CITY OF SAN ANGELO, TEXAS

AVENUE P
DETENTION BASIN

MAYOR
BRENDA GUNTER

COUNCIL MEMBERS

TOMMY HIEBERT
SINGLE MEMBER DISTRICT #1

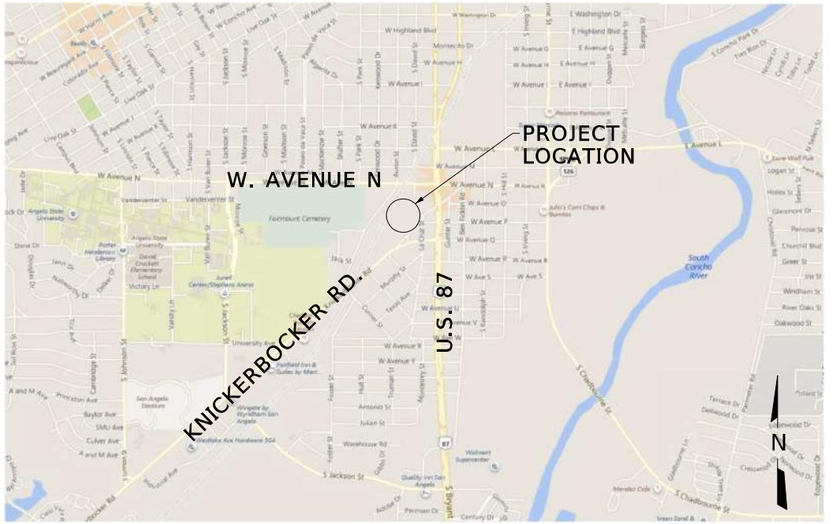
TOM THOMPSON
SINGLE MEMBER DISTRICT #2

HARRY THOMAS
SINGLE MEMBER DISTRICT #3

LUCY GONZALES
SINGLE MEMBER DISTRICT #4

LANE CARTER
SINGLE MEMBER DISTRICT #5

BILLIE DeWITT
SINGLE MEMBER DISTRICT #6



SEPTEMBER 2019

PREPARED BY:

FREESE AND NICHOLS
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Phone - (806) 686-2700
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FNI PROJECT NUMBER: SAN18286

DANIEL VALENZUELA
CITY MANAGER

LANCE OVERSTREET, P.E.
CITY ENGINEER

SHEET INDEX

GENERAL CONSTRUCTION NOTES - CITY OF SAN ANGELO

1. UTILITY LOCATION: THE UTILITIES SHOWN ON THE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW IN GENERAL THE EXISTENCE AND LOCATION OF UTILITIES IN THE AREA OF CONSTRUCTION. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE UTILITY INFORMATION SHOWN ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES 48 HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITIES IN ORDER TO DETERMINE IF THERE IS ANY CONFLICT WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED. THE CONTRACTOR SHALL VERIFY, OR HAVE VERIFIED BY THE APPROPRIATE UTILITY COMPANY, ALL ACTUAL LINE LOCATIONS, ELEVATIONS AND CONFIGURATIONS PRIOR TO CONSTRUCTION IN ORDER TO MAKE ANY NECESSARY TIE-INS OR BY-PASSES. SUCH VERIFICATIONS SHALL BE CONSIDERED SUBSIDIARY TO THE COST OF THE PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

2. UTILITY PROTECTION: THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS FOR THE PROTECTION AND SUPPORT OF ALL UTILITY FACILITIES AND EXISTING STRUCTURES (INCLUDING BUT NOT LIMITED TO UTILITY POLES, GAS MAINS, TELEPHONE CABLES, ELECTRIC CABLES, TV CABLES, DRAINAGE PIPES AND STRUCTURES, UTILITY SERVICES, OTHER UTILITIES, FENCES, TREES AND SHRUBS) BOTH ABOVE AND BELOW THE GROUND DURING CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY ALL UTILITY OWNERS PRIOR TO ANY CONSTRUCTION IN THE AREA AND VERIFY THE ACTUAL LOCATION OF ALL BURIED UTILITIES THAT MAY OR MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL UNDERGROUND AND OVERHEAD FACILITIES AND BE RESPONSIBLE FOR ANY DAMAGE CAUSED BY CONTRACTOR'S OPERATIONS.

3. THE CONTRACTOR SHALL CONTACT THE FOLLOWING AT LEAST 48 HOURS PRIOR TO EXCAVATING AT EACH LOCATION:

   CITY OF SAN ANGELO (325) 657-4299
   ATMOS ENERGY (GAS), GREGORY PARKER (325) 690-7549
   AT&T, BLAKE MITCHELL (479) 209-6783
   FRONTIER COMMUNICATIONS, WILLIAM GATLIN (325) 949-7667
   DIG TESS (UTILITIES) (800) 344-3877
   AEP-TEXAS, KEVIN POOL, (361) 290-7046
   SUDDENLINK, DANNY TRINIDAD (325) 650-4430

4. WHEN NOTIFYING UTILITY COMPANIES BY CALLING 1-800-DIG-TESS (1-800-344-8377) THE CONTRACTOR SHALL CALL AT LEAST 48 HOURS PRIOR TO CONSTRUCTION AND SHALL PROVIDE MAPSCO GRID NUMBERS FOR THE WORK AREA AND SHALL RECORD THE CONFIRMATION NUMBERS ISSUED BY DIG TESS. THESE NUMBERS AND/OR TICKETS SHALL BE PROVIDED TO THE CITY ON REQUEST.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING GENERAL SAFETY AT AND ADJACENT TO THE PROJECT AREA, INCLUDING THE PERSONAL SAFETY OF THE CONSTRUCTION CREW AND GENERAL PUBLIC, AND THE SAFETY OF PUBLIC AND PRIVATE PROPERTY.

6. THE TYPES AND LOCATIONS OF THE TEMPORARY BARRICADES AND SIGNS USED DURING CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. PLACEMENT AND MAINTENANCE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR WITH APPROVED TRAFFIC CONTROL PLAN.

7. THE CONTRACTOR SHALL NOTIFY ALL EMERGENCY UNITS AND SCHOOL DISTRICTS OPERATING WITHIN THE AREA OF THE PROPOSED WORK OF ANY LANE CLOSURES AND CONSTRUCTION SCHEDULES WITH 72 HRS MINIMUM ADVANCED NOTICE.

8. THE CONTRACTOR SHALL MAINTAIN FIRE EMERGENCY VEHICLE ACCESS TO FIRE HYDRANTS THROUGHOUT THE DURATION OF THE PROJECT. INACTIVE FIRE HYDRANTS SHALL BE SALVAGED.

9. INITIAL CONSTRUCTION INSPECTIONS AND MATERIAL TESTING WILL BE PERFORMED BY THE CITY OF SAN ANGELO THROUGH AN INDEPENDANT TESTING LABORATORY. ALL MATERIAL TESTING SHALL BE COORDINATED WITH THE PROJECT INSPECTOR. THE PROJECT INSPECTOR SHALL BE PRESENT DURING ALL TESTS AND SHALL BE GIVEN A MINIMUM OF 24 HOURS ADVANCED NOTICE PRIOR TO ANY TESTING. ANY TEST RESULTS NOT MEETING THE SPECIFICATIONS SHALL REQUIRE ADDITIONAL INSPECTIONS AND TESTS WHICH WILL BE PAID FOR BY THE CONTRACTOR. THE CITY ENGINEER AND/OR THE PROJECT INSPECTOR WILL DETERMINE THE ADDITIONAL TESTING AND EXTRA INSPECTION REQUIRED TO ENSURE CONFORMANCE WITH THE CONTRACT DOCUMENTS.

10. CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO THE HOURS OF 7:00 AM TO 6:00 PM MON.-FRI. UNLESS OTHERWISE APPROVED OR DIRECTED IN WRITING BY THE PROJECT INSPECTOR.

11. THE CONTRACTOR SHALL TAKE ADEQUATE MEASURES TO PREVENT EROSION. IN THE EVENT THAT SIGNIFICANT EROSION OCCURS AS A RESULT OF THE CONSTRUCTION, THE CONTRACTOR SHALL RESTORE THE ERODED AREA TO ITS ORIGINAL OR BETTER CONDITION AT HIS OWN EXPENSE.

12. ALL AREAS DISTURBED OR EXPOSED DURING CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH THE CONSTRUCTION PLANS AND/OR PROJECT SPECIFICATIONS. REVEGETATION OF ALL DISTURBED OR EXPOSED AREAS SHALL CONSIST OF DRILL SEEDING AS INDICATED IN THE PLANS & SPECS. HOWEVER, THE TYPE OF REVEGETATION MUST EQUAL OR EXCEED THE TYPE OF VEGETATION PRESENT BEFORE CONSTRUCTION BEGAN.

13. ALL MAILBOXES, FENCES, DRIVEWAYS, LANDSCAPING, IRRIGATION SYSTEMS, CULVERT PIPES, DRAINAGE DITCHES, AND ANY IMPROVEMENTS ON PRIVATE PROPERTY NOT SCHEDULED FOR REPLACEMENT DURING CONSTRUCTION WHICH ARE DAMAGED OR MOVED BY THE CONTRACTOR SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION BY THE CONTRACTOR WITH LIKE MATERIAL AT NO ADDITIONAL COST TO THE CITY OR TO THE AFFECTED PROPERTY OWNER.

15. CONTRACTOR SHALL MAKE THE WORK SITE AND ANY OPEN TRENCHES SECURE AND SAFE AT THE END OF EVERY DAY. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF ANY FENCING OR ANY OTHER SAFETY EQUIPMENT.

16. THE CONTRACTOR SHALL REMOVE ALL FENCES, LOCATED WITHIN EASEMENTS, INTERFERING WITH CONSTRUCTION OPERATION AND PROVIDE TEMPORARY FENCING DURING CONSTRUCTION. REMOVED FENCES, WOODEN OR CHAIN LINK, SHALL BE REPLACED WITH A NEW FENCE OR UNDAMAGED ORIGINAL FENCING. ALL AFFECTED PROPERTY OWNERS SHALL BE NOTIFIED PRIOR TO CONSTRUCTION. REMOVAL AND REPLACEMENT OF EXISTING FENCES SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT COST AND REFLECTED IN THE UNIT BID PRICES FOR VARIOUS ITEMS LISTED IN THE PROPOSAL.

17. WHEN IT IS REQUIRED THAT A CONTRACTOR WORK IN PRIVATE PROPERTY, THE CONTRACTOR SHALL DISTRIBUTE LETTERS TO ALL AFFECTED PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING WORK ON EACH PROPERTY. THE LETTER SHALL INCLUDE NAMES AND TELEPHONE NUMBERS OF CONTRACTOR CONTACTS, A DESCRIPTION OF THE WORK TO BE DONE, AND THE TIME FRAME FOR DOING THE WORK. COPIES OF THE LETTER SHALL BE FORWARDED TO THE CITY INSPECTOR. DISTRIBUTION OF LETTERS SHALL BE CONSIDERED AS SUBSIDIARY TO THE COST OF PROJECT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

18. THE CONTRACTOR SHALL REMOVE FROM THE PROJECT AREA ALL SURPLUS MATERIAL. THIS SHALL BE INCIDENTAL AND NOT A SEPARATE PAY ITEM. SURPLUS MATERIALS FROM EXCAVATION INCLUDING DIRT, TRASH, ETC. SHALL BE PROPERLY DISPOSED OF AT A SITE ACCEPTABLE TO THE CITY'S FLOOD PLAIN ADMINISTRATOR IF WITHIN THE CITY LIMITS. IF THE LOCATION IS NOT WITHIN THE CITY LIMITS, THE CONTRACTOR SHALL PROVIDE A LETTER STATING SO. NO EXCESS EXCAVATED MATERIAL SHALL BE DEPOSITED IN LOW AREAS OR ALONG NATURAL DRAINAGE WAY WITHOUT WRITTEN PERMISSION FROM THE AFFECTED PROPERTY OWNER AND THE CITY'S FLOOD PLAIN ADMINISTRATOR. IF THE CONTRACTOR PLACES EXCESS MATERIAL IN THE AREAS WITHOUT WRITTEN PERMISSION, HE WILL BE RESPONSIBLE FOR ALL DAMAGE RESULTING FROM SUCH FILL AND HE SHALL REMOVE THE MATERIAL AT HIS OWN COST.

19. ALL EXISTING CONCRETE TO BE SAWCUT WHEN CONSTRUCTING A NEW CONCRETE DRIVEWAY APPROACH.

20. CURB RETURN RADII FOR DRIVEWAYS SHALL BE 5 FEET UNLESS OTHERWISE NOTED.

21. ALL EXCAVATIONS, TRENCHING AND SHORING OPERATIONS SHALL COMPLY WITH THE REQUIREMENTS OF THE U.S. DEPARTMENT OF LABOR, OSHA, "CONST. SAFETY AND HEALTH REGULATIONS", VOL. 29, SUBPART P., PG 128-137, AND ANY AMENDMENTS THERETO.

22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL EXCESS TRENCH EXCAVATIONS AND HAULING MATERIALS TO AN APPROVED DISPOSAL SITE. THIS SHALL BE CONSIDERED SUBSIDIARY.

23. CONTRACTOR'S PERSONNEL SHALL HAVE IDENTIFYING CLOTHING, HATS OR BADGES AT ALL TIMES WHICH IDENTIFY THE CONTRACTOR'S NAME, LOGO OR COMPANY.

24. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING WATER AND SEWER CONNECTIONS TO ALL HOMES AND BUSINESSES IN WORKING ORDER AT ALL TIMES. EXCEPT FOR BRIEF PRE-NOTIFIED INTERRUPTIONS IN WATER SERVICES. IN NO CASE SHALL SERVICES BE ALLOWED TO REMAIN UNREINSTATED OVERNIGHT.

25. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS BEFORE CONSTRUCTION BEGINS.

26. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT ELECTRIC POWER AND TELEPHONE POLES ARE NOT DISTURBED DURING CONSTRUCTION. ALL COSTS INCURRED FOR SUPPORTING ELECTRIC POWER AND TELEPHONE POLES SHALL BE INCLUDED IN THE PRICE BID FOR THE POND EXCAVATION. NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

27. ALL STREETS WITHIN THE SCOPE OF THE CONTRACT SHALL BE KEPT ACCESSIBLE TO FIRE TRUCKS, AMBULANCES AND OTHER EMERGENCY VEHICLES.

28. CONTRACTOR SHALL MAINTAIN SUITABLE CONSTRUCTION ACCESS TO PRIVATE PROPERTY OWNERS, THE ENGINEER AND CITY OF SAN ANGELO, AT ALL TIMES DURING CONSTRUCTION.

29. IT IS THE CONTRACTORS RESPONSIBILITY TO MAINTAIN NEAT AND ACCURATE PLANS ON RECORD.

30. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ADEQUATE SITE DRAINAGE THROUGHOUT THE DURATION OF THIS PROJECT.

31. THE CONTRACTOR SHALL NOT PLACE FILL OR WASTE MATERIAL ON ANY PRIVATE PROPERTY WITHOUT PRIOR WRITTEN PERMISSION FROM THE PROPERTY OWNER AND PROVIDE CITY WITH A COPY. NO EXCESS EXCAVATED MATERIAL SHALL BE DEPOSITED IN LOW AREAS OR ALONG NATURAL DRAINAGE WAYS THAT WILL RESTRICT THE NATURAL FLOW OF WATER. IF THE CONTRACTOR PLACES EXCAVATED MATERIAL IN LOW AREAS THAT WILL CAUSE FLOOD DAMAGE, HE WILL BE RESPONSIBLE FOR ALL DAMAGE RESULTING FROM SUCH FILL AND HE SHALL REMOVE THE FILL AT HIS EXPENSE.

32. THE CONTRACTOR SHALL AVOID DAMAGING ANY EXISTING WATER SPRINKLER SYSTEM THAT MAY BE IN THE CONSTRUCTION AREA AND WILL BE RESPONSIBLE FOR REPAIRS TO ANY HEADS OR LINES OF DAMAGED. REPLACEMENT, AS NECESSARY, SHALL BE AT LIKE OR BETTER MATERIAL AND INSTALLED BY A LICENSED IRRIGATOR, AT THE CONTRACTORS EXPENSE. DAMAGED SPRINKLERS SHALL BE REPLACED THE SAME DAY THEY ARE DAMAGED, TO THE SATISFACTION OF THE CITY, DEVELOPER AND OWNER.

33. UNLESS SPECIFICALLY STATED ON DRAWINGS, THE CONTRACTOR SHALL NOT REMOVE, CUT OR DAMAGE ANY TREES OR LIMBS WITHOUT WRITTEN APPROVAL OF THE CITY

34. CONTRACTOR SHALL DELIVER ALL SALVAGED ITEMS TO THE CITY OF SAN ANGELO'S YARD.

35. HAZARD SIGN LOCATIONS SHALL BE APPROVED BY THE CITY. MOUNTING SIGNS TO FENCE OR GATE SHALL BE SUBSIDIARY TO VARIOUS PAY ITEMS.

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144
STATE OF TEXAS — HEATHER RAE KESTER — 100085 — LICENSED PROFESSIONAL ENGINEER
09/09/2019

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CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
GENERAL NOTES

NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-gn-notes01.sht

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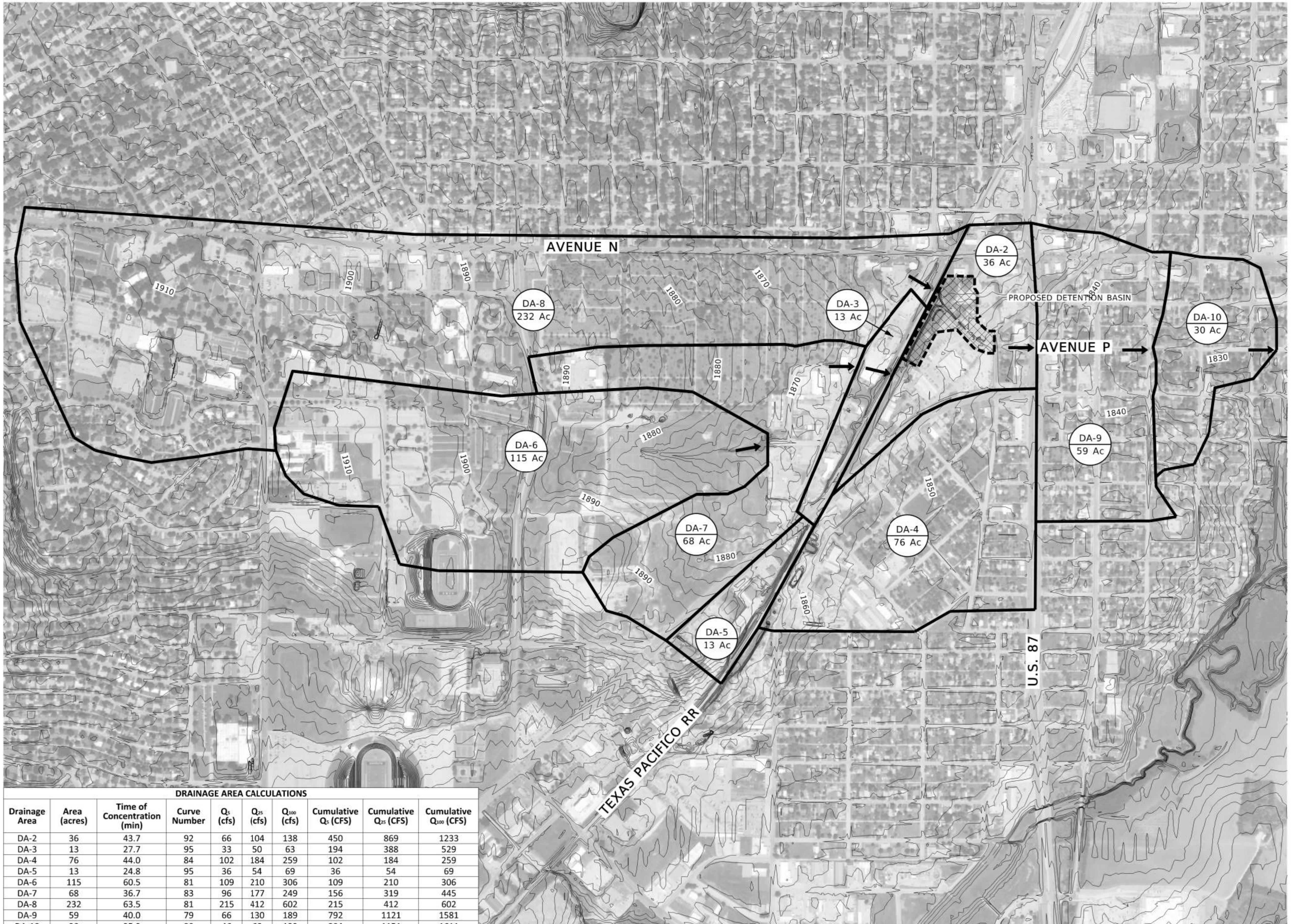

DRAINAGE AREA CALCULATIONS

Drainage Area	Area (acres)	Time of Concentration (min)	Curve Number	Q_5 (cfs)	Q_{25} (cfs)	Q_{100} (cfs)	Cumulative Q_5 (CFS)	Cumulative Q_{25} (CFS)	Cumulative Q_{100} (CFS)
DA-2	36	43.7	92	66	104	138	450	869	1233
DA-3	13	27.7	95	33	50	63	194	388	529
DA-4	76	44.0	84	102	184	259	102	184	259
DA-5	13	24.8	95	36	54	69	36	54	69
DA-6	115	60.5	81	109	210	306	109	210	306
DA-7	68	36.7	83	96	177	249	156	319	445
DA-8	232	63.5	81	215	412	602	215	412	602
DA-9	59	40.0	79	66	130	189	792	1121	1581
DA-10	30	25.9	80	46	69	123	804	1151	1611

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CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

DRAINAGE AREA MAP

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FILE NAME cv-trt-pl-damap.dgn

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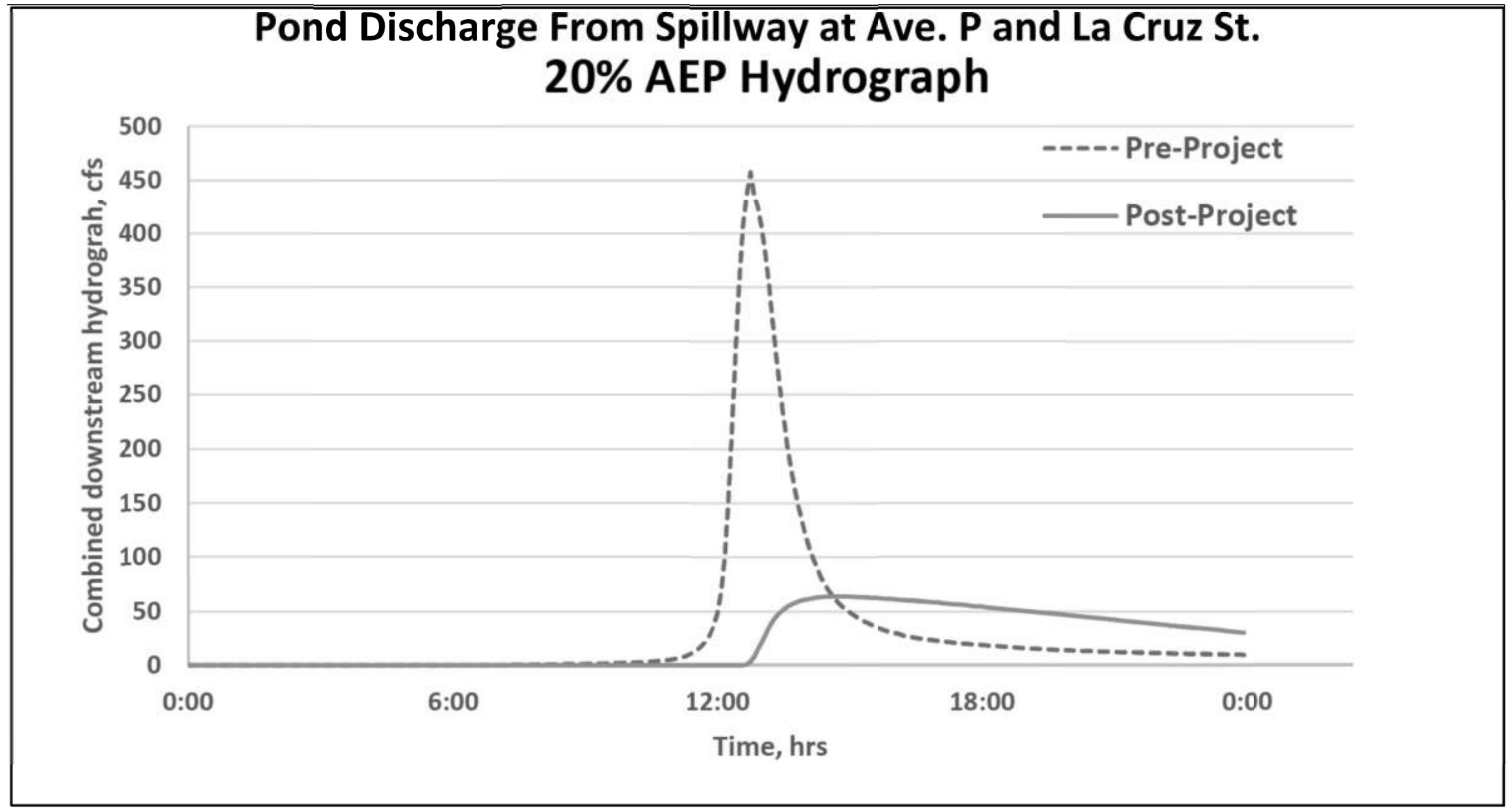
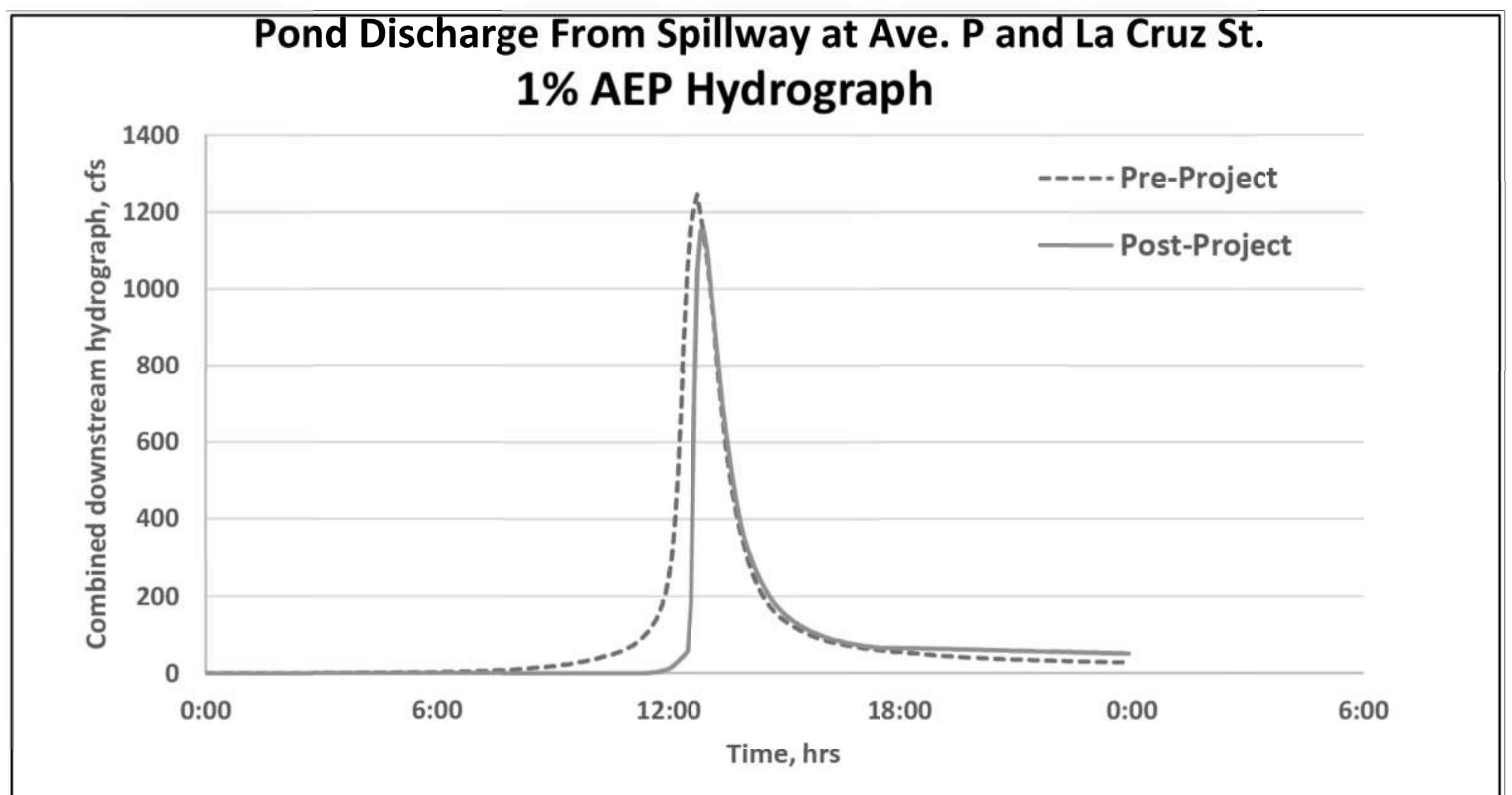
SHEET C-2

SEQ. 3





NOTES:

1. PROPOSED DETENTION SYSTEM MODELED IN HEC-HMS VERSION 3.5.
2. EXISTING CONDITIONS MODELS ORIGINALLY DEVELOPED AS PART OF THE 2015 AVENUE P. DESIGN RECOMMENDATIONS MEMO. THE ANALYSIS INCORPORATED INFORMATION FROM A COSA STORM DRAIN DESIGN.
3. PROPOSED DETENTION POND IS DESIGNED TO WORK AS AN INLINE STORAGE SYSTEM.
4. MAXIMUM STORAGE FOR SURFACE DETENTION IS 38.3 AC-FT.
5. PRE-PROJECT AND POST-PROJECT HYDROGRAPHS REPRESENT THE COMBINED PIPE AND SURFACE FLOW AT THE SPILLWAY.
6. AS NOTED BY THE HYDROGRAPHS ABOVE, SYSTEM DOES NOT PROVIDE 100-YEAR FLOOD PROTECTION. PROJECT PROVIDES INCREMENTAL FLOOD RELIEF IN FREQUENT STORM EVENTS ONLY.

5-year						100-year					
Time	Stage (ft)	Storage (ac-ft)	Discharge (cfs)	Pipe (cfs)	Spillway	Time	Stage (ft)	Storage (ac-ft)	Discharge (cfs)	Pipe (cfs)	Spillway
10:50	1842	0.2	0	0	0	6:50	1842	0.2	0	0	0
12:30	1843	3.6	0	0	0	10:55	1843	3.6	0	0	0
12:45	1844	7	3.4	3.4	0	11:45	1844	7.4	4.5	4.5	0
13:00	1845	11.4	21.1	21.1	0	12:10	1845	11.9	23.3	23.3	0
13:15	1846	16.5	40.7	40.7	0	12:20	1846	16	39.3	39.3	0
13:25	1847	19.7	49	49	0	12:25	1847	19.4	48.3	48.3	0
13:50	1848	24.8	59.2	59.2	0	12:30	1848	24.5	58.8	58.8	0
14:45	**1848.7***	27.5	63.9	63.9	0	12:35	1849	31	180.3	69.3	230.6
16:50	1848	24.4	58.6	58.6	0	12:40	1850	35.7	731.8	75.8	730.9
19:10	1847	20	49.6	49.6	0	12:55	**1850.9***	38.3	1151.8	79.1	1075.5
22:00	1846	15.5	38	38	0	13:40	1850	34.1	513.2	73.7	439.6

* DENOTES PEAK VALUE

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CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
DETENTION CALCULATIONS

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-damap02.dgn

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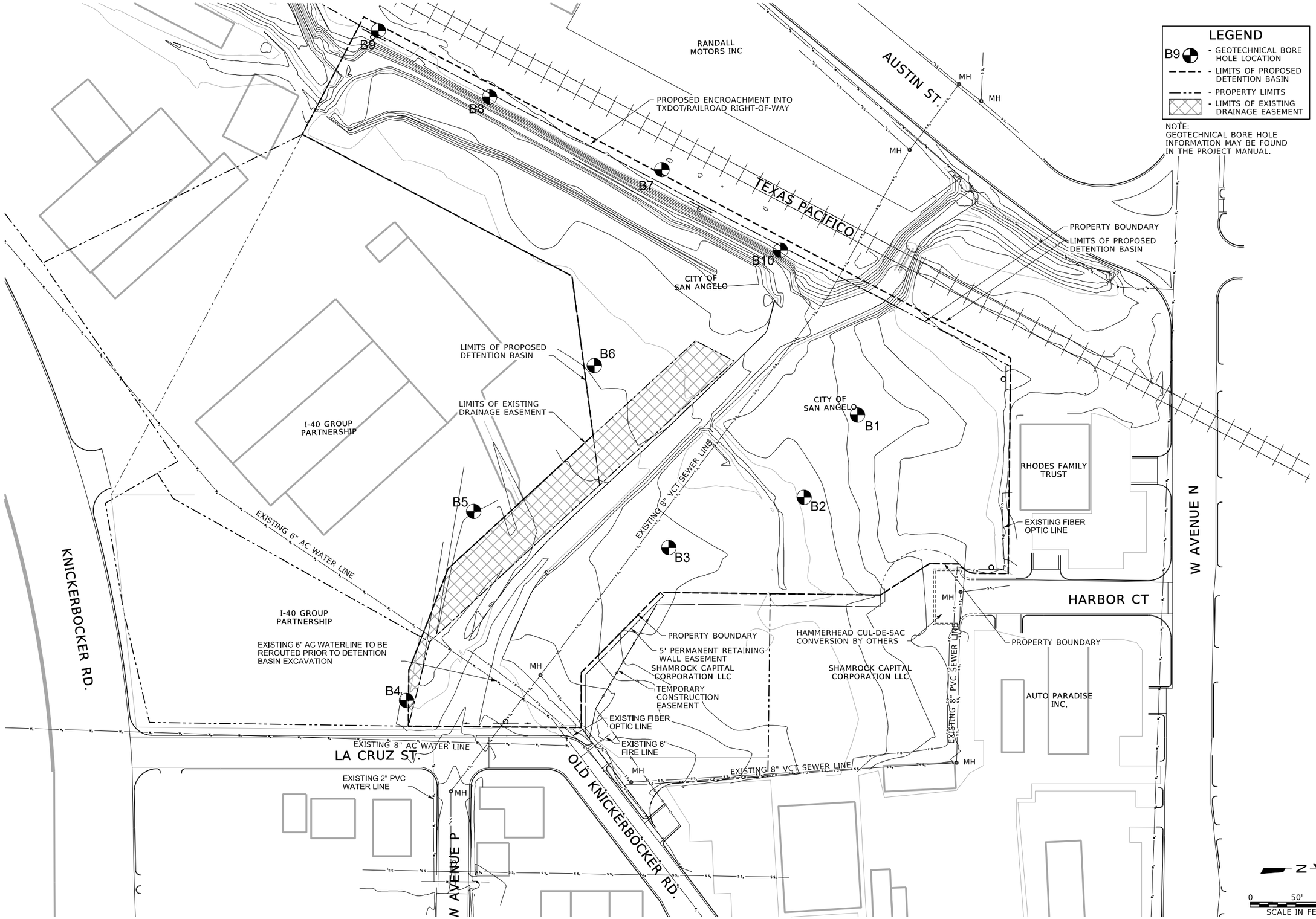
SEQ. 4



LEGEND

- B9 ⊕ - GEOTECHNICAL BORE HOLE LOCATION
- - LIMITS OF PROPOSED DETENTION BASIN
- - PROPERTY LIMITS
- ▨ - LIMITS OF EXISTING DRAINAGE EASEMENT

NOTE:
GEOTECHNICAL BORE HOLE INFORMATION MAY BE FOUND IN THE PROJECT MANUAL.

FREESE AND NICHOLS, INC.
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Heather Keister
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CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

EXISTING SITE PLAN

NO.	ISSUES	BY	DATE

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DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	cv-trt-pl-spln.dgn

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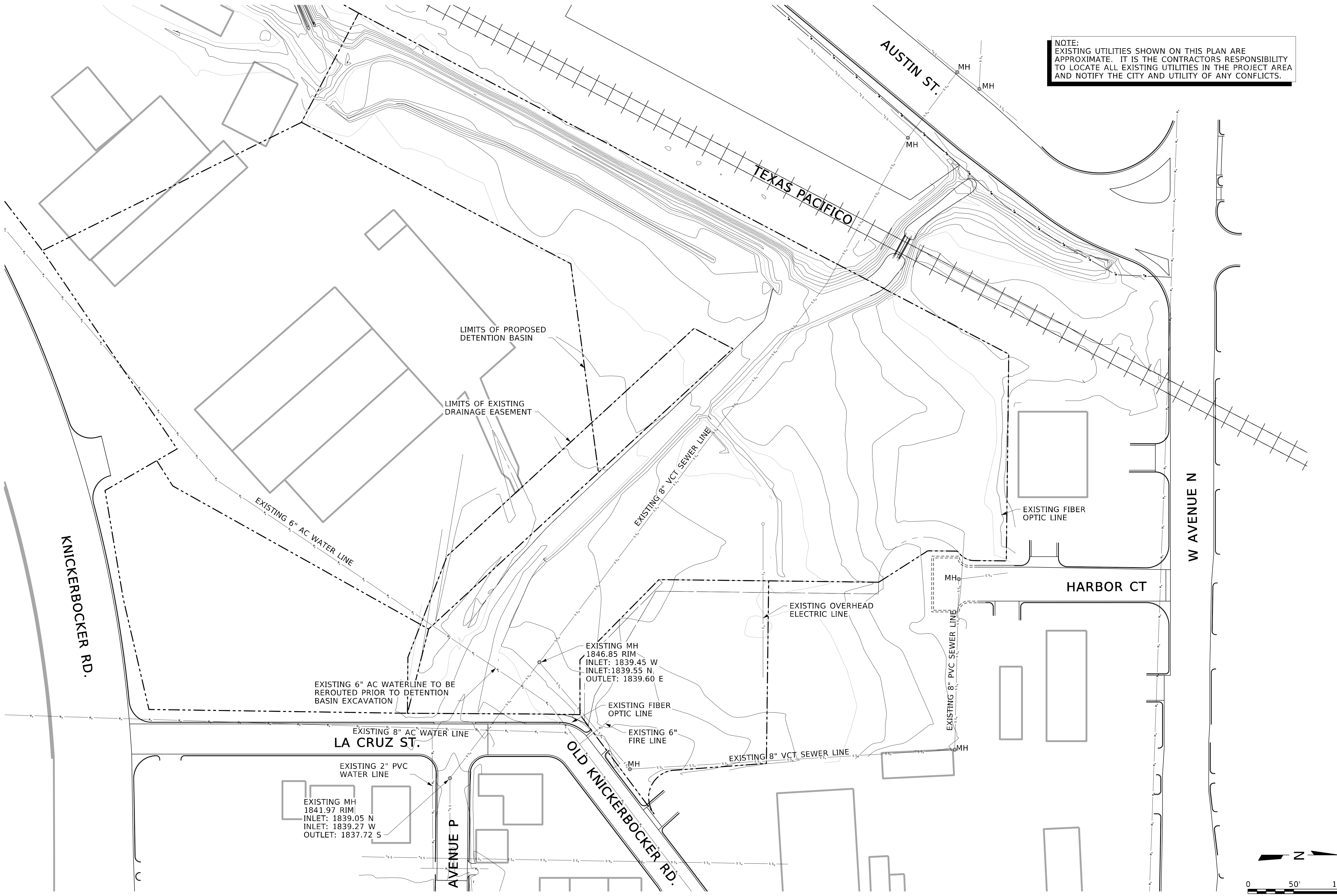
NOTE:
EXISTING UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL EXISTING UTILITIES IN THE PROJECT AREA AND NOTIFY THE CITY AND UTILITY OF ANY CONFLICTS.
AUSTIN ST.
TEXAS PACIFICO
MH
MH
MH
LIMITS OF PROPOSED DETENTION BASIN
LIMITS OF EXISTING DRAINAGE EASEMENT
EXISTING 6" AC WATER LINE
EXISTING 8" VCT SEWER LINE
KNICKERBOCKER RD.
EXISTING FIBER OPTIC LINE
W AVENUE N
HARBOR CT
MH
EXISTING OVERHEAD ELECTRIC LINE
EXISTING 8" PVC SEWER LINE
EXISTING MH
1846.85 RIM
INLET: 1839.45 W
INLET: 1839.55 N
OUTLET: 1839.60 E
EXISTING 6" AC WATERLINE TO BE REROUTED PRIOR TO DETENTION BASIN EXCAVATION
EXISTING FIBER OPTIC LINE
EXISTING 6" FIRE LINE
EXISTING 8" AC WATER LINE
LA CRUZ ST.
EXISTING 8" VCT SEWER LINE
MH
MH
EXISTING 2" PVC WATER LINE
EXISTING MH
1841.97 RIM
INLET: 1839.05 N
INLET: 1839.27 W
OUTLET: 1837.72 S
OLD KNICKERBOCKER RD.
AVENUE P
N
0 50' 100'
SCALE IN FEET

FREESE AND NICHOLS, INC.
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EXISTING UTILITIES

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SHEET C-5
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Date: 8/17/18 Project: Freese and Nichols, Inc. - True Type Fonts

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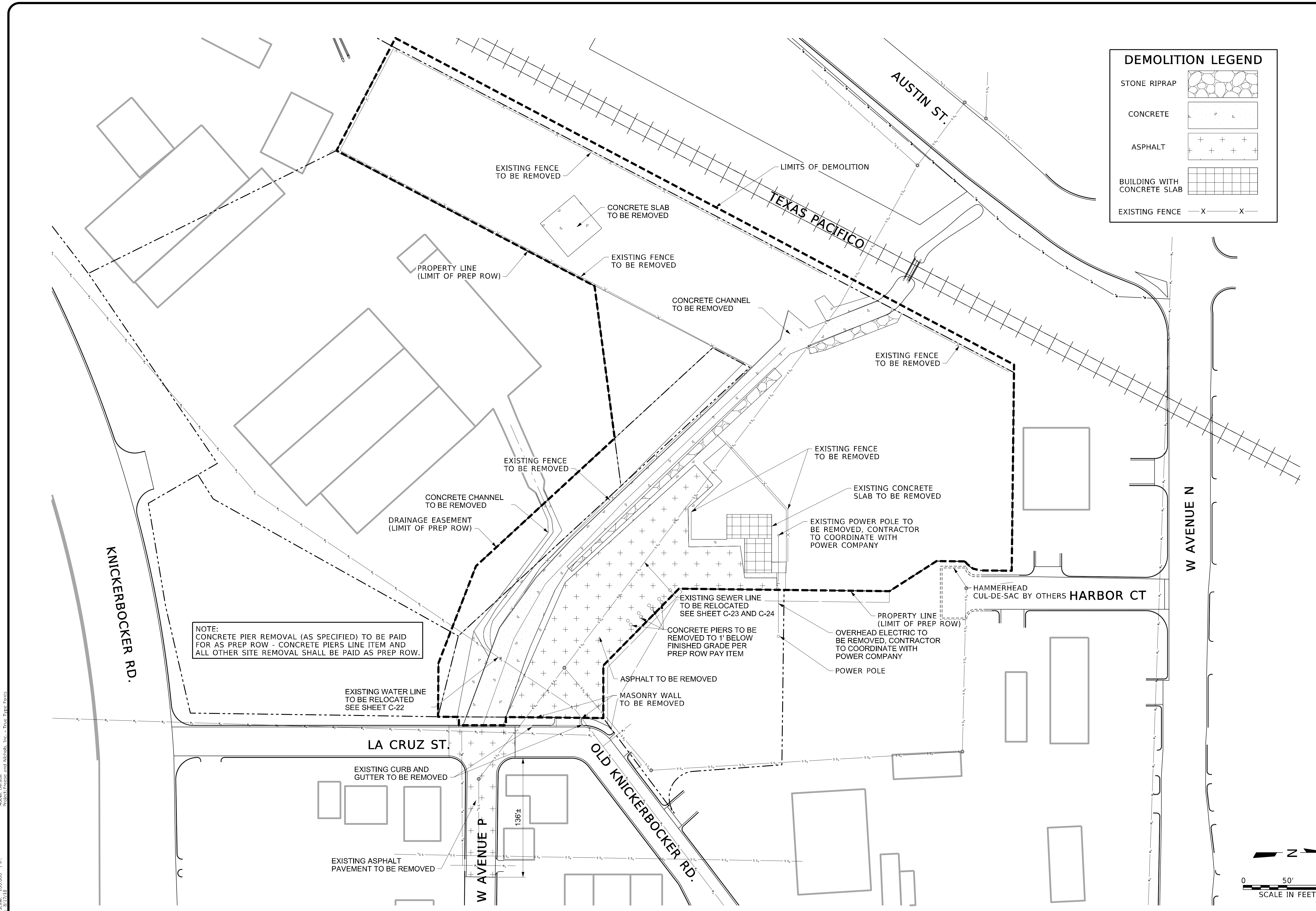

DEMOLITION LEGEND
STONE RIPRAP
CONCRETE
ASPHALT
BUILDING WITH CONCRETE SLAB
EXISTING FENCE
AUSTIN ST.
TEXAS PACIFICO
LIMITS OF DEMOLITION
EXISTING FENCE TO BE REMOVED
CONCRETE SLAB TO BE REMOVED
PROPERTY LINE (LIMIT OF PREP ROW)
CONCRETE CHANNEL TO BE REMOVED
EXISTING CONCRETE SLAB TO BE REMOVED
EXISTING POWER POLE TO BE REMOVED, CONTRACTOR TO COORDINATE WITH POWER COMPANY
DRAINAGE EASEMENT (LIMIT OF PREP ROW)
HAMMERHEAD CUL-DE-SAC BY OTHERS
HARBOR CT
W AVENUE N
EXISTING SEWER LINE TO BE RELOCATED SEE SHEET C-23 AND C-24
CONCRETE PIERS TO BE REMOVED TO 1' BELOW FINISHED GRADE PER PREP ROW PAY ITEM
OVERHEAD ELECTRIC TO BE REMOVED, CONTRACTOR TO COORDINATE WITH POWER COMPANY
POWER POLE
NOTE: CONCRETE PIER REMOVAL (AS SPECIFIED) TO BE PAID FOR AS PREP ROW - CONCRETE PIERS LINE ITEM AND ALL OTHER SITE REMOVAL SHALL BE PAID AS PREP ROW.
KNICKERBOCKER RD.
ASPHALT TO BE REMOVED
MASONRY WALL TO BE REMOVED
EXISTING WATER LINE TO BE RELOCATED SEE SHEET C-22
LA CRUZ ST.
EXISTING CURB AND GUTTER TO BE REMOVED
OLD KNICKERBOCKER RD.
136'±
W AVENUE P
EXISTING ASPHALT PAVEMENT TO BE REMOVED
N
0
50'
100'
SCALE IN FEET

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED PROFESSIONAL ENGINEER
09/09/2019

FREESE NICHOLS
2732 82nd Street, Suite A
Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

DEMOLITION PLAN

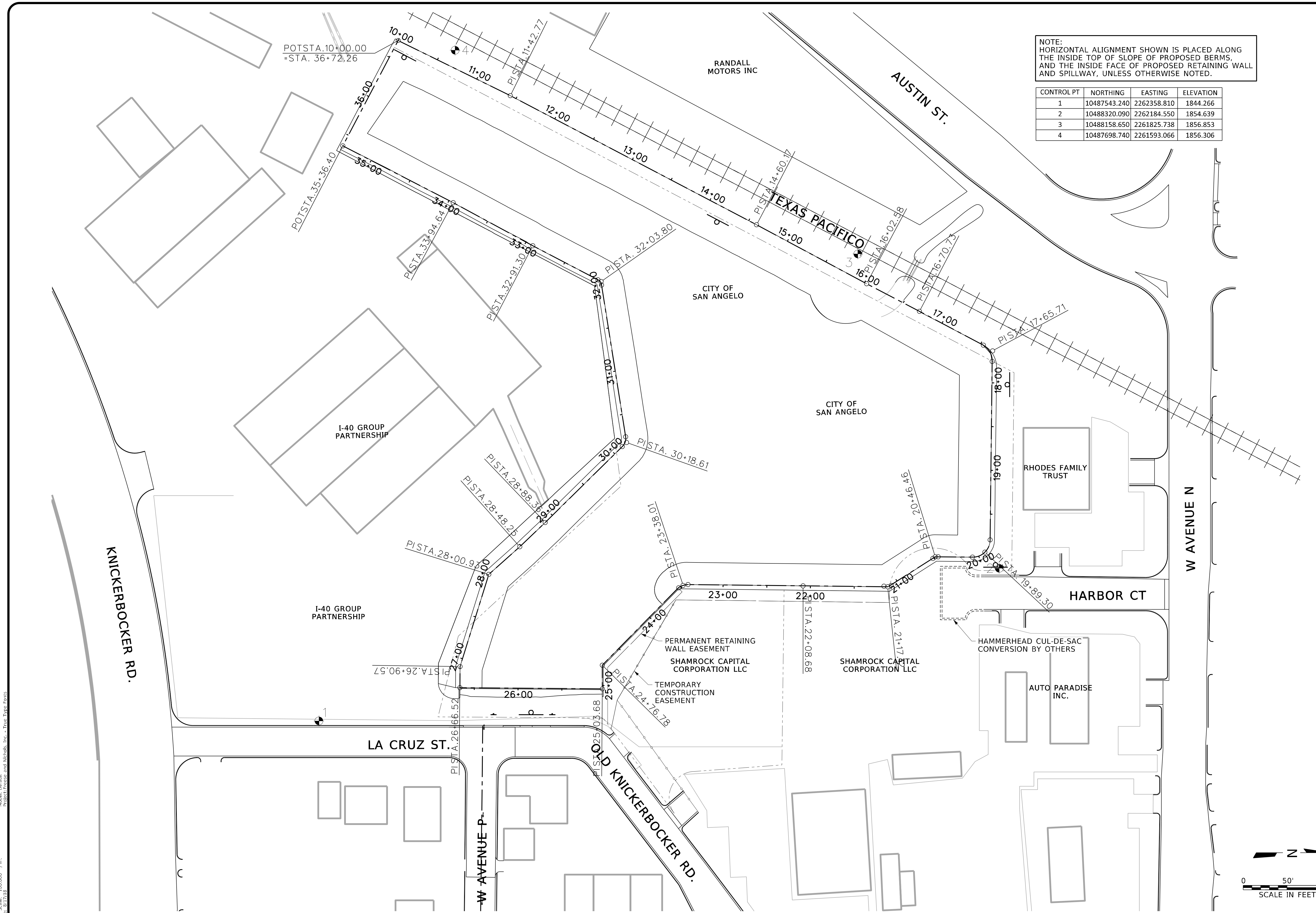
NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-demo plan.dgn

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-6
SEQ. 7

Office:Lubbock SAN18286 Date:8/17/18 User:02861 File:N:\IF\Drawings\5. Drainage\cv-trt-pl-demo plan.dgn


POTSTA.10+00.00
=STA. 36+72.26
RANDALL MOTORS INC
AUSTIN ST.
TEXAS PACIFICO
CITY OF SAN ANGELO
CITY OF SAN ANGELO
I-40 GROUP PARTNERSHIP
I-40 GROUP PARTNERSHIP
RHODES FAMILY TRUST
HARBOR CT
W AVENUE N
KNICKERBOCKER RD.
LA CRUZ ST.
W AVENUE P
OLD KNICKERBOCKER RD.
PERMANENT RETAINING WALL EASEMENT
TEMPORARY CONSTRUCTION EASEMENT
SHAMROCK CAPITAL CORPORATION LLC
SHAMROCK CAPITAL CORPORATION LLC
HAMMERHEAD CUL-DE-SAC CONVERSION BY OTHERS
AUTO PARADISE INC.
POTSTA.35+36.40
PISTA.33+94.64
PISTA.32+91.30
PISTA. 32+03.80
PISTA. 30+18.61
PISTA.28+88.36
PISTA.28+48.25
PISTA.28+00.93
PISTA.26+90.57
PISTA.26+66.52
PISTA.25+03.68
PISTA.24+76.78
PISTA.23+38.01
PISTA.22+08.68
PISTA.21+17
PISTA.20+46.46
PISTA.19+89.30
PISTA.17+65.71
PISTA.16+70.73
PISTA.16+02.58
PISTA.14+60.17
PISTA.11+42.77
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
0
50'
100'
SCALE IN FEET
N

NOTE:
HORIZONTAL ALIGNMENT SHOWN IS PLACED ALONG THE INSIDE TOP OF SLOPE OF PROPOSED BERMS, AND THE INSIDE FACE OF PROPOSED RETAINING WALL AND SPILLWAY, UNLESS OTHERWISE NOTED.

CONTROL PT	NORTHING	EASTING	ELEVATION
1	10487543.240	2262358.810	1844.266
2	10488320.090	2262184.550	1854.639
3	10488158.650	2261825.738	1856.853
4	10487698.740	2261593.066	1856.306

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
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09/09/2019

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CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
HORIZONTAL CONTROL PLAN

NO.	ISSUES	BY	DATE		
				F&N JOB NO.	SAN18286
				DATE	07/15/19
				DESIGNED	KMM
				DRAWN	DAP
				REVISED	
				CHECKED	HRK

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
FILE NAME cv-trt-pl-horz.dgn

SHEET C-7
SEQ. 8

```
Beginning chain BERM description
Feature: FNI LINE
==================================================

Point 1            N    10,487,633.81 E     2,261,581.92 Sta     10+00.00

Course from 1 to 2 N 26° 12' 33.67" E Dist 142.77

Point 2            N    10,487,761.91 E     2,261,644.98 Sta     11+42.77

Course from 2 to 3 N 27° 39' 44.53" E Dist 317.39

Point 3            N    10,488,043.03 E     2,261,792.33 Sta     14+60.17

Course from 3 to 4 N 28° 09' 50.49" E Dist 142.41

Point 4            N    10,488,168.57 E     2,261,859.55 Sta     16+02.58

Course from 4 to 5 N 27° 36' 23.64" E Dist 68.16

Point 5            N    10,488,228.97 E     2,261,891.13 Sta     16+70.73

Course from 5 to 6 N 27° 51' 17.67" E Dist 82.76

Point 6            N    10,488,302.14 E     2,261,929.80 Sta     17+53.49

                         Curve Data
                        *----------*
Curve C1
Feature: FNI CURVE
P.I.  Station           17+65.71  N      10,488,312.51  E       2,261,936.26
Delta        =      59° 48' 48.04" (RT)
Degree       =      269° 51' 16.85"
Tangent      =             12.21
Length       =             22.17
Radius       =             21.23
External     =             3.26
Long Chord   =             21.17
Mid. Ord.    =             2.83
P.C.  Station           17+53.49  N      10,488,302.14  E       2,261,929.80
P.T.  Station           17+75.66  N      10,488,312.13  E       2,261,948.46
C.C.                              N      10,488,290.91  E       2,261,947.82
Back         = N  31° 55' 42.40" E
Ahead        = S  88° 15' 29.57" E
Chord Bear   = N  61° 50' 06.41" E

Course from PT C1 to PC C2 S 89° 16' 41.57" E Dist 194.23

                         Curve Data
                        *----------*
Curve C2
Feature: FNI CURVE
P.I.  Station           19+89.30  N      10,488,310.23  E       2,262,162.08
Delta        =      89° 10' 56.54" (RT)
Degree       =      291° 01' 59.17"
Tangent      =             19.41
Length       =             30.64
Radius       =             19.69
External     =             7.96
Long Chord   =             27.64
Mid. Ord.    =             5.67
P.C.  Station           19+69.89  N      10,488,309.69  E       2,262,142.68
P.T.  Station           20+00.54  N      10,488,290.84  E       2,262,162.90
C.C.                              N      10,488,290.01  E       2,262,143.23
Back         = N  88° 24' 41.35" E
Ahead        = S   2° 24' 22.12" E
Chord Bear   = S  46° 59' 50.38" E

Course from PT C2 to PC C3 S 2° 44' 55.43" E Dist 42.54

                         Curve Data
                        *----------*
Curve C3
Feature: FNI CURVE
P.I.  Station           20+46.46  N      10,488,244.96  E       2,262,164.99
Delta        =      32° 38' 15.48" (LT)
Degree       =      496° 27' 06.08"
Tangent      =             3.38
Length       =             6.57
Radius       =             11.54
External     =             0.48
Long Chord   =             6.49
Mid. Ord.    =             0.46
P.C.  Station           20+43.08  N      10,488,248.34  E       2,262,164.94
P.T.  Station           20+49.65  N      10,488,242.14  E       2,262,166.85
C.C.                              N      10,488,248.50  E       2,262,176.48
Back         = S   0° 47' 14.14" E
Ahead        = S  33° 25' 29.62" E
Chord Bear   = S  17° 06' 21.88" E

Course from PT C3 to PC C4 S 36° 55' 33.65" E Dist 63.17

                         Curve Data
                        *----------*
Curve C4
Feature: FNI CURVE
P.I.  Station           21+17.12  N      10,488,187.58  E       2,262,206.20
Delta        =      26° 04' 08.31" (RT)
Degree       =      308° 59' 01.60"
Tangent      =             4.29
Length       =             8.44
Radius       =             18.54
External     =             0.49
Long Chord   =             8.36
Mid. Ord.    =             0.48
P.C.  Station           21+12.83  N      10,488,191.64  E       2,262,204.80
P.T.  Station           21+21.27  N      10,488,183.32  E       2,262,205.68
C.C.                              N      10,488,185.58  E       2,262,187.27
Back         = S  19° 03' 52.60" E
Ahead        = S   7° 00' 15.71" W
Chord Bear   = S   6° 01' 48.45" E

Course from PT C4 to 18 S 4° 14' 37.63" W Dist 87.41

Point 18           N    10,488,096.15 E     2,262,199.21 Sta     22+08.68

Course from 18 to PC C5 S 0° 53' 52.28" W Dist 113.91

                         Curve Data
                        *----------*
Curve C5
Feature: FNI CURVE
P.I.  Station           23+38.01  N      10,487,966.86  E       2,262,198.26
Delta        =      30° 29' 39.87" (LT)
Degree       =      101° 18' 23.13"
Tangent      =             15.42
Length       =             30.10
Radius       =             56.56
External     =             2.06
Long Chord   =             29.75
Mid. Ord.    =             1.99
P.C.  Station           23+22.59  N      10,487,982.25  E       2,262,197.43
P.T.  Station           23+52.69  N      10,487,954.02  E       2,262,206.80
C.C.                              N      10,487,985.33  E       2,262,253.90
Back         = S   3° 07' 12.90" E
Ahead        = S  33° 36' 52.76" E
Chord Bear   = S  18° 22' 02.83" E

Course from PT C5 to 22 S 45° 27' 10.00" E Dist 124.09

Point 22           N    10,487,866.97 E     2,262,295.23 Sta     24+76.78

Course from 22 to 23 N 89° 59' 29.75" E Dist 26.90

Point 23           N    10,487,866.98 E     2,262,322.14 Sta     25+03.68

Course from 23 to 24 S 0° 26' 52.37" W Dist 162.84

Point 24           N    10,487,704.14 E     2,262,320.86 Sta     26+66.52

Course from 24 to 25 N 89° 10' 57.89" W Dist 24.05

Point 25           N    10,487,704.49 E     2,262,296.82 Sta     26+90.57

Course from 25 to 26 N 72° 42' 49.78" W Dist 110.36

Point 26           N    10,487,737.28 E     2,262,191.44 Sta     28+00.93

Course from 26 to 27 N 41° 43' 33.87" W Dist 47.32

Point 27           N    10,487,772.59 E     2,262,159.95 Sta     28+48.25

Course from 27 to 28 N 43° 40' 08.35" W Dist 40.11

Point 28           N    10,487,801.61 E     2,262,132.26 Sta     28+88.36

Course from 28 to PC C6 N 44° 33' 28.27" W Dist 123.62

                         Curve Data
                        *----------*
Curve C6
Feature: FNI CURVE
P.I.  Station           30+18.61  N      10,487,894.54  E       2,262,040.99
Delta        =      54° 51' 07.49" (LT)
Degree       =      448° 14' 41.14"
Tangent      =             6.63
Length       =             12.24
Radius       =             12.78
External     =             1.62
Long Chord   =             11.78
Mid. Ord.    =             1.44
P.C.  Station           30+11.98  N      10,487,889.69  E       2,262,045.52
P.T.  Station           30+24.22  N      10,487,893.62  E       2,262,034.42
C.C.                              N      10,487,880.96  E       2,262,036.18
Back         = N  43° 04' 54.15" W
Ahead        = S  82° 03' 58.35" W
Chord Bear   = N  70° 30' 27.90" W

Course from PT C6 to PC C7 S 80° 59' 05.53" W Dist 175.45

                         Curve Data
                        *----------*
Curve C7
Feature: FNI CURVE
P.I.  Station           32+03.80  N      10,487,865.55  E       2,261,857.05
Delta        =      53° 50' 29.61" (LT)
Degree       =      704° 28' 19.42"
Tangent      =             4.13
Length       =             7.64
Radius       =             8.13
External     =             0.99
Long Chord   =             7.36
Mid. Ord.    =             0.88
P.C.  Station           31+99.67  N      10,487,866.13  E       2,261,861.14
P.T.  Station           32+07.31  N      10,487,861.90  E       2,261,855.11
C.C.                              N      10,487,858.08  E       2,261,862.29
Back         = S  81° 51' 53.62" W
Ahead        = S  28° 01' 24.01" W
Chord Bear   = S  54° 56' 38.81" W

Course from PT C7 to 35 S 27° 33' 28.64" W Dist 83.99

Point 35           N    10,487,787.44 E     2,261,816.25 Sta     32+91.30

Course from 35 to 36 S 28° 22' 59.06" W Dist 103.34

Point 36           N    10,487,696.52 E     2,261,767.12 Sta     33+94.64

Course from 36 to 37 S 27° 17' 08.72" W Dist 141.76

Point 37           N    10,487,570.53 E     2,261,702.14 Sta     35+36.40

Course from 37 to 1 N 62° 14' 12.31" W Dist 135.86

                   N    10,487,633.81 E     2,261,581.92  Sta    36+72.26
                                                                 =10+00.00
Point  1

==================================================
Ending chain BERM description
```

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

09/09/2019

FREESE NICHOLS
2732 82nd Street, Suite A
Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

HORIZONTAL ALIGNMENT DATA

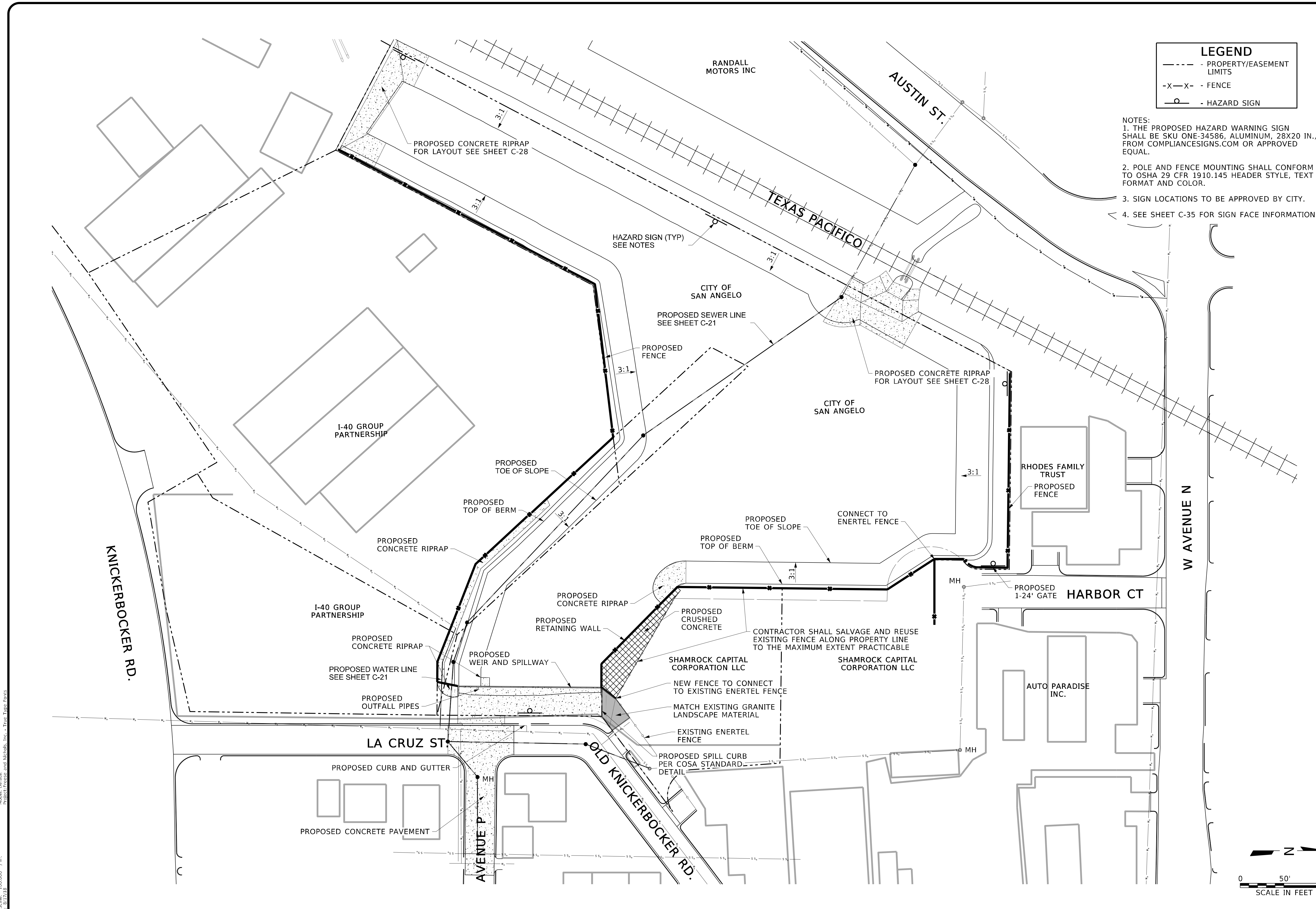
F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-horz002.dgn

NO. | ISSUES | BY | DATE

VERIFY SCALE 0 1" Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-8

SEQ. 9



LEGEND

- PROPERTY/EASEMENT LIMITS
- FENCE
- HAZARD SIGN

NOTES:

1. THE PROPOSED HAZARD WARNING SIGN SHALL BE SKU ONE-34586, ALUMINUM, 28X20 IN., FROM COMPLIANCESIGNS.COM OR APPROVED EQUAL.
2. POLE AND FENCE MOUNTING SHALL CONFORM TO OSHA 29 CFR 1910.145 HEADER STYLE, TEXT FORMAT AND COLOR.
3. SIGN LOCATIONS TO BE APPROVED BY CITY.
4. SEE SHEET C-35 FOR SIGN FACE INFORMATION.

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS — HEATHER RAE KEISTER — 100095 — LICENSED PROFESSIONAL ENGINEER
09/09/2019

FREESE NICHOLS
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Phone - (806) 686-2700
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CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

PROPOSED SITE PLAN

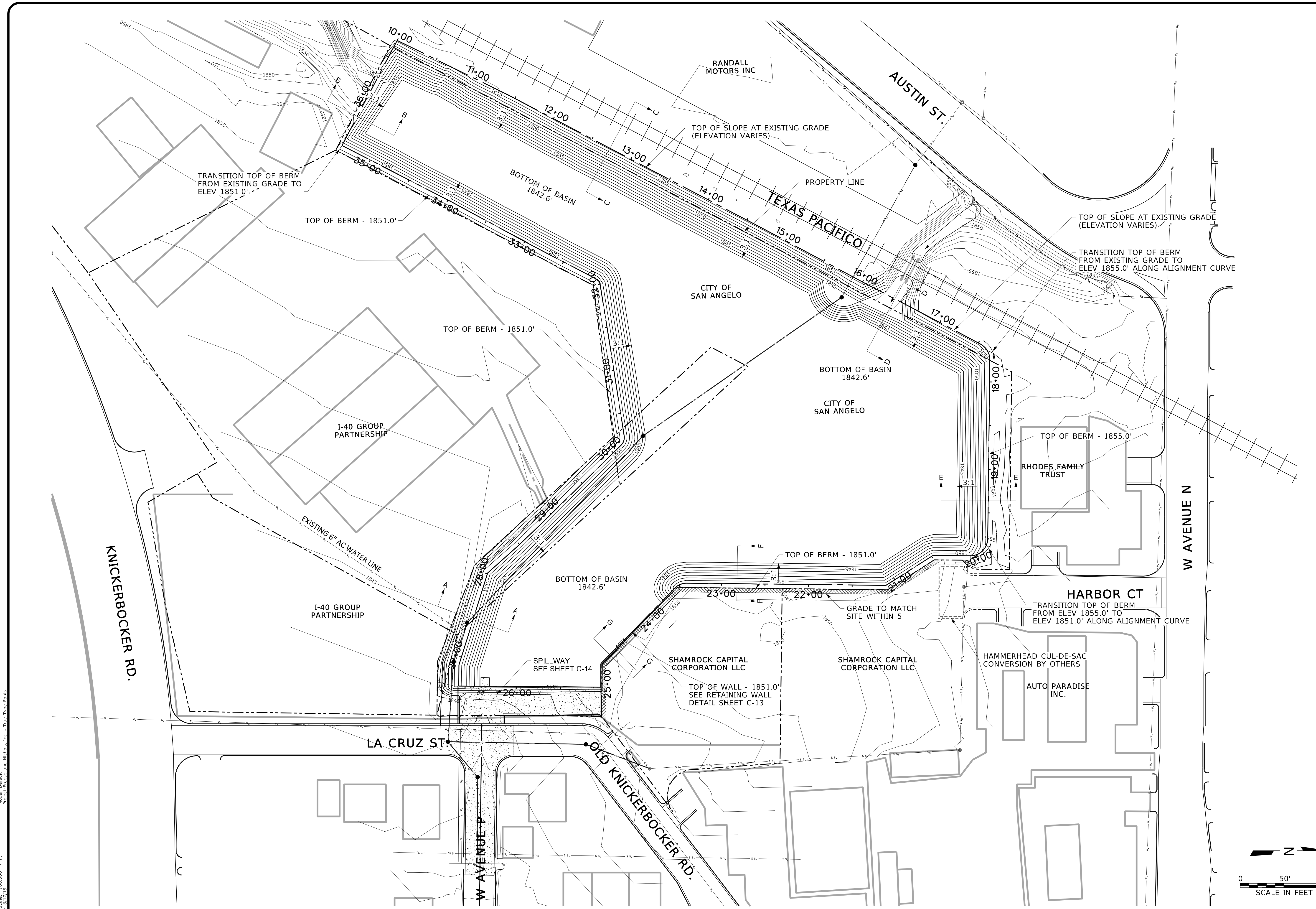
NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-proposedspln.dgn

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-9

SEQ. 10


RANDALL MOTORS INC
AUSTIN ST.
TEXAS PACIFICO
TOP OF SLOPE AT EXISTING GRADE (ELEVATION VARIES)
PROPERTY LINE
TRANSITION TOP OF BERM FROM EXISTING GRADE TO ELEV 1851.0'.
TOP OF BERM - 1851.0'
BOTTOM OF BASIN 1842.6'
CITY OF SAN ANGELO
TOP OF SLOPE AT EXISTING GRADE (ELEVATION VARIES)
TRANSITION TOP OF BERM FROM EXISTING GRADE TO ELEV 1855.0' ALONG ALIGNMENT CURVE
TOP OF BERM - 1851.0'
BOTTOM OF BASIN 1842.6'
CITY OF SAN ANGELO
I-40 GROUP PARTNERSHIP
TOP OF BERM - 1855.0'
RHODES FAMILY TRUST
W AVENUE N
EXISTING 6" AC WATER LINE
TOP OF BERM - 1851.0'
BOTTOM OF BASIN 1842.6'
I-40 GROUP PARTNERSHIP
KNICKERBOCKER RD.
HARBOR CT
GRADE TO MATCH SITE WITHIN 5'
TRANSITION TOP OF BERM FROM ELEV 1855.0' TO ELEV 1851.0' ALONG ALIGNMENT CURVE
SHAMROCK CAPITAL CORPORATION LLC
SHAMROCK CAPITAL CORPORATION LLC
HAMMERHEAD CUL-DE-SAC CONVERSION BY OTHERS
SPILLWAY SEE SHEET C-14
TOP OF WALL - 1851.0' SEE RETAINING WALL DETAIL SHEET C-13
AUTO PARADISE INC.
LA CRUZ ST
OLD KNICKERBOCKER RD.
W AVENUE P
10+00
11+00
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
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29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
3:1
1850
1845
1855
N
0 50' 100'
SCALE IN FEET

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KEISTER
100085
LICENSED PROFESSIONAL ENGINEER
09/09/2019

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CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
GRADING PLAN

F&N JOB NO.	SAN18286
DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	cv-trt-pl-grad.dgn

NO.	ISSUES	BY	DATE

VERIFY SCALE Bar is one inch on original drawing. 0 1" If not one inch on this sheet, adjust scale.

SHEET C-10
SEQ. 11

MicroStation V8 User:02861 Office:Lubbock
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Plot Scale: 100.000' / in. Model: Default
Date: 8/17/18 Project:Freese and Nichols, Inc. - True Type Fonts

CUT AND FILL ELEVATION RANGES		
MIN. ELEVATION	MAX. ELEVATION	COLOR
-12' OR GREATER	-9'	(red)
-9'	-6'	(yellow)
-6'	-3'	(green)
-3'	0'	(cyan)
0'	+3'	(blue)
+3'	+6'	(lilac)

OVERALL CUT AND FILL QUANTITES	
CUT	51,690 CY
FILL	1,480 CY
NET	50,210 CY (CUT)

NOTE:
QUANTITIES BASED ON COMPARISON BETWEEN EXISTING GRADE AND FINISHED GRADE, AND DOES NOT ACCOUNT FOR REMOVAL OF EXISTING CONCRETE, ASPHALT, ROCK, BULKING, ETC.

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED PROFESSIONAL ENGINEER
09/09/2019

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Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

CUT AND FILL PLAN

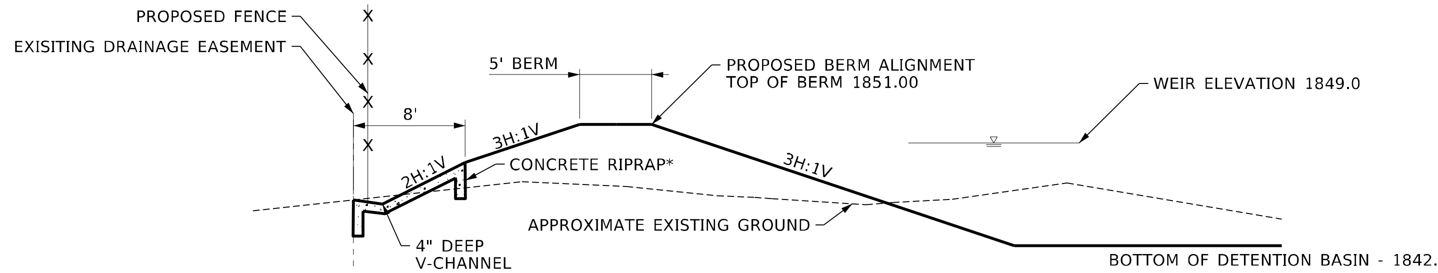
NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-cfpln.dgn

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

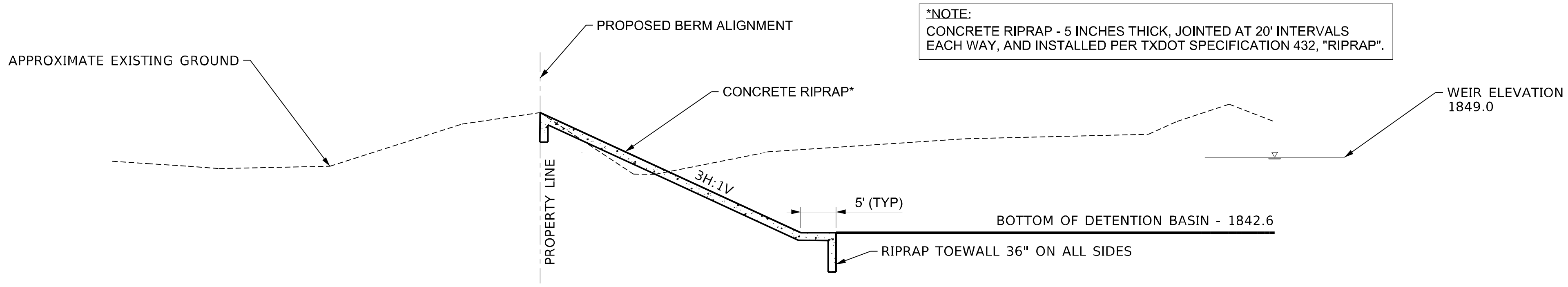
SHEET C-11
SEQ. 12

Office:Fort Worth SAN18286 Date:Sep. 06, 2019 - 09:07:16 AM User:02861 File:N:\IF\Drawings\5. Drainage\cv-trt-pl-cfpln.dgn

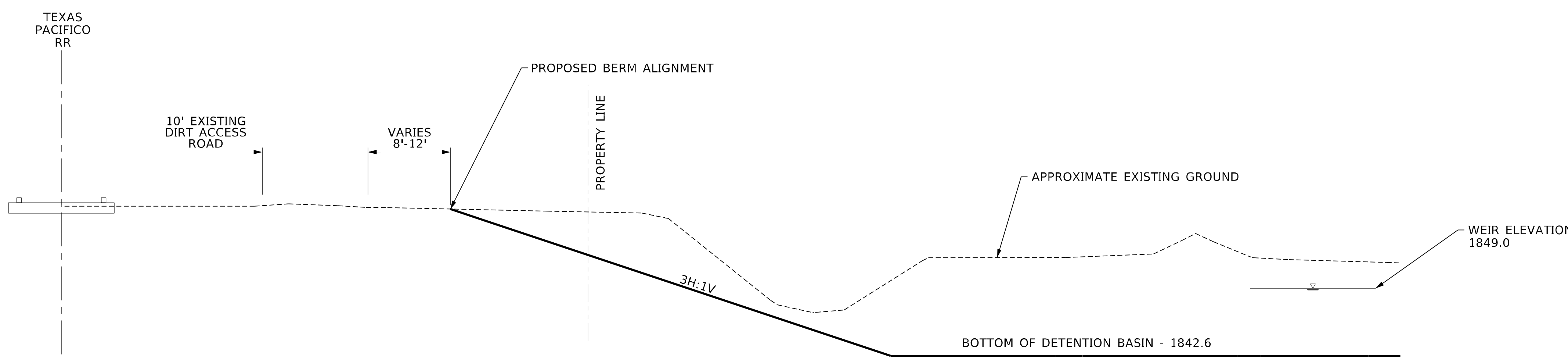


SOUTH BERM SECTION (A-A)
STA. 26+66 TO 35+36
NOT TO SCALE

*NOTE:
CONCRETE RIPRAP - 5 INCHES THICK, JOINTED AT 20' INTERVALS EACH WAY, AND INSTALLED PER TXDOT SPECIFICATION 432, "RIPRAP".



SOUTH BERM SECTION (B-B)
STA. 35+36 TO 36+72
NOT TO SCALE



WEST BERM SECTION (C-C)
STA. 10+00 TO 17+64.5
NOT TO SCALE

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

HEATHER RAE KEISTER
100095
LICENSED
PROFESSIONAL ENGINEER
09/09/2019

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2732 82nd Street, Suite A
Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
DETENTION BASIN SECTIONS

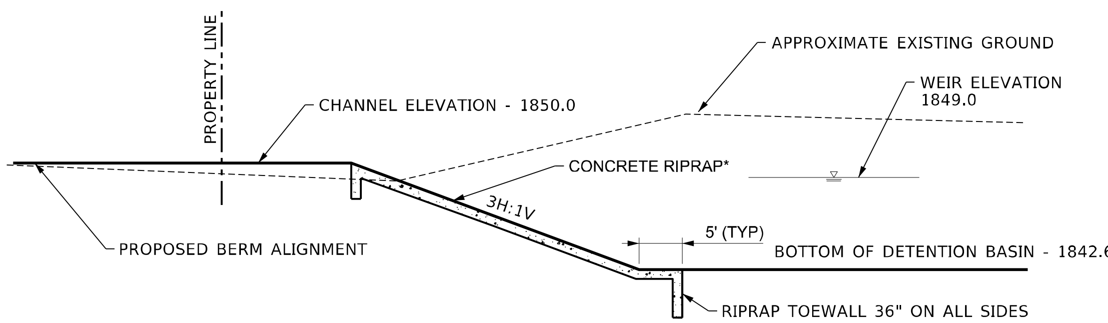
F&N JOB NO.	SAN18286
DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	cv-trt-pl-typl01.dgn

NO. | ISSUES | BY | DATE

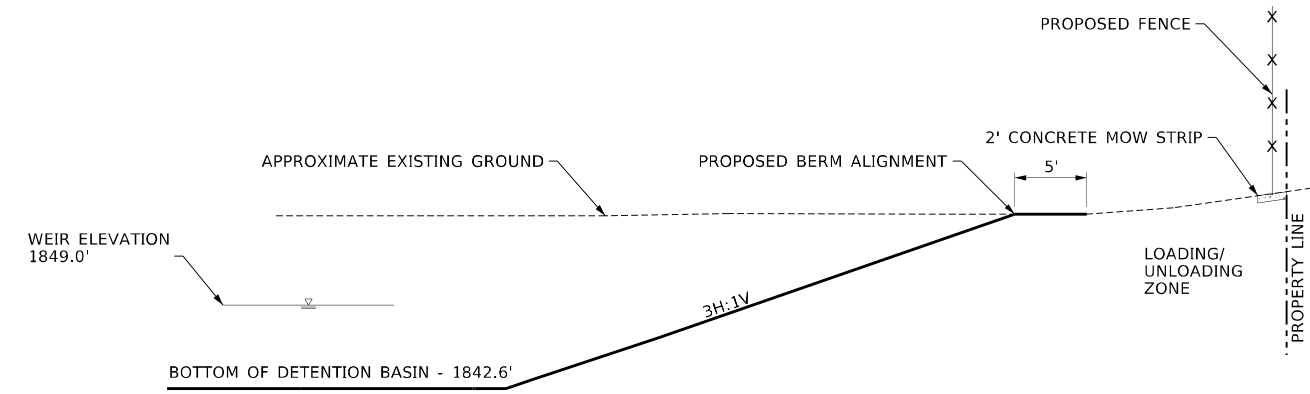
VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-12
SEQ. 13

Office:Lubbock SAN18286 Date:8/17/18 User:02861 File:N:\IF\Drawings\5. Drainage\cv-trt-pl-typl01.dgn

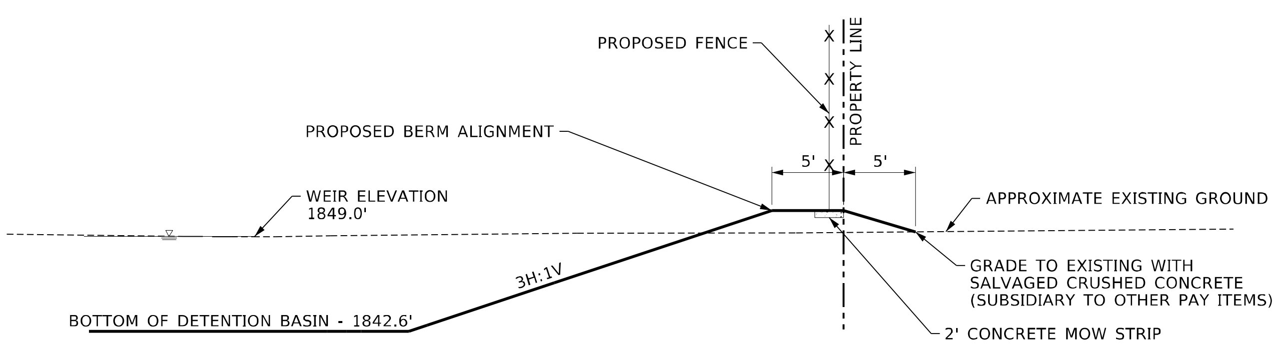


WEST BERM SECTION (D-D)
STA. 16+40.0
NOT TO SCALE

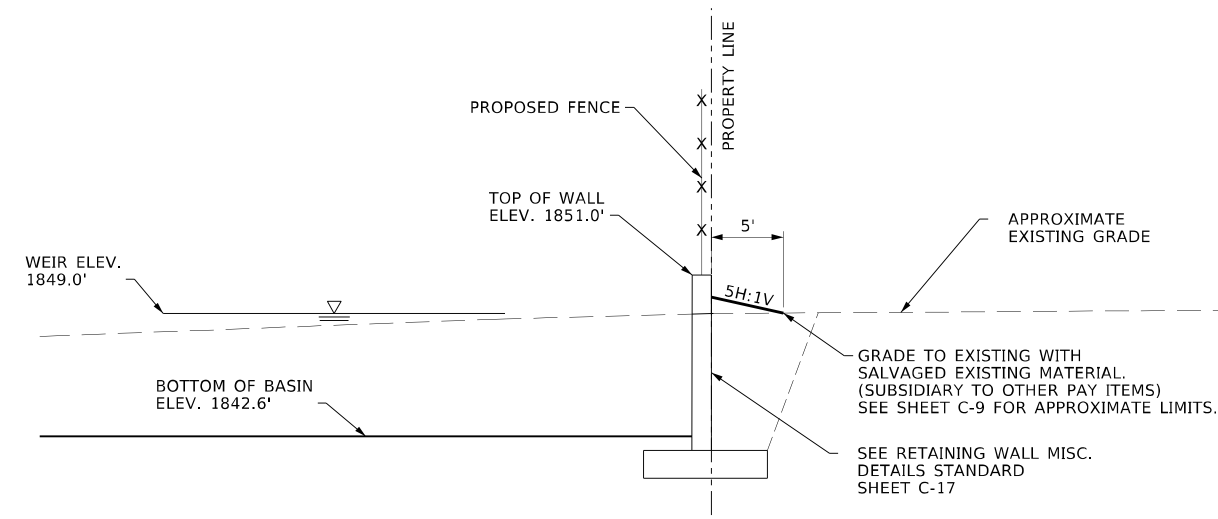


NORTH BERM SECTION (E-E)
STA. 17+64 TO 19+85
NOT TO SCALE

*NOTE:
CONCRETE RIPRAP - 5 INCHES THICK, JOINTED AT 20' INTERVALS EACH WAY, AND INSTALLED PER TXDOT SPECIFICATION 432, "RIPRAP".



EAST BERM SECTION (F-F)
STA. 19+85 TO 23+35
NOT TO SCALE



RETAINING WALL SECTION (G-G)
STA. 23+35 TO 24+75
NOT TO SCALE

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KESTER
100095
LICENSED
PROFESSIONAL ENGINEER
09/09/2019

FREESE NICHOLS
2732 82nd Street, Suite A
Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

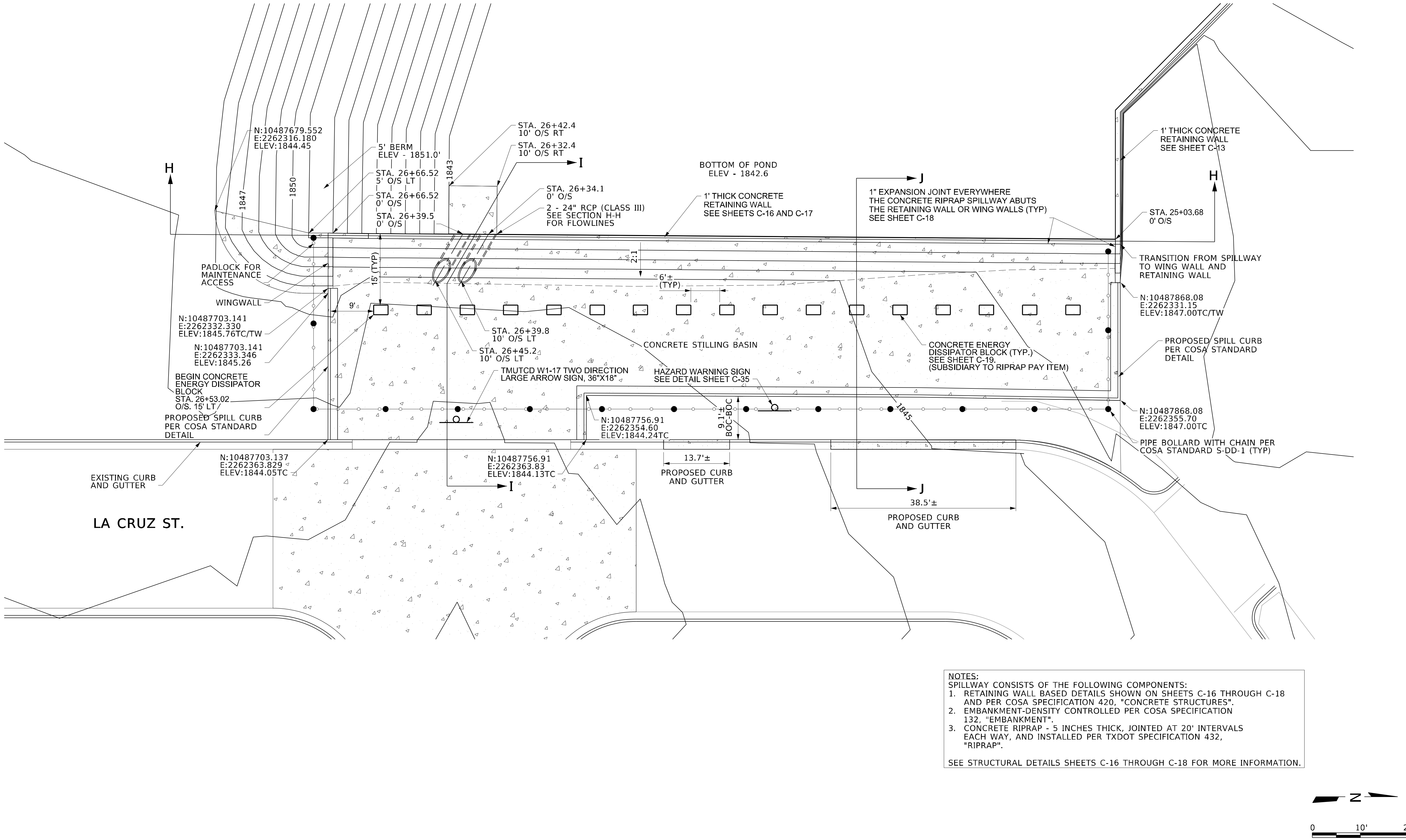
CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
DETENTION BASIN SECTIONS

F&N JOB NO.	SAN18286
DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	cv-trt-pl-typl02.dgn

NO.	ISSUES	BY	DATE

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-13
SEQ. 14



NOTES:
SPILLWAY CONSISTS OF THE FOLLOWING COMPONENTS:

1. RETAINING WALL BASED DETAILS SHOWN ON SHEETS C-16 THROUGH C-18 AND PER COSA SPECIFICATION 420, "CONCRETE STRUCTURES".
2. EMBANKMENT-DENSITY CONTROLLED PER COSA SPECIFICATION 132, "EMBANKMENT".
3. CONCRETE RIPRAP - 5 INCHES THICK, JOINTED AT 20' INTERVALS EACH WAY, AND INSTALLED PER TXDOT SPECIFICATION 432, "RIPRAP".

SEE STRUCTURAL DETAILS SHEETS C-16 THROUGH C-18 FOR MORE INFORMATION.

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

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09/09/2019

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CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
SPILLWAY PLAN

F&N JOB NO.	SAN18286
DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	cv-trt-pl-spwy.dgn

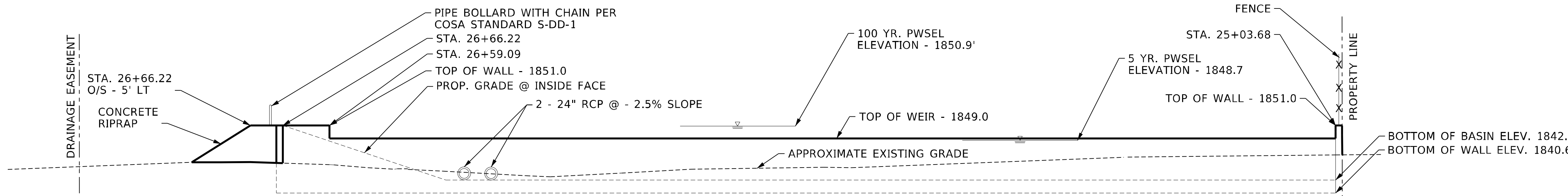
NO.	ISSUES	BY	DATE

VERIFY SCALE 0 1" Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

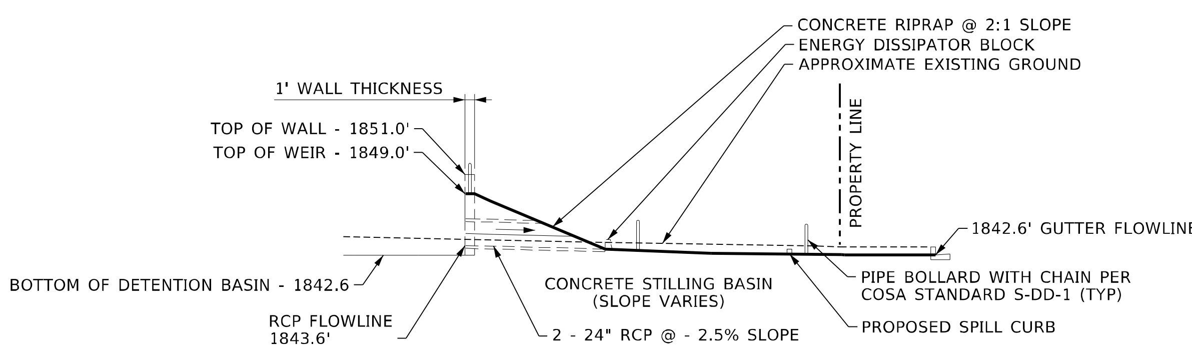
SHEET C-14

SEQ. 15

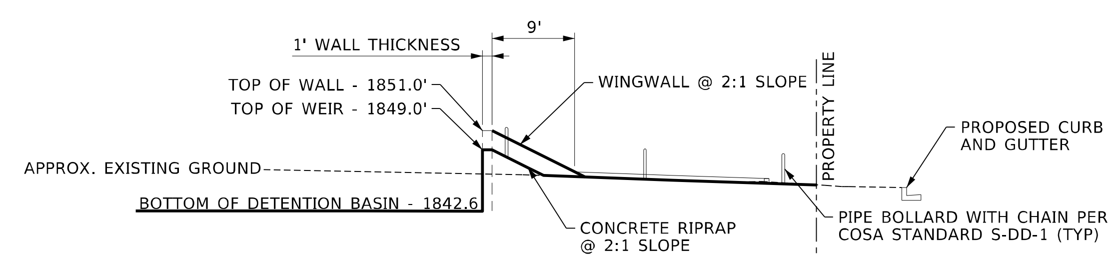
Office:Lubbock SAN18286 Date:8/17/18 User:02861 File:N:\IF\Drawings\5. Drainage\cv-trt-pl-spwy.dgn



SPILLWAY ELEVATION VIEW (H-H)
NOT TO SCALE



SECTION AT SPILLWAY DRAIN PIPES (I-I)
STA. 26+36
NOT TO SCALE



SECTION AT SPILLWAY (J-J)
STA. 25+03 TO 26+66
NOT TO SCALE

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KEISTER
100085
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PROFESSIONAL ENGINEER
09/09/2019

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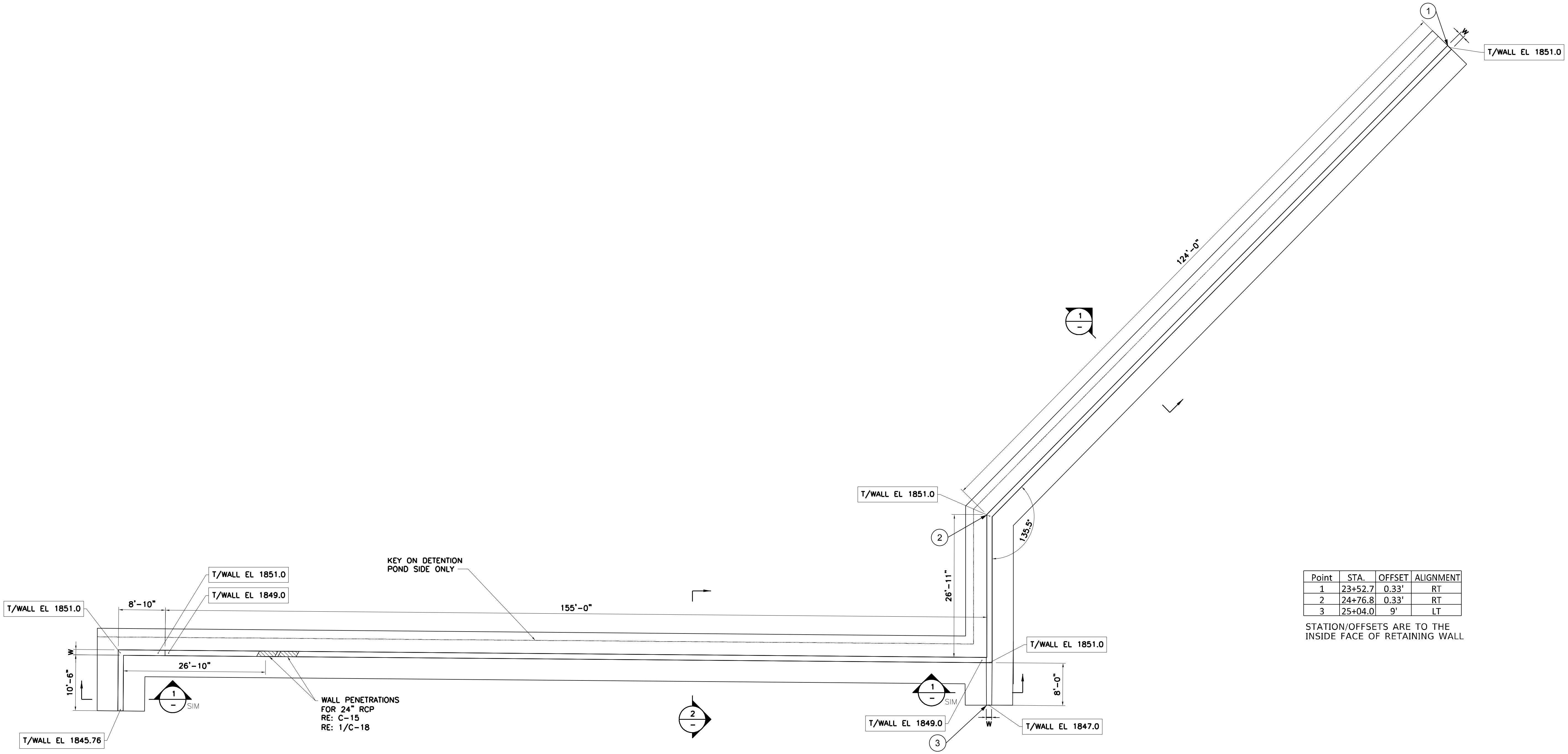
CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
SPILLWAY DETAILS

NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-spwy02.dgn

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET C-15
SEQ. 16



Point	STA.	OFFSET	ALIGNMENT
1	23+52.7	0.33'	RT
2	24+76.8	0.33'	RT
3	25+04.0	9'	LT

STATION/OFFSETS ARE TO THE INSIDE FACE OF RETAINING WALL

SPILLWAY AND RETAINING WALL STRUCTURAL PLAN

1"=10'

0 10' 20'
SCALE IN FEET

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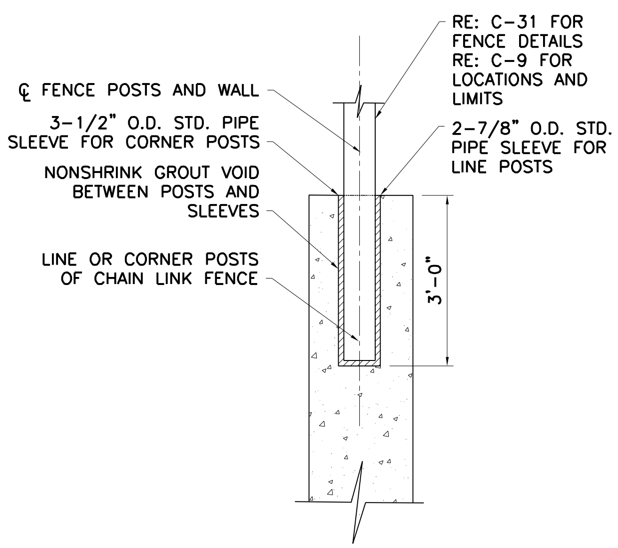
CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
STRUCTURAL DETAILS

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME Structural detail001.dgn

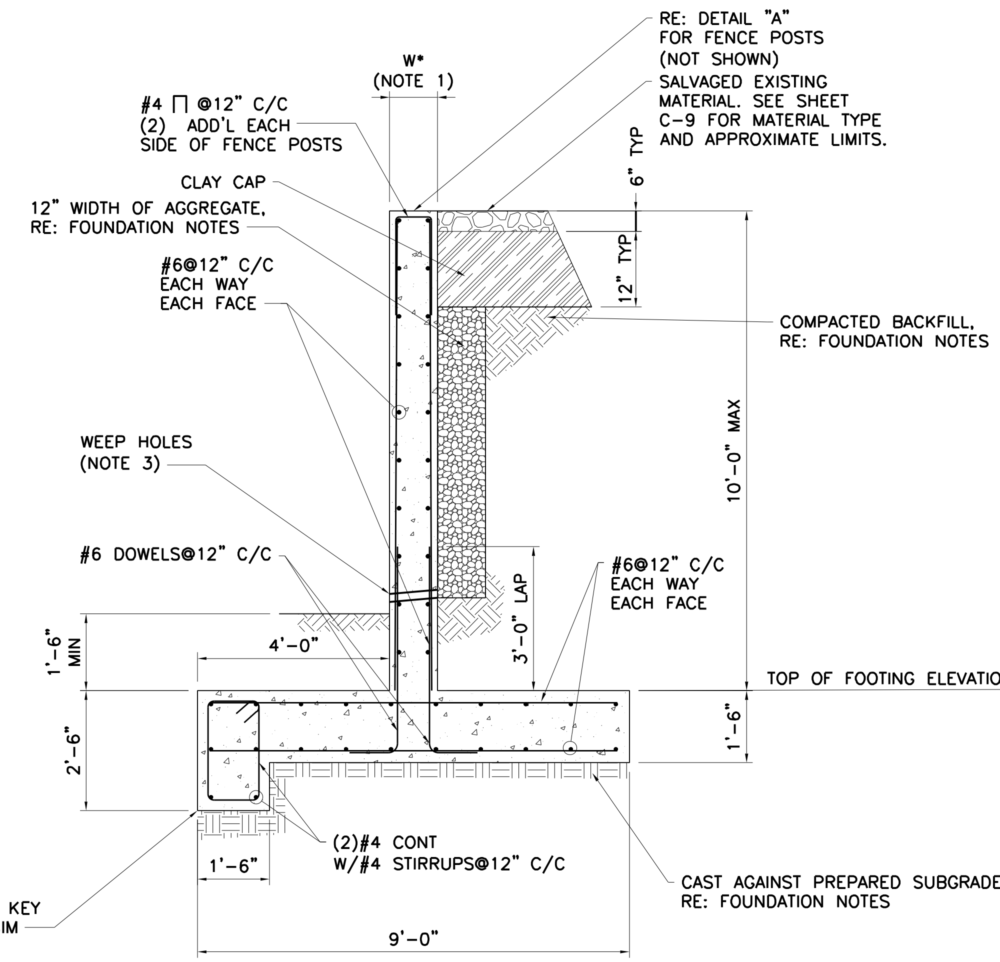
NO.	ISSUES	BY	DATE

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-16
SEQ. 17

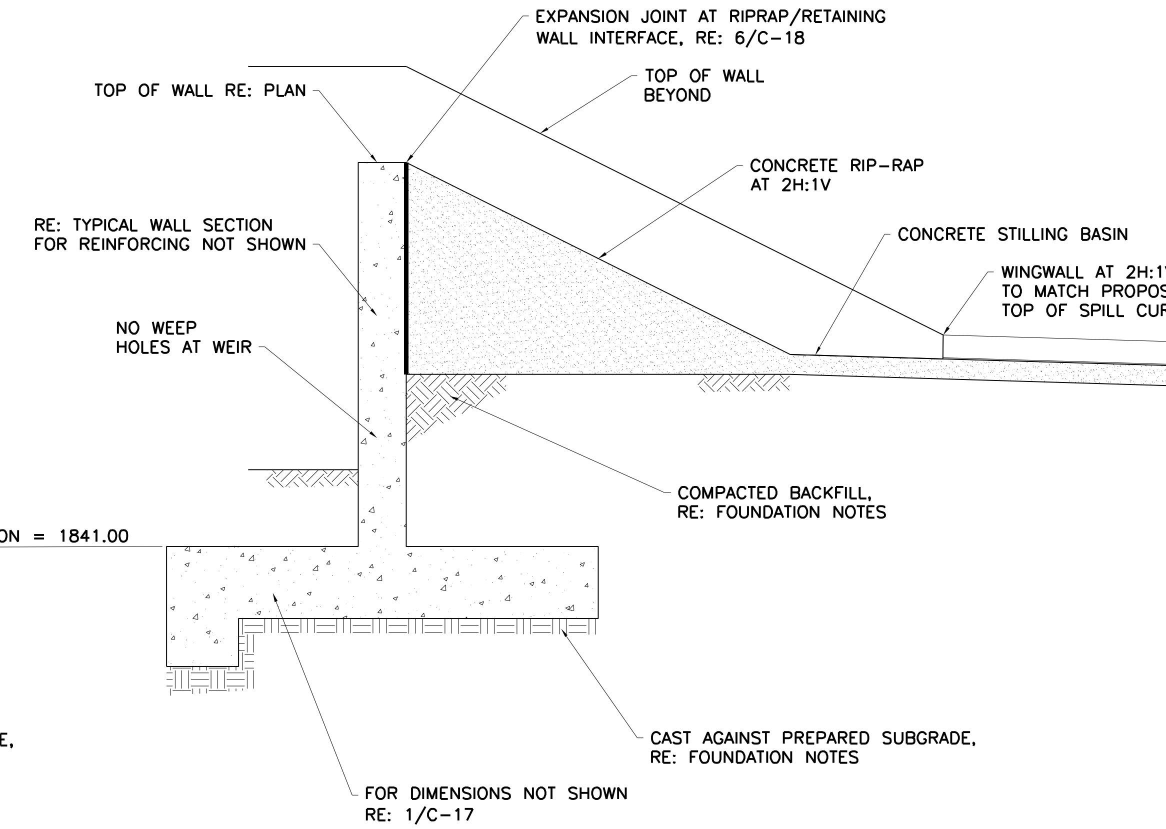


DETAIL "A"
NOT TO SCALE



DETAIL NOTES:
1. WIDTH "W" OF STEM WALL VARIES ALONG PROJECT. "W" SHALL BE 1'-0" ALONG THE SPILLWAY AND SOUTHERN WINGWALL. "W" SHALL BE 1'-4" ALONG POINTS 1,2 AND 3 AS SHOWN ON SHEET C-16.
2. PROVIDE #4 BENT BARS AT INTERSECTING WALLS, SEE SHEET C-18.
3. PROVIDE 2" DIAMETER WEEP HOLES @ 10'-0"C/C, SLOPE ½" PER FOOT TO DRAIN. PLACE 10" SQ HARDWARE CLOTH BEHIND OPENING.
4. SEE FOUNDATION NOTES.

1 TYPICAL WALL SECTION
1/2"=1'-0"



2 TYPICAL WEIR SECTION
1/2"=1'-0"

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
AMY L. RAINES
83515
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9/9/2019

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CITY OF SAN ANGELO
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CIVIL
STRUCTURAL DETAILS

NO.	ISSUES	BY	DATE

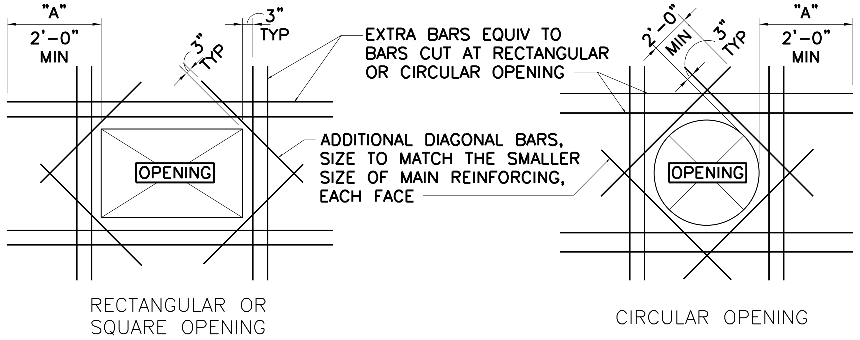
F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME Structural detail002.dgn

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-17
SEQ. 18

MicroStation V8 User:02861 Office:Fort Worth
$ACCOUNTS N:\IF\Drawings\5. Drainage\Structural detail002.dgn
Plotter: J:\Plotdrv_V8.11\PDF_F&N\PDF-Mono.pltcfg
Plot Scale: 20.000 / 1 in. Model: Default
Date: Sep. 09, 2019 - 04:06:36 PM Project: $PROJECTS

Office:Fort Worth $ACCOUNTS Date:Sep. 09, 2019 - 04:06:36 PM User:02861 File:N:\IF\Drawings\5. Drainage\Structural detail002.dgn

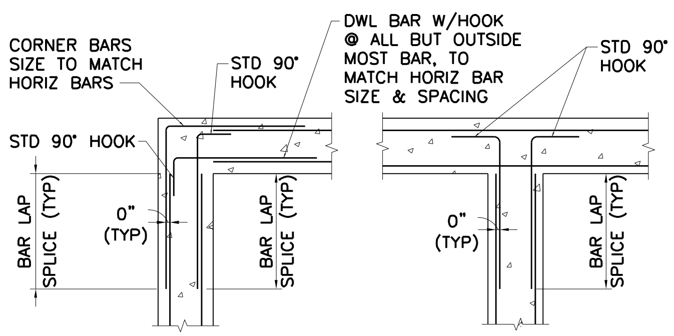


NOTES:

1. DISCONTINUE TYPICAL REINFORCING AT OPENING.
2. PLACE ADDITIONAL BARS IN SAME ORIENTATION AND POSITION AS BARS CUT BY OPENING. PROVIDE ONE SET OF BARS FOR EACH LAYER OF REINFORCING CUT.
3. "A" = 36 BAR DIAMETER EMBEDMENT LENGTH (24" MINIMUM). PROVIDE STANDARD HOOK IF FULL EMBEDMENT LENGTH IS NOT POSSIBLE.
4. REINFORCING STEEL IS TO BE CARRIED ACROSS ALL CONSTRUCTION JOINTS.
5. ADDITIONAL REINFORCING NOT REQUIRED WHEN SPECIFIED REINFORCING IS NOT CUT.
6. ALL REINFORCING SPACING SHALL BE GREATER THAN 3" CENTER TO CENTER.

1 — TYPICAL WALL OR SLAB OPENING ADDITIONAL REINFORCEMENT

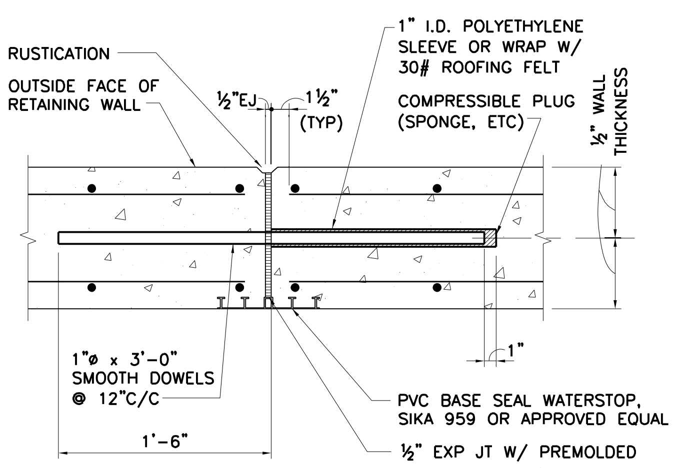
NOT TO SCALE



DETAIL NOTES:
1. REINFORCING SHOWN APPLIES TO ALL TOP, BOTTOM AND SIDE BARS. ALL REQUIRED BARS AR NOT SHOWN IN DETAIL.
2. AT CONTRACTOR'S OPTION, UNLESS NOTED OTHERWISE, ELIMINATE DOWELS AND TERMINATE HORIZONTAL BARS WITH STANDARD HOOKS.

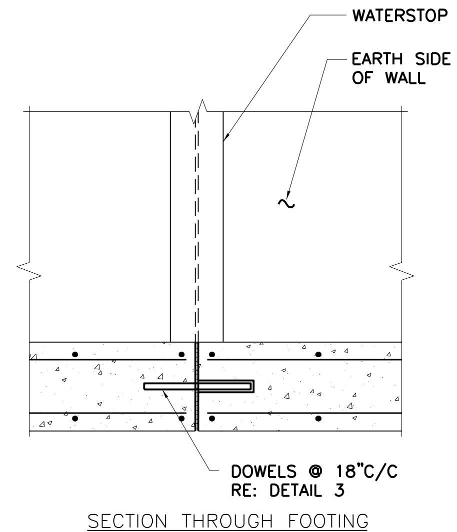
2 — CORNER & INTERSECTION REINFORCEMENT

NOT TO SCALE



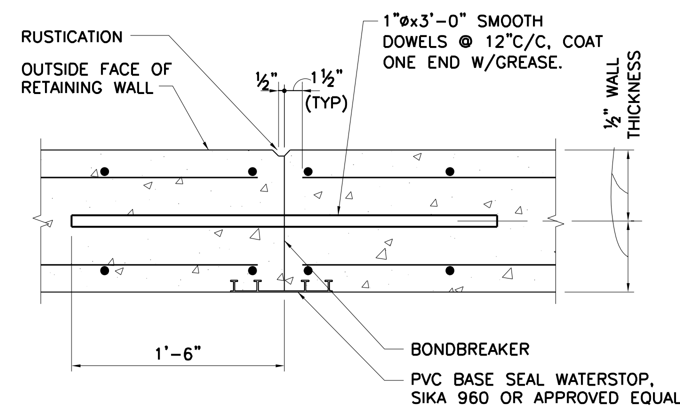
3 — WALL EXPANSION JOINT DETAIL

NOT TO SCALE



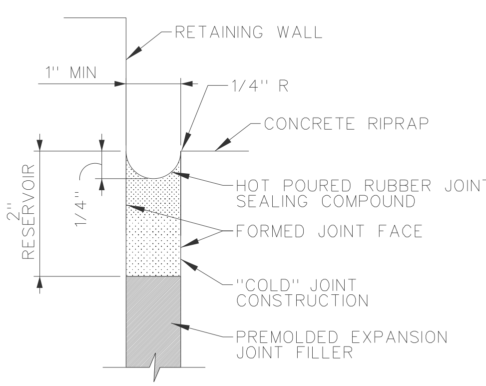
4 — BASE OF WALL DETAIL AT EXPANSION JOINT

NOT TO SCALE



5 — CONTRACTION JOINT DETAIL

NOT TO SCALE



6 — EXPANSION JOINT AT RETAINING WALL

NOT TO SCALE

FOUNDATION NOTES:

1. RETAINING WALLS HAVE BEEN DESIGNED BASED ON THE RECOMMENDATIONS IN "GEOTECHNICAL REPORT - PROPOSED DETENTION BASIN, SAN ANGELO, TEXAS," DATED JULY 2018, PREPARED BY SKG ENGINEERING. (PROJECT NO.18-E-0721).
2. SUBGRADE TO BE SCARIFIED TO A DEPTH OF 6". MOISTURE CONDITION AND COMPACT TO AT LEAST 95 PERCENT MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (STANDARD PROCTOR) AND WITHIN 2 PERCENT BELOW TO 2 PERCENT ABOVE OPTIMUM MOISTURE CONTENT. ANY SOFT OR PUMPING AREAS ARE TO BE EXCAVATED AND COMPACTED WITH SELECT FILL.
3. USE SELECT FILL FOR BACKFILL AGAINST WALLS. SELECT FILL (CLASS 4 EARTH FILL) SHALL CONSIST OF MATERIALS WHICH ARE A VERY SANDY CLAY, CLAYEY SAND, OR CRUSHED LIMESTONE WHICH HAVE A LIQUID LIMIT LESS THAN OR EQUAL TO 35 AND A PLASTICITY INDEX BETWEEN A MINIMUM OF 6 AND A MAXIMUM OF 14, AND WHICH ARE FREE OF ORGANIC MATERIALS. PLACE IN 8" LOOSE LIFTS AND COMPACTED TO BETWEEN 93 AND 97 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (STANDARD PROCTOR) AND WITHIN 2 PERCENT BELOW TO 2 PERCENT ABOVE OPTIMUM MOISTURE CONTENT.
3. AT AREAS NOT PAVED, BACKFILL SHALL STOP 2'-6" BELOW FINAL GRADE. THE UPPER 2'-6" SHALL BE BACKFILLED WITH ON-SITE CLAYS OR CLASS 2 EARTH FILL. EXTEND CLAY CAP A MINIMUM OF 3'-0" BEYOND LIMITS OF SELECT FILL. PLACE CLAY IN 8" LOOSE LIFTS (4" LOOSE LIFTS WHEN HAND COMPACTED) AND COMPACT TO BETWEEN 95 AND 100 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 (STANDARD PROCTOR) AND ±2 PERCENT OPTIMUM MOISTURE CONTENT.
4. DO NOT BACKFILL AGAINST ANY WALL UNTIL THE CONCRETE HAS REACHED ITS SPECIFIED 28-DAY COMPRESSIVE STRENGTH OR 7 DAYS, WHICHEVER IS LONGER. COMPACTION WITHIN 5'-0" OF WALLS SHALL BE ACHIEVED WITH HAND COMPACTION EQUIPMENT. OVER COMPACTION IS NOT ALLOWED.
5. IN-PLACE FIELD DENSITY TESTS SHALL BE CONDUCTED AT A RATE OF 1 TEST PER 3000 SQUARE FEET FOR EACH LIFT, WITH A MINIMUM OF 2 TESTS PER LIFT. EACH LIFT SHALL BE COMPACTED, TESTED AND APPROVED BEFORE ANOTHER LIFT IS PLACED. ANY AREA FOUND NOT TO COMPLY WITH COMPACTION REQUIREMENTS SHALL BE REWORKED AND RETESTED. THE SUBGRADE MOISTURE CONTENT AND DENSITY SHALL BE MAINTAINED DURING CONSTRUCTION.

CONCRETE NOTES:

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITIONS OF ACI 301 AND ACI 350
2. ALL DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS, UNLESS NOTED OTHERWISE, SHALL BE IN ACCORDANCE WITH THE ACI DETAILING MANUAL (ACI SP-66). LATEST EDITION
3. CONCRETE SHALL BE CLASS C.
4. ALL REINFORCING SHALL BE IN ACCORDANCE WITH ASTM A615, GRADE 60, DEFORMED.
5. CONCRETE CLEAR COVER OVER REINFORCING SHALL BE AS LISTED BELOW, UNLESS OTHERWISE NOTED.
   A. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3"
   B. ALL OTHER: 2"
   C. SEE DRAWINGS FOR EXCEPTIONS
6. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" INSIDE FORMS OR TOOLED TO 3/4" RADIUS ON SLABS UNLESS OTHERWISE NOTED.
7. PROVIDE EXPANSION JOINTS AT 90'-0" MAXIMUM SPACING AND CONTRACTION JOINTS AT 15'-0" MAXIMUM SPACING.
8. PENETRATIONS OTHER THAN SHOWN SHALL NOT BE ALLOWED WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
9. IN CASES WHERE REINFORCING BARS CANNOT BE EXTENDED AS FAR AS REQUIRED DUE TO THE LIMITED EXTENT OF THE ADJACENT CONCRETE STRUCTURE, THE BARS SHALL EXTEND AS FAR AS POSSIBLE AND END IN STANDARD HOOKS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL FORMING, TEMPORARY BRACING AND SHORING.
11. UNLESS NOTED OTHERWISE, HOOKS SHOWN ON DRAWINGS SHALL BE ASSUMED TO BE STANDARD HOOKS PER ACI 318.
12. UNLESS INDICATED OTHERWISE, LAP SPLICES IN BEAMS AND WALLS SHALL BE STAGGERED.
13. ALL REINFORCING SHALL BE CONTINUOUS. CONTINUOUS BARS SHALL LAP 48 BAR DIAMETERS OF SMALLER BAR LAPPED, UNLESS NOTED OTHERWISE. ALL REBAR EMBEDMENT LENGTHS SHALL BE 36 BAR DIAMETERS, UNLESS NOTED OTHERWISE.
14. THE STRUCTURE IS DESIGNED FOR STABILITY IN THE FINAL CONDITION ONLY. PROVIDE TEMPORARY BRACING AND SHORING AS REQUIRED FOR STABILITY DURING CONSTRUCTION.

BACKFILL NOTES:

1. CLASS 2 EARTH FILL: LIMITED TO CLAYS AND SANDY CLAYS CLASSIFIED AS CH AND CL MATERIALS AND A COEFFICIENT OF PERMEABILITY LESS THAN OR EQUAL TO 1.0X10^-7 CM/SEC, A LIQUID LIMIT GREATER THAN OR EQUAL TO 30, A PLASTICITY INDEX GREATER THAN OR EQUAL TO 15, AND MORE THAN 50 PERCENT PASSING THE NO. 200 SIEVE, WHICH ARE FREE OF ORGANIC MATERIALS.
2. CLASS 4 EARTH FILL: CONSIST OF MATERIALS WHICH ARE CLASSIFIED AS SP, SM, SC, CL OR DUAL CLASSIFICATIONS THEREOF, WHICH HAVE A LIQUID LIMIT LESS THAN OR EQUAL TO 35 AND A PLASTICITY INDEX OF A MINIMUM OF 4 AND A MAXIMUM OF 15, WHICH ARE FREE OF ORGANIC MATERIALS.

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CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
STRUCTURAL DETAILS

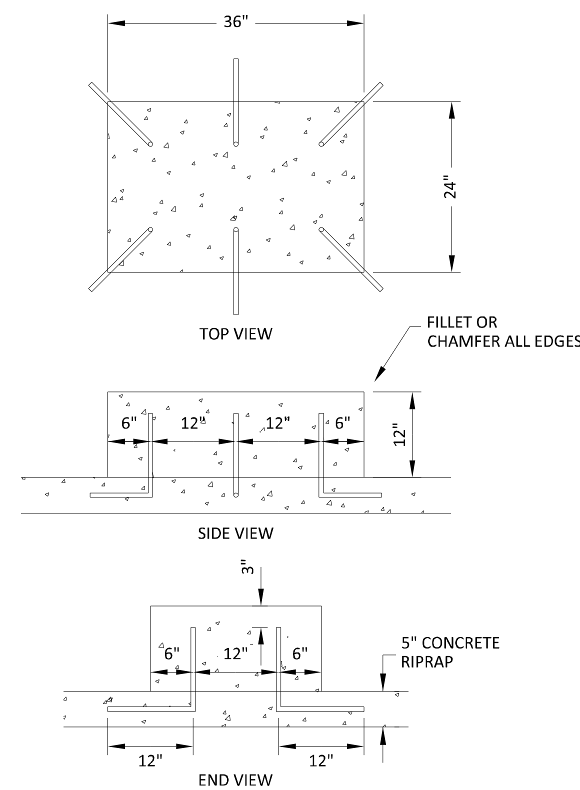
F&N JOB NO.	SAN18286
DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	Structural detail003.dgn

NO.	ISSUES	BY	DATE

VERIFY SCALE: Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-18

SEQ. 19



NOTE: CONCRETE FOR DRAINAGE CHANNEL BLOCK SHALL HAVE A MINIMUM 28-DAY COMPRESSION STRENGTH OF 3,000 PSI

1 CONCRETE ENERGY DISSIPATOR DETAIL

NOT TO SCALE

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KESTER
100095
LICENSED
PROFESSIONAL ENGINEER

09/09/2019

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CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

STRUCTURAL DETAILS

NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-spwy det001.dgn

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

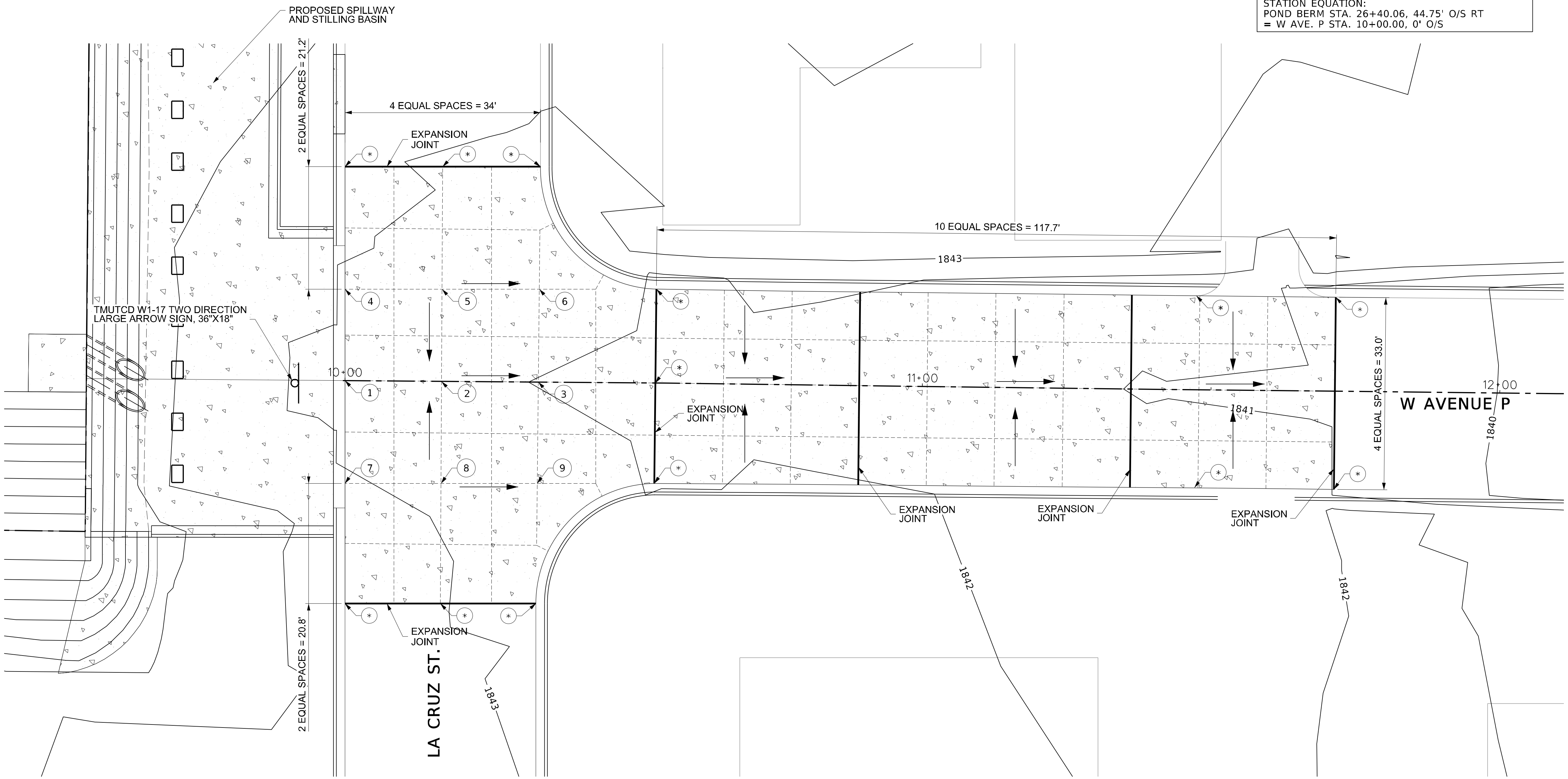
SHEET C-19

SEQ. 20

POINT	STATION	OFFSET	ELEVATION
1	10+00.00	0	1842.60
2	10+16.74	0	1842.26
3	10+33.47	0	1841.92
4	10+00.00	15.80' LT	1842.90*
5	10+16.74	15.93' LT	1842.58
6	10+33.47	16.05' LT	1842.25
7	10+00.00	17.79' RT	1843.07*
8	10+16.74	17.66' RT	1842.70
9	10+33.47	17.52' RT	1842.34

* MATCH EXISTING ELEVATION

STATION EQUATION:
POND BERM STA. 26+40.06, 44.75' O/S RT
= W AVE. P STA. 10+00.00, 0' O/S



NOTES:

1. CONCRETE TYPE, THICKNESS, JOINT SPACING, AND SUBGRADE REQUIREMENTS SHALL BE IN ACCORDANCE WITH COSA STANDARD DETAILS S-J-1, S-R-1, AND S-S-1.

2. EXISTING STREET CROSS SECTION IS INVERTED. CONTRACTOR SHALL SURVEY PRIOR TO DEMOLITION. NEW PAVEMENT TO MATCH EXISTING CROSS SLOPES AND GRADE UNLESS OTHERWISE NOTED.

N

0 10' 20'
SCALE IN FEET

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED
PROFESSIONAL ENGINEER
09/09/2019

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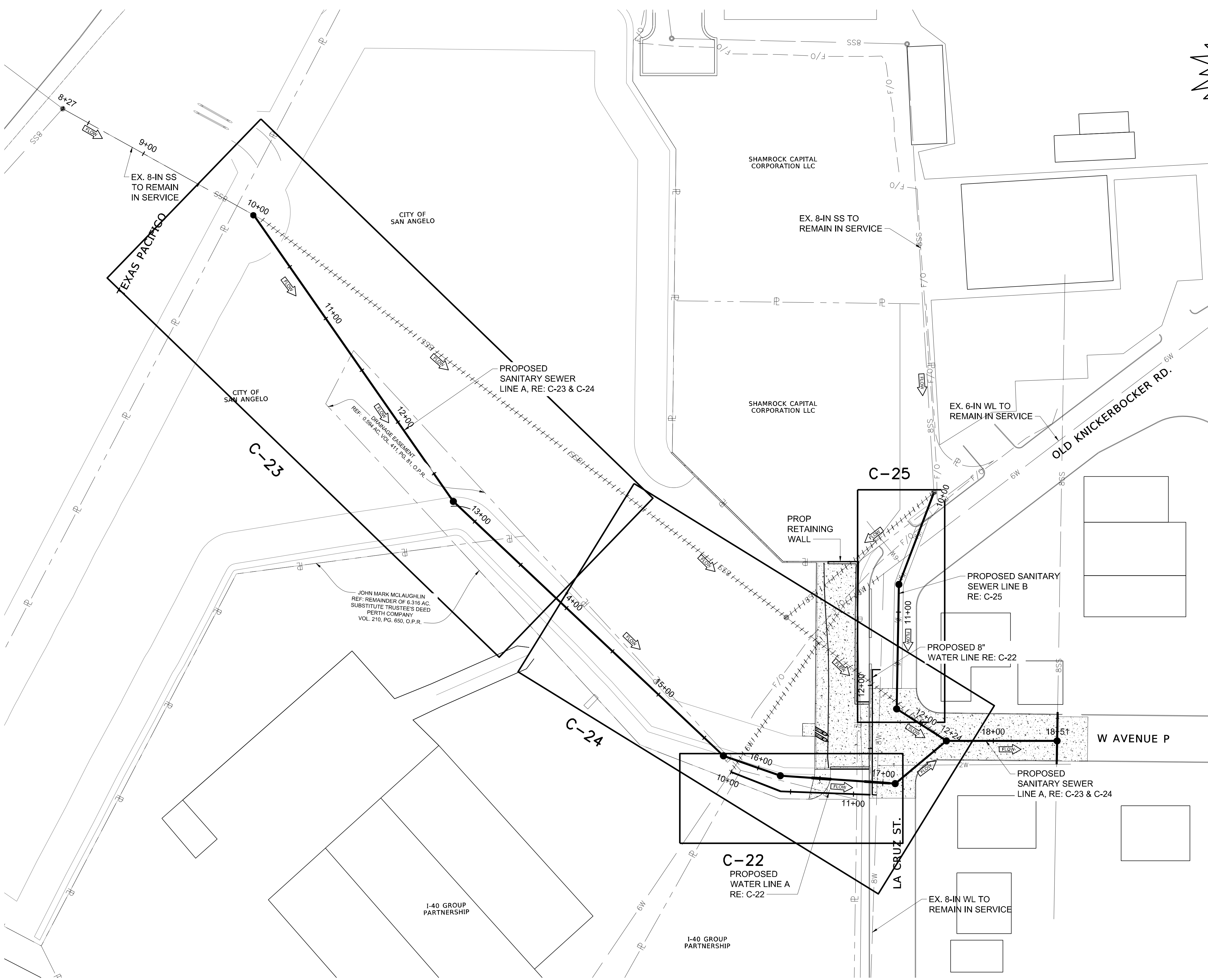
CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
ROADWAY PAVING PLAN - W AVENUE P

NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-road01.dgn

VERIFY SCALE Bar is one inch on original drawing. 0 1 If not one inch on this sheet, adjust scale.

SHEET C-20
SEQ. 21



CAUTION!!!
EXISTING UNDERGROUND AND OVERHEAD UTILITIES IN THE AREA. 48 HOURS PRIOR TO CONSTRUCTION CONTACT 1-800-DIG-TESS

NORTH

0 40' 80'
SCALE IN FEET

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.

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CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
WATER AND SANITARY SEWER
SITE LAYOUT

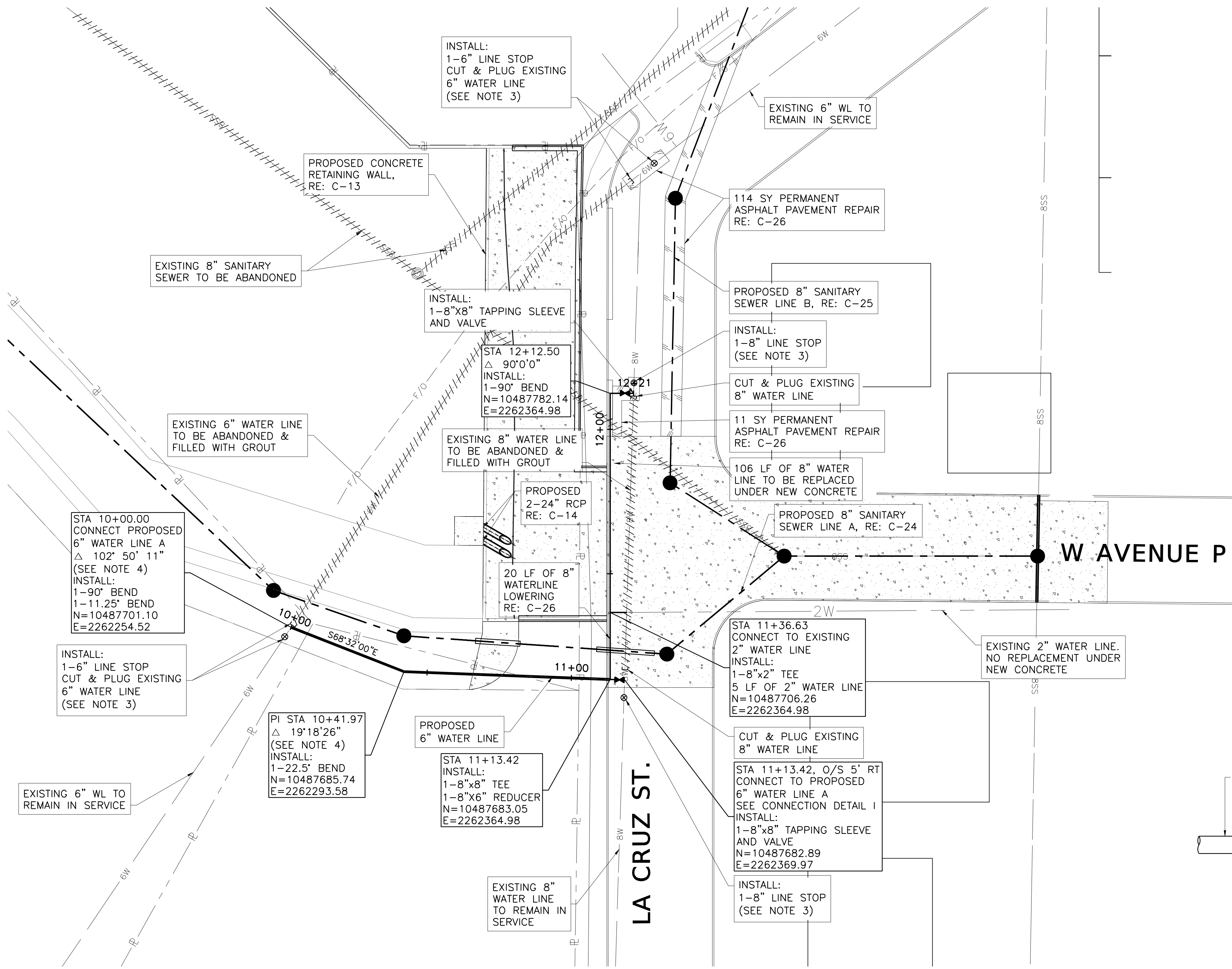
F&N JOB NO.	SAN18286
DATE	09/09/19
DESIGNED	JTN
DRAWN	AAJ/OC
REVISED	OC
CHECKED	ABC
FILE NAME	CV-UTL-PL-CTRL01.dwg

NO.	ISSUES	BY	DATE

VERIFY SCALE 0 1
Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET
C-21

SEQ.
22



CAUTION!!!
EXISTING UNDERGROUND AND OVERHEAD UTILITIES IN THE AREA. 48 HOURS PRIOR TO CONSTRUCTION CONTACT 1-800-DIG-TESS

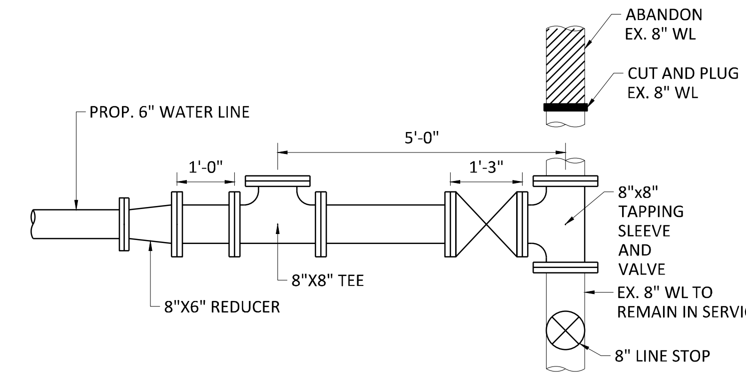
NORTH

0 20' 40'
SCALE IN FEET HORIZONTAL

0 5' 10'
SCALE IN FEET VERTICAL

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.
2. PROPOSED WATER LINES SHALL HAVE A MINIMUM COVER OF 30-INCHES FROM TOP OF PIPE TO FINISHED GROUND SURFACE PER CITY OF SAN ANGELO DESIGN STANDARDS.
3. LINE STOP IS ONLY NECESSARY IF EXISTING SYSTEM VALVE IS NOT LOCATED.
4. CONTRACTOR TO DEFLECT JOINTS AS NECESSARY TO ACHIEVE DEFLECTION ANGLE AND MAINTAIN THE PROPOSED ALIGNMENT. DEFLECTION SHALL NOT EXCEED 50% OF THE MANUFACTURER'S RECOMMENDATION.



1 / C-22 CONNECTION DETAIL I
NOT TO SCALE

FREESE AND NICHOLS, INC. TEXAS REGISTERED ENGINEERING FIRM F-2144

FREESE NICHOLS
2732 82nd Street, Suite A
Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

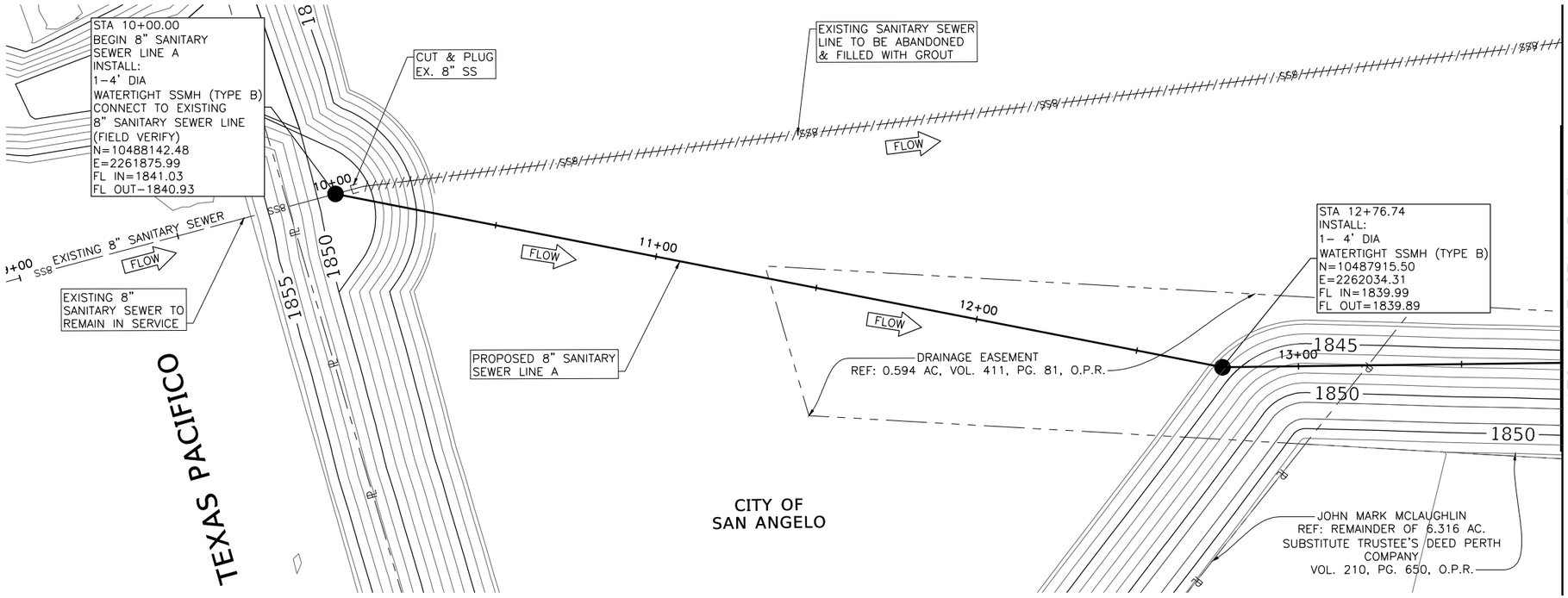
CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
WATER LINE A PLAN
STA 10+00 TO END

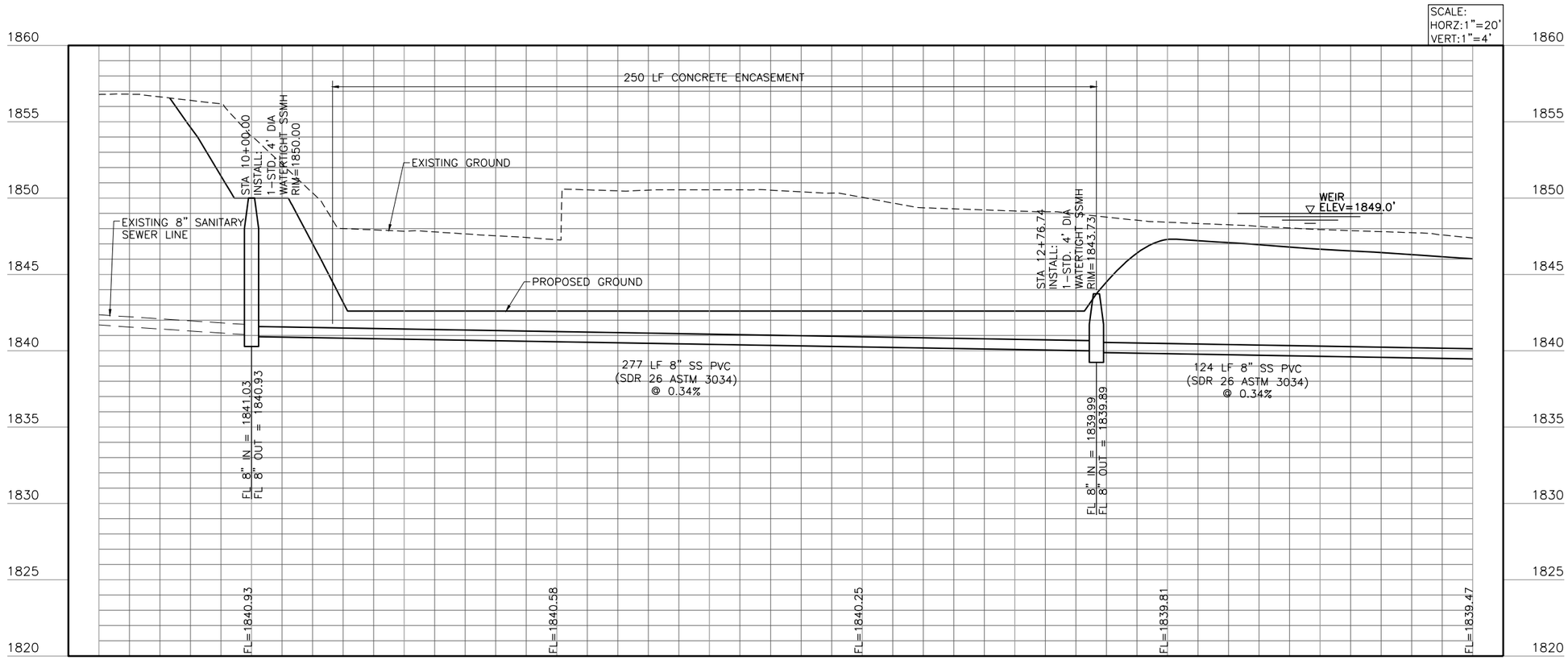
F&N JOB NO.	SAN18286
DATE	09/09/19
DESIGNED	TPN
DRAWN	AAL/OC
REVISED	OC
CHECKED	ABC
FILE NAME	CV-UTL-PP-WATR01.dwg

NO. ISSUES BY DATE

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-22
SEQ. 23





CAUTION!!!
EXISTING UNDERGROUND AND OVERHEAD UTILITIES IN THE AREA. 48 HOURS PRIOR TO CONSTRUCTION CONTACT 1-800-DIG-TESS

NORTH

0 20' 40'
SCALE IN FEET
HORIZONTAL

0 5' 10'
SCALE IN FEET
VERTICAL

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144
STATE OF TEXAS
AARON B. CONNE
109794
LICENSED PROFESSIONAL ENGINEER
09 Sep 2019
FREESE NICHOLS
2711 S. Loop 289, Suite 114
Lubbock, Texas 79423
Phone - (806) 854-0700
Web www.freese.com

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

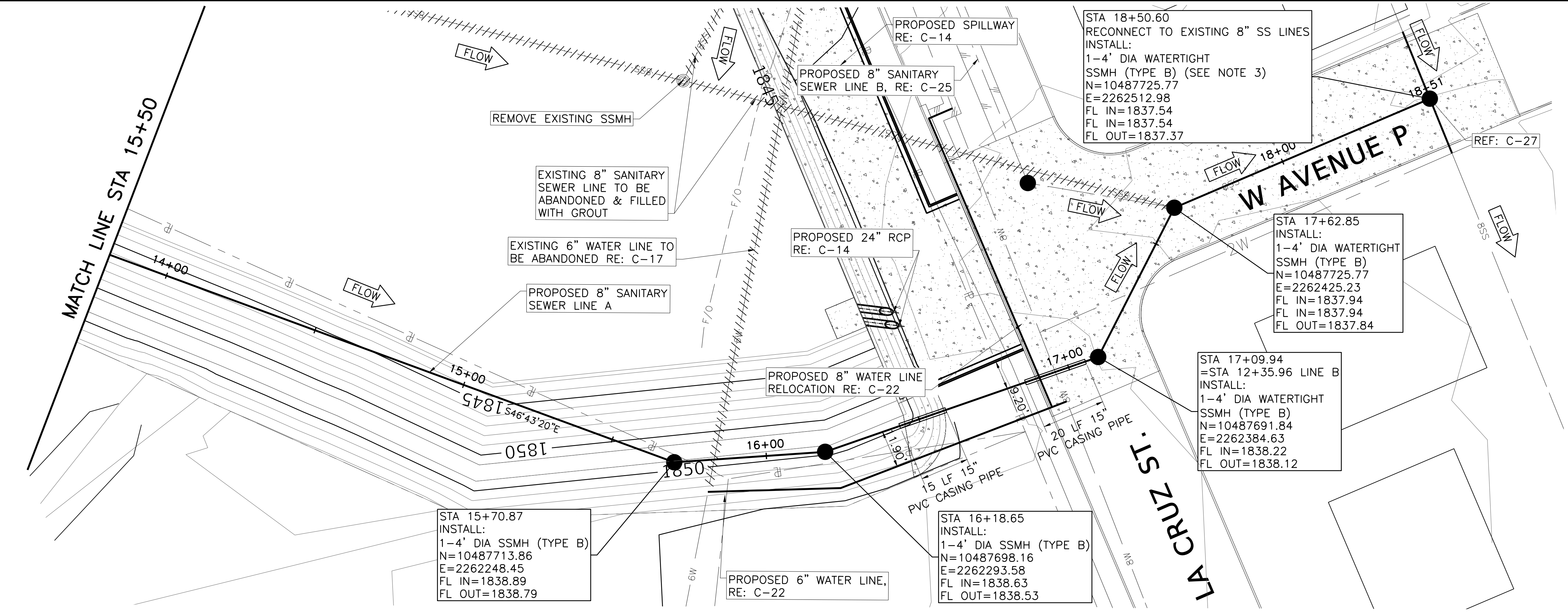
SS LINE A PLAN AND PROFILE STA 10+00 TO STA 14+00

NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 09/09/19
DESIGNED TPN
DRAWN AAL/OC
REVISED OC
CHECKED ABC
FILE NAME CV-UTL-PP-SSEW01.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1

SHEET C-23
SEQ. 24

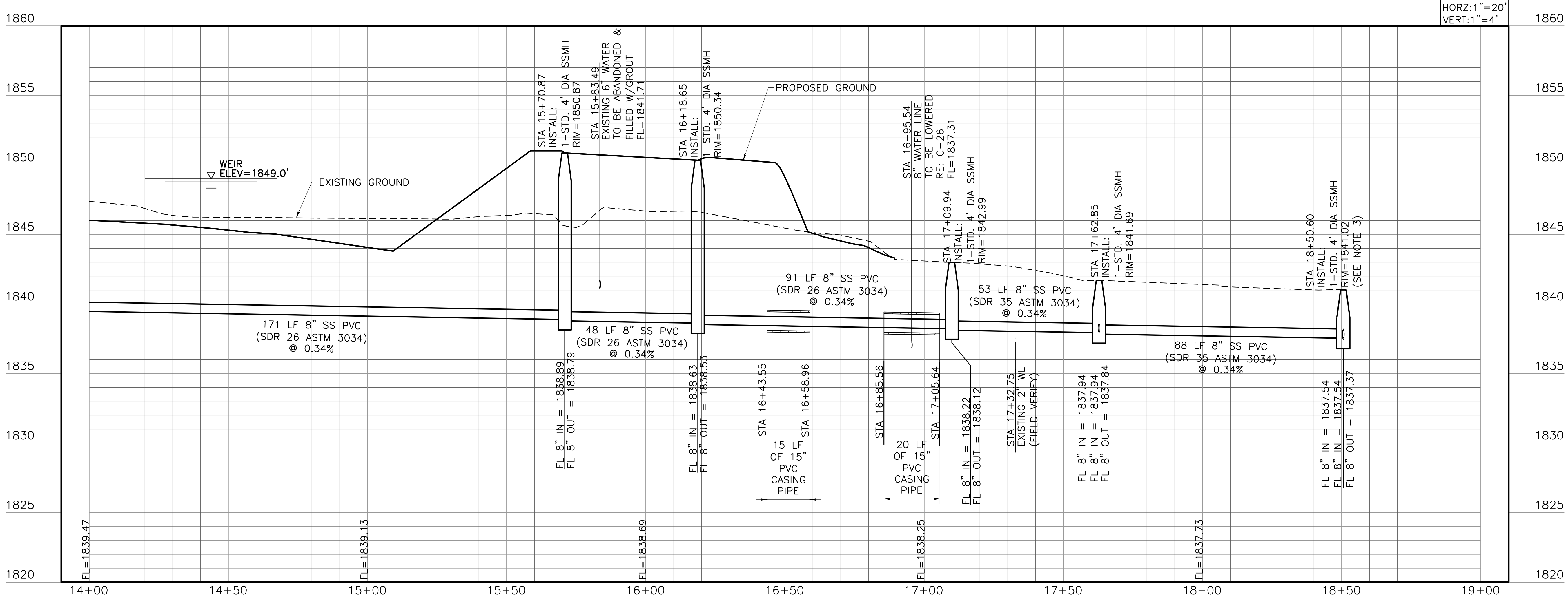


CAUTION!!!
EXISTING UNDERGROUND AND OVERHEAD UTILITIES IN THE AREA. 48 HOURS PRIOR TO CONSTRUCTION CONTACT 1-800-DIG-TESS

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.
2. WATER MAINS SHALL BE LOCATED A MINIMUM OF NINE FEET HORIZONTALLY OUTSIDE TO OUTSIDE FROM PROPOSED SANITARY SEWER MAINS AND MANHOLES.
3. CONTRACTOR TO FIELD VERIFY FLOWLINES AT MANHOLE AT STA 18+50.60. FLOWLINES SHOWN ARE BASED ON MEASURE DOWNS. IF CONTRACTOR'S FIELD VERIFICATION OF FLOWLINES DOES NOT MATCH PLANS, CONTACT CITY/ENGINEER IMMEDIATELY.

SCALE:
HORZ:1"=20'
VERT:1"=4'



FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
AARON P. CONINE
109794
PROFESSIONAL ENGINEER
17 Sep 2019

FREESE NICHOLS
2732 82nd Street, Suite A
Lubbock, Texas 79423
Phone - (806) 698-2700
Web www.freese.com

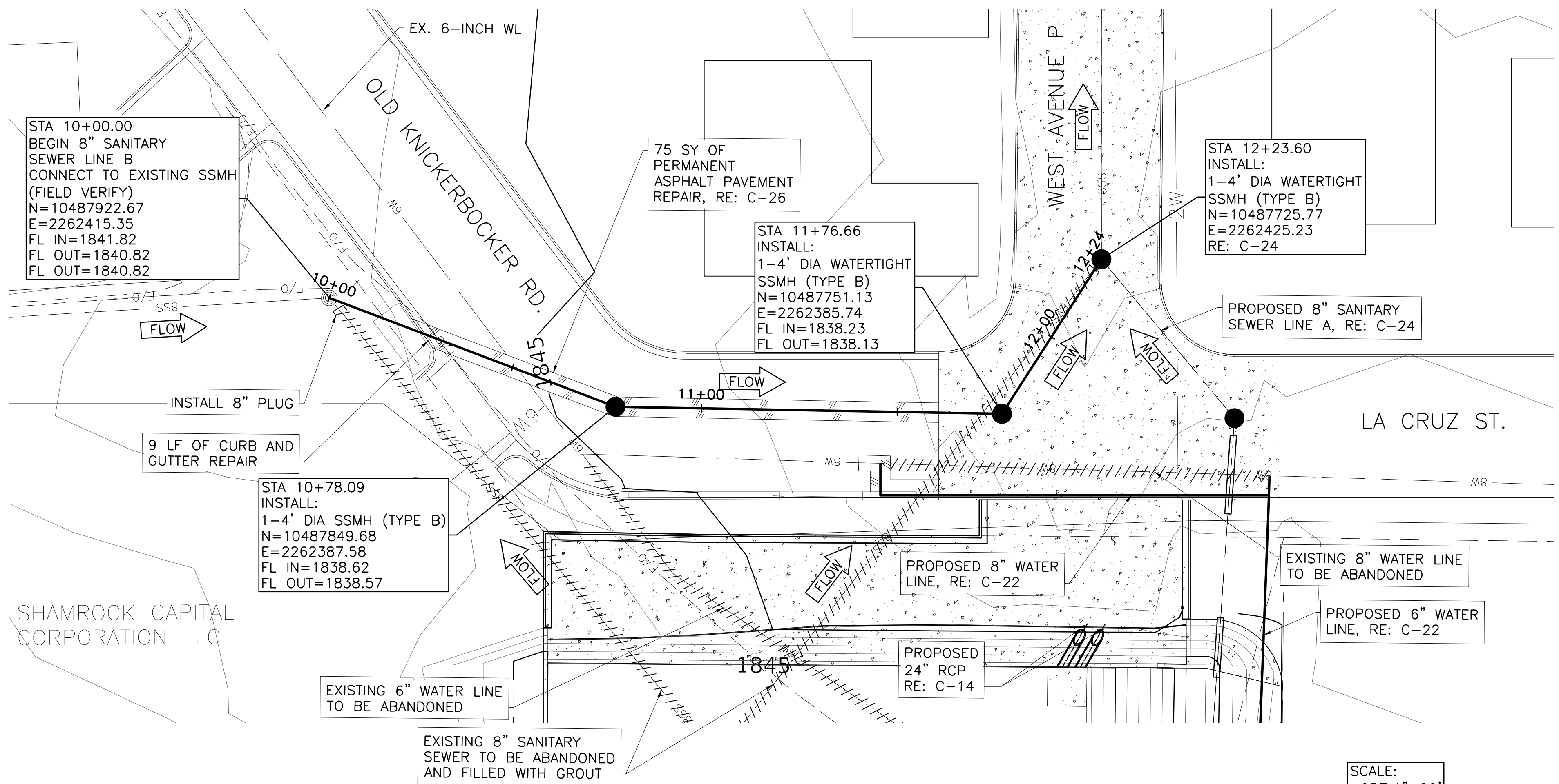
CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
SS LINE A PLAN AND PROFILE STA 14+00 TO END

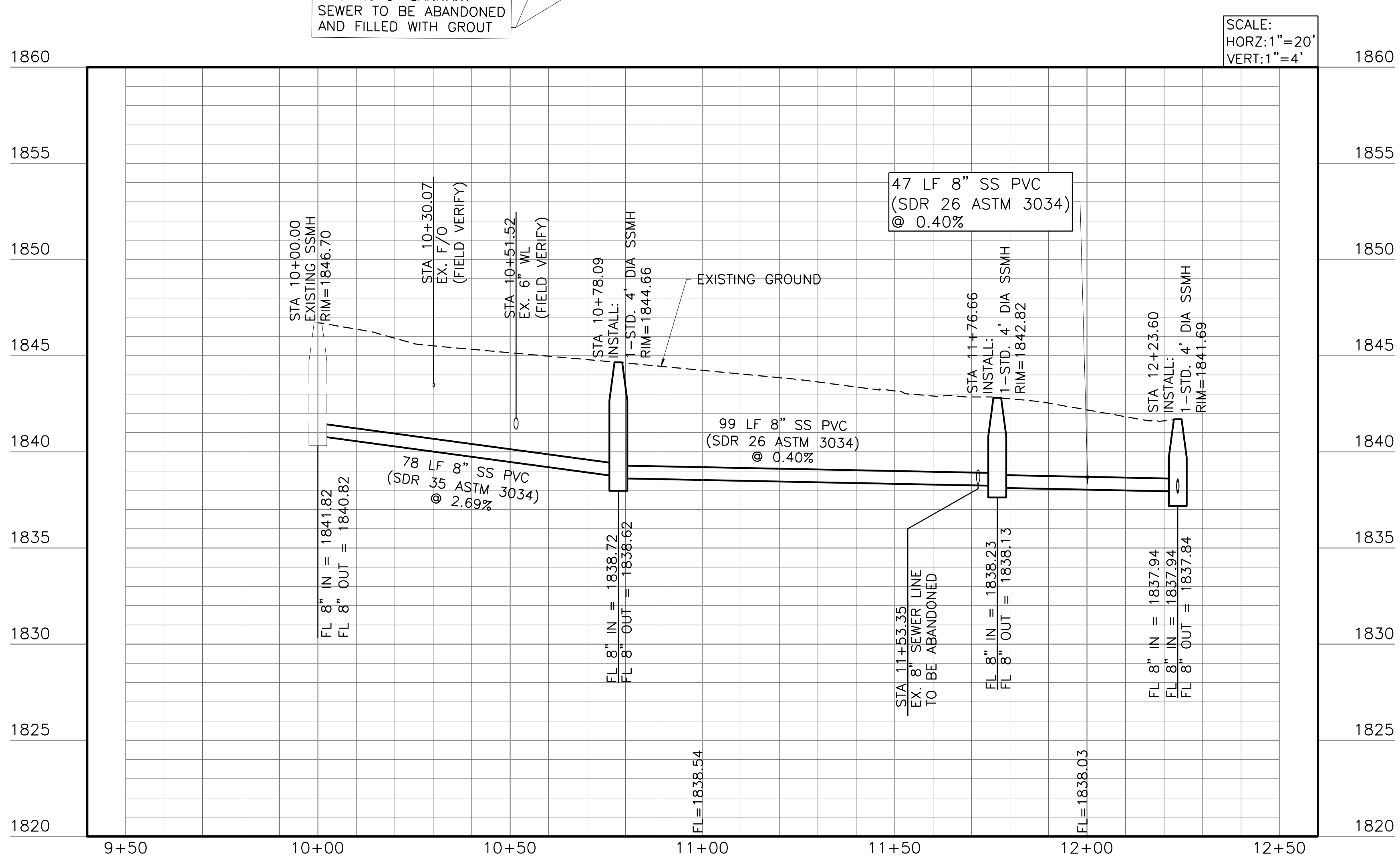
F&N JOB NO.	SAN18286
DATE	09/09/19
DESIGNED	TPN
DRAWN	AAL/OC
REVISED	OC
CHECKED	ABC
FILE NAME	CV-UTL-PP-SSEW01.dwg

NO.	ISSUES	DATE	BY

VERIFY SCALE 0 1
Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-24
SEQ. 25





CAUTION!!!
EXISTING UNDERGROUND AND OVERHEAD UTILITIES IN THE AREA. 48 HOURS PRIOR TO CONSTRUCTION CONTACT 1-800-DIG-TESS

NORTH

SCALE IN FEET HORIZONTAL: 0, 20', 40'

SCALE IN FEET VERTICAL: 0, 5', 10'

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144
AARON B. CONINE 109794
09 Sep 2019
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Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

SS LINE B PLAN AND PROFILE STA 10+00 TO END

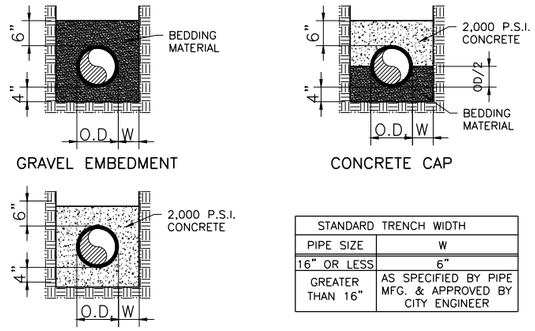
F&N JOB NO.	SAN18286
DATE	09/09/19
DESIGNED	TPN
DRAWN	AAL/OC
REVISED	OC
CHECKED	ABC
FILE NAME	CV-UTL-PP-SSEW02.dwg

NO.	ISSUES	BY	DATE

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-25

SEQ. 26

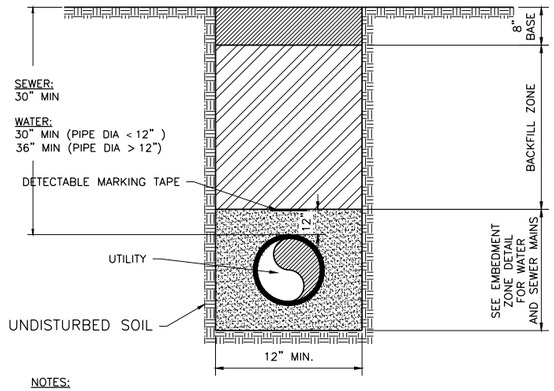


STANDARD TRENCH WIDTH	
PIPE SIZE	W
16" OR LESS	6"
GREATER THAN 16"	AS SPECIFIED BY PIPE MFG. & APPROVED BY CITY ENGINEER

NOTES:

1. BEDDING MATERIAL FOR THE INSTALLATION OF WATER AND SEWER MAINS SHALL BE CRUSHED STONE OR PEA GRAVEL THAT WILL REMAIN FIRM AND NOT PERMIT DISPLACEMENT OF THE PIPE EITHER DURING PIPE LAYING OR BACKFILLING OR FOLLOWING THE COMPLETION OF CONSTRUCTION.
2. BEDDING MATERIAL SHALL BE FROM AN APPROVED BEDDING MATERIAL SOURCE PER THE LIST OF APPROVED BEDDING SUPPLIERS OR BE APPROVED BY THE CITY ENGINEER.
3. TRENCH SPOILS ARE NOT ACCEPTABLE FOR "EMBEDMENT ZONE MATERIAL"

1 / - PIPE EMBEDMENT ZONE
WATER AND SEWER MAINS
NOT TO SCALE



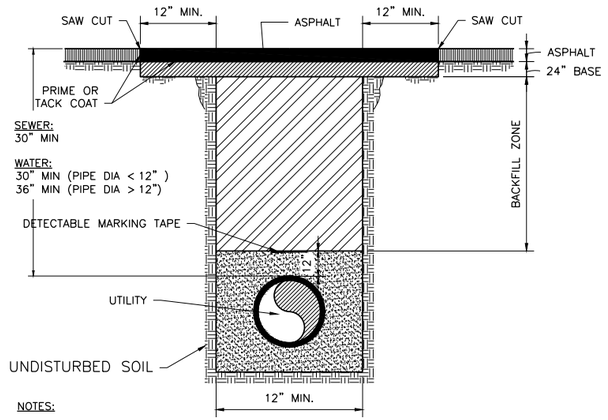
NOTES:

BASE: FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS. COMPACTED IN 6" LAYERS. MINIMUM DENSITY 95% MODIFIED PROCTOR.

BACKFILL ZONE: WHERE PULVERIZED OR GRANULAR MATERIAL IS AVAILABLE FROM EXCAVATION WHICH IS FREE OF SHARP EDGED STONES, OR STONES LARGER THAN 3" IN DIAMETER, CLAY, ORGANIC MATTER, OR OTHER UNSUITABLE SUBSTANCES, HAS A PI<= 20 AND LL<=40, AND MEETS THE APPROVAL OF THE CITY. SUCH MATERIAL MAY BE USED FOR BACKFILL MATERIAL AS INSTRUCTED BY THE OWNER.

COVER: WATER OR SEWER MAINS AND SERVICES WITH LESS THAN 30" COVER AT ANY LOCATION SHALL REQUIRE C.O.S.A. APPROVAL PRIOR TO CONSTRUCTION.

2 / - UTILITY TRENCH SECTION
UNPAVED STREETS, ALLEYS, AND DRIVEWAYS
NOT TO SCALE



NOTES:

ASPHALT: 2" LAYER
TYPE D, TxDOT HOT MIX OR
TYPE D, TxDOT HOT MIX – COLD LAID
(MUST HAVE PRIOR CITY APPROVAL)
4" LAYER TYPE B, TxDOT HOT MIX

PRIME COAT: TXDOT MC-30 OR AE-P ASPHALT AT THE RATE OF 0.25 TO 0.35 GALLON PER SQUARE YARD OF SURFACE

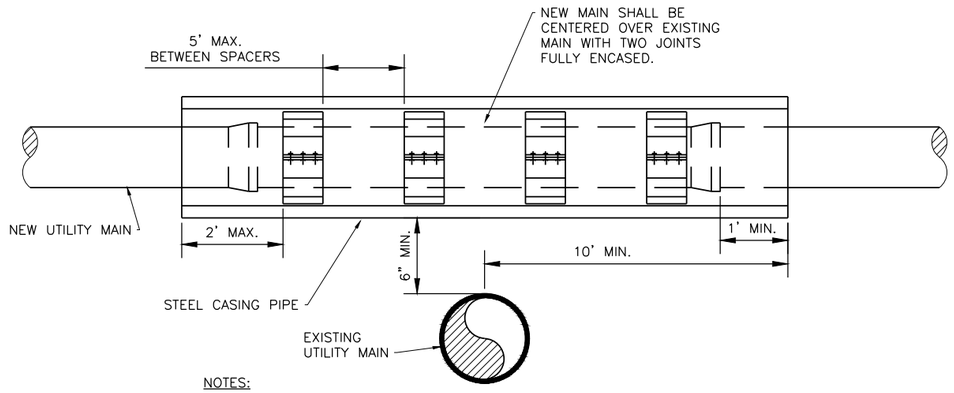
TACK COAT: SHALL MEET THE REQUIREMENTS OF TXDOT ITEM 300 "ASPHALTS, OILS, AND EMULSIONS".

BASE: FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS COMPACTED IN 6" HORIZONTAL LAYERS. MINIMUM DENSITY 95% MODIFIED PROCTOR. FLOWABLE FILL (CLSM) MAY BE USED IN LIEU OF FLEX-BASE.

BACKFILL ZONE: WHERE NATIVE PULVERIZED OR GRANULAR MATERIAL IS AVAILABLE FROM EXCAVATION WHICH IS FREE OF SHARP EDGED STONES, OR STONES LARGER THAN 3" IN DIAMETER, CLAY, ORGANIC MATTER, OR OTHER UNSUITABLE SUBSTANCES, HAS A PI<= 20 AND LL<=40, AND MEETS THE APPROVAL OF THE CITY. SUCH MATERIAL MAY BE USED FOR BACKFILL MATERIAL AS INSTRUCTED BY THE OWNER.

COVER: WATER OR SEWER MAINS AND SERVICES WITH LESS THAN 30" OF COVER AT ANY LOCATION SHALL REQUIRE C.O.S.A. APPROVAL PRIOR TO CONSTRUCTION.

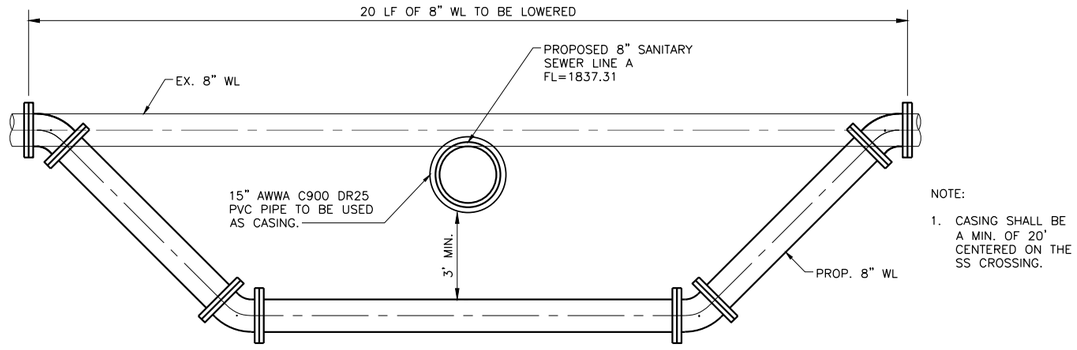
3 / - UTILITY TRENCH SECTION ASPHALT
TEMPORARY/PERMANENT PAVEMENT REPAIR
NOT TO SCALE



NOTES:

1. ALL WATER-SEWER CROSSING SITUATIONS WHERE A NEW MAIN WILL CROSS WITHIN 2' VERTICALLY OF AN EXISTING MAIN SHALL BE ENCASED AS SHOWN ABOVE.
2. CASING PIPE SHALL BE A MINIMUM 20' LENGTH OF OR C-900 PVC PIPE WITH GASKETED OR WELDED JOINTS.
3. EACH END OF CASING SHALL BE SEALED WITH WATERTIGHT NON-SHRINK GROUT OR A MANUFACTURED WATERTIGHT SEAL.
4. HDPE CASING SPACERS SHALL BE PLACED AT MAXIMUM 5' INTERVALS AND WITHIN 2' FROM EACH BELL AND END OF CASING.
5. CROSSING SITUATIONS NOT COVERED BY THIS DETAIL SHALL BE ACCOMPLISHED IN ACCORDANCE WITH COSA DESIGN STANDARDS AND TCEQ CHAPTERS 217 AND 290.

4 / - STEEL CASING DETAIL
NOT TO SCALE



NOTE:

1. CASING SHALL BE A MIN. OF 20' CENTERED ON THE SS CROSSING.

5 / - WATER LINE LOWERING DETAIL
NOT TO SCALE

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144
STATE OF TEXAS
AARON B. CONNE
109794
LICENSED PROFESSIONAL ENGINEER
09 Sep 2019

FREESE NICHOLS
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Lubbock, Texas 79423
Phone - (806) 854-5700
Web www.freese.com

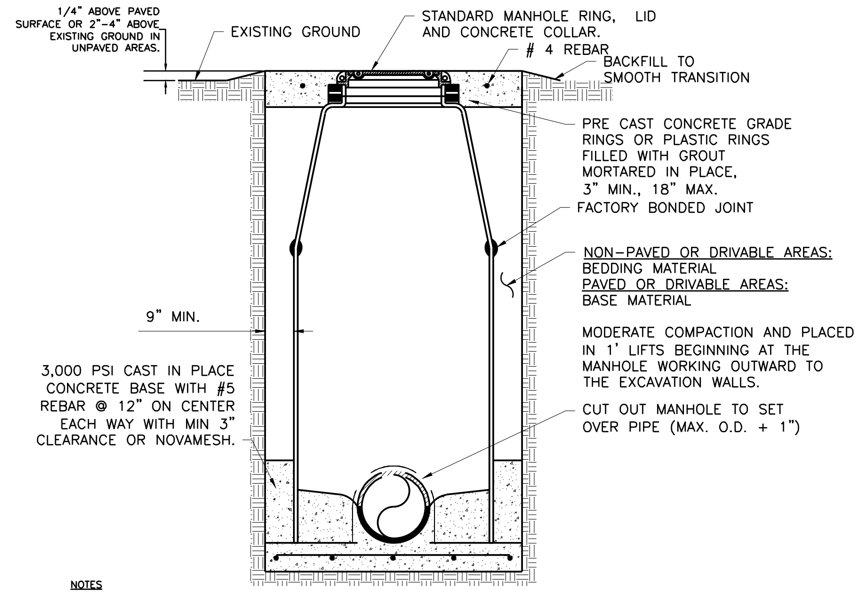
CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
TRENCH DETAILS

NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 09/09/19
DESIGNED TPN
DRAWN AAL/OC
REVISED OC
CHECKED ABC
FILE NAME CV-UTL-DT-DTL501.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET C-26
SEQ. 27



NOTES

1. CONTRACTOR SHALL VERIFY MANHOLE DEPTHS, INLET AND OUTLET ELEVATIONS.
2. MANHOLE CUTOUT TO BE MADE AT TIME OF INSTALLATION.
3. CONCRETE BASE TO BE POURED IN PLACE IN TRENCH AND MANHOLE TO BE INSTALLED BY INSERTING INTO WET CONCRETE BASE.
4. FLOW LINE INVERT MAY BE CHANNEL FORMED IN CONCRETE FLOOR OR PIPE SECTION WITH TOP CUT OUT.
5. SEAL CONCRETE TO PIPE WITH ELASTOMERIC GASKET SEAL.
6. CONCRETE SHALL BE PLACED A MINIMUM OF 6" BEYOND AND 1' ABOVE ALL CONNECTIONS.
7. MANHOLES SHALL BE STUBBED OUT WITH SUITABLE SIZE PIPE WHEREVER FUTURE EXTENSION OF THE SEWER IS ANTICIPATED.
8. STUB-OUTS SHALL EXTEND BEYOND THE EDGE OF EXISTING OR PROPOSED PAVING.
9. MANHOLES LOCATED WITHIN A 100-YEAR FLOOD PLAIN OR ANY AREA SUBJECT TO STORMWATER INFILTRATION SHALL INCORPORATE A WATERTIGHT, BOLT-DOWN RING AND LID AND AN INFLOW PREVENTION DEVISES (IPDs).
10. MANHOLE SPACING, DIAMETER AND DEPTH SHALL BE AS FOLLOWS:

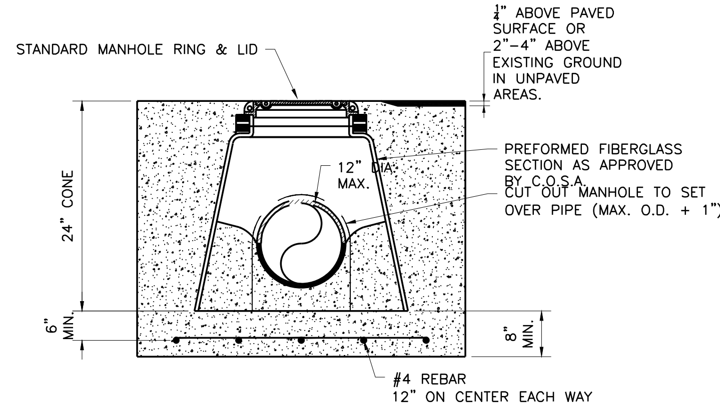
PIPE DIAMETER	MANHOLE DEPTH	MANHOLE DIAMETER	MAX. SPACING BETWEEN MANHOLES
15" OR SMALLER	0-16'	48"	500'
15" OR SMALLER	OVER 16'	60"	500'
OVER 15"	ALL DEPTHS	60"	800'

11. MINIMUM ELEVATION DIFFERENCE ACROSS MANHOLE INVERTS SHALL BE AS FOLLOWS:

DEFLECTION ANGLE BETWEEN INLET / OUTLET	MIN. ELEVATION DIFFERENCE
LESS THAN 30°	0.10'
GREATER THAN 30°	0.20'

1 FIBERGLASS MANHOLE - TYPE B

NOT TO SCALE



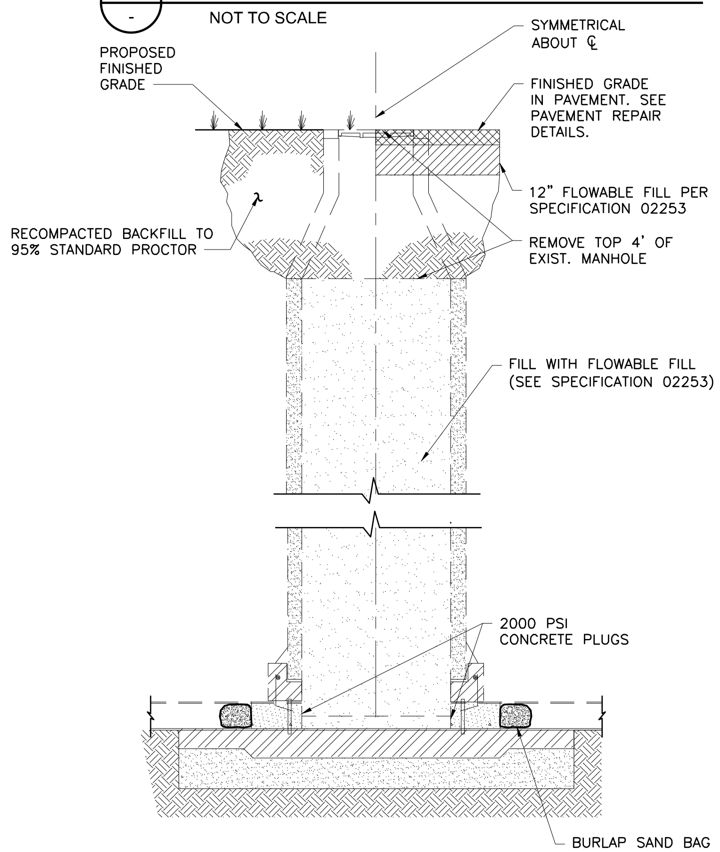
NOTES

1. DETAIL IS APPLICABLE FOR COVER LESS THAN 30" BUT A MINIMUM OF 10" AND FOR MAINS 12" OR SMALLER.
2. MANHOLES LOCATED WITHIN A 100-YEAR FLOOD PLAIN OR ANY AREA SUBJECT TO STORMWATER INFILTRATION SHALL INCORPORATE A WATERTIGHT, BOLT-DOWN RING AND LID AND AN INFLOW PREVENTION DEVICES (IPDs).
3. MINIMUM ELEVATION DIFFERENCE ACROSS MANHOLE INVERTS SHALL BE AS FOLLOWS:
4. THIS IS A NONE TRAFFIC RATED MANHOLE AND APPROVED ON A CASE BY CASE BASIS BY C.O.S.A. PRIOR TO CONSTRUCTION.

DEFLECTION ANGLE BETWEEN INLET / OUTLET	MIN. ELEVATION DIFFERENCE
LESS THAN 30"	0.10'
GREATER THAN 30"	0.20'

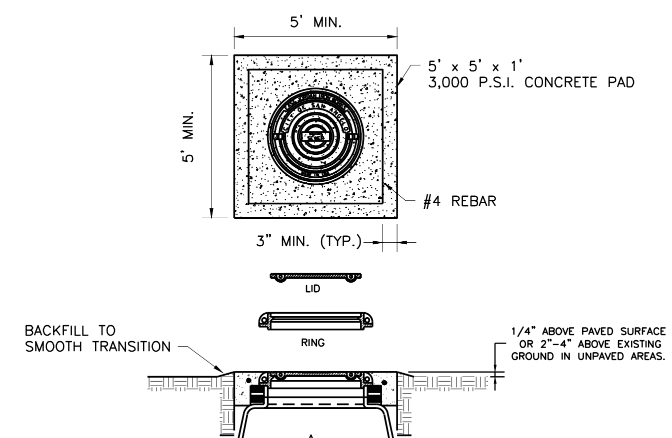
2 SHALLOW MANHOLE

NOT TO SCALE



3 MANHOLE ABANDONMENT DETAIL

NOT TO SCALE



NOTES:

1. MANHOLE RING (V-1420) & LID (V-1430) SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUAL WITH "CITY OF SAN ANGELO" CUSTOM LETTERING.
2. WATER TIGHT, BOLT-DOWN SPECIFIED RING (V-1420) & LID (V-1430) SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUAL WITH AN INFLOW PREVENTION DEVICE (IPD).
3. MANHOLE RING & LID SHALL BE MACHINE FITTED WITH TWO (2) PICK BAR SLOTS.
4. MANHOLE RING AND COVER SHALL BE CAST IRON, MEETING THE LATEST REVISION OF ASTM A-48 CLASS 30 WITH A HIGHWAY LOAD RATING OF H-20.
5. MANHOLES LOCATED WITHIN A 100-YEAR FLOOD PLAIN OR ANY AREA SUBJECT TO STORMWATER INFILTRATION SHALL INCORPORATE A WATERTIGHT, BOLT-DOWN RING AND LID AND AN INFLOW PREVENTION DEVICES (IPDs).
6. MANHOLES LOCATED WITHIN UNDEVELOPED AREAS, AGRICULTURAL FIELDS, OR ANY AREA SUBJECT TO BEING OVERGROWN OR OTHERWISE OBSCURED SHALL INCORPORATE A BOLLARD AT EACH CORNER OF THE CONCRETE COLLAR, FOUR (4) TOTAL.

4 SEWER MANHOLE RING AND LID WITH CONCRETE COLLAR

NOT TO SCALE

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

FREESE NICHOLS
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Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

MANHOLE DETAILS

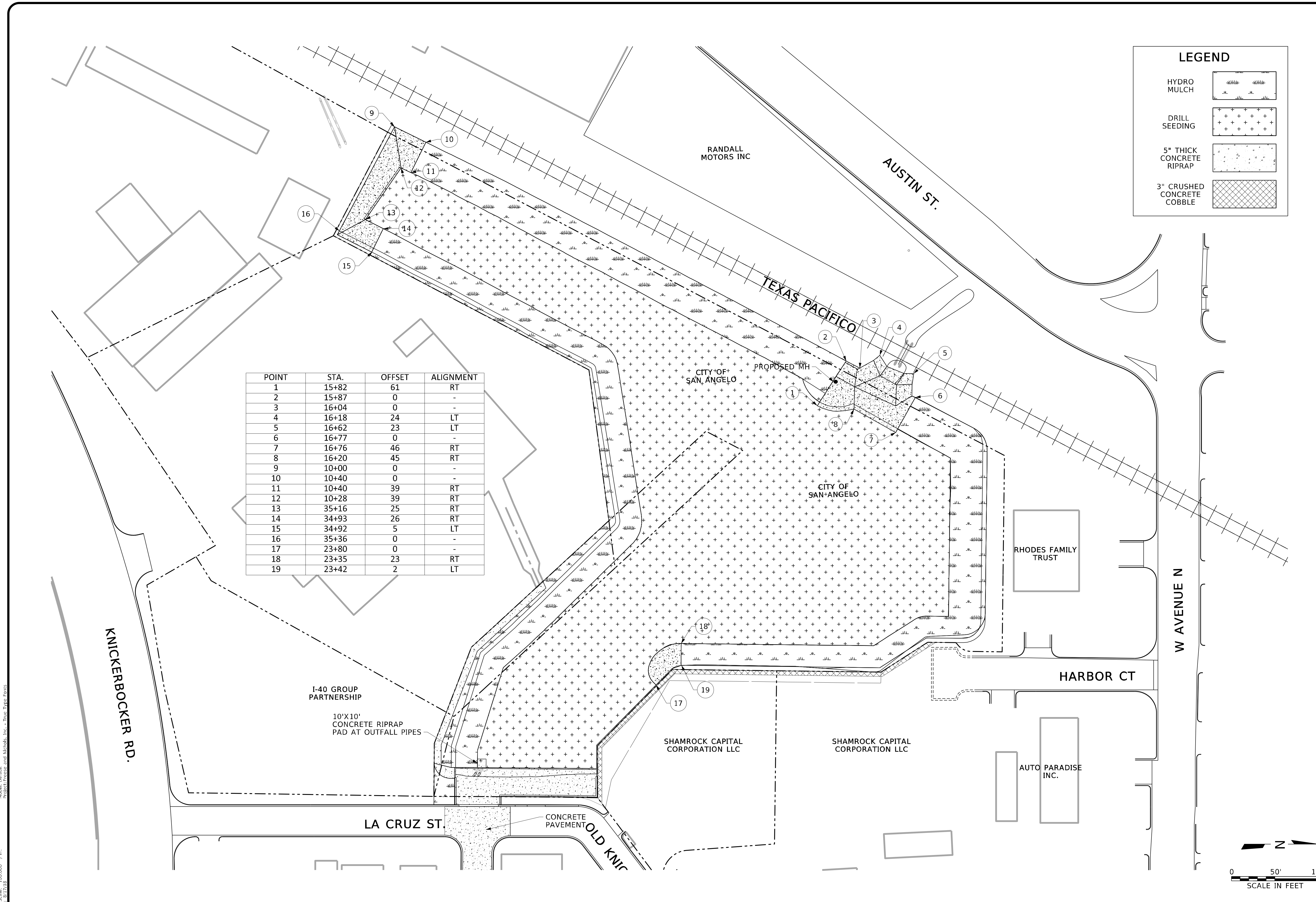
NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 09/09/19
DESIGNED TPN
DRAWN AAJ/OC
REVISED OC
CHECKED ABC
FILE NAME CV-UTL-DT-DTLS01.dwg

VERIFY SCALE 0 1
Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-27

SEQ. 28



POINT	STA.	OFFSET	ALIGNMENT
1	15+82	61	RT
2	15+87	0	-
3	16+04	0	-
4	16+18	24	LT
5	16+62	23	LT
6	16+77	0	-
7	16+76	46	RT
8	16+20	45	RT
9	10+00	0	-
10	10+40	0	-
11	10+40	39	RT
12	10+28	39	RT
13	35+16	25	RT
14	34+93	26	RT
15	34+92	5	LT
16	35+36	0	-
17	23+80	0	-
18	23+35	23	RT
19	23+42	2	LT

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KEISTER
100095
LICENSED PROFESSIONAL ENGINEER
09/09/2019

FREESE AND NICHOLS
2732 82nd Street, Suite A
Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

STABILIZATION PLAN

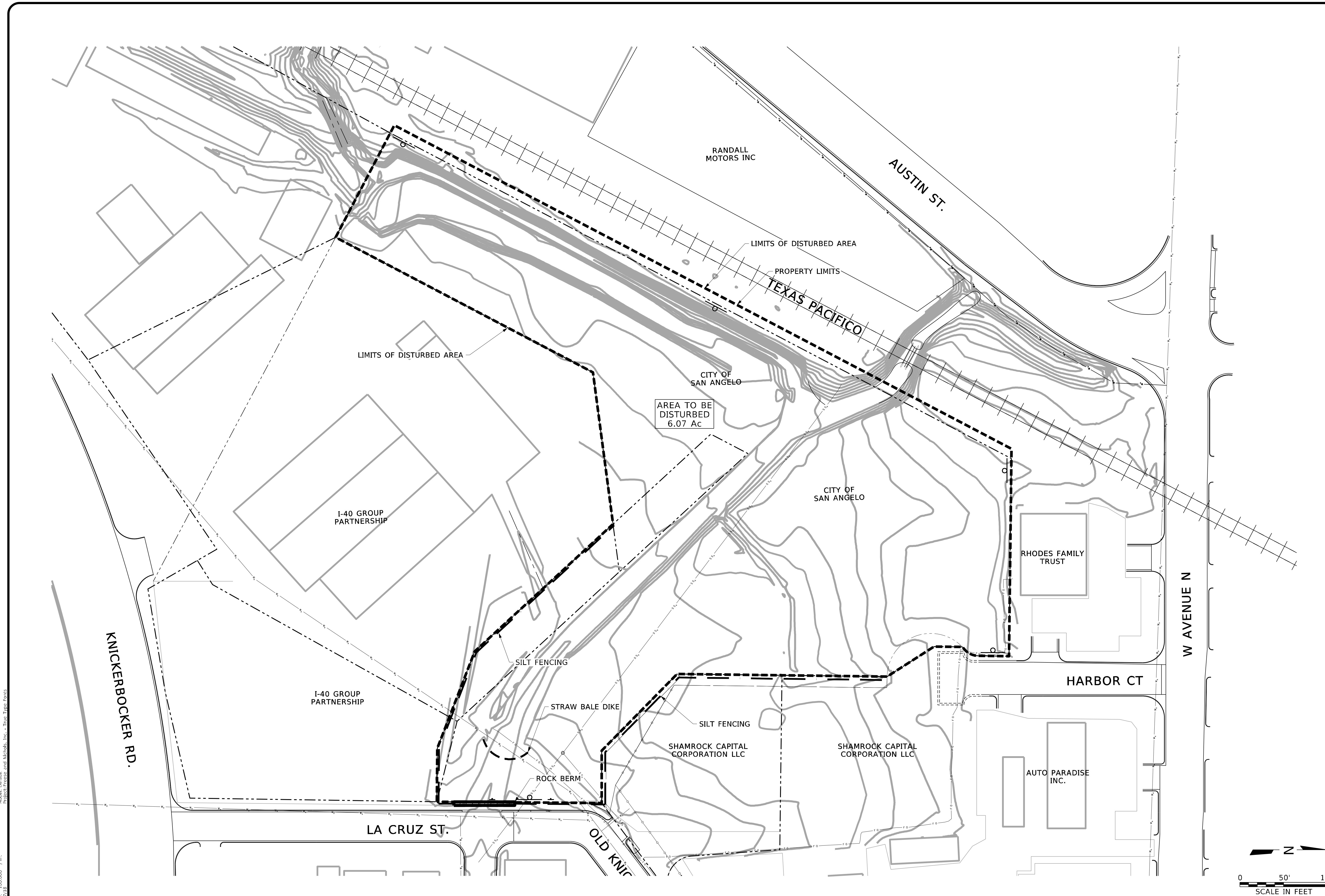
NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-stabilization.dgn

VERIFY SCALE 0 1 Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-28

SEQ. 29



RANDALL MOTORS INC
AUSTIN ST.
LIMITS OF DISTURBED AREA
PROPERTY LIMITS
TEXAS PACIFICO
LIMITS OF DISTURBED AREA
CITY OF SAN ANGELO
AREA TO BE DISTURBED 6.07 Ac
CITY OF SAN ANGELO
I-40 GROUP PARTNERSHIP
RHODES FAMILY TRUST
W AVENUE N
HARBOR CT
SILT FENCING
I-40 GROUP PARTNERSHIP
STRAW BALE DIKE
SILT FENCING
SHAMROCK CAPITAL CORPORATION LLC
SHAMROCK CAPITAL CORPORATION LLC
AUTO PARADISE INC.
ROCK BERM
KNICKERBOCKER RD.
LA CRUZ ST.
OLD KNIC
N
0 50' 100'
SCALE IN FEET

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KESTER
100095
LICENSED
PROFESSIONAL ENGINEER

09/09/2019

FREESE NICHOLS
2732 82nd Street, Suite A
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Web www.freese.com

CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
EROSION CONTROL PLAN

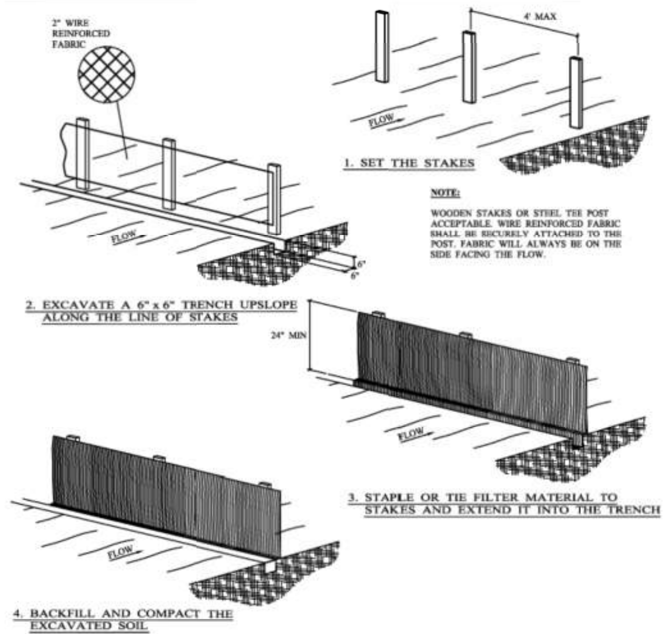
F&N JOB NO.	SAN18286
DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	cv-trt-pl-erosion ctrl001.dgn

NO.	ISSUES	BY	DATE

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-29

SEQ. 30



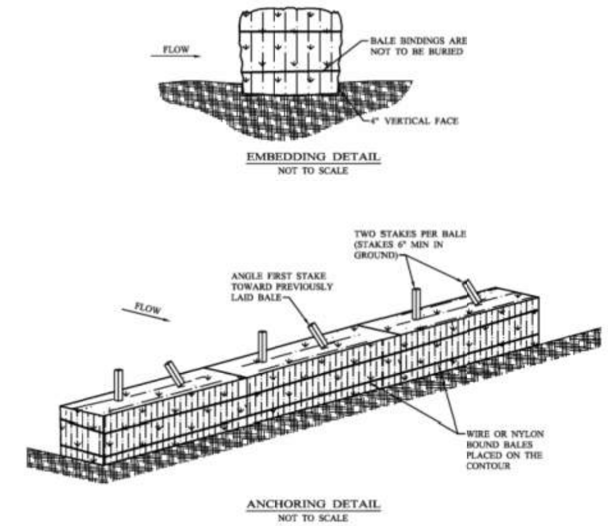
NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.
2. A CITY-APPROVED FILTER FABRIC WILL BE USED.
3. THE TRENCH MUST BE MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH WOODEN OR STEEL SUPPORT POST. THERE SHALL BE A 3 FOOT OVERLAP, SECURELY FASTENED, WHERE ENDS OF FABRIC MEET.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH ≥1/2" RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

CITY OF SAN ANGELO

SILT FENCE STANDARDS

S-CC-1



ANCHORING DETAIL
NOT TO SCALE

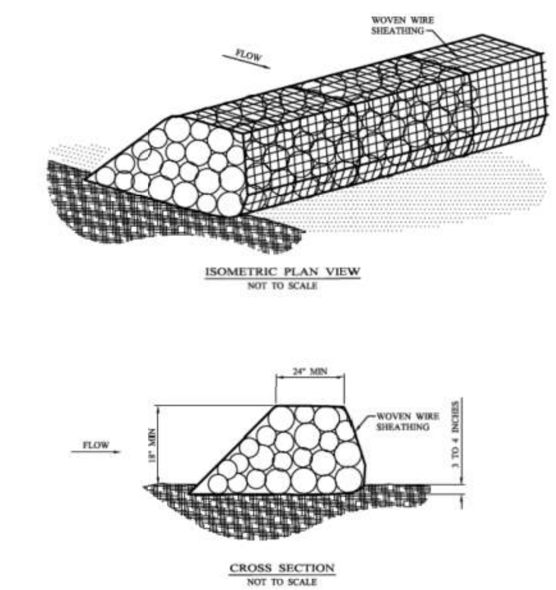
STRAW BALE DIKE GENERAL NOTES:

1. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF FOUR INCHES.
2. BALES SHALL BE SECURELY ANCHORED IN PLACE BY 2" x 2" WOOD STAKES DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.
3. INSPECTION SHALL BE MADE EVERY TWO WEEKS AND AFTER EACH ≥1/2" RAINFALL EVENT. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
4. WHEN SILT REACHES A DEPTH OF 6 INCHES, IT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.
5. AFTER THE DISTURBED AREAS OF THE SITE ARE COMPLETELY STABILIZED, THE BALES SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED SPOIL DISPOSAL SITE.

CITY OF SAN ANGELO

STRAW BALE DIKE

S-CC-2



CROSS SECTION
NOT TO SCALE

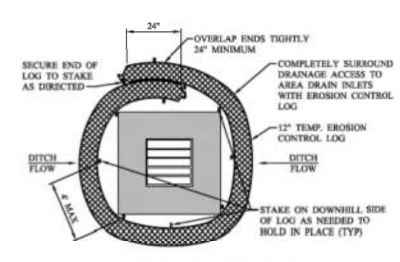
ROCK BERM GENERAL NOTES:

1. USE ONLY OPEN GRADED ROCK 4-8 INCHES IN DIAMETER FOR STREAM FLOW CONDITION. USE OPEN GRADED ROCK 3-5 INCHES IN DIAMETER FOR OTHER CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING A MAXIMUM OPENING OF 1 INCH AND A MINIMUM WIRE SIZE OF 20 GAUGE AND SHALL BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP.
3. THE ROCK BERM SHALL BE INSPECTED EVERY TWO WEEKS OR AFTER EACH ≥ 1/2" RAIN EVENT AND SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD OF THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF PROPERLY.
5. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.
6. ROCK BERM SHOULD BE USED AS CHECK DAMS FOR CONCENTRATED FLOW AND ARE NOT INTENDED FOR USE IN PERIMETER PROTECTION.

CITY OF SAN ANGELO

ROCK BERM

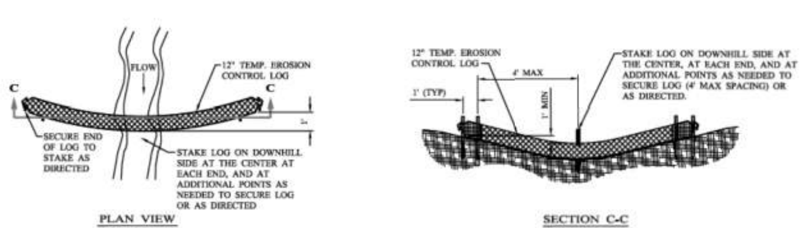
S-CC-3



LOGS PLACED AT AREA DRAIN INLETS
NOT TO SCALE

GENERAL NOTES:

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 60' FOR 18" DIAMETER OR 30' FOR 12" DIAMETER LOGS.
2. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WITH REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" x 2" WOOD OR T-POSTS 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED.
5. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.

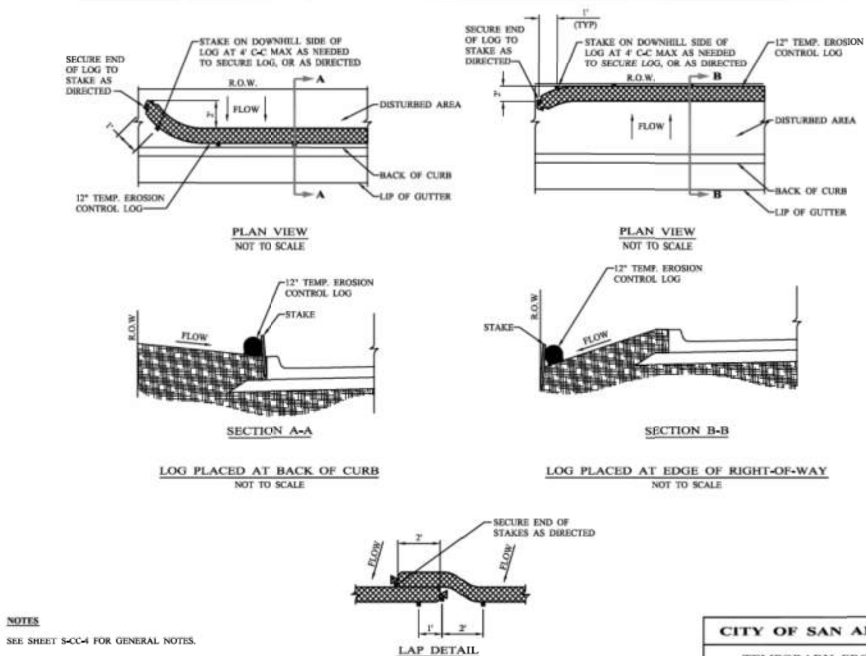


EROSION CONTROL LOG CHECK DAM
NOT TO SCALE

CITY OF SAN ANGELO

TEMPORARY EROSION CONTROL LOGS

S-CC-4



NOTES

SEE SHEET S-CC-4 FOR GENERAL NOTES.

CITY OF SAN ANGELO

TEMPORARY EROSION CONTROL LOGS

S-CC-5

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KESTER
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LICENSED
PROFESSIONAL ENGINEER
09/09/2019

FREESE NICHOLS
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Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

EROSION CONTROL DETAILS

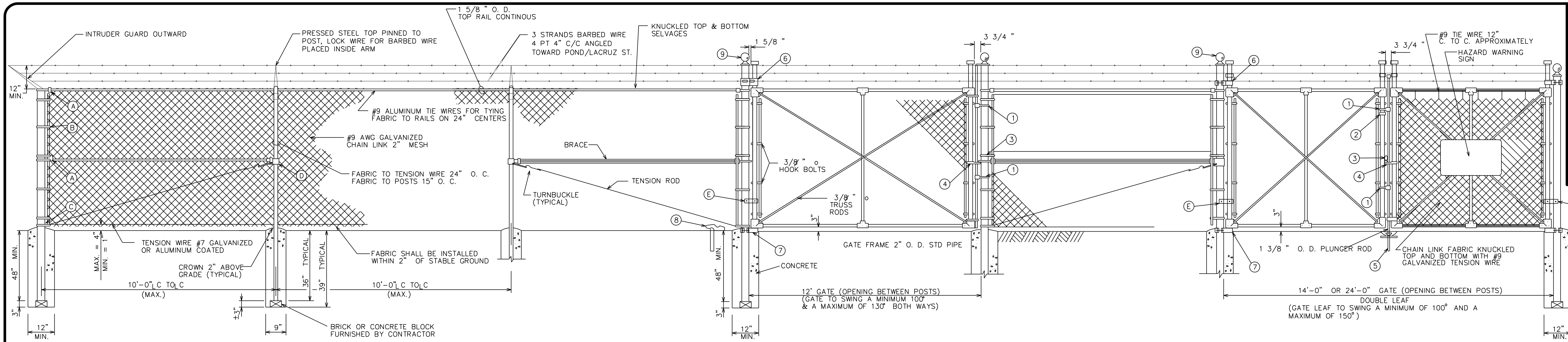
NO.	ISSUES	BY	DATE

F&N JOB NO.	SAN18286
DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	cv-trt-pl-erosion ctrl002.dgn

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

SHEET C-30

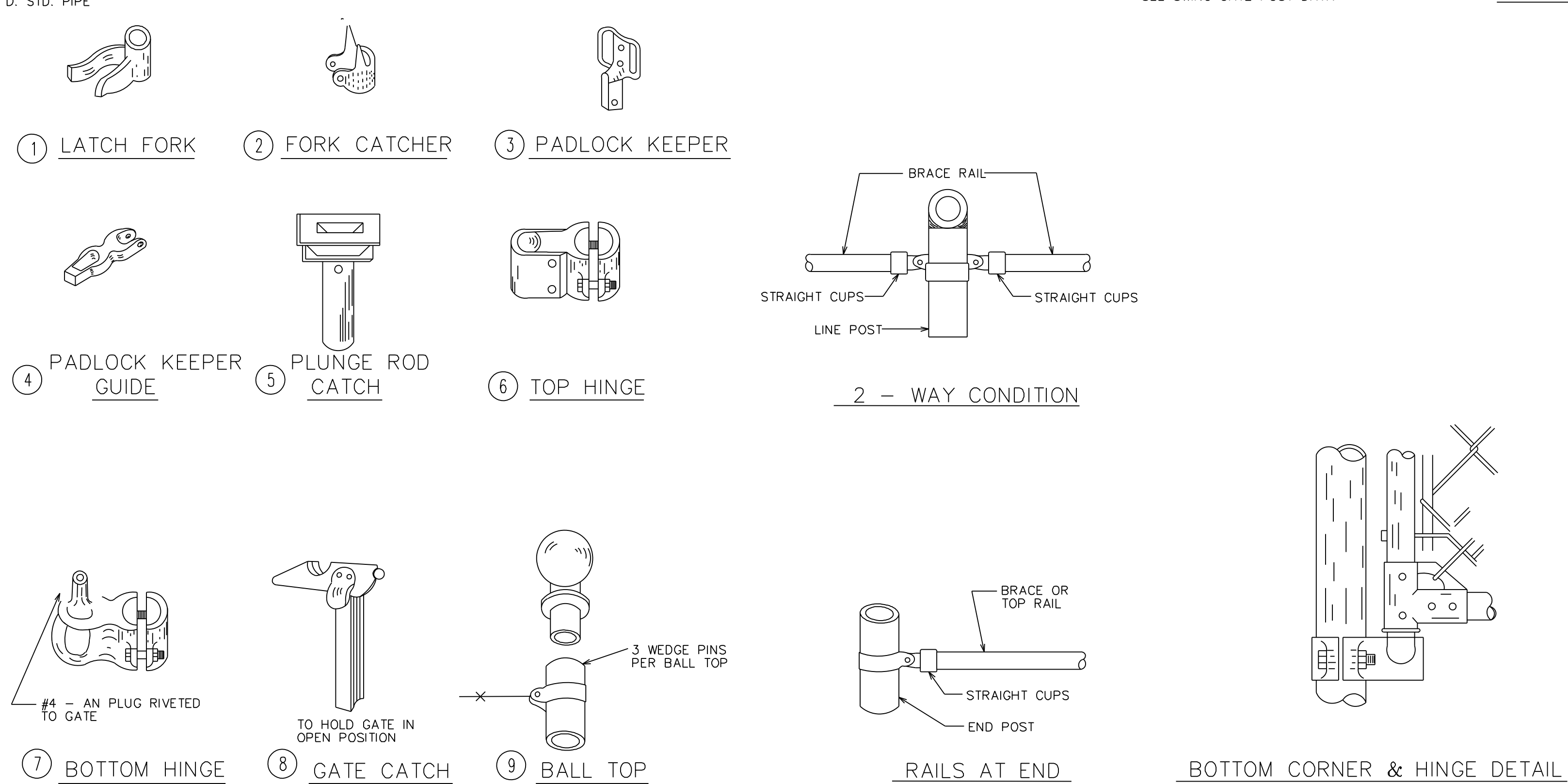
SEQ. 31



INSIDE ELEVATION CHAIN LINK FENCE AND GATES

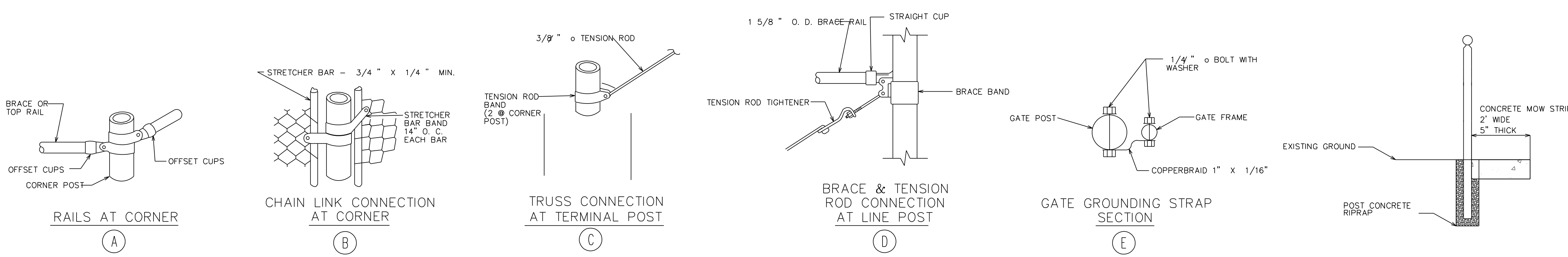
NOTE TO SCALE

SWING GATE POST DATA			
STD PIPE SIZE	WT PER FT	GATE OPENING SINGLE, INCLUSIVE	GATE OPENING DOUBLE, INCLUSIVE
2 1/2 "	5.79 LBS	TO 6'	UP TO 12'
3 1/2 "	9.11 LBS	OVER 6' TO 12'	OVER 12' TO 24'



NOTES:

1. ALL METAL SHALL BE HOT DIPPED GALVANIZED.
2. FENCES & GATES SHALL BE FURNISHED COMPLETE WITH ALL NECESSARY FITTINGS.
3. FOR GATES – SIZES OF PIPES, SAG RODS & TURNBUCKLES SHALL BE MANUFACTURE'S STANDARD WHICH ALSO MEET THE REQUIREMENTS OF THIS DRAWING.
4. POSTS SHALL BE ROLLED OR EXTRUDED SECTIONS OR TUBING OF STEEL OR ALUMINUM CAPABLE OF WITHSTANDING A LATERAL FORCE OF 100 POUNDS APPLIED AT THE TOP. ALL HOLLOW POSTS SHALL BE CAPPED.
5. ALL CONCRETE SHALL BE 2500 PSI WITH 3" SLUMP AND 3/4 " MAXIMUM SIZE AGGREGATE.
6. STANDARD PIPE SIZES INDICATED ARE NOMINAL INSIDE DIAMETER, SCHEDULE 40, PER AMERICAN STANDARDS ASSOCIATION (ASA) B 36.10.
7. FABRIC HEIGHT IS TO BE 72"



FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

09/09/2019

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Lubbock, Texas 79423
Phone - (806) 686-2700
Web www.freese.com

CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
FENCE DETAIL

NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME Fence detail.dgn

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

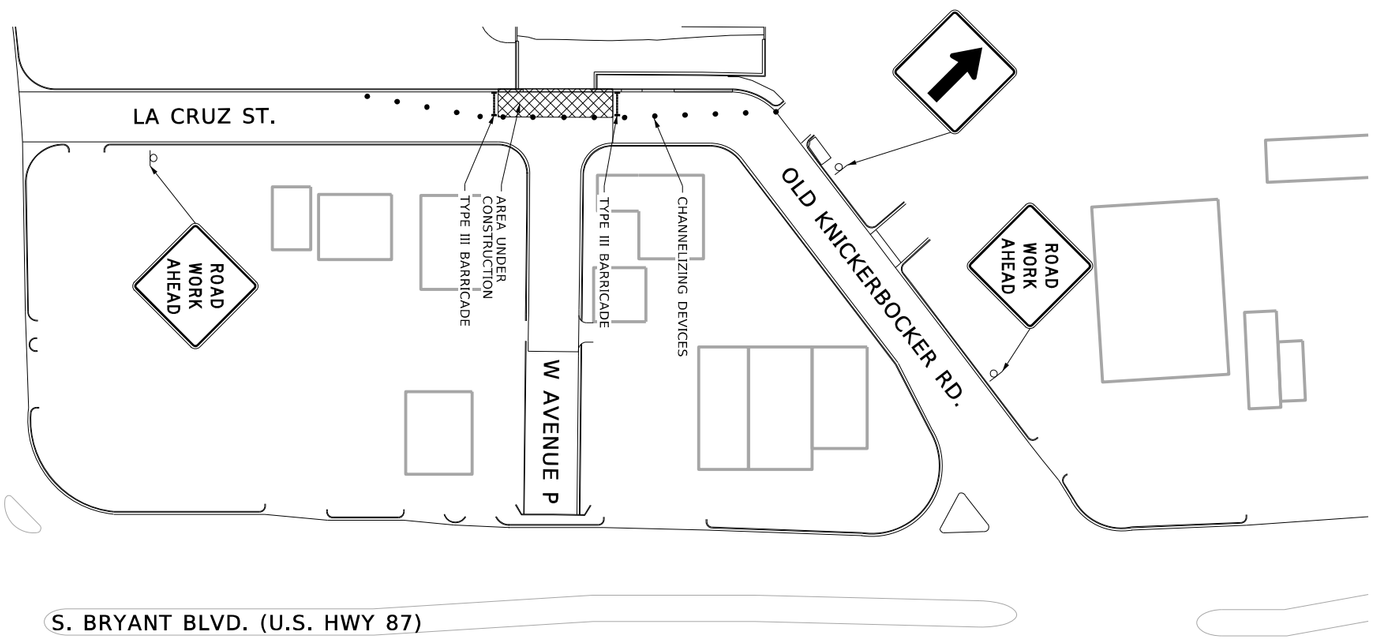
SHEET C-31

SEQ. 32

MicroStation V8 User:02861 Office:Lubbock SAN18286 N:\IF\Drawings\5. Drainage\Fence detail.dgn Plotter: .\\Plotsrv_V8.i.1\\PDF File\\PDF-Mono.pltcfg Plot Scale: 2.500 '/ in. Date: 8/17/18 Project: Freese and Nichols, Inc. - True Type Fonts

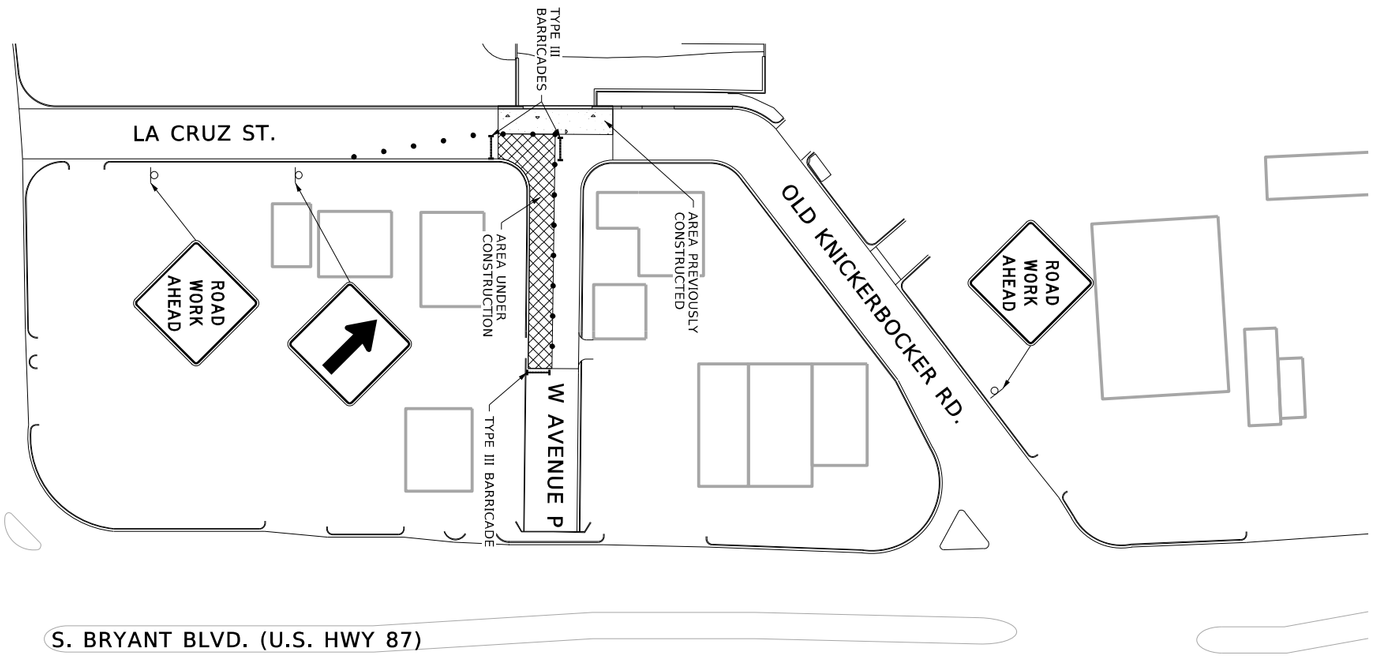
Office:Lubbock SAN18286 Date:8/17/18 User:02861 File:N:\IF\Drawings\5. Drainage\Fence detail.dgn

PHASE 1



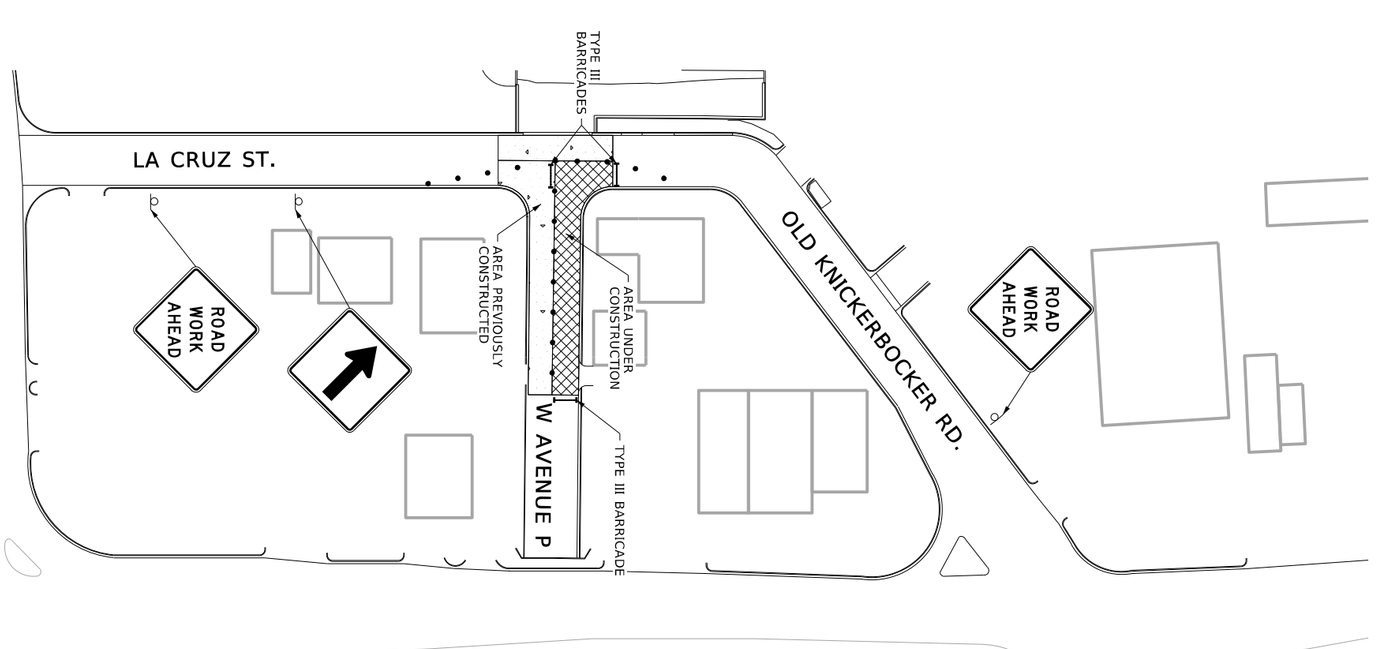
S. BRYANT BLVD. (U.S. HWY 87)

PHASE 2



S. BRYANT BLVD. (U.S. HWY 87)

PHASE 3



S. BRYANT BLVD. (U.S. HWY 87)

SCALE IN FEET 0 50' 100'

N

SEQ: 33 SHEET C-32

NO.	ISSUES	BY	DATE

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-tcp.dgn

CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

TRAFFIC CONTROL PLAN

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FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KEISTER
100095
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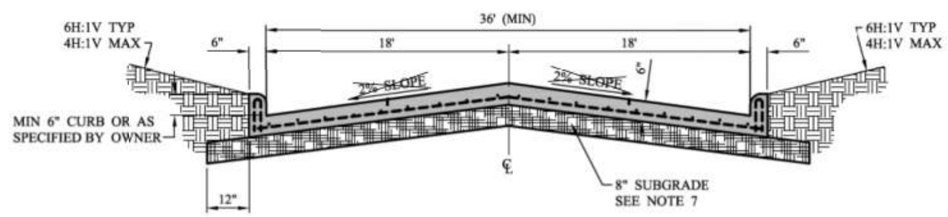
09/09/2019

NOTE:
PROPOSED AND EXISTING CROSS SECTIONS ARE INVERTED. NEW PAVEMENT TO MATCH EXISTING GRADE AND CROSS SLOPE UNLESS SHOWN OTHERWISE ON PLAN SHEET C-20.



TYPICAL SECTION
NOT TO SCALE

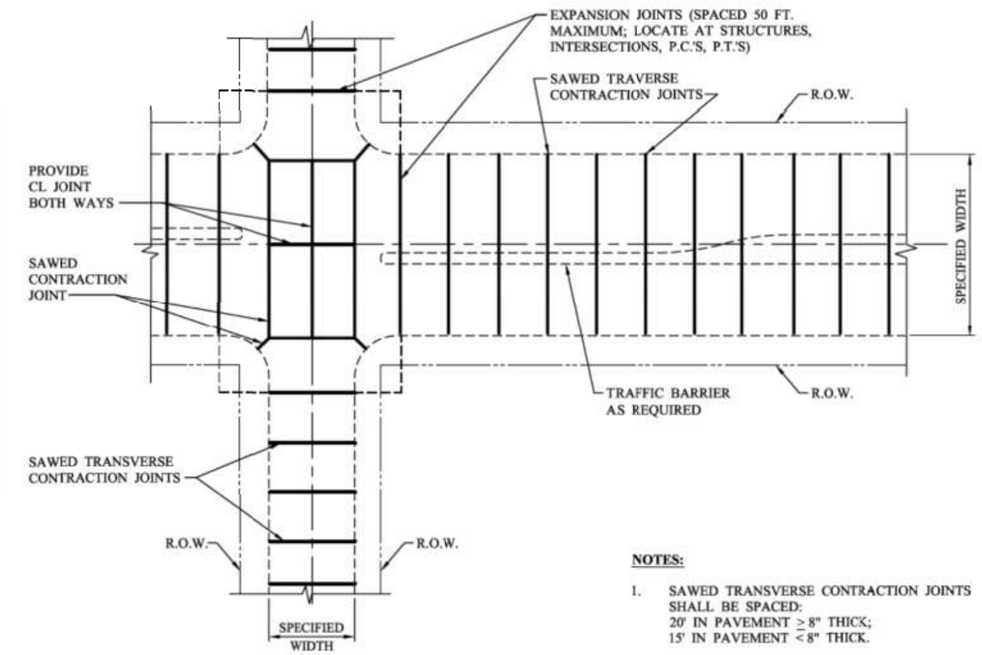
NOTES:

1. PROVIDE SAWED TRANSVERSE CONTRACTION JOINTS NOT MORE THAN 15' C-C.
2. REINFORCEMENT - #4 BARS AT 18" O.C.E.W.
3. EXPANSION JOINTS TO BE PLACED AT ALL INTERSECTIONS AND NOT TO EXCEED 50' BETWEEN JOINTS.
4. CONCRETE SHALL BE CLASS "P".
5. ALL BASE AND SUBGRADE WILL BE DENSITY CONTROLLED AND WILL MEET ALL SPECIFICATION REQUIREMENTS FOR THE CITY OF SAN ANGELO.
6. IT IS THE GOAL OF THE CITY TO DESIGN AND CONSTRUCT A STREET SYSTEM THAT WILL HAVE A LIFE EXPECTANCY OF TWENTY YEARS WITH NORMAL MAINTENANCE. STREETS THAT ARE CONSTRUCTED IN INDUSTRIAL AREAS WHERE HEAVY LOADS ARE EXPECTED WILL REQUIRE INDIVIDUAL DESIGN PROCESSES.
7. 8" ENGINEERED SUBGRADE. IF STABILIZATION IS REQUIRED, THE RATE WILL BE DETERMINED ACCORDING TO TEST RESULTS.

CITY OF SAN ANGELO

CONCRETE URBAN RESIDENTIAL STREETS WITH ALLEYS OR SIDEWALKS

S-J-1



NOTES:

1. SAWED TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED:
   20' IN PAVEMENT ≥ 8" THICK;
   15' IN PAVEMENT < 8" THICK.
2. REFER TO TYPICAL PAVEMENT SECTION FOR LONGITUDINAL JOINT SPACING.

SPACING DIAGRAM FOR TRANSVERSE JOINTS
NOT TO SCALE

CITY OF SAN ANGELO

REINFORCED CONCRETE PAVEMENT TRANSVERSE JOINT SPACING

S-R-1

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KESTER
100095
LICENSED PROFESSIONAL ENGINEER
09/09/2019

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CITY OF SAN ANGELO
AVENUE P DETENTION BASIN

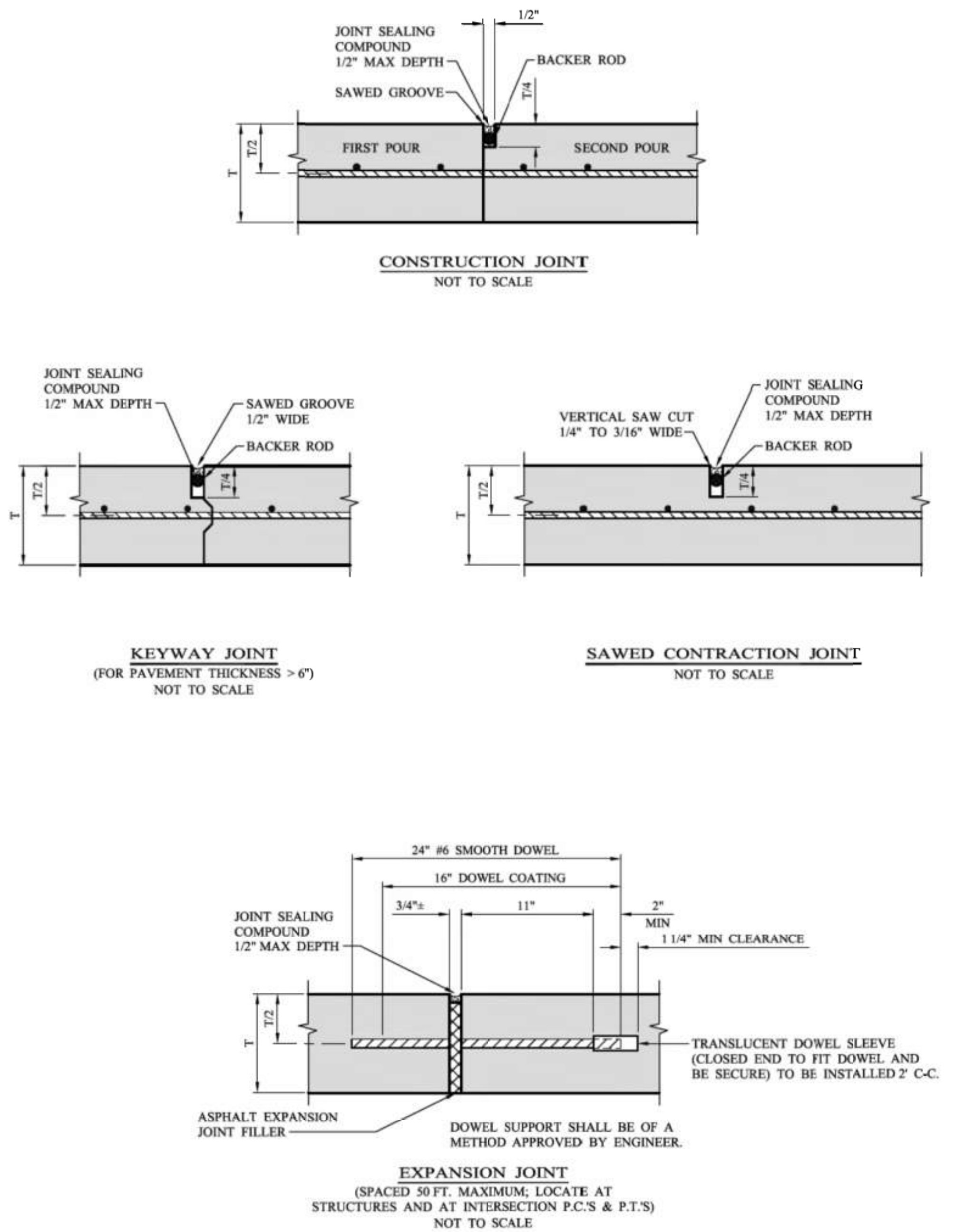
CIVIL
CITY OF SAN ANGELO STANDARD DETAILS (1 OF 3)

NO.	ISSUES	BY	DATE

F&N JOB NO.	SAN18286
DATE	07/15/19
DESIGNED	KMM
DRAWN	DAP
REVISED	
CHECKED	HRK
FILE NAME	cv-trt-pl-det01.dgn

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1

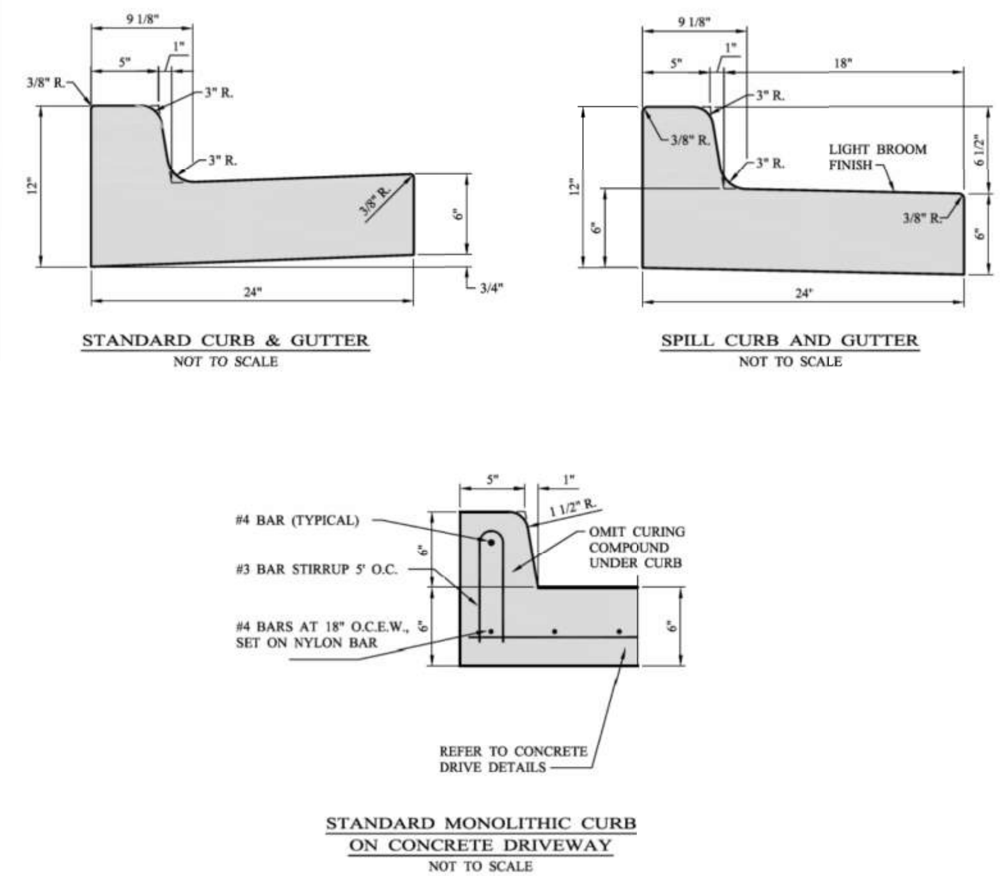
SHEET C-33
SEQ. 34



CITY OF SAN ANGELO

REINFORCED CONCRETE PAVEMENT DETAILS

S-S-1



NOTES:

1. DIMENSIONS HEREIN SHOWN ARE MINIMUM REQUIRED. THE DESIGNER MAY ADJUST WIDTH ACCORDING TO THE NEED. CONCRETE FOR CURB AND GUTTER SHALL BE CLASS "A" CONCRETE EXCEPT FOR STANDARD MONOLITHIC CURB WHICH IS CLASS "P". THE USE OF MORTAR TOPPING IS OPTIONAL. IF NOT MACHINE LAID, A "MULE" FINISING TOOL SHALL BE USED.
2. ALL TOOLED CONTRACTION JOINTS WILL BE ON 10' SPACING AT 1-1/2" MINIMUM DEPTHS. 1/2" EXPANSION JOINTS ON 50' SPACING OR AT BEGINNING OF RADII, OR AT INTERSECTIONS. LIGHT BROOM FINISH.
3. EXTRUDED CONCRETE MAY USE A MODIFIED GRADATION FOR MACHINE LAID CURB AND GUTTER AS APPROVED BY THE CITY ENGINEER.
4. IF MACHINE LAID, A MAXIMUM 1" FLARE AT THE BOTTOM IS PERMITTED.

CITY OF SAN ANGELO

CONCRETE CURB & GUTTERS

S-T-1

FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS — HEATHER RAE KEISTER — 100095 — LICENSED PROFESSIONAL ENGINEER
09/09/2019

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CITY OF SAN ANGELO

AVENUE P DETENTION BASIN

CIVIL

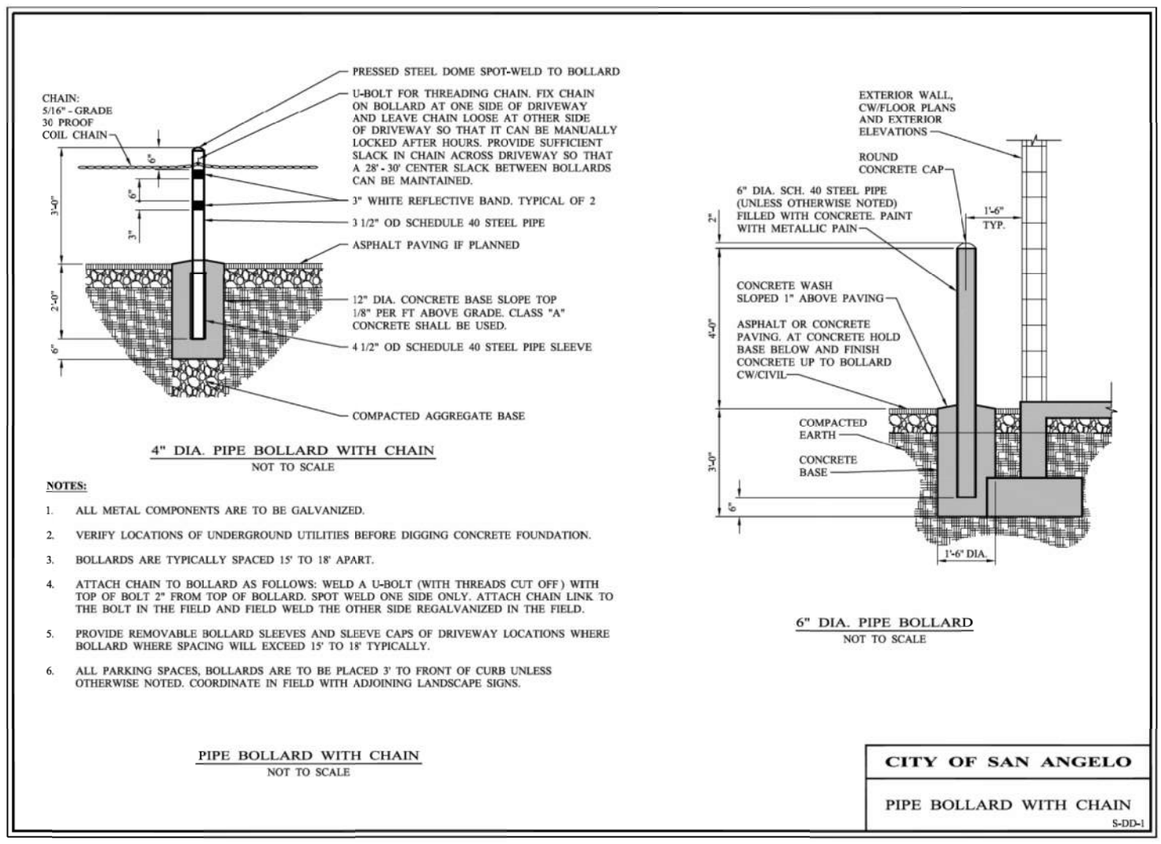
CITY OF SAN ANGELO
STANDARD DETAILS (2 OF 3)

NO.	ISSUES	BY	DATE

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-det02.dgn

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale. 0 1"

SHEET C-34
SEQ. 35



NOTES:
1. THE PROPOSED HAZARD WARNING SIGN SHALL BE SKU ONE-34586, ALUMINUM, 28X20 IN., FROM COMPLIANCESIGNS.COM OR APPROVED EQUAL.
2. POLE AND FENCE MOUNTING SHALL CONFORM TO OSHA 29 CFR 1910.145 HEADER STYLE, TEXT FORMAT AND COLOR.
3. SIGN LOCATIONS TO BE APPROVED BY CITY.

SEQ: 36
SHEET C-35

NO.	ISSUES	BY	DATE

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.

F&N JOB NO. SAN18286
DATE 07/15/19
DESIGNED KMM
DRAWN DAP
REVISED
CHECKED HRK
FILE NAME cv-trt-pl-det03.dgn

CITY OF SAN ANGELO
AVENUE P DETENTION BASIN
CIVIL
CITY OF SAN ANGELO
STANDARD DETAILS (3 OF 3)

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Lubbock, Texas 79423
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FREESE AND NICHOLS, INC.
TEXAS REGISTERED ENGINEERING FIRM F-2144

STATE OF TEXAS
HEATHER RAE KEISTER
100095
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PROFESSIONAL ENGINEER
09/09/2019