Zoning Board of Adjustment
Meeting Agenda

City Council Chambers
1311 Chestnut Street
Bastrop, TX 78602

BASTROPTX
Heart of the Lost Pines / Est. 1832

September 7, 2021 at 6:00 P.M.

City of Bastrop Zoning Board of Adjustment meetings are available to all persons regardless of disability. If you require special assistance, please contact the Board Secretary at (512) 332-8840 or write 1311 Chestnut Street, 78602, or by calling through a T.D.D. (Telecommunication Device for the Deaf) to Relay Texas at 1-800-735-2989 at least 48 hours in advance of the meeting.

As authorized by Section 551.071 of the Texas Government Code, this meeting may be convened into closed Executive Session for the purposes of seeking confidential legal advice from the City Attorney on any item on the agenda at any time during the meeting.

The City of Bastrop reserves the right to reconvene, recess, or realign the Regular Session or called Executive Session or order of business at any time prior to adjournment.

1. **CALL TO ORDER**

2. **CITIZEN COMMENTS**

   At this time, comments will be taken from the audience on any topic.

   In accordance with the Texas Open Meetings Act, if a citizen discusses any item not on the agenda, the Board cannot discuss issues raised or make any decision at this time. Instead, city Boards are limited to making a statement of specific information or a recitation of existing policy in response to the inquiry. Issues may be referred to the Staff Liaison for research and possible future action.

   It is not the intention of the City of Bastrop to provide a public forum for the embarrassment or demeaning of any individual or group. Neither is it the intention of the Board to allow a member of the public to slur the performance, honesty, and/or integrity of the Board, as a body or any member or members of the Board, individually or collectively, nor any members of the city's staff. Accordingly, profane, insulting, or threatening language directed toward the Board and/or any person in the Board's presence will not be tolerated.

3. ITEMS FOR INDIVIDUAL CONSIDERATION

3A. Introduction of new Board member Richard Smarzik.

3B. Consider action to approve meeting minutes from the August 4, 2021 Zoning Board of Adjustment Meeting

3C. Public hearing and consider action on an appeal of a Grandfathered Development Status Determination and request for a variance to be exempt from the Bastrop Building Block (B3) Code for Bastrop Grove Section 3, Lots 8 and 9 Preliminary Plat, being 19.46 acres out of the Nancy Blakey Survey, Abstract 98, located east of SH 304 in the 600 Block west of SH 71, within the city limits of the City of Bastrop, Texas.

3D. Public hearing and consider action on an appeal of a Grandfathered Development Status Determination and request for a variance to be exempt from the Bastrop Building Block (B3) Code for Bastrop Grove Section 5 (previously called Section 2) Proposed Preliminary Plat, being 25.9 acres out of the Nancy Blakey Survey, Abstract 98, located east of SH 304 in the 600 Block west of SH 71, within the city limits of the City of Bastrop, Texas.

4. ADJOURNMENT

I, the undersigned authority, do hereby certify that this Notice of Meeting as posted in accordance with the regulations of the Texas Open Meetings Act on the bulletin board located at the entrance to the City of Bastrop City Hall, a place of convenient and readily accessible to the general public, as well as to the City's website, www.cityofbastrop.org and said Notice was posted on the following date and time: Friday, September 3, 2021 at 3:45 p.m. and remained posted for at least two hours after said meeting was convened.

_____
Allison Land, Senior Planner

STAFF REPORT

MEETING DATE: September 7, 2021 **AGENDA ITEM:** 3A

TITLE:
Introduction of new Board member Richard Smarzik

STAFF REPRESENTATIVE:
Jennifer C. Bills, Assistant Planning Director

ATTACHMENTS:
None



STAFF REPORT

MEETING DATE: September 7, 2021 **AGENDA ITEM:** 3B

TITLE:
Consider action to approve meeting minutes from the August 4, 2021 Zoning Board of Adjustment Meeting.

STAFF REPRESENTATIVE:
Nicole Peterson, Planning Technician

ATTACHMENTS:
Meeting Minutes



Zoning Board of Adjustments
August 4, 2021 Meeting Minutes

The City of Bastrop Zoning Board of Adjustments met Friday, August 4, 2021 at 6:00 p.m. in the Council Chambers located at 1311 Chestnut Street, Bastrop, Texas 78602.

1. CALL TO ORDER

Patrick Connell called the meeting to order at 6:01 p.m.

Patrick Connell	Present
Gary Moss	Present
Scot Robichaud	Present
Jeff Haladyna	Present

2. CITIZEN COMMENTS

There were no comments from citizens.

3. ITEMS FOR INDIVIDUAL CONSIDERATION

3A. Consider action to approve meeting minutes from the June 25, 2021 Zoning Board of Adjustment Meeting.

Gary Moss made a motion to approve the June 25, 2021 Zoning Board of Adjustment Meeting Minutes. Scot Robichaud seconded the motion and the motion carried unanimously.

3B. Consider action to appoint a Vice-Chair for the Zoning Board of Adjustments.

Gary Moss made a motion to appoint Scot Robichaud as Vice-Chair for the Zoning Board of Adjustments. Scot Robichaud seconded the motion and the motion carried unanimously.

3C. Public hearing and consider action on a variance request to Section 6.5.003(B) and Section 6.3.008(D) to allow a 220-foot tower with an additional 5-foot lighting rod on a 0.13 acre portion, out of the 223-acre Bastrop Town Tract, Abstract A11 located at 120 East Highway 21, within the City Limits of the City of Bastrop, Texas.

Jennifer Bills presented the information distributed in the Zoning Board of Adjustment Agenda Packet.

She stated the applicant is requesting to build a new 220-foot self-supporting lattice tower, with a 5-foot lighting rod, that will support multiple wireless transmission facilities. She discussed with the Board the notifications City Staff had send out for the public hearing and that no responses had been received for or against the applicant's request.

The decisions were based on the following findings and facts:

1. The Bastrop Building Block (B^3) Code does not have provisions for Wireless Transmission Facilities (Communication Towers)

2. The applicant has a property with restrictions from the Lost Pines Habitat Conservation Plan that requires limits on impervious cover and soil disruptions.
3. The location is adjacent to existing commercial and undeveloped land, which will not be injurious to property in the area.
4. This property is identified in the Comprehensive Plan as Rural Residential adjacent to Local Commercial and Public future land uses. Along with the location near the State Highway 21, providing communication infrastructure is compatible with the existing and future land uses.
5. The hardship exists because the B³ Code does not account for WTF (towers) in any district.
6. The conditions and circumstances were not created by the property owner or applicant.
7. The applicant has not made any finding of financial hardship.
8. The applicant has provided their findings of fact as attached in the staff report, along with provided exhibits.

Jennifer Bills stated that Staff recommends approval of the variances to Section 6.5.003(B) Building Height and Section 6.3.008(D) Lot Occupation to allow a 220-foot tower with an additional 5-foot lighting rod (225-feet total) on a 0.13-acre portion, out of the 223-acre Bastrop Town Tract, Abstract A11 located at 120 East Highway 21.

Ralph Wyngarden, spoke on behalf of Hemphill LLC with the Board regarding the request. He stated the tower would be able to have other providers and that it wouldn't prevent other companies from using it. Additional discussion commenced between the Board and Ralph regarding the tower request, and the timing of construction on this project along with the uses from other companies and who it would all serve/support.

The presentation and discussion with the applicant's representative concluded.

Patrick Connell opened the public hearing.

There were no comments from the public.

Patrick Connell closed the public hearing.

Gary Moss made a motioned to approve a variance request to Section 6.5.003(B) and Section 6.3.008(D) to allow a 220-foot tower with an additional 5-foot lighting rod on a 0.13-acre portion, out of the 223-acre Bastrop Town Tract, Abstract A11 located at 120 East Highway 21, within the City Limits of the City of Bastrop, Texas. Jeffrey Haladyna seconded the motion and the motion carried unanimously.

4. ADJOURNMENT

Scot Robichaud made a motion to adjourn the meeting at 6:31 pm. Gary Moss seconded the motion and the motion carried unanimously.

_____
Chair

_____
Vice-Chair

STAFF REPORT

MEETING DATE: September 7, 2021 **AGENDA ITEM:** 3C

TITLE:
Public hearing and consider action on an appeal of a Grandfathered Development Status Determination and request for a variance to be exempt from the Bastrop Building Block (B3) Code for Bastrop Grove Section 3, Lots 8 and 9 Preliminary Plat, being 19.46 acres out of the Nancy Blakey Survey, Abstract 98, located east of SH 304 in the 600 Block west of SH 71, within the city limits of the City of Bastrop, Texas.

AGENDA ITEM SUBMITTED BY:
Jennifer C. Bills, Assistant Planning Director
Trey Job, Assistant City Manager of Community Development

ITEM DETAILS:

Site Address:	600 Block of West State Highway 71, east of State Highway 304 and south of State Highway 71 (Attachment 1)
Total Acreage:	19.46 acres
Legal Description:	19.46 acres of land out of the Nancy Blakey Survey, Abstract 98
Property Owner:	71 Retail Partners/Douglas MacMahon
Agent Contact:	Carlson, Brigance, and Doering/Brendan McEntee
Existing Use:	Vacant/Undeveloped
Existing Zoning:	P-5, Place Type 5 – Core
Future Land Use:	General Commercial

BACKGROUND/HISTORY:
The Texas Local Government Code Chapter 245 contains specific language about projects and permits that have been filed with a municipality and establishes the intent of the development projects. Below is a timeline of applications that provide the intent to create a nine-lot commercial subdivision. No other master plan or concept plan has been submitted that further defines the project for the entire subdivision. For Lot 1 and Lot 6, additional site development plans and building permits were submitted and subsequently constructed, completing the projects for those particular lots. However, no plans other than subdivision have been submitted for the remaining seven lots.

With the project information provided to this date, the City determined the appropriate grandfathering date is May 22, 2017, which is the date the applicant submitted the Preliminary Plat that has been moving forward with subsequent permits. The City agrees that the property classification is commercial, and as additional permits are submitted, will review them under the regulations in effect per the grandfathered date for subdivision and specific municipal regulations that informed the subdivision standards, including regulation in effect related to landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions,

lot coverage or building size. All other elements will be reviewed under current regulations (Stormwater Drainage Ordinance and Bastrop Building Block (B³) Code, etc.). The timeline below establishes the applications that have been considered during the review.

Bastrop Grove Plat Timeline:

- July 24, 2013 – Preliminary Plat for The Grove Application Submitted
    - Eight lot commercial subdivision - Approved by City Council on July 8, 2014
    - Plat expired on March 30, 2015

- August 5, 2013 – Final Plat for Bastrop Grove Phase 1 Application Submitted
    - One lot Final Plat – Comments sent September 29, 2013
    - No response from applicant – expired November 13, 2013 (45 days)

- May 23, 2014 - Final Plat for The Grove Phase 1 Lot 5 Application Submitted
    - One lot Final Plat approved by City Council August 12, 2014
    - 180-day Extension approved by City Council on July 28, 2015
    - Plat expired February 8, 2016

- May 22, 2017 – Preliminary Plat for The Bastrop Grove Application Submitted
    - Approved August 8, 2017, by City Council – replaced expired The Grove Preliminary Plat from July 24, 2013

- March 17, 2018 – Final Plat for Bastrop Grove Section 1 Application Submitted
    - 5 lots approved by City Council on July 24, 2018
    - Recorded July 27, 2018

- May 23, 2018 – Bastrop Grove Drainage Improvements – Improvements to Lots 1 & 2 and offsite Application Submitted
    - Plans Approved October 1, 2018
    - Completed May 17, 2019

- January 3, 2020 – Final Plat for Bastrop Section 2, Lot 6 Application Submitted
    - Approved by Planning & Zoning Commission on November 21, 2019
    - Recorded January 3, 2020

Individual lot timelines for Site Development and Building Permits:

- Bastrop Grove, Phase 1, Lot 1
    - Site Development Plan
        - Approved July 27, 2018, Amended September 25, 2019
        - Completed November 19, 2019

    - Building Permits
        - Issued August 1, 2018
        - Project/Permit Completed November 19, 2019

- Bastrop Grove, Section 2, Lot 6 – Bastrop Medtail (ARC Medical)
    - Final Drainage Plan
        - November 22, 2019 Application
        - Permit Completed on May 7, 2021 with City Engineer Acceptance

- February 27, 2020 – Site Development Plan
  - Submitted February 27, 2020
  - Permit Completed May 7, 2021

- Building Permit
  - Submitted March 3, 2020
  - Project/Permit Completed May 3, 2021

Grandfathering Appeal

The applicant is appealing three aspects of this determination (Attachment 3).

1. They do not agree with the determination that they are grandfathered to the Subdivision Ordinance (Chapter 10 of the Code of Ordinance on May 22, 2017) and the specific regulations that informed the subdivision standards, including regulations in effected related to landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size. (Chapter 14 of the Code of Ordinances as of May 22, 2017).

2. The property classification of commercial.

3. The project is not grandfathered to any regulations exempted by LGC Section 245.004 which includes drainage, zoning, sign regulations, which were updated with the Stormwater Drainage Ordinance and the Bastrop Building Block (B³) Code in 2019.

The Grandfathering Determination by the City maintains that the project is Grandfathered to the May 22, 2017, Subdivision Ordinance, and the sections of Chapter 14 – Zoning per LGC 245. The applicant is requesting that the city provide a full analysis of the previous and current code for applicability to any possible permits that may be submitted. The current project is defined by the nine-lot preliminary plat on file and staff agrees that it can continue to process subsequent subdivision applications using the preliminary plat layout. Planning staff is requesting clarification on the project outside of the subdivision improvements to make those determinations.

The appeal also states that since the B³ Code Place Type Zoning District do not mention use or provide a use table, that it cannot be considered zoning and exempt under Chapter 245. The B³ Code is a form-based code. Chapter 211 of the Local Government Code does not include “use” as a required element for zoning regulations.

Additionally, the applicant states that new stormwater regulations would only apply in a flood plain established by a federal flood control program. The subdivision was designed using a regional storm channel that directly discharges into Colorado River, thus impacting the floodway and 1 percent annual chance (100-year) flood hazard zone (floodplain). The Bastrop Grove Preliminary Plat for Sections 1-3 is also within the 0.2 percent annual chance (500-year) flood hazard zone (floodplain).

Request for Variance

If the appeal is denied, the applicant is requesting a variance for the Project to be exempt from all B³ Codes and the Stormwater Drainage Ordinance, and more specifically the requirements of the Code to complete a Neighborhood Regulating Plan, the requirements of the Development Patterns in Chapter 5, and compliance with the Building Placement requirements of Chapter 6, any building size regulation (or regulations that affect building size, including without limitation the Build-to-line and building to

land ratio), and minimum or maximum setbacks, and any other B³ Code requirements which affects the Project's Vested Rights.

Planning Staff does not recommend a blanket variance to the B³ Codes without review of a specific project outlining how the variances would affect each site.

POLICY EXPLANATION:
V.T.C.A. Local Government Code Chapter 245 ("LGC 245"), provides an opportunity for landowners or developers to lock-in certain government regulations that apply to a particular development by filing a specific permit application. are regulated under Section 212.172 of the Texas Local Government Code.

Bastrop adopted Article 1.20 – Uniformity of Requirements, commonly referred to as the "Grandfathering Development Status Ordinance". This provides standards and procedures to determine possible grandfathered development status of development projects.

Procedure:

1. Applicant submission of Grandfathering Request with documentation
    a. April 19, 2021 (Attachment 4)

2. Grandfathering Review Committee (Director of Planning, City Engineer, and Public Works Director) makes determination within 15 business days.
    a. The Committee determination was made and sent on May 4, 2021. (Attachment 5)

3. Applicant can request reconsideration of the determination by the Grandfathering Review Committee within 15 business days of determination.
    a. Submitted May 25, 2021 (Attachment 6)

4. Grandfathering Review Committee can either affirm or reverse the determination within 15 business days of request.
    a. Decision upheld – June 15, 2021 (Attachment 7)

5. If the determination reconsideration is denied, the request is automatically forwarded to the City Manager for determination, which must be completed within 15 business days of reconsideration determination.
    a. Forwarded on June 16, 2021
    b. Determination on July 7, 2021 (Attachment 2)

6. Applicant can appeal the City Manager's determination to the Zoning Board of Adjustment within 15 business days of determination.
    a. Appeal submitted on July 28, 2021 (Attachment 3)

7. The ZBA must be convened within 30 days after the appeal has been received (or the City Manager, at the request of the appellant can postpone to a date certain), or the appeal is deemed to have automatically been denied.
    a. Meeting called for September 7, 2021.

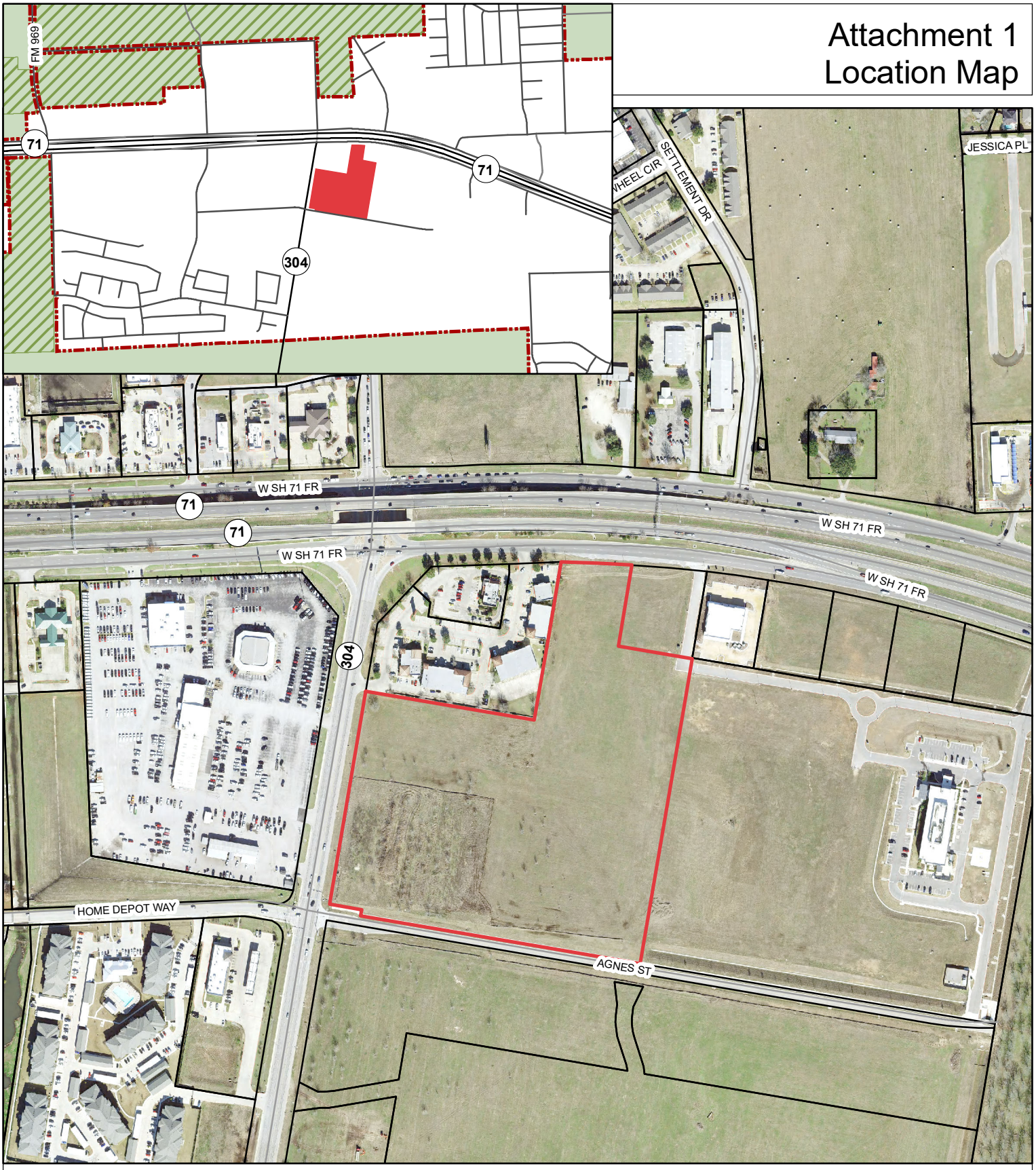
8. Should the appellant be dissatisfied with the actions of the ZBA, the appellant may pursue all legal remedies to review the ZBA's decision as set forth in LGC Section 211.011.

RECOMMENDATION:
Hold public hearing and consider action on an appeal of a Grandfathered Development Status Determination and request for a variance to be exempt from the Bastrop Building Block (B3) Code for Bastrop Grove Section 3, Lots 8 and 9 Preliminary Plat, being 19.46 acres out of the Nancy Blakey Survey, Abstract 98, located east of SH 304 in the 600 Block west of SH 71, within the city limits of the City of Bastrop, Texas.

ATTACHMENTS:

- Attachment 1 – Location Map
- Attachment 2 – City Manager Reconsideration Determination June 7, 2021
- Attachment 3 – Applicant Appeal to Zoning Board of Adjustment May 7, 2021
- Attachment 4 – Applicant Grandfathering Request for Bastrop Grove, Section 3, Lots 8 & 9 - April 19, 2021
- Attachment 5 – Grandfathering Review Committee Determination May 4, 2021
- Attachment 6 – Applicant GRC Reconsideration Request May 25, 2021
- Attachment 7 – GRC Reconsideration Determination July 7, 2021

Attachment 1
Location Map



Bastrop Grove
Lots 8 and 9

BASTROPTX
Heart of the Lost Pines
Est. 1832

0 135 270 540
Feet

1 inch = 400 feet

N

Date: 8/13/2021

The accuracy and precision of this cartographic data is limited and should be used for information /planning purposes only. This data does not replace surveys conducted by registered Texas land surveyors nor does it constitute an "official" verification of zoning, land use classification, or other classification set forth in local, state, or federal regulatory processes. The City of Bastrop, nor any of its employees, do not make any warranty of merchantability and fitness for particular purpose, or assumes any legal liablity or responsibility for the accuracy, completeness or usefullness of any such information, nor does it represent that its use would not infringe upon privately owned rights.

July 7, 2021

71 Retail Partners LP
C/O Douglas MacMahon
8214 Westchester Drive, Suite 550
Dallas, TX 75225

Dear Mr. MacMahon,

I have reviewed the documents that have been submitted and the previous determinations of the Grandfathering Committee issued by Trey Job, Assistant City Manager (Acting Director of Planning & Development).

This request is to determine which of the previously adopted city codes can be utilized by the current project, not which sections of the current code are applicable. I concur with the determination that the property described as Bastrop Grove, Section 3, Lot 8 & 9 is grandfathered to specific regulations in effect as of May 22, 2017, the date of the submittal of the Bastrop Grove Preliminary Plat, which was approved by City Council on August 8, 2017. This is the controlling document for the approval, disapproval, or conditional approval of future application for subdivision, pursuant to LGC § 245.002(a) and (b), as may be amended.

To this end, the project is grandfathered to the Subdivision Ordinance (Chapter 10 of the Code of Ordinances 2017), and specific municipal regulations that informed the subdivision standards, including regulations in effect related to landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size (Chapter 14 of the Code of Ordinance 2017). As noted in the previous determination, the property classification as of May 22, 2017 was commercial, and the property remains classified as commercial with the Place Type 5 district as rezoned during in the B^3 Code (Attachment 1).

The project is not grandfathered to any regulations exempted by LGC § 245.004, which includes drainage, zoning, and sign regulations, which were updated with the Stormwater Drainage Ordinance and the Bastrop Building Block (B^3) Code in 2019. The B^3 Code is a unified development code, which includes subdivision, zoning, and sign regulations.

Sincerely,

Paul A. Hofmann
City Manager

CC: Trey Job, Assistant City Manager
Jennifer Bills, Assistant Planning Director

Enclosure: Attachment 1

Notice of Pending Zoning Change
City of Bastrop
Planning & Zoning Commission
And City Council

Dear Property Owner: 71 RETAIL PARTNERS LP

The **Planning and Zoning Commission** will conduct a public hearing on **Thursday, September 26, 2019 at 6:00 p.m.** and the **City Council** will conduct a public hearing (first reading) **Tuesday, October 8, 2019 at 6:30 p.m.** and a public hearing (second reading) **Tuesday, October 22, 2019 at 6:30 p.m.** in the **City Hall Council Chambers located at 1311 Chestnut Street, Bastrop, Texas** on changing the zoning of all property within the City Limits of Bastrop, Texas.

Property ID/Parcel Number:	126678
Current Zoning:	Commercial-1
New Zoning (Place Type):	P-5 Core

If your property is within a Planned Development District, the change in zoning will not affect your specific Planned Development District standards.

The City will host a Come and Go Open House for citizens on **Thursday, September 19, 2019** from **6:30 p.m. to 8:00 p.m.** in the **City Hall Council Chambers located at 1311 Chestnut Street, Bastrop, Texas.** This is an opportunity to have property-specific questions answered.

Additional information on the Bastrop Building Block Code and a zoning map are available at this website: https://www.cityofbastrop.org/page/buildingbastrop

You may also contact the Planning & Development Department at (512) 332-8840, plan@cityofbastrop.org, visit the office at 1311 Chestnut Street, Bastrop, Texas, or mail the response card below to PO Box 427, Bastrop, Texas 78602.

✂ ----------

PROPERTY OWNER'S RESPONSE

As a property owner within 200 feet: (please check one)

- ☐ I am in favor of the change.
- ☐ I am opposed to the change.
- ☐ I have no objection to the change.

Property Owner Name: _____

Property Address: _____

Mailing Address (if different than property address): _____

Phone (optional): _____ Email (optional): _____

Property Owner's Signature: _____

Additional Comments (Optional): _____

_____

Re: Bastrop Building Block Code Zoning Change

71 RETAIL PARTNERS, L.P.
8214 Westchester Drive, Ste 550
Dallas, TX 75225

July 28, 2021

City of Bastrop
Zoning Board of Adjustment
1311 Chestnut Street
Bastrop, TX 78602

Re: Lots 8 & 9 Bastrop Grove - Grandfathering

Dear Sir or Madam,

71 Retail Partners, L.P. ("**71 RP**") filed a Grandfathering Development Status Application (the "**GDSA Application**") under City Code Art. 1.20 (the "**Ordinance**") on April 19th, 2021. The Grandfathering Review Committee (the "**GRC**") issued a determination (the "**GRC Determination**") on May 4th, 2021. 71 RP requested reconsideration of the GRC Determination on May 25th, 2021 (the "**Reconsideration Request**") and the GRC declined to reconsider on June 15th, 2021, which automatically appealed the GRC Determination to the City Manager, who issued his determination (the "**CM Determination**") on July 7th, 2021. This is an appeal of the prior determinations, and, in the alternative, a request for a variance.

The GRC Determination is required by the City for the City to make its own determination of its position on the application of Texas Local Government Code ("**LGC**") Chapter 245 ("**LGC 245**"), which provides protections from changes in local regulation as to an ongoing development project (such protections being commonly known as "**vested rights**"). Only LGC 245 determines the applicable vested rights, and to the extent the Ordinance seeks to limit vested rights or to give the City control over the interpretation process (such as, but not limited to, establishing standards and burdens), we protest, and submit the application and this appeal under protest. The GRC Determination and interim administrative appeals are for the benefit of the City and are not binding on 71 RP as to the nature or extent of vested rights. 71 RP reserves all its rights under LGC 245.

Vested Rights defined (emphasis added):

- "If a series of permits is required for a project, the orders, regulations, ordinances, rules, expiration dates, or other properly adopted requirements *in effect at the time the original application for the first permit in that series is filed shall be the sole basis for consideration of all subsequent permits required for the completion of the project.* All permits required

for the project are considered to be a single series of permits. Preliminary plans and related subdivision plats, site plans, and all other development permits for land covered by the preliminary plans or subdivision plats are considered collectively to be one series of permits for a project." LGC 245.002(b)

- "Rights to which a permit applicant is entitled under this chapter *accrue on the filing of an original application or plan for development or plat application* that gives the regulatory agency fair notice of the project and the nature of the permit sought." LGC 245.002(a-1)

CM DETERMINATIONS

The CM Determinations were as follows:

1. The Project is vested under LGC 245 as of May 22nd, 2017.

2. "...the project is grandfathered to the Subdivision Ordinance (Chapter 10 of the Code of Ordinances 2017), and specific municipal regulations that informed the subdivision standards, including regulations in effect related to landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size (Chapter 14 of the Code of Ordinancess 2017)."

3. "...the property classification as of May 22, 2017 was commercial...."

4. "The project is not grandfathered to any regulations exempted by LGC Sec. 245.004, which includes drainage, zoning and sign regulations, which were updated with the Stormwater Drainage Ordinance and the Bastrop Building Block (B3) Code in 2019."

71 RP appeals the 2nd, 3rd, and 4th determination above.

APPEAL OF GRANDFATHERING DETERMINATIONS

71 RP hereby appeals to Zoning Board of Adjustment (the "**ZBA**") pursuant to the Ordinance, which requires the following:

1. A statement that the appellant sought an appeal from the City Manager, and that the appeal:
    a. Was denied;
    b. Yielded an erroneous determination regarding the project's eligibility for grandfathered development status.
2. A statement of the reasons why the determination should be reversed or modified;
3. An explanation of the legal and factual grounds of the appeal; and

4. Payment of the appeal fee established by the City Council, as codified in the city's fee schedule.

For purposes of this appeal request, the word "Project" refers to the development of the 52.68 acre tract that was owned by 71 RP on May 22nd, 2017, which is the date 71 RP submitted a Preliminary Plat Application (the "**2017 Application**") that the City acknowledges is the vesting event for the Project. The Project, as shown on the 2017 application and on the plat applications discussed below, is inclusive of the creation of the lots and related infrastructure and the construction of buildings thereon. Both the land development and the building development are entitled to vested rights. 71 RP has continuously pursued this Project since the 2017 Application, having sold land which has been platted and buildings constructed, such as Seton Hospital and Medtail. The scope and nature of the Project is well known to the City, as suburban retail/commercial development for buildings consistent with the Seton and Medtail developments. Lot 8 is a typical pad site. The elements of the contemplated retail/commercial pad sites are relatively small buildings (usually 1 story), typically centered in each lot, with ample surface parking surrounding the building, and cross access easements shared among the other pad sites. These lots are typically called "commercial reserves". Lot 9 is a larger tract for larger development. Lots 8 & 9 were planned for and contemplated building under the regulations prescribed by the City's ordinances at the time of the 2017 Preliminary Plat application. 71 RP is seeking to finalize the platting of Lots 8 & 9, and to determinate the applicable local development rules.

Appeal # 1: The Grandfathered Development Status Application process (the "GDSA Process") requires determination of both (1) which of the previously adopted city codes apply to the Project, and (2) which sections of the current code are applicable.

71 RP believes the CM Determination made an erroneous determination in the following statement, "This request is to determine which of the previously adopted city codes can be utilized by the current project, not which sections of the current code are applicable."

71 RP asserts that the GDSA Process prescribed in the Ordinance should include a determination of <u>both</u> which previously adopted city codes can be utilized as well as which sections of the current code are and are not applicable. Otherwise, the effort has no practical benefit for either the City or the developer. The City seems to rely on Sec. 1.20.004(c) which states "This section shall not apply to permits or regulations listed as exemptions in LGC 245.004, as may be amended." The City acknowledges that the Subdivision Ordinance in effect in 2017 (and "...municipal regulations that informed the subdivision standards...") applies but does not explain its position as to what aspect of the B3 Code (as defined below) are applicable.

<u>It is only fair that the City provide this determination</u>.

71 RP asserts the following in support of its request:

- Section 1.20.003 of the Bastrop City Code states that the purpose of the GDSA Process is to "Provide increased certainty and predictability in the city's regulatory process."
- Section 1.20.006 of the Bastrop City Code states "It is the policy of the city that the construction, development, and/or land use permit applications filed with the city are presumed to be governed by then-current regulations."
- Section 1.20.010 of the Bastrop City Code states "If an applicant contends that certain city regulations do not apply to the project, the applicant is expected to identify, with particularity, all requirements that the applicant contends do not apply to the current application."
- 71 RP's GDSA Application stated that the following regulations do not apply to the Project:
    - The Bastrop Building Block Code, the Bastrop Building Block Technical Manual, and the Bastrop Development Manual (collectively the "**B3 Code**").
    - 71 RP's Reconsideration Request requested the City state the City's position on the applicability of the B3 Code to the Project.

Given the above, if (1) the purpose of the GDSA Process is to provide increased certainty and predictability, (2) the policy of the city is a presumption that the current regulations apply, (3) the city code requires the applicant to specify which regulations in the current code are not applicable to the Project, (4) the GDSA Application states with specificity which regulations 71 RP believes do not apply, (5) the GRC Determination and CM Determination state that certain elements of the B3 Code may apply without specificity, and (6) the Reconsideration Request asked for clarification of the statements in the GRC Determination and CM Determination, 71 RP asserts the following:

- To achieve the stated purpose of providing increased certainty and predictability, the CM Determination should have included a clear determination of which regulations do and do not apply. To say that some regulations apply and others may apply as the GRC Determination and CM Determination did does not achieve the stated purpose of the GDSA Process.

- The City Manager erred in stating that 71 RP's GDSA Application is not to determine which sections of the current code are applicable. In fact, Section 1.20.010 of the Bastrop City Code requires the applicant to identify which sections of the current code are not applicable under LGC 245, 71 RP did this as part of its application, and the City Manager is required to make a determination of the statements in the GDSA Application with a level of specificity that provides increased certainty and predictability.

Appeal # 2: The Bastrop Building Block (B3) Code, the B3 Technical Manual, and the Development Manual are NOT "municipal zoning regulations", thus are not exempted from vesting.

71 RP believes the CM Determination made an erroneous determination that the B3 Code is exempted by LGC 245.004 as a zoning ordinance. The CM Determination is silent as to the applicability of the B3 Technical Manual and Development Manual that is asserted in the GRC Determination, but for purposes of this appeal, the term B3 Code includes these documents. We request a clear determination of this issue.

The B3 Code does not apply to the Project, because it is not a municipal zoning regulation as defined by State law.

71 RP asserts the following in support of its request and offers the following explanation of the legal and factual grounds of this appeal:

- The B3 Code is a "Form Based Code," which is not based on use, but rather on the form of building and a required grid street structure and public infrastructure. Without use regulation, the B3 Code cannot be zoning, See *Powell v. City of Houston*, No. 19-0689, 2021 WL 2273976 (Tex. June 4, 2021) holding that use regulation is a critical component for a municipal ordinance to be considered a zoning regulation. Public infrastructure is regulated by the subdivision and platting process, not the zoning process. Zoning focuses on separation of use by geographic district. The City acknowledges that the Project is grandfathered to "municipal regulations which informed the subdivision standards". Use is not directly regulated by the B3 Code. There are no permitted/prohibited uses, no use table or matrix, and no use definitions. A fair reading of the B3 Code shows it is not zoning regulations, but rather subdivision and platting regulations.

- Additionally, the B3 Code does not comply with the mandatory requirement of TEX. LOC. GOV'T CODE § 211.005(b) that zoning regulations be uniform for each class or type of building in a zoning district, to be adopted with reasonable consideration for each district's peculiar suitability for particular uses. The form-based code does not consider uses, but blocks, grids, setbacks and building form. Thus, the B3 Code cannot be considered zoning regulations, as Texas municipal zoning regulations may only be adopted in compliance with TEX. LOC. GOV'T CODE § 211. Because the B3 Code is not a "municipal zoning regulation," it does not qualify for exemption under Texas TEX. LOC. GOV'T CODE § 245.004 and therefore, no portion of the B3 Code applies to the Project and the GRC Determination and the CM Determination erred in asserting that any portion of the B3 Code applies to the Project.

- The B3 Code is not a municipal zoning regulation, but a "form-based code" whose regulations are based on public infrastructure. Public infrastructure is regulated by the subdivision and platting process, not the zoning process. Zoning focuses on separation of use by geographic district. Use is not directly regulated by the B3 Code. There are no permitted/prohibited uses, no use table or matrix, and no use definitions. A fair reading of the B3 Code shows it is not zoning regulations, but subdivision and platting regulations.

Simply put, a zoning regulation regulates use by zone. The B3 Code regulates use by form. This is an important distinction as regulating use by form means that use regulations are based on specific requirements that affect the LGC 245.004 Vested Rights (defined below) and therefore do not qualify for exemption.

Appeal # 3: The B3 Code affects landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size, thus are not exempt from vesting, even if B3 Code is a municipal zoning regulation as defined by state law.

LGC 245.004(2) provides an exemption to LGC 245 for "*municipal zoning regulations* that do not affect landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size or that do not change development permitted by a restrictive covenant required by a municipality". *emphasis added.*

Therefore, in order for a zoning regulation to be exempt under LGC 245.004 (2), such regulation must pass a **two-part test**. It must be a municipal zoning regulation **and** must not affect landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size (collectively the "**LGC 245.004 Vested Rights**"). The word "affect" means "having an effect on", which is a broad interpretation. The B3 Code impacts every aspect of the LGC 245.004 Vested Rights. 71 RP asserts that the B3 Code fails this test as follows:

- The broad exceptions for LGC 245.004 Vested Rights to the general "municipal zoning regulations" exemption in LGC 245.004 swallow the general exemption when applied to the B3 Code. The "B3 Development Tables" in the Code, which "contain the details necessary to develop using the Code" contain specific requirements for lot sizes, lot dimensions, lot coverage, building sizes, open space and park dedication requirements. Any regulations which have any effect on these areas are subject to vesting as "exceptions to the exemption". As a form-based code, the core focus is on infrastructure, particularly the street grid and "blocks". This approach, by its nature, affects the LGC 245.004 Vested Rights. Given that the details necessary to develop using the B3 Code directly affect the

LGC 245.004 Vested Rights, the B3 Code fails the test and does not qualify as exempt under LGC 245.004.

- Page 22 of the B3 Code states "Blocks are the foundation for development in Bastrop." If Blocks (and therefore street grids/specifications and lot sizes/dimensions) are the foundation of development in Bastrop under the B3 Code, then the B3 Code, without question, fails the test and does not qualify as exempt under LGC 245.004 exemption for "municipal zoning regulations."

- The B3 Code is a "unified development code" which mixed various types of land use regulations that otherwise would be separate ordinances. It is not "municipal zoning regulations" of the type contemplated when LGC 245 was adopted. This is particularly true for a form-based code. The "Explanation of the Code" on Page 15 of the B3 Code states "Each section of the Code provides Standards that guide development to be holistic to each Building, Street, Block, and neighborhood." Merriam-Webster defines "holistic" as "relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts". As a result, the B3 Code cannot be dissected and must be considered in its entirety, where it fails the test to be "municipal zoning regulations" and does not qualify as exempt under LGC 245.004.

In summary, even if the B3 Code (as defined herein to include relating manuals) qualifies as a municipal zoning regulation, it is not exempt from LGC 245 because it fails the second test under LGC 245.004, and therefore, the B3 Code does not apply to the Project.

Appeal #4: To the extent the Project is subject to any elements of the Bastrop Building Block (B3) Code, the B3 Technical Manual, and the Development Manual, what are they?

As stated in #2 & #3 above, 71 RP asserts that the entirety of the Bastrop Building Block (B3) Code, the B3 Technical Manual, and the Development Manual are not applicable to the Project. To the extent the ZBA concurs with the City Manager's determination that the B3 Code is a "municipal zoning regulation", subject to the LGC 245.004 Vested Rights in LGC 245.004(2), 71 RP asserts that the Project is specifically exempt from the following elements (listed by Chapter) and asks the City to confirm the same:

- Executive Summary- This section is not regulatory in nature and should not be applicable to the Project.

- Chap. 1- Chapter 1: *Subdivisions* is not applicable to the Project. Pursuant to LGC 245, the Project is grandfathered to the subdivision ordinance in effect at the time of the original application and therefore any future subdivision or platting application for the Project

would not be subject to the requirements of Chapter 1. The City response on subdivision regulation is confusing and should be clarified to state that B3 Code Chap. 1 does not apply.

- Chap. 2- Chapter 2: *Zoning Procedures* deals with procedural aspects only. It is only applicable to the extent there is no effect on the LGC 245.004 Vested Rights (which we believe eliminates the B3 Code in its entirety).

- Chap. 3- Chapter 3: *Place Type Zoning Districts* cannot be fairly read as "municipal zoning regulations". There is no focus on use, whether with a hierarchy of uses or separate of uses. But for a gratuitous scattering of the word "zoning" in Chap. 3, it reads like a subdivision or platting regulation, focused on street and block patterns and size. The geographic division is not based on use, but on street block based subdivision/platting standards. The requirement to prepare a Neighborhood Regulating Plan (a "**NRP**") is a critical component of the B3 Code and its focus is purely streets and blocks. Each NRP will be unique to each site, thus will not be uniform for each class or type of building in a district, as required by LGC 211.005. The districts and related regulations do not consider each district's peculiar suitability for particular uses, as required by LGC 211.005, and don't consider or regulate uses at all. Chapter 2 of the B3 Technical Manual, which describes the NRP process, is titled "Site Planning and Private Realm." A fair reading of that Chapter shows that it is not part of "municipal zoning regulations", but rather subdivision and platting regulations. Article 2.3 of the B3 Technical Manual states "Neighborhood Regulating Plans are used as the process to create new complete neighborhoods. Each neighborhood will be made of a series of blocks created for a variety of Street Types, Building Types, and Place Types." The NRP's process to create "new complete neighborhoods" requires dedication of land for streets of designated sizes to creates certain block sizes to build specifically designated building types. The NRP is platting and subdivision regulation, not zoning, which is why the NRP is the first step for any owner of greater than 3.4 acres under the B3 Code seeking to subdivide its land. The NRP is a part of the platting process, not the zoning process. The NRP process is subject to vested rights and is not applicable to the Project (and no portion of Chapter 3 of the B3 Code or Chapter 2 of B3 Technical Manual is applicable). As such, the NRP process directly affects the LGC 245.004 Vested Rights, is not exempt under LGC 245.004, and the City should clearly so state.

- Chap. 4- Chapter 4: *Character Districts* of the B3 Code can't be fairly read as "municipal zoning regulations". There is no focus on use, whether with a hierarchy of uses or separate of uses. The districts and related regulations do not consider each district's peculiar suitability for particular uses, as required by LGC 211.005, and don't consider or regulate uses at all. Chapter Four of the B3 Code states that "Character Districts are the

largest regulating geographic boundary in the Code" and "...each character district allows for different Development Patterns." If this Chapter is "municipal zoning regulations", it is only applicable to the extent there is no effect on the LGC 245.004 Vested Rights (which we believe eliminates the B3 Code in its entirety).

- Chap. 5- Chapter 5: *Development Patterns* of the B3 Code states "The Development Pattern type will be used to guide the creation of...the Neighborhood Regulating Plan." Chapter 5 cannot be fairly read as "municipal zoning regulations". There is no focus on use, whether with a hierarchy of uses or separate of uses. As stated above, the Project is exempt from submitting a NRP and therefore is exempt from Chapter 5 of the B3 Code. In addition, Chapter 5 states the Project is located in the "Meadows" Character District, which solely permits either a Development Pattern of Traditional Neighborhood Development or Village Center Development. Each of these Development Patterns imposes development requirements on the Project that affect LGC 245.004 Vested Rights. If this Chapter is "municipal zoning regulations", it is only applicable to the extent there is no effect on the LGC 245.004 Vested Rights (which we believe eliminates the B3 Code in its entirety). If the Project is vested from the NRP process, then it should also be exempt from all of Chapter 5, and the City should clearly so state.

- Chap. 6- Chapter 6: *Private Realm* is not applicable to the Project. Chapter 6 states the permitting requirements under the B3 Code for building and site plan approvals, which are pre-requisites under the B3 Code for issuance of a building or construction permit. Chapter 6 clearly affects the LGC 245.004 Vested Rights, including without limitation, lot coverage and building size (as dictated by the Façade Buildout at Build-to-Line minimum percentage requirement), which is shown most clearly in the chart under Sec. 6.5.003 on Page 109. While lot coverage is explicitly regulated by Chapter 6, the use of the minimum "Build-to-Line" percentage requirement affects building size, which is included in the LGC 245.004 Vested Rights by requiring that a building be a minimum length based on the lot dimensions. By imposing a strict requirement on building dimensions, certain building sizes are impossible or impractical to build. Chapter 6 also affects landscaping and tree preservation (Section 6.3.004), which is a LGC 245.004 Vested Right. The Project should be grandfathered from all aspects of Chap. 6, but at least Façade Buildout, Build to Line, Building Placement, building dimensions, landscaping and tree preservation provisions.

- Chap. 7- Chapter 7: *Public Realm* is not applicable to the Project. Chapter 7 states the requirements for public dedication of streets and other ROW's of certain size and design, which impact LGC 245.004 Vested Rights, including without limitation landscaping and tree preservation, open space and park dedication, property classification, lot size, lot dimensions, lot coverage, and building size. Each aspect of Chapter 7 affects the LGC 245.004 Vested Rights and are therefore not exempt under LGC 254.004(2). Instead,

Chapter 7 is a subdivision or platting regulation. In addition, Section 7.4.001 *Intent* states "The Bastrop Building Block is the foundation of Bastrop and of the Code.". If the foundation of the Code is not exempt under LGC 254.004, then the Code itself cannot be exempt. Furthermore, Article 7.5 requires a specific percentage of any Project to be dedicated to Civic Space, which clearly affects LGC 245.004 Vested Rights and is not exempt under LGC 254.004.

- Chap. 8- Chapter 8: Signage is not applicable to the Project. Chapter 8 states the requirements for securing sign permits, which is not a municipal zoning regulation and therefore is not exempt under LGC 254.004. In addition, the Project benefits from an agreement between the City of Bastrop and Hal and Lisa Berdoll dated July 17, 1993, in which the City of Bastrop agrees to issue all permits, variances, and approvals as may be required to construct, own, and operate a sign with a height not to exceed twenty (20) feet higher than any sign, flag pole, or similar structure which may exist within 2500 feet (all as more particularly in described in such agreement). 71 RP reserves any and all rights under such agreement.

- Chap. 9- Chapter 9: *Historic Landmark Preservation & The Iredell District* are not applicable to the Project due to the nature of such chapter.

- Chap. 10- Chapter 10: *Definitions* is not applicable to the Project to the extent such definitions define terms that affect vested rights under LGC 245, including without limitation the LGC 245.004 Vested Rights or are otherwise used in the sections of the B3 Code that are not applicable to the Project.

- The B3 Technical Manual and the Development Manual (collectively the "Manuals") simply implement the B3 Code, and to the extent the B3 Code (or any portion thereof) is not applicable, then the Manuals are also not applicable. The Manuals do not stand on their own.

The B3 Code does not comply with the mandatory requirements of LGC 211.005(b) for its regulations to be uniform for each class or type of building in a district, to be adopted with reasonable consideration for each district's peculiar suitability for particular uses, thus the B3 Code cannot be considered zoning regulations, as Texas municipal zoning regulations may only be adopted in compliance with LGC 211.

In summary, 71 RP asserts the listed provisions of the B3 Code (as defined herein to include all related manuals) are not applicable to the Project. The ZBA should specifically state which provides of B3, if any, the ZBA believes are applicable to the Project.

Appeal # 5: The Project is vested from changes in the City Stormwater Drainage Ordinance after May 22, 2017.

The CM Determination that the Stormwater Drainage Code is not exempted by LGC 245 is incorrect.

LGC 245.004 provides that LCG 245 does not apply to "(9) regulations to prevent imminent destruction of property or injury to persons from flooding *that are effective only within a flood plain established by a federal flood control program* and enacted to prevent the flooding of buildings intended for public occupancy..." (*emphasis added*). This is the only exemption relating to stormwater drainage in LGC 245. Lot 7 is not within a flood plain established by a federal flood control program. The City's Stormwater Drainage Ordinance is not applicable to the Project. This section is interpreted in the manner requested in the *Koppolow* case cited in the Addendum.

Appeal # 6 – The Project is not limited to Commercial use.

The CM Determination states: "...the property classification as of May 22, 2017 was commercial, and the property remains classified as commercial with the Place Type 5 district...."

71 RP seeks clarification from the City that the permitted uses for the Project are not limited to "commercial" (whether interpreted as those permitted uses as of May 22, 2017, or otherwise), but is entitled to any use, as permitted by current regulations. LGC 245 permits 71 RP to utilize changes in the City's regulations to develop the Project for any use, not just commercial. The City seems to say that if 71 RP develops a non-commercial use, then it must accept all the regulations within B3, which is not true. 71 RP may cherry pick any later City regulation for aspects to apply. In this instance, the issue is use regulation by the City. Previously, the City imposed a traditional zoning scheme on use established by geographic district. 71 RP has the right per LGC 245 to have any use permitted as of the May 22, 2017 vesting date, but also to have any use permitted today. Today, any use is permitted at the location of the Project.

71 RP requests clarification on the City's position on this point.

Summary.

In summary, 71 RP requests a clear determination that either i) the GDSA Process does not apply to LGC 245.004 exemptions, or ii) if it does, please provide a determination of what regulations are applicable to the Project, as requested below.

Note on City Comments about Lack of Information.

During the previous ZBA hearing for Lot 7 of the Project, the City staff stated that the reason the City could not determine which sections of the B3 Code apply is that 71 RP failed to provide the required information for the City to make this determination. While71 RP disagrees that the City requires more information to determine whether the B3 Code is subject to exemption under LGC 245.004, 71 RP sent the City Manager a letter on July 13th, 2021 (attached hereto as Exhibit "A") offering to provide more information to the City and asking what further information was required. To date, 71 RP has received no response from the City.

Further, section 1.20 of the Ordinance lists in detail the specific information any applicant is required to submit in order to receive a determination, all of which was submitted by 71 RP. The Ordinance also provides the City the ability to request further information from the applicant or request a pre-determination conference to ensure that the nature of the claim is fully and completely understood prior to a determination being rendered. 71 RP has participated at great time and expense in this administrative process required by City Ordinance 1.20 and at no point during the process did the City request more information, request a meeting with 71 RP, or inform 71 RP that the City did not have enough information to make the determination required by the Ordinance. As such, 71 RP contends that the City's statements in the prior ZBA hearing that they did not have enough information to make a proper determination as required by the Ordinance demonstrate the City's lack of interest to genuinely work with 71 RP to determine the extent of its Vested Rights and how to move forward with the Project.

REQUEST FOR VARIANCE

The Ordinance permits the ZBA to grant a variance from the regulations at issue under the same standards governing variances for other matters.

<u>If the appeal is denied, in the alternative, 71 RP requests a variance for Lots 8 & 9</u> to be exempt from the B3 Code, particularly the requirements for a NRP, the requirements to develop in accordance with the TND or VCD Development Patterns in Chapter 5, compliance with the Building Placement requirements in Chapter 6, any building size regulation (or regulations that affect building size, including without limitation the Build-To-Line and building to land ratio), any minimum or maximum building setback (or "Build-to" requirement), and any other B3 Code requirement which affects the LGC 245.004 Vested Rights. All of the information, documentation and discussion in the City file and in this letter are incorporated as part of the record for this variance.

This variance is based upon hardship, and is not adverse to the public interest (or the interest of any neighboring property), promotes economic development, will promote the availability of market driven providers of goods and services to Bastrop, is due to the unique circumstances of

Lots 8 & 9, is consistent with intent of City Code to encourage reasonable development, and meets the requirements for a variance under state law and city ordinance.

Lot 8 is a small, single lot located in a suburban area of Bastrop impacted by the existence of State Highway 71, a major, heavily trafficked highway bisecting Bastrop. Lot 8's only frontage with a public right-of-way is along State Highway 71 and as far back as 2013 has been shown on plats, plans and schemes to be a "commercial reserve" or "pad site". These reserves/sites are locations for single owners or tenants with retail/office/restaurant/etc. uses who wish to be located on high traffic roadways in front of other developments, sometimes commercial and sometimes residential. Users are typically single story and require ample parking, and often a drive-through window (1 or more). An example is the Medtail project on Lot 6 directly to the east of Lot 7. In almost all instances, the user requires that vehicles can circle the building, and that there are parking spaces immediately at the entrance of the building, for customer convenience.

There are 8 lots planned in a row, including Lot 8. These lots are shown on the 2017 Application. Five lots are owned by Seton Hospital, one by Medtail and Lots 7 & 8 by 71 RP. On the other side of Lot 8 is a fully developed suburban style retail shopping center. Lot 6 and the shopping center have all been developed prior to the B3 Code.

The Hwy 71 and FM 304 frontage around Lots 8 & 9 for a mile each direction are clearly suburban retail/restaurant/commercial developed in a manner which is fundamentally inconsistent with the B3 Code. The following factors are hardships for Lots 8 & 9:

- The size and lot dimensions of Lot 8 & 9 vary significantly from the 330 x 330 preferred Block size for a TND making development under the B3 Code impractical. Lot size is a LGC 245.004 Vested Right and therefore the City cannot require further subdivision of either Lot.
- There is no public right-of-way with frontage on Lot 8 that is conducive to a pedestrian oriented development. State Highway 71 is the only public ROW with frontage on Lot 8. It is doubtful that pedestrians would walk down the frontage road of State Highway 71 to access Lot 8. Lot 9 has frontage along FM 304 (which has the same difficulties as SH 71) and Agnes Road; however given the length of Lot 9's boundary on Agnes Road, it would impractical to construct a building of the size required to meet the build-to line requirements of the B3 Code. The B3 build-to line requirement effectively dictates the building size that could be built on Lot 9 and because building size is a LGC 245.004 Vested Right, the City cannot require compliance with the build-to-line requirement.
- There are no sidewalks as part of the existing development immediately to the east and west along State Highway 71 or north or south along FM 304, which could lead to a potentially dangerous situation if Lots 8 & 9 were forced to develop along the highway frontage.

Requiring Lot 8 & 9 to comply with the B3 Code will prevent the appropriate use of Lot 8 & 9 and create a hardship because the following are unreasonable and unnecessary in the context of Lots 8 & 9 as outlined above and will preclude any market based user:

- compliance with the Building Placement requirements of the B3 Code, including without limitation the "Build Along" requirement requiring a building along a minimum amount of the building to be constructed along the frontage line;
- any regulations requiring building frontage along public rights-of-way;
- any regulations that affect building size (including without limitation the Build-To-Line or building to land ratio);
- any minimum or maximum building setback (or "Build-to" requirement).

Further, a NRP for Lots 8 & 9 will serve no reasonable purpose if the above regulations are not applicable.

Lots 8 & 9 have grandfathered rights under LGC 245, acknowledged by the City to vest Lots 8 & 9 in the City Subdivision Ordinance in effect in 2017, prior to the B3 Code. Such vesting also prevents the application of any portion of the B3 Code to the LGC 245.004 Vested Rights, which is acknowledged by the City, but the City does not agree to the scope of those vested rights. By the nature of the B3 Code, 71 RP reasonably believes that, at a minimum, the B3 Code is subject to all vested rights under LGC 245, including without limitation the LGC 245.004 Vested Rights. If not resolved by the Appeal, those rights will be resolved as provided by law. The confusion regarding the applicability of the B3 Code is a hardship.

71 RP requests a variance in accordance with the foregoing.

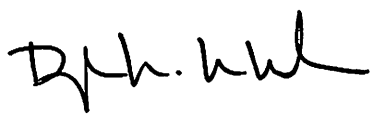
In the event the ZBA feels a variance from the B3 Code is too broad for their consideration, then 71 RP requests that the ZBA remand this appeal back to the City Manager to clarify their position on which sections of the previously adopted city codes would need to be utilized by the Project in order to develop proposed site plans for Lots 8 & 9, which 71 RP will present at the ZBA hearing, so that 71 RP may request a more specific variance for the ZBA's consideration at a future hearing in the hopes of resolving this bona fide dispute between the parties.

LEGAL CITATIONS

The Ordinance requests legal grounds and seems to want a legal brief on this matter, when 71 RP is simply trying to comply with the City's requirement to help the City determine its own conclusion on vested rights, and the City has no authority to adjudicate vested rights binding on 71 RP. Nonetheless, we attach Exhibit "B" with reference to LGC 245 and relevant case law. Our primary reliance is on the text of LGC 245, as cited herein and available online to the City.

CONCLUSION

I look forward to presenting this appeal at the upcoming hearing. I would like to request the ZBA hearing for this appeal take place on 8/23, 8/25, 8/26 or 8/27 so that I can personally appear. I will need to make travel plans to attend so any advance notice would be much appreciated. If it is not possible to meet on any of those dates, 71 RP would be willing to extend the timeline prescribed for the hearing by the Ordinance to facilitate my attendance.
Sincerely,



Douglas M. MacMahon
Manager of the General Partner of 71 Retails Partners, L.P.

Exhibit "A"
Letter to Paul Hofmann

71 RETAIL PARTNERS, L.P.
8214 Westchester Drive, Ste 550
Dallas, TX 75225

July 13th, 2021

Paul Hofmann
City Manager
City of Bastrop, Texas
1311 Chestnut Street
Bastrop, TX 78602

Dear Paul,

I am the manager of the General Partner of 71 Retail Partners, L.P. ("71 RP"). I understand from testimony given by your staff at the most recent Zoning Board of Adjustment hearing for Lot 7 of Bastrop Grove that the City contends it did not have the information the City requires to make a full determination of 71 RP's vested rights during the Grandfathering Development Status Application process and due to this lack of information the City was unable to determine the applicability of the B3 Code to the Bastrop Grove project.

I note that the Bastrop City Code Ordinance 1.20 lists in detail the information any applicant is required to submit in order to receive a determination, all of which was submitted by 71 RP. The Ordinance also provides the City the ability to request further information from the applicant or request a pre-determination conference to ensure that the nature of the claim is fully and completely understood prior to a determination being rendered.

We find it extremely disappointing that we participated at great time and expense in the administrative process for Lot 7 required by City Ordinance 1.20 and at no point during the process did the City request more information, request a meeting with 71 RP, or inform 71 RP that the City did not have enough information to make the determination required by the Ordinance.

As you know, 71 RP is also processing Lots 8 and 9 of Bastrop Grove through the Grandfather Development Status Application process and we are preparing on our appeal to the ZBA for those properties. While 71 RP disagrees that you require additional information to determine whether the B3 Code is subject to exemption under Texas LGC 245.004, 71 RP would be happy to provide additional information for Lots 8 and 9 if such information is available to 71 RP. **71 RP respectfully requests that the City provide as soon as possible to 71 RP a full list of whatever information the City asserts is required to make a determination as to the applicability of the B3 Code to the Bastrop Grove Project for Lots 8 & 9.**

Sincerely,

Douglas M. MacMahon

Exhibit "B"

Relevant Caselaw Supporting this Application

River City Partners, Ltd v. City of Austin, NO. 03-19-00253-CV, 2020 WL 3164404 (Tex. App.—Austin, 2020, no pet. h.)- Interpretes the LGC 245.004 Vested Rights and that the term "affecting" means broadly interpreted "to produce an effect on" and is applied to the subject ordinance "as applied" to the project, in this case focused on "building size."

Hatchett v. West Travis County Public Utility Agency, 598 S.W.3d 744, (Tex. App—Austin, 2020, pet denied)- Summary of the current state of vested rights under LGC 245.

FLCT, Ltd. v. City of Frisco, 49 S.W.3d 238 (Tex. App.—Fort Worth 2016, pet. den.)- The exceptions to the "municipal zoning regulations" except to vested rights under LGC 245.004 as determined on an "as applied" basis to any regulations which "have an effect" on the listed exception issues. The exception for "property classification" means the permissible uses under the regulator scheme when vesting occurs. A project is entitled to all uses permitted when vesting occurs. "Fair notice" of a project incorporates all the city actual knows about the project, not just what the applicate documents. The definition of a "project" is broad.

City of San Antonio v. Kopplow Development, Inc., 441 S.W.3d 436 (Tex. App.—San Antonio 2014, pet. den.)- LGC 245.004(9) does not vest local flood plain regulation, and the local regulation was subject to vested rights under LGC 245..

City of San Antonio v. Greater San Antonio Builders Ass'n, 419 S.W.3d 597 (Tex. App.—San Antonio 2013, pet. den.)- A city may not add local limits to vested rights, only LGC 245 determines vested rights.

Harper Park Two, LP v. City of Austin, 359 S.W.3d 247 (Tex. App.—Austin 2011, pet. den.)- The entirety of a development project is considered in a "project", not components or phases. The definition of "permit" is very broad. The vesting is considered in the context of the regulatory scheme at the time to determine the scope of the project. The objective intent shown in the permit application is the focus for vested rights, not the subjective intent of the developer at the time of the vesting event.

Hartsell v. Town of Talty, 130 S.W.3d 325, 326 (Tex. App.—Dallas 2004, pet. denied)- Vested rights extend to the entire development project, land and buildings. The city tried to separate land development from building development, but that distinction was not permitted.

City of Austin v. Garza, 124 S.W.3d 867, 868 (Tex. App.—Austin 2003, no pet.)- LGC 254.002(d) is valid and permits the developer to "cherry pick" between vested regulations and later adopted regulations.

Powell v. City of Houston, 580 S.W.3d 391 (Tex. App.—Houston [1st Dist.] 2019 pet. granted)- Interprets what it takes to be a zoning ordinance in Texas and holds that the Houston Historic Preservation Ordinance is not zoning. It cites to several cases which state that use is part of zoning, including *N.W. Enterprises, Inc. v. City of Houston*, 27 F. Supp. 2d 754, 797 (S. D. Tex. 1998), aff'd in part, rev'd in part, dism'd in part, 352 F3d 162, (5th Cir. 2003) (stating "the 'ordinary, contemporary, common meaning' of zoning refers to a comprehensive plan and *encompasses regulations that establish affirmatively what land uses are permissible* for certain geographic districts...."), and *City of Houston v.Johnny Frank's Auto Parts Co.*, 480 S.W.2d 774, 775 (Tex. App. – Houston [14th Dist.] 1972, writ. Ref'd n.r.e.) (stating "The ordinance with which this case is concerned is not a zoning ordinance. It does not establish a comprehensive plan by which *the city is divided into districts wherein property is limited to specified uses....*") *emphasis added*.

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

Date: April 19th, 2021

Trey Job, Assistant City Manager
City of Bastrop, TX
Planning and Development Department
1311 Chestnut Street
Bastrop, TX 78602

RE: Grandfather Development Status - Lots 8 and 9 of Bastrop Grove
Project Description Letter

Bastrop Grove is a multi-lot commercial land development at the SE corner of Hwy 71 and FM 304 in the City of Bastrop. It includes several out-parcels (avg. 1.5 ac. rectilinear lots) with frontage on Highway 71 and access limited to an internal private drive. There are larger parcel(s) behind the out-parcels with direct access to Agnes Street and FM 304 (the western portion). Proposed lot 8 consist of 1.15-acre of land located just south of State Highway 71 and west of the earlier submitted Grandfathering Determination for Lot 7 while Lot 9 is an 18.31-acre tract located behind Lots 7 and 8 and east of (with frontage on) SH304 and north of (with frontage on) Agnes Street. As discussed in numerous meetings with staff regarding this project, it is my belief that the project has vested rights, based on the earlier applications and entitlements and the continued nature of this commercial land development project, and therefore we are submitting this letter and the accompanying documentation for a Grandfathering Determination.

The "Project" is described in the following Project related applications for permits required for the Project, and has been the same Project since inception in 2013:

- Application dated 07-24-2013 for Preliminary Plat for The Grove
- Application dated 08-05-2013 for Final Plat for the Bastrop Grove Phase 1
- Application dated 05-23-2014 for Final Plat for The Grove Phase 1 Lot 5
- Application dated 05-22-2017 for Preliminary Plat for The Bastrop Grove
- Application dated 03-17-2018 for Final Plat for Bastrop Grove Section 1
- Application dated 10-01-2018 for Bastrop Grove Drainage Improvements
- Application dated 11-22-2019 for Drainage Plan for the Bastrop Grove Medtail
- Application dated 02-27-2020 for Site Plan Approval for the Bastrop Grove Medtail
- Application dated 01-03-2020 for Final Plat for Bastrop Grove, Section 2, Lot 6
- Application dated 03-30-2021 for Grandfathering Status for Bastrop Grove, Section 3, Lot 7

It is my understanding that the Project is not subjected to any City of Bastrop regulations except those described in Tx. Loc. Gov't Code Section 245.004, being those in effect 07-24-2013 and any which are exempt from vesting.

Furthermore, I understand that the zoning provisions of the City's Bastrop Building Block Code (B3) relating to the following are not applicable to the project (as being within the exemptions for the general exception from vested rights as to municipal zoning ordinances), which are all zoning provisions which affect (have an effect on):

- Landscaping or tree preservation
- Open space or park dedication
- Property classification (permitted uses)
- Lot size, dimensions or coverage
- Building size.

Our view is that the B3 isn't zoning so no portion of B3 is exempt from vesting, but to the extent the City says that portions are zoning, then the foregoing are vested.

It is my belief that all provisions in the Bastrop Building Block Technical Manual and the City of Bastrop Development Manual are subject to vesting, and not applicable to the Project. Only the City regulation in effect as of initial September 24th, 2013 plat application apply to the Project, including the City Subdivision Ordinance

Based on the above vesting, the following provisions of the City Zoning Ordinance as of April 13th, 1991 (1991 Zoning Ord.) apply to the Project, as vested rights:

The permitted uses under Section 28 - C-1 - Commercial-1 District (Light) are listed in the following exhibits.

Exhibit A - Use Regulations Chart, City of Bastrop, 1991,

The permitted lot size, dimensions or coverage for the Project under Section 28.4 - Area Regulations.

Size of Lot:

- Minimum Lot Area - Twelve thousand (12,000) square feet.
- Minimum Lot Width - One hundred feet (100').
- Minimum Lot Depth - One hundred ten feet (110').
- Maximum Lot Coverage: Fifty percent (50%).

The permitted building size under Section 28 (including the related regulations which affect Building Size, such as:

- Setback- Section 28.4
- Height- Section 28.3
- Required Parking- Section 38

Other Regulations: As established in the Development Standards, Sections 37 through 45

Required landscaping or tree preservation in Section 39.5, 39.6 & 39.7

The Project is also vested from changes in flood regulations effective outside the FEMA flood plain.

The Project is not dormant, as progress has been made towards completion of the original contemplated project as follows:

- Plat of Seton Hospital land-Project Name: Bastrop Grove Section 1 Final Plat
  (Approval Date: 03-17-2018)

- Construction of the offsite Drainage Channel to the Colorado River- Project Name: Bastrop Grove Drainage Improvements *(Approval Date: 10-01-2018)*
- Medtail Final Plat- Project Name: Bastrop Grove, Section 2, Lot 6 Final Plat *(Approval Date: 01-03-2020)*
- Cost have been incurred for development the project with CBD Engineering, and other professional and legal firms

This application is not intended to waive any vested rights, under Tex. Loc. Gov't Code Ch. 245 or otherwise. My client protests any idea that the City can legally determine or limit the vested rights for the Project, and submits this application only to aid the City is coming to its own internal decision as to the appropriate vested rights for the Project. All rights are reserved.

Should you have any questions or require any additional information, please feel free to call/email.

Sincerely,

Carlson, Brigance & Doering, Inc.
F-3791

Brendan P. McEntee, P.E.
Branch Manager

Grandfathered Development Status Application

Project Information

Legal Description: ABS A98 BLAKEY, NANCY, ACRES 20.520

Project Address(es): Not Addressed

Total Acreage: 19.46 BCAD Property ID: 126678

Was the Project in progress on or after September 1, 1997? After

Property Owner

Name/Entity/Trustee: 71 RETAIL PARTNERS LP

Mailing Address: 8214 WESTCHESTER DR STE 550, DALLAS, TX 75225

Phone & Fax Numbers: 214-622-6525 E-mail Address dm@morancap.com

Applicant

Name/Entity/Trustee: Brendan P. McEntee, P.E. - Carlson, Brigance & Doering, Inc.

Mailing Address: 12129 Ranch Road 620 North, Suite 600* Austin, Texas 78750

Phone & Fax Numbers: (512) 280-5160 E-mail Address bmcentee@cbdeng.com

Permit Identification

First Permit

Name: The Grove Preliminary Plat Application Date: 07-24-2013

Approval Date: Expiration Date: Volume and Page No.:

Additional Permit

Name: **Please see the attached supplement document** Application Date:

Approval Date: Expiration Date: Volume and Page No.:

Additional Permit

Name: Approval Date:

Expiration Date: Volume No.: Page No.:

Additional Permit

Name: Approval Date:

Expiration Date: Volume No.: Page No.:

Grandfathered Development Status Application

Additional Permit		
Name:		Approval Date:
Expiration Date:	Volume No.:	Page No.:
Additional Permit		
Name:		Approval Date:
Expiration Date:	Volume No.:	Page No.:

APPLICANT:			OFFICIAL USE ONLY	
Included in Submittal	Per Ordinance 2019-10, Additional Submittal Items are:		Meets Standard	Does Not Meet Standard
✓	1	Identification of the "Project," as that term is defined in LGC 245.001(3), as may be amended. Example: Residential Subdivision		
✓	2	Narrative description of the development/construction Project or proposed land use for which the Permit is being sought. Describe which Permits have been completed and which are remaining.		
✓	3	Layout of the site, including locations of buildings, streets, utilities, fences, drives, sidewalks, drainage facilities, and any other permanent or temporary structures which may be present at the time of application		
✓	4	Identification of each City regulation in effect at the time of the original application for the Permit filed that applies to the Project and that the Applicant contends: A. Is grandfathered B. Controls the approval, disapproval, or conditional approval of an application for a Permit, pursuant to LGC 245.002(a), as may be amended		
✓	5	Identification of each current City regulation for which the Applicant seeks an exemption due to the grandfathered development status provided the property owner by LGC 245 or other applicable vesting laws		
✓	6	Explanation of the applicability of any approval expirations and related requests for extension of approvals		
✓	7	Photographs, drawings, maps, and previous approvals that would assist the Grandfathering Review Committee in making its determination		
✓	8	Certified land survey of topography showing existing drainage patterns and structures		
✓	9	Any other information or supportive materials deemed necessary and requested in writing by the Director of Planning and Development		

Signature and Certification

The applicant certifies that the facts stated herein and exhibits attached hereto are true, correct, and complete.

Brian P McCarter — Project Engineer and Agent — 04-17-2021

Signature and Title — Date

Grandfathered Development Status Application

Process Overview

1. Complete Application, which includes: Application, Permit Identification, and Additional Submittal Items
    a. Incomplete submittals will not be accepted.
2. Director of Planning & Development will promptly forward to the Grandfathering Review Committee.
3. Determination made by Grandfathering Review Committee.
    a. Within 15 days of Application filing, the Committee will issue a written administrative determination approving the application, disapproving the application, or requesting more information.
    b. Determination shall identify the date the original Permit was filed, which claims have been recognized, and which claims have been rejected.
4. Reconsideration: must be requested in writing within 15 days of the Determination
5. Appeal to City Manager: must be requested in writing within 15 days of the date that the Committee declined to reconsider the Application.
6. Appeal to Zoning Board of Adjustment: must be requested in writing within 15 days of the City Manager's Determination.

Determination Standards

1. Date of first application
2. Fair notice
3. Consistency
4. Subsequent development
5. Prior vested rights determinations
6. Regulations
7. Expiration of prior applications
8. Exemptions in LGC 245.004
9. Expiration of Project
10. City Code
11. State Law

Staff Use Only

☐ Received By: Date:

Fees Paid $

Comments:

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

Bastrop Grove Lots 8 and 9

Grandfathered Development Status Application

Supplement Document-Permit Identification

First Permit
Name: The Grove Preliminary Plat
Application Date: 07-24-2013
Volume No:
Page No:

Additional Permit
Name: Bastrop Grove Phase 1 Final Plat
Application Date: 08-05-2013
Volume No:
Page No:

Additional Permit
Name: The Grove Phase 1 Lot 5 Final Plat
Application Date: 05-23-2014
Volume No:
Page No:

Additional Permit
Name: Bastrop Grove Preliminary Plat
Application Date: 05-22-2017
Approval Date: 08-08-2017
Volume No:
Resolution No: R-2017-62

Additional Permit
Name: Bastrop Grove Section 1 Final Plat
Approval Date: 03-27-2018
Volume No:
Page No:

Additional Permit
Name: Bastrop Grove Drainage Improvements
Approval Date: 10-01-2018

Volume No:
Page No:

Additional Permit
Name: Bastrop Grove Medtail - Final Drainage Plan
Approval Date: 11-22-2019
Volume No:
Page No:

Additional Permit
Name: Bastrop Grove Medtail - Site Development plans
Approval Date: 02-27-2020
Volume No:
Page No:

Additional Permit
Name:Bastrop Grove, Section 2, Lot 6 Final Plat
Approval Date: 01-03-2020
Volume No:
Page No:

Additional Permit
Name:Bastrop Grove, Section 3, Lot 7 Grandfathering Status
Approval Date: 03-30-2021
Volume No:
Page No:

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

Bastrop Grove Lots 8 and 9
Grandfathered Development Status Application
Checklist Supplement

1. Identification of the "Project," as that term is defined in LGC 245.001(3), as may be amended. Example: Residential Subdivision

   Please see the attached project narrative

2. Narrative description of the development/construction Project or proposed land use for which the Permit is being sought. Describe which Permits have been completed and which are remaining.

   Please see the attached project narrative

3. Layout of the site, including locations of buildings, streets, utilities, fences, drives, sidewalks, drainage facilities, and any other permanent or temporary structures which may be present at the time of application

   Please see the Bastrop Grove Preliminary Plat. No structures or improvements exist on the lots.

4. Identification of each City regulation in effect at the time of the original application for the Permit filed that applies to the Project and that the Applicant contends:
   a. Is grandfathered
   b. Controls the approval, disapproval, or conditional approval of an application for a Permit, pursuant to LGC 245.002(a), as may be amended

   Provided in the attached project narrative

5. Identification of each current City regulation for which the Applicant seeks an exemption due to the grandfathered development status provided the property owner by LGC 245 or other applicable vesting laws

   Provided in the attached project narrative

6. Explanation of the applicability of any approval expirations and related requests for extension of approvals

   Explained in the attached project narrative

7. Photographs, drawings, maps, and previous approvals that would assist the Grandfathering Review Committee in making its determination

   Previously approved/submitted plans that are listed in the 'Permit Identification' section have been attached.

8. Certified land survey of topography showing existing drainage patterns and structures

Please see the attached existing conditions plan

9. Any other information or supportive materials deemed necessary and requested in writing by the Director of Planning and Develop
   N/A.

SCALE: 1" = 150'

0 150' 300'

25' WASTEWATER AND UTILITY EASEMENT VOL. 684, PG. 718

ACCESS GRANTED VOLUME 1344, PAGE 774

25' WASTEWATER AND UTILITY EASEMENT VOL. 684, PG. 718

(L1)

(C1)

"X" FOUND

LOT 2A
HSF BASTROP INVESTROS LLC
VOLUME 1718, PAGE 47

BLOCK "A"

60' JOINT USE ACCESS EASEMENT CAB. 4, PG. 160-A

LOT 7
±1.15 ACRES

LOT 8

±1.11 ACRES

±1.19 ACRES

LOT 6

±1.29 ACRES

LOT 5

±1.25 ACRES

LOT 4

LOT 3
±1.25 ACRES

(N09°41'29"E 492.23')

RESUBDIVISION OF
LOT 1 BLOCK A
CENTERS OF
WOODLAND VILLAGE BASTROP
CABINET 4, PAGE 160-A

25' WASTEWATER AND UTILITY EASEMENT VOL. 684, PG. 718

LOT 1A
CENTERS OF WOODLAND VILLAGE #2, LTD.
VOLUME 1350, PAGE 624

35' X 60' JOINT USE ACCESS EASEMENT CAB. 4, PG. 160-A

(S80°19'00"E 525.56')

LOT 1
COVERT AUTOMOBILE DEALERSHIP SUBDIVISION
CABINET 2, PAGE 365-A
MATHEWS-BANKS BROTHERS INVESTMENTS, LP
VOLUME 1826, PAGE 416

STATE HIGHWAY 304
(120' R.O.W.)

LOT 9

±18.31 ACRES

REMAINDER OF 52.684 ACRES
71 RETAIL PARTNERS, LP
VOLUME 2245, PAGE 878

±24.16 ACRES

PORTION OF 52.684 ACRES
71 RETAIL PARTNERS, LP
VOLUME 2245, PAGE 878

NO BUILDINGS OBSERVED

LOT 1

(S09°40'25"W 717.00')

30' ELECTRIC TRANSMISSION AND/OR DISTRIBUTION LINE EASEMENT VOLUME 195, PAGE 209

HOME DEPOT WAY
(50' R.O.W.)

R.O.W.±1.43 ACRES

AGNES STREET (ARTERIAL)

(N80°19'35"W 1883.70')

CASE-NUMBER

FILE PATH:J:\AC3D\5349\dwg\5349- LOT 8 & 9 DRAINAGE combined topo.dwg - Apr 19, 2021 - 2:21pm

DESIGNED BY: NAME	DRAFTED BY: NAME
DATE	
REVISION	

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #13791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
www.cbdeng.com

SHEET NAME: EXISTING CONDITIONS

JOB NAME: BASTROP GROVE

PROJECT: LOTS 8 AND 9

DATE 04\2021

JOB NUMBER 5349

SHEET OF XX

CITY OF BASTROP
PLANNING DEPARTMENT
P. O. Box 427 • Bastrop, Texas 78602
(512) 321-0457

CASH RECEIPT

DATE 8/5/13

3261

RECEIVED FROM American National Bank of Texas

ADDRESS South right-of-way line of st HWY 71

DOLLARS $ 340.00

FOR: final Plat

ACCOUNT			HOW PAID		
AMT. OF ACCOUNT			CASH		
AMT. PAID			CHECK	340	00
BALANCE DUE			MONEY ORDER		

CK# 16993

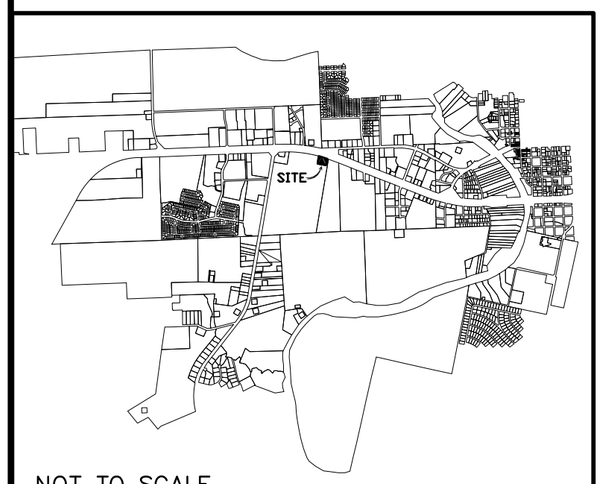
BY

NORTH

BEARING BASIS: STATE PLANE COORDINATES NAD83/TEXAS SOUTH CENTRAL ZONE, SCALE FACTOR 0.99998342 LCRA CONTROL MONUMENTS A763, A279, J805, & SID2

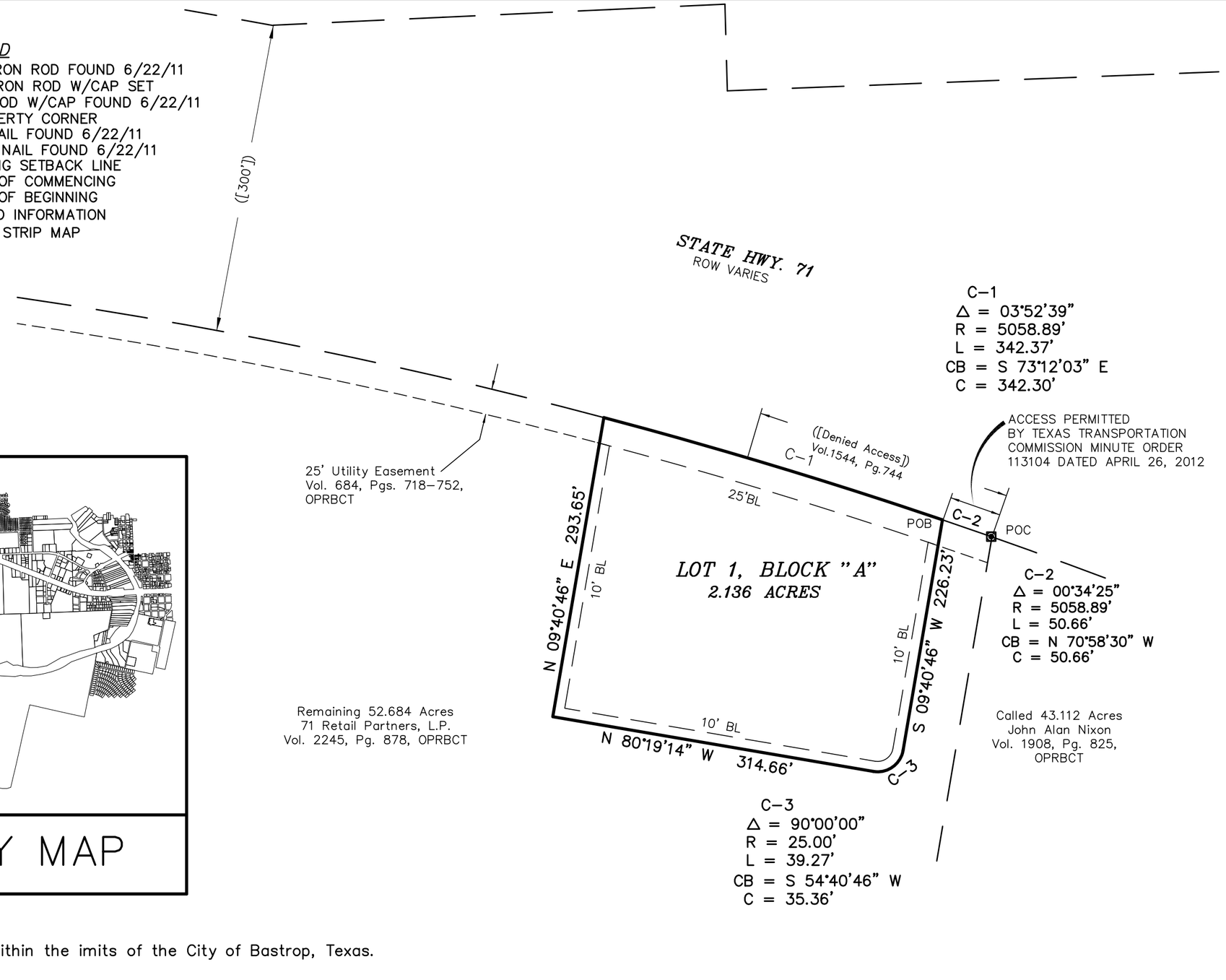
LEGEND

IRF● 1/2" IRON ROD FOUND 6/22/11
⊙ 5/8" IRON ROD W/CAP SET
◙ IRON ROD W/CAP FOUND 6/22/11 PROPERTY CORNER
MNF MAG NAIL FOUND 6/22/11
NF SMALL NAIL FOUND 6/22/11
BL BUILDING SETBACK LINE
POC POINT OF COMMENCING
POB POINT OF BEGINNING
RECORD INFORMATION
([ ]) TXDOT STRIP MAP



NOT TO SCALE

VICINITY MAP



CITY NOTE:
This subdivision lies within the imits of the City of Bastrop, Texas.

PLAT INFORMATION
Total Area: 2.136 Acres
Total Number of Lots: 1
Number of Residential Lots: 0
Number of Commercial Lots: 1
Right of Way: 0.00 Acres
Average Size of Lots: 2.136 Acres

Number of Lots Over 10 Acres: 0
Number of Lots 5–10 Acres: 0
Number of Lots 2–5 Acres: 1
Number of Lots 1–2 Acres: 0
Number of Lots Less than 1 Acres: 0

SCHOOL DISTRICT
This subdivision lies within the Bastrop Independent School District.

FLOOD PLAIN NOTE
This tract is not within an identified Special Flood Hazard Area inundated by 100–Year Flood as identified by the Federal Emergency Management Agency, Flood Insurance Rate Map for Bastrop County, Texas, and Incorporated Areas, Map Number 480219C0355E dated January 19, 2006.

PUBLIC UTILITY EASEMENT NOTE:
A Five Foot (5') Wide Public Utility Easement is hereby dedicated along all other property lines

UTILITY INFORMATION
Electricity: Bluebonnet Electric
Telephone: Southwestern Bell Telephone
Water: City of Bastrop
Wastewater: City of Bastrop

UTILITY NOTES:
No structure in this subidivision shall be occupied until connected to a public sewer system or to an on–site wastewater stytem which has been approved and permitted by City of Bastrop.

No structure in this subdivision shall be occupied until connected to an individual water supply or a state approved public water system.

Approved thid day ____ of _____ by the City Council of the City of Bastrop, Texas.

_____
Mayor
ATTEST BY: _____ City Secretary

STATE OF TEXAS
COUNTY OF HAYS

I, Rose Pietsch, County Clerk of Bastrop County, Texas, do hereby certify that the foregoing instrument of writing with its certificate of authentication was filed for record in my office on the _____ day of _____, A.D., 20__, at _____ o'clock ___m., in the Plat Records of Bastrop County, Texas, in Book _____, Page _____.

WITNESS MY HAND AND SEAL OF OFFICE this the _____ of _____, A.D., 20__.

_____
Rose Pietsche
County Clerk
Bastrop County, Texas

STATE OF TEXAS
COUNTY OF BASTROP

2.136 ACRES
NANCY BLAKEY SURVEY, A–98

DESCRIPTION

DESCRIPTION OF A 2.136 ACRE TRACT OF LAND OUT OF THE NANCY BLAKEY SURVEY, A–98, BASTROP COUNTY, TEXAS, AND BEING A PORTION OF THAT CERTAIN TRACT OF LAND CALLED TO BE 52.684 ACRES, DESCRIBED IN A DEED TO 71 RETAIL PARTNERS, LP, OF RECORD IN VOLUME 2246, PAGE 878, OF THE OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, SAID 2.136 ACRES BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING at an iron rod with cap marked "Property Corner" found June 11, 2011, in the south right–of–way line of State Highway 71, at the northwest corner of a tract of land called to be 43.112 acres, described in a deed to John Alan Nixon, of record in Volume 1908, Page 825, of the Official Public Records of Bastrop County, Texas, said iron rod being the northeast corner of said 52.684 acre tract;

THENCE, with the south right–of–way line of said State Highway 71, a curve to the left having a radius of 5058.89 feet, an arc distance of 50.66 feet, a central angle of 00° 34' 25", and a chord which bears, N 70° 58' 30" W, 50.66 feet to a 5/8 inch iron rod with cap set;

THENCE, across said 52.684 acres the following four (4) courses:
1) S 09° 40' 46" W, 226.23 feet to a 5/8 inch iron rod with cap set;
2) A curve to the right having a radius of 25.00 feet, an arc distance of 39.27 feet, a central angle of 90° 00' 00", and a chord which bears S 54° 40' 46" W, 35.36 feet to a 5/8 inch iron rod with cap set;
3) N 80° 19' 14" W, 314.66 feet to a 5/8 inch iron rod with cap set;
4) N 09° 40' 46" E, 293.65 feet to a 5/8 inch iron rod with cap set in the south right–of–way line of said State Highway 71;

THENCE, with the south right–of–way line of said State Highway 71, a curve to the right having a radius of 5058.89 feet, an arc distance of 342.37 feet, a central angle of 03° 52' 39", and a chord which bears S 73° 12' 03" E, 342.30 feet to the POINT OF BEGINNING containing 2.136 acres of land within these metes and bounds.

STATE OF TEXAS
COUNTY OF

KNOW ALL MEN BY THESE PRESENTS, That we, 71 Retail Partners, LP, a Texas limited partnership, with its home address at 8214 Westchester Drive, Suite 550, Dallasn, Texas 75225, owner of 52.684 acres of land being out of the Nancy Blakey Survey, A–98, Bastrop County, Texas, as conveyed to it by deed dated July 3, 2013, and recorded in Volume 2245, Page 878, of the Official Public Records of Bastrop County, Texas, DOES HEREBY SUBDIVIDE 2.14 acres of land out of the Nancy Blakey Survey, A–98, Bastrop County, Texas, to be known as THE GROVE, in accordance with the plat shown hereon, subject to any and all easements or restrictions heretofore granted and do hereby dedicate to the public the use of the streets and easements shown hereon.

IN WITNESS WHEREOF the said 71 Retail Partners, L.P. has caused these presents to be executed by _____ , thereunto duly authorized.

_____

STATE OF TEXAS
COUNTY OF

BEFORE ME, the undersigned authority, on this day personally appeared _____, known to me to be the person whose name is subscribed to the foregoing instrument as and acknowledged to me that he executed the same in such capacity as the act and deed of said limited liability company for the purposes and considerations therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this the _____ day of _____ A.D. 2013.

_____
Notary Public in and for the State of texas

THE STATE OF TEXAS
KNOW ALL MEN BY THESE PRESENTS

That I, Thomas E. Staudt do hereby certify that I prepare this plat from an actual and accurate on–the–ground survey of the land and that the corner monuments shown thereon were properly placed under my personal supervision, in accordance with the subdivision regulations of the City of Bastrop, Texas.

"Preliminary, this document shall not be recorded for any purpose."

_____
Signature and Seal of Registered Public Surveyor with date

STAUDT SURVEYING, INC.
Thomas E. Staudt
RPLS # 3984
P.O. Box 1273
Dripping Springs, Texas 78620
(512)858–2236

100 50 0 100 200
GRAPHIC SCALE IN FEET

SUBDIVISION PLAT OF
THE GROVE
PHASE 1
CITY OF BASTROP
BASTROP COUNTY, TEXAS

Rev:	Date: JULY 2013
Dr. By: TES	Job #: 13092	DWG #: LOT1

SHEET 1 OF 1

LOT1

CK# 161942

CITY OF BASTROP
PLANNING DEPARTMENT
P. O. Box 427 • Bastrop, Texas 78602
(512) 321-0457

CASH RECEIPT

DATE 7-24-13 3256

RECEIVED FROM 71 Retail Partners, LP

ADDRESS

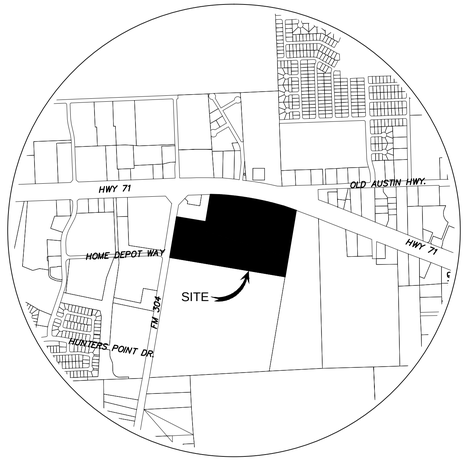
The Grove, Prelim. Plat DOLLARS $ 1120.00

FOR: Preliminary Plat - The Grove
Hwy 71 & 304

ACCOUNT			HOW PAID		
AMT. OF ACCOUNT			CASH		
AMT. PAID			CHECK	1120	00
BALANCE DUE			MONEY ORDER		

BY Marie Murnan

THE GROVE
PRELIMINARY PLAT



VICINITY MAP

N.T.S.

FLOODPLAIN INFORMATION:

NO PORTION OF THIS TRACT IS WITHIN THE BOUNDARIES OF THE 100 YEAR FLOODPLAIN PER THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP 48021C0355E, DATED JANUARY 19, 2006.

LEGAL DESCRIPTION:

BEING A 52.68 ACRE TRACT OF LAND OF AND OUT OF AND A PART OF THE NANCY BLAKEY SURVEY NO. 98, BASTROP, COUNTY, TEXAS AS RECORDED IN VOLUME PAGE OF THE BASTROP COUNTY OFFICIAL RECORDS.

UTILITIES:

WATER:	CITY OF BASTROP
WASTEWATER:	CITY OF BASTROP
GAS:	CENTERPOINT ENERGY
ELECTRIC:	BLUEBONNET ELECTRIC
TELEPHONE:	SOUTHWESTERN BELL TELEPHONE
CABLE:	TIME WARNER CABLE

ZONING – LAND USE SUMMARY

TRACT 1 – 52.68 ACRES
ZONING: C–1 AND GR–CO
PROPOSED USE: USES PER C1 ZONING

OWNER: 71 RETAIL PARTNERS, L.P.
8214 Westchester Drive, Suite 550
Dallas TEXAS 75225
(214) 849–9831
Douglas MacMahon
dm@morancap.com

ENGINEER: ALDERSON GROUP, INC.
2525 WALLINGWOOD DR.
BLDG 6, STE 600
AUSTIN, TEXAS 78746
(512) 364–0989
LYNN ALDERSON, P.E.
lalderson@aldersongroup.com

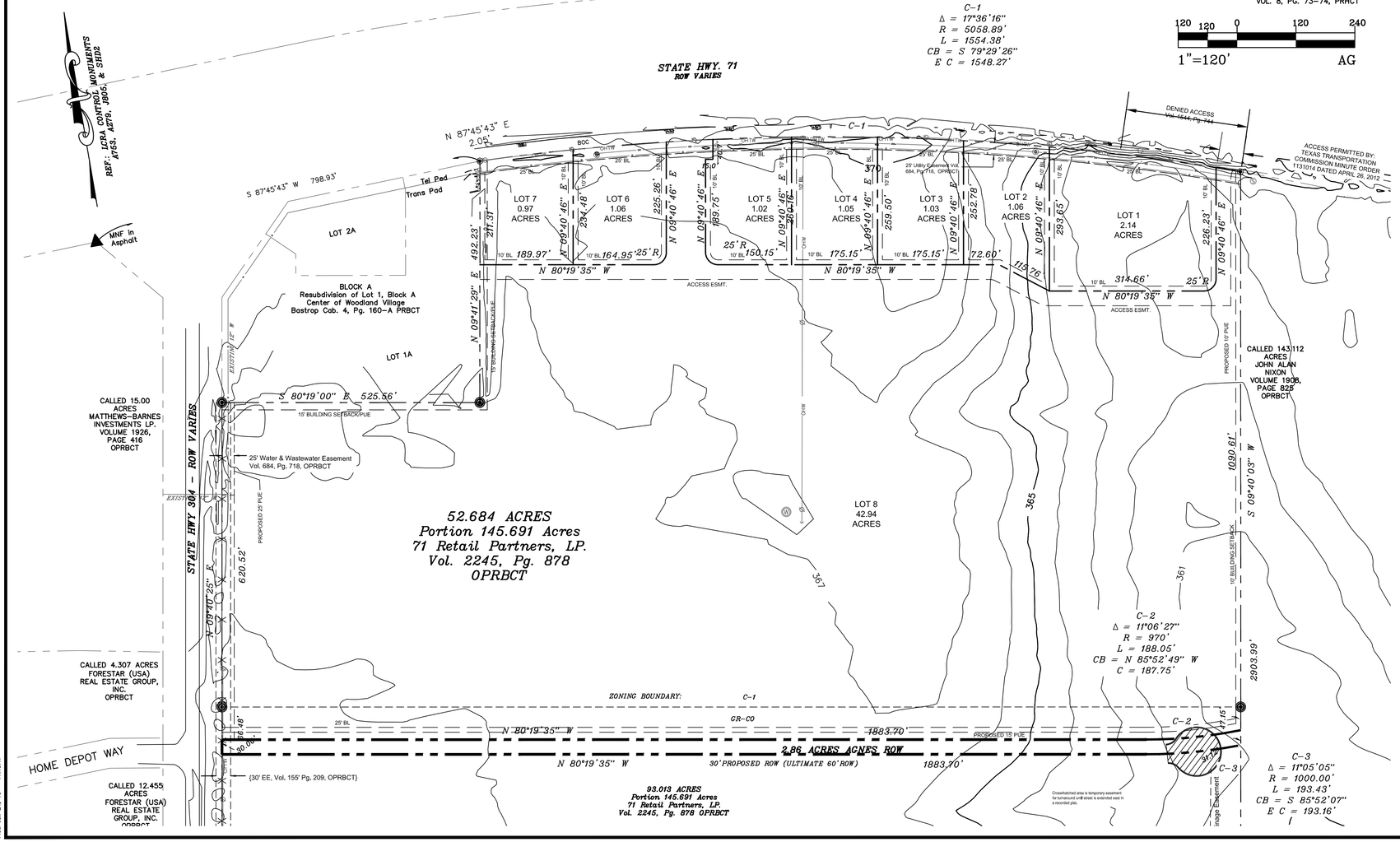
SURVEYOR: STAUDT SURVEYING, INC.
P.O. Box 3984
Dripping Springs, Texas 78620
(512) 858–2236
THOMAS STAUDT, RPLS
smstaudt@austin.rr.com

LEGEND

IRFC	IRON ROD FOUND W/ CAP–STAMPED NUMBER NOTED
IRF	IRON ROD FOUND–SIZE NOTED
IRFC	IRON ROD FOUND W/ CAP–BYRN
—OHW—	OVERHEAD UTILITY WIRE
—T—	OVERHEAD TELEPHONE
⊗	UTILITY POLE
—→	GUY WIRE
—X—	WIRE FENCE
BL	BUILDING LINE VOL. 8, PG. 73–74, PRHCT
PUE	PUBLIC UTILITY EASEMENT VOL. 8, PG. 73–74, PRHCT
DE	DRAINAGE EASEMENT VOL. 8, PG. 73–74, PRHCT

120 120 0 120 240

1"=120' AG



NOTES:

1. The Benchmarks used are: LCRA CONTROL MONUMENTS A753, AZ79, J805, & SHD2.
2. All easements of record as indicated on the most recent title run dated: 6-9-2011, conducted by First American Title Company, Title Commitment GF No. 201101334 issued by Heritage Title Company of Austin, for property including property are shown on this Preliminary Plat.
3. All subdivision improvement permits shall conform to the City of Bastrop Code of Ordinances, construction standards, and generally accepted engineering practices.
4. Construction Plans and Specifications for all subdivision improvements shall be reviewed and accepted by the City of Bastrop prior to any construction within the subdivision.
5. Erosion and sedimentation controls constructed in accordance with the Subdivision Ordinance of the City of Bastrop are required for all construction on each lot.
6. Building setbacks not shown shall be in accordance with City of Bastrop Subdivision and Zoning Ordinances.
7. Prior to construction of any improvements on lots in this subdivision, building permits will be obtained from the City of Bastrop.
8. Sidewalks shall be constructed in accordance with the Subdivision Ordinance of the City of Bastrop.
9. All utilities will be underground.
10. Developer/Owner shall be solely responsible for all relocation and modifications to existing utilities.
11. On-site storm water detention facilities will be provided to reduce post-development peak rates of discharge of the 2, 5, 10, 25, 50 and 100-year storm events by structural containment or other approved methods. Discharge of fully developed flows shall require off site conveyance and approval by the City of Bastrop.
12. No lot or structure shall be occupied prior to the Applicant submitting to the City of Bastrop documentation of subdivision/site registration with the Texas Department of Licensing and Regulations (TDLR) and provide documentation of review and compliance of the subdivision construction plans with Texas Architectural Barriers Act (TABA).
13. No lot in this subdivision shall be occupied until connected to the approved water distribution and wastewater collection facilities.
14. Wastewater and Water systems shall conform to TCEQ (Texas Commission on Environmental Quality).
15. The impact fees for this subdivision shall be based on Ordinance No. 213-9.
16. Site Development Construction Plans shall be reviewed and accepted by the City of Bastrop.
17. Fiscal surety for subdivision construction, in a form acceptable to the City of Bastrop, shall be provided prior to final plat approval by the City.
18. The owner of this subdivision, and his or her successors and assigns, assumes sole responsibility for plans for construction of subdivision improvements which comply with applicable codes and requirements of the City of Bastrop. The owner understands and acknowledges that plat vacation or re-platting may be required, at the owner's sole expense, if plans to construct this subdivision do not comply with such codes and requirements.

    if plans to construct this subdivision do not comply with such codes and requirements.
19. By approving this preliminary plat, the City of Bastrop assumes no obligation to construct any infrastructure in connection with this subdivision.
20. No buildings, fences, landscaping or other structures are permitted within drainage easements shown, except as approved by the City of Bastrop.
21. All drainage easements, storm water facilities / features shall be maintained by the property owner or his or her assigns.

STAUDT SURVEYING, INC.
Thomas E. Staudt
RPLS # 3984
P.O. Box 1273
Dripping Springs, Texas 78620
(512)858–2236

STATE OF TEXAS
COUNTY OF HAYS

The undersigned does hereby certify that this survey was this day made on the ground of the property legally described hereon and that to the best of my knowledge and belief is correct, and does declare that on the ground there are no apparent or visible: discrepancies, deed line conflicts, overlapping of improvements, utility easements, or roadways, except as shown hereon, and that said property adjoins a dedicated roadway, except as shown hereon.

"Preliminary, this document shall not be recorded for any purpose."

Thomas E. Staudt — Date
Registered Professional Land Surveyor No. 3984

#	REVISION	DATE

SCALE: 1"=120'
DATE: 7/23/2013
JOB: 1313-01
DRAWN BY: LEA
CHECKED BY: LEA

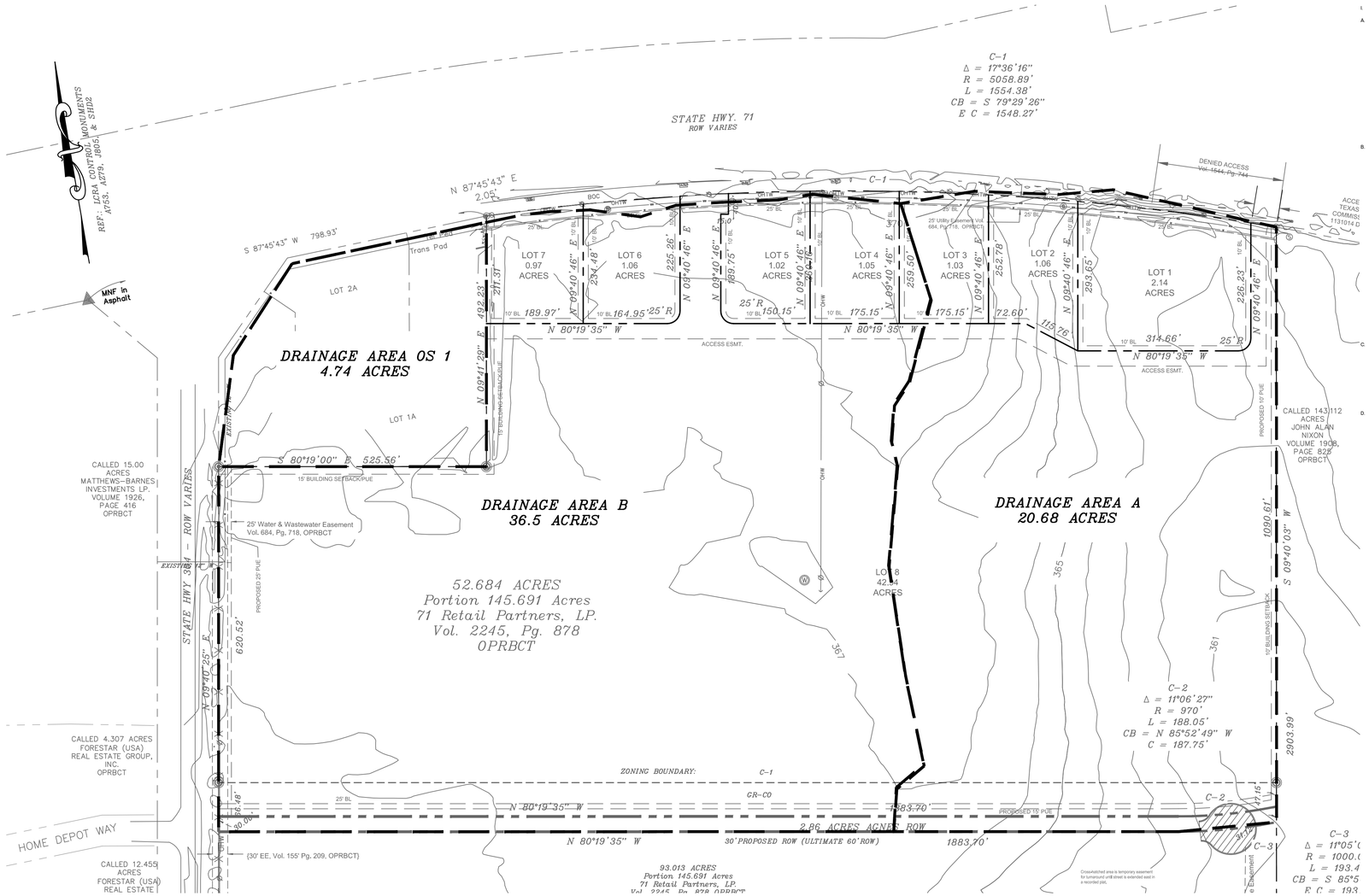
ALDERSON GROUP, INC.
TEXAS REGISTERED ENGINEERING FIRM F-11525
2525 Wallingwood Drive
Bldg. 6 Ste 600
Austin, Texas 78746
(512) 364-0989

STATE OF TEXAS
LYNN E. ALDERSON
96455
LICENSED
PROFESSIONAL ENGINEER
FOR PRELIMINARY REVIEW ONLY, NOT APPROVED FOR RECORDATION OR CONSTRUCTION

71 RETAIL PARTNERS, LP
HWY 71 / FM 304
THE GROVE
PRELIMINARY PLAT

SHEET 1 OF 1

Drawing: C:\1324 Moron Capital\01 Bastrop Grove\Plans\2013 Preliminary Plat.dwg 3.dyn01
Last saved: Jul. 24, 13 11:15:47
Plot: Jul. 24, 13 11:15:47



HYDROLOGY PARAMETERS
RATIONAL METHOD

I. **Area A**

A. **Runoff Coefficients**

Drainage Area 20.660 Acres
Impervious Cover 0.000 Acres
Pervious Cover 20.660 Acres
% Impervious Cover 0.00 Percent

Composite C (from Table 2-2 COA DCM)		Impervious	Pervious	Composite C
	2 yr	0.73	0.25	0.25
	10 yr	0.81	0.30	0.30
	25 yr	0.86	0.34	0.34
	100 yr	0.95	0.41	0.41
				Total
CA 2 =		0.00	5.17	5.17
CA 10 =		0.00	6.20	6.20
CA 25 =		0.00	7.03	7.03
CA 100 =		0.00	8.48	8.48

B. **Time of Concentration**
SHEET FLOW
Tc(A-B)=L^v/(42*s^.5)
L= 100 ft
n= 0.2
s= 0.01 ft/ft
Tc= 4.76 min.

SHALLOW CONCENTRATED
Tc(B-C)=L^v/(60*s^.5)
L= 500 ft
n= 0.02
s= 0.005 ft/ft
Tc= 3.37 min.

CHANNEL FLOW
Tc(C-D)=L^v/(60*s^.5)
Flow Area: 83.0 sf
Wetted Perimeter: 33.46 ft
Hydraulic Radius: 2.49 ft
Slope: 0.005 ft/ft
Mannings n: 0.04
Length: 0 ft
Avg. Velocity: 4.64 ft/sec
Tc = 0 min.

Total Tc'= 8.13 Minutes
*Tc min 8.13 Minutes

C. **Intensities**
i = a/(Tc+b)^c

	a	b	c		
2 yr	62	8.2	0.802	i2=	6.60 in/hr
10 yr	77	8.4	0.785	i10=	9.01 in/hr
25 yr	88	8.4	0.782	i25=	10.38 in/hr
100 yr	103	8.2	0.747	i100=	12.79 in/hr

D. **Q's**
Q=ciA

Q2 =	34.1 cfs
Q10 =	55.9 cfs
Q25 =	73.0 cfs
Q100 =	108.4 cfs

HYDROLOGY PARAMETERS
RATIONAL METHOD

I. **Area B**

A. **Runoff Coefficients**

Drainage Area 36.530 Acres
Impervious Cover 0.000 Acres
Pervious Cover 36.530 Acres
% Impervious Cover 0.00 Percent

Composite C (from Table 2-2 COA DCM)		Impervious	Pervious	Composite C
	2 yr	0.73	0.25	0.25
	10 yr	0.81	0.30	0.30
	25 yr	0.86	0.34	0.34
	100 yr	0.95	0.41	0.41
				Total
CA 2 =		0.00	9.13	9.13
CA 10 =		0.00	10.96	10.96
CA 25 =		0.00	12.42	12.42
CA 100 =		0.00	14.98	14.98

B. **Time of Concentration**
SHEET FLOW
Tc(A-B)=L^v/(42*s^.5)
L= 100 ft
n= 0.2
s= 0.01 ft/ft
Tc= 4.76 min.

SHALLOW CONCENTRATED
Tc(B-C)=L^v/(60*s^.5)
L= 1130 ft
n= 0.2
s= 0.005 ft/ft
Tc= 76.10 min.

CHANNEL FLOW
Tc(C-D)=L^v/(60*s^.5)
Flow Area: 33.46 sf
Wetted Perimeter 33.46 ft
Hydraulic Radius: 2.49 ft
Slope: 0.005 ft/ft
Mannings n: 0.04
Length: 0 ft
Avg. Velocity: 4.64 ft/sec
Tc = 0 min.

Total Tc'= 80.86 Minutes
*Tc min 80.86 Minutes

C. **Intensities**
i = a/(Tc+b)^c

	a	b	c		
2 yr	62	8.2	0.802	i2=	1.69 in/hr
10 yr	77	8.4	0.785	i10=	2.48 in/hr
25 yr	88	8.4	0.782	i25=	2.87 in/hr
100 yr	103	8.2	0.747	i100=	3.60 in/hr

D. **Q's**
Q=cIA

Q2 =	15.5 cfs
Q10 =	27.2 cfs
Q25 =	35.7 cfs
Q100 =	53.9 cfs

HYDROLOGY PARAMETERS
RATIONAL METHOD

I. **Offsite Area 1**

A. **Runoff Coefficients**

Drainage Area 4.740 Acres
Impervious Cover 3.800 Acres
Pervious Cover 0.940 Acres
% Impervious Cover 0.80 Percent

Composite C (from Table 2-2 COA DCM)		Impervious	Pervious	Composite C
	2 yr	0.73	0.25	0.63
	10 yr	0.81	0.30	0.71
	25 yr	0.86	0.34	0.76
	100 yr	0.95	0.41	0.84
				Total
CA 2 =		2.77	0.24	3.01
CA 10 =		3.08	0.28	3.36
CA 25 =		3.27	0.32	3.59
CA 100 =		3.61	0.39	4.00

B. **Time of Concentration**
SHEET FLOW
Tc(A-B)=L^v/(42*s^.5)
L= 20 ft
n= 0.2
s= 0.01 ft/ft
Tc= 0.95 min.

SHALLOW CONCENTRATED
Tc(B-C)=L^v/(60*s^.5)
L= 280 ft
n= 0.02
s= 0.007 ft/ft
Tc= 1.48 min.

CHANNEL FLOW
Tc(C-D)=L^v/(60*s^.5)
Flow Area: 83.3 sf
Wetted Perimeter: 33.46 ft
Hydraulic Radius: 2.49 ft
Slope: 0.005 ft/ft
Mannings n: 0.04
Length: 0 ft
Avg. Velocity: 4.64 ft/sec
Tc = 0 min.

Total Tc'= 2.43 Minutes
*Tc min 5.00 Minutes

C. **Intensities**
i = a/(Tc+b)^c

	a	b	c		
2 yr	62	8.2	0.802	i2=	7.83 in/hr
10 yr	77	8.4	0.785	i10=	10.57 in/hr
25 yr	88	8.4	0.782	i25=	12.18 in/hr
100 yr	103	8.2	0.747	i100=	14.99 in/hr

D. **Q's**
Q=cIA

Q2 =	23.6 cfs
Q10 =	35.5 cfs
Q25 =	45.7 cfs
Q100 =	59.9 cfs

LEGEND

IRFC	IRON ROD FOUND W/ CAP– STAMPED NUMBER NOTED
IRF	IRON ROD FOUND–SIZE NOTED
IRFC	IRON ROD FOUND W/ CAP–BYRN
—OHW—	OVERHEAD UTILITY WIRE
—T—	OVERHEAD TELEPHONE
	UTILITY POLE
—→	GUY WIRE
—X—	WIRE FENCE
BL	BUILDING LINE VOL. 8, PG. 73–74, PRHCT
PUE	PUBLIC UTILITY EASEMENT VOL. 8, PG. 73–74, PRHCT
DE	DRAINAGE EASEMENT VOL. 8, PG. 73–74, PRHCT

#	REVISION	DATE

SCALE: 1"=120'
DATE: 7/23/2013
JOB: 1313-01
DRAWN BY: LEA
CHECKED BY: LEA

ALDERSON GROUP, INC.
AG
TEXAS REGISTERED ENGINEERING FIRM F-11820
2525 Wallingwood Drive
Bldg. 6 Ste 600
Austin, Texas 78746
(512) 364-0989

STATE OF TEXAS
LYNN E. ALDERSON
96455
LICENSED PROFESSIONAL ENGINEER

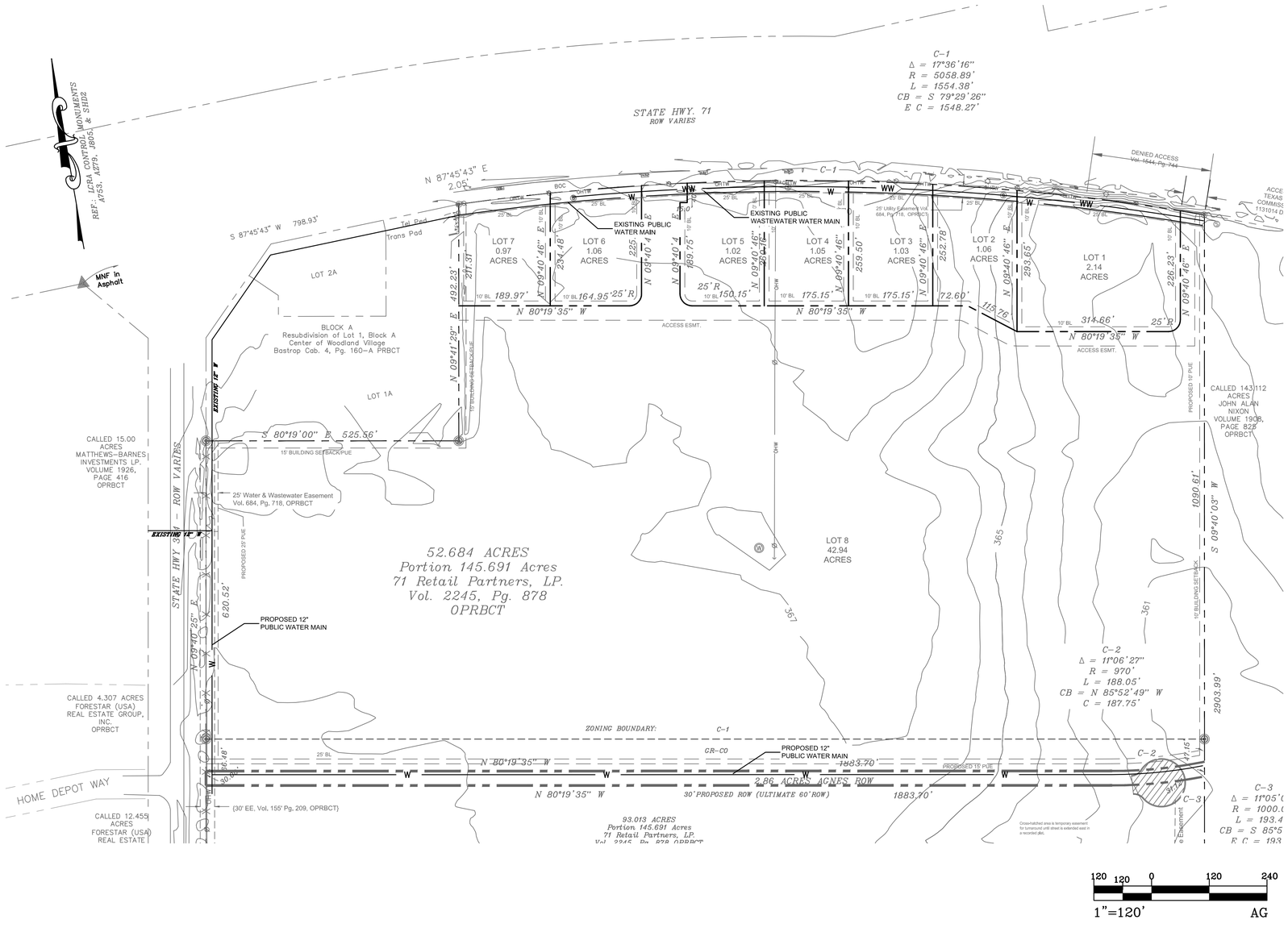
FOR PRELIMINARY REVIEW ONLY, NOT APPROVED FOR RECORDATION OR CONSTRUCTION

71 RETAIL PARTNERS, LP
HWY 71 / FM 304

THE GROVE
EXISTING DRAINAGE

SHEET
1 OF 1

Drawing: C:\1324 Matrix Capital\01 Bastrop Grove\Plans\2013 Drainage Plan.dwg, Layout1
Created: Jul 24, 13 - 12:10:13
Plotted: Jul. 24, 13 - 12:10:13



LEGEND

IRFC	IRON ROD FOUND W/ CAP-STAMPED NUMBER NOTED
IRF	IRON ROD FOUND-SIZE NOTED
IRFC	IRON ROD FOUND W/ CAP-BYRN
—OHW—	OVERHEAD UTILITY WIRE
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DE	DRAINAGE EASEMENT VOL. 8, PG. 73-74, PRHCT

Notes:

Existing utilities show do not represent field verified locations or size and are for reference only.

#	REVISION	DATE

SCALE: 1"=120'
DATE: 7/23/2013
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ALDERSON GROUP, INC.
TEXAS REGISTERED ENGINEERING FIRM F-11820
2525 Wallingwood Drive
Bldg. 6 Ste 600
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STATE OF TEXAS
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PROFESSIONAL ENGINEER

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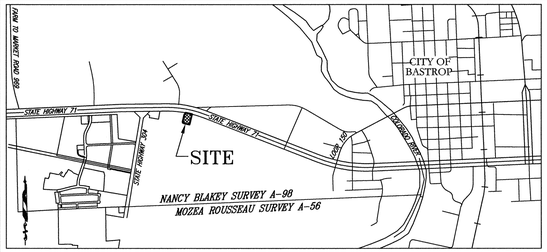
71 RETAIL PARTNERS, LP
HWY 71 / FM 304

THE GROVE UTILITIES

SHEET
1 OF 1

Drawing: C:\1324 Moran Capital\01 Bastrop Grove\Plans\2013 Utility plan.dwg Layout1
Edited: Jul. 24, 13 - 12:28
Plot: Jul. 24, 13 - 12:35:24

THE FINAL PLAT OF
THE GROVE PHASE 1, LOT 5, BLOCK A



LOCATION MAP
NOT TO SCALE

SCALE: 1"= 100'

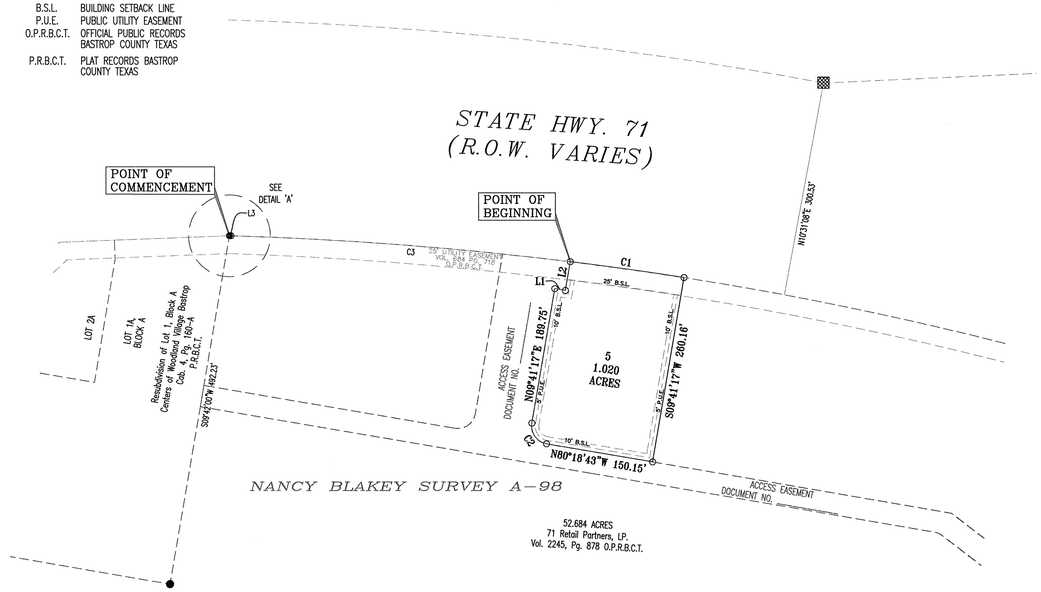
GRAPHIC SCALE

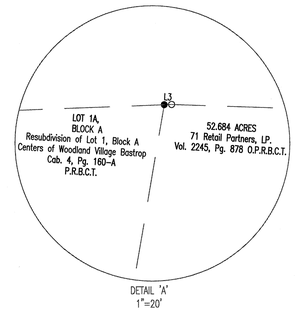
100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

LEGEND

▩	CONCRETE MONUMENT FOUND
○	CAPPED 1/2" IRON ROD SET
●	IRON ROD FOUND
1	LOT NUMBER
Ⓐ	BLOCK DESIGNATION
B.S.L.	BUILDING SETBACK LINE
P.U.E.	PUBLIC UTILITY EASEMENT
O.P.R.B.C.T.	OFFICIAL PUBLIC RECORDS BASTROP COUNTY TEXAS
P.R.B.C.T.	PLAT RECORDS BASTROP COUNTY TEXAS





DETAIL 'A'
1"=20'

FIELD NOTES

BEING ALL OF THAT CERTAIN TRACT OF LAND OUT OF THE NANCY BLAKEY SURVEY, ABSTRACT 98, SITUATED IN BASTROP COUNTY, TEXAS, BEING MORE PARTICULARY DESCRIBED AS BEING A PORTION OF THAT CERTAIN 52.684 ACRE TRACT CONVEYED TO 71 RETAIL PARTNERS, LP., IN VOLUME 2245, PAGE 878, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, SAID 1.020 ACRE TRACT OF LAND BEING MORE FULLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING, at a capped ½" iron rod found for the northeastern corner of Lot 1A, Block A, Resubdivision of Lot 1, Block A, Centers of Woodland Village Bastrop, a subdivision recorded in Cab. 4, Page 160-A, Plat Records of Bastrop County, Texas, also being in the southern right-of-way line of State Highway 71, (R.O.W. varies), from which a ½" iron rod found for the southeastern corner of said Lot 1A, also being an angle corner of said 52.684 acre tract, bears S09°42'00"W, a distance of 492.23 feet, for the **POINT OF COMMENCEMENT** of the herein described tract,

THENCE, with the common boundary line of said 52.684 acre tract and said southern right-of-way line of State Highway 71, the following three (3) courses and distances, numbered 1 through 3,

1. N87°46'14"E, a distance of 2.05 feet to a capped ½" iron rod set, at a point of curvature to the right,
2. with said curve to the right having a radius of 5058.89 feet, an arc length of 475.05 feet and whose chord bears S85°35'39"E, a distance of 474.88 feet to a capped ½" iron rod set, at a point of curvature to the right, for the northernmost northwestern corner and **POINT OF BEGINNING** of the herein described tract, and
3. with said curve to the right having a radius of 5058.89 feet, an arc length of 160.23 feet and whose chord bears S81°59'48"E, a distance of 160.22 feet to a capped ½" iron rod set,

THENCE, leaving said common boundary line and crossing said 52.684 acre tract , the following six (6) courses and distances, numbered 1 through 6,

1. S09°41'17"W, a distance of 260.16 feet to a capped ½" iron rod set,
2. N80°18'43"W, a distance of 150.15 feet to a capped ½" iron rod set, at a point of curvature to the right,
3. with said curve to the right having a radius of 25.00 feet, an arc length of 39.27 feet and whose chord bears N35°18'43"W, a distance of 35.36 feet to a capped ½" iron rod set,
4. N09°41'17"E, a distance of 189.75 feet to a capped ½" iron rod set,
5. S80°18'43"E, a distance of 15.00 feet to a capped ½" iron rod set, and
6. N09°41'17"E, a distance of 40.70 feet to the **POINT OF BEGINNING** and containing 1.020 acres of land.

Curve Table						
Curve #	Length	Radius	Chord Direction	Chord Length	Tangent	DELTA
C1	160.23	5058.89	S81°59'48"E	160.22	80.12	1°48'53"
C2	39.27	25.00	N35°18'43"W	35.36	25.00	90°00'00"
C3	475.05	5058.89	S85°35'39"E	474.88	237.70	5°22'49"

Line Table		
Line #	Length	Direction
L1	15.00	S80°18'43"E
L2	40.70	N09°41'17"E
L3	2.05	N87°46'14"E

STATE OF TEXAS)(
COUNTY OF BASTROP)(KNOW ALL MEN BY THESE PRESENTS:

THAT, 71 RETAIL PARTNERS, LP, ACTING HEREIN BY AND THROUGH DOUGLAS MACMAHON, AND BEING OWNER OF THAT CERTAIN CALLED 52.684 ACRES OF LAND OUT OF THE NANCY BLAKEY SURVEY, ABSTRACT NO. 98, SITUATED IN BASTROP COUNTY, TEXAS, AS CONVEYED TO 71 RETAIL PARTNERS, LP, BY DEED RECORDED IN VOLUME 2245, PAGE 878, OF THE DEED RECORDS OF BASTROP COUNTY, TEXAS, DO HEREBY SUBDIVIDE 1.020 ACRES OF LAND, IN ACCORDANCE WITH THE ATTACHED MAP OR PLAT, TO BE KNOWN AS:

"THE GROVE PHASE 1, LOT 5, BLOCK A",

AND DOES HEREBY DEDICATE TO THE PUBLIC, THE USE OF THE STREETS AND EASEMENTS SHOWN HEREON, SUBJECT TO ANY EASEMENTS AND/OR RESTRICTIONS HERETOFORE GRANTED AND NOT RELEASED.

WITNESS MY HAND, THIS THE _____ DAY OF _____, 20___, A.D.

_____
DOUGLAS MACMAHON, MANAGING MEMBER
71 RETAIL PARTNERS, LP
8214 WESTCHESTER DRIVE, SUITE 550
DALLAS, TEXAS 75225

STATE OF TEXAS)(
COUNTY OF BASTROP)(KNOW ALL MEN BY THESE PRESENTS:

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED DOUGLAS MACMAHON, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT OF WRITING, AND HE ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED AND IN THE CAPACITY THEREIN STATED.

WITNESS MY HAND AND SEAL OF OFFICE, THIS THE _____ DAY OF _____, 20___, A.D.

_____
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

STATE OF TEXAS)(
COUNTY OF BASTROP)(KNOW ALL MEN BY THESE PRESENTS:

I, ROSE PIETSCH, CLERK OF BASTROP COUNTY, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT OF WRITING AND ITS CERTIFICATE OF AUTHENTICATION WAS FILED FOR RECORD IN MY OFFICE ON THE ___ DAY OF _____, 20___, A.D., IN THE PLAT RECORDS OF SAID COUNTY AND STATE IN PLAT CABINET _____, PAGE(s)_____. FILED FOR RECORD AT _____ O'CLOCK ___.M., THIS _____ DAY OF _____, 20___, A.D.,

WITNESS MY HAND AND SEAL OF OFFICE OF THE COUNTY CLERK, THE ___ DAY OF _____, 20___, A.D.

_____. COUNTY CLERK, BASTROP COUNTY, TEXAS

_____
BY: DEPUTY

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

I, TIMOTHY M. HOLLAND, P.E. DO HEREBY CERTIFY THAT THE STREETS AND DRAINAGE DESIGN, AS SHOWN HEREON, COMPLIES WITH THE SUBDIVISION REGULATIONS FOR THE CITY OF BASTROP, AND THAT THE 100 YEAR FLOOD PLAIN IS AS SHOWN AND WILL BE CONTAINED WITHIN THE DRAINAGE EASEMENT AND OR DRAINAGE RIGHT-OF-WAY, AS SHOWN HEREON.

ENGINEERING BY: _____ DATE 5-28-14
TIMOTHY M. HOLLAND, P.E. NO. 94848
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
TIMOTHY M. HOLLAND
94848
LICENSED
PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

THAT I, ROBERT J. GERTSON, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON-THE-GROUND SURVEY OF THE LAND AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH THE SUBDIVISION REGULATIONS OF THE CITY OF BASTROP, BASTROP COUNTY, TEXAS. ALL EASEMENTS OF RECORD HAVE BEEN IDENTIFIED ON THIS PLAT TO THE BEST OF MY KNOWLEDGE.

SURVEYED BY: _____ DATE 5-28-14
ROBERT J. GERTSON ~ R.P.L.S. NO. 6367
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
ROBERT J. GERTSON
6367
PROFESSIONAL LAND SURVEYOR

DATE: MAY 16, 2014

OWNER:
71 REAL ESTATE PARTNERS, LP
8214 WESTCHESTER DRIVE, SUITE 550
DALLAS, TX 75225
PHONE: (214) 849-9831

ENGINEER & SURVEYOR:
CARLSON, BRIGANCE & DOERING, Inc.
5501 WEST WILLIAM CANNON
AUSTIN, TX 78749
(512) 280-5160
(512) 280-5165 fax

TOTAL ACREAGE: 1.020 ACRES
SURVEY: NANCY BLAKEY SURVEY, A-98

COMMERCIAL LOTS: 1 TOTAL: 1.020 ACRES
NO. OF BLOCKS: 1

F.E.M.A. MAP NO. 48021C 0355E
BASTROP COUNTY, TEXAS DATED: JANUARY 19, 2006

FLOOD PLAIN NOTE:

NO PORTION OF THIS TRACT LIES WITHIN A DESIGNATED FLOOD HAZARD AREA, ZONE A, AS SHOWN ON THE FEDERAL FLOOD INSURANCE ADMINISTRATION RATE MAP NO. 48021C 0355E FOR BASTROP COUNTY TEXAS, DATED JANUARY 19, 2006.

GENERAL NOTES:

1. THE BENCHMARKS USED ARE: LCRA CONTROL MONUMENTS A753, AZ79, J805 & SHD2.
2. ALL EASEMENTS OF RECORD AS INDICATED ON THE MOST RECENT TITLE RUN DATED: 6-9-2011, CONDUCTED BY FIRST AMERICAN TITLE COMPANY, TITLE COMMITMENT OF NO. 2011013.334 ISSUED BY HERITAGE TITLE COMPANY OF AUSTIN, FOR PROPERTY INCLUDING THIS PROPERTY ARE SHOWN ON THIS FINAL PLAT.
3. ALL SUBDIVISION IMPROVEMENT PERMITS SHALL CONFORM TO THE CITY OF BASTROP CODE OF ORDINANCES, CONSTRUCTION STANDARDS, AND GENERALLY ACCEPTED ENGINEERING PRACTICES.
4. CONSTRUCTION PLANS AND SPECIFICATIONS FOR ALL SUBDIVISION IMPROVEMENTS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP PRIOR TO ANY CONSTRUCTION WITHIN THE SUBDIVISION.
5. EROSION AND SEDIMENTATION CONTROLS CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP ARE REQUIRED FOR ALL CONSTRUCTION ON EACH LOT.
6. BUILDING SETBACKS SHOWN SHALL BE IN ACCORDANCE WITH THE CITY OF BASTROP SUBDIVISION AND ZONING ORDINANCES FOR C-1 ZONING DISTRICT.
7. PRIOR TO CONSTRUCTION OF ANY IMPROVEMENTS ON LOTS IN THIS SUBDIVISION, BUILDING PERMITS WILL BE OBTAINED FROM THE CITY OF BASTROP.
8. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP.
9. ALL UTILITIES WILL BE UNDERGROUND.
10. DEVELOPER/OWNER SHALL BE SOLELY RESPONSIBLE FOR ALL RELOCATION AND MODIFICATIONS TO EXISTING UTILITIES.
11. ON-SITE STORM WATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST-DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 2, 5, 10, 25, 50 AND 100-YEAR STORM EVENTS BY STRUCTURAL CONTAINMENT OR OTHER APPROVED METHODS. DISCHARGE OF FULLY DEVELOPED FLOWS SHALL REQUIRE OFF SITE CONVEYANCE AND APPROVAL BY THE CITY OF BASTROP.
12. NO LOT OR STRUCTURE SHALL BE OCCUPIED PRIOR TO THE APPLICANT SUBMITTING TO THE CITY OF BASTROP DOCUMENTATION OF SUBDIVISION/SITE REGISTRATION WITH THE TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR) AND PROVIDE DOCUMENTATION OF REVIEW AND COMPLIANCE OF THE SUBDIVISION CONSTRUCTION PLANS WITH THE TEXAS ARCHITECTURAL BARRIERS ACT (TABA).
13. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES.
14. WASTEWATER AND WATER SYSTEMS SHALL CONFORM TO TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY).
15. THE IMPACT FEES FOR THIS SUBDIVISION SHALL BE BASED ON ORDINANCE NO. 213-9.
16. SITE DEVELOPMENT CONSTRUCTION PLANS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP.
17. FISCAL SURETY FOR SUBDIVISION CONSTRUCTION, IN A FORM ACCEPTABLE TO THE CITY OF BASTROP, SHALL BE PROVIDED PRIOR TO FINAL PLAT APPROVAL BY THE CITY.
18. THE OWNER OF THIS SUBDIVISION, AND HIS OR HER SUCCESSORS AND ASSIGNS, ASSUMES SOLE RESPONSIBILITY FOR PLANS FOR CONSTRUCTION OF SUBDIVISION IMPROVEMENTS WHICH COMPLY WITH APPLICABLE CODES AND REQUIREMENTS OF THE CITY OF BASTROP.
19. BY APPROVING THIS FINAL PLAT, THE CITY OF BASTROP ASSUMES NO OBLIGATION TO CONSTRUCT ANY INFRASTRUCTURE IN CONNECTION WITH THIS SUBDIVISION. ANY SUBDIVISION INFRASTRUCTURE REQUIRED FOR THE DEVELOPMENT OF THE LOTS IN THIS SUBDIVISION IS THE SOLE RESPONSIBILITY OF THE DEVELOPER AND/OR THE OWNERS OF THE LOTS. FAILURE TO CONSTRUCT ANY REQUIRED INFRASTRUCTURE TO CITY STANDARDS MAY BE JUST CAUSE FOR THE CITY TO DENY APPLICATIONS FOR CERTAIN DEVELOPMENT PERMITS INCLUDING BUILDING PERMITS, SITE PLAN APPROVALS AND/OR CERTIFICATES OF OCCUPANCY.
20. NO BUILDINGS, FENCES, LANDSCAPING OR OTHER STRUCTURES ARE PERMITTED WITHIN DRAINAGE EASEMENTS SHOWN, EXCEPT AS APPROVED BY THE CITY OF BASTROP.
21. ALL DRAINAGE EASEMENTS, STORM WATER FACILITIES/FEATURES SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
22. FLOOD WARNING: THE DEGREE OF FLOOD PROTECTION REQUIRED BY THE CITY OF BASTROP FLOOD DAMAGE PREVENTION ORDINANCE IS CONSIDERED REASONABLE FOR REGULATORY PURPOSES AND IS BASED ON SCIENTIFIC AND ENGINEERING CONSIDERATIONS. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR AND FLOOD HEIGHTS MAY BE INCREASED BY MAN-MADE OR NATURAL CAUSES. ACCEPTANCE OF THIS PLAT BY THE CITY COUNCIL DOES NOT IMPLY THAT LAND OUTSIDE THE AREAS OF SPECIAL FLOOD HAZARDS OR USES PERMITTED WITHIN SUCH AREAS WILL BE FREE FROM FLOODING OR FLOOD DAMAGES. NOR SHALL ACCEPTANCE OF THIS PLAT CREATE LIABILITY ON THE PART OF THE CITY OF BASTROP OR ANY OFFICIAL OR EMPLOYEE THEREOF FOR ANY FLOOD DAMAGES THAT RESULT FROM RELIANCE ON THE INFORMATION CONTAINED WITHIN THIS PLAT OR ANY ADMINISTRATION DECISION LAWFULLY MADE HEREUNDER.
23. TEMPORARY AND PERMANENT EASEMENTS TO BE PROVIDED, AS REQUIRED AT THE CITY'S SOLE DISCRETION FOR OFF-SITE WATER, WASTEWATER AND DRAINAGE IMPROVEMENTS.
24. PROPERTY OWNER SHALL PROVIDE FOR ACCESS TO ALL EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY GOVERNMENTAL AUTHORITIES.
25. AS SHOWN HEREON, A TEN (10) FOOT WIDE PUBLIC UTILITY EASEMENT (P.U.E.) IS HEREBY DEDICATED ADJACENT TO STREET ROW ON ALL LOTS. A FIVE (5) FOOT WIDE P.U.E. IS HEREBY DEDICATED ALONG EACH SIDE LOT LINE.
26. THE JOINT USE DRIVEWAY(S) AS SHOWN ON THIS PLAT WILL PROVIDE JOINT ACCESS FROM STATE HIGHWAY 71 TO LOT(S) 1-8.
27. ALL CONSTRUCTION WORK MUST COMPLY WITH THE TCEQ GENERAL CONSTRUCTION STORM WATER PERMIT TXR150000.
28. ALL WORK INSIDE TXDOT RIGHT-OF-WAY SHALL BE APPROVED IN WRITING BY TXDOT.
29. ALL TRAFFIC-RELATED WORK MUST COMPLY WITH THE RECOMMENDATIONS CONTAINED IN THE TRAFFIC IMPACT ANALYSIS RELATED TO THIS PROJECT AS APPROVED BY THE CITY OF BASTROP.

APPROVED THIS THE _____ DAY OF _____, 20____, BY THE CITY COUNCIL OF THE CITY OF BASTROP, TEXAS.

APPROVED:
_____
KEN KESSELUS,
MAYOR OF THE CITY OF BASTROP, TEXAS

ATTEST:
_____
CITY SECRETARY, CITY OF BASTROP, TEXAS

REVISION	DATE	COMMENT

SHEET NO. 1 OF 1

RG

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791 ◆ REG. # 10024900
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

PATH-J: \4697\SURVEY\PLAT

BASTROPTX
Heart of the Lost Pines
Est 1832

ADMINISTRATIVE PLAT APPLICATION

(For amending plats or minor plats meeting the conditions and requirements in accordance with Local Government Code Section 212.0065)

Please complete all of the following information (type or print):

Project Name: The Grove Phase 1, Lot 5, Block A

Project Address/Location: 1,450' +/- east of FM 304 / Hwy 71 intersection

Legal Description: Nancy Blakey Survey, A-98

Zoning District (if inside city limits): C-1 (Commercial-1)

Owner / Developer (applicant):

Contact Person: Douglas MacMahon

Company: 71 Retail Partners LP

Address: 8214 Westchester Drive

City, State Zip: Dallas, Texas 75225

Phone Number: (214) 622-6525 E-mail Address dm@morancap.com

Agent:

Contact Person: Geoff Guerrero

Company Name: Carlson, Brigance & Doering, Inc.

Address: 5501 W. William Cannon Drive

City, State Zip: Austin, Texas 78749

Phone Number: (512) 280-5160 E-mail Address geoff@cbdeng.com

Engineer / Surveyor (all plats must be prepared by a licensed engineer or land surveyor):

Contact Person: Tim Holland

Company Name: Carlson, Brigance & Doering, Inc.

Address: 5501 W. William Cannon Dr.

Phone Number: (512) 280-5160 E-mail Address tim@cbdeng.com

Signature of Owner:

(STAFF USE ONLY) Date Submitted: _____ Fee Paid: _____ Received by _____

ADMINISTRATIVE PLAT APPLICATION

The signature of the Owner authorizes the City of Bastrop and its agents to visit and inspect the property for which this application is being submitted. The signature also indicates that the Owner or his Agent has reviewed the requirements of this checklist and all items on this checklist have been addressed and complied with. **Note: The Owner's signature designates the Agent as the official contact person for this project and the single point of contact. All correspondence and communication will be conducted with the Agent. If no agent is listed, the Owner will be considered the Agent.**

REQUIRED ITEMS FOR SUBMITTAL PACKAGE:

The following items are required to be submitted to the Planning Department or included on the subdivision plat in order for the Subdivision Application to be accepted for review.

___ 1. Completed and signed application/checklist. Provide a brief letter explaining the number of lots you are proposing and if these are residential or commercial lots.

___ 2. Prints of plat--**Collated and Folded, 24" x 36" and one 11" x 17". (Submit 6 prints of plat within City, 5 prints when in ETJ- Area A)**

___ 3. Two (2) copies **each**: ___drainage study and three (3) copies **each:** ___utility schematic/plan. If outside the City, three (3) copies.

___ 4. A tax map highlighting the subject property.

___ 5. Copy of deed showing current ownership and a copy of the current tax certificate showing taxes have been paid.

___ 6. Planning Dept. Review Fee: $450.00

**Does not include County recording fees.

___ 7. 3 copies of the recorded final plat. Check with Bastrop County Clerk's office to see if this property is part of/within an existing recorded plat.

N 8 Is this plat a part of an approved Planned Development? Y/N If yes, name of PD:

n/a a. Provide letter and 3 copies, outlining PD development requirements and how they are addressed on the plat.

Note: No partial submittals will be accepted by this office.

ADMINISTRATIVE PLAT APPLICATION

The following shall be provided in accordance with the plat details stated in Section 4.40.3 of the subdivision ordinance, unless otherwise approved by the Planning and Development Director in coordination with the City Manager. Note: references to standards required in other sections of the City's development ordinances are provided to facilitate completion of the administrative procedures application. However these references are not inclusive of all regulations applicable to the proposed development, and must conform to the conditions and requirements in accordance with Local Government Code Section 212.0065.

The applicant is encouraged to contact the Planning Department with any questions regarding the required information. Written explanation must be provided for any requirement not submitted with the application or not addressed in accordance with the Zoning and Subdivision Ordinances.

Section 4.40 Administrative Procedures Plat Details					
To Be Completed By Applicant Indicate Below Compliance With The Following.					**To Be Completed By Staff**
		Yes	No	Comments	Reviewed By:
Section 4.40.1.C	**The topography of the tract and the surrounding lands is such that no regard need be given in such subdivision to drainage. If drainage facilities are required, this administrative process cannot be used.**	✓			
Section 4.40.1.D	**Each lot meets the minimum lot requirements as set forth in Section 5.50 and 6.110.4 and does not require any variance or exception to regulations. The resubdivision of any lot, tract or parcel of land within a rural subdivision shall not be permitted if the proposed lot (s) size will be less than one (1) acre.**	✓			
Section 4.40.1.E	**The perimeter of the tract being subdivided has been surveyed and marked on the ground, and each corner of each lot of such proposed subdivision has been marked on the ground, and is tied to a corner of the tract being subdivided. A plat thereof shall be filed with the City as outlined in Section 4.30.2 and 4.30.3.**	✓			

ADMINISTRATIVE PLAT APPLICATION

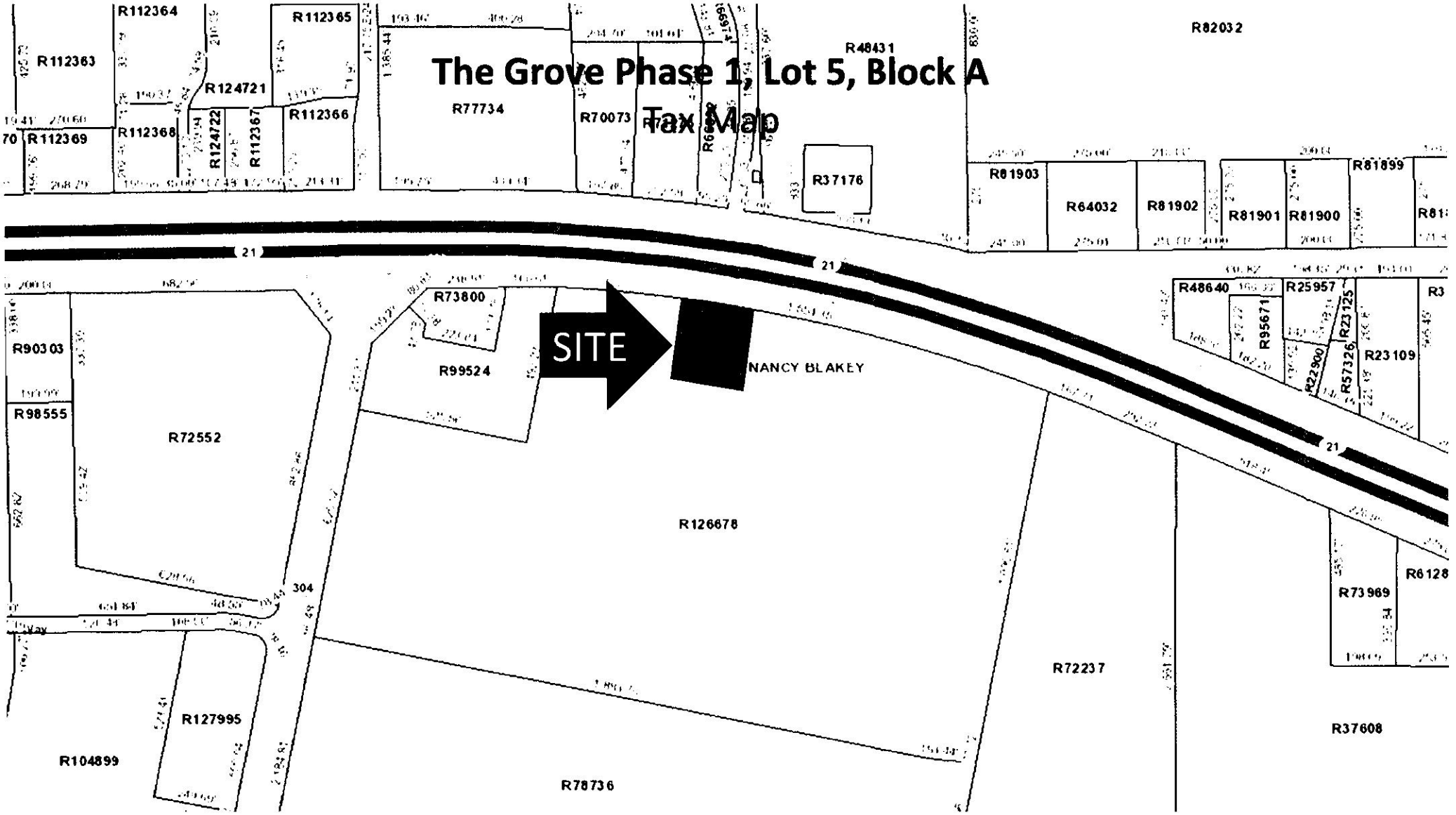
Section 4.40.3.A	**The name of the land owner or owners - the name of the licensed public surveyor responsible for the preparation of the plat; the scale and location of each lot with reference to an original corner of the original subdivision or tract of which said land is a part; the date, north point and total acres in the proposed subdivision or lots.**	✓			
Section 4.40.3.B	**The certificate of the licensed public surveyor and/or licensed engineer who surveyed, mapped and monumented the land shall be placed on the face of the plat as described in Section 4.40.3.B**	✓			

To Be Completed By Applicant Indicate Below Compliance With The Following.					To Be Completed By Staff
		Yes	No	Comments	Reviewed By:
Section 4.40.3.C	**A certificate of ownership acknowledged before a notary public by the owners and any holders of liens against the land.**	✓			
Section 4.40.3.D	**An accurate on-the-ground boundary survey of the property showing bearing and distances and the lines of all adjacent land, streets, easements and alleys with their names and width. (Streets, alleys and lot lines in adjacent subdivisions shall be shown dashed.) All necessary data to reproduce the plat on the ground must be shown on the plat.**	✓			
Section 4.40.3.E	**A certificate of approval to be signed by the mayor shall be placed on the face of the plat. See Section 4.20.3.**	✓			
Section 4.40.3.F	**The plat shall show all existing features within the area being subdivided, amended or replatted such as existing drainage, easements, width of adjacent streets and alleys**	✓			

	and existing utility easements.				
Section 4.40.3.G	**Lot lines and numbers of all lots proposed to be created with complete dimensions for front, rear and side lot lines.**	✓			
Section 4.40.3.H	**Building setback lines shall be shown for each lot created. Refer to Section 5.70 for set back dimensions.**	✓			
Section 4.40.3.I	**Existing Utilities and Drainage. Five (5) copies of the proposed plat marked to show locations and size of dimensions of existing utilities, drainage and streets.**	✓			
Section 4.40.3.J	**A receipt showing that all taxes have been paid shall be submitted with the plat.**	✓			

The Grove Phase 1, Lot 5, Block A

Tax Map



V2245 - P878
ELECTRONICALLY RECORDED
OFFICIAL PUBLIC RECORDS
Rose Pietsch
7/3/2013 3:28 PM
FEE: $28.00 BOOK: 2245 PAGE: 878
ROSE PIETSCH, County Clerk
Bastrop, Texas
DEED 201308705

Unofficial Document

IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

GENERAL WARRANTY DEED

THE STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF BASTROP §

MC BASTROP XI, LP, a Texas limited partnership (hereinafter called "Grantor"), in consideration of the sum of TEN AND NO/100 ($10.00) DOLLARS and other good and valuable consideration in hand paid by 71 RETAIL PARTNERS, LP, a Texas limited partnership, whose address is 8214 Westchester Drive, Suite 550, Dallas, Texas 75225 (hereinafter called "Grantee"), the receipt and sufficiency of which are hereby acknowledged and confessed, has GRANTED, BARGAINED, SOLD AND CONVEYED, and by these presents does hereby GRANT, BARGAIN, SELL and CONVEY unto Grantee, the real property located in Bastrop County, Texas which is more particularly described on Exhibit A attached hereto and made a part hereof for all purposes (the "Land"), together with all right, title and interest of Grantor, if any, in (i) all improvements and fixtures on the Land, (ii) all oil, gas and other minerals in, on or under the Land, (iii) all adjacent and/or contiguous streets, roads, avenues, alleys, and rights of way, (iv) rivers, streams, and strips and gores of land adjoining, adjacent and contiguous thereto, (v) all easements, rights of ingress and egress, rights of way, and covenants appurtenant to the Land, (vi) all riparian rights, surface and underground water rights, and any and all other water rights pertaining to the Land and (vii) all permits, approvals, licenses, rights, and authorizations and exemptions of any kind from governmental authorities related to the ownership, maintenance, use, development or operation of the Land or any improvements thereon (the Land together with such rights, titles, being collectively called the "Property"), subject to, however, those exceptions and encumbrances set forth on Owner's Policy of Title Insurance No. 5019648-0011649c dated October 6, 2011, issued by First American Title Insurance Company (said exceptions and encumbrances being called the "Permitted Exceptions").

TO HAVE AND TO HOLD the Property, together with all and singular the rights and appurtenances thereto in anywise belonging, unto Grantee, its successors and assigns FOREVER, subject to the Permitted Exceptions, and, subject to the Permitted Exceptions, Grantor does hereby bind itself and its successors and assigns to WARRANT AND FOREVER DEFEND all and singular the Property unto Grantee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof.

Real property ad valorem taxes and assessments having been prorated to the date hereof, Grantee hereby assumes and agrees to pay when due all such ad valorem property taxes and assessments for the year 2013 and subsequent years.

Executed as of July 3rd, 2013

GRANTOR:

MC BASTROP 71, LP,
a Texas limited partnership
By: MC Bastrop 71 GP, LLC,
a Texas limited liability company,
its General Partner

By: _____
Douglas MacMahon, Manager

STATE OF TEXAS §
§
COUNTY OF Dallas §

This instrument was acknowledged before me on the 3rd day of July, 2013, by Douglas MacMahon, the Manager of MC Bastrop 71 GP, LLC, a Texas limited liability company, the General Partner of MC Bastrop 71, LP, a Texas limited partnership, on behalf of said limited partnership.

Andrea J McLeod
My Commission Expires
11/29/2015

_____
Notary Public in and for the State of Texas
My Commission Expires: 11/29/2015
ANDREA J. MCLEOD
Printed Name

Unofficial Document

Unofficial Document

STATE OF TEXAS
COUNTY OF BASTROP

52.684 ACRES
NANCY BLAKEY SURVEY, A-98

DESCRIPTION

DESCRIPTION OF A 52.684 ACRE TRACT OF LAND OUT OF THE NANCY BLAKEY SURVEY, A-98, BASTROP COUNTY, TEXAS, AND BEING A PORTION OF THAT CERTAIN TRACT OF LAND CALLED TO BE 145.691 ACRES, DESCRIBED IN A DEED TO MC BASTROP 71 LP, OF RECORD IN VOLUME 2097, PAGE 241, OF THE OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, SAID 52.684 ACRES BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING at an iron rod with cap marked "Property Corner" found June 22, 2011, in the south right-of-way line of State Highway 71, at the northeast corner of Lot 1A, Block A, Resubdivision of Lot 1, Block A, Center of Woodland Village Bastrop, a subdivision of record in Cabinet 4, Page 160-A, of the Plat Records of Bastrop County, Texas, said iron rod being the most northerly northwest corner of said 145.691 acre tract, and the most northerly northwest corner of the herein described tract;

THENCE, with the south right-of-way line of said State Highway 71, the following two (2) courses:

1) N 87° 45' 43" E, 2.05 feet to a large hole where concrete with TXDOT Brass Cap found disturbed;
2) A curve to the right having a radius of 5058.89 feet, an arc distance of 1554.38 feet, a central angle of 17° 36' 16", and a chord which bears S 79° 29' 26" E, 1548.27 feet to an iron rod with cap marked "Property Corner" found June 21, 2011, at the northwest corner of a tract of land called to be 43.112 acres, described in a deed to John Alan Nixon, of record in Volume 1908, Page 825, of the Official Public Records of Bastrop County, Texas, said iron rod being the northeast corner of said 145.691 acre tract, and the northeast corner of the herein described tract;

THENCE, S 09° 40' 03" W, with the east line of said 145.691 acre tract, and the west line of said 43.112 acre tract, at 1090.61 feet passing a ½ inch iron rod found June 22, 2011, and continuing for a total distance of 1168.33 feet to a 5/8 inch iron rod with cap set October 1, 2010, found June 22, 2011, for the southeast corner of the herein described tract;

THENCE, across said 145.691 acre tract, the following two (2) courses:

1) A curve to the right having a radius of 1000.00 feet, an arc distance of 193.46 feet, a central angle of 11° 05' 05", and a chord which bears N 85° 52' 07" W, 193.16 feet to a 5/8 inch iron rod with cap set October 1, 2010, found June 22, 2011;
2) N 80° 19' 35" W, 1883.70 feet to a 5/8 inch iron rod with cap set October 1, 2010, found, June 22, 2011, in the east right-of-way line of State Highway 304, same being the most westerly west line of said 145.691 acre tract, said iron rod being the southwest corner of the herein described tract;

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THENCE, N 09° 40' 25" E, with the east right-of-way line of said State Highway 304, at 96.48 feet passing a ½ inch iron rod found June 22, 2011, and continuing for a total distance of 717.00 feet to a ½ inch iron rod found June 22, 2011, at the southwest corner of said Lot 1A, Resubdivision of Lot 1, Block A, Center of Woodland Village Bastrop, said iron rod being the most westerly northwest corner of said 145.691 acre tract, and the most westerly northwest corner of the herein described tract;

THENCE, S 80° 19' 00" E, with the westerly north line of said 145.691 acre tract, and the south line of said Lot 1A, 525.56 feet to a ½ inch iron rod found June 22, 2011, at the southeast corner of said Lot 1A, said iron rod being an ell corner of said 145.691 acre tract, and an ell corner of the herein described tract;

THENCE, N 09° 41' 29" E, with the northerly west line of said 145.691 acre tract, and the east line of said Lot 1, 492.23 feet to the POINT OF BEGINNING containing 52.684 acres of land within these metes and bounds.

71 Retail Partners, LP **1006**

NAME: City of Bastrop CHECK DATE: 5/23/2014

	Administrative Plat Filing Fee	450.00
American National Ba	The Grove Phase 1, Lot 5, Block A	450.00

THIS CHECK IS VOID WITHOUT A TURQUOISE BACKGROUND AND A WATERMARK - HOLD UP TO THE LIGHT TO VERIFY

71 Retail Partners, LP
8214 Westchester Drive
Suite 550
Dallas, TX 75225

American National Bank of Texas
800-837-6584
www.anbtx.com
88-151/1119

1006

Printed>WinUser-Andrea McLeod: 05/23/14 09:51:00 am

DATE 5/23/2014
AMOUNT 450.00

PAY ONLY 4 5 0 00 Four Five Zero

MEMO: The Grove Phase 1, Lot 5, Block A

PAY Four Hundred Fifty and 00/100 Dollars

TO THE ORDER OF City of Bastrop

CHECK IS PRINTED ON SECURITY PAPER WHICH INCLUDES A MICROPRINT BORDER & FLUORESCENT FIBERS

⑈001006⑈ ⑆111901519⑆300160516⑈

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

July 29, 2014

Ms. Yvonne Pritchard
City of Bastrop
1311 Chestnut Street
Bastrop, Texas 78602

Re: *The Grove Phase 1, Lot 5, Block A*
Comment Response Update #1
CBD No. 4697

Dear Ms. Pritchard,

Please find attached our itemized responses to comments issued on June 24, 2014.

Melissa McCollum, AICP, LEED AP-Director of Planning and Development

1. Zoning of the property has been added to the face of the plat.
2. Rear setback corrected to 20' as required in C1, Commercial.
3. Utility providers added to the face of the plat.

Wesley Brandon, PE – City Engineer

1. Lot 5 does not adjoin F.M. 304. No tie added. A tie across Hwy 71 is on the face of the plat.
2. Benchmark information added to the face of the plat.
3. Width of adjacent access easement added to the face of the plat.
4. Revised note 15 to reference Ordinance 2011-21.
5. Revised note 26 to state reciprocal access shall be provided. Language was revised to what was approved via email on June 26, 2014. A reference to note 26 has been added to the face of the plat.
6. Provided a note stating "Development of Lot 5 shall substantially conform to the Preliminary Plat entitled "The Grove" as approved by the Bastrop City Council on July 8, 2014.
7. Access easement not recorded at this time. Will be recorded concurrent with final plat. Easement documentation was previously sent for approval.
8. No new easements recorded at this time.

Trey Job, Director of Water and Wastewater and Public Works

1. Comment acknowledged.

Diane Schulze, PE, Assistant Area Engineer, TxDOT

1. Comment acknowledged.
2. Comment acknowledged.
3. Comment acknowledged.

Yvonne Pritchard, Project Coordinator

1. No other changes made.

If additional information is required, please contact me at 512-280-5160.

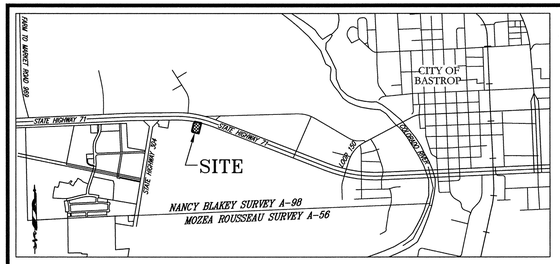
Sincerely,

CARLSON, BRIGANCE, & DOERING INC.



Robert J. Gertson, R.P.L.S.

THE FINAL PLAT OF
THE GROVE PHASE 1, LOT 5, BLOCK A



LOCATION MAP
NOT TO SCALE

SCALE: 1"= 100'

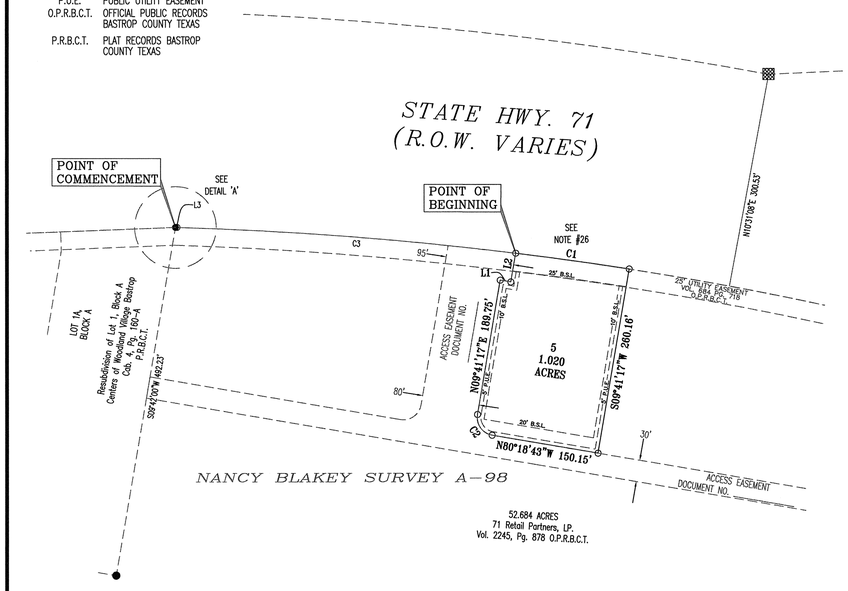
GRAPHIC SCALE

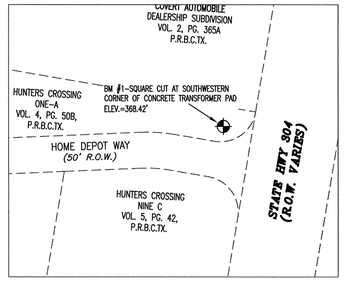
100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

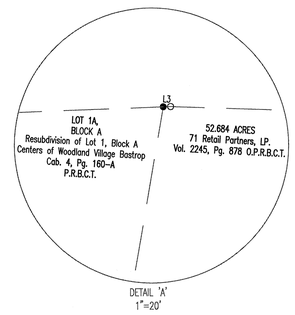
LEGEND

▩	CONCRETE MONUMENT FOUND
○	CAPPED 1/2" IRON ROD SET
●	IRON ROD FOUND
1	LOT NUMBER
Ⓐ	BLOCK DESIGNATION
B.S.L.	BUILDING SETBACK LINE
P.U.E.	PUBLIC UTILITY EASEMENT
O.P.R.B.C.T.	OFFICIAL PUBLIC RECORDS BASTROP COUNTY TEXAS
P.R.B.C.T.	PLAT RECORDS BASTROP COUNTY TEXAS





BENCHMARK DETAIL
1"=100'



DETAIL 'A'
1"=20'

FIELD NOTES

BEING ALL OF THAT CERTAIN TRACT OF LAND OUT OF THE NANCY BLAKEY SURVEY, ABSTRACT 98, SITUATED IN BASTROP COUNTY, TEXAS, BEING MORE PARTICULARY DESCRIBED AS BEING A PORTION OF THAT CERTAIN 52.684 ACRE TRACT CONVEYED TO 71 RETAIL PARTNERS, LP., IN VOLUME 2245, PAGE 878, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, SAID 1.020 ACRE TRACT OF LAND BEING MORE FULLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING, at a capped ½" iron rod found for the northeastern corner of Lot 1A, Block A, Resubdivision of Lot 1, Block A, Centers of Woodland Village Bastrop, a subdivision recorded in Cab. 4, Page 160-A, Plat Records of Bastrop County, Texas, also being in the southern right-of-way line of State Highway 71, (R.O.W. varies), from which a ½" iron rod found for the southeastern corner of said Lot 1A, also being an angle corner of said 52.684 acre tract, bears S09°43'00"W, a distance of 492.23 feet, for the **POINT OF COMMENCEMENT** of the herein described tract,

THENCE, with the common boundary line of said 52.684 acre tract and said southern right-of-way line of State Highway 71, the following three (3) courses and distances, numbered 1 through 3,

1. N87°46'14"E, a distance of 2.05 feet to a capped ½" iron rod set, at a point of curvature to the right,
2. with said curve to the right having a radius of 5058.89 feet, an arc length of 475.05 feet and whose chord bears S85°35'39"E, a distance of 474.88 feet to a capped ½" iron rod set, at a point of curvature to the right, for the northernmost northwestern corner and **POINT OF BEGINNING** of the herein described tract, and
3. with said curve to the right having a radius of 5058.89 feet, an arc length of 160.23 feet and whose chord bears S81°59'48"E, a distance of 160.22 feet to a capped ½" iron rod set,

THENCE, leaving said common boundary line and crossing said 52.684 acre tract , the following six (6) courses and distances, numbered 1 through 6,

1. S09°41'17"W, a distance of 260.16 feet to a capped ½" iron rod set,
2. N80°18'43"W, a distance of 150.15 feet to a capped ½" iron rod set, at a point of curvature to the right,
3. with said curve to the right having a radius of 25.00 feet, an arc length of 39.27 feet and whose chord bears N35°18'43"W, a distance of 35.36 feet to a capped ½" iron rod set,
4. N09°41'17"E, a distance of 189.75 feet to a capped ½" iron rod set,
5. S80°18'43"E, a distance of 15.00 feet to a capped ½" iron rod set, and
6. N09°41'17"E, a distance of 40.70 feet to the **POINT OF BEGINNING** and containing 1.020 acres of land.

BENCHMARK:

BM#1: SQUARE CUT IN SOUTHWEST CORNER OF A CONCRETE ELECTRIC TRANSFORMER PAD LOCATED ON THE NORTHERN RIGHT-OF-WAY LINE OF HOME DEPOT WAY, APROXIMATELY 24' NORTH OF THE RETURN AT STATE HIGHWAY NO. 304
ELEV=368.42'

Curve Table						
Curve #	Length	Radius	Chord Direction	Chord Length	Tangent	DELTA
C1	160.23	5058.89	S81°59'48"E	160.22	80.12	1°48'53"
C2	39.27	25.00	N35°18'43"W	35.36	25.00	90°00'00"
C3	475.05	5058.89	S85°35'39"E	474.88	237.70	5°22'49"

Line Table		
Line #	Length	Direction
L1	15.00	S80°18'43"E
L2	40.70	N09°41'17"E
L3	2.05	N87°46'14"E

DATE: JUNE 26, 2014

OWNER:
71 REAL ESTATE PARTNERS, LP
8214 WESTCHESTER DRIVE, SUITE 550
DALLAS, TX 75225
PHONE: (214) 849-9831

ENGINEER & SURVEYOR:
CARLSON, BRIGANCE & DOERING, Inc.
5501 WEST WILLIAM CANNON
AUSTIN, TX 78749
(512) 280-5160
(512) 280-5165 fax

TOTAL ACREAGE: 1.020 ACRES
SURVEY: NANCY BLAKEY SURVEY, A-98

COMMERCIAL LOTS: 1 TOTAL: 1.020 ACRES
NO. OF BLOCKS: 1

FLOODPLAIN INFORMATION: F.E.M.A. MAP NO. 48021C 0355E
BASTROP COUNTY, TEXAS DATED: JANUARY 19, 2006

ZONING: C1, COMMERCIAL

UTILITIES:

WATER:	CITY OF BASTROP
WASTEWATER:	CITY OF BASTROP
GAS:	CENTERPOINT ENERGY
ELECTRIC:	BLUEBONNET ELECTRIC
TELEPHONE:	SOUTHWESTERN BELL TELEPHONE
CABLE:	TIME WARNER CABLE

FLOOD PLAIN NOTE:

NO PORTION OF THIS TRACT LIES WITHIN A DESIGNATED FLOOD HAZARD AREA, ZONE A, AS SHOWN ON THE FEDERAL FLOOD INSURANCE ADMINISTRATION RATE MAP NO. 48021C 0355E FOR BASTROP COUNTY TEXAS, DATED JANUARY 19, 2006.

GENERAL NOTES:

1. BENCHMARK: SQUARE CUT IN SOUTHWEST CORNER OF A CONCRETE ELECTRIC TRANSFORMER PAD LOCATED ON THE NORTHERN RIGHT-OF-WAY LINE OF HOME DEPOT WAY, APROXIMATELY 24' NORTH OF THE RETURN AT STATE HIGHWAY NO. 304. ELEV=368.42'
2. ALL EASEMENTS OF RECORD AS INDICATED ON THE MOST RECENT TITLE RUN DATED: 6-9-2011, CONDUCTED BY FIRST AMERICAN TITLE COMPANY, TITLE COMMITMENT GF NO. 201101334 ISSUED BY HERITAGE TITLE COMPANY OF AUSTIN, FOR PROPERTY INCLUDING THIS PROPERTY ARE SHOWN ON THIS FINAL PLAT.
3. ALL SUBDIVISION IMPROVEMENT PERMITS SHALL CONFORM TO THE CITY OF BASTROP CODE OF ORDINANCES, CONSTRUCTION STANDARDS, AND GENERALLY ACCEPTED ENGINEERING PRACTICES.
4. CONSTRUCTION PLANS AND SPECIFICATIONS FOR ALL SUBDIVISION IMPROVEMENTS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP PRIOR TO ANY CONSTRUCTION WITHIN THE SUBDIVISION.
5. EROSION AND SEDIMENTATION CONTROLS CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP ARE REQUIRED FOR ALL CONSTRUCTION ON EACH LOT.
6. BUILDING SETBACKS SHOWN SHALL BE IN ACCORDANCE WITH THE CITY OF BASTROP SUBDIVISION AND ZONING ORDINANCES FOR C-1 ZONING DISTRICT.
7. PRIOR TO CONSTRUCTION OF ANY IMPROVEMENTS ON LOTS IN THIS SUBDIVISION, BUILDING PERMITS WILL BE OBTAINED FROM THE CITY OF BASTROP.
8. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP.
9. ALL UTILITIES WILL BE UNDERGROUND.
10. DEVELOPER/OWNER SHALL BE SOLELY RESPONSIBLE FOR ALL RELOCATION AND MODIFICATIONS TO EXISTING UTILITIES.
11. ON-SITE STORM WATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST-DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 2, 5, 10, 25, 50 AND 100-YEAR STORM EVENTS BY STRUCTURAL CONTAINMENT OR OTHER APPROVED METHODS. DISCHARGE OF FULLY DEVELOPED FLOWS SHALL REQUIRE OFF SITE CONVEYANCE AND APPROVAL BY THE CITY OF BASTROP.
12. NO LOT OR STRUCTURE SHALL BE OCCUPIED PRIOR TO THE APPLICANT SUBMITTING TO THE CITY OF BASTROP DOCUMENTATION OF SUBDIVISION/SITE REGISTRATION WITH THE TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR) AND PROVIDE DOCUMENTATION OF REVIEW AND COMPLIANCE OF THE SUBDIVISION CONSTRUCTION PLANS WITH THE TEXAS ARCHITECTURAL BARRIERS ACT (TABA).
13. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES.
14. WASTEWATER AND WATER SYSTEMS SHALL CONFORM TO TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY).
15. THE IMPACT FEES FOR THIS SUBDIVISION SHALL BE BASED ON ORDINANCE NO. 2011-21.
16. SITE DEVELOPMENT CONSTRUCTION PLANS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP.
17. FISCAL SURETY FOR SUBDIVISION CONSTRUCTION, IN A FORM ACCEPTABLE TO THE CITY OF BASTROP, SHALL BE PROVIDED PRIOR TO FINAL PLAT APPROVAL BY THE CITY.
18. THE OWNER OF THIS SUBDIVISION, AND HIS OR HER SUCCESSORS AND ASSIGNS, ASSUMES SOLE RESPONSIBILITY FOR PLANS FOR CONSTRUCTION OF SUBDIVISION IMPROVEMENTS WHICH COMPLY WITH APPLICABLE CODES AND REQUIREMENTS OF THE CITY OF BASTROP.
19. BY APPROVING THIS FINAL PLAT, THE CITY OF BASTROP ASSUMES NO OBLIGATION TO CONSTRUCT ANY INFRASTRUCTURE IN CONNECTION WITH THIS SUBDIVISION. ANY SUBDIVISION INFRASTRUCTURE REQUIRED FOR THE DEVELOPMENT OF THE LOTS IN THIS SUBDIVISION IS THE SOLE RESPONSIBILITY OF THE DEVELOPER AND/OR THE OWNERS OF THE LOTS. FAILURE TO CONSTRUCT ANY REQUIRED INFRASTRUCTURE TO CITY STANDARDS MAY BE JUST CAUSE FOR THE CITY TO DENY APPLICATIONS FOR CERTAIN DEVELOPMENT PERMITS INCLUDING BUILDING PERMITS, SITE PLAN APPROVALS AND/OR CERTIFICATES OF OCCUPANCY.
20. NO BUILDINGS, FENCES, LANDSCAPING OR OTHER STRUCTURES ARE PERMITTED WITHIN DRAINAGE EASEMENTS SHOWN, EXCEPT AS APPROVED BY THE CITY OF BASTROP.
21. ALL DRAINAGE EASEMENTS, STORM WATER FACILITIES/FEATURES SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
22. FLOOD WARNING: THE DEGREE OF FLOOD PROTECTION REQUIRED BY THE CITY OF BASTROP FLOOD DAMAGE PREVENTION ORDINANCE IS CONSIDERED REASONABLE FOR REGULATORY PURPOSES AND IS BASED ON SCIENTIFIC AND ENGINEERING CONSIDERATIONS. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR AND FLOOD HEIGHTS MAY BE INCREASED BY MAN-MADE OR NATURAL CAUSES. ACCEPTANCE OF THIS PLAT BY THE CITY COUNCIL DOES NOT IMPLY THAT LAND OUTSIDE THE AREAS OF SPECIAL FLOOD HAZARDS OR USES PERMITTED WITHIN SUCH AREAS WILL BE FREE FROM FLOODING OR FLOOD DAMAGES. NOR SHALL ACCEPTANCE OF THIS PLAT CREATE LIABILITY ON THE PART OF THE CITY OF BASTROP OR ANY OFFICIAL OR EMPLOYEE THEREOF FOR ANY FLOOD DAMAGES THAT RESULT FROM RELIANCE ON THE INFORMATION CONTAINED WITHIN THIS PLAT OR ANY ADMINISTRATION DECISION LAWFULLY MADE HEREUNDER.
23. TEMPORARY AND PERMANENT EASEMENTS TO BE PROVIDED, AS REQUIRED AT THE CITY'S SOLE DISCRETION FOR OFF-SITE WATER, WASTEWATER AND DRAINAGE IMPROVEMENTS.
24. PROPERTY OWNER SHALL PROVIDE FOR ACCESS TO ALL EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY GOVERNMENTAL AUTHORITIES.
25. AS SHOWN HEREON, A TEN (10) FOOT WIDE PUBLIC UTILITY EASEMENT (P.U.E.) IS HEREBY DEDICATED ADJACENT TO STREET ROW ON ALL LOTS. A FIVE (5) FOOT WIDE P.U.E. IS HEREBY DEDICATED ALONG EACH SIDE LOT LINE.
26. RECIPROCAL ACCESS SHALL BE PROVIDED BETWEEN THE NEIGHBORING LOTS OF "THE GROVE" FOR THE PURPOSE OF VEHICULAR AND PEDESTRIAN TRAFFIC IN LOCATIONS TO BE DETERMINED AND APPROVED IN CONJUNCTION WITH THE SITE DEVELOPMENT PLANS. DRIVEWAY ACCESS FROM STATE HIGHWAY 71 SHALL BE VIA ACCESS EASEMENT DOCUMENT NO. _____ AND NOT TO EACH INDIVIDUAL LOT, AS APPROVED IN CONJUNCTION WITH THE SITE DEVELOPMENT PLANS.
27. ALL CONSTRUCTION WORK MUST COMPLY WITH THE TCEQ GENERAL CONSTRUCTION STORM WATER PERMIT TXR150000.
28. ALL WORK INSIDE TXDOT RIGHT-OF-WAY SHALL BE APPROVED IN WRITING BY TXDOT.
29. ALL TRAFFIC-RELATED WORK MUST COMPLY WITH THE RECOMMENDATIONS CONTAINED IN THE TRAFFIC IMPACT ANALYSIS RELATED TO THIS PROJECT AS APPROVED BY THE CITY OF BASTROP.
30. DEVELOPMENT OF LOT 5 SHALL SUBSTANTIALLY CONFORM TO THE PRELIMINARY PLAT ENTITLED "THE GROVE" AS APPROVED BY THE BASTROP CITY COUNCIL ON JULY 8, 2014.

REVISION	DATE	COMMENT

STATE OF TEXAS)(
COUNTY OF BASTROP)(KNOW ALL MEN BY THESE PRESENTS:

THAT, 71 RETAIL PARTNERS, LP, ACTING HEREIN BY AND THROUGH DOUGLAS MACMAHON, AND BEING OWNER OF THAT CERTAIN CALLED 52.684 ACRES OF LAND OUT OF THE NANCY BLAKEY SURVEY, ABSTRACT NO. 98, SITUATED IN BASTROP COUNTY, TEXAS, AS CONVEYED TO 71 RETAIL PARTNERS, LP, BY DEED RECORDED IN VOLUME 2245, PAGE 878, OF THE DEED RECORDS OF BASTROP COUNTY, TEXAS, DO HEREBY SUBDIVIDE 1.020 ACRES OF LAND, IN ACCORDANCE WITH THE ATTACHED MAP OR PLAT, TO BE KNOWN AS:

"THE GROVE PHASE 1, LOT 5, BLOCK A",

AND DOES HEREBY DEDICATE TO THE PUBLIC, THE USE OF THE STREETS AND EASEMENTS SHOWN HEREON, SUBJECT TO ANY EASEMENTS AND/OR RESTRICTIONS HERETOFORE GRANTED AND NOT RELEASED.

WITNESS MY HAND, THIS THE _____ DAY OF _____, 20___, A.D.

_____
DOUGLAS MACMAHON, MANAGING MEMBER
71 RETAIL PARTNERS, LP
8214 WESTCHESTER DRIVE, SUITE 550
DALLAS, TEXAS 75225

STATE OF TEXAS)(
COUNTY OF BASTROP)(KNOW ALL MEN BY THESE PRESENTS:

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED DOUGLAS MACMAHON, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT OF WRITING, AND HE ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED AND IN THE CAPACITY THEREIN STATED.

WITNESS MY HAND AND SEAL OF OFFICE, THIS THE _____ DAY OF _____, 20___, A.D.

_____
NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

STATE OF TEXAS)(
COUNTY OF BASTROP)(KNOW ALL MEN BY THESE PRESENTS:

I, ROSE PIETSCH, CLERK OF BASTROP COUNTY, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT OF WRITING AND ITS CERTIFICATE OF AUTHENTICATION WAS FILED FOR RECORD IN MY OFFICE ON THE ___ DAY OF _____, 20___, A.D., IN THE PLAT RECORDS OF SAID COUNTY AND STATE IN PLAT CABINET _____, PAGE(s)_____. FILED FOR RECORD AT _____ O'CLOCK __.M., THIS _____ DAY OF _____, 20___, A.D.,

WITNESS MY HAND AND SEAL OF OFFICE OF THE COUNTY CLERK, THE ___ DAY OF _____, 20___, A.D.

_____, COUNTY CLERK, BASTROP COUNTY, TEXAS

_____
BY: DEPUTY

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

I, TIMOTHY M. HOLLAND, P.E. DO HEREBY CERTIFY THAT THE STREETS AND DRAINAGE DESIGN, AS SHOWN HEREON, COMPLIES WITH THE SUBDIVISION REGULATIONS FOR THE CITY OF BASTROP, AND THAT THE 100 YEAR FLOOD PLAIN IS AS SHOWN AND WILL BE CONTAINED WITHIN THE DRAINAGE EASEMENT AND OR DRAINAGE RIGHT-OF-WAY, AS SHOWN HEREON.

ENGINEERING BY: _____ DATE 7-29-2014
TIMOTHY M. HOLLAND, P.E. NO. 94848
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
TIMOTHY M. HOLLAND
94848
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

THAT I, ROBERT J. GERTSON, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON-THE-GROUND SURVEY OF THE LAND AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH THE SUBDIVISION REGULATIONS OF THE CITY OF BASTROP, BASTROP COUNTY, TEXAS. ALL EASEMENTS OF RECORD HAVE BEEN IDENTIFIED ON THIS PLAT TO THE BEST OF MY KNOWLEDGE.

SURVEYED BY: _____ DATE 7-29-14
ROBERT J. GERTSON ~ R.P.L.S. NO. 6367
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
REGISTERED
ROBERT J. GERTSON
6367
PROFESSIONAL LAND SURVEYOR

APPROVED THIS THE _____ DAY OF _____, 20____, BY THE CITY COUNCIL OF THE CITY OF BASTROP, TEXAS.

APPROVED:

_____
KEN KESSELUS,
MAYOR OF THE CITY OF BASTROP, TEXAS

ATTEST:

_____
CITY SECRETARY, CITY OF BASTROP, TEXAS

SHEET NO. 1 OF 1

RG

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791 ◆ REG. # 10024900
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

PATH-J: \4697\SURVEY\PLAT

RESOLUTION NO. R-2017-62

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BASTROP, TEXAS, APPROVING THE PRELIMINARY PLAT KNOWN AS BASTROP GROVE BEING 52.684 ACRES OUT OF THE NANCY BLAKEY SURVEY, LOCATED EAST OF STATE HIGHWAY 304 AND SOUTH OF WEST STATE HIGHWAY 71, WITHIN THE CITY LIMITS OF BASTROP, TEXAS, REPEALING ALL CONFLICTING RESOULTIONS; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, pursuant to the Texas Local Government Code Section 212 and the City of Bastrop Subdivision Ordinance, the City Council is required to take action regarding certain plats; and

WHEREAS, 71 Retail Partners LP ("the Applicant") has submitted a preliminary plat Bastrop Grove, a commercial subdivision; and

WHEREAS, the preliminary plat is consistent with the Comprehensive Plan designation of General Commercial and requirements of the Zoning District, C-1, Commercial-1; and

WHEREAS, the preliminary plat is conforms to the Transportation Master Plan and includes right-of-way dedication for the extension of Agnes Street; and

WHEREAS, the preliminary plat for Bastrop Grove was recommended for approval by the Planning & Zoning Commission on July 27, 2017; and

WHEREAS, the Bastrop Planning and Engineering Department has reviewed the above-referenced final plat and found it is in compliance with the Comprehensive Plan, Zoning Ordinance, and Subdivision Ordinance; and

WHEREAS, notice of the subdivision were sent in accordance with the Subdivision Ordinance to notify the public.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BASTROP, TEXAS:

Section 1. The Preliminary Plat known as Bastrop Grove, being 52.684 acres out of the Nancy Blakey Survey, located east of Highway 304 and south of West State Highway 71, attached hereto as Exhibit "A" and incorporated herein for all purposes.

DULY RESOLVED AND ADOPTED by the City Council of the City of Bastrop this 8th day of August, 2017.

CITY OF BASTROP, TEXAS

APPROVED:

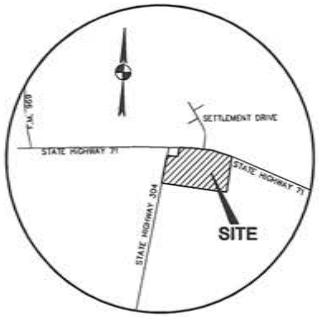
Connie B. Schroeder, Mayor

ATTEST:

Ann Franklin, City Secretary

APPROVED AS TO FORM:

David F. Bragg, City Attorney



VICINITY MAP
N.T.S.

OWNER: 71 RETAIL PARTNERS LP
8214 WESTCHESTER DRIVE, SUITE 550
DALLAS, TEXAS 75225

ENGINEER: STANTEC CONSULTING SERVICES, INC.
221 WEST SIXTH STREET, SUITE 600
AUSTIN, TEXAS 78701
(512) 328-0011

SURVEYOR: STANTEC CONSULTING SERVICES, INC.
221 WEST SIXTH STREET, SUITE 600
AUSTIN, TEXAS 78701
(512) 328-0011

WATERSHED STATUS:

THIS SITE IS LOCATED WITHIN THE LOWER COLORADO-CUMMINS WATERSHED.

FLOODPLAIN INFORMATION:

A PORTION OF THE SUBJECT PROPERTY IS LOCATED WITHIN THE BOUNDARIES OF THE 500 YEAR FLOODPLAIN, AS IDENTIFIED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, FEDERAL INSURANCE ADMINISTRATION, SHOWN ON MAP NO. 48021C0355E, DATED JANUARY 19, 2006 FOR CITY OF BASTROP.

LEGAL DESCRIPTION:

52.684 ACRES OF THE NANCY BLAKEY ABSTRACT NO. 98 SITUATED IN THE CITY OF BASTROP IN BASTROP COUNTY, TEXAS PER VOLUME 2245, PAGE 628.

UTILITY PROVIDERS:

WATER SERVICE: CITY OF BASTROP
WASTEWATER SERVICE: CITY OF BASTROP
ELECTRIC: BLUEBONNET ELECTRIC
GAS: CENTERPOINT ENERGY
TELEPHONE: AT&T

Stantec
221 West Sixth Street, Suite 600
Austin, Texas 78701
Tel. (512) 328-0011 Fax (512) 328-0325
TBPE # F-5324 TBPLS # F-10194230

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BASTROP GROVE PRELIMINARY PLAT

BASTROP GROVE

ZONING:	COMMERCIAL-1
NO. OF LOTS:	9
LOT ACREAGE:	51.25 ACRES
ROW ACREAGE:	1.43 ACRES
TOTAL ACREAGE:	52.68 ACRES

SUBDIVISION NO. :

ADDRESS :

SUBMITTAL DATE : MAY 22, 2017

SUBMITTED BY : 07/12/2017

JOSE M. FARIS, P.E., P.E. DATE
STANTEC CONSULTING SERVICES, INC.
221 WEST SIXTH STREET, SUITE 600
AUSTIN, TEXAS 78701
(512) 328-0011

STATE OF TEXAS
JOSE M. FARIS
111389
LICENSED
PROFESSIONAL ENGINEER

I, JOSE M. FARIS, P.E., P.E., AM AUTHORIZED UNDER THE LAWS OF THE STATE OF TEXAS TO PRACTICE THE PROFESSION OF ENGINEERING, AND HEREBY CERTIFY THAT THIS PRELIMINARY PLAN IS FEASIBLE FROM AN ENGINEERING STANDPOINT AND COMPLIES WITH THE ENGINEERING RELATED PORTIONS OF CHAPTER 10 OF THE BASTROP CITY CODE AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, I CERTIFY THAT THESE ENGINEERING DOCUMENTS ARE COMPLETE, ACCURATE, AND ADEQUATE FOR THE INTENDED PURPOSES, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION PRIOR TO FORMAL CITY APPROVAL.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN APPROVING THESE PLANS, THE CITY OF BASTROP MUST RELY UPON THE ADEQUACY OF THE DESIGN ENGINEER. THE PLANS WERE PREPARED IN ACCORDANCE WITH CHAPTER 10, BASTROP CITY CODE.

FILE: V:\2220\active\222010772\civil\cad\prelim plat\222010772TI2.dwg

SHEET INDEX

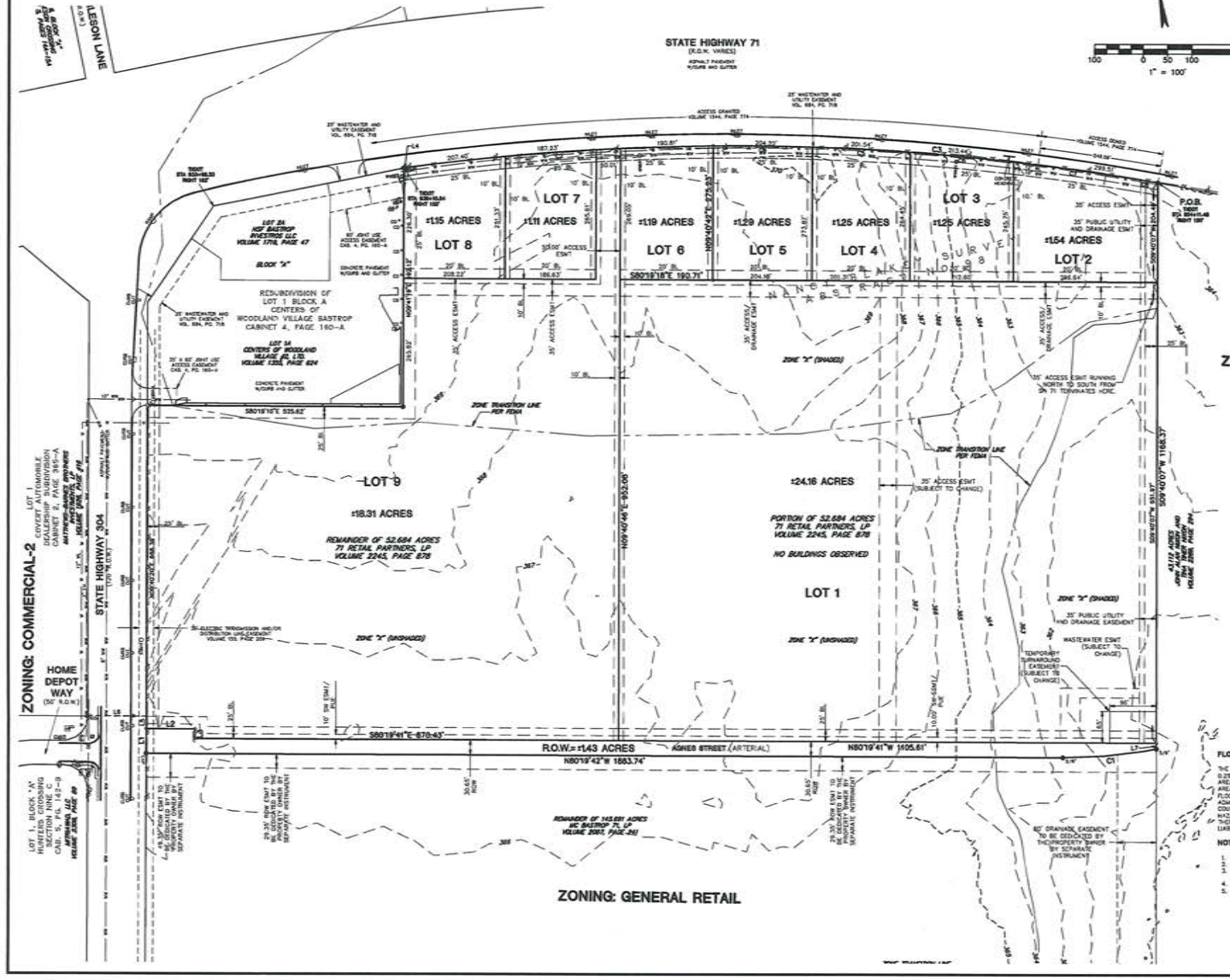
SHEET NO.	DESCRIPTION
1	COVER
2	PRELIMINARY PLAT
3	PRELIMINARY PLAT
4	GENERAL NOTES

NO.	DESCRIPTION	REVISE (R) ADD (A) VOID (V) SHEET NO.'S	TOTAL # SHEETS IN PLAN SET	NET CHANGE IMP. COVER (sq. ft.)	TOTAL SITE IMP. COVER (sq. ft.) [%]	CITY OF AUSTIN APPROVAL/DATE	DATE IMAGED

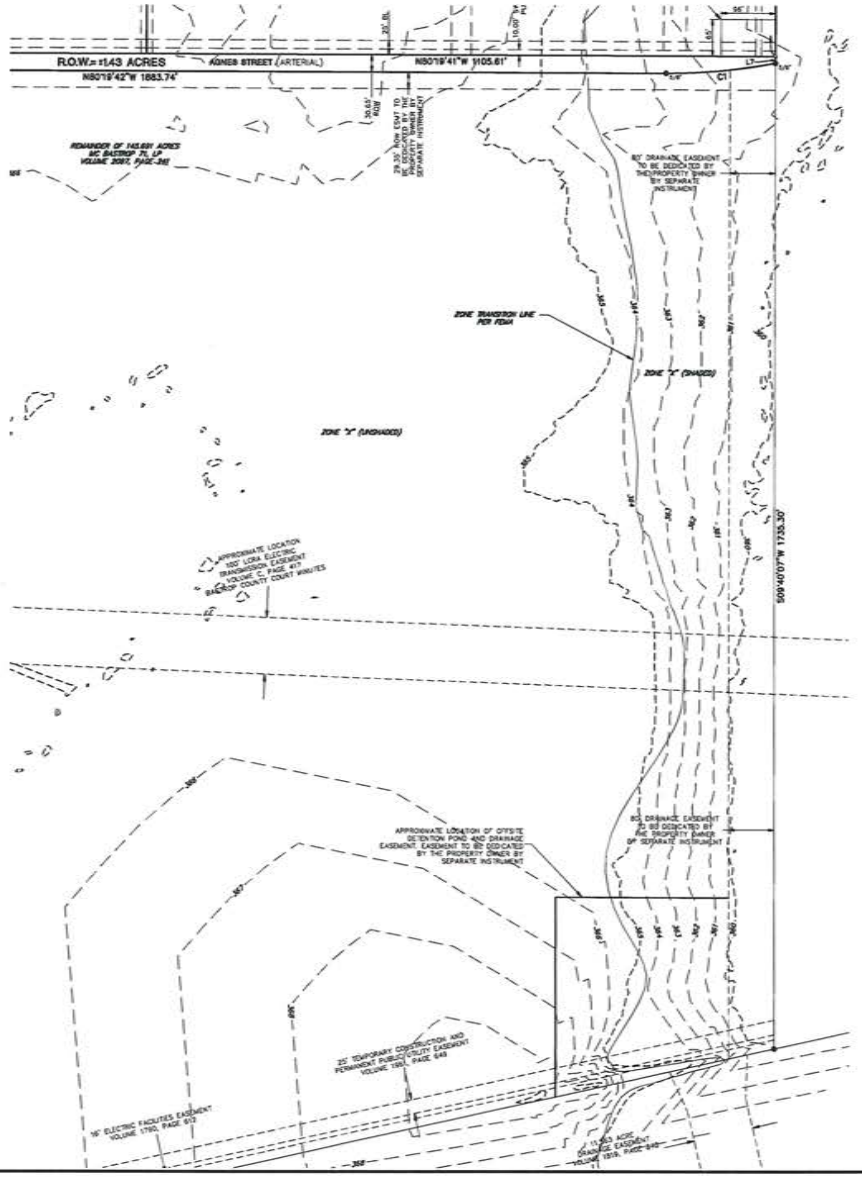
APPROVED FOR ACCEPTANCE:

CITY COUNCIL DATE

BASTROP GROVE PRELIMINARY PLAT


STATE HIGHWAY 71
(R.O.W. VARIES)
ASPHALT PAVEMENT W/CURB AND GUTTER
LESSON LANE
STATE HIGHWAY 304
(100' R.O.W.)
HOME DEPOT WAY
(50' R.O.W.)
AGNES STREET (ARTERIAL)
R.O.W.= ±1.43 ACRES
LOT 1
±24.16 ACRES
PORTION OF 52.684 ACRES 71 RETAIL PARTNERS, LP VOLUME 2245, PAGE 878
NO BUILDINGS OBSERVED
LOT 2
±1.54 ACRES
LOT 3
±1.25 ACRES
LOT 4
±1.25 ACRES
LOT 5
±1.29 ACRES
LOT 6
±1.19 ACRES
LOT 7
±1.11 ACRES
LOT 8
±1.15 ACRES
LOT 9
±18.31 ACRES
REMAINDER OF 52.684 ACRES 71 RETAIL PARTNERS, LP VOLUME 2245, PAGE 878
REMAINDER OF 145.691 ACRES MC BASTROP 71, LP VOLUME 2007, PAGE 261
REMAINDER OF WOODLAND VILLAGE BASTROP CABINET 4, PAGE 160-A
RESUBDIVISION OF LOT 1 BLOCK A CENTERS OF WOODLAND VILLAGE BASTROP CABINET 4, PAGE 160-A
LOT 2A CENTERS OF WOODLAND VILLAGE RE, LTD. VOLUME 1355, PAGE 824
LOT 2A HGT BASTROP RYECROSS GLC VOLUME 3778, PAGE 47
BLOCK "A"
LOT 1 COVERT AUTOMOBILE DEALERSHIP SUBDIVISION CABINET 2, PAGE 365-A
MITCHELL-DANIEL BUYERS VOLUME 2305, PAGE 711
LOT 1, BLOCK "A" HUNTERS CROSSING SECTION NINE C CAB. 3, PG. 113-B
MITCHELL LTD VOLUME 2305, PAGE 711
ZONE "X" (SHADED)
ZONE TRANSITION LINE PER FEMA
ZONING: COMMERCIAL-1
ZONING: COMMERCIAL-2
ZONING: GENERAL RETAIL
S80°19'41"E 870.43'
N80°19'42"W 1863.74'
N80°19'41"W 1405.61'
S80°19'18"E 190.71'
S80°19'10"E 525.62'
N09°40'46"E 952.06'
S09°40'07"W 1168.37'
N09°40'46"E 275.33'
N09°40'46"E 273.67'
N09°40'46"E 273.67'
N09°40'46"E 273.67

BASTROP GROVE PRELIMINARY PLAT



LEGEND

●	1/2" IRON ROD FOUND (UNLESS NOTED)
○	1/2" IRON ROD WITH "STANTEC" CAP SET
	LIGHT POLE
	POWER POLE
	DOWN GUY
	FIRE HYDRANT
	WATER VALVE
	CABLE TV RISER
	ELECTRIC BOX
	ELECTRIC METER
	OVERHEAD ELEC. LINE
	WASTEWATER MANHOLE
	STORMSEWER MANHOLE
	WASTEWATER CLEANOUT
	WASTE WATER LINE
	UNDERGROUND CABLE MARKER
	SIGN
(XXX)	RECORD INFORMATION
P.O.B.	POINT OF BEGINNING

NOTES:

1. TOPOGRAPHY SHOWN WITHIN THE MC BASTROP 71, LP TRACT OF LAND IS BASED ON 2008 CAPCOG 5' CONTOUR GIS DATA.
2. OFFSITE DETENTION POND BEING PROVIDED WILL PROVIDE DETENTION FOR LOTS 1-9 AND THE SECTION OF AGNES STREET (ARTERIAL) SHOWN ON THIS PLAT.

NO.	DATE	REVISION	APPROVAL

Stantec
221 West 6th Street, Suite 600
Austin, Texas 78701
Tel (512) 328-0011 Fax (512) 328-0325
TBPE # F-0324 TBPLS # F-10194239

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STATE OF TEXAS
JESSE M. FARMS
111369
LICENSED
07/12/2017

PRELIMINARY PLAT

BASTROP GROVE PRELIMINARY PLAT
SH 71 AT SH 304, BASTROP, TX 78602

71 RETAIL PARTNERS LP

DRAWN BY: JAMPSID
DESIGNED BY: PRD
QA / QC: JF
PROJECT NO.: 222010772

SHEET
3
OF
4

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BASTROP GROVE PRELIMINARY PLAT

PRELIMINARY PLAN NOTES:

1. ALL EASEMENTS OF RECORD AS INDICATED ON THE MOST RECENT TITLE RUN (DATED: FEBRUARY 7, 2017, CONDUCTED BY _____) FOR THIS PROPERTY ARE SHOWN ON THIS PLAT.

2. FISCAL SURETY FOR SUBDIVISION CONSTRUCTION, IN A FORM ACCEPTABLE TO THE CITY OF BASTROP, SHALL BE PROVIDED PRIOR TO PLAT APPROVAL BY THE CITY.

3. THE OWNER OF THIS SUBDIVISION, AND HIS OR HER SUCCESSORS AND ASSIGNS, ASSUMES SOLE RESPONSIBILITY FOR PLANS FOR CONSTRUCTION OF SUBDIVISION IMPROVEMENTS WHICH COMPLY WITH APPLICABLE CODES AND REQUIREMENTS OF THE CITY OF BASTROP. THE OWNER UNDERSTANDS AND ACKNOWLEDGES THAT PLAT VACATION OR RE-PLATTING MAY BE REQUIRED, AT THE OWNER'S SOLE EXPENSE, IF PLANS TO CONSTRUCT THIS SUBDIVISION DO NOT COMPLY WITH SUCH CODES AND REQUIREMENTS.

4. WATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.

5. WASTEWATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.

6. ELECTRIC SERVICE IS PROVIDED BY THE BLUEBONNET ELECTRIC COOPERATIVE.

7. ALL UTILITIES WILL BE UNDERGROUND.

8. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES.

9. A PORTION OF THIS TRACT IS WITHIN A FLOOD HAZARD AREA AS SHOWN ON THE FLOOD INSURANCE RATE MAP PANEL # 48021C0335E FOR BASTROP CO., EFFECTIVE JANUARY 19, 2006 COMMUNITY # 480022 AND IS ON ZONE X.

10. OFF-SITE STORM WATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST-DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 5, 10, 25, 50 AND 100-YEAR STORM EVENTS.

11. PROPERTY OWNER SHALL PROVIDE FOR ACCESS TO ALL EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY GOVERNMENTAL AUTHORITIES.

12. NO BUILDINGS, FENCES, LANDSCAPING OR OTHER STRUCTURES ARE PERMITTED WITHIN DRAINAGE EASEMENTS SHOWN, EXCEPT AS APPROVED BY THE CITY OF BASTROP AND/OR BASTROP COUNTY.

13. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.

14. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP.

15. THE OWNER SHALL BE RESPONSIBLE FOR INSTALLATION OF TEMPORARY EROSION CONTROL, RE-VEGETATION AND TREE PROTECTION FOR ELECTRIC UTILITY WORK REQUIRED TO PROVIDE ELECTRIC SERVICE TO THIS PROJECT.

16. OUT-PARCEL LOTS SHALL HAVE NO DIRECT ACCESS TO SH 71.

17. LOT 9 SHALL HAVE NO DIRECT ACCESS TO SH 304.

18. OWNERS OF LOT 1 AND LOT 9 ARE RESPONSIBLE FOR PROVIDING PUBLIC ACCESS BETWEEN SH 71 AND AGNES STREET AT THE TIME OF THEIR DEVELOPMENT.

19. UTILITY IMPACT FEE SHALL BE BASED ON THE CITY OF BASTROP IMPACT FEE ORDINANCE IN EFFECT'S AT THE TIME OF FINAL PLATTING FOR EACH LOT.

20. 35-FOOT ACCESS EASEMENT RUNNING NORTH TO SOUTH WITHIN LOT 9 MAY BE RELOCATED WITHIN LOT 9 SO LONG AS IT PROVIDES ACCESS BETWEEN SH 71 AND AGNES STREET.

21. DETENTION FOR LOTS 1-9 AND AGNES STREET WILL BE PROVIDED OFFSITE WITHIN THE ADJACENT TRACT OF LAND LOCATED SOUTH OF AGNES STREET. PLEASE REFERENCE SHEET 3 FOR APPROXIMATE LOCATION OF DETENTION IMPROVEMENTS. FOR DETENTION POND ENGINEERING CALCULATIONS, PLEASE REFERENCE ENGINEERING AND DRAINAGE REPORT PREPARED BY CARLSON, BRIGANCE, AND DOERING.

22. PRIOR TO A SITE DEVELOPMENT PERMIT BEING ISSUED, A DECLARATION OF CONDITIONS, COVENANTS, AND RESTRICTIONS MUST BE RECORDED THAT DEFINES THE PARTY OR PARTIES RESPONSIBLE FOR THE MAINTENANCE OF SHARED/COMMON INTERNAL PRIVATE IMPROVEMENTS SUCH AS DRIVES AND FACILITIES USED IN CONNECTION WITH PRIVATE WATER, SEWER, GAS, ELECTRIC, TELEPHONE, OR OTHER UTILITIES.

23. UTILITY IMPACT FEES SHALL BE BASED ON THE CITY OF BASTROP IMPACT FEE ORDINANCE IN EFFECT AT THE TIME OF FINAL PLATTING FOR EACH LOT.

GENERAL NOTES:

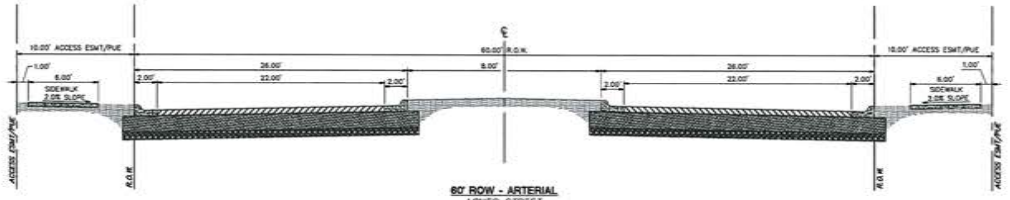
1) ONLY VISIBLE EVIDENCE OF IMPROVEMENTS AND UTILITIES IS SHOWN HEREON.

2) A FIELDNOTE DESCRIPTION HAS BEEN PREPARED TO ACCOMPANY THE SURVEY SHOWN HEREON AND IS IDENTIFIED AS STANTEC CONSULTING SERVICES, INC FIELDNOTE FILE FN. NO. 17-045(MJL)

3) AT THE TIME OF SURVEY, THERE WAS NO OBSERVABLE EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS IN RECENT MONTHS.

4) AT THE TIME OF SURVEY, THERE WAS NO OBSERVABLE EVIDENCE OF RECENT CHANGE IN STREET RIGHTS-OF-WAY OR RECENT CONSTRUCTION OR REPAIRS OF STREETS, SIDEWALKS OR OTHER INFRASTRUCTURES.

5) THE IS A UNDERGROUND WASTEWATER LINE ALONG THE SOUTHERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 71, NO OTHER VISIBLE ABOVE-GROUND EVIDENCE OF OTHER UTILITIES WERE NOTED.



60' ROW - ARTERIAL
AGNES STREET
N.T.S.

NO.	DATE	REVISION	APPROVAL

Stantec
221 West Sixth Street, Suite 600
Austin, Texas 78701
Tel (512) 328-0011 Fax (512) 328-0325
TBPE # F-0324 TBPLS # F-10194329

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STATE OF TEXAS
JOSE M. PARAS
111389
LICENSED
07/12/2017

GENERAL NOTES

BASTROP GROVE PRELIMINARY PLAT
SH 71 AT SH 304, BASTROP, TX 78602

71 RETAIL PARTNERS LP

DRAWN BY: JAMPSID
DESIGNED BY: PSD
QA / QC: JF
PROJECT NO.: 222010772

SHEET
4
OF 4

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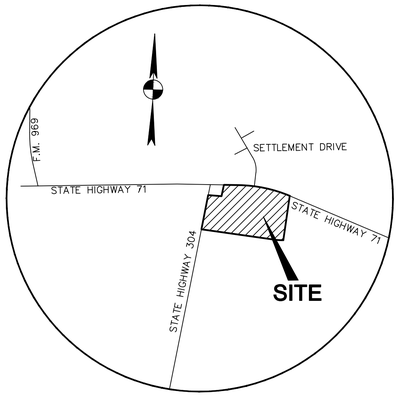

VICINITY MAP

N.T.S.

OWNER: 71 RETAIL PARTNERS LP
8214 WESTCHESTER DRIVE, SUITE 550
DALLAS, TEXAS 75225

ENGINEER: STANTEC CONSULTING SERVICES, INC.
221 WEST SIXTH STREET, SUITE 600
AUSTIN, TEXAS 78701
(512) 328-0011

SURVEYOR: STANTEC CONSULTING SERVICES, INC.
221 WEST SIXTH STREET, SUITE 600
AUSTIN, TEXAS 78701
(512) 328-0011

WATERSHED STATUS:

THIS SITE IS LOCATED WITHIN THE LOWER COLORADO-CUMMINS WATERSHED.

FLOODPLAIN INFORMATION:

A PORTION OF THE SUBJECT PROPERTY IS LOCATED WITHIN THE BOUNDARIES OF THE 500 YEAR FLOODPLAIN, AS IDENTIFIED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, FEDERAL INSURANCE ADMINISTRATION, SHOWN ON MAP NO. 48021C0355E, DATED JANUARY 19, 2006 FOR CITY OF BASTROP.

LEGAL DESCRIPTION:

52.684 ACRES OF THE NANCY BLAKEY ABSTRACT NO. 98 SITUATED IN THE CITY OF BASTROP IN BASTROP COUNTY, TEXAS PER VOLUME 2245, PAGE 828.

UTILITY PROVIDERS:

WATER SERVICE: CITY OF BASTROP
WASTEWATER SERVICE: CITY OF BASTROP
ELECTRIC: BLUEBONNET ELECTRIC
GAS: CENTERPOINT ENERGY
TELEPHONE: AT&T

Stantec
221 West Sixth Street, Suite 600
Austin, Texas 78701
Tel. (512) 328-0011 Fax (512) 328-0325
TBPE # F-6324 TBPLS # F-10194230
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BASTROP GROVE
PRELIMINARY PLAT

BASTROP GROVE

ZONING:	COMMERCIAL–1
NO. OF LOTS:	9
LOT ACREAGE:	51.25 ACRES
ROW ACREAGE:	1.43 ACRES
TOTAL ACREAGE:	52.68 ACRES

SUBDIVISION NO. :

ADDRESS :

SUBMITTAL DATE : MAY 22, 2017

SUBMITTED BY : 07/07/2017
DATE

JOSE M. FARIS, P.E., P.E.
STANTEC CONSULTING SERVICES, INC.
221 WEST SIXTH STREET, SUITE 600
AUSTIN, TEXAS 78701
(512) 328-0011

STATE OF TEXAS
JOSE M. FARIS
111389
LICENSED
PROFESSIONAL ENGINEER

I, JOSE M. FARIS, P.E., P.E., AM AUTHORIZED UNDER THE LAWS OF THE STATE OF TEXAS TO PRACTICE THE PROFESSION OF ENGINEERING, AND HEREBY CERTIFY THAT THIS PRELIMINARY PLAN IS FEASIBLE FROM AN ENGINEERING STANDPOINT AND COMPLIES WITH THE ENGINEERING RELATED PORTIONS OF CHAPTER 10 OF THE BASTROP CITY CODE AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. I CERTIFY THAT THESE ENGINEERING DOCUMENTS ARE COMPLETE, ACCURATE, AND ADEQUATE FOR THE INTENDED PURPOSES, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION PRIOR TO FORMAL CITY APPROVAL.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN APPROVING THESE PLANS, THE CITY OF BASTROP MUST RELY UPON THE ADEQUACY OF THE DESIGN ENGINEER. THE PLANS WERE PREPARED IN ACCORDANCE WITH CHAPTER 10, BASTROP CITY CODE.

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SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER
2	PRELIMINARY PLAT
3	PRELIMINARY PLAT
4	GENERAL NOTES

NO.	DESCRIPTION	REVISE (R) ADD (A) VOID (V) SHEET NO.'S	TOTAL # SHEETS IN PLAN SET	NET CHANGE IMP. COVER (sq. ft.)	TOTAL SITE IMP. COVER (sq. ft.) [%]	CITY OF AUSTIN APPROVAL/DATE	DATE IMAGED

APPROVED FOR ACCEPTANCE:

CITY COUNCIL DATE

SHEET 1 OF 4

BASTROP GROVE PRELIMINARY PLAT

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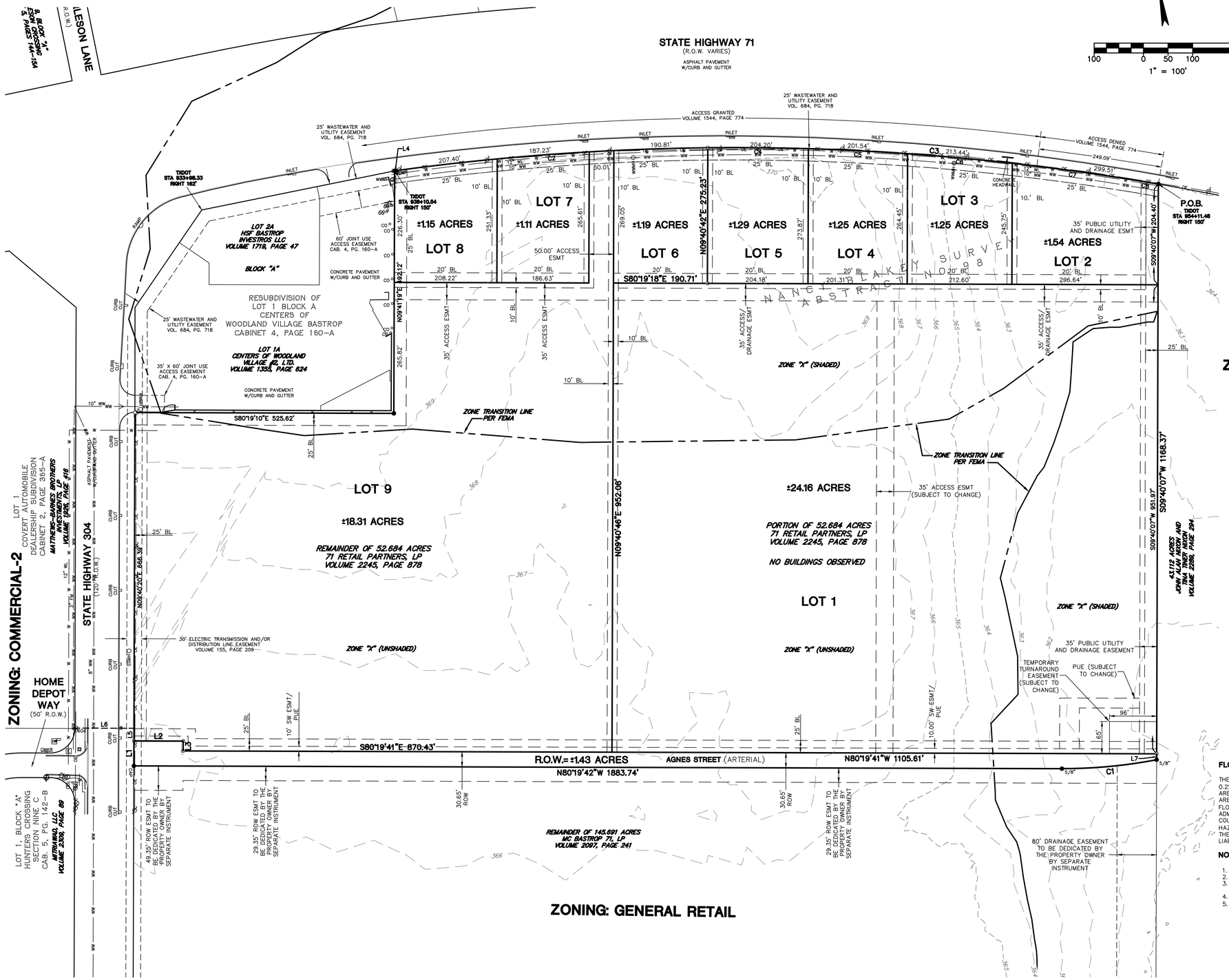
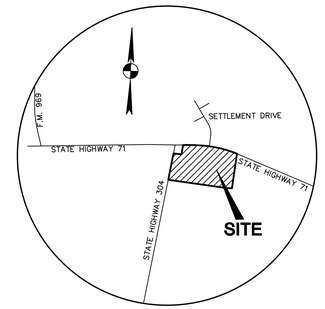
BASTROP GROVE PRELIMINARY PLAT





VICINITY MAP
N.T.S.

LEGEND

●	1/2" IRON ROD FOUND (UNLESS NOTED)
○	1/2" IRON ROD WITH "STANTEC" CAP SET
☆	LIGHT POLE
	POWER POLE
	DOWN GUY
	FIRE HYDRANT
	WATER VALVE
	CABLE TV RISER
	ELECTRIC BOX
	ELECTRIC METER
— OE —	OVERHEAD ELEC. LINE
WWMH	WASTEWATER MANHOLE
SSMH	STORMSEWER MANHOLE
CO	WASTEWATER CLEANOUT
— WW —	WASTE WATER LINE
CMKR	UNDERGROUND CABLE MARKER
	SIGN
(XXX)	RECORD INFORMATION
P.O.B.	POINT OF BEGINNING

ZONING: COMMERCIAL-1

PARCEL LINE DATA		
LINE #	BEARING	DISTANCE
L1	N9°40'20"E	50.65'
L2	S80°19'41"E	100.00'
L3	S9°40'19"W	20.00'
L4	N87°43'09"E	2.31'
L5	N9°40'21"E	25.69'
L6	S80°19'40"E	120.01'
L7	S9°40'07"W	12.00'

PARCEL CURVE DATA					
CURVE #	LENGTH	RADIUS	DELTA	CHORD LENGTH	BEARING
C1	193.51'	1000.00'	11°05'14"	193.21'	N85° 51' 54.79"W
C2	635.52'	5058.31'	7°11'55"	635.10'	S84° 41' 47.98"E
C3	918.69'	5058.31'	10°24'22"	917.43'	S75° 53' 39.54"E
C4	204.20'	5058.31'	2°18'47"	204.19'	N79° 56' 27.16"W
C5	201.55'	5058.31'	2°16'59"	201.53'	N77° 38' 34.52"W
C6	213.44'	5058.31'	2°25'03"	213.42'	N75° 17' 33.57"W
C7	248.84'	5058.31'	2°49'07"	248.81'	N72° 40' 28.42"W
C8	50.67'	5058.31'	0°34'26"	50.67'	N70° 58' 41.75"W

BEARING BASIS NOTE:

THE BASIS OF BEARING OF THE SURVEY SHOWN HEREON IS TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NAD 83(96), UTILIZING WESTERN DATA SYSTEMS CONTINUALLY OPERATING REFERENCE STATION (CORS) NETWORK.

FLOOD NOTE:

THE TRACT SHOWN HEREON LIES WITHIN ZONE "X" (UNSHADED), (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AND ZONE "X" (SHADED) (AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD), AS IDENTIFIED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY, FEDERAL INSURANCE ADMINISTRATION, AS SHOWN ON MAP NO. 48021C0355E, DATED JANUARY 19, 2006, FOR BASTROP COUNTY, TEXAS AND INCORPORATED AREAS. IF THIS SITE IS NOT WITHIN AN IDENTIFIED SPECIAL FLOOD HAZARD AREA, THIS FLOOD STATEMENT DOES NOT IMPLY THAT THE PROPERTY AND/OR THE STRUCTURES THEREON WILL BE FREE FROM FLOODING OR FLOOD DAMAGE. THIS FLOOD STATEMENT SHALL NOT CREATE LIABILITY ON THE PART OF THE SURVEYOR.

NOTES:

1. THE OUT-PARCEL LOTS SHALL NOT HAVE DIRECT ACCESS TO THE SH 71.
2. THE 18.31 ACRE LOT SHALL NOT HAVE DIRECT ACCESS TO SH 304.
3. THE OWNERS OF THE 18.3 ACRE LOT AND THE 24.4 ACRE LOT ARE RESPONSIBLE FOR PROVIDING PUBLIC ACCESS BETWEEN SH 71 AND AGNES ST. AT THE TIME OF THEIR DEVELOPMENT.
4. TOPOGRAPHY SHOWN WITHIN LOTS 1-6 AND AGNES STREET IS BASED ON A GROUND SURVEY.
5. TOPOGRAPHY SHOWN WITHIN LOTS 7-9 IS BASED ON 2008 CAPCOG 5' CONTOUR GIS DATA.

NO.	DATE	REVISION	APPROVAL

Stantec
221 West Sixth Street, Suite 600
Austin, Texas 78701
Tel. (512) 328-0011 Fax (512) 328-0325
TBPE # F-6324 TBPLS # F-10194230

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STATE OF TEXAS
JOSE M. FARIAS
111389
LICENSED PROFESSIONAL ENGINEER
07/07/2017

PRELIMINARY PLAT

BASTROP GROVE PRELIMINARY PLAT
SH 71 AT SH 304, BASTROP, TX 78602

71 RETAIL PARTNERS LP

DRAWN BY: JAMIPSD
DESIGNED BY: PSD
QA/QC: JF
PROJECT NO.: 222010772

SHEET 2 OF 4

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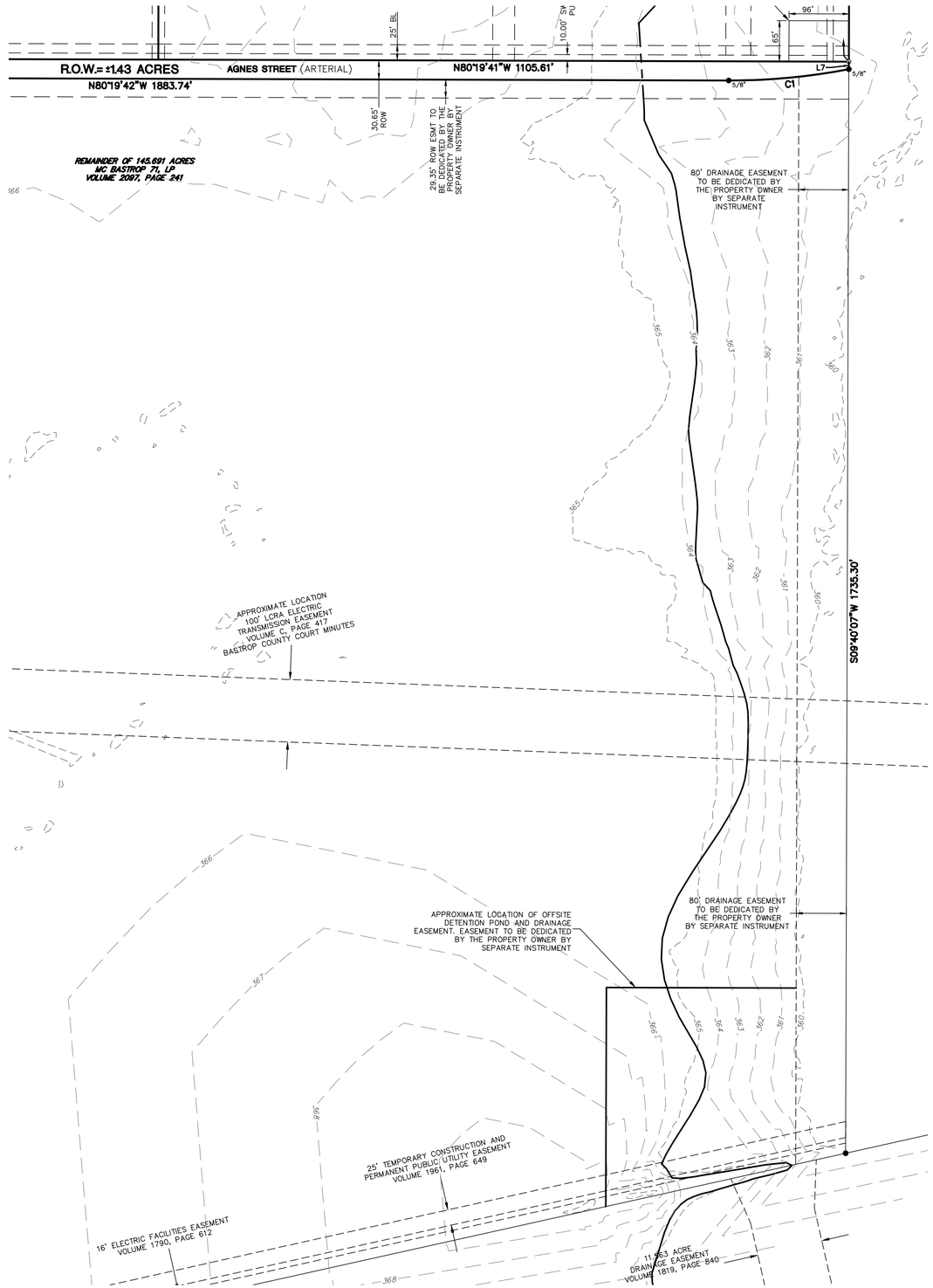
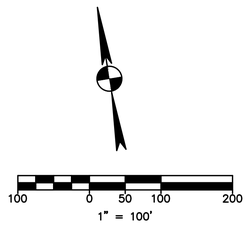
BASTROP GROVE PRELIMINARY PLAT





LEGEND

●	1/2" IRON ROD FOUND (UNLESS NOTED)
○	1/2" IRON ROD WITH "STANTEC" CAP SET
	LIGHT POLE
	POWER POLE
	DOWN GUY
	FIRE HYDRANT
	WATER VALVE
	CABLE TV RISER
	ELECTRIC BOX
	ELECTRIC METER
— OE —	OVERHEAD ELEC. LINE
WWMH ○	WASTEWATER MANHOLE
SSMH ○	STORMSEWER MANHOLE
CO ○	WASTEWATER CLEANOUT
— WW —	WASTE WATER LINE
CMKR	UNDERGROUND CABLE MARKER
	SIGN
(XXX)	RECORD INFORMATION
P.O.B.	POINT OF BEGINNING

NOTES:

1. TOPOGRAPHY SHOWN WITHIN THE MC BASTROP 71, LP TRACT OF LAND IS BASED ON 2008 CAPCOG 5' CONTOUR GIS DATA.
2. OFFSITE DETENTION POND BEING PROVIDED WILL PROVIDE DETENTION FOR LOTS 1–9 AND THE SECTION OF AGNES STREET (ARTERIAL) SHOWN ON THIS PLAT.

DATE	NO.	REVISION	APPROVAL

Stantec
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Austin, Texas 78701
Tel. (512) 328-0011 Fax (512) 328-0325
TBPE # F-6324 TBPLS # F-10194230

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STATE OF TEXAS
JOSE M. FARIAS
111389
LICENSED
PROFESSIONAL ENGINEER
07/07/2017

PRELIMINARY PLAT

BASTROP GROVE PRELIMINARY PLAT
SH 71 AT SH 304, BASTROP, TX 78602

71 RETAIL PARTNERS LP

DRAWN BY: JAM/PSD
DESIGNED BY: PSD
QA / QC: JF
PROJECT NO.: 222010772

SHEET
3
OF 4

V:\2220\active\222010772\civil\cad\prelim Plat\222010772T12.dwg modified by jamartinez on Jul 7, 17 2:26 PM

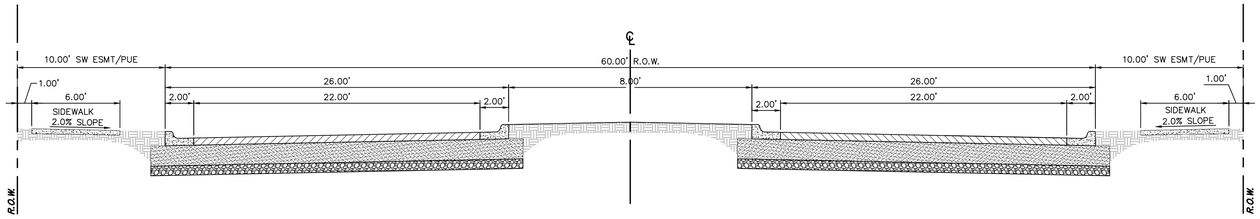
BASTROP GROVE PRELIMINARY PLAT

PRELIMINARY PLAN NOTES:

1. ALL EASEMENTS OF RECORD AS INDICATED ON THE MOST RECENT TITLE RUN (DATED: FEBRUARY 7, 2017, CONDUCTED BY _____) FOR THIS PROPERTY ARE SHOWN ON THIS PLAT.
2. FISCAL SURETY FOR SUBDIVISION CONSTRUCTION, IN A FORM ACCEPTABLE TO THE CITY OF BASTROP, SHALL BE PROVIDED PRIOR TO PLAT APPROVAL BY THE CITY.
3. THE OWNER OF THIS SUBDIVISION, AND HIS OR HER SUCCESSORS AND ASSIGNS, ASSUMES SOLE RESPONSIBILITY FOR PLANS FOR CONSTRUCTION OF SUBDIVISION IMPROVEMENTS WHICH COMPLY WITH APPLICABLE CODES AND REQUIREMENTS OF THE CITY OF BASTROP. THE OWNER UNDERSTANDS AND ACKNOWLEDGES THAT PLAT VACATION OR RE-PLATTING MAY BE REQUIRED, AT THE OWNER'S SOLE EXPENSE, IF PLANS TO CONSTRUCT THIS SUBDIVISION DO NOT COMPLY WITH SUCH CODES AND REQUIREMENTS.
4. WATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.
5. WASTEWATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.
6. ELECTRIC SERVICE IS PROVIDED BY THE BLUEBONNET ELECTRIC COOPERATIVE.
7. ALL UTILITIES WILL BE UNDERGROUND.
8. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES.
9. A PORTION OF THIS TRACT IS WITHIN A FLOOD HAZARD AREA AS SHOWN ON THE FLOOD INSURANCE RATE MAP PANEL # 48021C0355E FOR BASTROP CO., EFFECTIVE JANUARY 19, 2006 COMMUNITY # 480022 AND IS ON ZONE X.
10. OFF-SITE STORM WATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST-DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 5, 10, 25, 50 AND 100-YEAR STORM EVENTS.
11. PROPERTY OWNER SHALL PROVIDE FOR ACCESS TO ALL EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY GOVERNMENTAL AUTHORITIES.
12. NO BUILDINGS, FENCES, LANDSCAPING OR OTHER STRUCTURES ARE PERMITTED WITHIN DRAINAGE EASEMENTS SHOWN, EXCEPT AS APPROVED BY THE CITY OF BASTROP AND/OR BASTROP COUNTY.
13. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
14. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP.
15. THE OWNER SHALL BE RESPONSIBLE FOR INSTALLATION OF TEMPORARY EROSION CONTROL, RE-VEGETATION AND TREE PROTECTION FOR ELECTRIC UTILITY WORK REQUIRED TO PROVIDE ELECTRIC SERVICE TO THIS PROJECT.
16. OUT-PARCEL LOTS SHALL HAVE NO DIRECT ACCESS TO SH 71.
17. LOT 9 SHALL HAVE NO DIRECT ACCESS TO SH 304.
18. OWNERS OF LOT 1 AND LOT 9 ARE RESPONSIBLE FOR PROVIDING PUBLIC ACCESS BETWEEN SH 71 AND AGNES STREET AT THE TIME OF THEIR DEVELOPMENT.
19. UTILITY IMPACT FEE SHALL BE BASED ON THE CITY OF BASTROP IMPACT FEE ORDINANCE IN EFFECTS AT THE TIME OF FINAL PLATTING FOR EACH LOT.
20. 35-FOOT ACCESS EASEMENT RUNNING NORTH TO SOUTH WITHIN LOT 9 MAY BE RELOCATED WITHIN LOT 9 SO LONG AS IT PROVIDES ACCESS BETWEEN SH 71 AND AGNES STREET.
21. DETENTION FOR LOTS 1-9 AND AGNES STREET WILL BE PROVIDED OFFSITE WITHIN THE ADJACENT TRACT OF LAND LOCATED SOUTH OF AGNES STREET. PLEASE REFERENCE SHEET 3 FOR APPROXIMATE LOCATION OF DETENTION IMPROVEMENTS. FOR DETENTION POND ENGINEERING CALCULATIONS, PLEASE REFERENCE ENGINEERING AND DRAINAGE REPORT PREPARED BY CARLSON, BRIGANCE, AND DOERING.
22. PRIOR TO A SITE DEVELOPMENT PERMIT BEING ISSUED, A DECLARATION OF CONDITIONS, COVENANTS, AND RESTRICTIONS MUST BE RECORDED THAT DEFINES THE PARTY OR PARTIES RESPONSIBLE FOR THE MAINTENANCE OF SHARED/COMMON INTERNAL PRIVATE IMPROVEMENTS SUCH AS DRIVES AND FACILITIES USED IN CONNECTION WITH PRIVATE WATER, SEWER, GAS, ELECTRIC, TELEPHONE, OR OTHER UTILITIES.
23. UTILITY IMPACT FEES SHALL BE BASED ON THE CITY OF BASTROP IMPACT FEE ORDINANCE IN EFFECT AT THE TIME OF FINAL PLATTING FOR EACH LOT.

GENERAL NOTES:

1) ONLY VISIBLE EVIDENCE OF IMPROVEMENTS AND UTILITIES IS SHOWN HEREON.
2) A FIELDNOTE DESCRIPTION HAS BEEN PREPARED TO ACCOMPANY THE SURVEY SHOWN HEREON AND IS IDENTIFIED AS STANTEC CONSULTING SERVICES, INC FIELDNOTE FILE FN. NO. 17-048(MJJ)
3) AT THE TIME OF SURVEY, THERE WAS NO OBSERVABLE EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS IN RECENT MONTHS.
4) AT THE TIME OF SURVEY, THERE WAS NO OBSERVABLE EVIDENCE OF RECENT CHANGE IN STREET RIGHTS-OF-WAY OR RECENT CONSTRUCTION OR REPAIRS OF STREETS, SIDEWALKS OR OTHER INFRASTRUCTURES.
5) THE IS A UNDERGROUND WASTEWATER LINE ALONG THE SOUTHERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 71, NO OTHER VISIBLE ABOVE-GROUND EVIDENCE OF OTHER UTILITIES WERE NOTED.



80' ROW - ARTERIAL
AGNES STREET
N.T.S.

NO.	DATE	REVISION	APPROVAL

Stantec
221 West Sixth Street, Suite 600
Austin, Texas 78701
Tel. (512) 328-0011 Fax (512) 328-0325
TBPE # F-6324 TBPLS # F-10194230

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STATE OF TEXAS
JOSE M. FARIAS
111389
LICENSED
PROFESSIONAL ENGINEER
07/07/2017

GENERAL NOTES

BASTROP GROVE PRELIMINARY PLAT
SH 71 AT SH 304, BASTROP, TX 78602

71 RETAIL PARTNERS LP

DRAWN BY: JAMPSD
DESIGNED BY: PSD
QA / QC: JF
PROJECT NO.: 222010772

SHEET
4
OF 4

V:\222\active\222010772\civil\cad\prelim Plat\222010772f10.dwg modified by jamartinez on Jul 7, 17 3:56 PM

Notice of Pending Subdivision Approval
City of Bastrop
City Council

Dear Property Owner:

The **City Council** will conduct a meeting on **March 27, 2018 at 6:30 p.m.** in the **City Hall Council Chambers located at 1311 Chestnut Street, Bastrop, Texas** on the request for Final Plat for **Bastrop Grove, Section 1,** being 30.970 acres out of the Nancy Blakey Survey, Abstract 98.

Owner/Applicant:	Ascension Texas/Scott Fuller
Address:	South of the State Highway 71 and north of the extension of Agnes Street, located in the city limit of Bastrop, Texas
Legal Description:	30.970 acres out of the Nancy Blakey Survey, Abstract 98.

The site location map and Final Plat is attached for reference.

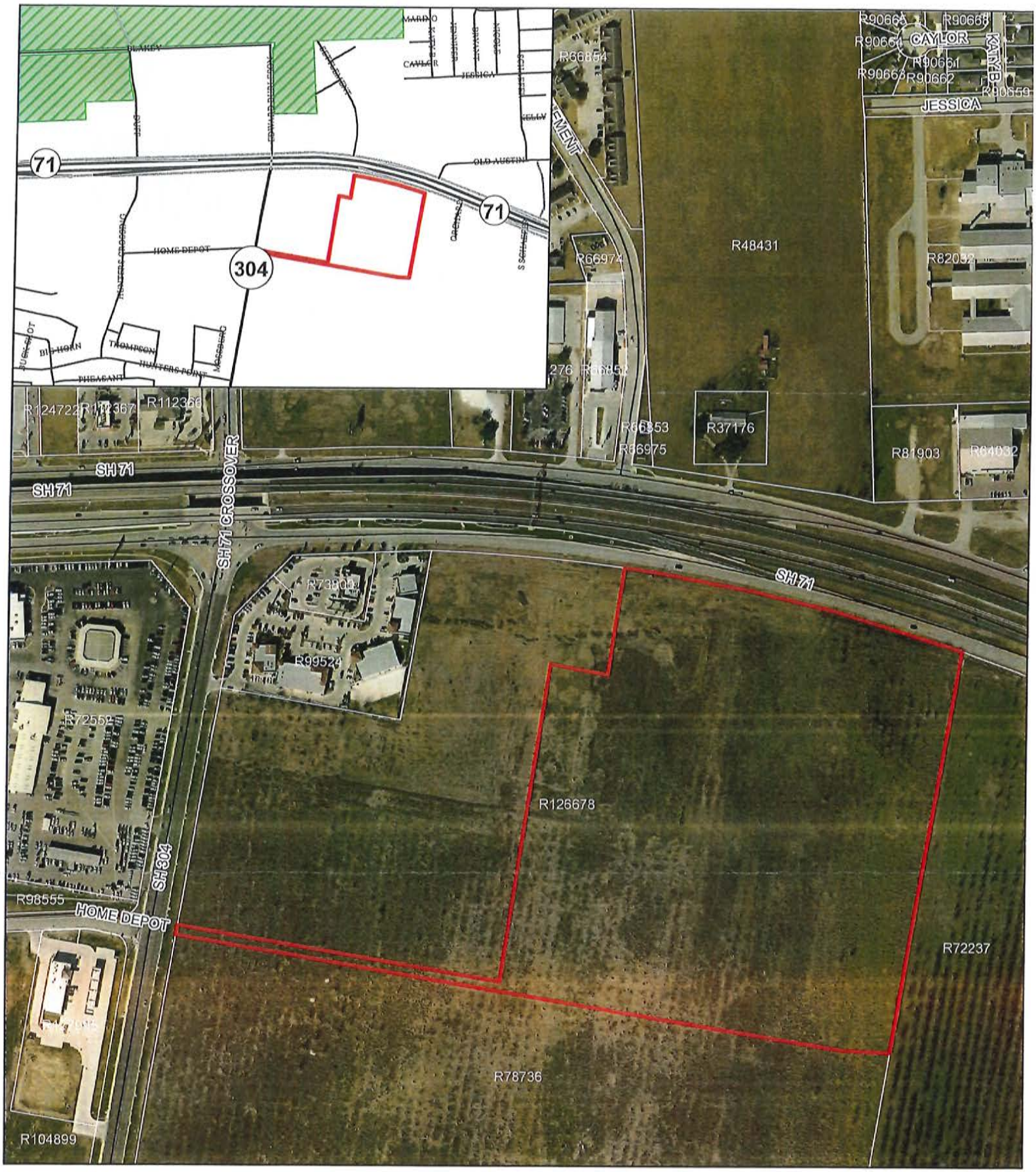
As a property owner within 200 feet of the above referenced property, you are being notified of the upcoming meetings per the Bastrop Code of Ordinances Subdivision Regulations.

Property owners wishing to subdivide land must follow the rules within the City Subdivision Regulations, which can be found online at:

https://library.municode.com/tx/bastrop/codes/code_of_ordinances.

The city must approve plats in accordance with the process outlined in the Texas Local Government Code, Section 212.

For more information on this project, you can contact the Planning & Development offices at (512) 332-8840, plan@cityofbastrop.org, or visit the office at 1311 Chestnut Street, Bastrop, Texas.



BASTROPTX
Heart of the Lost Pines
Est. 1832

1 inch = 360.35 feet

Location Map
Final Plat
Bastrop Grove Section 1

Date: 3/13/2018

N

The accuracy and precision of this cartographic data is limited and should be used for information /planning purposes only. This data does not replace surveys conducted by registered Texas land surveyors nor does it constitute an "official" verification of zoning, land use classification, or other classification set forth in local, state, or federal regulatory processes. The City of Bastrop, nor any of its employees, do not make any warranty of merchantability and fitness for particular purpose, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any such information, nor does it represent that its use would not infringe upon privately owned rights.

BASTROP GROVE SECTION 1 - FINAL PLAT

CITY OF BASTROP, BASTROP COUNTY, TEXAS

JUNE 2017



VICINITY MAP
NOT TO SCALE

LEGEND

- ○ 1/2" IRON ROD WITH "STANTEC" CAP SET
- ● 1/2" IRON ROD FOUND (UNLESS NOTED)
- CAP 1/2" IRON ROD WITH "STAUDT" CAP FOUND
- NAIL 60D NAIL FOUND
- ■ TxDOT CONCRETE MONUMENT FOUND
- BENCHMARK
- BL BUILDING LINE
- SE SIDEWALK EASEMENT
- PUE PUBLIC UTILITY EASEMENT
- P.O.B. POINT OF BEGINNING

OWNER: SETON HEALTHCARE FAMILY
1300 WEST 34TH STREET
AUSTIN, TX 78705

SURVEYOR: STANTEC CONSULTING SERVICES, INC
1905 ALDRICH STREET, SUITE 300
AUSTIN, TX 78723

ENGINEER: STANTEC CONSULTING SERVICES, INC
1905 ALDRICH STREET, SUITE 300
AUSTIN, TX 78723

STATE HIGHWAY 71
(R.O.W. VARIES)

25' WASTEWATER AND UTILITY EASEMENT VOL. 684, PG. 718

25' WASTEWATER AND UTILITY EASEMENT VOL. 684, PG. 716

38' DRAINAGE EASEMENT

LOT 5 1.290 ACRES

LOT 4 1.247 ACRES

LOT 3 1.249 ACRES

LOT 2 1.543 ACRES

P.O.B.
TXDOT
STA 939+11.46
RIGHT 130'

LOT 2A
HSF BASTROP INVESTORS LLC
VOLUME 1719, PAGE 47

BLOCK "A"

50.00' ACCESS EASEMENT
DOC. NO. 201716343
VOL. 2245 PG. 880

RESUBDIVISION OF LOT 1 BLOCK A CENTERS OF WOODLAND VILLAGE BASTROP CABINET 4, PAGE 160-A

LOT 1A
CENTERS OF WOODLAND VILLAGE #2, LTD.
VOLUME 1393, PAGE 624

ZONE "X" (SHADED)

ACCESS/DRAINAGE EASEMENT

34' PUE/ACCESS EASEMENT

50' DRAINAGE EASEMENT

ZONE TRANSITION LINE PER FEMA

TBM 101

LOT 1
COVERT AUTOMOBILE DEALERSHIP SUBDIVISION CABINET 2, PAGE 365-A

MATTHEWS-BARNES BROTHERS INVESTMENTS, LP
VOLUME 1928, PAGE 416

STATE HIGHWAY 304
(120' R.O.W.)

REMAINDER OF 52.684 ACRES
71 RETAIL PARTNERS, LP
VOLUME 2245, PAGE 878

LOT 1
24.162 ACRES

NANCY BLAKEY SURVEY
ABSTRACT NO. 98

43.112 ACRES
JOHN ALAN NIXON AND TINA TINER NIXON
VOLUME 2289, PAGE 294

ZONE "X" (SHADED)

ZONE "X" (UNSHADED)

30' ELECTRIC TRANSMISSION AND/OR DISTRIBUTION LINE EASEMENT VOLUME 153, PAGE 209

98'x73' WASTEWATER/LIFT STATION EASEMENT

58'x60.5' TURNAROUND EASEMENT

HOME DEPOT WAY
(50' R.O.W.)

1.479 ACRES HEREBY DEDICATED FOR RIGHT-OF-WAY

15' WASTEWATER EASEMENT

10' SE/PUE

63' DRAINAGE EASEMENT

S80°19'41"E 870.43'

AGNES STREET (R.O.W. VARIES)

N80°19'42"W 1883.74'

N80°19'41"W 1105.61'

± S79°38'E 7,831' TO THE SOUTHEASTERLY CORNER OF THE NANCY BLAKEY SURVEY, ABSTRACT NO. 98

LOT 1, BLOCK "A"
HUNTERS CROSSING SECTION NINE C
CAB. 5, PG. 142-B

MITRIAHAD, LLC
VOLUME 2300, PAGE 89

TBM 102

REMAINDER OF 145.691 ACRES
MC BASTROP 71, LP
VOLUME 2097, PAGE 241

DRAINAGE EASEMENT DOC. NO.

BEARING BASIS NOTE:
THE BASIS OF BEARING OF THE SURVEY SHOWN HEREON IS TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NAD 83(93), UTILIZING WESTERN DATA SYSTEMS CONTINUALLY OPERATING REFERENCE STATION (CORS) NETWORK.

DISTANCES SHOWN HEREON ARE GRID DISTANCES. TO CONVERT TO GROUND, MULTIPLY BY A SCALE FACTOR OF 1.000014.

LINE TABLE

NO.	BEARING	DISTANCE
L1	N9°40'20"E	30.65'
L2	S80°19'41"E	100.00'
L3	S9°40'19"W	20.00'
L4	N87°43'05"E	2.31'
L5	N9°40'20"E	35.89'
L6	S80°19'40"E	130.01'
L7	S9°40'07"W	12.00'
L8	N80°19'22"W	15.55'
L9	S9°40'46"W	28.00'
L10	S80°19'14"E	15.55'

CURVE TABLE

NO.	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD LENGTH
C1	193.51'	1000.00'	11°05'14"	N85°31'55"W	193.21'
C2	635.52'	5058.31'	7°11'25"	S84°41'48"E	635.10'
C3	918.88'	5058.31'	10°24'22"	S75°53'40"E	917.43'
C4	204.20'	5058.31'	2°18'47"	N79°36'27"W	204.19'
C5	201.55'	5058.31'	2°16'59"	N77°38'35"W	201.53'
C6	213.44'	5058.31'	2°25'03"	N75°17'34"W	213.42'
C7	248.84'	5058.31'	2°49'07"	N72°40'28"W	248.81'
C8	50.67'	5058.31'	0°34'26"	N70°58'42"W	50.67'

AREA SUMMARY

LOT #	AREA (ACRES)
1	24.162
2	1.543
3	1.249
4	1.247
5	1.290
R.O.W.	1.479
TOTAL	30.970

BENCHMARK INFORMATION:

ELEVATIONS HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) UTILIZING WESTERN DATA SYSTEMS CONTINUALLY OPERATING REFERENCE STATION (CORS) NETWORK.

TBM 101: PK NAIL SET WITH "STANTEC" WASHER AT BACK OF CURB AT DRIVEWAY, EAST SIDE OF STATE HIGHWAY 304, ±210 FEET SOUTH OF THE SOUTHEAST OUTBACK LINE AT THE INTERSECTION OF STATE HIGHWAY 71 WITH THE EASTERLY LINE OF STATE HIGHWAY 304. ELEVATION=390.78' (AS SHOWN)

TBM 102: PK NAIL SET WITH "STANTEC" WASHER AT EDGE OF CONCRETE SIDEWALK, SOUTHWEST CORNER OF THE INTERSECTION OF STATE HIGHWAY 304 AND HOME DEPOT WAY. ELEVATION=387.77' (AS SHOWN)

AGREEMENTS ASSOCIATED WITH THIS PLAT:

1. ECONOMIC DEVELOPMENT PERFORMANCE AGREEMENT.
2. AGREEMENT WITH DEVELOPER AND HOSPITAL FOR CONSTRUCTION OF STORMWATER DRAINAGE IMPROVEMENT.
3. ESCROW AGREEMENT.
4. WASTEWATER/LIFT STATION IMPACT FEE AGREEMENT.

NOTES:

1. ALL EASEMENTS SHOWN ON THIS PLAT ARE PUBLIC EASEMENTS.

Stantec
1905 Aldrich Street, Suite 300
Austin, TX 78723
TBPE # F-9324 TBPLS # 10194330
www.stantec.com

Drawn by: MJR Approved by: MJJ Project No. 222010772 File: V:\2220\active\222010772\survey\222010772PL3.dwg

SHEET 1 OF 2

V:\2220\active\222010772\survey\222010772PL3.dwg\ Mar 13, 2018 - 1:20pm\ jay.mroobe

BASTROP GROVE SECTION 1 - FINAL PLAT

CITY OF BASTROP, BASTROP COUNTY, TEXAS

JUNE 2017

STATE OF TEXAS §
COUNTY OF BASTROP §

THAT SETON FAMILY OF HOSPITALS, A TEXAS NONPROFIT CORPORATION, ACTING BY AND THROUGH SCOTT L. FULLER, ITS SENIOR VICE PRESIDENT, BEING THE OWNER OF THAT CERTAIN 30.970 ACRE TRACT OF LAND OUT OF THE NANCY BLAKEY SURVEY, ABSTRACT NO. 98, SITUATED IN THE CITY OF BASTROP, BASTROP COUNTY, TEXAS CONVEYED BY DEED OF RECORD IN DOCUMENT NO. 2017016541 OF THE OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, DO HEREBY SUBDIVIDE SAID 30.970 ACRES OF LAND IN ACCORDANCE WITH THE PLAT SHOWN HEREON, SUBJECT TO ANY EASEMENTS OR RESTRICTIONS HERETOFORE GRANTED, TO BE KNOWN AS "BASTROP GROVE SECTION 1 - FINAL PLAT", AND DO HEREBY DEDICATE TO THE PUBLIC THE USE OF EASEMENTS AND STREETS SHOWN HEREON.

WITNESS MY HAND THIS THE ______ DAY OF ______________ 20___ A.D.

BY: ______________________

SCOTT L. FULLER, SENIOR VICE PRESIDENT — DATE
SETON FAMILY OF HOSPITALS
A TEXAS NONPROFIT CORPORATION
1345 PHILOMENA, SUITE 402
AUSTIN, TEXAS 78723

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF ________ §

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED SCOTT L. FULLER, KNOW TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED.

GIVEN UNDER MY HAND AND SEAL OF THE OFFICE THIS THE ______ DAY OF ______________ 20 ____ A.D.

____
NOTARY PUBLIC IN AND FOR
THE STATE OF TEXAS

____
PRINTED NAME OF NOTARY / EXPIRES

STATE OF TEXAS §
COUNTY OF TRAVIS §

I, JOSE M. FARIAS, P.E., DO HEREBY CERTIFY THAT THE STREET AND DRAINAGE DESIGN, AS SHOWN HEREON, COMPLIES WITH THE SUBDIVISION REGULATIONS OF THE CITY OF BASTROP, AND THAT A PORTION OF THIS TRACT IS WITHIN A FLOOD HAZARD AREA AS SHOWN ON THE FLOOD INSURANCE RATE MAP NO. 48021C0355E, DATED JANUARY 19, 2006, FOR BASTROP COUNTY, TEXAS AND INCORPORATED AREAS.

2-8-18
JOSE M. FARIAS, P.E. — DATE
PROFESSIONAL ENGINEER NO. 111389
STANTEC CONSULTING SERVICES, INC.
1905 ALDRICH STREET, SUITE 300
AUSTIN, TEXAS 78723

STATE OF TEXAS §
COUNTY OF TRAVIS §

THAT I, MATTHEW J. RAABE, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL ON-THE-GROUND SURVEY OF THE LAND AND THAT THE CORNER MONUMENTS SHOWN WERE PROPERLY PLACED, UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH THE SUBDIVISION REGULATIONS OF BASTROP COUNTY, TEXAS.

2-8-18
MATTHEW J. RAABE, R.P.L.S. — DATE
REGISTERED PROFESSIONAL LAND SURVEYOR NO. 6402
STANTEC CONSULTING SERVICES INC.
1905 ALDRICH STREET, SUITE 300
AUSTIN, TEXAS 78723

GENERAL NOTES:

1. THE BENCHMARKS USED ARE PK NAILS WITH "STANTEC" WASHERS SET AND REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) UTILIZING WESTERN DATA SYSTEMS CONTINUALLY OPERATING REFERENCE STATION (CORS) NETWORK.
2. ALL EASEMENTS OF RECORD AS INDICATED ON THE MOST RECENT TITLE RUN (DATED: DECEMBER 8, 2016, CONDUCTED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY) FOR THIS PROPERTY ARE SHOWN ON THIS PLAT.
3. THIS PLAT CONFORMS TO THE PRELIMINARY PLAT APPROVED BY THE CITY COUNCIL ON AUGUST 8, 2017.
4. ALL SUBDIVISION PERMITS SHALL CONFORM TO THE CITY OF BASTROP CODE OF ORDINANCES, CONSTRUCTION STANDARDS, AND GENERALLY ACCEPTED ENGINEERING PRACTICES.
5. CONSTRUCTION PLANS AND SPECIFICATIONS FOR ALL SUBDIVISION IMPROVEMENTS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP PRIOR TO ANY CONSTRUCTION WITHIN THE SUBDIVISION.
6. PRIOR TO CONSTRUCTION OF ANY IMPROVEMENTS ON LOTS IN THIS SUBDIVISION, BUILDING PERMITS WILL BE OBTAINED FROM THE CITY OF BASTROP.
7. SITE DEVELOPMENT CONSTRUCTION PLANS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP PRIOR TO ANY MULTI-FAMILY OR NON-RESIDENTIAL CONSTRUCTION. (CITY LIMITS ONLY)
8. FISCAL SURETY FOR SUBDIVISION CONSTRUCTION, IN A FORM ACCEPTABLE TO THE CITY OF BASTROP, SHALL BE PROVIDED PRIOR TO PLAT APPROVAL BY THE CITY.
9. THE OWNER OF THIS SUBDIVISION, AND HIS OR HER SUCCESSORS AND ASSIGNS, ASSUMES SOLE RESPONSIBILITY FOR PLANS FOR CONSTRUCTION OF SUBDIVISION IMPROVEMENTS WHICH COMPLY WITH APPLICABLE CODES AND REQUIREMENTS OF THE CITY OF BASTROP. THE OWNER UNDERSTANDS AND ACKNOWLEDGES THAT PLAT VACATION OR RE-PLATTING MAY BE REQUIRED, AT THE OWNER'S SOLE EXPENSE, IF PLANS TO CONSTRUCT THIS SUBDIVISION DO NOT COMPLY WITH SUCH CODES AND REQUIREMENTS.
10. WATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.
11. WASTEWATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.
12. ELECTRIC SERVICE IS PROVIDED BY BLUEBONNET ELECTRIC.
13. ALL UTILITIES WILL BE UNDERGROUND.
14. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES.
15. WASTEWATER AND WATER SYSTEMS SHALL CONFORM TO TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY).
16. APPROVED UNDER ORDINANCE 2017-13 REGARDING IMPACT FEE ASSESSMENT TO BE COLLECTED PRIOR TO BUILDING PERMIT ISSUANCE.
17. DEVELOPER SHALL BE SOLELY RESPONSIBLE FOR ALL RELOCATION AND MODIFICATIONS TO EXISTING UTILITIES.
18. A PORTION OF THIS TRACT IS WITHIN A FLOOD HAZARD AREA AS SHOWN ON THE FLOOD INSURANCE RATE MAP PANEL # 0355C FOR BASTROP COUNTY, TEXAS, EFFECTIVE JANUARY 19, 2006. COMMUNITY # 480022 AND IS ON ZONE "X" (SHADED).
19. OFF-SITE STORM WATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST-DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 2, 10, 25, 50 AND 100-YEAR STORM EVENTS.
20. TEMPORARY AND PERMANENT EASEMENTS TO BE PROVIDED, AS REQUIRED AT THE CITY'S SOLE DISCRETION FOR OFF-SITE WATER, WASTEWATER AND DRAINAGE IMPROVEMENTS.
21. AS SHOWN HEREON, A TEN (10) FOOT WIDE PUBLIC UTILITY EASEMENT (P.U.E.) IS HEREBY DEDICATED ADJACENT TO STREET ROW ON ALL LOTS. A FIVE (5) FOOT WIDE P.U.E. IS HEREBY DEDICATED ALONG EACH SIDE LOT LINE.
22. PROPERTY OWNER SHALL PROVIDE FOR ACCESS TO ALL EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY GOVERNMENTAL AUTHORITIES.
23. NO BUILDINGS, FENCES, LANDSCAPING OR OTHER STRUCTURES ARE PERMITTED WITHIN DRAINAGE EASEMENTS SHOWN, EXCEPT AS APPROVED BY THE CITY OF BASTROP AND/OR BASTROP COUNTY.
24. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
25. THE ELECTRIC UTILITY HAS THE RIGHT TO PRUNE AND/OR REMOVE TREES, SHRUBBERY, VEGETATION AND OTHER OBSTRUCTIONS TO THE EXTENT NECESSARY TO KEEP THE EASEMENTS CLEAR. THE OWNER/DEVELOPER OF THIS SUBDIVISION/LOT SHALL PROVIDE THE CITY OF BASTROP ELECTRIC UTILITY DEPARTMENT WITH ANY EASEMENT AND/OR ACCESS REQUIRED, IN ADDITION TO THOSE INDICATED, FOR THE INSTALLATION AND ONGOING MAINTENANCE OF OVERHEAD AND UNDERGROUND ELECTRIC FACILITIES.
26. THE OWNER SHALL BE RESPONSIBLE FOR INSTALLATION OF TEMPORARY EROSION CONTROL, REVEGETATION AND TREE PROTECTION FOR ELECTRIC UTILITY WORK REQUIRED TO PROVIDE ELECTRIC SERVICE TO THIS PROJECT.
27. BUILDING SETBACKS NOT SHOWN SHALL BE IN ACCORDANCE WITH CITY OF BASTROP ZONING ORDINANCE. (CITY LIMITS ONLY)
28. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP.
29. EROSION AND SEDIMENTATION CONTROLS CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP ARE REQUIRED FOR ALL CONSTRUCTION ON EACH LOT, INCLUDING SINGLE FAMILY AND DUPLEX CONSTRUCTION.
30. ALL SIGNS SHALL COMPLY WITH THE BASTROP SIGN ORDINANCE.
31. NO LOT OR STRUCTURE SHALL BE OCCUPIED PRIOR TO THE APPLICANT SUBMITTING TO THE CITY OF BASTROP DOCUMENTATION OF SUBMISSION/SITE REGISTRATION WITH THE TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR) AND PROVIDE DOCUMENTATION OF REVIEW AND COMPLIANCE OF THE SUBDIVISION CONSTRUCTION PLANS WITH TEXAS ARCHITECTURAL BARRIERS ACT (TABA).
32. BY APPROVING THIS PLAT, THE CITY OF BASTROP ASSUMES NO OBLIGATION TO CONSTRUCT ANY INFRASTRUCTURE IN CONNECTION WITH THIS SUBDIVISION. ANY SUBDIVISION INFRASTRUCTURE REQUIRED FOR THE DEVELOPMENT OF THE LOTS IN THIS SUBDIVISION IS THE SOLE RESPONSIBILITY OF THE DEVELOPER AND/OR THE OWNERS OF THE LOTS. FAILURE TO CONSTRUCT ANY REQUIRED INFRASTRUCTURE TO CITY STANDARDS MAY BE JUST CAUSE FOR THE CITY TO DENY APPLICATIONS FOR CERTAIN DEVELOPMENT PERMITS INCLUDING BUILDING PERMITS, SITE PLAN APPROVALS AND/OR CERTIFICATES OF OCCUPANCY.
33. UPON COMPLETION OF CONSTRUCTION AND INSTALLATION OF THE ELECTRIC FACILITIES ON THE PROPERTY THE DEVELOPER/OWNER SHALL HAVE THE PERMANENT UTILITY EASEMENT AREA (20 FOOT EASEMENT, TO INCLUDE A 10 FOOT BUFFER AROUND ALL NON OPENING SIDES AND A 20 FOOT BUFFER AROUND OPENING SIDES OF EQUIPMENT) SURVEYED BY METES AND BOUNDS, AT ITS SOLE COST AND EXPENSE, AND A COPY OF THAT PERMANENT EASEMENT SURVEY PROVIDED TO BPAL FOR THE DRAFTING AND RECORDING OF A PERMANENT PUBLIC UTILITY EASEMENT. THE BLANKET TEMPORARY ACCESS AND CONSTRUCTION EASEMENT SHALL BE VACATED AT SUCH TIME AS BPAL ACCEPTS AND RECORDS THE PERMANENT PUBLIC UTILITY EASEMENT.
34. IT IS THE RESPONSIBILITY OF EACH BUILDER TO DESIGN AND CONSTRUCT A SUITABLE GRADING AND DRAINAGE SCHEME WHICH WILL CONVEY SURFACE WATER, WITHOUT PONDING IN THE LOT OR UNDER THE STRUCTURE, FROM THE STRUCTURE TO THE DRAINAGE SYSTEM CONSTRUCTED BY THE SUBDIVISION DEVELOPER.
35. PUBLIC UTILITY AND DRAINAGE EASEMENTS WHERE SHOWN AND/OR DESCRIBED HEREON ARE INTENDED TO INDICATE AN EASEMENT FOR CONSTRUCTION, OPERATION, AND MAINTENANCE OF PUBLIC UTILITIES AND DRAINAGE WAYS; INCLUDING, BUT NOT LIMITED TO, SANITARY SEWER, FORCE MAINS, WATER LINES, TELEPHONE SIGNAL CONDUITS, ELECTRIC CONDUCTORS, DRAINAGE PIPES, AND NATURAL GAS LINES.
36. ACCESS EASEMENTS SHOWN HEREON ARE INTENDED TO INDICATE AN EASEMENT ALLOWING UNRESTRICTED ACCESS TO THE TRAVELLING PUBLIC.
37. NO DIRECT VEHICULAR ACCESS TO STATE HIGHWAY 71 FROM LOTS 2, 3, 4, AND 5 SHALL BE PERMITTED.

APPROVED ON THE ________ DAY OF ______________, 2018, A.D., BY THE CITY COUNCIL OF THE CITY OF BASTROP

APPROVED:

____
CONNIE B. SCHROEDER, MAYOR OF THE CITY OF BASTROP, TEXAS

ATTEST:

____
CITY SECRETARY, CITY OF BASTROP, TEXAS

STATE OF TEXAS §
COUNTY OF BASTROP §

I, ROSE PIETSCH, COUNTY CLERK OF BASTROP COUNTY, TEXAS, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT OF WRITING AND ITS CERTIFICATE OF AUTHENTICATION WAS FILED FOR RECORD IN MY OFFICE ON THE ______ DAY OF ______________ 20___ A.D. AT ______ O'CLOCK .M., AND DULY RECORDED ON THE ______ DAY OF ______________ 20___ A.D. AT O'CLOCK ____.M., PLAT RECORDS OF BASTROP COUNTY, TEXAS IN PLAT CABINET ____________ PAGE ________

FILED FOR RECORD ON THE ______ DAY OF ______________ 20___ A.D.

______________________ BY: ______________________
ROSE PIETSCH — DEPUTY
COUNTY CLERK
BASTROP COUNTY, TEXAS

FIELDNOTE DESCRIPTION:

OF 30.970 ACRES OF LAND OUT OF THE NANCY BLAKEY SURVEY, ABSTRACT NO. 98, SITUATED IN THE CITY OF BASTROP, BASTROP COUNTY, TEXAS BEING A PORTION OF THAT CERTAIN 52.684 ACRE TRACT OF LAND CONVEYED TO 71 RETAIL PARTNERS, LP BY DEED OF RECORD IN VOLUME 2246, PAGE 672 OF THE OFFICIAL RECORDS OF BASTROP COUNTY, TEXAS; SAID 30.970 ACRE CONVEYED TO SETON FAMILY OF HOSPITALS, A TEXAS NONPROFIT CORPORATION BY DEED OF RECORD IN DOCUMENT NO. 2017016541 OF THE OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS; SAID 30.970 ACRES OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING, AT A 1/2 INCH IRON ROD WITH CAP FOUND IN THE SOUTHERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 71 (R.O.W. VARIES) (STATE HIGHWAY 71 STA. 354+11.48, 150.00' RIGHT), BEING THE NORTHWESTERLY CORNER OF THAT CERTAIN 43.112 ACRE TRACT OF LAND CONVEYED TO JOHN ALAN NIXON AND TINA TINER NIXON BY DEED OF RECORD IN VOLUME 2289, PAGE 294 OF SAID OFFICIAL RECORDS, BEING THE NORTHEASTERLY CORNER OF SAID 52.684 ACRE TRACT, FOR THE NORTHEASTERLY CORNER HEREOF;

THENCE, S09°40'07"W, LEAVING THE SOUTHERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 71, ALONG A PORTION OF THE WESTERLY LINE OF SAID 43.112 ACRE TRACT, BEING THE EASTERLY LINE OF SAID 52.684 ACRE TRACT, FOR THE EASTERLY LINE HEREOF, A DISTANCE OF 1108.37 FEET TO A 3/8 INCH IRON ROD FOUND AT THE NORTHEASTERLY CORNER OF THE REMAINING PORTION OF THAT CERTAIN 145.981 ACRE TRACT OF LAND CONVEYED TO KC BASTROP 71, LP BY DEED OF RECORD IN VOLUME 2087, PAGE 241 OF SAID OFFICIAL RECORDS, BEING THE SOUTHEASTERLY CORNER OF SAID 52.684 ACRE TRACT, FOR THE SOUTHEASTERLY CORNER HEREOF;

THENCE, LEAVING THE WESTERLY LINE OF SAID 43.112 ACRE TRACT, ALONG THE SOUTHERLY LINE OF SAID 52.684 ACRE TRACT, FOR THE SOUTHERLY LINE HEREOF, THE FOLLOWING TWO (2) COURSES AND DISTANCES:

1) ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 1000.00 FEET, A CENTRAL ANGLE OF 11°05'14", AN ARC LENGTH OF 193.51 FEET AND A CHORD WHICH BEARS, N80°51'55"W, A DISTANCE OF 193.21 FEET TO A 5/8 INCH IRON ROD FOUND FOR THE END OF SAID CURVE;

2) N80°19'42"W, A DISTANCE OF 1653.74 FEET TO A 1/2 INCH IRON ROD WITH CAP FOUND IN THE EASTERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 304 (120' R.O.W.), BEING THE NORTHWESTERLY CORNER OF THE REMAINING PORTION OF SAID 145.001 ACRE TRACT, BEING THE SOUTHWESTERLY CORNER OF SAID 52.684 ACRE TRACT, FOR THE SOUTHWESTERLY CORNER HEREOF;

THENCE, N09°40'20"E, ALONG THE EASTERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 304, BEING A PORTION OF THE WESTERLY LINE OF SAID 52.648 ACRE TRACT, FOR A PORTION OF THE WESTERLY LINE HEREOF, A DISTANCE OF 30.83 FEET TO A 1/2 INCH IRON ROD WITH "STANTEC" CAP SET FOR THE MOST WESTERLY NORTHWEST CORNER HEREOF, FROM WHICH THE SOUTHWESTERLY CORNER OF LOT 1A, RESUBDIVISION OF LOT 1, BLOCK A CENTERS OF WOODLAND VILLAGE BASTROP, A SUBDIVISION OF RECORD IN CABINET 4, PAGE 100-A OF THE PLAT RECORDS OF BASTROP COUNTY, TEXAS, BEING THE MOST WESTERLY NORTHWEST CORNER OF SAID 52.684 ACRE TRACT BEARS N09°40'20"E, A DISTANCE OF 660.39 FEET;

THENCE, LEAVING THE EASTERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 304, OVER AND ACROSS SAID 52.684 ACRE TRACT, FOR THE WESTERLY LINE HEREOF, THE FOLLOWING SIX (6) COURSES AND DISTANCES:

1) S80°19'41"E, A DISTANCE OF 100.00 FEET TO A 1/2 INCH IRON ROD WITH "STANTEC" CAP SET FOR AN ANGLE POINT;

2) S09°40'19"W, A DISTANCE OF 20.00 FEET TO A 1/2 INCH IRON ROD WITH "STANTEC" CAP SET FOR AN ANGLE POINT;

3) S80°19'41"E, A DISTANCE OF 870.43 FEET TO A 1/2 INCH IRON ROD WITH "STANTEC" CAP SET FOR AN ANGLE POINT;

4) N09°40'40"E, A DISTANCE OF 952.08 FEET TO A 1/2 INCH IRON ROD WITH "STANTEC" CAP SET FOR AN ANGLE POINT;

5) S80°19'18"E, A DISTANCE OF 190.71 FEET TO A 1/2 INCH IRON ROD WITH "STANTEC" CAP SET FOR AN ANGLE POINT;

6) N09°40'47"E, A DISTANCE OF 279.25 FEET TO A 1/2 INCH IRON ROD WITH "STANTEC" CAP SET IN THE CURVING SOUTHERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 71, BEING THE NORTHERLY LINE OF SAID 52.684 ACRE TRACT, FOR THE MOST NORTHERLY NORTHWEST CORNER HEREOF;

THENCE, ALONG THE CURVING SOUTHERLY RIGHT-OF-WAY LINE OF STATE HIGHWAY 71, BEING A PORTION OF THE NORTHERLY LINE OF SAID 52.684 ACRE TRACT, FOR THE NORTHERLY LINE HEREOF, ALONG A NON-TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 5058.31 FEET, A CENTRAL ANGLE OF 10°24'22", AN ARC LENGTH OF 918.69 FEET AND A CHORD WHICH BEARS, S75°53'40"E, A DISTANCE OF 917.43 FEET TO THE POINT OF BEGINNING, CONTAINING AN AREA OF 30.970 ACRES (1,349,030 SQ. FT.) OF LAND, MORE OR LESS, WITHIN THESE METES AND BOUNDS.

Stantec
1905 Aldrich Street, Suite 300
Austin TX 78723
TBPE # F-6324 TBPLS # 10194230
www.stantec.com

Dr 17-105(RSW)
Drawn by: M.R. Approved by: MJR Project No. 222010772 File: V:\2220\active\222010772\survey\222010772PLS.dwg

SHEET 2 OF 2

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BASTROP GROVE

DRAINAGE IMPROVEMENTS
AGNES ROAD TO COLORADO RIVER
BASTROP COUNTY, TEXAS

SUBMITTED BY:

09/28/2018
CARLSON, BRIGANCE, & DOERING, INC.

REVIEWED BY:

10/1/2018
CITY OF BASTROP ENGINEER

SHEET INDEX

Sheet Number	Sheet Title
1	COVER
2	GENERAL NOTES & DETAILS
3	DETAILS – EROSION CONTROL MATTING
4	DETAILS – BOX CULVERTS
5	EROSION CONTROL PLAN
6	EXISTING DRAINAGE AREA MAP
7	PROPOSED DRAINAGE AREA MAP
8	CHANNEL – STA. 0+00 TO 6+00
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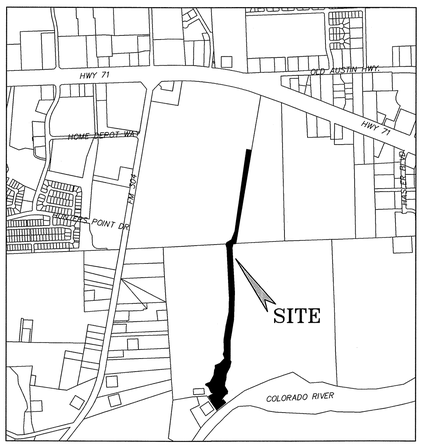
11	CHANNEL – STA. 20+50 TO 30+50
12	CHANNEL – STA. 30+50 TO 41+50
13	CHANNEL – STA. 41+50 TO END
14	CHANNEL X–SECTIONS



LOCATION MAP
N.T.S.

MAPSCO PAGE #:	MAPSCO GRID #:
468S	Q34
468N	Q35
468P	Q35

NOTES:

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF BASTROP MUST RELY UPON THE ADEQUACY OF THE DESIGN ENGINEER.

THIS PROJECT IS LOCATED IN THE COLORADO RIVER WATERSHED AND WITHIN THE BOUNDARIES OF THE 100-YEAR FLOOD PLAIN AS PER FEDERAL FLOOD INSURANCE ADMINISTRATION FIRM MAP NO. 48021C0335E, DATED JANUARY 19, 2006, BASTROP COUNTY, TEXAS. BASTROP COUNTY COMMUNITY NO. 481193.

811 Know what's below. Call before you dig.

OWNER: 71 RETAIL PARTNERS, L.P.
DOUGLAS MACMAHON
8214 WESTCHESTER DRIVE
DALLAS, TEXAS 75225
(214) 622–6565

ENGINEER: CARLSON, BRIGANCE & DOERING, INC.
CIVIL ENGINEERING & SURVEYING
MR. BRENDAN P. MCENTEE, P.E.
5501 WEST WILLIAM CANNON
AUSTIN, TEXAS 78749
(512) 280–5160

UTILITY PROVIDERS:

ELECTRIC: BLUEBONNET ELECTRIC
(979) 542–3151

GAS: CENTER POINT ENERGY
(830) 643–6936

PHONE: AT&T
(512) 870–1450

WATER: CITY OF BASTROP
(512) 332–8960

WASTEWATER: CITY OF BASTROP
(512) 332–8960

CABLE: SPECTRUM
(800) 418–8848

NO.	DESCRIPTION	REVISE (R) ADD (A) VOID (V)	CITY OF BASTROP APPROVAL/DATE	APPROVED BY

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/28/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION / DATE

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: COVER
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018
JOB NUMBER: 4697
SHEET: 1 OF 14
SHEET NO.: 1

FILE PATH: J:\AutoCad 2004 Land Projects\4697\Dwg\Channel\4697 - COVER.dwg - May 15, 2018 - 1:31pm

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF BASTROP DESIGN AND CONSTRUCTION STANDARDS MANUAL.

2. ANY EXISTING UTILITIES, PAVEMENT, CURBS, SIDEWALKS, STRUCTURES, TREES, ETC., NOT PLANNED FOR DEMOLITION THAT ARE DAMAGED OR REMOVED SHALL BE REPAIRED OR REPLACED AT THE APPLICANT'S EXPENSE.

3. THE CONTRACTOR SHALL VERIFY ALL DEPTHS AND LOCATIONS OF EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES WITH THE CONSTRUCTION PLANS FOUND IN THE FIELD SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER WHO SHALL BE RESPONSIBLE FOR REVISING THE PLANS ARE APPROPRIATE.

4. ALL AREAS DISTURBED OR EXPOSED DURING CONSTRUCTION SHALL BE RE-VEGETATED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. RE-VEGETATION IS TO TAKE PLACE WITHIN 14 DAYS OF CONSTRUCTION INACTIVITY. RE-VEGETATION OF ALL DISTURBED OR EXPOSED AREAS SHALL CONSIST OF SODDING OR SEEDING, AT THE CONTRACTOR'S OPTION. HOWEVER, THE TYPE OF RE-VEGETATION MUST EQUAL OR EXCEED THE TYPE OF VEGETATION PRESENT BEFORE CONSTRUCTION

5. PRIOR TO ANY CONSTRUCTION, THE APPLICANT'S ENGINEER SHALL CONVENE A PRECONSTRUCTION CONFERENCE BETWEEN HIMSELF, THE CITY OF BASTROP, THE CONTRACTOR, UTILITY COMPANIES, ANY AFFECTED PARTIES AND ANY OTHER ENTITY THE CITY OR THE ENGINEER MAY REQUIRE. REFERENCE DEVELOPMENT PACKET FOR GUIDANCE ON HOW TO SCHEDULE A PRECONSTRUCTION CONFERENCE.

6. THE CONTRACTOR AND THE ENGINEER SHALL KEEP ACCURATE RECORDS OF ALL CONSTRUCTION THAT DEVIATES FROM THE PLANS. THE ENGINEER SHALL FURNISH THE CITY OF BASTROP ACCURATE "AS-BUILT" DRAWINGS FOLLOWING COMPLETION OF ALL CONSTRUCTION.

7. WHEN CONSTRUCTION IS BEING CARRIED OUT WITHIN EASEMENTS, THE CONTRACTOR SHALL CONFINE HIS WORK TO WITHIN THE PERMANENT AND ANY TEMPORARY EASEMENTS. PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL TRASH AND DEBRIS WITHIN THE PERMANENT AND TEMPORARY EASEMENTS.

8. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL APPLY FOR AND SECURE ALL PROPER PERMITS FROM THE APPROPRIATE AUTHORITIES.

9. ALL STORM SEWER FITTINGS MUST BE PRE-CAST.

11. AVAILABLE BENCHMARKS THAT MAY BE UTILIZED FOR THE CONSTRUCTION OF THIS PROJECT ARE DESCRIBED AS FOLLOWS:

BENCHMARKS:

BM #1: SOUTHWEST CORNER OF CONCRETE OF ELECTRIC TRANSFORMER
10015646.4860 N, 3239451.2111 E
ELEVATION: 368.42'

BM #2: 1/2" IRON ROD AT THE NORTHEASTERN CORNER 145.691 ACRE TRACT OUT OF THE NANCY BLAKEY SURVEY (ABSTRACT NO. 98) CONVEYED TO MC BASTROP 71, LP. (V 2097, P 241, O.P.R.B.C.TX.), AND THE SOUTHEASTERN CORNER OF 52.684 ACRES TRACT CONVEYED TO 71 RETAIN PARTNERS, PL. (V 2245, P 878, O.P.R.B.C.TX.), WITHIN WESTERN BOUNDARY LINE OF 43.112 ACRE TRACT CONVEYED TO JOHN ALAN NIXON AND TINA TINER NIXON (V 2289, P 294, O.P.R.B.C.TX.). THIS IS THE NORTHEASTERN CORNER OF THE 3.653 ACRE DRAINAGE EASEMENT.
10015318.2455 N, 3241663.8667 E
ELEVATION: 361.00'

BM #3: 1/2" CAPPED IRON ROD WITHIN NORTHERN BOUNDARY OF 194.92 ACRE TRACT IN DEED TO JO ANN GRIESENBECK CANTRELL (V 445, P 684, O.P.R.B.C.TX.) OUT OF THE MAZEA ROUSSEAU SURVEY NO. 56. AT THE SOUTHEAST CORNER OF 145.697 ACRE TRACT IN DEED TO BASTROP GROVE PARTNERS, LTD. (V 1698, P 245, O.P.R.B.C.TX), AND SOUTHWEST CORNER OF 43.112 ACRE TRACT IN DEED TO CHP PROPERTIES, LTD. (V 1413, P 857, O.P.R.B.C.TX.).
10013530.9814 N, 3241359.4032 E
ELEVATION: 360.03'

CONSTRUCTION SEQUENCE:

NO CLEARING OR ROUGH GRADING MAY BE DONE UNTIL THE APPROVED EROSION AND SEDIMENTATION CONTROLS ARE IN PLACE.

1. HOLD PRE-CONSTRUCTION CONFERENCE.

2. INSTALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS AND STABILIZED CONSTRUCTION ENTRANCE AS SHOWN ON THE PLANS.

3. WITH THE APPROVAL OF ALL AFFECTED PARTIES, THE CONTRACTOR MAY BEGIN CLEARING AND GRUBBING.

4. COMPLETE ALL ROUGH GRADING AND UNDERGROUND INSTALLATION WITHIN THE LIMITS OF CONSTRUCTION.

5. COMPLETE FINAL GRADING WITHIN LIMITS OF CONSTRUCTION ALONG AREAS DESIGNATED. RESTORE CONSTRUCTION SPOILS & STAGING AREA TO NATURAL GRADE.

6. COMPLETE PERMANENT EROSION CONTROL AND RESTORATION OF SITE VEGETATION.

7. PROJECT ENGINEER OBSERVES CONSTRUCTION AND WRITES CONCURRENCE LETTER TO THE CITY OF BASTROP.

8. AFTER FINAL INSPECTION AND ACCEPTANCE OF CONSTRUCTION, COMPLETE ANY NECESSARY FINAL DRESS UP OF DISTURBED AREAS AND REMOVE/ DISPOSE OF TEMPORARY EROSION CONTROLS IN AN APPROVED MANNER.

EROSION AND SEDIMENTATION CONTROL:

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND FENCING FOR AREAS OUTSIDE OF THE CONSTRUCTION AREA PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).

2. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS, AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.

3. PRIOR TO FINAL ACCEPTANCE, HAUL ROADS AND WATERWAY CROSSINGS CONSTRUCTED FOR TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED, ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND REVEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSED OF IN APPROVED SPOIL DISPOSAL SITES.

4. ANY METHODS, STREET MARKINGS AND SIGNAGE NECESSARY FOR WARNING MOTORISTS, WARNING PEDESTRIANS OR DIVERTING TRAFFIC DURING CONSTRUCTION SHALL CONFORM TO THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITION.

5. ALL PAVEMENT MARKINGS, MARKERS, PAINT, TRAFFIC BUTTONS, TRAFFIC CONTROLS AND SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS, BRIDGES, AND THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITIONS.

6. EROSION CONTROL MEASURES, SITE WORK AND RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE CITY OF BASTROP CODE OF ORDINANCES.

7. ALL SLOPES SHALL BE SODDED OR SEEDED WITH APPROVED GRASS, GRASS MIXTURES OR GROUND COVER SUITABLE TO THE AREA AND SEASON IN WHICH THEY WERE APPLIED.

8. SILT FENCES, ROCK BERMS, SEDIMENTATION BASINS AND SIMILARLY RECOGNIZED TECHNIQUES AND MATERIALS SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT POINT SOURCE SEDIMENTATION LOADING OF DOWNSTREAM FACILITIES. SUCH INSTALLATION SHALL BE REGULARLY INSPECTED BY THE CITY OF BASTROP FOR EFFECTIVENESS. ADDITIONAL MEASURES MAY BE REQUIRED IF, IN THE OPINION OF THE CITY ENGINEER, THEY ARE WARRWNTED.

9. ALL TEMPORARY EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL FINAL INSPECTION AND APPROVAL OF THE PROJECT BY THE CITY INSPECTOR. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL TEMPORARY EROSION CONTROL STRUCTURES AND TO REMOVE EACH STRUCTURE AS APPROVED BY THE CITY INSPECTOR.

10. ALL MUD, DIRT, ROCKS, DEBRIS, ETC., SPILLED, TRACKED OR OTHERWISE DEPOSITED ON EXISTING PAVED STREETS. DRIVES AND AREAS USED BY THE PUBLIC SHALL BE CLEANED UP IMMEDIATELY.

11. PERMANENT EROSION CONTROL: ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW:

A. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL SHALL BE PLACED IN ALL DRAINAGE CHANNELS (EXCEPT ROCK), AND BETWEEN THE CURB AND RIGHT-OF-WAY.

B. THE SEEDING FOR PERMANENT EROSION CONTROL SHALL BE APPLIED OVER AREAS DISTURBED BY CONSTRUCTION AS FOLLOWS:

BROADCAST SEEDING:

(I) FROM OCTOBER TO FEBRUARY, SEEDING SHALL BE WITH ONE (1) POUND PER 1,000 SQUARE FEET OF UNHULLED BERMUDA OR THREE (3) POUNDS PER

(II) FROM MARCH TO SEPTEMBER, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF ONE (1) POUND PER 1,000 SQUARE FEET, WITH A PURITY OF 95% WITH 85% GERMINATION.

FERTILIZER SHALL BE SLOW RELEASE GRANULAR OR PALETTE TYPE, AND SHALL HAVE AN ANALYSIS OF 15-15-15, AND SHALL BE APPLIED AT THE RATE OF ONE (1) POUND PER 1,000 SQUARE FEET, ONCE AT THE TIME OF PLANTING, AND AGAIN ONCE DURING THE TIME OF ESTABLISHMENT.

MULCH TYPE USED SHALL BE STRAW OR HAY APPLIED AT A RATE OF 45 POUNDS PER 1,000 SQUARE FEET.

HYDRAULIC SEEDING:

(I) FROM OCTOBER TO FEBRUARY, SEEDING SHALL BE WITH ONE (1) POUND PER 1,000 SQUARE FEET OF UNHULLED BERMUDA, OR THREE (3) POUNDS PER 1,000 SQUARE FEET OF WINTER RYE, WITH A PURITY OF 95% WITH 90 % GERMINATION.

(II) FROM MARCH TO SEPTEMBER, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF ONE (1) POUND PER 1,000 SQUARE FEET WITH A PURITY OF 95% WITH 95% GERMINATION.

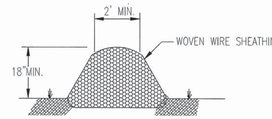
FERTILIZER SHALL BE A WATER SOLUBLE FERTILIZER WITH AN ANALYSIS OF 15-15-15 AT A RATE OF 1.5 POUNDS PER 1,000 SQUARE FEET.

MULCH TYPE SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1,000 SQUARE FEET, WITH A SOIL TACKIFIER AT A RATE OF 1.4 POUNDS PER 1,000 SQUARE FEET.

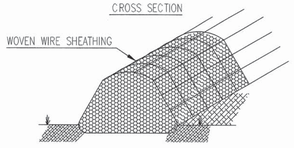
C. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK TO A DEPTH OF SIX (6) INCHES. THE IRRIGATION SHALL OCCUR AT 10-DAY INTERVALS DURING THE FIRST TWO (2) MONTHS. RAINFALL OCCURRENCES OF 1/2 INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR TEN (10) DAYS.

D. RESTORATION SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 INCH HIGH WITH 85% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 20 SQUARE FEET EXIST.

ROCK BERM



CROSS SECTION

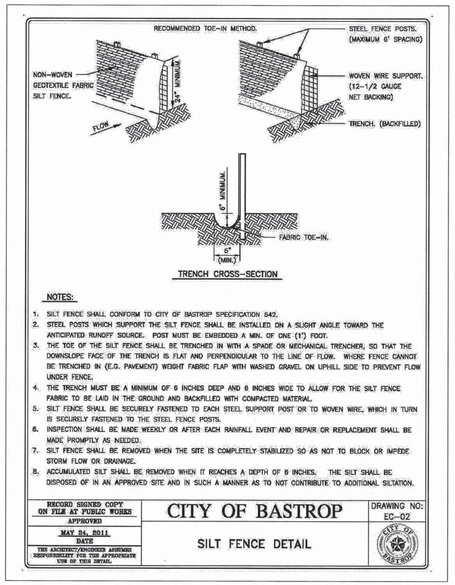


GENERAL NOTES

1. USE ONLY OPEN GRADED ROCK 4-8 INCH DIAMETER FOR STREAMFLOW CONDITIONS, USE OPEN GRADED ROCK 3-5 INCHES DIAMETER FOR OTHER CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 1 INCH OPENING AND MINIMUM WIRE DIAMETER OF 20 GAUGE.
3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN WIRE SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE AND IN A MANNER AS TO NOT CREATE A SILTRATION PROBLEM.
5. DAILY INSPECTION SHALL BE MADE ON SERVE SERVICE ROCK BERMS; SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES 6 INCHES.
6. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

STANDARD SYMBOL RB

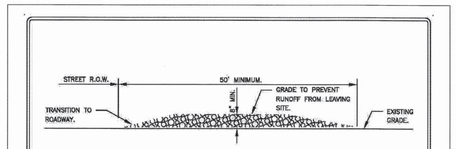
SOURCE: COA



NOTES:

1. SILT FENCE SHALL CONFORM TO CITY OF BASTROP SPECIFICATION 642.
2. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MIN. OF ONE (1') FOOT.
3. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G. PAVEMENT) WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
4. THE TRENCH MUST BE A MINIMUM OF 8 INCHES DEEP AND 8 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
5. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POSTS.
6. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
7. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
8. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED	CITY OF BASTROP	DRAWING NO: EC-02
MAY 24, 2011 DATE	SILT FENCE DETAIL	CITY OF BASTROP TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		



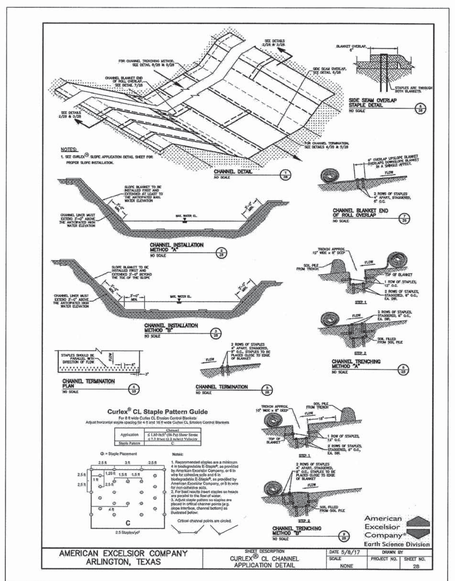
NOTES:

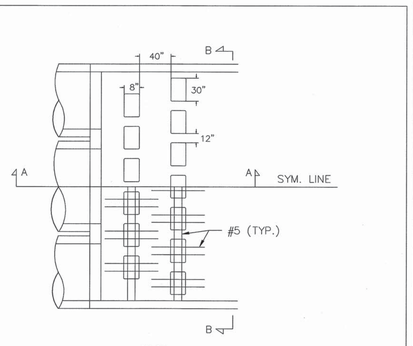
1. A STABILIZED CONSTRUCTION ENTRANCE APPLIES TO ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO A PUBLIC RIGHT OF WAY, STREET, ALLEY, SIDEWALK, OR PARKING AREA.
2. STONE SIZE SHALL BE 4" - 8" OPEN GRADED ROCK.
3. THICKNESS OF CRUSHED STONE PAD TO BE NOT LESS THAN 6".
4. LENGTH SHALL BE A MINIMUM OF 50' FROM ACTUAL ROADWAY, AND WIDTH NOT LESS THAN FULL WIDTH OF INGRESS/EGRESS.
5. ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY BY CONTRACTOR.

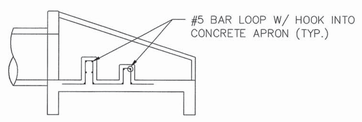
AS NECESSARY, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED	CITY OF BASTROP	DRAWING NO: EC-01
MAY 24, 2011 DATE	STABILIZED CONSTRUCTION ENTRANCE DETAIL	CITY OF BASTROP TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		



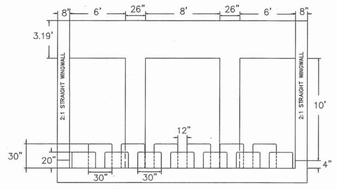


PLAN



SECTION A-A

ENERGY DISSIPATORS

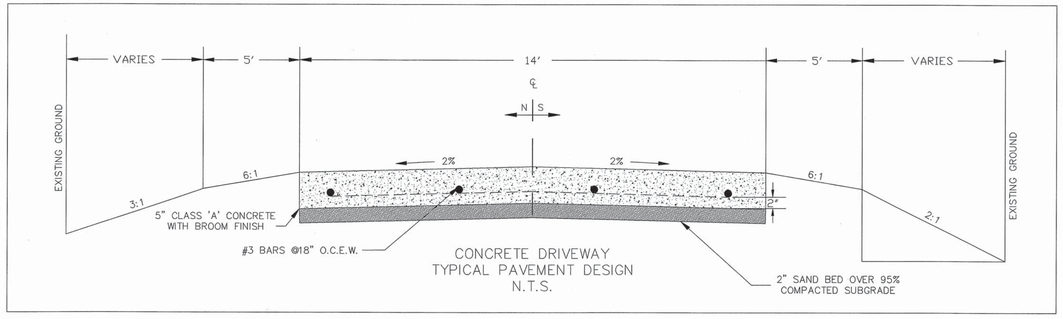


SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS A.
2. CHAMFER ALL EXTERNAL VISIBLE CORNERS.
3. DISSIPATOR BLOCKS REQUIRED ON DISCHARGE HEADWALLS ONLY.

ENERGY DISSIPATORS



CONCRETE DRIVEWAY
TYPICAL PAVEMENT DESIGN
N.T.S.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
FIRM ID #3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	IW

REVISION	DATE

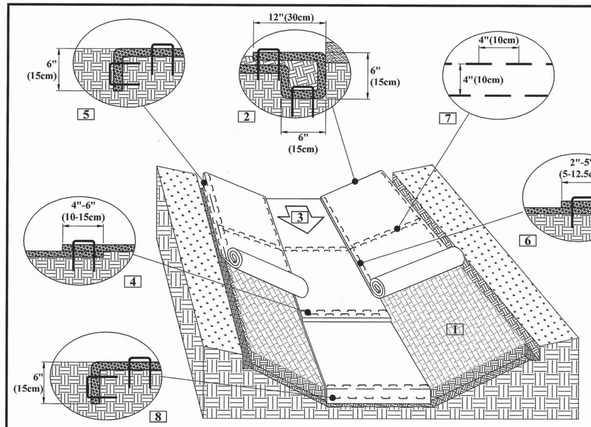
Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: GENERAL NOTES & DETAILS
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018
JOB NUMBER: 4697
SHEET: 2 OF 14
SHEET NO.: 2

FILE PATH: J:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - GENERAL NOTES.dwg - May 14, 2018 - 5:24pm

CHANNEL INSTALLATION DETAIL



1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the channel by anchoring the RECPs in a 6"(15cm) deep X 6"(15cm) wide trench with approximately 12"(30cm) of RECPs extended, beyond the up-slope portion of the trench. Use ShoreMax mat at the channel/culvert outlet as supplemental scour protection as needed. Anchor the RECPs with a row of staples/stakes approximately 12"(30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12"(30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12" apart across the width of the RECPs.
3. Roll center RECPs in direction of water flow in bottom of channel. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. Place consecutive RECPs end-over-end (Shingle style) with a 4"-6" overlap. Use a double row of staples staggered 4" apart and 4" on center to secure RECPs.
5. Full length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes approximately 12"(30cm) apart in a 6"(15cm) deep X 6"(15cm) wide trench. Backfill and compact the trench after stapling.
6. Adjacent RECPs must be overlapped approximately 2"-5" (5-12.5cm) (Depending on RECPs type) and stapled.
7. In high flow channel applications a staple check slot is recommended at 30 to 40 foot (9 -12m) intervals. Use a double row of staples staggered 4"(10cm) apart and 4"(10cm) on center over entire width of the channel.
8. The terminal end of the RECPs must be anchored with a row of staples/stakes approximately 12" (30cm) apart in a 6"(15cm) deep X 6"(15cm) wide trench. Backfill and compact the trench after stapling.

CRITICAL POINTS
A. Overlaps and Seams
B. Projected Water Line
C. Channel Bottom/Side Slope Vertices



NOTES:
*Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

**In loose soil conditions, the use of staple or stake lengths greater than 6"(15cm) may be necessary to properly secure the RECP's.

Drawing Not To Scale

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Poseyville, IN 47633 www.nagreen.com

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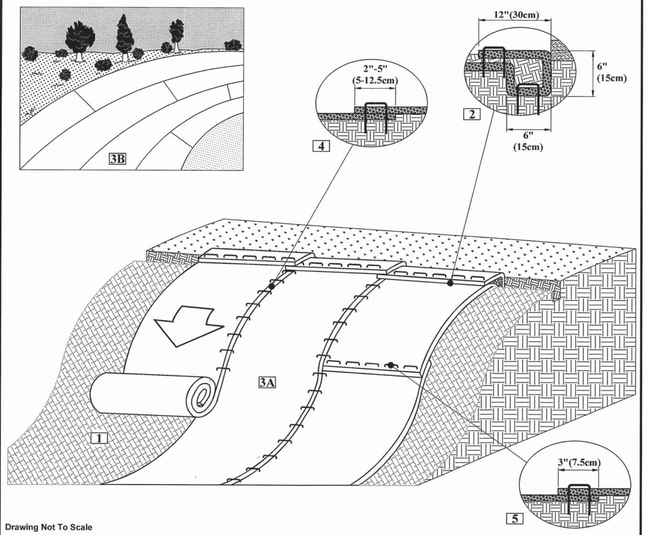
Drawn on: 5-4-17

SLOPE INSTALLATION DETAIL



1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6"(15cm) deep X 6"(15cm) wide trench with approximately 12" (30cm) of RECPs extended beyond the up-slope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12" (30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12"(30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12"(30cm) apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with approximately 2" - 5" (5-12.5cm) overlap depending on the RECPs type.
5. Consecutive RECPs spliced down the slope must be end over end (Shingle style) with an approximate 3"(7.5cm) overlap. Staple through overlapped area, approximately 12"(30cm) apart across entire RECPs width.

*NOTE:
In loose soil conditions, the use of staple or stake lengths greater than 6"(15cm) may be necessary to properly secure the RECP's.

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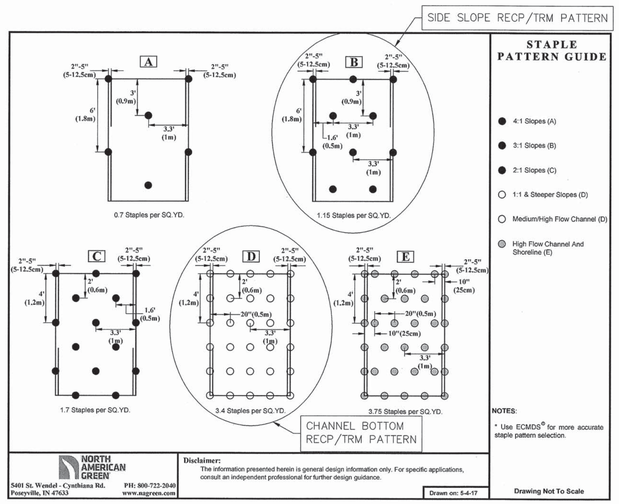

STAPLE PATTERN GUIDE

- 4:1 Slopes (A)
- 3:1 Slopes (B)
- 2:1 Slopes (C)
- 1:1 & Steeper Slopes (D)
- Medium/High Flow Channel (D)
- High Flow Channel And Shoreline (E)

NOTES:
* Use ECMDS® for more accurate staple pattern selection.

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Drawing Not To Scale

Figure 1. Minimum Anchor Pattern

Maximum Design Conditions			Anchor Pattern
Shear Stress	Velocity	Wave Height	
<= 6 lbs/ft2	<= 14 ft/s	6 in.	F
> 6-8 lbs/ft2	> 14-18 ft/s	12 in.	G
> 8 lbs/ft2	> 18 ft/s	18 in.	H

Figure 2. Minimum Anchor Type

Soil Type	Anchor Type
Clay-Clay Loam	10 in Wire Staple
Silt Loam - Loam	10 in Wire Staple
Sandy Loam	12 in Wire Staple
Sand / Muck <= 6 in	12in Rebar Staple
Sand / Muck 6-12 in	18 in Rebar Staple
Sand / Muck 12-18 in	24 in Earth Anchor + 12 in Rebar Staple
Sand / Muck > 18 in	36 in Earth Anchor + 18 in Rebar Staple

SHOREMAX SIDE & BOTTOM PATTERN

Figure 3. Anchor Patterns for use with Wire/Rebar Staples

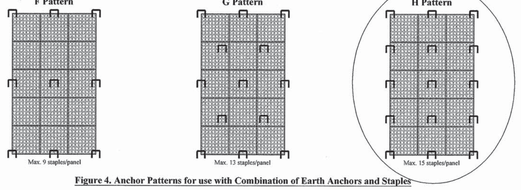
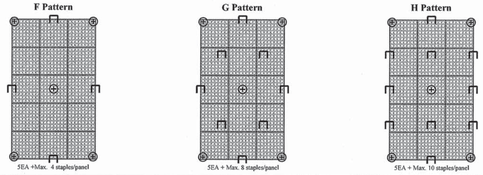


Figure 4. Anchor Patterns for use with Combination of Earth Anchors and Staples



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ShoreMax

ANCHORING GUIDE

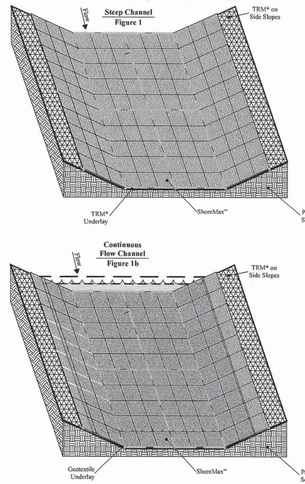
1. When installing ShoreMax mat, the anchor pattern (figure 3 or 4) should be selected based on the expected maximum design conditions (shear stress, velocity, or wave impact) (figure 1).
2. Anchor selection should be based on the soil type and pull-out strength required (figure 2). In soft, highly erodible soils percussion earth anchors may be necessary. Earth anchors can be installed in conjunction with rebar staples (figure 4).
3. When using percussion earth anchors, position anchors in each corner and the center of the panel. Place staples in the appropriate pattern through remainder of mat. Staples can be shared between two adjacent panels.

*Note:
Number of staples used per panel can be reduced by 30-40% when sharing staples between panels.

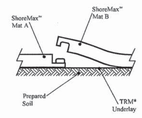
⊓ - Wire/Rebar Staple

⊕ - Percussion Earth Anchor

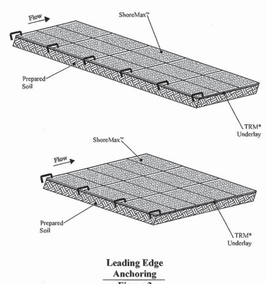
Drawing Not To Scale



Channel/Downchute/Spillway Plan View



Integrated Panel Interlock System
Figure 2



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Poseyville, IN 47633 www.nagreen.com

Disclaimer:
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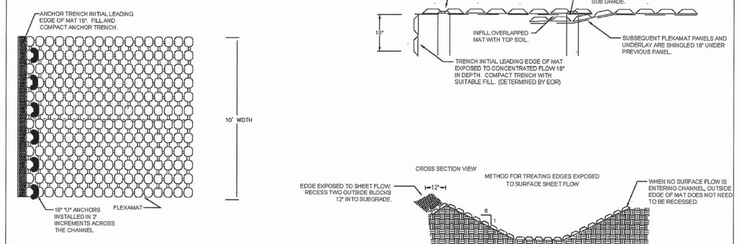
ShoreMax

STEEP CHANNEL/ CHUTE/SPILLWAY DETAIL

* ShoreMax mats can be installed over a variety of underlayments including: sod, turf reinforcement mats (TRMs), geotextiles, and in some cases erosion control blankets (ECBs).

1. Prepare soil before installing erosion control products, including any necessary application of lime, fertilizer, and seed (when installing TRM or ECB underlayment).
2. Install turf reinforcement mat (TRM) over prepared soils according to manufacturer's recommendations.
3. Place ShoreMax mat in the bottom of the channel over the installed TRM (figure 1). The ShoreMax mat should be installed up to the appropriate elevation on the side slope as determined by the engineer. When using multiple panels, connect the panels using the Integrated Panel Interlock System (figure 2). ShoreMax mat can be laid in either direction.
4. For channels carrying continuous water flows, an appropriate geotextile should be placed under the ShoreMax mat for submerged applications (figure 1b).
5. Place staples/anchors in the appropriate pattern. Perimeter staples can be shared between two adjacent panels. In soft or highly erodible soils, percussion earth anchors may be required. View ShoreMax Anchoring Guide, for additional details.
6. At beginning of channel and areas where significant concentrated flows are directed onto the ShoreMax mat, place 1 staple/pin per linear foot along the leading edge of the ShoreMax system, resulting in 1 staple/pin on each corner and gridline (figure 3).



FLEXAMAT INFORMATION

Manufacturer:	Motz Enterprises, Inc.
Product Name:	Flexamat®
Address:	3153 Madison Road
	Cincinnati, Ohio 45209
Telephone:	513-772-MOTZ (6689)
Fax:	513-772-6690
Contact:	Matt Motz
Email:	Matt@Flexamat.com
Website:	www.Flexamat.com

CONSTRUCTION NOTES:

1. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN THE CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS.
2. APPLY SEED DIRECTLY TO THE PREPARED SOIL PRIOR TO FLEXAMAT INSTALLATION. USE SEED PER PROJECT SPECIFICATIONS.
3. INSTALL FLEXAMAT ROLLS. AVAILABLE WIDTHS ARE 4', 5.5', 8', 10', 12', & 16' AVAILABLE IN CUSTOM LENGTHS.
4. AT THE TOP OF THE CHANNEL, THE INITIAL LEADING EDGE OF FLEXAMAT EXPOSED TO CONCENTRATED FLOWS SHALL BE EMBEDDED 18" VERTICALLY INTO THE SUBGRADE TO SERVE AS AN ANCHOR TRENCH. THE TRENCH SHALL BE FILLED AND COMPACTED WITH SUITABLE FILL.
5. AT THE END OF THE ARMORED CHANNEL, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH SUITABLE FILL.

FLEXAMAT ®CHANNEL DETAIL – LOW WATER CROSSING

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
PE F3791
05/15/2018

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

DESIGNED BY:	DRAFTED BY:
BM	IW

DATE

REVISION

SHEET NAME: DETAILS - EROSION CONTROL MATTING

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 3 OF 14

SHEET NO.: 3

FILE PATH:J:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - GENERAL NOTES.dwg - May 15, 2018 - 9:12am

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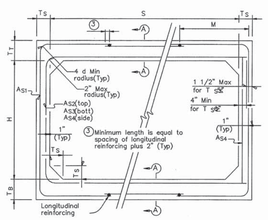
DATE:
FILE:

BOX DATA

SECTION DIMENSIONS S (ft)	H (ft)	T_1 (in)	T_2 (in)	T_3 (in)	Fill Height (ft)	M (Min) (in)	REINFORCING (in²/ft) A_{S1}	A_{S2}	A_{S3}	A_{S4}	A_{S5}	A_{S6}	A_{S7}	A_{S8}	① Unit Weight (Tons)
10	5	10	10	10	<2	–	0.30	0.36	0.30	0.24	0.24	0.24	0.24	0.24	17.5
10	5	10	10	10	2<3	58	0.35	0.39	0.34	0.24	–	–	–	–	17.5
10	5	10	10	10	3–5	53	0.28	0.31	0.30	0.24	–	–	–	–	17.5
10	5	10	10	10	10	52	0.33	0.35	0.36	0.24	–	–	–	–	17.5
10	5	10	10	10	15	47	0.42	0.46	0.47	0.24	–	–	–	–	17.5
10	5	10	10	10	20	47	0.55	0.59	0.61	0.24	–	–	–	–	17.5
10	5	10	10	10	25	47	0.68	0.73	0.75	0.24	–	–	–	–	17.5
10	6	10	10	10	<2	–	0.28	0.38	0.33	0.24	0.24	0.24	0.24	0.24	18.5
10	6	10	10	10	2<3	58	0.32	0.42	0.37	0.24	–	–	–	–	18.5
10	6	10	10	10	3–5	52	0.26	0.34	0.33	0.24	–	–	–	–	18.5
10	6	10	10	10	10	52	0.30	0.38	0.39	0.24	–	–	–	–	18.5
10	6	10	10	10	15	47	0.39	0.49	0.51	0.24	–	–	–	–	18.5
10	6	10	10	10	20	47	0.50	0.63	0.65	0.24	–	–	–	–	18.5
10	6	10	10	10	25	47	0.61	0.78	0.80	0.24	–	–	–	–	18.5
10	7	10	10	10	<2	–	0.25	0.40	0.36	0.24	0.24	0.24	0.24	0.24	19.5
10	7	10	10	10	2<3	58	0.30	0.45	0.40	0.24	–	–	–	–	19.5
10	7	10	10	10	3–5	58	0.24	0.36	0.35	0.24	–	–	–	–	19.5
10	7	10	10	10	10	52	0.28	0.40	0.42	0.24	–	–	–	–	19.5
10	7	10	10	10	15	47	0.36	0.52	0.54	0.24	–	–	–	–	19.5
10	7	10	10	10	20	47	0.46	0.67	0.69	0.24	–	–	–	–	19.5
10	7	10	10	10	25	47	0.56	0.82	0.85	0.24	–	–	–	–	19.5
10	8	10	10	10	<2	–	0.24	0.41	0.38	0.24	0.24	0.24	0.24	0.24	20.5
10	8	10	10	10	2<3	64	0.27	0.47	0.43	0.24	–	–	–	–	20.5
10	8	10	10	10	3–5	58	0.24	0.38	0.38	0.24	–	–	–	–	20.5
10	8	10	10	10	10	52	0.26	0.42	0.44	0.24	–	–	–	–	20.5
10	8	10	10	10	15	47	0.34	0.54	0.57	0.24	–	–	–	–	20.5
10	8	10	10	10	20	47	0.43	0.69	0.72	0.24	–	–	–	–	20.5
10	9	10	10	10	<2	–	0.24	0.42	0.41	0.24	0.24	0.24	0.24	0.24	21.5
10	9	10	10	10	2<3	70	0.26	0.50	0.46	0.24	–	–	–	–	21.5
10	9	10	10	10	3–5	64	0.24	0.40	0.40	0.24	–	–	–	–	21.5
10	9	10	10	10	10	58	0.25	0.43	0.46	0.24	–	–	–	–	21.5
10	9	10	10	10	15	52	0.32	0.56	0.59	0.24	–	–	–	–	21.5
10	9	10	10	10	20	47	0.40	0.71	0.75	0.24	–	–	–	–	21.5
10	10	10	10	10	<2	–	0.24	0.44	0.44	0.24	0.24	0.24	0.24	0.24	22.5
10	10	10	10	10	2<3	79	0.25	0.52	0.48	0.24	–	–	–	–	22.5
10	10	10	10	10	3–5	70	0.24	0.42	0.43	0.24	–	–	–	–	22.5
10	10	10	10	10	10	64	0.24	0.44	0.48	0.24	–	–	–	–	22.5
10	10	10	10	10	15	52	0.30	0.57	0.61	0.24	–	–	–	–	22.5
10	10	10	10	10	20	52	0.38	0.73	0.77	0.24	–	–	–	–	22.5

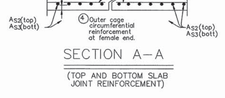
① For Box Length = 8'-0"

② A S1 thru A S4, S8 and A S6 the minimum required areas of reinforcement per linear foot of box length. A S5 and A S7 are minimum required areas of reinforcement per linear foot of box width.



FILL HEIGHT 2 FT AND GREATER

FILL HEIGHT LESS THAN 2 FT



SECTION A–A
(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.
See SCP-MD standard sheet for miscellaneous details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

SINGLE BOX CULVERTS PRECAST 10'-0" SPAN

SCP-10

FILE:	scp10s1s.dgn	DN: GAF	CK: LWJ	DW: BVM/TxDOT	CK: GAF
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REVISIONS		DIST	COUNTY		SHEET NO.

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FILE:

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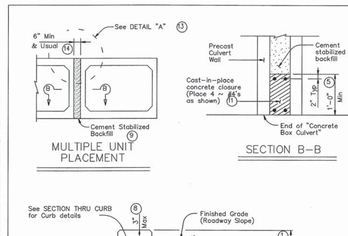
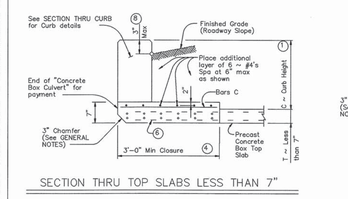
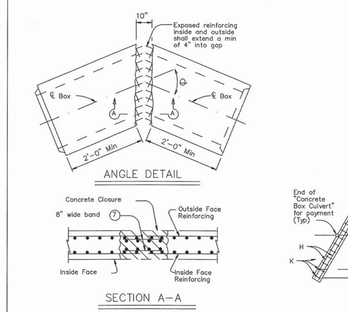
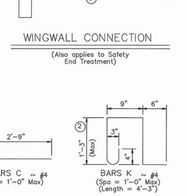
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.





(6) QUANTITIES PER FOOT OF CURB	
Reinforcing Steel	4.18 Lb
Concrete	0.037 CY





① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 traffic rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

② For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

③ Curb, Wingwall or Safety End Treatment reinforcing shall extend into concrete closure. Any reinforcing that does not fit into the closure shall be bent or trimmed as necessary.

④ Cast-in-place concrete closure shall be 3'-0" min. Boxes shall be cast short or broken back in the field. All reinforcing in the closure shall be the same size and spacing as in the precast box section. Except where shown otherwise, the cast-in-place closure shall be flush with the inside and outside faces of the precast box section.

⑤ For multiple unit placements the length of the closure for the interior walls may be adjusted as necessary. The length of the top slab, bottom slab, and exterior wall closure shall not be less than 3'-0". See Section B–B detail when interior walls are cast full length.

⑥ Precast box reinforcing shall extend a minimum of 1'-0" into concrete closure (Typ).

⑦ Bands of reinforcing matching the inside and outside face reinforcing shall be placed in the gaps of the top and bottom slabs. A band matching the outside face reinforcing of the wall shall be placed in the gaps of the walls (placed in the outside face only). The bands shall be tack welded to the exposed reinforcing at each point of contact.

⑧ For vehicle safety, the following requirements must be met:
– For structures without bridge rail, curbs shall project no more than 6" above finished grade.
– For structures with bridge rail, curbs shall be flush with finished grade.
Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

⑨ Cement Stabilized Backfill between boxes is considered part of the Box Culvert for payment.

⑩ All curb concrete and reinforcing is considered part of the Box Culvert for payment.

⑪ Any additional concrete and reinforcing required for the closures shall be considered as subsidiary to the Concrete Box Culvert.

⑫ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

⑬ For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in DETAIL "A".

⑭ This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
All closure concrete shall be Class "C" with a minimum compressive strength of 3600 psi and shall be placed according to the Item, "Concrete Substructures".
Any additional concrete required for the closures shall be considered as subsidiary to the Concrete Box Culvert.
Refer to the Single Box Culverts Precast standard for details not shown.
The bottom edge of the top slab closure shall be chamfered 3 inches at the entrance.

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE:	scpmdetails.dgn	DN: GAF	CK: LWJ	DW: BVM/TxDOT	CK: GAF
©TxDOT February 2012		CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID # F3791
Brendan McEntee
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

DATE
REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

TABLE OF DIMENSIONS & REINFORCING STEEL (Wings for One Structure End)												
Dimensions					Variable Reinforcing				Estimated ③ Quantities per ft of wing length (2~Wings)			
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J 1 Size	Bars J 1 Spa	Bars J 2 Size	Bars J 2 Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'- 8"	1'- 9"	1'- 3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'- 2"	2'- 0"	1'- 6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'- 8"	2'- 3"	1'- 9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'- 2"	2'- 6"	2'- 0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'- 8"	2'- 9"	2'- 3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'- 2"	3'- 0"	2'- 6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'- 8"	3'- 3"	2'- 9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'- 2"	3'- 6"	3'- 0"	1'- 0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'- 8"	4'- 0"	3'- 0"	1'- 1"	#8	6"	#6	6"	283.06	1.068
16'-0"	8'- 2"	4'- 6"	3'- 0"	1'- 3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING (2~Wings)			
Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES			
Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)
Hw = H + T + C – 0.250'
A = (Hw – 0.333') (SL)
B = (A) Tangent (30°)
Lw = (A) ÷Cosine (30°)
For Cast-in-place culverts:
Ltw = (N) (S) (N) + (U)
For Precast culverts:
Ltw = (N) (2U -S) (N) + (0.5')
Total Wingwall Area (Two Wings ~ S.F.)=(Hw – 0.333') (Lw)

Hw = Height of Wingwall
SL:1 = Side Slope Ratio (Horizontal:1 Vertical)
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans

See applicable box culvert standard for H, S, T, and U values.

① Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.

② Adjust to fit as necessary to maintain 1 1/4" clear cover and 4" minimum between bars.

③ Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by Lw.

④ Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.

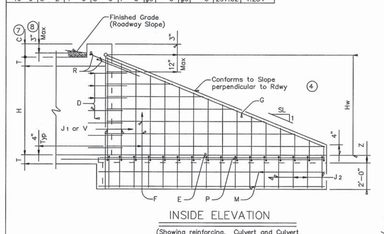
⑤ When shown elsewhere on the plans, a 5" deep concrete riprap shall be constructed. Payment for riprap shall be as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, the riprap shall have a 6" wide by 1'-6" deep reinforced concrete toewall along all edges adjacent to natural ground; the toewall shall be reinforced by extending typical riprap reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprap, at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B–B will not be required.

⑥ At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing from that shown as necessary.

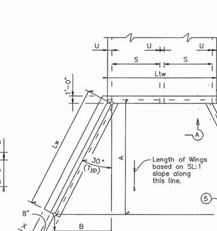
⑦ 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

⑧ For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.

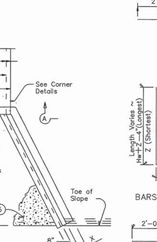
GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
All reinforcing steel shall be Grade 60.
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
All reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See BCS sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.



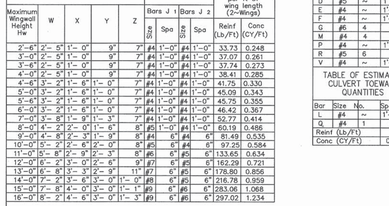
SECTION A–A



CORNER DETAILS
(Culvert and Culvert Toewall reinforcing not shown for clarity.)



SECTION B–B ⑤



INSIDE ELEVATION
(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)



PLAN
(Showing dimensions.)

BARS J1 BARS V BARS L BARS J2

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M	#4	4	~
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V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES			
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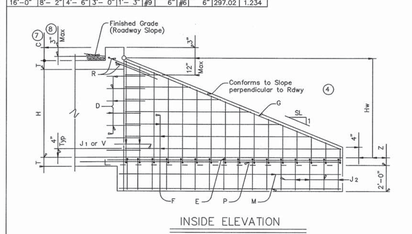
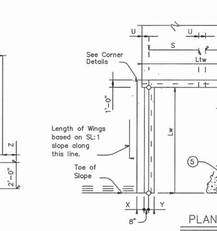
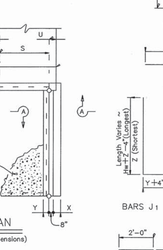


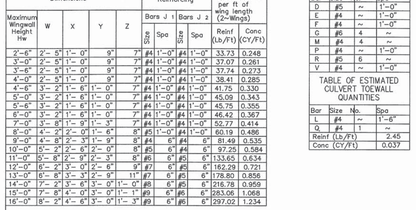
SECTION A–A



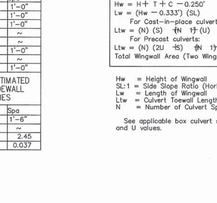
CORNER DETAILS



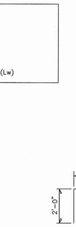
SECTION B–B ⑤



INSIDE ELEVATION
(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)



PLAN
(Showing Dimensions)



BARS J1 BARS V BARS L BARS J2

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0

FILE:	fw-0s1s.dgn	DN: GAF	CK:	DW: TxDOT	CK: GAF
©TxDOT February 2003		CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.
11-05: Add note for synthetic fibers.					

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

SW-0

FILE:	sw-0s1s.dgn	DN: GAF	CK:	DW: TxDOT	CK: GAF
©TxDOT February 2003		CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.
11-05: Add note for synthetic fibers.					

SHEET NAME: DETAILS - BOX CULVERTS
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018
JOB NUMBER: 4697
SHEET: 4 OF 14
SHEET NO.: 4

FILE PATH: J:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - GENERAL NOTES.dwg - May 14, 2018 - 5:25pm

CONTRACTOR TO PROTECT & PRESERVE EX. OVERHEAD ELECTRIC WIRES, POLES, & GUY WIRES

STABILIZED CONSTRUCTION ENTRANCE (50'L x 20'W)

J-HOOK (TYP. 1 OF 4)

STAGING & SPOILS STORAGE APPROX. 1.5 ACRES FOR 18,000 CY (VEHICULAR)

STAGING & SPOILS STORAGE APPROX. 2.8 ACRES FOR 34,000 CY (VEHICULAR)

STAGING & SPOILS STORAGE APPROX. 2.7 ACRES FOR 33,750 CY (VEHICULAR)

STATE HWY 304 - ROW VARIES

4' ELECTRIC FACILITIES EASEMENT VOLUME 1790, PAGE 606, OPRBCT

16' ELECTRIC FACILITIES EASEMENT VOLUME 1790, PAGE 612

25' TEMPORARY CONSTRUCTION AND PERMANENT PUBLIC UTILITY EASEMENT VOLUME 1961, PAGE 649

Remaining 93.013 Acres Bastrop Grove Partners, LTD. Vol. 1698, Pg. 246, OPRBCT

Centerline of 100' Wide Electric Easement, Vol. C Pg. 417, Court Minutes (Bastrop County)

AGNES ROAD (BY OTHERS)

52.684 ACRES
Portion 145.691 Acres
71 Retail Partners, LP.
Vol. 2245, Pg. 878
OPRBCT

SOUTH AGNES ROAD

INSTALL NORTH AMERICAN GREEN SHOREMAX OVER SC250 TRM (OR EQUIVALENT) EXTENDING 80' FROM END OF HEADWALL. SHOREMAX TO BE USED ON CHANNEL BOTTOM AND SLOPES TO ELEVATION 342.20. FROM ELEVATION 342.20 – 349.80 INSTALL NORTH AMERICAN GREEN P550 TRM (OR EQUIVALENT).

PROPOSED LOW WATER CROSSING TO MATCH CURRENT DRIVE ALIGNMENT & SURFACED WITH 10' WIDE x 212' LONG FLEXAMAT FLEXIBLE CONCRETE BLOCKS MAT WITH SC250 TRM UNDERLAYMENT

COLORADO RIVER

PROPOSED 14' WIDE CONCRETE DRIVEWAY TO REPLACE EX. DIRT ROAD

ROCK BERM (TYP. 1 OF 10) SEE DETAIL ON SHEET 2

EX. BOX CULVERT & FLOOD CONTROL STRUCTURE TO BE REMOVED AND REPLACED

11.563 ACRE DRAINAGE EASEMENT VOLUME 1819, PAGE 840

CHANNEL SIDE SLOPES & BOTTOM TO BE SURFACED WITH NORTH AMERICAN GREEN SC250 TRM (OR EQUIVALENT) UNTIL 100-YR WSE (SEE SHEET 7 FOR 100-YR WSE ALONG CHANNEL CENTERLINE). FROM 100-YR WSE TO EXTENTS OF PROPOSED GRADING INSTALL NORTH AMERICAN GREEN SC150 RECM (OR EQUIVALENT). MATTING INSTALLED PER MANUFACTURERS DIRECTIONS (TYP.)

CONTRACTOR TO PROTECT AND PRESERVE EX. OVERHEAD ELECTRIC WIRES & POLES

3.653 ACRE 80' DRAINAGE EASEMENT DEDICATED BY PROPERTY OWNER

INSTALL NORTH AMERICAN GREEN SC250 TRM (OR EQUIVALENT) ON CHANNEL BOTTOM AND ALONG SLOPES TO ELEVATION 356.10. DISTURBED AREAS ABOVE 356.10 TO BE SURFACED WITH NORTH AMERICAN GREEN SC150 RECM (OR EQUIVALENT).

STABILIZED CONSTRUCTION ENTRANCE (50'L x 20'W)

2-6'x5' BOX CULVERTS, HEADWALL, & PARALLEL WINGWALLS TO BE INSTALLED BY OTHERS

0 200' 400'

SCALE: 1" = 200'

LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- IP — INLET PROTECTION
- RB — ROCK BERM
- JH — J-HOOK
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- NORTH AMERICAN GREEN SHOREMAX OVER SC250 TRM (OR EQUIVALENT) (SEE DETAIL ON SHEET 3)
- NORTH AMERICAN GREEN P550 TRM (OR EQUIVALENT) (SEE DETAIL ON SHEET 3)
- NORTH AMERICAN GREEN SC250 TRM (OR EQUIVALENT) (SEE DETAIL ON SHEET 3)
- NORTH AMERICAN GREEN SC150 RECM (OR EQUIVALENT) (SEE DETAIL ON SHEET 3)

NOTES:

1. ALL SLOPES 3:1 OR GREATER SHALL BE STRUCTURALLY STABILIZED WITH TRM, SOIL, AND SEEDING PER GENERAL NOTES.
2. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES ARE TO BE REVEGETATED PER TPDES REQUIREMENTS. CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN BMPS UNTIL A N.O.T. IS PROCESSED FOR THE SITE.

LIMITS OF CONSTRUCTION: 958,599 SF / 22.01 AC

APPROX. NET CUT: 63,500 CY (NET SECTION)

SILT FENCE: 13,740 LF

J-HOOK: 4 EA

SC150 RECM: 11,221 SY

SC250 TRM: 41,367 SY

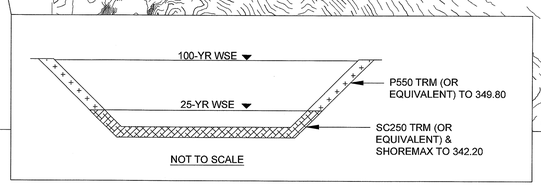
P550 TRM: 1,669 SY

SHOREMAX MAT: 738 SY

FLEXAMAT MAT: 236 SY

ROCK BERMS: 10 EA

SCE: 2 EA



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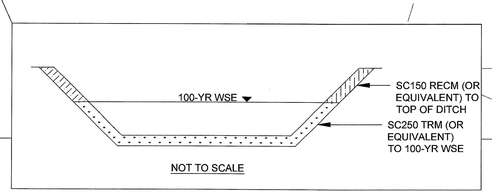

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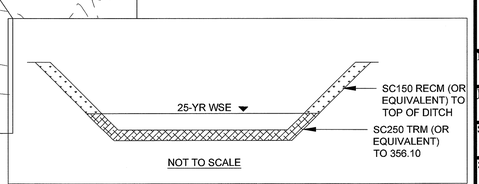


NOT TO SCALE

10/18/2018
STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION	DATE
1 RELOCATED SPOIL PILES	10/18/18

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791

Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: EROSION CONTROL PLAN

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

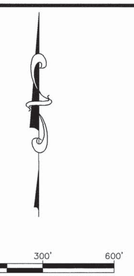
JOB NUMBER: 4697

SHEET: 5 OF 14

SHEET NO.: 5

FILE PATH: J:\AutoCad 2004 Land Projects\4697\Dwg\Channel\4697 - EROSION CONTROL



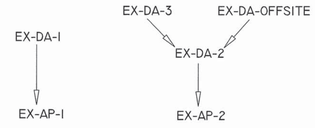


SCALE: 1" = 300'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- DRAINAGE BOUNDARY LINE
- AI — DRAINAGE AREA LABEL
- ANALYSIS POINT (AP)
- 940 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- FLOW ARROW
- TcFP — TIME OF CONCENTRATION FLOW PATH

HYDROLOGY FLOW CHART



TIME OF CONCENTRATION CALCULATIONS EXISTING CONDITIONS

Drainage Area #	Sheet Flow				Shallow Conc. Flow				Channel Flow						Tc (Min.)
	n	Slope	L	Tc	Paved/ Unpaved	Slope	L	Tc	n	Slope	L	Ax-sect	WP	Tc	
EX-DA-1	0.15	0.30%	100	19.73	U	0.19%	3154.97	74.77							94.5
DA-OFFSITE	0.011	0.50%	100	1.99	U	0.50%	2336	34.13	0.013	0.50%	1793	18	18	3.69	39.8
EX-DA-2	0.15	0.56%	100	15.37	U	0.34%	3712.93	65.78	0.026	1.58%	2631.64	200	60	2.72	83.9
EX-DA-3	0.15	0.36%	100	18.34	U	0.76%	1684.2	19.96							38.3

RESULTS TABLE - EXISTING CONDITIONS

SUB-BASIN	AREA (AC.)	% IC	CN	Q_{10} (CFS)	Q_{25} (CFS)	Q_{100} (CFS)
EX-DA-1 / EX-AP-1	101.79	0	57	59.56	97.12	167.35
DA-OFFSITE	69.84	28	71	127.94	181.31	273.3
EX-DA-2	193.08	0	60	140.32	219.91	366.23
EX-DA-3	50.91	0	52	36.56	64.3	117.99
EX-AP-2				257.24	395.87	648.66

NOTES:

- SCS WAS USED AS DRAINAGE CALCULATION METHOD
- RAINFALL INTENSITY DATA FOR DESIGN STORMS WERE PROVIDED BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90)
- CN'S ARE BASED ON EXISTING TYPE A & B SOILS AND REFLECT VALUES PER THE USDA WEB SOIL SURVEY
- TOC CALCULATIONS ARE BASED ON ASSUMED EXISTING CONDITIONS & TR-55
- MANNING'S N VALUES FROM TR-55:
  - PIPE/CHANNEL FLOW
    - PIPES - REINFORCED CONCRETE = 0.013
    - NATURAL CHANNELS - EARTH, STRAIGHT, SOME GRASS = 0.026
  - OVERLAND FLOW
    - SMOOTH SURFACE (CONCRETE, ASPHALT, BARE SOIL) = 0.011
    - SHORT GRASS = 0.015
- OFFSITE IMPERVIOUS COVERS ARE APPROXIMATE BASED ON AERIAL IMAGERY

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	TW

REVISION / DATE

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: EXISTING DRAINAGE AREA MAP
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018
JOB NUMBER: 4697
SHEET: 6 OF 14
SHEET NO.: 6

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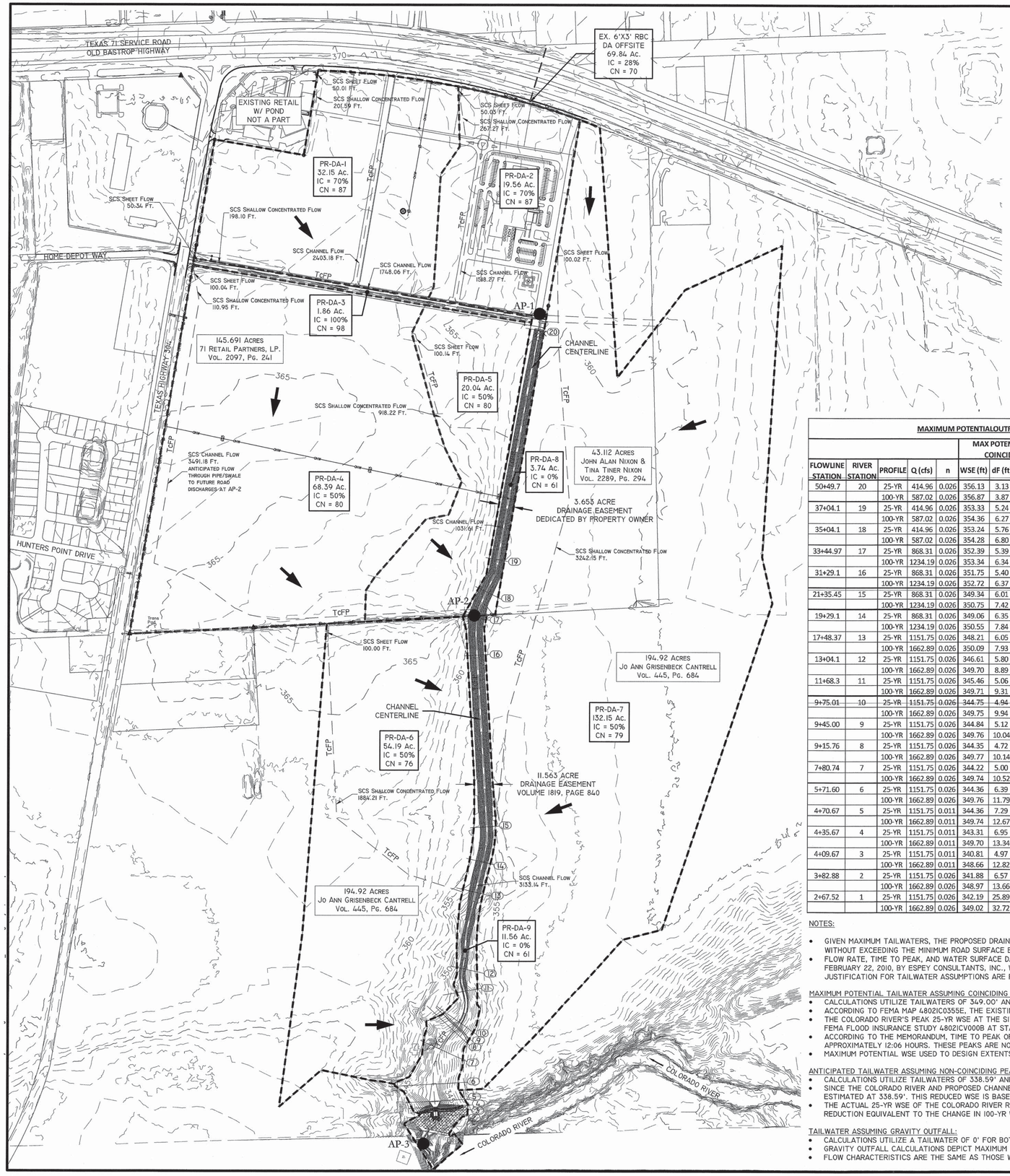
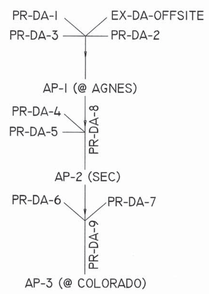


HYDROLOGY FLOW CHART







SCALE: 1" = 300'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- DRAINAGE BOUNDARY LINE
- AI — DRAINAGE AREA LABEL
- ANALYSIS POINT (AP)
- 940 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- FLOW ARROW
- TcFP — TIME OF CONCENTRATION FLOW PATH

TIME OF CONCENTRATION CALCULATIONS PROPOSED CONDITIONS

Area #	Sheet Flow				Shallow Conc. Flow				Channel Flow						Tc (Min.)
	n	Slope	L	Tc	Paved/ Unpaved	Slope	L	Tc	n	Slope	L	Axsect	WP	Tc	
DA-OFFSITE	0.011	0.50%	100	1.99	U	0.50%	2336	34.13	0.013	0.50%	1793	18	18	3.69	39.8
PR-DA-1	0.011	0.50%	100	1.99	U	0.50%	202	2.22	0.013	0.50%	2403	27.58	15.88	3.41	7.6
PR-DA-2	0.011	0.50%	100	1.99	U	0.50%	217.47	3.18	0.013	0.50%	1518.01	19.15	13.23	2.44	7.6
PR-DA-3	0.011	2.00%	50	0.66	P	1.00%	198	1.62	0.013	0.50%	1748.06	27.58	15.88	2.48	4.8
PR-DA-4	0.011	0.50%	100	1.99	U	0.50%	110.95	1.62	0.013	0.50%	3491.18	37.54	18.53	4.47	8.1
PR-DA-5	0.011	0.50%	100	1.99	U	0.50%	918.22	13.41	0.026	0.30%	1031.61	86.78	34.61	2.96	18.4
PR-DA-6	0.011	0.50%	100	1.99	U	0.74%	1884.2	22.63							24.6
PR-DA-7	0.011	0.50%	100	1.99	U	0.23%	3242.18	69.83							71.8
PR-DA-8									0.026	0.30%	1715.36	86.78	34.61	4.92	4.9
PR-DA-9									0.026	0.30%	3133	320	65.25	5.73	5.7

MAXIMUM POTENTIALOUTFALL CONDITIONS FOR 100-YR AND 25-YR STORM EVENTS

					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS				TW WITH GRAVITY OUTFALL			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
50+49.7	20	25-YR	414.96	0.026	356.13	3.13	3.31	0.000888	356.13	3.13	3.31	0.000888	356.13	3.13	3.31	0.000888
		100-YR	587.02	0.026	356.87	3.87	3.79	0.000918	356.87	3.87	3.79	0.000918	356.87	3.87	3.79	0.000918
37+04.1	19	25-YR	414.96	0.026	353.33	5.24	3.34	0.000782	353.33	5.24	3.34	0.000782	353.33	5.24	3.34	0.000782
		100-YR	587.02	0.026	354.36	6.27	3.49	0.000694	354.35	6.26	3.5	0.000698	354.35	6.26	3.5	0.000698
35+04.1	18	25-YR	414.96	0.026	353.24	5.76	2.85	0.000513	353.24	5.76	2.85	0.000513	353.24	5.76	2.85	0.000513
		100-YR	587.02	0.026	354.28	6.80	3.04	0.00048	354.27	6.79	3.05	0.000483	354.27	6.79	3.05	0.000483
33+44.97	17	25-YR	868.31	0.026	352.39	5.39	6.66	0.003008	352.39	5.39	6.66	0.003008	352.39	5.39	6.66	0.003008
		100-YR	1234.19	0.026	353.34	6.34	7.2	0.002937	353.32	6.32	7.24	0.002981	353.32	6.32	7.24	0.002981
31+29.1	16	25-YR	868.31	0.026	351.75	5.40	6.65	0.002991	351.75	5.40	6.65	0.002991	351.75	5.40	6.65	0.002991
		100-YR	1234.19	0.026	352.72	6.37	7.14	0.00285	352.68	6.33	7.22	0.002935	352.68	6.33	7.22	0.002935
21+35.45	15	25-YR	868.31	0.026	349.34	6.01	5.56	0.001849	349.34	6.01	5.56	0.001849	349.34	6.01	5.56	0.001849
		100-YR	1234.19	0.026	350.75	7.42	5.5	0.001418	350.43	7.10	5.93	0.001734	350.43	7.10	5.93	0.001734
19+29.1	14	25-YR	868.31	0.026	349.06	6.35	5.05	0.001429	349.06	6.35	5.05	0.001429	349.06	6.35	5.05	0.001429
		100-YR	1234.19	0.026	350.55	7.84	4.99	0.001095	350.18	7.47	5.43	0.001371	350.18	7.47	5.43	0.001371
17+48.37	13	25-YR	1151.75	0.026	348.21	6.05	7.26	0.003155	348.21	6.05	7.26	0.003155	348.21	6.05	7.26	0.003155
		100-YR	1662.89	0.026	350.09	7.93	6.28	0.001586	349.23	7.07	7.96	0.003064	349.23	7.07	7.96	0.003064
13+04.1	12	25-YR	1151.75	0.026	346.61	5.80	7.44	0.004251	346.61	5.80	7.44	0.004251	346.61	5.80	7.44	0.004251
		100-YR	1662.89	0.026	349.70	8.89	4.78	0.000681	347.22	6.41	8.83	0.004786	347.22	6.41	8.83	0.004786
11+68.3	11	25-YR	1151.75	0.026	345.46	5.06	9.46	0.005489	345.46	5.06	9.46	0.005489	345.46	5.06	9.46	0.005489
		100-YR	1662.89	0.026	349.71	9.31	4.44	0.000416	346.47	6.07	9.83	0.004214	346.47	6.07	9.83	0.004214
9+75.01	10	25-YR	1151.75	0.026	344.75	4.94	9.18	0.004232	344.75	4.94	9.18	0.004232	344.75	4.94	9.18	0.004232
		100-YR	1662.89	0.026	349.75	9.94	3.11	0.000166	346.54	6.73	6.94	0.001482	346.54	6.73	6.94	0.001482
9+45.00	9	25-YR	1151.75	0.026	344.84	5.12	4.55	0.00111	344.84	5.12	4.55	0.00111	344.84	5.12	4.55	0.00111
		100-YR	1662.89	0.026	349.76	10.04	2.16	0.000081	346.70	6.98	3.99	0.000497	346.70	6.98	3.99	0.000497
9+15.76	8	25-YR	1151.75	0.026	344.35	4.72	7.99	0.002899	344.35	4.72	7.99	0.002899	344.35	4.72	7.99	0.002899
		100-YR	1662.89	0.026	349.77	10.14	2.63	0.000106	346.63	7.00	5.43	0.000759	346.63	7.00	5.43	0.000759
7+80.74	7	25-YR	1151.75	0.026	344.22	5.00	7.39	0.002116	344.22	5.00	7.39	0.002116	344.22	5.00	7.39	0.002116
		100-YR	1662.89	0.026	349.74	10.52	2.89	0.000117	346.55	7.33	5.45	0.00068	346.55	7.33	5.45	0.00068
5+71.60	6	25-YR	1151.75	0.026	344.36	6.39	2.86	0.000215	344.36	6.39	2.86	0.000215	344.36	6.39	2.86	0.000215
		100-YR	1662.89	0.026	349.76	11.79	1.36	0.000021	346.62	8.65	2.47	0.000107	346.62	8.65	2.47	0.000107
4+70.67	5	25-YR	1151.75	0.011	344.36	7.29	2.11	0.000017	344.36	7.29	2.11	0.000017	344.36	7.29	2.11	0.000017
		100-YR	1662.89	0.011	349.74	12.67	1.55	0.000004	346.59	9.52	2.22	0.000013	346.59	9.52	2.22	0.000013
4+35.67	4	25-YR	1151.75	0.011	343.31	6.95	8.09	0.00053	343.31	6.95	8.09	0.00053	343.31	6.95	8.09	0.00053
		100-YR	1662.89	0.011	349.70	13.34	2.6	0.000032	345.33	8.97	8.89	0.000525	345.33	8.97	8.89	0.000525
4+09.67	3	25-YR	1151.75	0.011	340.81	4.97	11.41	0.001431	340.48	4.64	12.22	0.001747	340.48	4.64	12.22	0.001747
		100-YR	1662.89	0.011	348.66	12.82	5.86	0.000198	341.76	5.92	13.81	0.0018	341.76	5.92	13.81	0.0018
3+82.88	2	25-YR	1151.75	0.026	341.88	6.57	5.71	0.000868	339.04	3.73	10.76	0.006582	339.04	3.73	10.76	0.006582
		100-YR	1662.89	0.026	348.97	13.66	2.81	0.000079	340.02	4.71	12	0.00599	340.02	4.71	12	0.00599
2+67.52	1	25-YR	1151.75	0.026	342.19	25.89	0.67	0.000006	332.04	15.74	1.97	0.000084	325.16	8.86	6.07	0.001823
		100-YR	1662.89	0.026	349.02	32.72	0.54	0.000003	338.64	22.34	1.38	0.000031	326.69	10.39	6.36	0.001551

RESULTS TABLE - PROPOSED CONDITIONS

SUB-BASIN	AREA (AC.)	%IC	CN	Q_{10} (CFS)	Q_{25} (CFS)	Q_{100} (CFS)
DA-OFFSITE	69.84	28	71	127.94	181.31	273.3
PR-DA-1	32.15	70	87	149.45	192.56	263.76
PR-DA-2	19.56	70	87	90.92	117.15	160.47
PR-DA-3	1.86	100	98	9.76	12.14	16.10
PR-DA-4	68.39	50	80	275.24	367.46	521.27
PR-DA-5	20.05	50	80	66.42	88.96	126.64
PR-DA-6	54.19	50	76	142.77	195.94	285.88
PR-DA-7	132.15	50	79	213.43	288.18	413.80
PR-DA-8	3.74	0	61	7.88	12.16	19.88
PR-DA-9	11.56	0	61	24.36	37.58	61.45
AP-1 (CHANNEL SOUTH OF AGNES)				312.95	414.96	587.02
AP-2 (CHANNEL AT SOUTHEAST PROPERTY CORNER)				650.57	868.31	1234.19
AP-3 (CHANNEL AT COLORADO RIVER)				850.01	1151.75	1662.89

NOTES:

- SCS WAS USED AS DRAINAGE CALCULATION METHOD
- RAINFALL INTENSITY DATA FOR DESIGN STORMS WERE PROVIDED BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90)
- CN'S ARE BASED ON EXISTING TYPE A & B SOILS AND REFLECT VALUES PER THE USDA WEB SOIL SURVEY
- TOC CALCULATIONS ARE BASED ON ASSUMED FUTURE DEVELOPMENT & TR-55
- MANNING'S N VALUES FROM TR-55:
  - PIPE/CHANNEL FLOW
    - PIPES - REINFORCED CONCRETE = 0.013
    - NATURAL CHANNELS - EARTH, STRAIGHT, SOME GRASS = 0.026
  - OVERLAND FLOW
    - SMOOTH SURFACE (CONCRETE, ASPHALT, BARE SOIL) = 0.011
    - SHORT GRASS = 0.015
- OFFSITE IMPERVIOUS COVERS ARE APPROXIMATE BASED ON AERIAL IMAGERY
- ONSITE IMPERVIOUS COVERS REFLECT ASSUMED FUTURE DEVELOPMENT AS FOLLOWS:
  - SINGLE-USE RESIDENTIAL = 50%
  - COMMERCIAL = 70%
  - ROADWAY = 100%

NOTES:

- GIVEN MAXIMUM TAILWATERS, THE PROPOSED DRAINAGE CHANNEL PROVIDES AT LEAST ONE FOOT OF FREEBOARD AT DESIGN FLOWS AND THE PROPOSED CULVERT HAS CAPACITY TO CONVEY 100-YR STORM RUNOFF WITHOUT EXCEEDING THE MINIMUM ROAD SURFACE ELEVATION OF AGNES ROAD AT 359.50', AS PER DESIGN REQUIREMENTS BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90).
- FLOW RATE, TIME TO PEAK, AND WATER SURFACE DATA FOR THE COLORADO RIVER ARE BASED ON FEMA MAP 48021C0355E AND THE DRAINAGE TECHNICAL MEMORANDUM FOR THE PECAN PARK DEVELOPMENT DATED FEBRUARY 22, 2010, BY ESPEY CONSULTANTS, INC., WHICH UTILIZED THE USGS GAGE 08159200 LOCATED AT STATE HIGHWAY 71 APPROXIMATELY 2 MILES UPSTREAM OF THE PROPOSED CHANNEL'S OUTFALL. JUSTIFICATION FOR TAILWATER ASSUMPTIONS ARE PROVIDED BELOW:

MAXIMUM POTENTIAL TAILWATER ASSUMING COINCIDING PEAKS:

- CALCULATIONS UTILIZE TAILWATERS OF 349.00' AND 342.17' FOR THE 100-YR AND 25-YR STORM EVENTS, RESPECTIVELY.
- ACCORDING TO FEMA MAP 48021C0355E, THE EXISTING 100-YR BFE AT THE SITE IS 349' MSL.
- THE COLORADO RIVER'S PEAK 25-YR WSE AT THE SITE IS ESTIMATED AT 342.17'. THIS WSE WAS EXTRAPOLATED FROM A LOGARITHMIC TREND OF BFE'S FOR VARIOUS ANNUAL CHANCE FLOODS USING DATA FROM THE FEMA FLOOD INSURANCE STUDY 48021CV000B AT STATION 'AW'.
- ACCORDING TO THE MEMORANDUM, TIME TO PEAK OF THE COLORADO RIVER IS APPROXIMATED AT 31:45 HOURS FOR THE 100-YR EVENT, WHEREAS THE PROPOSED CHANNEL'S TIME TO PEAK IS MODELED AT APPROXIMATELY 12:06 HOURS. THESE PEAKS ARE NON-COINCIDING AND THEREFORE THESE WSE'S OVERESTIMATE EXPECTED FLOODING FOR THE 100-YR AND 25-YR EVENTS.
- MAXIMUM POTENTIAL WSE USED TO DESIGN EXTENTS OF EROSION CONTROL MEASURES.

ANTICIPATED TAILWATER ASSUMING NON-COINCIDING PEAKS:

- CALCULATIONS UTILIZE TAILWATERS OF 338.59' AND 331.96' FOR THE 100-YR AND 25-YR STORM EVENTS, RESPECTIVELY.
- SINCE THE COLORADO RIVER AND PROPOSED CHANNEL PEAKS ARE NON-COINCIDING, AN ESTIMATED REDUCTION OF 10.41' IS EXPECTED TO BE REALIZED IN ACTUAL WSE AT 12:06 HOURS. THE 100-YR WSE IS ESTIMATED AT 338.59'. THIS REDUCED WSE IS BASED ON GRAPHICAL INTERPOLATIONS OF THE MEMORANDUM'S COLORADO RIVER 1% ANNUAL CHANCE HYDROGRAPH AND HYDRAULIC RATING CURVE.
- THE ACTUAL 25-YR WSE OF THE COLORADO RIVER REALIZED AT 12:06 HOURS AT THE PROPOSED CHANNEL'S OUTFALL IS ESTIMATED AT 331.96'. THIS REDUCED WSE WAS CALCULATED USING A PROPORTIONAL REDUCTION EQUIVALENT TO THE CHANGE IN 100-YR WSE'S REALIZED AT A TIME TO PEAK OF 31:45 HOURS AS COMPARED TO 12:06 HOURS.

TAILWATER ASSUMING GRAVITY OUTFALL:

- CALCULATIONS UTILIZE A TAILWATER OF 0' FOR BOTH THE 100-YR AND 25-YR STORM EVENTS.
- GRAVITY OUTFALL CALCULATIONS DEPICT MAXIMUM VELOCITIES WHICH ARE USED FOR DESIGN OF OUTFALL PROTECTION.
- FLOW CHARACTERISTICS ARE THE SAME AS THOSE WITH THE ANTICIPATED TAILWATER ASSUMING NON-COINCIDING PEAKS AT EVERY STATION EXCEPT STATION 1.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	IW

DATE

REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: PROPOSED DRAINAGE AREA MAP

JOB NAME: BASTROP GROVE

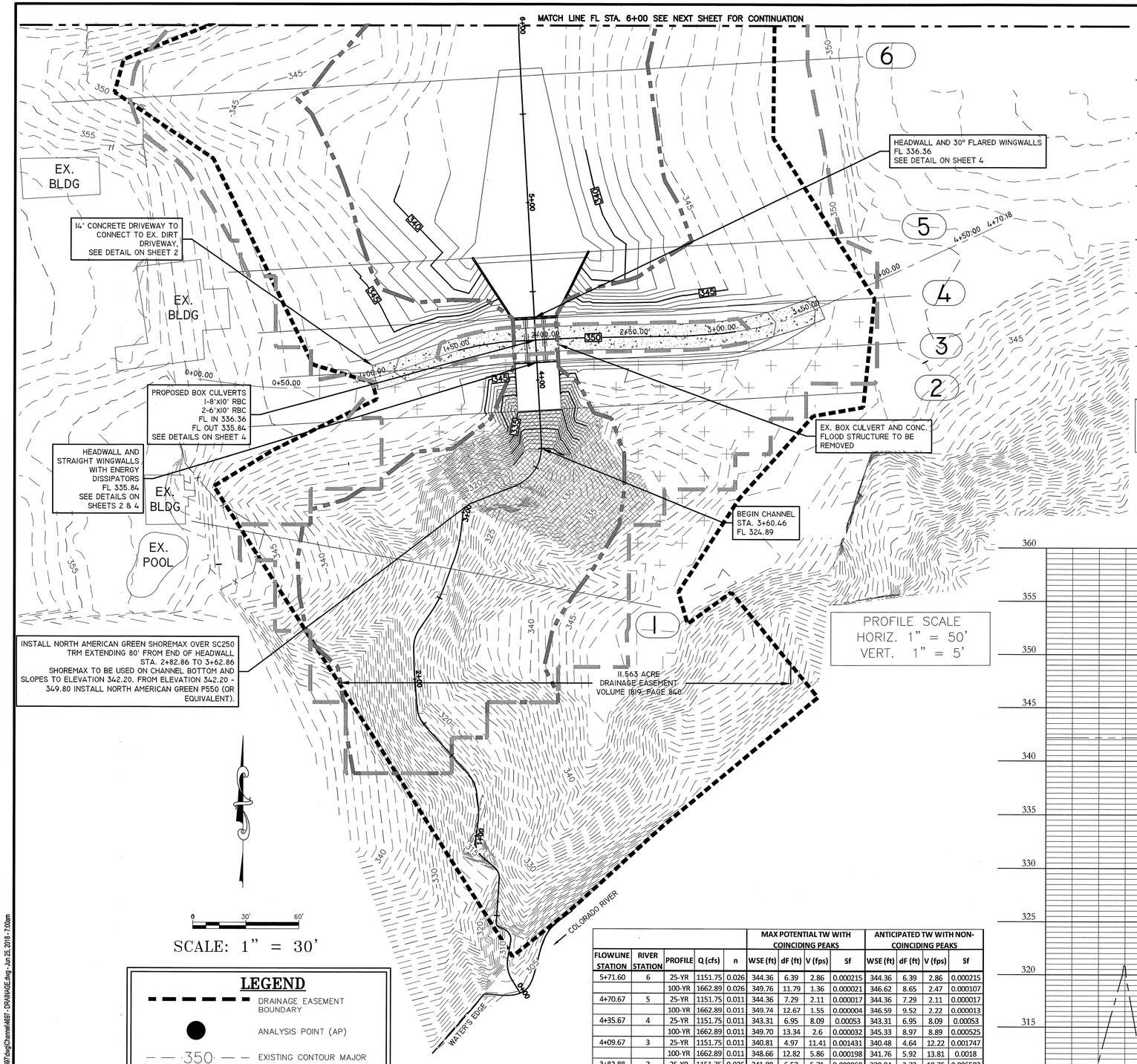
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 7 OF 14

SHEET NO.: 7



0 30' 60'

SCALE: 1" = 30'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

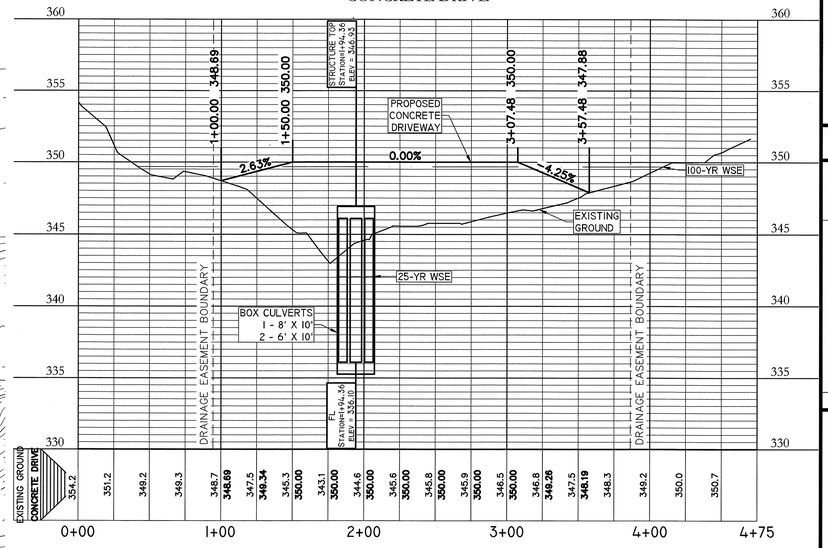
PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
5+71.60	6	25-YR	1151.75	0.026	344.36	6.39	2.86	0.000215	344.36	6.39	2.86	0.000215
		100-YR	1662.89	0.026	349.76	11.79	1.36	0.000021	346.62	8.65	2.47	0.000107
4+70.67	5	25-YR	1151.75	0.011	344.36	7.29	2.11	0.000017	344.36	7.29	2.11	0.000017
		100-YR	1662.89	0.011	349.74	12.67	1.55	0.000004	346.59	9.52	2.22	0.000013
4+35.67	4	25-YR	1151.75	0.011	343.31	6.95	8.09	0.00053	343.31	6.95	8.09	0.00053
		100-YR	1662.89	0.011	349.70	13.34	2.6	0.000032	345.33	8.97	8.89	0.000525
4+09.67	3	25-YR	1151.75	0.011	340.81	4.97	11.41	0.001431	340.48	4.64	12.22	0.001747
		100-YR	1662.89	0.011	348.66	12.82	5.86	0.000198	341.76	5.92	13.81	0.0018
3+82.88	2	25-YR	1151.75	0.026	341.88	6.57	5.71	0.000868	339.04	3.73	10.76	0.006582
		100-YR	1662.89	0.026	348.97	13.66	2.81	0.000079	340.02	4.71	12	0.00599
2+67.52	1	25-YR	1151.75	0.026	342.19	25.89	0.67	0.000006	332.04	15.74	1.97	0.000084
		100-YR	1662.89	0.026	349.02	32.72	0.54	0.000003	338.64	22.34	1.38	0.000031

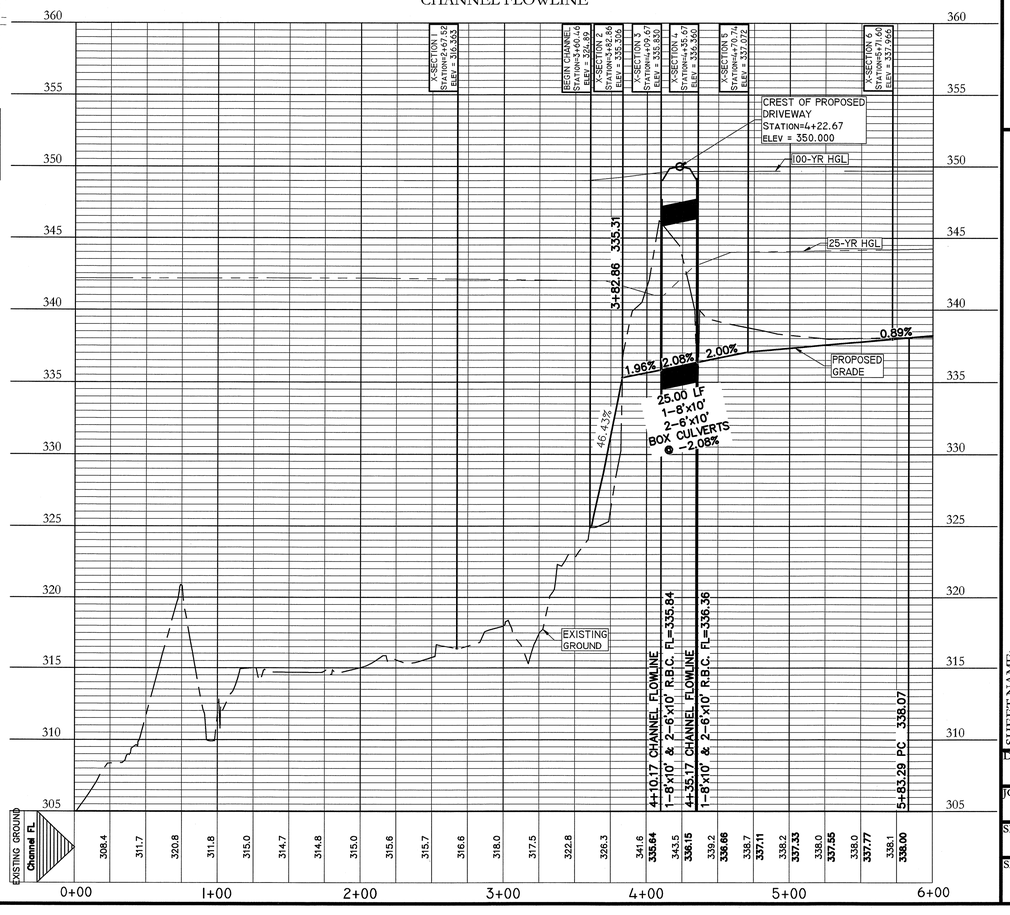
NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

CONCRETE DRIVE



CHANNEL FLOWLINE



STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
09/28/2018

Carlson, Brigance & Doering, Inc.
FIRM ID #F9791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION / DATE

SHEET NAME: CHANNEL - STA. 0+00 TO 6+00

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 8 OF 14

SHEET NO.: 8

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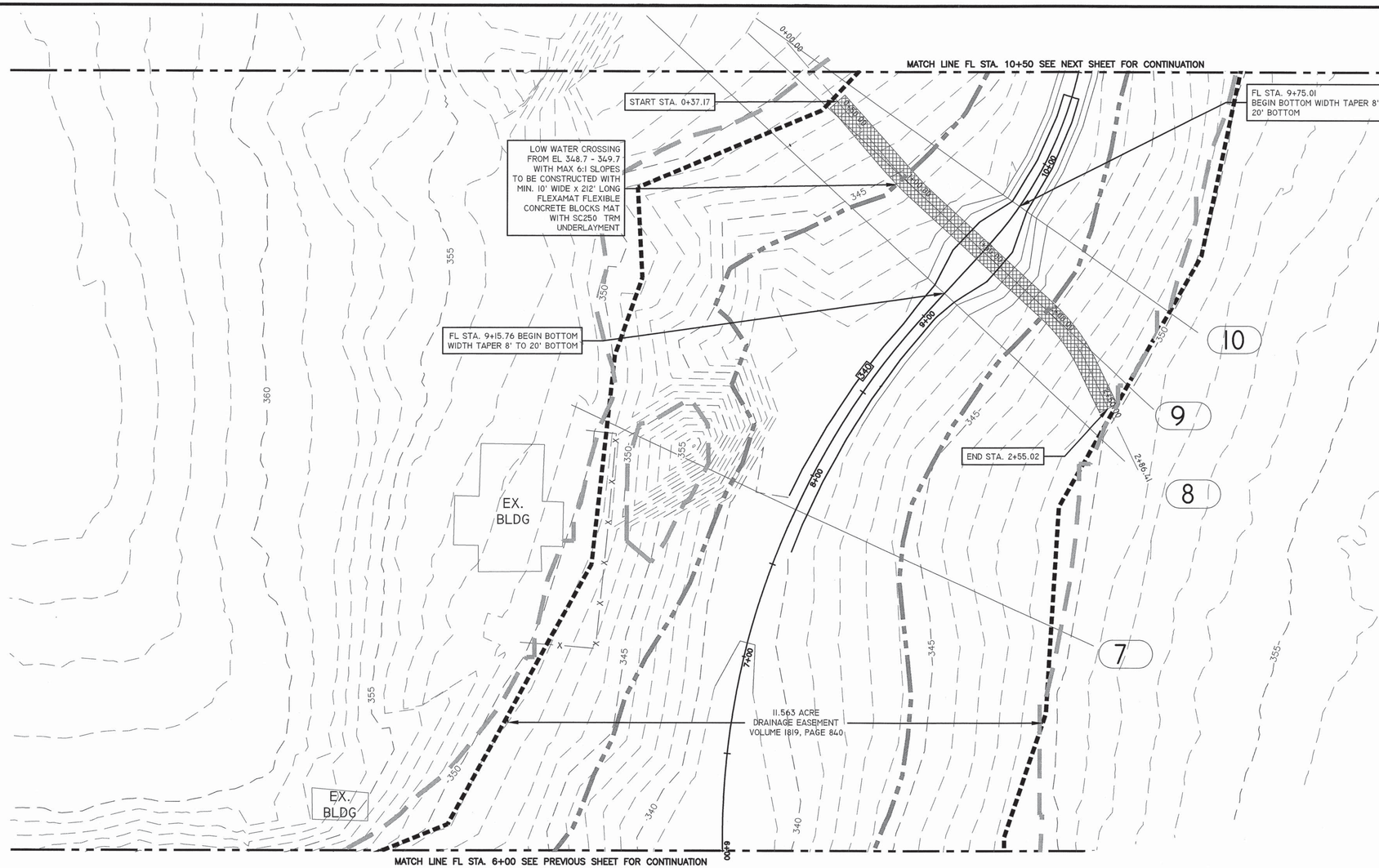


LEGEND

- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

0 30' 60'

SCALE: 1" = 30'

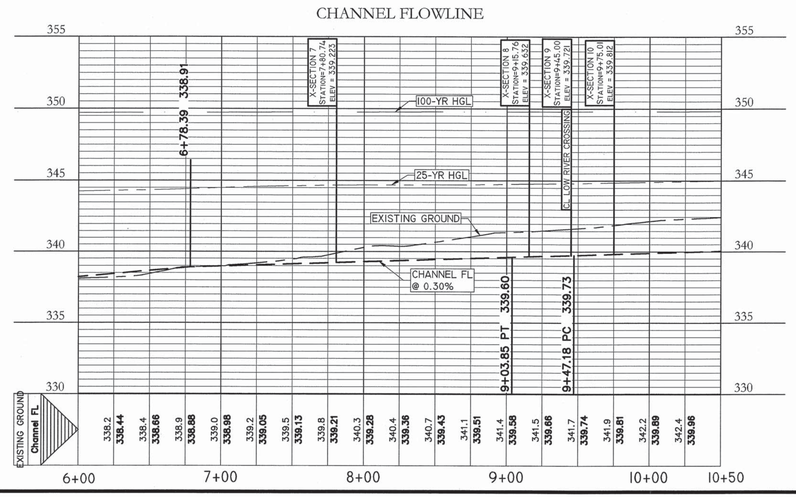
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	MAX POTENTIAL TW WITH COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf	ANTICIPATED TW WITH NON-COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf
9+75.01	10	25-YR	1151.75	0.026	344.75	4.94	9.18	0.004232	344.75	4.94	9.18	0.004232
		100-YR	1662.89	0.026	349.75	9.94	3.11	0.000166	346.54	6.73	6.94	0.001482
9+45.00	9	25-YR	1151.75	0.026	344.84	5.12	4.55	0.00111	344.84	5.12	4.55	0.00111
		100-YR	1662.89	0.026	349.76	10.04	2.16	0.000081	346.70	6.98	3.99	0.000497
9+15.76	8	25-YR	1151.75	0.026	344.35	4.72	7.99	0.002899	344.35	4.72	7.99	0.002899
		100-YR	1662.89	0.026	349.77	10.14	2.63	0.000106	346.63	7.00	5.43	0.000759
7+80.74	7	25-YR	1151.75	0.026	344.22	5.00	7.39	0.002116	344.22	5.00	7.39	0.002116
		100-YR	1662.89	0.026	349.74	10.52	2.89	0.000117	346.55	7.33	5.45	0.00068

NOTES:

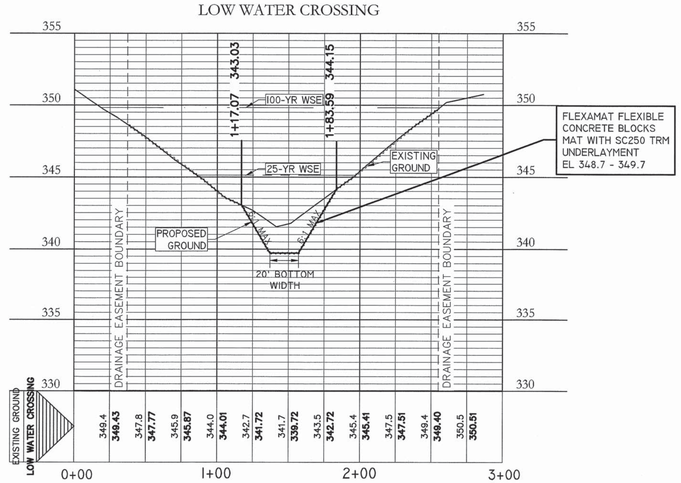
- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



LOW WATER CROSSING



STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
Brendan P McEntee
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

DATE

REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: CHANNEL - STA. 6+00 TO 10+50

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 9 OF 14

SHEET NO.: 9

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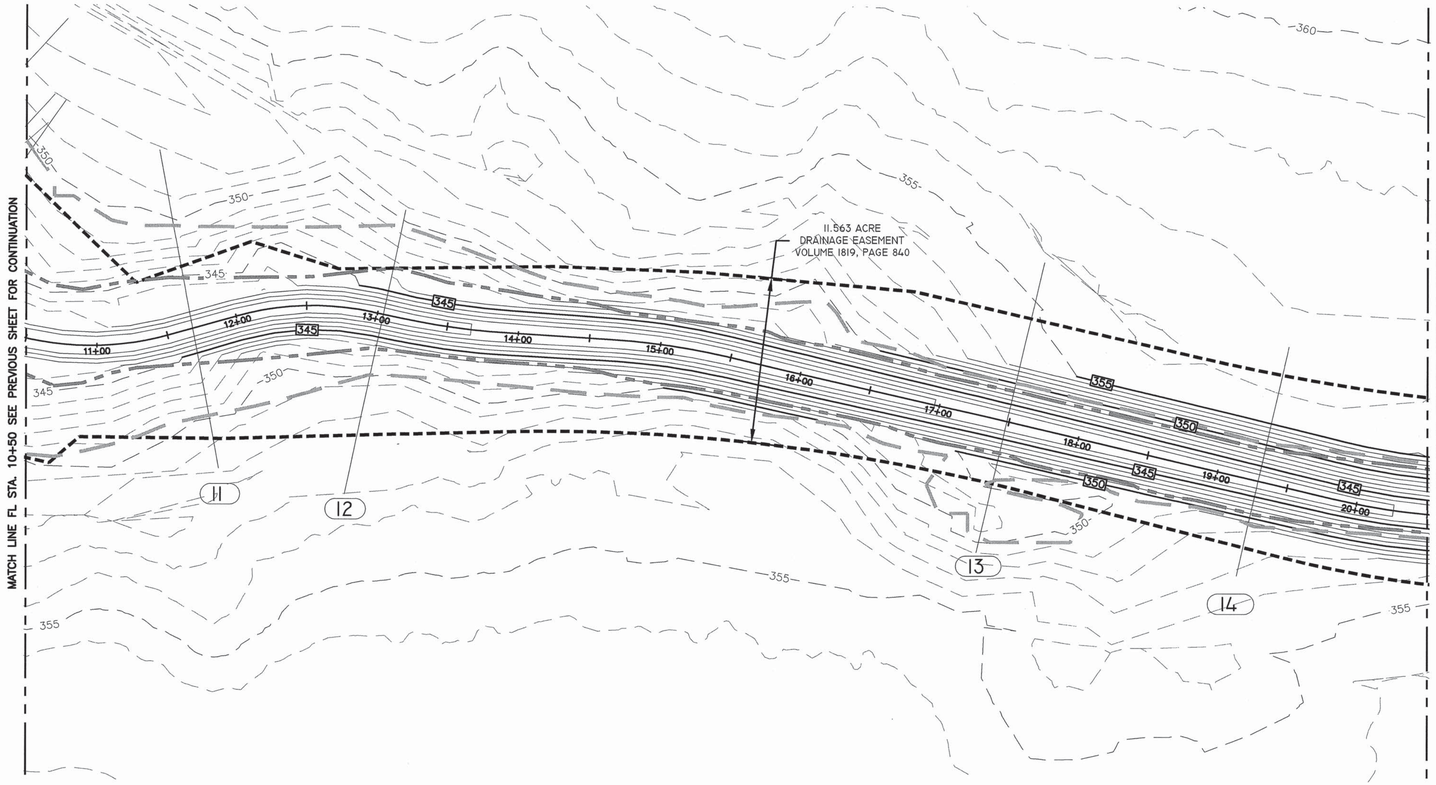


LEGEND

- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

0 50' 100'

SCALE: 1" = 50'

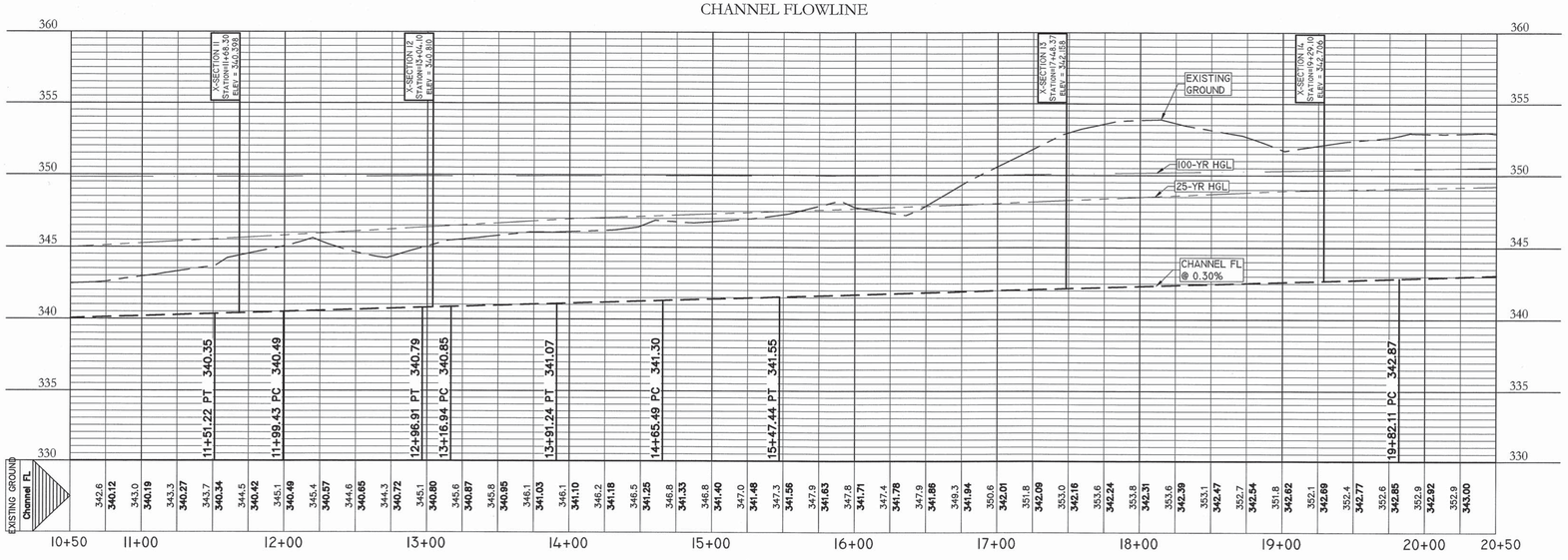
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	MAX POTENTIAL TW WITH COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf	ANTICIPATED TW WITH NON-COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf
19+29.1	14	25-YR	868.31	0.026	349.06	6.35	5.05	0.001429	349.06	6.35	5.05	0.001429
		100-YR	1234.19	0.026	350.55	7.84	4.99	0.001095	350.18	7.47	5.43	0.001371
17+48.37	13	25-YR	1151.75	0.026	348.21	6.05	7.26	0.003155	348.21	6.05	7.26	0.003155
		100-YR	1662.89	0.026	350.09	7.93	6.28	0.001586	349.23	7.07	7.96	0.003064
13+04.1	12	25-YR	1151.75	0.026	346.61	5.80	7.44	0.004251	346.61	5.80	7.44	0.004251
		100-YR	1662.89	0.026	349.70	8.89	4.78	0.000681	347.22	6.41	8.83	0.004786
11+68.3	11	25-YR	1151.75	0.026	345.46	5.06	9.46	0.005489	345.46	5.06	9.46	0.005489
		100-YR	1662.89	0.026	349.71	9.31	4.44	0.000416	346.47	6.07	9.83	0.004214

NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY: BM
DRAFTED BY: JW

DATE
REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ❖ Surveying
5501 West William Cannon Dr. ❖ Austin, Texas 78749
Phone No. (512) 280-5160 ❖ Fax No. (512) 280-5165

SHEET NAME: CHANNEL - STA.10+50 TO 20+50

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 10 OF 14

SHEET NO.: 10

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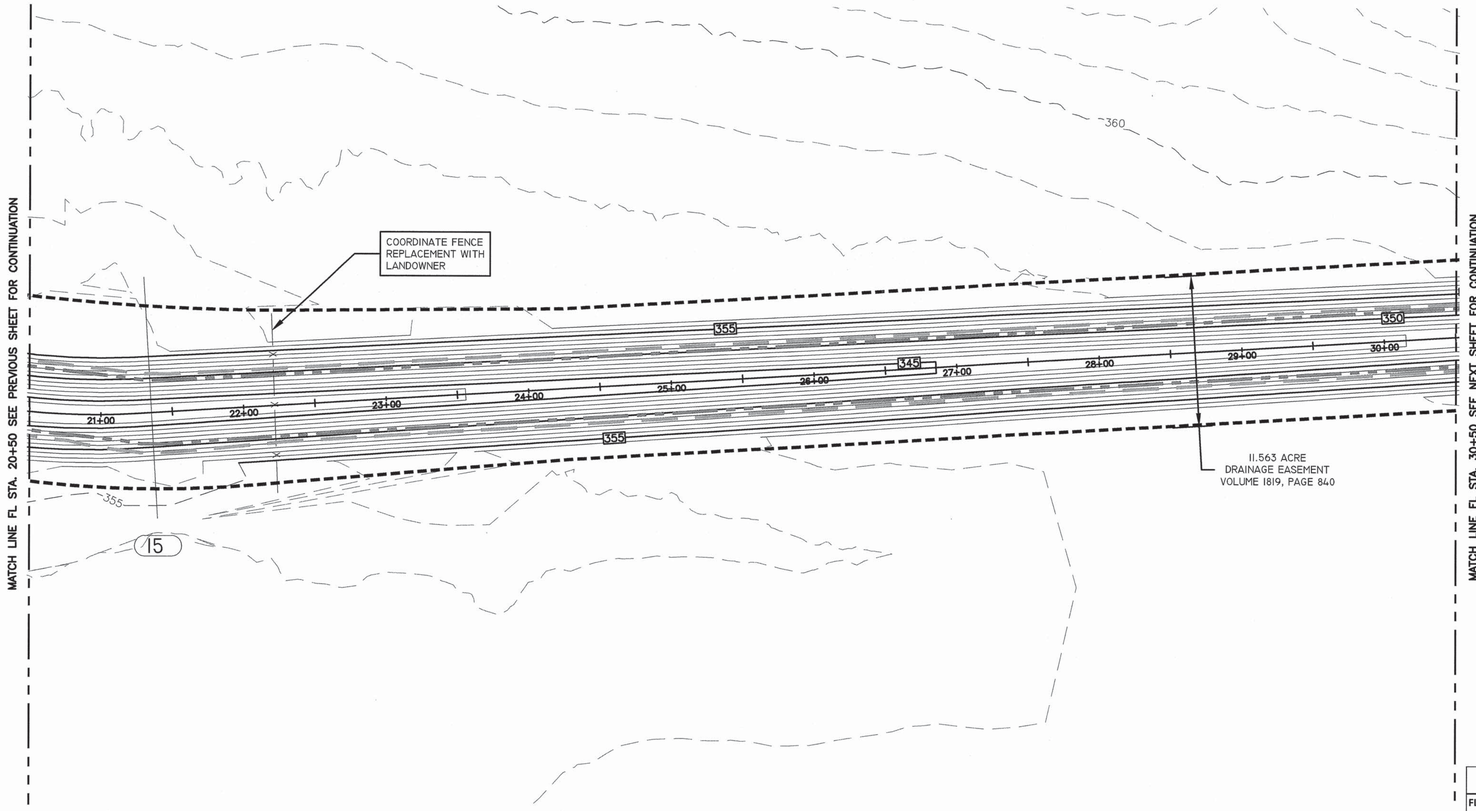


LEGEND

- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

0 50' 100'

SCALE: 1" = 50'

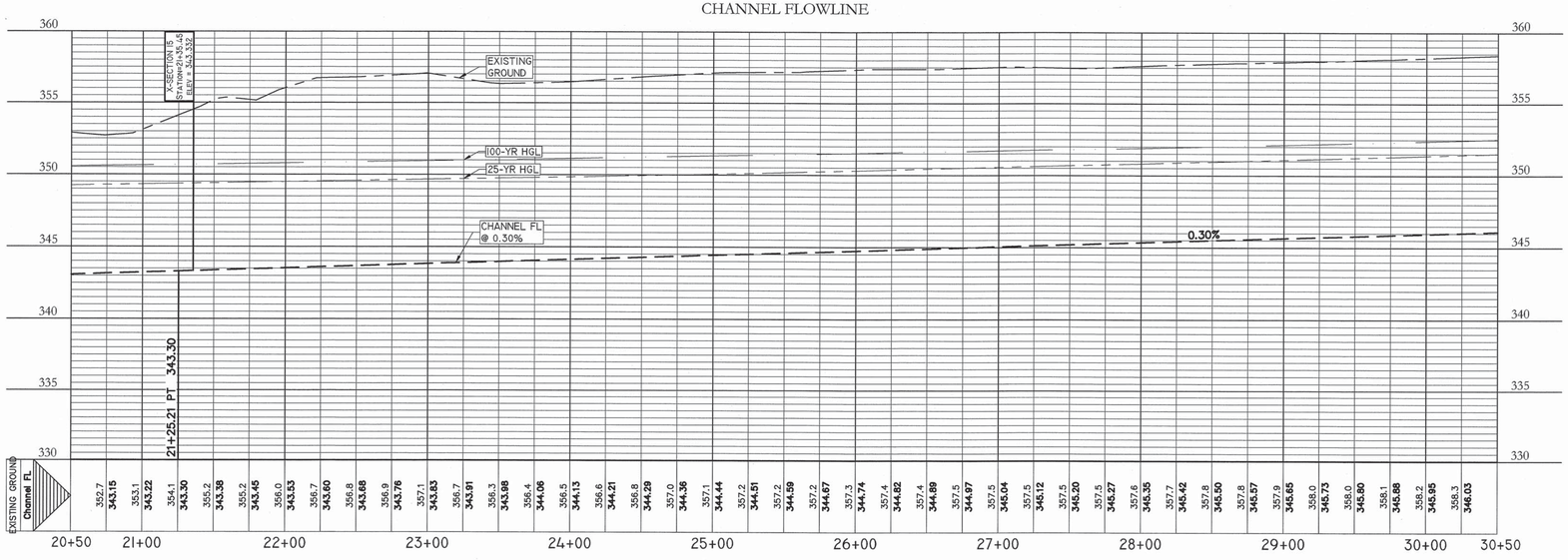
					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
21+35.45	15	25-YR	868.31	0.026	349.34	6.01	5.56	0.001849	349.34	6.01	5.56	0.001849
		100-YR	1234.19	0.026	350.75	7.42	5.5	0.001418	350.43	7.10	5.93	0.001734

NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



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STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY: BM | DRAFTED BY: JW

DATE

REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: CHANNEL - STA. 20+50 TO 30+50

JOB NAME: BASTROP GROVE

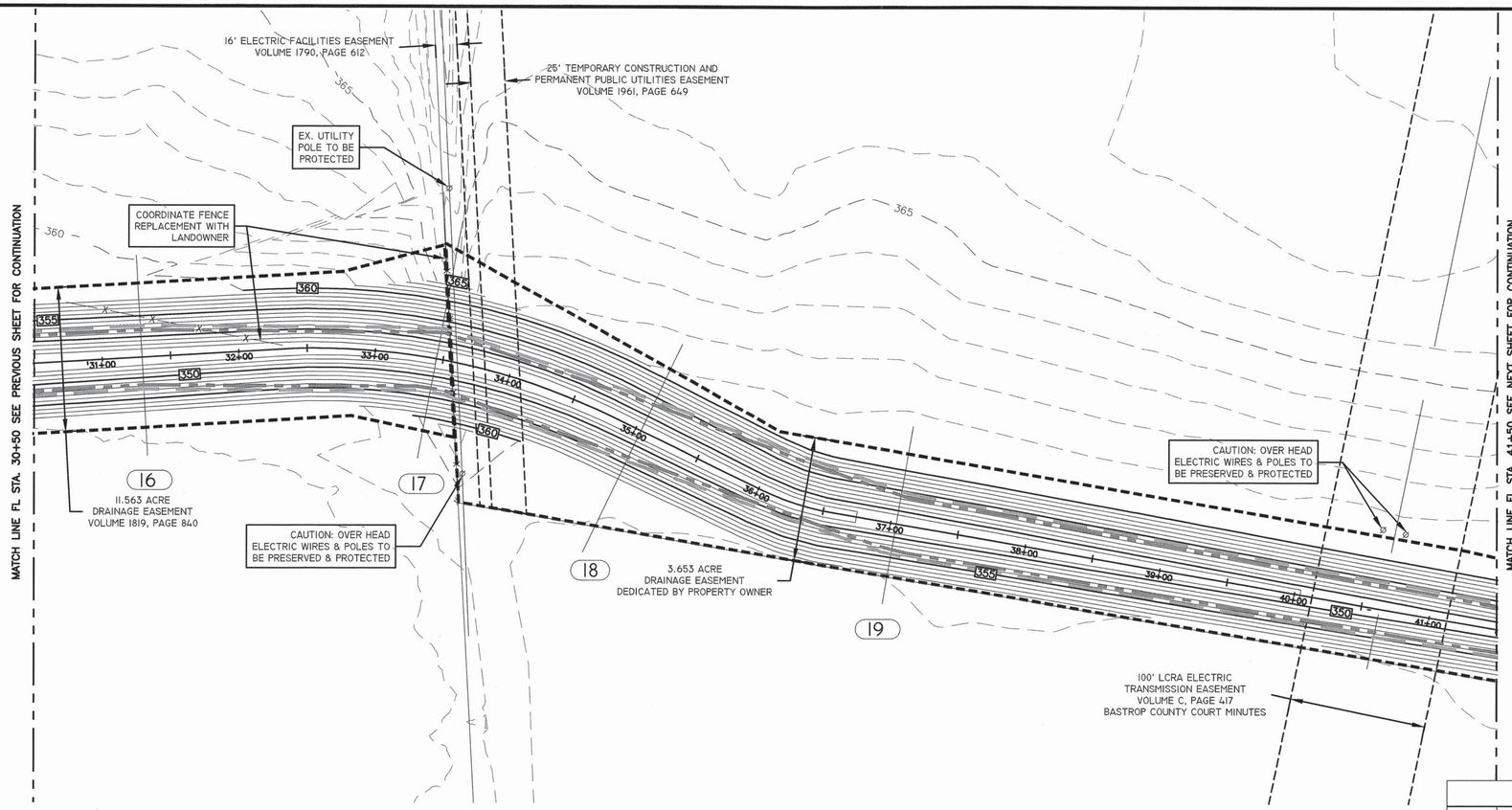
PROJECT: DRAINAGE IMPROVEMENTS

DATE APRIL 2018

JOB NUMBER 4697

SHEET 11 OF 14

SHEET NO. 11



LEGEND

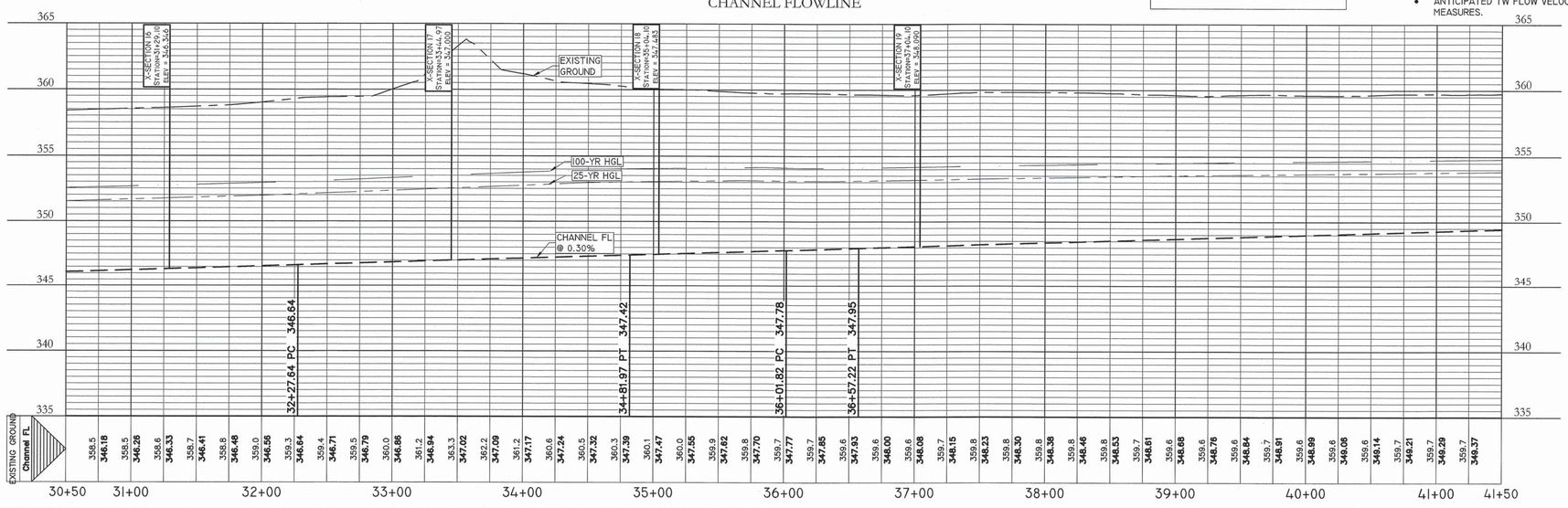
- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

0 50' 100'

SCALE: 1" = 50'

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
37+04.1	19	25-YR	414.96	0.026	353.33	5.24	3.34	0.000782	353.33	5.24	3.34	0.000782
		100-YR	587.02	0.026	354.36	6.27	3.49	0.000694	354.35	6.26	3.5	0.000698
35+04.1	18	25-YR	414.96	0.026	353.24	5.76	2.85	0.000513	353.24	5.76	2.85	0.000513
		100-YR	587.02	0.026	354.28	6.80	3.04	0.00048	354.27	6.79	3.05	0.000483
33+44.97	17	25-YR	868.31	0.026	352.39	5.39	6.66	0.003008	352.39	5.39	6.66	0.003008
		100-YR	1234.19	0.026	353.34	6.34	7.2	0.002937	353.32	6.32	7.24	0.002981
31+29.1	16	25-YR	868.31	0.026	351.75	5.40	6.65	0.002991	351.75	5.40	6.65	0.002991
		100-YR	1234.19	0.026	352.72	6.37	7.14	0.00285	352.68	6.33	7.22	0.002935

NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED
PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION / DATE

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ❖ Surveying
5501 West William Cannon Dr. ❖ Austin, Texas 78749
Phone No. (512) 280-5160 ❖ Fax No. (512) 280-5165

SHEET NAME: CHANNEL - STA. 30+50 TO 41+50

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 12 OF 14

SHEET NO.: 12

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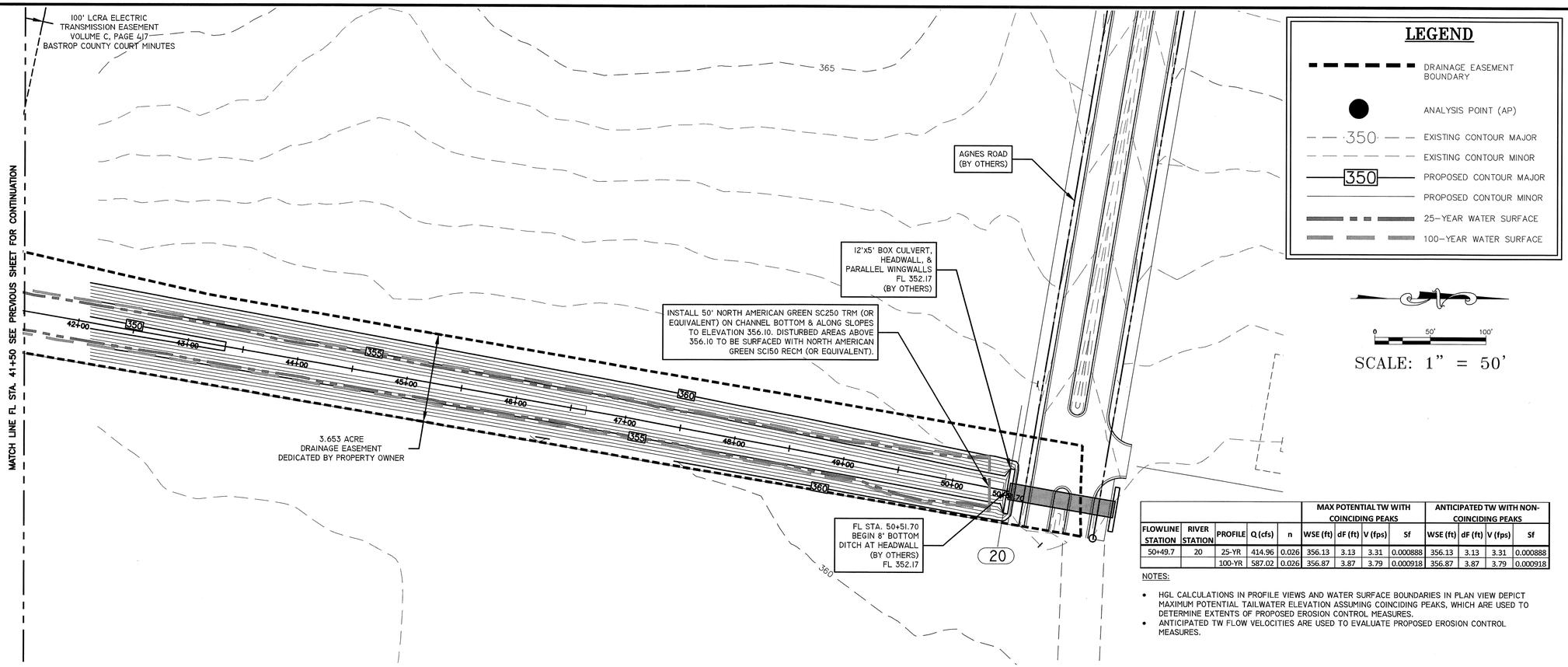


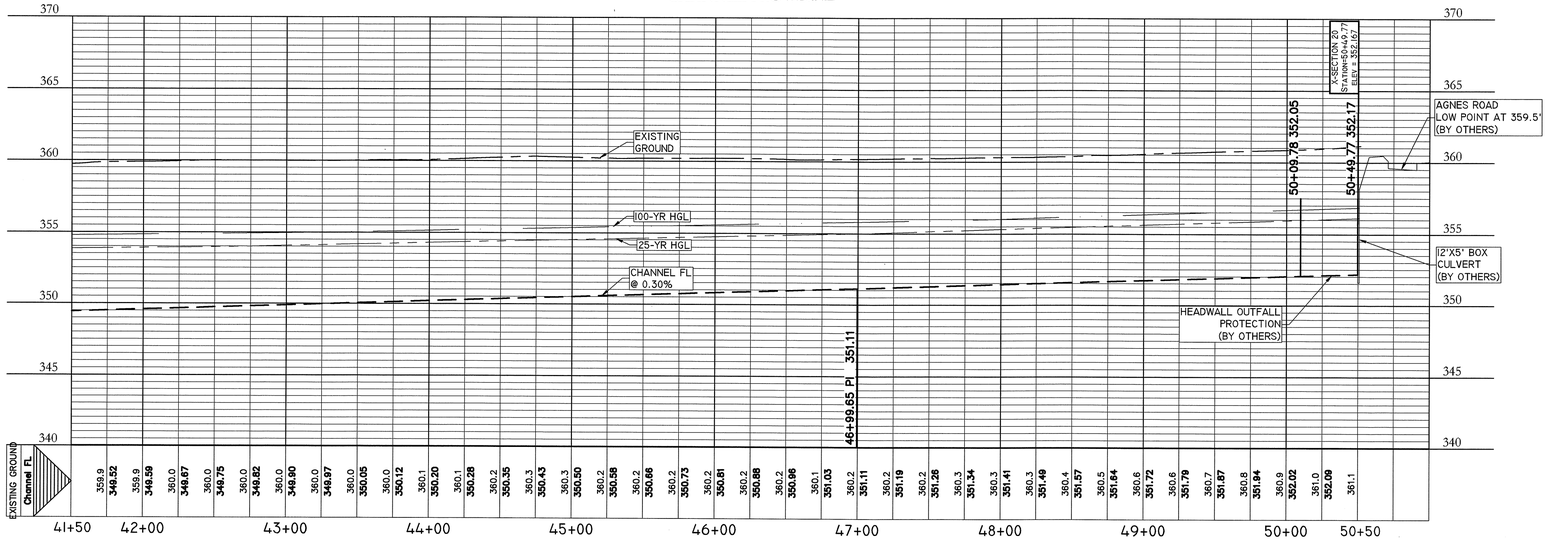
					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
50+49.7	20	25-YR	414.96	0.026	356.13	3.13	3.31	0.000888	356.13	3.13	3.31	0.000888
		100-YR	587.02	0.026	356.87	3.87	3.79	0.000918	356.87	3.87	3.79	0.000918

NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/28/2018

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION / DATE

SHEET NAME: CHANNEL - STA. 41+50 TO END

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 13 OF 14

SHEET NO.: 13

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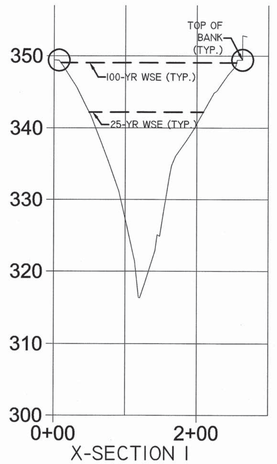

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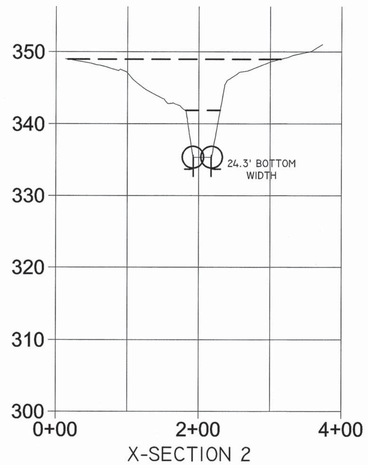

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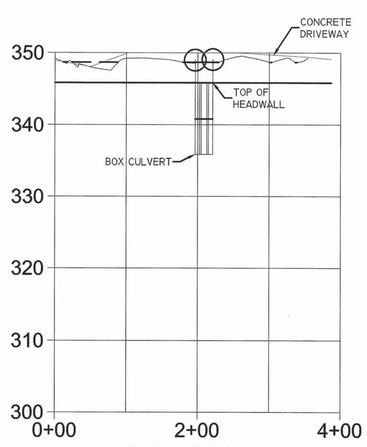

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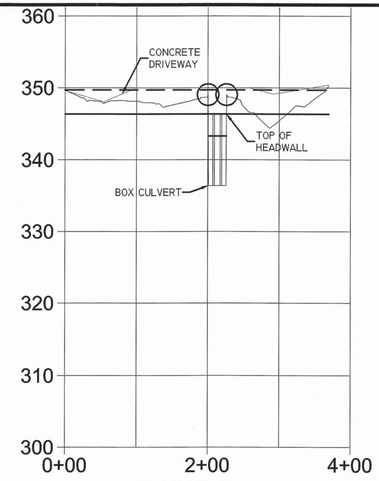

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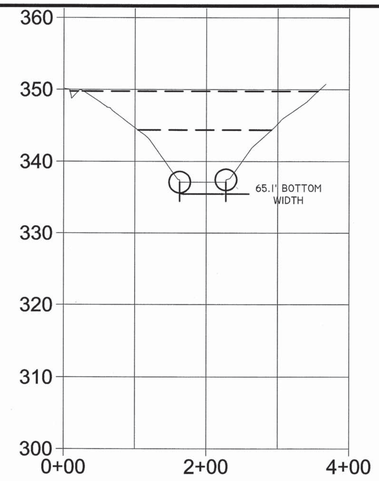

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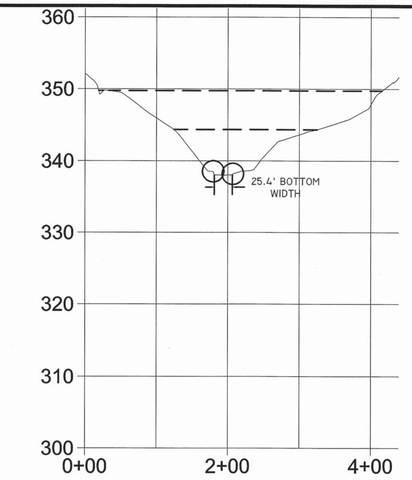

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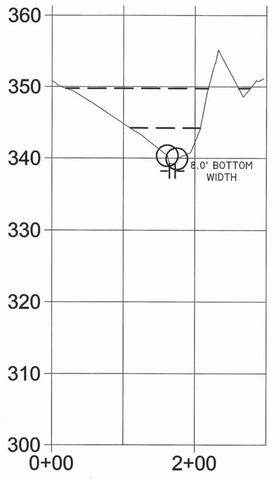

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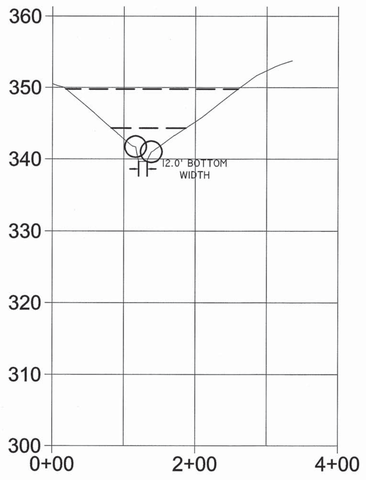

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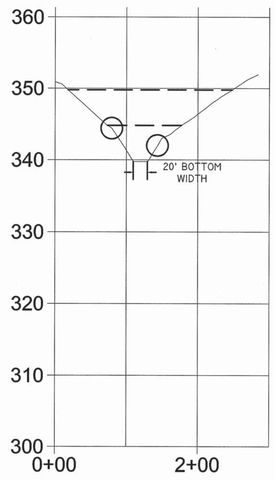

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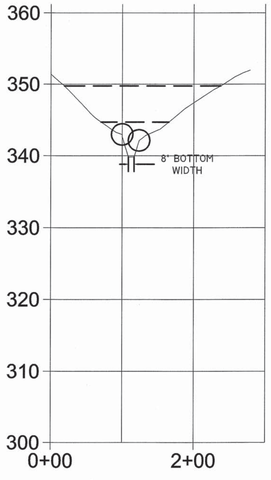

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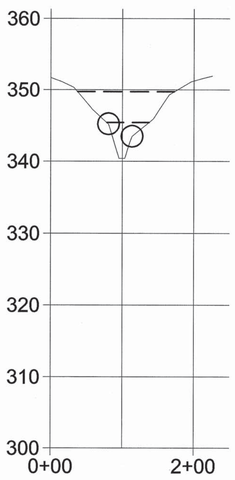

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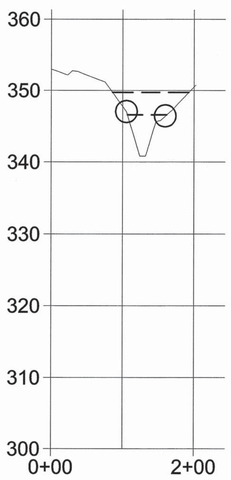

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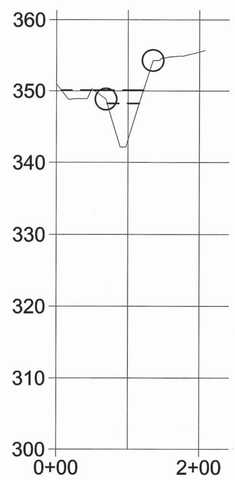

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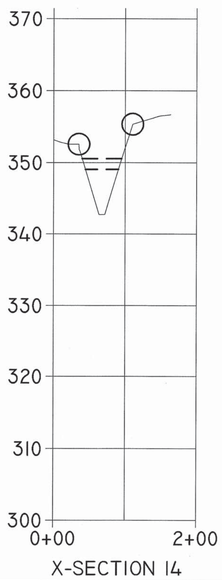

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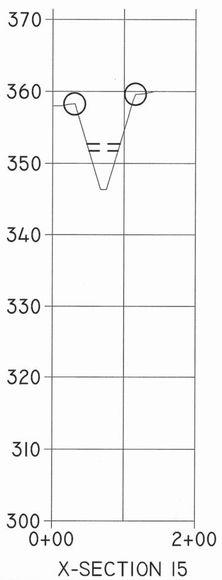

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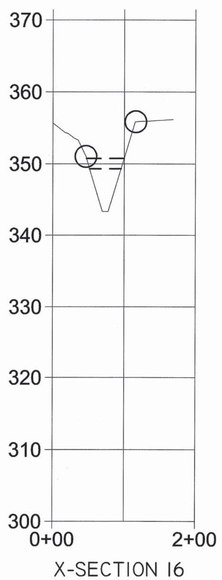

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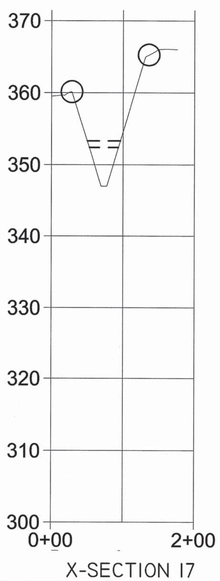

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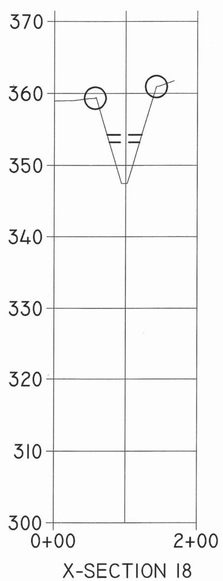

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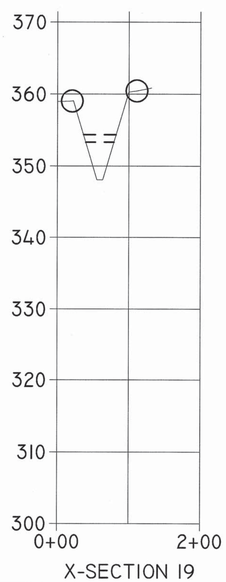

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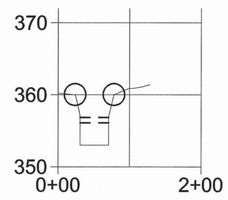

X-SECTION 20

PROFILE SCALE
HORIZ. 1" = 100'
VERT. 1" = 10'

LEGEND

- MAX POTENTIAL WSE ASSUMING COINCIDING PEAKS
- OVERBANK STATION
- PROPOSED DRIVEWAY

NOTES:

- OVERBANK STATIONS DESIGNATE THE BOUNDARY BETWEEN CHANNEL AND OVERBANK MANNING'S N VALUES ACCORDING TO THE FOLLOWING DESCRIPTIONS:
  MAIN CHANNEL - CLEAN, STRAIGHT, FULL, NO RIFTS OR DEEP POOLS = 0.026
  FLOOD PLAIN - PASTURE, NO BRUSH, SHORT GRASS = 0.035
  CONCRETE CHANNEL - TROWEL FINISH = 0.011
  (MANNING'S N VALUES ACCORDING TO HEC-RAS)
- CROSS-SECTIONS CREATED USING THE AUTODESK RIVER AND FLOOD ANALYSIS MODULE

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED
PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

DATE
REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: CHANNEL X-SECTIONS
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE APRIL 2018
JOB NUMBER 4697
SHEET 14 OF 14
SHEET NO. 14

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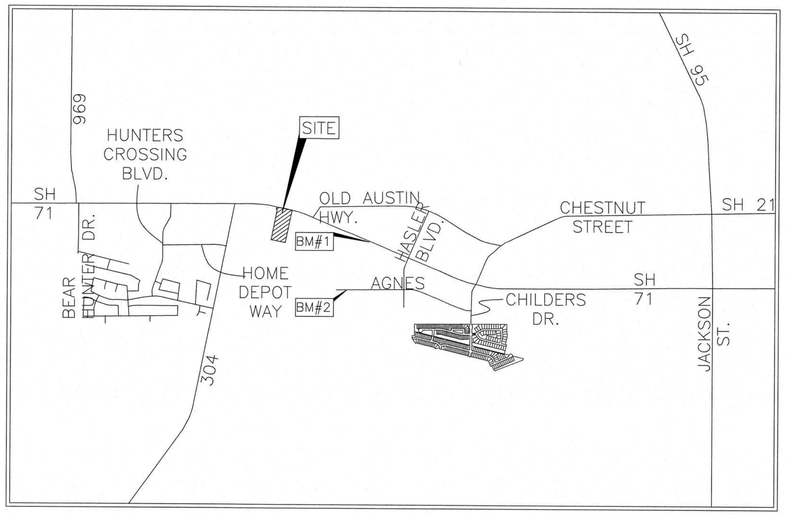
BASTROP GROVE MEDTAIL DEVELOPMENT

LOT 6 - BASTROP GROVE
CITY OF BASTROP
FINAL MASTER DRAINAGE PLAN SUBMITTAL
BASTROP COUNTY, TEXAS

SHEET INDEX

SHEET #	SHEET TITLE
01	COVER SHEET
02	HYDROLOGY SHEET
03	GRADING SHEET
04	STORM PROFILE
05	EROSION CONTROL
06	EROSION CONTROL DETAILS



LOCATION MAP
(NOT TO SCALE)

BENCHMARKS:

#1 TXDOT MON. BRASS DISC IN CONCRETE, 44' WEST OF THE NORTH-EASTERN PROPERTY CORNER.

#2 MAG NAIL IN PAVEMENT ON AGNES ST. 500' SOUTH OF THE PROPERTY BOUNDARY

GENERAL NOTES:

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF BASTROP MUST RELY UPON THE ADEQUACY OF THE DESIGN ENGINEER.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED WITH THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

THIS PROJECT IS LOCATED IN THE COLORADO RIVER WATERSHED.

NO PORTION OF THIS TRACT IS WITHIN THE BOUNDARIES OF THE 100-YEAR FLOOD PLAIN OF ANY WATERWAY THAT IS WITHIN THE LIMITS OF STUDY OF THE FEDERAL FLOOD INSURANCE ADMINISTRATION FIRM MAP NO. 48021C0335E, DATED JANUARY 19, 2006, BASTROP COUNTY, TEXAS. BASTROP COUNTY COMMUNITY NO. 481193.

REVIEWED BY:

CITY OF BASTROP ENGINEER — DATE

APPROVED BY:

CITY OF BASTROP PLANNING — DATE

DATE

OWNER: KPG COMMERCIAL–TYLER DUTTON
3809 S. 2ND STREET, D–200
AUSTIN, TEXAS 78704
512 437–6404

ENGINEER: CARLSON, BRIGANCE & DOERING, INC.
CIVIL ENGINEERING & SURVEYING
C/O MR. BRENDAN P. MCENTEE, P.E.
12129 RANCH ROAD 620 NORTH, SUITE 600
AUSTIN, TEXAS 78750
(512) 280–5160

UTILITY PROVIDERS:

ELECTRIC:	BLUEBONNET ELECTRIC (979) 542–3151
GAS:	CENTER POINT ENERGY (830) 643–6936
PHONE:	AT&T (512) 870–1450
WATER:	CITY OF BASTROP (512) 332–8830
WASTEWATER:	CITY OF BASTROP (512) 332–8830
CABLE:	SPECTRUM (855) 243–8892

NO.	DESCRIPTION	REVISE (R) ADD (A) VOID (V)	CITY OF BASTROP APPROVAL/DATE	APPROVED BY

811 Know what's below. Call before you dig.

BASTROPTX Heart of the Lost Pines Est. 1832

Final Drainage Plan Approved

11/22/19

DESIGNED BY: | DRAFTED BY:

DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
Fax No. (512) 280-5165

SHEET NAME: COVER
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
9/16/2019

DATE: 9/16/2019
JOB NUMBER: 5135
SHEET: 01 OF 6
SHEET NO.: 01

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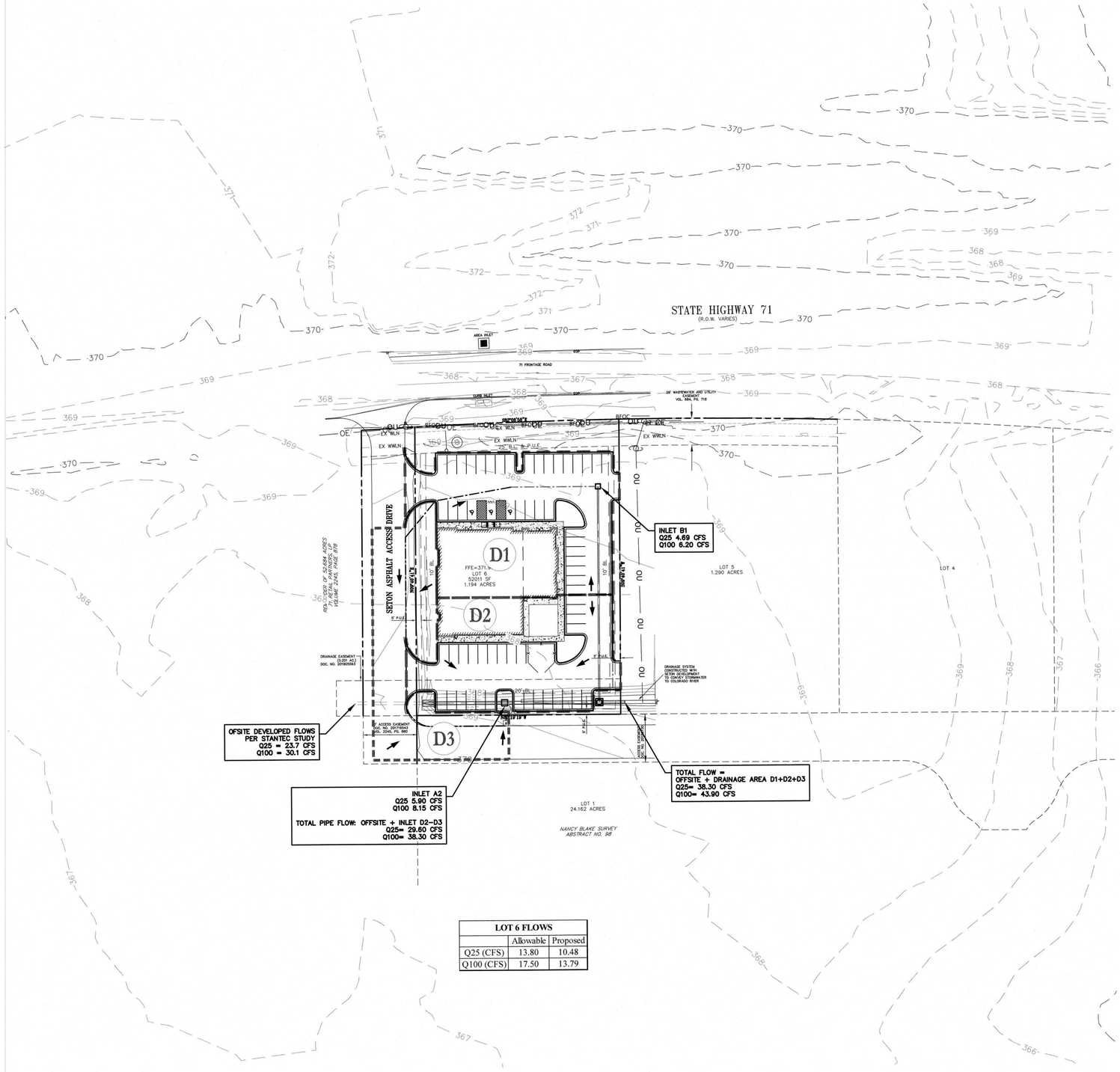

SCALE: 1" = 50'

LEGEND

- D3 — DRAINAGE AREA #
- DRAINAGE BNDY
- TIME OF CONCENTRATION SHALLOW FLOW
- TIME OF CONCENTRATION SHEET FLOW
- TIME OF CONCENTRATION CHANNEL FLOW
- FLOW ARROW

Rainfall Intensity, I = b/(T + d)^e

Design Year	b	d	e
2-yr	67	13.3	0.841
10-yr	87	11.1	0.805
25-yr	100	10.8	0.793
100-yr	130	11.3	0.784

Source: Table 2-3, City of Bastrop Drainage Design Manual

Surface Description	Design Year			
	2-year	10-year	25-year	100-year
Asphaltic	0.95	0.95	1	1
Concrete/Roof	0.95	0.95	1	1
Lawns:Sandy Soil				
Flat (0-2%)	0.1	0.11	0.12	0.125
Average (2-7%)	0.15	0.165	0.18	0.1875
Steep, (over 7%)	0.2	0.22	0.24	0.25
Commercial/Industrial				
Light areas	0.7	0.77	0.84	0.875
Heavy areas	0.8	0.88	0.96	1
Parks, cemeteries	0.25	0.275	0.3	0.3125

Source: City of Bastrop Stormwater Drainage Design Manual

Time of Concentration Computations		Existing	Developed		
			D1	D2	D3
Sheet flow [Tc1 = 0.007*(L1 * n1)^0.8 / (P2^0.5*s1^0.4)]	L1	100	100	43	44
	n1	0.2	0.011	0.011	0.011
	S1	0.010	0.011	0.012	0.012
	Time (min)	15.70	1.46	0.73	0.74
Shallow Flow: Unpaved [Tc3= L3 / (60(16.1345) * s3^0.5)] Paved [Tc3= L3 / (60(20.3282) * s3^0.5)	L2	87	79	209	0
	n2	0.2	0.011	0.011	0.2
	S2	0.015	0.011	0.013	0.011
	Paved/Unpaved	Unpaved	Paved	Paved	Paved
	Time (min)	0.74	0.61	1.50	0.00
Channel Flow	L3	151	0	0	264
	Assumed V	6	0	0	6
	S3	0.008	0	0	0.012
	Time (min)	0.42	0.00	0.00	0.73
Total Time of Concentration		**16.86**	**10.00**	**10.00**	**10.00**

Run-off Computation Summary

Design Storm	Area Desc.	Existing	Developed				
			D1	D2	D3	D2+D3	D1+D2+D3
	Drainage Area	1.194	0.534	0.422	0.358	0.780	1.315
2-year	Tc (min)	16.86	10.00	10.00	10.00	10.00	10.00
	Intensity (in/hr)	3.82	4.74	4.74	4.74	4.74	4.74
	C	0.10	0.93	0.65	0.89	0.76	0.84
	Q (cfs)	0.5	2.3	1.3	1.5	2.82	5.23
10-year	Tc (min)	16.9	10.0	10.0	10.0	10.00	10.00
	Intensity (in/hr)	5.96	7.47	7.47	7.47	7.47	7.47
	C	0.10	0.93	0.65	0.89	0.84	0.84
	Q (cfs)	0.7	3.7	2.1	2.4	4.89	8.24
25-year	Tc (min)	16.9	10.0	10.0	10.0	10.00	10.00
	Intensity (in/hr)	7.19	9.01	9.01	9.01	9.01	9.01
	C	0.11	0.97	0.69	0.93	0.84	0.88
	Q (cfs)	0.9	**4.69**	**2.63**	**3.02**	**5.90**	**10.48**
100-year	Tc (min)	16.9	10.0	10.0	10.0	10.00	10.00
	Intensity (in/hr)	9.49	11.82	11.82	11.82	11.82	11.82
	C	0.13	0.98	0.70	0.94	0.88	0.89
	Q (cfs)	1.4	6.2	3.5	4.0	8.15	13.79

LOT 6 FLOWS	Allowable	Proposed
Q25 (CFS)	13.80	10.48
Q100 (CFS)	17.50	13.79

BASTROPTX
Heart of the Lost Pines
Est. 1832

Final Drainage
Plan Approved

11/22/19

GRATE INLET CALCULATIONS

Orifice equation: $Q_i = Q_o = C_o A \sqrt{2gh}$ (Equation 10-31., TxDOT Hydraulic Design Manual)

Opening Area of the Grate, Ag = Area X Clogging Factor X Grate Factor

Orifice Coefficient, C = 0.67

g = 32.17 ft/s2

P-1-7/8-4 Grate Opening Ratio = 0.8 (Fig: 4-13 , Austin, TX Drainage Criteria Manual)

Inlet Name	Design Q_{25} (CFS)	Design Q_{100} (CFS)	Inlet Size	Clogging Factor	Grate Factor	A_g (sq. ft.)	Grate EL	h_{25}	$Head_{25}$	h_{100}	$Head_{100}$	Allowable h (ft)	Inlet Capacity, Qmax (CFS)
B1	4.69	6.16	3' x 3'	0.5	0.8	3.6	369.2	0.059	369.26	0.10	369.30	0.5	13.68
A2	5.90	8.15	4' x 4'	0.5	0.8	6.4	368.25	0.029	368.28	0.06	368.31	0.5	24.32

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
Fax No. (512) 280-5165

DESIGNED BY: | DRAFTED BY:

DATE | REVISION

SHEET NAME: HYDROLOGY SHEET

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/16/2019

DATE: 9/16/2019

JOB NUMBER: 5135

SHEET: 02 OF 6

SHEET NO.: 02

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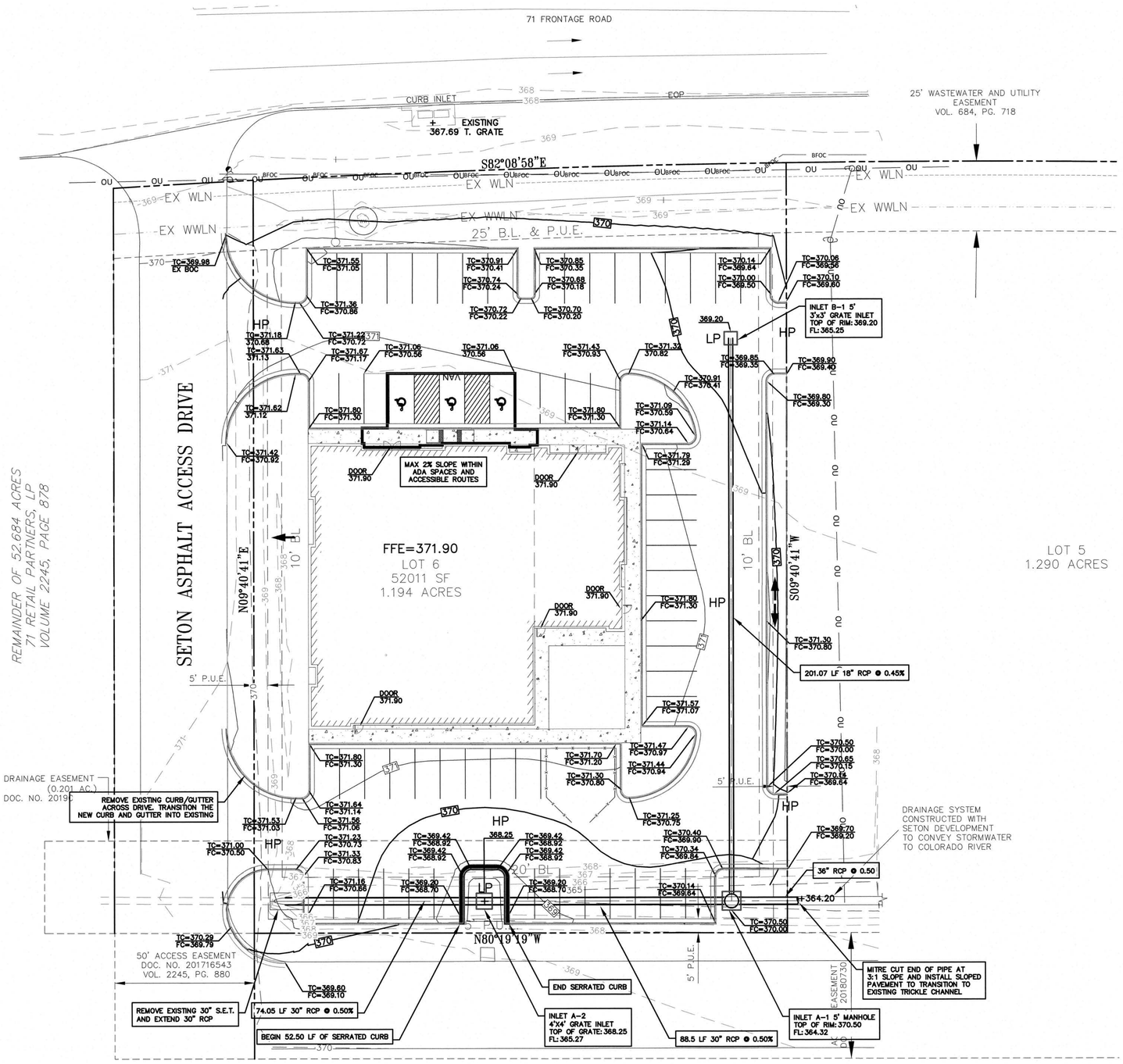

LEGEND

- 936 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 936 — PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- FLOW ARROW
- TC=XXX.XX / FC=XXX.XX — TOP OF CURB ELEVATION / FACE OF CURB ELEVATION
- PROPOSED GRATE INLET
- PROPOSED STORM MANHOLE
- HP — HIGH POINT
- LP — LOW POINT
- PROPOSED STORM SEWER
- PROPOSED 24" CURB & GUTTER

0 20' 40'

SCALE: 1" = 20'

BASTROPTX
Heart of the Lost Pines
Est. 1832

Final Drainage Plan Approved

11/22/19

GRADING NOTES:

1.) UNLESS OTHERWISE SPECIFIED, ALL FINISHED EARTHEN SLOPES ARE TO BE FINE GRADED TO PROVIDE A RELATIVELY UNIFORM SURFACE WITH NO ROCKS GREATER THAN 1-INCH IN DIAMETER, NO CLOGS OF SOIL GREATER THAN 1-INCHES IN DIAMETER, AND DEVIATIONS FROM AN OTHERWISE SMOOTH SURFACE GREATER THAN 4 INCHES IN HEIGHT OR DEPTH WITH NO AREAS OF STANDING WATER

2.) ALL FINISHED SLOPES OF A GRADE OF 3:1 OR GREATER ARE TO BE COVERED WITH A JUTE MAT, CURLEX MATTING, OR SIMILAR PRODUCT AFTER SEEDING WITH HYDROMULCH AND THE JUTE ANCHORED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

3.) ALL DRAINAGE COMPONETS ARE TO BE PRECAST CONCRETE. STORM DRAIN PIPE TO BE RCP OR RCPA, CLASS III, PER ASTM C76 AND INLETS TO BE ASTM C913 PER TxDOT STANDARDS WITH GALVANIZED GRATES. INLETS IN PAVED AREAS SHALL INCLUDE PEDESTRIAN GRATES.

4.) REFER TO LANDSCAPE PLAN FOR PLANTING, IRRIGATION, AND TOPSOIL REQUIREMENTS.

DESIGNED BY:	DRAFTED BY:

DATE / REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr. Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600 Austin, Texas 78750
Fax No. (512) 280-5165

SHEET NAME: GRADING SHEET

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/16/2019

DATE 9/16/2019

JOB NUMBER 5135

SHEET 03 OF 6

SHEET NO. 03

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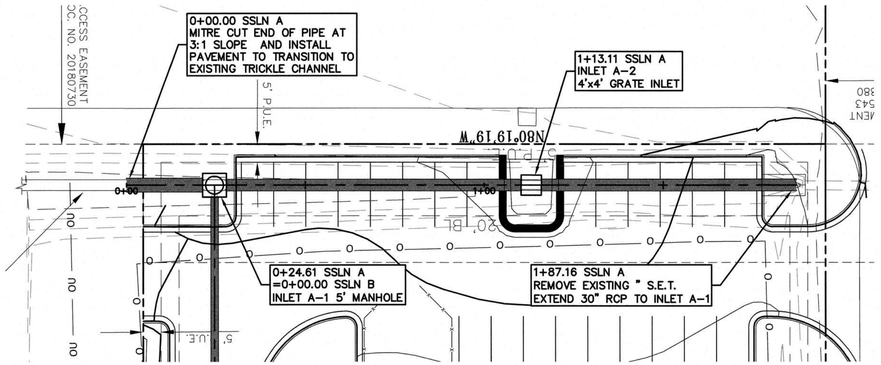

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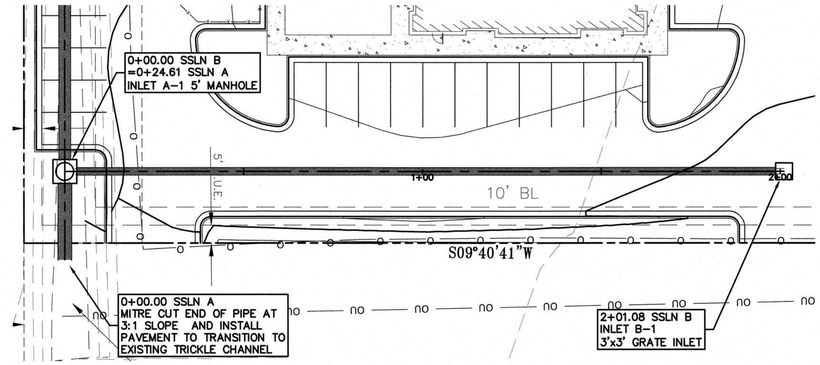
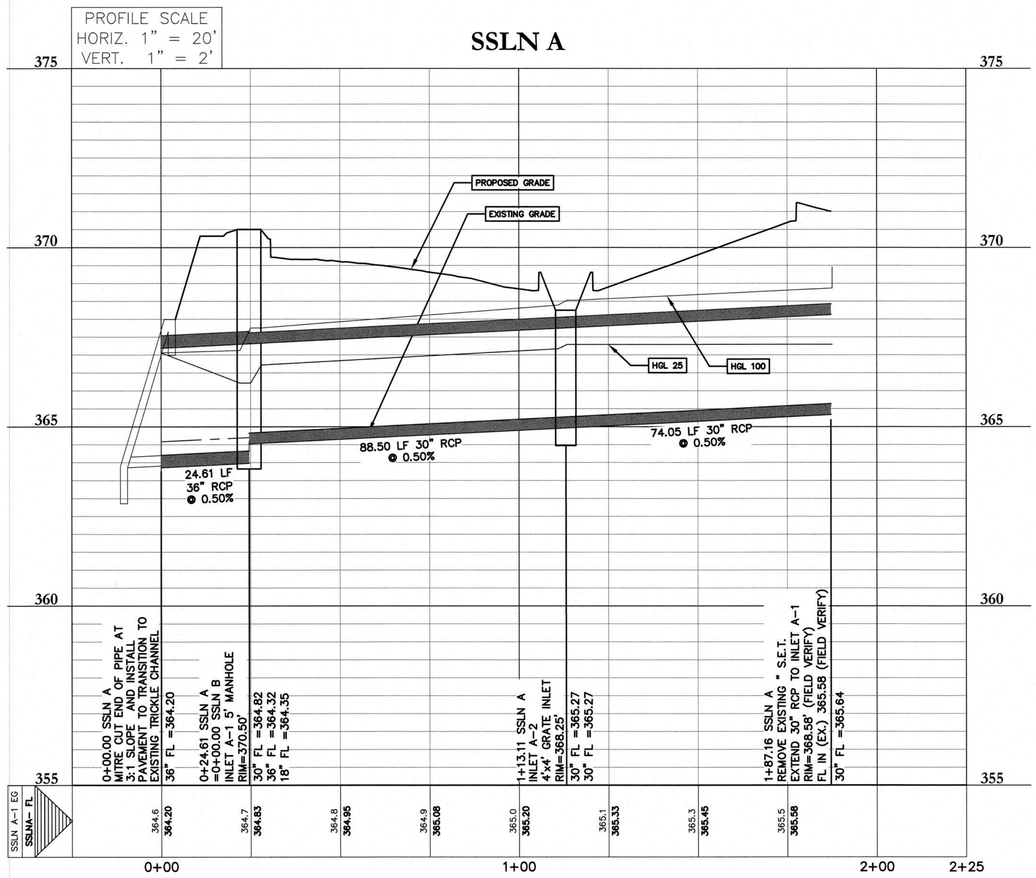


0 20' 40'

SCALE: 1" = 20'

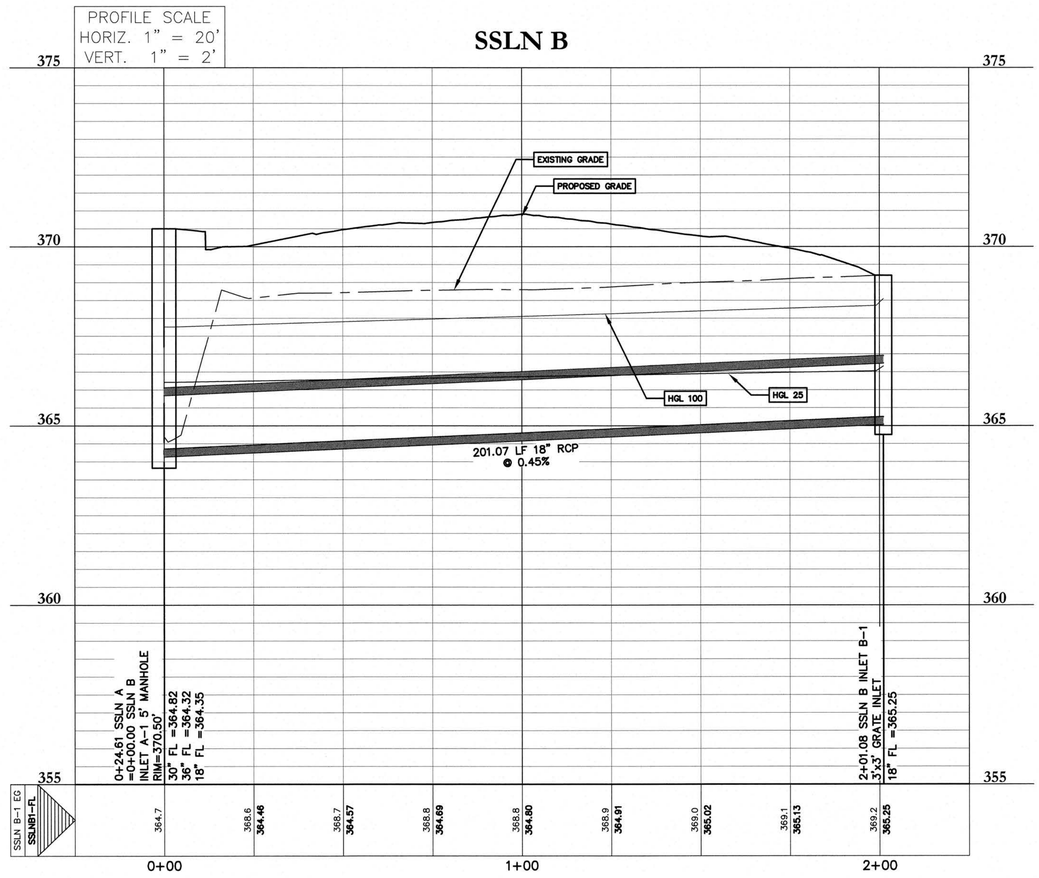
PROFILE SCALE
HORIZ. 1" = 20'
VERT. 1" = 2'

SSLN A



PROFILE SCALE
HORIZ. 1" = 20'
VERT. 1" = 2'

SSLN B



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DESIGNED BY:	DRAFTED BY:

DATE

REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
Phone No. (512) 280-5160
Fax No. (512) 280-5165

SHEET NAME: STORM SEWER PROFILE

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID F3791

09/16/2019

BASTROPTX
Heart of the Lost Pines
Est. 1832

Final Drainage
Plan Approved

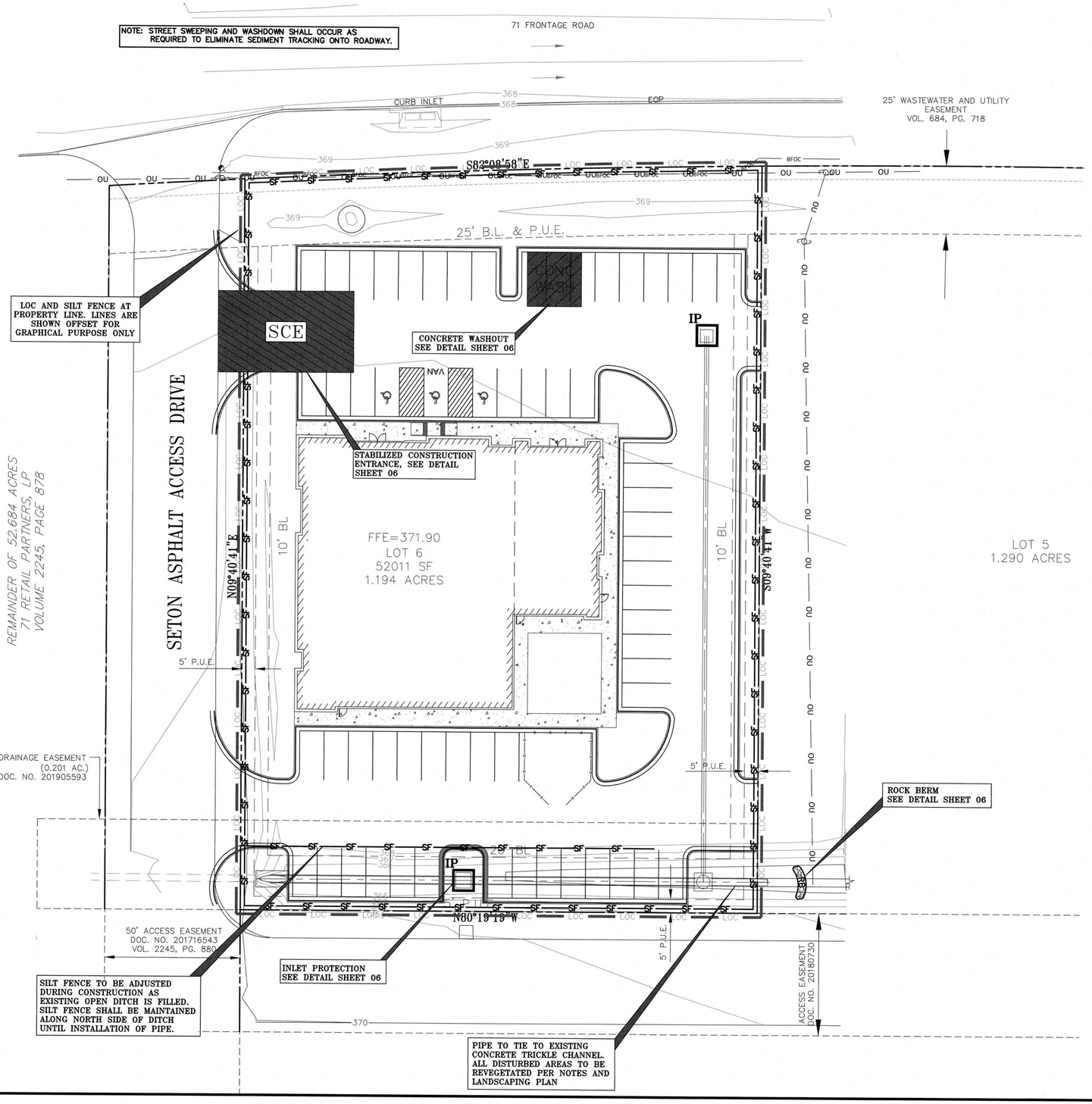
11/22/19

DATE 9/16/2019

JOB NUMBER 5135

SHEET 04 OF 6

SHEET NO. 04



0 20' 40'

SCALE: 1" = 20'

LEGEND

SF	SILT FENCE
LOC	LIMITS OF CONSTRUCTION
IP	INLET PROTECTION
RB	ROCK BERM
JH	J-HOOK
SCE	STABILIZED CONSTRUCTION ENTRANCE
CONC WASH	CONCRETE WASHOUT

WARNING!!!!
REVIEW THE SEQUENCE OF CONSTRUCTION ON THE GENERAL NOTES SHEET PRIOR TO BEGINNING CONSTRUCTION

!!! WARNING !!!:
UNDERGROUND UTILITIES SHOWN ON THESE PLANS IS A BEST ESTIMATE BASED ON RECORDS THAT COULD BE OBTAINED AND PHYSICAL FEATURES VISIBLE AT THE GROUND LEVEL. THE ENGINEER MAKES NO ASSERTIONS BEYOND THAT THEY ARE A BEST ESTIMATE AND AN ATTEMPT TO HELP IDENTIFY POSSIBLE UTILITIES IN THE AREA. THE CONTRACTOR MUST CALL ONE CALL IN ACCORDANCE WITH THE NOTES TO BETTER LOCATE ANY UNDERGROUND UTILITIES.

GENERAL EROSION CONTROL NOTES:

1) CONTRACTOR TO FIELD LOCATE DIVERSION, INTERCEPTOR, AND PERIMETER DIKES/DITCHES AS REQUIRED BASED ON THE DRAIN SEQUENCE OF CONSTRUCTION.
2) IF DISTURBED AREA IS NOT WORKED FOR MORE THAN 14 DAYS THEN DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TARP, OR MATTING.
3) THE ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON SITE TO KEEP PROJECT IN-COMPLIANCE WITH THE CITY OF BASTROP RULES AND REGULATIONS.
4) THE CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS WATERING WITH IRRIGATION TRUCKS AND MULCHING AS PER CITY REQUIREMENTS, OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
5) SILT FENCE TYPE AND INSTALLATION SHALL COMPLY WITH CITY OF BASTROP RULES AND REGULATIONS.
6) CONTRACTOR WILL CHECK AND IF NECESSARY CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
7) CONTRACTOR IS SOLEY RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION INCLUDING COMPLIANCE WITH SWPPP INSPECTION, REPORTING, NOI, AND NOT FILING. THE PLAN SHOWN IS THE MINIMUM REQUIRED AND THE CONTRACTOR SHALL MODIFY THE PLAN AS REQUIRED TO ELIMINATE SEDIMENT FROM LEAVING THE SITE.
8) ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITY ARE TO BE REVEGETATED IN ACCORDANCE WITH THIS SHEET AND THE LANDSCAPING PLAN. REFER TO SHEET 06 FOR EROSION CONTROL DETAILS AND ADDITIONAL NOTES REGARDING REVEGETATION.

BASTROPTX Heart of the Lost Pines Est. 1832

Final Drainage Plan Approved

11/22/19

DESIGNED BY:	DRAFTED BY:

REVISION	DATE

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FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749
North Office: 12129 RR 620 N. Ste. 600 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

SHEET NAME: EROSION CONTROL

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/16/2019

DATE	9/16/2019
JOB NUMBER	5135
SHEET	05 OF 6
SHEET NO.	05

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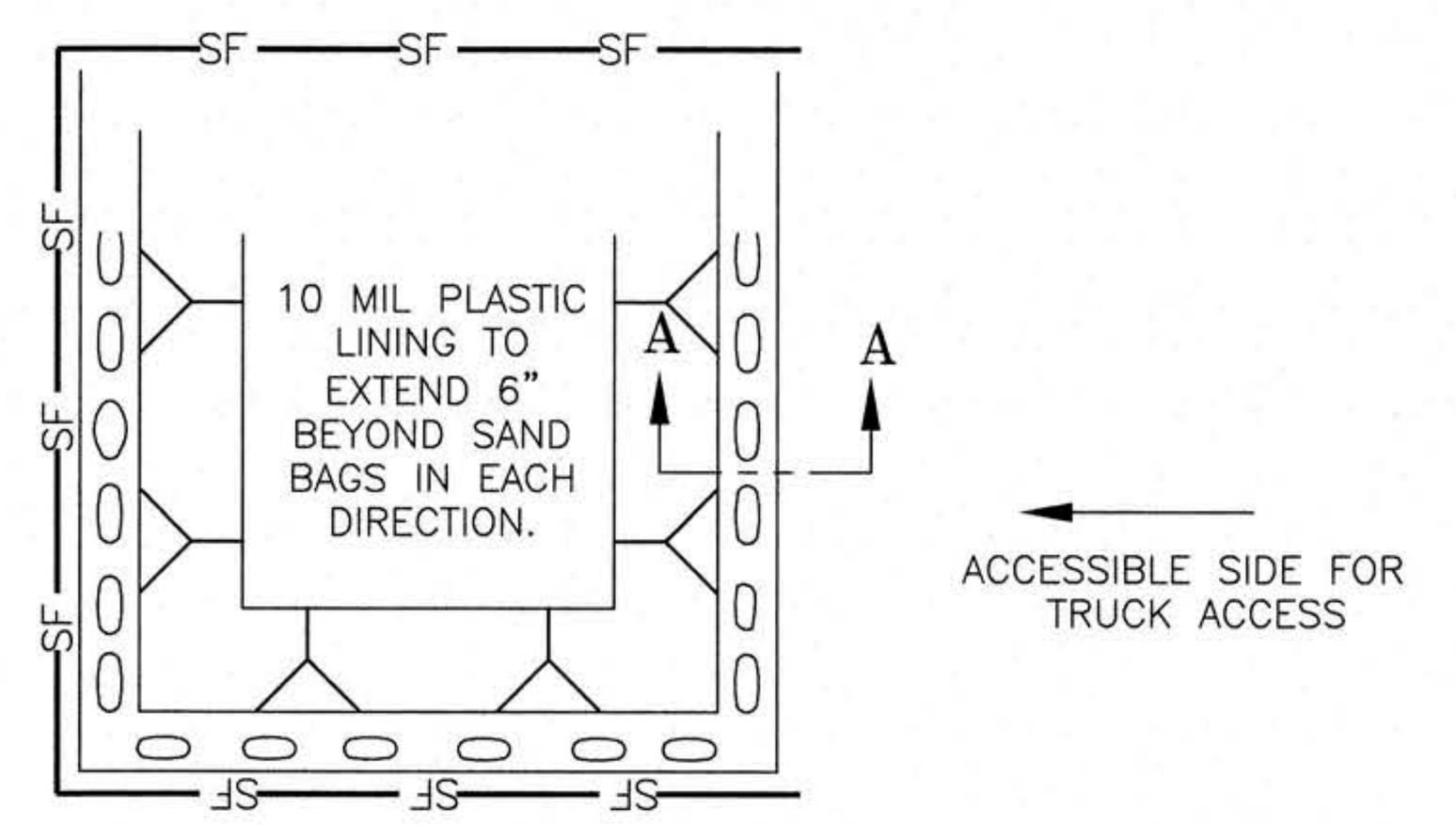


PLAN

CONCRETE WASHOUT AREA NOTES:

1. WASHOUT SHALL BE INSTALLED PRIOR TO PLACING ANY CONCRETE ON–SITE.

2. INSTALL DIRECTIONAL SIGNS AS NECESSARY TO INDICATE WASHOUT LOCATION TO CONCRETE SUPPLY VEHICLES.

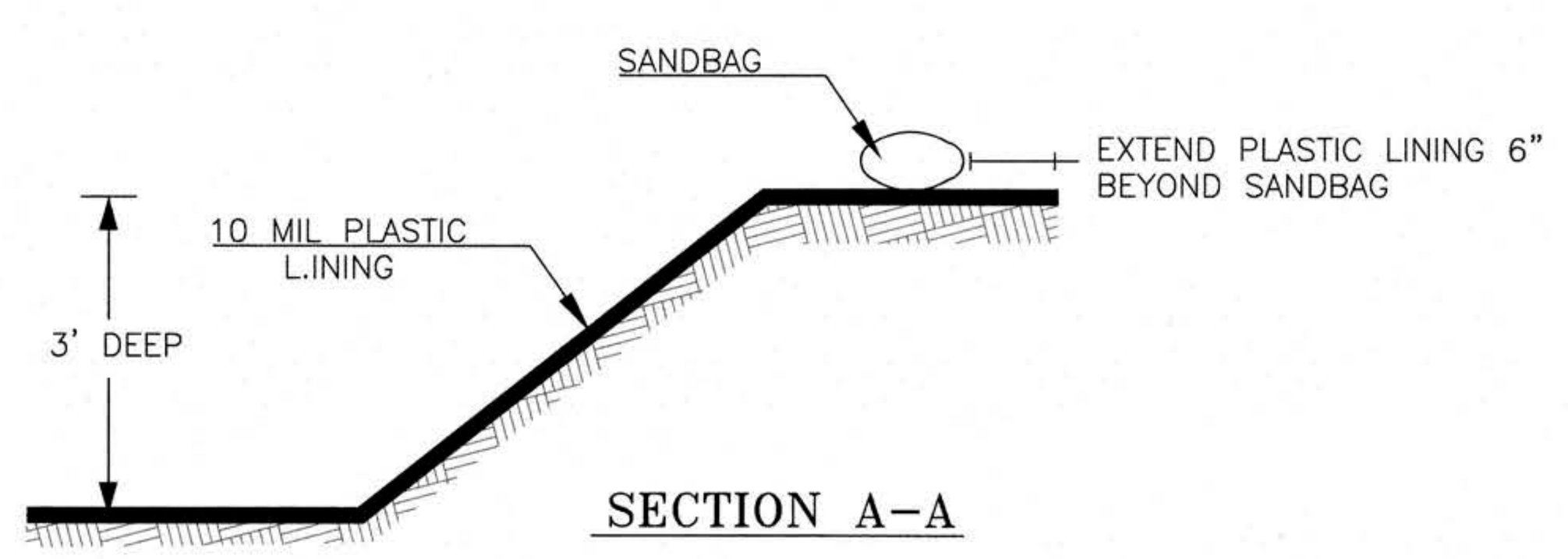
3. WASHOUT SHALL BE INSPECTED WEEKLY AND AFTER RAIN EVENTS IN ACCORDANCE WITH SWPPP.

4. CONTRACTOR TO MAINTAIN, REPAIR, ENLARGE OR RELOCATE WASHOUT AS NECESSARY TO MEET PROJECT REQUIREMENTS.

5. WHEN NECESSARY DURING CONSTRUCTION, OR AT THE COMPLETION OF ALL CONSTRUCTION, CONCRETE SHALL BE REMOVED AND LAWFULLY DISPOSED OF AND THE WASHOUT AREA FILLED WITH COMPACTED SELECT FILL.

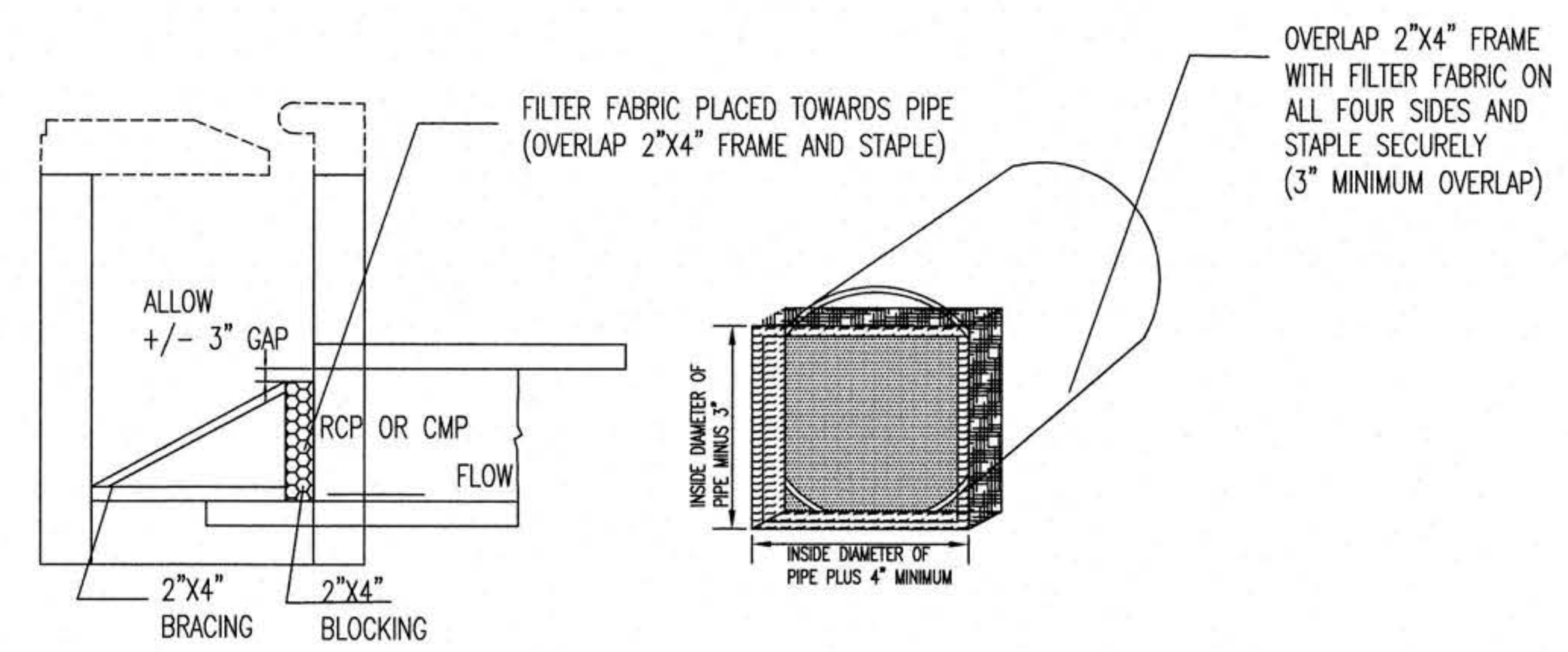
6. CONCRETE WASHOUT SHALL NOT BE LOCATED WITHIN 50' OF STORM INLET, DITCH, OR SUBSURFACE DRAINAGE SYSTEM.

NOTE: SIZE VARIES BASED ON ANTICIPATED VOLUME OF CONCRETE TO BE PLACED. MINIMUM SIZE 8'X8' BOTTOM.



SECTION A–A

CONCRETE WASHOUT DETAIL
N.T.S



NOTES:
"STORM INLET SEDIMENT TRAPS" SHALL BE PLACED IN ALL PROPOSED AND EXISTING CURB INLETS AND DROP INLETS AS DIRECTED BY THE CITY OF BASTROP.

THE LATERAL BRACING SHALL BE PLACED IN A MANNER AS TO ADEQUATELY SECURE THE FILTER FRAME TO THE SIDE OF THE INLET, INSURING THE PROPER FUNCTION OF THE SEDIMENT TRAP

FILTER FABRIC MAY BE IDENTICAL TO THAT SPECIFIED A "TEMPORARY SEDIMENT CONTROL FENCE"
OTHER MATERIAL MAY BE USED UPON APPROVAL OF THE CITY OF CEDAR PARK'S PROJECT REPRESENTATIVE.

THE "STORM INLET SEDIMENT TRAP" SHALL BE INSTALLED IN EXISTING INLETS BEFORE CONSTRUCTION BEGINS AND UPON COMPLETION OF THE INLET WALLS IN PROPOSED INLETS OR AS DIRECTED BY THE CITY REPRESENTATIVE.

THE CONTRACTOR WILL BE REQUIRED TO PERFORM PERIODIC MAINTENANCE OF THE SEDIMENT TRAP AND REMOVE ACCUMULATED SILT AS DIRECTED BY THE CITY OF BASTROP.

ALL WOOD SHALL BE PRESSURE TREATED

SEDIMENT TRAPS TO BE REMOVED AFTER PAVING IS COMPLETE

STORM INLET SEDIMENT TRAP (TYPE 1) DETAILS
(TxDOT–AUSTIN DISTRICT)

EROSION AND SEDIMENTATION CONTROL:

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND FENCING FOR AREAS OUTSIDE OF THE CONSTRUCTION AREA PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).

2. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS, AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.

3. PRIOR TO FINAL ACCEPTANCE, HAUL ROADS AND WATERWAY CROSSINGS CONSTRUCTED FOR TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED, ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND REVEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSED OF IN APPROVED SPOIL DISPOSAL SITES.

4. ANY METHODS, STREET MARKINGS AND SIGNAGE NECESSARY FOR WARNING MOTORISTS, WARNING PEDESTRIANS OR DIVERTING TRAFFIC DURING CONSTRUCTION SHALL CONFORM TO THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITION.

5. ALL PAVEMENT MARKINGS, MARKERS, PAINT, TRAFFIC BUTTONS, TRAFFIC CONTROLS AND SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS. STREETS, BRIDGES, AND THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITIONS.

6. EROSION CONTROL MEASURES, SITE WORK AND RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE CITY OF BASTROP CODE OF ORDINANCES.

7. ALL SLOPES SHALL BE SODDED OR SEEDED WITH APPROVED GRASS, GRASS MIXTURES OR GROUND COVER SUITABLE TO THE AREA AND SEASON IN WHICH THEY WERE APPLIED.

8. SILT FENCES, ROCK BERMS, SEDIMENTATION BASINS AND SIMILARLY RECOGNIZED TECHNIQUES AND MATERIALS SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT POINT SOURCE SEDIMENTATION LOADING OF DOWNSTREAM FACILITIES. SUCH INSTALLATION SHALL BE REGULARLY INSPECTED BY THE CITY OF BASTROP FOR EFFECTIVENESS. ADDITIONAL MEASURES MAY BE REQUIRED IF, IN THE OPINION OF THE CITY ENGINEER, THEY ARE WARRANTED.

9. ALL TEMPORARY EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL FINAL INSPECTION AND APPROVAL OF THE PROJECT BY THE CITY INSPECTOR. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL TEMPORARY EROSION CONTROL STRUCTURES AND TO REMOVE EACH STRUCTURE AS APPROVED BY THE CITY INSPECTOR.

10. ALL MUD, DIRT, ROCKS, DEBRIS, ETC., SPILLED, TRACKED OR OTHERWISE DEPOSITED ON EXISTING PAVED STREETS. DRIVES AND AREAS USED BY THE PUBLIC SHALL BE CLEANED UP IMMEDIATELY.

11. PERMANENT EROSION CONTROL: ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW:

   A. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL SHALL BE PLACED IN ALL DRAINAGE CHANNELS (EXCEPT ROCK), AND BETWEEN THE CURB AND RIGHT–OF–WAY.

   B. THE SEEDING FOR PERMANENT EROSION CONTROL SHALL BE APPLIED OVER AREAS DISTURBED BY CONSTRUCTION AS FOLLOWS:

   BROADCAST SEEDING:

   (I) FROM OCTOBER TO FEBRUARY, SEEDING SHALL BE WITH ONE (1) POUND PER 1,000 SQUARE FEET OF UNHULLED BERMUDA OR THREE (3) POUNDS PER

   (II) FROM MARCH TO SEPTEMBER, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF ONE (1) POUND PER 1,000 SQUARE FEET, WITH A PURITY OF 95% WITH 85% GERMINATION.

   FERTILIZER SHALL BE SLOW RELEASE GRANULAR OR PALETTE TYPE, AND SHALL HAVE AN ANALYSIS OF 15–15–15, AND SHALL BE APPLIED AT THE RATE OF ONE (1) POUND PER 1,000 SQUARE FEET, ONCE AT THE TIME OF PLANTING, AND AGAIN ONCE DURING THE TIME OF ESTABLISHMENT.

   MULCH TYPE USED SHALL BE STRAW OR HAY APPLIED AT A RATE OF 45 POUNDS PER 1,000 SQUARE FEET.

   HYDRAULIC SEEDING:

   (I) FROM OCTOBER TO FEBRUARY, SEEDING SHALL BE WITH ONE (1) POUND PER 1,000 SQUARE FEET OF UNHULLED BERMUDA, OR THREE (3) POUNDS PER 1,000 SQUARE FEET OF WINTER RYE, WITH A PURITY OF 95% WITH 90 % GERMINATION.

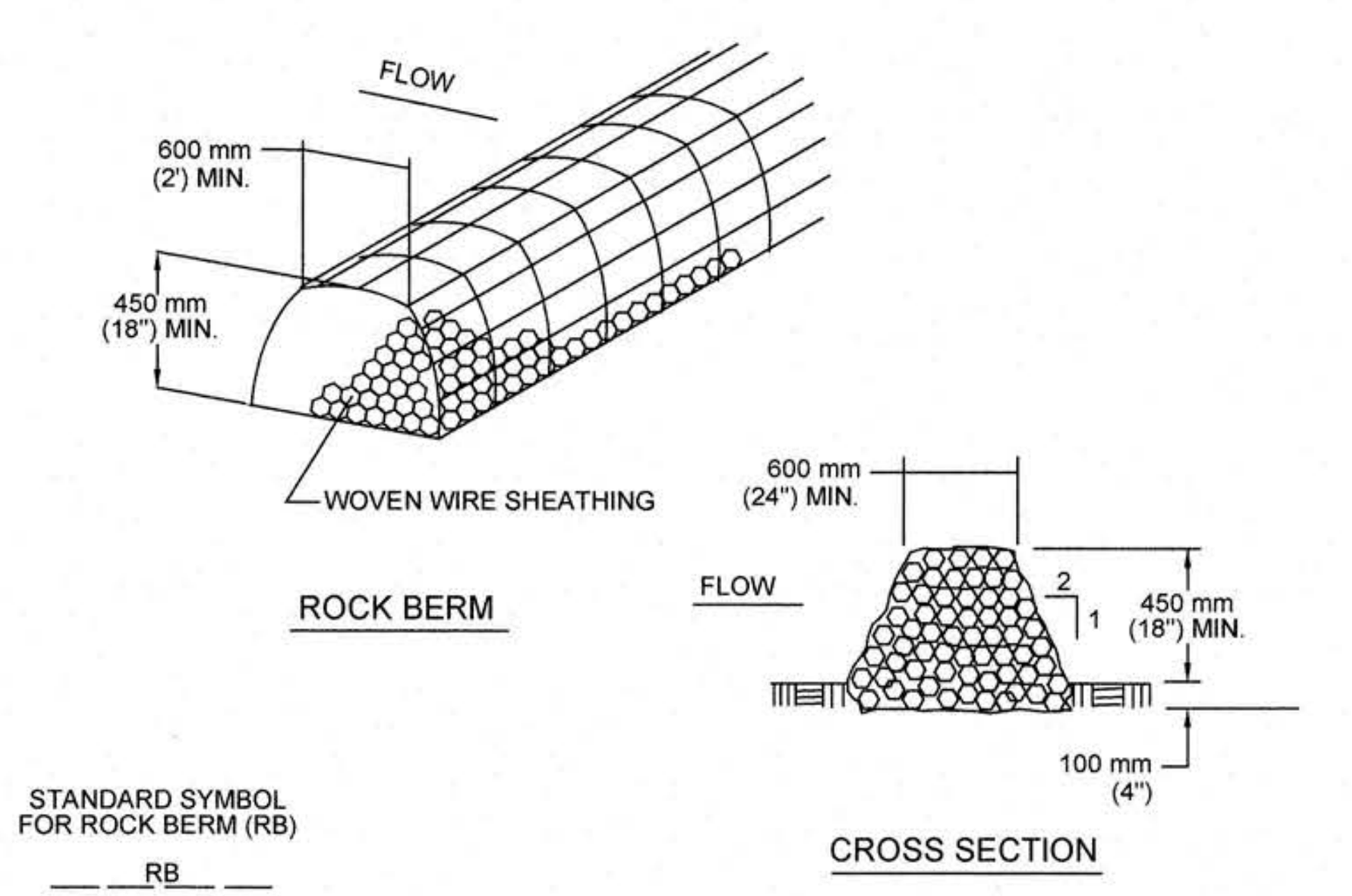
   (II) FROM MARCH TO SEPTEMBER, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF ONE (1) POUND PER 1,000 SQUARE FEET WITH A PURITY OF 95% WITH 95% GERMINATION.

   FERTILIZER SHALL BE A WATER SOLUBLE FERTILIZER WITH AN ANALYSIS OF 15–15–15 AT A RATE OF 1.5 POUNDS PER 1,000 SQUARE FEET.

   MULCH TYPE SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1,000 SQUARE FEET, WITH A SOIL TACKIFIER AT A RATE OF 1.4 POUNDS PER 1,000 SQUARE FEET.

   C. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK TO A DEPTH OF SIX (6) INCHES. THE IRRIGATION SHALL OCCUR AT 10–DAY INTERVALS DURING THE FIRST TWO (2) MONTHS. RAINFALL OCCURRENCES OF 1/2 INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR TEN (10) DAYS.

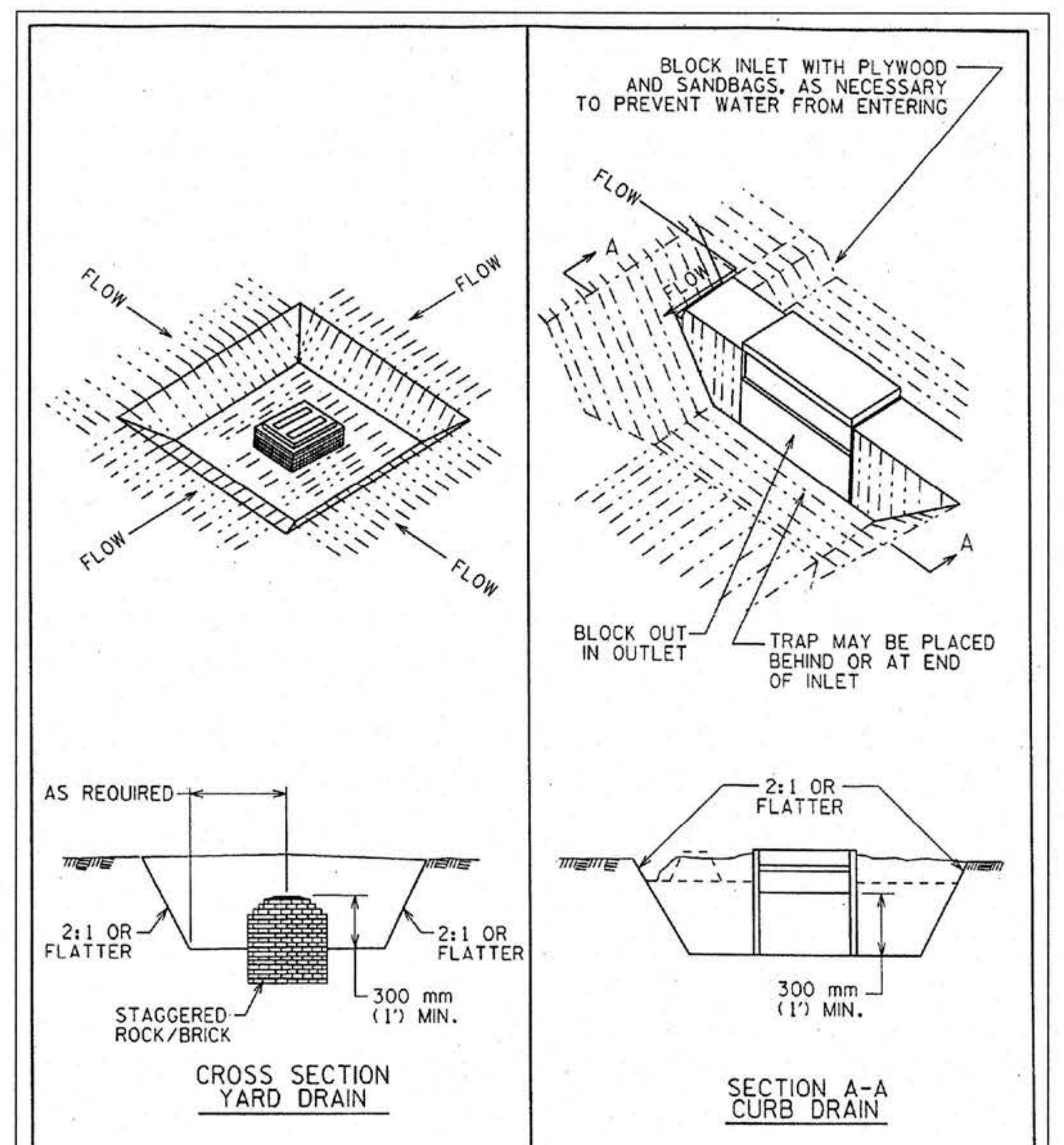
   D. RESTORATION SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 INCH I 85% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 20 SQUARE FEET EXIST.



NOTES:

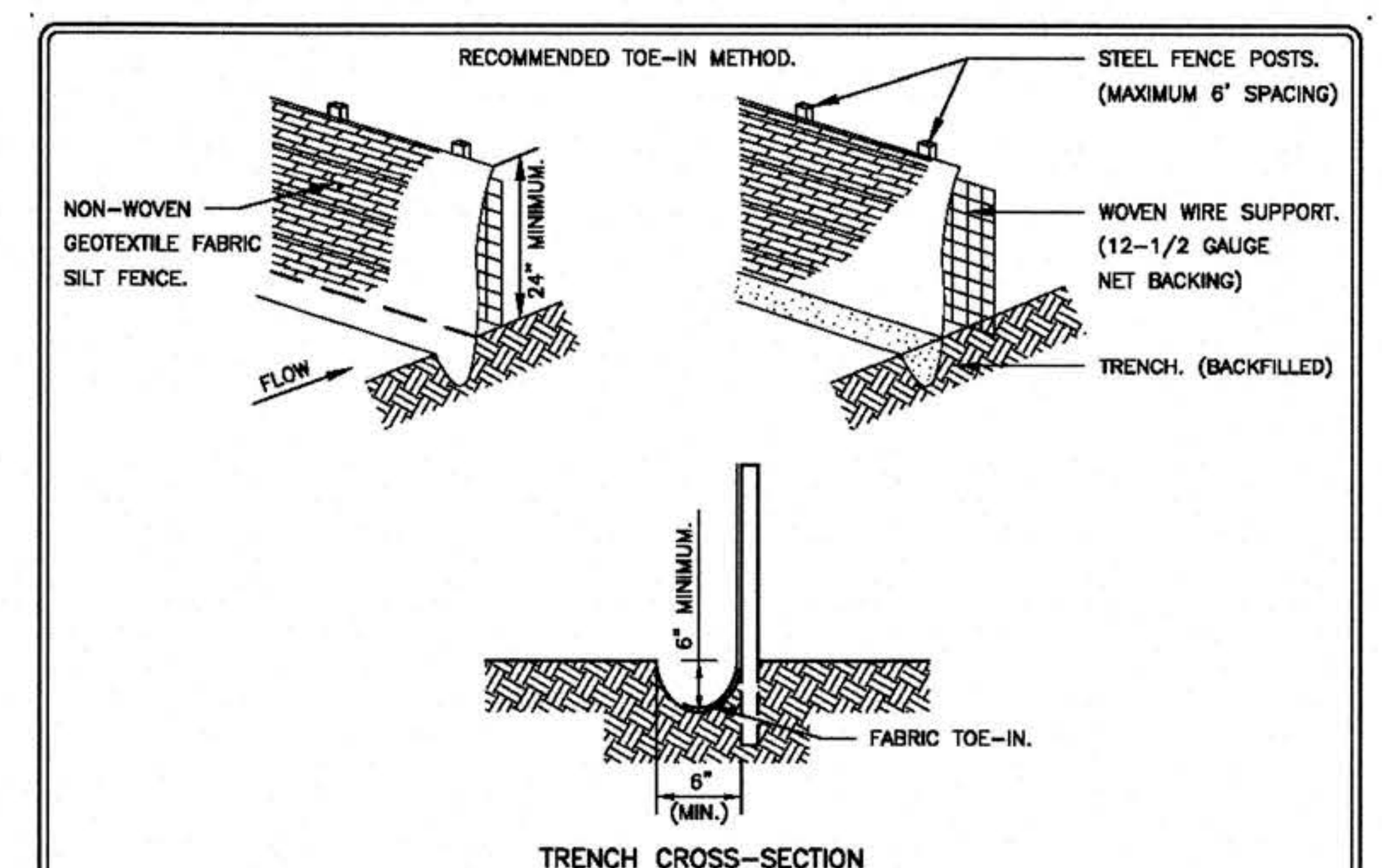
1. USE ONLY OPEN GRADED ROCK 75 to 125 mm (3 to 5") DIAMETER FOR ALL CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 25 mm (1") OPENING AND MINIMUM WIRE DIAMETER OF 12.9 mm (20 GAUGE).
3. THE ROCK BERM SHALL BE INSPECTED DAILY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SEDIMENT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. IF SEDIMENT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR 150 mm (6"), WHICHEVER IS LESS, THE SEDIMENT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SEDIMENTION PROBLEM.
5. WHEN THE SITE IS COMPLETELY STABILIZED,THE BERM AND ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	ROCK BERM	
RECORD COPY SIGNED BY MORGAN BYARS — 8/24/2010 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 639S-1



NOTE:
WHERE CURB IS IN PLACE, PROVIDE A 300 mm (1') WIDE OPENING IN THE CURB, OR USE A SANDBAG TO DAM TO FORCE WATER OVER THE CURB TO THE TRAP.

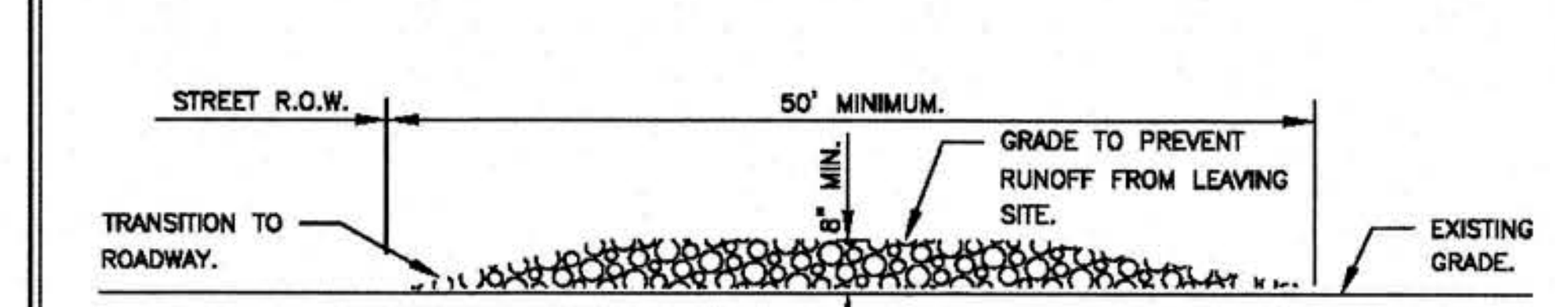
CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	STORM INLET SEDIMENT TRAP	
3·27·00 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 632S-1



NOTES:

1. SILT FENCE SHALL CONFORM TO CITY OF BASTROP SPECIFICATION 642.
2. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MIN. OF ONE (1') FOOT.
3. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G. PAVEMENT) WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
4. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
5. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POSTS.
6. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
7. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
8. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED MAY 24, 2011 DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	CITY OF BASTROP SILT FENCE DETAIL	DRAWING NO: EC–02



NOTES:

1. A STABILIZED CONSTRUCTION ENTRANCE APPLIES TO ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO A PUBLIC RIGHT OF WAY, STREET, ALLEY, SIDEWALK, OR PARKING AREA.
2. STONE SIZE SHALL BE 4" – 8" OPEN GRADED ROCK.
3. THICKNESS OF CRUSHED STONE PAD TO BE NOT LESS THAN 8".
4. LENGTH SHALL BE A MINIMUM OF 50' FROM ACTUAL ROADWAY, AND WIDTH NOT LESS THAN FULL WIDTH OF INGRESS/EGRESS.
5. ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY BY CONTRACTOR.

AS NECESSARY, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED MAY 24, 2011 DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	CITY OF BASTROP STABILIZED CONSTRUCTION ENTRANCE DETAIL	DRAWING NO: EC–01

BASTROPTX
Heart of the Lost Pines
Est. 1832
Final Drainage Plan Approved
11/22/19

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REVISION	DATE

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SHEET NAME: EROSION CONTROL DETAILS
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
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DATE 9/16/2019
JOB NUMBER 5135
SHEET 06 OF 6
SHEET NO. 06

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PLANT SCHEDULE

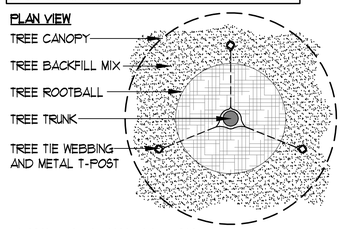
SHADE TREES	QTY	COMMON / BOTANICAL NAME	CONT	CALIPER	HEIGHT	SPREAD		
	8	CEDAR ELM ULMUS CRASSIFOLIA	65 GAL	3" CAL.	10'-12' HT.	5-6' SPR.		
	5	CHINQUAPIN OAK QUERCUS MUHLENBERGII	65 GAL	3.25-3.5" CAL.	11-13' HT.	56' SPR.		
	1	SOUTHERN LIVE OAK QUERCUS VIRGINIANA	65 GAL	3" CAL.	10' HT.	6' SPR.		

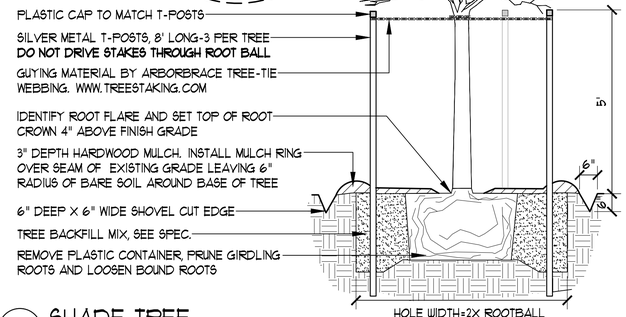
SHRUBS	QTY	COMMON / BOTANICAL NAME	CONT	SPACING
GM	12	GULF MUHLY MUHLENBERGIA CAPILLARIS 'REGAL MIST'	3 GAL	36" o.c.
RY	81	RED YUCCA HESPERALOE PARVIFLORA	5 GAL	36" o.c.
DW	98	DON'S DWARF WAXMYRTLE MYRICA CERIFERA 'DON'S DWARF'	5 GAL	36" o.c.
DY	124	DWARF YAUPON ILEX VOMITORIA 'NANA'	5 GAL	36" o.c.

GROUNDCOVER	CODE	QTY	COMMON / BOTANICAL NAME	CONT	SPACING
	NG	66	LANTANA 'NEW GOLD' LANTANA X 'NEW GOLD'	1 GAL	24" o.c.
	ZX	84	ZEXMANIA ZEXMENIA HISPIDA	1 GAL	12" o.c.
TURF	CODE	QTY	COMMON / BOTANICAL NAME	CONT	
	SBG	AS SHOWN	SAHARA BERMUDA GRASS CYNODON DACTYLON 'SAHARA'	HYDRO	

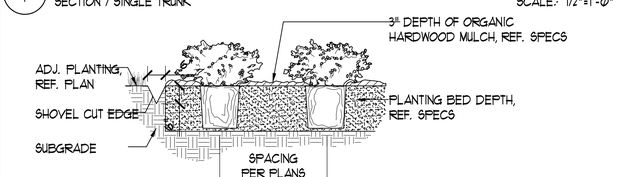
NOTES.:
1. PRUNE DEAD OR BROKEN BRANCHES ONLY
BRANCHES TO BE 80"AFF AT ACCESSIBLE AREAS.
2. ALIGN STAKING OF TREES IDENTICALLY WHEN IN LINES OR GROUPS.

PLAN VIEW





1 SHADE TREE
SECTION / SINGLE TRUNK
SCALE.: 1/2"=1'-0"



2 SHRUBS / SHOVEL CUT EDGE
SECTION
SCALE.: 1/2"=1'-0"

STREET YARD

	REQUIRED	PROVIDED
TOTAL SITE AREA		52,017 S.F.
TOTAL STREET YARD AREA		18,137 S.F.
STREETYARD LANDSCAPE (15% OF STREET YARD REQUIRED)	2,811 S.F.	2,811 S.F.

LANDSCAPE BUFFER

10' LANDSCAPE BUFFER ADJACENT TO RIGHT-OF-WAY OF ANY MAJOR THOROUGHFARE STREET IS REQUIRED, 1 LARGE TREE PER FORTY LINEAR FEET.

REQUIRED	PROVIDED
230 LF = 6 TREES	6 TREES

SHRUBS

SHRUBS MUST BE PLANTED ALONG THE SIDE PROPERTY LINE FROM THE FRONT PROPERTY LINE TO THE REAR. SHRUBS MUST BE PLANTED IN SUCH A MANNER TO CREATE A DENSE HEDGE OF AT LEAST THREE FEET AT MATURITY.

PARKING LOT LANDSCAPING

THERE SHALL BE A LANDSCAPED AREA WITH AT LEAST ONE (1) TREE WITHIN SIXTY FEET (60') OF EVERY PARKING SPACE. THERE: SHALL BE A MINIMUM OF ONE (1) TREE PLANTED IN THE PARKING AREA FOR EVERY TEN (10) PARKING SPACES WITHIN PARKING LOTS WITH MORE THAN TWENTY (20) SPACES. WITHIN PARKING LOTS, LANDSCAPE AREAS SHOULD BE LOCATED TO DEFINE PARKING AREAS AND ASSIST IN CLARIFYING APPROPRIATE CIRCULATION PATTERNS. A LANDSCAPE ISLAND SHALL BE LOCATED AT THE TERMINUS OF ALL PARKING ROWS, AND SHOULD CONTAIN AT LEAST ONE (1) TREE. ALL LANDSCAPE AREAS SHALL BE PROTECTED BY A MONOLITHIC CURB OR WHEEL STOPS AND REMAIN FREE OF TRASH, LITTER, AND CAR BUMPER OVERHANGS.

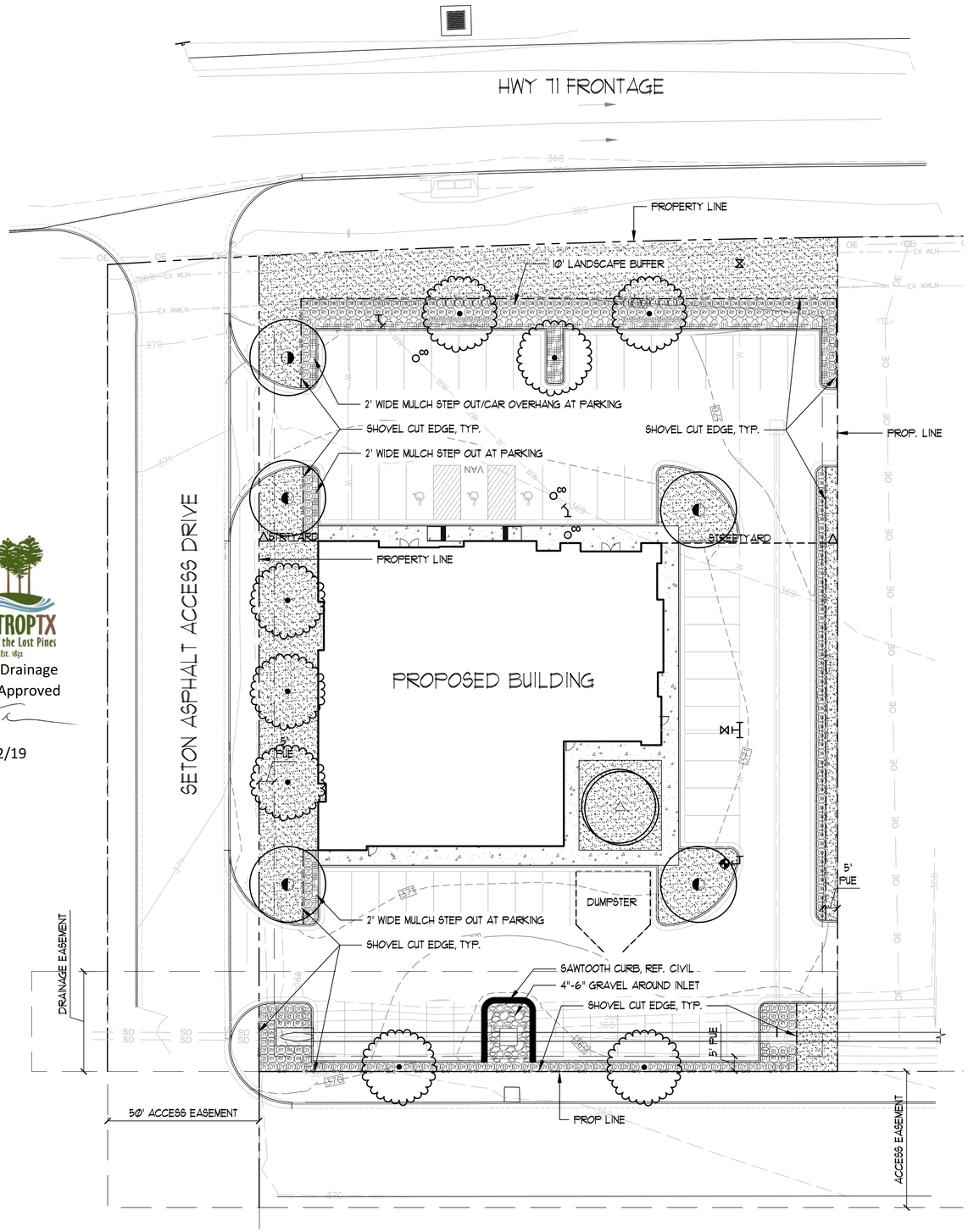
SITE DEVELOPMENT PERMIT LANDSCAPE NOTES.:

1. ALL LANDSCAPED AREAS TO BE PROTECTED BY 6 INCH CURBS, WHEEL-STOPS OR OTHER APPROVED BARRIERS AS PER ECM 2.4.7(A).
2. THE OWNER WILL CONTINUOUSLY MAINTAIN THE REQUIRED LANDSCAPING IN ACCORDANCE WITH LDC 25-2-984.
3. EXISTING TREES TO BE SAVED SHALL BE PROTECTED BY FENCING BEFORE CONSTRUCTION BEGINS. NO EQUIPMENT OR MATERIALS SHALL BE STORED OR OPERATED WITHIN THE FENCED-IN AREAS. FENCES SHALL BE AT THE DRIP LINE AND COMPLETELY SURROUND THE TREE OR CLUSTERS OF TREES. NO BURNING OF DEBRIS, CLEANING FLUIDS, CONCRETE SPILLS, ETC. WILL BE ALLOWED WITHIN THESE AREAS.
4. BUFFERING OF THE STREET YARD WILL BE ACCOMPLISHED THROUGH THE COMBINATION OF TREES, SHRUBS, GRADE CHANGES, AND FENCES.
5. GRADE CHANGES THAT DO NOT APPEAR ON THE SITE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT BY THE GENERAL CONTRACTOR PRIOR TO CONSTRUCTION.
6. TRENCHING SHALL NOT OCCUR WITHIN THE FENCED DRIP LINE AREAS OF EXISTING TREES.
7. SHRUB MATERIAL NOT TO EXCEED 36" O.C. UNLESS OTHERWISE SPECIFIED. GROUNDCOVERS NOT TO EXCEED 18" O.C. DURING THE TIME OF MARCH 15-OCTOBER 15 INSTALLATION OF HYDROMULCH SHALL BE COMMON BERMUDA OR SAHARA BERMUDA FOR OCTOBER 16 -MARCH 14 INSTALLATION OF HYDROMULCH SHALL BE ANNUAL OR PERENNIAL RYE WITH A SPRING APPLICATION OF COMMON BERMUDA OR SAHARA BERMUDA.
8. ALL LAWN AREAS WITHIN THE LIMITS OF CONSTRUCTION SHALL BE RE-VEGETATED WITH BERMUDA SOD OR RYE UNLESS NATIVE RESTORATION MIX IS SPECIFIED.
9. NOT MORE THAN 50% OF THE TREES AND 50% OF SHRUBS PROPOSED WILL BE OF THE SAME SPECIES.
10. AN AUTOMATIC IRRIGATION SYSTEM SHALL BE INSTALLED. SEE IRRIGATION NOTES IN THESE DRAWINGS FOR REQUIREMENT.
11. IF ESTABLISHING VEGETATION DURING ANY STAGE OF DROUGHT, SECTION 6-4-30 MAY REQUIRE A VARIANCE. CONTACT BASTROP WATER CONSERVATION STAFF.

BASTROPTX
Heart of the Lost Pines
Est. 1832

Final Drainage Plan Approved

11/22/19



LANDSCAPE CERTIFICATION

I, AAN G. COLEMAN, DO HEREBY CERTIFY THAT THE PLANS FOR THE DEVELOPMENT PROJECT LOCATED AT HWY 71 EAST OF 304, SATISFY THE REQUIREMENTS OF THE BASTROP CODE OF ORDIANCES, SECTION 39 AND ALL AMENDEMENTS

MARISSA MCKINNEY — 10/14/19
COLEMAN & ASSOCIATES — DATE

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE LANDSCAPE ARCHITECT WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF BASTROP MUST RELY ON THE ADEQUACY OF THE WORK OF THE LANDSCAPE ARCHITECT.

NORTH — SCALE IN FEET (1"=20')
0 5 10 20 50

COLEMAN & ASSOCIATES
Landscape Architecture
Environmental Design

9890 Silver Mountain Drive
Austin, Texas 78737
Ph: 512-476-2090
F: 512-476-2099

1926 Cambria
San Antonio, Texas 78258
Ph: 210-492-4550
F: 210-492-9930

9511 Modesto Ave. NE
Albuquerque, New Mexico 87122
Ph: 505-433-3426

REGISTERED LANDSCAPE ARCHITECT
MARISSA MCKINNEY
5773
STATE OF TEXAS
10/14/2019

LANDSCAPE PLAN AND DETAILS
CITY SUBMITTAL

BASTROP GROVE MEDTAIL DEV.
CITY OF BASTROP
BASTROP COUNTY, TEXAS

REVISIONS

SCALE:	AS SHOWN
DRAWN BY:	MAM
CHECKED BY:	MAM
APP. BY:	MAM
PROJECT NO.	
DATE:	10/14/2019

SHEET:
14
OF

LEGEND

- HUNTER PROS-06-PRS30 SERIES POP UP SPRAY HEADS WITH HUNTER MSBN-50H STREAM BUBBLER NOZZLES. (TWO PER TREE)
  SEE INSTALLATION NOTE #13 REGARDING TREE BUBBLER LATERAL PIPE
- HUNTER PROS-04-PRS30 SERIES POP UP SPRAY HEAD WITH SS / ES SERIES STRIP NOZZLE UNLESS NOTED OTHERWISE.
- HUNTER PROS-04-PRS30 SERIES POP UP SPRAY HEAD WITH PRO SPRAY SERIES NOZZLE AS NOTED BELOW
- NETAFIM TECHLINE TLHCVXR5-12 SERIES DRIP TUBE IN NARROW TURF AREAS INSTALLED AT 4" DEPTH
  SEE INSTALLATION NOTE #17 REGARDING DRIP TUBE LAYOUT IN TURF.
- HUNTER ICV SERIES ELECTRIC REMOTE CONTROL VALVE WITH ICD-100 SERIES DECODER
- HUNTER ICV SERIES ELECTRIC REMOTE CONTROL, "TREE BUBBLER ZONE" VALVE WITH ICD-100 SERIES DECODER
  SEE INSTALLATION NOTE #12 REGARDING TREE BUBBLER LATERAL PIPE
- NETAFIM LVCZ SERIES DRIP VALVE ASSEMBLY WITH PRESSURE REGULATOR AND 140 MESH FILTER
  USE MODEL LVCZS8010075-LF FOR DRIP ZONES WITH .25 TO 4.4 GPM FLOW RATE WITH
  PRESSURE REGULATOR MODEL #PRV075LF42V2K
  USE MODEL LVCZ10075-HFHP FOR DRIP ZONES WITH 4.5 TO 17.6 GPM FLOW RATE
  PRESSURE REGULATOR MODEL #PRV075HF45V2K
- WILKINS 375 SERIES REDUCED PRESSURE TYPE BACKFLOW PREVENTOR INSTALLED PER CITY CODE
  WITH SAME SIZE BRONZE BALL VALVE AND HEATED / INSULATED ENCLOSURE INSTALLED ON THE UP-STREAM SIDE.
- IRRIGATION WATER METER AND TAP, SIZE AS NOTED ON THE PLAN
- CONTROLLER "A"
  HUNTER ACC2 DECODER SERIES TWO-WIRE CONTROLLER MODEL A2C-75D-M WITH TWO A2C-D75 MODULES AND WIRELESS SOLAR SYNC SENSOR
  LOCATE SENSOR AS FIELD DIRECTED BY THE LANDSCAPE ARCHITECT
  SURGE PROTECTION DEVICE WITH GROUNDING DEVICE TO BE SPACED NO MORE THAN 500 FEET APART ALONG PATH
- BERMAD 310 RAM SERIES "MASTER" VALVE, ICD-100 DECODER, HFS SERIES FLOW METER WITH FCT AND ICD-SEN SENSOR DECODER
- MAINLINE PIPE
  3" DIAMETER AND SMALLER SHALL BE SCHEDULE 40 PVC SOLVENT-WELD TYPE
  4" DIAMETER AND LARGER SHALL BE CLASS 200 PVC O-RING GASKET TYPE WITH DUCTILE IRON GASKET FITTINGS
  4" EQUALIZER LINE BETWEEN TANKS SHALL BE SCHEDULE 40.
- CLASS 200 (EXCEPT 1/2 INCH #315) PVC LATERAL PIPE
- ONE 4" CLASS 200 SLEEVE PIPES
- TWO 4" CLASS 200 SLEEVE PIPES AT PAVEMENT CROSSINGS WITH 2 1/2" MAINLINE OR SMALLER UNLESS NOTED OTHERWISE
  ONE 8" AND ONE 4" CLASS 200 SLEEVE PIPE AT PAVEMENT CROSSINGS WITH 4" MAINLINE UNLESS NOTED OTHERWISE

L.I.C. SHALL SELECT SPRAY NOZZLES FOR "HEAD-TO-HEAD" COVERAGE, ADJUSTED FOR NO OVERSPRAY ONTO WALLS AND WALKS. NO OVERSPRAY INTO STREETS IS PERMITTED.

ALL PIPES SHALL BE SIZED TO ALLOW A MAXIMUM FLOW VELOCITY OF 5 FEET PER SECOND

BASTROPTX
Heart of the Lost Pines
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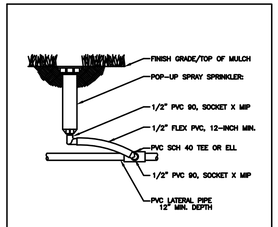
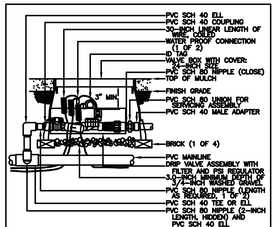
Final Drainage Plan Approved

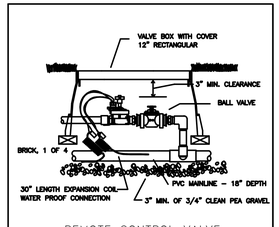
11/22/19



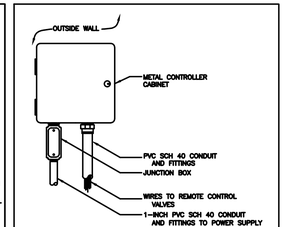
POP-UP SPRAY HEAD



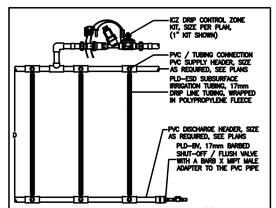
CONTROL ZONE KIT



REMOTE CONTROL VALVE

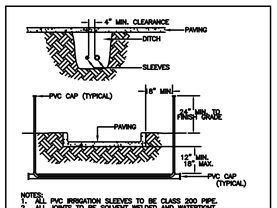


WALL MOUNT CONTROLLER



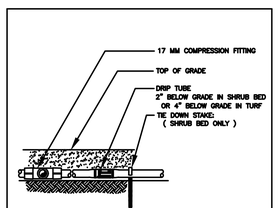
NOTE: SEE CATALOG FOR ALLOWABLE LENGTH OF TUBING RUN (D).

PLD-ESD - PLAN
PVC SUPPLY HEADER AND PVC DISCHARGE HEADER.

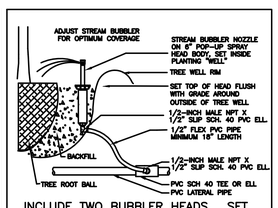


NOTES:
1. ALL PVC IRRIGATION SLEEVES TO BE CLASS 200 PIPE.
2. ALL JOINTS TO BE SOLVENT WELDED AND WATERTIGHT.
3. WHERE THERE IS MORE THAN ONE SLEEVE, EXTEND THE SMALLER SLEEVE TO 24-INCHES MINIMUM ABOVE FINISH GRADE.
4. MECHANICALLY TAMP TO 95% PROCTOR.

SLEEVING

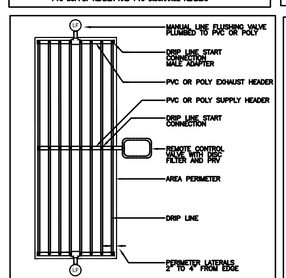


DRIP TUBE



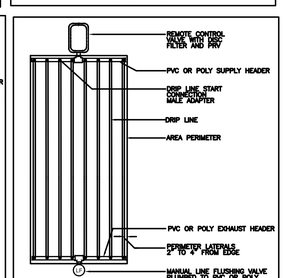
INCLUDE TWO BUBBLER HEADS, SET ON OPPOSITE SIDES OF ROOT BALL

TREE BUBBLER



SUPPLY AND EXHAUST HEADERS SHALL BE CLASS 200 PVC PIPE, OF THE SAME DIAMETER AS THE ZONE VALVE SIZE.
USE DRIP TUBE FOR SUPPLY AND EXHAUST HEADERS ON GRIDS WITH FLOW SMALLER THAN 5 GPM ONLY.

DRIP CENTER FEED LAYOUT



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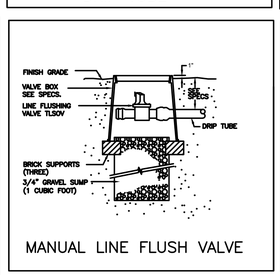
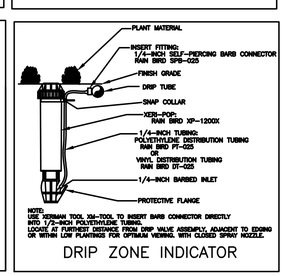
USE DRIP TUBE FOR SUPPLY AND EXHAUST HEADERS ON GRIDS WITH FLOW SMALLER THAN 5 GPM ONLY.

DRIP END FEED LAYOUT

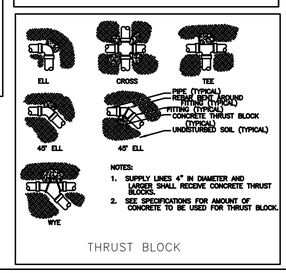


MANUAL LINE FLUSH VALVE



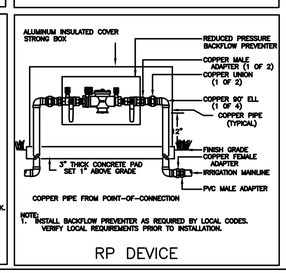
NOTE:
USE XERMAN TOOL XM-TOOL TO INSERT BARB CONNECTOR DIRECTLY INTO 1/2-INCH POLYETHYLENE TUBING.
LOCATE AT FURTHEST DISTANCE FROM DRIP VALVE ASSEMBLY, ADJACENT TO EDGING OR WITHIN LOW PLANTINGS FOR OPTIMUM VIEWING. WITH CLOSED SPRAY NOZZLE.

DRIP ZONE INDICATOR



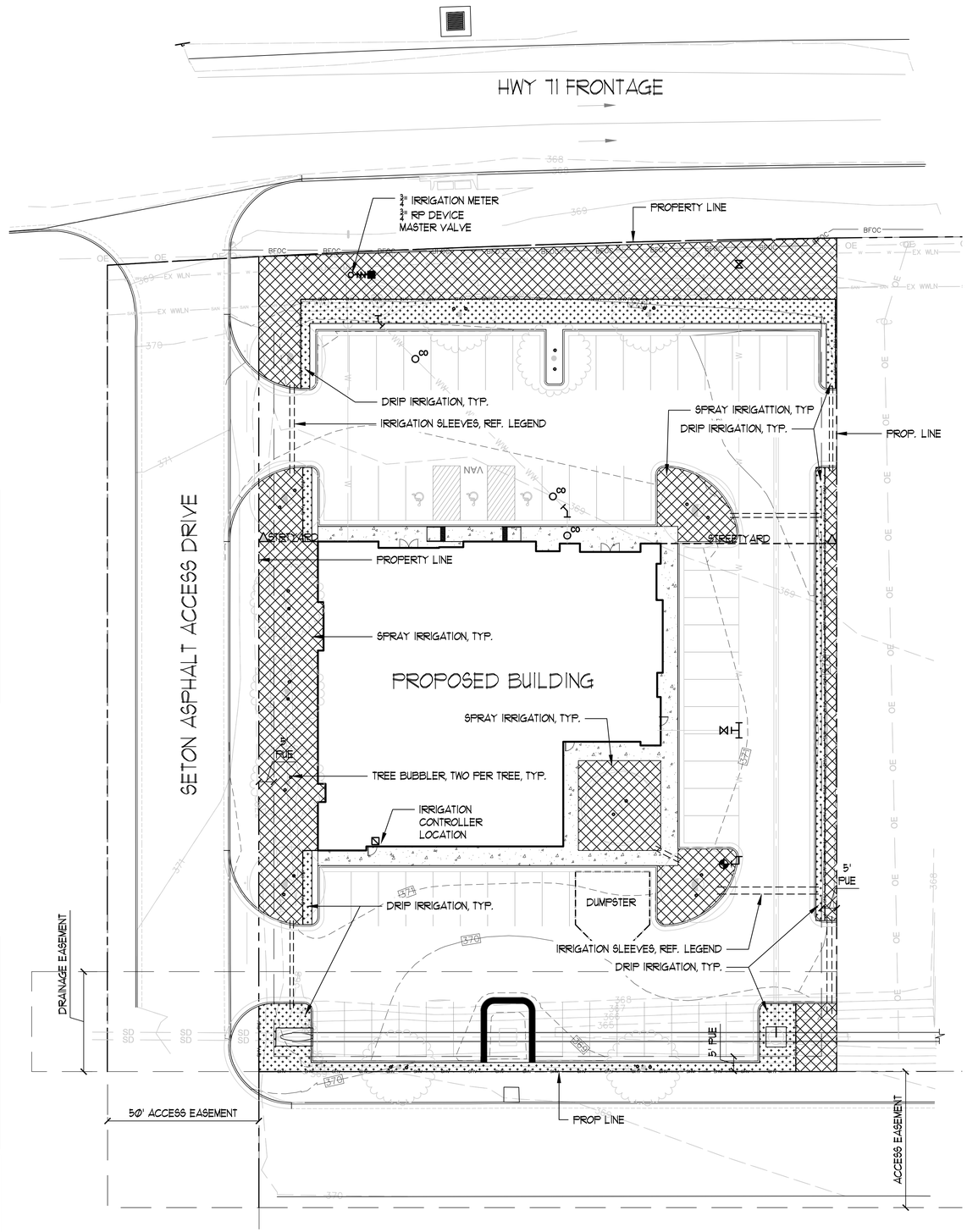
NOTES:
1. SUPPLY LINES 4" IN DIAMETER AND LARGER SHALL RECEIVE CONCRETE THRUST BLOCKS.
2. SEE SPECIFICATIONS FOR AMOUNT OF CONCRETE TO BE USED FOR THRUST BLOCK.

THRUST BLOCK



NOTE:
1. INSTALL BACKFLOW PREVENTER AS REQUIRED BY LOCAL CODES. VERIFY LOCAL REQUIREMENTS PRIOR TO INSTALLATION.

RP DEVICE



COLEMAN & ASSOCIATES
Landscape Architecture
Environmental Design

9890 Silver Mountain Drive
Austin, Texas 78737
Ph: 512-476-2090
F: 512-476-2099

1926 Cambria
San Antonio, Texas 78258
Ph: 210-492-4550
F: 210-492-9930

9511 Modesto Ave. NE
Albuquerque, New Mexico 87122
Ph: 505-433-3426

REGISTERED LANDSCAPE ARCHITECT
MARISSA McKINNEY
STATE OF TEXAS
10/14/2019

IRRIGATION PLAN AND DETAILS
CITY SUBMITTAL

BASTROP GROVE MEDTAIL DEV.
CITY OF BASTROP
BASTROP COUNTY, TEXAS

REVISIONS

SCALE:	AS SHOWN
DRAWN BY:	MAM
CHECKED BY:	MAM
APP. BY:	MAM
PROJECT NO.	
DATE:	10/14/2019

SHEET:
15
OF

BASTROP GROVE MEDTAIL DEVELOPMENT

CIVIL SITE DEVELOPMENT PLANS
CITY OF BASTROP
BASTROP COUNTY, TEXAS

SHEET INDEX

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03	OVERALL SITE PLAN SHEET
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06	BUILDING ELEVATIONS SHEET (1 OF 2)
07	BUILDING ELEVATIONS SHEET (2 OF 2)
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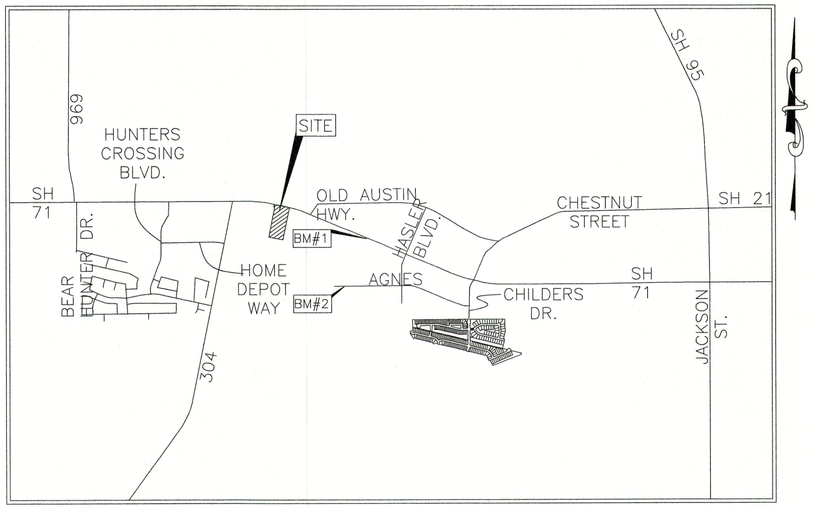
28	CONSTRUCTION DETAILS (2 OF 3)
29	CONSTRUCTION DETAILS (3 OF 3)

BASTROP FIRE DEPARTMENT	
FIRE DESIGN CODES	2018 INTERNATIONAL FIRE CODE WITH APPENDICES AND LOCAL AMENDMENTS
FIRE FLOW DEMAND @ 20 psi)	2,250 gpm - 2 hr DURATION
INTENDED USE	BUSINESS (GROUP B)
CONSTRUCTION CLASSIFICATION	TYPE II-B
BUILDING FIRE AREA (S.F.)	10,237 sf
AUTOMATIC FIRE SPRINKLER SYSTEM TYPE (IFAPPLICABLE)	NFPA 13
REDUCED FIRE FLOW DEMAND @ 20 psi FOR HAVING A SPRINKLER SYSTEM (gpm) (IF APPLICABLE)	1,500 gpm - 2 hr DURATION
FIRE HYDRANT FLOW TEST DATE	12/05/2019
FIRE HYDRANT FLOW TEST LOCATION	ONE MAIN FINANCIAL 696 HIGHWAY 71
ALTERNATIVE METHOD OF COMPLIANCE AMOC (IF APPLICABLE)	N/A

NO.	DESCRIPTION	REVISE (R) ADD (A) VOID (V)	CITY OF BASTROP APPROVAL/DATE	APPROVED BY



LOCATION MAP
(NOT TO SCALE)

BENCHMARKS:

#1 TXDOT MON. BRASS DISC IN CONCRETE, 44' WEST OF THE NORTH–EASTERN PROPERTY CORNER.

#2 MAG NAIL IN PAVEMENT ON AGNES ST. 500' SOUTH OF THE PROPERTY BOUNDARY.

GENERAL NOTES:

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF BASTROP MUST RELY UPON THE ADEQUACY OF THE DESIGN ENGINEER.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED WITH THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

THIS PROJECT IS LOCATED IN THE COLORADO RIVER WATERSHED.

NO PORTION OF THIS TRACT IS WITHIN THE BOUNDARIES OF THE 100–YEAR FLOOD PLAIN OF ANY WATERWAY THAT IS WITHIN THE LIMITS OF STUDY OF THE FEDERAL FLOOD INSURANCE ADMINISTRATION FIRM MAP NO. 48021C0335E, DATED JANUARY 19, 2006, BASTROP COUNTY, TEXAS. BASTROP COUNTY COMMUNITY NO. 481193.

FINAL PLAT APPROVED ON 11/21/2019 BY PLANNING & ZONING COMMISSION

FINAL MASTER DRAINAGE PLAN APPROVED ON 10/31/2019 BY CITY OF BASTROP

LEGAL DESCRIPTION:

A 1.194 ACRE (52,024 SQUARE FEET) TRACT OR PARCEL OF LAND, MORE PARTICULARLY DESCRIBED AS LOT 6 OF THE FINAL PLAT OF BASTROP GROVE, SECTION 2 RECORDED IN CABINET 7, PAGE 12–B OF THE OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS.

ORDINANCES CODES:

* CITY OF BASTROP STORMWATER DRAINAGE DESIGN MANUAL
* CITY OF BASTROP SUBDIVISION REGULATIONS
* CITY OF BASTROP ZONING CODE
* 2018 INTERNATIONAL FIRE CODE WITH APPENDICES AND LOCAL AMENDMENTS

JURISDICTION CODES:

* CITY OF BASTROP, TEXAS

811 Know what's below. Call before you dig.

UTILITY PROVIDERS:

ELECTRIC:	BLUEBONNET ELECTRIC (979) 542–3151
GAS:	CENTER POINT ENERGY (830) 643–6936
PHONE:	AT&T (512) 870–1450
WATER:	CITY OF BASTROP (512) 332–8830
WASTEWATER:	CITY OF BASTROP (512) 332–8830
CABLE:	SPECTRUM (855) 243–8892

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN ACCEPTING THESE PLANS , THE CITY OF BASTROP MUST RELY UPON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.

ACCEPTED FOR CONSTRUCTION:

DIRECTOR OF PLANNING AND DEVELOPMENT — DATE 2/27/20

CITY OF BASTROP ENGINEER — 2/27/2020

THE CITY OF BASTROP FIRE DEPARTMENT — CFM, CFI ASST. CHIEF — DATE 27FEB2020

AS OWNER OF THIS PROPERTY, I PROMISE TO DEVELOP AND MAINTAIN THIS PROPERTY AS DESCRIBED BY THIS PLAN.

TYLER DUTTON, GROVE 71 PARTNERS, LP — DATE 2/6/2020

SIGNED AND SEALED CERTIFICATION OF THE LICENSED ENGINEER WHO PREPARED THE SITE DEVELOPMENT PLAN:

I BRENDAN McENTEE, DO HEREBY CERTIFY THAT THE INFORMATION CONTAINED IN THESE ENGINEERING DOCUMENTS ARE COMPLETE, ACCURATE, AND ADEQUATE FOR THE INTENDED PURPOSES, INCLUDING CONSTRUCTION, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION PRIOR TO FORMAL CITY APPROVAL.

BRENDAN McENTEE, P.E. — DATE 02/06/2020

STATE OF TEXAS — BRENDAN P. McENTEE — 96200 — LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

OWNER: GROVE 71 PARTNERS, LP–TYLER DUTTON
3809 S. 2ND STREET, D–200
AUSTIN, TEXAS 78704
512 437–6404

ENGINEER: CARLSON, BRIGANCE & DOERING, INC.
CIVIL ENGINEERING & SURVEYING
C/O MR. BRENDAN P. MCENTEE, P.E.
12129 RANCH ROAD 620 NORTH, SUITE 600
AUSTIN, TEXAS 78750
(512) 280–5160

ARCHITECT: LEVY ARCHITECTS
MICHAEL D. GIN, ARCHITECT
2438 WEST ANDERSON LANE, SUITE B–2
AUSTIN, TEXAS 78757
(512) 342–9177

LANDSCAPE ARCHITECT: COLEMAN & ASSOCIATES
MARISSA McKINNEY, RLA
9890 SILVER MOUNTAIN DRIVE
AUSTIN, TEXAS 78737
(512) 476–2090

CUSTOMER COPY

DESIGNED BY: | DRAFTED BY:

REVISION	DATE

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
3501 West Williams Gannon Dr. 12129 RR 620 N., Ste. 600
Austin, Texas 78749 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

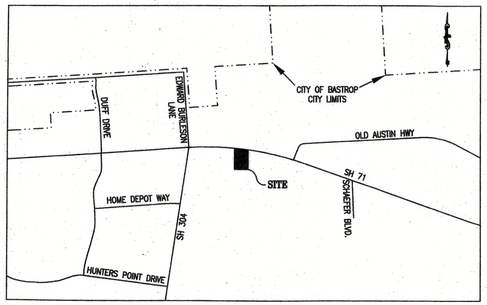
SHEET NAME: COVER SHEET
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: CIVIL SITE DEVELOPMENT PLANS

DATE 11/25/2019
JOB NUMBER 5135
SHEET 01 OF 29
SHEET NO. 01

FILE PATH:N:\ACSD-N\5135\dwg\5135-COVER.dwg - Feb 06, 2020 - 11:44am

THE FINAL PLAT OF
BASTROP GROVE, SECTION 2

7/12-B



VICINITY MAP
NOT TO SCALE



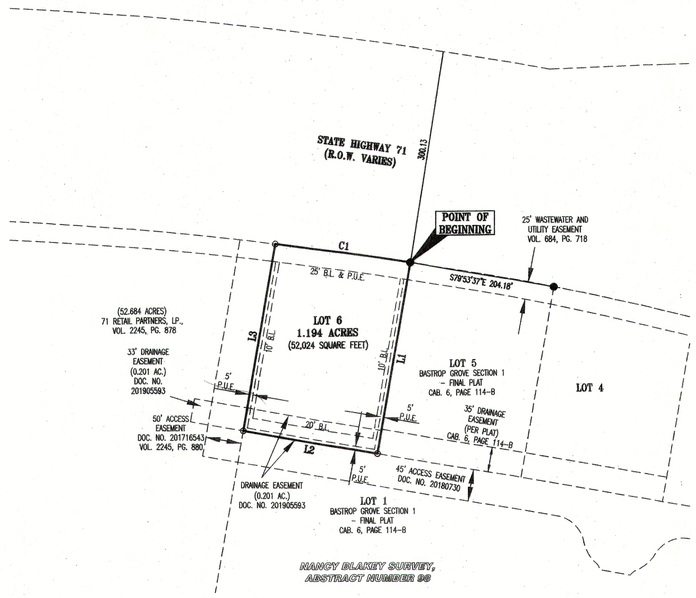
GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

LEGEND

○	1/2" CAPPED IRON ROD SET
●	CAPPED IRON ROD FOUND (UNLESS OTHERWISE NOTED)
1	LOT NUMBER
B.L.	BUILDING SETBACK LINE
P.U.E.	PUBLIC UTILITY EASEMENT



Curve Table						
Curve #	Length	Radius	Chord Direction	Chord Length	Tangent	DELTA
C1	190.82	5058.89	S82°08'58"E	190.81	95.42	2°09'40"

Line Table		
Line #	Length	Direction
L1	275.23	S09°40'41"W
L2	190.71	N80°19'19"W
L3	269.15	N09°40'41"E

NO.	REVISION	DATE
1	ORIGINAL SUBMITTAL	07/29/19
2	CITY OF BASTROP COMMENTS	09/03/19
3	OWNERSHIP REVISION	11/25/19

FIELD NOTES

BEING ALL OF THAT CERTAIN 1.194 ACRE (52,024 SQUARE FEET) TRACT OR PARCEL OF LAND OUT OF AND A PART OF THE NANCY BLAKEY SURVEY, ABSTRACT NUMBER 98, SITUATED IN BASTROP COUNTY, TEXAS, BEING ALL OF A CALLED 1.194 ACRE TRACT OF LAND CONVEYED TO GROVE 71 PARTNERS, LP., IN DOCUMENT NUMBER 201916932 OF THE OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS (O.P.R.B.C.TX.), SAID 1.194 ACRE TRACT OF LAND BEING MORE FULLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING, AT A CAPPED ½" IRON ROD FOUND STAMPED "CBD SETSTONE", BEING THE NORTHEASTERN CORNER OF SAID 1.194 ACRE TRACT, SAME BEING A NORTHWESTERN CORNER OF LOT 5, BASTROP GROVE SECTION 1 – FINAL PLAT, A SUBDIVISION RECORDED IN CABINET 6, PAGE 114–B OF THE PLAT RECORDS OF BASTROP COUNTY, TEXAS (P.R.B.C.TX.), AND BEING ALSO A POINT ON A SOUTHERN RIGHT–OF–WAY LINE OF STATE HIGHWAY 71 (R.O.W. VARIES), FOR THE NORTHEASTERN CORNER AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT,

THENCE, WITH THE COMMON BOUNDARY LINE OF SAID 1.194 ACRE TRACT AND SAID LOT 5, S09°40'41"W, A DISTANCE OF 275.23 FEET TO A CAPPED ½" IRON ROD SET STAMPED "CBD SETSTONE", BEING THE SOUTHEASTERN CORNER OF SAID 1.194 ACRE TRACT, SAME BEING THE SOUTHWESTERN CORNER OF SAID LOT 5 AND BEING ALSO A POINT ON A NORTHERN BOUNDARY LINE OF LOT 1, SAID BASTROP GROVE SECTION 1 – FINAL PLAT, FOR THE SOUTHEASTERN CORNER OF THE HEREIN DESCRIBED TRACT,

THENCE, WITH THE COMMON BOUNDARY LINE OF SAID 1.194 ACRE TRACT AND SAID LOT 1, N80°19'19"W, A DISTANCE OF 190.71 FEET TO A CAPPED ½" IRON ROD SET STAMPED "CBD SETSTONE", BEING A SOUTHWESTERN CORNER OF SAID 1.194 ACRE TRACT AND BEING ALSO A NORTHERN CORNER OF SAID LOT 1, FOR THE SOUTHWESTERN CORNER OF THE HEREIN DESCRIBED TRACT,

THENCE, WITH THE WESTERN BOUNDARY LINE OF SAID 1.194 ACRE TRACT, N09°40'41"E, A DISTANCE OF 269.15 FEET TO A CAPPED ½" IRON ROD SET STAMPED "CBD SETSTONE", AT A POINT OF CURVATURE, FOR A CURVE TO THE RIGHT, BEING A NORTHWESTERN CORNER OF SAID 1.194 ACRE TRACT, SAME BEING A POINT ON A NORTHERN BOUNDARY LINE OF SAID 52.684 ACRE TRACT AND BEING ALSO A POINT ON A SOUTHERN RIGHT–OF–WAY LINE OF SAID STATE HIGHWAY 71, FOR THE NORTHWESTERN CORNER OF THE HEREIN DESCRIBED TRACT,

THENCE, WITH THE COMMON BOUNDARY LINE OF SAID 1.194 ACRE TRACT, SAID HIGHWAY 71 AND WITH SAID CURVE TO THE RIGHT HAVING A RADIUS OF 5058.89 FEET, AN ARC LENGTH OF 190.82 FEET AND WHOSE CHORD BEARS S82°08'58"E, A DISTANCE OF 190.81 FEET TO THE POINT OF BEGINNING AND CONTAINING 1.194 ACRES (52,024 SQUARE FEET) OF LAND.

DATE: NOVEMBER 25, 2019

OWNER:
GROVE 71 PARTNERS, LP.
C/O JONATHAN KASLING, MANAGER
3809 S. 2ND STREET,
SUITE D–200
AUSTIN, TX. 78704

ENGINEER & SURVEYOR:
CARLSON, BRIGANCE & DOERING, Inc.
5501 WEST WILLIAM CANNON
AUSTIN, TX 78749
(512) 280–5160
(512) 280–5165 fax

F.E.M.A. MAP NO. 48021 C 0355E
BASTROP COUNTY, TEXAS DATED: JANUARY 19, 2006

TOTAL ACREAGE: 1.194 ACRES
SURVEY: NANCY BLAKEY SURVEY, ABSTRACT No. 98

COMMERCIAL LOTS	1	TOTAL:	1.194 ACRES
NO. OF BLOCKS:	1		

BENCHMARK:

1) LCRA MOUMENT # A688 – 3" LCRA ALUMINUM DISK FOUND IN THE EAST RIGHT–OF–WAY LINE OF SH 304. BEING +/– 800' NORTH OF THE INTERSECTION OF HUNTERS POINT DRIVE AND SH 304.
N: 10014712.67 E: 3239449.66 ELEV = 365.68'

FLOOD PLAIN NOTE:

NO PORTION OF THIS TRACT LIES WITHIN A DESIGNATED FLOOD HAZARD AREA, THIS TRACT LIES IN ZONE X–500 (0.2 PERCENT ANNUAL CHANCE FLOOD HAZARD), AS SHOWN ON THE FEDERAL FLOOD INSURANCE ADMINISTRATION RATE MAP NO. 48021 C 0355E, FOR BASTROP COUNTY TEXAS, DATED JANUARY 19, 2006. COMMUNITY NUMBER 481193.

GENERAL NOTES:

1. ALL SUBDIVISION PERMITS SHALL CONFORM TO THE CITY OF BASTROP CODE OF ORDINANCES, CONSTRUCTION STANDARDS, AND GENERALLY ACCEPTED ENGINEERING PRACTICES.
2. CONSTRUCTION PLANS AND SPECIFICATIONS FOR ALL SUBDIVISION IMPROVEMENTS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP PRIOR TO ANY CONSTRUCTION WITHIN THE SUBDIVISION.
3. EROSION AND SEDIMENTATION CONTROLS CONSTRUCTED WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP ARE REQUIRED FOR ALL CONSTRUCTION ON EACH LOT.
4. THE OWNER OF THIS SUBDIVISION, AND HIS OR HER SUCCESSORS AND ASSIGNS, ASSUMES SOLE RESPONSIBILITY FOR PLANS FOR CONSTRUCTION OF SUBDIVISION IMPROVEMENTS WHICH COMPLY WITH APPLICABLE CODES AND REQUIREMENTS OF THE CITY OF BASTROP. THE OWNER UNDERSTANDS AND ACKNOWLEDGES THAT PLAT VACATION OR RE–PLATTING MAY BE REQUIRED, AT THE OWNER'S SOLE EXPENSE, IF PLANS TO CONSTRUCT THIS SUBDIVISION DO NOT COMPLY WITH SUCH CODES AND REQUIREMENTS.
5. CITY ACCEPTANCE OF SUBDIVISION INFRASTRUCTURE OR FISCAL SURETY FOR SUBDIVISION CONSTRUCTION, IN A FORM ACCEPTABLE TO THE CITY OF BASTROP, SHALL BE PROVIDED PRIOR TO FINAL PLAT RECORDATION BY THE CITY.
6. BY APPROVING THIS FINAL PLAT, THE CITY OF BASTROP ASSUMES NO OBLIGATION TO CONSTRUCT ANY INFRASTRUCTURE IN CONNECTION WITH THIS SUBDIVISION. ANY SUBDIVISION INFRASTRUCTURE REQUIRED FOR THE DEVELOPMENT OF THE LOTS IN THIS SUBDIVISION IS THE SOLE RESPONSIBILITY OF THE DEVELOPER AND/OR THE OWNERS OF THE LOTS. FAILURE TO CONSTRUCT ANY REQUIRED INFRASTRUCTURE TO THE CITY STANDARDS MAY BE JUST CAUSE FOR THE CITY TO DENY APPLICATIONS FOR CERTAIN DEVELOPMENT PERMITS INCLUDING BUILDING PERMITS, SITE PLAN APPROVALS AND/OR CERTIFICATE OF OCCUPANCY.
7. NO LOT OR STRUCTURE SHALL BE OCCUPIED PRIOR TO THE APPLICANT SUBMITTING TO THE CITY OF BASTROP DOCUMENTATION OF SUBDIVISION/SITE REGISTRATION WITH THE TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR) AND PROVIDE DOCUMENTATION OF REVIEW AND COMPLIANCE OF THE SUBDIVISION CONSTRUCTION PLANS WITH TEXAS ARCHITECTURAL BARRIERS ACT (TABA).
8. WATER IS PROVIDED BY THE CITY OF BASTROP.
9. WASTEWATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.
10. ELECTRIC SERVICE WILL PROVIDED BY BLUEBONNET ELECTRIC.
11. GAS SERVICE WILL BE PROVIDED BY CENTERPOINT ENERGY.
12. CABLE SERVICE IS PROVIDED BY SPECTRUM.
13. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES
14. WASTEWATER AND WATER SYSTEMS SHALL CONFORM TO TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY).
15. DEVELOPER/OWNER SHALL BE SOLELY RESPONSIBLE FOR ALL RELOCATIONS AND MODIFICATIONS TO EXISTING UTILITIES.
16. FLOOD WARNING: THE DEGREE OF FLOOD WATER PROTECTION REQUIRED BY THE CITY OF BASTROP FLOOD DAMAGE PREVENTION ORDINANCE IS CONSIDERED REASONABLE FOR THE REGULATORY PURPOSES AND IS BASED ON SCIENTIFIC AND ENGINEERING CONSIDERATIONS. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR AND FLOOD HEIGHTS MAY BE INCREASED BY MAN–MADE OR NATURAL CAUSES. ACCEPTANCE OF THIS FINAL PLAT BY THE CITY COUNCIL DOES NOT IMPLY THAT LAND OUTSIDE OF THE AREA OF SPECIAL FLOOD HAZARDS OR USES PERMITTED IN SUCH AREAS WILL BE FREE FROM FLOODING OR FLOOD DAMAGES. NOR SHALL ACCEPTANCE OF THIS FINAL PLAT CREATE LIABILITY ON THE PART OF THE CITY OF BASTROP OR ANY OFFICIAL OR EMPLOYEE THEREOF FOR ANY FLOOD DAMAGES THAT RESULT FROM RELIANCE ON THE INFORMATION CONTAINED WITHIN THIS FINAL PLAT OR ANY ADMINISTRATION DECISION LAWFULLY MADE HEREUNDER.
17. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNEES.
18. TEMPORARY OR PERMANENT EASEMENTS ARE TO BE PROVIDED AS REQUIRED AT THE CITY'S SOLE DISCRETION FOR OFF–SITE WATER, WASTEWATER AND DRAINAGE IMPROVEMENTS.
19. PROPERTY OWNERS SHALL PROVIDE FOR ACCESS TO ALL EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY GOVERNMENTAL AUTHORITIES.
20. IT IS THE RESPONSIBILITY OF EACH BUILDER TO DESIGN AND CONSTRUCT A SUITABLE GRADING AND DRAINAGE SCHEME WHICH WILL CONVEY SURFACE WATER WITHOUT PONDING IN OR AROUND THE LOT, FROM ITS STRUCTURE TO THE DRAINAGE SYSTEM CONSTRUCTED BY THE SUBDIVISION DEVELOPER. LOT DRAINAGE PLAN SHALL BE SUBMITTED FOR REVIEW/APPROVAL BY THE CITY ENGINEER.
21. PUBLIC UTILITY AND DRAINAGE EASEMENTS WHERE SHOWN HEREON ARE INTENDED TO INDICATE AN EASEMENT FOR CONSTRUCTION, OPERATIONS AND MAINTENANCE OF PUBLIC UTILITIES AND DRAINAGE WAYS; INCLUDING BUT NOT LIMITED TO SANITARY SEWERS, FORCE MAINS, WATER LINES, TELEPHONE SIGNAL CONDUITS, ELECTRIC CONDUCTORS, DRAINAGE PIPES AND NATURAL GAS LINES.
22. ALL EASEMENTS OF RECORD AS INDICATED ON THE MOST RECENT TITLE RUN (DATED: APRIL 5, 2019, CONDUCTED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY) FOR THIS PROPERTY ARE SHOWN ON THIS PLAT.
23. THIS PLAT CONFORMS TO THE PRELIMINARY PLAT APPROVED BY THE CITY COUNCIL ON AUGUST 08, 2019.
24. ALL UTILITIES WILL BE UNDERGROUND.
25. IMPACT FEES SHALL BE ASSESSED IN ACCORDANCE WITH THE ORDINANCE EFFECTIVE AT THE TIME OF FINAL PLATTING.
26. ON–SITE STORM WATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST–DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 5, 10, 25, 50 AND 100–YEAR STORM EVENTS.
27. AS SHOWN HEREON, A TWENTY–FIVE (25) FOOT WIDE PUBLIC UTILITY EASEMENT (P.U.E.) IS HEREBY DEDICATED ADJACENT TO STREET RIGHTS–OF–WAY ON ALL LOTS. A FIVE (5) FOOT WIDE P.U.E. IS HEREBY DEDICATED ALONG EACH SIDE AND REAR LOT LINE.
28. NO BUILDINGS, FENCES, LANDSCAPING OR OTHER STRUCTURES ARE PERMITTED WITHIN DRAINAGE EASEMENTS SHOWN, EXCEPT AS APPROVED BY THE CITY OF BASTROP AND/OR BASTROP COUNTY.
29. NO LOT OR STRUCTURE SHALL BE OCCUPIED PRIOR TO THE APPLICANT SUBMITTING TO THE CITY OF BASTROP DOCUMENTATION OF SUBDIVISION/SITE REGISTRATION WITH THE TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR) AND PROVIDE DOCUMENTATION OF REVIEW AND COMPLIANCE OF THE SUBDIVISION CONSTRUCTION PLANS WITH TEXAS ARCHITECTURAL BARRIERS ACT (TABA).
30. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP.
31. PRIOR TO CONSTRUCTION OF ANY IMPROVEMENTS ON LOTS IN THIS SUBDIVISION, BUILDING PERMITS WILL BE OBTAINED FROM THE CITY OF BASTROP
32. BUILDING SETBACKS NOT SHOWN SHALL BE IN ACCORDANCE WITH CITY OF BASTROP ZONING ORDINANCE.

STATE OF TEXAS §
COUNTY OF BASTROP § KNOW ALL MEN BY THESE PRESENTS:

THAT, GROVE 71 PARTNERS, LP., JONATHAN KASLING ACTING HEREIN BY AND THROUGH AND BEING THE OWNER OF THAT CERTAIN 1.194 ACRE TRACT OF LAND AS CONVEYED TO GROVE 71 PARTNERS, LP., IN DOCUMENT NUMBER 201916932, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, OUT OF THE NANCY BLAKEY SURVEY, ABSTRACT NUMBER 98, SITUATED IN BASTROP COUNTY, TEXAS, DOES HEREBY SUBDIVIDE 1.194 ACRES OF LAND, IN ACCORDANCE WITH THE ATTACHED MAP OR PLAT, TO BE KNOWN AS:

"BASTROP GROVE, SECTION 2 "

AND DOES HEREBY DEDICATE TO THE PUBLIC, THE USE OF THE EASEMENTS SHOWN HEREON, SUBJECT TO ANY EASEMENTS AND/OR RESTRICTIONS HERETOFORE GRANTED AND NOT RELEASED.

WITNESS MY HAND, THIS THE 26 DAY OF November, 20 19, A.D.

JONATHAN KASLING
GROVE 71 PARTNERS, LP.

STATE OF TEXAS §
COUNTY OF BASTROP § KNOW ALL MEN BY THESE PRESENTS:

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED Jonathan Kasling KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT OF WRITING, AND HE ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED AND IN THE CAPACITY THEREIN STATED.

WITNESS MY HAND AND SEAL OF OFFICE, THIS THE 26 DAY OF November, 2019, A.D.

NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

APPROVED ON THIS _____ DAY OF _____, 20____ A.D., BY THE PLANNING & ZONING COMMISSION OF THE CITY OF BASTROP.

APPROVED:
Deborah A. Moore
PLANNING & ZONING COMMISSION
CHAIRMAN

ATTEST:
CITY SECRETARY, CITY OF
BASTROP, TEXAS

I, ROSE PIETSCH, CLERK OF BASTROP COUNTY, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT OF WRITING AND ITS CERTIFICATE OF AUTHENTICATION WAS FILED FOR RECORD IN MY OFFICE ON THE 3rd DAY OF January, 2020 A.D. IN THE PLAT RECORDS OF SAID COUNTY AND STATE IN PLAT CABINET 7 PAGE(s) 12-B FILED FOR RECORD AT 12:45 O'CLOCK P.M., THIS 3rd DAY OF January, 2020 A.D.

WITNESS MY HAND AND SEAL OF OFFICE OF THE COUNTY CLERK, THE 3rd DAY OF January, 2020 A.D.

ROSE PIETSCH, COUNTY CLERK, BASTROP COUNTY, TEXAS

BY: DEPUTY

FILED Jan 3 2020
12:45 P.M.
Rose Pietsch
COUNTY CLERK
BASTROP COUNTY, TEXAS

COUNTY COURT OF BASTROP COUNTY, TEXAS

THIS FLOOD STATEMENT, AS DETERMINED BY A H.U.D.–F.I.A. FLOOD INSURANCE RATE MAP, DOES NOT IMPLY THAT THE PROPERTY OR THE IMPROVEMENTS THEREON WILL BE FREE FROM FLOODING OR FLOOD DAMAGE. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR, AND FLOOD HEIGHTS MAY INCREASE BY MAN–MADE OR NATURAL CAUSES.

THIS STATEMENT SHALL NOT CREATE LIABILITY ON THE PART OF ENGINEER OR SURVEYOR.

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

I, BRENDAN P. McENTEE, P.E. DO HEREBY CERTIFY THAT THE STREETS AND DRAINAGE DESIGN, AS SHOWN HEREON, COMPLIES WITH THE SUBDIVISION REGULATIONS FOR THE CITY OF BASTROP, AND THAT THE 100 YEAR FLOOD PLAIN IS AS SHOWN AND WILL BE CONTAINED WITHIN THE DRAINAGE EASEMENT AND OR DRAINAGE RIGHT–OF–WAY, AS SHOWN HEREON.

ENGINEERING BY: Brendan P McEntee DATE 11/25/2019
BRENDAN P. McENTEE, P.E. NO. 96200
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED
PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

THAT I, AARON V. THOMASON, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON–THE–GROUND SURVEY OF THE LAND AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH THE SUBDIVISION REGULATION OF THE CITY OF BASTROP, BASTROP COUNTY, TEXAS. ALL EASEMENTS OF RECORD HAVE BEEN IDENTIFIED ON THIS PLAT TO THE BEST OF MY KNOWLEDGE.

SURVEYED BY: _____ DATE 25 Nov 2019
AARON V. THOMASON ~ R.P.L.S. NO. 6214
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
REGISTERED
AARON V. THOMASON
6214
PROFESSIONAL
LAND SURVEYOR

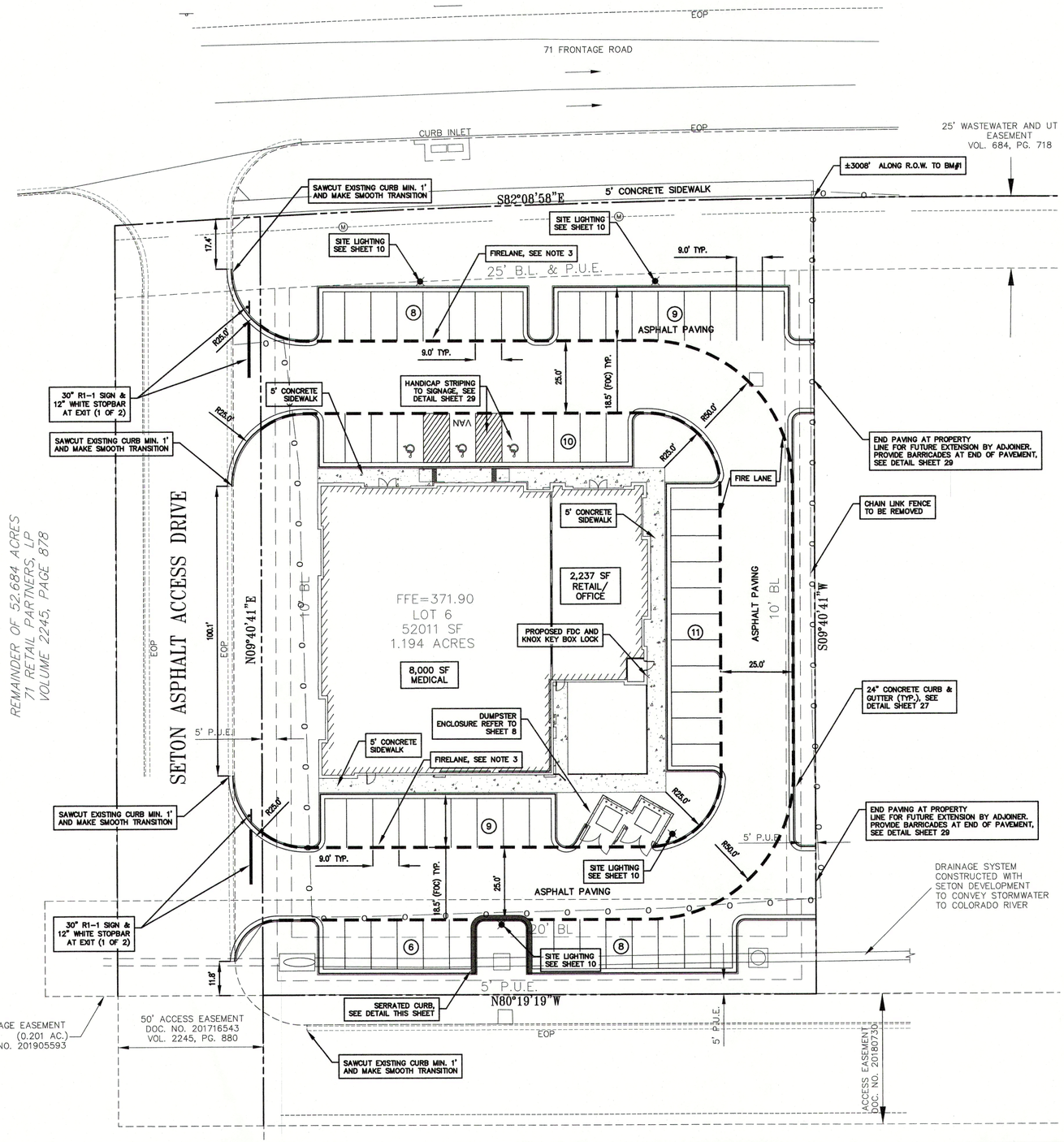
CUSTOMER COPY

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791 ◆ REG. # 10024900
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

PATH–J:\AC3D\5135\Survey\FINAL PLAT – 1.194 AC BASTROP MEDTAIL.dwg

!!! WARNING !!!:
UNDERGROUND UTILITIES SHOWN ON THESE PLANS ARE A BEST ESTIMATE BASED ON RECORDS THAT COULD BE OBTAINED AND PHYSICAL FEATURES VISIBLE AT THE GROUND LEVEL. THE ENGINEER MAKES NO ASSERTIONS BEYOND THAT THEY ARE A BEST ESTIMATE AND AN ATTEMPT TO HELP IDENTIFY POSSIBLE UTILITIES IN THE AREA. THE CONTRACTOR MUST CALL ONE CALL IN ACCORDANCE WITH THE NOTES TO BETTER LOCATE ANY UNDERGROUND UTILITIES.

WARNING!!!!
REVIEW THE SEQUENCE OF CONSTRUCTION ON THE GENERAL NOTES SHEET PRIOR TO BEGINNING CONSTRUCTION.





0 20' 40'

SCALE: 1" = 20'

LEGEND

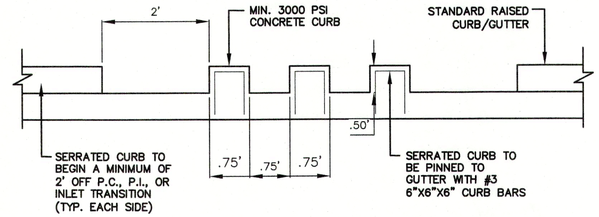
- PROPERTY LINE
- OU — EXISTING OVERHEAD UTILITY
- WLN — EXISTING WASTEWATER LINE
- WWLN — EXISTING EASEMENT/BUFFER LINE
- FIRE LANE
- EXISTING GUY WIRE
- EXISTING POWER POLE
- EXISTING SIGN-ROAD
- EXISTING WASTEWATER MANHOLE
- SERRATED CURB
- WHITE STOPBAR
- PARKING COUNT
- SITE LIGHTING
- TEMPORARY BARRICADE

SITE DATA BLOCK

LOT 6:	1.194	ACRES
	52,011	SF
ZONING :	P-5 CORE	
PROPOSED BUILDING:		
MEDICAL OFFICE USE	8,000	SF
RETAIL/OFFICE	2,237	SF
TOTAL BUILDING	10,237	SF
BUILDING COVERAGE (%)	19.40	
OPEN SPACE	0.45	ACRES
OPEN SPACE (%)	37.7	
IMPERVIOUS COVER	0.65	ACRES
IMPERVIOUS COVER %	54.4	
PARKING ANALYSIS:		
REQUIRED PARKING		
	MEDICAL 1 SPACE/200	40
	RETAIL 1 SPACE/200	11
TOTAL SPACES REQUIRED		51
	ADA ACCESSIBLE REQUIRED	3
PROPOSED PARKING		
	STANDARD PARKING	58
	HANDICAP PARKING	3
TOTAL SPACES PROPOSED		61

GENERAL NOTES:

1.) DIMENSIONS ARE TO FACE OF CURB. ALL DIMENSIONS & RADII ARE TO FACE TO FACE OF CURB IF ONE EXISTS. ALL RADII ARE 3' UNLESS OTHERWISE NOTED.
2.) SEE GENERAL NOTES SHEET.
3.) WHERE — — — IS SHOWN, PAINT CURB, OR PAVEMENT WHERE NO CURB EXISTS, 6" WIDE RED PAINT WITH "NO PARKING FIRE LANE" IN 4" TALL WHITE LETTERS.
WORDING MAY NOT BE SPACED GREATER THAN 30" APART. STRIPING TO BE PAINTED ON THE FACE OF CURB WHEN PRESENT AND PAINTED FLAT ON THE PARKING SURFACE WHEN IT IS NOT.
4.) THE OWNER SHALL BE RESPONSIBLE FOR INSTALLATION OF TEMPORARY EROSION CONTROL, REVEGETATION AND TREE PROTECTION. IN ADDITION, THE OWNER SHALL BE RESPONSIBLE FOR ANY INITIAL TREE PRUNING AND TREE REMOVAL THAT IS WITHIN TEN FEET OF THE CENTER LINE OF THE PROPOSED OVERHEAD ELECTRICAL FACILITIES DESIGNED TO PROVIDE ELECTRIC SERVICE TO THIS PROJECT. THE OWNER SHALL INCLUDE THIS WORK WITHIN THE LIMITS OF CONSTRUCTION FOR THIS PROJECT.
5.) THE OWNER OF THE PROPERTY IS RESPONSIBLE FOR MAINTAINING CLEARANCES REQUIRED BY THE NATIONAL ELECTRIC SAFETY CODE, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS, CITY OF BASTROP RULES AND REGULATIONS AND TEXAS STATE LAWS PERTAINING TO CLEARANCES WHEN WORKING IN CLOSE PROXIMITY TO OVERHEAD POWER LINES AND EQUIPMENT.
6.) ALL IMPROVEMENTS SHALL BE MADE IN ACCORDANCE WITH THE RELEASED SITE PLAN. ANY ADDITIONAL IMPROVEMENTS WILL REQUIRE A SITE PLAN AMENDMENT AND APPROVAL FROM THE PLANNING DEPARTMENT.
7.) APPROVAL OF THIS SITE PLAN DOES NOT INCLUDE BUILDING CODE APPROVAL; FIRE CODE APPROVAL; OR BUILDING, DEMOLITION, OR RELOCATION PERMITS APPROVAL.
8.) ALL SIGNS MUST COMPLY WITH THE CITY OF BASTROP SIGN CODE REQUIREMENTS AND WILL REQUIRE SEPARATE SIGN PERMIT APPLICATION AND REVIEW.
9.) REFER TO BUILDING PLANS FOR EXACT BUILDING DIMENSIONS, LOCATIONS OF DOORS, STOOPS, AND OTHER BUILDING APPURTENANCES. BUILDING SHOWN ON THESE PLANS IS FOR GRAPHICAL REPRESENTATION ONLY, AND SHOULD NOT BE ASSUMED TO BE ACCURATE OR EXACT.
10.) LEGAL ADDRESS AND BUILDING NUMBERS SHALL BE AT LEAST 8 INCHES HIGH AND VISIBLE FROM THE STREET/FIRE LANE. THE ADDRESS NUMBERS MUST BE OF A COLOR THAT CONTRASTS WITH THE BACKGROUND AND MUST BE INSTALLED ON THE SIDE OF THE BUILDING THAT FACES THE PUBLIC STREET



SERRATED CURB DETAIL

NTS

DESIGNED BY: | DRAFTED BY:
DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 Rivera Rd., Ste. 600 Austin, Texas 78750 Fax No. (512) 280-5165

SHEET NAME: OVERALL SITE PLAN SHEET
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
02/06/2020

DATE: 11/25/2019
JOB NUMBER: 5135
SHEET: 03 OF 29
SHEET NO.: 03

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PLANT SCHEDULE

SHADE TREES	QTY	COMMON / BOTANICAL NAME	CONT	CALIPER	HEIGHT	SPREAD		
	10	CEDAR ELM ULMUS CRASSIFOLIA	65 GAL	3" CAL.	10'-12' HT.	5-6' SPR.		
	5	CHINQUAPIN OAK QUERCUS MUHLENBERGII	65 GAL	3.25-3.5" CAL.	11-13' HT.	56' SPR.		
	1	SOUTHERN LIVE OAK QUERCUS VIRGINIANA	65 GAL	3" CAL.	10' HT.	6' SPR.		

SHRUBS	QTY	COMMON / BOTANICAL NAME	CONT	SPACING
GM	12	GULF MUHLY MUHLENBERGIA CAPILLARIS 'REGAL MIST'	3 GAL	36" o.c.
RY	130	RED YUCCA HESPERALOE PARVIFLORA	5 GAL	36" o.c.
DW	98	DON'S DWARF WAXMYRTLE MYRICA CERIFERA 'DON'S DWARF'	5 GAL	36" o.c.
DY	133	DWARF YAUPON ILEX VOMITORIA 'NANA'	5 GAL	36" o.c.

GROUNDCOVER	CODE	QTY	COMMON / BOTANICAL NAME	CONT	SPACING
	NG	66	LANTANA 'NEW GOLD' LANTANA X 'NEW GOLD'	1 GAL	24" o.c.
	ZX	84	ZEXMANIA ZEXMENIA HISPIDA	1 GAL	12" o.c.
TURF	CODE	QTY	COMMON / BOTANICAL NAME	CONT	
	SBG	AS SHOWN	SAHARA BERMUDA GRASS CYNODON DACTYLON 'SAHARA'	HYDRO	

STREET YARD

	REQUIRED	PROVIDED
TOTAL SITE AREA		52,017 S.F.
TOTAL STREET YARD AREA		18,737 S.F.
STREETYARD LANDSCAPE (15% OF STREET YARD REQUIRED)	2,811 S.F.	2,811 S.F.

LANDSCAPE BUFFER

10' LANDSCAPE BUFFER ADJACENT TO RIGHT-OF-WAY OF ANY MAJOR THOROUGHFARE STREET IS REQUIRED, 1 LARGE TREE PER FORTY LINEAR FEET.

REQUIRED	PROVIDED
190 LF = 5 TREES	6 TREES

SHRUBS

SHRUBS MUST BE PLANTED ALONG THE SIDE PROPERTY LINE FROM THE FRONT PROPERTY LINE TO THE REAR. SHRUBS MUST BE PLANTED IN SUCH A MANNER TO CREATE A DENSE HEDGE OF AT LEAST THREE FEET AT MATURITY.

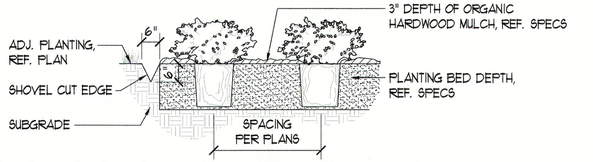
PARKING LOT LANDSCAPING

THERE SHALL BE A LANDSCAPED AREA WITH AT LEAST ONE (1) TREE WITHIN SIXTY FEET (60') OF EVERY PARKING SPACE. THERE- SHALL BE A MINIMUM OF ONE (1) TREE PLANTED IN THE PARKING AREA FOR EVERY TEN (10) PARKING SPACES WITHIN PARKING LOTS WITH MORE THAN TWENTY (20) SPACES. WITHIN PARKING LOTS, LANDSCAPE AREAS SHOULD BE LOCATED TO DEFINE PARKING AREAS AND ASSIST IN CLARIFYING APPROPRIATE CIRCULATION PATTERNS. A LANDSCAPE ISLAND SHALL BE LOCATED AT THE TERMINUS OF ALL PARKING ROWS, AND SHOULD CONTAIN AT LEAST ONE (1) TREE. ALL LANDSCAPE AREAS SHALL BE PROTECTED BY A MONOLITHIC CURB OR WHEEL STOPS AND REMAIN FREE OF TRASH, LITTER, AND CAR BUMPER OVERHANGS.

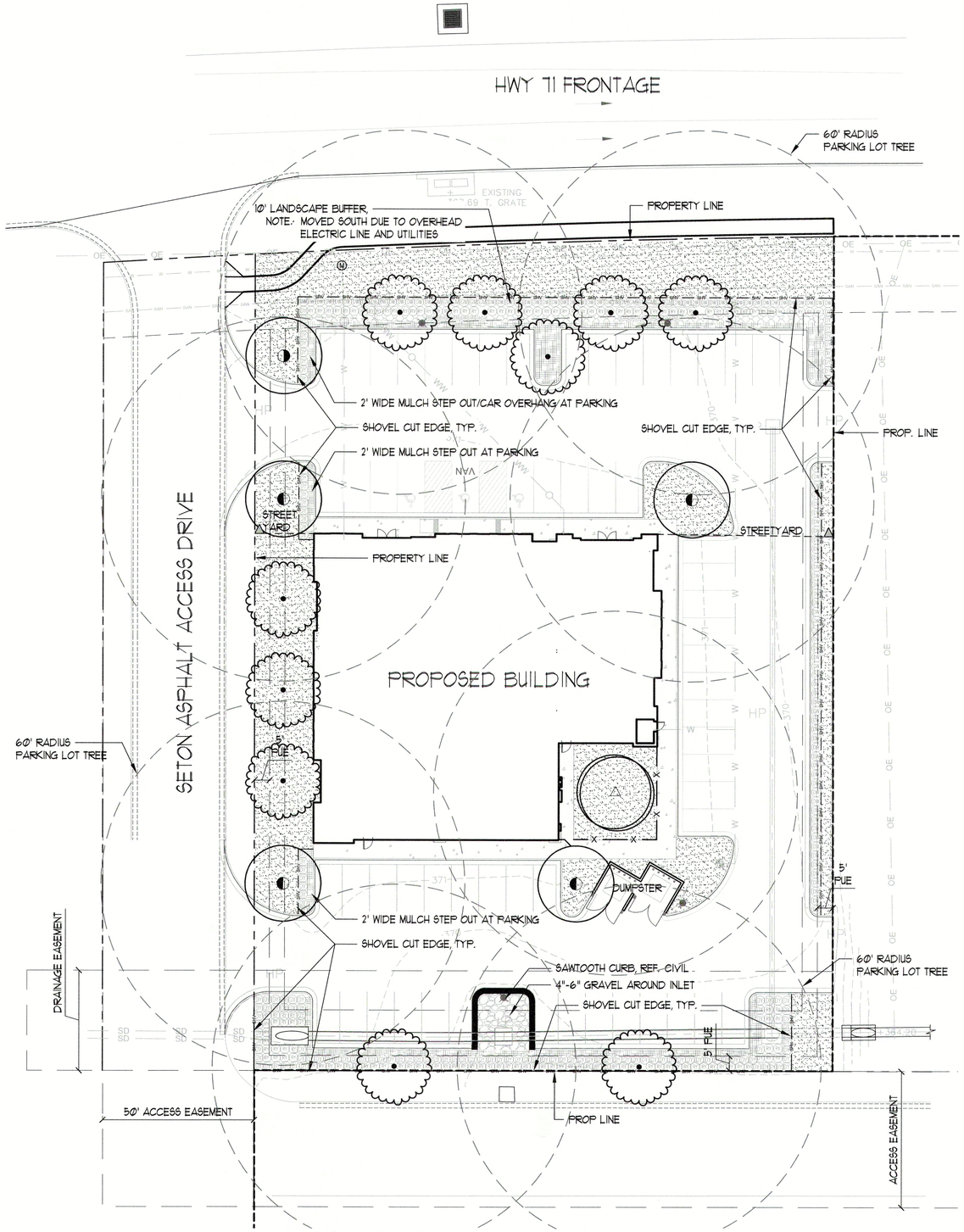
SITE DEVELOPMENT PERMIT LANDSCAPE NOTES:-

1. ALL LANDSCAPED AREAS TO BE PROTECTED BY 6 INCH CURBS, WHEEL-STOPS OR OTHER APPROVED BARRIERS AS PER ECM 2.4.7(A).
2. THE OWNER WILL CONTINUOUSLY MAINTAIN THE REQUIRED LANDSCAPING IN ACCORDANCE WITH DEVELOPMENT STANDARD SECTION-39
3. EXISTING TREES TO BE SAVED SHALL BE PROTECTED BY FENCING BEFORE CONSTRUCTION BEGINS. NO EQUIPMENT OR MATERIALS SHALL BE STORED OR OPERATED WITHIN THE FENCED-IN AREAS. FENCES SHALL BE AT THE DRIP LINE AND COMPLETELY SURROUND THE TREE OR CLUSTERS OF TREES. NO BURNING OF DEBRIS, CLEANING FLUIDS, CONCRETE SPILLS, ETC. WILL BE ALLOWED WITHIN THESE AREAS.
4. BUFFERING OF THE STREET YARD WILL BE ACCOMPLISHED THROUGH THE COMBINATION OF TREES, SHRUBS, GRADE CHANGES, AND FENCES.
5. GRADE CHANGES THAT DO NOT APPEAR ON THE SITE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT BY THE GENERAL CONTRACTOR PRIOR TO CONSTRUCTION.
6. TRENCHING SHALL NOT OCCUR WITHIN THE FENCED DRIP LINE AREAS OF EXISTING TREES.
7. SHRUB MATERIAL NOT TO EXCEED 36" O.C. UNLESS OTHERWISE SPECIFIED. GROUNDCOVERS NOT TO EXCEED 18" O.C. DURING THE TIME OF MARCH 15-OCTOBER 15 INSTALLATION OF HYDROMULCH SHALL BE COMMON BERMUDA OR SAHARA BERMUDA FOR OCTOBER 16 -MARCH 14 INSTALLATION OF HYDROMULCH SHALL BE ANNUAL OR PERENNIAL RYE WITH A SPRING APPLICATION OF COMMON BERMUDA OR SAHARA BERMUDA.
8. ALL LAWN AREAS WITHIN THE LIMITS OF CONSTRUCTION SHALL BE RE-VEGETATED WITH BERMUDA SOD OR RYE UNLESS NATIVE RESTORATION MIX IS SPECIFIED.
9. NOT MORE THAN 50% OF THE TREES AND 50% OF SHRUBS PROPOSED WILL BE OF THE SAME SPECIES.
10. AN AUTOMATIC IRRIGATION SYSTEM SHALL BE INSTALLED. SEE IRRIGATION NOTES IN THESE DRAWINGS FOR REQUIREMENT.
11. IF ESTABLISHING VEGETATION DURING ANY STAGE OF DROUGHT, SECTION 6-4-30 MAY REQUIRE A VARIANCE. CONTACT BASTROP WATER CONSERVATION STAFF.
12. IRRIGATION PLANS REQUIRE SEPARATE PERMITS- APPROVAL OF SITE DEVELOPMENT PLAN DOES NOT CONSTITUTE APPROVAL OF ANY IRRIGATION PLANS OR ELEMENTS OF THE LANDSCAPE PLAN

1 SHADE TREE
SECTION / SINGLE TRUNK
SCALE:- 1/2"=1'-0"



2 SHRUBS / SHOVEL CUT EDGE
SECTION
SCALE:- 1/2"=1'-0"



LANDSCAPE CERTIFICATION

I, MARISSA A. MCKINNEY, DO HEREBY CERTIFY THAT THE PLANS FOR THE DEVELOPMENT PROJECT LOCATED AT HWY 71 EAST OF 304, SATISFY THE REQUIREMENTS OF THE BASTROP CODE OF ORDIANCES, SECTION 39 AND ALL AMENDEMENTS

1/8/2020
MARISSA MCKINNEY — DATE
COLEMAN & ASSOCIATES

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE LANDSCAPE ARCHITECT WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF BASTROP MUST RELY ON THE ADEQUACY OF THE WORK OF THE LANDSCAPE ARCHITECT.

NORTH — SCALE IN FEET (1"=20')
0 5 10 20 50

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COLEMAN & ASSOCIATES
Landscape Architecture
Environmental Design

9890 Silver Mountain Drive
Austin, Texas 78737
Ph: 512-476-2090
F: 512-476-2099

1926 Cambria
San Antonio, Texas 78258
Ph: 210-492-4550
F: 210-492-9930

9511 Modesto Ave. NE
Albuquerque, New Mexico 87122
Ph: 505-433-3426

REGISTERED LANDSCAPE ARCHITECT — MARISSA MCKINNEY — 2723 — STATE OF TEXAS
1/8/2020

LANDSCAPE PLAN AND DETAILS
CITY SUBMITTAL

BASTROP GROVE MEDTAIL DEV.
CITY OF BASTROP
BASTROP COUNTY, TEXAS

REVISIONS

SCALE:	AS SHOWN
DRAWN BY:	MAM
CHECKED BY:	MAM
APP. BY:	MAM
PROJECT NO.	
DATE:	1/8/2020

SHEET:

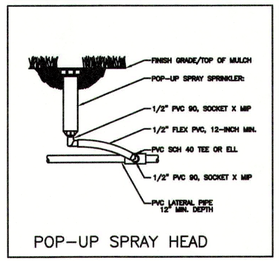
04 OF 29

LEGEND

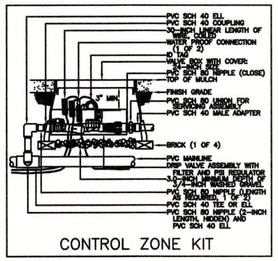
- HUNTER PROS-06-PRS30 SERIES POP UP SPRAY HEADS WITH HUNTER MSBN-50H STREAM BUBBLER NOZZLES. (TWO PER TREE)
  SEE INSTALLATION NOTE #13 REGARDING TREE BUBBLER LATERAL PIPE
- HUNTER PROS-04-PRS30 SERIES POP UP SPRAY HEAD WITH SS / ES SERIES STRIP NOZZLE UNLESS NOTED OTHERWISE.
- HUNTER PROS-04-PRS30 SERIES POP UP SPRAY HEAD WITH PRO SPRAY SERIES NOZZLE AS NOTED BELOW
- NETAFIM TECHLINE TLHCVXR5-12 SERIES DRIP TUBE IN NARROW TURF AREAS INSTALLED AT 4" DEPTH
  SEE INSTALLATION NOTE #17 REGARDING DRIP TUBE LAYOUT IN TURF.
- HUNTER ICV SERIES ELECTRIC REMOTE CONTROL VALVE WITH ICD-100 SERIES DECODER
- HUNTER ICV SERIES ELECTRIC REMOTE CONTROL, "TREE BUBBLER ZONE" VALVE WITH ICD-100 SERIES DECODER
  SEE INSTALLATION NOTE #12 REGARDING TREE BUBBLER LATERAL PIPE
- NETAFIM LVCZ SERIES DRIP VALVE ASSEMBLY WITH PRESSURE REGULATOR AND 140 MESH FILTER
  USE MODEL LVCZSB010075-LF FOR DRIP ZONES WITH .25 TO 4.4 GPM FLOW RATE WITH PRESSURE REGULATOR MODEL #PRV075LF42V2K
  USE MODEL LVCZ10075-HFHP FOR DRIP ZONES WITH 4.5 TO 17.6 GPM FLOW RATE PRESSURE REGULATOR MODEL #PRV075HF45V2K
- WILKINS 375 SERIES REDUCED PRESSURE TYPE BACKFLOW PREVENTOR INSTALLED PER CITY CODE WITH SAME SIZE BRONZE BALL VALVE AND HEATED / INSULATED ENCLOSURE INSTALLED ON THE UP-STREAM SIDE.
- IRRIGATION WATER METER AND TAP, SIZE AS NOTED ON THE PLAN
- CONTROLLER "A"
  HUNTER ACC2 DECODER SERIES TWO-WIRE CONTROLLER MODEL A2C-75D-M WITH TWO A2C-D75 MODULES AND WIRELESS SOLAR SYNC SENSOR LOCATE SENSOR AS FIELD DIRECTED BY THE LANDSCAPE ARCHITECT
  SURGE PROTECTION DEVICE WITH GROUNDING DEVICE TO BE SPACED NO MORE THAN 500 FEET APART ALONG PATH
- BERMAD 310 RAM SERIES "MASTER" VALVE, ICD-100 DECODER, HFS SERIES FLOW METER WITH FCT AND ICD-SEN SENSOR DECODER
- MAINLINE PIPE
  3" DIAMETER AND SMALLER SHALL BE SCHEDULE 40 PVC SOLVENT-WELD TYPE
  4" DIAMETER AND LARGER SHALL BE CLASS 200 PVC O-RING GASKET TYPE WITH DUCTILE IRON GASKET FITTINGS
  4" EQUALIZER LINE BETWEEN TANKS SHALL BE SCHEDULE 40.
- CLASS 200 (EXCEPT 1/2 INCH #315) PVC LATERAL PIPE
- ONE 4" CLASS 200 SLEEVE PIPES
- TWO 4" CLASS 200 SLEEVE PIPES AT PAVEMENT CROSSINGS WITH 2 1/2" MAINLINE OR SMALLER UNLESS NOTED OTHERWISE
  ONE 8" AND ONE 4" CLASS 200 SLEEVE PIPE AT PAVEMENT CROSSINGS WITH 4" MAINLINE UNLESS NOTED OTHERWISE

L.I.C. SHALL SELECT SPRAY NOZZLES FOR "HEAD-TO-HEAD" COVERAGE, ADJUSTED FOR NO OVERSPRAY ONTO WALLS AND WALKS. NO OVERSPRAY INTO STREETS IS PERMITTED.

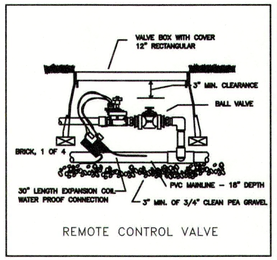
ALL PIPES SHALL BE SIZED TO ALLOW A MAXIMUM FLOW VELOCITY OF 5 FEET PER SECOND



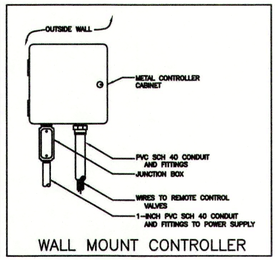
POP-UP SPRAY HEAD



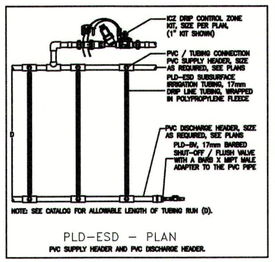
CONTROL ZONE KIT



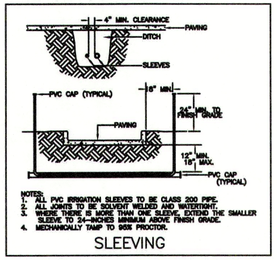
REMOTE CONTROL VALVE



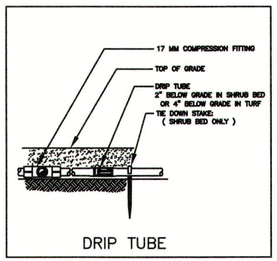
WALL MOUNT CONTROLLER



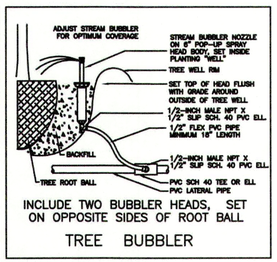
PLD-ESD - PLAN
PVC SUPPLY HEADER AND PVC DISCHARGE HEADER.



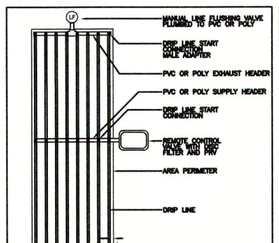
SLEEVING



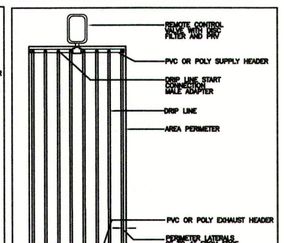
DRIP TUBE



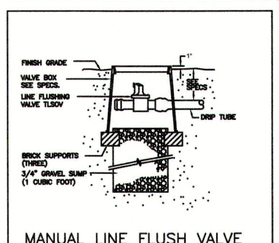
INCLUDE TWO BUBBLER HEADS, SET ON OPPOSITE SIDES OF ROOT BALL
TREE BUBBLER



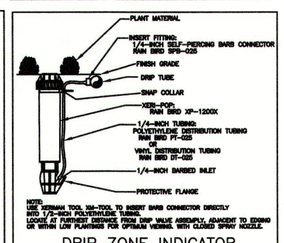
SUPPLY AND EXHAUST HEADERS SHALL BE CLASS 200 PVC PIPE, OF THE SAME DIAMETER AS THE ZONE VALVE SIZE.
USE DRIP TUBE FOR SUPPLY AND EXHAUST HEADERS ON GRIDS WITH FLOW SMALLER THAN 5 GPM ONLY.
DRIP CENTER FEED LAYOUT



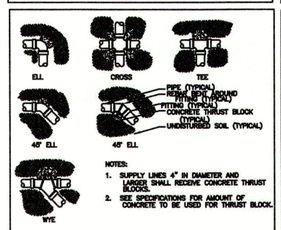
SUPPLY AND EXHAUST HEADERS SHALL BE CLASS 200 PVC PIPE, OF THE SAME DIAMETER AS THE ZONE VALVE SIZE.
USE DRIP TUBE FOR SUPPLY AND EXHAUST HEADERS ON GRIDS WITH FLOW SMALLER THAN 5 GPM ONLY.
DRIP END FEED LAYOUT



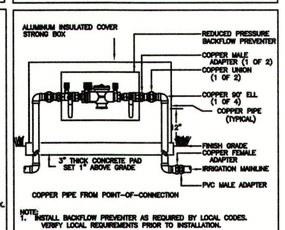
MANUAL LINE FLUSH VALVE



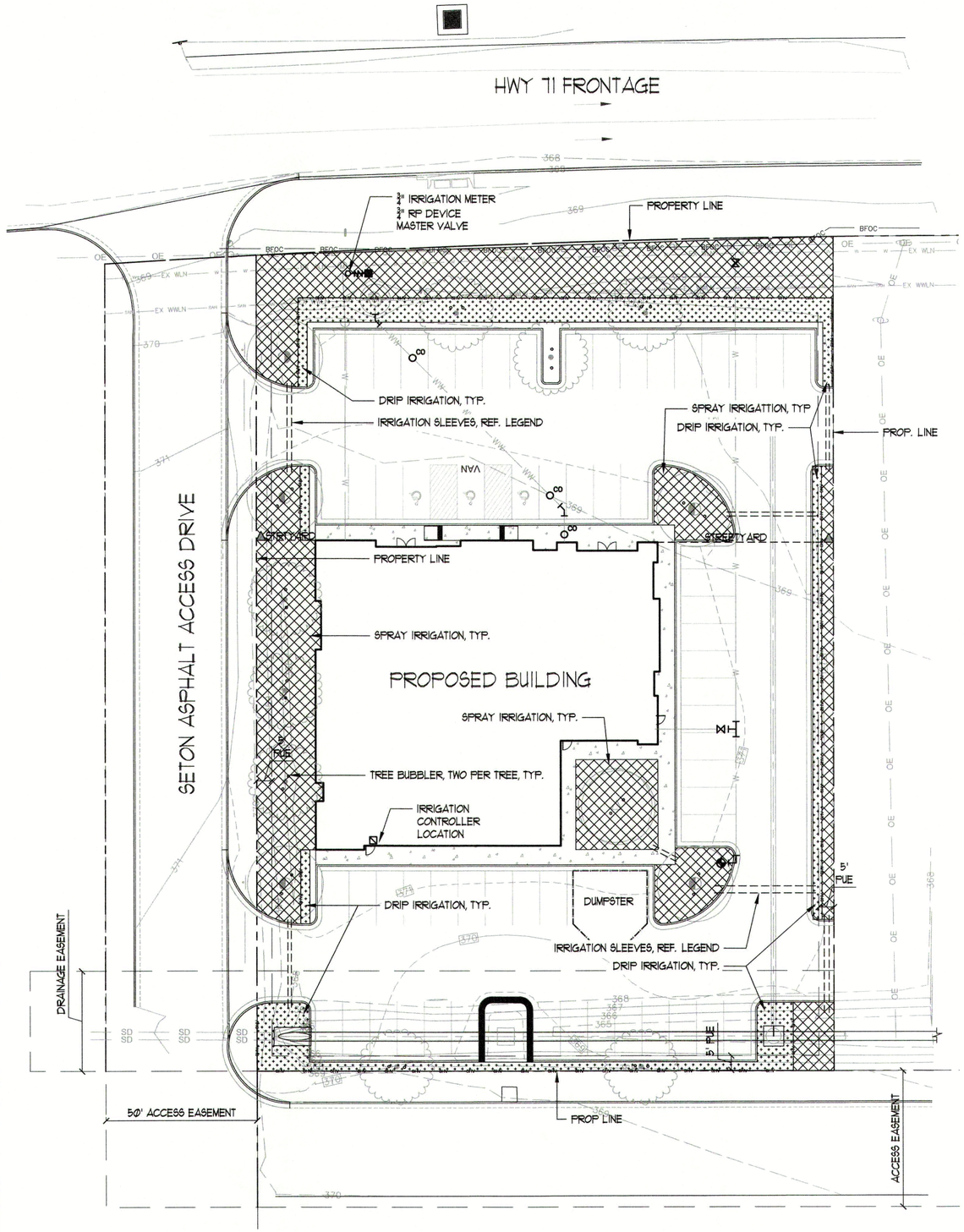
NOTE: USE TERMINAL TOOL 338-TOOL TO INSERT BARB CONNECTOR DIRECTLY INTO 1/4-INCH POLYETHYLENE TUBING.
LOCATE AT FURTHEST DISTANCE FROM DRIP VALVE ASSEMBLY, ADJACENT TO EDGING OR WITHIN LOW PLANTINGS FOR OPTIMUM VIEWING. WITH CLOSED SPRAY NOZZLE.
DRIP ZONE INDICATOR



THRUST BLOCK



NOTE:
1. INSTALL BACKFLOW PREVENTER AS REQUIRED BY LOCAL CODES. VERIFY LOCAL REQUIREMENTS PRIOR TO INSTALLATION.
RP DEVICE



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COLEMAN & ASSOCIATES
Landscape Architecture
Environmental Design

9890 Silver Mountain Drive
Austin, Texas 78737
Ph: 512-476-2090
F: 512-476-2099

1926 Cambria
San Antonio, Texas 78258
Ph: 210-492-4550
F: 210-492-9930

9511 Modesto Ave. NE
Albuquerque, New Mexico 87122
Ph: 505-433-3426

REGISTERED LANDSCAPE ARCHITECT MARISSA McGINNIS 3225 STATE OF TEXAS
10/14/2019

IRRIGATION PLAN AND DETAILS
CITY SUBMITTAL

BASTROP GROVE MEDTAIL DEV.
CITY OF BASTROP
BASTROP COUNTY, TEXAS

REVISIONS

SCALE:	AS SHOWN
DRAWN BY:	MAM
CHECKED BY:	MAM
APP. BY:	MAM
PROJECT NO.	
DATE	10/14/2019

SHEET:

05 OF 29

LEVY

PO Box 30312
Austin, Texas 78755
(512) 342-9177

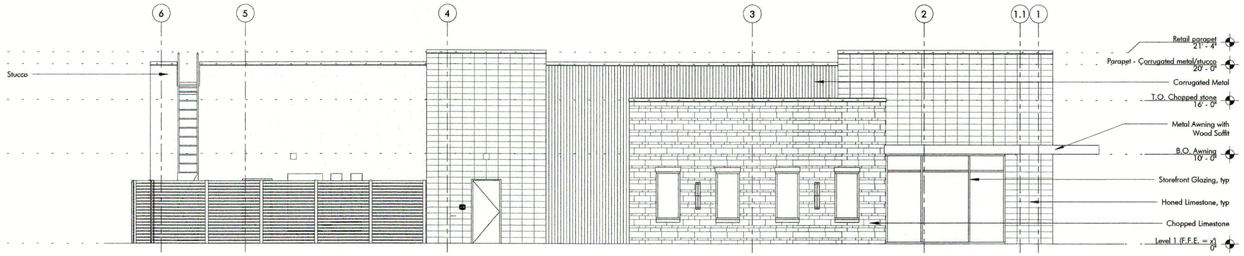
www.LEVYArchitects.com

PRELIMINARY

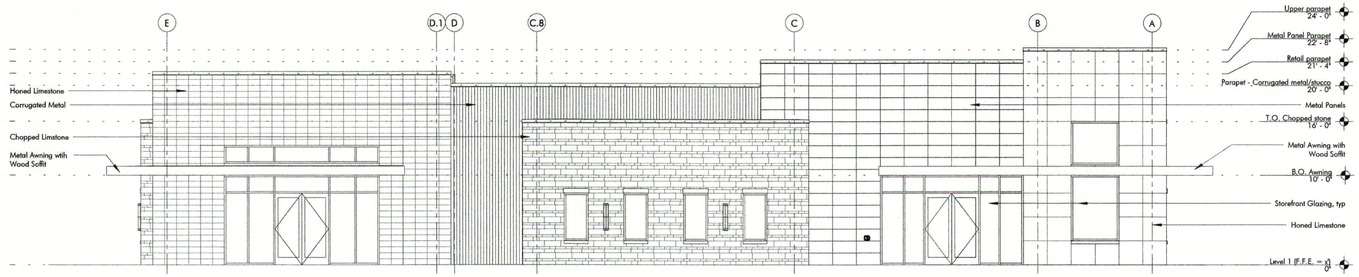
This document was issued on
11/12/19
by Michael D. Gin, Architect,
State of Texas, #21287.
Not for regulatory approval,
permitting, or construction.

FIELD INSPECTION REQUIRED

Prior to performing any bidding, new construction, and / or repairs, General Contractor shall visit the site, inspect all existing conditions, and report any discrepancies to the Architect.



2 EAST ELEVATION
SCALE: 1/8" = 1'-0"



1 NORTH ELEVATION
SCALE: 1/8" = 1'-0"

The Grove Medtail

Bastrop, TX 78602

#	Date	Issue

Project Number: L9007

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ELEVATIONS FOR CIVIL

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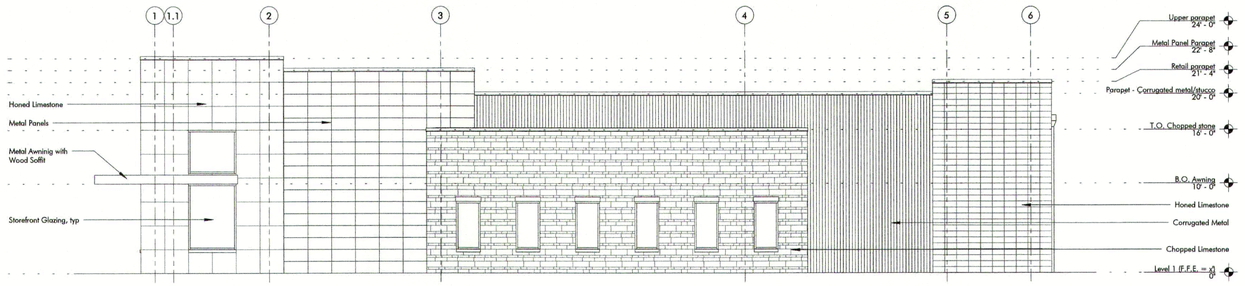
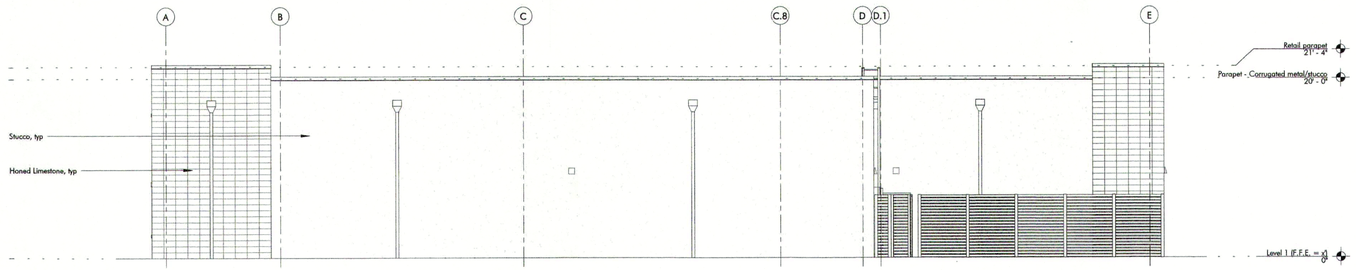


2 WEST ELEVATION

SCALE: 1/8" = 1'-0"



1 SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

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PO Box 30312
Austin, Texas 78755
(512) 342-9177

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PRELIMINARY

This document was issued on 11/12/19
by Michael D. Gin, Architect, State of Texas, #21287.
Not for regulatory approval, permitting, or construction.

FIELD INSPECTION REQUIRED

Prior to performing any bidding, new construction, and / or repairs, General Contractor shall visit the site, inspect all existing conditions, and report any discrepancies to the Architect.

The Grove Medtail

Bastrop, TX 78602

#	Date	Issue

Project Number: L9007

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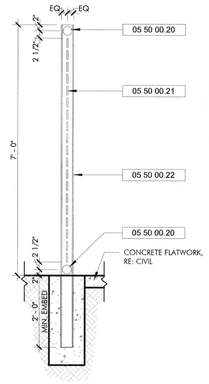
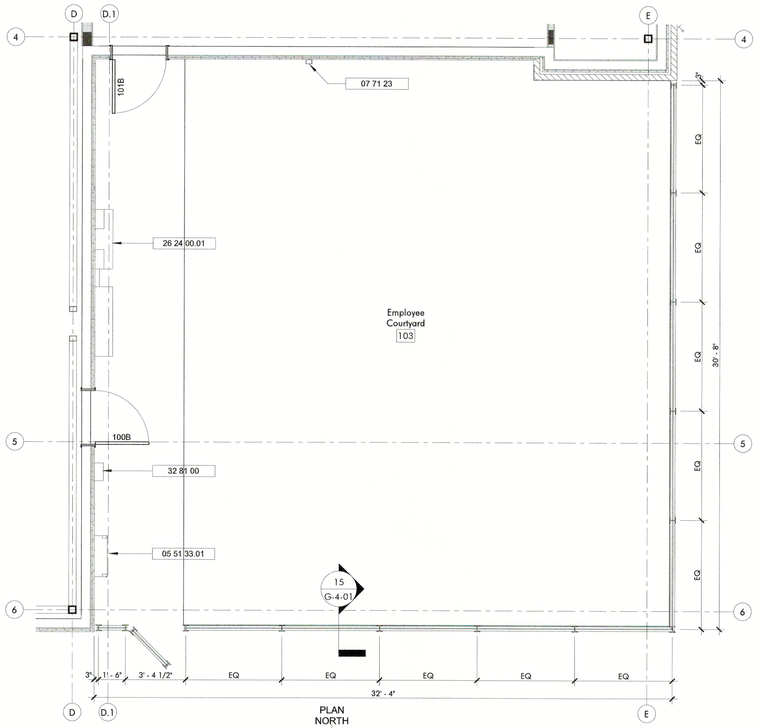
ELEVATIONS FOR CIVIL

11/12/2019 11:48:11 AM



15 SCREEN DETAIL

SCALE: 1/2" = 1'-0"

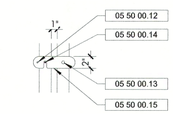


7 EMPLOYEE COURTYARD

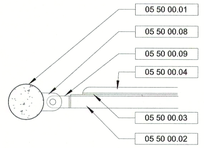
SCALE: 1/4" = 1'-0"

KEY NOTES

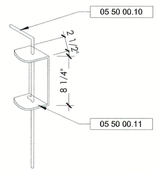
04 22 00.01	REINFORCED CMU WALL WITH STUCCO FINISH TO MATCH BUILDING. INSIDE FACE OF CMU TO BE PAINTED TO MATCH THE BUILDING, RE: 17 & 18/A-600
05 50 00.01	6" DIA. PAINTED STEEL PIPE FILLED WITH CONCRETE. CAST BOLLARD IN CONCRETE AT A DEPTH OF 5'-0" (MIN.) BELOW DUMPSTER PAD PAVEMENT
05 50 00.02	TS 2" X 2" X 3/8" STEEL FRAME, WELD FRAME SOLID ALL SIDES
05 50 00.03	1/16" STEEL PLATE CORNER BRACE, WELD BOTH SIDES
05 50 00.04	L 1" X 1" X 3/8" STEEL CROSS BRACE, WELD TO FRAME
05 50 00.05	L 5/8" X 1" X 1/8" STEEL BRACE, WELD TO FRAME
05 50 00.06	1/4" STAINLESS STEEL FASTENER
05 50 00.07	CORRUGATED METAL PANEL TO MATCH BUILDING
05 50 00.08	L 3" X 3" X 3/8" X 3" RADIUS END AS SHOWN, WELD 1/2" ROUND X 1 1/2" A325 STEEL PIVOT STUD TO BOLLARD
05 50 00.09	L 3" X 3" X 3/8" X 2" RADIUS END AS SHOWN, PROVIDE 9/16" HOLE, WELD TO GATE
05 50 00.10	1" STAINLESS STEEL ROD WITH SIDE ROD FOR LIFT OUT, PROVIDE 2" DEEP HOLE IN CONCRETE PAVING TO RECEIVE ROD
05 50 00.11	3/8" STEEL PLATE FABRICATED AS SHOWN, WELD TO FRAME
05 50 00.12	1/2" ROUND STAINLESS STEEL ROD KNOB, WELD TO LATCH
05 50 00.13	1/2" BOLT PIVOT; DOUBLE NUT FOR EASY PIVOT
05 50 00.14	1/2" STAINLESS STEEL STUD, WELD TO TUBE STEEL
05 50 00.15	1/8" STAINLESS STEEL PLATE LATCH ARM, FABRICATE AS SHOWN
05 50 00.16	GATE FRAME, RE: 17/G-4.01
05 50 00.17	GATE HINGE, RE: 17/G-4.01
05 50 00.18	CANE BOLT, RE: 17/G-4.01
05 50 00.20	3" DIA. STEEL RAIL, WELDED TO POST, PAINTED EP-01.1
05 50 00.21	3" x 1/2" STEEL BATTEN STRIPS SPACED 1" APART, WELDED TO POST, PAINTED EP-01.1
05 50 00.22	W4x13 PAINTED EP-01.1
05 51 33.01	ROOF ACCESS LADDER WITH MESH SECURITY GATE PRIMED AND FINISHED WITH EP-01.1
07 71 23	PRE-FINISHED MANUFACTURED SCUPPER & DOWNSPOUT, RE: PLUMBING
26 24 00.01	DISCONNECTS AND TENANT PANELBOARDS, RE: ELECTRICAL
32 30 00.01	DUMPSTER PROVIDED BY OWNER
32 31 00.01	DUMPSTER GATE, RE: 10/G-4.01
32 81 00	IRRIGATION CONTROL BOX, RE: LANDSCAPE



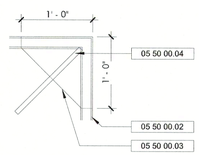
DETAIL E - GATE LATCH



DETAIL C - GATE HINGE



DETAIL D - CANE BOLT

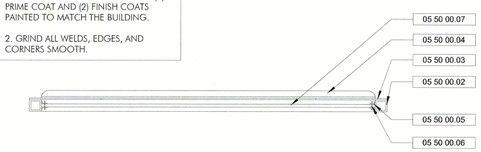


DETAIL B - FRAME ELEVATION

NOTE:

1. ALL STEEL SHALL BE PAINTED WITH (1) PRIME COAT AND (2) FINISH COATS PAINTED TO MATCH THE BUILDING.

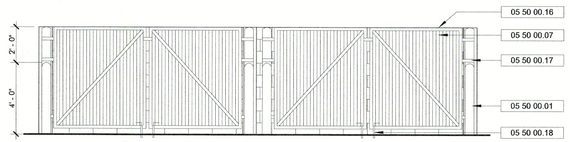
2. GRIND ALL WELDS, EDGES, AND CORNERS SMOOTH.



DETAIL A - GATE PLAN

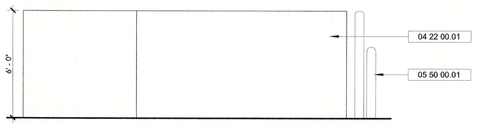
17 DUMPSTER GATE - DETAILS

SCALE: 1" = 1'-0"



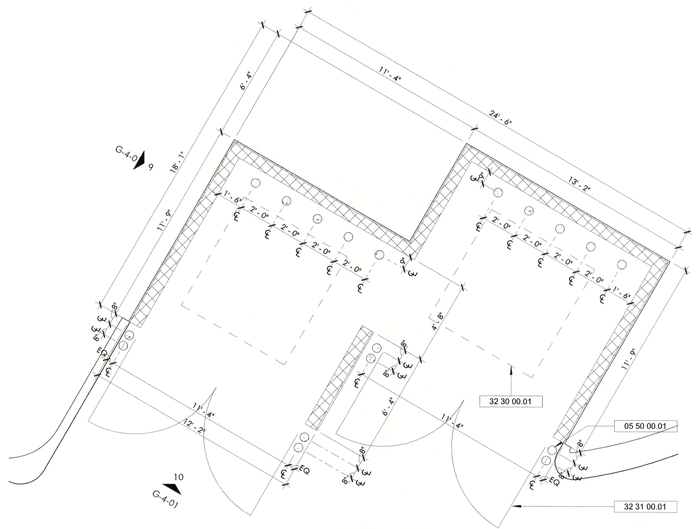
10 DUMPSTER - GATE

SCALE: 1/4" = 1'-0"



9 DUMPSTER - SIDE

SCALE: 1/4" = 1'-0"



1 DUMPSTER ENCLOSURE

SCALE: 1/4" = 1'-0"

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LEVY

PO Box 30312
Austin, Texas 78755
(512) 342-9177

www.LEVYArchitects.com

PRELIMINARY

This document was issued on 01/10/2020 by Michael D. Gin, Architect, State of Texas, #21287. Not for regulatory approval, permitting, or construction.

FIELD INSPECTION REQUIRED

Prior to performing any bidding, new construction, and / or repairs, General Contractor shall visit the site, inspect all existing conditions, and report any discrepancies to the Architect.

The Grove Medtail

Bastrop, TX 78602

#	Date	Issue
	01/10/2020	Pricing and Permit

Project Number: L9007

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ENLARGED SITE DETAILS

08 OF 29

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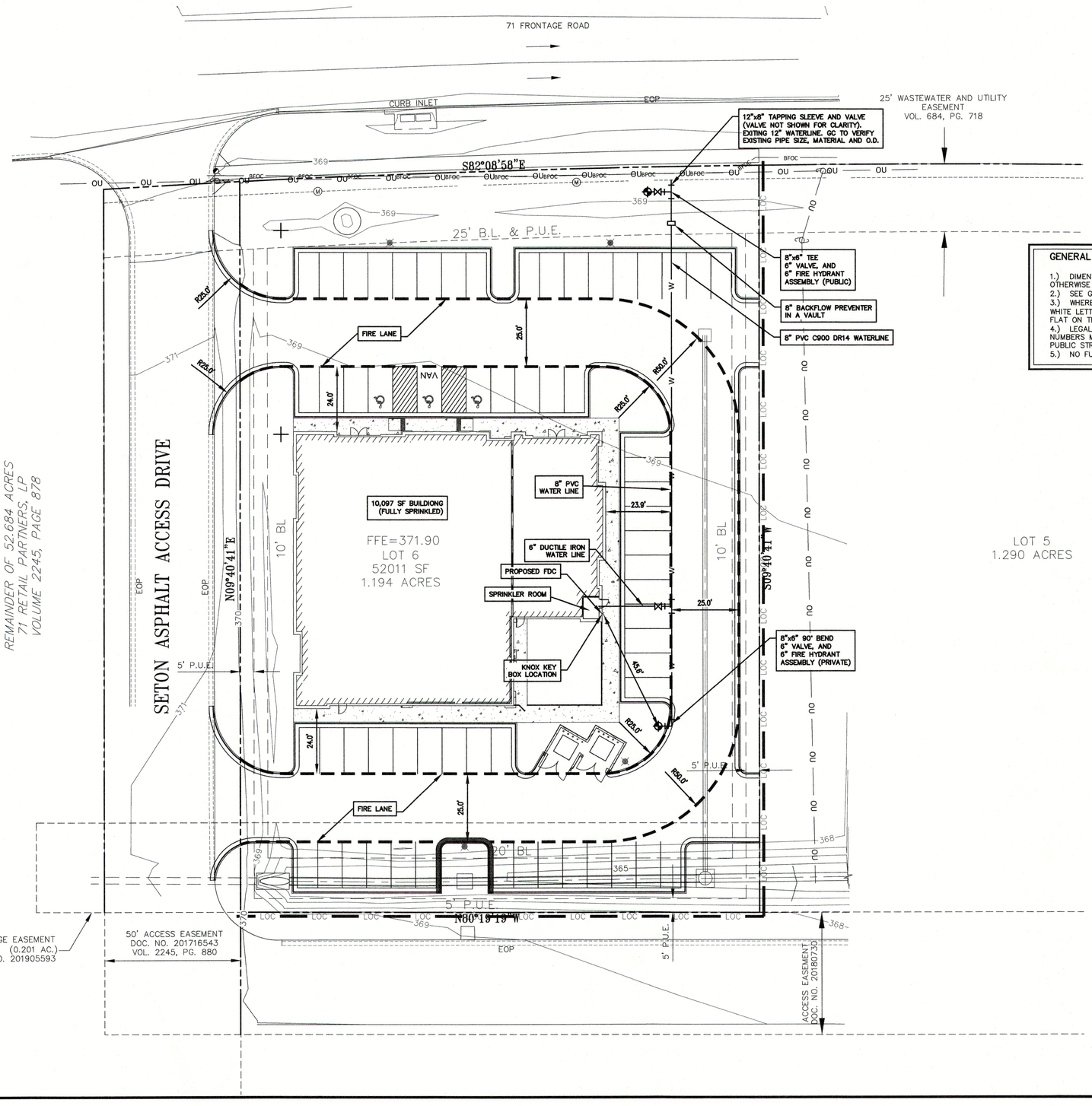

0 20' 40'

SCALE: 1" = 20'

GENERAL NOTES:

1.) DIMENSIONS ARE TO FACE OF CURB. ALL DIMENSIONS & RADII ARE TO FACE TO FACE OF CURB IF ONE EXISTS. ALL RADII ARE 3' UNLESS OTHERWISE NOTED.
2.) SEE GENERAL NOTES SHEET.
3.) WHERE ▬ ▬ ▬ IS SHOWN, PAINT CURB, OR PAVEMENT WHERE NO CURB EXISTS, 6" WIDE RED PAINT WITH "NO PARKING FIRE LANE" IN TALL WHITE LETTERS. WORDING MAY NOT BE SPACED GREATER THAN 30" APART. STRIPING TO BE PAINTED ON THE FACE OF CURB WHEN PRESENT AND PAINTED FLAT ON THE PARKING SURFACE WHEN IT IS NOT.
4.) LEGAL ADDRESS AND BUILDING NUMBERS SHALL BE AT LEAST 8 INCHES HIGH AND VISIBLE FROM THE STREET/FIRE LANE. THE ADDRESS NUMBERS MUST BE OF A COLOR THAT CONTRASTS WITH THE BACKGROUND AND MUST BE INSTALLED ON THE SIDE OF THE BUILDING THAT FACES THE PUBLIC STREET
5.) NO FUEL TANKS OR DIESEL FUEL GENERATORS ARE PROPOSED.

BASTROP FIRE DEPARTMENT

FIRE DESIGN CODES	2018 INTERNATIONAL FIRE CODE WITH APPENDICES AND LOCAL AMENDMENTS
FIRE FLOW DEMAND @ 20 psi)	2,250 gpm - 2 hr DURATION
INTENDED USE	BUSINESS (GROUP B)
CONSTRUCTION CLASSIFICATION	TYPE II-B
BUILDING FIRE AREA (S.F.)	10,237 sf
AUTOMATIC FIRE SPRINKLER SYSTEM TYPE (IFAPPLICABLE)	NFPA 13
REDUCED FIRE FLOW DEMAND @ 20 psi FOR HAVING A SPRINKLER SYSTEM (gpm) (IF APPLICABLE)	1,500 gpm - 2 hr DURATION
FIRE HYDRANT FLOW TEST DATE	12/05/2019
FIRE HYDRANT FLOW TEST LOCATION	ONE MAIN FINANCIAL 696 HIGHWAY 71
ALTERNATIVE METHOD OF COMPLIANCE AMOC (IF APPLICABLE)	N/A

DESIGNED BY: | DRAFTED BY:

DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr. Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600 Austin, Texas 78750
Fax No. (512) 280-5165

SHEET NAME: FIRE ACCESS AND CONTROL PLAN SHEET
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
@ F3791
02/06/2020

DATE 11/25/2019
JOB NUMBER 5135
SHEET 09 OF 29
SHEET NO. 09

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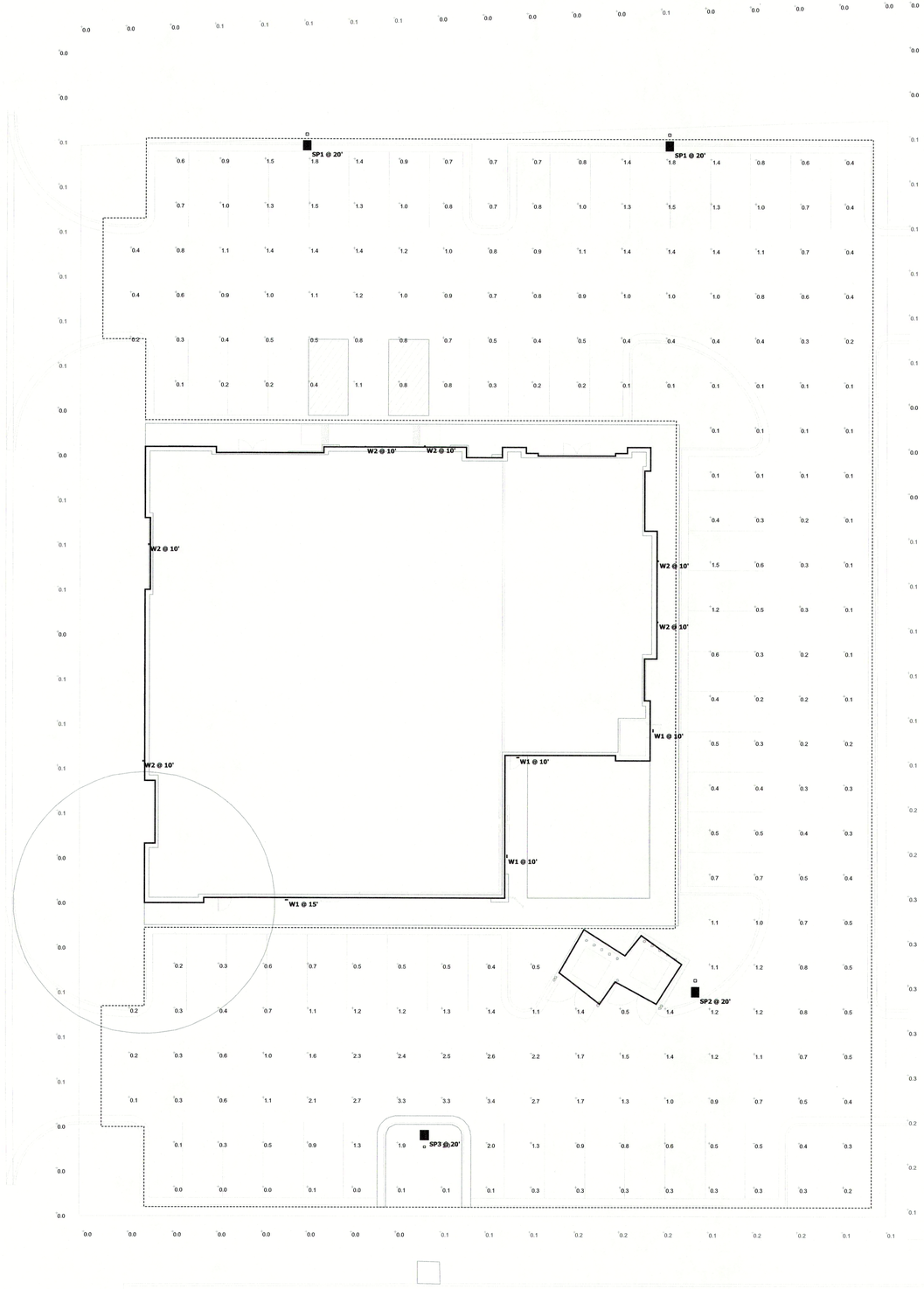

Plan View
Scale - 1" = 14'

EXTERIOR LIGHTING FIXTURE SCHEDULE

TYPE	COUNT	DESCRIPTION	MANUFACTURER	CATALOG NO.	LUMENS	COLOR TEMP	INPUT WATTS	VOLTS	MOUNTING	REMARKS
SP1	2	LED POLE LIGHT	LITHONIA	DSXD LED P2 40K TFTM MVOLT SPA HS SSS 18 4C DM19AS DDBXD	6007	4000K	49W	MVOLT	POLE	FULLY SHEILDED, NO UP LIGHTING
SP2	1	LED POLE LIGHT	LITHONIA	DSXD LED P2 40K T5M MVOLT SSS 18 4C DM19AS DDBXD	6007	4000K	49W	MVOLT	POLE	FULLY SHEILDED, NO UP LIGHTING
SP3	1	POLE LIGHT	LITHONIA	DSXD LED P3 40K BLC MVOLT SSS 18 4C DM19AS DDBXD	6926	4000K	71W	MVOLT	POLE	FULLY SHEILDED, NO UP LIGHTING
W1	4	WALL PACK	BEGA	33 242 K4	1893	4000K	18W	MVOLT	SURFACE	FULLY SHEILDED, NO UP LIGHTING
W2	6	WALL SCONCE	OBERON	WS-W45726 3000K BK 35	1027	4000K	35W	MVOLT	SURFACE	FIXTURE LUMEN OUTPUT IS BELOW 2050 LUMENS AND DOES NOT REQUIRE FULL CUT OFF PER CODE

NOTES:
1. WHETHER INDICATED IN CATALOG NUMBER OR NOT, CONTRACTOR TO PROVIDE ALL NECESSARY ACCESSORIES AND MOUNTING HARDWARE REQUIRED FOR A COMPLETE INSTALLATION.
2. COORDINATE FIXTURE COLOR SELECTION WITH ARCHITECT PRIOR TO PURCHASE.
3. LEDs SHALL MEET THE FOLLOWING MIN SPECS IN ADDITION TO THE REQUIREMENTS SHOWN ELSEWHERE:
   a. 50,000 HOUR RATED, MIN CRI = 80 (FOR INTERIOR LIGHTING), 1 TO 10V DIMMABLE
   b. LAMP CCT SHALL CONFORM TO ANSI C78.377A COLOR BINNING AND UTILIZE 4 STEP MACADAM ELLIPSE ALGORITHM BINNING PROCESS
4. LED DRIVERS SHALL MEET THE FOLLOWING MIN SPECS IN ADDITION TO THE REQUIREMENTS SHOWN ELSEWHERE:
   a. THD LESS THAN 10 %, POWER FACTOR GREATER THAN 90%
5. TOTAL INSTALLED LUMENS 38681

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Parking Lot	+	0.8 fc	3.4 fc	0.0 fc	N/A	N/A
Property Line	+	0.1 fc	0.3 fc	0.0 fc	N/A	N/A

VISUAL

Designer

Date
2/11/2020
Scale
Not to Scale
Drawing No.
10 OF 29

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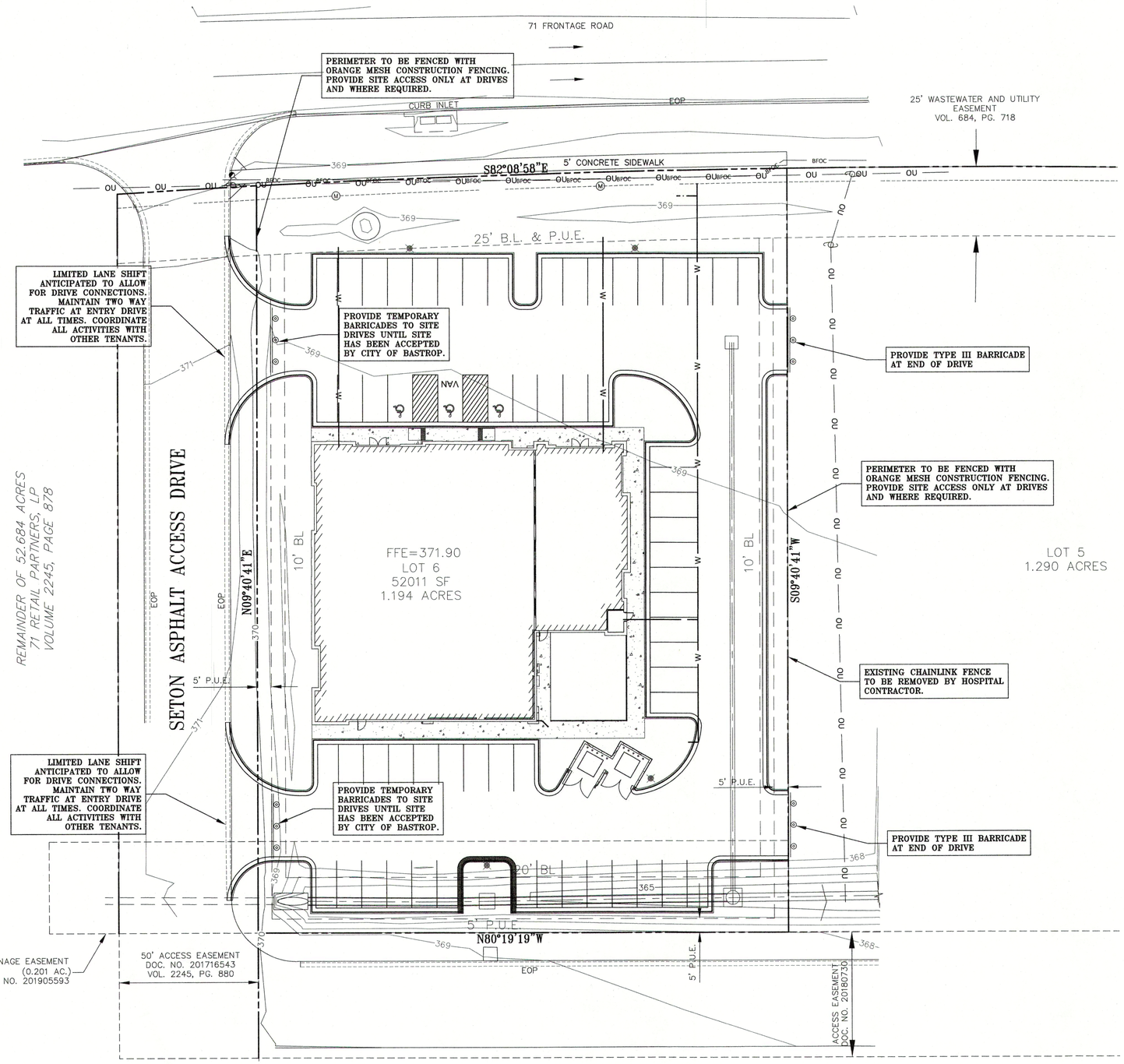



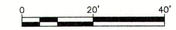

SCALE: 1" = 20'

LEGEND

- PROPERTY LINE
- OU — EXISTING OVERHEAD UTILITY
- WLN — EXISTING WASTEWATER LINE
- WWLN — EXISTING EASEMENT/BUFFER LINE
- FIRE LANE
- EXISTING GUY WIRE
- EXISTING POWER POLE
- EXISTING SIGN-ROAD
- EXISTING WASTEWATER MANHOLE
- SERRATED CURB
- WHITE STOPBAR
- PARKING COUNT
- SITE LIGHTING
- TEMPORARY BARRICADE

TRAFFIC CONTROL NOTES:

1. NO PUBLIC LANE CLOSURES ARE ANTICIPATED AS A RESULT OF THIS PROJECT.
2. NO PEDESTRIAN ROUTE IMPACTS ARE ANTICIPATED AS NO AREA SIDEWALKS EXIST.
3. ENTIRE PROJECT AREA TO BE FENCED WITH SILT FENCE PER THE EROSION CONTROL PLAN AS WELL AS ORANGE MESH CONSTRUCTION GRADE FENCING.

DESIGNED BY:

DRAFTED BY:

DATE

REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
Fax No. (512) 280-5165

SHEET NAME: TRAFFIC CONTROL & PEDESTRIAN SAFETY SHEET

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
02/06/2020

DATE 11/25/2019

JOB NUMBER 5135

SHEET 11 OF 29

SHEET NO. 11

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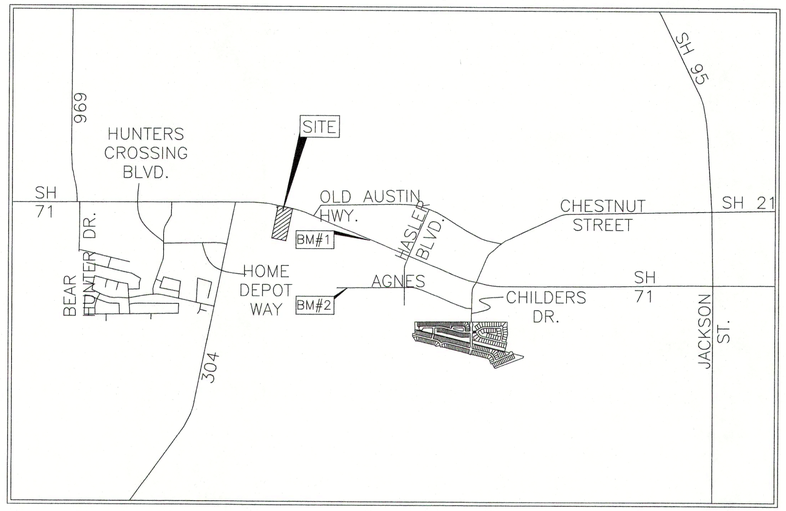
BASTROP GROVE MEDTAIL DEVELOPMENT

LOT 6 - BASTROP GROVE
CITY OF BASTROP
FINAL MASTER DRAINAGE PLAN SUBMITTAL
BASTROP COUNTY, TEXAS

SHEET INDEX

SHEET #	SHEET TITLE
01	COVER SHEET
02	HYDROLOGY SHEET
03	GRADING SHEET
04	STORM PROFILE
05	EROSION CONTROL
06	EROSION CONTROL DETAILS



LOCATION MAP
(NOT TO SCALE)

BENCHMARKS:

#1 TXDOT MON. BRASS DISC IN CONCRETE, 44' WEST OF THE NORTH-EASTERN PROPERTY CORNER.

#2 MAG NAIL IN PAVEMENT ON AGNES ST. 500' SOUTH OF THE PROPERTY BOUNDARY

GENERAL NOTES:

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF BASTROP MUST RELY UPON THE ADEQUACY OF THE DESIGN ENGINEER.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED WITH THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

THIS PROJECT IS LOCATED IN THE COLORADO RIVER WATERSHED.

NO PORTION OF THIS TRACT IS WITHIN THE BOUNDARIES OF THE 100-YEAR FLOOD PLAIN OF ANY WATERWAY THAT IS WITHIN THE LIMITS OF STUDY OF THE FEDERAL FLOOD INSURANCE ADMINISTRATION FIRM MAP NO. 48021C0335E, DATED JANUARY 19, 2006, BASTROP COUNTY, TEXAS. BASTROP COUNTY COMMUNITY NO. 481193.

REVIEWED BY:

CITY OF BASTROP ENGINEER DATE

APPROVED BY:

CITY OF BASTROP PLANNING DATE

DATE

OWNER: KPG COMMERCIAL–TYLER DUTTON
3809 S. 2ND STREET, D–200
AUSTIN, TEXAS 78704
512 437–6404

ENGINEER: CARLSON, BRIGANCE & DOERING, INC.
CIVIL ENGINEERING & SURVEYING
C/O MR. BRENDAN P. MCENTEE, P.E.
12129 RANCH ROAD 620 NORTH, SUITE 600
AUSTIN, TEXAS 78750
(512) 280–5160

UTILITY PROVIDERS:

ELECTRIC:	BLUEBONNET ELECTRIC (979) 542–3151
GAS:	CENTER POINT ENERGY (830) 643–6936
PHONE:	AT&T (512) 870–1450
WATER:	CITY OF BASTROP (512) 332–8830
WASTEWATER:	CITY OF BASTROP (512) 332–8830
CABLE:	SPECTRUM (855) 243–8892

NO.	DESCRIPTION	REVISE (R) ADD (A) VOID (V)	CITY OF BASTROP APPROVAL/DATE	APPROVED BY

811 Know what's below. Call before you dig.

BASTROPTX Heart of the Lost Pines Est. 1832

Final Drainage Plan Approved

11/22/19

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DESIGNED BY: | DRAFTED BY:

DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
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5501 West William Cannon Dr. Austin, Texas 78749
Phone No. (512) 280-5160
North Office
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Fax No. (512) 280-5165

SHEET NAME: COVER

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
9/16/2019

DATE 9/16/2019

JOB NUMBER 5135

SHEET 12 OF 29

SHEET NO. 12

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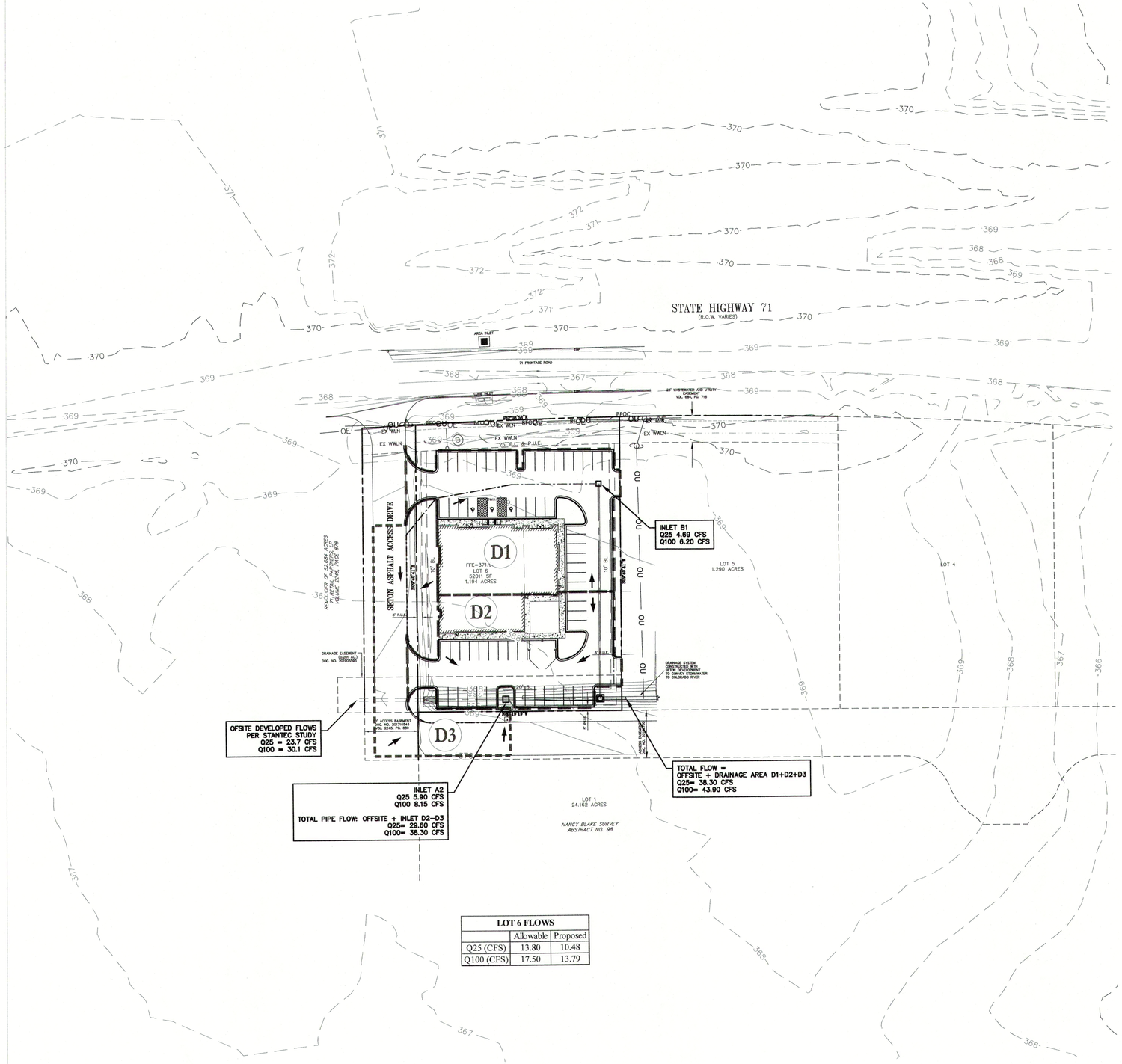

SCALE: 1" = 50'

LEGEND

- D3 — DRAINAGE AREA #
- DRAINAGE BNDY
- TIME OF CONCENTRATION SHALLOW FLOW
- TIME OF CONCENTRATION SHEET FLOW
- TIME OF CONCENTRATION CHANNEL FLOW
- FLOW ARROW

LOT 6 FLOWS	Allowable	Proposed
Q25 (CFS)	13.80	10.48
Q100 (CFS)	17.50	13.79

Rainfall Intensity, I = b/(T + d)^e

Design Year	b	d	e
2-yr	67	13.3	0.841
10-yr	87	11.1	0.805
25-yr	100	10.8	0.793
100-yr	130	11.3	0.784

Source: Table 2-3, City of Bastrop Drainage Design Manual

Surface Description	Design Year 2-year	10-year	25-year	100-year
Asphaltic	0.95	0.95	1	1
Concrete/Roof	0.95	0.95	1	1
Lawns:Sandy Soil				
Flat (0-2%)	0.1	0.11	0.12	0.125
Average (2-7%)	0.15	0.165	0.18	0.1875
Steep, (over 7%)	0.2	0.22	0.24	0.25
Commercial/Industrial				
Light areas	0.7	0.77	0.84	0.875
Heavy areas	0.8	0.88	0.96	1
Parks, cemeteries	0.25	0.275	0.3	0.3125

Source: City of Bastrop Stormwater Drainage Design Manual

Time of Concentration Computations		Existing	Developed D1	D2	D3
Sheet flow [Tc1 = 0.007*(L1 * n1)^0.8 / (P2^0.5*s1^0.4)]	L1	100	100	43	44
	n1	0.2	0.011	0.011	0.011
	S1	0.010	0.011	0.012	0.012
	Time (min)	15.70	1.46	0.73	0.74
Shallow Flow: Unpaved [Tc3= L3 / (60(16.1345) * s3^0.5)] Paved [Tc3= L3 / (60(20.3282) * s3^0.5)	L2	87	79	209	0
	n2	0.2	0.011	0.011	0.2
	S2	0.015	0.011	0.013	0.011
	Paved/Unpaved	Unpaved	Paved	Paved	Paved
	Time (min)	0.74	0.61	1.50	0.00
Channel Flow	L3	151	0	0	264
	Assumed V	6	0	0	6
	S3	0.008	0	0	0.012
	Time (min)	0.42	0.00	0.00	0.73
Total Time of Concentration		**16.86**	**10.00**	**10.00**	**10.00**

Run-off Computation Summary

Design Storm	Area Desc.	Existing	Developed D1	D2	D3	D2+D3	D1+D2+D3
2-year	Drainage Area	1.194	0.534	0.422	0.358	0.780	1.315
	Tc (min)	16.86	10.00	10.00	10.00	10.00	10.00
	Intensity (in/hr)	3.82	4.74	4.74	4.74	4.74	4.74
	C	0.10	0.93	0.65	0.89	0.76	0.84
	Q (cfs)	0.5	2.3	1.3	1.5	2.82	5.23
10-year	Tc (min)	16.9	10.0	10.0	10.0	10.00	10.00
	Intensity (in/hr)	5.96	7.47	7.47	7.47	7.47	7.47
	C	0.10	0.93	0.65	0.89	0.84	0.84
	Q (cfs)	0.7	3.7	2.1	2.4	4.89	8.24
25-year	Tc (min)	16.9	10.0	10.0	10.0	10.00	10.00
	Intensity (in/hr)	7.19	9.01	9.01	9.01	9.01	9.01
	C	0.11	0.97	0.69	0.93	0.84	0.88
	Q (cfs)	0.9	**4.69**	**2.63**	**3.02**	**5.90**	**10.48**
100-year	Tc (min)	16.9	10.0	10.0	10.0	10.00	10.00
	Intensity (in/hr)	9.49	11.82	11.82	11.82	11.82	11.82
	C	0.13	0.98	0.70	0.94	0.88	0.89
	Q (cfs)	1.4	6.2	3.5	4.0	8.15	13.79

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Heart of the Lost Pines
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GRATE INLET CALCULATIONS

Orifice equation: Q i = Qo = C_A √2gh (Equation 10-31., TxDOT Hydraulic Design Manual)
Opening Area of the Grate, Ag = Area X Clogging Factor X Grate Factor
Orifice Coefficient, C = 0.67
g = 32.17 ft/s2
P-1-7/8-4 Grate Opening Ratio = 0.8 (Fig: 4-13 , Austin, TX Drainage Criteria Manual)

Inlet Name	Design Q_{25} (CFS)	Design Q_{100} (CFS)	Inlet Size	Clogging Factor	Grate Factor	A_g (sq. ft.)	Grate EL	h_{25}	$Head_{25}$	h_{100}	$Head_{100}$	Allowable h (ft)	Inlet Capacity, Qmax (CFS)
B1	4.69	6.16	3' x 3'	0.5	0.8	3.6	369.2	0.059	369.26	0.10	369.30	0.5	13.68
A2	5.90	8.15	4' x 4'	0.5	0.8	6.4	368.25	0.029	368.28	0.06	368.31	0.5	24.32

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DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr. Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600 Austin, Texas 78750
Fax No. (512) 280-5165

SHEET NAME: HYDROLOGY SHEET
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/16/2019

DATE 9/16/2019
JOB NUMBER 5135
SHEET 13 OF 29
SHEET NO. 13

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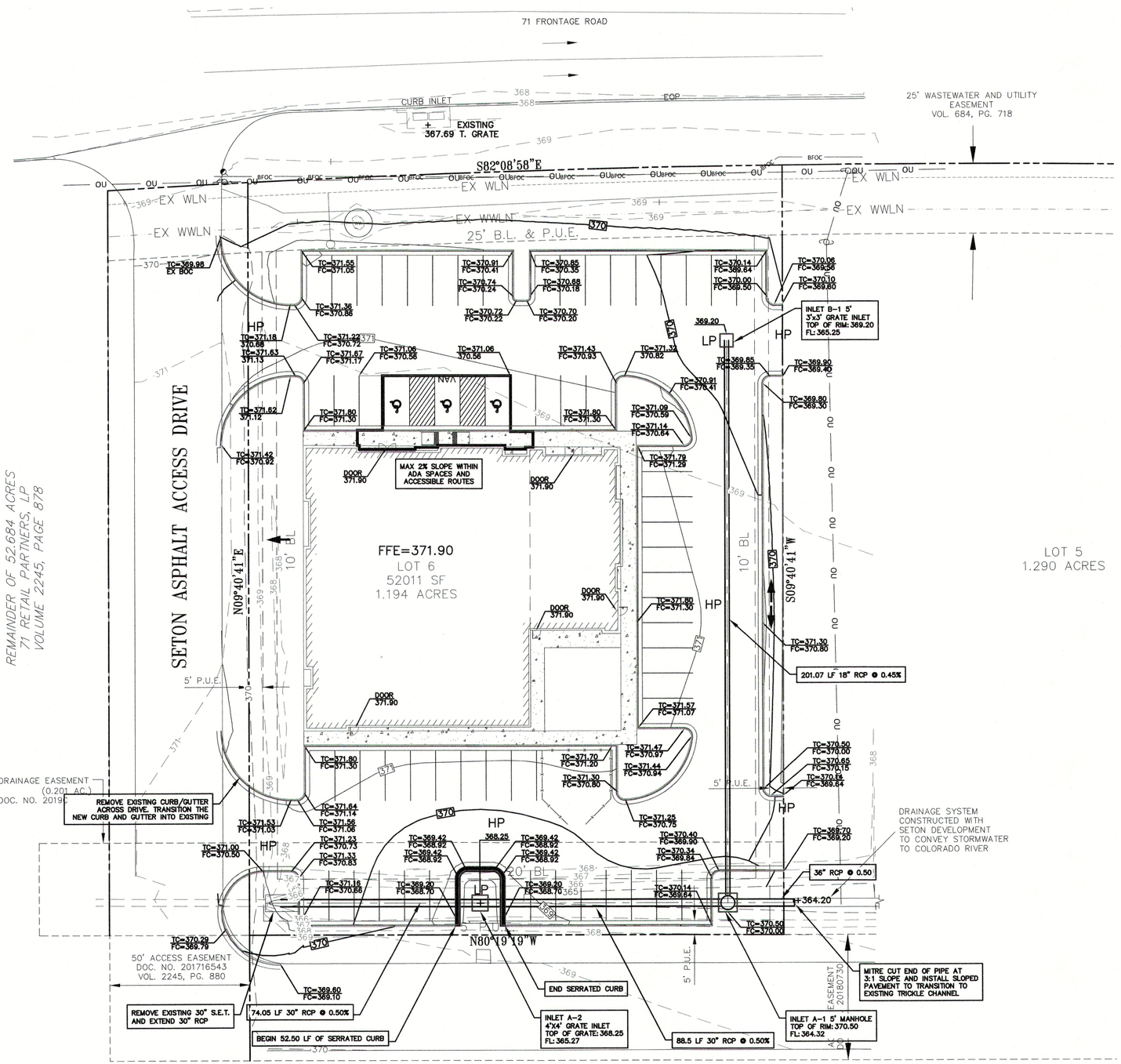

LEGEND

- 936 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 930 — PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- FLOW ARROW
- TC=XXX.XX / FC=XXX.XX — TOP OF CURB ELEVATION / FACE OF CURB ELEVATION
- PROPOSED GRATE INLET
- PROPOSED STORM MANHOLE
- HP — HIGH POINT
- LP — LOW POINT
- PROPOSED STORM SEWER
- PROPOSED 24" CURB & GUTTER

0 20' 40'

SCALE: 1" = 20'

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GRADING NOTES:

1.) UNLESS OTHERWISE SPECIFIED, ALL FINISHED EARTHEN SLOPES ARE TO BE FINE GRADED TO PROVIDE A RELATIVELY UNIFORM SURFACE WITH NO ROCKS GREATER THAN 1-INCH IN DIAMETER, NO CLOGS OF SOIL GREATER THAN 1-INCHES IN DIAMETER, AND DEVIATIONS FROM AN OTHERWISE SMOOTH SURFACE GREATER THAN 4 INCHES IN HEIGHT OR DEPTH WITH NO AREAS OF STANDING WATER

2.) ALL FINISHED SLOPES OF A GRADE OF 3:1 OR GREATER ARE TO BE COVERED WITH A JUTE MAT, CURLEX MATTING, OR SIMILAR PRODUCT AFTER SEEDING WITH HYDROMULCH AND THE JUTE ANCHORED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

3.) ALL DRAINAGE COMPONENTS ARE TO BE PRECAST CONCRETE. STORM DRAIN PIPE TO BE RCP OR RCPA, CLASS III, PER ASTM C76 AND INLETS TO BE ASTM C913 PER TxDOT STANDARDS WITH GALVANIZED GRATES. INLETS IN PAVED AREAS SHALL INCLUDE PEDESTRIAN GRATES.

4.) REFER TO LANDSCAPE PLAN FOR PLANTING, IRRIGATION, AND TOPSOIL REQUIREMENTS.

13 OF 29

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Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750 Fax No. (512) 280-5165

SHEET NAME: GRADING SHEET

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/16/2019

DATE: 9/16/2019

JOB NUMBER: 5135

SHEET: 14 OF 29

SHEET NO.: 14

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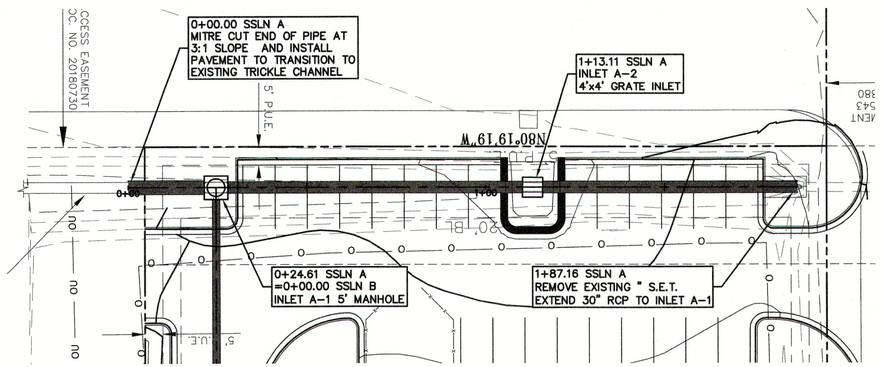

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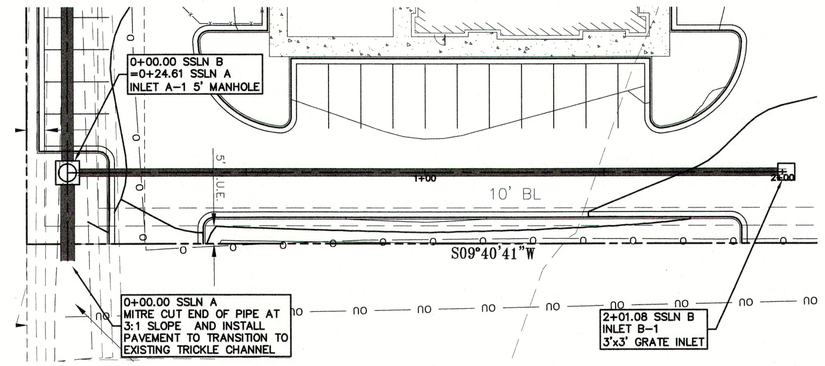

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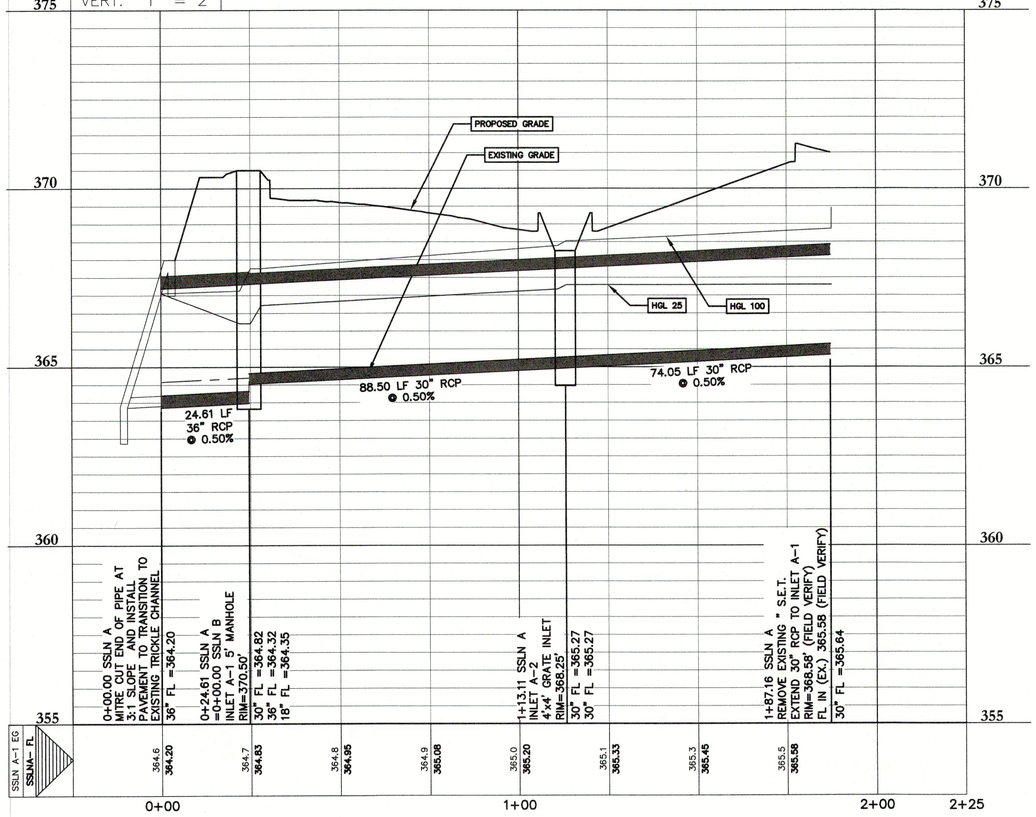
SSLN A

PROFILE SCALE
HORIZ. 1" = 20'
VERT. 1" = 2'



SSLN B

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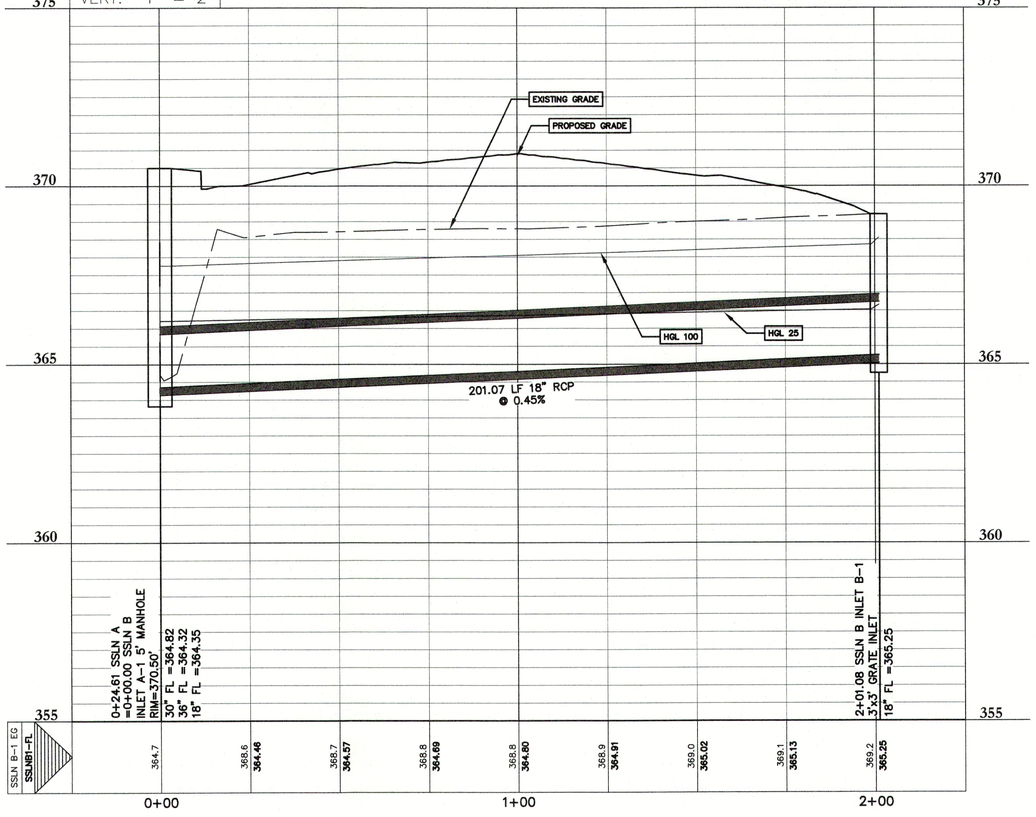
VERT. 1" = 2'



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11/22/19

DESIGNED BY:

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REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
Fax No. (512) 280-5165

SHEET NAME: STORM SEWER PROFILE

JOB NAME: BASTROP GROVE MED'TAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/16/2019

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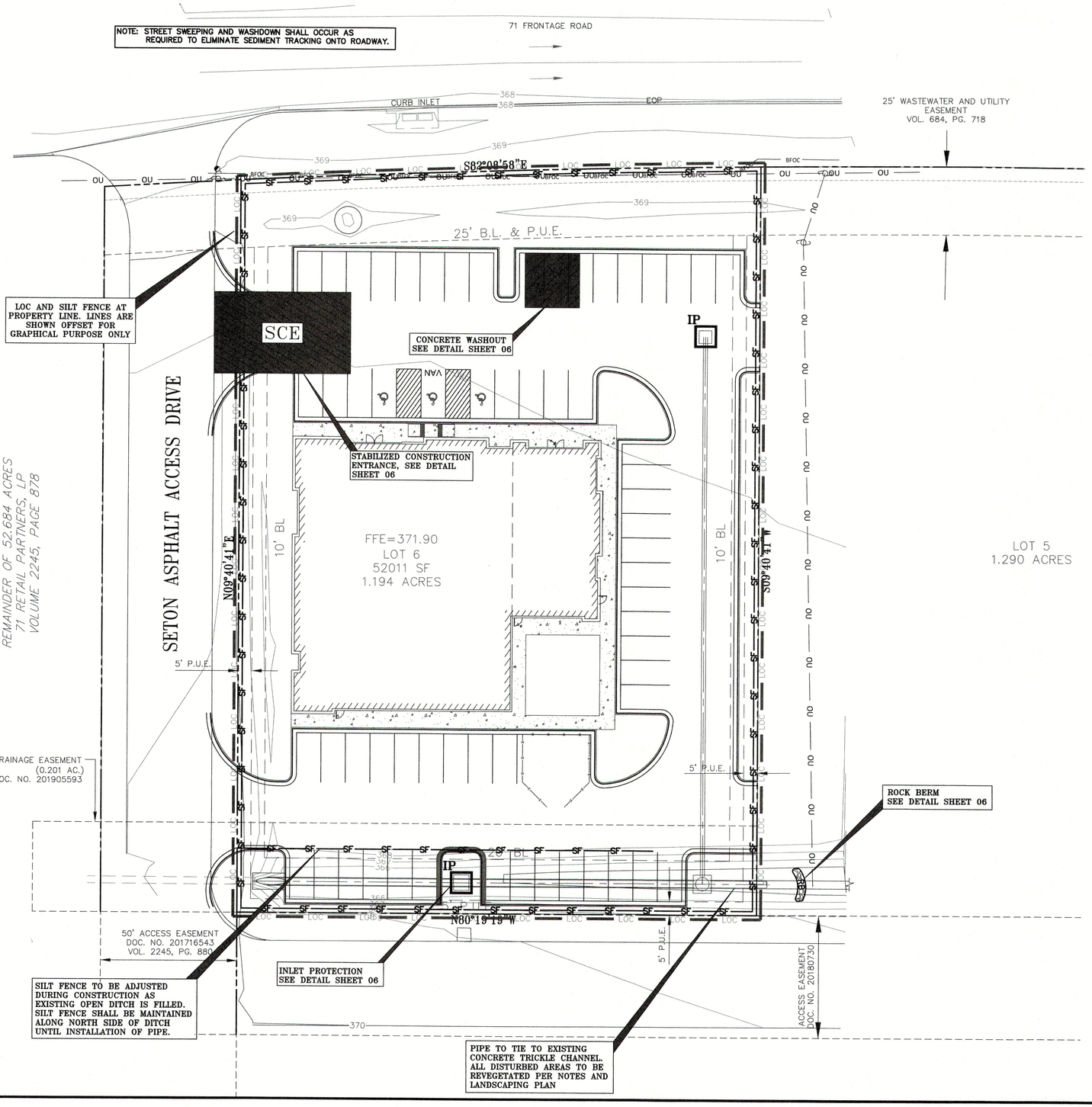
DATE 9/16/2019

JOB NUMBER 5135

SHEET 15 OF 29

SHEET NO. 15





SCALE: 1" = 20'

LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- IP — INLET PROTECTION
- RB — ROCK BERM
- JH — J-HOOK
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT

WARNING!!!!
REVIEW THE SEQUENCE OF CONSTRUCTION ON THE GENERAL NOTES SHEET PRIOR TO BEGINNING CONSTRUCTION

!!! WARNING !!!:
UNDERGROUND UTILITIES SHOWN ON THESE PLANS IS A BEST ESTIMATE BASED ON RECORDS THAT COULD BE OBTAINED AND PHYSICAL FEATURES VISIBLE AT THE GROUND LEVEL. THE ENGINEER MAKES NO ASSERTIONS BEYOND THAT THEY ARE A BEST ESTIMATE AND AN ATTEMPT TO HELP IDENTIFY POSSIBLE UTILITIES IN THE AREA. THE CONTRACTOR MUST CALL ONE CALL IN ACCORDANCE WITH THE NOTES TO BETTER LOCATE ANY UNDERGROUND UTILITIES.

GENERAL EROSION CONTROL NOTES:

1) CONTRACTOR TO FIELD LOCATE DIVERSION, INTERCEPTOR, AND PERIMETER DIKES/DITCHES AS REQUIRED BASED ON THE DRAIN SEQUENCE OF CONSTRUCTION.
2) IF DISTURBED AREA IS NOT WORKED FOR MORE THAN 14 DAYS THEN DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TARP, OR MATTING.
3) THE ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON SITE TO KEEP PROJECT IN-COMPLIANCE WITH THE CITY OF BASTROP RULES AND REGULATIONS.
4) THE CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS WATERING WITH IRRIGATION TRUCKS AND MULCHING AS PER CITY REQUIREMENTS, OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
5) SILT FENCE TYPE AND INSTALLATION SHALL COMPLY WITH CITY OF BASTROP RULES AND REGULATIONS.
6) CONTRACTOR WILL CHECK AND IF NECESSARY CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
7) CONTRACTOR IS SOLEY RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION INCLUDING COMPLIANCE WITH SWPPP INSPECTION, REPORTING, NOI, AND NOT FILING. THE PLAN SHOWN IS THE MINIMUM REQUIRED AND THE CONTRACTOR SHALL MODIFY THE PLAN AS REQUIRED TO ELIMINATE SEDIMENT FROM LEAVING THE SITE.
8) ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITY ARE TO BE REVEGETATED IN ACCORDANCE WITH THIS SHEET AND THE LANDSCAPING PLAN. REFER TO SHEET 06 FOR EROSION CONTROL DETAILS AND ADDITIONAL NOTES REGARDING REVEGETATION.

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Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749 Phone No. (512) 280-5160
North Office: 12129 Rivera Rd. Suite 690 Austin, Texas 78759 Fax No. (512) 280-5165

SHEET NAME: EROSION CONTROL

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/16/2019

DATE: 9/16/2019
JOB NUMBER: 5135
SHEET: 16 OF 29
SHEET NO.: 16

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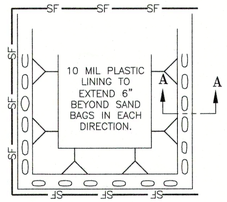
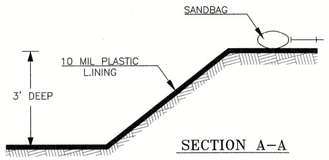


PLAN

ACCESSIBLE SIDE FOR TRUCK ACCESS

NOTE: SIZE VARIES BASED ON ANTICIPATED VOLUME OF CONCRETE TO BE PLACED. MINIMUM SIZE 8'X8' BOTTOM.

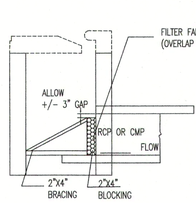


SECTION A–A

CONCRETE WASHOUT AREA NOTES:

1. WASHOUT SHALL BE INSTALLED PRIOR TO PLACING ANY CONCRETE ON–SITE.
2. INSTALL DIRECTIONAL SIGNS AS NECESSARY TO INDICATE WASHOUT LOCATION TO CONCRETE SUPPLY VEHICLES.
3. WASHOUT SHALL BE INSPECTED WEEKLY AND AFTER RAIN EVENTS IN ACCORDANCE WITH SWPPP.
4. CONTRACTOR TO MAINTAIN, REPAIR, ENLARGE OR RELOCATE WASHOUT AS NECESSARY TO MEET PROJECT REQUIREMENTS.
5. WHEN NECESSARY DURING CONSTRUCTION, OR AT THE COMPLETION OF ALL CONSTRUCTION, CONCRETE SHALL BE REMOVED AND LAWFULLY DISPOSED OF AND THE WASHOUT AREA FILLED WITH COMPACTED SELECT FILL.
6. CONCRETE WASHOUT SHALL NOT BE LOCATED WITHIN 50' OF STORM INLET, DITCH, OR SUBSURFACE DRAINAGE SYSTEM.

CONCRETE WASHOUT DETAIL
N.T.S



NOTES:
"STORM INLET SEDIMENT TRAPS" SHALL BE PLACED IN ALL PROPOSED AND EXISTING CURB INLETS AND DROP INLETS AS DIRECTED BY THE CITY OF BASTROP.

THE LATERAL BRACING SHALL BE PLACED IN A MANNER AS TO ADEQUATELY SECURE THE FILTER FRAME TO THE SIDE OF THE INLET, INSURING THE PROPER FUNCTION OF THE SEDIMENT TRAP

FILTER FABRIC MAY BE IDENTICAL TO THAT SPECIFIED A "TEMPORARY SEDIMENT CONTROL FENCE" OTHER MATERIAL MAY BE USED UPON APPROVAL OF THE CITY OF CEDAR PARK'S PROJECT REPRESENTATIVE.

THE "STORM INLET SEDIMENT TRAP" SHALL BE INSTALLED IN EXISTING INLETS BEFORE CONSTRUCTION BEGINS AND UPON COMPLETION OF THE INLET WALLS IN PROPOSED INLETS OR AS DIRECTED BY THE CITY REPRESENTATIVE.

THE CONTRACTOR WILL BE REQUIRED TO PERFORM PERIODIC MAINTENANCE OF THE SEDIMENT TRAP AND REMOVE ACCUMULATED SILT AS DIRECTED BY THE CITY OF BASTROP.

ALL WOOD SHALL BE PRESSURE TREATED

SEDIMENT TRAPS TO BE REMOVED AFTER PAVING IS COMPLETE

STORM INLET SEDIMENT TRAP (TYPE 1) DETAILS
(TxDOT–AUSTIN DISTRICT)

EROSION AND SEDIMENTATION CONTROL:

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND FENCING FOR AREAS OUTSIDE OF THE CONSTRUCTION AREA PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).
2. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS, AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.
3. PRIOR TO FINAL ACCEPTANCE, HAUL ROADS AND WATERWAY CROSSINGS CONSTRUCTED FOR TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED, ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND REVEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSED OF IN APPROVED SPOIL DISPOSAL SITES.
4. ANY METHODS, STREET MARKINGS AND SIGNAGE NECESSARY FOR WARNING MOTORISTS, WARNING PEDESTRIANS OR DIVERTING TRAFFIC DURING CONSTRUCTION SHALL CONFORM TO THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITION.
5. ALL PAVEMENT MARKINGS, MARKERS, PAINT, TRAFFIC BUTTONS, TRAFFIC CONTROLS AND SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS. STREETS, BRIDGES, AND THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITIONS.
6. EROSION CONTROL MEASURES, SITE WORK AND RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE CITY OF BASTROP CODE OF ORDINANCES.
7. ALL SLOPES SHALL BE SODDED OR SEEDED WITH APPROVED GRASS, GRASS MIXTURES OR GROUND COVER SUITABLE TO THE AREA AND SEASON IN WHICH THEY WERE APPLIED.
8. SILT FENCES, ROCK BERMS, SEDIMENTATION BASINS AND SIMILARLY RECOGNIZED TECHNIQUES AND MATERIALS SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT POINT SOURCE SEDIMENTATION LOADING OF DOWNSTREAM FACILITIES. SUCH INSTALLATION SHALL BE REGULARLY INSPECTED BY THE CITY OF BASTROP FOR EFFECTIVENESS. ADDITIONAL MEASURES MAY BE REQUIRED IF, IN THE OPINION OF THE CITY ENGINEER, THEY ARE WARRANTED.
9. ALL TEMPORARY EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL FINAL INSPECTION AND APPROVAL OF THE PROJECT BY THE CITY INSPECTOR. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL TEMPORARY EROSION CONTROL STRUCTURES AND TO REMOVE EACH STRUCTURE AS APPROVED BY THE CITY INSPECTOR.
10. ALL MUD, DIRT, ROCKS, DEBRIS, ETC., SPILLED, TRACKED OR OTHERWISE DEPOSITED ON EXISTING PAVED STREETS. DRIVES AND AREAS USED BY THE PUBLIC SHALL BE CLEANED UP IMMEDIATELY.
11. PERMANENT EROSION CONTROL: ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW:

A. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL SHALL BE PLACED IN ALL DRAINAGE CHANNELS (EXCEPT ROCK), AND BETWEEN THE CURB AND RIGHT–OF–WAY.

B. THE SEEDING FOR PERMANENT EROSION CONTROL SHALL BE APPLIED OVER AREAS DISTURBED BY CONSTRUCTION AS FOLLOWS:

BROADCAST SEEDING:

(I) FROM OCTOBER TO FEBRUARY, SEEDING SHALL BE WITH ONE (1) POUND PER 1,000 SQUARE FEET OF UNHULLED BERMUDA OR THREE (3) POUNDS PER

(II) FROM MARCH TO SEPTEMBER, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF ONE (1) POUND PER 1,000 SQUARE FEET, WITH A PURITY OF 95% WITH 85% GERMINATION.

FERTILIZER SHALL BE SLOW RELEASE GRANULAR OR PALETTE TYPE, AND SHALL HAVE AN ANALYSIS OF 15–15–15, AND SHALL BE APPLIED AT THE RATE OF ONE (1) POUND PER 1,000 SQUARE FEET, ONCE AT THE TIME OF PLANTING, AND AGAIN ONCE DURING THE TIME OF ESTABLISHMENT.

MULCH TYPE USED SHALL BE STRAW OR HAY APPLIED AT A RATE OF 45 POUNDS PER 1,000 SQUARE FEET.

HYDRAULIC SEEDING:

(I) FROM OCTOBER TO FEBRUARY, SEEDING SHALL BE WITH ONE (1) POUND PER 1,000 SQUARE FEET OF UNHULLED BERMUDA, OR THREE (3) POUNDS PER 1,000 SQUARE FEET OF WINTER RYE, WITH A PURITY OF 95% WITH 90 % GERMINATION.

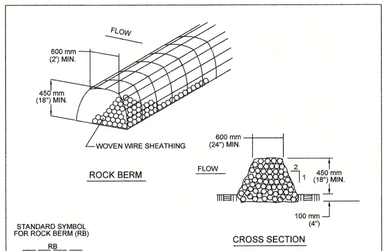
(II) FROM MARCH TO SEPTEMBER, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF ONE (1) POUND PER 1,000 SQUARE FEET WITH A PURITY OF 95% WITH 95% GERMINATION.

FERTILIZER SHALL BE A WATER SOLUBLE FERTILIZER WITH AN ANALYSIS OF 15–15–15 AT A RATE OF 1.5 POUNDS PER 1,000 SQUARE FEET.

MULCH TYPE SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1,000 SQUARE FEET, WITH A SOIL TACKIFIER AT A RATE OF 1.4 POUNDS PER 1,000 SQUARE FEET.

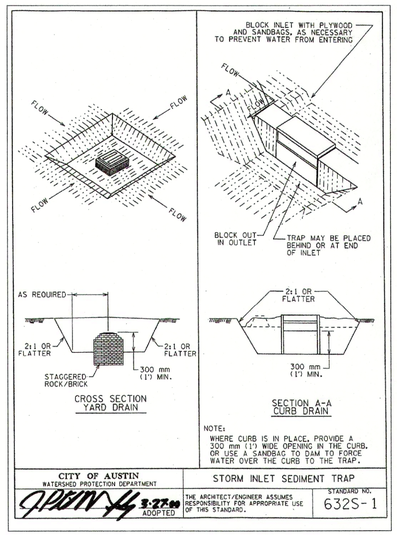
C. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK TO A DEPTH OF SIX (6) INCHES. THE IRRIGATION SHALL OCCUR AT 10–DAY INTERVALS DURING THE FIRST TWO (2) MONTHS. RAINFALL OCCURRENCES OF 1/2 INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR TEN (10) DAYS.

D. RESTORATION SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 INCH H 85% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 20 SQUARE FEET EXIST.



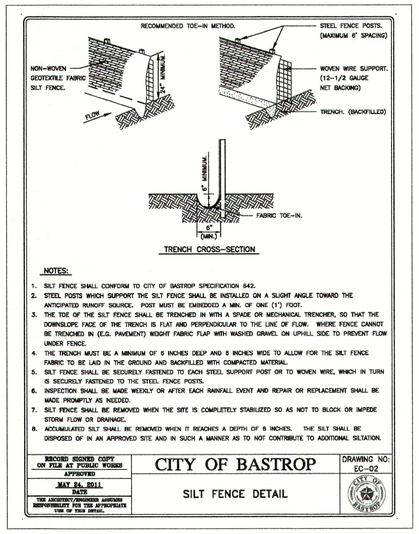
NOTES:
1. USE ONLY OPEN GRADED ROCK 75 to 125 mm (3 to 5") DIAMETER FOR ALL CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 25 mm (1") OPENING AND MINIMUM WIRE DIAMETER OF 12.9 mm (20 GAUGE).
3. THE ROCK BERM SHALL BE INSPECTED DAILY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE–WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SEDIMENT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. IF SEDIMENT REACHES A DEPTH EQUAL TO ONE–THIRD THE HEIGHT OF THE BERM OR 150 mm (6"), WHICHEVER IS LESS, THE SEDIMENT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SEDIMENTION PROBLEM.
5. WHEN THE SITE IS COMPLETELY STABILIZED,THE BERM AND ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	ROCK BERM
RECORD COPY SIGNED BY MORGAN BYARS 8/24/2010 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. STANDARD NO. 639S-1



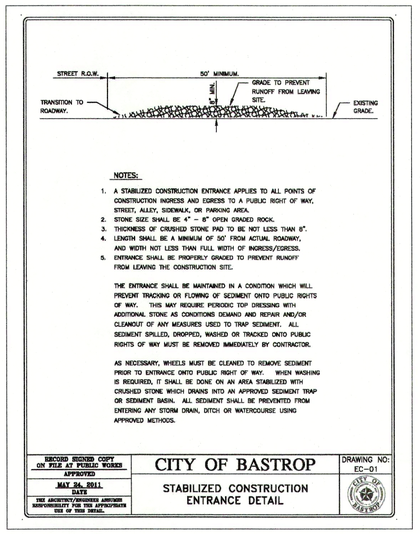
NOTE:
WHERE CURB IS IN PLACE, PROVIDE A 300 mm (1') WIDE OPENING IN THE CURB. OR USE A SANDBAG TO DAM TO FORCE WATER OVER THE CURB TO THE TRAP.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	STORM INLET SEDIMENT TRAP
3.27.08 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. STANDARD NO. 632S-1



NOTES:
1. SILT FENCE SHALL CONFORM TO CITY OF BASTROP SPECIFICATION 642.
2. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MIN. OF ONE (1') FOOT.
3. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G. PAVEMENT) WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
4. THE TRENCH MUST BE A MINIMUM OF 8 INCHES DEEP AND 8 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
5. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POSTS.
6. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
7. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
8. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED MAY 24, 2011. DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	CITY OF BASTROP SILT FENCE DETAIL	DRAWING NO: EC–02



NOTES:
1. A STABILIZED CONSTRUCTION ENTRANCE APPLIES TO ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO A PUBLIC RIGHT OF WAY, STREET, ALLEY, SIDEWALK, OR PARKING AREA.
2. STONE SIZE SHALL BE 4" – 8" OPEN GRADED ROCK.
3. THICKNESS OF CRUSHED STONE PAD TO BE NOT LESS THAN 8".
4. LENGTH SHALL BE A MINIMUM OF 50' FROM ACTUAL ROADWAY, AND WIDTH NOT LESS THAN FULL WIDTH OF INGRESS/EGRESS.
5. ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY BY CONTRACTOR.

AS NECESSARY, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED MAY 24, 2011. DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	CITY OF BASTROP STABILIZED CONSTRUCTION ENTRANCE DETAIL	DRAWING NO: EC–01

DESIGNED BY: | DRAFTED BY:

REVISION	DATE

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr. 12129 RR 620 N., Ste. 600
Austin, Texas 78749 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

SHEET NAME: EROSION CONTROL DETAILS

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: FINAL MASTER DRAINAGE PLAN SUBMITTAL

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/16/2019

DATE 9/16/2019

JOB NUMBER 5135

SHEET 17 OF 29

SHEET NO. 17

BASTROPTX
Heart of the Lost Pines
Est. 1832

Final Drainage Plan Approved

11/22/19

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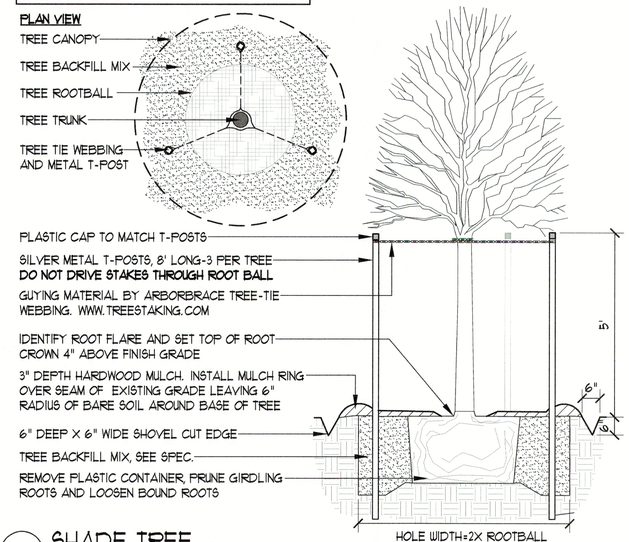
PLANT SCHEDULE

SHADE TREES	QTY	COMMON / BOTANICAL NAME	CONT	CALIPER	HEIGHT	SPREAD		
	8	CEDAR ELM ULMUS CRASSIFOLIA	65 GAL	3" CAL.	10'-12' HT.	5-6' SPR.		
	5	CHINQUAPIN OAK QUERCUS MUHLENBERGII	65 GAL	3.25-3.5" CAL.	11-13' HT.	56' SPR.		
	1	SOUTHERN LIVE OAK QUERCUS VIRGINIANA	65 GAL	3" CAL.	10' HT.	6' SPR.		

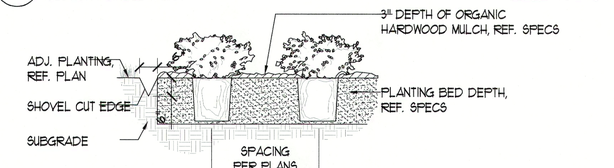
SHRUBS	QTY	COMMON / BOTANICAL NAME	CONT	SPACING
GM	12	GULF MUHLY MUHLENBERGIA CAPILLARIS 'REGAL MIST'	3 GAL	36" o.c.
RY	81	RED YUCCA HESPERALOE PARVIFLORA	5 GAL	36" o.c.
DW	98	DON'S DWARF WAXMYRTLE MYRICA CERIFERA 'DON'S DWARF'	5 GAL	36" o.c.
DY	124	DWARF YAUPON ILEX VOMITORIA 'NANA'	5 GAL	36" o.c.

GROUNDCOVER	CODE	QTY	COMMON / BOTANICAL NAME	CONT	SPACING
	NG	66	LANTANA 'NEW GOLD' LANTANA X 'NEW GOLD'	1 GAL	24" o.c.
	ZX	84	ZEXMANIA ZEXMENIA HISPIDA	1 GAL	12" o.c.
TURF	CODE	QTY	COMMON / BOTANICAL NAME	CONT	
	SBG	AS SHOWN	SAHARA BERMUDA GRASS CYNODON DACTYLON 'SAHARA'	HYDRO	

NOTES:
1. PRUNE DEAD OR BROKEN BRANCHES ONLY
BRANCHES TO BE 80"AFF AT ACCESSIBLE AREAS.
2. ALIGN STAKING OF TREES IDENTICALLY WHEN IN LINES OR GROUPS.



1 SHADE TREE
SECTION / SINGLE TRUNK
SCALE: 1/2"=1'-0"



2 SHRUBS / SHOVEL CUT EDGE
SECTION
SCALE: 1/2"=1'-0"

STREET YARD

	REQUIRED	PROVIDED
TOTAL SITE AREA		52,017 S.F.
TOTAL STREET YARD AREA		18,737 S.F.
STREETYARD LANDSCAPE (15% OF STREET YARD REQUIRED)	2,811 S.F.	2,811 S.F.

LANDSCAPE BUFFER

10' LANDSCAPE BUFFER ADJACENT TO RIGHT-OF-WAY OF ANY MAJOR THOROUGHFARE STREET IS REQUIRED, 1 LARGE TREE PER FORTY LINEAR FEET.

REQUIRED	PROVIDED
230 LF = 6 TREES	6 TREES

SHRUBS

SHRUBS MUST BE PLANTED ALONG THE SIDE PROPERTY LINE FROM THE FRONT PROPERTY LINE TO THE REAR. SHRUBS MUST BE PLANTED IN SUCH A MANNER TO CREATE A DENSE HEDGE OF AT LEAST THREE FEET AT MATURITY.

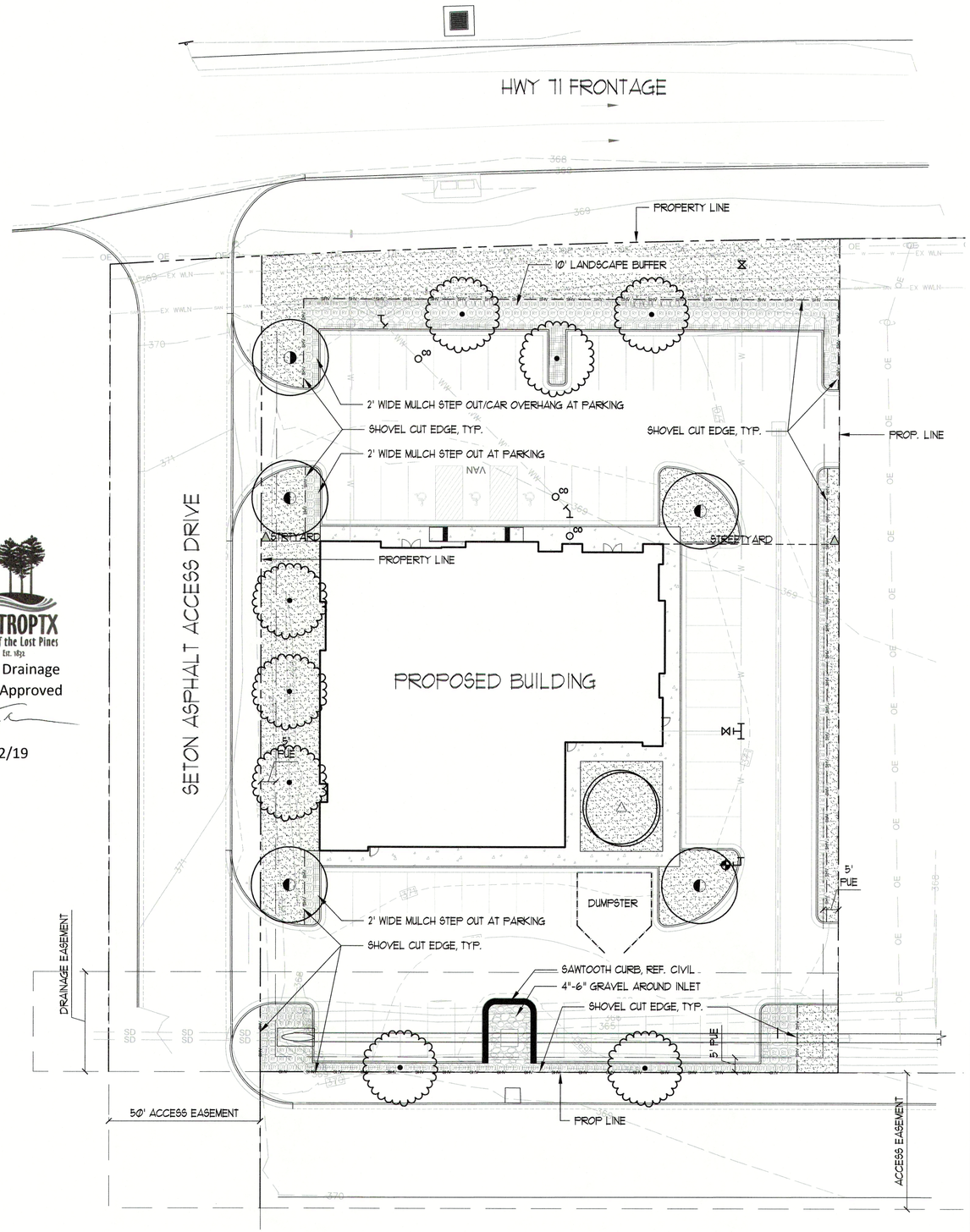
PARKING LOT LANDSCAPING

THERE SHALL BE A LANDSCAPED AREA WITH AT LEAST ONE (1) TREE WITHIN SIXTY FEET (60') OF EVERY PARKING SPACE. THERE: SHALL BE A MINIMUM OF ONE (1) TREE PLANTED IN THE PARKING AREA FOR EVERY TEN (10) PARKING SPACES WITHIN PARKING LOTS WITH MORE THAN TWENTY (20) SPACES. WITHIN PARKING LOTS, LANDSCAPE AREAS SHOULD BE LOCATED TO DEFINE PARKING AREAS AND ASSIST IN CLARIFYING APPROPRIATE CIRCULATION PATTERNS. A LANDSCAPE ISLAND SHALL BE LOCATED AT THE TERMINUS OF ALL PARKING ROWS, AND SHOULD CONTAIN AT LEAST ONE (1) TREE. ALL LANDSCAPE AREAS SHALL BE PROTECTED BY A MONOLITHIC CURB OR WHEEL STOPS AND REMAIN FREE OF TRASH, LITTER, AND CAR BUMPER OVERHANGS.

SITE DEVELOPMENT PERMIT LANDSCAPE NOTES:

1. ALL LANDSCAPED AREAS TO BE PROTECTED BY 6 INCH CURBS, WHEEL-STOPS OR OTHER APPROVED BARRIERS AS PER ECM 2.4.7(A).
2. THE OWNER WILL CONTINUOUSLY MAINTAIN THE REQUIRED LANDSCAPING IN ACCORDANCE WITH LDC 25-2-984.
3. EXISTING TREES TO BE SAVED SHALL BE PROTECTED BY FENCING BEFORE CONSTRUCTION BEGINS. NO EQUIPMENT OR MATERIALS SHALL BE STORED OR OPERATED WITHIN THE FENCED-IN AREAS. FENCES SHALL BE AT THE DRIP LINE AND COMPLETELY SURROUND THE TREE OR CLUSTERS OF TREES. NO BURNING OF DEBRIS, CLEANING FLUIDS, CONCRETE SPILLS, ETC. WILL BE ALLOWED WITHIN THESE AREAS.
4. BUFFERING OF THE STREET YARD WILL BE ACCOMPLISHED THROUGH THE COMBINATION OF TREES, SHRUBS, GRADE CHANGES, AND FENCES.
5. GRADE CHANGES THAT DO NOT APPEAR ON THE SITE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT BY THE GENERAL CONTRACTOR PRIOR TO CONSTRUCTION.
6. TRENCHING SHALL NOT OCCUR WITHIN THE FENCED DRIP LINE AREAS OF EXISTING TREES.
7. SHRUB MATERIAL NOT TO EXCEED 36" O.C. UNLESS OTHERWISE SPECIFIED. GROUNDCOVERS NOT TO EXCEED 18" O.C. DURING THE TIME OF MARCH 15-OCTOBER 15 INSTALLATION OF HYDROMULCH SHALL BE COMMON BERMUDA OR SAHARA BERMUDA FOR OCTOBER 16 -MARCH 14 INSTALLATION OF HYDROMULCH SHALL BE ANNUAL OR PERENNIAL RYE WITH A SPRING APPLICATION OF COMMON BERMUDA OR SAHARA BERMUDA.
8. ALL LAWN AREAS WITHIN THE LIMITS OF CONSTRUCTION SHALL BE RE-VEGETATED WITH BERMUDA SOD OR RYE UNLESS NATIVE RESTORATION MIX IS SPECIFIED.
9. NOT MORE THAN 50% OF THE TREES AND 50% OF SHRUBS PROPOSED WILL BE OF THE SAME SPECIES.
10. AN AUTOMATIC IRRIGATION SYSTEM SHALL BE INSTALLED. SEE IRRIGATION NOTES IN THESE DRAWINGS FOR REQUIREMENT.
11. IF ESTABLISHING VEGETATION DURING ANY STAGE OF DROUGHT, SECTION 6-4-30 MAY REQUIRE A VARIANCE. CONTACT BASTROP WATER CONSERVATION STAFF.

BASTROPTX
Heart of the Lost Pines
Est. 1832
Final Drainage Plan Approved
11/22/19



LANDSCAPE CERTIFICATION

I, AAN G. COLEMAN, DO HEREBY CERTIFY THAT THE PLANS FOR THE DEVELOPMENT PROJECT LOCATED AT HWY 71 EAST OF 304, SATISFY THE REQUIREMENTS OF THE BASTROP CODE OF ORDIANCES, SECTION 33 AND ALL AMENDEMENTS

10/14/19
DATE

MARISSA MCKINNEY
COLEMAN & ASSOCIATES
ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE LANDSCAPE ARCHITECT WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF BASTROP MUST RELY ON THE ADEQUACY OF THE WORK OF THE LANDSCAPE ARCHITECT.

NORTH
SCALE IN FEET (1"=20')
0 5 10 20 50

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COLEMAN & ASSOCIATES
Landscape Architecture
Environmental Design

9890 Silver Mountain Drive
Austin, Texas 78737
Ph: 512-476-2090
F: 512-476-2099

1926 Cambria
San Antonio, Texas 78258
Ph: 210-492-4550
F: 210-492-9930

9511 Modesto Ave. NE
Albuquerque, New Mexico 87122
Ph: 505-433-3426

REGISTERED LANDSCAPE ARCHITECT
MARISSA M. MCKINNEY
STATE OF TEXAS
2723
10/14/2019

LANDSCAPE PLAN AND DETAILS
CITY SUBMITTAL

BASTROP GROVE MEDTAIL DEV.
CITY OF BASTROP
BASTROP COUNTY, TEXAS

REVISIONS

SCALE:	AS SHOWN
DRAWN BY:	MAM
CHECKED BY:	MAM
APP. BY:	MAM
PROJECT NO.	
DATE:	10/14/2019

SHEET:
18 OF 29

LEGEND

- HUNTER PROS-06-PRS30 SERIES POP UP SPRAY HEADS WITH HUNTER MSBN-50H STREAM BUBBLER NOZZLES. (TWO PER TREE)
  SEE INSTALLATION NOTE #13 REGARDING TREE BUBBLER LATERAL PIPE
- HUNTER PROS-04-PRS30 SERIES POP UP SPRAY HEAD WITH SS / ES SERIES STRIP NOZZLE UNLESS NOTED OTHERWISE.
- HUNTER PROS-04-PRS30 SERIES POP UP SPRAY HEAD WITH PRO SPRAY SERIES NOZZLE AS NOTED BELOW
- NETAFIM TECHLINE TLHCVXR5-12 SERIES DRIP TUBE IN NARROW TURF AREAS INSTALLED AT 4" DEPTH
  SEE INSTALLATION NOTE #17 REGARDING DRIP TUBE LAYOUT IN TURF.
- HUNTER ICV SERIES ELECTRIC REMOTE CONTROL VALVE WITH ICD-100 SERIES DECODER
- HUNTER ICV SERIES ELECTRIC REMOTE CONTROL, "TREE BUBBLER ZONE" VALVE WITH ICD-100 SERIES DECODER
  SEE INSTALLATION NOTE #12 REGARDING TREE BUBBLER LATERAL PIPE
- NETAFIM LVCZ SERIES DRIP VALVE ASSEMBLY WITH PRESSURE REGULATOR AND 140 MESH FILTER
  USE MODEL LVCZS8010075-LF FOR DRIP ZONES WITH .25 TO 4.4 GPM FLOW RATE WITH
  PRESSURE REGULATOR MODEL #PRV075LF42V2K
  USE MODEL LVCZ10075-HFHP FOR DRIP ZONES WITH 4.5 TO 17.6 GPM FLOW RATE
  PRESSURE REGULATOR MODEL #PRV075HF45V2K
- WILKINS 375 SERIES REDUCED PRESSURE TYPE BACKFLOW PREVENTOR INSTALLED PER CITY CODE
  WITH SAME SIZE BRONZE BALL VALVE AND HEATED / INSULATED ENCLOSURE INSTALLED ON THE UP-STREAM SIDE.
- IRRIGATION WATER METER AND TAP, SIZE AS NOTED ON THE PLAN
- CONTROLLER "A"
  HUNTER ACC2 DECODER SERIES TWO-WIRE CONTROLLER MODEL A2C-75D-M WITH TWO A2C-D75 MODULES AND WIRELESS SOLAR SYNC SENSOR
  LOCATE SENSOR AS FIELD DIRECTED BY THE LANDSCAPE ARCHITECT
  SURGE PROTECTION DEVICE WITH GROUNDING DEVICE TO BE SPACED NO MORE THAN 500 FEET APART ALONG PATH
- BERMAD 310 RAM SERIES "MASTER" VALVE, ICD-100 DECODER, HFS SERIES FLOW METER WITH FCT AND ICD-SEN SENSOR DECODER

- MAINLINE PIPE
  3" DIAMETER AND SMALLER SHALL BE SCHEDULE 40 PVC SOLVENT-WELD TYPE
  4" DIAMETER AND LARGER SHALL BE CLASS 200 PVC O-RING GASKET TYPE WITH DUCTILE IRON GASKET FITTINGS
  4" EQUALIZER LINE BETWEEN TANKS SHALL BE SCHEDULE 40.
- CLASS 200 (EXCEPT 1/2 INCH #315) PVC LATERAL PIPE
- ONE 4" CLASS 200 SLEEVE PIPES
- TWO 4" CLASS 200 SLEEVE PIPES AT PAVEMENT CROSSINGS WITH 2 1/2" MAINLINE OR SMALLER UNLESS NOTED OTHERWISE
  ONE 8" AND ONE 4" CLASS 200 SLEEVE PIPE AT PAVEMENT CROSSINGS WITH 4" MAINLINE UNLESS NOTED OTHERWISE

L.I.C. SHALL SELECT SPRAY NOZZLES FOR "HEAD-TO-HEAD" COVERAGE, ADJUSTED FOR NO OVERSPRAY ONTO WALLS AND WALKS. NO OVERSPRAY INTO STREETS IS PERMITTED.

ALL PIPES SHALL BE SIZED TO ALLOW A MAXIMUM FLOW VELOCITY OF 5 FEET PER SECOND

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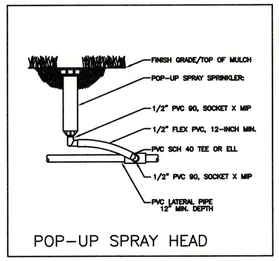
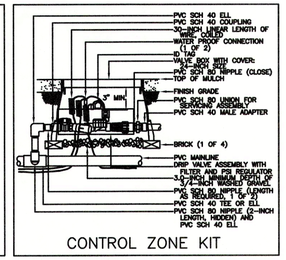
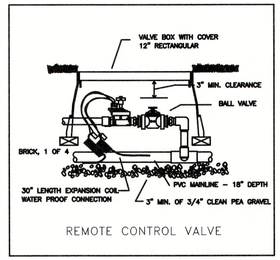


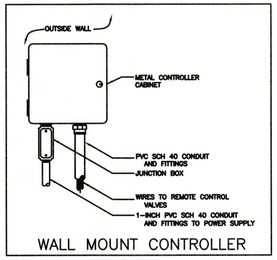
POP-UP SPRAY HEAD



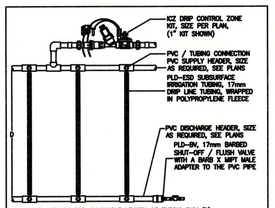
CONTROL ZONE KIT



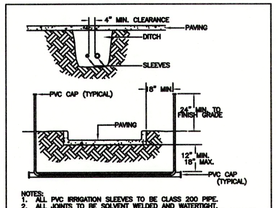
REMOTE CONTROL VALVE



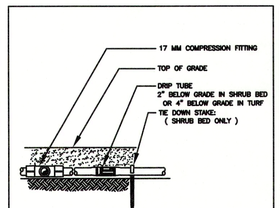
WALL MOUNT CONTROLLER



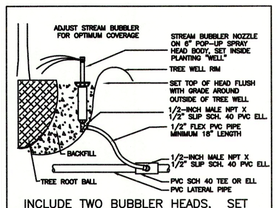
PLD-ESD - PLAN
PVC SUPPLY HEADER AND PVC DISCHARGE HEADER.



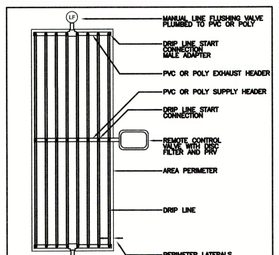
SLEEVING



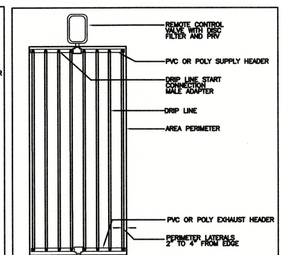
DRIP TUBE



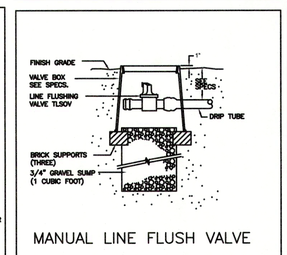
INCLUDE TWO BUBBLER HEADS, SET ON OPPOSITE SIDES OF ROOT BALL
TREE BUBBLER



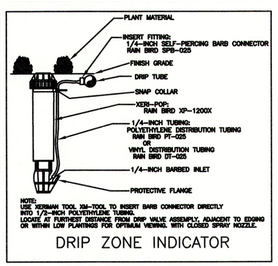
SUPPLY AND EXHAUST HEADERS SHALL BE CLASS 200 PVC PIPE, OF THE SAME DIAMETER AS THE ZONE VALVE SIZE.
USE DRIP TUBE FOR SUPPLY AND EXHAUST HEADERS ON GRIDS WITH FLOW SMALLER THAN 5 GPM ONLY.
DRIP CENTER FEED LAYOUT



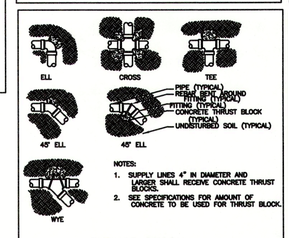
SUPPLY AND EXHAUST HEADERS SHALL BE CLASS 200 PVC PIPE, OF THE SAME DIAMETER AS THE ZONE VALVE SIZE.
USE DRIP TUBE FOR SUPPLY AND EXHAUST HEADERS ON GRIDS WITH FLOW SMALLER THAN 5 GPM ONLY.
DRIP END FEED LAYOUT



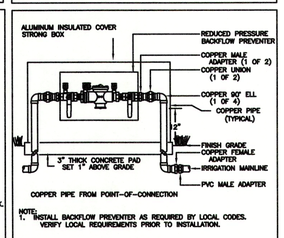
MANUAL LINE FLUSH VALVE



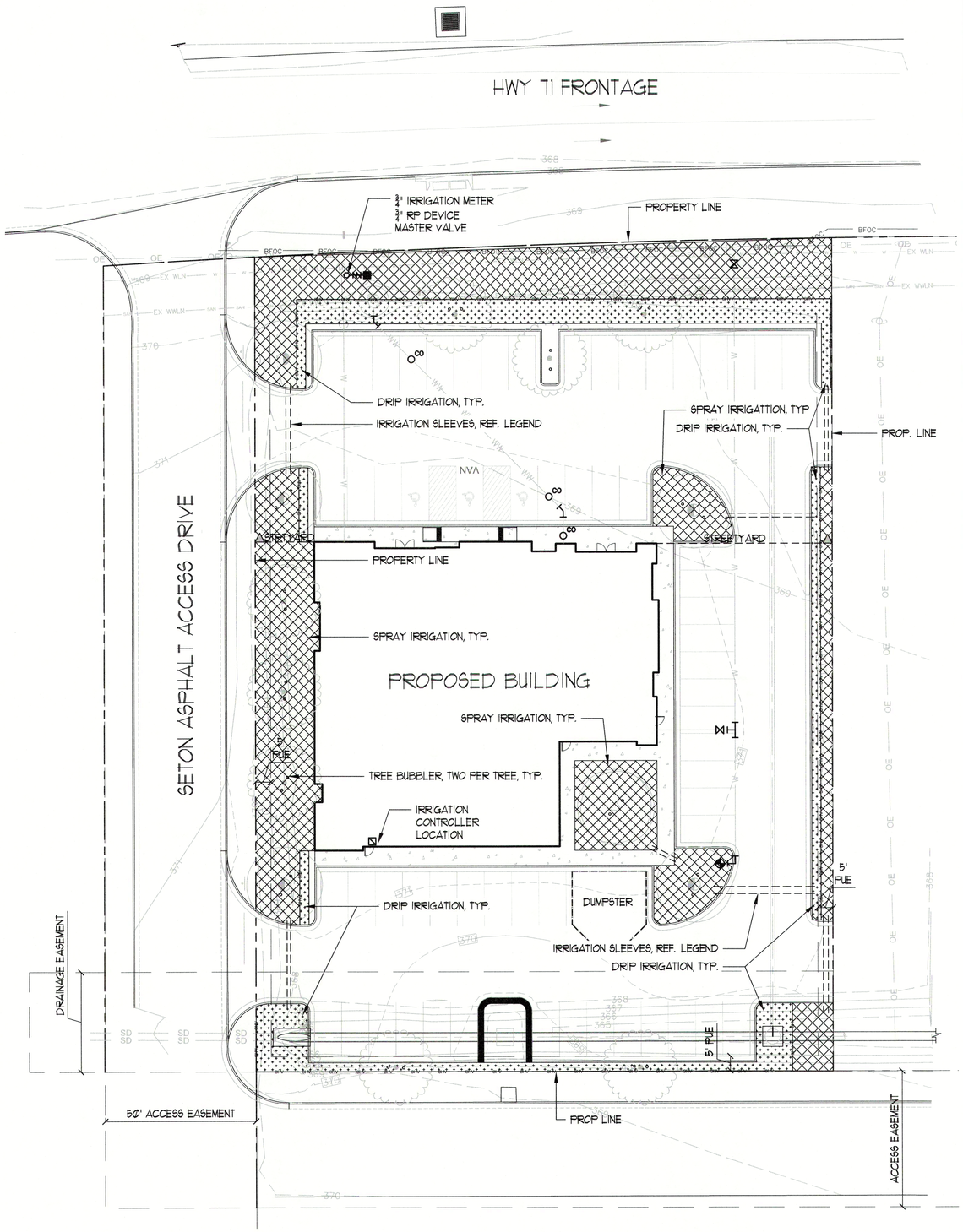
DRIP ZONE INDICATOR



THRUST BLOCK



RP DEVICE



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COLEMAN & ASSOCIATES
Landscape Architecture
Environmental Design

9890 Silver Mountain Drive
Austin, Texas 78737
Ph: 512-476-2090
F: 512-476-2099

1926 Cambria
San Antonio, Texas 78258
Ph: 210-492-4550
F: 210-492-9930

9511 Modesto Ave. NE
Albuquerque, New Mexico 87122
Ph: 505-433-3426

REGISTERED LANDSCAPE ARCHITECT
MELISSA M. ANDREW
2723
STATE OF TEXAS
10/14/2019

IRRIGATION PLAN AND DETAILS
CITY SUBMITTAL

BASTROP GROVE MEDTAIL DEV.
CITY OF BASTROP
BASTROP COUNTY, TEXAS

REVISIONS

SCALE:	AS SHOWN
DRAWN BY:	MAM
CHECKED BY:	MAM
APP. BY:	MAM
PROJECT NO.	
DATE:	10/14/2019

SHEET:
19 OF 29

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER DISTRIBUTION SYSTEM GENERAL CONSTRUCTION NOTES:

1. This water distribution system must be constructed in accordance with the current Texas Commission on Environmental Quality (TCEQ) Rules and Regulations for Public Water Systems 30 Texas Administrative Code (TAC) Chapter 290 Subchapter D. When conflicts are noted with local standards, the more stringent requirement shall be applied. At a minimum, construction for public water systems must always meet TCEQ's "Rules and Regulations for Public Water Systems.

2. All newly installed pipes and related products must conform to American National Standards Institute (ANSI)/NSF International Standard 61 and must be certified by an organization accredited by ANSI [§290.44(a)(1)].

3. Plastic pipe for use in public water systems must bear the NSF International Seal of Approval (NSF - pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less [§290.44(a)(2)].

4. No pipe which has been used for any purpose other than the conveyance of drinking water shall be accepted or relocated for use in any public drinking water supply [§290.44(a)(3)].

5. All water line crossings of wastewater mains shall be perpendicular [§290.44(e)(4)(B)].

6. Water transmission and distribution lines s hall be installed in accordance with the manufacturer's instructions. However, the top of the water line must be located below the frost line and in no case shall the top of the water line be less than 24 inches below ground surface [§290.44(a)(4)].

7. The maximum allowable lead content of pipes, pipe fittings, plumbing fittings, and fixtures is 0.25 percent [§290.44(b)].

8. The contractor shall install appropriate air release devices with vent openings to the atmosphere covered with 16 -mesh or finer, corrosion resistant screening material or an acceptable equivalent [§290.44(d)(1)].

9. The contractor shall not place the pipe in water or where it can be flooded with water or sewage during its storage or installation [§290.44(f)(1)].

10. When waterlines are laid under any flowing or intermittent stream or semi -permanent body of water the waterline shall be installed in a separate watertight pipe encasement. Valves must be provided on each side of the crossing with facilities to allow the underwater portion of the system to be isolated and tested [§290.44(f)(2)].

11. Pursuant to 30 TAC §290.44(a)(5), the hydrostatic leakage rate shall not exceed the amount allowed or recommended by the most current AWWA formulas for PVC pipe, cast iron and ductile iron pipe. Include the formula s in the notes on the plans.

    The hydrostatic leakage rate for polyvinyl chloride (PVC) pipe and appurtenances shall not exceed the amount allowed or recommended by formulas in America Water Works Association (AWWA) C -605 as required in 30 TAC §290.44(a)(5) . Please ensure that the formula for this calculation is correct and most cu rrent formula is in use;

$$Q = \frac{LP\sqrt{P}}{148{,}000}$$

    Where:

    Q = the quantity of ma keup water in gallons per hour,
    L = the length of the pipe section being tested, in feet,
    D = the nominal dia m eter of the pipe in inches, and
    P = the average test pressure during the hydrostatic test i n pounds per square inch (psi).

    The hydrostatic leakage rate for ductile iron (DI) pipe and appurtenances shall not exceed the amount allowed or recommended by form ulas in America Water Works Association (AWWA) C -600 as required in 30 TAC §290.44(a)(5). Please ensure that the formula for this calculation is correct and most current formula is in use;

$$L = \frac{SP\sqrt{P}}{148{,}000}$$

    Where:

    L = the quantity of makeup water in gallons per hour,
    S = the length of the pipe section being tested, in feet,
    D = the nominal diameter of the pipe in inches, and
    P = the average test pressure during the hydrostatic test in pounds per square inch (psi).

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER DISTRIBUTION SYSTEM GENERAL CONSTRUCTION NOTES:

14. The contractor shall maintain a minim um separation distance in all directions of nine feet between the proposed waterline and wastewater collection facilities including manholes. If this distance cannot be maintained, the contractor must immediately notify the project engineer for further direction. Separation distances, installation methods, and materials utilized must meet §290.44(e)(1) -(4).

15. The separation distance from a potable waterline to a wastewater main or lateral manhole or cleanout shall be a minimum of nine feet. Where the nine-foot separation distance cannot be achieved, the potable waterline shall be encased in a joint of at least 150 psi pressure class pipe at least 18 feet long and two nominal sizes larger than the new conveyance. The space around the carrier pipe shall be supported at five-foot intervals with spacers or be filled to the springline with washed sand. The encasement pipe shall be centered on the crossing and both ends sealed with cement grout or manufactured sealant [§290.44(e)(5)].

16. Fire hydrants shall not be insta lled within nine feet vertically or horizontally of any wastewater line, wastewater lateral, or wastewater service line regardless of construction[§290.44(e)(6)].

17. Suction mains to pumping equipment shall not cross wastewater mains, wastewater laterals, or wastewater service lines. Raw water supply lines shall not be installed within five feet of any tile or concrete wastewater main, wastewater lateral, or wastewater service line [§290.44(e)(7)].

18. Waterlines shall not be installed closer than ten feet to sep tic tank drainfields [§290.44(e)(8)].

19. The contractor shall disinfect the new waterlines in accordance with AWWA Standard C-651-14 or most recent, then flush and sample the lines before being placed into service. Samples shall be collected for microbiologic al analysis to check the effectiveness of the disinfection procedure which shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed waterline will be required or at the next available sampling point beyond 1,000 feet as designated by the design engineer [§290.44(f)(3)].

20. Dechlorination of disinfecting water shall be in strict accordance with current AWWA Standard C655 -09 or most recent.

Revised: February 2019

WATER & WASTEWATER NOTES:

1. Pipe material for water mains shall be pvc (awwa c-900, dr 14), or ductile iron (awwa c-115/151, minimum class 350). Water services (2inches or less) shall be polyethylene tubing (black, 200 psi, dr 9).

2. Pipe material for pressure wastewater mains shall be pvc dr 21 or ductile iron (minimum class 350). Pipe material for gravity wastewater mains shall be pvc (astm d3034, sdr-26).

3. Unless otherwise accepted by the engineer, depth of cover for all lines out of the pavement shall be 42 inches minimum, and depth of cover for all lines under pavement shall be a minimum of 30 inches below subgrade.

4. All fire hydrant leads shall be ductile iron pipe (awwa c-115/151, minimum class 350).

5. All iron pipe and fittings shall be wrapped with minimum 8-mil polyethylene and sealed with duct tape or equal.

6. The contractor shall notify city of bastrop, telephone at (512) 332-8920 to coordinate utility tie-ins and notify at least 48 hours prior to connecting to existing lines.

7. The contractor must obtain a fire hydrant meter from city of bastrop for all water used during construction or, connect to well at plant, must coordinate with city of bastrop.

8. The contractor must obtain a bulk water permit or purchase and install a water meter for all water used during construction. A copy of this permit must be carried at all times by all who use water.

9. Line flushing or any activity using a large quantity of water must be scheduled with city of bastrop, telephone at (512) 332-8920.

10. The contractor, at his expense, shall perform sterilization of all potable water lines constructed and shall provide all equipment (including test gauges), supplies (including concentrated chlorine disinfecting material), and necessary labor required for the sterilization procedure. The sterilization procedure shall be monitored by city of bastrop personnel. Water samples will be collected by the city of bastrop to verify each treated line has attained an initial chlorine concentration of 50 ppm. Where means of flushing is necessary, the contractor, at his expense, shall provide flushing devices and remove said devices prior to final acceptance.

11. Sampling taps shall be brought up to 3 feet above grade and shall be easily accessible for city personnel. At the contractor's request, and in his presence, samples for bacteriological testing will be collected not less than 24 hours after the treated line has been flushed of the concentrated chlorine solution and charged with water approved by the city.

12. The contractor, at his expense, shall perform quality testing for all wastewater pipe installed and pressure pipe hydrostatic testing of all water lines constructed and shall provide all equipment (including pumps and gauges), supplies and labor necessary to perform the tests. Quality and pressure testing shall be monitored by city of bastrop personnel and district personnel.

13. The contractor shall coordinate testing with the city inspector and city of bastrop and provide no less than 24 hours notice prior to performing sterilization, quality testing or pressure testing.

14. The contractor shall not open or close any valves unless authorized by the city of bastrop.

15. All valve boxes and covers shall be cast iron.

16. Contact city of bastrop utility, telephone at (512) 332-8920 for assistance in obtaining existing water and wastewater locations.

17. Embedment materials shall include the material used for bedding, haunching and initial backfill and shall meet the requirements of astm 2321, class 1 material. Embedment material shall be angular 1/4 to 3/4 inch uniformly graded, hard, durable crushed stone. The embedment material shall have 95 percent passing a 3/4 inch sieve and 95 percent retained on a 1/4 inch sieve (no. 4 sieve). No material which is rounded or has smooth surfaces shall be suitable for embedment material. Sand shall not be used for bedding

18. The contractor is hereby notified that connecting to, shutting down, or terminating existing utility lines may have to occur at off-peak hours. Such hours are usually outside normal working hours and possibly between 12 a.M. And 6 a.M.

19. All wastewater construction shall be in accordance with the texas commission on environmental quality (tceq) regulations, 30 tac chapter 213 and 317, as applicable. Whenever tceq and city of bastrop specifications conflict, the more stringent shall apply.

GENERAL NOTES:

1. All construction shall be in accordance with the city of bastrop design and construction standards manual.

2. Any existing utilities, pavement, curbs, sidewalks, structures, trees, etc., not planned for demolition that are damaged or removed shall be repaired or replaced at the applicant's expense.

3. The contractor shall verify all depths and locations of existing utilities prior to any construction. Any discrepancies with the construction plans found in the field shall be brought immediately to the attention of the engineer who shall be responsible for revising the plans are appropriate.

4. Manhole frames, covers, valves, cleanouts, etc. Shall be raised to finished grade after to final paving construction. A concrete square shall be poured around all appurtenances.

5. All areas disturbed or exposed during construction shall be re-vegetated in accordance with the plans and specifications. Re-vegetation is to take place within 14 days of construction inactivity. Re-vegetation of all disturbed or exposed areas shall consist of sodding or seeding, at the contractor's option. However, the type of re-vegetation must equal or exceed the type of vegetation present before construction

6. Prior to any construction, the applicant's engineer shall convene a preconstruction conference between himself, the city of bastrop, the contractor, utility companies, any affected parties and any other entity the city or the engineer may require. Reference development packet for guidance on how to schedule a preconstruction conference.

7. The contractor and the engineer shall keep accurate records of all construction that deviates from the plans. The engineer shall furnish the city of bastrop accurate "as-built" drawings following completion of all construction.

8. When construction is being carried out within easements, the contractor shall confine his work to within the permanent and any temporary easements. Prior to final acceptance, the contractor shall be responsible for removing all trash and debris within the permanent and temporary easements.

9. Prior to any construction, the contractor shall apply for and secure all proper permits from the appropriate authorities.
10. All storm sewer fittings must be pre-cast.

11. Available benchmarks that may be utilized for the construction of this project are described as follows:

12. All responsibility for the adequacy of these plans remains with the engineer who prepared them. In reviewing these plans, the city of bastrop must rely upon the adequacy of the design engineer.

13. The locations of existing underground utilities are shown in an approximate way only and have not been independently verified by the owner or its representative. The contractor shall determine the exact location of all existing utilities before commencing work, and agrees to be fully responsible for any and all damages which might be associated with the contractor's failure to exactly locate and preserve any and all underground utilities.

14. This project is located in the colorado river watershed.

15. No portion of this tract is within the boundaries of the 100-year flood plain of any waterway that is within the limits of study of the federal flood insurance administration firm map no. 48021co335e, dated january 19, 2006, bastrop county, texas. Bastrop county community no. 481193.

16. All mechanical equipment not shown will require screening from public view.

CONSTRUCTION SEQUENCE:

No clearing or rough grading may be done until the approved erosion and sedimentation controls are in place.

1. Hold pre-construction conference.
2. Install temporary erosion and sedimentation controls and stabilized construction entrance as shown on the plans.
3. With the approval of all affected parties, the contractor may begin clearing and grubbing.
4. Install storm drainage and utilities.
5. Complete all rough grading and underground installation within the limits of construction. Insure that all underground utility crossings are completed.
6. Construct site paving and improvements.
7. Complete final grading within limits of construction along areas designated, including ditches and parkways restore construction spoils & staging area to natural grade.
8. Complete permanent erosion control and restoration of site vegetation.
9. Project engineer observes construction and writes concurrence letter to the city of bastrop and the district.
10. After final inspection and acceptance of construction, complete any necessary final dress up of disturbed areas and remove/ dispose of temporary erosion controls in an approved manner.

DEVELOPER INFORMATION: OWNER: GROVE 71 PARTNERS, LP-TYLER DUTTON

ADDRESS: 3809 S. 2ND STREET, D-200
AUSTIN, TEXAS 78704

PHONE: 512 437-6404

DESIGN ENGINEER/REPRESENTATIVE RESPONSIBLE FOR PLAN CHANGES
NAME: CARLSON BRIGANCE & DOERING, INC. - BRENDAN P. McENTEE, P.E.

ADDRESS: 12129 RANCH ROAD 620 NORTH, SUITE 600
AUSTIN TX 78750

PHONE: (512) 280-5160

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DESIGNED BY: | DRAFTED BY:

REVISION | DATE

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr.
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600
Austin, Texas 78750
Fax No. (512) 280-5165

SHEET NAME: GENERAL NOTES
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
02/06/2020

DATE 11/25/2019
JOB NUMBER 5135
SHEET 20 OF 29
SHEET NO. 20

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CONSTRUCTION PLAN NOTES

GENERAL NOTES

1. All construction shall be in accordance with the City of Bastrop Design and Construction Standards Manual.
2. Any existing utilities, pavement, curbs, sidewalks, structures, trees, etc., not planned for demolition that are damaged or removed shall be repaired or replaced at the Applicant's expense.
3. The Contractor shall verify all depths and locations of existing utilities prior to any construction. Any discrepancies with the construction plans found in the field shall be brought immediately to the attention of the Engineer who shall be responsible for revising the plans are appropriate.
4. Manhole frames, covers, valves, cleanouts, etc. shall be raised to finished grade after to final paving construction. A concrete square shall be poured around all appurtenances.
5. The Contractor shall give the City of Bastrop 48 hours notice before beginning each phase of construction. Notice shall be given to the Planning and Development Department: telephone 512-332-8841.
6. All areas disturbed or exposed during construction shall be re-vegetated in accordance with the plans and specifications. Re-vegetation is to take place within 14 days of construction inactivity. Re-vegetation of all disturbed or exposed areas shall consist of sodding or seeding, at the Contractor's option. However, the type of re-vegetation must equal or exceed the type of vegetation present before construction
7. Prior to any construction, the Applicant's Engineer shall convene a preconstruction conference between himself, the City of Bastrop, the Contractor, utility companies, any affected parties and any other entity the City or the Engineer may require. Reference Development Packet for guidance on how to schedule a preconstruction conference.
8. The Contractor and the Engineer shall keep accurate records of all construction that deviates from the plans. The Engineer shall furnish the City of Bastrop accurate "As-Built" drawings following completion of all construction. These "As-Built" drawings shall meet with the satisfaction of the Planning and Development Department prior to final acceptance.
9. The Bastrop City Council shall not be petitioned for acceptance until all necessary easement documents have been signed and recorded.
10. When construction is being carried out within easements, the Contractor shall confine his work to within the permanent and any temporary easements. Prior to final acceptance, the Contractor shall be responsible for removing all trash and debris within the permanent and temporary easements. Clean-up shall be to the satisfaction of the Director.
11. Prior to any construction, the Contractor shall apply for and secure all proper permits from the appropriate authorities.
12. Available benchmarks that may be utilized for the construction of this project are described as follows:

TRENCH SAFETY NOTES

1. In accordance with the Laws of the State of Texas and the U. S. Occupational Safety and Health Administration regulations, all trenches over 5 feet in depth in either hard and compact or soft and unstable soil shall be sloped, shored, sheeted, braced or otherwise supported. Furthermore, all trenches less than 5 feet in depth shall also be effectively protected when hazardous ground movement may be expected. Trench safety systems to be utilized for this project will be provided by the contractor to the City.
2. In accordance with the U. S. Occupational Safety and Health Administration regulations, when persons are in trenches 4-feet deep or more, adequate means of exit, such as a ladder or steps, must be provided and located so as to require no more than 25 feet of lateral travel.
3. If trench safety system details were not provided in the plans because trenches were anticipated to be less than 5 feet in depth and during construction it is found that trenches are in fact 5 feet or more in depth or trenches less than 5 feet in depth are in an area where hazardous ground movement is expected, all construction shall cease, the trenched area shall be barricaded and the Engineer notified immediately. Construction shall not resume until appropriate trench safety system details, as designed by a professional engineer, are retained and copies submitted to the City of Bastrop.

STREET AND DRAINAGE NOTES

1. All testing shall be done by an independent laboratory at the Applicant's expense. A City Inspector shall be present during all tests. Testing shall be coordinated with the City inspector and he shall be given a minimum of 24 hours notice prior to any testing. Contact the Planning and Development Department with notice 512-332-8841.
2. Backfill behind the curb shall be compacted to obtain a minimum of 85% maximum density to within 3 inches of top of curb. Material used shall be primarily granular with no rocks larger than 3 inches in the greatest dimension. The remaining 3 inches shall be clean topsoil free from all clods and suitable for sustaining plant life.
3. Depth of cover for all crossings under pavement including gas, electric, telephone, cable TV, water services, etc., shall be a minimum of 30 inches below subgrade.
4. Street rights-of-way shall be graded at a slope of 1/4 inch per foot toward the curb unless otherwise indicated. However, in no case shall the width of right-of-way at 1/4 inch per foot slope be less than 10 feet unless a specific request for an alternate grading scheme is made to and accepted by the City of Bastrop Planning and Development Department.
5. Barricades built to City of Bastrop standards shall be constructed on all dead-end streets and as necessary during construction to maintain job and public safety.
6. All RCP shall be minimum Class III.
7. The paving sections were designed by the engineer in accordance with the current City of Bastrop design criteria. The paving sections are to be constructed as follows:

   Paving and Drives: 2" HMAC Type D, 8" Flex Base, 9" Compact Subgrade
8. The Geotechnical Engineer shall inspect the subgrade for compliance with the design assumptions made during preparation of the Soils Report. Any adjustments that are required shall be made through revision of the construction plans.
9. Where PI's are over 20, subgrades must be stabilized utilizing a method acceptable to the City Engineer. The Geotechnical Engineer shall recommend an appropriate subgrade stabilization if sulfates are determined to be present.

WATER AND WASTEWATER NOTES

1. Pipe material for water mains shall be PVC (AWWA C-900, minimum Class 200), or Ductile Iron (AWWA C-100, minimum Class 200). Water services (2 inches or less) shall be polyethylene tubing (black, 200 psi, DR 9).
2. Pipe material for pressure wastewater mains shall be PVC, or Ductile Iron (minimum Class 250). Pipe material for gravity wastewater mains shall be PVC (ASTM D2241 or D3034, maximum DR-26), Ductile Iron (AWWA C-100, minimum Class 200200).
3. Unless otherwise accepted by the City Engineer, depth of cover for all lines out of the pavement shall be 42 inches minimum, and depth of cover for all lines under pavement shall be a minimum of 30 inches below subgrade.
4. All fire hydrant leads shall be PVC (AWWA C-900, minimum Class 200) or ductile iron pipe (AWWA C-100, minimum Class 200). as approved by the Director of Water and Wastewater during plan review.
5. All iron pipe and fittings shall be wrapped with minimum 8-mil polyethylene and sealed with duct tape or equal accepted by the City Engineer.
6. The Contractor shall contact the City Inspector, telephone at 512-332-8841 to coordinate utility tie-ins and notify him at least 48 hours prior to connecting to existing lines.
7. All manholes shall be concrete with cast iron ring and cover. All manholes located outside of the pavement shall have bolted covers. Tapping of fiberglass manholes shall not be allowed.
8. The Contractor must obtain a bulk water permit or purchase and install a water meter for all water used during construction. A copy of this permit must be carried at all times by all who use water.
9. Line flushing or any activity using a large quantity of water must be scheduled with the City Inspector, telephone at 512-332-8841.
10. The Contractor, at his expense, shall perform sterilization of all potable water lines constructed and shall provide all equipment (including test gauges), supplies (including concentrated chlorine disinfecting material), and necessary labor required for the sterilization procedure. The sterilization procedure shall be monitored by City of Bastrop personnel. Water samples will be collected by the City of Bastrop to verify each treated line has attained an initial chlorine concentration of 50 ppm. Where means of flushing is necessary, the Contractor, at his expense, shall provide flushing devices and remove said devices prior to final acceptance by the City of Bastrop.
11. Sampling taps shall be brought up to 3 feet above grade and shall be easily accessible for City personnel. At the Contractor's request, and in his presence, samples for bacteriological testing will be collected by the City of Bastrop not less than 24 hours after the treated line has been flushed of the concentrated chlorine solution and charged with water approved by the City. The Contractor shall supply a check or money order, payable to the City of Bastrop, to cover the fee charged for testing each water sample. City of Bastrop fee amounts may be obtained by calling the Water and Wastewater Department, telephone at 512-332-8960
12. The Contractor, at his expense, shall perform quality testing for all wastewater pipe installed and pressure pipe hydrostatic testing of all water lines constructed and shall provide all equipment (including pumps and gauges), supplies and labor necessary to perform the tests. Quality and pressure testing shall be monitored by City of Bastrop personnel.
13. The Contractor shall coordinate testing with the City of Inspector and provide no less than 24 hours notice prior to performing sterilization, quality testing or pressure testing.
14. The Contractor shall not open or close any valves unless authorized by the City of Bastrop.
15. All valve boxes and covers shall be plastic.
16. Contact the Water and Wastewater Department, telephone at 512-332-8960 for assistance in obtaining existing water and wastewater locations.
17. The Planning and Development Department, telephone at 512-332-8841 shall be notified 48 hours prior to testing of any building sprinkler piping in order that the Building Official and/or Fire Department may monitor such testing.
18. Sand, as described in Specification item 510 pipe, shall not be used as bedding for wastewater lines. Acceptable bedding materials are pipe bedding stone, pea gravel and in lieu of sand, a naturally occurring or manufactured stone material conforming to ASTM C33 for stone quality and meeting the following gradation specification:

Sieve Size	Percent Retained By Weight
1/2"	0
3/8"	0-2
#4	40-85
#10	95-100

19. The Contractor is hereby notified that connecting to, shutting down, or terminating existing utility lines may have to occur at off-peak hours. Such hours are usually outside normal working hours and possibly between 12 a.m. and 6 a.m.
20. All wastewater construction shall be in accordance with the Texas Commission on Environmental Quality (TCEQ) Regulations, 30 TAC Chapter 213 and 317, as applicable. Whenever TCEQ and City of Bastrop Specifications conflict, the more stringent shall apply.

TRAFFIC MARKING NOTES

1. Any methods, street markings and signage necessary for warning motorists, warning pedestrians or diverting traffic during construction shall conform to the Texas Manual of Uniform Traffic Control Devices for Streets and Highways, latest edition.
2. All pavement markings, markers, paint, traffic buttons, traffic controls and signs shall be installed in accordance with the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges and, the Texas Manual of Uniform Traffic Control Devices for Streets and Highways, latest editions.

EROSION AND SEDIMENTATION CONTROL NOTES

1. Erosion control measures, site work and restoration work shall be in accordance with the City of Bastrop Code of Ordinances.
2. All slopes shall be sodded or seeded with approved grass, grass mixtures or ground cover suitable to the area and season in which they are applied.
3. Silt fences, rock berms, sedimentation basins and similarly recognized techniques and materials shall be employed during construction to prevent point source sedimentation loading of downstream facilities. Such installation shall be regularly inspected by the City of Bastrop for effectiveness. Additional measures may be required if, in the opinion of the City Engineer, they are warranted.
4. All temporary erosion control measures shall not be removed until final inspection and approval of the project by the City Inspector. It shall be the responsibility of the Contractor to maintain all temporary erosion control structures and to remove each structure as approved by the City Inspector.
5. All mud, dirt, rocks, debris, etc., spilled, tracked or otherwise deposited on existing paved streets, drives and areas used by the public shall be cleaned up immediately.

BASTROP FIRE DEPARTMENT GENERAL NOTES

1. The bastrop fire department requires final asphalt or concrete pavement on required access roads prior to the start of combustible construction. Any other method of providing "all-weather driving capabilities" shall be required to be documented and approved as an alternate method of construction in accordance with the applicable rules for temporary roads.
2. Fire hydrants shall be installed with the center of the large diameter hose connection (steamer) located at least 18 inches above finished grade. The steamer opening of fire hydrants shall face the approved fire access driveway or public-street set back from curb line(s) an approved distance, typically three (3) to six (6) feet. The area within three (3) feet in all directions from any fire hydrant shall be free of obstructions and the area between the steamer opening and the street or driveway giving emergency vehicle access shall be free of obstructions.
3. Timing of installations: when fire protection facilities are installed by the contractor, such facilities shall include surface access roads. Emergency access roads or drives shall be installed and made serviceable prior to and during the time of construction. When the fire department approves an alternate method of protection, this requirement may be modified as documented in the approval of the alternate method.
4. All emergency access roadways and fire lanes, including pervious/decorative paving, shall be engineered and installed as required to support the axle loads of emergency vehicles. A load capacity sufficient to meet the requirements for hs-20 loading (16 kips/wheel) and a total vehicle live load of 80,000 pounds is considered compliant with this requirement.
5. Fire lanes designated on site plans shall be registered with the bastrop fire department and inspected for final approval.
6. The minimum vertical clearance required for emergency vehicle access roads or drives is 13 fee - 6 inches for the full width of the roadway or driveway.
7. Dumpsters and containers with an individual capacity of 1.5 cubic yards or more shall not be stored in buildings or placed within ten feet of combustible walls, openings, or combustible roof eave lines.

DESIGNED BY:

DRAFTED BY:

REVISION	DATE

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr. 12129 RR 620 N., Ste. 600
Austin, Texas 78749 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

SHEET NAME: CONSTRUCTION NOTES

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID # F3791
02/06/2020

DATE 11/25/2019

JOB NUMBER 5135

SHEET 21 OF 29

SHEET NO. 21

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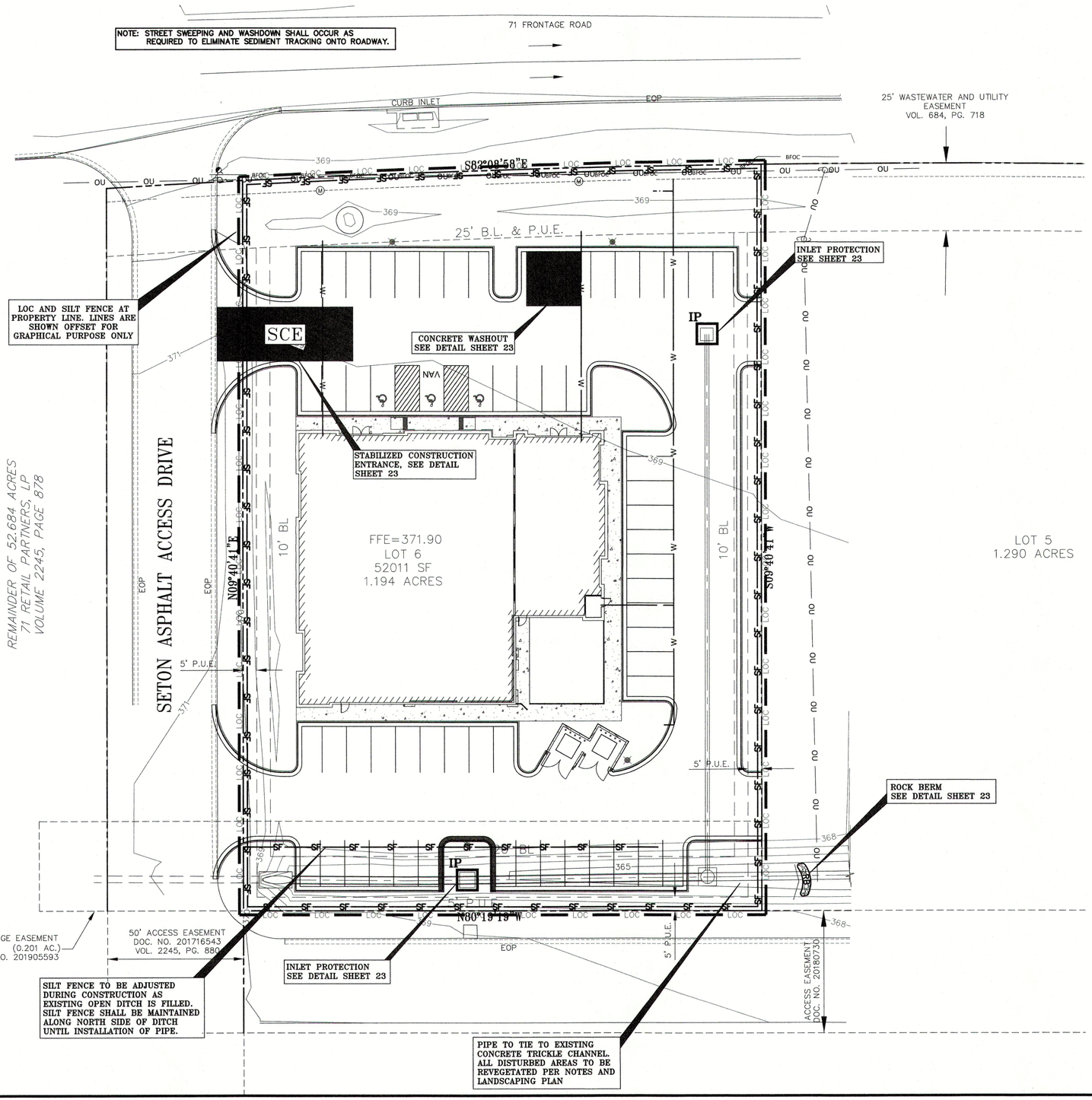

0 20' 40'

SCALE: 1" = 20'

LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- IP — INLET PROTECTION
- RB — ROCK BERM
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- CONCRETE WASHOUT

WARNING!!!
REVIEW THE SEQUENCE OF CONSTRUCTION ON THE GENERAL NOTES SHEET PRIOR TO BEGINNING CONSTRUCTION

!!! WARNING !!!:
UNDERGROUND UTILITIES SHOWN ON THESE PLANS IS A BEST ESTIMATE BASED ON RECORDS THAT COULD BE OBTAINED AND PHYSICAL FEATURES VISIBLE AT THE GROUND LEVEL. THE ENGINEER MAKES NO ASSERTIONS BEYOND THAT THEY ARE A BEST ESTIMATE AND AN ATTEMPT TO HELP IDENTIFY POSSIBLE UTILITIES IN THE AREA. THE CONTRACTOR MUST CALL ONE CALL IN ACCORDANCE WITH THE NOTES TO BETTER LOCATE ANY UNDERGROUND UTILITIES.

GENERAL EROSION CONTROL NOTES:

1) CONTRACTOR TO FIELD LOCATE DIVERSION, INTERCEPTOR, AND PERIMETER DIKES/DITCHES AS REQUIRED BASED ON THE DRAIN SEQUENCE OF CONSTRUCTION.
2) IF DISTURBED AREA IS NOT WORKED FOR MORE THAN 14 DAYS THEN DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TARP, OR MATTING.
3) THE ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON SITE TO KEEP PROJECT IN-COMPLIANCE WITH THE CITY OF BASTROP RULES AND REGULATIONS.
4) THE CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS WATERING WITH IRRIGATION TRUCKS AND MULCHING AS PER CITY REQUIREMENTS, OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
5) SILT FENCE TYPE AND INSTALLATION SHALL COMPLY WITH CITY OF BASTROP RULES AND REGULATIONS.
6) CONTRACTOR WILL CHECK AND IF NECESSARY CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
7) CONTRACTOR IS SOLEY RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION INCLUDING COMPLIANCE WITH SWPPP INSPECTION, REPORTING, NOI, AND NOT FILING. THE PLAN SHOWN IS THE MINIMUM REQUIRED AND THE CONTRACTOR SHALL MODIFY THE PLAN AS REQUIRED TO ELIMINATE SEDIMENT FROM LEAVING THE SITE.
8) ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITY ARE TO BE REVEGETATED IN ACCORDANCE WITH THIS SHEET AND THE LANDSCAPING PLAN. REFER TO SHEET 23 FOR EROSION CONTROL DETAILS AND ADDITIONAL NOTES REGARDING REVEGETATION.

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DATE | REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr. Ste. 600
Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N. Ste. 600
Austin, Texas 78750
Fax No. (512) 280-5165

SHEET NAME: EROSION CONTROL PLAN

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
02/06/2020

DATE: 11/25/2019

JOB NUMBER: 5135

SHEET: 22 OF 29

SHEET NO.: 22

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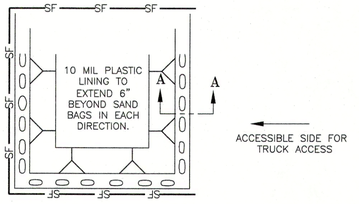
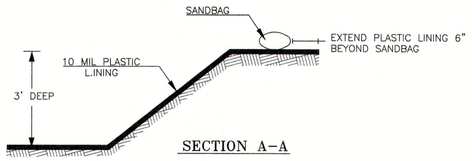


PLAN

ACCESSIBLE SIDE FOR TRUCK ACCESS

NOTE: SIZE VARIES BASED ON ANTICIPATED VOLUME OF CONCRETE TO BE PLACED. MINIMUM SIZE 8'X8' BOTTOM.

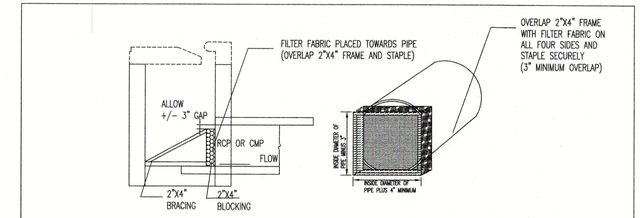


SECTION A-A

CONCRETE WASHOUT AREA NOTES:

1. WASHOUT SHALL BE INSTALLED PRIOR TO PLACING ANY CONCRETE ON-SITE.
2. INSTALL DIRECTIONAL SIGNS AS NECESSARY TO INDICATE WASHOUT LOCATION TO CONCRETE SUPPLY VEHICLES.
3. WASHOUT SHALL BE INSPECTED WEEKLY AND AFTER RAIN EVENTS IN ACCORDANCE WITH SWPPP.
4. CONTRACTOR TO MAINTAIN, REPAIR, ENLARGE OR RELOCATE WASHOUT AS NECESSARY TO MEET PROJECT REQUIREMENTS.
5. WHEN NECESSARY DURING CONSTRUCTION, OR AT THE COMPLETION OF ALL CONSTRUCTION, CONCRETE SHALL BE REMOVED AND LAWFULLY DISPOSED OF AND THE WASHOUT AREA FILLED WITH COMPACTED SELECT FILL.
6. CONCRETE WASHOUT SHALL NOT BE LOCATED WITHIN 50' OF STORM INLET, DITCH, OR SUBSURFACE DRAINAGE SYSTEM.

CONCRETE WASHOUT DETAIL
N.T.S



NOTES:
"STORM INLET SEDIMENT TRAPS" SHALL BE PLACED IN ALL PROPOSED AND EXISTING CURB INLETS AND DROP INLETS AS DIRECTED BY THE CITY OF BASTROP.

THE LATERAL BRACING SHALL BE PLACED IN A MANNER AS TO ADEQUATELY SECURE THE FILTER FRAME TO THE SIDE OF THE INLET, INSURING THE PROPER FUNCTION OF THE SEDIMENT TRAP

FILTER FABRIC MAY BE IDENTICAL TO THAT SPECIFIED A "TEMPORARY SEDIMENT CONTROL FENCE"
OTHER MATERIAL MAY BE USED UPON APPROVAL OF THE CITY OF CEDAR PARK'S PROJECT REPRESENTATIVE.

THE "STORM INLET SEDIMENT TRAP" SHALL BE INSTALLED IN EXISTING INLETS BEFORE CONSTRUCTION BEGINS AND UPON COMPLETION OF THE INLET WALLS IN PROPOSED INLETS OR AS DIRECTED BY THE CITY REPRESENTATIVE.

THE CONTRACTOR WILL BE REQUIRED TO PERFORM PERIODIC MAINTENANCE OF THE SEDIMENT TRAP AND REMOVE ACCUMULATED SILT AS DIRECTED BY THE CITY OF BASTROP.

ALL WOOD SHALL BE PRESSURE TREATED

SEDIMENT TRAPS TO BE REMOVED AFTER PAVING IS COMPLETE

STORM INLET SEDIMENT TRAP (TYPE 1) DETAILS
(TxDOT-AUSTIN DISTRICT)

EROSION AND SEDIMENTATION CONTROL:

1. The contractor shall install erosion/sedimentation controls and fencing for areas outside of the construction area prior to any site preparation work (clearing, grubbing or excavation).
2. The contractor is required to inspect the controls and fences at weekly intervals, and after significant rainfall events to insure that they are functioning properly. The person(s) responsible for maintenance of controls and fences shall immediately make any necessary repairs to damaged areas. Silt accumulation at controls must be removed when the depth reaches six (6) inches.
3. Prior to final acceptance, haul roads and waterway crossings constructed for temporary contractor access must be removed, accumulated sediment removed from the waterway and the area restored to the original grade and revegetated. All land clearing debris shall be disposed of in approved spoil disposal sites.
4. Any methods, street markings and signage necessary for warning motorists, warning pedestrians or diverting traffic during construction shall conform to the texas manual of uniform traffic control devices for streets and highways, latest edition.
5. All pavement markings, markers, paint, traffic buttons, traffic controls and signs shall be installed in accordance with the texas department of transportation standard specifications for construction of highways. Streets, bridges, and the texas manual of uniform traffic control devices for streets and highways, latest editions.
6. Erosion control measures, site work and restoration work shall be in accordance with the city of bastrop code of ordinances.
7. All slopes shall be sodded or seeded with approved grass, grass mixtures or ground cover suitable to the area and season in which they were applied.
8. Silt fences, rock berms, sedimentation basins and similarly recognized techniques and materials shall be employed during construction to prevent point source sedimentation loading of downstream facilities. Such installation shall be regularly inspected by the city of bastrop for effectiveness. Additional measures may be required if, in the opinion of the city engineer, they are warranted.
9. All temporary erosion control measures shall not be removed until final inspection and approval of the project by the city inspector. It shall be the responsibility of the contractor to maintain all temporary erosion control structures and to remove each structure as approved by the city inspector.
10. All mud, dirt, rocks, debris, etc., spilled, tracked or otherwise deposited on existing paved streets. Drives and areas used by the public shall be cleaned up immediately.
11. Permanent erosion control: all disturbed areas shall be restored as noted below:

a. Minimum of four (4) inches of topsoil shall be placed in all drainage channels (except rock), and between the curb and right-of-way.

B. The seeding for permanent erosion control shall be applied over areas disturbed by construction as follows:

broadcast seeding:

(i) from october to february, seeding shall be with one (1) pound per 1,000 square feet of unhulled bermuda or three (3) pounds per

(ii) from march to september, seeding shall be with hulled bermuda at a rate of one (1) pound per 1,000 square feet, with a purity of 95% with 85% germination.

Fertilizer shall be slow release granular or palette type, and shall have an analysis of 15-15-15, and shall be applied at the rate of one (1) pound per 1,000 square feet, once at the time of planting, and again once during the time of establishment.

Mulch type used shall be straw or hay applied at a rate of 45 pounds per 1,000 square feet.

Hydraulic seeding:

(i) from october to february, seeding shall be with one (1) pound per 1,000 square feet of unhulled bermuda, or three (3) pounds per 1,000 square feet of winter rye, with a purity of 95% with 90% germination.

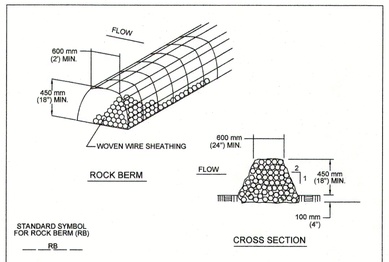
(ii) from march to september, seeding shall be with hulled bermuda at a rate of one (1) pound per 1,000 square feet with a purity of 95% with 95% germination.

Fertilizer shall be a water soluble fertilizer with an analysis of 15-15-15 at a rate of 1.5 pounds per 1,000 square feet.

Mulch type shall be hay, straw or mulch applied at a rate of 45 pounds per 1,000 square feet, with a soil tackifier at a rate of 1.4 pounds per 1,000 square feet.

C. The planted area shall be irrigated or sprinkled in a manner that will not erode the topsoil, but will sufficiently soak to a depth of six (6) inches. The irrigation shall occur at 10-day intervals during the first two (2) months. Rainfall occurrences of 1/2 inch or more shall postpone the watering schedule for ten (10) days.

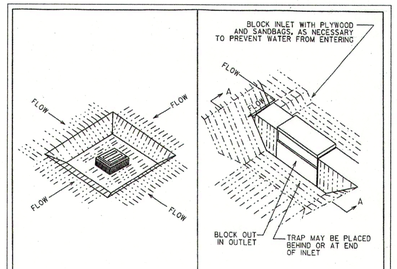
D. Restoration shall be acceptable when the grass has grown at least 1 inch high with 85% coverage, provided no bare spots larger than 20 square feet exist.



STANDARD SYMBOL FOR ROCK BERM (RB)
___RB___

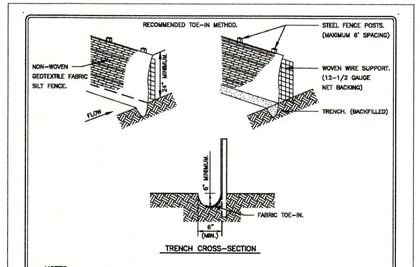
NOTES:
1. USE ONLY OPEN GRADED ROCK 75 to 125 mm (3 to 5") DIAMETER FOR ALL CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 25 mm (1") OPENING AND MINIMUM WIRE DIAMETER OF 12.9 mm (20 GAUGE).
3. THE ROCK BERM SHALL BE INSPECTED DAILY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED. DUE TO SEDIMENT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. IF SEDIMENT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR 150 mm (6"), WHICHEVER IS LESS, THE SEDIMENT SHALL BE REMOVED AND DISPOSED OF ON AN APPROVED SITE AND IN A MANNER THAT WILL NOT CREATE A SEDIMENTION PROBLEM.
5. WHEN THE SITE IS COMPLETELY STABILIZED,THE BERM AND ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	ROCK BERM	
RECORD COPY SIGNED BY MORGAN BYARS 8/24/2010 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 639S-1



NOTE:
WHERE CURB IS IN PLACE, PROVIDE A 300 mm (1') WIDE OPENING IN THE CURB, OR USE A SANDBAG TO DAM TO FORCE WATER OVER THE CURB TO THE TRAP.

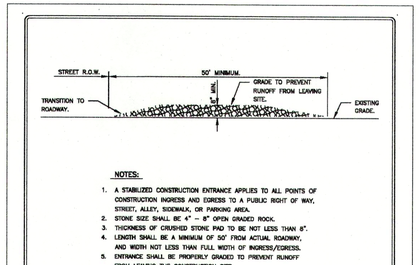
CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	STORM INLET SEDIMENT TRAP	
8-27-08 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 632S-1



TRENCH CROSS-SECTION

NOTES:
1. SILT FENCE SHALL CONFORM TO CITY OF BASTROP SPECIFICATION 642.
2. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MIN. OF ONE (1') FOOT.
3. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G. PAVEMENT) WIDGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
4. THE TRENCH MUST BE A MINIMUM OF 8 INCHES DEEP AND 8 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
5. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POSTS.
6. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
7. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
8. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED MAY 24, 2011 DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	CITY OF BASTROP SILT FENCE DETAIL	DRAWING NO.: EC-02



NOTES:
1. A STABILIZED CONSTRUCTION ENTRANCE APPLIES TO ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO A PUBLIC RIGHT OF WAY, STREET, ALLEY, SIDEWALK, OR PARKING AREA.
2. STONE SIZE SHALL BE 4" - 8" OPEN GRADED ROCK.
3. THICKNESS OF CRUSHED STONE PAD TO BE NOT LESS THAN 8".
4. LENGTH SHALL BE A MINIMUM OF 50' FROM ACTUAL ROADWAY, AND WIDTH NOT LESS THAN FULL WIDTH OF INGRESS/EGRESS.
5. ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY BY CONTRACTOR.

AS NECESSARY, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED MAY 24, 2011 DATE THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.	CITY OF BASTROP STABILIZED CONSTRUCTION ENTRANCE DETAIL	DRAWING NO.: EC-01

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REVISION	DATE

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office
5501 West William Cannon Dr. 12129 RR 620 N., Ste. 600
Austin, Texas 78749 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

SHEET NAME: EROSION CONTROL NOTES & DETAILS

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
02/06/2020

DATE 11/25/2019

JOB NUMBER 5135

SHEET 23 OF 29

SHEET NO. 23

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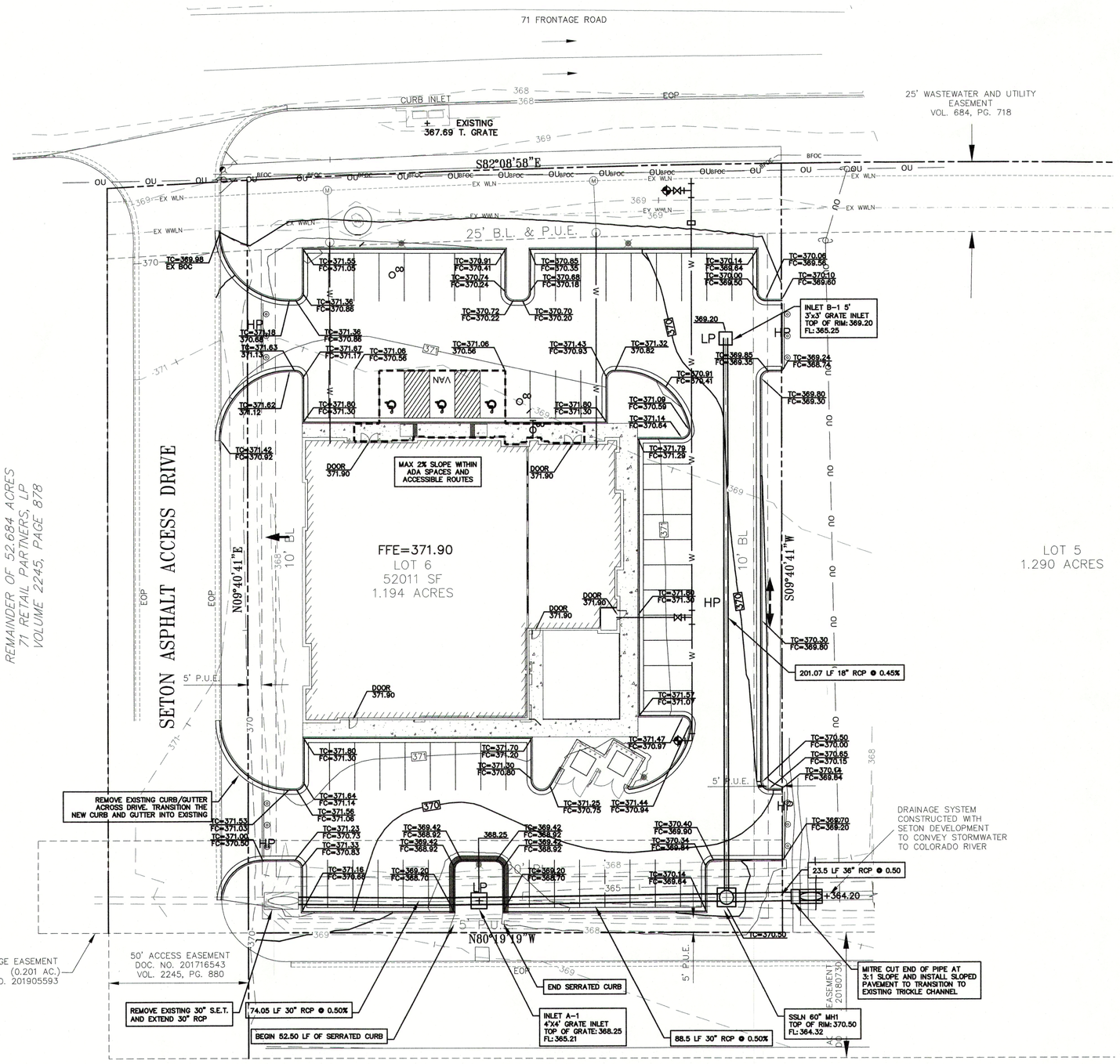

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- FLOW ARROW
- TC=XXX.XX / FC=XXX.XX — TOP OF CURB ELEVATION / FACE OF CURB ELEVATION
- PROPOSED GRATE INLET
- PROPOSED STORM MANHOLE
- HP — HIGH POINT
- LP — LOW POINT
- PROPOSED STORM SEWER
- PROPOSED 24" CURB & GUTTER

GRADING NOTES:

1.) UNLESS OTHERWISE SPECIFIED, ALL FINISHED EARTHEN SLOPES ARE TO BE FINE GRADED TO PROVIDE A RELATIVELY UNIFORM SURFACE WITH NO ROCKS GREATER THAN 1-INCH IN DIAMETER, NO MATERIAL GREATER THAN 1-INCHES IN DIAMETER, AND NO DEVIATIONS FROM AN OTHERWISE SMOOTH SURFACE GREATER THAN 4 INCHES IN HEIGHT OR DEPTH WITH NO AREAS OF STANDING WATER

2.) ALL FINISHED SLOPES GREATER THAN 3:1 ARE TO BE COVERED WITH A JUTE MAT, CURLEX MATTING, OR SIMILAR PRODUCT AFTER SEEDING WITH HYDROMULCH AND THE JUTE ANCHORED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

3.) ALL DRAINAGE COMPONENTS ARE TO BE PRECAST CONCRETE. STORM DRAIN PIPE TO BE RCP OR RCPA, CLASS III, PER ASTM C76 AND INLETS TO BE ASTM C913 PER TxDOT STANDARDS WITH GALVANIZED GRATES. INLETS IN PAVED AREAS SHALL INCLUDE PEDESTRIAN GRATES.

4.) REFER TO LANDSCAPE PLAN FOR PLANTING, IRRIGATION, AND TOPSOIL REQUIREMENTS.

5.) REFER TO EROSION CONTROL PLAN FOR TEMPORARY AND PERMANENT REVEGETATION REQUIREMENTS.

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Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

SHEET NAME: GRADING AND DRAINAGE PLAN
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
02/06/2020

DATE 11/25/2019
JOB NUMBER 5135
SHEET 24 OF 29
SHEET NO. 24

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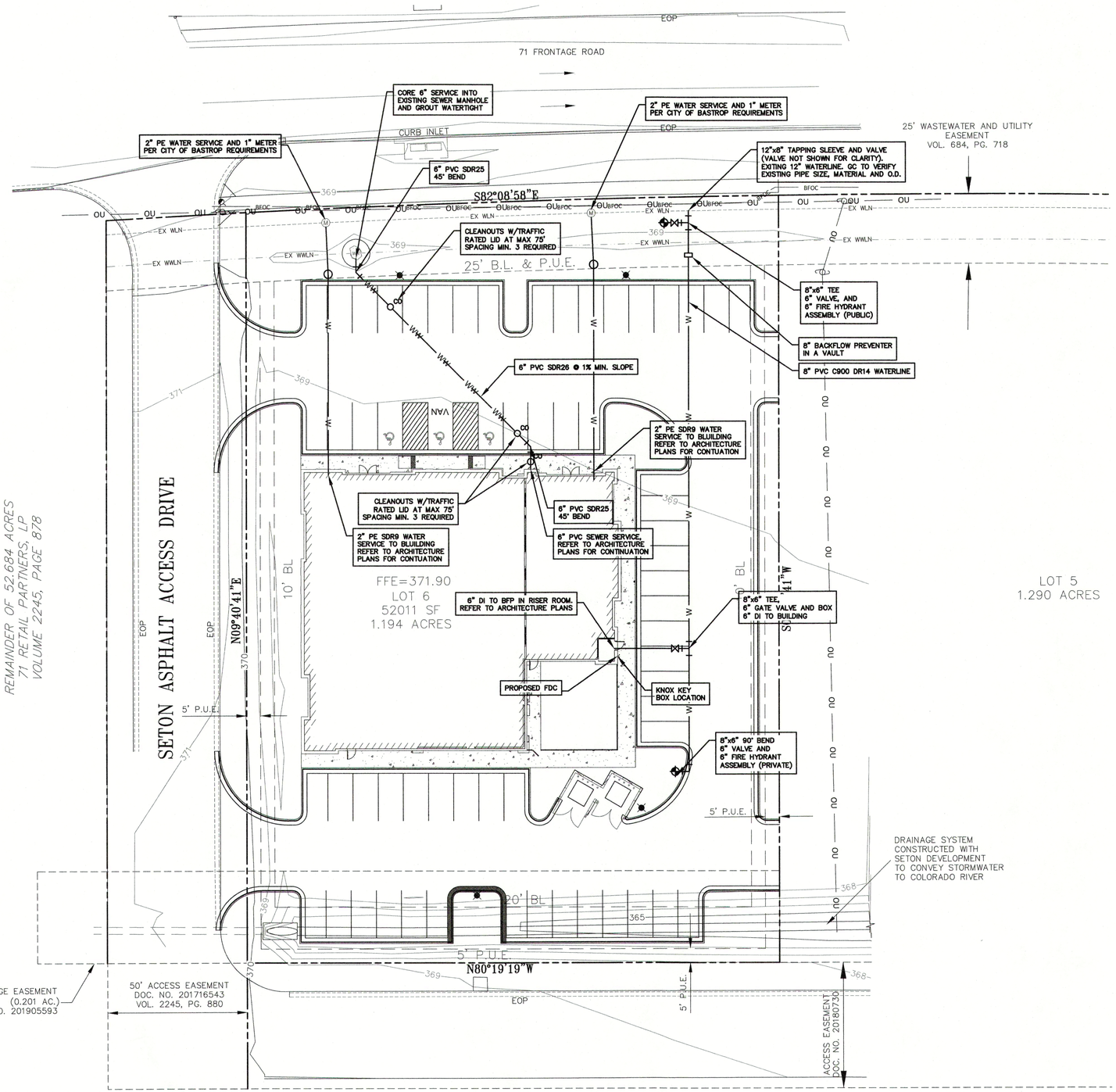

0 30' 60'

SCALE: 1" = 30'

LEGEND

	PROPERTY LINE
703	EXISTING MINOR CONTOURS
700	EXISTING MAJOR CONTOURS
OU	EXISTING OH ELEC/TELE
WLN	EXISTING WATER LINE
WWLN	EXISTING WASTEWATER LINE
	EXISTING EASEMENT/BUFFER LINE
	EXISTING GUY WIRE
	EXISTING POWER POLE
	EXISTING SIGN-ROAD
WW	EXISTING WASTEWATER MANHOLE
W	PROPOSED WATER LINE
WW	PROPOSED WASTEWATER LINE
W	PROPOSED WATERMETER LINE
	PROPOSED CLEANOUT
	PROPOSED 45° BEND
	PROPOSED FIRE HYDRANT
	PROPOSED WATER VALVE
	PROPOSED TEE
	PROPOSED 90° BEND
	SITE LIGHTING
	BACKFLOW PREVENTER IN A VAULT

NOTE:
THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR WILL AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE INCURRED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES, STRUCTURES OR FACILITIES. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES 24 – HOURS PRIOR TO COMMENCING CONSTRUCTION.

UTILITY NOTES:

1. ALL WATER LINES MUST BE CONSTRUCTED IN COMPLIANCE WITH TCEQ RULE 30 TAC SEC. 290.44 RELATED TO WATER DISTRIBUTION LINES. WATER LINES SHALL HAVE A MINIMUM 4' SEPARATION FROM PRESSURE SEWER MAINS
2. ALL HORIZONTAL AND VERTICAL WATER LINE BENDS, TEE'S AND DEAD END'S SHALL BE RESTRAINED TO THE WATER MAIN USING FACTORY RESTRAINED JOINT PIPE OR MECHANICAL JOINT RESTRAINT DEVICES.
3. ALL FILL AREAS ARE TO BE COMPACTED TO 95% PROCTOR DENSITY, PRIOR TO UTILITY INSTALLATION.
4. ALL FITTINGS, VALVES, PLUGS AND OTHER PIPE APPURTENANCES TO BE RESTRAINED.
5. ALL MAINS MUST HAVE A MAXIMUM 48 INCHES OF COVER FROM FINISHED GRADE TO TOP OF PIPE AND A MINIMUM COVER OF 30 INCHES.
6. WATER LINE PIPE SHALL BE C-900 DR-14 BLUE IN COLOR OR DUCTILE IRON PIPE CLASS 350.
7. REFER TO ARCHITECTURAL PLANS FOR EXACT BUILDING PENETRATION, LOCATIONS, SIZE, AND ELEVATIONS.
8. BUILDING IS TO BE SPRINKLED. BACKFLOW PREVENTER IS LOCATED IN SPRINKLER ROOM ALONG REAR WALL. CONTRACTOR TO REFER TO ARCHITECTURAL PLANS FOR BFP, FDC LOCATIONS, AND BUILDING SPRINKLER REQUIREMENTS.
9. REFER TO MEP PLANS FOR REQUIRED ELECTRICAL TRANSFORMER SIZE AS WELL AS PRIMARY AND SECONDARY CONDUIT REQUIREMENTS, ALL CONDUITS ARE TO BE INSTALLED PRIOR TO SUBGRADE COMPACTION AND TESTING.
10. CONSTRUCTION MATERIALS AND METHODS SHALL CONFORM TO CITY DESIGN STANDARDS FOR ALL WORK IN PUBLIC R/W AND EASEMENTS AND TO 2009 INTERNATIONAL PLUMBING CODE, WITH LOCAL AMENDMENTS, FOR WORK ON PRIVATE PROPERTY.
11. IRRIGATION SYSTEM WILL REQUIRE A SEPARATE IRRIGATION PERMIT.
12. UNDERGROUND MAINS SERVING NFPA 13 FIRE SPRINKLER SYSTEMS AND PRIVATE HYDRANTS SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH NFPA 13, NFPA 24, AND FIRE CODE BY A LICENSED CONTRACTOR WITH A PLUMBING PERMIT. THE ENTIRE MAIN MUST BE HYDROSTATICALLY TESTED AT ONE TIME, UNLESS ISOLATION VALVES ARE PROVIDED BETWEEN TESTED SECTIONS.

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Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749
North Office: 12129 RR 620 N, Ste. 600 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

SHEET NAME: UTILITY PLAN

JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
02/06/2020

DATE	11/25/2019
JOB NUMBER	5135
SHEET	25 OF 29
SHEET NO.	25

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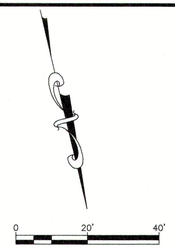
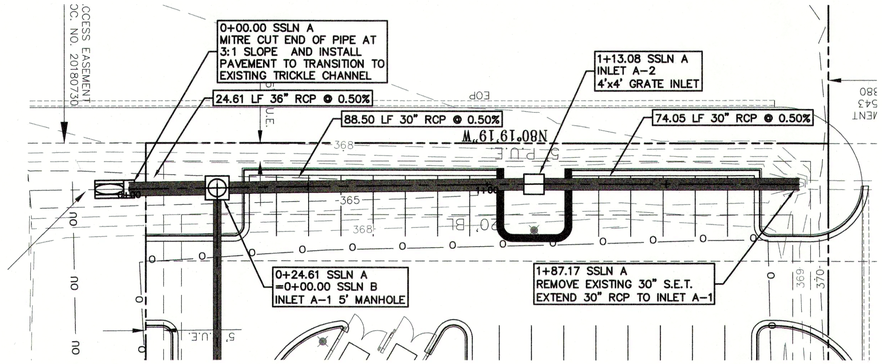


SCALE: 1" = 20'



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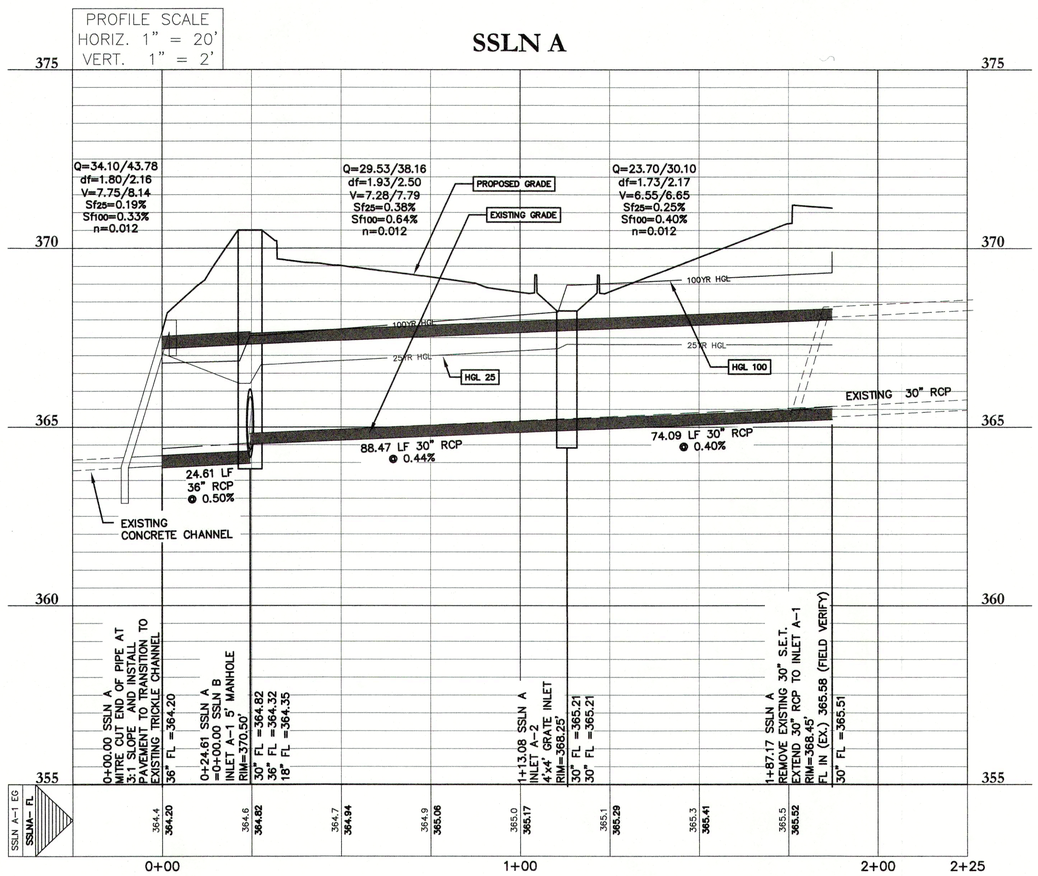

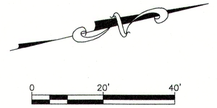

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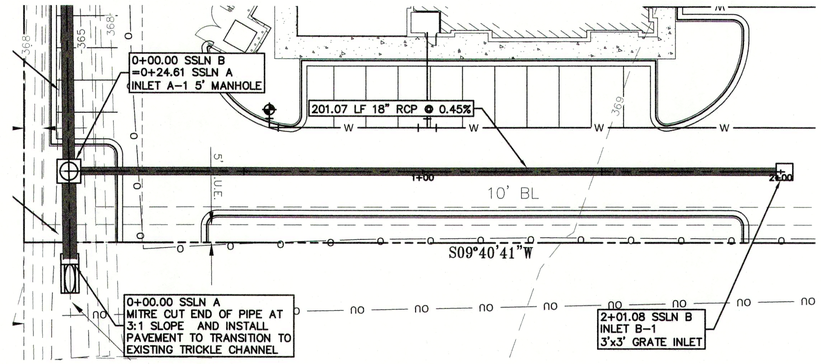

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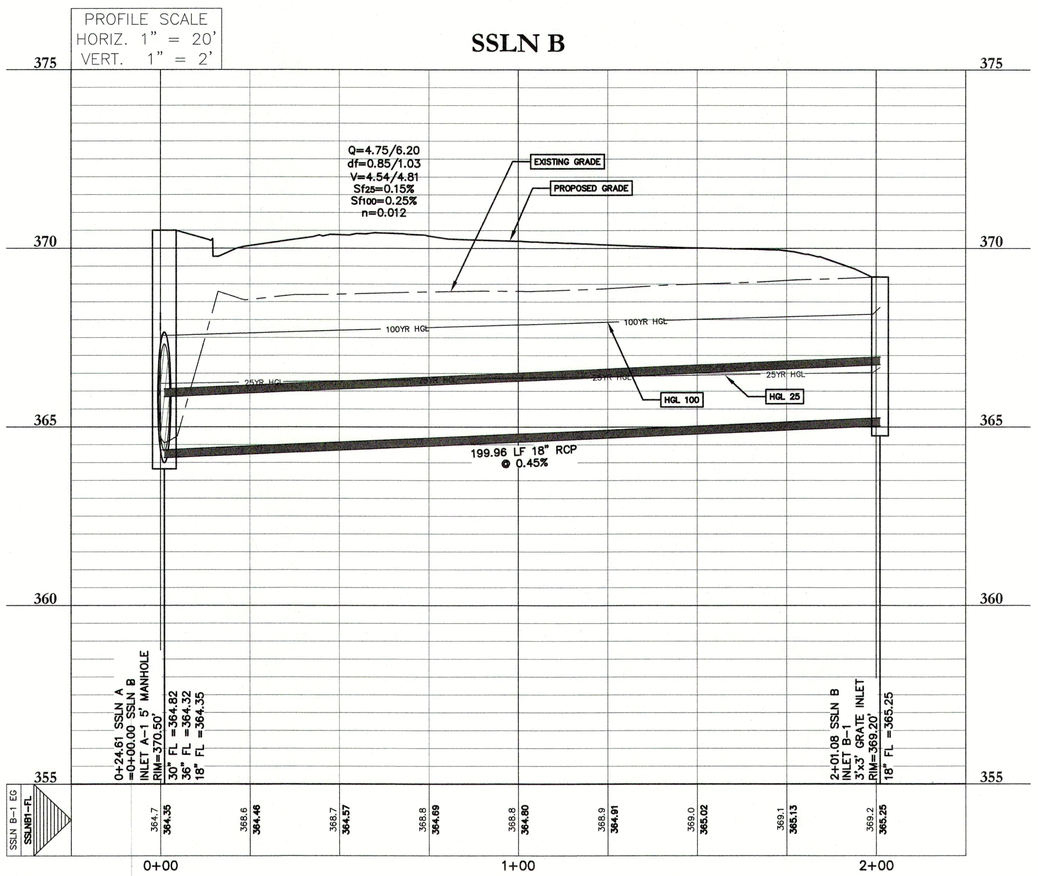

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Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F5791
Main Office
5501 West William Cannon Dr. Austin, Texas 78749
Phone No. (512) 280-5160
North Office
12129 RR 620 N., Ste. 600 Austin, Texas 78750
Fax No. (512) 280-5165

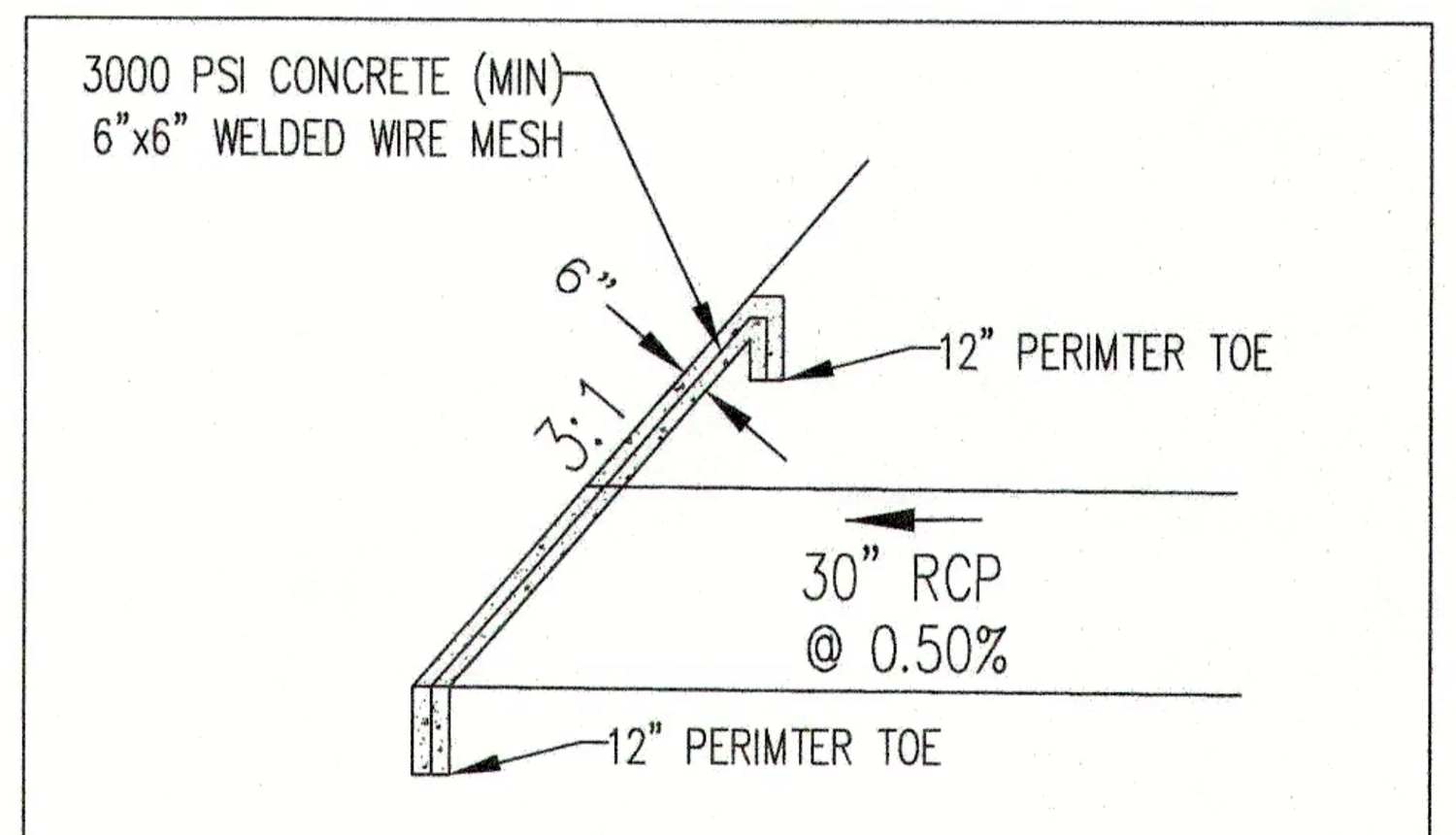
DESIGNED BY:
DRAFTED BY:
DATE
REVISION

SHEET NAME: STORM SEWER PROFILES
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: CIVIL SITE DEVELOPMENT PLANS

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
03/06/2020

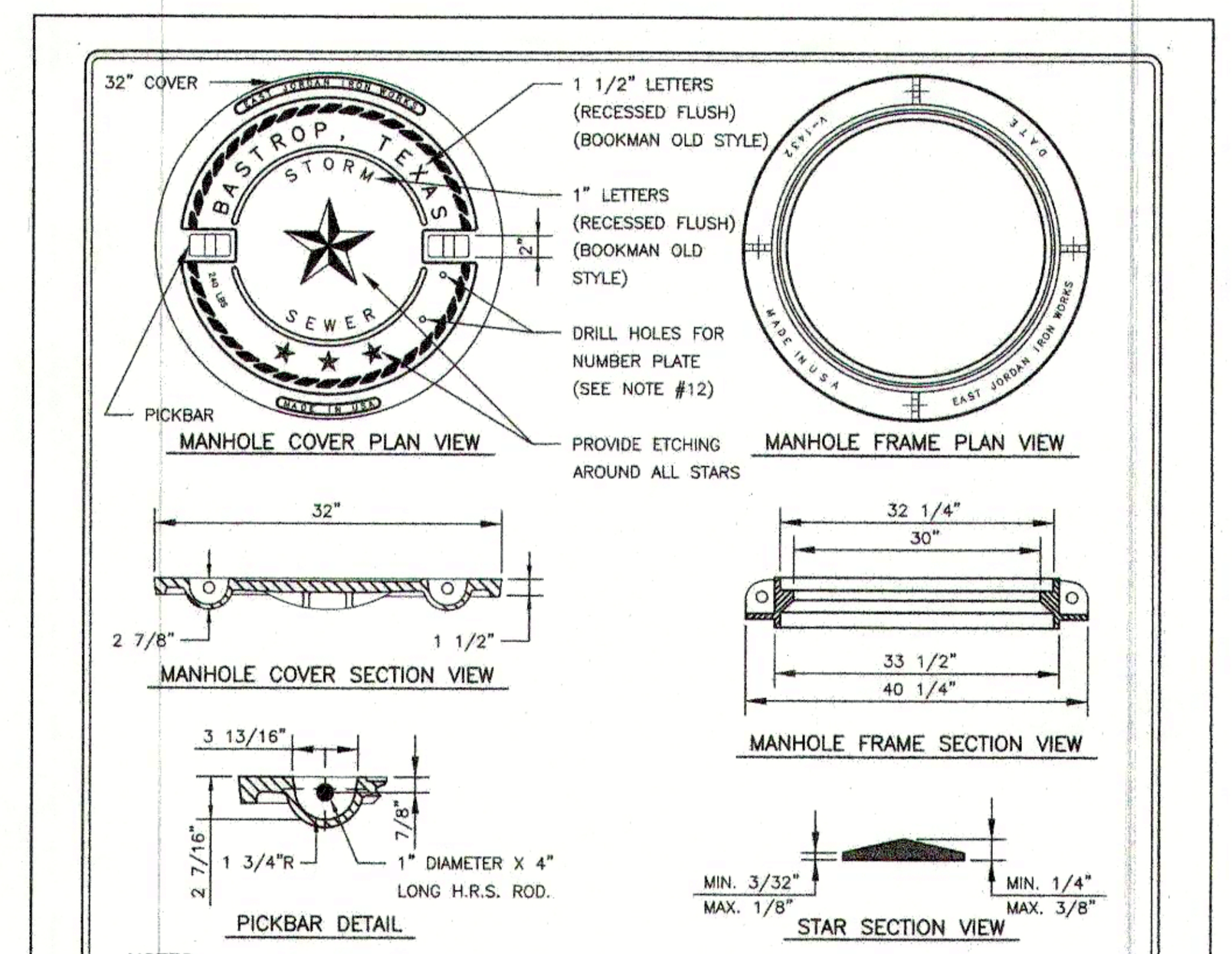
DATE 11/25/2019
JOB NUMBER 5135
SHEET 26 OF 29
SHEET NO. 26

FILE PATH:N:\AC3D-M\5135\dwg\5135_STORM.dwg - Feb 06, 2020 - 11:10am



CONCRETE RIP-RAP HEADWALL

N.T.S.



NOTES:

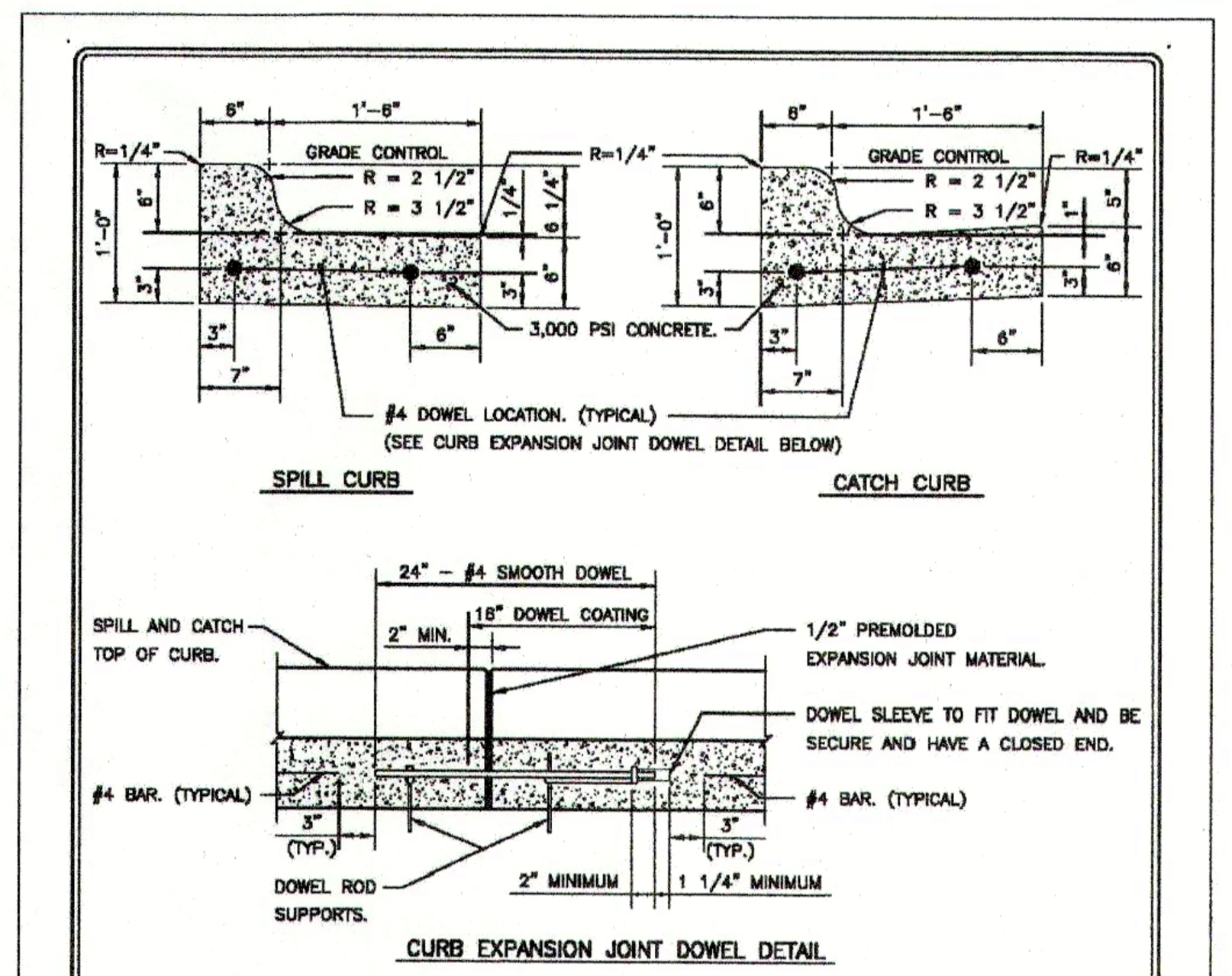
1. COVER AND FRAME SHALL COMPLY WITH STANDARD SPECIFICATIONS FOR DRAINAGE, SEWER, UTILITY AND RELATED CASTINGS: AASHTO DESIGNATION M306-04.
2. MANHOLE COVER SHALL BE MODEL NUMBER: V-1432-3, AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
3. MANHOLE FRAME SHALL BE MODEL NUMBER: V-1432, AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
4. MANHOLE COVER AND FRAME ASSEMBLY, IF ORDERED AS A SET, SHALL BE MODEL NUMBER: V-1432, AS MANUFACTURED BY EAST JORDAN IRON WORKS, INCORPORATED, OR APPROVED EQUAL.
5. ALL CORNERS AND EDGES SHALL HAVE A 1/16" MINIMUM AND 1/8" MAXIMUM RADIUS.
6. MANHOLE COVERS SHALL BE CAST WITH TWO 1" DIAMETER STEEL PICKBARS.
7. MANHOLE COVER WEIGHT SHALL BE 240 LBS. FOR DUCTILE IRON. WEIGHT SHALL BE CAST ON BOTH TOP AND BOTTOM OF COVER.
8. MANUFACTURER SHALL CERTIFY THAT EACH MANHOLE COVER MEETS HS-20 LOADING.
9. FILLETS SHALL BE 1/4" RADIUS UNLESS OTHERWISE SPECIFIED.
10. MANUFACTURER SHALL REMOVE EXCESS IRON AND MACHINE FINISH SEATING SURFACES TO NOTED DIMENSIONS.
11. COVER SHALL BE DIPPED IN A WATER-BASED ASPHALTIC COATING, PRIOR TO SHIPMENT FROM FOUNDRY.
12. MANUFACTURER SHALL DRILL 2-3/16"X1/2" DEEP HOLES FOR A MANHOLE NUMBER PLATE TO BE PROVIDED BY THE CITY OF BASTROP. THE TOP HOLE SHALL BE DRILLED 1" O.C. FROM THE BOTTOM OF THE PICKBAR AND THE BOTTOM HOLE SHALL BE DRILLED 4" O.C. FROM THE TOP HOLE.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS
APPROVED
MAY 24, 2011
DATE
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.

CITY OF BASTROP

NON-BOLTED STORMSEWER MANHOLE COVER AND FRAME DETAIL

DRAWING NO: DR-06



NOTES:

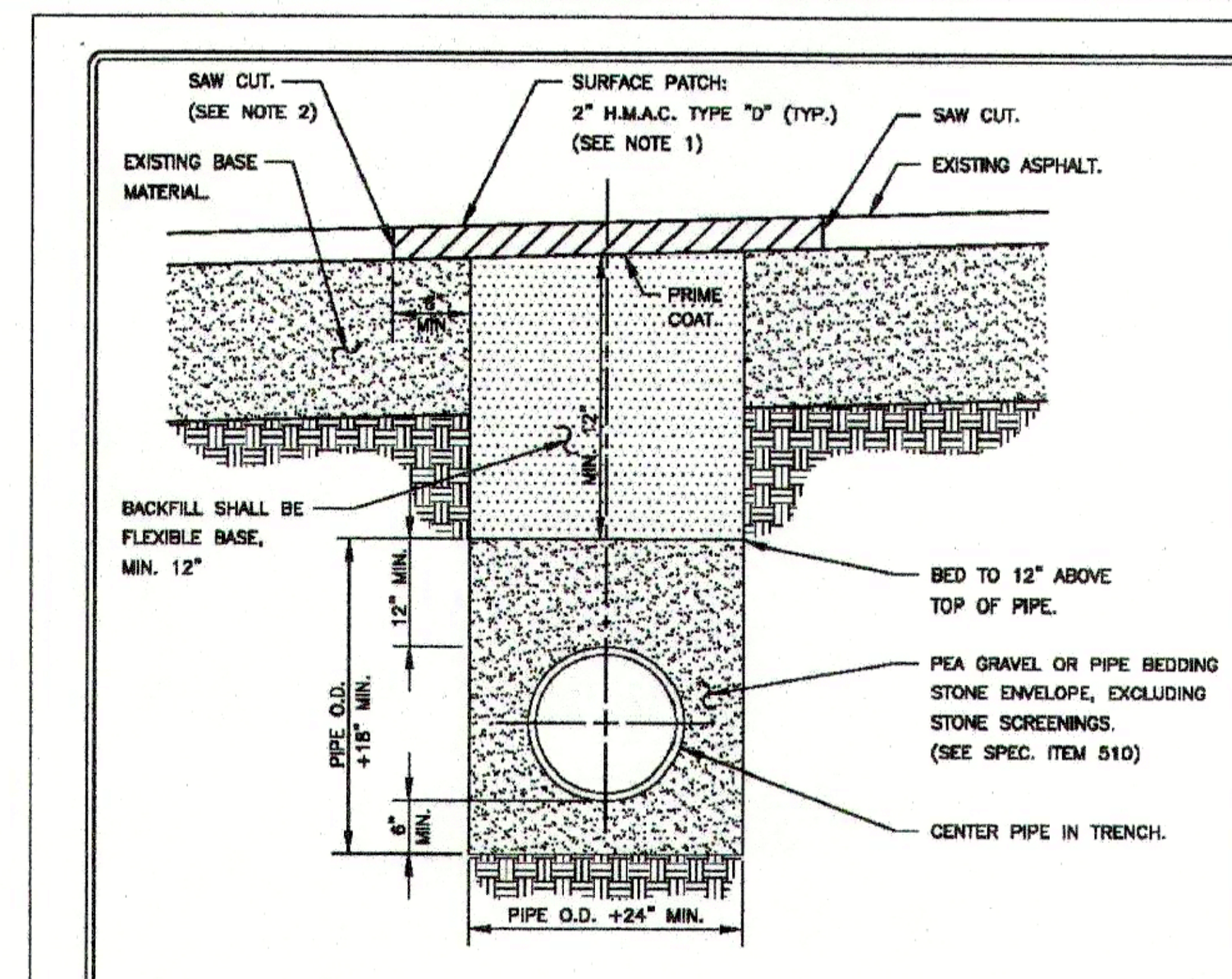
1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309 AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTROL JOINT SPACING SHALL NOT EXCEED 10'-0'.
3. EXPANSION JOINTS AS PER STANDARD ASTM D-1752.
4. EXPANSION JOINT INTERVALS NOT TO EXCEED 40'-0" FOR ALL CURBS AND CONSTRUCTION METHODS.
5. ALL CURBS SHALL HAVE A MINIMUM OF 4" OF COMPACTED FLEXIBLE BASE BETWEEN BOTTOM OF CURB AND TOP SUBGRADE THAT SHALL EXTEND A MINIMUM OF 18" BEHIND BACK OF CURB. TOTAL DEPTH OF FLEXIBLE BASE UNDER AND BEHIND CURB SHALL BE: (TOTAL DEPTH OF FLEXIBLE BASE) LESS (6-INCHES).
6. ALL CURBS SHALL CONFORM TO THESE DETAILS INDEPENDANT OF THE CONSTRUCTION METHODS USED.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS
APPROVED
MAY 24, 2011
DATE
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.

CITY OF BASTROP

SPILL AND CATCH CURB DETAIL (WITH CURB EXPANSION JOINT DOWEL DETAIL)

DRAWING NO: ST-05



NOTES:

1. H.M.A.C. SHOWN IN THIS DETAIL IS SEPARATE FROM ANY ADDITIONAL THICKNESS CREATED BY ANY OVERLAY ITEM IN CONTRACT.
2. THE CONTRACTOR SHALL SAW CUT, REMOVE AND REPLACE EXISTING PAVEMENT A MINIMUM OF 6" BEYOND EITHER THE EDGE OF THE STORM SEWER TRENCH OR THE POINT WHERE EXISTING PAVEMENT IS DAMAGED DUE TO TRENCHING OPERATIONS, WHICHEVER IS GREATER.
3. INSTALLATION OF BACKFILL, SAW CUTTING AND REMOVAL OF EXISTING PAVEMENT AND SURFACE PATCH, SHALL NOT BE PAID FOR SEPARATELY. COSTS FOR THESE ITEMS SHALL BE INCLUDED IN UNIT PRICE BIDS FOR STORM SEWER PIPE.
4. THE CONTRACTOR SHALL PROVIDE STEEL PLATES TO SPAN THE TRENCH AS NECESSARY OR TO ALLOW BACKFILL TO CURE. SUCH PLATES SHALL BE SUITABLE FOR VEHICLE PASSAGE OVER THE TRENCH AND SHALL BE SATISFACTORILY ANCHORED IN PLACE. COSTS FOR THIS ITEM SHALL BE INCLUDED IN UNIT PRICE BIDS FOR STORM SEWER PIPE.
5. ALL TRENCHING AND TRENCH SAFETY SHALL COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

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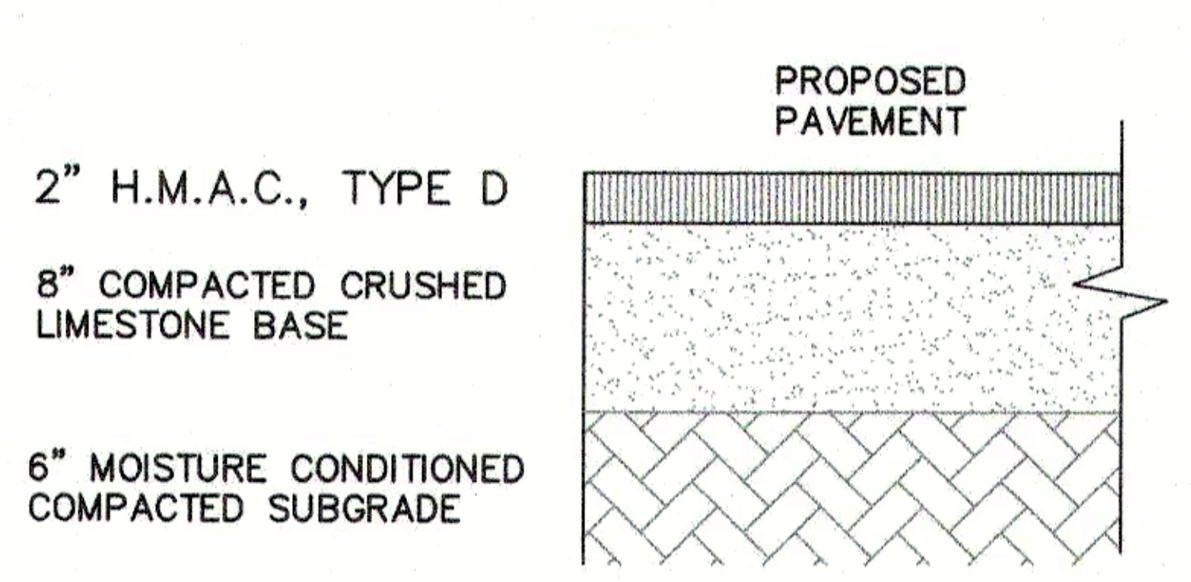
APPROVED
MAY 24, 2011
DATE
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.

CITY OF BASTROP

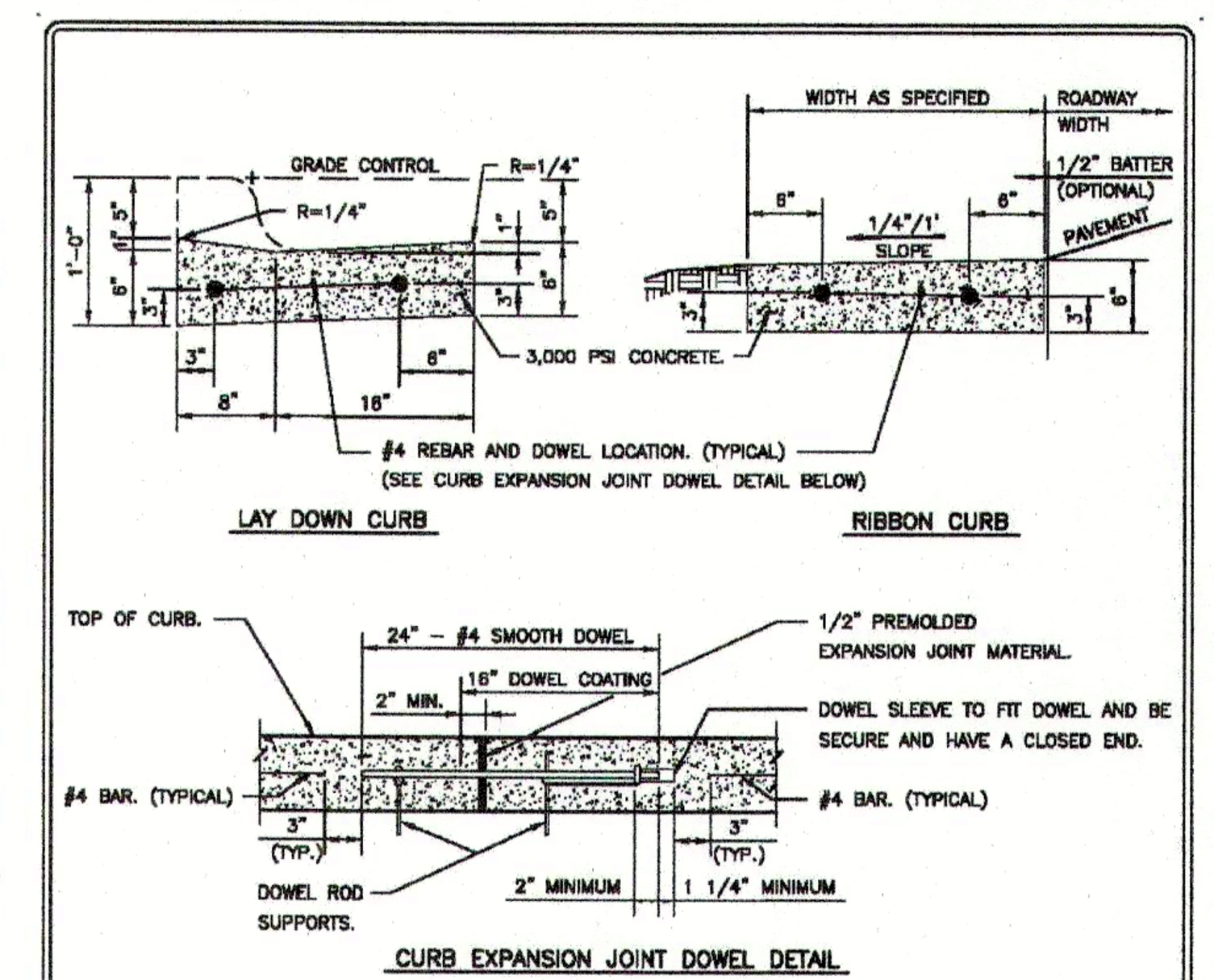
STORM SEWER LINE BEDDING DETAIL (EXISTING PAVED SURFACE)

DRAWING NO: DR-01



TYP. SECTION THRU EXIST. AND NEW ASPHALT PAVEMENT

SCALE: NTS



NOTES:

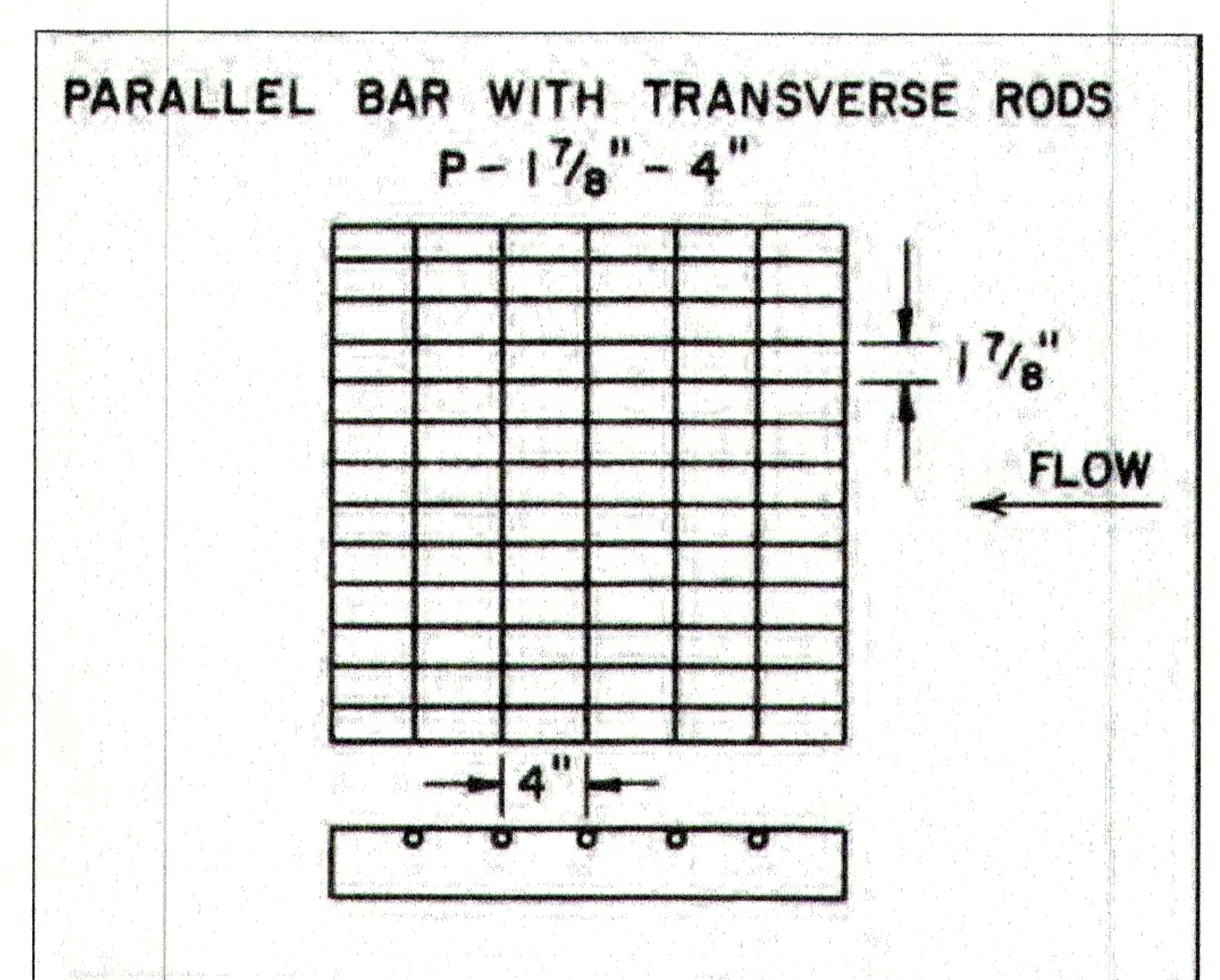
1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309 AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTROL JOINT SPACING SHALL NOT EXCEED 10'-0'.
3. EXPANSION JOINTS AS PER STANDARD ASTM D-1752.
4. EXPANSION JOINT INTERVALS NOT TO EXCEED 40'-0" FOR ALL CURBS AND CONSTRUCTION METHODS.
5. ALL CURBS SHALL HAVE A MINIMUM OF 4" OF COMPACTED FLEXIBLE BASE BETWEEN BOTTOM OF CURB AND TOP SUBGRADE THAT SHALL EXTEND A MINIMUM OF 18" BEHIND BACK OF CURB. TOTAL DEPTH OF FLEXIBLE BASE UNDER AND BEHIND CURB SHALL BE: (TOTAL DEPTH OF FLEXIBLE BASE) LESS (6-INCHES).
6. ALL CURBS SHALL CONFORM TO THESE DETAILS INDEPENDANT OF THE CONSTRUCTION METHODS USED.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS
APPROVED
MAY 24, 2011
DATE
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.

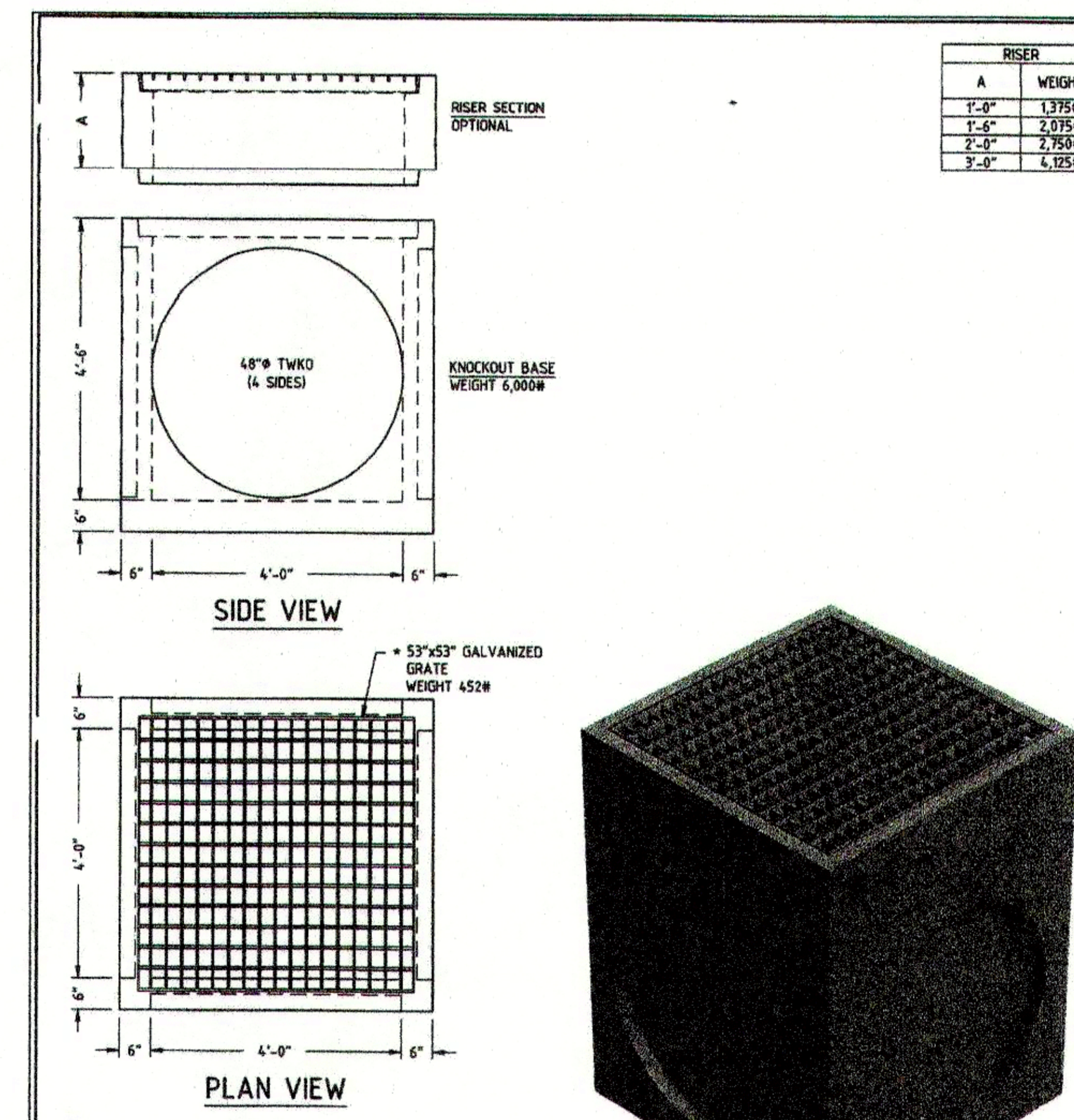
CITY OF BASTROP

LAYDOWN AND RIBBON CURB DETAIL (WITH CURB EXPANSION JOINT DOWEL DETAIL)

DRAWING NO: ST-04



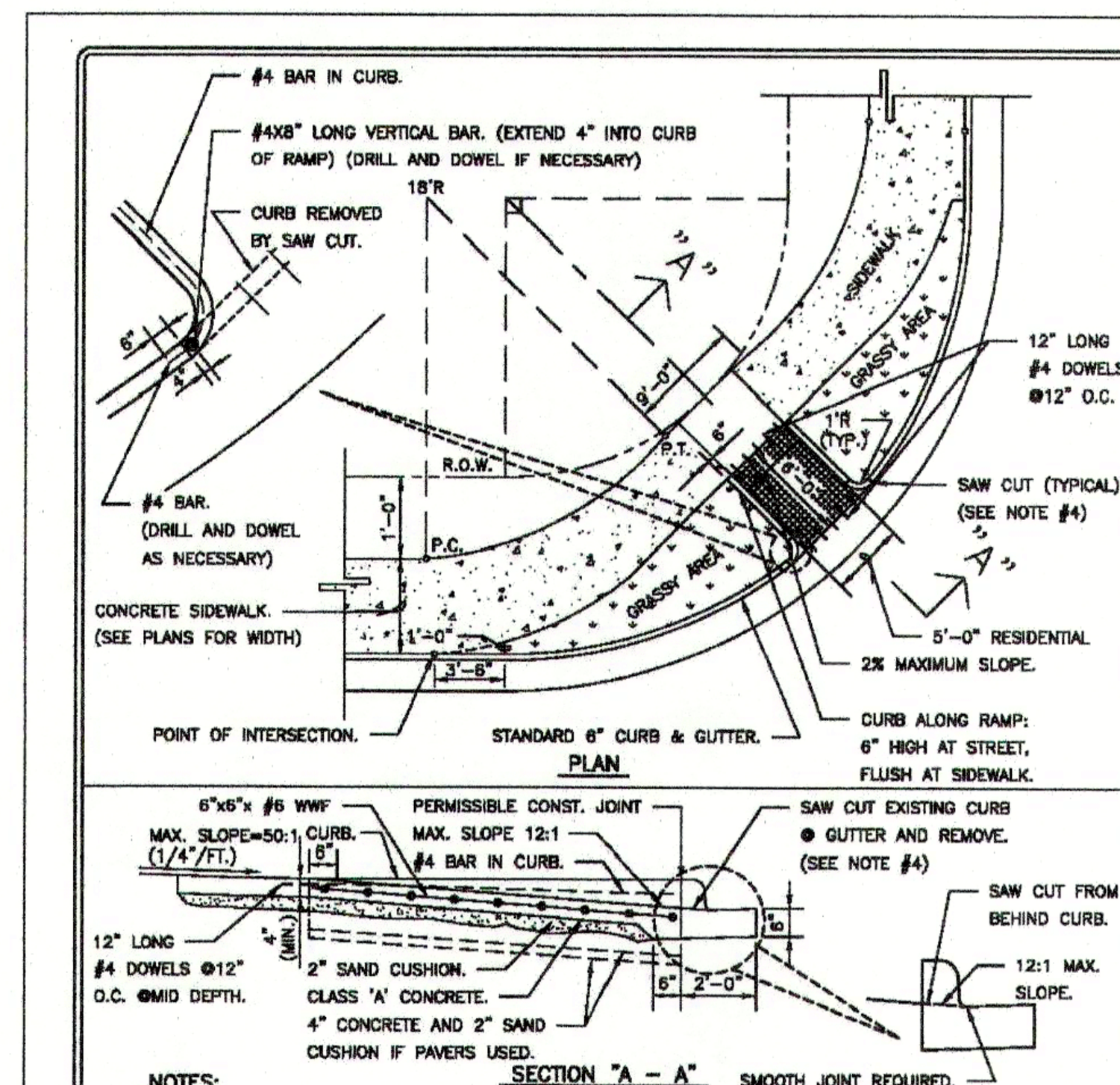
GRATE INLET



RISER	
A	WEIGHT
1'-0"	1,375#
1'-6"	2,075#
2'-0"	2,750#
3'-0"	4,125#

NOTE:
- MAX. PIPE CONNECTION: 36"Ø RCP AT 0° SKEW
- MADE IN ACCORDANCE WITH ASTM C913
- STEEL REINFORCEMENT: ASTM A615 GRADE 60 OR EQ. ASTM A1064 WWR
- MAX BURIAL DEPTH 25'-0" FROM INSIDE FLOOR TO FINISHED GRADE
- PER TxDOT PRECAST BASE DETAIL TYPE 'PB' JANUARY 2015.
- STEPS NOT AVAILABLE
- ADA GRATE AVAILABLE.
- GRATE DROPS INTO JOINT AND IS NOT CAST IN

FORTERRA | REGION, STATE: CENTRAL TX | DATE: 2018 | SECT.PAGE: 2.4.5 | GRATE INLET - GALVANIZED 4'-0" x 4'-0"



NOTES:

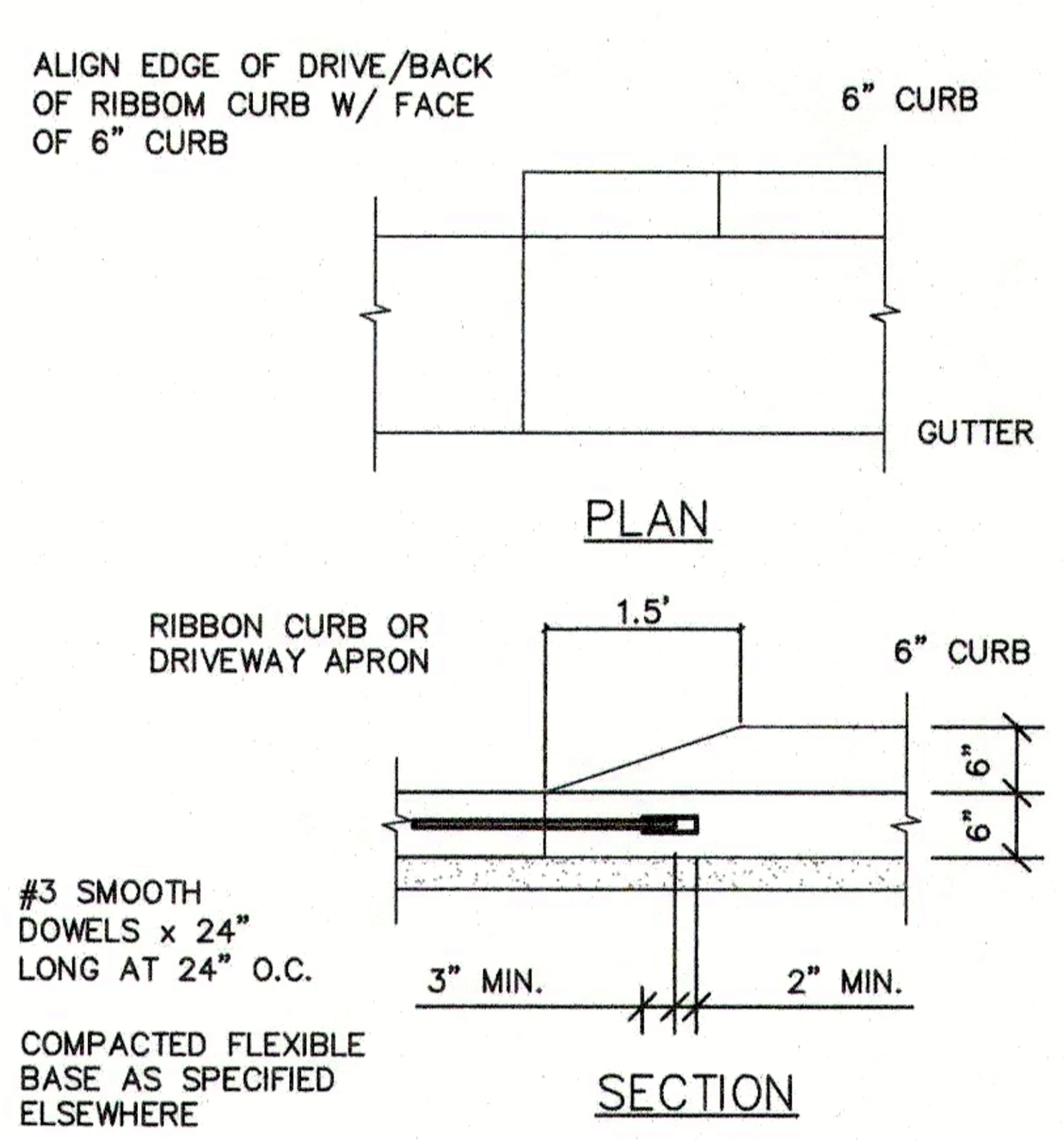
1. SIDEWALKS SHALL BE A MINIMUM OF 4'-0" WIDE IN RESIDENTIAL AREAS AND 6'-0" WIDE IN COMMERCIAL AREAS.
2. THE RAMP SHALL HAVE A DETECTABLE WARNING AND CONTRASTING COLORED SURFACE. THE RAMP SHALL BE STAMPED AND DYED CONCRETE OR APPROVED EQUAL.
3. THE POSITION OF THE RAMP MAY BE ALTERED IN THE FIELD BY THE DESIGN ENGINEER, BUT ONLY WITH THE APPROVAL OF THE CITY INSPECTOR.
4. SAW CUTTING IS APPLICABLE FOR INSTALLATION WHERE THE CURB LAYDOWN FOR THE RAMP IS NOT PROVIDED.
5. THE SIDEWALK PEDESTRIAN RAMP SHALL MEET ALL APPLICABLE A.D.A. REQUIREMENTS.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS
APPROVED
MAY 24, 2011
DATE
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.

CITY OF BASTROP

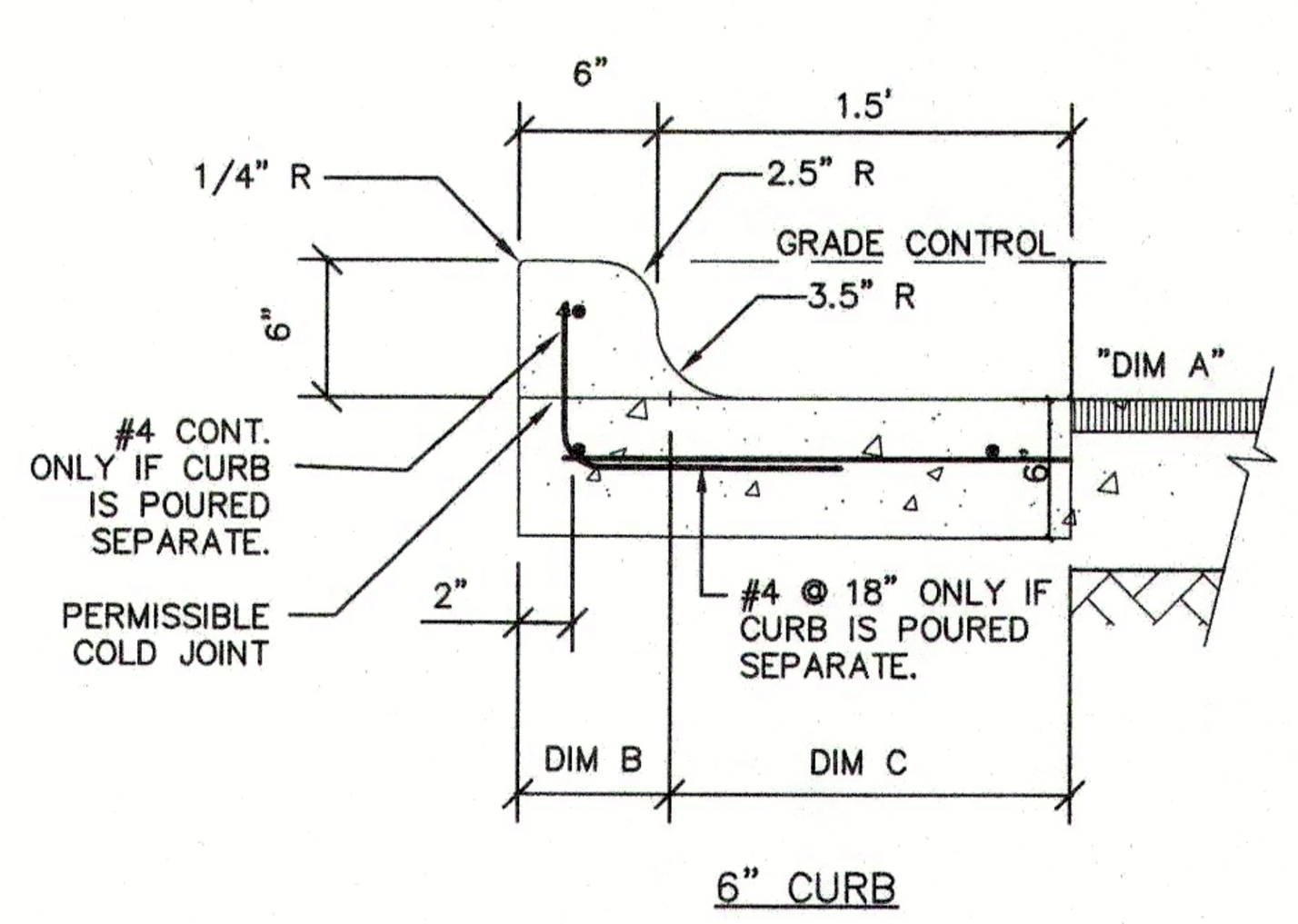
SIDEWALK PEDESTRIAN RAMP DETAIL (TYPE 2)

DRAWING NO: ST-08



CURB TERMINATION

SCALE: NTS

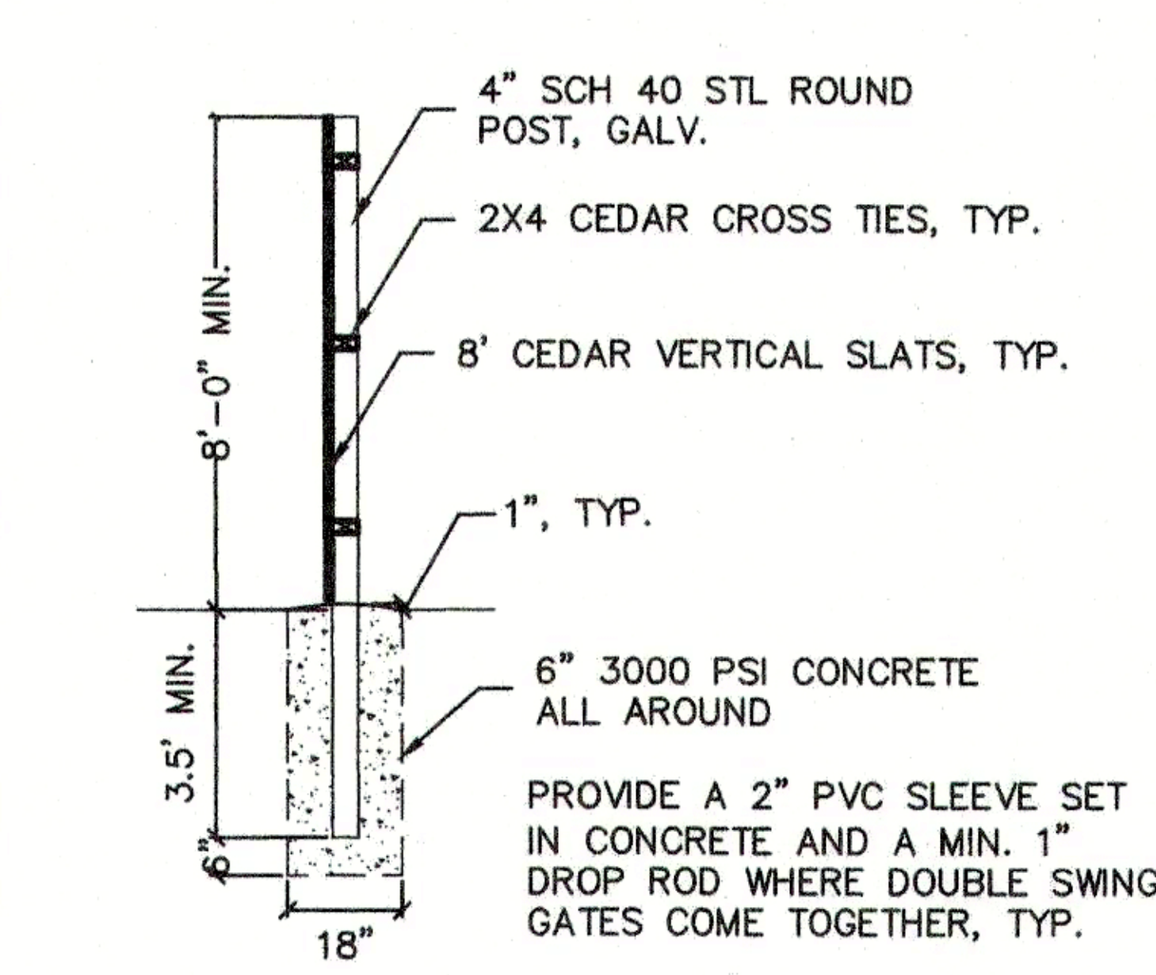


CURB TYPE	DIM "A"	DIM "B"	DIM "C"
SPILL	6-1/4"	7"	1'-5"
CATCH	5"	7"	1'-5"
LAYDOWN	5"	8"	1'-4"

REINFORCED CONCRETE PER OWNER OR GEOTECH REPORT, RECOMMEND AT MIN. 6"

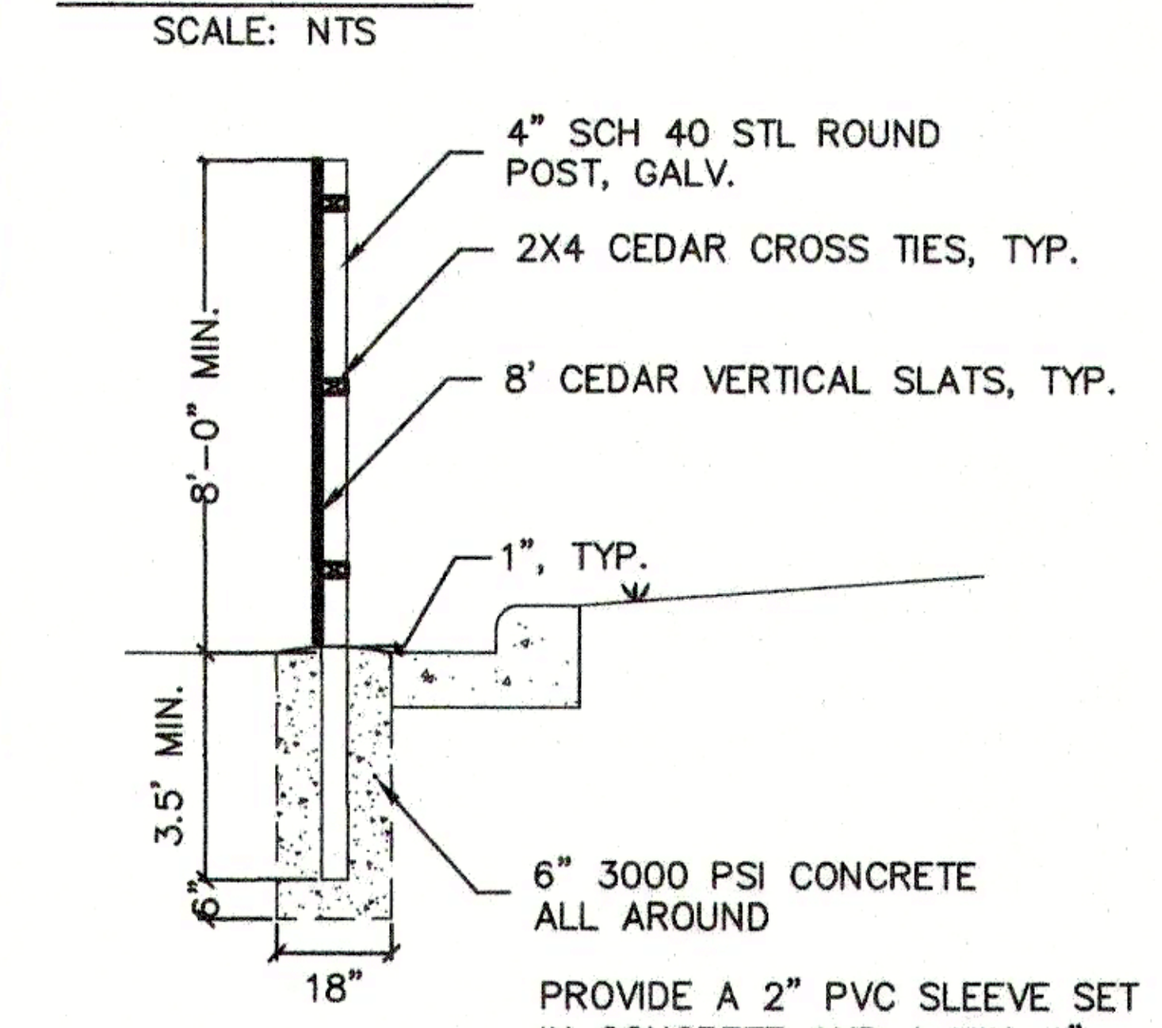
CURB FOR ASPHALT PAVEMENT

SCALE: NTS



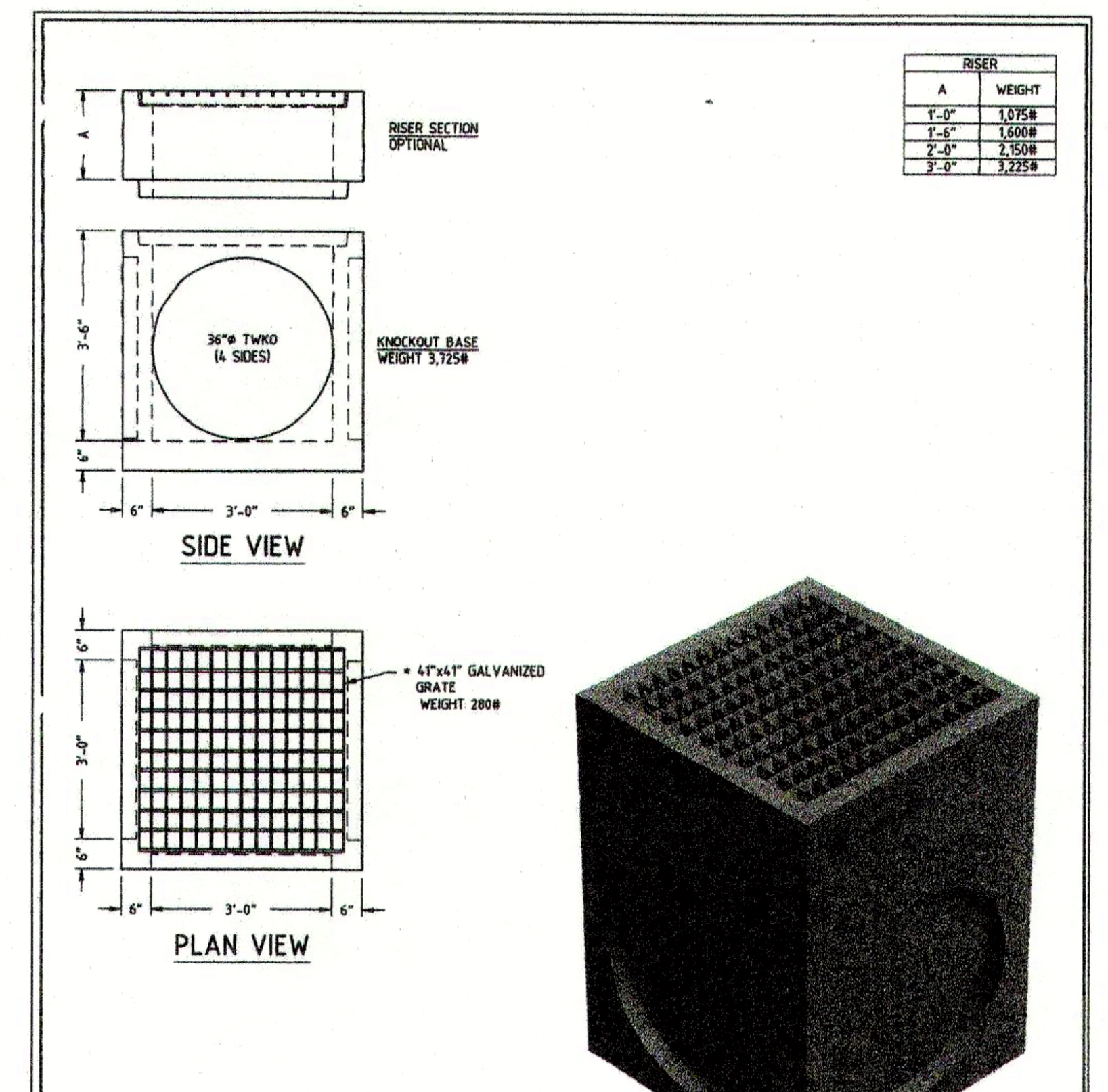
SECTION A-A

SCALE: NTS



SECTION B-B

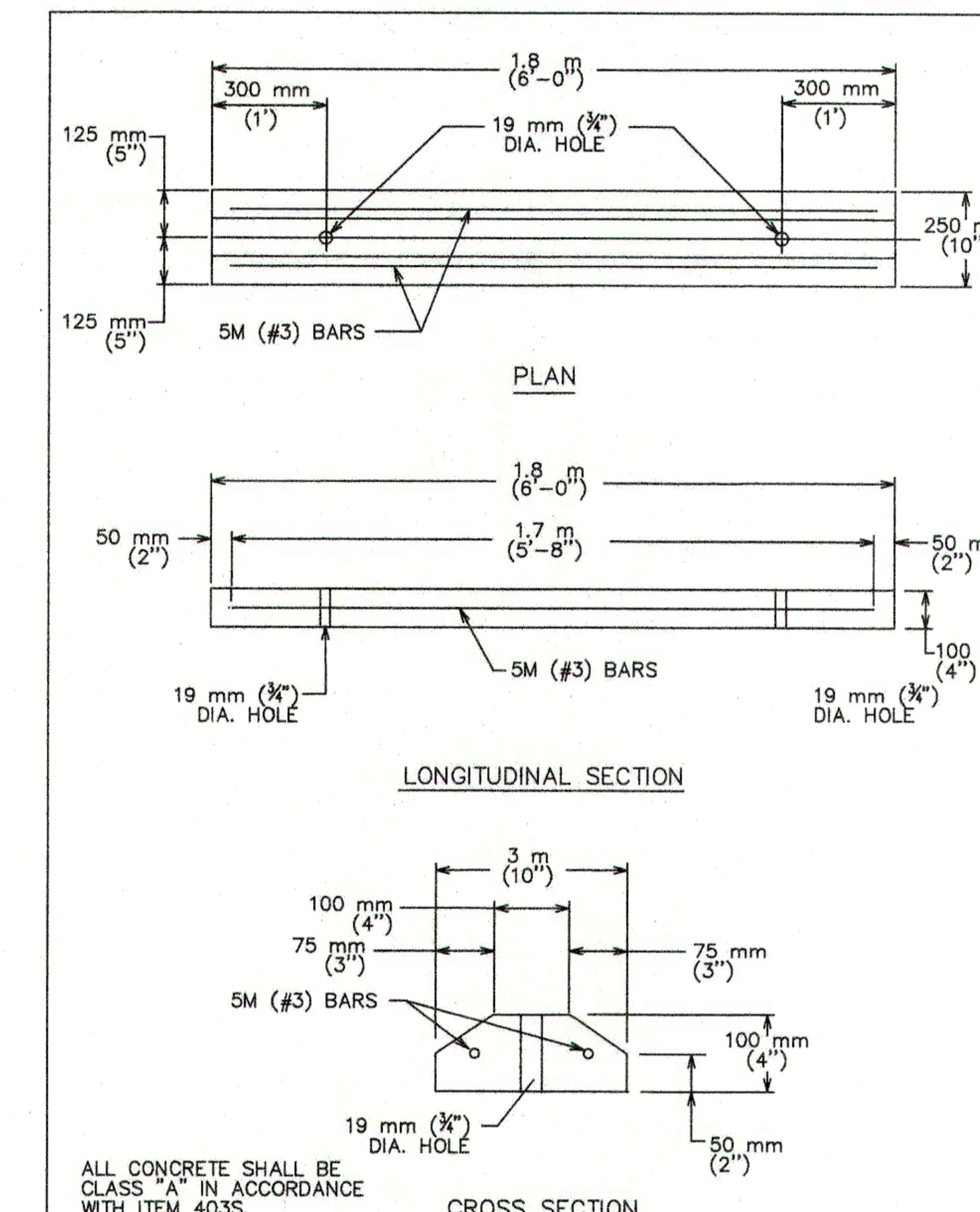
SCALE: NTS



RISER	
A	WEIGHT
1'-0"	1,075#
1'-6"	1,600#
2'-0"	2,150#
3'-0"	3,225#

NOTE:
- MADE IN ACCORDANCE WITH ASTM C913
- STEEL REINFORCEMENT: ASTM A615 GRADE 60 OR EQ. ASTM A1064 WWR
- MAX BURIAL DEPTH 25'-0" FROM INSIDE FLOOR TO FINISHED GRADE
- PER TxDOT PRECAST BASE DETAIL TYPE 'PB' JANUARY 2015.
- STEPS NOT AVAILABLE
- ADA GRATE AVAILABLE.

FORTERRA | REGION, STATE: CENTRAL TX | DATE: 2018 | SECT.PAGE: 2.4.2 | GRATE INLET - GALVANIZED 3'-0" x 3'-0"



ALL CONCRETE SHALL BE CLASS "A" IN ACCORDANCE WITH ITEM 403S.

CITY OF AUSTIN, DEPARTMENT OF PUBLIC WORKS
PARKING LOT BUMPER CURB
RECORD COPY SIGNED BY BILL GARDNER — APPROVED — 3/15/05 ADOPTED
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
STANDARD NO. 439S-1

CUSTOMER COPY

FILE PATH:N:\AC3D-N\5135\dwg\5135-CONSTRUCTION DETAILS.dwg - Feb 06, 2020 - 11:14am

DESIGNED BY:	DRAFTED BY:

DATE	REVISION

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749
North Office: 12129 RR 620 N., Ste. 600 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

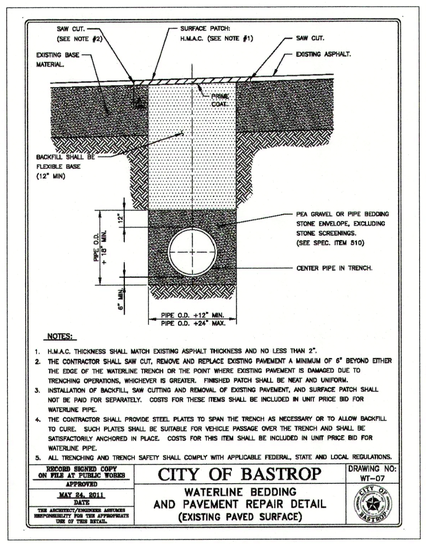
SHEET NAME: CONSTRUCTION DETAILS (1 OF 3)

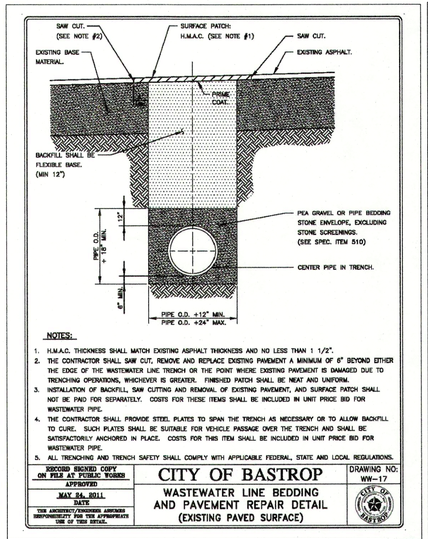
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT

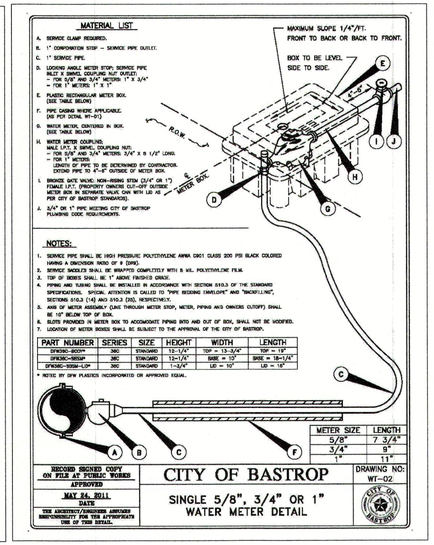
PROJECT: CIVIL SITE DEVELOPMENT PLANS

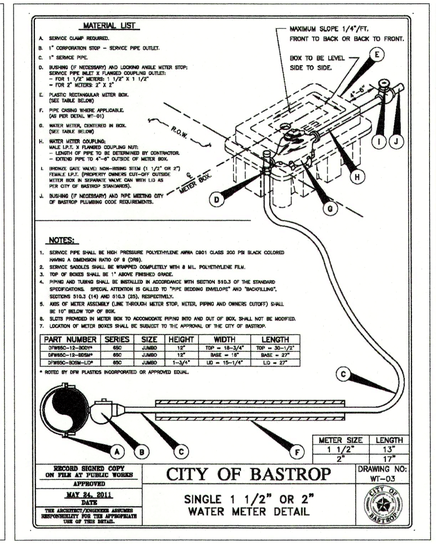
STATE OF TEXAS — BRENDAN P. McENTEE — 96200 — LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC. ID# F3791
02/06/2020

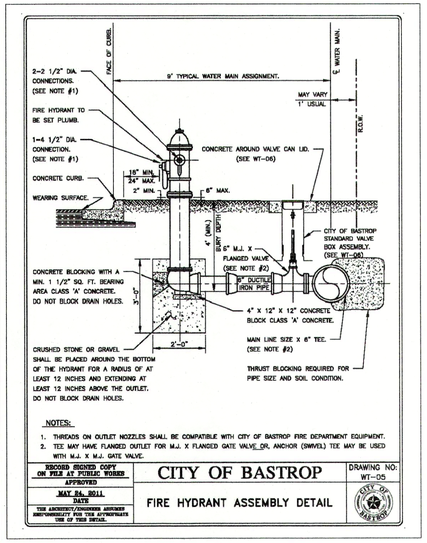
DATE: 11/25/2019
JOB NUMBER: 5135
SHEET: 27 OF 29
SHEET NO. 27

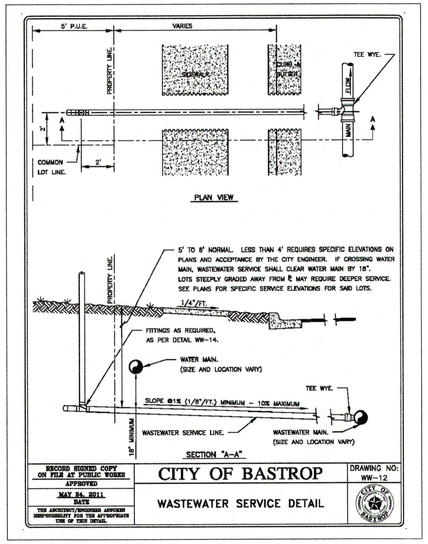


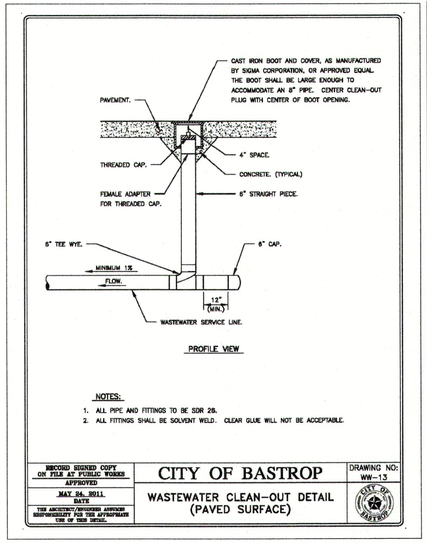


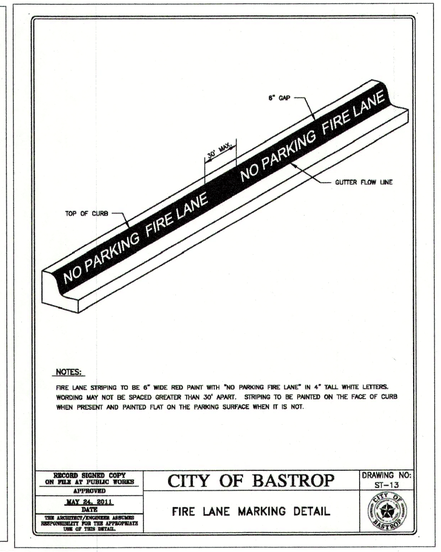






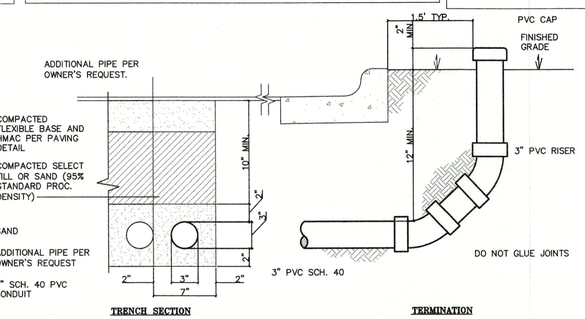






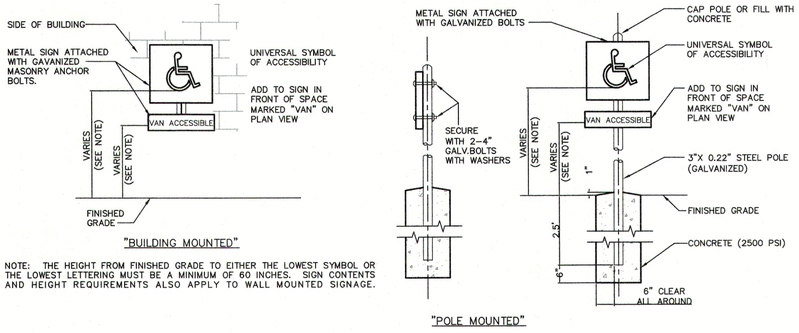
SINGLE/DOUBLE CLEAN-OUT (PRIVATE)

SCALE: NTS



IRRIGATION AND/OR ELECTRICAL SLEEVES

SCALE: NTS



ADA PARKING SIGN

SCALE: NTS (POLE OR WALL MOUNTED)

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DESIGNED BY: | DRAFTED BY:

DATE | REVISION

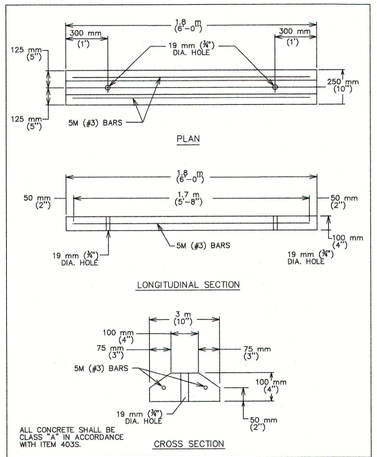
Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
CBD
Main Office: 5501 West William Cannon Dr. Austin, Texas 78749
North Office: 12120 RR 620 N., #300 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

SHEET NAME: CONSTRUCTION DETAILS (2 OF 3)
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: CIVIL SITE DEVELOPMENT PLANS

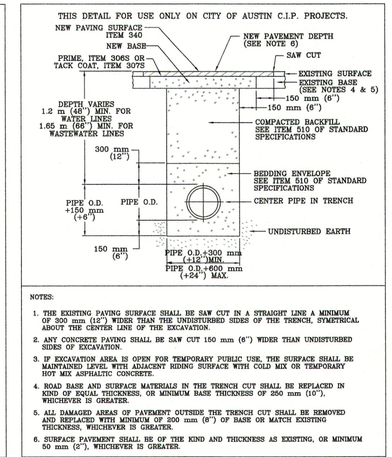
STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
02/06/2020

DATE: 11/25/2019
JOB NUMBER: 5135
SHEET: 28 OF 29
SHEET NO.: 28

FILE PATH:M:\ACD\M5135\dwg\5135-CONSTRUCTION DETAILS.dwg - Feb 06, 2020 - 11:14am



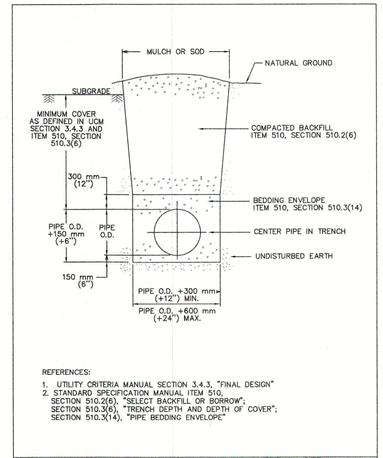
CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		PARKING LOT BUMPER CURB	
RECORD COPY SIGNED BY BILL GARDNER	3/15/05	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 439S–1
APPROVED	ADOPTED		



NOTES:

1. THE EXISTING PAVING SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE A MINIMUM OF 300 mm (12") WIDER THAN THE UNDISTURBED SIDES OF THE TRENCH, SYMETRICAL ABOUT THE CENTER LINE OF THE EXCAVATION.
2. ANY CONCRETE PAVING SHALL BE SAW CUT 150 mm (6") WIDER THAN UNDISTURBED SIDES OF EXCAVATION.
3. IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE, THE SURFACE SHALL BE MAINTAINED LEVEL WITH ADJACENT RIDING SURFACE WITH COLD MIX OR TEMPORARY HOT MIX ASPHALTIC CONCRETE.
4. ROAD BASE AND SURFACE MATERIALS IN THE TRENCH CUT SHALL BE REPLACED IN KIND OF EQUAL THICKNESS, OR MINIMUM BASE THICKNESS OF 250 mm (10"), WHICHEVER IS GREATER.
5. ALL DAMAGED AREAS OF PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED WITH MINIMUM OF 300 mm (6") OF BASE OR MATCH EXISTING THICKNESS, WHICHEVER IS GREATER.
6. SURFACE PAVEMENT SHALL BE OF THE KIND AND THICKNESS AS EXISTING, OR MINIMUM 50 mm (2"), WHICHEVER IS GREATER.

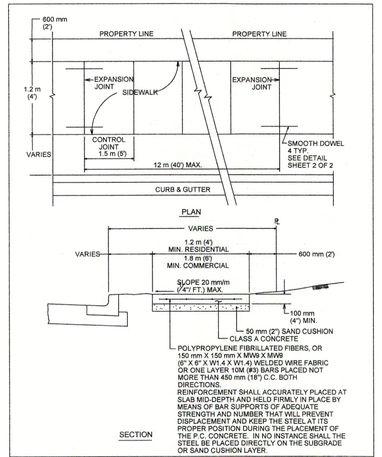
CITY OF AUSTIN WATER AND WASTEWATER UTILITY		TYPICAL TRENCH WITH PAVED SURFACE	
RECORD COPY SIGNED BY KATHI L. FLOWERS	*8/19/02*	*THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.*	STANDARD NO. 510S–3
	ADOPTED		



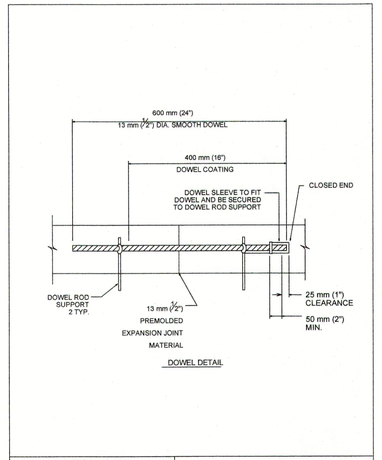
REFERENCES:

1. UTILITY CRITERIA MANUAL SECTION 3.4.3, "FINAL DESIGN"
2. STANDARD SPECIFICATION MANUAL ITEM 510, SECTION 510.2(6), "SELECT BACKFILL OR BORROW"; SECTION 510.3(6), "TRENCH DEPTH AND DEPTH OF COVER"; SECTION 510.3(14), "PIPE BEDDING ENVELOPE"

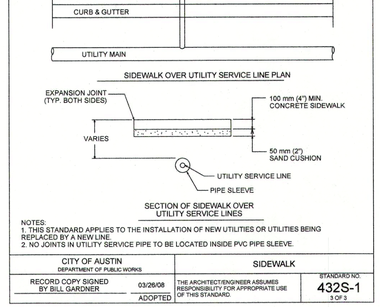
CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		TYPICAL TRENCH DETAIL WITH UNFINISHED SURFACE	
RECORD COPY SIGNED BY BILL GARDNER	03/13/06	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 510S–5
	ADOPTED		



CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		SIDEWALK	
RECORD COPY SIGNED BY BILL GARDNER	03/26/08	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S-1 1 OF 3
	ADOPTED		

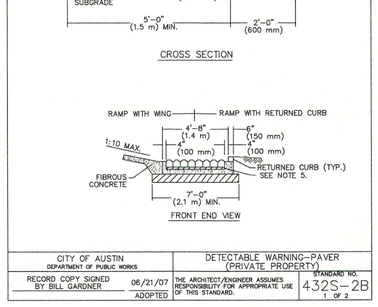


CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		SIDEWALK	
RECORD COPY SIGNED BY BILL GARDNER	03/26/08	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S-1 2 OF 3
	ADOPTED		



NOTES:
1. THIS STANDARD APPLIES TO THE INSTALLATION OF NEW UTILITIES OR UTILITIES BEING REPLACED BY A NEW LINE.
2. NO JOINTS IN UTILITY SERVICE PIPE TO BE LOCATED INSIDE PVC PIPE SLEEVE.

CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		SIDEWALK	
RECORD COPY SIGNED BY BILL GARDNER	03/26/08	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S-1 3 OF 3
	ADOPTED		

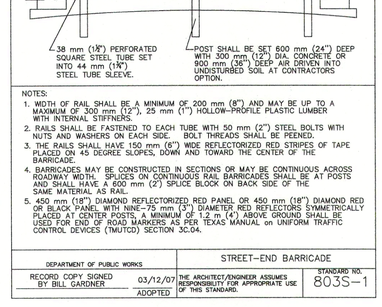


CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		DETECTABLE WARNING–PAVER (PRIVATE PROPERTY)	
RECORD COPY SIGNED BY BILL GARDNER	06/21/07	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S–2B 1 OF 2
	ADOPTED		

GENERAL NOTES:

1. THIS STANDARD IS APPLICABLE FOR RAMP CONSTRUCTION WITHIN PRIVATE PROPERTY ONLY.
2. PAVERS ARE REQUIRED FOR ALL CURB RAMP INSTALLATIONS.
3. PAVERS WILL HAVE DETECTABLE WARNING THAT CONSISTS OF RAISED TRUNCATED DOMES WITH A DIAMETER OF 0.9" (23 mm), A NOMINAL HEIGHT OF 0.2" (5 mm) AND A NOMINAL CENTER TO CENTER SPACING OF 2.35" (60 mm) AND SHALL CONSTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT (Re: ADAAG SECTION 4.29.2). MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. PAVER PATTERN SHALL BE BASKET WEAVE, UNLESS DIRECTED OTHERWISE BY THE ENGINEER OR DESIGNATED REPRESENTATIVE.
4. TYPICAL SIDEWALK WIDTHS AND CURB RADII ARE SHOWN FOR ILLUSTRATION ONLY. REFER TO THE TRANSPORTATION CRITERIA MANUAL FOR SIDEWALK WIDTHS, CURB RADII AND CURB BASES.
5. THE PERMISSIBLE CONSTRUCTION JOINT BETWEEN THE PAVERS AND THE ADJOINING SURFACE SHALL BE LIMITED TO ¼" (6 mm) JOINT SIZE. GAPS LARGER THAN ¼" (6 mm) MUST BE APPROVED BY THE ENGINEER OR DESIGNATED REPRESENTATIVE. ALL JOINTS BETWEEN BRICKS AND ADJOINING SURFACE SHALL BE MORTAR FILLED UNLESS DIRECTED OTHERWISE BY THE ENGINEER OR DESIGNATED REPRESENTATIVE.
6. MORTAR SHALL CONFORM TO STD. SPECIFICATION ITEM SECTION 403S.3.5, MORTAR AND GROUT. ALL OTHER CONCRETE SHALL CONFORM TO STD. SPECIFICATION ITEM 403S, CONCRETE FOR STRUCTURES, UNLESS OTHERWISE NOTED.
7. CURB RAMPS WITH RETURNED CURB MAY ONLY BE USED WHERE PEDESTRIANS WOULD NOT NORMALLY WALK DIAGONALLY ACROSS THE RAMP.

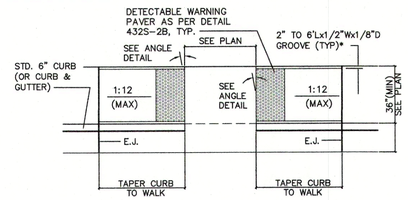
CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS		DETECTABLE WARNING–PAVER (PRIVATE PROPERTY)	
RECORD COPY SIGNED BY BILL GARDNER	06/21/07	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S–2B 2 OF 2
	ADOPTED		



NOTES:

1. WIDTH OF RAIL SHALL BE A MINIMUM OF 200 mm (8") AND MAY BE UP TO A MAXIMUM OF 300 mm (12"), 25 mm (1") HOLLOW-PROFILE PLASTIC LUMBER WITH INTERNAL STIFFNERS.
2. RAILS SHALL BE FASTENED TO EACH TUBE WITH 50 mm (2") STEEL BOLTS WITH NUTS AND WASHERS ON EACH SIDE. BOLT THREADS SHALL BE PEENED.
3. THE RAILS SHALL HAVE 150 mm (6") WIDE REFLECTORIZED RED STRIPES OF TAPE PLACED ON 45 DEGREE SLOPES, DOWN AND TOWARD THE CENTER OF THE BARRICADE.
4. BARRICADES MAY BE CONSTRUCTED IN SECTIONS OR MAY BE CONTINUOUS ACROSS ROADWAY WIDTH. SPLICES ON CONTINUOUS RAIL BARRICADES SHALL BE AT POSTS AND SHALL HAVE A 600 mm (2') SPLICE BLOCK ON BACK SIDE OF THE SAME MATERIAL AS RAIL.
5. 450 mm (18") DIAMOND REFLECTORIZED RED PANEL OR 450 mm (18") DIAMOND RED OR BLACK PANEL WITH NINE–75 mm (3") DIAMETER RED REFLECTORS SYMMETRICALLY PLACED AT CENTER POSTS, A MINIMUM OF 1/2 m (4") ABOVE GROUND SHALL BE USED FOR END OF ROAD MARKERS AS PER TEXAS MANUAL on UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) SECTION 3C.04.

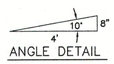
DEPARTMENT OF PUBLIC WORKS		STREET–END BARRICADE	
RECORD COPY SIGNED BY BILL GARDNER	03/12/07	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 803S–1
	ADOPTED		



(*) 3:1 SLOPE IF SIDEWALK IS BELOW GRADE. IF ABOVE OR AT FINISHED GRADE SEE TYPICAL SIDEWALK DETAIL

(**) SLOPED PORTION OF CONCRETE TO BE COLORED RED AND BE FINISHED WITH A COURSE BROOM FINISH

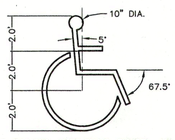
TYPE 4 RAMP



ANGLE DETAIL

HANDICAP RAMP (PRIVATE)

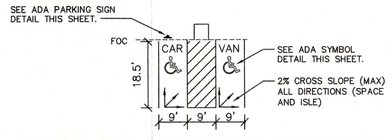
SCALE: NTS



PROVIDE PAINTED WHEELCHAIR SYMBOL AT EACH DESIGNATED HANDICAP PARKING STALL. CENTER SYMBOL IN STALL.
ALL LINES ARE 5" WIDE.

ADA SYMBOL

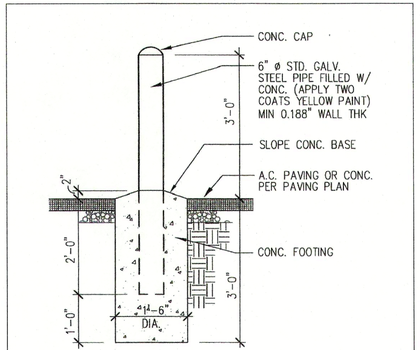
SCALE: NTS



WARNING!! EXCEEDING 2 PERCENT SLOPE IN ANY DIRECTION COULD BE CAUSE FOR REJECTION OF SPACE. CONTRACTOR IS TO VERIFY SPOT ELEVATIONS PRIOR TO CONSTRUCTION AND ENSURE 2% IS NOT EXCEEDED.

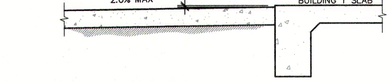
TYPICAL ADA PARKING SPACE

SCALE: NTS



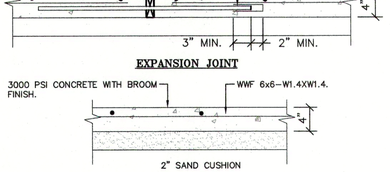
PIPE BOLLARD

SCALE: 3/4"=1'-0"



SIDEWALK AT BUILDING ENTRANCE

SCALE: NTS



SIDEWALK DETAILS (PRIVATE)

SCALE: NTS

FILE PATH:N:\ACAD-MS\5135dwg\5135-CONSTRUCTION DETAILS.dwg - Feb 06, 2020 - 11:20am

DESIGNED BY: | DRAFTED BY:

REVISION	DATE

Carlson, Brigance & Doering, Inc.
Civil Engineering ◆ Surveying
FIRM ID #F3791
Main Office: 5501 West Courtyard Dr. Austin, Texas 78730
North Office: 12129 Rivera Rd. Suite 600 Austin, Texas 78750
Phone No. (512) 280-5160 Fax No. (512) 280-5165

SHEET NAME: CONSTRUCTION DETAILS (3 OF 3)
JOB NAME: BASTROP GROVE MEDTAIL DEVELOPMENT
PROJECT: CIVIL SITE DEVELOPMENT PLANS

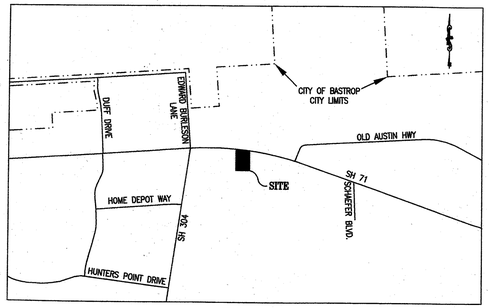
STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
D# F3791
02/06/2020

DATE 11/25/2019
JOB NUMBER 5135
SHEET 29 OF 29
SHEET NO. 29

CUSTOMER COPY

THE FINAL PLAT OF
BASTROP GROVE, SECTION 2

7/12-B



VICINITY MAP
NOT TO SCALE



GRAPHIC SCALE

100 0 50 100 200 400

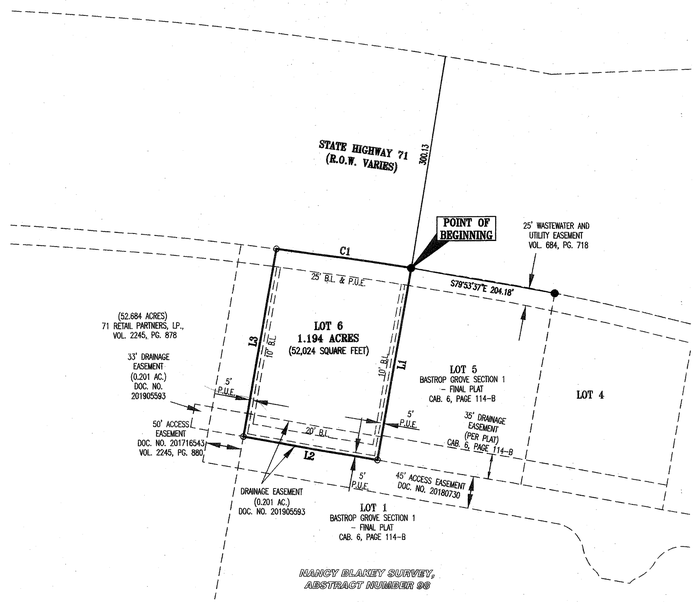
(IN FEET)
1 inch = 100 ft.

LEGEND

○	1/2" CAPPED IRON ROD SET
●	CAPPED IRON ROD FOUND (UNLESS OTHERWISE NOTED)
1	LOT NUMBER
B.L.	BUILDING SETBACK LINE
P.U.E.	PUBLIC UTILITY EASEMENT

Curve Table						
Curve #	Length	Radius	Chord Direction	Chord Length	Tangent	DELTA
C1	190.82	5058.89	S82°05'58"E	190.81	95.42	2°09'40"

Line Table		
Line #	Length	Direction
L1	275.23	S09°40'41"W
L2	190.71	N80°19'19"W
L3	269.15	N09°40'41"E



NO.	REVISION	DATE
1	ORIGINAL SUBMITTAL	07/29/19
2	CITY OF BASTROP COMMENTS	09/03/19
3	OWNERSHIP REVISION	11/25/19

FIELD NOTES

BEING ALL OF THAT CERTAIN 1.194 ACRE (52,024 SQUARE FEET) TRACT OR PARCEL OF LAND OUT OF AND A PART OF THE NANCY BLAKEY SURVEY, ABSTRACT NUMBER 98, SITUATED IN BASTROP COUNTY, TEXAS, BEING ALL OF A CALLED 1.194 ACRE TRACT OF LAND CONVEYED TO GROVE 71 PARTNERS, LP., IN DOCUMENT NUMBER 201916932 OF THE OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS (O.P.R.B.C.TX.), SAID 1.194 ACRE TRACT OF LAND BEING MORE FULLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING, AT A CAPPED ½" IRON ROD FOUND STAMPED "CBD SETSTONE", BEING THE NORTHEASTERN CORNER OF SAID 1.194 ACRE TRACT, SAME BEING A NORTHWESTERN CORNER OF LOT 5, BASTROP GROVE SECTION 1 – FINAL PLAT, A SUBDIVISION RECORDED IN CABINET 6, PAGE 114–B OF THE PLAT RECORDS OF BASTROP COUNTY, TEXAS (P.R.B.C.TX.), AND BEING ALSO A POINT ON A SOUTHERN RIGHT–OF–WAY LINE OF STATE HIGHWAY 71 (R.O.W. VARIES), FOR THE NORTHEASTERN CORNER AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT,

THENCE, WITH THE COMMON BOUNDARY LINE OF SAID 1.194 ACRE TRACT AND SAID LOT 5, S09°40'41"W, A DISTANCE OF 275.23 FEET TO A CAPPED ½" IRON ROD SET STAMPED "CBD SETSTONE", BEING THE SOUTHEASTERN CORNER OF SAID 1.194 ACRE TRACT, SAME BEING THE SOUTHWESTERN CORNER OF SAID LOT 5 AND BEING ALSO A POINT ON A NORTHERN BOUNDARY LINE OF LOT 1, SAID BASTROP GROVE SECTION 1 – FINAL PLAT, FOR THE SOUTHEASTERN CORNER OF THE HEREIN DESCRIBED TRACT,

THENCE, WITH THE COMMON BOUNDARY LINE OF SAID 1.194 ACRE TRACT AND SAID LOT 1, N80°19'19"W, A DISTANCE OF 190.71 FEET TO A CAPPED ½" IRON ROD SET STAMPED "CBD SETSTONE", BEING A SOUTHWESTERN CORNER OF SAID 1.194 ACRE TRACT AND BEING ALSO A NORTHERN CORNER OF SAID LOT 1, FOR THE SOUTHWESTERN CORNER OF THE HEREIN DESCRIBED TRACT,

THENCE, WITH THE WESTERN BOUNDARY LINE OF SAID 1.194 ACRE TRACT, N09°40'41"E, A DISTANCE OF 269.15 FEET TO A CAPPED ½" IRON ROD SET STAMPED "CBD SETSTONE", AT A POINT OF CURVATURE, FOR A CURVE TO THE RIGHT, BEING A NORTHWESTERN CORNER OF SAID 1.194 ACRE TRACT, SAME BEING A POINT ON A NORTHERN BOUNDARY LINE OF SAID 52.684 ACRE TRACT AND BEING ALSO A POINT ON A SOUTHERN RIGHT–OF–WAY LINE OF SAID STATE HIGHWAY 71, FOR THE NORTHWESTERN CORNER OF THE HEREIN DESCRIBED TRACT,

THENCE, WITH THE COMMON BOUNDARY LINE OF SAID 1.194 ACRE TRACT, SAID HIGHWAY 71 AND WITH SAID CURVE TO THE RIGHT HAVING A RADIUS OF 5058.89 FEET, AN ARC LENGTH OF 190.82 FEET AND WHOSE CHORD BEARS S82°08'58"E, A DISTANCE OF 190.81 FEET TO THE POINT OF BEGINNING AND CONTAINING 1.194 ACRES (52,024 SQUARE FEET) OF LAND.

DATE: NOVEMBER 25, 2019

OWNER:
GROVE 71 PARTNERS, LP.
C/O JONATHAN KASLING, MANAGER
3809 S. 2ND STREET,
SUITE D–200
AUSTIN, TX. 78704

ENGINEER & SURVEYOR:
CARLSON, BRIGANCE & DOERING, Inc.
5501 WEST WILLIAM CANNON
AUSTIN, TX 78749
(512) 280–5160
(512) 280–5165 fax

F.E.M.A. MAP NO. 48021 C 0355E
BASTROP COUNTY, TEXAS DATED: JANUARY 19, 2006

TOTAL ACREAGE: 1.194 ACRES
SURVEY: NANCY BLAKEY SURVEY, ABSTRACT No. 98

COMMERCIAL LOTS 1 TOTAL: 1.194 ACRES

NO. OF BLOCKS: 1

BENCHMARK:

1) LCRA MOUMENT # A688 – 3" LCRA ALUMINUM DISK FOUND IN THE EAST RIGHT–OF–WAY LINE OF SH 304. BEING +/– 800' NORTH OF THE INTERSECTION OF HUNTERS POINT DRIVE AND SH 304.
N: 10014712.67 E: 3239449.66 ELEV = 365.68'

STATE OF TEXAS §
COUNTY OF BASTROP § KNOW ALL MEN BY THESE PRESENTS:

THAT, GROVE 71 PARTNERS, LP., JONATHAN KASLING ACTING HEREIN BY AND THROUGH AND BEING THE OWNER OF THAT CERTAIN 1.194 ACRE TRACT OF LAND AS CONVEYED TO GROVE 71 PARTNERS, LP., IN DOCUMENT NUMBER 201916932, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, OUT OF THE NANCY BLAKEY SURVEY, ABSTRACT NUMBER 98, SITUATED IN BASTROP COUNTY, TEXAS, DOES HEREBY SUBDIVIDE 1.194 ACRES OF LAND, IN ACCORDANCE WITH THE ATTACHED MAP OR PLAT, TO BE KNOWN AS:

"BASTROP GROVE, SECTION 2 "

AND DOES HEREBY DEDICATE TO THE PUBLIC, THE USE OF THE EASEMENTS SHOWN HEREON, SUBJECT TO ANY EASEMENTS AND/OR RESTRICTIONS HERETOFORE GRANTED AND NOT RELEASED.

WITNESS MY HAND, THIS THE 26 DAY OF November, 20 19, A.D.

JONATHAN KASLING
GROVE 71 PARTNERS, LP.

STATE OF TEXAS §
COUNTY OF BASTROP § KNOW ALL MEN BY THESE PRESENTS:

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED Jonathan Kasling KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT OF WRITING, AND HE ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN EXPRESSED AND IN THE CAPACITY THEREIN STATED.

WITNESS MY HAND AND SEAL OF OFFICE, THIS THE 26 DAY OF November, 2019, A.D.

NOTARY PUBLIC IN AND FOR THE STATE OF TEXAS

APPROVED ON THIS _____ DAY OF _____, 20____ A.D., BY THE PLANNING & ZONING COMMISSION OF THE CITY OF BASTROP.

APPROVED:
Deborah D. Moore
PLANNING & ZONING COMMISSION
CHAIRMAN

ATTEST:
CITY SECRETARY, CITY OF
BASTROP, TEXAS

STATE OF TEXAS §
COUNTY OF BASTROP § KNOW ALL MEN BY THESE PRESENTS:

I, ROSE PIETSCH, CLERK OF BASTROP COUNTY, DO HEREBY CERTIFY THAT THE FOREGOING INSTRUMENT OF WRITING AND ITS CERTIFICATE OF AUTHENTICATION WAS FILED FOR RECORD IN MY OFFICE ON THE 3rd DAY OF January, 2020 A.D. IN THE PLAT RECORDS OF SAID COUNTY AND STATE IN PLAT CABINET 7, PAGE(s) 12-B FILED FOR RECORD AT 12:45 O'CLOCK P.M., THIS 3rd DAY OF January, 2020 A.D.

WITNESS MY HAND AND SEAL OF OFFICE OF THE COUNTY CLERK, THE 3rd DAY OF January, 20 20 A.D.

ROSE PIETSCH, COUNTY CLERK, BASTROP COUNTY, TEXAS

BY: DEPUTY

FILED Jan 3 2020
12:45 P.M.
Rose Pietsch
COUNTY CLERK
BASTROP COUNTY, TEXAS

COUNTY COURT OF BASTROP COUNTY, TEXAS

FLOOD PLAIN NOTE:

NO PORTION OF THIS TRACT LIES WITHIN A DESIGNATED FLOOD HAZARD AREA, THIS TRACT LIES IN ZONE X–500 (0.2 PERCENT ANNUAL CHANCE FLOOD HAZARD), AS SHOWN ON THE FEDERAL FLOOD INSURANCE ADMINISTRATION RATE MAP NO. 48021 C 0355E, FOR BASTROP COUNTY TEXAS, DATED JANUARY 19, 2006. COMMUNITY NUMBER 481193.

GENERAL NOTES:

1. ALL SUBDIVISION PERMITS SHALL CONFORM TO THE CITY OF BASTROP CODE OF ORDINANCES, CONSTRUCTION STANDARDS, AND GENERALLY ACCEPTED ENGINEERING PRACTICES.
2. CONSTRUCTION PLANS AND SPECIFICATIONS FOR ALL SUBDIVISION IMPROVEMENTS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP PRIOR TO ANY CONSTRUCTION WITHIN THE SUBDIVISION.
3. EROSION AND SEDIMENTATION CONTROLS CONSTRUCTED WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP ARE REQUIRED FOR ALL CONSTRUCTION ON EACH LOT.
4. THE OWNER OF THIS SUBDIVISION, AND HIS OR HER SUCCESSORS AND ASSIGNS, ASSUMES SOLE RESPONSIBILITY FOR PLANS FOR CONSTRUCTION OF SUBDIVISION IMPROVEMENTS WHICH COMPLY WITH APPLICABLE CODES AND REQUIREMENTS OF THE CITY OF BASTROP. THE OWNER UNDERSTANDS AND ACKNOWLEDGES THAT PLAT VACATION OR RE–PLATTING MAY BE REQUIRED, AT THE OWNER'S SOLE EXPENSE, IF PLANS TO CONSTRUCT THIS SUBDIVISION DO NOT COMPLY WITH SUCH CODES AND REQUIREMENTS.
5. CITY ACCEPTANCE OF SUBDIVISION INFRASTRUCTURE OR FISCAL SURETY FOR SUBDIVISION CONSTRUCTION, IN A FORM ACCEPTABLE TO THE CITY OF BASTROP, SHALL BE PROVIDED PRIOR TO FINAL PLAT RECORDATION BY THE CITY.
6. BY APPROVING THIS FINAL PLAT, THE CITY OF BASTROP ASSUMES NO OBLIGATION TO CONSTRUCT ANY INFRASTRUCTURE IN CONNECTION WITH THIS SUBDIVISION. ANY SUBDIVISION INFRASTRUCTURE REQUIRED FOR THE DEVELOPMENT OF THE LOTS IN THIS SUBDIVISION IS THE SOLE RESPONSIBILITY OF THE DEVELOPER AND/OR THE OWNERS OF THE LOTS. FAILURE TO CONSTRUCT ANY REQUIRED INFRASTRUCTURE TO THE CITY STANDARDS MAY BE JUST CAUSE FOR THE CITY TO DENY APPLICATIONS FOR CERTAIN DEVELOPMENT PERMITS INCLUDING BUILDING PERMITS, SITE PLAN APPROVALS AND/OR CERTIFICATE OF OCCUPANCY.
7. NO LOT OR STRUCTURE SHALL BE OCCUPIED PRIOR TO THE APPLICANT SUBMITTING TO THE CITY OF BASTROP DOCUMENTATION OF SUBDIVISION/SITE REGISTRATION WITH THE TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR) AND PROVIDE DOCUMENTATION OF REVIEW AND COMPLIANCE OF THE SUBDIVISION CONSTRUCTION PLANS WITH TEXAS ARCHITECTURAL BARRIERS ACT (TABA).
8. WATER IS PROVIDED BY THE CITY OF BASTROP.
9. WASTEWATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.
10. ELECTRIC SERVICE WILL PROVIDED BY BLUEBONNET ELECTRIC.
11. GAS SERVICE WILL BE PROVIDED BY CENTERPOINT ENERGY.
12. CABLE SERVICE IS PROVIDED BY SPECTRUM.
13. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES
14. WASTEWATER AND WATER SYSTEMS SHALL CONFORM TO TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY).
15. DEVELOPER/OWNER SHALL BE SOLELY RESPONSIBLE FOR ALL RELOCATIONS AND MODIFICATIONS TO EXISTING UTILITIES.
16. FLOOD WARNING: THE DEGREE OF FLOOD WATER PROTECTION REQUIRED BY THE CITY OF BASTROP FLOOD DAMAGE PREVENTION ORDINANCE IS CONSIDERED REASONABLE FOR THE REGULATORY PURPOSES AND IS BASED ON SCIENTIFIC AND ENGINEERING CONSIDERATIONS. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR AND FLOOD HEIGHTS MAY BE INCREASED BY MAN–MADE OR NATURAL CAUSES. ACCEPTANCE OF THIS FINAL PLAT BY THE CITY COUNCIL DOES NOT IMPLY THAT LAND OUTSIDE OF THE AREA OF SPECIAL FLOOD HAZARDS OR USES PERMITTED IN SUCH AREAS WILL BE FREE FROM FLOODING OR FLOOD DAMAGES. NOR SHALL ACCEPTANCE OF THIS FINAL PLAT CREATE LIABILITY ON THE PART OF THE CITY OF BASTROP OR ANY OFFICIAL OR EMPLOYEE THEREOF FOR ANY FLOOD DAMAGES THAT RESULT FROM RELIANCE ON THE INFORMATION CONTAINED WITHIN THIS FINAL PLAT OR ANY ADMINISTRATION DECISION LAWFULLY MADE HEREUNDER.
17. ALL EASEMENTS ON PRIVATE PROPERTY SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNEES.
18. TEMPORARY OR PERMANENT EASEMENTS ARE TO BE PROVIDED AS REQUIRED AT THE CITY'S SOLE DISCRETION FOR OFF–SITE WATER, WASTEWATER AND DRAINAGE IMPROVEMENTS.
19. PROPERTY OWNERS SHALL PROVIDE FOR ACCESS TO ALL EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY GOVERNMENTAL AUTHORITIES.
20. IT IS THE RESPONSIBILITY OF EACH BUILDER TO DESIGN AND CONSTRUCT A SUITABLE GRADING AND DRAINAGE SCHEME WHICH WILL CONVEY SURFACE WATER WITHOUT PONDING IN OR AROUND THE LOT, FROM ITS STRUCTURE TO THE DRAINAGE SYSTEM CONSTRUCTED BY THE SUBDIVISION DEVELOPER. LOT DRAINAGE PLAN SHALL BE SUBMITTED FOR REVIEW/APPROVAL BY THE CITY ENGINEER.
21. PUBLIC UTILITY AND DRAINAGE EASEMENTS WHERE SHOWN HEREON ARE INTENDED TO INDICATE AN EASEMENT FOR CONSTRUCTION, OPERATIONS AND MAINTENANCE OF PUBLIC UTILITIES AND DRAINAGE WAYS; INCLUDING BUT NOT LIMITED TO SANITARY SEWERS, FORCE MAINS, WATER LINES, TELEPHONE SIGNAL CONDUITS, ELECTRIC CONDUCTORS, DRAINAGE PIPES AND NATURAL GAS LINES.
22. ALL EASEMENTS OF RECORD AS INDICATED ON THE MOST RECENT TITLE RUN (DATED: APRIL 5, 2019, CONDUCTED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY) FOR THIS PROPERTY ARE SHOWN ON THIS PLAT.
23. THIS PLAT CONFORMS TO THE PRELIMINARY PLAT APPROVED BY THE CITY COUNCIL ON AUGUST 08, 2019.
24. ALL UTILITIES WILL BE UNDERGROUND.
25. IMPACT FEES SHALL BE ASSESSED IN ACCORDANCE WITH THE ORDINANCE EFFECTIVE AT THE TIME OF FINAL PLATTING.
26. ON–SITE STORM WATER DETENTION FACILITIES WILL BE PROVIDED TO REDUCE POST–DEVELOPMENT PEAK RATES OF DISCHARGE OF THE 5, 10, 25, 50 AND 100–YEAR STORM EVENTS.
27. AS SHOWN HEREON, A TWENTY–FIVE (25) FOOT WIDE PUBLIC UTILITY EASEMENT (P.U.E.) IS HEREBY DEDICATED ADJACENT TO STREET RIGHTS–OF–WAY ON ALL LOTS. A FIVE (5) FOOT WIDE P.U.E. IS HEREBY DEDICATED ALONG EACH SIDE AND REAR LOT LINE.
28. NO BUILDINGS, FENCES, LANDSCAPING OR OTHER STRUCTURES ARE PERMITTED WITHIN DRAINAGE EASEMENTS SHOWN, EXCEPT AS APPROVED BY THE CITY OF BASTROP AND/OR BASTROP COUNTY.
29. NO LOT OR STRUCTURE SHALL BE OCCUPIED PRIOR TO THE APPLICANT SUBMITTING TO THE CITY OF BASTROP DOCUMENTATION OF SUBDIVISION/SITE REGISTRATION WITH THE TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR) AND PROVIDE DOCUMENTATION OF REVIEW AND COMPLIANCE OF THE SUBDIVISION CONSTRUCTION PLANS WITH TEXAS ARCHITECTURAL BARRIERS ACT (TABA).
30. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP.
31. PRIOR TO CONSTRUCTION OF ANY IMPROVEMENTS ON LOTS IN THIS SUBDIVISION, BUILDING PERMITS WILL BE OBTAINED FROM THE CITY OF BASTROP
32. BUILDING SETBACKS NOT SHOWN SHALL BE IN ACCORDANCE WITH CITY OF BASTROP ZONING ORDINANCE.

THIS FLOOD STATEMENT, AS DETERMINED BY A H.U.D.–F.I.A. FLOOD INSURANCE RATE MAP, DOES NOT IMPLY THAT THE PROPERTY OR THE IMPROVEMENTS THEREON WILL BE FREE FROM FLOODING OR FLOOD DAMAGE. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR, AND FLOOD HEIGHTS MAY INCREASE BY MAN–MADE OR NATURAL CAUSES.

THIS STATEMENT SHALL NOT CREATE LIABILITY ON THE PART OF ENGINEER OR SURVEYOR.

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

I, BRENDAN P. McENTEE, P.E. DO HEREBY CERTIFY THAT THE STREETS AND DRAINAGE DESIGN, AS SHOWN HEREON, COMPLIES WITH THE SUBDIVISION REGULATIONS FOR THE CITY OF BASTROP, AND THAT THE 100 YEAR FLOOD PLAIN IS AS SHOWN AND WILL BE CONTAINED WITHIN THE DRAINAGE EASEMENT AND OR DRAINAGE RIGHT–OF–WAY, AS SHOWN HEREON.

ENGINEERING BY: _____ DATE 11/25/2019
BRENDAN P. McENTEE, P.E. NO. 96200
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

THAT I, AARON V. THOMASON, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON–THE–GROUND SURVEY OF THE LAND AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH THE SUBDIVISION REGULATION OF THE CITY OF BASTROP, BASTROP COUNTY, TEXAS. ALL EASEMENTS OF RECORD HAVE BEEN IDENTIFIED ON THIS PLAT TO THE BEST OF MY KNOWLEDGE.

SURVEYED BY: _____ DATE 25 Nov 2019
AARON V. THOMASON – R.P.L.S. NO. 6214
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
REGISTERED
AARON V. THOMASON
6214
PROFESSIONAL LAND SURVEYOR

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791 ◆ REG. # 10024900
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

PATH–J: \AC3D\5135\Survey\FINAL PLAT – 1.194 AC BASTROP MEDTAIL.dwg

Grandfathering Review Committee

Date of Decision – March 30, 2021

Applicant: **Carlson, Brigance, and Doering, Inc.**
71 Retail Partners LP

Project: **#21-000055 – Bastrop Grove Section 3 Lot 7 Grandfathering Request**

Members:
Director of Planning & Development
City Engineer
Director of Public Works

DETERMINATION

The Grandfathering Review Committee has evaluated the above referenced project and recognizes certain items of the project as grandfathered as described below.

BASIS OF DETERMINATION AND CLAIMS RECOGNIZED / REJECTED

The original lot layout and dimensions for lot 7 that can be seen on the preliminary plat dated May 22, 2017; thus, the City of Bastrop can justify making a determination that the project is grandfathered to that date. Any plans or permits prior to that date appear to have been for what could only be characterized as a different project, and thus do not support an earlier grandfathering determination. The record for this property and the material you submitted do not provide a basis for a finding that the project is grandfathered to July 24, 2013. In addition to the lot lay out your request states you believe you are grandfathered to property classification. The City agrees that your property classification was commercial, and it remains commercial. This does not apply to (permitted uses) such as C-1 or C-2 which is a zoning district. However, the new zoning (P5) Placetype 5 allows for more diverse building types such as apartments etc., if it is built in the correct form as seen in the Bastrop Building Block Code (B3 Code).

The duration of the 2017 project for purposes of grandfathering for lot 7 was in our opinion was extended upon recording of the final plat for lot 6 which shows progression of the above-mentioned preliminary plat. This continues the grandfathering status.

Certain items properly characterized as zoning are not recognized as grandfathered in accordance with statutory exemptions listed in LGC 245.004.

Contrary to the Project Description Letter (dated March 16, 2021), the City of Bastrop's Building Bastrop Block Code (B3) was enacted (in substantive part) in accordance with the City's statutory zoning authority, and elements of the B3 Code do constitute municipal zoning regulations under LGC 245. Related regulations such as the B3 Technical Manual and Development Manual may be applicable to your project (depending on your specific plans). The City of Bastrop's process for determining grandfathering is governed by LGC 245 as implemented through Article 1.20 of Bastrop's Code of Ordinances [Uniformity of Regulations].

SIGNED:

Trey Job

Trey Job, Assistant City Manager for Community Development









Grandfathering Review Committee

Date of Decision – May 4, 2021

Applicant: **Carlson, Brigance, and Doering, Inc.**
71 Retail Partners LP

Project: **#21-000089 – Bastrop Grove Section 3 Lot 8 & 9 Grandfathering Request**

Members:
Director of Planning & Development
City Engineer
Director of Public Works

DETERMINATION

The Grandfathering Review Committee has evaluated the above referenced project and recognizes certain items of the project as grandfathered as described below.

BASIS OF DETERMINATION AND CLAIMS RECOGNIZED / REJECTED

The original lot layout and dimensions for lots 8 & 9 that can be seen on the preliminary plat dated May 22, 2017. In addition to the lot lay out your request states you believe you are grandfathered to property classification. That is correct your property classification is commercial, and it remains commercial. This does not apply to (permitted uses) such as C-1 or C-2 which is a zoning district. However, the is the new zoning (P5) Placetype 5 allows for more diverse building types such as apartments etc., if it is built in the correct form as seen in the Bastrop Building Block Code (B3 Code).

The expiration of the grandfathering for lots 8 & 9 in our opinion was extended upon recording of the final plat for lot 6 which shows progression of the above-mentioned preliminary plat. This continues the grandfathering status two years from January 3, 2020.

The following items are not recognized as grandfathered in accordance with LGC 245 or because the items have not been submitted to date:

- Drainage standards: all drainage standards must comply with currently adopted stormwater drainage codes
- Uniform building, fire, electrical, plumbing, or mechanical codes and their locally adopted amendments as they apply to this project
- Landscaping or tree preservation
- Permitted uses
- Building size
- Zoning district C- 1

SIGNED:

Trey Job

Trey Job, Assistant City Manager for Community Development

71 RETAIL PARTNERS, L.P.
8214 Westchester Drive, Ste 550
Dallas, TX 75225

May 25, 2021

Trey Jobs, Assistant City Manager
City of Bastrop, TX
Planning and Development Department
1311 Chestnut Street
Bastrop, TX 78602

Request for Reconsideration

Dear Trey,

71 Retail Partners, L.P. ("71 RP") filed a Grandfathering Development Status Application under City Code Art. 1.20 (the "Ordinance") on April 19, 2021. The Grandfathering Review Committee (the "GRC") issued a determination (the "GRC Determination") on May 4, 2021. 71 RP hereby requests reconsideration of the GRC Determination pursuant to the Ordinance.

The GRC Determination is required by the City for the City to make its own determination of its position on the application of Texas Local Government Code ("LGC") Chapter 245 ("LGC 245"), which provides protections from changes in local regulation as to an ongoing development project (such protections being commonly known as "vested rights"). Only Chapter 245 determines the applicable vested rights, and to the extent the Ordinance seeks to limit vested rights or give the City control over the interpretation process (such as, but not limited to, establishing standards and burdens), we protest, and submit this application under protest. The GRC Determination is for the benefit of the City only, and is not binding on 71 RP as to the nature or extent of vested rights. 71 RP reserves all its rights under LGC 245.

Vested Rights defined (emphasis added):

- "If a series of permits is required for a project, the orders, regulations, ordinances, rules, expiration dates, or other properly adopted requirements *in effect at the time the original application for the first permit in that series is filed shall be the sole basis for consideration of all subsequent permits required for the completion of the project*. All permits required for the project are considered to be a single series of permits. Preliminary plans and related subdivision plats, site plans, and all other development permits for land covered by the preliminary plans or subdivision plats

are considered collectively to be one series of permits for a project." LGC 245.002(b)

- "Rights to which a permit applicant is entitled under this chapter *accrue on the filing of an original application or plan for development or plat application* that gives the regulatory agency fair notice of the project and the nature of the permit sought." LGC 245.002(a-1)

The GRC Determination granted grandfathered status, but not the date (appearing to approve May 22, 2017). It seems to limit the scope of grandfathered status to (i) "lot lay out" as shown on the 2017 Preliminary Plat application, and (ii) "property classification", which the city determined to be "commercial", but not all the permitted uses permitted under then zoning district C-1. The City goes on to say that other uses are permitted today, but only if development is compliant with the B3 Code. Lastly, the City lists landscaping or tree preservation and building size as not grandfathered "because the items have not been submitted to date."

The Ordinance requires the following:

1. Filing with the Director of Planning and Development in writing within fifteen (15) business days of the date of the Grandfathering Review Committee's previous determination or the date of automatic denial;
2. State the reasons why the previous determination should be reversed or modified;
3. Present information that has not previously been presented for consideration by the Grandfathering Review Committee;
4. Provide an explanation of the legal and factual grounds of the request; and
5. Be accompanied by payment of the reconsideration fee established by the City Council, as codified in the city's fee schedule.

For purposes of this appeal request, the word "Project" refers to 52.68 acres that was owned on the date of the original application by 71 RP, inclusive of the creation of the lots and related infrastructure and the construction of buildings thereon. Both the land development and the building development are entitled to vested rights. 71 RP has continuously pursued this Project since the original application. The scope and nature of the Project is well known to the City, as suburban retail/commercial pad site development for buildings consistent with the Medtail facility. The elements of the contemplated retail/commercial pad sites are relatively small buildings (usually 1 story), typically centered in each lot, with ample, surface parking surrounding the building, and cross access easements shared among the other pad sites. These lots are typically called "commercial reserves". Lot 8 is a typical pad site and Lot 9 is a larger tract for larger development. Lots 8 & 9 were planned for and contemplated building for the uses permitted under Zoning District C-1 at the time of the 2017 Preliminary Plat application.

Reconsideration Request # 1: Which application is the original application for the Project?

71 RP believes the GRC Determination made an erroneous determination that the original application for the Project is the application dated 5-22-2017 for the Preliminary Plat for the Bastrop Grove (the "2017 Application"). 71 RP agrees that the 2017 Application was a vesting event, but asserts that the first vesting event was the application dated 7-24-2013 for Preliminary Plat for the Grove (the "2013 Application").

71 RP asserts that the original application for the Project that gave the regulatory agency fair notice of the Project and the nature of the permit sought pursuant to LGC 245.002(a-1) was the 2013 Application.

71 RP asserts the following in support of its request and offers the following explanation of the legal and factual grounds of this appeal:

- The 2013 Application and 2017 Application are both for the exact same tract of land.

- The 2013 Application and 2017 Application generally provide both the same access points onto State Highway 71 and the same internal vehicular circulation.

- A side-by-side comparison of the 2013 Application and 2017 Application shows that they are substantially similar and generally depict the same project, which is a development of smaller lots and buildings fronting on State Highway 71 with the remainder of land available for further subdivision and future development of larger buildings as the Project progresses.

- LGC 245.002(a-1) states:
  "Rights to which a permit applicant is entitled under this chapter accrue on the *filing of an original application or plan for development or plat application* that gives the regulatory agency *fair notice of the project and the nature of the permit sought.*" *emphasis added.*
  - 71 RP did file the 2013 Application on 7-22-2013 properly and as required.
  - The 2013 Application was of sufficient detail to give fair notice of the Project and the nature of the permit sought.
  - The City has accepted the 2017 Application and a side by side comparison shows that the 2013 Application and 2017 Application are substantially similar.

- LGC 245.002(b) states:

"If a series of permits is required for a project, the orders, regulations, ordinances, rules, expiration dates, or other properly adopted requirements *in effect at the time the original application for the first permit in that series is filed* shall be the sole basis for consideration of all subsequent permits required for the completion of the project. All permits required for the project are considered to be a single series of permits. Preliminary plans and related subdivision plats, site plans, and all other development permits for land covered by the preliminary plans or subdivision plats are considered collectively to be one series of permits for a project." *emphasis added.*

- Both the 2013 Application and 2017 Application are Preliminary Plat applications for the same exact tract of land and therefore are deemed to be one series of permits for the Project under Texas LGC 245.002(b).
- The 2017 Application was merely a refinement of the Project.

In summary, 71 RP is vested with the both the 2013 Application and the 2017 Application.

Reconsideration Request # 2: Is the Project subject to the Bastrop Building Block (B3) Code, the B3 Technical Manual, and the Development Manual (collectively the "B3 Code")?

While 71 RP asserts the 2013 Application is the proper application for determining vested rights under Texas LGC 245, both the 2013 Application and 2017 Application pre-date the B3 Code. Therefore, 71 RP asserts the GRC Determination made an erroneous determination in the following statement, "However the is the [sic] new zoning (P5) Placetype 5 allows for more diverse building types such as apartments, etc., if it is built in the correct form as seen in the Bastrop Building Block (B3 Code)." The B3 Code does not apply to the Project, as it does not qualify for exemption under Texas LGC 245.004.

71 RP asserts the following in support of its request and offers the following explanation of the legal and factual grounds of this appeal:

- LGC 245.004(2) provides an exemption to LGC 245 for "*municipal zoning regulations* that do not affect landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size or that do not change development permitted by a restrictive covenant required by a municipality". *emphasis added.*

- In order for a zoning regulation to be exempt under LGC 245.004 (2), such regulation must be a municipal zoning regulation **and** must not affect landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size (collectively the "LGC 245.004 Vested Rights"). The word "affect" means "having an effect on", which is a broad

interpretation. The B3 Code impacts every aspect of the LGC 245.004 Vested Rights. 71 RP asserts that the B3 Code fails this test as follows:

- B3 is not a municipal zoning regulation, but a "form based code" whose regulations are based on public infrastructure. Public infrastructure is regulated by the subdivision and platting process, not the zoning process. Zoning focuses on separation of use by geographic district. Use is not directly regulated by the B3 Code. There are no permitted/prohibited uses, no use table or matrix, and no use definitions. A fair reading of the B3 Code shows it is not zoning regulations, but subdivision and platting regulations.

- Page 22 of the B3 Code states "Blocks are the foundation for development in Bastrop." If Blocks (and therefore street grids/specifications and lot sizes/dimensions) are the foundation of development in Bastrop under the B3 Code, then the B3 Code, without question, fails the test and does not qualify as exempt under LGC 245.004 exemption for "municipal zoning regulations."

- B3 is a "unified development code" which mixed various types of land use regulations that otherwise would be separate ordinances. It is not "municipal zoning regulations" of the type contemplated when LGC 245 was adopted. This is particularly true for a form-based code. The "Explanation of the Code" on Page 15 of the B3 Code states "Each section of the Code provides Standards that guide development to be holistic to each Building, Street, Block, and neighborhood." Merriam-Webster defines "holistic" as "relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts". As a result, the B3 Code in its entirety fails the test to be "municipal zoning regulations" and does not qualify as exempt under LGC 245.004.

- The broad exceptions to the general "municipal zoning regulations" exception in LGC 245.004 swallow the general exception when applied to the B3 Code. The "B3 Development Tables" in the Code, which "contain the details necessary to develop using the Code" contain specific requirements for lot sizes, lot dimensions, lot coverage, building sizes, open space and park dedication requirements. Any regulations which have any effect on these areas are subject to vesting as "exceptions to the exceptions". As a form-based code, the core focus is on infrastructure, particularly the street grid and "blocks". This approach, by its nature, affects the LGC 245.004 Vested Rights. Given that the details necessary to develop using the B3 Code directly affect the LGC 245.004 Vested Rights, the B3 Code fails the test and does not qualify as exempt under LGC 245.004.

Reconsideration Request # 3:

71 RP believes the GRC Determination made an erroneous determination in this statement, "The following items are not recognized as grandfathered in accordance with LGC 245 or because the items have not been submitted to date:

- Landscaping and tree preservation
- Permitted Uses
- Building Size
- Zoning District C-1"

71 RP asserts the following in support of its request and offers the following explanation of the legal and factual grounds of this appeal:

1. LGC 245(2)(b) states:

> "If a series of permits is required for a project, the orders, regulations, ordinances, rules, expiration dates, or other properly adopted requirements *in effect at the time the original application for the first permit in that series is filed* shall be the sole basis for consideration of all subsequent permits required for the completion of the project. All permits required for the project are considered to be a single series of permits. Preliminary plans and related subdivision plats, site plans, and all other development permits for land covered by the preliminary plans or subdivision plats are considered collectively to be one series of permits for a project."

LGC 245 does not require each and every permit in a series of permits to be filed in order for the Project to have vested rights under LGC 245 and whether those specific items have been submitted to date does not preclude the Project's vested rights under LGC 245. The Project includes the entire life cycle of development, from lots to completed buildings, such that the Project is fully vested under LGC 245. The City determination should be clarified, or rescinded.

2. LGC 245.004 (2) provides an exemption to LGC 245 for "municipal zoning regulations that do not affect landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size or that do not change development permitted by a restrictive covenant required by a municipality". 71 RP asserts that there has been no new zoning regulation passed by the City that meets this test and therefore Zoning District C-1 and the Permitted Uses under C-1 as of the date of the original application for the Project are vested rights. The "property classification" vested rights covers all uses permitted as of the date of vesting, in this case the date of the original

application, at which time the C-1 Zoning District applies. All uses then permitted are permissible for the Project. Any provisions of the B3 Code that would have an effect on those permitted uses are not applicable to the Project. A number of those permitted uses are not practically possible under the B3 Code, therefore those B3 Code provisions may not be applied to such uses, as they indirectly do what LGC 245 prohibits.

3. LGC 245.002(d) permits a permit holder to take advantage of "a change in the laws, rules, regulations, or ordinances of a regulatory agency that enhance or protect the project...." This means that the Project may be developed with any uses, since the City does not currently regulate uses. The owner of any portion of the Project may develop under the regulatory scheme as of the vesting date, but without any of the limits of the B3 Code. This section permits a developer to "cherry pick" new regulations to develop a vested project, without forfeiting any vested rights.

Reconsideration Request #4: To the extent the Project is subject to any elements of the B3 Code, what are they?

As stated in #2, 71 RP asserts that the entirety of the Bastrop Building Block (B3) Code, the B3 Technical Manual, and the Development Manual are not applicable to the Project. To the extent the City determines that the B3 Code is a "municipal zoning regulation", subject to the LGC 245.004 Vested Rights in LGC 245.004(2), 71 RP asserts that the Project is specifically exempt from the following elements (listed by Chapter) and asks the City to confirm the same:

- Executive Summary- This section is not regulatory in nature and should not be applicable to the Project.

- Chap. 1- Chapter 1: *Subdivisions* is not applicable to the Project. Pursuant to LGC 245, the Project is grandfathered to the subdivision ordinance in effect at the time of the original application and therefore any future subdivision or platting application for the Project would not be subject to the requirements of Chapter 1.

- Chap. 2- Chapter 2: *Zoning Procedures* deals with procedural aspects only. It is only applicable to the extent there is no effect on the LGC 245.004 Vested Rights (which we believe eliminates the B3 Code in its entirety).

- Chap. 3- Chapter 3: *Place Type Zoning Districts* cannot be fairly read as "municipal zoning regulations". There is no focus on use, whether with a hierarchy of uses or separate of uses. But for a gratuitous scattering of the word "zoning" in Chap. 3, it reads like a subdivision or platting regulation, focused on street and block patterns and size. The geographic division is not based on use, but on street block

based subdivision/platting standards. The requirement to prepare a Neighborhood Regulating Plan (a "NRP") is a critical component of the B3 Code and its focus is purely streets and blocks. Chapter 2 of the B3 Technical Manual, which includes the NRP process, is entitled "Site Planning and Private Realm." A fair reading of that Chapter shows that it is not part of "municipal zoning regulations", but rather subdivision and platting regulations. Article 2.3 of the B3 Technical Manual states "Neighborhood Regulating Plans are used as the process to create new complete neighborhoods. Each neighborhood will be made of a series of blocks created for a variety of Street Types, Building Types, and Place Types." The NRP's process to create "new complete neighborhoods" requires dedication of land for streets of designated sizes to creates certain block sizes to build specifically designated building types. The NRP is platting and subdivision regulation, not zoning, which is why the NRP is the first step for any owner of greater than 3.4 acres under the B3 Code seeking to subdivide its land. The NRP is a part of the the platting process, not the zoning process. The NRP process is subject to vested rights and is not applicable to the Project (and no portion of Chapter 3 of the B3 Code or Chapter 2 of B3 Technical Manual is applicable). As such, the NRP process directly affects the LGC 245.004 Vested Rights and is not exempt under LGC 245.004.

- Chap. 4- Chapter 4: *Character Districts* of the B3 Code can't be fairly read as "municipal zoning regulations". There is no focus on use, whether with a hierarchy of uses or separate of uses. Chapter Four of the B3 Code states that "Character Districts are the largest regulating geographic boundary in the Code" and "...each character district allows for different Development Patterns." If this Chapter is "municipal zoning regulations", it is only applicable to the extent there is no effect on the LGC 245.004 Vested Rights (which we believe eliminates the B3 Code in its entirety).

- Chap. 5- Chapter 5: *Development Patterns* of the B3 Code states "The Development Pattern type will be used to guide the creation of...the Neighborhood Regulating Plan." Chapter 5 cannot be fairly read as "municipal zoning regulations". There is no focus on use, whether with a hierarchy of uses or separate of uses. As stated above, the Project is exempt from submitting a NRP and therefore is exempt from Chapter 5 of the B3 Code. In addition, Chapter 5 states the Project is located in the "Meadows" Character District, which solely permits either a Development Pattern of Traditional Neighborhood Development or Village Center Development. Each of these Development Patterns imposes development requirements on the Project that affect LGC 245.004 Vested Rights. If this Chapter is "municipal zoning regulations", it is only applicable to the extent there is no effect on the LGC 245.004 Vested Rights (which we believe eliminates the B3 Code in its entirety).

- Chap. 6- Chapter 6: *Private Realm* is not applicable to the Project. Chapter 6 states the permitting requirements under the B3 Code for building and site plan approvals, which are pre-requisites under the B3 Code for issuance of a building or construction permit. Chapter 6 clearly affects the LGC 245.004 Vested Rights, including without limitation, lot coverage and building size (as dictated by the Façade Buildout at Build-to-Line minimum percentage requirement), which is shown most clearly in the chart under Sec. 6.5.003 on Page 109. While lot coverage is explicitly dictated by Chapter 6, the use of the minimum "Build-to-Line" percentage requirement effectively dictates building size, which is included in the LGC 245.004 Vested Rights by requiring that a building be a minimum length based on the lot dimensions. By imposing a strict requirement on building dimensions, certain building sizes are impossible or impractical to build. Chapter 6 also affects landscaping and tree preservation (Section 6.3.004), which is a LGC 245.004 Vested Right.

- Chap. 7- Chapter 7: *Public Realm* is not applicable to the Project. Chapter 7 states the requirements for public dedication of streets and other ROW's of certain size and design, which impact LGC 245.004 Vested Rights, including without limitation landscaping and tree preservation, open space and park dedication, property classification, lot size, lot dimensions, lot coverage, and building size. Each aspect of Chap. 7 affects the LGC 245.004 Vested Rights and are therefore not exempt under LGC 254.004(2). Instead, Chapter 7 is a subdivision or platting regulation. In addition, Section 7.4.001 *Intent* states "The Bastrop Building Block is the foundation of Bastrop and of the Code.". If the foundation of the Code is not exempt under LGC 254.004, then the Code itself cannot be exempt. Furthermore, Article 7.5 requires a specific percentage of any Project to be dedicated to Civic Space, which clearly affects LGC 245.004 Vested Rights and is not exempt under LGC 254.004.

- Chap. 8- Chapter 8: Signage is not applicable to the Project. Chapter 8 states the requirements for securing sign permits, which is not a municipal zoning regulation and therefore is not exempt under LGC 254.004. In addition, the Project benefits from an agreement between the City of Bastrop and Hal and Lisa Berdoll dated July 17, 1993, in which the City of Bastrop agrees to issue all permits, variances, and approvals as may be required to construct, own, and operate a sign with a height not to exceed twenty (20) feet higher than any sign, flag pole, or similar structure which may exist within 2500 feet (all as more particularly in described in such agreement). 71 RP reserves any and all rights under such agreement.

- Chap. 9- Chapter 9: *Historic Landmark Preservation & The Iredell District* are not applicable to the Project due to the nature of such chapter.

- Chap. 10- Chapter 10: *Definitions* is not applicable to the Project to the extent such definitions define terms that affect vested rights under LGC 245, including without limitation the LGC 245.004 Vested Rights or are otherwise used in the sections of the B3 Code that are not applicable to the Project.

- The B3 Technical Manual, and the Development Manual (collectively the "Manuals") simply implement the B3 Code, and to the extent the B3 Code (or any portion thereof) is not applicable, then the Manuals are also not applicable. The Manuals do not stand on their own.

The Ordinance requests legal grounds, and seems to want a legal brief on this matter, when 71 RP is simply trying to comply with a City requirement to help it determine its own conclusion on vested rights, and the City has no authority to adjudicate vested rights binding on 71 RP. Nonetheless, we attach an addendum with reference to LGC 245 and relevant case law. Our primary reliance is on the text of LGC 245, as cited herein and available online to the City.

71 Retail Partners, L.P. and its representatives look forward to your reconsideration. Should any further information or clarification be required, please do not hesitate to contact us.

Sincerely,

Douglas M. MacMahon
Manager of the General Partner of 71 Retail Partners, L.P.

Addendum

Relevant Vested Rights Caselaw Supporting this Application

River City Partners, Ltd v. City of Austin, NO. 03-19-00253-CV, 2020 WL 3164404 (Tex. App.—Austin, 2020, no pet. h.)- Interpretes the LGC 245.004 Vested Rights and that the term "affecting" means broadly interpreted "to produce an effect on" and is applied to the subject ordinance "as applied" to the project, in this case focused on "building size."

Hatchett v. West Travis County Public Utility Agency, 598 S.W.3d 744, (Tex. App—Austin, 2020, pet denied)- Summary of the current state of vested rights under LGC 245.

FLCT, Ltd. v. City of Frisco, 49 S.W.3d 238 (Tex. App.—Fort Worth 2016, pet. den.)- The exceptions to the "municipal zoning regulations" except to vested rights under LGC 245.004 as determined on an "as applied" basis to any regulations which "have an effect" on the listed exception issues. The exception for "property classification" means the permissible uses under the regulator scheme when vesting occurs. A project is entitled to all uses permitted when vesting occurs. "Fair notice" of a project incorporates all the city actual knows about the project, not just what the applicate documents. The definition of a "project" is broad.

City of San Antonio v. Greater San Antonio Builders Ass'n, 419 S.W.3d 597 (Tex. App.—San Antonio 2013, pet. den.)- A city may not add local limits to vested rights, only LGC 245 determines vested rights.

Harper Park Two, LP v. City of Austin, 359 S.W.3d 247 (Tex. App.—Austin 2011, pet. den.)- The entirety of a development project is considered in a "project", not components or phases. The definition of "permit" is very broad. The vesting is considered in the context of the regulatory scheme at the time to determine the scope of the project. The objective intent shown in the permit application is the focus for vested rights, not the subjective intent of the developer at the time of the vesting event.

Hartsell v. Town of Talty, 130 S.W.3d 325, 326 (Tex. App.—Dallas 2004, pet. denied)- Vested rights extend to the entire development project, land and buildings. The city tried to separate land development from building development, but that distinction was not permitted.

City of Austin v. Garza, 124 S.W.3d 867, 868 (Tex. App.—Austin 2003, no pet.)- LGC 254.002(d) is valid and permits the developer to "cherrypick" between vested regulations and later adopted regulations.

June 15, 2021

71 Retail Partners LP
C/O Douglas MacMahon
8214 Westchester Drive, Suite 550
Dallas, TX 75225

Dear Mr. MacMahon,

I have reviewed the documents that have been submitted and the previous determination the Grandfathering Committee issued.

This request is to determine which of the previously adopted city codes can be utilized by the current project, not which sections of the current code are applicable. We have determined that the property described as Bastrop Grove, Section 3, Lot 8 & 9 is grandfathered to specific regulations in effect as of May 22, 2017, the date of the submittal of the Bastrop Grove Preliminary Plat, which was approved by City Council on August 8, 2017. This is the controlling document for the approval, disapproval, or conditional approval of future application for subdivision, pursuant to LGC § 245.002(a) and (b), as may be amended.

To this end, the project is grandfathered to the Subdivision Ordinance (Chapter 10 of the Code of Ordinances 2017), and specific municipal regulations that informed the subdivision standards, including regulations in effect related to landscaping or tree preservation, open space or park dedication, property classification, lot size, lot dimensions, lot coverage, or building size (Chapter 14 of the Code of Ordinance 2017). As noted in the previous determination, the property classification as of May 22, 2017 was commercial (C-1, Local Commercial), and the property remains classified as commercial with the Place Type 5 district as rezoned during in the B^3 Code.

The project is not grandfathered to any regulations exempted by LGC § 245.004, which includes drainage and zoning regulations, which were updated with the Stormwater Drainage Ordinance and the Bastrop Building Block (B^3) Code in 2019. The B^3 Code is a unified development code, which includes subdivision, zoning, and sign regulations.

Sincerely,

Trey Job
Acting Director of Planning
Assistant City Manager of Community Development

CC: Jennifer Bills, Assistant Planning Director

STAFF REPORT

MEETING DATE: September 7, 2021 **AGENDA ITEM:** 3D

TITLE:
Public hearing and consider action on an appeal of a Grandfathered Development Status Determination and request for a variance to be exempt from the Bastrop Building Block (B3) Code for Bastrop Grove Section 5 (previously called Section 2) Proposed Preliminary Plat, being 25.9 acres out of the Nancy Blakey Survey, Abstract 98, located east of SH 304 in the 600 Block west of SH 71, within the city limits of the City of Bastrop, Texas.

AGENDA ITEM SUBMITTED BY:
Jennifer C. Bills, Assistant Planning Director
Trey Job, Assistant City Manager of Community Development

ITEM DETAILS:

Site Address:	East of SH 304 in the 600 Block west of SH 71 (Attachment 1)
Total Acreage:	25.9 acres
Legal Description:	25.9 acres of land out of the Nancy Blakey Survey, Abstract 98
Property Owner:	MC Bastrop 71 LP/Douglas MacMahon
Agent Contact:	Carlson, Brigance, and Doering/Brendan McEntee
Existing Use:	Vacant/Undeveloped
Existing Zoning:	P-5, Place Type 5 – Core
Future Land Use:	General Commercial

BACKGROUND/HISTORY:
The Texas Local Government Code Chapter 245 contains specific language about projects and permits that have been filed with a municipality and establishes the intent of the development projects. Below is the information provided by the applicant.

With the project information provided to this date, the City determined that the project is not considered Grandfathered to the previous codes in effect on January 22, 2019 as claimed by the applicant, as the project has not continued to move forward by submitting permits that can be approved by the city. Additionally, the applicant has provided and has filed a competing application following the adopted Bastrop Building Block (B^3) Code process.

Documents Provided by the Applicant:

- October 1, 2018 - Bastrop Grove Drainage Improvements Application Submitted
    - A construction plans and drainage plan for a regional drainage channel to provide direct discharge from the area owned by Retail 71 Partners and MC Bastrop 71. Plans specifically show Bastrop Grove Section 1-3 Preliminary Plat. Does not provide any information for the layout of lots south of Agnes.

- January 22, 2019 – Preliminary Plat for Bastrop Grove Section 2 (now Section 5) Application Submitted
    - Not accepted for review due to the drainage moratorium adopted under Emergency Ordinance No. 2018-1-A

- April 4, 2019 – Drainage Moratorium Exemption Application Submitted
    - Drainage Moratorium was lifted May 14, 2019

Grandfathering Appeal

The applicant is appealing three aspects of this determination (Attachment 7).

1. The Original Application gave fair notice to the City of the Project;

2. MC 71 made progress towards completion of the Project as required by LGC 245.005 (c); and

3. The Project is vested as of the Original Application on January 22, 2019.

The applicant is requesting that the ZBA remand the determination back to the City Manager for review.

Planning Staff recommends upholding the City Manager's Determination. While fair notice may have been provided, staff disputes that any progress has been made to further the completion of any permits within the two years after submittal, because permits submitted have not met the code requirements, first of the drainage moratorium, and then of the Stormwater Drainage Manual and the B³ Codes.

Request for Variance
If the appeal is denied, the applicant is requesting a variance for the Project to be exempt from the B³ Code, and more specifically the requirements of the Code to complete a Neighborhood Regulating Plan, the requirements of the Development Patterns in Chapter 5, and compliance with the Building Placement requirements of Chapter 6, any building size regulation (or regulations that affect building size, including without limitation the Built-to-line and building to land ratio), and minimum or maximum setbacks and any other B³ Code requirements which affects the Project's Vested Rights.

Planning Staff does not recommend a blanket variance to the B³ Codes without review of a specific project outlining how the variances would affect each site.

POLICY EXPLANATION:
V.T.C.A. Local Government Code Chapter 245 ("LGC 245"), provides an opportunity for landowners or developers to lock-in certain government regulations that apply to a particular development by filing a specific permit application. are regulated under Section 212.172 of the Texas Local Government Code.

Bastrop adopted Article 1.20 – Uniformity of Requirements, commonly referred to as the "Grandfathering Development Status Ordinance". This provides standards and procedures to determine possible grandfathered development status of development projects.

Procedure:

1. Applicant submission of Grandfathering Request with documentation
    a. April 19, 2021 (Attachment 4)

2. Grandfathering Review Committee (Director of Planning, City Engineer, and Public Works Director) makes determination within 15 business days.
    a. The Committee determination was made and sent on May 4, 2021. (Attachment 5)

3. Applicant can request reconsideration of the determination by the Grandfathering Review Committee within 15 business days of determination.
    a. Submitted May 25, 2021 (Attachment 6)

4. Grandfathering Review Committee can either affirm or reverse the determination within 15 business days of request.
    a. Decision upheld – June 15, 2021 (Attachment 7)

5. If the determination reconsideration is denied, the request is automatically forwarded to the City Manager for determination, which must be completed within 15 business days of reconsideration determination.
    a. Forwarded on June 16, 2021
    b. Determination on July 7, 2021 (Attachment 2)

6. Applicant can appeal the City Manager's determination to the Zoning Board of Adjustment within 15 business days of determination.
    a. Appeal submitted on July 28, 2021 (Attachment 3)

7. The ZBA must be convened within 30 days after the appeal has been received (or the City Manager, at the request of the appellant can postpone to a date certain), or the appeal is deemed to have automatically been denied.
    a. Meeting called for September 7, 2021.

8. Should the appellant be dissatisfied with the actions of the ZBA, the appellant may pursue all legal remedies to review the ZBA's decision as set forth in LGC Section 211.011.

RECOMMENDATION:

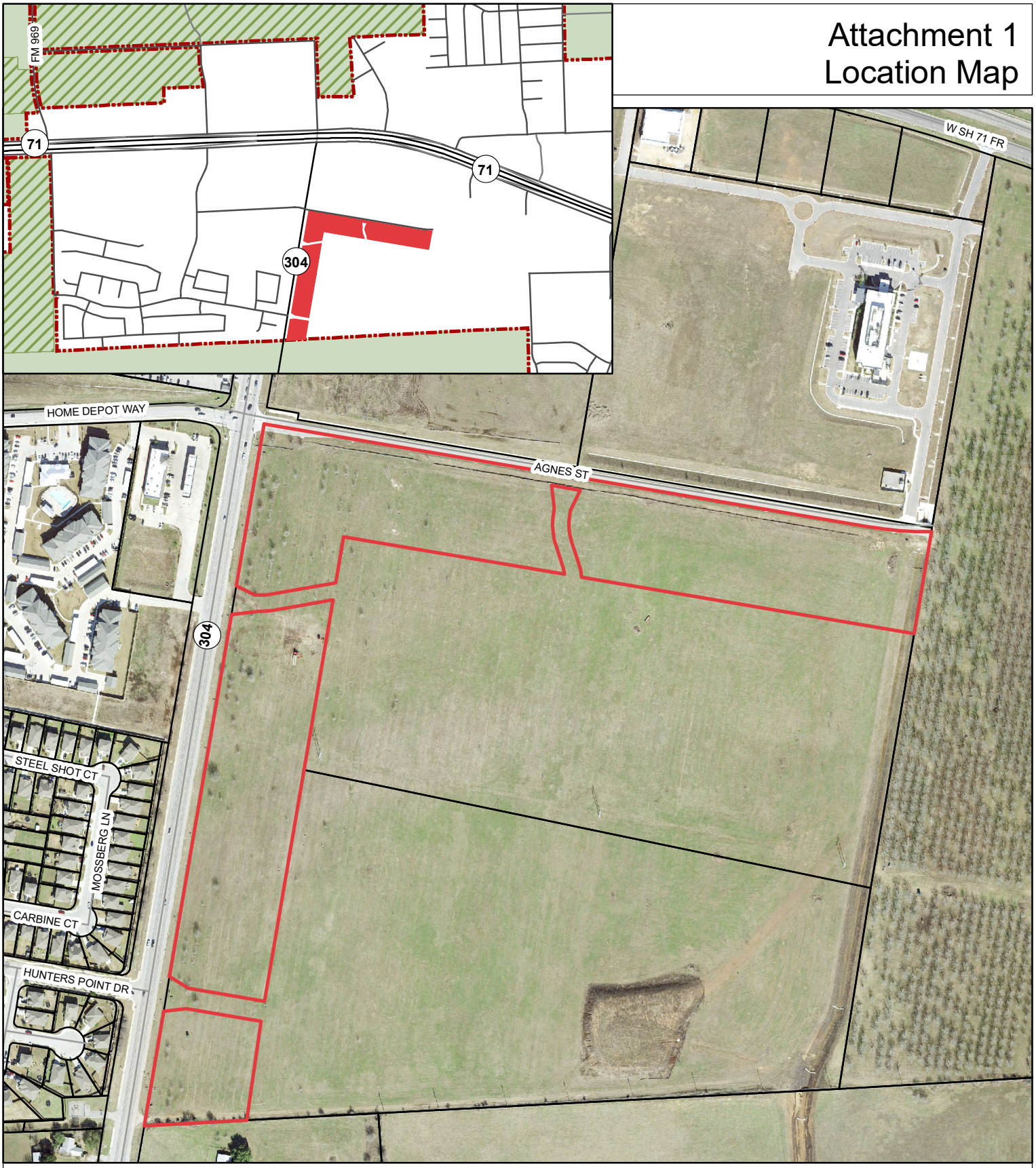
Hold public hearing and consider action on an appeal of a Grandfathered Development Status Determination and request for a variance to be exempt from the Bastrop Building Block (B3) Code for Bastrop Grove Section 5 (previously called Section 2) Proposed Preliminary Plat, being 25.9 acres out of the Nancy Blakey Survey, Abstract 98, located east of SH 304 in the 600 Block west of SH 71, within the city limits of the City of Bastrop, Texas.

ATTACHMENTS:

- Attachment 1 – Location Map
- Attachment 2 – City Manager Reconsideration Determination July 7, 2021
- Attachment 3 – Applicant Appeal to Zoning Board of Adjustment July 28, 2021
- Attachment 4 – Applicant Grandfathering Request for Bastrop Grove, Section 5 April 19, 2021
- Attachment 5 – Grandfathering Review Committee Determination May 4, 2021

- Attachment 6 – Applicant GRC Reconsideration Request April 14, 2021
- Attachment 7 – GRC Reconsideration Determination April 22, 2021

Attachment 1
Location Map



BASTROPTX
Heart of the Lost Pines
Est. 1832

0 135 270 540
Feet

1 inch = 400 feet

Bastrop Grove
Section 5

N

Date: 8/13/2021

The accuracy and precision of this cartographic data is limited and should be used for information /planning purposes only. This data does not replace surveys conducted by registered Texas land surveyors nor does it constitute an "official" verification of zoning, land use classification, or other classification set forth in local, state, or federal regulatory processes. The City of Bastrop, nor any of its employees, do not make any warranty of merchantability and fitness for particular purpose, or assumes any legal liablity or responsibility for the accuracy, completeness or usefullness of any such information, nor does it represent that its use would not infringe upon privately owned rights.

July 7, 2021

71 Retail Partners LP
C/O Douglas MacMahon
8214 Westchester Drive, Suite 550
Dallas, TX 75225

Dear Mr. MacMahon,

I have reviewed the documents that have been submitted and the previous determinations of the Grandfathering Committee issued by Trey Job, Assistant City Manager (Acting Director of Planning & Development).

This request is to determine if the city has had fair notice of a project and that a series of permits have been submitted that have moved the project forward towards completion. The determination under review is for Bastrop Grove Section 5 (previously submitted as Section 2). The first application for this specific project was submitted on April 4, 2019, more than two years before the request for Grandfathering on April 19, 2021. This submittal and other subsequent submittals were not complete and are considered expired. Additionally, a Neighborhood Regulating Plan for this section was submitted on November 6, 2020, was reviewed by staff, and sent to the Planning & Zoning Commission for the February 25, 2021, meeting. The item was not heard due to a request by the applicant to withdraw the application on February 24, 2021. Due to this submittal, the City has received notice of multiple projects on this property none of which have moved forward.

In consideration of these facts, it is my determination that this project does not qualify as grandfathered.

Sincerely,

Paul A. Hofmann
City Manager

CC: Trey Job, Assistant City Manager
Jennifer Bills, Assistant Planning Director

MC BASTROP 71, L.P.
8214 Westchester Drive, Ste 550
Dallas, TX 75225

July 28th, 2021

City of Bastrop
Zoning Board of Adjustment
1311 Chestnut Street
Bastrop, TX 78602

Request for Appeal

Dear Sir or Madam,

The determination by the City Manager dated July 7, 2021 that the Project is not grandfathered is incorrect, since the City mistakenly states that our plat *application* expired and that a later withdrawn application is relevant. The Project is vested by the original 2019 *application*, which application gave the City *fair notice* of the Project and the requested plan approval. The Project has progressed with numerous later filings, none of which have yet to be approved by the City, so this appeal has nothing to do with any issued permit. We have the right to withdraw any application and thereafter that withdrawn application is irrelevant. The City is twisting the facts because it doesn't want the Project to be vested from the application of its new B3 Unified Development Code.

MC BASTROP 71, L.P. ("**MC 71**") filed a Grandfathering Development Status Application on April 19th, 2021 under City Code Art. 1.20 (the "**Ordinance**"). The Grandfathering Review Committee (the "**GRC**") issued a determination (the "**GRC Determination**") on May 4th, 2021. MC 71 requested reconsideration of the GRC Determination pursuant to the Ordinance on May 25th, 2021. The GRC declined to reconsider on June 15th, 2021. The GRC Determination was automatically appealed to the City Manager, who issued his determination (the "**CM Determination**") on July 7th, 2021. This is an appeal of the prior determinations, and, in the alternative a request for variance.

The GRC Determination is required by the City for the City to make its own determination of its position on the application of Texas Local Government Code Chapter 245 ("**LGC 245**"), which provides protections from changes in local regulation as to an ongoing development project (such protections being commonly known as "**Vested Rights**"). Only LGC 245 determines the applicable Vested Rights, and to the extent the Ordinance seeks to limit Vested Rights or to give the City control over the interpretation process (such as, but not limited to, establishing standards and burdens), we protest, and submit this appeal under protest. The GRC Determination, the CM Determination, and interim administrative appeals are for the benefit of the City and are not binding on MC 71 as to the nature or extent of vested rights. MC 71 reserves all its rights under LGC 245.

For this appeal, the relevant LGC 245 provisions are **highlighted** below:

Sec. 245.002. UNIFORMITY OF REQUIREMENTS. (a) Each regulatory agency shall consider the approval, disapproval, or conditional approval of an application for a permit solely on the basis of any orders, regulations, ordinances, rules, expiration dates, or other properly adopted requirements in effect at the time:

(1) **the original application for the permit is filed for review for any purpose, including review for administrative completeness;** or

(2) a plan for development of real property or **plat application is filed with a regulatory agency.**

(a-1) **Rights to which a permit applicant is entitled under this chapter accrue on the filing of an original application or plan for development or plat application that gives the regulatory agency fair notice of the project and the nature of the permit sought.** An application or plan is considered filed on the date the applicant delivers the application or plan to the regulatory agency or deposits the application or plan with the United States Postal Service by certified mail addressed to the regulatory agency. A certified mail receipt obtained by the applicant at the time of deposit is prima facie evidence of the date the application or plan was deposited with the United States Postal Service.

(b) If a series of permits is required for a project, the orders, regulations, ordinances, rules, expiration dates, or other properly adopted requirements in effect **at the time the original application for the first permit in that series is filed** shall be the sole basis for consideration of all subsequent permits required for the completion of the project. All permits required for the project are considered to be a single series of permits. **Preliminary plans and related**

subdivision plats, site plans, and all other development permits for land covered by the preliminary plans or subdivision plats are considered collectively to be one series of permits for a project.

…(e) **A regulatory agency may provide that a permit *application* expires** on or after the 45th day after the date the application is filed if:

(1) the applicant fails to provide documents or other information necessary to comply with the agency's technical requirements relating to the form and content of the permit application;

(2) **the agency provides to the applicant not later than the 10th business day after the date the application is filed written notice of the failure that specifies the necessary documents or other information and the date the application will expire if the documents or other information is not provided;** and

(3) the applicant fails to provide the specified documents or other information within the time provided in the notice.

Sec. 245.005. DORMANT PROJECTS. (a) After the first anniversary of the effective date of this chapter, a regulatory agency may enact an ordinance, rule, or regulation that places an **expiration date on a permit** if as of the first anniversary of the effective date of this chapter: (i) the **permit** does not have an expiration date; and (ii) no progress has been made towards completion of the project. Any ordinance, rule, or regulation enacted pursuant to this subsection shall place an expiration date of no earlier than the fifth anniversary of the effective date of this chapter.

(b) A regulatory agency may enact an ordinance, rule, or regulation that places an expiration date of not less than two years on an individual **permit** if no progress has been made towards

completion of the project. **Notwithstanding any other provision of this chapter, any ordinance, rule, or regulation enacted pursuant to this section shall place an expiration date on a project of no earlier than the fifth anniversary of the date the first permit application was filed for the project if no progress has been made towards completion of the project.** Nothing in this subsection shall be deemed to affect the timing of a **permit** issued solely under the authority of Chapter 366, Health and Safety Code, by the Texas Commission on Environmental Quality or its authorized agent.

(c) Progress towards completion of the project shall include any one of the following:

(1) an application for a final plat or plan is submitted to a regulatory agency;

(2) **a good-faith attempt is made to file with a regulatory agency an application for a permit necessary to begin or continue towards completion of the project;**

(3) costs have been incurred for developing the project including, without limitation, costs associated with roadway, utility, and other infrastructure facilities designed to serve, in whole or in part, the project (but exclusive of land acquisition) in the aggregate amount of five percent of the most recent appraised market value of the real property on which the project is located;

(4) fiscal security is posted with a regulatory agency to ensure performance of an obligation required by the regulatory agency; or

(5) utility connection fees or impact fees for the project have been paid to a regulatory agency.

APPEAL OF GRANDFATHERING DETERMINATIONS

MC 71 hereby appeals to Zoning Board of Adjustment (the "**ZBA**") pursuant to the Ordinance, which requires the following:

1. A statement that the appellant sought an appeal from the City Manager, and that the appeal:
    a. Was denied;
    b. Yielded an erroneous determination regarding the project's eligibility for grandfathered development status.
2. A statement of the reasons why the determination should be reversed or modified;
3. An explanation of the legal and factual grounds of the appeal; and
4. Payment of the appeal fee established by the City Council, as codified in the city's fee schedule.

For purposes of this appeal request, the word "Project" refers to the development of the 25.902 acres owned by MC 71 as shown in the Preliminary Plat Application dated 1-22-2019 (the "**Original Application**") discussed below, inclusive of the creation of the lots and related infrastructure and the construction of buildings thereon. Both the land development and the building development are entitled to vested rights.

The CM Determination relied on an interpretation of LGC 245 that contradicts the plain language of the statute as well as the applicable case law and therefore yielded an erroneous determination regarding the Project's eligibility for grandfathered development status. An analysis of the CM Determination's shortcomings is included as Exhibit "A" to this appeal.

In order to determine whether the Project is entitled to Vested Rights under LGC 245 as of the date of the Original Application, we are asking that the ZBA review this appeal and make the following determinations:

1. The Original Application gave fair notice to the City of the Project;
2. MC 71 made progress towards completion of the Project as required by LGC 245.005(c); and, therefore
3. The Project is vested as of the Original Application on January 22, 2019.

It Is Undisputed the MC 71 Properly Filed the Original Application on January 22nd, 2019

MC 71 properly filed the Original Application on January 22nd, 2019. Following the submittal, MC 71 representatives met with the City staff to discuss the Original Application on February 5th, 2019. The City issued a memo (the "**Meeting Memo**") to MC 71 dated February 13th, 2019 attached as Exhibit "B" in which the City states "Previously have submitted – Plat, grading, utility, engineering report discussing access, etc." Therefore, there is no dispute as to whether MC 71 filed the Original Application.

LGC 245.002 only requires filing (not acceptance, approval nor completeness):

> "...the original application for the permit is filed for review for any purpose, including review for administrative completeness "

"...the original application for the first permit in that series is filed...."

These statements in the CM Determination are incorrect:

- "This submittal and other subsequent submittals were not complete and are considered expired."
- "Due to this [NRP] submittal, the City has received notice of multiple projects on this property none of which have been moved forward."

The Original Application Was Sufficient to Give the City "fair notice" of the Project

Further, it is clear from an objective review of the Original Application that it is sufficient to give the City fair notice of the Project and the nature of the permit sought as required by Texas LGC 245.022 (a-1). In addition, the Project was discussed in detail between MC 71 and the City staff at February 5th, 2019 Meeting and the Meeting Memo shows the City had a clear understanding of the Project:

- The Meeting Memo refers to the Project as "Grove Commercial"
- The Meeting Memo describes the Meeting Goal as "Discuss commercial development"
- The Meeting Memo states that MC 71 "Wants to do preliminary plat for all commercial parcels"

Lastly, as detailed in the Meeting Memo, MC 71 was instructed to file an Exemption Application, which MC 71 did on April 14th, 2019. Included in the Exemption Application is a "Project Description Letter", which was a requirement of the submittal. This letter is attached as Exhibit "C". The Project Description Letter thoroughly details the Project and further demonstrates that the City had fair notice of the Project.

The Neighborhood Regulating Plan ("NRP") application referenced in the CM Determination was for the same Project. Further, it is irrelevant as it was *affirmatively withdrawn* by MC 71. Only MC 71 has the right to define its Project. The NRP application was filed by MC 71 as a result of statements by City Staff which were inconsistent with the City Staff Report for the that application, therefore it was withdrawn, as is MC 71's right to do.

The CM Determination statement: "Due to this [NRP] submittal, the City has received notice of multiple projects on this property none of which have been moved forward." is incorrect.

The term "fair notice" is not defined in the statute, but should be interpreted to simply require the applicant to reasonably identify the project and the requested permit so the City understands what is asked. This occurred. The City and its staff understand that the project is commercial reserves and the permit is a plat. This is very simple and clear. For the City to say that it does not have fair notice is disingenuous.

In fact, the CM Determination is *silent* on the issue of fair notice, therefore we request the ZBA hold that there is NO fair notice issue.

MC 71 Received No LGC 245.005(e) Notice, Thus its Application Never Expired

The only way an application (contrasted to a permit) may expire is if the City provides the detailed notice required by LGC 245.005(e). The City never provided that notice to MC 71. The Meeting Memo does not satisfy the requirements for LGC 245.005(e).

The CM Determination statement "This submittal and other subsequent submittals were not complete and are considered expired." is incorrect.

Only Permits sre Subject to Required "Progress", but no Permit was Issued

LGC 245.005 only applies to issued permits and limits the City's ability to limit the term of an issued permit to no less than a period equal to the later of (i) 2 years from permit issuance, or (ii) 5 years from project vesting. "Progress" as defined in LGC 245.005 does not apply to applications for a permit, nor the issue of whether a project is vested.

The CM Determination does not use the work "progress", but "continuation". It does not state that there is a lack of progress. Therefore, the ZBA should hold that there is no impact of LGC 245.005 to this matter.

Even if LGC 245.005 applies, MC 71 made progress, as follows:

- Attached as Exhibit "D" is a list of the applications submitted by MC 71 for the Project. Since filing the Original Application, MC 71 has continued to submit applications required by City staff.
- In fact, MC 71 made seventeen separate submittals to the City for the Project, including four preliminary plat applications on the following dates:
    - January 22, 2019
    - January 13, 2020
    - June 1, 2020
    - June 15, 2020
- Each submittal was made for the same Project.
- Each preliminary plat application is virtually identical:
    - Each application is for the exact same land
    - Each application shows the exact same number of lots
    - Each application shows the exact same size of the individual lots
    - Each application shows the exact same access road configuration
- An objective review of Exhibit "D" and the various submittals made by MC 71 leaves no doubt that MC 71 has made a good faith attempt to file with the City for a permit to begin the Project.

The Project has Vested Rights Under LGC 245 as of the Date of the Original Application

As detailed above, MC 71 has met the requirements of LGC 245 for Vested Rights. MC 71 properly submitted the Original Application. MC 71 has continued to make progress towards completion of the Project. Therefore, the Project has Vested Rights under LGC 245.

The ZBA Should Remand This Appeal Back to the City Manager Following its Determination that the Project has Vested Rights Under LGC 245.

The CM Determination did not reach all of the issues related to Vested Rights for the Project. If the ZBA reverses the CM Determination and finds that a vesting event occurred, then MC 71 requests this appeal be remanded back to the City Manager to make a determination as to the extent of the Project's Vested Rights, following which MC 71 will have the opportunity to review that determination and have a separate opportunity to appeal such determination to the ZBA.

Alternative Remedy - REQUEST FOR VARIANCE

The Ordinance permits the ZBA to grant a variance from the regulations at issue under the same standards governing variances for other matters.

If the appeal is denied, in the alternative, MC 71 requests a variance for the Project to be exempt from the B3 Code, particularly the requirements for a NRP, the requirements to develop in accordance with the TND or VCD Development Patterns in Chapter 5, compliance with the Building Placement requirements in Chapter 6, any building size regulation (or regulations that affect building size, including without limitation the Build-To-Line and building to land ratio), any minimum or maximum building setback (or "Build-to" requirement), and any other B3 Code requirement which affects the Project's Vested Rights. All of the information, documentation and discussion in the City file and in this letter are incorporated as part of the record for this variance.

This variance is based upon hardship, and is not adverse to the public interest (or the interest of any neighboring property), promotes economic development, will promote the availability of market driven providers of goods and services to Bastrop, is due to the unique circumstances of the Project, is consistent with intent of City Code to encourage reasonable development, and meets the requirements for a variance under state law and city ordinance.

The Project is an inverted "L" configuration located in a suburban area of Bastrop impacted by the existence of FM 304, a major, heavily trafficked highway along its western frontage. The Project has been shown on plats, plans and schemes to be "commercial reserves" or "pad sites" as far back as 2019. These reserves/sites are locations for single owners or tenants with commercial uses who wish to be located on high traffic roadways in front of other developments, sometimes commercial and sometimes residential. Users are typically single story and require ample parking, and often a drive-through window (1 or more). An example is the Medtail project along SH 71 to the north. In almost all instances, the user requires that vehicles can circle the building, and that there are parking spaces immediately at the entrance of the building, for customer convenience.

There are 12 lots planned in the Project. These lots are shown on the Original Application as well as each subsequent plat submittal. Directly to the east and south is a residential development, which has been developed pursuant to a "PD". The residential development does not face the Project, but rather the Project fronts the rear fence of the residential homes with no direct access to the Project.

The following factors are a hardship for Lot 7:

- The size and lot dimensions in the Project vary significantly from the 330' x 330' preferred block size for a TND making development under the B3 Code impractical.
- FM 304 is not conducive to a pedestrian oriented development and there is no access to the residential development along the shared border between the residential development and the Project. It is doubtful that pedestrians would walk down FM 304 or the rear fence of the residential "PD" to access the Project.
- There are no sidewalks as part of the existing development immediately to the north or south along FM 304, which could lead to a potentially dangerous situation if the Project were forced to develop along the highway frontage. There are also no sidewalks on the rear of the residential "PD".
- The development conditions of the "PD" approved for the Lennar project around which the Project wraps makes it impossible to achieve the goals of B3.

71 RP requests a variance in accordance with the foregoing.

Legal Ground for this Appeal

The Ordinance requests legal grounds and seems to want a legal brief on this matter, when MC 71 is simply trying to comply with a City requirement to help it determine its own conclusion on the Project's Vested Rights, and the City has no authority to adjudicate Vested Rights that are binding on MC 71. Nonetheless, we attach an addendum as Exhibit "E" with reference to LGC 245 and relevant case law. Our primary reliance is on the text of LGC 245, as cited herein and available online to the City.

I look forward to presenting this appeal at the upcoming hearing. I would like to request the ZBA hearing for this appeal take place on 8/23, 8/25, 8/26 or 8/27 so that I can personally appear. I will need to make travel plans to attend so any advance notice would be much appreciated. If it is not possible to meet on any of those dates, MC 71 would be willing to extend the timeline prescribed for the hearing by the Ordinance to facilitate my attendance.

Sincerely,

Douglas M. MacMahon
Manager of the General Partner of MC Bastrop 71, L.P.

Exhibit "A"

An Analysis of the CM Determination's Interpretation of LGC 245

The CM Determination relied on an interpretation of LGC 245 that contradicts the plain language of the statute as well as the applicable case law and therefore yielded an erroneous determination regarding the Project's eligibility for grandfathered development status. Below are **bolded** excerpts from the CM Determination along with an analysis of the CM's interpretation of LGC 245:

"This request is to determine if the city has had fair notice of a project and that a series of permits have been submitted that have moved the project towards completion."

- After stating that "fair notice" is part of the appeal, the CM Determination does not further address fair notice.
- LGC 245.005 applies only to permits, not applications.

- LGC 245.005 (C)(2) provides that "a good faith attempt is made to file with a regulatory agency an *application for a permit* necessary to begin or continue towards completion of the project" (*emphasis added*), so even if LGC 245.005 applies, it was satisfied by numerous later applications.
- LGC 245 is clear that "an application for a permit" demonstrates progress towards completion of a project

"The first application for this specific project was submitted on April 4, 2019, more than two years before the request for Grandfathering on April 19, 2021. This submittal and other subsequent submittals were not complete and are considered expired."

- The statement is factually inaccurate as the Original Application was submitted on January 22nd, 2019
- First, LGC 245 does not require the City to "accept" a filing. See, LGC 245.002(a), (a-1) and (b), none of which require an "accepted" or "complete" application, and mention only an "original application." The Ordinance, particularly Sec. 1.20.010(g) is not consistent with LGC 245.
- Second, LGC 245.002 (e) is the only section of LGC 245 that provides for the expiration of a permit application and it details specific requirements, none of which occurred for the submittals.
    - MC 71 did not receive written notice within 10 business days after the filing of the Original Application that it failed to provide documents or other information necessary to comply the City's technical requirements relating to the form and content of the permit application.

- Rather MC 71 received the Meeting Memo on February 13th, 2019 instructing MC 71 to submit the Exemption Application as the next step in the Project, which MC 71 did on April 14th, 2019.
- After filing the Exemption Application, MC 71 did not receive written notice within 10 business days that it failed to provide documents or other information necessary to comply the City's technical requirements relating to the form and content of the Exemption Application.
- The Meeting Memo states that "After the submittal is deemed complete, Staff will take to the next available City Council meeting for approval to move forward with the Checklist option chosen and the development process". As such, the Exemption Application is pending action by the City.
- Given the above, the City does not have the ability under LGC 245 to deem the applications filed by MC 71 as incomplete or expired.

- Third, LGC 245.005 only applies to *permits* and provides limited situations for permits to expire.
  - LGC 245.005 (b) does provide the City the ability to set expiration dates for *permits* if no progress has been made towards completion of the project as follows, "A regulatory agency may enact an ordinance, rule, or regulation that places an expiration date of not less than two years on an individual *permit* if no progress has been made towards completion of the project." (*emphasis added*).
  - LGC 245.001 (1) provides a very specific definition of the word "Permit" as follows, ""Permit" means a license, certificate, approval, registration, consent, permit, contract or other agreement for construction related to, or provision of, service from a water or wastewater utility owned, operated, or controlled by a regulatory agency, or other form of authorization required by law, rule, regulation, order, or ordinance that a person must obtain to perform an action or initiate, continue, or complete a project for which the permit is sought."
    - The word "application" is nowhere in this definition.
    - An "application" and a "permit" are different.
    - The difference between a "permit" and an "application" has been further validated by the court in *City of San Antonio v. Rogers Shavano Ranch, Ltd.*, which provided that a "request" for a Permit is an application.
- Fourth, LGC 245.005 (b) provides specific limitations on the City's ability to place expiration dates on the Project as follows, "Notwithstanding any other provision of this chapter, any ordinance, rule, or regulation enacted pursuant to this section shall place an expiration date on a project of no earlier than the fifth anniversary of the date the first permit application was filed for the project if no progress has been made towards completion of the project."
  - The Original Application was submitted on January 22, 2019. Therefore, even if you were to accept the City's position that no progress had been made towards completion of the Project (which MC 71 denies as detailed in this appeal), the earliest possible expiration date for the Project would be January 22, 2024.

- Fifth, if the City's position is that the application lapsed under its internal requirements, then that is an inequitable result since it was the City which was refusing to process the filed applications, thus impeding the progress of the Project.

"Additionally a Neighborhood Regulating Plan for this section was submitted on November 6, 2020, was reviewed by staff, and sent to the Planning & Zoning Commission for the February 25, 2021 meeting. This item was not heard due to a request by the applicant to withdraw the application on February 24, 2021. Due to this submittal, the City has received notice of multiple projects on this property none of which have moved forward."

- This statement is factually inaccurate.
    - The City has not received notice of multiple projects.
    - LGC 245.001 defines Project as "an endeavor over which a regulatory agency exerts its jurisdiction and for which one or more permits are required to initiate, continue, or complete the endeavor."
    - Each and every submittal MC 71 made was for the same project as such word is defined by LGC 245 and has been further defined by the courts in the cases cited in Exhibit "E", including without limitation *Anderson v. City of Cedar Hill.*
- Further, the submittal of the Neighborhood Regulating Plan was made for the same Project as was every prior submittal and was an attempt to follow the process dictated by the City staff to move the Project forward.
    - MC 71 *withdrew* the submittal because the City staff requirements for approval of the Neighborhood Regulating Plan were in violation of the Project's Vested Rights.
- MC 71 has not withdrawn any other submittal for the Project, including without limitation the Original Application or the Exemption Application. In fact, MC 71's engineer routinely followed up with the City about the status of these items. In essence, the City seems to have stonewalled the Original Application and Exemption Application.

Exhibit "B"

The Meeting Memo

MEMO

To: Brendan McEntee

From: Allison Land

cc: Staff

Date: February 13, 2019

Re: Pre-Application Meeting – Grove Commercial

City staff has generated notes from the meeting on February 5, 2019. The information discussed and comments made by staff during this meeting are not intended to constitute a formal review of your project. This meeting *does not substitute* for the formal review that will take place in the event you file a development application with the City. Information provided and comments made by staff during the meeting are based solely on the information provided by you prior to or during the meeting.

Upon submittal of the appropriate application(s), additional comments are to be expected that may or may not be discussed in this meeting. More detailed information provided by you concerning your project during staff's review of a formal application may alter comments made during the meeting depending on the situation.

Property Information

Address: TBD

R Number:

Jurisdiction: City Limits

Platted: No

In floodplain: partial

Water, Wastewater available: Nearby

Electricity available: Nearby

Toad Habitat Area: No

Current Zoning: General Retail with restrictions

Meeting Goal

Discuss commercial development

Items Discussed:

Drainage channel

- Needs to establish good vegetation
- Anticipated 9 to 10 feet/second eventually

Exemption:

- Requires pre-submission meeting (this one)
- Requires submittal of the Exemption Application and an associated Checklist: Planned Development District, Alternative Site Design, ETJ Agreement, or Waiver. A checklist and all items listed on the checklist must accompany the Application
- After the submittal is deemed complete, Staff will take to the next available City Council meeting for approval to move forward with the Checklist option chosen and the development process
- **Engineer Certification required. See Emergency Ordinance 2018-2-A Section 5b - link**
- Note: Documentation provided with the Exemption Application does NOT constitute a submittal for any required permits after the Exemption is granted
- This project could use either Planned Development or Alternative Design Standards
- Alternative Design Standards
    - Use new rainfall totals and Atlas 14 data
    - Add some water quality infrastructure
- Need to run the channel and anticipated development against Atlas 14 data to show that it works and that the new development tying in is accounted for
- If you can live with the setbacks, use Alternative Design Standards
- If not, use the Planned Development
    - Can keep high level, call out uses, driveway spacing
    - Need to show a concept plan
    - If you choose to address water quality, address the first 1.5 inches
    - Pervious pavers are allowed under this
    - Leave GR as the base zoning
    - Change setbacks (could be flexible, min/max), drainage standards, landscaping, etc. Get creative

Zoning

- Two story development will have a 60-foot building setback from the residential lots
    - To change: need either a zoning variance (no financial hardship) or a planned development
    - Variances are hard to justify and hard to support

Platting

- Lot of Record Verification or Platting is required before permits may be issued
- All lots must have public road frontage and utility access. Access easements and/or driveways across other lots does not provide public road frontage.
- Wants to do preliminary plat for all commercial parcels
- Channel sized for 50% cover of Nixon and 80% cover on the other side
- Preliminary plat:
    - Previously have submitted - Plat, grading, utility, engineering report discussing access, etc.
    - Checklist is the same now. Additional details are needed for the Exemption before the prelim can be submitted
- Note: still need to record Agnes St ROW by separate instrument

Utilities

- Lift station: does it have capacity for the south side of Agnes?
    - Stantec for capacity

Moving Forward

Action Items

- City
    - Send copy of PD to Brendan
- Applicant

Process Overview

What steps the project attendees need to follow to move forward in the project, in order of recommended completion.

- Exemption and Exception applications and checklists are available on the Building Bastrop website.
- Building/Permitting and Planning applications and checklists are available on the Planning & Development Department's website via the menu on the left.

1. Exemption Application with Planned Development Checklist
    a. This will go to P&Z and Council like a normal PD
2. Planning Application with Preliminary Plat Checklist
3.

City of Bastrop

"Where Preservation of the Past Combined with Progress for the Future Encourages Opportunities to Grow"

Pre-Application Meeting Sign-in Sheet (Staff):

Project & Location: Grove Commercial

Date: February 5, 2019

	Name	Title/Organization	Phone	Email
☐	Lynda Humble	City Manager	(512)-332-8800	lhumble@cityofbastrop.org
☒	Jerry Palady, PE	Director of Engineering	(512) 332-8846	jpalady@cityofbastrop.org
☐	James McCann, PE	Engineering Consultant		
☐	Matt Jones, AICP	Director of Planning	(512) 332-8840	mjones@cityofbastrop.org
☒	Jennifer C. Bills, AICP, LEED AP	Assistant Planning Director	(512) 332-8845	jbills@cityofbastrop.org
☐	Matt Lewis, CNU	Planning Consultant		
☒	Trey Job	Director of Water/Wastewater and Public Works	(512) 332-8932	tjob@cityofbastrop.org
☐	Curtis Hancock	Assistant Director of Water/Wastewater and Public Works	(512) 332-8964	chancock@cityofbastrop.org
☒	Allison Land	Planner/GIS Coordinator	(512) 332-8843	aland@cityofbastrop.org
☐	Kimberly Hanly (Tap & Impact Fees)	Coordinator, Water & Wastewater Department	(512) 332-8960	khanly@cityofbastrop.org
☐	Tim Goetz	Electric Superintendent, Bastrop Power & Light	(512) 332-8900	tgoetz@cityofbastrop.org
☐	Cheryl Renfro	Project Coordinator Bastrop Power & Light	(512) 332-8901	crenfro@cityofbastrop.org
☐	Andres Rosales	Fire Chief	(512) 332-8670	arosales@cityofbastrop.org
☐	Rod Stradling	Assistant Fire Chief	(512) 332-8670	rstradling@cityofbastrop.org
☐	David Brasich	Building Official	(512) 332-8847	Dbrasich@cityofbastrop.org
☐	Jean Riemenschneider	Bastrop Economic Development Corp.	(512) 332-8873	jean@bastropedc.org
☐	Carolyn Dill, PE	County Engineer, Bastrop County	(512) 581-7180	carolyn.dill@co.bastrop.tx.us
☐	Cari Croft (contact for Houston toad)	Lost Pines HCP Administrator, Bastrop County	(512) 332-7284	Cari.croft@co.bastrop.tx.us

City of Bastrop

"Where Preservation of the Past Combined with Progress for the Future Encourages Opportunities to Grow"

Pre-Application Meeting Sign-in Sheet (Project Attendees):

Project & Location: Grove Commercial

Date: February 5, 2019

Name	Title/Organization	Phone	Email*
Brendan McEntee			

*Email address will be used to send a copy of notes taken at this meeting, and as a further correspondence option as needed

Exhibit "C"

The Project Description Letter

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

CBD Project Number: 4879
Date: April 4, 2019

City of Bastrop, TX
Planning and Development Department
1311 Chestnut Street
Bastrop, TX 78602

RE: Exemption Application Submittal for Bastrop Grove Section 2
Project Description Letter

The proposed project consists of developing 12 lots, encompassing an overall acreage of 25.882 acres, located along the south side of Agnes Road and the east side of SH 304. This development is anticipated to consist of individual developments consisting of office, retail, commercial, medical and/or other uses allowed within the current GR zoning. This project is being submitted for approval of an Exemption Application based on an Alternative Drainage Plan to allow for the development to proceed with submittal of Preliminary Plans, Final Plats, and construction drawings for the various developments.

The stormwater drainage system for this area was recently enhanced with the construction of the Bastrop Grove Channel Improvement project. That project, jointly funded by the Bastrop Economic Development Corporation, Ascension (Seton) Hospital, and the Bastrop Grove developer, provided for the conveyance of stormwater from the fully developed areas that contribute to the channel. The Bastrop Grove Channel Improvement project was designed and permitted prior to the Drainage Moratorium and was based on the codes and ordinances of the City of Bastrop. Since that time, Atlas 14 has been issued by the NWS and updated precipitation values were issued for Central Texas areas. Attached to this Exemption Application is an updated Drainage Report for the Bastrop Grove Channel Improvement project with all precipitation values updated to reflect the higher current values of Atlas 14. A review of the report demonstrates that the constructed channel adequately conveys the fully developed conditions (including development of the Bastrop Grove Section 2 area at 75% impervious cover) up to and including a 100-year event. These improvements, coupled with updated calculations for Atlas 14 precipitation, result in a stormwater system that exceeds the current standards in the Code of Ordinances.

Please contact me should you have any questions or require any additional information.

Sincerely,

Carlson, Brigance and Doering, Inc.
(TX Firm #F3791)

Brendan P. McEntee, P.E.
Branch Manager

Exhibit "D"

MC 71 has made the following applications in good faith to secure a permit necessary to begin or continue towards completion of the Project. All applications for permits have been for the same Project since filing the Original Application:

- Application dated 10-01-2018 for Bastrop Grove Drainage Improvements
- Application dated 01-22-2019 for Preliminary Plat Bastrop Grove, Section 2
- Application dated 01-22-2019 for Plat Details and Drainage Improvements Report
- Application dated 04-14-2019 for Bastrop Grove Section 2 Exemption Application
- Application dated 01-13-2020 for Preliminary Plat, Bastrop Grove, Section 5
- Application dated 01-13-2020 for Preliminary Drainage, Bastrop Grove, Section 5
- Application dated 01-13-2020 for Preliminary Infrastructure, Bastrop Grove, Section 5
- Application Resubmittal dated 06-01-2020 for Preliminary Plat, Bastrop Grove, Section 5
- Application Resubmittal dated 06-01-2020 for Preliminary Drainage, Bastrop Grove, Section 5
- Application Resubmittal dated 06-01-2020 for Preliminary Infrastructure Submittal, Bastrop Grove, Section 5
- Application dated 06-08-2020 for Preliminary Plat Application Bastrop Grove, Section 5
- Application Resubmittal dated 06-15-2020 for Preliminary Plat, Bastrop Grove, Section 5
- Application Resubmittal dated 06-15-2020 for Preliminary Drainage, Bastrop Grove, Section 5
- Application Resubmittal dated 06-15-2020 for Preliminary Infrastructure Submittal, Bastrop Grove, Section 5
- Application dated 11-06-2020 for Bastrop Grove Neighborhood Regulating Plan, North and South of Agnes
- Application dated 11-09-2020 for Bastrop Grove B3 Warrant Request
- Application dated 03-16-2021 for Bastrop Grove Neighborhood Regulating Plan, South of Agnes

Exhibit "E"

Relevant Vested Rights Caselaw Supporting this Appeal

Hatchett v. West Travis County Public Utility Agency, 598 S.W.3d 744, (Tex. App—Austin, 2020, pet denied)- Summary of the current state of vested rights under LGC 245.

FLCT, Ltd. v. City of Frisco, 49 S.W.3d 238 (Tex. App.—Fort Worth 2016, pet. den.)- The exceptions to the "municipal zoning regulations" except to vested rights under LGC 245.004 is determined on an "as applied" basis to any regulations which "have an effect" on the listed exception issues. The exception for "property classification" means the permissible uses under the regulator scheme when vesting occurs. A project is entitled to all uses permitted when vesting occurs. "Fair notice" of a project incorporates all the city actual knows about the project, not just what the applicate documents. The definition of a "project" is broad.

City of San Antonio v. Greater San Antonio Builders Ass'n, 419 S.W.3d 597 (Tex. App.—San Antonio 2013, pet. den.)- A city may not add local limits to vested rights, only LGC 245 determines vested rights.

Harper Park Two, LP v. City of Austin, 359 S.W.3d 247 (Tex. App.—Austin 2011, pet. den.)- The entirety of a development project is considered in a "project", not components or phases. The definition of "permit" is very broad. The vesting is considered in the context of the regulatory scheme at the time to determine the scope of the project.

Hartsell v. Town of Talty, 130 S.W.3d 325, 326 (Tex. App.—Dallas 2004, pet. denied)- Vested rights extend to the entire development project, land and buildings.

Anderson v. City of Cedar Hill, 447 S.W.3d 84 (Tex. App.—Dallas 2014, pet. den.)- • Broad definition of "Endeavor" = "the action of endeavoring; effort, or pains, directed to attain an object" (citing AG OP. No. JC-0425 (2001)), "a systematic or continuous effort to attain some goal", "to exert physical or intellectual strength toward the attainment of an object of goal"

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

Date: April 19th, 2021

Trey Job, Assistant City Manager
City of Bastrop, TX
Planning and Development Department
1311 Chestnut Street
Bastrop, TX 78602

RE: Grandfather Development Status - Bastrop Grove Section 2 (South of Agnes)
Project Description Letter

Bastrop Grove Section 2 is a multi-lot commercial land development with frontage along SH 304 and Agnes Road in the City of Bastrop. It includes 12 outparcels with frontage on SH 304 or Agnes as well as provides for the dedication of the southern portion of Agnes Road. As discussed in earlier meetings with staff regarding this project, it is my belief that the project has vested rights, based on the earlier applications and the continued nature of this commercial land development project, and therefore we are submitting this letter and the accompanying documentation for a Grandfathering Determination Status.

The "Project" is described in the following Project related applications for permits required for the Project, and has been the same Project since inception in 2018:

- Application dated 10-01-2018 for Bastrop Grove Drainage Improvements
- Application dated 01-22-2019 for Preliminary Plat Bastrop Grove, Section 2
- Application dated 04-14-2019 for Bastrop Grove Section 2 Exemption Application

It is my understanding that the Project is not subjected to any City of Bastrop regulations except those described in Tx. Loc. Gov't Code Section 245.004, being those in effect 01-22-2019 (date of first accepted development application) and any which are exempt from vesting.

Furthermore, I understand that the zoning provisions of the City's Bastrop Building Block Code (B3) relating to the following are not applicable to the project (as being within the exemptions for the general exception from vested rights as to municipal zoning ordinances), which are all zoning provisions which affect (have an effect on):

- Landscaping or tree preservation
- Open space or park dedication
- Property classification (permitted uses)
- Lot size, dimensions or coverage
- Building size.

Our view is that the B3 isn't zoning so no portion of B3 is exempt from vesting, but to the extent the City says that portions are zoning, then the foregoing are vested.

It is my belief that all provisions in the Bastrop Building Block Technical Manual and the City of Bastrop Development Manual are subject to vesting, and not applicable to the Project. Only the City regulation in effect as of initial January 22, 2019 plat application apply to the Project, including the City Subdivision Ordinance

Based on the above vesting, the following provisions of the City Zoning Ordinance as of April 13th, 1991 (1991 Zoning Ord.) apply to the Project, as vested rights:

The permitted uses allowed for GR (General Retail) listed in the following exhibits.

Exhibit A - Use Regulations Chart, City of Bastrop, 1991,

The permitted lot size, dimensions or coverage for the Project under Section 25.4 - Area Regulations.

Size of Lot:

- Minimum Lot Area - Twelve thousand (12,000) square feet.
- Minimum Lot Width - One hundred feet (100').
- Minimum Lot Depth - One hundred ten feet (110').
- Maximum Lot Coverage: Fifty percent (50%).

The permitted building size under Section 25 (including the related regulations which affect Building Size, such as:

- Setback- Section 25.4
- Height- Section 25.3
- Required Parking- Section 38

Other Regulations: As established in the Development Standards, Sections 37 through 45

Required landscaping or tree preservation in Section 39.5, 39.6 & 39.7

The Project is also vested from changes in flood regulations effective outside the FEMA flood plain.

The Project is not dormant, as progress has been made towards completion of the original contemplated project as follows:

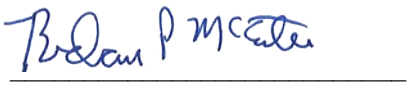
- Construction of the offsite Drainage Channel to the Colorado River- Project Name: Bastrop Grove Drainage Improvements *(Approval Date: 10-01-2018)*
- Cost have been incurred for development the project with CBD Engineering, and other professional and legal firms

This application is not intended to waive any vested rights, under Tex. Loc. Gov't Code Ch. 245 or otherwise. My client protests any idea that the City can legally determine or limit the vested rights for the Project, and submits this application only to aid the City is coming to its own internal decision as to the appropriate vested rights for the Project. All rights are reserved.

Should you have any questions or require any additional information, please feel free to call/email.

Sincerely,

Carlson, Brigance & Doering, Inc.
F-3791



Brendan P. McEntee, P.E.
Branch Manager

Grandfathered Development Status Application

Project Information

Legal Description: ABS A98 BLAKEY, NANCY, ACRES 145.697

Project Address(es): Not Addressed

Total Acreage: 25.882 BCAD Property ID: 78736, 8712472, and 8712473

Was the Project in progress on or after September 1, 1997? After

Property Owner

Name/Entity/Trustee: MC BASTROP 71, LP

Mailing Address: 8214 WESTCHESTER DR, STE 550, DALLAS, TX 75225

Phone & Fax Numbers: 214-622-6525 E-mail Address dm@morancap.com

Applicant

Name/Entity/Trustee: Brendan P. McEntee, P.E. - Carlson, Brigance & Doering, Inc.

Mailing Address: 12129 Ranch Road 620 North, Suite 600, Austin, Texas 78750

Phone & Fax Numbers: (512) 280-5160 E-mail Address bmcentee@cbdeng.com

Permit Identification

First Permit

Name: Preliminary Plat Bastrop Grove, Section 2 Application Date: 01/22/2019

Approval Date: Expiration Date: Volume and Page No.:

Additional Permit

Name: **Please see the attached supplement document** Application Date:

Approval Date: Expiration Date: Volume and Page No.:

Additional Permit

Name: Approval Date:

Expiration Date: Volume No.: Page No.:

Additional Permit

Name: Approval Date:

Expiration Date: Volume No.: Page No.:

Grandfathered Development Status Application

Additional Permit		
Name:		Approval Date:
Expiration Date:	Volume No.:	Page No.:
Additional Permit		
Name:		Approval Date:
Expiration Date:	Volume No.:	Page No.:

APPLICANT:			OFFICIAL USE ONLY	
Included in Submittal	Per Ordinance 2019-10, Additional Submittal Items are:		Meets Standard	Does Not Meet Standard
✓	1	Identification of the "Project," as that term is defined in LGC 245.001(3), as may be amended. Example: Residential Subdivision		
✓	2	Narrative description of the development/construction Project or proposed land use for which the Permit is being sought. Describe which Permits have been completed and which are remaining.		
✓	3	Layout of the site, including locations of buildings, streets, utilities, fences, drives, sidewalks, drainage facilities, and any other permanent or temporary structures which may be present at the time of application		
✓	4	Identification of each City regulation in effect at the time of the original application for the Permit filed that applies to the Project and that the Applicant contends: A. Is grandfathered B. Controls the approval, disapproval, or conditional approval of an application for a Permit, pursuant to LGC 245.002(a), as may be amended		
✓	5	Identification of each current City regulation for which the Applicant seeks an exemption due to the grandfathered development status provided the property owner by LGC 245 or other applicable vesting laws		
✓	6	Explanation of the applicability of any approval expirations and related requests for extension of approvals		
✓	7	Photographs, drawings, maps, and previous approvals that would assist the Grandfathering Review Committee in making its determination		
✓	8	Certified land survey of topography showing existing drainage patterns and structures		
✓	9	Any other information or supportive materials deemed necessary and requested in writing by the Director of Planning and Development		

Signature and Certification

The applicant certifies that the facts stated herein and exhibits attached hereto are true, correct, and complete.

Brian P McCarter — Project Engineer and Agent — 04-18-2021

Signature and Title — Date

Grandfathered Development Status Application

Process Overview

1. Complete Application, which includes: Application, Permit Identification, and Additional Submittal Items
    a. Incomplete submittals will not be accepted.
2. Director of Planning & Development will promptly forward to the Grandfathering Review Committee.
3. Determination made by Grandfathering Review Committee.
    a. Within 15 days of Application filing, the Committee will issue a written administrative determination approving the application, disapproving the application, or requesting more information.
    b. Determination shall identify the date the original Permit was filed, which claims have been recognized, and which claims have been rejected.
4. Reconsideration: must be requested in writing within 15 days of the Determination
5. Appeal to City Manager: must be requested in writing within 15 days of the date that the Committee declined to reconsider the Application.
6. Appeal to Zoning Board of Adjustment: must be requested in writing within 15 days of the City Manager's Determination.

Determination Standards

1. Date of first application
2. Fair notice
3. Consistency
4. Subsequent development
5. Prior vested rights determinations
6. Regulations
7. Expiration of prior applications
8. Exemptions in LGC 245.004
9. Expiration of Project
10. City Code
11. State Law

Staff Use Only

☐ Received By: Date:

Fees Paid $

Comments:

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

Bastrop Grove Section 2 (South of Agnes)

Grandfathered Development Status Application

Supplement Document-Permit Identification

First Project Related Development Permit
Name: Bastrop Grove Drainage Improvements
Approval Date: 10-01-2018
Volume No:
Page No:

First Development Application
Name: Preliminary Plat Bastrop Grove, Section 2
Application Date: 1-22-2019
Volume No:
Page No:

Additional Development Application
Name: Bastrop Grove Section 2 Exemption Application
Approval Date: 04-04-2019
Volume No:
Page No:

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

Bastrop Grove Section 2 (South of Agnes)
Grandfathered Development Status Application
Checklist Supplement

1. Identification of the "Project," as that term is defined in LGC 245.001(3), as may be amended. Example: Residential Subdivision

   Please see the attached project narrative

2. Narrative description of the development/construction Project or proposed land use for which the Permit is being sought. Describe which Permits have been completed and which are remaining.

   Please see the attached project narrative

3. Layout of the site, including locations of buildings, streets, utilities, fences, drives, sidewalks, drainage facilities, and any other permanent or temporary structures which may be present at the time of application

   Please see the attached Preliminary Plat Bastrop Grove, Section 2 submittal. No structures or improvements exist on the lots.

4. Identification of each City regulation in effect at the time of the original application for the Permit filed that applies to the Project and that the Applicant contends:
   a. Is grandfathered
   b. Controls the approval, disapproval, or conditional approval of an application for a Permit, pursuant to LGC 245.002(a), as may be amended

   Provided in the attached project narrative

5. Identification of each current City regulation for which the Applicant seeks an exemption due to the grandfathered development status provided the property owner by LGC 245 or other applicable vesting laws

   Provided in the attached project narrative

6. Explanation of the applicability of any approval expirations and related requests for extension of approvals

   Explained in the attached project narrative

7. Photographs, drawings, maps, and previous approvals that would assist the Grandfathering Review Committee in making its determination

   Previously submitted plans that are listed in the 'Permit Identification' section have been attached.

8. Certified land survey of topography showing existing drainage patterns and structures

   Please see the Preliminary Plat Bastrop Grove, Section 2 submittal attached.

9. Any other information or supportive materials deemed necessary and requested in writing by the Director of Planning and Develop
   N/A.

SECTION 36 - USE REGULATIONS (CHARTS)

36.1 - USE CHART ORGANIZATION/UNLISTED USES

A. The use of land and/or buildings shall be in accordance with those listed in the following Use Charts. No land or building shall hereafter be used and no building or structure shall be erected, altered, or converted other than for those uses specified in the zoning district in which it is located. The legend for interpreting the permitted uses in the Schedule of Uses is:

__X__ Designates use is permitted in the zoning district indicated

_____ Designates use is prohibited in district indicated

__C__ Designates use may be approved by a Conditional Use Permit (also see Section 33)

See Definitions in the Appendix (A-3) for further description of uses identified with an asterisk (*).

B. If a use is not listed, it is not allowed in any zoning district.

C. *Use Chart Organization:*

1. Primary Residential Uses (Use Chart 36.2)
2. Accessory and Incidental Uses (Use Chart 36.3)
3. Utility and Service Uses (Use Chart 36.4)
4. Recreational and Entertainment Uses (Use Chart 36.5)
5. Education, Institutional, Public, and Special Uses (Use Chart 36.6)
6. Transportation Related Uses (Use Chart 36.7)
7. Automobile and Related Uses (Use Chart 36.8)
8. Office and Professional Uses (Use Chart 36.9)
9. Retail and Related Service Uses (Use Chart 36.10)
10. Commercial Uses (Use Chart 36.11)
11. Light Industrial and Related Uses (Use Chart 36.12)

D. *Classification of New/Unlisted Uses:* It is recognized that new types of land use will develop and forms of land use not presently anticipated may seek to locate in the City of Bastrop. In order to provide for such changes and contingencies, a determination as to the appropriate classification of any new or unlisted form of land use in the Use Charts (Sections 36.2 through 36.12) shall be made as follows:

1. *Initiation*
   a. A person, City department, the Planning and Zoning Commission, or City Council may propose zoning amendments to regulate new and previously unlisted uses.
   b. A person requesting the addition of a new or unlisted use shall submit to the Director of Planning all information necessary for the classification of the use, including but not limited to:
      (1) The nature of the use and whether the use involves dwelling activity, sales, services, or processing;
      (2) The type of product sold or produced under the use;
      (3) Whether the use has enclosed or open storage and the amount and nature of the storage;
      (4) Anticipated employment typically anticipated with the use;
      (5) Transportation requirements;
      (6) The nature and time of occupancy and operation of the premises;
      (7) The off-street parking and loading requirements;
      (8) The amount of noise, odor, fumes, dust, toxic materials and vibration likely to be generated; and
      (9) The requirements for public utilities such as sanitary sewer and water and any special public services that may be required.
2. The Director of Planning shall refer the question concerning any new or unlisted use to the Planning and Zoning Commission with a recommendation as to the zoning classification into which such use should be placed. The referral of the use interpretation question shall be accompanied by the statement of facts in "b" above. An amendment to this ordinance shall be required as prescribed by Section 10.
3. The Planning and Zoning Commission shall consider the nature and described performance of the proposed use and its compatibility with the uses permitted in the various districts and determine the zoning district or districts within which such use is most similar and should be permitted.
4. The Planning and Zoning Commission shall transmit its findings and recommendations to the City Council as to the classification proposed for any new or unlisted use. The City Council shall approve or disapprove the recommendation of the Planning and Zoning Commission or make such determination concerning the classification of such use as is determined appropriate based upon its findings. If approved, the new or unlisted use shall be amended in the Use Charts of the Zoning Ordinance according to Section 10.
5. Standards for new and unlisted uses may be interpreted by the Director of Planning as those of a similar use. When a determination of the appropriate zoning district cannot be readily ascertained, the same criteria outlined above ("b") shall be followed for determination of the appropriate district. The decision of the Director of Planning may be appealed according to the process outlined in "2" through "4" above.

(Ord. No. 2002-8, § 2, 3-26-02)

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.2

Legend for interpreting the Schedule of Uses

__X__ Designated use permitted in District

_____ Designated use prohibited in District

__C__ Use may be allowed with a Conditional Use Permit

Primary Residential Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Bed and Breakfast Inn or Facility	X	C	C	C	C	C	C	X	X		X	X	X	X		X	X	X			X	
Boarding or Rooming House								X	X		X	X	X	X							X	
Community Home (per State Statue)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fraternity or Sorority House								X	X		X	X	X	X								
Housing for the Elderly/Senior								X	X		X	X	X	X							X	
Manufactured/HUD-Code Mobile Home	C	C	C	C	C					X											X	X
Manufactured Home Park										X											X	X
Mobile Home Subdivision										X											X	X
Multiple-Family Dwelling (Apartment)									X		X	X	X	X							X	
Multiple-Family Dwelling (Quadraplex)								X	X		X	X	X	X								
Patio Home (Zero Lot Line Dwelling)																					X	
Single-Family Dwelling Attached						C	X	X	X					X							X	
Single-Family Dwelling Detached		X	X	X	X	X	X	X	X	X				X		X					X	X
Two-Family Dwelling (Duplex)						X	X	X	X												X	

(Ord. No. 2010-1, 1-12-10)

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.3:

Legend for interpreting the Schedule of Uses

__X__Designated use permitted in District

_____Designated use prohibited in District

__C__Use may be allowed with a Conditional Use Permit

Accessory and Incidental Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Accessory Building (Residential) +240 s	X	C	C	C	C	C	C	C	X		X	X	X	X	X	X	X	X		X	X	
Accessory Building (Residential) -240 s.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Accessory Building Non Residential (Bus/Ind)											X	X	X	X	X	X	X	X	X	X	X	
Caretaker's or Guard's Residence	X	C						X	X		X	X	X	X	X	X	X	X	X	X	X	X
Garage/Accessory Dwelling (See Sec 40.4)	X	X	C	C	C	C	C	X	X		X	X	X	X	X	X	X	X		X	X	
Home Occupation	See Definitions A-3, Home Occupation (123)																			See Def.		
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Off-street Parking Incidental to Main Use	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Swimming Instruction as Home Occupation	C	C	C	C	C	C	C	C	C	C	X	X	X	X		X	X	X		X	X	C
Swimming Pool (Private)	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	
Temp Field Office/Const. Yard or Office Subject to Permit issued by Building Official																						
Tennis Court (Lighted)	C	C							C		X	X	X	X	X	X	X	X		X	X	C
Tennis Court (Private) (No Lights)	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X

(Ord. No. 2010-1, 1-12-10; Ord. No. 2013-24, 11-12-13)

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.4:

Legend for interpreting the Schedule of Uses

__X__Designated use permitted in District

_____Designated use prohibited in District

__C__Use may be allowed with a Conditional Use Permit

Utility, Service and Other Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Antenna (Commercial) See Section 43	C																			C		
Antenna (Non Commercial)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Electrical Energy Generating Plant	C																		C	C	X	
Electrical Substation (High Volt. Bulk Power)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Electrical Transmission Line (High Voltage)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Farm, Ranch, Crops or Orchard (Commercial)	X																					
Fire, Police, Public Health, Municipal Bldgs/Fac	X	C	C	C	C	C	C	C	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Franchised Private Utility (not listed)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Garden or Orchard (Non Commercial)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Gas Line and Regulating Station	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Local Utility Line	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Public Building with Shop/Yard of Local, State or Federal Agency (Outside Storage)	C													C	C	C	C	X	C	X	X	
Radio or Television Transmitting Station	C											C	C	C	C	C	C	X	C	X	X	
Sewage Pumping Station (Public)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Telephone Business Office											X	X	X	X		X	X	X	X	X	X	
Telephone Exchange/ Switching/Relay or Transmitting Station	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Utility Shop/ Storage Yards/Buildings	C																	X	C	X	X	
Water Reservoir Well/Pumping Station	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Water stand Pipe/Elevated Water Stora [Storage]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Water Treatment Plant	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.5:

Legend for interpreting the Schedule of Uses

__X__ Designated use permitted in District

_____ Designated use prohibited in District

__C__ Use may be allowed with a Conditional Use Permit

Recreational and Entertainment Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Amusement Arcade													C	C	C		X	X		X	X	
Amusement Arcade (Indoor)													C	C	C		X	X		X	X	
Amusement Arcade (Outdoor)																	C	C		X	X	
Ballroom Dancing														X	X		X	X			X	
Carnival, Circus or Tent Services (Temp) See City of Bastrop Code of Ordinances																						

Country Club (Private)	X	C	C	C	C	C	C	C	C	C	X	X	X	X		C	X	X		X	X	X
Day Camp for Children	C							C	C	C	C	C	X	X	X	C	X	X			X	C
Golf Course (Commercial)	C	C	C	C	C	C	C	C	C	C	C		C	C		C	X	X		X	X	C
Park/Playground (Private) Non Commercial	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Playfield/Stadium (Public)	C										C	C	X	X	X		X	X	X	X	X	C
Private Club (See Article 4.100 [Art. 4.02])																						
R.V Park																		X		X	X	
Rodeo Grounds	C																			X	X	
Roller/Ice Rink																	X	X		X	X	
Stable (Commercial)	C																			X	X	
Stable (Private)	X	C	C	C	C															X	X	
Swim/Tennis or Handball Club	C	C	C	C	C	C	C	C	C	C	C	C	X	X		X	X	X		X	X	C
Swimming Pool (Commercial)											C	C	C	C	X		X	X		X	X	
Theater (Open Drive-In)																				X	X	
Theater/Playhouse (Indoor)											X	X	X	X	X		X	X		X	X	
Zoo (Private)	C																			C	X	
Zoo (Public)	C																			X	X	

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.6:

Legend for interpreting the Schedule of Uses

__X__Designated use permitted in District

_____Designated use prohibited in District

__C__Use may be allowed with a Conditional Use Permit

Educational, Institutional and Special Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Art Gallery/ Museum											X	X	X	X	X	X	X	X			X	
Assisted Living Facility								C	X		X	X	X	X							X	
Cemetery/ Mausoleum	C										C	C	C	C			C	C		C	X	
Cemetery, Animal	C																				X	
Child Care Center w/Church	C	C	C	C	C	C	C	C	C		X	X	X	X	X		X	X			X	
Child Care Center/Day Care Center									C		X	X	X	X	X		X	X	C	C	X	
Church, Rectory or Temple	C	C	C	C	C	C	C	C	X	X	X	X	X	X	X	X	X	X		X	X	X
College/ University	C	C	C	C	C	C	C	C	C	C	X	X	X	X		X	X	X	X	X	X	C
Community Center (Public)	X										X	X	X	X	X	X	X	X			X	X
Continuing Care Retirement Community									C		X	X	X	X			X	X			X	
Convent/Monastery	C	C	C	C	C	C	C	C	C	C	X	X	X	X			X	X			X	C
Fairgrounds/Exhibition Area	C																			C	X	
Family Home (Child Care)	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X			X	X
Fraternal/Lodge/Union/Hall/Civic Cente [Center]	C										C	C	X	X			X	X		X	X	
Group Daycare Center	C							C	C	C	X	X	X	X			X	X			X	C
Hospital, Acute Care	C										X	X	X	X			X	X			X	C
Hospital, Chronic Care	C										C	C	X	X			X	X			X	
Institution for Alcoholic, Narcotic, Psychiatric	C										C	C	C	C			C	C			X	
Institution for Religious, Charitable or Philanthropic Nature	C								C	C	X	X	X	X			X	X			X	
Kindergarten/ Nursery School (Private)	C							C	C	C	C	X	X	X			X	X			X	C
Non Profit Activities by a Church	C							X	X	X	X	X	X	X	X	X	X	X			X	X
Rehab Care Facility (Halfway House)								C	C		C	C	C	C			C	C			X	
Retirement Housing for the Elderly							X	X	X		X	X	X	X							X	
School Driving/Defensive Driving													X	X			X	X		X	X	

School Private (Primary/ Secondary)	C							C	C	C	C	X	X	X			X	X			X	
School, Business													C	C			X	X	C	C	X	
School, Commercial Trade													C	C			X	X	C	C	X	
School, Federally Funded Preschool Pgrm.	C	C	C	C	C	C	C	C	X		X	X	X	X			X	X		X		
School, Public/Parochial	X	C	C	C	C	C	C	C	X	X	X	X	X	X		X	X	X		X	X	X
Seasonal Uses (Temporary)	C										C	C	C	C	C	C	C	C		C	C	
Skilled Nursing Facility									C		X	X	X	X		C	X	X			X	

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.7:

Legend for interpreting the Schedule of Uses

__X__ Designated use permitted in District

_____ Designated use prohibited in District

__C__ Use may be allowed with a Conditional Use Permit

Transportation Related Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Airport/Landing Field	C																			C	X	
Bus Station/Other Terminal of Similar Nature														C		C	X	X		X	X	
Hauling/Storage Co w/outside Storage																		X		X	X	
Heliport	C																	C		C	X	
Helistop	C														C		C	C	C	C	C	
Motor Freight Company																		X	C	X	X	
Parking Lot/Structure Commercial-Auto													C	C	X	C	X	X		X	X	
Parking Lot, Truck/Trailers															X			X		X	X	
Tractor Sales																		X		X	X	

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.8:

Legend for interpreting the Schedule of Uses

__X__Designated use permitted in District

_____Designated use prohibited in District

__C__Use may be allowed with a Conditional Use Permit

Automobile and Related Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Auto Accessory Installation, Minor														C			C	X		X	X	
Auto Financing/Leasing (No outdoor lot/display)											C	C	X	X			X	X		X	X	
Auto Glass/Seat Cover/Upholstery/ Muffler Shop																	C	X		X	X	
Auto Laundry/Car Wash																	C	X		X	X	
Auto Painting/Body Rebuilding Shop																		X		X	X	
Auto Parts/Accessory Sales (Indoor)													C	X			X	X		X	X	
Auto Rental														C			C	X		X	X	
Auto Repair, Major																		X		X	X	
Auto Repair, Minor														C			C	X		X	X	
Auto Storage/Auto Auction																					X	
Automotive Gasoline/Motor Fuel Service Station														C			C	X		X	X	
Boat Sales																	C	X		X	X	
Motorcycle Sales/Repair																	C	X		X	X	
New/Used Auto Sales																	C	X		X	X	
RV/Camper Sales																	C	X		X	X	
Tire Dealership														C			C	X		X	X	

Trailer/Heavy Load Vehicle Repair																		X		X	X	
Trailer/Truck Rental																		C		X	X	
Used Auto Sales																		X		X	X	
Window Tinting, Auto																	C	X		X	X	

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.9:

Legend for interpreting the Schedule of Uses

__X__Designated use permitted in District

_____Designated use prohibited in District

__C__Use may be allowed with a Conditional Use Permit

Office and Professional Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Accountant/Bookkeeping Office											X	X	X	X	X	X	X	X			X	
Architect's Office											X	X	X	X	X	X	X	X			X	
Armed Services Recruiting Center											X	X	X	X		X	X	X			X	
Bank/Savings & Loan/Credit Union/Brokerage											C	C	X	X		X	X	X			X	
Check Cashing Service/Loan Agency												C	C	C		C	X	X			X	
Dental Clinic/ Laboratory/Office											X	X	X	X		X	X	X			X	
Medical Clinic or Office											X	X	X	X		X	X	X			X	
Medical Laboratory												C	C	C		C	X	X			X	
Minor Medical Emergency Clinic											C	C	X	X		X	X	X			X	
Mortgage/Loan Agency											C	X	X	X		X	X	X			X	
Offices, General Business/ Professional											X	X	X	X		X	X	X			X	
Optician/Optometrist											X	X	X	X		X	X	X			X	
Radio/TV Broadcasting w/o Tower											C	X	X	X		X	X	X			X	

Real Estate Office											X	X	X	X		X	X	X			X	
Telemarketing Agency											C	C	C	C		C	C	C			X	

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.10:

Legend for interpreting the Schedule of Uses

__X__Designated use permitted in District

_____Designated use prohibited in District

__C__Use may be allowed with a Conditional Use Permit

Retail and Service Type Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHC
Animal Humane Society	C																	C		X	X	
Antique Shop/Sales Indoor												C	X	X		X	X	X			X	
Appliance Rental													X	X			X	X			X	
Art Supply Store												X	X	X		X	X	X			X	
Bakery/Confectionery Shop (Retail)											X	X	X	X		X	X	X			X	
Banking, Automatic Teller Only											X	X	X	X	X	X	X	X			X	
Barber Shop/Hair Salon											X	X	X	X		X	X	X				
Book/Stationery/Newsstand Shop												X	X	X	X	X	X	X			X	
Building Material/Hardware/Home Improvement (Indoor)																	X	X		X	X	
Building Material/Hardware/Home Improvement (Outdoor)																	C	X		X	X	
Cellular Phone/Pager Sales (Indoor)												C	X	X		X	X	X		X	X	
Cleaning Plant (Commercial/ Wholesale)																		X		X	X	
Cleaning Shop/Laundry Pick-up Self-Service (Small Shop)												X	X	X		X	X	X			X	
Computer Sales												C	X	X		X	X	X			X	
Consignment Store												C	X	X		X	X	X			X	
Copy Shop											C	C	X	X		X	X	X			X	
Custom Personal Service Shop											C	C	X	X		X	X	X			X	
Discount/Department Store													X	X		X	X	X			X	
Donut Shop												X	X	X		X	X	X			X	

Drapery/Needlework/Weaving Shop													X	X		X	X	X			X	
Drug Store/Pharmacy											C	X	X	X		X	X	X			X	
Florist Shop											C	X	X	X	X	X	X	X			X	
Food/Beverage Sales Store w/Gasoline												C		C			X	X		X	X	
Food/Beverage Sales Store w/o Gasoline												X	X	X		C	X	X		X	X	
Food Store												C	X	X	X	X	X	X		X	X	
Funeral Home/Mortuary												C	C	X			X	X			X	
Furniture, Home Furnishings/ Appliance														X		X	X	X			X	
Garden Shop												C	C	X		X	X	X			X	
Greenhouse/Plant Nursery w/Outside Display of Plants (Retail)														X		X	X	X			X	
Handicraft/Art Object Sales Shop												C	X	X	X	X	X	X			X	
Hardware Shop/Store													C	X		X	X	X			X	
Hobby Shop												C	X	X		X	X	X			X	
Household Appliance Service/Repair														X		X	X	X			X	
Ice Cream/Yogurt Sales												X	X	X	X	X	X	X			X	
Incidental/Accessory Retail/Service Uses												X	X	X	X	X	X	X			X	
Key Shop												X	X	X		X	X	X			X	
Kiosk											C	C	C	C	X	C	C	C			X	
Laundromat/Self Service Washateria												C	X	X		C	X	X			X	
Medical Appliances, Fitting, Sales/Rental											X	X	X	X		C	X	X			X	
Metal Recycling Center																		C		C	X	
Mini-Warehouse																		C		X	X	
Off-Premises Sales Office													X	X		X	X	X				
Pawn Shop																		X		X		
Pet Shop/ Grooming												C	X	X		C	X	X			X	
Restaurant/Drive Thru													C			C	X	X			X	
Restaurant/Cafeteria (Not a Drive Thru)												C	X	X	X	X	X	X			X	

Restaurant/Eating Place (Drive In Service)													X	X		X	X	X			X
Retail Shop/Apparel/Gift/Accessory Similar												X	X	X	X	X	X	X			X
Security Systems Installation Company													X	X		X	X	X			X
Silk Screening Studio/Tee-Shirt Shop													X	X		X	X	X			X
Studio/Decorator/Artist/Photographer											C	X	X	X	X	X	X	X			X
Studio/Health/Reducing Service (or Similar)											C	X	X	X	X	X	X	X			X
Studio/Music/ Dance/Drama											C	X	X	X	X	X	X	X			X
Temp Outdoor Retail Sales Commercial													C	X	X	X	X	X			X
Tool/Light Equipment Rental (Indoor)													C	X		C	X	X			X
Travel Bureau/Travel Consultant											X	C	X	X	X	X	X	X			X
Trophy Sales/Engraving													X	X		C	X	X			X
Used Merchandise/Second Hand Thrift														C		C	X	X			X
Used Merchandise/Second Hand (non profit)														C		C	X	X			X
Vacuum Cleaner Sales and Repair													C	X		C	X	X			X
Variety Store/Similar Retail Outlet													X	X		X	X	X			X
Vet Hospital (Inside Animal Pens Only)	C												X	X		C	X	X			X
Vet Hospital (Outside Animal Pens Only	C																C	X		X	X
Veterinarian Office (No Animal Hospital)	C										C	X	X	X		C	X	X			X
Wallpaper/Flooring/Carpet Store													C	X		C	X	X			X

(Ordinance 2010-1 adopted 1/12/10)

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.11:

Legend for interpreting the Schedule of Uses

__X__Designated use permitted in District

_____Designated use prohibited in District

__C__Use may be allowed with a Conditional Use Permit

Commercial Type Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Alcoholic Beverage Establishments (Beer Wine) See Bastrop Code 4.100 [Art. 4.02]																						
Alcoholic Beverage Establishments (Liquor) See Bastrop Code 4.100 [Art. 4.02]																						
Ambulance Service																	X	X			X	
Bakery/Confectionery Shop (Commercial)														C			X	X		X	X	
Bakery/Confectionary Ship (Wholesale)														C			X	X	X	X	X	
Book Binding																		X	X	X	X	
Bottling Works																		X	X	X	X	
Breweries														C				C		C		
Cabinet Shop														C				X	X	X	X	
Clothing/Similar Light Manufacturing																		X	X	X	X	
Contractor Shop w/Outside Storage Yard																		C		C	X	
Distilleries														C				C		C		
Distribution Center																			X	X	X	
Drapery/ Furniture Upholstery Shop														C			X	X	X	X	X	
Dyeing/Laundry Plant (Commercial)																		X	X	X	X	
Equipment Rental (Heavy)																		C		X	X	
Equipment Sales (New/Used)																		C		X	X	
Feed/Grain Store																	X	X		X	X	
Flea Market (Indoor)																	C	X		X	X	
Food Processing Plant																		C		X	C	

Furniture Manufacture/ Refinishing Shop														C				X		X	X	
Heating/AC Sales																	X	X		X	X	
Heavy Machinery Sales Storage																		X		X	X	
Kennel (Indoor Pens)	C																X	X		X	X	
Kennel (Outdoor Pens)	C																	C		X	X	
Laboratory Equipment Manufacturing																		X	X	X	X	
Laboratory Scientific/Research																		X	X	X	X	
Landscaping Service/ Construction																		X		X	X	
Light Manufacturing/ Assembly Processes																		X	X	X	X	
Lithorgraphic/ Print Shop														C			X	X	X	X	X	
Maintenance/ Repair Service for Buildings																		X		X	X	
Manufactured or Lt. Industrialized Home New																		C		X	X	
Manufactured or Lt. Industrialized Home Used																		C		X	X	
Milk Depot, Dairy/Ice Cream Plant																		X	X	X	X	
Motel/Hotel (Less than 75 Rooms)													C	C		X	X	X			X	
Motel/Hotel (More than 75 Rooms)														C		C	X	X			X	
Newspaper Printing																		C	X	X	X	
Office Showroom														C		C	C	X	C	X	X	
Office Warehouse																		X	X	X	X	

Open Storage/Display/ Work Area for Merchandise or Machinery																		X		X	X	
Paint Shop														C			C	C	C	X	X	
Palm Reader/Card Reader																		X		X	X	
Plumbing Shop																		X		X	X	
Portable Building Sales (Outdoor Display)																		C		X	X	
Printing Company														C			C	X		X	X	
Propane Sales (Retail)																	C	X		X	X	
Taxidermist																	X	X		X	X	
Tinsmith/Sheet Metal Shop																		X		X	X	
Welding/Machine Shop																		X		X	X	
Wineries														C				C		C		

(Ord. No. 2010-1, 1-12-10; Ord. No. 2014-17, pt. 2, 9-23-14)

USE CHART
ZONING ORDINANCE
CITY OF BASTROP, TX

SECTION 36.12:

Legend for interpreting the Schedule of Uses

__X__Designated use permitted in District

_____Designated use prohibited in District

__C__Use may be allowed with a Conditional Use Permit

Industrial and Related Uses	AOS	SF20	SF9	SF8	SF7	2F	SFA	MF1	MF2	MH	O	NS	GR	CBD	CF	CT	C-1	C-2	IP	LI	PD	MHO
Animal Rendering Plant																				C		
Any Use Which Could Potentially Create A Problem To The Environment Due To Emissions, Odor, Noise, Etc																				C		

Cement/Hydrated Lime Plant																			C		
Concrete/Asphalt Batching Plant (Perm)																			C		
Concrete/Asphalt Batching Plant (Temp) With 6 Month, With One Extension																	C		C		
Grain Elevator	C																		C		
Hatcheries	C																		C		
High Risk/Hazardous Industrial Mnfctrng. Wholly Enclosed Within a Bldg See 31.2																			C		
High Risk/Hazardous Industrial Mnfctrng. Not Wholly Enclosed Within Building																					
Light Manufacturing/ Industrial Use as Defined in Appendix A-3																		X	X	X	
Livestock Auction Facilities	C																		C		
Low Risk Industrial Manufacturing Not Wholly Enclosed Within a Building																			C	X	
Low Risk Industrial Manufacturing Wholly Enclosed Within A Building																		C	C	X	
Petroleum Storage/ Collection Facilities																			C		

Sand/Topsoil/ Gravel/Stone/ Petroleum Extraction or Storage	C																			C	X	
Sexually Oriented Business (See [Sec.] 43.9)																				C		
Slaughtering Facilities																				C		
Smelter/Refinery/ Chemical Plant																				C		
Storage/ Wholesale Warehouse																				X	X	
Wrecking Yard																				C		

(Ord. No. 2010-1, 1-12-10)

BASTROP GROVE

DRAINAGE IMPROVEMENTS
AGNES ROAD TO COLORADO RIVER
BASTROP COUNTY, TEXAS

SUBMITTED BY:

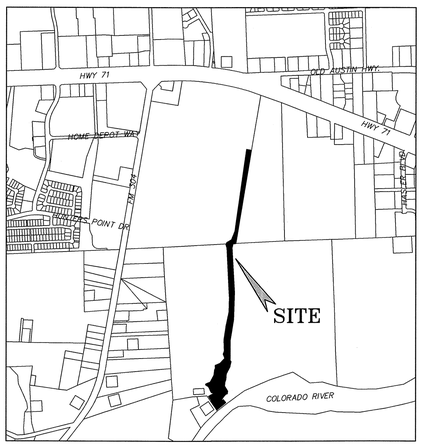
09/28/2018
CARLSON, BRIGANCE, & DOERING, INC.

REVIEWED BY:

10/1/2018
CITY OF BASTROP ENGINEER

SHEET INDEX

Sheet Number	Sheet Title
1	COVER
2	GENERAL NOTES & DETAILS
3	DETAILS – EROSION CONTROL MATTING
4	DETAILS – BOX CULVERTS
5	EROSION CONTROL PLAN
6	EXISTING DRAINAGE AREA MAP
7	PROPOSED DRAINAGE AREA MAP
8	CHANNEL – STA. 0+00 TO 6+00
9	CHANNEL – STA. 6+00 TO 10+50
10	CHANNEL – STA.10+50 TO 20+50
11	CHANNEL – STA. 20+50 TO 30+50
12	CHANNEL – STA. 30+50 TO 41+50
13	CHANNEL – STA. 41+50 TO END
14	CHANNEL X–SECTIONS



LOCATION MAP
N.T.S.

MAPSCO PAGE #:	MAPSCO GRID #:
468S	Q34
468N	Q35
468P	Q35

NOTES:

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF BASTROP MUST RELY UPON THE ADEQUACY OF THE DESIGN ENGINEER.

THIS PROJECT IS LOCATED IN THE COLORADO RIVER WATERSHED AND WITHIN THE BOUNDARIES OF THE 100-YEAR FLOOD PLAIN AS PER FEDERAL FLOOD INSURANCE ADMINISTRATION FIRM MAP NO. 48021C0335E, DATED JANUARY 19, 2006, BASTROP COUNTY, TEXAS. BASTROP COUNTY COMMUNITY NO. 481193.

811 Know what's below. Call before you dig.

OWNER: 71 RETAIL PARTNERS, L.P.
DOUGLAS MACMAHON
8214 WESTCHESTER DRIVE
DALLAS, TEXAS 75225
(214) 622–6565

ENGINEER: CARLSON, BRIGANCE & DOERING, INC.
CIVIL ENGINEERING & SURVEYING
MR. BRENDAN P. MCENTEE, P.E.
5501 WEST WILLIAM CANNON
AUSTIN, TEXAS 78749
(512) 280–5160

UTILITY PROVIDERS:

ELECTRIC: BLUEBONNET ELECTRIC
(979) 542–3151

GAS: CENTER POINT ENERGY
(830) 643–6936

PHONE: AT&T
(512) 870–1450

WATER: CITY OF BASTROP
(512) 332–8960

WASTEWATER: CITY OF BASTROP
(512) 332–8960

CABLE: SPECTRUM
(800) 418–8848

NO.	DESCRIPTION	REVISE (R) ADD (A) VOID (V)	CITY OF BASTROP APPROVAL/DATE	APPROVED BY

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/28/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION / DATE

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: COVER
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018
JOB NUMBER: 4697
SHEET: 1 OF 14
SHEET NO.: 1

FILE PATH: J:\AutoCad 2004 Land Projects\4697\Dwg\Channel\4697 - COVER.dwg - May 15, 2018 - 1:31pm

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF BASTROP DESIGN AND CONSTRUCTION STANDARDS MANUAL.

2. ANY EXISTING UTILITIES, PAVEMENT, CURBS, SIDEWALKS, STRUCTURES, TREES, ETC., NOT PLANNED FOR DEMOLITION THAT ARE DAMAGED OR REMOVED SHALL BE REPAIRED OR REPLACED AT THE APPLICANT'S EXPENSE.

3. THE CONTRACTOR SHALL VERIFY ALL DEPTHS AND LOCATIONS OF EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES WITH THE CONSTRUCTION PLANS FOUND IN THE FIELD SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER WHO SHALL BE RESPONSIBLE FOR REVISING THE PLANS ARE APPROPRIATE.

4. ALL AREAS DISTURBED OR EXPOSED DURING CONSTRUCTION SHALL BE RE-VEGETATED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. RE-VEGETATION IS TO TAKE PLACE WITHIN 14 DAYS OF CONSTRUCTION INACTIVITY. RE-VEGETATION OF ALL DISTURBED OR EXPOSED AREAS SHALL CONSIST OF SODDING OR SEEDING, AT THE CONTRACTOR'S OPTION. HOWEVER, THE TYPE OF RE-VEGETATION MUST EQUAL OR EXCEED THE TYPE OF VEGETATION PRESENT BEFORE CONSTRUCTION

5. PRIOR TO ANY CONSTRUCTION, THE APPLICANT'S ENGINEER SHALL CONVENE A PRECONSTRUCTION CONFERENCE BETWEEN HIMSELF, THE CITY OF BASTROP, THE CONTRACTOR, UTILITY COMPANIES, ANY AFFECTED PARTIES AND ANY OTHER ENTITY THE CITY OR THE ENGINEER MAY REQUIRE. REFERENCE DEVELOPMENT PACKET FOR GUIDANCE ON HOW TO SCHEDULE A PRECONSTRUCTION CONFERENCE.

6. THE CONTRACTOR AND THE ENGINEER SHALL KEEP ACCURATE RECORDS OF ALL CONSTRUCTION THAT DEVIATES FROM THE PLANS. THE ENGINEER SHALL FURNISH THE CITY OF BASTROP ACCURATE "AS-BUILT" DRAWINGS FOLLOWING COMPLETION OF ALL CONSTRUCTION.

7. WHEN CONSTRUCTION IS BEING CARRIED OUT WITHIN EASEMENTS, THE CONTRACTOR SHALL CONFINE HIS WORK TO WITHIN THE PERMANENT AND ANY TEMPORARY EASEMENTS. PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL TRASH AND DEBRIS WITHIN THE PERMANENT AND TEMPORARY EASEMENTS.

8. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL APPLY FOR AND SECURE ALL PROPER PERMITS FROM THE APPROPRIATE AUTHORITIES.

9. ALL STORM SEWER FITTINGS MUST BE PRE-CAST.

11. AVAILABLE BENCHMARKS THAT MAY BE UTILIZED FOR THE CONSTRUCTION OF THIS PROJECT ARE DESCRIBED AS FOLLOWS:

BENCHMARKS:

BM #1: SOUTHWEST CORNER OF CONCRETE OF ELECTRIC TRANSFORMER
10015646.4860 N, 3239451.2111 E
ELEVATION: 368.42'

BM #2: 1/2" IRON ROD AT THE NORTHEASTERN CORNER 145.691 ACRE TRACT OUT OF THE NANCY BLAKEY SURVEY (ABSTRACT NO. 98) CONVEYED TO MC BASTROP 71, LP. (V 2097, P 241, O.P.R.B.C.TX.), AND THE SOUTHEASTERN CORNER OF 52.684 ACRES TRACT CONVEYED TO 71 RETAIN PARTNERS, PL. (V 2245, P 878, O.P.R.B.C.TX.), WITHIN WESTERN BOUNDARY LINE OF 43.112 ACRE TRACT CONVEYED TO JOHN ALAN NIXON AND TINA TINER NIXON (V 2289, P 294, O.P.R.B.C.TX.). THIS IS THE NORTHEASTERN CORNER OF THE 3.653 ACRE DRAINAGE EASEMENT.
10015318.2455 N, 3241663.8667 E
ELEVATION: 361.00'

BM #3: 1/2" CAPPED IRON ROD WITHIN NORTHERN BOUNDARY OF 194.92 ACRE TRACT IN DEED TO JO ANN GRIESENBECK CANTRELL (V 445, P 684, O.P.R.B.C.TX.) OUT OF THE MAZEA ROUSSEAU SURVEY NO. 56. AT THE SOUTHEAST CORNER OF 145.697 ACRE TRACT IN DEED TO BASTROP GROVE PARTNERS, LTD. (V 1698, P 245, O.P.R.B.C.TX), AND SOUTHWEST CORNER OF 43.112 ACRE TRACT IN DEED TO CHP PROPERTIES, LTD. (V 1413, P 857, O.P.R.B.C.TX.).
10013530.9814 N, 3241359.4032 E
ELEVATION: 360.03'

CONSTRUCTION SEQUENCE:

NO CLEARING OR ROUGH GRADING MAY BE DONE UNTIL THE APPROVED EROSION AND SEDIMENTATION CONTROLS ARE IN PLACE.

1. HOLD PRE-CONSTRUCTION CONFERENCE.

2. INSTALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS AND STABILIZED CONSTRUCTION ENTRANCE AS SHOWN ON THE PLANS.

3. WITH THE APPROVAL OF ALL AFFECTED PARTIES, THE CONTRACTOR MAY BEGIN CLEARING AND GRUBBING.

4. COMPLETE ALL ROUGH GRADING AND UNDERGROUND INSTALLATION WITHIN THE LIMITS OF CONSTRUCTION.

5. COMPLETE FINAL GRADING WITHIN LIMITS OF CONSTRUCTION ALONG AREAS DESIGNATED. RESTORE CONSTRUCTION SPOILS & STAGING AREA TO NATURAL GRADE.

6. COMPLETE PERMANENT EROSION CONTROL AND RESTORATION OF SITE VEGETATION.

7. PROJECT ENGINEER OBSERVES CONSTRUCTION AND WRITES CONCURRENCE LETTER TO THE CITY OF BASTROP.

8. AFTER FINAL INSPECTION AND ACCEPTANCE OF CONSTRUCTION, COMPLETE ANY NECESSARY FINAL DRESS UP OF DISTURBED AREAS AND REMOVE/ DISPOSE OF TEMPORARY EROSION CONTROLS IN AN APPROVED MANNER.

EROSION AND SEDIMENTATION CONTROL:

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND FENCING FOR AREAS OUTSIDE OF THE CONSTRUCTION AREA PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).

2. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS, AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.

3. PRIOR TO FINAL ACCEPTANCE, HAUL ROADS AND WATERWAY CROSSINGS CONSTRUCTED FOR TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED, ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND REVEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSED OF IN APPROVED SPOIL DISPOSAL SITES.

4. ANY METHODS, STREET MARKINGS AND SIGNAGE NECESSARY FOR WARNING MOTORISTS, WARNING PEDESTRIANS OR DIVERTING TRAFFIC DURING CONSTRUCTION SHALL CONFORM TO THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITION.

5. ALL PAVEMENT MARKINGS, MARKERS, PAINT, TRAFFIC BUTTONS, TRAFFIC CONTROLS AND SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS, BRIDGES, AND THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, LATEST EDITIONS.

6. EROSION CONTROL MEASURES, SITE WORK AND RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE CITY OF BASTROP CODE OF ORDINANCES.

7. ALL SLOPES SHALL BE SODDED OR SEEDED WITH APPROVED GRASS, GRASS MIXTURES OR GROUND COVER SUITABLE TO THE AREA AND SEASON IN WHICH THEY WERE APPLIED.

8. SILT FENCES, ROCK BERMS, SEDIMENTATION BASINS AND SIMILARLY RECOGNIZED TECHNIQUES AND MATERIALS SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT POINT SOURCE SEDIMENTATION LOADING OF DOWNSTREAM FACILITIES. SUCH INSTALLATION SHALL BE REGULARLY INSPECTED BY THE CITY OF BASTROP FOR EFFECTIVENESS. ADDITIONAL MEASURES MAY BE REQUIRED IF, IN THE OPINION OF THE CITY ENGINEER, THEY ARE WARRWNTED.

9. ALL TEMPORARY EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL FINAL INSPECTION AND APPROVAL OF THE PROJECT BY THE CITY INSPECTOR. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL TEMPORARY EROSION CONTROL STRUCTURES AND TO REMOVE EACH STRUCTURE AS APPROVED BY THE CITY INSPECTOR.

10. ALL MUD, DIRT, ROCKS, DEBRIS, ETC., SPILLED, TRACKED OR OTHERWISE DEPOSITED ON EXISTING PAVED STREETS. DRIVES AND AREAS USED BY THE PUBLIC SHALL BE CLEANED UP IMMEDIATELY.

11. PERMANENT EROSION CONTROL: ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW:

A. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL SHALL BE PLACED IN ALL DRAINAGE CHANNELS (EXCEPT ROCK), AND BETWEEN THE CURB AND RIGHT-OF-WAY.

B. THE SEEDING FOR PERMANENT EROSION CONTROL SHALL BE APPLIED OVER AREAS DISTURBED BY CONSTRUCTION AS FOLLOWS:

BROADCAST SEEDING:

(I) FROM OCTOBER TO FEBRUARY, SEEDING SHALL BE WITH ONE (1) POUND PER 1,000 SQUARE FEET OF UNHULLED BERMUDA OR THREE (3) POUNDS PER

(II) FROM MARCH TO SEPTEMBER, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF ONE (1) POUND PER 1,000 SQUARE FEET, WITH A PURITY OF 95% WITH 85% GERMINATION.

FERTILIZER SHALL BE SLOW RELEASE GRANULAR OR PALETTE TYPE, AND SHALL HAVE AN ANALYSIS OF 15-15-15, AND SHALL BE APPLIED AT THE RATE OF ONE (1) POUND PER 1,000 SQUARE FEET, ONCE AT THE TIME OF PLANTING, AND AGAIN ONCE DURING THE TIME OF ESTABLISHMENT.

MULCH TYPE USED SHALL BE STRAW OR HAY APPLIED AT A RATE OF 45 POUNDS PER 1,000 SQUARE FEET.

HYDRAULIC SEEDING:

(I) FROM OCTOBER TO FEBRUARY, SEEDING SHALL BE WITH ONE (1) POUND PER 1,000 SQUARE FEET OF UNHULLED BERMUDA, OR THREE (3) POUNDS PER 1,000 SQUARE FEET OF WINTER RYE, WITH A PURITY OF 95% WITH 90 % GERMINATION.

(II) FROM MARCH TO SEPTEMBER, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF ONE (1) POUND PER 1,000 SQUARE FEET WITH A PURITY OF 95% WITH 95% GERMINATION.

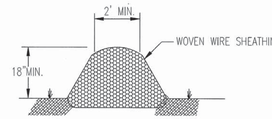
FERTILIZER SHALL BE A WATER SOLUBLE FERTILIZER WITH AN ANALYSIS OF 15-15-15 AT A RATE OF 1.5 POUNDS PER 1,000 SQUARE FEET.

MULCH TYPE SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1,000 SQUARE FEET, WITH A SOIL TACKIFIER AT A RATE OF 1.4 POUNDS PER 1,000 SQUARE FEET.

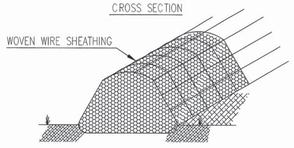
C. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK TO A DEPTH OF SIX (6) INCHES. THE IRRIGATION SHALL OCCUR AT 10-DAY INTERVALS DURING THE FIRST TWO (2) MONTHS. RAINFALL OCCURRENCES OF 1/2 INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR TEN (10) DAYS.

D. RESTORATION SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 INCH HIGH WITH 85% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 20 SQUARE FEET EXIST.

ROCK BERM



CROSS SECTION

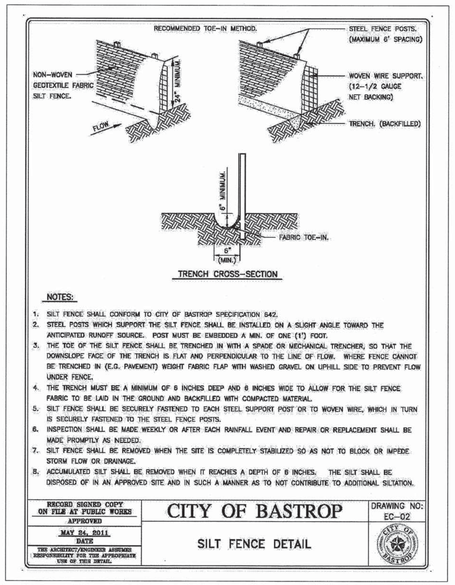


GENERAL NOTES

1. USE ONLY OPEN GRADED ROCK 4-8 INCH DIAMETER FOR STREAMFLOW CONDITIONS, USE OPEN GRADED ROCK 3-5 INCHES DIAMETER FOR OTHER CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 1 INCH OPENING AND MINIMUM WIRE DIAMETER OF 20 GAUGE.
3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN WIRE SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE AND IN A MANNER AS TO NOT CREATE A SILTRATION PROBLEM.
5. DAILY INSPECTION SHALL BE MADE ON SERVE SERVICE ROCK BERMS; SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES 6 INCHES.
6. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

STANDARD SYMBOL RB

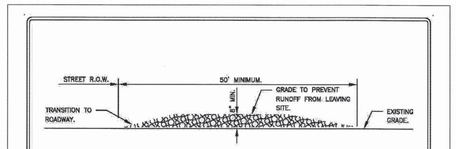
SOURCE: COA



NOTES:

1. SILT FENCE SHALL CONFORM TO CITY OF BASTROP SPECIFICATION 642.
2. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MIN. OF ONE (1') FOOT.
3. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G. PAVEMENT) WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
4. THE TRENCH MUST BE A MINIMUM OF 8 INCHES DEEP AND 8 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
5. SILT FENCE SHALL BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IN TURN IS SECURELY FASTENED TO THE STEEL FENCE POSTS.
6. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
7. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
8. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED	CITY OF BASTROP	DRAWING NO: EC-02
MAY 24, 2011 DATE	SILT FENCE DETAIL	CITY OF BASTROP TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		



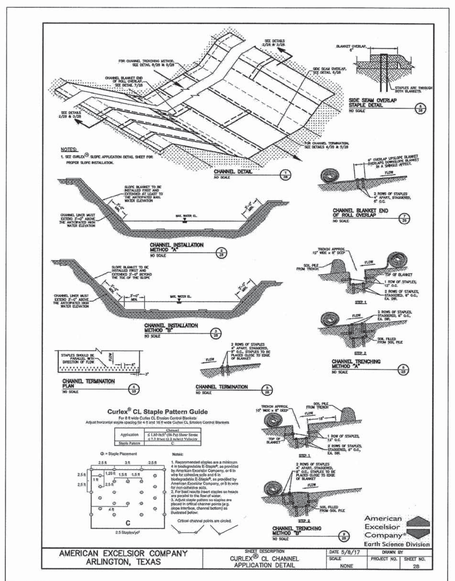
NOTES:

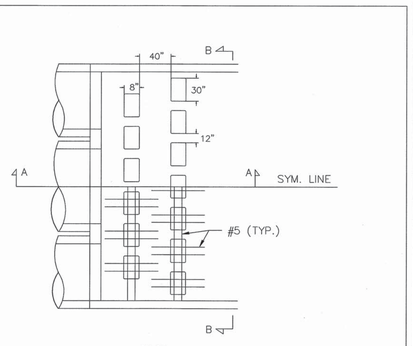
1. A STABILIZED CONSTRUCTION ENTRANCE APPLIES TO ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS TO A PUBLIC RIGHT OF WAY, STREET, ALLEY, SIDEWALK, OR PARKING AREA.
2. STONE SIZE SHALL BE 4" - 8" OPEN GRADED ROCK.
3. THICKNESS OF CRUSHED STONE PAD TO BE NOT LESS THAN 6".
4. LENGTH SHALL BE A MINIMUM OF 50' FROM ACTUAL ROADWAY, AND WIDTH NOT LESS THAN FULL WIDTH OF INGRESS/EGRESS.
5. ENTRANCE SHALL BE PROPERLY GRADED TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY BY CONTRACTOR.

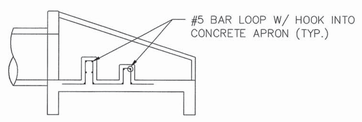
AS NECESSARY, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.

RECORD SIGNED COPY ON FILE AT PUBLIC WORKS APPROVED	CITY OF BASTROP	DRAWING NO: EC-01
MAY 24, 2011 DATE	STABILIZED CONSTRUCTION ENTRANCE DETAIL	CITY OF BASTROP TEXAS
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR THE APPROPRIATE USE OF THIS DETAIL.		



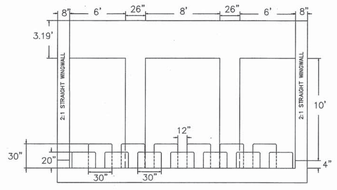


PLAN



SECTION A-A

ENERGY DISSIPATORS

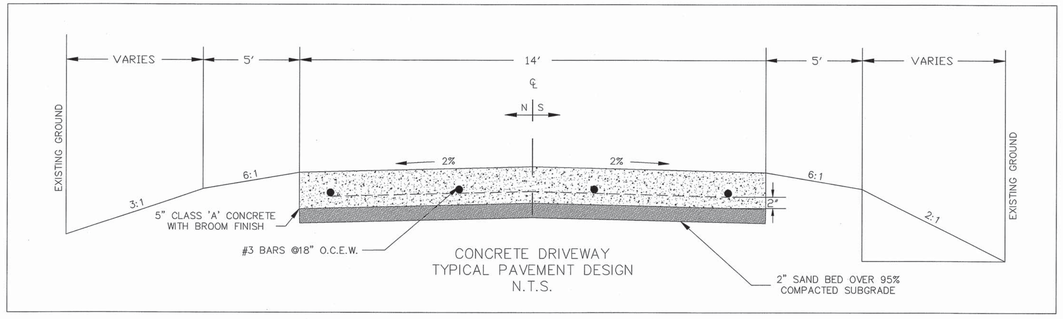


SECTION B-B

NOTES:

1. ALL CONCRETE SHALL BE CLASS A.
2. CHAMFER ALL EXTERNAL VISIBLE CORNERS.
3. DISSIPATOR BLOCKS REQUIRED ON DISCHARGE HEADWALLS ONLY.

ENERGY DISSIPATORS



CONCRETE DRIVEWAY
TYPICAL PAVEMENT DESIGN
N.T.S.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
FIRM ID #3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	IW

REVISION	DATE

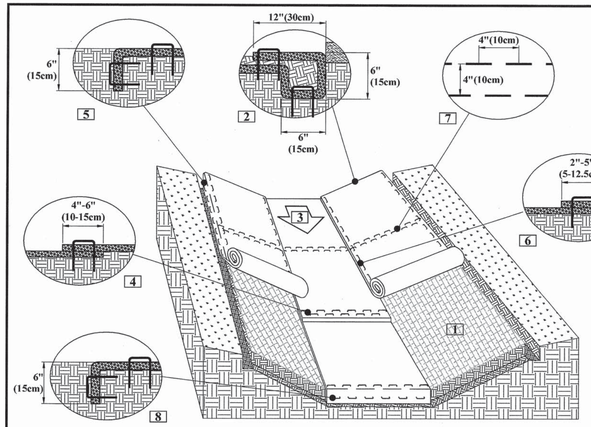
Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: GENERAL NOTES & DETAILS
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018
JOB NUMBER: 4697
SHEET: 2 OF 14
SHEET NO.: 2

FILE PATH: J:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - GENERAL NOTES.dwg - May 14, 2018 - 5:24pm

CHANNEL INSTALLATION DETAIL



1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the channel by anchoring the RECPs in a 6"(15cm) deep X 6"(15cm) wide trench with approximately 12"(30cm) of RECPs extended, beyond the up-slope portion of the trench. Use ShoreMax mat at the channel/culvert outlet as supplemental scour protection as needed. Anchor the RECPs with a row of staples/stakes approximately 12"(30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12"(30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12" apart across the width of the RECPs.
3. Roll center RECPs in direction of water flow in bottom of channel. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. Place consecutive RECPs end-over-end (Shingle style) with a 4"-6" overlap. Use a double row of staples staggered 4" apart and 4" on center to secure RECPs.
5. Full length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes approximately 12"(30cm) apart in a 6"(15cm) deep X 6"(15cm) wide trench. Backfill and compact the trench after stapling.
6. Adjacent RECPs must be overlapped approximately 2"-5" (5-12.5cm) (Depending on RECPs type) and stapled.
7. In high flow channel applications a staple check slot is recommended at 30 to 40 foot (9 -12m) intervals. Use a double row of staples staggered 4"(10cm) apart and 4"(10cm) on center over entire width of the channel.
8. The terminal end of the RECPs must be anchored with a row of staples/stakes approximately 12" (30cm) apart in a 6"(15cm) deep X 6"(15cm) wide trench. Backfill and compact the trench after stapling.

CRITICAL POINTS
A. Overlaps and Seams
B. Projected Water Line
C. Channel Bottom/Side Slope Vertices



NOTES:
*Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

**In loose soil conditions, the use of staple or stake lengths greater than 6"(15cm) may be necessary to properly secure the RECP's.

Drawing Not To Scale

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Poseyville, IN 47633 www.nagreen.com

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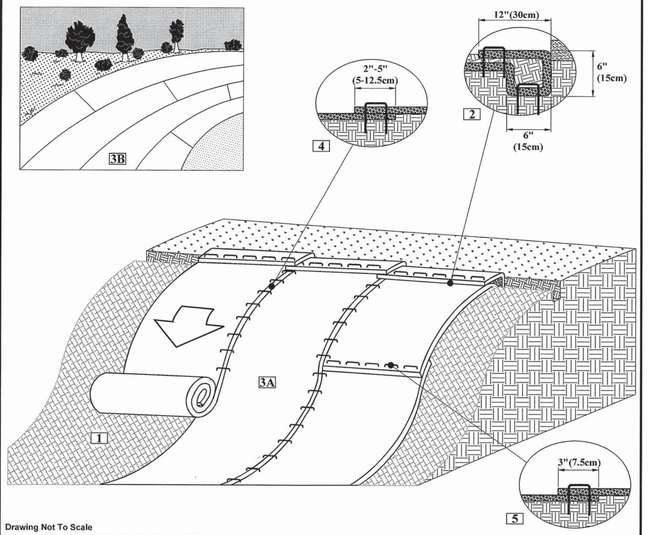
Drawn on: 5-4-17

SLOPE INSTALLATION DETAIL



1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the RECPs in a 6"(15cm) deep X 6"(15cm) wide trench with approximately 12" (30cm) of RECPs extended beyond the up-slope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12" (30cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12"(30cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12"(30cm) apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with approximately 2" - 5" (5-12.5cm) overlap depending on the RECPs type.
5. Consecutive RECPs spliced down the slope must be end over end (Shingle style) with an approximate 3"(7.5cm) overlap. Staple through overlapped area, approximately 12"(30cm) apart across entire RECPs width.

*NOTE:
In loose soil conditions, the use of staple or stake lengths greater than 6"(15cm) may be necessary to properly secure the RECP's.

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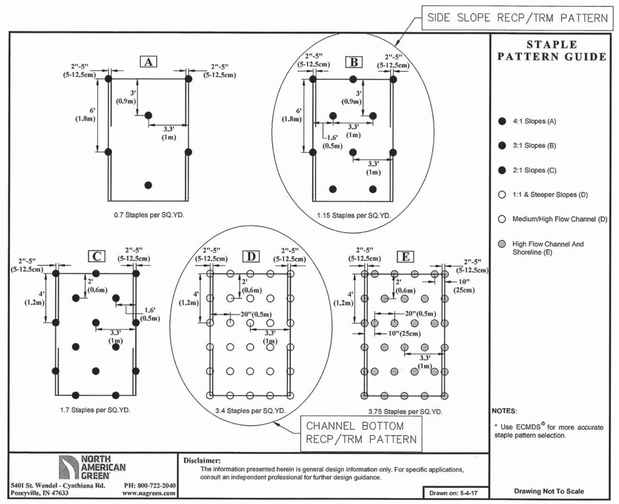

STAPLE PATTERN GUIDE

- 4:1 Slopes (A)
- 3:1 Slopes (B)
- 2:1 Slopes (C)
- 1:1 & Steeper Slopes (D)
- Medium/High Flow Channel (D)
- High Flow Channel And Shoreline (E)

NOTES:
* Use ECMDS® for more accurate staple pattern selection.

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Figure 1. Minimum Anchor Pattern

Maximum Design Conditions			Anchor Pattern
Shear Stress	Velocity	Wave Height	
<= 6 lbs/ft2	<= 14 ft/s	6 in.	F
> 6-8 lbs/ft2	> 14-18 ft/s	12 in.	G
> 8 lbs/ft2	> 18 ft/s	18 in.	H

Figure 2. Minimum Anchor Type

Soil Type	Anchor Type
Clay-Clay Loam	10 in Wire Staple
Silt Loam - Loam	10 in Wire Staple
Sandy Loam	12 in Wire Staple
Sand / Muck <= 6 in	12in Rebar Staple
Sand / Muck 6-12 in	18 in Rebar Staple
Sand / Muck 12-18 in	24 in Earth Anchor + 12 in Rebar Staple
Sand / Muck > 18 in	36 in Earth Anchor + 18 in Rebar Staple

SHOREMAX SIDE & BOTTOM PATTERN

Figure 3. Anchor Patterns for use with Wire/Rebar Staples

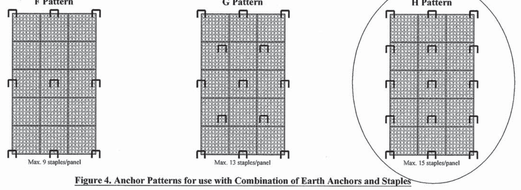
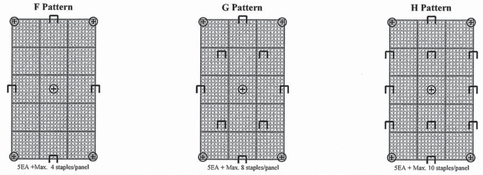


Figure 4. Anchor Patterns for use with Combination of Earth Anchors and Staples



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ShoreMax

ANCHORING GUIDE

1. When installing ShoreMax mat, the anchor pattern (figure 3 or 4) should be selected based on the expected maximum design conditions (shear stress, velocity, or wave impact) (figure 1).
2. Anchor selection should be based on the soil type and pull-out strength required (figure 2). In soft, highly erodible soils percussion earth anchors may be necessary. Earth anchors can be installed in conjunction with rebar staples (figure 4).
3. When using percussion earth anchors, position anchors in each corner and the center of the panel. Place staples in the appropriate pattern through remainder of mat. Staples can be shared between two adjacent panels.

*Note:
Number of staples used per panel can be reduced by 30-40% when sharing staples between panels.

⊓ - Wire/Rebar Staple

⊕ - Percussion Earth Anchor

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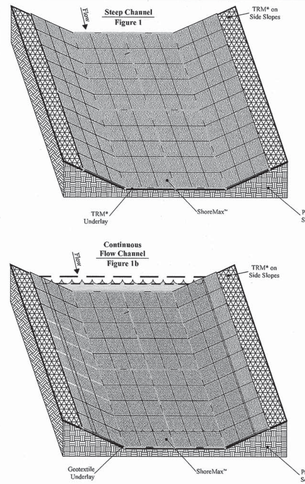
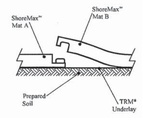
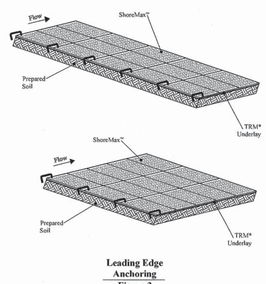


Channel/Downchute/Spillway Plan View



Integrated Panel Interlock System
Figure 2



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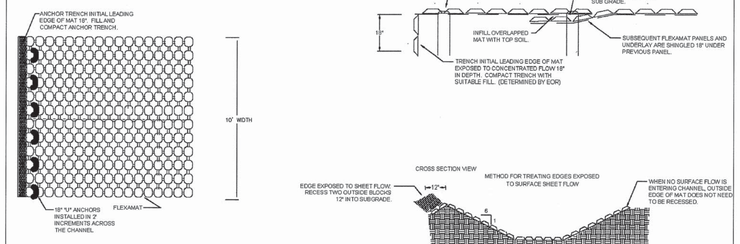
ShoreMax

STEEP CHANNEL/ CHUTE/SPILLWAY DETAIL

* ShoreMax mats can be installed over a variety of underlayments including: sod, turf reinforcement mats (TRMs), geotextiles, and in some cases erosion control blankets (ECBs).

1. Prepare soil before installing erosion control products, including any necessary application of lime, fertilizer, and seed (when installing TRM or ECB underlayment).
2. Install turf reinforcement mat (TRM) over prepared soils according to manufacturer's recommendations.
3. Place ShoreMax mat in the bottom of the channel over the installed TRM (figure 1). The ShoreMax mat should be installed up to the appropriate elevation on the side slope as determined by the engineer. When using multiple panels, connect the panels using the Integrated Panel Interlock System (figure 2). ShoreMax mat can be laid in either direction.
4. For channels carrying continuous water flows, an appropriate geotextile should be placed under the ShoreMax mat for submerged applications (figure 1b).
5. Place staples/anchors in the appropriate pattern. Perimeter staples can be shared between two adjacent panels. In soft or highly erodible soils, percussion earth anchors may be required. View ShoreMax Anchoring Guide, for additional details.
6. At beginning of channel and areas where significant concentrated flows are directed onto the ShoreMax mat, place 1 staple/pin per linear foot along the leading edge of the ShoreMax system, resulting in 1 staple/pin on each corner and gridline (figure 3).



FLEXAMAT INFORMATION

Manufacturer:	Motz Enterprises, Inc.
Product Name:	Flexamat®
Address:	3153 Madison Road
	Cincinnati, Ohio 45209
Telephone:	513-772-MOTZ (6689)
Fax:	513-772-6690
Contact:	Matt Motz
Email:	Matt@Flexamat.com
Website:	www.Flexamat.com

CONSTRUCTION NOTES:

1. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN THE CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS.
2. APPLY SEED DIRECTLY TO THE PREPARED SOIL PRIOR TO FLEXAMAT INSTALLATION. USE SEED PER PROJECT SPECIFICATIONS.
3. INSTALL FLEXAMAT ROLLS. AVAILABLE WIDTHS ARE 4', 5.5', 8', 10', 12', & 16' AVAILABLE IN CUSTOM LENGTHS.
4. AT THE TOP OF THE CHANNEL, THE INITIAL LEADING EDGE OF FLEXAMAT EXPOSED TO CONCENTRATED FLOWS SHALL BE EMBEDDED 18" VERTICALLY INTO THE SUBGRADE TO SERVE AS AN ANCHOR TRENCH. THE TRENCH SHALL BE FILLED AND COMPACTED WITH SUITABLE FILL.
5. AT THE END OF THE ARMORED CHANNEL, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH SUITABLE FILL.

FLEXAMAT ®CHANNEL DETAIL – LOW WATER CROSSING

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
PE F3791
05/15/2018

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

DESIGNED BY:	DRAFTED BY:
BM	IW

DATE

REVISION

SHEET NAME: DETAILS - EROSION CONTROL MATTING

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 3 OF 14

SHEET NO.: 3

FILE PATH:J:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - GENERAL NOTES.dwg - May 15, 2018 - 9:12am

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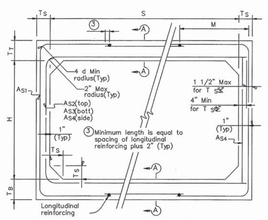
BOX DATA

SECTION DIMENSIONS S (ft)	H (ft)	T_1 (in)	T_2 (in)	T_3 (in)	Fill Height (ft)	M (Min) (in)	REINFORCING (in²/ft) A_{S1}	A_{S2}	A_{S3}	A_{S4}	A_{S5}	A_{S6}	A_{S7}	A_{S8}	① Unit Weight (Tons)
10	5	10	10	10	<2	–	0.30	0.36	0.30	0.24	0.24	0.24	0.24	0.24	17.5
10	5	10	10	10	2<3	58	0.35	0.39	0.34	0.24	–	–	–	–	17.5
10	5	10	10	10	3–5	53	0.28	0.31	0.30	0.24	–	–	–	–	17.5
10	5	10	10	10	10	52	0.33	0.35	0.36	0.24	–	–	–	–	17.5
10	5	10	10	10	15	47	0.42	0.46	0.47	0.24	–	–	–	–	17.5
10	5	10	10	10	20	47	0.55	0.59	0.61	0.24	–	–	–	–	17.5
10	5	10	10	10	25	47	0.68	0.73	0.75	0.24	–	–	–	–	17.5
10	6	10	10	10	<2	–	0.28	0.38	0.33	0.24	0.24	0.24	0.24	0.24	18.5
10	6	10	10	10	2<3	58	0.32	0.42	0.37	0.24	–	–	–	–	18.5
10	6	10	10	10	3–5	52	0.26	0.34	0.33	0.24	–	–	–	–	18.5
10	6	10	10	10	10	52	0.30	0.38	0.39	0.24	–	–	–	–	18.5
10	6	10	10	10	15	47	0.39	0.49	0.51	0.24	–	–	–	–	18.5
10	6	10	10	10	20	47	0.50	0.63	0.65	0.24	–	–	–	–	18.5
10	6	10	10	10	25	47	0.61	0.78	0.80	0.24	–	–	–	–	18.5
10	7	10	10	10	<2	–	0.25	0.40	0.36	0.24	0.24	0.24	0.24	0.24	19.5
10	7	10	10	10	2<3	58	0.30	0.45	0.40	0.24	–	–	–	–	19.5
10	7	10	10	10	3–5	58	0.24	0.36	0.35	0.24	–	–	–	–	19.5
10	7	10	10	10	10	52	0.28	0.40	0.42	0.24	–	–	–	–	19.5
10	7	10	10	10	15	47	0.36	0.52	0.54	0.24	–	–	–	–	19.5
10	7	10	10	10	20	47	0.46	0.67	0.69	0.24	–	–	–	–	19.5
10	7	10	10	10	25	47	0.56	0.82	0.85	0.24	–	–	–	–	19.5
10	8	10	10	10	<2	–	0.24	0.41	0.38	0.24	0.24	0.24	0.24	0.24	20.5
10	8	10	10	10	2<3	64	0.27	0.47	0.43	0.24	–	–	–	–	20.5
10	8	10	10	10	3–5	58	0.24	0.38	0.38	0.24	–	–	–	–	20.5
10	8	10	10	10	10	52	0.26	0.42	0.44	0.24	–	–	–	–	20.5
10	8	10	10	10	15	47	0.34	0.54	0.57	0.24	–	–	–	–	20.5
10	8	10	10	10	20	47	0.43	0.69	0.72	0.24	–	–	–	–	20.5
10	9	10	10	10	<2	–	0.24	0.42	0.41	0.24	0.24	0.24	0.24	0.24	21.5
10	9	10	10	10	2<3	70	0.26	0.50	0.46	0.24	–	–	–	–	21.5
10	9	10	10	10	3–5	64	0.24	0.40	0.40	0.24	–	–	–	–	21.5
10	9	10	10	10	10	58	0.25	0.43	0.46	0.24	–	–	–	–	21.5
10	9	10	10	10	15	52	0.32	0.56	0.59	0.24	–	–	–	–	21.5
10	9	10	10	10	20	47	0.40	0.71	0.75	0.24	–	–	–	–	21.5
10	10	10	10	10	<2	–	0.24	0.44	0.44	0.24	0.24	0.24	0.24	0.24	22.5
10	10	10	10	10	2<3	79	0.25	0.52	0.48	0.24	–	–	–	–	22.5
10	10	10	10	10	3–5	70	0.24	0.42	0.43	0.24	–	–	–	–	22.5
10	10	10	10	10	10	64	0.24	0.44	0.48	0.24	–	–	–	–	22.5
10	10	10	10	10	15	52	0.30	0.57	0.61	0.24	–	–	–	–	22.5
10	10	10	10	10	20	52	0.38	0.73	0.77	0.24	–	–	–	–	22.5

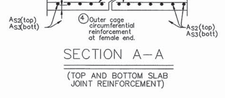
① For Box Length = 8'-0"

② A S1 thru A S4, S8 and A S6 the minimum required areas of reinforcement per linear foot of box length. A S5 and A S7 are minimum required areas of reinforcement per linear foot of box width.



FILL HEIGHT 2 FT AND GREATER

FILL HEIGHT LESS THAN 2 FT



SECTION A–A
(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.
See SCP-MD standard sheet for miscellaneous details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

SINGLE BOX CULVERTS PRECAST 10'-0" SPAN

SCP-10

FILE:	scp10s1s.dgn	DN: GAF	CK: LWJ	DW: BVM/TxDOT	CK: GAF
©TxDOT February 2009		CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

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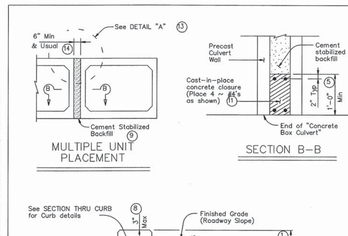
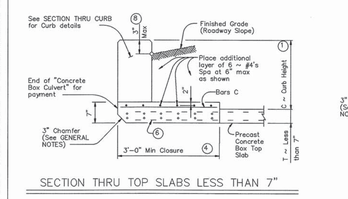
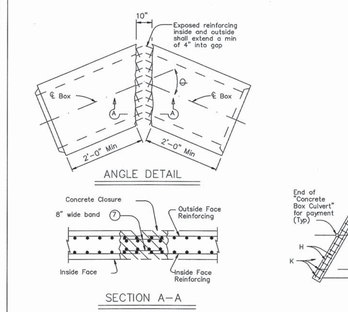
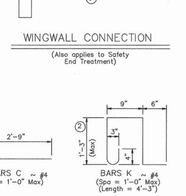




(6) QUANTITIES PER FOOT OF CURB	
Reinforcing Steel	4.18 Lb
Concrete	0.037 CY





① 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 traffic rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

② For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

③ Curb, Wingwall or Safety End Treatment reinforcing shall extend into concrete closure. Any reinforcing that does not fit into the closure shall be bent or trimmed as necessary.

④ Cast-in-place concrete closure shall be 3'-0" min. Boxes shall be cast short or broken back in the field. All reinforcing in the closure shall be the same size and spacing as in the precast box section. Except where shown otherwise, the cast-in-place closure shall be flush with the inside and outside faces of the precast box section.

⑤ For multiple unit placements the length of the closure for the interior walls may be adjusted as necessary. The length of the top slab, bottom slab, and exterior wall closure shall not be less than 3'-0". See Section B–B detail when interior walls are cast full length.

⑥ Precast box reinforcing shall extend a minimum of 1'-0" into concrete closure (Typ).

⑦ Bands of reinforcing matching the inside and outside face reinforcing shall be placed in the gaps of the top and bottom slabs. A band matching the outside face reinforcing of the wall shall be placed in the gaps of the walls (placed in the outside face only). The bands shall be tack welded to the exposed reinforcing at each point of contact.

⑧ For vehicle safety, the following requirements must be met:
– For structures without bridge rail, curbs shall project no more than 6" above finished grade.
– For structures with bridge rail, curbs shall be flush with finished grade.
Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

⑨ Cement Stabilized Backfill between boxes is considered part of the Box Culvert for payment.

⑩ All curb concrete and reinforcing is considered part of the Box Culvert for payment.

⑪ Any additional concrete and reinforcing required for the closures shall be considered as subsidiary to the Concrete Box Culvert.

⑫ 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

⑬ For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in DETAIL "A".

⑭ This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
All closure concrete shall be Class "C" with a minimum compressive strength of 3600 psi and shall be placed according to the Item, "Concrete Substructures".
Any additional concrete required for the closures shall be considered as subsidiary to the Concrete Box Culvert.
Refer to the Single Box Culverts Precast standard for details not shown.
The bottom edge of the top slab closure shall be chamfered 3 inches at the entrance.

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE:	scpmdetails.dgn	DN: GAF	CK: LWJ	DW: BVM/TxDOT	CK: GAF
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REVISIONS		DIST	COUNTY		SHEET NO.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID # F3791
Brendan McEntee
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

DATE
REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

TABLE OF DIMENSIONS & REINFORCING STEEL (Wings for One Structure End)												
Dimensions					Variable Reinforcing				Estimated ③ Quantities per ft of wing length (2~Wings)			
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J 1 Size	Bars J 1 Spa	Bars J 2 Size	Bars J 2 Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'- 8"	1'- 9"	1'- 3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'- 2"	2'- 0"	1'- 6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'- 8"	2'- 3"	1'- 9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'- 2"	2'- 6"	2'- 0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'- 8"	2'- 9"	2'- 3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'- 2"	3'- 0"	2'- 6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'- 8"	3'- 3"	2'- 9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'- 2"	3'- 6"	3'- 0"	1'- 0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'- 8"	4'- 0"	3'- 0"	1'- 1"	#8	6"	#6	6"	283.06	1.068
16'-0"	8'- 2"	4'- 6"	3'- 0"	1'- 3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING (2~Wings)			
Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES			
Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)
Hw = H + T + C – 0.250'
A = (Hw – 0.333') (SL)
B = (A) Tangent (30°)
Lw = (A) ÷Cosine (30°)
For Cast-in-place culverts:
Ltw = (N) (S) (N) + (U)
For Precast culverts:
Ltw = (N) (2U -S) (N) + (0.5')
Total Wingwall Area (Two Wings ~ S.F.)=(Hw – 0.333') (Lw)

Hw = Height of Wingwall
SL:1 = Side Slope Ratio (Horizontal:1 Vertical)
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans

See applicable box culvert standard for H, S, T, and U values.

① Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.

② Adjust to fit as necessary to maintain 1 1/4" clear cover and 4" minimum between bars.

③ Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by Lw.

④ Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.

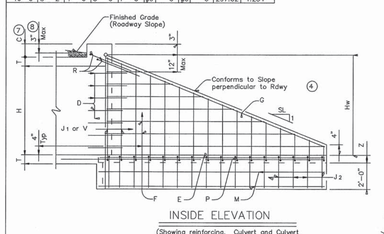
⑤ When shown elsewhere on the plans, a 5" deep concrete riprap shall be constructed. Payment for riprap shall be as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, the riprap shall have a 6" wide by 1'-6" deep reinforced concrete toewall along all edges adjacent to natural ground; the toewall shall be reinforced by extending typical riprap reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprap, at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B–B will not be required.

⑥ At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing from that shown as necessary.

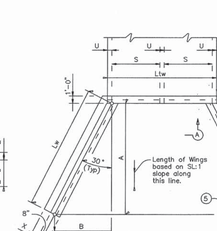
⑦ 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

⑧ For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.

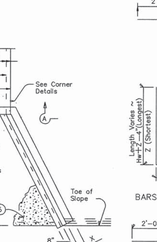
GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
All reinforcing steel shall be Grade 60.
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
All reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See BCS sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.



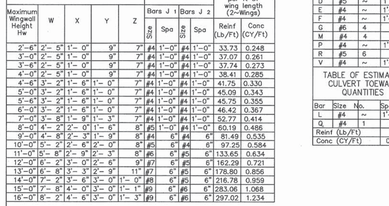
SECTION A–A



CORNER DETAILS
(Culvert and Culvert Toewall reinforcing not shown for clarity.)



SECTION B–B ⑤



INSIDE ELEVATION
(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)



PLAN
(Showing dimensions.)

BARS J1 BARS V BARS L BARS J2

TABLE OF DIMENSIONS & REINFORCING STEEL (Wings for One Structure End)												
Dimensions					Variable Reinforcing				Estimated ③ Quantities per ft of wing length (2~Wings)			
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J 1 Size	Bars J 1 Spa	Bars J 2 Size	Bars J 2 Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'- 5"	1'- 0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'- 2"	1'- 6"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'- 8"	1'- 9"	1'- 3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'- 2"	2'- 0"	1'- 6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'- 8"	2'- 3"	1'- 9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'- 2"	2'- 6"	2'- 0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'- 8"	2'- 9"	2'- 3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'- 2"	3'- 0"	2'- 6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'- 8"	3'- 3"	2'- 9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'- 2"	3'- 6"	3'- 0"	1'- 0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'- 8"	4'- 0"	3'- 0"	1'- 1"	#8	6"	#6	6"	283.06	1.068
16'-0"	8'- 2"	4'- 6"	3'- 0"	1'- 3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING (2~Wings)			
Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES			
Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)
Hw = H + T + C – 0.250'
Lw = (Hw – 0.333') (SL)
For Cast-in-place culverts:
Ltw = (N) (S) (N) + (U)
For Precast culverts:
Ltw = (N) (2U -S) (N) + (0.5')
Total Wingwall Area (Two Wings ~ S.F.)=(Hw – 0.333') (Lw)

Hw = Height of Wingwall
SL:1 = Side Slope Ratio (Horizontal:1 Vertical)
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans

See applicable box culvert standard for H, S, T, and U values.

① Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.

② Adjust to fit as necessary to maintain 1 1/4" clear cover and 4" minimum between bars.

③ Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by Lw.

④ Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.

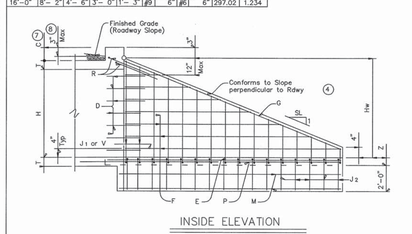
⑤ When shown elsewhere on the plans, a 5" deep concrete riprap shall be constructed. Payment for riprap shall be as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, the riprap shall have a 6" wide by 1'-6" deep reinforced concrete toewall along all edges adjacent to natural ground; the toewall shall be reinforced by extending typical riprap reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprap, at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B–B will not be required.

⑥ At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing from that shown as necessary.

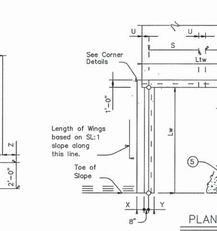
⑦ 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

⑧ For vehicle safety, curb heights and wall heights shall be reduced, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.

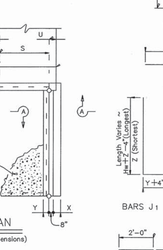
GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
All reinforcing steel shall be Grade 60.
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
All reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See BCS sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.



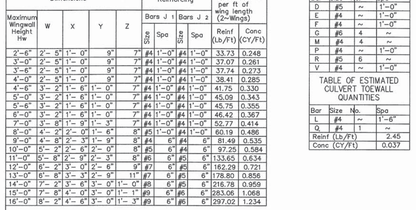
SECTION A–A



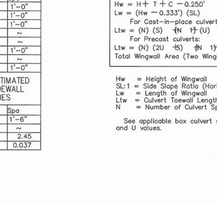
CORNER DETAILS



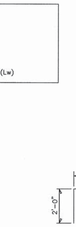
SECTION B–B ⑤



INSIDE ELEVATION
(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)



PLAN
(Showing Dimensions)



BARS J1 BARS V BARS L BARS J2

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0

FILE:	fw-0s1s.dgn	DN: GAF	CK:	DW: TxDOT	CK: GAF
©TxDOT February 2003		CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.
11-05: Add note for synthetic fibers.					

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

SW-0

FILE:	sw-0s1s.dgn	DN: GAF	CK:	DW: TxDOT	CK: GAF
©TxDOT February 2003		CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.
11-05: Add note for synthetic fibers.					

SHEET NAME: DETAILS - BOX CULVERTS
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018
JOB NUMBER: 4697
SHEET: 4 OF 14
SHEET NO.: 4

FILE PATH: J:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - GENERAL NOTES.dwg - May 14, 2018 - 5:25pm

CONTRACTOR TO PROTECT & PRESERVE EX. OVERHEAD ELECTRIC WIRES, POLES, & GUY WIRES

STABILIZED CONSTRUCTION ENTRANCE (50'L x 20'W)

J-HOOK (TYP. 1 OF 4)

STAGING & SPOILS STORAGE APPROX. 1.5 ACRES FOR 18,000 CY (VEHICULAR)

STAGING & SPOILS STORAGE APPROX. 2.8 ACRES FOR 34,000 CY (VEHICULAR)

STAGING & SPOILS STORAGE APPROX. 2.7 ACRES FOR 33,750 CY (VEHICULAR)

STATE HWY 304 - ROW VARIES

4' ELECTRIC FACILITIES EASEMENT VOLUME 1790, PAGE 606, OPRBCT

16' ELECTRIC FACILITIES EASEMENT VOLUME 1790, PAGE 612

25' TEMPORARY CONSTRUCTION AND PERMANENT PUBLIC UTILITY EASEMENT VOLUME 1961, PAGE 649

Remaining 93.013 Acres Bastrop Grove Partners, LTD. Vol. 1698, Pg. 246, OPRBCT

Centerline of 100' Wide Electric Easement, Vol. C Pg. 417, Court Minutes (Bastrop County)

AGNES ROAD (BY OTHERS)

52.684 ACRES
Portion 145.691 Acres
71 Retail Partners, LP.
Vol. 2245, Pg. 878
OPRBCT

SOUTH AGNES ROAD

INSTALL NORTH AMERICAN GREEN SHOREMAX OVER SC250 TRM (OR EQUIVALENT) EXTENDING 80' FROM END OF HEADWALL. SHOREMAX TO BE USED ON CHANNEL BOTTOM AND SLOPES TO ELEVATION 342.20. FROM ELEVATION 342.20 – 349.80 INSTALL NORTH AMERICAN GREEN P550 TRM (OR EQUIVALENT).

PROPOSED LOW WATER CROSSING TO MATCH CURRENT DRIVE ALIGNMENT & SURFACED WITH 10' WIDE x 212' LONG FLEXAMAT FLEXIBLE CONCRETE BLOCKS MAT WITH SC250 TRM UNDERLAYMENT

COLORADO RIVER

PROPOSED 14' WIDE CONCRETE DRIVEWAY TO REPLACE EX. DIRT ROAD

ROCK BERM (TYP. 1 OF 10) SEE DETAIL ON SHEET 2

EX. BOX CULVERT & FLOOD CONTROL STRUCTURE TO BE REMOVED AND REPLACED

11.563 ACRE DRAINAGE EASEMENT VOLUME 1819, PAGE 840

CHANNEL SIDE SLOPES & BOTTOM TO BE SURFACED WITH NORTH AMERICAN GREEN SC250 TRM (OR EQUIVALENT) UNTIL 100-YR WSE (SEE SHEET 7 FOR 100-YR WSE ALONG CHANNEL CENTERLINE). FROM 100-YR WSE TO EXTENTS OF PROPOSED GRADING INSTALL NORTH AMERICAN GREEN SC150 RECM (OR EQUIVALENT). MATTING INSTALLED PER MANUFACTURERS DIRECTIONS (TYP.)

CONTRACTOR TO PROTECT AND PRESERVE EX. OVERHEAD ELECTRIC WIRES & POLES

3.653 ACRE 80' DRAINAGE EASEMENT DEDICATED BY PROPERTY OWNER

INSTALL NORTH AMERICAN GREEN SC250 TRM (OR EQUIVALENT) ON CHANNEL BOTTOM AND ALONG SLOPES TO ELEVATION 356.10. DISTURBED AREAS ABOVE 356.10 TO BE SURFACED WITH NORTH AMERICAN GREEN SC150 RECM (OR EQUIVALENT).

STABILIZED CONSTRUCTION ENTRANCE (50'L x 20'W)

2-6'x5' BOX CULVERTS, HEADWALL, & PARALLEL WINGWALLS TO BE INSTALLED BY OTHERS

0 200' 400'

SCALE: 1" = 200'

LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- IP — INLET PROTECTION
- RB — ROCK BERM
- JH — J-HOOK
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- NORTH AMERICAN GREEN SHOREMAX OVER SC250 TRM (OR EQUIVALENT) (SEE DETAIL ON SHEET 3)
- NORTH AMERICAN GREEN P550 TRM (OR EQUIVALENT) (SEE DETAIL ON SHEET 3)
- NORTH AMERICAN GREEN SC250 TRM (OR EQUIVALENT) (SEE DETAIL ON SHEET 3)
- NORTH AMERICAN GREEN SC150 RECM (OR EQUIVALENT) (SEE DETAIL ON SHEET 3)

NOTES:

1. ALL SLOPES 3:1 OR GREATER SHALL BE STRUCTURALLY STABILIZED WITH TRM, SOIL, AND SEEDING PER GENERAL NOTES.
2. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES ARE TO BE REVEGETATED PER TPDES REQUIREMENTS. CONTRACTOR WILL BE RESPONSIBLE TO MAINTAIN BMPS UNTIL A N.O.T. IS PROCESSED FOR THE SITE.

LIMITS OF CONSTRUCTION: 958,599 SF / 22.01 AC

APPROX. NET CUT: 63,500 CY (NET SECTION)

SILT FENCE: 13,740 LF

J-HOOK: 4 EA

SC150 RECM: 11,221 SY

SC250 TRM: 41,367 SY

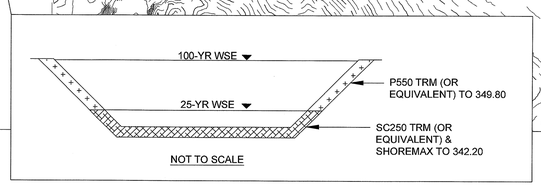
P550 TRM: 1,669 SY

SHOREMAX MAT: 738 SY

FLEXAMAT MAT: 236 SY

ROCK BERMS: 10 EA

SCE: 2 EA



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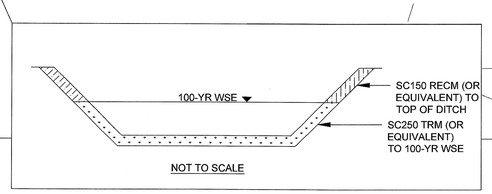

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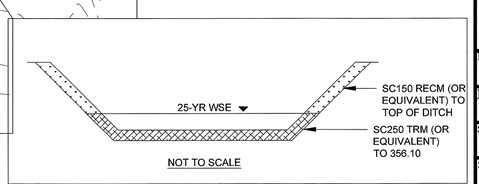


NOT TO SCALE

10/18/2018
STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION	DATE
1 RELOCATED SPOIL PILES	10/18/18

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791

Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: EROSION CONTROL PLAN

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

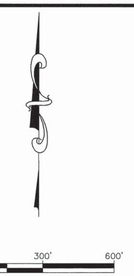
JOB NUMBER: 4697

SHEET: 5 OF 14

SHEET NO.: 5

FILE PATH: J:\AutoCad 2004 Land Projects\4697\Dwg\Channel\4697 - EROSION CONTROL



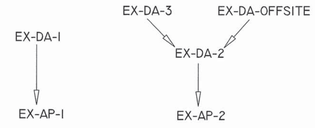


SCALE: 1" = 300'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- DRAINAGE BOUNDARY LINE
- AI — DRAINAGE AREA LABEL
- ANALYSIS POINT (AP)
- 940 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- FLOW ARROW
- TcFP — TIME OF CONCENTRATION FLOW PATH

HYDROLOGY FLOW CHART



TIME OF CONCENTRATION CALCULATIONS EXISTING CONDITIONS

Drainage Area #	Sheet Flow				Shallow Conc. Flow				Channel Flow						Tc (Min.)
	n	Slope	L	Tc	Paved/ Unpaved	Slope	L	Tc	n	Slope	L	Ax-sect	WP	Tc	
EX-DA-1	0.15	0.30%	100	19.73	U	0.19%	3154.97	74.77							94.5
DA-OFFSITE	0.011	0.50%	100	1.99	U	0.50%	2336	34.13	0.013	0.50%	1793	18	18	3.69	39.8
EX-DA-2	0.15	0.56%	100	15.37	U	0.34%	3712.93	65.78	0.026	1.58%	2631.64	200	60	2.72	83.9
EX-DA-3	0.15	0.36%	100	18.34	U	0.76%	1684.2	19.96							38.3

RESULTS TABLE - EXISTING CONDITIONS

SUB-BASIN	AREA (AC.)	% IC	CN	Q_{10} (CFS)	Q_{25} (CFS)	Q_{100} (CFS)
EX-DA-1 / EX-AP-1	101.79	0	57	59.56	97.12	167.35
DA-OFFSITE	69.84	28	71	127.94	181.31	273.3
EX-DA-2	193.08	0	60	140.32	219.91	366.23
EX-DA-3	50.91	0	52	36.56	64.3	117.99
EX-AP-2				257.24	395.87	648.66

NOTES:

- SCS WAS USED AS DRAINAGE CALCULATION METHOD
- RAINFALL INTENSITY DATA FOR DESIGN STORMS WERE PROVIDED BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90)
- CN'S ARE BASED ON EXISTING TYPE A & B SOILS AND REFLECT VALUES PER THE USDA WEB SOIL SURVEY
- TOC CALCULATIONS ARE BASED ON ASSUMED EXISTING CONDITIONS & TR-55
- MANNING'S N VALUES FROM TR-55:
  - PIPE/CHANNEL FLOW
    - PIPES - REINFORCED CONCRETE = 0.013
    - NATURAL CHANNELS - EARTH, STRAIGHT, SOME GRASS = 0.026
  - OVERLAND FLOW
    - SMOOTH SURFACE (CONCRETE, ASPHALT, BARE SOIL) = 0.011
    - SHORT GRASS = 0.015
- OFFSITE IMPERVIOUS COVERS ARE APPROXIMATE BASED ON AERIAL IMAGERY

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	TW

REVISION / DATE

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: EXISTING DRAINAGE AREA MAP
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018
JOB NUMBER: 4697
SHEET: 6 OF 14
SHEET NO.: 6

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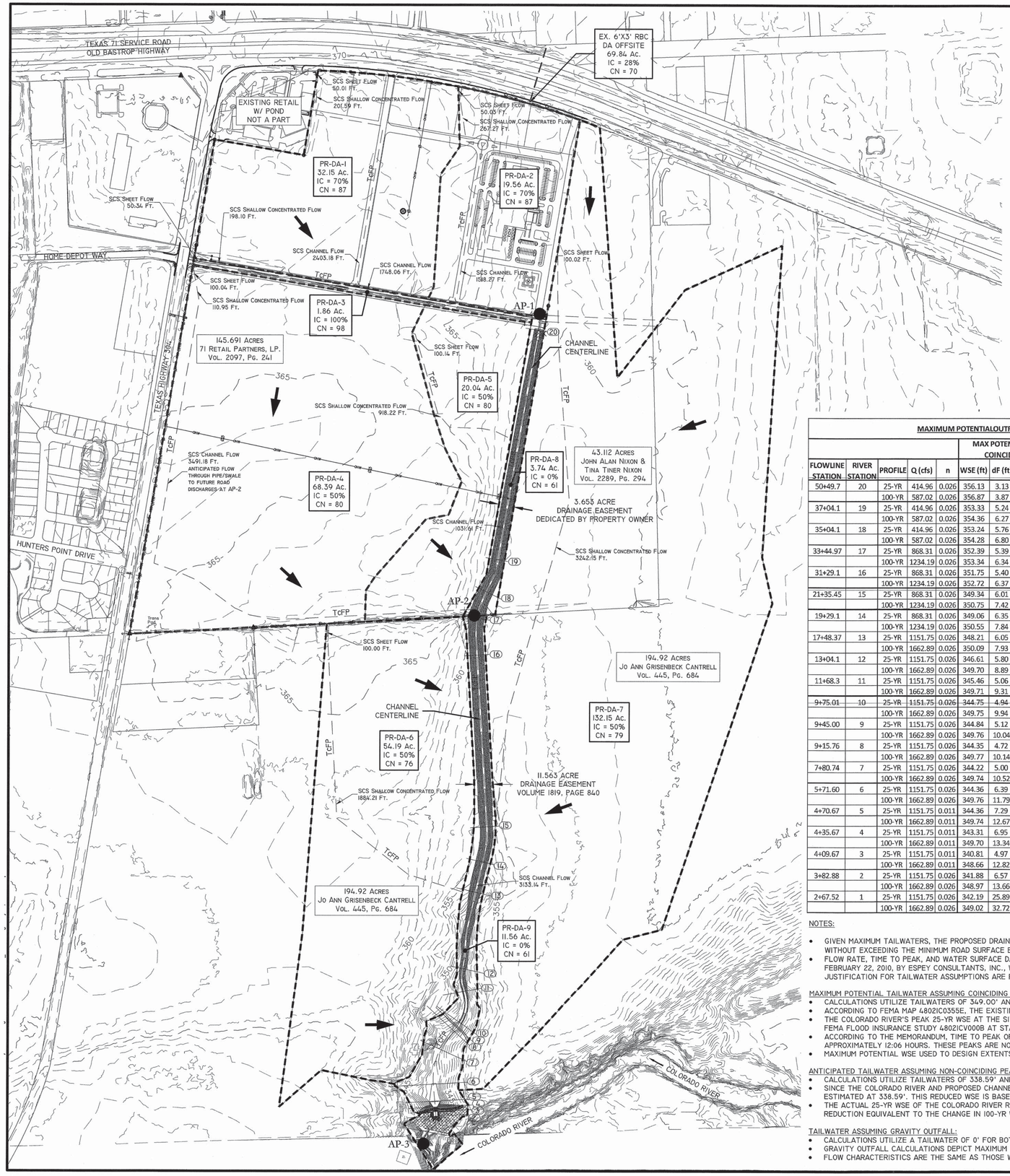
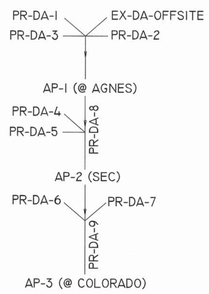


HYDROLOGY FLOW CHART







SCALE: 1" = 300'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- DRAINAGE BOUNDARY LINE
- AI — DRAINAGE AREA LABEL
- ANALYSIS POINT (AP)
- 940 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- FLOW ARROW
- TcFP — TIME OF CONCENTRATION FLOW PATH

TIME OF CONCENTRATION CALCULATIONS PROPOSED CONDITIONS

Area #	Sheet Flow				Shallow Conc. Flow				Channel Flow						Tc (Min.)
	n	Slope	L	Tc	Paved/ Unpaved	Slope	L	Tc	n	Slope	L	Axsect	WP	Tc	
DA-OFFSITE	0.011	0.50%	100	1.99	U	0.50%	2336	34.13	0.013	0.50%	1793	18	18	3.69	39.8
PR-DA-1	0.011	0.50%	100	1.99	U	0.50%	202	2.22	0.013	0.50%	2403	27.58	15.88	3.41	7.6
PR-DA-2	0.011	0.50%	100	1.99	U	0.50%	217.47	3.18	0.013	0.50%	1518.01	19.15	13.23	2.44	7.6
PR-DA-3	0.011	2.00%	50	0.66	P	1.00%	198	1.62	0.013	0.50%	1748.06	27.58	15.88	2.48	4.8
PR-DA-4	0.011	0.50%	100	1.99	U	0.50%	110.95	1.62	0.013	0.50%	3491.18	37.54	18.53	4.47	8.1
PR-DA-5	0.011	0.50%	100	1.99	U	0.50%	918.22	13.41	0.026	0.30%	1031.61	86.78	34.61	2.96	18.4
PR-DA-6	0.011	0.50%	100	1.99	U	0.74%	1884.2	22.63							24.6
PR-DA-7	0.011	0.50%	100	1.99	U	0.23%	3242.18	69.83							71.8
PR-DA-8									0.026	0.30%	1715.36	86.78	34.61	4.92	4.9
PR-DA-9									0.026	0.30%	3133	320	65.25	5.73	5.7

MAXIMUM POTENTIALOUTFALL CONDITIONS FOR 100-YR AND 25-YR STORM EVENTS

					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS				TW WITH GRAVITY OUTFALL			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
50+49.7	20	25-YR	414.96	0.026	356.13	3.13	3.31	0.000888	356.13	3.13	3.31	0.000888	356.13	3.13	3.31	0.000888
		100-YR	587.02	0.026	356.87	3.87	3.79	0.000918	356.87	3.87	3.79	0.000918	356.87	3.87	3.79	0.000918
37+04.1	19	25-YR	414.96	0.026	353.33	5.24	3.34	0.000782	353.33	5.24	3.34	0.000782	353.33	5.24	3.34	0.000782
		100-YR	587.02	0.026	354.36	6.27	3.49	0.000694	354.35	6.26	3.5	0.000698	354.35	6.26	3.5	0.000698
35+04.1	18	25-YR	414.96	0.026	353.24	5.76	2.85	0.000513	353.24	5.76	2.85	0.000513	353.24	5.76	2.85	0.000513
		100-YR	587.02	0.026	354.28	6.80	3.04	0.00048	354.27	6.79	3.05	0.000483	354.27	6.79	3.05	0.000483
33+44.97	17	25-YR	868.31	0.026	352.39	5.39	6.66	0.003008	352.39	5.39	6.66	0.003008	352.39	5.39	6.66	0.003008
		100-YR	1234.19	0.026	353.34	6.34	7.2	0.002937	353.32	6.32	7.24	0.002981	353.32	6.32	7.24	0.002981
31+29.1	16	25-YR	868.31	0.026	351.75	5.40	6.65	0.002991	351.75	5.40	6.65	0.002991	351.75	5.40	6.65	0.002991
		100-YR	1234.19	0.026	352.72	6.37	7.14	0.00285	352.68	6.33	7.22	0.002935	352.68	6.33	7.22	0.002935
21+35.45	15	25-YR	868.31	0.026	349.34	6.01	5.56	0.001849	349.34	6.01	5.56	0.001849	349.34	6.01	5.56	0.001849
		100-YR	1234.19	0.026	350.75	7.42	5.5	0.001418	350.43	7.10	5.93	0.001734	350.43	7.10	5.93	0.001734
19+29.1	14	25-YR	868.31	0.026	349.06	6.35	5.05	0.001429	349.06	6.35	5.05	0.001429	349.06	6.35	5.05	0.001429
		100-YR	1234.19	0.026	350.55	7.84	4.99	0.001095	350.18	7.47	5.43	0.001371	350.18	7.47	5.43	0.001371
17+48.37	13	25-YR	1151.75	0.026	348.21	6.05	7.26	0.003155	348.21	6.05	7.26	0.003155	348.21	6.05	7.26	0.003155
		100-YR	1662.89	0.026	350.09	7.93	6.28	0.001586	349.23	7.07	7.96	0.003064	349.23	7.07	7.96	0.003064
13+04.1	12	25-YR	1151.75	0.026	346.61	5.80	7.44	0.004251	346.61	5.80	7.44	0.004251	346.61	5.80	7.44	0.004251
		100-YR	1662.89	0.026	349.70	8.89	4.78	0.000681	347.22	6.41	8.83	0.004786	347.22	6.41	8.83	0.004786
11+68.3	11	25-YR	1151.75	0.026	345.46	5.06	9.46	0.005489	345.46	5.06	9.46	0.005489	345.46	5.06	9.46	0.005489
		100-YR	1662.89	0.026	349.71	9.31	4.44	0.000416	346.47	6.07	9.83	0.004214	346.47	6.07	9.83	0.004214
9+75.01	10	25-YR	1151.75	0.026	344.75	4.94	9.18	0.004232	344.75	4.94	9.18	0.004232	344.75	4.94	9.18	0.004232
		100-YR	1662.89	0.026	349.75	9.94	3.11	0.000166	346.54	6.73	6.94	0.001482	346.54	6.73	6.94	0.001482
9+45.00	9	25-YR	1151.75	0.026	344.84	5.12	4.55	0.00111	344.84	5.12	4.55	0.00111	344.84	5.12	4.55	0.00111
		100-YR	1662.89	0.026	349.76	10.04	2.16	0.000081	346.70	6.98	3.99	0.000497	346.70	6.98	3.99	0.000497
9+15.76	8	25-YR	1151.75	0.026	344.35	4.72	7.99	0.002899	344.35	4.72	7.99	0.002899	344.35	4.72	7.99	0.002899
		100-YR	1662.89	0.026	349.77	10.14	2.63	0.000106	346.63	7.00	5.43	0.000759	346.63	7.00	5.43	0.000759
7+80.74	7	25-YR	1151.75	0.026	344.22	5.00	7.39	0.002116	344.22	5.00	7.39	0.002116	344.22	5.00	7.39	0.002116
		100-YR	1662.89	0.026	349.74	10.52	2.89	0.000117	346.55	7.33	5.45	0.00068	346.55	7.33	5.45	0.00068
5+71.60	6	25-YR	1151.75	0.026	344.36	6.39	2.86	0.000215	344.36	6.39	2.86	0.000215	344.36	6.39	2.86	0.000215
		100-YR	1662.89	0.026	349.76	11.79	1.36	0.000021	346.62	8.65	2.47	0.000107	346.62	8.65	2.47	0.000107
4+70.67	5	25-YR	1151.75	0.011	344.36	7.29	2.11	0.000017	344.36	7.29	2.11	0.000017	344.36	7.29	2.11	0.000017
		100-YR	1662.89	0.011	349.74	12.67	1.55	0.000004	346.59	9.52	2.22	0.000013	346.59	9.52	2.22	0.000013
4+35.67	4	25-YR	1151.75	0.011	343.31	6.95	8.09	0.00053	343.31	6.95	8.09	0.00053	343.31	6.95	8.09	0.00053
		100-YR	1662.89	0.011	349.70	13.34	2.6	0.000032	345.33	8.97	8.89	0.000525	345.33	8.97	8.89	0.000525
4+09.67	3	25-YR	1151.75	0.011	340.81	4.97	11.41	0.001431	340.48	4.64	12.22	0.001747	340.48	4.64	12.22	0.001747
		100-YR	1662.89	0.011	348.66	12.82	5.86	0.000198	341.76	5.92	13.81	0.0018	341.76	5.92	13.81	0.0018
3+82.88	2	25-YR	1151.75	0.026	341.88	6.57	5.71	0.000868	339.04	3.73	10.76	0.006582	339.04	3.73	10.76	0.006582
		100-YR	1662.89	0.026	348.97	13.66	2.81	0.000079	340.02	4.71	12	0.00599	340.02	4.71	12	0.00599
2+67.52	1	25-YR	1151.75	0.026	342.19	25.89	0.67	0.000006	332.04	15.74	1.97	0.000084	325.16	8.86	6.07	0.001823
		100-YR	1662.89	0.026	349.02	32.72	0.54	0.000003	338.64	22.34	1.38	0.000031	326.69	10.39	6.36	0.001551

RESULTS TABLE - PROPOSED CONDITIONS

SUB-BASIN	AREA (AC.)	%IC	CN	Q_{10} (CFS)	Q_{25} (CFS)	Q_{100} (CFS)
DA-OFFSITE	69.84	28	71	127.94	181.31	273.3
PR-DA-1	32.15	70	87	149.45	192.56	263.76
PR-DA-2	19.56	70	87	90.92	117.15	160.47
PR-DA-3	1.86	100	98	9.76	12.14	16.10
PR-DA-4	68.39	50	80	275.24	367.46	521.27
PR-DA-5	20.05	50	80	66.42	88.96	126.64
PR-DA-6	54.19	50	76	142.77	195.94	285.88
PR-DA-7	132.15	50	79	213.43	288.18	413.80
PR-DA-8	3.74	0	61	7.88	12.16	19.88
PR-DA-9	11.56	0	61	24.36	37.58	61.45
AP-1 (CHANNEL SOUTH OF AGNES)				312.95	414.96	587.02
AP-2 (CHANNEL AT SOUTHEAST PROPERTY CORNER)				650.57	868.31	1234.19
AP-3 (CHANNEL AT COLORADO RIVER)				850.01	1151.75	1662.89

NOTES:

- SCS WAS USED AS DRAINAGE CALCULATION METHOD
- RAINFALL INTENSITY DATA FOR DESIGN STORMS WERE PROVIDED BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90)
- CN'S ARE BASED ON EXISTING TYPE A & B SOILS AND REFLECT VALUES PER THE USDA WEB SOIL SURVEY
- TOC CALCULATIONS ARE BASED ON ASSUMED FUTURE DEVELOPMENT & TR-55
- MANNING'S N VALUES FROM TR-55:
  - PIPE/CHANNEL FLOW
    - PIPES - REINFORCED CONCRETE = 0.013
    - NATURAL CHANNELS - EARTH, STRAIGHT, SOME GRASS = 0.026
  - OVERLAND FLOW
    - SMOOTH SURFACE (CONCRETE, ASPHALT, BARE SOIL) = 0.011
    - SHORT GRASS = 0.015
- OFFSITE IMPERVIOUS COVERS ARE APPROXIMATE BASED ON AERIAL IMAGERY
- ONSITE IMPERVIOUS COVERS REFLECT ASSUMED FUTURE DEVELOPMENT AS FOLLOWS:
  - SINGLE-USE RESIDENTIAL = 50%
  - COMMERCIAL = 70%
  - ROADWAY = 100%

NOTES:

- GIVEN MAXIMUM TAILWATERS, THE PROPOSED DRAINAGE CHANNEL PROVIDES AT LEAST ONE FOOT OF FREEBOARD AT DESIGN FLOWS AND THE PROPOSED CULVERT HAS CAPACITY TO CONVEY 100-YR STORM RUNOFF WITHOUT EXCEEDING THE MINIMUM ROAD SURFACE ELEVATION OF AGNES ROAD AT 359.50', AS PER DESIGN REQUIREMENTS BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90).
- FLOW RATE, TIME TO PEAK, AND WATER SURFACE DATA FOR THE COLORADO RIVER ARE BASED ON FEMA MAP 48021C0355E AND THE DRAINAGE TECHNICAL MEMORANDUM FOR THE PECAN PARK DEVELOPMENT DATED FEBRUARY 22, 2010, BY ESPEY CONSULTANTS, INC., WHICH UTILIZED THE USGS GAGE 08159200 LOCATED AT STATE HIGHWAY 71 APPROXIMATELY 2 MILES UPSTREAM OF THE PROPOSED CHANNEL'S OUTFALL. JUSTIFICATION FOR TAILWATER ASSUMPTIONS ARE PROVIDED BELOW:

MAXIMUM POTENTIAL TAILWATER ASSUMING COINCIDING PEAKS:

- CALCULATIONS UTILIZE TAILWATERS OF 349.00' AND 342.17' FOR THE 100-YR AND 25-YR STORM EVENTS, RESPECTIVELY.
- ACCORDING TO FEMA MAP 48021C0355E, THE EXISTING 100-YR BFE AT THE SITE IS 349' MSL.
- THE COLORADO RIVER'S PEAK 25-YR WSE AT THE SITE IS ESTIMATED AT 342.17'. THIS WSE WAS EXTRAPOLATED FROM A LOGARITHMIC TREND OF BFE'S FOR VARIOUS ANNUAL CHANCE FLOODS USING DATA FROM THE FEMA FLOOD INSURANCE STUDY 48021CV000B AT STATION 'AW'.
- ACCORDING TO THE MEMORANDUM, TIME TO PEAK OF THE COLORADO RIVER IS APPROXIMATED AT 31:45 HOURS FOR THE 100-YR EVENT, WHEREAS THE PROPOSED CHANNEL'S TIME TO PEAK IS MODELED AT APPROXIMATELY 12:06 HOURS. THESE PEAKS ARE NON-COINCIDING AND THEREFORE THESE WSE'S OVERESTIMATE EXPECTED FLOODING FOR THE 100-YR AND 25-YR EVENTS.
- MAXIMUM POTENTIAL WSE USED TO DESIGN EXTENTS OF EROSION CONTROL MEASURES.

ANTICIPATED TAILWATER ASSUMING NON-COINCIDING PEAKS:

- CALCULATIONS UTILIZE TAILWATERS OF 338.59' AND 331.96' FOR THE 100-YR AND 25-YR STORM EVENTS, RESPECTIVELY.
- SINCE THE COLORADO RIVER AND PROPOSED CHANNEL PEAKS ARE NON-COINCIDING, AN ESTIMATED REDUCTION OF 10.41' IS EXPECTED TO BE REALIZED IN ACTUAL WSE AT 12:06 HOURS. THE 100-YR WSE IS ESTIMATED AT 338.59'. THIS REDUCED WSE IS BASED ON GRAPHICAL INTERPOLATIONS OF THE MEMORANDUM'S COLORADO RIVER 1% ANNUAL CHANCE HYDROGRAPH AND HYDRAULIC RATING CURVE.
- THE ACTUAL 25-YR WSE OF THE COLORADO RIVER REALIZED AT 12:06 HOURS AT THE PROPOSED CHANNEL'S OUTFALL IS ESTIMATED AT 331.96'. THIS REDUCED WSE WAS CALCULATED USING A PROPORTIONAL REDUCTION EQUIVALENT TO THE CHANGE IN 100-YR WSE'S REALIZED AT A TIME TO PEAK OF 31:45 HOURS AS COMPARED TO 12:06 HOURS.

TAILWATER ASSUMING GRAVITY OUTFALL:

- CALCULATIONS UTILIZE A TAILWATER OF 0' FOR BOTH THE 100-YR AND 25-YR STORM EVENTS.
- GRAVITY OUTFALL CALCULATIONS DEPICT MAXIMUM VELOCITIES WHICH ARE USED FOR DESIGN OF OUTFALL PROTECTION.
- FLOW CHARACTERISTICS ARE THE SAME AS THOSE WITH THE ANTICIPATED TAILWATER ASSUMING NON-COINCIDING PEAKS AT EVERY STATION EXCEPT STATION 1.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	IW

DATE

REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: PROPOSED DRAINAGE AREA MAP

JOB NAME: BASTROP GROVE

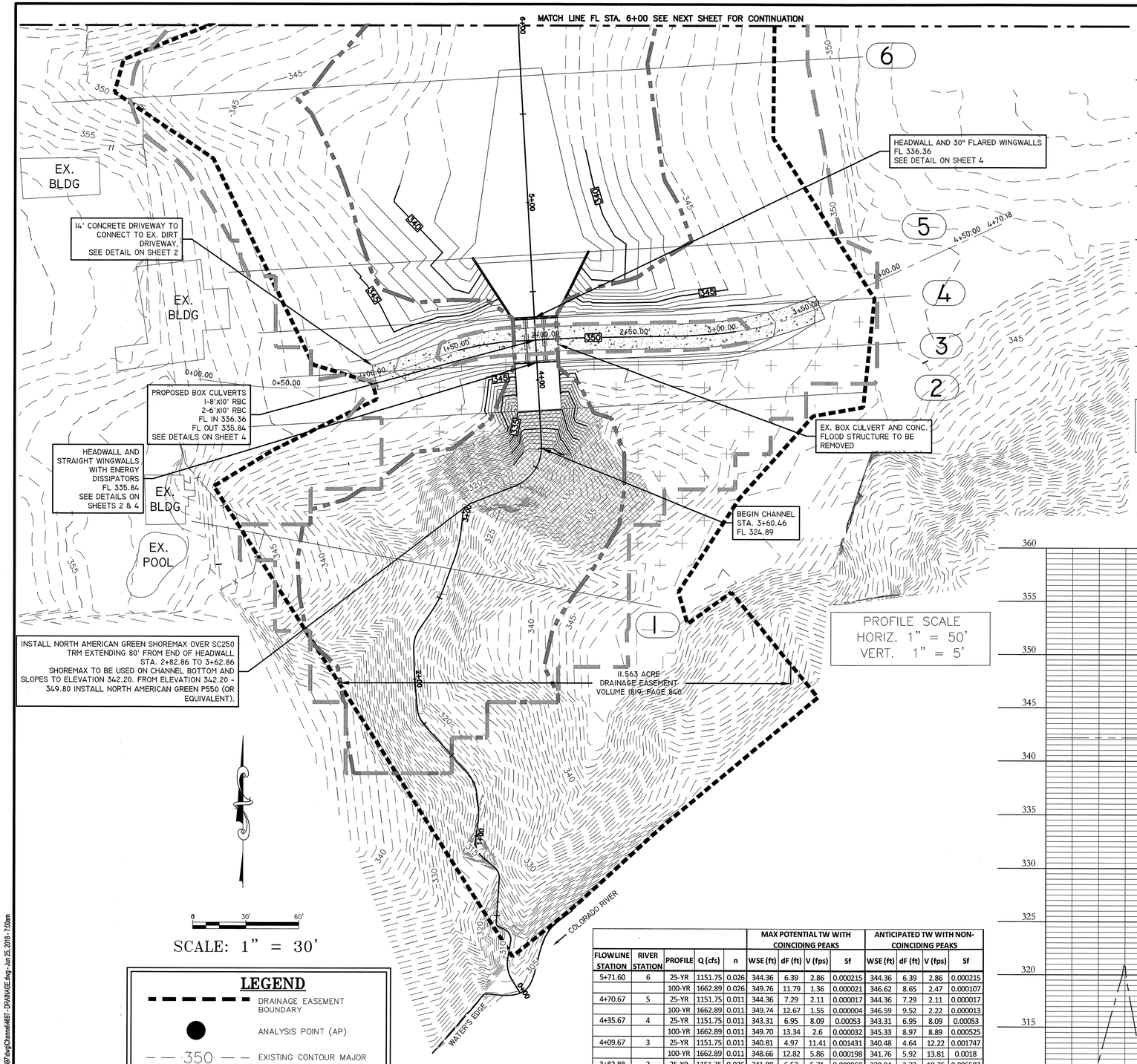
PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 7 OF 14

SHEET NO.: 7



0 30' 60'

SCALE: 1" = 30'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

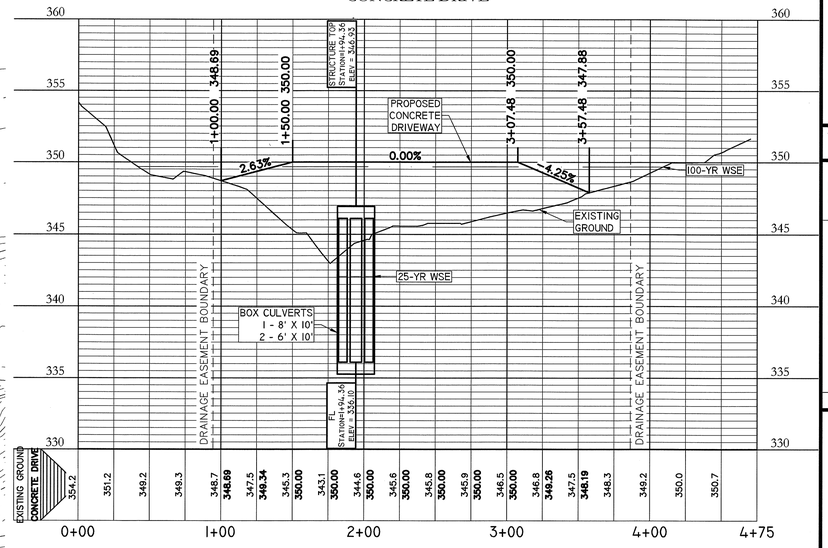
PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
5+71.60	6	25-YR	1151.75	0.026	344.36	6.39	2.86	0.000215	344.36	6.39	2.86	0.000215
		100-YR	1662.89	0.026	349.76	11.79	1.36	0.000021	346.62	8.65	2.47	0.000107
4+70.67	5	25-YR	1151.75	0.011	344.36	7.29	2.11	0.000017	344.36	7.29	2.11	0.000017
		100-YR	1662.89	0.011	349.74	12.67	1.55	0.000004	346.59	9.52	2.22	0.000013
4+35.67	4	25-YR	1151.75	0.011	343.31	6.95	8.09	0.00053	343.31	6.95	8.09	0.00053
		100-YR	1662.89	0.011	349.70	13.34	2.6	0.000032	345.33	8.97	8.89	0.000525
4+09.67	3	25-YR	1151.75	0.011	340.81	4.97	11.41	0.001431	340.48	4.64	12.22	0.001747
		100-YR	1662.89	0.011	348.66	12.82	5.86	0.000198	341.76	5.92	13.81	0.0018
3+82.88	2	25-YR	1151.75	0.026	341.88	6.57	5.71	0.000868	339.04	3.73	10.76	0.006582
		100-YR	1662.89	0.026	348.97	13.66	2.81	0.000079	340.02	4.71	12	0.00599
2+67.52	1	25-YR	1151.75	0.026	342.19	25.89	0.67	0.000006	332.04	15.74	1.97	0.000084
		100-YR	1662.89	0.026	349.02	32.72	0.54	0.000003	338.64	22.34	1.38	0.000031

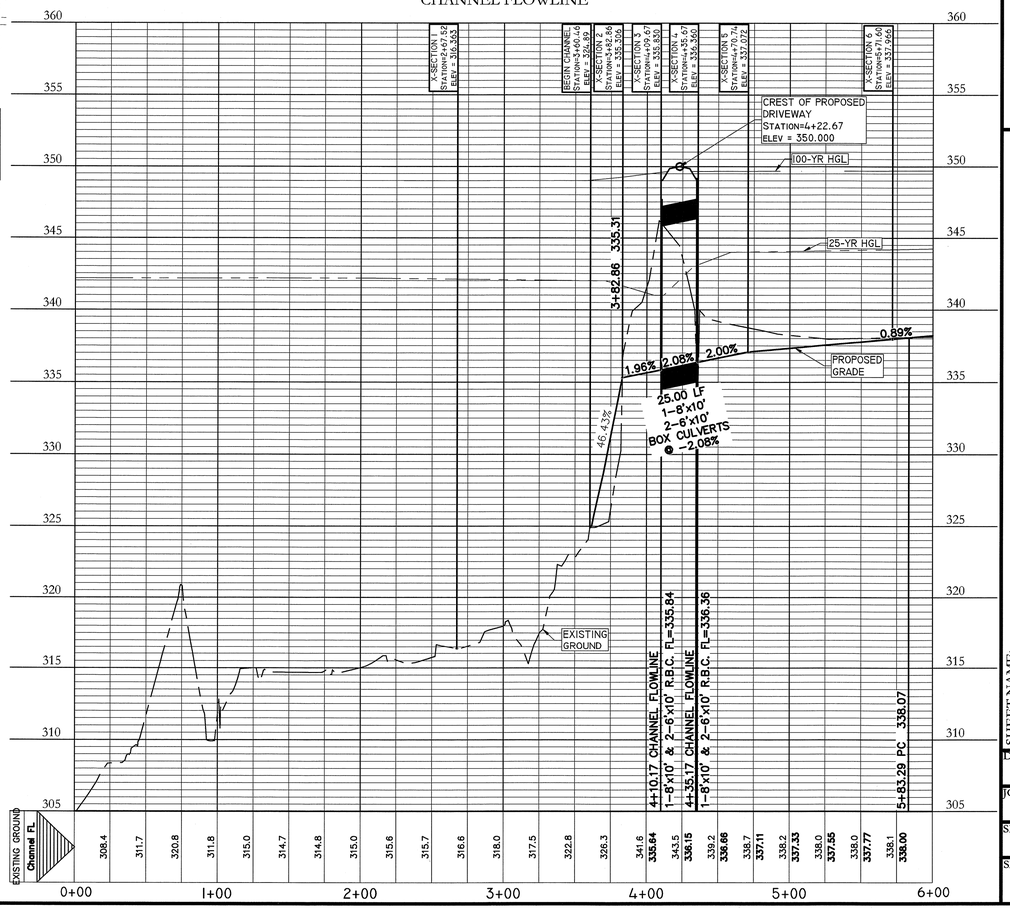
NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

CONCRETE DRIVE



CHANNEL FLOWLINE



STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
09/28/2018

Carlson, Brigance & Doering, Inc.
FIRM ID #F9791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION / DATE

SHEET NAME: CHANNEL - STA. 0+00 TO 6+00

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 8 OF 14

SHEET NO.: 8

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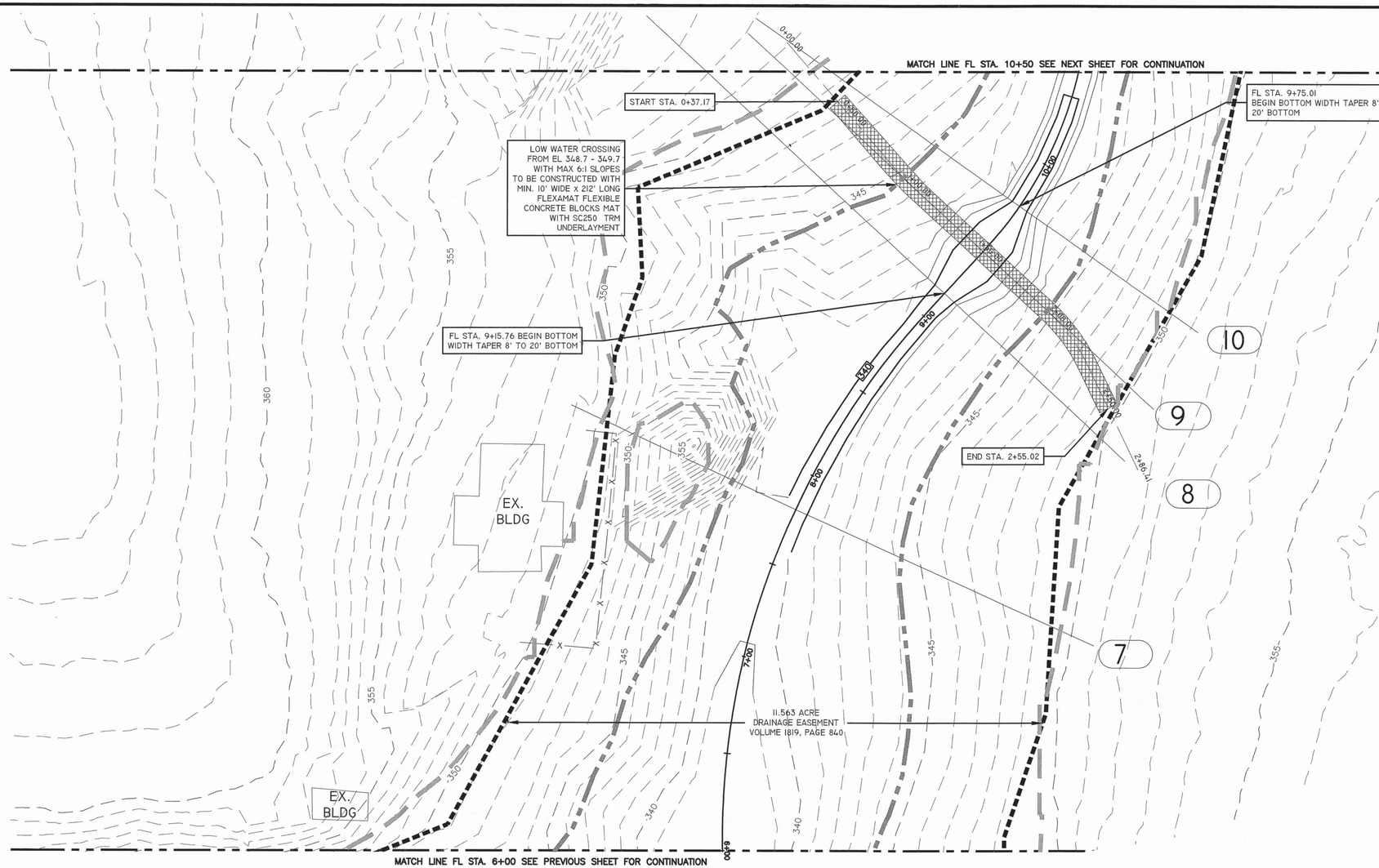


LEGEND

- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

0 30' 60'

SCALE: 1" = 30'

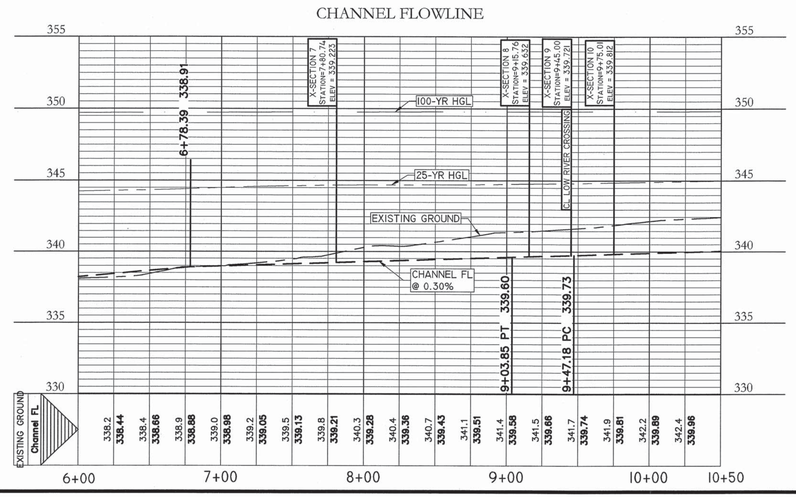
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	MAX POTENTIAL TW WITH COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf	ANTICIPATED TW WITH NON-COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf
9+75.01	10	25-YR	1151.75	0.026	344.75	4.94	9.18	0.004232	344.75	4.94	9.18	0.004232
		100-YR	1662.89	0.026	349.75	9.94	3.11	0.000166	346.54	6.73	6.94	0.001482
9+45.00	9	25-YR	1151.75	0.026	344.84	5.12	4.55	0.00111	344.84	5.12	4.55	0.00111
		100-YR	1662.89	0.026	349.76	10.04	2.16	0.000081	346.70	6.98	3.99	0.000497
9+15.76	8	25-YR	1151.75	0.026	344.35	4.72	7.99	0.002899	344.35	4.72	7.99	0.002899
		100-YR	1662.89	0.026	349.77	10.14	2.63	0.000106	346.63	7.00	5.43	0.000759
7+80.74	7	25-YR	1151.75	0.026	344.22	5.00	7.39	0.002116	344.22	5.00	7.39	0.002116
		100-YR	1662.89	0.026	349.74	10.52	2.89	0.000117	346.55	7.33	5.45	0.00068

NOTES:

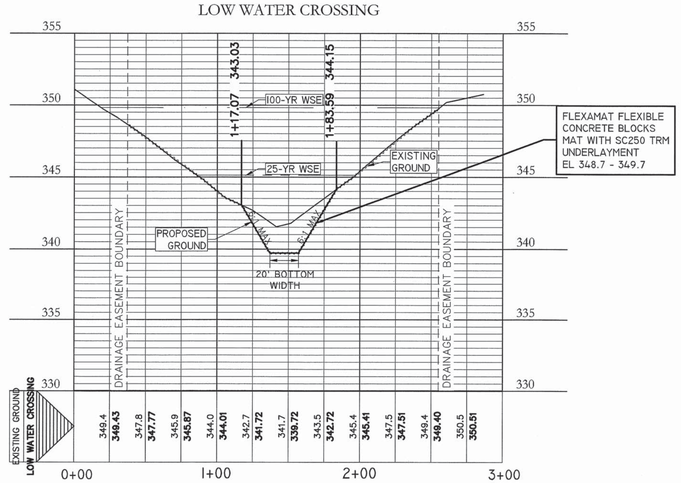
- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



LOW WATER CROSSING



STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
Brendan P McEntee
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

DATE

REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: CHANNEL - STA. 6+00 TO 10+50

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 9 OF 14

SHEET NO.: 9

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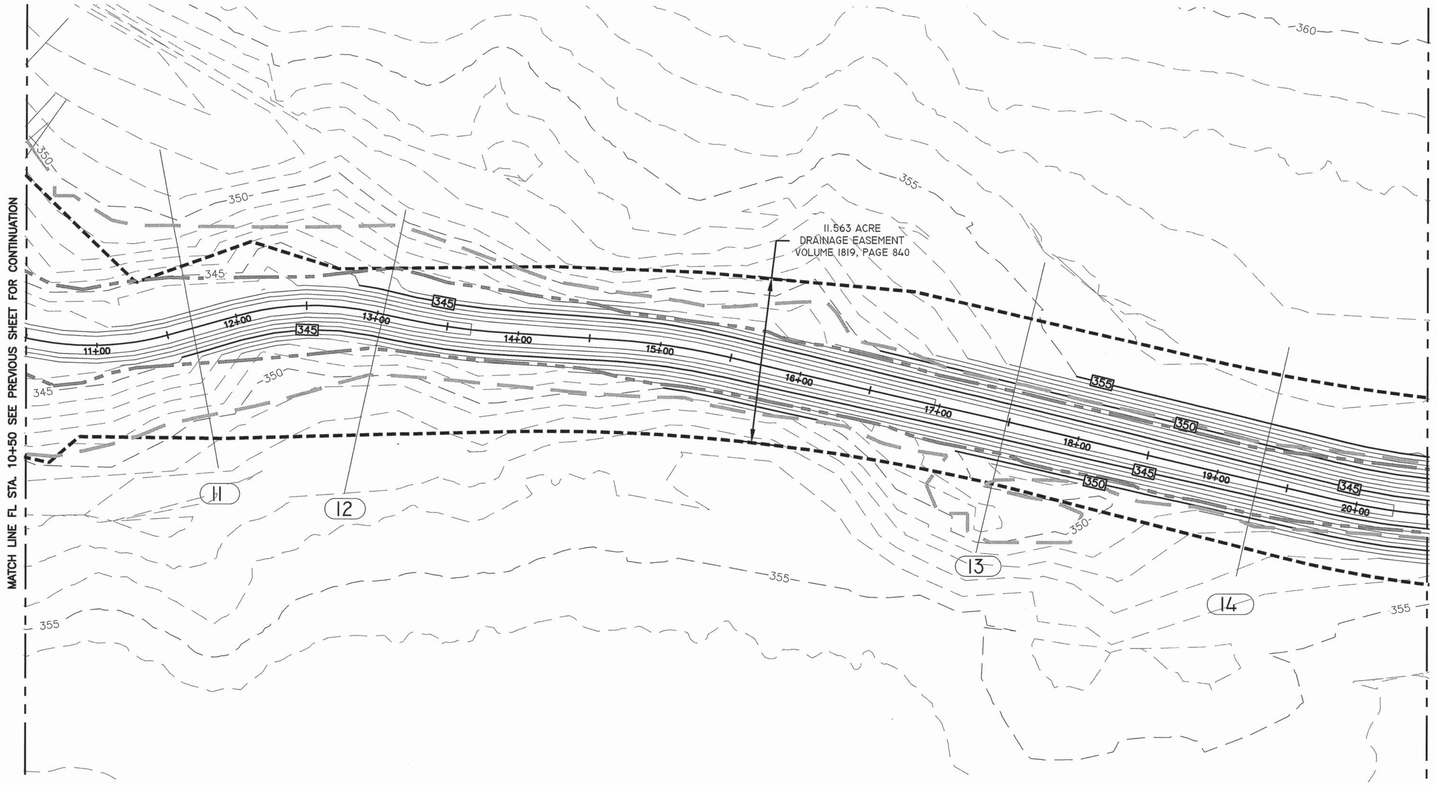


LEGEND

- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

0 50' 100'

SCALE: 1" = 50'

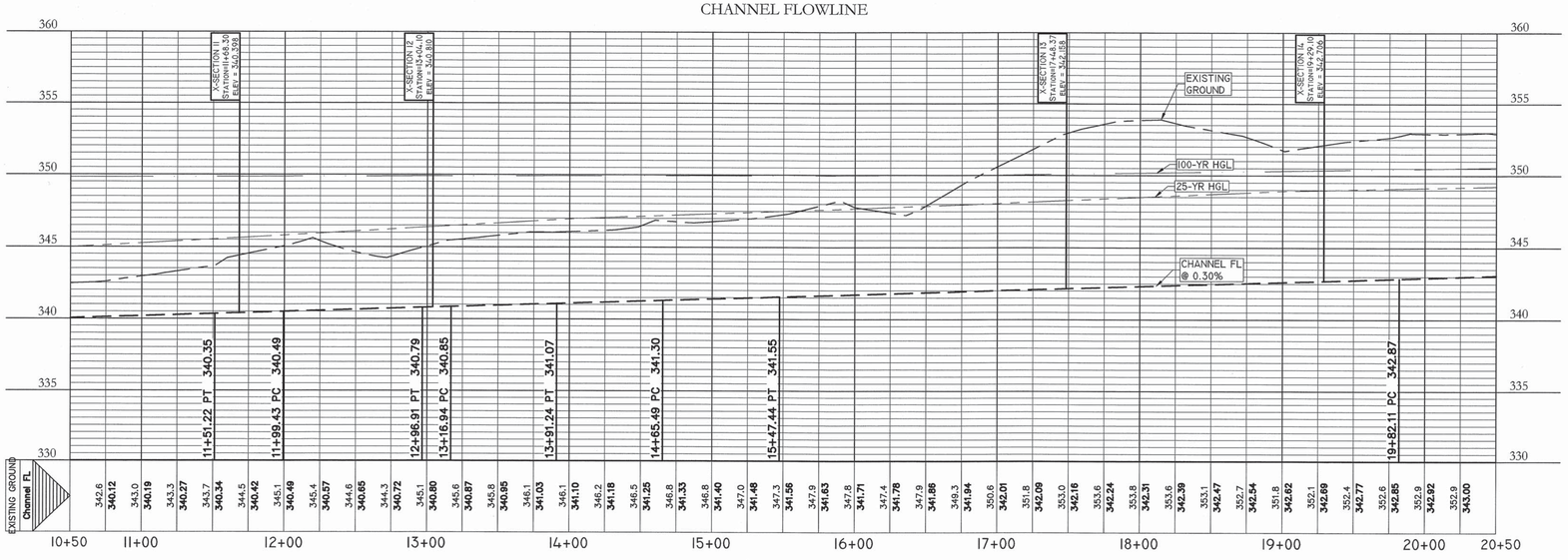
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	MAX POTENTIAL TW WITH COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf	ANTICIPATED TW WITH NON-COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf
19+29.1	14	25-YR	868.31	0.026	349.06	6.35	5.05	0.001429	349.06	6.35	5.05	0.001429
		100-YR	1234.19	0.026	350.55	7.84	4.99	0.001095	350.18	7.47	5.43	0.001371
17+48.37	13	25-YR	1151.75	0.026	348.21	6.05	7.26	0.003155	348.21	6.05	7.26	0.003155
		100-YR	1662.89	0.026	350.09	7.93	6.28	0.001586	349.23	7.07	7.96	0.003064
13+04.1	12	25-YR	1151.75	0.026	346.61	5.80	7.44	0.004251	346.61	5.80	7.44	0.004251
		100-YR	1662.89	0.026	349.70	8.89	4.78	0.000681	347.22	6.41	8.83	0.004786
11+68.3	11	25-YR	1151.75	0.026	345.46	5.06	9.46	0.005489	345.46	5.06	9.46	0.005489
		100-YR	1662.89	0.026	349.71	9.31	4.44	0.000416	346.47	6.07	9.83	0.004214

NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY: BM
DRAFTED BY: JW

DATE
REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ❖ Surveying
5501 West William Cannon Dr. ❖ Austin, Texas 78749
Phone No. (512) 280-5160 ❖ Fax No. (512) 280-5165

SHEET NAME: CHANNEL - STA.10+50 TO 20+50

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 10 OF 14

SHEET NO.: 10

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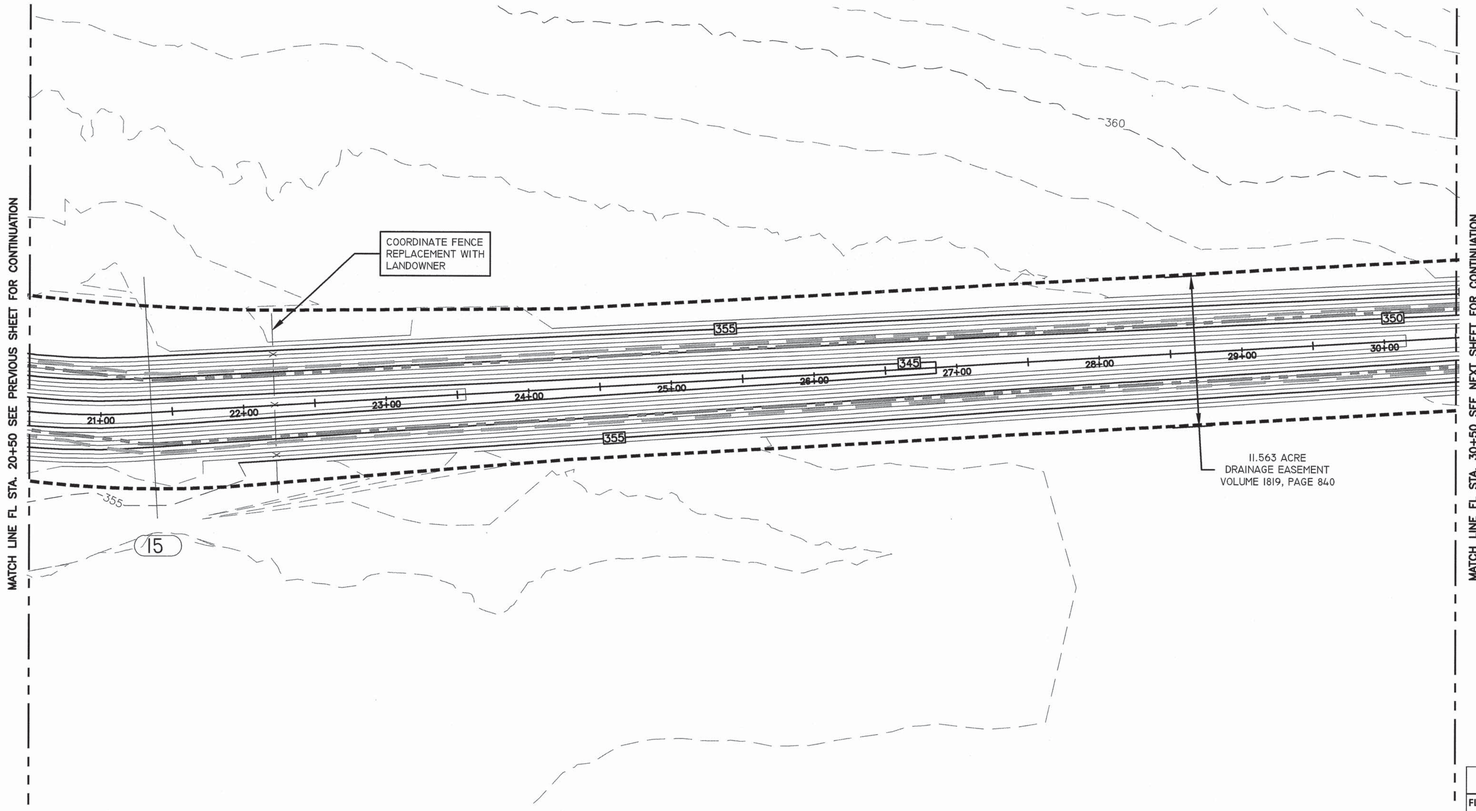


LEGEND

- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

0 50' 100'

SCALE: 1" = 50'

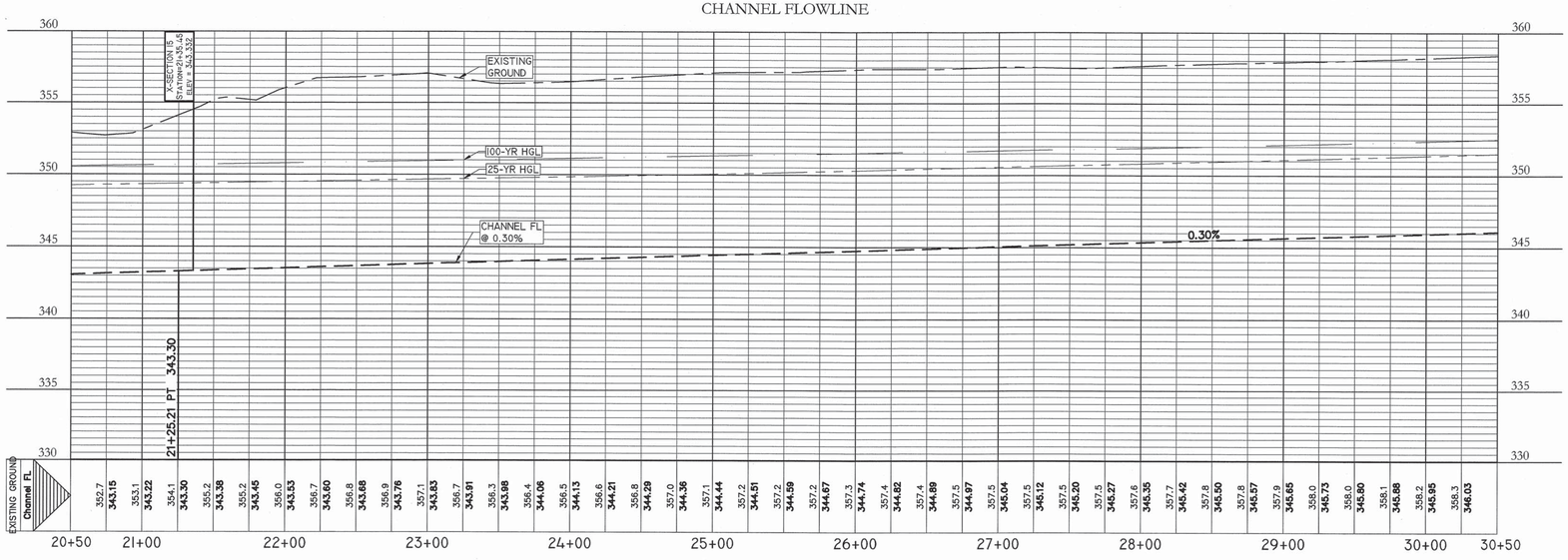
					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
21+35.45	15	25-YR	868.31	0.026	349.34	6.01	5.56	0.001849	349.34	6.01	5.56	0.001849
		100-YR	1234.19	0.026	350.75	7.42	5.5	0.001418	350.43	7.10	5.93	0.001734

NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



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STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY: BM | DRAFTED BY: JW

DATE

REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: CHANNEL - STA. 20+50 TO 30+50

JOB NAME: BASTROP GROVE

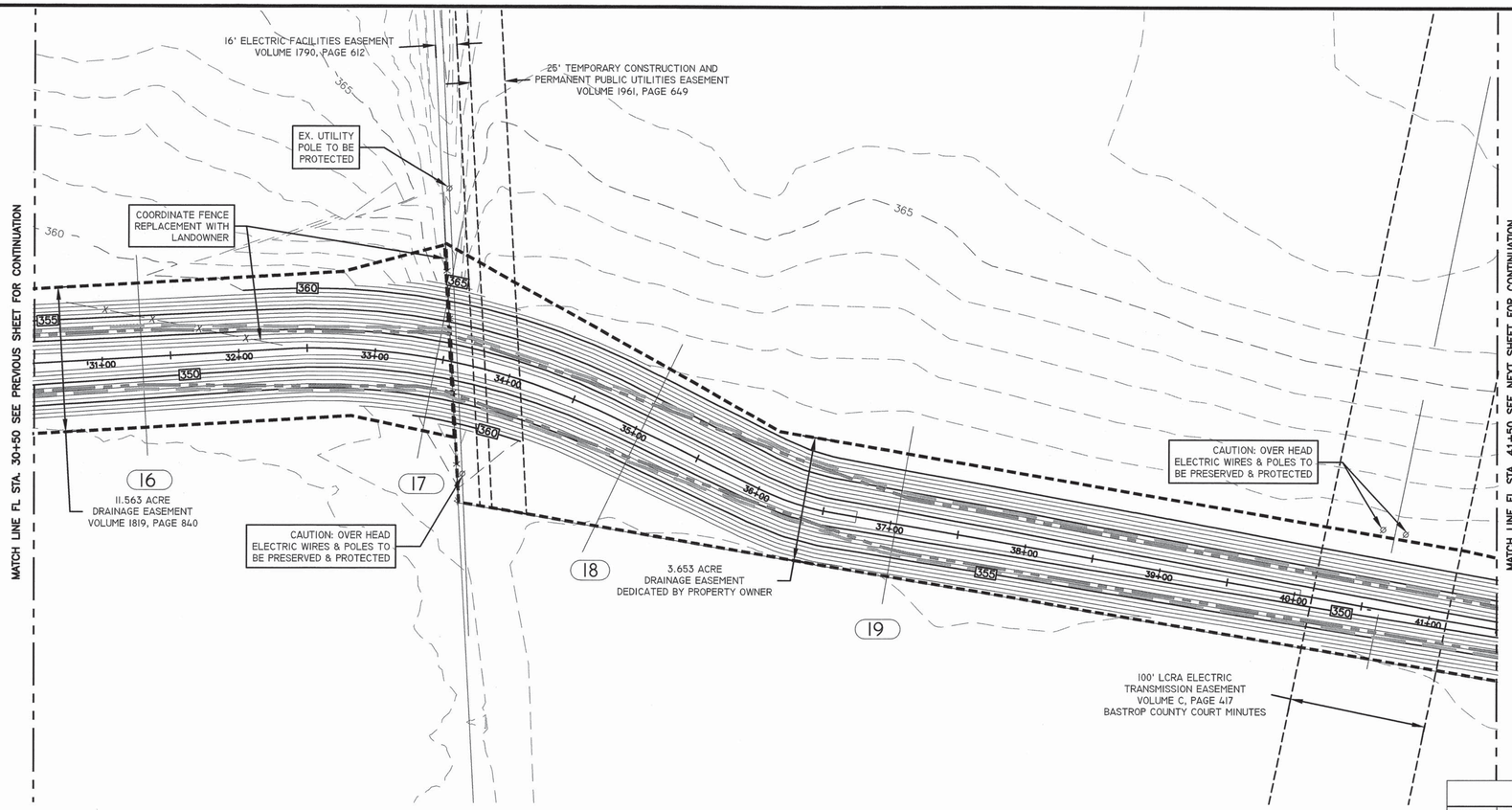
PROJECT: DRAINAGE IMPROVEMENTS

DATE APRIL 2018

JOB NUMBER 4697

SHEET 11 OF 14

SHEET NO. 11



LEGEND

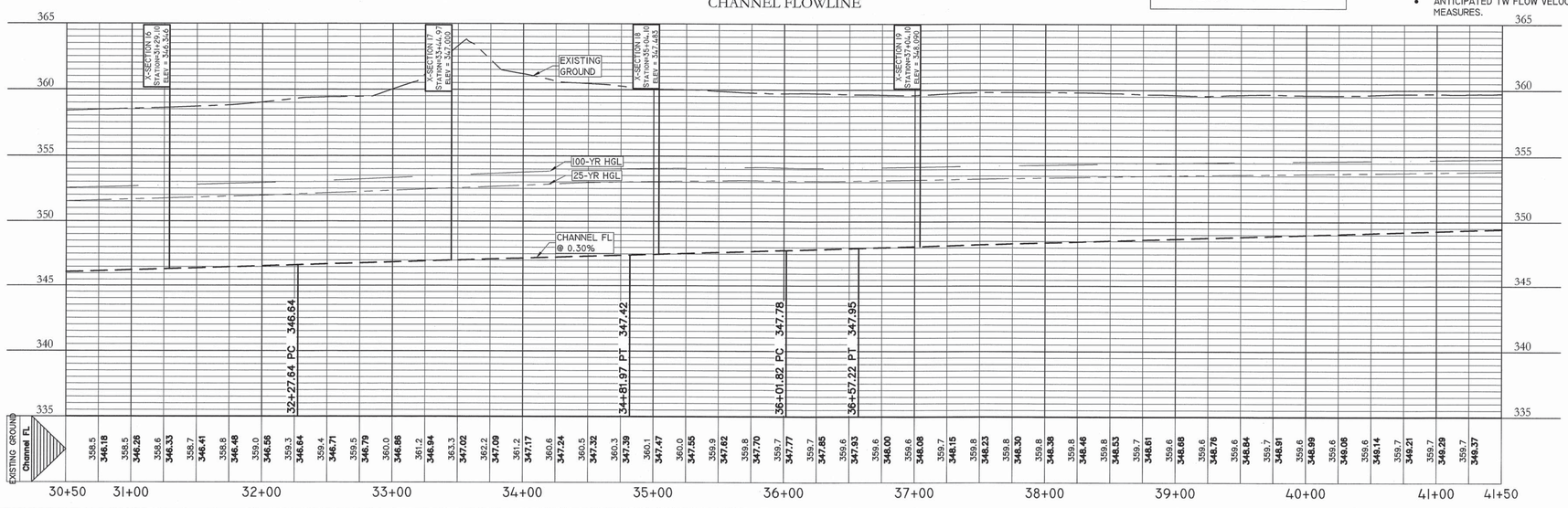
- DRAINAGE EASEMENT BOUNDARY
- ANALYSIS POINT (AP)
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- 25-YEAR WATER SURFACE
- 100-YEAR WATER SURFACE

0 50' 100'

SCALE: 1" = 50'

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
37+04.1	19	25-YR	414.96	0.026	353.33	5.24	3.34	0.000782	353.33	5.24	3.34	0.000782
		100-YR	587.02	0.026	354.36	6.27	3.49	0.000694	354.35	6.26	3.5	0.000698
35+04.1	18	25-YR	414.96	0.026	353.24	5.76	2.85	0.000513	353.24	5.76	2.85	0.000513
		100-YR	587.02	0.026	354.28	6.80	3.04	0.00048	354.27	6.79	3.05	0.000483
33+44.97	17	25-YR	868.31	0.026	352.39	5.39	6.66	0.003008	352.39	5.39	6.66	0.003008
		100-YR	1234.19	0.026	353.34	6.34	7.2	0.002937	353.32	6.32	7.24	0.002981
31+29.1	16	25-YR	868.31	0.026	351.75	5.40	6.65	0.002991	351.75	5.40	6.65	0.002991
		100-YR	1234.19	0.026	352.72	6.37	7.14	0.00285	352.68	6.33	7.22	0.002935

NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED
PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION / DATE

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ❖ Surveying
5501 West William Cannon Dr. ❖ Austin, Texas 78749
Phone No. (512) 280-5160 ❖ Fax No. (512) 280-5165

SHEET NAME: CHANNEL - STA. 30+50 TO 41+50

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 12 OF 14

SHEET NO.: 12

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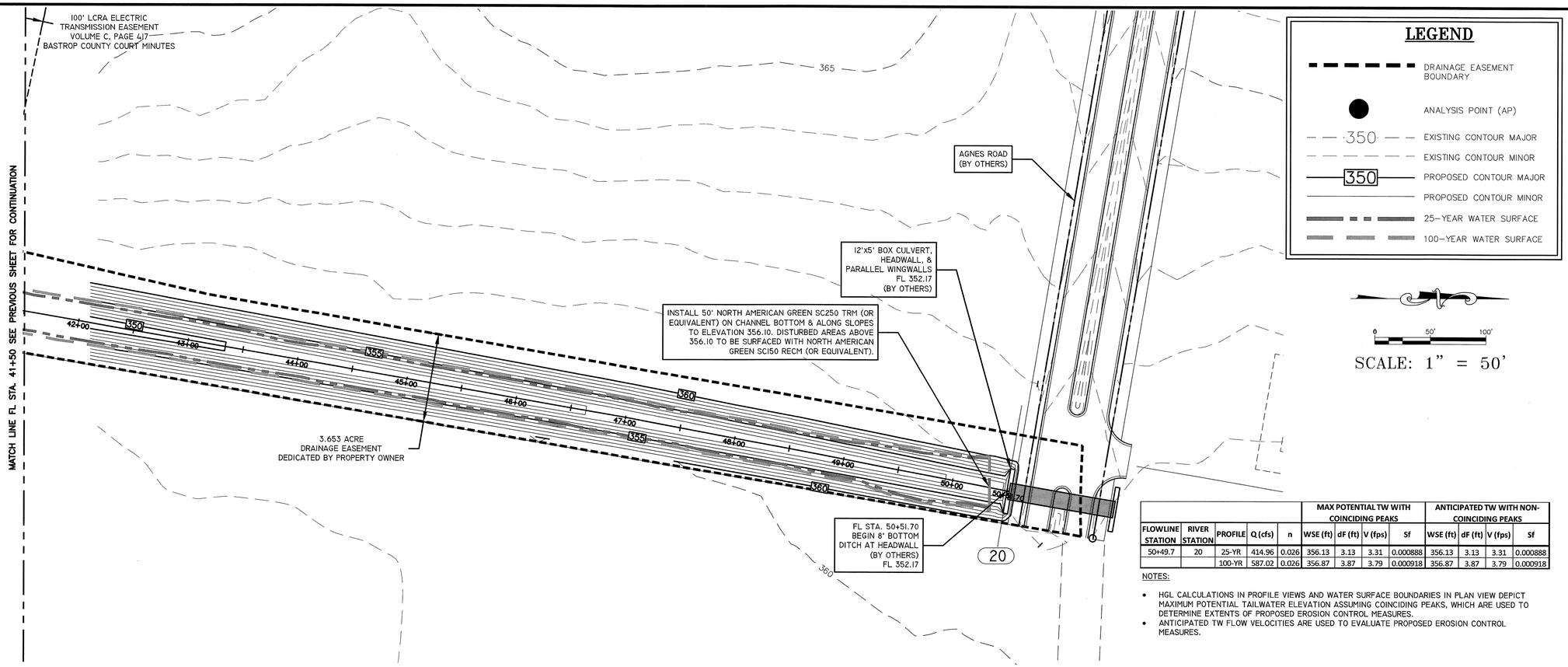


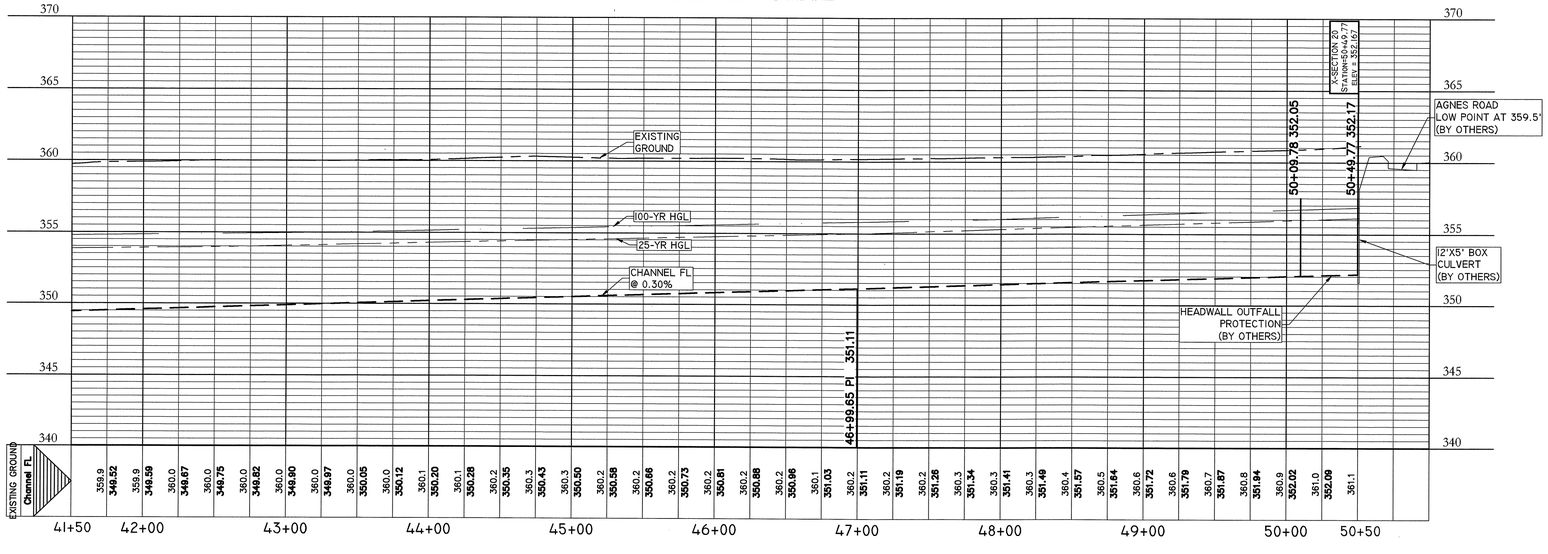
					MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS			
FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
50+49.7	20	25-YR	414.96	0.026	356.13	3.13	3.31	0.000888	356.13	3.13	3.31	0.000888
		100-YR	587.02	0.026	356.87	3.87	3.79	0.000918	356.87	3.87	3.79	0.000918

NOTES:

- HGL CALCULATIONS IN PROFILE VIEWS AND WATER SURFACE BOUNDARIES IN PLAN VIEW DEPICT MAXIMUM POTENTIAL TAILWATER ELEVATION ASSUMING COINCIDING PEAKS, WHICH ARE USED TO DETERMINE EXTENTS OF PROPOSED EROSION CONTROL MEASURES.
- ANTICIPATED TW FLOW VELOCITIES ARE USED TO EVALUATE PROPOSED EROSION CONTROL MEASURES.

PROFILE SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

CHANNEL FLOWLINE



STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
09/28/2018

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION / DATE

SHEET NAME: CHANNEL - STA. 41+50 TO END

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 13 OF 14

SHEET NO.: 13

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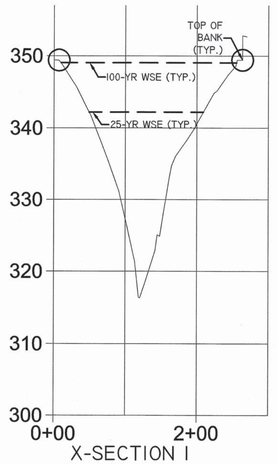

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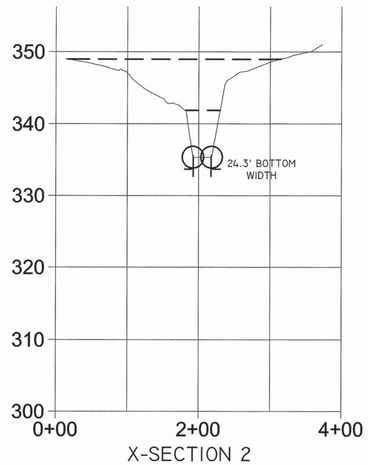

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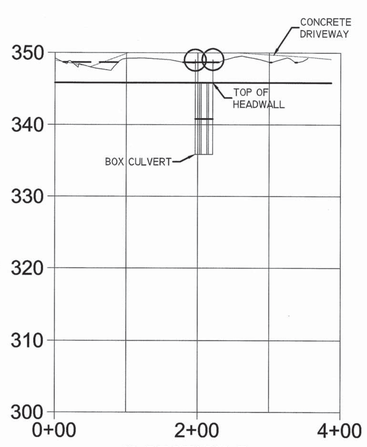

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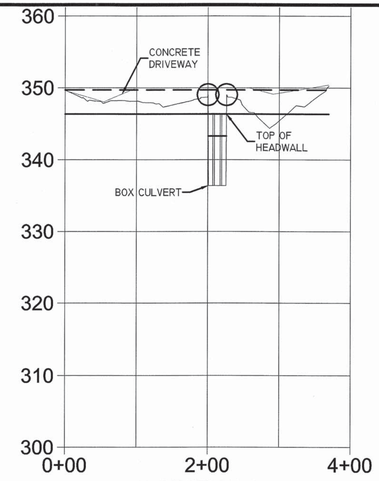

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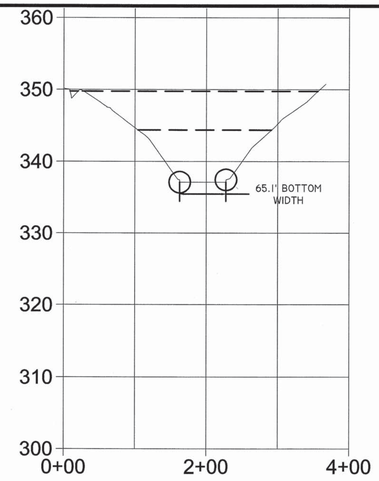

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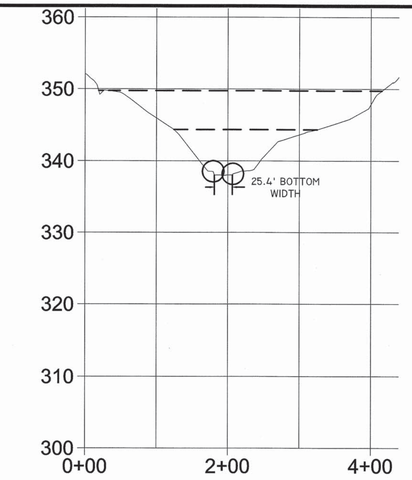

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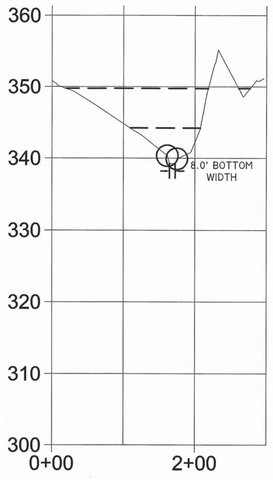

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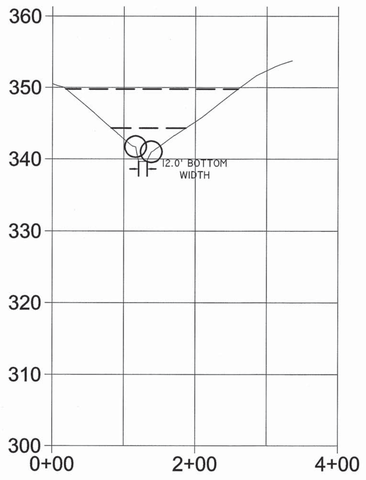

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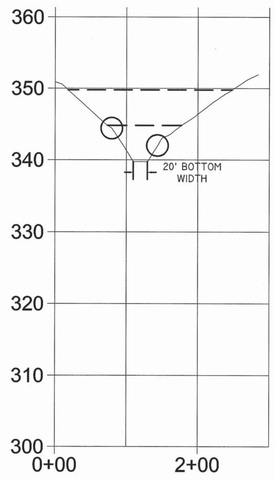

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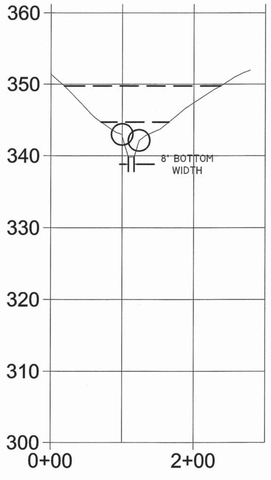

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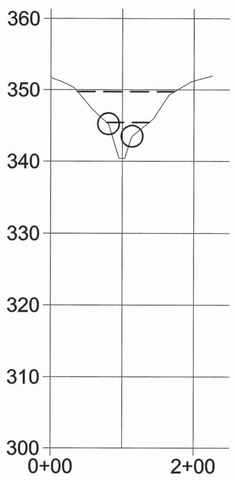

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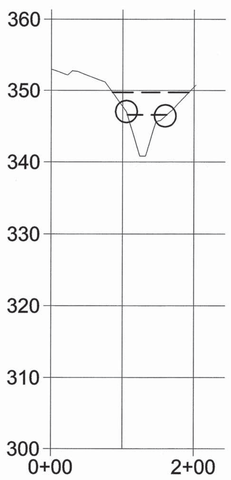

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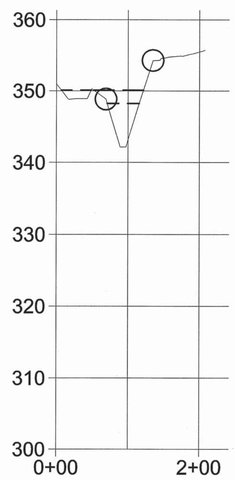

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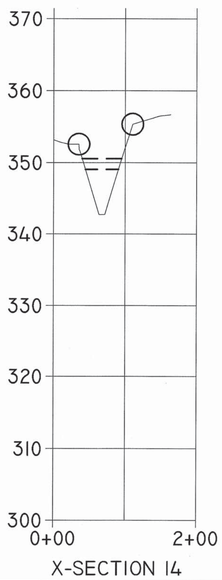

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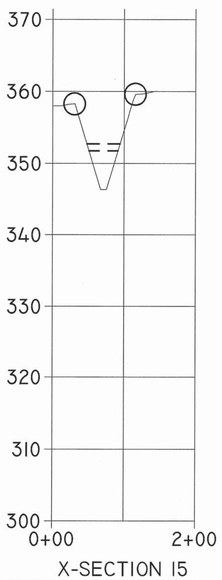

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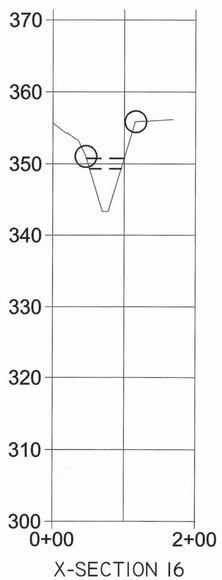

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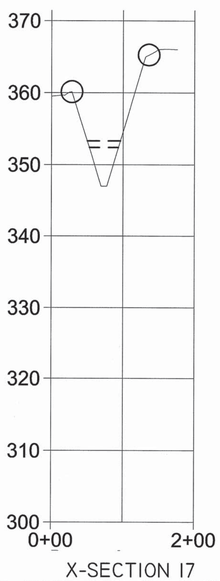

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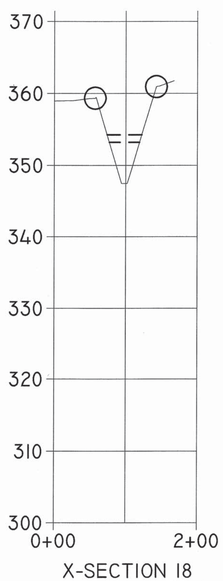

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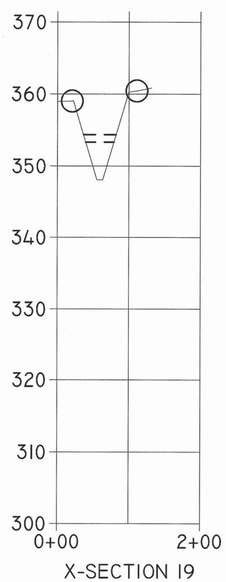

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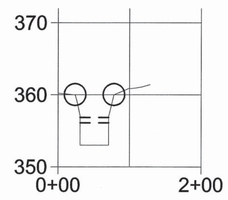

X-SECTION 20

PROFILE SCALE
HORIZ. 1" = 100'
VERT. 1" = 10'

LEGEND

- MAX POTENTIAL WSE ASSUMING COINCIDING PEAKS
- OVERBANK STATION
- PROPOSED DRIVEWAY

NOTES:

- OVERBANK STATIONS DESIGNATE THE BOUNDARY BETWEEN CHANNEL AND OVERBANK MANNING'S N VALUES ACCORDING TO THE FOLLOWING DESCRIPTIONS:
  MAIN CHANNEL - CLEAN, STRAIGHT, FULL, NO RIFTS OR DEEP POOLS = 0.026
  FLOOD PLAIN - PASTURE, NO BRUSH, SHORT GRASS = 0.035
  CONCRETE CHANNEL - TROWEL FINISH = 0.011
  (MANNING'S N VALUES ACCORDING TO HEC-RAS)
- CROSS-SECTIONS CREATED USING THE AUTODESK RIVER AND FLOOD ANALYSIS MODULE

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED
PROFESSIONAL ENGINEER

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ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

DATE
REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: CHANNEL X-SECTIONS
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE APRIL 2018
JOB NUMBER 4697
SHEET 14 OF 14
SHEET NO. 14

FILE PATH: J:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - DRAINAGE.dwg - May 14, 2018 - 5:35pm

BASTROP GROVE
DRAINAGE IMPROVEMENTS
ENGINEERING REPORT

PREPARED FOR:

71 Retail Partners LP
8214 Westchester Drive, Suite 550
Dallas, TX 75225

PREPARED BY:

CARLSON, BRIGANCE & DOERING, INC.
(TX Firm F-3791)
Mr. Brendan P. McEntee, P.E.
5501 West William Cannon
Austin, Texas 78749



CBD NO. 4697
May 2018

BASTROP GROVE
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- ►Cross-Sections Map & Geometries
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V. APPENDIX C – Engineering Report for Pecan Crossing Offsite Drainage Improvements

I. PROJECT SUMMARY

1.0 GENERAL

Bastrop Grove is a 145.70 Acre site, located within City of Bastrop at the intersection of Texas Highway 304 and Texas 71 Service Road. This engineering report details the proposed drainage improvements intended to convey storm runoff from upstream Seton Hospital and 71 Retail Partners LP developments to the Colorado River without ponding. Drainage improvements include construction of a 4,691-foot long earthen drainage ditch beginning south of Agnes Road and discharging into an existing channel that outfalls at the Colorado River, stabilization of an existing low water crossing, and replacement of a washed-out driveway, culvert, and flood control structure. The proposed culvert contains one 8'x10' and two 6'x10' box culverts and was designed to mimic the site's existing hydrology by matching the conveyance provided by the existing flood control structure that currently regulates flow to the Colorado River. The proposed channel was designed to contain upstream storm runoff and the Colorado River's 100-year flood without inundating Agnes Road.

2.0 ORDINANCE STATUS

This project is subject to the City of Bastrop Code of Ordinances.

3.0 DRAINAGE

Storm water runoff from the developed sites north of Agnes Road flow to the southeast corner of the 52.68-acre site, where it flows through a 12'x5' box culvert (designed by others) underneath Agnes Road. An existing 6'x3' box culvert conveys storm water runoff from approximately 69.84 acres north of Texas 71 Service Road. The ultimate drainage plan for the 145.70-acre development includes construction of a drainage channel to the Colorado River within an existing Drainage Easement recorded in Volume 1819, Page 840 in the Official Public Records of Bastrop County. The following engineering report presents design assumptions and justifications for the proposed channel, low water crossing, box culvert, and driveway. The report also evaluates the proposed channel's capacity to contain and convey the 25-year and 100-year storm events under different tailwater conditions. The model demonstrates that the channel will have sufficient capacity to convey runoff from these storm events given maximum possible tailwater at the Colorado River without flooding Agnes Road. Final channel design and details are found in the Bastrop Grove Drainage Improvement plans.

4.0 CERTIFICATION

I hereby certify that this report complies with the Bastrop Code of Ordinances where applicable and the information contained hereon is true and correct to the best of my knowledge.

Brendan P. McEntee, P.E.

05-17-2018
Date

II. DESIGN NARRATIVE & ANALYSIS

A. Hydrological Analysis

METHODOLOGY & INPUT VARIABLES

Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2018 version 12 was used to model the hydrologic characteristics of existing and proposed conditions.

The proposed channel's drainage area is greater than 200 acres and thus the Soil Conservation Service unit hydrograph method was used to determine storm runoff. The modeled rainfall event was a 24-hour SCS Type III storm with a 3-minute time interval and the following rainfall depths:

Table A.1 – Bastrop County 24-hr SCS Rainfall Depths

	2-YR	5-YR	10-YR	25-YR	100-YR
24-HOUR DEPTH (IN)	3.6	5.1	6.2	7.7	10.2

Source: Chapter 10, Section 1.40.3(2) of Bastrop County Code of Ordinances

The site contains hydrologic soil groups A and B, as per the USDA Web Soil Survey. The site's soils map and data have been included in Section B. The curve numbers and Manning's n values found in Tables A.2 & A.3 below were taken from "Technical Release 55 – Urban Hydrology for Small Urban Watersheds".

Table A.2 – Curve Numbers

Cover Type	Hydrologic Condition	Hydrologic Soil Group	Curve Number
Agricultural lands			
Pasture, grassland, or range – continuous forage for grazing	Good Grass cover > 75% & lightly grazed	A	39
		B	61
Fully developed urban areas			
Open space	Good Grass cover > 75%	A	39
		B	61
Impervious areas		ALL	98

Source: Soil Conservation Service TR-55

Table A.3 - Manning's N-Values

Surface Description	N
Sheet Flow & Shallow Overland Flow	
Smooth surfaces - concrete, asphalt, gravel, or bare soil	0.011
Grass – short grass prairie	0.15
Channel Flow	
Natural channels – earth, straight, some grass	0.026

Source: Soil Conservation Service TR-55

All time of concentration calculations were generated using the formulas given in "Technical Release 55 – Urban Hydrology for Small Urban Watersheds" for sheet, shallow concentrated, and channel flow. A maximum of 100 feet was used for sheet flow calculations.

EXISTING DRAINAGE CONDITIONS

Four drainage basins and two confluence points were used to model and evaluate existing site drainage conditions. An impervious cover of 28% was determined using aerial imagery for the 69.84 acres of drainage basin EX-OFFSITE. There was an assumed 0% impervious cover on the remaining existing drainage basins. EX-DA-1 drains to the roadside ditch along State Highway 304 marked EX-AP-1. EX-OFFSITE contributes to EX-DA-2 as sheet flow after discharging from existing 6'x3' box culvert running underneath Texas 71 Service Road. EX-DA-3 is the southwestern basin contributing to the existing channel flowing into the Colorado River. EX-DA-2 includes overland flow contributing to the existing channel flowing into the Colorado River and drains to the southern analysis point EX-AP-2. See the Existing Drainage Area Map in Section C.

PROPOSED DRAINAGE CONDITIONS

Nine drainage basins and three confluence points were used to model and evaluate proposed site drainage conditions. Proposed drainage basin impervious covers were assumed based on future development as shown in the table below:

Land Use	Impervious Cover %
Single-Use Residential	50
Commercial	70
Roadway	100

PR-DA-1 and PR-DA-2 will be commercially developed. PR-DA-3 will be the proposed Agnes Drive, which is currently a 30' R.O.W. PR-DA-4 through PR-DA-7 will potentially be developed as single-use residential. PR-DA-8 models the northern part of the proposed drainage channel within the boundaries of the 3.653-acre drainage easement dedicated by MC Bastrop 71, LP. PR-DA-9 models the southern part of the proposed drainage channel within the boundaries of the 11.563-acre drainage easement (Volume 1819, Page 840, O.P.R.B.C.TX.). Three analysis points were selected along the length of the proposed channel. AP-1 represents the initial channel flow from EX-DA-OFFSITE,

PR-DA-1, PR-DA-2, and PR-DA-3. AP-2 marks the border of the two dedicated drainage easements and the junction of the upstream drainage areas and PR-DA-4, PR-DA-5, and PR-DA-8. AP-3 is the final confluence point of all upstream drainage basins before flow is released into the Colorado River. See the Proposed Drainage Area Map in Section D.

Flows at proposed analysis points were used to model the capacity of the proposed channel in the Autodesk River and Flood Analysis Module. See Hydraulic Analysis in Section G.

B. Hydrologic Soil Group Summary

Soil Map—Bastrop County, Texas



Map Scale: 1:14,700 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 200 400 800 1200

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bastrop County, Texas
Survey Area Data: Version 15, Nov 7, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 8, 2015—Mar 14, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Bo	Bosque loam, 0 to 1 percent slopes, occasionally flooded	300.1	56.0%
DeC	Robco-Tanglewood complex, 1 to 5 percent slopes	46.8	8.7%
SeD2	Shep clay loam, 3 to 8 percent slopes, eroded	21.8	4.1%
Sm	Smithville fine sandy loam, 0 to 1 percent slopes	167.4	31.2%
Totals for Area of Interest		**536.1**	**100.0%**

Bastrop County, Texas

Bo—Bosque loam, 0 to 1 percent slopes, occasionally flooded

Map Unit Setting

National map unit symbol: f67c
Elevation: 200 to 1,400 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 64 to 70 degrees F
Frost-free period: 220 to 275 days
Farmland classification: Not prime farmland

Map Unit Composition

Bosque and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bosque

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium of holocene age derived from mixed sources

Typical profile

H1 - 0 to 24 inches: loam
H2 - 24 to 58 inches: clay loam
H3 - 58 to 75 inches: clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B
Ecological site: Loamy Bottomland (R086AY012TX)
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: Bastrop County, Texas
Survey Area Data: Version 15, Nov 7, 2017

Bastrop County, Texas

DeC—Robco-Tanglewood complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2wg9h
Elevation: 220 to 610 feet
Mean annual precipitation: 35 to 45 inches
Mean annual air temperature: 67 to 69 degrees F
Frost-free period: 252 to 275 days
Farmland classification: Farmland of statewide importance, if drained

Map Unit Composition

Robco and similar soils: 46 percent
Tanglewood and similar soils: 25 percent
Minor components: 29 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Robco

Setting

Landform: Ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Sandy, clayey, and loamy residuum weathered from sandstone, claystone, and shale of eocene age

Typical profile

A - 0 to 11 inches: loamy fine sand
E - 11 to 26 inches: loamy fine sand
Btg1 - 26 to 31 inches: sandy clay loam
Btg2 - 31 to 39 inches: sandy clay loam
Bt/C - 39 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: Sandy (R087AY234TX)
Hydric soil rating: No

Description of Tanglewood

Setting

Landform: Ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Sandy, clayey, and loamy residuum weathered from sandstone, claystone, and shale of eocene age

Typical profile

A - 0 to 5 inches: loamy fine sand
E - 5 to 23 inches: loamy fine sand
Btg1 - 23 to 33 inches: sandy clay loam
Btg2 - 33 to 68 inches: clay
Btg3 - 68 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 20 to 46 inches
Frequency of flooding: None
Frequency of ponding: None
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: Sandy (R087AY234TX)
Hydric soil rating: No

Minor Components

Edge

Percent of map unit: 5 percent
Landform: Ridges, ridges
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Claypan Savannah (R087AY221TX)
Hydric soil rating: No

Rader

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Sandy Loam (R087AY237TX)
Hydric soil rating: No

Straber

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy (R087AY234TX)
Hydric soil rating: No

Silstid

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy (R087AY234TX)
Hydric soil rating: No

Tabor

Percent of map unit: 5 percent
Landform: Ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Sandy Loam (R087AY237TX)
Hydric soil rating: No

Padina

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: Deep Sand (R087AY225TX)
Hydric soil rating: No

Gasil

Percent of map unit: 2 percent
Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Sandy Loam (R087AY237TX)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Bastrop County, Texas
Survey Area Data: Version 15, Nov 7, 2017

Bastrop County, Texas

SeD2—Shep clay loam, 3 to 8 percent slopes, eroded

Map Unit Setting

National map unit symbol: f68m
Elevation: 1,200 to 2,300 feet
Mean annual precipitation: 21 to 34 inches
Mean annual air temperature: 64 to 70 degrees F
Frost-free period: 210 to 230 days
Farmland classification: Not prime farmland

Map Unit Composition

Shep and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shep

Setting

Landform: Stream terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy alluvium of pleisticene age

Typical profile

H1 - 0 to 20 inches: clay loam
H2 - 20 to 60 inches: clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Southern Clay Loam (R086AY007TX)
Hydric soil rating: No

Minor Components

Unnamed, hydric
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Bastrop County, Texas
Survey Area Data: Version 15, Nov 7, 2017

Bastrop County, Texas

Sm—Smithville fine sandy loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: f68q
Elevation: 150 to 500 feet
Mean annual precipitation: 35 to 42 inches
Mean annual air temperature: 66 to 70 degrees F
Frost-free period: 260 to 290 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Smithville and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Smithville

Setting

Landform: Flood-plain steps
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium of quaternary age derived from mixed sources

Typical profile

H1 - 0 to 6 inches: fine sandy loam
H2 - 6 to 16 inches: loam
H3 - 16 to 50 inches: sandy clay loam
H4 - 50 to 62 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Ecological site: Loamy Upland (F133BY005TX)

Hydric soil rating: No

Minor Components

Unnamed, hydric

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Bastrop County, Texas
Survey Area Data: Version 15, Nov 7, 2017

C. Existing Conditions Drainage Area Map



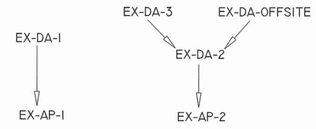
0 300' 600'

SCALE: 1" = 300'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- DRAINAGE BOUNDARY LINE
- AI — DRAINAGE AREA LABEL
- ANALYSIS POINT (AP)
- 940 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- FLOW ARROW
- TcFP — TIME OF CONCENTRATION FLOW PATH

HYDROLOGY FLOW CHART



TIME OF CONCENTRATION CALCULATIONS EXISTING CONDITIONS

Drainage Area #	Sheet Flow				Shallow Conc. Flow				Channel Flow						Tc (Min.)
	n	Slope	L	Tc	Paved/ Unpaved	Slope	L	Tc	n	Slope	L	Ax-sect	WP	Tc	
EX-DA-1	0.15	0.30%	100	19.73	U	0.19%	3154.97	74.77							94.5
DA-OFFSITE	0.011	0.50%	100	1.99	U	0.50%	2336	34.13	0.013	0.50%	1793	18	18	3.69	39.8
EX-DA-2	0.15	0.56%	100	15.37	U	0.34%	3712.93	65.78	0.026	1.58%	2631.64	200	60	2.72	83.9
EX-DA-3	0.15	0.36%	100	18.34	U	0.76%	1684.2	19.96							38.3

RESULTS TABLE - EXISTING CONDITIONS

SUB-BASIN	AREA (AC.)	% IC	CN	Q_{10} (CFS)	Q_{25} (CFS)	Q_{100} (CFS)
EX-DA-1 / EX-AP-1	101.79	0	57	59.56	97.12	167.35
DA-OFFSITE	69.84	28	71	127.94	181.31	273.3
EX-DA-2	193.08	0	60	140.32	219.91	366.23
EX-DA-3	50.91	0	52	36.56	64.3	117.99
EX-AP-2				257.24	395.87	648.66

NOTES:

- SCS WAS USED AS DRAINAGE CALCULATION METHOD
- RAINFALL INTENSITY DATA FOR DESIGN STORMS WERE PROVIDED BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90)
- CN'S ARE BASED ON EXISTING TYPE A & B SOILS AND REFLECT VALUES PER THE USDA WEB SOIL SURVEY
- TOC CALCULATIONS ARE BASED ON ASSUMED EXISTING CONDITIONS & TR-55
- MANNING'S N VALUES FROM TR-55:
  - PIPE/CHANNEL FLOW
    - PIPES - REINFORCED CONCRETE = 0.013
    - NATURAL CHANNELS - EARTH, STRAIGHT, SOME GRASS = 0.026
  - OVERLAND FLOW
    - SMOOTH SURFACE (CONCRETE, ASPHALT, BARE SOIL) = 0.011
    - SHORT GRASS = 0.015
- OFFSITE IMPERVIOUS COVERS ARE APPROXIMATE BASED ON AERIAL IMAGERY

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

DATE

REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ✦ Surveying
5501 West William Cannon ✦ Austin, Texas 78749
Phone No. (512) 280-5160 ✦ Fax No. (512) 280-5165

SHEET NAME: **EXISTING DRAINAGE AREA MAP**

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 6 OF 14

SHEET NO.: 6

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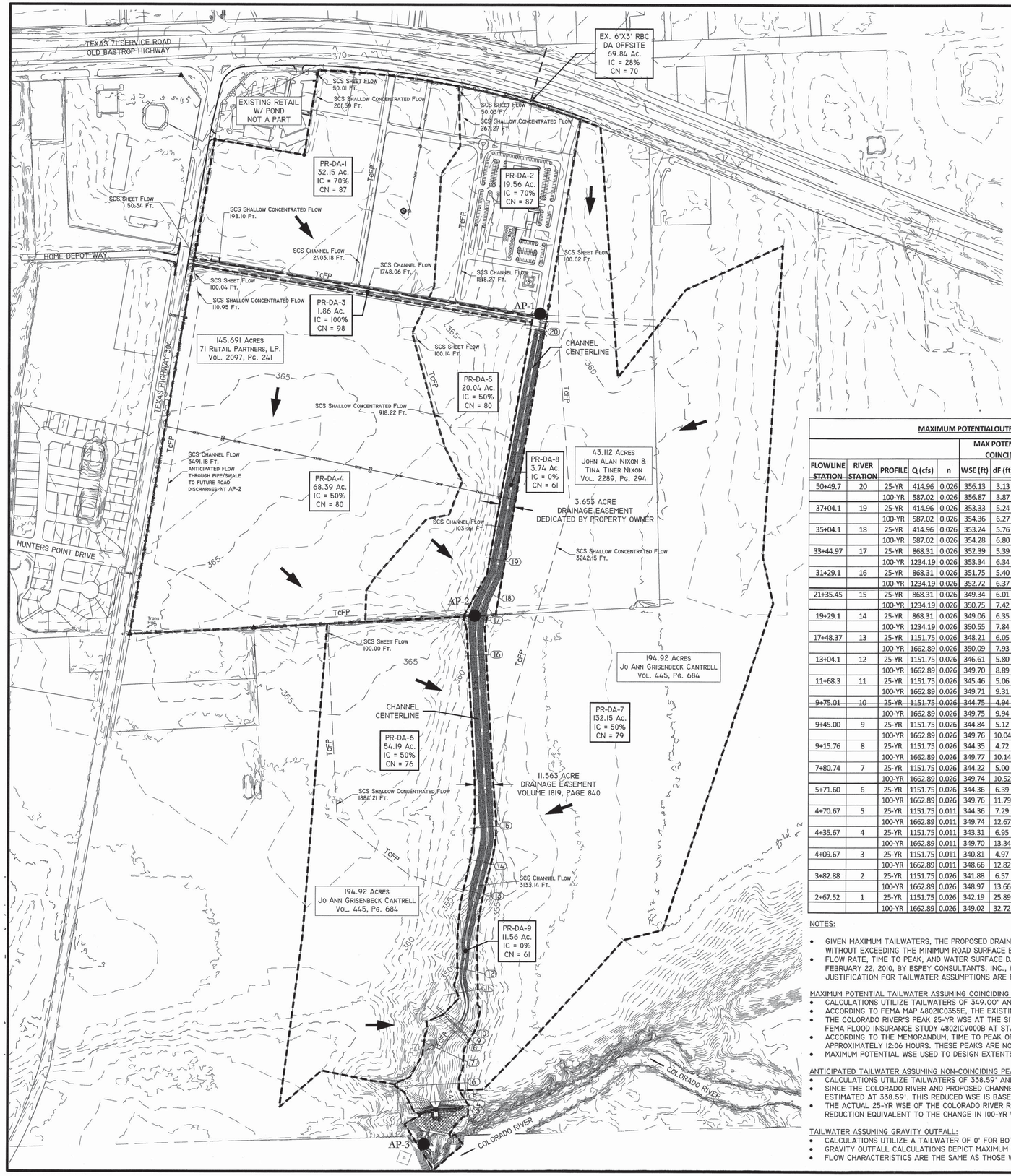
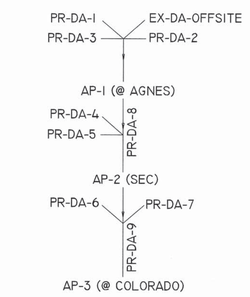
D. Proposed Conditions Drainage Area Map



HYDROLOGY FLOW CHART





0 300' 600'

SCALE: 1" = 300'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- DRAINAGE BOUNDARY LINE
- AI — DRAINAGE AREA LABEL
- ANALYSIS POINT (AP)
- 940 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- FLOW ARROW
- TcFP — TIME OF CONCENTRATION FLOW PATH

TIME OF CONCENTRATION CALCULATIONS PROPOSED CONDITIONS

Area #	Sheet Flow				Shallow Conc. Flow				Channel Flow						Tc (Min.)
	n	Slope	L	Tc	Paved/ Unpaved	Slope	L	Tc	n	Slope	L	Ax-sect	WP	Tc	
DA-OFFSITE	0.011	0.50%	100	1.99	U	0.50%	2336	34.13	0.013	0.50%	1793	18	18	3.69	39.8
PR-DA-1	0.011	0.50%	100	1.99	U	0.50%	202	2.22	0.013	0.50%	2403	27.58	15.88	3.41	7.6
PR-DA-2	0.011	0.50%	100	1.99	U	0.50%	217.47	3.18	0.013	0.50%	1518.01	19.15	13.23	2.44	7.6
PR-DA-3	0.011	2.00%	50	0.66	P	1.00%	198	1.62	0.013	0.50%	1748.06	27.58	15.88	2.48	4.8
PR-DA-4	0.011	0.50%	100	1.99	U	0.50%	110.95	1.62	0.013	0.50%	3491.18	37.54	18.53	4.47	8.1
PR-DA-5	0.011	0.50%	100	1.99	U	0.50%	918.22	13.41	0.026	0.30%	1031.61	86.78	34.61	2.96	18.4
PR-DA-6	0.011	0.50%	100	1.99	U	0.74%	1884.2	22.63							24.6
PR-DA-7	0.011	0.50%	100	1.99	U	0.23%	3242.18	69.83							71.8
PR-DA-8									0.026	0.30%	1715.36	86.78	34.61	4.92	4.9
PR-DA-9									0.026	0.30%	3133	320	65.25	5.73	5.7

MAXIMUM POTENTIALOUTFALL CONDITIONS FOR 100-YR AND 25-YR STORM EVENTS

FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	MAX POTENTIAL TW WITH COINCIDING PEAKS				ANTICIPATED TW WITH NON-COINCIDING PEAKS				TW WITH GRAVITY OUTFALL			
					WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf	WSE (ft)	dF (ft)	V (fps)	Sf
50+49.7	20	25-YR	414.96	0.026	356.13	3.13	3.31	0.000888	356.13	3.13	3.31	0.000888	356.13	3.13	3.31	0.000888
		100-YR	587.02	0.026	356.87	3.87	3.79	0.000918	356.87	3.87	3.79	0.000918	356.87	3.87	3.79	0.000918
37+04.1	19	25-YR	414.96	0.026	353.33	5.24	3.34	0.000782	353.33	5.24	3.34	0.000782	353.33	5.24	3.34	0.000782
		100-YR	587.02	0.026	354.36	6.27	3.49	0.000694	354.35	6.26	3.5	0.000698	354.35	6.26	3.5	0.000698
35+04.1	18	25-YR	414.96	0.026	353.24	5.76	2.85	0.000513	353.24	5.76	2.85	0.000513	353.24	5.76	2.85	0.000513
		100-YR	587.02	0.026	354.28	6.80	3.04	0.00048	354.27	6.79	3.05	0.000483	354.27	6.79	3.05	0.000483
33+44.97	17	25-YR	868.31	0.026	352.39	5.39	6.66	0.003008	352.39	5.39	6.66	0.003008	352.39	5.39	6.66	0.003008
		100-YR	1234.19	0.026	353.34	6.34	7.2	0.002937	353.32	6.32	7.24	0.002981	353.32	6.32	7.24	0.002981
31+29.1	16	25-YR	868.31	0.026	351.75	5.40	6.65	0.002991	351.75	5.40	6.65	0.002991	351.75	5.40	6.65	0.002991
		100-YR	1234.19	0.026	352.72	6.37	7.14	0.00285	352.68	6.33	7.22	0.002935	352.68	6.33	7.22	0.002935
21+35.45	15	25-YR	868.31	0.026	349.34	6.01	5.56	0.001849	349.34	6.01	5.56	0.001849	349.34	6.01	5.56	0.001849
		100-YR	1234.19	0.026	350.75	7.42	5.5	0.001418	350.43	7.10	5.93	0.001734	350.43	7.10	5.93	0.001734
19+29.1	14	25-YR	868.31	0.026	349.06	6.35	5.05	0.001429	349.06	6.35	5.05	0.001429	349.06	6.35	5.05	0.001429
		100-YR	1234.19	0.026	350.55	7.84	4.99	0.001095	350.18	7.47	5.43	0.001371	350.18	7.47	5.43	0.001371
17+48.37	13	25-YR	1151.75	0.026	348.21	6.05	7.26	0.003155	348.21	6.05	7.26	0.003155	348.21	6.05	7.26	0.003155
		100-YR	1662.89	0.026	350.09	7.93	6.28	0.001586	349.23	7.07	7.96	0.003064	349.23	7.07	7.96	0.003064
13+04.1	12	25-YR	1151.75	0.026	346.61	5.80	7.44	0.004251	346.61	5.80	7.44	0.004251	346.61	5.80	7.44	0.004251
		100-YR	1662.89	0.026	349.70	8.89	4.78	0.000681	347.22	6.41	8.83	0.004786	347.22	6.41	8.83	0.004786
11+68.3	11	25-YR	1151.75	0.026	345.46	5.06	9.46	0.005489	345.46	5.06	9.46	0.005489	345.46	5.06	9.46	0.005489
		100-YR	1662.89	0.026	349.71	9.31	4.44	0.000416	346.47	6.07	9.83	0.004214	346.47	6.07	9.83	0.004214
9+75.01	10	25-YR	1151.75	0.026	344.75	4.94	9.18	0.004232	344.75	4.94	9.18	0.004232	344.75	4.94	9.18	0.004232
		100-YR	1662.89	0.026	349.75	9.94	3.11	0.000166	346.54	6.73	6.94	0.001482	346.54	6.73	6.94	0.001482
9+45.00	9	25-YR	1151.75	0.026	344.84	5.12	4.55	0.00111	344.84	5.12	4.55	0.00111	344.84	5.12	4.55	0.00111
		100-YR	1662.89	0.026	349.76	10.04	2.16	0.000081	346.70	6.98	3.99	0.000497	346.70	6.98	3.99	0.000497
9+15.76	8	25-YR	1151.75	0.026	344.35	4.72	7.99	0.002899	344.35	4.72	7.99	0.002899	344.35	4.72	7.99	0.002899
		100-YR	1662.89	0.026	349.77	10.14	2.63	0.000106	346.63	7.00	5.43	0.000759	346.63	7.00	5.43	0.000759
7+80.74	7	25-YR	1151.75	0.026	344.22	5.00	7.39	0.002116	344.22	5.00	7.39	0.002116	344.22	5.00	7.39	0.002116
		100-YR	1662.89	0.026	349.74	10.52	2.89	0.000117	346.55	7.33	5.45	0.00068	346.55	7.33	5.45	0.00068
5+71.60	6	25-YR	1151.75	0.026	344.36	6.39	2.86	0.000215	344.36	6.39	2.86	0.000215	344.36	6.39	2.86	0.000215
		100-YR	1662.89	0.026	349.76	11.79	1.36	0.000021	346.62	8.65	2.47	0.000107	346.62	8.65	2.47	0.000107
4+70.67	5	25-YR	1151.75	0.011	344.36	7.29	2.11	0.000017	344.36	7.29	2.11	0.000017	344.36	7.29	2.11	0.000017
		100-YR	1662.89	0.011	349.74	12.67	1.55	0.000004	346.59	9.52	2.22	0.000013	346.59	9.52	2.22	0.000013
4+35.67	4	25-YR	1151.75	0.011	343.31	6.95	8.09	0.00053	343.31	6.95	8.09	0.00053	343.31	6.95	8.09	0.00053
		100-YR	1662.89	0.011	349.70	13.34	2.6	0.000032	345.33	8.97	8.89	0.000525	345.33	8.97	8.89	0.000525
4+09.67	3	25-YR	1151.75	0.011	340.81	4.97	11.41	0.001431	340.48	4.64	12.22	0.001747	340.48	4.64	12.22	0.001747
		100-YR	1662.89	0.011	348.66	12.82	5.86	0.000198	341.76	5.92	13.81	0.0018	341.76	5.92	13.81	0.0018
3+82.88	2	25-YR	1151.75	0.026	341.88	6.57	5.71	0.000868	339.04	3.73	10.76	0.006582	339.04	3.73	10.76	0.006582
		100-YR	1662.89	0.026	348.97	13.66	2.81	0.000079	340.02	4.71	12	0.00599	340.02	4.71	12	0.00599
2+67.52	1	25-YR	1151.75	0.026	342.19	25.89	0.67	0.000006	332.04	15.74	1.97	0.000084	325.16	8.86	6.07	0.001823
		100-YR	1662.89	0.026	349.02	32.72	0.54	0.000003	338.64	22.34	1.38	0.000031	326.69	10.39	6.36	0.001551

RESULTS TABLE - PROPOSED CONDITIONS

SUB-BASIN	AREA (AC.)	%IC	CN	Q_{10} (CFS)	Q_{25} (CFS)	Q_{100} (CFS)
DA-OFFSITE	69.84	28	71	127.94	181.31	273.3
PR-DA-1	32.15	70	87	149.45	192.56	263.76
PR-DA-2	19.56	70	87	90.92	117.15	160.47
PR-DA-3	1.86	100	98	9.76	12.14	16.10
PR-DA-4	68.39	50	80	275.24	367.46	521.27
PR-DA-5	20.05	50	80	66.42	88.96	126.64
PR-DA-6	54.19	50	76	142.77	195.94	285.88
PR-DA-7	132.15	50	79	213.43	288.18	413.80
PR-DA-8	3.74	0	61	7.88	12.16	19.88
PR-DA-9	11.56	0	61	24.36	37.58	61.45
AP-1 (CHANNEL SOUTH OF AGNES)				312.95	414.96	587.02
AP-2 (CHANNEL AT SOUTHEAST PROPERTY CORNER)				650.57	868.31	1234.19
AP-3 (CHANNEL AT COLORADO RIVER)				850.01	1151.75	1662.89

NOTES:

- SCS WAS USED AS DRAINAGE CALCULATION METHOD
- RAINFALL INTENSITY DATA FOR DESIGN STORMS WERE PROVIDED BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90)
- CN'S ARE BASED ON EXISTING TYPE A & B SOILS AND REFLECT VALUES PER THE USDA WEB SOIL SURVEY
- TOC CALCULATIONS ARE BASED ON ASSUMED FUTURE DEVELOPMENT & TR-55
- MANNING'S N VALUES FROM TR-55:
  - PIPE/CHANNEL FLOW
    - PIPES - REINFORCED CONCRETE = 0.013
    - NATURAL CHANNELS - EARTH, STRAIGHT, SOME GRASS = 0.026
  - OVERLAND FLOW
    - SMOOTH SURFACE (CONCRETE, ASPHALT, BARE SOIL) = 0.011
    - SHORT GRASS = 0.015
- OFFSITE IMPERVIOUS COVERS ARE APPROXIMATE BASED ON AERIAL IMAGERY
- ONSITE IMPERVIOUS COVERS REFLECT ASSUMED FUTURE DEVELOPMENT AS FOLLOWS:
  - SINGLE-USE RESIDENTIAL = 50%
  - COMMERCIAL = 70%
  - ROADWAY = 100%

NOTES:

- GIVEN MAXIMUM TAILWATERS, THE PROPOSED DRAINAGE CHANNEL PROVIDES AT LEAST ONE FOOT OF FREEBOARD AT DESIGN FLOWS AND THE PROPOSED CULVERT HAS CAPACITY TO CONVEY 100-YR STORM RUNOFF WITHOUT EXCEEDING THE MINIMUM ROAD SURFACE ELEVATION OF AGNES ROAD AT 359.50', AS PER DESIGN REQUIREMENTS BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90).
- FLOW RATE, TIME TO PEAK, AND WATER SURFACE DATA FOR THE COLORADO RIVER ARE BASED ON FEMA MAP 48021C0355E AND THE DRAINAGE TECHNICAL MEMORANDUM FOR THE PECAN PARK DEVELOPMENT DATED FEBRUARY 22, 2010, BY ESPEY CONSULTANTS, INC., WHICH UTILIZED THE USGS GAGE 08159200 LOCATED AT STATE HIGHWAY 71 APPROXIMATELY 2 MILES UPSTREAM OF THE PROPOSED CHANNEL'S OUTFALL. JUSTIFICATION FOR TAILWATER ASSUMPTIONS ARE PROVIDED BELOW:

MAXIMUM POTENTIAL TAILWATER ASSUMING COINCIDING PEAKS:

- CALCULATIONS UTILIZE TAILWATERS OF 349.00' AND 342.17' FOR THE 100-YR AND 25-YR STORM EVENTS, RESPECTIVELY.
- ACCORDING TO FEMA MAP 48021C0355E, THE EXISTING 100-YR BFE AT THE SITE IS 349' MSL.
- THE COLORADO RIVER'S PEAK 25-YR WSE AT THE SITE IS ESTIMATED AT 342.17'. THIS WSE WAS EXTRAPOLATED FROM A LOGARITHMIC TREND OF BFE'S FOR VARIOUS ANNUAL CHANCE FLOODS USING DATA FROM THE FEMA FLOOD INSURANCE STUDY 48021CV000B AT STATION 'AW'.
- ACCORDING TO THE MEMORANDUM, TIME TO PEAK OF THE COLORADO RIVER IS APPROXIMATED AT 31:45 HOURS FOR THE 100-YR EVENT, WHEREAS THE PROPOSED CHANNEL'S TIME TO PEAK IS MODELED AT APPROXIMATELY 12:06 HOURS. THESE PEAKS ARE NON-COINCIDING AND THEREFORE THESE WSE'S OVERESTIMATE EXPECTED FLOODING FOR THE 100-YR AND 25-YR EVENTS.
- MAXIMUM POTENTIAL WSE USED TO DESIGN EXTENTS OF EROSION CONTROL MEASURES.

ANTICIPATED TAILWATER ASSUMING NON-COINCIDING PEAKS:

- CALCULATIONS UTILIZE TAILWATERS OF 338.59' AND 331.96' FOR THE 100-YR AND 25-YR STORM EVENTS, RESPECTIVELY.
- SINCE THE COLORADO RIVER AND PROPOSED CHANNEL PEAKS ARE NON-COINCIDING, AN ESTIMATED REDUCTION OF 10.41' IS EXPECTED TO BE REALIZED IN ACTUAL WSE AT 12:06 HOURS. THE 100-YR WSE IS ESTIMATED AT 338.59'. THIS REDUCED WSE IS BASED ON GRAPHICAL INTERPOLATIONS OF THE MEMORANDUM'S COLORADO RIVER 1% ANNUAL CHANCE HYDROGRAPH AND HYDRAULIC RATING CURVE.
- THE ACTUAL 25-YR WSE OF THE COLORADO RIVER REALIZED AT 12:06 HOURS AT THE PROPOSED CHANNEL'S OUTFALL IS ESTIMATED AT 331.96'. THIS REDUCED WSE WAS CALCULATED USING A PROPORTIONAL REDUCTION EQUIVALENT TO THE CHANGE IN 100-YR WSE'S REALIZED AT A TIME TO PEAK OF 31:45 HOURS AS COMPARED TO 12:06 HOURS.

TAILWATER ASSUMING GRAVITY OUTFALL:

- CALCULATIONS UTILIZE A TAILWATER OF 0' FOR BOTH THE 100-YR AND 25-YR STORM EVENTS.
- GRAVITY OUTFALL CALCULATIONS DEPICT MAXIMUM VELOCITIES WHICH ARE USED FOR DESIGN OF OUTFALL PROTECTION.
- FLOW CHARACTERISTICS ARE THE SAME AS THOSE WITH THE ANTICIPATED TAILWATER ASSUMING NON-COINCIDING PEAKS AT EVERY STATION EXCEPT STATION 1.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER
CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
Brendan P McEntee
05/15/2018

DESIGNED BY:	DRAFTED BY:
BM	JW

DATE

REVISION

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Drive ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: PROPOSED DRAINAGE AREA MAP

JOB NAME: BASTROP GROVE

PROJECT: DRAINAGE IMPROVEMENTS

DATE: APRIL 2018

JOB NUMBER: 4697

SHEET: 7 OF 14

SHEET NO.: 7

E. Hydraflow Report

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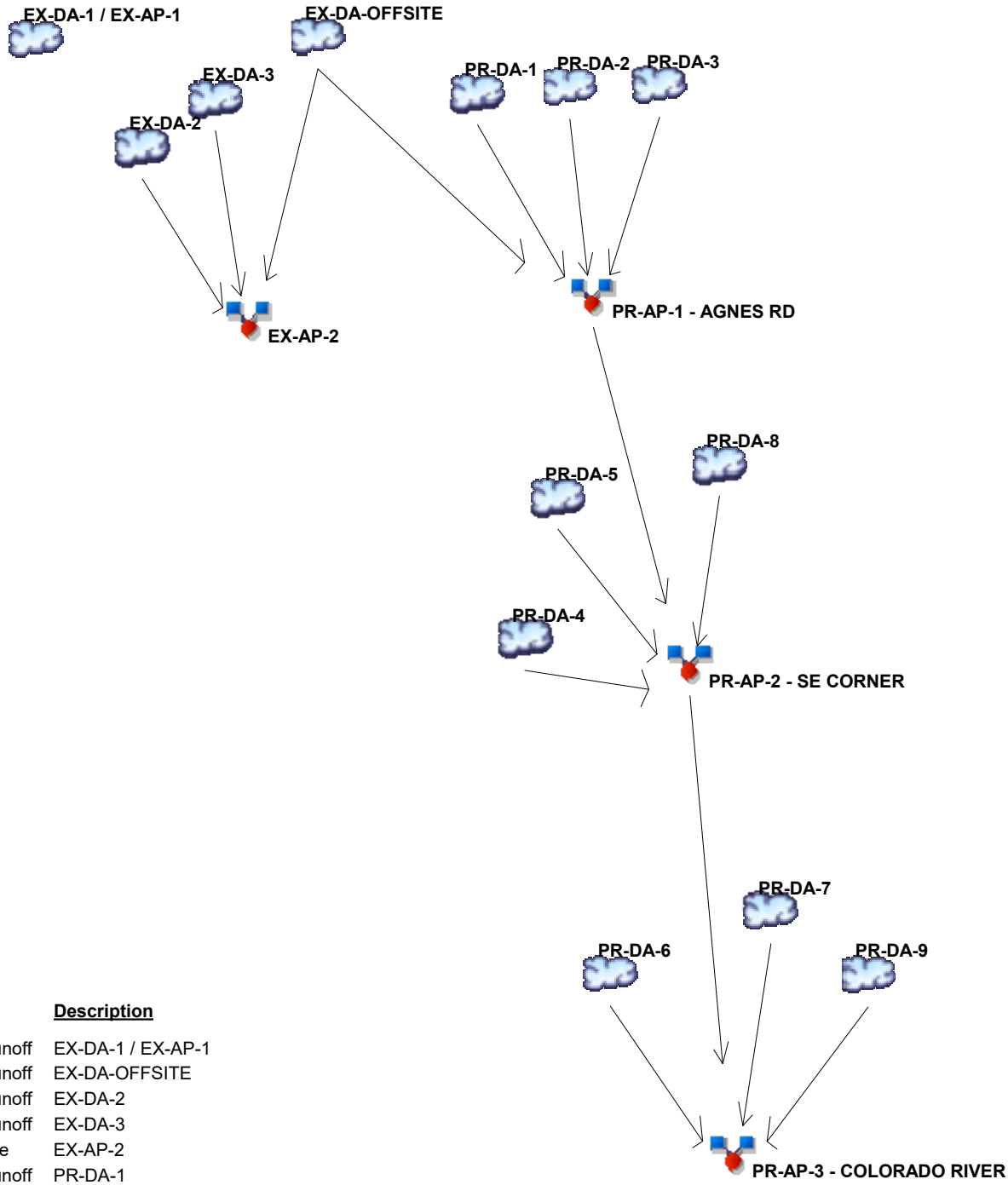
Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	EX-DA-1 / EX-AP-1
2	SCS Runoff	EX-DA-OFFSITE
3	SCS Runoff	EX-DA-2
4	SCS Runoff	EX-DA-3
5	Combine	EX-AP-2
6	SCS Runoff	PR-DA-1
7	SCS Runoff	PR-DA-2
8	SCS Runoff	PR-DA-3
9	SCS Runoff	PR-DA-4
10	SCS Runoff	PR-DA-5
11	SCS Runoff	PR-DA-6
12	SCS Runoff	PR-DA-7
13	SCS Runoff	PR-DA-8
14	SCS Runoff	PR-DA-9
15	Combine	PR-AP-1 - AGNES RD
16	Combine	PR-AP-2 - SE CORNER
17	Combine	PR-AP-3 - COLORADO RIVER

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	10.98	-------	35.60	59.56	97.12	-------	167.35	EX-DA-1 / EX-AP-1
2	SCS Runoff	------	-------	44.36	-------	90.58	127.94	181.31	-------	273.30	EX-DA-OFFSITE
3	SCS Runoff	------	-------	30.77	-------	87.97	140.32	219.91	-------	366.23	EX-DA-2
4	SCS Runoff	------	-------	3.938	-------	19.58	36.56	64.30	-------	117.99	EX-DA-3
5	Combine	2, 3, 4	-------	63.75	-------	165.26	257.24	395.87	-------	648.66	EX-AP-2
6	SCS Runoff	------	-------	74.29	-------	117.66	149.45	192.56	-------	263.76	PR-DA-1
7	SCS Runoff	------	-------	45.20	-------	71.58	90.92	117.15	-------	160.47	PR-DA-2
8	SCS Runoff	------	-------	5.631	-------	8.018	9.764	12.14	-------	16.10	PR-DA-3
9	SCS Runoff	------	-------	119.75	-------	208.26	275.24	367.46	-------	521.27	PR-DA-4
10	SCS Runoff	------	-------	28.56	-------	50.07	66.42	88.96	-------	126.64	PR-DA-5
11	SCS Runoff	------	-------	56.40	-------	104.79	142.77	195.94	-------	285.88	PR-DA-6
12	SCS Runoff	------	-------	89.62	-------	159.57	213.43	288.18	-------	413.80	PR-DA-7
13	SCS Runoff	------	-------	1.724	-------	5.024	7.881	12.16	-------	19.88	PR-DA-8
14	SCS Runoff	------	-------	5.329	-------	15.53	24.36	37.58	-------	61.45	PR-DA-9
15	Combine	2, 6, 7, 8,	-------	142.63	-------	239.42	312.95	414.96	-------	587.02	PR-AP-1 - AGNES RD
16	Combine	9, 10, 13, 15	-------	286.68	-------	493.34	650.57	868.31	-------	1234.19	PR-AP-2 - SE CORNER
17	Combine	11, 12, 14, 16	-------	354.73	-------	634.13	850.01	1151.75	-------	1662.89	PR-AP-3 - COLORADO RIVER

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	10.98	3	804	168,807	------	------	------	EX-DA-1 / EX-AP-1
2	SCS Runoff	44.36	3	750	281,463	------	------	------	EX-DA-OFFSITE
3	SCS Runoff	30.77	3	792	392,306	------	------	------	EX-DA-2
4	SCS Runoff	3.938	3	765	50,899	------	------	------	EX-DA-3
5	Combine	63.75	3	759	724,668	2, 3, 4	------	------	EX-AP-2
6	SCS Runoff	74.29	3	726	248,636	------	------	------	PR-DA-1
7	SCS Runoff	45.20	3	726	151,270	------	------	------	PR-DA-2
8	SCS Runoff	5.631	3	726	21,261	------	------	------	PR-DA-3
9	SCS Runoff	119.75	3	726	399,398	------	------	------	PR-DA-4
10	SCS Runoff	28.56	3	732	128,801	------	------	------	PR-DA-5
11	SCS Runoff	56.40	3	738	275,703	------	------	------	PR-DA-6
12	SCS Runoff	89.62	3	771	788,659	------	------	------	PR-DA-7
13	SCS Runoff	1.724	3	729	7,870	------	------	------	PR-DA-8
14	SCS Runoff	5.329	3	729	24,325	------	------	------	PR-DA-9
15	Combine	142.63	3	726	702,631	2, 6, 7, 8,	------	------	PR-AP-1 - AGNES RD
16	Combine	286.68	3	726	1,238,700	9, 10, 13, 15	------	------	PR-AP-2 - SE CORNER
17	Combine	354.73	3	726	2,327,386	11, 12, 14, 16	------	------	PR-AP-3 - COLORADO RIVER

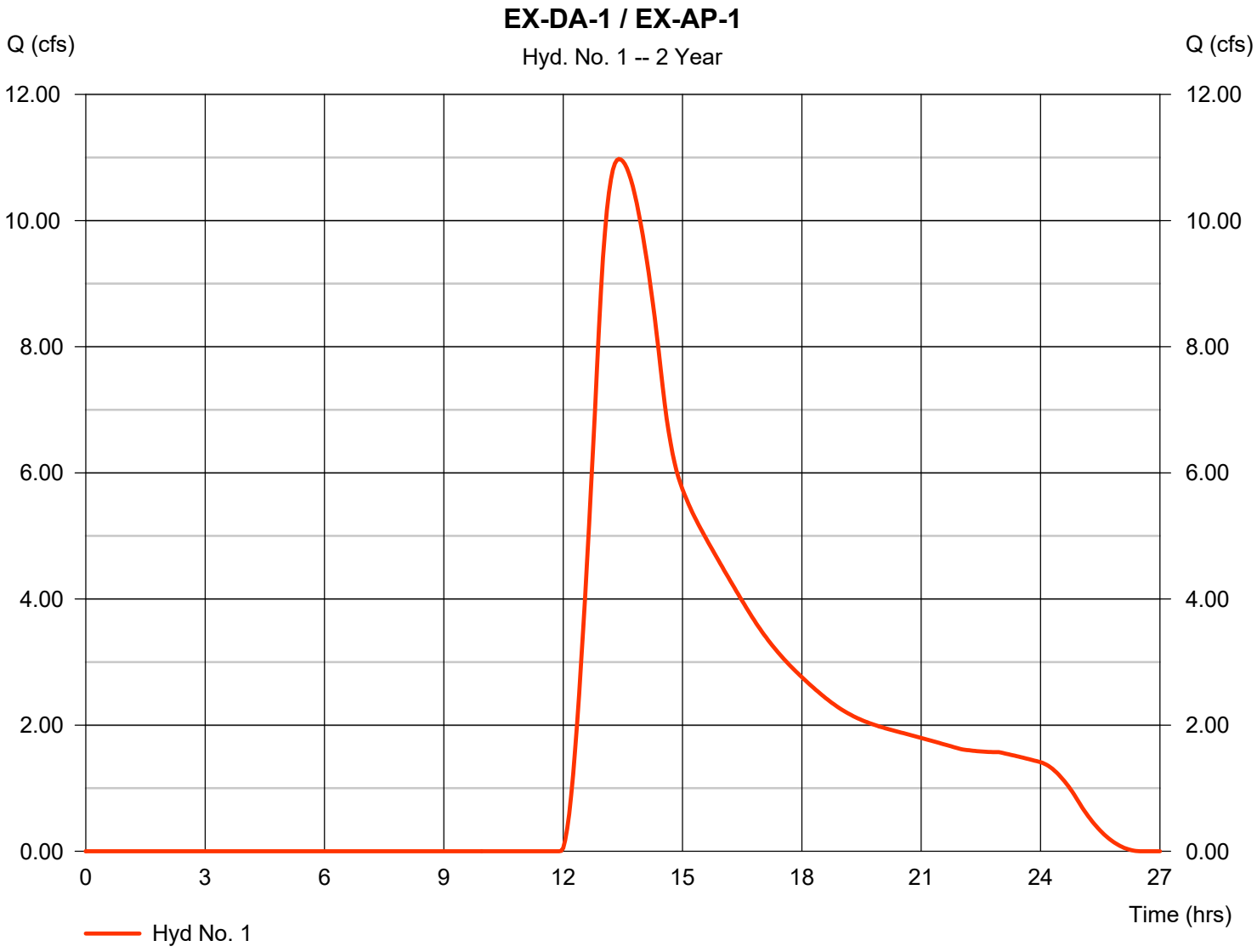
Hydrograph Report

Hyd. No. 1

EX-DA-1 / EX-AP-1

Hydrograph type	= SCS Runoff	Peak discharge	= 10.98 cfs
Storm frequency	= 2 yrs	Time to peak	= 13.40 hrs
Time interval	= 3 min	Hyd. volume	= 168,807 cuft
Drainage area	= 101.790 ac	Curve number	= 57*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 94.50 min
Total precip.	= 3.60 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(84.000 x 61) + (17.790 x 39)] / 101.790



TR55 Tc Worksheet

Hyd. No. 1

EX-DA-1 / EX-AP-1

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.30		0.00		0.00		
Travel Time (min)	**= 19.73**	**+**	**0.00**	**+**	**0.00**	**=**	**19.73**
Shallow Concentrated Flow							
Flow length (ft)	= 3154.97		0.00		0.00		
Watercourse slope (%)	= 0.19		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=0.70		0.00		0.00		
Travel Time (min)	**= 74.77**	**+**	**0.00**	**+**	**0.00**	**=**	**74.77**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 94.50 min

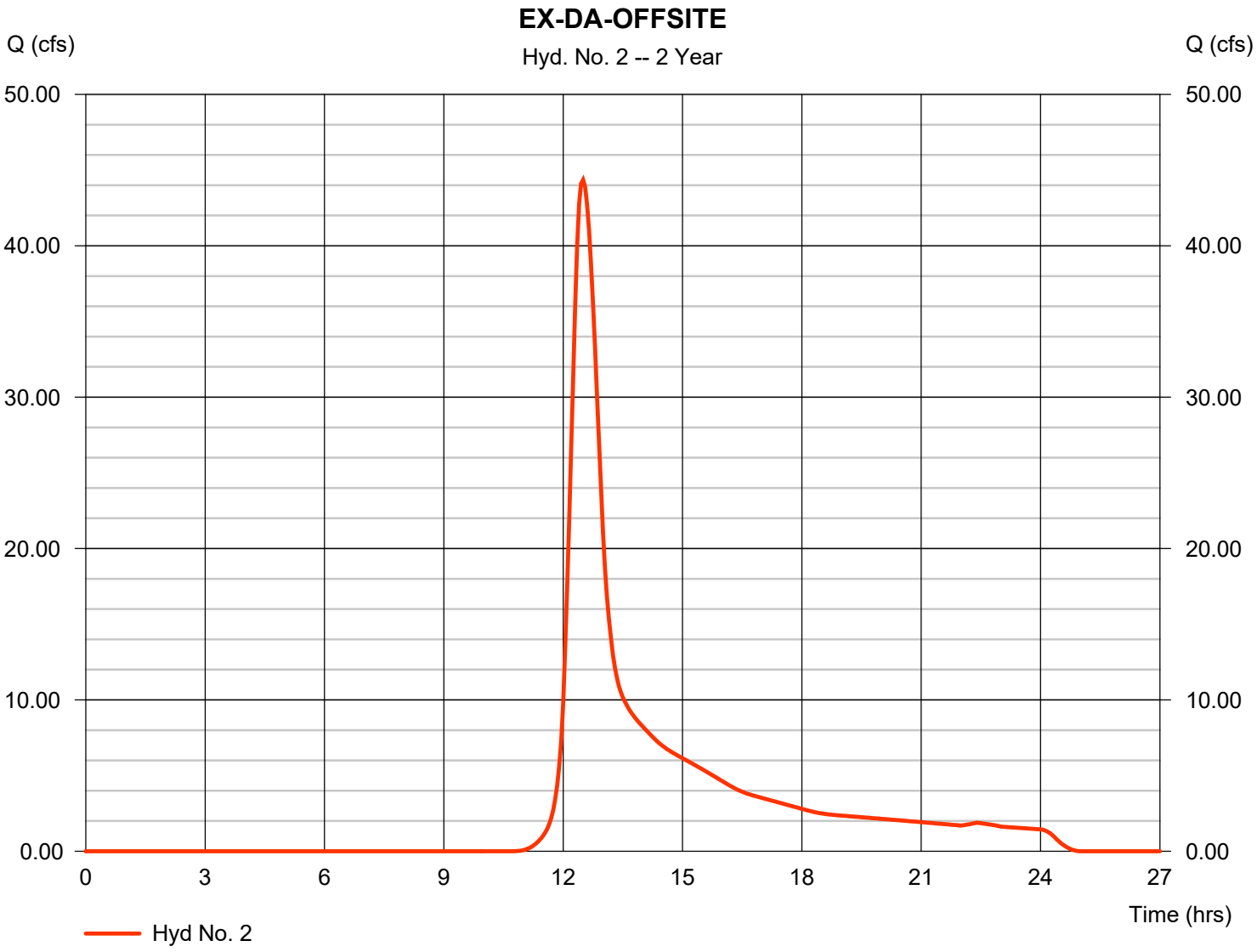
Hydrograph Report

Hyd. No. 2

EX-DA-OFFSITE

Hydrograph type	=	SCS Runoff	Peak discharge	=	44.36 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.50 hrs
Time interval	=	3 min	Hyd. volume	=	281,463 cuft
Drainage area	=	69.840 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	39.80 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.230 x 98) + (50.610 x 61)] / 69.840



TR55 Tc Worksheet

Hyd. No. 2

EX-DA-OFFSITE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.50		0.00		0.00		
Travel Time (min)	**= 1.99**	**+**	**0.00**	**+**	**0.00**	**=**	**1.99**
Shallow Concentrated Flow							
Flow length (ft)	= 2336.00		0.00		0.00		
Watercourse slope (%)	= 0.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.14		0.00		0.00		
Travel Time (min)	**= 34.13**	**+**	**0.00**	**+**	**0.00**	**=**	**34.13**
Channel Flow							
X sectional flow area (sqft)	= 18.00		0.00		0.00		
Wetted perimeter (ft)	= 18.00		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	=8.10						
			0.00				
					0.00		
Flow length (ft)	({0})1793.0		0.0		0.0		
Travel Time (min)	**= 3.69**	**+**	**0.00**	**+**	**0.00**	**=**	**3.69**

Total Travel Time, Tc ..... 39.80 min

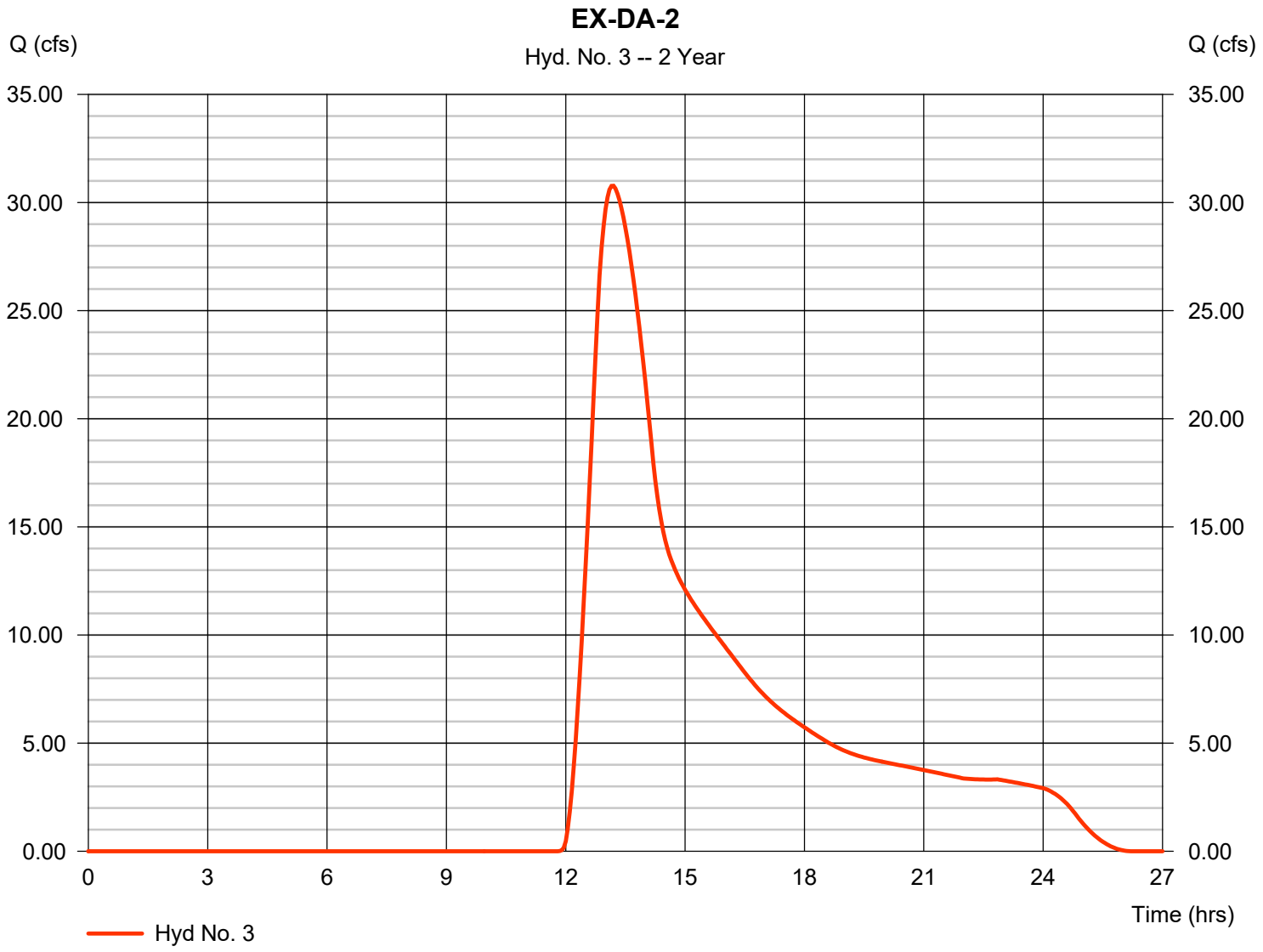
Hydrograph Report

Hyd. No. 3

EX-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	30.77 cfs
Storm frequency	=	2 yrs	Time to peak	=	13.20 hrs
Time interval	=	3 min	Hyd. volume	=	392,306 cuft
Drainage area	=	189.310 ac	Curve number	=	60*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	83.86 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(183.470 x 61) + (5.840 x 39)] / 189.310



TR55 Tc Worksheet

Hyd. No. 3

EX-DA-2

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.56		0.00		0.00		
Travel Time (min)	**= 15.37**	**+**	**0.00**	**+**	**0.00**	**=**	**15.37**
Shallow Concentrated Flow							
Flow length (ft)	= 3712.93		0.00		0.00		
Watercourse slope (%)	= 0.34		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=0.94		0.00		0.00		
Travel Time (min)	**= 65.78**	**+**	**0.00**	**+**	**0.00**	**=**	**65.78**
Channel Flow							
X sectional flow area (sqft)	= 200.00		0.00		0.00		
Wetted perimeter (ft)	= 60.00		0.00		0.00		
Channel slope (%)	= 1.58		0.00		0.00		
Manning's n-value	= 0.026		0.015		0.015		
Velocity (ft/s)	=16.14						
			0.00				
					0.00		
Flow length (ft)	({0})2631.6		0.0		0.0		
Travel Time (min)	**= 2.72**	**+**	**0.00**	**+**	**0.00**	**=**	**2.72**

Total Travel Time, Tc ..... 83.86 min

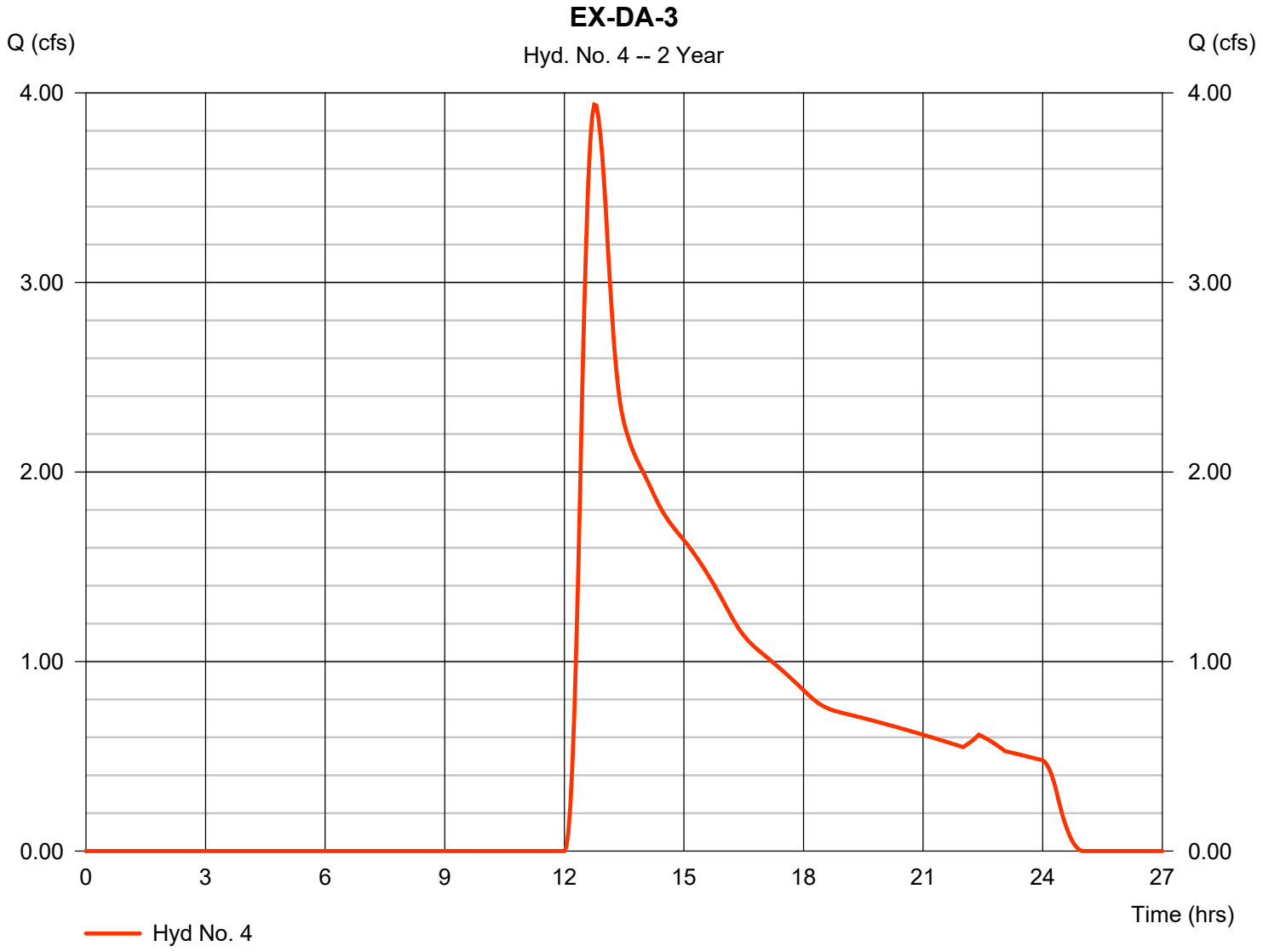
Hydrograph Report

Hyd. No. 4

EX-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.938 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.75 hrs
Time interval	=	3 min	Hyd. volume	=	50,899 cuft
Drainage area	=	50.910 ac	Curve number	=	52*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	38.30 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(30.546 x 61) + (20.364 x 39)] / 50.910



TR55 Tc Worksheet

Hyd. No. 4

EX-DA-3

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.36		0.00		0.00		
Travel Time (min)	**= 18.34**	**+**	**0.00**	**+**	**0.00**	**=**	**18.34**
Shallow Concentrated Flow							
Flow length (ft)	= 1684.20		0.00		0.00		
Watercourse slope (%)	= 0.76		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.41		0.00		0.00		
Travel Time (min)	**= 19.96**	**+**	**0.00**	**+**	**0.00**	**=**	**19.96**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

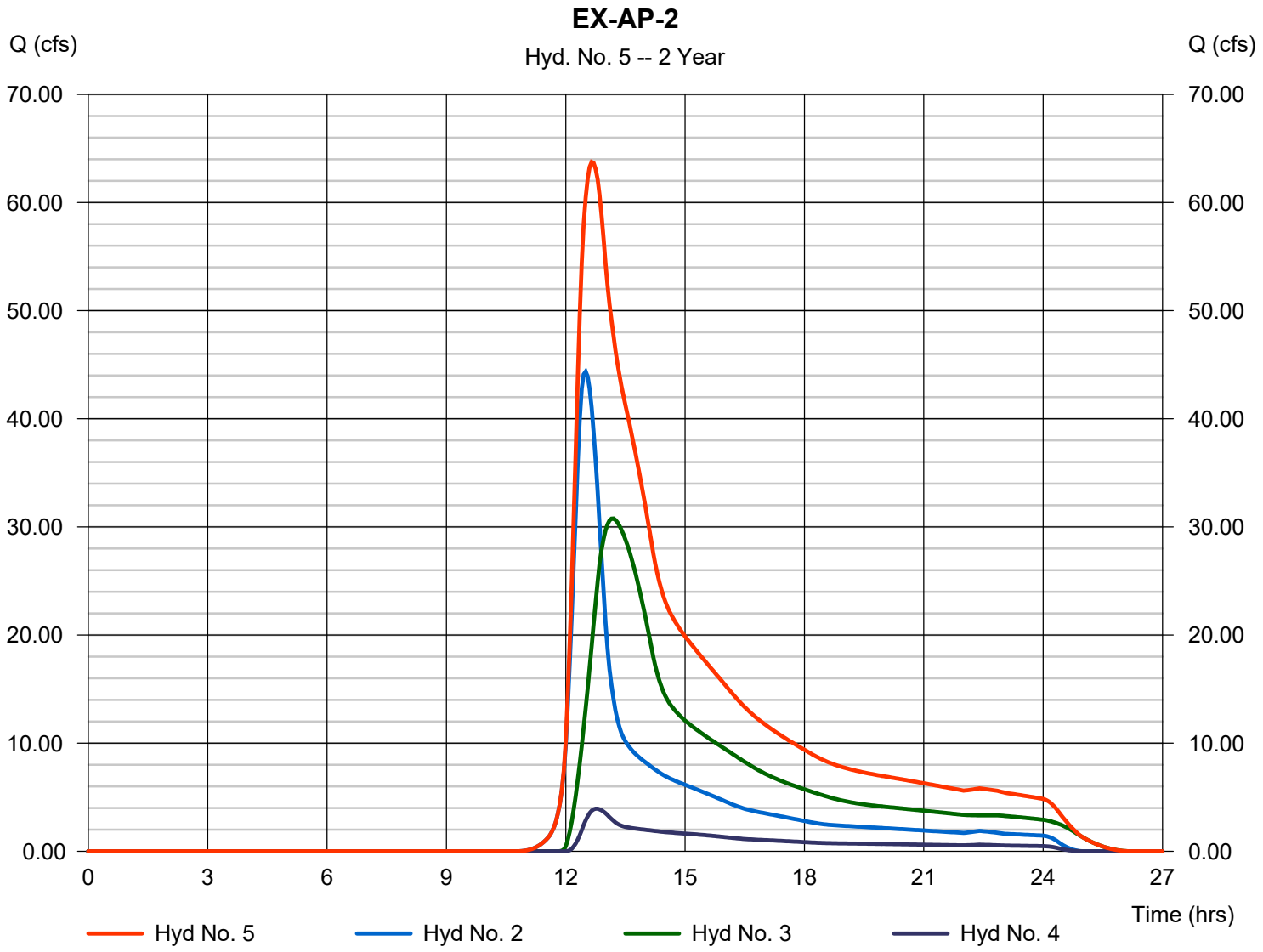
Total Travel Time, Tc ..... 38.30 min

Hydrograph Report

Hyd. No. 5

EX-AP-2

Hydrograph type	= Combine	Peak discharge	= 63.75 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.65 hrs
Time interval	= 3 min	Hyd. volume	= 724,668 cuft
Inflow hyds.	= 2, 3, 4	Contrib. drain. area	= 310.060 ac



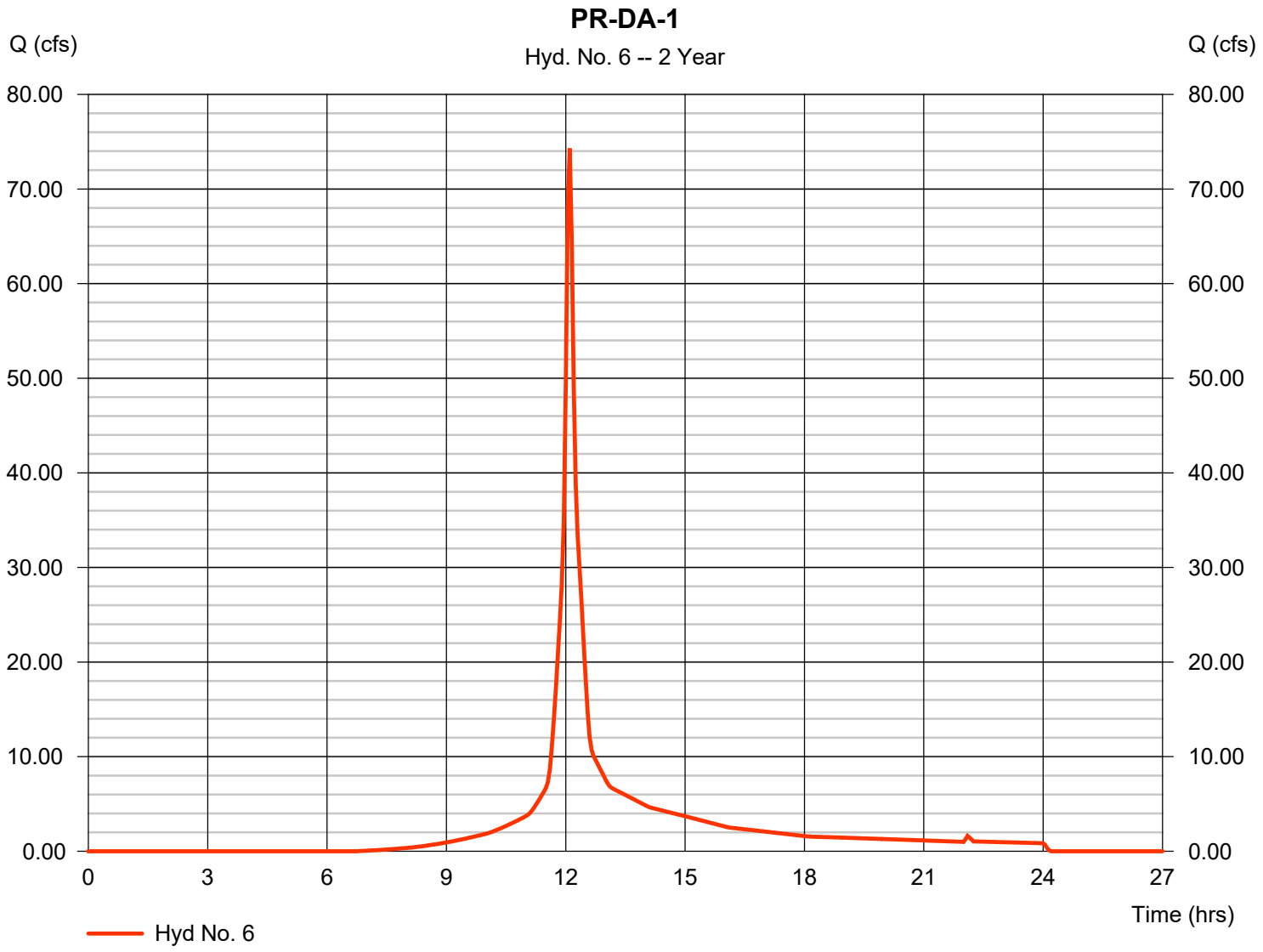
Hydrograph Report

Hyd. No. 6

PR-DA-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	74.29 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	248,636 cuft
Drainage area	=	32.150 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(22.300 x 98) + (9.560 x 61)] / 32.150



TR55 Tc Worksheet

Hyd. No. 6

PR-DA-1

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.50		0.00		0.00		
Travel Time (min)	**= 1.99**	**+**	**0.00**	**+**	**0.00**	**=**	**1.99**
Shallow Concentrated Flow							
Flow length (ft)	= 152.00		0.00		0.00		
Watercourse slope (%)	= 0.50		0.00		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=1.14		0.00		0.00		
Travel Time (min)	**= 2.22**	**+**	**0.00**	**+**	**0.00**	**=**	**2.22**
Channel Flow							
X sectional flow area (sqft)	= 27.58		0.00		0.00		
Wetted perimeter (ft)	= 15.88		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	=11.73						
			0.00				
					0.00		
Flow length (ft)	({0})2403.0		0.0		0.0		
Travel Time (min)	**= 3.41**	**+**	**0.00**	**+**	**0.00**	**=**	**3.41**

Total Travel Time, Tc ..... 7.60 min

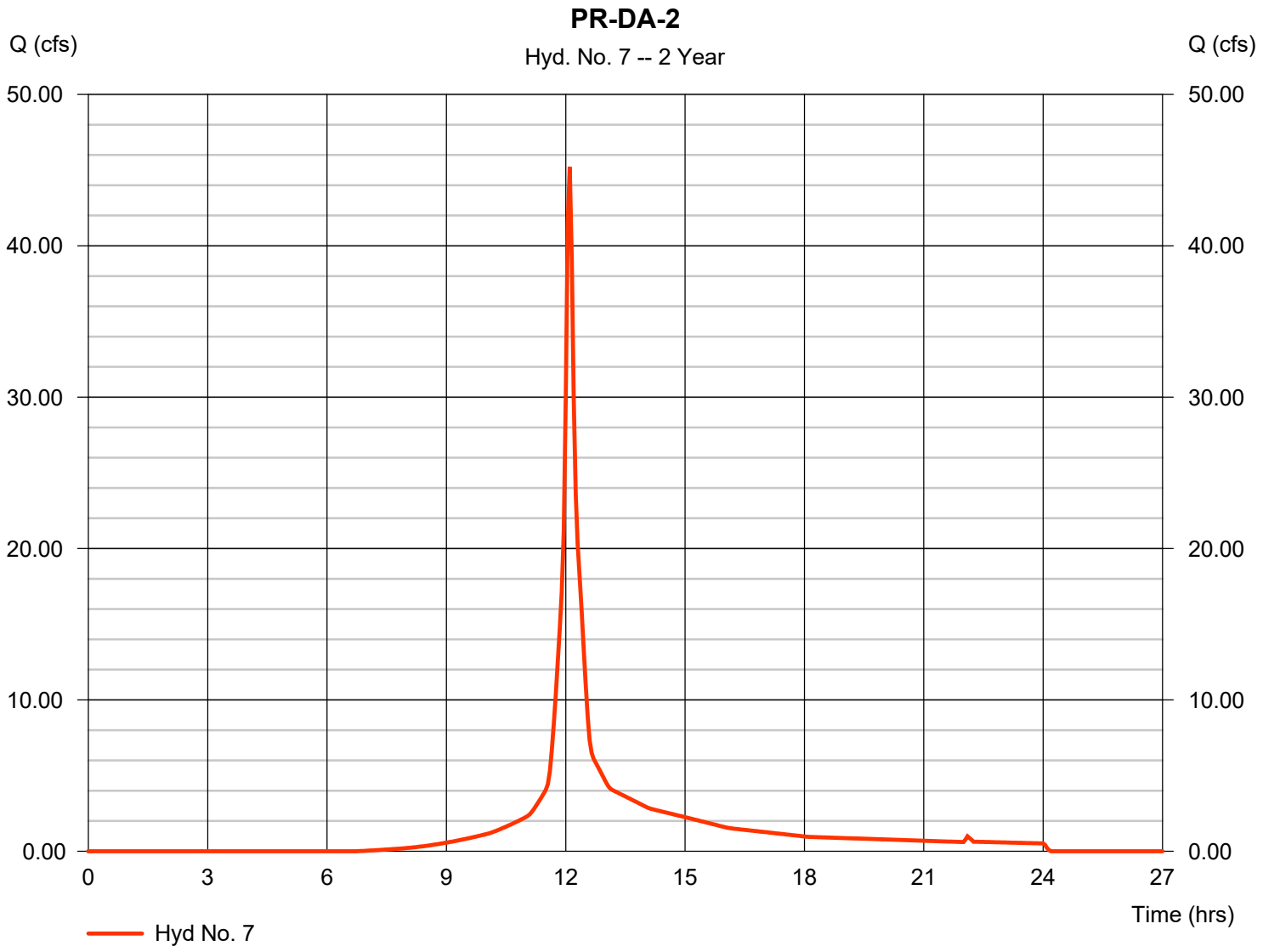
Hydrograph Report

Hyd. No. 7

PR-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	45.20 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	151,270 cuft
Drainage area	=	19.560 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(13.580 x 98) + (5.820 x 61)] / 19.560



TR55 Tc Worksheet

Hyd. No. 7

PR-DA-2

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.50		0.00		0.00		
Travel Time (min)	**= 1.99**	**+**	**0.00**	**+**	**0.00**	**=**	**1.99**
Shallow Concentrated Flow							
Flow length (ft)	= 217.47		0.00		0.00		
Watercourse slope (%)	= 0.50		0.00		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=1.14		0.00		0.00		
Travel Time (min)	**= 3.18**	**+**	**0.00**	**+**	**0.00**	**=**	**3.18**
Channel Flow							
X sectional flow area (sqft)	= 19.15		0.00		0.00		
Wetted perimeter (ft)	= 13.23		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	=10.38						
			0.00				
					0.00		
Flow length (ft)	({0})1518.0		0.0		0.0		
Travel Time (min)	**= 2.44**	**+**	**0.00**	**+**	**0.00**	**=**	**2.44**

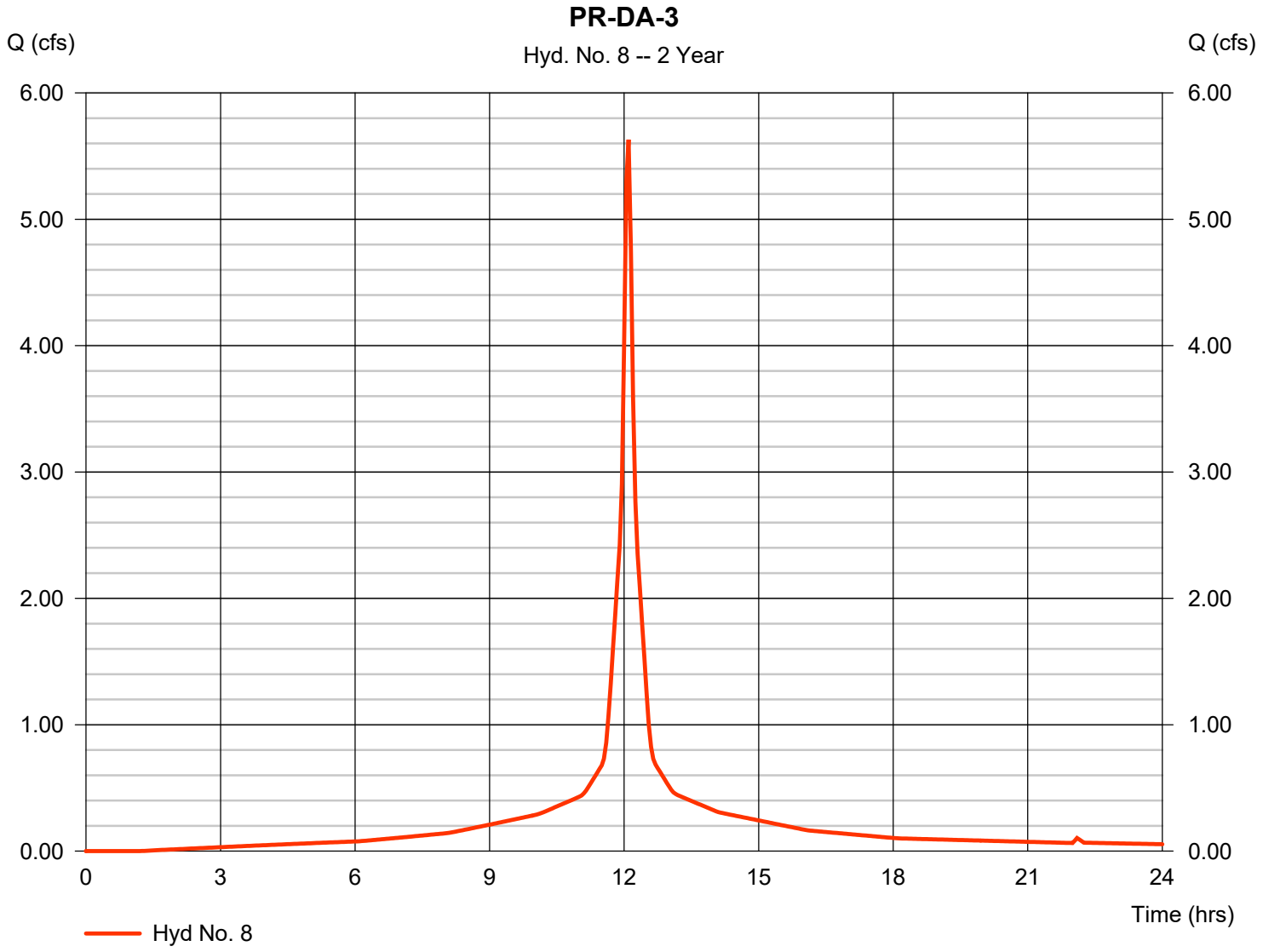
Total Travel Time, Tc ..... 7.60 min

Hydrograph Report

Hyd. No. 8

PR-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.631 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	21,261 cuft
Drainage area	=	1.856 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.80 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 8

PR-DA-3

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 0.66**	**+**	**0.00**	**+**	**0.00**	**=**	**0.66**
Shallow Concentrated Flow							
Flow length (ft)	= 198.00		0.00		0.00		
Watercourse slope (%)	= 1.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.03		0.00		0.00		
Travel Time (min)	**= 1.62**	**+**	**0.00**	**+**	**0.00**	**=**	**1.62**
Channel Flow							
X sectional flow area (sqft)	= 27.58		0.00		0.00		
Wetted perimeter (ft)	= 15.88		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	=11.73						
			0.00				
					0.00		
Flow length (ft)	({0})1748.1		0.0		0.0		
Travel Time (min)	**= 2.48**	**+**	**0.00**	**+**	**0.00**	**=**	**2.48**

Total Travel Time, Tc ..... 4.80 min

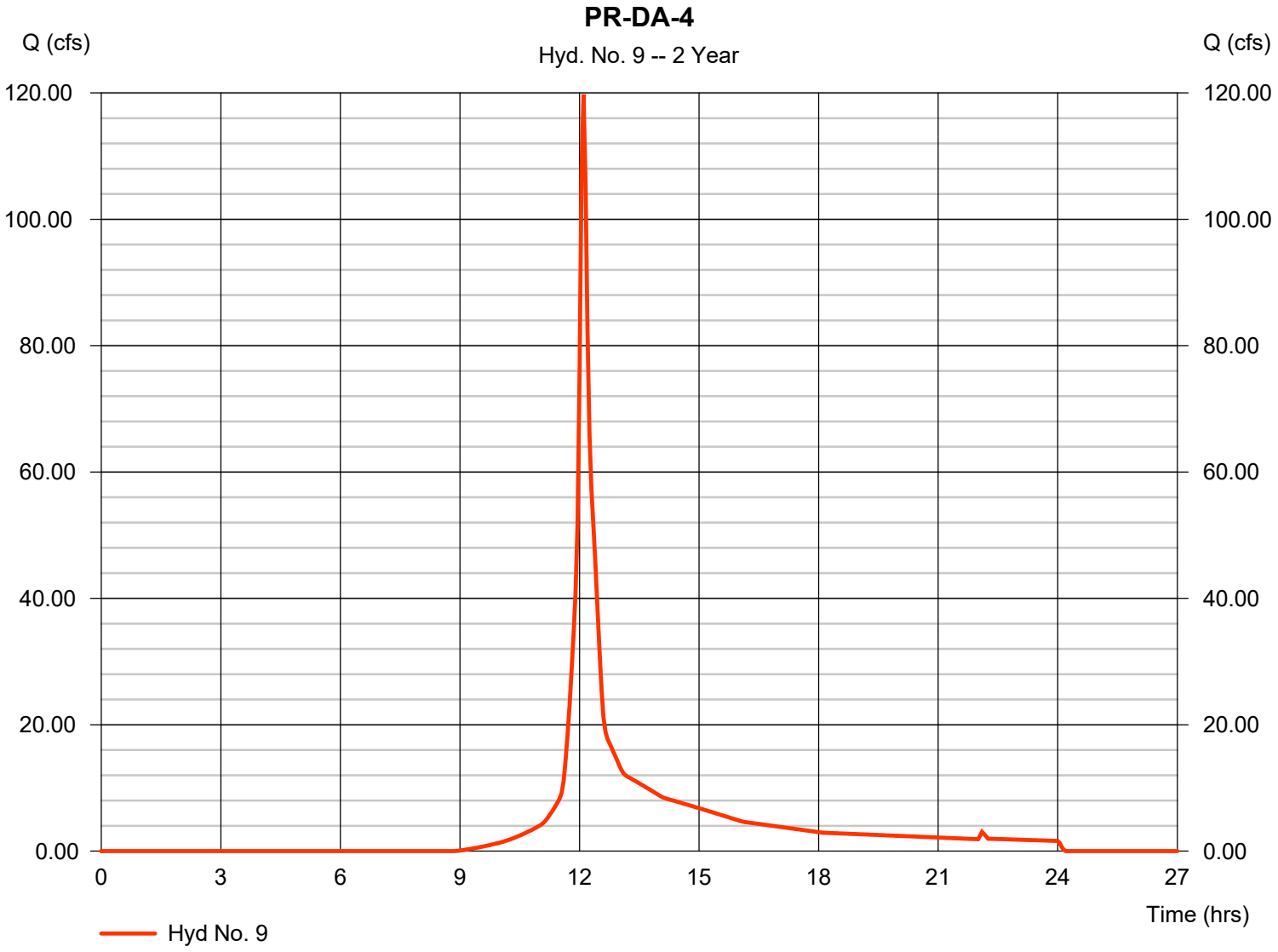
Hydrograph Report

Hyd. No. 9

PR-DA-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	119.75 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	399,398 cuft
Drainage area	=	68.390 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.10 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(34.190 x 98) + (34.200 x 61)] / 68.390



TR55 Tc Worksheet

Hyd. No. 9

PR-DA-4

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.50		0.00		0.00		
Travel Time (min)	**= 1.99**	**+**	**0.00**	**+**	**0.00**	**=**	**1.99**
Shallow Concentrated Flow							
Flow length (ft)	= 110.95		0.00		0.00		
Watercourse slope (%)	= 0.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.14		0.00		0.00		
Travel Time (min)	**= 1.62**	**+**	**0.00**	**+**	**0.00**	**=**	**1.62**
Channel Flow							
X sectional flow area (sqft)	= 37.54		0.00		0.00		
Wetted perimeter (ft)	= 18.53		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	=13.01						
			0.00				
					0.00		
Flow length (ft)	({0})3491.2		0.0		0.0		
Travel Time (min)	**= 4.47**	**+**	**0.00**	**+**	**0.00**	**=**	**4.47**

Total Travel Time, Tc ..... 8.10 min

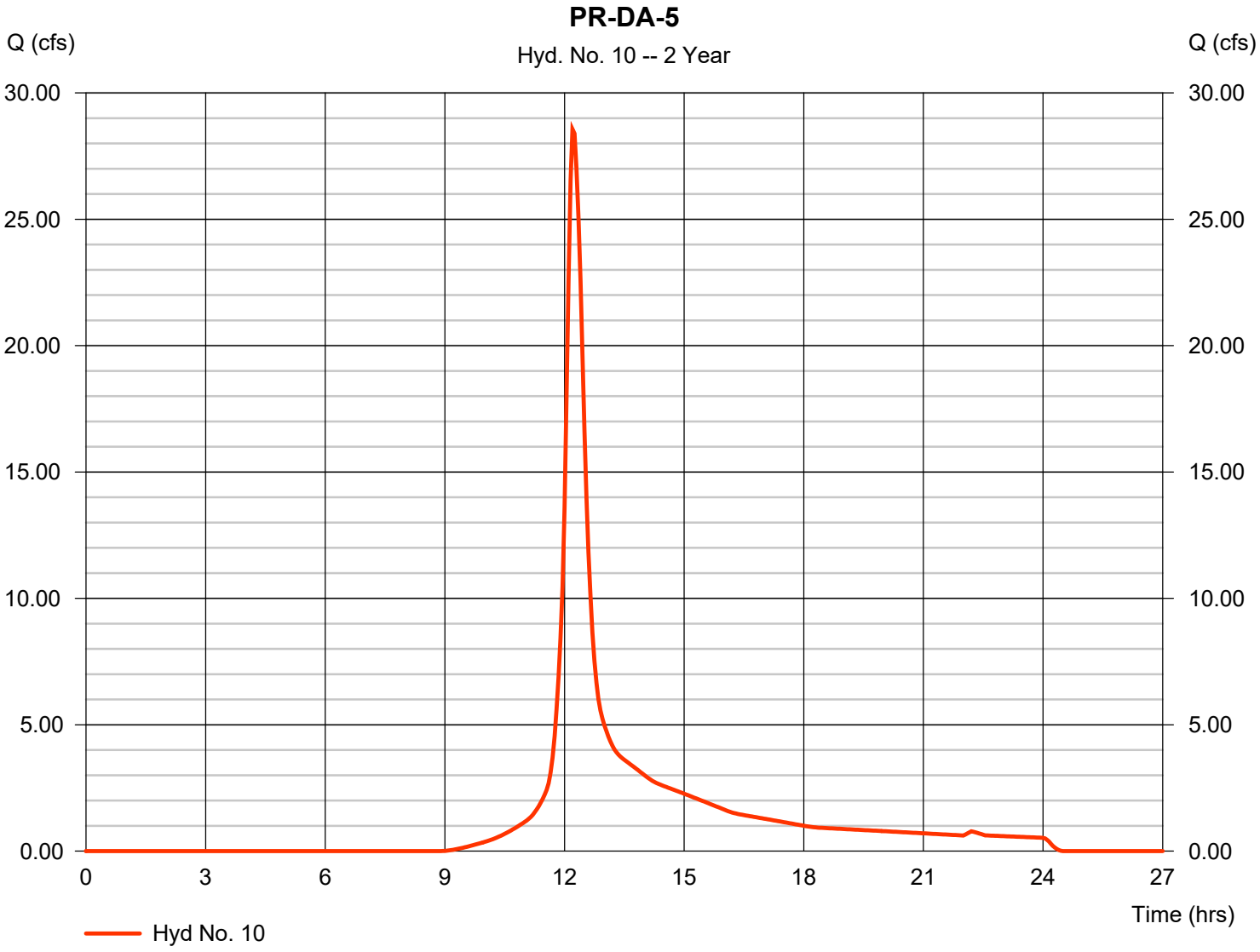
Hydrograph Report

Hyd. No. 10

PR-DA-5

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.56 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.20 hrs
Time interval	=	3 min	Hyd. volume	=	128,801 cuft
Drainage area	=	20.050 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.40 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(10.167 x 98) + (10.167 x 61)] / 20.050



TR55 Tc Worksheet

Hyd. No. 10

PR-DA-5

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.50		0.00		0.00		
Travel Time (min)	**= 1.99**	**+**	**0.00**	**+**	**0.00**	**=**	**1.99**
Shallow Concentrated Flow							
Flow length (ft)	= 918.22		0.00		0.00		
Watercourse slope (%)	= 0.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.14		0.00		0.00		
Travel Time (min)	**= 13.41**	**+**	**0.00**	**+**	**0.00**	**=**	**13.41**
Channel Flow							
X sectional flow area (sqft)	= 86.78		0.00		0.00		
Wetted perimeter (ft)	= 34.61		0.00		0.00		
Channel slope (%)	= 0.30		0.00		0.00		
Manning's n-value	= 0.026		0.015		0.015		
Velocity (ft/s)	=5.81						
			0.00				
					0.00		
Flow length (ft)	({0})1031.6		0.0		0.0		
Travel Time (min)	**= 2.96**	**+**	**0.00**	**+**	**0.00**	**=**	**2.96**

Total Travel Time, Tc ..... 18.40 min

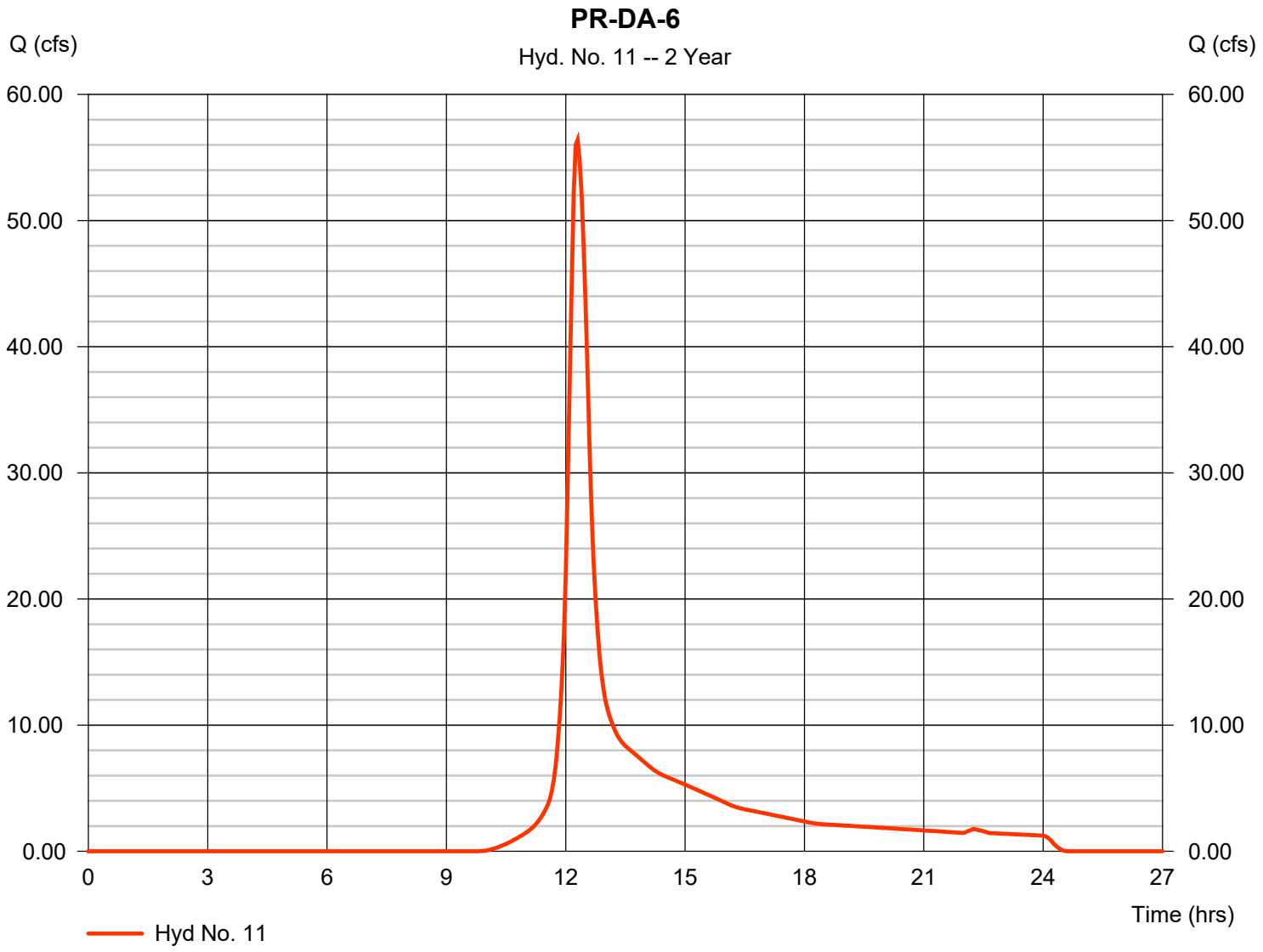
Hydrograph Report

Hyd. No. 11

PR-DA-6

Hydrograph type	=	SCS Runoff	Peak discharge	=	56.40 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.30 hrs
Time interval	=	3 min	Hyd. volume	=	275,703 cuft
Drainage area	=	54.160 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.60 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.630 x 61) + (7.450 x 39) + (27.080 x 98)] / 54.160



TR55 Tc Worksheet

Hyd. No. 11

PR-DA-6

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.50		0.00		0.00		
Travel Time (min)	**= 1.99**	**+**	**0.00**	**+**	**0.00**	**=**	**1.99**
Shallow Concentrated Flow							
Flow length (ft)	= 1884.20		0.00		0.00		
Watercourse slope (%)	= 0.74		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.39		0.00		0.00		
Travel Time (min)	**= 22.63**	**+**	**0.00**	**+**	**0.00**	**=**	**22.63**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 24.60 min

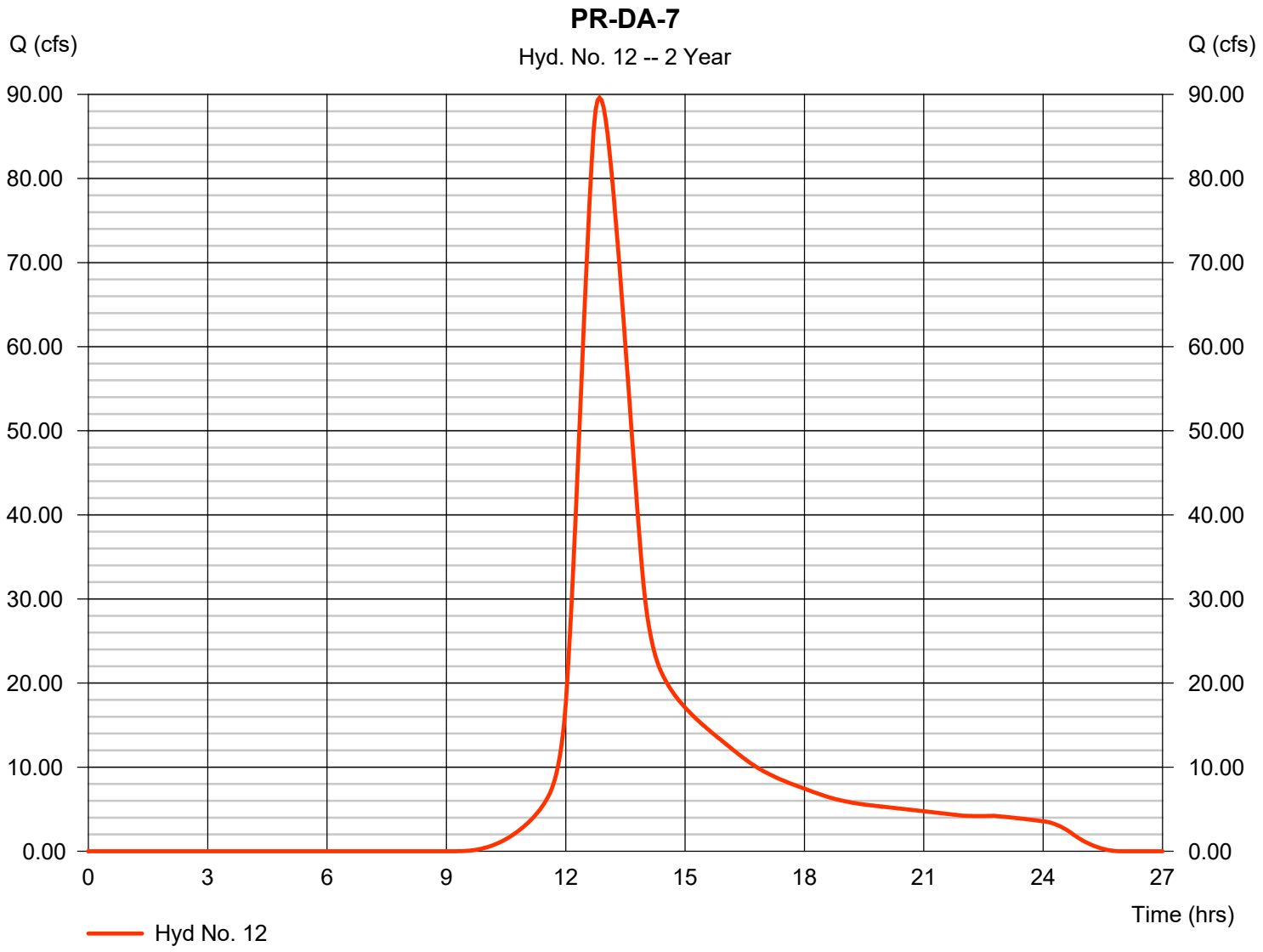
Hydrograph Report

Hyd. No. 12

PR-DA-7

Hydrograph type	=	SCS Runoff	Peak discharge	=	89.62 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.85 hrs
Time interval	=	3 min	Hyd. volume	=	788,659 cuft
Drainage area	=	132.150 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	71.80 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(66.080 x 98) + (66.070 x 61)] / 132.150



TR55 Tc Worksheet

Hyd. No. 12

PR-DA-7

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.60		0.00		0.00		
Land slope (%)	= 0.50		0.00		0.00		
Travel Time (min)	**= 1.99**	**+**	**0.00**	**+**	**0.00**	**=**	**1.99**
Shallow Concentrated Flow							
Flow length (ft)	= 3242.18		0.00		0.00		
Watercourse slope (%)	= 0.23		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=0.77		0.00		0.00		
Travel Time (min)	**= 69.83**	**+**	**0.00**	**+**	**0.00**	**=**	**69.83**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

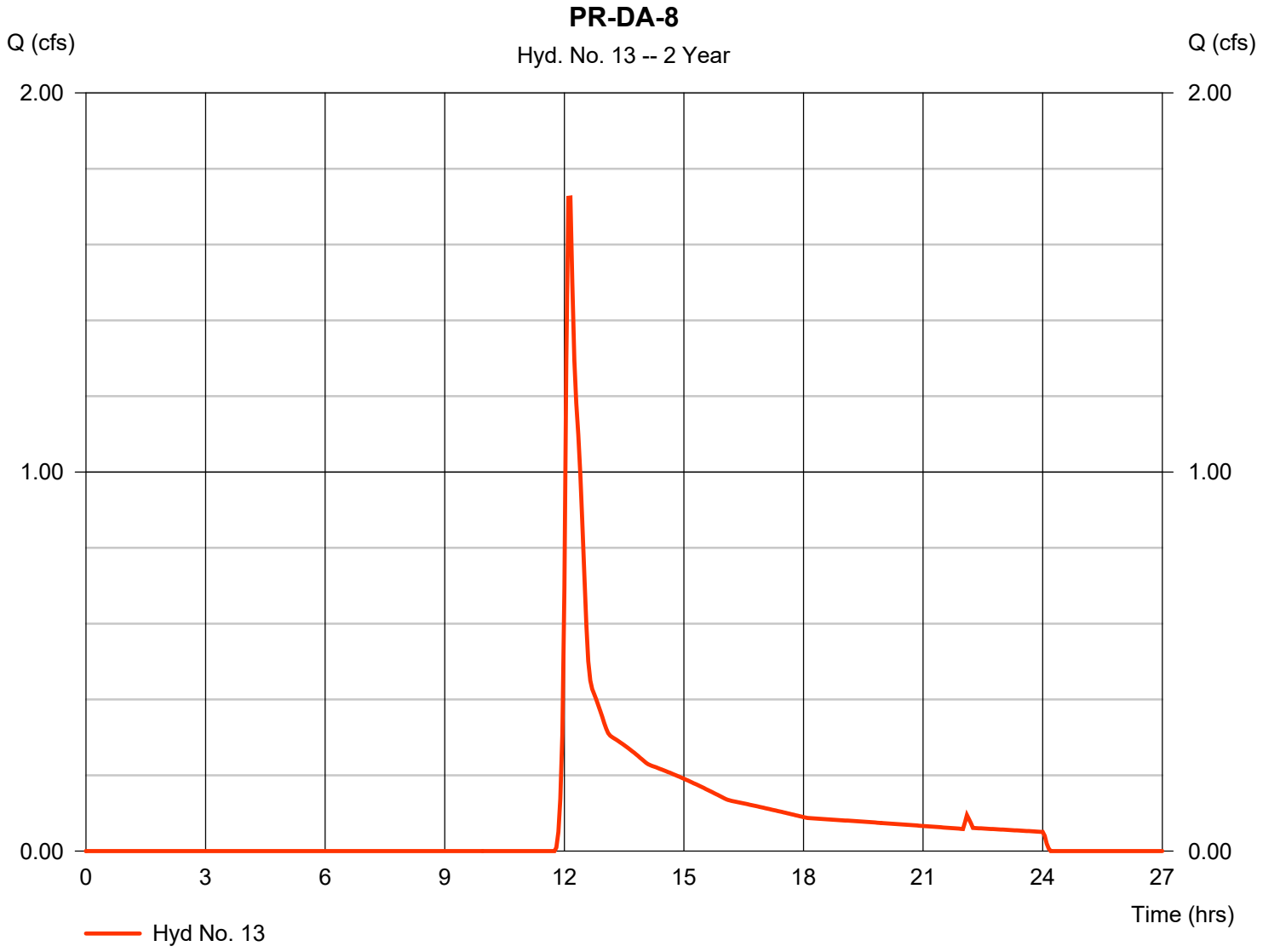
Total Travel Time, Tc ..... 71.80 min

Hydrograph Report

Hyd. No. 13

PR-DA-8

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.724 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.15 hrs
Time interval	=	3 min	Hyd. volume	=	7,870 cuft
Drainage area	=	3.740 ac	Curve number	=	61
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.90 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 13

PR-DA-8

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 0.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 0.00		0.00		0.00		
Land slope (%)	= 0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 86.78		0.00		0.00		
Wetted perimeter (ft)	= 34.61		0.00		0.00		
Channel slope (%)	= 0.30		0.00		0.00		
Manning's n-value	= 0.026		0.015		0.015		
Velocity (ft/s)	=5.81						
			0.00				
					0.00		
Flow length (ft)	({0})1715.4		0.0		0.0		
Travel Time (min)	**= 4.92**	**+**	**0.00**	**+**	**0.00**	**=**	**4.92**

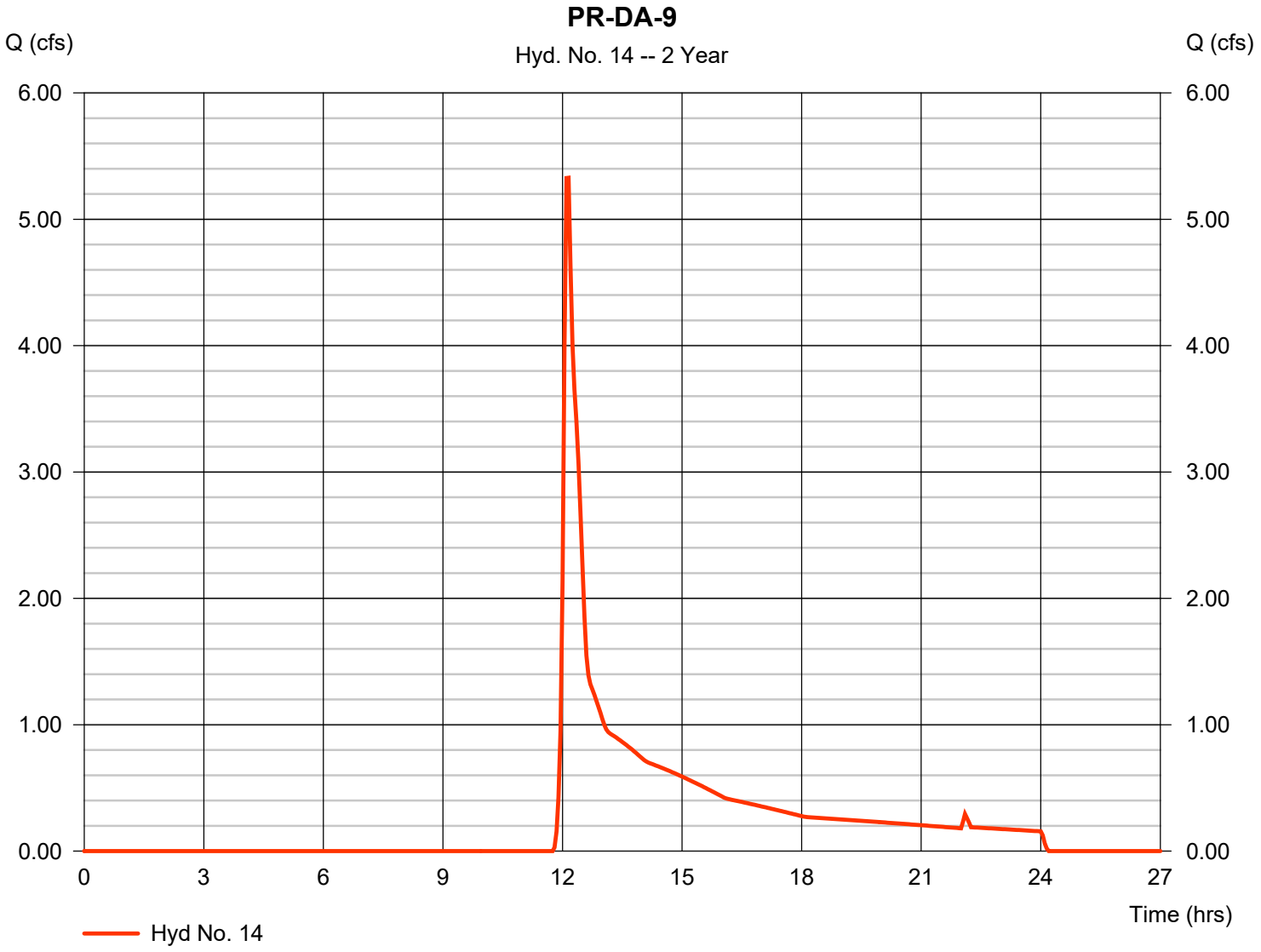
Total Travel Time, Tc ..... 4.90 min

Hydrograph Report

Hyd. No. 14

PR-DA-9

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.329 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.15 hrs
Time interval	=	3 min	Hyd. volume	=	24,325 cuft
Drainage area	=	11.560 ac	Curve number	=	61
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.70 min
Total precip.	=	3.60 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 14

PR-DA-9

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 0.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 0.00		0.00		0.00		
Land slope (%)	= 0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 320.00		0.00		0.00		
Wetted perimeter (ft)	= 65.25		0.00		0.00		
Channel slope (%)	= 0.30		0.00		0.00		
Manning's n-value	= 0.026		0.015		0.015		
Velocity (ft/s)	=9.11						
			0.00				
					0.00		
Flow length (ft)	({0})3133.0		0.0		0.0		
Travel Time (min)	**= 5.73**	**+**	**0.00**	**+**	**0.00**	**=**	**5.73**

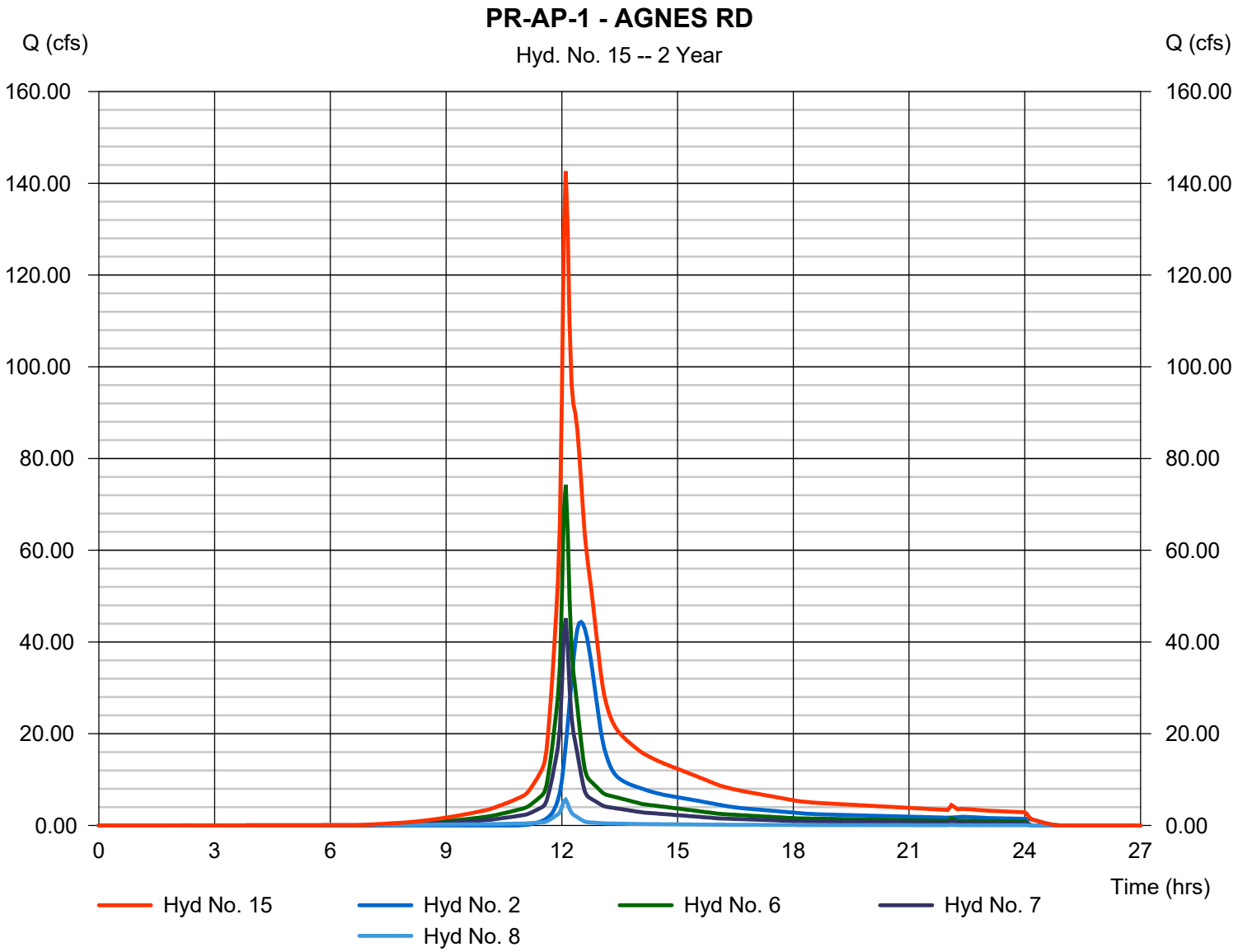
Total Travel Time, Tc ..... 5.70 min

Hydrograph Report

Hyd. No. 15

PR-AP-1 - AGNES RD

Hydrograph type	= Combine	Peak discharge	= 142.63 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 702,631 cuft
Inflow hyds.	= 2, 6, 7, 8	Contrib. drain. area	= 123.406 ac

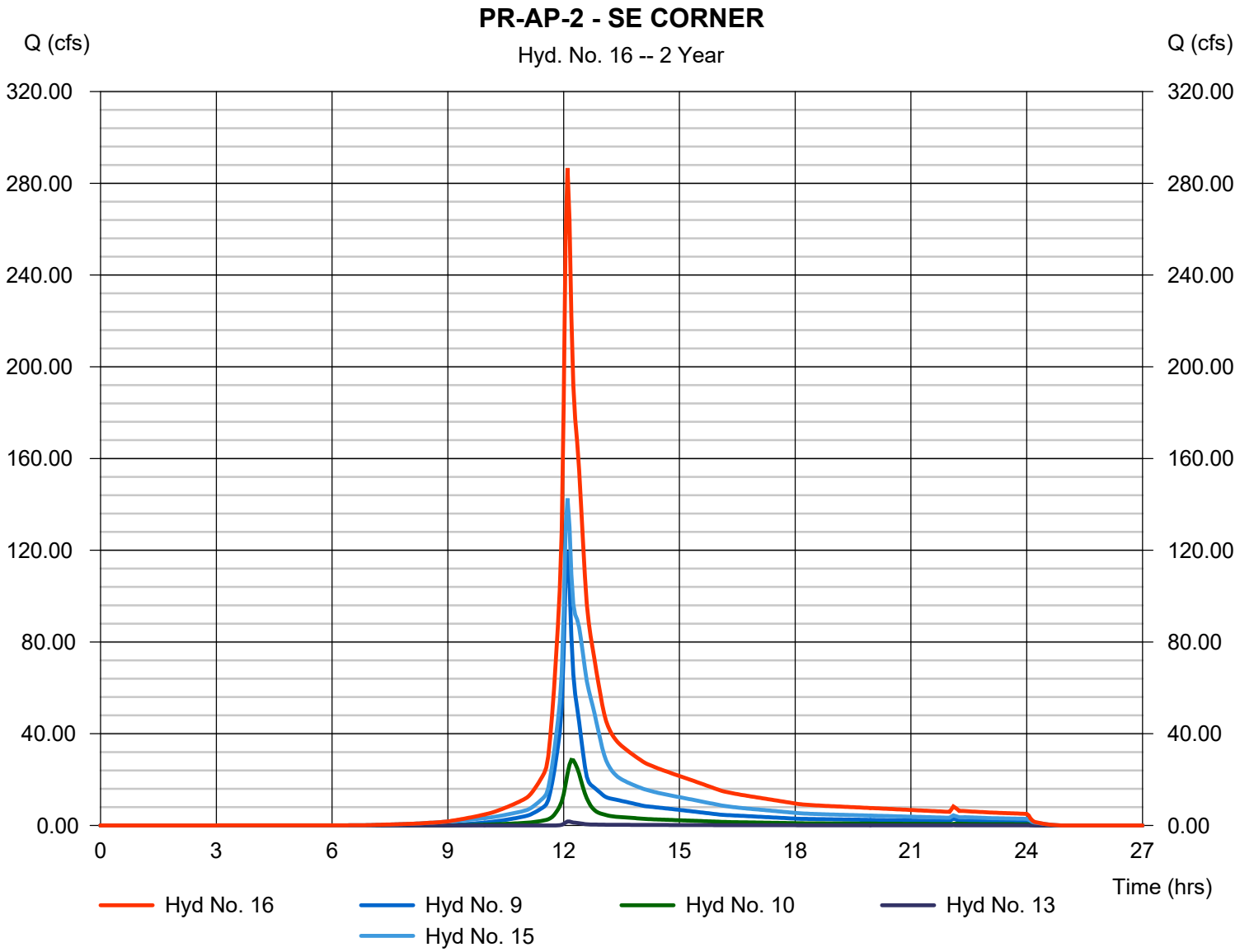


Hydrograph Report

Hyd. No. 16

PR-AP-2 - SE CORNER

Hydrograph type	= Combine	Peak discharge	= 286.68 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 1,238,700 cuft
Inflow hyds.	= 9, 10, 13, 15	Contrib. drain. area	= 92.180 ac

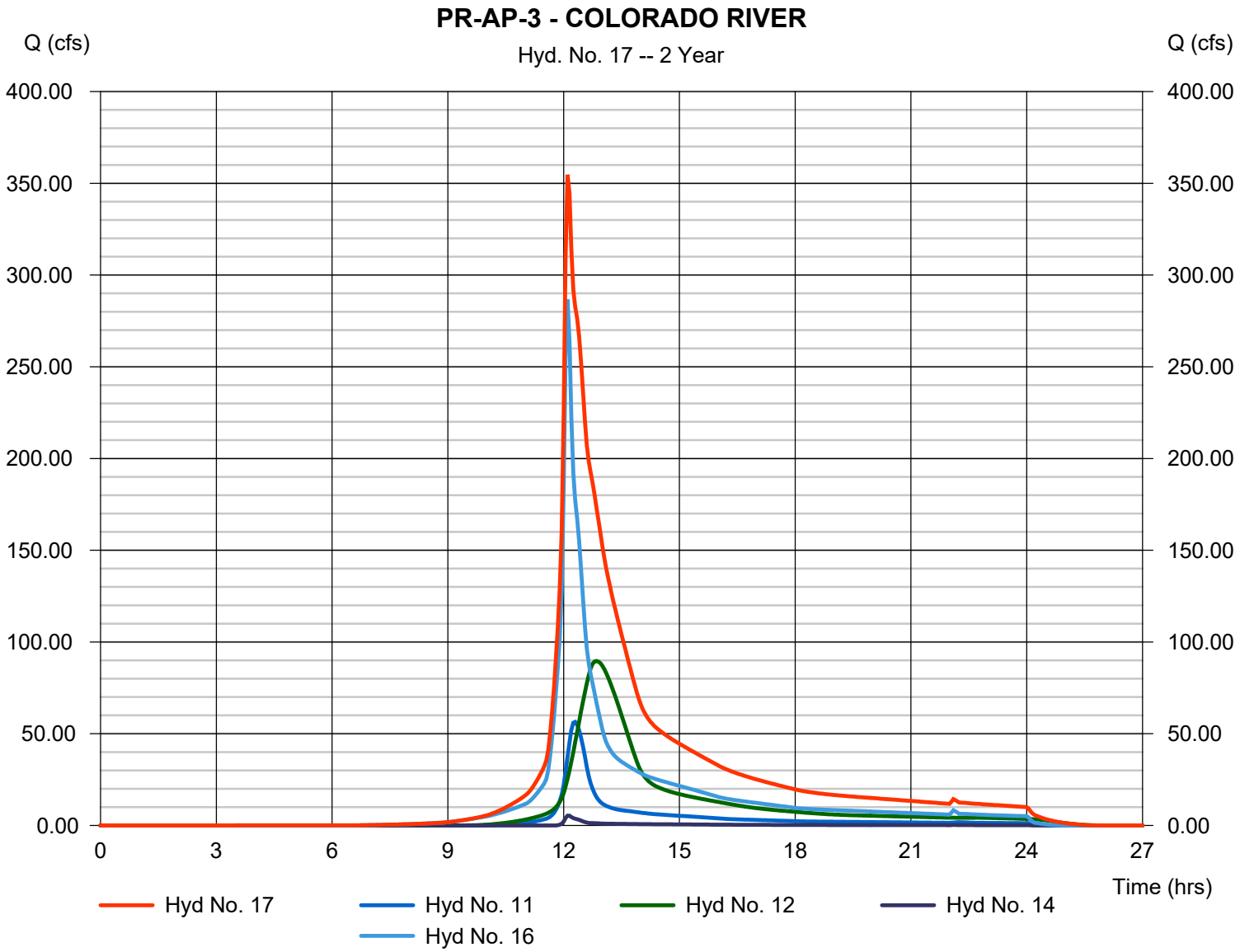


Hydrograph Report

Hyd. No. 17

PR-AP-3 - COLORADO RIVER

Hydrograph type	=	Combine	Peak discharge	=	354.73 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	2,327,386 cuft
Inflow hyds.	=	11, 12, 14, 16	Contrib. drain. area	=	197.870 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	35.60	3	792	430,770	------	------	------	EX-DA-1 / EX-AP-1
2	SCS Runoff	90.58	3	747	547,124	------	------	------	EX-DA-OFFSITE
3	SCS Runoff	87.97	3	783	927,611	------	------	------	EX-DA-2
4	SCS Runoff	19.58	3	756	154,249	------	------	------	EX-DA-3
5	Combine	165.26	3	759	1,628,986	2, 3, 4	------	------	EX-AP-2
6	SCS Runoff	117.66	3	726	400,613	------	------	------	PR-DA-1
7	SCS Runoff	71.58	3	726	243,732	------	------	------	PR-DA-2
8	SCS Runoff	8.018	3	726	30,716	------	------	------	PR-DA-3
9	SCS Runoff	208.26	3	726	693,630	------	------	------	PR-DA-4
10	SCS Runoff	50.07	3	732	223,688	------	------	------	PR-DA-5
11	SCS Runoff	104.79	3	735	501,861	------	------	------	PR-DA-6
12	SCS Runoff	159.57	3	768	1,385,353	------	------	------	PR-DA-7
13	SCS Runoff	5.024	3	726	18,195	------	------	------	PR-DA-8
14	SCS Runoff	15.53	3	726	56,238	------	------	------	PR-DA-9
15	Combine	239.42	3	726	1,222,186	2, 6, 7, 8,	------	------	PR-AP-1 - AGNES RD
16	Combine	493.34	3	726	2,157,699	9, 10, 13, 15	------	------	PR-AP-2 - SE CORNER
17	Combine	634.13	3	726	4,101,151	11, 12, 14, 16	------	------	PR-AP-3 - COLORADO RIVER

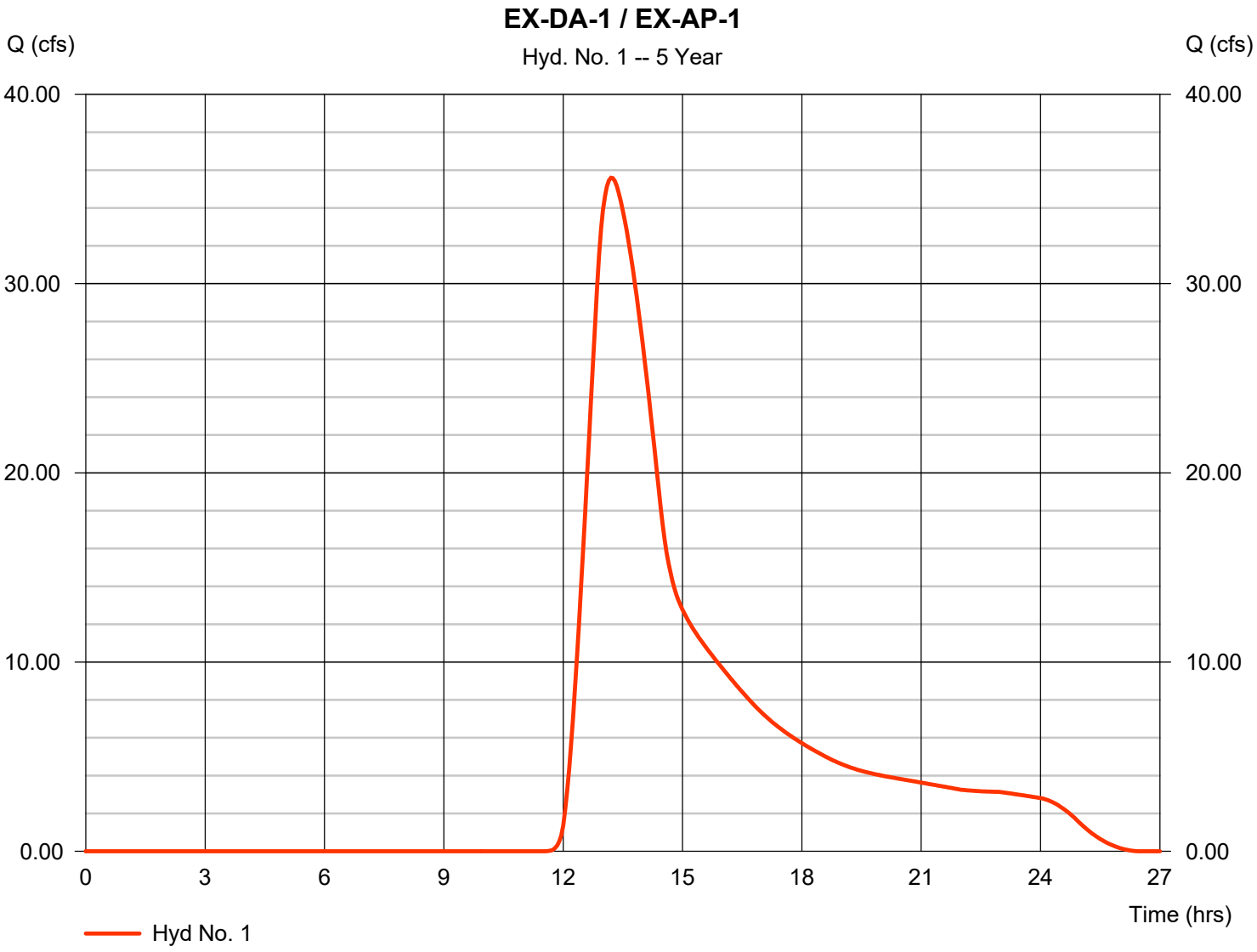
Hydrograph Report

Hyd. No. 1

EX-DA-1 / EX-AP-1

Hydrograph type	= SCS Runoff	Peak discharge	= 35.60 cfs
Storm frequency	= 5 yrs	Time to peak	= 13.20 hrs
Time interval	= 3 min	Hyd. volume	= 430,770 cuft
Drainage area	= 101.790 ac	Curve number	= 57*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 94.50 min
Total precip.	= 5.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(84.000 x 61) + (17.790 x 39)] / 101.790



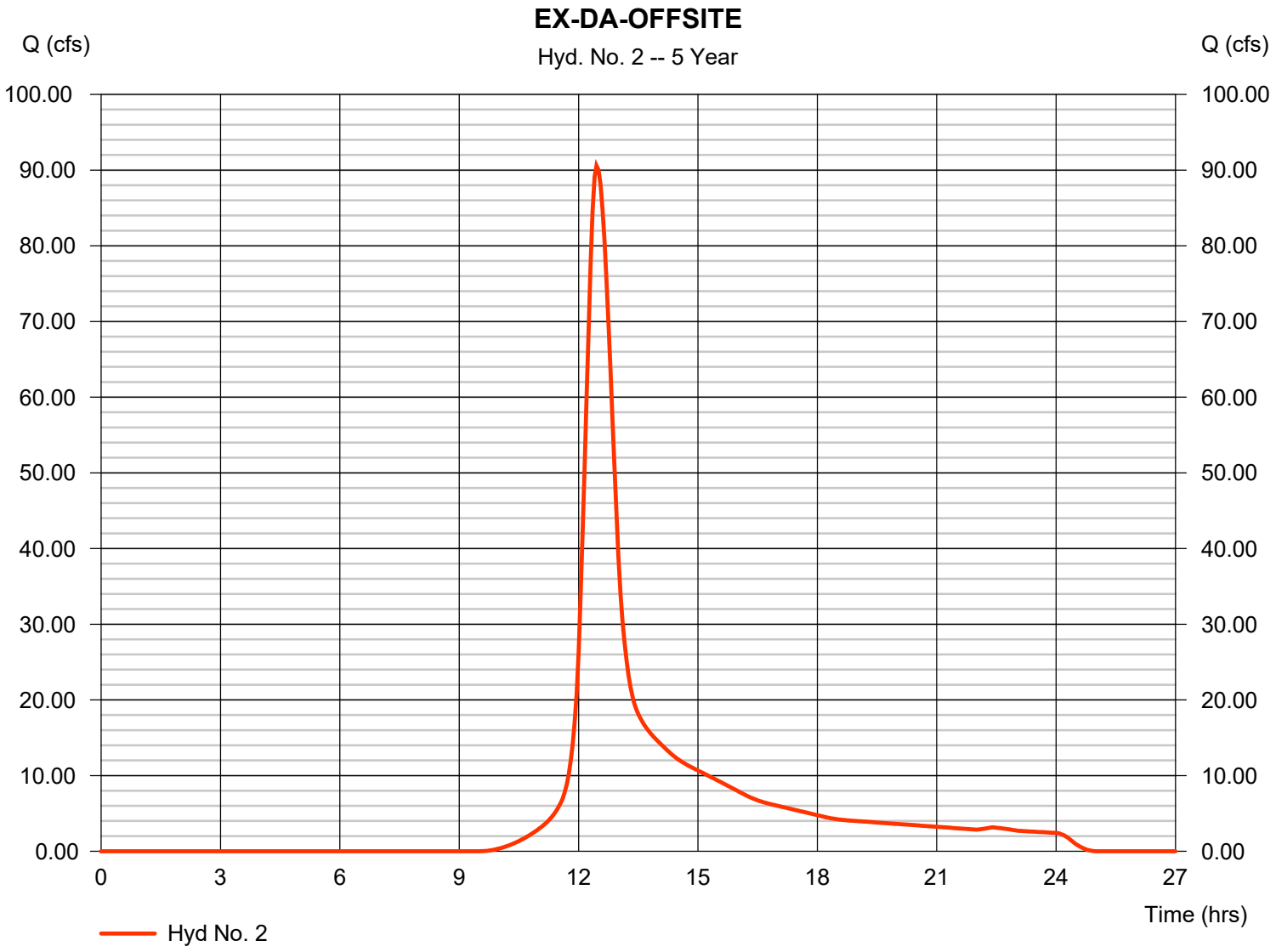
Hydrograph Report

Hyd. No. 2

EX-DA-OFFSITE

Hydrograph type	=	SCS Runoff	Peak discharge	=	90.58 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.45 hrs
Time interval	=	3 min	Hyd. volume	=	547,124 cuft
Drainage area	=	69.840 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	39.80 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.230 x 98) + (50.610 x 61)] / 69.840



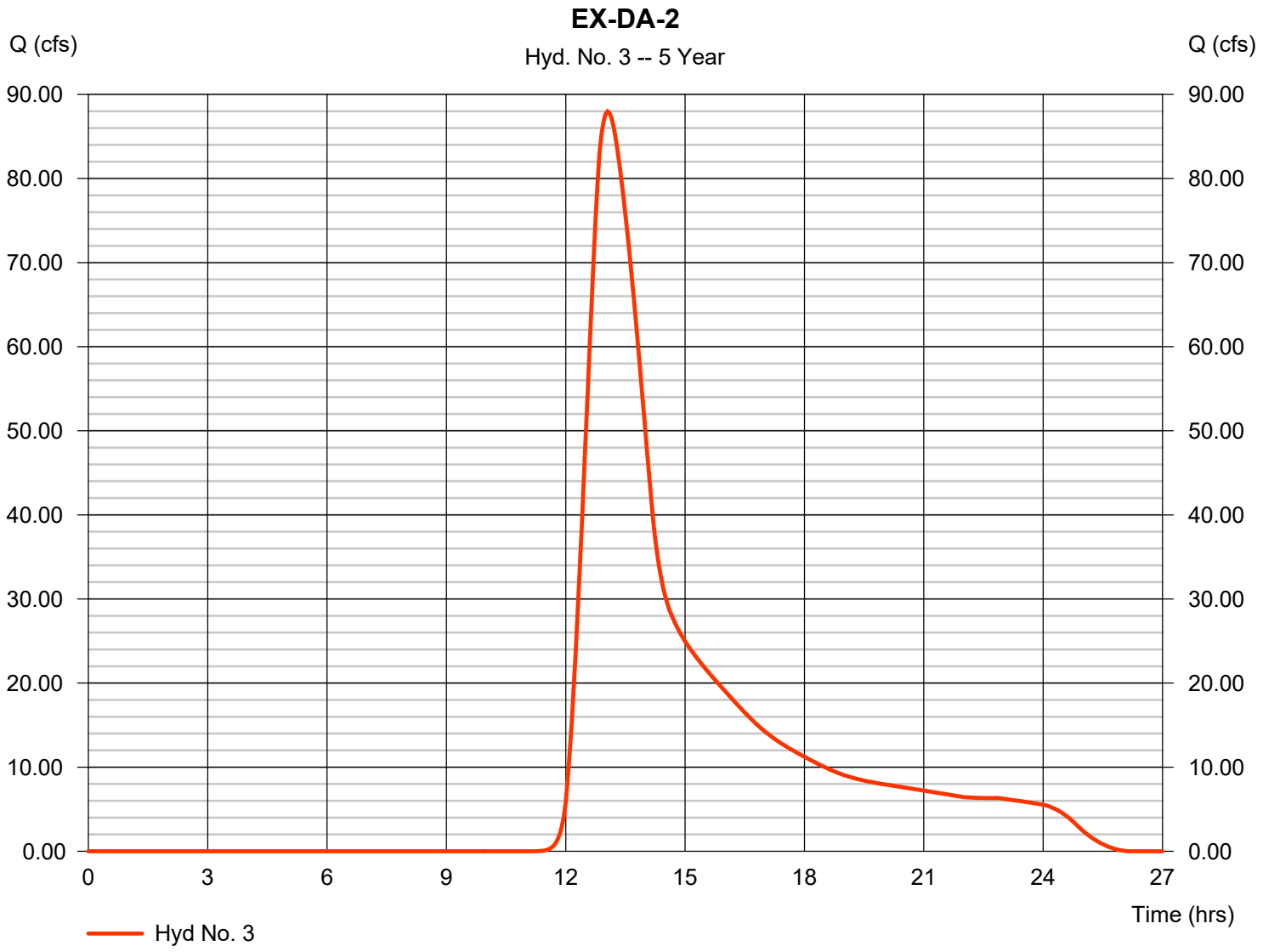
Hydrograph Report

Hyd. No. 3

EX-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	87.97 cfs
Storm frequency	=	5 yrs	Time to peak	=	13.05 hrs
Time interval	=	3 min	Hyd. volume	=	927,611 cuft
Drainage area	=	189.310 ac	Curve number	=	60*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	83.86 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(183.470 x 61) + (5.840 x 39)] / 189.310



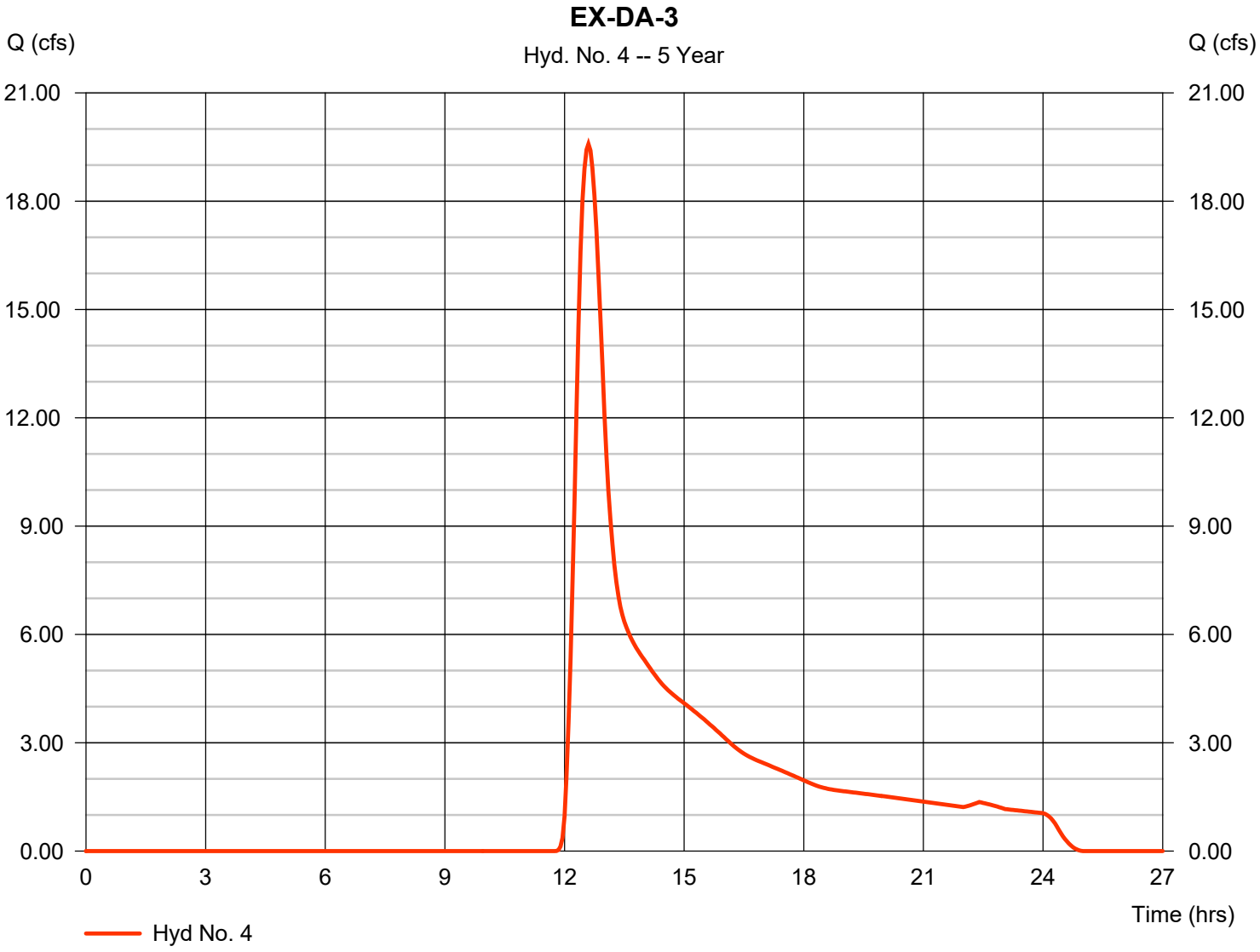
Hydrograph Report

Hyd. No. 4

EX-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.58 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.60 hrs
Time interval	=	3 min	Hyd. volume	=	154,249 cuft
Drainage area	=	50.910 ac	Curve number	=	52*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	38.30 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(30.546 x 61) + (20.364 x 39)] / 50.910

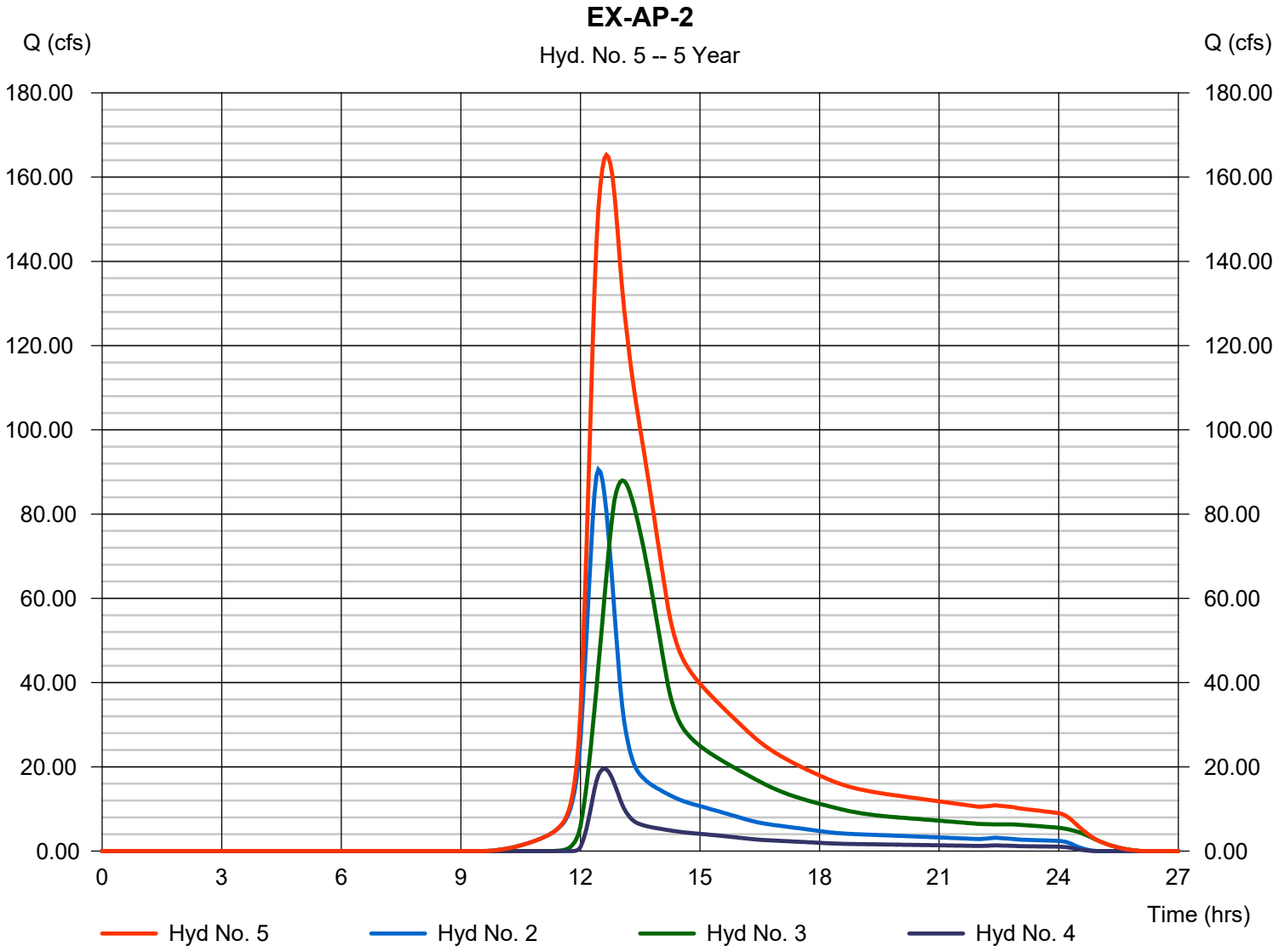


Hydrograph Report

Hyd. No. 5

EX-AP-2

Hydrograph type	=	Combine	Peak discharge	=	165.26 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.65 hrs
Time interval	=	3 min	Hyd. volume	=	1,628,986 cuft
Inflow hyds.	=	2, 3, 4	Contrib. drain. area	=	310.060 ac



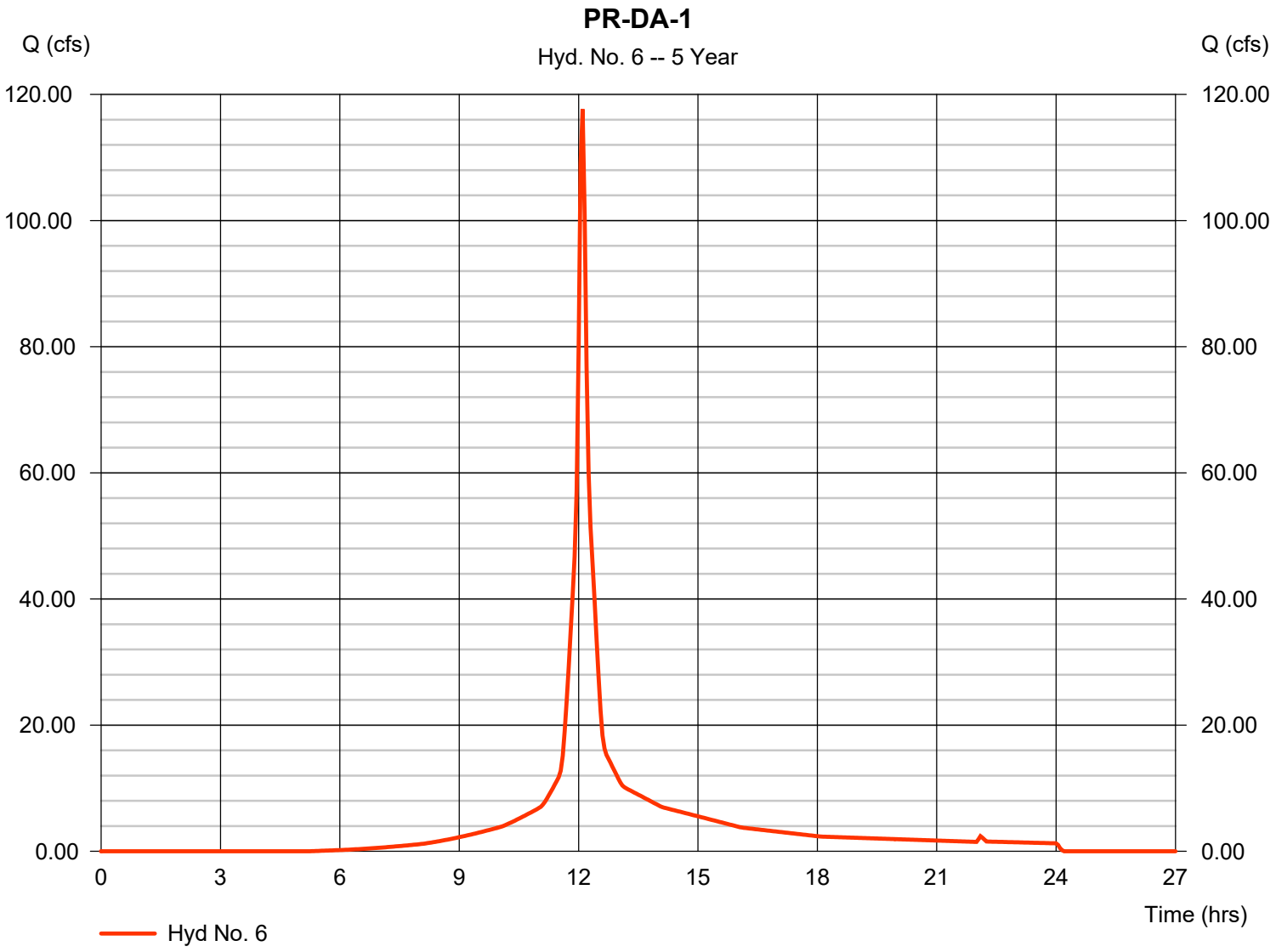
Hydrograph Report

Hyd. No. 6

PR-DA-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	117.66 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	400,613 cuft
Drainage area	=	32.150 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(22.300 x 98) + (9.560 x 61)] / 32.150



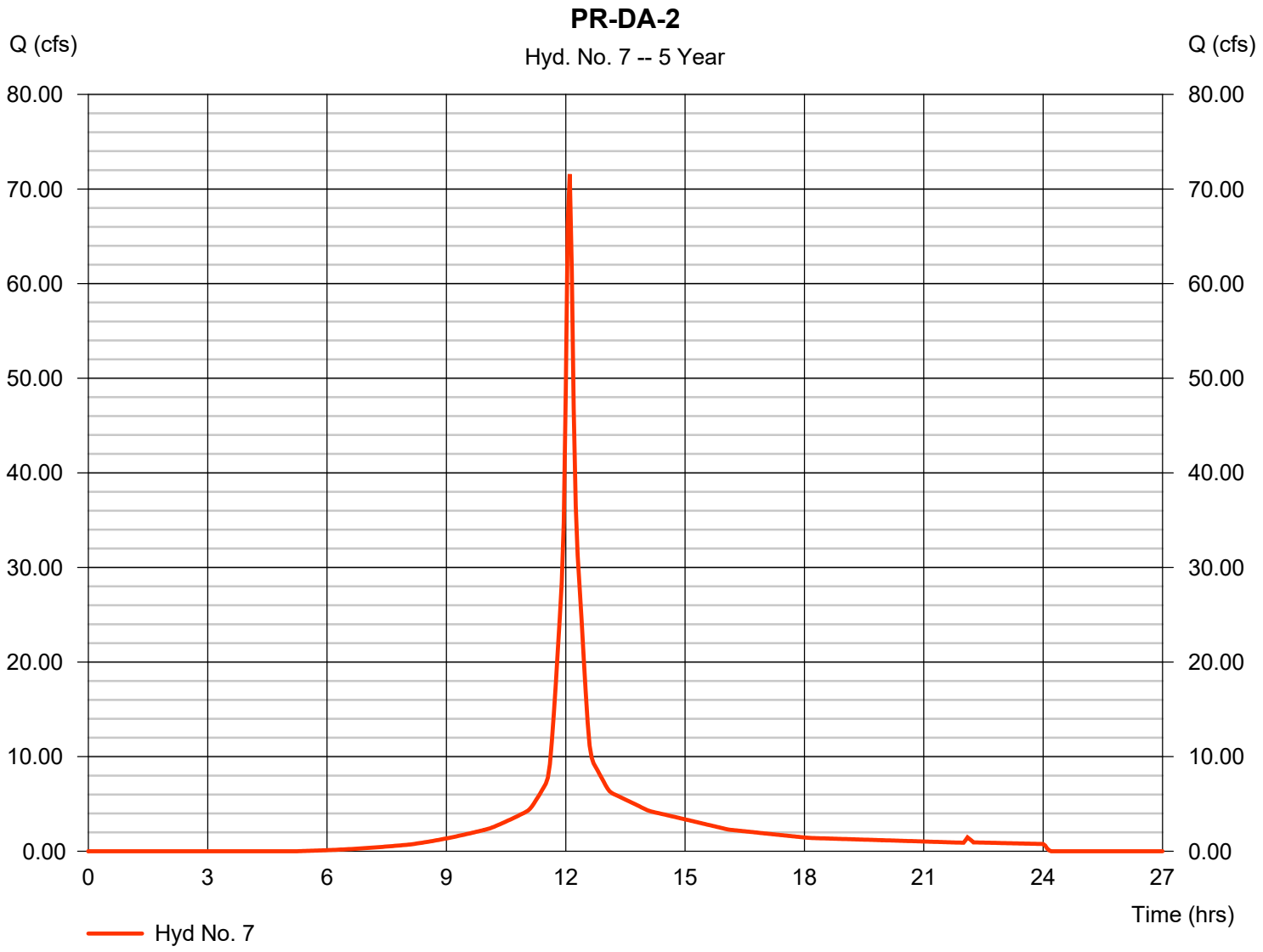
Hydrograph Report

Hyd. No. 7

PR-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	71.58 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	243,732 cuft
Drainage area	=	19.560 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(13.580 x 98) + (5.820 x 61)] / 19.560

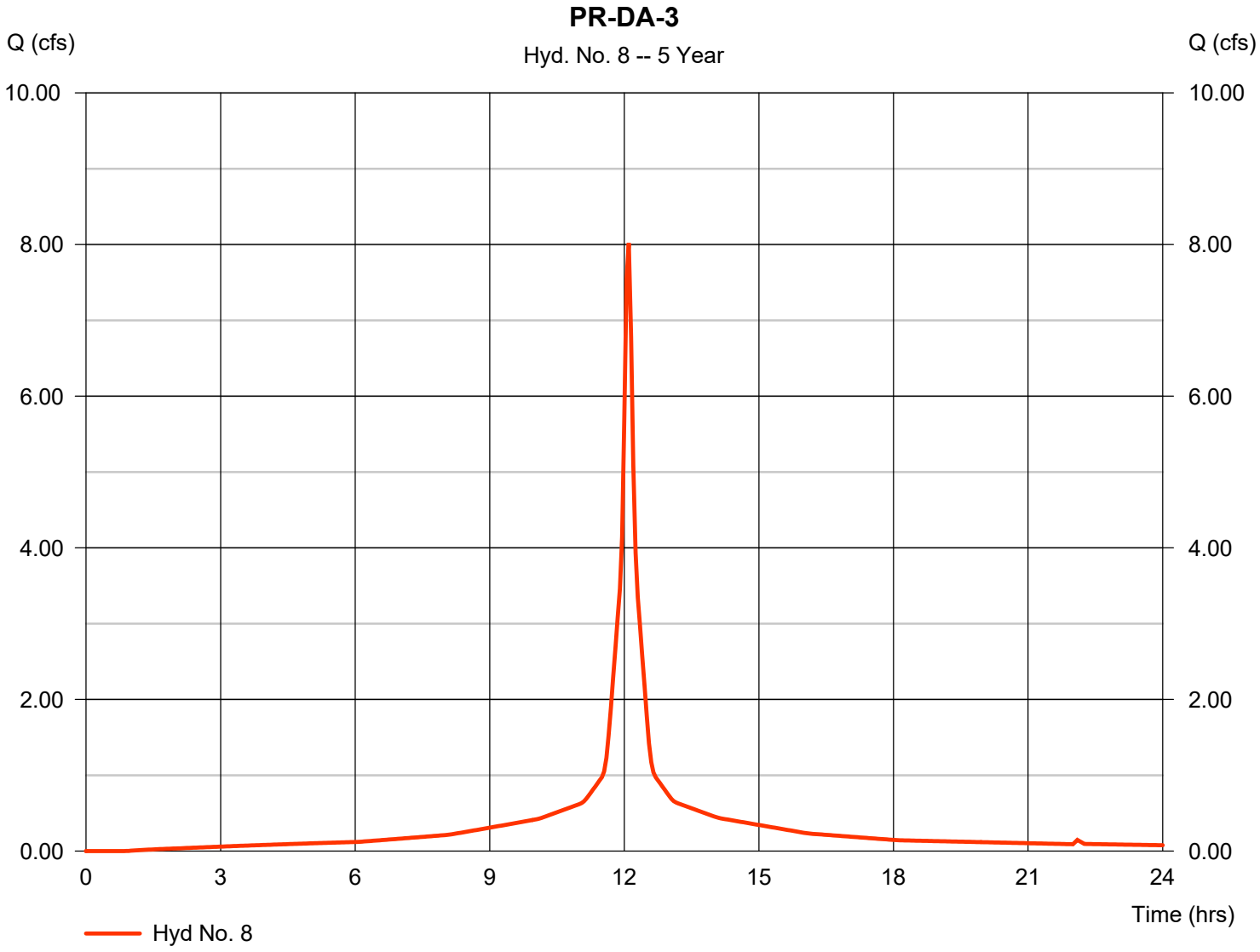


Hydrograph Report

Hyd. No. 8

PR-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.018 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	30,716 cuft
Drainage area	=	1.856 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.80 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



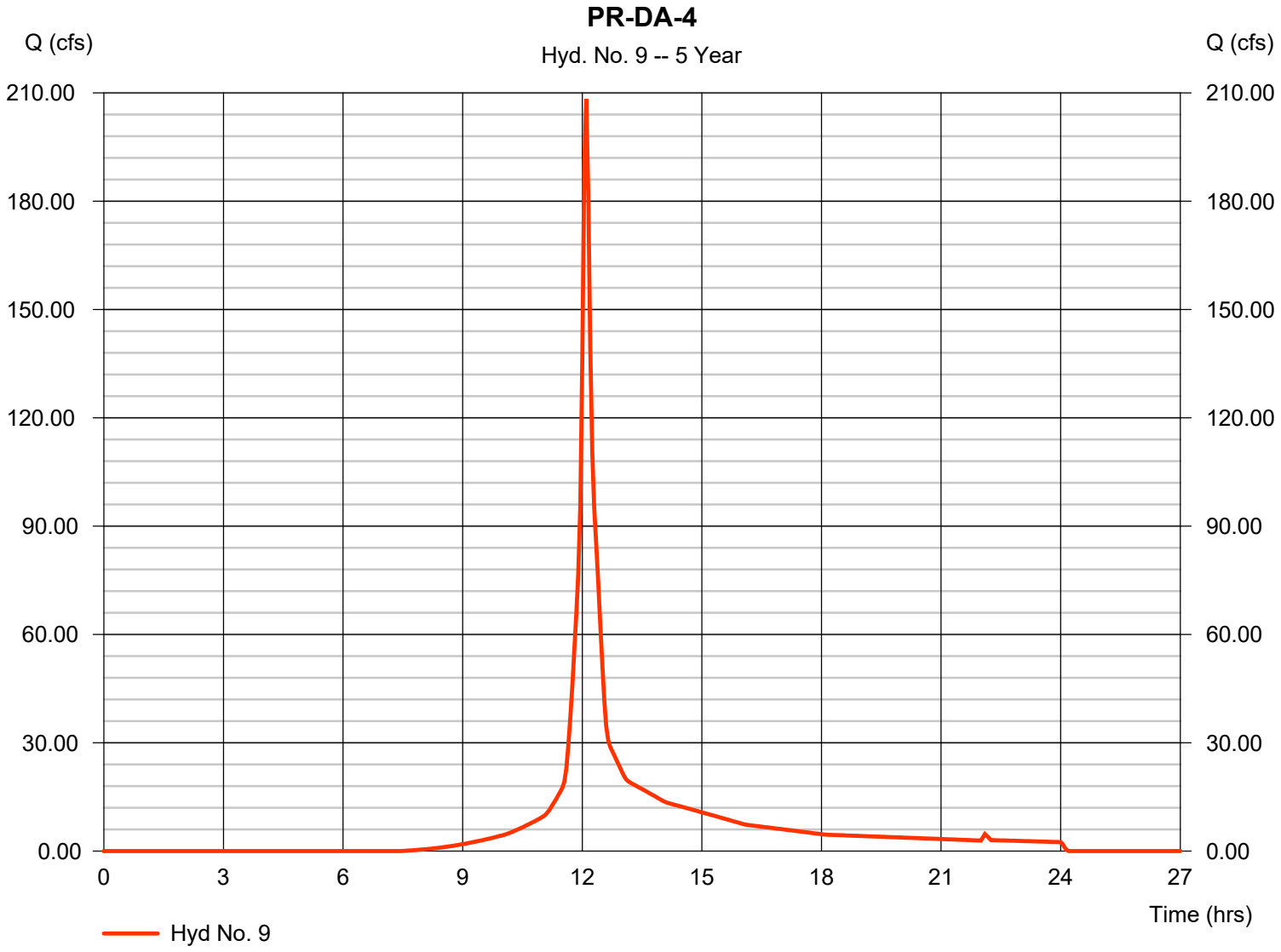
Hydrograph Report

Hyd. No. 9

PR-DA-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	208.26 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	693,630 cuft
Drainage area	=	68.390 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.10 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(34.190 x 98) + (34.200 x 61)] / 68.390



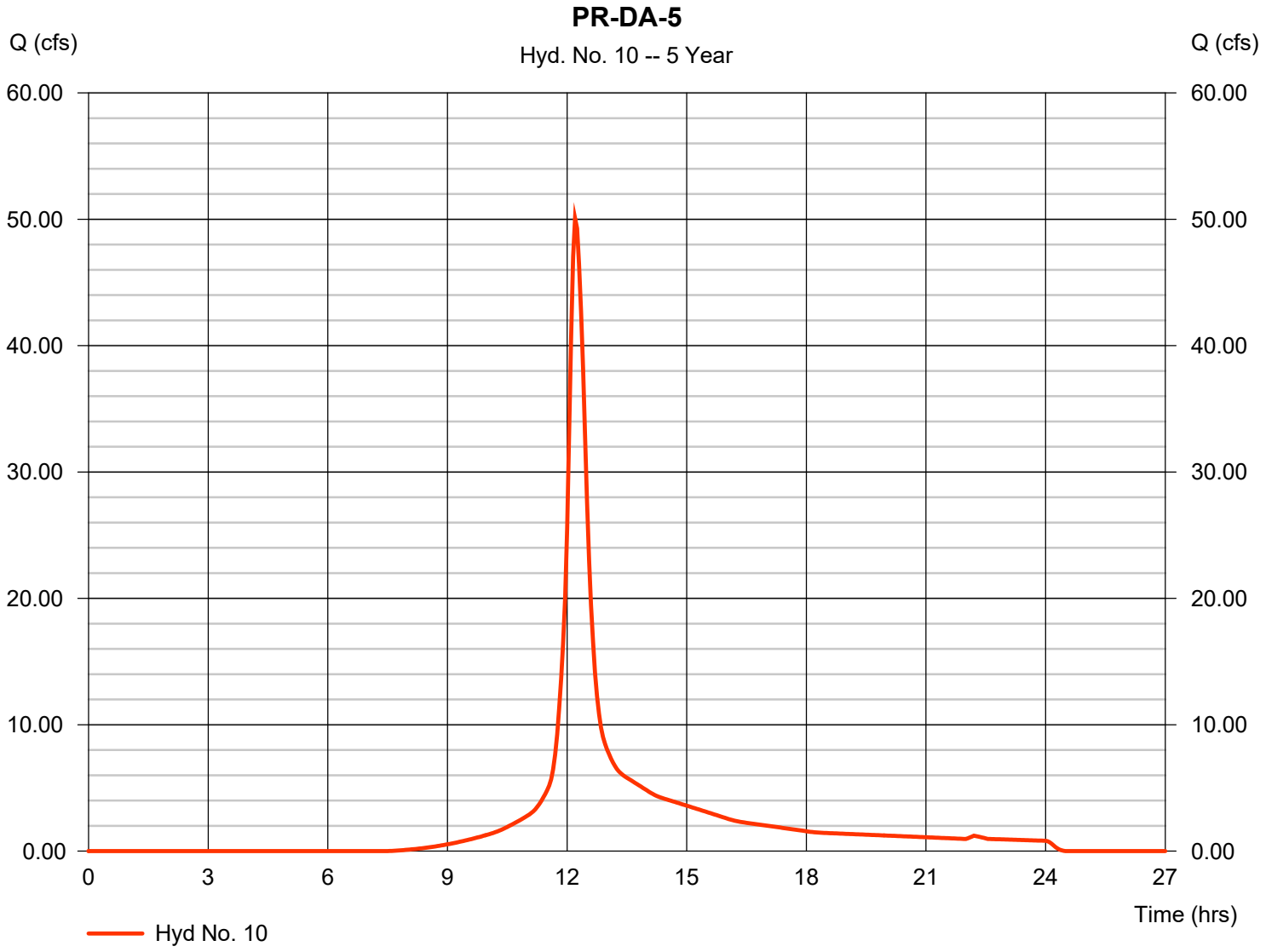
Hydrograph Report

Hyd. No. 10

PR-DA-5

Hydrograph type	=	SCS Runoff	Peak discharge	=	50.07 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.20 hrs
Time interval	=	3 min	Hyd. volume	=	223,688 cuft
Drainage area	=	20.050 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.40 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(10.167 x 98) + (10.167 x 61)] / 20.050



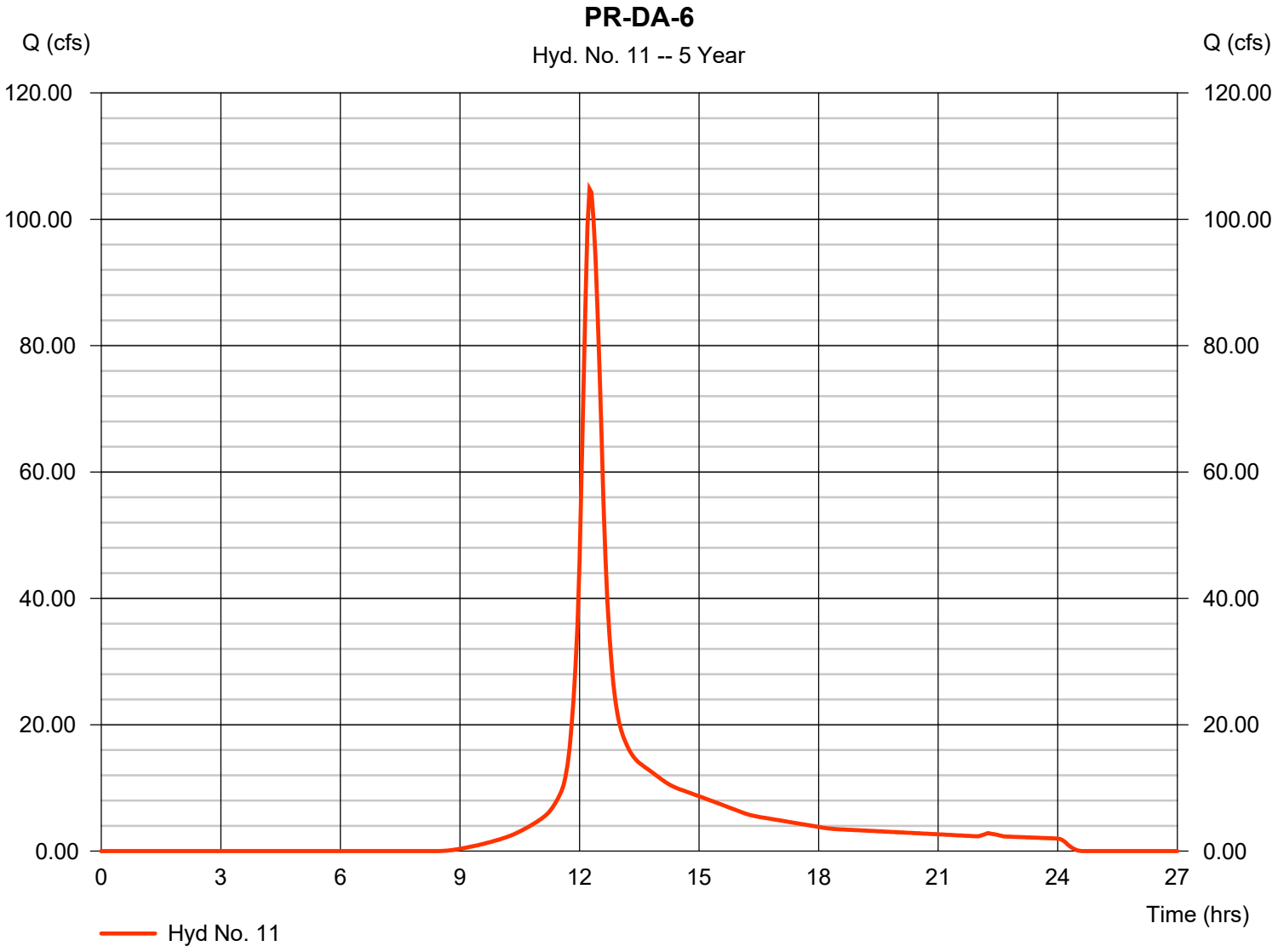
Hydrograph Report

Hyd. No. 11

PR-DA-6

Hydrograph type	=	SCS Runoff	Peak discharge	=	104.79 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.25 hrs
Time interval	=	3 min	Hyd. volume	=	501,861 cuft
Drainage area	=	54.160 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.60 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.630 x 61) + (7.450 x 39) + (27.080 x 98)] / 54.160



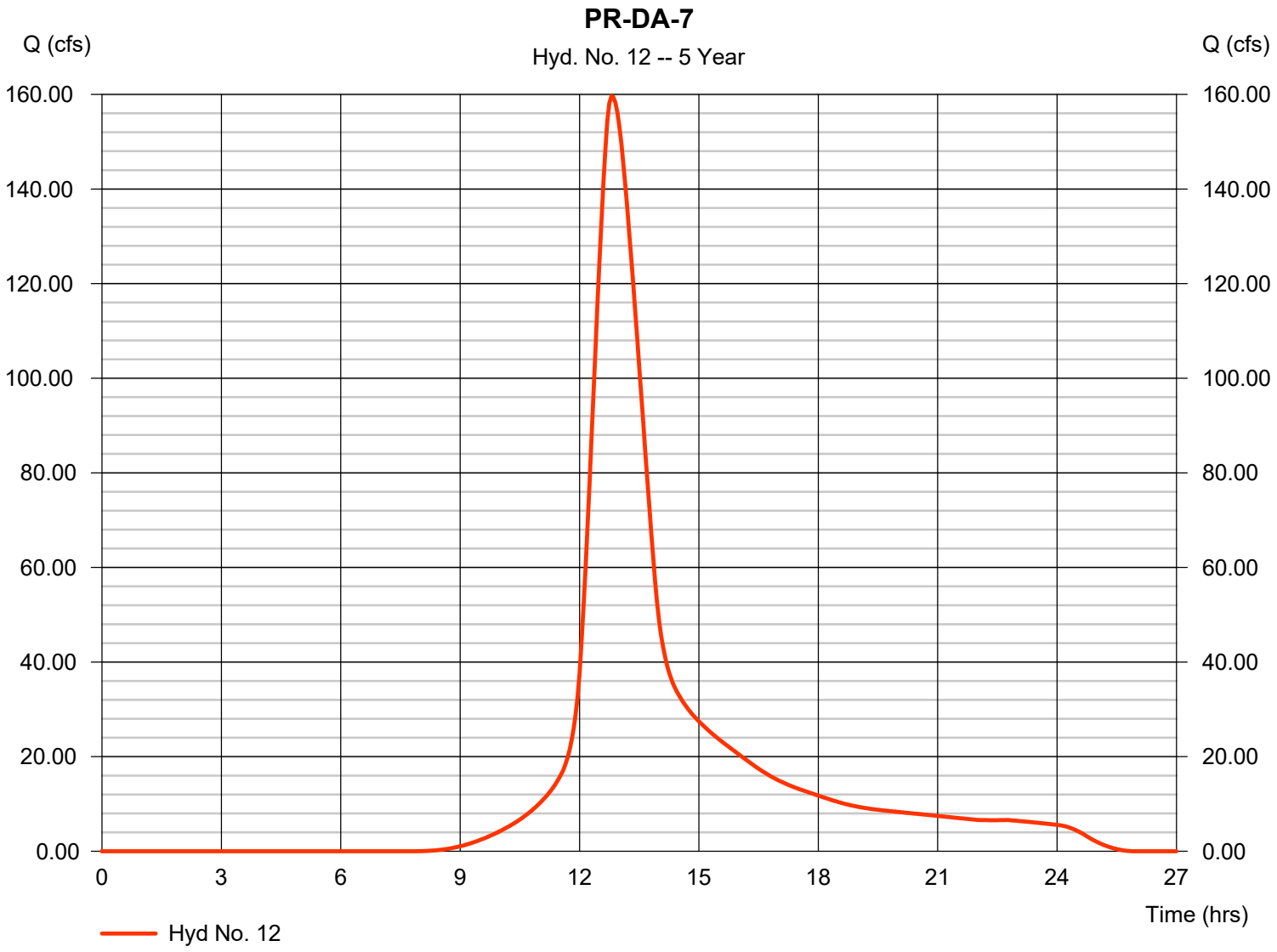
Hydrograph Report

Hyd. No. 12

PR-DA-7

Hydrograph type	=	SCS Runoff	Peak discharge	=	159.57 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.80 hrs
Time interval	=	3 min	Hyd. volume	=	1,385,353 cuft
Drainage area	=	132.150 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	71.80 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(66.080 x 98) + (66.070 x 61)] / 132.150

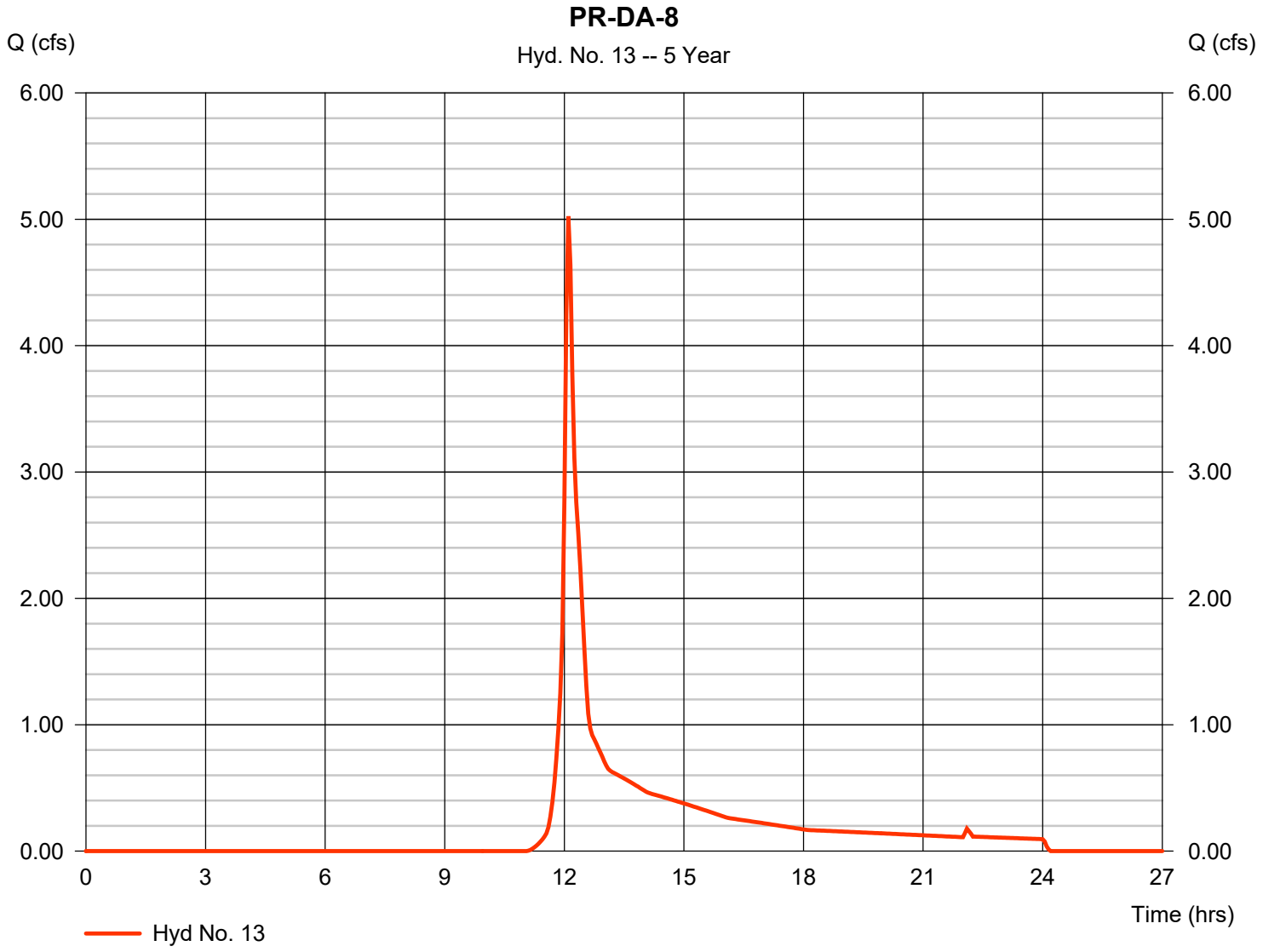


Hydrograph Report

Hyd. No. 13

PR-DA-8

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.024 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	18,195 cuft
Drainage area	=	3.740 ac	Curve number	=	61
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.90 min
Total precip.	=	5.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

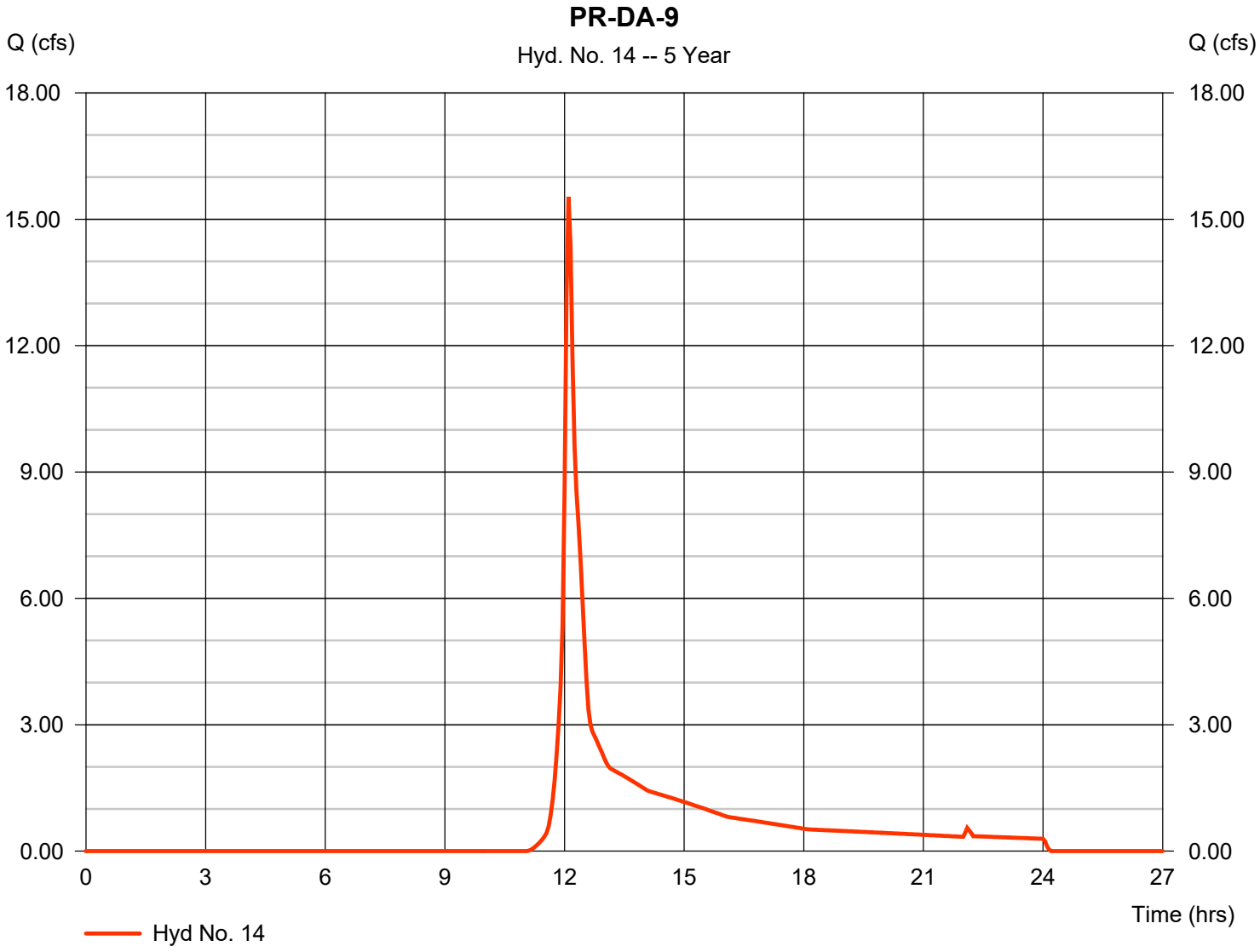


Hydrograph Report

Hyd. No. 14

PR-DA-9

Hydrograph type	= SCS Runoff	Peak discharge	= 15.53 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 56,238 cuft
Drainage area	= 11.560 ac	Curve number	= 61
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.70 min
Total precip.	= 5.10 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

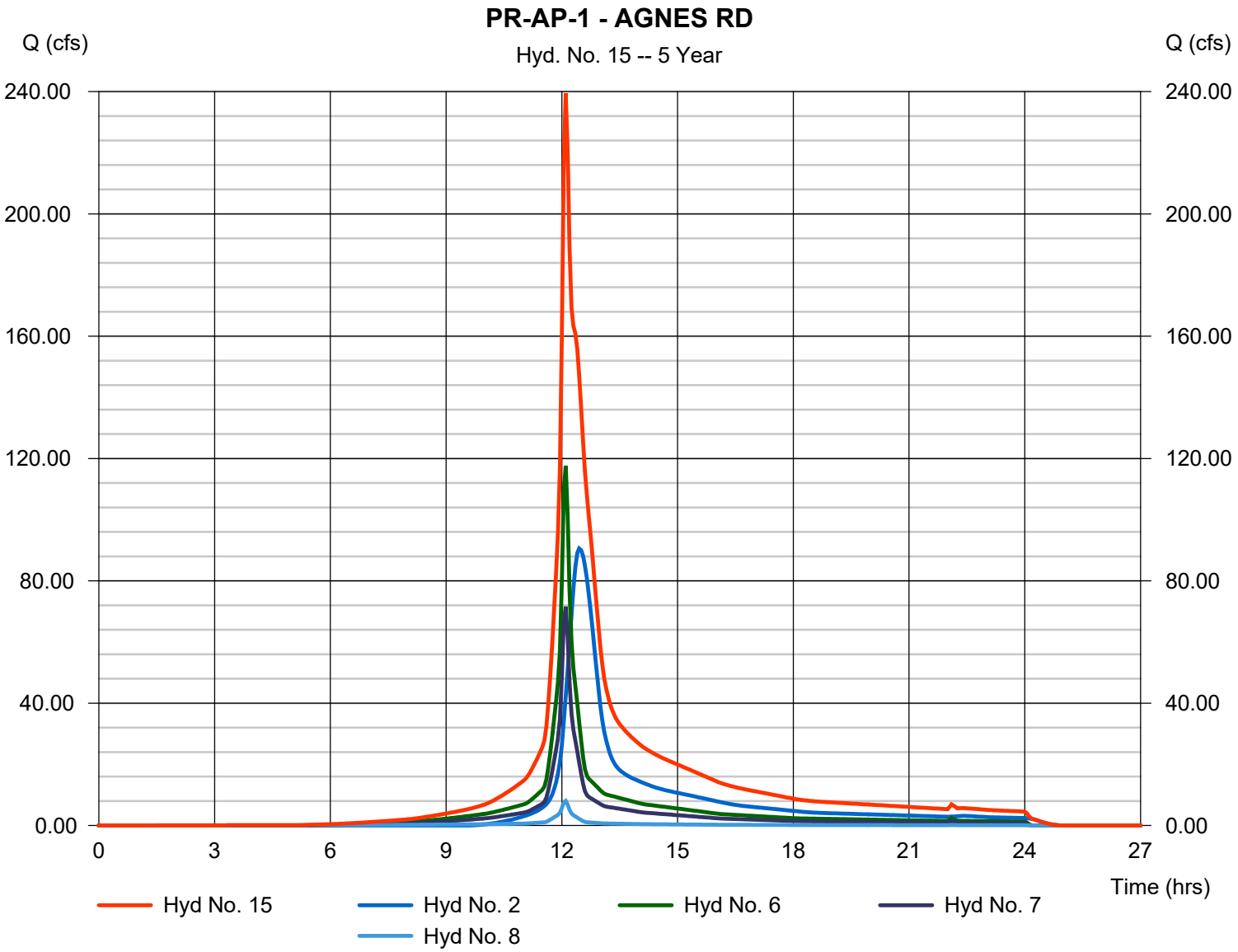


Hydrograph Report

Hyd. No. 15

PR-AP-1 - AGNES RD

Hydrograph type	= Combine	Peak discharge	= 239.42 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 1,222,186 cuft
Inflow hyds.	= 2, 6, 7, 8	Contrib. drain. area	= 123.406 ac

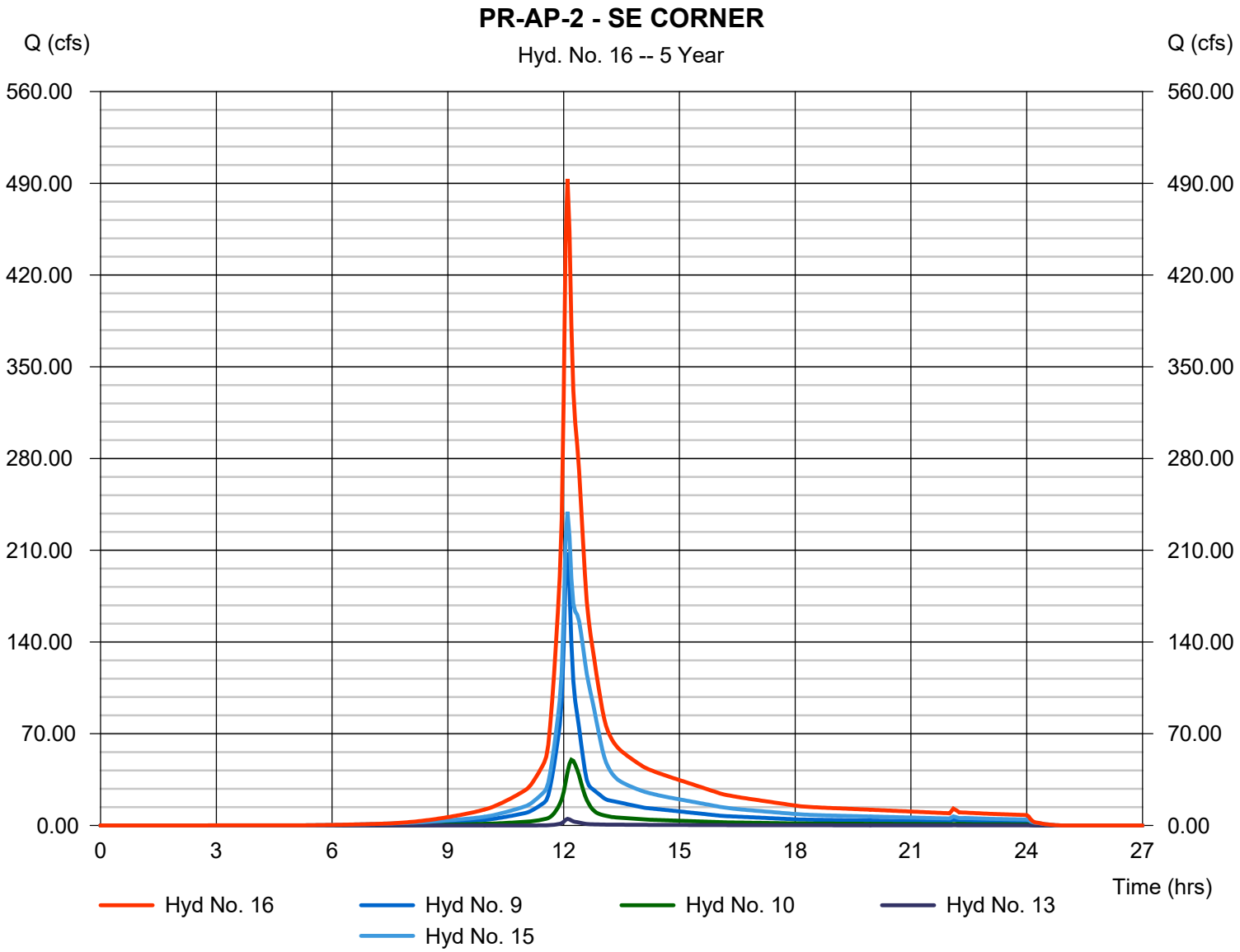


Hydrograph Report

Hyd. No. 16

PR-AP-2 - SE CORNER

Hydrograph type	= Combine	Peak discharge	= 493.34 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 2,157,699 cuft
Inflow hyds.	= 9, 10, 13, 15	Contrib. drain. area	= 92.180 ac

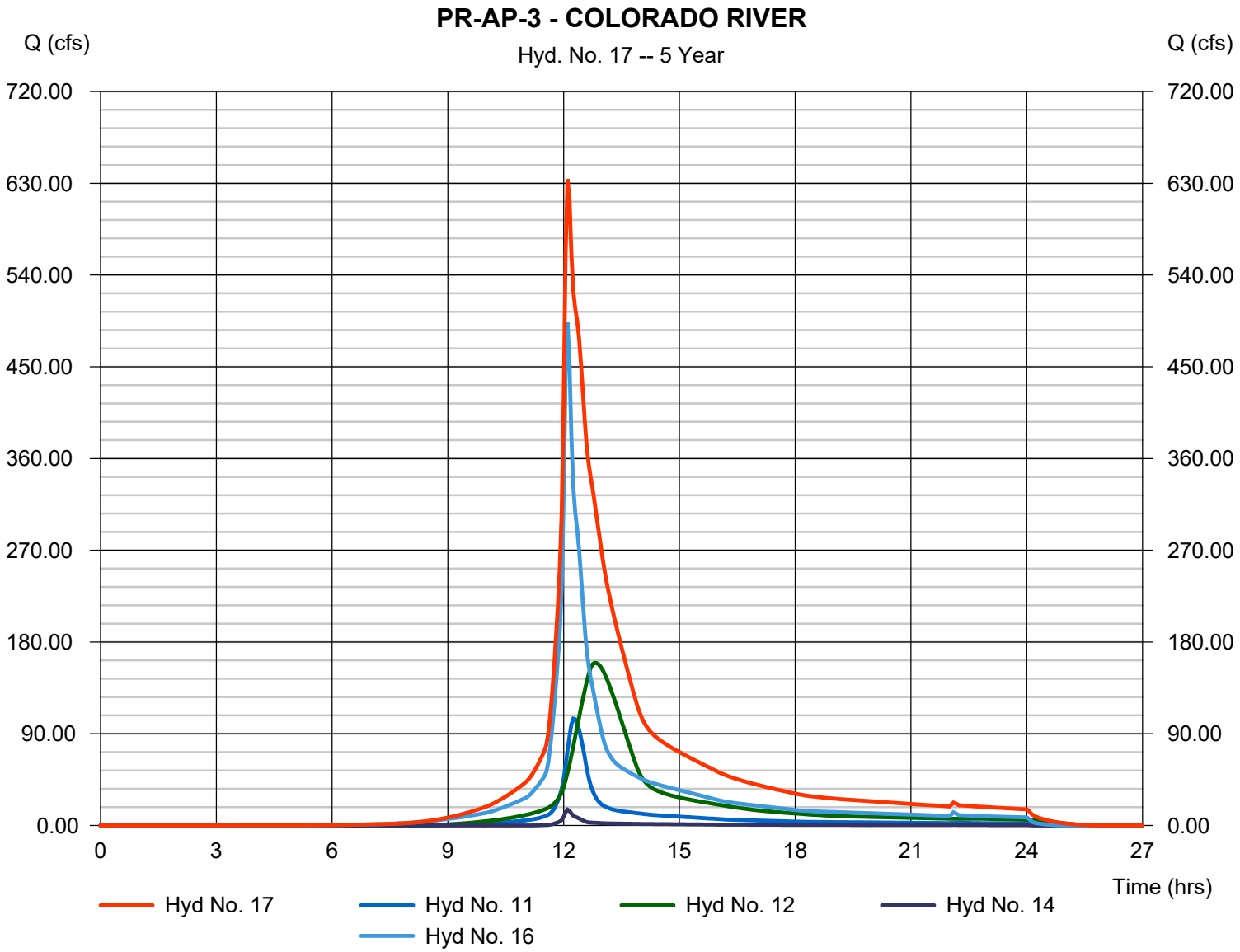


Hydrograph Report

Hyd. No. 17

PR-AP-3 - COLORADO RIVER

Hydrograph type	= Combine	Peak discharge	= 634.13 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 4,101,151 cuft
Inflow hyds.	= 11, 12, 14, 16	Contrib. drain. area	= 197.870 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	59.56	3	789	668,998	------	------	------	EX-DA-1 / EX-AP-1
2	SCS Runoff	127.94	3	747	763,829	------	------	------	EX-DA-OFFSITE
3	SCS Runoff	140.32	3	780	1,400,815	------	------	------	EX-DA-2
4	SCS Runoff	36.56	3	753	253,845	------	------	------	EX-DA-3
5	Combine	257.24	3	759	2,418,488	2, 3, 4	------	------	EX-AP-2
6	SCS Runoff	149.45	3	726	515,193	------	------	------	PR-DA-1
7	SCS Runoff	90.92	3	726	313,443	------	------	------	PR-DA-2
8	SCS Runoff	9.764	3	726	37,655	------	------	------	PR-DA-3
9	SCS Runoff	275.24	3	726	922,160	------	------	------	PR-DA-4
10	SCS Runoff	66.42	3	732	297,386	------	------	------	PR-DA-5
11	SCS Runoff	142.77	3	735	681,119	------	------	------	PR-DA-6
12	SCS Runoff	213.43	3	768	1,851,061	------	------	------	PR-DA-7
13	SCS Runoff	7.881	3	726	27,244	------	------	------	PR-DA-8
14	SCS Runoff	24.36	3	726	84,207	------	------	------	PR-DA-9
15	Combine	312.95	3	726	1,630,120	2, 6, 7, 8,	------	------	PR-AP-1 - AGNES RD
16	Combine	650.57	3	726	2,876,911	9, 10, 13, 15	------	------	PR-AP-2 - SE CORNER
17	Combine	850.01	3	726	5,493,296	11, 12, 14, 16	------	------	PR-AP-3 - COLORADO RIVER

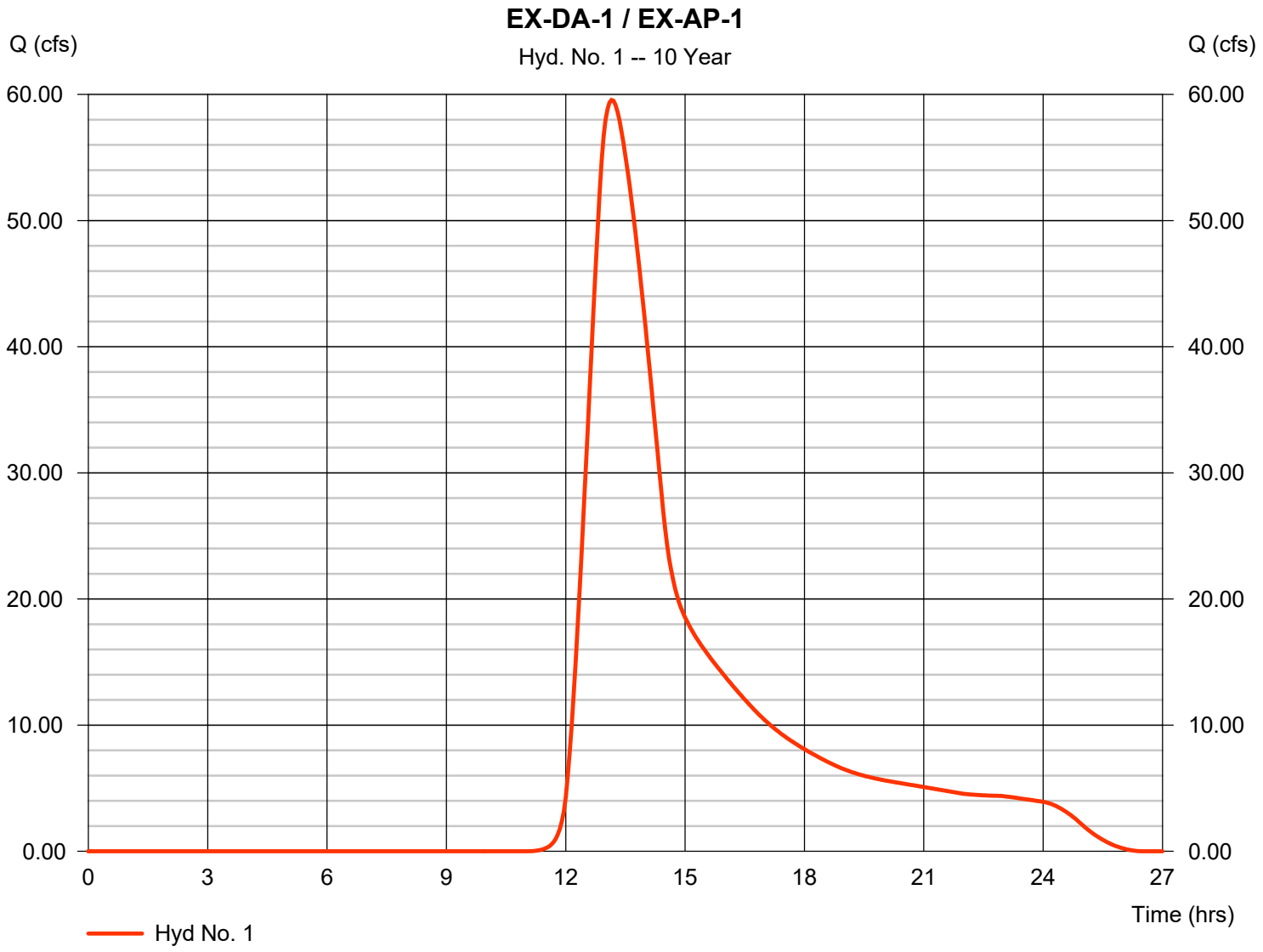
Hydrograph Report

Hyd. No. 1

EX-DA-1 / EX-AP-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	59.56 cfs
Storm frequency	=	10 yrs	Time to peak	=	13.15 hrs
Time interval	=	3 min	Hyd. volume	=	668,998 cuft
Drainage area	=	101.790 ac	Curve number	=	57*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	94.50 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(84.000 x 61) + (17.790 x 39)] / 101.790



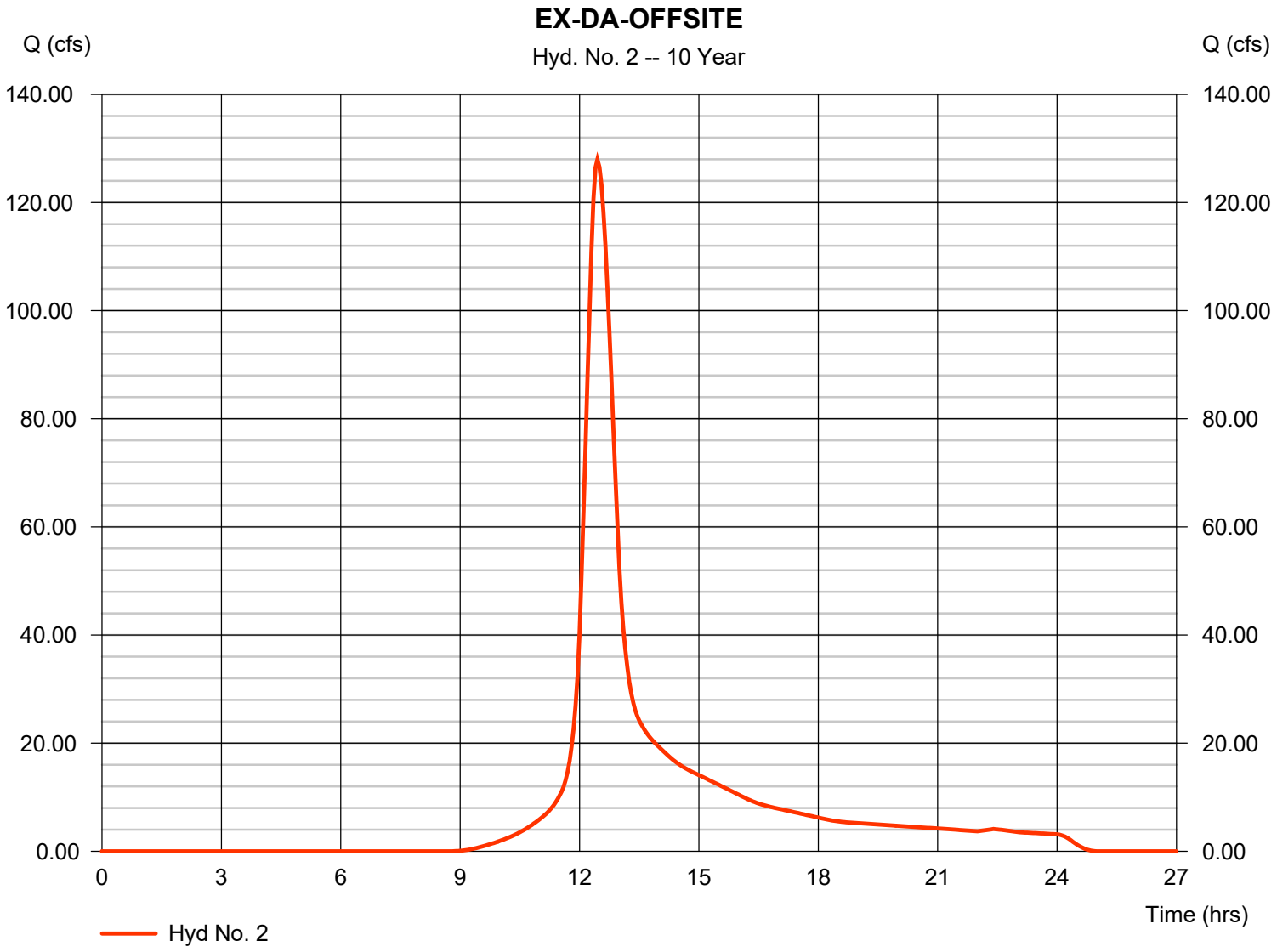
Hydrograph Report

Hyd. No. 2

EX-DA-OFFSITE

Hydrograph type	=	SCS Runoff	Peak discharge	=	127.94 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.45 hrs
Time interval	=	3 min	Hyd. volume	=	763,829 cuft
Drainage area	=	69.840 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	39.80 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.230 x 98) + (50.610 x 61)] / 69.840



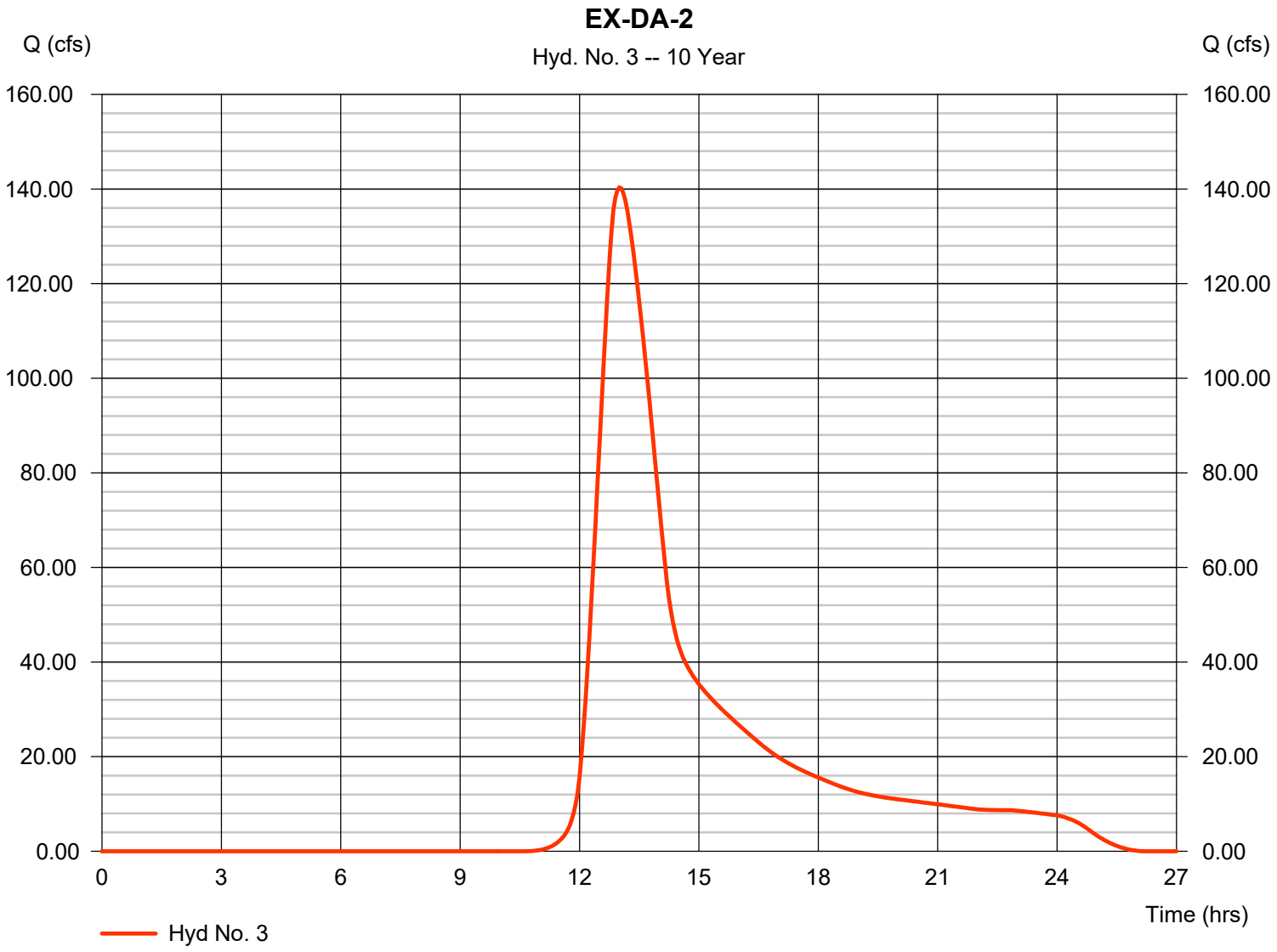
Hydrograph Report

Hyd. No. 3

EX-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	140.32 cfs
Storm frequency	=	10 yrs	Time to peak	=	13.00 hrs
Time interval	=	3 min	Hyd. volume	=	1,400,815 cuft
Drainage area	=	189.310 ac	Curve number	=	60*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	83.86 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(183.470 x 61) + (5.840 x 39)] / 189.310



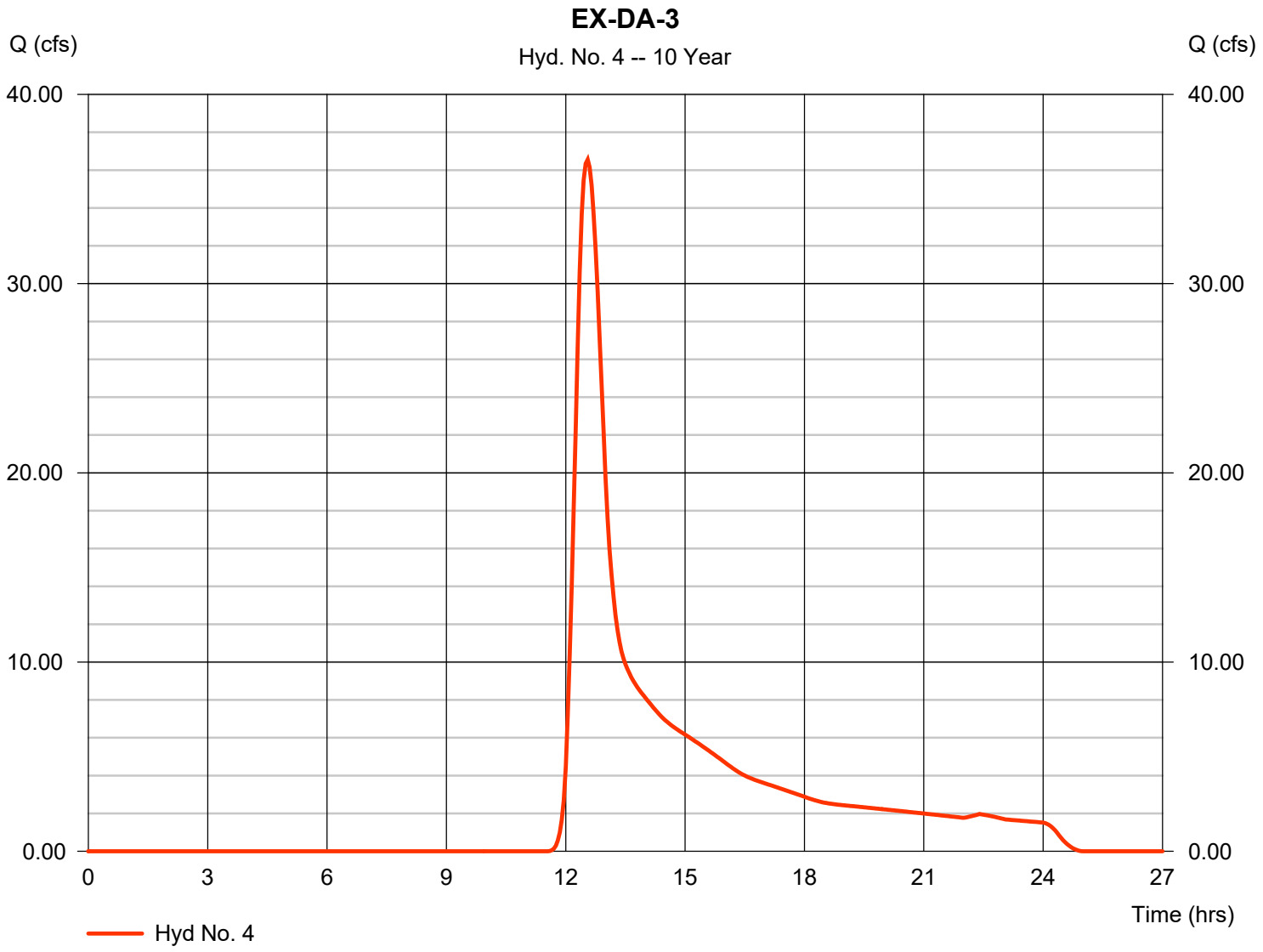
Hydrograph Report

Hyd. No. 4

EX-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	36.56 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.55 hrs
Time interval	=	3 min	Hyd. volume	=	253,845 cuft
Drainage area	=	50.910 ac	Curve number	=	52*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	38.30 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(30.546 x 61) + (20.364 x 39)] / 50.910

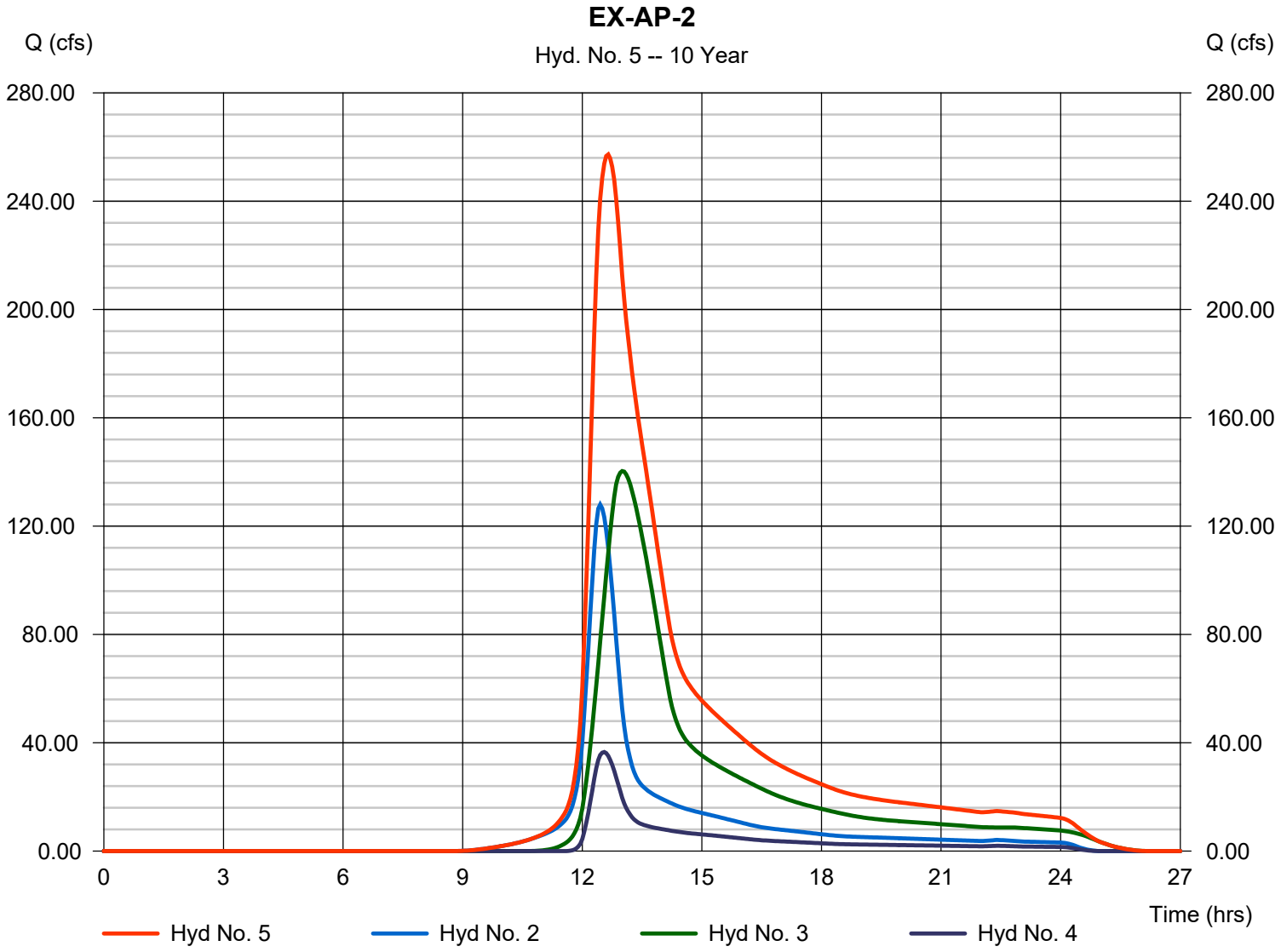


Hydrograph Report

Hyd. No. 5

EX-AP-2

Hydrograph type	=	Combine	Peak discharge	=	257.24 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.65 hrs
Time interval	=	3 min	Hyd. volume	=	2,418,488 cuft
Inflow hyds.	=	2, 3, 4	Contrib. drain. area	=	310.060 ac



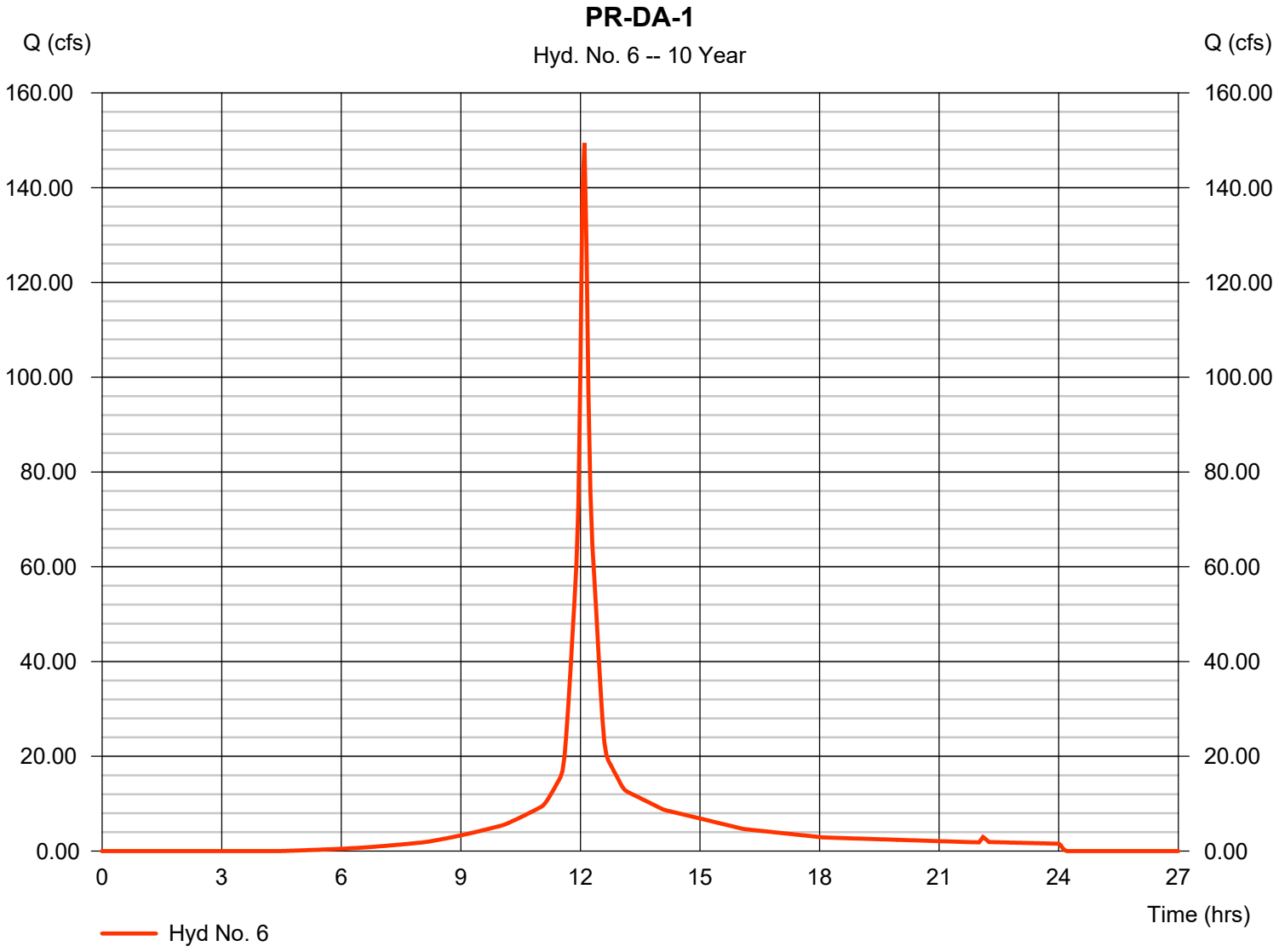
Hydrograph Report

Hyd. No. 6

PR-DA-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	149.45 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	515,193 cuft
Drainage area	=	32.150 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(22.300 x 98) + (9.560 x 61)] / 32.150



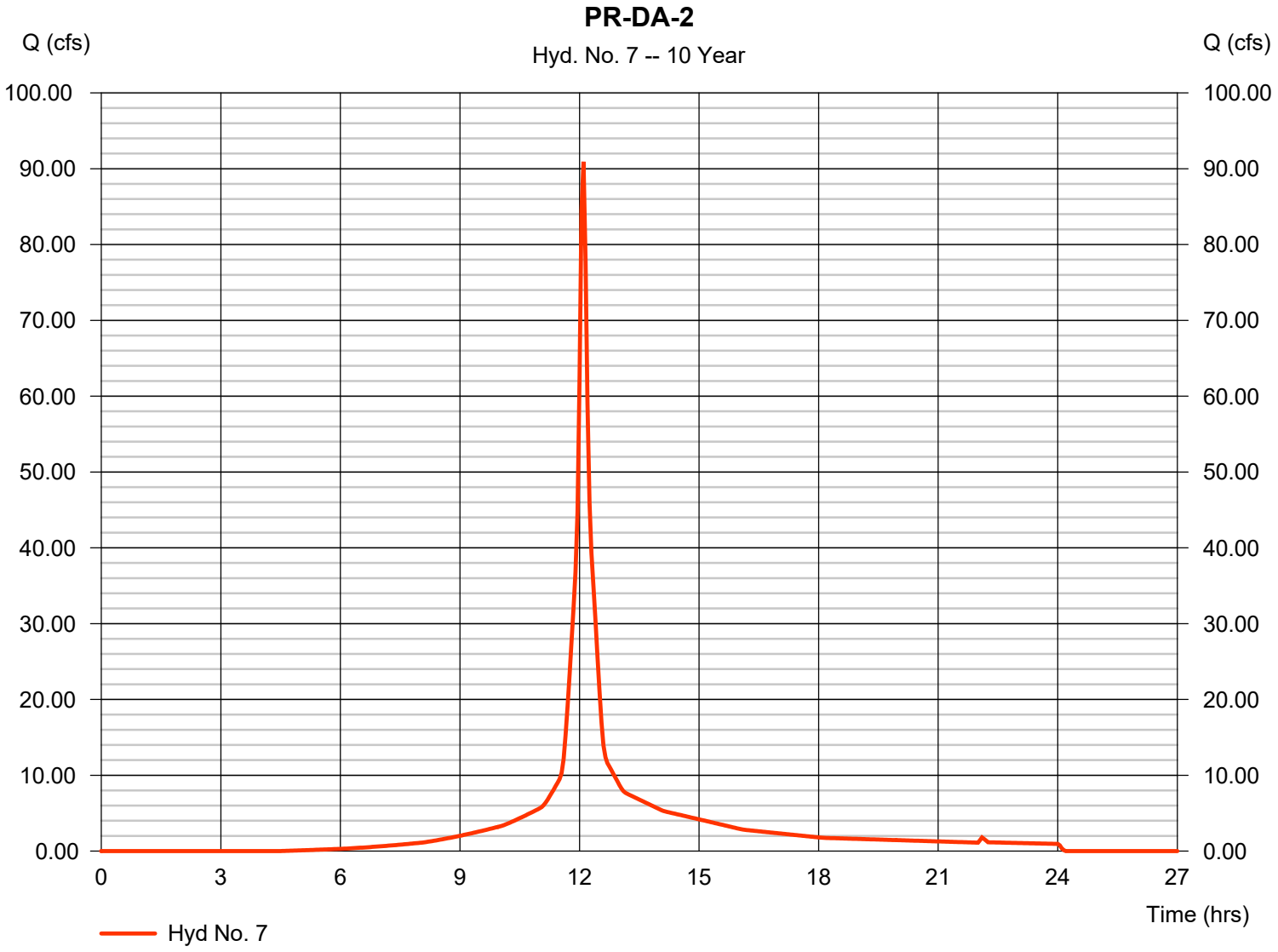
Hydrograph Report

Hyd. No. 7

PR-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	90.92 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	313,443 cuft
Drainage area	=	19.560 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(13.580 x 98) + (5.820 x 61)] / 19.560

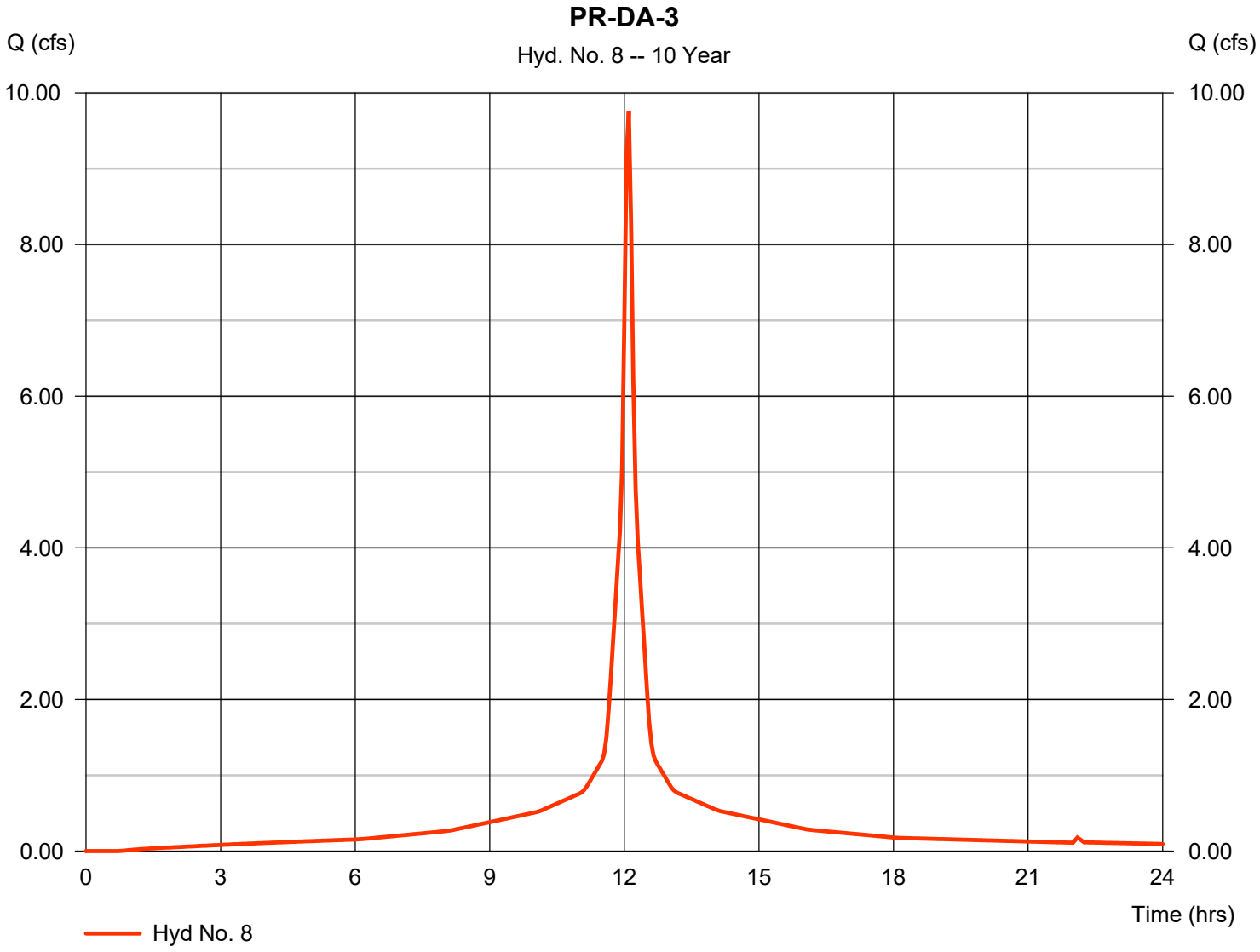


Hydrograph Report

Hyd. No. 8

PR-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.764 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	37,655 cuft
Drainage area	=	1.856 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.80 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



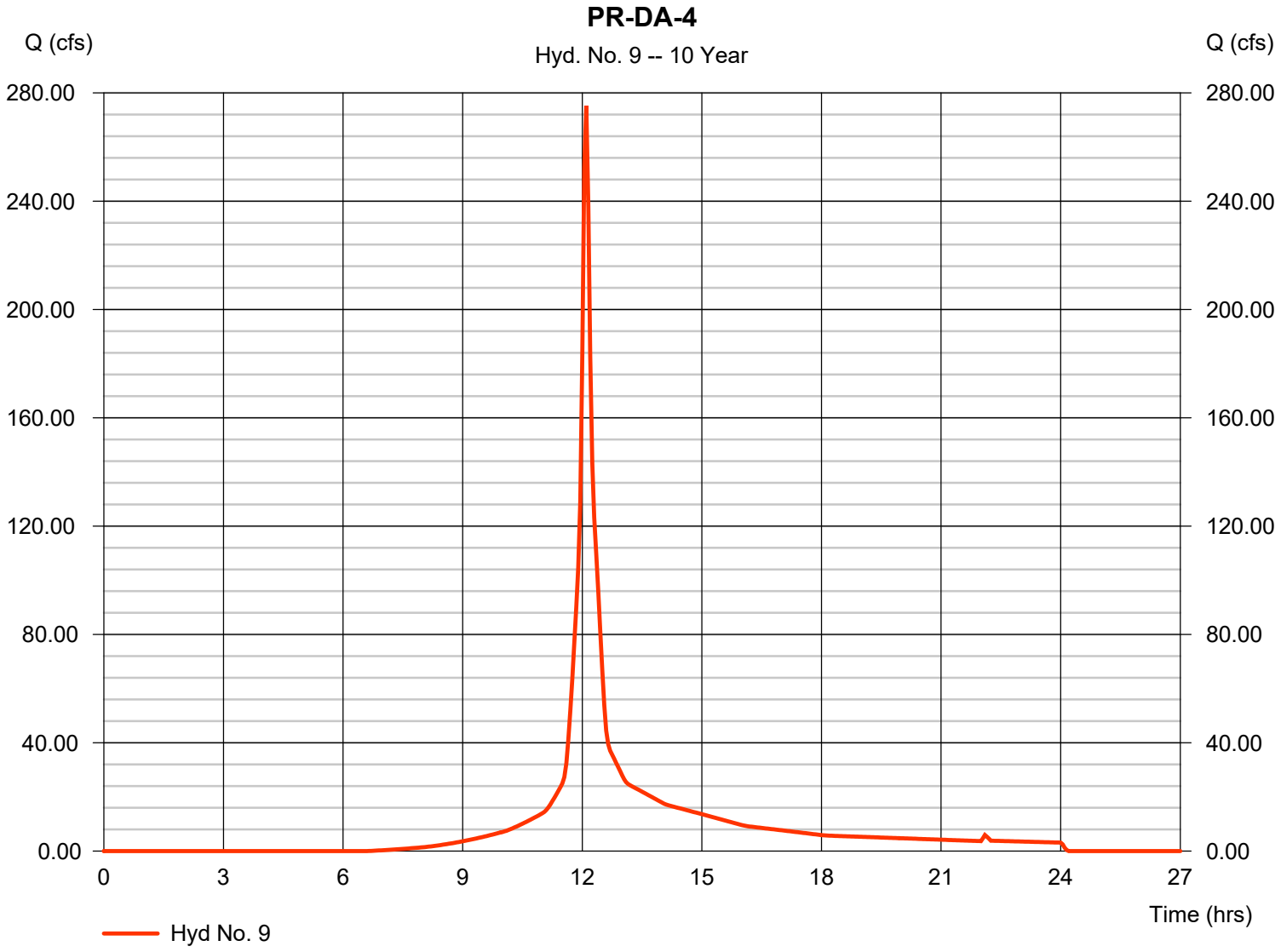
Hydrograph Report

Hyd. No. 9

PR-DA-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	275.24 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	922,160 cuft
Drainage area	=	68.390 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.10 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(34.190 x 98) + (34.200 x 61)] / 68.390



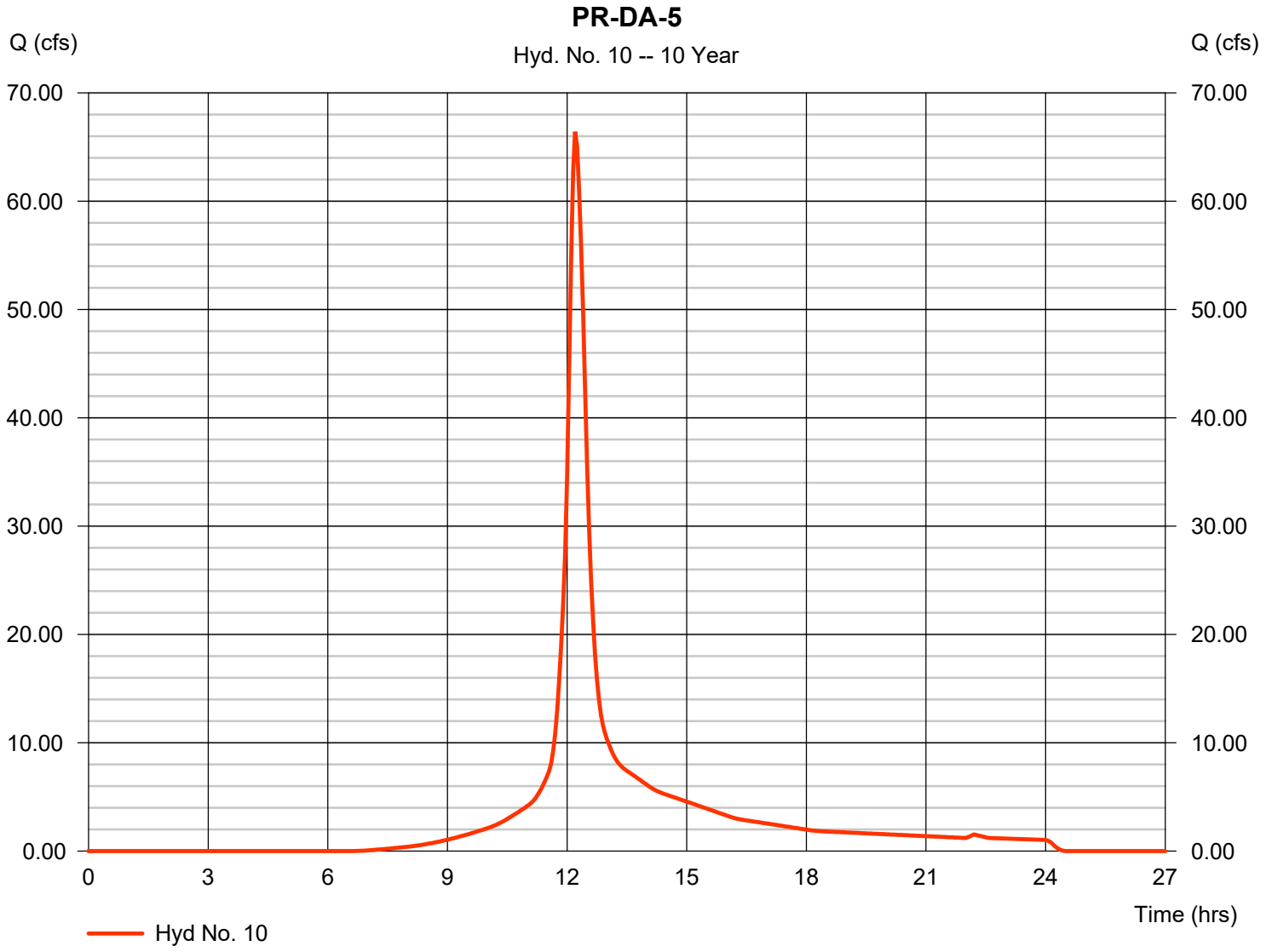
Hydrograph Report

Hyd. No. 10

PR-DA-5

Hydrograph type	=	SCS Runoff	Peak discharge	=	66.42 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	3 min	Hyd. volume	=	297,386 cuft
Drainage area	=	20.050 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.40 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(10.167 x 98) + (10.167 x 61)] / 20.050



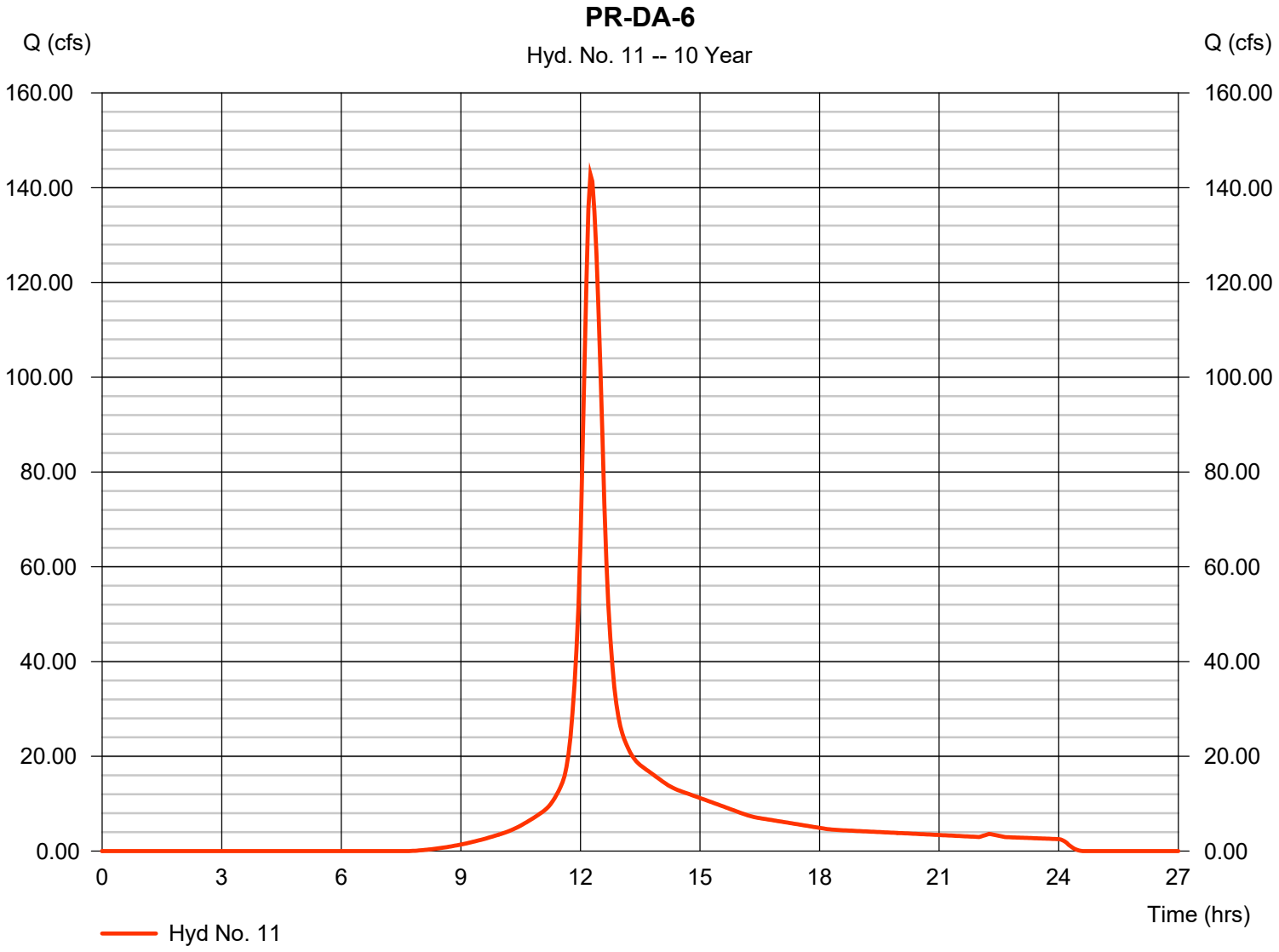
Hydrograph Report

Hyd. No. 11

PR-DA-6

Hydrograph type	=	SCS Runoff	Peak discharge	=	142.77 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.25 hrs
Time interval	=	3 min	Hyd. volume	=	681,119 cuft
Drainage area	=	54.160 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.60 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.630 x 61) + (7.450 x 39) + (27.080 x 98)] / 54.160



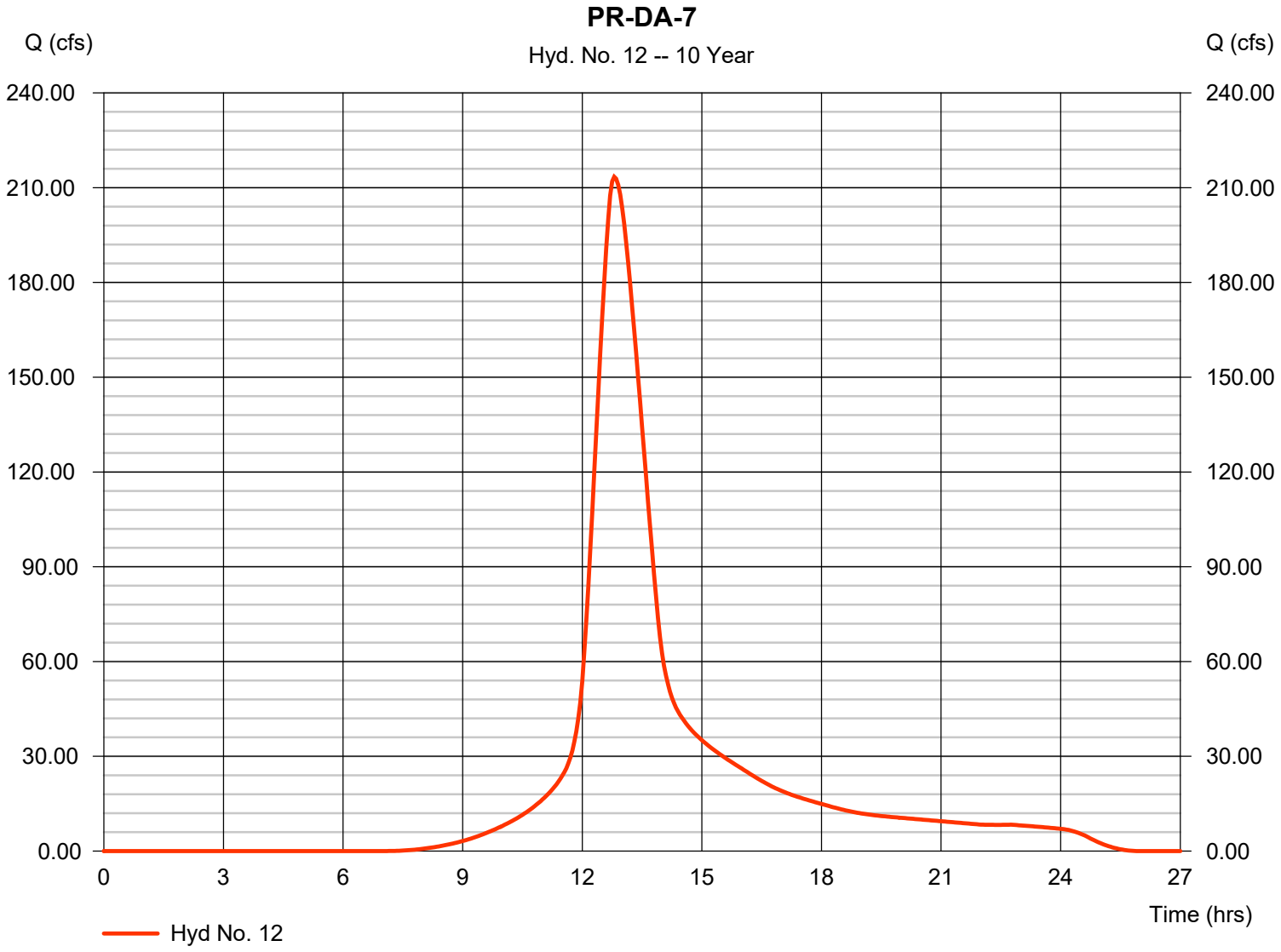
Hydrograph Report

Hyd. No. 12

PR-DA-7

Hydrograph type	=	SCS Runoff	Peak discharge	=	213.43 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.80 hrs
Time interval	=	3 min	Hyd. volume	=	1,851,061 cuft
Drainage area	=	132.150 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	71.80 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(66.080 x 98) + (66.070 x 61)] / 132.150

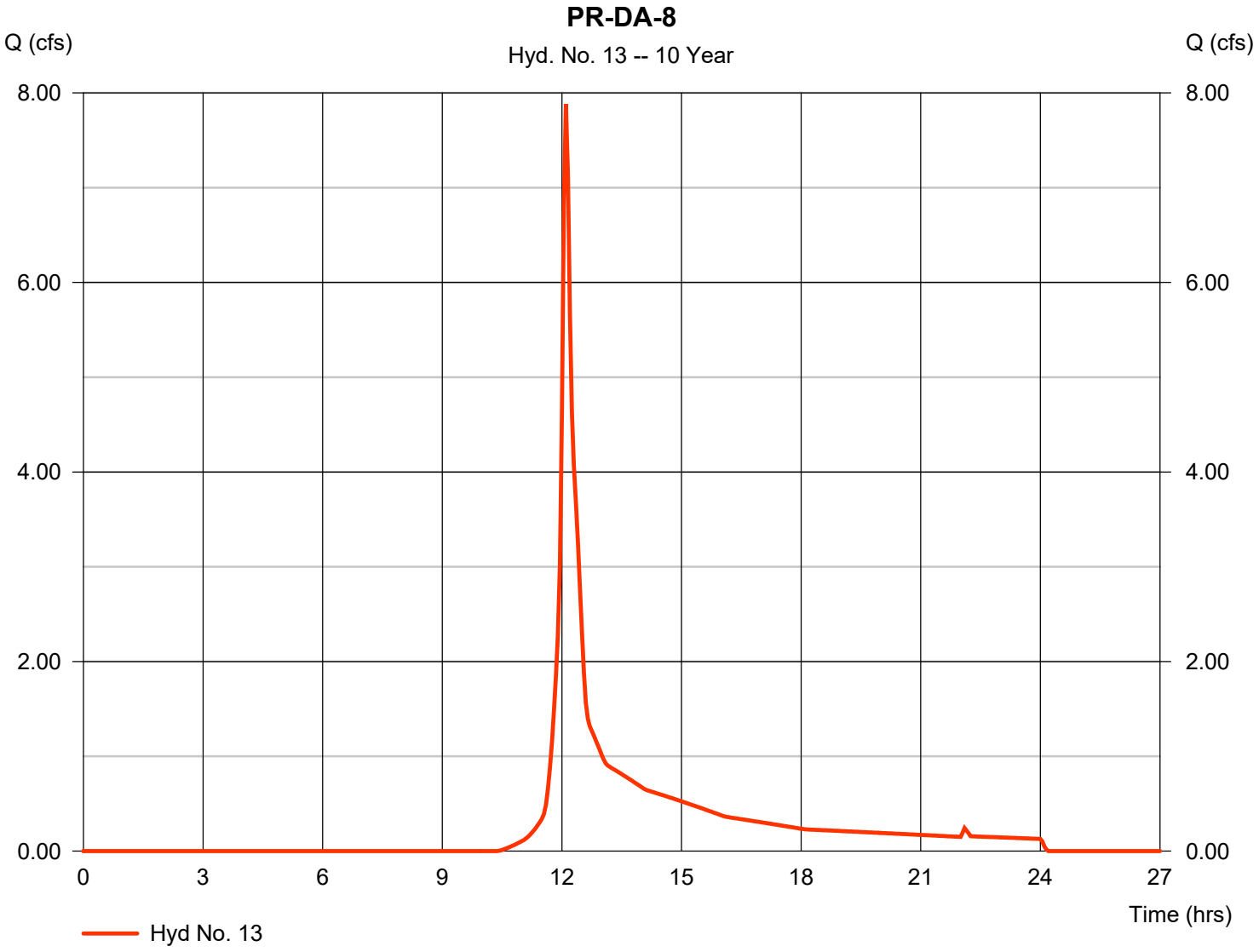


Hydrograph Report

Hyd. No. 13

PR-DA-8

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.881 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	27,244 cuft
Drainage area	=	3.740 ac	Curve number	=	61
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.90 min
Total precip.	=	6.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

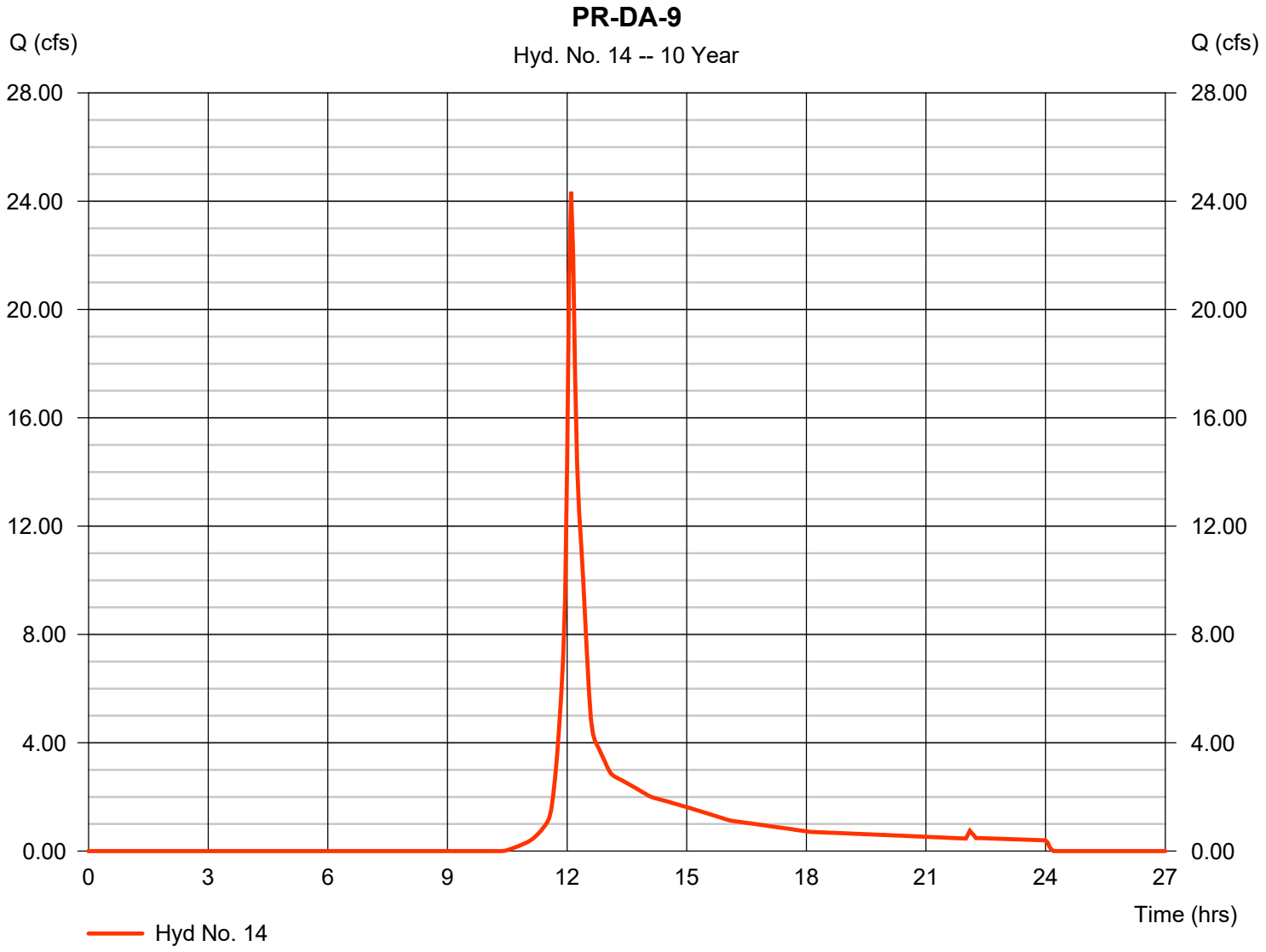


Hydrograph Report

Hyd. No. 14

PR-DA-9

Hydrograph type	= SCS Runoff	Peak discharge	= 24.36 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 84,207 cuft
Drainage area	= 11.560 ac	Curve number	= 61
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.70 min
Total precip.	= 6.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

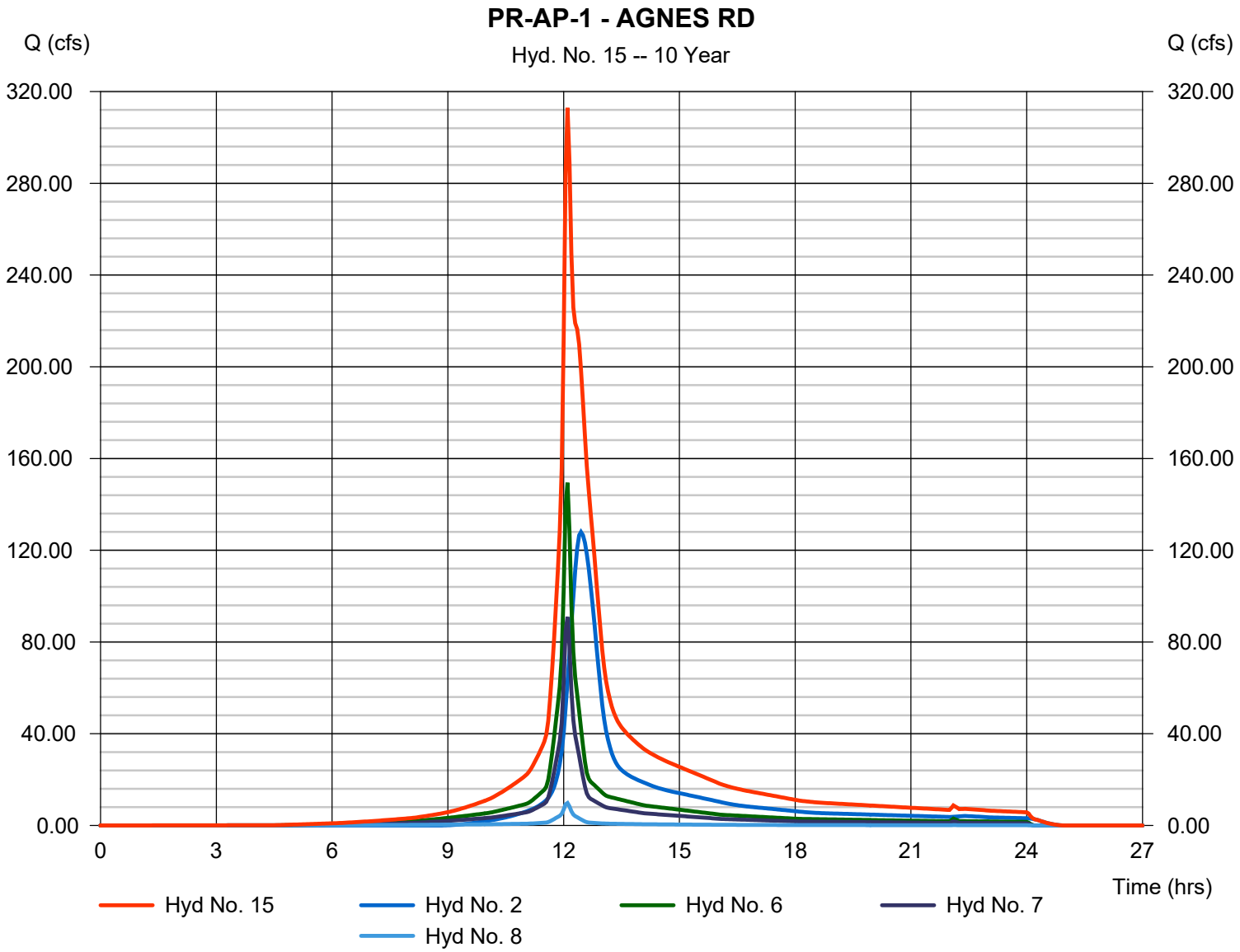


Hydrograph Report

Hyd. No. 15

PR-AP-1 - AGNES RD

Hydrograph type	= Combine	Peak discharge	= 312.95 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 1,630,120 cuft
Inflow hyds.	= 2, 6, 7, 8	Contrib. drain. area	= 123.406 ac

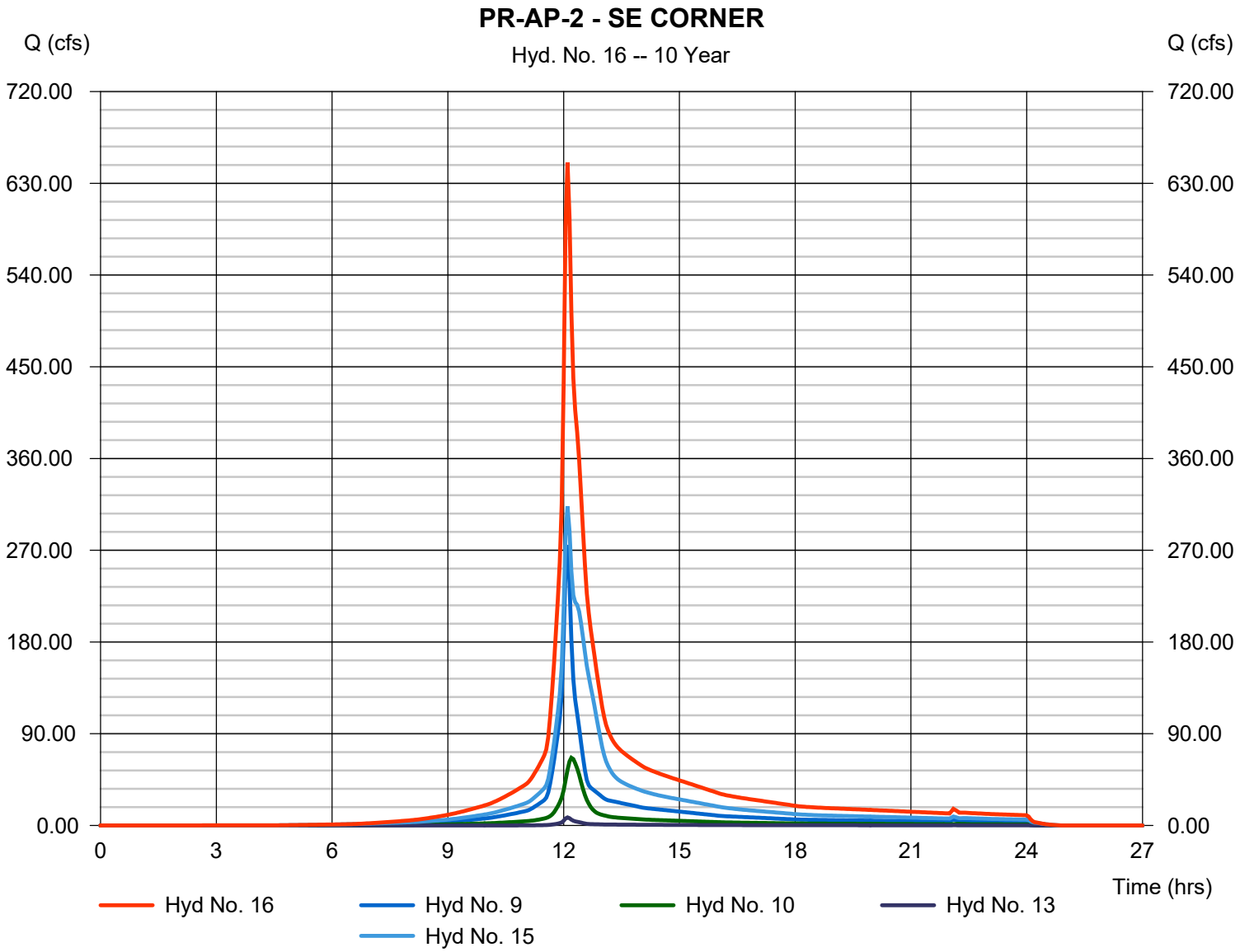


Hydrograph Report

Hyd. No. 16

PR-AP-2 - SE CORNER

Hydrograph type	= Combine	Peak discharge	= 650.57 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 2,876,911 cuft
Inflow hyds.	= 9, 10, 13, 15	Contrib. drain. area	= 92.180 ac

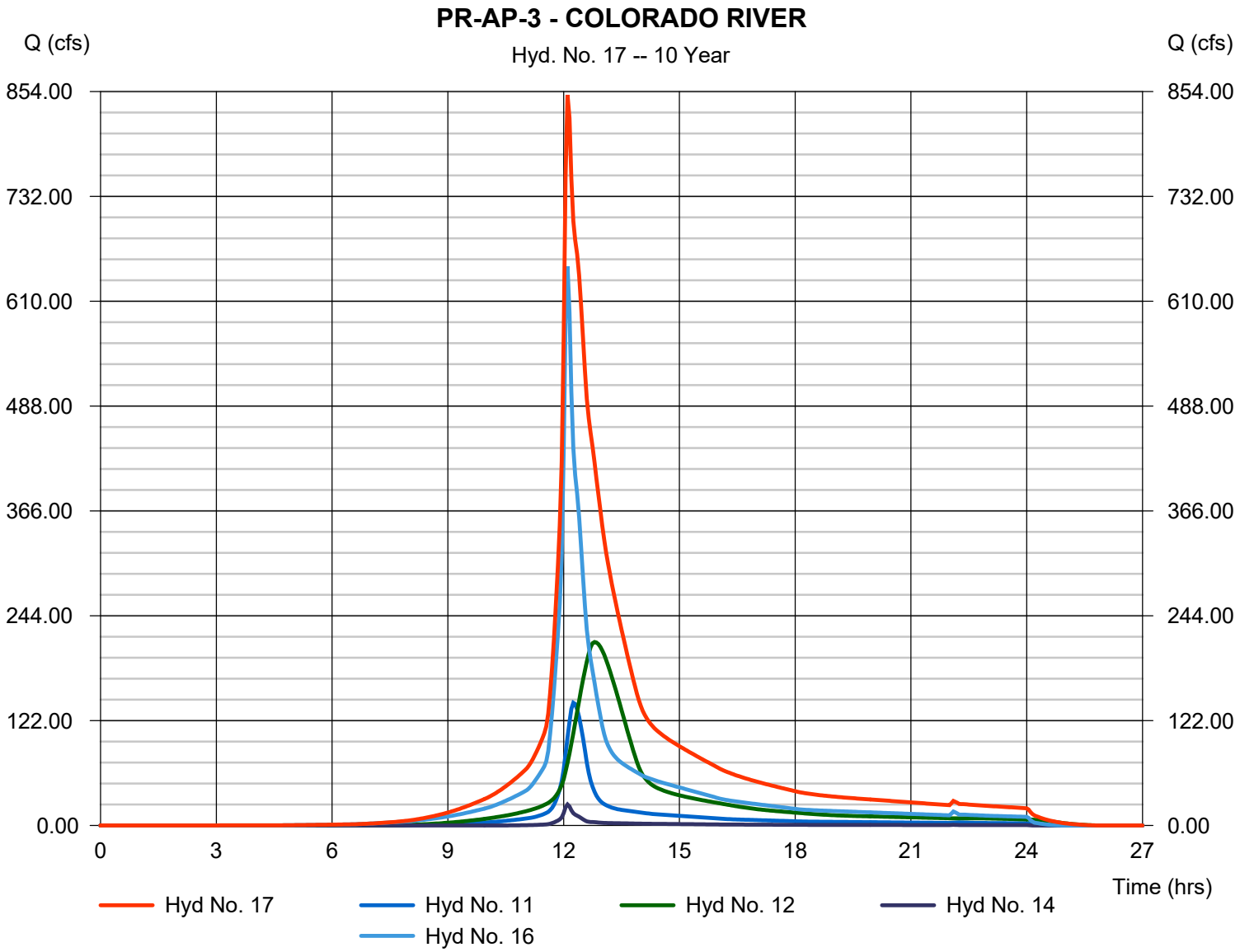


Hydrograph Report

Hyd. No. 17

PR-AP-3 - COLORADO RIVER

Hydrograph type	= Combine	Peak discharge	= 850.01 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 5,493,296 cuft
Inflow hyds.	= 11, 12, 14, 16	Contrib. drain. area	= 197.870 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	97.12	3	786	1,037,961	------	------	------	EX-DA-1 / EX-AP-1
2	SCS Runoff	181.31	3	747	1,078,021	------	------	------	EX-DA-OFFSITE
3	SCS Runoff	219.91	3	780	2,121,502	------	------	------	EX-DA-2
4	SCS Runoff	64.30	3	750	413,255	------	------	------	EX-DA-3
5	Combine	395.87	3	756	3,612,778	2, 3, 4	------	------	EX-AP-2
6	SCS Runoff	192.56	3	726	673,739	------	------	------	PR-DA-1
7	SCS Runoff	117.15	3	726	409,901	------	------	------	PR-DA-2
8	SCS Runoff	12.14	3	726	47,121	------	------	------	PR-DA-3
9	SCS Runoff	367.46	3	726	1,243,838	------	------	------	PR-DA-4
10	SCS Runoff	88.96	3	732	401,124	------	------	------	PR-DA-5
11	SCS Runoff	195.94	3	735	936,516	------	------	------	PR-DA-6
12	SCS Runoff	288.18	3	768	2,508,478	------	------	------	PR-DA-7
13	SCS Runoff	12.16	3	726	40,953	------	------	------	PR-DA-8
14	SCS Runoff	37.58	3	726	126,582	------	------	------	PR-DA-9
15	Combine	414.96	3	726	2,208,784	2, 6, 7, 8,	------	------	PR-AP-1 - AGNES RD
16	Combine	868.31	3	726	3,894,697	9, 10, 13, 15	------	------	PR-AP-2 - SE CORNER
17	Combine	1151.75	3	726	7,466,272	11, 12, 14, 16	------	------	PR-AP-3 - COLORADO RIVER

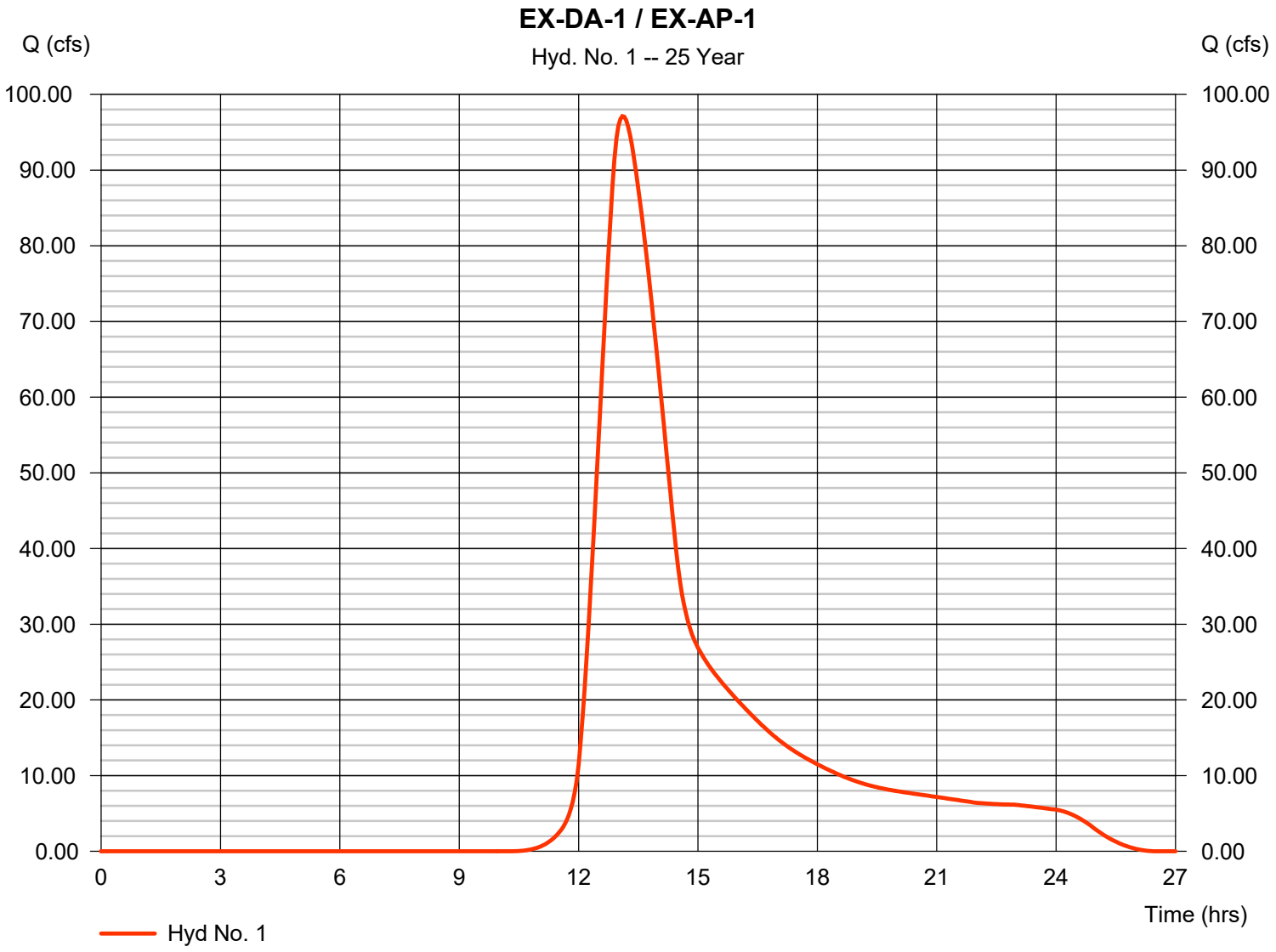
Hydrograph Report

Hyd. No. 1

EX-DA-1 / EX-AP-1

Hydrograph type	= SCS Runoff	Peak discharge	= 97.12 cfs
Storm frequency	= 25 yrs	Time to peak	= 13.10 hrs
Time interval	= 3 min	Hyd. volume	= 1,037,961 cuft
Drainage area	= 101.790 ac	Curve number	= 57*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 94.50 min
Total precip.	= 7.70 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(84.000 x 61) + (17.790 x 39)] / 101.790



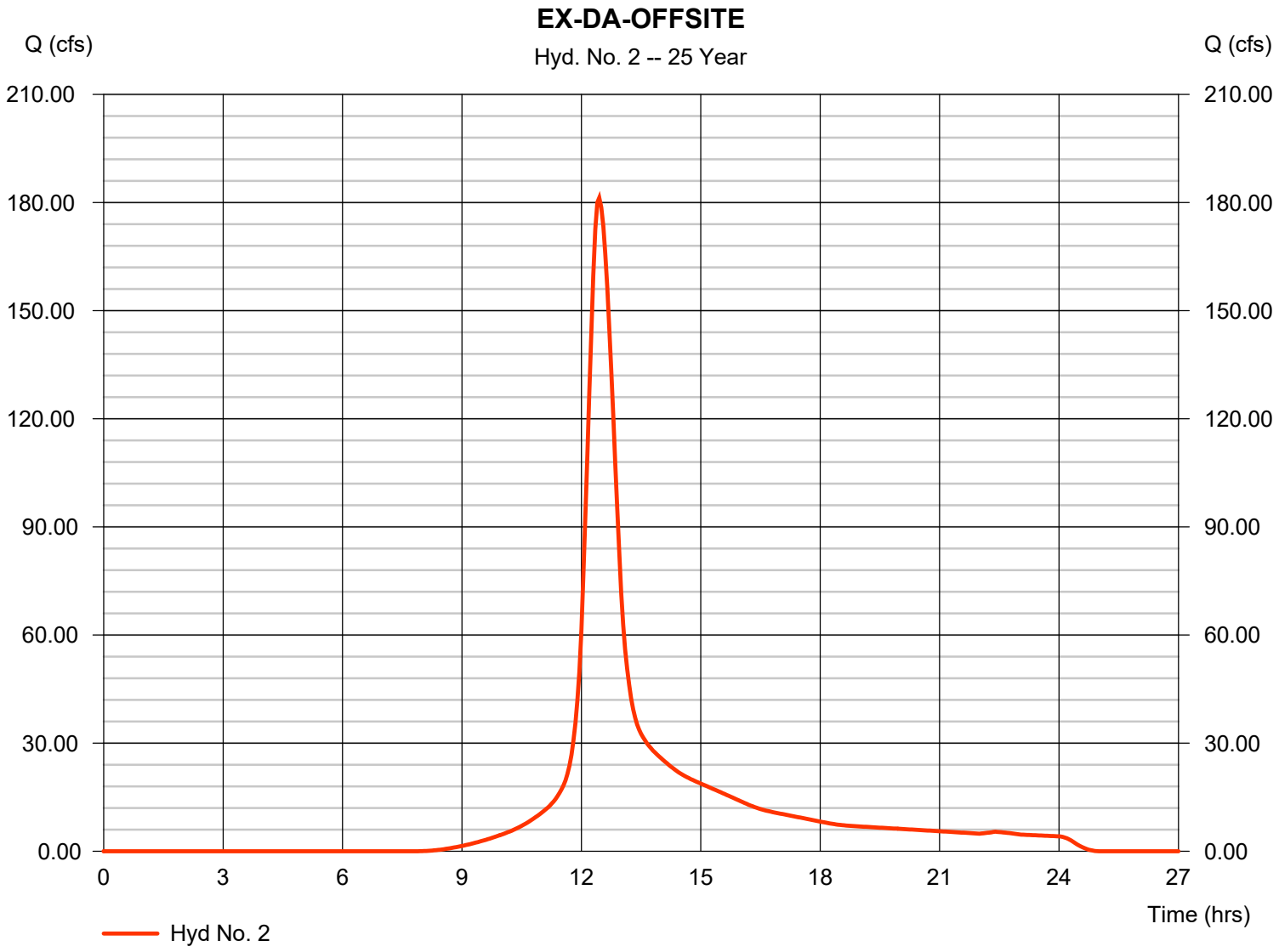
Hydrograph Report

Hyd. No. 2

EX-DA-OFFSITE

Hydrograph type	=	SCS Runoff	Peak discharge	=	181.31 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.45 hrs
Time interval	=	3 min	Hyd. volume	=	1,078,021 cuft
Drainage area	=	69.840 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	39.80 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.230 x 98) + (50.610 x 61)] / 69.840



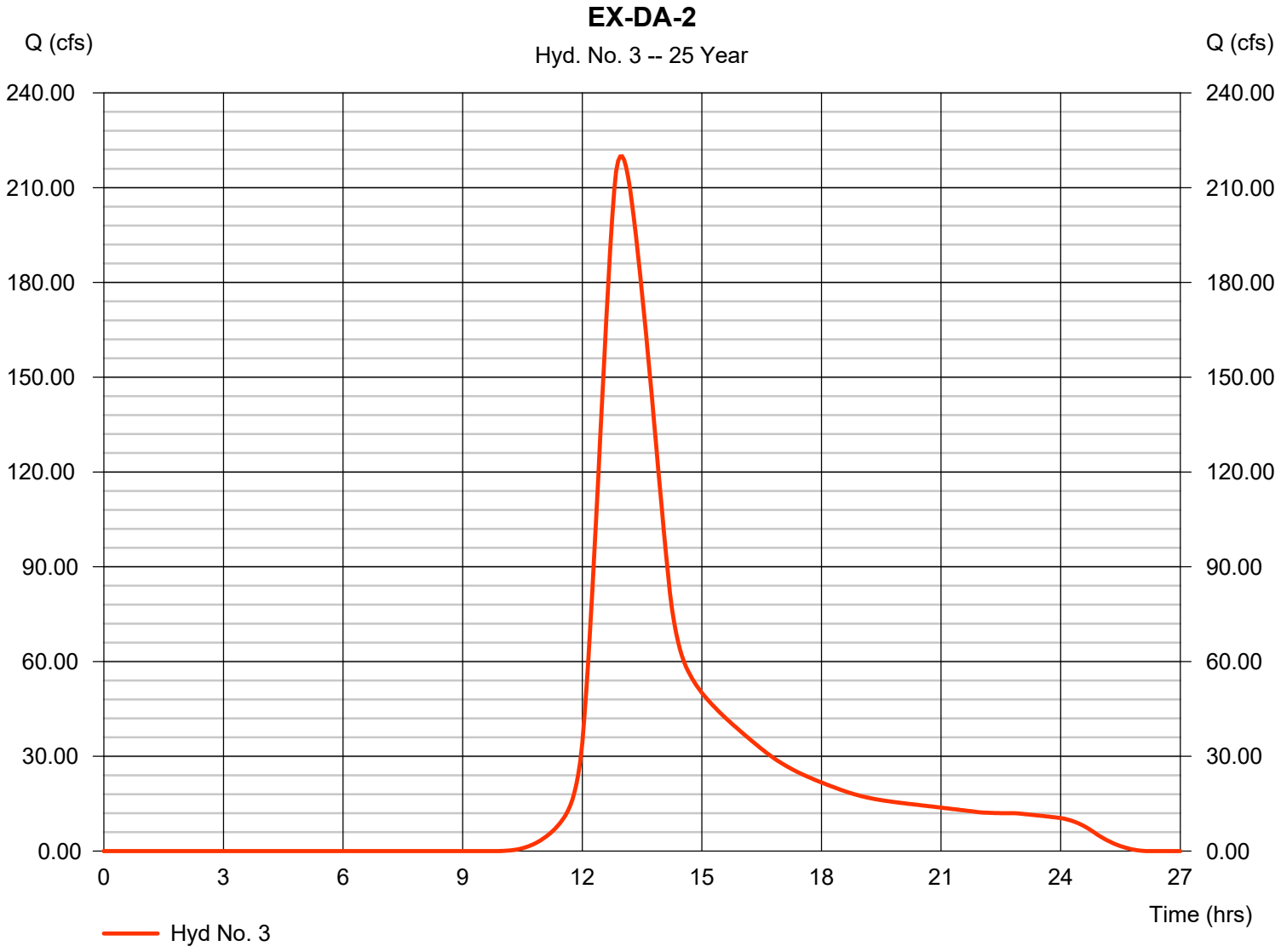
Hydrograph Report

Hyd. No. 3

EX-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	219.91 cfs
Storm frequency	=	25 yrs	Time to peak	=	13.00 hrs
Time interval	=	3 min	Hyd. volume	=	2,121,502 cuft
Drainage area	=	189.310 ac	Curve number	=	60*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	83.86 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(183.470 x 61) + (5.840 x 39)] / 189.310



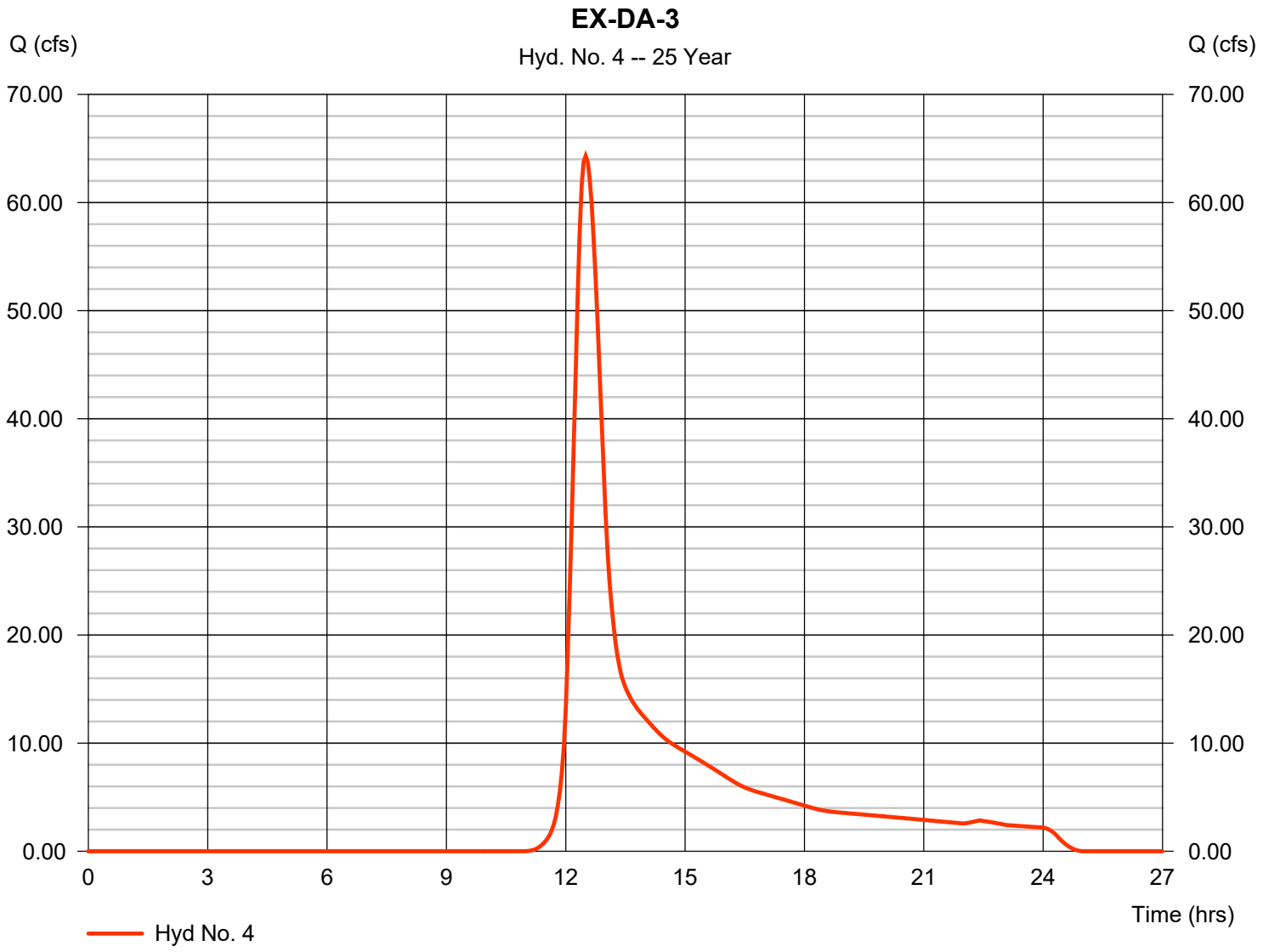
Hydrograph Report

Hyd. No. 4

EX-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	64.30 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.50 hrs
Time interval	=	3 min	Hyd. volume	=	413,255 cuft
Drainage area	=	50.910 ac	Curve number	=	52*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	38.30 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(30.546 x 61) + (20.364 x 39)] / 50.910

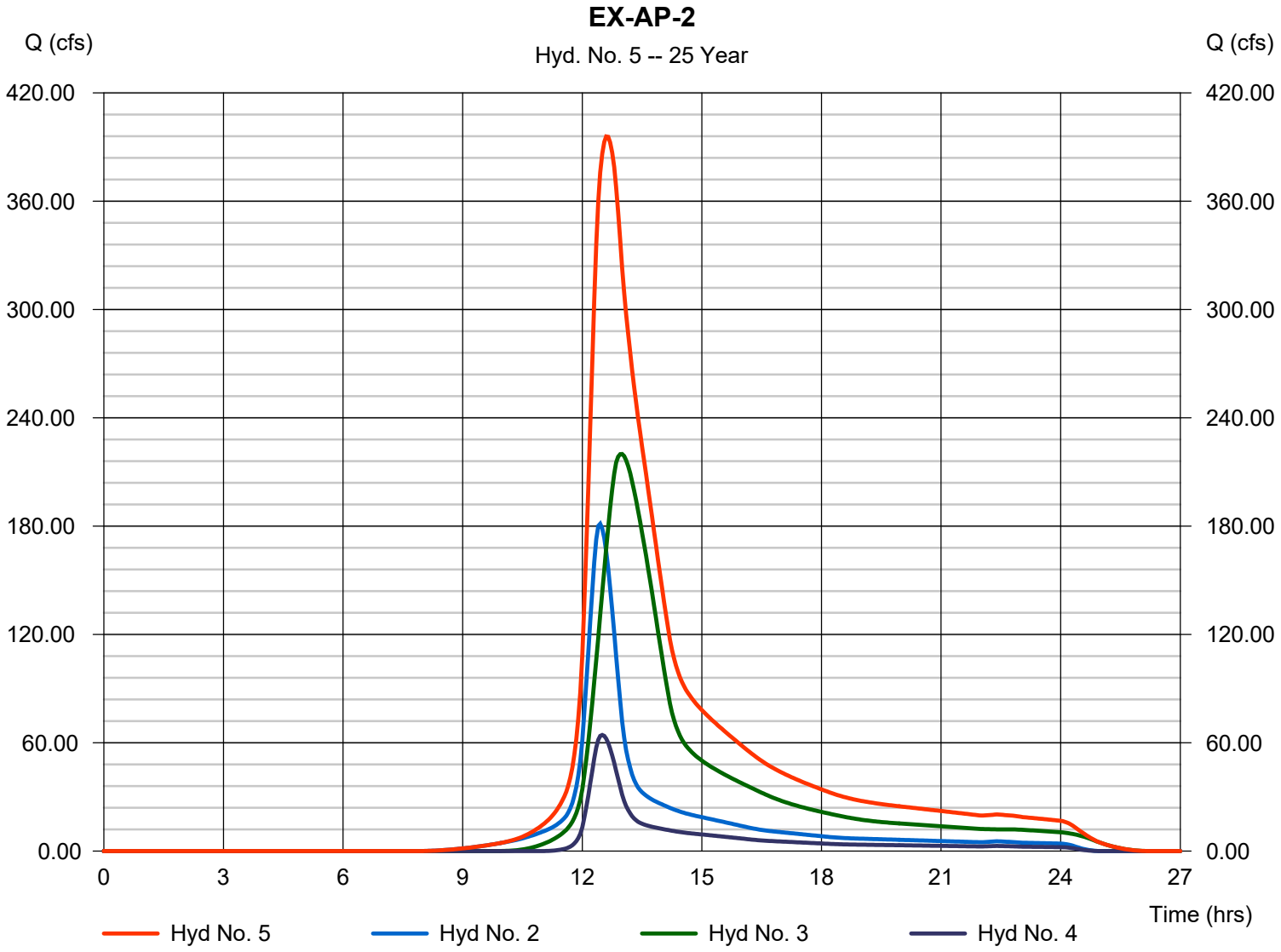


Hydrograph Report

Hyd. No. 5

EX-AP-2

Hydrograph type	=	Combine	Peak discharge	=	395.87 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.60 hrs
Time interval	=	3 min	Hyd. volume	=	3,612,778 cuft
Inflow hyds.	=	2, 3, 4	Contrib. drain. area	=	310.060 ac



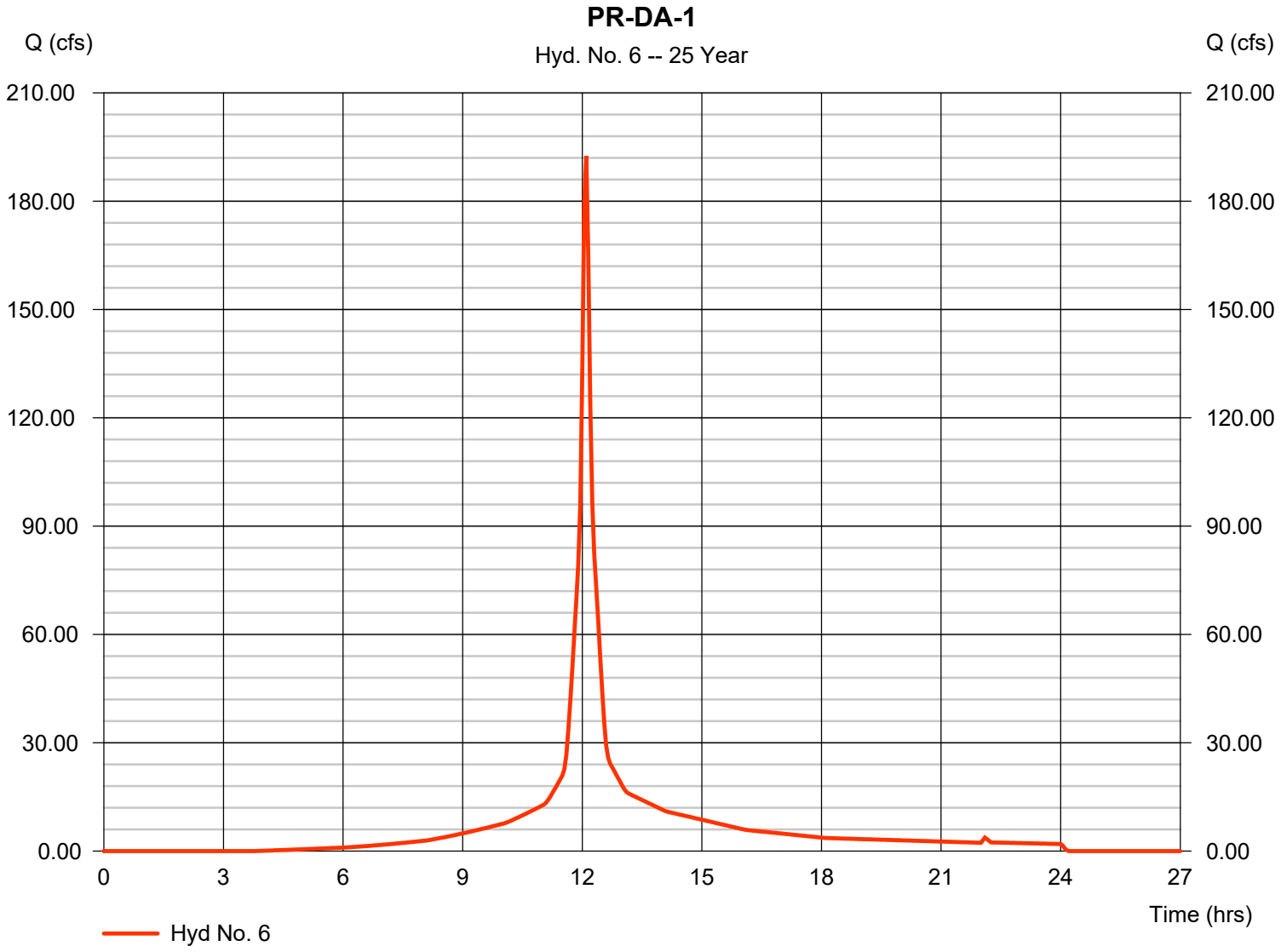
Hydrograph Report

Hyd. No. 6

PR-DA-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	192.56 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	673,739 cuft
Drainage area	=	32.150 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(22.300 x 98) + (9.560 x 61)] / 32.150



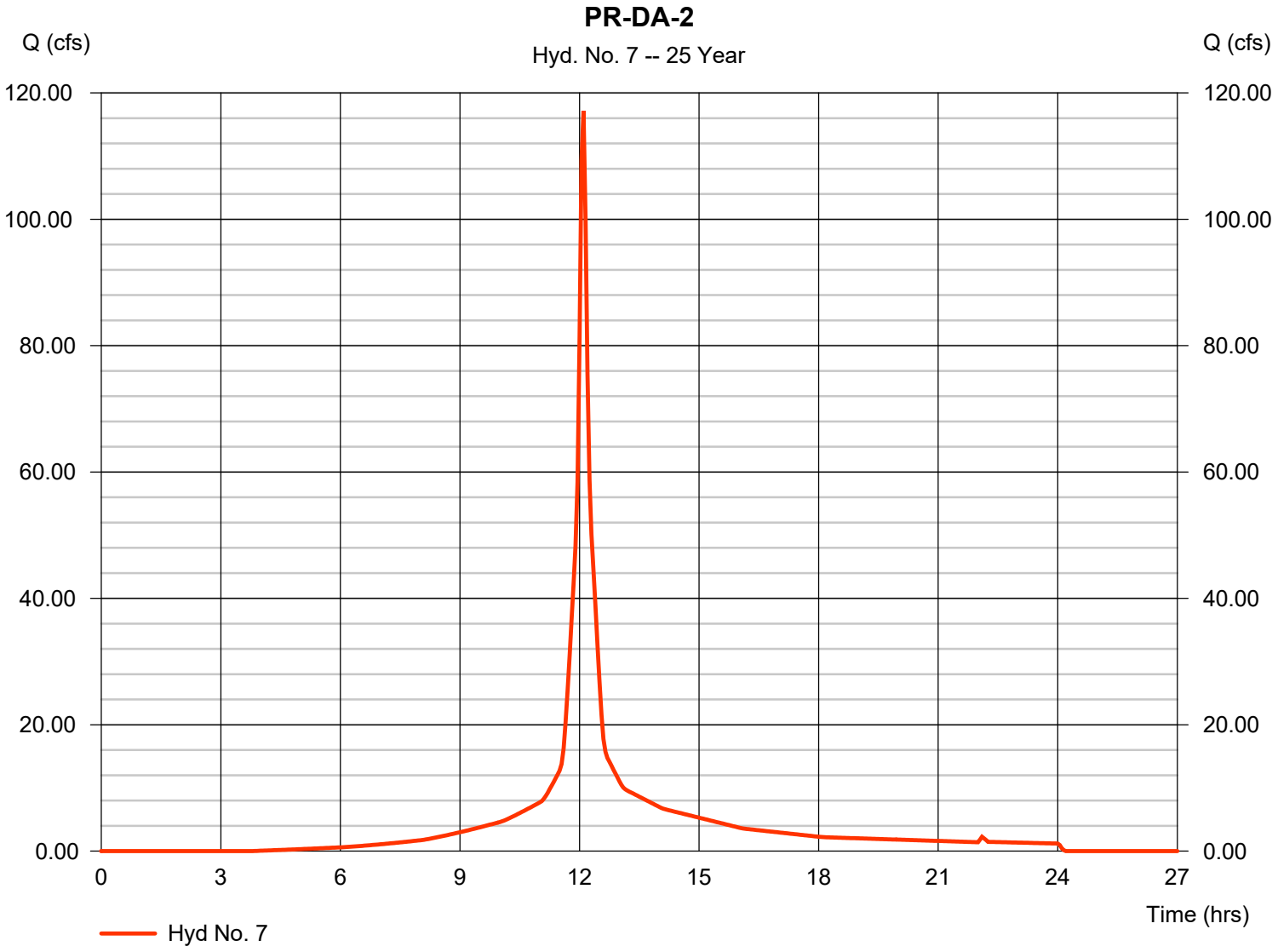
Hydrograph Report

Hyd. No. 7

PR-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	117.15 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	409,901 cuft
Drainage area	=	19.560 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(13.580 x 98) + (5.820 x 61)] / 19.560

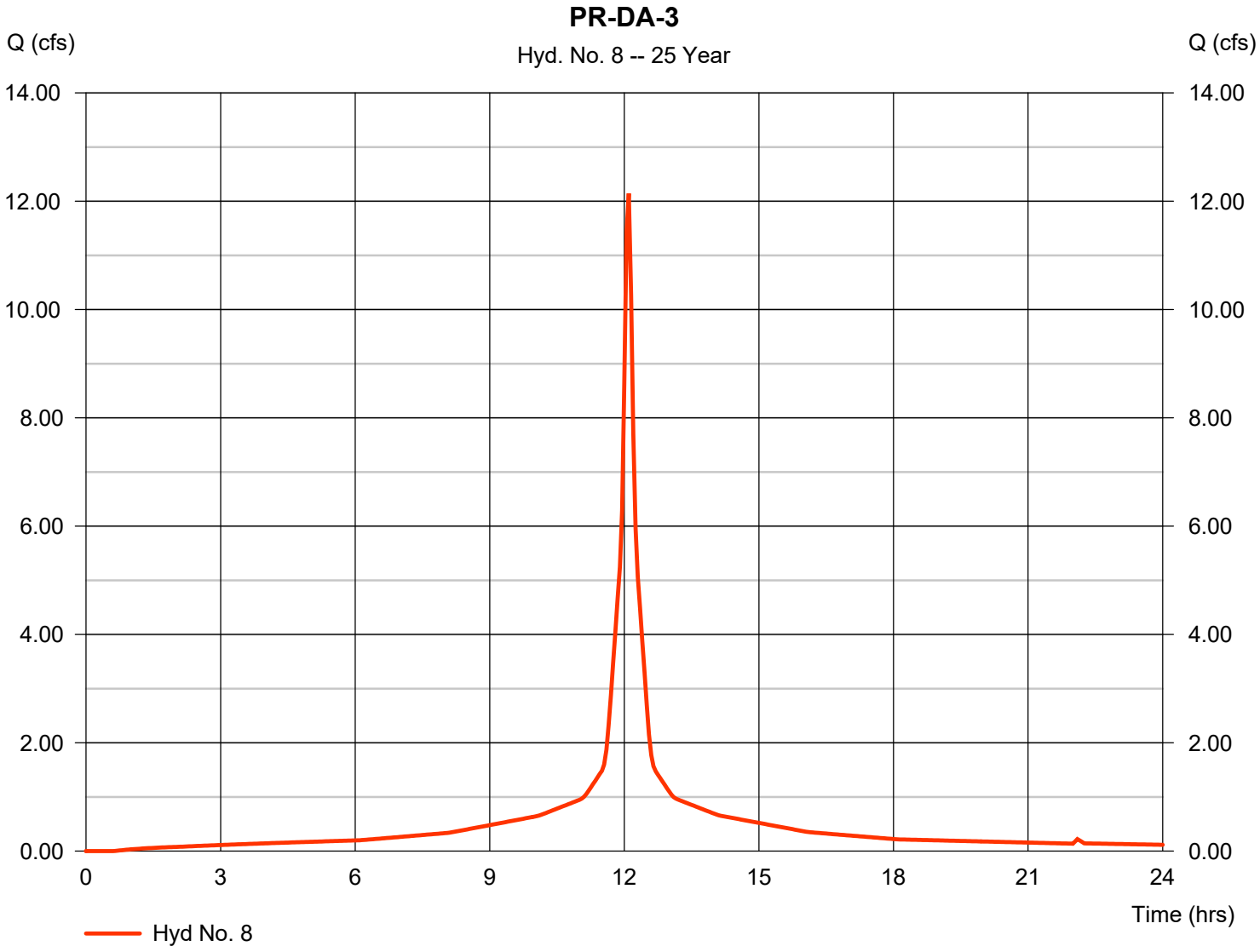


Hydrograph Report

Hyd. No. 8

PR-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.14 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	47,121 cuft
Drainage area	=	1.856 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.80 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



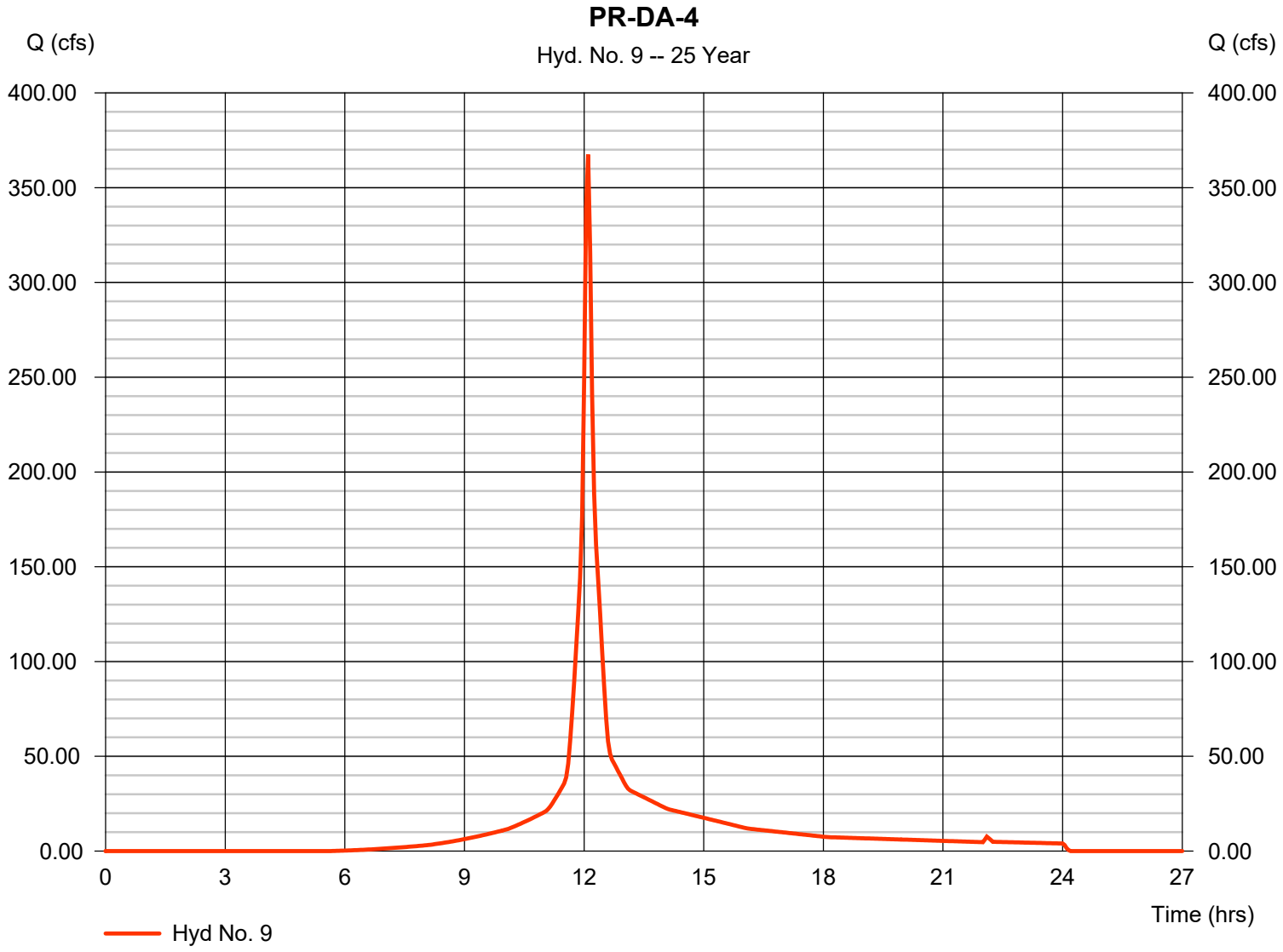
Hydrograph Report

Hyd. No. 9

PR-DA-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	367.46 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	1,243,838 cuft
Drainage area	=	68.390 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.10 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(34.190 x 98) + (34.200 x 61)] / 68.390



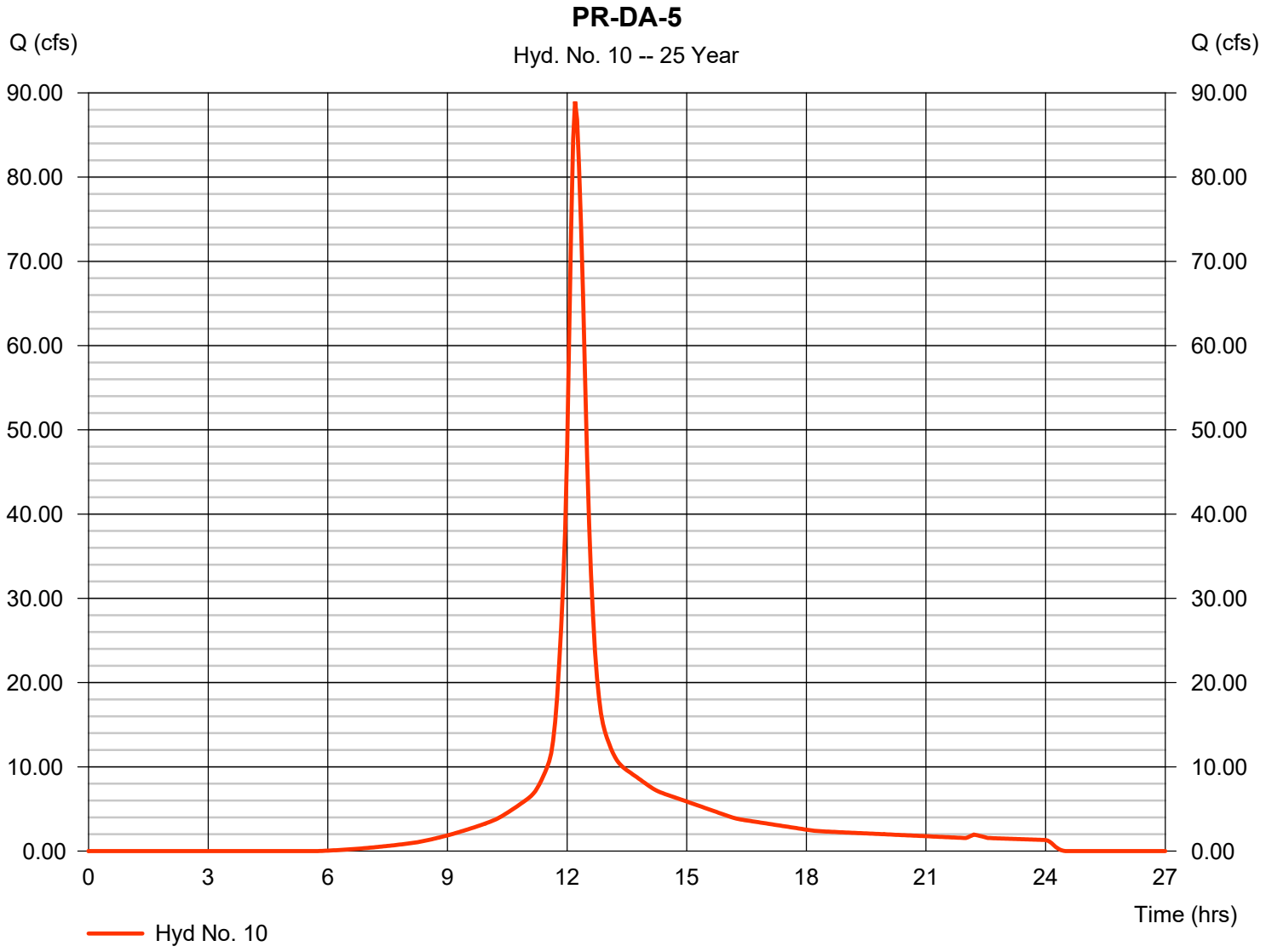
Hydrograph Report

Hyd. No. 10

PR-DA-5

Hydrograph type	=	SCS Runoff	Peak discharge	=	88.96 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.20 hrs
Time interval	=	3 min	Hyd. volume	=	401,124 cuft
Drainage area	=	20.050 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.40 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(10.167 x 98) + (10.167 x 61)] / 20.050



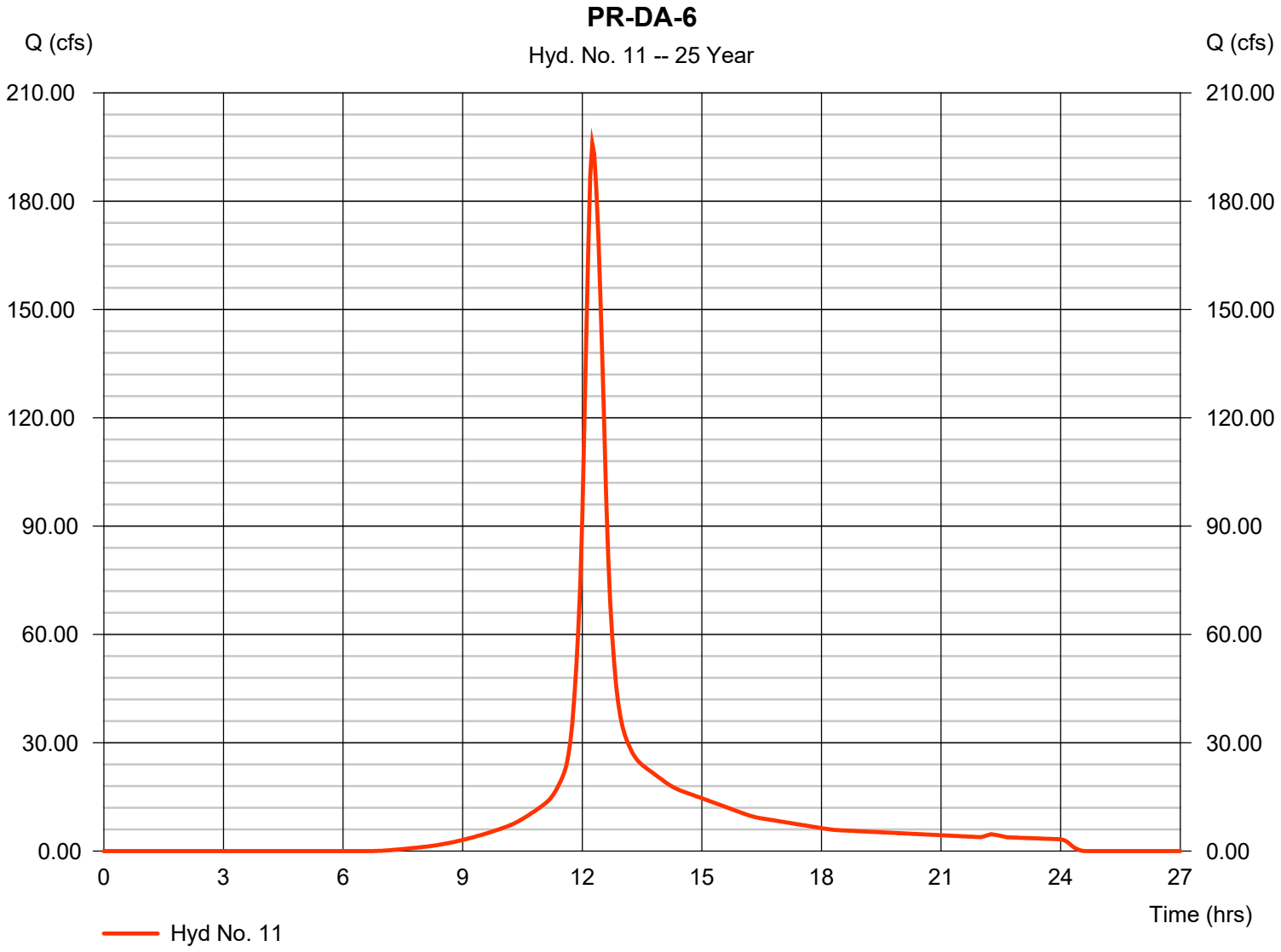
Hydrograph Report

Hyd. No. 11

PR-DA-6

Hydrograph type	=	SCS Runoff	Peak discharge	=	195.94 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.25 hrs
Time interval	=	3 min	Hyd. volume	=	936,516 cuft
Drainage area	=	54.160 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.60 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.630 x 61) + (7.450 x 39) + (27.080 x 98)] / 54.160



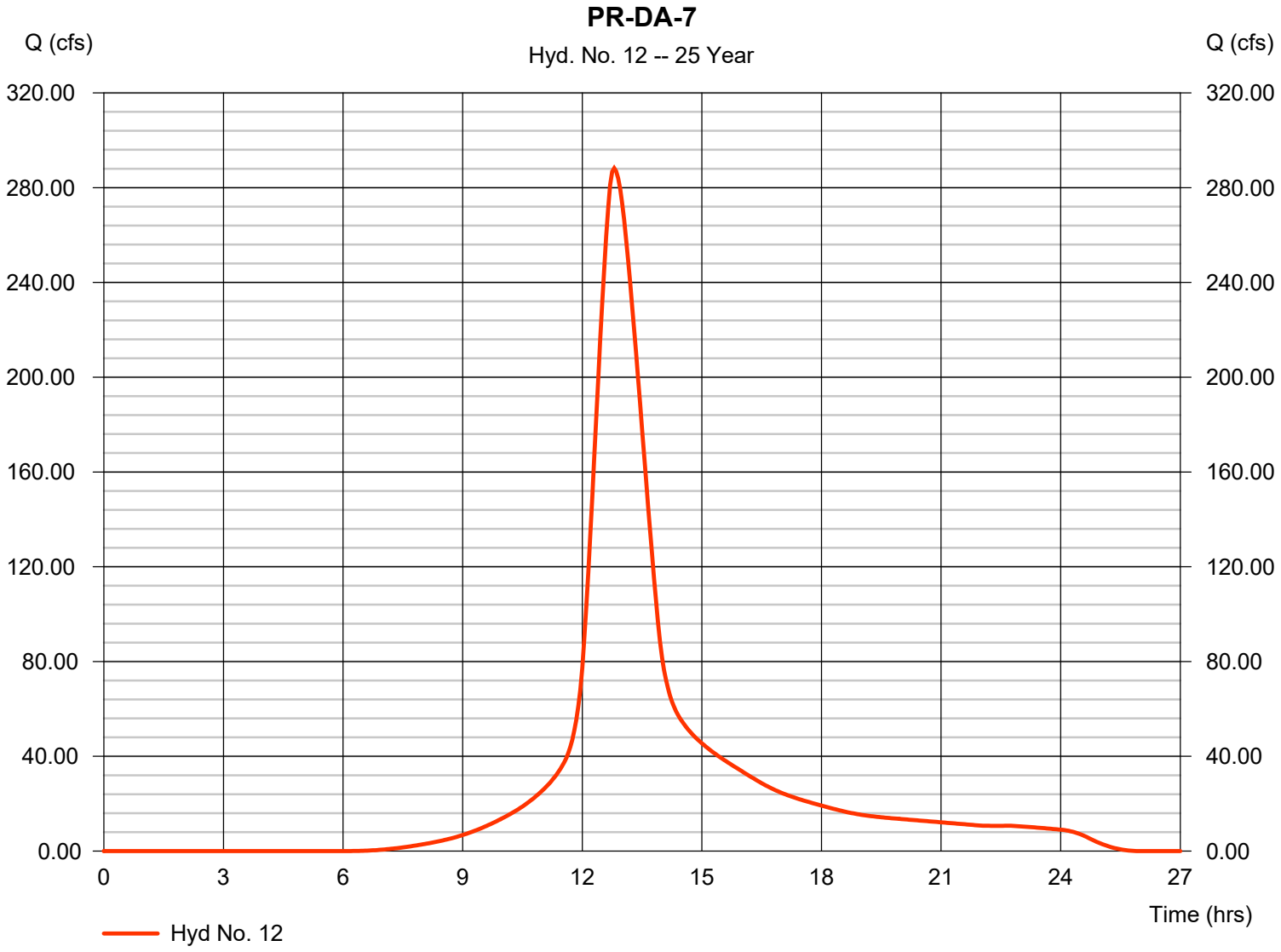
Hydrograph Report

Hyd. No. 12

PR-DA-7

Hydrograph type	=	SCS Runoff	Peak discharge	=	288.18 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.80 hrs
Time interval	=	3 min	Hyd. volume	=	2,508,478 cuft
Drainage area	=	132.150 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	71.80 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(66.080 x 98) + (66.070 x 61)] / 132.150

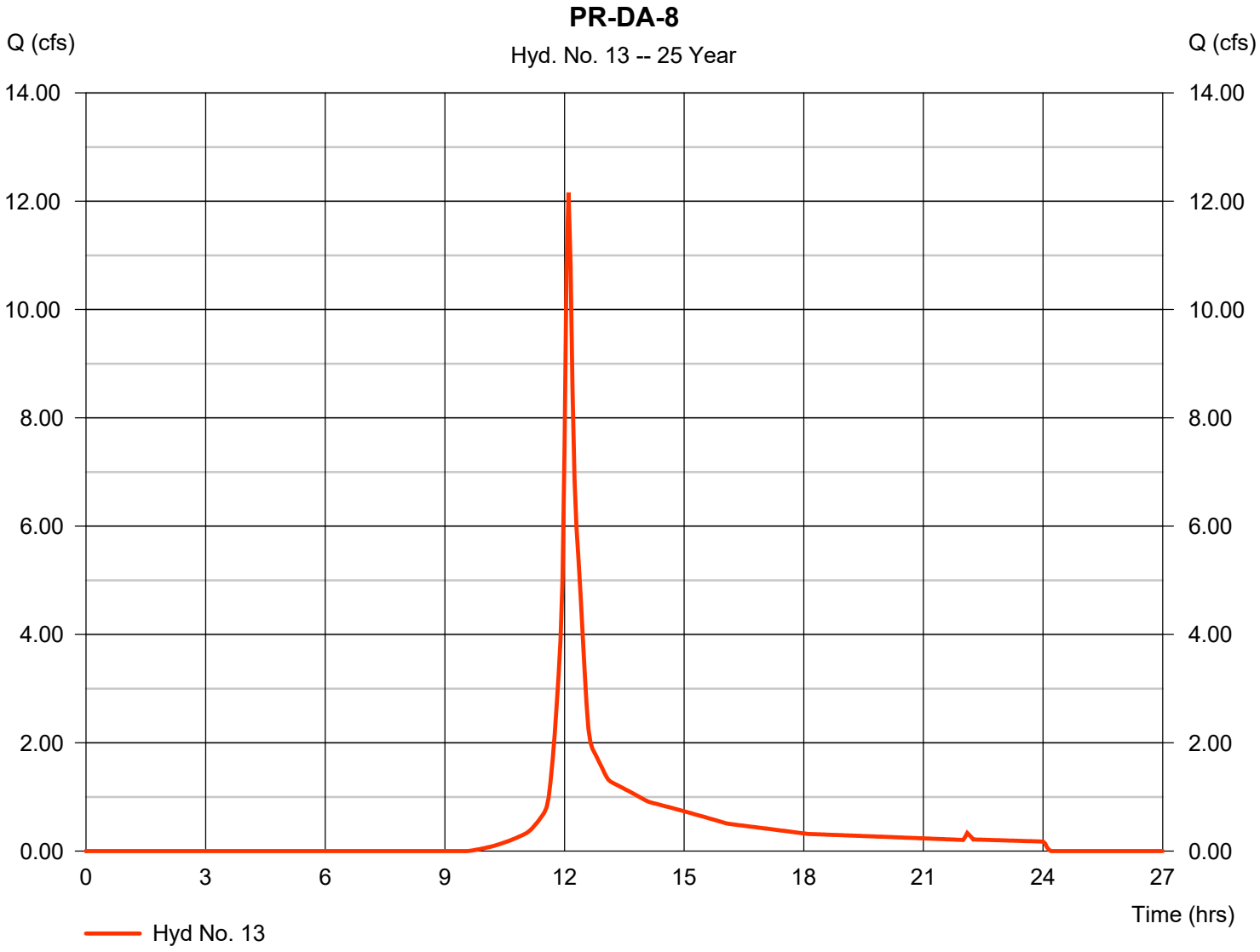


Hydrograph Report

Hyd. No. 13

PR-DA-8

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.16 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	40,953 cuft
Drainage area	=	3.740 ac	Curve number	=	61
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.90 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

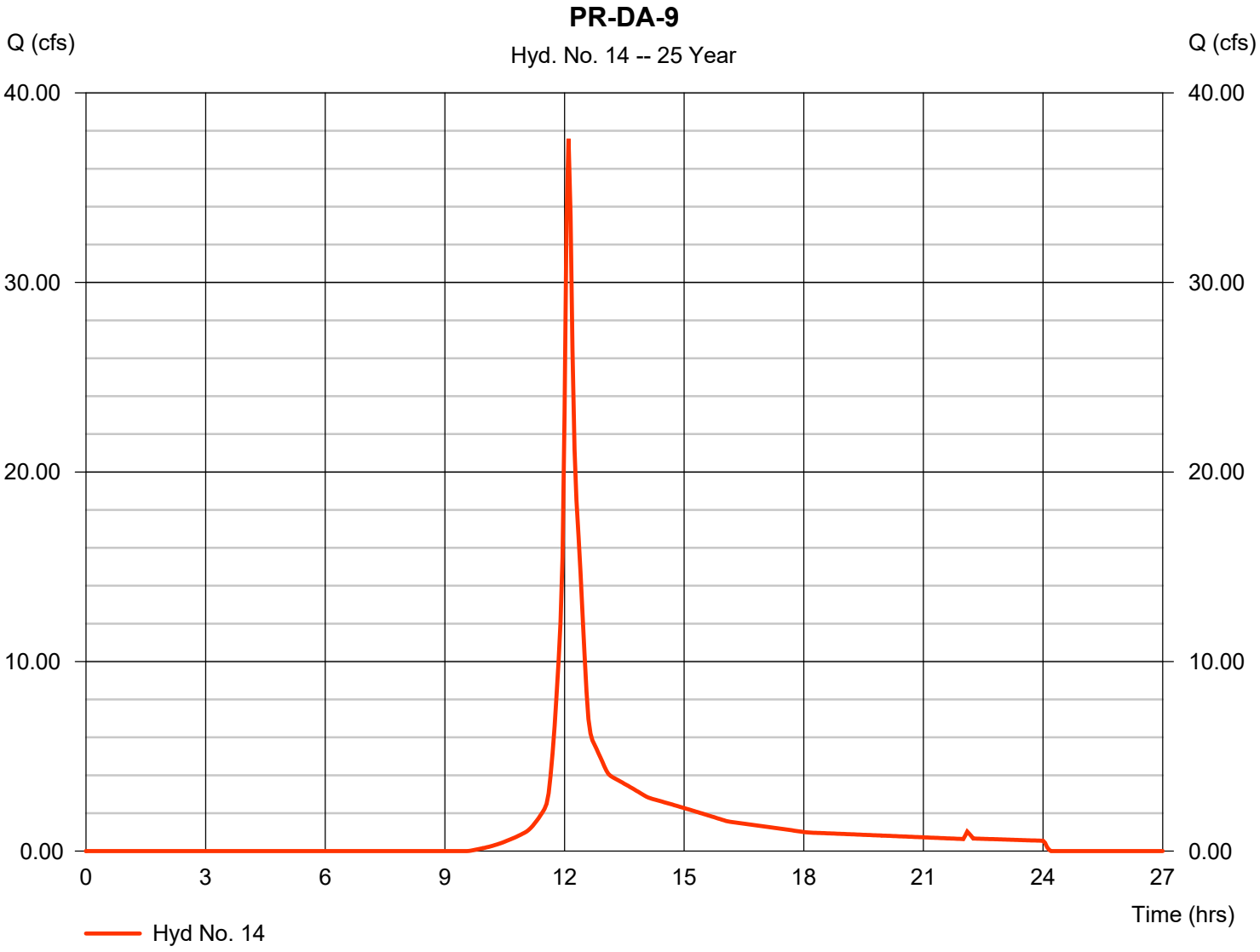


Hydrograph Report

Hyd. No. 14

PR-DA-9

Hydrograph type	=	SCS Runoff	Peak discharge	=	37.58 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	126,582 cuft
Drainage area	=	11.560 ac	Curve number	=	61
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.70 min
Total precip.	=	7.70 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

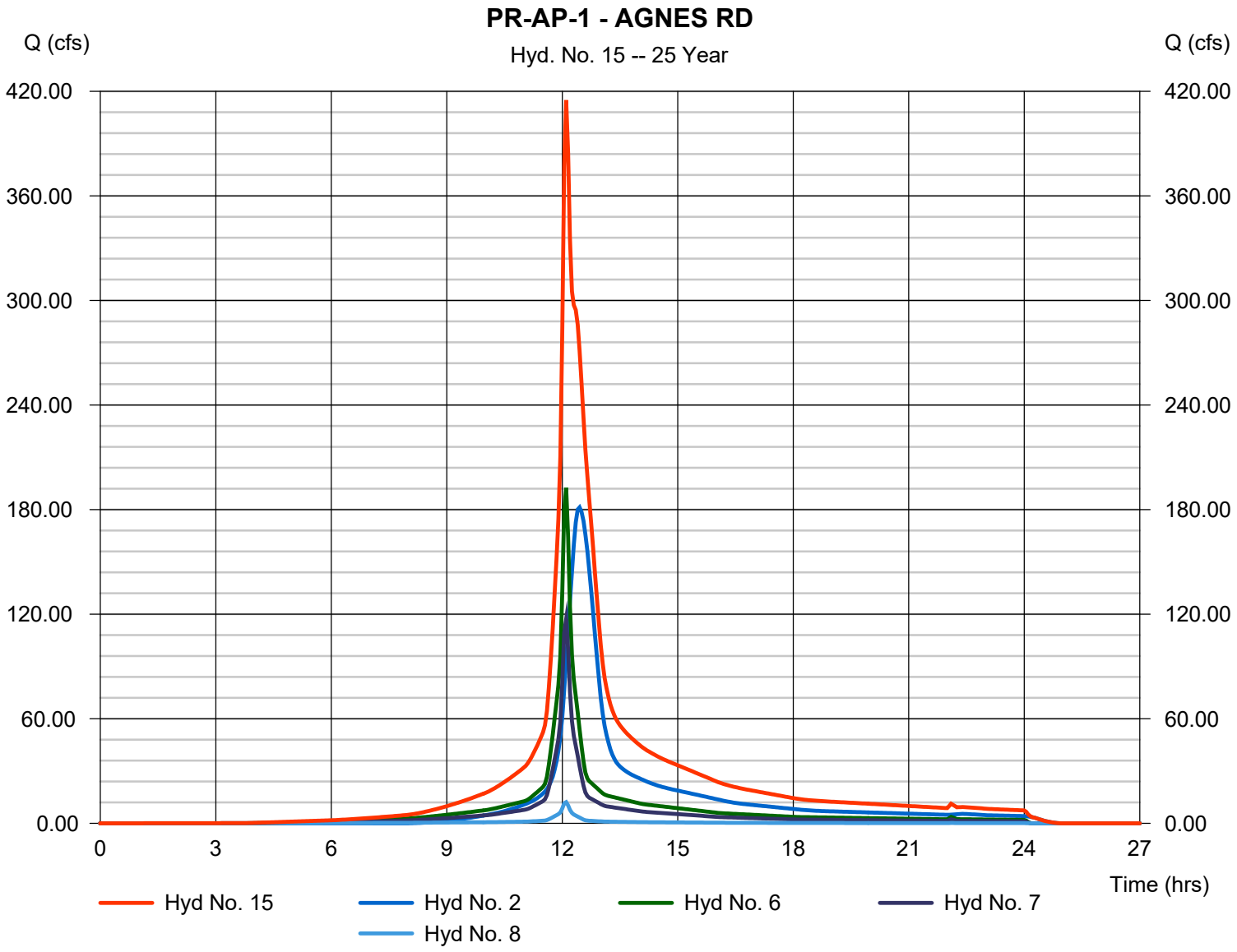


Hydrograph Report

Hyd. No. 15

PR-AP-1 - AGNES RD

Hydrograph type	= Combine	Peak discharge	= 414.96 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 2,208,784 cuft
Inflow hyds.	= 2, 6, 7, 8	Contrib. drain. area	= 123.406 ac

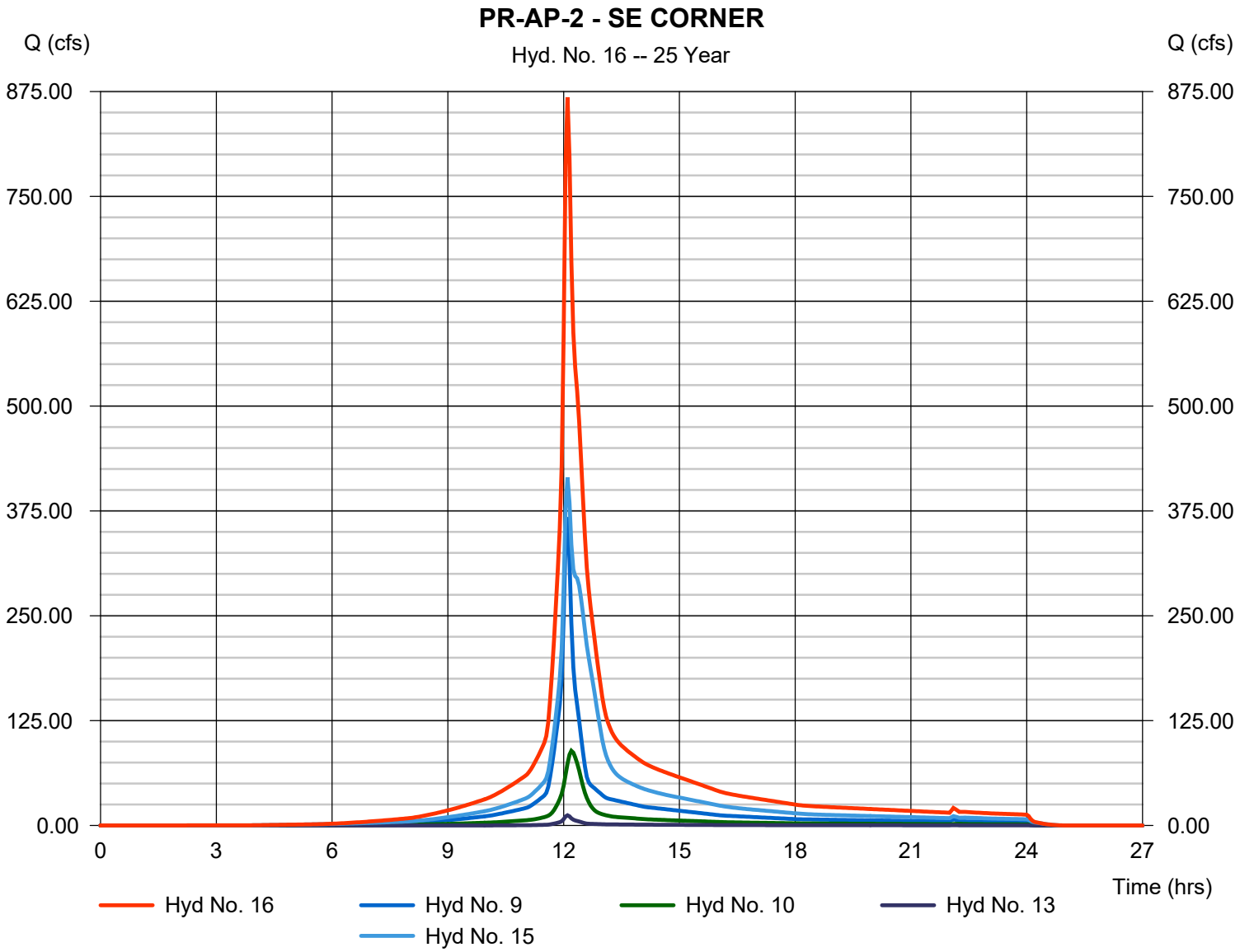


Hydrograph Report

Hyd. No. 16

PR-AP-2 - SE CORNER

Hydrograph type	= Combine	Peak discharge	= 868.31 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 3,894,697 cuft
Inflow hyds.	= 9, 10, 13, 15	Contrib. drain. area	= 92.180 ac

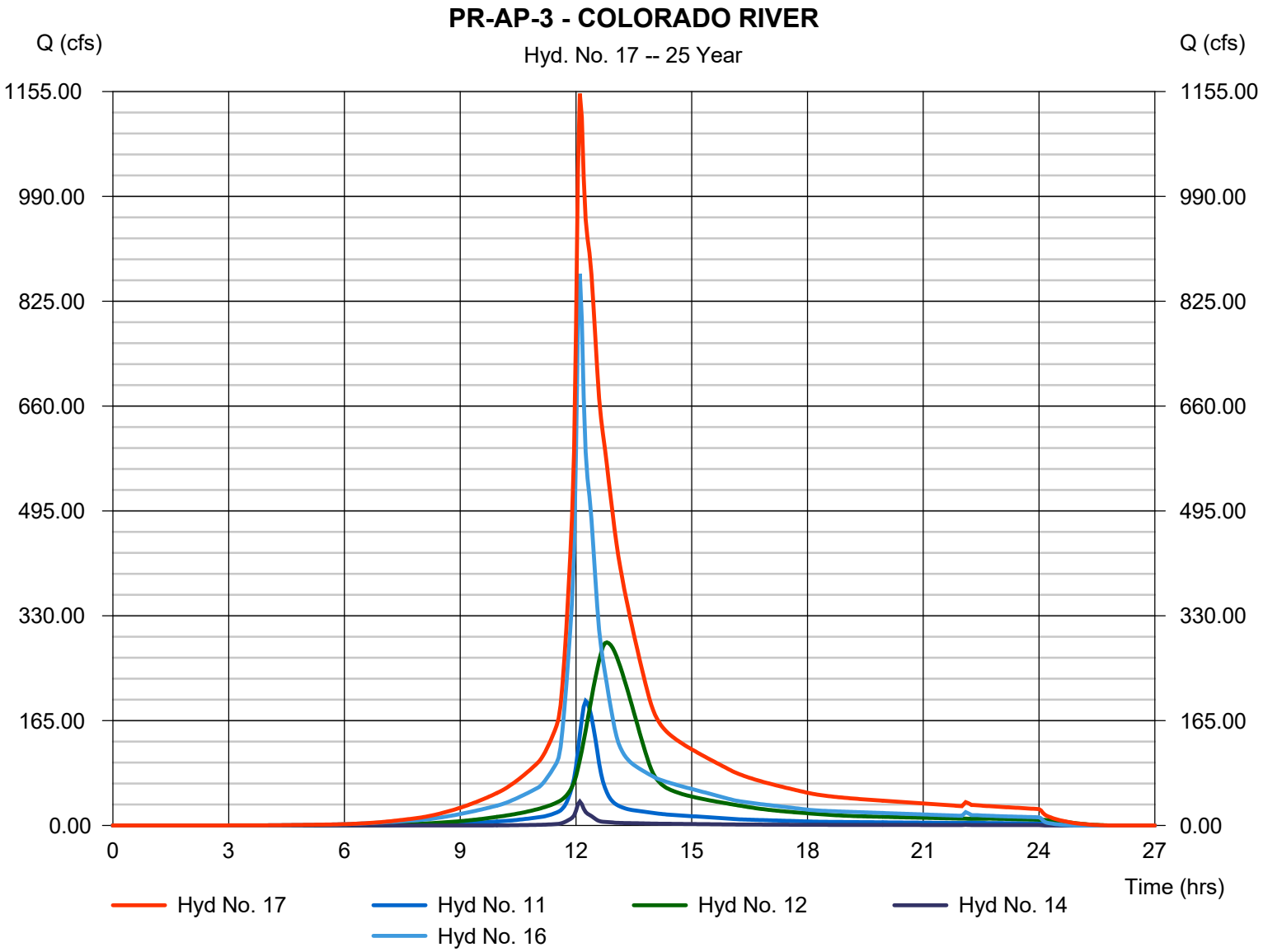


Hydrograph Report

Hyd. No. 17

PR-AP-3 - COLORADO RIVER

Hydrograph type	=	Combine	Peak discharge	=	1151.75 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	7,466,272 cuft
Inflow hyds.	=	11, 12, 14, 16	Contrib. drain. area	=	197.870 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2018 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	167.35	3	783	1,730,482	------	------	------	EX-DA-1 / EX-AP-1
2	SCS Runoff	273.30	3	747	1,631,448	------	------	------	EX-DA-OFFSITE
3	SCS Runoff	366.23	3	777	3,452,475	------	------	------	EX-DA-2
4	SCS Runoff	117.99	3	747	721,955	------	------	------	EX-DA-3
5	Combine	648.66	3	756	5,805,873	2, 3, 4	------	------	EX-AP-2
6	SCS Runoff	263.76	3	726	941,240	------	------	------	PR-DA-1
7	SCS Runoff	160.47	3	726	572,648	------	------	------	PR-DA-2
8	SCS Runoff	16.10	3	726	62,904	------	------	------	PR-DA-3
9	SCS Runoff	521.27	3	726	1,794,956	------	------	------	PR-DA-4
10	SCS Runoff	126.64	3	732	578,854	------	------	------	PR-DA-5
11	SCS Runoff	285.88	3	735	1,379,011	------	------	------	PR-DA-6
12	SCS Runoff	413.80	3	768	3,637,777	------	------	------	PR-DA-7
13	SCS Runoff	19.88	3	726	66,145	------	------	------	PR-DA-8
14	SCS Runoff	61.45	3	726	204,448	------	------	------	PR-DA-9
15	Combine	587.02	3	726	3,208,240	2, 6, 7, 8,	------	------	PR-AP-1 - AGNES RD
16	Combine	1234.19	3	726	5,648,194	9, 10, 13, 15	------	------	PR-AP-2 - SE CORNER
17	Combine	1662.89	3	726	10,869,425	11, 12, 14, 16	------	------	PR-AP-3 - COLORADO RIVER

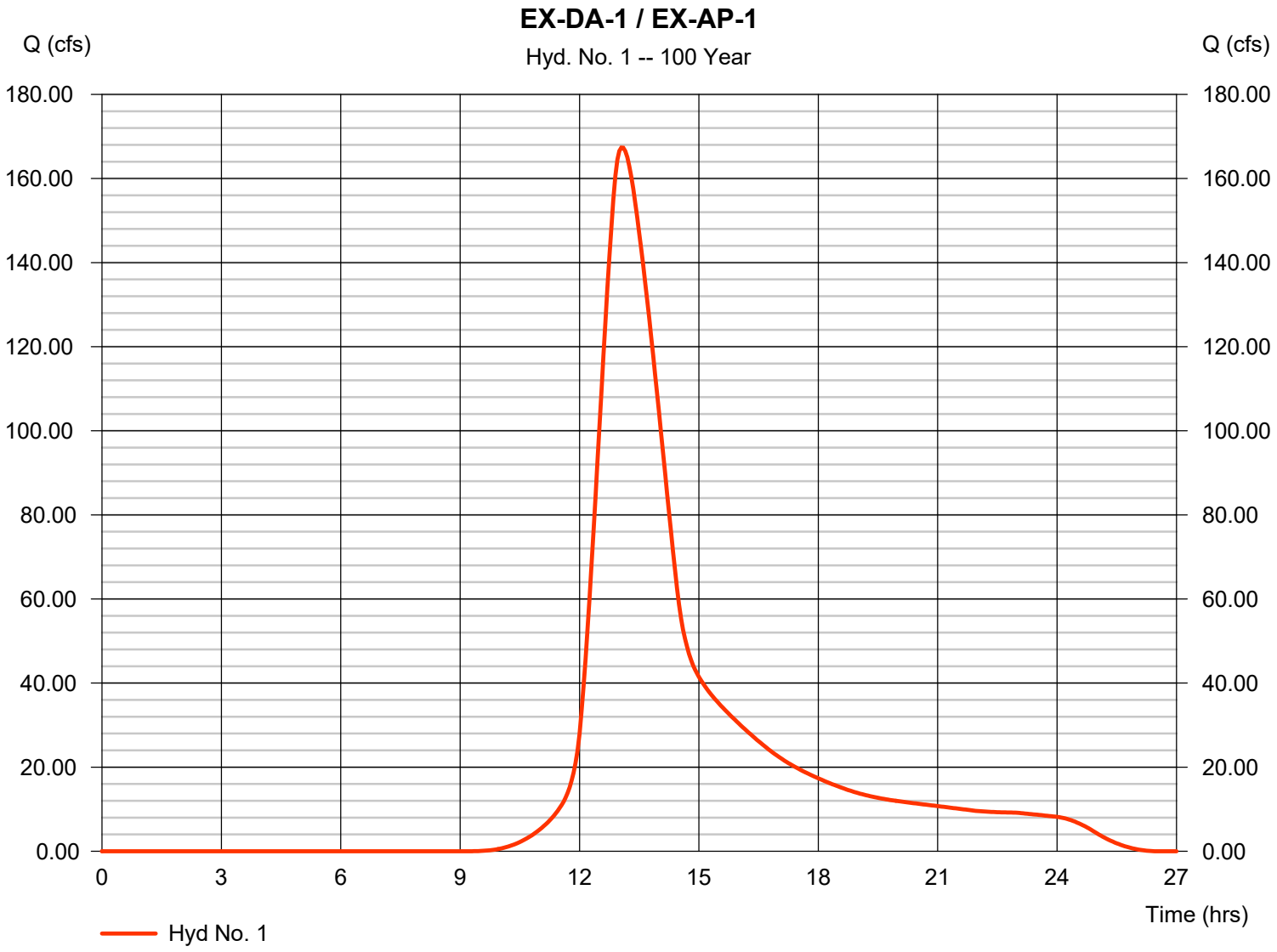
Hydrograph Report

Hyd. No. 1

EX-DA-1 / EX-AP-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	167.35 cfs
Storm frequency	=	100 yrs	Time to peak	=	13.05 hrs
Time interval	=	3 min	Hyd. volume	=	1,730,482 cuft
Drainage area	=	101.790 ac	Curve number	=	57*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	94.50 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(84.000 x 61) + (17.790 x 39)] / 101.790



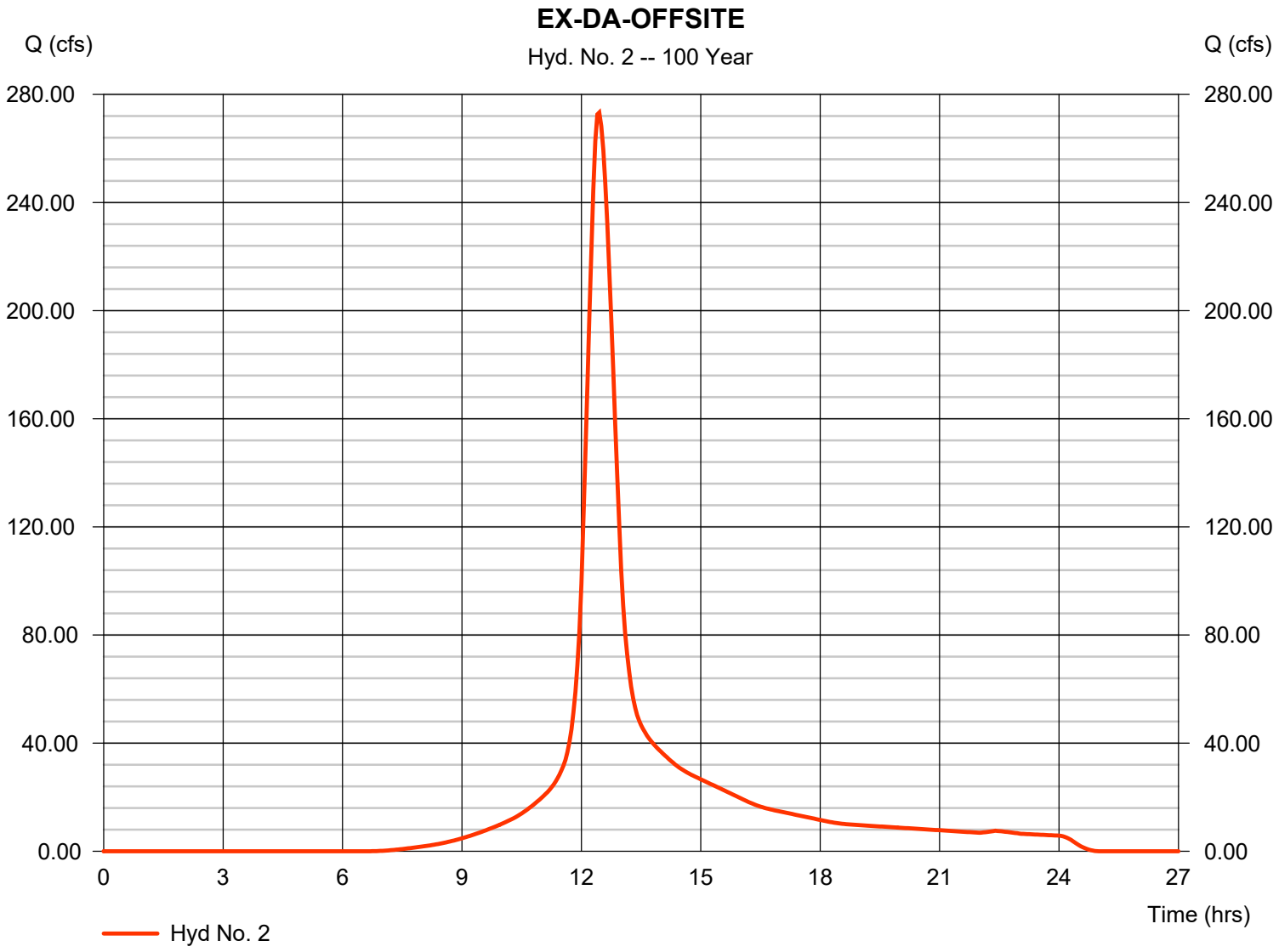
Hydrograph Report

Hyd. No. 2

EX-DA-OFFSITE

Hydrograph type	=	SCS Runoff	Peak discharge	=	273.30 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.45 hrs
Time interval	=	3 min	Hyd. volume	=	1,631,448 cuft
Drainage area	=	69.840 ac	Curve number	=	71*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	39.80 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.230 x 98) + (50.610 x 61)] / 69.840



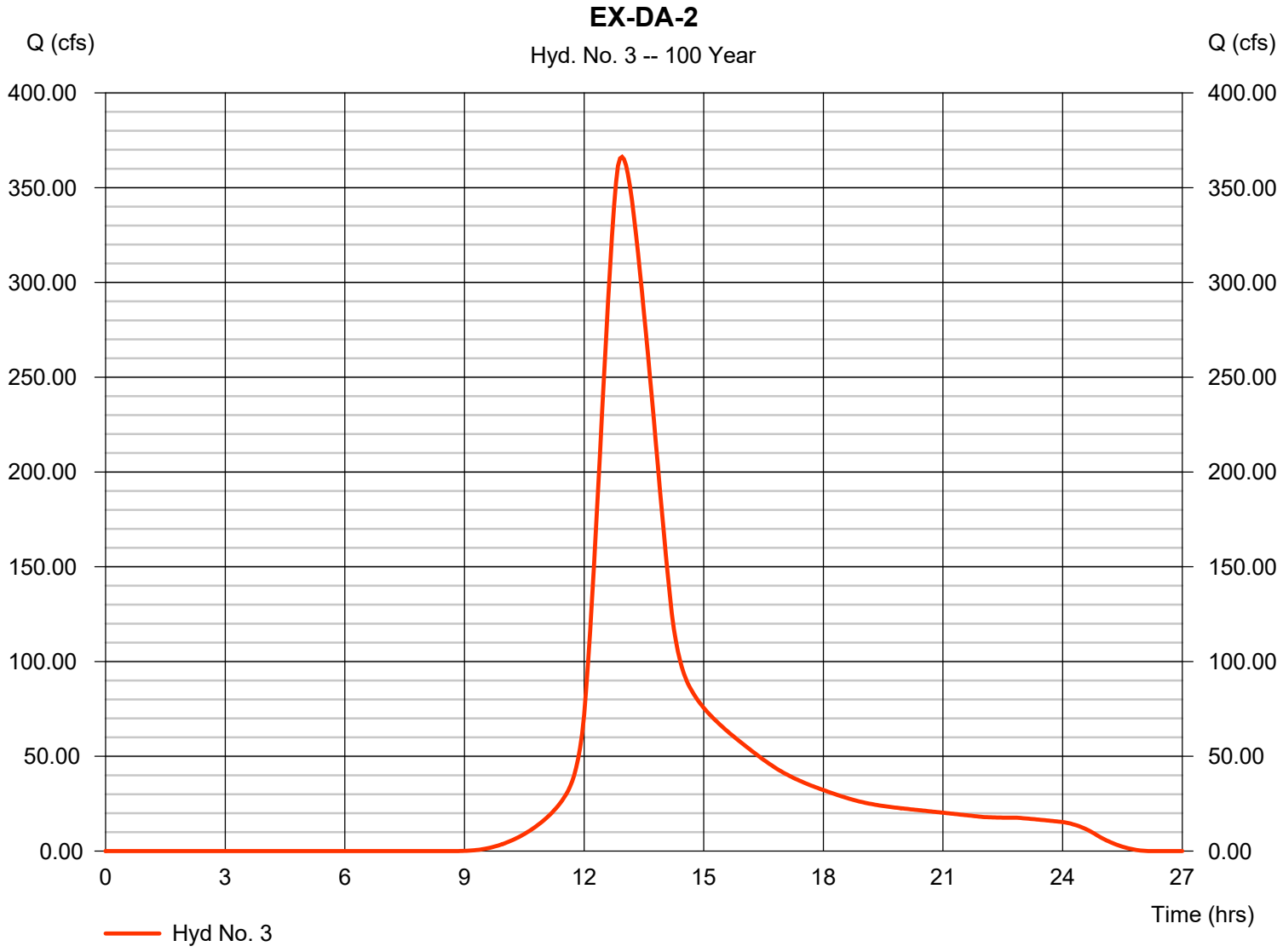
Hydrograph Report

Hyd. No. 3

EX-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	366.23 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.95 hrs
Time interval	=	3 min	Hyd. volume	=	3,452,475 cuft
Drainage area	=	189.310 ac	Curve number	=	60*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	83.86 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(183.470 x 61) + (5.840 x 39)] / 189.310



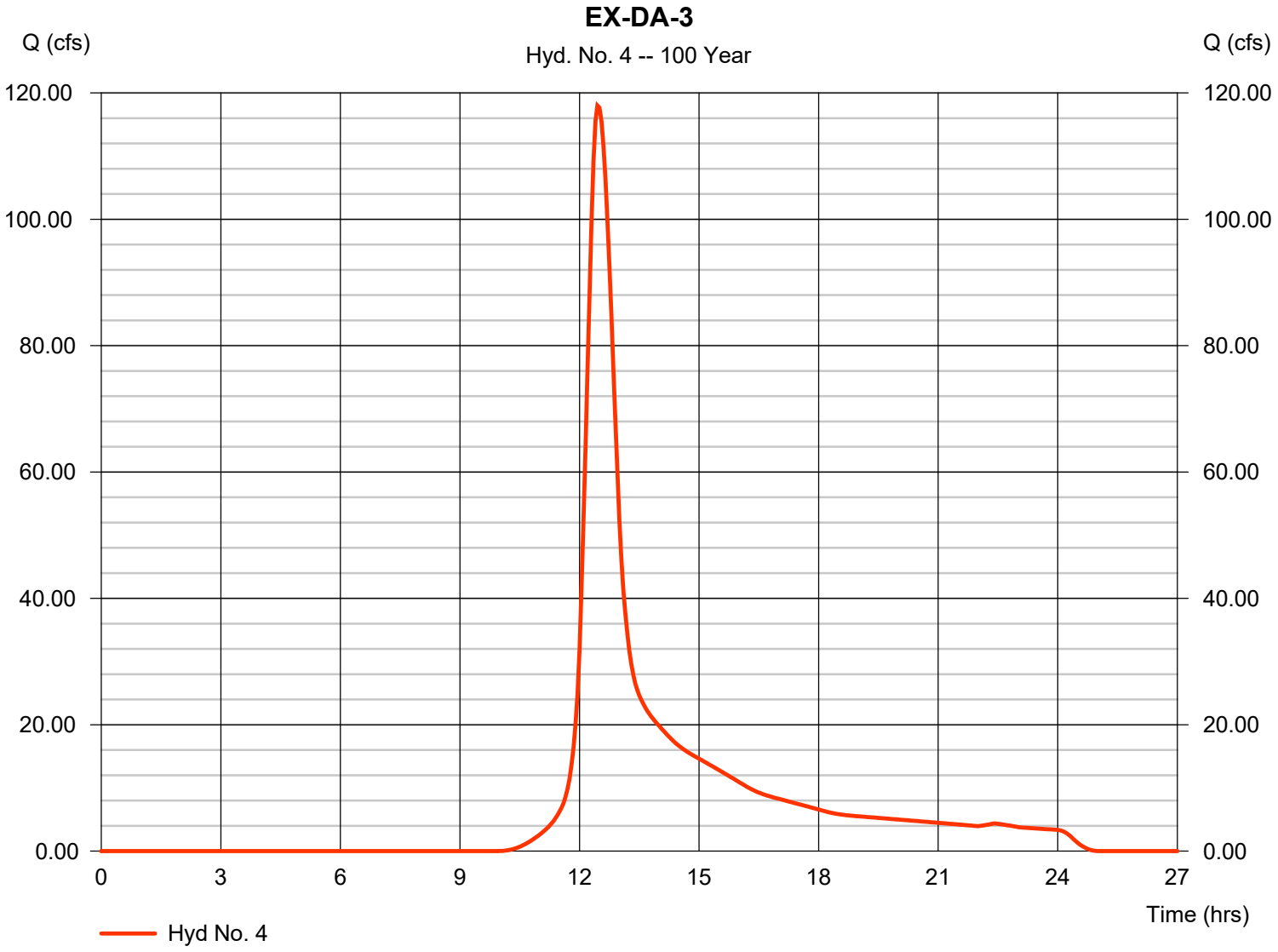
Hydrograph Report

Hyd. No. 4

EX-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	117.99 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.45 hrs
Time interval	=	3 min	Hyd. volume	=	721,955 cuft
Drainage area	=	50.910 ac	Curve number	=	52*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	38.30 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(30.546 x 61) + (20.364 x 39)] / 50.910

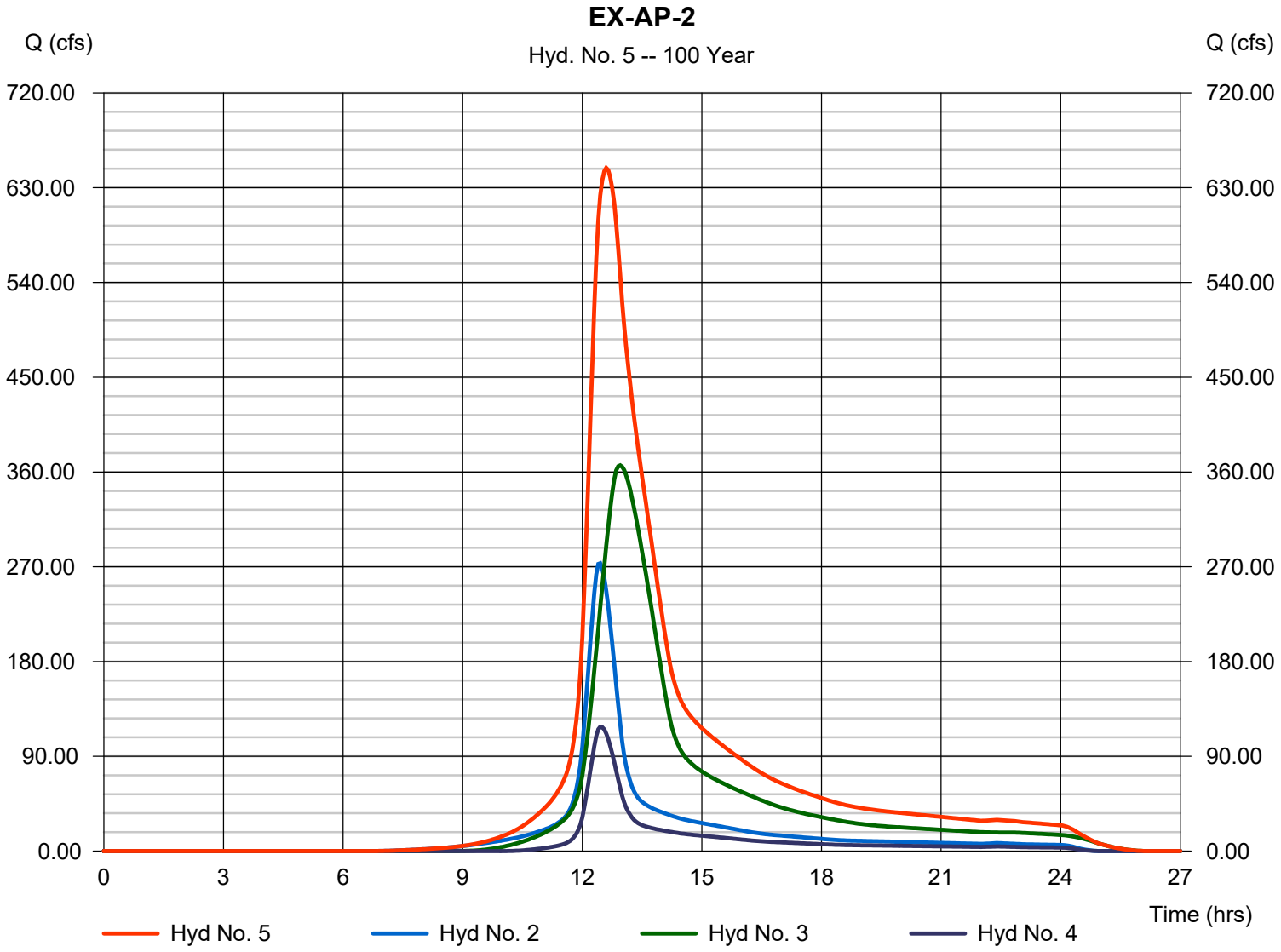


Hydrograph Report

Hyd. No. 5

EX-AP-2

Hydrograph type	=	Combine	Peak discharge	=	648.66 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.60 hrs
Time interval	=	3 min	Hyd. volume	=	5,805,873 cuft
Inflow hyds.	=	2, 3, 4	Contrib. drain. area	=	310.060 ac



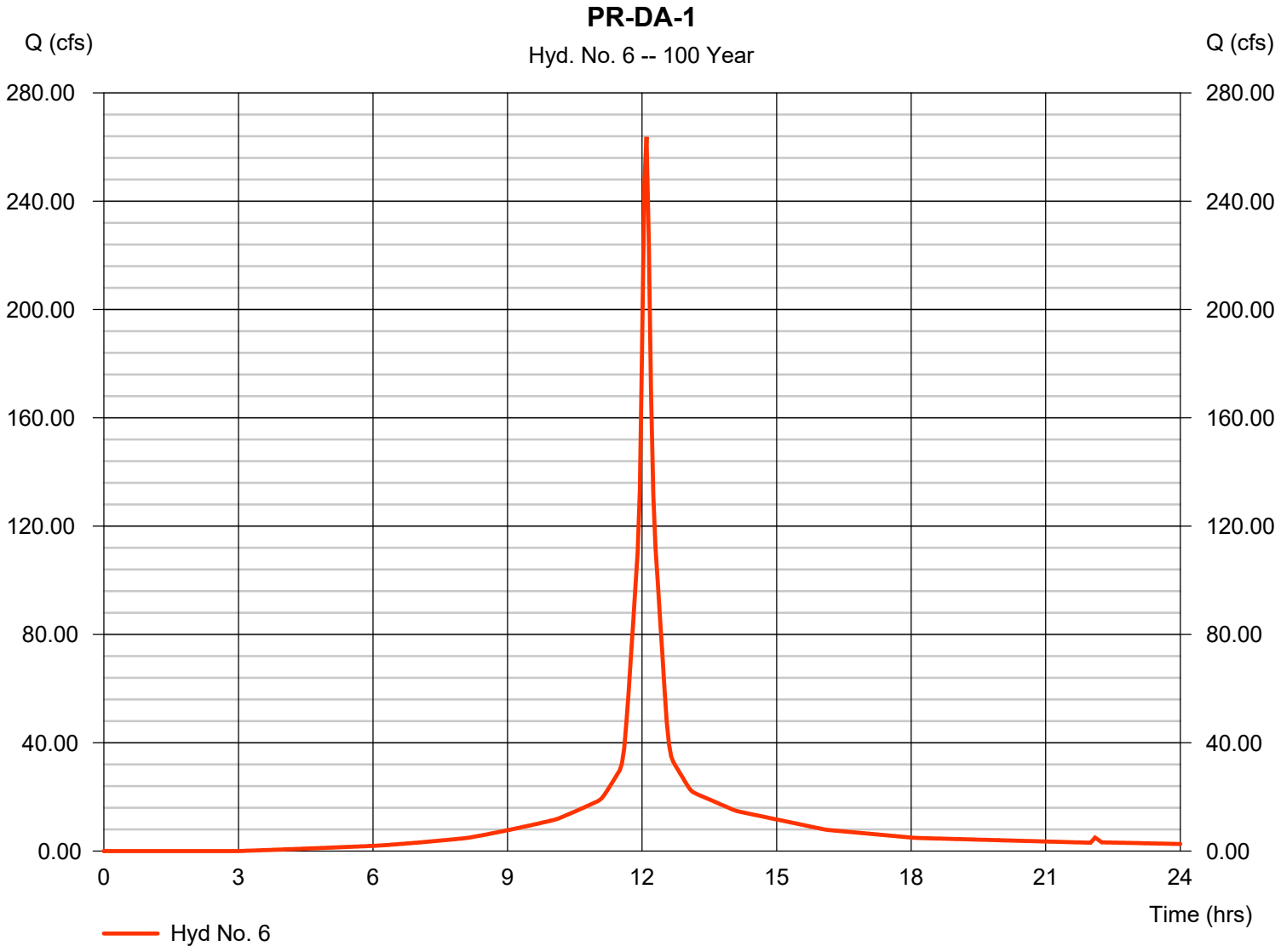
Hydrograph Report

Hyd. No. 6

PR-DA-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	263.76 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	941,240 cuft
Drainage area	=	32.150 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(22.300 x 98) + (9.560 x 61)] / 32.150



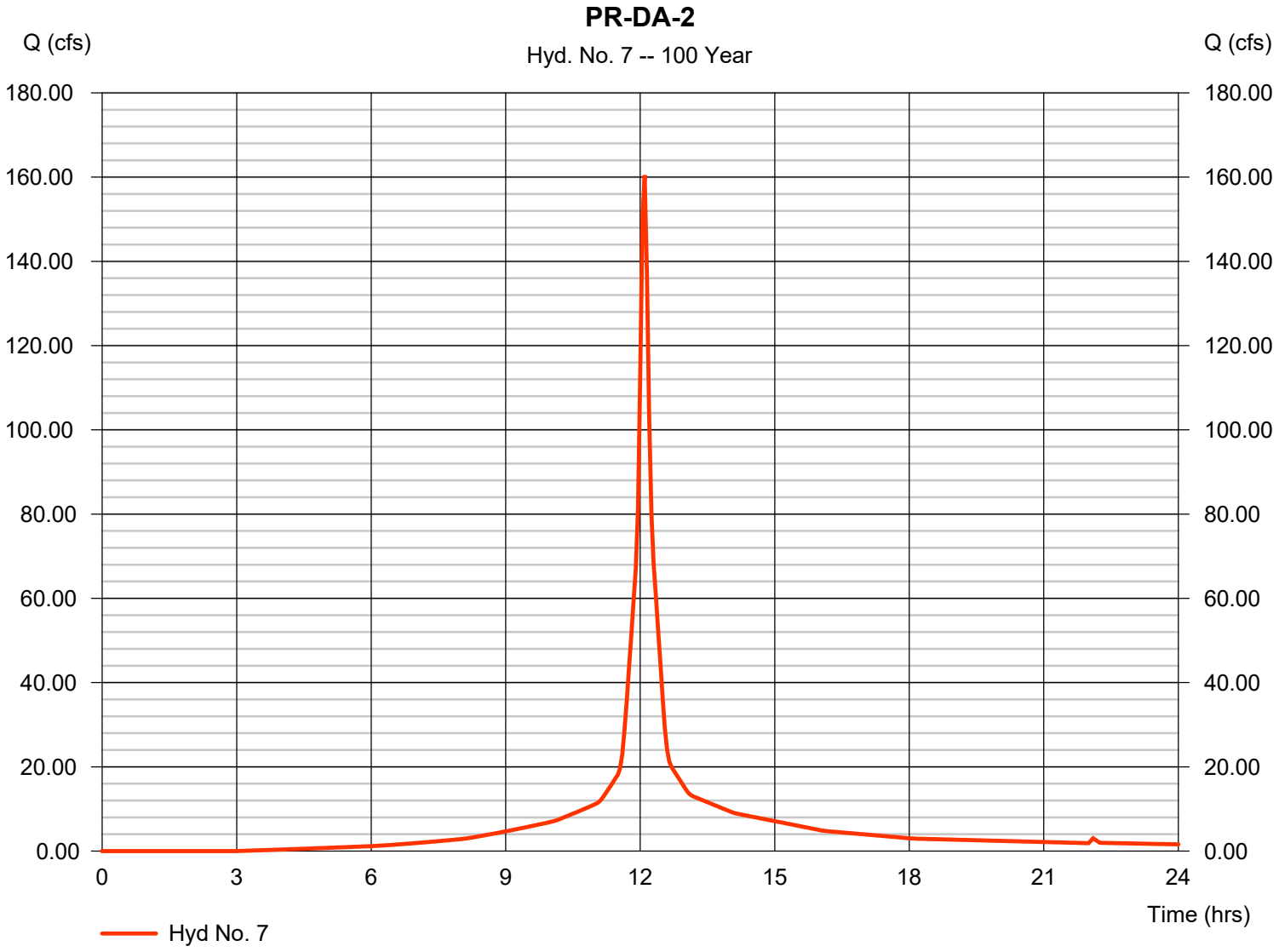
Hydrograph Report

Hyd. No. 7

PR-DA-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	160.47 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	572,648 cuft
Drainage area	=	19.560 ac	Curve number	=	87*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(13.580 x 98) + (5.820 x 61)] / 19.560

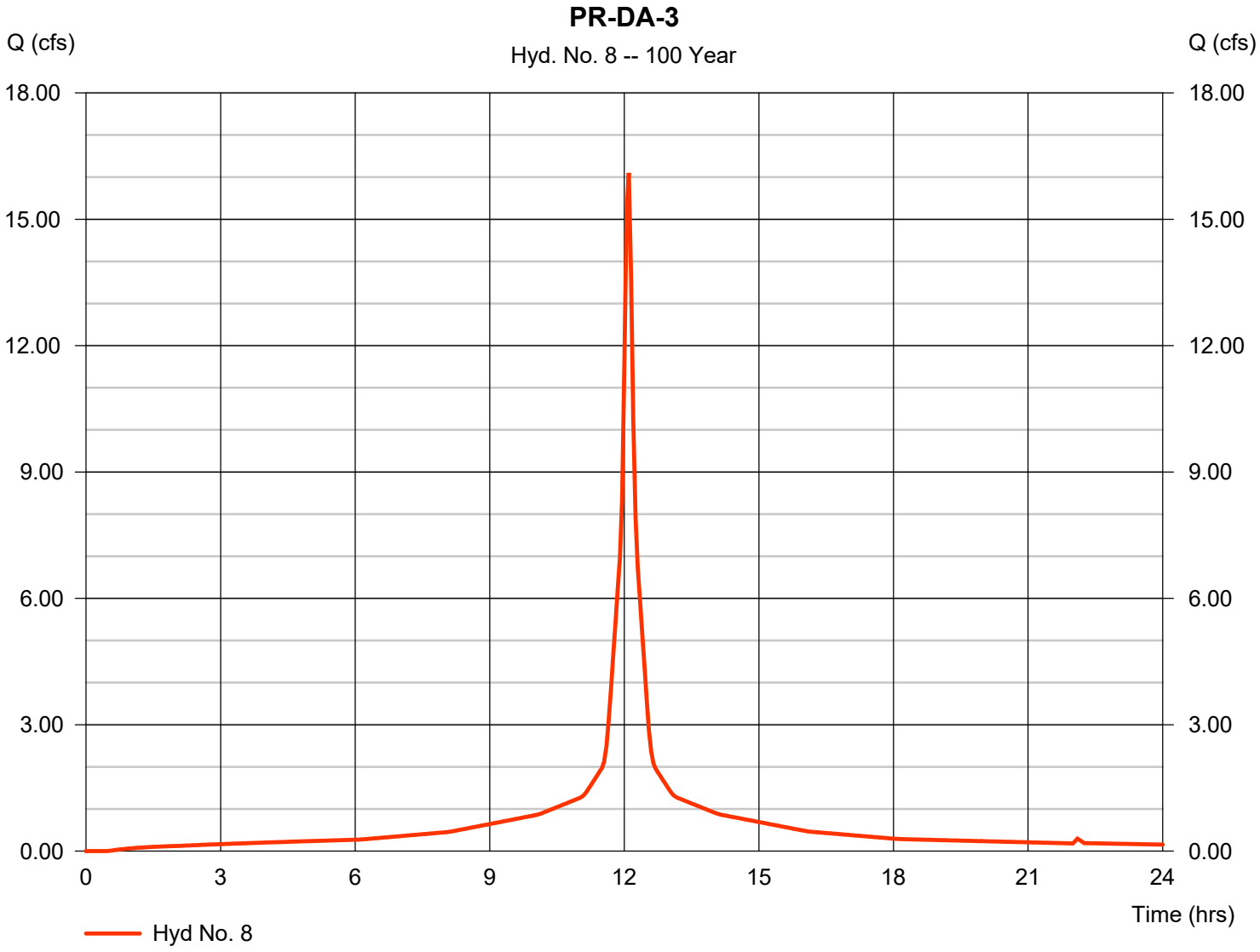


Hydrograph Report

Hyd. No. 8

PR-DA-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.10 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	62,904 cuft
Drainage area	=	1.856 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.80 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



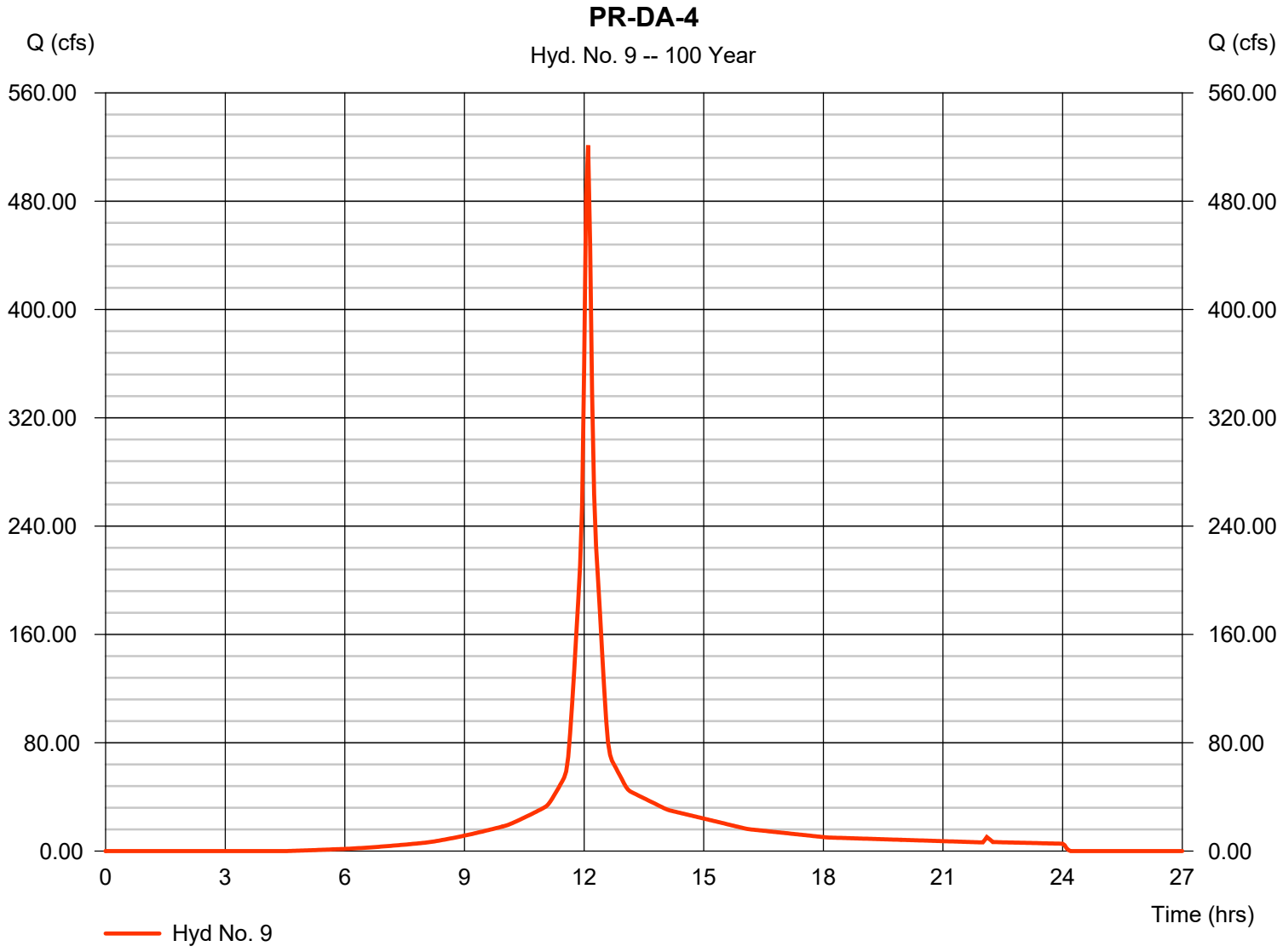
Hydrograph Report

Hyd. No. 9

PR-DA-4

Hydrograph type	=	SCS Runoff	Peak discharge	=	521.27 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	1,794,956 cuft
Drainage area	=	68.390 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.10 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(34.190 x 98) + (34.200 x 61)] / 68.390



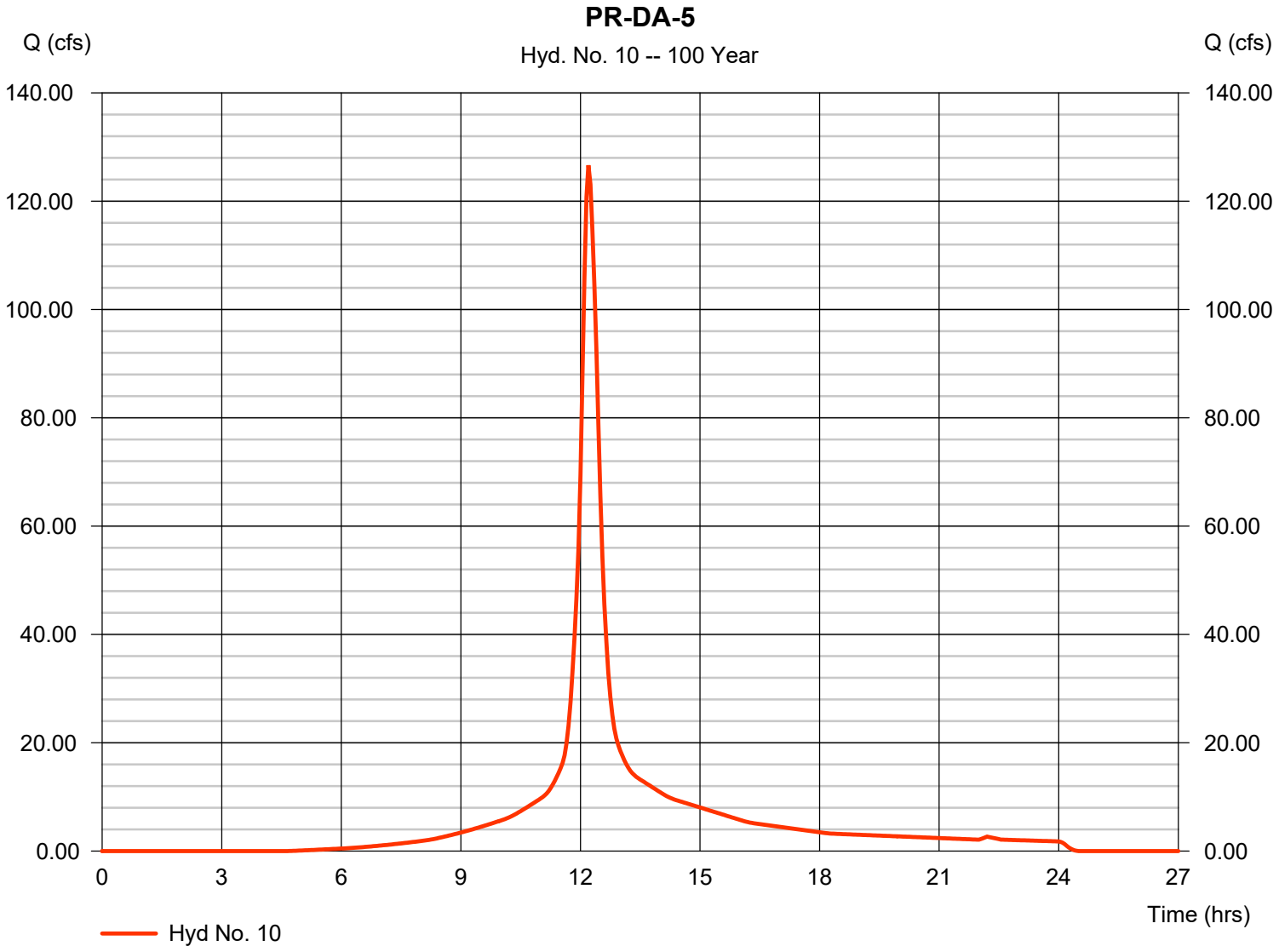
Hydrograph Report

Hyd. No. 10

PR-DA-5

Hydrograph type	=	SCS Runoff	Peak discharge	=	126.64 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	3 min	Hyd. volume	=	578,854 cuft
Drainage area	=	20.050 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.40 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(10.167 x 98) + (10.167 x 61)] / 20.050



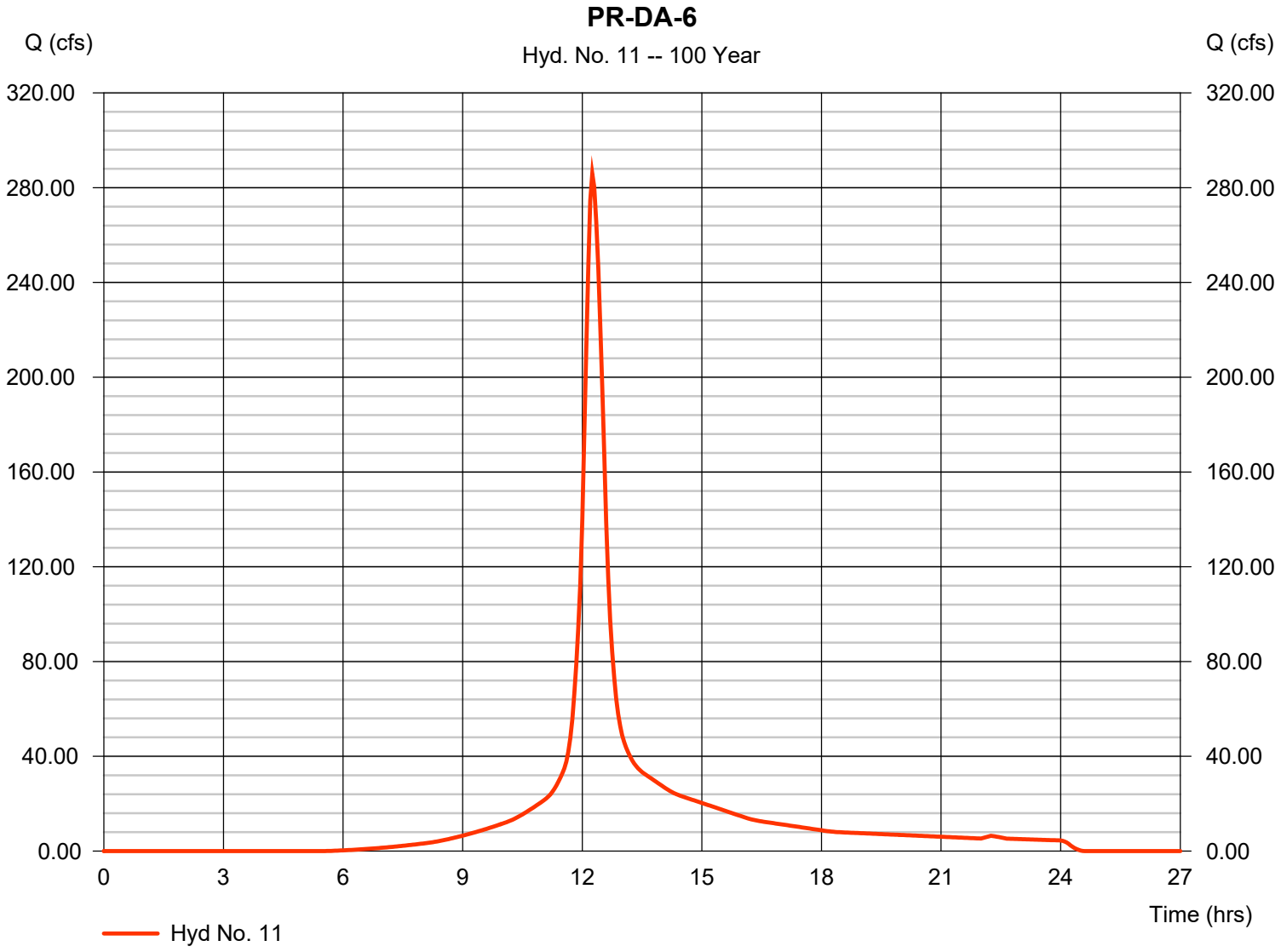
Hydrograph Report

Hyd. No. 11

PR-DA-6

Hydrograph type	=	SCS Runoff	Peak discharge	=	285.88 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.25 hrs
Time interval	=	3 min	Hyd. volume	=	1,379,011 cuft
Drainage area	=	54.160 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.60 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(19.630 x 61) + (7.450 x 39) + (27.080 x 98)] / 54.160



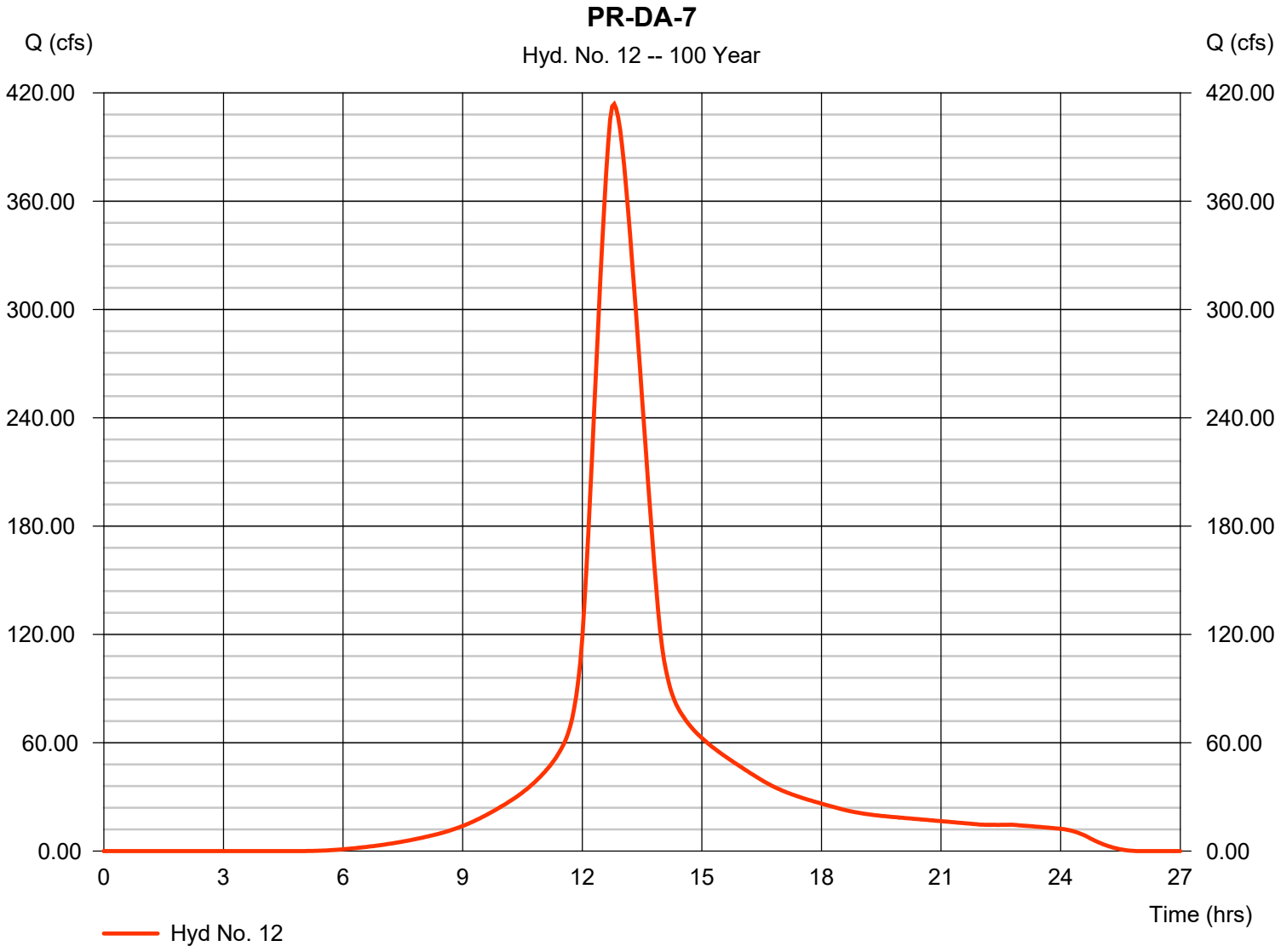
Hydrograph Report

Hyd. No. 12

PR-DA-7

Hydrograph type	=	SCS Runoff	Peak discharge	=	413.80 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.80 hrs
Time interval	=	3 min	Hyd. volume	=	3,637,777 cuft
Drainage area	=	132.150 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	71.80 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(66.080 x 98) + (66.070 x 61)] / 132.150

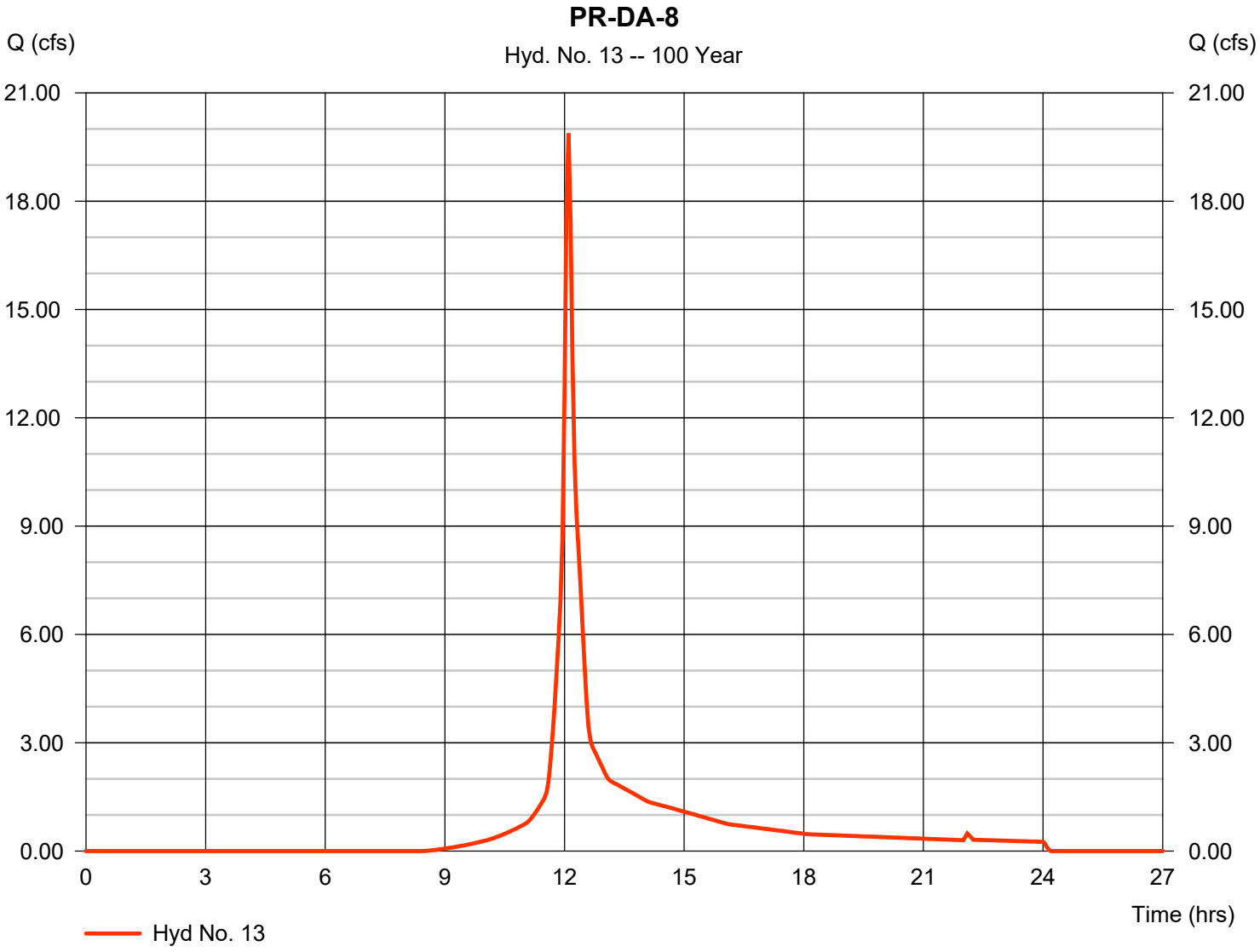


Hydrograph Report

Hyd. No. 13

PR-DA-8

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.88 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	66,145 cuft
Drainage area	=	3.740 ac	Curve number	=	61
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	4.90 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

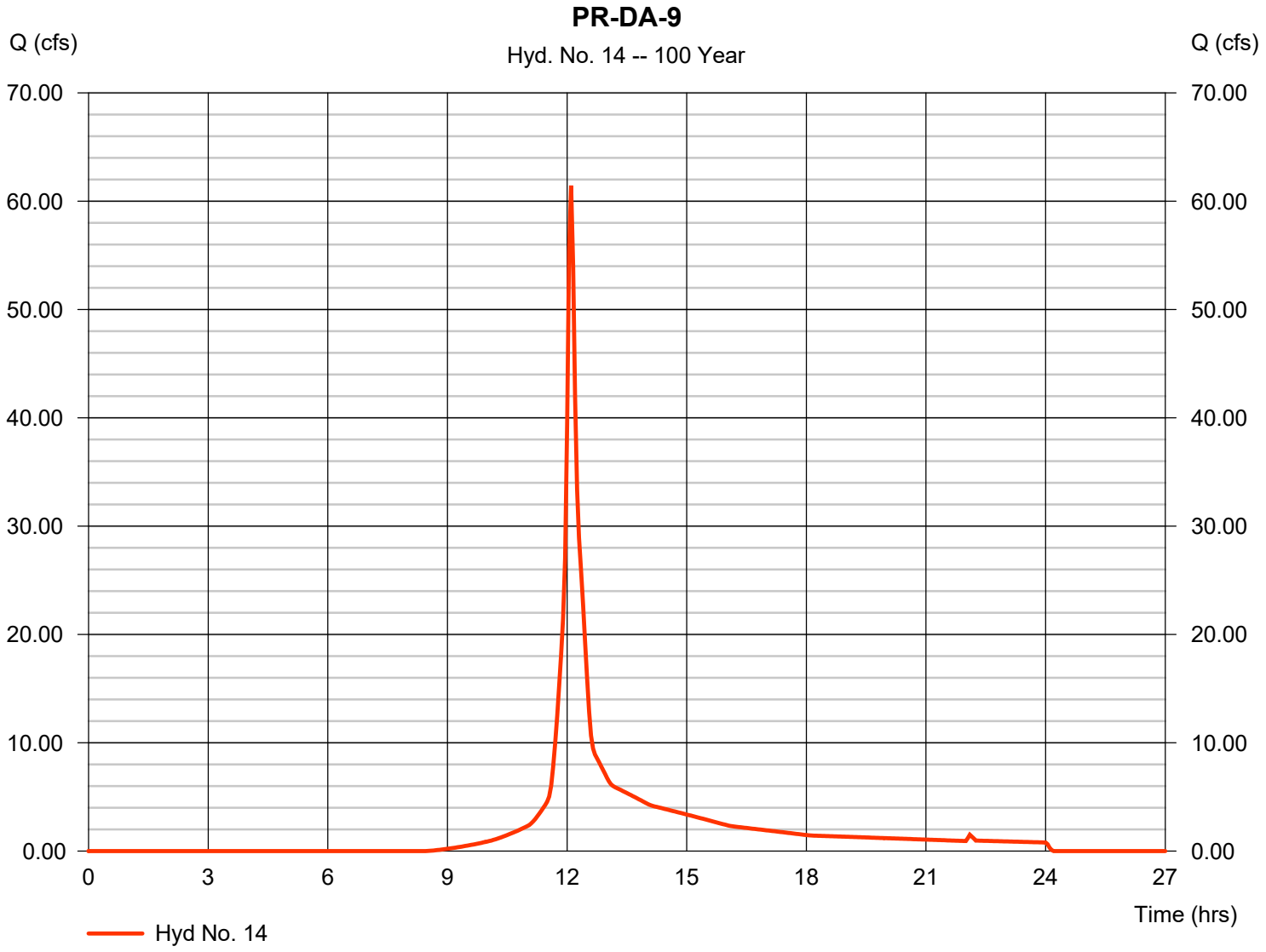


Hydrograph Report

Hyd. No. 14

PR-DA-9

Hydrograph type	=	SCS Runoff	Peak discharge	=	61.45 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	204,448 cuft
Drainage area	=	11.560 ac	Curve number	=	61
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.70 min
Total precip.	=	10.20 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

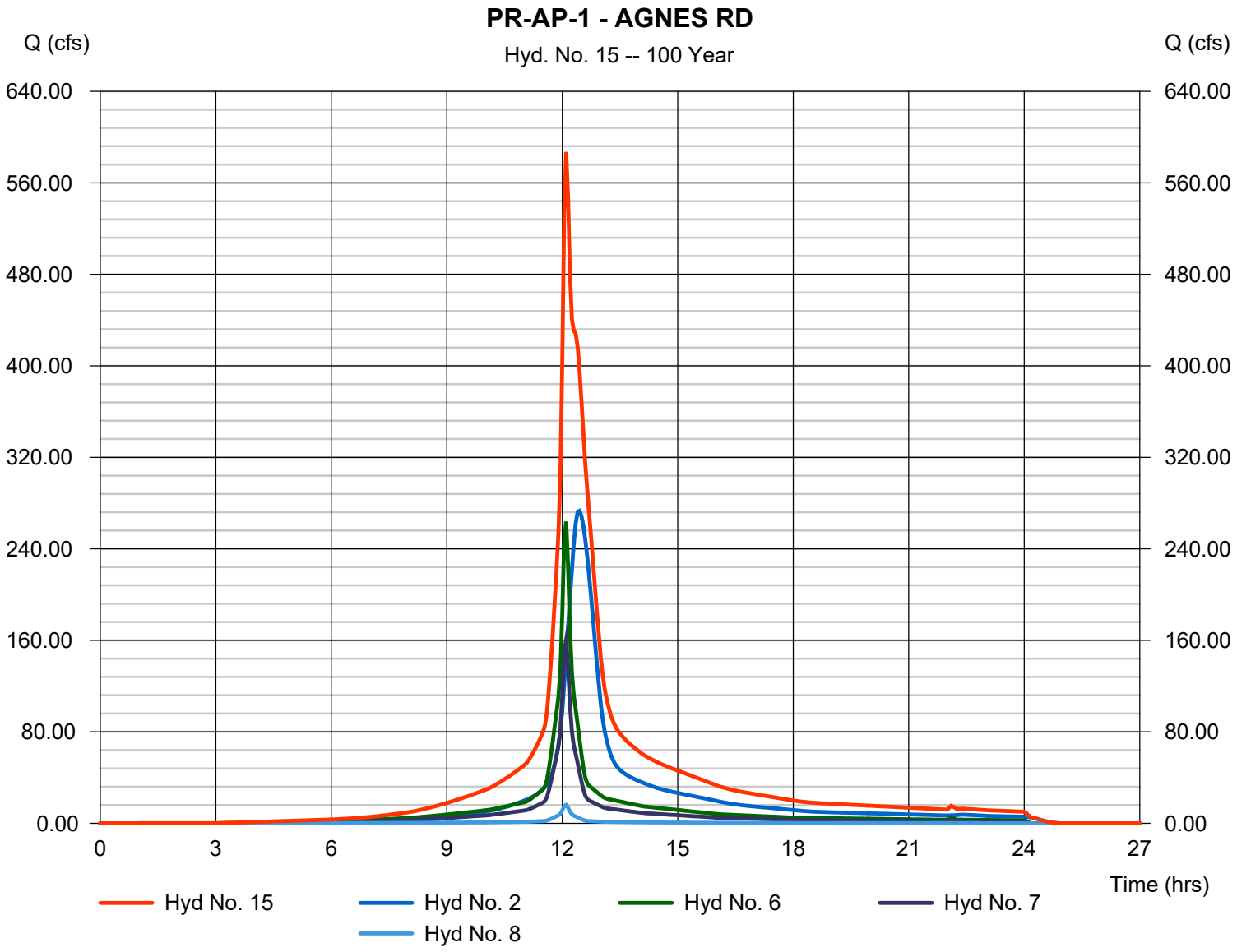


Hydrograph Report

Hyd. No. 15

PR-AP-1 - AGNES RD

Hydrograph type	= Combine	Peak discharge	= 587.02 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 3,208,240 cuft
Inflow hyds.	= 2, 6, 7, 8	Contrib. drain. area	= 123.406 ac

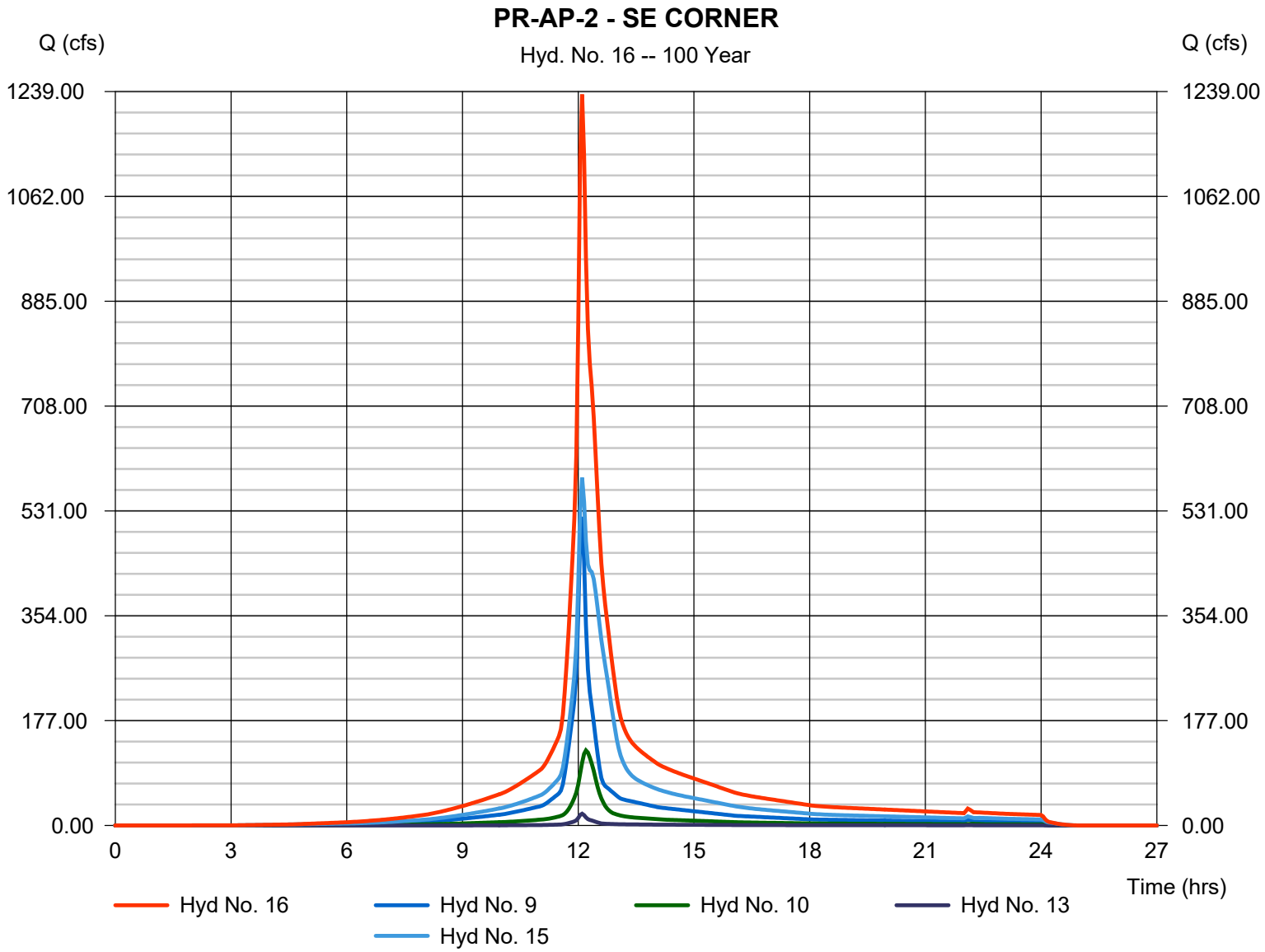


Hydrograph Report

Hyd. No. 16

PR-AP-2 - SE CORNER

Hydrograph type	= Combine	Peak discharge	= 1234.19 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 3 min	Hyd. volume	= 5,648,194 cuft
Inflow hyds.	= 9, 10, 13, 15	Contrib. drain. area	= 92.180 ac

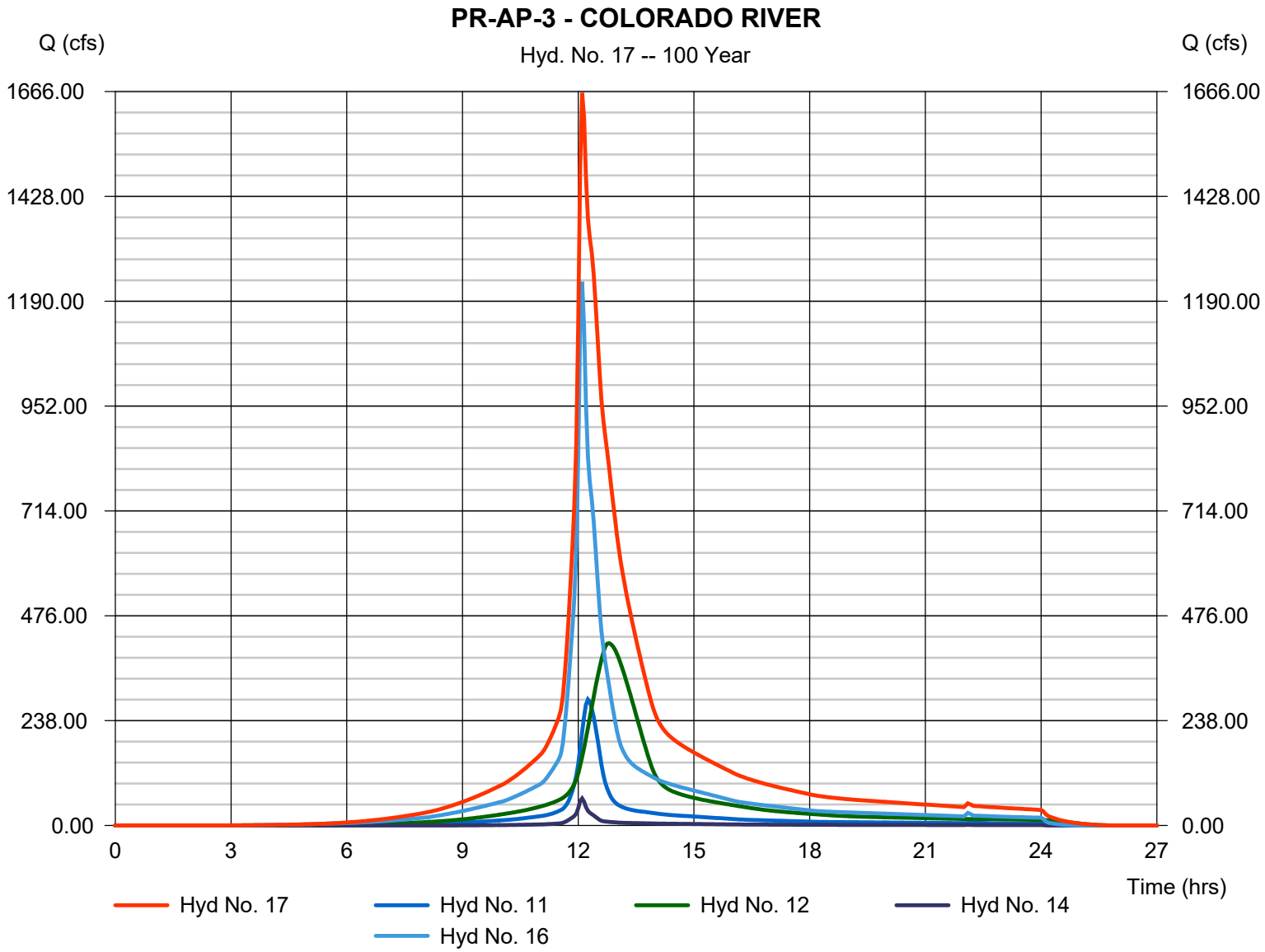


Hydrograph Report

Hyd. No. 17

PR-AP-3 - COLORADO RIVER

Hydrograph type	=	Combine	Peak discharge	=	1662.89 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	3 min	Hyd. volume	=	10,869,425 cuft
Inflow hyds.	=	11, 12, 14, 16	Contrib. drain. area	=	197.870 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	62.0000	8.4000	0.8020	--------
3	0.0000	0.0000	0.0000	--------
5	72.0000	8.4000	0.8000	--------
10	77.0000	8.4000	0.7650	--------
25	88.0000	8.4000	0.7620	--------
50	93.0000	8.4000	0.7480	--------
100	103.0000	8.2000	0.7470	--------

File name: COB IDF TABLE.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	7.73	6.00	4.95	4.23	3.72	3.32	3.01	2.76	2.55	2.38	2.22	2.09
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	9.03	7.01	5.78	4.95	4.35	3.89	3.53	3.23	2.99	2.78	2.60	2.45
10	10.57	8.30	6.90	5.95	5.26	4.73	4.30	3.96	3.67	3.43	3.22	3.04
25	12.18	9.57	7.96	6.87	6.07	5.46	4.97	4.58	4.25	3.97	3.73	3.52
50	13.35	10.53	8.80	7.61	6.74	6.07	5.54	5.11	4.75	4.44	4.17	3.94
100	14.99	11.79	9.84	8.50	7.53	6.78	6.18	5.70	5.29	4.95	4.65	4.40

Tc = time in minutes. Values may exceed 60.

Precip. file name: J:\AutoCad 2004 Land Projects\4697\Eng\Drainage\COB.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.60	0.00	5.10	6.20	7.70	0.00	10.20
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

F. Channel Design

DESIGN BACKGROUND

The proposed channel design is supported by the previously approved Pecan Park Drainage Study by Espey Consultants, Inc. (Appendix B) and Pecan Crossing Offsite Drainage Improvements Report by Cunningham Allen, Inc. (Appendix C).

The Pecan Park Drainage Study was provided by the City of Bastrop and demonstrates the benefits of direct outfall to the Colorado without detention for developments that are proximal to the river. Efficient conveyance of the site's storm runoff will ensure non-coinciding peaks with the Colorado River and will lessen the on-site flooding potential due to upstream developments. See Section G for a discussion of the flooding potential under tailwater conditions assuming coinciding and non-coinciding peaks.

The Pecan Crossing Offsite Drainage Improvements Report provides the basis for the 11.563-acre drainage easement (Volume 1819, Page 840, O.P.R.B.C.TX.) established across the Cantrell Property. The channel and culvert improvements proposed by Cunningham Allen, Inc., are designed to contain the 100-year storm runoff from upstream developments. This report therefore established a baseline design for the proposed channel developed by CBD.

CHANNEL GEOMETRY

The proposed 4,691-foot long earthen drainage ditch begins south of Agnes Road and is fed by a 12'x5' box culvert with an outfall flowline at 352.17' (designed by others). The channel is designed with a bottom width of 8' and 3:1 side slopes extending to meet existing grade at a slope of 0.30% along the flowline of the existing channel within the designated drainage easements where possible. Approaching the low water crossing, the bottom width expands to 20' and side slopes flatten to 6:1. After the low water crossing the bottom width tapers to 8' and side slopes steepen to 3:1. When the proposed channel bottom is graded at approximately 338', a low point in the existing channel, the proposed channel shifts to a slope of 0.89% and transitions to a bottom width of 24' until the apron of the upstream headwall. The aprons and culvert are designed at approximately 2.0% slope. The culvert discharges onto a concrete apron with dissipater blocks and into the channel bed that shall be graded at approximately 2:1 until it intersects with the existing channel bed. This existing channel outfalls at the Colorado River.

CHANNEL SURFACING

The selected erosion matting to be installed along the channel effectively protects against scour due to the channelization of upstream runoff, 100-year flooding of the Colorado River, and vehicle traffic along the low river crossing. Permissible flow velocities and corresponding channel surfaces are presented in Table F.1.

Table F.1 – Erosion Control Matting Selection

Channel Location	Maximum Channel Velocity (fps)	Erosion Control Matting	Design Permissible Velocity (fps)
12'x5' Box Culvert Outfall	11.53 (by others)	North American Green ShoreMax Transition Mat[1]	18.0 (unvegetated & vegetated)
Low Water Crossing	4.55	Flexamat Flexible Concrete Blocks Mat[2]	20.0
1 – 8'x10' & 2 – 6'x10' Box Culverts	13.81	North American Green ShoreMax Transition Mat[1]	18.0 (unvegetated & vegetated)
Channel (before proposed box culverts)	9.83	North American Green SC250 TRM[3]	9.5 (unvegetated) 15.0 (vegetated)

[1] North American Green RevetMax Specification Sheet – ShoreMax Transition Mat
[2] Flexamat, Tied Concrete Block Mats Specification Sheet
[3] North American Green RollMax Product Selection Chart – SC250

LOW WATER CROSSING

The 212' long by 10' wide low water crossing is designed to provide a stabilized vehicular access route for the property owners adjacent to the dedicated drainage easement during low water conditions. This crossing is created by flattening the proposed channel side slopes to a maximum of 6:1, expanding the channel bottom to 20', and installing the Flexamat flexible concrete blocks mat. The Flexamat will be installed along the alignment of the existing low water crossing and shall intersect with existing ranch roads on either side of the dedicated drainage easement. The Flexamat will be installed from elevation 348.7' to 349.7' to protect against scour during the maximum potential flooding event while remaining within the dedicated drainage easement.

CULVERT

The existing drainage channel discharging the site's runoff into the Colorado River is regulated by a 4'x4' box culvert followed by a 10'x20' flood control structure on the downstream side of the dirt driveway. Survey data suggest that the flood control structure is broken and/or buried, and the upstream dirt road has experienced scour. CBD proposes to replace these structures with the intent of providing efficient drainage of runoff from proposed upstream developments into the Colorado River while mimicking existing channel hydrology. For this reason, a structure, containing one 8'x10' and two 6'x10' box culverts, is proposed along the alignment and within the footprint of the existing structures. The culvert outfalls to the existing channel bed as soon as possible while providing sufficient space for the proposed 14' concrete driveway and culvert wingwalls.

The culvert design is intended to minimize disturbance of existing ground cover within and around the channel.

The proposed culvert was designed to provide sufficient conveyance of design storms. A comparison of existing and proposed flows modeled at the culvert location can be found in Table F.1 below.

Table F.1 – Existing vs. Proposed Flows Discharging into Colorado River

	Flow (cfs)	
Storm Frequencies	**EX-AP-2**	**PR-AP-3**
25-year	395.87	1,115.75
100-year	648.66	1,662.89

Source: Hydraflow Report (Section E)

Hydraulic analyses, included in Section G, confirm that the culvert has sufficient capacity to convey runoff without causing flooding at Agnes Road. The minimum surface elevation of Agnes Road is estimated at 359.50'. Regardless of tailwater conditions utilized (see Section G), the realized water surface elevation within the proposed channel at Agnes Road is modeled at 356.87' for 100-year storm. Sufficient freeboard is thus provided to protect against flooding at Agnes Road.

DRIVEWAY

The proposed 258' long by 14' wide concrete driveway provides a vehicular access route across the proposed box culverts for the property owners adjacent to the dedicated drainage easement during flood events. To prevent against scour such as the existing dirt driveway experienced, the crest of the proposed driveway is designed at 1' above the existing 100-year base flood elevation as per FEMA Flood Map (see Part III). The beginning and end sections of the proposed driveway lower to meet existing grade while remaining within the dedicated drainage easement. The minimum driveway elevation is subject to approximately flooding due to the rise of the Colorado River during the 100-year storm; however, flooding with an anticipated tailwater (see Section G) due to the site's 100-year storm event is not expected to overtop the minimum surface elevation of the proposed driveway at 347.74'.

G. Hydraulic Analysis

METHODOLOGY & INPUT VARIABLES

The capacity and the proposed channel was evaluated using the Autodesk River and Flood Analysis Module and HEC-RAS. The proposed channel was modeled with 39 river stations between Agnes Road and the Colorado River, as shown on the cross-section map. Section lengths were generally extended beyond the dedicated drainage easements to evaluate the full extents of potential flooding. Overbank stations were selected at the boundary of proposed channel grading. The Manning's n-values in Table G.1 were selected as per the ranges provided in the HEC-RAS Reference Manual, version 5.0.

Table G.1 - Manning's N-Values

Surface Description	N
Main channel – clean straight, full, no rifts or deep pools	0.026
Floodplain – pasture, no brush, short grass	0.035
Lined channel – concrete, trowel finish	0.011

Source: HEC-RAS Reference Manual, version 5.0.

Flow inputs varied along the length of the proposed channel as per the proposed hydrology described by the Hydraflow report in Section E. The flow inputs utilized for the HEC-RAS model are found in Table G.2.

Table G.2 – HEC-RAS Flow Inputs at River Stations

	Flow (cfs)		
Storm Frequency	**Stations 1 to 28**	**Stations 23 to 30**	**Stations 31 to 39**
25-Year	414.96	868.31	1,151.75
100-Year	587.02	1,234.19	1,662.89

The 25-year and 100-year flows through the channel were evaluated under three different tailwater conditions as shown in Table G.3.

Table G.3 – Tailwater Conditions

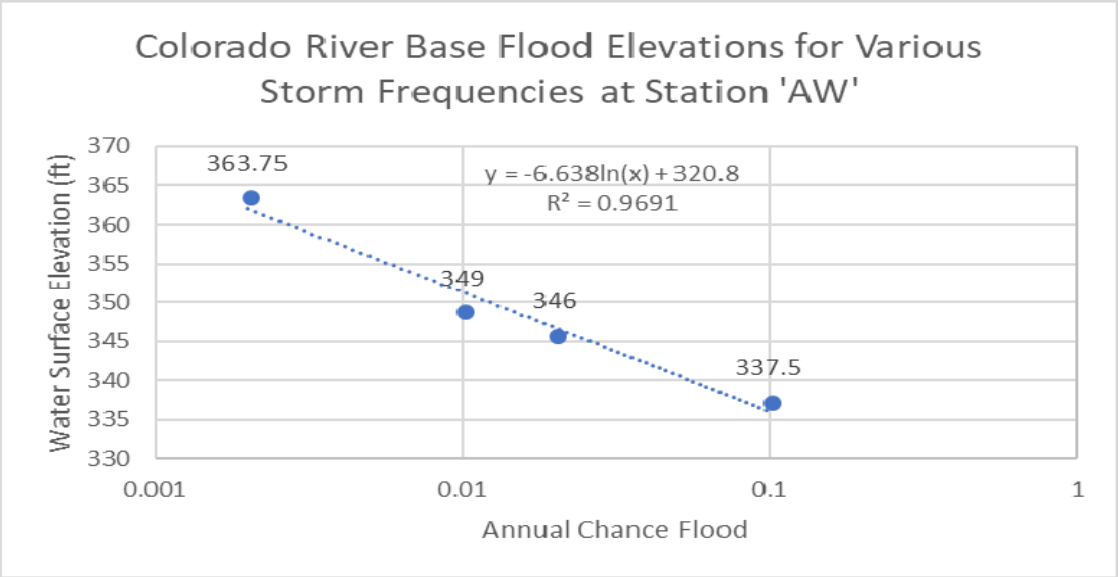
Storm Frequency	Maximum Potential Tailwater Assuming Coinciding Peaks	Anticipated Tailwater Assuming Non-Coinciding Peaks	Tailwater Assuming Gravity Outfall
25-Year	342.17'	331.96'	0'
100-Year	349.00'	338.59'	0'

The 25-year and 100-year flows through the channel were evaluated under three different tailwater conditions as shown in Table G.3. Water surface elevation data and time to peak of the Colorado River are based on FEMA Flood Insurance Map & Study (Appendix A) and the Pecan Park Drainage Study (Appendix B), which utilizes the United States Geological Survey gage 08159200 located at State Highway 71 approximately two miles

upstream of the proposed channel's outfall. Tailwater justifications and assumptions are provided below.

Maximum Potential Tailwater Assuming Coinciding Peaks

The existing 100-year base flood elevation is at 349.00' MSL (see Appendix A). The Colorado River's peak 25-yr water surface elevation is estimated at 342.17'. This water surface elevation was extrapolated from a logarithmic trend of base flood elevations for various annual chance floods in the graph below, which uses data from the FEMA Flood Insurance Study at Station 'AW'.



Data Source: FEMA Flood Insurance Study 48021CV000B (Appendix A)

Time to peak for the Colorado River is approximated at 31:45 hours for the 100-year event (see Appendix B), whereas the proposed channel's time to peak is modeled at approximately 12:06 hours (see Hydraflow report in Section E). These peaks are non-coinciding and therefore these water surface elevations overestimate expected flooding for the 100-year and 25-year events.

The maximum potential tailwater assuming coinciding peaks was used to design the extents of the proposed erosion control measures to ensure stability of the proposed channel during worst possible conditions of the 100-year storm event. As shown in the HEC-RAS report, under this tailwater condition, the proposed culvert and low points along the proposed concrete driveway are inundated only during the 100-year storm.

Anticipated Tailwater Assuming Non-Coinciding Peaks

As mentioned above, the Colorado River and proposed channel's peaks are non-coinciding; therefore, an estimated reduction of 10.41' is expected to be realized in actual water surface elevation at 12:06 hours. The 100-year water surface elevation is estimated

at 338.59’. This reduced water surface elevation is based on graphical interpolations of Figures 1 and 2 in Appendix B. The anticipated 25-year water surface elevation of the Colorado River realized at 12:06 hours at the proposed channel’s outfall is estimated at 331.96’. This was calculated using a proportional reduction equivalent to the change in 100-year water surface elevations realized at a time to peak of 31:45 hours as compared to 12:06 hours, as shown below:

342.17’ / 349.00’ = x / 338.59’

The anticipated tailwater assuming non-coinciding peaks was used to evaluate the capacity of the channel and realistic site flooding. As shown in the HEC-RAS section drawings and profile tables, under this tailwater condition, the proposed culvert and concrete driveway are not inundated during for the 25-year or 100-year storms.

Tailwater Assuming Gravity Outfall

Gravity outfall calculations provide maximum velocities which are used for the appropriate material selection of erosion control matting downstream of the proposed culvert and across the low water crossing. Flow characteristics of this tailwater condition are the same as those using the anticipated tailwater assuming non-coinciding peaks at every station upstream of Station 5.

CROSS-SECTION MAP & GEOMETRIES

PROPOSED BOX CULVERTS
1–8'X10'
2–6'X10'

PROPOSED 14' WIDE CONCRETE DRIVEWAY

10' WIDE LOW WATER CROSSING

11.563 ACRE
DRAINAGE EASEMENT
VOLUME 1819, PAGE 840

PROPOSED CHANNEL CENTERLINE

3.653 ACRE
DRAINAGE EASEMENT
DEDICATED BY PROPERTY OWNER

12'x5' BOX CULVERT, HEADWALL, & PARALLEL WINGWALLS TO BE INSTALLED BY OTHERS

STATE HWY 304
ROW VARIES

PROPOSED PUE

Remaining 93.013 Acres
BASTROP GROVE
LTD., VOL. 1699, Pg. 245,
OPRBCT

(Centerline of 100' Wide Electric Easement, Vol. C, Pg. 417 Deed Records Bastrop County)

100' HARA ELECTRIC TRANSMISSION EASEMENT VOLUME C, PAGE 417 COUNTY DEED RECORDS

6" ELECTRIC FACILITIES EASEMENT VOLUME 1749, PAGE 604 OPRBCT

6" ELECTRIC FACILITIES EASEMENT VOLUME 1749, PAGE 612

25' TEMPORARY CONSTRUCTION AND PERMANENT PUBLIC DRAINAGE EASEMENT VOLUME 1381, PAGE 449

20' WIDE ROADWAY EASEMENT VOLUME 1381, PAGE 440

FM 20 (BUSINESS HWY 71)

C-1

0 200' 400'

SCALE: 1" = 200'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- 350 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- 350 PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- (#) CHANNEL CROSS-SECTION

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

DESIGNED BY:	DRAFTED BY:
BM	JW

REVISION	DATE

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

CHANNEL CROSS-SECTION MAP

SHEET NAME:

BASTROP GROVE

JOB NAME:

DRAINAGE IMPROVEMENTS

PROJECT:

DATE
APRIL 2018

JOB NUMBER
4697

SHEET
MAP

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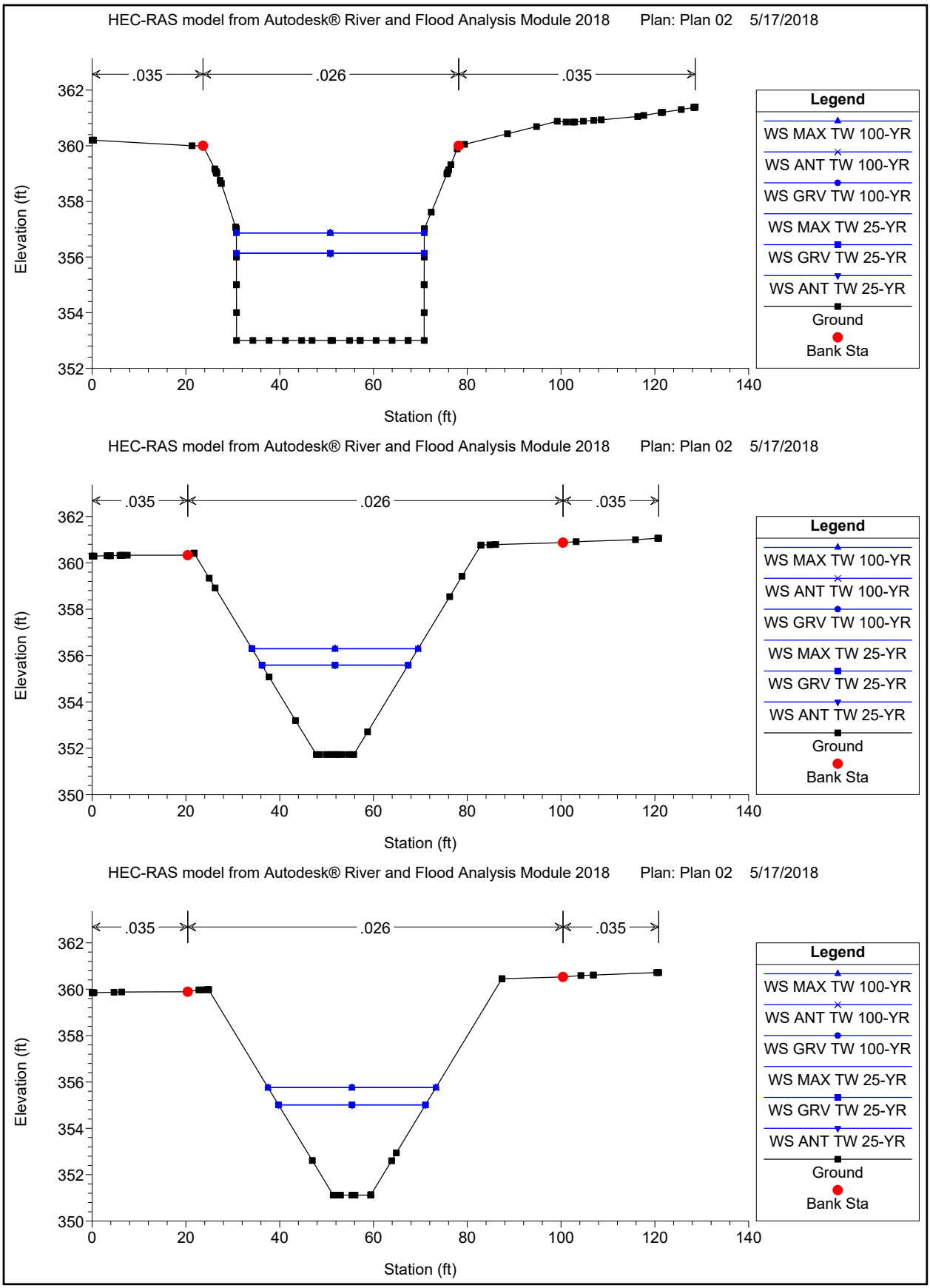
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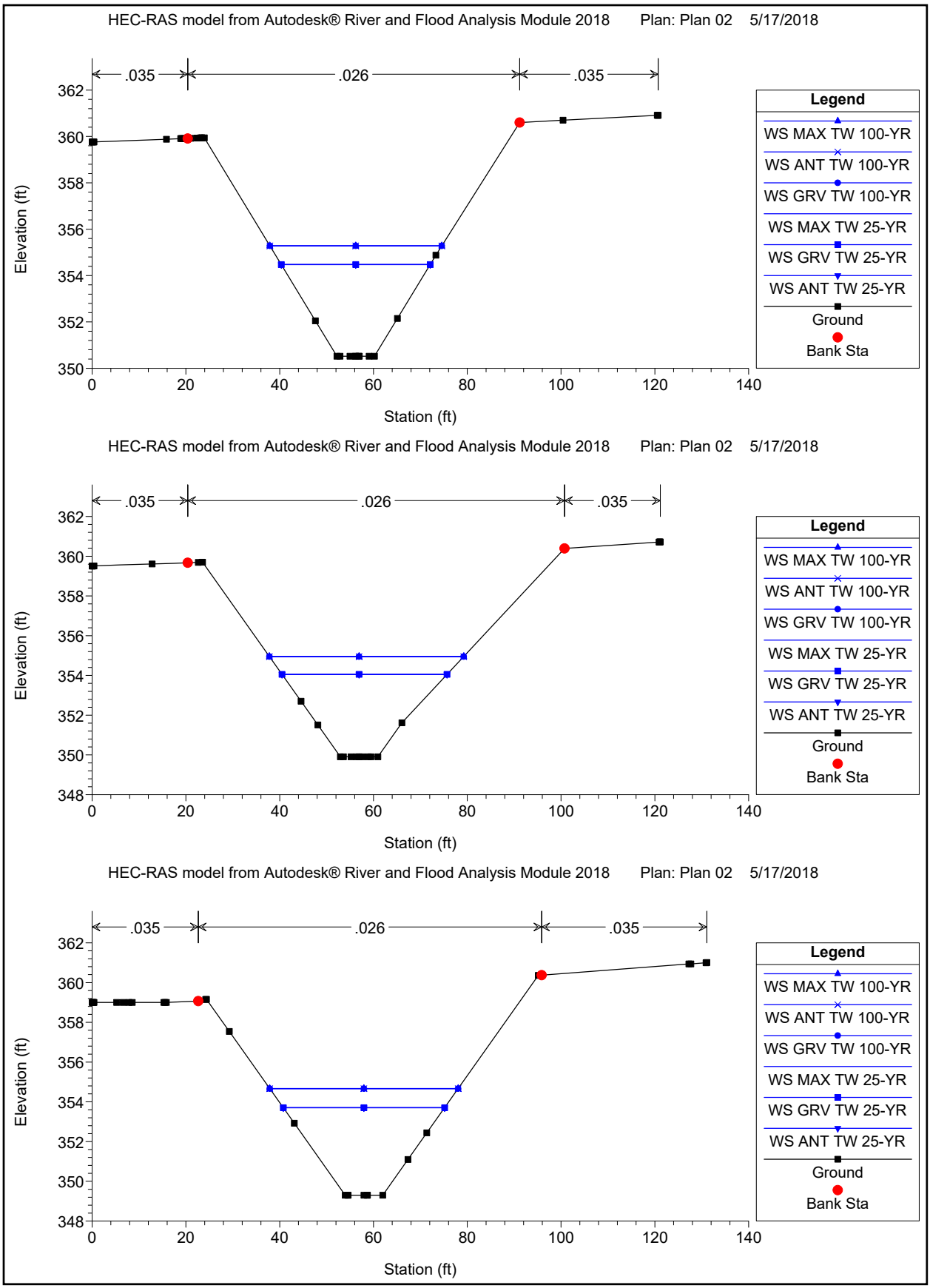
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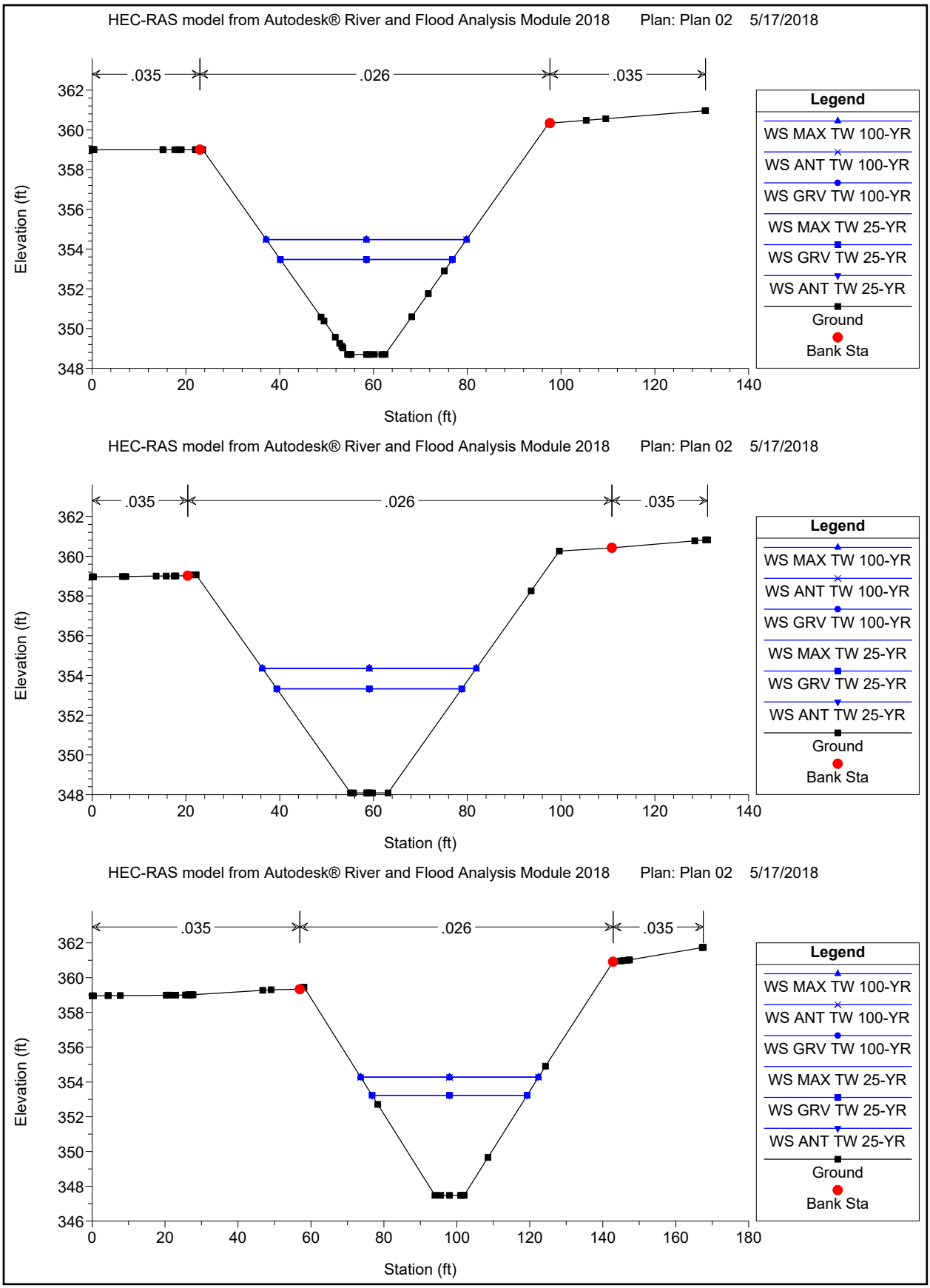
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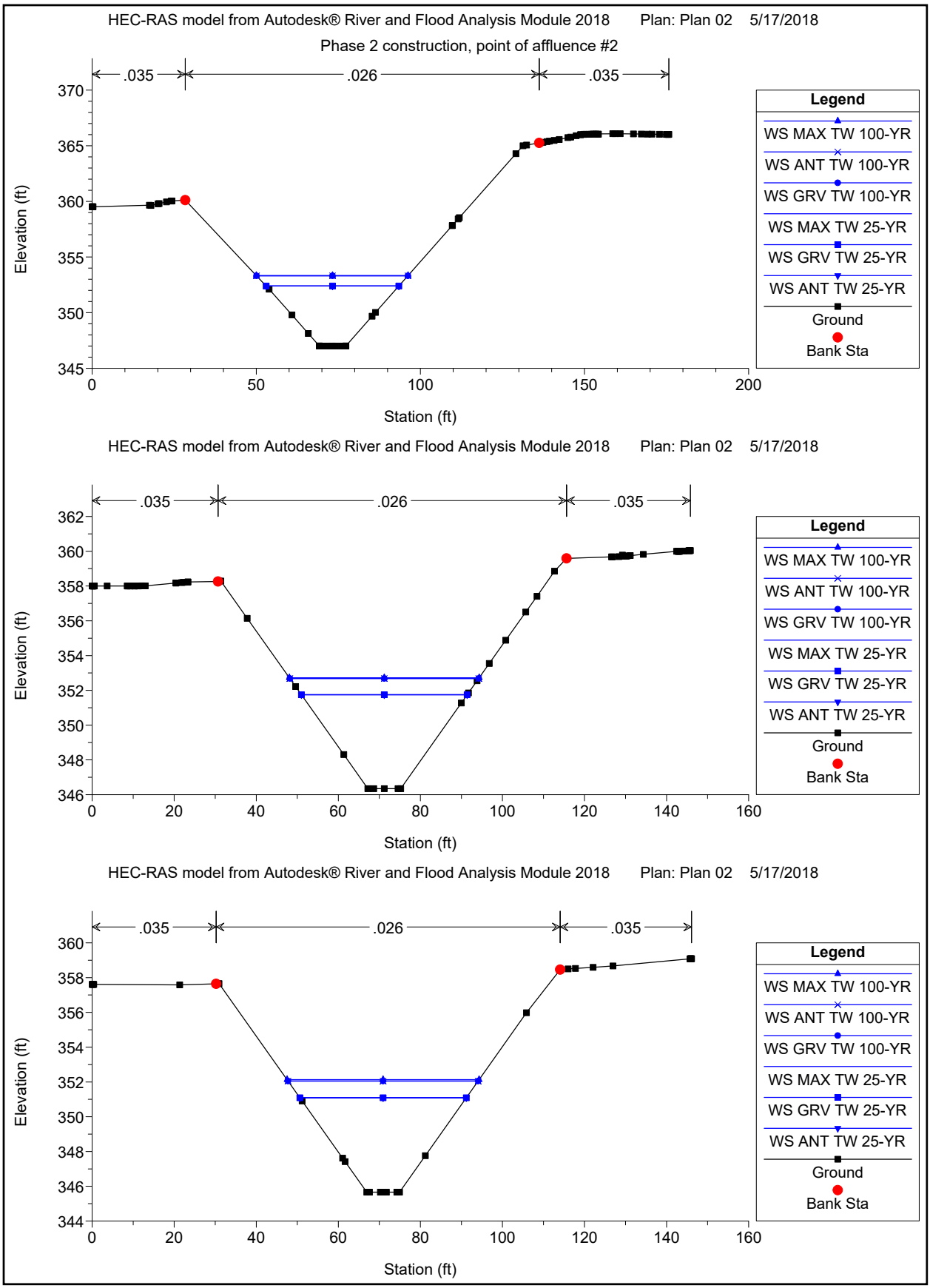
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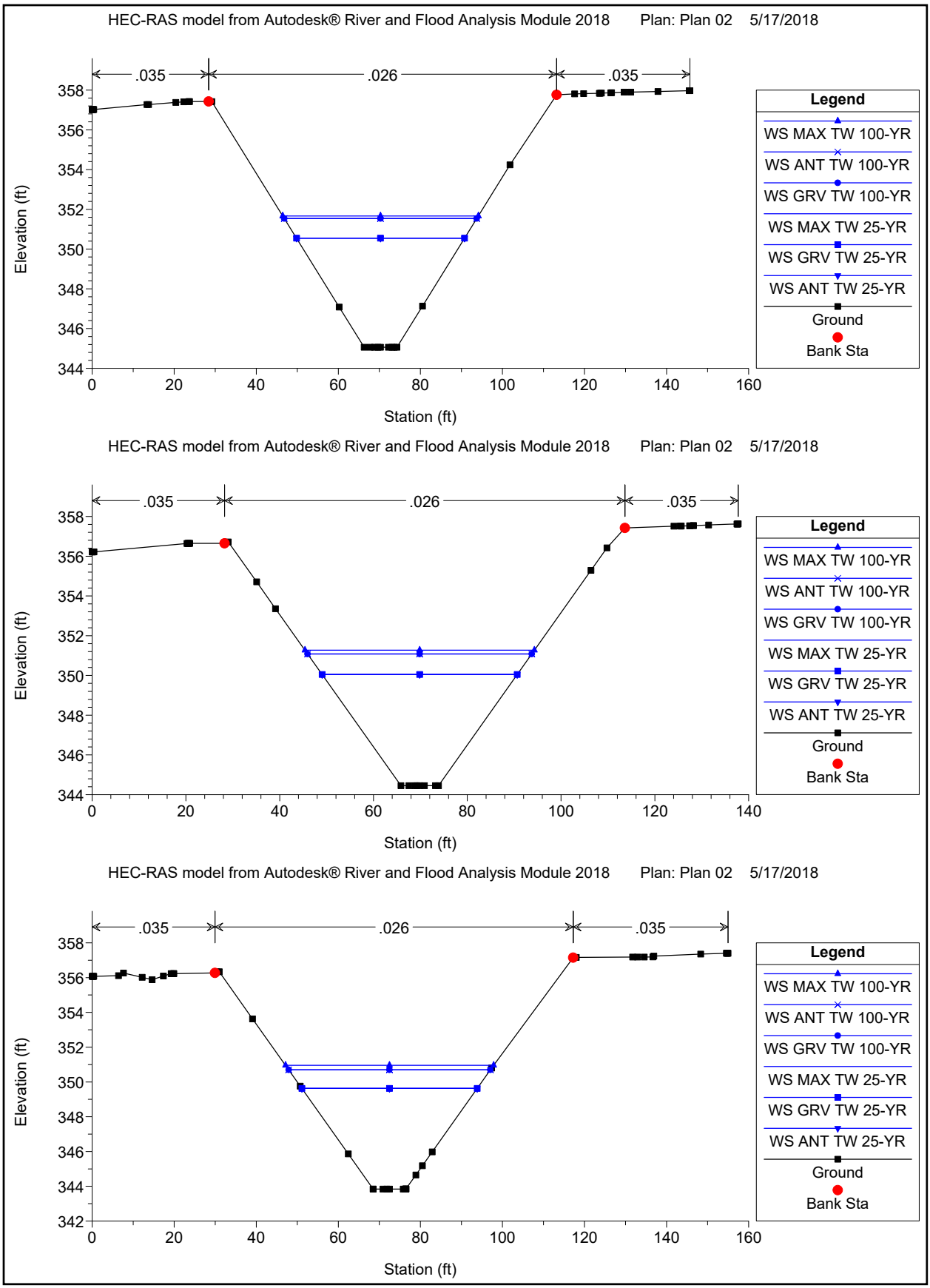
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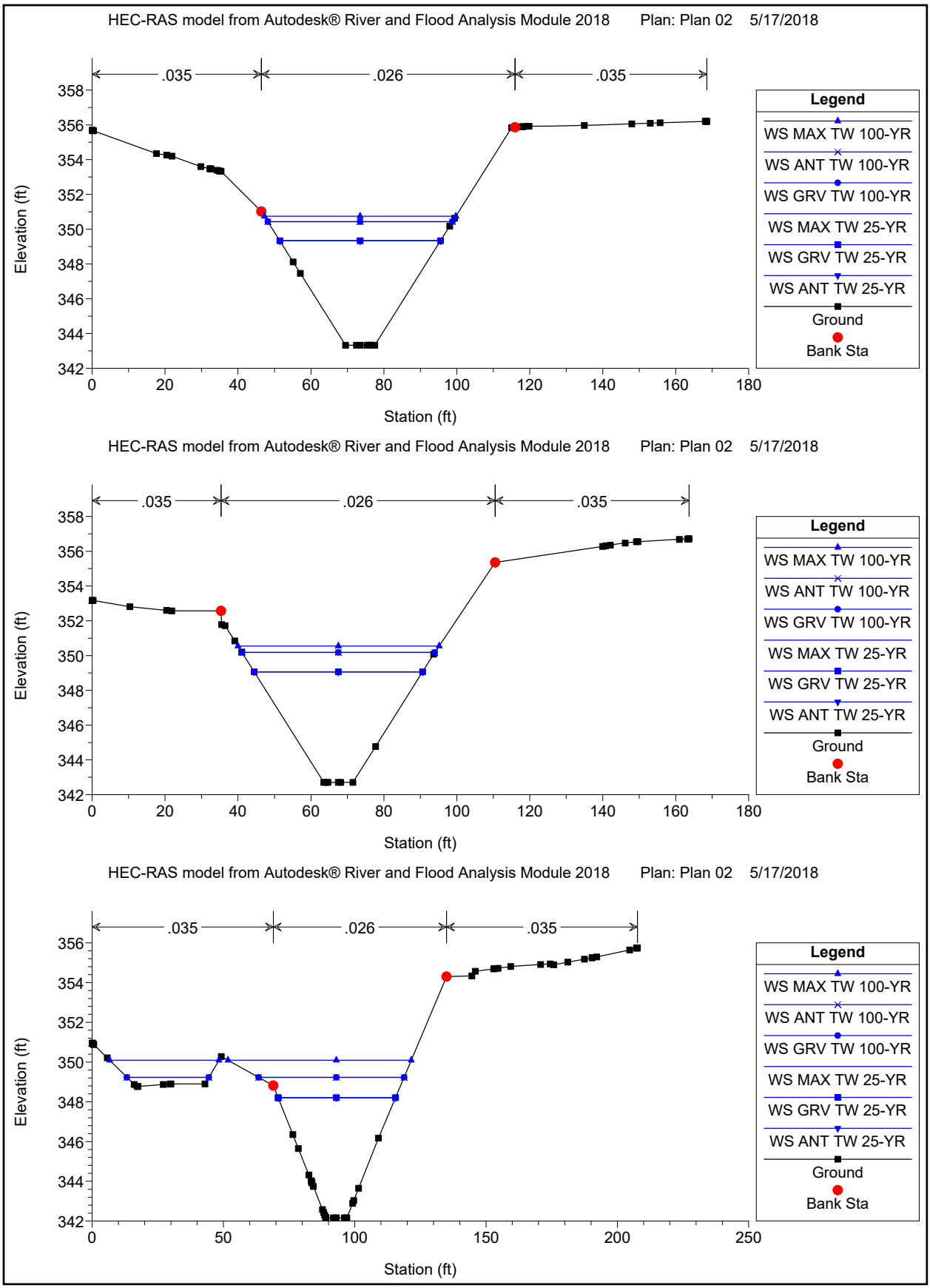
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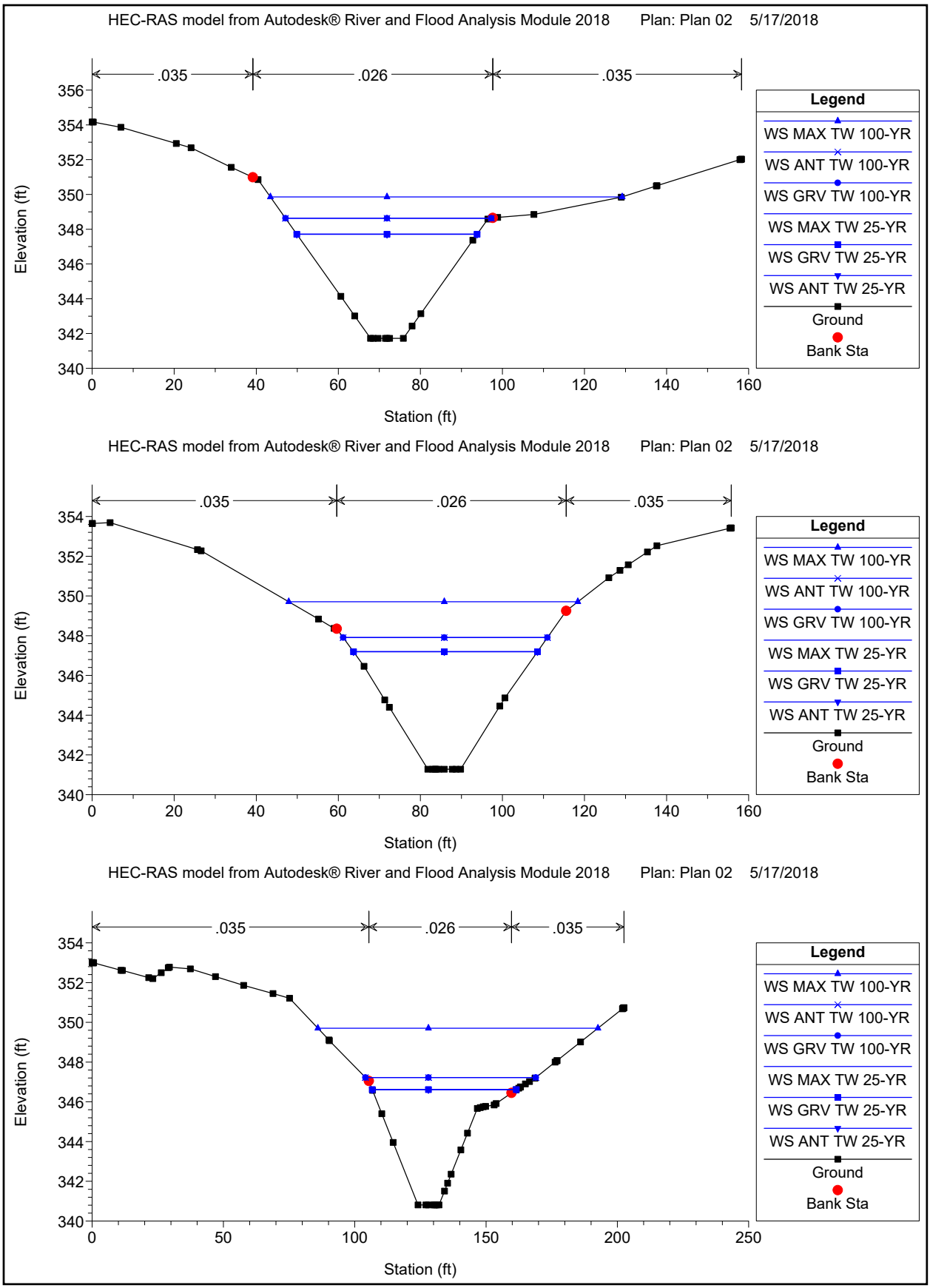
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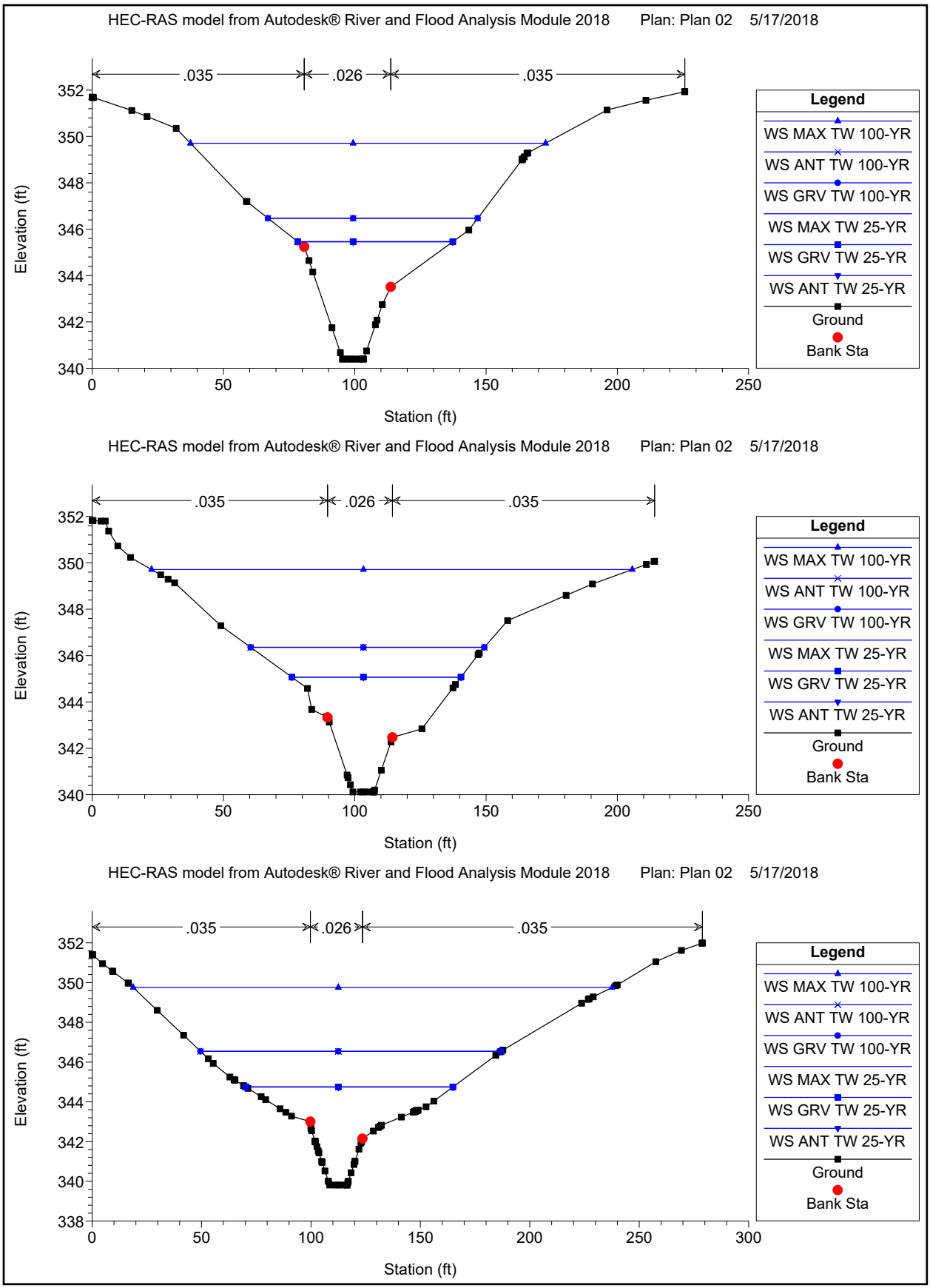
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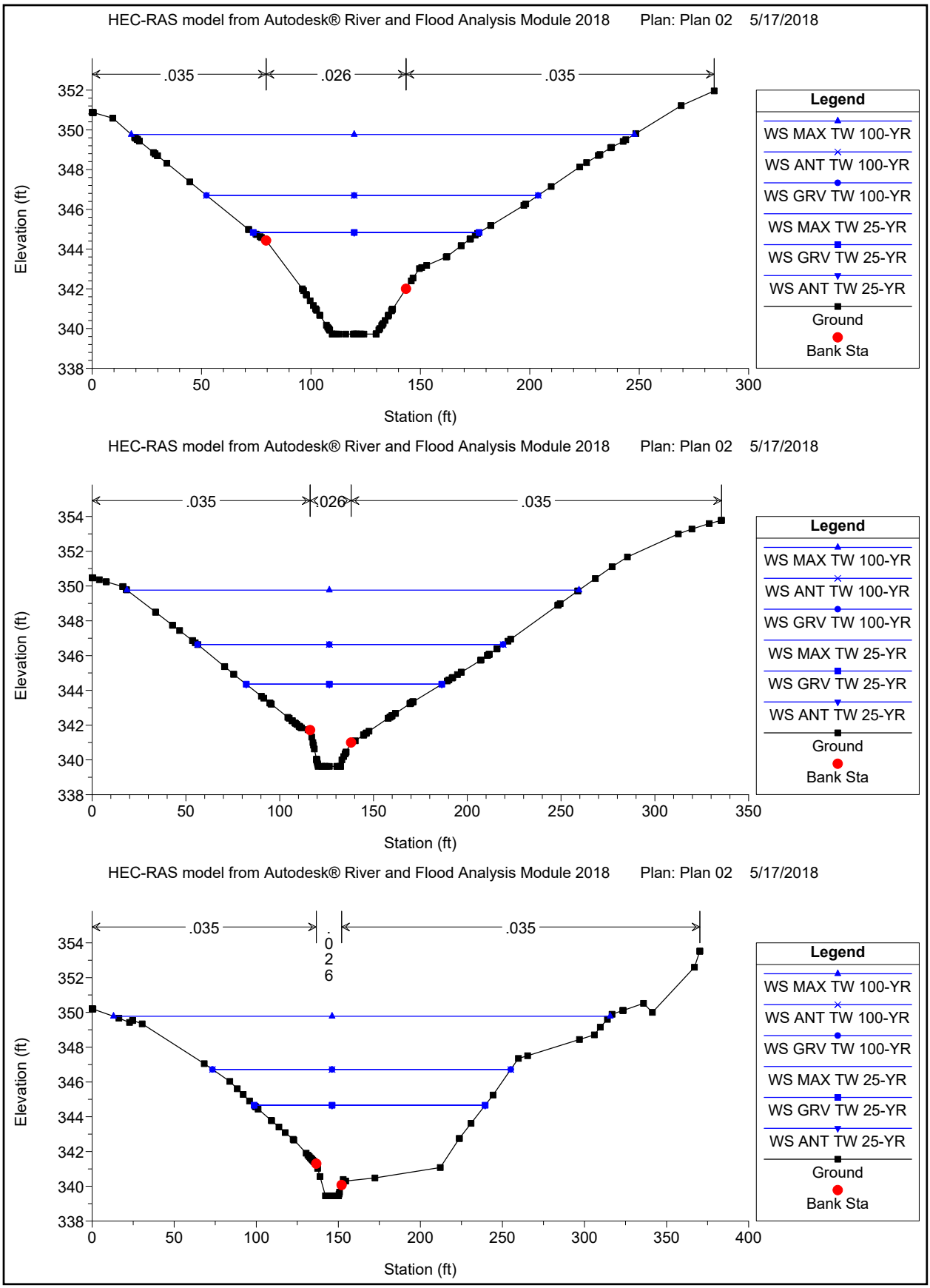
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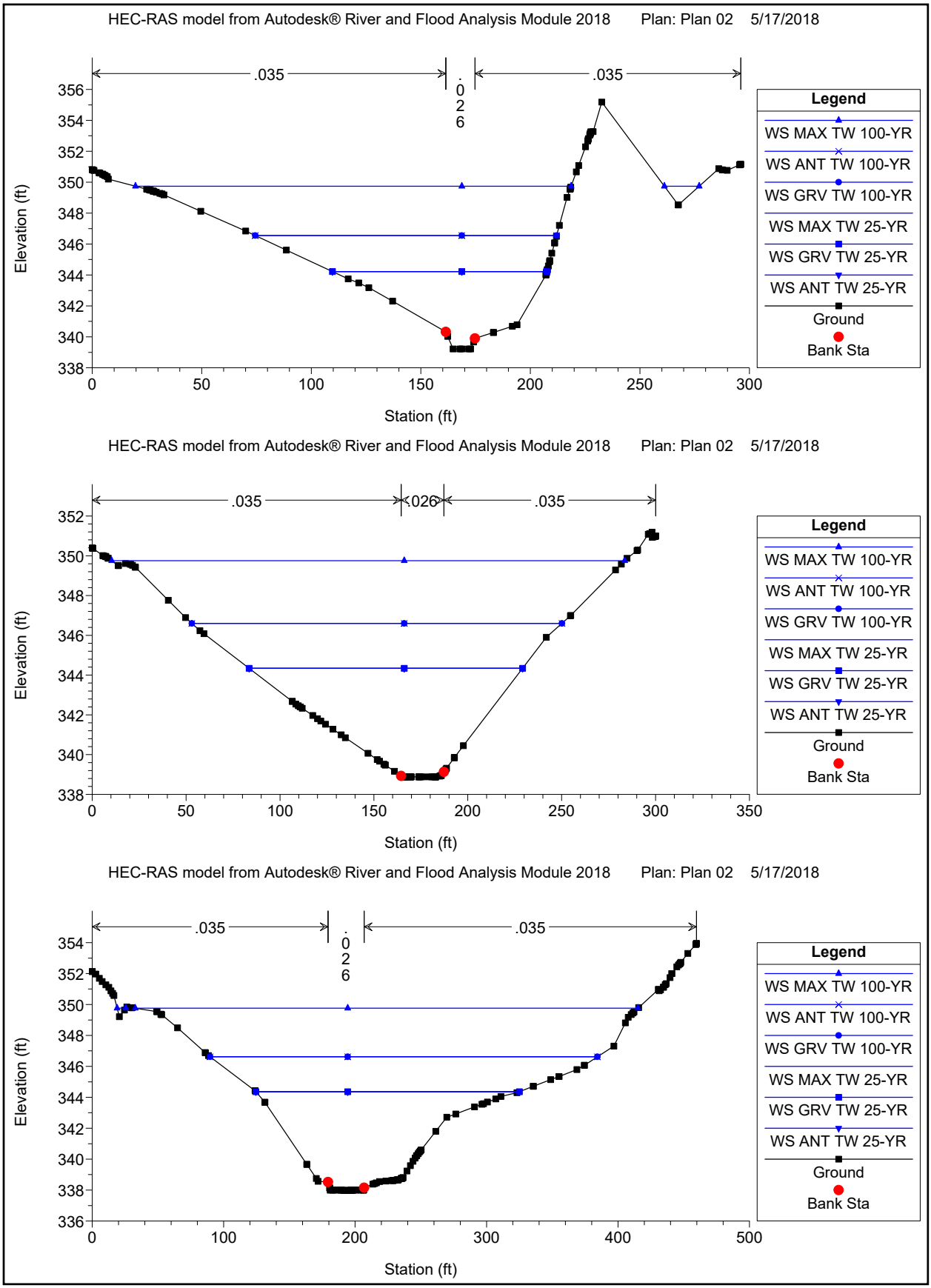
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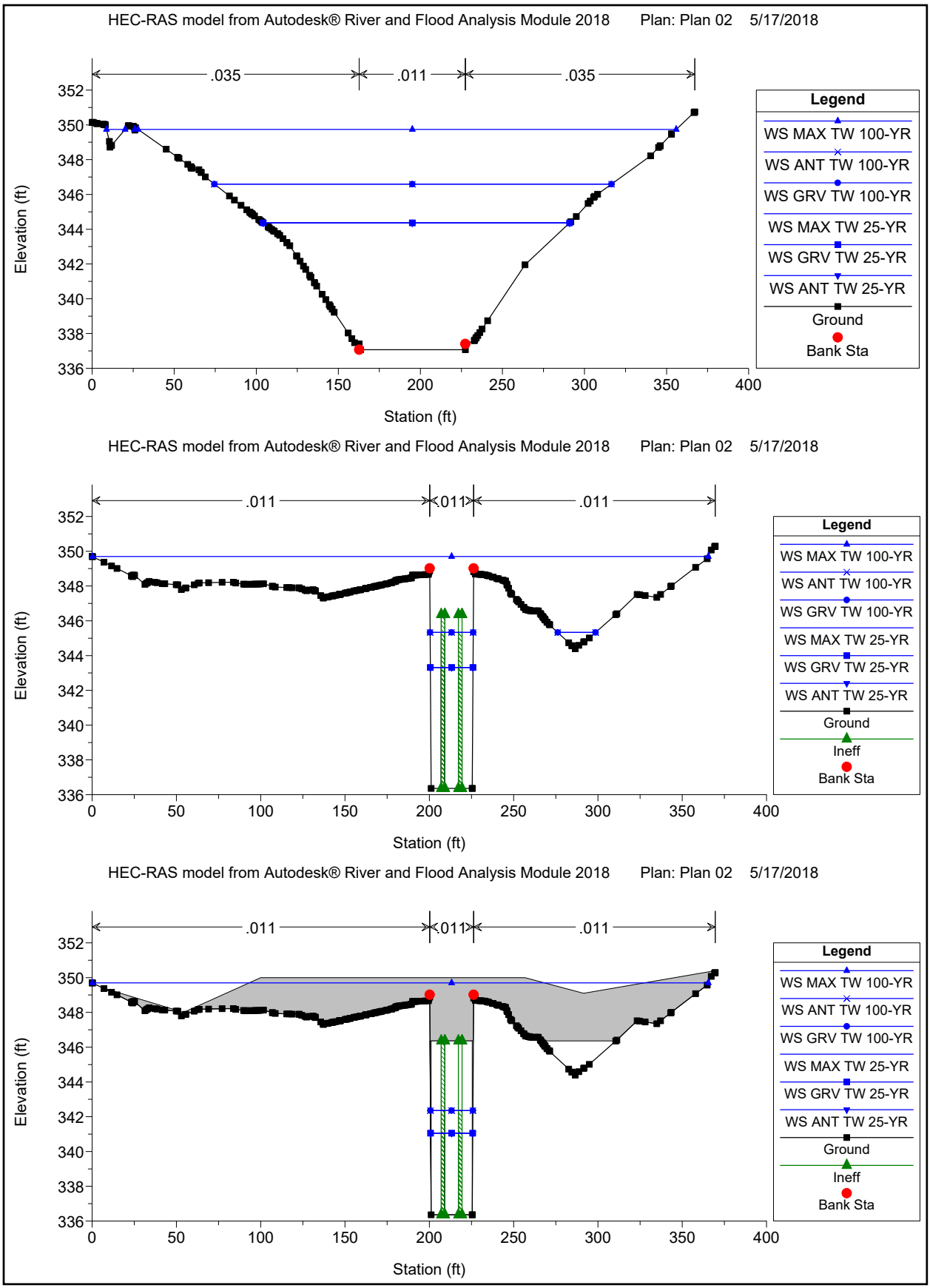
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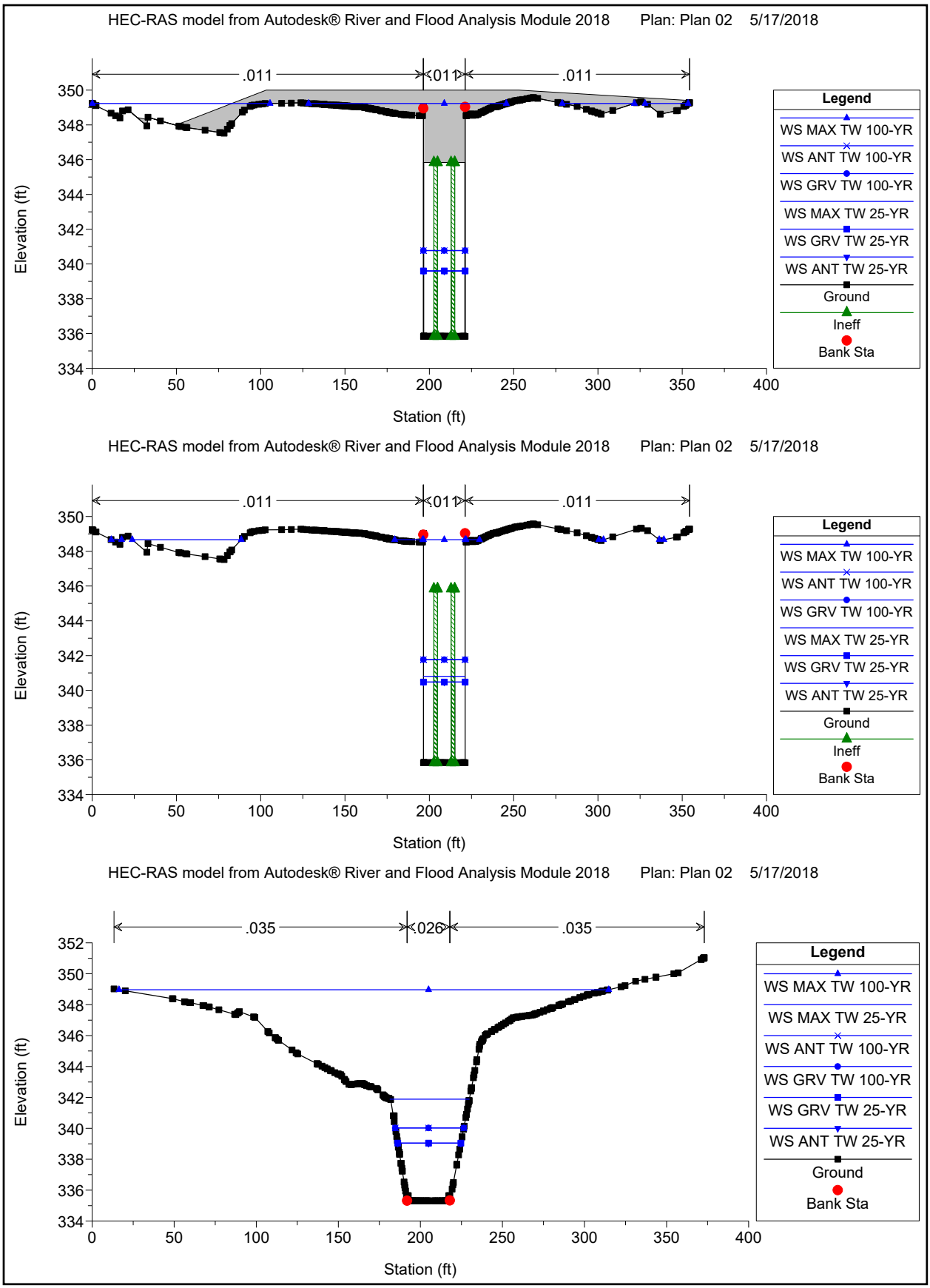
HEC-RAS model from Autodesk® River and Flood Analysis Module 2018 Plan: Plan 02 5/17/2018
.011
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Elevation (ft)
Station (ft)
Legend
WS MAX TW 100-YR
WS ANT TW 100-YR
WS GRV TW 100-YR
WS MAX TW 25-YR
WS GRV TW 25-YR
WS ANT TW 25-YR
Ground
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HEC-RAS model from Autodesk® River and Flood Analysis Module 2018 Plan: Plan 02 5/17/2018
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Elevation (ft)
Station (ft)
Legend
WS MAX TW 100-YR
WS ANT TW 100-YR
WS GRV TW 100-YR
WS MAX TW 25-YR
WS GRV TW 25-YR
WS ANT TW 25-YR
Ground
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HEC-RAS model from Autodesk® River and Flood Analysis Module 2018 Plan: Plan 02 5/17/2018
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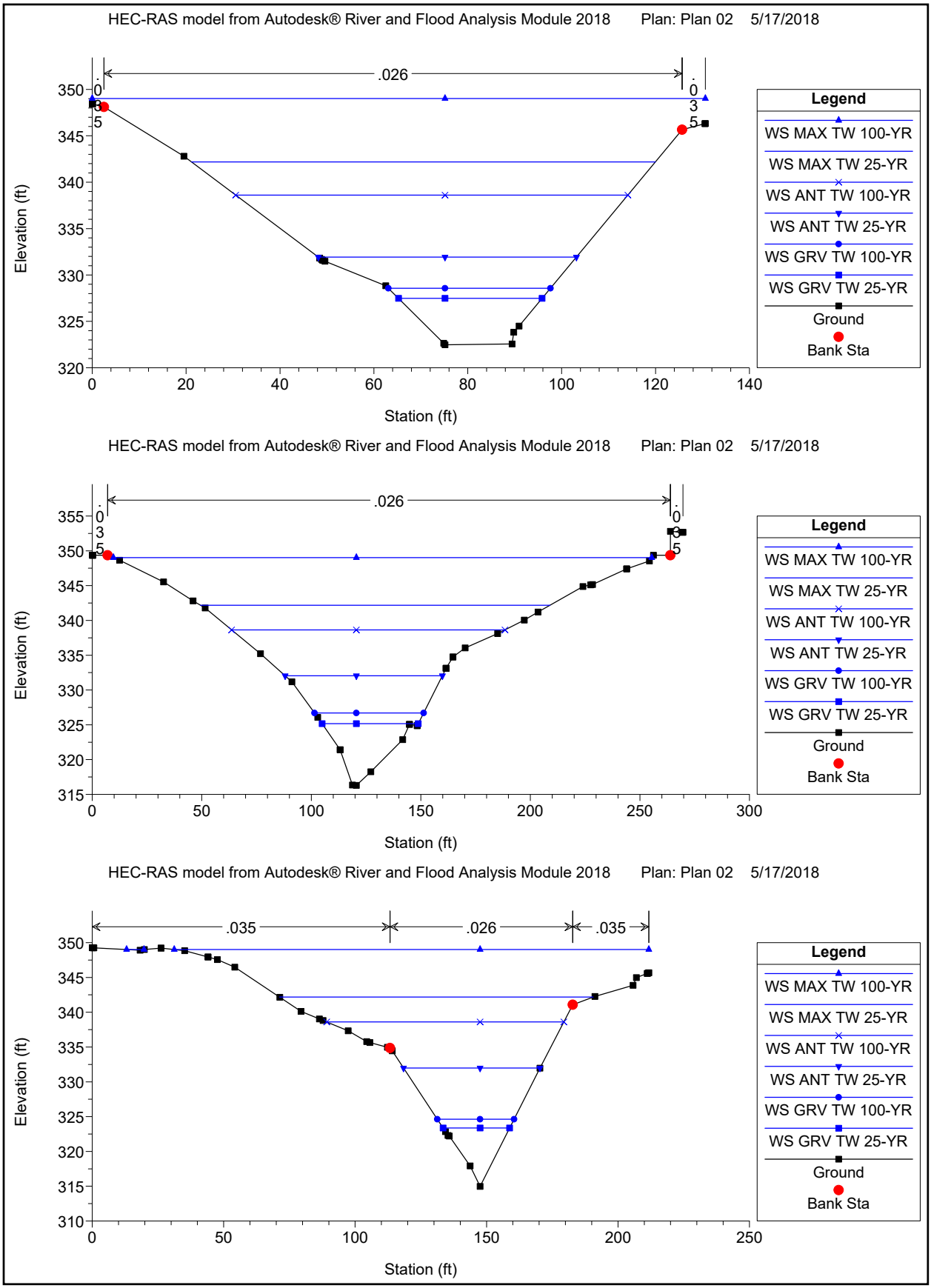
Elevation (ft)
Station (ft)
Legend
WS MAX TW 100-YR
WS MAX TW 25-YR
WS ANT TW 100-YR
WS GRV TW 100-YR
WS GRV TW 25-YR
WS ANT TW 25-YR
Ground
Bank Sta


HEC-RAS model from Autodesk® River and Flood Analysis Module 2018 Plan: Plan 02 5/17/2018
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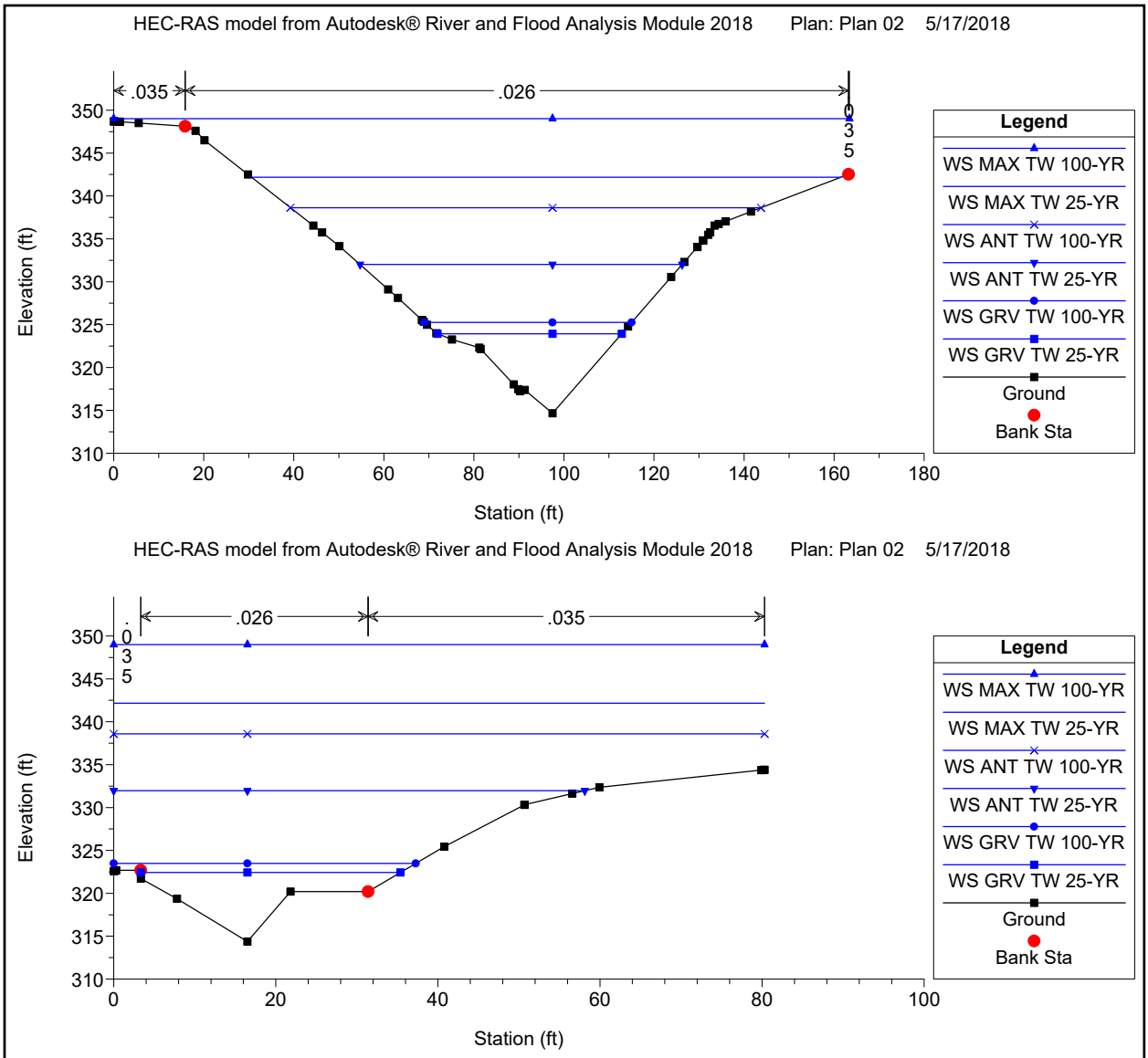
Elevation (ft)
Station (ft)
Legend
WS MAX TW 100-YR
WS MAX TW 25-YR
WS ANT TW 100-YR
WS ANT TW 25-YR
WS GRV TW 100-YR
WS GRV TW 25-YR
Ground
Bank Sta


HEC-RAS model from Autodesk® River and Flood Analysis Module 2018 Plan: Plan 02 5/17/2018
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Elevation (ft)
Station (ft)
Legend
WS MAX TW 100-YR
WS MAX TW 25-YR
WS ANT TW 100-YR
WS ANT TW 25-YR
WS GRV TW 100-YR
WS GRV TW 25-YR
Ground
Bank Sta

HEC-RAS model from Autodesk® River and Flood Analysis Module 2018 Plan: Plan 02 5/17/2018
.035
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Elevation (ft)
Station (ft)
Legend
WS MAX TW 100-YR
WS MAX TW 25-YR
WS ANT TW 100-YR
WS ANT TW 25-YR
WS GRV TW 100-YR
WS GRV TW 25-YR
Ground
Bank Sta

PROFILE TABLES

HEC-RAS Plan: Plan 02 River: Proposed Channel Reach: Proposed Channel

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Proposed Channel	39	MAX TW 25-YR	414.96	353.00	356.13		356.30	0.000887	3.31	125.39	40.06	0.33
Proposed Channel	39	MAX TW 100-YR	587.02	353.00	356.87		357.09	0.000917	3.79	154.79	40.08	0.34
Proposed Channel	39	ANT TW 25-YR	414.96	353.00	356.13		356.30	0.000887	3.31	125.39	40.06	0.33
Proposed Channel	39	ANT TW 100-YR	587.02	353.00	356.87		357.09	0.000918	3.79	154.77	40.08	0.34
Proposed Channel	39	GRV TW 25-YR	414.96	353.00	356.13		356.30	0.000887	3.31	125.39	40.06	0.33
Proposed Channel	39	GRV TW 100-YR	587.02	353.00	356.87		357.09	0.000918	3.79	154.77	40.08	0.34
Proposed Channel	38	MAX TW 25-YR	414.96	351.73	355.59		356.06	0.002979	5.49	75.63	31.17	0.62
Proposed Channel	38	MAX TW 100-YR	587.02	351.73	356.30		356.84	0.002875	5.92	99.12	35.41	0.62
Proposed Channel	38	ANT TW 25-YR	414.96	351.73	355.59		356.06	0.002979	5.49	75.63	31.17	0.62
Proposed Channel	38	ANT TW 100-YR	587.02	351.73	356.29		356.84	0.002878	5.92	99.08	35.40	0.62
Proposed Channel	38	GRV TW 25-YR	414.96	351.73	355.59		356.06	0.002979	5.49	75.63	31.17	0.62
Proposed Channel	38	GRV TW 100-YR	587.02	351.73	356.29		356.84	0.002878	5.92	99.08	35.40	0.62
Proposed Channel	37	MAX TW 25-YR	414.96	351.12	355.01		355.47	0.002875	5.42	76.62	31.35	0.61
Proposed Channel	37	MAX TW 100-YR	587.02	351.12	355.76		356.28	0.002685	5.77	101.65	35.82	0.60
Proposed Channel	37	ANT TW 25-YR	414.96	351.12	355.01		355.47	0.002875	5.42	76.62	31.35	0.61
Proposed Channel	37	ANT TW 100-YR	587.02	351.12	355.76		356.28	0.002690	5.78	101.59	35.81	0.60
Proposed Channel	37	GRV TW 25-YR	414.96	351.12	355.01		355.47	0.002875	5.42	76.62	31.35	0.61
Proposed Channel	37	GRV TW 100-YR	587.02	351.12	355.76		356.28	0.002690	5.78	101.59	35.81	0.60
Proposed Channel	36	MAX TW 25-YR	414.96	350.52	354.47		354.91	0.002687	5.28	78.60	31.76	0.59
Proposed Channel	36	MAX TW 100-YR	587.02	350.52	355.28		355.76	0.002385	5.52	106.32	36.67	0.57
Proposed Channel	36	ANT TW 25-YR	414.96	350.52	354.47		354.91	0.002687	5.28	78.60	31.76	0.59
Proposed Channel	36	ANT TW 100-YR	587.02	350.52	355.28		355.76	0.002392	5.53	106.20	36.65	0.57
Proposed Channel	36	GRV TW 25-YR	414.96	350.52	354.47		354.91	0.002687	5.28	78.60	31.76	0.59
Proposed Channel	36	GRV TW 100-YR	587.02	350.52	355.28		355.76	0.002392	5.53	106.20	36.65	0.57
Proposed Channel	35	MAX TW 25-YR	414.96	349.91	354.05		354.40	0.002142	4.74	87.49	35.19	0.53
Proposed Channel	35	MAX TW 100-YR	587.02	349.91	354.96		355.32	0.001759	4.81	122.11	41.47	0.49
Proposed Channel	35	ANT TW 25-YR	414.96	349.91	354.05		354.40	0.002142	4.74	87.49	35.19	0.53
Proposed Channel	35	ANT TW 100-YR	587.02	349.91	354.95		355.31	0.001766	4.82	121.90	41.44	0.49
Proposed Channel	35	GRV TW 25-YR	414.96	349.91	354.05		354.40	0.002142	4.74	87.49	35.19	0.53
Proposed Channel	35	GRV TW 100-YR	587.02	349.91	354.95		355.31	0.001766	4.82	121.90	41.44	0.49
Proposed Channel	34	MAX TW 25-YR	414.96	349.30	353.70		354.01	0.001689	4.45	93.33	34.40	0.48
Proposed Channel	34	MAX TW 100-YR	587.02	349.30	354.67		354.99	0.001403	4.54	129.40	40.20	0.45
Proposed Channel	34	ANT TW 25-YR	414.96	349.30	353.70		354.01	0.001689	4.45	93.33	34.40	0.48
Proposed Channel	34	ANT TW 100-YR	587.02	349.30	354.66		354.99	0.001411	4.55	129.14	40.16	0.45
Proposed Channel	34	GRV TW 25-YR	414.96	349.30	353.70		354.01	0.001689	4.45	93.33	34.40	0.48
Proposed Channel	34	GRV TW 100-YR	587.02	349.30	354.66		354.99	0.001411	4.55	129.14	40.16	0.45
Proposed Channel	33	MAX TW 25-YR	414.96	348.70	353.48		353.71	0.001177	3.89	106.73	36.69	0.40
Proposed Channel	33	MAX TW 100-YR	587.02	348.70	354.49		354.73	0.000998	4.00	146.91	42.75	0.38
Proposed Channel	33	ANT TW 25-YR	414.96	348.70	353.48		353.71	0.001177	3.89	106.73	36.69	0.40
Proposed Channel	33	ANT TW 100-YR	587.02	348.70	354.48		354.73	0.001005	4.00	146.57	42.71	0.38
Proposed Channel	33	GRV TW 25-YR	414.96	348.70	353.48		353.71	0.001177	3.89	106.73	36.69	0.40
Proposed Channel	33	GRV TW 100-YR	587.02	348.70	354.48		354.73	0.001005	4.00	146.57	42.71	0.38
Proposed Channel	32	MAX TW 25-YR	414.96	348.09	353.33		353.50	0.000782	3.34	124.27	39.44	0.33
Proposed Channel	32	MAX TW 100-YR	587.02	348.09	354.36		354.55	0.000694	3.49	168.28	45.65	0.32
Proposed Channel	32	ANT TW 25-YR	414.96	348.09	353.33		353.50	0.000782	3.34	124.27	39.44	0.33
Proposed Channel	32	ANT TW 100-YR	587.02	348.09	354.35		354.54	0.000698	3.50	167.88	45.60	0.32
Proposed Channel	32	GRV TW 25-YR	414.96	348.09	353.33		353.50	0.000782	3.34	124.27	39.44	0.33
Proposed Channel	32	GRV TW 100-YR	587.02	348.09	354.35		354.54	0.000698	3.50	167.88	45.60	0.32
Proposed Channel	31	MAX TW 25-YR	414.96	347.48	353.24		353.36	0.000513	2.85	145.40	42.52	0.27
Proposed Channel	31	MAX TW 100-YR	587.02	347.48	354.28		354.42	0.000480	3.04	193.07	48.79	0.27
Proposed Channel	31	ANT TW 25-YR	414.96	347.48	353.24		353.36	0.000513	2.85	145.40	42.52	0.27
Proposed Channel	31	ANT TW 100-YR	587.02	347.48	354.27		354.42	0.000483	3.05	192.62	48.73	0.27
Proposed Channel	31	GRV TW 25-YR	414.96	347.48	353.24		353.36	0.000513	2.85	145.40	42.52	0.27
Proposed Channel	31	GRV TW 100-YR	587.02	347.48	354.27		354.42	0.000483	3.05	192.62	48.73	0.27
Proposed Channel	30	MAX TW 25-YR	868.31	347.00	352.39		353.08	0.003008	6.66	130.46	40.41	0.65
Proposed Channel	30	MAX TW 100-YR	1234.19	347.00	353.34		354.14	0.002937	7.20	171.33	46.25	0.66
Proposed Channel	30	ANT TW 25-YR	868.31	347.00	352.39		353.08	0.003008	6.66	130.46	40.41	0.65
Proposed Channel	30	ANT TW 100-YR	1234.19	347.00	353.32		354.13	0.002981	7.24	170.38	46.13	0.66
Proposed Channel	30	GRV TW 25-YR	868.31	347.00	352.39		353.08	0.003008	6.66	130.46	40.41	0.65
Proposed Channel	30	GRV TW 100-YR	1234.19	347.00	353.32		354.13	0.002981	7.24	170.38	46.13	0.66
Proposed Channel	29	MAX TW 25-YR	868.31	346.35	351.75		352.43	0.002992	6.65	130.66	40.40	0.65
Proposed Channel	29	MAX TW 100-YR	1234.19	346.35	352.72		353.52	0.002850	7.14	172.93	46.26	0.65
Proposed Channel	29	ANT TW 25-YR	868.31	346.35	351.75		352.43	0.002992	6.65	130.66	40.40	0.65
Proposed Channel	29	ANT TW 100-YR	1234.19	346.35	352.68		353.49	0.002936	7.22	171.02	46.01	0.66
Proposed Channel	29	GRV TW 25-YR	868.31	346.35	351.75		352.43	0.002992	6.65	130.66	40.40	0.65
Proposed Channel	29	GRV TW 100-YR	1234.19	346.35	352.68		353.49	0.002936	7.22	171.02	46.01	0.66
Proposed Channel	28	MAX TW 25-YR	868.31	345.66	351.09		351.77	0.002917	6.58	131.89	40.57	0.64
Proposed Channel	28	MAX TW 100-YR	1234.19	345.66	352.13		352.88	0.002669	6.97	177.19	46.79	0.63
Proposed Channel	28	ANT TW 25-YR	868.31	345.66	351.09		351.77	0.002917	6.58	131.89	40.57	0.64
Proposed Channel	28	ANT TW 100-YR	1234.19	345.66	352.05		352.84	0.002822	7.11	173.53	46.32	0.65
Proposed Channel	28	GRV TW 25-YR	868.31	345.66	351.09		351.77	0.002917	6.58	131.89	40.57	0.64
Proposed Channel	28	GRV TW 100-YR	1234.19	345.66	352.05		352.84	0.002822	7.11	173.53	46.32	0.65

HEC-RAS Plan: Plan 02 River: Proposed Channel Reach: Proposed Channel (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Proposed Channel	27	MAX TW 25-YR	868.31	345.06	350.55		351.20	0.002774	6.46	134.39	40.96	0.63
Proposed Channel	27	MAX TW 100-YR	1234.19	345.06	351.67		352.37	0.002414	6.71	183.97	47.67	0.60
Proposed Channel	27	ANT TW 25-YR	868.31	345.06	350.55		351.20	0.002774	6.46	134.39	40.96	0.63
Proposed Channel	27	ANT TW 100-YR	1234.19	345.06	351.54		352.29	0.002640	6.94	177.92	46.90	0.63
Proposed Channel	27	GRV TW 25-YR	868.31	345.06	350.55		351.20	0.002774	6.46	134.39	40.96	0.63
Proposed Channel	27	GRV TW 100-YR	1234.19	345.06	351.54		352.29	0.002640	6.94	177.92	46.90	0.63
Proposed Channel	26	MAX TW 25-YR	868.31	344.45	350.05		350.66	0.002537	6.25	138.93	41.61	0.60
Proposed Channel	26	MAX TW 100-YR	1234.19	344.45	351.27		351.90	0.002087	6.35	194.24	48.95	0.56
Proposed Channel	26	ANT TW 25-YR	868.31	344.45	350.05		350.66	0.002537	6.25	138.93	41.61	0.60
Proposed Channel	26	ANT TW 100-YR	1234.19	344.45	351.08		351.77	0.002378	6.67	184.99	47.80	0.60
Proposed Channel	26	GRV TW 25-YR	868.31	344.45	350.05		350.66	0.002537	6.25	138.93	41.61	0.60
Proposed Channel	26	GRV TW 100-YR	1234.19	344.45	351.08		351.77	0.002378	6.67	184.99	47.80	0.60
Proposed Channel	25	MAX TW 25-YR	868.31	343.84	349.63		350.17	0.002192	5.92	146.72	42.72	0.56
Proposed Channel	25	MAX TW 100-YR	1234.19	343.84	350.96		351.50	0.001722	5.91	208.76	50.72	0.51
Proposed Channel	25	ANT TW 25-YR	868.31	343.84	349.63		350.17	0.002192	5.92	146.72	42.72	0.56
Proposed Channel	25	ANT TW 100-YR	1234.19	343.84	350.70		351.31	0.002043	6.30	195.81	49.14	0.56
Proposed Channel	25	GRV TW 25-YR	868.31	343.84	349.63		350.17	0.002192	5.92	146.72	42.72	0.56
Proposed Channel	25	GRV TW 100-YR	1234.19	343.84	350.70		351.31	0.002043	6.30	195.81	49.14	0.56
Proposed Channel	24	MAX TW 25-YR	868.31	343.33	349.34		349.82	0.001849	5.56	156.31	44.05	0.52
Proposed Channel	24	MAX TW 100-YR	1234.19	343.33	350.75		351.22	0.001418	5.50	224.34	52.49	0.47
Proposed Channel	24	ANT TW 25-YR	868.31	343.33	349.34		349.82	0.001849	5.56	156.31	44.05	0.52
Proposed Channel	24	ANT TW 100-YR	1234.19	343.33	350.43		350.98	0.001734	5.93	208.14	50.61	0.52
Proposed Channel	24	GRV TW 25-YR	868.31	343.33	349.34		349.82	0.001849	5.56	156.31	44.05	0.52
Proposed Channel	24	GRV TW 100-YR	1234.19	343.33	350.43		350.98	0.001734	5.93	208.14	50.61	0.52
Proposed Channel	23	MAX TW 25-YR	868.31	342.71	349.06		349.46	0.001428	5.04	172.12	46.15	0.46
Proposed Channel	23	MAX TW 100-YR	1234.19	342.71	350.55		350.94	0.001095	4.99	247.36	55.17	0.42
Proposed Channel	23	ANT TW 25-YR	868.31	342.71	349.06		349.46	0.001428	5.04	172.12	46.15	0.46
Proposed Channel	23	ANT TW 100-YR	1234.19	342.71	350.18		350.64	0.001370	5.43	227.30	52.86	0.46
Proposed Channel	23	GRV TW 25-YR	868.31	342.71	349.06		349.46	0.001428	5.04	172.12	46.15	0.46
Proposed Channel	23	GRV TW 100-YR	1234.19	342.71	350.18		350.64	0.001370	5.43	227.30	52.86	0.46
Proposed Channel	22	MAX TW 25-YR	1151.75	342.16	348.21		349.03	0.003155	7.26	158.64	44.70	0.68
Proposed Channel	22	MAX TW 100-YR	1662.89	342.16	350.09		350.68	0.001586	6.28	304.27	111.44	0.51
Proposed Channel	22	ANT TW 25-YR	1151.75	342.16	348.21		349.03	0.003155	7.26	158.64	44.70	0.68
Proposed Channel	22	ANT TW 100-YR	1662.89	342.16	349.23		350.21	0.003063	7.96	219.16	86.58	0.69
Proposed Channel	22	GRV TW 25-YR	1151.75	342.16	348.21		349.03	0.003155	7.26	158.64	44.70	0.68
Proposed Channel	22	GRV TW 100-YR	1662.89	342.16	349.23		350.21	0.003063	7.96	219.16	86.58	0.69
Proposed Channel	21	MAX TW 25-YR	1151.75	341.72	347.71		348.56	0.003293	7.40	155.58	43.93	0.69
Proposed Channel	21	MAX TW 100-YR	1662.89	341.72	349.86		350.45	0.001530	6.22	284.80	85.75	0.50
Proposed Channel	21	ANT TW 25-YR	1151.75	341.72	347.71		348.56	0.003293	7.40	155.58	43.93	0.69
Proposed Channel	21	ANT TW 100-YR	1662.89	341.72	348.63		349.72	0.003642	8.38	198.44	50.16	0.74
Proposed Channel	21	GRV TW 25-YR	1151.75	341.72	347.71		348.56	0.003293	7.40	155.58	43.93	0.69
Proposed Channel	21	GRV TW 100-YR	1662.89	341.72	348.63		349.72	0.003642	8.38	198.44	50.16	0.74
Proposed Channel	20	MAX TW 25-YR	1151.75	341.28	347.19		348.07	0.003524	7.50	153.53	44.83	0.71
Proposed Channel	20	MAX TW 100-YR	1662.89	341.28	349.71		350.23	0.001245	5.81	293.47	70.45	0.45
Proposed Channel	20	ANT TW 25-YR	1151.75	341.28	347.19		348.07	0.003524	7.50	153.53	44.83	0.71
Proposed Channel	20	ANT TW 100-YR	1662.89	341.28	347.91		349.13	0.004348	8.88	187.37	49.78	0.81
Proposed Channel	20	GRV TW 25-YR	1151.75	341.28	347.19		348.07	0.003524	7.50	153.53	44.83	0.71
Proposed Channel	20	GRV TW 100-YR	1662.89	341.28	347.91		349.13	0.004348	8.88	187.37	49.78	0.81
Proposed Channel	19	MAX TW 25-YR	1151.75	340.81	346.61	346.01	347.47	0.004248	7.44	154.91	54.86	0.77
Proposed Channel	19	MAX TW 100-YR	1662.89	340.81	349.70		350.03	0.000681	4.78	404.02	106.66	0.35
Proposed Channel	19	ANT TW 25-YR	1151.75	340.81	346.61	346.01	347.47	0.004248	7.44	154.91	54.86	0.77
Proposed Channel	19	ANT TW 100-YR	1662.89	340.81	347.22	346.84	348.43	0.004791	8.84	191.20	64.87	0.84
Proposed Channel	19	GRV TW 25-YR	1151.75	340.81	346.61	346.01	347.47	0.004248	7.44	154.91	54.86	0.77
Proposed Channel	19	GRV TW 100-YR	1662.89	340.81	347.22	346.84	348.43	0.004791	8.84	191.20	64.87	0.84
Proposed Channel	18	MAX TW 25-YR	1151.75	340.40	345.46	345.41	346.77	0.005489	9.46	137.52	59.03	0.90
Proposed Channel	18	MAX TW 100-YR	1662.89	340.40	349.71		349.93	0.000416	4.44	553.00	135.23	0.28
Proposed Channel	18	ANT TW 25-YR	1151.75	340.40	345.46	345.41	346.77	0.005489	9.46	137.52	59.03	0.90
Proposed Channel	18	ANT TW 100-YR	1662.89	340.40	346.47	346.34	347.81	0.004208	9.82	208.53	79.85	0.82
Proposed Channel	18	GRV TW 25-YR	1151.75	340.40	345.46	345.41	346.77	0.005489	9.46	137.52	59.03	0.90
Proposed Channel	18	GRV TW 100-YR	1662.89	340.40	346.47	346.34	347.81	0.004208	9.82	208.53	79.85	0.82
Proposed Channel	17	MAX TW 25-YR	1151.75	340.12	345.07	344.92	346.27	0.004626	9.55	154.74	64.45	0.84
Proposed Channel	17	MAX TW 100-YR	1662.89	340.12	349.71		349.88	0.000328	4.25	687.95	183.07	0.26
Proposed Channel	17	ANT TW 25-YR	1151.75	340.12	345.07	344.92	346.27	0.004626	9.55	154.74	64.45	0.84
Proposed Channel	17	ANT TW 100-YR	1662.89	340.12	346.36	345.82	347.39	0.003005	9.27	253.20	88.96	0.71
Proposed Channel	17	GRV TW 25-YR	1151.75	340.12	345.07	344.92	346.27	0.004626	9.55	154.74	64.45	0.84
Proposed Channel	17	GRV TW 100-YR	1662.89	340.12	346.36	345.82	347.39	0.003005	9.27	253.20	88.96	0.71
Proposed Channel	16	MAX TW 25-YR	1151.75	339.81	344.75	344.75	345.79	0.004228	9.18	181.19	94.68	0.80
Proposed Channel	16	MAX TW 100-YR	1662.89	339.81	349.75		349.83	0.000166	3.11	960.60	218.89	0.18
Proposed Channel	16	ANT TW 25-YR	1151.75	339.81	344.75	344.75	345.79	0.004228	9.18	181.19	94.68	0.80
Proposed Channel	16	ANT TW 100-YR	1662.89	339.81	346.54		347.02	0.001479	6.93	390.70	137.36	0.51
Proposed Channel	16	GRV TW 25-YR	1151.75	339.81	344.75	344.75	345.79	0.004228	9.18	181.19	94.68	0.80

HEC-RAS Plan: Plan 02 River: Proposed Channel Reach: Proposed Channel (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Proposed Channel	16	GRV TW 100-YR	1662.89	339.81	346.54		347.02	0.001479	6.93	390.70	137.36	0.51
Proposed Channel	15	MAX TW 25-YR	1151.75	339.72	344.84		345.14	0.001109	4.55	281.34	103.19	0.42
Proposed Channel	15	MAX TW 100-YR	1662.89	339.72	349.76		349.82	0.000081	2.16	1101.46	229.87	0.13
Proposed Channel	15	ANT TW 25-YR	1151.75	339.72	344.84		345.14	0.001109	4.55	281.34	103.19	0.42
Proposed Channel	15	ANT TW 100-YR	1662.89	339.72	346.70		346.92	0.000496	3.99	519.87	151.59	0.30
Proposed Channel	15	GRV TW 25-YR	1151.75	339.72	344.84		345.14	0.001109	4.55	281.34	103.19	0.42
Proposed Channel	15	GRV TW 100-YR	1662.89	339.72	346.70		346.92	0.000496	3.99	519.87	151.59	0.30
Proposed Channel	14	MAX TW 25-YR	1151.75	339.63	344.35		345.05	0.002893	7.98	223.65	104.30	0.68
Proposed Channel	14	MAX TW 100-YR	1662.89	339.63	349.77		349.82	0.000106	2.63	1161.89	241.03	0.15
Proposed Channel	14	ANT TW 25-YR	1151.75	339.63	344.35		345.05	0.002893	7.98	223.65	104.30	0.68
Proposed Channel	14	ANT TW 100-YR	1662.89	339.63	346.64		346.89	0.000757	5.42	530.14	162.89	0.37
Proposed Channel	14	GRV TW 25-YR	1151.75	339.63	344.35		345.05	0.002893	7.98	223.65	104.30	0.68
Proposed Channel	14	GRV TW 100-YR	1662.89	339.63	346.64		346.89	0.000757	5.42	530.14	162.89	0.37
Proposed Channel	13	MAX TW 25-YR	1151.75	339.45	344.66		344.81	0.000732	4.35	423.78	140.72	0.35
Proposed Channel	13	MAX TW 100-YR	1662.89	339.45	349.78		349.80	0.000068	2.15	1486.98	302.60	0.12
Proposed Channel	13	ANT TW 25-YR	1151.75	339.45	344.66		344.81	0.000732	4.35	423.78	140.72	0.35
Proposed Channel	13	ANT TW 100-YR	1662.89	339.45	346.72		346.82	0.000325	3.67	754.41	181.74	0.25
Proposed Channel	13	GRV TW 25-YR	1151.75	339.45	344.66		344.81	0.000732	4.35	423.78	140.72	0.35
Proposed Channel	13	GRV TW 100-YR	1662.89	339.45	346.72		346.82	0.000325	3.67	754.41	181.74	0.25
Proposed Channel	12	MAX TW 25-YR	1151.75	339.22	344.22		344.69	0.002111	7.38	258.47	97.88	0.59
Proposed Channel	12	MAX TW 100-YR	1662.89	339.22	349.74		349.79	0.000117	2.89	1072.22	214.75	0.16
Proposed Channel	12	ANT TW 25-YR	1151.75	339.22	344.22		344.69	0.002111	7.38	258.47	97.88	0.59
Proposed Channel	12	ANT TW 100-YR	1662.89	339.22	346.55		346.77	0.000679	5.45	532.44	137.58	0.36
Proposed Channel	12	GRV TW 25-YR	1151.75	339.22	344.22		344.69	0.002111	7.38	258.47	97.88	0.59
Proposed Channel	12	GRV TW 100-YR	1662.89	339.22	346.55		346.77	0.000679	5.45	532.44	137.58	0.36
Proposed Channel	11	MAX TW 25-YR	1151.75	338.86	344.34		344.49	0.000545	4.13	456.95	145.68	0.31
Proposed Channel	11	MAX TW 100-YR	1662.89	338.86	349.75		349.78	0.000048	1.94	1572.27	273.25	0.10
Proposed Channel	11	ANT TW 25-YR	1151.75	338.86	344.34		344.49	0.000545	4.13	456.95	145.68	0.31
Proposed Channel	11	ANT TW 100-YR	1662.89	338.86	346.60		346.69	0.000235	3.42	843.09	197.11	0.22
Proposed Channel	11	GRV TW 25-YR	1151.75	338.86	344.34		344.49	0.000545	4.13	456.95	145.68	0.31
Proposed Channel	11	GRV TW 100-YR	1662.89	338.86	346.60		346.69	0.000235	3.42	843.09	197.11	0.22
Proposed Channel	10	MAX TW 25-YR	1151.75	337.97	344.36		344.43	0.000214	2.86	684.97	200.54	0.20
Proposed Channel	10	MAX TW 100-YR	1662.89	337.97	349.76		349.77	0.000021	1.36	2298.87	389.15	0.07
Proposed Channel	10	ANT TW 25-YR	1151.75	337.97	344.36		344.43	0.000214	2.86	684.97	200.54	0.20
Proposed Channel	10	ANT TW 100-YR	1662.89	337.97	346.62		346.66	0.000107	2.47	1250.07	294.65	0.15
Proposed Channel	10	GRV TW 25-YR	1151.75	337.97	344.36		344.43	0.000214	2.86	684.97	200.54	0.20
Proposed Channel	10	GRV TW 100-YR	1662.89	337.97	346.62		346.66	0.000107	2.47	1250.07	294.65	0.15
Proposed Channel	9	MAX TW 25-YR	1151.75	337.07	344.37		344.43	0.000017	2.11	875.62	186.70	0.14
Proposed Channel	9	MAX TW 100-YR	1662.89	337.07	349.74		349.77	0.000004	1.55	2256.71	339.58	0.08
Proposed Channel	9	ANT TW 25-YR	1151.75	337.07	344.37		344.43	0.000017	2.11	875.62	186.70	0.14
Proposed Channel	9	ANT TW 100-YR	1662.89	337.07	346.59		346.66	0.000013	2.22	1351.09	241.98	0.13
Proposed Channel	9	GRV TW 25-YR	1151.75	337.07	344.37		344.43	0.000017	2.11	875.62	186.70	0.14
Proposed Channel	9	GRV TW 100-YR	1662.89	337.07	346.59		346.66	0.000013	2.22	1351.09	241.98	0.13
Proposed Channel	8	MAX TW 25-YR	1151.75	336.36	343.31	341.02	344.33	0.000530	8.09	142.42	25.29	0.55
Proposed Channel	8	MAX TW 100-YR	1662.89	336.36	349.70	342.31	349.76	0.000032	2.60	990.46	365.32	0.13
Proposed Channel	8	ANT TW 25-YR	1151.75	336.36	343.31	341.02	344.33	0.000530	8.09	142.42	25.29	0.55
Proposed Channel	8	ANT TW 100-YR	1662.89	336.36	345.33	342.31	346.54	0.000525	8.89	195.47	47.96	0.53
Proposed Channel	8	GRV TW 25-YR	1151.75	336.36	343.31	341.02	344.33	0.000530	8.09	142.42	25.29	0.55
Proposed Channel	8	GRV TW 100-YR	1662.89	336.36	345.33	342.31	346.54	0.000525	8.89	195.47	47.96	0.53
Proposed Channel	7.5		Culvert									
Proposed Channel	7	MAX TW 25-YR	1151.75	335.84	340.81	340.46	342.83	0.001433	11.41	100.90	24.66	0.90
Proposed Channel	7	MAX TW 100-YR	1662.89	335.84	348.66		349.18	0.000198	5.86	318.95	125.55	0.31
Proposed Channel	7	ANT TW 25-YR	1151.75	335.84	340.48	340.48	342.80	0.001746	12.22	94.26	24.66	1.00
Proposed Channel	7	ANT TW 100-YR	1662.89	335.84	341.77	341.77	344.73	0.001798	13.81	120.42	24.66	1.00
Proposed Channel	7	GRV TW 25-YR	1151.75	335.84	340.48	340.48	342.80	0.001746	12.22	94.26	24.66	1.00
Proposed Channel	7	GRV TW 100-YR	1662.89	335.84	341.77	341.77	344.73	0.001798	13.81	120.42	24.66	1.00
Proposed Channel	6	MAX TW 25-YR	1151.75	335.31	341.88		342.33	0.000868	5.71	242.60	48.25	0.39
Proposed Channel	6	MAX TW 100-YR	1662.89	335.31	348.97		349.04	0.000079	2.81	1191.18	298.39	0.13
Proposed Channel	6	ANT TW 25-YR	1151.75	335.31	339.04	339.04	340.71	0.006578	10.76	120.02	38.49	0.98
Proposed Channel	6	ANT TW 100-YR	1662.89	335.31	340.02	340.02	342.05	0.005985	12.00	159.35	41.76	0.98
Proposed Channel	6	GRV TW 25-YR	1151.75	335.31	339.04	339.04	340.71	0.006578	10.76	120.02	38.49	0.98
Proposed Channel	6	GRV TW 100-YR	1662.89	335.31	340.02	340.02	342.05	0.005985	12.00	159.35	41.76	0.98
Proposed Channel	5	MAX TW 25-YR	1151.75	322.48	342.18		342.20	0.000016	1.06	1081.73	98.78	0.06
Proposed Channel	5	MAX TW 100-YR	1662.89	322.48	349.01		349.02	0.000007	0.89	1873.82	130.60	0.04
Proposed Channel	5	ANT TW 25-YR	1151.75	322.48	331.93		332.17	0.000566	3.92	293.88	54.97	0.30
Proposed Channel	5	ANT TW 100-YR	1662.89	322.48	338.61		338.69	0.000089	2.20	756.67	83.54	0.13
Proposed Channel	5	GRV TW 25-YR	1151.75	322.48	327.48	327.48	329.25	0.007396	10.67	107.94	30.58	1.00
Proposed Channel	5	GRV TW 100-YR	1662.89	322.48	328.57	328.57	330.66	0.007048	11.58	143.58	34.55	1.00
Proposed Channel	4	MAX TW 25-YR	1151.75	316.30	342.19		342.19	0.000006	0.67	1707.90	159.60	0.04
Proposed Channel	4	MAX TW 100-YR	1662.89	316.30	349.02		349.02	0.000003	0.54	3078.07	245.75	0.03

HEC-RAS Plan: Plan 02 River: Proposed Channel Reach: Proposed Channel (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Proposed Channel	4	ANT TW 25-YR	1151.75	316.30	332.04		332.10	0.000084	1.97	584.07	71.75	0.12
Proposed Channel	4	ANT TW 100-YR	1662.89	316.30	338.64		338.67	0.000031	1.38	1203.81	124.76	0.08
Proposed Channel	4	GRV TW 25-YR	1151.75	316.30	325.16		325.74	0.001821	6.06	189.93	43.89	0.51
Proposed Channel	4	GRV TW 100-YR	1662.89	316.30	326.70		327.32	0.001550	6.36	261.60	49.78	0.49
Proposed Channel	3	MAX TW 25-YR	1151.75	314.97	342.18		342.19	0.000010	1.01	1252.89	119.28	0.05
Proposed Channel	3	MAX TW 100-YR	1662.89	314.97	349.01		349.02	0.000005	0.91	2285.71	187.15	0.03
Proposed Channel	3	ANT TW 25-YR	1151.75	314.97	331.98		332.09	0.000162	2.66	433.60	51.87	0.16
Proposed Channel	3	ANT TW 100-YR	1662.89	314.97	338.61		338.66	0.000051	1.97	882.79	90.21	0.10
Proposed Channel	3	GRV TW 25-YR	1151.75	314.97	323.36	323.36	325.38	0.008034	11.39	101.11	25.31	1.00
Proposed Channel	3	GRV TW 100-YR	1662.89	314.97	324.62	324.62	326.97	0.007635	12.28	135.43	29.19	1.01
Proposed Channel	2	MAX TW 25-YR	1151.75	314.67	342.18		342.19	0.000006	0.72	1610.67	130.89	0.04
Proposed Channel	2	MAX TW 100-YR	1662.89	314.67	349.01		349.02	0.000003	0.65	2582.57	163.42	0.03
Proposed Channel	2	ANT TW 25-YR	1151.75	314.67	332.01		332.07	0.000067	1.84	626.83	71.54	0.11
Proposed Channel	2	ANT TW 100-YR	1662.89	314.67	338.62		338.65	0.000027	1.39	1192.05	104.50	0.07
Proposed Channel	2	GRV TW 25-YR	1151.75	314.67	323.94		324.63	0.002310	6.67	172.57	40.93	0.57
Proposed Channel	2	GRV TW 100-YR	1662.89	314.67	325.25		326.06	0.002170	7.24	229.78	45.99	0.57
Proposed Channel	1	MAX TW 25-YR	1151.75	314.38	342.17	322.44	342.19	0.000008	1.20	1326.58	80.31	0.04
Proposed Channel	1	MAX TW 100-YR	1662.89	314.38	349.00	323.48	349.02	0.000006	1.24	1875.09	80.31	0.04
Proposed Channel	1	ANT TW 25-YR	1151.75	314.38	331.96	322.44	332.06	0.000087	2.65	535.90	58.13	0.13
Proposed Channel	1	ANT TW 100-YR	1662.89	314.38	338.59	323.48	338.65	0.000034	2.19	1039.07	80.31	0.09
Proposed Channel	1	GRV TW 25-YR	1151.75	314.38	322.43	322.43	324.21	0.007630	10.78	109.83	32.04	0.98
Proposed Channel	1	GRV TW 100-YR	1662.89	314.38	323.48	323.48	325.65	0.006817	11.95	147.31	37.27	0.96

OUTPUT REPORT

HEC-RAS HEC-RAS 5.0.3 September 2016
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: HEC-RAS model from Autodesk® River and Flood Analysis Module 2018
Project File : 4697 - FLOOD MAP2.prj
Run Date and Time: 5/17/2018 8:58:10 AM

Project in English units

PLAN DATA

Plan Title: Plan 02
Plan File : j:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - FLOOD MAP2.p02

Geometry Title: Base Conditions Geometry
Geometry File : j:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - FLOOD MAP2.G01

Flow Title : 6 Flow Profiles
Flow File : j:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - FLOOD MAP2.f02

Plan Summary Information:

Number of:	Cross Sections	= 39	Multiple Openings	=	0
	Culverts	= 1	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 6 Flow Profiles
Flow File : j:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - FLOOD MAP2.f02

Flow Data (cfs)

River	Reach	RS	MAX TW 25-YR	MAX TW 100-YR	ANT TW 25-YR	ANT TW 100-YR	GRV TW 25-YR	GRV TW 100-YR
Proposed Channel	Proposed Channel	39	414.96	587.02	414.96	587.02	414.96	587.02
Proposed Channel	Proposed Channel	30	868.31	1234.19	868.31	1234.19	868.31	1234.19
Proposed Channel	Proposed Channel	22	1151.75	1662.89	1151.75	1662.89	1151.75	1662.89

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Proposed Channel	Proposed Channel	MAX TW 25-YR		Known WS = 342.17
Proposed Channel	Proposed Channel	MAX TW 100-YR		Known WS = 349
Proposed Channel	Proposed Channel	ANT TW 25-YR		Known WS = 331.96
Proposed Channel	Proposed Channel	ANT TW 100-YR		Known WS = 338.59
Proposed Channel	Proposed Channel	GRV TW 25-YR		Known WS = 0
Proposed Channel	Proposed Channel	GRV TW 100-YR		Known WS = 0

GEOMETRY DATA

Geometry Title: Base Conditions Geometry
Geometry File : j:\AutoCad 2004 Land Projects\4697\dwg\Channel\4697 - FLOOD MAP2.G01

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 39

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	360.2	.1	360.2	.2	360.2	.3	360.2	21.3	360
23.65	360	26.16	359.17	26.4	359.08	26.49	359.04	26.53	359.03
26.55	359.02	26.57	359.01	27.28	358.75	27.57	358.64	30.59	357.08
30.72	357.03	30.76	357	30.77	356.01	30.77	356	30.78	355.01
30.78	355	30.79	354	30.8	353	34.27	353	37.74	353
41.21	353	44.68	353	46.9	353	50.91	353	51.27	353
54.91	353	57.14	353	57.15	353	60.56	353	63.97	353
67.38	353	67.39	353	70.8	353	70.81	354	70.82	355
70.82	355.01	70.83	356	70.83	356.01	70.84	357	70.85	357.01
70.87	357.02	72.31	357.61	75.67	358.99	75.69	359	75.82	359.05
76.04	359.14	76.48	359.32	77.85	359.89	78.19	360	79.42	360.05
88.59	360.43	94.76	360.69	99.18	360.88	101.08	360.85	102.51	360.85
102.91	360.85	104.76	360.88	106.95	360.91	108.58	360.93	116.34	361.05
117.64	361.09	121.31	361.19	121.66	361.2	125.64	361.3	128.31	361.38
128.41	361.38	128.51	361.38	128.61	361.39				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	23.65	.026	78.19	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23.65	78.19	145.12	144.81	144.93	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 38

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	360.29	.1	360.29	.2	360.29	.4	360.29	3.17	360.31
3.83	360.31	3.86	360.31	3.89	360.31	5.93	360.32	6.17	360.32
6.3	360.32	6.43	360.33	7.5	360.33	20.4	360.33	21.74	360.42
21.77	360.41	24.96	359.34	26.23	358.92	34.09	356.3	37.75	355.08
43.38	353.2	47.8	351.73	48.47	351.73	49.93	351.73	50.75	351.73
51.8	351.73	52.46	351.73	53.29	351.73	54.75	351.73	55.8	351.73
58.75	352.71	76.25	358.54	78.87	359.42	82.91	360.76	82.92	360.77
84.83	360.78	86.05	360.79	100.41	360.87	103.23	360.91	115.86	361
120.61	361.06	120.71	361.06	120.81	361.06				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	20.4	.026	100.41	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
20.4	100.41	200	200	200	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 37

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	359.85	.1	359.85	.2	359.85	.4	359.85	4.67	359.87
6.32	359.88	20.4	359.89	22.77	359.97	23.4	359.97	24.52	359.98
24.82	359.98	24.85	359.98	46.95	352.61	51.41	351.12	51.42	351.12
51.48	351.12	51.71	351.12	52.08	351.12	52.96	351.12	55.42	351.12
55.48	351.12	56.07	351.12	59.41	351.12	59.42	351.12	59.48	351.14
63.86	352.6	64.88	352.94	87.4	360.45	87.43	360.45	100.41	360.53
104.24	360.59	106.88	360.61	106.91	360.61	120.41	360.72	120.71	360.72
120.81	360.72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	20.4	.026	100.41	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
20.4	100.41	200	200	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 36

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	359.76	.1	359.76	.3	359.76	.4	359.76	15.85	359.88
18.89	359.91	19.05	359.91	19.26	359.91	19.57	359.91	20.4	359.91
20.46	359.92	21.02	359.92	22.36	359.93	22.52	359.93	23.08	359.94
23.37	359.94	23.38	359.94	23.92	359.94	47.61	352.05	52.21	350.52
52.86	350.52	54.98	350.52	56.2	350.52	56.21	350.52	56.86	350.52
56.98	350.52	59.06	350.52	60.21	350.52	65.11	352.15	73.31	354.88
91.17	360.6	100.41	360.7	120.51	360.91	120.61	360.91	120.71	360.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	20.4	.026	91.17	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
20.4	91.17	200	200	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 35

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	359.5	.1	359.51	.2	359.51	.4	359.51	12.79	359.61
20.4	359.67	22.65	359.69	23.42	359.7	23.56	359.7	44.56	352.7
48.13	351.51	52.93	349.91	53.59	349.91	55.21	349.91	56.36	349.91
56.93	349.91	57.59	349.91	58.89	349.91	59.45	349.91	60.93	349.91
66.06	351.62	100.75	360.39	120.88	360.71	120.98	360.71	121.08	360.72
121.18	360.72								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	20.4	.026	100.75	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
20.4	100.75	200	200	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 34

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	359	.1	359	.2	359	.3	359	.4	359
5.22	359	6.61	359	7.85	359	8.55	359	15.3	359
15.53	359	15.84	359	22.65	359.07	24.2	359.15	24.39	359.16
29.25	357.54	43.12	352.92	53.96	349.3	54.48	349.3	54.61	349.3
57.96	349.3	58.61	349.3	58.72	349.3	61.96	349.3	67.34	351.1
71.37	352.44	95.13	360.36	95.88	360.37	127.25	360.94	127.68	360.94
130.91	361	130.98	361	131.08	361.01				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	22.65	.026	95.88	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
22.65	95.88	200	200	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 33

INPUT

Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	359	.1	359	.2	359	.3	359	.4	359
15.09	359	15.14	359	17.62	359	18.49	359	19.02	359
22	359	22.2	359	23	359	23.33	359	23.51	359
23.57	359	48.82	350.58	49.44	350.38	51.86	349.57	52.78	349.26
53.23	349.11	53.5	349.03	54.48	348.7	54.62	348.7	55.14	348.7
55.22	348.7	58.48	348.7	59.14	348.7	60.18	348.7	61.77	348.7
62.48	348.7	68.16	350.59	71.68	351.76	75.1	352.9	97.39	360.33
97.65	360.34	105.37	360.48	109.53	360.56	130.71	360.96	130.81	360.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	23	.026	97.65	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
23	97.65	200	200	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 32

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	358.96	.1	358.96	.2	358.96	.3	358.96	6.49	358.98
7.19	358.98	13.66	359	15.8	359	17.5	359	17.87	359.01
20.4	359.02	21.67	359.06	21.89	359.06	22.18	359.06	55.11	348.09
55.77	348.09	58.54	348.09	58.7	348.09	59.11	348.09	59.77	348.09
63.11	348.09	93.63	358.26	99.63	360.26	110.84	360.42	128.52	360.77
130.84	360.82	130.94	360.82	131.04	360.82	131.14	360.82	131.24	360.82

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	20.4	.026	110.84	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
20.4	110.84	210.32	198.97	186.62	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 31

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	358.95	.1	358.95	.2	358.95	.3	358.95	.4	358.95

```
    4.36  358.97    4.48  358.97    7.74  358.97   20.33  358.99   20.79  358.99
   21.12  358.99   21.22  358.99   22.92  358.99   25.61     359   26.39     359
   26.46     359   26.69     359   26.73     359   26.84     359   26.95  359.01
   27.48  359.01   27.69  359.02   46.76  359.27   49.06   359.3   56.97  359.33
   57.72  359.44    58.1  359.45   78.33  352.71      94  347.48   95.57  347.48
      98  347.48  100.99  347.48  101.35  347.48     102  347.48  108.54  349.66
  124.29  354.91  142.83  360.91  144.86  360.96  145.71  360.98  146.69     361
  147.24  361.02  147.34  361.02  167.28  361.73  167.38  361.74  167.48  361.74
  167.58  361.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035   56.97    .026  142.83    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         56.97  142.83           148.65  159.48  174.49             .1       .3

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 30

INPUT
Description: Phase 2 construction, point of affluence #2
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  359.52      .1  359.52      .2  359.52      .3  359.52   17.44  359.66
   17.91  359.63    20.1  359.78    20.4   359.8   22.64  359.95   24.13  360.03
   24.19  360.04   24.24  360.04    24.3  360.04   28.37  360.11   53.93  352.11
   60.86   349.8   65.86  348.13   69.22  347.01   69.26     347   69.32     347
   70.07     347   71.75     347   73.22     347   73.26     347   74.06     347
   75.86     347   77.22     347   77.26     347   77.31  347.01    85.3  349.68
   86.32  350.02  109.71  357.82  109.79  357.84  111.52  358.42  111.88  358.54
   129.1  364.28  131.27     365  132.33  365.06  136.22  365.25   136.8  365.28
  137.35  365.31  138.57  365.37  139.32  365.41  140.74  365.48  142.29  365.56
  144.94  365.73  145.81  365.78  147.45   365.9  148.75  365.99  148.88     366
  149.75  366.02  149.79  366.02  149.91  366.03  150.47  366.03  151.44  366.03
  152.13  366.04  152.67  366.05  153.43  366.05  154.17  366.04  154.23  366.04
   158.6  366.08  159.36  366.08  160.86  366.08  164.92  366.06  167.31  366.05
  169.22  366.04  170.53  366.04  172.84  366.03  174.93  366.02  175.29  366.02
  175.39  366.02  175.49  366.02  175.59  366.02  175.69  366.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035   28.37    .026  136.22    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         28.37  136.22           203.91   215.5  230.32             .1       .3

CROSS SECTION


RIVER: Proposed Channel
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REACH: Proposed Channel RS: 29

INPUT
Description:
Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	358	.1	358	.2	358	.3	358	.4	358
.56	358	3.67	358	8.54	358	8.68	358	9.26	358
10.24	358	10.37	358	11.32	358	11.92	358.01	12.16	358.01
12.28	358.01	12.95	358.01	20.4	358.17	20.46	358.17	21.82	358.2
22.23	358.21	23.18	358.22	23.32	358.23	23.38	358.23	30.7	358.26
30.91	358.29	31.35	358.29	37.8	356.14	49.59	352.22	61.32	348.31
67.2	346.35	68.62	346.35	71.2	346.35	74.55	346.35	75.2	346.35
89.98	351.27	91.71	351.85	93.82	352.55	96.8	353.55	100.8	354.88
105.67	356.5	108.41	357.41	112.7	358.85	115.62	359.59	126.59	359.68
126.78	359.68	128.37	359.69	129.26	359.78	129.42	359.71	129.96	359.72
130.15	359.72	130.4	359.73	131.14	359.75	134.32	359.82	142.43	360
142.72	360	142.74	360	142.9	360	143.04	360	143.12	360
143.24	360	144.27	360.01	145.4	360.03	145.5	360.03	145.6	360.04
145.7	360.04	145.8	360.04						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	30.7	.026	115.62	.035

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
30.7	115.62	224.36	224.72	224.36	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 28

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	357.61	.1	357.61	.2	357.61	.3	357.61	.4	357.61
21.35	357.58	30.24	357.64	30.43	357.65	30.93	357.66	51.18	350.91
61.06	347.62	61.64	347.42	66.92	345.66	67.6	345.66	70.26	345.66
70.92	345.66	71.73	345.66	74.26	345.66	74.92	345.66	81.2	347.76
105.86	355.98	114.06	358.46	116	358.5	117.78	358.53	122.09	358.59
126.95	358.67	145.7	359.08	145.8	359.09	145.9	359.09	146	359.09
146.1	359.09								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	30.24	.026	114.06	.035

Bank Sta: Left	Right	Lengths: Left Channel	Channel	Right	Coeff Contr.	Expan.
30.24	114.06	199.82	197.88	198.18	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel   RS: 27

INPUT
Description:
Station Elevation Data   num=   40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	357.01	.1	357.02	.2	357.02	.3	357.02	.4	357.02
13.37	357.27	13.75	357.27	20.4	357.38	22.34	357.41	23.52	357.42
23.73	357.42	28.41	357.43	28.63	357.42	29.18	357.42	60.22	347.08
66.29	345.06	67.79	345.06	68.8	345.06	69.63	345.06	70.29	345.06
72.21	345.06	73.05	345.06	73.63	345.06	74.29	345.06	80.52	347.13
101.84	354.24	113.22	357.76	117.59	357.81	119.79	357.82	123.61	357.84
123.8	357.84	124.12	357.85	126.38	357.86	126.6	357.87	129.66	357.9
131.27	357.9	137.91	357.93	145.51	357.97	145.6	357.97	145.7	357.97

Manning's n Values   num=   3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	28.41	.026	113.22	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28.41	113.22	200.46	198.55	198.87	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel   RS: 26

INPUT
Description:
Station Elevation Data   num=   39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	356.21	.1	356.22	.2	356.22	.3	356.22	.4	356.22
20.23	356.64	20.4	356.64	20.47	356.64	20.49	356.64	20.5	356.64
20.78	356.65	20.79	356.65	28.25	356.65	29.03	356.72	35.09	354.71
39.11	353.36	65.85	344.45	67.55	344.45	68.87	344.45	69.2	344.45
69.85	344.45	70.87	344.45	73.2	344.45	73.85	344.45	106.38	355.29
109.78	356.42	113.61	357.42	124.06	357.51	125.4	357.52	125.63	357.52
127.41	357.53	127.48	357.53	128.22	357.54	128.26	357.54	131.46	357.57
137.49	357.62	137.59	357.62	137.69	357.62	137.79	357.63		

Manning's n Values   num=   3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	28.25	.026	113.61	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28.25	113.61	199.32	197.75	200.13	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 25

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	356.07	.1	356.07	.2	356.07	.3	356.07	.4	356.07
6.44	356.11	7.65	356.26	12.2	356.02	14.62	355.88	17.37	356.09
19.26	356.23	19.33	356.22	19.49	356.22	19.83	356.23	19.89	356.23
19.92	356.23	29.96	356.27	30.45	356.34	30.98	356.34	39.1	353.63
50.73	349.76	62.43	345.86	68.48	343.84	68.5	343.84	70.89	343.84
71.82	343.84	72.48	343.84	75.82	343.84	76.22	343.84	76.47	343.84
76.48	343.84	76.48	343.85	78.89	344.65	80.48	345.18	82.89	345.98
97.36	350.8	117.25	357.15	117.99	357.16	131.73	357.18	132.95	357.18
134.55	357.18	136.65	357.19	136.89	357.24	148.33	357.35	154.58	357.4
154.68	357.4	154.78	357.4	154.88	357.4	154.98	357.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	29.96	.026	117.25	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
29.96	117.25	168.67	167.76	167.64	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 24

INPUT
Description:
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	355.69	.1	355.68	.2	355.68	.3	355.67	.4	355.66
17.62	354.35	20.44	354.26	21.92	354.2	29.81	353.6	32.27	353.48
32.5	353.47	32.58	353.47	34.24	353.39	34.82	353.36	34.91	353.35
35.3	353.33	35.35	353.33	46.42	351.02	55.11	348.12	57.1	347.46
69.49	343.33	72.47	343.33	73.49	343.33	75.37	343.33	75.84	343.33
76.47	343.33	76.6	343.33	77.49	343.33	98.04	350.18	99.38	350.63
115.02	355.84	115.95	355.86	117.3	355.88	117.33	355.88	117.35	355.88
117.8	355.89	117.9	355.89	118.15	355.9	119.38	355.92	119.5	355.92
119.79	355.92	134.96	355.97	147.98	356.06	153.02	356.09	155.72	356.12
168.13	356.2	168.23	356.2	168.33	356.2	168.43	356.2	168.53	356.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	46.42	.026	115.95	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
46.42	115.95	213	204.72	192.9	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 23

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	353.18	.2	353.17	.3	353.17	10.35	352.81	20.4	352.6
21.84	352.57	35.34	352.57	35.51	351.78	36.46	351.72	39.1	350.84
41.04	350.2	63.51	342.71	64.17	342.71	64.65	342.71	67.51	342.71
68.17	342.71	71.51	342.71	77.72	344.77	93.65	350.08	110.52	355.36
139.97	356.28	140.83	356.31	142.1	356.35	146.16	356.47	149.22	356.55
149.64	356.55	161	356.68	163.26	356.7	163.46	356.71	163.56	356.71
163.66	356.71								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	35.34	.026	110.52	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
35.34	110.52	180.58	180.39	178.93	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 22

INPUT
Description:
Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	350.96	.1	350.95	.23	350.93	.36	350.92	.49	350.9
.62	350.88	5.79	350.21	16	348.87	17.13	348.77	17.5	348.77
27.1	348.87	29.64	348.89	30	348.9	42.95	348.9	49.18	350.28
69.03	348.82	70.87	348.2	76.44	346.35	78.51	345.65	82.53	344.32
83.38	344.03	83.5	343.99	83.6	343.96	83.71	343.92	83.72	343.92
84.24	343.74	87.74	342.58	88.18	342.43	88.59	342.3	88.92	342.19
88.93	342.18	89	342.16	91.82	342.16	92.74	342.16	93	342.16
96.02	342.16	96.75	342.16	97	342.16	99.2	342.89	99.63	343.03
101.49	343.65	109.04	346.17	134.96	354.3	144.59	354.34	145.9	354.57
152.92	354.69	153.21	354.7	154.55	354.72	159.41	354.81	170.8	354.91
174.46	354.94	175.81	354.9	181.12	355.03	187.47	355.18	190.4	355.25
190.41	355.25	192.15	355.29	204.68	355.64	207.3	355.74	207.34	355.74
207.43	355.74	207.56	355.75	207.69	355.75				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	69.03	.026	134.96	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69.03	134.96	144.57	143.8	144.85	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 21

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	354.17	.3	354.16	7.02	353.86	20.51	352.93	24.12	352.68
33.9	351.56	39.17	350.99	40.46	350.85	60.61	344.14	63.98	343.01
67.85	341.72	68.51	341.72	69.67	341.72	71.49	341.72	71.85	341.72
72.51	341.72	75.85	341.72	77.99	342.43	80.12	343.14	92.79	347.37
96.43	348.58	97.65	348.65	98.83	348.68	107.67	348.85	128.95	349.84
137.51	350.49	137.67	350.5	157.86	352	157.96	352	158.06	352.01
158.16	352.02	158.26	352.03						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	39.17	.026	97.65	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39.17	97.65	137.33	145.29	153.36	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 20

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	353.65	.1	353.65	4.38	353.69	25.67	352.33	26.57	352.27
55.16	348.84	58.97	348.37	59.62	348.35	66.26	346.46	71.33	344.77
72.43	344.4	81.82	341.28	82.97	341.28	83.5	341.28	83.77	341.28
84.47	341.28	85.82	341.28	87.75	341.28	88.69	341.28	89.82	341.28
99.36	344.46	100.61	344.87	115.53	349.25	125.94	350.92	128.64	351.29
130.66	351.57	135.33	352.21	137.65	352.53	155.46	353.41	155.56	353.41
155.66	353.42	155.76	353.42						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	59.62	.026	115.53	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
59.62	115.53	164.3	152.27	149.67	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 19

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	353.01	.1	353.01	.23	353	.35	353	.48	352.99
.6	352.99	11.02	352.62	11.54	352.61	21.55	352.25	23.12	352.2
26.34	352.5	29	352.75	29.42	352.78	37.42	352.69	46.95	352.3
57.69	351.86	68.89	351.45	75.2	351.21	90.18	349.11	90.34	349.08
105.37	347.05	106.77	346.58	110.31	345.4	114.64	343.96	124.08	340.81
127.12	340.81	128.08	340.81	130.38	340.81	130.39	340.81	131.12	340.81
132.08	340.81	134.18	341.51	135.39	341.91	136.74	342.36	140.4	343.58
142.93	344.42	146.66	345.67	147.8	345.71	148.95	345.75	149.83	345.77
153.09	345.84	153.87	345.91	159.72	346.45	161.36	346.6	161.47	346.61
162.46	346.69	163.14	346.74	163.15	346.75	164.99	346.9	166.54	347.02
168.65	347.19	176.32	348	177.01	348.07	177.02	348.07	185.99	349.01
201.95	350.68	202.07	350.69	202.2	350.71	202.32	350.72	202.45	350.73
202.55	350.74								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	105.37	.026	159.72	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
105.37	159.72	125.2	136.45	142.49	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 18

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	351.7	.1	351.69	.2	351.69	.3	351.69	.4	351.68
.5	351.68	15.09	351.12	20.9	350.86	31.99	350.35	58.74	347.2
58.95	347.19	80.77	345.24	80.81	345.23	82.57	344.65	84.04	344.16
91.31	341.75	94.53	340.68	95.38	340.4	95.39	340.4	97.23	340.4
98.25	340.4	99.4	340.4	100.48	340.4	102.28	340.4	102.33	340.4
103.04	340.4	103.42	340.4	104.48	340.75	107.88	341.88	108.48	342.08
110.5	342.75	113.74	343.51	143.42	345.96	163.67	348.99	163.77	349
163.87	349.02	163.97	349.03	164.58	349.12	165.55	349.27	165.91	349.29
196.08	351.14	210.86	351.56	225.61	351.93	225.71	351.94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	80.77	.026	113.74	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80.77	113.74	98.1	92.44	88.69	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 17

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	351.82	.1	351.82	.22	351.82	.34	351.82	3.38	351.8
4.99	351.8	6.33	351.37	9.79	350.73	14.66	350.23	26.11	349.48
28.92	349.3	31.43	349.14	49.02	347.29	82	344.58	83.6	343.68
89.14	343.36	89.67	343.33	90.27	343.13	97.1	340.85	97.48	340.73
98.35	340.43	99.31	340.12	102.21	340.12	103.31	340.12	104.82	340.12
106.98	340.12	107.17	340.12	107.31	340.12	107.38	340.14	107.57	340.2
110.13	341.06	113.81	342.28	114.37	342.47	125.59	342.84	137.4	344.61
138.33	344.75	146.97	346.04	147.45	346.11	158.22	347.51	180.48	348.6
190.56	349.09	211.07	349.93	214	350.06	214.13	350.06	214.23	350.07

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	89.67	.026	114.37	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
89.67	114.37	107.38	99.59	92.13	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 16

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	351.42	.1	351.41	.2	351.4	.3	351.39	4.78	350.95
9.29	350.58	9.49	350.56	16.47	349.98	16.68	349.97	29.75	348.6
41.79	347.35	53.08	346.17	55.33	345.93	62.95	345.25	64.84	345.12
64.98	345.11	65.02	345.11	65.1	345.1	65.27	345.09	69.16	344.82
70.13	344.75	71.19	344.68	77.24	344.26	79.29	344.11	85.84	343.65
88.49	343.47	91.09	343.28	99.73	343	99.96	342.66	100.3	342.55
101.87	342.03	101.87	342.02	101.9	342	101.92	341.99	101.97	341.98
101.98	341.98	102.7	341.74	103.31	341.53	103.63	341.43	104.92	341
104.97	340.99	105.09	340.95	106.38	340.52	107.94	340	107.96	340
108.51	339.81	111.11	339.81	112.51	339.81	114.41	339.81	116.51	339.81
116.52	339.81	116.86	339.93	117.08	340	118.38	340.43	119.63	340.85
120.07	341	120.1	341.01	121.95	341.62	122.84	341.92	123.09	342
123.53	342.15	128.55	342.53	130.79	342.71	131.6	342.77	132.2	342.82
141.36	343.23	146.76	343.48	147.03	343.49	147.29	343.51	147.51	343.52
147.8	343.53	147.86	343.53	147.93	343.54	148.24	343.55	148.62	343.57
148.98	343.58	152.6	343.75	156.17	344.04	184.47	346.34	186.43	346.51

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   186.8  346.53  187.71   346.6   223.7  348.96   226.7  349.16  227.17  349.19
  228.97  349.28  239.25  349.84  239.94  349.88  257.57  351.05   269.3  351.62
  278.67  351.98  278.77  351.99  278.87  351.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035   99.73    .026  123.53    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         99.73  123.53             32.36   29.69   29.39             .1       .3

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 15

INPUT
Description:
Station Elevation Data    num=     109
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  350.88      .1  350.88      .2  350.88      .3  350.87      .4  350.87
      .6  350.87    9.42  350.59    9.47  350.59    19.4  349.62   19.65   349.6
   19.83  349.58   20.54  349.53    20.6  349.52   20.85   349.5   21.62  349.43
   28.03  348.86   28.75   348.8   28.76  348.79   29.84   348.7   29.85   348.7
   34.12  348.32   44.62  347.38   71.47  344.99   71.57  344.98   74.89  344.75
   75.23  344.73   76.83  344.62    77.4  344.58   79.51  344.43   96.08     342
   96.61  341.91   97.78  341.72   98.02  341.68   99.66   341.4  101.11  341.16
  102.08     341  102.28  340.97  102.54  340.92  103.99  340.68  104.11  340.66
  107.06  340.17  107.67  340.07  108.08     340   108.2  339.98  108.51  339.93
  108.56  339.92  109.75  339.72  109.77  339.72  109.86  339.72  110.62  339.72
   111.7  339.72  112.82  339.72  115.86  339.72  119.36  339.72  119.75  339.72
  119.78  339.72  120.59  339.72  120.85  339.72   121.4  339.72  122.57  339.72
  123.06  339.72  124.19  339.72  129.75  339.72  129.76  339.72  129.85  339.74
  130.99  339.93  131.43     340  132.31  340.15  132.63   340.2  132.99  340.26
  133.87  340.41  135.22  340.63  135.27  340.64  135.49  340.68  136.78  340.89
  137.02  340.93   137.2  340.96  137.31  340.98  143.43     342  145.83   342.4
  146.67  342.54  149.55  343.02  150.61  343.07  152.88  343.18  161.81   343.6
  162.14  343.62  168.66  344.17  168.67  344.17  172.68   344.5  172.83  344.51
   172.9  344.52  175.06   344.7  176.12  344.79  182.14  345.19   182.2  345.19
  197.27   346.2  198.13  346.27  209.79  347.15   222.8  348.13  225.94  348.35
   231.3  348.71  232.06  348.76  236.93   349.1  237.34  349.12  242.67  349.42
  243.84   349.5  248.47  349.81  269.17  351.22  284.24  351.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035   79.51    .026  143.43    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         79.51  143.43             29.84   29.08    29.9             .1       .3

CROSS SECTION
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RIVER: Proposed Channel
REACH: Proposed Channel RS: 14

INPUT
Description:
Station Elevation Data num= 142

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	350.48	.1	350.48	.2	350.47	.3	350.47	.4	350.47
3.87	350.36	7.47	350.25	7.57	350.24	16.29	349.97	16.44	349.97
18.18	349.8	18.38	349.78	33.82	348.5	33.92	348.49	42.82	347.75
42.92	347.74	46.62	347.44	53.51	346.86	53.61	346.86	54.96	346.74
56.33	346.63	70.54	345.37	70.66	345.36	75.48	344.93	75.5	344.92
90.24	343.66	91.51	343.55	94.77	343.27	94.78	343.27	95.5	343.21
95.51	343.21	104.3	342.45	105.07	342.39	106.59	342.26	106.68	342.25
106.69	342.25	108.05	342.13	108.44	342.1	109.18	342.04	110.32	341.94
110.44	341.93	110.71	341.91	110.89	341.89	111.66	341.84	115.11	341.74
116.12	341.71	116.18	341.71	116.25	341.71	117.07	341.31	117.69	341
117.99	340.85	118.45	340.63	119.63	340.05	119.68	340.03	119.73	340
119.78	339.98	119.79	339.97	119.89	339.92	120.12	339.81	120.26	339.74
120.48	339.63	122.47	339.63	122.48	339.63	124.07	339.63	124.17	339.63
125.03	339.63	126.48	339.63	130.47	339.63	130.49	339.63	131.93	339.63
132.42	339.63	132.48	339.63	133.13	340	134.1	340.19	134.89	340.35
134.9	340.36	135.34	340.44	135.35	340.45	138.07	341	138.1	341
140.31	341.1	144.68	341.43	144.71	341.43	144.78	341.44	144.81	341.44
146.03	341.53	146.14	341.54	146.24	341.55	147.61	341.65	157.75	342.39
157.85	342.39	158.75	342.46	158.85	342.46	159.64	342.52	159.77	342.53
159.83	342.54	159.84	342.54	161.67	342.67	161.75	342.68	169.43	343.23
169.5	343.24	169.55	343.24	169.76	343.26	169.78	343.26	169.91	343.27
170.86	343.33	170.91	343.33	171.01	343.34	171.23	343.35	189.3	344.54
190.19	344.6	191.91	344.71	192.01	344.72	192.3	344.74	194.78	344.91
196.76	345.04	196.85	345.04	207.08	345.73	207.36	345.75	210.78	346.01
210.79	346.01	211.51	346.06	211.67	346.07	211.77	346.08	215.77	346.38
215.87	346.39	221.7	346.83	223.17	346.95	248.2	348.89	248.57	348.92
249.52	348.99	258.89	349.71	258.99	349.72	268.28	350.43	277.21	351.11
285.37	351.67	312.52	353	319.79	353.28	328.96	353.59	335.32	353.77
335.42	353.77	335.52	353.78						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	116.25	.026	138.07	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
116.25	138.07	58.57	59.23	59.39	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 13

INPUT
Description:
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
       0  350.21      .1  350.21      .2   350.2      .3   350.2      .4   350.2
      .5  350.19   16.32  349.67    22.8  349.42   24.65  349.53   24.75  349.54
   30.51  349.34   68.32  347.05   83.88  346.03   88.43  345.61      92  345.28
   95.96  344.91   99.35   344.6   99.74  344.56  101.15  344.44  109.19  343.79
  109.36  343.77  113.82  343.41  117.65  343.09   122.5   342.7  122.89  342.66
  130.43   341.9  131.49  341.79   132.3  341.71  132.92  341.64  133.57  341.58
  133.86  341.55  134.35   341.5  135.01  341.43  135.07  341.43  135.13  341.42
  136.06  341.36  136.08  341.36  136.35  341.33  136.61   341.3  137.42  341.03
  138.83  340.56  142.16  339.45  143.21  339.45  144.07  339.45  145.11  339.45
  146.16  339.45  147.67  339.45  148.39  339.45  149.09  339.45  150.16  339.45
  150.46  339.55  150.77  339.66  152.03  340.07  152.96  340.39  154.47   340.3
  172.27  340.48  212.09  341.08  223.71  342.75  223.76  342.75  230.87  343.62
  244.29  345.25  259.72  347.35  265.35  347.51  296.93  348.44     306  348.71
  309.63  349.15  313.96   349.6   316.8  349.89  323.34  350.11  323.44  350.11
  323.54  350.11  335.96  350.52  341.39     350  366.97   352.6   370.2  353.51
   370.3  353.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035  136.61    .026  152.03    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        136.61  152.03             71.67   74.84   71.63             .1       .3

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 12

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  350.81      .1   350.8      .2  350.79     .46  350.78      .8  350.76
     3.1  350.61    3.51  350.59    4.75  350.52    4.82  350.51    5.52  350.46
    5.97  350.42    6.89  350.36    7.38   350.2   24.87  349.55   24.91  349.55
   25.03  349.54      26  349.51   26.64  349.48   27.72  349.43   27.84  349.42
   28.18  349.41   29.23  349.36   30.89  349.28   31.85  349.24   32.75  349.18
   49.54  348.12   70.05  346.84   88.59  345.61  116.84  343.75  121.65  343.49
  126.25  343.18  137.11  342.31  161.42  340.32  162.29  340.03  164.72  339.22
  167.79  339.22  168.72  339.22  171.79  339.22  172.72  339.22  174.06  339.67
  174.74   339.9  183.16  340.28  183.18  340.28  191.77  340.68  193.95  340.78
   207.1     344  207.12  344.02  207.33  344.13  207.47   344.2  207.49  344.21
  207.51  344.22  207.55  344.24  207.59  344.26  207.71  344.32  207.76  344.35
  208.21  344.58  208.74  344.86  208.87  344.93  209.79  345.41  211.06  346.07
  211.09  346.08   211.9   346.5  213.26  347.21  216.74  349.02  218.09  349.54
   218.1  349.55  218.17  349.57  218.22  349.59  218.44  349.68  220.99  350.67
  222.04  351.08  225.17  352.29  226.14  352.67   226.4  352.77  226.52  352.82
   227.1  353.04  227.26   353.1  227.29  353.11  227.43  353.17  227.44  353.18
   227.5   353.2  227.64  353.25  227.65  353.26  228.63  353.27  232.61  355.18
  267.49  348.54  267.56  348.53  285.97  350.87  287.63   350.8  287.64   350.8
  287.78  350.79  289.83  350.77  295.43  351.12   295.6  351.13  295.73  351.14
  295.86  351.15  295.96  351.15  296.06  351.16
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Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	161.42	.026	174.74	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
161.42	174.74	105.29	105.72	114.8	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 11

INPUT
Description:
Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	350.39	.1	350.39	.3	350.37	.4	350.37	5.69	350.01
5.9	350	6.15	349.99	7.06	349.97	7.14	349.97	7.33	349.95
8.47	349.88	8.48	349.88	13.84	349.51	13.85	349.51	13.98	349.51
17.76	349.61	20.24	349.58	20.49	349.57	21.46	349.52	22.84	349.44
23.02	349.42	40.52	347.76	49.72	346.89	57.39	346.23	59.52	346.08
106.51	342.68	106.52	342.68	108.44	342.54	109.72	342.46	110.78	342.4
110.79	342.4	111.85	342.33	117.47	341.97	119.99	341.81	121.76	341.69
124.28	341.53	128.15	341.28	132.57	341	134.77	340.85	146.88	340.07
151.8	339.75	153.05	339.67	155.32	339.52	156.03	339.48	156.04	339.48
160.95	339.16	164.24	338.95	164.54	338.93	165.37	338.88	165.64	338.86
166.2	338.86	166.62	338.86	166.7	338.86	166.75	338.88	166.83	338.88
168.66	338.88	168.67	338.88	169.22	338.88	169.44	338.88	169.71	338.88
169.74	338.88	169.89	338.88	173.87	338.88	174.03	338.88	174.04	338.88
174.76	338.88	174.79	338.88	177.64	338.88	180.91	338.88	180.92	338.88
182.23	338.88	182.77	338.88	182.81	338.87	182.82	338.87	185.01	338.92
185.57	338.94	185.58	338.94	185.9	338.95	187.28	339.13	187.88	339.21
188.38	339.27	188.72	339.32	192.77	339.84	192.86	339.85	192.88	339.86
192.91	339.86	197.66	340.45	241.86	345.9	254.65	346.98	254.84	347
278.67	349.29	281.75	349.58	284.81	349.87	290.1	350.26	290.46	350.29
296.08	351.08	296.86	351.12	298.14	351.19	298.26	350.93	298.87	350.95
299.63	350.98	299.64	350.98	299.72	350.98	299.82	350.98	299.91	350.99
300.01	350.99	300.11	350.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	164.54	.026	187.28	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
164.54	187.28	96.08	103.13	116.02	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 10

INPUT
Description:
Station Elevation Data num= 162

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	352.13	.1	352.13	2.67	351.97	5.38	351.69	7.59	351.49
10.36	351.27	12.62	351.11	14.24	350.88	15.48	350.72	16.49	350.58
20.63	349.21	24.56	349.64	26.36	349.84	29.92	349.79	30.02	349.79
30.13	349.79	30.24	349.79	30.36	349.79	49.08	349.54	49.27	349.53
52.29	349.37	52.3	349.37	52.49	349.36	52.81	349.34	64.95	348.49
85.98	346.89	85.99	346.88	88.41	346.7	123.91	344.42	123.92	344.42
131.35	343.68	131.36	343.68	163.24	339.66	163.25	339.66	170.46	338.75
171.83	338.57	179.43	338.52	180.7	338.14	180.71	338.14	181.09	338
181.12	338	182.86	338	183.06	338	185.4	338	185.6	338
189.44	338	189.45	338	189.54	338	190.84	337.99	191.14	337.98
193.73	337.97	194.44	337.97	194.5	337.97	194.97	337.97	195.03	337.97
195.29	337.98	195.43	337.98	196.37	337.98	196.38	337.98	196.42	337.98
196.82	337.99	196.91	337.99	196.92	337.99	196.98	337.99	197.26	337.99
197.27	337.99	197.28	337.99	197.45	337.99	197.49	337.99	198.18	338
198.19	338	198.5	338	200.73	338	202.3	338	204.58	338
206.28	338	206.46	338	206.49	338	206.91	338.15	213.51	338.38
214.83	338.42	216.15	338.47	218.61	338.55	223.38	338.58	227.57	338.61
228.92	338.62	228.93	338.62	228.94	338.62	229.92	338.63	231.24	338.64
231.98	338.65	232.23	338.66	232.28	338.66	232.36	338.66	232.42	338.66
232.58	338.67	232.83	338.67	232.87	338.68	234.99	338.74	235.15	338.75
235.49	338.76	235.5	338.76	235.9	338.77	236.22	338.78	236.23	338.78
236.44	338.81	239.47	339.23	242.08	339.58	244.07	339.86	245.65	340.07
246.66	340.21	246.92	340.24	247.98	340.35	248.86	340.45	249.62	340.53
250.27	340.6	261.34	341.8	269.78	342.71	276.6	342.92	290.86	343.38
296.48	343.55	297.71	343.59	300.65	343.69	307	343.89	310.93	344.05
323.09	344.3	335.56	344.71	335.57	344.71	348.8	345.14	355.09	345.34
355.1	345.34	368.7	345.79	374.37	346.07	374.38	346.07	396.87	347.31
405.65	348.81	407.73	349.17	409.99	349.35	411.29	349.45	412.2	349.52
415.69	349.8	430.74	350.97	430.75	350.97	431.33	350.89	432.36	350.95
434.59	351.12	434.6	351.12	435.89	351.28	436.75	351.35	439.57	351.74
440.92	352	440.93	352	444.7	352.44	446.01	352.55	446.98	352.63
447.37	352.67	447.83	352.73	453.13	353.3	459.2	353.88	459.48	353.92
459.58	353.94	459.68	353.95						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	179.43	.026	206.91	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
179.43	206.91	101.74	100.81	109.13	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 9

INPUT
Description:
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	350.14	.1	350.14	.2	350.14	.3	350.14	.4	350.14
.95	350.13	2.74	350.08	2.75	350.08	3.22	350.07	6.93	350.03
7.04	350.03	7.49	350.02	7.77	350.02	8.06	350	10.51	349.05
10.87	348.72	11.77	348.82	11.81	348.82	21.97	349.94	22.22	349.94
22.3	349.94	22.37	349.94	23.19	349.93	25.12	349.92	25.58	349.86
26.04	349.7	26.47	349.84	45.14	348.6	52.06	348.14	52.94	348.08
58.25	347.73	60.21	347.6	60.26	347.52	60.84	347.51	65.06	347.42
66.38	347.28	66.51	347.26	68.97	347.01	83.69	345.91	86.66	345.68
90.76	345.38	94.2	345.12	95.93	344.99	96.54	344.94	97.22	344.89
97.23	344.89	97.72	344.85	98.96	344.76	101.58	344.56	101.86	344.54
102.67	344.48	103.43	344.42	103.77	344.4	107.25	344.14	107.26	344.14
108	344.08	109.33	343.99	110.46	343.91	111	343.88	112.92	343.75
113.21	343.73	114.34	343.65	116.3	343.46	118.57	343.24	118.58	343.23
118.71	343.22	120.44	343.05	124.54	342.47	124.68	342.45	126.71	342.16
128.71	341.88	130.09	341.69	132.48	341.35	133.21	341.25	133.21	341.24
135.43	340.93	135.5	340.92	136.82	340.73	140.15	340.26	142.38	339.95
144.43	339.66	144.9	339.59	145.17	339.55	146.24	339.4	147.52	339.22
155.97	338.03	158.22	337.71	159.92	337.47	162.71	337.4	162.72	337.07
162.74	337.07	163.58	337.07	227.42	337.07	227.43	337.4	232.84	337.59
233.09	337.63	233.84	337.73	234.05	337.77	234.95	337.89	236.18	338.06
237.57	338.26	240.96	338.74	263.76	341.95	291.64	344.43	294.99	344.73
302.21	345.48	303.51	345.62	305.51	345.83	306.09	345.89	307.95	346.01
340.28	348.22	345.12	348.7	346.09	348.79	346.1	348.79	352.94	349.47
352.95	349.47	352.98	349.48	366.76	350.71	366.86	350.72	366.97	350.73
367.07	350.74	367.17	350.74						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	162.74	.011	227.43	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
162.74	227.43	40.29	34.96	40.34	.1	.3

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 8

INPUT
Description:
Station Elevation Data num= 225

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	349.7	.1	349.7	.3	349.69	7.05	349.37	11.54	349.16
14.77	349.01	23.35	348.58	23.36	348.58	24.03	348.54	24.32	348.62
24.37	348.62	24.94	348.63	25.2	348.61	31.33	348.1	32.24	348.16
32.93	348.2	33.87	348.27	37.15	348.21	38.46	348.19	41.63	348.14
43.12	348.13	49.87	348.08	50.8	348.07	52.95	347.8	55.38	347.88
55.6	347.89	60.59	348.07	62.93	348.16	63.54	348.18	69.09	348.19
77.1	348.21	83.77	348.22	85.17	348.17	89.78	348.11	90.56	348.1
91.2	348.09	91.48	348.1	92.56	348.1	93.68	348.1	93.84	348.1
95.38	348.1	96.44	348.11	97.29	348.11	98.54	348.11	99.7	348.12
101.67	348.13	106.89	347.99	107.09	347.98	108.61	347.94	115.42	347.91

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  116.89  347.91  118.68   347.9   122.7  347.89  122.73  347.89  124.38  347.83
  126.31  347.77  127.24  347.73  129.58  347.77  130.99  347.79  131.73  347.75
  132.06  347.73  132.28  347.72  132.52   347.7  135.58  347.45  137.05  347.32
   137.2  347.31  139.36  347.36  140.19  347.38   142.2  347.42  142.71  347.43
  143.39  347.45  144.62  347.47  146.66  347.52  146.76  347.52  146.86  347.52
  146.92  347.52  147.08  347.53   147.1  347.53  147.33  347.53   150.1  347.59
  150.93  347.61  151.28  347.62   152.8  347.65   153.1  347.66  155.24  347.71
  155.74  347.72  157.08  347.75  158.67  347.78  159.08  347.79  159.21  347.79
  162.07  347.85  162.46  347.86  162.61  347.87  165.06  347.92   165.7  347.93
  167.17  347.97  168.05  347.98  168.77     348  170.14  348.03  171.04  348.05
  171.17  348.05  171.85  348.07  173.97  348.11  174.94  348.13  175.18  348.14
  177.01  348.18  177.74   348.2  177.81   348.2  179.21  348.25  179.99  348.28
  180.03  348.28  180.23  348.33  181.14  348.35  181.64  348.36  182.15  348.37
  183.26  348.38  184.25   348.4  185.47  348.41  185.94  348.42  187.33  348.44
  187.37  348.44  188.91  348.46   189.3  348.47  189.39  348.47     190  348.63
  190.49  348.63  191.42  348.63  191.87  348.63  193.12  348.64  193.64  348.64
  196.93  348.65   197.8  348.66  199.45  348.67  199.72  348.79  200.24  349.02
  200.24  348.88  201.08  336.36  225.43  336.36  225.44  336.36  226.27  348.82
  226.27  349.02  227.13  348.91  227.28  348.69  227.32  348.69  227.52  348.69
  227.59  348.69  228.06  348.68   229.7  348.67  230.61  348.67  231.15  348.66
  232.52  348.65  233.14  348.65  234.29  348.61  234.51  348.61  235.32  348.58
  237.42  348.52  237.78  348.51  237.91  348.51  239.96  348.44  240.82  348.42
  240.95  348.41  243.49  348.34  243.98  348.32  244.98  348.29  245.19  348.29
  245.94  348.11  246.18  348.05  246.98  347.87  248.11   347.6  248.62  347.55
  248.89  347.52  251.61  347.23  252.35  347.16  252.95  347.09  254.38  346.94
   255.9  346.78  256.14  346.76  257.07  346.66  257.23  346.64  258.62  346.61
  258.85  346.61  259.81  346.59  259.98  346.58  261.17  346.56  261.78  346.56
  262.87  346.57  263.87  346.57  264.65  346.57   264.7  346.56  265.83  346.42
  266.27  346.36  267.12  346.26  267.43  346.22  267.81  346.17  268.35   346.1
  268.47  346.08   268.8  346.04  269.76  345.92   269.9  345.91  271.11   345.8
  271.42  345.77  282.69  344.74   284.5  344.57  284.72  344.56  286.54  344.39
  288.67  344.59  291.54  344.78  291.81   344.8  294.92  345.01  310.58  346.35
  311.25  346.41  323.26  347.52  324.77   347.5  328.06  347.45  334.93  347.35
  337.15  347.52  343.14  347.97  343.47     348  357.97  349.08  364.82  349.57
  367.18  350.07  369.28  350.26  369.38  350.27  369.48  350.28  369.58  350.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .011  200.24    .011  226.27    .011

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        200.24  226.27               26      26      26             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  207.08  209.25  346.36       T
  217.25  219.42  346.36       F

CULVERT


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 7.5

INPUT
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Description:
Distance from Upstream XS = 1
Deck/Roadway Width = 14
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	349.6	346.36	54.27	348	346.36	100.01	350	346.36
256.77	350	346.36	291.52	349.1	346.36	369.58	350.4	346.36

Upstream Bridge Cross Section Data
Station Elevation Data num= 225

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	349.7	.1	349.7	.3	349.69	7.05	349.37	11.54	349.16
14.77	349.01	23.35	348.58	23.36	348.58	24.03	348.54	24.32	348.62
24.37	348.62	24.94	348.63	25.2	348.61	31.33	348.1	32.24	348.16
32.93	348.2	33.87	348.27	37.15	348.21	38.46	348.19	41.63	348.14
43.12	348.13	49.87	348.08	50.8	348.07	52.95	347.8	55.38	347.88
55.6	347.89	60.59	348.07	62.93	348.16	63.54	348.18	69.09	348.19
77.1	348.21	83.77	348.22	85.17	348.17	89.78	348.11	90.56	348.1
91.2	348.09	91.48	348.1	92.56	348.1	93.68	348.1	93.84	348.1
95.38	348.1	96.44	348.11	97.29	348.11	98.54	348.11	99.7	348.12
101.67	348.13	106.89	347.99	107.09	347.98	108.61	347.94	115.42	347.91
116.89	347.91	118.68	347.9	122.7	347.89	122.73	347.89	124.38	347.83
126.31	347.77	127.24	347.73	129.58	347.77	130.99	347.79	131.73	347.75
132.06	347.73	132.28	347.72	132.52	347.7	135.58	347.45	137.05	347.32
137.2	347.31	139.36	347.36	140.19	347.38	142.2	347.42	142.71	347.43
143.39	347.45	144.62	347.47	146.66	347.52	146.76	347.52	146.86	347.52
146.92	347.52	147.08	347.53	147.1	347.53	147.33	347.53	150.1	347.59
150.93	347.61	151.28	347.62	152.8	347.65	153.1	347.66	155.24	347.71
155.74	347.72	157.08	347.75	158.67	347.78	159.08	347.79	159.21	347.79
162.07	347.85	162.46	347.86	162.61	347.87	165.06	347.92	165.7	347.93
167.17	347.97	168.05	347.98	168.77	348	170.14	348.03	171.04	348.05
171.17	348.05	171.85	348.07	173.97	348.11	174.94	348.13	175.18	348.14
177.01	348.18	177.74	348.2	177.81	348.2	179.21	348.25	179.99	348.28
180.03	348.28	180.23	348.33	181.14	348.35	181.64	348.36	182.15	348.37
183.26	348.38	184.25	348.4	185.47	348.41	185.94	348.42	187.33	348.44
187.37	348.44	188.91	348.46	189.3	348.47	189.39	348.47	190	348.63
190.49	348.63	191.42	348.63	191.87	348.63	193.12	348.64	193.64	348.64
196.93	348.65	197.8	348.66	199.45	348.67	199.72	348.79	200.24	349.02
200.24	348.88	201.08	336.36	225.43	336.36	225.44	336.36	226.27	348.82
226.27	349.02	227.13	348.91	227.28	348.69	227.32	348.69	227.52	348.69
227.59	348.69	228.06	348.68	229.7	348.67	230.61	348.67	231.15	348.66
232.52	348.65	233.14	348.65	234.29	348.61	234.51	348.61	235.32	348.58
237.42	348.52	237.78	348.51	237.91	348.51	239.96	348.44	240.82	348.42
240.95	348.41	243.49	348.34	243.98	348.32	244.98	348.29	245.19	348.29
245.94	348.11	246.18	348.05	246.98	347.87	248.11	347.6	248.62	347.55
248.89	347.52	251.61	347.23	252.35	347.16	252.95	347.09	254.38	346.94
255.9	346.78	256.14	346.76	257.07	346.66	257.23	346.64	258.62	346.61
258.85	346.61	259.81	346.59	259.98	346.58	261.17	346.56	261.78	346.56
262.87	346.57	263.87	346.57	264.65	346.57	264.7	346.56	265.83	346.42
266.27	346.36	267.12	346.26	267.43	346.22	267.81	346.17	268.35	346.1
268.47	346.08	268.8	346.04	269.76	345.92	269.9	345.91	271.11	345.8
271.42	345.77	282.69	344.74	284.5	344.57	284.72	344.56	286.54	344.39

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  288.67  344.59  291.54  344.78  291.81   344.8  294.92  345.01  310.58  346.35
  311.25  346.41  323.26  347.52  324.77   347.5  328.06  347.45  334.93  347.35
  337.15  347.52  343.14  347.97  343.47     348  357.97  349.08  364.82  349.57
  367.18  350.07  369.28  350.26  369.38  350.27  369.48  350.28  369.58  350.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .011  200.24    .011  226.27    .011

Bank Sta: Left   Right    Coeff Contr.   Expan.
        200.24  226.27            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  207.08  209.25  346.36       T
  217.25  219.42  346.36       F

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0   348.9  345.84      50     348  345.84  103.29     350  345.84
  253.18     350  345.84  354.33   349.4  345.84     387   349.1  345.84

Downstream Bridge Cross Section Data
Station Elevation Data    num=     286
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  349.24      .1  349.24     .19  349.23     .56  349.21    2.35  349.11
   11.22  348.67   13.87  348.53   16.49   348.4   18.01   348.8   21.34  348.87
   32.44  347.94   33.12  348.44   40.54  348.23   51.49  347.93   52.51   347.9
   55.48  347.86   56.27  347.84   66.99  347.69   75.71  347.56   76.42  347.54
   78.31  347.52    80.2  347.75   81.81  347.96   81.82  347.96   82.76  348.07
    89.1  348.73   90.32  348.85   93.71  349.06    94.7  349.12   96.05  349.14
   98.87  349.18  100.74   349.2  100.98   349.2  102.62  349.23  112.41  349.24
  118.17  349.25  123.88  349.27  125.19  349.26  127.45  349.24  130.23  349.22
  131.61  349.22  132.43  349.21  133.02  349.21  133.91   349.2  136.43  349.18
  137.54  349.18  137.63  349.18  137.75  349.17  139.74  349.16   141.4  349.15
  141.68  349.15  141.89  349.15  143.28  349.14  144.77  349.13   144.9  349.13
  145.07  349.13  146.16  349.12  146.17  349.12  146.63  349.12   147.7  349.11
  147.71  349.11  148.32  349.11  148.61   349.1  149.56   349.1  149.93   349.1
  150.05  349.09  151.05  349.09  151.41  349.09  151.96  349.08  153.55  349.07
  153.65  349.07  153.72  349.07  154.33  349.07  154.75  349.06  155.27  349.06
  155.61  349.06  155.62  349.06  156.43  349.05   158.3  349.04  158.86  349.04
     159  349.04  161.38  349.01  161.54  349.01  162.05     349  163.67  348.96
  164.05  348.96  164.76  348.94  165.15  348.94  165.49  348.93  166.34  348.91
  167.91  348.88  168.15  348.88  168.84  348.86  168.85  348.86  168.99  348.86
  169.01  348.86  171.14  348.82  171.34  348.81  171.57  348.81  171.77  348.81
  174.12  348.76   174.3  348.76  174.53  348.75  174.59  348.75  175.01  348.74
  176.01  348.72  176.02  348.72  176.09  348.72  176.12  348.72  176.14  348.72
  176.15  348.72  176.37  348.71  176.38  348.71  176.67  348.71  178.02  348.68
  178.49  348.68  178.69  348.67  179.73  348.66  183.19  348.61   184.8  348.59
  185.18  348.58  186.13  348.57  186.42  348.57  186.44  348.57  188.04  348.56
  189.65  348.55  194.03  348.53  194.81  348.53  195.59  348.53  195.88  348.53
  195.88  348.54  196.44  348.95  196.55  349.03  196.55  335.84  196.57  335.84
  196.69  335.84  196.71  335.84  196.78  335.84  196.79  335.84   196.8  335.84
  196.82  335.84  196.85  335.84  196.86  335.84  196.87  335.84  196.88  335.84
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   196.9  335.84  196.91  335.84  196.92  335.84  196.94  335.84  199.68  335.84
  199.69  335.84  199.89  335.84  200.01  335.84  201.89  335.84  202.55  335.84
  202.57  335.84  203.21  335.84  203.48  335.84  204.42  335.84  204.44  335.84
  204.84  335.84  205.35  335.84  206.23  335.84  206.88  335.84  206.94  335.84
   207.1  335.84  207.25  335.84  207.88  335.84   208.2  335.84  208.87  335.84
  208.88  335.84  209.15  335.84  210.57  335.84  211.09  335.84  211.97  335.84
  212.17  335.84  213.91  335.84  214.01  335.84  214.69  335.84   214.7  335.84
  216.98  335.84  217.18  335.84  219.52  335.84  219.57  335.84  220.32  335.84
  220.33  335.84  220.39  335.84  220.42  335.84  220.43  335.84  221.21  335.84
  221.21  349.03  221.88  348.54  221.88  348.53  221.95  348.53  222.05  348.54
  223.55  348.58  223.76  348.59  224.48  348.61  225.08  348.63  225.31  348.61
  225.78  348.55  226.49  348.56  226.83  348.56  226.84  348.56  227.22  348.57
  227.72  348.57   228.8  348.62  229.05  348.63   230.7  348.71  230.75  348.71
   230.8  348.71  231.32  348.74  231.96  348.76  232.79   348.8  233.58  348.84
  234.82  348.89  235.11  348.91  235.81  348.94   236.6  348.97  237.74  349.03
  238.11  349.03  238.12  349.03  239.48  349.05  239.49  349.05  240.03  349.06
  240.39  349.07   240.4  349.07  240.66  349.08  241.27   349.1  241.89  349.12
  242.89  349.15  243.88  349.18  245.04  349.21  245.06  349.22     246  349.24
  247.05  349.28  247.31  349.28  248.28  349.31  248.42  349.32  248.45  349.32
  248.51  349.32  249.09  349.34  250.76  349.39  251.94  349.41  252.25  349.41
  252.26  349.41  253.62  349.43  253.89  349.43   255.3  349.46  257.82   349.5
  258.22   349.5  259.69  349.54  259.86  349.54  260.46  349.55  261.52  349.57
  262.07  349.56  264.26  349.52  276.23  349.29     278  349.25   281.4  349.18
  287.66  349.06  293.17  348.89  296.16   348.8  296.45  348.79  298.11  348.74
  299.98  348.68  299.99  348.68  301.88  348.62  308.77  348.83  322.81  349.27
  325.35  349.33   325.8  349.31  329.44  349.18  336.93  348.62  346.58  348.81
  347.18  348.83  350.95  349.06  351.92  349.12  352.42  349.15  353.77  349.25
  353.86  349.25  353.95  349.26  354.13  349.27  354.14  349.27  354.23  349.28
  354.33  349.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .011  196.44    .011  221.21    .011

Bank Sta: Left   Right    Coeff Contr.   Expan.
        196.44  221.21             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  202.71  204.88  345.84       T
  212.88  215.05  345.84       T

Upstream Embankment side slope              =       3 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =     350
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  2

Culvert Name     Shape      Rise    Span
CULVERT#1            Box      10       8
FHWA Chart # 10- 90 degree headwall; Chamfered or beveled inlet
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FHWA Scale # 1 - Inlet edges chamfered 3/4 inch
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length   Top n Bottom n Depth Blocked Entrance Loss Coef   Exit Loss Coef
0 26 .011 .011 0 .4 1
Upstream Elevation = 336.36
Centerline Station = 213.25
Downstream Elevation = 335.84
Centerline Station = 208.88

Culvert Name Shape Rise Span
CULVERT#2 Box 10 6
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 3 - Wingwall flared 0 deg. (sides extended straight)
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist Length   Top n Bottom n Depth Blocked Entrance Loss Coef   Exit Loss Coef
0 26 .011 .011 0 .4 1
Number of Barrels = 2
Upstream Elevation = 336.36
Centerline Stations
Sta. Sta.
204.08 222.42
Downstream Elevation = 335.84
Centerline Stations
Sta. Sta.
199.71 218.05

CULVERT OUTPUT Profile #MAX TW 25-YR Culv Group: CULVERT#1

Q Culv Group (cfs)	460.07	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	12.28
Q Barrel (cfs)	460.07	Culv Vel DS (ft/s)	15.44
E.G. US. (ft)	344.33	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	343.31	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	342.83	Culv Frctn Ls (ft)	0.00
W.S. DS (ft)	340.81	Culv Exit Loss (ft)	0.44
Delta EG (ft)	1.50	Culv Entr Loss (ft)	0.94
Delta WS (ft)	2.51	Q Weir (cfs)	
E.G. IC (ft)	344.03	Weir Sta Lft (ft)	
E.G. OC (ft)	344.32	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	341.04	Weir Max Depth (ft)	
Culv WS Outlet (ft)	339.57	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.33	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	4.68	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #MAX TW 100-YR Culv Group: CULVERT#1

Q Culv Group (cfs)	562.67	Culv Full Len (ft)	26.00
# Barrels	1	Culv Vel US (ft/s)	7.03

Q Barrel (cfs)	562.67	Culv Vel DS (ft/s)	7.03
E.G. US. (ft)	349.77	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	349.70	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	349.18	Culv Frctn Ls (ft)	0.02
W.S. DS (ft)	348.66	Culv Exit Loss (ft)	0.25
Delta EG (ft)	0.59	Culv Entr Loss (ft)	0.31
Delta WS (ft)	1.04	Q Weir (cfs)	256.66
E.G. IC (ft)	345.14	Weir Sta Lft (ft)	0.00
E.G. OC (ft)	349.76	Weir Sta Rgt (ft)	331.44
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	346.36	Weir Max Depth (ft)	1.76
Culv WS Outlet (ft)	345.84	Weir Avg Depth (ft)	0.68
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	109.47
Culv Crt Depth (ft)	5.36	Min El Weir Flow (ft)	350.00

CULVERT OUTPUT Profile #ANT TW 25-YR Culv Group: CULVERT#1

Q Culv Group (cfs)	460.10	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	12.28
Q Barrel (cfs)	460.10	Culv Vel DS (ft/s)	15.44
E.G. US. (ft)	344.33	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	343.31	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	342.80	Culv Frctn Ls (ft)	0.02
W.S. DS (ft)	340.48	Culv Exit Loss (ft)	0.47
Delta EG (ft)	1.53	Culv Entr Loss (ft)	0.94
Delta WS (ft)	2.83	Q Weir (cfs)	
E.G. IC (ft)	344.03	Weir Sta Lft (ft)	
E.G. OC (ft)	344.32	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	341.04	Weir Max Depth (ft)	
Culv WS Outlet (ft)	339.57	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.33	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	4.68	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #ANT TW 100-YR Culv Group: CULVERT#1

Q Culv Group (cfs)	664.38	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	13.88
Q Barrel (cfs)	664.38	Culv Vel DS (ft/s)	16.99
E.G. US. (ft)	346.54	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	345.33	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	344.73	Culv Frctn Ls (ft)	0.02
W.S. DS (ft)	341.77	Culv Exit Loss (ft)	0.48
Delta EG (ft)	1.81	Culv Entr Loss (ft)	1.20
Delta WS (ft)	3.56	Q Weir (cfs)	
E.G. IC (ft)	346.17	Weir Sta Lft (ft)	
E.G. OC (ft)	346.53	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	342.34	Weir Max Depth (ft)	
Culv WS Outlet (ft)	340.73	Weir Avg Depth (ft)	

Culv Nml Depth (ft)	3.03	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	5.98	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #GRV TW 25-YR Culv Group: CULVERT#1

Q Culv Group (cfs)	460.10	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	12.28
Q Barrel (cfs)	460.10	Culv Vel DS (ft/s)	15.44
E.G. US. (ft)	344.33	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	343.31	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	342.80	Culv Frctn Ls (ft)	0.02
W.S. DS (ft)	340.48	Culv Exit Loss (ft)	0.47
Delta EG (ft)	1.53	Culv Entr Loss (ft)	0.94
Delta WS (ft)	2.83	Q Weir (cfs)	
E.G. IC (ft)	344.03	Weir Sta Lft (ft)	
E.G. OC (ft)	344.32	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	341.04	Weir Max Depth (ft)	
Culv WS Outlet (ft)	339.57	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.33	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	4.68	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #GRV TW 100-YR Culv Group: CULVERT#1

Q Culv Group (cfs)	664.38	Culv Full Len (ft)	
# Barrels	1	Culv Vel US (ft/s)	13.88
Q Barrel (cfs)	664.38	Culv Vel DS (ft/s)	16.99
E.G. US. (ft)	346.54	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	345.33	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	344.73	Culv Frctn Ls (ft)	0.02
W.S. DS (ft)	341.77	Culv Exit Loss (ft)	0.48
Delta EG (ft)	1.81	Culv Entr Loss (ft)	1.20
Delta WS (ft)	3.56	Q Weir (cfs)	
E.G. IC (ft)	346.17	Weir Sta Lft (ft)	
E.G. OC (ft)	346.53	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	342.34	Weir Max Depth (ft)	
Culv WS Outlet (ft)	340.73	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	3.03	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	5.98	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #MAX TW 25-YR Culv Group: CULVERT#2

Q Culv Group (cfs)	691.68	Culv Full Len (ft)	
# Barrels	2	Culv Vel US (ft/s)	12.29

Q Barrel (cfs)	345.84	Culv Vel DS (ft/s)	15.34
E.G. US. (ft)	344.33	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	343.31	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	342.83	Culv Frctn Ls (ft)	0.00
W.S. DS (ft)	340.81	Culv Exit Loss (ft)	0.42
Delta EG (ft)	1.50	Culv Entr Loss (ft)	0.94
Delta WS (ft)	2.51	Q Weir (cfs)	
E.G. IC (ft)	344.25	Weir Sta Lft (ft)	
E.G. OC (ft)	344.34	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	341.05	Weir Max Depth (ft)	
Culv WS Outlet (ft)	339.60	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.46	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	4.69	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #MAX TW 100-YR Culv Group: CULVERT#2

Q Culv Group (cfs)	843.55	Culv Full Len (ft)	26.00
# Barrels	2	Culv Vel US (ft/s)	7.03
Q Barrel (cfs)	421.78	Culv Vel DS (ft/s)	7.03
E.G. US. (ft)	349.77	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	349.70	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	349.18	Culv Frctn Ls (ft)	0.03
W.S. DS (ft)	348.66	Culv Exit Loss (ft)	0.25
Delta EG (ft)	0.59	Culv Entr Loss (ft)	0.31
Delta WS (ft)	1.04	Q Weir (cfs)	256.66
E.G. IC (ft)	345.40	Weir Sta Lft (ft)	0.00
E.G. OC (ft)	349.77	Weir Sta Rgt (ft)	331.44
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	346.36	Weir Max Depth (ft)	1.76
Culv WS Outlet (ft)	345.84	Weir Avg Depth (ft)	0.68
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	109.47
Culv Crt Depth (ft)	5.36	Min El Weir Flow (ft)	350.00

CULVERT OUTPUT Profile #ANT TW 25-YR Culv Group: CULVERT#2

Q Culv Group (cfs)	691.65	Culv Full Len (ft)	
# Barrels	2	Culv Vel US (ft/s)	12.29
Q Barrel (cfs)	345.83	Culv Vel DS (ft/s)	15.34
E.G. US. (ft)	344.33	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	343.31	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	342.80	Culv Frctn Ls (ft)	0.03
W.S. DS (ft)	340.48	Culv Exit Loss (ft)	0.46
Delta EG (ft)	1.53	Culv Entr Loss (ft)	0.94
Delta WS (ft)	2.83	Q Weir (cfs)	
E.G. IC (ft)	344.25	Weir Sta Lft (ft)	
E.G. OC (ft)	344.34	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	341.05	Weir Max Depth (ft)	
Culv WS Outlet (ft)	339.60	Weir Avg Depth (ft)	

Culv Nml Depth (ft)	2.46	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	4.69	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #ANT TW 100-YR Culv Group: CULVERT#2

Q Culv Group (cfs)	998.51	Culv Full Len (ft)	
# Barrels	2	Culv Vel US (ft/s)	13.89
Q Barrel (cfs)	499.26	Culv Vel DS (ft/s)	16.88
E.G. US. (ft)	346.54	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	345.33	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	344.73	Culv Frctn Ls (ft)	0.03
W.S. DS (ft)	341.77	Culv Exit Loss (ft)	0.47
Delta EG (ft)	1.81	Culv Entr Loss (ft)	1.20
Delta WS (ft)	3.56	Q Weir (cfs)	
E.G. IC (ft)	346.51	Weir Sta Lft (ft)	
E.G. OC (ft)	346.55	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	342.35	Weir Max Depth (ft)	
Culv WS Outlet (ft)	340.77	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	3.24	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	5.99	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #GRV TW 25-YR Culv Group: CULVERT#2

Q Culv Group (cfs)	691.65	Culv Full Len (ft)	
# Barrels	2	Culv Vel US (ft/s)	12.29
Q Barrel (cfs)	345.83	Culv Vel DS (ft/s)	15.34
E.G. US. (ft)	344.33	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	343.31	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	342.80	Culv Frctn Ls (ft)	0.03
W.S. DS (ft)	340.48	Culv Exit Loss (ft)	0.46
Delta EG (ft)	1.53	Culv Entr Loss (ft)	0.94
Delta WS (ft)	2.83	Q Weir (cfs)	
E.G. IC (ft)	344.25	Weir Sta Lft (ft)	
E.G. OC (ft)	344.34	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	341.05	Weir Max Depth (ft)	
Culv WS Outlet (ft)	339.60	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.46	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	4.69	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #GRV TW 100-YR Culv Group: CULVERT#2

Q Culv Group (cfs)	998.51	Culv Full Len (ft)	
# Barrels	2	Culv Vel US (ft/s)	13.89

Q Barrel (cfs)	499.26	Culv Vel DS (ft/s)	16.88
E.G. US. (ft)	346.54	Culv Inv El Up (ft)	336.36
W.S. US. (ft)	345.33	Culv Inv El Dn (ft)	335.84
E.G. DS (ft)	344.73	Culv Frctn Ls (ft)	0.03
W.S. DS (ft)	341.77	Culv Exit Loss (ft)	0.47
Delta EG (ft)	1.81	Culv Entr Loss (ft)	1.20
Delta WS (ft)	3.56	Q Weir (cfs)	
E.G. IC (ft)	346.51	Weir Sta Lft (ft)	
E.G. OC (ft)	346.55	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	342.35	Weir Max Depth (ft)	
Culv WS Outlet (ft)	340.77	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	3.24	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	5.99	Min El Weir Flow (ft)	350.00

Note: The flow in the culvert is entirely supercritical.

CROSS SECTION

RIVER: Proposed Channel
REACH: Proposed Channel RS: 7

INPUT
Description:
Station Elevation Data num= 286

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	349.24	.1	349.24	.19	349.23	.56	349.21	2.35	349.11
11.22	348.67	13.87	348.53	16.49	348.4	18.01	348.8	21.34	348.87
32.44	347.94	33.12	348.44	40.54	348.23	51.49	347.93	52.51	347.9
55.48	347.86	56.27	347.84	66.99	347.69	75.71	347.56	76.42	347.54
78.31	347.52	80.2	347.75	81.81	347.96	81.82	347.96	82.76	348.07
89.1	348.73	90.32	348.85	93.71	349.06	94.7	349.12	96.05	349.14
98.87	349.18	100.74	349.2	100.98	349.2	102.62	349.23	112.41	349.24
118.17	349.25	123.88	349.27	125.19	349.26	127.45	349.24	130.23	349.22
131.61	349.22	132.43	349.21	133.02	349.21	133.91	349.2	136.43	349.18
137.54	349.18	137.63	349.18	137.75	349.17	139.74	349.16	141.4	349.15
141.68	349.15	141.89	349.15	143.28	349.14	144.77	349.13	144.9	349.13
145.07	349.13	146.16	349.12	146.17	349.12	146.63	349.12	147.7	349.11
147.71	349.11	148.32	349.11	148.61	349.1	149.56	349.1	149.93	349.1
150.05	349.09	151.05	349.09	151.41	349.09	151.96	349.08	153.55	349.07
153.65	349.07	153.72	349.07	154.33	349.07	154.75	349.06	155.27	349.06
155.61	349.06	155.62	349.06	156.43	349.05	158.3	349.04	158.86	349.04
159	349.04	161.38	349.01	161.54	349.01	162.05	349	163.67	348.96
164.05	348.96	164.76	348.94	165.15	348.94	165.49	348.93	166.34	348.91
167.91	348.88	168.15	348.88	168.84	348.86	168.85	348.86	168.99	348.86
169.01	348.86	171.14	348.82	171.34	348.81	171.57	348.81	171.77	348.81
174.12	348.76	174.3	348.76	174.53	348.75	174.59	348.75	175.01	348.74
176.01	348.72	176.02	348.72	176.09	348.72	176.12	348.72	176.14	348.72
176.15	348.72	176.37	348.71	176.38	348.71	176.67	348.71	178.02	348.68
178.49	348.68	178.69	348.67	179.73	348.66	183.19	348.61	184.8	348.59
185.18	348.58	186.13	348.57	186.42	348.57	186.44	348.57	188.04	348.56
189.65	348.55	194.03	348.53	194.81	348.53	195.59	348.53	195.88	348.53

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  195.88  348.54  196.44  348.95  196.55  349.03  196.55  335.84  196.57  335.84
  196.69  335.84  196.71  335.84  196.78  335.84  196.79  335.84   196.8  335.84
  196.82  335.84  196.85  335.84  196.86  335.84  196.87  335.84  196.88  335.84
   196.9  335.84  196.91  335.84  196.92  335.84  196.94  335.84  199.68  335.84
  199.69  335.84  199.89  335.84  200.01  335.84  201.89  335.84  202.55  335.84
  202.57  335.84  203.21  335.84  203.48  335.84  204.42  335.84  204.44  335.84
  204.84  335.84  205.35  335.84  206.23  335.84  206.88  335.84  206.94  335.84
   207.1  335.84  207.25  335.84  207.88  335.84   208.2  335.84  208.87  335.84
  208.88  335.84  209.15  335.84  210.57  335.84  211.09  335.84  211.97  335.84
  212.17  335.84  213.91  335.84  214.01  335.84  214.69  335.84   214.7  335.84
  216.98  335.84  217.18  335.84  219.52  335.84  219.57  335.84  220.32  335.84
  220.33  335.84  220.39  335.84  220.42  335.84  220.43  335.84  221.21  335.84
  221.21  349.03  221.88  348.54  221.88  348.53  221.95  348.53  222.05  348.54
  223.55  348.58  223.76  348.59  224.48  348.61  225.08  348.63  225.31  348.61
  225.78  348.55  226.49  348.56  226.83  348.56  226.84  348.56  227.22  348.57
  227.72  348.57   228.8  348.62  229.05  348.63   230.7  348.71  230.75  348.71
   230.8  348.71  231.32  348.74  231.96  348.76  232.79   348.8  233.58  348.84
  234.82  348.89  235.11  348.91  235.81  348.94   236.6  348.97  237.74  349.03
  238.11  349.03  238.12  349.03  239.48  349.05  239.49  349.05  240.03  349.06
  240.39  349.07   240.4  349.07  240.66  349.08  241.27   349.1  241.89  349.12
  242.89  349.15  243.88  349.18  245.04  349.21  245.06  349.22     246  349.24
  247.05  349.28  247.31  349.28  248.28  349.31  248.42  349.32  248.45  349.32
  248.51  349.32  249.09  349.34  250.76  349.39  251.94  349.41  252.25  349.41
  252.26  349.41  253.62  349.43  253.89  349.43   255.3  349.46  257.82   349.5
  258.22   349.5  259.69  349.54  259.86  349.54  260.46  349.55  261.52  349.57
  262.07  349.56  264.26  349.52  276.23  349.29     278  349.25   281.4  349.18
  287.66  349.06  293.17  348.89  296.16   348.8  296.45  348.79  298.11  348.74
  299.98  348.68  299.99  348.68  301.88  348.62  308.77  348.83  322.81  349.27
  325.35  349.33   325.8  349.31  329.44  349.18  336.93  348.62  346.58  348.81
  347.18  348.83  350.95  349.06  351.92  349.12  352.42  349.15  353.77  349.25
  353.86  349.25  353.95  349.26  354.13  349.27  354.14  349.27  354.23  349.28
  354.33  349.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .011  196.44    .011  221.21    .011

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        196.44  221.21            26.79   26.79   26.79             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  202.71  204.88  345.84       T
  212.88  215.05  345.84       T

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 6

INPUT
Description:
Station Elevation Data    num=     303
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

13.35	349.02	20.2	348.9	48.88	348.39	49.24	348.38	56.26	348.19
56.69	348.17	59.47	348.13	59.93	348.13	67.5	347.95	68.04	347.94
71.22	347.85	71.23	347.85	71.24	347.85	71.25	347.85	71.26	347.85
71.27	347.85	77.21	347.67	86.87	347.38	87.54	347.36	88.6	347.45
89.04	347.49	89.73	347.55	98.41	347.21	99.16	347.18	107.04	346.27
107.88	346.17	111.61	345.86	111.62	345.86	112.71	345.76	113.6	345.69
121.84	345.07	124.28	344.89	125.25	344.81	137.06	344.18	137.07	344.18
137.08	344.18	137.8	344.14	140.06	344.02	141.79	343.93	143.25	343.85
145.26	343.74	145.27	343.74	145.78	343.72	147.86	343.6	149.76	343.52
150.19	343.51	151.38	343.47	152.09	343.37	153.62	343.17	153.74	343.15
153.92	343.13	154.69	343.03	156.41	342.86	156.51	342.85	157.63	342.84
157.76	342.84	157.77	342.84	158.38	342.84	159.64	342.86	161.74	342.88
161.75	342.88	162.98	342.9	163.07	342.9	163.15	342.9	164.36	342.91
164.44	342.91	165.26	342.87	165.27	342.87	165.73	342.84	166.06	342.83
167.24	342.76	168.91	342.71	169.69	342.69	169.7	342.69	170.09	342.68
173.25	342.58	173.67	342.54	174.13	342.49	177.13	342.17	177.41	342.14
177.95	342.08	177.96	342.08	178.35	342.04	178.83	341.99	179.47	341.97
180.46	341.94	180.59	341.94	180.9	341.93	181.89	341.86	183.49	340.81
184.07	340.81	184.08	340.43	185.05	339.8	185.56	339.46	185.95	339.21
186.59	338.79	186.6	338.78	186.61	338.78	187.1	338.46	187.31	338.33
187.31	338.32	188.2	337.74	188.21	337.73	188.22	337.73	188.72	337.41
188.98	337.23	188.99	337.23	190.06	336.53	190.38	336.32	190.63	336.16
190.95	335.95	191.47	335.61	191.91	335.32	191.94	335.31	191.94	335.64
192.19	335.64	192.46	335.64	192.61	335.64	192.61	335.31	192.9	335.31
192.91	335.31	192.94	335.31	193.72	335.31	193.96	335.31	194.35	335.31
194.36	335.31	195.28	335.31	195.48	335.31	195.82	335.31	196.42	335.31
196.64	335.31	196.77	335.31	197.33	335.31	197.6	335.31	199.7	335.31
200.17	335.31	200.26	335.31	200.3	335.31	200.84	335.31	203.68	335.31
203.71	335.31	203.72	335.31	204.43	335.31	204.56	335.31	207.68	335.31
208.79	335.31	208.8	335.31	209.67	335.31	210.75	335.31	211.92	335.31
212.86	335.31	213.22	335.31	213.23	335.31	214.84	335.31	215.42	335.31
215.52	335.31	216.19	335.31	216.94	335.31	217.27	335.31	217.27	335.64
217.58	335.64	217.69	335.64	217.94	335.64	217.94	335.31	217.95	335.31
217.99	335.33	219.33	336.07	219.83	336.35	220.09	336.5	222.12	337.62
222.21	337.67	222.22	337.67	223.32	338.28	223.98	338.65	225.41	339.44
225.42	339.45	226.31	339.94	226.67	340.14	227.68	340.7	228.05	340.9
228.68	341.25	229.21	341.55	229.5	341.71	229.63	341.78	229.66	341.8
229.67	341.8	230.76	342.41	231.06	342.57	231.16	342.63	231.17	342.63
231.18	342.63	232.32	343.27	232.67	343.46	233.18	343.75	234.17	344.29
234.42	344.43	234.43	344.44	235.67	345.12	236	345.3	236.13	345.38
236.24	345.44	237.16	345.61	237.77	345.7	237.78	345.71	237.78	345.72
237.8	345.72	237.81	345.72	237.85	345.73	238.3	345.81	239.54	346.03
240.3	346.08	240.59	346.1	240.95	346.12	243.34	346.27	243.35	346.27
245.02	346.38	245.4	346.4	245.41	346.4	247.26	346.52	247.96	346.57
249.34	346.65	250.61	346.74	250.67	346.74	251.86	346.82	253.58	346.93
253.95	346.95	254.65	346.99	254.68	347	255.7	347.08	256.64	347.16
258.37	347.18	258.38	347.18	259.28	347.2	260.23	347.21	261.85	347.24
261.86	347.24	263.92	347.27	264.96	347.28	266.22	347.3	267.34	347.32
268.27	347.33	269.46	347.38	270.02	347.4	270.03	347.4	270.95	347.44
272.93	347.51	274.99	347.59	275	347.59	275.15	347.6	277.27	347.68
279.18	347.75	279.87	347.78	279.96	347.78	279.97	347.78	280.54	347.81
280.55	347.81	284.36	347.95	284.37	347.96	285.46	348	286.07	348.02
286.08	348.02	286.67	348.05	290.26	348.19	291.62	348.24	293.74	348.32
294.23	348.34	297.17	348.46	299.27	348.54	301.56	348.63	301.71	348.63

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  302.17  348.64  302.67  348.66  305.93  348.74  308.13   348.8  308.14   348.8
  308.17   348.8  308.18   348.8   308.2   348.8  308.21   348.8   310.4  348.86
  310.77  348.87  311.24  348.88  313.71  348.94  313.72  348.94  313.88  348.95
     314  348.95  314.07  348.95  314.13  348.95  322.26  349.16  324.72  349.23
  331.15  349.52  336.79  349.64   343.5  349.78  343.51  349.78  354.39     350
  357.09  350.06  371.11  350.92  372.22  350.99  372.46  351.01  372.59  351.02
  372.73  351.02  372.82  351.03  372.92  351.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   13.35    .035  191.91    .026  217.99    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        191.91  217.99             91.04   35.85   21.93             .1       .3

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 5

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  348.42      .1  348.41    2.51  348.11   19.53   342.8   48.43  331.83
   48.85  331.69    49.1  331.58   49.58  331.48   62.54  328.84   74.88  322.65
   75.15  322.48   89.44  322.57   89.79  323.83   90.93  324.49  125.66  345.66
   130.5  346.31   130.6  346.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035    2.51    .026  125.66    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          2.51  125.66             70.97   79.09  147.51             .1       .3

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 4

INPUT
Description:
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  349.37      .1  349.37      .2  349.37      .3  349.37    7.04  349.36
   12.49  348.65   32.58  345.54   46.06  342.81   51.54  341.78   76.81  335.22
   91.12  331.18  102.95  326.07  113.17  321.42  113.17  321.41  118.79  316.34
  120.58   316.3  127.18  318.26   141.7  322.87  144.82  325.06  144.83  325.06
  148.35  324.87  148.36  324.87  161.53  333.11  161.53  333.12  161.54  333.12
  164.65  334.74  164.65  334.75  170.23  336.04  185.07  338.11  197.22  340.05
  203.52  341.21  223.98  344.86  227.49   345.1  228.37  345.16  243.94   347.4
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  243.95   347.4  254.35  348.54  256.21  349.37  263.91  349.37  263.92  352.81
  269.46  352.67  269.56  352.67  269.66  352.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035    7.04    .026  263.91    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          7.04  263.91             54.16   63.01  122.53             .1       .3

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 3

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  349.26      .1  349.26     .37  349.26     .65  349.25   18.19  348.91
   19.84  349.02    26.2  349.21   26.21  349.21   35.17  348.85   44.02  347.94
   44.03  347.94   47.58  347.57   54.22  346.47   71.38  342.15   79.42  340.13
   86.43  339.03   87.82  338.82   97.37  337.33  104.41  335.78   105.6  335.65
  112.29  334.96  113.28  334.86  114.13  334.45  134.37  322.84  135.31   322.3
  135.83  322.21  143.74  317.91  147.53  314.97  170.29  331.97  182.79  341.07
  191.22  342.27  205.75  343.87  207.01  344.98   211.1  345.57  211.38  345.61
  211.65  345.65  211.75  345.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035  113.28    .026  182.79    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        113.28  182.79             37.13   64.73   76.92             .1       .3

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 2

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  348.69      .2  348.69      .3  348.68    1.37  348.65    1.38  348.65
    5.54   348.5   15.86  348.12   18.18   347.6   20.14   346.5   29.84  342.51
   44.32  336.54   46.27  335.74   50.12  334.15   60.95  329.11   63.12  328.11
   68.47  325.53   68.47  325.52   68.87  325.33   69.59  324.98   71.65  323.99
   75.14  323.27   81.22  322.31   81.49  322.15   88.83  318.04   89.84  317.47
   90.27  317.23   91.26  317.39   97.45  314.67  114.25  324.78  123.82  330.55
  126.73   332.3  129.64  334.05  129.65  334.06  130.89   334.8  130.89  334.81
   130.9  334.81  132.02  335.48   132.5  335.77  133.46  336.55  134.36  336.73
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  135.93  337.04  141.55  338.18  163.22  342.52  163.32  342.56  163.42  342.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035   15.86    .026  163.22    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         15.86  163.22            96.24    79.9   64.17             .1       .3

CROSS SECTION


RIVER: Proposed Channel
REACH: Proposed Channel   RS: 1

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  322.59      .1  322.62      .2  322.65      .3  322.68    3.34  322.69
    3.35  321.71    7.81  319.37   16.49  314.38   21.82   320.2   31.39   320.2
   40.78  325.45   50.68  330.32   50.68  330.33   56.59  331.62   59.94  332.36
   79.91  334.36   80.01  334.37   80.11  334.38   80.21  334.39   80.31   334.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035    3.34    .026   31.39    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
          3.34   31.39             .1       .3



SUMMARY OF MANNING'S N VALUES

River:Proposed Channel

      Reach          River Sta.       n1        n2        n3

 Proposed Channel     39               .035      .026      .035
 Proposed Channel     38               .035      .026      .035
 Proposed Channel     37               .035      .026      .035
 Proposed Channel     36               .035      .026      .035
 Proposed Channel     35               .035      .026      .035
 Proposed Channel     34               .035      .026      .035
 Proposed Channel     33               .035      .026      .035
 Proposed Channel     32               .035      .026      .035
 Proposed Channel     31               .035      .026      .035
 Proposed Channel     30               .035      .026      .035
 Proposed Channel     29               .035      .026      .035
 Proposed Channel     28               .035      .026      .035
 Proposed Channel     27               .035      .026      .035
 Proposed Channel     26               .035      .026      .035
 Proposed Channel     25               .035      .026      .035
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Proposed Channel	24	.035	.026	.035
Proposed Channel	23	.035	.026	.035
Proposed Channel	22	.035	.026	.035
Proposed Channel	21	.035	.026	.035
Proposed Channel	20	.035	.026	.035
Proposed Channel	19	.035	.026	.035
Proposed Channel	18	.035	.026	.035
Proposed Channel	17	.035	.026	.035
Proposed Channel	16	.035	.026	.035
Proposed Channel	15	.035	.026	.035
Proposed Channel	14	.035	.026	.035
Proposed Channel	13	.035	.026	.035
Proposed Channel	12	.035	.026	.035
Proposed Channel	11	.035	.026	.035
Proposed Channel	10	.035	.026	.035
Proposed Channel	9	.035	.011	.035
Proposed Channel	8	.011	.011	.011
Proposed Channel	7.5	Culvert		
Proposed Channel	7	.011	.011	.011
Proposed Channel	6	.035	.026	.035
Proposed Channel	5	.035	.026	.035
Proposed Channel	4	.035	.026	.035
Proposed Channel	3	.035	.026	.035
Proposed Channel	2	.035	.026	.035
Proposed Channel	1	.035	.026	.035

SUMMARY OF REACH LENGTHS

River: Proposed Channel

Reach	River Sta.	Left	Channel	Right
Proposed Channel	39	145.12	144.81	144.93
Proposed Channel	38	200	200	200
Proposed Channel	37	200	200	200
Proposed Channel	36	200	200	200
Proposed Channel	35	200	200	200
Proposed Channel	34	200	200	200
Proposed Channel	33	200	200	200
Proposed Channel	32	210.32	198.97	186.62
Proposed Channel	31	148.65	159.48	174.49
Proposed Channel	30	203.91	215.5	230.32
Proposed Channel	29	224.36	224.72	224.36
Proposed Channel	28	199.82	197.88	198.18
Proposed Channel	27	200.46	198.55	198.87
Proposed Channel	26	199.32	197.75	200.13
Proposed Channel	25	168.67	167.76	167.64
Proposed Channel	24	213	204.72	192.9
Proposed Channel	23	180.58	180.39	178.93
Proposed Channel	22	144.57	143.8	144.85
Proposed Channel	21	137.33	145.29	153.36

Proposed Channel	20	164.3	152.27	149.67
Proposed Channel	19	125.2	136.45	142.49
Proposed Channel	18	98.1	92.44	88.69
Proposed Channel	17	107.38	99.59	92.13
Proposed Channel	16	32.36	29.69	29.39
Proposed Channel	15	29.84	29.08	29.9
Proposed Channel	14	58.57	59.23	59.39
Proposed Channel	13	71.67	74.84	71.63
Proposed Channel	12	105.29	105.72	114.8
Proposed Channel	11	96.08	103.13	116.02
Proposed Channel	10	101.74	100.81	109.13
Proposed Channel	9	40.29	34.96	40.34
Proposed Channel	8	26	26	26
Proposed Channel	7.5	Culvert		
Proposed Channel	7	26.79	26.79	26.79
Proposed Channel	6	91.04	35.85	21.93
Proposed Channel	5	70.97	79.09	147.51
Proposed Channel	4	54.16	63.01	122.53
Proposed Channel	3	37.13	64.73	76.92
Proposed Channel	2	96.24	79.9	64.17
Proposed Channel	1			

III.

APPENDIX A

FEMA FLOOD INSURANCE MAP & STUDY

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was State Plane Central zone (FIPS zone 4203). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information about the **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Texas Department of Transportation. This information was digitized from USGS 7.5 minute quadrangle maps at a scale of 1:15840.

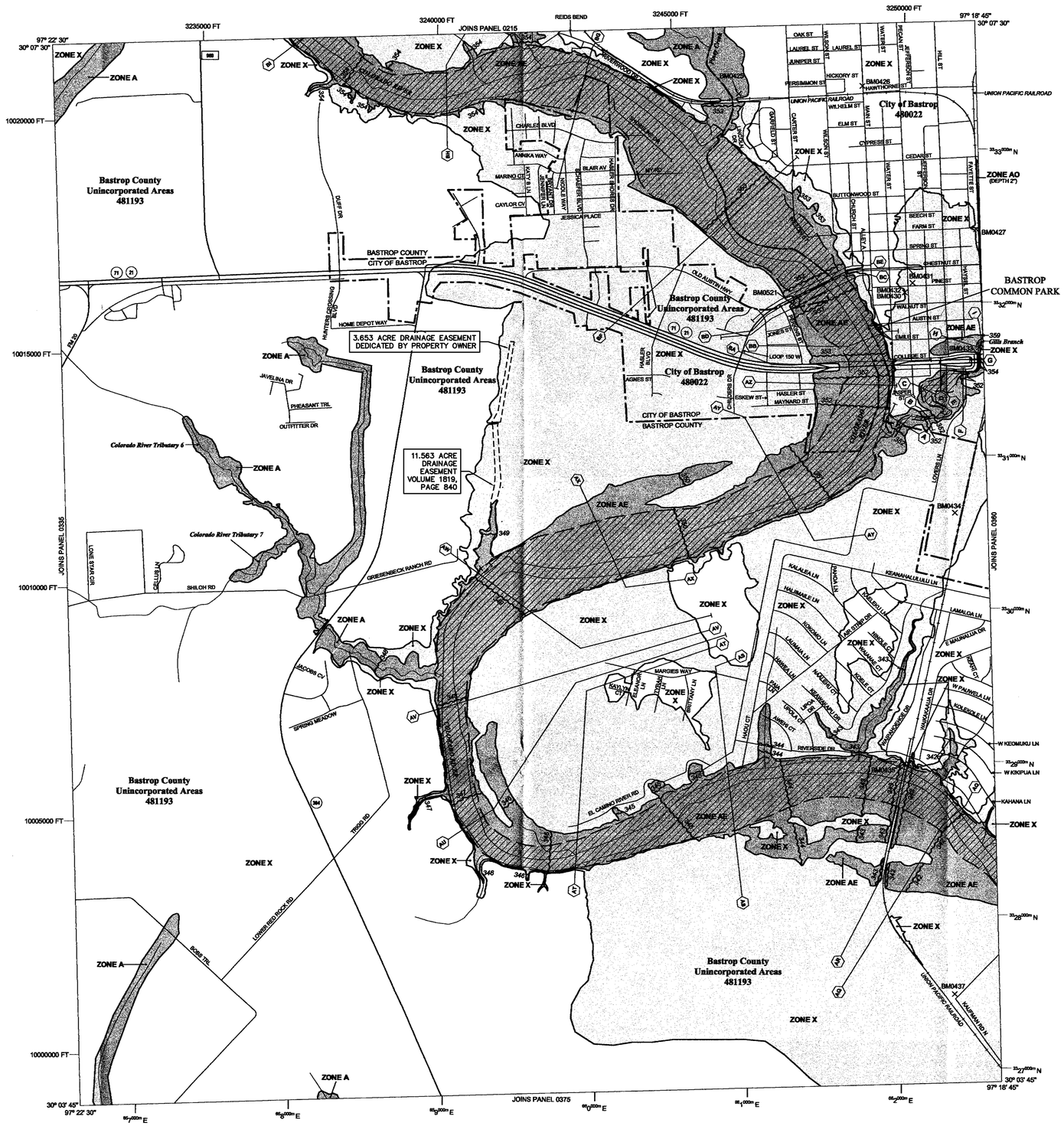
This map reflects more detailed up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the **separately printed Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at www.fema.gov/msc.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A)—(A) Cross section line
- (23)—(23) Transect line
- 45° 02' 08", 93° 02' 12" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4685000 FT 5000-foot grid ticks: Texas State Plane coordinate system, Central zone (FIPS Zone 4203), Transverse Mercator Projection
- 1000-meter Universal Transverse Mercator grid values, zone 14
- ML5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

August 19, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

December 8, 1998 - to change Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, and to change zone designations.
January 19, 2006 - to decrease Base Flood Elevations, to add Base Flood Elevations, to change Special Flood Hazard Areas, floodway and zone designations; to update corporate limits; to incorporate previously issued Letters of Map Revision; and to reflect updated topographic information.

For Community map revision history prior to countywide mapping, refer to the community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0355E

FIRM

FLOOD INSURANCE RATE MAP

BASTROP COUNTY, TEXAS
AND INCORPORATED AREAS

PANEL 355 OF 625

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BASTROP, CITY OF	480022	0355	E
BASTROP COUNTY	481193	0355	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
48021C0355E

MAP REVISED
JANUARY 19, 2006

Federal Emergency Management Agency

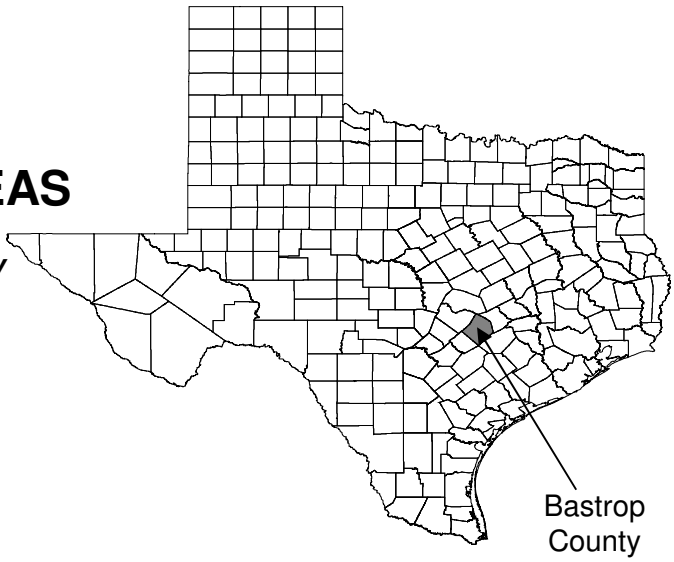
FLOOD INSURANCE STUDY



BASTROP COUNTY, TEXAS

AND INCORPORATED AREAS

Community Name	*Community Number*
BASTROP, CITY OF	480022
BASTROP COUNTY (UNINCORPORATED AREAS)	481193
ELGIN, CITY OF	480023
SMITHVILLE, CITY OF	480024



Revised: January 6, 2016

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER

48021CV000B

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

This FIS report was revised on January 6, 2016. Users should refer to Section 10.0, Revisions Description, for further information. Section 10.0 is intended to present the most up-to-date information for specific portions of this FIS report. Therefore, users of this report should be aware that the information presented in Section 10.0 supersedes information in Sections 1.0 through 9.0 of this FIS report.

Initial Countywide FIS Effective Date: August 19, 1991

Revised Countywide FIS Date(s): December 8, 1998
January 19, 2006
January 6, 2016

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EXHIBITS

Exhibit 1 - Flood Profiles

Cedar Creek	Panels 01P-04P
Colorado River	Panels 05P-20P
Dry Creek East	Panels 21Pa-21Pb
Gills Branch	Panels 22P-23P
Piney Creek	Panels 24P-25P
Sandy Creek	Panels 26P-27P

Exhibit 2 - Flood Insurance Rate Map Index

Flood Insurance Rate Map

FLOOD INSURANCE STUDY
BASTROP COUNTY AND INCORPORATED AREAS, TEXAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide-format Flood Insurance Study investigates the existence and severity of flood hazards in, or revises previous Flood Insurance Studies/Flood Insurance Rate Maps for the geographic area of Bastrop County, Texas, including: the Cities of Bastrop, Elgin, and Smithville; and the unincorporated areas of Bastrop County (hereinafter referred to collectively as Bastrop County). This study aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. This information will also be used by Bastrop County to update existing floodplain regulations as part of the regular phase of the National Flood Insurance Program (NFIP). Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for Cedar Creek, Gills Branch, and the Colorado River were prepared by Lockwood, Andrews & Newnam, Inc. for the Federal Emergency Management Agency (FEMA), under Contract No. EMT-87-C-0156. This work was completed in July 1989. The hydrologic and hydraulic analyses for Dry Creek South were taken from the Flood Insurance Study for the unincorporated areas of Travis County.

1.3 Coordination

On October 9, 1986, an Initial Consultation Coordination Officer's (CCO) meeting was held with representatives of FEMA, the City of Bastrop, Bastrop County, and Lockwood, Andrews & Newnam, Inc. (the study contractor) to identify the streams to be studied by detailed methods.

On August 27, 1990, a final CCO meeting was with representatives of FEMA, the communities, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

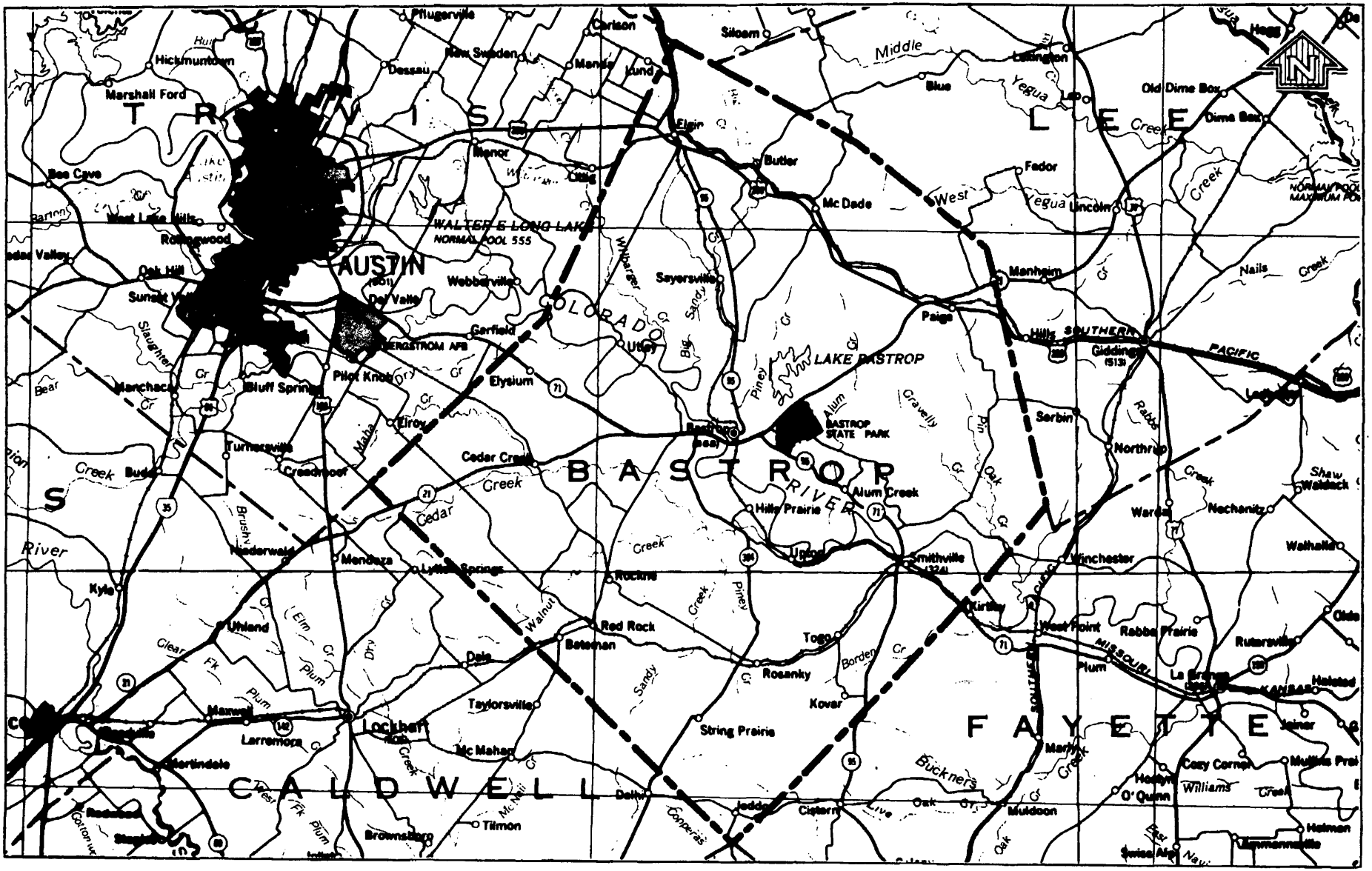
This Flood Insurance Study covers the geographic area of Bastrop County, Texas. The area of study is shown on the Vicinity Map (Figure 1).

The following tabulation shows the limits of study for the streams studied by detailed methods.

Stream	Limits of Detailed Study
Colorado River	From approximately 4.2 miles downstream of the Kansas-Missouri-Texas Railroad to a point approximately 9.5 miles upstream of Loop 150
Gills Branch	From its confluence with the Colorado River to a point just downstream of State Route 95
Cedar Creek	From approximately 1.1 miles downstream of FM 535 to a point approximately 3.7 miles upstream of FM 535
Dry Creek South	From a point approximately 2.0 miles upstream of the confluence with the Colorado River to a point approximately 3.6 miles upstream of the confluence with the Colorado River.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through July 1994.

All or portions of the following flooding sources were studied by approximate methods: Long Hollow, Lytton Spring Creek, Maha Creek, Cottonwood Creek, Red Gully Creek, Moss Creek, Dry Creek, Coleman Branch, Wilbargers Creek, Little Sandy Creek, Elm Creek, Dogwood Creek, Burlson Creek, Big Sandy Creek, Lytton Creek, Walnut Creek, Town Creek, Little Alum Creek, Alum Creek, Cedar Hollow Creek, Habbs Creek, Long Branch, Lake Bastrop, McLaughlin Creek, Piney Creek, West Yegua Creek, Rocky Creek, Paint Creek, Marshy Branch, Upper Elm


AUSTIN
BASTROP
CALDWELL
FAYETTE
TRAVIS
LEE
WALTER E LONG LAKE
NORMAL POOL 555
LAKE BASTROP
BASTROP STATE PARK
COLORADO RIVER
Pflugerville
Hutto
Taylor
Manor
Elgin
Butler
Giddings
Lexington
Serbin
Smithville
Winchester
Rosanky
Red Rock
Bastrop
Cedar Creek
Elroy
Webberville
Del Valle
Garfield
Elysium
Pilot Knob
Bluff Springs
Manchaca
Creedmoor
Buda
Kyle
Uhland
Maxwell
Lockhart
Martindale
Mendoza
Lytton Springs
Utley
Sayersville
Paige
Manheim
Fedor
Dime Box
Old Dime Box
Northrup
Nechanitz
Warda
Walhalla
Rabbs Prairie
West Point
Muldoon
Cistern
Taylorsville
String Prairie
Tilmon
Brownsboro
Mc Mahan
Mc Dade
Hilda Prairie
Alum Creek
Cedar Creek
Piney Creek
Sandy Creek
Big Sandy Cr
Gravelly Cr
Oak Cr
Dry Cr
Elm Cr
Walnut Creek
Clear Fk Plum
West Fk Plum
Plum Creek
Buckners Creek
Williams Creek
Rabbs Creek
Nails Creek
Middle Yegua
West Yegua
Yegua Creek
Lincoln
Hilda
Gidding
Serbin
Northrup
Warda
Nechanitz
Shaw
Waldeck
Walhalla
Winchester
Smithville
Kirsey
Rabbs Prairie
Rutersville
Olde
Halsted
Weimer
Muldoon
Cistern
Jeddo
Dale
Red Rock
Bateman
Togo
Rosanky
Kovar
Taylorsville
String Prairie
Tilmon
Brownsboro
Mc Mahan
Lockhart
Martindale
Maxwell
Uhland
Kyle
Mendoza
Lytton Springs
Creedmoor
Turnersville
Bluff Springs
Pilot Knob
Elroy
Manchaca
Buda
Del Valle
Webberville
Garfield
Elysium
Utley
Sayersville
Paige
Manheim
Fedor
Dime Box
Old Dime Box
Lexington
Giddings
Serbin
Northrup
Nechanitz
Warda

Creek, Lower Elm Creek, Brushy Creek, Sandy Creek, Lentz Branch, Waterhole Branch, Little Piney Creek, Copperas Creek, Pigeonroost Hollow, Reeds Creek, Mill Creek, Line Creek, Wolf Creek, Puss Hollow, JD Creek, Hunt Brook, Price Creek, West Fork Gravelly Creek, East Fork Gravelly Creek, Sprawling Branch, Pin Oak Creek, Spring Creek, Bluff Creek, Orts Branch, Little Copperas Creek, Peach Creek, Rocky Creek, Hickory Creek, Bartons Creek, Buckners Creek, Pricklypear Creek, Gazley Creek, Willow Creek, Lake Creek, Stagners Lake, Shipps Lake, Gravelly Creek, Grassy Creek, Alum Branch, Little Pin Oak Creek, Dreissner Branch, Long Prairie Branch, Live Oak Branch, Spicey Creek, Trigg Lake, Bee Creek, Buescher Lake, Turner Creek, the Colorado River, and Cedar Creek.

2.2 Community Description

Bastrop County is located in central Texas, approximately 30 miles southeast of the City of Austin. It is bordered by Lee County to the east, Fayette County to the southeast, Caldwell County to the southwest, Travis County to the Northwest, and Williamson County to the North.

Bastrop County is primarily an agricultural community with a population of approximately 24,726. The City of Bastrop is the county seat and has a population of approximately 3,789 (Reference 1). Recent development in both communities is mainly residential in nature.

The physical features of the county include rolling hills, alluvial and sandy loam soils, and the Colorado River bisecting the county. The City of Bastrop is located on the eastern bank of the Colorado River and is relatively flat in the interior regions of the urbanized area. The city lies in a large depression, which drains poorly.

The primary drainage system in the City of Bastrop consists of Piney Creek to the north, Gills Branch to the south, and the Colorado River to the west. A majority of the storm runoff contributes to Piney Creek or Gills Branch. A relatively small drainage area immediately adjacent to the river contributes directly to the Colorado River.

The climate of the county is reasonably mild. The average annual precipitation is approximately 37 inches. The largest storm events are usually the result of tropical systems which move inland from the Gulf of Mexico. However, major thunderstorms can also be generated from frontal systems which typically approach from the northwest. The mean maximum and minimum temperatures for July and January are 96 degrees Fahrenheit (^{o}F) and 40°F, respectively (Reference 1).

2.3 Principal Flood Problems

The City of Bastrop can experience some local flooding due to Piney Creek and Gills Branch. However, due to the lack of gage records, no frequency information is available. The Colorado River can

experience significant increases in stage. Some of the more significant storms on record include those of May 1975, June 1981, and October 1961. These were approximately 10-year, 10-year, and 20-year storms respectively. These storms have all occurred since the construction of Lake Travis, approximately 80 river miles upstream, in the early 1940's. Lake Travis, Buchanan, and other reservoirs in the Highland Lake System provide a significant amount of flood protection for the Colorado River near the City of Bastrop. Prior to the construction of Lake Travis, extremely large floods were experienced in July 1869, June 1935, and December 1913. These events exceeded the stage of the October 1961 flood of 34.4 feet by 25.9 feet, 22.6 feet, and 18.9 feet respectively. If events such as these were to occur today, without the upstream control provided by the Highland Lakes as discussed above, widespread flooding and property damage would result.

2.4 Flood Protection Measures

As residential development continues to occur, the demand for aesthetically pleasing stream or riverfront property will increase. However, the adoption of local regulations concerning floodplain management, as a part of the requirements for NFIP participation, and the determination of floodways, will help alleviate storm-related losses. The construction of Lakes Travis and Buchanan, discussed in the previous section, provided Bastrop County with a significant reduction in flood magnitude. No other major structural flood protection measures exist or are currently planned for the county.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the county, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the county.

Flow frequencies for the Colorado River were based on a statistical analysis of USGS streamflow gage data. The Colorado River analysis was performed in accordance with criteria outlined in the Water Resources Council Bulletin No. 17B (Reference 2). The U. S. Army Corps of Engineers computer model, HECWRC was used to develop the frequency-discharge relationships (Reference 3). The analysis was based on a systematic record of 26 years and a generalized skew coefficient of -0.26 as shown on Plate 1 in Bulletin No. 17B. With the concurrence of FEMA, the expected probability values were used in the hydraulic analysis rather than the computed values normally used. These values account for some of the uncertainty encountered in this previously unstudied reach of the stream.

There exists a series of seven reservoirs upstream of the study location. This reservoir system provides a substantial amount of flood regulation. The primary control for the Colorado River in this lake system is Lake Travis, which is approximately 80 river miles upstream of the City of Bastrop. Although there exists some regulation of flood flows in the Colorado River basin, flood frequency analysis of the Bastrop gage records provides a reliable estimate of the frequency-discharge relationship at the City of Bastrop.

The Gills Branch hydrology was performed using the Soil Conservation Service (SCS) computer program TR-20 (Reference 4). This program allows ponding, basin storage, and diversion of flow to be modeled as a part of the hydrologic system. The program uses the procedures described in Section 4 of the National Engineering Handbook to develop synthetic flood hydrographs and determine peak flows at selected locations. Hydrologic data required for the model includes storm rainfall frequency information and drainage basin characteristics such as basin size, time of concentration and SCS runoff curve numbers.

The hydrologic analysis for Cedar Creek was performed using the USGS Publication 77-110 previously referenced for the 10-, 50-, and 100-year storm events. The 500-year discharge was determined graphically from an extrapolation of 10-, 50-, and 100-year events on log-probability paper.

The hydrologic analyses for Dry Creek South were taken from the Flood Insurance for Travis County (Reference 5). The SCS method was used in determining peak flood flows for Dry Creek South. The SCS method of estimating direct runoff from storm rainfall is based on procedures developed by SCS hydrologists over the last three decades. Time of travel, peak flows, and accumulated runoff ratios

from SCS dimensionless hydrographs were used to tabulate the design flood hydrographs and peak discharges for the 10-, 50-, and 100-year storms. The 500-year discharge was determined by a log-normal extrapolation of the 10-, 50-, and 100-year flows.

A summary of the drainage area-peak discharge relationships for the streams studied by detailed methods is shown in Table 1, "Summary of Discharges."

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Cross-section data for the Colorado River were obtained from aerial surveys. Typical subsurface streambed geometry was obtained by field survey. The three bridges within the study reach were surveyed to obtain elevation data. Bridge geometry was taken from construction drawings. Cross-section data for Gills Branch were obtained from field surveys in conjunction with USGS topographic

Table 1 – Summary of Discharges

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Cedar Creek					
Downstream of Maha Creek	88.0	11,490	22,230	28,290	46,760
Upstream of Maha Creek	49.0	7,390	15,400	20,100	34,910
Colorado River					
Bastrop Gage (USGS Gage No. 08159200)	39,980.0	71,975	120,920	142,020	319,352
Dry Creek South					
At confluence with the Colorado River	57.3	11,379	17,292	19,813	25,719
Gills Branch					
At confluence with the Colorado River	2.8	2,300	3,221	3,873	5,000
At State Route 71	2.3	1,525	2,013	2,215	2,750
At Loop 150	1.2	850[1]	850[1]	850[1]	850[1]
At State Route 95	1.0	1,076	1,700	1,981	2,700
Piney Creek					
At confluence of Sandy Creek	17.7	8,499	12,821	16,360	19,599
Approximately 4 miles upstream of the confluence with Sandy Creek	3.0	8,078	12,078	15,388	18,297
Sandy Creek					
At confluence with Piney Creek	39.9	20,650	30,916	39,539	46,887
Approximately 4 miles upstream of the confluence with Piney Creek	31.7	15,091	22,906	29,365	35,207

[1]Approximate capacity of upstream channel

maps (Reference 6). All bridges and culverts were surveyed to obtain elevation data and structural geometry. Cross-section data for Cedar Creek was obtained from aerial surveys. The FM 535 bridge was field surveyed to obtain elevation and geometry data. Cross section data for Dry Creek South was taken from the Travis County Flood Insurance Study (Reference 5). These cross sections were obtained from field surveys.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map (Exhibit 2). Along certain portions of streams, a profile base line is shown on the maps to represent channel distances as indicated on the flood profiles and floodway data tables.

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 7). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for the analysis were determined by the slope-area method. However, the Colorado River backwater was considered in the floodplain mapping for Gills Branch. For Dry Creek South, the water-surface elevations were computed using the Slope-Area Method as outlined in the Travis County Flood Insurance Study (Reference 5).

Channel and overbank roughness factors (Manning's "n") used in the hydraulic computations were chosen based on field observations or model calibration of the stream and floodplain areas. The following tabulation lists Channel and overbank "n" values for the streams studied by detailed methods.

Stream	Channel "n"	Overbank "n"
Colorado River	0.0365	0.060-0.120
Gills Branch	0.015-0.060	0.070-0.100
Cedar Creek	0.060	0.050-0.010
Dry Creek South	0.032-0.055	0.045-0.092

Several unique circumstances were encountered while analyzing and mapping the floodplains for Gills Branch. After reviewing the hydraulic model results, the energy grade line elevation was determined to be more representative of the actual water-surface elevations at two cross sections along Gills Branch where weir flow occurs. At these two locations, the flow can be categorized as being in the transition range between pressure flow and as a combination of pressure and weir flow. In the case of these two bridges, this approach provides the more correct solution. Therefore, the water-surface elevations at the upstream face of the Marion Street Bridge and the Pine Street Bridge were set equal to the energy grade line at these locations.

Along the west bank of Gills Branch north of Chestnut Street, the 100-year and 500-year floodplain boundaries correspond to the west channel bank location. This location represents the highest point west of the channel.

A broad area of 100-year shallow flooding is located west of Gills Branch due to the overflow from this channel north of Chestnut Street. The majority of the shallow flooding consists of sheet flow across the sloping terrain of the west overbank eventually ponding along the eastern side of the Missouri Kansas and Texas railroad tracks. Cross section and slope information for those areas outside the limits of the surveys was obtained from the USGS topographic maps (Reference 6). Delineation of the ponded areas and the base flood elevations along the railroad tracks was based on site reconnaissance and interpretation of the USGS maps.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study, and their descriptions, are shown on the maps.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the streams studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with contour intervals of 10 and 20 feet (Reference 6).

For the streams studied by approximate methods, 100-year floodplain boundaries were delineated using the Flood Hazard Boundary Maps for the City of Bastrop, and the unincorporated areas of Bastrop County

(References 8 and 9); and the previously printed Flood Insurance Studies for the Cities of Elgin and Smithville (References 10 and 11).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the Flood Insurance Rate Map (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodways are shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. For Gills Branch, the water-surface elevation at the upstream face of the Marion Street Bridge and the Pine Street Bridge

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CEDAR CREEK								
A	0	833	9,913	2.9	411.0	411.0	412.0	1.0
B	400	1,000	10,886	2.6	412.1	412.1	413.1	1.0
C	5,608	900	6,895	4.1	415.6	415.6	416.6	1.0
D	7,200	1,400	8,300	2.4	417.5	417.5	418.5	1.0
E	9,050	1,100	5,923	3.4	419.5	419.5	420.5	1.0
F	9,900	1,400	8,581	2.3	420.5	420.5	421.5	1.0
G	16,050	1,600	9,327	2.2	422.2	422.2	423.2	1.0
H	17,350	900	6,672	3.0	423.3	423.3	424.2	0.9
I	18,850	975	6,740	3.0	424.4	424.4	425.4	1.0
J	20,400	660	4,390	4.6	426.4	426.4	427.4	1.0
K	21,450	450	3,929	5.1	428.1	428.1	429.0	0.9
L	22,500	500	3,735	5.4	430.0	430.0	430.9	0.9
M	24,500	1,050	8,918	2.3	431.5	431.5	432.5	1.0
N	25,100	500	3,167	6.3	432.1	432.1	432.9	0.8
O	25,330	550	3,242	6.2	432.8	432.8	433.6	0.8
P	26,300	600	4,672	4.3	435.1	435.1	436.1	1.0
Q	27,400	1,226	7,155	2.8	436.7	436.7	437.7	1.0
R	30,000	1,000	8,303	2.4	438.9	438.9	439.8	0.9
S	33,500	880	9,099	2.2	441.6	441.6	442.5	0.9

[1] Feet above limit of detailed study located approximately 5,808 feet downstream of FM 535

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

CEDAR CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
CEDAR CREEK (CONTINUED)								
T	35,200	1,243	8,087	2.5	443.6	443.6	444.4	0.8
U	38,700	1,500	8,430	2.4	447.1	447.1	448.1	1.0
V	39,800	1,500	8,860	2.3	448.4	448.4	449.4	1.0
W	40,800	948	4,502	4.5	451.1	451.1	452.1	1.0

[1] Feet above limit of detailed study located approximately 5,808 feet downstream of FM 535

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

CEDAR CREEK

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
COLORADO RIVER								
A	1,085,903	1,679	33,099	4.38	297.7	297.7	298.2	0.5
B	1,087,867	2,098	40,747	3.55	298.5	298.5	299.0	0.5
C	1,091,987	1,304	36,949	3.92	299.4	299.4	300.0	0.6
D	1,097,080	2,600	54,564	2.65	300.4	300.4	301.2	0.8
E	1,101,892	2,500	52,857	2.74	301.1	301.1	301.9	0.8
F	1,106,195	5,900	96,112	1.51	301.6	301.6	302.4	0.8
G	1,110,142	6,300	73,119	1.98	301.9	301.9	302.8	0.9
H	1,115,026	1,600	35,142	4.15	302.9	302.9	303.8	0.9
I	1,117,254	2,500	37,910	3.86	303.8	303.8	304.6	0.8
J	1,118,198	1,175	26,744	5.47	304.1	304.1	305.1	1.0
K	1,118,345	1,175	26,992	5.43	304.2	304.2	305.2	1.0
L	1,119,744	925	21,899	6.69	304.6	304.6	305.4	0.8
M	1,120,708	840	21,494	6.83	305.2	305.2	306.1	0.9
N	1,121,886	750	20,423	7.20	305.9	305.9	306.8	0.9
O	1,123,511	1,060	29,466	5.00	307.4	307.4	308.3	0.9
P	1,127,754	2,380	45,287	3.25	309.0	309.0	309.8	0.8
Q	1,130,204	2,800	51,755	2.85	309.5	309.5	310.3	0.8
R	1,133,016	2,010	39,221	3.76	310.0	310.0	310.9	0.9

[1] Feet above mouth at Matagorda Bay

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

COLORADO RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
COLORADO RIVER (CONTINUED)								
S	1,135,961	1,772	40,768	3.62	310.7	310.7	311.7	1.0
T	1,138,769	1,505	23,578	6.26	311.4	311.4	312.3	0.9
U	1,143,510	3,833	51,525	2.87	313.9	313.9	314.7	0.8
V	1,146,181	5,310	65,537	2.26	314.6	314.6	315.3	0.7
W	1,148,519	3,712	44,578	3.32	314.9	314.9	315.6	0.7
X	1,151,455	5,442	61,682	2.40	315.5	315.5	316.4	0.9
Y	1,154,267	6,275	57,531	2.58	316.3	316.3	317.2	0.9
Z	1,158,495	5,800	79,859	1.87	317.3	317.3	318.3	1.0
AA	1,162,642	3,160	43,754	3.42	318.1	318.1	319.1	1.0
AB	1,167,120	3,739	53,262	2.83	319.4	319.4	320.4	1.0
AC	1,171,513	3,755	39,383	3.83	320.6	320.6	321.4	0.8
AD	1,176,755	4,550	72,538	2.09	322.1	322.1	322.9	0.8
AE	1,178,498	5,450	80,945	1.87	322.3	322.3	323.1	0.8
AF	1,181,045	5,400	75,519	2.01	322.5	322.5	323.4	0.9
AG	1,184,092	4,600	53,638	2.83	322.9	322.9	323.9	1.0
AH	1,186,865	4,310	49,004	3.11	323.6	323.6	324.7	1.1
AI	1,190,104	3,313	31,859	4.80	325.0	325.0	325.9	0.9
AJ	1,196,209	1,560	23,189	6.08	329.1	329.1	329.7	0.6
AK	1,203,862	646	22,116	6.38	333.4	333.4	334.1	0.7

[1] Feet above mouth at Matagorda Bay

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

COLORADO RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
COLORADO RIVER (CONTINUED)								
AL	1,206,494	1,197	24,824	5.68	334.2	334.2	335.0	0.8
AM	1,211,260	1,124	31,796	4.44	336.4	336.4	337.1	0.7
AN	1,215,066	1,080	25,045	5.64	337.6	337.6	338.2	0.6
AO	1,219,159	818	25,750	5.49	339.4	339.4	339.9	0.5
AP	1,223,050	753	23,256	6.08	340.7	340.7	341.2	0.5
AQ	1,226,009	648	20,706	6.83	342.0	342.0	342.5	0.5
AR	1,227,473	898	23,341	6.06	342.6	342.6	343.2	0.6
AS	1,231,270	1,277	31,365	4.51	344.6	344.6	345.5	0.9
AT	1,235,031	618	19,910	7.11	345.6	345.6	346.4	0.8
AU	1,237,640	485	18,456	7.68	346.8	346.8	347.5	0.7
AV	1,240,216	612	20,708	6.84	347.8	347.8	348.5	0.7
AW	1,243,238	1,375	32,779	4.32	349.0	349.0	349.7	0.7
AX	1,246,272	1,336	34,501	4.11	349.6	349.6	350.3	0.7
AY	1,250,328	927	23,080	6.15	350.6	350.6	351.2	0.6
AZ	1,253,864	1,064	26,572	3.08	352.3	352.3	352.8	0.5
BA	1,254,380	923	25,824	3.17	352.3	352.3	352.8	0.5
BB	1,254,927	984	26,218	3.12	352.4	352.4	352.9	0.5
BC	1,256,293	1,172	29,545	2.77	352.6	352.6	353.1	0.5
BD	1,256,462	1,083	29,658	2.76	352.6	352.6	353.1	0.5

[1] Feet above mouth at Matagorda Bay

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

COLORADO RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
COLORADO RIVER (CONTINUED)								
BE	1,256,595	1,070	28,885	2.84	352.7	352.7	353.2	0.5
BF	1,259,200	1,720	51,553	1.70	353.0	353.0	353.4	0.4
BG	1,263,864	1,180	24,318	3.60	353.2	353.2	353.6	0.4
BH	1,267,038	860	23,264	3.76	353.6	353.6	353.9	0.3
BI	1,270,548	910	25,321	3.45	354.0	354.0	354.2	0.2
BJ	1,272,597	1,250	36,869	2.59	354.3	354.3	354.5	0.2
BK	1,275,058	715	18,649	5.11	354.4	354.4	354.6	0.2
BL	1,277,251	700	20,152	4.92	354.7	354.7	354.9	0.2
BM	1,282,305	1,615	23,965	5.71	355.5	355.5	356.1	0.6
BN	1,290,762	1,025	25,148	5.43	357.3	357.3	358.3	1.0
BO	1,295,024	645	18,482	7.38	358.4	358.4	359.3	0.9
BP	1,297,534	910	17,285	7.89	358.8	358.8	359.7	0.9
BQ	1,301,763	2,255	24,402	5.35	361.1	361.1	362.1	1.0
BR	1,304,422	965	20,183	6.47	361.6	361.6	362.6	1.0
BS	1,309,137	500	15,203	8.58	362.7	362.7	363.7	1.0
BT	1,311,372	675	18,675	6.99	363.8	363.8	364.8	1.0
BU	1,317,217	520	15,267	8.55	365.4	365.4	366.4	1.0
BV	1,321,274	6,050	47,265	2.36	367.6	367.6	368.6	1.0
BW	1,325,899	6,000	60,485	1.84	368.2	368.2	369.1	0.9

[1] Feet above mouth at Matagorda Bay

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

COLORADO RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
COLORADO RIVER (CONTINUED)								
BX	1,328,438	5,950	49,640	2.24	368.3	368.3	369.2	0.9
BY	1,333,143	3,300	41,060	2.71	368.9	368.9	369.8	0.9
BZ	1,335,504	1,746	16,839	6.62	368.9	368.9	369.8	0.9
CA	1,336,204	1,870	21,075	5.29	369.2	369.2	370.1	0.9
CB	1,337,188	2,075	22,355	5.00	369.6	369.6	370.5	0.9
CC	1,343,300	1,359	15,674	7.19	371.5	371.5	372.3	0.8
CD	1,346,839	705	18,876	6.01	373.7	373.7	374.6	0.9
CE	1,350,669	460	13,782	8.25	375.0	375.0	375.8	0.8
CF	1,352,843	695	19,165	5.94	375.9	375.9	376.8	0.9
CG	1,355,282	530	15,457	7.37	376.5	376.5	377.4	0.9
CH	1,357,639	740	19,315	5.90	377.3	377.3	378.2	0.9
CI	1,358,984	715	16,923	6.73	377.7	377.7	378.5	0.8
CJ	1,360,952	605	15,617	7.30	378.2	378.2	379.1	0.9
CK	1,362,079	640	16,244	7.02	378.9	378.9	379.8	0.9
CL	1,365,260	610	16,847	6.77	379.8	379.8	380.6	0.8
CM	1,367,983	785	16,894	6.75	381.1	381.1	382.0	0.9
CN	1,371,605	555	16,555	6.89	382.3	382.3	383.2	0.9
CO	1,374,089	550	13,548	8.42	382.7	382.7	383.7	1.0
CP	1,375,883	620	16,050	7.11	383.5	383.5	384.4	0.9

[1] Feet above mouth at Matagorda Bay

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

COLORADO RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
COLORADO RIVER (CONTINUED)								
CQ	1,379,366	995	20,052	5.69	385.0	385.0	385.9	0.9
CR	1,381,622	1,368	15,150	7.53	385.3	385.3	386.2	0.9
CS	1,383,693	1,110	17,992	6.34	385.9	385.9	386.8	0.9
CT	1,386,708	1,243	19,181	5.95	386.9	386.9	387.9	1.0
CU	1,389,663	4,805	67,999	1.68	388.0	388.0	388.9	0.9
CV	1,393,376	4,980	69,757	1.57	388.2	388.2	389.1	0.9
CW	1,396,157	3,270	26,521	4.15	388.4	388.4	389.3	0.9
CX	1,399,205	2,786	25,943	4.26	389.3	389.3	390.1	0.8
CY	1,400,662	1,761	22,350	4.97	389.7	389.7	390.6	0.9
CZ	1,407,078	2,935	54,369	2.06	391.1	391.1	392.0	0.9

[1] Feet above mouth at Matagorda Bay

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

COLORADO RIVER

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DRY CREEK EAST								
A	11,556	340	5,266	3.3	396.8	396.8	397.6	0.8
B	15,679	275	4,042	4.2	400.2	400.2	401.1	0.9
C	20,325	290	2,702	6.2	402.1	402.1	403.1	1.0

[1]Feet above confluence with Colorado River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

DRY CREEK EAST

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
DRY CREEK SOUTH								
A	10,930	720	8,197	2.4	392.8	392.8	393.7	0.9
B	13,880	281	3,934	5.0	397.3	397.3	398.3	1.0
C	19,110	302	4,048	4.5	404.2	404.2	405.1	0.9

[1] Feet above confluence with Colorado River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

DRY CREEK SOUTH

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
GILLS BRANCH								
A	750	112	746	5.2	353.0	327.4[2]	327.5	0.1
B	1,550	53	427	9.1	353.0	331.9[2]	331.9	0.0
C	2,888	293	1,099	3.5	353.0	342.3[2]	342.3	0.0
D	3,274	284	34	5.3	353.0	344.4[2]	344.4	0.0
E	3,573	474	1,100	3.5	353.0	346.9[2]	346.9	0.0
F	3,888	50	285	13.6	353.0	349.4[2]	349.4	0.0
G	4,550	53	290	13.4	353.7	353.7	353.7	0.0
H	4,800	72	683	5.7	357.4	357.4	358.1	0.2
I	4,900	69	572	3.9	358.7	358.7	358.7	0.0
J	5,880	68	387	5.7	364.4	364.4	394.4	0.0
K	6,611	52	303	5.7	366.0	366.0	366.6	0.6
L	7,021	96	258	3.3	370.0	370.0	370.3	0.3
M	7,540	113	294	2.9	372.7	372.7	372.8	0.1
N	8,000	24	174	4.9	375.4	375.4	375.5	0.1
O	8,686	39	174	4.9	380.1	380.1	380.4	0.3
P	9,236	53	254	7.8	394.8	394.8	395.1	0.3
Q	9,634	65	392	5.0	397.2	397.2	397.7	0.5

[1] Feet above confluence with Colorado River
[2] Elevation computed without consideration of backwater effects from Colorado River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

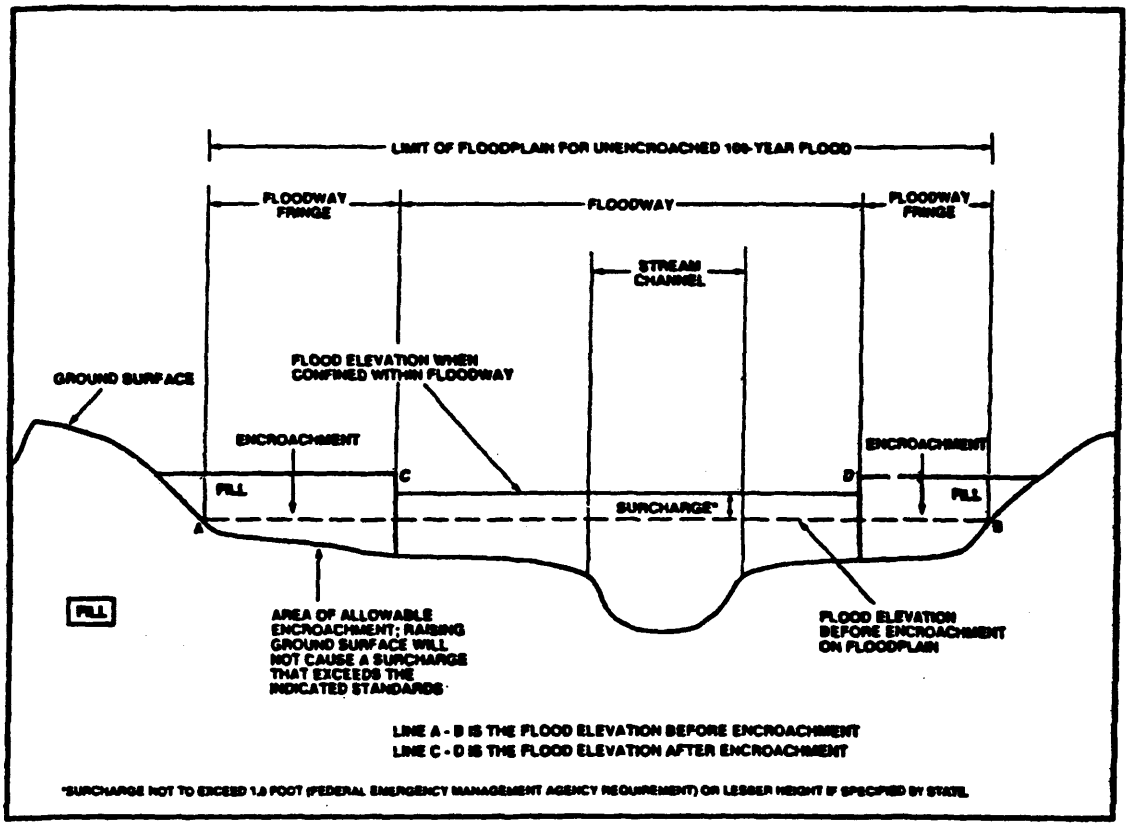
BASTROP COUNTY, TX
AND INCORPORATED AREAS

FLOODWAY DATA

GILLS BRANCH

were set equal to the energy grade line (as described in Section 3.2). Consistent with that approach, the water-surface elevation rise resulting from the floodway encroachment was maintained at a maximum of one foot greater than the energy grade line at these locations.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.



FLOODWAY SCHEMATIC Figure 2

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "Without Floodway" elevations presented in Table 2 for certain downstream cross sections of Gills Branch are lower than the regulatory flood elevations in that area, which must take into account the 100-year flooding due to backwater from other sources.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-

year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

The current Flood Insurance Rate Map (FIRM) presents flooding information for the entire geographic area of Bastrop County, Texas. Previously, separate Flood Hazard Boundary Maps and/or FIRMs were prepared for each

identified flood-prone incorporated community and the unincorporated areas of the county. This countywide FIRM also includes flood hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 3, "Community Map History."

7.0 OTHER STUDIES

Flood Insurance Studies have been prepared for the unincorporated areas of Travis, Caldwell, and Fayette Counties, Texas (References 5, 12, and 13).

Because it is based on more up-to-date and detailed analysis, this study supersedes the Flood Hazard Boundary Maps for the City of Bastrop and the unincorporated areas of Bastrop County (References 8 and 9); and the previously printed Flood Insurance Studies for the Cities of Elgin and Smithville (Reference 10 and 11).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Mitigation Division, Federal Regional Center, Room 206, 800 North Loop 288, Denton, Texas 76201-3698.

9.0 BIBLIOGRAPHY AND REFERENCES

1. Dallas Morning News, 1988-1989 Texas Almanac, Dallas, Texas, 1987.

2. U. S. Department of the Interior, Geological Survey, Office of Water Data Collection, Interagency Advisory Committee on Water Data, "Guidelines for Determining Flood Flow Frequency," Bulletin 17B, Reston, Virginia, Revised September 1981.

3. U. S. Army Corps of Engineers, Computer Program, HECWRC, Users Manual, Flood Flow Frequency Analysis, Hydrologic Engineering Center, Davis, California, February 1982.

4. U. S. Department of Agriculture, Soil Conservation Service, Technical Release No. 20, Computer Program, Project Formulation, Hydrology, Washington, D. C., 1965.

5. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Unincorporated Areas of Travis County, Texas, Washington, D. C., September 27, 1985.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FLOOD INSURANCE RATE MAP EFFECTIVE DATE	FLOOD INSURANCE RATE MAP REVISION DATE(S)
Bastrop, City of	March 19, 1976	None	August 19, 1991	
Bastrop County (Unincorporated Areas)	August 9, 1977	June 3, 1980	August 19, 1991	
Elgin, City of	June 21, 1974	February 27, 1976	July 1, 1988	
Smithville, City of	April 5, 1974	May 21, 1976	January 16, 1979	

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

6. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Intervals 10 and 20 Feet: Smithville NW, Texas, 1982; Lake Bastrop, Texas, 1982; Bastrop, Texas, 1982; Red Rock, Texas 1964, Photorevised 1981; Cistern, Texas, 1965, Photorevised, 1981; Couplano, Texas, 1982; Creedmoor, Texas, 1968, Photorevised 1973; Dale, Texas, 1964, Photorevised 1981; Delhi, Texas, 1964, Photorevised, 1981; Fedor, Texas, 1982; Jeddo, Texas, 1964, Photorevised, 1981; McDade, Texas, 1982; Paige, Texas, 1982; Rosanky, Texas, 1964, Photorevised 1981; Structure, Texas, 1982; Utley, Texas, 1982; Webberville, Texas, 1987; West Point, Texas, 1958, Photorevised 1981; Winchester, Texas, 1982; Lytton Springs, Texas, 1968, Photorevised 1994; Elgin West, Texas, 1982; Elgin East, Texas, 1982; Bastrop SW, Texas, 1982; Togo, Texas, 1964, Photorevised, 1981.

7. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, April 1984.

8. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, City of Bastrop, Bastrop County, Texas, March 19, 1976.

9. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Unincorporated Areas of Bastrop County, Texas, June 3, 1980.

10. Federal Emergency Management Agency, Flood Insurance Study, City of Elgin, Bastrop County, Texas, Washington, D. C., July 1, 1988.

11. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, City of Smithville, Bastrop County, Texas, Washington, D. C., January 16, 1979.

12. Federal Emergency Management Agency, Flood Insurance Study, Unincorporated Areas of Caldwell County, Texas, Washington, D. C., March 15, 1982.

13. Federal Emergency Management Agency, Flood Insurance Study, Unincorporated Areas of Fayette County, Texas, Washington, D. C., June 1, 1987.

14. Schroeder, E. E. and Massey, B. C., U. S. Department of the Interior, Geological Survey, Water Resources Investigations Report 77-11, Techniques for Estimating the Magnitude and Frequency of Floods in Texas, 1977.

15. Jennings, M. E., Thomas, W. O., and Riggs, H. C., U. S. Department of the Interior, Geological Survey, Water Resources Investigations Report 94-4002, 1994 Nationwide Summary of U.S. Geological Survey Regional Regression Equations for Estimating Magnitude and Frequency of Floods for Ungaged Sites, 1993.

16. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water-Surface Profiles, Generalized Computer Program, Davis, California, 1991.

10.0 REVISION DESCRIPTIONS

This section has been added to provide information regarding significant revisions made since the original Flood Insurance Study was printed. Future revisions may be made that do not result in the republishing of the Flood Insurance Study report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data located at the City of Bastrop City Hall, Bastrop, Texas; the City of Elgin City Hall, Elgin, Texas; the City of Smithville City Hall, Smithville, Texas; or the Bastrop County Courthouse, 804 Pecan, Bastrop, Texas.

10.1 First Revision

This restudy was revised on December 8, 1998, to show modifications to flood hazards along Cedar Creek from approximately 1.1 miles downstream of FM 535 to the upstream FM 812. This restudy includes a complete revision of the reach previously studied along Cedar Creek. The previous study reach extended from the same downstream beginning of detailed study to approximately 3.7 miles upstream of FM 535.

The hydrologic and hydraulic analyses for this revision were performed for FEMA by the U.S. Geological Survey (USGS), under Interagency Agreement No. EMW-95-E-4757, Project Order No. 3.

The results of this revision were reviewed at a final CCO meeting held on September 30, 1997, and attended by representatives of FEMA, Bastrop County, the USGS, and the TNRCC. All problems raised at that meeting have been addressed in this restudy.

Equations from USGS Water Resources Investigations Report 77-11, "Techniques for Estimating the Magnitude and Frequency of Floods in Texas" (Reference 14), were used to estimate the 10-, 50-, and 100-year- flood peak discharges for Cedar Creek. The 500-year-flood peak discharges were estimated using USGS Water Resources Investigations Report 94-4002, "1994 Nationwide Summary of U.S. Geological Survey Regional Regression Equations for Estimating Magnitude and Frequency of Floods for Ungaged Sites" (Reference 15). The study reach was divided into two subreaches, below and above the confluence with Maha Creek (just above FM 535). While the two watersheds may peak at different times, a conservative direct arithmetic sum of the two peaks was used in estimating the flood peak discharges downstream from the confluence. The flood peak discharges calculated for Cedar Creek above the confluence were used for the entire subreach above the confluence because no substantial single tributary exists in that subreach.

Cross-section data from the previous Cedar Creek study were retained for use in this revision. Additional upstream cross-section data were field surveyed by the USGS. All USGS-surveyed cross sections were referenced to RM1 of the previous study.

Water-surface elevations of the floods for the selected recurrence intervals were computed using the U.S. Army Corps of Engineers HEC-2 computer program (Reference 16). Between cross sections, the floodplain and floodway boundaries were interpolated using topographic mapping at a scale of 1:24,000, with a contour interval of 10 feet (Reference 6).

Roughness values (Manning's "n") for cross sections from the previous study were retained for those sections. Channel and overbank roughness values for the additional upstream cross sections were chosen based on field observations and photographs of Cedar Creek and ranged from 0.05 to 0.07 and 0.04 to 0.10, respectively.

Table 1, "Summary of Discharges," Table 2, "Floodway Data," Table 3, "Community Map History," and Exhibit 1, "Flood Profiles," were also revised to reflect changes as a result of the restudy.

10.2 Second Revision
Colorado River (January 19, 2006)

a. Purpose of Revision

This revision updates and revises the previous Flood Insurance Study (FIS) report and Flood Insurance Rate Map (FIRM) for Bastrop County, Texas, including the cities of Bastrop, Elgin, and Smithville. This information will be used by the communities to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development

b. Authority and Acknowledgements

The Colorado River revision was completed and submitted to FEMA on March 17, 2003, by Halff Associates, Inc., on behalf of the Lower Colorado River Authority under Contract No. EMT-2001-CO-0029. The revision to the streams studied by limited detail methods was submitted to FEMA on August 3, 2004, by Watershed Concepts, under Contract No. TA-04, Task Order 1.

c. Coordination

The Initial Consultation and Coordination Officer's (CCO) meeting was held on June 20, 2002, and attended by representatives of Bastrop County, City of Bastrop, City of Smithville, City of Elgin, the Lower Colorado River Authority, and the study contractors. All comments and concerns raised at the CCO meeting have been addressed. A final CCO meeting was held on October 26, 2004, to review the revised report with representatives of Halff Associates, Inc., Watershed Concepts, LCRA, FEMA, and officials of incorporated communities.

d. Scope of Revision

The Colorado River was restudied by detailed hydrologic and hydraulic methods for a total of approximately 60.5 miles from the Bastrop County-Travis County line to the Bastrop County-Fayette County line. The streams studied by limited detail methods, approximate Zone A, were divided into 10 sub-basins: Bartons Creek, Cedar Creek, Lower Pin-Oak, North Piney-Alum, Sandy Creek, Southeast Tributaries, South Piney-Sandy, Upper Pin-Oak, Walnut Creek and Willbarger Creek. This revision also converts the vertical datum reference for the entire county to the North American Vertical Datum of 1988 (NAVD 88).

This revision also incorporates the following Letters of Map Revision (LOMRs) that affect the 1-percent-annual-chance floodplain delineation:

Case No.	Effective Date	Project Identifier
01-06-1939P	08/15/2002	Elgin Wastewater Treatment Plant Channel Improvement
01-06-1169P	12/05/2002	La Reata Subdivision
04-06-1182P	07/08/2004	Hunter's Crossing
04-06-1736P	02/02/2005	Highway 290 to Brenham Street

e. Hydrologic Analysis

For this revision, the peak discharges for the Colorado River were developed by a flood frequency analysis of the annual peak floods for the stream flow data recorded over a 70-year period of record (Reference 17). The USACE HEC-HMS computer program (Reference 18) was used to create hydrographs for each of the resulting peaks. The peak discharge-drainage area relationship for the Colorado River is shown Table 1.

Peak flood discharges for streams restudied by limited detail methods were estimated following the regional regression approach described in USGS Water Resource Investigation (WRI) report 98-4015 (Reference 19). Drainage area and main channel slope were found to be the two parameters significant to the regression equation development. The basin delineations and drainage areas were determined using a 50' x 50' grid size digital elevation model (DEM) generated from a USGS topographic map with a 10-foot contour interval.

f. Hydraulic Analysis

For this revision, cross section data for the Colorado River was taken from 2-foot contour interval topographic maps of Bastrop County and 1-foot contour interval topographic maps for the City of Bastrop (Reference 17). The mapping was supplemented with field surveys conducted in the summer of 2001 as a part of the Lower Colorado River Basin-wide study (Reference 17) as well as Texas Department of Transportation roadway and bridge construction plans.

The water surface elevations (WSEL) for the Colorado River were computed using the USACE HEC-RAS step-backwater computer program unsteady flow option (Reference 20). Starting downstream boundary conditions (stage hydrographs) were determined in the Lower Colorado River Basin-Wide Study (Reference 17).

For the streams studied by limited detail methods, topographic data for the floodplain models were developed using USGS topographic maps with a 10-foot contour interval, field measurements of structures, and updated hydrologic information.

The floodplain models were generated through use of the USACE HEC-RAS step-backwater computer program (Reference 21). The starting WSELs for the hydraulic models were set to normal depth by estimating the slope of the energy grade line from USGS topographic maps with a 10-foot contour interval or, where applicable, derived from the water surface profile of existing effective flood elevations.

Channel roughness factors (Manning's "n") for the hydraulic computations were assigned on the basis of visual inspection and analysis of aerial photographs. The Manning's "n" values for the Colorado River ranged from 0.03-0.046 for the channel, and 0.040-0.10 for the overbank. The Manning's "n" values for the limited detail streams ranged from 0.030-0.060 for channels and 0.070 to 1.0 for overbank areas.

The Floodway Data Tables and Flood Profiles for the Colorado River have been updated as a part of the revised hydrologic and hydraulic analysis.

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports, and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in BFEs across the corporate limits between the communities. The average conversion of +0.2 feet was applied to convert all effective Base Flood Elevations (BFEs). The Floodway Data Tables and Flood Profiles for Cedar Creek, Gills Branch, and Dry Creek South have been updated to reflect the new vertical datum reference (NAVD 88).

g. Floodplain Boundaries

For this revision, the boundaries for the Colorado River, Cedar Creek, Gills Branch, and Dry Creek South were interpolated between cross sections using orthophotography flown in 1998 and 1999. The orthophotography consists of 4-foot contour interval topographic mapping that was interpolated to 2-foot contours in rural areas and 1-foot contours in the City of Bastrop (Reference 17). Floodplain boundaries for streams studied by limited detail methods were also redelineated based on this topographic data.

h. Bibliography and References

17. Halff Associates, Incorporated, Mapping the Colorado River, Technical Support Data Notebook, Fort Worth, Texas, September 2002.

18. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-HMS Hydrologic Modeling System Version 2.0, Davis, California, March 1990.

19. U.S. Geological Survey, Water Resources Investigations Report 98-4015, Peak Flow Frequency for Tributaries of the Colorado River Downstream of Austin, Texas, USGS, 1998.

20. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-RAS River Analysis System Version 3.1, Davis, California, November 2002.

21. U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-RAS River Analysis System Version 3.0, Davis, California, 2001.

10.3 Third Revision (January 6, 2016)

a. Authority and Acknowledgments

The hydrologic and hydraulic analyses, for Dry Creek East, were performed by Halff and Associates for FEMA, under Contract No. EMT-2010-CA-011. The work was completed in August 2013.

b. Coordination

No initial meeting was held. A final meeting was held on June 18, 2014, and was attended by representatives of Bastrop County, FEMA Region VI, and Atkins. All issues raised at the meeting were addressed.

c. Scope of Study

As part of this revised countywide FIS, updated analyses were performed for Dry Creek East.

The following tabulation lists streams that have names in this revised countywide FIS other than those used in the previously printed FIS reports for the communities in which they are located.

Old Name	New Name
Dry Creek South	Dry Creek East

Figure 4 presents important considerations for using the information contained in this FIS report and the FIRM and is provided in response to changes in format and content.

d. Hydrologic Analyses

Flow data for Dry Creek East was based on aerially reduced peak discharges. Peak discharges at key locations along the study streams were placed approximately one-half to one-third upstream of the reach between the key flow break locations.

Peak discharge-drainage area relationships for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance floods are presented in Table 4.

Table 4 – Revised Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent-Annual-Chance	4-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Dry Creek East						
At confluence with Colorado River	55.660	11,200	14,100	15,900	19,200	28,900
Just downstream of confluence of Moss Branch	54.850	11,200	14,100	15,800	19,000	28,600
Approximately 700 feet upstream of confluence of Moss Branch	52.730	11,100	13,900	15,700	17,900	27,300
Just downstream of confluence of Red Gully Creek	52.140	11,100	13,900	15,700	17,500	26,800
Approximately 0.35 miles upstream of confluence of Red Gully Creek	45.280	10,800	13,500	15,100	16,800	20,700
Approximately 0.59 miles downstream of Empedrado Lane	44.370	10,800	13,500	15,100	16,800	20,600
Approximately 0.28 miles downstream of Empedrado Lane	44.130	10,800	13,500	15,100	16,800	20,600
Approximately 385 feet downstream of Travis/Bastrop County Line	43.790	10,800	13,500	15,100	16,700	20,600
Approximately 0.57 miles upstream of Tucker Hill Lane	42.990	12,900	17,400	20,500	23,500	29,800

e. Hydraulic Analyses

Field surveys of bridges, culverts, cross sections, and the channel of Dry Creek East were conducted. HEC-RAS 3.1.3 was used to calculate water surface elevations (Reference 22). Bridges and culverts were modeled using field surveys, field measurements, and State Highway 130 construction plans. Manning's "n" values were assigned by visual inspection and analysis of digital orthophotos.

The Manning's "n" values for all streams newly studied, for this countywide revision, are presented in the following table.

Stream Name	Channel "n" values	Overbank "n" values
Dry Creek East	0.050-0.070	0.040-0.150

f. Floodplain Boundaries

Floodplain boundaries for Dry Creek East were delineated between cross-sections using 2-foot contour interval topographic data based on LiDAR (Reference 23).

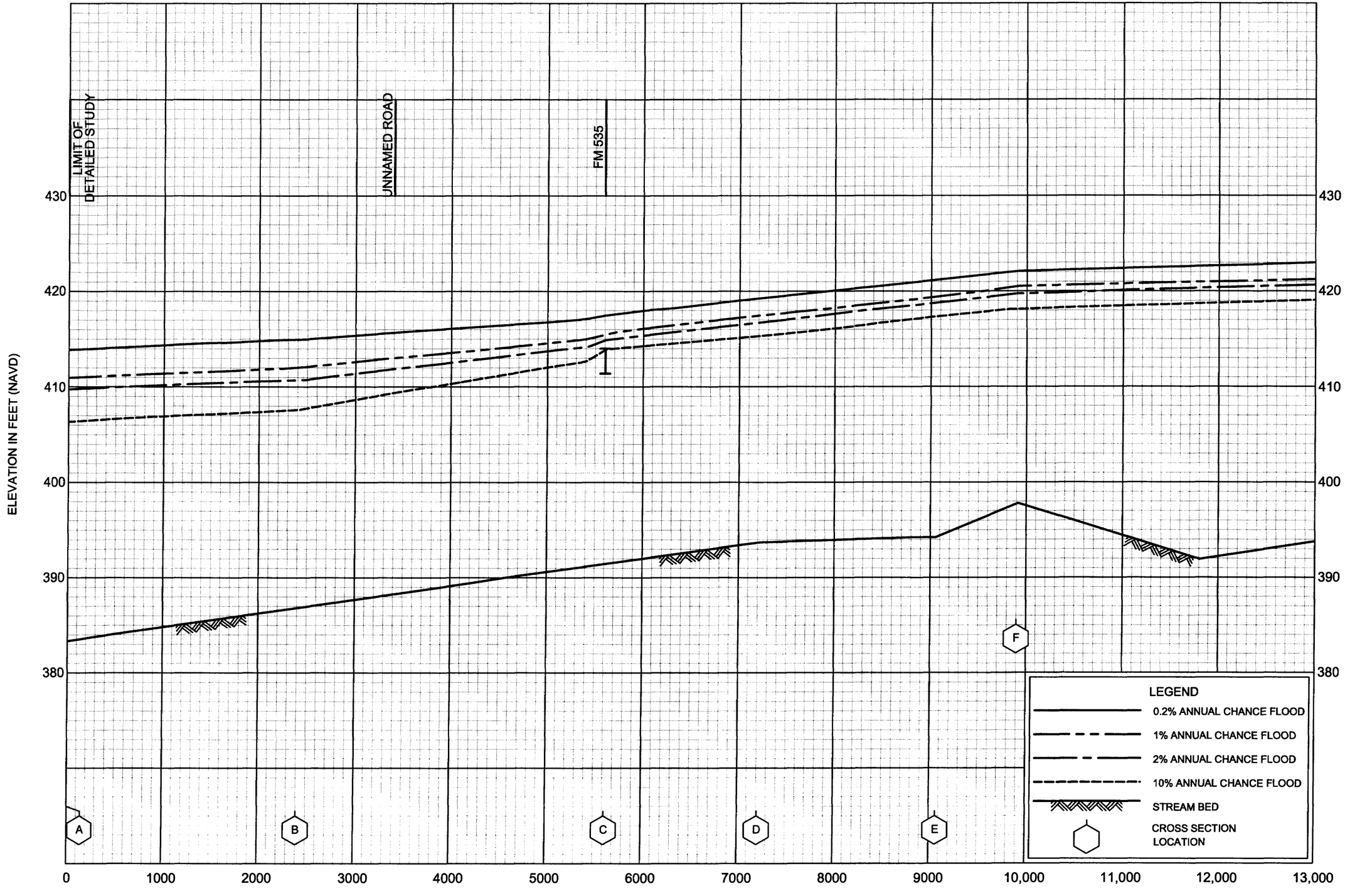
g. Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

h. Bibliography and References

22. Hydrologic Engineering Center, HEC-RAS River Analysis System, Version 3.1.3, U.S. Army Corps of Engineers, Davis, California, May 2005.

23. The Sanborn Map Company, Inc., Topographic Maps Compiled from LiDAR, Contour Interval 2-Feet, City of Austin and Travis County, Texas, January 2003.



FLOOD PROFILES

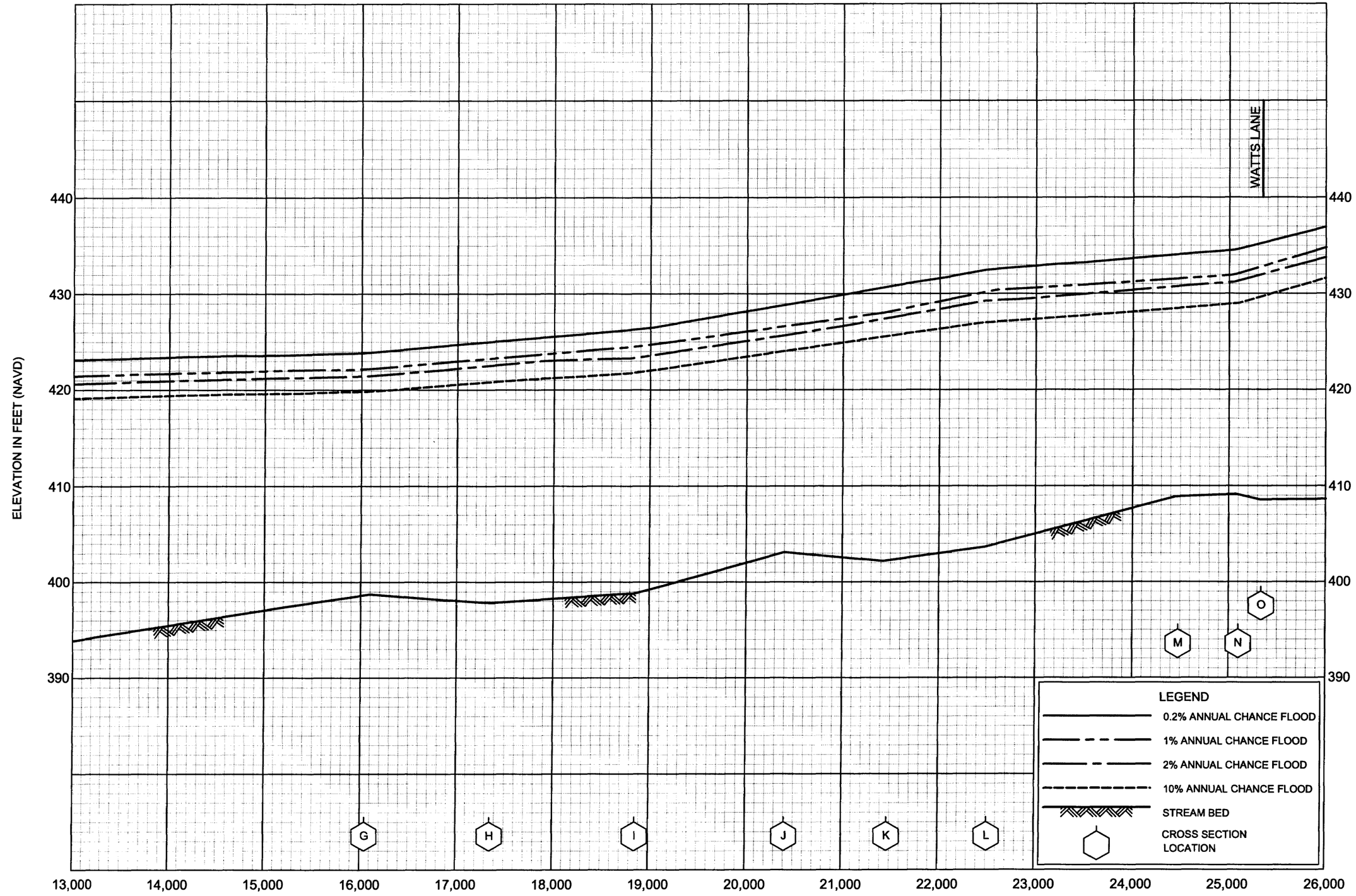
CEDAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

01P



FLOOD PROFILES

CEDAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

02P

ELEVATION IN FEET (NAVD)

450
440
430
420
410
400

P
Q
R
S
T

26,000
27,000
28,000
29,000
30,000
31,000
32,000
33,000
34,000
35,000
36,000

STREAM DISTANCE IN FEET ABOVE LIMIT OF DETAILED STUDY
(LIMIT OF DETAILED STUDY APPROXIMATELY 5,808 FEET DOWNSTREAM OF FM 535)

LEGEND
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

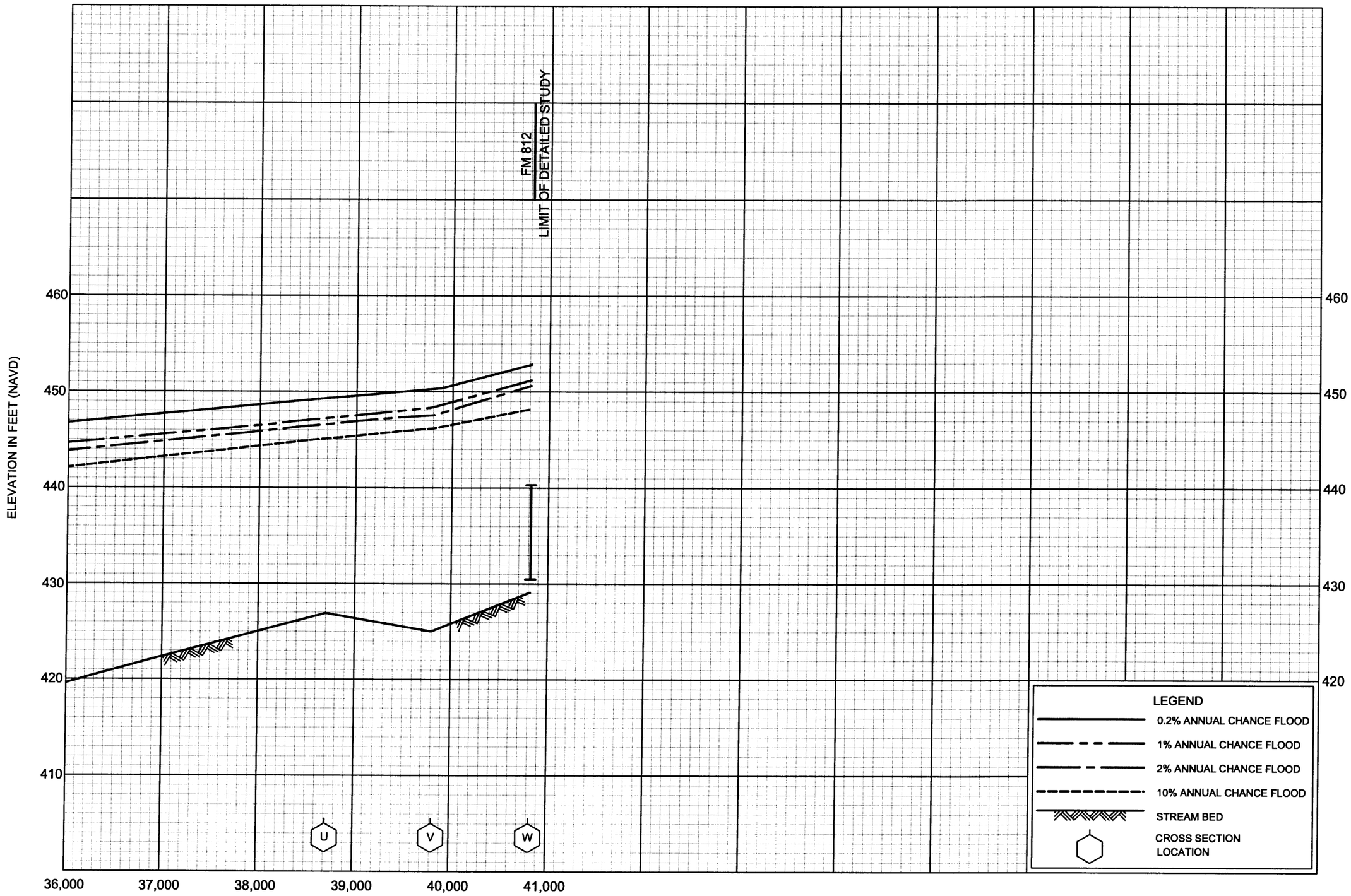
CEDAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

03P



FLOOD PROFILES

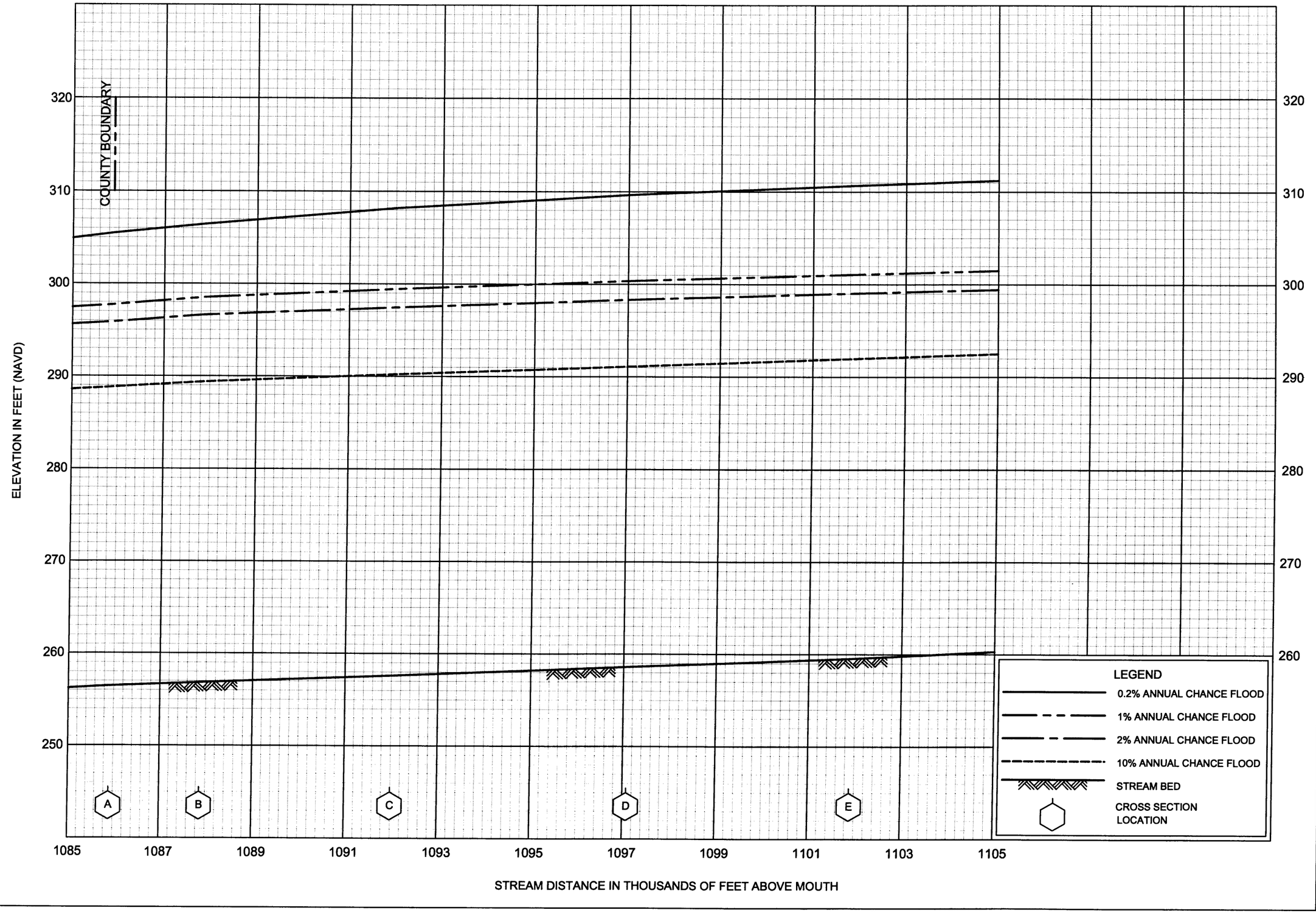
CEDAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

04P



FLOOD PROFILES

COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

05P

ELEVATION IN FEET (NAVD)

320
310
300
290
280
270
260

CONFLUENCE OF JO CREEK
CONFLUENCE OF HUNT BRANCH
STATE HIGHWAY 71
STATE HIGHWAY 71
CORPORATE LIMITS
STATE HIGHWAY 95
CORPORATE LIMITS
CONFLUENCE OF GAZLEY CREEK
CONFLUENCE OF COLORADO TRIBUTARY NO. 1

F G H I J K L M N O

LEGEND
0.2% ANNUAL CHANCE FLOOD
1% ANNUAL CHANCE FLOOD
2% ANNUAL CHANCE FLOOD
10% ANNUAL CHANCE FLOOD
STREAM BED
CROSS SECTION LOCATION

1105 1107 1109 1111 1113 1115 1117 1119 1121 1123 1125

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE MOUTH

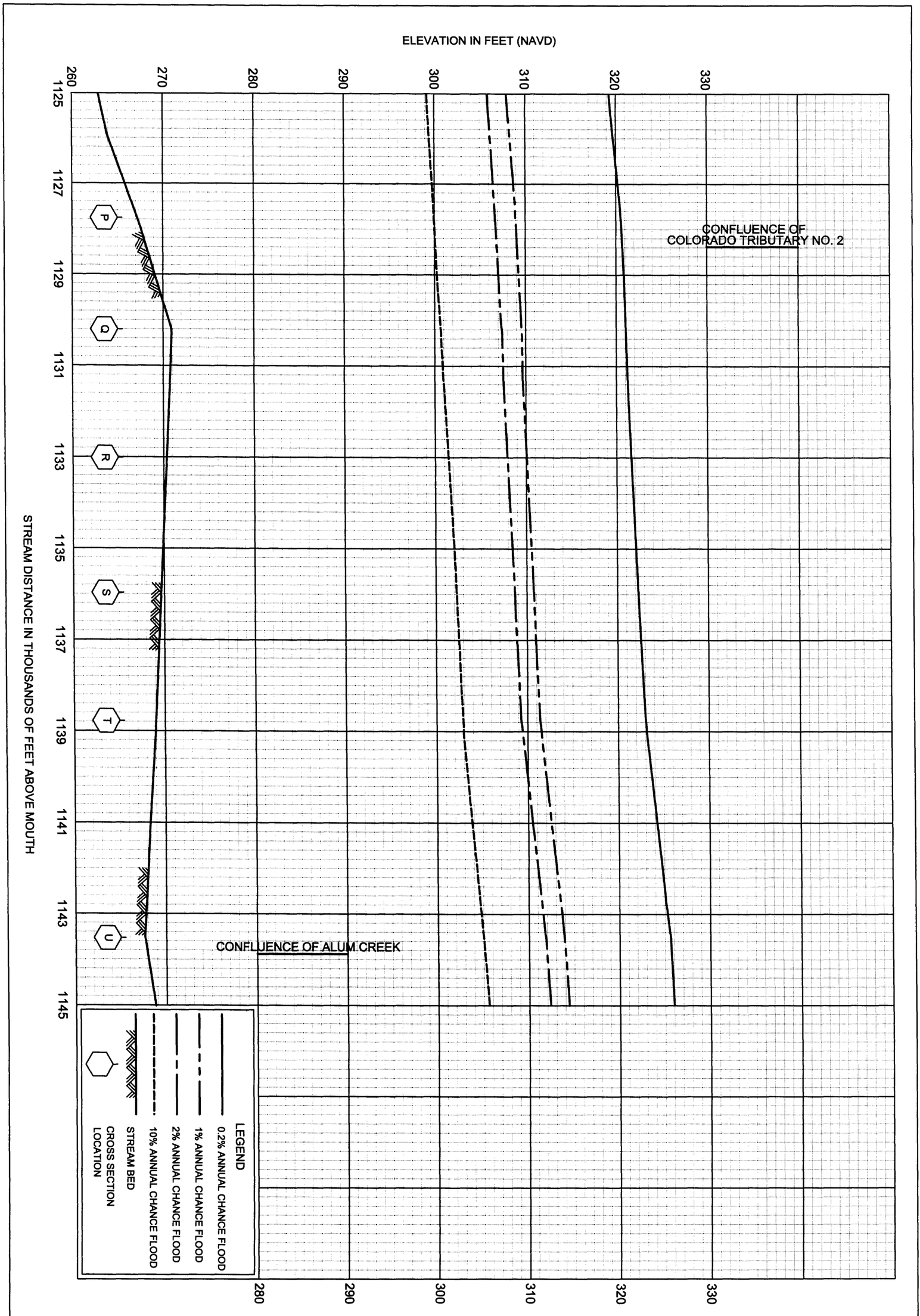
FLOOD PROFILES

COLORADO RIVER

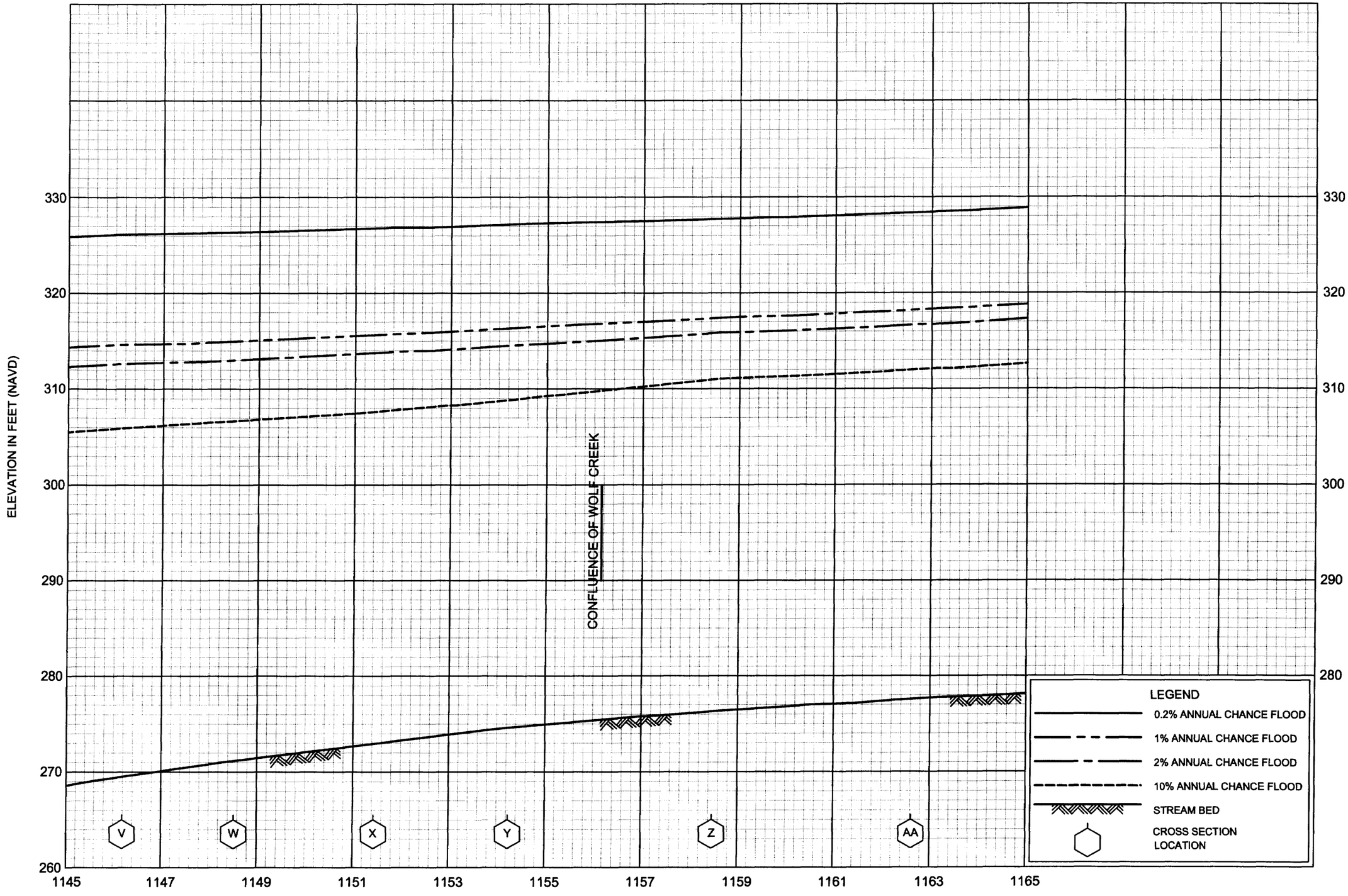
FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX
AND INCORPORATED AREAS

06P



07P	FEDERAL EMERGENCY MANAGEMENT AGENCY BASTROP COUNTY, TX AND INCORPORATED AREAS	FLOOD PROFILES COLORADO RIVER



FLOOD PROFILES

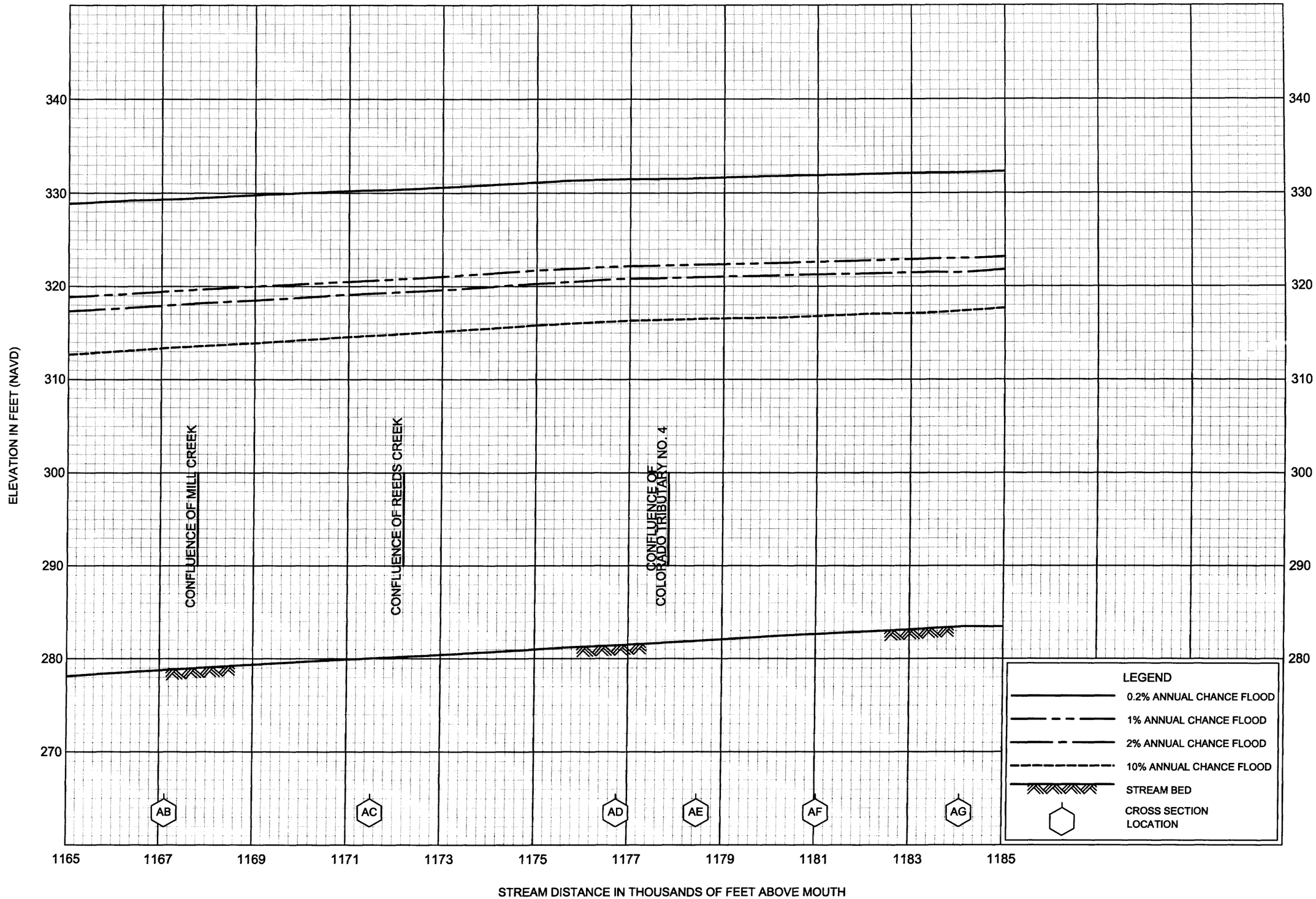
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

08P



FLOOD PROFILES

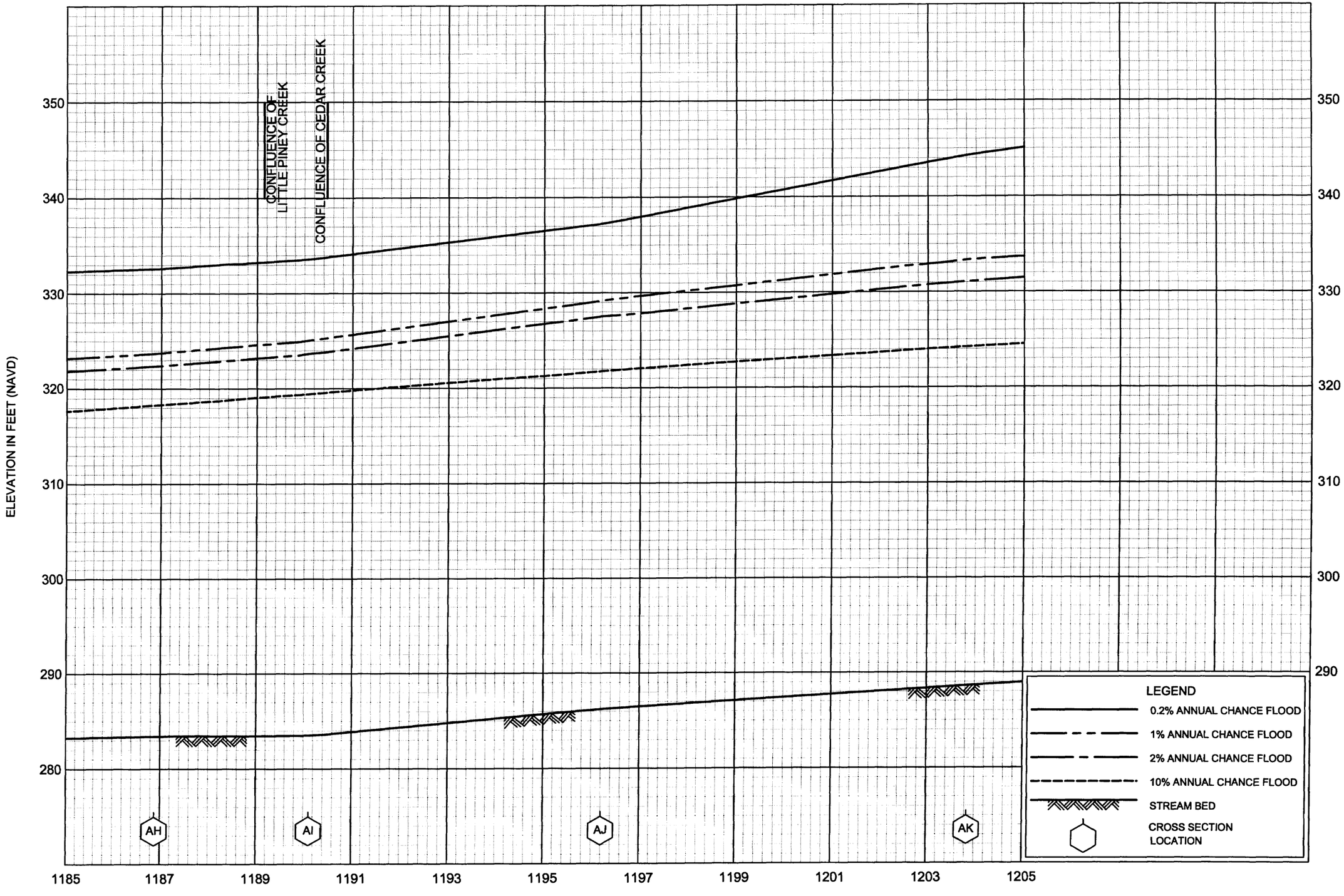
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

09P



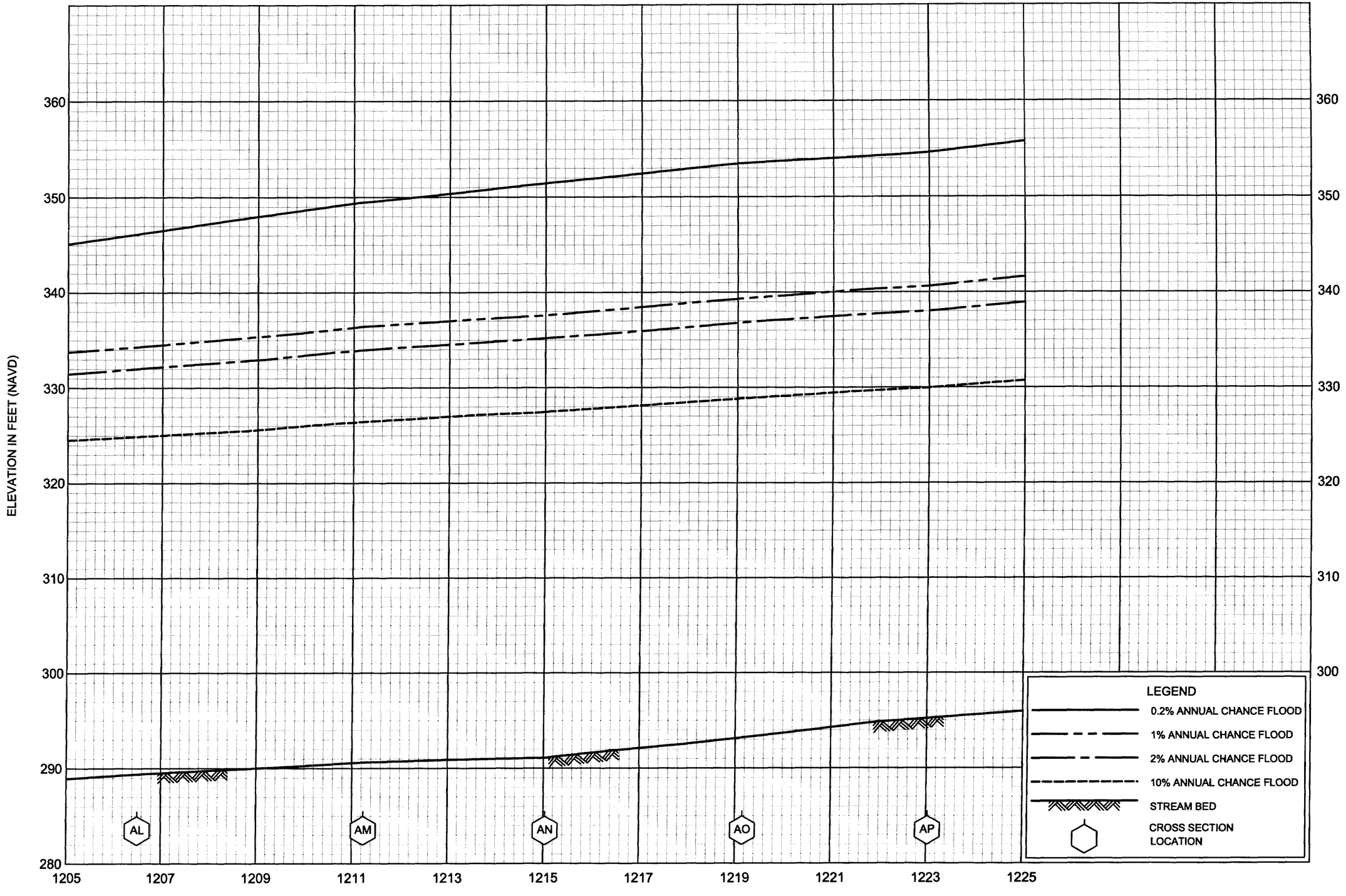
FLOOD PROFILES

COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

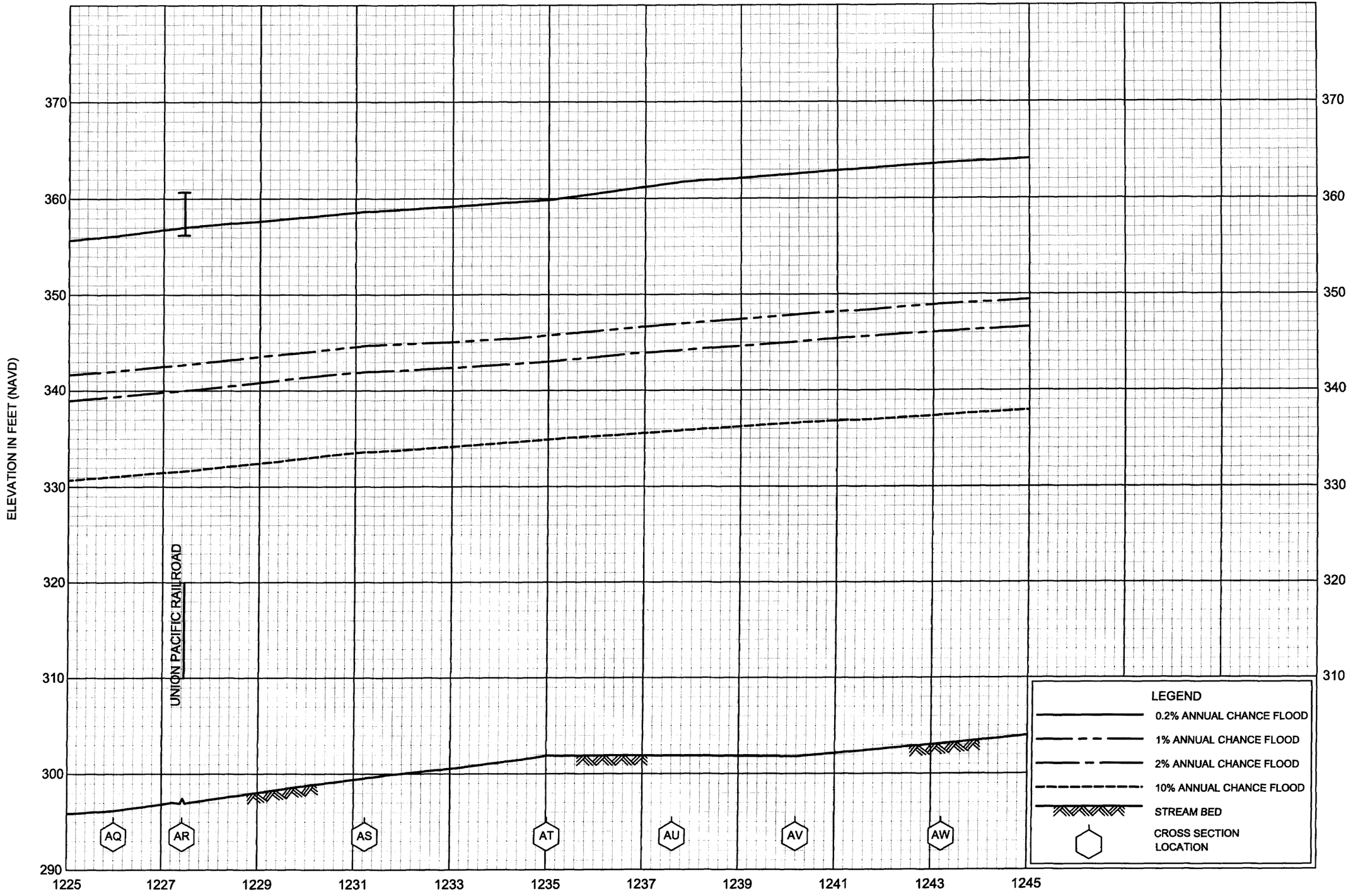
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

11P



FLOOD PROFILES

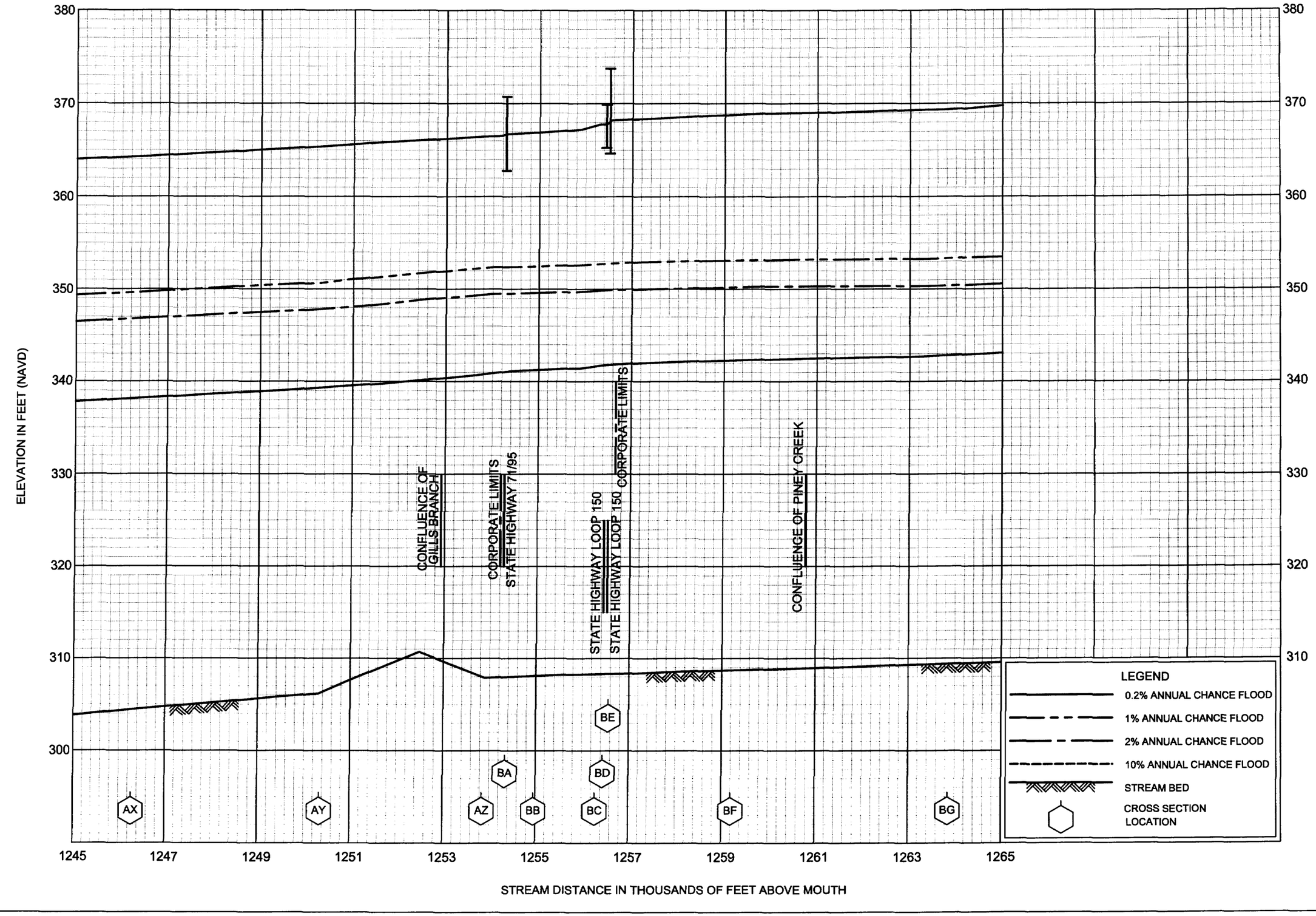
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

12P



FLOOD PROFILES

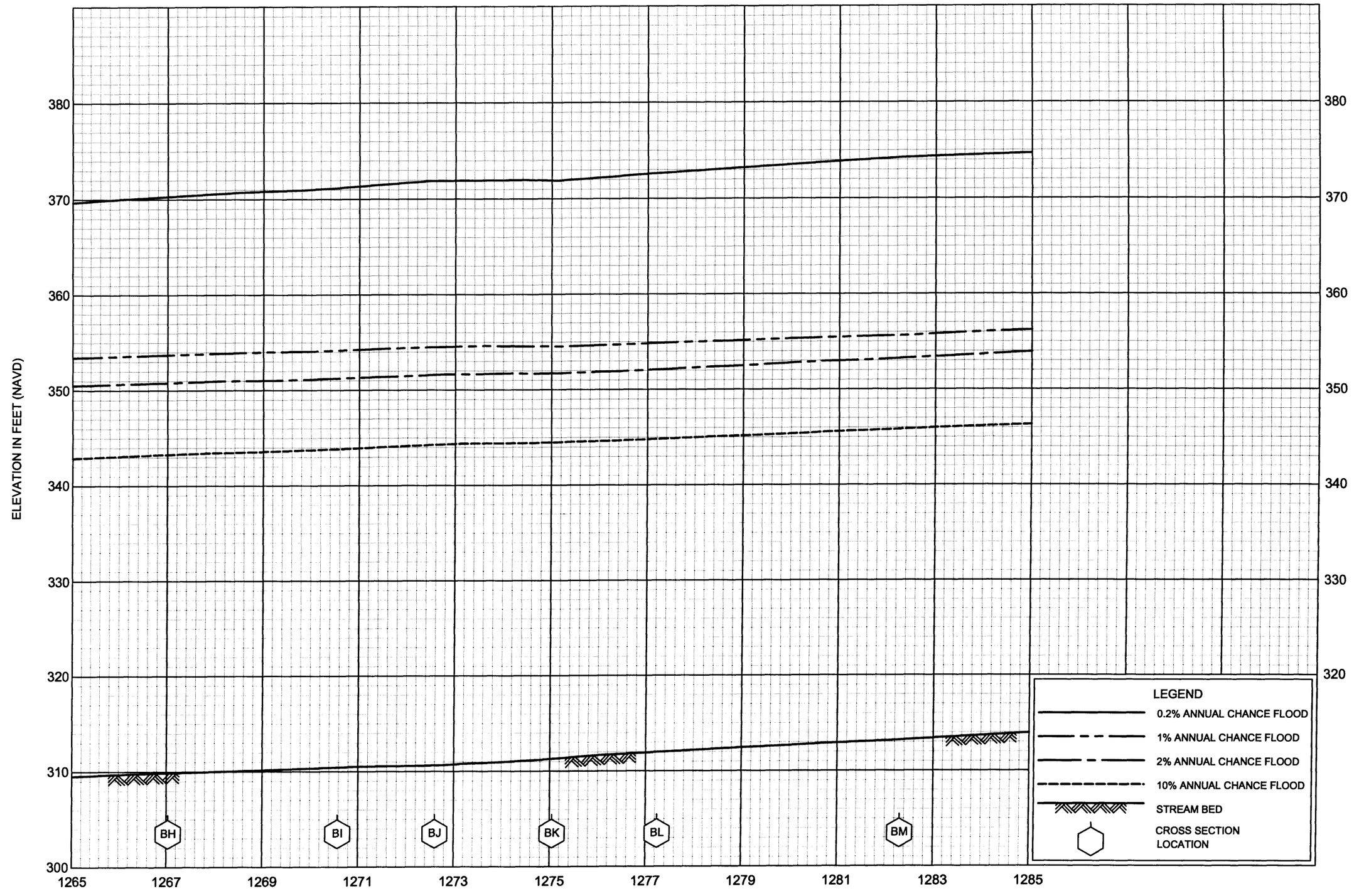
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

13P



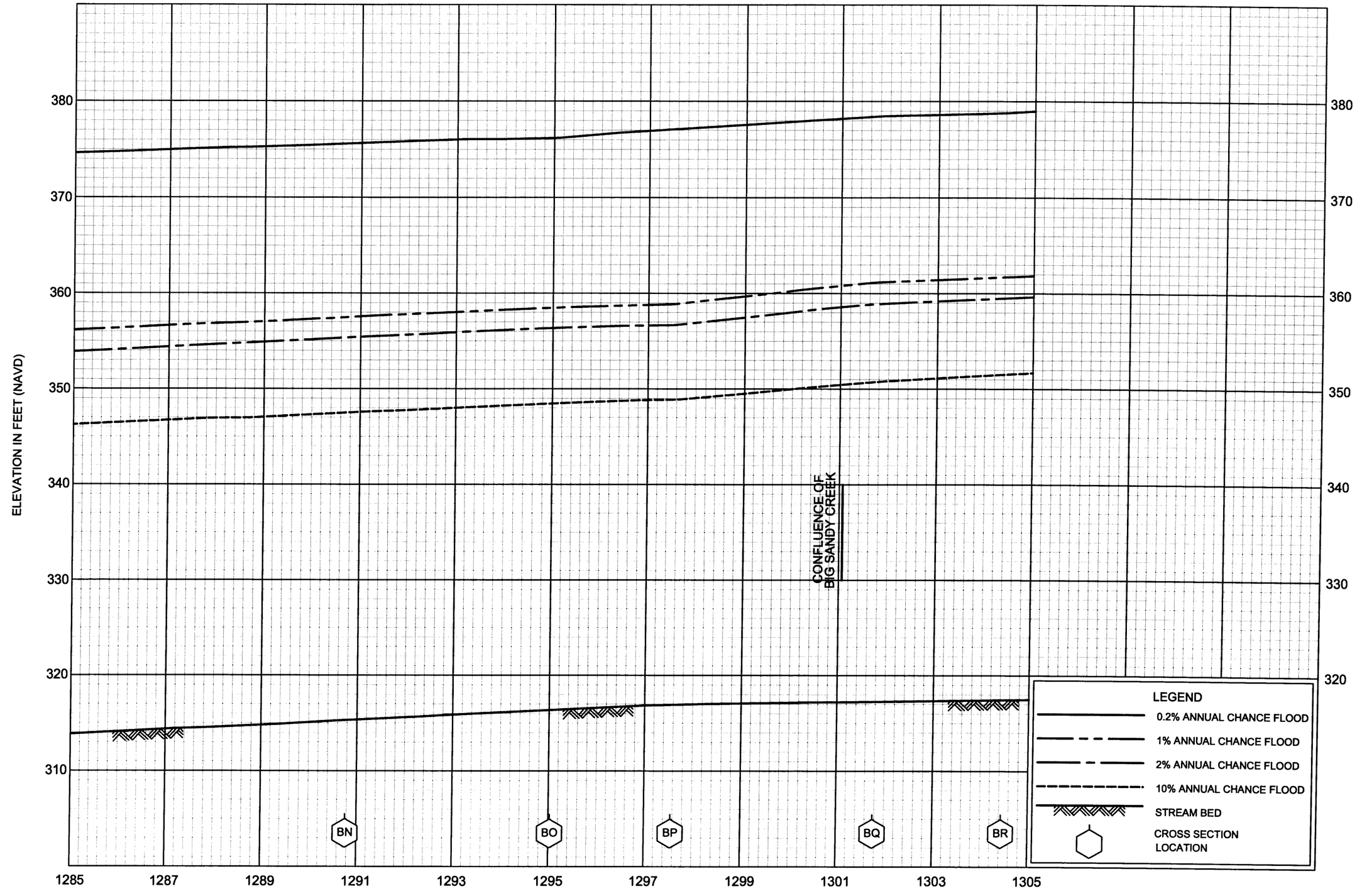
FLOOD PROFILES

COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS



FLOOD PROFILES

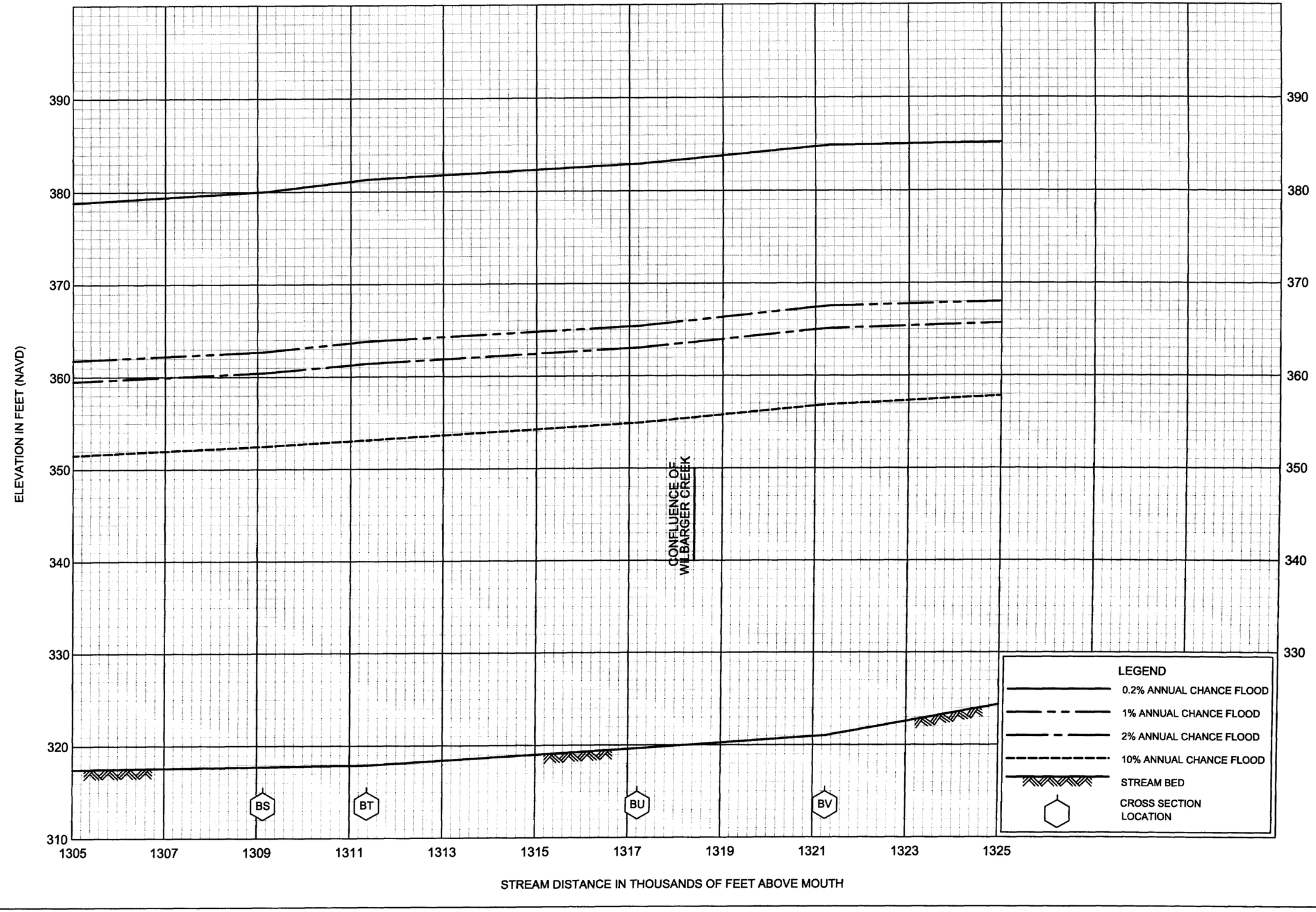
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

15P



FLOOD PROFILES

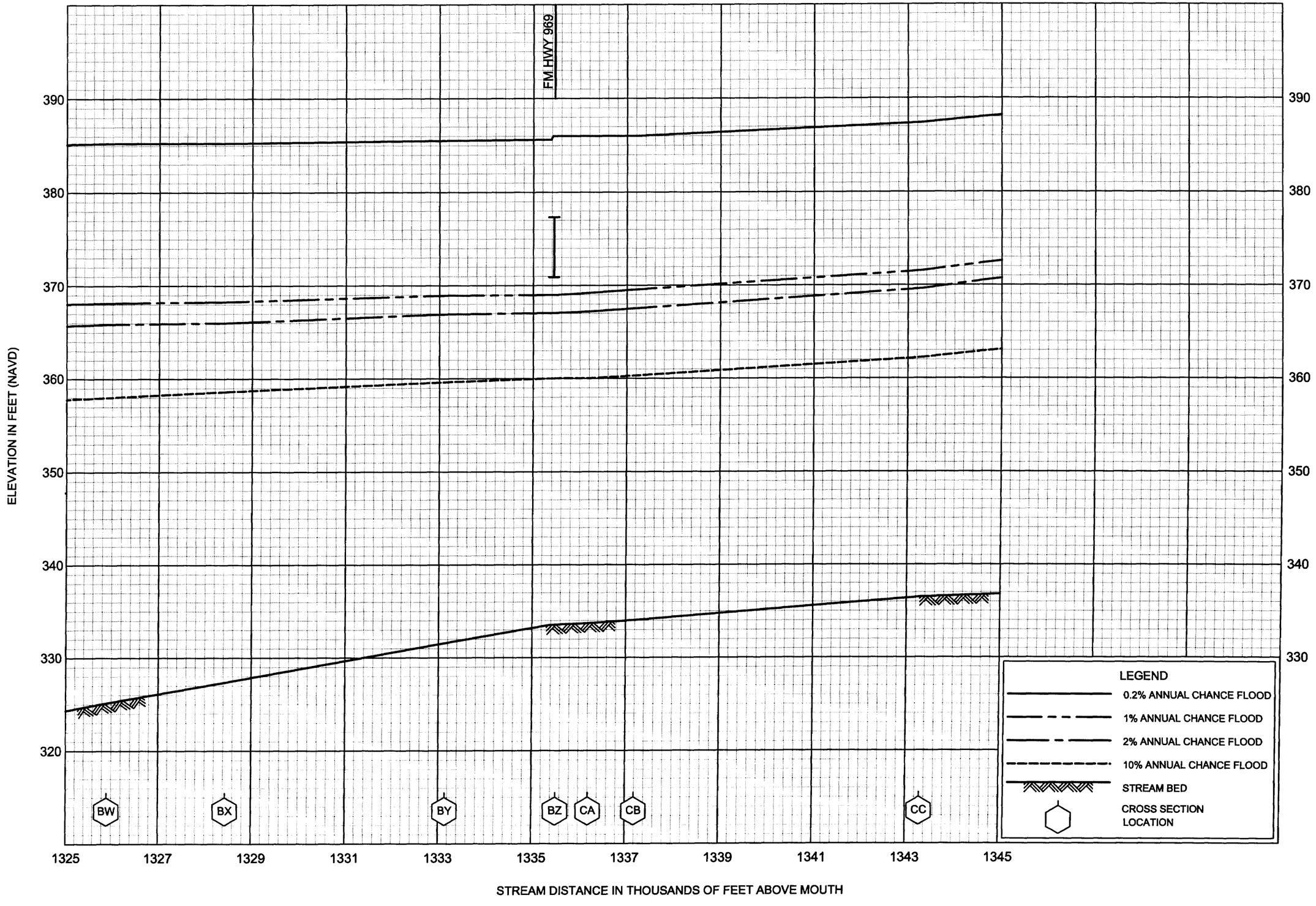
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

16P



FLOOD PROFILES

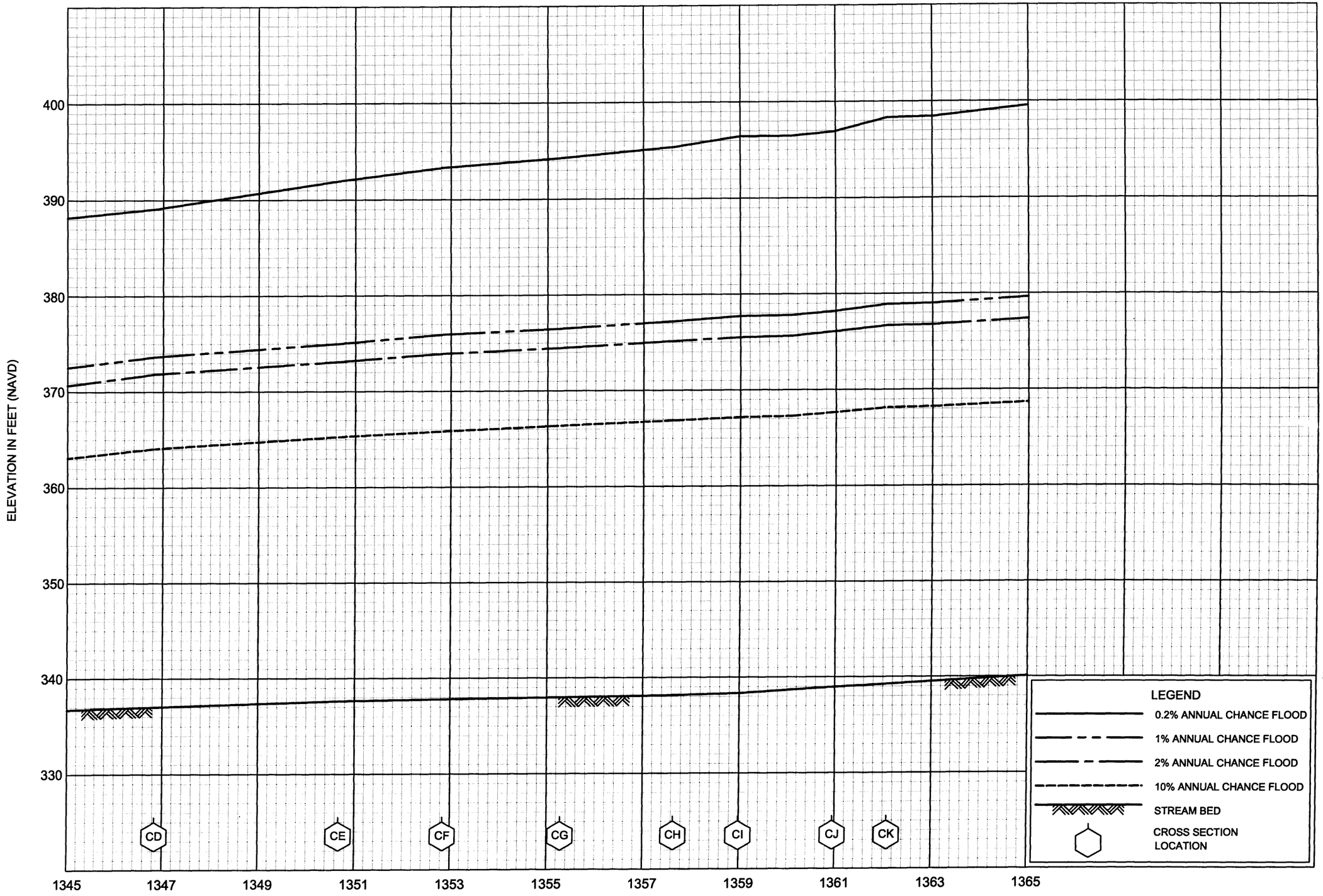
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

17P



FLOOD PROFILES

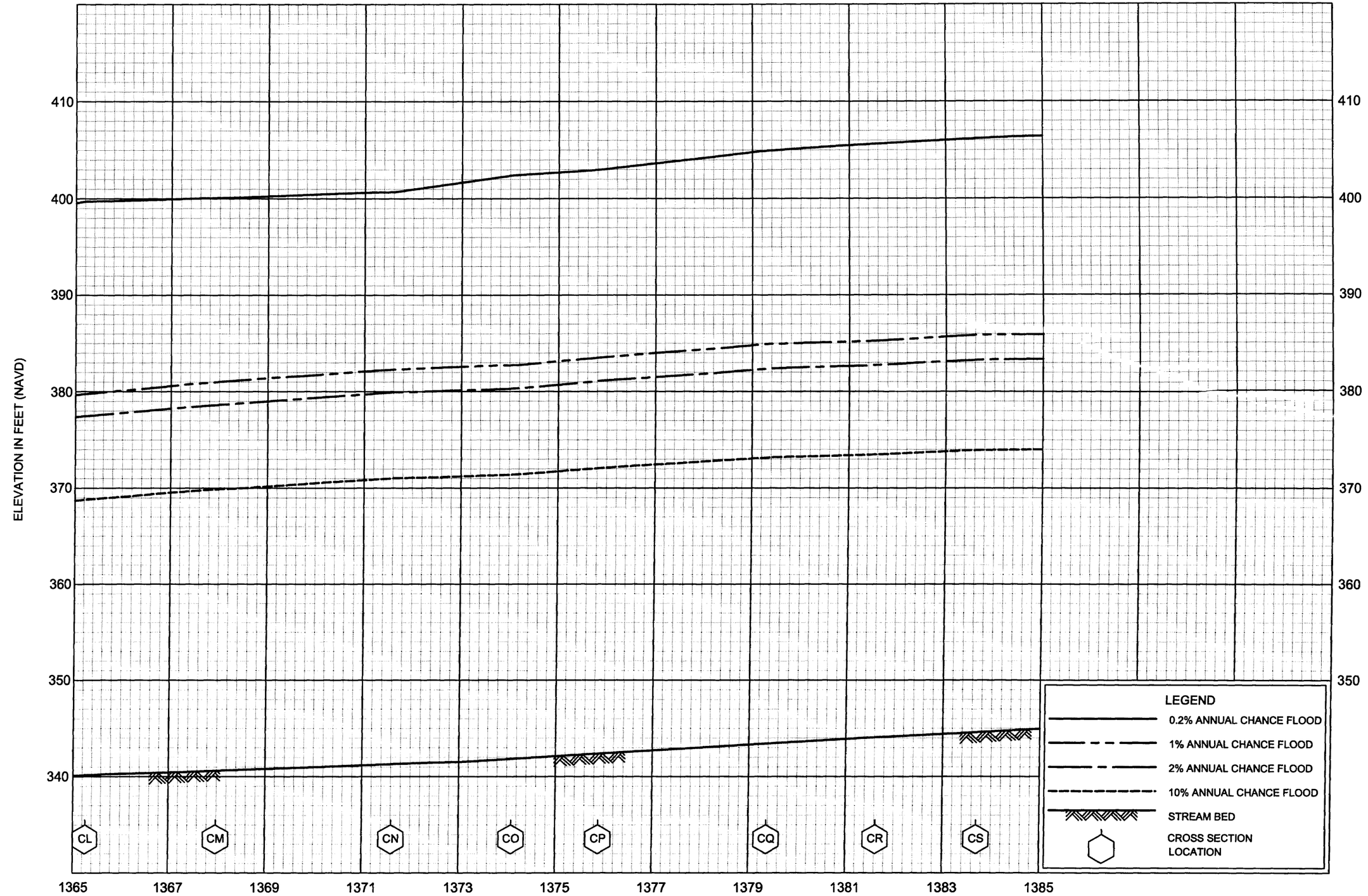
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

18P



FLOOD PROFILES

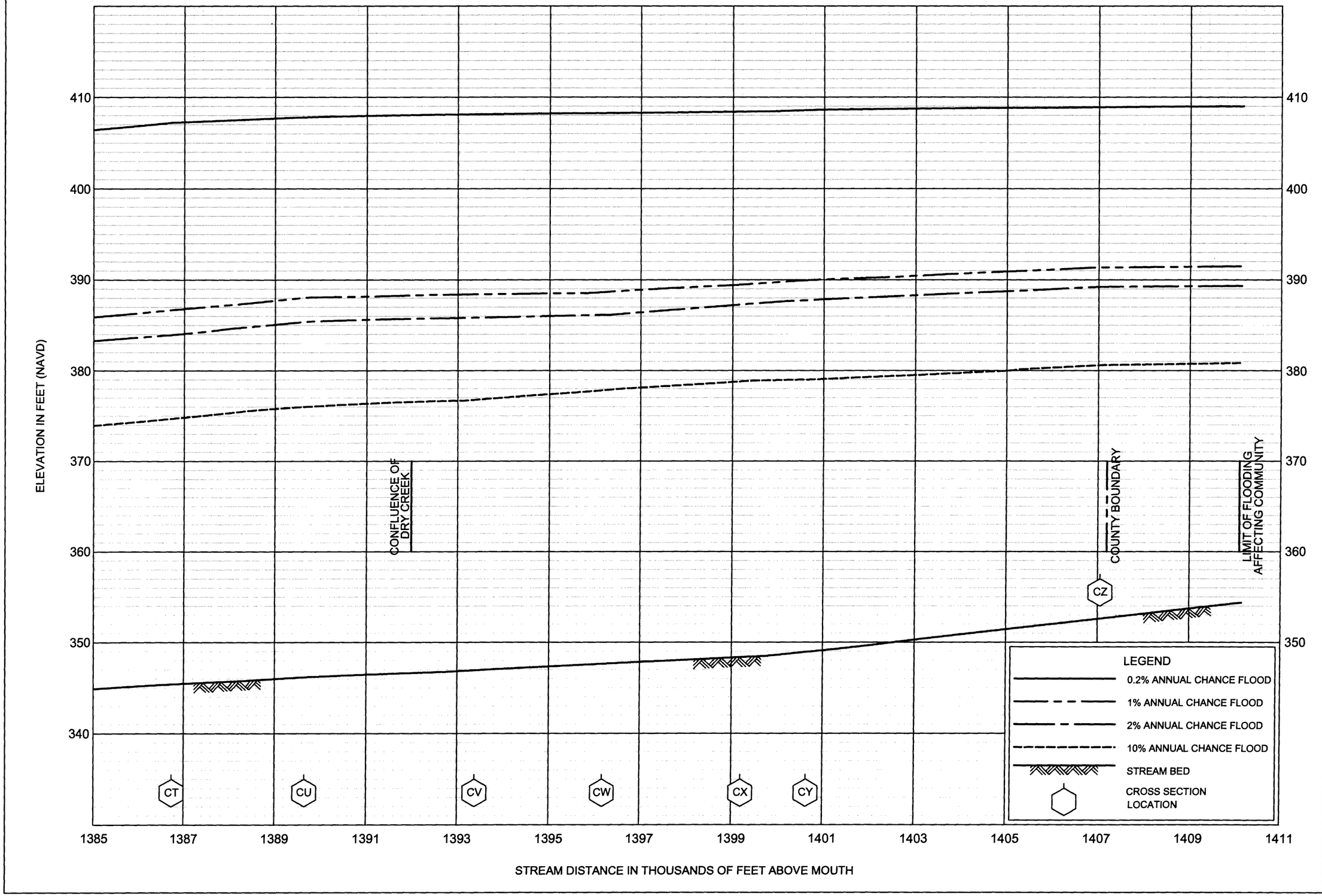
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

19P



FLOOD PROFILES

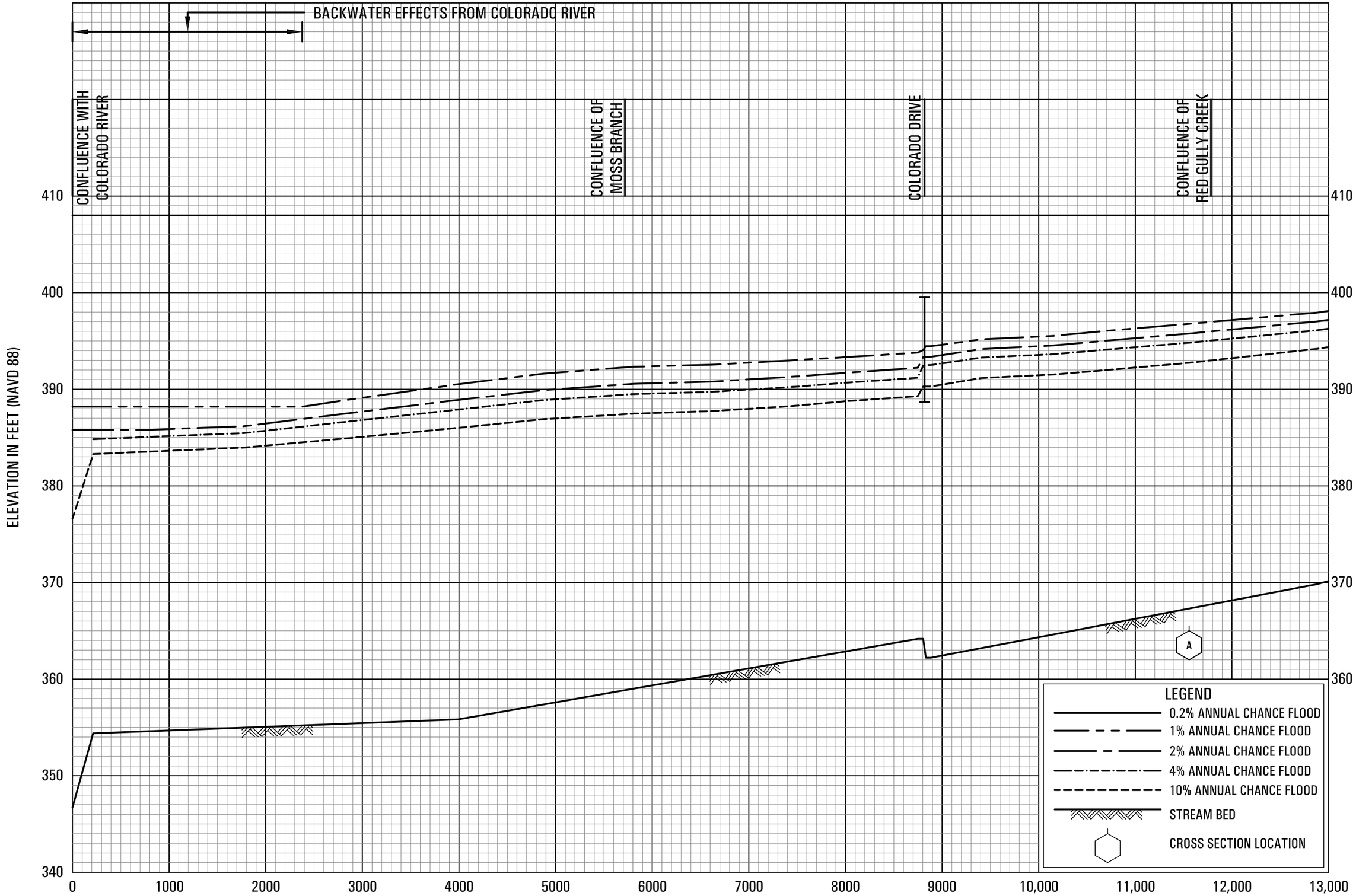
COLORADO RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

20P



FLOOD PROFILES

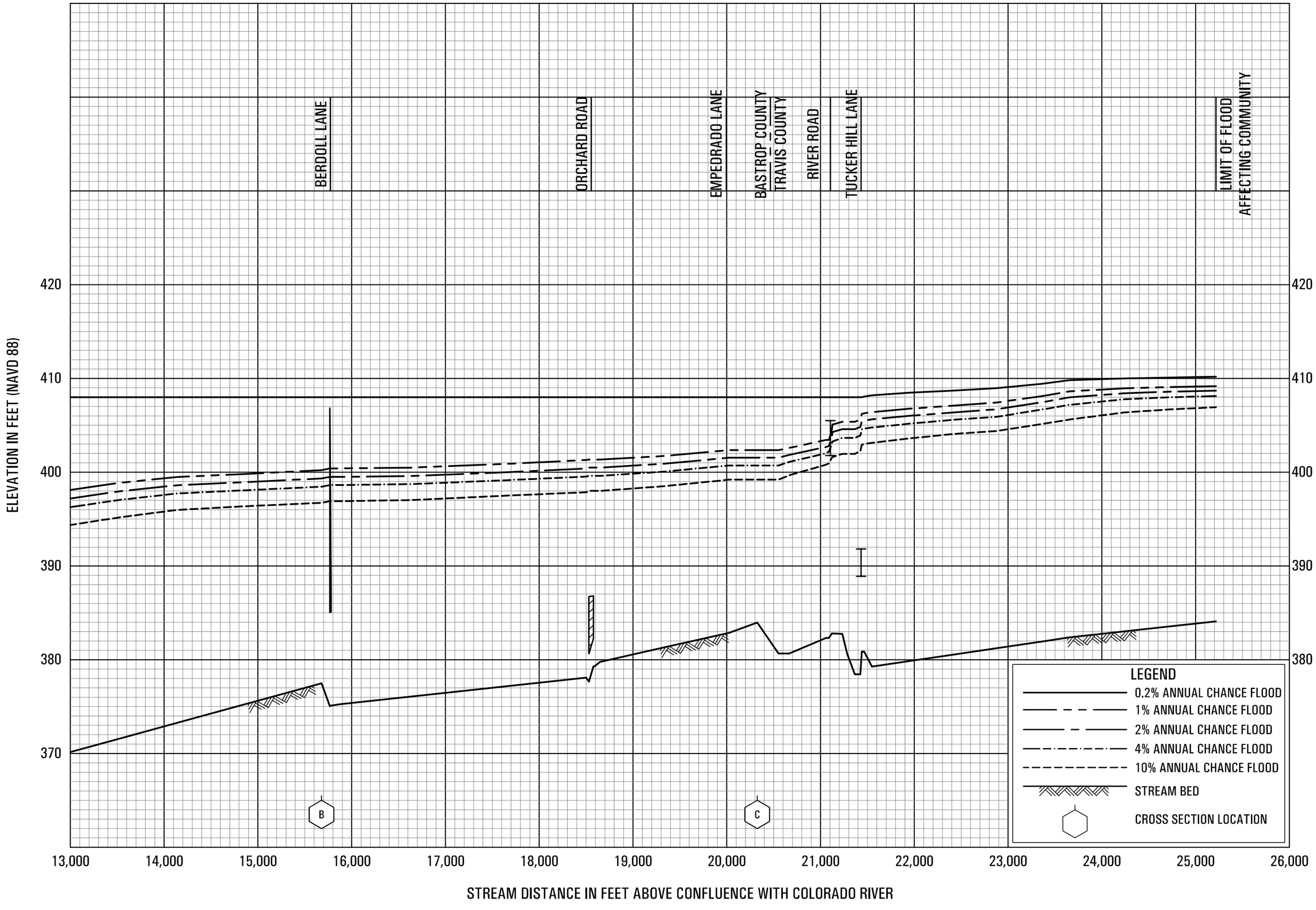
DRY CREEK EAST

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

21Pa



FLOOD PROFILES

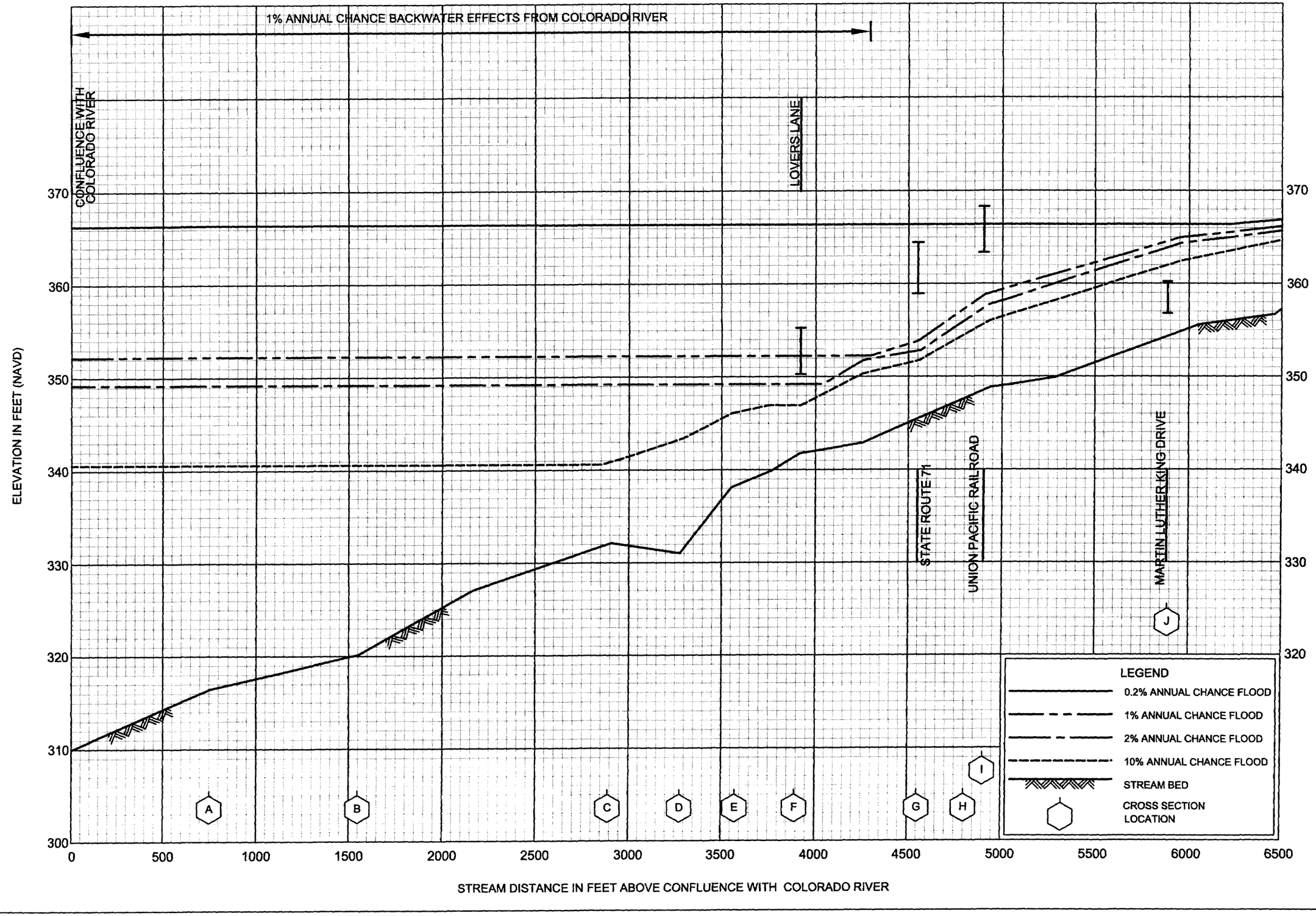
DRY CREEK EAST

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

21Pb



FLOOD PROFILES

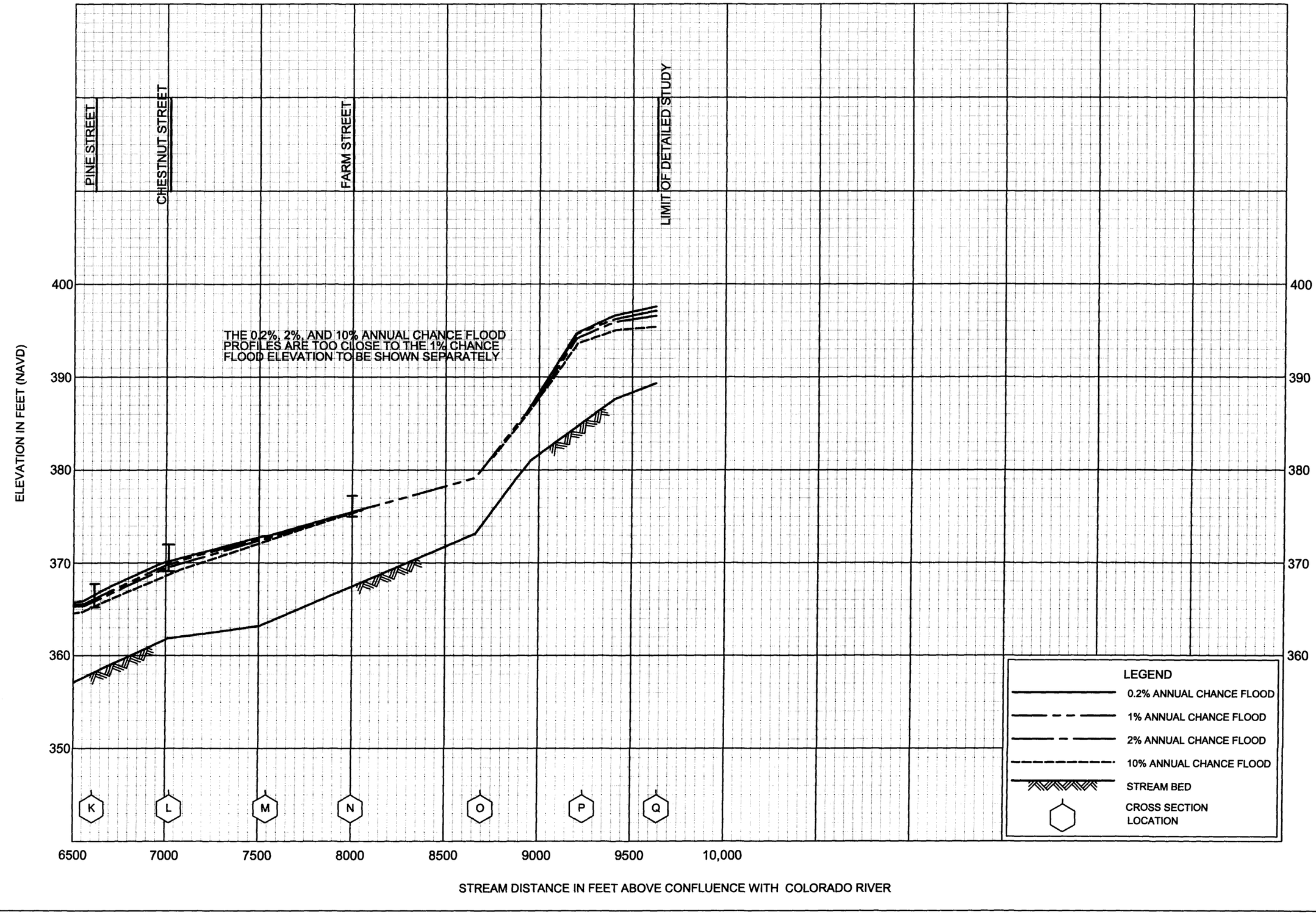
GILLS BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

22P



FLOOD PROFILES

GILLS BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

LIMIT OF DETAILED STUDY

PONY EXPRESS DRIVE

ELEVATION IN FEET (NAVD)

400
390
380
370
360
350
340

4000 5000 6000 7000 8000 9000 10,000 11,000 12,000 13,000 14,000 15,000 16,000 17,000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE OF SANDY CREEK

LEGEND

1% ANNUAL CHANCE FLOOD

STREAM BED

FLOOD PROFILES

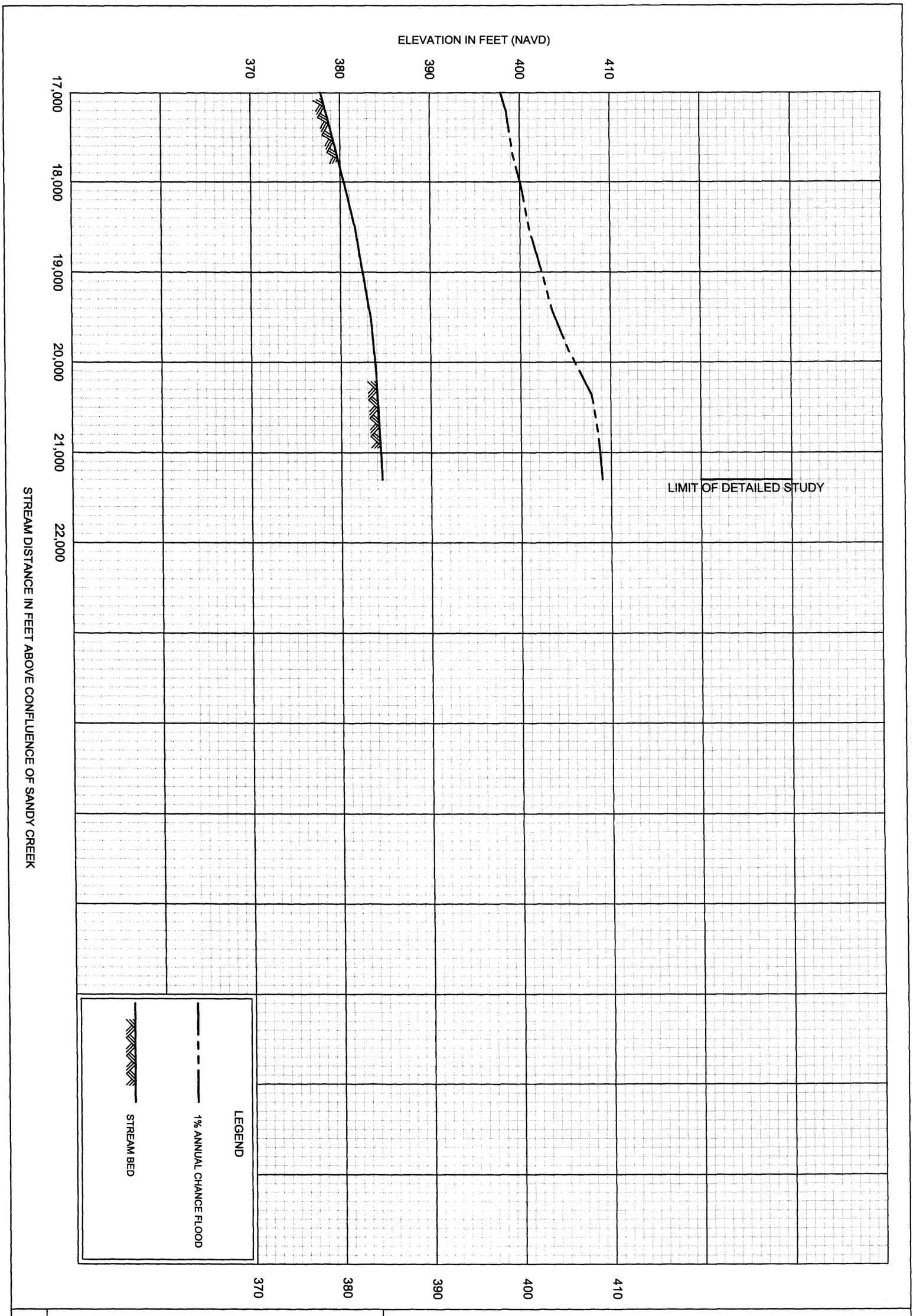
PINEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

24P



25P

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

FLOOD PROFILES

PINEY CREEK

LIMIT OF DETAILED STUDY

CONFLUENCE OF SANDY CREEK TRIBUTARY

ELEVATION IN FEET (NAVD)

400
390
380
370
360
350

8000 9000 10,000 11,000 12,000 13,000 14,000 15,000 16,000 17,000 18,000 19,000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH PINEY CREEK

LEGEND

1% ANNUAL CHANCE FLOOD

STREAM BED

FLOOD PROFILES

SANDY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

26P

CONFLUENCE OF WATERHOLE BRANCH

LIMIT OF DETAILED STUDY

ELEVATION IN FEET (NAVD)

410
400
390
380
370

19,000
20,000
21,000
22,000
23,000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH PINEY CREEK

LEGEND

1% ANNUAL CHANCE FLOOD

STREAM BED

FLOOD PROFILES

SANDY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BASTROP COUNTY, TX

AND INCORPORATED AREAS

27P

IV.

APPENDIX B

DRAINAGE TECHNICAL MEMORANDUM FOR PECAN PARK DEVELOPMENT

Espey Consultants, Inc.
Environmental & Engineering Services

TECHNICAL MEMORANDUM

Date: February 22, 2010

To: Lynn Alderson, P.E. – Alderson Group, Inc.

From: J. Travis Wilson, P.E., C.F.M.

Re: Drainage Technical Memorandum
Pecan Park Development
Bastrop, Bastrop County, Texas
EC Project No. 09080.00

STATE OF TEXAS
J. TRAVIS WILSON
97307
LICENSED
PROFESSIONAL ENGINEER
22 FEB 2010

cc: Dale W. Gray, P.E., Vice President – Espey Consultants, Inc.

Attachments:
1 – Site Location Map
2 – Floodplain Map
3 – Time of Concentration Computations
4 – Existing and Proposed Conditions 1% Annual Chance Hydrologic Model

Espey Consultants, Inc. (EC) is pleased to submit this technical memorandum documenting the results of the hydrologic and hydraulic analysis of the proposed Pecan Park Development located adjacent to the Colorado River along State Highway 71 (SH 71) in the City of Bastrop, Bastrop County, Texas. Specifically, the Pecan Park Development is located on 311 acres of land as shown on the Site Location Map attached with this memorandum. A portion of the site lies within the 1% annual chance (100-year) floodplain of the Colorado River as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 48021C0355E dated January 19, 2006. The site is not impacted by any floodplain or creek systems other than the Colorado River. An exhibit showing the regulatory floodplain relative to the Pecan Park site is included with this memorandum as Attachment 2.

The intent of this memorandum is to demonstrate that development of the Pecan Park property does not adversely impact the regulatory floodplain of the Colorado River. This memorandum does not include an analysis of the internal (local) drainage system of the Pecan Park site. The sections that follow present a drainage analysis of Pecan Park and the drainage relationship of Pecan Park to the Colorado River.

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By

1.0 DRAINAGE ANALYSIS OF PECAN PARK

The Pecan Park Development is a 311-acre site located along the Colorado River. The City of Bastrop Drainage Design Ordinance states that the 1% annual chance event be used to evaluate flooding impacts; therefore, this analysis only considers the 1% annual chance event. Existing conditions and developed conditions flows for the 1% annual chance storm event for the site are calculated using the United States Army Corps of Engineers (USACE) HEC-1 computer program utilizing the NRCS unit hydrograph method. This analysis only pertains to on-site flows—off-site flows are assumed to convey through or around the property and do not affect the premise of this analysis.

1.1 PRECIPITATION AND RAINFALL DISTRIBUTION

The precipitation depth of 10.2 inches for the 1% annual chance event is taken from the City of Bastrop Drainage Design Ordinance. This precipitation depth is distributed as a hyetograph assuming a 24-hour NRCS Type III rainfall distribution.

1.2 INFILTRATION LOSSES

The U.S. Department of Agriculture Natural Resource Conservation Service (NRCS, formerly the Soil Conservation Service, SCS) has developed a rainfall runoff index called the runoff curve number (CN), which takes into account such factors as soil characteristics, land use/land condition, and antecedent soil moisture to derive a generalized rainfall/runoff relationship for a given area. A description of these components and the equations for calculating runoff depth from rainfall are provided below.

The NRCS classifies soils into four hydrologic soil groups: A, B, C, and D. These groups indicate the runoff potential of a soil, ranging from a low runoff potential (group A) to a high runoff potential (group D). The NRCS provides runoff curve numbers for three Antecedent Moisture Conditions (AMC): I, II and III. AMC I represents dry soil conditions and AMC III represents saturated soil conditions. AMC II is normally considered to be the average soil condition; however, studies have indicated that AMC II is not the average throughout Texas. Investigations have shown that the average condition ranges from AMC I in west Texas to between AMC II and III for east Texas. Runoff curve numbers vary from 0 to 100, with the smaller values representing soils with lower runoff potential and the larger values representing soils with higher runoff potential. This study assumes an AMC II to represent average conditions.

For this analysis, curve numbers are evaluated independently of imperious cover (i.e., these curve numbers reflect good condition range land). According to the soil survey of Bastrop County, Texas, most of the soils within the study area are classified as NRCS Group B soils with a smaller portion of the site near the Colorado River classified as NRCS Group A soils. A runoff curve number (CN) of 57 is representative for the study area.

HEC-HMS computes 100 percent runoff from impervious areas, while runoff from pervious areas is computed using the selected CN value and the following equations:

$$Q = (P - 0.2 \times S)^2 / (P + 0.8 \times S) \qquad \text{Equation 1}$$

And

$$CN = 1000 / (10 + S) \qquad \text{Equation 2}$$

Where:

Q	=	depth of runoff (in),
P	=	depth of precipitation (in),
S	=	potential maximum retention after runoff begins (in)[1], and
CN	=	runoff curve number.

Land use (impervious cover) is another key component of the infiltration losses in the hydrologic model. Most of the existing land area of the study area is undeveloped land with no impervious cover. Under proposed conditions, the impervious cover for the project site is increased to reflect proposed usage. The assumed proposed impervious cover for this tract is 80 percent. The actual impervious cover will be determined as part of the proposed site design and does not affect the premise of this technical memorandum.

1.3 UNIT HYDROGRAPH METHOD

1.3.1 Background

A rainfall/runoff transformation is required to convert rainfall excess (total rainfall minus infiltration losses) into runoff from a particular subarea. The NRCS unit hydrograph option in HEC-1 is used in this analysis to generate a runoff hydrograph for the defined subarea. The unit hydrograph method represents a hydrograph for one unit [inch] of direct runoff and is a nationally accepted, standard engineering practice approach.

The dimensionless unit hydrograph developed by the NRCS (figure below) was developed by Victor Mockus and presented in *National Engineering Handbook, Section 4, Hydrology.* The dimensionless unit hydrograph has its ordinate values expressed in a dimensionless ratio, q/qp, and its abscissa values as t/Tp. This unit hydrograph has a point of inflection approximately 1.7 times the time to peak (Tp), and the time-to-peak 0.2 of the time-of-base (Tb) (NRCS 1985).

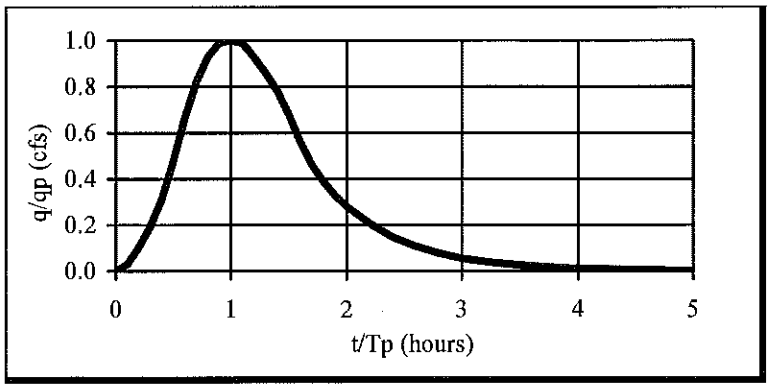


Figure 2. NRCS Unit Graph

In HEC-1, input data for this method consists of a single input parameter, T_{LAG}, which is equal to the time (hours) between the center of mass of rainfall excess and the peak of the unit hydrograph (NRCS 1985). In other words, there is a delay in time after a rain event before the runoff reaches it maximum peak. This delay is known as lag.

[1] Solve for S based on known CN

The time to peak is computed using the following equation:

$$T_{PEAK} = \Delta t/2 + T_{LAG} \quad \text{Equation 3}$$

Where:

T_{PEAK} = time to peak of the unitgraph (hours),
Δt = computation interval or duration of unit excess (hours), and
T_{LAG} = watershed lag (hours).

The peak flow rate of the unit graph is computed using the following equation:

$$qp = 484A/T_{PEAK} \quad \text{Equation 4}$$

Where:

qp = peak flow rate of the unit graph (cubic feet per second [cfs] / inch),
A = watershed area (square miles), and
484 = peak rate factor (dimensionless)[2]

1.3.2 Time of Concentration

The NRCS method assumes that the lag time of a watershed is 60 percent of the watershed's time of concentration. The time of concentration is the time for runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed (NRCS 1985). The time of concentration may be estimated by calculating and summing the travel time defined by the flow type: sheet flow, shallow concentrated flow, and channelized flow (including roadways, storm sewers, and natural/manmade channels). The methods prescribed in the NRCS' Technical Release 55 (TR-55) are used to determine the times of concentration for each flow segment in this analysis. Attachment 3 shows the results of the calculations for this analysis utilizing each typical flow segment presented below.

Sheet Flow (≤ 300 feet)

Sheet flow is flow over plane surfaces. It usually occurs in the headwater of streams. With sheet flow, the friction value (Manning's n) is an effective roughness coefficient that includes the effect of raindrop impact, of drag over the plane surface and obstacles such as litter, crop ridges, and rocks, and of erosion and transportation of sediment. These n values are for very shallow flow depths of approximately 0.1 foot. Assuming sheet flow of less than or equal to 300 feet, travel time is computed as follows:

$$Tt = (0.007 \times (n \times L)^{0.8}) / (P_2^{0.5} \times s^{0.4}) \quad \text{Equation 5}$$

Where:

Tt = travel time (hr),
n = Manning's roughness coefficient,
L = flow length (ft),
P_2 = 2-year, 24-hour rainfall (in), and
s = slope of hydraulic grade line (land slope, ft/ft).

[2] The peak rate factor of 484 has been known to vary from 600 in steep terrain to 300 in very flat, swampy terrain. The 484 value is standard engineering practice and is utilized in this analysis.

Shallow Concentrated Flow

After a maximum of 300 feet, sheet flow usually becomes shallow concentrated flow. The average velocity for this flow can be determined from the following figure in which average velocity is a function of watercourse slope and type of channel (TR-55). The flow is still considered shallow in depth and flows in a swale or gutter instead of a channel, which has greater depth.

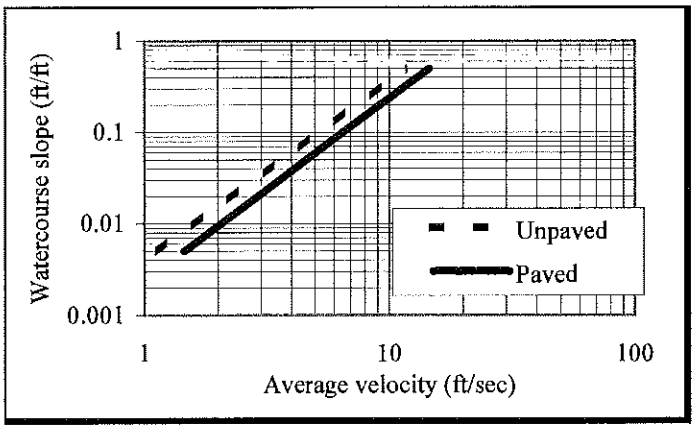


Figure 3. Avg. Velocities for Estimating Travel Time in Shallow Concentrated Flow Segments

After determining the average velocity, the following equation is used to compute travel time:

$$Tt = L / (3600 \times V) \qquad \text{Equation 6}$$

Where:

Tt = travel time (hr),
L = flow length (ft),
V = average velocity (ft/sec), and
3,600 = conversion factor from seconds to hours.

Channelized Flow

As the depth of concentrated flow increases, the shallow concentrated flow evolves into channelized flow. Open channels are assumed to begin where surveyed cross section information has been obtained, where channels are visible on aerial photographs, or where blue lines (indicating streams) appear on United States Geological Survey (USGS) quadrangle maps. Under proposed conditions, shallow concentrated flow is assumed to evolve more quickly into channel flow than under existing conditions.

1.4 HYDROGRAPH ROUTING

This analysis includes one drainage area and does not include any stormwater management facilities. There is no hydrograph routing (stream routing, storage routing, diversion routing, or the like) associated with this analysis.

1.5 HYDROLOGIC ANALYSIS RESULTS

The table shown below summarizes the existing conditions and proposed conditions results obtained from HEC-1 for the Pecan Park Development. The results of this analysis are compared to the drainage characteristics of the Colorado River later in this memorandum for the purpose of evaluating the potential runoff impact from the Pecan Park Development on the Colorado River. The existing and proposed hydrologic models are included with this technical memorandum as Attachment 4.

Table 6. Computed Peak Flow Rates from Pecan Park Development

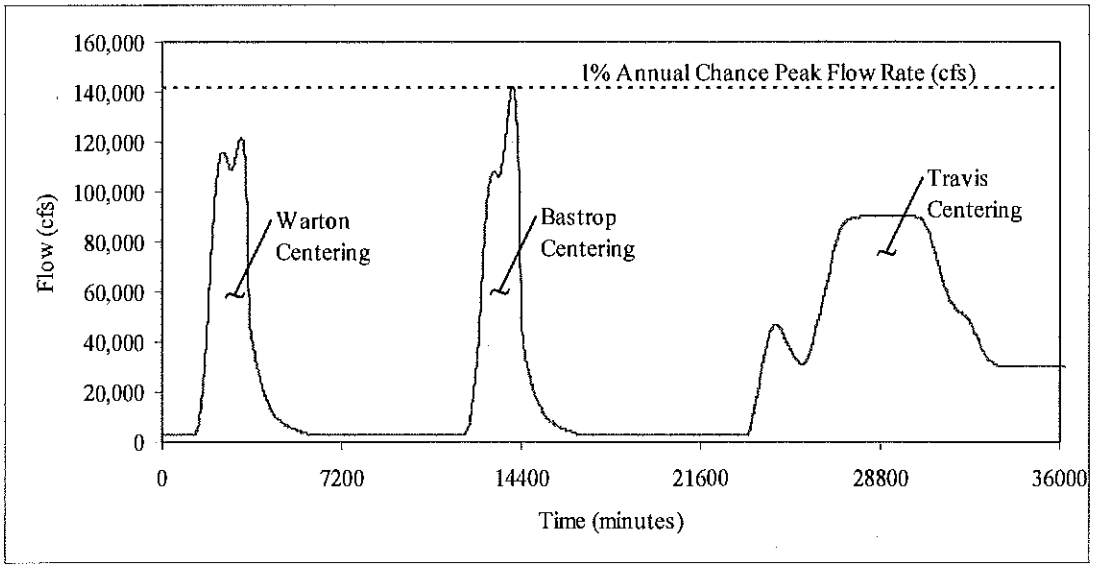
		1% Annual Chance Peak Flow Rate (cfs)	
HEC-1 Node	Area (acres)	Existing	Proposed
Site	314	535	1,670

2.0 DRAINAGE CHARACTERISTICS OF THE COLORADO RIVER

The Colorado River is adjacent to the Pecan Park property and accepts the runoff from the site. According to the Bastrop County Flood Insurance Study (FIS) dated January 19, 2006, the Colorado River has a drainage area of approximately 39,980 square miles at USGS gage 08159200 located at SH 71 just upstream of the Pecan Park site. Of the 39,980 square miles of drainage area, approximately 11,403 square miles is estimated to be non-contributing according to the United States Geological Survey (USGS). Flow in the Bastrop County section of the Colorado River is also heavily influenced by the Highland Lakes as well as other flow control structures upstream.

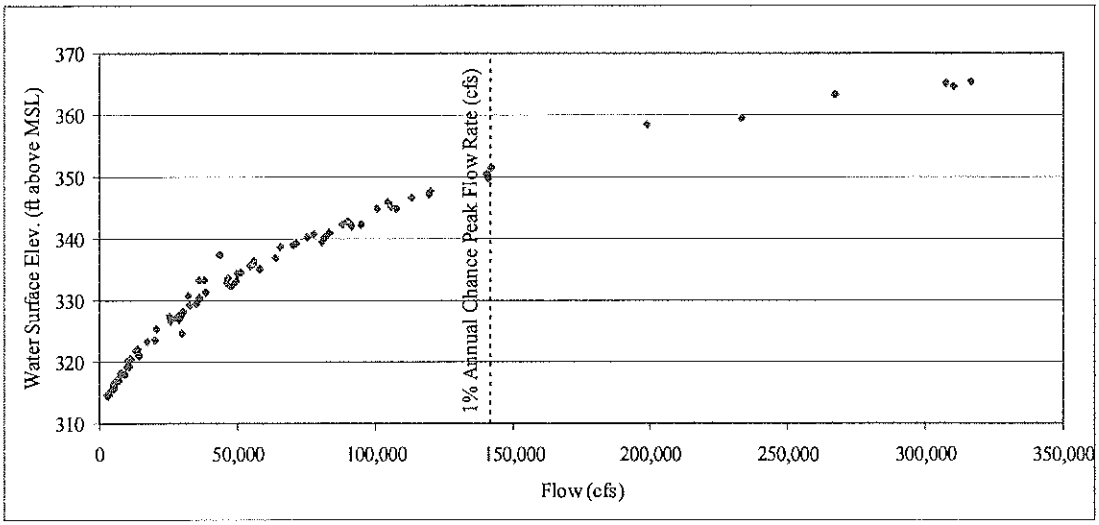
According to the FIS, the 1% annual chance peak at the USGS gage near the site is 142,020 cfs, which was derived by a flood frequency analysis of the annual peak flow rates at this gage location over a 70-year period of record. The USACE HEC-HMS computer program was then used to create a hydrograph of this peak flow rate. This hydrograph is then input into the unsteady hydraulic model for this section of the Colorado River using the USACE HEC-RAS computer program. The figure below presents the resulting hydrograph that is input into the hydraulic model at SH 71 just upstream of the Pecan Park site. This is a three-peak hydrograph to represent centering the storm simulation at three points of interest. The first peak represents centering over the Warton County point of interest, the second peak represents centering over the Bastrop County point of interest, and the third represents centering over the Travis County point of interest. The highest of the three peaks, and thus the regulatory 1% annual chance peak flow rate, is represented by centering over the Bastrop County point of interest.

Figure 1. Colorado River 1% Annual Chance Hydrograph at SH 71 near Pecan Park Site



The hydraulic model for Bastrop County is divided into two sections including 1) from Lady Bird Lake to the USGS gage at Bastrop and 2) from the USGS gage at Bastrop to the USGS gage at La Grange. The Pecan Park site lies near the upstream end of the Bastrop – La Grange section of the Colorado River hydraulic model near Cross Section 12503+28 (FEMA Lettered Cross Section AY). This hydraulic model was developed as a one-dimensional unsteady flow model as part of the Lower Colorado River Basin-Wide Study in 2002. The regulatory floodplain elevation adjacent to the Pecan Park site is 350.60 feet above mean sea level (MSL) and corresponds to the peak flow rate from centering the simulation at the Bastrop County point of interest. The figure below presents the hydraulic rating curve on the Colorado River at the Pecan Park site.

Figure 2. Hydraulic Rating Curve for Cross Section 12503+28 near Pecan Park Site



3.0 RELATIONSHIP OF PECAN PARK SITE TO COLORADO RIVER

The sections above describe the drainage characteristics of the Pecan Park site and the Colorado River near the site. The 1% annual chance flood event for the site is statistically independent of the 1% annual chance flood event for the Colorado River—the events are non-coincident. This rationale is consistent with FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, which states that the assumption of coincident peaks (peak-on-peak scenario) may be appropriate if all of the following are true:

- The ratio of drainage areas lies between 0.6 and 1.4.
  - The drainage area ratio of the Pecan Park site to the Colorado River is 0.00001. The figure shown below is a graphical relationship of the site relative to the overall Colorado River watershed (within the State of Texas).

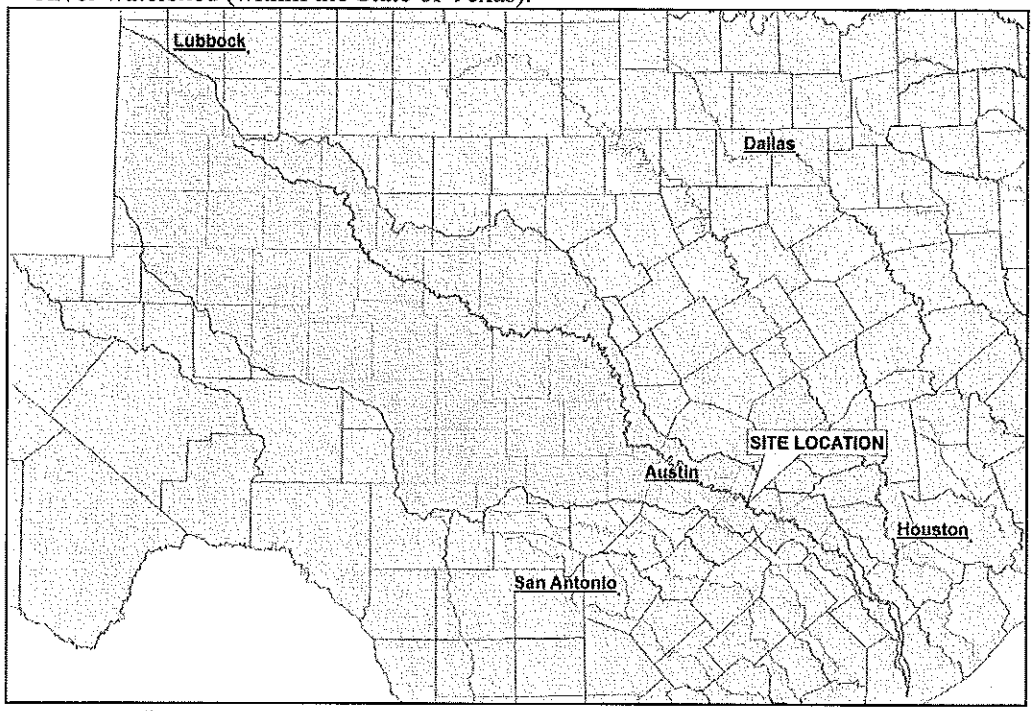


Figure 3. Pecan Park Site Location within Colorado River Watershed

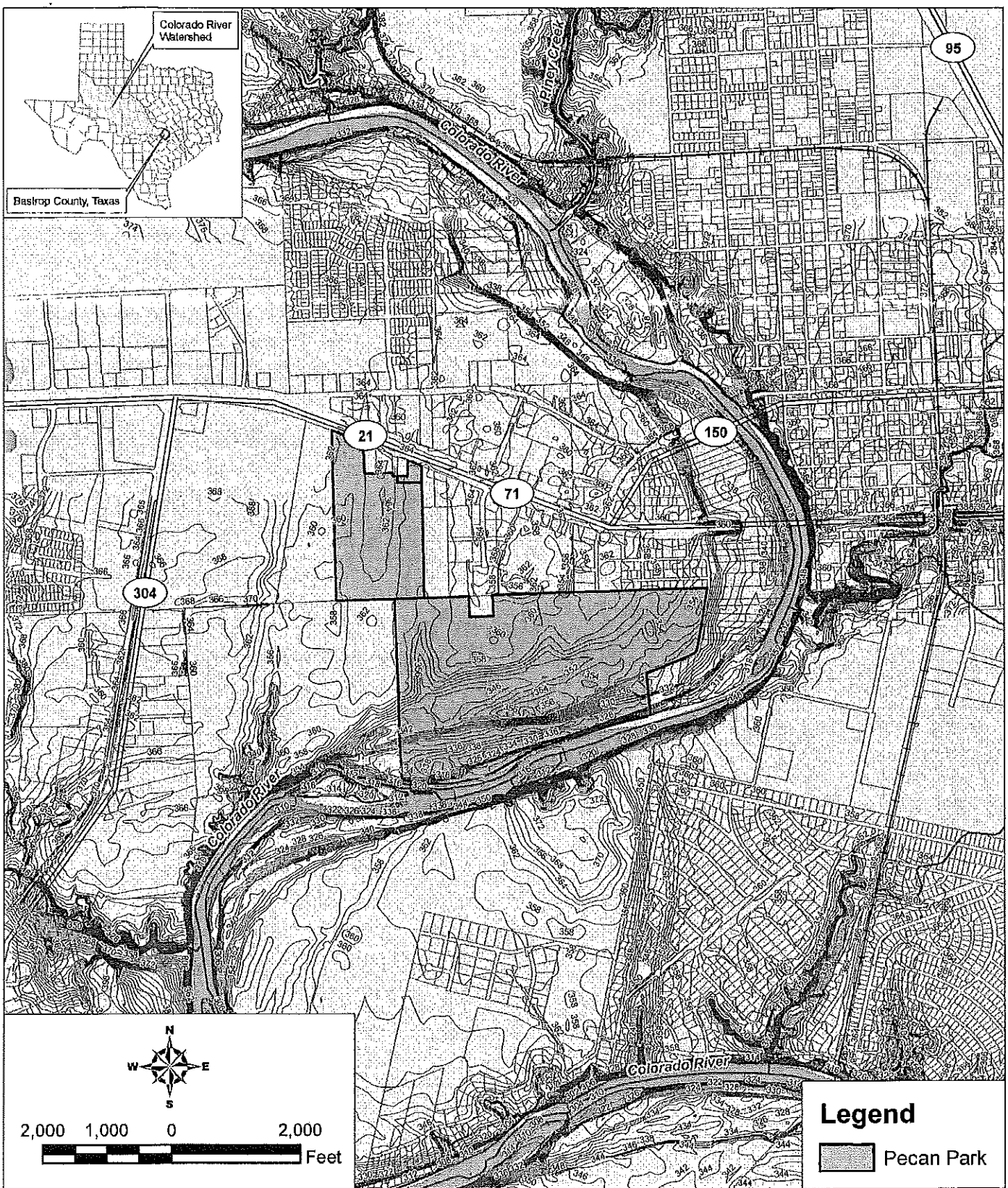
- The times of peak flow are similar for the two combining watersheds.
  - The time of peak for the Colorado River is at approximately 31:45 hours as measured from the beginning of the Bastrop-centered simulation described earlier in this memorandum.
  - The Pecan Park site drainage is simulated based on a 24-hour design storm as described in the City of Bastrop Drainage Design Ordinance and is not directly comparable to the time of peak for the Colorado River. Based on a 24-hour design storm, the time of peak for the site is at approximately 12:20 under proposed conditions as measured from the beginning of the simulation.

- The likelihood of both watersheds being covered by the storm event being modeled is high.
  - The likelihood of the Pecan Park site experiencing a 100-year event as modeled above is a 1% annual chance. The likelihood of the Colorado River experiencing a 100-year event as described above is a 1% annual chance. However, the likelihood of both events

occurring simultaneously in a peak-on-peak scenario is less than a 1% annual chance, and therefore, does not qualify as a 100-year event.

None of the above conditions are met; therefore, the assumption of coincident peaks is not appropriate for the Pecan Park site relative to the Colorado River. Given the conditions outlined above and the drainage characteristics of the Pecan Park site relative to the Colorado River, increases in runoff from the development of the Pecan Park site will not adversely impact the 1% annual chance peak flow rate or regulatory floodplain elevation on the Colorado River. Therefore, site detention for the development of the Pecan Park site is not necessary to mitigate any impacts to peaks flow rates along the Colorado River. This rationale is consistent with the City of Austin drainage criteria for development that discharges into and is immediately adjacent to the Colorado River (reference Austin *Drainage Criteria Manual* §1.2.2(F).

P:\Active\09080.00_Pecan_Park_Dev\Documents\100222_TMemo_PecanParkDetention.doc



Espey Consultants, Inc.

Environmental & Engineering Services

ATTACHMENT 1

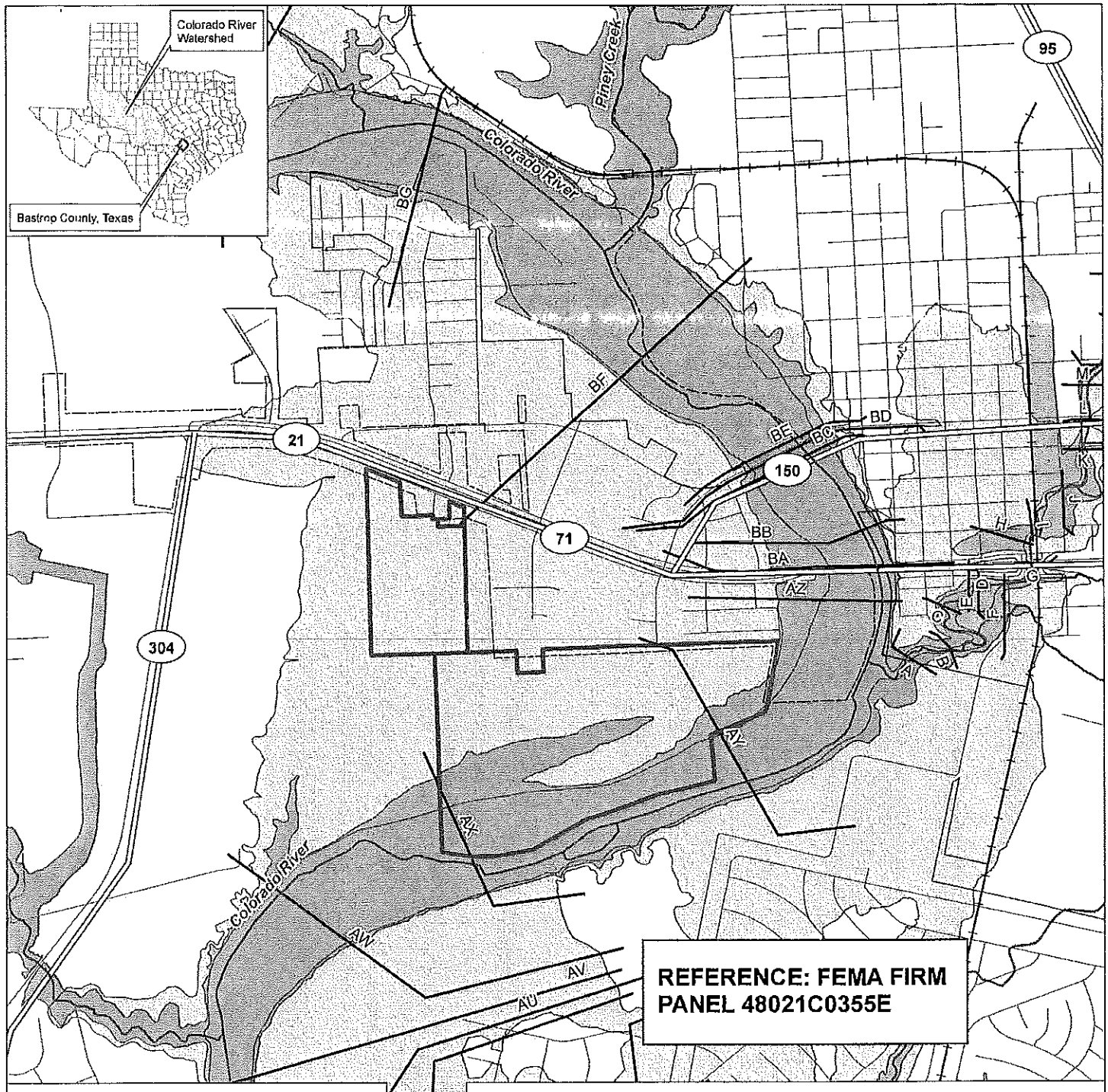
SITE LOCATION MAP

PECAN PARK DEVELOPMENT

FEBRUARY 2010

PROJECT NUMBER 09080.00

Monday, February 15, 2010 10:20:55 AM; P:\Active\09080.00_Pecan_Park_Dev\GIS\Exh\Site_Location_Map_20092009.mxd



Espey Consultants, Inc.
Environmental & Engineering Services

ATTACHMENT 2
FLOODPLAIN MAP

FEBRUARY 2010

PROJECT NUMBER 09080.00

PECAN PARK DEVELOPMENT
TIME OF CONCENTRATION CALCULATIONS

ATTACHMENT 3

EXISTING CONDITIONS

TR-55 Method of Computing the Time of Concentration

			Site
Sheet Flow	variable	units	
Manning's roughness coef.	n	n/a	0.24
Flow Length	L	feet	300
2-year, 24-hour rainfall	P2	inches	3.6
Slope	s	ft/ft	0.0110
Travel time (equation 3-3)	Tt	hours	0.686
Shallow Concentrated Flow		min.	41.2
Flow Length	L	feet	2,000
Slope	s	ft/ft	0.003
Surface (1=paved or 2=unpaved)		n/a	2
Velocity (figure 3-1)	V	ft/sec	0.89
Travel time	Tt	hours	0.626
Manning's Equation		min.	37.6
Flow Length	L	feet	2,750
Slope	S	ft/ft	0.0130
roughness	n	n/a	0.08
Open Channel			
Bottom Width	BW	feet	10
Side Slopes (H:1)	H	feet	3
Depth	d	feet	4
...or Closed Conduit			
Rise / Diameter	R / D	feet	
Span (0 if circular)	S	feet	
Cross-Sectional Area	X-A	feet^2	88.00
Flow Rate	Q	cfs	342.66
Velocity (figure 3-1)	V	ft/sec	3.89
Travel time	Tt	hours	0.196
Flow Length	L	feet	
Slope	S	ft/ft	
roughness	n	n/a	
Open Channel			
Bottom Width	BW	feet	
Side Slopes (H:1)	H	feet	
Depth	d	feet	
...or Closed Conduit			
Rise / Diameter	R / D	feet	
Span (0 if circular)	S	feet	
Cross-Sectional Area	X-A	feet^2	0.00
Flow Rate	Q	cfs	n/a
Velocity (figure 3-1)	V	ft/sec	n/a
Travel time	Tt	hours	-
Total Travel Time	TC	hours	1.508
	TC	min.	90.5
Lag Time	TL	hours	0.9049
	TL	min.	54.3

PECAN PARK DEVELOPMENT
TIME OF CONCENTRATION CALCULATIONS

PROPOSED CONDITIONS

TR-55 Method of Computing the Time of Concentration

			Site
Sheet Flow	variable	units	
Manning's roughness coef.	n	n/a	0.24
Flow Length	L	feet	50
2-year, 24-hour rainfall	P2	inches	3.6
Slope	s	ft/ft	0.0110
Travel time (equation 3-3)	Tt	hours	0.164
Shallow Concentrated Flow		min.	9.8
Flow Length	L	feet	500
Slope	s	ft/ft	0.003
Surface (1=paved or 2=unpaved)		n/a	1
Velocity (figure 3-1)	V	ft/sec	1.13
Travel time	Tt	hours	0.123
Manning's Equation		min.	7.4
Flow Length	L	feet	4,500
Slope	S	ft/ft	0.0130
roughness	n	n/a	0.04
Open Channel			
Bottom Width	BW	feet	10
Side Slopes (H:1)	H	feet	3
Depth	d	feet	4
...or Closed Conduit			
Rise / Diameter	R / D	feet	
Span (0 if circular)	S	feet	
Cross-Sectional Area	X-A	feet^2	88.00
Flow Rate	Q	cfs	685.33
Velocity (figure 3-1)	V	ft/sec	7.79
Travel time	Tt	hours	0.161
Flow Length	L	feet	
Slope	S	ft/ft	
roughness	n	n/a	
Open Channel			
Bottom Width	BW	feet	
Side Slopes (H:1)	H	feet	
Depth	d	feet	
...or Closed Conduit			
Rise / Diameter	R / D	feet	
Span (0 if circular)	S	feet	
Cross-Sectional Area	X-A	feet^2	0.00
Flow Rate	Q	cfs	n/a
Velocity (figure 3-1)	V	ft/sec	n/a
Travel time	Tt	hours	-
Total Travel Time	TC	hours	0.447
	TC	min.	26.8
Lag Time	TL	hours	0.2683
	TL	min.	16.1

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*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-I INPUT PAGE 1

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    5         ID  Project No. 09080.00.....................Espey Consultants
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              *

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              *
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1 SCHEMATIC DIAGRAM OF STREAM NETWORK

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INPUT
 LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<----) RETURN OF DIVERTED OR PUMPED FLOW
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 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
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 *              JUN   1998               *                                                  *    HYDROLOGIC ENGINEERING CENTER    *
 *           VERSION 4.1                 *                                                  *          609 SECOND STREET          *
 *                                       *                                                  *       DAVIS, CALIFORNIA 95616       *
 *  RUN DATE   15FEB10  TIME  13:11:40   *                                                  *           (916) 756-1104            *
 *                                       *                                                  *                                     *
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                        Pecan Park Development.....................Bastrop, Bastrop County, TX
                        Existing Conditions.......................February 2010
                        100-Year Event (1% Event).................File name:  E_100.IH1
                        NRCS Type III Distribution (24-HR Duration)
                        Project No. 09080.00......................Espey Consnltants

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                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
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                      ITIME        0000  STARTING TIME
                         NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN10  ENDING DATE
                     NDTIME        0055  ENDING TIME
                     ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

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               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT
1
                                                        RUNOFF SUMMARY
                                                  FLOW IN CUBIC FEET PER SECOND
                                               TIME IN HOURS,  AREA IN SQUARE MILES

                                      PEAK   TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN     MAXIMUM     TIME OF
         OPERATION       STATION      FLOW    PEAK                                            AREA      STAGE     MAX STAGE
+                                                          6-HOUR     24-HOUR     72-HOUR

         HYDROGRAPH AT
+                          DA_1       535.   13.00         199.         61.         59.        .49


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*            VERSION 4.1                *
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*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
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X     X  X        X     X        X
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KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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            2       ID  Proposed Conditions.....February 2010
            3       ID  100-Year Event (1% Event).....File name:  P_100.IH1
            4       ID  NRCS Type III Distribntion (24-HR Duration)
            5       ID  Project No. 09080.00.....Espey Consultants
                    *
            6       IT       5 01JAN10       0     300
            7       IO       5
                    *

            8       KK    DA_1
            9       BA   0.491
           10       PB    10.2
                    * SCS Type 3 Rainfall Pattern
           11       IN       5 01JAN10       0
           12       PC       0  0.0008  0.0017  0.0025  0.0033  0.0042   0.005  0.0058  0.0067  0.0075
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           17       PC  0.0452  0.0463  0.0474  0.0485  0.0497  0.0509   0.052  0.0532  0.0544  0.0555
           18       PC  0.0567  0.0579  0.0592  0.0604  0.0617   0.063  0.0642  0.0654  0.0668   0.068
           19       PC  0.0693  0.0707   0.072  0.0733  0.0747  0.0761  0.0776  0.0791  0.0806  0.0822
           20       PC  0.0838  0.0854  0.0871  0.0887  0.0905  0.0922  0.0941  0.0959  0.0978  0.0997
           21       PC  0.1016  0.1036  0.1056  0.1076  0.1097  0.1118   0.114  0.1163  0.1185  0.1208
           22       PC  0.1233  0.1258  0.1284  0.1311  0.1339  0.1367  0.1397  0.1427  0.1458   0.149
           23       PC  0.1522  0.1555  0.1589  0.1624  0.1659  0.1696  0.1733  0.1771   0.181   0.185
           24       PC   0.189  0.1931  0.1975   0.202  0.2067  0.2115  0.2165  0.2216   0.227  0.2325
           25       PC  0.2382   0.244    0.25  0.2564  0.2634  0.2711  0.2795  0.2884   0.298  0.3111
           26       PC  0.3298  0.3559  0.3848  0.4273     0.5  0.5727  0.6152  0.6441  0.6702  0.6889
           27       PC   0.702  0.7116  0.7205  0.7289  0.7366  0.7436    0.75   0.756  0.7618  0.7675
           28       PC   0.773  0.7784  0.7835  0.7885  0.7933   0.798  0.8025  0.8069   0.811   0.815
           29       PC   0.819  0.8229  0.8267  0.8304  0.8341  0.8376  0.8411  0.8445  0.8478  0.8511
           30       PC  0.8543  0.8573  0.8603  0.8633  0.8661  0.8689  0.8716  0.8742  0.8767  0.8792
           31       PC  0.8815  0.8837   0.886  0.8882  0.8903  0.8924  0.8944  0.8964  0.8984  0.9003
           32       PC  0.9022  0.9041  0.9059  0.9078  0.9095  0.9113  0.9129  0.9146  0.9162  0.9178
           33       PC  0.9194  0.9209  0.9224  0.9239  0.9253  0.9267   0.928  0.9293  0.9307  0.9319
           34       PC  0.9332  0.9346  0.9358   0.937  0.9383  0.9396  0.9408  0.9421  0.9433  0.9445
           35       PC  0.9456  0.9468   0.948  0.9491  0.9503  0.9515  0.9526  0.9537  0.9548  0.9559
           36       PC   0.957  0.9581  0.9592  0.9603  0.9613  0.9623  0.9634  0.9644  0.9654  0.9664
           37       PC  0.9674  0.9684  0.9694  0.9704  0.9714  0.9723  0.9733  0.9743  0.9752  0.9762
           38       PC  0.9771   0.978   0.979  0.9799  0.9808  0.9816  0.9825  0.9834  0.9843  0.9852
           39       PC   0.986  0.9868  0.9877  0.9885  0.9893  0.9902  0.9909  0.9917  0.9925  0.9933
           40       PC  0.9941  0.9948  0.9956  0.9964  0.9971  0.9979  0.9986  0.9992       1
                    *
           41       LS       0      57      80
           42       UD    0.27
                    *
           43       ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

```
 INPUT
  LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<----) RETURN OF DIVERTED OR PUMPED FLOW
```

```
    8        DA_1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *               JUN  1998               *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   17FEB10  TIME  11:45:58   *
 *                                       *
 *****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
                    Pecan Park Development.....................Bastrop, Bastrop County, TX
                    Proposed Conditions........................February 2010
                    100-Year Event (1% Event).................File name:  P_100.IH1
                    NRCS Type III Distribution (24-HR Duration)
                    Project No. 09080.00.......................Espey Consultants

   7 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROOGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                      NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1JAN10  STARTING DATE
                      ITIME        0000  STARTING TIME
                        NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN10  ENDING DATE
                     NDTIME        0055  ENDING TIME
                     ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL      .08 HOURS
                      TOTAL TIME BASE    24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA          SQUARE MILES
               PRECIPITATION DEPTH    INCHES
               LENGTH, ELEVATION      FEET
               FLOW                   CUBIC FEET PER SECOND
               STORAGE VOLUME         ACRE-FEET
               SURFACE AREA           ACRES
               TEMPERATURE            DEGREES FAHRENHEIT
1
                                                RUNOFF SUMMARY
                                          FLOW IN CUBIC FEET PER SECOND
                                       TIME IN HOURS,  AREA IN SQUARE MILES

                                    PEAK    TIME OF     AVERAGE FLOW FOR MAXIMUM PERIOD       BASIN     MAXIMUM     TIME OF
          OPERATION       STATION   FLOW     PEAK                                            AREA      STAGE     MAX STAGE
+                                                        6-HOUR      24-HOUR      72-HOUR

          HYDROGRAPH AT
+                          DA_1      1670.   12.33         343.         120.         116.       .49


 *** NORMAL END OF HEC-1 ***
```

V.

APPENDIX C

ENGINEERING REPORT FOR PECAN CROSSING OFFSITE DRAINAGE IMPROVEMENTS

ENGINEERING REPORT

FOR

PECAN CROSSING
OFFSITE
DRAINAGE IMPROVEMENTS

MAY 2007

Prepared By:

Cunningham | Allen

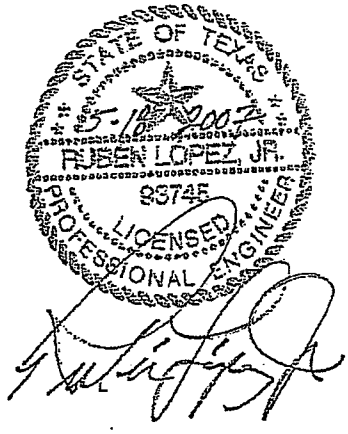
Engineers • Surveyors

ENGINEERING REPORT

FOR

PECAN CROSSING
OFFSITE
DRAINAGE IMPROVEMENTS

MAY 2007



Cunningham | Allen, Inc.

Engineers • Surveyors

3103 Bee Cave Road, Suite 202
Austin, Texas 78746-6819
Tel.: (512) 327-2946 • Fax: (512) 327-2973
www.cunningham-allen.com

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SUMMARY 1

EXHIBITS

A. FEMA FLOOD INSURANCE RATE MAP
B. DRAINAGE AREA MAP
C. HEC-1 ANALYSIS –100YR
D. HECRAS CROSS SECTION WITH 100 YR DELINEATION
E. HECRAS ANALYSIS

PECAN CROSSING
DRAINAGE IMPROVEMENTS

INTRODUCTION

This report outlines the proposed improvements required to convey run-off generated by the 100 year storm event across the Cantrell Property as outlined in the *"OPTION AGREEMENT FOR SALE AND PURCHASE OF DRAIANGE EASMENT"*. The area that was included for sizing the improvements consists of what is considered the Bastrop Grove Partners (BGP) Property and The Cantrell Property. The tracts that are included in the study are outlined in exhibit B. The tracts are depicted as "Drainage Areas" in the following manner:

Drainage Area 1 – the Cantrell Tract
Drainage Area 2, 3 and 4 – the BGP Tract
Drainage Area 5 – Offsite Area conveyed to BGP tract by the Texas Department of Transportation TXDOT

The National Weather Service Maps based on the Hydro-35 and TP-40 data and were used to determine the 24 hour rainfall in inches for the county of Bastrop, Texas. This rainfall was used in the SCS (soils conservation service) 24 hour rainfall storm duration - type III rainfall distribution.

The Drainage Areas are assumed to be fully developed in order to size the proposed channel accordingly. Assumptions in terms of time of concentration are based on "redirecting" flows to the proposed channel. The CN value for the drainage areas is based on the SCS soils conservation survey for Bastrop County, Texas. The CN value was based on a type B soil as a majority of the area is Smithville or Bosque soil classification. The generated fully developed flows as assumed in exhibit B (the Drainage Area Map) were calculated using the U.S. Army Corp of Engineers' Hydrologic Engineering Center hydrology program HEC-1. The report is included in exhibit C.

One of the parameters of the analysis was the existing Federal Emergency Management Agency (FEMA) floodplain for the Colorado River. This existing floodplain inundates the southern portion of the Cantrell Tract (referred to Drainage Area 1 on exhibit B). The current FEMA map 48021C0355E, dated January 19, 2006 for Bastrop County, Texas is included as exhibit A. The limit of the floodplain as it affects the channel design is identified on exhibit D (elevation 349 ft mean sea level). It extends into the limit of the proposed channel improvements (between cross sections 10 and 11).

Other constraints are outlined by the agreement and requirements of the City of Bastrop for channel design. Thus the channel is both grass lined and maintains side slopes of 3ft vertical to 1ft horizontal and a bottom width of 6 ft for the majority of the improvements. The proposed channel design also has provisions for a low water crossing with a maximum slope of 6 ft vertical to 1ft horizontal. This low water crossing is proposed between cross sections 9 and 8 (on exhibit D). The channel was designed with a slope of 0.3%. The channel widens/transitions to a bottom width of 6ft to 24 ft from cross section 7 to 6 (as identified on exhibit D) to minimize the abrupt change and connectivity to the proposed culverts. Based on visual observations of the Cantrell tract and the type of vegetation that exists, the n value for the proposed channel was assumed to be 0.35.

The proposed culverts were designed by utilizing the U.S. Army Corp of Engineers' Hydrologic Engineering Center - River Analysis system (HEC-RAS). These culverts were included to preserve the existing dam/crossing structure located on the southern portion of the Cantrell Tract. In it's current

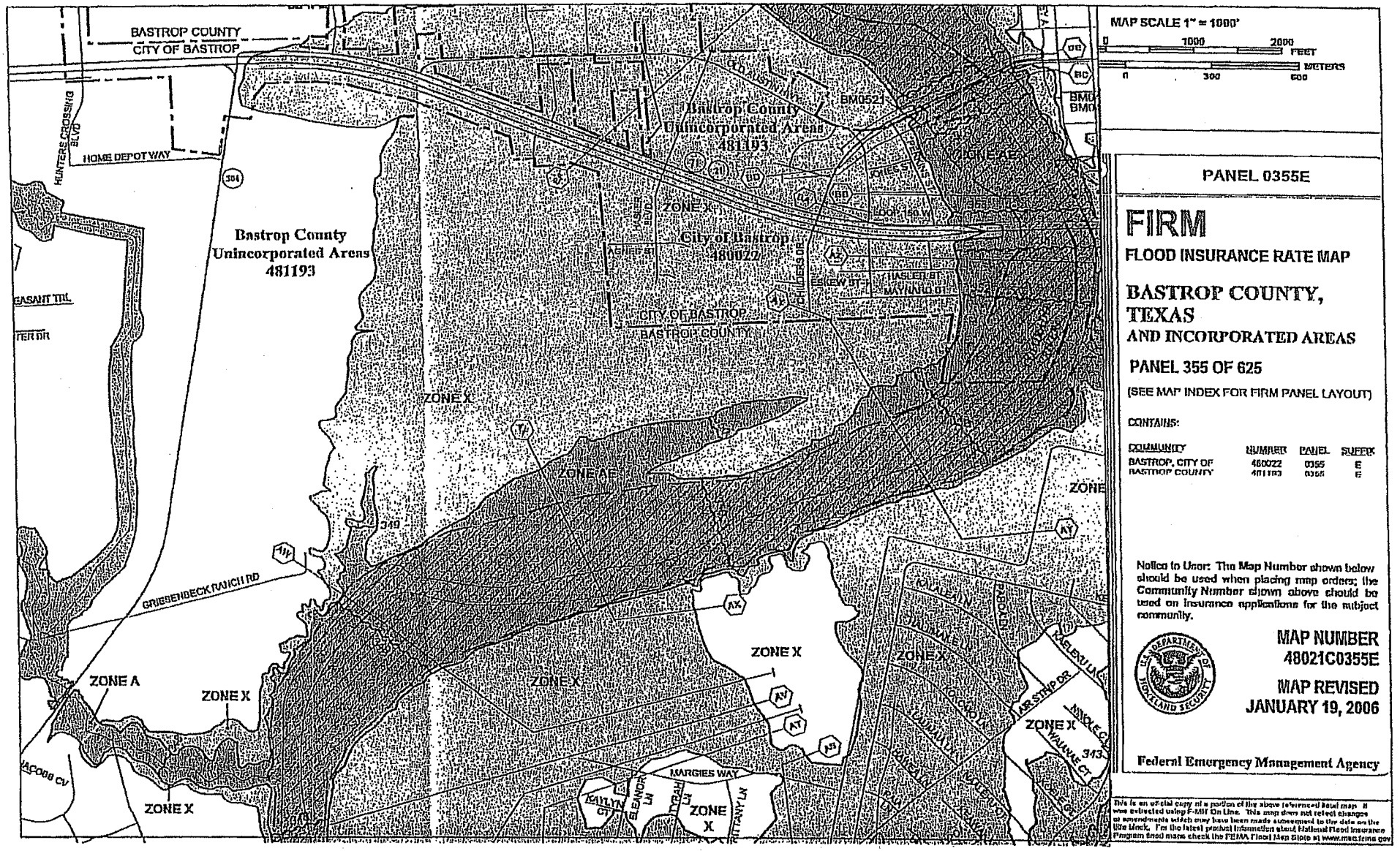
condition, the crossing is submerged during the 100 year flood according to FEMA. On average it is submerged by 2 ft.

In fully developed conditions, the channel was designed to have the least amount of impact on the existing 100 year floodplain elevation of 349 ft msl (mean sea level). With the known water surface elevation of 349, the porpoed improvements raised the floodplain in this area by a depth no greater than 0.2 ft (approximately 2.4 inches). The HEC-RAS analysis for the design of the channel is provided in exhibit E.

Though the 100 yr floodplain elevation impacts are minimized, erosion measures will be proposed at the existing crossing. This will be achieved by rock rip rap (24" diameter minimum) on the downstream side of the embankment and culvert outlet. The extents are outline in exhibit D. In the same manner, the existing 10 ft dirt road crossing will be improved to a 14 ft wide concrete road. This will be achieve within the same embankment extents and is also depicted in exhibit D.

EXHIBIT A

FEMA FLOOD INSURANCE RATE MAP



This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

EXHIBIT B

DRAINAGE AREA MAP

GRAPHIC SCALE
400 0 200 400 800
(IN FEET)
1 inch = 400 ft.

AREAS D,G,H,I,J,C,F,E,K & B
Q(100)=1092.38 CFS

DRAINAGE AREA 5 (OFFSITE)
DEVELOPED ASSUMPTIONS
PER TXDOT
PROJECT NO. F283(5)
81 AC. @ APPROX. 25% I.C.

DRAINAGE AREA 4
DEVELOPED ASSUMPTION
120 AC. @ 90% I.C.

DRAINAGE AREA 3
DEVELOPED ASSUMPTION
82 AC. @ 45% I.C.

100 YR ULTIMATE FLOOD PLAIN

100 FEMA FLOOD PLAIN

UNNAMED TRIBUTARY

COLORADO RIVER

PROPOSED DRAINAGE EASEMENT

DRAINAGE AREA 1
DEVELOPED ASSUMPTION
169 AC. @ 32% I.C.

APPROXIMATE: 120 AC. @ 45% I.C.
REMAINDER IN FLOODPLAIN

DRAINAGE AREA 2
DEVELOPED ASSUMPTION
40.8 AC. @ 45% I.C.

HASLER BOULEVARD

LEGEND

- BOUNDARY LINE
- LOT LINES
- ADJACENT LOT LINES
- SUB-BASIN
- WATERSHED BASIN
- (A) CONFLUENCE POINTS
- FLOW ARROWS

NOTE: AERIAL 1 FOOT TOPOGRAPHY DEPICTED WAS PROVIDED BY BASTROP GROVE PARTNERS

HYDROLOGIC SUMMARY

CONFLUENCE POINT	A		B			C		D
DRAINAGE AREA NUMBER	5	4	5-4	3	2	5-2	1	5-1
DRAINAGE AREA (AC)	81.0	120	201	82	40.8	323.8	169	492.8
CN NUMBER	73	73		73	73		73	73
% IMPERVIOUS COVER	25	90		45	45		45	
TC (HRS)	0.5833	0.2200		0.3700	0.3900		0.6000	
100 YEAR DISCHARGE (CFS)	373	893	1161	395	328	1465	1116	2458

3103 Bee Caves Road, Suite 20
Austin, Texas 78746-681
Tel: (512) 327-2946
Fax: (512) 327-297
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CUNNINGHAM-ALLEN
INC.

STATE OF TEXAS
5/18/07
RUBEN LOPEZ JR.
93746
LICENSED
PROFESSIONAL ENGINEER

PECAN CROSSING SHOPPING CENTER
BASTROP, TEXAS
EXHIBIT

PROPOSED OVERALL DRAINAGE AREA MAP FOR FLOODPLAIN STUDY

PROJECT No. 277.2001
DESIGN RL
DRAWN ST, PT
CAD FILE

SHEET 1 OF 1

E:\2772001_Eng_Drawings\Ref Dwgs\Offsite Improvements\2772001 SHT Overall-DA-Flood Study.dwg, Layout1, 5/18/2007 1:18:43 PM, othomas, OCE 36w.pc3, 1:1

EXHIBIT C

HEC-1 ANALYSIS – 100 YR

```
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*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY  1991                 *
*          VERSION 4.0.1E               *
*                                       *
*  RUN DATE  05/04/2007  TIME  12:52:13 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::              by                      :::
:::        Haestad Methods, Inc.         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT


```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  1           ID
  2           IT       5                     300
  3           IO       5       0

  4           KK  DA 5
  5           KM  Offsite Drainage Area 40 from TxDot Federal Project
  6           KO                                      22
  7           BA  0.1266
  8           PB    10.5
  9           IN       5
 10           PC       0  0.0008  0.0017  0.0025  0.0033  0.0042   0.005  0.0058  0.0067  0.0075
 11           PC  0.0083  0.0092    0.01  0.0108  0.0117  0.0125  0.0133  0.0142   0.015  0.0158
 12           PC  0.0167  0.0175  0.0183  0.0192    0.02  0.0208  0.0217  0.0225  0.0234  0.0243
 13           PC  0.0252  0.0261   0.027  0.0279  0.0289  0.0298  0.0308  0.0317  0.0327  0.0337
 14           PC  0.0347  0.0357  0.0367  0.0377  0.0388  0.0398  0.0408  0.0419   0.043  0.0441
 15           PC  0.0452  0.0463  0.0474  0.0485  0.0497  0.0509   0.052  0.0532  0.0544  0.0555
 16           PC  0.0567  0.0579  0.0592  0.0604  0.0617   0.063  0.0642  0.0654  0.0668   0.068
 17           PC  0.0693  0.0707   0.072  0.0733  0.0747  0.0761  0.0776  0.0791  0.0806  0.0822
 18           PC  0.0838  0.0854  0.0871  0.0887  0.0905  0.0922  0.0941  0.0959  0.0978  0.0997
 19           PC  0.1016  0.1036  0.1056  0.1076  0.1097  0.1118   0.114  0.1163  0.1185  0.1208
 20           PC  0.1233  0.1258  0.1284  0.1311  0.1339  0.1367  0.1397  0.1427  0.1458   0.149
 21           PC  0.1522  0.1555  0.1589  0.1624  0.1659  0.1696  0.1733  0.1771   0.181   0.185
 22           PC   0.189  0.1931  0.1975   0.202  0.2067  0.2115  0.2165  0.2216   0.227  0.2325
 23           PC  0.2382   0.244    0.25  0.2564  0.2634  0.2711  0.2795  0.2884   0.298  0.3111
 24           PC  0.3298  0.3559  0.3848  0.4273     0.5  0.5727  0.6152  0.6441  0.6702  0.6889
 25           PC   0.702  0.7116  0.7205  0.7289  0.7366  0.7436    0.75   0.756  0.7618  0.7675
 26           PC   0.773  0.7784  0.7835  0.7885  0.7933   0.798  0.8025  0.8069   0.811   0.815
 27           PC   0.819  0.8229  0.8267  0.8304  0.8341  0.8376  0.8411  0.8445  0.8478  0.8511
 28           PC  0.8543  0.8573  0.8603  0.8633  0.8661  0.8689  0.8716  0.8742  0.8767  0.8792
 29           PC  0.8815  0.8837   0.886  0.8882  0.8903  0.8924  0.8944  0.8964  0.8984  0.9003
 30           PC  0.9022  0.9041  0.9059  0.9078  0.9095  0.9113  0.9129  0.9146  0.9162  0.9178
 31           PC  0.9194  0.9209  0.9224  0.9239  0.9253  0.9267   0.928  0.9293  0.9307  0.9319
 32           PC  0.9332  0.9346  0.9358   0.937  0.9383  0.9396  0.9408  0.9421  0.9433  0.9445
 33           PC  0.9456  0.9468   0.948  0.9491  0.9503  0.9515  0.9526  0.9537  0.9548  0.9559
 34           PC   0.957  0.9581  0.9592  0.9603  0.9613  0.9623  0.9634  0.9644  0.9654  0.9664
 35           PC  0.9674  0.9684  0.9694  0.9704  0.9714  0.9723  0.9733  0.9743  0.9752  0.9762
 36           PC  0.9771   0.978   0.979  0.9799  0.9808  0.9816  0.9825  0.9834  0.9843  0.9852
 37           PC   0.986  0.9868  0.9877  0.9885  0.9893  0.9902  0.9909  0.9917  0.9925  0.9933
 38           PC  0.9941  0.9948  0.9956  0.9964  0.9971  0.9979  0.9986  0.9992       1
 39           LS              73      25
 40           UD    0.35

 41           KK  DA 4
 42           KM  Site
 43           KO                                      22
 44           BA  0.1876
 45           PB    10.5
 46           IN       5
 47           PC       0  0.0008  0.0017  0.0025  0.0033  0.0042   0.005  0.0058  0.0067  0.0075
```

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 49    PC  0.0167  0.0175  0.0183  0.0192    0.02  0.0208  0.0217  0.0225  0.0234  0.0243
 50    PC  0.0252  0.0261   0.027  0.0279  0.0289  0.0298  0.0308  0.0317  0.0327  0.0337
 51    PC  0.0347  0.0357  0.0367  0.0377  0.0388  0.0398  0.0408  0.0419   0.043  0.0441
 52    PC  0.0452  0.0463  0.0474  0.0485  0.0497  0.0509   0.052  0.0532  0.0544  0.0555
 53    PC  0.0567  0.0579  0.0592  0.0604  0.0617   0.063  0.0642  0.0654  0.0668   0.068
```



```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 54    PC  0.0693  0.0707   0.072  0.0733  0.0747  0.0761  0.0776  0.0791  0.0806  0.0822
 55    PC  0.0838  0.0854  0.0871  0.0887  0.0905  0.0922  0.0941  0.0959  0.0978  0.0997
 56    PC  0.1016  0.1036  0.1056  0.1076  0.1097  0.1118   0.114  0.1163  0.1185  0.1208
 57    PC  0.1233  0.1258  0.1284  0.1311  0.1339  0.1367  0.1397  0.1427  0.1458   0.149
 58    PC  0.1522  0.1555  0.1589  0.1624  0.1659  0.1696  0.1733  0.1771   0.181   0.185
 59    PC   0.189  0.1931  0.1975   0.202  0.2067  0.2115  0.2165  0.2216   0.227  0.2325
 60    PC  0.2382   0.244    0.25  0.2564  0.2634  0.2711  0.2795  0.2884   0.298  0.3111
 61    PC  0.3298  0.3559  0.3848  0.4273     0.5  0.5727  0.6152  0.6441  0.6702  0.6889
 62    PC   0.702  0.7116  0.7205  0.7289  0.7366  0.7436    0.75   0.756  0.7618  0.7675
 63    PC   0.773  0.7784  0.7835  0.7885  0.7933   0.798  0.8025  0.8069   0.811   0.815
 64    PC   0.819  0.8229  0.8267  0.8304  0.8341  0.8376  0.8411  0.8445  0.8478  0.8511
 65    PC  0.8543  0.8573  0.8603  0.8633  0.8661  0.8689  0.8716  0.8742  0.8767  0.8792
 66    PC  0.8815  0.8837   0.886  0.8882  0.8903  0.8924  0.8944  0.8964  0.8984  0.9003
 67    PC  0.9022  0.9041  0.9059  0.9078  0.9095  0.9113  0.9129  0.9146  0.9162  0.9178
 68    PC  0.9194  0.9209  0.9224  0.9239  0.9253  0.9267   0.928  0.9293  0.9307  0.9319
 69    PC  0.9332  0.9346  0.9358   0.937  0.9383  0.9396  0.9408  0.9421  0.9433  0.9445
 70    PC  0.9456  0.9468   0.948  0.9491  0.9503  0.9515  0.9526  0.9537  0.9548  0.9559
 71    PC   0.957  0.9581  0.9592  0.9603  0.9613  0.9623  0.9634  0.9644  0.9654  0.9664
 72    PC  0.9674  0.9684  0.9694  0.9704  0.9714  0.9723  0.9733  0.9743  0.9752  0.9762
 73    PC  0.9771   0.978   0.979  0.9799  0.9808  0.9816  0.9825  0.9834  0.9843  0.9852
 74    PC   0.986  0.9868  0.9877  0.9885  0.9893  0.9902  0.9909  0.9917  0.9925  0.9933
 75    PC  0.9941  0.9948  0.9956  0.9964  0.9971  0.9979  0.9986  0.9992       1
 76    LS              73      90
 77    UD   0.132

 78    KK  DA 5-4
 79    KM
 80    KO                                      22
 81    HC       2

 82    KK  DA 3
 83    KM
 84    KO                                      22
 85    BA  0.1281
 86    PB    10.5
 87    IN       5
 88    PC       0  0.0008  0.0017  0.0025  0.0033  0.0042   0.005  0.0058  0.0067  0.0075
 89    PC  0.0083  0.0092    0.01  0.0108  0.0117  0.0125  0.0133  0.0142   0.015  0.0158
 90    PC  0.0167  0.0175  0.0183  0.0192    0.02  0.0208  0.0217  0.0225  0.0234  0.0243
 91    PC  0.0252  0.0261   0.027  0.0279  0.0289  0.0298  0.0308  0.0317  0.0327  0.0337
 92    PC  0.0347  0.0357  0.0367  0.0377  0.0388  0.0398  0.0408  0.0419   0.043  0.0441
 93    PC  0.0452  0.0463  0.0474  0.0485  0.0497  0.0509   0.052  0.0532  0.0544  0.0555
```

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 94    PC  0.0567  0.0579  0.0592  0.0604  0.0617   0.063  0.0642  0.0654  0.0668   0.068
 95    PC  0.0693  0.0707   0.072  0.0733  0.0747  0.0761  0.0776  0.0791  0.0806  0.0822
 96    PC  0.0838  0.0854  0.0871  0.0887  0.0905  0.0922  0.0941  0.0959  0.0978  0.0997
 97    PC  0.1016  0.1036  0.1056  0.1076  0.1097  0.1118   0.114  0.1163  0.1185  0.1208
 98    PC  0.1233  0.1258  0.1284  0.1311  0.1339  0.1367  0.1397  0.1427  0.1458   0.149
 99    PC  0.1522  0.1555  0.1589  0.1624  0.1659  0.1696  0.1733  0.1771   0.181   0.185
100    PC   0.189  0.1931  0.1975   0.202  0.2067  0.2115  0.2165  0.2216   0.227  0.2325
101    PC  0.2382   0.244    0.25  0.2564  0.2634  0.2711  0.2795  0.2884   0.298  0.3111
102    PC  0.3298  0.3559  0.3848  0.4273     0.5  0.5727  0.6152  0.6441  0.6702  0.6889
103    PC   0.702  0.7116  0.7205  0.7289  0.7366  0.7436    0.75   0.756  0.7618  0.7675
104    PC   0.773  0.7784  0.7835  0.7885  0.7933   0.798  0.8025  0.8069   0.811   0.815
105    PC   0.819  0.8229  0.8267  0.8304  0.8341  0.8376  0.8411  0.8445  0.8478  0.8511
106    PC  0.8543  0.8573  0.8603  0.8633  0.8661  0.8689  0.8716  0.8742  0.8767  0.8792
```



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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

107    PC  0.8815  0.8837   0.886  0.8882  0.8903  0.8924  0.8944  0.8964  0.8984  0.9003
108    PC  0.9022  0.9041  0.9059  0.9078  0.9095  0.9113  0.9129  0.9146  0.9162  0.9178
109    PC  0.9194  0.9209  0.9224  0.9239  0.9253  0.9267   0.928  0.9293  0.9307  0.9319
110    PC  0.9332  0.9346  0.9358   0.937  0.9383  0.9396  0.9408  0.9421  0.9433  0.9445
111    PC  0.9456  0.9468   0.948  0.9491  0.9503  0.9515  0.9526  0.9537  0.9548  0.9559
112    PC   0.957  0.9581  0.9592  0.9603  0.9613  0.9623  0.9634  0.9644  0.9654  0.9664
113    PC  0.9674  0.9684  0.9694  0.9704  0.9714  0.9723  0.9733  0.9743  0.9752  0.9762
114    PC  0.9771   0.978   0.979  0.9799  0.9808  0.9816  0.9825  0.9834  0.9843  0.9852
115    PC   0.986  0.9868  0.9877  0.9885  0.9893  0.9902  0.9909  0.9917  0.9925  0.9933
116    PC  0.9941  0.9948  0.9956  0.9964  0.9971  0.9979  0.9986  0.9992       1
117    LS              73      45
118    UD   0.352

119    KK  DA 2
120    KM
121    KO                                      22
122    BA  0.0638
123    PB    10.5
124    IN       5
125    PC  0.0000 0.00101 0.00202 0.00305 0.00408 0.00513 0.00618 0.00725 0.00832 0.00941
126    PC  0.0105 0.01161 0.01272 0.01385 0.01498 0.01613 0.01728 0.01845 0.01962 0.02081
127    PC  0.0220 0.02321 0.02442 0.02565 0.02688 0.02813 0.02938 0.03065 0.03192 0.03321
128    PC  0.0345 0.03581 0.03712 0.03845 0.03978 0.04113 0.04248 0.04385 0.04522 0.04661
129    PC  0.0480 0.04941 0.05084 0.05229 0.05376 0.05525 0.05676 0.05829 0.05984 0.06141
130    PC  0.0630 0.06461 0.06624 0.06789 0.06956 0.07125 0.07296 0.07469 0.07644 0.07821
131    PC  0.0800 0.08181 0.08364 0.08549 0.08736 0.08925 0.09116 0.09309 0.09504 0.09701
132    PC  0.0990 0.10101 0.10304 0.10509 0.10716 0.10925 0.11136 0.11349 0.11564 0.11781
133    PC  0.1200 0.12225 0.12460 0.12705 0.12960 0.13225 0.13500 0.13785 0.14080 0.14385
134    PC  0.1470 0.15020 0.15340 0.15660 0.15980 0.16300 0.16620 0.16972 0.17332 0.17700
135    PC  0.1810 0.18512 0.18948 0.19408 0.19892 0.20400 0.20940 0.21520 0.22140 0.22800
136    PC  0.2350 0.24268 0.25132 0.26092 0.27148 0.28300 0.30684 0.35436 0.43079 0.56786
137    PC  0.6630 0.68196 0.69864 0.71304 0.72516 0.73500 0.74344 0.75136 0.75876 0.76564
138    PC  0.7720 0.77796 0.78364 0.78904 0.79416 0.79900 0.80360 0.80800 0.81220 0.81620
139    PC  0.8200 0.82367 0.82726 0.83079 0.83424 0.83763 0.84094 0.84419 0.84736 0.85047
140    PC  0.8535 0.85647 0.85936 0.86219 0.86494 0.86763 0.87024 0.87279 0.87526 0.87767
```

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141          PC  0.8800 0.88229 0.88455 0.88679 0.88900 0.89119 0.89335 0.89549 0.89760 0.89969
142          PC  0.9018 0.90379 0.90580 0.90779 0.90975 0.91169 0.91360 0.91549 0.91735 0.91919
143          PC  0.9210 0.92279 0.92455 0.92629 0.92800 0.92969 0.93135 0.93299 0.93460 0.93619
144          PC  0.9377 0.93929 0.94080 0.94229 0.94375 0.94519 0.94660 0.94799 0.94935 0.95069
145          PC  0.9520 0.95330 0.95459 0.95588 0.95716 0.95844 0.95971 0.96098 0.96224 0.96350
146          PC  0.9647 0.96600 0.96724 0.96848 0.96971 0.97094 0.97216 0.97338 0.97459 0.97580
147          PC  0.9770 0.97820 0.97939 0.98058 0.98176 0.98294 0.98411 0.98528 0.98644 0.98760
148          PC  0.9887 0.98990 0.99104 0.99218 0.99331 0.99444 0.99556 0.99668 0.99779 0.99890
149          PC  1.0000 1.00000 1.00000 1.00000 1.00000
150          LS              73      45
151          UD   0.234

152          KK  DA 5-2
153          KM
154          KO                                      22
155          HC       3
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

156          KK  DA 1
157          KM  Cattrell Tract
158          KO                                      22
159          BA  0.3766
160          PB    10.5
161          IN       5
162          PC       0  0.0008  0.0017  0.0025  0.0033  0.0042   0.005  0.0058  0.0067  0.0075
163          PC  0.0083  0.0092    0.01  0.0108  0.0117  0.0125  0.0133  0.0142   0.015  0.0158
164          PC  0.0167  0.0175  0.0183  0.0192    0.02  0.0208  0.0217  0.0225  0.0234  0.0243
165          PC  0.0252  0.0261   0.027  0.0279  0.0289  0.0298  0.0308  0.0317  0.0327  0.0337
166          PC  0.0347  0.0357  0.0367  0.0377  0.0388  0.0398  0.0408  0.0419   0.043  0.0441
167          PC  0.0452  0.0463  0.0474  0.0485  0.0497  0.0509   0.052  0.0532  0.0544  0.0555
168          PC  0.0567  0.0579  0.0592  0.0604  0.0617   0.063  0.0642  0.0654  0.0668   0.068
169          PC  0.0693  0.0707   0.072  0.0733  0.0747  0.0761  0.0776  0.0791  0.0806  0.0822
170          PC  0.0838  0.0854  0.0871  0.0887  0.0905  0.0922  0.0941  0.0959  0.0978  0.0997
171          PC  0.1016  0.1036  0.1056  0.1076  0.1097  0.1118   0.114  0.1163  0.1185  0.1208
172          PC  0.1233  0.1258  0.1284  0.1311  0.1339  0.1367  0.1397  0.1427  0.1458   0.149
173          PC  0.1522  0.1555  0.1589  0.1624  0.1659  0.1696  0.1733  0.1771   0.181   0.185
174          PC   0.189  0.1931  0.1975   0.202  0.2067  0.2115  0.2165  0.2216   0.227  0.2325
175          PC  0.2382   0.244    0.25  0.2564  0.2634  0.2711  0.2795  0.2884   0.298  0.3111
176          PC  0.3298  0.3559  0.3848  0.4273     0.5  0.5727  0.6152  0.6441  0.6702  0.6889
177          PC   0.702  0.7116  0.7205  0.7289  0.7366  0.7436    0.75   0.756  0.7618  0.7675
178          PC   0.773  0.7784  0.7835  0.7885  0.7933   0.798  0.8025  0.8069   0.811   0.815
179          PC   0.819  0.8229  0.8267  0.8304  0.8341  0.8376  0.8411  0.8445  0.8478  0.8511
180          PC  0.8543  0.8573  0.8603  0.8633  0.8661  0.8689  0.8716  0.8742  0.8767  0.8792
181          PC  0.8815  0.8837   0.886  0.8882  0.8903  0.8924  0.8944  0.8964  0.8984  0.9003
182          PC  0.9022  0.9041  0.9059  0.9078  0.9095  0.9113  0.9129  0.9146  0.9162  0.9178
183          PC  0.9194  0.9209  0.9224  0.9239  0.9253  0.9267   0.928  0.9293  0.9307  0.9319
184          PC  0.9332  0.9346  0.9358   0.937  0.9383  0.9396  0.9408  0.9421  0.9433  0.9445
185          PC  0.9456  0.9468   0.948  0.9491  0.9503  0.9515  0.9526  0.9537  0.9548  0.9559
186          PC   0.957  0.9581  0.9592  0.9603  0.9613  0.9623  0.9634  0.9644  0.9654  0.9664
```

```
          187          PC  0.9674  0.9684  0.9694  0.9704  0.9714  0.9723  0.9733  0.9743  0.9752  0.9762
          188          PC  0.9771   0.978   0.979  0.9799  0.9808  0.9816  0.9825  0.9834  0.9843  0.9852
          189          PC   0.986  0.9868  0.9877  0.9885  0.9893  0.9902  0.9909  0.9917  0.9925  0.9933
          190          PC  0.9941  0.9948  0.9956  0.9964  0.9971  0.9979  0.9986  0.9992       1
          191          LS              73      32
          192          UD   0.360

          193          KK  DA 5-1
          194          KM
          195          KO                                      22
          196          HC       2
          197          ZZ

HEC1 S/N: 1343001909        HMVersion: 6.33     Data File: C:\WINDOWS\TEMP\~vbh0878.TMP

**********************************************
*                                            *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)        *
*              MAY   1991                    *
*           VERSION 4.0.1E                   *
*                                            *
*  RUN DATE  05/04/2007  TIME  12:52:13      *
*                                            *
**********************************************

**********************************************
*                                            *
*    U.S. ARMY CORPS OF ENGINEERS            *
*    HYDROLOGIC ENGINEERING CENTER           *
*          609 SECOND STREET                 *
*       DAVIS, CALIFORNIA 95616              *
*          (916) 756-1104                    *
*                                            *
**********************************************

    3 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                        NMIN          5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1   0  STARTING DATE
                       ITIME       0000  STARTING TIME
                          NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE     2   0  ENDING DATE
                       NDTIME       0055  ENDING TIME
                       ICENT         19  CENTURY MARK

                    COMPUTATION INTERVAL     0.08 HOURS
                        TOTAL TIME BASE    24.92 HOURS

          ENGLISH UNITS
               DRAINAGE AREA        SQUARE MILES
               PRECIPITATION DEPTH  INCHES
               LENGTH, ELEVATION    FEET
```

FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

*** *** *** *

```
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE
                IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                 IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
               TIMINT      0.083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
152 KK    *    DA 5-2  *
          *            *
          **************

154 KO          OUTPUT CONTROL VARIABLES
                IPRNT          5  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE
                IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                 IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
               TIMINT      0.083  TIME INTERVAL IN HOURS

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


          **************
          *            *
156 KK    *    DA 1    *
          *            *
          **************

158 KO          OUTPUT CONTROL VARIABLES
                IPRNT          5  PRINT CONTROL
                IPLOT          0  PLOT CONTROL
                QSCAL         0.  HYDROGRAPH PLOT SCALE
                IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                 IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
               TIMINT      0.083  TIME INTERVAL IN HOURS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
```

```
          **************
          *            *
193 KK    *    DA 5-1  *
          *            *
          **************
```

195 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	300	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
				6-HOUR	24-HOUR	72-HOUR			
HYDROGRAPH AT	DA 5	373.	12.42	83.	27.	26.	0.13		
HYDROGRAPH AT	DA 4	893.	12.17	146.	51.	49.	0.19		
2 COMBINED AT	DA 5-4	1161.	12.17	228.	78.	75.	0.31		
HYDROGRAPH AT	DA 3	395.	12.42	88.	30.	29.	0.13		
HYDROGRAPH AT	DA 2	328.	10.08	46.	15.	14.	0.06		
3 COMBINED AT	DA 5-2	1465.	12.17	360.	123.	118.	0.51		
HYDROGRAPH AT	DA 1	1116.	12.42	251.	83.	80.	0.38		
2 COMBINED AT	DA 5-1	2458.	12.33	609.	205.	198.	0.88		

*** NORMAL END OF HEC-1 ***

EXHIBIT D

HEC-RAS CROSS SECTION WITH 100 YR DELINEATION

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

1 inch = 100 ft.

APPROXIMATE DEED LINE

APPROXIMATE DEED LINE

Jo Ann Griesenbeck Cantrell
115.00 acres
445/684

ULTIMATE 100 YR FLOODPLAIN

PROPOSED DRAINAGE EASEMENT DOC #

CHANNEL SIDE SLOPES @ 3:1 BOTH SIDES (UNLESS NOTED)

CANTRELL REACH

PROPOSED DRAINAGE EASEMENT DOC #

CONTOUR ELEVATION 349' APPROXIMATE LOCATION OF FEMA 100-YR FLOODPLAIN

CHANNEL CROSSING W/6:1 CHANNEL SIDE SLOPES (BOTH SIDES)

(CROSS SECTION-7) 6' FLAT BOTTOM CHANNEL WIDENS TO 24' FLAT BOTTOM CHANNEL

CANTRELL REACH

TREES TO BE REMOVED #1615, #1617 AND #1618

LIMITS OF PROPOSED 14' WIDE CONCRETE DRIVE

APPROXIMATE DRAINAGE EASEMENT AREA = ±11.28 AC.

ULTIMATE 100 YR FLOODPLAIN

CONTOUR ELEVATION 349' APPROXIMATE LOCATION OF FEMA 100-YR FLOODPLAIN

FEMA 100 YR FLOODPLAIN

CONTOUR ELEVATION 349' APPROXIMATE LOCATION OF FEMA 100-YR FLOODPLAIN

COLORADO RIVER

APPROXIMATE LOCATION OF 24" DIA. ROCK

STATE OF TEXAS
RUBEN LOPEZ JR.
92746
LICENSED
PROFESSIONAL ENGINEER

TREE LIST

TAG #	DESCRIPTION
1609	13" GUM BUMELIA
1609	9" GUM BUMELIA
1610	19" GUM BUMELIA
1611	33" PECAN
1612	13" HACKBERRY
1613	8" HACKBERRY
1614	16" ELM
1615	9" HACKBERRY
* 1616	24" ELM
* 1617	16" ELM
* 1618	8" HACKBERRY
1619	13" HACKBERRY
1620	31" ELM
1621	9" ELM
1622	11" GUM BUMELIA
1623	16" ELM
1624	12" ELM
1625	30" COTTONWOOD
1626	35" COTTONWOOD
1627	26" HACKBERRY
1628	16" ELM
1629	12" ELM
1630	14" ELM
1631	17" ELM
1632	8",6" ELM
1633	44" COTTONWOOD
1634	9" ELM
1635	18" ELM
1636	14" ELM
1637	14" ELM
1638	13" ELM
1639	13" ELM
1640	13" ELM
1641	12" ELM
1642	9" HACKBERRY
1643	10" ELM
1644	16" ELM
1645	14" CHINA BERRY
1646	13" ELM
1647	18" ELM
1648	18" ELM
1649	16" ELM
1650	13" ELM
1651	13" ELM
1652	14" ELM
1653	12" ELM
1654	15" ELM
1655	30" ELM
1656	9" ELM
1657	9" HACKBERRY
1658	12" HACKBERRY
1659	18" ELM
1660	23" ELM
1661	9" ELM
1662	16" ELM
1663	14" ELM
1664	15" ELM
1665	18" ELM
1666	9" ELM
1667	30" COTTONWOOD
1668	10",4" ELM
1669	11" ELM
1670	14" ELM
1671	13",12",11",10" ASH
1672	14" ELM
1673	48" COTTONWOOD
1674	17" ELM
1675	48" CYPRESS
1676	18" SYCAMORE
1677	38" COTTONWOOD
1678	11",4" ELM
1679	11" ELM
1680	17" PECAN
1681	11" ELM
1682	11" ELM
1683	29" HACKBERRY
1684	9" ELM
1685	9" ELM
1686	16",13" CHINA BERRY
1687	11",4" ELM
1688	17" CHINA BERRY
1689	14" ELM
1690	20" ELM
1691	14",10" ELM
1692	13" MULBERRY
1693	13" ELM
1694	9" ELM
1695	9" ELM
1696	12" ELM
1697	9" ELM
1698	9" ELM
1699	10" ELM
1700	8" ELM
1801	40" PECAN
1802	38" PECAN
1803	31" PECAN
1804	27", 17" PECAN
1805	31" PECAN
1806	15" PECAN
1807	32" PECAN
1808	34" PECAN
1809	13" PECAN
1810	18" PECAN
1821	17",16" PECAN
1822	19",15" PECAN
1823	23",15" PECAN
1824	25" PECAN
2301	14" ELM
2302	15",11",6" ELM
2303	12" ELM
2304	18" ELM
2305	6" ELM
2306	13" CHINA BERRY
2307	11" CHINA BERRY
2308	12" COTTONWOOD
2309	8",6" ELM
2310	26" ELM
2311	13",11" ELM
2312	10" ELM
2313	23" COTTONWOOD
2314	24" COTTONWOOD
2315	30" COTTONWOOD
2316	30" COTTONWOOD
2317	11" COTTONWOOD
2318	11" COTTONWOOD
2319	15" HACKBERRY
2394	12",11",11",10" ELM
2395	15",6" ELM
2396	10" ELM
2397	14",13",10" HACKBERR
2398	17" HACKBERRY
2399	17" GUM BUMELIA
3400	30" PECAN
3408	24" PECAN
3409	49" PECAN
3410	5",9",10",17",19",20"
3411	31" PECAN
3412	12" HACKBERRY
3413	12",10" ELM
3414	13" ELM
3415	15" HACKBERRY
3416	17" ELM

* TREES TO BE REMOVED

10' WIDE CONC. DRIVE
24" DIA. ROCK

(1) – 8' WIDE x 10' HIGH
(2) – 6' WIDE x 10' HIGH
CONC. CULVERTS
@ 17.92%

FL= 336.44

FL= 323.00

24" DIA. ROCK

SECTION A–A

BEGIN (1) – 8' WIDE x 10' HIGH
(2) – 6' WIDE x 10' HIGH CLUVERTS
@ HEADWALL, FL= 336.44

PROPOSED 14' WIDE CONCRETE DRIVE

END (1) – 8' WIDE x 10' HIGH
(2) – 6' WIDE x 10' HIGH CLUVERTS
@ HEADWALL WITH 24" DIA. ROCK
FL= 323.00

24" DIA. ROCK TO FLOWLINE OF RAVINE
(24.5' WIDE CENTERED ON CULVERT)

EXHIBIT E

HEC-RAS ANALYSIS

HEC-RAS Plan: Plan 03 River: Unnamed-Trib-Col Reach: Central Reach Profile: 100 yr

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Central Reach	24	100yr	1465.00	345.15	353.86		354.28	0.002001	5.24	279.73	58.25	0.42
Central Reach	23	100yr	1465.00	344.85	353.58		354.08	0.001871	5.11	286.86	58.98	0.41
Central Reach	22	100yr	1465.00	344.25	353.36		353.72	0.001604	4.82	303.88	60.69	0.38
Central Reach	21	100yr	1465.00	343.85	353.10		353.42	0.001343	4.51	324.80	62.73	0.35
Central Reach	20	100yr	1465.00	343.05	352.89		353.16	0.001104	4.19	349.51	65.05	0.32
Central Reach	19	100yr	1465.00	342.45	352.72		352.95	0.000895	3.88	377.96	67.62	0.29
Central Reach	18	100yr	2458.00	341.85	351.83		352.66	0.002900	6.85	358.72	65.90	0.52
Central Reach	17	100yr	2458.00	341.40	351.40		352.12	0.002872	6.83	359.98	65.99	0.52
Central Reach	16	100yr	2458.00	341.00	351.02		351.74	0.002848	6.81	361.12	66.10	0.51
Central Reach	15	100yr	2458.00	340.64	350.70		351.41	0.002804	6.75	363.96	66.64	0.51
Central Reach	14	100yr	2458.00	340.17	350.27		350.97	0.002738	6.71	366.49	66.59	0.50
Central Reach	13	100yr	2458.00	339.75	349.89		350.56	0.002682	6.66	369.33	66.84	0.50
Central Reach	12	100yr	2458.00	339.46	349.54		350.32	0.002634	6.61	371.87	67.08	0.49
Central Reach	11	100yr	2458.00	339.15	349.38		350.05	0.002568	6.55	375.39	67.39	0.49
Central Reach	10	100yr	2458.00	338.75	349.06		349.66	0.003025	6.22	395.04	67.56	0.52
Central Reach	9	100yr	2458.00	338.25	349.17		349.33	0.000527	3.22	790.06	183.70	0.25
Central Reach	8	100yr	2458.00	337.79	349.21		349.26	0.000132	1.89	1451.82	278.44	0.12
Central Reach	7	100yr	2458.00	337.50	349.20		349.24	0.000096	1.75	1585.15	284.88	0.10
Central Reach	6	100yr	2458.00	337.21	349.19		349.23	0.000105	1.86	1534.11	271.07	0.11
Central Reach	5	100yr	2458.00	336.90	349.19		349.22	0.000071	1.68	1840.09	321.51	0.09
Central Reach	4	100yr	2458.00	336.54	349.18	341.43	349.21	0.000067	1.62	1866.82	312.31	0.09
Central Reach	3.25	100yr	Culvert									
Central Reach	3	100yr	2458.00	322.02	349.02		349.03	0.000037	0.97	3399.78	316.12	0.03
Central Reach	2	100yr	2458.00	315.59	349.01		349.02	0.000090	0.95	2547.10	230.83	0.04
Central Reach	1	100yr	2458.00	314.76	349.00	324.75	349.02	0.000069	0.95	2459.91	151.69	0.03

HEC-RAS Version 4.0 Beta
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Proposed Pecan Crossing channel
Project File : HecRas100yrUltimate.prj
Run Date and Time: 5/18/2007 11:49:13 AM

Project in English units

Project Description:
Ultimate 100 year flood plain with proposed channel - Ctrall Reach Unnamed Tributary Colorado R.

PLAN DATA

Plan Title: Plan 03
Plan File : e:\2772001_Eng_Documents\HecRas-4-11-07\HecRas100yrUltimate.p03

Geometry Title: Add topo 1-10
Geometry File : e:\2772001_Eng_Documents\HecRas-4-11-07\HecRas100yrUltimate.g01

Flow Title : 100 YR
Flow File : e:\2772001_Eng_Documents\HecRas-4-11-07\HecRas100yrUltimate.f02

Plan Summary Information:

Number of:	Cross Sections =	24	Multiple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: 100 YR
Flow File : e:\2772001_Eng_Documents\HecRas-4-11-07\HecRas100yrUltimate.f02

Flow Data (cfs)

River	Reach	RS	100 yr
Unnamed-Trib-Col	Cantrell Reach	24.	1465
Unnamed-Trib-Col	Cantrell Reach	18.	2458

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Unnamed-Trib-Col	Cantrell Reach	100 yr		Known WS = 349

GEOMETRY DATA

Geometry Title: Add topo 1-10
Geometry File : e:\2772001_Eng_Documents\HecRas-4-11-07\HecRas100yrUltimate.g01

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 24.

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	358.23	5.72	358.27	9.04	358.32	15.87	358.31	64.55	358.51
77.3	358.59	120.62	359.42	124.19	360.45	127.97	360.48	133.4	359.65
137.13	359.65	140.78	359.66	152.77	359.66	153.17	359.86	155.03	359.14
170	354.15	197	345.15	203	345.15	254.27	362.24	257.16	363.2
262.37	363.34	266.17	363.4	315.78	364.82				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	155.03	.035	254.27	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
155.03	254.27	100.04	100 100.17	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 23.

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	357.96	37.43	357.97	61.46	357.85	82.81	358.09	87.49	358.17
96.21	358.15	152.59	358.57	153.39	358.58	153.43	358.72	153.57	358.69
153.7	358.68	154.11	358.6	154.46	358.61	155.6	358.63	168.59	354.3
169.95	353.85	196.95	344.85	202.95	344.85	249.01	360.2	251.03	360.65
255.74	360.85	271.49	360.7	271.61	360.7	272.1	360.72	272.48	360.73
272.58	360.72	274.93	360.78	322.67	362.26	331.61	362.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	155.6	.035	251.03	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
155.6	251.03	200	200 200.01	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 22.

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11.77	357.36	69.7	357.71	127.06	357.84	129.7	357.77	150.04	357.93
151.67	358.09	155.16	358.18	168.56	353.71	169.95	353.25	196.95	344.25
202.95	344.25	245.25	358.35	246.86	358.86	247.85	358.76	248.6	358.86
249.53	358.85	249.79	358.84	254.31	359.21	255.14	359.28	256.98	359.15
297.59	359.81	305.96	360.03	365.04	361.51				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
11.77	.035	155.16	.035	246.86	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
155.16	246.86	200.01	200	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 21.

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
32.81	356.93	73.53	357.23	84.04	357.34	89.82	357.38	144.27	357.6
147.3	357.62	147.9	357.63	148.88	357.63	154.97	357.66	168.58	353.12
170	352.65	197	343.65	203	343.65	245.28	357.74	246.89	358.28
249.42	358.29	258	358.35	278.17	358.53	288.11	358.65	290.15	358.75
294.45	359.01	306.97	359.68	327.36	359.76	337.19	359.76	346.95	359.85
362.49	360.17	370.84	360.34	378.59	360.47	382.46	360.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
32.81	.035	154.97	.035	246.89	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
154.97	246.89	200.01	200	200.01	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 20.

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
49.61	356.69	76.37	356.76	87.84	356.76	105.53	356.86	153.22	357.27
154.32	357.27	155.81	356.78	172.55	351.2	197	343.05	203	343.05
230	352.05	231.63	352.59	247.29	357.81	247.68	357.81	249.05	357.83
279.45	358.07	284.66	358.1	286.93	358.12	288.17	358.12	288.57	358.13
290.29	358.14	339.53	358.54	351.11	358.65	356.45	359.02	358.22	359.12
390.41	359.51								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
49.61	.035	154.32	.035	247.68	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
154.32	247.68	199.95	200	199.71	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 19.

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
41.3	356.95	81.83	355.94	95.16	355.58	147.95	356.33	148.56	356.34
148.69	356.37	148.96	356.38	149.45	356.4	150.61	356.45	155.27	356.64
170.84	351.45	174	350.39	197.84	342.45	203.84	342.45	207	343.51
246.27	356.59	248.33	357.28	251.84	357.28	252.69	357.29	253.15	357.31
253.33	357.29	254.35	357.27	262.87	357.39	307.57	357.88	323.96	358.11
363.37	358.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
41.3	.035	155.27	.035	248.33	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
155.27	248.33	199.97	200 200.17	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 18.

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
29.38	357.4	58.42	356.95	67.62	356.7	71.98	356.56	94.34	355.64
117.31	354.84	125.33	354.96	128.97	355.07	134.03	355.42	153.83	356.24
155.76	355.59	194.01	342.85	197	341.85	203	341.85	227.19	349.91
249.43	357.32	249.59	357.33	249.89	357.42	250.17	357.42	260.74	357.5
267.73	357.54	318.02	358.35	321.37	358.38	375.64	358.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
29.38	.035	153.83	.035	250.17	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
153.83	250.17	157.85	150 141.26	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 17.

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
19.31	361.17	80.78	360.98	83.23	360.83	124.94	359.58	136.7	359.05
140.23	358.92	143.99	359.07	167.67	351.18	170	350.4	172.62	349.53
197	341.4	203	341.4	227.52	349.57	230	350.4	232.98	351.39
233.03	351.41	260.67	360.62	263.63	360.66	290.39	360.85	333.73	361.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
19.31	.035	143.99	.035	260.67	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
143.99	260.67	142.15	134.6 125.25	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 16.

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
47.76	359.2	.75	359.02	94.78	358.51	136.18	357.3	142.99	357.27
146.31	357.2	148.15	357.1	148.36	357.09	148.8	357.07	197.01	341
203.01	341	247.43	355.81	260.12	360.13	260.34	360.2	260.44	360.24
261.05	360.44	261.6	360.63	261.71	360.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
47.76	.035	148.8	.035	247.43	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
148.8	247.43	114.96	115.4	117.45	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 15.

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
20.13	358.79	47.4	357.86	55.73	357.77	76.93	357.43	83.25	357.41
84.37	357.36	86.95	357.1	105.87	355.71	113.53	354.78	125.22	354.75
148.78	354.36	150.81	354.24	150.91	354.24	151.19	354.23	151.25	354.22
151.81	354.23	152.96	355.17	153.23	355.16	167.1	350.51	168.82	350.02
169.36	349.86	170.01	349.64	171.19	349.25	197.01	340.64	203.01	340.64
233.09	350.67	235.74	351.53	262.96	360.6	263.29	360.47	272.17	360.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
20.13	.035	153.23	.035	235.74	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
153.23	235.74	158.4	158.35	157.45	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 14.

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
76.23	359.44	116.96	356.83	117.64	356.8	136.62	355.15	137.13	355.11
156.89	352.72	157.03	352.71	157.34	352.69	158.58	352.6	159.3	352.55
159.96	352.5	196.96	340.17	202.96	340.17	254.86	357.47	256.95	357.54
262.34	357.7	268.95	357.91	281.91	357.75				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
76.23	.035	136.62	.035	254.86	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
136.62	254.86	135.07	141.65	149.54	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 13.

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
115.49	359	131.61	358.35	133.62	358.22	137.85	358.01	137.92	357.88
138.7	357.79	139.43	357.91	139.56	357.92	143.38	357.63	145.83	356.8
170	348.75	172.48	347.92	197	339.75	203	339.75	205.48	340.58
248.18	354.81	248.38	354.89	248.68	355.48	248.73	355.49	253.89	356.14
254.63	356.24	256.68	356.56	296.45	359.23				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
115.49	.035	145.83	.035	248.38	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
145.82	248.38	92.29	97.78	103.08	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 12.

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
108.84	358.35	125	357.96	137.38	357.22	138.19	357.18	138.34	357.16
139.82	357.01	141.29	357.17	146.28	356.36	197	339.46	203	339.46
249.11	354.83	249.49	354.87	249.72	354.89	250.11	354.93	250.71	355.3
251.77	355.62	253.32	355.26	255.77	355.79	257.32	355.68	273.25	356.39
286.92	356.43	303.14	357.22	303.66	357.06				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
108.84	.035	146.28	.035	249.49	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
146.28	249.49	102.36	102.22	102.49	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 11.

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
106.07	357.79	114.08	357.59	143.18	356.94	143.79	356.79	144.12	356.77
197	339.15	203	339.15	236.84	351.1	243.35	351.31	244.29	350.61
244.36	350.61	257.56	352.17	277.79	354.2	289.67	355	318	356.8

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
106.07	.035	143.79	.035	238.84	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
143.79	238.84	131.27	131.31	131.28	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 10.

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
102.62	356.55	122.64	355.91	156.23	355.34	205	339.09	206	338.75
212	338.75	213	339.09	240.28	348.18	242.53	348.1	242.66	348.09
245.94	347.97	249.5	348.23	254.78	348.37	262.86	349.08	279.49	351.69
293.89	354.08	301.03	353.09	311.03	355.04	331.86	357.03		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
102.62	.035	156.23	.035	279.49	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
156.23	279.49	181.57	168.69	158.11	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 9.

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-5.75	356	68.91	352.73	86.94	351.53	104.82	350.51	134.66	346.72
151.39	344.84	162.42	343.87	164.91	343.81	170.21	343.88	171.19	343.82
190.71	343.35	205.91	338.28	206.01	338.25	212.01	338.25	212.91	338.55
213.01	338.58	225.76	342.83	227.24	343.29	230.26	343.49	255.51	346.36
275.34	347.95	298.62	349.1	309.57	350.76	386.87	354		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-5.75	.035	134.66	.035	275.34	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
134.66	275.34	161.36	152.96	141.6	.1 .3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 8.

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	355.5	163.5	346	181.5	346	205	338.12	206	337.79
212	337.79	213	338.12	218.5	340	231.03	341.02	231.66	340.99
243.14	340.56	257.14	340.49	285.1	340.73	285.84	340.75	288.97	340.95
304.07	341.78	309.13	342.22	316.85	343.17	329.08	344.77	334.75	345.25
347.32	346.6	444.15	353						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	163.5	.035	316.85	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
163.5	316.85	97.08	97.04	97.05	.1 .3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 7.

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	354.25	171.9	343	185.54	336.46	187.5	337.83	188.4	337.53
188.5	337.5	212.5	337.5	213.4	337.6	213.5	337.83	214.27	338.09
223.51	340.53	223.59	340.52	223.75	341.2	237.82	339.82	249.42	339.55
255.49	339.61	272.37	341.25	301.54	343.54	311.73	345.14	331.59	347.83
333.17	348.04	344.23	349.49	350.97	350.36	355.36	351.35	360.61	351.66
403.46	353.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	171.9	.035	311.73	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
171.9	311.73	97.39	97.21	97.35	.1 .3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 6.

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-42.29	353.5	88.4	346.41	114.18	344.46	127.2	343.06	151.06	341.59
175.34	340.28	179.46	340.05	187	337.54	188	337.21	212	337.21
213	337.54	217.27	338.96	218.85	339.03	218.94	339.04	221.29	339.33
234.38	340.95	235.97	340.96	238.57	341.48	255.6	343.51	283.89	346.43
286.63	346.78	293.79	347.59	311.14	349.5	367.92	353	367.92	356

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-42.29	.035	127.2	.035	255.6	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
127.2	255.6	91.28 102.79	114.33	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 5.

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-48.65	352	48.59	347.23	81.48	345.85	85.9	345.61	87.13	345.52
125.97	341.58	135.24	340.64	144.34	340.25	145.71	340.29	148.92	340.06
170.54	338.41	170.89	338.48	173.34	338.19	174.8	338.22	176.08	338.3
183.43	338.42	186.67	337.34	186.99	337.23	187.08	337.2	187.99	336.9
211.99	336.9	212.89	337.2	212.99	337.23	221.62	340.11	222.23	340.17
226.43	340.55	228.48	340.68	229.75	340.79	230.56	340.87	230.92	340.78
243.77	341.3	262.55	344.2	341.95	350	384.95	358		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-48.65	.035	135.24	.035	243.77	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
135.24	243.77	105.32 120.08	132.36	.1	.3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 4.

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-90.43	350.5	-70.7	350	-29.43	349	-9.02	348	18.3	347
62.91	343.43	68.16	343.04	78.03	342.26	113.34	340.19	145.91	339.4
156.41	339.08	163.76	339.53	165.07	339.14	168.9	339.28	174.12	340.15
180.34	339.34	180.93	338.89	185.47	340.63	186.99	336.87	187.08	336.84
187.99	336.54	211.99	336.54	212.99	336.87	214.32	337.32	216.91	343.09
273.9	349	350.07	358						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-90.43	.035	68.16	.035	216.91	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68.16	216.91	104.3 104	106	.1	.3

CULVERT

RIVER: Unnamed-Trib-Col
REACH: Centrell Reach RS: 3.25

INPUT
Description: proposed culvert
Distance from Upstream XS = 45
Deck/Roadway Width = 10
Weir Coefficient = 3
Upstream Deck/Roadway Coordinates
num= 13

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-166.91	352	336.41	-129.8	351	336.41	-63.91	350	336.41
-34.85	349	336.41	-6.19	348	336.41	22.99	347	336.41
200	347	336.41	209.36	348	336.41	241.24	349	336.41
273.31	350	336.41	300.24	351	336.41	321.89	352	336.41
348.35	353	336.41						

Upstream Bridge Cross Section Data
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-90.43	350.5	-70.7	350	-29.43	349	-9.02	348	18.3	347
62.91	343.43	68.16	343.04	78.03	342.26	113.34	340.19	145.91	339.4
156.41	339.05	163.76	339.53	165.07	339.14	166.9	339.28	174.12	340.15
180.34	339.34	180.93	336.89	185.47	340.63	186.99	336.87	187.08	336.84
187.99	336.54	211.99	336.54	212.99	336.87	214.32	337.32	216.91	343.05
273.9	349	350.07	358						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-90.43	.035	68.16	.035	216.91	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
68.16	216.91	.1	.3

Downstream Deck/Roadway Coordinates
num= 14

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
-166.91	352	322	-129.8	351	322	-63.91	350	322
-34.85	349	322	-6.19	348	322	22.99	347	322
200	347	322	209.36	348	322	241.24	349	322
273.31	350	322	300.24	351	322	321.89	352	322
348.35	353	322	357.82	353	322			

Downstream Bridge Cross Section Data
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17.17	349	46.08	346	66.17	345.23	68.31	345.18	101.7	343.33
104.94	343.06	115.85	337.5	116.08	337.39	129.65	330.48	136.17	328.82
138.15	326.26	142.27	325.37	144.83	325.57	150.87	322.14	153.1	322.75
161.65	322.6	161.76	322.49	161.92	322.47	162.33	322.5	175.94	323.1
185.54	322.02	188.92	322.52	198.72	327.25	215.02	337.23	215.46	337.49
215.84	337.84	216.05	337.86	217.14	337.93	259.39	341.06	277.47	342.06
283.14	342.29	290.32	341.87	306.97	344.36	321.14	347.03	323.89	347.57
324.79	347.61	326.68	347.71	332.51	348.91	350.32	351.41	354.01	352
357.82	353	389.25	354	401.81	354.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
17.17	.035	116.08	.1	217.14	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
116.08	217.14	.1	.3

E.G. OC (ft)	349.21	Weir Sta Rgt (ft)	248.02
Culvert Control	Outlet	Weir Submerg	0.90
Culv WS Inlet (ft)	346.54	Weir Max Depth (ft)	2.21
Culv WS Outlet (ft)	333.00	Weir Avg Depth (ft)	1.74
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	499.14
Culv Crt Depth (ft)	2.81	Min El Weir Flow (ft)	347.01

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 3.

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
17.17	349	46.08	346	66.17	345.23	68.31	345.18	101.7	343.33
104.94	343.06	115.85	337.5	116.08	337.39	129.65	330.48	136.17	328.82
136.15	326.26	142.27	325.37	144.83	325.57	150.87	322.14	153.1	322.75
161.65	322.6	161.76	322.49	161.92	322.47	162.33	322.5	175.94	323.1
185.54	322.02	188.92	322.52	198.72	327.25	215.02	337.23	215.46	337.49
215.84	337.84	216.05	337.86	217.14	337.93	259.39	341.06	277.47	342.06
283.14	342.29	290.32	341.87	306.97	344.36	321.14	347.03	323.89	347.57
324.79	347.61	326.68	347.71	332.51	348.91	350.32	351.42	354.01	352
357.82	353	389.25	354	401.81	354.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
17.17	.035	116.08	.1	217.14	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
116.08	217.14	90.79	77.86	64.21	.1 .3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 2.

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
42.41	347.85	46.54	348.57	48.92	348.82	49.33	348.91	58.99	349.22
71.14	349.36	79.86	348.95	85.12	348.4	103.34	346.25	107.75	345.52
123.54	341.86	127.47	341.13	140.7	338.81	144.15	338.1	146.68	337.49
147.15	337.42	149.93	336.92	156.11	334.04	159.97	332.18	177.2	320.65
181.82	315.59	183.06	315.82	185.34	315.88	186.86	316.29	188.73	316.79
196.34	319.72	200.61	321.87	204.71	324.6	213	330.04	218.81	332.73
226.36	337.17	238.45	339.36	240.99	339.95	246.41	341.01	257.8	342.62
282.15	345.71	294.4	348.36	297.17	348.76	304.06	349.52	311.09	349.69
315.8	350.36								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
42.41	.035	140.7	.1	246.41	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
140.7	246.41	56.27	99.43	111.65	.1 .3

CROSS SECTION

RIVER: Unnamed-Trib-Col
REACH: Cantrell Reach RS: 1

INPUT
Description:
Station Elevation Data num= 21

Cantrell Reach	10.	181.57	168.69	158.11
Cantrell Reach	9.	161.36	152.96	141.6
Cantrell Reach	8.	97.08	97.04	97.05
Cantrell Reach	7.	97.39	97.21	97.35
Cantrell Reach	6.	91.28	102.79	114.33
Cantrell Reach	5.	105.32	120.08	132.36
Cantrell Reach	4.	104.3	104	106
Cantrell Reach	3.25	Culvert		
Cantrell Reach	3.	90.79	77.86	64.21
Cantrell Reach	2.	58.27	99.43	111.65
Cantrell Reach	1	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Unnamed-Trib-Col

Reach	River Sta.	Contr.	Expan.
Cantrell Reach	24.	.1	.3
Cantrell Reach	23.	.1	.3
Cantrell Reach	22.	.1	.3
Cantrell Reach	21.	.1	.3
Cantrell Reach	20.	.1	.3
Cantrell Reach	19.	.1	.3
Cantrell Reach	18.	.1	.3
Cantrell Reach	17.	.1	.3
Cantrell Reach	16.	.1	.3
Cantrell Reach	15.	.1	.3
Cantrell Reach	14.	.1	.3
Cantrell Reach	13.	.1	.3
Cantrell Reach	12.	.1	.3
Cantrell Reach	11.	.1	.3
Cantrell Reach	10.	.1	.3
Cantrell Reach	9.	.1	.3
Cantrell Reach	8.	.1	.3
Cantrell Reach	7.	.1	.3
Cantrell Reach	6.	.1	.3
Cantrell Reach	5.	.1	.3
Cantrell Reach	4.	.1	.3
Cantrell Reach	3.25	Culvert	
Cantrell Reach	3.	.1	.3
Cantrell Reach	2.	.1	.3
Cantrell Reach	1	.1	.3

BUILDING BASTROP

HONORING OUR AUTHENTIC PAST.
PLANNING FOR OUR SUSTAINABLE FUTURE.

Waiver Checklist

Process Overview

1. Pre-Application Meeting
    a. Discuss your project with staff prior to submitting an application. Staff can help identify opportunities and constraints on the proposed project, as well as provide more information on the process and code requirements.
2. Complete Submittal Package*, which includes: Application and all Checklist Items
3. Staff review, with comments issued as needed
4. City Council meeting for approval by Resolution or Ordinance
   *Incomplete submittals will not be accepted

Submittal Package Checklist Items

Staff	Applicant	Item
☐	☐	Completed and signed Application
☐	☐	Agent Authorization Form
☐	☐	Project Description Letter listing the following: • Type of improvements proposed • Scope of improvements • How the project will affect areas within the scope of work
☐	☐	A signed, sealed and dated letter from a registered engineer certifying that they have personally reviewed the topography and completed a field investigation of the existing and proposed flow patterns for stormwater runoff from the subject development to the main stem of all creeks that may impact the project, and build-out conditions allowable by zoning, restrictive covenant or plat note, that the stormwater flows from the subject development will not cause any additional adverse flooding impacts for storms of magnitude up through the one-hundred (100) year event.
☐	☐	Map of Affected Area and/or Concept Plan as requested by Staff
☐	☐	Detailed plans of proposed drainage improvements signed, sealed, and dated by a registered engineer
☐	☐	Digital Submittal – Provide pdf copies of all documents listed above via email, CD, or flash drive

Carlson, Brigance & Doering, Inc.
Civil Engineering ❖ Surveying

5501 West William Cannon Drive
Austin, Texas 78749
(512) 280-5160 Office (512) 583-0903 Fax

Delivery Receipt & Letter of Transmittal

TO: City of Bastrop
Planning & Development Dept.
ATTN: Vivianna Nicole Hamilton
City Hall, 1311 Chestnut Street
Bastrop, TX 78602

SENT BY: Christine Methvin
christine@cbdeng.com
(512) 280-5160 x175 office (512) 484-6591 cell

DATE:	April 4, 2019
ATTENTION:	Vivianna Nicole Hamilton
REFERENCE:	Bastrop Grove Section 2
	Exemption Application
CBD PROJECT NO:	4697

THESE ITEMS ARE TRANSMITTED AS INDICATED BELOW:

- [ ] **For Action**
- [ ] **For Signature(s)**
- [ ] **For Approval**
- [X] **For Information/Files**
- [X] **For Review & Comment**
- [ ] **Other** _____
- [ ] **Contact Christine Methvin for pick up when processed**
- [ ] **Submit** ____ **copies for distribution**
- [ ] **Other** _____
- [ ] **Other** _____

REMARKS:

NO.	COPIES	DATE	DESCRIPTION
1	1	4/2/19	Alternate Design Standards Checklist
2	1	4/2/19	Exemption Application (Alternative Drainage Plan)
3	1	1/7/2019	Owner Agent Authorization Form
4	1	4/4/2019	Project Description Letter
5	1	4/4/2019	Certification Letter
6	1	1/22/2019	Proposed Preliminary Plat
7	1	Feb. 2019	Drainage Improvement Plan
8	1	2/13/2019	Copy of Pre-Application Meeting Minutes
9	1	Feb-19	Drainage Improvements Report: Developed Conditions Hydrology Revision Report
10	1	May-19	Bastrop Grove Drainage Improvements Engineering Report

Received by: _____

Date: 4/4/19

Owner's Agent Authorization

Property Owner's Information

Owner's Name(s): MC BASTROP 71, LP

Property Address(s): PARCEL #R78736

Owner's Email Address: DM@MORANCAP.COM

Owner's Phone Number: (214) 622-6525

The individuals listed below are hereby authorized to apply for, sign for, and conduct business for permits, plan, and/or other legal documents with the City of Bastrop Planning and Development Department on behalf of the above identified property owner(s).

The City of Bastrop Planning and Development Department may retain a copy of this form for our records and maintain a file as a courtesy. The form with the most recent date shall supersede all previous authorizations on file and **remain in effect for one (1) year, or until a new form is filed by the property owners, whichever is shorter**.

All signatories understand that it is the property owner's responsibility to provide a copy of this form every time they would like to add or remove authorized agents, and that this form expires one (1) year after it is signed. The property owner's signature designates the agent as the official contact person for projects and the single point of contact. All correspondence and communication will be conducted with the agent.

Print full name(s) and title(s) of authorized agent(s):

1. ANY EMPLOYEE OF
2. CARLSON, BRIGANCE & DOERING, INC.

X _____ X 1-7-19

Signature(s) of Property Owner(s) — Date

_____ _____

Signature(s) of Property Owner(s) — Date

_____ 1/3/19

Signature(s) of Agent(s) — Date

_____ _____

Signature(s) of Agent(s) — Date

BUILDING BASTROP

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PLANNING FOR OUR SUSTAINABLE FUTURE.

Waiver Checklist

Process Overview

1. Pre-Application Meeting
    a. Discuss your project with staff prior to submitting an application. Staff can help identify opportunities and constraints on the proposed project, as well as provide more information on the process and code requirements.
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3. Staff review, with comments issued as needed
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   *Incomplete submittals will not be accepted

Submittal Package Checklist Items

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☐	☒*	Map of Affected Area and/or Concept Plan as requested by Staff
☐	☒*	Detailed plans of proposed drainage improvements signed, sealed, and dated by a registered engineer
☐	☒	Digital Submittal – Provide pdf copies of all documents listed above via email, CD, or flash drive

(*) SEE BASTROP GROVE DRAINAGE IMPROVEMENTS ENGINEERING REPORT DATED MAY 2018 AND BASTROP GROVE DRAINAGE IMPROVEMENTS PLANS DATED APRIL 2018

BUILDING BASTROP
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Exception Application

Process Overview

1. Complete Submittal Package*, which includes: Application and associated Checklist Items
2. Staff review, with comments issued as needed
3. Exception Determination Letter issued by Planning Director
    a. If determined the project DOES qualify as an Exception, submit permit application for project
    b. If determined the project DOES NOT qualify as an Exception by the Planning Director, the City Manager will make determination, followed by a City Council determination if needed.

*Incomplete submittals will not be accepted

Select your Exception

☐ No Impact Project
☒ Ongoing Project
☐ Grandfathered Project

Property Owner

Name: MC BASTROP 71, LP

Address: 2828 ROUTH STREET, SUITE 500

City, State Zip: DALLAS, TX 75201

Phone Number: 214-622-6525 E-mail Address DM@MORANCAP.COM

Applicant

Name: Christine Methvin Role (i.e. developer, agent, etc.): Agent

Company Name: Carlson, Brigance & Doering, Inc.

Address: 5501 W. William Cannon Drive, Austin, TX 78749

Phone Number: 512-280-5160 X175 E-mail Address CHRISTINE@CBDENG.COM

Project Information

Project Name: BASTOP GROVE, SECTION 2

Property Address: BCAD Property ID: R78736

Legal Description: A98 BLAKEY, NANCY, ACRES 93.013

Current Use(s) of the Property: UNDEVELOPED

Nature of the Project: 12 LOT COMMERCIAL SUBDIVISION

Existing Zoning District: GENERAL RETAIL

Exception Application

Total Property Area (sq ft): 1,127,419.92 SF (25.882 ACRES) Total Number Lots: 12

Total Area of Impervious Surface (sq ft): Existing: 0 Proposed: _____

Total Number of Buildings: Existing: 0 Proposed: _____

Footprint of Each Building (sq ft):
Existing: n/a
Proposed: n/a

Total Number of Dwelling Units by Type (single family, duplex, multi-family, etc.):
Existing: 0
Proposed: 0

Amount of Non-Residential Square Footage (ground floor building footprint only) by Type (office, retail, commercial, industrial, warehouse, etc.). If project is mixed-use (mix of uses on same lot, please specify):
Existing: n/a
Proposed: n/a

Number of Phases of Development: 1 PHASE

Explain the current drainage pattern on the site (submit attachment if needed):

See Bastrop Grove Drainage Improvements Engineering Report dated May 2018

Explain the drainage pattern of the site after the project is complete (submit attachment if needed): See Bastrop Grove Drainage Improvements Engineering Report dated May 2018

No Impact Projects: **N/A**

☐ Yes ☐ No Will the project increase density on site?
☐ Yes ☐ No Will the project increase or impact impervious cover?
☐ Yes ☐ No Will the project expand the footprint of an existing structure?
☐ Yes ☐ No Will the project alter the current drainage pattern on the property?

Ongoing Projects:

List of Permit(s) and Numbers (if available): LAND-1291-2018 "BASTROP GROVE DRAINAGE IMPROVEMENTS"

Applicant Certification

The applicant certifies that the facts stated herein and exhibits attached hereto are true, correct, and complete. Signature below also authorizes the City of Bastrop and its agents to visit and inspect the property for which this application is being submitted.

Project Coordinator — Signature and Title

1/19/19 — Date

Exception Application

Additional Information Required for Grandfathered Projects N/A

1. **Please indicate permits or development approvals received that are the basis to establish rights to complete the Project.** *Please specify all that may be applicable and include copies of the permit.*

CONSENT AGREEMENT/DEVELOPMENT AGREEMENT/MEMORANDUM OF UNDERSTANDING		
Name:		Approval Date:
Expiration Date:	Volume No.:	Page No.:
PLANNED DEVELOPMENT DISTRICT (PDD) PLAN		
PDD Name:		Ordinance No.:
Approval Date:	Last Revision Date:	Acreage:
PLAT APPLICATION *Note: Plat must be approved within 24 months of application submittal date*		
Plat Name:		
Legal Description:		
Submittal Date:	Expiration Date:	Acreage:
APPROVED/RECORDED PLAT *Note: If plat is not recorded within 2 years of plat approval permit rights will expire*		
Plat Name:		
Legal Description:		
Approval Date:	Expiration Date:	Acreage:
Recording Date:	Volume No.:	Page No.:
OTHER PERMIT		
Type of Permit:		Submittal Date:
Permit No.:	Date Issued:	Expiration Date:

2. Date establishing claim of rights for this Project: _____

3. Describe any construction or related actions that have taken place on the property since that date: *Include the date, nature and extent of each physical improvement to the property including structures, utilities, roads, driveways, etc.*

4. Describe how the Project has addressed drainage: *Include the standards and assumptions used, impact to this property and adjacent properties, stormwater flows from the Project, etc.*

BASTROPTX
Heart of the Lost Pines / Est. 1832

Exception Application

5. Authorization from Property Owner

I, Douglas MacMahon, swear and affirm that I am the owner of property at Parcel #R78736, as shown in the records of Bastrop County, Texas, which is the subject of this application.

I, Douglas MacMahon, the owner of the property subject to this Grandfathered Project Exception Application, authorize to submit the application and serve as my representative for this request.

X _____ X 1-7-19

Property owner's signature — Date

6. Sworn statement:

I, the undersigned, hereby certify that all information contained herein and the attached documents are true and correct and that it is my belief that the property owner is entitled to the requested rights for this Project and, during the pending time of this determination, I understand my continuing obligation to notify the Development Services Director in writing of the inaccuracy of any statement or representation which was incorrect when made or which becomes incorrect by virtue of changed circumstances.

Christine M. Methvin — Applicant's Name

_____ — Applicant's signature

1/3/19 — Date

Sworn to and subscribed before me by Susan O. Martin on this 3rd day of January

in the year 2019, to certify which witness my hand and seal of office.

_____
Notary Public, State of Texas

SUSAN O. MARTIN
NOTARY PUBLIC
ID# 13049238-6
State of Texas
Comm. Exp. 01-11-2020

BASTROPTX
Heart of the Lost Pines / Est. 1832

Owner's Agent Authorization

Property Owner's Information

Owner's Name(s): MC BASTROP 71, LP

Property Address(s): PARCEL #R78736

Owner's Email Address: DM@MORANCAP.COM

Owner's Phone Number: ( )(214) 622-6525

The individuals listed below are hereby authorized to apply for, sign for, and conduct business for permits, plan, and/or other legal documents with the City of Bastrop Planning and Development Department on behalf of the above identified property owner(s).

The City of Bastrop Planning and Development Department may retain a copy of this form for our records and maintain a file as a courtesy. The form with the most recent date shall supersede all previous authorizations on file and **remain in effect for one (1) year, or until a new form is filed by the property owners, whichever is shorter**.

All signatories understand that it is the property owner's responsibility to provide a copy of this form every time they would like to add or remove authorized agents, and that this form expires one (1) year after it is signed. The property owner's signature designates the agent as the official contact person for projects and the single point of contact. All correspondence and communication will be conducted with the agent.

Print full name(s) and title(s) of authorized agent(s):

1. ANY EMPLOYEE OF
2. CARLSON, BRIGANCE & DOERING, INC.

X _____ X 1-7-19
Signature(s) of Property Owner(s) — Date

_____ _____
Signature(s) of Property Owner(s) — Date

_____ 1/3/19
Signature(s) of Agent(s) — Date

_____ _____
Signature(s) of Agent(s) — Date

Pre-Application Meeting Request Form

Pre-application meetings are required prior to starting any project in the City of Bastrop. They allow applicants to learn more about the City of Bastrop's code, application process, and to provide answers to questions. Representatives from various departments may be present depending on the project and associated questions.

Pre-application meeting are held on Tuesday afternoons by appointment. Staff suggests scheduling a meeting as soon as possible because requests are processed in the order in which they are received, and appointment times fill quickly. To reserve an appointment, complete this form, attach a location map of the property of interest, and return to Staff. You may return the application in person or by mail to 1311 Chestnut St. Bastrop, TX 78602 or by email to plan@cityofbastrop.org. Staff will contact you to confirm an appointment date and time.

Property Information

Property Address: _____ Tax ID: R78736

Legal Description: A98 BLAKEY, NANCY, ACRES 93.013

Land Use Category: _____ Acreage: 25.882

Existing Zoning District: GENERAL RETAIL (If rezone) Proposed Zoning District: N/A

Name of Overarching Regulation (PD, MUD, DA, etc.): N/A

Project Details

Project Name: BASTOP GROVE, SECTION 2

What is the primary purpose for the meeting?

☐ Due Diligence/Fact Finding ☐ Project Feasibility ☐ Project Design ■ Ready to Submit App ■ Other

If other, please explain: POSSIBLE EXCEPTION & FUTURE PRELIMINARY PLAT

Briefly describe your project: Proposed 12 lot, commercial subdivision.

Have you spoken to City Staff about this project? ■ Yes ☐ No If yes, name: Jennifer Bills

Have there been previous meetings about this project? ■ Yes ☐ No If yes, date: _____

Meeting Details

Requested Meeting Date (must be a Tuesday): First availble Tuesday

Backup Meeting Date (must be a Tuesday): Next available Tuesday

Pre-Application Meeting Request Form

Contact Information

Name: MC BASTROP 71, LP Role (i.e. developer, agent, etc): Agent

Company Name: Carlson, Brigance & Doering, Inc.

Address: 2828 ROUTH STREET, SUITE 500

Phone Number: 214-622-6525 Email: bmcentee@cbdeng.com

Additional Contact Information

Name: Christine Methvin Role (i.e. engineer, architect, etc):

Company Name:

Address: 5501 W. William Cannon Drive, Austin, TX 78749

Phone Number: 512-280-5160 X175 Email:

By submitting this request form, the applicant understands that the pre-application meeting is for informational purposes and any preliminary analysis provided by staff during this meeting does not constitute a formal review of the project, imply subsequent approval, nor preclude future comments. It is the responsibility of the applicant to read and comply with all applicable ordinances and requirements in effect on the submittal date.

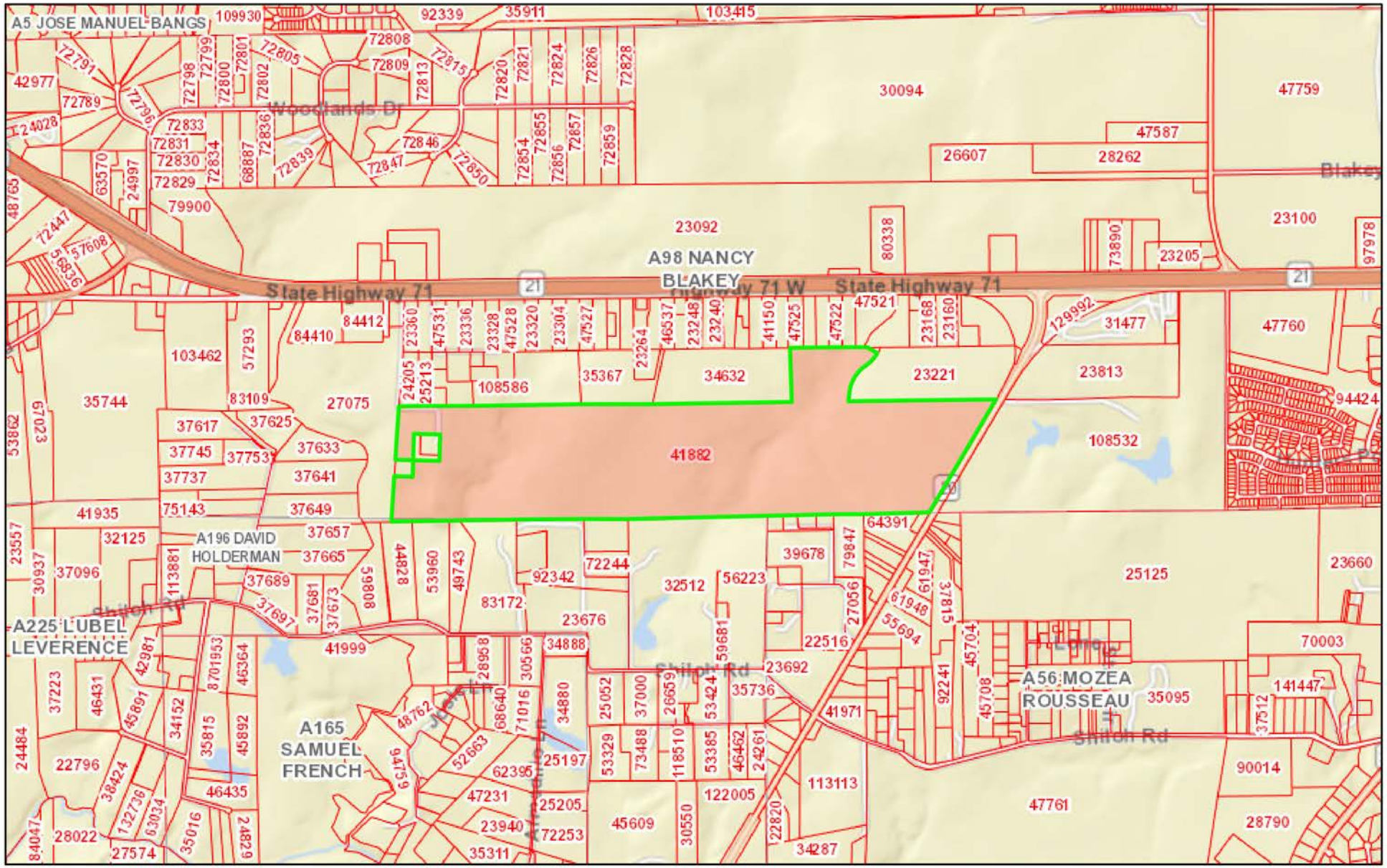
Staff Use Only

Date Received: By:

Meeting Date: Meeting Time:

Staff to Attend:

BASTROP VILLAGE WEST



January 18, 2019

Parcels

Abstracts

1:24,525

0 0.2 0.4 0.8 mi

0 0.33 0.65 1.3 km

Esri, HERE, Garmin, INCREMENT P, NGA, USGS

Bastrop County Appraisal District & BIS Consulting - www.bisconsultants.com

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

Planning Application

Select your Plan

Subdivision
- ☐ Amending Plat
- ☐ Minor Plat
- ☐ Replat
- ■ Preliminary Plat
- ☐ Final Plat
- ☐ Plat Vacation
- ☐ Subdivision Variance
- ☐ Public Improvement Construction Plans

Zoning & Development
- ☐ Zoning Map Amendment (Rezone)
- ☐ New Planned Development (PD)
- ☐ Conditional Use Permit (CUP)
- ☐ Zoning Variance
- ☐ Site Development Plan
- ☐ Site Work (On-Site Infrastructure)
- ☐ New Agreement: _____
- ☐ Alternative Plan: _____
- ☐ Agreement/PD Amendment

Other
- ☐ Abandonment – Easement
- ☐ Abandonment – ROW
- ☐ License to Encroach
- ☐ Nonconforming Structure
- ☐ Nonconforming Use
- ☐ Planning Appeal
- ☐ Voluntary Annexation
- ☐ Land Disturbance
- ☐ Work in the ROW

See associated checklists to ensure a complete application.

Project Information

Project Name: BASTOP GROVE, SECTION 2

Property Address: _____ Tax ID: R78736

Legal Description: A98 BLAKEY, NANCY, ACRES 93.013

Land Use Category: _____

Existing Zoning District: GENERAL RETAIL (If rezone) Proposed Zoning District: N/A

Name of Overarching Regulation (PD, MUD, DA, etc.): N/A

Total Acreage: 25.882 ACRES Total Lots: 12

Acreage Not Designated as Lots: 1.853 AC ROW Lots Subject to Parkland Fee: 0

Property Owner

Name: MC BASTROP 71, LP

Company: MC BASTROP 71, LP

Address: 2828 ROUTH STREET, SUITE 500

City, State Zip: DALLAS, TX 75201

Phone Number: 214-622-6525 E-mail Address DM@MORANCAP.COM

Planning Application

Applicant

Name: Christine Methvin Role (i.e. developer, agent, etc.): Agent

Company Name: Carlson, Brigance & Doering, Inc.

Address: 5501 W. William Cannon Drive, Austin, TX 78749

Phone Number: 512-280-5160 X175 E-mail Address CHRISTINE@CBDENG.COM

Additional Contact (Optional)

Name: Brendan P. McEntee, P.E. Role (i.e. engineer, architect, etc.):

Company Name:

Address: 5501 W. William Cannon Drive, Austin, TX 78749

Phone Number: (512) 280-5160 X106 E-mail Address bmcentee@cbdeng.com

The applicant certifies that the facts stated herein and exhibits attached hereto are true, correct, and complete. **If this application is filed by anyone other than the property owner, an Agent Authorization form signed by all property owners must accompany this application.** Signature below also authorizes the City of Bastrop and its agents to visit and inspect the property for which this application is being submitted.

CM Methvin — Christine M. Methvin, Project Coordinator

Signature and Title

Date

Staff Use Only

☐ Received By: Date:

Fees Paid $

Comments:

Administratively Complete Date:

Paper: Prop. Owner Notification: P&Z: City Council:

Bastrop CAD

Property Search

Property Search Results > 78736 MC BASTROP 71 LP for Year 2019

Property

Account

Property ID:	78736	Legal Description:	ABS A98 Blakey, Nancy,15.3100 ACRES
Geographic ID:	R78736	Agent Code:	A0216794
Type:	Real		
Property Use Code:			
Property Use Description:			

Location

Address:		Mapsco:	
Neighborhood:	BASTROP CITY 006	Map ID:	9-11
Neighborhood CD:	NBHD0206		

Owner

Name:	MC BASTROP 71 LP	Owner ID:	758572
Mailing Address:	8214 WESTCHESTER DR STE 550 DALLAS, TX 75225	% Ownership:	100.0000000000%
		Exemptions:	

Values

(+) Improvement Homesite Value:	+	N/A		
(+) Improvement Non-Homesite Value:	+	N/A		
(+) Land Homesite Value:	+	N/A		
(+) Land Non-Homesite Value:	+	N/A	Ag / Timber Use Value	
(+) Agricultural Market Valuation:	+	N/A		N/A
(+) Timber Market Valuation:	+	N/A		N/A

(=) Market Value:	=	N/A		
(–) Ag or Timber Use Value Reduction:	–	N/A		

(=) Appraised Value:	=	N/A		
(–) HS Cap:	–	N/A		

(=) Assessed Value:	=	N/A		

Taxing Jurisdiction

Owner:	MC BASTROP 71 LP
% Ownership:	100.0000000000%

Total Value: N/A

Entity	Description	Tax Rate	Appraised Value	Taxable Value	Estimated Tax
C04	CITY OF BASTROP	N/A	N/A	N/A	N/A
CAD	APPRAISAL DISTRICT	N/A	N/A	N/A	N/A
G01	BASTROP COUNTY	N/A	N/A	N/A	N/A
RD1	COUNTY ROAD	N/A	N/A	N/A	N/A
S04	BASTROP ISD	N/A	N/A	N/A	N/A
	Total Tax Rate:	N/A			
				Taxes w/Current Exemptions:	N/A
				Taxes w/o Exemptions:	N/A

Improvement / Building

No improvements exist for this property.

Land

#	Type	Description	Acres	Sqft	Eff Front	Eff Depth	Market Value	Prod. Value
1	IP	IMPROVED PASTURE	15.3100	666903.60	0.00	0.00	N/A	N/A

Roll Value History

Year	Improvements	Land Market	Ag Valuation	Appraised	HS Cap	Assessed
2019	N/A	N/A	N/A	N/A	N/A	N/A
2018	$0	$2,668,310	8,836	8,836	$0	$8,836
2017	$0	$2,668,310	9,115	9,115	$0	$9,115
2016	$0	$2,668,310	9,952	9,952	$0	$9,952
2015	$0	$2,628,296	10,231	10,231	$0	$10,231
2014	$0	$2,628,296	50,599	50,599	$0	$50,599
2013	$0	$3,664,417	50,785	50,785	$0	$50,785
2012	$0	$5,740,000	77,802	77,802	$0	$77,802
2011	$0	$6,156,864	41,961	41,961	$0	$41,961
2010	$0	$6,156,864	41,961	41,961	$0	$41,961
2009	$0	$4,104,576	41,669	41,669	$0	$41,669
2008	$0	$4,104,576	0	0	$0	$0
2007	$0	$4,104,576	40,941	40,941	$0	$40,941

Deed History - (Last 3 Deed Transactions)

#	Deed Date	Type	Description	Grantor	Grantee	Volume	Page	Deed Number
1	10/5/2011	SWD	SPECIAL WARRANTY DEED	BASTROP GROVE PARTNERS LTD	MC BASTROP 71 LP	2097	241	0
2	11/29/2006	SWD	SPECIAL WARRANTY DEED	BRUNDAGE BASTROP LTD	BASTROP GROVE PARTNERS LTD	1698	245	0

3	5/10/2001	CONV	CONVERSION	BECK, MARVIN E & ANNE P	BRUNDAGE BASTROP LTD	1130	014	0

Tax Due

Property Tax Information as of 01/03/2019

Amount Due if Paid on:

Year	Taxing Jurisdiction	Taxable Value	Base Tax	Base Taxes Paid	Base Tax Due	Discount / Penalty & Interest	Attorney Fees	Amount Due

NOTE: Penalty & Interest accrues every month on the unpaid tax and is added to the balance. Attorney fees may also increase your tax liability if not paid by July 1. If you plan to submit payment on a future date, make sure you enter the date and RECALCULATE to obtain the correct total amount due.

Questions Please Call (512) 303-1930

This year is not certified and ALL values will be represented with "N/A".

Website version: 1.2.2.14 Database last updated on: 1/2/2019 8:49 PM © N. Harris Computer Corporation

Carlson, Brigance & Doering, Inc.
Civil Engineering ✣ Surveying

5501 West William Cannon Drive
Austin, Texas 78749
(512) 280-5160 Office

Fee Request Form

TO: Douglas MacMahon
MC Bastrop 71, LP
2828 Routh Street, Suite 500
Dallas, TX 75201
dm@morancap.com
214-622-6525

SENT BY: Christine Methvin
christine@cbdeng.com
(512) 280-5160 x117 office (512) 484-6591 cell

DATE:	January 3, 2019
ATTENTION:	Douglas MacMahon
REFERENCE:	Bastrop Grove Section 2 ***Preliminary Plat*** ***APPLICATION FEE***
CBD PROJECT NO:	4697

REASON FOR FEE REQUEST: Preliminary Plat Application Fee

[X] **See excerpt from City of Bastrop Fee Schedule published 10/1/18 & calculations below**

Preliminary Plat	$1,050 + $25 per lot + $25 per acre of right-of-way $1,200 minimum

Application Fee		**$1,050.00**
12 Lots *	$25.00	**$300.00**
1.853 Acres	$25.00	**$46.33**
TOTAL FEES DUE		**$1,396.33**

AMOUNT: **$1,396.33**

Make Check Payable to: City of Bastrop

REMARKS:

[ ] **Contact Christine Methvin for pick up when processed**

[ ] **Please forward via regular mail**

[X] **Please forward payment to Christine Methvin at your earliest convenience**

BASTROPTX
Heart of the Lost Pines / Est. 1832

Owner's Agent Authorization

Property Owner's Information

Owner's Name(s): MC BASTROP 71, LP

Property Address(s): PARCEL #R78736

Owner's Email Address: DM@MORANCAP.COM

Owner's Phone Number: ( )(214) 622-6525

The individuals listed below are hereby authorized to apply for, sign for, and conduct business for permits, plan, and/or other legal documents with the City of Bastrop Planning and Development Department on behalf of the above identified property owner(s).

The City of Bastrop Planning and Development Department may retain a copy of this form for our records and maintain a file as a courtesy. The form with the most recent date shall supersede all previous authorizations on file and **remain in effect for one (1) year, or until a new form is filed by the property owners, whichever is shorter**.

All signatories understand that it is the property owner's responsibility to provide a copy of this form every time they would like to add or remove authorized agents, and that this form expires one (1) year after it is signed. The property owner's signature designates the agent as the official contact person for projects and the single point of contact. All correspondence and communication will be conducted with the agent.

Print full name(s) and title(s) of authorized agent(s):

1. ANY EMPLOYEE OF
2. CARLSON, BRIGANCE & DOERING, INC.

X _____ X 1-7-19
Signature(s) of Property Owner(s) — Date

_____ _____
Signature(s) of Property Owner(s) — Date

_____ 1/3/19
Signature(s) of Agent(s) — Date

_____ _____
Signature(s) of Agent(s) — Date

Owner's Agent Authorization

Property Owner's Information

Owner's Name(s): MC BASTROP 71, LP

Property Address(s): PARCEL #R78736

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Print full name(s) and title(s) of authorized agent(s):

1. ANY EMPLOYEE OF
2. CARLSON, BRIGANCE & DOERING, INC.

X _____ X _____

Signature(s) of Property Owner(s) — Date

_____ _____

Signature(s) of Property Owner(s) — Date

CM Mettri — 1/3/19

Signature(s) of Agent(s) — Date

_____ _____

Signature(s) of Agent(s) — Date

BASTROPTX
Heart of the Lost Pines / Est. 1832

Exception Application

5. Authorization from Property Owner

I, Douglas MacMahon, swear and affirm that I am the owner of property at Parcel #R78736, as shown in the records of Bastrop County, Texas, which is the subject of this application.

I, Douglas MacMahon, the owner of the property subject to this Grandfathered Project Exception Application, authorize to submit the application and serve as my representative for this request.

X _____ X _____

Property owner's signature Date

6. Sworn statement:

I, the undersigned, hereby certify that all information contained herein and the attached documents are true and correct and that it is my belief that the property owner is entitled to the requested rights for this Project and, during the pending time of this determination, I understand my continuing obligation to notify the Development Services Director in writing of the inaccuracy of any statement or representation which was incorrect when made or which becomes incorrect by virtue of changed circumstances.

Christine M. Methvin — Applicant's Name

CM Methvin — Applicant's signature

1/3/19 — Date

Sworn to and subscribed before me by Susan O. Martin on this 3rd day of January

in the year 2019, to certify which witness my hand and seal of office.

Susan O. Martin
Notary Public, State of Texas

SUSAN O. MARTIN
NOTARY PUBLIC
ID# 13049238-6
State of Texas
Comm. Exp. 01-11-2020

Office of Linda Harmon Tax Assessor-Collector
Bastrop County Tax Office
PO Box 579
Bastrop, TX 78602
(512) 581-7161
(512) 581-7167

2018
Tax Statement

Date	QuickRef ID
1/21/2019	R78736
CAD ID	**Owner ID**
78736	O0103331

Property Description

Legal

A98 BLAKEY, NANCY, ACRES 93.013

Property Location

Property ID: R78736

R78736
MC BASTROP 71 LP
8214 WESTCHESTER DR
STE 550
DALLAS, TX 75225

County Taxes Reduced By Additional Sales Tax 6.96

Property Values	
Land	0
Improvement	0
AG Market	2,668,310
AG Use	8,836
Timber Market	0
Timber Use	0
Cap Adjustment	0
Assessed	8,836
Exemptions	
AG	

Tax Breakdown

Tax Year	Taxing Unit	Tax Rate	Exemptions	Taxable	Tax	Tax Paid	Tax Due
2018	Bastrop County	0.474900	0	8,836	41.96	41.96	0.00
2018	Bastrop Isd	1.441000	0	8,836	127.32	127.32	0.00
2018	City Of Bastrop	0.564000	0	8,836	49.83	49.83	0.00
2018	County Road	0.105000	0	8,836	9.28	9.28	0.00
		TOTAL			228.39	228.39	See TOTAL DUE

TOTAL DUE IF PAID BY January 31, 2019 0.00

Pay by	%	P&I	Total Due
Jan 2019		0.00	0.00
Feb 2019		0.00	0.00
Mar 2019		0.00	0.00
Apr 2019		0.00	0.00
May 2019		0.00	0.00
Jun 2019		0.00	0.00
Jul 2019		0.00	0.00
Aug 2019		0.00	0.00
Sep 2019		0.00	0.00
Oct 2019		0.00	0.00

IF YOU ARE 65 YEARS OF AGE OR OLDER OR ARE DISABLED, AND YOU OCCUPY THE PROPERTY DESCRIBED IN THIS DOCUMENT AS YOUR RESIDENCE HOMESTEAD, YOU SHOULD CONTACT THE APPRAISAL DISTRICT REGARDING ANY ENTITLEMENT YOU MAY HAVE TO A POSTPONEMENT IN THE PAYMENT OF THESE TAXES

detach and return bottom portion with payment

Property ID
R78736
Owner ID
O0103331
Property Location

Make check payable to:
Office of Linda Harmon Tax Assessor-Collector
Bastrop County Tax Office
PO Box 579
Bastrop, TX 78602
(512) 581-7161
(512) 581-7167

TOTAL DUE IF PAID BY January 31, 2019 0.00

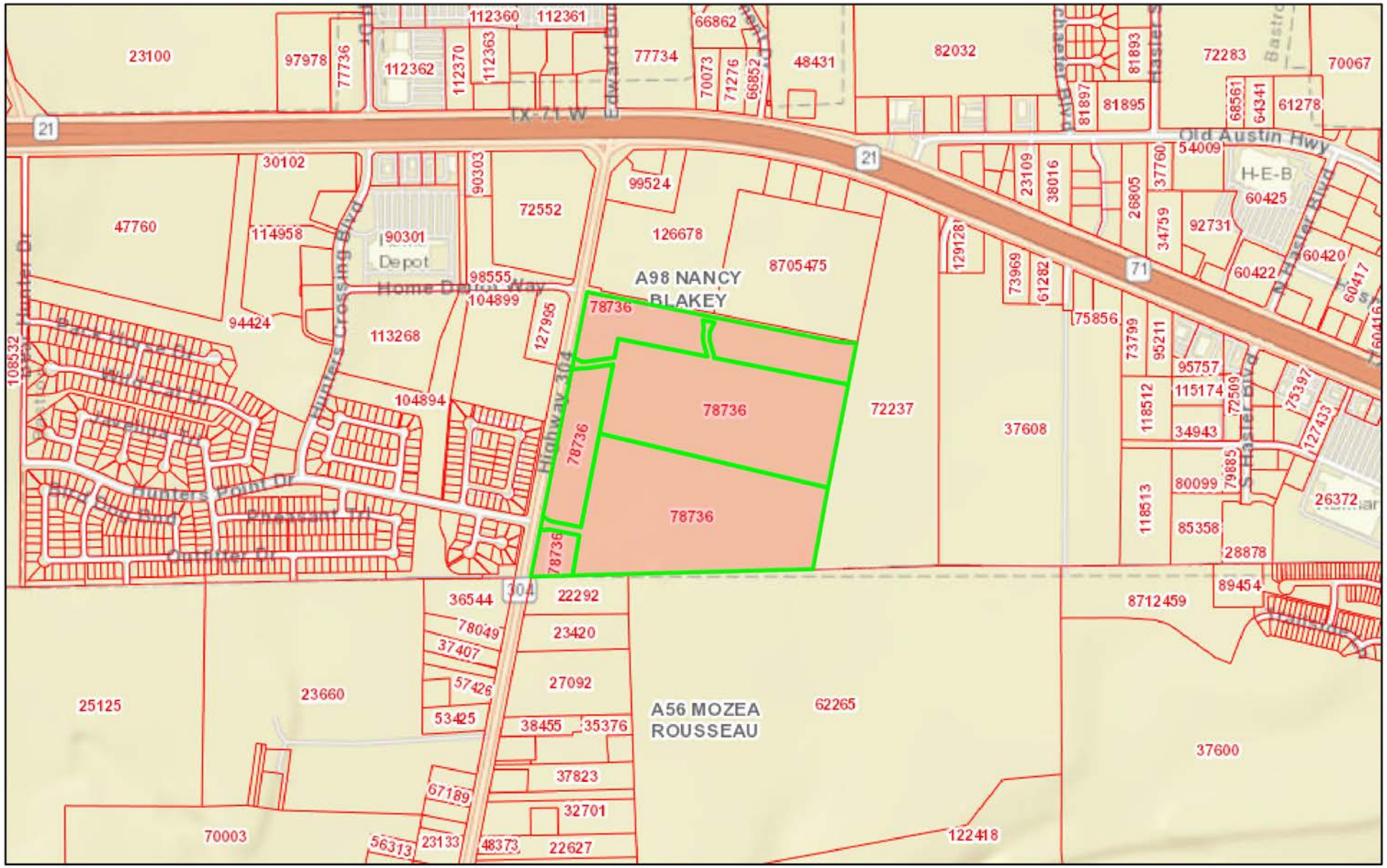
%000000220603C0000059266

R78736
MC BASTROP 71 LP
8214 WESTCHESTER DR
STE 550
DALLAS, TX 75225

20180000R78736000000000000

IF THE PROPERTY DESCRIBED IN THIS DOCUMENT IS YOUR RESIDENCE HOMESTEAD, YOU SHOULD CONTACT THE OFFICE OF LINDA HARMON TAX ASSESSOR-COLLECTOR REGARDING A RIGHT YOU MAY HAVE TO ENTER INTO AN INSTALLMENT AGREEMENT DIRECTLY WITH THE OFFICE OF LINDA HARMON TAX ASSESSOR-COLLECTOR FOR THE PAYMENT OF THESE TAXES.

BASTROP GROVE SECTION 2



January 21, 2019

Parcels

Abstracts

1:12,507

0 0.1 0.2 0.4 mi

0 0.15 0.3 0.6 km

Esri, HERE, Garmin, INCREMENT P, NGA, USGS

Bastrop County Appraisal District & BIS Consulting - www.bisconsultants.com

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

Preliminary Plat Checklists

Process Overview

1. Pre-Application Meeting
    a. Discuss your project with staff prior to submitting an application. Staff can help identify opportunities and constraints on the proposed project, as well as provide more information on the process and code requirements.
2. Complete Submittal Package, which includes: Application, Supplemental Forms, and Checklist Items
    a. Incomplete submittals will not be accepted
3. Staff review, with comments issued as needed
4. Notification of property owners within 200 feet and in newspaper
5. Planning and Zoning (P&Z) Commission review and recommendation to City Council
6. City Council review and action – one meeting
    a. Approval expires after 180 days; Council may extend up to 180 days in response to written request
7. Signed and sealed mylar, certified tax certificate showing taxes have been paid and remaining fees are submitted to the Planning department.
8. Copies of recorded plat returned to applicant.

Submittal Package Checklist Items

Check items included in the Applicant column before submitting documents with the project application and supplemental forms. If all checklist items are not present, the submittal will not be accepted.

Staff	Applicant	Item
☐	☒	Completed and signed Application
☐	☐	Agent Authorization Letter
☐	☐	Copy of Exception Determination Letter or proof of Exemption
☐	☐	Project Description Letter explaining proposed project, including number of lots existing and proposed, and if those lots are residential or commercial
☐	☐	Tax map highlighting the subject property
☐	☐	Copy of deed showing current ownership
☐	☐	Copy of current tax statement showing taxes have been paid
☐	☐	Preliminary Plat prints, collated and folded: One (1) 11”x17”; Eight (8) 24”x36”
☐	☐ 5	~~Three (3)~~ prints of a drainage study
☐	☐ 5	~~Three (3)~~ prints of the utility schematic/plan
☐	☐	Three (3) copies of letter outlining Planned Development requirements and how those requirements are addressed on the plat. **If not applicable, check this box:** ☒
☐	☒	Digital Submittal – See requirements below. Application will not be accepted if not in the specified format listed in requirements.
☐	☒	Preliminary Plat fee
	☒	Engineering Reports (3 copies)

Project Name_____
Project #_____

Preliminary Plat Details Required

These details shall be provided in accordance with Section 4.10.2 of the adopted Subdivision Ordinance, unless otherwise approved by the Planning and Development Director in coordination with the City Manager. These details may reference other applicable sections of the Code of Ordinances. Please contact the Planning and Development Department with any questions. A plat that does not contain this information is not considered administratively complete. Additional information may be deemed necessary by staff.

Staff	Applicant	Item
☐	☒	Name of the subdivision, which shall not duplicate an existing or pending subdivision
☐	☐	Total acreage and the proposed total number of lots and blocks within the subdivision, total acreage of rights-of-way
☐	☐	Name of the licensed public surveyor and licensed engineer (when required) responsible for preparing the plat
☐	☐	Scale: 1" = 100'
☐	☐	North arrow, north to be at top of sheet if possible, located beside the plat sketch
☐	☐	Legend, depicting all symbols, located beside the plat sketch
☐	☐	Date, revision block, and each revision shall bear a new date
☐	☐	Applicable Plat Notes (see Standard Plat Notes)
☐	☐	Ownership boundaries shall be drawn in very heavy lines and shall include overall dimensions and bearings
☐	☐	Adjacent boundary lines and adjacent right-of-way lines of the proposed subdivision drawn with dashed lines.
☐	☐	A tie to an original corner of the tract of land of which subdivision is a part
☐	☐	Name and location of adjacent subdivisions, streets, easements, pipelines, water courses, etc., and the property lines and name of all adjoining property owners
☐	☐	Existing and proposed topographic and planimetric features within the subdivision, including water courses and ravines, high banks, width of existing and proposed easements and any other physical features pertinent to the subdivision. Contour lines at two (2) foot intervals in terrain with a slope of two (2) percent or less and five (5) foot intervals in terrain with slope greater than two (2) percent.
☐	☐	Existing transportation features within the subdivision including the location and width of right-of-way, streets, alleys and easements
☐	☐	Proposed features including location, right-of-way and pavement width, surfacing and name of streets; approximate width and depth of all lots; location of building lines, alleys and public utility easements; and schematic plans for drainage, sanitary facilities, and utilities
☐	☐	Designation of any sites for special uses including churches, sewage disposal plants, water storage/pumping facilities, wells or plants, business, industry or other special land uses. If proposed use is unknown, designate as unrestricted
☐	☐	Regulatory flood elevations and boundaries of flood prone areas, including floodways
☐	☐	A preliminary plan sheet showing proposed on-site sewage disposal systems, or sanitary sewers with grade, pipe size and location of points of discharge or connection to existing collection lines
☐	☐	A preliminary plan of the drainage system, indicating inlet locations, with grade, pipe size and location of points of discharge

Staff	Applicant	Item
☐	☒	A preliminary plan for proposed fills or other structure elevating techniques, levees, channel modifications, and other methods to overcome flood or erosion related hazards
☐	☒	Location of City limits line, the outer border of the City's extraterritorial jurisdiction and zoning district boundaries, if they traverse the subdivision, form part of the subdivision, or are contiguous to such boundary
☐	☐	Key Map. A key map showing relation of subdivision to well-known streets in all directions to a distance of at least one (1) mile
☐	☐	Master Plan Submission. When the subdivision is a portion of a tract later to be subdivided in its entirety, a general development plan of the entire subdivision, showing a schematic layout of the entire subdivision, in the entire tract, shall be submitted with the preliminary plan of the portion first to be subdivided. Acceptance or approval of the said Master Plan does not release the subdivider from submitting a preliminary plat for each section to be developed to compare against Master Plan. The Master Plan may be required by the City to show and provide continuous public utility easements for the construction of future utilities through the subdivision for service to adjoining property. Such easements shall have sufficient setback requirements to accommodate construction of future utility
☐	☐	A Blanket Temporary Access and Construction Easement for the construction of Electric Facilities will be required ***before*** final platting. (Contact Bastrop Power & Light for Easement documents.)

Digital Submittal

Digital submittals shall be provided on a **labeled** CD/DVD or flash drive in the format specified below in addition to the hard copy submittal. The CD/DVD or flash drive will not be returned to the applicant.

PDF 1 – Main Application Materials

- Title should be Application-Project Name
- Combine Application, Agent Authorization Form, Waiver Letter, and Project Description Letter into one document

PDF 2 – Plat & Utilities

- Title should be Plat Details-Project Name
- Combine plat(s), drainage study, and utility schematics into one document

PDF 3 – Remaining Checklist Items

- Title should be Checklist Items-Project Name
- Combine tax map, deed(s), tax certificate, and Planned Development information (if applicable) into one document

GIS or AutoCAD files

- Files that show new parcel layout and easements
- GIS geodatabase file or shape file; AutoCAD dwg file
    - Spatially referenced using NAD_1983_StatePlane_Texas_Central_FIPS_4203_Feet
- Titles should be Parcels_ProjectName and Easements_ProjectName

Signature Blocks

These signature blocks shall be used as appropriate.

City Council Approval Format:

Approved this day _____ of _____, 2018 A.D. by the City Council of the City of Bastrop, Texas.

Approved: Attest:

_____ _____
Mayor, Connie Schroeder City Secretary

The certificate of the licensed public surveyor:

THE STATE OF TEXAS §
COUNTY OF BASTROP §

KNOW ALL MEN BY THESE PRESENTS

That I, _____ do hereby certify that I prepare this plat from an actual and accurate on-the-ground survey of the land and that the corner monuments shown thereon were properly placed under my personal supervision, in accordance with the subdivision regulations of the City of Bastrop, Texas.

_____
Signature and Seal of Registered Public Surveyor with date

Owner's Signature Block:

THE STATE OF TEXAS §
COUNTY OF BASTROP §

KNOW ALL MEN BY THESE PRESENTS

That we, ___, being the owners of ___ acre out of (legal description), according to the map or plat recorded in plat cabinet __, Page __, plat records of Bastrop County, Texas and as conveyed to us by deeds recorded in Instrument no. ___ of the official public records of said county do hereby subdivide said land with the plat shown hereon, to be known as:

(Subdivision Name)

Subject to easements and restrictions heretofore granted and not released and do hereby dedicate any streets and/or easements shown hereon to the public.

Witness my hand this the __ day of ___, 2018, A.D.

_____
Property owner name
Property owner address

County Clerk Signature Block:

THE STATE OF TEXAS §

COUNTY OF BASTROP §

I, Rose Pietsch, County Clerk of Bastrop County, Texas, do hereby certify that the foregoing instrument of writing and its certificate of authentication was filed for record in my office on the ___ day of ____, 2018, A.D. at ___ o'clock __M., in the plat records of Bastrop County, Texas in plat cabinet ___, page ___.

Filed for record on the ___ day of ___, 2018, A.D.

_____ _____

Deputy

Rose Pietsch
County Clerk
Bastrop County, Texas

Signed and sealed certification of the licensed engineer who prepared the plat:

THE STATE OF TEXAS §
COUNTY OF BASTROP §

KNOW ALL MEN BY THESE PRESENTS:

That I, _____ ,do hereby certify that the information contained on this plat complies with the subdivision regulations for the City of Bastrop, Texas and that the 100 year flood plain is as shown and will be contained within the drainage easement and or drainage right-of-way, as shown hereon.

_____

Signature and Seal of Registered Engineer with date

V 2097 - P 241
ELECTRONICALLY RECORDED
OFFICIAL PUBLIC RECORDS
Rose Pietsch
10/6/2011 11:21 AM
FEE: $68.00 BOOK: 2097 PAGE: 241
ROSE PIETSCH, County Clerk
Bastrop, Texas
DEED 201111002

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NOTICE OF CONFIDENTIALITY: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM THIS INSTRUMENT BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED

Date: October 6, 2011

Grantor: BRUNDAGE GROVE PARTNERS, LTD.,
a Texas limited partnership

Grantor's Mailing Address:

254 Spencer Lane
San Antonio, Texas 78201

Grantee: MC BASTROP 71, LP
a Texas limited partnership

Grantee's Mailing Address:

2828 Routh Street, Suite 500
Dallas, Texas 75201

Consideration:

The sum of Ten and No/100 Dollars ($10.00) and other good and valuable consideration paid from Grantee to Grantor, the receipt and sufficiency of which are hereby acknowledged.

Property (including any improvements):

Being all of that certain tract of land containing 145.697 acres, more or less, situated in the Nancy Blakey Survey No. A-98, Bastrop, County, Texas, said tract being more particularly described in Exhibit "A" attached hereto and made a part hereof (the "*Land*"), together with (i) all, fixtures, structures and improvements thereon including any wells and trees located on the Land; (ii) all right, title and interest, if any, of Grantor in and to any land lying in the bed of any street, road or access way, opened or proposed, in front of, at a side of or adjoining the Land, to the centerline of such

street, road or access way, and to all strips and gores; (iii) all rights in and to roads, rights-of-way and ingress and egress easements benefiting the Land, if any, whether surface, subsurface or otherwise; (iv) all rights in and to other easements, including, without limitation, that one certain drainage easement estate described in Drainage Easement Agreement dated August 13, 2008, recorded in Volume 1819, Page 840 of the Official Records of Bastrop County, Texas, by and between Jo Ann Griesenbeck Cantrell and William Cantrel, Grantors and Bastrop Grove Partners, Ltd., Grantee, said easement being more particularly described in Exhibit "B" attached hereto and made a part hereof (the "*Cantrell Easement*"); (v) all governmental or quasi-governmental permits and approvals of any kind or character pertaining to the Land, if any, including, without limitation, any permits to withdraw water from wells on the Land; (vi) all permits, contracts and rights of any kind or character to receive utilities services for the Land, if any; (vii) any water rights belonging or pertaining to the Land owned by Grantor; (viii) any minerals in, on or under the Land or interests therein owned by Grantor including any executive rights owned by Grantor; (ix) all other rights, privileges and appurtenances belonging or in any way pertaining to the Land (the Land together with the aforesaid improvements, rights and appurtenances being hereinafter referred to as the "*Property*").

Reservations from and Exceptions to Conveyance and Warranty:

This conveyance and the warranties of title herein are expressly made subject to the exceptions, easements, restrictive covenants, conditions and encumbrances set forth in Exhibit "C" which is attached hereto and incorporated herein by reference for all purposes.

Ad valorem taxes have been paid through the year 2010, and ad valorem taxes for the year 2011 have been prorated and Grantee, by acceptance of this Special Warranty Deed, assumes the obligation to pay such taxes and all taxes and assessments imposed subsequent to this conveyance, including any rollback taxes incurred as a result of a change in use of the Property upon or subsequent to this conveyance.

Conveyance:

Grantor, for the consideration and subject to the above reservations from and exceptions to conveyance and warranty, grants, bargains, sells and conveys to Grantee the Property, together with all and singular the rights and appurtenances thereto in any wise belonging, to have and to hold it to Grantee, Grantee's successors and assigns forever. Grantor binds Grantor and Grantor's successors to warrant and forever defend all and singular the Property to Grantee and Grantee's successors and assigns against every person whomsoever lawfully claiming or to claim the same or any part thereof when the claim is by, through, or under Grantor but not otherwise, except as to the Reservations from and Exceptions to Conveyance and Warranty.

[SIGNATURE APPEARS ON FOLLOWING PAGE.]

Document is NOT OFFICIAL!

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EXECUTED to be EFFECTIVE as of the date first indicated above.

GRANTOR:

BASTROP GROVE PARTNERS, LTD.,
a Texas limited partnership

By: Bastrop Management Company, L.L.C.
a Texas limited liability company,
its General Partner

By: _____
Thomas O. Brundage, Manager

ACKNOWLEDGMENT

STATE OF TEXAS §
§
COUNTY OF BEXAR §

This instrument was acknowledged before me on the 5 day of October 2011, by Thomas O. Brundage, Manager of Bastrop Management Company, L.L.C., a Texas limited liability company, the General Partner of Bastrop Grove Partners, Ltd., a Texas limited partnership, on behalf of said limited partnership.

ALMA J. LARGE
Notary Public State of Texas
My Commission Expires
December 21, 2012

_____
Notary Public, State of Texas
Alma J Large
(Name - Typed or Printed)
December 21, 2012
(My Commission Expires)

AFTER RECORDING RETURN TO:
Wright, Ginsberg Brusilow
Attention: Michael H. Saks, Esq.
14755 Preston Road, Suite 600
Dallas, Texas 75254

M:\5000\5200\5202\5202.077\Special Warranty Deed\Special Warranty Deed.004.DOC

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EXHIBIT "A"

STATE OF TEXAS
COUNTY OF BASTROP

145.691 ACRES
NANCY BLAKEY SURVEY,
A-98

DESCRIPTION

DESCRIPTION OF A 145.691 ACRE TRACT OF LAND OUT OF THE NANCY BLAKEY SURVEY, A-98, BASTROP COUNTY, TEXAS, AND BEING ALL OF THAT CERTAIN TRACT OF LAND CALLED TO BE 145.697 ACRES, DESCRIBED IN A DEED TO BASTROP GROVE PARTNERS, LTD., OF RECORD IN VOLUME 1698, PAGE 245, OF THE OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, SAID 145.691 ACRES BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING at a nail found in concrete in the east line of F.M. Highway 304, at the northwest corner of a tract of land called to be 5.0 acres, described in a deed to Codie Smith Wyatt, of record in Volume 165, Page 772, of the Deed Records of Bastrop County, Texas, said nail being the southwest corner of said 145.697 acre tract, and the southwest corner of the herein described tract;

THENCE, N 09° 40' 25" E, with the east right-of-way line of said F. M. 304, at 446.94 feet passing a 5/8 inch iron rod with cap set October 1, 2010, at 2184.81 feet, passing a 5/8 inch iron rod with cap set October 1, 2010, at 2281.29 feet, passing a ½ inch iron rod found, and continuing for a total distance of 2901.81 to a ½ inch iron rod found at the southwest corner of Lot 1A, Block A, *Resubdivision of Lot 1, Block A, Center of Woodland Village Bastrop*, a subdivision of record in Cabinet 4, Page 160-A, of the Plat Records of Bastrop County, Texas, said iron rod being the most westerly northwest corner of said 145.697 acre tract and the most westerly northwest corner of the herein described tract;

THENCE, S 80° 19' 00" E, with a northerly line of said 145.697 acre tract, and the southerly line of said Lot 1A, 525.56 feet to a ½ inch iron rod found at the southeast corner of said Lot 1A, for an ell corner of said 145.697 acre tract, and an ell corner of the herein described tract;

THENCE, N 09° 41' 29" E, with a westerly line of said 145.697 acre tract, and the easterly line of said Lot 1A, 492.23 feet to an iron rod with cap marked "property corner" found in the southerly right-of-way line of State Highway 71, at the northeast corner of said Lot 1A, said iron rod being the most northerly northwest corner of said 145.697 acre tract, and the most northerly northwest corner of the herein described tract;

THENCE, with the southerly right-of-way line of said State Highway 71, the following two (2) courses:

1) N 87° 45' 43" E, 2.05 feet to a calculated point in a large hole (a concrete TXDOT monument with brass cap found disturbed);
2) A curve to the right having a radius of 5058.89 feet, an arc distance of 1554.38 feet, a central angle of 17° 36' 16", and a chord which bears S 79° 29' 26" E, 1548.27 feet to an iron rod with cap marked "property corner" found at the northwest corner of a tract of land called to be 43.112 acres, described in a deed to John Alan Nixon, of record in Volume 1908, Page 825, of the Official Public Records of Bastrop County, Texas, said iron rod being the northeast corner of said 145.697 acre tract, and the northeast corner of the herein described tract;

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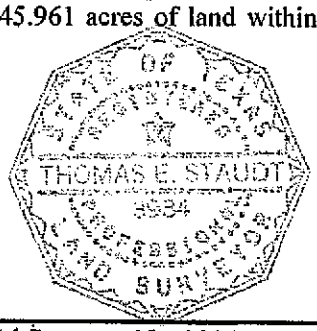
THENCE, S 09° 40' 03" W, with the east line of said 145.697 acre tract, and the west line of said 43.112 acre tract, at 1090.61 feet, passing a ½ inch iron rod found, at 1168.33 feet, passing a 5/8 inch iron rod with cap set October 1, 2010, at 2821.99 feet, passing a 5/8 inch iron rod with cap set October 1, 2010, and continuing for a total distance of 2903.99 feet to a ½ inch iron rod found in the north line of a tract of land called to be 194.916 acres, described in a deed to Jo Ann Cantrell, of record in Volume 445, Page 684, of the Deed Records of Bastrop County, Texas, at the southwest corner of said 43.112 acre tract, said iron rod being the southeast corner of said 145.697 acre, and the southeast corner of the herein described tract;

THENCE, S 86° 58' 32" W, with the south line of said 145.697 acre tract, at 1406.79 feet, passing a mag nail found 0.89 feet left near the northwest corner of said 194.916 acre tract, and the northeast corner of said 5.0 acre Wyatt tract, and continuing for a total distance of 2128.20 feet to the POINT OF BEGINNING containing 145.961 acres of land within these metes and bounds.

Description accompanied by plat.
Surveyed by: *Staudt Surveying, Inc.*
P.O. Box 1273
Dripping Springs, Texas 78620
512-858-2236



Thomas E. Staudt Registered Professional Land Surveyor No. 3984 6/22/11 Date

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EXHIBIT "B"

DESCRIPTION

DESCRIPTION OF 11.563 ACRES OF LAND SITUATED IN THE MAZEA ROUSSEAU SURVEY NO. 56, IN BASTROP COUNTY, TEXAS, BEING A PORTION OF THAT CERTAIN TRACT OF LAND SAID TO CONTAION 194.92 ACRES OF LAND, DESCRIBED IN DEED TO JO ANN GRIESENBECK CANTRELL OF RECORD IN VOLUME 445, PAGE 684 OF THE OFFICIAL RECORDS OF BASTROP COUNTY, TEXAS; SAID 11.563 ACRES OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING at a 1/2 inch iron rod with cap found in the north line of said Cantrell tract, for the southeast corner of that certain tract of land said to contain 145.697 acres of land described in deed to Bastrop Grove Partners, Ltd., of record in Volume 1698, Page 245 of the Official Records of Bastrop County, Texas, and the southwest corner of that certain tract of land said to contain 43.112 acres of land described in deed to CHP Properties, Ltd., of record in Volume 1413, Page 857 of the Official Records of Bastrop County, Texas, from which a 1/2 inch iron rod with cap (Property Corner) found for the southeast corner of said CHP Properties, Ltd., tract, bears N86°58'42"E a distance of 953.42 feet;

THENCE with the north line of said Cantrell tract and the south line of said Bastrop Grove Partners, Ltd., tract, S86°58'42"W a distance of 48.19 feet to a point for the northeast corner and POINT OF BEGINNING of the herein described tract;

THENCE over and across said Cantrell tract, the following, twenty-two (22) courses and distances:

1. S11°42'54"W a distance of 77.13 feet to a point;
2. S03°16'34"E a distance of 853.40 feet to a point;
3. S04°42'31"E a distance of 222.80 feet to a point at the beginning of a curve to the right;
4. With said curve to the right an arc distance of 261.06 feet, having a radius of 800.00 feet, a central angle of 18°41'51", and a chord which bears S04°38'23"W a distance of 259.91 feet to a point;
5. S13°59'18"W a distance of 189.30 feet to a point at the beginning of a curve to the

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left;

6. With said curve to the left an arc distance of 363.58 feet, having a radius of 1350.00 feet, a central angle of 15°25'51", and a chord which bears S06°16'23"W a distance of 362.48 feet to a point;
7. S01°26'33"E a distance of 197.06 feet to a point;
8. S00°37'50"W a distance of 100.41 feet to a point;
9. S40°08'24"E a distance of 27.70 feet to a point;
10. S11°59'14"W a distance of 112.49 feet to a point;
11. S29°36'57"W a distance of 147.88 feet to a point;
12. S03°28'22"W a distance of 106.26 feet to a point;
13. S18°37'19"W a distance of 67.03 feet to a point;
14. S00°30'59"W a distance of 70.47 feet to a point;
15. S32°30'41"E a distance of 106.60 feet to a point;
16. S05°47'43"W a distance of 61.84 feet to a point;
17. S79°48'16"W a distance of 28.72 feet to a point;
18. S41°49'29"W a distance of 62.67 feet to a point;
19. S33°08'04"W a distance of 62.47 feet to a point;
20. S15°58'58"E a distance of 18.81 feet to a point;
21. N53°57'26"E a distance of 30.57 feet to a point;
22. S39°34'27"E a distance of 76.96 feet to a point on the north bank of the Colorado River, for the easternmost southeast corner of the herein described tract;

THENCE with the meanders of the north bank of said Colorado River, the following three (3) courses and distances:

1. S50°25'33"W a distance of 114.99 feet to a point;
2. S47°42'18"W a distance of 64.37 feet to a point;
3. S50°50'58"W a distance of 46.53 feet to a point for the southeast corner of that certain tract of land said to contain 3.994 acres of land described in deed to Jack A. Griesenbeck of record in Volume 184, Page 231 of the Official Records of Bastrop County, Texas, and for the south corner of the herein described tract;

THENCE with the east line of said 3.994 acre tract, N32°38'15"W a distance of 314.02 feet to a point, from which a 1/2 inch iron rod found for an interior ell corner of said 3.994 acre tract and an exterior ell corner of that certain tract of land said to contain 10.090 acres of land described in deed to Jack A. Griesenbeck of record in Volume 184, Page 231 of the Official Records of Bastrop County, Texas, bears N32°38'15"W a distance of 28.13 feet to

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a calculated point for the northeast corner of said 3.994 acre tract, S85°09'07"W a distance of 205.83 feet to a calculated point for the northernmost northwest corner of said 3.994 acre tract and the northeast corner of said 10.090 acre tract, and S17°30'59"W a distance of 166.37 feet;

THENCE over and across said Cantrell tract, the following, twenty-four (24) courses and distances:

1. N58°46'12"E a distance of 39.85 feet to a point;
2. N63°48'18"E a distance of 64.50 feet to a point;
3. N14°02'29"W a distance of 9.70 feet to a point;
4. N73°33'52"W a distance of 34.96 feet to a point;
5. N26°00'20"W a distance of 129.24 feet to a point;
6. N56°14'37"W a distance of 67.28 feet to a point;
7. N15°37'06"E a distance of 19.22 feet to a point;
8. N68°07'33"E a distance of 87.95 feet to a point;
9. N28°58'56"E a distance of 152.26 feet to a point;
10. N06°19'30"E a distance of 107.74 feet to a point;
11. N19°18'13"E a distance of 42.37 feet to a point;
12. N02°58'19"W a distance of 46.42 feet to a point;
13. N67°25'44"E a distance of 102.32 feet to a point;
14. N43°57'41"E a distance of 133.93 feet to a point;
15. N19°43'55"W a distance of 85.62 feet to a point;
16. N17°20'35"E a distance of 64.34 feet to a point;
17. N00°45'36"W a distance of 150.96 feet to a point;
18. N02°02'28"E a distance of 103.11 feet to a point;
19. N05°05'47"E a distance of 150.36 feet to a point;
20. N12°57'30"E a distance of 202.21 feet to a point at the beginning of a curve to the left;
21. With said curve to the left an arc distance of 350.12 feet, having a radius of 1500.00 feet, a central angle of 13°22'25", and a chord which bears N06°16'17"E a distance of 349.33 feet to a point;
22. N00°24'56"W a distance of 187.14 feet to a point;
23. N03°16'34"W a distance of 853.40 feet to a point;
24. N14°32'22"W a distance of 76.60 feet to a point in the north line of said Cantrell tract and the south line of said Bastrop Grove Partners, Ltd., tract, for the northwest corner of the herein described tract, from which a PK nail found in concrete in the

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east right-of-way line of F.M. No. 304 (R.O.W. varies) for the southwest corner of said Bastrop Grove Partners, Ltd., tract, and the northwest corner of that certain tract of land said to contain 5.00 acres of land described in deed to Clodie S. Wyatt of record in Volume 165, Page 772 of the Official Records of Bastrop County, Texas, bears S86°58'42"W a distance of 1940.04 feet;

THENCE with the north line of said Cantrell tract and the south line of said Bastrop Grove Partners, Ltd, tract, N86°58'42"E a distance of 139.91 feet to the POINT OF BEGINNING, containing 11.563 acres of land more or less within these metes and bounds.

Reference is herein made to the sketch accompanying this metes and bounds description.

Bearing basis: Grid North, Texas State Plane Coordinate System NAD83 (CORS) Central Zone.

I hereby certify that this description was prepared from a survey made on the ground under my supervision.

CUNNINGHAM-ALLEN, INC.

David A. McDow
Registered Professional Land Surveyor No. 5908
State of Texas
Date: 05/18/07

STATE OF TEXAS REGISTERED DAVID A. MCDOW 5908 PROFESSIONAL LAND SURVEYOR

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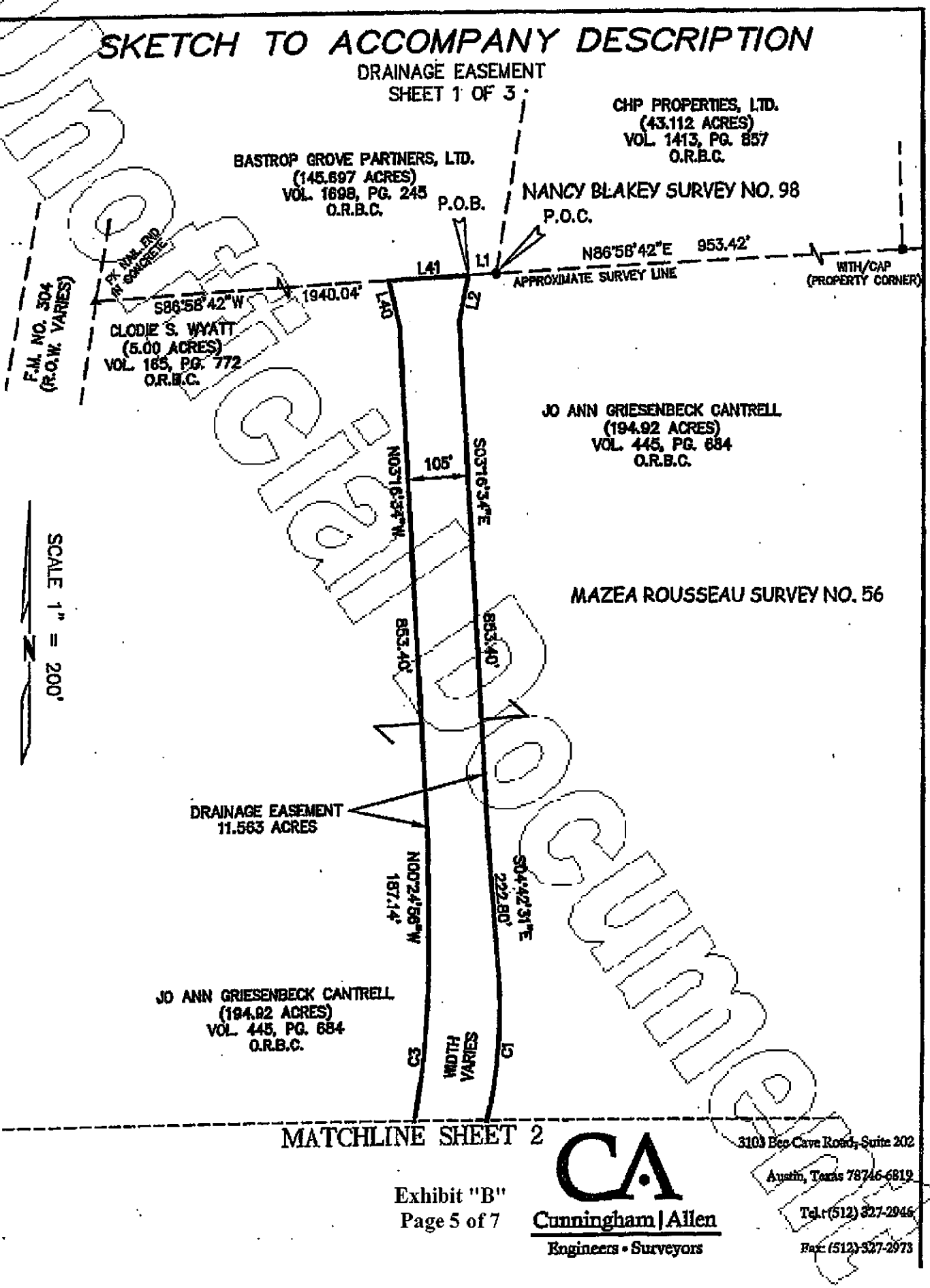
SKETCH TO ACCOMPANY DESCRIPTION

DRAINAGE EASEMENT
SHEET 1 OF 3



Cunningham | Allen
Engineers • Surveyors
3103 Bee Cave Road, Suite 202
Austin, Texas 78746-6819
Tel: (512) 327-2946
Fax: (512) 327-2973

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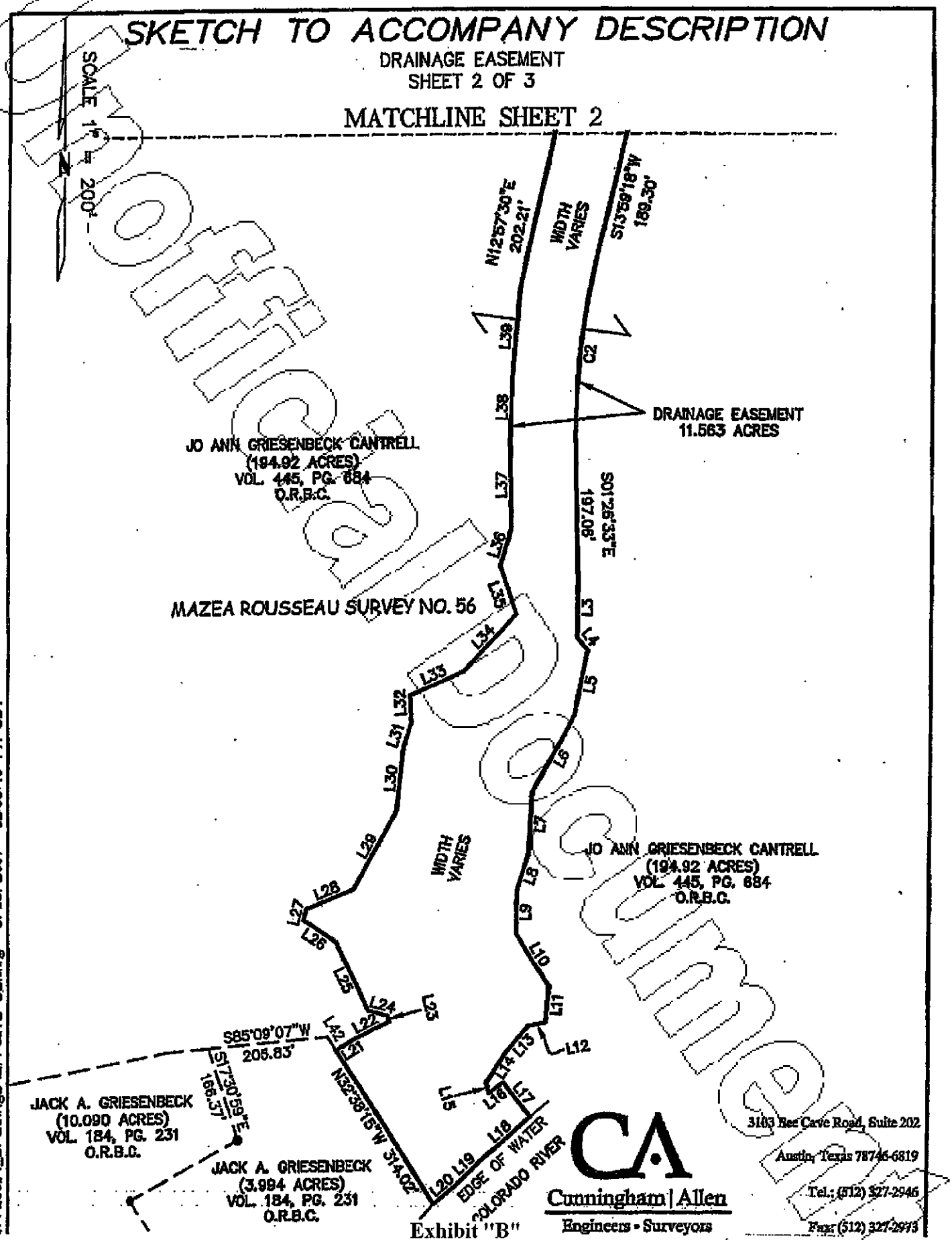
SKETCH TO ACCOMPANY DESCRIPTION

DRAINAGE EASEMENT
SHEET 2 OF 3

MATCHLINE SHEET 2



CA
Cunningham | Allen
Engineers • Surveyors
3103 Bee Cave Road, Suite 202
Austin, Texas 78746-6819
Tel.: (512) 327-2946
Fax: (512) 327-2973

SKETCH TO ACCOMPANY DESCRIPTION

DRAINAGE EASEMENT
SHEET 3 OF 3

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S86°58'42"W	48.19'
L2	S11°42'54"W	77.13'
L3	S00°37'50"W	100.41'
L4	S40°08'24"E	27.70'
L5	S11°59'14"W	112.49'
L6	S29°36'57"W	147.88'
L7	S03°28'22"W	106.28'
L8	S16°37'19"W	57.05'
L9	S00°36'59"W	70.47'
L10	S32°30'41"E	106.80'
L11	S05°47'43"W	51.84'
L12	S79°48'16"W	28.72'
L13	S41°49'29"W	62.57'
L14	S33°08'04"W	62.47'
L15	S15°58'58"E	18.81'
L16	N53°57'26"E	30.87'
L17	S39°34'27"E	76.96'
L18	S50°25'33"W	114.99'
L19	S47°42'18"W	64.37'
L20	S50°50'58"W	46.53'
L21	N58°46'12"E	39.85'
L22	N63°48'18"E	64.50'
L23	N14°02'29"W	9.70'
L24	N73°33'52"W	34.96'
L25	N26°00'20"W	129.24'
L26	N56°14'37"W	67.26'
L27	N15°37'06"E	19.22'
L28	N68°07'33"E	87.95'
L29	N28°58'56"E	152.26'
L30	N06°19'30"E	107.74'
L31	N19°18'13"E	42.37'
L32	N02°58'19"W	46.42'
L33	N87°25'44"E	102.32'
L34	N43°57'41"E	133.93'
L35	N19°43'55"W	85.62'
L36	N17°20'35"E	64.34'
L37	N00°45'36"W	150.96'
L38	N02°02'28"E	103.11'
L39	N05°05'47"E	150.36'
L40	N14°32'22"W	76.60'
L41	N86°58'42"E	139.91'
L42	N32°38'15"W	28.13'

BEARING BASIS: GRID NORTH, TEXAS STATE PLANE COORDINATE SYSTEM NAD83 (CORS) CENTRAL ZONE.

REFERENCE IS HEREIN MADE TO THE METES AND BOUND DESCRIPTION TO ACCOMPANY THIS SKETCH.

CURVE TABLE					
CURVE	RADIUS	LENGTH	DELTA	CHORD BRG.	CHORD
C1	800.00'	261.08'	18°41'51"	S04°38'23"W	259.91
C2	1350.00'	363.56'	15°25'51"	S06°16'23"W	362.48
C3	1500.00'	350.12'	13°22'25"	N06°16'17"E	349.33

LEGEND

●	½" IRON ROD FOUND (UNLESS STATED)
▲	PK NAIL FOUND IN CONCRETE
O.R.B.C.	OFFICIAL RECORDS OF BASTROP COUNTY
P.O.B.	POINT OF BEGINNING
P.O.C.	POINT OF COMMENCEMENT

SURVEYED BY:

DAVID A. MCDOW
REG. PROF. LAND SURVEYOR
NO. 5908
DATE: 05/18/07

STATE OF TEXAS REGISTERED DAVID A. MCDOW 5908 PROFESSIONAL LAND SURVEYOR

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UNOFFICIAL DOCUMENT

UNOFFICIAL DOCUMENT

EXHIBIT "C"
Exceptions, Easements, Restrictive Covenants, Conditions and Encumbrances

Applicable to the Land Described in Exhibit "A":

1. Electric transmission line easement granted to the Lower Colorado River Authority by instrument dated September 19, 1941, recorded in Volume C, Page 417 of the Minutes of County Court of Bastrop County, Texas;

2. Electric transmission and/or distribution lines and systems easement granted to Lower Colorado River Authority by instrument dated September 13, 1961, recorded in Volume 155, Page 209 of the Deed Records of Bastrop County, Texas.

3. Wastewater easement granted to the City of Bastrop by instrument dated July 17, 1993, recorded in Volume 684, Page 718 of the Official Records of Bastrop County, Texas. The aforesaid Water and Wastewater Easement is recorded at Volume 684, Pages 744-750 of the Official Public Records of Bastrop County, Texas as Exhibit "D" of that one certain Agreement between the City of Bastrop and Hal Berdoll and Lisa Berdoll recorded at Volume 684, Pages 737-752 of the Official Records of Bastrop County, Texas, as Exhibit "F" of that one certain Petition Requesting Annexation recorded at Volume 684, Pages 718-752 of the Official Records of Bastrop County, Texas;

4. An undivided 1/16th non-participating royalty interest in all oil, gas and other minerals reserved by The Federal Land Bank of Houston in instrument recorded in Volume 102, Page 162 of the Deed Records of Bastrop County, Texas;

5. One-half (1/2) interest (without executive rights) in all water, oil, gas, sand, gravel, coal, lignite and any other minerals reserved by Hal Berdoll and wife, Lisa Berdoll, in instrument recorded in Volume 842, Page 103 of the Official Records of Bastrop County, Texas;

6. Release and Relinquishment of Access Rights to Highway Facility dated January 13, 2005, executed by Brundage Bastrop, Ltd. to State of Texas, recorded in Volume 1544, Page 774 of the Official Records of Bastrop County, Texas;

7. Electric distribution line or system telecommunications systems and equipment or other services and systems easement granted to Bluebonnet Electric Cooperative, Inc., recorded in Volume 1790, Page 606 of the Official Records of Bastrop County, Texas;

8. Terms, Conditions and Stipulations of the Drainage Easement Agreement dated March 13, 2008 by and between Jo Ann Griesenbeck Cantrell and William Cantrell as Grantors, and

Bastrop Grove Partners, Ltd., as Grantee, recorded in Volume 1819, Page 840 of the Official Records of Bastrop County, Texas;

9. Terms, Conditions and Stipulations of the Temporary Construction Easement and Permanent Public Utility Easement dated December 8, 2009, by and between Tom Brundage, Bastrop Grove Partners, Ltd., as Grantors, and the City of Bastrop as Grantee, recorded in Volume 1961, Page 649 of the Official Records of Bastrop County, Texas;

10. 16 foot electric distribution line or system telecommunications systems and equipment or other services and systems easement granted to Bluebonnet Electric Cooperative, Inc., recorded in Volume 1790, Page 612 of the Official Records of Bastrop County, Texas;

Applicable to the Cantrell Easement Tract Described in Exhibit "B":

11. Terms, Conditions and Stipulations of the Drainage Easement Agreement dated March 13, 2008 by and between Jo Ann Griesenbeck Cantrell and William Cantrell as Grantors, and Bastrop Grove Partners, Ltd., as Grantee, recorded in Volume 1819, Page 840 of the Official Records of Bastrop County, Texas;

12. Underground electric facilities and overhead electric facilities easement traversing north property line(s), by and between Jo Ann Cantrell as Grantor, and Bluebonnet Electric Cooperative, Inc., as Grantee, recorded in Volume 1790, Page 632 of the Official Records of Bastrop County, Texas;

13. All interest in oil, gas and other minerals reserved by J.P. Fitzwilliams in instrument recorded in Volume 121, Page 433 of the Deed Records of Bastrop County, Texas.

11-GF# 0040334 BKH
RETURN TO: HERITAGE TITLE
401 CONGRESS, SUITE 1500
AUSTIN, TEXAS 78701

Unofficial Document

BASTROPTX
Heart of the Lost Pines / Est. 1832

Owner's Agent Authorization

Property Owner's Information

Owner's Name(s): MC BASTROP 71, LP

Property Address(s): PARCEL #R78736

Owner's Email Address: DM@MORANCAP.COM

Owner's Phone Number: ( )(214) 622-6525

The individuals listed below are hereby authorized to apply for, sign for, and conduct business for permits, plan, and/or other legal documents with the City of Bastrop Planning and Development Department on behalf of the above identified property owner(s).

The City of Bastrop Planning and Development Department may retain a copy of this form for our records and maintain a file as a courtesy. The form with the most recent date shall supersede all previous authorizations on file and **remain in effect for one (1) year, or until a new form is filed by the property owners, whichever is shorter**.

All signatories understand that it is the property owner's responsibility to provide a copy of this form every time they would like to add or remove authorized agents, and that this form expires one (1) year after it is signed. The property owner's signature designates the agent as the official contact person for projects and the single point of contact. All correspondence and communication will be conducted with the agent.

Print full name(s) and title(s) of authorized agent(s):

1. ANY EMPLOYEE OF
2. CARLSON, BRIGANCE & DOERING, INC.

X _____ X 1-7-19
Signature(s) of Property Owner(s) Date

_____ _____
Signature(s) of Property Owner(s) Date

_____ 1/3/19
Signature(s) of Agent(s) Date

_____ _____
Signature(s) of Agent(s) Date

BASTROPTX
Heart of the Lost Pines / Est. 1832

Exception Application

5. Authorization from Property Owner

I, Douglas MacMahon, swear and affirm that I am the owner of property at Parcel #R78736, as shown in the records of Bastrop County, Texas, which is the subject of this application.

I, Douglas MacMahon, the owner of the property subject to this Grandfathered Project Exception Application, authorize to submit the application and serve as my representative for this request.

X _____ X 1-7-19

Property owner's signature — Date

6. Sworn statement:

I, the undersigned, hereby certify that all information contained herein and the attached documents are true and correct and that it is my belief that the property owner is entitled to the requested rights for this Project and, during the pending time of this determination, I understand my continuing obligation to notify the Development Services Director in writing of the inaccuracy of any statement or representation which was incorrect when made or which becomes incorrect by virtue of changed circumstances.

Christine M. Methvin — Applicant's Name

_____ — Applicant's signature

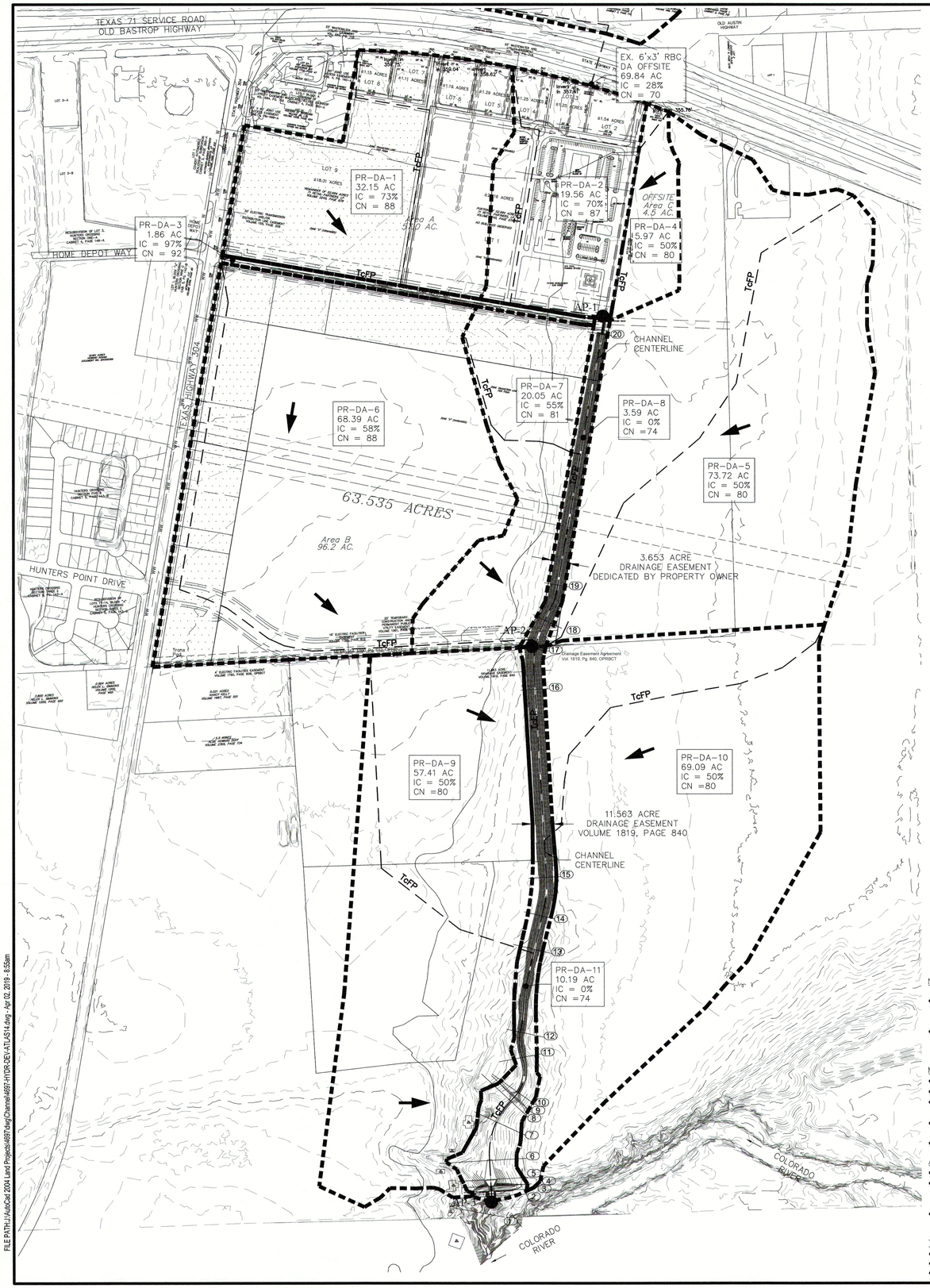
1/3/19 — Date

Sworn to and subscribed before me by Susan O. Martin on this 3rd day of January

in the year 2019, to certify which witness my hand and seal of office.

_____
Notary Public, State of Texas

SUSAN O. MARTIN
NOTARY PUBLIC
ID# 13049238-6
State of Texas
Comm. Exp. 01-11-2020



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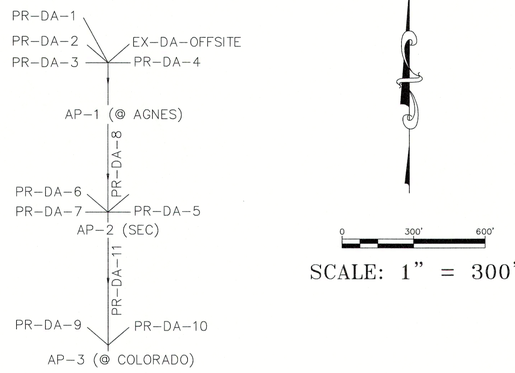
HYDROLOGY FLOW CHART



0 300' 600'

SCALE: 1" = 300'

LEGEND

- DRAINAGE EASEMENT BOUNDARY
- DRAINAGE BOUNDARY LINE
- A1 — DRAINAGE AREA LABEL
- ANALYSIS POINT (AP)
- 940 — EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- FLOW ARROW
- TcFP — TIME OF CONCENTRATION FLOW PATH
- COMMERCIAL LOTS AT 75% IMPERVIOUS COVER

TIME OF CONCENTRATION CALCULATIONS - SCS METHOD

Drainage Area	Sheet Flow Tc = (0.007 x (n x L)^.8) / (P2^0.5 x S^0.4)				Shallow Concentrated Flow Tc = L / (3600V)					Channel Flow Tc = L / (3600V)					Time of Concentration	Lag Time
	n	L	Slope	Tc (min)	Paved/ Unpaved	L	Slope	V (fps)	Tc (min)	n	L	Slope	V (fps)	Tc (min)	Tc (min)	TL (min)
DA-OFFSITE	0.011	100	0.50%	1.85	U	2,336	0.50%	1.141	34.13	0.013	1,793	0.50%	8.0	3.735	**39.71**	**23.83**
PR-DA-1	0.011	100	0.50%	1.85	P	200	0.50%	1.437	2.32	0.013	2,405	0.50%	8.0	5.010	**9.18**	**5.51**
PR-DA-2	0.011	100	0.50%	1.85	P	200	0.50%	1.437	2.32	0.013	1,535	0.50%	8.0	3.198	**7.36**	**4.42**
PR-DA-3	0.011	100	2.00%	1.06	P	200	0.50%	1.437	2.32	0.013	1,746	0.50%	8.0	3.638	**7.02**	**4.21**
PR-DA-4	0.011	100	0.50%	1.85	P	200	0.50%	1.437	2.32	0.013	868	0.50%	6.0	2.411	**6.58**	**3.95**
AP-1 to AP-2										0.026	1,774	0.30%	6.0	4.928	**4.93**	**2.96**
PR-DA-5	0.011	100	0.50%	1.85	P	200	0.50%	1.437	2.32	0.013	2,729	0.50%	8.0	5.685	**9.85**	**5.91**
PR-DA-6	0.011	100	0.50%	1.85	P	200	0.50%	1.437	2.32	0.013	3,402	0.50%	8.0	7.088	**11.25**	**6.75**
PR-DA-7	0.011	100	0.50%	1.85	P	200	0.50%	1.437	2.32	0.013	1,750	0.50%	6.0	4.861	**9.03**	**5.42**
PR-DA-8	0.011	20	0.50%	0.51	P	50	0.50%	1.437	0.58	0.026	1,715	0.30%	6.0	4.764	**5.85**	**3.51**
AP-2 to AP-3										0.026	3,004	0.30%	6.0	8.344	**8.34**	**5.01**
PR-DA-9	0.011	100	0.50%	1.85	P	200	0.50%	1.437	2.32	0.013	1,759	0.50%	8.0	3.665	7.83	4.70
										0.026	1,376	0.30%	7.0	3.276	**11.11**	**6.66**
PR-DA-10	0.011	100	0.50%	1.85	P	200	0.50%	1.437	2.32	0.013	1,789	0.50%	8.0	3.727	7.89	4.74
										0.026	1,980	0.30%	7.0	4.714	**12.61**	**7.57**
PR-DA-11	0.011	20	0.50%	0.51	U	50	0.50%	1.141	0.73	0.026	2,934	0.30%	7.0	6.986	**8.23**	**4.94**

MAXIMUM POTENTIAL OUTFALL CONDITIONS FOR 100-YR AND 25-YR STORM EVENTS

FLOWLINE STATION	RIVER STATION	PROFILE	Q (cfs)	n	MAX POTENTIAL TW WITH COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf	ANTICIPATED TW WITH NON-COINCIDING PEAKS WSE (ft)	dF (ft)	V (fps)	Sf	TW WITH GRAVITY OUTFALL WSE (ft)	dF (ft)	V (fps)	Sf
50+49.7	20	25-YR	538.92	0.026	356.74	3.74	3.6	0.000856	356.74	3.74	3.6	0.000856	356.74	3.74	3.6	0.000856
		100-YR	819.37	0.026	357.89	4.89	4.15	0.000895	357.89	4.89	4.14	0.000893	357.89	4.89	4.14	0.000893
37+04.1	19	25-YR	538.92	0.026	354.91	6.82	2.78	0.000399	354.91	6.82	2.78	0.000399	354.91	6.82	2.78	0.000399
		100-YR	819.37	0.026	356.47	8.38	2.95	0.000353	356.48	8.39	2.94	0.00035	356.48	8.39	2.94	0.00035
35+04.1	18	25-YR	538.92	0.026	354.86	7.38	2.42	0.000277	354.86	7.38	2.42	0.000277	354.86	7.38	2.42	0.000277
		100-YR	819.37	0.026	356.43	8.95	2.63	0.000259	356.44	8.96	2.62	0.000257	356.44	8.96	2.62	0.000257
33+44.97	17	25-YR	1467.49	0.026	353.79	6.79	7.63	0.003024	353.79	6.79	7.63	0.003024	353.79	6.79	7.63	0.003024
		100-YR	2236.82	0.026	355.15	8.15	8.46	0.002998	355.18	8.18	8.4	0.002948	355.18	8.18	8.4	0.002948
31+29.1	16	25-YR	1467.49	0.026	353.13	6.78	7.63	0.003033	353.13	6.78	7.63	0.003033	353.13	6.78	7.63	0.003033
		100-YR	2236.82	0.026	354.51	8.16	8.44	0.002985	354.56	8.21	8.35	0.002896	354.56	8.21	8.35	0.002896
21+35.45	15	25-YR	1467.49	0.026	350.12	6.79	7.62	0.003018	350.12	6.79	7.62	0.003018	350.12	6.79	7.62	0.003018
		100-YR	2236.82	0.026	351.83	8.50	7.86	0.002468	352.24	8.91	7.23	0.001976	352.24	8.91	7.23	0.001976
19+29.1	14	25-YR	1467.49	0.026	349.50	6.79	7.62	0.003015	349.50	6.79	7.62	0.003015	349.50	6.79	7.62	0.003015
		100-YR	2236.82	0.026	351.39	8.68	7.56	0.002222	351.91	9.20	6.81	0.001773	351.91	9.20	6.81	0.001773
17+48.37	13	25-YR	1467.49	0.026	348.96	6.80	7.6	0.003	348.96	6.80	7.6	0.003	348.96	6.80	7.6	0.003
		100-YR	2236.82	0.026	351.31	9.15	6.24	0.001406	351.91	9.75	5.36	0.00093	351.91	9.75	5.36	0.00093
13+04.1	12	25-YR	1467.49	0.026	347.81	7.00	7.1	0.002055	347.81	7.00	7.1	0.002055	347.81	7.00	7.1	0.002055
		100-YR	2236.82	0.026	350.91	10.10	5.5	0.000631	351.63	10.82	4.82	0.00043	351.63	10.82	4.82	0.00043
11+68.3	11	25-YR	1467.49	0.026	347.92	7.52	5.01	0.000845	347.92	7.52	5.01	0.000845	347.92	7.52	5.01	0.000845
		100-YR	2236.82	0.026	350.97	10.57	4.21	0.000329	351.67	11.27	3.79	0.000239	351.67	11.27	3.79	0.000239
9+75.01	10	25-YR	1467.49	0.026	347.93	8.12	4.16	0.000396	347.93	8.12	4.16	0.000396	347.93	8.12	4.16	0.000396
		100-YR	2236.82	0.026	351.02	11.21	3.27	0.000153	351.71	11.90	2.89	0.000109	351.71	11.90	2.89	0.000109
9+45.00	9	25-YR	1467.49	0.026	347.97	8.25	2.62	0.000164	347.97	8.25	2.62	0.000164	347.97	8.25	2.62	0.000164
		100-YR	2236.82	0.026	351.03	11.31	2.33	0.00008	351.72	12.00	2.09	0.000058	351.72	12.00	2.09	0.000058
9+15.76	8	25-YR	1467.49	0.026	347.96	8.33	3.4	0.000234	347.96	8.33	3.4	0.000234	347.96	8.33	3.4	0.000234
		100-YR	2236.82	0.026	351.03	11.40	2.8	0.000103	351.72	12.09	2.47	0.000074	351.72	12.09	2.47	0.000074
7+80.74	7	25-YR	1467.49	0.026	347.93	8.71	3.47	0.000217	347.93	8.71	3.47	0.000217	347.93	8.71	3.47	0.000217
		100-YR	2236.82	0.026	351.01	11.79	3.09	0.000114	351.71	12.49	2.71	0.000082	351.71	12.49	2.71	0.000082
5+71.60	6	25-YR	1467.49	0.026	347.97	10.00	1.1	0.000022	347.97	10.00	1.1	0.000022	347.97	10.00	1.1	0.000022
		100-YR	2236.82	0.026	351.03	13.06	1.08	0.000014	351.73	13.76	0.99	0.000011	351.73	13.76	0.99	0.000011
4+70.67	5	25-YR	1467.49	0.011	347.95	10.90	1.67	0.000006	347.95	10.90	1.67	0.000006	347.95	10.90	1.67	0.000006
		100-YR	2236.82	0.011	351.00	13.95	1.83	0.000006	351.70	14.65	1.69	0.000004	351.70	14.65	1.69	0.000004
4+35.67	4	25-YR	1991.19	0.011	346.40	10.04	9.63	0.000581	346.40	10.04	9.63	0.000581	346.40	10.04	9.63	0.000581
		100-YR	3099.38	0.011	348.36	12.00	12.54	0.000878	349.49	13.13	11.45	0.000676	349.49	13.13	11.45	0.000676
4+09.67	3	25-YR	1991.19	0.011	342.45	6.62	14.6	0.001819	342.45	6.62	14.6	0.001821	342.45	6.62	14.6	0.001821
		100-YR	3099.38	0.011	347.17	11.34	13.26	0.001018	344.70	8.87	16.96	0.001966	344.70	8.87	16.96	0.001966
3+82.88	2	25-YR	1991.19	0.026	341.33	6.02	9.19	0.003735	340.38	5.07	11.43	0.006983	340.38	5.07	11.43	0.006983
		100-YR	3099.38	0.026	348.94	13.63	3.94	0.00022	341.87	6.56	12.81	0.006616	341.89	6.58	12.76	0.006537
2+67.52	1	25-YR	1991.19	0.026	342.21	25.91	1.39	0.000014	332.32	16.02	3.28	0.000209	328.32	12.02	5.65	0.000959
		100-YR	3099.38	0.026	349.05	32.75	1.39	0.000009	338.78	22.48	2.8	0.000074	330.69	14.39	6.24	0.000911

RESULTS TABLE - PROPOSED CONDITIONS

HYDROLOGIC ELEMENT	AREA (AC.)	%IC	CN	Tc (min)	Q_{10} (CFS)	Q_{25} (CFS)	Q_{100} (CFS)
DA-OFFSITE	69.84	28	71	39.71	149.39	221.84	362.99
PR-DA-1	32.15	73	92	9.18	178.20	234.33	339.79
PR-DA-2	19.56	70	87	7.36	101.60	136.44	201.68
PR-DA-3	1.86	97	92	7.02	10.31	13.56	19.66
PR-DA-4	5.97	50	80	6.58	27.29	38.04	58.32
AP-1 (CHANNEL SOUTH OF					392.31	538.92	819.37
AP-1 to AP-2				4.93	347.81	485.27	750.03
PR-DA-5	73.72	50	80	9.85	305.25	426.32	654.92
PR-DA-6	68.39	58	88	11.25	327.91	438.75	646.40
PR-DA-7	20.05	55	81	9.03	93.59	129.69	197.66
PR-DA-8	3.59	0	74	5.85	14.23	20.62	32.86
AP-2 (CHANNEL AT SOUTHEAST					1063.08	1467.49	2236.82
AP-2 to AP-3				8.34	941.24	1320.95	2047.90
PR-DA-9	57.41	50	80	11.11	237.72	332.00	510.02
PR-DA-10	69.09	50	80	12.61	286.08	399.55	613.78
PR-DA-11	10.19	0	74	8.23	40.40	58.52	93.26
AP-3 (CHANNEL AT COLORADO					1413.58	1991.19	3099.38

NOTES:

- SCS METHODOLOGY WAS USED FOR DRAINAGE ANALYSIS
- 24-HOUR RAINFALL DEPTH DATA FOR DESIGN STORMS WERE SELECTED FROM THE NOAA ATLAS 14 PRECIPITATION FREQUENCY DATA SERVER FOR BASTROP, TX
  - 2-YR = 4.17 IN
  - 5-YR = 5.52 IN
  - 10-YR = 6.81 IN
  - 25-YR = 8.81 IN
  - 100-YR = 12.6 IN
- EXISTING CURVE NUMBERS REFLECT HYDROLOGIC SOIL GROUP DATA FOR TYPE A & B SOILS AS PER THE USDA WEB SOIL SURVEY
- DEVELOPED CNs REFLECT HSGs FOR TYPE B & C SOILS, ASSUMING FILL CONDITIONS RESEMBLE HSG C SOILS
- TOC CALCULATIONS ASSUME FUTURE DEVELOPMENT & USE TR-55 METHODOLOGY
- MANNING'S N VALUES FROM TR-55:
  - PIPE/CHANNEL FLOW
    - PIPES - REINFORCED CONCRETE = 0.013
    - NATURAL CHANNELS - EARTH, STRAIGHT, SOME GRASS = 0.026
  - OVERLAND FLOW
    - SMOOTH SURFACE (CONCRETE, ASPHALT, BARE SOIL) = 0.011
    - SHORT GRASS = 0.15
- OFFSITE IMPERVIOUS COVERS ARE APPROXIMATE BASED ON AERIAL IMAGERY
- ONSITE IMPERVIOUS COVERS REFLECT ASSUMED FUTURE DEVELOPMENT AS FOLLOWS:
  - SINGLE-USE RESIDENTIAL = 50%
  - COMMERCIAL = 70-75%
  - ROW = 97%

NOTES:

- GIVEN MAXIMUM TAILWATERS, THE PROPOSED DRAINAGE CHANNEL PROVIDES AT LEAST ONE FOOT OF FREEBOARD AT DESIGN FLOWS AND THE PROPOSED CULVERT HAS CAPACITY TO CONVEY 100-YR STORM RUNOFF WITHOUT EXCEEDING THE MINIMUM ROAD SURFACE ELEVATION OF AGNES ROAD AT 359.50', AS PER DESIGN REQUIREMENTS BY BASTROP COUNTY'S CODE OF ORDINANCES (10.1.40 & 10.5.90).
- FLOW RATE, TIME TO PEAK, AND WATER SURFACE DATA FOR THE COLORADO RIVER ARE BASED ON FEMA MAP 48021C0355E AND THE DRAINAGE TECHNICAL MEMORANDUM FOR THE PECAN PARK DEVELOPMENT DATED FEBRUARY 22, 2010, BY ESPEY CONSULTANTS, INC., WHICH UTILIZED THE USGS GAGE 08159200 LOCATED AT STATE HIGHWAY 71 APPROXIMATELY 2 MILES UPSTREAM OF THE PROPOSED CHANNEL'S OUTFALL. JUSTIFICATION FOR TAILWATER ASSUMPTIONS ARE PROVIDED BELOW:

MAXIMUM POTENTIAL TAILWATER ASSUMING COINCIDING PEAKS:

- CALCULATIONS UTILIZE TAILWATERS OF 349.00' AND 342.17' FOR THE 100-YR AND 25-YR STORM EVENTS, RESPECTIVELY.
- ACCORDING TO FEMA MAP 48021C0355E, THE EXISTING 100-YR BFE AT THE SITE IS 349' MSL.
- THE COLORADO RIVER'S PEAK 25-YR WSE AT THE SITE IS ESTIMATED AT 342.17'. THIS WSE WAS EXTRAPOLATED FROM A LOGARITHMIC TREND OF BFE's FOR VARIOUS ANNUAL CHANCE FLOODS USING DATA FROM THE FEMA FLOOD INSURANCE STUDY 48021CV000B AT STATION 'AW'.
- ACCORDING TO THE MEMORANDUM, TIME TO PEAK OF THE COLORADO RIVER IS APPROXIMATED AT 31:45 HOURS FOR THE 100-YR EVENT, WHEREAS THE PROPOSED CHANNEL'S TIME TO PEAK IS MODELED AT APPROXIMATELY 12:06 HOURS. THESE PEAKS ARE NON-COINCIDING AND THEREFORE THESE WSE's OVERESTIMATE EXPECTED FLOODING FOR THE 100-YR AND 25-YR EVENTS.
- MAXIMUM POTENTIAL WSE USED TO DESIGN EXTENTS OF EROSION CONTROL MEASURES.

ANTICIPATED TAILWATER ASSUMING NON-COINCIDING PEAKS:

- CALCULATIONS UTILIZE TAILWATERS OF 338.59' AND 331.96' FOR THE 100-YR AND 25-YR STORM EVENTS, RESPECTIVELY.
- SINCE THE COLORADO RIVER AND PROPOSED CHANNEL PEAKS ARE NON-COINCIDING, AN ESTIMATED REDUCTION OF 10.41' IS EXPECTED TO BE REALIZED IN ACTUAL WSE AT 12:06 HOURS. THE 100-YR WSE IS ESTIMATED AT 338.59'. THIS REDUCED WSE IS BASED ON GRAPHICAL INTERPOLATIONS OF THE MEMORANDUM'S COLORADO RIVER 1% ANNUAL CHANCE HYDROGRAPH AND HYDRAULIC RATING CURVE.
- THE ACTUAL 25-YR WSE OF THE COLORADO RIVER REALIZED AT 12:06 HOURS AT THE PROPOSED CHANNEL'S OUTFALL IS ESTIMATED AT 331.96'. THIS REDUCED WSE WAS CALCULATED USING A PROPORTIONAL REDUCTION EQUIVALENT TO THE CHANGE IN 100-YR WSE's REALIZED AT A TIME TO PEAK OF 31:45 HOURS AS COMPARED TO 12:06 HOURS.

TAILWATER ASSUMING GRAVITY OUTFALL:

- CALCULATIONS UTILIZE A TAILWATER OF 0' FOR BOTH THE 100-YR AND 25-YR STORM EVENTS.
- GRAVITY OUTFALL CALCULATIONS DEPICT MAXIMUM VELOCITIES WHICH ARE USED FOR DESIGN OF OUTFALL PROTECTION.
- FLOW CHARACTERISTICS ARE THE SAME AS THOSE WITH THE ANTICIPATED TAILWATER ASSUMING NON-COINCIDING PEAKS AT EVERY STATION EXCEPT STATION 1.

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED
PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791
04-02-2019

DESIGNED BY:	DRAFTED BY:
BM	JW

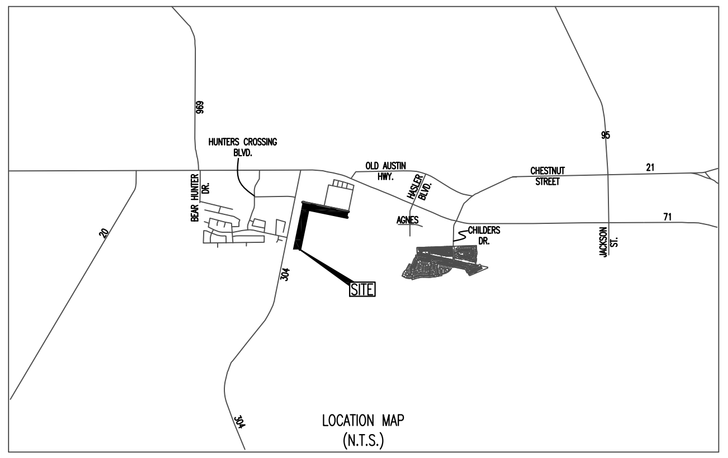
DATE
REVISION

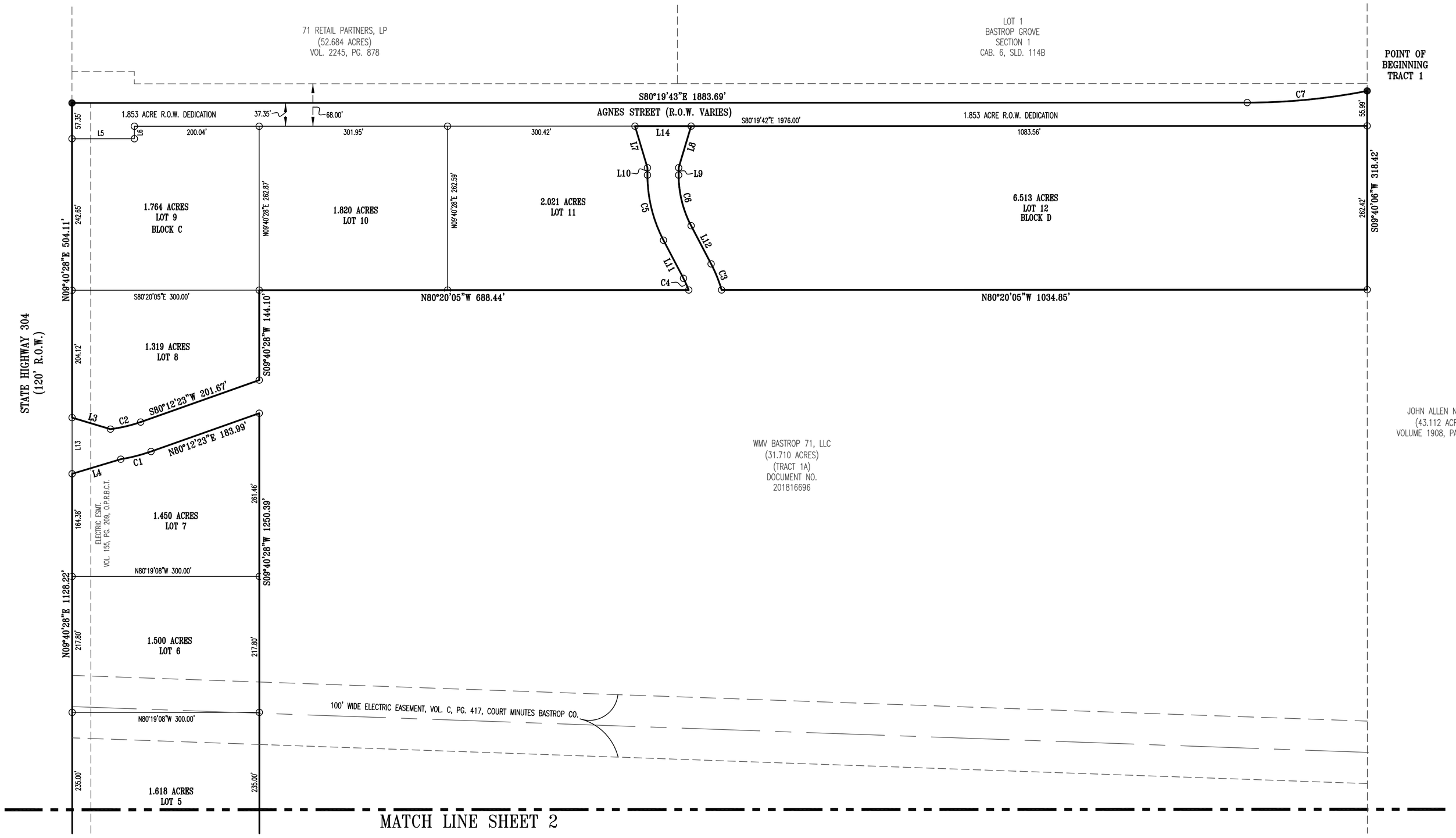
Carlson, Brigance & Doering, Inc.
FIRM ID #F3791
Civil Engineering ◆ Surveying
5501 West William Cannon Dr. ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

SHEET NAME: DEVELOPED HYDROLOGY REVISION MAP
JOB NAME: BASTROP GROVE
PROJECT: DRAINAGE IMPROVEMENTS

DATE: FEBRUARY 2019
JOB NUMBER: 4697
SHEET: OF 14
SHEET NO.

PRELIMINARY PLAT
BASTROP GROVE, SECTION 2





LEGEND

- ● 1/2" IRON ROD FOUND
- ○ 1/2" CAPPED IRON ROD SET
- ▲ MAG NAIL FOUND

SCALE: 1" = 100'

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

Curve Table						
Curve #	Length	Radius	Chord Direction	Chord Length	Tangent	DELTA
C1	50.15	275.00	N85°25'49"E	50.08	25.14	10°26'55"
C2	49.78	225.00	S86°32'41"W	49.68	24.99	12°40'36"
C3	45.11	225.00	N12°12'59"W	45.04	22.63	11°29'17"
C4	20.42	175.00	S14°37'05"E	20.41	10.22	6°41'10"
C5	108.55	225.00	S04°08'23"E	107.50	55.35	27°38'31"
C6	84.43	175.00	N04°08'23"W	83.61	43.05	27°38'30"
C7	193.46	1000.00	S85°51'51"E	193.16	97.03	11°05'04"

Line Table		
Line #	Length	Direction
L1	69.82	N82°59'00"E
L2	67.53	N58°31'01"W
L3	64.18	N63°38'06"W
L4	81.42	N82°57'59"E
L5	99.95	S80°19'42"E
L6	20.00	S09°40'18"W
L7	69.64	S07°01'06"E
L8	69.66	N26°22'49"E
L9	11.70	N09°40'53"E
L10	11.70	S09°40'53"W
L11	69.01	S17°57'38"E
L12	69.01	N17°57'38"W
L13	90.02	N09°40'28"E
L14	90.03	N80°19'42"W
L15	105.16	N09°40'28"E

TOTAL ACREAGE: 25.882 ACRES
SURVEY: NANCY BLAKEY SURVEY, ABSTRACT No. 98

COMMERCIAL LOTS	12	TOTAL: 24.029 ACRES
R.O.W. DEDICATION	1	TOTAL: 1.853 ACRES
NO. OF BLOCKS:	4	
R.O.W.:		TOTAL: 25.882 ACRES

DATE: JANUARY 22, 2019

OWNER:
MC BASTROP 71, LP
2828 ROUTH STREET, SUITE 500
DALLAS, TEXAS 75201

ENGINEER & SURVEYOR:
CARLSON, BRIGANCE & DOERING, Inc.
5501 WEST WILLIAM CANNON
AUSTIN, TX 78749
(512) 280-5160
(512) 280-5165 fax

F.E.M.A. MAP NO. 48021 C 0355E
BASTROP COUNTY, TEXAS DATED: JANUARY 19, 2006

Carlson, Brigance & Doering, Inc.
FIRM ID #F3791 ◆ REG. # 10024900
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

PATH–J: AC2004LP\4697\SURVEY\PRELIMINARY PLAT – BASTROP GROVE.DWG

PRELIMINARY PLAT
BASTROP GROVE, SECTION 2

FLOOD PLAIN NOTE:

NO PORTION OF THIS TRACT LIES WITHIN A DESIGNATED FLOOD HAZARD AREA, AS SHOWN ON THE FEDERAL FLOOD INSURANCE ADMINISTRATION RATE MAP NO. 48021 C 0355E, FOR BASTROP COUNTY TEXAS, DATED JANUARY 19, 2006.

GENERAL NOTES:

1. ALL SUBDIVISION PERMITS SHALL CONFORM TO THE CITY OF BASTROP CODE OF ORDINANCES, CONSTRUCTION STANDARDS, AND GENERALLY ACCEPTED ENGINEERING PRACTICES.
2. CONSTRUCTION PLANS AND SPECIFICATIONS FOR ALL SUBDIVISION IMPROVEMENTS SHALL BE REVIEWED AND ACCEPTED BY THE CITY OF BASTROP PRIOR TO ANY CONSTRUCTION WITHIN THE SUBDIVISION.
3. EROSION AND SEDIMENTATION CONTROLS CONSTRUCTED WITH THE SUBDIVISION ORDINANCE OF THE CITY OF BASTROP ARE REQUIRED FOR ALL CONSTRUCTION ON EACH LOT.
4. ALL WORK, INCLUDING SIGNS, SHALL COMPLY WITH THE CITY OF BASTROP ORDINANCES,
5. CITY ACCEPTANCE OF SUBDIVISION INFRASTRUCTURE OR FISCAL SURETY FOR SUBDIVISION CONSTRUCTION, IN A FORM ACCEPTABLE TO THE CITY OF BASTROP, SHALL BE PROVIDED PRIOR TO FINAL PLAT RECORDATION BY THE CITY.
6. BY APPROVING THIS PRELIMINARY PLAT, THE CITY OF BASTROP ASSUMES NO OBLIGATION TO CONSTRUCT ANY INFRASTRUCTURE IN CONNECTION WITH THIS SUBDIVISION. ANY SUBDIVISION INFRASTRUCTURE REQUIRED FOR THE DEVELOPMENT OF THE LOTS IN THIS SUBDIVISION IS THE SOLE RESPONSIBILITY OF THE DEVELOPER AND/OR THE OWNERS OF THE LOTS. FAILURE TO CONSTRUCT ANY REQUIRED INFRASTRUCTURE TO THE CITY STANDARDS MAY BE JUST CAUSE FOR THE CITY TO DENY APPLICATIONS FOR CERTAIN DEVELOPMENT PERMITS INCLUDING BUILDING PERMITS, SITE PLAN APPROVALS AND/OR CERTIFICATE OF OCCUPANCY.
7. NO LOT OR STRUCTURE SHALL BE OCCUPIED PRIOR TO THE APPLICANT SUBMITTING TO THE CITY OF BASTROP DOCUMENTATION OF SUBDIVISION/SITE REGISTRATION WITH THE TEXAS DEPARTMENT OF LICENSING AND REGULATIONS (TDLR) AND PROVIDE DOCUMENTATION OF REVIEW AND COMPLIANCE OF THE SUBDIVISION CONSTRUCTION PLANS WITH TEXAS ARCHITECTURAL BARRIERS ACT (TABA).
8. WATER IS PROVIDED BY THE CITY OF BASTROP.
9. WASTEWATER SERVICE IS PROVIDED BY THE CITY OF BASTROP.
10. ELECTRIC SERVICE WILL PROVIDED BY BLUEBONNET ELECTRIC.
11. GAS SERVICE WILL BE PROVIDED BY CENTERPOINT ENERGY.
12. CABLE SERVICE IS PROVIDED BY SPECTRUM.
13. NO LOT IN THIS SUBDIVISION SHALL BE OCCUPIED UNTIL CONNECTED TO THE APPROVED WATER DISTRIBUTION AND WASTEWATER COLLECTION FACILITIES
14. WASTEWATER AND WATER SYSTEMS SHALL CONFORM TO TCEQ (TEXAS COMMISSION ON ENVIRONMENTAL QUALITY).
15. DEVELOPER/OWNER SHALL BE SOLELY RESPONSIBLE FOR ALL RELOCATIONS AND MODIFICATIONS TO EXISTING UTILITIES.
16. FLOOD WARNING: THE DEGREE OF FLOOD WATER PROTECTION REQUIRED BY THE CITY OF BASTROP FLOOD DAMAGE PREVENTION ORDINANCE IS CONSIDERED REASONABLE FOR THE REGULATORY PURPOSES AND IS BASED ON SCIENTIFIC AND ENGINEERING CONSIDERATIONS. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR AND FLOOD HEIGHTS MAY BE INCREASED BY MAN-MADE OR NATURAL CAUSES. ACCEPTANCE OF THIS PRELIMINARY PLAT BY THE CITY COUNCIL DOES NOT IMPLY THAT LAND OUTSIDE OF THE AREA OF SPECIAL FLOOD HAZARDS OR USES PERMITTED IN SUCH AREAS WILL BE FREE FROM FLOODING OR FLOOD DAMAGES. NOR SHALL ACCEPTANCE OF THIS PRELIMINARY PLAT CREATE LIABILITY ON THE PART OF THE CITY OF BASTROP OR ANY OFFICIAL OR EMPLOYEE THEREOF FOR ANY FLOOD DAMAGES THAT RESULT FROM RELIANCE ON THE INFORMATION CONTAINED WITHIN THIS PRELIMINARY PLAT OR ANY ADMINISTRATION DECISION LAWFULLY MADE HEREUNDER.
17. ALL DRAINAGE EASEMENTS, STORM WATER FACILITIES / FEATURE SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HIS OR HER ASSIGNS.
18. TEMPORARY OR PERMANENT EASEMENTS ARE TO BE PROVIDED AS REQUIRED AT THE CITY'S SOLE DISCRETION FOR OFF-SITE WATER, WASTEWATER AND DRAINAGE IMPROVEMENTS.
19. PROPERTY OWNERS SHALL PROVIDE FOR ACCESS TO ALL EASEMENTS AS MAY BE NECESSARY AND SHALL NOT PROHIBIT ACCESS BY GOVERNMENTAL AUTHORITIES.
20. IT IS THE RESPONSIBILITY OF EACH BUILDER TO DESIGN AND CONSTRUCT A SUITABLE GRADING AND DRAINAGE SCHEME WHICH WILL CONVEY SURFACE WATER WITHOUT PONDING IN OR AROUND THE LOT, FROM ITS STRUCTURE TO THE DRAINAGE SYSTEM CONSTRUCTED BY THE SUBDIVISION DEVELOPER.
21. PUBLIC UTILITY AND DRAINAGE EASEMENTS WHERE SHOWN HEREON ARE INTENDED TO INDICATE AN EASEMENT FOR CONSTRUCTION, OPERATIONS AND MAINTENANCE OF PUBLIC UTILITIES AND DRAINAGE WAYS; INCLUDING BUT NOT LIMITED TO SANITARY SEWERS, FORCE MAINS, WATER LINES, TELEPHONE SIGNAL CONDUITS, ELECTRIC CONDUCTORS, DRAINAGE PIPES AND NATURAL GAS LINES.

THIS FLOOD STATEMENT, AS DETERMINED BY A H.U.D.-F.I.A. FLOOD INSURANCE RATE MAP, DOES NOT IMPLY THAT THE PROPERTY OR THE IMPROVEMENTS THEREON WILL BE FREE FROM FLOODING OR FLOOD DAMAGE. ON RARE OCCASIONS, GREATER FLOODS CAN AND WILL OCCUR, AND FLOOD HEIGHTS MAY INCREASE BY MAN-MADE OR NATURAL CAUSES.

THIS STATEMENT SHALL NOT CREATE LIABILITY ON THE PART OF ENGINEER OR SURVEYOR.

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

I, BRENDAN P. McENTEE, P.E. DO HEREBY CERTIFY THAT THE STREETS AND DRAINAGE DESIGN, AS SHOWN HEREON, COMPLIES WITH THE SUBDIVISION REGULATIONS FOR THE CITY OF BASTROP, AND THAT THE 100 YEAR FLOOD PLAIN IS AS SHOWN AND WILL BE CONTAINED WITHIN THE DRAINAGE EASEMENT AND OR DRAINAGE RIGHT-OF-WAY, AS SHOWN HEREON.

ENGINEERING BY: _____ DATE _____
BRENDAN P. McENTEE, P.E. NO. 96200
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
BRENDAN P. McENTEE
96200
LICENSED PROFESSIONAL ENGINEER

CARLSON, BRIGANCE & DOERING, INC.
ID# F3791

STATE OF TEXAS)(
COUNTY OF TRAVIS)(KNOW ALL MEN BY THESE PRESENTS:

THAT I, AARON V. THOMASON, DO HEREBY CERTIFY THAT I PREPARED THIS PLAT FROM AN ACTUAL AND ACCURATE ON-THE-GROUND SURVEY OF THE LAND AND THAT THE CORNER MONUMENTS SHOWN THEREON WERE PROPERLY PLACED UNDER MY PERSONAL SUPERVISION, IN ACCORDANCE WITH THE SUBDIVISION REGULATION OF THE CITY OF BASTROP, BASTROP COUNTY, TEXAS. ALL EASEMENTS OF RECORD HAVE BEEN IDENTIFIED ON THIS PLAT TO THE BEST OF MY KNOWLEDGE.

SURVEYED BY: _____ DATE _____
AARON V. THOMASON ~ R.P.L.S. NO. 6214
CARLSON, BRIGANCE & DOERING, INC.
5501 WEST WILLIAM CANNON DRIVE
AUSTIN, TEXAS 78749

STATE OF TEXAS
REGISTERED
AARON V. THOMASON
6214
PROFESSIONAL LAND SURVEYOR

APPROVED ON THIS _____ DAY OF _____, 20____ A.D., BY THE CITY COUNCIL OF THE CITY OF BASTROP.

APPROVED: ATTEST:

_____ _____
CONNIE SCHROEDER, MAYOR OF THE CITY OF BASTROP, TEXAS

CITY SECRETARY, CITY OF BASTROP, TEXAS

FIELD NOTES - TRACT 1

BEING ALL OF THAT CERTAIN 15.290 ACRE TRACT OR PARCEL OF LAND OUT OF AND PART OF THE NANCY BLAKEY SURVEY, ABSTRACT NUMBER 98, SITUATED IN BASTROP COUNTY, TEXAS, BEING MORE PARTICULARY DESCRIBED AS BEING A PORTION OF THAT CALLED 145.691 ACRE TRACT CONVEYED TO MC BASTROP 71, LP., IN VOLUME 2097, PAGE 241, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, SAID 15.290 ACRE TRACT OF LAND BEING MORE FULLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING, AT A 1/2 INCH IRON ROD FOUND IN THE EAST LINE OF SAID 145.691 ACRE TRACT OF LAND, BEING AT THE SOUTHEAST CORNER OF BASTROP GROVE, SECTION 1, A SUBDIVISION RECORDED IN CABINET 6, SLIDE 114B, PLAT RECORDS OF BASTROP COUNTY, TEXAS, SAME BEING AT THE SOUTHEAST CORNER OF THAT 1.479 ACRE PORTION OF AGNES STREET (R.O.W. VARIES) DEDICATED IN SAID BASTROP GROVE, SECTION 1, ALSO BEING IN THE WEST LINE OF A CALLED 43.112 ACRE TRACT OF LAND CONVEYED TO JOHN ALLEN NIXON IN VOLUME 1908, PAGE 825, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, FOR THE NORTHEAST CORNER AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT,

THENCE, S09°40'06"W, WITH THE EAST LINE OF SAID 145.691 ACRE TRACT OF LAND AND THE WEST LINE OF SAID 43.112 ACRE TRACT OF LAND, A DISTANCE OF 318.42 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE SOUTHEAST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND,

THENCE, OVER AND ACROSS SAID 145.691 ACRE TRACT OF LAND, THE FOLLOWING SEVENTEEN (17) COURSES AND DISTANCES, NUMBERED 1 THROUGH 17,

1) N80°20'05"W, A DISTANCE OF 1034.85 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER AT THE BEGINNING OF A CURVE TO THE LEFT,
2) ALONG SAID CURVE TO THE LEFT, HAVING A RADIUS OF 225.00 FEET, AN ARC LENGTH OF 45.11 FEET, AND A CHORD THAT BEARS N12°12'59"W, A DISTANCE OF 45.04 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
3) N17°57'38"W, A DISTANCE OF 69.01 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER AT THE BEGINNING OF A CURVE TO THE RIGHT,
4) ALONG SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 175.00 FEET, AN ARC LENGTH OF 84.43 FEET, AND A CHORD THAT BEARS N04°08'23"W, A DISTANCE OF 83.61 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
5) N09°40'53"E, A DISTANCE OF 11.70 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
6) N26°22'49"E, A DISTANCE OF 69.66 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
7) N80°19'42"W, A DISTANCE OF 90.03 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
8) S07°01'09"E, A DISTANCE OF 69.64 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
9) S09°40'53"W, A DISTANCE OF 11.70 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER AT THE BEGINNING OF A CURVE TO THE LEFT,
10) ALONG SAID CURVE TO THE LEFT, HAVING A RADIUS OF 225.00 FEET, AN ARC LENGTH OF 108.55 FEET, AND A CHORD THAT BEARS S04°08'23"E, A DISTANCE OF 107.50 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
11) S17°57'38"E, A DISTANCE OF 69.01 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER AT THE BEGINNING OF A CURVE TO THE RIGHT,
12) ALONG SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 175.00 FEET, AN ARC LENGTH OF 20.42 FEET, AND A CHORD THAT BEARS S14°37'05"E, A DISTANCE OF 20.41 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
13) N80°20'05"W, A DISTANCE OF 688.44 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
14) S09°40'28"W, A DISTANCE OF 144.10 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
15) S80°12'23"W, A DISTANCE OF 201.67 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER AT THE BEGINNING OF A CURVE TO THE RIGHT,
16) ALONG SAID CURVE TO THE RIGHT, HAVING A RADIUS OF 225.00 FEET, AN ARC LENGTH OF 49.78 FEET, AND A CHORD THAT BEARS S86°32'41"W, A DISTANCE OF 49.68 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER, AND
17) S63°38'06"W, A DISTANCE OF 64.18 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE SOUTHWEST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND, BEING IN THE WEST LINE OF SAID 145.961 ACRE TRACT OF LAND, SAME BEING IN THE EAST LINE OF STATE HIGHWAY 304 (120' R.O.W.)

THENCE, N09°40'28"E, WITH THE EAST LINE OF SAID STATE HIGHWAY 304 AND THE WEST LINE OF SAID 145.961 ACRE TRACT OF LAND, A DISTANCE OF 504.11 FEET TO A CALCULATED POINT FOR THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND, BEING AT THE SOUTHWEST CORNER OF SAID BASTROP GROVE, SECTION 1,

THENCE, WITH THE SOUTH LINE OF SAID BASTROP GROVE, SECTION 1, THE FOLLOWING TWO (2) COURSES AND DISTANCES, NUMBERED 1 AND 2,

1) S80°19'43"E, A DISTANCE OF 1883.69 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER AT THE BEGINNING OF A CURVE TO THE LEFT, AND
2) ALONG SAID CURVE TO THE LEFT, HAVING A RADIUS OF 1000.00 FEET, AN ARC LENGTH OF 193.46 FEET, AND A CHORD THAT BEARS S85°51'51"E, A DISTANCE OF 193.16 FEET TO THE POINT OF BEGINNING AND CONTAINING 15.290 ACRES OF LAND.

FIELD NOTES - TRACT 2

BEING ALL OF THAT CERTAIN 8.242 ACRE TRACT OR PARCEL OF LAND OUT OF AND PART OF THE NANCY BLAKEY SURVEY, ABSTRACT NUMBER 98, SITUATED IN BASTROP COUNTY, TEXAS, BEING MORE PARTICULARY DESCRIBED AS BEING A PORTION OF THAT CALLED 145.691 ACRE TRACT CONVEYED TO MC BASTROP 71, LP., IN VOLUME 2097, PAGE 241, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, SAID 8.242 ACRE TRACT OF LAND BEING MORE FULLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING AT A MAG NAIL FOUND IN CONCRETE AT THE SOUTHWEST CORNER OF SAID 145.691 ACRE TRACT OF LAND, BEING IN THE EAST LINE OF STATE HIGHWAY 304 (120' R.O.W.), SAME BEING AT THE NORTHWEST CORNER OF A CALLED 5.021 ACRE TRACT OF LAND CONVEYED TO NANCY KELLY IN DOCUMENT NUMBER 201004563, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS,

THENCE, N09°40'28"E, WITH THE EAST LINE OF SAID HIGHWAY 304 AND THE WEST LINE OF SAID 145.691 ACRE TRACT OF LAND, A DISTANCE OF 462.32 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE SOUTHWEST CORNER AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT,

THENCE, S09°40'28"E, CONTINUING WITH THE WEST LINE OF SAID 145.691 ACRE TRACT OF LAND AND THE EAST LINE OF SAID HIGHWAY 304, A DISTANCE OF 1128.22 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND,

THENCE, OVER AND ACROSS SAID 145.691 ACRE TRACT OF LAND, THE FOLLOWING SIX (6) COURSES AND DISTANCES, NUMBERED 1 THROUGH 6,

1) N82°57'59"E, A DISTANCE OF 81.42 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER AT THE BEGINNING OF A CURVE TO THE LEFT,
2) ALONG SAID CURVE TO THE LEFT, HAVING A RADIUS OF 275.00 FEET, AN ARC LENGTH OF 50.15 FEET, AND A CHORD THAT BEARS N85°25'49"E, A DISTANCE OF 50.08 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
3) N80°12'23"E, A DISTANCE OF 183.99 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
4) S09°40'28"W, A DISTANCE OF 1250.39 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE SOUTHEAST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND,
5) N80°19'03"W, A DISTANCE OF 237.30 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE SOUTHEAST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND, AND
6) N58°31'01"W, A DISTANCE OF 67.53 FEET TO THE POINT OF BEGINNING AND CONTAINING 8.242 ACRES OF LAND.

FIELD NOTES - TRACT 3

BEING ALL OF THAT CERTAIN 2.350 ACRE TRACT OR PARCEL OF LAND OUT OF AND PART OF THE NANCY BLAKEY SURVEY, ABSTRACT NUMBER 98, SITUATED IN BASTROP COUNTY, TEXAS, BEING MORE PARTICULARY DESCRIBED AS BEING A PORTION OF THAT CALLED 145.691 ACRE TRACT CONVEYED TO MC BASTROP 71, LP., IN VOLUME 2097, PAGE 241, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, SAID 2.350 ACRE TRACT OF LAND BEING MORE FULLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING AT A MAG NAIL FOUND IN CONCRETE AT THE SOUTHWEST CORNER OF SAID 145.691 ACRE TRACT OF LAND, BEING IN THE EAST LINE OF STATE HIGHWAY 304 (120' R.O.W.), SAME BEING AT THE NORTHWEST CORNER OF A CALLED 5.021 ACRE TRACT OF LAND CONVEYED TO NANCY KELLY IN DOCUMENT NUMBER 201004563, OFFICIAL PUBLIC RECORDS OF BASTROP COUNTY, TEXAS, FOR THE SOUTHWEST CORNER AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT,

THENCE, N09°40'28"E, WITH THE EAST LINE OF SAID HIGHWAY 304 AND THE WEST LINE OF SAID 145.691 ACRE TRACT OF LAND, A DISTANCE OF 357.16 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND,

THENCE, OVER AND ACROSS SAID 145.691 ACRE TRACT OF LAND, THE FOLLOWING THREE (3) COURSES AND DISTANCES, NUMBERED 1 THROUGH 3,

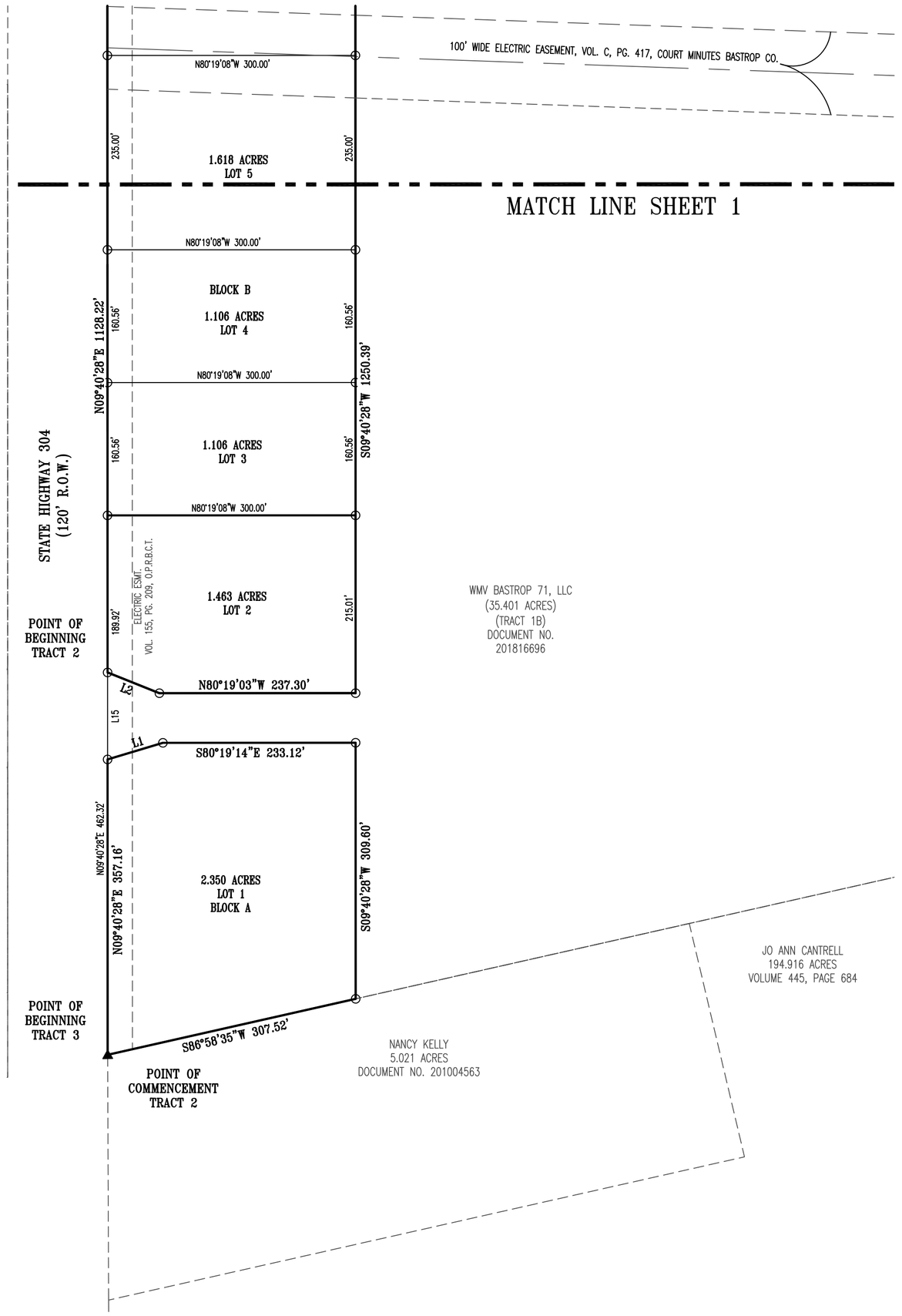
1) N82°59'00"E, A DISTANCE OF 69.82 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR CORNER,
2) S80°19'14"E, A DISTANCE OF 233.12 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE NORTHEAST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND, AND
3) S09°40'28"W, A DISTANCE OF 309.60 FEET TO A CAPPED 1/2 INCH IRON ROD SET STAMPED 'CBD SETSTONE' FOR THE SOUTHEAST CORNER OF THE HEREIN DESCRIBED TRACT OF LAND, BEING IN THE NORTH LINE OF SAID 5.021 ACRE TRACT OF LAND, SAME BEING IN THE SOUTH LINE OF SAID 145.691 ACRE TRACT OF LAND,

THENCE, S86°58'35"W, WITH THE SOUTH LINE OF SAID 145.691 ACRE TRACT AND THE NORTH LINE OF SAID 5.021 ACRE TRACT OF LAND, A DISTANCE OF 307.52 FEET TO THE POINT OF BEGINNING AND CONTAINING 2.350 ACRES OF LAND.

LEGEND
- ● 1/2" IRON ROD FOUND
- ○ 1/2" CAPPED IRON ROD SET
- ▲ MAG NAIL FOUND



SCALE: 1" = 100'
GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.



Carlson, Brigance & Doering, Inc.
FIRM ID #F3791 ◆ REG. # 10024900
Civil Engineering ◆ Surveying
5501 West William Cannon ◆ Austin, Texas 78749
Phone No. (512) 280-5160 ◆ Fax No. (512) 280-5165

PATH-J: AC2004LP\4697\SURVEY\PRELIMINARY PLAT - BASTROP GROVE.DWG





Grandfathering Review Committee

Date of Decision – May 4, 2021

Applicant: **Carlson, Brigance, and Doering, Inc.**
71 Retail Partners LP

Project: **#21-000090 – Bastrop Grove Section 2 Grandfathering Request**

Members:

Director of Planning & Development
City Engineer
Director of Public Works

DETERMINATION

The Grandfathering Review Committee has evaluated the above referenced project and this project is not Grandfathered due to expiration of the last submitted document from 4/04/2019.

BASIS OF DETERMINATION AND CLAIMS RECOGNIZED / REJECTED

The original lot layout and dimensions for Section 2 can be found in the Bastrop Grove Drainage Improvement. However, it appears a deed division of property inconsistent with State Law took place sometime between 10-01-2018 and 01-22-2019 as shown on the Proposed Preliminary Plat from 1-22-2019. In addition to the lot layout on the Propose Preliminary Plat an additional Exemption Application was submitted to the City of Bastrop on 04-04-2019 during a drainage moratorium. Unfortunately, all the applications were submitted over two years ago and have exceeded the time that allows for an exemption under the Local Government Code Chapter 245, Sec. 245.004.

SIGNED:

Trey Job

Trey Job, Assistant City Manager for Community Development

MC BASTROP 71, L.P.
8214 Westchester Drive, Ste 550
Dallas, TX 75225

May 25, 2021

Trey Job, Assistant City Manager
City of Bastrop, TX
Planning and Development Department
1311 Chestnut Street
Bastrop, TX 78602

Request for Reconsideration

Dear Trey,

MC BASTROP 71, L.P. ("MC 71") filed a Grandfathering Development Status Application on April 19, 2021 under City Code Art. 1.20 (the "Ordinance"). The Grandfathering Review Committee (the "GRC") issued a determination (the "GRC Determination") on May 4, 2021. MC 71 hereby requests reconsideration of the GRC Determination pursuant to the Ordinance.

The GRC Determination is required by the City for the City to make its own determination of its position on the application of Texas Local Government Code ("LGC") Chapter 245 ("LGC 245"), which provides protections from changes in local regulation as to an ongoing development project (such protections being commonly known as "vested rights"). Only LGC 245 determines the applicable vested rights, and to the extent the Ordinance seeks to limit vested rights or give the City control over the interpretation process (such as, but not limited to, establishing standards and burdens), we protest, and submit this application under protest. The GRC Determination is for the benefit of the City only and is not binding on MC 71 as to the nature or extent of vested rights. MC 71 reserves all its rights under LGC 245.

Vested Rights defined (emphasis added):

- "If a series of permits is required for a project, the orders, regulations, ordinances, rules, expiration dates, or other properly adopted requirements *in effect at the time the original application for the first permit in that series is filed shall be the sole basis for consideration of all subsequent permits required for the completion of the project*. All permits required for the project are considered to be a single series of permits. Preliminary plans and related subdivision plats, site plans, and all other development permits for land covered by the preliminary plans or subdivision plats

are considered collectively to be one series of permits for a project." LGC 245.002(b)

- "Rights to which a permit applicant is entitled under this chapter *accrue on the filing of an original application or plan for development or plat application* that gives the regulatory agency fair notice of the project and the nature of the permit sought." LGC 245.002(a-1)

The Ordinance requires the following:

1. Filing with the Director of Planning and Development in writing within fifteen (15) business days of the date of the Grandfathering Review Committee's previous determination or the date of automatic denial;
2. State the reasons why the previous determination should be reversed or modified;
3. Present information that has not previously been presented for consideration by the Grandfathering Review Committee;
4. Provide an explanation of the legal and factual grounds of the request; and
5. Be accompanied by payment of the reconsideration fee established by the City Council, as codified in the city's fee schedule.

The GRC Determination states:

> "The Grandfathering Review Committee has evaluated the above referenced project and this project is not Grandfathered due to expiration of the last submitted document from 4/4/2019... Unfortunately, all the applications were submitted over two years ago and have exceeded the time that allows for an exemption under the Local Government Code Chapter 245, Sec 245.004."

This statement leaves MC 71 confused as to the specific basis for denial.

For purposes of this letter, the term "Project" shall refer to 25.882 acres owned by MC 71, shown in the Preliminary Plat Application dated 1-22-2019 (the "PP Application"), inclusive of the creation of the lots and related infrastructure and the construction of buildings thereon. Both the land development and the building development are entitled to vested rights. MC 71 has continuously pursued this Project since the filing of the PP Application. The scope and nature of the Project is well known to the City, as suburban retail/commercial pad site development for buildings consistent with surrounding developments such as the Medtail facility located on Highway 71 in the Bastrop Grove Project of 71 Retail Partners, L.P. The elements of the contemplated retail/commercial pad sites are relatively small buildings (usually 1 story), typically centered in each lot, with ample, surface parking surrounding the building, and cross access easements shared among the other pad sites. These lots are typically call "commercial reserves".

MC 71 asserts the following reasons the previous determination should be reversed:

- Texas LGC 245.004 does not contain an applicable time limit for exemption for the applications submitted for the Project, but only for building permits (LGC 245.004(1)).

- MC 71 properly filed the PP Application consistent with the requirements of LGC 245 with the City on 1-22-2019. This is the proper vesting date for the Project. Since 2005, LGC 245 does not require the City to "accept" a filing. See, LGC 245.002(a), (a-1) and (b), none of which required an "accepted" or "complete" application, and mention only an "original application." The Ordinance, particularly Sec. 1.20.010(g) is not consistent with LGC 245.

- While Texas LGC 245 does contain certain time limits under various provisions, none of those time limits are applicable for the Project. If the City's position is that the application lapsed under its internal requirements, then that is an inequitable result since it was the City which was refusing to process the filed applications, thus impeding the progress of the Project.

- Following the submission of the PP Application, MC 71 representatives held a meeting with Allison Land and the City Planning staff to review and discuss the PP Application. MC 71 received a memo from Allison Land containing a summary of that meeting (attached hereto as Exhibit "A"). That memo inaccurately characterizes the meeting as a "Pre-Application Meeting", but it was a meeting to discuss the application previously filed. But for the receipt of the PP Application, there would have been no meeting and as such the filing prompted the meeting. That memo directed MC 71 to submit an exemption application (the "Exemption Application"), which MC 71 properly did on 4-14-2019. The memo states that "After the submittal is deemed complete, Staff will take to the next available City Council meeting for approval to move forward with the Checklist option chosen and the development process". As such, the Exemption Application is pending action by the City.

- MC 71 has not withdrawn the PP Application or Exemption Application. In fact, MC 71's engineer routinely followed up with the City about the status of these items. In essence, the City seems to have stonewalled MC 71.

Because MC 71 properly filed applications for the Project consistent with the requirements of LGC 245 and those applications are still pending action by the City, and MC 71 is not aware of any legally enforceable limits on the relevant applications, the Project should be vested as of the filing of the PP Application under LGC 245.

MC 71 hereby presents new information that has not previously been presented for consideration by the Grandfathering Review Committee in this letter and attached hereto as "Exhibit A".

MC 71's request is based on the following legal and factual grounds:

- Texas LGC 245.002(a-1) states:
  "Rights to which a permit applicant is entitled under this chapter accrue *on the filing of an original application or plan for development or plat application* that gives the regulatory agency fair notice of the project and the nature of the permit sought." *emphasis added*

  - MC 71 did file the PP Application on 1-22-2019 properly and as required.
  - The PP Application was of sufficient detail to give fair notice of the Project and the nature of the permit sought.

- Texas LGC 245.002(2)(e) requires the City to provide notice within 45 days of filing if "the applicant fails to provide documents or other information necessary to comply with the agency's technical requirements relating to the form and content of the permit application". MC 71 did not receive any notice from the City regarding the PP Application or the Exemption Application of any deficiency in either application.

- Texas LGC 245.004(1) provides an exemption to LGC 245 for "a permit that is at least two years old, is issued for construction of a building or structure intended for human occupancy, or habitation, and is issued under laws, ordinances, procedures, rules, or regulations adopting only (A) uniform building, fire, electrical, plumbing, or mechanical codes adopted by a recognized national code organization; or (B) local amendments to those codes enacted solely to address imminent threats of destruction of property or injury to persons;".
  - This section is not applicable to the Project because the PP Application and Exemption Applications are not building permits as contemplated by LGC 245.004(1).

- Texas LGC 245.005 addresses "Dormant Projects". The Project is not a Dormant Project under Texas LGC 245.005 due to the following:
  - The PP Application and the Exemption Applications are not permits for the purpose of this section.
  - Even if they were, the time limits in Texas LGC 245.005 are not applicable because MC 71 has made progress towards completion of the Project in accordance with Texas LGC 245.005 (2) through MC 71's (i) filing the PP Application, (ii) filing the Exemption Application, and (iii) good faith attempt

to file with a regulatory agency an application for a permit necessary to begin or continue towards completion of the Project.

- Even if no progress towards completion of the Project had been made by MC 71, LGC 245.005 (b) states "Notwithstanding any other provision of this chapter, any ordinance, rule, or regulation enacted pursuant to this section shall place an expiration date on a project of no earlier than the fifth anniversary of the date the first permit application was filed for the project if no progress has been made towards completion of the project." The expiration of the PP Application and Exemption Application could be no earlier than 4-14-2024.

The City's decision did not reach all issues relating to vested rights for the Project. If the City reverses its determination and finds that a vesting event occurred, then MC 71 requests the opportunity to review that decision and have a separate opportunity for reconsideration on the merits of that decision.

The Ordinance requests legal grounds and seems to want a legal brief on this matter, when MC 71 is simply trying to comply with a City requirement to help it determine its own conclusion on vested rights, and the City has no authority to adjudicate vested rights that are binding on MC 71. Nonetheless, we attach an addendum with reference to LGC 245 and relevant case law. Our primary reliance is on the text of LGC 245, as cited herein and available online to the City.

MC Bastrop 71, L.P. and its representatives look forward to your reconsideration. Should any further information or clarification be required, please do not hesitate to contact us.

Sincerely,

Douglas M. MacMahon
Manager of the General Partner of MC Bastrop 71, L.P.

Addendum

Relevant Vested Rights Caselaw Supporting this Reconsideration Request

Hatchett v. West Travis County Public Utility Agency, 598 S.W.3d 744, (Tex. App—Austin, 2020, pet denied)- Summary of the current state of vested rights under LGC 245.

FLCT, Ltd. v. City of Frisco, 49 S.W.3d 238 (Tex. App.—Fort Worth 2016, pet. den.)- The exceptions to the "municipal zoning regulations" except to vested rights under LGC 245.004 is determined on an "as applied" basis to any regulations which "have an effect" on the listed exception issues. The exception for "property classification" means the permissible uses under the regulator scheme when vesting occurs. A project is entitled to all uses permitted when vesting occurs. "Fair notice" of a project incorporates all the city actual knows about the project, not just what the applicate documents. The definition of a "project" is broad.

City of San Antonio v. Greater San Antonio Builders Ass'n, 419 S.W.3d 597 (Tex. App.—San Antonio 2013, pet. den.)- A city may not add local limits to vested rights, only LGC 245 determines vested rights.

Harper Park Two, LP v. City of Austin, 359 S.W.3d 247 (Tex. App.—Austin 2011, pet. den.)- The entirety of a development project is considered in a "project", not components or phases. The definition of "permit" is very broad. The vesting is considered in the context of the regulatory scheme at the time to determine the scope of the project.

Hartsell v. Town of Talty, 130 S.W.3d 325, 326 (Tex. App.—Dallas 2004, pet. denied)- Vested rights extend to the entire development project, land and buildings.

Exhibit “A”

MEMO

To: Brendan McEntee

From: Allison Land

cc: Staff

Date: February 13, 2019

Re: Pre-Application Meeting – Grove Commercial

City staff has generated notes from the meeting on February 5, 2019. The information discussed and comments made by staff during this meeting are not intended to constitute a formal review of your project. This meeting *does not substitute* for the formal review that will take place in the event you file a development application with the City. Information provided and comments made by staff during the meeting are based solely on the information provided by you prior to or during the meeting.

Upon submittal of the appropriate application(s), additional comments are to be expected that may or may not be discussed in this meeting. More detailed information provided by you concerning your project during staff's review of a formal application may alter comments made during the meeting depending on the situation.

Property Information

Address: TBD

R Number:

Jurisdiction: City Limits

Platted: No

In floodplain: partial

Water, Wastewater available: Nearby

Electricity available: Nearby

Toad Habitat Area: No

Current Zoning: General Retail with restrictions

Meeting Goal

Discuss commercial development

Items Discussed:

Drainage channel

- Needs to establish good vegetation
- Anticipated 9 to 10 feet/second eventually

Exemption:

- Requires pre-submission meeting (this one)
- Requires submittal of the Exemption Application and an associated Checklist: Planned Development District, Alternative Site Design, ETJ Agreement, or Waiver. A checklist and all items listed on the checklist must accompany the Application
- After the submittal is deemed complete, Staff will take to the next available City Council meeting for approval to move forward with the Checklist option chosen and the development process
- **Engineer Certification required. See Emergency Ordinance 2018-2-A Section 5b - link**
- Note: Documentation provided with the Exemption Application does NOT constitute a submittal for any required permits after the Exemption is granted
- This project could use either Planned Development or Alternative Design Standards
- Alternative Design Standards
    - Use new rainfall totals and Atlas 14 data
    - Add some water quality infrastructure
- Need to run the channel and anticipated development against Atlas 14 data to show that it works and that the new development tying in is accounted for
- If you can live with the setbacks, use Alternative Design Standards
- If not, use the Planned Development
    - Can keep high level, call out uses, driveway spacing
    - Need to show a concept plan
    - If you choose to address water quality, address the first 1.5 inches
    - Pervious pavers are allowed under this
    - Leave GR as the base zoning
    - Change setbacks (could be flexible, min/max), drainage standards, landscaping, etc. Get creative

Zoning

- Two story development will have a 60-foot building setback from the residential lots
    - To change: need either a zoning variance (no financial hardship) or a planned development
    - Variances are hard to justify and hard to support

Platting

- Lot of Record Verification or Platting is required before permits may be issued
- All lots must have public road frontage and utility access. Access easements and/or driveways across other lots does not provide public road frontage.
- Wants to do preliminary plat for all commercial parcels
- Channel sized for 50% cover of Nixon and 80% cover on the other side
- Preliminary plat:
    - Previously have submitted - Plat, grading, utility, engineering report discussing access, etc.
    - Checklist is the same now. Additional details are needed for the Exemption before the prelim can be submitted
- Note: still need to record Agnes St ROW by separate instrument

Utilities

- Lift station: does it have capacity for the south side of Agnes?
    - Stantec for capacity

Moving Forward

Action Items

- City
    - Send copy of PD to Brendan
- Applicant

Process Overview

What steps the project attendees need to follow to move forward in the project, in order of recommended completion.

- Exemption and Exception applications and checklists are available on the Building Bastrop website.
- Building/Permitting and Planning applications and checklists are available on the Planning & Development Department's website via the menu on the left.

1. Exemption Application with Planned Development Checklist
    a. This will go to P&Z and Council like a normal PD
2. Planning Application with Preliminary Plat Checklist
3.

City of Bastrop

"Where Preservation of the Past Combined with Progress for the Future Encourages Opportunities to Grow"

Pre-Application Meeting Sign-in Sheet (Staff):

Project & Location: Grove Commercial

Date: February 5, 2019

	Name	Title/Organization	Phone	Email
☐	Lynda Humble	City Manager	(512)-332-8800	lhumble@cityofbastrop.org
☒	Jerry Palady, PE	Director of Engineering	(512) 332-8846	jpalady@cityofbastrop.org
☐	James McCann, PE	Engineering Consultant		
☐	Matt Jones, AICP	Director of Planning	(512) 332-8840	mjones@cityofbastrop.org
☒	Jennifer C. Bills, AICP, LEED AP	Assistant Planning Director	(512) 332-8845	jbills@cityofbastrop.org
☐	Matt Lewis, CNU	Planning Consultant		
☒	Trey Job	Director of Water/Wastewater and Public Works	(512) 332-8932	tjob@cityofbastrop.org
☐	Curtis Hancock	Assistant Director of Water/Wastewater and Public Works	(512) 332-8964	chancock@cityofbastrop.org
☒	Allison Land	Planner/GIS Coordinator	(512) 332-8843	aland@cityofbastrop.org
☐	Kimberly Hanly (Tap & Impact Fees)	Coordinator, Water & Wastewater Department	(512) 332-8960	khanly@cityofbastrop.org
☐	Tim Goetz	Electric Superintendent, Bastrop Power & Light	(512) 332-8900	tgoetz@cityofbastrop.org
☐	Cheryl Renfro	Project Coordinator Bastrop Power & Light	(512) 332-8901	crenfro@cityofbastrop.org
☐	Andres Rosales	Fire Chief	(512) 332-8670	arosales@cityofbastrop.org
☐	Rod Stradling	Assistant Fire Chief	(512) 332-8670	rstradling@cityofbastrop.org
☐	David Brasich	Building Official	(512) 332-8847	Dbrasich@cityofbastrop.org
☐	Jean Riemenschneider	Bastrop Economic Development Corp.	(512) 332-8873	jean@bastropedc.org
☐	Carolyn Dill, PE	County Engineer, Bastrop County	(512) 581-7180	carolyn.dill@co.bastrop.tx.us
☐	Cari Croft (contact for Houston toad)	Lost Pines HCP Administrator, Bastrop County	(512) 332-7284	Cari.croft@co.bastrop.tx.us

City of Bastrop

"Where Preservation of the Past Combined with Progress for the Future Encourages Opportunities to Grow"

Pre-Application Meeting Sign-in Sheet (Project Attendees):

Project & Location: Grove Commercial

Date: February 5, 2019

Name	Title/Organization	Phone	Email*
Brendan McEntee			

*Email address will be used to send a copy of notes taken at this meeting, and as a further correspondence option as needed

June 15, 2021

71 Retail Partners LP
C/O Douglas MacMahon
8214 Westchester Drive, Suite 550
Dallas, TX 75225

Dear Mr. MacMahon,

I have reviewed the documents that have been submitted and the previous determination the Grandfathering Committee issued.

The Committee does not agree with your interpretation of LGC 245 and has determined that the original application (permit) was not complete and did not continue to move forward. This puts the permits beyond the two-year time frame for applying for a grandfathered status, per Local Government Code Chapter 245, Section 245.004.

Sincerely,

Trey Job
Acting Director of Planning
Assistant City Manager of Community Development

CC: Jennifer Bills, Assistant Planning Director