APPLICATION FOR FINAL PLAT

Planning & Development Department
30360 Cougar Bend, Bulverde, TX 78163
Telephone: 830-438-3612 - Fax. 830-438-4339
www.bulverdetx.gov

1. Name of Subdivision: Bulverde Convenience Store Unit No _____
   Location Description/Nearest Intersection: 4470 FM 1863 Bulverde (at the Southwest corner of FM 1863 and Starlight Drive)

2. Owner/Applicant: Vista Builverde Properties,LLC (Inayat Momin)
   Address: 2931 Antique bend San Antonio, TX 78259 Email: inayatalimomin@gmail.com
   Telephone: _____ Fax: _____ Mobile: 210- 326- 2551

   **Note: If applicant is person other than owner, a letter of authorization must be provided from owner.*

3. Licensed Engineer/Surveyor (technical contact): Salah E Diab (Seda Consulting Engineers)
   Address: 6735 IH 10 West San Antonio, TX 78201 Email: seda@satx.rr.com
   Telephone: 210-308-0057 Fax: _____ Mobile: 210-825-5353

4. Property Details:

City Limits:	X In X Out (ETJ)	Water Source:	South West Water Co
Commercial:	X Yes __ No	Sewage Treatment:	Septic
Residential:	X Yes __ No		
		TxDOT Frontage:	X Yes __ No
No. of Lots:	2	100-Year Floodplain:	X Yes __ No
Total Acreage without floodplain:			
Density Class:		Edwards Aquifer Zone:	X Recharge
Zoning Class:			__ Contributing

The undersigned agrees to comply with all platting and subdivision requirements of the City of Bulverde, and hereby authorizes the surveyor/engineer to record the approved final plat. The undersigned agrees to pay the appropriate fees as outlined in the Planning and Development Fee Schedule and agrees to pay fees for any additional review requiring consultation with City Consultants, including involvement of a contract engineer in a predevelopment conference. To the extent possible, City Staff will provide the Owner/Applicant with an estimate of fees should outside consultation be required.

PROPERTY OWNER'S ACKNOWLEDGEMENT

_____ 2-21-25
Signature of Owner/Applicant **Date**

State of Texas
County of BEXAR

This instrument was acknowledged before me on the 21st day of February, 2025, by IMAYAT MOMIN (name of property owner).

RIDA A. DAAU
My Notary ID # 126901245
Expires May 22, 2025

_____
Notary Public's Signature

(Notarial Seal)

Submittal Format:

**Plat submittals must follow format outlined in Pages 3 and 4 of this application.

LETTER OF AUTHORIZATION FOR APPLICATION

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30360 Cougar Bend, Bulverde, TX 78163
Telephone: 830-438-3612 - Fax. 830-438-4339
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***This form is only required for property owners allowing another person or entity to submit and amend documentation required by the City on the property owner's behalf.*

I, INAYAT MOMIN, owner of the property, described in this application, authorize David Ranjbar (name) to apply for a Final Plat on my/our behalf of the property.

The Additional Applicant's information is:

Company: Vista Bulverde properties LLC
Contact Name: INAYAT MOMIN
Address: 4470 FM 1863
Bulverde, TX

Signature of Owner/Applicant

2-21-25
Date

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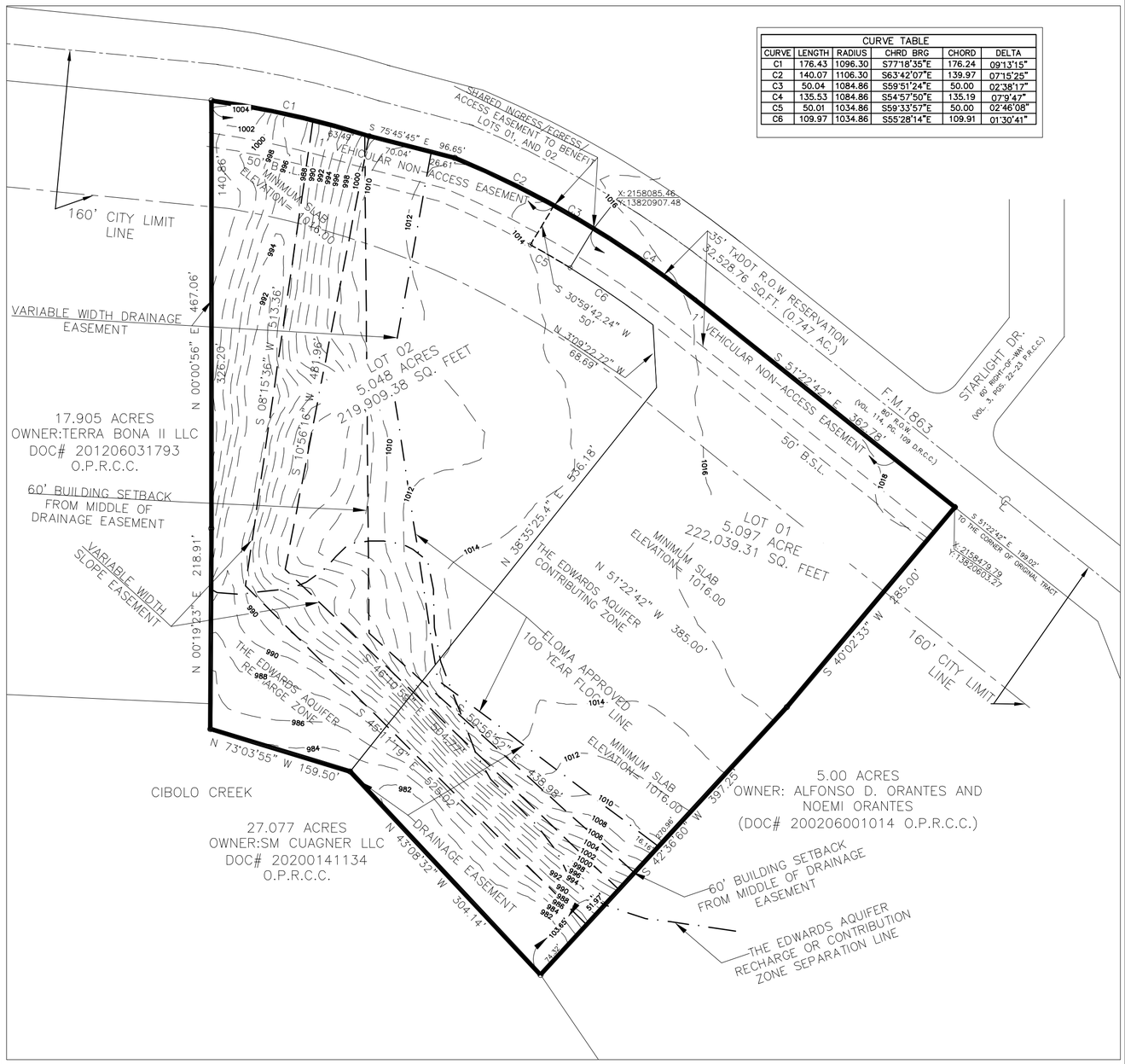

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NEW CITY BLOCK	NCB
DOCUMENT	DOC
SPOT ELEVATION AS PER SURVEY	⊠
VEHICULAR NON–ACCESS EASEMENT	V.N–A.E.

STATE OF TEXAS
COUNTY OF BEXAR

I HEREBY CERTIFY THAT PROPER ENGINEERING CONSIDERATION HAS BEEN GIVEN THIS PLAT TO THE MATTERS OF STREETS, LOTS AND DRAINAGE LAYOUT. TO THE BEST OF MY KNOWLEDGE THIS PLAT CONFORMS TO ALL REQUIREMENTS OF THE UNIFIED DEVELOPMENT CODE, EXCEPT FOR THOSE VARIANCES GRANTED BY THE SAN ANTONIO PLANNING COMMISSION.

SALAH E DIAB
LICENSED PROFESSIONAL ENGINEER
FIRM REGISTRATION NO:F–1601
6735 IH 10 W
SAN ANTONIO, TEXAS 78201

COUNTY OF GUADALUPE

I HEREBY CERTIFY THAT THE ABOVE PLAT CONFORMS TO THE MINIMUM STANDARDS SET FORTH BY THE TEXAS BOARD OF PROFESSIONAL LAND SURVEYING ACCORDING TO AN ACTUAL SURVEY MADE ON THE GROUND

CAESAR A. GARCIA
REGISTERED PROFESSIONAL LAND SURVEYOR
FIRM REGISTRATION NO. 10194785
14384 HUBER ROAD
SEGUIN, TEXAS 78155

STATE OF TEXAS · SALAH E. DIAB · 55516 · REGISTERED · PROFESSIONAL ENGINEER

STATE OF TEXAS · REGISTERED · CAESAR A. GARCIA · 5904 · PROFESSIONAL · LAND SURVEYOR

PLAT NUMBER

SUBDIVISION PLAT ESTABLISHING

BULVERDE CONVENIENCE STORE

BEING A TOTAL OF 10.698 ACRES SITUATED IN THE AGAPITAN GAYTON SURVEY NO. 194, ABSTRACT NO. 174, BEING PART OF 143.3 ACRES TRACT, AS RECORDED IN VOLUME 972, PAGE 803 OF THE PUBLIC OFFICIAL RECORDS OF COMAL COUNTY, TEXAS.

ESTABLISHING LOT 01,02 & 03, COMAL COUNTY, TEXAS.

N

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)
1 INCH = 100 FT.

Seda Consulting Engineers, Inc.
FIRM REGISTRATION NO:F–1601 (210) 308–0057
6735 IH 10 W FAX: (210) 308–8842
SAN ANTONIO, TEXAS 78201 E–MAIL: SEDA@SATX.RR.COM
CIVIL·STRUCTURAL·ENVIRONMENTAL· PLANNER

CAESAR A. GARCIA
REGISTERED PROFESSIONAL LAND SURVEYOR
FIRM REGISTRATION NO. 10194785
14384 HUBER ROAD
SEGUIN, TEXAS 78155
PH: (512) 470–4669

DATE: 02/19/2025 JOB # 1907

STATE OF TEXAS
COUNTY OF COMAL

KNOWN ALL MEN BY THESE PRESENTS:

THE OWNER OF LAND SHOWN ON THIS PLAT AND WHOSE NAME IS SUBSCRIBED HERETO, AND IN PERSON OR THROUGH A DULY AUTHORIZED AGENT, HEREBY DEDICATES TO THE USE OF THE PUBLIC FOREVER ALL STREETS, PARKS, WATER COURSES, DRAINS, EASEMENTS AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSE AND CONSIDERATION THEREIN EXPRESSED.

OWNER

OWNER/DEVELOPER:
INAYAT MOMIN
VIATA BULVERDE PROPERTY
2931 ANTIQUE BEND
SAN ANTONIO, TEXAS 78259
PH: (210)–326–2551

STATE OF TEXAS
COUNTY OF COMAL

BEFORE ME, THE UNDERSIGNED AUTHORITY ON THIS DAY PERSONALLY APPEARED INAYAT MOMIN KNOWN 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 AND IN THE CAPACITY THEREIN STATED.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS

_____ DAY OF _____ , A.D. 20__

_____
NOTARY PUBLIC, BEXAR COUNTY, TEXAS

THIS PLAT OF BULVERDE CONVENIENCE STORE HAS BEEN SUBMITTED TO AND CONSIDERED BY THE CITY PLANNING AND ZONING COMMISSION OF THE CITY OF BULVERDE, TEXAS AND IS HEREBY APPROVED BY SUCH COMMISSION.

DATED THIS _____ DAY OF _____, YEAR_____

BY: _____
CHAIRPERSON

STATE OF TEXAS
COUNTY OF COMAL

I _____ COUNTY CLERK OF COMAL COUNTY, DO HEREBY CERTIFY THAT THIS PLAT WAS FILED FOR RECORD IN MY OFFICE, ON THE DAY OF _____ A.D. _____ AT _____ M. AND DULY RECORDED THE DAY OF _____ A.D. _____ AT _____ M. IN THE DEED AND PLAT RECORDS OF COMAL COUNTY, IN BOOK/VOLUME _____ ON PAGE _____ IN TESTIMONY WHEREOF, WITNESS MY HAND AND OFFICIAL SEAL OF OFFICE, THIS

_____ DAY OF _____ A.D., 20___.

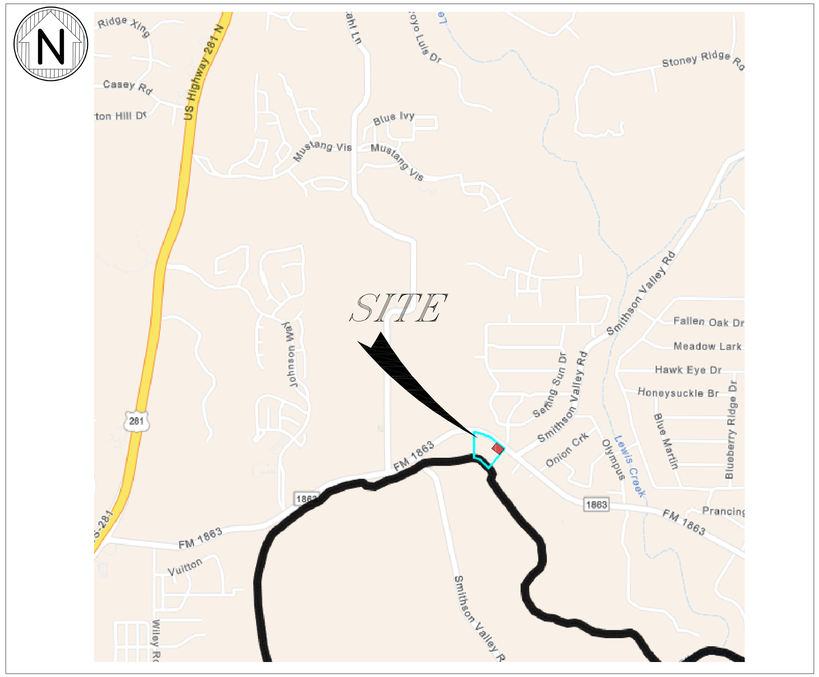
COUNTY CLERK, COMAL COUNTY TEXAS

BY: _____ , DEPUTY

4470 FM 1863

BULVERDE, TEXAS

CONSTRUCTION PLANS



LOCATION MAP

NOT TO SCALE.

INDEX to DRAWINGS

SHEET NUMBER	SHEET NAME	SHEET TITLE
1		COVER SHEET
2		PLAT
3	SDP-1 OF 1	SITE DIMENSIONAL PLAN
4	GRD-1 OF 1	GRADING PLAN
5	SED-1 OF 1	SEDIMENTATION & EROSION CONTROL PLAN
6	FPP-1 OF 1	FIRE PROTECTION PLAN
7	PP-1 OF 1	PAVEMENT PLAN
8	UP-1 OF 1	UTILITY PLAN

02/19/2025

STATE OF TEXAS
SALAH E. DIAB
55516
REGISTERED
PROFESSIONAL ENGINEER

PREPARED BY:

SCE
Seda Consulting Engineers, Inc.
Firm Registration No: F-1601 (210) 308-0057
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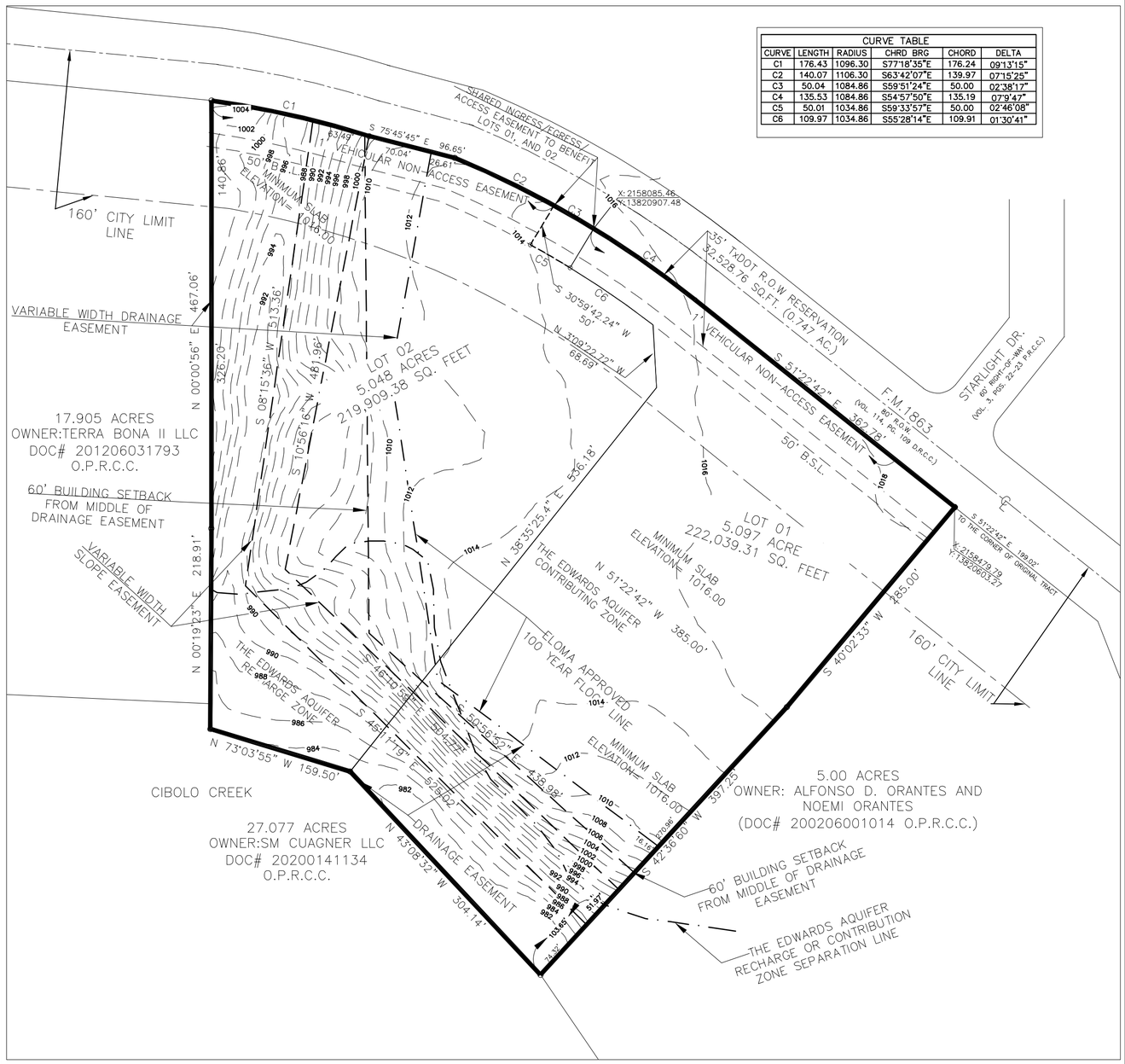

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CAESAR A. GARCIA
REGISTERED PROFESSIONAL LAND SURVEYOR
FIRM REGISTRATION NO. 10194785
14384 HUBER ROAD
SEGUIN, TEXAS 78155

STATE OF TEXAS · SALAH E. DIAB · 55516 · REGISTERED · PROFESSIONAL ENGINEER

STATE OF TEXAS · REGISTERED · CAESAR A. GARCIA · 5904 · PROFESSIONAL · LAND SURVEYOR

PLAT NUMBER

SUBDIVISION PLAT ESTABLISHING

BULVERDE CONVENIENCE STORE

BEING A TOTAL OF 10.698 ACRES SITUATED IN THE AGAPITAN GAYTON SURVEY NO. 194, ABSTRACT NO. 174, BEING PART OF 143.3 ACRES TRACT, AS RECORDED IN VOLUME 972, PAGE 803 OF THE PUBLIC OFFICIAL RECORDS OF COMAL COUNTY, TEXAS.

ESTABLISHING LOT 01,02 & 03, COMAL COUNTY, TEXAS.

N

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)
1 INCH = 100 FT.

Seda Consulting Engineers, Inc.
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6735 IH 10 W FAX: (210) 308–8842
SAN ANTONIO, TEXAS 78201 E–MAIL: SEDA@SATX.RR.COM
CIVIL·STRUCTURAL·ENVIRONMENTAL· PLANNER

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REGISTERED PROFESSIONAL LAND SURVEYOR
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14384 HUBER ROAD
SEGUIN, TEXAS 78155
PH: (512) 470–4669

DATE: 02/19/2025 JOB # 1907

STATE OF TEXAS
COUNTY OF COMAL

KNOWN ALL MEN BY THESE PRESENTS:

THE OWNER OF LAND SHOWN ON THIS PLAT AND WHOSE NAME IS SUBSCRIBED HERETO, AND IN PERSON OR THROUGH A DULY AUTHORIZED AGENT, HEREBY DEDICATES TO THE USE OF THE PUBLIC FOREVER ALL STREETS, PARKS, WATER COURSES, DRAINS, EASEMENTS AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSE AND CONSIDERATION THEREIN EXPRESSED.

OWNER

OWNER/DEVELOPER:
INAYAT MOMIN
VIATA BULVERDE PROPERTY
2931 ANTIQUE BEND
SAN ANTONIO, TEXAS 78259
PH: (210)–326–2551

STATE OF TEXAS
COUNTY OF COMAL

BEFORE ME, THE UNDERSIGNED AUTHORITY ON THIS DAY PERSONALLY APPEARED INAYAT MOMIN KNOWN 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 AND IN THE CAPACITY THEREIN STATED.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS

_____ DAY OF _____ , A.D. 20__

_____
NOTARY PUBLIC, BEXAR COUNTY, TEXAS

THIS PLAT OF BULVERDE CONVENIENCE STORE HAS BEEN SUBMITTED TO AND CONSIDERED BY THE CITY PLANNING AND ZONING COMMISSION OF THE CITY OF BULVERDE, TEXAS AND IS HEREBY APPROVED BY SUCH COMMISSION.

DATED THIS _____ DAY OF _____, YEAR_____

BY: _____
CHAIRPERSON

STATE OF TEXAS
COUNTY OF COMAL

I _____ COUNTY CLERK OF COMAL COUNTY, DO HEREBY CERTIFY THAT THIS PLAT WAS FILED FOR RECORD IN MY OFFICE, ON THE DAY OF _____ A.D. _____ AT _____ M. AND DULY RECORDED THE DAY OF _____ A.D. _____ AT _____ M. IN THE DEED AND PLAT RECORDS OF COMAL COUNTY, IN BOOK/VOLUME _____ ON PAGE _____ IN TESTIMONY WHEREOF, WITNESS MY HAND AND OFFICIAL SEAL OF OFFICE, THIS

_____ DAY OF _____ A.D., 20___.

COUNTY CLERK, COMAL COUNTY TEXAS

BY: _____ , DEPUTY

LOCATION MAP NOT TO SCALE

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1 INCH = 40 FT.

STARLIGHT DR
60' R.O.W.

35' TxDOT R.O.W RESERVATION
32,528.76 SQ.FT. (0.747 AC.)

F.M.1863
80' R.O.W.

SHARED INGRESS/EGRESS/
ACCESS EASEMENT TO BENEFIT
LOTS 01, AND 02

X: 2158085.46
Y: 13820907.48

S 51°22'42" E 362.78'

S 51°22'42" E 199.02'
TO THE CORNER OF ORIGINAL TRACT

X: 2158479.79
Y: 13820603.27

VEHICULAR NON-ACCESS EASEMENT

50' B.S.L.

S 75°45'45" E 96.65'
63.49' C1 70.04' 126.61'
1' VEHICULAR NON-ACCESS EASEMENT

C1 C2 C3 C4 C5 C6

R60.00' R30.00' R35.00' R35.31' R35.00' R35.00'

40.00' 27.72' 89.00' 30.40'

S 30°59'42.24" W
50'

STANDARD CURB

N 3°09'22.72" W
68.69'

25.00'

UNDERGROUND FUEL TANKS

FIRE EXTINGUISHERS WITHIN 75' (IFC 906.1)

164.00'

24.00'

BICYCLE PARKING

18.00' 9.00' 25.00' 17.41'

160' CITY LIMIT
STANDARD CURB LINE

S 40°02'33" W 285.00'

ENTRANCE TO THE
MAINTENANCE RAMP

N 38°35'25.4" E 536.18'

11.57'

STANDARD CURB

11 FT ACCESS RAMP

5 FT CHANNEL

WATER QUALITY POND
60'X100'

100.00' 60.00'

SEPTIC TANK
LOCATION

100.00' 60.00' 22.44'

S 42°36'60" W 397.25'

270.96'

16.16'

S 50°56'52" E 438.98'

S 46°10'59" E 504.77'

S 45°11'19" E 525.02'

51.97'

103.65'

74.32'

N 43°08'32" W 304.14'

N 73°03'55" W 159.50'

CIBOLO CREEK

DRAINAGE EASEMENT

THE EDWARDS AQUIFER
RECHARGE ZONE

60' BUILDING SETBACK
FROM MIDDLE OF
DRAINAGE EASEMENT

VARIABLE WIDTH
SLOPE EASEMENT

ELOMA APPROVED
100 YEAR FLOOD LINE

60' BUILDING SETBACK
FROM MIDDLE OF DRAINAGE
EASEMENT

THE EDWARDS AQUIFER
RECHARGE OR CONTRIBUTION
ZONE SEPARATION LINE

N 00°19'23" E 218.91'

S 10°56'16" W 481.96'

S 08°15'56" W 526.20'

N 00°00'56" E 467.06'

BASED ON UDC TABLE 526-3b

Use: RETAIL.	Area: SQFT	Minimum Vehicle Spaces
Convenience store	6000 sqft	6 per 1,000 S.F. GFA
		6000 / 1,000 X 6 = 36 spaces

Use: RETAIL.	Area: SQFT	Minimum Vehicle Spaces
Retail	1500 sqft	1 per 300 S.F. GFA
		1500/ 300 = 5 spaces

Minimum vehicle spaces required = 41
Vehicle spaces provided = 54
Compact vehicle spaces provided = 0
Minimum accessible vehicle spaces required, 1 standard 1 van
Accessible vehicle spaces provided, 2 standard 2 van

02/19/2025
SALAH E. DIAB 85516 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS

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4470 FM 1863 BULVERDE

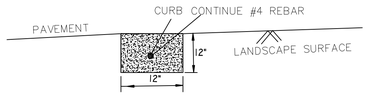
CITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS

SITE PLAN

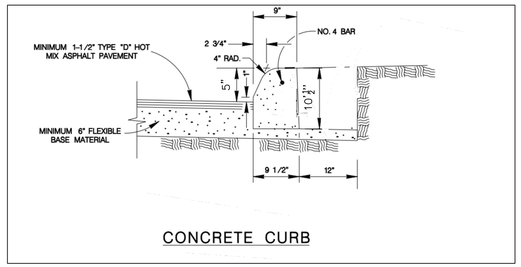
JOB NO: 1907
DATE: 02/12/2025
DRAWN BY: AS
CHECKED BY: SED
SHEET: SDP 1 OF 1

C-3

LOCATION MAP
NOT TO SCALE



LOWDOWN CURB DETAIL
N.T.S.



CONCRETE CURB

CURB DETAIL
N.T.S.

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1 INCH = 20 FT.

LEGEND
- EXISTING GRADE
- PROPOSED GRADE
- F.F.E. FINISHED FLOOR ELEVATION
- 988.00 PROPOSED CONTOURS
- 988.00 EXISTING CONTOURS

STARLIGHT DR.
60' R.O.W.

F.M.1863
80' R.O.W.

35' TxDOT R.O.W RESERVATION
32,528.76 SQ.FT. (0.747 AC.)

SHARED INGRESS/EGRESS/ ACCESS EASEMENT TO BENEFIT LOTS 01, AND 02

X: 2158085.46
Y: 13820907.48

S 75°45'45" E 96.65'

C1 C2 C3 C4 C5 C6

S 53°47'37" E 30.04'

S 30°59'42.24" W 50'

N 3°09'22.72" W 68.69'

IRREGULAR NON-ACCESS EASEMENT

150' B.S.L.

140.98'

ENTRANCE TO THE MAINTENANCE RAMP

N 38°35'25.4" E 18'

S 51°22'42" E 362.78'

S 51°22'42" E 199.02'
TO THE CORNER OF ORIGINAL TRACT

X: 2158479.79
Y: 13820603.27

STANDARD CURB

50' B.S.L.

285.00'

S 40°02'33" W 317.62

160' CITY LIMIT LINE

160' CITY LIMIT LINE

467.06'

S 08°15'36" W 320.26'

N 00°00'56" E 320.56'

S 10°56'19" W 48.47'

ELOMA APPROVED 100 YEAR FLOOD LINE

VARIABLE WIDTH DRAINAGE EASEMENT

WATER QUALITY POND

SEPTIC TANK LOCATION

SEDIMENTATION POND (100'X30')

ROCK BERM WITH GAMBIAN WIRE

WEIR CUT

397.25'

S 42°36'60" W

S 50°56'52" E 438.98'

60' BUILDING SETBACK FROM MIDDLE OF DRAINAGE EASEMENT

THE EDWARDS AQUIFER RECHARGE OR CONTRIBUTION ZONE SEPARATION LINE

60' BUILDING SETBACK FROM MIDDLE OF DRAINAGE EASEMENT

218.91'

N 00°19'23" E

VARIABLE WIDTH SLOPE EASEMENT

THE EDWARDS AQUIFER RECHARGE ZONE

S 45°41'19" E 525.02'

DRAINAGE EASEMENT

N 73°03'55" W 159.50'

N 43°08'32" W 304.14'

CIBOLO CREEK

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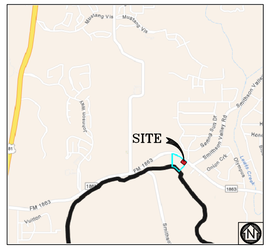
Revisions:

02/19/2025

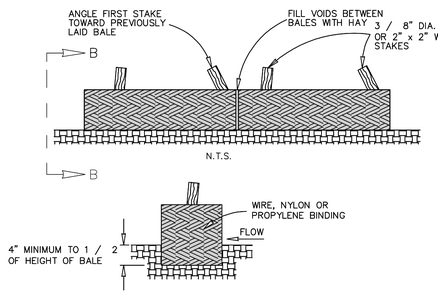
STATE OF TEXAS — SALAH E. DIAB — 85516 — LICENSED PROFESSIONAL ENGINEER

4470 FM 1863
CITY OF BULVERDE, COMAL COUNTY, TEXAS
GRADING PLAN

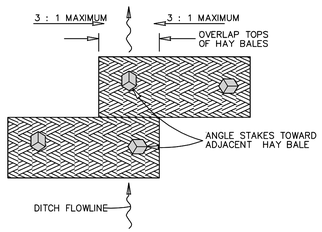
JOB NO. 1907
DATE: 02/19/2025
DRAWN BY: AS
CHECKED BY: SED
SHEET: C-4



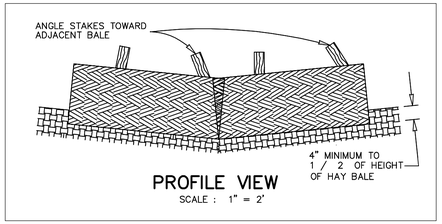
LOCATION MAP
NOT TO SCALE



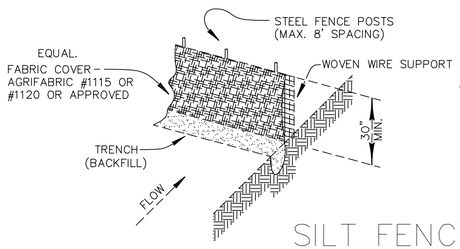
SECTION B–B
N.T.S.



PLAN VIEW
N.T.S.



PROFILE VIEW
SCALE : 1" = 2'



SILT FENCE

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 INCH = 60 FT.

GENERAL NOTES (CONSTRUCTION EXIT)

1. Stone size – 3 to 5 inch open graded rock
2. Length – as effective, but not less than 50 feet.
3. Thickness – not less than 8 inches.
4. Width – not less than full width of all points of ingress or egress.
5. Washing – when necessary, wheels shall be cleaned to remove sediment prior to entrance onto public roadway. When washing is required, it shall be done on an area stabilized with crushed stone which drains into an approved strap or sediment basin. All sediment shall be prevented from entering any storm, drain, ditch, or watercourse using approved methods.
6. Maintenance – the entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public roadways. This may require periodic 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 roadway must be removed immediately.
7. Drainage – entrance must be properly graded or incorporate a drainage swale to prevent runoff from leaving the construction site.

BALED HAY USAGE GUIDELINES

A BAILED HAY INSTALLATION MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF. A TWO YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED. THE INSTALLATION SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 5 GPM / FT SQUARED OF CROSS SECTIONAL AREA. BALED HAY MAY BE USED AT THE FOLLOWING LOCATIONS:

1. WHERE THE RUNOFF APPROACHING THE BALED HAY FLOWS OVER DISTURBED SOIL FOR LESS THAN 100'. IF THE SLOPE OF THE DISTURBED SOIL EXCEEDS 10 %, THE LENGTH OF SLOPE UPSTREAM OF THE BAILED HAY SHOULD BE LESS THAN 50'.
2. WHERE THE INSTALLATION WILL BE REQUIRED FOR LESS THAN 3 MONTHS.
3. WHERE THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 1 / 2 ACRE.

FOR BALED HAY INSTALLATIONS IN SMALL DITCHES, THE FOLLOWING ADDITIONAL CONDI–TIONAL CONSIDERATIONS APPLY:

1. THE DITCH SIDESLOPES SHOULD BE GRADED AS FLAT AS POSSIBLE TO MAXIMIZE THE DRAINAGE FLOW RATE THRU THE HAY.
2. THE DITCH SHOULD BE GRADED LARGE ENOUGH TO CONTAIN THE OVERLAPPING DRAINAGE WHEN SEDIMENT HAS FILLED TO THE TOP OF THE BAILED HAY.

BALES SHOULD BE REPLACED USUALLY EVERY 2 MONTHS OR MORE OFTEN DURING WET WEATHER WHEN LOSS OF STRUCTURAL INTERGRITY IS ACCELERATED.

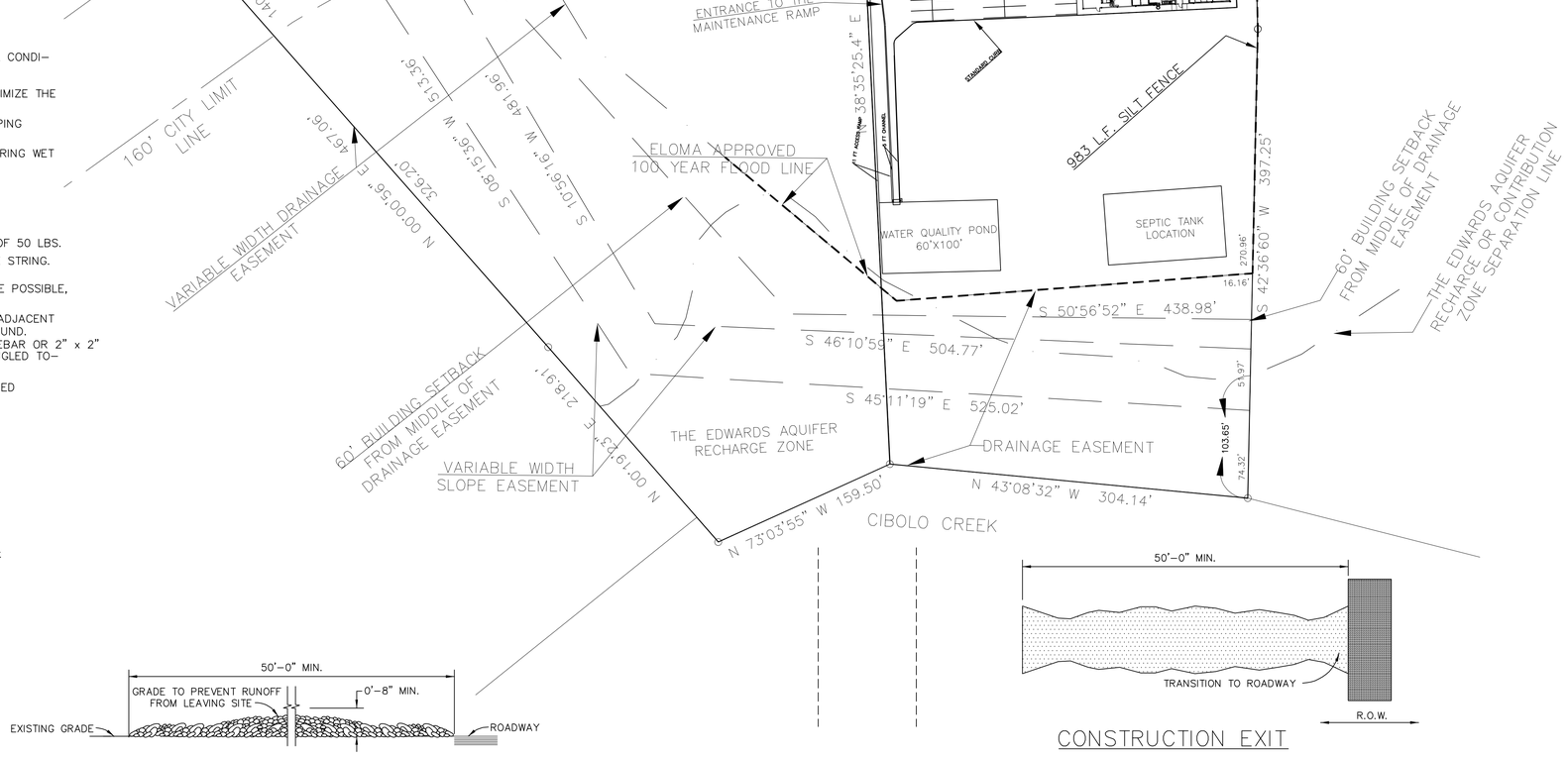
GENERAL NOTES

1. HAY BALES SHALL BE A MINIMUM OF 30" IN LENGTH AND WEIGH A MINIMUM OF 50 LBS.
2. HAY BALES SHALL BE BOUND BY EITHER WIRE OR NYLON OR POLYPROPYLENE STRING. THE BALES SHALL BE COMPOSED ENTIRELY OF VEGETABLE MATTER.
3. HAY BALES SHALL BE EMBEDDED IN THE SOIL A MININMUM OF 4" AND, WHERE POSSIBLE, ONE–HALF THE HEIGHT OF THE BALE.
4. HAY BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES. THE BALES SHALL BE PLACED WITH BINDINGS PARALLEL TO THE GROUND.
5. HAY BALES SHALL BE SECURELY ANCHORED IN PLACE WITH 3 / 8" DIA. REBAR OR 2" x 2" WOOD STAKES DRIVEN THROUGH THE BALES. THE FIRST STAKE SHALL BE ANGLED TO–WARDS THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

BALED HAY FOR EROSION CONTROL

GENERAL NOTES (SILTATION FENCE)

1. Steel posts which support the silt fence shall be installed on a slight angle toward the anticipated runoff source.
2. 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.
3. The trench should be a minimum of 6 inches deep and 3–4 feet wide to allow for the silt fence to be laid in the ground and backfilled.
4. Silt fence should be securely fastened to each steel support post or to woven wire, which is in turn attached to the steel fence posts.
5. Inspection shall be frequent and repair or replacement shall be made promptly as needed.
6. Silt fence shall be removed when it has served its usefulness, so as not to block or impede storm flow or drainage.
7. Sediment trapped by this practice shall be disposed of in an approved site in a manner that will not contribute to additional siltation.
8. Accumulated silt shall be removed when it reaches a depth of 6 inches and disposed of in an approved spoil site or as in No. 7 above.



CONSTRUCTION EXIT

Revisions:

2/19/2025
STATE OF TEXAS
SALAH E. DIAB
55516
REGISTERED PROFESSIONAL ENGINEER

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CIVIL • STRUCTURAL • ENVIRONMENTAL • PLANNER

4470 FM 1863
CITY OF BULVERDE, COMAL COUNTY, TEXAS
SEDIMENTATION EROSION CONTROL PLAN

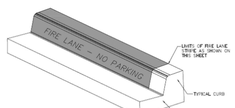
JOB NO. 1907
DATE: 02/18/2025
DRAWN BY: AS
CHECKED BY: SED
SHEET:

C-4

LOCATION MAP NOT TO SCALE

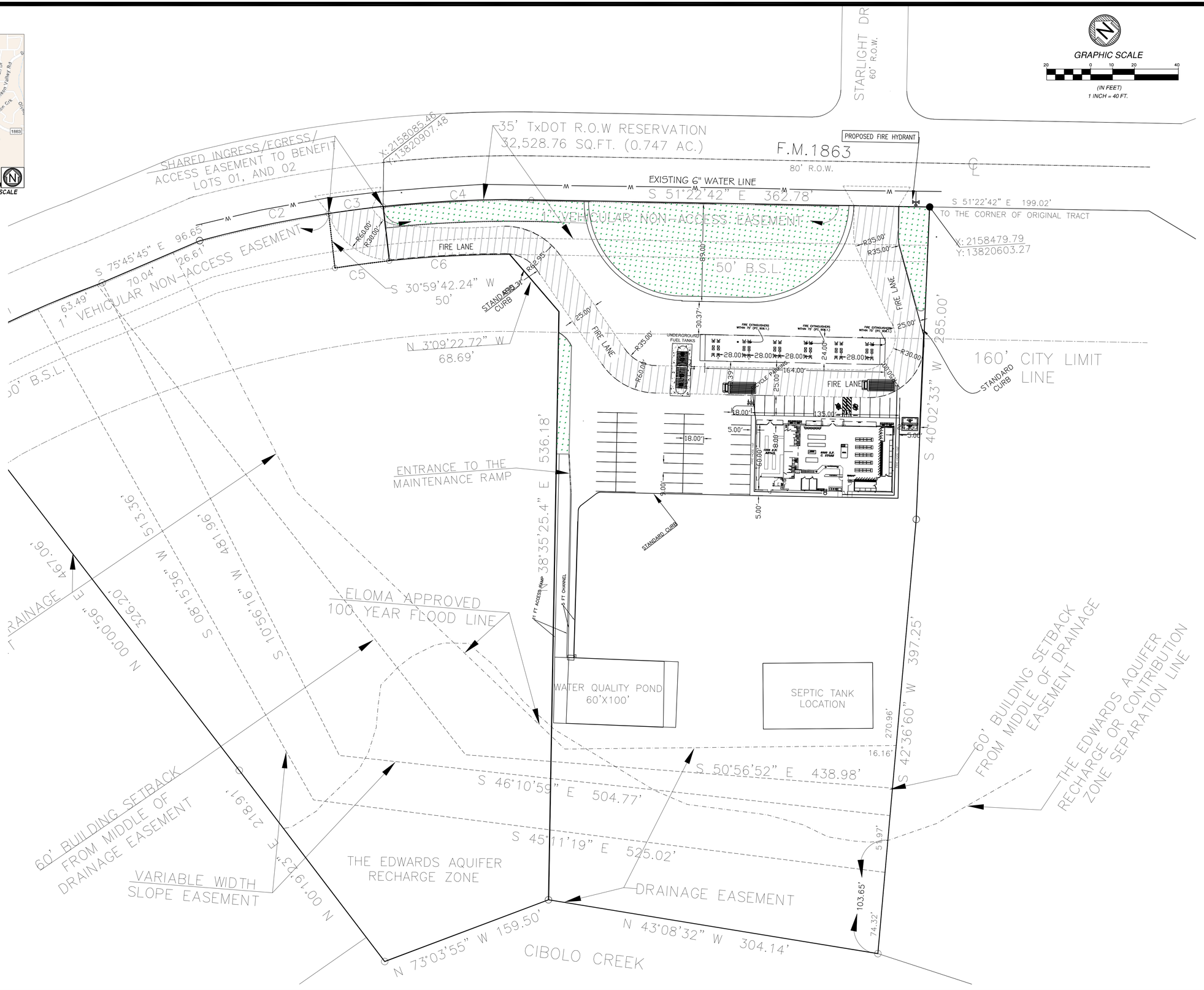
NOTES:
1. LETTERS AND BORDER IN RED ON WHITE BACKGROUND.
2. STANDARD SIZE OF SIGN SHALL BE 12"x18" AS SPECIFIED BY THE TEXAS OCCUPATIONAL CODE.
3. FIRE PLAN REVIEWER OR FIRE INSPECTOR WILL MAP OUT THE LOCATIONS AND NUMBER OF SIGNS REQUIRED.
4. BOTTOM OF EDGE OF THE SIGN MUST BE AT LEAST SEVEN (7) FEET ABOVE GRADE WHERE THE SIGN IS INSTALLED AND AT LEAST TWO (2) FEET FROM THE BACK OF CURB.

FIRE LANE SIGN DETAIL (COSA)
NOT TO SCALE



APPLICATION:
1. ON EXISTING 6" CURB: PAINT RED LANE STRIPE ON BOTH FACE AND TOP OF CURB PAINT WHITE LETTERS ON FACE OF CURB ONLY.
2. WHERE NO CURB EXIST: PAINT A 6" WIDE RED STRIPE LOCATED 1.0' OFF EDGE OF PAVEMENT WITH 4" WHITE LETTER IN RED STRIPE.
3. SEE SITE PLAN FOR CURB TYPES AND LOCATIONS
4. NO MORE THAN 40 FEET SPACING BETWEEN WORDING

TYPICAL FIRE LANE MARKING DETAIL
NOT TO SCALE



02/19/2025

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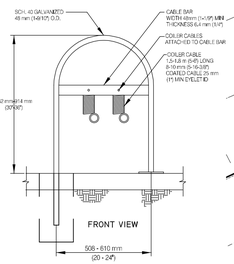
4470 FM 1863 BULVERDE

CITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS

FIRE PROTECTION PLAN

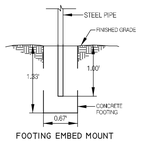
JOB NO: 1907
DATE: 02/12/2025
DRAWN BY: AS
CHECKED BY: SED
SHEET: FRR 1 OF 1

C-6

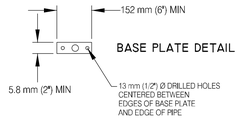


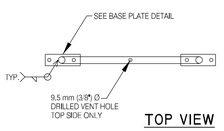
CLASS II STYLE BICYCLE PARKING

NOT TO SCALE

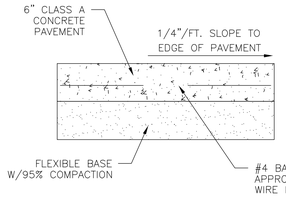


FOOTING EMBED MOUNT



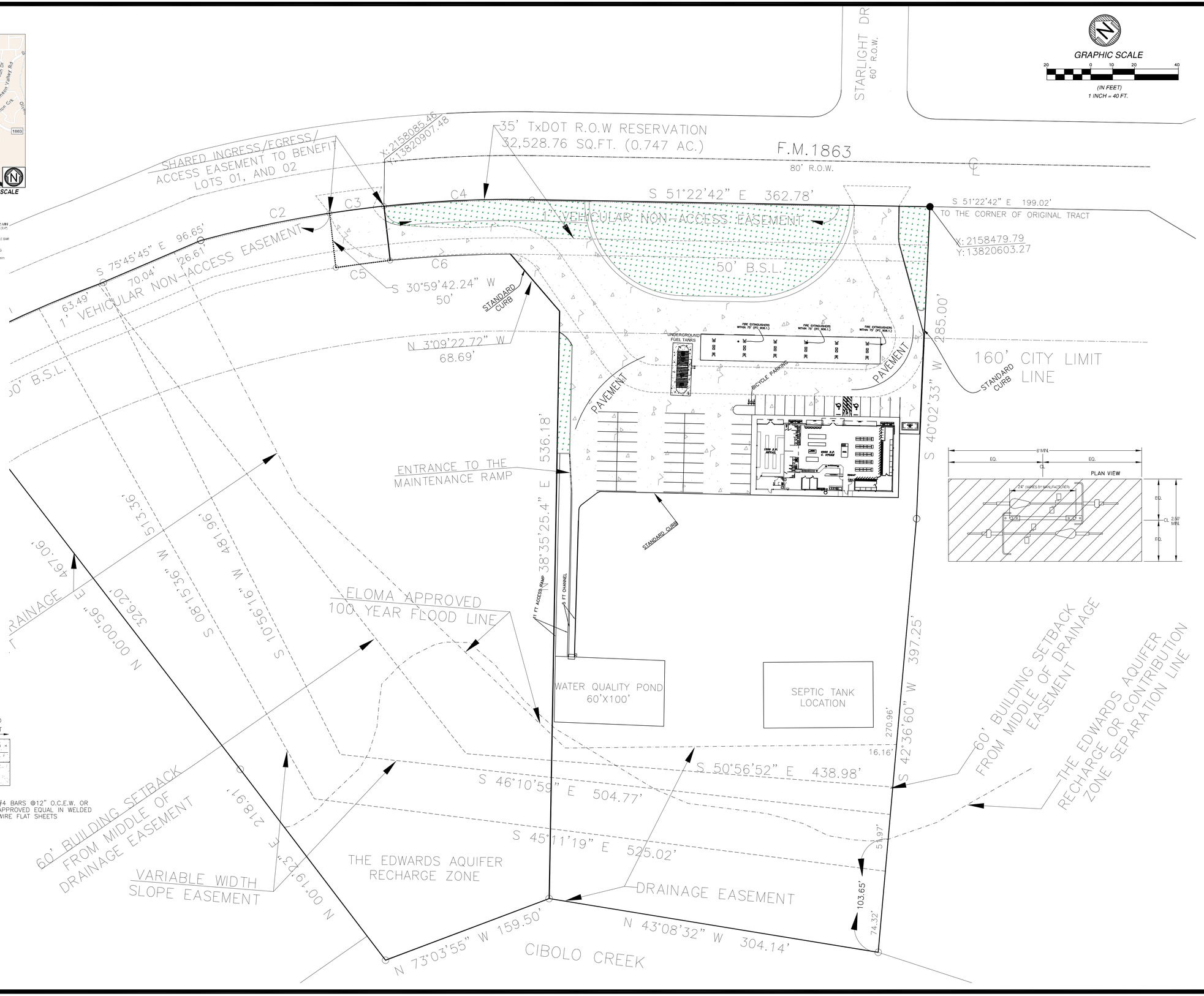


TOP VIEW



CONCRETE PAVEMENT

NOTE:
USE 7" EXTRA STRENGTH CONCRETE FOR DRIVE-THRU LANE AND DUMPSTER SITE.



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CIVIL• STRUCTURAL • ENVIRONMENTAL• PLANNER

02/19/2025

4470 FM 1863

CITY OF BULVERDE, COMAL COUNTY, TEXAS

PAVEMENT PLAN

JOB NO:	1907
DATE:	02/12/2025
DRAWN BY:	AS
CHECKED BY:	SED
SHEET:	SP 1 OF 1

C-7

LOCATION MAP NOT TO SCALE

NOTE:
CONTRACTOR SHOULD FOLLOW THE EAST CENTRAL SPECIAL UTILITY DETAILS FOR ALL CONSTRUCTION RELATED TO WATER FACILITY IN THIS PROJECT.

CAUTION:
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC AND PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO WATER, SANITARY SEWER, STORM SEWERS, CULVERTS, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC LINES, DUCTBANKS, LANDSCAPE IRRIGATION LINES, GAS LINES. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT THE SOLE EXPENSE OF THE CONTRACTOR. ANY UTILITY CONFLICTS THAT ARISE SHALL BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION.

CAUTION:
THE CONTRACTOR SHALL EXERCISE EXTREME CARE WHEN WORKING UNDER "HIGH VOLTAGE TRANSMISSION LINES". A WORKING HEIGHT OF 30 FEET FROM GROUND ELEVATION WILL BE OBSERVED WHEN WORKING UNDER HIGH VOLTAGE LINES. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY.

GRAPHIC SCALE
20 0 10 20 40
(IN FEET)
1 INCH = 40 FT.

STARLIGHT DR
60' R.O.W.

FOR SPECIFICATION REFER TO SOUTH WEST WATER CO UTILITY

35' TxDOT R.O.W RESERVATION
32,528.76 SQ.FT. (0.747 AC.)

F.M.1863
80' R.O.W.

PROPOSED FIRE HYDRANT

DOMESTIC SERVICE (RETAIL)
1" TAPPING SADDLE
11.5 LF-1" COPPER PIPE
1-1" WATER METER
STANDARD METER BOX

EXISTING 6" WATER LINE
S 51°22'42" E 362.78'

S 51°22'42" E 199.02'
TO THE CORNER OF ORIGINAL TRACT

Y: 2158479.79
Y: 13820603.27

1" BACK FLOW PREVENTOR

SHARED INGRESS/EGRESS/ ACCESS EASEMENT TO BENEFIT LOTS 01, AND 02

X: 2158085.46
Y: 13820907.48

S 75°45'45" E 96.65'
63.49' C2 70.04' C3 126.61' C4
1' VEHICULAR NON-ACCESS EASEMENT

1' VEHICULAR NON-ACCESS EASEMENT

50' B.S.L.

C5
C6
S 30°59'42.24" W
50'

STANDARD CURB

N 3°09'22.72" W
68.69'

UNDERGROUND FUEL TANKS

FIRE EXTINGUISHERS WITHIN 75' (TYP., 906.1.)

BICYCLE PARKING

PROPOSED 1.5" WATER LINE

160' CITY LIMIT LINE

S 40°02'33" W 285.00'

ENTRANCE TO THE MAINTENANCE RAMP

N 38°35'25.4" E 536.18'

STANDARD CURB

TWO-WAY CLEAN OUT

MIN 4" SANITARY SEWER LINE

11' FT ACCESS RAMP

5 FT CHANNEL

WATER QUALITY POND
60'X100'

SEPTIC TANK LOCATION

S 42°36'60" W 397.25'

270.96'

16.16'

ELOMA APPROVED
100 YEAR FLOOD LINE

N 00°00'56" E 326.20'
S 08°15'26" W 481.96'
S 10°56'16" W 467.06'

60' BUILDING SETBACK FROM MIDDLE OF DRAINAGE EASEMENT

60' BUILDING SETBACK FROM MIDDLE OF DRAINAGE EASEMENT

THE EDWARDS AQUIFER RECHARGE OR CONTRIBUTION ZONE SEPARATION LINE

S 50°56'52" E 438.98'
S 46°10'59" E 504.77'
S 45°11'19" E 525.02'

51.97'

VARIABLE WIDTH SLOPE EASEMENT

N 00°19'25" E 218.97'

THE EDWARDS AQUIFER RECHARGE ZONE

DRAINAGE EASEMENT

103.65'
74.32'

N 43°08'32" W 304.14'
N 73°03'55" W 159.50'

CIBOLO CREEK

02/19/2025

Seda Consulting Engineers, Inc.
Firm Registration No: F-1601
6735 IH 10 West
San Antonio, Texas 78201
(210) 308-0057
FAX:(210) 308-8842
e-mail: seda@satx.rr.com
CIVIL• STRUCTURAL • ENVIRONMENTAL• PLANNER

4470 FM 1863
CITY OF BULVERDE, COMAL COUNTY, TEXAS
UTILITY PLAN

JOB NO: 1907
DATE: 02/19/2025
DRAWN BY: AS
CHECKED BY: SED
SHEET: UP 1 OF 1

C-8

Traffic Impact Analysis - REVISED

Gas Station

Bulverde, Texas

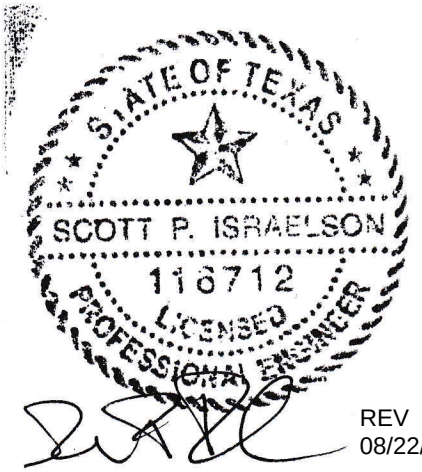
22 August 2023

TRAFFIC IMPACT GROUP, LLC
1431 Greenway Drive, Suite 800
Irving, TX 75038
972.358.6383
Firm #16210

TRAFFIC IMPACT GROUP, LLC

Gas Station - Bulverde

I hereby certify that this report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Texas.



REV
08/22/2023

Scott P. Israelson, P.E., PTOE
License No. 116712

Executive Summary

Project Description

A C-store with gas pumps is proposed to be developed in Bulverde, Texas. The development is proposed to consist of a 7,000 SF convenience store with twelve fueling positions. The site is located on the west side of FM 1863 at Starlight Drive.

The property will have two full-access driveways to FM 1863, one of which will align with Starlight Drive.

Methodology was provided to the City prior to beginning analysis. This study will be used in support of TxDOT access permit requests. This REVISED analysis incorporates comments from the City.

Trip Generation

The proposed new development is expected to generate 51 entering trips and 50 exiting net new trips in the AM peak hour, and 44 entering and 43 exiting net new trips in the PM peak hour. This site will also have pass-by/diverted link trip reductions, which have been included in the driveway analysis.

Turn Lanes/Access Management

The two accesses are proposed to be approximately 200 feet apart which is below TxDOT access spacing requirements. It is **recommended** to seek a waiver of access spacing for Access A.

The developer proposes right-turn lanes at both driveways.

Intersection Sight Distance

Access A is located east of a horizontal curve on FM 1863 and does not have ISD. The developer owns the property adjacent to this development. It is **recommended** to create a sight distance easement along the frontage of the adjacent property so that trees and shrubs can be cleared to provide sight distance.

Traffic Impacts

FM 1863 & Starlight Drive/Access B

For the Full Build scenario, vehicles exiting the development are projected to experience LOS F for both peak hours. It is recommended to install a traffic signal at this intersection.

Recommended Improvements

The following summarizes recommended improvements:

Adjacent Property (Full Build)

- Create a sight distance easement along the property frontage to clear trees and shrubs.

FM 1863 & Access A (Full Build)

- Stripe a westbound left-turn lane the driveways. It may be necessary to restrict this driveway to right-in/right-out only due to proximity to Starlight Drive.

FM 1863 & Starlight Drive/Access B (Full Build)

- Install a traffic signal.
- Stripe a westbound left-turn lane.

Table of Contents

I. Introduction

A C-store with gas pumps is proposed to be developed in Bulverde, Texas. The site is located on the west side of FM 1863 at Starlight Drive.

The development is proposed to consist of a 7,000 SF convenience store with twelve fueling positions. The property will have two full-access driveways to FM 1863, one of which will align with Starlight Drive.

Methodology was provided to the City prior to beginning analysis.

The study area included the following intersections:

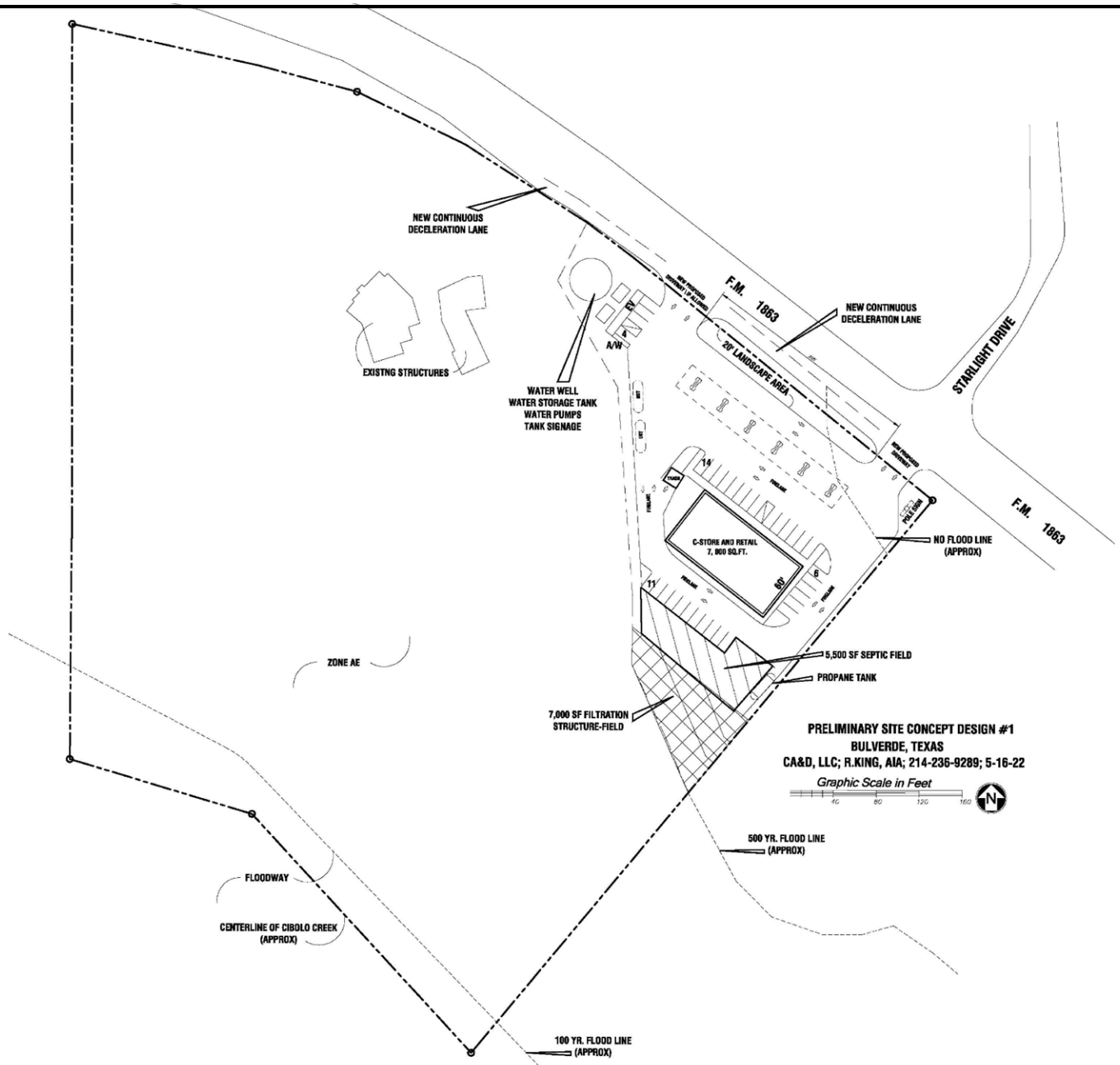
- FM 1863 & Access A
- FM 1863 & Starlight Drive/Access B
- FM 1863 & Smithson Valley Road

The study analyzed the following scenarios:

- 2022 Existing Conditions
- Full Build 2023 Conditions

The AM peak hour and PM peak hour were analyzed.

Figure 1 shows the most recent site plan. **Figure 2** shows the project vicinity map.



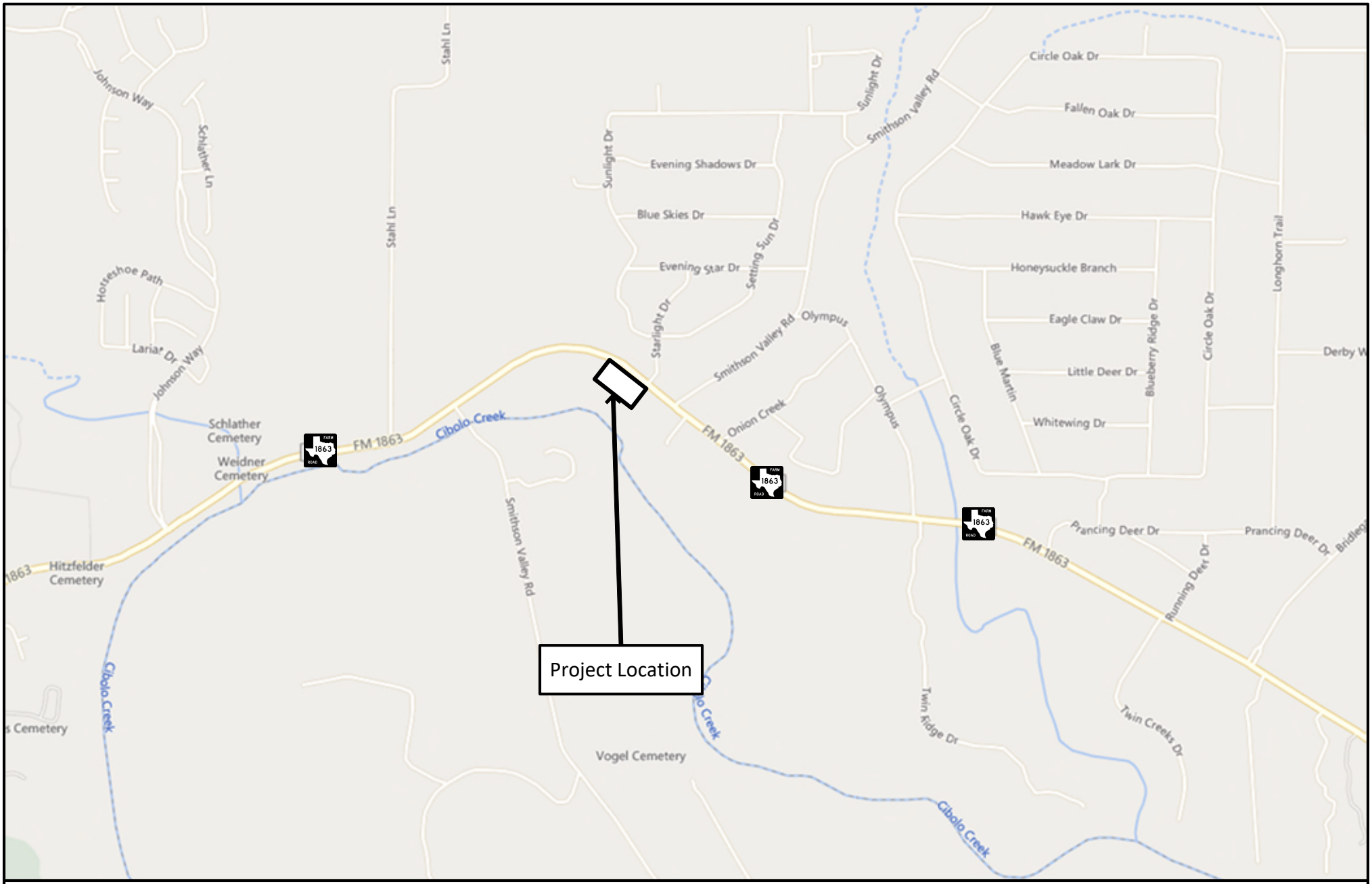
Site Plan

Date: 18 October 2022

Figure 1

Gas Station - Bulverde

TRAFFIC IMPACT GROUP, LLC



Vicinity Map

Figure 2

Gas Station – Bulverde

Date: 18 October 2022

TRAFFIC IMPACT GROUP, LLC

II. Existing Conditions

A. Existing Roadway Conditions

Table 2.1 presents a summary of the existing roadway conditions in the study area. **Figure 3** shows the roadways in the study area.

Table 2.1 - Existing Roadways			
Street Name	Functional Class	Typical Section	Posted Speed
FM 1863	Principal Arterial	Two-lane undivided	55 mph
Smithson Valley Rd	Principal Arterial	Two-lane undivided	30 mph
Starlight Drive	Local street	Two-lane undivided	30 mph

B. Existing Intersection Geometry

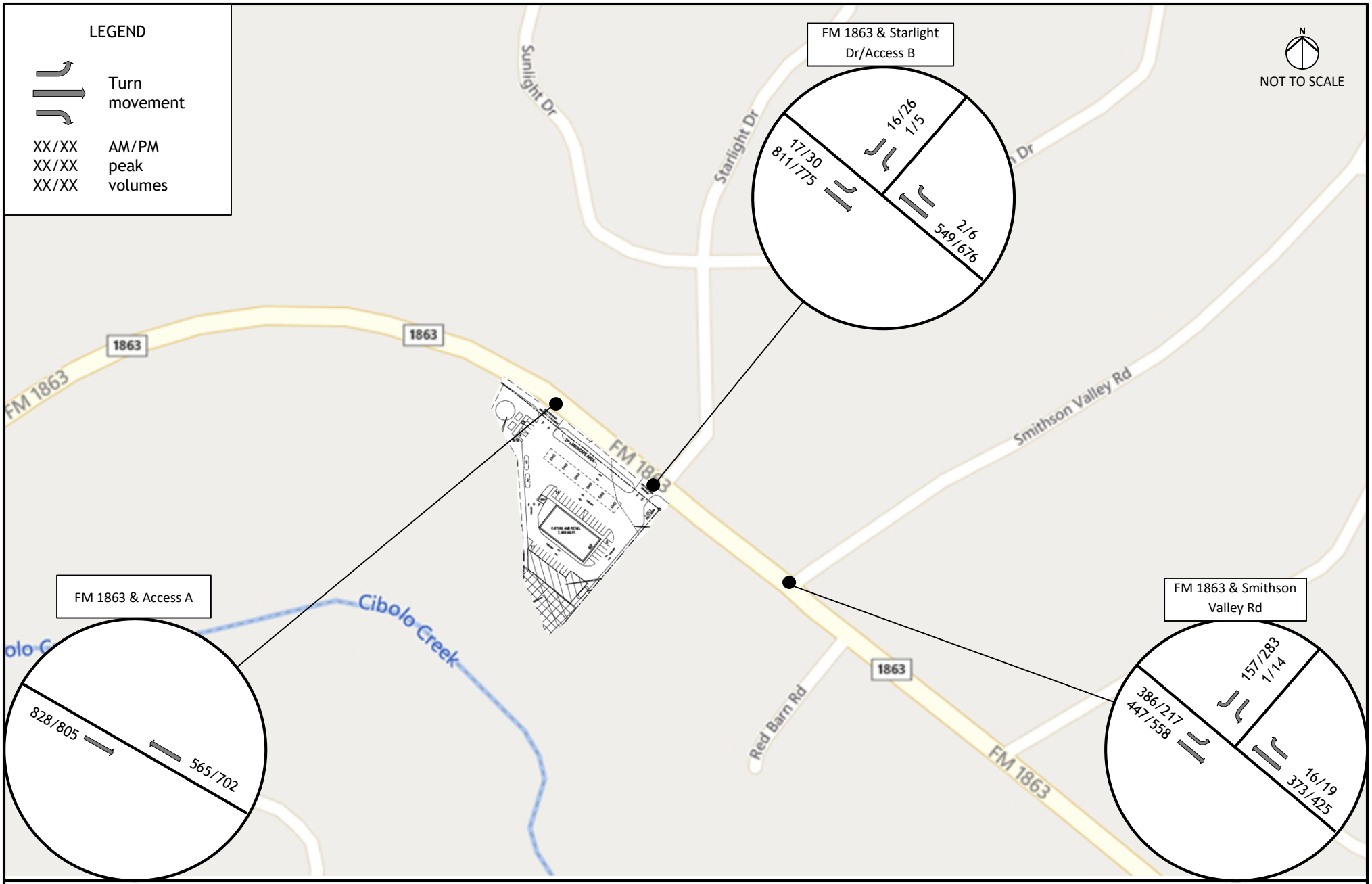
Access A is proposed to be a full-access driveway to FM 1863. It will be located approximately 200 feet northwest of Starlight Drive. The developer proposes to construct a right-turn lane as part of development. FM 1863 is a three-lane section at this location tapering to a two-lane undivided section west of the driveway.

FM 1863 & Starlight Drive is an unsignalized T-intersection. Access B will be the south leg of the intersection and FM 1863 has a TWLTL that allows left-turn lane striping for both directions. The developer proposes to construct a right-turn lane as part of development.

FM 1863 & Smithson Valley Road is an unsignalized T-intersection. FM 1863 tapers to a two-lane undivided roadway east of this intersection.

C. Traffic Volumes

Traffic data collection for study area intersections was performed on October 4, 2022. **Figure 4** displays existing traffic volumes. These volumes can be found in the Appendix.



Existing Traffic Volumes

Figure 3

Gas Station - Bulverde

Date: 18 October 2022

TRAFFIC IMPACT GROUP, LLC

III. Methodology

A. Base Assumptions

Intersection capacity analysis was conducted using Synchro v11.0. Trip generation was calculated using the 11th edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. Traffic signal and all-way stop warrants were examined using the Manual on Uniform Traffic Control Devices (MUTCD).

Turn lanes on state roadways were examined using guidelines from the TxDOT *Access Management Manual*.

B. Background Growth

The average annual background growth rate is calculated using historical AADT volumes. Calculations show that the background growth on FM 1863 is 4.35% per year. These calculations can be found in the Appendix.

Existing volumes were increased by 4% to estimate background growth for Full Build 2023 conditions.

C. Trip Generation

The development is proposed to consist of a 7,000 SF convenience store with twelve fueling positions.

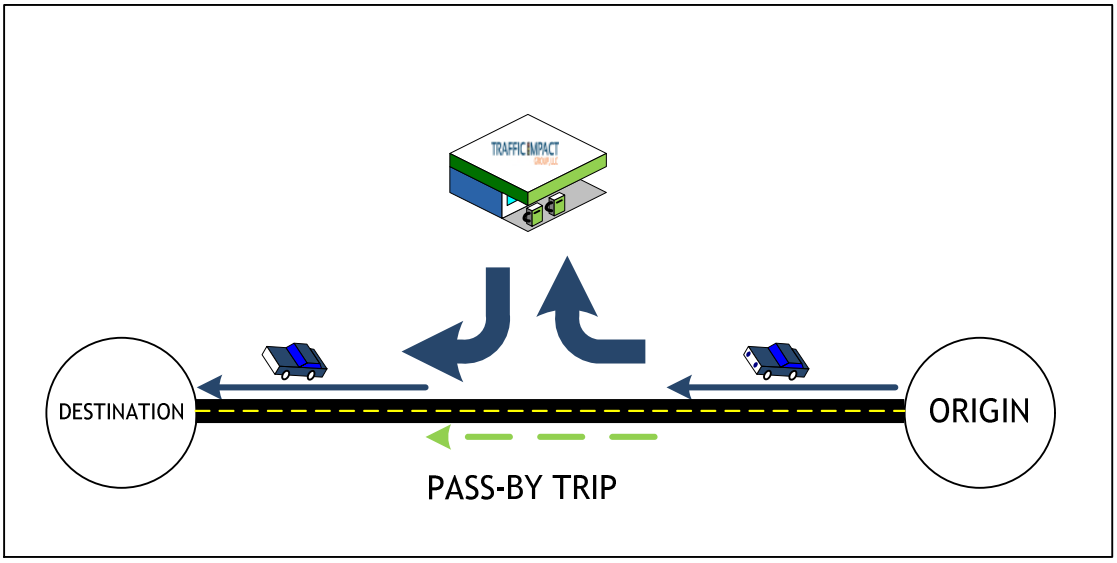
The *ITE Trip Generation Manual, 11th Edition* was used to estimate the projected trips by this development. Table 3.1 contains the summary of the land uses and sizes used for trip generation estimates.

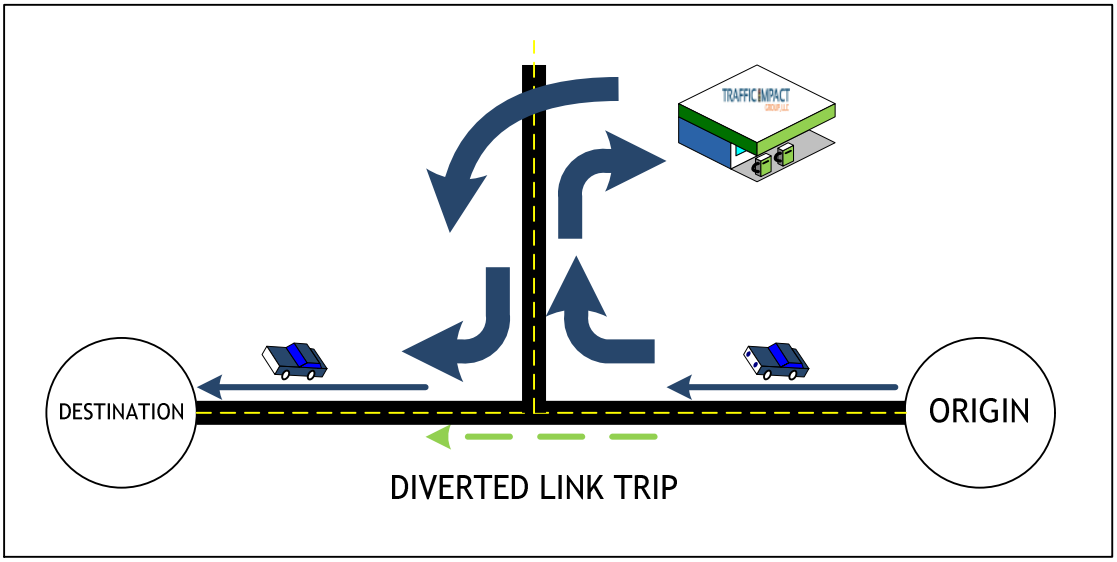
Table 3.1 - ITE Trip Generation

Average Weekday Driveway Volumes					AM Peak Hour		PM Peak Hour	
Land Use	**ITE Code**	**Size**		**Daily Trips**	**Enter**	**Exit**	**Enter**	**Exit**
Gasoline/Service Station with Convenience Market (5.5k to 10k)	945	12	Fueling Positions	4149	190	189	162	161
Driveway Peak Hour Trips					**190**	**189**	**162**	**161**
Pass-By/Diverted Link Reduction - from ITE Manual								
Pass-By/Diverted Link Reduction		*Gasoline/Service Station with Convenience Market (75% AM/73% PM)*			*-139*	*-139*	*-118*	*-118*
Total New Peak Hour Trips to Adjacent Network					**51**	**50**	**44**	**43**

Pass-by reductions are included to account for the phenomenon where land uses such as convenience stores or other similar uses attract vehicles whose ultimate destination is elsewhere. These driveway turning movement trips replace what would otherwise be “through”

movements, but do not contribute to "new trips" on the roadway network. This reduction was calculated in accordance with the *ITE Trip Generation Handbook, 3rd Edition.*
The following graphic illustrates how pass-by and diverted link trips affect traffic calculations at the project driveways and adjacent intersection.





Pass-by trips are capped at 10% of the adjacent roadway peak hour volumes. The percentages and directionality of pass-by and diverted link trips is based on the count data collected in the peak hours. Table 3.3 summarizes the calculation.

Table 3.3 - Pass-by/Diverted Link Trips

Roadway	Direction	AM Volume	% of total AM	AM Pass-by Trips	PM Volume	% of total PM	PM Pass-by Trips
FM 1863	EB Through	828	59.4%	83	805	53.4%	63
	WB Through	565	40.6%	56	702	46.6%	55

Pass-by trips are shown in **Figure 4**.

D. Trip Distribution

Trips for this proposed development were assigned to the surrounding roadway network based on engineering judgment. The proposed trip distribution is shown in **Figure 4b**.

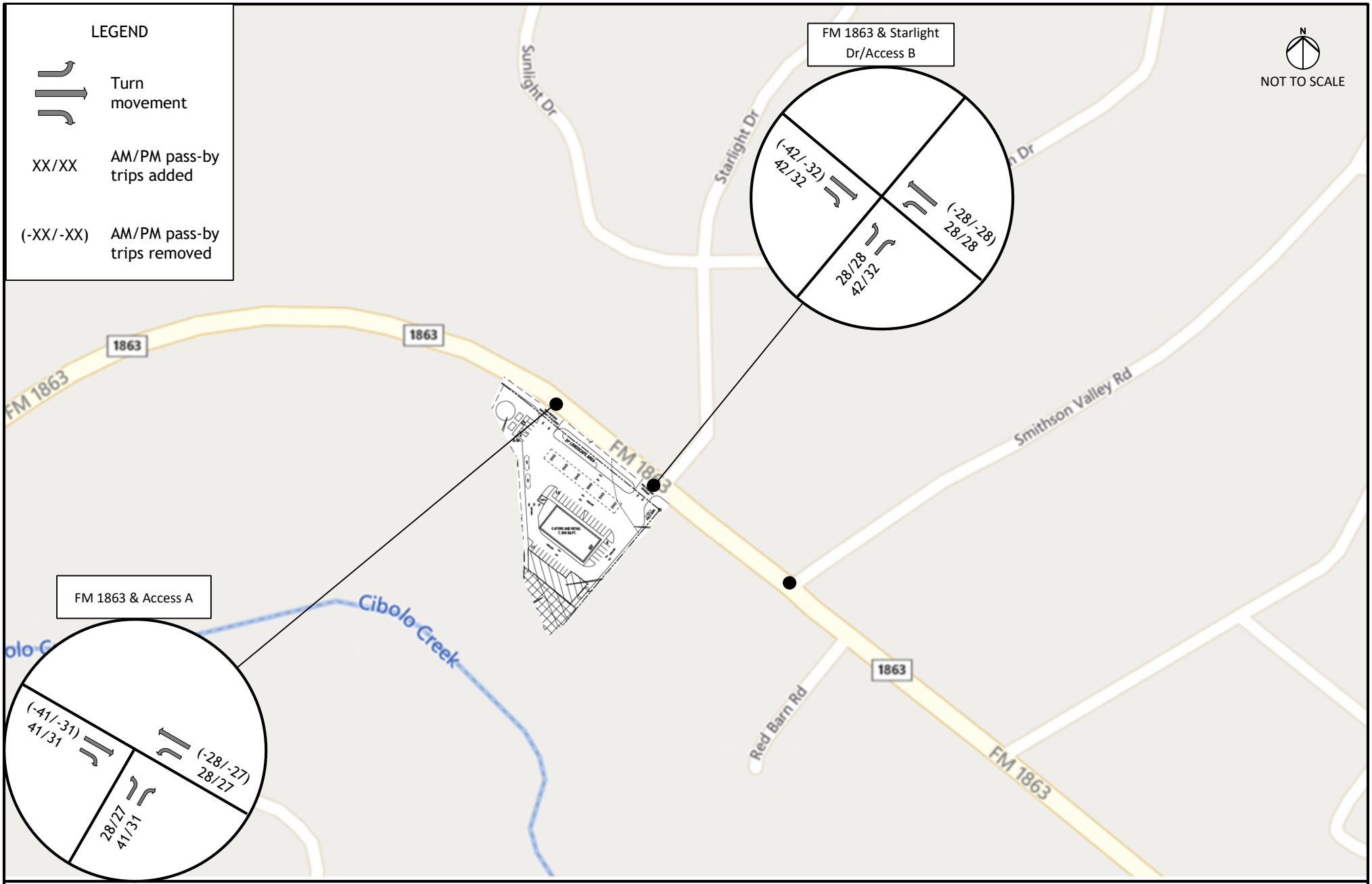
It should be noted that driveway trips are distributed based on origin/destination path. For example, the west driveway is projected to see 75% of trips heading to/from the west, but 25% of trips heading to/from the east.

The estimated site trips are shown in **Figure 5**.

Full Build 2023 volumes are shown in **Figure 6.**

D. Intersection Sight Distance

Intersection sight distances (ISD) are based on the American Association of State Highway Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets* design sight distance standards. ISD is measured along the major road beginning at a point that coincides with the location of the minor road vehicle.



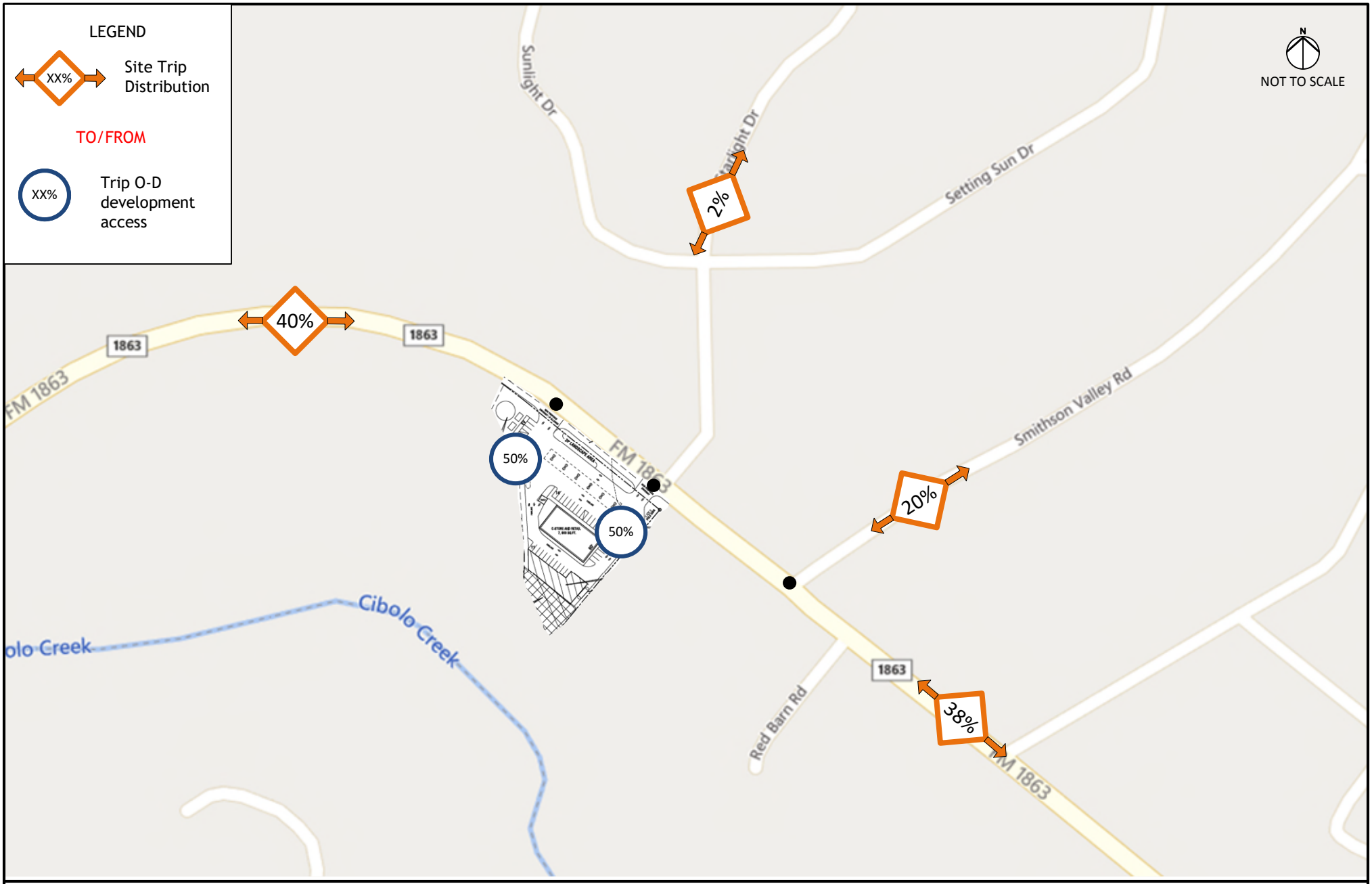
Pass-By Trip Reductions

Figure 4

Gas Station - Bulverde

Date: 18 October 2022

TRAFFIC IMPACT GROUP, LLC



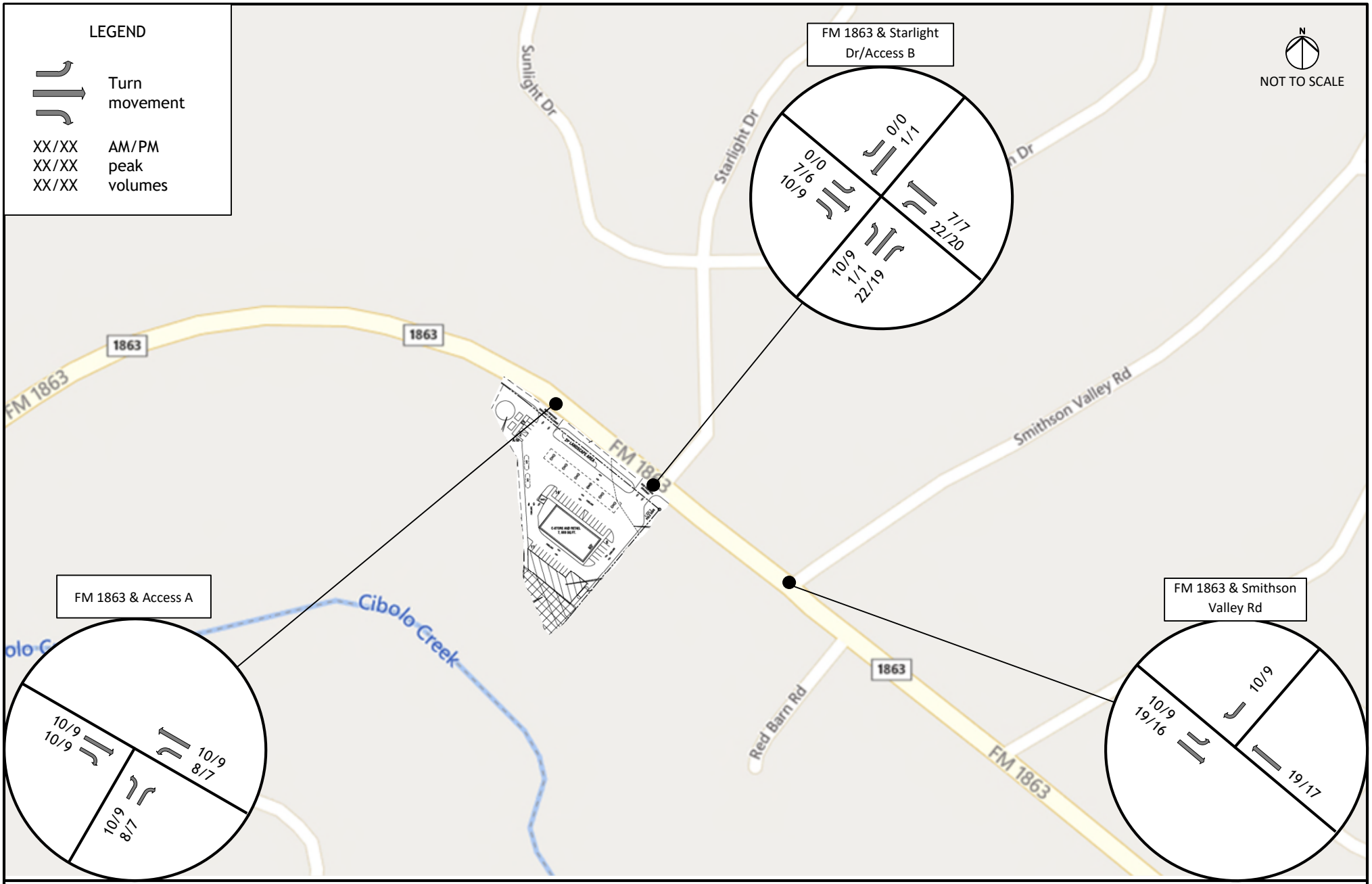
Trip Distribution

Figure 4B

Gas Station - Bulverde

Date: 22 August 2023

TRAFFIC IMPACT GROUP, LLC



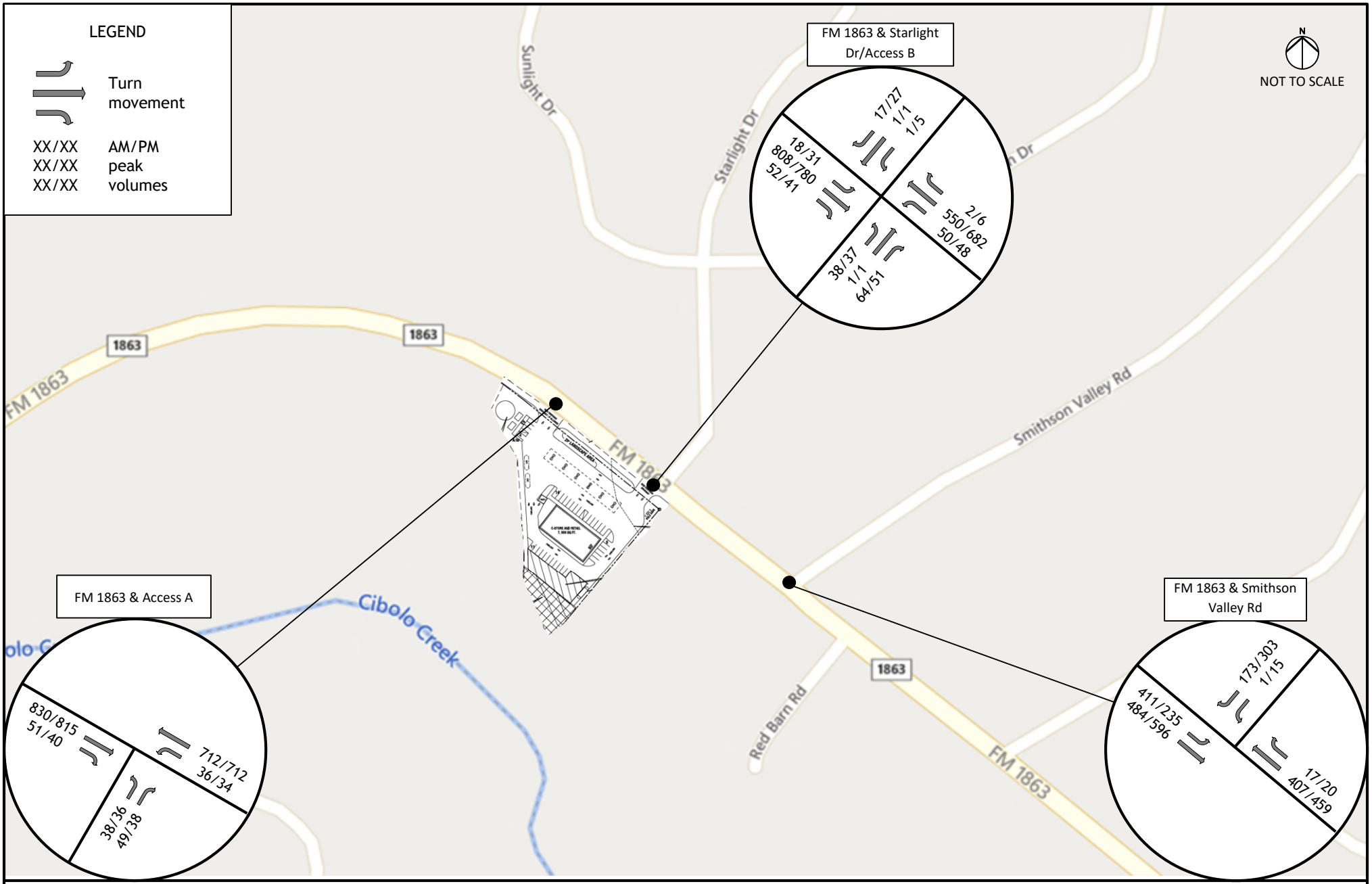
Site Trips

Figure 5

Gas Station - Bulverde

Date: 18 October 2022

TRAFFIC IMPACT GROUP, LLC



Full Build 2023 Volumes

Figure 6

Gas Station - Bulverde

Date: 18 October 2022

TRAFFIC IMPACT GROUP, LLC

IV. Turn Lane/Access Management

A. Right-Turn Lanes

The development proposes eastbound right-turn lanes for the two driveways.

B. Left-Turn Lanes

FM 1863 has a TWLTL that allows left-turn lane striping for both directions.

For left-turn deceleration lanes, the TxDOT *Access Management Manual* provides tabular thresholds based on the posted speed limit, amount of advancing traffic, amount of oncoming traffic, and percentage of left turns. Table 4.1 shows the volume thresholds for left-turn lanes.

Table 4.1 - TxDOT Volume Thresholds for Left-turn Lanes (50 mph)

Opposing Volumes (vph)	Advancing Volumes (vph)							
	5% Left Turns		10% Left Turns		20% Left Turns		30% Left Turns	
	Left	Through	Left	Through	Left	Through	Left	Through
800	14	280	21	210	33	165	41	135
600	18	350	26	260	39	195	51	170
400	22	430	32	320	48	240	63	210
200	28	550	40	400	60	300	81	270
100	31	615	45	445	67	335	89	295

Table 4.2 shows the volumes used in the analysis.

Table 4.2 - Left-Turn Lane Analysis

Driveway	AM/ PM	Approach	Posted Speed	Advancing Vol	Opposing Vol	LT Vol	Turn Lane needed?
FM 1863 & Access A	AM	WB	55	712	808	36	Yes
	PM			830	815	34	Yes

Based on Full Build volumes, it is recommended to stripe a westbound left-turn lane on FM 1863 at Access A.

Since Access A is proposed to be located approximately 205 feet northwest of Starlight Drive, it will not be feasible to construct a left-turn lane to TxDOT standards, and Access A may need to be restricted to right-in/right-out only.

C. Intersection Sight Distance

The table below shows required ISD for posted speeds based on AASHTO Greenbook standards.

Speed (mph)	Stopping Sight Distance (ft.)	Design Intersection Sight Distance (ft.)
25	155	280
30	200	335
35	250	390
40	305	445
45	360	500
50	425	555
55	495	610
60	570	665
65	645	720

Source: *A Policy on Geometric Design of Highway and Streets*, 5th Edition, American Association of State Highway and Transportation Officials (AASHTO), 2004.

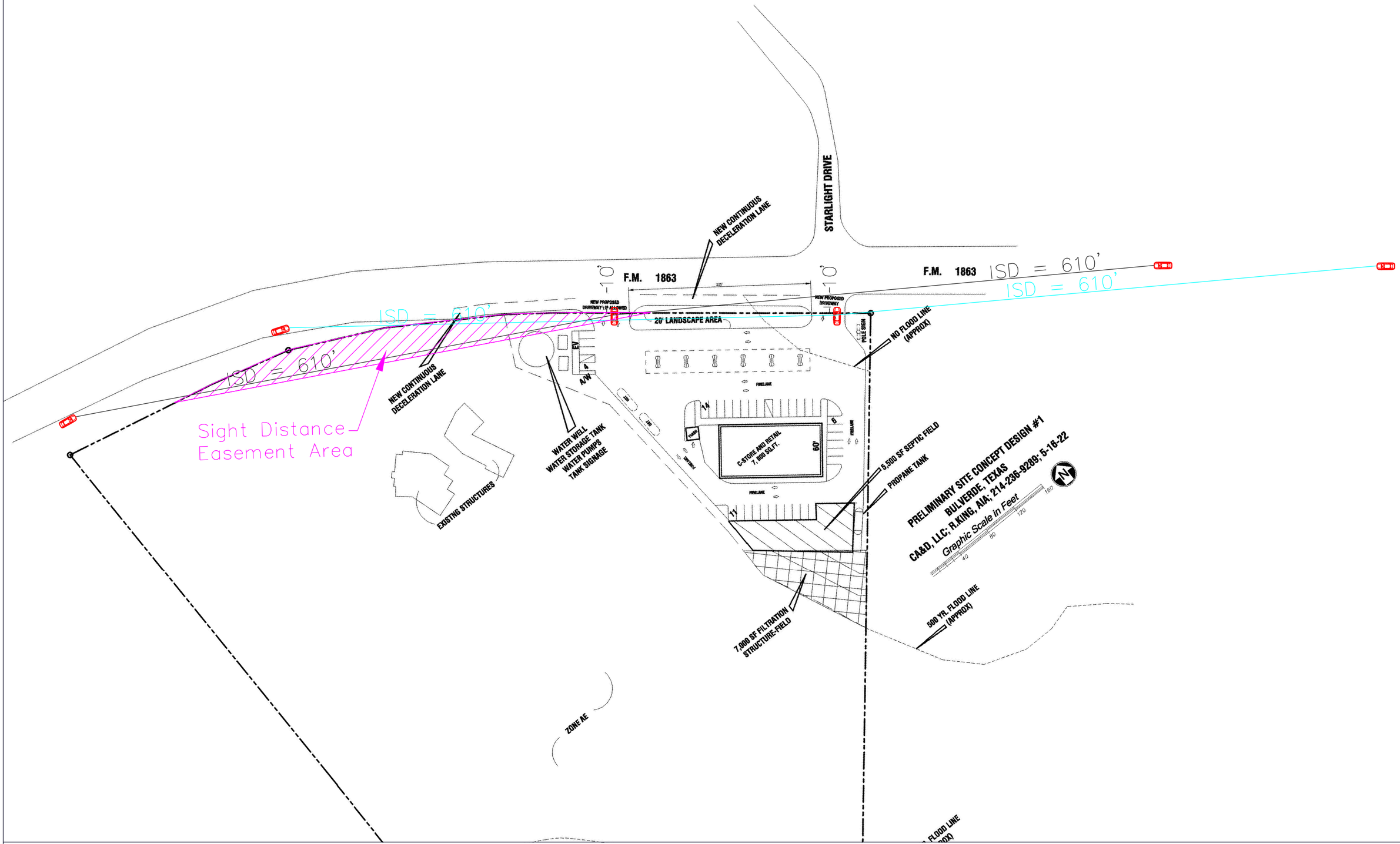
FM 1863 has a posted speed limit of 55 mph and requires ISD of 610 feet. An ISD analysis on FM 1863 shows sight distance obstructions caused by the horizontal curve west of Access A. **Figure 7** shows the sight distance analysis for both driveways.

The developer is also the property owner for the adjacent parcel. It is **recommended** to create a sight distance easement along the property frontage adjacent to the development so that trees and shrubs can be cleared for sight distance.

D. Access Spacing

The *Access Management Manual* provides guidance on access point spacing based on the posted speed limit of the roadway. For a state highway with a posted speed limit of 55 mph, the required spacing between access points is 425 feet.

The proposed Access A is proposed to be located approximately 205 feet east Access B/Starlight Drive. It is **recommended** to seek a variance from TxDOT for access spacing at Access A.



Intersection Sight Distance
Figure 7
Gas Station - Bulverde

Date: 22 August 2023

TRAFFIC IMPACT GROUP, LLC

V. Capacity Analysis

The Transportation Research Board's Highway Capacity Manual (HCM) utilizes a term "level of service" (LOS) to measure how traffic operates in intersections. There are currently six levels of service ranging from A to F. Level of Service "A" represents the best conditions and Level of Service "F" represents the worst. Synchro software was used to determine the level of service for intersections in the study area. All worksheet reports from the analyses can be found in the Appendix.

Table 5.1 shows the control delay per vehicle associated with LOS A through F for signalized and unsignalized intersections.

Table 5.1 - Highway Capacity Manual Levels of Service and Control Delay

Signalized Intersection		Unsignalized Intersection	
Level of Service	**Control Delay per Vehicle (sec)**	**Level of Service**	**Control Delay per Vehicle (sec)**
A	≤ 10	A	≤ 10
B	> 10 and ≤ 20	B	> 10 and ≤ 15
C	> 20 and ≤ 35	C	> 15 and ≤ 25
D	> 35 and ≤ 55	D	> 25 and ≤ 35
E	> 55 and ≤ 80	E	> 35 and ≤ 50
F	> 80	F	> 50

A. FM 1863 & Starlight Drive/Access B

FM 1863 & Starlight Drive is an unsignalized T-intersection. Access B will be the south leg of the intersection.

Table 5.2 shows the current LOS, control delay, and 95th percentile queue length for existing conditions.

Table 5.2 - Intersection LOS, Delay, and Queue by Movement - 2022 Existing								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
FM 1863 & Starlight Drive	SEB	LT	A	8.7	-	A	9.3	-
		TH	Free					
	NWB	TH	Free					
		RT						
	SWB	LT	B	13.7	-	C	22.8	13'
		RT						

Table 5.3 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2023 conditions.

Table 5.3 - Intersection LOS, Delay, and Queue by Movement - 2023 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
FM 1863 & Starlight Dr/Access B	SEB	LT	A	8.7	-	A	9.4	-
		TH	Free					
		RT						
	NWB	LT	B	12.8	8'	B	10.0	5'
		TH	Free					
		RT						
	NEB	LT	F	61.0	93'	F	133.1	135'
		TH						
		RT						
	SWB	LT	C	20.4	5'	D	31.8	20'
		TH						
		RT						

Analysis shows that vehicles exiting the development are projected to experience LOS F in both peak hours. It is **recommended** to construct a traffic signal at this intersection.

According to TxMUTCD warrant analysis, the driveway is projected to meet Warrant 2, Four-Hour Volume.

Table 5.3B shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2023 conditions under signalized control.

Table 5.3B - Intersection LOS, Delay, and Queue by Movement - 2023 Full Build with imps								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
FM 1863 & Starlight Dr/Access B	SEB	LT	A	4.4	8'	A	5.0	14'
		TH	A	9.0	297'	A	9.7	313'
		RT	A	1.6	29'	A	1.5	8'
	NWB	LT	A	5.7	21'	A	6.0	21'
		TH	A	6.3	159'	A	8.2	246'
		RT						
	NEB	LT	B	14.6	46'	B	15.0	46'
		TH						
		RT						
	SWB	LT	B	11.9	15'	B	11.5	21'
		TH						
		RT						

B. FM 1863 & Smithson Valley Drive

FM 1863 & Smithson Valley Road is an unsignalized T-intersection. FM 1863 tapers to a two-lane undivided roadway east of this intersection.

Table 5.4 shows the current LOS, control delay, and 95th percentile queue length for existing conditions.

Table 5.4 - Intersection LOS, Delay, and Queue by Movement - 2022 Existing								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
FM 1863 & Smithson Valley Rd	NWB	LT	A	9.8	40'	A	9.2	20'
		RT	Free					
	SEB	TH	Free					
		RT						
	NEB	LT	B	12.6	25'	C	20.6	90'
		RT						

Table 5.5 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2023 conditions.

Table 5.5 - Intersection LOS, Delay, and Queue by Movement - 2023 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
FM 1863 & Smithson Valley Rd	NWB	LT	B	10.3	48'	A	9.5	25'
		RT	Free					
	SEB	TH	Free					
		RT						
	NEB	LT	B	13.4	33'	C	24.7	123'
		RT						

C. FM 1863 & Access A

Table 5.3 shows the expected LOS, control delay, and 95th percentile queue length for Full Build 2023 conditions.

Table 5.6 - Intersection LOS, Delay, and Queue by Movement - 2023 Full Build								
Intersection	Approach	Movement	AM			PM		
			LOS	Delay	Queue	LOS	Delay	Queue
FM 1863 & Access A	SEB	LT	Free					
		RT						
	NWB	TH	A	9.9	5'	B	10.1	5'
		RT						
	SWB	LT	E	45.0	63'	F	54.4	68'
		RT						

Analysis shows that vehicles exiting the development are expected to see LOS F in the PM peak hour. This can be mitigated by using the recommended signal at Access B/Starlight Drive.

FM 1863 & Access A - looking west

VI. Summary and Conclusion

This study serves as an analysis of the traffic impacts from the proposed C-store/gas station development in Bulverde, Texas.

Trip Generation

The proposed new development is expected to generate 51 entering trips and 50 exiting trips in the AM peak hour, and 44 entering and 43 exiting trips in the PM peak hour. This site will also see pass-by/diverted link trip reductions, which have been included in the driveway analysis.

Turn Lanes/Access Management

The two accesses are proposed to be approximately 200 feet apart which is below TxDOT access spacing requirements. It is **recommended** to seek a waiver of access spacing for Access A.

The developer proposes right-turn lanes at both driveways.

Intersection Sight Distance

Access A is located east of a horizontal curve on FM 1863 and does not have ISD. The developer owns the property adjacent to this development. It is **recommended** to create a sight distance easement along the frontage of the adjacent property so that trees and shrubs can be cleared to provide sight distance.

Traffic Impacts

FM 1863 & Starlight Drive/Access B

For the Full Build scenario, vehicles exiting the development are projected to experience LOS F for both peak hours. It is recommended to install a traffic signal at this intersection.

Recommended Improvements

The following summarizes recommended improvements:

Adjacent Property (Full Build)

- Create a sight distance easement along the property frontage to clear trees and shrubs.

Access A and Access B (Full Build)

- Stripe a westbound left-turn lane for both driveways. It may be necessary to restrict Access A to right-in/right-out only.

FM 1863 & Starlight Drive/Access B (Full Build)

- Install a traffic signal.

Appendix

Background Information

Traffic Volumes

Trip Generation

Capacity Analysis

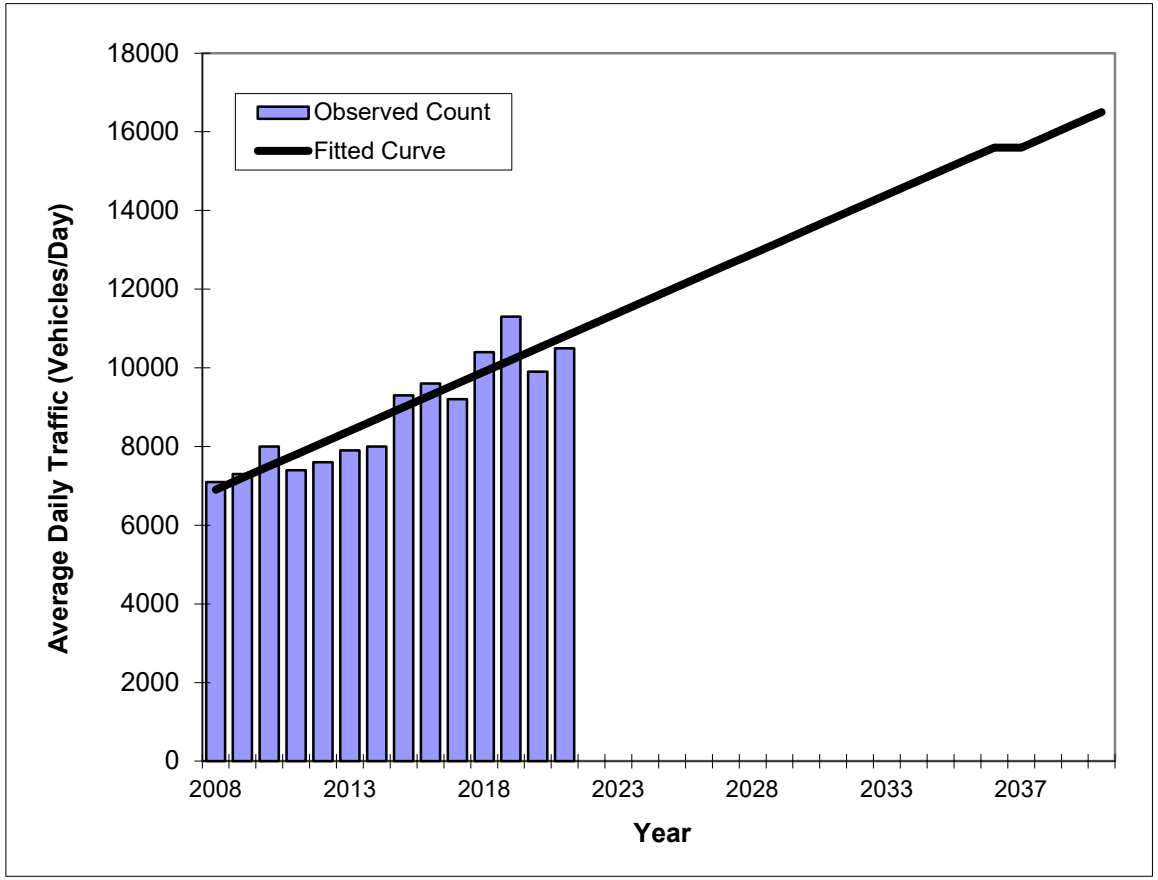
Background Information

Traffic Trends - V2.0

FM 1863 -- east of US281

Location	0

County:	Bexar
Station #:	46H34
Highway:	FM 1863



Year	Traffic (ADT/AADT) Count*	Trend**
2008	7100	6900
2009	7300	7200
2010	8000	7500
2011	7400	7800
2012	7600	8100
2013	7900	8400
2014	8000	8700
2015	9300	9000
2016	9600	9300
2017	9200	9600
2018	10400	9900
2019	11300	10200
2020	9900	10500
2021	10500	10800
2008 Opening Year Trend		
2008	N/A	6900
2021 Mid-Year Trend		
2021	N/A	10800
2022 Design Year Trend		
2022	N/A	11100
TRANPLAN Forecasts/Trends		

**** Annual Trend Increase:**	303
Trend R-squared:	85.00%
Trend Annual Historic Growth Rate:	4.35%
Trend Growth Rate (2021 to Design Year):	2.78%
Printed:	12-Oct-22

Straight Line Growth Option

***Axle-Adjusted**

Traffic Volumes

GRAM Traffic Counting, Inc.

3751 FM 1105, Bldg. A
Georgetown, Texas 78626
512-832-8650

File Name : Site 1 - FM 1863 & Smithson Valley Rd - AM
Site Code : 1
Start Date : 10/4/2022
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

	Smithson Valley Rd Southbound					FM 1863 Westbound					Northbound					FM 1863 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
07:00	1	0	26	0	27	0	90	1	0	91	0	0	0	0	0	28	64	0	0	92	210
07:15	2	0	38	0	40	0	80	3	0	83	0	0	0	0	0	29	91	0	0	120	243
07:30	0	0	24	0	24	0	96	3	0	99	0	0	0	0	0	66	136	0	0	202	325
07:45	0	0	34	0	34	0	95	2	0	97	0	0	0	0	0	110	124	0	0	234	365
Total	3	0	122	0	125	0	361	9	0	370	0	0	0	0	0	233	415	0	0	648	1143
08:00	0	0	47	0	47	0	84	8	0	92	0	0	0	0	0	111	89	0	0	200	339
08:15	1	0	52	0	53	0	98	3	0	101	0	0	0	0	0	99	98	0	0	197	351
08:30	5	0	71	0	76	0	86	1	0	87	0	0	0	0	0	55	54	0	0	109	272
08:45	2	0	51	0	53	0	87	2	0	89	0	0	0	0	0	21	61	0	0	82	224
Total	8	0	221	0	229	0	355	14	0	369	0	0	0	0	0	286	302	0	0	588	1186
Grand Total	11	0	343	0	354	0	716	23	0	739	0	0	0	0	0	519	717	0	0	1236	2329
Apprch %	3.1	0	96.9	0		0	96.9	3.1	0		0	0	0	0		42	58	0	0		
Total %	0.5	0	14.7	0	15.2	0	30.7	1	0	31.7	0	0	0	0	0	22.3	30.8	0	0	53.1	
Vehicles	10	0	338	0	348	0	690	21	0	711	0	0	0	0	0	506	688	0	0	1194	2253
% Vehicles																					
Heavy Vehicles	1	0	5	0	6	0	26	2	0	28	0	0	0	0	0	13	29	0	0	42	76
% Heavy Vehicles	9.1	0	1.5	0	1.7	0	3.6	8.7	0	3.8	0	0	0	0	0	2.5	4	0	0	3.4	3.3

	Smithson Valley Rd Southbound					FM 1863 Westbound					Northbound					FM 1863 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30																					
07:30	0	0	24	0	24	0	96	3	0	99	0	0	0	0	0	66	**136**	0	0	202	325
07:45	0	0	34	0	34	0	95	2	0	97	0	0	0	0	0	110	124	0	0	**234**	**365**
08:00	0	0	47	0	47	0	84	**8**	0	92	0	0	0	0	0	**111**	89	0	0	200	339
08:15	**1**	0	**52**	0	**53**	0	**98**	3	0	**101**	0	0	0	0	0	99	98	0	0	197	351
Total Volume	1	0	157	0	158	0	373	16	0	389	0	0	0	0	0	386	447	0	0	833	1380
% App. Total	0.6	0	99.4	0		0	95.9	4.1	0		0	0	0	0		46.3	53.7	0	0		
PHF	.250	.000	.755	.000	.745	.000	.952	.500	.000	.963	.000	.000	.000	.000	.000	.869	.822	.000	.000	.890	.945
Vehicles	1	0	155	0	156	0	364	14	0	378	0	0	0	0	0	377	434	0	0	811	1345
% Vehicles			98.7	0	98.7	0	97.6	87.5	0	97.2	0	0	0	0	0	97.7	97.1	0	0	97.4	97.5
Heavy Vehicles																					
% Heavy Vehicles	0	0	1.3	0	1.3	0	2.4	12.5	0	2.8	0	0	0	0	0	2.3	2.9	0	0	2.6	2.5

GRAM Traffic Counting, Inc.

3751 FM 1105, Bldg. A
Georgetown, Texas 78626
512-832-8650

File Name : Site 1 - FM 1863 & Smithson Valley Rd - PM
Site Code : 1
Start Date : 10/4/2022
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

	Smithson Valley Rd Southbound					FM 1863 Westbound					Northbound					FM 1863 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
16:00	1	0	75	0	76	0	87	5	0	92	0	0	0	0	0	55	114	0	0	169	337
16:15	5	0	34	0	39	0	86	4	0	90	0	0	0	0	0	56	118	0	0	174	303
16:30	1	0	38	0	39	0	80	3	0	83	0	0	0	0	0	50	116	0	0	166	288
16:45	8	0	114	0	122	0	83	2	0	85	0	0	0	0	0	45	159	0	0	204	411
Total	15	0	261	0	276	0	336	14	0	350	0	0	0	0	0	206	507	0	0	713	1339
17:00	2	0	79	0	81	0	106	6	0	112	0	0	0	0	0	70	148	0	0	218	411
17:15	2	0	47	0	49	0	120	9	0	129	0	0	0	0	0	49	139	0	0	188	366
17:30	2	0	43	0	45	0	116	2	0	118	0	0	0	0	0	53	112	0	0	165	328
17:45	3	0	57	0	60	0	115	3	0	118	0	0	0	0	0	36	99	0	0	135	313
Total	9	0	226	0	235	0	457	20	0	477	0	0	0	0	0	208	498	0	0	706	1418
Grand Total	24	0	487	0	511	0	793	34	0	827	0	0	0	0	0	414	1005	0	0	1419	2757
Apprch %	4.7	0	95.3	0		0	95.9	4.1	0		0	0	0	0		29.2	70.8	0	0		
Total %	0.9	0	17.7	0	18.5	0	28.8	1.2	0	30	0	0	0	0	0	15	36.5	0	0	51.5	
Vehicles	24	0	478	0	502	0	782	33	0	815	0	0	0	0	0	410	973	0	0	1383	2700
% Vehicles																					
Heavy Vehicles	0	0	9	0	9	0	11	1	0	12	0	0	0	0	0	4	32	0	0	36	57
% Heavy Vehicles	0	0	1.8	0	1.8	0	1.4	2.9	0	1.5	0	0	0	0	0	1	3.2	0	0	2.5	2.1

	Smithson Valley Rd Southbound					FM 1863 Westbound					Northbound					FM 1863 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:45																					
16:45	**8**	0	**114**	0	**122**	0	83	2	0	85	0	0	0	0	0	45	**159**	0	0	204	**411**
17:00	2	0	79	0	81	0	106	6	0	112	0	0	0	0	0	**70**	148	0	0	**218**	411
17:15	2	0	47	0	49	0	**120**	**9**	0	**129**	0	0	0	0	0	49	139	0	0	188	366
17:30	2	0	43	0	45	0	116	2	0	118	0	0	0	0	0	53	112	0	0	165	328
Total Volume	14	0	283	0	297	0	425	19	0	444	0	0	0	0	0	217	558	0	0	775	1516
% App. Total	4.7	0	95.3	0		0	95.7	4.3	0		0	0	0	0		28	72	0	0		
PHF	.438	.000	.621	.000	.609	.000	.885	.528	.000	.860	.000	.000	.000	.000	.000	.775	.877	.000	.000	.889	.922
Vehicles	14	0	278	0	292	0	417	19	0	436	0	0	0	0	0	216	542	0	0	758	1486
% Vehicles			98.2	0	98.3	0	98.1	100	0	98.2	0	0	0	0	0	99.5	97.1	0	0	97.8	98.0
Heavy Vehicles																					
% Heavy Vehicles	0	0	1.8	0	1.7	0	1.9	0	0	1.8	0	0	0	0	0	0.5	2.9	0	0	2.2	2.0

GRAM Traffic Counting, Inc.

3751 FM 1105, Bldg. A
Georgetown, Texas 78626
512-832-8650

File Name : Site 2 - FM 1863 & Starlight Dr - AM
Site Code : 2
Start Date : 10/4/2022
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

	Starlight Dr Southbound					FM 1863 Westbound					Northbound					FM 1863 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
07:00	0	0	12	0	12	0	106	0	0	106	0	0	0	0	0	2	100	0	0	102	220
07:15	1	0	8	0	9	0	117	0	0	117	0	0	0	0	0	4	154	0	0	158	284
07:30	0	0	8	0	8	0	122	0	0	122	0	0	0	0	0	5	218	0	0	223	353
07:45	0	0	2	0	2	0	127	0	0	127	0	0	0	0	0	3	226	0	0	229	358
Total	1	0	30	0	31	0	472	0	0	472	0	0	0	0	0	14	698	0	0	712	1215
08:00	1	0	2	0	3	0	141	0	0	141	0	0	0	0	0	3	195	0	0	198	342
08:15	0	0	4	0	4	0	159	2	0	161	0	0	0	0	0	6	172	0	0	178	343
08:30	1	0	9	0	10	0	138	0	0	138	0	0	0	0	0	4	100	0	0	104	252
08:45	1	0	6	0	7	0	133	0	0	133	0	0	0	0	0	4	72	0	0	76	216
Total	3	0	21	0	24	0	571	2	0	573	0	0	0	0	0	17	539	0	0	556	1153
Grand Total	4	0	51	0	55	0	1043	2	0	1045	0	0	0	0	0	31	1237	0	0	1268	2368
Apprch %	7.3	0	92.7	0		0	99.8	0.2	0		0	0	0	0		2.4	97.6	0	0		
Total %	0.2	0	2.2	0	2.3	0	44	0.1	0	44.1	0	0	0	0	0	1.3	52.2	0	0	53.5	
Vehicles	4	0	49	0	53	0	1008										1195				
% Vehicles	100	0	96.1	0	96.4	0	96.6	100	0	96.7	0	0	0	0	0	93.5	96.6	0	0	96.5	96.6
Heavy Vehicles																					
% Heavy Vehicles	0	0	3.9	0	3.6	0	3.4	0	0	3.3	0	0	0	0	0	6.5	3.4	0	0	3.5	3.4

	Starlight Dr Southbound					FM 1863 Westbound					Northbound					FM 1863 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30																					
07:30	0	0	**8**	0	**8**	0	122	0	0	122	0	0	0	0	0	5	218	0	0	223	353
07:45	0	0	2	0	2	0	127	0	0	127	0	0	0	0	0	3	**226**	0	0	**229**	**358**
08:00	**1**	0	2	0	3	0	141	0	0	141	0	0	0	0	0	3	195	0	0	198	342
08:15	0	0	4	0	4	0	**159**	**2**	0	**161**	0	0	0	0	0	**6**	172	0	0	178	343
Total Volume	1	0	16	0	17	0	549	2	0	551	0	0	0	0	0	17	811	0	0	828	1396
% App. Total	5.9	0	94.1	0		0	99.6	0.4	0		0	0	0	0		2.1	97.9	0	0		
PHF	.250	.000	.500	.000	.531	.000	.863	.250	.000	.856	.000	.000	.000	.000	.000	.708	.897	.000	.000	.904	.975
Vehicles	1	0	15	0	16	0	533	2	0	535	0	0	0	0	0	16	792	0	0	808	1359
% Vehicles			93.8	0	94.1	0	97.1	100	0	97.1	0	0	0	0	0	94.1	97.7	0	0	97.6	97.3
Heavy Vehicles																					
% Heavy Vehicles	0	0	6.3	0	5.9	0	2.9	0	0	2.9	0	0	0	0	0	5.9	2.3	0	0	2.4	2.7

GRAM Traffic Counting, Inc.

3751 FM 1105, Bldg. A
Georgetown, Texas 78626
512-832-8650

File Name : Site 2 - FM 1863 & Starlight Dr - PM
Site Code : 2
Start Date : 10/4/2022
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

	Starlight Dr Southbound					FM 1863 Westbound					Northbound					FM 1863 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
16:00	0	0	4	0	4	0	141	2	0	143	0	0	0	0	0	11	187	0	0	198	345
16:15	1	0	7	0	8	0	104	2	0	106	0	0	0	0	0	9	165	0	0	174	288
16:30	1	0	6	0	7	0	140	1	0	141	0	0	0	0	0	10	189	0	0	199	347
16:45	0	0	9	0	9	0	208	1	0	209	0	0	0	0	0	4	192	0	0	196	414
Total	2	0	26	0	28	0	593	6	0	599	0	0	0	0	0	34	733	0	0	767	1394
17:00	1	0	4	0	5	0	169	3	0	172	0	0	0	0	0	9	215	0	0	224	401
17:15	3	0	7	0	10	0	159	1	0	160	0	0	0	0	0	7	179	0	0	186	356
17:30	0	0	8	0	8	0	167	0	0	167	0	0	0	0	0	3	145	0	0	148	323
17:45	2	0	4	0	6	0	160	3	0	163	0	0	0	0	0	4	153	0	0	157	326
Total	6	0	23	0	29	0	655	7	0	662	0	0	0	0	0	23	692	0	0	715	1406
Grand Total	8	0	49	0	57	0	1248	13	0	1261	0	0	0	0	0	57	1425	0	0	1482	2800
Apprch %	14	0	86	0		0	99	1	0		0	0	0	0		3.8	96.2	0	0		
Total %	0.3	0	1.8	0	2	0	44.6	0.5	0	45	0	0	0	0	0	2	50.9	0	0	52.9	
Vehicles	7	0	47	0	54	0	1228										1390				
% Vehicles	87.5	0	95.9	0	94.7	0	98.4	92.3	0	98.3	0	0	0	0	0	98.2	97.5	0	0	97.6	97.9
Heavy Vehicles																					
% Heavy Vehicles	12.5	0	4.1	0	5.3	0	1.6	7.7	0	1.7	0	0	0	0	0	1.8	2.5	0	0	2.4	2.1

	Starlight Dr Southbound					FM 1863 Westbound					Northbound					FM 1863 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:30																					
16:30	1	0	6	0	7	0	140	1	0	141	0	0	0	0	0	**10**	189	0	0	199	347
16:45	0	0	**9**	0	9	0	**208**	1	0	**209**	0	0	0	0	0	4	192	0	0	196	**414**
17:00	1	0	4	0	5	0	169	**3**	0	172	0	0	0	0	0	9	**215**	0	0	**224**	401
17:15	**3**	0	7	0	**10**	0	159	1	0	160	0	0	0	0	0	7	179	0	0	186	356
Total Volume	5	0	26	0	31	0	676	6	0	682	0	0	0	0	0	30	775	0	0	805	1518
% App. Total	16.1	0	83.9	0		0	99.1	0.9	0		0	0	0	0		3.7	96.3	0	0		
PHF	.417	.000	.722	.000	.775	.000	.813	.500	.000	.816	.000	.000	.000	.000	.000	.750	.901	.000	.000	.898	.917
Vehicles	4	0	24	0	28	0	663	5	0	668	0	0	0	0	0	29	760	0	0	789	1485
% Vehicles	80.0	0	92.3	0	90.3	0	98.1	83.3	0	97.9	0	0	0	0	0	96.7	98.1	0	0	98.0	97.8
Heavy Vehicles																					
% Heavy Vehicles	20.0	0	7.7	0	9.7	0	1.9	16.7	0	2.1	0	0	0	0	0	3.3	1.9	0	0	2.0	2.2

Gas Station - Bulverde

Vistro File: C:\...\Bulverde vistro.vistro
Report File: C:\...\vistro am.pdf

Scenario 1 am
10/14/2022

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Southbound		Eastbound		Westbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
1	FM 1863 & Smithson Valley Rd	Final Base	1	157	386	447	373	16	1380
		Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	10	10	19	19	0	58
		Other	0	0	0	0	0	0	0
		Future Total	**1**	**173**	**411**	**484**	**407**	**17**	**1493**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2	FM 1863 & Starlight Dr/Access B	Final Base	0	0	0	1	0	16	17	811	0	0	549	2	1396
		Growth Factor	1.00	1.00	1.00	1.04	1.00	1.04	1.04	1.04	1.00	1.00	1.04	1.04	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	38	1	64	0	1	0	0	-35	52	50	-21	0	150
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**38**	**1**	**64**	**1**	**1**	**17**	**18**	**808**	**52**	**50**	**550**	**2**	**1602**

ID	Intersection Name	Volume Type	Northbound		Eastbound		Westbound		Total Volume
			Left	Right	Thru	Right	Left	Thru	
3	FM 1863 & Access A	Final Base	0	0	828	0	0	702	1530
		Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	38	49	-31	51	36	-18	125
		Other	0	0	0	0	0	0	0
		Future Total	**38**	**49**	**830**	**51**	**36**	**712**	**1716**

Gas Station - Bulverde

Vistro File: C:\...\Bulverde vistro.vistro
Report File: C:\...\vistro pm.pdf

Scenario 2 pm
10/14/2022

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Southbound		Eastbound		Westbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
1	FM 1863 & Smithson Valley Rd	Final Base	14	283	217	558	425	19	1516
		Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	9	9	16	17	0	51
		Other	0	0	0	0	0	0	0
		Future Total	**15**	**303**	**235**	**596**	**459**	**20**	**1628**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2	FM 1863 & Starlight Dr/Access B	Final Base	0	0	0	5	0	26	30	775	0	0	676	6	1518
		Growth Factor	1.00	1.00	1.00	1.04	1.00	1.04	1.04	1.04	1.00	1.00	1.04	1.04	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	37	1	51	0	1	0	0	-26	41	48	-21	0	132
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**37**	**1**	**51**	**5**	**1**	**27**	**31**	**780**	**41**	**48**	**682**	**6**	**1710**

ID	Intersection Name	Volume Type	Northbound		Eastbound		Westbound		Total Volume
			Left	Right	Thru	Right	Left	Thru	
3	FM 1863 & Access A	Final Base	0	0	805	0	0	702	1507
		Growth Factor	1.04	1.04	1.04	1.04	1.04	1.04	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	36	38	-22	40	34	-18	108
		Other	0	0	0	0	0	0	0
		Future Total	**36**	**38**	**815**	**40**	**34**	**712**	**1675**

Trip Generation

Prepared By	Scott P. Israelson	PE no.	116712	Count	1/0/00
Major Road	FM 1863	Speed	55	Lanes	1
Minor Road	Starlight Dr	Speed	30	Lanes	1

Warrants	1	2	3	4	5	6	7	8	9
Satisfied	**no**	YES	N/A	no	N/A	N/A	N/A	no	no

Signal Warranted?	**YES**

FULL BUILD

Warrant 1, Eight-Hour Vehicular Volume

Requirements: Either Condition A (Minimum Vehicular Volume) or Condition B (Interruption of Continuous Traffic) is satisfied to 100% of the stated volumes for each of any 8 hours of an average day, OR Both Condition A and B are satisfied to 80% of the stated volumes for each of any 8 hours of an average day

Condition A - Minimum Vehicular Volume									
Number of lanes for traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction)			
Major Street	**Minor Street**	**100%**	**80%**	**70%**	**56%**	**100%**	**80%**	**70%**	**56%**
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic									
Number of lanes for traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction)			
Major Street	**Minor Street**	**100%**	**80%**	**70%**	**56%**	**100%**	**80%**	**70%**	**56%**
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

100% Basic minimum hourly volume

80% Used for combination of Conditions A and B

70% Used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

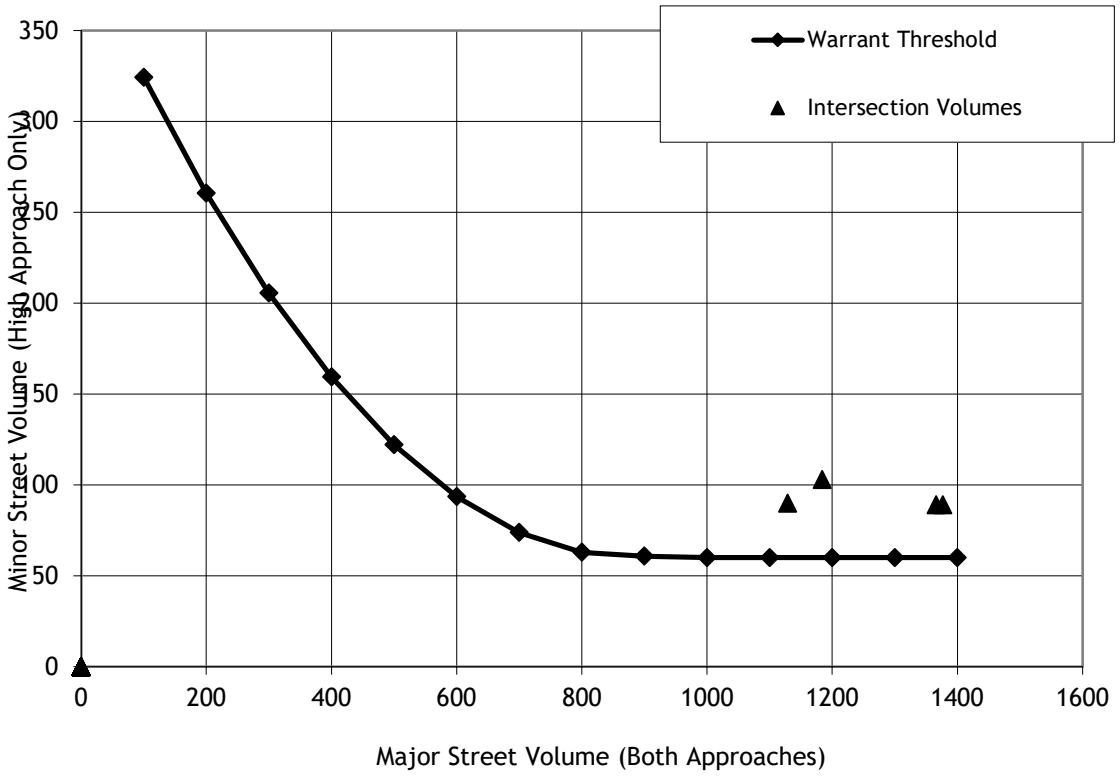
56% Used for combination of Conditions A and B and where 70% of minimum hourly volume is used

Hour	Major Street total	highest minor	Condition A	Condition B	Condition A+B
00:00	0	0			
01:00	0	0			
02:00	0	0			
03:00	0	0			
04:00	0	0			
05:00	0	0			
06:00	0	0			
07:00	1184	103		YES	YES
08:00	1129	90		YES	YES
09:00	0	0			
10:00	0	0			
11:00	0	0			
12:00	0	0			
13:00	0	0			
14:00	0	0			
15:00	0	0			
16:00	1366	89		YES	YES
17:00	1377	89		YES	YES
18:00	0	0			
19:00	0	0			
20:00	0	0			
21:00	0	0			
22:00	0	0			
23:00	0	0			

Warrant 1 Met?	no
Condition A	no
Condition B	no
Condition A+B	no

Warrant 2, Four-Hour Vehicular Volume

Requirements: Plot four highest hour volumes on the figures below, if four points lie above the curve then the warrant is satisfied



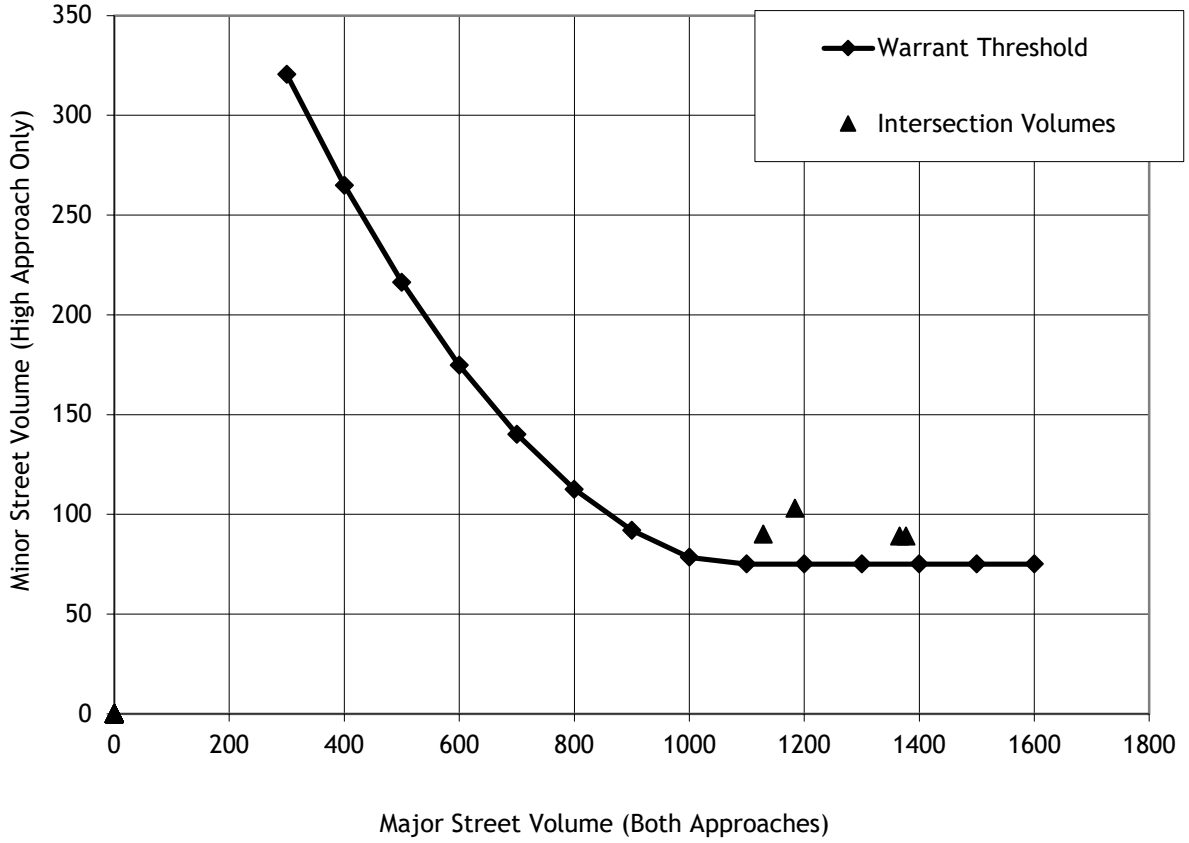
Warrant 2 Met? **YES**

Warrant 3, Peak Hour (Unusual Condition)

Requirements: This signal warrant shall only be applied in cases such as office complexes, manufacturing plants, industrial complexes, or high occupancy vehicle facilities that attract or discharge large number of vehicles over a short time.

Condition A (Must meet all three criteria)			
Criteria	Criteria Met	Peak Hour Value	Satisfied?
Delay on Minor Approach (veh-hr)	4 veh-hr for 1 lane approach 5 veh-hr for 2 lane approach		
Volume on Minor Approach	100 vph for 1 lane, or 150 vph for 2 lanes	103	YES
Total Entering Volume	650 vph for 3 approaches, 800 vph for 4 or more	1466	YES

Condition B



Warrant 3 met? N/A

Capacity Analysis

Existing Conditions

Intersection	
Int Delay, s/veh	0.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	17	811	0	0	549	2	0	0	0	1	0	16
Future Vol, veh/h	17	811	0	0	549	2	0	0	0	1	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	6	2	0	0	3	0	0	0	0	0	0	6
Mvmt Flow	17	828	0	0	560	2	0	0	0	1	0	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	562	0	0	828	0	0	1431	1424	828	1423	1423	561
Stage 1	-	-	-	-	-	-	862	862	-	561	561	-
Stage 2	-	-	-	-	-	-	569	562	-	862	862	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.354
Pot Cap-1 Maneuver	990	-	-	812	-	-	113	137	374	115	137	520
Stage 1	-	-	-	-	-	-	353	375	-	516	513	-
Stage 2	-	-	-	-	-	-	511	513	-	353	375	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	990	-	-	812	-	-	108	135	374	114	135	520
Mov Cap-2 Maneuver	-	-	-	-	-	-	108	135	-	114	135	-
Stage 1	-	-	-	-	-	-	347	369	-	507	513	-
Stage 2	-	-	-	-	-	-	495	513	-	347	369	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.2	0	0	13.7
HCM LOS			A	B

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	-	812	-	-	990	-	-	430
HCM Lane V/C Ratio	-	-	-	-	0.018	-	-	0.04
HCM Control Delay (s)	0	0	-	-	8.7	-	-	13.7
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	4.2

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	386	447	373	16	1	157
Future Vol, veh/h	386	447	373	16	1	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	3	2	13	0	1
Mvmt Flow	406	471	393	17	1	165

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	410	0	-	0	1685	402
Stage 1	-	-	-	-	402	-
Stage 2	-	-	-	-	1283	-
Critical Hdwy	4.12	-	-	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.309
Pot Cap-1 Maneuver	1149	-	-	-	105	650
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	263	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1149	-	-	-	68	650
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	440	-
Stage 2	-	-	-	-	263	-

Approach	SE	NW	SW
HCM Control Delay, s	4.6	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1149	-	639
HCM Lane V/C Ratio	-	-	0.354	-	0.26
HCM Control Delay (s)	-	-	9.8	-	12.6
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	1.6	-	1

Intersection	
Int Delay, s/veh	0.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	30	775	0	0	676	6	0	0	0	5	0	26
Future Vol, veh/h	30	775	0	0	676	6	0	0	0	5	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	2	0	0	2	17	0	0	0	10	0	8
Mvmt Flow	33	842	0	0	735	7	0	0	0	5	0	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	742	0	0	842	0	0	1661	1650	842	1647	1647	739
Stage 1	-	-	-	-	-	-	908	908	-	739	739	-
Stage 2	-	-	-	-	-	-	753	742	-	908	908	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.2	6.5	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.59	4	3.372
Pot Cap-1 Maneuver	861	-	-	802	-	-	78	100	367	76	100	408
Stage 1	-	-	-	-	-	-	332	357	-	397	427	-
Stage 2	-	-	-	-	-	-	405	425	-	319	357	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	861	-	-	802	-	-	70	96	367	74	96	408
Mov Cap-2 Maneuver	-	-	-	-	-	-	70	96	-	74	96	-
Stage 1	-	-	-	-	-	-	319	343	-	382	427	-
Stage 2	-	-	-	-	-	-	377	425	-	307	343	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.3	0	0	22.8
HCM LOS			A	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	-	802	-	-	861	-	- 236
HCM Lane V/C Ratio	-	-	-	-	0.038	-	- 0.143
HCM Control Delay (s)	0	0	-	-	9.3	-	- 22.8
HCM Lane LOS	A	A	-	-	A	-	- C
HCM 95th %tile Q(veh)	-	0	-	-	0.1	-	- 0.5

Intersection	
Int Delay, s/veh	5.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	217	558	425	19	14	283
Future Vol, veh/h	217	558	425	19	14	283
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	3	2	0	0	2
Mvmt Flow	236	607	462	21	15	308

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	483	0	-	0	1552	473
Stage 1	-	-	-	-	473	-
Stage 2	-	-	-	-	1079	-
Critical Hdwy	4.11	-	-	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.318
Pot Cap-1 Maneuver	1085	-	-	-	126	591
Stage 1	-	-	-	-	631	-
Stage 2	-	-	-	-	329	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1085	-	-	-	99	591
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	493	-
Stage 2	-	-	-	-	329	-

Approach	SE	NW	SW
HCM Control Delay, s	2.6	0	20.6
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1085	-	548
HCM Lane V/C Ratio	-	-	0.217	-	0.589
HCM Control Delay (s)	-	-	9.2	-	20.6
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	0.8	-	3.8

Full Build 2023 Conditions

Intersection	
Int Delay, s/veh	2.5

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	830	51	36	712	38	49
Future Vol, veh/h	830	51	36	712	38	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	0	0	6	0	0
Mvmt Flow	847	52	37	727	39	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	899	0	1648	847
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	801	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	764	-	110	365
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	445	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	764	-	105	365
Mov Cap-2 Maneuver	-	-	-	-	105	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	424	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.5	45
HCM LOS			E

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	175	764	-	-	-
HCM Lane V/C Ratio	0.507	0.048	-	-	-
HCM Control Delay (s)	45	9.9	-	-	-
HCM Lane LOS	E	A	-	-	-
HCM 95th %tile Q(veh)	2.5	0.2	-	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	18	808	525	50	550	2	38	1	64	1	1	17
Future Vol, veh/h	18	808	525	50	550	2	38	1	64	1	1	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	200	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	6	2	0	0	3	0	0	0	0	0	0	6
Mvmt Flow	18	824	536	51	561	2	39	1	65	1	1	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	563	0	0	1360	0	0	1533	1525	824	1825	2060	562
Stage 1	-	-	-	-	-	-	860	860	-	664	664	-
Stage 2	-	-	-	-	-	-	673	665	-	1161	1396	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.354
Pot Cap-1 Maneuver	989	-	-	512	-	-	96	119	376	60	56	519
Stage 1	-	-	-	-	-	-	353	376	-	453	461	-
Stage 2	-	-	-	-	-	-	448	461	-	240	210	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	989	-	-	512	-	-	83	105	376	45	50	519
Mov Cap-2 Maneuver	-	-	-	-	-	-	83	105	-	45	50	-
Stage 1	-	-	-	-	-	-	347	369	-	445	415	-
Stage 2	-	-	-	-	-	-	389	415	-	194	206	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.1	1.1	61	20.4
HCM LOS			F	C

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	162	512	-	-	989	-	- 253
HCM Lane V/C Ratio	0.649	0.1	-	-	0.019	-	- 0.077
HCM Control Delay (s)	61	12.8	-	-	8.7	-	- 20.4
HCM Lane LOS	F	B	-	-	A	-	- C
HCM 95th %tile Q(veh)	3.7	0.3	-	-	0.1	-	- 0.2

Intersection	
Int Delay, s/veh	4.4

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	411	484	407	17	1	173
Future Vol, veh/h	411	484	407	17	1	173
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	3	2	13	0	1
Mvmt Flow	433	509	428	18	1	182

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	446	0	-	0	1812	437
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	1375	-
Critical Hdwy	4.12	-	-	-	6.4	6.21
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.309
Pot Cap-1 Maneuver	1114	-	-	-	87	622
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	237	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1114	-	-	-	53	622
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	400	-
Stage 2	-	-	-	-	237	-

Approach	SE	NW	SW
HCM Control Delay, s	4.7	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1114	-	612
HCM Lane V/C Ratio	-	-	0.388	-	0.299
HCM Control Delay (s)	-	-	10.3	-	13.4
HCM Lane LOS	-	-	B	-	B
HCM 95th %tile Q(veh)	-	-	1.9	-	1.3

Intersection	
Int Delay, s/veh	2.6

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	815	40	34	712	36	38
Future Vol, veh/h	815	40	34	712	36	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	886	43	37	774	39	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	929	0	1734	886
Stage 1	-	-	-	-	886	-
Stage 2	-	-	-	-	848	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	744	-	98	346
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	423	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	744	-	93	346
Mov Cap-2 Maneuver	-	-	-	-	93	-
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	402	-

Approach	SE	NW	NE
HCM Control Delay, s	0	0.5	54.4
HCM LOS			F

Minor Lane/Major Mvmt	NELn1	NWL	NWT	SET	SER
Capacity (veh/h)	149	744	-	-	-
HCM Lane V/C Ratio	0.54	0.05	-	-	-
HCM Control Delay (s)	54.4	10.1	-	-	-
HCM Lane LOS	F	B	-	-	-
HCM 95th %tile Q(veh)	2.7	0.2	-	-	-

Intersection	
Int Delay, s/veh	8

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	31	780	41	48	682	6	37	1	51	5	1	27
Future Vol, veh/h	31	780	41	48	682	6	37	1	51	5	1	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	200	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	2	0	0	2	17	0	0	0	10	0	8
Mvmt Flow	34	848	45	52	741	7	40	1	55	5	1	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	748	0	0	893	0	0	1780	1768	848	1816	1810	745
Stage 1	-	-	-	-	-	-	916	916	-	849	849	-
Stage 2	-	-	-	-	-	-	864	852	-	967	961	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.1	6.5	6.2	7.2	6.5	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.5	4	3.3	3.59	4	3.372
Pot Cap-1 Maneuver	856	-	-	768	-	-	65	84	364	57	80	404
Stage 1	-	-	-	-	-	-	329	354	-	344	380	-
Stage 2	-	-	-	-	-	-	352	379	-	296	337	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	856	-	-	768	-	-	55	75	364	44	72	404
Mov Cap-2 Maneuver	-	-	-	-	-	-	55	75	-	44	72	-
Stage 1	-	-	-	-	-	-	316	340	-	330	354	-
Stage 2	-	-	-	-	-	-	303	353	-	240	324	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.3	0.7	133.1	31.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NELn1	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	108	768	-	-	856	-	- 170
HCM Lane V/C Ratio	0.896	0.068	-	-	0.039	-	- 0.211
HCM Control Delay (s)	133.1	10	-	-	9.4	-	- 31.8
HCM Lane LOS	F	B	-	-	A	-	- D
HCM 95th %tile Q(veh)	5.4	0.2	-	-	0.1	-	- 0.8

Intersection	
Int Delay, s/veh	6.2

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	235	596	459	20	15	303
Future Vol, veh/h	235	596	459	20	15	303
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	3	2	0	0	2
Mvmt Flow	255	648	499	22	16	329

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	521	0	-	0	1668	510
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	1158	-
Critical Hdwy	4.11	-	-	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.318
Pot Cap-1 Maneuver	1050	-	-	-	107	563
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	302	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1050	-	-	-	81	563
Mov Cap-2 Maneuver	-	-	-	-	201	-
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	302	-

Approach	SE	NW	SW
HCM Control Delay, s	2.7	0	24.7
HCM LOS			C

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1050	-	519
HCM Lane V/C Ratio	-	-	0.243	-	0.666
HCM Control Delay (s)	-	-	9.5	-	24.7
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	1	-	4.9

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	18	808	525	50	550	2	38	1	64	1	1	17
Future Volume (vph)	18	808	525	50	550	2	38	1	64	1	1	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		200	200		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1703	1863	1615	1805	1843	0	0	1709	0	0	1580	0
Flt Permitted	0.425			0.262				0.870			0.972	
Satd. Flow (perm)	762	1863	1615	498	1843	0	0	1514	0	0	1541	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			536					65			17	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		288			408			125			101	
Travel Time (s)		3.6			5.1			2.8			2.3	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	6%	2%	0%	0%	3%	0%	0%	0%	0%	0%	0%	6%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	824	536	51	563	0	0	105	0	0	19	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2			4			8		
Detector Phase	6	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		20.0	20.0		20.0	20.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effct Green (s)	36.2	36.2	36.2	36.2	36.2			7.5			7.5	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71			0.15			0.15	
v/c Ratio	0.03	0.62	0.41	0.14	0.43			0.38			0.08	
Control Delay	4.4	9.0	1.6	5.7	6.3			14.6			11.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	4.4	9.0	1.6	5.7	6.3			14.6			11.9	
LOS	A	A	A	A	A			B			B	
Approach Delay		6.1			6.3			14.6			11.9	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	2	134	0	5	73			12			1	
Queue Length 95th (ft)	8	297	29	21	159			46			15	
Internal Link Dist (ft)		208			328			45			21	
Turn Bay Length (ft)	100		200	200								
Base Capacity (vph)	542	1327	1304	355	1313			482			455	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Starvation Cap Reductn	0	0	0	0	0			0			0	
Spillback Cap Reductn	0	0	0	0	0			0			0	
Storage Cap Reductn	0	0	0	0	0			0			0	
Reduced v/c Ratio	0.03	0.62	0.41	0.14	0.43			0.22			0.04	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 50.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 6.6		Intersection LOS: A	
Intersection Capacity Utilization 65.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 5: Access B/Starlight Dr & FM 1863

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	31	780	41	48	682	6	37	1	51	5	1	27
Future Volume (vph)	31	780	41	48	682	6	37	1	51	5	1	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		200	200		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	0		0
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1752	1863	1615	1805	1858	0	0	1719	0	0	1550	0
Flt Permitted	0.306			0.245				0.849			0.930	
Satd. Flow (perm)	564	1863	1615	466	1858	0	0	1489	0	0	1452	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55		1			55			29	
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		288			408			125			101	
Travel Time (s)		3.6			5.1			2.8			2.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	2%	0%	0%	2%	17%	0%	0%	0%	10%	0%	8%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	848	45	52	748	0	0	96	0	0	35	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6		6	2			4			8		
Detector Phase	6	6	6	2	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0		20.0	20.0		20.0	20.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		20.0	20.0		20.0	20.0	
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%		33.3%	33.3%		33.3%	33.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effct Green (s)	35.0	35.0	35.0	35.0	35.0			7.4			7.4	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71			0.15			0.15	
v/c Ratio	0.09	0.64	0.04	0.16	0.57			0.36			0.14	
Control Delay	5.0	9.7	1.5	6.0	8.2			15.0			11.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0			0.0	
Total Delay	5.0	9.7	1.5	6.0	8.2			15.0			11.5	
LOS	A	A	A	A	A			B			B	
Approach Delay		9.2			8.0			15.0			11.5	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	3	140	0	5	113			11			2	
Queue Length 95th (ft)	14	313	8	21	246			46			21	
Internal Link Dist (ft)		208			328			45			21	
Turn Bay Length (ft)	100		200	200								
Base Capacity (vph)	400	1323	1163	331	1320			480			450	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Starvation Cap Reductn	0	0	0	0	0			0			0	
Spillback Cap Reductn	0	0	0	0	0			0			0	
Storage Cap Reductn	0	0	0	0	0			0			0	
Reduced v/c Ratio	0.09	0.64	0.04	0.16	0.57			0.20			0.08	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 49.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 62.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Access B/Starlight Dr & FM 1863

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 INCH = 50 FT.

LEGEND

- 1015 — EXISTING MAJOR CONTOUR
- 1017 — EXISTING MINOR CONTOUR
- 0%-2% SLOPE
- 2%-5% SLOPE
- >5% SLOPE

AVERAGE SLOPE

LOT 02
1.74 ACRES

LOT 03
6.538 ACRES

17.905 ACRES
DOC# 201206031793
O.P.R.

50' B.S.L.

30' INGRESS/EGRESS AND SHARE ACCESS EASEMENT FOR LOT 2 AND 3

20' ELEC. & CATV ESMT.

F.M.1863

STARLIGHT DR.

LOT 01
2.420 ACRES

SITE

-0.9%

-1.6%

-21.4%

-1.5%

-18.6%

-8.9%

-11.2%

-0.7%

-8.6%

50' SLOPE EASEMENT

ONSITE SLOPE

ELSOMA APPROVED FLOODPLAIN

FEMA ZONE AE FLOODPLAIN
(0.2% ANNUAL CHANCE)

5.00 ACRES
ALFONSO D. ORANTES AND
NOEMI ORANTES
(DOC# 200206001014 O.P.R.C.C.)

FEMA ZONE AE FLOODPLAIN
(1%

DRAINAGE EASEMENT

CIBOLO CREEK

Number	Slope Ranges	Area
1	Less than 15%	6.53 Ac
2	15%-20%	1.02 Ac.
3	20%-25%	1.25 Ac.
4	>25 %	1.90 Ac.

Revisions:

Seda Consulting Engineers, Inc.
Firm Registration No: F-1601
6735 IH 10 West
San Antonio, Texas 78201
(210) 308-0057
FAX:(210) 308-8842
e-mail: seda@satx.rr.com
CIVIL • STRUCTURAL • ENVIRONMENTAL • PLANNER

BULVERDE CONVENIENCE STORE SUBDIVISION

SLOPE MAP EXHIBITS

CITY OF BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 1907
DATE: 06/22/2023
DRAWN BY: FM
CHECKED BY: SED
SHEET: 1 OF 1

BULVERDE CONVENIENCE STORE
SUBDIVISION
City of Bulverde
Comal County, Texas

STORM WATER MANAGEMENT PLAN

June 22 2023

Revised May 02 2024

Prepared By:

Seda Consulting Engineers, Inc.
6735 I.H. 10 West
San Antonio, TX. 78201
TBPE FIRM REGISTRATION NO., F- 1601

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ELOMA APPROVAL

Federal Emergency Management Agency
Washington, D.C. 20472

DR. SALAH DIAB
SEDA CONSULTING ENGINEERS INC
6735 FRONTAGE RD
SAN ANTONIO, TX 78201

CASE NO.: 24-06-0777A
COMMUNITY: CITY OF BULVERDE, COMAL COUNTY, TEXAS
COMMUNITY NO.: 481681

DEAR DR. DIAB:

This is in reference to a request that the Federal Emergency Management Agency (FEMA) determine if the property described in the enclosed document is located within an identified Special Flood Hazard Area, the area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood), on the effective National Flood Insurance Program (NFIP) map. Using the information submitted and the effective NFIP map, our determination is shown on the attached Letter of Map Amendment (LOMA) Determination Document. This determination document provides additional information regarding the effective NFIP map, the legal description of the property and our determination.

Additional documents are enclosed which provide information regarding the subject property and LOMAs. Please see the List of Enclosures below to determine which documents are enclosed. Other attachments specific to this request may be included as referenced in the Determination/Comment document. If you have any questions about this letter or any of the enclosures, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, NWRP eLOMA Coordinator, 3601 Eisenhower Ave., Alexandria, VA 22304-6439, Fax: 703-751-7415.

Sincerely,

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

LIST OF ENCLOSURES:
LOMA DETERMINATION DOCUMENT (REMOVAL)

cc: State/Commonwealth NFIP Coordinator
Community Map Repository
Region

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

COMMUNITY AND MAP PANEL INFORMATION		LEGAL PROPERTY DESCRIPTION
COMMUNITY	CITY OF BULVERDE, COMAL COUNTY, TEXAS	A parcel of land, as described in the Warranty Deed recorded as Document No. 441560 in Volume 972, Pages 803, 804, and 805, in the Office of the County Clerk, Comal County, Texas The portion of property is more particularly described by the following metes and bounds: BEGINNING; at an iron pin found on the South Right-of-Way (ROW) line of FM 1863, said iron pin being the most Northeast corner of said 6.093 acres tract of
	COMMUNITY NO: 481681	
AFFECTED MAP PANEL	NUMBER: 48091C0220F; 48091C0385F	
	DATE: 9/2/2009; 9/2/2009	
FLOODING SOURCE: CIBOLO CREEK		APPROXIMATE LATITUDE & LONGITUDE OF PROPERTY: 29.749758, -98.402258 SOURCE OF LAT & LONG: GOOGLE EARTH DATUM: WGS 84

DETERMINATION

LOT	BLOCK/ SECTION	SUBDIVISION	STREET	OUTCOME WHAT IS REMOVED FROM THE SFHA	FLOOD ZONE	1% ANNUAL CHANCE FLOOD ELEVATION (NAVD 88)	LOWEST ADJACENT GRADE ELEVATION (NAVD 88)	LOWEST LOT ELEVATION (NAVD 88)
--	--	--	4070 FM 1863	Portion of Property	X (shaded)	--	--	1016.6 feet

Special Flood Hazard Area (SFHA) - The SFHA is an area that would be inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood).

ADDITIONAL CONSIDERATIONS (Please refer to the appropriate section on Attachment 1 for the additional considerations listed below.)

LEGAL PROPERTY DESCRIPTION
PORTIONS REMAIN IN THE SFHA/FLOODWAY
eLOMA DETERMINATION

This document provides the Federal Emergency Management Agency's determination regarding a request for a Letter of Map Amendment for the property described above. Using the information submitted and the effective National Flood Insurance Program (NFIP) map, we have determined that the described portion(s) of the property(ies) is/are not located in the SFHA, an area inundated by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). This document amends the effective NFIP map to remove the subject property from the SFHA located on the effective NFIP map; therefore, the Federal mandatory flood insurance requirement does not apply. However, the lender has the option to continue the flood insurance requirement to protect its financial risk on the loan.

This determination is based on the flood data presently available. If there are any errors on this eLOMA Determination Letter that cause FEMA to rescind and/or nullify the determination the property owner should consult the Licensed Professional that submitted this eLOMA. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, 3601 Eisenhower Avenue, Alexandria, VA 22304-4605, Fax: 703-751-7415.

Patrick “Rick” F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

eLOMA

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

LEGAL PROPERTY DESCRIPTION (CONTINUED)

land, THENCE: along the eastern boundary of subject property the following Two(2) courses; 1. S 40°02’33” W, a distance of 285.00 feet to a point; 2. S 42°36’60” W, a distance of 206.85 feet to a set iron rod within the southerly boundary of the said 6.093 tract of land, said point being the Southeast corner of the herein described 6.093 acres tract of land; THENCE: along the south and west boundary of subject property the 1. N 53°01’33” W, a distance of 302.05 feet to a point; 2. N 08°39’57” W, a distance of 338.49 feet to a point; 3. N 10°18’38” E, a distance of 245.89 feet to a set iron rod within the northerly boundary of the said 6.093 tract of land, said point being the Northwest corner of the herein described 6.093 acres tract of land; THENCE: along the southern ROW line of FM 1863, S 75°45’45” E, a distance of 26.61 feet to a Set Iron Rod THENCE: along the southern ROW line of FM 1863,a curve to the right having a radius of 1106.30 feet, a central angle of 15°27’38”, an arc length of 298.52 feet, a chord bearing of N59°38’24”E and a chord distance of 297.62 feet, to a set iron Rod with in the southern ROW of FM 1863; THENCE: along the southern ROW line of FM 1863,a curve to the right having a radius of 1106.30 feet, a central angle of 00°22’26”, an arc length of 7.22 feet, a chord bearing of N51°43’22”E and a chord distance of 7.22 feet, to a set iron Rod with in the southern ROW of FM 1863; THENCE: along the southern ROW line of FM 1863, S 51°22’42” E, a distance of 362.78 feet to a point the POINT OF BEGINNING

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, NWRP eLOMA Coordinator, 3601 Eisenhower Ave., Alexandria, VA 22304-6439, Fax: 703-751-7415

Patrick “Rick” F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

Portion of Property Removal:

The following considerations may or may not apply to the determination for your Portion of Property:

PORTIONS OF THE PROPERTY REMAIN IN THE SFHA and/or FLOODWAY - Portions of this property, but not the subject of the Determination document, may remain in the Special Flood Hazard Area (SFHA) and/or the regulatory floodway for the flooding source indicated on the Determination Document. The NFIP regulatory floodway is the area that must remain unobstructed in order to prevent unacceptable increases in base flood elevations. Therefore, no construction may take place in an NFIP regulatory floodway that may cause an increase in the base flood elevation. Therefore, any future construction or substantial improvement on the property remains subject to Federal, State/Commonwealth, and local regulations for floodplain management. The NFIP regulatory floodway is provided to the community as a tool to regulate floodplain development. Modifications to the NFIP regulatory floodway must be accepted by both the Federal Emergency Management Agency (FEMA) and the community involved. Appropriate community actions are defined in Paragraph 60.3(d) of the NFIP regulations. Any proposed revision to the NFIP regulatory floodway must be submitted to FEMA by community officials. The community should contact either the Regional Director (for those communities in Regions I-IV, and VI-X), or the Regional Engineer (for those communities in Region V) for guidance on the data which must be submitted for a revision to the NFIP regulatory floodway. Contact information for each regional office can be obtained by calling the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or from our web site at https://www.fema.gov/regional-contact-information

STUDY UNDERWAY - This determination is based on the flood data presently available. However, the Federal Emergency Management Agency may be currently revising the National Flood Insurance Program (NFIP) map for the community. New flood data could be generated that may affect this property. If a new NFIP map is issued it will supersede this determination. The Federal requirement for the purchase of flood insurance will then be based on the newly revised NFIP map.

EXTRATERRITORIAL JURISDICTION - The subject of the determination is shown on the National Flood Insurance Program map and may be located in an Extraterritorial Jurisdiction area for the community indicated on the Determination Document.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, NWRP eLOMA Coordinator, 3601 Eisenhower Ave., Alexandria, VA 22304-6439, Fax: 703-751-7415

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Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP AMENDMENT
DETERMINATION DOCUMENT (REMOVAL)

ATTACHMENT 1 (ADDITIONAL CONSIDERATIONS)

GREAT LAKES - The Federal Emergency Management Agency (FEMA) has based this determination on elevation data which is published in the current Flood Insurance Study for the community. However, the elevations established in the U.S. Army Corps of Engineers (USACE) reports on the Great Lakes are the best available data known to us. If in the future there are any subsequent map revisions to the National Flood Insurance Program map and the USACE reports remain the best available data known, FEMA will use those elevations for any such revisions. Further, be advised that the elevations on the Flood Insurance Rate Map (FIRM) may only reflect the Stillwater elevation for the lake and may not account for the effects of wind driven waves or wave run-up. On-site conditions such as wind speed, wind direction, fetch distance, water depth and the slope of the beach or bluff may result in significant increases to the base flood elevation. Therefore, it is strongly recommended that the requestor be aware of these circumstances and, if warranted, evaluate the effects of wind driven waves along the shoreline of the property.

STATE AND LOCAL CONSIDERATIONS - Please note that this document does not override or supersede any State or local procedural or substantive provisions which may apply to floodplain management requirements associated with amendments to State or local floodplain zoning ordinances, maps, or State or local procedures adopted under the National Flood Insurance Program.

COASTAL BARRIER RESOURCE SYSTEM - Based upon information provided to FEMA by the U.S. Fish and Wildlife Service (USFWS), the subject property may be within a System Unit or an Otherwise Protected Area (OPA) of the John H. Chafee Coastal Barrier Resource System (CBRS). Federal flood insurance is generally not available within the CBRS for new construction or substantial improvements occurring after the flood insurance prohibition date (which is generally tied to the date that the area was first established as either a System Unit or OPA, but may differ in some cases). Other federal expenditures and financial assistance (including certain types of disaster assistance) are also restricted within System Units of the CBRS. The USFWS is the authoritative source for information regarding the CBRS. Additional information, including the CBRS Mapper, can be found on the USFWS website at: https://www.fws.gov/cbra.

This attachment provides additional information regarding this request. If you have any questions about this attachment, please contact the FEMA Map Assistance Center toll free at (877) 336-2627 (877-FEMA MAP) or by letter addressed to the Federal Emergency Management Agency, Attn: North Wind Resource Partners (NWRP) eLOMA Coordinator, NWRP eLOMA Coordinator, 3601 Eisenhower Ave., Alexandria, VA 22304-6439, Fax: 703-751-7415

Patrick “Rick” F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

ADDITIONAL INFORMATION REGARDING LETTERS OF MAP AMENDMENT

When making determinations on requests for Letters of Map Amendment (LOMAs), the Department of Homeland Security's Federal Emergency Management Agency (FEMA) bases its determination on the flood hazard information available at the time of the determination. Requesters should be aware that flood conditions may change or new information may be generated that would supersede FEMA's determination. In such cases, the community will be informed by letter.

Requesters also should be aware that removal of a property (parcel of land or structure) from the Special Flood Hazard Area (SFHA) means FEMA has determined the property is not subject to inundation by the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). This does not mean the property is not subject to other flood hazards. The property could be inundated by a flood with a magnitude greater than the base flood or by localized flooding not shown on the effective National Flood Insurance Program (NFIP) map.

The effect of a LOMA is it removes the Federal requirement for the lender to require flood insurance coverage for the property described. The LOMA *is not* a waiver of the condition that the property owner maintain flood insurance coverage for the property. *Only* the lender can waive the flood insurance purchase requirement because the lender imposed the requirement. *The property owner must request and receive a written waiver from the lender before canceling the policy*. The lender may determine, on its own as a business decision that it wishes to continue the flood insurance requirement to protect its financial risk on the loan.

The LOMA provides FEMA's comment on the mandatory flood insurance requirements of the NFIP as they apply to a particular property. A LOMA is not a building permit, nor should it be construed as such. Any development, new construction, or substantial improvement of a property impacted by a LOMA must comply with all applicable State and local criteria and other Federal criteria.

If a lender releases a property owner from the flood insurance requirement, and the property owner decides to cancel the policy and seek a refund, the NFIP will refund the premium paid for the current policy year, provided that no claim is pending or has been paid on the policy during the current policy year. The property owner must provide a written waiver of the insurance requirement from the lender to the property insurance agent or company servicing his or her policy. The agent or company will then process the refund request.

Even though structures are not located in an SFHA, as mentioned above, they could be flooded by a flooding event with a greater magnitude than the base flood. In fact, more than 25 percent of all claims paid by the NFIP are for policies for structures located outside the SFHA in Zones B, C, X (shaded), or X (unshaded). More than one-fourth of all policies purchased under the NFIP protect structures located in these zones. The risk to structures located outside SFHAs is just not as great as the risk to structures located in SFHAs. Finally, approximately 90 percent of all federally declared disasters are caused by flooding, and homeowners insurance does not provide financial protection from this flooding. Therefore, FEMA encourages the widest possible coverage under the NFIP.

LOMAs are based on minimum criteria established by the NFIP. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If a State, county, or community has adopted more restrictive and comprehensive floodplain management criteria, these criteria take precedence over the minimum Federal criteria.

In accordance with regulations adopted by the community when it made application to join the NFIP, letters issued to amend an NFIP map must be attached to the community's official record copy of the map. That map is available for public inspection at the community's official map repository. Therefore, FEMA sends copies of all such letters to the affected community's official map repository.

When a restudy is undertaken, or when a sufficient number of revisions or amendments occur on particular map panels, FEMA initiates the printing and distribution process for the affected panels. FEMA notifies community officials in writing when affected map panels are being physically revised and distributed. In such cases, FEMA attempts to reflect the results of the LOMA on the new map panel. If the results of particular LOMAs cannot be reflected on the new map panel because of scale limitations, FEMA notifies the community in writing and revalidates the LOMAs in that letter. LOMAs revalidated in this way usually will become effective 1 day after the effective date of the revised map.

TABLE OF CONTENTS

1. PROJECT DESCRIPTION

PROJECT DESCRIPTION

Bulverde Convenience Store Subdivision is 10.698-acre located on 4470 FM 1863, Bulverde, and Comal County, Texas. Based on COSA-LIDAR mapping, the subject site referred to as Bulverde Convenience Store Subdivision is located on the Bulverde northeast quadrant.

Under existing conditions, the average grade on the 10.698-acre tract of land is 1.83%. The subject site is covered by short grass.

Under the proposed condition, the average grade on the 10.698 acre tract of land is 1.83%. Under proposed conditions, one lot of land is covered by proposed building, proposed driveway and parking lots. The total onsite impervious cover for the lot of land is 92,650 square feet. The total increase in impervious for this development is 92,650 sf.

FEMA flood line of Cibolo creek is flowing the downstream of the subject site. The total property will flow through this creek directly. The proposed condition and grading plan shows that the total proposed water will also flow toward Lot 03 which is on regulatory floodway to the creek. Please see the proposed exhibits on the report.

According to FIRM Map No. 48091C0220f and 48091C0385F dated on September 2, 2009, the property has been mapped partially includes FEMA regulatory floodway, Zone AE floodplain (1% annual chance), 0.2% annual chance, and a small portion that is in Zone X. Refer to Maps for the FIRM Map.

The rational hydrograph method was used to compute the peak runoff described on city of Bulverde storm water design criteria manual section 4.3.

The Time of Concentration (Tc), was determined by using the TR-55 method as suggested by the City of Bulverde Storm Water Design Criteria Manual (January 2019), section 4.2.4. Please see included Time of Concentration calculation worksheets. The Rainfall Intensities noted as (i) were obtained from City of Bulverde Storm Water Design Criteria Manual.

2. DRAINAGE STUDY LETTER

SCE
TBPE FIRM REGISTRATION NO., F-1601
Seda Consulting Engineers, Inc.
6735 I.H. 10 West
San Antonio, TX 78201
Phone: (210) 308-0057
FAX: (210) 308-8842
E-MAIL:seda@satx.rr.com

June 22, 2023

Storm Water Engineering
Department of Public Works
City of Bulverde
Bulverde, Texas 78163

Re: Bulverde Convenience Store Subdivision

Dear Sir/Madam,

Bulverde Convenience Store Subdivision is 10.698-acre located on 4470 FM 1863, Bulverde, and Comal County, Texas. Based on COSA-LIDAR mapping, the subject site referred to as Bulverde Convenience Store Subdivision is located on the Bulverde northeast quadrant.

The purpose of this drainage study is to evaluate the probability of a significant adverse impact on the project site, existing infrastructures, and related drainage structures within two thousand (2,000) linear feet of the project, and to provide proper design measures and procedures during the development stage provided existing and proposed drainage calculations.

Under existing conditions, the average grade on the 10.698-acre tract of land is 1.83%. The subject site is covered by short grass.

Under the proposed condition, the average grade on the 10.698 acre tract of land is 1.83%. Under proposed conditions, one lot of land is covered by proposed building, proposed driveway and parking lots. The total onsite impervious cover for the lot of land is 92,650 square feet. The total increase in impervious for this development is 92,650 sf.

Existing ATLAS 14 100 years WSE, and Proposed ATLAS 14 100 years WSE due to development have been determined for River station 28518, 287762 and 286938 of Cibolo Creek by using database of San Antonio River Authority which is effective HEC-RAS floodplain. Please see uploaded Hec-Ras and Hec-HMS Files. This WSE has considered during the proposed grading plan of the subject site to make sure that the property will be above the ultimate 100 year flood plain. Please see the exhibits of the report.

The proposed onsite peak runoff shows a modest increase of 33.83 CFS, which is incorporated into the proposed 100-year hydrology. By referring to the HEC-HMS database, we can observe that the peak discharge for the C4010437 hydrologic element is recorded as 72910 cfs (100-year). Consequently, the HEC-RAS study has taken into account a discharge of 72910 cfs (100-year EX) and 72934 cfs (100-year prop) to account for the increase in discharge resulting from the development. For visual representation, please consult the Topographic plan exhibit map. Additionally, it's important to note that Cibolo creek serves as the point of influence where the floodplain intersects with the downstream flow.

TOTAL ULTIMATE UPSTREAM RUNOFF VALUES					
CONDITIONS	**Q(CFS) 2-YR**	**Q(CFS) 5-YR**	**Q(CFS) 10-YR**	**Q(CFS) 25-YR**	**Q(CFS) 100YR**
TOTAL EX. onsite	20.20	31.90	43.58	61.68	96.06
TOTAL PROP. onsite	29.97	45.63	61.08	84.90	129.89
INCREMENT	9.77	13.73	17.50	23.22	33.83

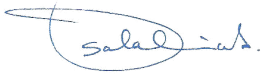
No increment in the WSE elevation has been found from Hec-Ras and Hec-HMS analysis for both existing and proposed condition for FEMA effective and Atlas 14 model. The WSE of existing and proposed remain same for the onsite development which is 1013.61 feet. Therefore, no mitigation required for the development. The developed portion of property is graded such way that the 100 year atlas 14 ultimate floodplain must be below to the property and the water flow towards the water quality pond on the south side of property. The updated flood plain is being shown in the exhibits. Please see the storm water quality pond design at the end of the report.

Based on the aerial photography and the conditions downstream, it is in my opinion that, there is non-visible increase in runoff from the existing condition to the proposed condition. The proposed development will not produce any significant impact to other properties, habitable structures or infrastructure drainage systems to a point along the 2000 liner-foot downstream segment from the site and proposed development. Downstream conditions have been verified by me and members of my staff.

If you have any questions or need additional information, please let us know.

Sincerely

SEDA CONSULTING ENGINEERS, INC.



Salah E. Diab, PhD., P.E.

3. HYDROLOGY & HYDRAULICS

Hydrologic Soil Group—Bexar County, Texas, and Comal and Hays Counties, Texas
(bulverde)

Map Scale: 1:2,290 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

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 Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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 scales ranging from 1:20,000 to 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: Bexar County, Texas
Survey Area Data: Version 26, Aug 24, 2022

Soil Survey Area: Comal and Hays Counties, Texas
Survey Area Data: Version 19, Aug 24, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 10, 2020—Dec 17, 2020

MAP LEGEND

MAP INFORMATION

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Or	Orif soils, moist, 0 to 3 percent slopes, frequently flooded	A	0.9	6.2%
Subtotals for Soil Survey Area			**0.9**	**6.2%**
Totals for Area of Interest			**14.4**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BrB	Bolar clay loam, 1 to 3 percent slopes	C	0.4	2.4%
Or	Orif soils, moist, 0 to 3 percent slopes, frequently flooded	A	2.5	17.5%
TaB	Tarpley clay, 1 to 3 percent slopes	D	10.6	73.8%
Subtotals for Soil Survey Area			**13.5**	**93.8%**
Totals for Area of Interest			**14.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Watershed Model Schematic

Legend

Hyd.	Origin	Description
1	SCS Runoff	EX ONSITE DA
2	SCS Runoff	PROP ONSITE DA

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	------	-------	20.20	-------	31.90	43.58	61.68	-------	96.06	EX ONSITE DA
2	SCS Runoff	------	-------	29.97	-------	45.63	61.08	84.90	-------	129.89	PROP ONSITE DA

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	20.20	1	730	80,049	------	------	------	EX ONSITE DA
2	SCS Runoff	29.97	1	725	92,362	------	------	------	PROP ONSITE DA

Hydrograph Report

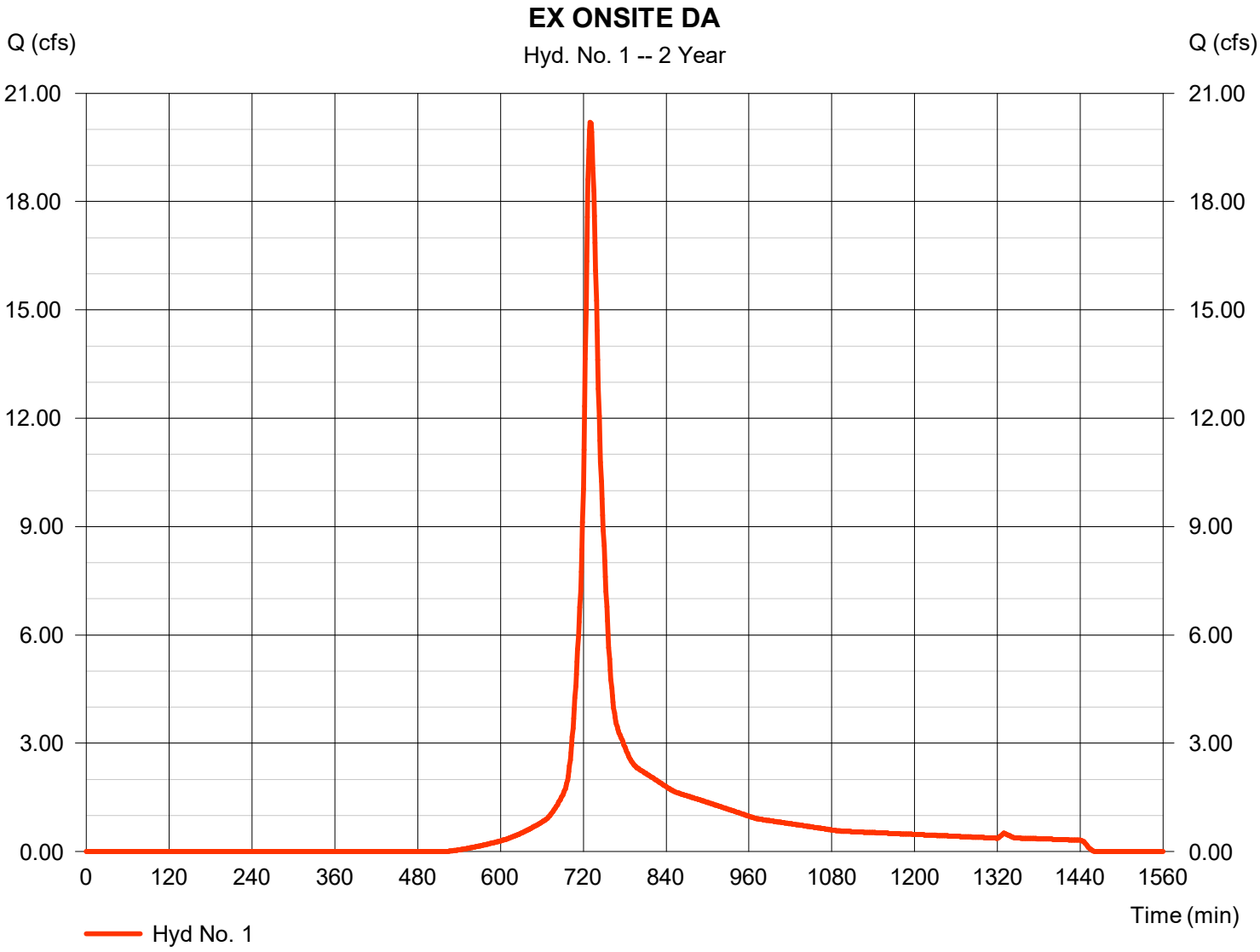
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 1

EX ONSITE DA

Hydrograph type	= SCS Runoff	Peak discharge	= 20.20 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 1 min	Hyd. volume	= 80,049 cuft
Drainage area	= 10.698 ac	Curve number	= 79*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.20 min
Total precip.	= 4.12 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.500 x 49) + (9.198 x 84)] / 10.698



TR55 Tc Worksheet

Hyd. No. 1

EX ONSITE DA

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)	= 4.12		0.00		0.00		
Land slope (%)	= 1.83		0.00		0.00		
Travel Time (min)	**= 8.95**	**+**	**0.00**	**+**	**0.00**	**=**	**8.95**
Shallow Concentrated Flow							
Flow length (ft)	= 376.00		661.00		0.00		
Watercourse slope (%)	= 1.83		8.20		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=2.18		4.62		0.00		
Travel Time (min)	**= 2.87**	**+**	**2.38**	**+**	**0.00**	**=**	**5.26**
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 ..... 14.20 min

Hydrograph Report

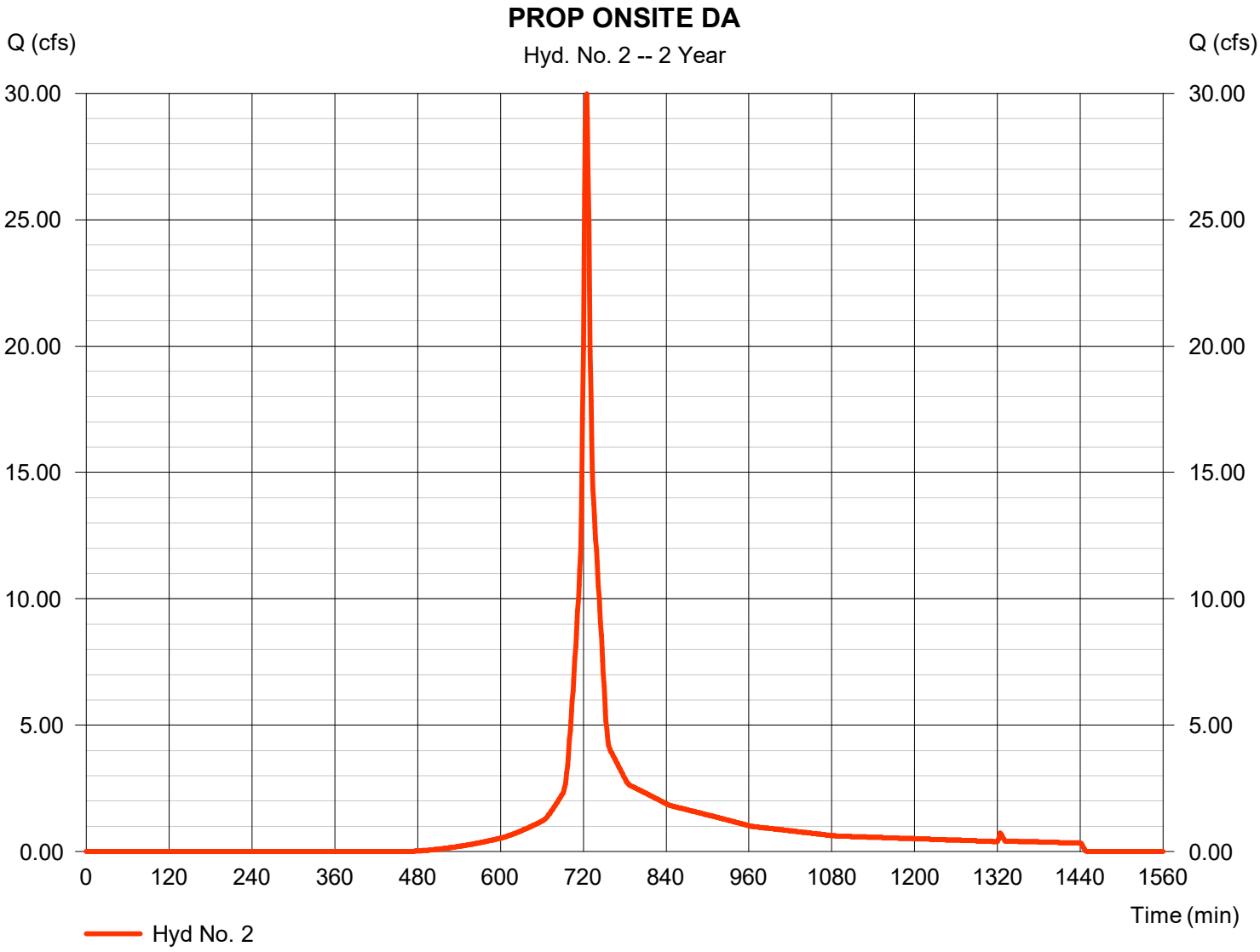
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 2

PROP ONSITE DA

Hydrograph type	= SCS Runoff	Peak discharge	= 29.97 cfs
Storm frequency	= 2 yrs	Time to peak	= 725 min
Time interval	= 1 min	Hyd. volume	= 92,362 cuft
Drainage area	= 10.700 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.50 min
Total precip.	= 4.12 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.420 x 95) + (1.500 x 49) + (6.778 x 84)] / 10.700



TR55 Tc Worksheet

Hyd. No. 2

PROP ONSITE DA

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)	= 4.12		0.00		0.00		
Land slope (%)	= 1.83		0.00		0.00		
Travel Time (min)	**= 1.11**	**+**	**0.00**	**+**	**0.00**	**=**	**1.11**
Shallow Concentrated Flow							
Flow length (ft)	= 401.00		551.00		0.00		
Watercourse slope (%)	= 1.83		8.20		0.00		
Surface description	= Paved		Unpaved		Paved		
Average velocity (ft/s)	=2.75		4.62		0.00		
Travel Time (min)	**= 2.43**	**+**	**1.99**	**+**	**0.00**	**=**	**4.42**
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 ..... 5.50 min

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	31.90	1	730	126,032	------	------	------	EX ONSITE DA
2	SCS Runoff	45.63	1	725	141,754	------	------	------	PROP ONSITE DA

Hydrograph Report

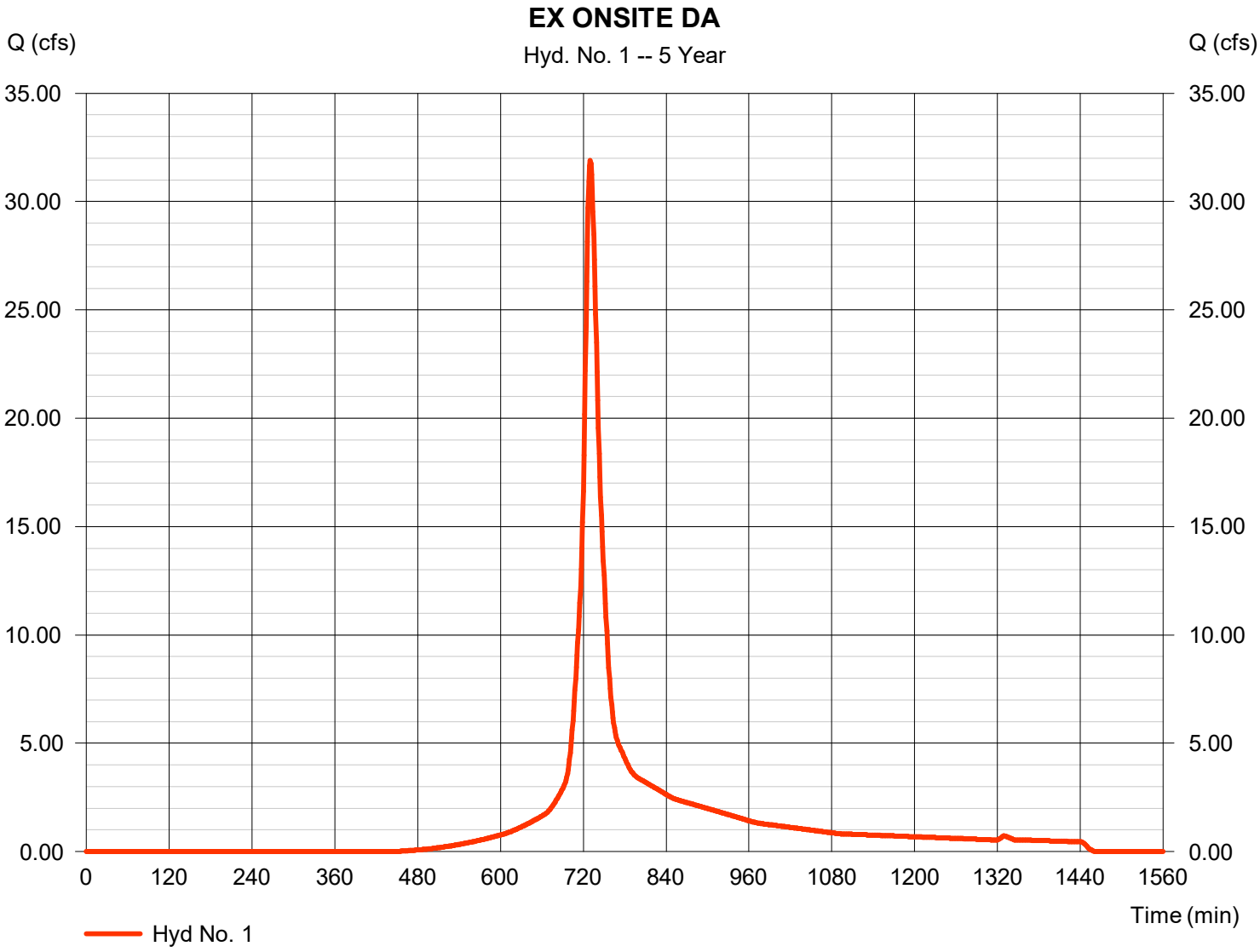
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 1

EX ONSITE DA

Hydrograph type	=	SCS Runoff	Peak discharge	=	31.90 cfs
Storm frequency	=	5 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	126,032 cuft
Drainage area	=	10.698 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	5.51 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.500 x 49) + (9.198 x 84)] / 10.698



Hydrograph Report

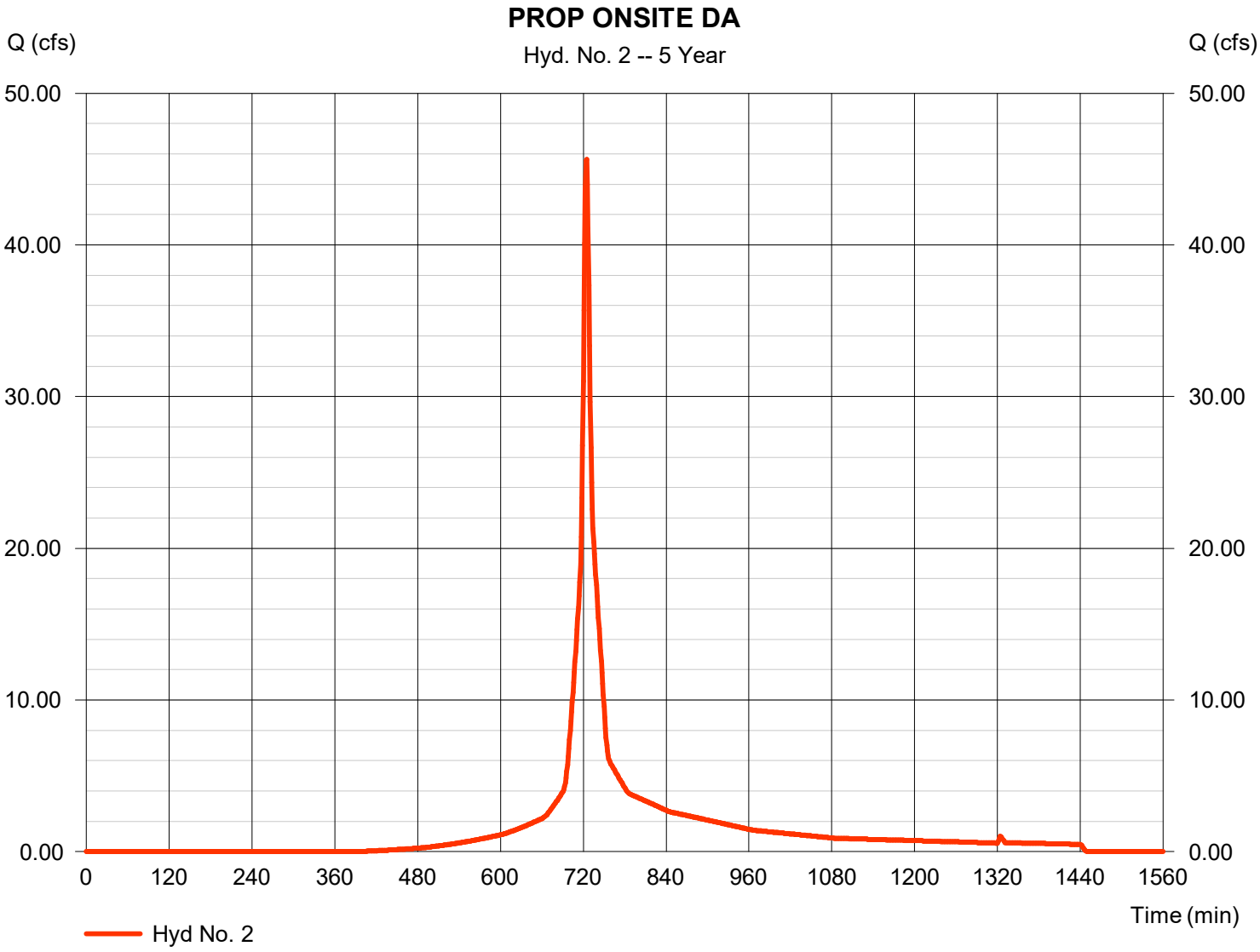
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 2

PROP ONSITE DA

Hydrograph type	= SCS Runoff	Peak discharge	= 45.63 cfs
Storm frequency	= 5 yrs	Time to peak	= 725 min
Time interval	= 1 min	Hyd. volume	= 141,754 cuft
Drainage area	= 10.700 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.50 min
Total precip.	= 5.51 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.420 x 95) + (1.500 x 49) + (6.778 x 84)] / 10.700



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	43.58	1	730	173,060	------	------	------	EX ONSITE DA
2	SCS Runoff	61.08	1	724	191,666	------	------	------	PROP ONSITE DA

Hydrograph Report

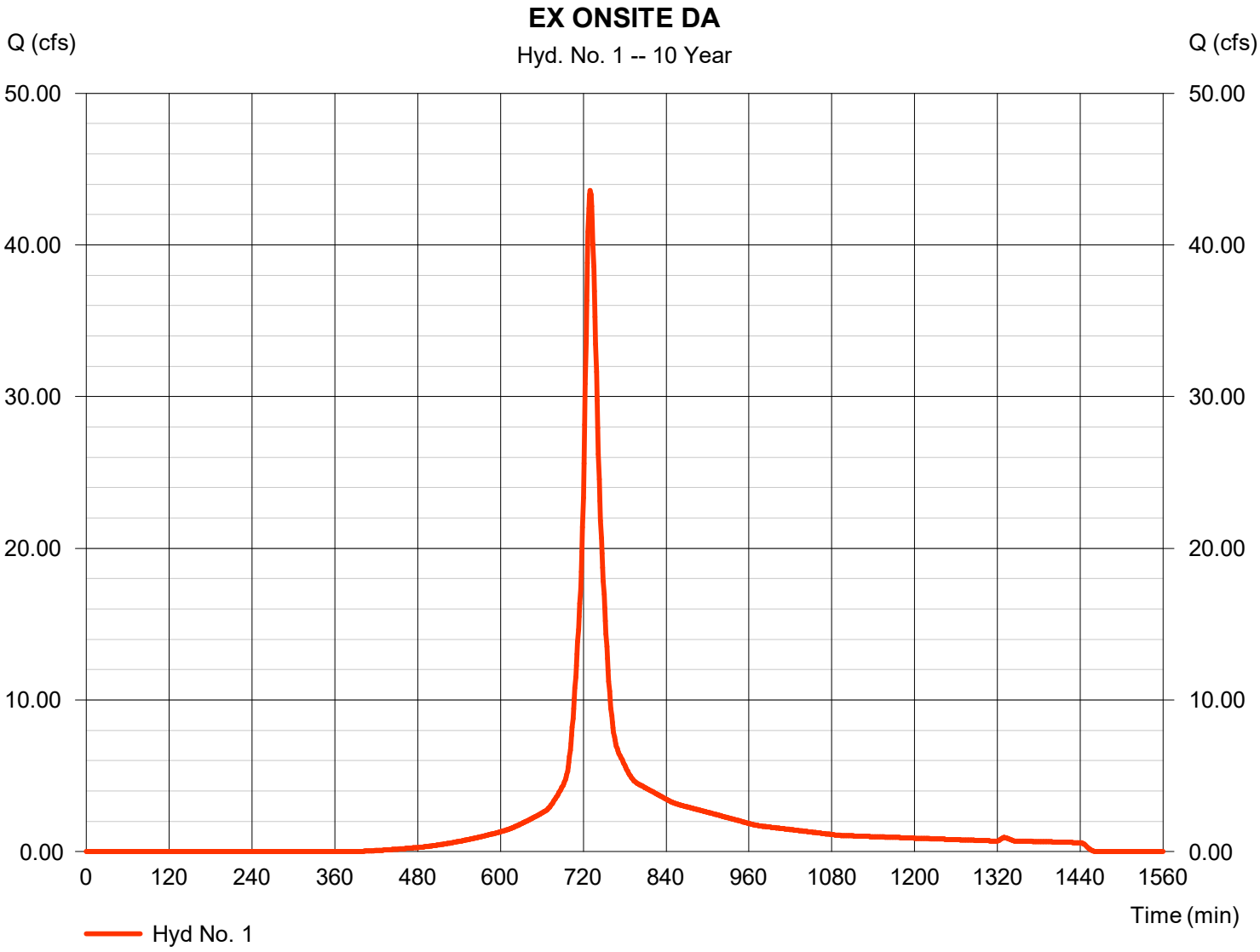
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 1

EX ONSITE DA

Hydrograph type	=	SCS Runoff	Peak discharge	=	43.58 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	173,060 cuft
Drainage area	=	10.698 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	6.86 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.500 x 49) + (9.198 x 84)] / 10.698



Hydrograph Report

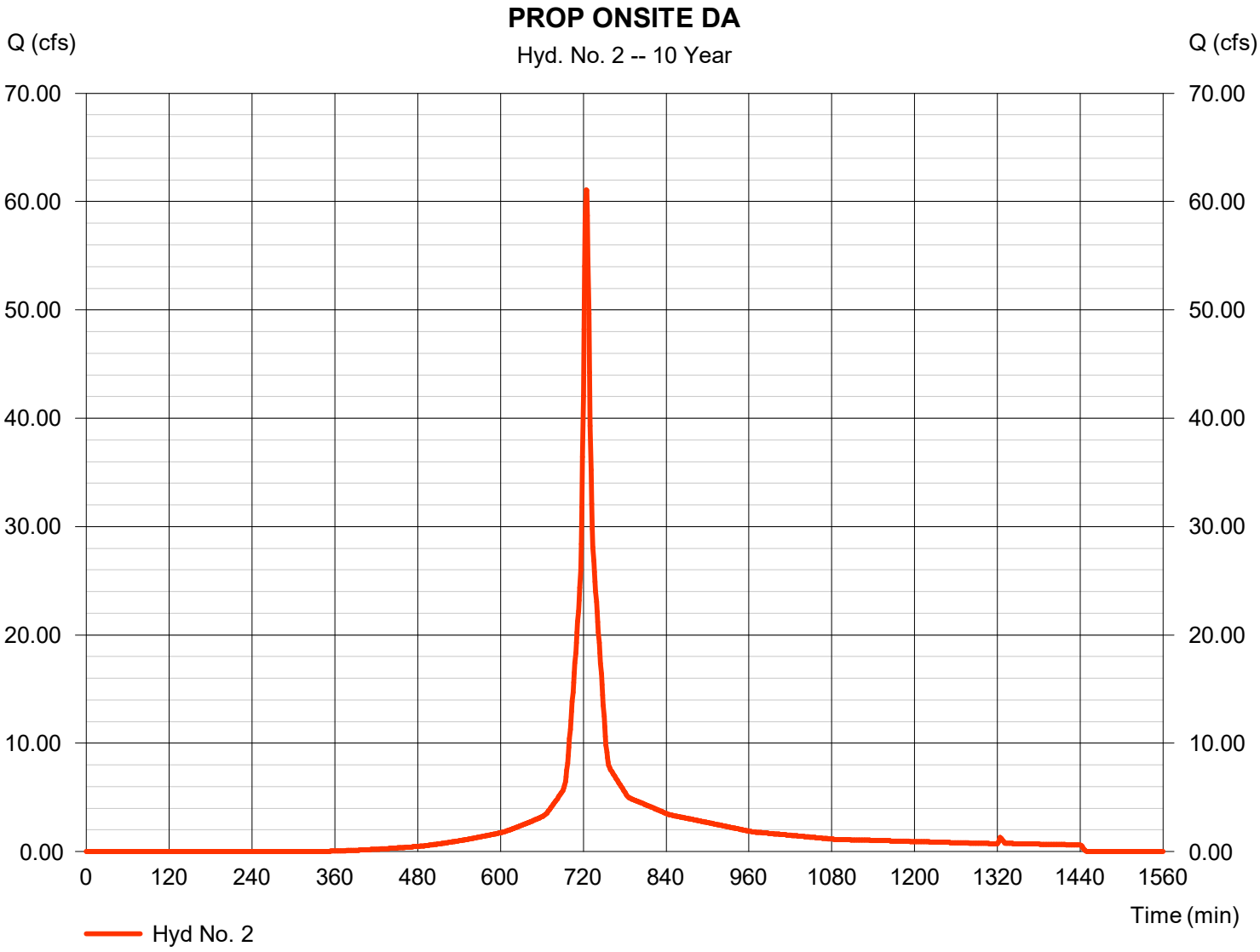
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 2

PROP ONSITE DA

Hydrograph type	=	SCS Runoff	Peak discharge	=	61.08 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	191,666 cuft
Drainage area	=	10.700 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	5.50 min
Total precip.	=	6.86 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.420 x 95) + (1.500 x 49) + (6.778 x 84)] / 10.700



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	61.68	1	730	247,729	------	------	------	EX ONSITE DA
2	SCS Runoff	84.90	1	724	270,241	------	------	------	PROP ONSITE DA

Hydrograph Report

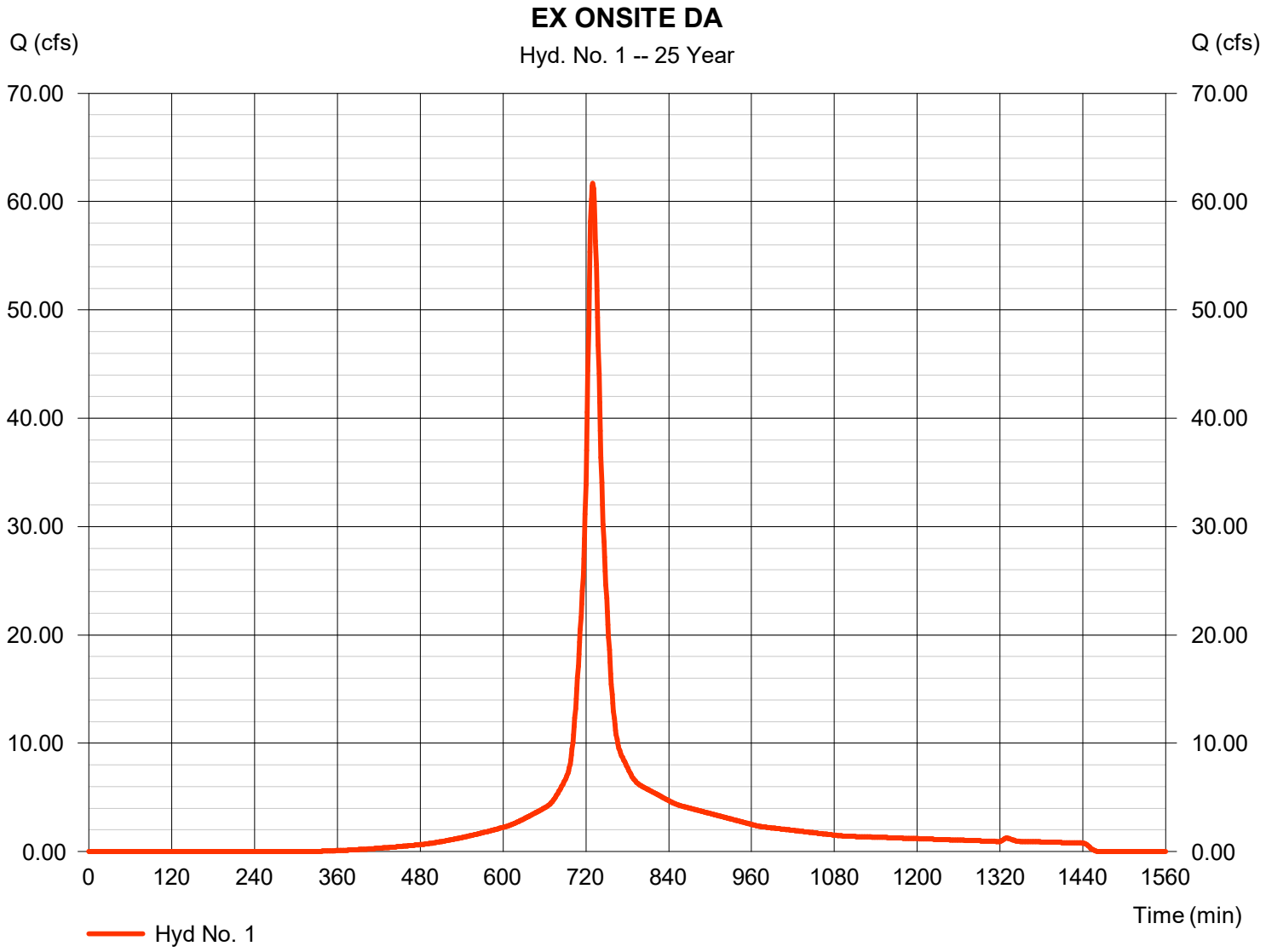
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 1

EX ONSITE DA

Hydrograph type	=	SCS Runoff	Peak discharge	=	61.68 cfs
Storm frequency	=	25 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	247,729 cuft
Drainage area	=	10.698 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	8.93 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.500 x 49) + (9.198 x 84)] / 10.698



Hydrograph Report

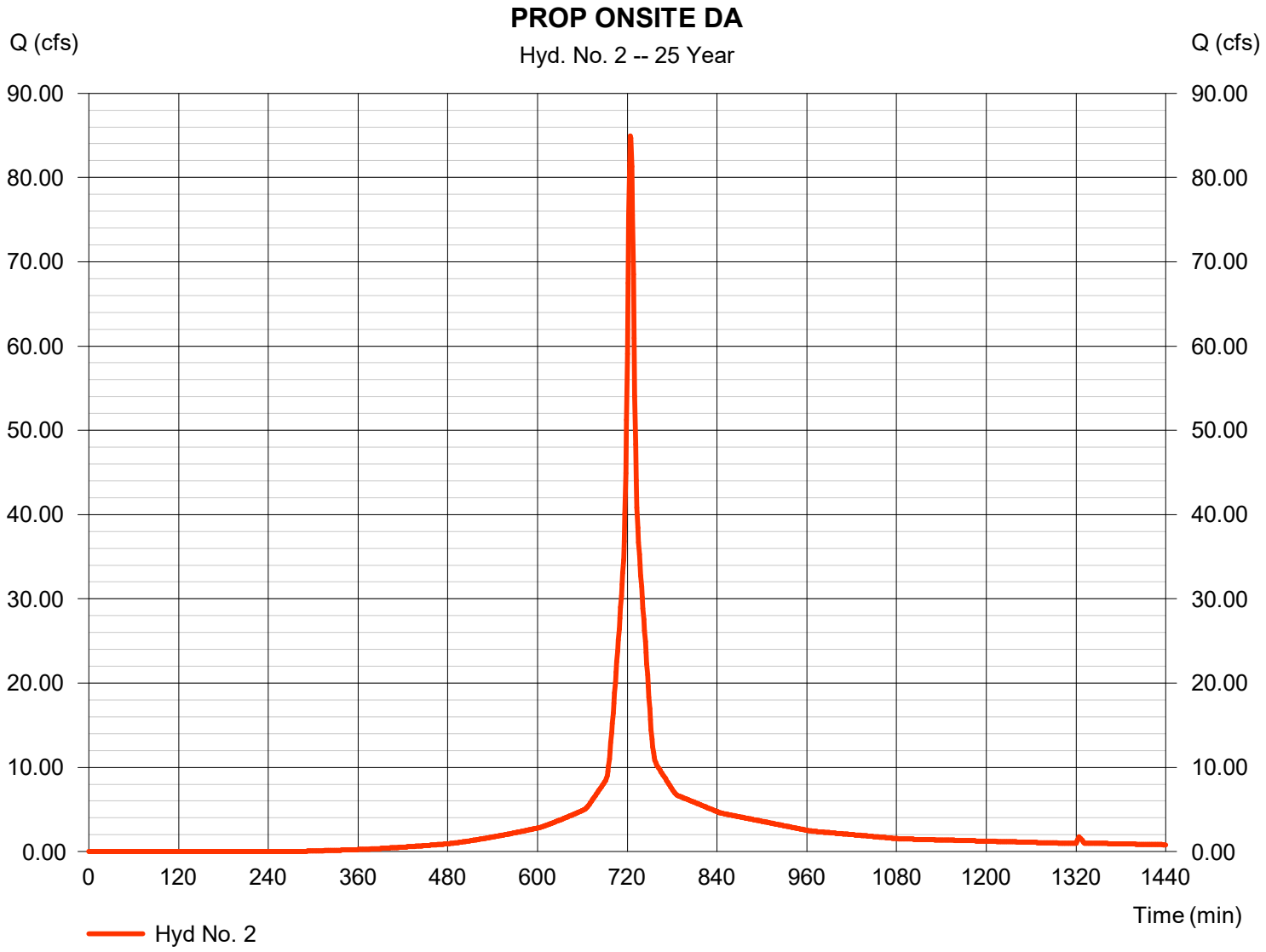
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 2

PROP ONSITE DA

Hydrograph type	= SCS Runoff	Peak discharge	= 84.90 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 270,241 cuft
Drainage area	= 10.700 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.50 min
Total precip.	= 8.93 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.420 x 95) + (1.500 x 49) + (6.778 x 84)] / 10.700



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	96.06	1	730	394,213	------	------	------	EX ONSITE DA
2	SCS Runoff	129.89	1	724	423,191	------	------	------	PROP ONSITE DA

Hydrograph Report

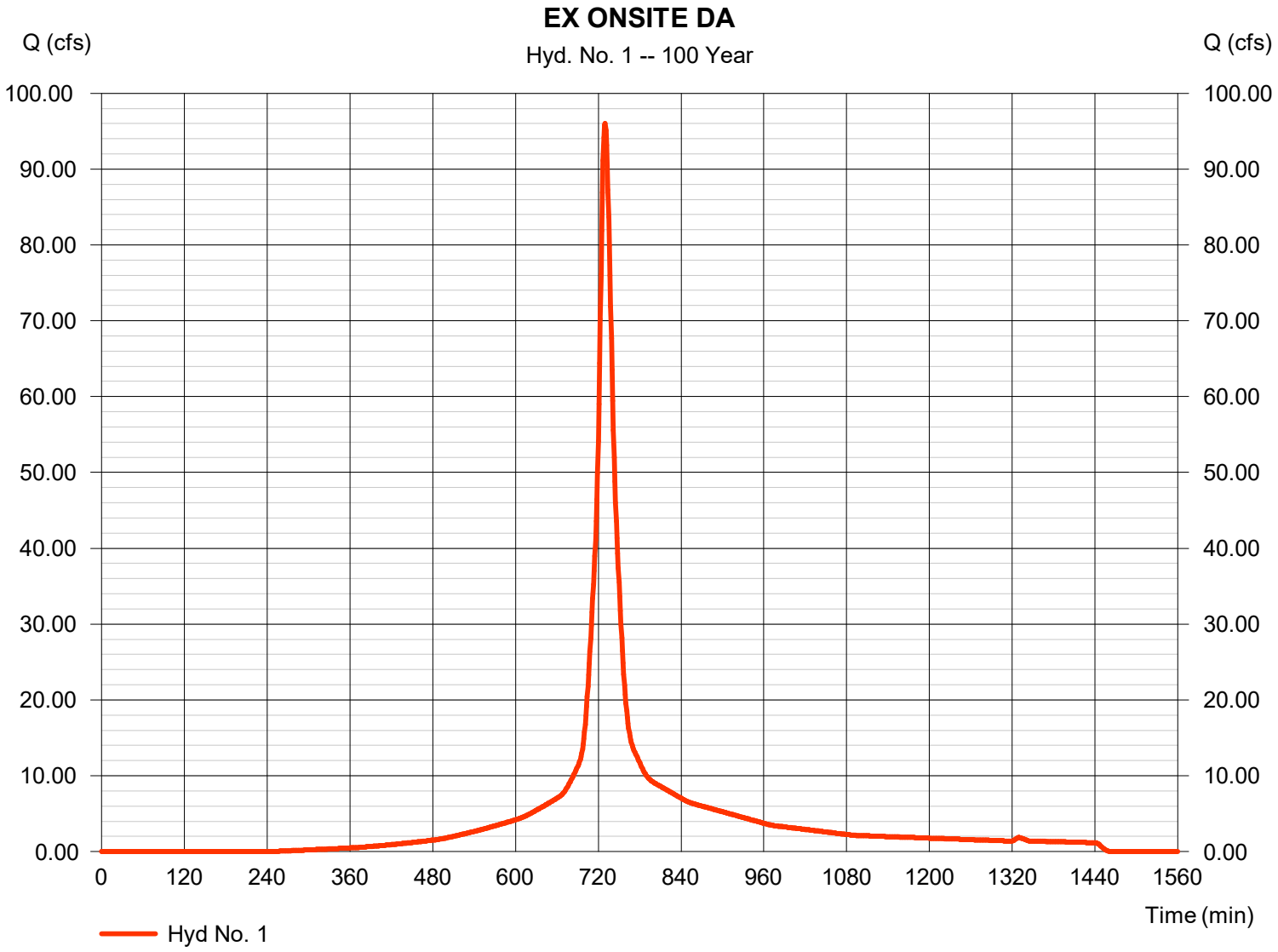
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 1

EX ONSITE DA

Hydrograph type	=	SCS Runoff	Peak discharge	=	96.06 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	394,213 cuft
Drainage area	=	10.698 ac	Curve number	=	79*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	12.87 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.500 x 49) + (9.198 x 84)] / 10.698



Hydrograph Report

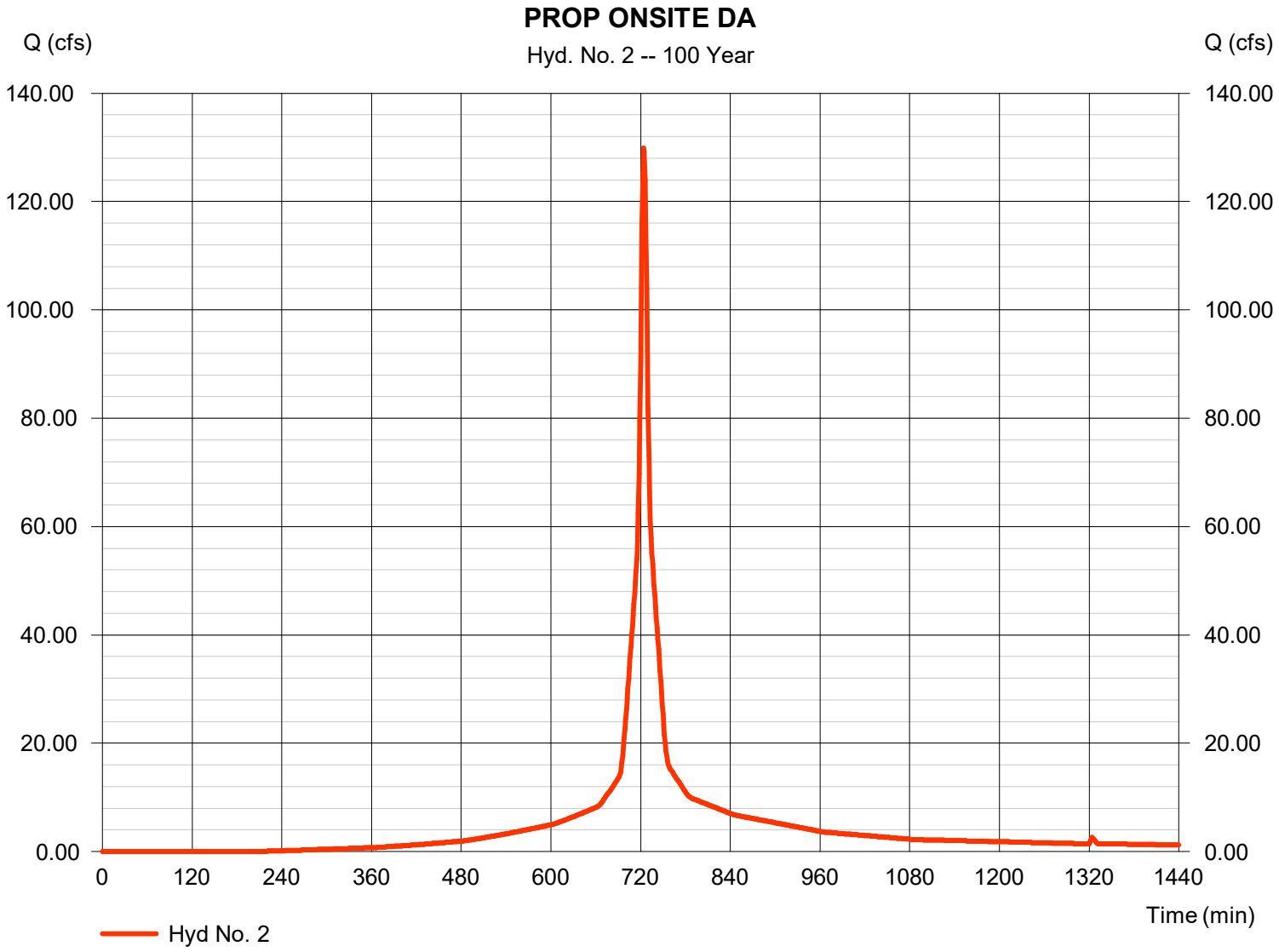
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023 Thursday, 05 / 2 / 2024

Hyd. No. 2

PROP ONSITE DA

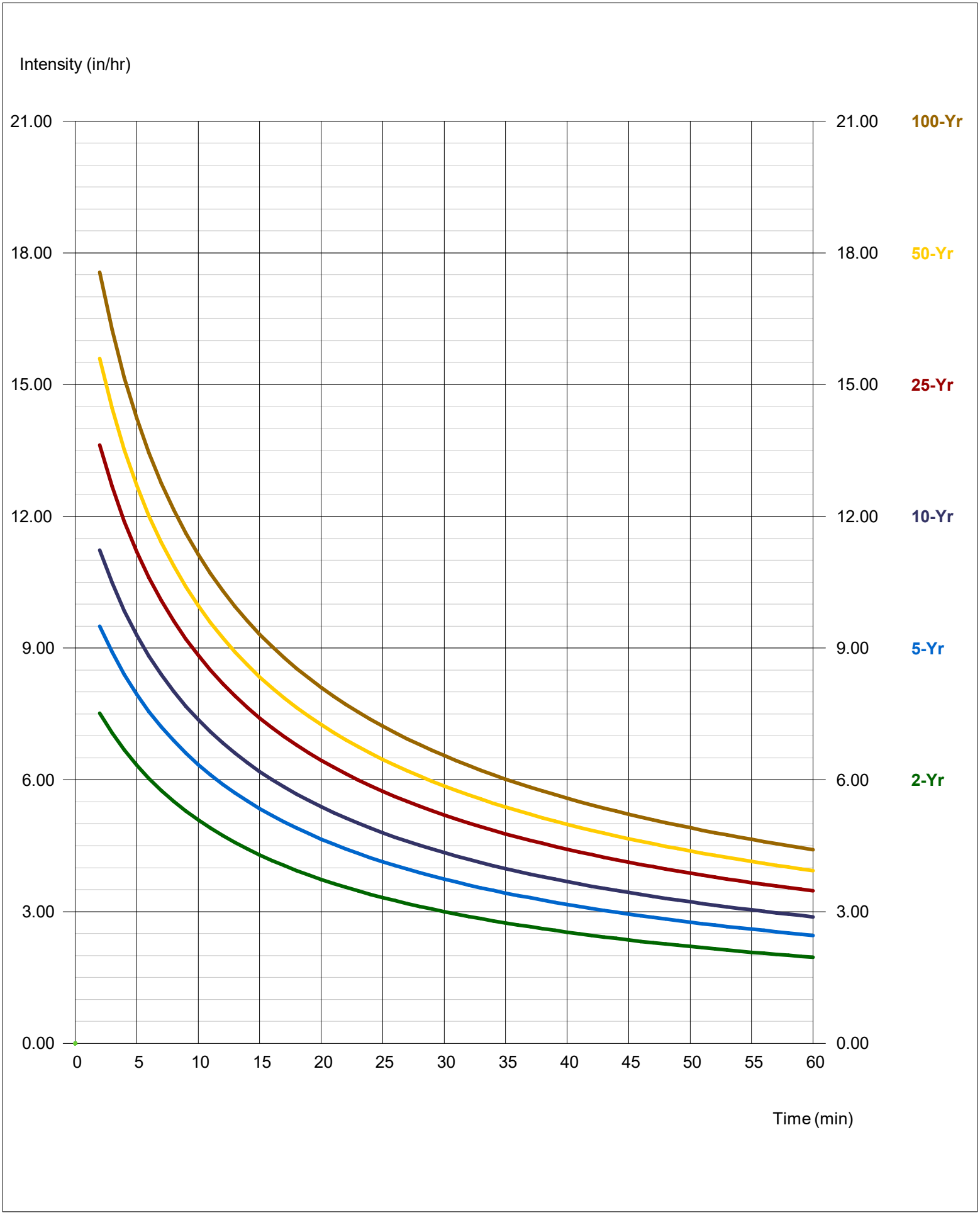
Hydrograph type	= SCS Runoff	Peak discharge	= 129.89 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 423,191 cuft
Drainage area	= 10.700 ac	Curve number	= 82*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 5.50 min
Total precip.	= 12.87 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.420 x 95) + (1.500 x 49) + (6.778 x 84)] / 10.700



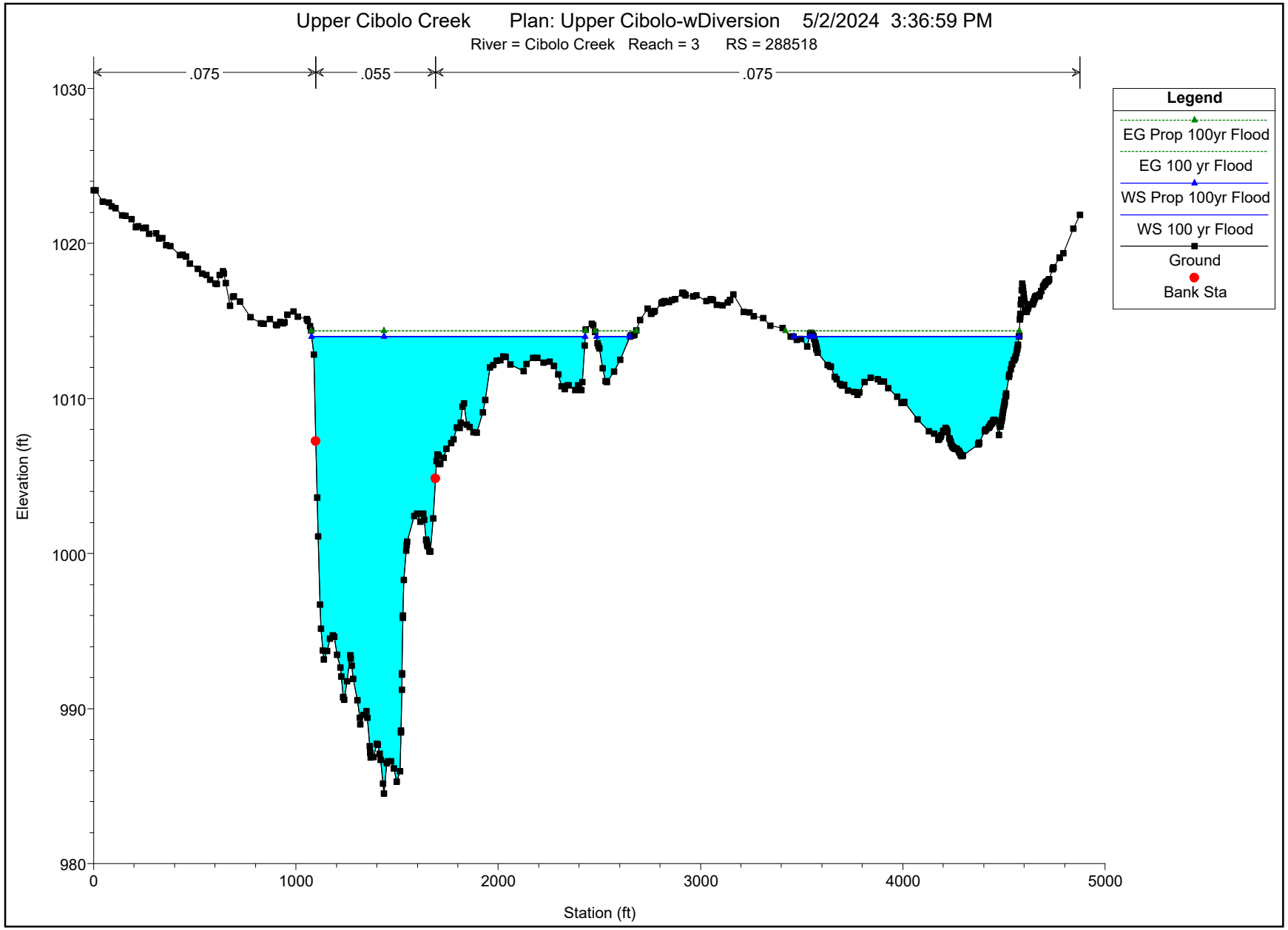
Hydraflow IDF Curves

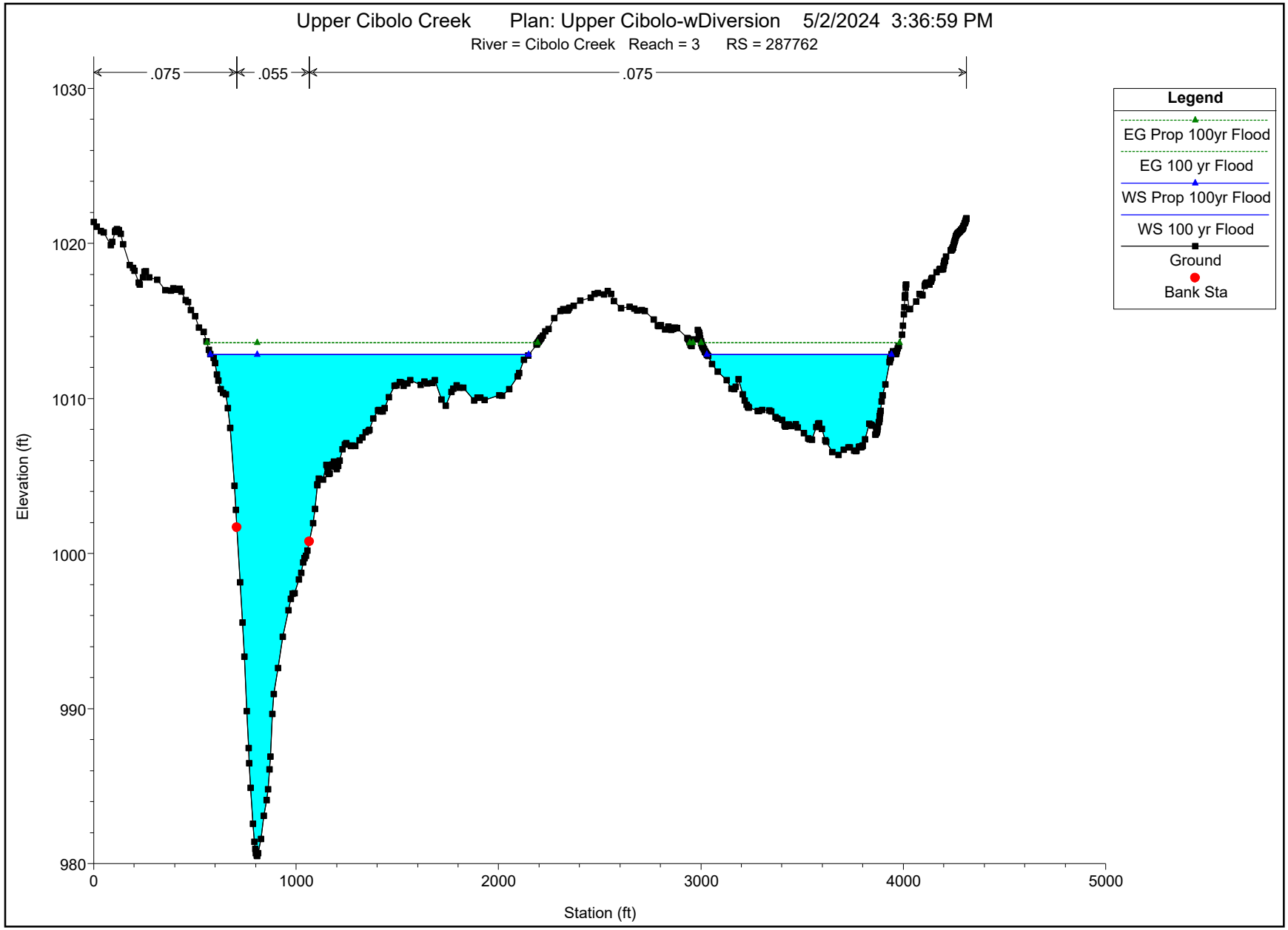
IDF file: BULVERDE IDF.IDF

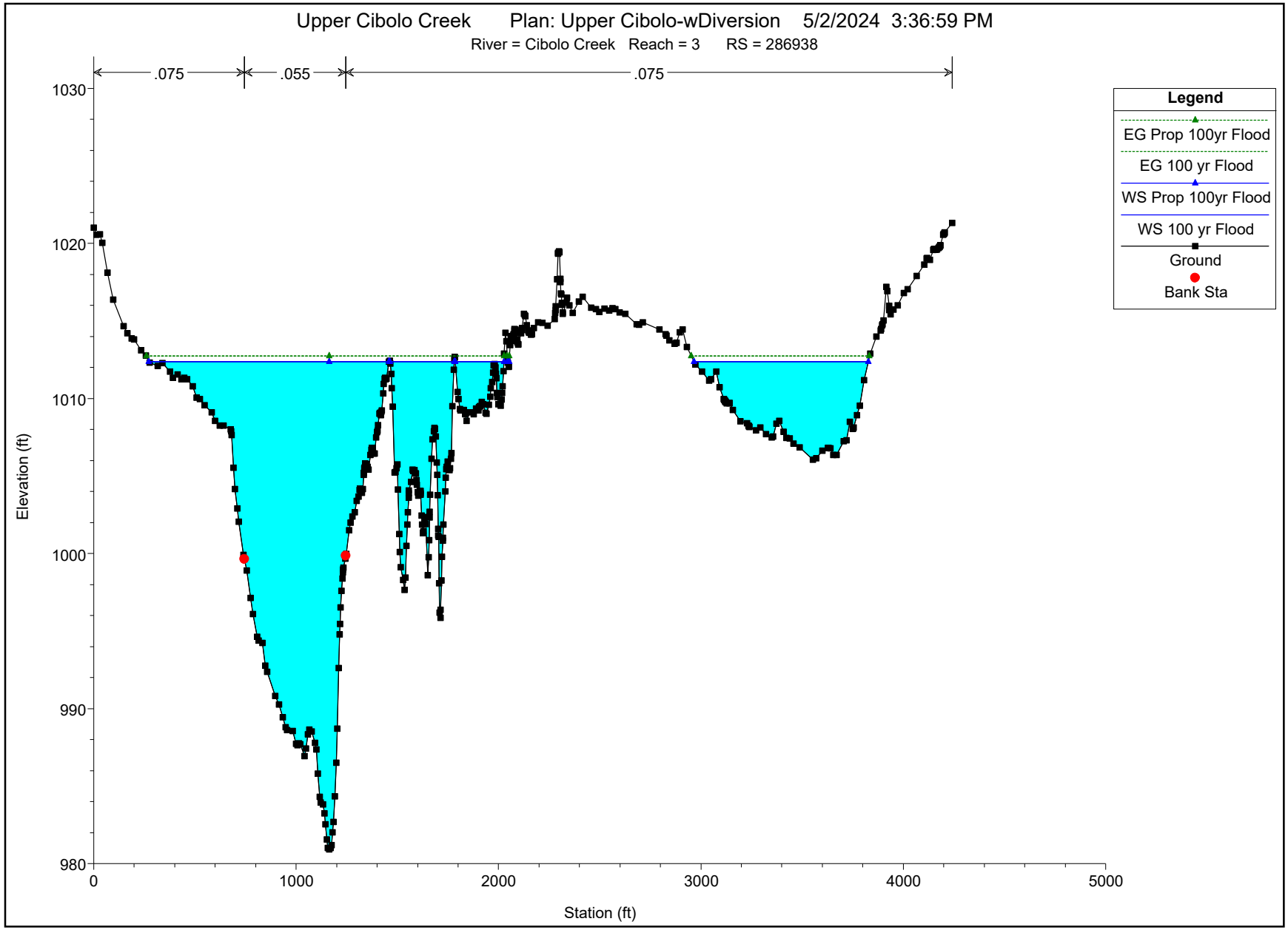


HEC-RAS Plan: Up. Cib. w Div. River: Cibolo Creek Reach: 3

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)	
3	288518	100 yr Flood	72910.00	984.52	1013.99		1014.36	0.000678	5.22	19554.08	2611.38	0.20
3	288518	Prop 100yr Flood	72934.00	984.52	1013.99		1014.36	0.000678	5.22	19559.98	2611.81	0.20
3	287762	100 yr Flood	72910.00	980.50	1012.84		1013.60	0.001445	7.77	15525.27	2484.06	0.30
3	287762	Prop 100yr Flood	72934.00	980.50	1012.84		1013.60	0.001445	7.77	15530.72	2484.51	0.30
3	286938	100 yr Flood	72910.00	980.93	1012.39		1012.74	0.000606	5.26	20756.09	2614.90	0.20
3	286938	Prop 100yr Flood	72934.00	980.93	1012.39		1012.74	0.000606	5.26	20761.51	2615.20	0.20


Upper Cibolo Creek Plan: Upper Cibolo-wDiversion 5/2/2024 3:36:59 PM
River = Cibolo Creek Reach = 3 RS = 288518
.075
.055
.075
Legend
EG Prop 100yr Flood
EG 100 yr Flood
WS Prop 100yr Flood
WS 100 yr Flood
Ground
Bank Sta
Elevation (ft)
Station (ft)
1030
1020
1010
1000
990
980
0
1000
2000
3000
4000
5000


Upper Cibolo Creek Plan: Upper Cibolo-wDiversion 5/2/2024 3:36:59 PM
River = Cibolo Creek Reach = 3 RS = 287762
.075
.055
.075
Legend
EG Prop 100yr Flood
EG 100 yr Flood
WS Prop 100yr Flood
WS 100 yr Flood
Ground
Bank Sta
Elevation (ft)
1030
1020
1010
1000
990
980
0
1000
2000
3000
4000
5000
Station (ft)


Upper Cibolo Creek Plan: Upper Cibolo-wDiversion 5/2/2024 3:36:59 PM
River = Cibolo Creek Reach = 3 RS = 286938
.075
.055
.075
Legend
EG Prop 100yr Flood
EG 100 yr Flood
WS Prop 100yr Flood
WS 100 yr Flood
Ground
Bank Sta
Elevation (ft)
Station (ft)
1030
1020
1010
1000
990
980
0
1000
2000
3000
4000
5000

5. MAPS

City of San Antonio One Stop

June 22, 2023

- Community Service Centers
- Pre-K Sites
- BCAD Parcels
- Recorded Plats

1:8,000

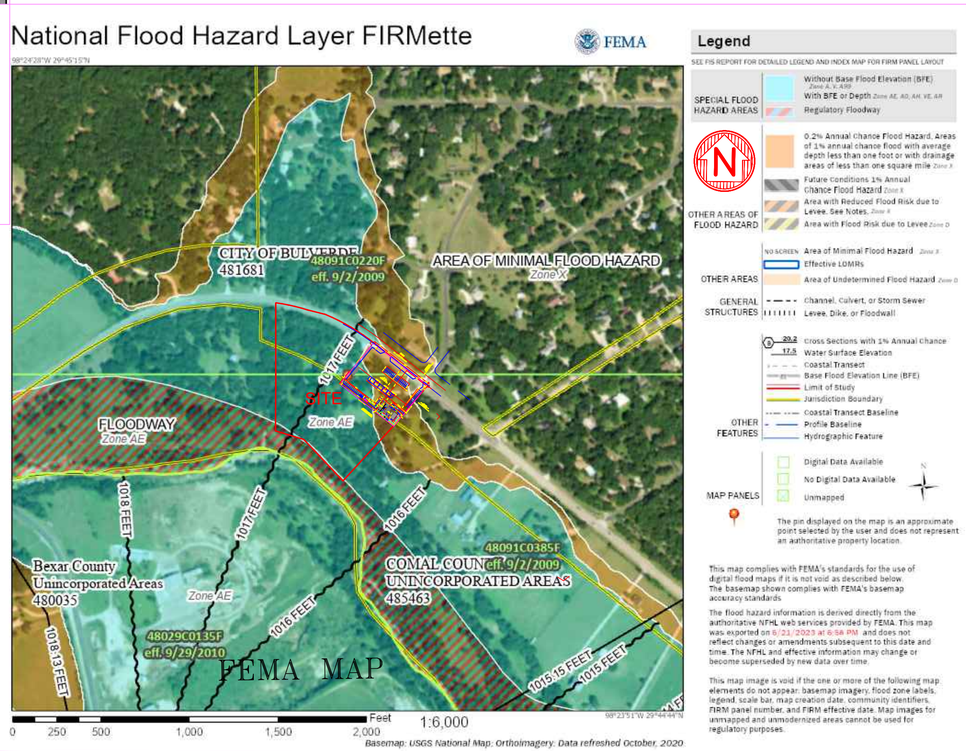
0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

LOCATION MAP

City of San Antonio G
Copyright 6-22-20

National Flood Hazard Layer FIRMette



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee. See Notes. Zone X
- Area with Flood Risk due to Levee Zone D

OTHER AREAS
- NO SCREEN: Area of Minimal Flood Hazard Zone X
- Effective LOMRs
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5: Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/21/2023 at 6:58 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

GRAPHIC SCALE
NOT TO SCALE

Revisions:

Seda Consulting Engineers, Inc.
Firm Registration No: F-1601 (210) 308-0057
6735 IH 10 West FAX:(210) 308-8842
San Antonio, Texas 78201 e-mail: seda@satx.rr.com
CIVIL • STRUCTURAL • ENVIRONMENTAL • PLANNER

BULVERDE CONVENIENCE STORE SUBDIVISION

MAPS EXHIBITS

CITY OF BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 1907
DATE: 05/02/2024
DRAWN BY: FM
CHECKED BY: SED
SHEET: 1 OF 1

6. DRAINAGE EXHIBITS

Intermediate Intensity Values (In/hr)				
Return Period	5-Minute	15-Minute	30-Minute	60-Minute
1-Yr	0.00	0.00	0.00	0.00
2-Yr	6.34	4.24	3.00	1.96
3-Yr	0.00	0.00	0.00	0.00
5-Yr	7.96	5.32	3.74	2.46
10-Yr	9.31	6.20	4.34	2.88
25-Yr	11.22	7.44	5.20	3.47
50-Yr	12.72	8.44	5.86	3.93
100-Yr	14.26	9.43	6.55	4.41

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 INCH = 50 FT.

LEGEND

- DIRECTION OF FLOW
- 1015 EXISTING MAJOR CONTOUR
- 1017 EXISTING MINOR CONTOUR
- 1017 PROP CONTOUR
- DRAIN PATH
- LOT LINE

50' B.S.L.

LOT 02
1.74 ACRES

17.905 ACRES
DOC# 201206031793
O.P.R.

LOT 03
6.538 ACRES

20' U.E.G., TEL & CATV ESM'T

30' INGRESS/EGRESS AND
SHARE ACCESS EASEMENT
FOR LOT 2 AND 3

V.M. 18693

STARLIGHT DR.

50' B.S.L.

2.420
ACRES

EXISTING CONTOUR

50' SLOPE EASEMENT

ELOMA APPROVED
FLOODPLAIN
DATED: 02/20/2024

FEMA ZONE AE FLOODPLAIN
(0.2% ANNUAL CHANCE)
DATED: 09/202/2009

5.00 ACRES
ALFONSO D. ORANTES AND
NOEMI ORANTES
(DOC# 200206001014 O.P.R.C.C.)

FEMA ZONE AE FLOODPLAIN
(1% ANNUAL CHANCE)
DATED: 09/202/2009

DRAINAGE EASEMENT

CIBOLO CREEK

Seda Consulting Engineers, Inc.
Firm Registration No: F-1601
6735 IH 10 West
San Antonio, Texas 78201
(210) 308-0057
FAX:(210) 308-8842
e-mail: seda@satx.rr.com
CIVIL • STRUCTURAL • ENVIRONMENTAL • PLANNER

BULVERDE CONVENIENCE STORE SUBDIVISION
EXISTING DRAINAGE PLAN
CITY OF BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 1907
DATE: 05/02/2024
DRAWN BY: FM
CHECKED BY: SED
SHEET: 1 OF 1

Intermediate Intensity Values (in/hr)				
Return Period	5-Minute	15-Minute	30-Minute	60-Minute
1-Yr	0.00	0.00	0.00	0.00
2-Yr	6.34	4.24	3.00	1.96
3-Yr	0.00	0.00	0.00	0.00
5-Yr	7.96	5.32	3.74	2.46
10-Yr	9.31	6.20	4.34	2.88
25-Yr	11.22	7.44	5.20	3.47
50-Yr	12.72	8.44	5.86	3.93
100-Yr	14.26	9.43	6.55	4.41

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 INCH = 50 FT.

LEGEND

- DIRECTION OF FLOW
- 1015 EXISTING MAJOR CONTOUR
- 1017 EXISTING MINOR CONTOUR
- 1017 PROP CONTOUR
- DRAIN PATH

50' B.S.L.

LOT 02
1.74 ACRES

20' U.E.G., TEL & CATV ESM'T
V.M.1/265

30' INGRESS/EGRESS AND
SHARE ACCESS EASEMENT
FOR LOT 2 AND 3

PROPOSED CONTOUR

EXISTING CONTOUR

17.905 ACRES
DOC# 201206031793
O.P.R.

LOT 03
6.538 ACRES

CIBOLO CREEK

50' B.S.L.

2.420
ACRES

P.M.1863

STARLIGHT DR.

WATER QUALITY POND

50' SLOPE EASEMENT

ELOMA APPROVED
FLOODPLAIN
DATED: 02/20/2024

FEMA ZONE AE FLOODPLAIN
(0.2% ANNUAL CHANCE)
DATED: 09/202/2009

5.00 ACRES
ALFONSO D. ORANTES AND
NOEMI ORANTES
(DOC# 200206001014 O.P.R.C.C.)

DRAINAGE EASEMENT

FEMA ZONE AE FLOODPLAIN
(1% ANNUAL CHANCE)
DATED: 09/202/2009

CIBOLO CREEK

1010.00 1015.00 1017.00 1019.00 1020.00 1014.00 1005.00 990.00 985.00

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BULVERDE CONVENIENCE STORE SUBDIVISION
PROPOSED DRAINAGE PLAN
CITY OF BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 1907
DATE: 05/02/2024
DRAWN BY: FM
CHECKED BY: SED
SHEET: 1 OF 1

EXISTING IMPERVIOUS COVER= 00 SF
PROPOSED IMPERVIOUS COVER = 92650 SF

INCREASE IN IMPERVIOUS COVER= 92650 SF

GRAPHIC SCALE
50 0 25 50 100
(IN FEET)
1 INCH = 50 FT.

50' B.S.L.

LOT 02
1.74 ACRES

20' U.E.G.TEL & CATV ESM'T

30' INGRESS/EGRESS AND
SHARE ACCESS EASEMENT
FOR LOT 2 AND 3

F.M.1863 F.M.1863

STARLIGHT DR. STARLIGHT DR.

17.905 ACRES
DOC# 201206031793
O.P.R.

LOT 03
6.538 ACRES

50' B.S.L.

LOT 01
2.420 ACRES

SILT FENCE

50' SLOPE EASEMENT

ELOMA APPROVED
FLOODPLAIN

FEMA ZONE AE FLOODPLAIN
(0.2% ANNUAL CHANCE)

5.00 ACRES
ALFONSO D. ORANTES AND
NOEMI ORANTES
(DOC# 200206001014 O.P.R.C.C.)

FEMA ZONE AE FLOODPLAIN
(1% ANNUAL CHANCE)

DRAINAGE EASEMENT

CIBOLO CREEK

revisions:

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BULVERDE CONVENIENCE STORE SUBDIVISION
IMPERVIOUS COVER EXHIBIT
CITY OF BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 1907
DATE: 05/02/2024
DRAWN BY: FM
CHECKED BY: SED
SHEET: 1 OF 1

Intermediate Intensity Values (in/hr)

Return Period	5-Minute	15-Minute	30-Minute	60-Minute
1-Yr	0.00	0.00	0.00	0.00
2-Yr	6.34	4.24	3.00	1.96
3-Yr	0.00	0.00	0.00	0.00
5-Yr	7.96	5.32	3.74	2.46
10-Yr	9.31	6.20	4.34	2.88
25-Yr	11.22	7.44	5.20	3.47
50-Yr	12.72	8.44	5.86	3.93
100-Yr	14.26	9.43	6.55	4.41

GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 INCH = 50 FT.

LEGEND

- DIRECTION OF FLOW
- 1015 EXISTING MAJOR CONTOUR
- 1017 EXISTING MINOR CONTOUR
- 1017 PROP CONTOUR
- DRAIN PATH

Clearing the Area to be Filled

All timber, logs, trees, brush shall be mulched, and rubbish shall be kept onsite.

Scarifying the Area to be Filled

All organic matter shall be removed from the surface upon which the fill is to be placed, and the surface shall then be disked or scarified to a minimum depth of six inches (6"), all surface ruts or other uneven features will be leveled prior

Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be disked or scarified. Where the slope ratio of the original ground is steeper than 5 horizontal to 1 vertical, the bank shall be stepped or benched. Ground slopes which are flatter than 5 to 1 shall be benched when considered necessary by the Geotechnical Engineer.

Compacting the Area to be Filled

Following the clearing and disking or scarifying of the fill area, it shall be bladed until it is uniform and free from large clods. The area shall be brought to +/-2% of the optimum moisture content and compacted (typically) to not less than ninety percent (90%) of maximum density in accordance with the current ASTM D 1557 Compaction Procedure, or 95% of maximum density in accordance with the current THD--TEX--113--E Compaction Procedure.

Cut/Fill Lots

Areas involving cut on one portion and fill on another portion of a specific lot shall be prepared to a minimum depth of 6-in. and will be the same material classification at the same compaction and moisture content. A minimum of two (2) field density tests shall be required on each cut/fill lot for the purpose of determining uniformity of the area supporting the proposed structures.

Depth and Mixing of Fill Layers

The selected fill material shall be placed in level, uniform layers which, when compacted, shall have a density conforming to that stipulated above. Each layer shall be thoroughly mixed during the spreading to ensure uniformity of material in each layer. Compacted layer thickness may vary depending on the compaction equipment of demonstrated capability. The maximum loose depth for any material shall not exceed twelve inches (12"). For testing requirements of fill material, see density testing.

Rock

When fill material includes rock, the maximum rock size shall be as approved by the Geotechnical Engineer. No large rocks shall be allowed to nest and all voids must be filled with small stones or soil and adequately compacted. No large rocks will be permitted within eighteen inches (18") of the finished grade.

Moisture Content

The fill material shall be compacted at the appropriate moisture content specified for the soils being used. Appropriate moisture content is defined, typically, as optimum moisture content; however, for expansive soils it may be greater than optimum moisture content, and other moisture contents may be necessary to produce the desired results with certain soils.

revisions:

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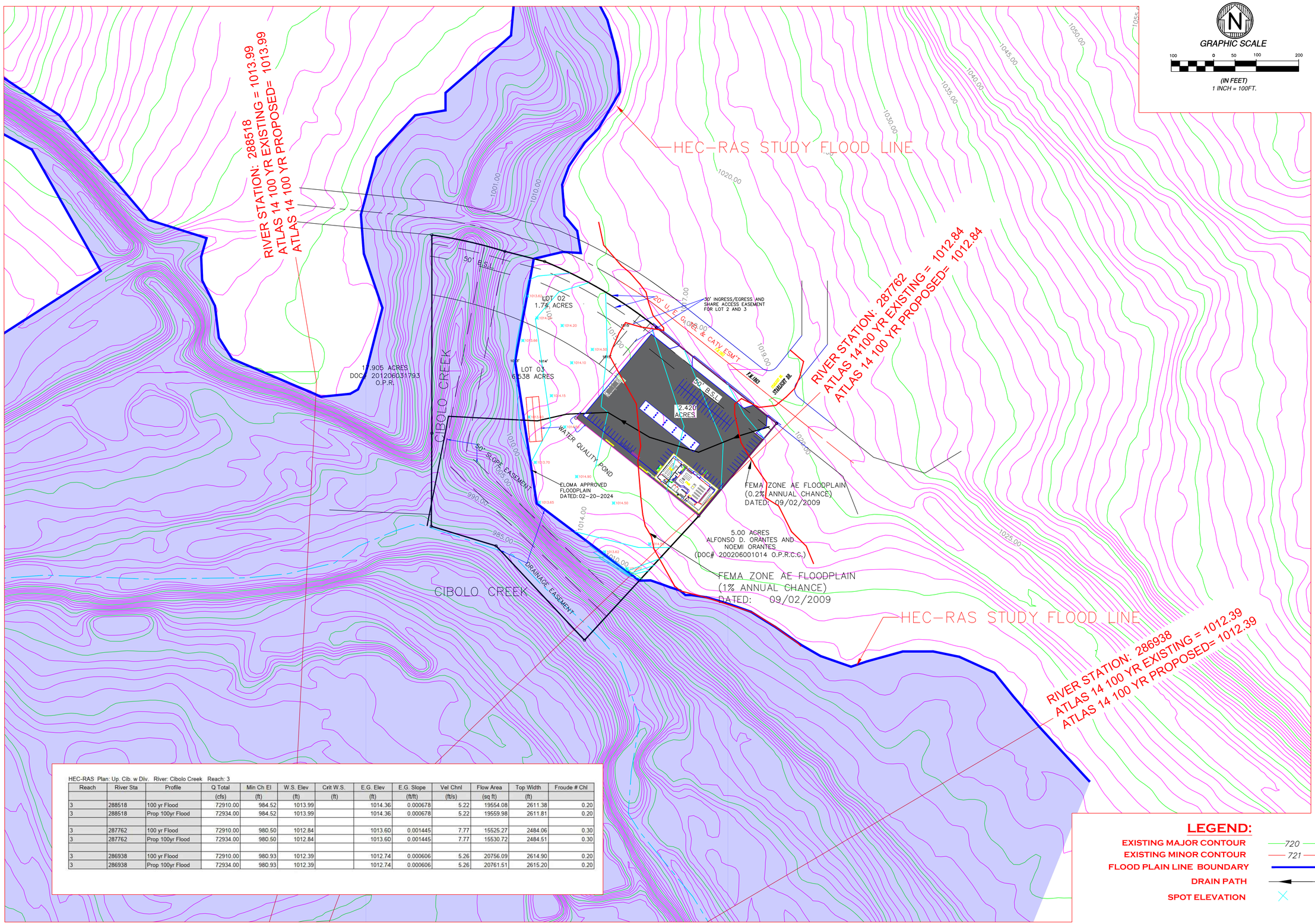
BULVERDE CONVENIENCE STORE SUBDIVISION
GRADING PLAN
CITY OF BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 1907
DATE: 05/02/2024
DRAWN BY: FM
CHECKED BY: SED
SHEET: 1 OF 1



GRAPHIC SCALE

100 0 50 100 200

(IN FEET)
1 INCH = 100FT.

HEC-RAS Plan: Up. Clb. w Div. River: Cibolo Creek Reach: 3

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)	
3	288518	100 yr Flood	72910.00	984.52	1013.99		1014.36	0.000678	5.22	19554.08	2611.38	0.20
3	288518	Prop 100yr Flood	72934.00	984.52	1013.99		1014.36	0.000678	5.22	19559.98	2611.81	0.20
3	287762	100 yr Flood	72910.00	980.50	1012.84		1013.60	0.001445	7.77	15525.27	2484.06	0.30
3	287762	Prop 100yr Flood	72934.00	980.50	1012.84		1013.60	0.001445	7.77	15530.72	2484.51	0.30
3	286938	100 yr Flood	72910.00	980.93	1012.39		1012.74	0.000606	5.26	20756.09	2614.90	0.20
3	286938	Prop 100yr Flood	72934.00	980.93	1012.39		1012.74	0.000606	5.26	20761.51	2615.20	0.20

LEGEND:

EXISTING MAJOR CONTOUR — 720
EXISTING MINOR CONTOUR — 721
FLOOD PLAIN LINE BOUNDARY
DRAIN PATH
SPOT ELEVATION

Revisions:

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BULVERDE CONVENIENCE STORE SUBDIVISION

TOPOGRAPHIC EXHIBIT PLAN

CITY OF SAN ANTONIO, BEXAR COUNTY, TEXAS

JOB NO. 1907
DATE: 05/02/2024
DRAWN BY: FM
CHECKED BY: SED
SHEET: TP 1 OF 1

Hydrologic Soil Group—Bexar County, Texas, and Comal and Hays Counties, Texas
(bulverde)

Map Scale: 1:2,290 if printed on A portrait (8.5" x 11") sheet.

N

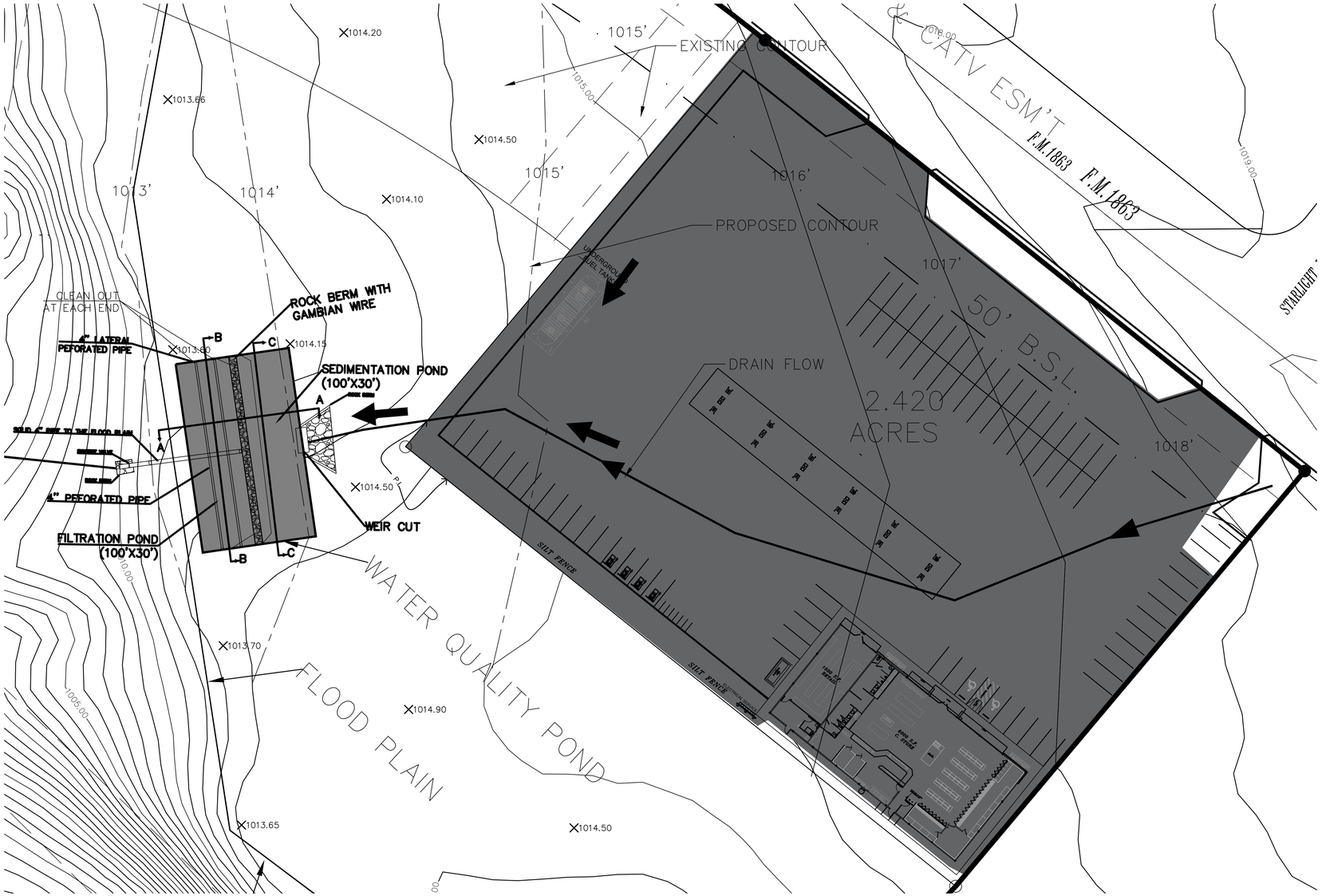
Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84

NOT IN SCALE

WEIGHTED CN VALUE EXHIBIT



GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 INCH = 30 FT.

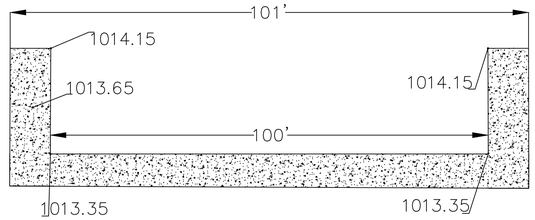
LEGEND

- DIRECTION OF FLOW
- 1015 — EXISTING MAJOR CONTOUR
- 1017 — EXISTING MINOR CONTOUR
- 1017 — PROP CONTOUR
- SPOT ELEVATION

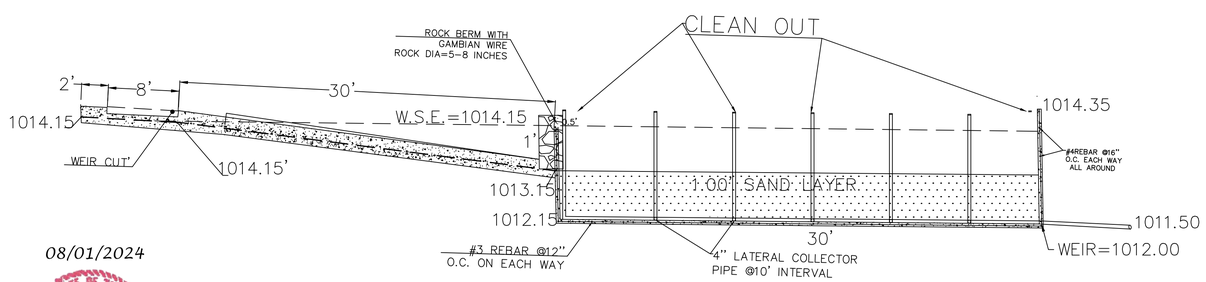
NOTE:

THE BASIN IS A CONCRETE LINER.
SAND AND GRAVEL LAYER (MATCH RG-348 DESIGN CRITERIA SECTION 3.4.2 AND 3.4.7).
THE SAND FILTER IS CONSTRUCTED WITH 12 INCHES OF SAND OVERLYING 6 INCHES OF GRAVEL. THE SAND AND GRAVEL MEDIA ARE SEPARATED BY PERMEABLE GEOTEXTILE FABRIC. FOUR-INCH PERFORATED PVC PIPE IS USED TO DRAIN CAPTURED FLOWS FROM THE GRAVEL LAYER. A MINIMUM OF 2 INCHES OF GRAVEL MUST COVER THE TOP SURFACE OF THE PVC PIPE. FIGURE 3-23 PRESENTS A SCHEMATIC REPRESENTATION OF A STANDARD SAND BED PROFILE. THE SAND GRAIN SIZE DISTRIBUTION SHOULD BE COMPARABLE TO THAT OF "WASHED CONCRETE SAND" (I.E., ASTM C-33 FINE AGGREGATE)

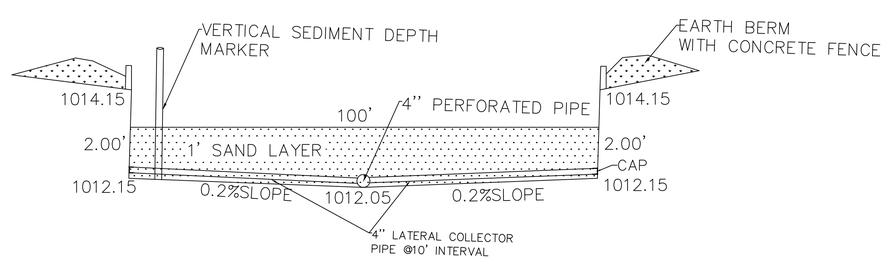
IMPERVIOUS COVER TREATMENT SUMMARY TABLE	
TOTAL EX IMPERVIOUS COVER	00.00 AC
PROPOSED IMPERVIOUS COVER	2.12 AC.
TOTAL PROPOSED IMPERVIOUS COVER INCREASE	2.12 AC
TREATED IMPERVIOUS COVER AREA	2.12 AC. (100%)



SECTION C–C
(NOT TO SCALE)



SECTION A–A
(NOT TO SCALE)



SECTION B–B
(NOT TO SCALE)

08/01/2024

STATE OF TEXAS
SALAH E. DIAB
95516
REGISTERED
PROFESSIONAL ENGINEER

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BULVERDE CONVENIENCE STORE SUBDIVISION
WATER QUALITY POND PLAN
CITY OF BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 1907
DATE: 05/02/2024
DRAWN BY: FM
CHECKED BY: SED
SHEET: 1 OF 2

CONSTRUCTION NOTES:

1. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY GROUND DISTURBANCE OR CONSTRUCTION ACTIVITIES. THIS NOTICE MUST INCLUDE:
   - THE NAME OF THE APPROVED PROJECT;
   - THE ACTIVITY START DATE; AND
   - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.

2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT SHOULD BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED CONTRIBUTING ZONE PLAN (CZP) AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTOR(S) SHOULD KEEP COPIES OF THE APPROVED PLAN AND APPROVAL LETTER ON-SITE.

3. NO HAZARDOUS SUBSTANCE STORAGE TANK SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.

4. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.

5. ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED OF BEFORE THE NEXT RAIN EVENT TO ENSURE IT IS NOT WASHED INTO SURFACE STREAMS, SENSITIVE FEATURES, ETC.

6. SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS WHEN IT OCCUPIES 50% OF THE BASIN'S DESIGN CAPACITY.

7. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BEING DISCHARGED OFFSITE.

8. ALL EXCAVATED MATERIAL THAT WILL BE STORED ON-SITE MUST HAVE PROPER E&S CONTROLS.

9. IF PORTIONS OF THE SITE WILL HAVE A CEASE IN CONSTRUCTION ACTIVITY LASTING LONGER THAN 14 DAYS, SOIL STABILIZATION IN THOSE AREAS SHALL BE INITIATED AS SOON AS POSSIBLE PRIOR TO THE 14TH DAY OF INACTIVITY. IF ACTIVITY WILL RESUME PRIOR TO THE 21ST DAY, STABILIZATION MEASURES ARE NOT REQUIRED. IF DROUGHT CONDITIONS OR INCLEMENT WEATHER PREVENT ACTION BY THE 14TH DAY, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE.

10. THE FOLLOWING RECORDS SHOULD BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST:
    - THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
    - THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND
    - THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.

11. THE HOLDER OF ANY APPROVED CZP MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:

    A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY BEST MANAGEMENT PRACTICES (BMPS) OR STRUCTURE(S), INCLUDING BUT NOT LIMITED TO TEMPORARY OR PERMANENT PONDS, DAMS, BERMS, SILT FENCES, AND DIVERSIONARY STRUCTURES;

    B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED;

    C. ANY CHANGE THAT WOULD SIGNIFICANTLY IMPACT THE ABILITY TO PREVENT POLLUTION OF THE EDWARDS AQUIFER; OR

    D. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE APPROVED CONTRIBUTING ZONE PLAN.

AUSTIN REGIONAL OFFICE
12100 PARK 35 CIRCLE, BUILDING A
AUSTIN, TEXAS 78753-1808
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FAX (512) 339-3795

SAN ANTONIO REGIONAL OFFICE
14250 JUDSON ROAD
SAN ANTONIO, TEXAS 78233-4480
PHONE (210) 490-3096
FAX (210) 545-4329

08/01/2024

STATE OF TEXAS
SALAH E. DIAS
55516
REGISTERED
PROFESSIONAL ENGINEER

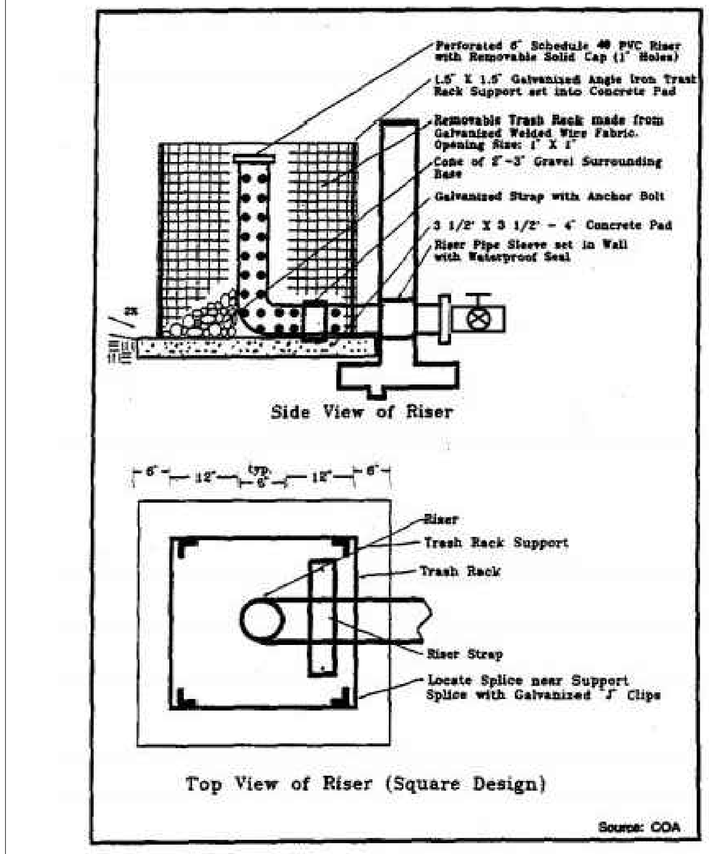

Figure 3-24 Detail of Sedimentation Riser Pipe

Revisions:

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SCE

BULVERDE CONVENIENCE STORE SUBDIVISION
WATER QUALITY POND DETAIL
CITY OF BULVERDE, COMAL COUNTY, TEXAS

JOB NO. 1811
DATE: 08/01/2024
DRAWN BY: FM
CHECKED BY: SED
SHEET: 2 OF 2

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 6, 2024

Mr. Inayat Momin
Vista Bulverde Properties, LLC.
2931 Antique Bend
San Antonio, Texas, 78259

Re: Approval of a Water Pollution Abatement Plan (WPAP)
Bulverde Convenience Store Subdivision; Located northeast of FM 1863 and Smithson Valley Road; Bulverde, Comal County, Texas
Edwards Aquifer Protection Program ID: 13002005, Regulated Entity No. RN112060603

Dear Mr. Momin:

The Texas Commission on Environmental Quality (TCEQ) has completed its review on the application for the above-referenced project submitted to the Edwards Aquifer Protection Program (EAPP) by Seda Consulting Engineers, Inc. on behalf of the applicant, Vista Bulverde Properties, LLC. on October 4, 2024. Final review of the application was completed after additional material was received on November 27, 2024.

As presented to the TCEQ, the application was prepared in general compliance with the requirements of 30 Texas Administrative Codes (TAC) Chapter §213. The permanent best management practices (BMPs) and measures represented in the application were prepared by a Texas licensed professional engineer (PE). All construction plans and design information were sealed, signed, and dated by a Texas licensed PE. Therefore, the application for the construction of the proposed project and methods to protect the Edwards Aquifer are **approved,** subject to applicable state rules and the conditions in this letter.

This approval expires two years from the date of this letter, unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been officially requested. This approval or extension will expire, and no extension will be granted if more than 50 percent of the project has not been completed within ten years from the date of this letter.

The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer protection plan. A motion for reconsideration must be filed in accordance with 30 TAC §50.139.

PROJECT DESCRIPTION

The proposed commercial project will have an area of approximately 10.698-acres and is located over the Recharge Zone and Contributing Zone boundary. The project will include the development of a convenience store building with an associated driveway, parking lot, and fuel pumps. Site improvements such as the convenience store building, associated fuel pumps, driveway, and parking will be located over the Contributing Zone. The impervious cover will be 2.12-acres (19.82 percent). According to a letter dated, November 19, 2024, signed by Mr. Robert Boyd, P.E., with Comal County, the site in the development is acceptable for the use of on-site sewage facilities.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, one (1) sedimentation/filtration sand filter system, designed using the TCEQ technical guidance, *RG-348, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices,* will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 1,903 pounds of TSS generated from the 2.12-acres of impervious cover. The approved permanent BMPs and measures meet the required 80 percent removal of the increased load in TSS caused by the project.

The permanent BMPS shall be operational prior to occupancy or use of the proposed project. Inspection, maintenance, repair, and retrofit of the permanent BMPs shall be in accordance with the approved application.

GEOLOGY

According to the Geologic Assessment (GA) included with the application, the surficial units of the site are the Fluviatile terrace deposits and Upper Glen Rose Formation. No sensitive geologic features were identified in the GA. The site assessment conducted on November 13, 2024, by TCEQ staff determined the site to be generally as described by the GA.

STANDARD CONDITIONS

1. The plan holder (applicant) must comply with all provisions of 30 TAC Chapter §213 and all technical specifications in the approved plan. The plan holder should also acquire and comply with additional and separate approvals, permits, registrations or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, Dam Safety, Underground Injection Control) as required based on the specifics of the plan.

2. In addition to the rules of the Commission, the plan holder must also comply with state and local ordinances and regulations providing for the protection of water quality as applicable.

Prior to Commencement of Construction:

3. Within 60 days of receiving written approval of an Edwards Aquifer protection plan, the plan holder must submit to the EAPP proof of recordation of notice in the county deed records, with the volume and page number(s) of the county record. A description of the property boundaries shall be included in the deed recordation in the county deed records. TCEQ form, Deed Recordation Affidavit (TCEQ-0625), may be used.

4. The plan holder of any approved Edwards Aquifer protection plan must notify the EAPP and obtain approval from the executive director prior to initiating any modification to the activities described in the referenced application following the date of the approval.

5. The plan holder must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the EAPP no later than 48 hours prior to commencement of the regulated activity. Notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person.

6. Temporary erosion and sedimentation (E&S) controls as described in the referenced application, must be installed prior to construction, and maintained during construction. Temporary E&S controls may be removed when vegetation is established, and the construction area is stabilized. The TCEQ may monitor stormwater discharges from the site

to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

7. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring or gravel. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation.

During Construction:

8. This approval does not authorize the installation of temporary or permanent aboveground storage tanks on this project that will have a total storage capacity of five hundred gallons or more of static hydrocarbons or hazardous substances without prior approval of an Aboveground Storage Tank facility application.

9. If any sensitive feature is encountered during construction, replacement, or rehabilitation on this project, all regulated activities must be **immediately** suspended near it and notification must be made to TCEQ EAPP staff. Temporary BMPs must be installed and maintained to protect the feature from pollution and contamination. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality.

10. All water wells, including injection, dewatering, and monitoring wells shall be identified in the geologic assessment and must be in compliance with the requirements of the Texas Department of Licensing and Regulation 16 TAC Chapter §76 and all other locally applicable rules, as appropriate.

11. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.

12. Intentional discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge must be filtered through appropriately selected BMPs.

13. The following records shall be maintained and made available to the executive director upon request: the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

14. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

After Completion of Construction:

15. Owners of permanent BMPs and temporary measures must ensure that the BMPs and measures are constructed and function as designed. A Texas licensed PE must certify in writing that the **permanent** BMPs or measures were constructed as designed. The certification letter must be submitted to the EAPP within 30 days of site completion.

16. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property or the ownership of the property is transferred to the entity. A copy of the transfer of responsibility must be filed with the executive director through the EAPP within 30 days of the transfer. TCEQ form, Change in Responsibility for Maintenance on Permanent BMPs and Measures (TCEQ-10263), may be used.

The holder of the approved Edwards Aquifer protection plan is responsible for compliance with Chapter §213 and any condition of the approved plan through all phases of plan implementation. Failure to comply with any condition within this approval letter is a violation of Chapter §213 and is subject to administrative rule or orders and penalties as provided under §213.10 of this title (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. Upon legal transfer of this property, the new owner is required to comply with all terms of the approved Edwards Aquifer protection plan.

This action is taken as delegated by the executive director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Mr. Hunter Patterson of the Edwards Aquifer Protection Program at (210) 403-4026 or the regional office at 512-339-2929.

Sincerely,

Monica Reyes

Monica Reyes, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

MR/hhp

cc: Mr. Salah E. Diab, Ph.D, P.E., Seda Consulting Engineers, Inc.

TRAFFIC IMPACT GROUP, LLC

DATE: 22 August 2023

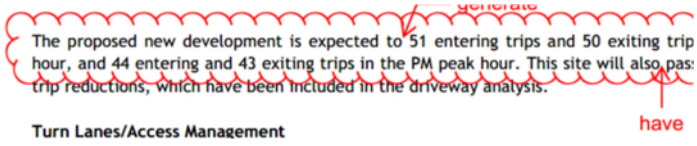
TO: David Ranjbar, Prime & Paradigm Construction

FROM: Scott Israelson

RE: Responses to Comments
Bulverde, TX
Gas Station TIA

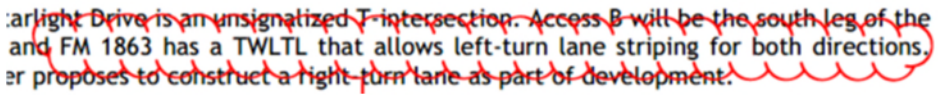
This memo serves as responses to City comments dated 8/17/23.

Need to clarify that are net new trips added to network. The total trips entering and exiting the site are much higher



The resubmittal has revised the executive summary and conclusion text.

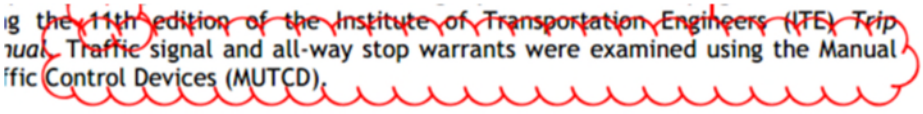
Incorrect. It is a two-lane undivided roadway with turn lanes provided at major intersections



The resubmittal has corrected the text on page 5.

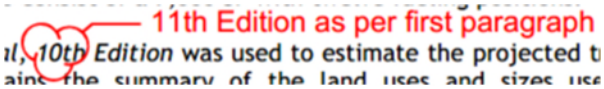
The resubmittal has corrected the text on page 5.

No warrants discussed in the report.



The resubmittal has added the results of signal warrants analysis.

convenience store

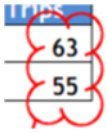


The resubmittal has corrected the text on page 7.

945 as per ITE 11th Edition

The resubmittal has corrected Table 3.1.

Is this meant to be 10% of PM volume, similar to AM calculation? Please check.



No, pass-by trip reductions are capped at 10% for the AM peak hour only. The full pass-by trip reduction was applied for the PM peak hour since it was less than 10% of the adjacent roadway volume.

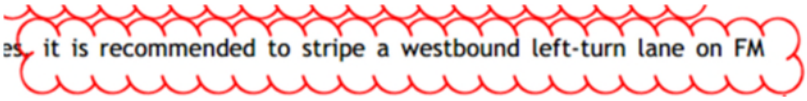
Please provide a figure showing trip distribution. Distribution at Driveways is not discussed.

The resubmittal includes Figure 3B “Trip Distribution”, and added text regarding distribution at driveways.

Check Volumes in this table. The advancing and opposing volumes do not match the Figure 6, and LT volumes are for Access B not Access A.

The resubmittal corrects the volumes in Table 4.2.

Explain the feasibility of accommodating a westbound left-turn lane at Access A. The entire frontage of the site has a dedicated eastbound left turn lane serving Starlight Drive. This existing turn lane length is needed to meet the minimum Deceleration and storage length recommendations by TxDOT.

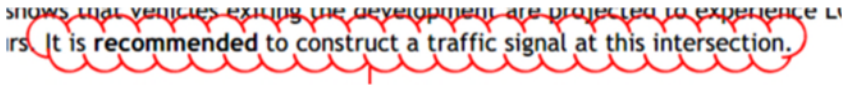


The resubmittal states that a westbound LTL will not meet TxDOT standards, and that the driveway may need to be restricted to right-in/right-out only.

Mention the required sight distance. Discuss if the sight distance is achievable and how much area should be cleared (may be showing the area on map)

The resubmittal adds the required sight distance and adds clearing area on Figure 7.

Is a traffic signal warranted? What would be the operations under a traffic signal control?



The resubmittal adds the results of signal warrant analysis and also adds Table 5.3B under signalized control.

SEB	LT
	RT
NWB	TH
	RT
SWB	LT
	RT

Check the Approach directions and Movements. For example, the driveway should be NEB not SWB. The NWB approach should have LT and TH movements.

The resubmittal corrects Tables 5.4 and 5.5.

TBPE FIRM REGISTRATION NO., F-1601
Seda Consulting Engineers, Inc
6735 I.H. 10 West
San Antonio, TX 78201
Phone: (210) 308-0057
FAX: (210) 308-8842
E-Mail: seda@satx.rr.com

May 02 , 2024

City of Bulverde
San Antonio, Texas 78216
Att:. Ms Suzanne Williams

Re: Review # 2 Comment for Bulverde Convenience Store

Dear Ms. Williams:

Please consider this letter as a response to your review comments for the above referenced, as follow;

Preliminary Plat Comments

1. New Comment: Per the General Design regulations of the Subdivision Ordinance, all lots shall have a minimum frontage as outlined in subsection 2.03(c)(iv). Lot 3 currently does not meet this requirement. Unless a variance is requested, the 30' ingress/egress and shared access easement does not suffice. If you would like to pursue a variance, contact Suzanne Williams, Director of Planning with the City of Bulverde.

Please see revised plat, now we have only 2 lots.

2. Darken the southern boundary of Lot 2 to match the other lot line weights.
Round 2: Each lot needs to have the heavier weighted border to clearly show the lot separations. Have the lot line weight match the perimeter lot lines.

Revised as per request.

3. Include the required notes that parts of the parcels are located within a FEMA 100-year floodplain and if applicable, parcel is located within the Edwards Aquifer Recharge Zone and developments within the Edwards Aquifer Contributing Zone must comply with TCEQ Edwards Aquifer Rules, 30 TAC §213. Copies of the TCEQ approved Edwards Aquifer Protection Plan shall be submitted with the initial permit for a development (17.02.002).
Round 2: Comment not cleared. FEMA 1% annual chance floodplain line from FIRM must be used. Refer to the FEMA FIRMette (.pdf page 40 in drainage report), FEMA zone AE boundary looks much different than what is shown in preliminary plat. The Edwards Aquifer Recharge and/or Contributing Zone should be labeled or a note added describing all the plot(s) are located within zone..

Revised. Please see plat and updated narrative of drainage report.

4. Label all easements. Include any utility lines on the lot.
Round 2: A drainage easement is needed around all proposed drainage infrastructure that is used to treat or detain runoff from a different parcel.

There is no required drainage infrastructure needed to detain the runoff from different parcel.

5. Per the City's stormwater drainage manual, areas within FEMA's Special Flood Hazard Area shall be dedicated as a drainage easement. Add SFHA Zone AE boundary and add drainage easement boundary the bounds the SFHA Zone AE.
Round 2: Comment not cleared, amend drainage easement boundary once Zone AE is updated.

The current food plain as per FEMA is needed to be revised. That is why we have applied for "Eloma" floodplain revision and got approved to remove flood plain as per updated elevation. Please see the approved ELOMA letter where the floodplain is revised. We have provided the easement up to that eloma approved floodplain (approved February 20, 2024) not FEMA floodplain which was updated back in 2009. Please see the report and plat.

6. Include 100-year Flood Zone water surface elevations at a minimum of a two-foot interval and minimum slab elevations for each lot with a portion of the 100-year Flood Zone on the lot per Bulverde Subdivision Ordinance 1.05 (b) (19). Include FEMA delineated floodway. If the proposed plat is part of concurrent platting, the concurrent plat outlines for the adjacent property shall be shown and labeled as "concurrent platting." Such lines shall be dashed and gray-scaled to avoid confusion with the subdivision lot lines, right-of-way boundaries, etc. (Bulverde Subdivision Ordinance 1.05 (b) (22)).
Round: Use the correct FEMA boundaries. Note that if the development is located in the FEMA 1% floodplain, the applicant must also apply for a floodplain development permit.

Please check reply to comment 5.

7. Refer to the City's drainage manual, section 8.1 to size the drainage easement required utility easement width.
Round 2: Comment not cleared.

XXXXXXXXXXXXXXXXXXXX

8. Every area identified in the slope map as having a slope greater than 25% shall be dedicated an easement in the plat as a "Slope Easement" (Ref. Ch.10A 4.04.6).
Round 2: Comment not cleared.

Constant slope easement is provided. Please the plat.

15. Include the square footage for Lot 01.
Round 2: add comma in square footage for clarity.

Included as per request.

17. Add a notary statement for the surveyor and engineer certifications (Ref. Ch.10A 2.05.b.ii.5).
Round 2: Comment not addressed.

Statements have been added as per request.

19. There are differences that should be confirmed between the plat and the ESA document submitted, including the name of the original survey (F.F. Morales or Agapita Gayton), and the most eastern property line which either has an angle point as shown here, or is one straight line as shown in original survey.)
Round 2: Cannot verify this is corrected as the ESA was not resubmitted.

Was discussed between Mr. David Ranjbar and Ms. Caroline Stewart

Civil Plans Review not resubmitted).

Yes the revised civil plans and utility were submitted back to 09/14/2023.

Phase I ESA (not resubmitted)

Yes was submitted as per Mr. David Ranjbar

General Drainage Comments

Please include the following in your next submittal:
1. Hydrology and hydraulic models. Please refer to section 5.3.1 and 4.4 of the SDDCM for approved modeling software.
Round 2: Comment not cleared. Please provide.

Yes, the atlas 14 hydraulics were submitted 9/14/2023.

2. If proposed activities are within FEMA zone AE, ordinance 1.04.c.iv.f. applies, and a floodplain development permit would be required. Part of this permit will be supporting documentation demonstrating the proposed activities meet City/County floodplain development requirements which would include how the proposed grading may affect flood water elevation.
Round 2: Per the provided FEMA FIRMette in the drainage report (.pdf page 40), the proposed activities are located within a special flood hazard zone (FEMA zone AE).

The current food plain as per FEMA is needed to be revised. That is why we have applied for "Eloma" floodplain revision and got approved to remove flood plain as per updated elevation. Please see the approved ELOMA letter where the floodplain is revised. We have provided the easement up to that eloma approved floodplain (approved February 20, 2024) not FEMA floodplain which was updated back in 2009. Please see the report and plat.

Drainage Report

PDF Page 4
1. Note that lot 3 is in the regulatory floodway.
Round 2: Add note to report that part of lot 3 is in regulatory floodway.

The narrative of report has been revised. Please see 12 of the updated report.

PDF Page 6
2. This is not an acceptable engineering method to assess hydraulic impacts since it disregards the hydrologic condition of timing to peak discharge of runoff from the site to timing to peak discharge in the receiving water (Cibolo Creek). Furthermore, the City's ordinance does not permit increases of rainfall runoff due to proposed activities at parcel boundaries.

Round 2: Comment not cleared. An increase in peak discharge between existing conditions and proposed conditions of 51.67 cfs at the parcel boundary. This is not allowed. Also, the HEC-RAS output table shows a rise in WSE, this is not allowed in a FEMA floodway. Additionally, the report indicates that WSE data from the San Antonio River Authority was used. This model is not the effective HEC RAS model. Provide HEC-RAS and HEC-HMS models for validation.

The revised HEC-RAS HEC-HMS study has shown no increase in WSE due the proposed development. Please see the report. Therefore, no regulatory detaining is needed. Please see page 42 of the updated report.

3. This discharge was calculated using the rational method and the rational method was used to compare pre-construction to post construction peak rainfall runoff. This is not an allowable application of the rational method per section 4.3.1 of the City's drainage manual. An acceptable method is using the SCS hydrograph method.
Round 2: Type III distribution for the SCS hydrograph (SDDCM 4.2.3).

Revised. All affected hydrology and hydraulic calculations are being updated. Please see the hydrology section of report.

PDF Page 7
4. Please provide WSE data for existing and proposed conditions. If there is any change in WSE or floodplain extents due to this project, the applicant must follow FEMA's CLOMR/LOMR procedure.
Round 2:
a. The HEC-RAS output table shows a rise in WSE. This is not allowed in a FEMA floodway.
b. No calculations have been provided about a proposed water quality pond. Provide narrative on pond, include in models, and report.

The revised HEC-RAS table doesn't show any rise in WSE elevation. Please see page 42 of the report.

5. Follow FEMA model description such as effective model, corrected effective, post-project model, etc.
Round 2: Comment not cleared. It appears the applicant is trying to avoid site runoff detention through a means of directly discharging into a drainage easement. If this is what the applicant is trying to convey, they must make this clear in the report and the applicant must apply for a variance from the requirements of the City's drainage criteria manual.

Will apply. There will be no development in future at the down side of the developing property. Please note that.

6. How will the increased runoff be mitigated?
Round 2: Comment not cleared. The comment is speaking to the runoff (discharge, Q), not the water surface elevation. Additionally, the HEC-RAS output table shows a rise in WSE.

We are directly discharging to the flood plain and the revised WSE do not changed due to development. As per manual, if the increased impervious cover is more than 10,000 sf, the design must include a detention pond. This site development is less than 10,000 sf in increased impervious cover. So, no detention pond required. Therefore, no mitigation required.

PDF Page 12

8. Per table 4.2, the City would consider existing conditions as fair.
Round 2: Please provide curve number calculations.

A map is provided at the end of report. Please see page 54 of the report.

Page 37
11. Ensure that the most hydraulically distant (time) path is being used for Tc calculations. The longest flow path should be labeled with flow type, slope, and length. This applies to existing and proposed conditions.
Round 2: Page 42 of the submittal are blank. If referring to page 45/46: It is unclear which lines are existing and proposed longest flow paths. The longest flow path should be labeled with flow type, slope, and length. Provide an existing drainage map and a proposed drainage map so that all components that are existing or proposed are clearly distinguished.

Added. Please see report.

12. It is hard to distinguish between existing contour and proposed contour.
Round 2: Pages 42 of the submittal are blank.

Added. Please see report.

13. Label easements/setbacks in all maps.
Round 2: Pages 42 of the submittal are blank.

Added. Please see report.

14. All lines should be clearly labeled or have a corresponding legend item.

Round 2: Pages 42 of the submittal are blank.

Added. Please see report.

15. Parcel boundary is cut off. Show a point of analysis here for post construction to pre-construction comparison of runoff. This comment applies to post construction conditions as well.
Round 2: Pages 42 of the submittal are blank
Added. Please see report.

16. Tc must extend to parcel boundary; comment applies to proposed conditions as well.
Round 2: Pages 42 of the submittal are blank

Added. Please see report.

17. Note: if/when rainfall runoff detention is required, please include information about offsite runoff including basin area delineations, Tc, etc.
Round 2: Page 42 of the submittal are blank. Water quality pond is located within FEMA floodplain. Determine the frequency the pond will be inundated, demonstrate that it will still function as designed.

Revised. Please see report.

18. Note: if/when rainfall runoff detention is required, reevaluate basin delineation and outfall locations. Both should be labeled on the existing and proposed condition maps.
Round 2: Page 42 of the submittal are blank.

Added. Please see report.

PDF Page 38
19. Show how grading will influence the proposed rainfall runoff. Refer to Article 17.03 and 17.04 of the Bulverde Code of Ordinances for cut/fill regulations.
Round 2: The proposed grading should be shown in proposed exhibits. The proposed grading is not captured in the HEC-RAS sections.

Revised. Please see pages 50 , 52 and 53 in the report.

PDF Page 40
20. Contours should be labeled so grading activities are clear.
Round 2: The proposed grading should be shown in proposed exhibits.

Revised. Please see pages 50 and 52 in the report
PDF Page 41
21. This floodplain boundary does not appear to match boundary in map exhibit on page 35. The regulatory floodway boundary also needs to be included.
Round 2: The FEMA floodplain delineation must be used. Refer to section 9 of the SDDCM and the Bulverde floodplain ordinance.

Revised. Please see the exhibits.

New Round 2 Comments for Drainage Report:

PDF Page 40:
1. This site shape does not match other figures. Keep consistent. See pdf page 40 for exact callout location.

Revised. Please see page 47 of the report.

PDF Page 45:
2. Flow direction lines appear incorrect based on the contour lines provided. Provide an existing drainage map and a proposed drainage map so that all components that are existing or proposed are clearly distinguished.

Revised. Please see page 49-53 of the report.

3. It is unclear which lines are existing and proposed longest flow paths. The longest flow path should be labeled with flow type, slope, and length. Provide an existing drainage map and a proposed drainage map so that all components that are existing or proposed are clearly distinguished.
Revised. Please see page 49-50 of the report.

4. Show the approximate pond dimensions. The contour lines should reflect the changes made with the addition of a pond.

Revised. Please see page 52 of the report.

5. Provide stage-discharge and stage-storage tables for detention routing (SDDCM 2.2).

We are not providing any detention pond. No need for detaining table.

6. Demonstrate that the detention facility is in compliance with SDDCM Ch 7.

We are not providing any detention pond.

7. spot elevations are inconsistent with existing contours and inconsistent with proposed contours, update contours or remove spot elevations

The spot elevation is from onsite survey which is inconstant with contour. Please refer the spot elevation as independent single entity and correct elevation from the onsite.

PDF Page 46:
8. WSE in the topographic exhibit plan do not match HEC-RAS output on pdf page 34.
Revised. Please see page 53 of the report.

9. The FEMA 100-year floodplain boundary should be shown on the map.

Revised. Please see pages 49-53 of the report.

10. The captured survey point of 1014.50' appears to fall between the existing contours 1014' and 1013'. Use the best available data for all figures and analyses.

The spot elevation is from onsite survey which is inconstant with contour. Please refer the spot elevation as independent single entity and correct elevation from the onsite.

Slope Map

1. Sheet title should be "**SLOPE** MAP EXHIBITS"

Round 2: Comment not addressed.

"Slope Map Exhibits" was on the title

2. Indicate slopes per (Ch.10A 4.04.c-e) and provide a table to show % of slope ranges.

Round 2: Comment not addressed.

a. Limit slope map to around parcel boundaries.

b. Break slope colors into intervals as listed in the ordinance, summarize the area for each slope interval and calculate the area being disturbed within each slope interval.

Revised. Please see the slope maps

New Round 2 Comments for Storm Water Quality Pond Design Report:

.pdf page 2
4. Slope easement should be precise and not "variable width."

5. Use FEMA floodplain boundary.

.pdf page 3
6. Per stormwater report, .pdf page 4, the amount of increased impervious cover is 2.29 acres, update (.pdf page 3)

.pdf page 4
7. these dimensions do not match what is shown in plan
.pdf page 5
8. This is not what is scaled at 1":50'. Dimensions are 145'+/- and 45'+/-
9. In section B-B there is conflict between 2.0' dimension and 1' sand layer, how thick is sand layer?

10. The inflow structure to the sedimentation chamber should incorporate a flow-splitting device capable of isolating the capture volume and bypassing the 25-year peak flow around the sand filter system once the entire water quality volume has been captured (TCEQ RG-348 pg 3-59). Once the final peak flows are approved, verify that the 25-year peak flow can be captured as specified above.

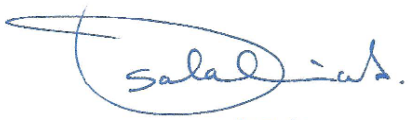
11. Provide contours that represent the sand filter installation and how it ties into existing ground.
12. Energy dissipation is required at the sedimentation basin inlet so that flows entering the basin should be distributed uniformly and at low velocity in order to prevent resuspension and encourage conditions necessary for deposition of solids (TCEQ RG-348 pg 3-61).
13. Safety should be provided either by fencing of the facility or by managing the contours of the pond to eliminate dropoffs and other hazards. Earthen side slopes should not exceed 3:1 (H:V) and should terminate on a flat safety bench area. Landscaping can be used to impede access to the facility. The primary spillway opening must not permit access by small children. Outfall pipes more than 48 inches in diameter should be fenced (TCEQ RG-348 pg 3-62).
14. Section C does not contain a weir

15. Section A-A shows a weir at 1011.65 which would mean it is underground. this is not correct.

16. calculations assume a 2' ponding depth, only a 1' ponding depth has been provided and sometimes less across the basin. correct.
17. the depth of sand layer(s) as described in note is inconsistent with sections. the narrative's depth thickness over the laterals is 2'+/- of gravel and sand. in section A-A only 1' has been provided.
18. Include in notes that all piping is to be Schedule 40 PVC. The maximum spacing between rows of perforations should not exceed 6 inches. (TCEQ RG-348 pg 3-59).
19. Note that the gabion rock should be 5 to 8 inches in diameter (TCEQ RG-348 pg 3-61).
20. Include a stabilization plan indicating how adjacent terrestrial areas will be stabilized (TCEQ RG-348 pg 3-63).
21. Gravel layer and the geotextile fabric should be represented in all pertinent sections. Dimensions in section view should match the notes and should comply with TCEQ requirements (TCEQ RG-348 pg 3-59).
22. A fixed vertical sediment depth marker should be installed in the sedimentation basin to indicate when the accumulated depth of sediment equals 6 inches and sediment removal is required (TCEQ RG-348 pg 3-58).

For water quality pond, please see attached TCEQ approval

Thank you for all of your hard work and assistance. Please call if you have any question.
Respectfully,
Seda consulting engineers, Inc.



Salah E. Diab, PhD., P.E.