

# CITY OF LUCAS

## CONSTRUCTION PLANS FOR

# WATER SYSTEM IMPROVEMENTS

## STINSON ROAD WATER LINE



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\*\*SEE GENERAL NOTES (SHEET NO. 1) FOR NTMWD NOTES.

#### OWNER:

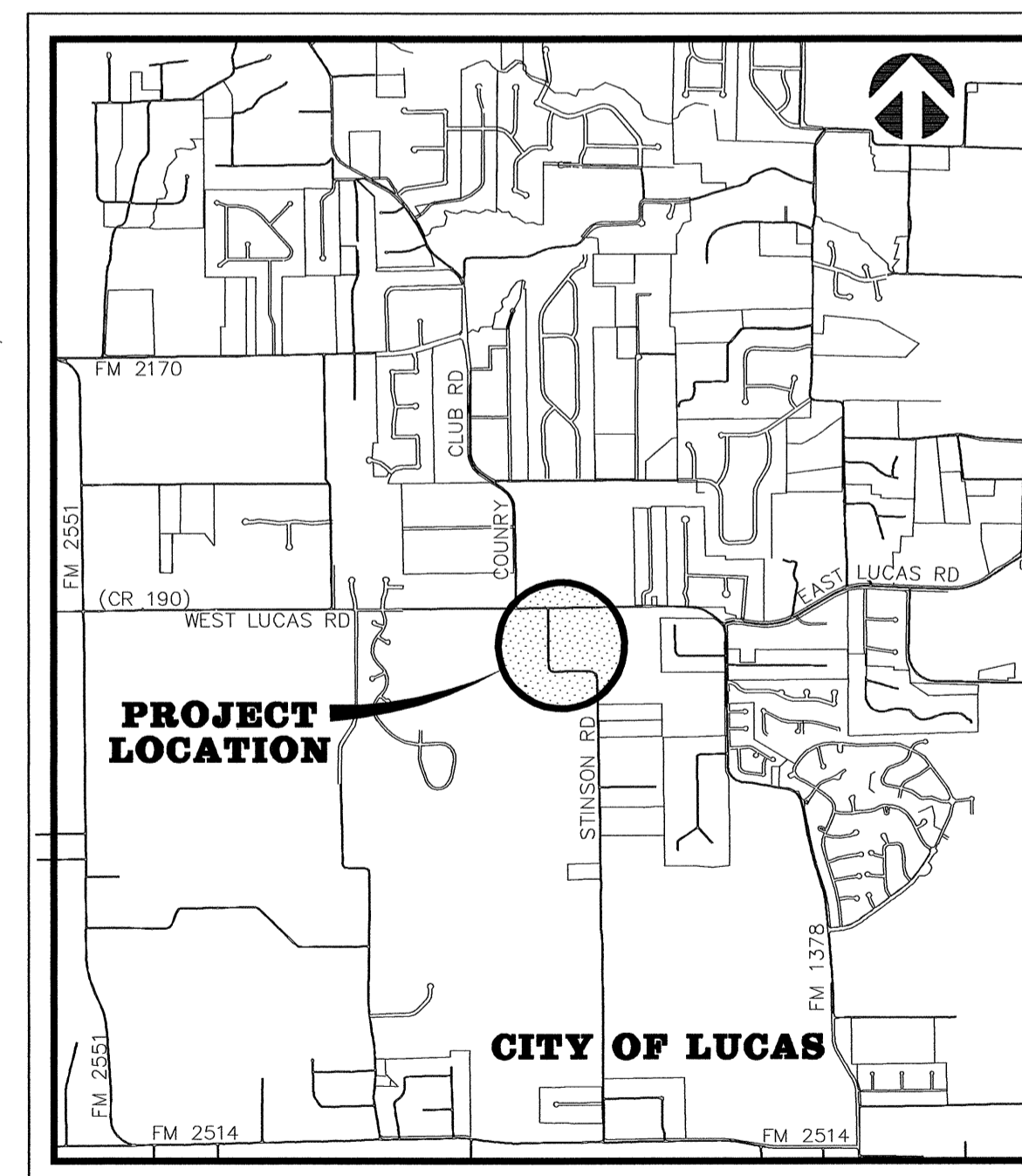
CITY OF LUCAS  
151 COUNTRY CLUB ROAD  
LUCAS, TEXAS 75002

#### ENGINEER:



**BW2 ENGINEERS, INC.**

1919 S. SHILOH ROAD  
SUITE 500, L.B. 27  
GARLAND, TEXAS 75042



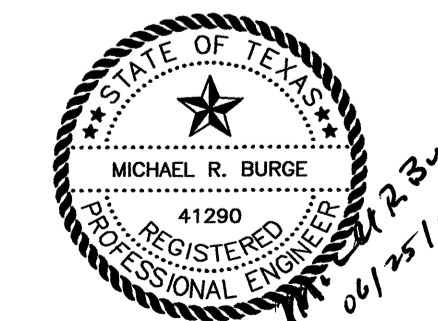
VICINITY MAP

BW2 JOB NO. 06-1183

AUGUST 2006

"REVISED PER ADDENDA"

**RECORD DRAWING**  
BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.



MAYOR  
BOB SANDERS

CITY COUNCIL

BILL CARMICKLE                      DEBBIE FISHER

TONDA FRAZIER                      KATHLEEN PEELE

DON ZRINY

CITY ADMINISTRATOR  
CHARLES FENNER

DIRECTOR OF PUBLIC WORKS  
STACY CAUDELL, P.E.

### CONTRACTOR

WILSON CONTRACTOR SERVICES, LLC  
COMPLETED JUNE 2007

**GENERAL NOTES:**

- It is the CONTRACTOR's responsibility to maintain neat and accurate plans of record.
- The CONTRACTOR is responsible for maintaining adequate site drainage throughout the duration of this project.
- The CONTRACTOR is responsible for obtaining all necessary permits and approvals before construction begins.
- The CONTRACTOR shall replace all fence removed during construction in as good as or better condition than before construction.
- The CONTRACTOR shall take all necessary precautions to ensure that electric power and telephone poles are either moved to a safe location by the affected utility company or not disturbed during construction. All costs incurred for moving electric power and telephone poles shall be included in the price bid for the construction of the project.
- The CONTRACTOR shall restore all property including driveways, public streets, sidewalks and all other improvements removed or damaged inside and outside the project limits during construction to as good as or better condition than before construction. Restoration shall be made immediately after the property no longer interferes with construction.
- The information shown on these drawings concerning type and location of underground and other utilities is not guaranteed to be accurate or all-inclusive. The CONTRACTOR is responsible for making his own determinations as to the type and location of underground utilities and other utilities as may be necessary to avoid damage thereto.
- The CONTRACTOR shall not place fill or waste material on any private property without prior written permission from the ENGINEER. 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, CONTRACTOR will be responsible for all damage resulting from such fill, and he shall remove the fill at CONTRACTOR's expense.
- All streets within the scope of the Contract shall be kept accessible to fire trucks, ambulances and other emergency vehicles.
- The CONTRACTOR shall be responsible for public safety during the duration of construction. All barricades, warning signs, lights, devices, etc., for the guidance and protection of traffic and pedestrians must conform to the installation shown in 1980 Texas Manual of Uniform Traffic Control Devices, as currently amended by the Texas Department of Transportation. CONTRACTOR shall at all times provide barricades, warning signs and lighting adequate to safeguard the public from any hazards resulting from open trenches during non-work hours.
- Filter fabric fence for erosion control shall be provided in accordance with specifications and as shown on the plans and in accordance with the EPA regulations.
- The CONTRACTOR shall use the public right-of-ways and existing utility easements for access to the job site.
- The CONTRACTOR shall select the subcontractor to be utilized for testing and lab work. The CONTRACTOR shall be responsible for paying for testing and lab work. Selection of subcontractor for this purpose will be subject to approval by the OWNER. Testing referred to herein includes compaction and water pressure testing, which shall be required on this project. Testing shall include testing of concrete required to determine and ascertain that concrete strengths in specifications are attained for all concrete members on the project.
- The CONTRACTOR shall keep excavated trenches free of groundwater during construction. If necessary, the CONTRACTOR shall utilize dewatering procedures in order to control groundwater during construction such that it does not affect his construction work.
- The CONTRACTOR shall provide means for adequately controlling and avoiding soil erosion during construction. The CONTRACTOR shall not store spoil in drainage ways during construction.
- All disturbed earth areas are to be finish graded to original or proposed contours, fertilized and either hydromulched with bermuda seed or covered with block sod according to NCTCOG specifications immediately after construction. Backfill to be select material free of rock and other debris. CONTRACTOR shall thoroughly water the hydromulch or block sod immediately after placement. Block sod shall match the existing type of grass on a case by case basis. There shall be no separate pay for matching each type of grass. The CONTRACTOR shall also be responsible for continued maintenance and watering of the newly hydromulched or sodded areas until the entire project is completed and accepted by the City of Highland Village. Watering of the bermuda hydromulch or block sod shall be done in a manner and quantity as directed by City of Lucas field representative.
- No existing sprinkler/irrigations systems have been shown on the plans; however, they may exist in certain areas. It is the CONTRACTOR'S responsibility to locate any existing irrigation systems within the project limits and determine if they will be affected by this construction. If CONTRACTOR encounters any sprinkler systems during construction, he shall repair and/or replace in as good as or better condition than before construction.
- The CONTRACTOR shall maintain adequate sanitary facilities for use by workers throughout construction.
- The CONTRACTOR shall conform to the Occupational Safety and Health Administration's (OSHA) standards for trench safety that are in effect during the period of construction.
- All materials and workmanship shall conform to the City of Lucas Standards and Specifications and the North Central Texas Council of Government (NCTCOG) Standards and Specifications, except as noted. In the event of a conflict, the City of Lucas Standards and Specifications shall govern.
- No existing trees shall be removed without approval of the City of Lucas.
- CONTRACTOR shall provide all necessary construction staking.
- CONTRACTOR's working hours shall be in accordance with the provisions of the current City Ordinance governing hours of construction work in the City.

**GENERAL NOTES CONT'D.:**

- Driveways affected by construction shall be replaced with driveway of same type material and surface as that removed for installation of water line. Driveway culverts shall be removed when necessary to allow for construction of water line. Culverts are to be replaced in the same location if condition of culvert is deemed satisfactory by OWNER. If culvert cannot be salvaged, a new culvert of the same type removed will be installed by the CONTRACTOR. Driveways that are disturbed during construction shall be restored to as good as or better condition than they were prior to construction and materials utilized to restore the driveway shall be the same material as what the driveway is presently made of.
- All concrete shall have a minimum compressive strength of 4000 psi at 28 days (minimum 6 sacks of cement per cubic yard) unless otherwise noted. All reinforcing steel and dowel bars in pavement shall be supported and maintained at the correct clearances by the use of bar chairs or other approved support.
- All existing water lines and service lines to remain in service during construction. At times when water has to be cut-off, the CONTRACTOR shall coordinate with the OWNER to notify the affected area at least 48 hours prior to water cut-off.
- The CONTRACTOR shall phase his daily work schedule so that all driveway crossings are to be complete prior to the end of the day. No driveway crossings are to be left open overnight. During installation of the pipeline across driveways, the CONTRACTOR shall be prepared to provide access across trenches and driveways at all times in case of emergency.
- Water line shall be polyvinyl chloride (PVC) AWWA C900. New water service line shall be copper pipe with compression type fittings. Main line valves and fittings shall be cast iron.
- CONTRACTOR shall install isolation gate valves and fire hydrants at locations shown on plans unless otherwise directed by OWNER. OWNER may direct CONTRACTOR to locate valves and fire hydrants at locations other than those shown on plans. Also, OWNER may add additional isolation gate valves and fire hydrants as required for operational purposes.
- The CONTRACTOR is responsible for keeping streets, parking areas, sidewalks, etc., adjacent to the project free of mud and debris from construction.
- The CONTRACTOR shall assume responsibility for protection of public utilities in the construction of this project. All manholes, valve boxes, fire hydrants, etc., must be adjusted to proper line and grade by the CONTRACTOR prior to and/or after placing any permanent paving. The CONTRACTOR shall also be responsible for support of existing utility poles, street signs, etc., when excavating in the vicinity of such poles.
- The City of Lucas Public Works Department is to be notified 48 hours (2 working days) prior to any construction of paving and utilities in rights-of-way, easements and alleys.
- Arrangements for construction water shall be made through the City of Lucas.
- All locations of underground utility lines are approximate. CONTRACTOR shall contact the proper utility companies at least 48 hours prior to construction, shall inform them of beginning of construction and shall make arrangements to have utilities located by flagging. Flagging of utilities shall be completed prior to beginning construction.
- PVC pipe shall be manufactured from a low filler PVC component capable of meeting the highest performance standards of the ASTM specifications.
- All PVC pipe installed shall be tested for deflection. The deflections test shall be used to determine adequacy of pipe, bedding, backfill, and installation. The test shall consist of hand pulling a mandrel sized at 95% of the inside diameter of the pipe from manhole to manhole at least 30 days after backfilling.
- Construction sites shall be secure at all times. Safety precautions shall be taken to protect the public from any injury which might result from construction activities.
- As part of bid item, "EROSION CONTROL", the CONTRACTOR shall be responsible for implementing any and all erosion control measures as needed to control runoff of siltation from the project site. This shall include, but is not limited to, silt fencing, rock berms, inlet protection, etc. The CONTRACTOR shall maintain these erosion control measures as required until the construction is completed and sod has been placed over disturbed areas.
- There is no separate pay resulting from any of the work required as a result of the requirements included in these general notes. All work required shall be included in the price bid for the project.
- CONTRACTOR shall comply with all applicable Texas Department of Transportation (TXDOT) requirements included in the appendix of the specifications during the installation of the proposed water line in and near the F.M. 1378 right-of-way.
- All new service lines shall be copper tubing, Type K.

**GENERAL TRAFFIC CONTROL NOTES**

- All temporary signs, markings, cones, channelizing devices, warning lights and barricades shall be in accordance with the current State of Texas Manual on Uniform Traffic Control Devices (MUTCD).
- Type "A" warning lights shall be placed on all advance warning signs. In addition, flags shall be placed on all advance warning signs that detour traffic.
- Any existing conflicting markings shall be removed prior to shifting traffic.
- All temporary pavement markings required during construction shall be of the removable type. Temporary markings and striping may be required to transition travel lanes between construction phases. All pavement markings and striping shall be reflective.
- The spacing of signs and channelization devices may be adjusted to fit the geometric conditions encountered, such as driveways, intersecting roadways, vertical and horizontal alignment, etc., as approved by the City of Lucas.
- Advance warning signs shall not be displayed more than forty-eight (48) hours before physical construction begins. Signs may be erected up to one week before needed, if the sign face is fully covered.
- Use of barricades, portable barrier rails, vertical panels, and drums shall be limited to the immediate areas of construction where a hazard is present. These devices shall not be stored along the roadway within thirty (30) feet of the edge of the traveled way before or after use unless protected by guardrail, bridge rail, and/or barriers installed for other purposes. These devices shall be removed from the construction work zone when the City of Lucas determines they are no longer needed. Where there is insufficient right-of-way to provide for this thirty (30) foot setback, the City of Lucas shall approve alternate locations.
- The posted speed for warning signage is to be determined at the site by the City of Lucas.
- Reduced speed warning signage should be placed prior to and at regular intervals within the construction zone.
- As part of the bid item, "Construction Barricading/Signing/Traffic Control," the CONTRACTOR is required to submit a traffic control plan for construction a minimum of 3 days prior to changes in traffic handling or movement. These plans are to be reviewed and approved by the City of Lucas prior to construction of that phase.
- The Contractor shall accommodate existing traffic during construction and shall maintain at least one open lane of traffic at all times. Use of flag men, barricades, vertical panels, etc. shall be required and shall be considered subsidiary to "Construction Barricading/Signing/Traffic Control".
- CONTRACTOR shall be required to place temporary pavement markings and/or buttons as needed to maintain traffic in a safe and efficient manner after removal of existing markings. These temporary markings shall not be paid for separately but shall be considered subsidiary to "CONSTRUCTION BARRICADING/SIGNING/TRAFFIC CONTROL".

**CONSTRUCTION SEQUENCE:**

- Existing water lines shall remain in service until all new water lines are installed and ready for service. Once new water lines are all installed and ready for service, new water lines shall be placed in service and existing water service connections shall be switched over to the new water line where existing water lines are being replaced by the new water line.

**NTMWD NOTES:**

- North Texas Municipal Water District (NTMWD) 20-inch and 42-inch water transmission pipelines respectively are located within limits of construction.
- Operation of heavy earth moving equipment, compaction equipment or heavy construction equipment, such as concrete trucks, shall be restricted to specific crossing points across NTMWD easements, as approved by the NTMWD. The crossings shall be designated and verified to provide a minimum of five feet of cover.
- To assure that placing of significant loads over the NTMWD pipeline does not damage the existing pipeline, no materials shall be stockpiled on the NTMWD easement without authorization from the NTMWD. If the CONTRACTOR desires to use NTMWD's easement for stockpile of materials, contact NTMWD Engineering at (972) 442-5405 so your plans for use of NTMWD's easement can be reviewed.
- Unless otherwise shown or required a minimum of one-foot clearance shall be provided for all utilities crossing the NTMWD pipelines.
- The CONTRACTOR shall contact NTMWD Engineering at (972) 442-5404 at least 48 hours prior to performing any work in the vicinity of the NTMWD facilities.
- For open cut where crossing under the NTMWD pipeline, within ten feet either side of centerline of pipeline, the trench width shall be limited to four-foot with vertical walls, no sloping banks and with the appropriate trench safety. The entire excavation within the limits noted above shall be backfilled with sand to one-foot above top of NTMWD pipeline. One-foot minimum vertical clearance is required between NTMWD pipeline and proposed utilities.
- Limits of bore shall be a minimum of the NTMWD easement width.
- The casing pipe shall terminate outside of the NTMWD easement.
- Boring and receiving pits shall be located outside of NTMWD easements.
- A minimum of two-foot horizontal and one-foot vertical clearance is required between proposed water lines and NTMWD pipelines.
- Water lines crossing the NTMWD easement shall be installed in compliance with the Rules and Regulations for Public Water Systems Paragraph 290.44 (e), Location of Water Lines.

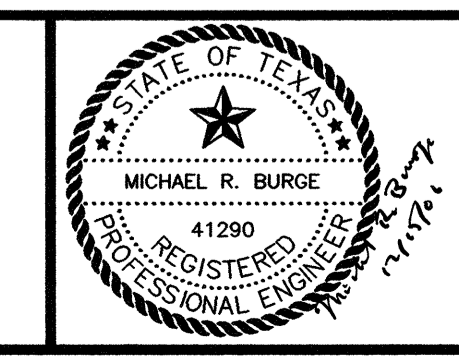
**RECORD DRAWING**  
 BASED ON CONTRACTOR MARKUPS,  
 NOT FIELD SURVEY.

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1	12/15/06	REVISED PER ADDENDUM NO. 1	MRB
NO.	DATE	REVISION	REVIEWED

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 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
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 DATE: \_\_\_\_\_ AUGUST 2006  
 DWG. NAME: \_\_\_\_\_ 1183GENNOTE

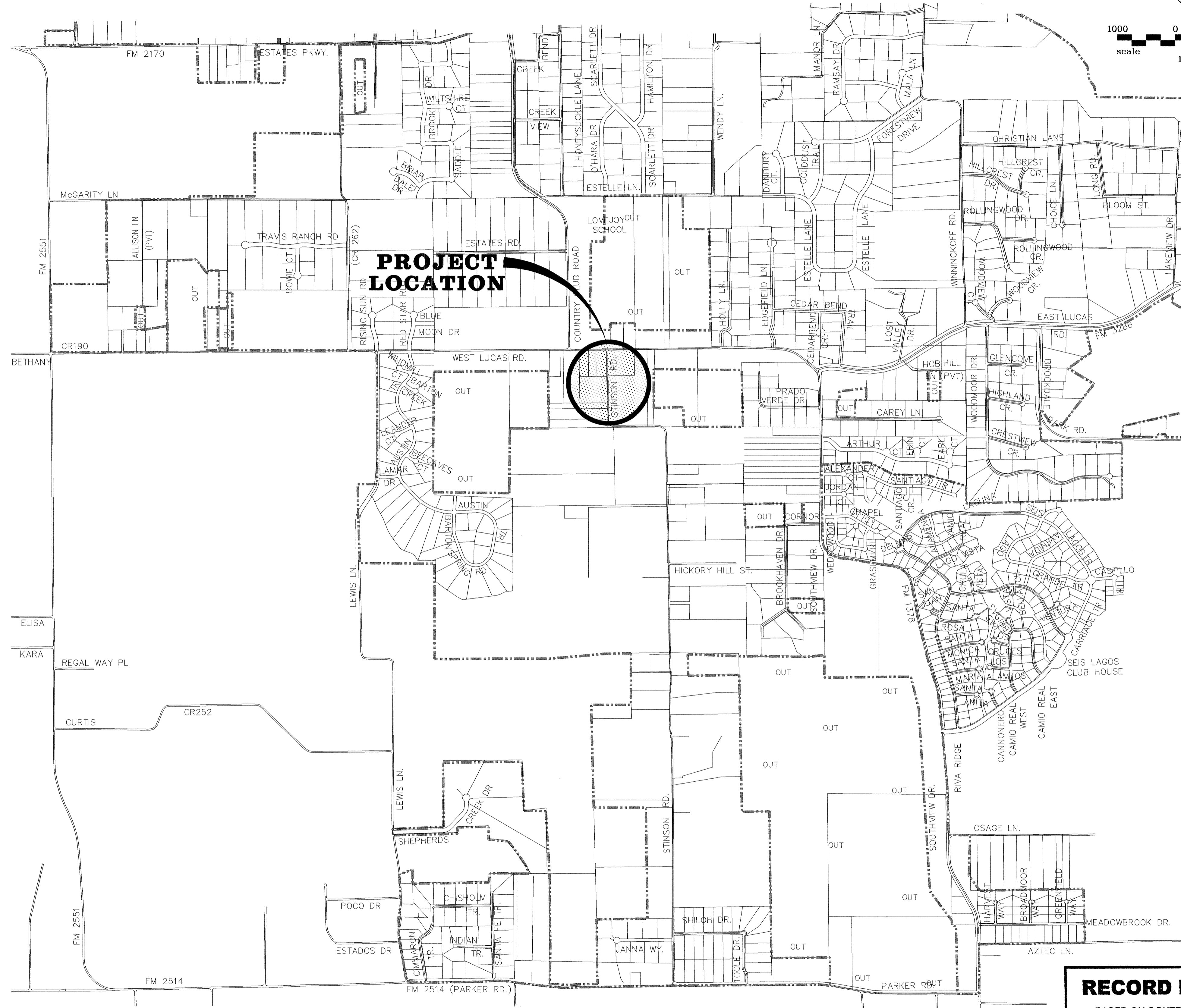
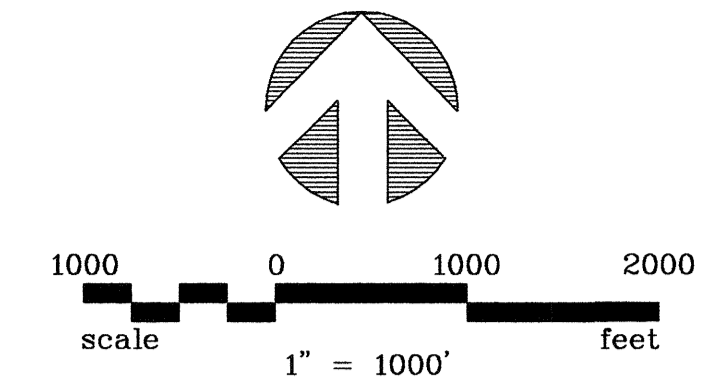


**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (tel)  
 (972) 864-8220 (fax)



**WATER SYSTEM IMPROVEMENTS  
 STINSON ROAD WATER LINE  
 GENERAL NOTES  
 CITY OF LUCAS**

SHEET NO. 1  
 OF 8 SHEETS  
 JOB NO. 06-1183



**SUMMARY OF QUANTITIES**

ITEM NO.	DESCRIPTION	UNIT	PLAN QUANTITY	BID QUANTITY
1.	MOBILIZATION, BONDS AND INSURANCE	L.S.	1	1
2.	SAWCUT, REMOVE AND REPLACE EXISTING CONCRETE DRIVEWAY	S.Y.	10	15
3.	SAWCUT, REMOVE AND REPLACE EXISTING ASPHALT STREET PAVEMENT	S.Y.	80	80
4.	12" POLYVINYL CHLORIDE (PVC) AWWA C900, DR-18 INCLUDING EMBEDMENT	L.F.	602	610
5.	12" POLYVINYL CHLORIDE (PVC) AWWA C900, DR-18 W/STEEL CASING BY BORING AND JACKING	L.F.	91	95
6.	4" POLYVINYL CHLORIDE (PVC) AWWA C900, DR-18 INCLUDING EMBEDMENT	L.F.	14	20
7.	12" GATE VALVE	EA.	2	2
8.	FIRE HYDRANT W/VALVE AND APPURTENANCES	EA.	2	2
9.	CONNECTION TO EXISTING 12" WATER LINE INCLUDING 12"x12" TEE, 12" SPOOL PIECE, SLEEVE FOR 12" PIPE, AND 12" VALVE	EA.	1	1
10.	CONNECTION TO EXISTING 4" WATER LINE INCLUDING 4" 90° BEND, 4" SPOOL PIECE, SLEEVE FOR 4" PIPE	EA.	1	1
11.	12"x6" TEE	EA.	2	2
12.	12"x4" TEE	EA.	1	1
13.	12" - 45° BEND (VERTICAL)	EA.	2	2
14.	12" - 22 1/2° BEND (VERTICAL)	EA.	2	2
15.	12" BLIND FLANGE	EA.	1	1
16.	4" GATE VALVE	EA.	1	1
17.	TRENCH SAFETY SYSTEM (INCLUDING SWPPP)	L.F.	616	630
18.	CONCRETE THRUST BLOCKING	C.Y.	8	10
19.	CUT AND PLUG EXISTING 4" WATER LINE	EA.	1	1
20.	1" SERVICE CONNECTION	EA.	1	1
21.	1" SERVICE CROSSING ROAD	EA.	2	2
22.	EROSION CONTROL	L.S.	1	1
23.	BLOCK SODDING	S.Y.	100	100
24.	HYDROMULCH ALL DISTURBED AREAS	S.Y.	300	300
25.	TRAFFIC CONTROL	L.S.	1	1

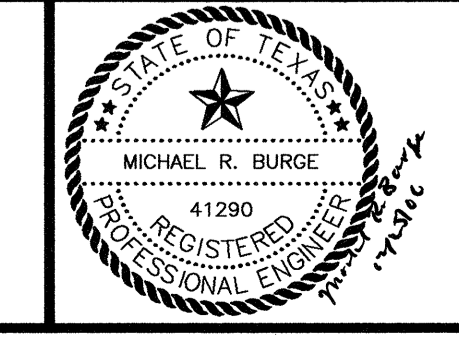
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 BASED ON CONTRACTOR MARKUPS,  
 NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
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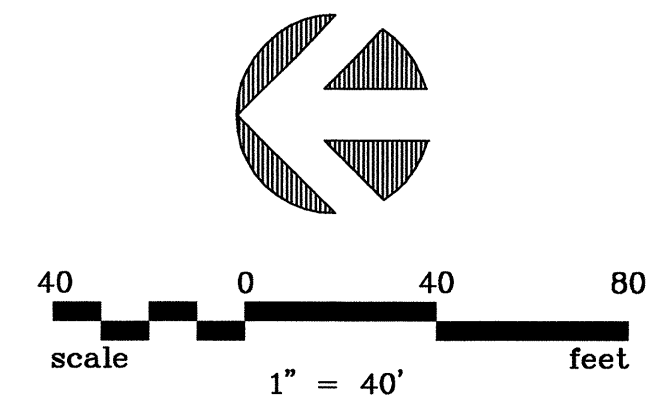


**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (tel)  
 (972) 864-8220 (fax)



WATER SYSTEM IMPROVEMENTS  
 STINSON ROAD WATER LINE  
 LOCATION MAP AND SUMMARY OF QUANTITIES  
**CITY OF LUCAS**

SHEET NO. 2  
 OF 8 SHEETS  
 JOB NO. 06-1183



C/L STATIONS LINE "W-A" WATER LINE

STATION	NORTHING	EASTING
STA. 0+00	7084218.9115	2554240.5583
STA. 6+92.56	7083526.3772	2554246.3945
STA. 7+06.42	7083526.4939	2554260.2502

HORIZONTAL & VERTICAL CONTROL POINTS

DESCRIPTION	NO.	NORTHING	EASTING	ELEVATION
△ 1/2" IR W/CAP	#106	7084120.6974	2554201.5514	601.60
△ 1/2" IR W/CAP	#107	7083335.1109	2554213.0419	596.83

LUCAS UNITED METHODIST CHURCH TRACT 1  
LUCAS UNITED METHODIST CHURCH TRACT 2

F.M. 1378  
(WEST LUCAS ROAD)  
(90' R.O.W.)

WILLIAM S. THOMPSON III, AND WIFE VIRGINIA  
VOL. 639 PG. 474

BOP STA. 0+00

BASE LINE

EXIST. 30' NTMWD ESMT.  
VOL. 1282 PG. 24

PROP. 10' WATER ESMT.

STINSON ROAD

EOP STA. 7+06.42

P.I. STA. 6+92.56

#106

#107

BIGHORN VENTURES I LTD

LUCAS BAPTIST CHURCH  
VOL. 666 PG. 527

RCW VANHORN  
VOL. 6084 PG. 01920

MINH NGUYEN  
VOL. 6004 PG. 01334

NEVA JOY WHITE  
VOL. 03893 PG. 00679

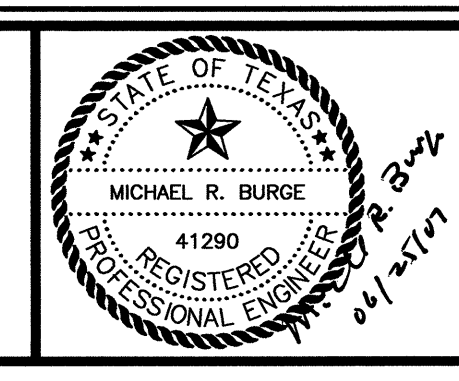
**RECORD DRAWING**  
BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
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5			
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3			
2			
△	4/30/07	REVISED PER FIELD CHANGE	MRB

DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: \_\_\_\_\_ 1" = 40'  
DATE: \_\_\_\_\_ AUGUST 2006  
DWG. NAME: \_\_\_\_\_ 1183HYCONT



**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (tel)  
(972) 864-8220 (fax)



WATER SYSTEM IMPROVEMENTS  
STINSON ROAD WATER LINE  
HORIZONTAL AND VERTICAL CONTROL PLAN  
**CITY OF LUCAS**

SHEET NO. 3  
OF 8 SHEETS  
JOB NO. 06-1183

LUCAS UNITED METHODIST CHURCH TRACT 1

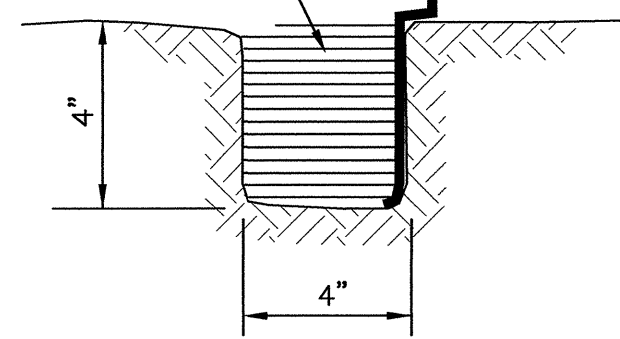
LUCAS UNITED METHODIST CHURCH TRACT 2

F.M. 1378  
(WEST LUCAS ROAD)  
(90' R.O.W.)

BIGHORN VENTURES I LTD

POSTS AT 3' CENTERS  
(SEE NOTE 1)

INSERT FILTER FABRIC INTO 4" TRENCH AND BACKFILL AND COMPACT WITH THE EXCAVATED SOIL

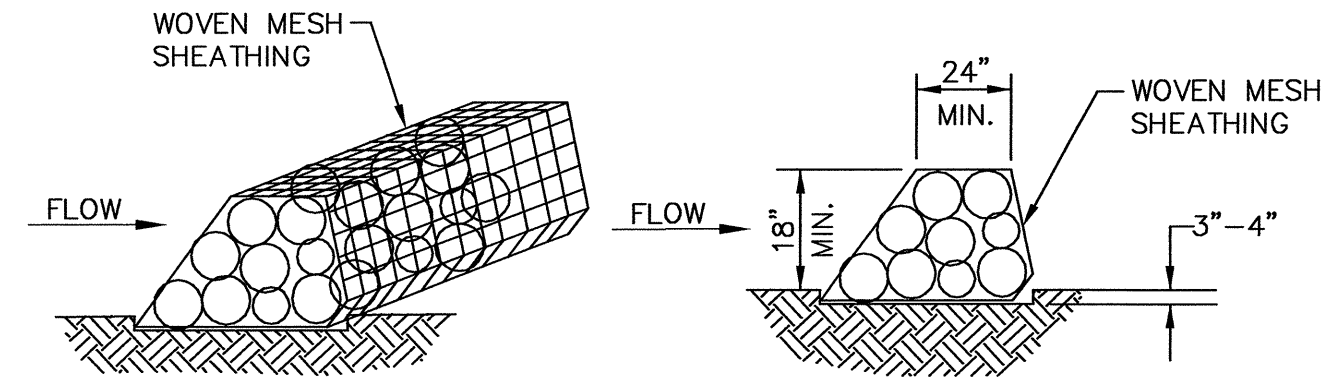


**DETAIL "A"**  
NOT TO SCALE

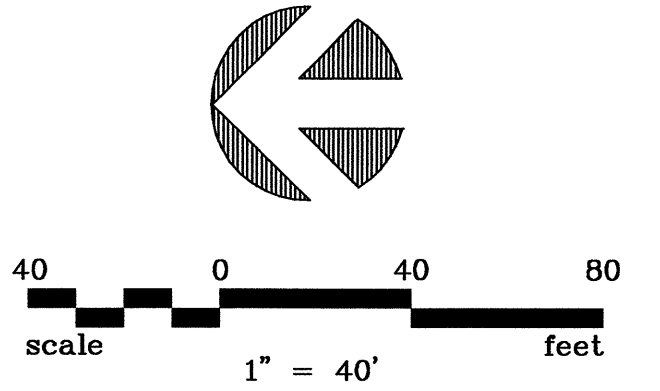
**FILTER FABRIC FENCE**  
NOT TO SCALE

**NOTES:**

1. IF FACTORY PREASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POSTS MAY INCREASE TO 8' MAXIMUM.
2. FILTER FABRIC SHALL BE AS PER ASTM D4833.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, PROVIDE 6" OF OVERLAP AT THE POST AND FOLD.



**ROCK BERM DETAIL**  
NOT TO SCALE



WILLIAM S. THOMPSON III, AND WIFE VIRGINIA  
VOL. 639 PG. 474

**INSTALL 20 L.F. ROCK BERM**

**INSTALL 180 L.F. SILT FENCE**

**INSTALL 165 L.F. SILT FENCE**

**INSTALL 10 L.F. ROCK BERM**

**INSTALL 305 L.F. SILT FENCE**

LUCAS BAPTIST CHURCH  
VOL. 666 PG. 527

RCW VANHORN  
VOL. 6084 PG. 01920

MINH NGUYEN  
VOL. 6004 PG. 01334

NEVA JOY WHITE  
VOL. 03893 PG. 00679

**RECORD DRAWING**

BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

**LEGEND:**

- SILT FENCE
- ROCK BERM

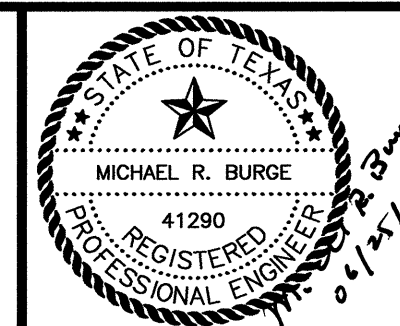
6			
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NO.	DATE	REVISION	REVIEWED

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DESIGN: MRB  
REVIEWED: JFW  
SCALE: 1" = 40'  
DATE: AUGUST 2006  
DWG. NAME: 1183EROS



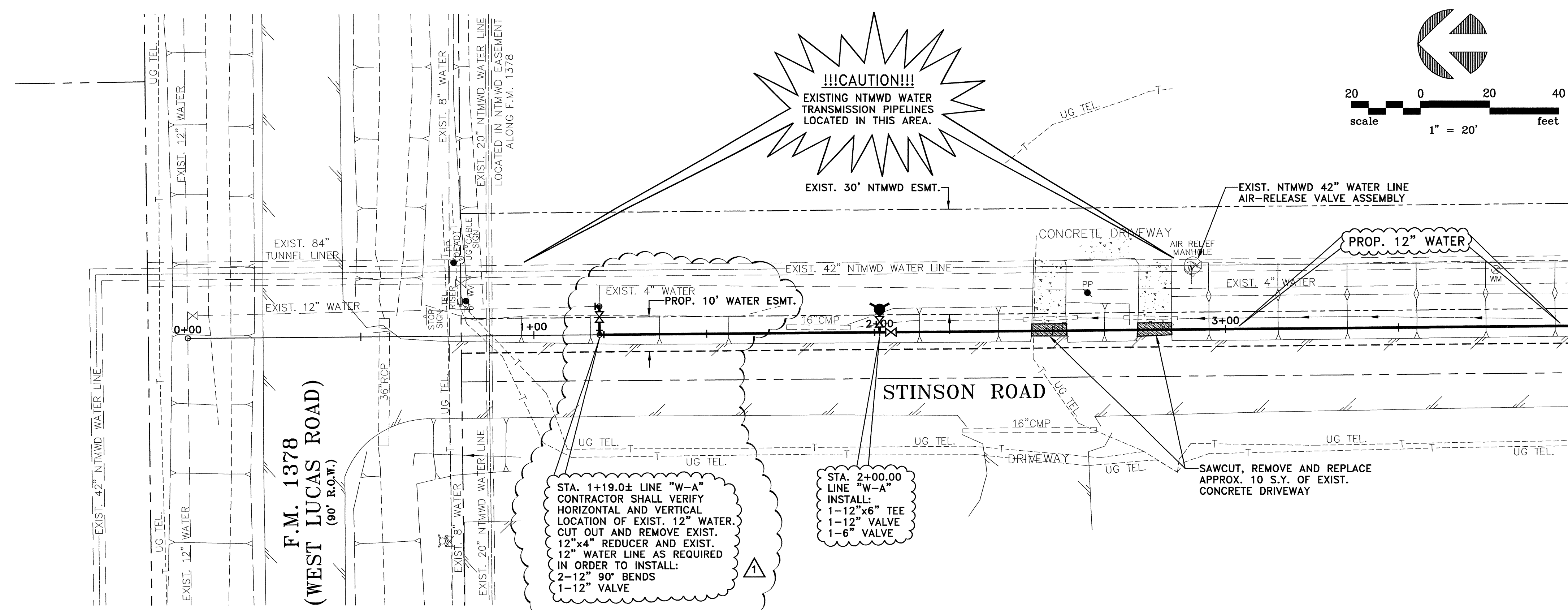
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1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (tel)  
(972) 864-8220 (fax)



WATER SYSTEM IMPROVEMENTS  
STINSON ROAD WATER LINE  
EROSION CONTROL PLAN  
**CITY OF LUCAS**

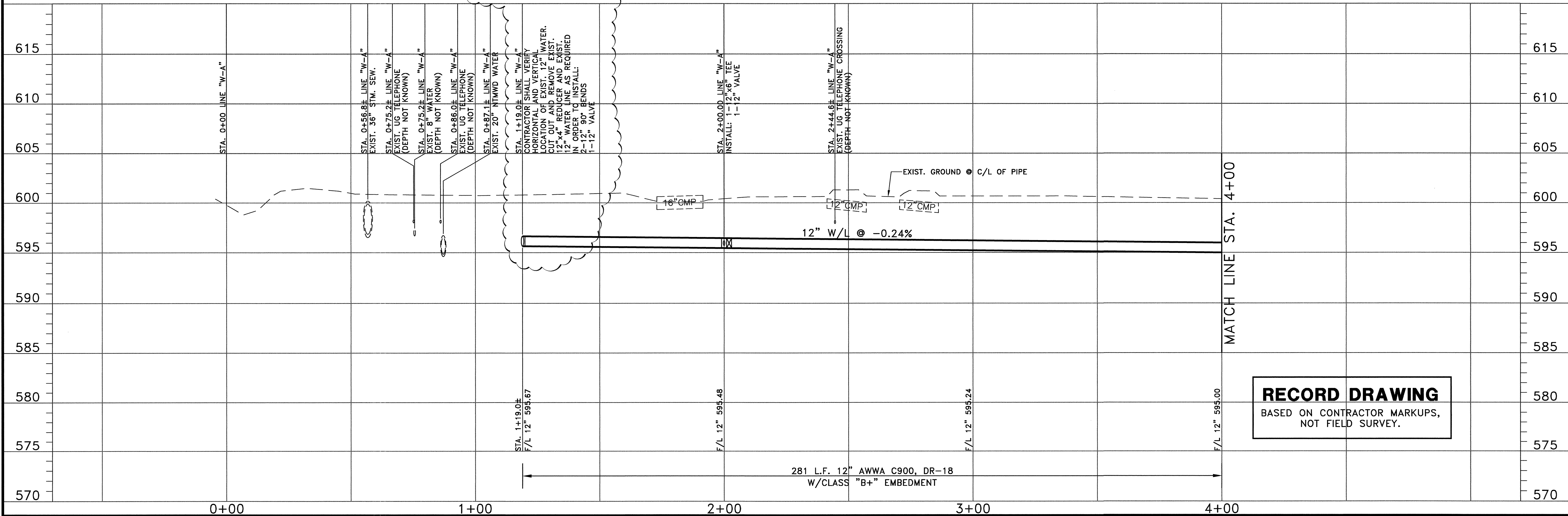
SHEET NO. 4  
OF 8 SHEETS  
JOB NO. 06-1183



- NOTES:**
1. A 3M LOCATOR COMPATIBLE WITH TYPE 1265 SHALL BE FURNISHED AND INSTALLED NO DEEPER THAN 4 FEET BY THE CONTRACTOR BESIDE ALL VALVES, ABOVE ALL BENDS AND ABOVE ALL CORPORATION STOPS ON THE PROPOSED WATER LINE.
  2. EMBEDMENT FOR THE PROPOSED WATER LINES SHALL BE CLASS "B+" EXCEPT FOR THE PIPELINE EMBEDMENT AT SANITARY SEWER LINE CROSSINGS, IN WHICH CASE THE EMBEDMENT SHALL BE CONCRETE ENCASEMENT TO NINE FEET EACH SIDE OF THE SANITARY SEWER LINE.
  3. WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900.
  4. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING BURIED LINES. LOCATIONS OF PIPELINES SHOWN ON THE PLANS ARE APPROXIMATE AND ARE TO THE BEST KNOWLEDGE OF THE CITY. CONTRACTOR WILL MAKE ALL REPAIRS TO EXISTING LINES DAMAGED DURING CONSTRUCTION WORK AND WILL HAVE MATERIALS ON HAND TO MAKE SUCH REPAIRS.
  5. MEGA-LUGS SHALL BE FURNISHED AND INSTALLED ON ALL BENDS, VALVES, AND OTHER FITTINGS THAT ARE REQUIRED FOR THE PROPOSED WATER LINE.
  6. CONTRACTOR SHALL TAKE THE EXISTING WATER LINES OUT OF SERVICE AND ABANDON IN PLACE ONCE ALL SERVICE CONNECTIONS ARE CHANGED OVER. CONTRACTOR SHALL CUT AND PLUG EXISTING WATER LINES IN A SUFFICIENT MANNER TO PREVENT LOSS OF WATER.
  7. CONTRACTOR SHALL CONNECT EXISTING SERVICE CONNECTIONS TO PROPOSED WATER LINE ONCE WATER LINE INSTALLATION HAS BEEN COMPLETED AND WATER LINE HAS BEEN TESTED AND DISINFECTED, ALL BACTERIOLOGICAL SAMPLES HAVE PASSED, AND THE WATER LINE HAS BEEN PLACED IN SERVICE. ALL SERVICE CONNECTIONS SHALL HAVE A 3m LOCATOR, (TOILET SEAT) PLACED 18" ABOVE CORPORATION DIRECTLY ABOVE PROPOSED WATER LINE. THE CITY WILL FURNISH THE METER SETUP AT EACH SERVICE CONNECTION, INCLUDING A METER, A GATE VALVE, A BACK-FLOW PREVENTER, AND A 6" NIPPLE FOR CONTRACTOR TO INSTALL. THE CONTRACTOR WILL FURNISH ALL OTHER MATERIALS REQUIRED FOR THE NEW SERVICE CONNECTIONS, INCLUDING NEW METER BOXES AND NEW 1" DIAMETER SERVICE LINES AND WILL INSTALL ALL MATERIALS REQUIRED FOR THE SERVICE CONNECTIONS.
  8. CONTRACTOR SHALL FURNISH AND INSTALL A TRACER WIRE THAT IS COMPATIBLE WITH AND WILL ALLOW DETECTION BY RADIO DETECTION CORPORATION'S DIGITAL PXL-2 PIPE LOCATOR. THE TRACER WIRE SHALL BE INSTALLED JUST ABOVE THE PROPOSED WATER LINES AND THROUGHOUT THE LENGTH OF THE WATER LINES. THE TRACER WIRE SHALL BE MINIMUM 14 GAUGE WIRE.
  9. CONTRACTOR SHALL COMPLY WITH NTMWD REQUIREMENTS REGARDING PROTECTION OF NTMWD'S EXISTING WATER LINES WHEN WORKING ON THE NTMWD EASEMENTS.
  10. SEE GENERAL NOTES (SHEET NO. 1) FOR NTMWD NOTES.

STA. 1+19.0± LINE "W-A"  
CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXIST. 12" WATER. CUT OUT AND REMOVE EXIST. 12"x4" REDUCER AND EXIST. 12" WATER LINE AS REQUIRED IN ORDER TO INSTALL:  
2-12" 90° BENDS  
1-12" VALVE

STA. 2+00.00 LINE "W-A"  
INSTALL:  
1-12"x6" TEE  
1-12" VALVE  
1-6" VALVE



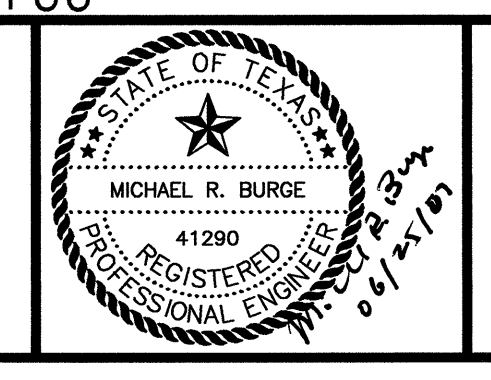
**RECORD DRAWING**  
BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

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2	4/30/07	REVISED PER FIELD CHANGE	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
DESIGN: MRB  
REVIEWED: JFW  
SCALE: (H)1"=20', (V)1"=5'  
DATE: AUGUST 2006  
DWG. NAME: 1183WTRPP01



**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (tel)  
(972) 864-8220 (fax)

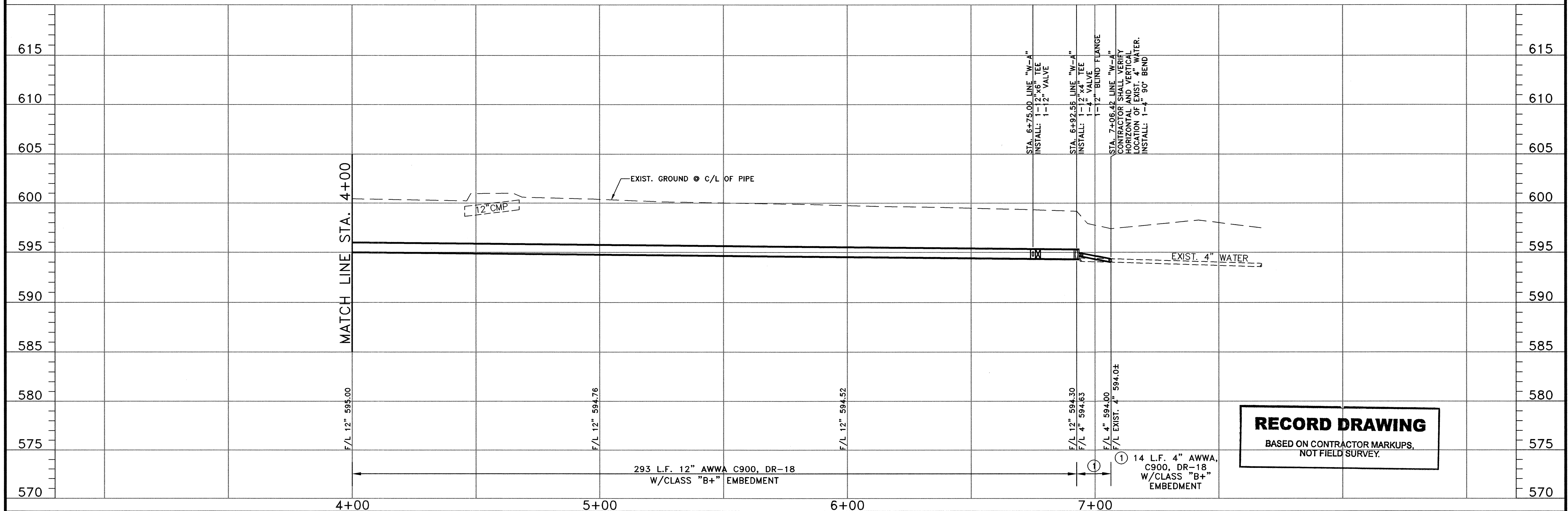
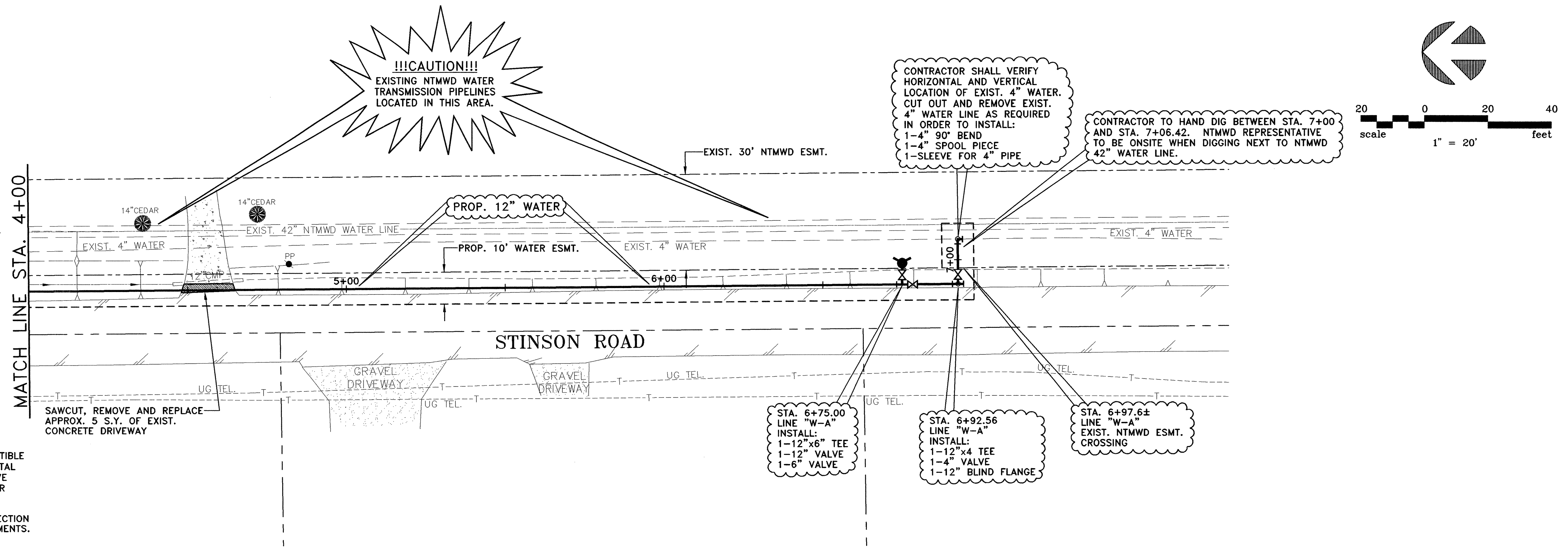


WATER SYSTEM IMPROVEMENTS  
STINSON ROAD WATER LINE  
STA. 0+00 TO STA. 4+00 (LINE "W-A")  
**CITY OF LUCAS**

SHEET NO. 5  
OF 8 SHEETS  
JOB NO. 06-1183

**NOTES:**

1. A 3M LOCATOR COMPATIBLE WITH TYPE 1265 SHALL BE FURNISHED AND INSTALLED NO DEEPER THAN 4 FEET BY THE CONTRACTOR BESIDE ALL VALVES, ABOVE ALL BENDS AND ABOVE ALL CORPORATION STOPS ON THE PROPOSED WATER LINE.
2. EMBEDMENT FOR THE PROPOSED WATER LINES SHALL BE CLASS "B+" EXCEPT FOR THE PIPELINE EMBEDMENT AT SANITARY SEWER LINE CROSSINGS, IN WHICH CASE THE EMBEDMENT SHALL BE CONCRETE ENCASEMENT TO NINE FEET EACH SIDE OF THE SANITARY SEWER LINE.
3. WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING BURIED LINES. LOCATIONS OF PIPELINES SHOWN ON THE PLANS ARE APPROXIMATE AND ARE TO THE BEST KNOWLEDGE OF THE CITY. CONTRACTOR WILL MAKE ALL REPAIRS TO EXISTING LINES DAMAGED DURING CONSTRUCTION WORK AND WILL HAVE MATERIALS ON HAND TO MAKE SUCH REPAIRS.
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6. CONTRACTOR SHALL TAKE THE EXISTING WATER LINES OUT OF SERVICE AND ABANDON IN PLACE ONCE ALL SERVICE CONNECTIONS ARE CHANGED OVER. CONTRACTOR SHALL CUT AND PLUG EXISTING WATER LINES IN A SUFFICIENT MANNER TO PREVENT LOSS OF WATER.
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8. CONTRACTOR SHALL FURNISH AND INSTALL A TRACER WIRE THAT IS COMPATIBLE WITH AND WILL ALLOW DETECTION BY RADIODETECTION CORPORATION'S DIGITAL PXL-2 PIPE LOCATOR. THE TRACER WIRE SHALL BE INSTALLED JUST ABOVE THE PROPOSED WATER LINES AND THROUGHOUT THE LENGTH OF THE WATER LINES. THE TRACER WIRE SHALL BE MINIMUM 14 GAUGE WIRE.
9. CONTRACTOR SHALL COMPLY WITH NTMWD REQUIREMENTS REGARDING PROTECTION OF NTMWD'S EXISTING WATER LINES WHEN WORKING ON THE NTMWD EASEMENTS.
10. SEE GENERAL NOTES (SHEET NO. 1) FOR NTMWD NOTES.



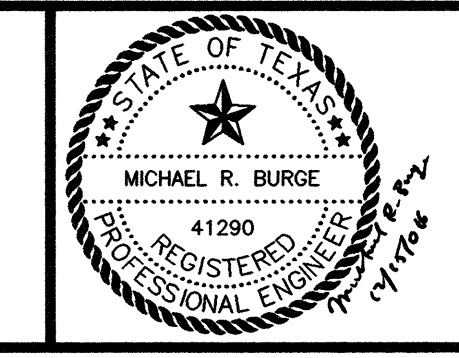
**RECORD DRAWING**  
 BASED ON CONTRACTOR MARKUPS,  
 NOT FIELD SURVEY.

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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: (H)1"=20', (V)1"=5'  
 DATE: \_\_\_\_\_ AUGUST 2006  
 DWG. NAME: \_\_\_\_\_ 1183WTRPP02

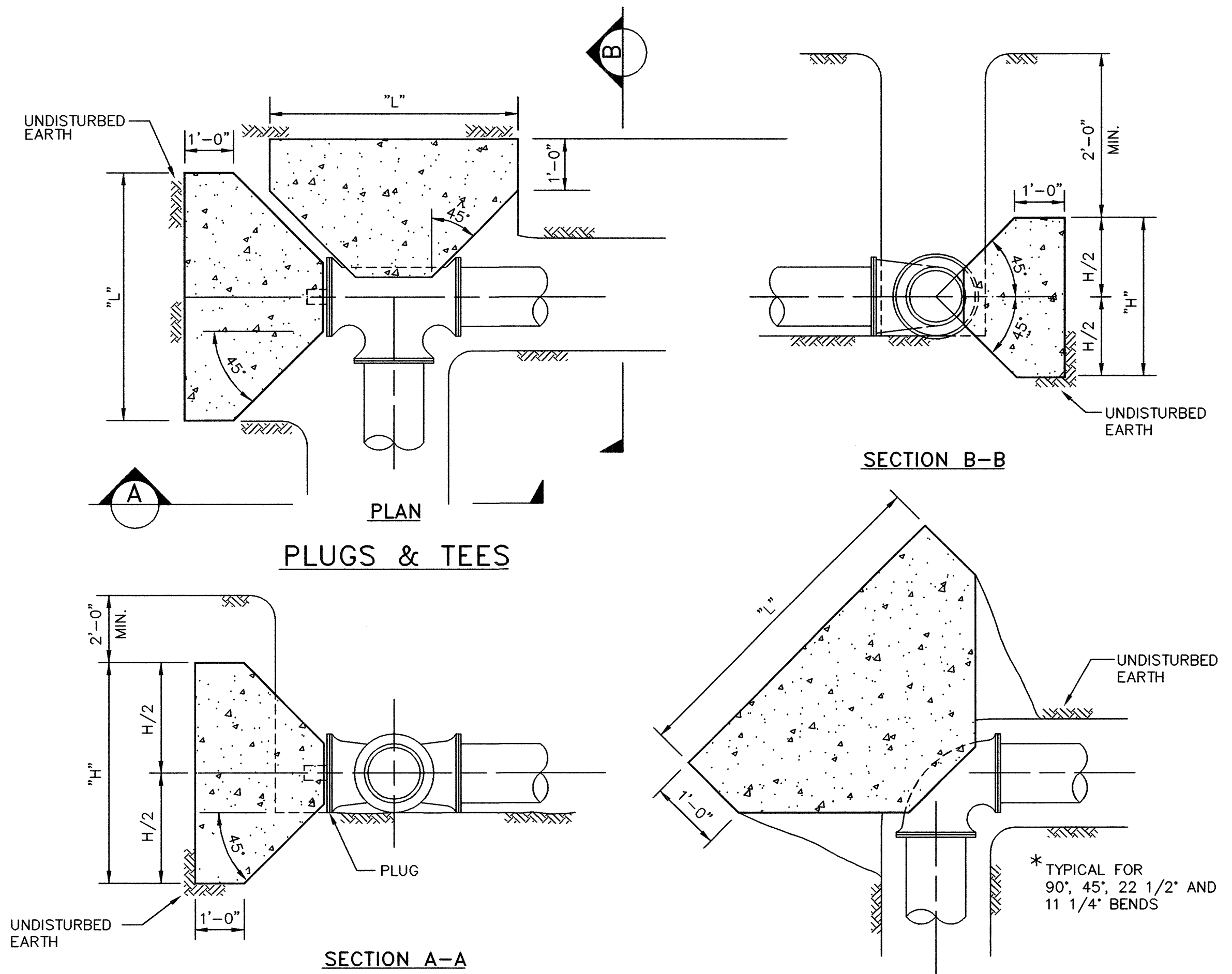
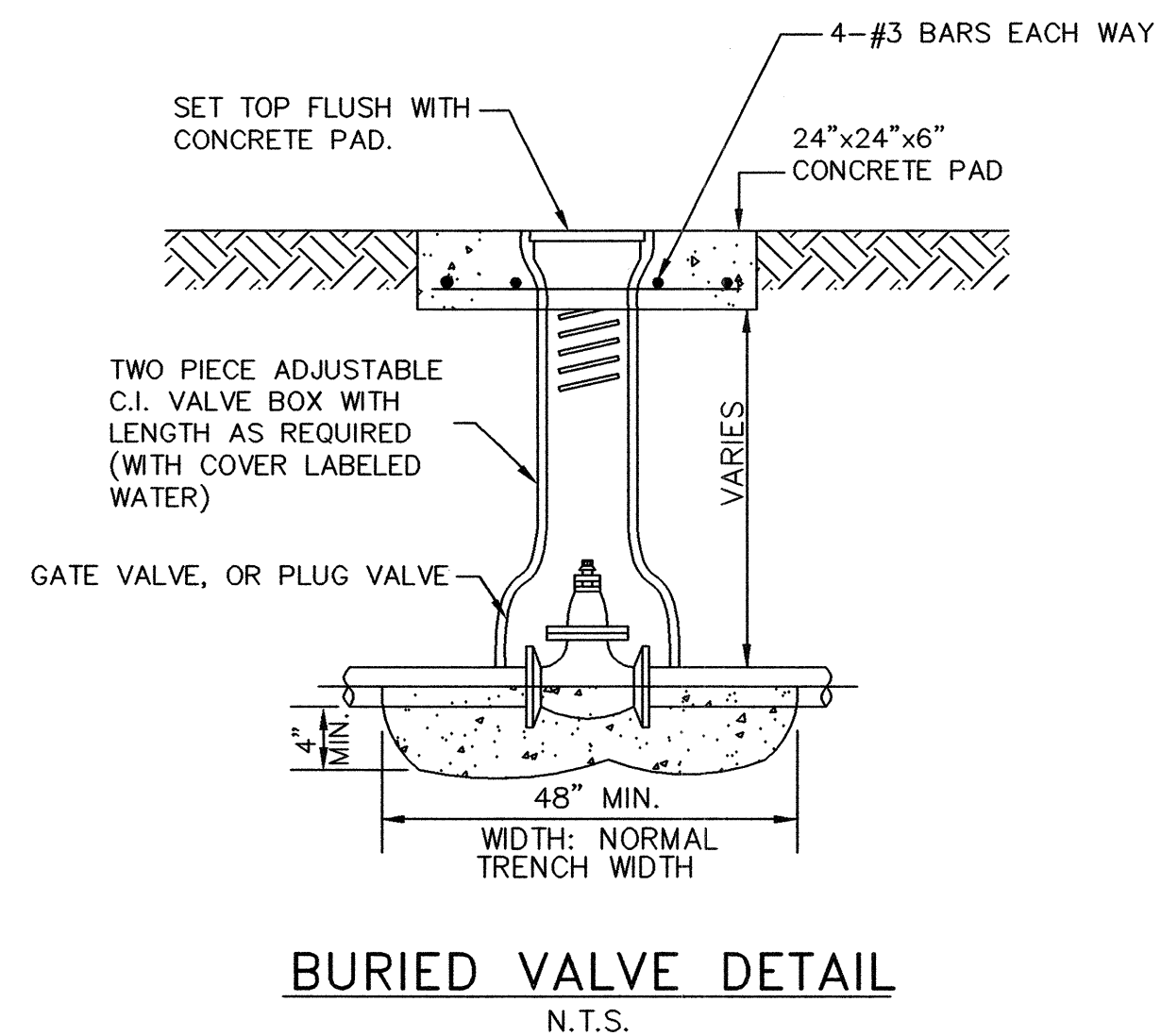
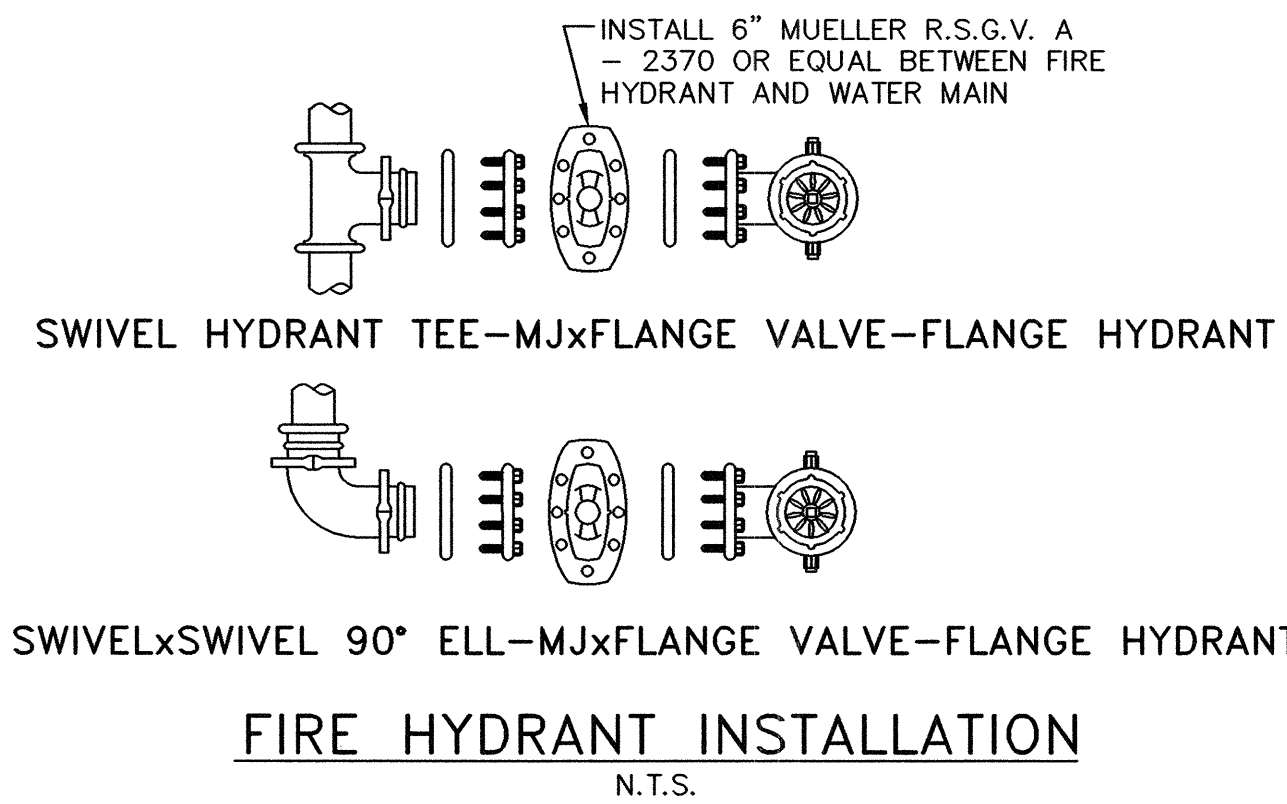
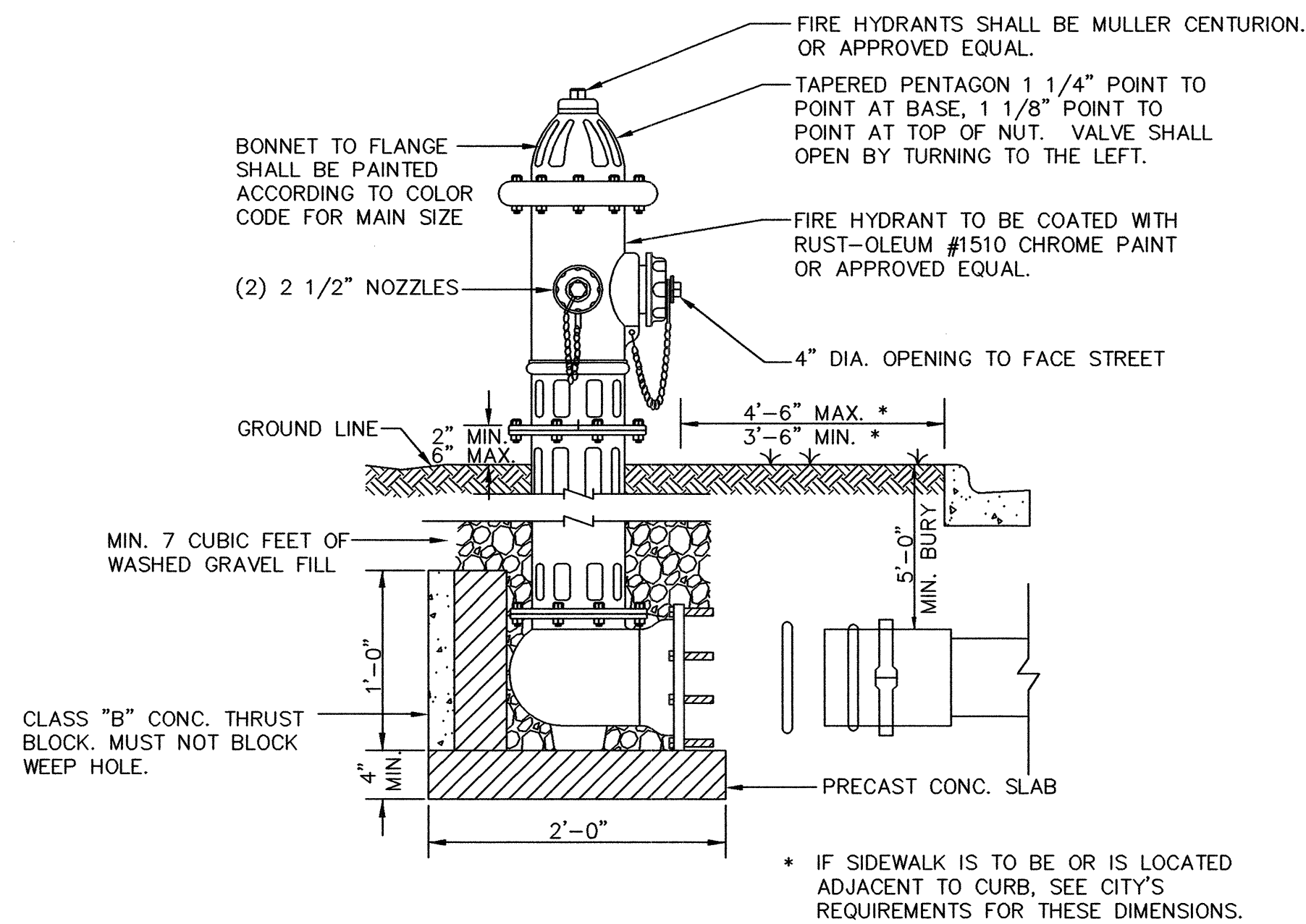


**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (tel)  
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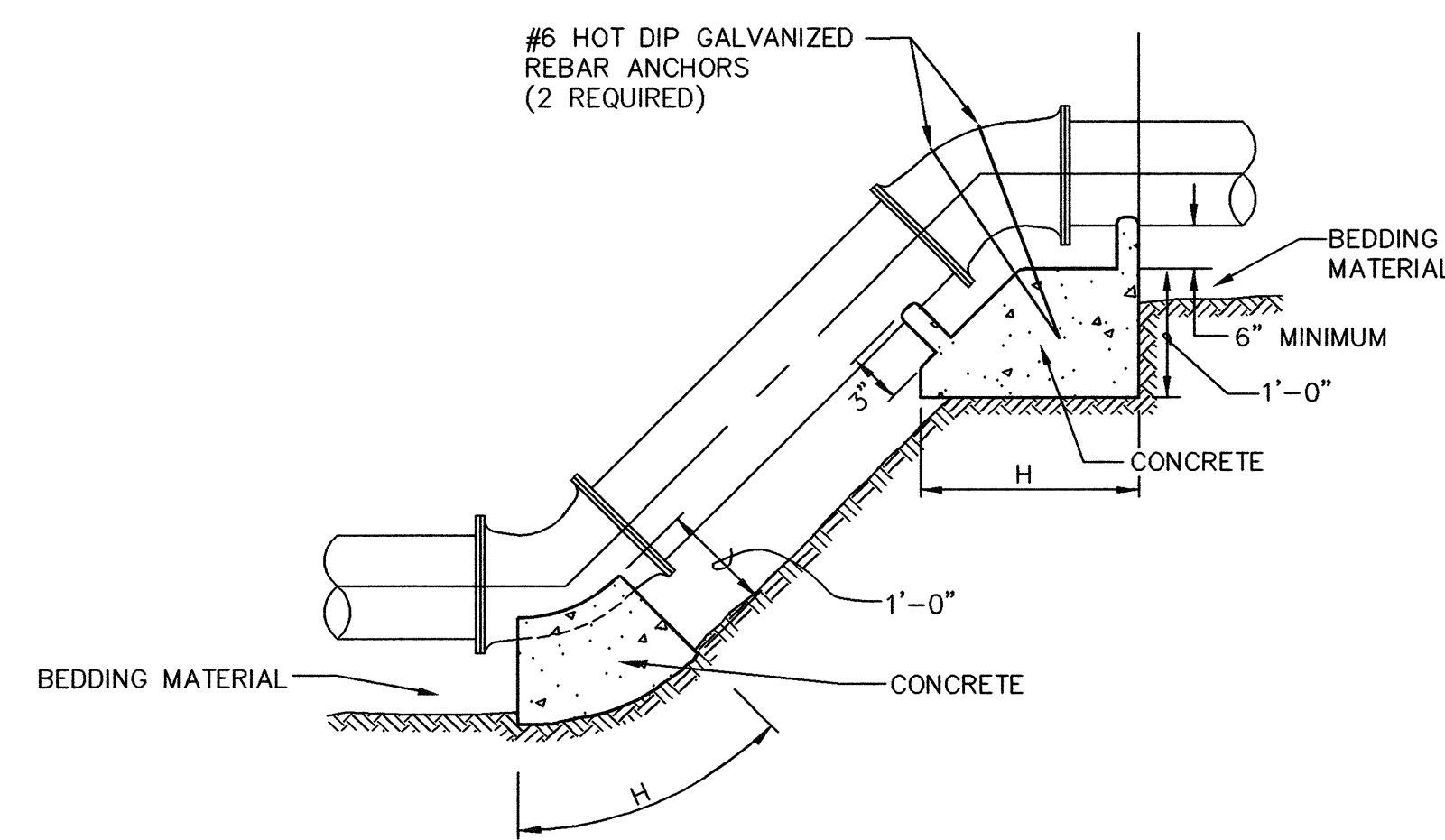
WATER SYSTEM IMPROVEMENTS  
 STINSON ROAD WATER LINE  
 STA. 4+00 TO STA. 7+06.42 (LINE "W-A")  
**CITY OF LUCAS**

SHEET NO. 6  
 OF 8 SHEETS  
 JOB NO. 06-1183



**GENERAL NOTES:**

1. ALL ANCHOR BLOCKS SHALL BE FORMED, POURED IN PLACE, CLASS "B" CONCRETE.



**ELEVATION - VERTICAL BEND**

**PLAN BENDS**

PIPE SIZE (INCHES)	DEGREE OF BEND (DEGREE)	MINIMUM CONCRETE ANCHOR BLOCK			
		EARTH (FEET)		ROCK (FEET)	
		"L"	"H"	"L"	"H"
6, 8	11 1/4	1.0	1.5	1.0	1.0
10, 12*	22 1/2	1.5	1.5	1.0	1.0
16**	45	2.0	2.0	1.5	1.5
	90	5.0	1.5	2.0	2.0

\* FOR 12" LINE ADD 1 FOOT TO ALL DIMENSIONS IN THE TABLE.

\*\* FOR 16" LINE ADD 2 FEET TO ALL DIMENSIONS IN THE TABLE.

**NOTES:**

1. THE ABOVE TABLE IS BASED ON 2000 PSF SOIL BEARING CAPACITY AND FOR A TEST PRESSURE OF 150 P.S.I.
2. CONCRETE FOR THRUST BLOCKING SHALL BE 2000 PSI CONCRETE.
3. VERTICAL BEND THRUST BLOCKING SHALL HAVE REINFORCING BARS NO. 4 AT 12" C-C.
4. ALL BEARING SURFACES OF THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH.
5. ALL THRUST BLOCKING SHALL BE AS INDICATED OR AS PER THE MANUFACTURE'S SPECIFICATIONS.

**RECORD DRAWING**  
BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

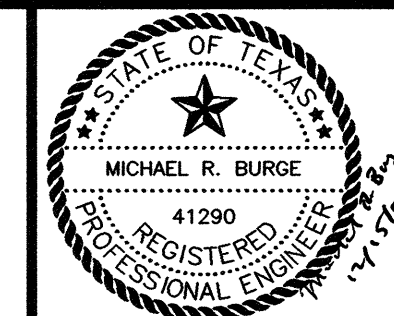
**CONCRETE ANCHOR BLOCKS**  
N.T.S.

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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: \_\_\_\_\_ N.T.S.  
DATE: \_\_\_\_\_ AUGUST 2006  
DWG. NAME: \_\_\_\_\_ 1183DET1



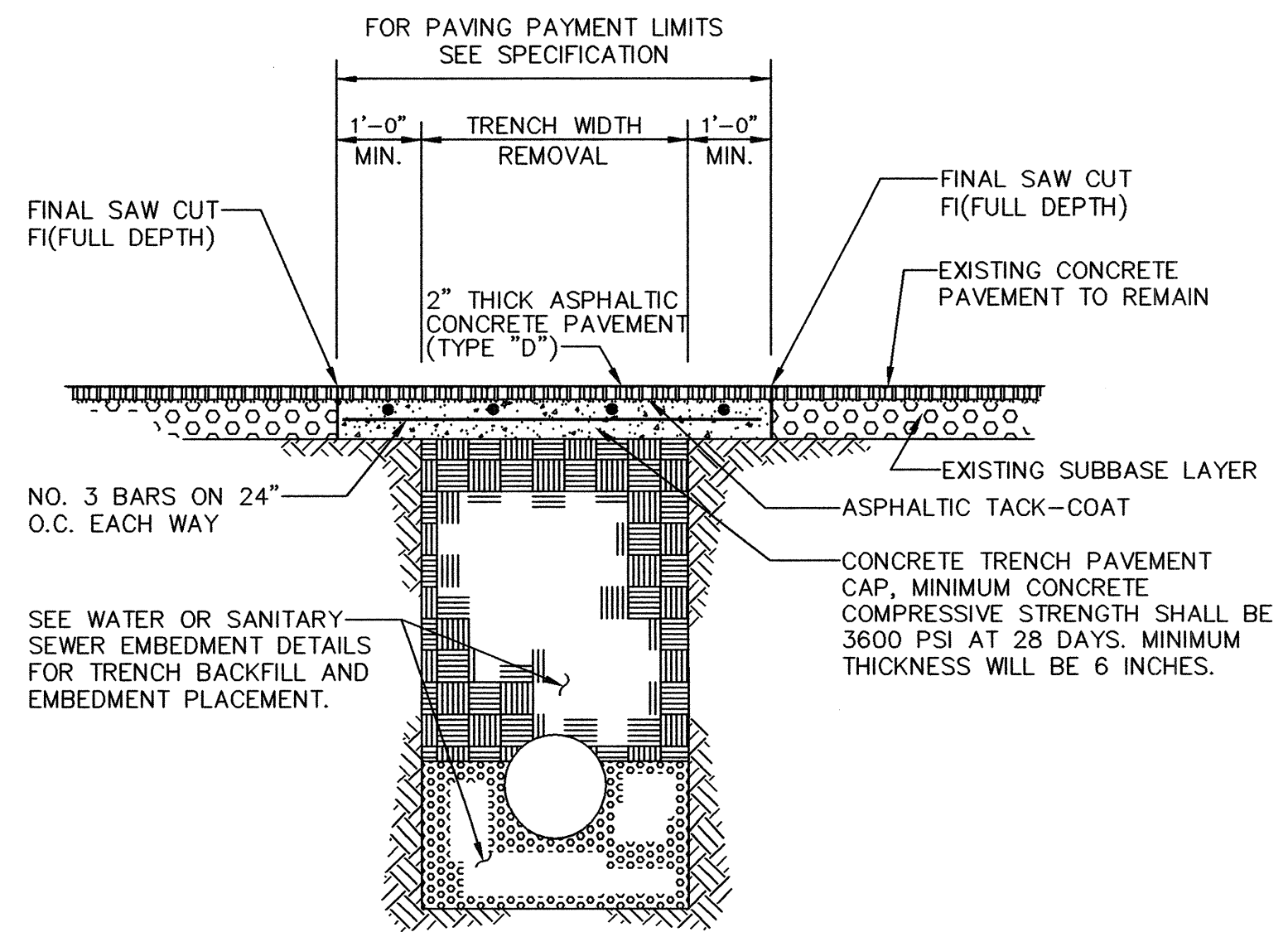
**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (tel)  
(972) 864-8220 (fax)



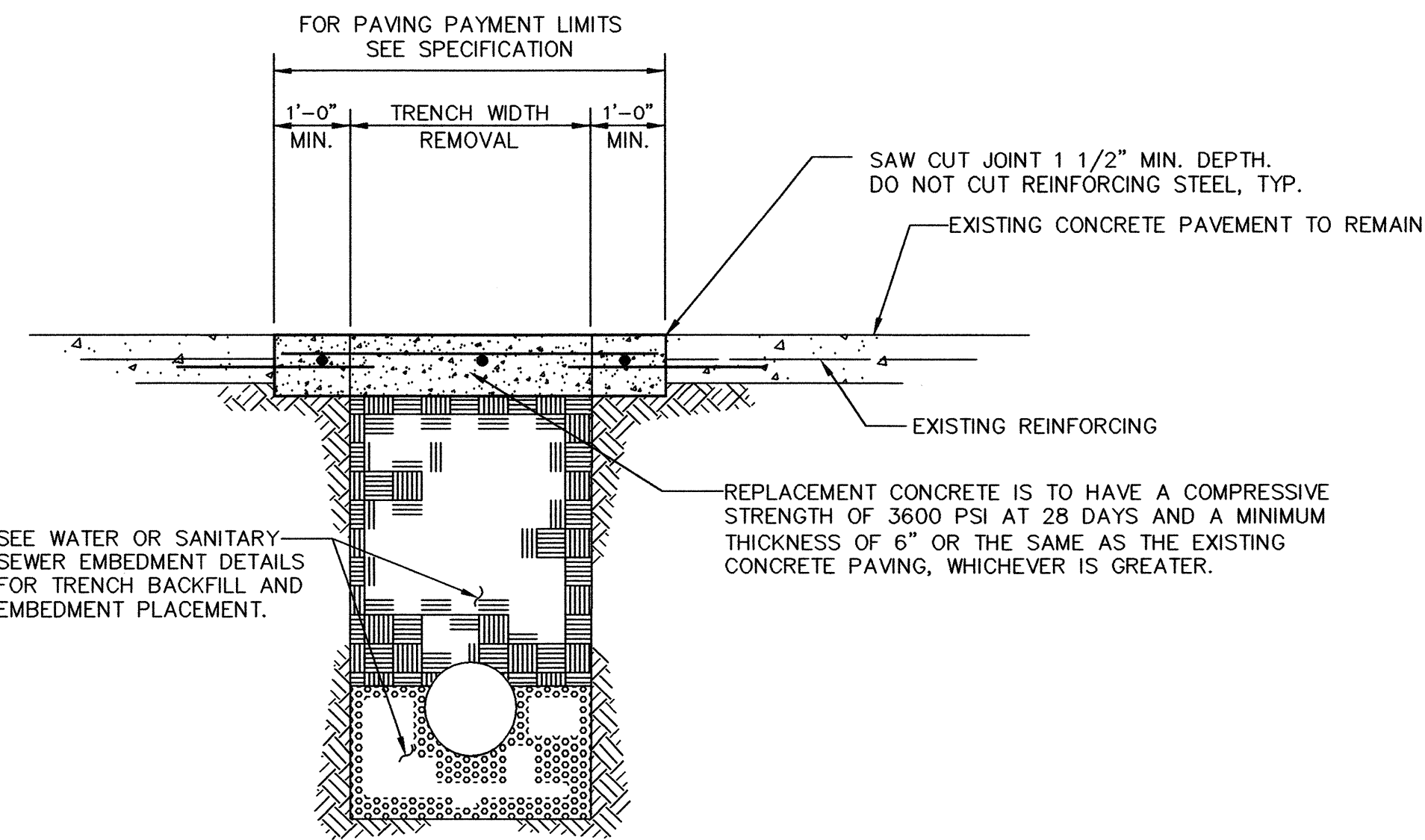
**WATER SYSTEM IMPROVEMENTS  
STINSON ROAD WATER LINE  
GENERAL CONSTRUCTION DETAILS - SHEET 1  
CITY OF LUCAS**

SHEET NO. 7  
OF 8 SHEETS  
JOB NO. 06-1183

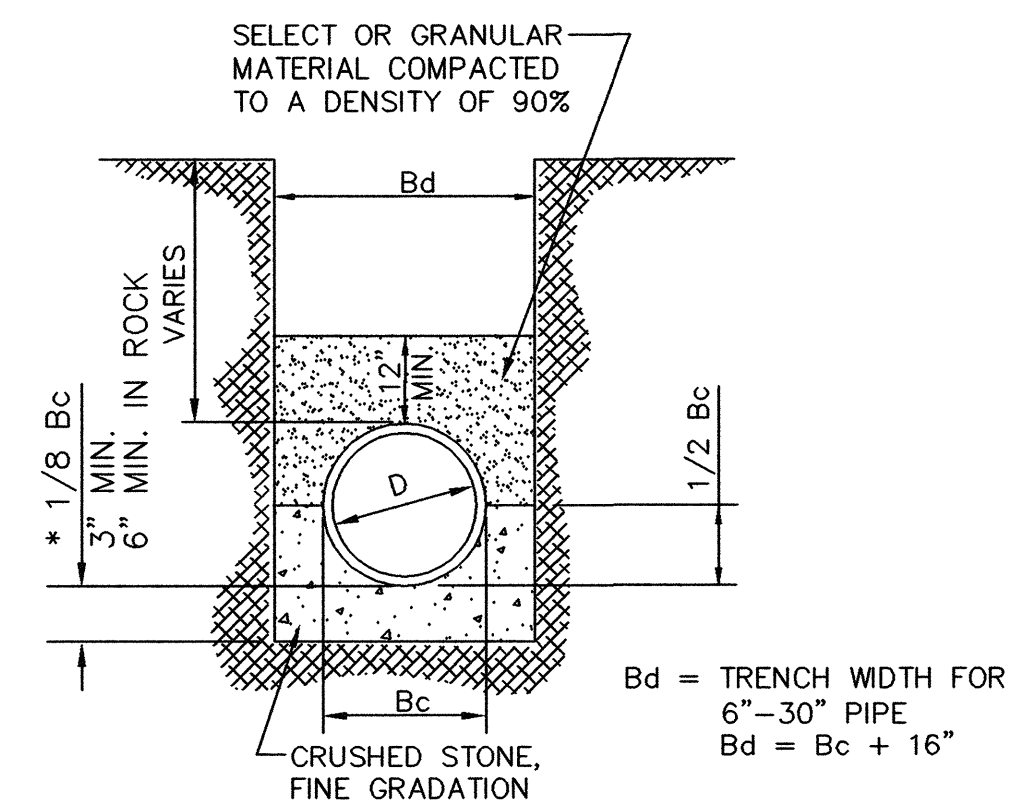




**FLEXIBLE BASE AND ASPHALTIC CONCRETE SURFACE**



**REINFORCED CONCRETE PAVEMENT**



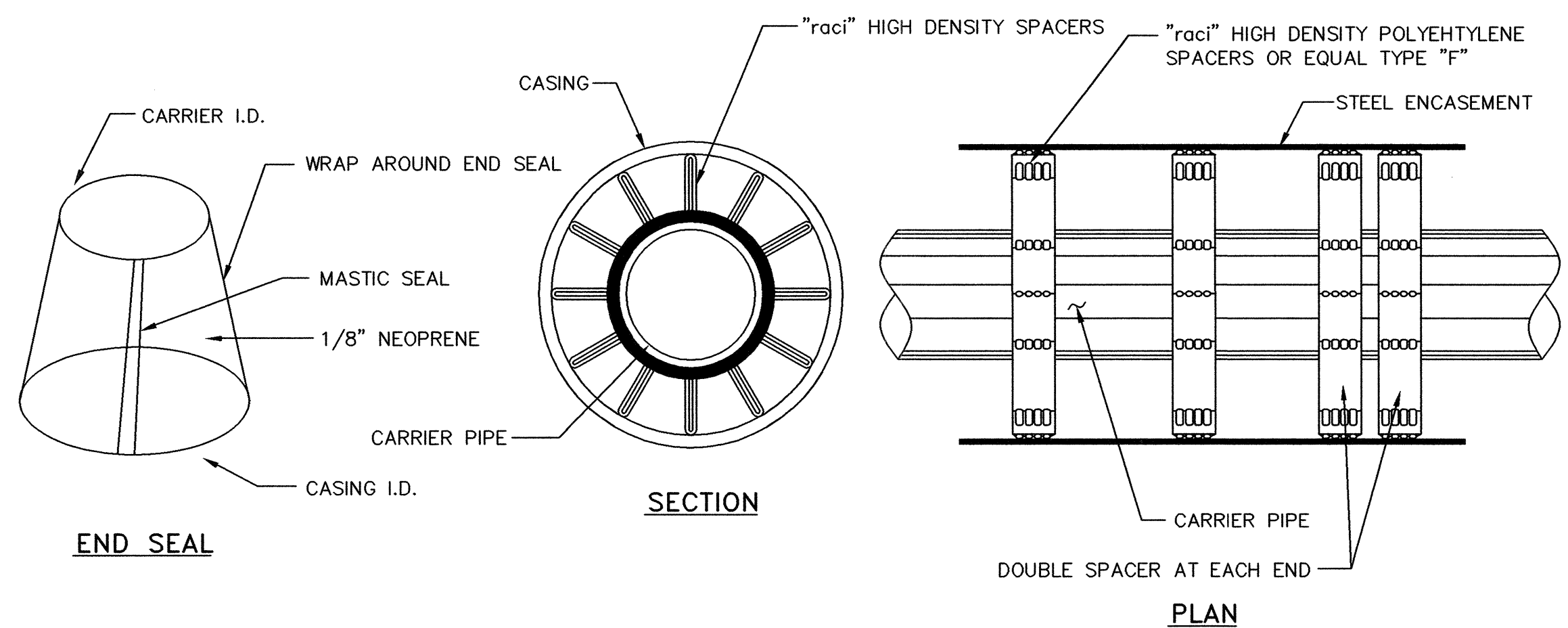
**CLASS "B+" EMBEDMENT**  
N.T.S.

**TRENCH BACKFILL AND EMBEDMENT NOTES:**

- UNLESS OTHERWISE NOTED, TRENCH BACKFILL AND EMBEDMENT SHALL BE AS SPECIFIED IN NTCOG SPECIFICATION ITEMS 2.1.8, 6.2.9, AND 6.2.10.
- ALL TRENCH BACKFILL SHALL BE COMPACTED TO 95% DENSITY WHEN UNDER PAVEMENT.
- SAND SHALL BE FREE FROM LUMPS, STONES, CLAY AND ORGANIC MATTER. ALL PARTICLES MUST PASS A NO. 8 SIEVE.
- GRANULAR MATERIAL SHALL BE DEFINED AS FREE FLOWING RIVER RUN, SANDY MATERIAL, FREE FROM LARGE STONES, CLAY AND ORGANIC MATERIAL. THE EMBEDMENT MATERIAL WILL NOT BE SUCH THAT WHEN WET, THE FINE MATERIAL FORMS MUD OR MUCK. THE EMBEDMENT MATERIAL SHALL BE COMPOSED OF TOUGH DURABLE PARTICLES, REASONABLY FREE FROM THIN, FLAT AND ELONGATED PIECES, AND OF SUITABLE QUALITY TO INSURE PERMANENCE IN THE TRENCH. THE P.I. OF THE FINES SHALL NOT EXCEED 3. LIGHT WEIGHT AGGREGATE IS NOT ACCEPTABLE FOR GRANULAR EMBEDMENT. STONES LARGER THAN 2" IN DIAMETER ARE NOT ALLOWED.
- STONES LARGER THAN 6" ARE NOT ALLOWED IN THE TRENCH BACKFILL.
- THE TOP 12" (MINIMUM) OF ALL TRENCHES SHALL BE TOPSOIL. STONES LARGER THAN 2" ARE NOT ALLOWED.

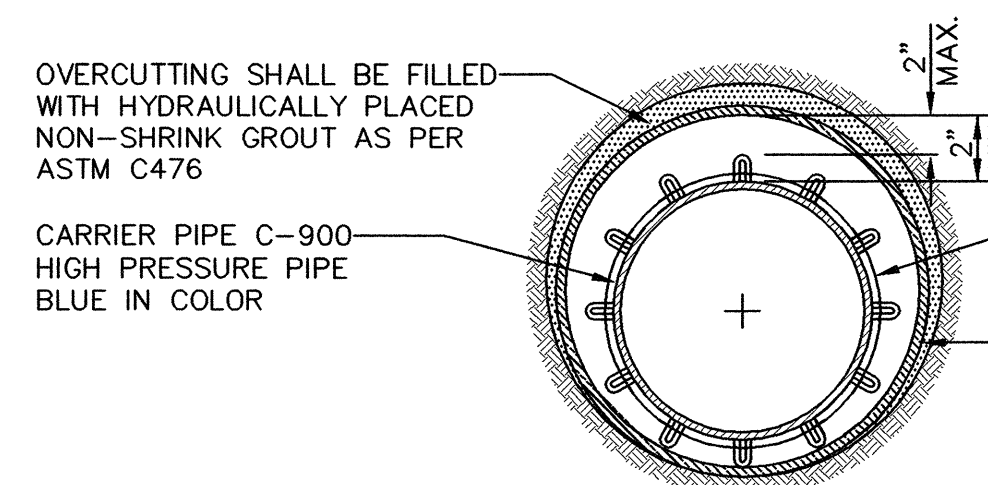
**TYPICAL PAVEMENT REPAIR DETAILS**

N.T.S.



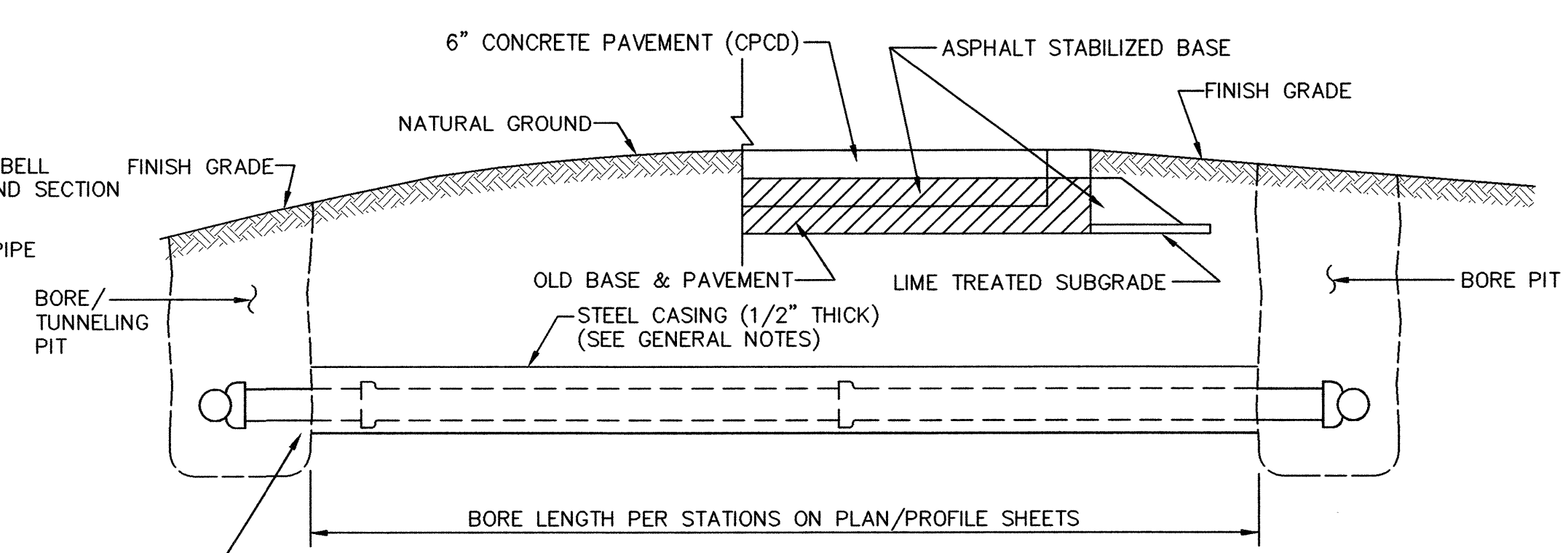
**PIPE CASING SPACERS DETAIL**

N.T.S.



**CROSS-SECTION OF BORE WITH STEEL CASING**

N.T.S.



**BORING DETAIL**

N.T.S.

**GENERAL NOTES:**

- ALL CONSTRUCTION ACTIVITIES SHALL BE RESTRICTED TO THE EASEMENTS.
- WHERE A BORE/TUNNELING PIT EXCEEDS FIVE (5) FEET IN DEPTH THE CONTRACTOR SHALL INSTALL SHORING OF THE PIT WALLS AS REQUIRED BY TEXAS STATE LAW (HB 662 AND HB 665) REGARDING THE SAFETY SYSTEMS TO BE USED DURING TRENCH EXCAVATION (AS STATED IN THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATIONS STANDARDS).
- ALL BORE/TUNNELING PITS SHALL BE BACKFILLED WITHIN FORTY-EIGHT (48) HOURS OF UTILITY INSTALLATION. NO BORE/TUNNELING PIT SHALL REMAIN OPEN IN EXCESS OF SEVENTY-TWO (72) HOURS WITHOUT SHORING TO PREVENT THE CAVING OF PIT WALLS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PHYSICALLY VERIFYING ALL UTILITY CLEARANCES PRIOR TO BEGINNING INSTALLATION.
- CONTRACTOR SHALL REMOVE UNSTABLE MATERIAL FROM THE BOTTOM OF THE BORE PITS ONCE CONSTRUCTION OF THE TUNNEL IS COMPLETE AND CARRIER PIPE HAS BEEN INSTALLED AND SHALL REPLACE THIS UNSTABLE MATERIAL WITH DRY STABLE MATERIAL THAT WILL ADEQUATELY AND SUFFICIENTLY SUPPORT THE PROPOSED PIPELINE.
- CONTRACTOR SHALL INSTALL RACI SPACERS (OR EQUAL) IN ANNULAR SPACE BETWEEN CARRIER PIPE AND CASING PIPE.

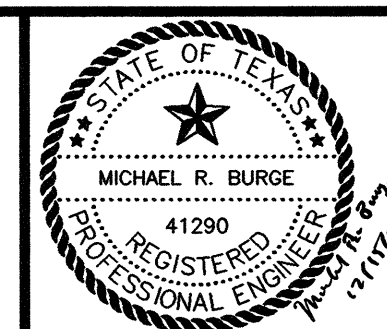
**RECORD DRAWING**  
BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: \_\_\_\_\_ N.T.S.  
DATE: \_\_\_\_\_ AUGUST 2006  
DWG. NAME: \_\_\_\_\_ 1183DET2



**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (tel)  
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**WATER SYSTEM IMPROVEMENTS  
STINSON ROAD WATER LINE  
GENERAL CONSTRUCTION DETAILS - SHEET 2  
CITY OF LUCAS**

SHEET NO. **8**  
OF **8** SHEETS  
JOB NO. 06-1183