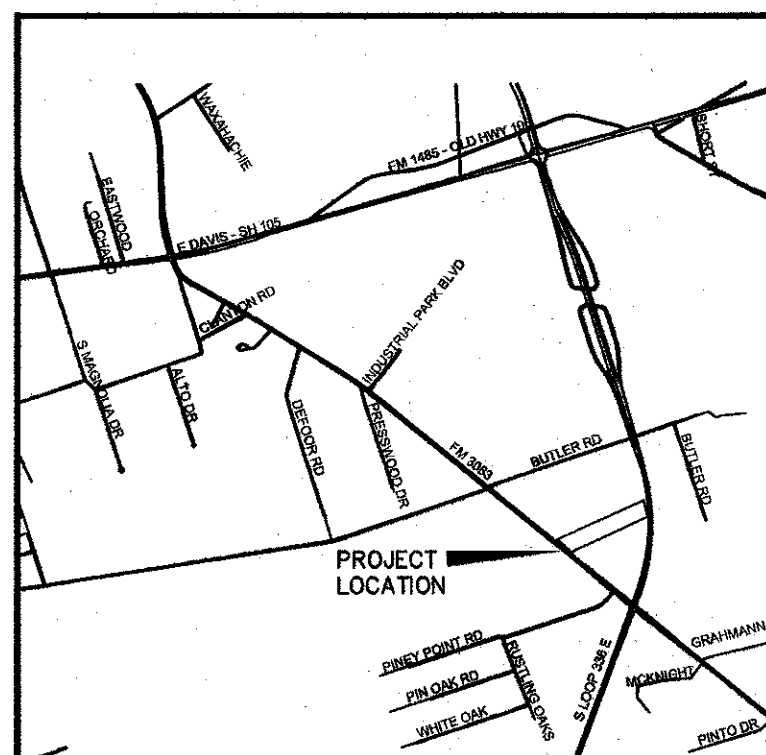


SANBERG INVESTMENTS SITE PLAN

4065 S. LOOP 336 E. CONROE, TX 77301

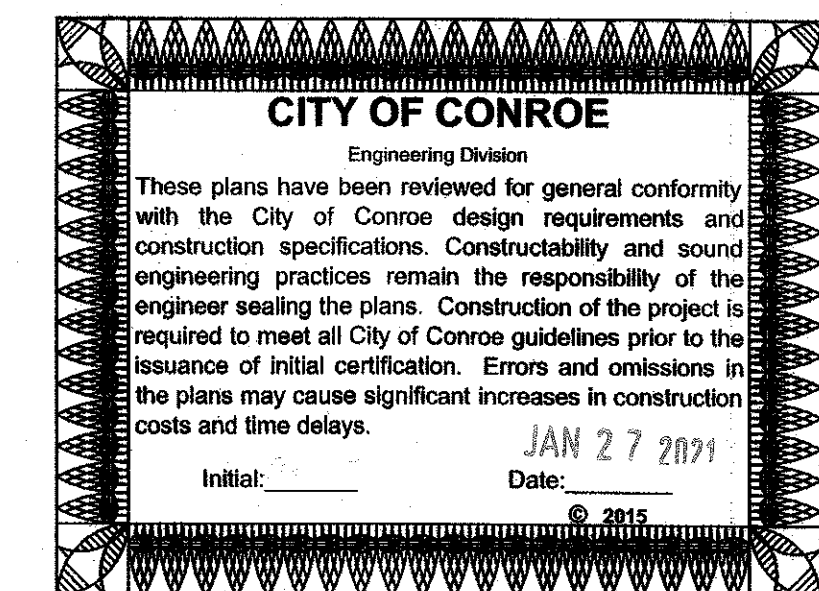
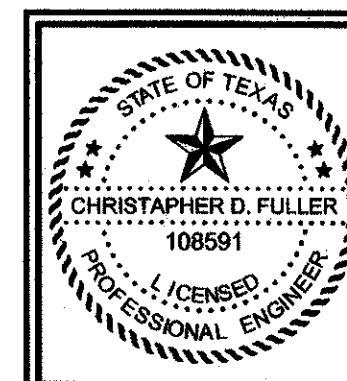
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VICINITY MAP
Montgomery County Key Map
N.T.S.

Construction Plans Grading & Paving & Utilities A.C.E.S. Job Number 125919-051



DP-20-007203

4065 S. Loop 336 E.

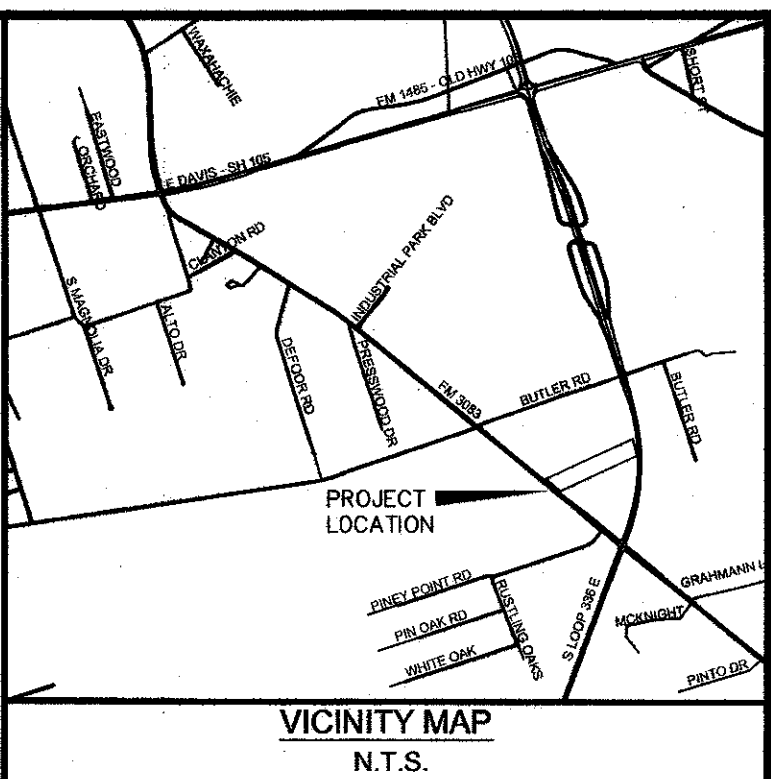
Sanberg Investments
125919-051 Sanberg Investments Site Plan

GENERAL CONSTRUCTION NOTES ~ CITY OF CONROE

1. MATERIALS, CONSTRUCTION AND TESTING TO BE IN ACCORDANCE WITH THE CITY OF CONROE ORDINANCES AND SPECIFICATIONS, LATEST PRINTING AND AMENDMENTS THERETO.
2. Contractor to obtain all development and construction permits required from Montgomery County, Texas and the City of Conroe at his expense prior to commencement of work.
3. Contractor shall give notice to all authorized inspectors, superintendents or persons in charge of private and public utilities or railroads affected by his operations and the City of Conroe, Department of Public Works and Engineering, (telephone: (409) 760-4605) 48 hours prior to commencement of work in streets rights-of-way or easements.
4. All existing underground utilities are not guaranteed to be completed or definite, but were obtained from the best information available. Contractor has sole responsibility for field verification of all existing facilities shown on drawings. Contractor shall coordinate all conflicts with the appropriate governing agency.
5. The location of Conroe-Lufkin Telephone Exchange or AT&T Company, Entex, and Entergy-GSU (Gulf States Utilities) utilities are shown in an approximate way only. The contractor shall request the exact location of these facilities by calling the utility companies, at least 48 hours before commencing work. The contractor is fully responsible for any and all damages which occur due to his failure to request the location and preservation of these underground facilities. Any damage for existing facilities incurred as a result of construction operations will be repaired by the contractor at his own expense.
6. Texas Law Article 1436c, prohibits all activities in which persons or equipment may come within 6 feet of energized overhead power lines, and federal regulation, Title 29, Part 1910.130 (1) and Part 1926.440 (a) (15) require a minimum clearance of 10 feet from these facilities. The above laws carry both criminal and civil liabilities, with contractors and owners being legally responsible for the safety of workers under these laws. If you or your company must work near overhead power lines, call the power company for the lines to be de-energized and/or moved at your expense.
7. Construction shall comply with the latest revisions of OSHA Regulations and State of Texas Law concerning trenching and shoring. Contractor shall provide a trench safety system to meet, as a minimum, the requirements of OSHA Safety and Health Regulation, Part 1926, Sub-part P as published in the Federal Register, Volume 54, No. 209, dated October 31, 1989, and City of Conroe Ordinance Number 1033-87, and latest revisions.
8. Details prepared by the City of Conroe do not extend to or include designs or systems pertaining to the safety of the Contractor or its employees, agents or representatives in the performance of the work. The Construction Contractor shall prepare or obtain the appropriate safety systems, including the plans and specifications required by Chapter 756, Subchapter "C" of the Texas Health and Safety Code.
9. Contractor shall cover open excavations with anchored steel plates during non-working hours, along existing roadways and traffic areas.

10. Adequate drainage shall be maintained at all times during construction and any drainage ditch or structure disturbed during construction shall be restored to the satisfaction of the City Engineer. All construction storm runoff shall comply with Storm Water Management for Construction Activities and the National Pollutant Discharge Elimination System (NPDES) requirements.
11. Contractor shall be responsible for providing adequate flagmen, signing, striping and warning devices, etc., during construction in accordance with the "Texas Manual of Uniform Control Devices". Contractor shall maintain at least one lane of traffic in each direction during working hours or provide all-weather detours around construction site, provide public notifications, and use uniformed police officers to control traffic.
12. Existing pavements, curbs, sidewalks, and driveways damaged or removed during construction shall be replaced to City of Conroe standards. All asphalt and concrete driveways excavated during construction shall be backfilled with stabilized material and returned to existing conditions. All State and County highway pavement and railroad right-of-way to be bored according to the regulations and requirements for approval and acceptance by said agencies.
13. Existing roads and/or right-of-way disturbed during construction shall be as good or better than the condition prior to starting the work, upon completion of the project. After disturbed areas have been completed to the lines, grades, and cross-sections shown on the plans, seeding shall be performed in accordance with the requirements of the Plans and Specifications to establish adequate vegetation coverage to eliminate erosion. If no provision for planting grass is included in the plans or specifications, the minimum requirement for this item will be in accordance with the Texas Department of Transportation Standard Specifications for "Sodding or Seeding for Erosion Control."

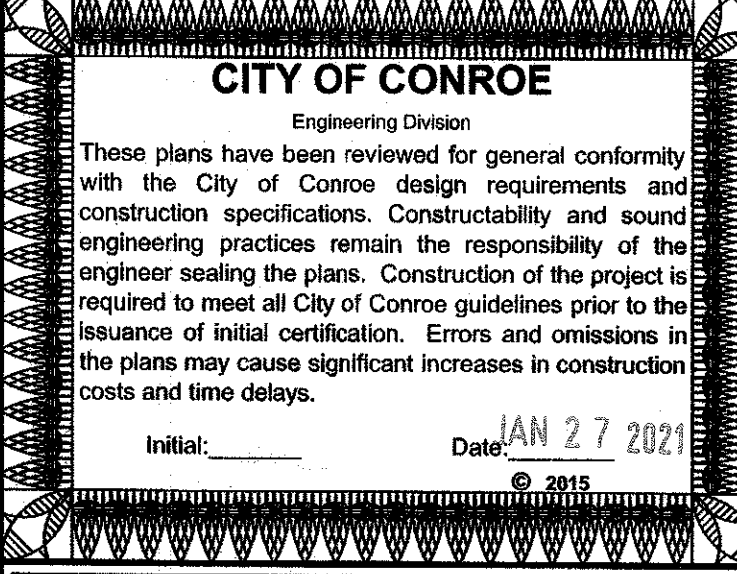
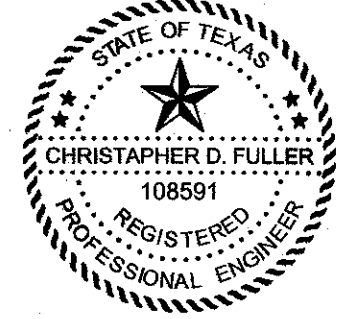
14. All trenches, including trenches for leads and stubs under pavement and to a point one (1) foot back of all curbs shall be backfilled with cements stabilized sand as per specification to a point immediately below the subgrade. Trenches other than under pavement shall be backfilled with suitable earth material in 6 inch layers and mechanically compacted to a density of not less than 95 percent of the maximum dry density as determined by the standard proctor compaction test (ASTM Designation D-698/AASHTO 199). Moisture content of backfill shall be in accordance with the requirements of the cement stabilized sand specifications. See City Standard Detail Sheets for Bedding and Other Design Requirements.
15. Include price of all bedding and backfill of type required, in price bid per linear foot of pipe.
16. Contractor to remove existing plugs and connect to existing utility lines as indicated on plans.
17. Unless otherwise noted on Plans, where manholes are located within the Utility Easements, the Contractor shall set rim elevations three inches above finished ground elevations.
18. When trench condition requires the use of well points, this is to be requested by the Contractor and approved by the Engineer.
19. Contractor shall be responsible for cleaning the mud and/or dirt deposited on existing pavement due to his construction activity daily. All equipment and debris from construction to be moved at end of project.
20. Approval of these plans does not constitute approval of any land activities within wetland area. It is the property's owner responsibility to ensure that the appropriate regulatory agencies are contacted and their requirements are met prior to any wetland area disturbance.



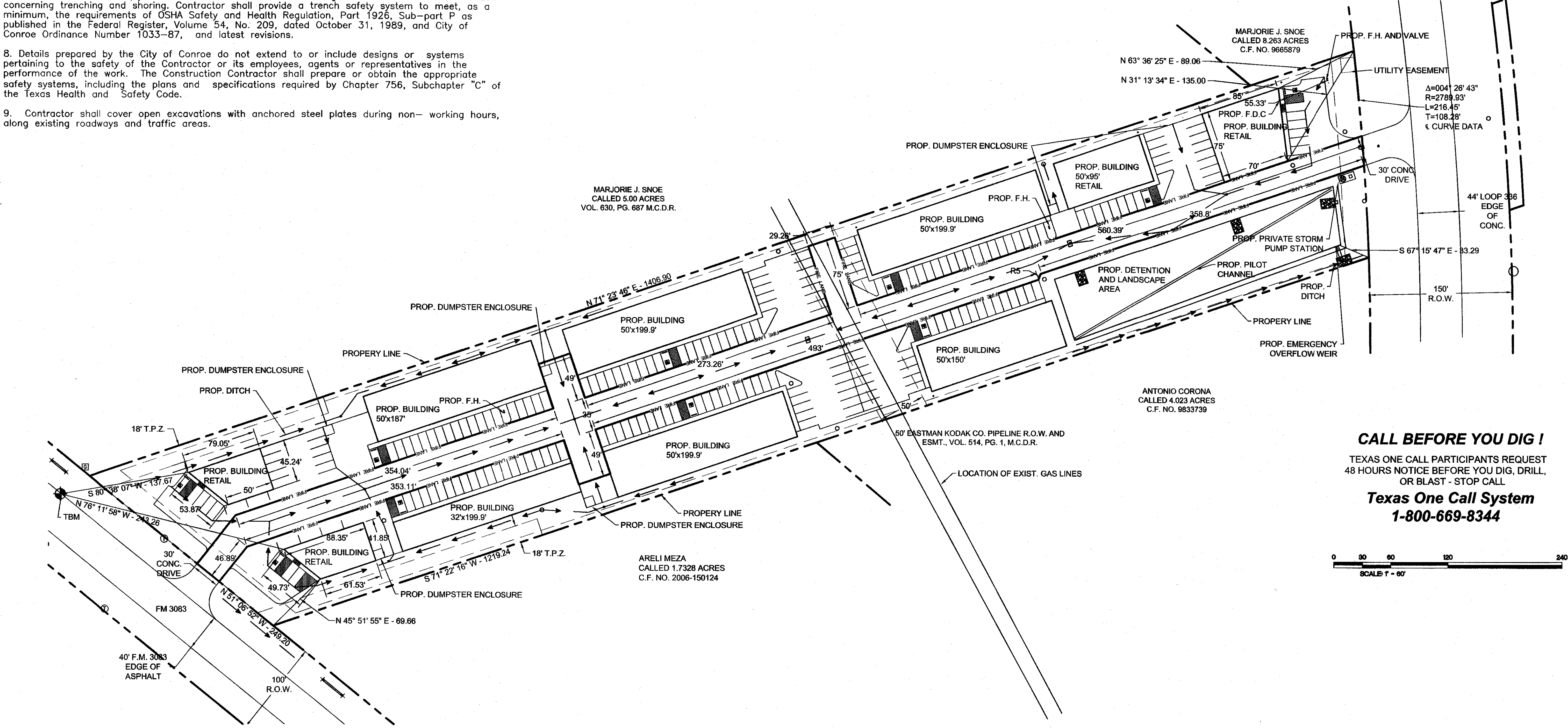
Utility Legend

- | | |
|-----------------------------|------------------------|
| Street Signs | Street Light |
| Plug | Tapping Sleeve & Valve |
| Blow-Off Valve | Clean Out |
| Gate Valve | San Manhole |
| Fire Hydrant | Storm Inlet |
| Tee | Storm Manhole |
| FL FLOWLINE | PC Point of Curve |
| TOB Top of Bank | ROW Right of Way |
| LF Linear Feet | UE Utility Easement |
| RCP Reinforced Conc Pipe | CO Cleanout |
| TP TOP OF PAVING | TG TOP GRAVEL |
| SW SIDE WALK | PG PROP. GRADE |
| NG NATURAL GRADE | TC TOP CURB |
| SET SAFETY END TREATMENT MH | MAHOLE |
| FH FIRE HYDRANT | FF FINISHED FLOOR |

- NOTES:
1. SITE BENCHMARK:
TBM IS SET MAG NAIL NORTHWEST OF PROPERTY
ELEV. -212.56'
2. FLOODPLAIN NOTE:
THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100 YEAR FLOODPLAIN ACCORDING TO FEMA FIRM PANEL NO. 48339C0395Q, EFFECTIVE AUGUST 18, 2014.



SANBERG INVESTMENTS
SITE PLAN
GENERAL NOTES AND LAYOUT



PARKING TYPE	AREA (SF)	REQUIREMENTS	PROVIDED
TOTAL RETAIL	16,628 SF	84	84
TOTAL OFFICE	23,500 SF	94	94
TOTAL WAREHOUSE	33,995 SF	34	34
1 SPACE IS REQUIRED PER 200 SQ. FT. OF RETAIL SPACE			
1 SPACE IS REQUIRED PER 250 SQ. FT. OF OFFICE SPACE			
1 SPACE IS REQUIRED PER 1,000 SQ. FT. OF WAREHOUSE SPACE			

- NOTE:
- ALL UTILITIES TIE INS WILL BE MADE BY THE CITY OF CONROE AT DEVELOPERS EXPENSE
 - WATER AND SEWER UTILITIES SHALL BE PRIVATE AND TO PLUMBING CODE
 - ALL WATER LINES ARE TO BE C-900 OR APPROVED EQUAL
 - ALL SANITARY SEWER LINES ARE TO BE SDR-26 OR APPROVED EQUAL
 - CONTRACTOR TO FIELD VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES

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- CONTRACTOR TO FIELD VERIFY LOCATION, DEPTH, AND SIZE OF EXISTING UTILITIES

0 5 10 20 40
SCALE 1" = 10'

0 25 50 100 200
SCALE 1" = 50'

0 20 40 80 160
SCALE 1" = 40'

VICINITY MAP
N.T.S.

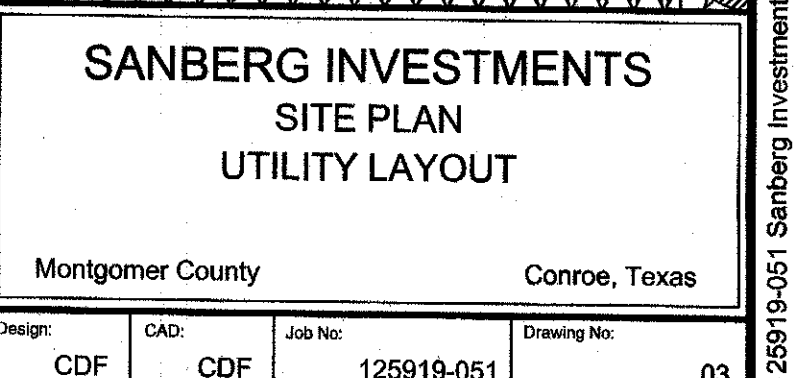
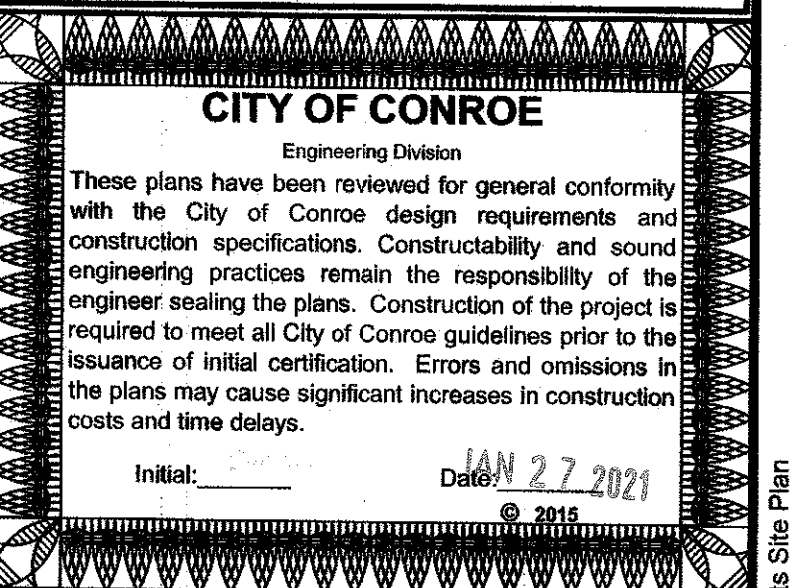
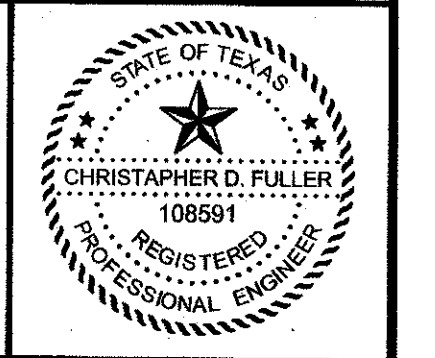
Utility Legend

- | | |
|--------------------------|-----------------------|
| Street Signs | Street Light |
| Plug | Taping Sleeve & Valve |
| Blow-Off Valve | Clean Out |
| Gate Valve | San Manhole |
| Fire Hydrant | Storm Inlet |
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| SW SIDE WALK | PG PROP. GRADE |
| NG NATURAL GRADE | TC TOP CURB |
| SET SAFETY END TREATMENT | MH MAHOLE |
| FH FIRE HYDRANT | FF FINISHED FLOOR |

NOTES:

1. **SITE BENCHMARK:**
T.B.M. IS SET MAG NAIL NORTH-WEST OF PROPERTY
ELEV=212.56'

2. **FLOODPLAIN NOTE:**
THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100
YEAR FLOODPLAIN ACCORDING TO FEMA FIRM PANEL
NO. 48339C0395Q, EFFECTIVE AUGUST 18, 2014.

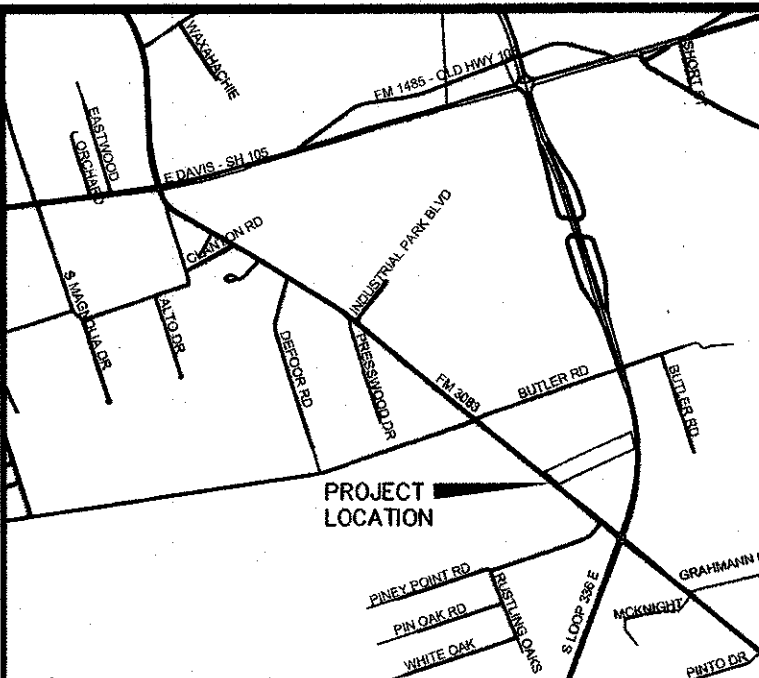


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User: JCF

125919-051 Sanberg Investments Site Plan

PROJECT NAME: Sanberg Investments		Storm Frequency: 100 yr.																											
JOB NO.:		b= 92																											
DATE CREATED:		d= 7.9																											
BY: C. Dane Fuller, P.E.		e= 0.712																											
DATE REVISED:																													
100 YEAR FREQUENCY																													
SYSTEM																													
MANHOLES/ INLETS from	MANHOLES/ INLETS to	Additional Area Through Sewer	Area to Inlet ac.	Total Area ac.	tc min.	C Cumulative	Intensity in./hr.	Q c.f.s.	Additional Q c.f.s.	Total Q c.f.s.	Q Pass c.f.s.	Reach ft.	LINE size in.	slope %	n	DESIGN Q c.f.s.		V f.p.s.	Actual V f.p.s.	Friction Loss ft.	Minor Loss ft.	FLOWLINES upstrm. elev.		dnstrm. elev.	Line Size ft.	HYDR. GRAD. upstrm. elev.		dnstrm. elev.	HYDR.GRAD. slope %
1	2		0.80	0.80	15.00	0.85	9.90	6.73	0.00	6.73	0.00	234	30	0.15%	0.013	15.86	3.2	1.4	0.06	0.00	198.33	197.98	2.5	201.36	201.30	0.03			
2	3		0.96	1.76	15.00	0.85	9.90	14.81	0.00	14.81	0.00	259	30	0.15%	0.013	15.92	3.2	3.0	0.34	0.00	197.98	197.59	2.5	201.30	200.96	0.13			
3	4		1.00	2.76	15.00	0.65	9.90	39.61	0.00	39.61	0.00	295	30	0.32%	0.013	46.31	4.7	4.0	0.68	0.00	197.59	196.65	2.5	200.96	200.28	0.23			
4	POND		0.64	7.02	15.00	0.67	9.90	46.50	0.00	46.50	0.00	31	36	0.16%	0.013	26.79	3.8	6.6	0.15	0.00	196.65	196.60	3.0	200.28	200.13	0.48			
5	6		2.82	2.82	15.00	0.40	9.90	11.17	0.00	11.17	0.00	257	30	0.18%	0.013	17.54	3.6	2.3	0.19	0.00	198.60	198.13	2.5	201.43	201.24	0.07			
6	7		2.82	2.82	15.00	0.40	9.90	11.17	0.00	11.17	0.00	259	30	0.15%	0.013	15.92	3.2	2.3	0.19	0.00	198.13	197.74	2.5	201.24	201.05	0.07			
7	3		0.11	2.93	15.00	0.42	9.90	12.09	0.00	12.09	0.00	97	30	0.16%	0.013	16.13	3.3	2.5	0.08	0.00	197.74	197.59	2.5	201.05	200.96	0.09			
8	9		0.40	0.40	15.00	0.85	9.90	3.37	0.00	3.37	0.00	234	18	0.44%	0.013	6.97	3.9	1.9	0.24	0.00	199.95	198.92	1.5	201.45	201.04	0.18			
9	10		0.33	0.33	15.00	0.85	9.90	2.78	0.00	2.78	0.00	259	24	0.44%	0.013	15.07	4.8	0.9	0.04	0.00	198.92	197.77	2.0	201.04	201.00	0.01			
10	3		0.11	0.51	15.00	0.85	9.90	4.29	0.00	4.29	0.00	297	24	0.19%	0.013	9.75	3.1	1.4	0.03	0.00	197.77	197.59	2.0	201.00	200.96	0.04			
11	4		0.18	0.18	15.00	0.85	9.90	1.51	0.00	1.51	0.00	90	12	0.88%	0.013	3.35	4.3	1.9	0.16	0.00	197.45	196.65	1.0	200.44	200.28	0.18			
12	POND		0.09	0.09	15.00	0.85	9.90	0.76	0.00	0.76	0.00	162	12	0.44%	0.013	2.36	3.0	1.0	0.07	0.00	197.00	196.29	1.0	198.00	197.29	0.44			
13	14		0.07	0.07	15.00	0.85	9.90	0.59	0.00	0.59	0.00	182	12	0.44%	0.013	2.36	3.0	0.7	0.05	0.00	197.00	196.20	1.0	198.00	197.47	0.29			
14	POND		0.43	0.50	15.00	0.85	9.90	4.21	0.00	4.21	0.00	28	12	0.44%	0.013	2.36	3.0	5.4	0.39	0.00	196.20	196.08	1.0	197.47	197.08	1.39			

NOTE: ALL STORM DESIGNED FOR 100 YR
- EXTREME EVENT WILL FLOW DOWN C.L. OF DRIVE

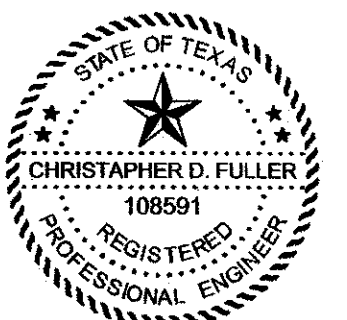


VICINITY MAP
N.T.S.

Utility Legend

- Street Signs
- Plug
- Blow-Off Valve
- Gate Valve
- Fire Hydrant
- Tee
- FL FLOWLINE
- TOB Top of Bank
- LF Linear Feet
- RCP Reinforced Conc Pipe
- TP TOP OF PAVING
- SW SIDE WALK
- NG NATURAL GRADE
- SET SAFETY END TREATMENT
- FH FIRE HYDRANT
- Street Light
- Taping Sleeve & Valve
- Clean Out
- San Manhole
- Storm Inlet
- Storm Manhole
- PC Point of Curve
- ROW Right of Way
- UE Utility Easement
- CO Cleanout
- TG TOP GRAVEL
- PG PROP. GRADE
- TC TOP CURB
- MH MAHOLE
- FF FINISHED FLOOR

NOTES:
1. SITE BENCHMARK:
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ELEV. -212.56'
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YEAR FLOODPLAIN ACCORDING TO FEMA FIRM PANEL
NO. 48339C0395Q, EFFECTIVE AUGUST 18, 2014.

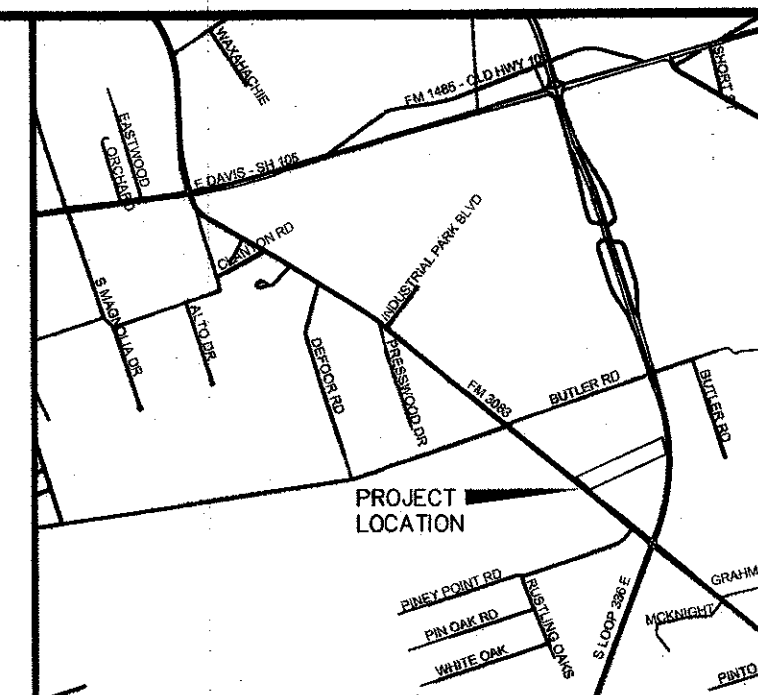
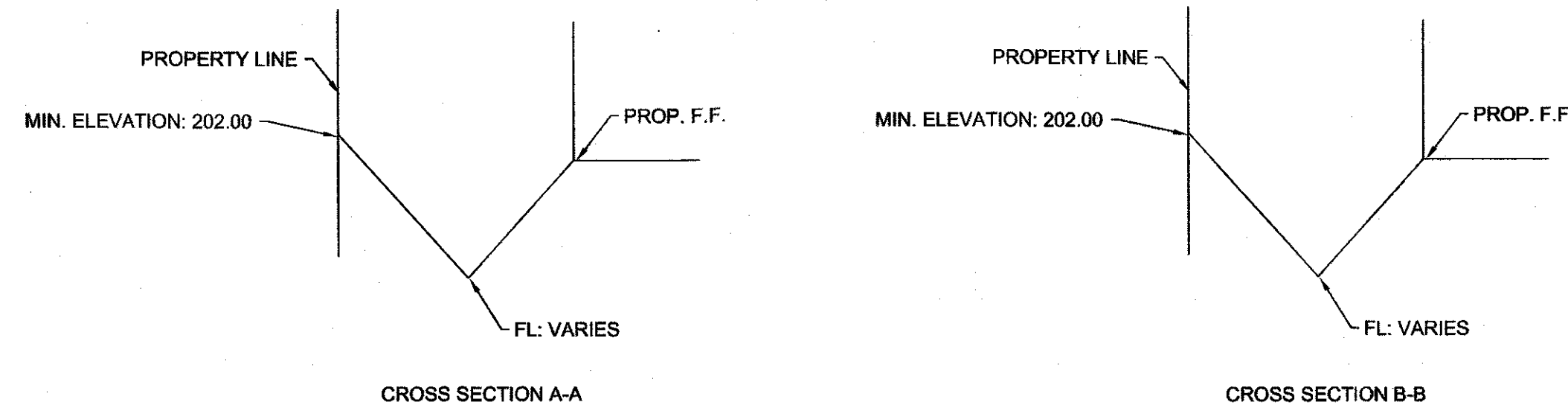


ACES
AMERICAN CIVIL ENGINEERING SERVICES, L.P.
P.O. Box 3220 • Conroe, Texas 77305 • FRN - 7349
936-760-3260 • 936-760-3270 (Fax) • www.americanaces.com

CITY OF CONROE
Engineering Division
These plans have been reviewed for general conformity
with the City of Conroe design requirements and
construction specifications. Constructability and sound
engineering practices remain the responsibility of the
engineer sealing the plans. Construction of the project is
required to meet all City of Conroe guidelines prior to the
issuance of initial certification. Errors and omissions in
the plans may cause significant increases in construction
costs and time delays.
Initial: _____ Date: JAN 27 202
© 2015

**SANBERG INVESTMENTS
SITE PLAN
STORM SEWER PLAN**
Montgomery County Conroe, Texas
Design: CDF CAD: CDF Job No: 125919-051 Drawing No: 04

Date: 10 Jan 2022
Sanberg Investments Site Plan
125919-051 Sanberg Investments Site Plan

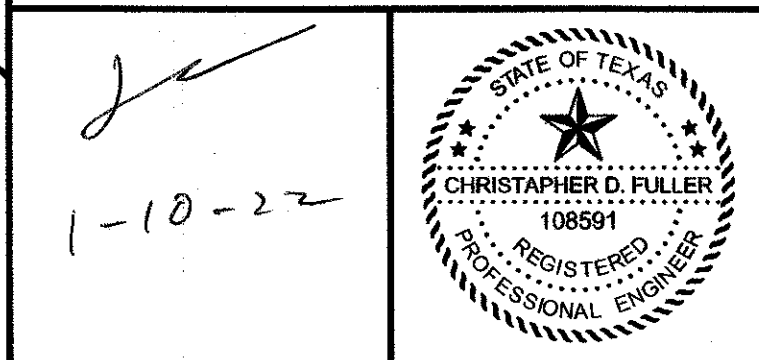


VICINITY MAP
N.T.S.

Utility Legend

- | | |
|--------------------------|-----------------------|
| Street Signs | Street Light |
| Plug | Taping Sleeve & Valve |
| Blow-Off Valve | Clean Out |
| Gate Valve | San Manhole |
| Fire Hydrant | Storm Inlet |
| Tee | Storm Manhole |
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| LF Linear Feet | UE Utility Easement |
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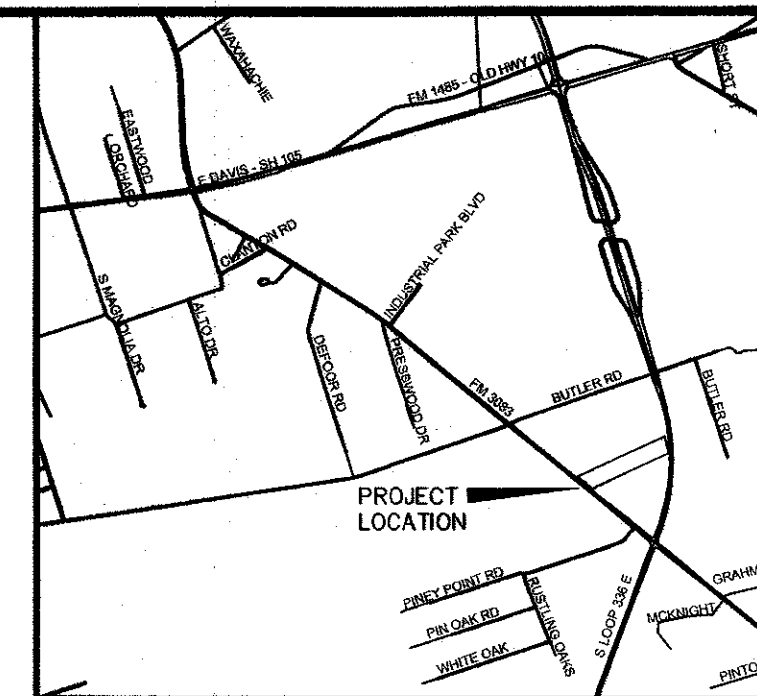


CITY OF CONROE
Engineering Division
These plans have been reviewed for general conformity with the City of Conroe design requirements and construction specifications. Constructability and sound engineering practices remain the responsibility of the engineer sealing the plans. Construction of the project is required to meet all City of Conroe guidelines prior to the issuance of initial certification. Errors and omissions in the plans may cause significant increases in construction costs and time delays.
Initial: _____ Date: **JAN 27 2021**
© 2015

SANBERG INVESTMENTS
SITE PLAN
GRADING LAYOUT 01
Montgomery County Conroe, Texas
Design: CDF CAD: CDF Job No: 125919-051 Drawing No: 05

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125919-051 Sanberg Investments Site Plan

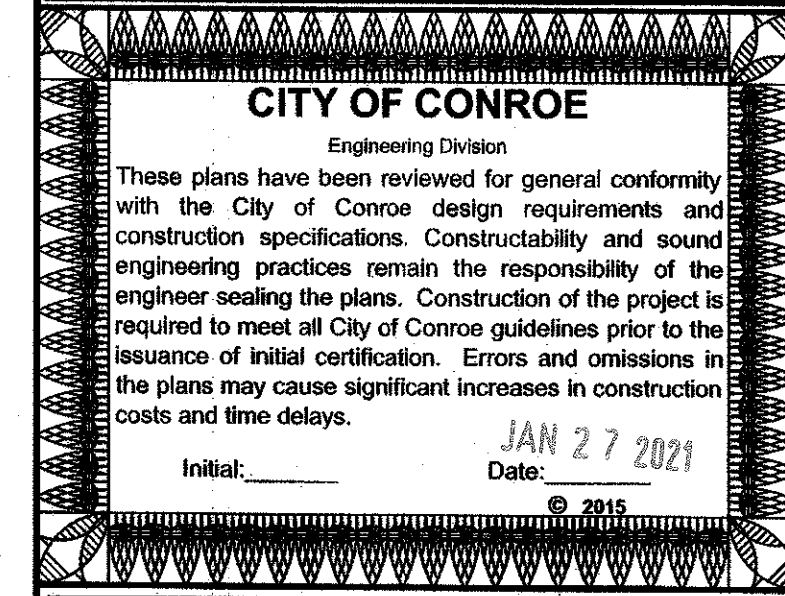
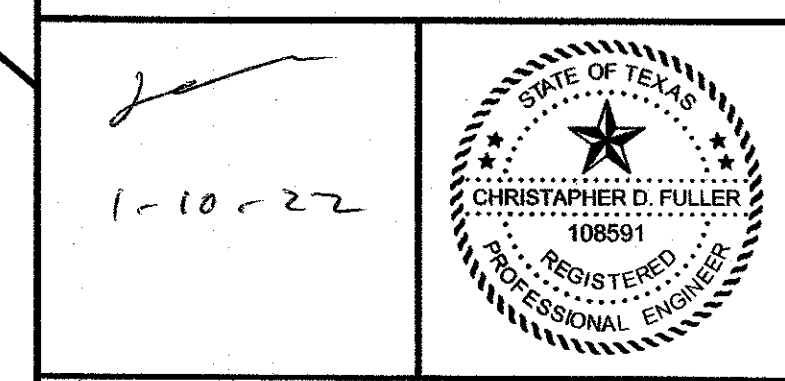


VICINITY MAP
N.T.S.

Utility Legend

Street Signs	Street Light
Plug	Taping Sleeve & Valve
Blow-Off Valve	Clean Out
Gate Valve	San Manhole
Fire Hydrant	Storm Inlet
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FL FLOWLINE	PC Point of Curve
TOB Top of Bank	ROW Right of Way
LF Linear Feet	UE Utility Easement
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SET SAFETY END TREATMENT MH	MAHOLE
FH FIRE HYDRANT	FF FINISHED FLOOR

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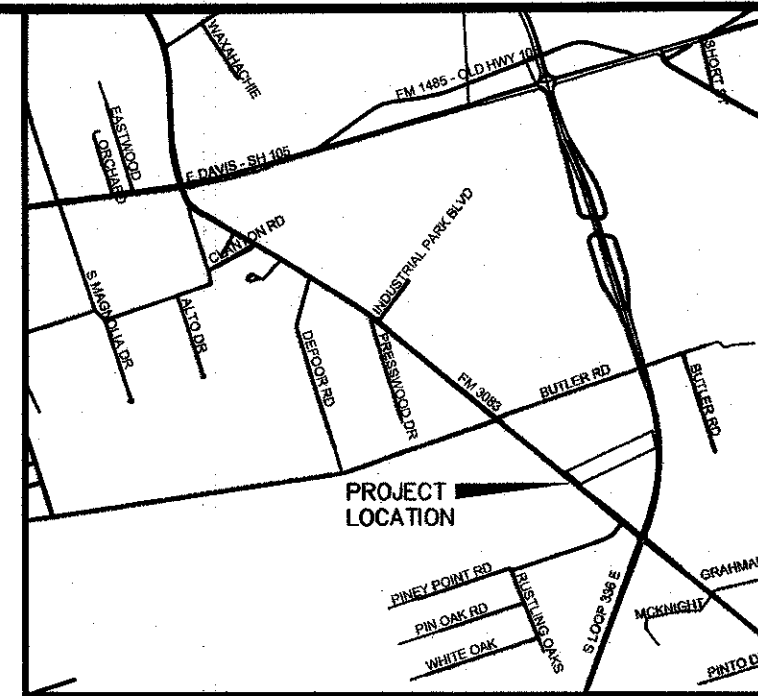


SANBERG INVESTMENTS SITE PLAN GRADING LAYOUT 01	
Montgomery County	Conroe, Texas
Design: CDF	CAD: CDF
Job No: 125919-051	Drawing No: 05

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125919-051 Sanberg Investments Site Plan

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SCALE 1" = 30'

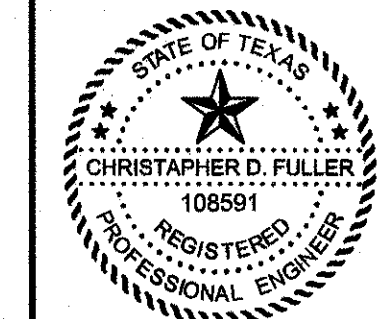


VICINITY MAP
N.T.S.

Utility Legend

Street Signs	Street Light
Plug	Taping Sleeve & Valve
Blow-Off Valve	Clean Out
Gate Valve	San Manhole
Fire Hydrant	Storm Inlet
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PC Point of Curve	
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NS NATURAL GRADE	TC TOP CURB
SET SAFETY END TREATMENT	MH MAHOLE
FH FIRE HYDRANT	FF FINISHED FLOOR

NOTES:
1. SITE BENCHMARK:
TBM IS SET MAG NAIL NORTHWEST OF PROPERTY
ELEV. 212.56'
2. FLOODPLAIN NOTE:
THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100
YEAR FLOODPLAIN ACCORDING TO FEMA FIRM PANEL
NO. 48339C0395G, EFFECTIVE AUGUST 18, 2014.



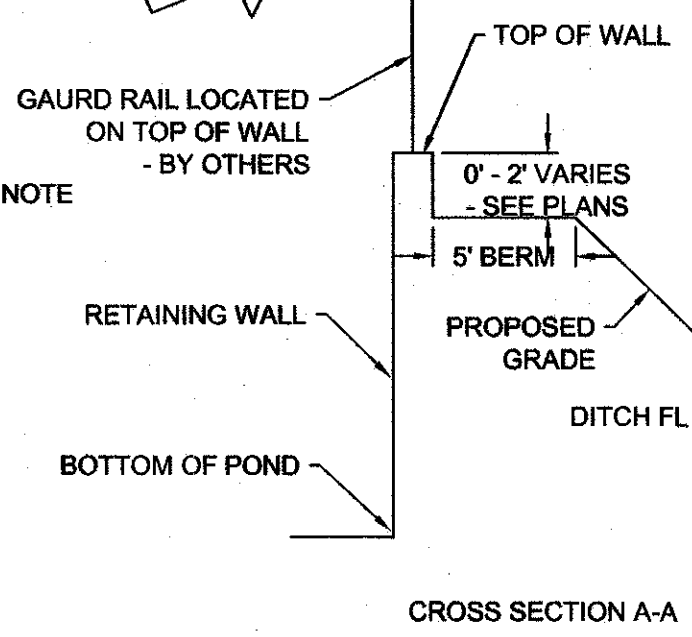
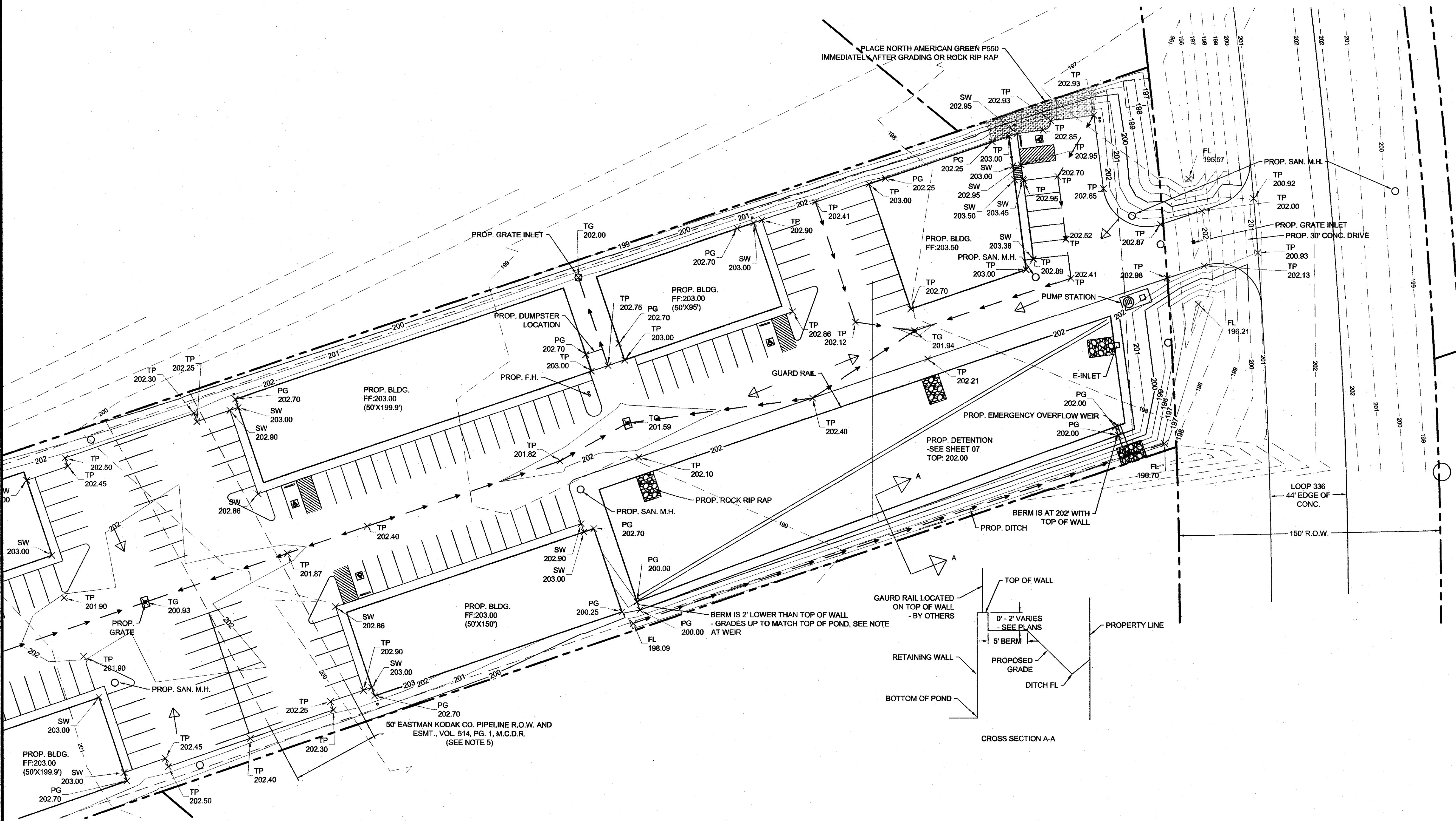
CITY OF CONROE
Engineering Division
These plans have been reviewed for general conformity
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construction specifications. Constructability and sound
engineering practices remain the responsibility of the
engineer sealing the plans. Construction of the project is
required to meet all City of Conroe guidelines prior to the
issuance of initial certification. Errors and omissions in
the plans may cause significant increases in construction
costs and time delays.
Initial: _____ Date: **JAN 27 2021**

SANBERG INVESTMENTS SITE PLAN GRADING LAYOUT 02

Montgomery County Conroe, Texas

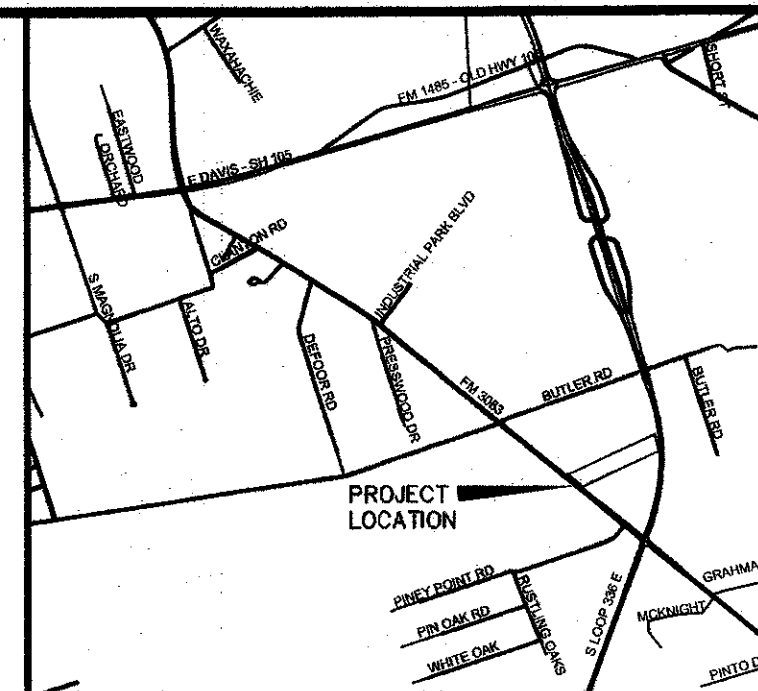
Design: CDF CAD: CDF Job No: 125919-051 Drawing No: 06

Plot Name: Z:\Files\PROJECTS\125919-051\125919-051.dwg
Date: Jan 10, 2021 4:19 PM
User: J. Fuller



CROSS SECTION A-A

0 15 30 60 120
SCALE 1" = 30'

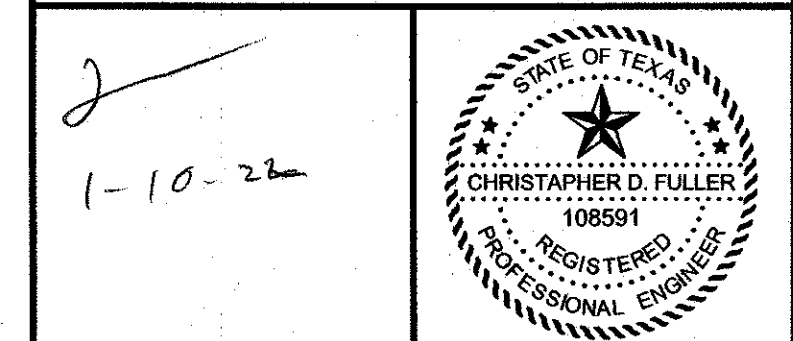


VICINITY MAP
N.T.S.

Utility Legend

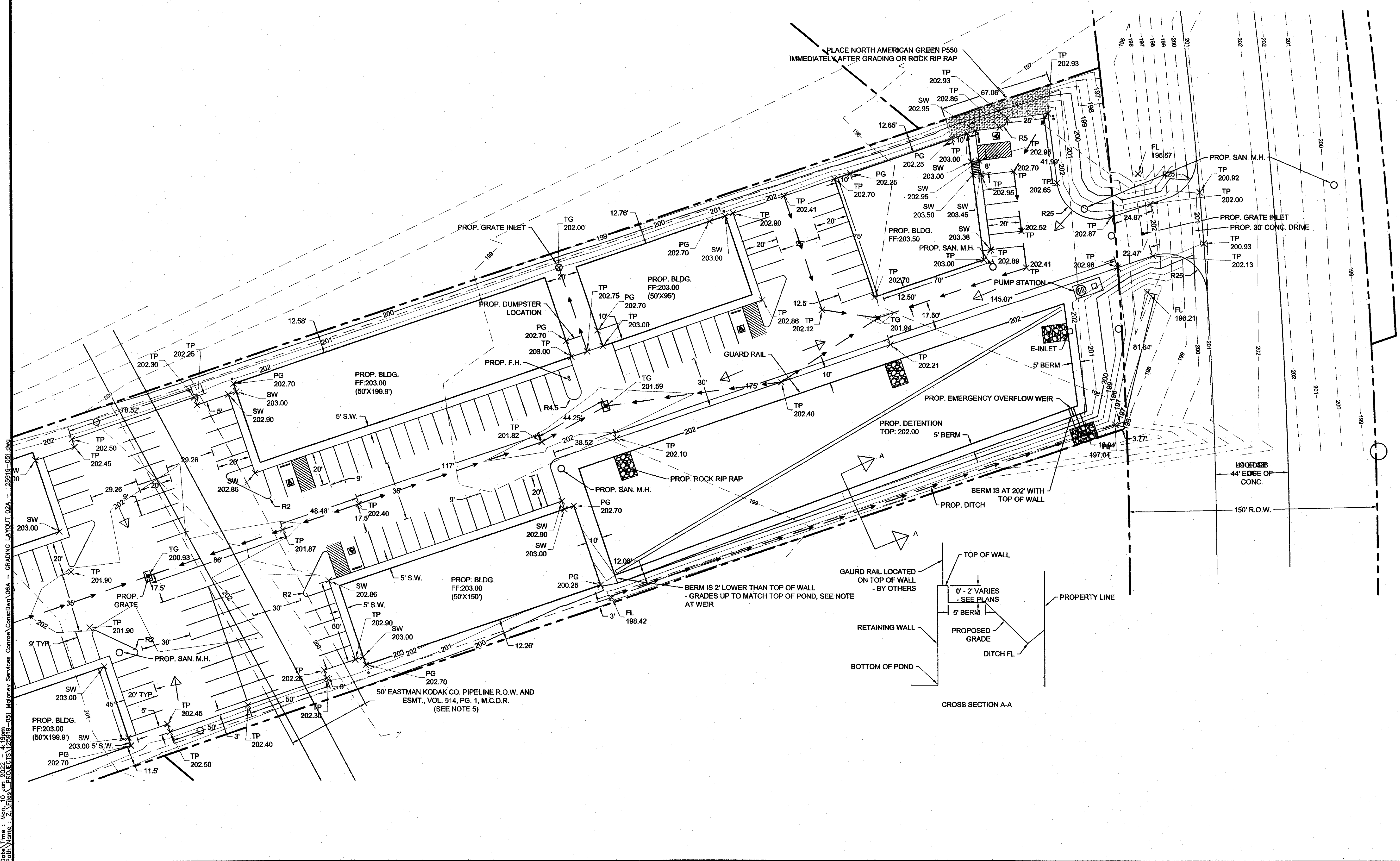
- | | |
|--------------------------|------------------------|
| Street Signs | Street Light |
| Plug | Tapping Sleeve & Valve |
| Blow-Off Valve | Clean Out |
| Gate Valve | San Manhole |
| Fire Hydrant | Storm Inlet |
| Tee | Storm Manhole |
| PC Point of Curve | |
| ROW Right of Way | |
| UE Utility Easement | |
| CO Cleanout | |
| TP TOP OF PAVING | TG TOP GRAVEL |
| SW SIDE WALK | PG PROP. GRADE |
| NG NATURAL GRADE | TC TOP CURB |
| SET SAFETY END TREATMENT | MH MAHOLE |
| FH FIRE HYDRANT | FF FINISHED FLOOR |

NOTES:
1. SITE BENCHMARK:
T.B.M. IS SET MAG NAIL NORTHWEST OF PROPERTY
ELEV. -212.56'
2. FLOODPLAIN NOTE:
THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100
YEAR FLOODPLAIN ACCORDING TO FEMA F.I.R.M. PANEL
NO. 48339C0395C, EFFECTIVE AUGUST 18, 2014.

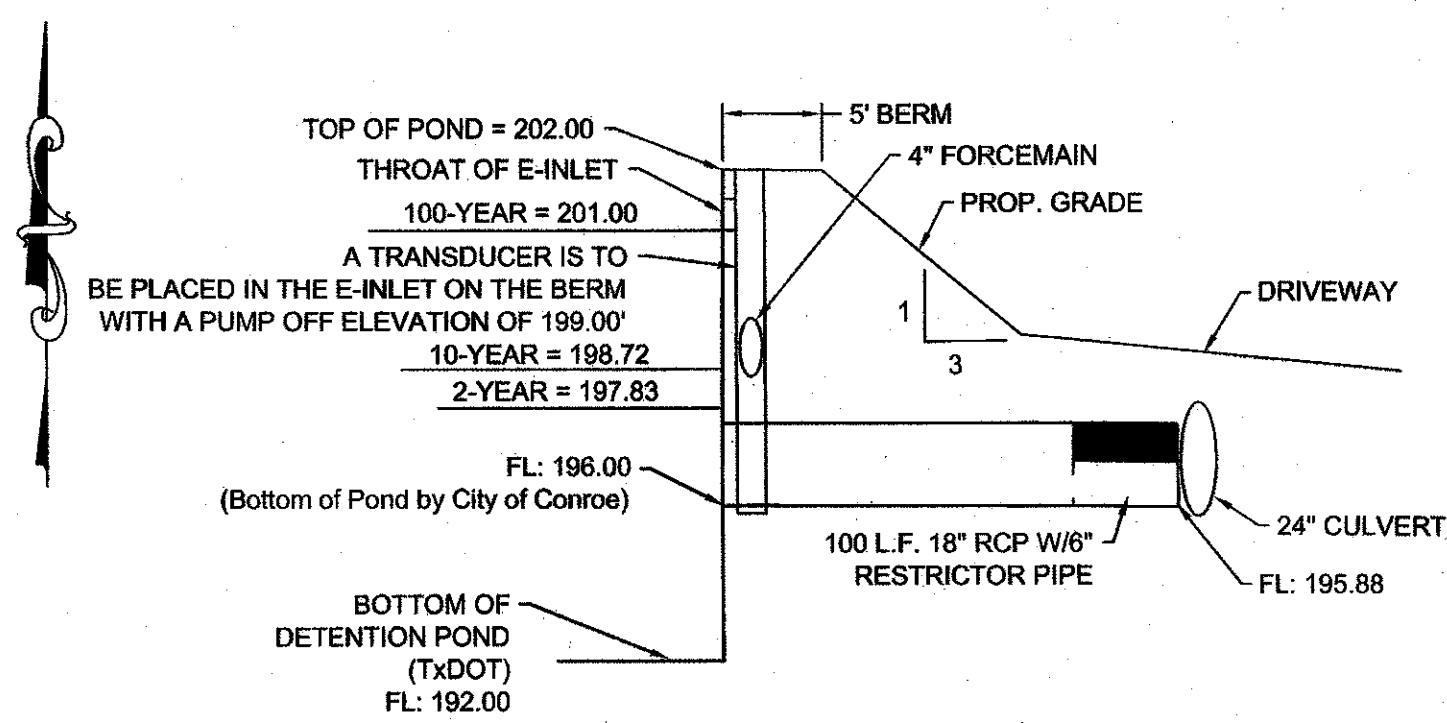
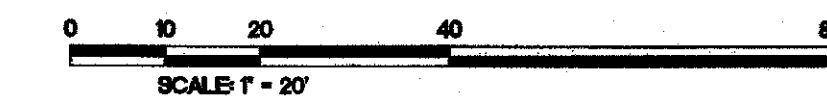


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costs and time delays.
Initial: _____ Date: 2/7/2021
By: _____

SANBERG INVESTMENTS SITE PLAN GRADING LAYOUT 02A	
Montgomery County	Conroe, Texas
Design: CDF	CAD: CDF
Job No: 125919-051	Drawing No: 06A

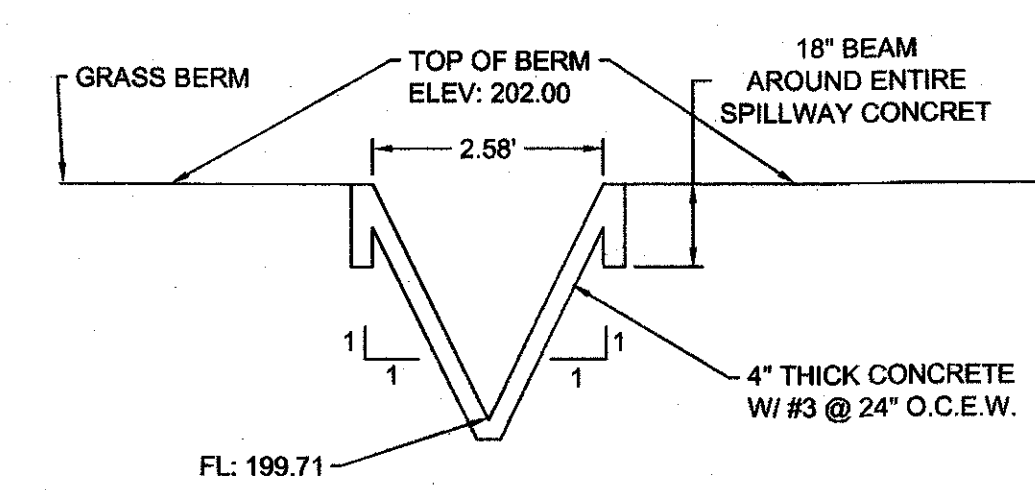


Date: Time: 10 Jan 2021 1:39pm
User: j...
Project: 125919-051
Drawing: 06A
Title: GRADING LAYOUT 02A - 125919-051.dwg

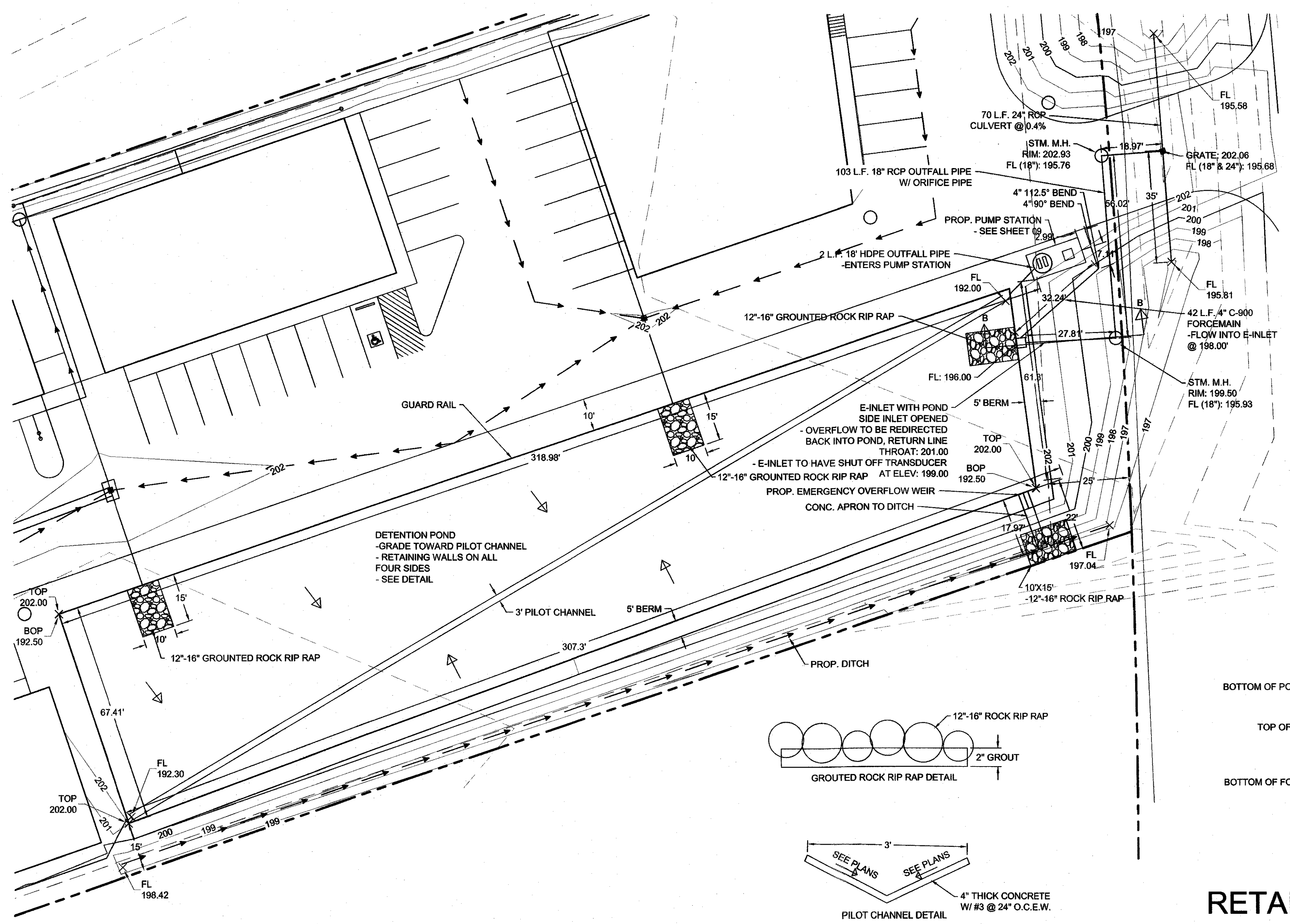
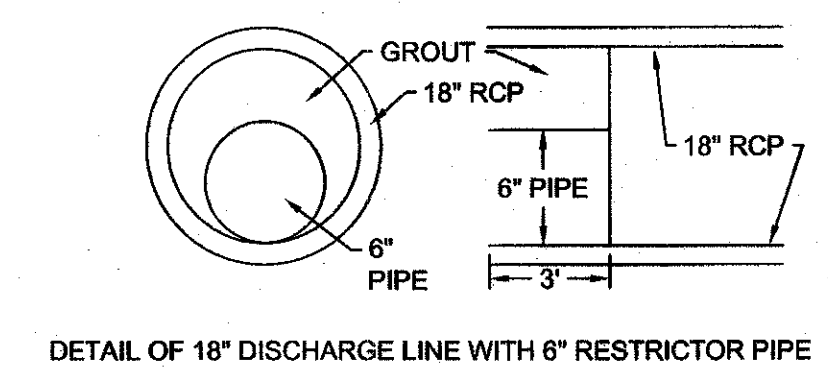


DETENTION CROSS-SECTION B-B
NOT TO SCALE

NOTE: GRAVITY PORTION OF POND SATISFIES CITY OF CONROE DETENTION REGULATIONS. EXTRA DEPTH AND PUMP STATION ARE FOR ADDITIONAL TxDOT REQUIREMENTS

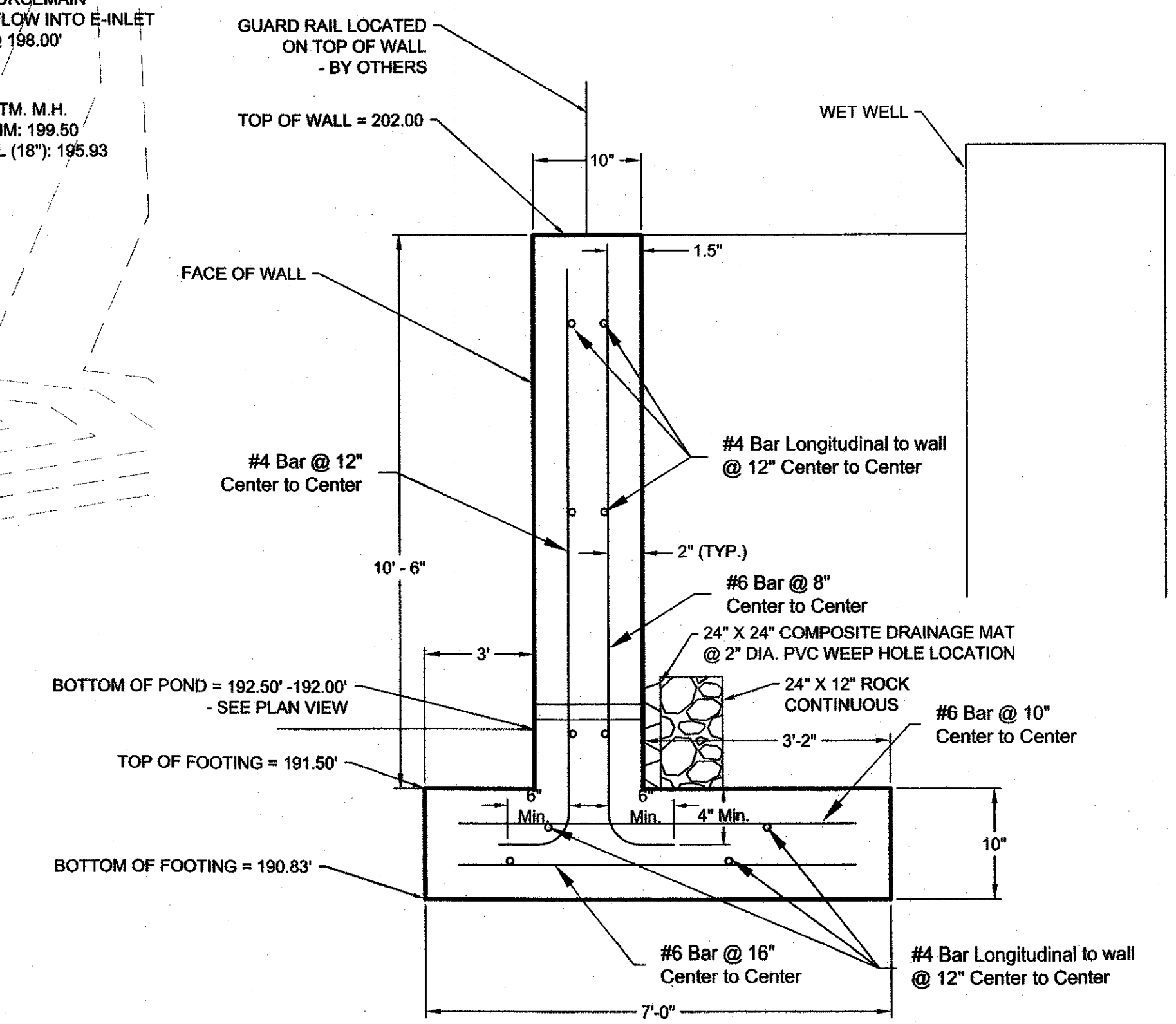


EMERGENCY SPILLWAY PROFILE



RETAINING WALL SPECIFICATIONS		
MATERIAL		ASTM SPECIFICATION (MINIMUM)
1.0 STEEL		
1.01 CONCRETE REINFORCING		A615 GRADE 60 A305
1.02 ALL REINFORCED STEEL SHALL BE DETAILED AND INSTALLED PER MOST RECENT AMERICAN CONCRETE INSTITUTE (ACI) SPECIFICATIONS (ACI 315).		
2.0 CONCRETE		
2.01 PORTLAND CEMENT		C-150
2.02 AGGREGATE		C-33
2.03 ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 4,000 PSI. USE OF CALCIUM CHLORIDE OR FLY ASH IS PROHIBITED. CONCRETE SHALL BE PLACED AND CURED PER LATEST ACI SPECIFICATIONS. CONCRETE SHALL NOT BE PLACED IN FREEZING WEATHER.		
B. GENERAL		
1.0 SOIL BEARING SPECIFICATIONS:		2,800 PSF MINIMUM
2.0 DESIGNS ARE NOT INTENDED TO BE USED WHERE ICE COULD FORM UNDER FOUNDATIONS OR ADJACENT TO WALL. NO WATER LINES SHALL BE PERMITTED BEHIND RETAINING WALL. STANDING WATER BEHIND WALL IS PROHIBITED. POSITIVE DRAINAGE OF ALL SURFACE WATER BEHIND RETAINING WALL IS REQUIRED.		
3.0		

- NOTES:
1. PROVIDE CONSTRUCTION JOINT AT 30' MAX. O.C.
 2. PROVIDE EXPANSION JOINT AT CHANGE FROM RETAINING WALL 1 TO RETAINING WALL 2
 3. PROVIDE 2" Ø PVC DRAINS AT 10' O.C. - MESH INSECT SCREEN TO COVER ON FACE OF WALL
 4. PROVIDE 24" X 24" MIRADRIN OR EQUAL COMPOSITE DRAINAGE MAT AT WEEP HOLE AND ANCHORED TO BACK FACE.
 5. PROVIDE 24" (TALL) X 12" (DEPTH) PERVIOUS BACKFILL CONTINUOUS BEHIND WALL.
 6. PROVIDE 12" X #4 @ 12" O.C. CORNER BARS AT ALL ANGLE POINTS AND CONSTRUCTION JOINTS.
 7. PROVIDE 2-#4 HOOPS AT ALL 12" Ø OR LARGER PENETRATIONS.



RETAINING WALL CROSS SECTION 1
Not To Scale

VICINITY MAP
N.T.S.

PROJECT LOCATION

Utility Legend

Street Signs	Street Light
Plug	Taping Sleeve & Valve
Blow-Off Valve	Clean Out
Gate Valve	San Manhole
Fire Hydrant	Storm Inlet
Tee	Storm Manhole
FL FLOWLINE	PC Point of Curve
TOB Top of Bank	ROW Right of Way
LF Linear Feet	UE Utility Easement
RCP Reinforced Conc Pipe	CO Cleanout
TP TOP OF PAVING	TG TOP GRAVEL
SW SIDE WALK	PG PROP. GRADE
NG NATURAL GRADE	TC TOP CURB
SET SAFETY END TREATMENT	MH MAHOLE
FH FIRE HYDRANT	FF FINISHED FLOOR

NOTES:

1. SITE BENCHMARK:
T.B.M. IS SET MAG NAIL NORTHWEST OF PROPERTY
ELEV. -212.56'

2. FLOODPLAIN NOTE:
THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100 YEAR FLOODPLAIN ACCORDING TO FEMA FIRM PANEL NO. 48339C03950, EFFECTIVE AUGUST 18, 2014.

1-10-22

STATE OF TEXAS
REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER D. FULLER
108591

ACES
AMERICAN CIVIL ENGINEERING SERVICES, L.P.
P.O. Box 3220 • Conroe, Texas 77305 • FRN - 7349
936-760-3280 • 936-760-3270 (Fax) • www.americanaces.com

CITY OF CONROE
Engineering Division
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Initial: _____ Date: JAN 27 2022

SANBERG INVESTMENTS
SITE PLAN
DETENTION LAYOUT
Montgomery County Conroe, Texas

Design: CDF	CAD: CDF	Job No: 125919-051	Drawing No: 07
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Plot Time: Mon, 10 Jan 2022 4:19 PM
Path: N:\Projects\125919-051_Maloney_Services_Conroe\Consolidated\125919-051.dwg
User: Maloney_Services_Conroe
Title: DETENTION LAYOUT - 125919-051.dwg

Modified Rational Detention Pond Calculations

County = Montgomery
2-Year, 24-Hour Rainfall Depth (in): 4.832

PRE - Pond 8.83 Ac.

Type of Flow	Distance (ft)	Slope (ft/ft)	Ground Cover	Manning's Coefficient	Hydraulic Radius	Velocity (ft/s)	Travel Time (min)
Sheet	300	0.010	Woods: Light Underbrush	0.4		N/A	55.5
Shallow	560	0.015	Woodland			0.61	15.2
Shallow	1050	0.009	Woodland			0.47	36.9

Land Cover Type	Drainage Areas	C values
Unimproved areas	384619.00	0.3

Combined C value for Rational Method: 0.30
Total Site Area (sf): 384619.00
Intensity (in/hr): 4.832
Discharge (cfs): 4.06

POST - Pond 8.83 Ac.

Type of Flow	Distance (ft)	Slope (ft/ft)	Ground Cover	Manning's Coefficient	Hydraulic Radius	Velocity (ft/s)	Travel Time (min)
Sheet	300	0.010	Woods: Light Underbrush	0.4		N/A	55.5
Shallow	560	0.015	Woodland			0.61	15.2

Land Cover Type	Drainage Areas	C values
Commercial	275444.00	0.8
Unimproved areas	109175	0.3

Combined C value for Rational Method: 0.66
Total Site Area (sf): 384619.00
Intensity (in/hr): 4.832
Discharge (cfs): 12.12

2 Year Release Rate = 4.06 cfs

Duration of Storm (min)	Intensity (in / Hr)	Peak Flow Q (cfs)	Volume of Runoff (cuft)	Release Flow Volume (cuft)	Required Storage Volume (cuft)
100.000	1.607280801	9.42	56502.10	20818.70	35683.41
102.000	1.583838001	9.28	56791.56	21062.52	35729.04
104.000	1.561150755	9.15	57075.67	21308.33	35789.34
106.000	1.53918185	9.02	57354.65	21550.15	35804.50
108.000	1.517986515	8.89	57628.69	21793.97	35834.72
110.000	1.497262228	8.77	57897.98	22037.79	35860.19
112.000	1.477248529	8.66	58162.69	22281.61	35881.07
114.000	1.457826862	8.54	58422.97	22525.43	35897.54
116.000	1.438970424	8.43	58679.00	22769.25	35909.75
118.000	1.420654033	8.32	58930.92	23013.07	35917.85
120.000	1.402854007	8.22	59178.86	23256.89	35921.97
122.000	1.38548051	8.12	59422.96	23500.71	35922.25
124.000	1.368715158	8.02	59663.35	23744.53	35918.62
126.000	1.352335507	7.92	59900.14	23988.35	35911.26
128.000	1.3363904	7.83	60133.46	24232.17	35901.26
130.000	1.320862163	7.74	60363.40	24475.99	35887.42
132.000	1.305734085	7.65	60590.06	24719.80	35870.28
134.000	1.290993051	7.56	60813.59	24963.62	35849.97
136.000	1.276615983	7.48	61034.03	25207.44	35826.59
138.000	1.262596785	7.40	61251.49	25451.26	35800.22
140.000	1.24891929	7.32	61468.05	25695.08	35770.96
142.000	1.235570715	7.24	61677.79	25938.90	35738.89
144.000	1.222538919	7.16	61886.80	26182.72	35704.08

2 Year Peak Flow = 35922.25 Cu. Ft. 0.82 Ac. Ft.

10 Year Release Rate = 5.95 cfs

Duration of Storm (min)	Intensity (in / Hr)	Peak Flow Q (cfs)	Volume of Runoff (cuft)	Release Flow Volume (cuft)	Required Storage Volume (cuft)
120.000	2.061097372	12.08	86946.60	34025.04	52921.56
122.000	2.036992627	11.93	87361.92	34381.75	52980.16
124.000	2.013532237	11.80	87771.42	34738.46	53032.96
126.000	1.990898582	11.66	88175.30	35095.17	53080.13
128.000	1.968439513	11.53	88573.72	35451.88	53121.84
130.000	1.94675826	11.41	88966.86	35808.59	53158.26
132.000	1.925623332	11.28	89354.85	36165.30	53189.55
134.000	1.905013432	11.16	89737.86	36522.01	53215.85
136.000	1.884908381	11.04	90116.02	36878.72	53237.30
138.000	1.865289039	10.93	90489.48	37235.43	53254.05
140.000	1.846137244	10.82	90858.36	37592.14	53268.22
142.000	1.827435747	10.71	91222.78	37948.85	53273.93
144.000	1.809168153	10.60	91582.88	38305.56	53277.32
146.000	1.791318871	10.50	91938.75	38662.27	53276.48
148.000	1.773873054	10.39	92290.62	39018.98	53271.54
150.000	1.756818603	10.29	92638.29	39375.69	53262.60
152.000	1.740138022	10.20	92982.16	39732.40	53249.76
154.000	1.723818498	10.10	93322.23	40089.11	53233.12
156.000	1.707851748	10.01	93658.59	40445.82	53212.77
158.000	1.692224116	9.91	93991.34	40802.53	53188.81
160.000	1.676924425	9.83	94320.55	41159.24	53161.31
162.000	1.661942004	9.74	94646.32	41515.95	53130.37
164.000	1.647266648	9.65	94968.73	41872.66	53096.07

10 Year Peak Flow = 53277.32 Cu. Ft. 1.22 Ac. Ft.

Release Rate = 100 Year 8.35 cfs

Duration of Storm (min)	Intensity (in / Hr)	Peak Flow Q (cfs)	Volume of Runoff (cuft)	Release Flow Volume (cuft)	Required Storage Volume (cuft)
160.000	2.396358179	14.04	134785.93	57813.31	76972.62
162.000	2.376239121	13.92	135324.99	58314.35	77010.64
164.000	2.356521482	13.81	135858.91	58815.40	77043.51
166.000	2.33719272	13.69	136387.78	59316.44	77071.34
168.000	2.318240825	13.58	136911.74	59817.49	77094.26
170.000	2.299654287	13.47	137430.88	60318.53	77112.35
172.000	2.281422073	13.37	137945.31	60819.57	77125.74
174.000	2.2635336	13.26	138455.13	61320.62	77134.51
176.000	2.245978715	13.16	138960.43	61821.66	77138.78
178.000	2.228747668	13.06	139461.32	62322.70	77138.61
180.000	2.211831098	12.96	139957.87	62823.75	77134.12
182.000	2.195220008	12.86	140450.18	63324.79	77125.39
184.000	2.178905752	12.77	140938.33	63825.83	77112.50
186.000	2.162880013	12.67	141422.41	64326.88	77095.53
188.000	2.14713479	12.58	141902.49	64827.92	77074.57
190.000	2.131662385	12.49	142378.65	65328.97	77049.69
192.000	2.116455385	12.40	142850.97	65830.01	77020.96
194.000	2.101506648	12.31	143319.52	66331.05	76988.47
196.000	2.086809296	12.23	143784.38	66832.10	76952.28
198.000	2.072356695	12.14	144245.60	67333.14	76912.45
200.000	2.058142453	12.06	144703.25	67834.18	76869.07
202.000	2.044160401	11.98	145157.41	68335.23	76822.18
204.000	2.030404588	11.90	145608.13	68836.27	76771.85

100 Year Peak Flow = 77138.78 Cu. Ft. 1.77 Ac. Ft.

3. Determine the surface area / storage capacity in the pond.

Description	Elevation (ft-msl)	Surface Area (sq. ft)	Surface Area (ac)	Volume (cu-ft)	Volume (ac-ft)	Flow (cfs)
18" Pipe Flowline	195.00	19360	0.4444	0	0	0
	197.00	19360	0.4444	19360	0.44	0.82
2-Year Elevation	197.83	19360	0.4444	35441	0.81	1.19
	198.00	19360	0.4444	38720	0.89	1.25
10-Year Elevation	198.72	19360	0.4444	52729	1.21	1.49
	199.00	19360	0.4444	58080	1.33	1.57
	200.00	19360	0.4444	77440	1.78	1.83
100-Year Elevation	201.00	19360	0.4444	96800	2.22	2.06
Top of Pond	202.00	19360	0.4444	116160	2.67	24.77

Total Volumetric Rate (Ac. Ft./Ac.) = 0.4217

4. Using the weir equation, determine the size of the weir required to attenuate the peak flow to predevelopment conditions.

$$Q = CA\sqrt{2g(h_1 - D/2)}$$

2 Year Event Storage Capacity - Primary
C = Orifice Coefficient = 0.6
g = acceleration of gravity = 32.2 ft/s²
h₁ = 2-Year Event - pipe invert = 1.83 ft

A = cross-sectional area = 0.20 ft²
D = Diameter = 6.00 in
Q = Discharge = 1.19 cfs

10 Year Event Storage Capacity - Primary
C = Orifice Coefficient = 0.6
g = acceleration of gravity = 32.2 ft/s²
h₁ = 10-Year Event - pipe invert = 2.72 ft

A = cross-sectional area = 0.20 ft²
D = Diameter = 6.00 in
Q = Discharge = 1.49 cfs

100 Year Event Storage Capacity - Primary
C = Orifice Coefficient = 0.6
g = acceleration of gravity = 32.2 ft/s²
h₁ = 100-Year Event - pipe invert = 5.00 ft

A = cross-sectional area = 0.20 ft²
D = Diameter = 6.00 in
Q = Discharge = 2.06 cfs

Total Discharge Q100 = 2.06

Top of Pond / Emergency Overflow - Primary
C = Orifice Coefficient = 0.6
g = acceleration of gravity = 32.2 ft/s²
h₁ = Top of Pond - pipe invert = 6.00 ft

A = cross-sectional area = 0.20 ft²
D = Diameter = 6.00 in
Q = Discharge = 2.27 cfs

Total Discharge QEmrg = 24.77

CONCLUSION: Utilize a 18" Concrete pipe with a 6" restrictor pipe and a concrete-lined triangular wier with 1:8 side slopes with a FL of 201.00 for the emergency overflow.

NOTE: DETENTION POND GRAVITY PORTION MEETS CITY OF CONROE STANDARDS.
ADDITIONAL STORAGE AND PUMP STATION REQUIRED FOR TXDOT STANDARDS.

Drainage Area Name: Swale 5.9 Ac.

Type of Flow	Distance (ft)	Slope (ft/ft)	Ground Cover	Manning's Coefficient	Hydraulic Radius	Velocity (ft/s)	Travel Time (min)
sheet	200	0.010	Woods: Light Underbrush	0.4		N/A	40.1
shallow	1100	0.010	Woodland			0.50	36.7

Land Cover Type	Drainage Areas	C values
Unimproved areas	326440.00	0.3

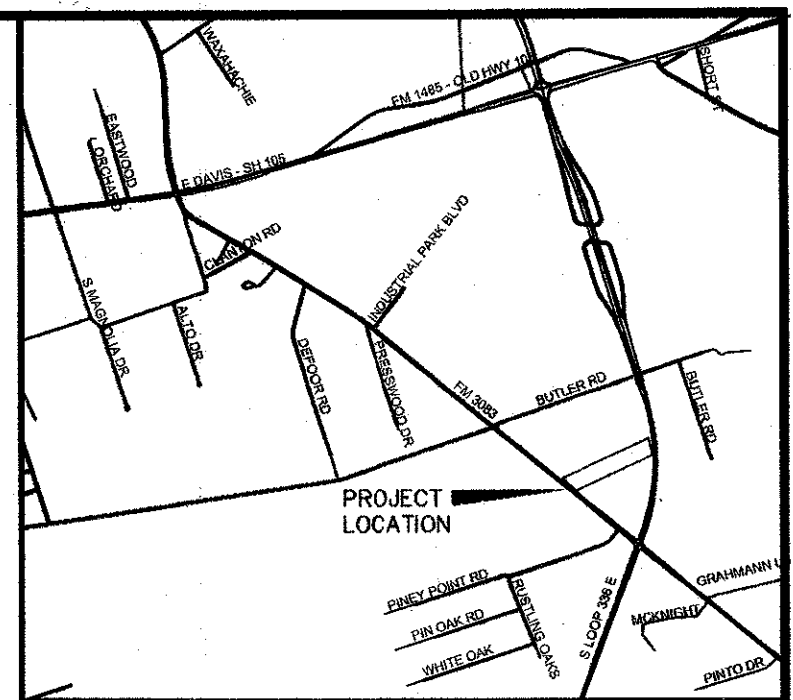
Combined C value for Rational Method: 0.30
Total Site Area (sf): 256883.00
Intensity (in/hr): 4.832
Discharge (cfs): 3.48

Swale 100 - YEAR

Manning's "n" = 0.040
Channel Width = 0 ft
Side Slopes (H/V) = 3 ft./ft.
Minimum Slope = 0.0043 ft./ft.
Channel Depth = 1.20 ft.

Area = 4.32 ft²
Wetted Perimeter = 7.59 ft.
Hydraulic Radius = 0.57 ft.

Flow = 7.25 cfs
Velocity = 1.68 ft/s

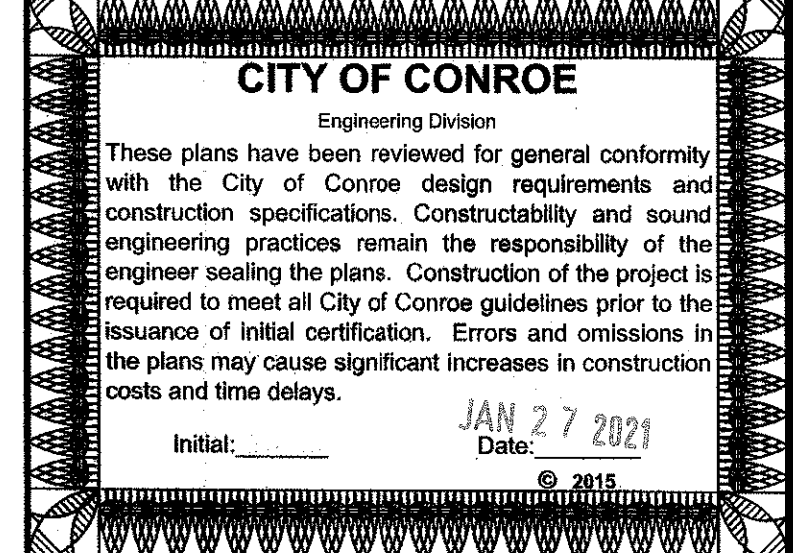
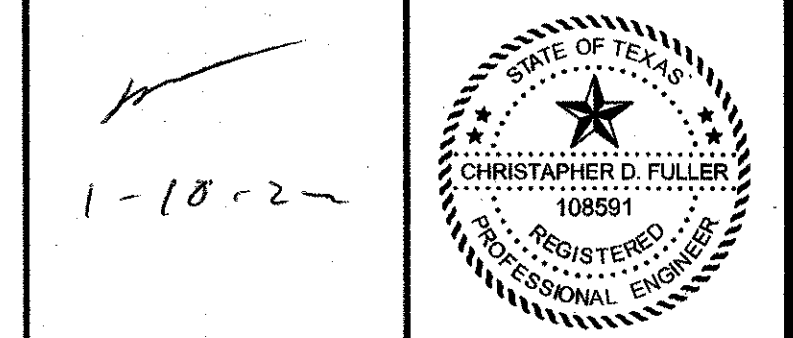


VICINITY MAP
N.T.S.

Utility Legend

- Street Signs
- Plug
- Blow-Off Valve
- Gate Valve
- Fire Hydrant
- Tee
- Street Light
- Taping Sleeve & Valve
- Clean Out
- San Manhole
- Storm Inlet
- Storm Manhole
- Point of Curve
- Right of Way
- Utility Easement
- Cleanout
- TOP GRAVEL
- PROP. GRADE
- TOP CURB
- MAHOLE
- FINISHED FLOOR

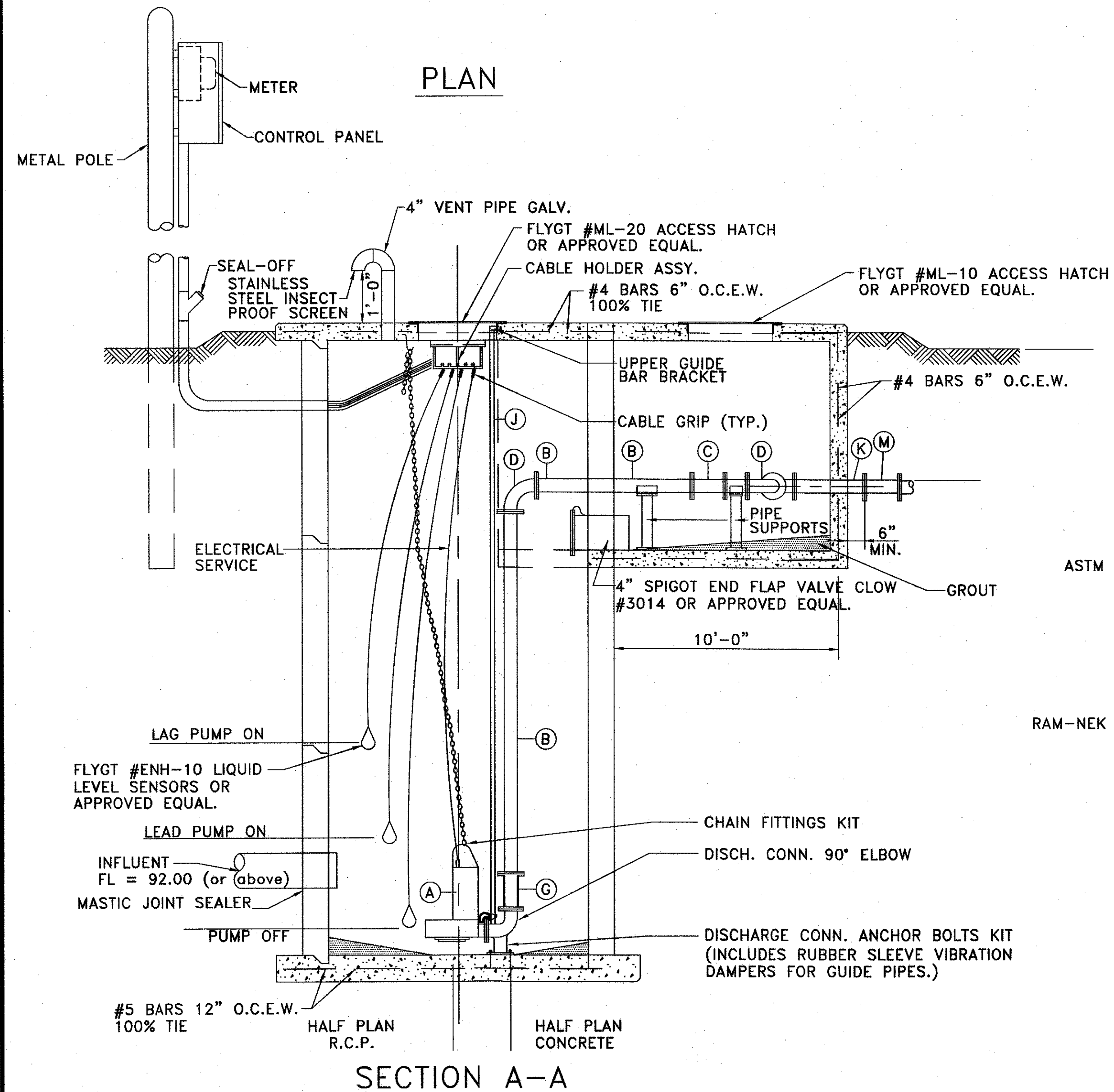
NOTES:
1. SITE BENCHMARK:
T.B.M. IS SET GAGE NAIL NORTHWEST OF PROPERTY
ELEV.-212.56'
2. FLOODPLAIN NOTE:
THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100
YEAR FLOODPLAIN ACCORDING TO FEMA FIRM PANEL
NO. 48383C0395Q, EFFECTIVE AUGUST 18, 2014.



SANBERG INVESTMENTS
SITE PLAN
CALCULATIONS

Montgomery County Conroe, Texas

Design: CDF CAD: CDF Job No: 125919-051 Drawing No: 08



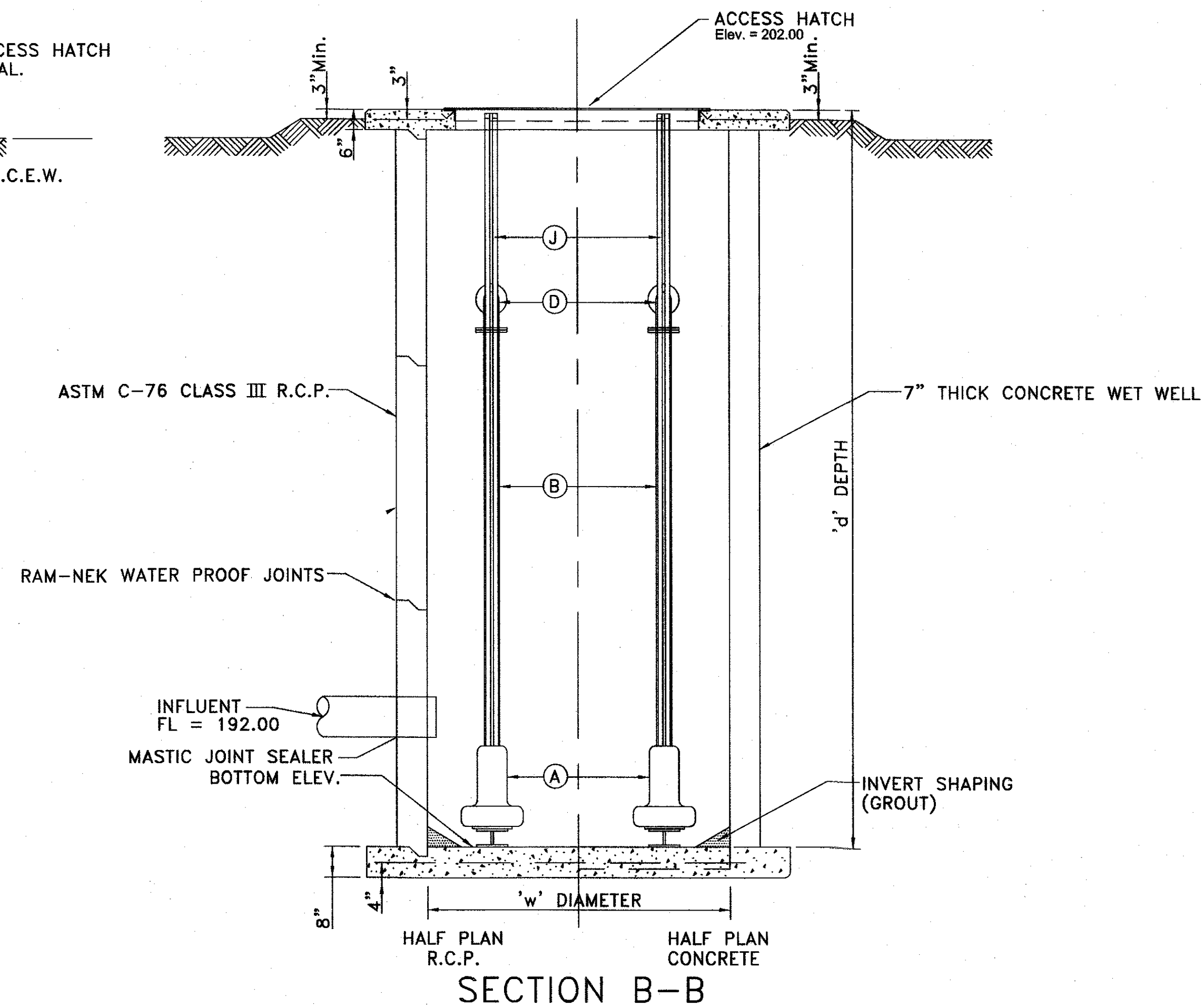
NOTE: A TRANSDUCER IS TO BE PLACED IN THE E-INLET ON THE BERM WITH A PUMP OFF ELEVATION OF 199.00'												
PUMP STATION CONDITION	DEPTH 'd'	DIA. 'w'	INFLUENT ELEV.	LEAD PUMP ON ELEV.	EMERGENCY PUMP ON ELEV.	PUMP OFF ELEV.	E-INLET OFF ELEV.	BOTTOM ELEV.	PUMP DISCHARGE SIZE	TOP ELEV.	PUMPS	T.D.H.
PROPOSED	12.50'	6 FT	192.00	192.50	194.00	191.50	199.00	189.50	2"	202.00	118 GPM	7.12 FT
PROPOSED	FLYGT CP 3045 HT, 252 IMP., 2" Discharge, 1 HP - 1Ø Power											

PUMP STATION PIPE, VALVE, AND FITTING SCHEDULE		
ITEM NO.	DESCRIPTION	QTY
A	SUBMERSIBLE PUMP	2
B	4" Class 150 D.I. (LENGTH VARIES)	VARIES

D	4" FLANGED 90° ELBOW	4
---	----------------------	---

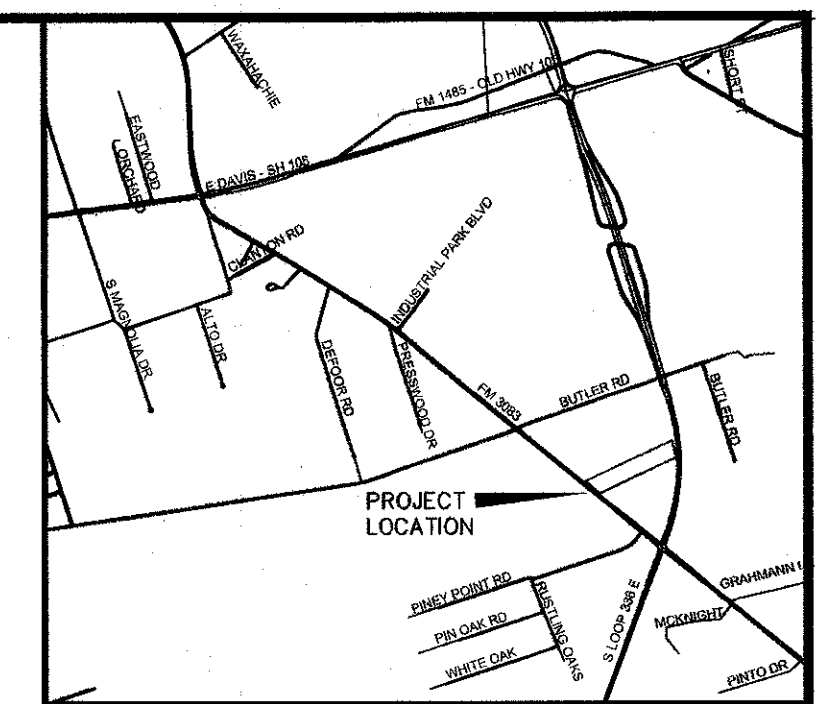
F	4" FLANGED D.I. TEE	1
G	2" to 4" FLANGED REDUCER	2
H	4" FLANGED 45° ELBOW	2
J	PUMP GUIDE RAILS (STAINLESS STEEL)	2-PAY
K	4" Class 150 D.I. (LENGTH VARIES)	VARIABLE

M	4" D.I. to 4" PVC TRANSITION SLEEVE	1
---	-------------------------------------	---















NOTE:

1. BOTTOM OF WET WELL TO HAVE MIN. OF 10% SLOPE.



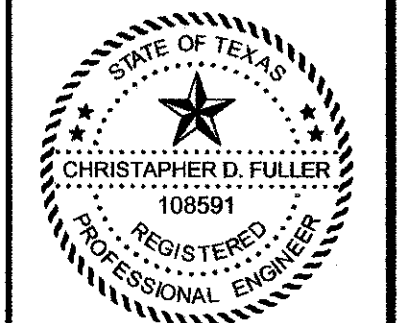
VICINITY MAP
N.T.S.

Utility Legend

	Street Signs		Street Light
	Plug		Taping Sleeve & Valve
	Blow-Off Valve		Clean Out
	Gate Valve		San Manhole
	Fire Hydrant		Storm Inlet
	Tee		Storm Manhole
FL	FLOWLINE	PC	Point of Curve
TOB	Top of Bank	ROW	Right of Way
LF	Linear Feet	UE	Utility Easement
RCP	Reinforced Conc Pipe	CO	Cleanout
TP	TOP OF PAVING	TG	TOP GRAVEL
SW	SIDE WALK	PG	PROP. GRADE
NG	NATURAL GRADE	TC	TOP CURB
SET SAFETY END TREATMENT	MF	MAHOLE	
FH	FIRE HYDRANT	FF	FINISHED FLOOR

NOTES:
1. SITE BENCHMARK:
T.B.M. IS SET MAG NAIL NORTH-WEST OF PROPERTY
ELEV. -212.56'

2. FLOODPLAIN NOTE:
THIS TRACT IS LOCAT' IN ZONE X AND IS NOT IN THE 100
YEAR FLOODPLAIN ACCORDING TO FEMA F.I.R.M. PANEL
NO. 48339C0395G, EFFECTIVE AUGUST 18, 2014.

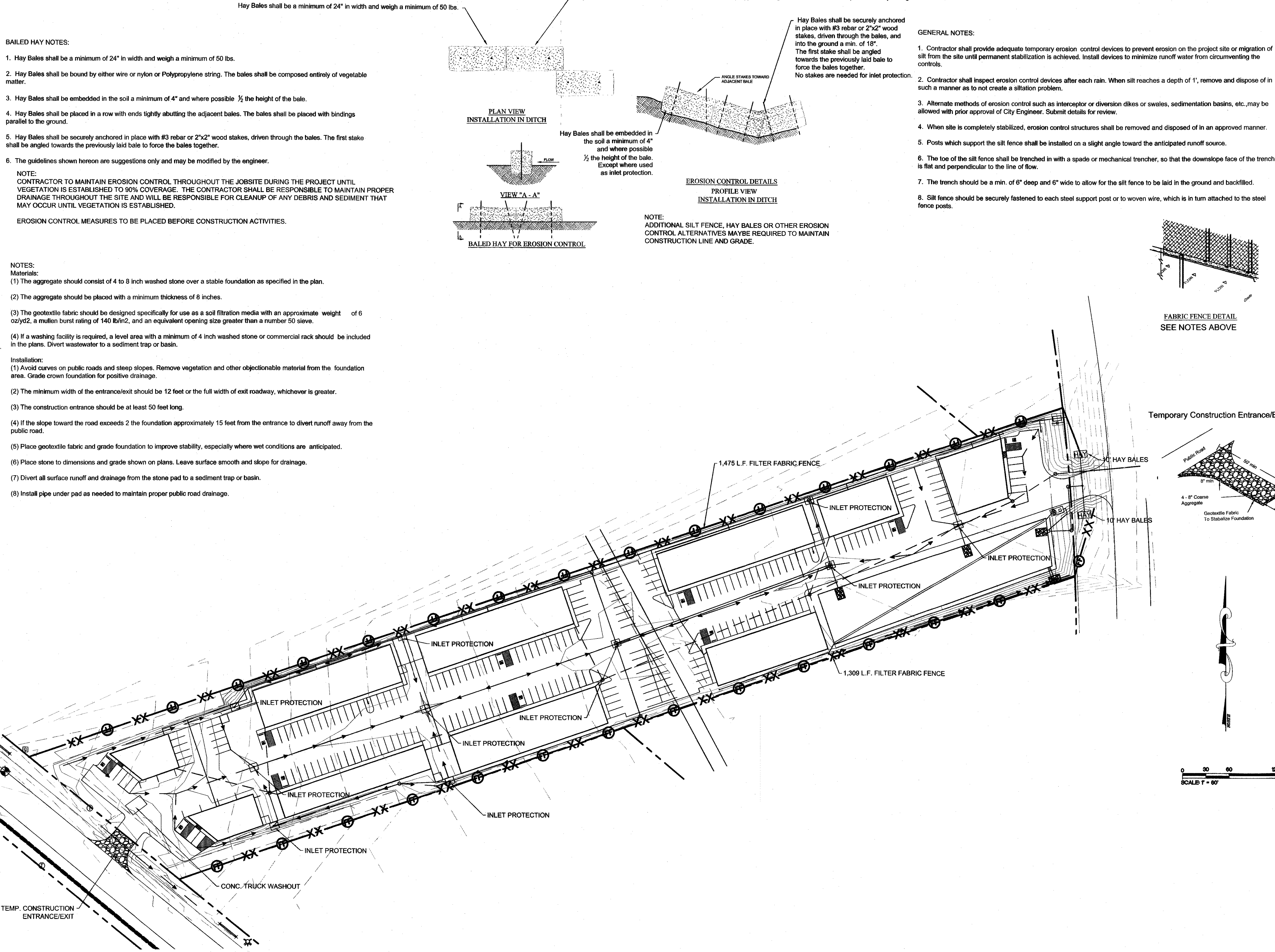


CITY OF CONROE	
Engineering Division	
These plans have been reviewed for general conformity with the City of Conroe design requirements and construction specifications. Constructability and sound engineering practices remain the responsibility of the engineer sealing the plans. Construction of the project is required to meet all City of Conroe guidelines prior to the issuance of Initial certification. Errors and omissions in the plans may cause significant increases in construction costs and time delays.	
Initial: _____	JAN 27 2021
	© 2015

SANBERG INVESTMENTS
STORM PUMP STATION
DETAIL

Montgomery County		Conroe, Texas	
Design:	CAD:	Job No:	Drawing No:
CDF	CDF	125919-051	09

DATE: Mon, 10 Jan 2022 - 3:51pm
Path Name: Z:\Users\mccoy\Projects\125919-051\MOOREY SERVICES CONROE\Const\DWG\10 - ERO-PRO-PLAN SITE - 125919-051.dwg



BAILED HAY NOTES:

- Hay Bales shall be a minimum of 24" in width and weigh a minimum of 50 lbs.
- Hay Bales shall be bound by either wire or nylon or Polypropylene string. The bales shall be composed entirely of vegetable matter.
- Hay Bales shall be embedded in the soil a minimum of 4" and where possible $\frac{1}{2}$ the height of the bale.
- 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.
- Hay Bales shall be securely anchored in place with #3 rebar or 2"x2" wood stakes, driven through the bales. The first stake shall be angled towards the previously laid bale to force the bales together.
- The guidelines shown hereon are suggestions only and may be modified by the engineer.

NOTE:
CONTRACTOR TO MAINTAIN EROSION CONTROL THROUGHOUT THE JOBSITE DURING THE PROJECT UNTIL VEGETATION IS ESTABLISHED TO 90% COVERAGE. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN PROPER DRAINAGE THROUGHOUT THE SITE AND WILL BE RESPONSIBLE FOR CLEANUP OF ANY DEBRIS AND SEDIMENT THAT MAY OCCUR UNTIL VEGETATION IS ESTABLISHED.

EROSION CONTROL MEASURES TO BE PLACED BEFORE CONSTRUCTION ACTIVITIES.

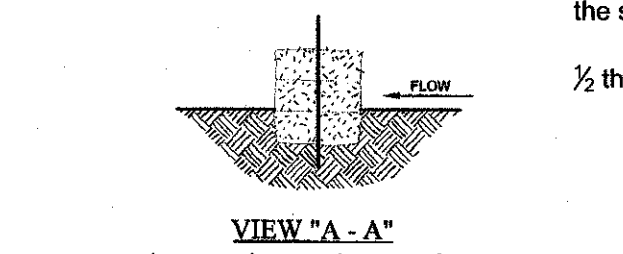
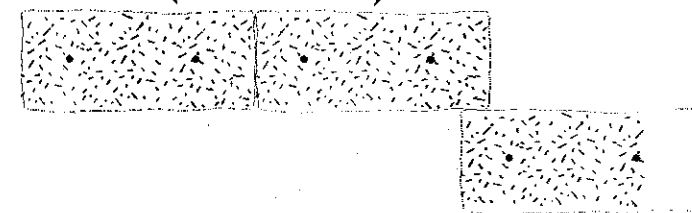
NOTES:

- Materials:
- The aggregate should consist of 4 to 8 inch washed stone over a stable foundation as specified in the plan.
 - The aggregate should be placed with a minimum thickness of 8 inches.
 - The geotextile fabric should be designed specifically for use as a soil filtration media with an approximate weight of 6 oz/yd², a mullen burst rating of 140 lb/in², and an equivalent opening size greater than a number 50 sieve.
 - If a washing facility is required, a level area with a minimum of 4 inch washed stone or commercial rack should be included in the plans. Divert wastewater to a sediment trap or basin.
- Installation:
- Avoid curves on public roads and steep slopes. Remove vegetation and other objectionable material from the foundation area. Grade crown foundation for positive drainage.
 - The minimum width of the entrance/exit should be 12 feet or the full width of exit roadway, whichever is greater.
 - The construction entrance should be at least 50 feet long.
 - If the slope toward the road exceeds 2 the foundation approximately 15 feet from the entrance to divert runoff away from the public road.
 - Place geotextile fabric and grade foundation to improve stability, especially where wet conditions are anticipated.
 - Place stone to dimensions and grade shown on plans. Leave surface smooth and slope for drainage.
 - Divert all surface runoff and drainage from the stone pad to a sediment trap or basin.
 - Install pipe under pad as needed to maintain proper public road drainage.

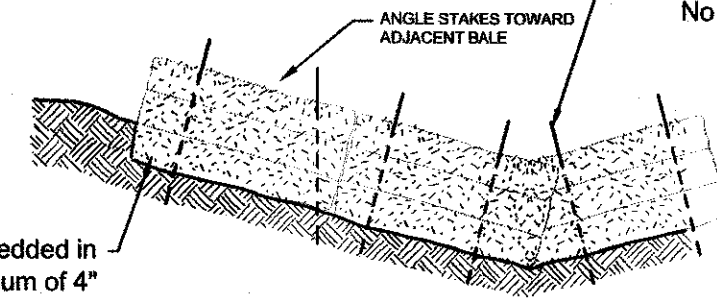
Hay Bales shall be a minimum of 24" in width and weigh a minimum of 50 lbs.

Hay Bales shall be bound by either wire or nylon or Polypropylene string. The bales shall be composed entirely of vegetable matter.

Hay Bales shall be securely anchored in place with #3 rebar or 2"x2" wood stakes, driven through the bales, and into the ground a min. of 18". The first stake shall be angled towards the previously laid bale to force the bales together. No stakes are needed for inlet protection.



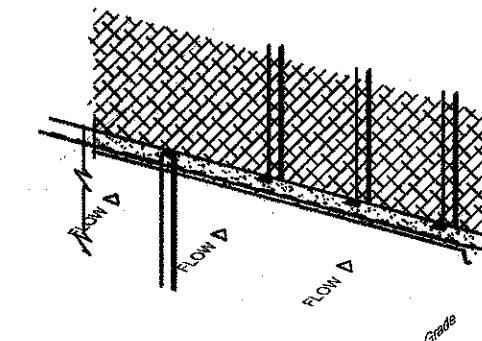
BAILED HAY FOR EROSION CONTROL



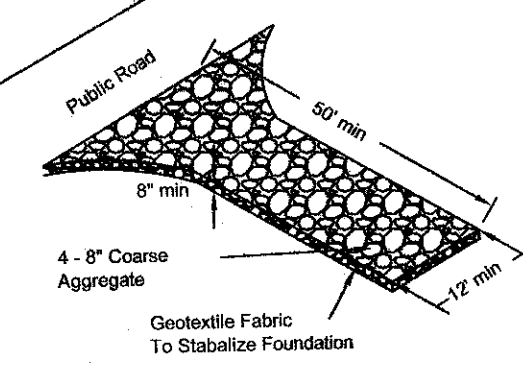
NOTE:
ADDITIONAL SILT FENCE, HAY BALES OR OTHER EROSION CONTROL ALTERNATIVES MAYBE REQUIRED TO MAINTAIN CONSTRUCTION LINE AND GRADE.

GENERAL NOTES:

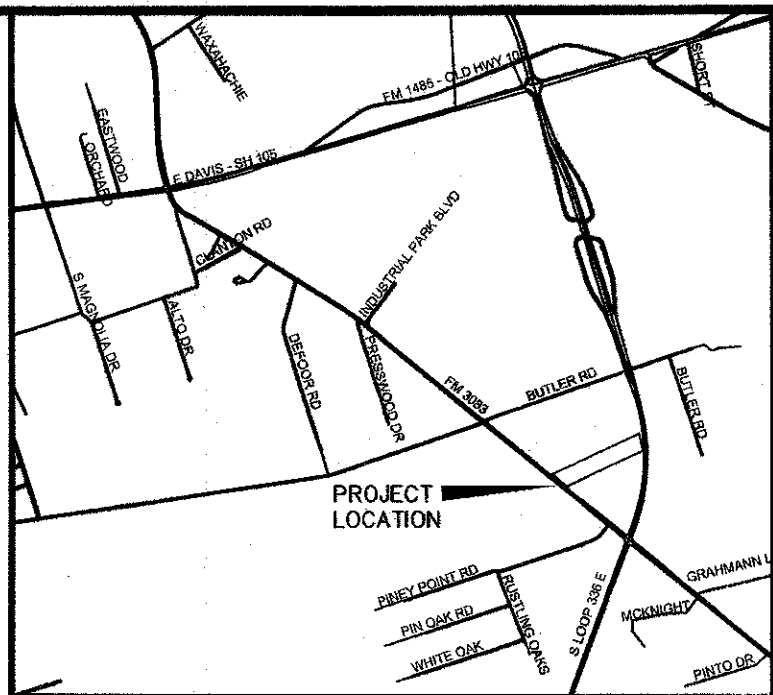
- Contractor shall provide adequate temporary erosion control devices to prevent erosion on the project site or migration of silt from the site until permanent stabilization is achieved. Install devices to minimize runoff water from circumventing the controls.
- Contractor shall inspect erosion control devices after each rain. When silt reaches a depth of 1', remove and dispose of in such a manner as to not create a siltation problem.
- Alternate methods of erosion control such as interceptor or diversion dikes or swales, sedimentation basins, etc., may be allowed with prior approval of City Engineer. Submit details for review.
- When site is completely stabilized, erosion control structures shall be removed and disposed of in an approved manner.
- Posts which support the silt fence shall be installed on a slight angle toward the anticipated runoff source.
- 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.
- The trench should be a min. of 6" deep and 6" wide to allow for the silt fence to be laid in the ground and backfilled.
- 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.



Temporary Construction Entrance/Exit



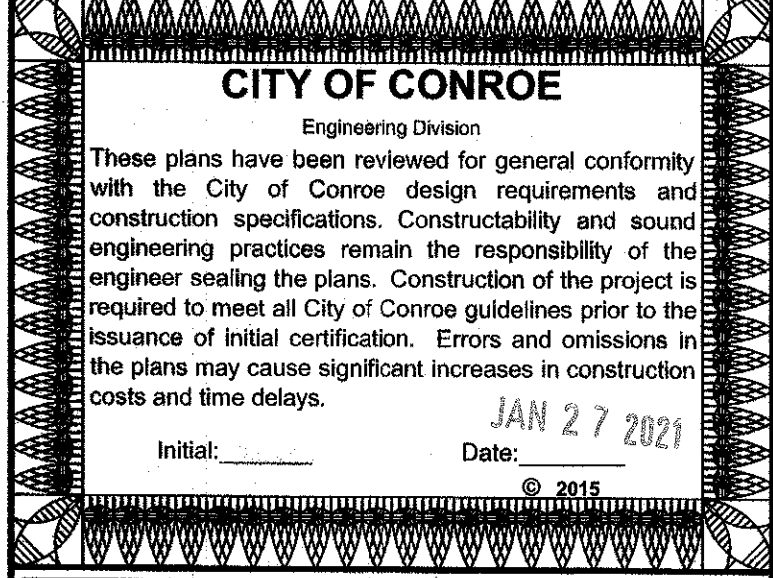
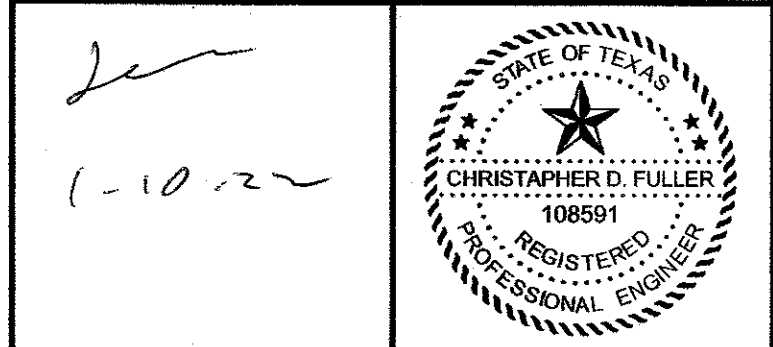
0 30 60 120
SCALE 1" = 60'



Utility Legend

Street Signs	Street Light
Plug	Taping Sleeve & Valve
Blow-Off Valve	Clean Out
Gate Valve	San Manhole
Fire Hydrant	Storm Inlet
Tee	Storm Manhole
FL FLOWLINE	PC Point of Curve
TOB Top of Bank	ROW Right of Way
LF Linear Feet	UE Utility Easement
RCP Reinforced Conc Pipe	CO Cleanout
TP TOP OF PAVING	TG TOP GRAVEL
SW SIDE WALK	PG PROP. GRADE
NG NATURAL GRADE	TC TOP CURB
SET SAFETY END TREATMENT	MH MAHOLE
FH FIRE HYDRANT	FF FINISHED FLOOR

NOTES:
1. SITE BENCHMARK:
T.B.M. IS SET MAG NAIL NORTHWEST OF PROPERTY
ELEV. +212.56'
2. FLOODPLAIN NOTE:
THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100 YEAR FLOODPLAIN ACCORDING TO FEMA F.I.R.M. PANEL NO. 48393C03995Q, EFFECTIVE AUGUST 18, 2014.

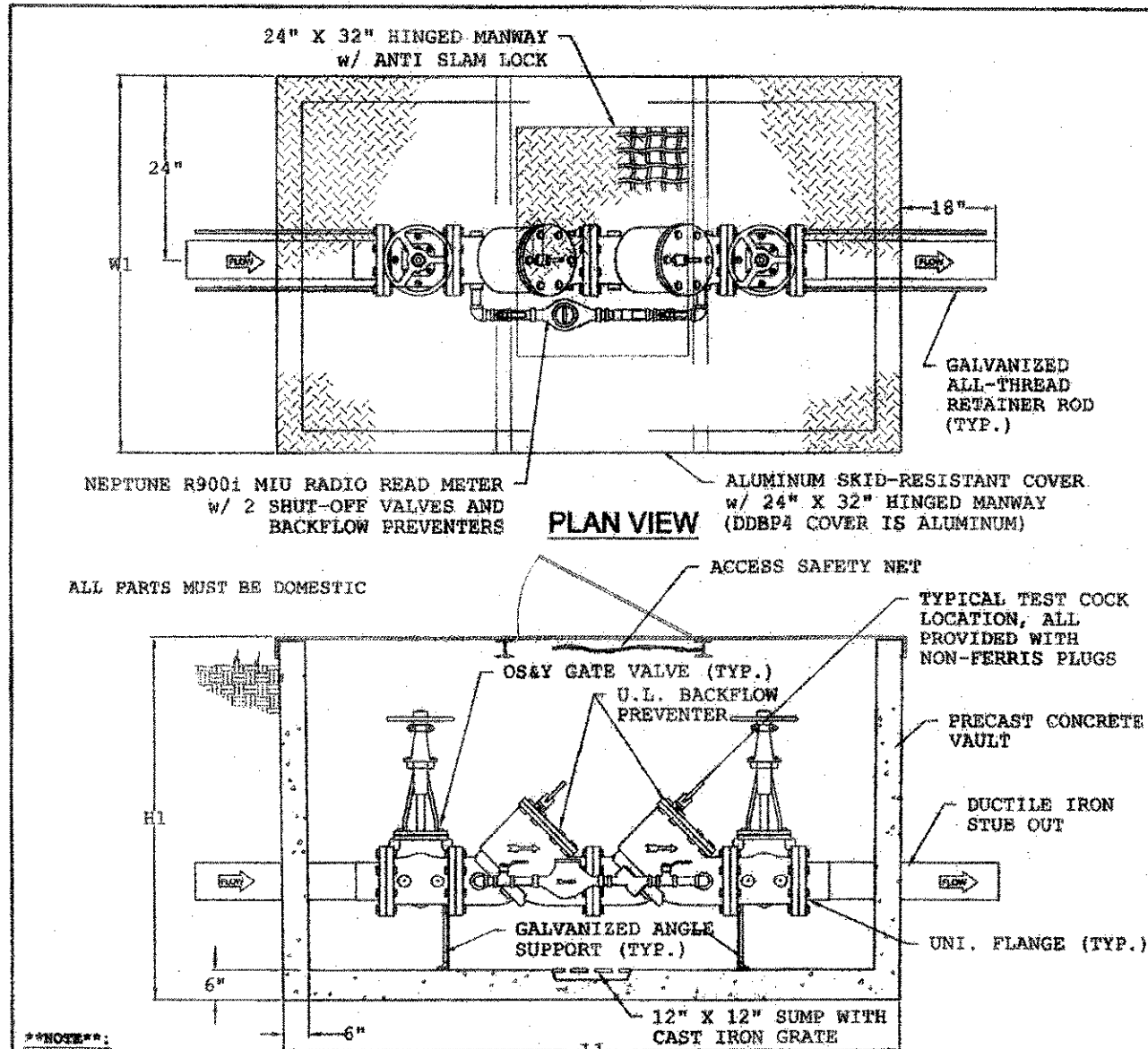


SANBERG INVESTMENTS
SITE PLAN
EROSION PLAN

Montgomery County Conroe, Texas

Design: CDF CAD: CDF Job No: 15919-051 Drawing No: 10

125919-051 Sanberg Investments Site Plan



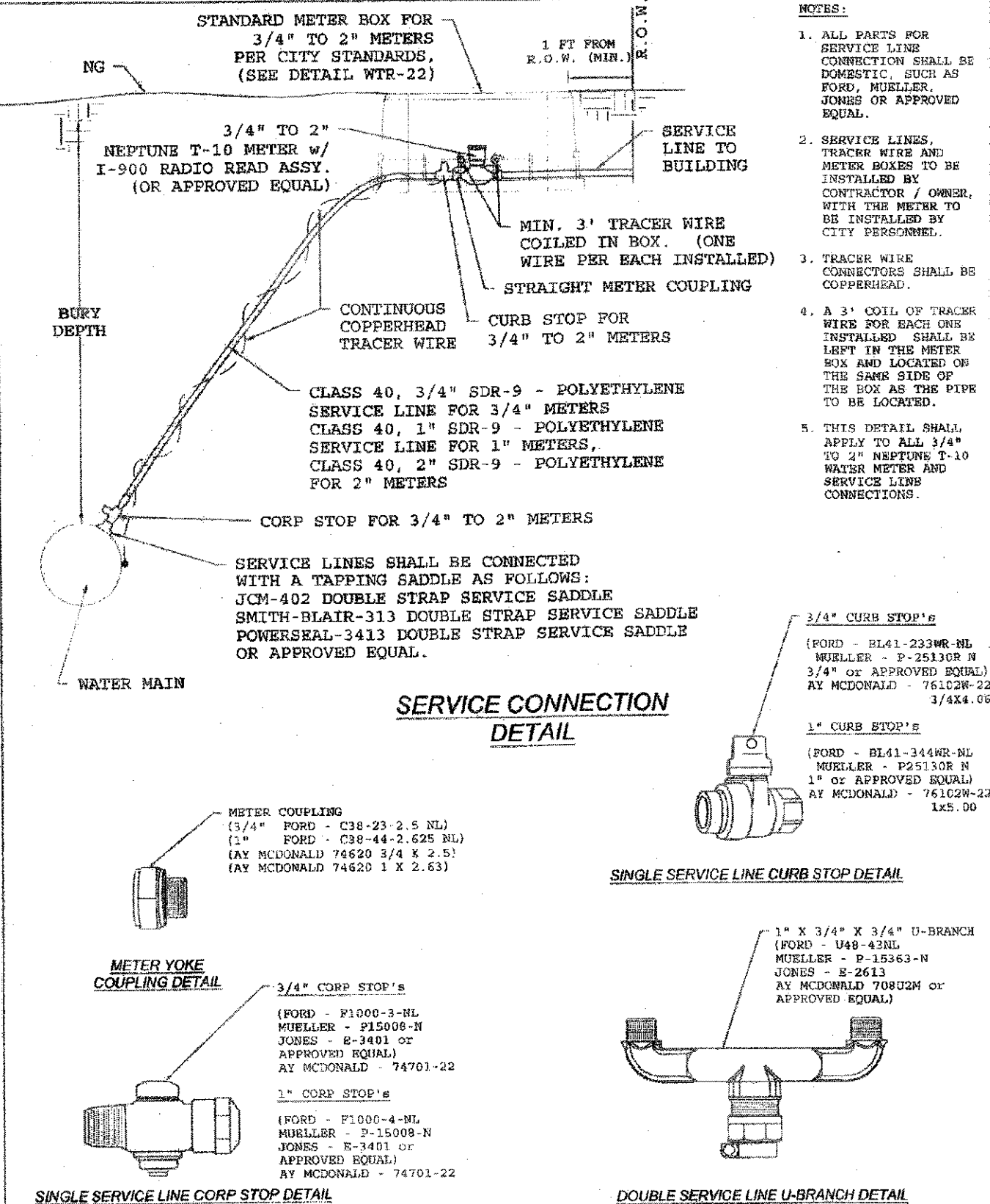
MODEL	SIZE	LT	WT	HL	WEIGHT
DDBP3	3"	6'-0"	3'-6"	4'-0"	3,500
DDBP4	4"	6'-0"	3'-6"	4'-0"	3,500
DDBP6	6"	7'-0"	4'-6"	5'-6"	5,000
DDBP8	8"	8'-0"	5'-6"	6'-6"	15,000
DDBP10	10"	9'-0"	6'-6"	7'-6"	18,000
DDBP12	12"	9'-0"	6'-6"	7'-6"	18,000

WATER MAIN DOUBLE DETECTOR BACKFLOW PREVENTER ASSEMBLY / FIRE SERVICE

Revision Date: 03/01/2018

Approved By: [Signature]

WTR-19

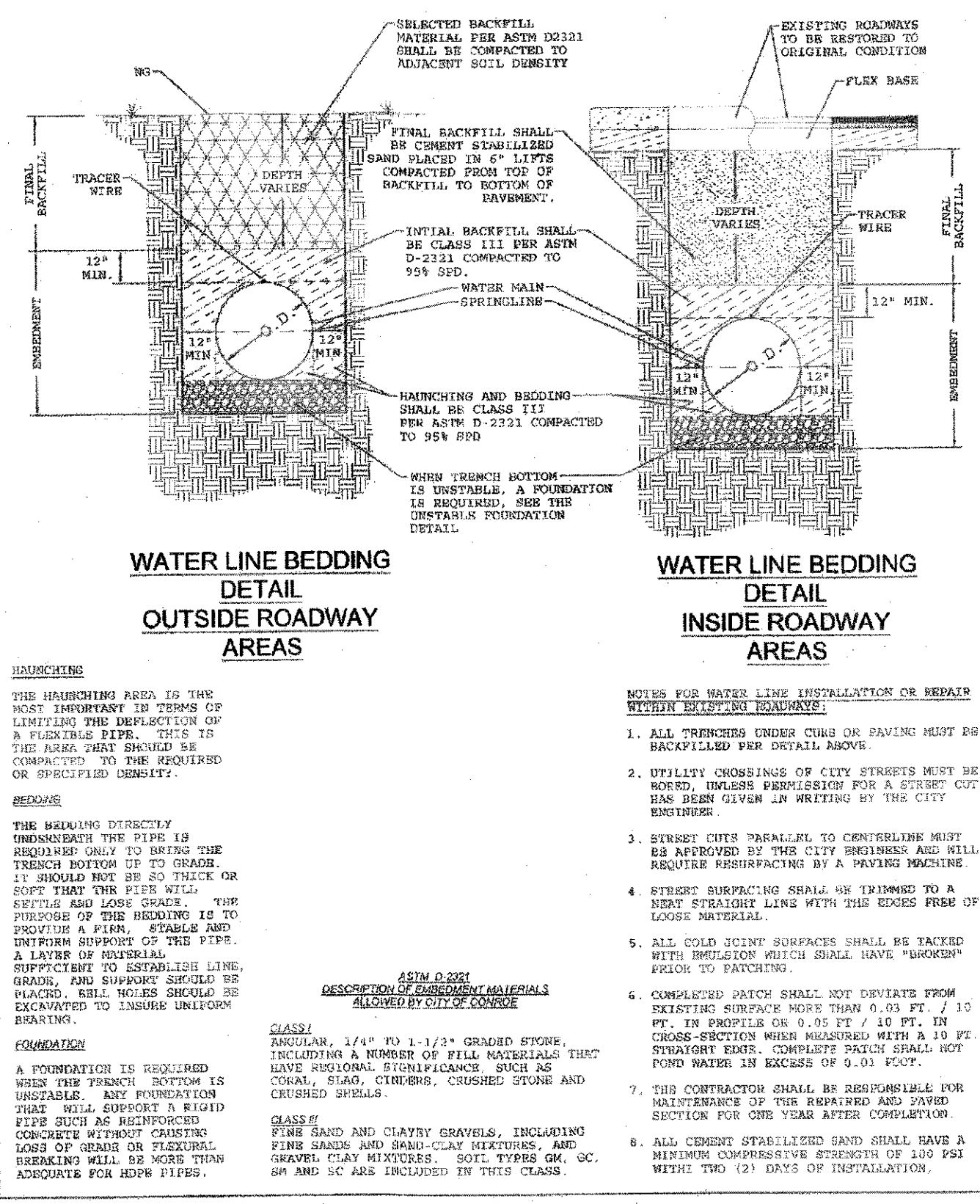


WATER MAIN STANDARD 2" OR LESS SERVICE LINE / WATER METER CONNECTION

Revision Date: 09/16/2019

Approved By: [Signature]

WTR-24

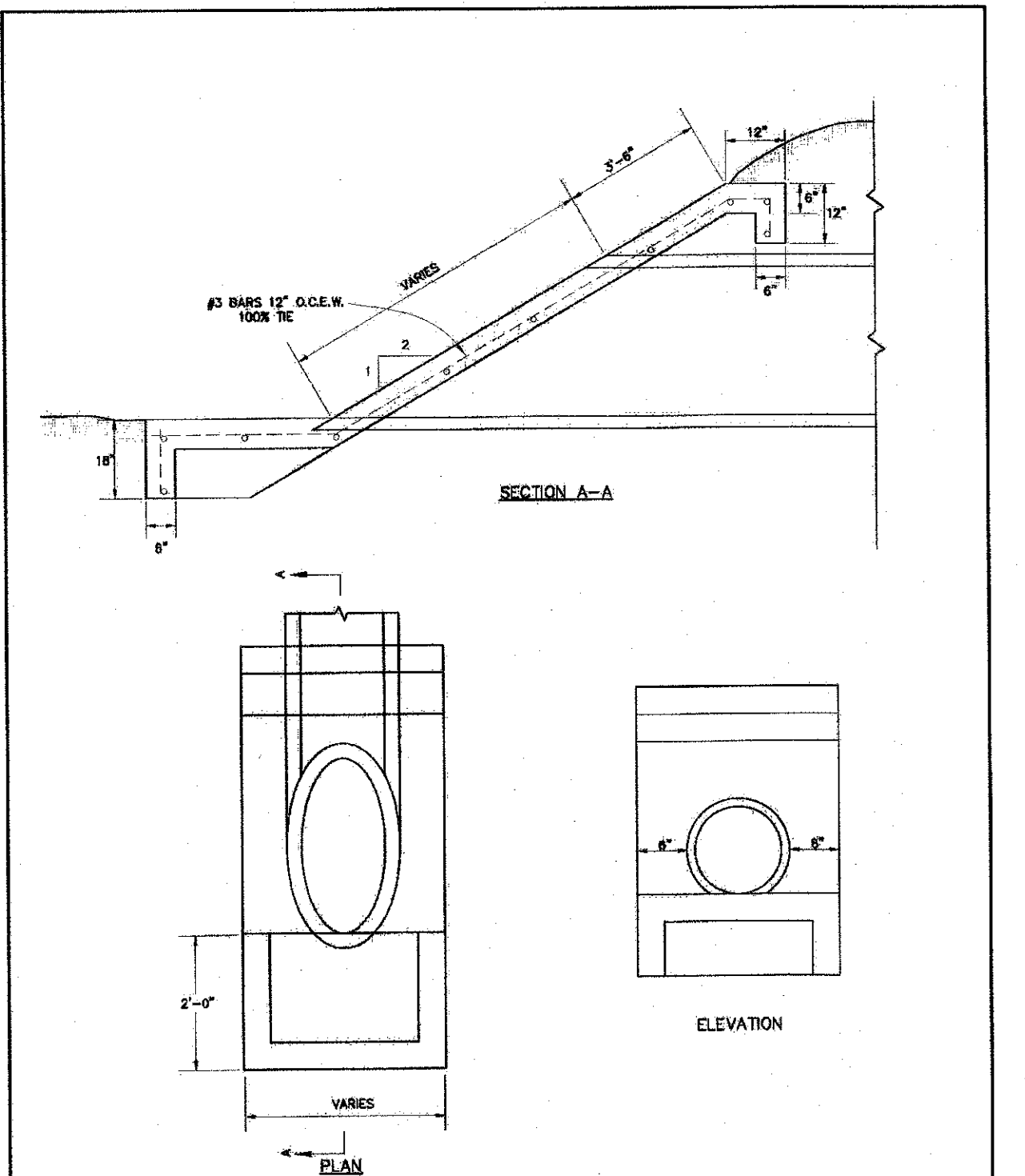


WATER MAIN BEDDING AND TRENCH DETAIL

Revision Date: 03/11/2019

Approved By: [Signature]

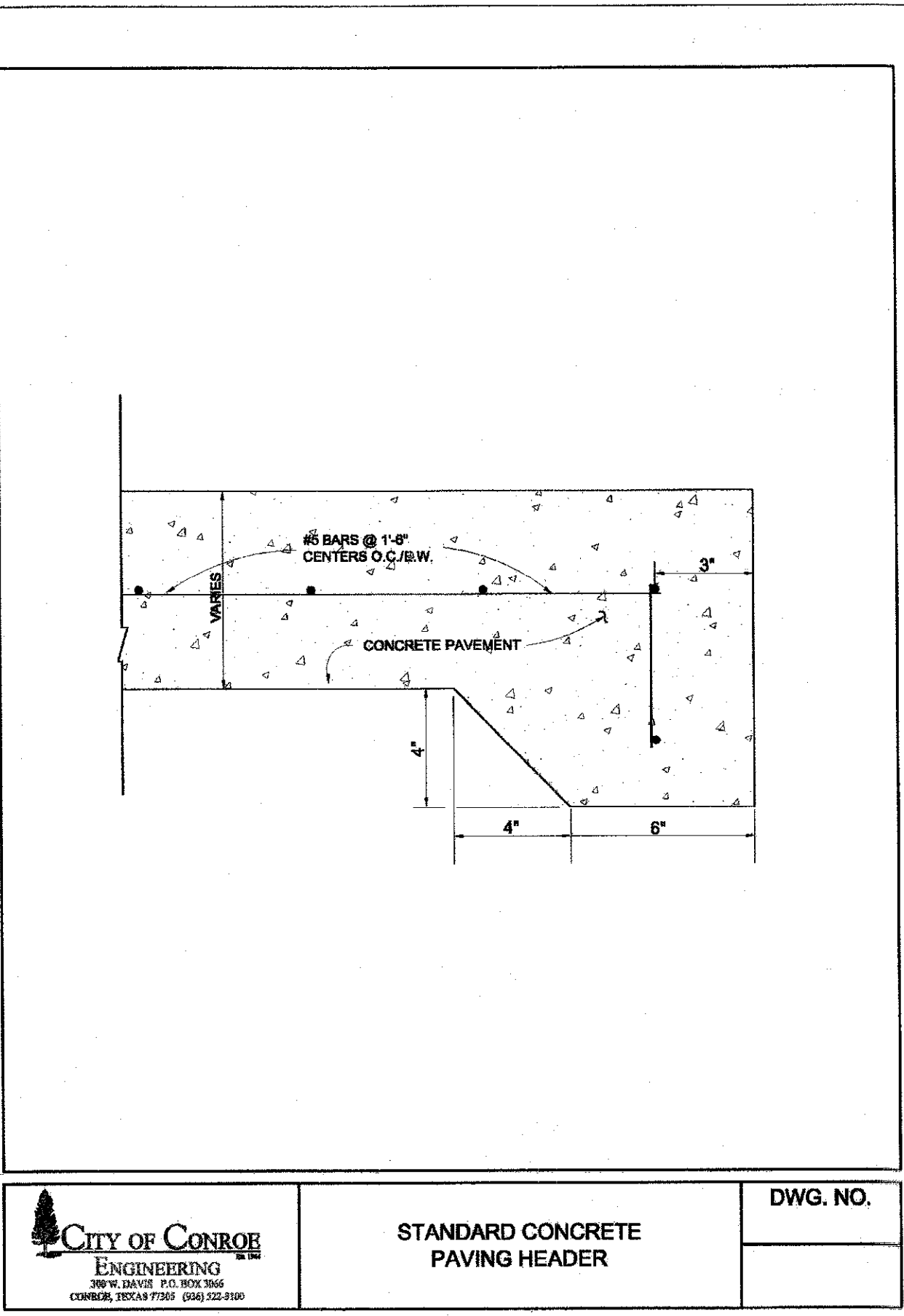
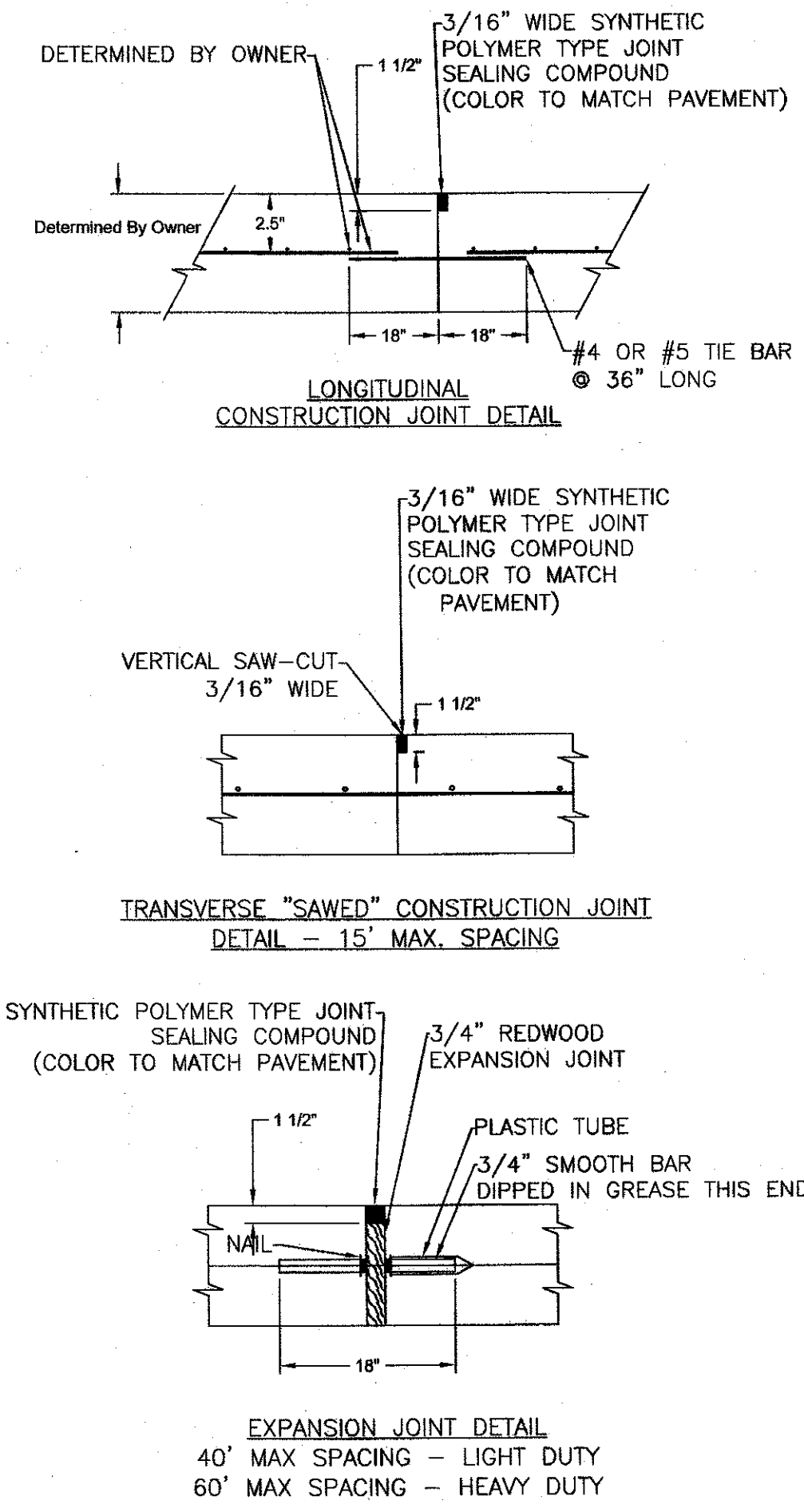
WTR-02



CITY OF CONROE EFFLUENT/INFLUENT STORM HEADWALL

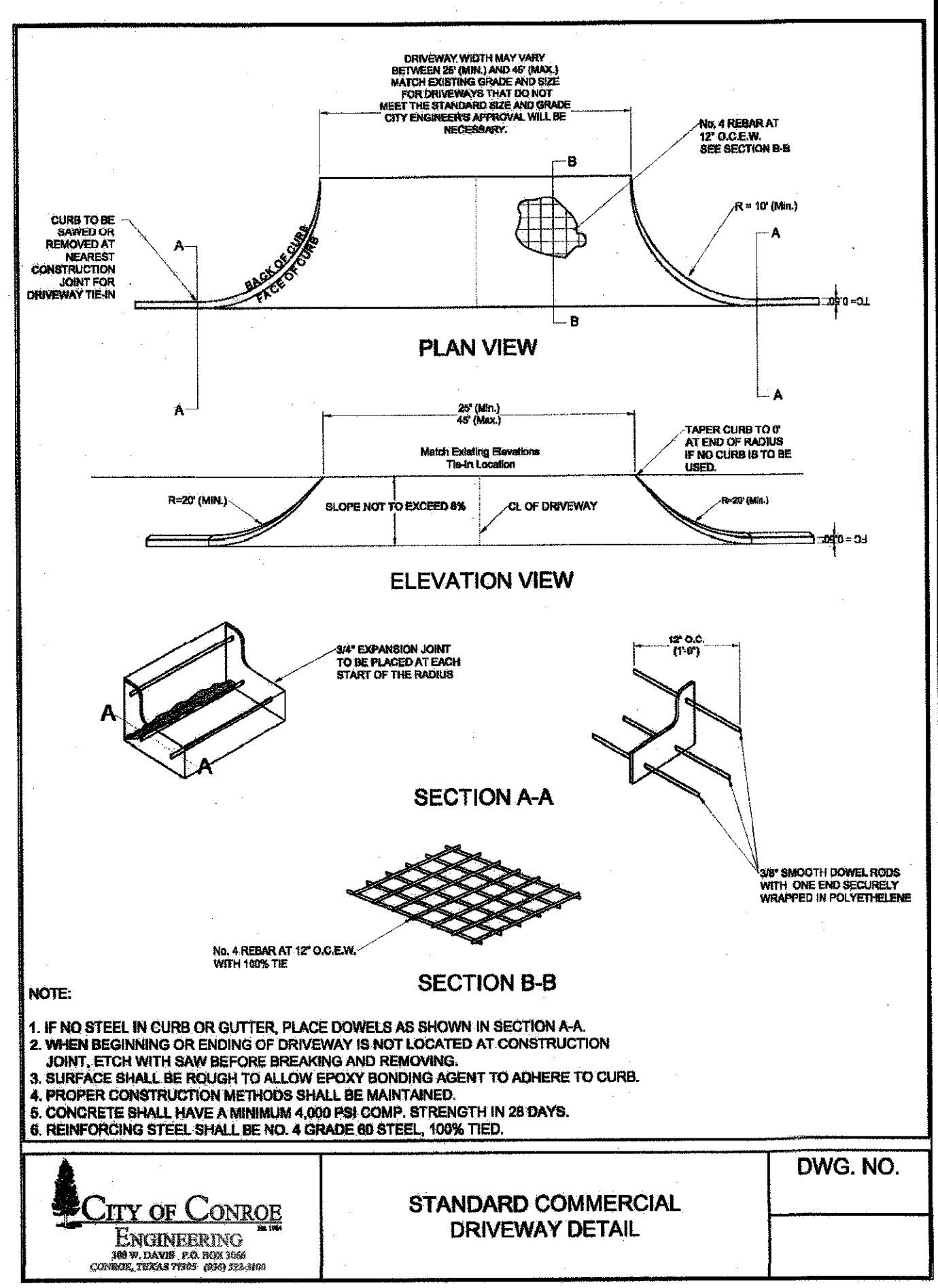
DWG. NO. 1202

D-12



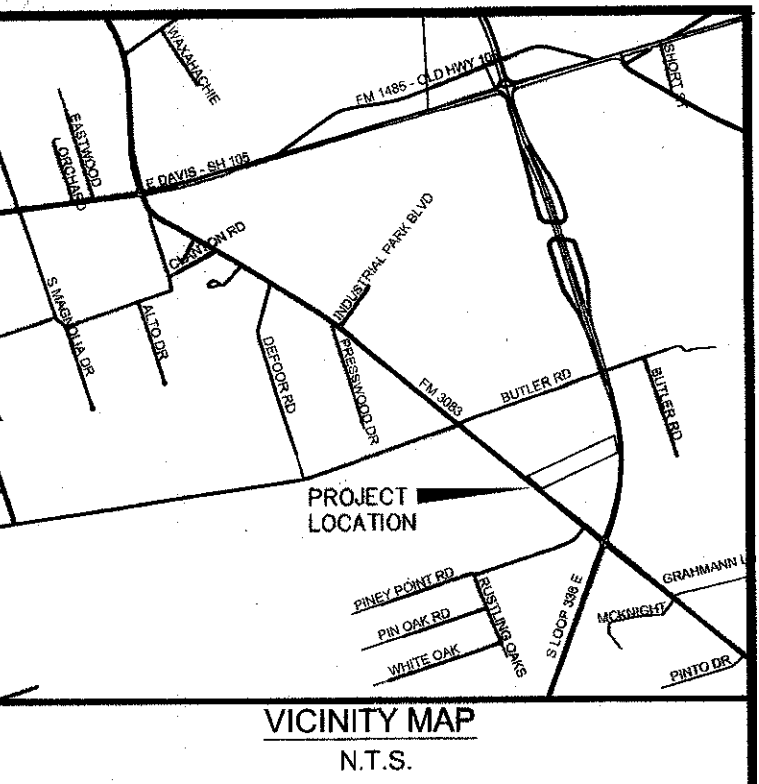
CITY OF CONROE STANDARD CONCRETE PAVING HEADER

DWG. NO.



CITY OF CONROE STANDARD COMMERCIAL DRIVEWAY DETAIL

DWG. NO.



Utility Legend	
Street Signs	Street Light
Plug	Taping Sleeve & Valve
Blow-Off Valve	Clean Out
Gate Valve	San Manhole
Fire Hydrant	Storm Inlet
Tee	Storm Manhole
FL FLOWLINE	PC Point of Curve
TOB Top of Bank	ROW Right of Way
LF Linear Feet	UE Utility Easement
RCP Reinforced Conc Pipe	CO Cleanout
TP TOP OF PAVING	TG TOP GRAVEL
SW SIDE WALK	PG PROP. GRADE
NG NATURAL GRADE	TC TOP CURB
SET SAFETY END TREATMENT	MH MAHOLE
FH FIRE HYDRANT	FF FINISHED FLOOR

NOTES:

1. SITE BENCHMARK: T.B.M. IS SET MAG NAIL NORTHWEST OF PROPERTY ELEV.-212.56'

2. FLOODPLAIN NOTE: THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100 YEAR FLOODPLAIN ACCORDING TO FEMA FIRM PANEL NO. 4839C0395C, EFFECTIVE AUGUST 18, 2014.

CHISTOPHER D. FULLER
REGISTERED PROFESSIONAL ENGINEER
108591

ACES
AMERICAN CIVIL ENGINEERING SERVICES, L.P.
P.O. Box 3220 • Conroe, Texas 77305 • FVN - 7349
936-760-3260 • 936-760-3270 (Fax) • www.americanaces.com

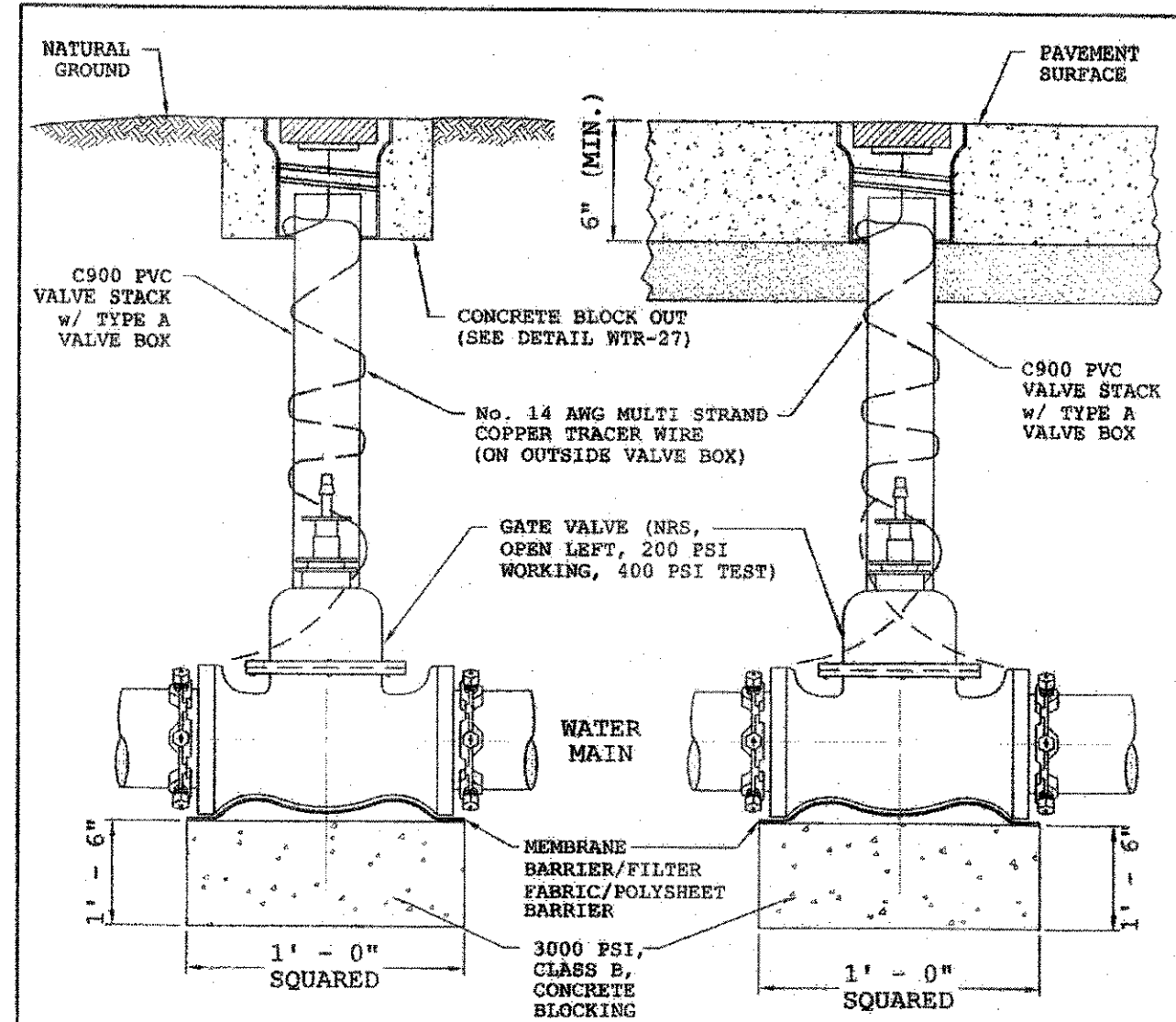
CITY OF CONROE
Engineering Division
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Initial: _____
Date: JAN 27 2021
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SANBERG INVESTMENTS
SITE PLAN
DETAILS 01

Montgomery County Conroe, Texas

Design: CDF CAD: CDF Job No: 125919-051 Drawing No: 11

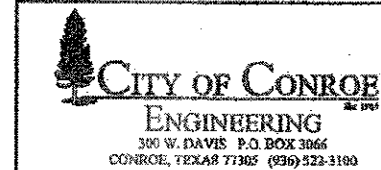


VALVES IN YARDS OR OTHER AREAS NOT SUBJECT TO TRAFFIC

VALVES WITHIN ROADWAYS OR OTHER PAVED OR SURFACED AREAS

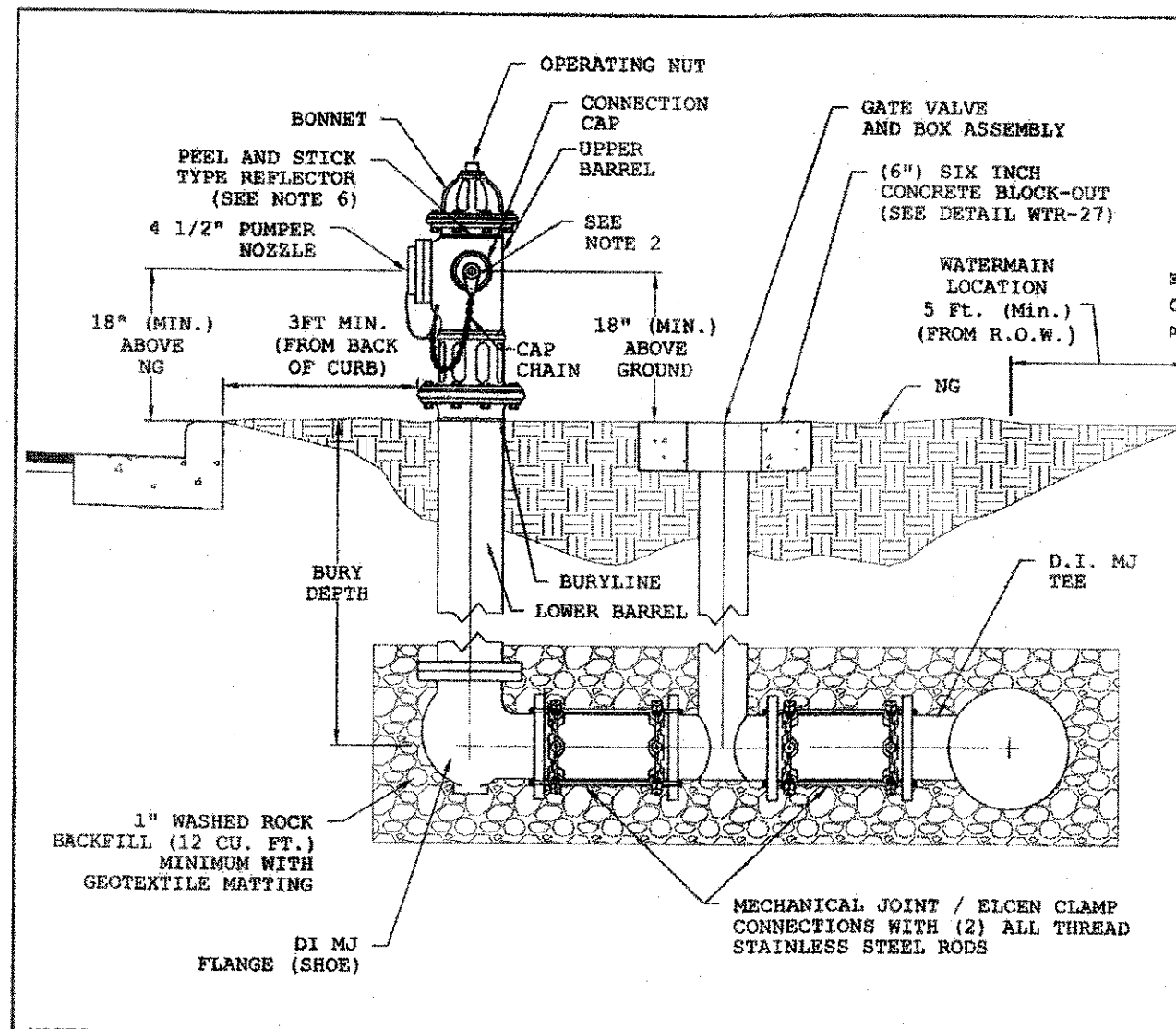
NOTES:

- ALL PARTS FOR SERVICE LINE CONNECTION SHALL BE DOMESTIC, SUCH AS MUELLER, AMERICAN DARLING, AMERICAN FLOW CONTROL, KENNEDY, CLOW OR APPROVED EQUAL.
- ALL GATE VALVE AND BOX INSTALLATIONS SHALL BE FLUSH WITH NATURAL GROUND, ASPHALT PAVEMENT OR CONCRETE PAVEMENT.



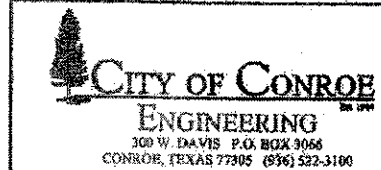
**WATER MAIN
GATE VALVE & BOX INSTALLATION**
Approved By: *[Signature]*

Revision Date
03/01/2018
WTR-04



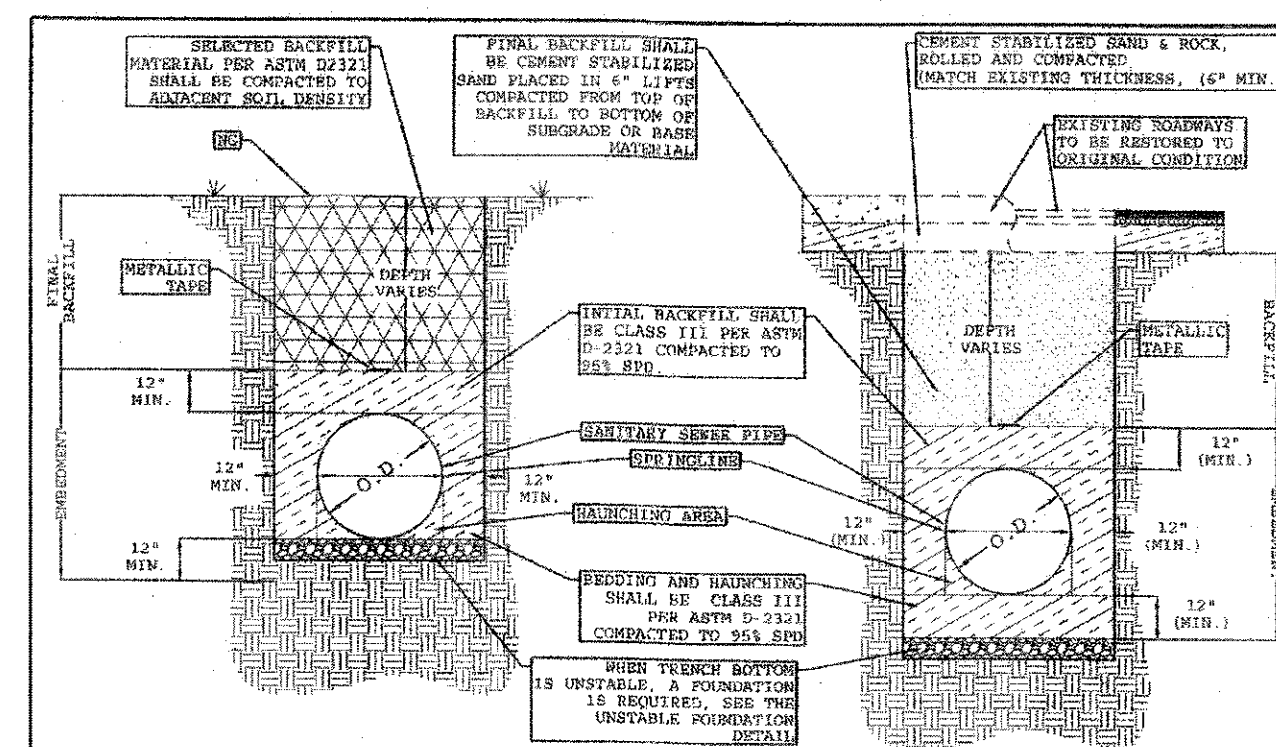
NOTES:

- ALL PARTS SHALL BE MANUFACTURED BY MUELLER, KENNEDY, AMERICAN DARLING, U.S.P., CLOW OR APPROVED EQUAL.
- PUBLIC FIRE HYDRANTS SHALL BE SHOP COATED WITH A SUITABLE PRIMER AND FINISHED WITH SILVER-BRITE PAINT BY SHERWIN WILLIAMS OR APPROVED EQUAL, WITH THE CHAIN RING AND SLOT NOT PAINTED.
- PUBLIC FIRE HYDRANTS SHALL BE COLOR CODED BY CITY PERSONNEL BASED ON PRESSURE TESTING FOR FIRE FLOW.
- PRIVATE FIRE HYDRANTS SHALL BE SHOP COATED WITH A SUITABLE PRIMER AND FINISHED WITH RED PAINT BY SHERWIN WILLIAMS (SW4061) OR APPROVED EQUAL, WITH THE CHAIN RING AND SLOT NOT PAINTED.
- ALL MECHANICAL JOINTS AND ELBEN CLAMPS ARE TO BE JOINED TOGETHER USING 3/4" ALL THREAD STAINLESS STEEL RODS.
- FOURNISH AND INSTALL 1.5" X 31" ALUMINUM REFLECTOR TAPE (BLUE), CRYSTAL GRADE MEETING THE REQUIREMENTS OF ASTM F711.
- FIRE HYDRANTS OR VALVES MAY NOT BE PLACED WITHIN SIDEWALKS (CITY APPROVAL SHALL BE REQUIRED IF NEEDED).



**WATER MAIN
FIRE HYDRANT ASSEMBLY
w/ MECHANICAL JOINT / ELBEN CLAMPS**
Approved By: *[Signature]*

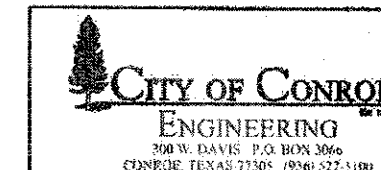
Revision Date
03/01/2018
WTR-06



**SANITARY SEWER BEDDING
DETAIL
OUTSIDE ROADWAY AREAS**

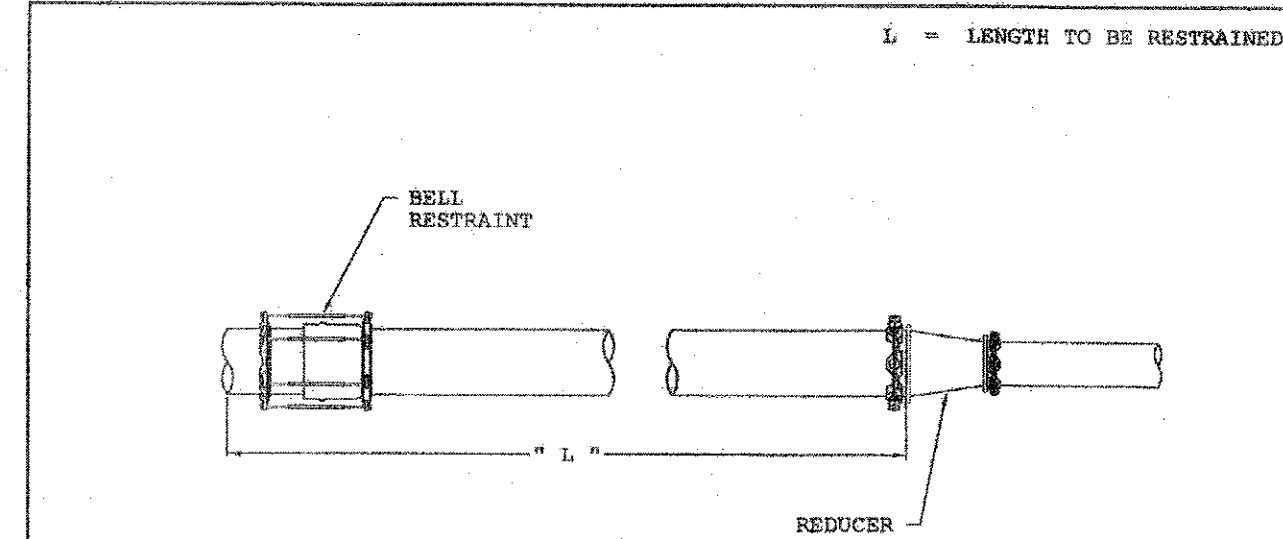
NOTES:

- ALL TRENCHES UNDER CURB OR PAVING MUST BE BACKFILLED PER DETAIL ABOVE.
- UTILITY CROSSINGS OF CITY STREETS MUST BE BASED, UNLESS PERMISSION FOR A STREET CUT HAS BEEN GIVEN IN WRITING BY THE CITY ENGINEER.
- STREET CUTS PARALLEL TO CENTERLINE MUST BE APPROVED BY THE CITY ENGINEER AND WILL PROVIDE RESPECTING BY A PAVED WADION.
- STREET SURFACING SHALL BE TRIMMED TO A NEAT FINISH WITH THE SIDES FREE OF LOOSE MATERIAL.
- ALL COLD JOINT SURFACES SHALL BE TACKED WITH EMULSION WHICH SHALL HAVE "BROKEN" PRIOR TO PATCHING.
- COMPLETED PATCH SHALL NOT DEVIATE FROM EXISTING SURFACE MORE THAN 0.03 FT. / 10 FT. IN SLOPE OR 0.05 FT. / 10 FT. IN CROSS. PATCHES WHEN REPAIRED WITH A 10 FT. STRAIGHT EDGE COMPLETES PATCH SHALL NOT FORD WATER IN DEPTH OF 0.01 FOOT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REPAIRED AND PAVED SECTION FOR ONE YEAR AFTER COMPLETION.



**SANITARY SEWER
BEDDING AND TRENCH DETAIL**
Approved By: *[Signature]*

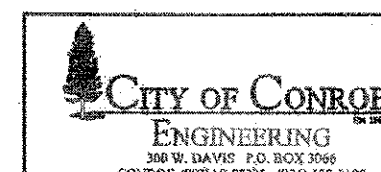
Revision Date
03/01/2018
SWR-12



NOTES:

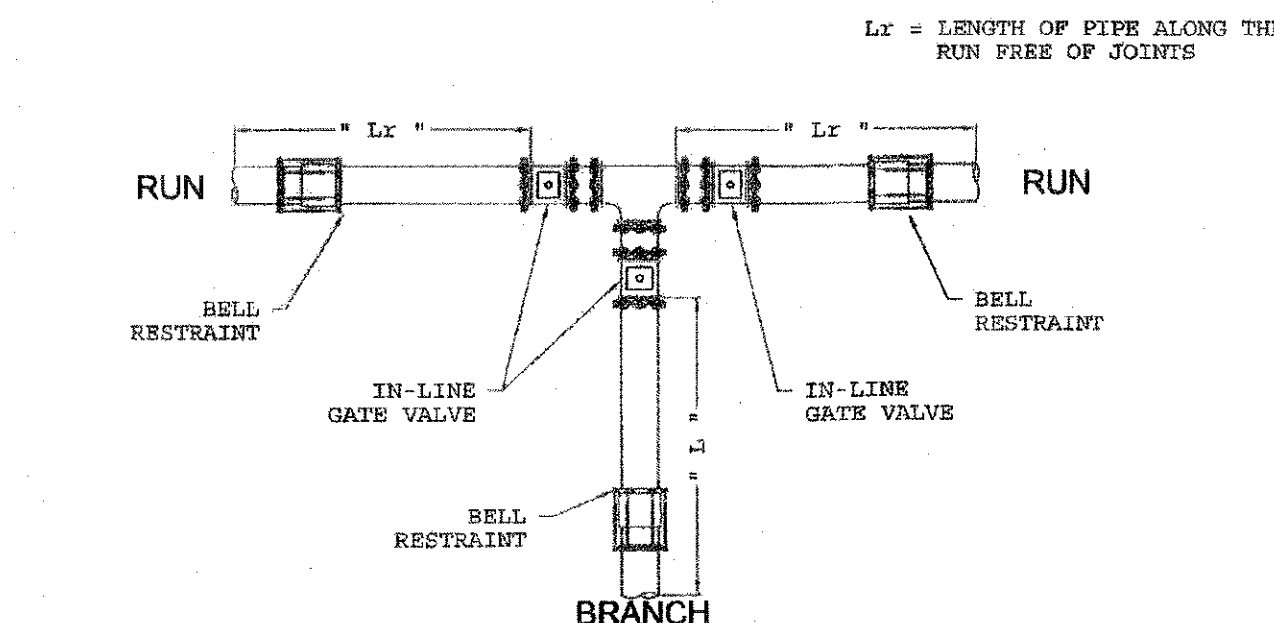
- RESTRAINED LENGTH CALCULATIONS ARE FOR P.V.C. PIPE BEDDED IN COMPACTED GRANULAR MATERIAL PER CITY STANDARD DETAILS. ACTUAL RESTRAINED LENGTH SHALL BE DETERMINED BY THE DESIGN ENGINEER BASED ON THE SOIL CONDITIONS AND EMBEDMENT PROVIDED.
- FOR PIPES LARGER THAN 12 INCH, RESTRAINED LENGTHS MUST BE CALCULATED BY THE DESIGN ENGINEER AND APPROVED BY THE CITY ENGINEERING DEPT.

REDUCER SIZE		MINIMUM RESTRAINED LENGTH (L) IN FEET WITH TEST PRESSURE (150 PSI)
LARGER PIPE SIZE (I.D.)	SMALLER PIPE SIZE (I.D.)	
8"	4"	42
8"	6"	24
12"	6"	60
12"	8"	43



**WATER MAIN
MINIMUM RESTRAINED LENGTHS
FOR PIPE REDUCERS**
Approved By: *[Signature]*

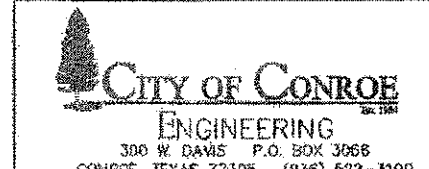
Revision Date
03/01/2018
WTR-14



NOTES:

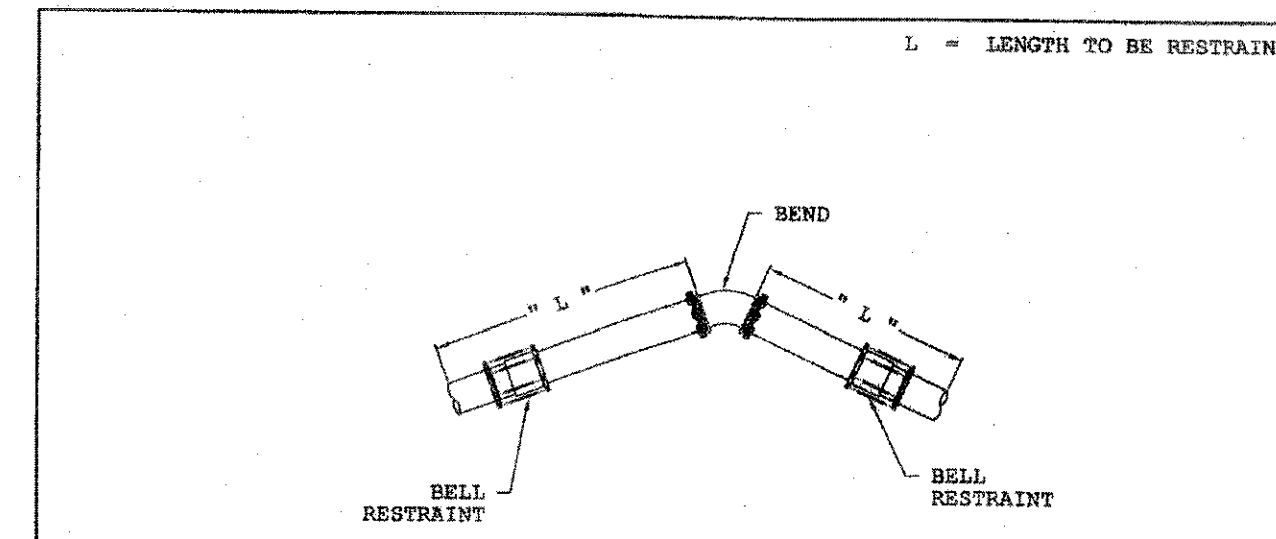
- RESTRAINED LENGTH CALCULATIONS ARE FOR P.V.C. PIPE BEDDED IN COMPACTED GRANULAR MATERIAL PER CITY STANDARD DETAILS. ACTUAL RESTRAINED LENGTH SHALL BE DETERMINED BY THE DESIGN ENGINEER BASED ON THE SOIL CONDITIONS AND EMBEDMENT PROVIDED.
- FOR PIPES LARGER THAN 12 INCH, RESTRAINED LENGTHS MUST BE CALCULATED BY THE DESIGN ENGINEER AND APPROVED BY THE CITY ENGINEERING DEPT.

DEPTH @ CL OF WATER MAIN AND TEE (4 FEET BURY MIN.)				DEPTH @ CL OF WATER MAIN AND TEE (5 FEET BURY MIN.)			
PIPE SIZE (I.D.)	BRANCH SIZE (I.D.)	LENGTH OF RUN IN FEET	MINIMUM RESTRAINED LENGTH (L) IN FEET WITH TEST PRESSURE (150 PSI)	PIPE SIZE (I.D.)	BRANCH SIZE (I.D.)	LENGTH OF RUN IN FEET	MINIMUM RESTRAINED LENGTH (L) IN FEET WITH TEST PRESSURE (150 PSI)
6"	4"	0	31	12"	4"	0	31
6"	4"	5	1	12"	4"	5	1
6"	4"	10	1	12"	6"	0	44
6"	6"	0	44	12"	6"	5	1
6"	6"	5	20	12"	6"	10	1
6"	6"	10	1	12"	8"	0	58
8"	4"	0	31	12"	8"	5	23
8"	4"	5	1	12"	8"	10	1
8"	6"	0	44	12"	8"	15	1
8"	6"	5	13	12"	12"	0	82
8"	6"	10	1	12"	12"	5	59
8"	8"	0	58	12"	12"	10	35
8"	8"	5	34	12"	12"	15	12
8"	8"	10	11				
8"	8"	15	1				



**WATER MAIN
MINIMUM RESTRAINED LENGTHS
FOR TEES**
Approved By: *[Signature]*

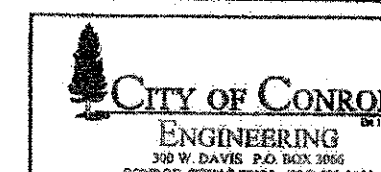
Revision Date
06/08/2021
WTR-17



NOTES:

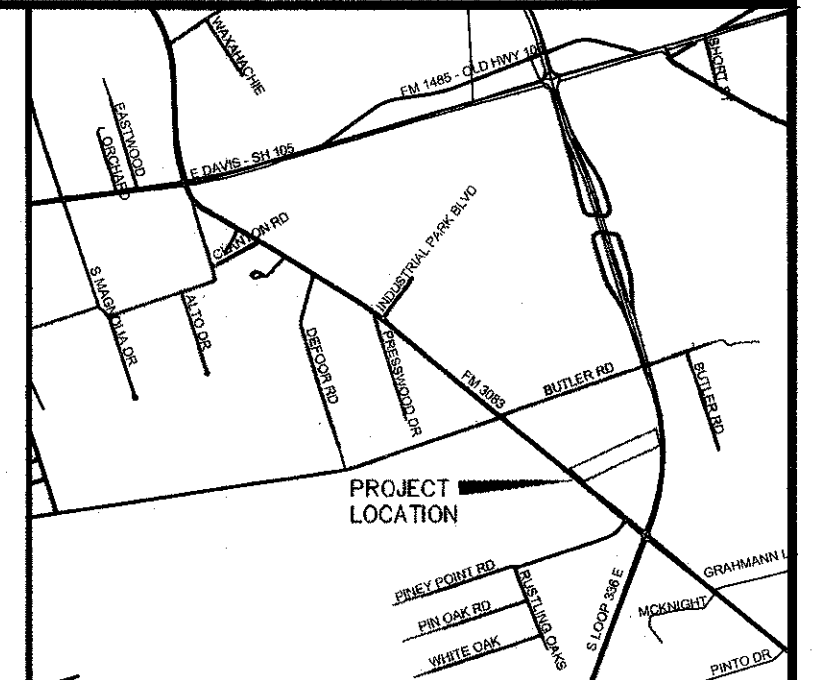
- RESTRAINED LENGTH CALCULATIONS ARE FOR P.V.C. PIPE BEDDED IN COMPACTED GRANULAR MATERIAL PER CITY STANDARD DETAILS. ACTUAL RESTRAINED LENGTH SHALL BE DETERMINED BY THE DESIGN ENGINEER BASED ON THE SOIL CONDITIONS AND EMBEDMENT PROVIDED.
- FOR PIPES LARGER THAN 12 INCH, RESTRAINED LENGTHS MUST BE CALCULATED BY THE DESIGN ENGINEER AND APPROVED BY THE CITY ENGINEERING DEPT.

BEND ANGLE	PIPE SIZE (I.D.)	MINIMUM RESTRAINED LENGTH (L) IN FEET WITH TEST PRESSURE (150 PSI)
90°	6"	17
90°	8"	22
90°	12"	32
45°	6"	7
45°	8"	9
45°	12"	13
22.5°	6"	3
22.5°	8"	4
22.5°	12"	6
11.25°	6"	2
11.25°	8"	2
11.25°	12"	3



**WATER MAIN
MINIMUM RESTRAINED LENGTHS
FOR HORIZONTAL BENDS**
Approved By: *[Signature]*

Revision Date
03/01/2018
WTR-16

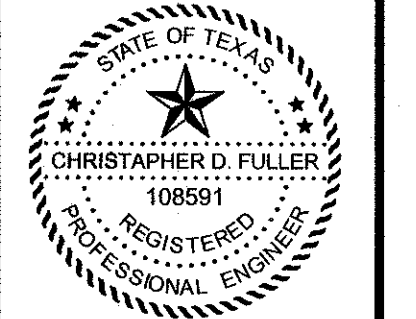


VICINITY MAP
N.T.S.

Utility Legend

- | | |
|--------------------------|-----------------------|
| Street Signs | Street Light |
| Plug | Taping Sleeve & Valve |
| Blow-Off Valve | Clean Out |
| Gate Valve | San Manhole |
| Fire Hydrant | Storm Inlet |
| Te | Storm Manhole |
| FL FLOWLINE | PC Point of Curve |
| TOB Top of Bank | ROW Right of Way |
| LF Linear Feet | UE Utility Easement |
| RCP Reinforced Conc Pipe | CO Cleanout |
| TP TOP OF PAVING | TG TOP GRAVEL |
| SW SIDE WALK | PG PROP. GRADE |
| NG NATURAL GRADE | TC TOP CURB |
| SET SAFETY END TREATMENT | MH MAHOLE |
| FF FIRE HYDRANT | FF FINISHED FLOOR |

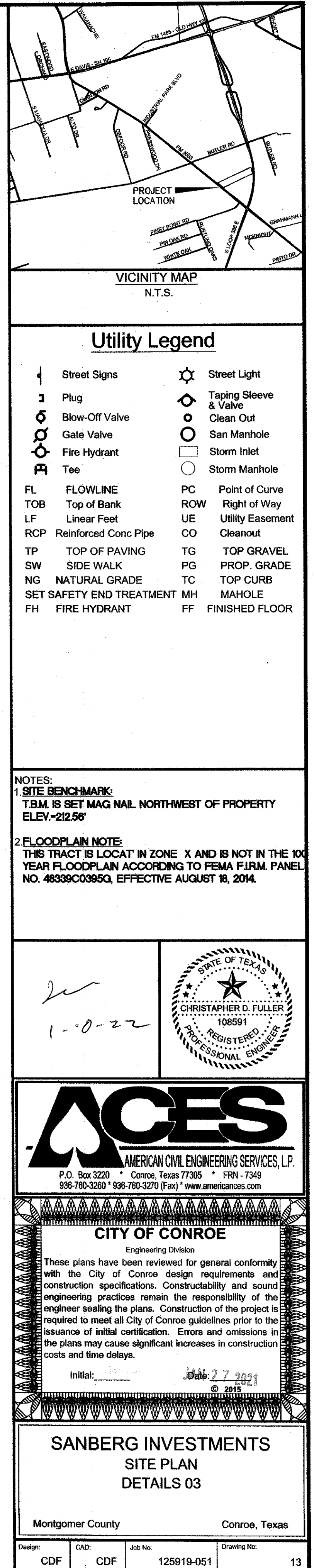
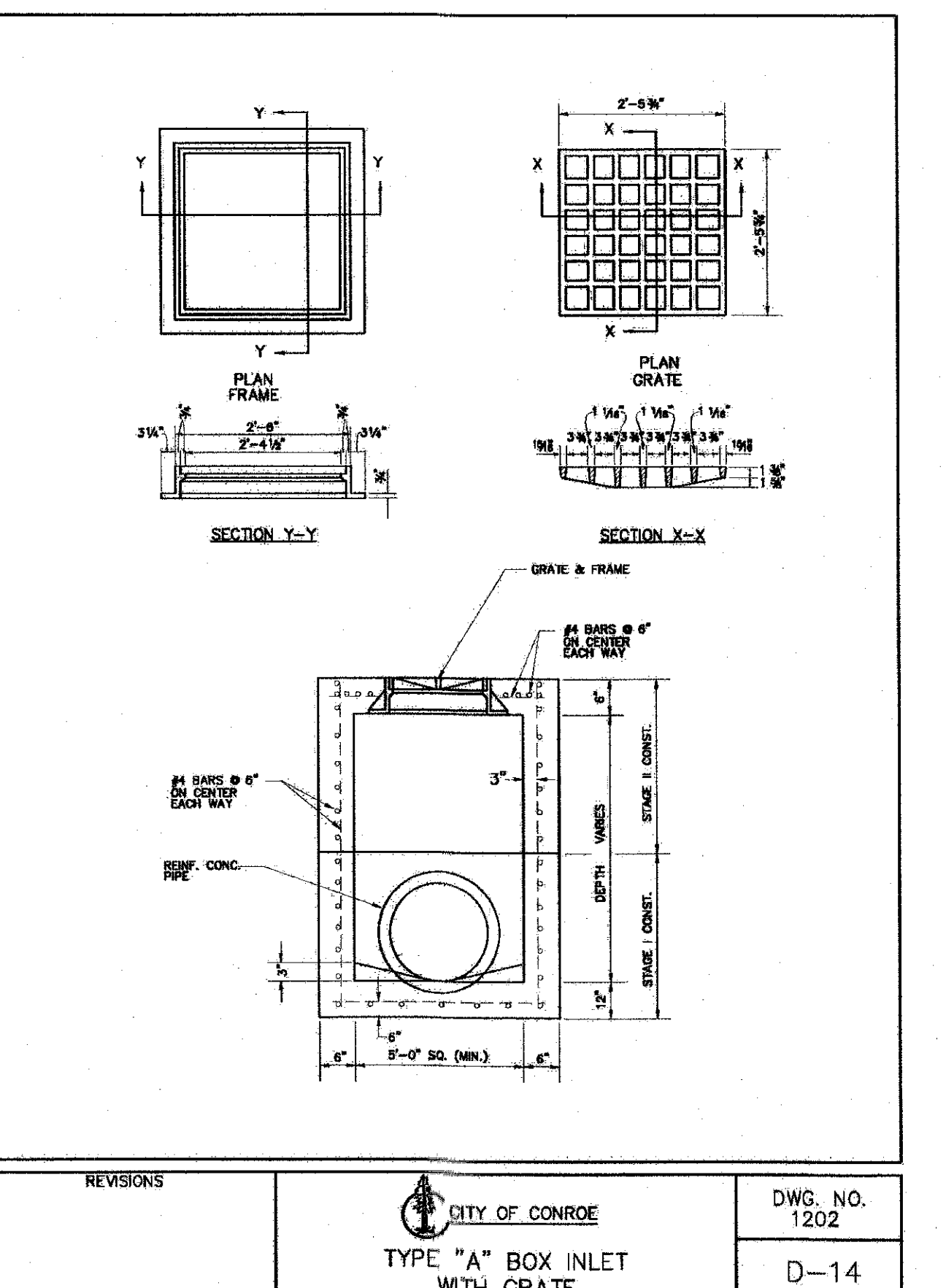
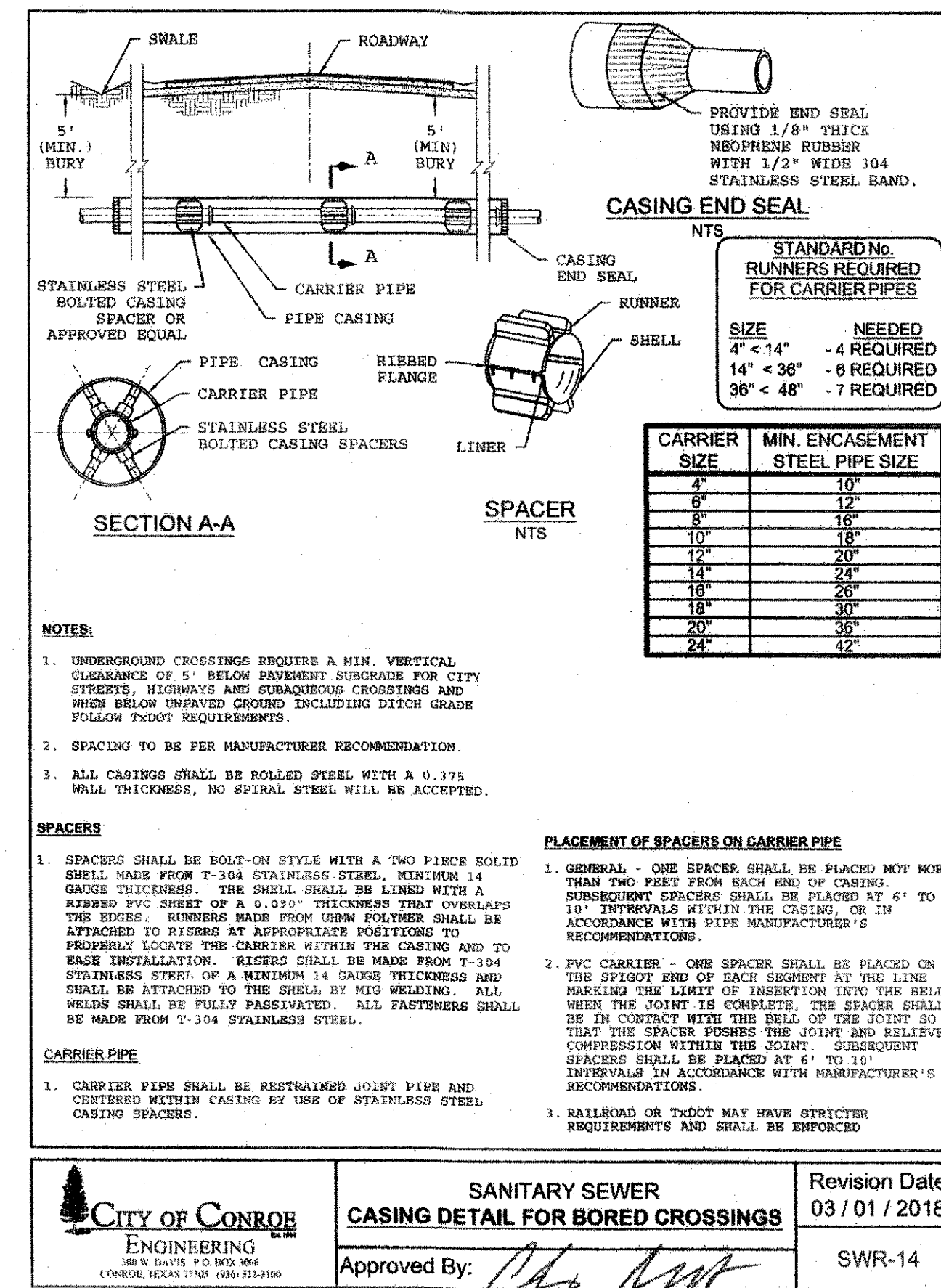
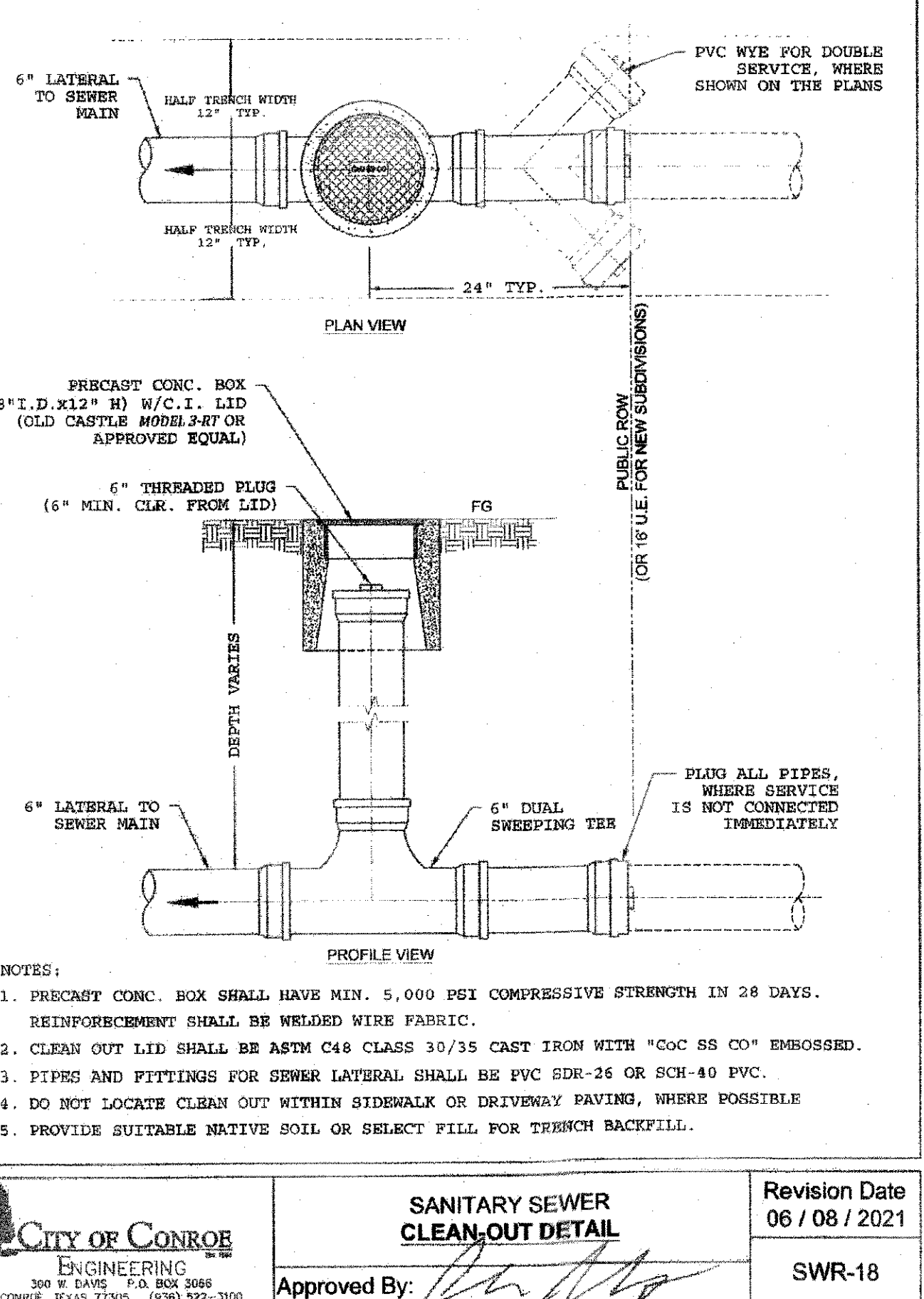
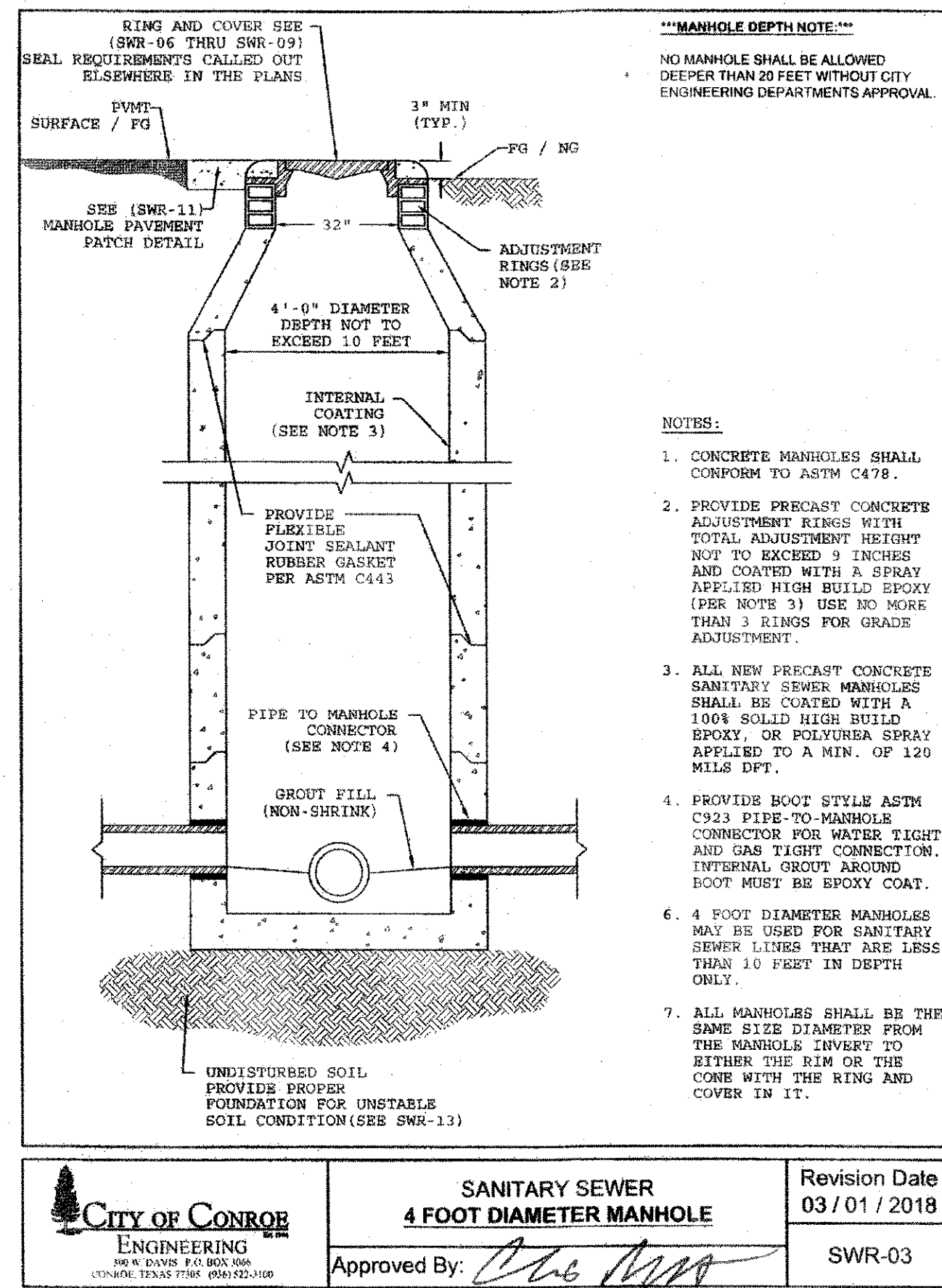
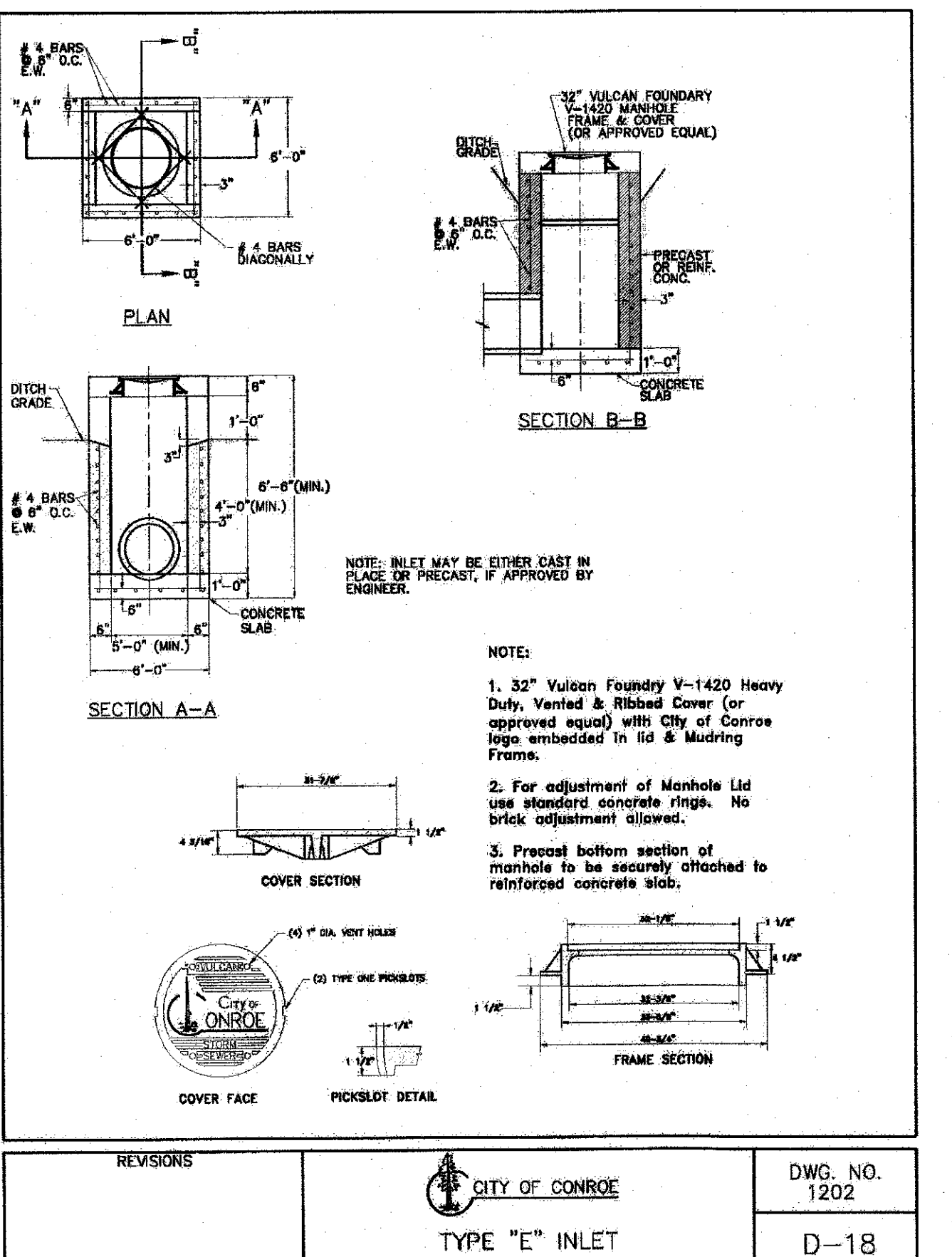
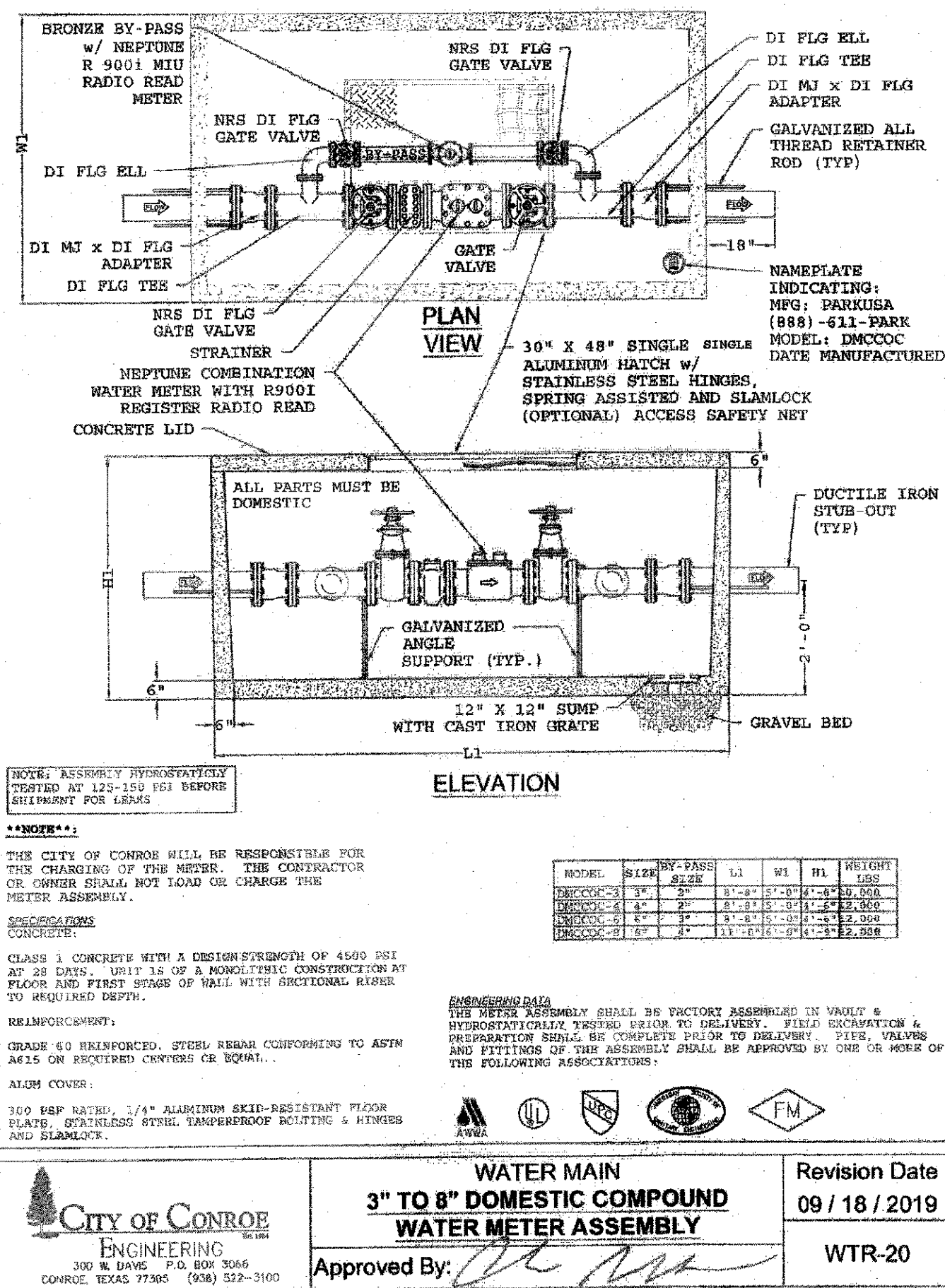
- NOTES:
1. SITE BENCHMARK: T.B.M. IS SET MAG NAIL NORTHWEST OF PROPERTY ELEV-212.56'
2. FLOODPLAIN NOTE: THIS TRACT IS LOCAT' IN ZONE X AND IS NOT IN THE 100 YEAR FLOODPLAIN ACCORDING TO FEMA F.I.R.M. PANEL NO. 48398C0395G, EFFECTIVE AUGUST 18, 2014.



**SANBERG INVESTMENTS
SITE PLAN
DETAILS 02**

Montgomery County Conroe, Texas

Design: CDF CAD: CDF Job No: 125919-051 Drawing No: 12



Maloney Services
ULTIMATE DESIGN CALCULATIONS

A. FLOW

Volume of Pumped Flow = 1.57 Ac. - Ft.
Flow for 72 Hours Maximum Release Time = 949.85 Cu.- Ft./Hr
Flow = 15.83083333 Cu.- Ft./min
Total Design Flow = 118.41 GPM

B. FRICTION HEAD (Hf + Hfm)

C=140
Proposed 225 L.F. of 4" force main
Hf = $0.002083(L)(100/C)^{1.85} (GPM)^{1.85}/d^{4.955}$
L = 41.00 FEET
C = 140.00
GPM = 118.41 GPM
d = 4.00 INCHES (pipe diameter)
Hf = 0.37 FEET

Hazen-Williams
C=120
Proposed 225 L.F. of 4" force main
Hf = $0.002083(L)(100/C)^{1.85} (GPM)^{1.85}/d^{4.955}$
L = 41.00 FEET
C = 120.00
GPM = 118.41 GPM
d = 4.00 INCHES (pipe diameter)
Hf = 0.49 FEET

C. STATIC HEAD (Hs)

Maximum Static Loss = High Elev. - Pump Off Elev.
High FM Elev = 199.00
Low Elev = 192.00
Hs = 7.00 FEET

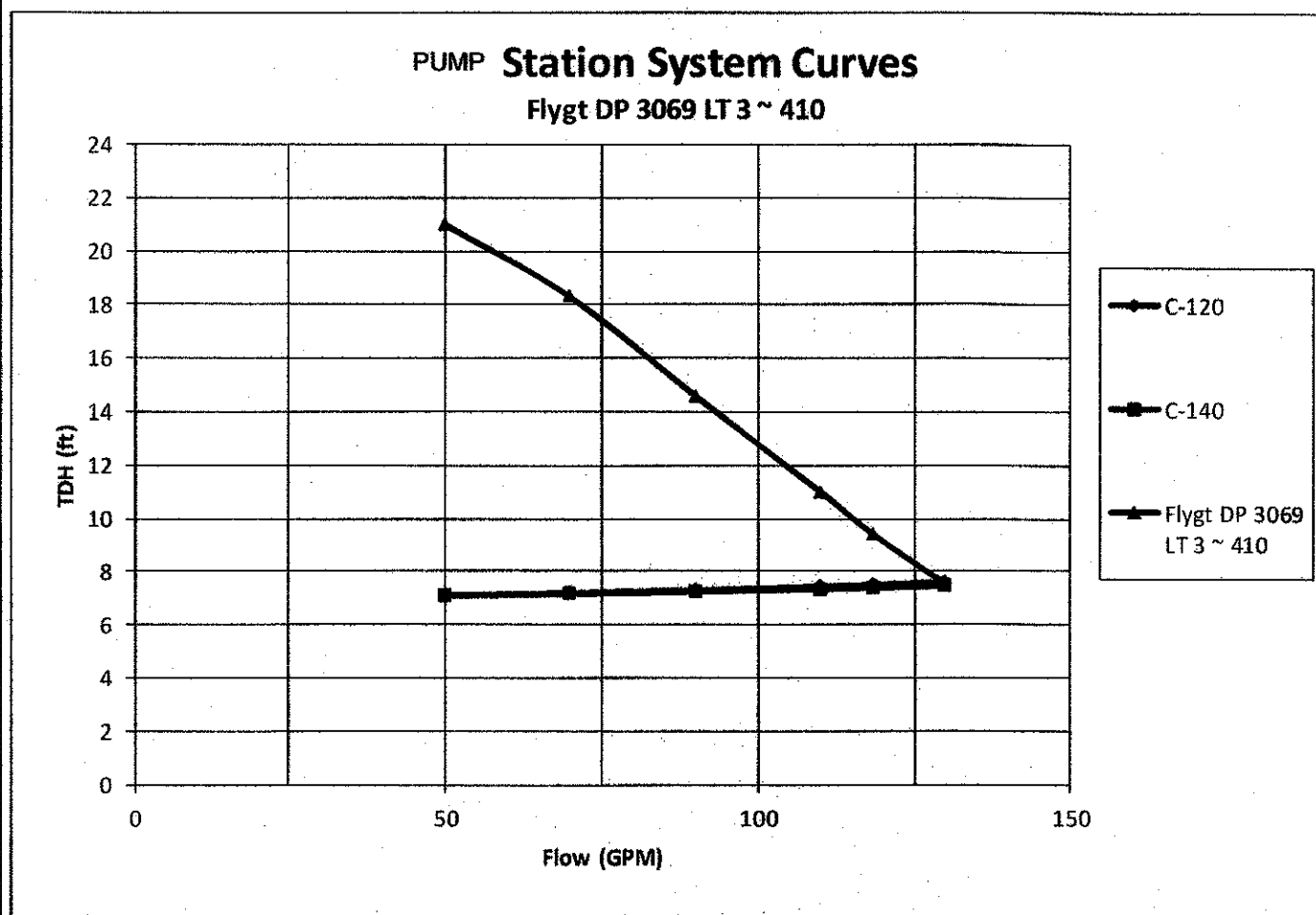
D. TOTAL DYNAMIC HEAD (TDH)

C = 140
TDH = Hf + Hfm + Hs
TDH = 7.37 FEET

C = 120
TDH = Hf + Hfm + Hs
TDH = 7.49 FEET

E. SYSTEM HEAD CURVES

Q	C-120 TDH	C-140 TDH
50	7.10	7.07
70	7.19	7.14
90	7.30	7.22
110	7.43	7.32
118	7.49	7.37
130	7.58	7.44



Buoyancy Calculation

volumetric weight of water = 62.4 lbs/ft³
volumetric weight of concrete = 150 lbs/ft³
volumetric weight of soil = 120 lbs/ft³

Wet Well

Top of Top Slab Elevation = 202.00
Top of Bottom Slab Elevation = 189.50
Thickness Top of Slab = 0.5 ft
Thickness Bottom of Slab = 0.5 ft
Thickness of Seal Slab = 0.67 ft
Top Slab Extension Above Grade = 0.5 ft
Bottom Slab Extension = 0 ft
Wall Height = 12 ft
Diameter = 6.00 ft
Wall Thickness = 7 inches
Top Slab Width = 7.166667 ft
Top Slab Length = 7.166667 ft
Hatch Openings:
Number of Hatches = 2
Length of Hatch Opening = 4 ft
Width of Hatch Opening = 2.5 ft
Total Area of Hatch Openings = 20 ft²

Wet Well Weight Forces

Wall = 21,716 lbs
Top Slab = 2,352 lbs
Bottom Slab + Seal Slab = 7,079 lbs
Soil Above Slab Extension = 0 lbs

Total Weight = 31,148 lbs

Wet Well Buoyancy Force

Total Buoyancy = 30,206 lbs

Total Weight / Total Buoyancy = 1.03 Factor of Safety

MEETS MINIMUM FACTOR OF SAFETY

H. FORCE MAIN VELOCITY CALCULATIONS

Design Flow = 118.41 GPM
Pipe Size = 4.00 INCH
Velocity = Q/A = 3.02 fps > 3, < 10 fps OK

I. CONCLUSIONS

118.41 GPM @ 3.02 fps
1 hp. submersible - 1 ø power - 115 V
Flygt CP 3045 HT 1 ~ 252

PUMP STATION
PIPE, VALVE, AND FITTING SCHEDULE

ITEM NO.	DESCRIPTION	QTY.
A	SUBMERSIBLE PUMP	2
B	4" Class 150 D.I. (LENGTH VARIES)	VARIES

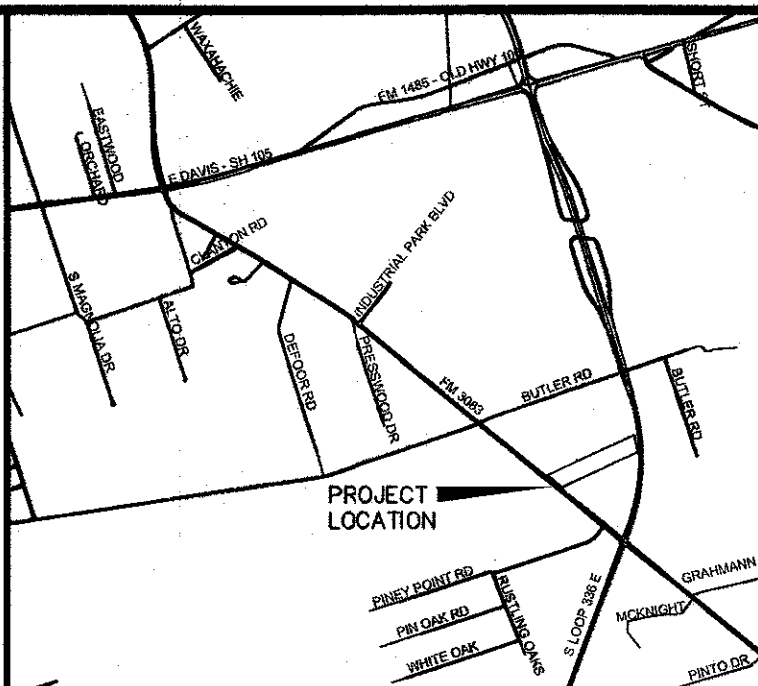
D	4" FLANGED 90° ELBOW	4
---	----------------------	---

F	4" FLANGED D.I. TEE	1
G	2" to 4" FLANGED REDUCER	2
H	4" FLANGED 45° ELBOW	2
J	PUMP GUIDE RAILS (STAINLESS STEEL)	2-PAIR
K	4" Class 150 D.I. (LENGTH VARIES)	VARIES

M	4" D.I. to 4" PVC TRANSITION SLEEVE	1
---	-------------------------------------	---

NOTE: A TRANSDUCER IS TO BE PLACED IN THE E-INLET ON THE BERM
WITH A PUMP OFF ELEVATION OF 199.00'

PUMP STATION CONDITION	DEPTH 'd'	DIA. 'w'	INFLUENT ELEV.	LEAD PUMP ON ELEV.	EMERGENCY PUMP ON ELEV.	PUMP OFF ELEV.	E-INLET OFF ELEV.	BOTTOM ELEV.	PUMP DISCHARGE SIZE	TOP ELEV.	PUMPS	T.D.H.
PROPOSED	12.50'	6 FT	192.00	192.50	194.00	191.50	199.00	189.50	2"	202.00	118 GPM	7.12 FT
PROPOSED	FLYGT CP 3045 HT, 252 IMP., 2" Discharge, 1 HP - 1ø Power											

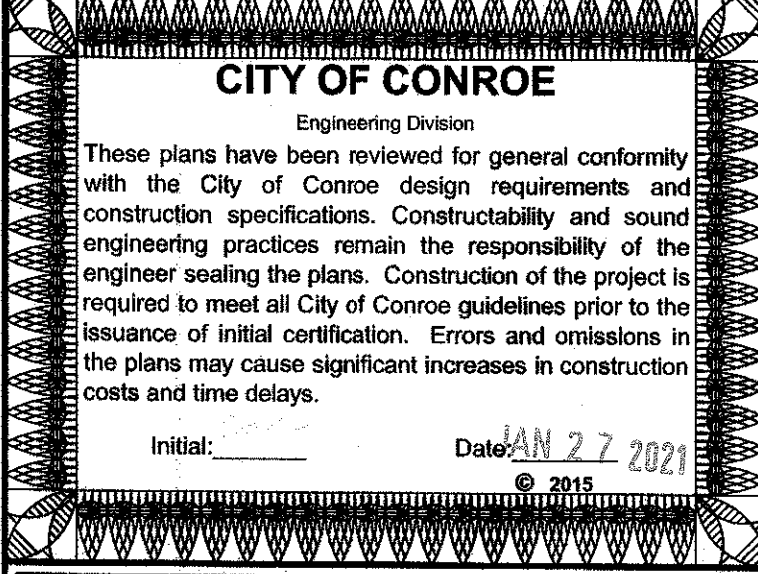
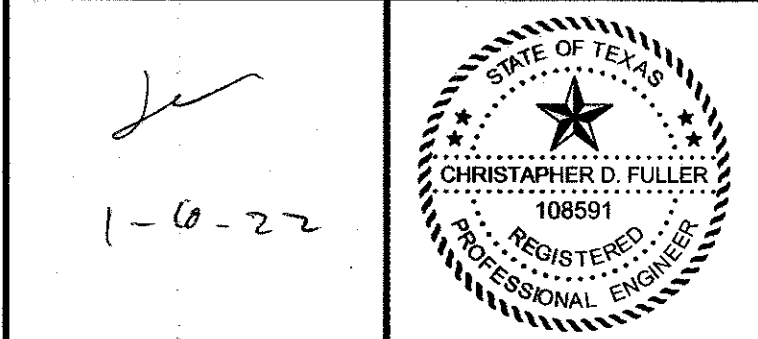


VICINITY MAP
N.T.S.

Utility Legend

Street Signs	Street Light
Plug	Taping Sleeve & Valve
Blow-Off Valve	Clean Out
Gate Valve	San Manhole
Fire Hydrant	Storm Inlet
Tee	Storm Manhole
FL FLOWLINE	PC Point of Curve
TOB Top of Bank	ROW Right of Way
LF Linear Feet	UE Utility Easement
RCP Reinforced Conc Pipe	CO Cleanout
TP TOP OF PAVING	TG TOP GRAVEL
SW SIDE WALK	PG PROP. GRADE
NG NATURAL GRADE	TC TOP CURB
SET SAFETY END TREATMENT	MH MAHOLE
FH FIRE HYDRANT	FF FINISHED FLOOR

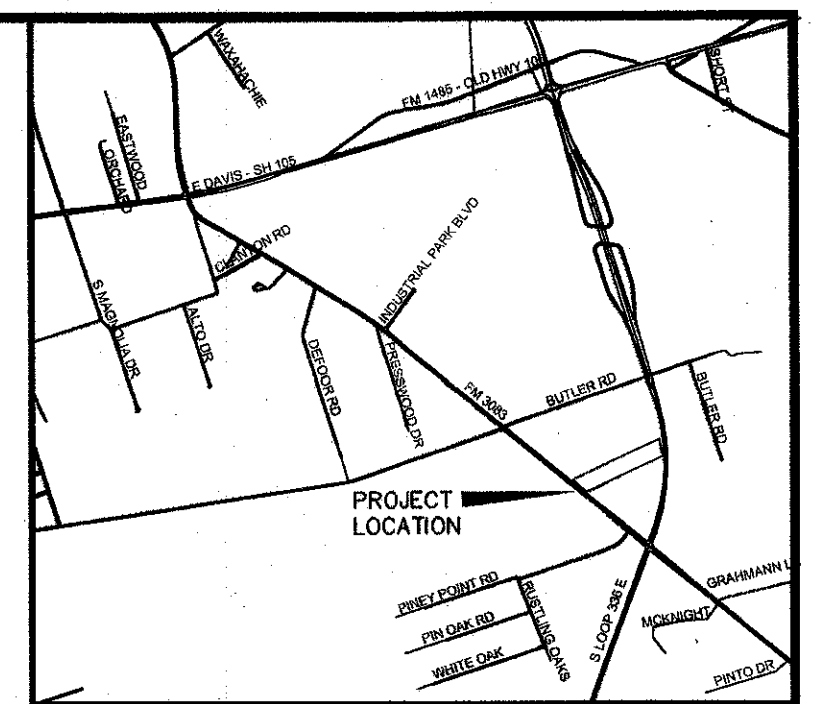
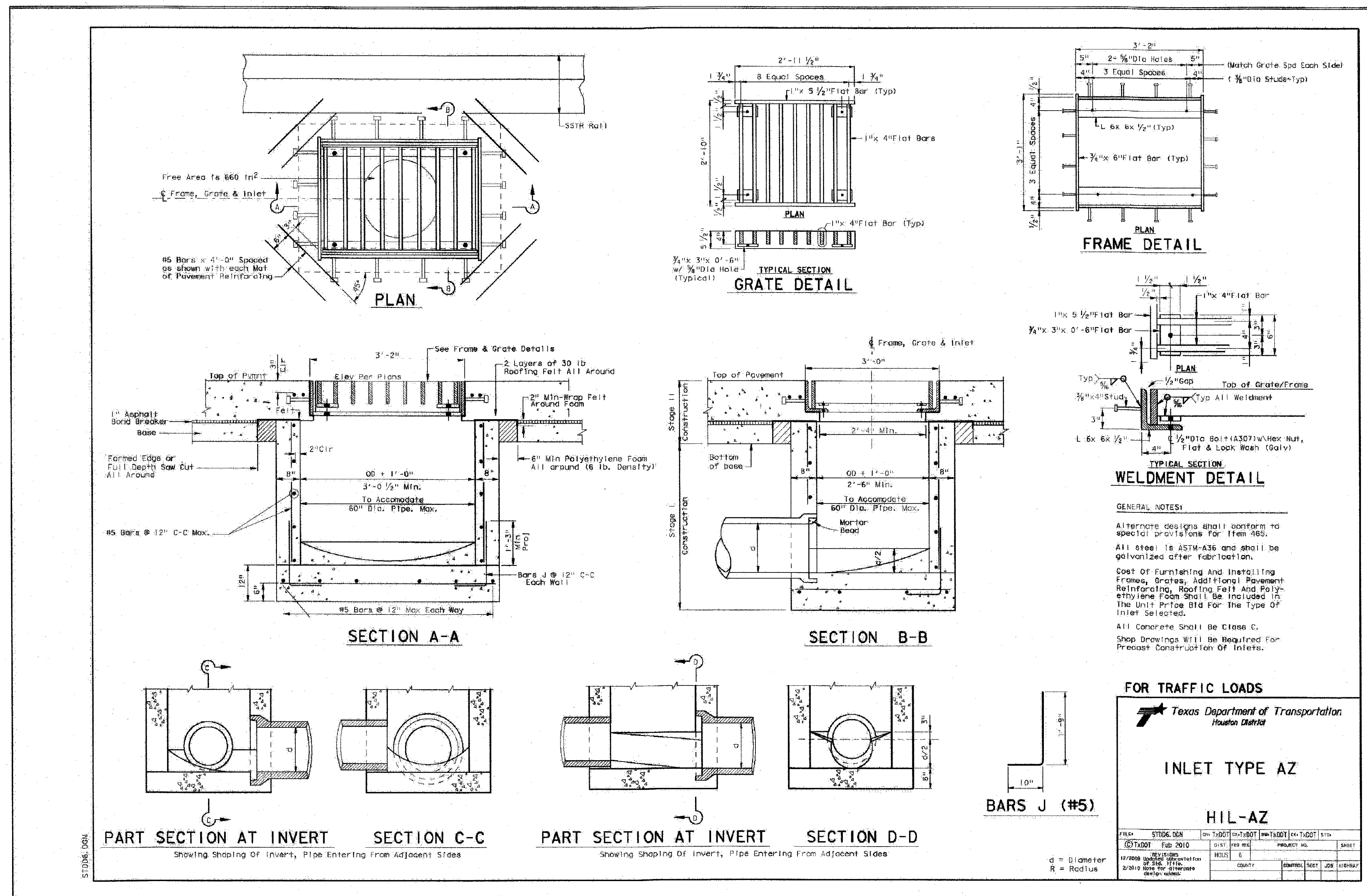
NOTES:
1. SITE BENCHMARK:
T.B.M. IS SET MAG NAIL NORTHWEST OF PROPERTY
ELEV.-212.56'
2. FLOODPLAIN NOTE:
THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100
YEAR FLOODPLAIN ACCORDING TO FEMA F.I.R.M. PANEL
NO. 48339C0395Q, EFFECTIVE AUGUST 18, 2014.



SANBERG INVESTMENTS
SITE PLAN
PUMP STATION CALCULATIONS

Montgomery County Conroe, Texas

Design: CDF CAD: CDF Job No: 125919-051 Drawing No: 14



Utility Legend

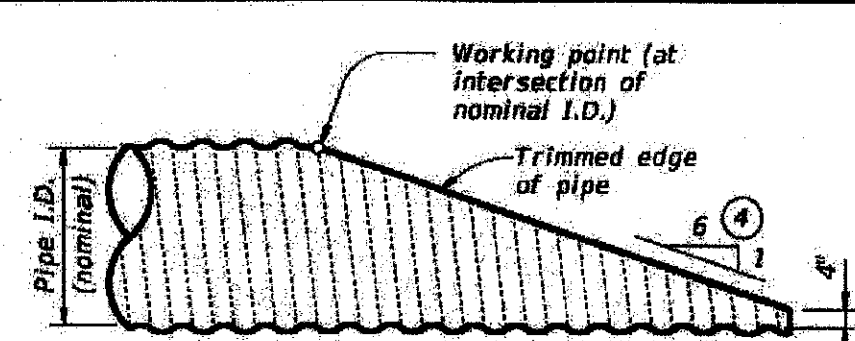
NOTES:
1. SITE BENCHMARK:
T.B.M. IS SET MAG NAIL NORTH-WEST OF PROPERTY
ELEV.-212.56'
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NO. 48339C0395G, EFFECTIVE AUGUST 18, 2014.



SANBERG INVESTMENTS
SITE PLAN
TXDOT DETAILS 01

DISCLAIMER: The use of this document is governed by the Texas Engineering Practice Act. No warranty of any kind is made by the engineer or the State of Texas for the use of this document for any purpose other than that for which it was prepared. The engineer and the State of Texas assume no responsibility for damages resulting from its use.

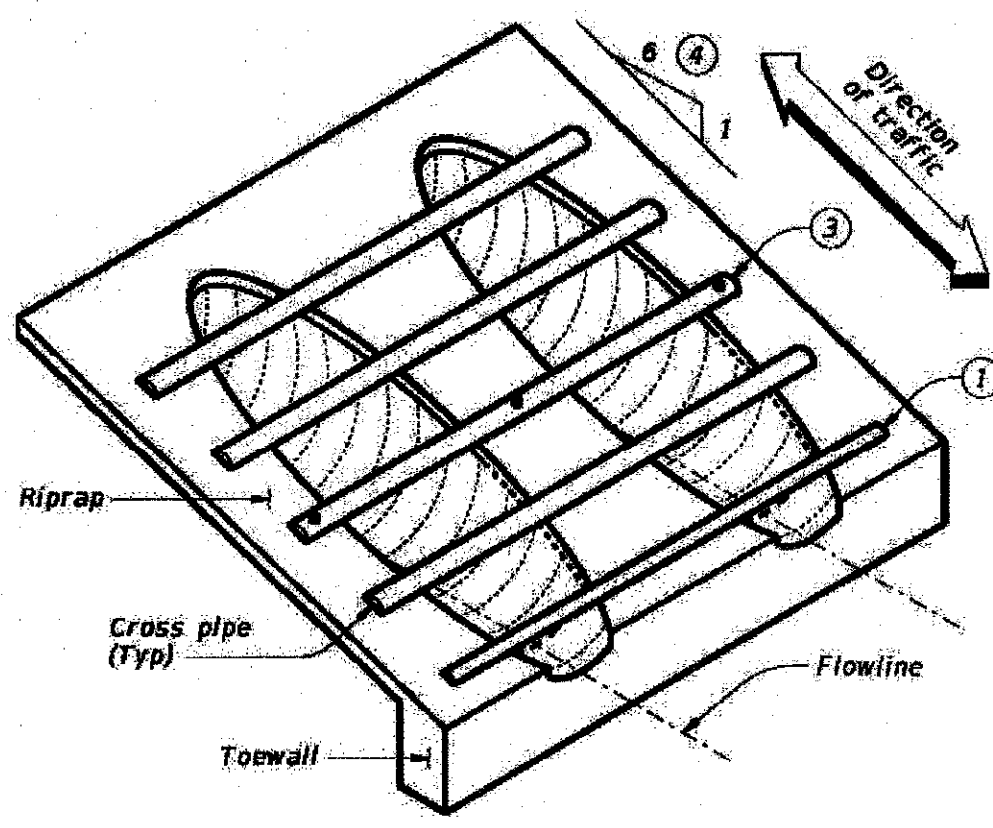
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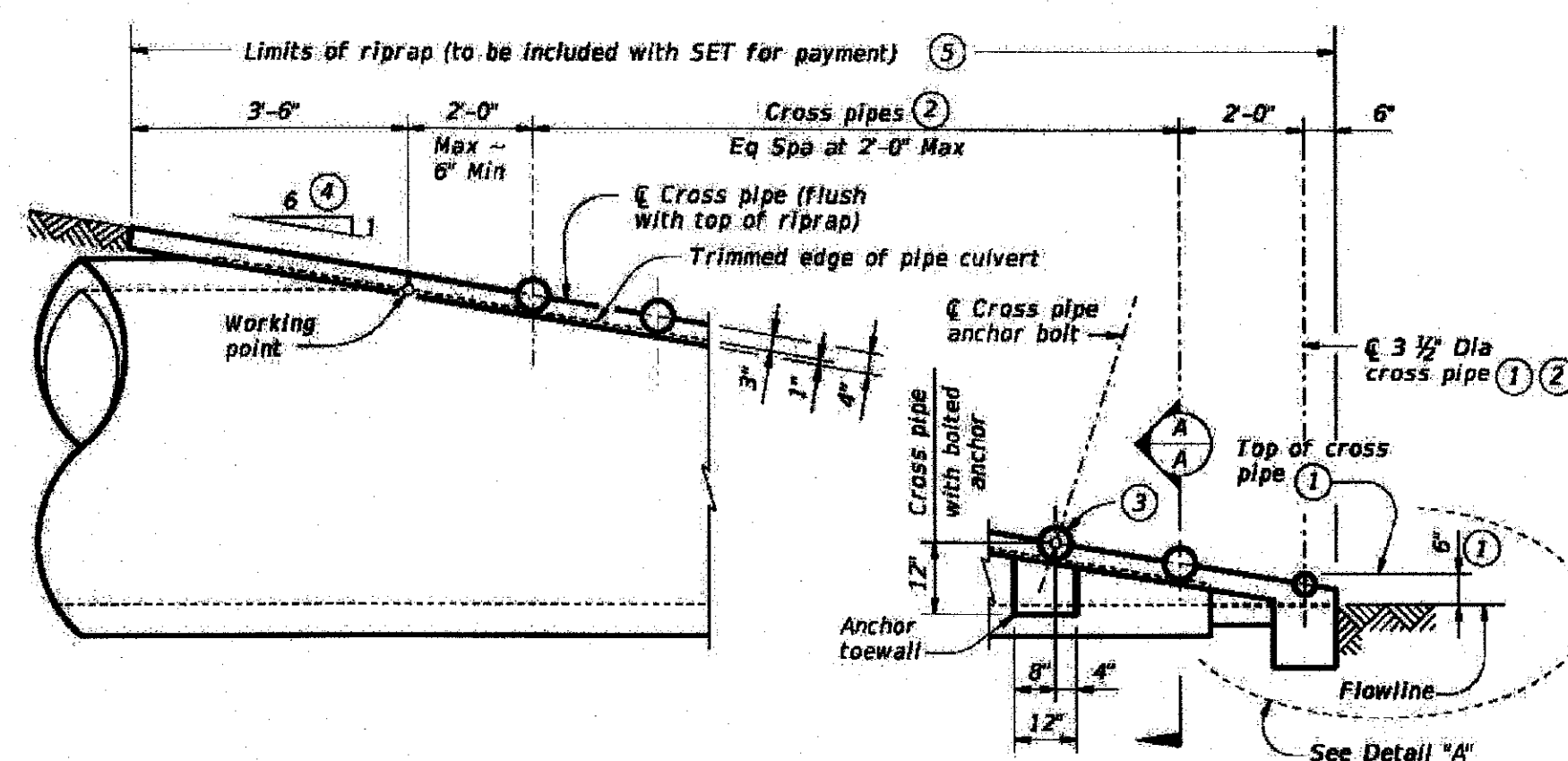
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete pipe (RCP) culvert are similar.)

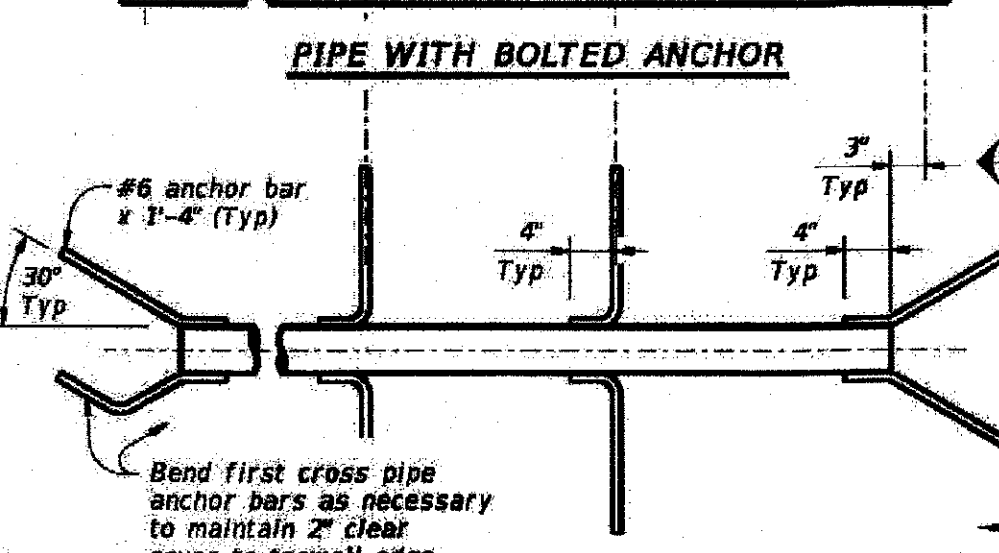
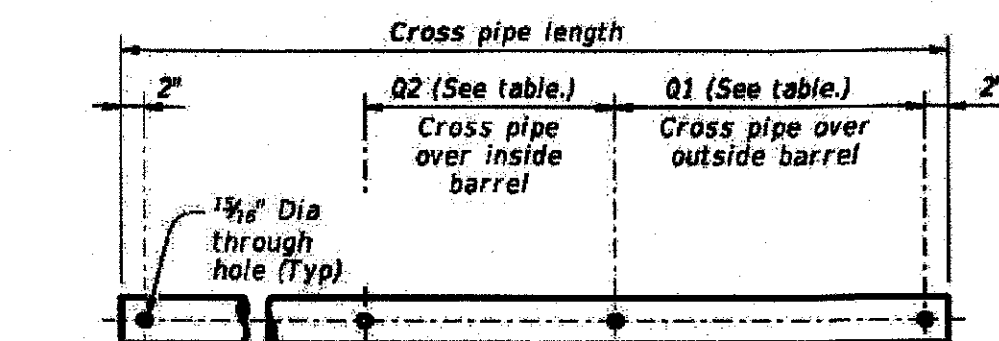


ISOMETRIC VIEW OF TYPICAL INSTALLATION

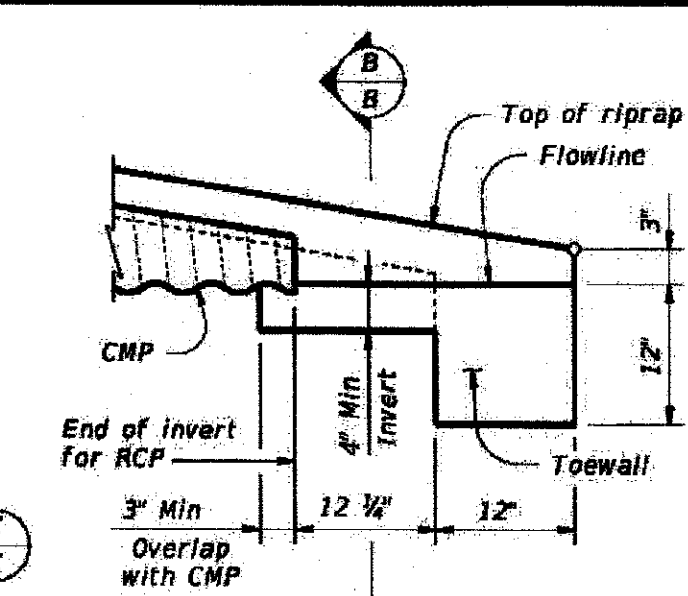
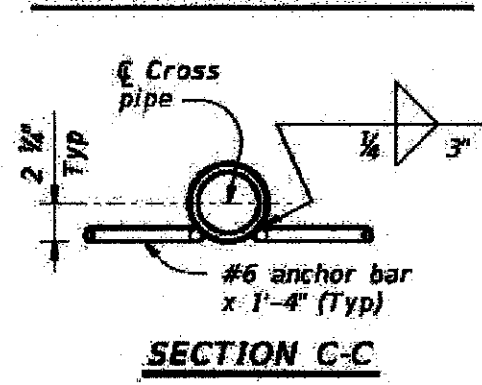


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)

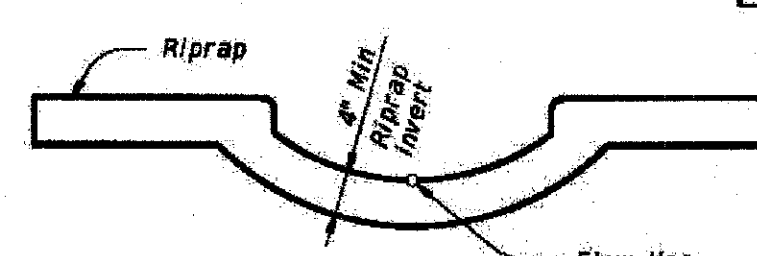


CROSS PIPE DETAILS



DETAIL "A"

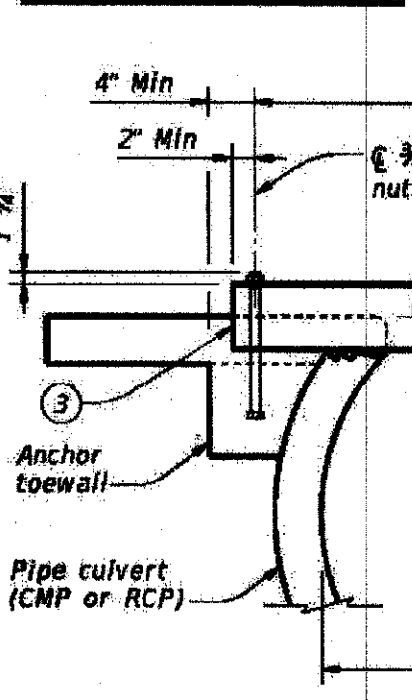
(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



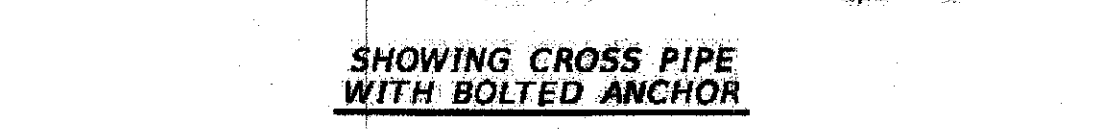
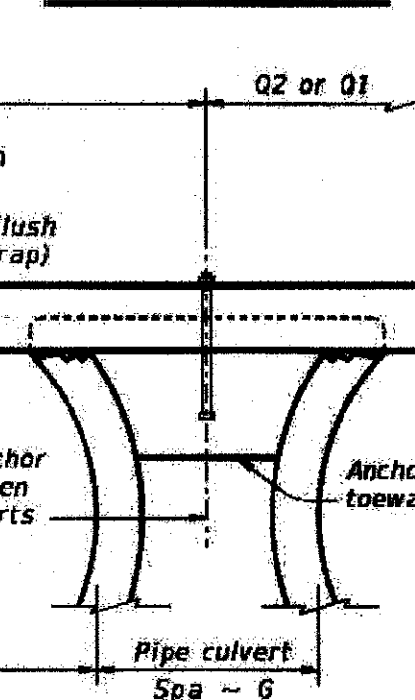
SECTION B-B

(Cross pipes not shown for clarity.)

SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0'-9"	N/A	2'-1"	1'-9"	3 or more pipe culverts	3" Std (3,500" O.D.)
15"	0.7	0'-11"	N/A	2'-5"	2'-2"		
18"	0.8	1'-2"	N/A	2'-10"	2'-8"		
21"	0.9	1'-4"	N/A	3'-2"	3'-1"		
24"	0.9	1'-7"	N/A	3'-6"	3'-7"		
27"	1.0	1'-8"	N/A	3'-10"	3'-11"	3 or more pipe culverts	
30"	1.1	1'-10"	N/A	4'-2"	4'-4"	2 or more pipe culverts	3 1/2" Std (4,000" O.D.)
33"	1.2	1'-11"	4'-2"	4'-5"	4'-8"	All pipe culverts	
36"	1.3	2'-1"	4'-5"	4'-9"	5'-1"		
42"	1.5	2'-4"	4'-11"	5'-5"	5'-10"		
48"	1.7	2'-7"	5'-5"	6'-0"	6'-7"		
54"	2.0	3'-0"	5'-11"	6'-9"	7'-6"		
60"	2.2	3'-3"	6'-5"	7'-4"	8'-3"		
66"	2.4	3'-6"	6'-11"	7'-10"	8'-9"		
72"	2.7	3'-9"	7'-5"	8'-5"	9'-4"		

- The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.
- Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1/2" standard pipe (4" O.D.) for the first bottom pipe.
- Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
- Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
- Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".
- Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr. B), ASTM A500 (Gr. B), or API 5LX52. Provide ASTM A307 bolts and nuts. Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

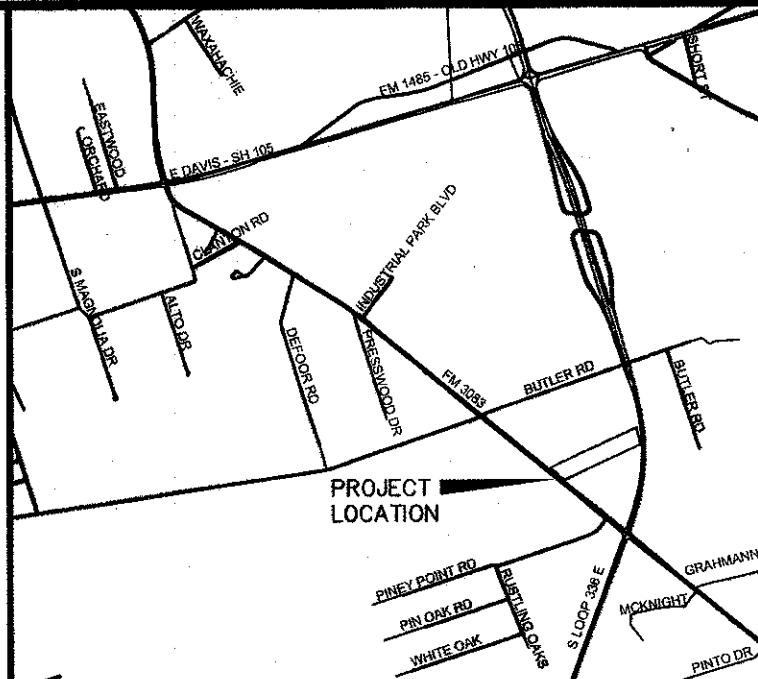
Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981. Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes. Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap". Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.



SAFETY END TREATMENT FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE

FILE: setp210-20.dgn	DR: GAF	CD: CAT	CR: JNP	CC: GAF
PROJECT: February 2020	CON: SECT	REV: 001	REVISION	
DATE: 02/19/20	BY: GAF	CHECKED: JNP	APPROVED: GAF	

SETP-PD



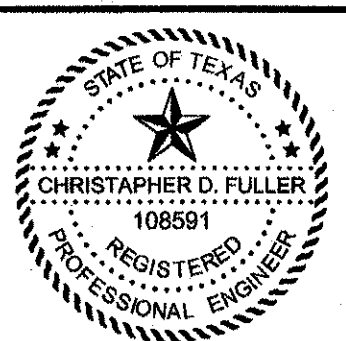
VICINITY MAP N.T.S.

Utility Legend

- Street Signs
- Plug
- Blow-Off Valve
- Gate Valve
- Fire Hydrant
- Tee
- FL FLOWLINE
- TOB Top of Bank
- LF Linear Feet
- RCP Reinforced Conc Pipe
- TP TOP OF PAVING
- SW SIDE WALK
- NG NATURAL GRADE
- SET SAFETY END TREATMENT
- FH FIRE HYDRANT
- Street Light
- Tapping Sleeve & Valve
- Clean Out
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- PC Point of Curve
- ROW Right of Way
- UE Utility Easement
- CO Cleanout
- TG TOP GRAVEL
- PG PROP. GRADE
- TC TOP CURB
- MH MAHOLE
- FF FINISHED FLOOR

NOTES:

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- FLOODPLAIN NOTE: THIS TRACT IS LOCATED IN ZONE X AND IS NOT IN THE 100 YEAR FLOODPLAIN ACCORDING TO FEMA FIRM PANEL NO. 48399C0095Q, EFFECTIVE AUGUST 18, 2014.



CITY OF CONROE
Engineering Division
These plans have been reviewed for general conformity with the City of Conroe design requirements and construction specifications. Constructability and sound engineering practices remain the responsibility of the engineer sealing the plans. Construction of the project is required to meet all City of Conroe guidelines prior to the issuance of initial certification. Errors and omissions in the plans may cause significant increases in construction costs and time delays.
JAN 27 2021
Initial: _____ Date: _____
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SANBERG INVESTMENTS
SITE PLAN
TXDOT DETAILS 02
Montgomery County Conroe, Texas
Design: CDF CAD: CDF Job No: 125919-051 Drawing No: 16