

# CITY OF LUCAS

## CONSTRUCTION PLANS FOR

# ~~ROCK RIDGE ROAD WATER LINE~~

# ~~COUNTRY CLUB ROAD TO EXCHANGE PARKWAY~~

# SHADY LANE WATER LINE

## (EAST WINNINGKOFF ROAD TO SNIDER LANE)



MAYOR  
BILL CARMICKLE

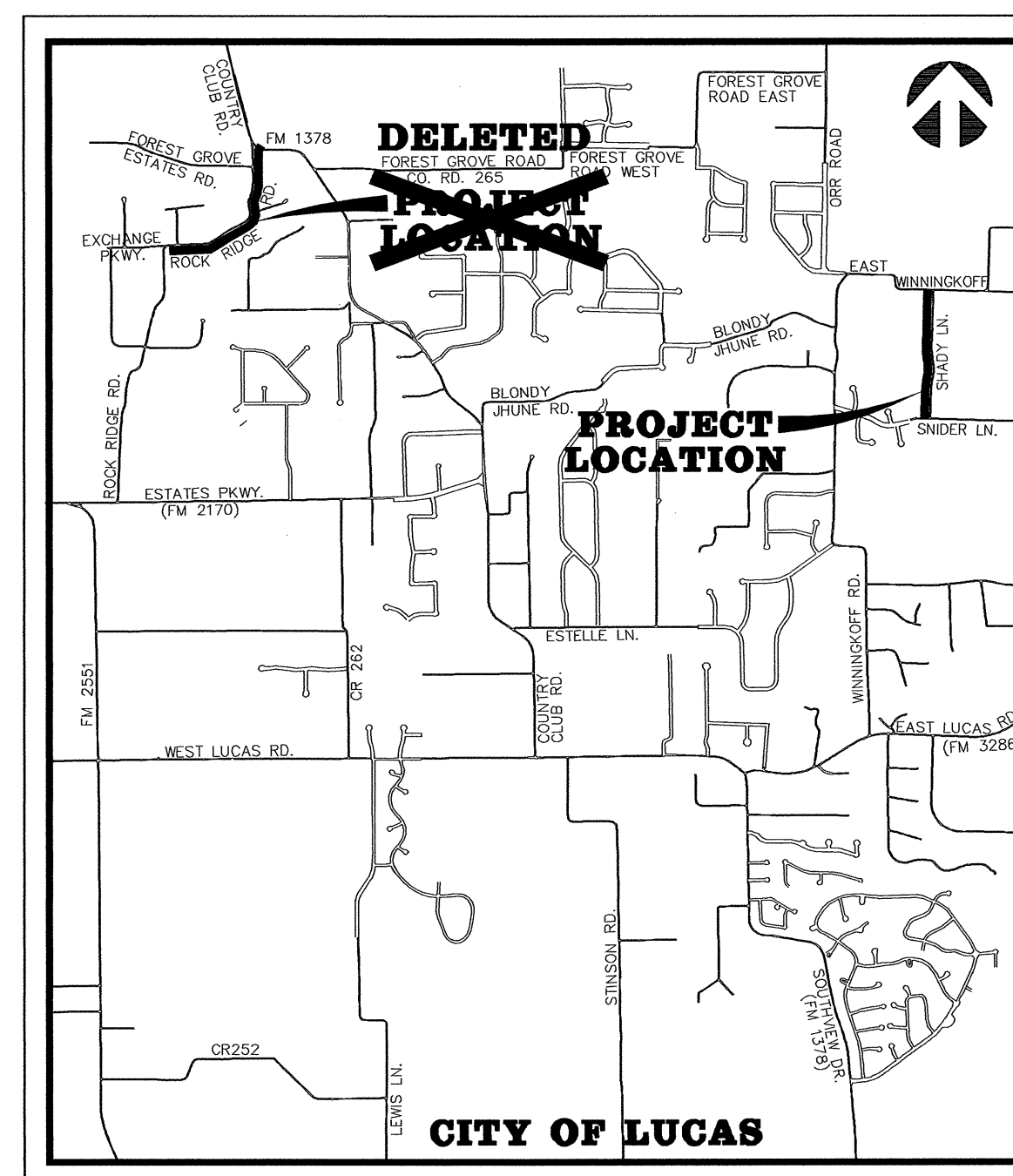
CITY COUNCIL

MARK BARRATT	DEBBIE FISHER
PHILIP LAWRENCE	REBECCA MARK
KATHLEEN PEELE	DON ZRINY

CITY MANAGER  
ROBERT PATRICK

DIRECTOR OF PUBLIC WORKS  
STACY CAUDELL, P.E.

CONTRACTOR  
FOX CONTRACTORS, INC.  
COMPLETED JUNE 2011



VICINITY MAP

BW2 JOB NO. 07-1268

NOVEMBER 2010

"REVISED PER ADDENDA  
AND CHANGE ORDER NO. 1"

NOTE: ROCK RIDGE ROAD WATER LINE DELETED  
PER CHANGE ORDER NO. 1

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### OWNER:

CITY OF LUCAS  
665 COUNTRY CLUB ROAD  
LUCAS, TEXAS 75002

### ENGINEER:

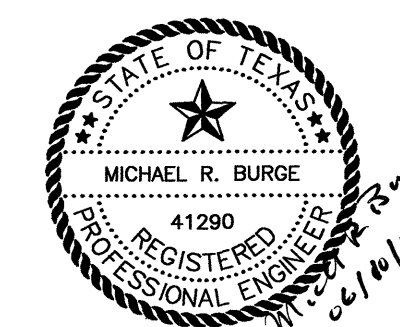


**BW2 ENGINEERS, INC.**

1919 S. SHILOH ROAD  
SUITE 500, L.B. 27  
GARLAND, TEXAS 75042  
Firm Registration No. F-5290

### RECORD DRAWING

BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.





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, public utilities, franchise utilities, private utilities, 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 Lucas. 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 CONTRACTORS 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.
- 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.

GENERAL NOTES CONT'D.:

- 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 City of Lucas 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.
- 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.
- ⚠

CONTRACTOR shall expose each existing pipeline to which a proposed pipeline will be connected and shall verify the horizontal and vertical location of the existing pipeline prior to the installation of the proposed pipeline.
- ⚠

Any proposed service lines to be installed across a road shall be installed without cutting and removing any road pavement.
- ⚠

The fittings for the proposed water line shall be AWWA C153 compact fittings.
- ⚠

All materials furnished and installed on this project shall be domestic materials and shall be in compliance with the appropriate AWWA Standards for such items.
- ⚠

Hydromulch or block sodding shall be installed to match surrounding areas where the ground is disturbed in the construction area. City reserves the right to provide direction with regard to areas to be hydromulched or sodded. The CONTRACTOR will receive payment only for the square yards of area actually hydromulched or sodded in the construction area.
- ⚠

Existing fire hydrants removed during construction shall be removed from the job site and delivered to a site within the City limits to be determined by the City.
- ⚠

If any conflicts with other utilities occur during the construction activities, the CONTRACTOR shall immediately notify the City's representative and shall make adjustments as necessary with City's concurrence.
- ⚠

No connections to other City water distribution lines shall be made on Fridays.
- ⚠

During construction, when installing the proposed water line across any road, at least one lane will be left open at all times. Two-way traffic shall be re-established on all roads in the construction area at the end of each workday.
- ⚠

Any blind flanges shown on the plans shall be MJ plugs.

SERVICE CONNECTION NOTES:

- CONTRACTOR shall install new 1" service lines from existing water meters to proposed water lines. These new 1" service lines shall replace the existing service lines. Once CONTRACTOR has completed installation of the proposed water lines and the new water lines have been tested and disinfected and once all the bacteriological samples have passed and the water lines have been placed in service, the CONTRACTOR shall disconnect the old service lines and connect the new service lines to the existing water meters. The CONTRACTOR shall provide all labor and materials to install the new 1" service lines and connect the 1" service lines to existing water meters. These new 1" service lines include the following categories:
  - Long 1" service lines from proposed water lines to existing meters across Rock Ridge Road and Shady Lane.
  - Short 1" service lines from proposed water lines to existing meters where existing meters are on the same side of the road as the proposed water lines.For the service connections, CONTRACTOR shall furnish and install Ford brass taps and saddles (double saddles) or approved equal. The cost for the taps and saddles shall be included in the price bid for the service lines.

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".

NTMWD NOTES:

- North Texas Municipal Water District (NTMWD) 20-inch water transmission pipeline 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.

EXISTING 2" WATER LINE AT ROCK RIDGE COURT NOTES:

- CONTRACTOR shall connect the existing 2" water line to the proposed 8" water line. Once CONTRACTOR has completed installation of the proposed water line and the new water line has been tested and disinfected and once all bacteriological samples have passed and the water line has been placed in service, the CONTRACTOR shall disconnect the existing 2" water line from the existing 4" water line and connect the existing 2" water line to the new 8" water line. The CONTRACTOR shall provide all labor and materials to connect the existing 2" water line to the new 8" water line. For connecting the existing 2" water line to the new 8" water line, CONTRACTOR shall furnish and install Ford brass taps and saddles (double saddles) or City approved equal.
- 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.

CONSTRUCTION SEQUENCE:

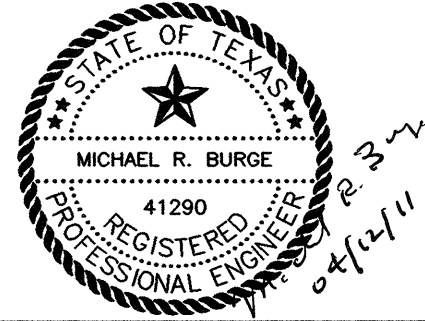
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NO.	DATE	R E V I S I O N	
			REVIEWED

DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: \_\_\_\_\_ NO SCALE  
DATE: \_\_\_\_\_ NOVEMBER 2010  
DWG. NAME: 1268GENNOTE-ROCK



BW2 Engineers, Inc.

1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
Firm Registration No. F-5290



WATER SYSTEM IMPROVEMENTS  
ROCK RIDGE ROAD WATER LINE  
(COUNTRY CLUB ROAD TO EXCHANGE PARKWAY)  
SHADY LANE WATER LINE  
(EAST WINNINGKOFF ROAD TO SNIDER LANE)  
GENERAL NOTES  
**CITY OF LUCAS**

SHEET NO. 1  
OF 20 SHEETS  
JOB NO. 07-1268

RECORD DRAWING

BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

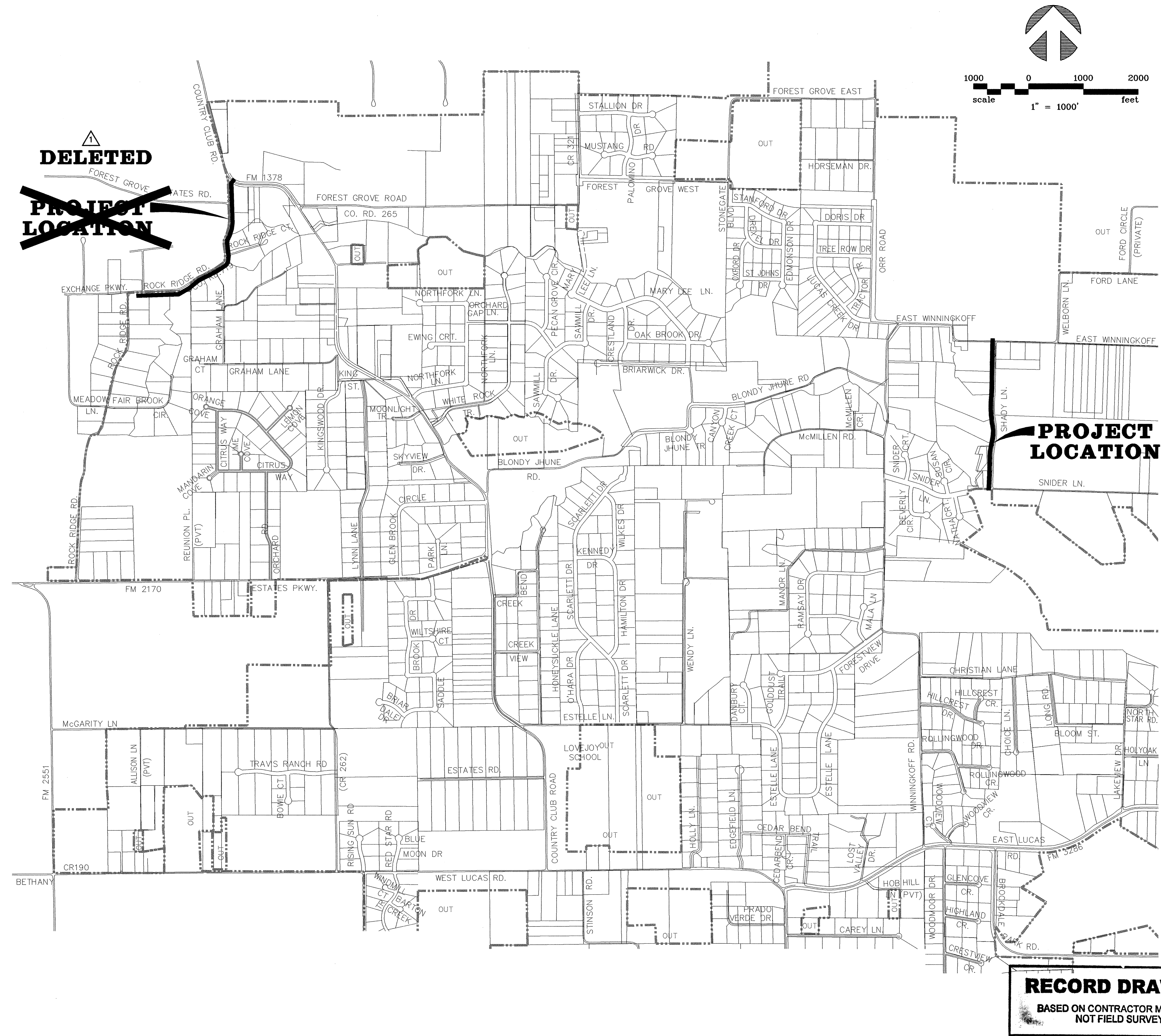
!! CAUTION !!

THERE ARE EXISTING AND/OR PROPOSED UTILITIES IN PROJECT AREA. UTILITY INFORMATION SHOWN ON PLANS REPRESENTS APPROXIMATE LOCATIONS OF EXISTING UTILITIES AND IS NOT NECESSARILY ALL-INCLUSIVE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS OF ALL EXISTING UTILITIES AND SHALL BE REQUIRED TO PROTECT UTILITIES TO AVOID DAMAGE.

**PRIOR TO ANY EXCAVATION, CONTRACTOR SHALL CONTACT DIG-TESS, TEXAS ONE CALL, LONE STAR NOTIFICATION AND OTHERS AS REQUIRED TO LOCATE EXISTING UTILITIES.**

CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.





SUMMARY OF QUANTITIES

	DESCRIPTION	UNIT	
1	mobilization, bonds, and insurance	LS	
2	Remove, remove, and replace existing asphalt street pavement	EA	178
3	Remove and install 8" polyvinyl chloride (PVC) AWWA C900, DR-18, including Class "B" embedment	EA	5630
4	Furnish and install 4" polyvinyl chloride (PVC) AWWA C900, DR-18, including Class "B" embedment	LF	115
5	Furnish and install 8" polyvinyl chloride (PVC) AWWA C900, DR-18 w/14" casing by bored pile racking	LF	170
6	Furnish and install polyvinyl chloride (PVC) AWWA C900, DR-18 w/14" bore	LF	200
7	Furnish and install 8" w/valve and appurtenances	EA	13
8	Furnish and install 8" w/valve and appurtenances	EA	13
9	Furnish and install 8" x 4" w/valve and appurtenances	EA	2
10	Furnish and install 8" valve	EA	8
11	Furnish and install 4" valve	EA	2
12	Furnish and install 8" 45 degree bend	EA	2
13	Furnish and install 8" 45 degree bend (actual)	EA	4
14	Furnish and install 8" 22 1/2 degree bend	EA	1
15	Furnish and install 8" 11 1/4 degree bend	EA	12
16	Furnish and install 4" 90 degree bend	EA	2
17	Furnish and install 8" mechanical joint pipe	EA	1
18	Connect to existing 12" water line, including 8" valve	EA	1
19	Connect to existing 8" water line, including 8"x8" tee and 8" valve	EA	1
20	Connect to existing 4" water line, including 4" 90° bend	EA	2
21	Connect to existing 3" water line, including 8"x3" reducer, tee, and 3" valve	EA	1
22	Cut and plug existing 4" water line	EA	2
23	Connect long 1" service line from proposed water line to existing meter across Rock Ridge Road and Exchange Parkway	EA	19
24	Connect short 1" service line from proposed water line to existing water on same side of road as proposed water line	EA	12
25	Connect to existing water at Rock Ridge Court	EA	1
26	Concrete trenching	CY	41
27	Remove and replace existing mailboxes	EA	6
28	Remove existing fire hydrant and return to the City	EA	3
29	Block paving	CY	7000
30	Furnish and install Trench Safety System, design and implementation		5745
31	Furnish and install erosion control with SWPPP, complete in place, per unit		1
32	Furnish and install construction barricading, signage, and traffic control		1
	Hydromulch	SY	100
	Connect to existing 6" water line, including installation of a 6" tapping sleeve and valve, 6" diameter lead line, and fire hydrant	EA	

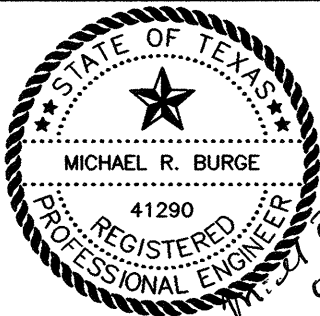
QUANTITIES REVISED PER CHANGE ORDER NO. 1.

6			
5			
4			
3			
2			
1	4/12/11	DELETED PER CHANGE ORDER NO. 1	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
DESIGN: MRB  
REVIEWED: JFW  
SCALE: 1" = 1000'  
DATE: NOVEMBER 2010  
DWG. NAME: 1268LOCAP-ROCK



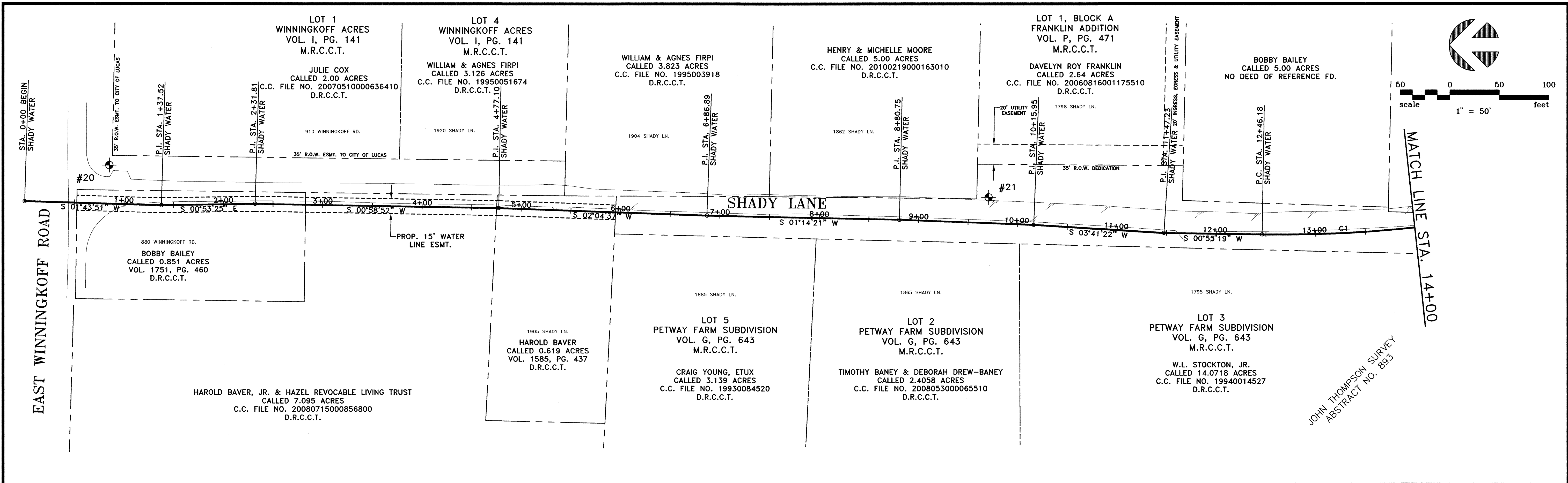
BW2 Engineers, Inc.  
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WATER SYSTEM IMPROVEMENTS  
ROCK RIDGE ROAD WATER LINE  
(COUNTRY CLUB ROAD TO EXCHANGE PARKWAY)  
SHADY LANE WATER LINE  
(EAST WINNINGKOFF ROAD TO SNIDER LANE)  
LOCATION MAP AND SUMMARY OF QUANTITIES  
CITY OF LUCAS

SHEET NO. 2  
OF 20 SHEETS  
JOB NO. 07-1268





LINE TABLE

NUMBER	DIRECTION	DISTANCE
L5	S 10°31'14" E	69.76'

C/L SHADY WATER LINE CURVE TABLE

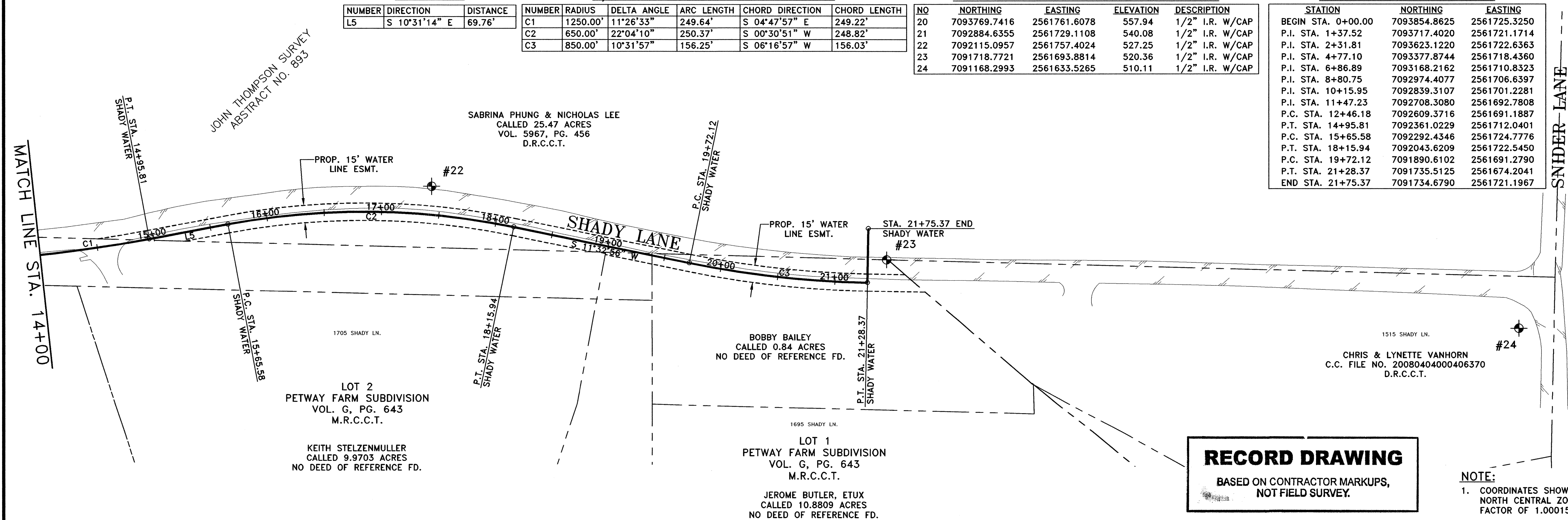
NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C1	1250.00'	11°26'33"	249.64'	S 04°47'57" E	249.22'
C2	650.00'	22°04'10"	250.37'	S 00°30'51" W	248.82'
C3	850.00'	10°31'57"	156.25'	S 06°16'57" W	156.03'

HORIZONTAL & VERTICAL CONTROL POINTS

NO	NORTHING	EASTING	ELEVATION	DESCRIPTION
20	7093769.7416	2561761.6078	557.94	1/2" I.R. W/CAP
21	7092884.6355	2561729.1108	540.08	1/2" I.R. W/CAP
22	7092115.0957	2561757.4024	527.25	1/2" I.R. W/CAP
23	7091718.7721	2561693.8814	520.36	1/2" I.R. W/CAP
24	7091168.2993	2561633.5265	510.11	1/2" I.R. W/CAP

SHADY LANE WATER LINE

STATION	NORTHING	EASTING
BEGIN STA. 0+00.00	7093854.8625	2561725.3250
P.I. STA. 1+37.52	7093717.4020	2561721.1714
P.I. STA. 2+31.81	7093623.1220	2561722.6363
P.I. STA. 4+77.10	7093377.8744	2561718.4360
P.I. STA. 6+86.89	7093168.2162	2561710.8323
P.I. STA. 8+80.75	7092974.4077	2561706.6397
P.I. STA. 10+15.95	7092839.3107	2561701.2281
P.I. STA. 11+47.23	7092708.3080	2561692.7808
P.C. STA. 12+46.18	7092609.3716	2561691.1887
P.T. STA. 14+95.81	7092361.0229	2561712.0401
P.C. STA. 15+65.58	7092292.4346	2561724.7776
P.T. STA. 18+15.94	7092043.6209	2561722.5450
P.C. STA. 19+72.12	7091890.6102	2561691.2790
P.T. STA. 21+28.37	7091735.5125	2561674.2041
END STA. 21+75.37	7091734.6790	2561721.1967



# RECORD DRAWING

BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

## NOTE:

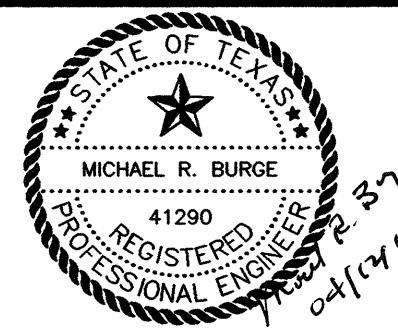
- COORDINATES SHOWN HEREON ARE TEXAS STATE PLANE COORDINATES NORTH CENTRAL ZONE (4202) NAD 83 AT SURFACE WITH A SCALE FACTOR OF 1.000152710. VERTICAL DATUM IS AT NAVD 88.

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1	4/12/11	REVISED PER CHANGE ORDER NO. 1	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
DESIGN: MRB  
REVIEWED: JFW  
SCALE: 1" = 50'  
DATE: NOVEMBER 2010  
DWG. NAME: 1268HORZ-SHADY



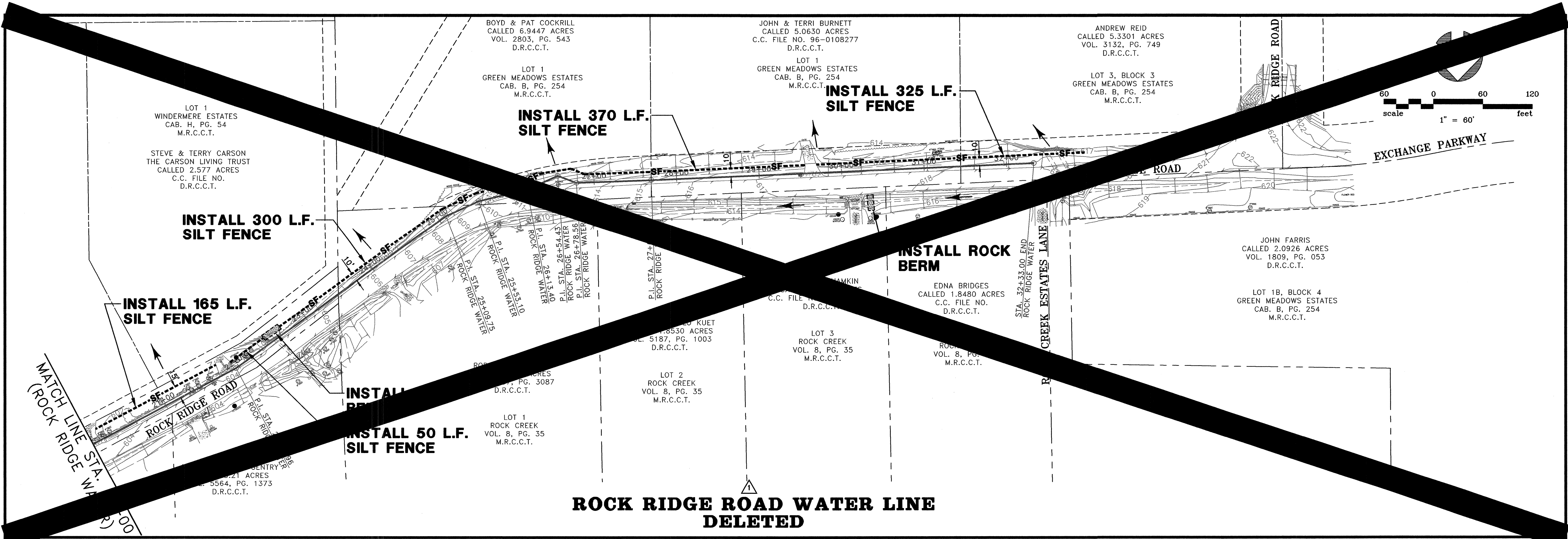
BW2 Engineers, Inc.  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
Firm Registration No. F-5290



WATER SYSTEM IMPROVEMENTS  
SHADY LANE WATER LINE  
(EAST WINNINGKOFF ROAD TO SNIDER LANE)  
HORIZONTAL & VERTICAL CONTROL PLAN - 3  
**CITY OF LUCAS**

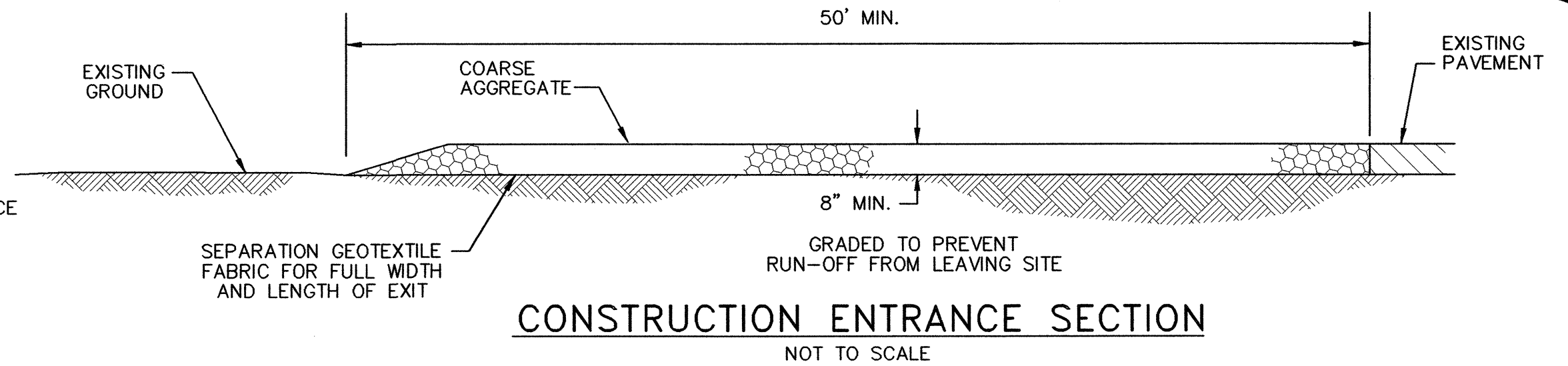
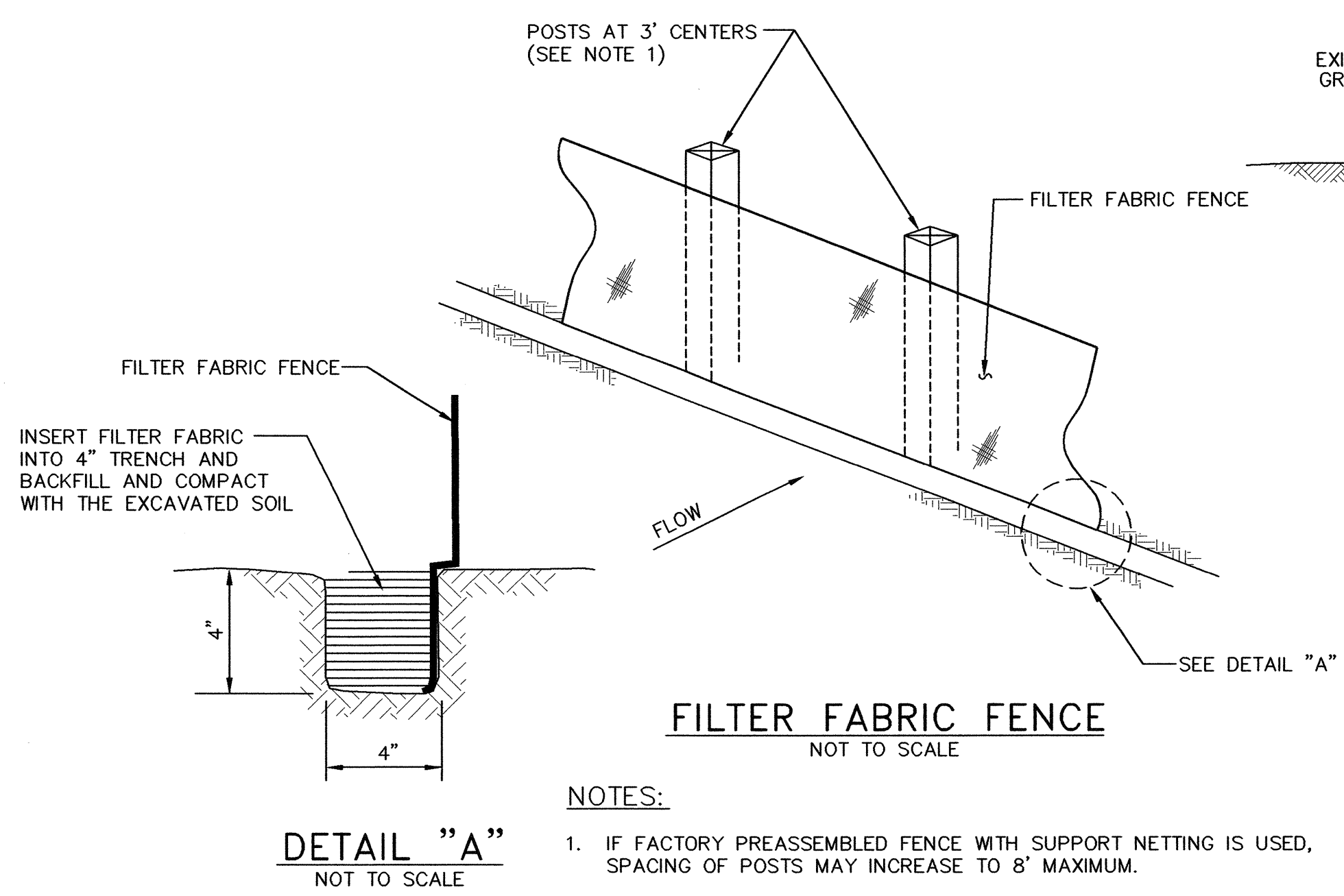
SHEET NO. 5  
OF 20 SHEETS  
JOB NO. 07-1268





**EROSION CONTROL NOTES:**

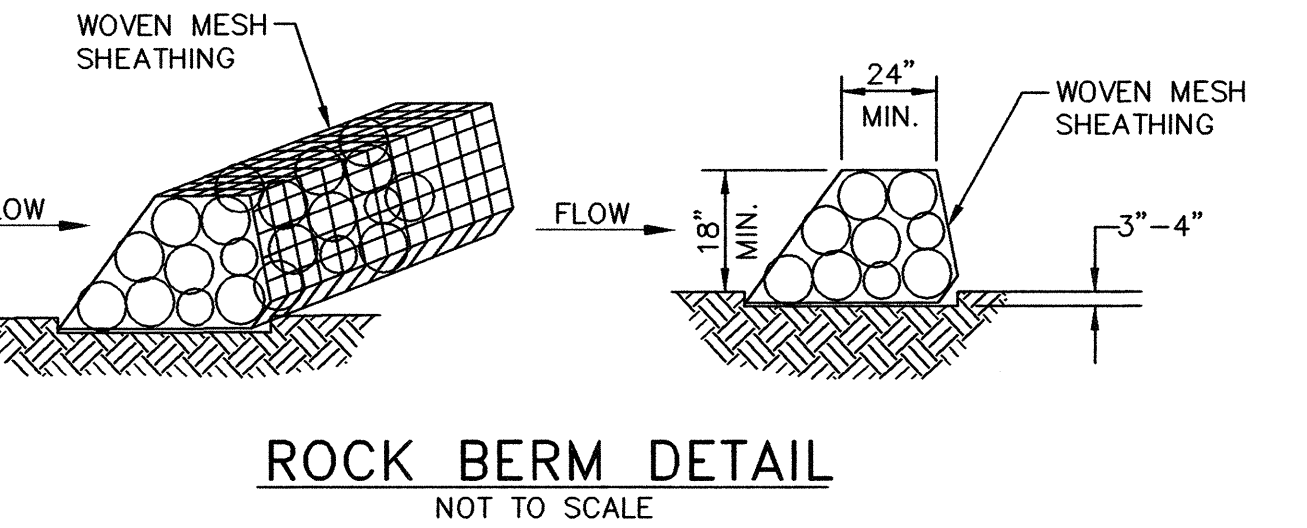
1. EROSION CONTROL DEVICES AS SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBING ACTIVITIES ON THE PROJECT.
2. ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT. CHANGES ARE TO BE APPROVED BEFORE CONSTRUCTION BY THE DESIGN ENGINEER AND CITY OF LUCAS.
3. IF THE EROSION CONTROL PLANS AS APPROVED CANNOT CONTROL EROSION AND OFF-SITE SEDIMENTATION FROM THE PROJECT, THE EROSION CONTROL PLAN WILL BE REQUIRED TO BE REVISED AND/OR ADDITIONAL EROSION CONTROL DEVICES WILL BE REQUIRED ON SITE.
4. IF OFF-SITE SOIL BORROW OR SPOIL SITES ARE USED IN CONJUNCTION WITH THIS PROJECT, THIS INFORMATION SHALL BE DISCLOSED AND SHOWN ON THE EROSION CONTROL PLAN. STAGING, BORROW, AND SPOIL AREAS (INCLUDING THOSE LOCATED OFF-SITE) ARE CONSIDERED A PART OF THE PROJECT SITE AND THEREFORE SHALL COMPLY WITH THE CITY OF LUCAS'S EROSION CONTROL REQUIREMENTS. PERIMETER CONTROLS WILL BE PROVIDED BY THE CONTRACTOR FOR THESE AREAS. THEY SHALL BE STABILIZED WITH PERMANENT GROUND COVER PRIOR TO FINAL APPROVAL OF THE PROJECT.
5. ALL EROSION CONTROL DEVICES SHALL BE INSPECTED WEEKLY BY THE CONTRACTOR AND AFTER ALL MAJOR RAIN EVENTS. ANY DEVICES THAT ARE DAMAGED OR DISPLACED WILL BE RESTORED (NO SEPARATE PAY).
6. ALL NON-IMPERVIOUS AREAS AFTER CONSTRUCTION SHALL BE COVERED WITH SOD OR LANDSCAPED IN ACCORDANCE WITH THE LANDSCAPE DRAWINGS. ALL OTHER REMAINING AREAS SHALL BE HYDROMULCHED OR COVERED WITH CURLEX BLANKET (WHERE SHOWN) AND MAINTAINED UNTIL ESTABLISHED.
7. TEMPORARY STONE STABILIZED CONSTRUCTION ENTRANCE SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS (UNLESS OTHERWISE SHOWN): 25' WIDE X 50' LONG X 8" DEEP. (3"-5" COARSE AGGREGATE). PLACE FILTER FABRIC UNDER STONE PER NCTCOG ITEM 2.23.3.
8. THE STABILIZED CONSTRUCTION ENTRANCE IS TO BE USED AS A VEHICLE WASH DOWN AREA FOR DEBRIS AND SOIL REMOVAL PRIOR TO EXITING THE SITE. THIS STABILIZED ENTRANCE SHALL BE TOP DRESSED WITH ADDITIONAL STONE AS NECESSARY. LOCATION OF STABILIZED ENTRANCE MAY BE MODIFIED IF APPROVED BY CITY OF LUCAS AND THE DESIGN ENGINEER.
9. THE CONTRACTOR SHALL BE RESPONSIBLE, AS THE ENTITY EXERCISING OPERATIONAL CONTROL, FOR ALL PERMITTING AS REQUIRED BY THE EPA/TCEQ. THIS INCLUDES, BUT IS NOT LIMITED TO, MEETING ALL REQUIREMENTS OF TPDES GENERAL PERMIT TXR150000 AND PAYMENT OF ALL ASSOCIATED FEES.
10. IT SHOULD BE NOTED THAT THE AREA OF IMPACT ON THIS PROJECT WILL REQUIRE A SMALL CONSTRUCTION PERMIT THROUGH TCEQ.
11. IT IS VERY IMPORTANT THAT MUD AND OTHER DEBRIS BE KEPT OFF ALL ROADS. CONTRACTOR SHALL IMMEDIATELY REMOVE ANY MUD AND DEBRIS DEPOSITED ON ROADS.
12. CONTRACTOR WILL REPLACE ANY EROSION CONTROL DEVICES THAT ARE DAMAGED AND/OR DISPLACED DURING CONSTRUCTION (NO SEPARATE PAY).



**CONSTRUCTION ENTRANCE NOTES:**

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET, UNLESS OTHERWISE SHOWN.
2. THICKNESS SHALL NOT BE LESS THAN 8 INCHES.
3. WIDTH SHALL NOT BE LESS THAN 25 FEET, UNLESS OTHERWISE SHOWN.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ENTRANCE, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED CONSTRUCTION ENTRANCES ARE REQUIRED FOR ANY STAGING, BORROW, AND SPOIL AREAS.

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



**LEGEND:**

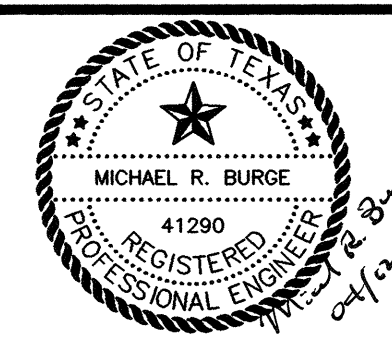
- SF--- SILT FENCE
- ROCK BERM
- ← RUNOFF DIRECTION

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NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
DESIGN: MRB  
REVIEWED: JFW  
SCALE: 1" = 60'  
DATE: NOVEMBER 2010  
DWG. NAME: 1268EROCONT2-ROCK



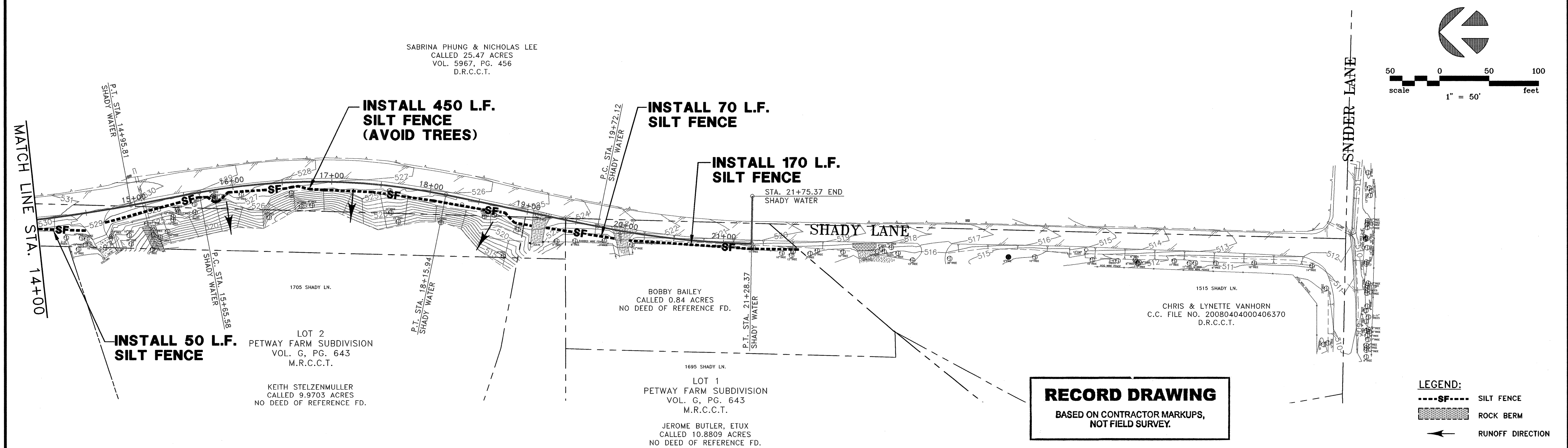
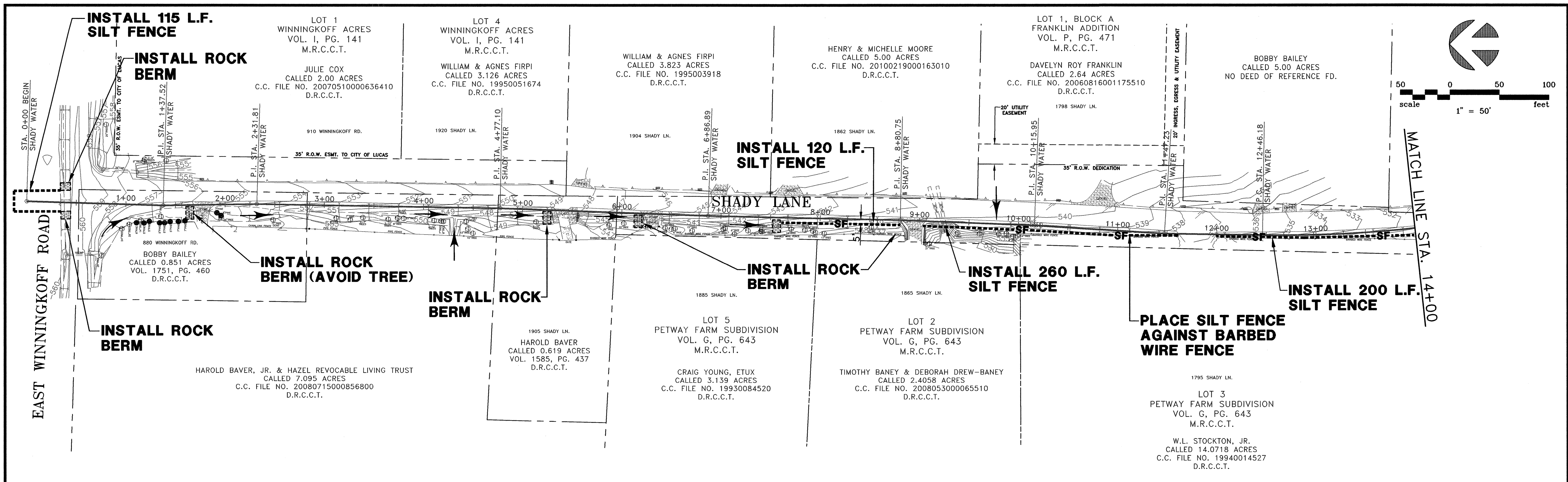
**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**ROCK RIDGE ROAD WATER LINE**  
(COUNTRY CLUB ROAD TO EXCHANGE PARKWAY)  
**EROSION CONTROL PLAN - 2**  
**CITY OF LUCAS**

SHEET NO. 7  
OF 20 SHEETS  
JOB NO. 07-1268





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

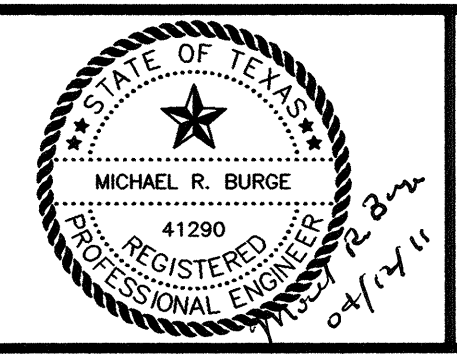
**LEGEND:**  
 ----SF---- SILT FENCE  
 ROCK BERM  
 RUNOFF DIRECTION

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1	4/12/11	REVISED PER CHANGE ORDER NO. 1	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
 DESIGN: MRB  
 REVIEWED: JFW  
 SCALE: 1" = 50'  
 DATE: NOVEMBER 2010  
 DWG. NAME: 1268EROS-SHADY

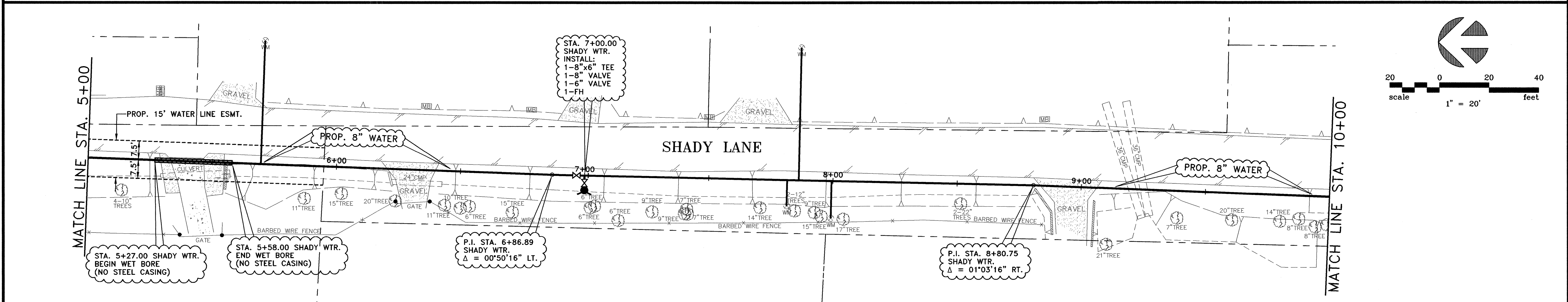
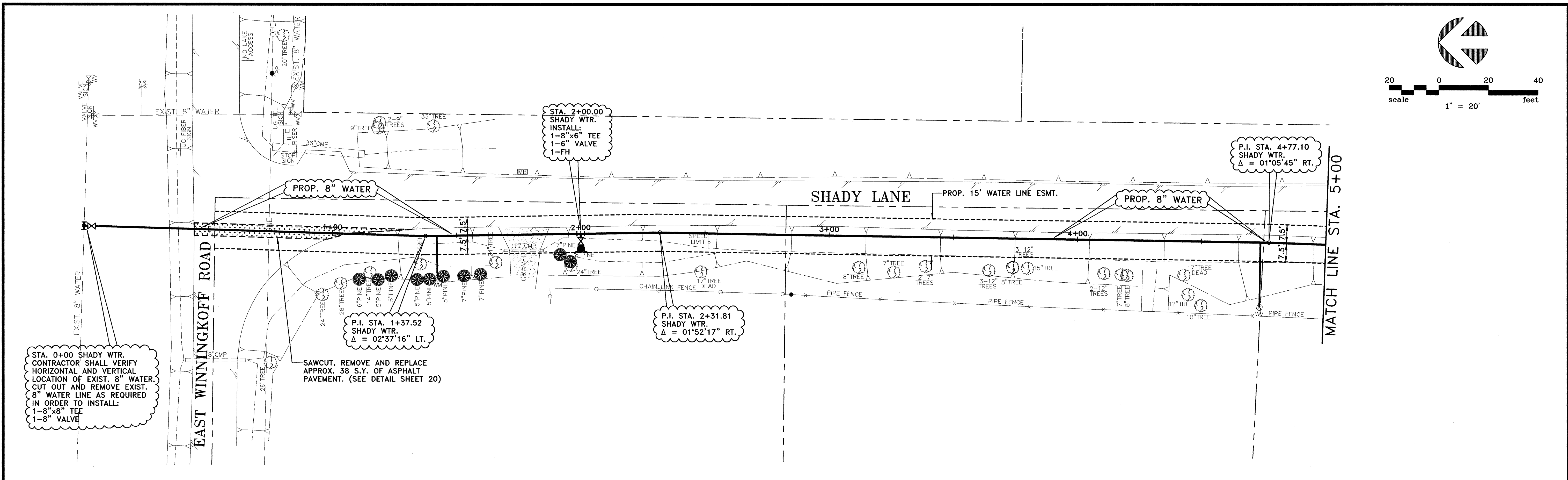


**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS  
 SHADY LANE WATER LINE  
 (EAST WINNINGKOFF ROAD TO SNIDER LANE)  
 EROSION CONTROL PLAN - 3  
 CITY OF LUCAS**

SHEET NO. **8**  
 OF **20** SHEETS  
 JOB NO. 07-1268



#### 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. 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.
3. MEGA-LUGS SHALL BE FURNISHED AND INSTALLED ON ALL BENDS, VALVES, AND OTHER FITTINGS THAT ARE REQUIRED FOR THE PROPOSED WATER LINE.
4. 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.
5. CONTRACTOR SHALL REFER TO THE SERVICE CONNECTION NOTES ON THE GENERAL NOTES SHEET FOR INFORMATION REGARDING THE INSTALLATION OF ALL SERVICE CONNECTIONS.
6. 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.
7. EMBEDMENT FOR THE PROPOSED WATER LINES SHALL BE CLASS "B+" EXCEPT FOR THE PIPELINE EMBEDMENT AT LOW AREAS OR CREEK CROSSINGS, IN WHICH CASE THE EMBEDMENT SHALL BE CONCRETE ENCASUREMENT TO THE TOP OF BANK ON EACH SIDE OF THE CROSSING.
8. WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900. MINIMUM COVER FOR WATER LINE SHALL BE FORTY TWO INCHES (42").

#### RECORD DRAWING

BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

#### !! CAUTION !!

THERE ARE EXISTING AND/OR PROPOSED UTILITIES IN PROJECT AREA. UTILITY INFORMATION SHOWN ON PLANS REPRESENTS APPROXIMATE LOCATIONS OF EXISTING UTILITIES AND IS NOT NECESSARILY ALL-INCLUSIVE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS OF ALL EXISTING UTILITIES AND SHALL BE REQUIRED TO PROTECT UTILITIES TO AVOID DAMAGE.

**PRIOR TO ANY EXCAVATION, CONTRACTOR SHALL CONTACT DIG-TESS, TEXAS ONE CALL, LONE STAR NOTIFICATION AND OTHERS AS REQUIRED TO LOCATE EXISTING UTILITIES.**

CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

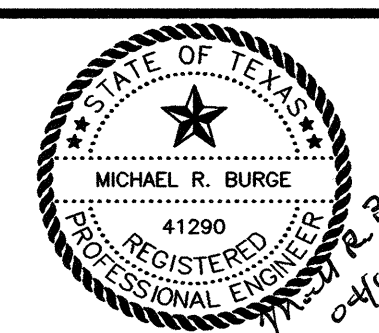
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NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
DESIGN: MRB  
REVIEWED: JFW  
SCALE: 1" = 20'  
DATE: NOVEMBER 2010  
DWG. NAME: 1268SHADYWTR01



#### BW2 Engineers, Inc.

1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
Firm Registration No. F-5290

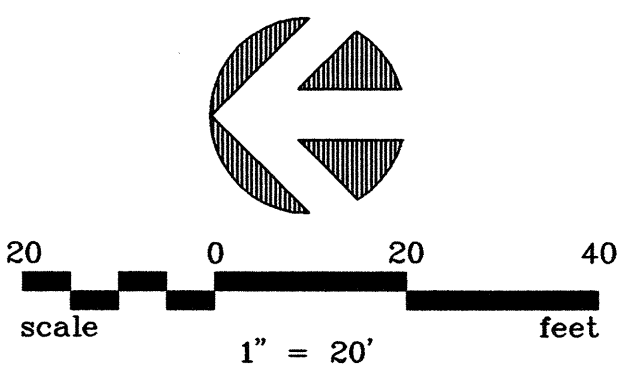
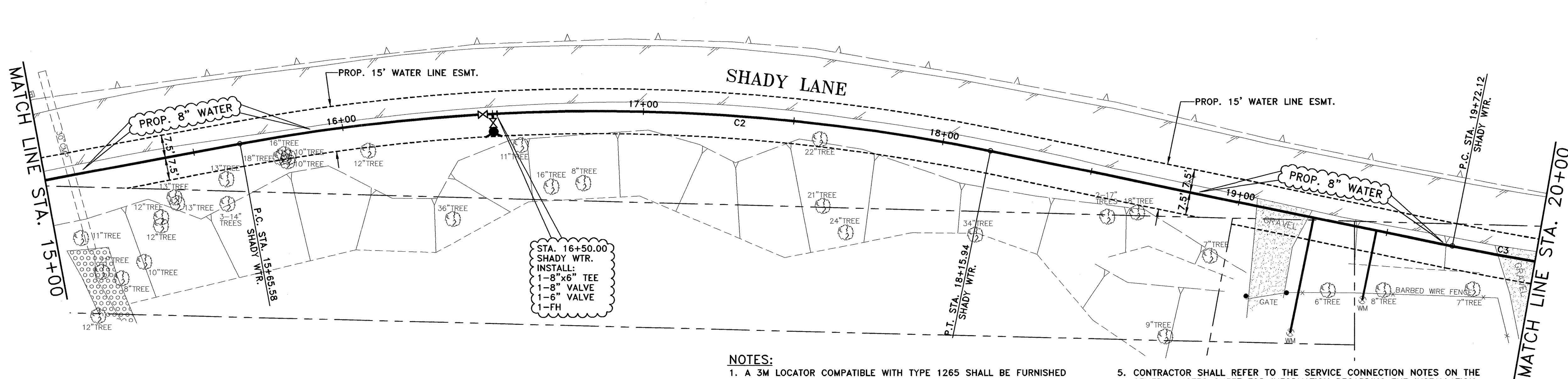
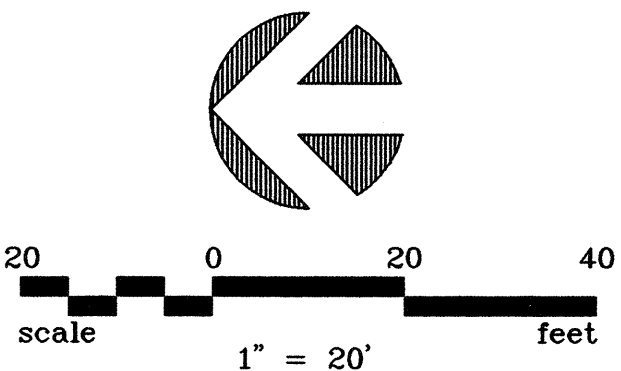
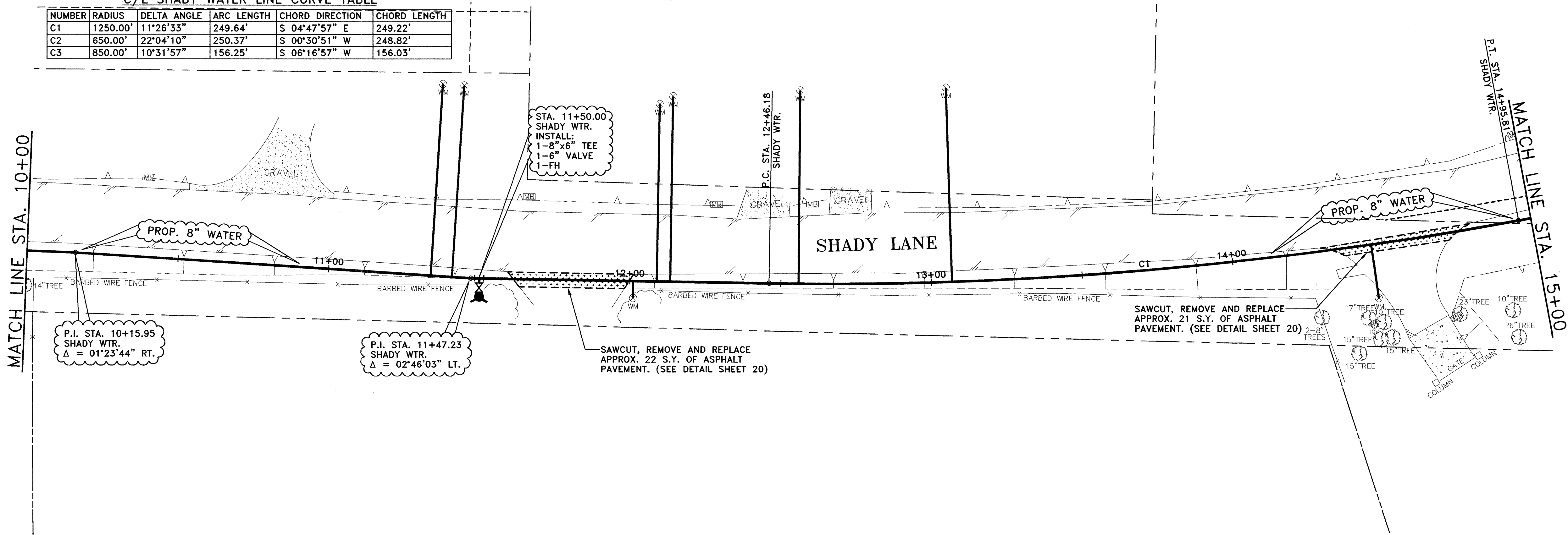


WATER SYSTEM IMPROVEMENTS  
SHADY LANE WATER LINE  
(EAST WINNINGKOFF ROAD TO SNIDER LANE)  
SHADY LANE WATER - STA. 0+00 TO STA. 10+00  
**CITY OF LUCAS**

SHEET NO. 16  
OF 20 SHEETS  
JOB NO. 07-1268



C/L SHADY WATER LINE CURVE TABLE					
NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C1	1250.00'	11°26'33"	249.64'	S 04°47'57" E	249.22'
C2	650.00'	22°04'10"	250.37'	S 00°30'51" W	248.82'
C3	850.00'	10°31'57"	156.25'	S 06°16'57" W	156.03'



**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. 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.
3. MEGA-LUGS SHALL BE FURNISHED AND INSTALLED ON ALL BENDS, VALVES, AND OTHER FITTINGS THAT ARE REQUIRED FOR THE PROPOSED WATER LINE.
4. 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.
5. CONTRACTOR SHALL REFER TO THE SERVICE CONNECTION NOTES ON THE GENERAL NOTES SHEET FOR INFORMATION REGARDING THE INSTALLATION OF ALL SERVICE CONNECTIONS.
6. 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.
7. EMBEDMENT FOR THE PROPOSED WATER LINES SHALL BE CLASS "B+" EXCEPT FOR THE PIPELINE EMBEDMENT AT LOW AREAS OR CREEK CROSSINGS, IN WHICH CASE THE EMBEDMENT SHALL BE CONCRETE ENCASUREMENT TO THE TOP OF BANK ON EACH SIDE OF THE CROSSING.
8. WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900. MINIMUM COVER FOR WATER LINE SHALL BE FORTY TWO INCHES (42").

**RECORD DRAWING**

BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

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**PRIOR TO ANY EXCAVATION, CONTRACTOR SHALL CONTACT DIG-TESS, TEXAS ONE CALL, LONE STAR NOTIFICATION AND OTHERS AS REQUIRED TO LOCATE EXISTING UTILITIES.**

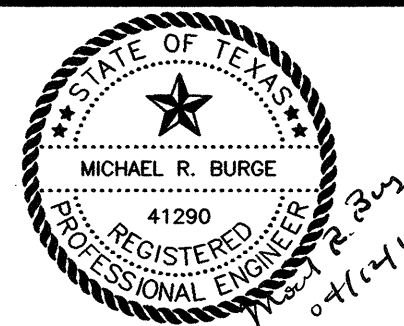
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
DESIGN: MRB  
REVIEWED: JFW  
SCALE: 1" = 20'  
DATE: NOVEMBER 2010  
DWG. NAME: 1268SHADYWTR02



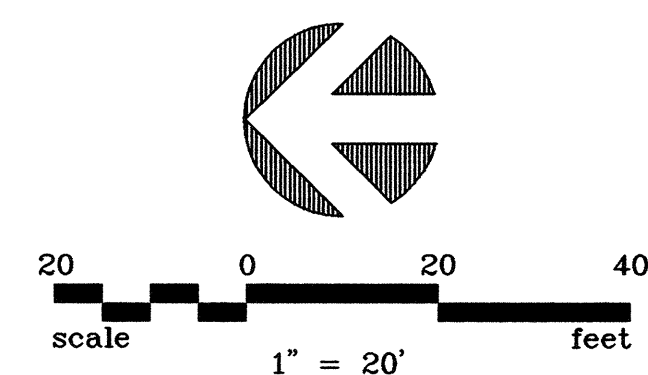
**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
Firm Registration No. F-5290



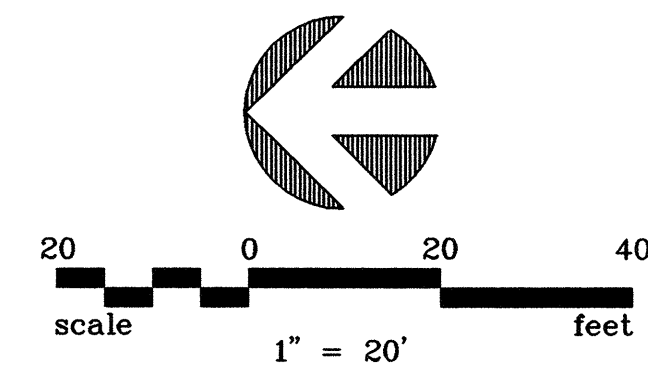
WATER SYSTEM IMPROVEMENTS  
SHADY LANE WATER LINE  
(EAST WINNINGKOFF ROAD TO SNIDER LANE)  
SHADY LANE WATER - STA. 10+00 TO STA. 20+00  
**CITY OF LUCAS**

SHEET NO. 17  
OF 20 SHEETS  
JOB NO. 07-1268





C/L SHADY WATER LINE CURVE TABLE					
NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C3	850.00'	10°31'57"	156.25'	S 06°16'57" W	156.03'



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. 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.
3. MEGA-LUGS SHALL BE FURNISHED AND INSTALLED ON ALL BENDS, VALVES, AND OTHER FITTINGS THAT ARE REQUIRED FOR THE PROPOSED WATER LINE.
4. 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.
5. CONTRACTOR SHALL REFER TO THE SERVICE CONNECTION NOTES ON THE GENERAL NOTES SHEET FOR INFORMATION REGARDING THE INSTALLATION OF ALL SERVICE CONNECTIONS.
6. CONTRACTOR SHALL FURNISH AND INSTALL A TRACER WIRE THAT IS COMPATIBLE WITH AND WILL ALLOW DETECTION BY RADIODTECTION 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.
7. EMBEDMENT FOR THE PROPOSED WATER LINES SHALL BE CLASS "B+" EXCEPT FOR THE PIPELINE EMBEDMENT AT LOW AREAS OR CREEK CROSSINGS, IN WHICH CASE THE EMBEDMENT SHALL BE CONCRETE ENCASEMENT TO THE TOP OF BANK ON EACH SIDE OF THE CROSSING.
8. WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900. MINIMUM COVER FOR WATER LINE SHALL BE FORTY TWO INCHES (42").

**!! CAUTION !!**

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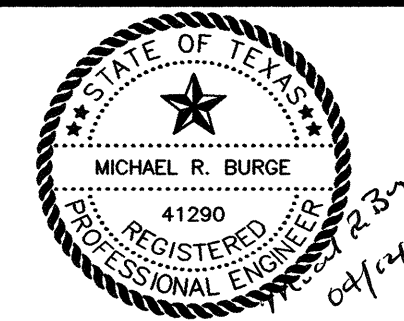
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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	4/12/11	REVISED PER CHANGE ORDER NO. 1	MRB
NO.	DATE	R E V I S I O N	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: \_\_\_\_\_ 1" = 20'  
DATE: \_\_\_\_\_ NOVEMBER 2010  
DWG. NAME: \_\_\_\_\_ 1268SHADYWTRO3



**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
*Firm Registration No. F-5290*

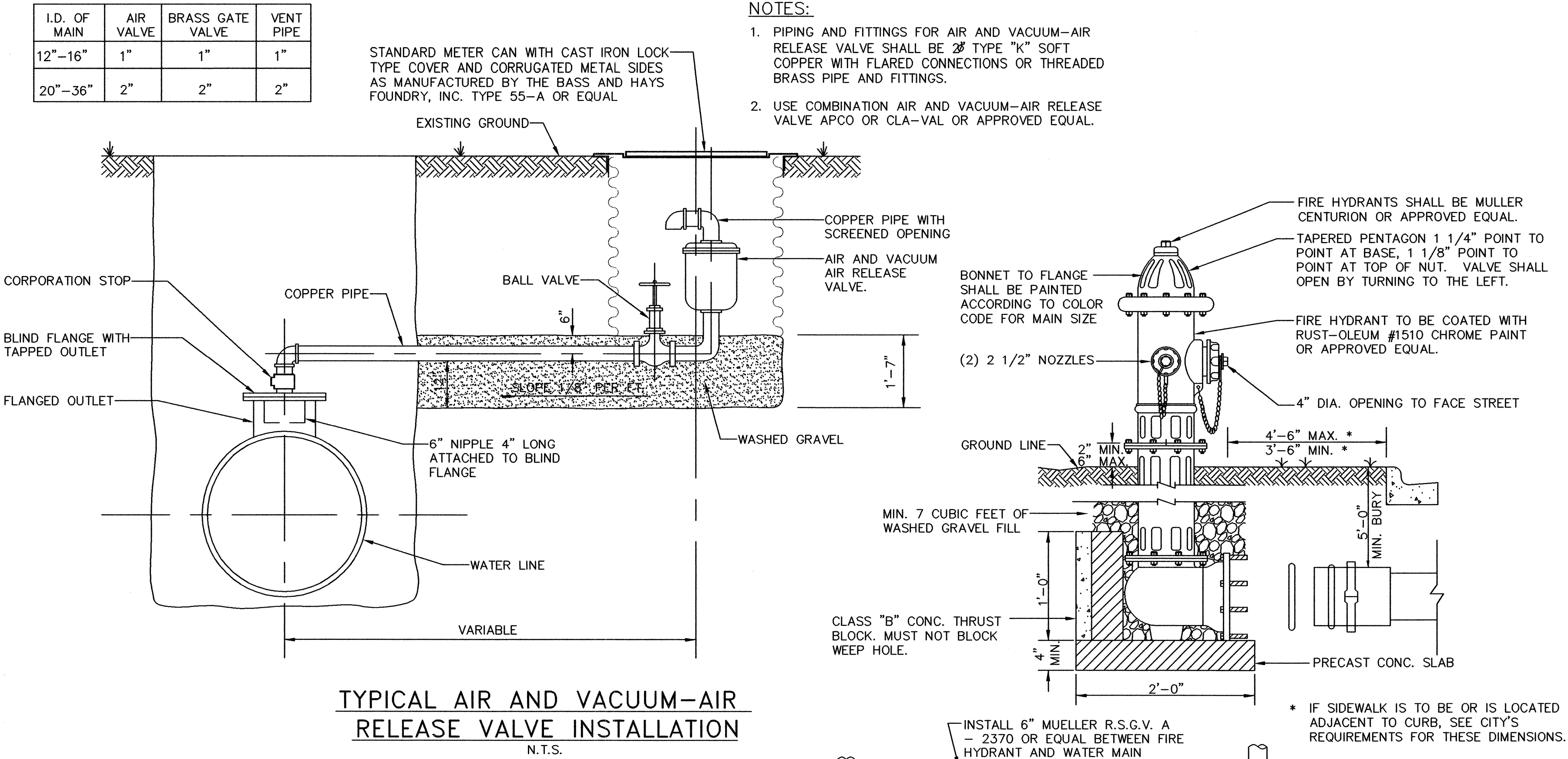


WATER SYSTEM IMPROVEMENTS  
SHADY LANE WATER LINE  
(EAST WINNINGKOFF ROAD TO SNIDER LANE)  
SHADY LANE WATER - STA. 20+00 TO STA. 27+57.28  
**CITY OF LUCAS**

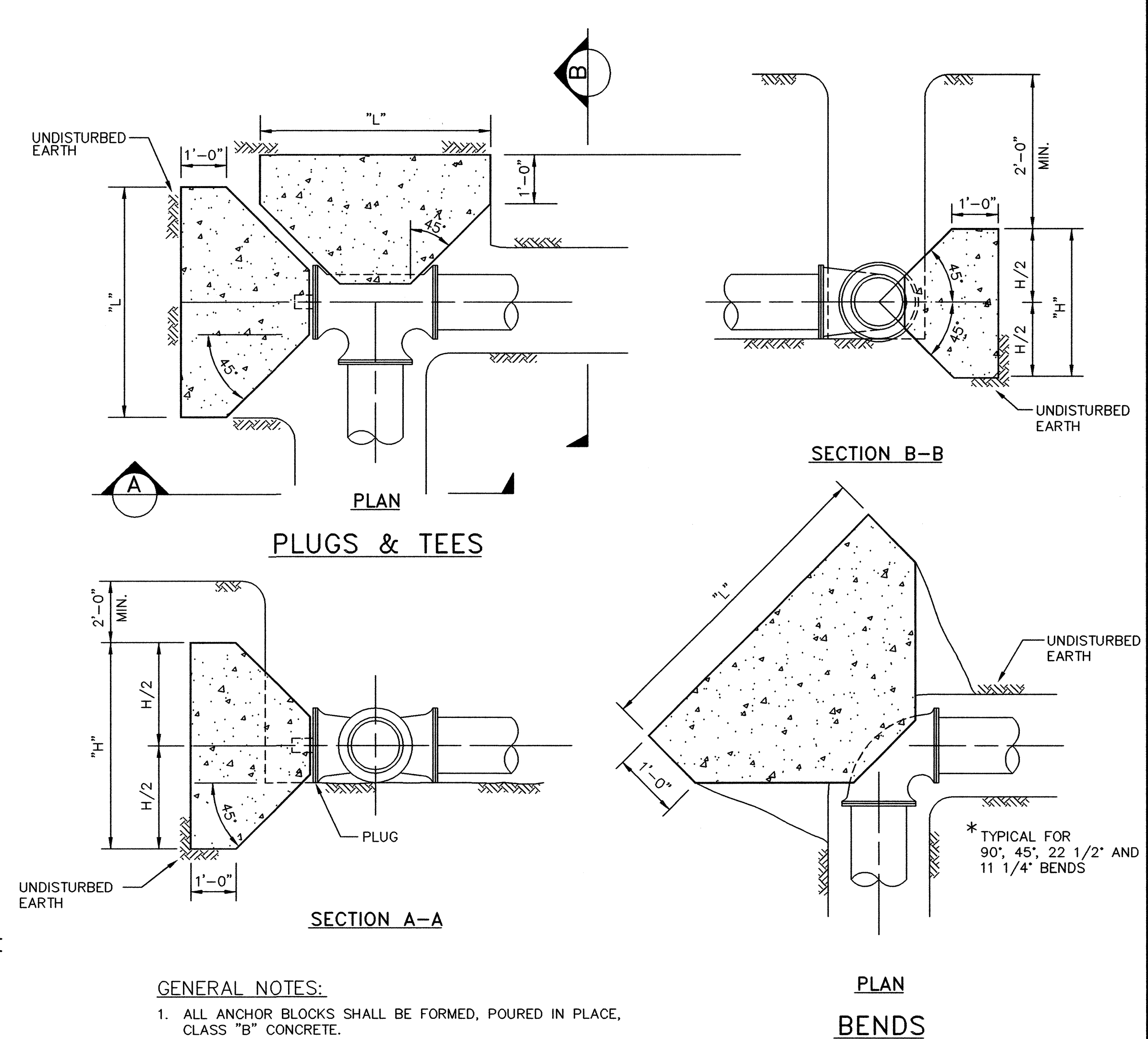
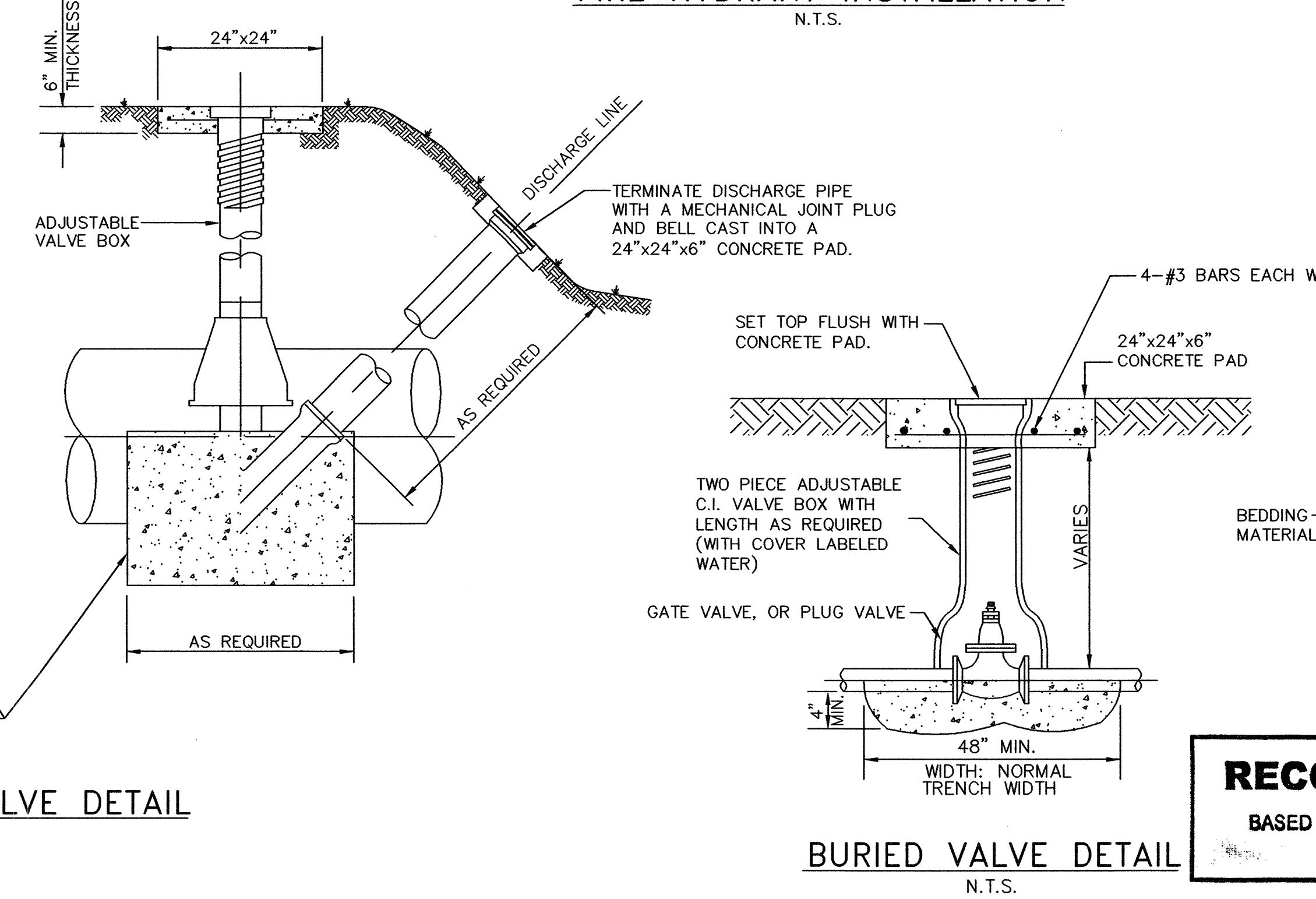
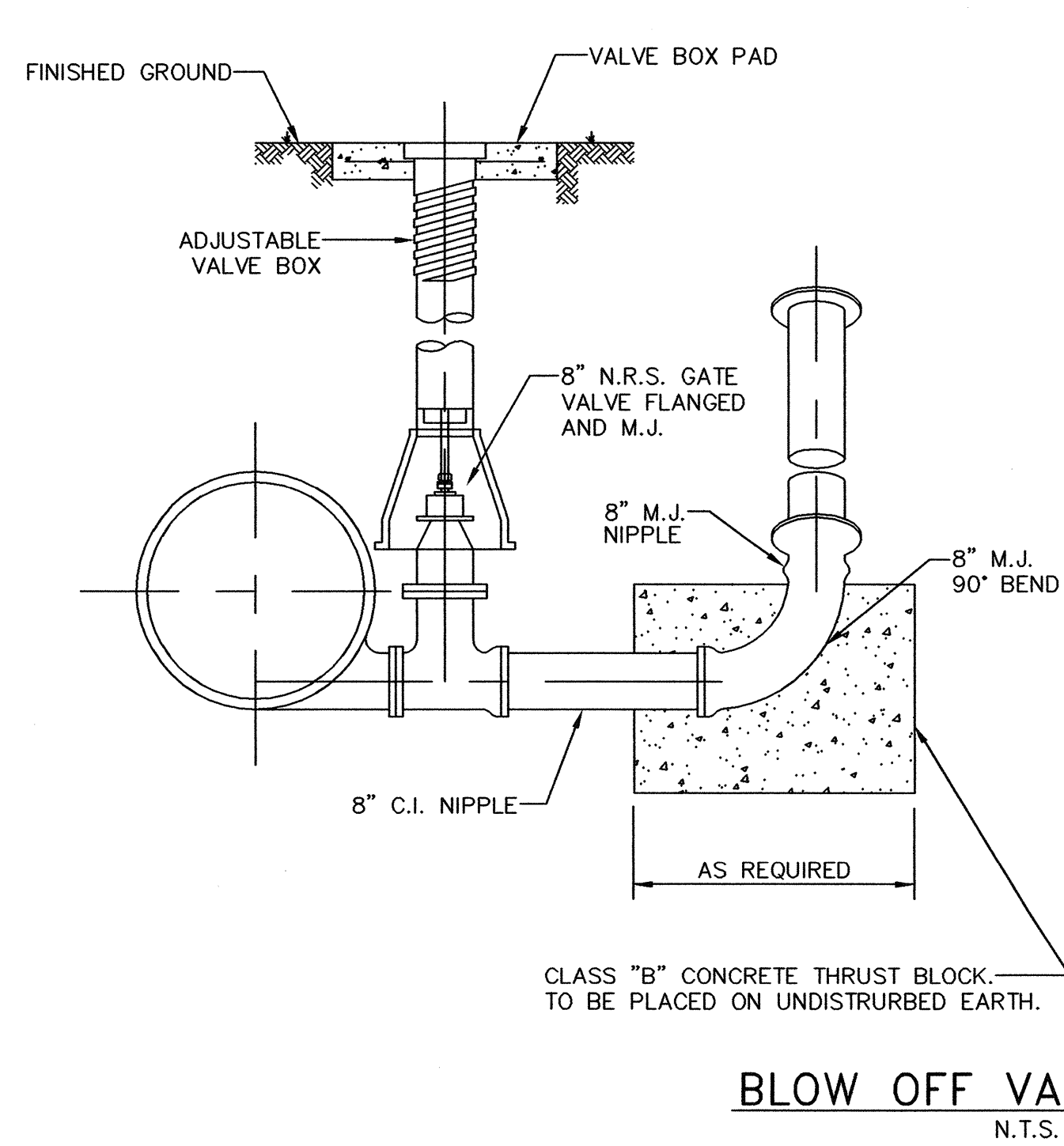
SHEET NO. 18  
OF 20 SHEETS  
JOB NO. 07-1268



I.D. OF MAIN	AIR VALVE	BRASS GATE VALVE	VENT PIPE
12"-16"	1"	1"	1"
20"-36"	2"	2"	2"



**NOTE:**  
A PERMANENTLY ATTACHED VALVE EXTENSION STEM SHALL BE REQUIRED FOR ANY VALVE WHERE THE OPERATOR NUT IS LOCATED IN EXCESS OF 48 INCHES BELOW FINISH GRADE. THIS EXTENSION SHALL BE OF SUFFICIENT LENGTH TO INSURE THAT THE OPERATOR NUT IS WITHIN 48 INCHES OF THE FINISH GRADE.



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.

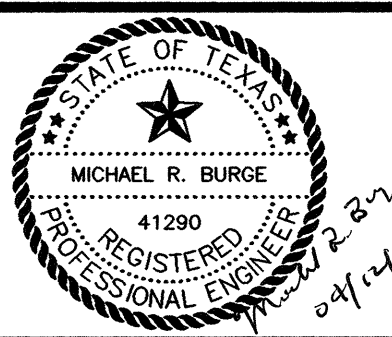
**CONCRETE ANCHOR BLOCKS**  
 N.T.S.

6			
5			
4			
3			
2			
1			
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
 DESIGN: MRB  
 REVIEWED: JFW  
 SCALE: N.T.S.  
 DATE: NOVEMBER 2010  
 DWG. NAME: 1268DET1-ROCK



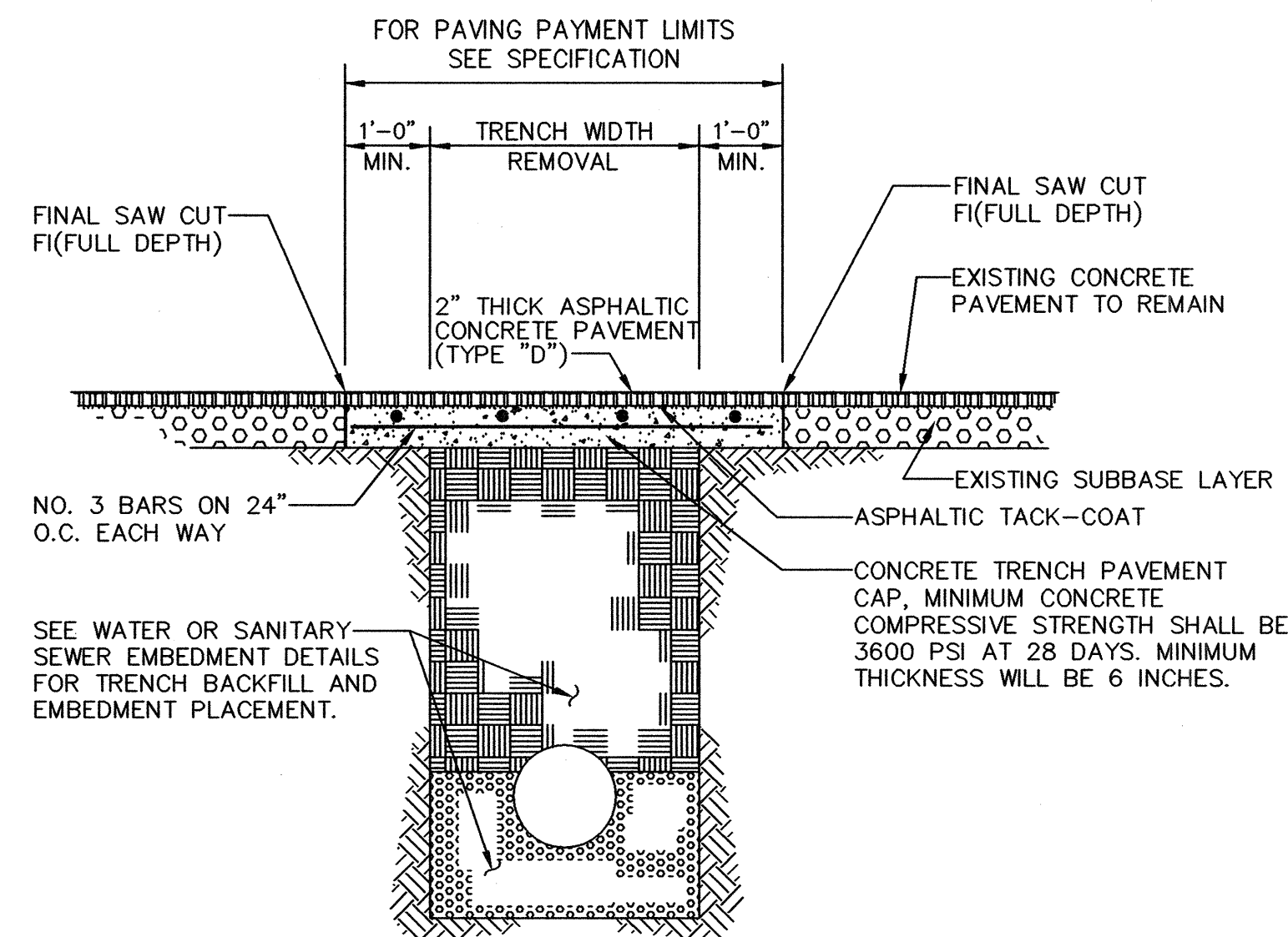
**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



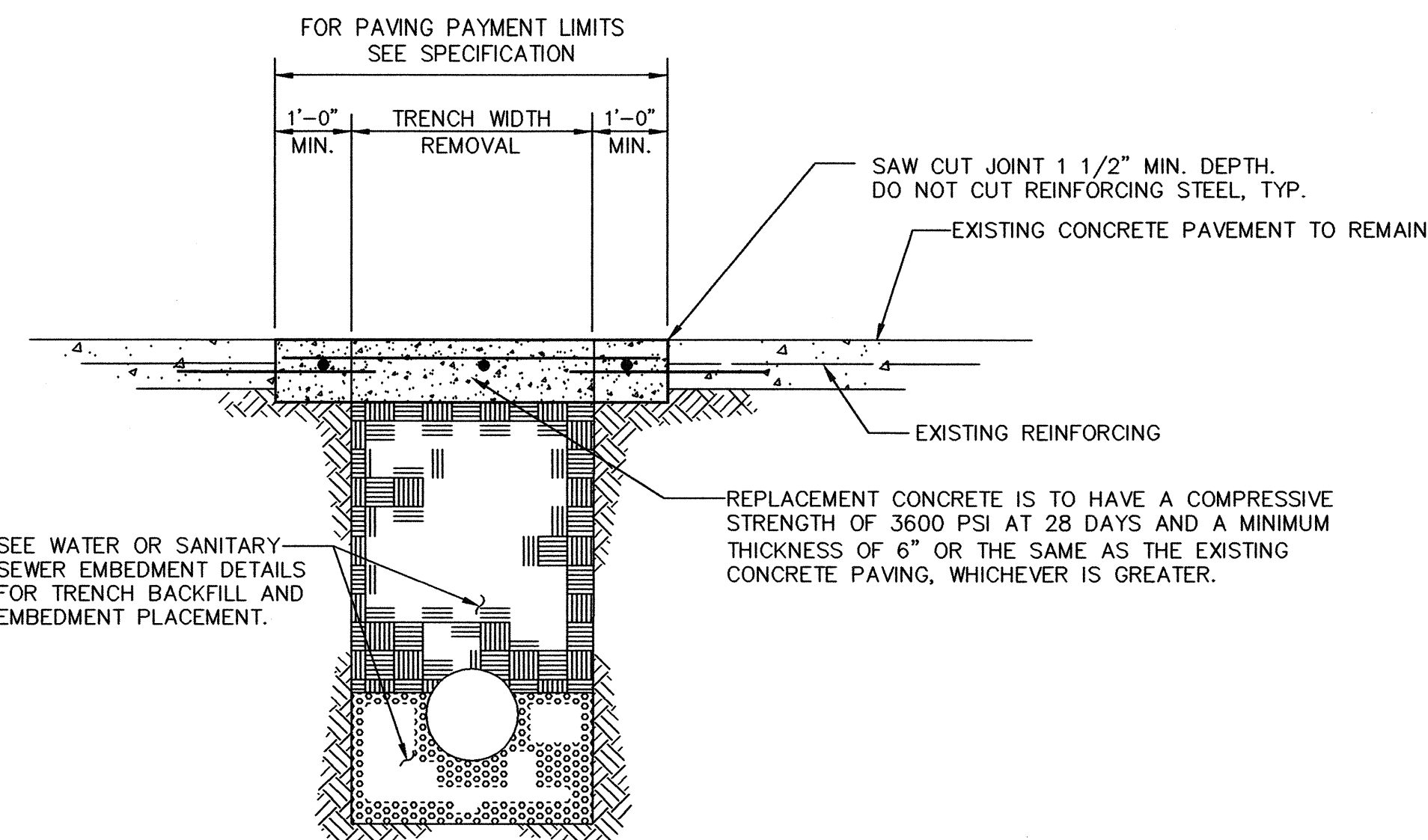
WATER SYSTEM IMPROVEMENTS  
 ROCK RIDGE ROAD WATER LINE  
 (COUNTRY CLUB ROAD TO EXCHANGE PARKWAY)  
 SHADY LANE WATER LINE  
 (EAST WINNINGKOFF ROAD TO SNIDER LANE)  
 GENERAL CONSTRUCTION DETAILS - SHEET 1  
**CITY OF LUCAS**

SHEET NO. **19**  
 OF **20** SHEETS  
 JOB NO. 07-1268



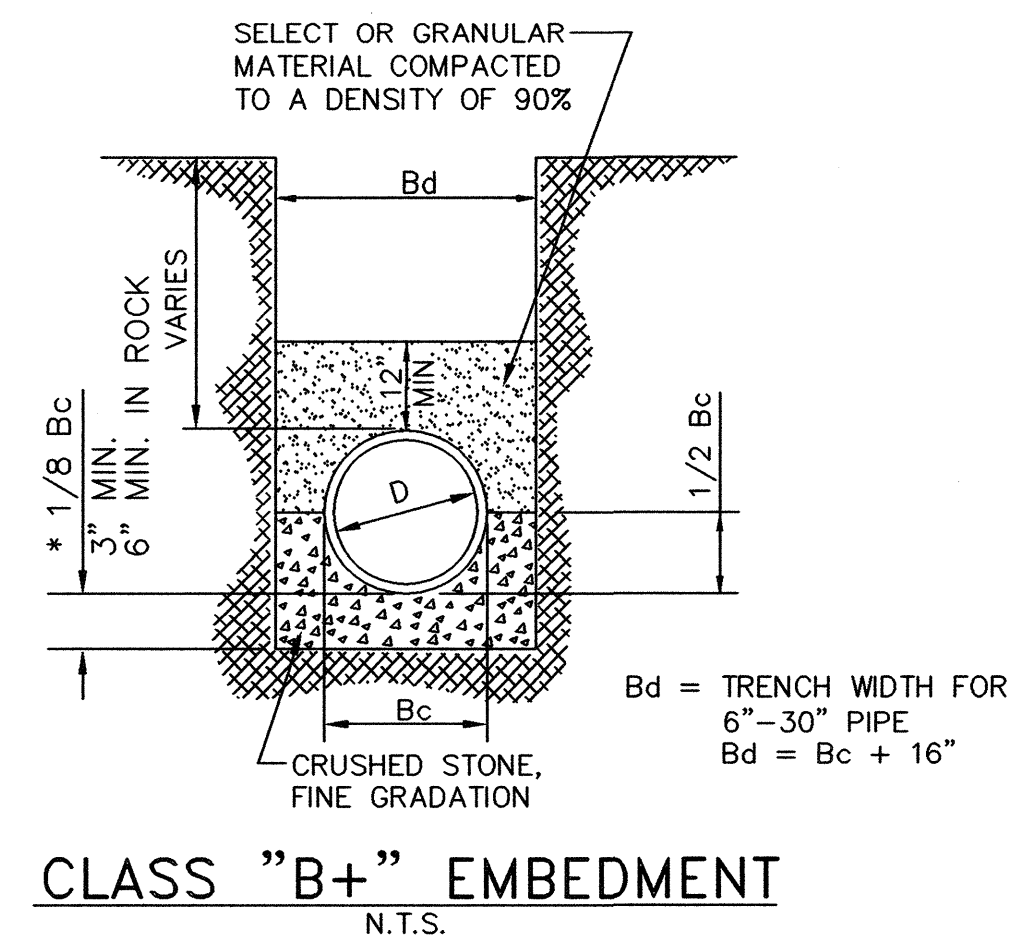


FLEXIBLE BASE AND  
ASPHALTIC CONCRETE SURFACE

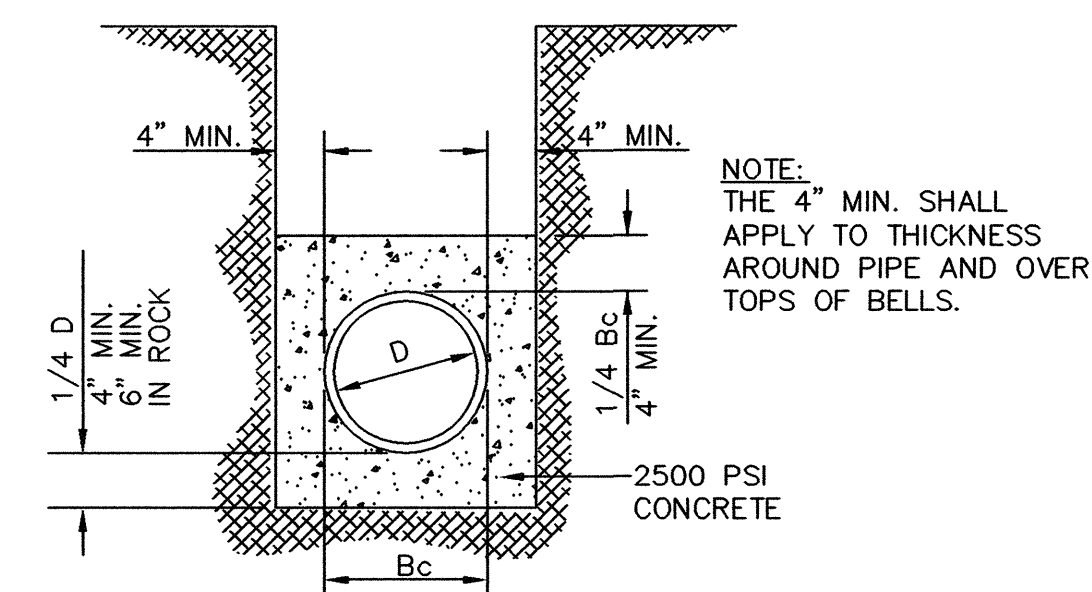


REINFORCED CONCRETE PAVEMENT

TYPICAL PAVEMENT REPAIR DETAILS  
N.T.S.



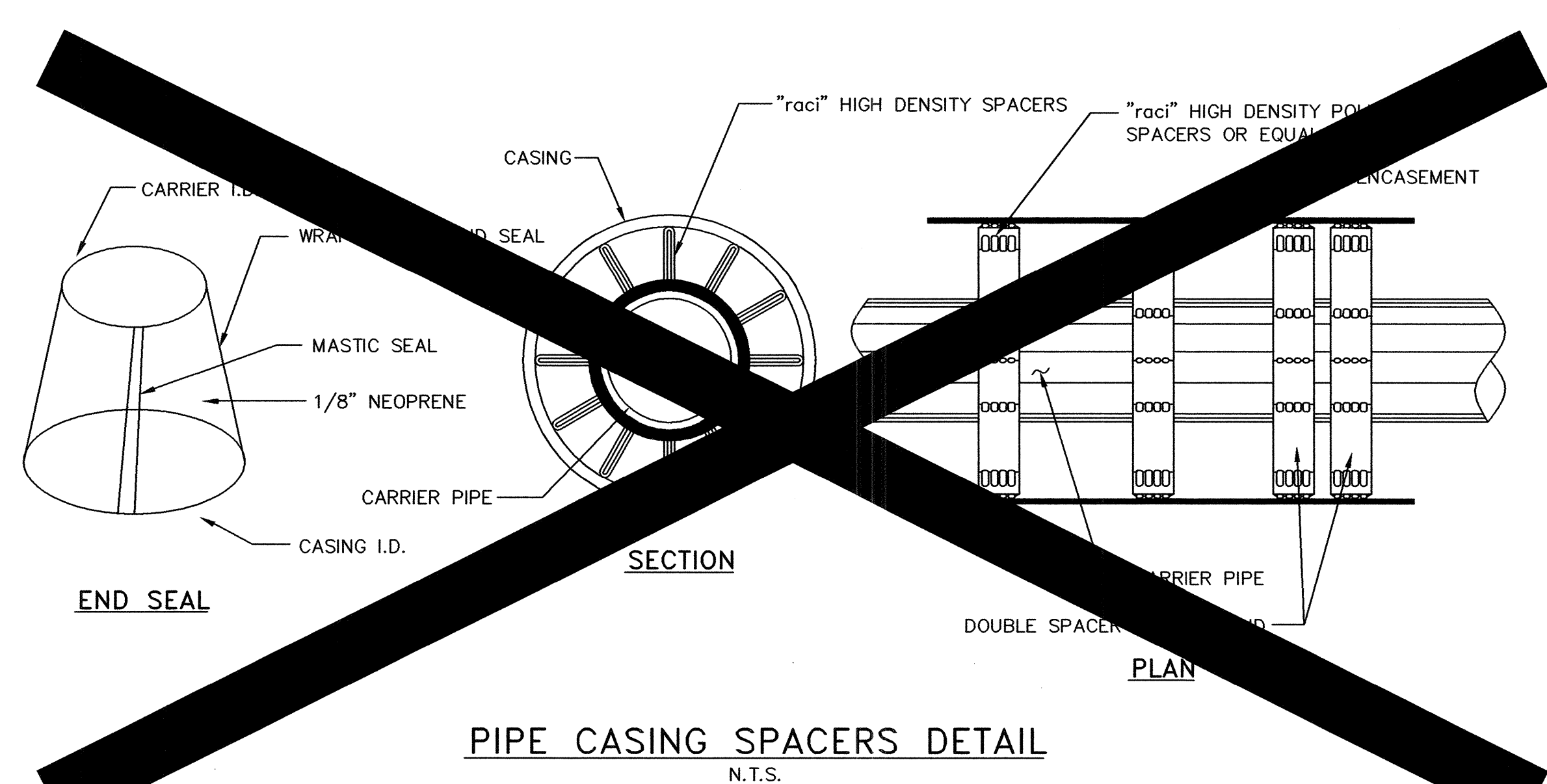
CLASS "B+" EMBEDMENT  
N.T.S.



CLASS "G" EMBEDMENT  
(CONCRETE ENCASEMENT)  
N.T.S.

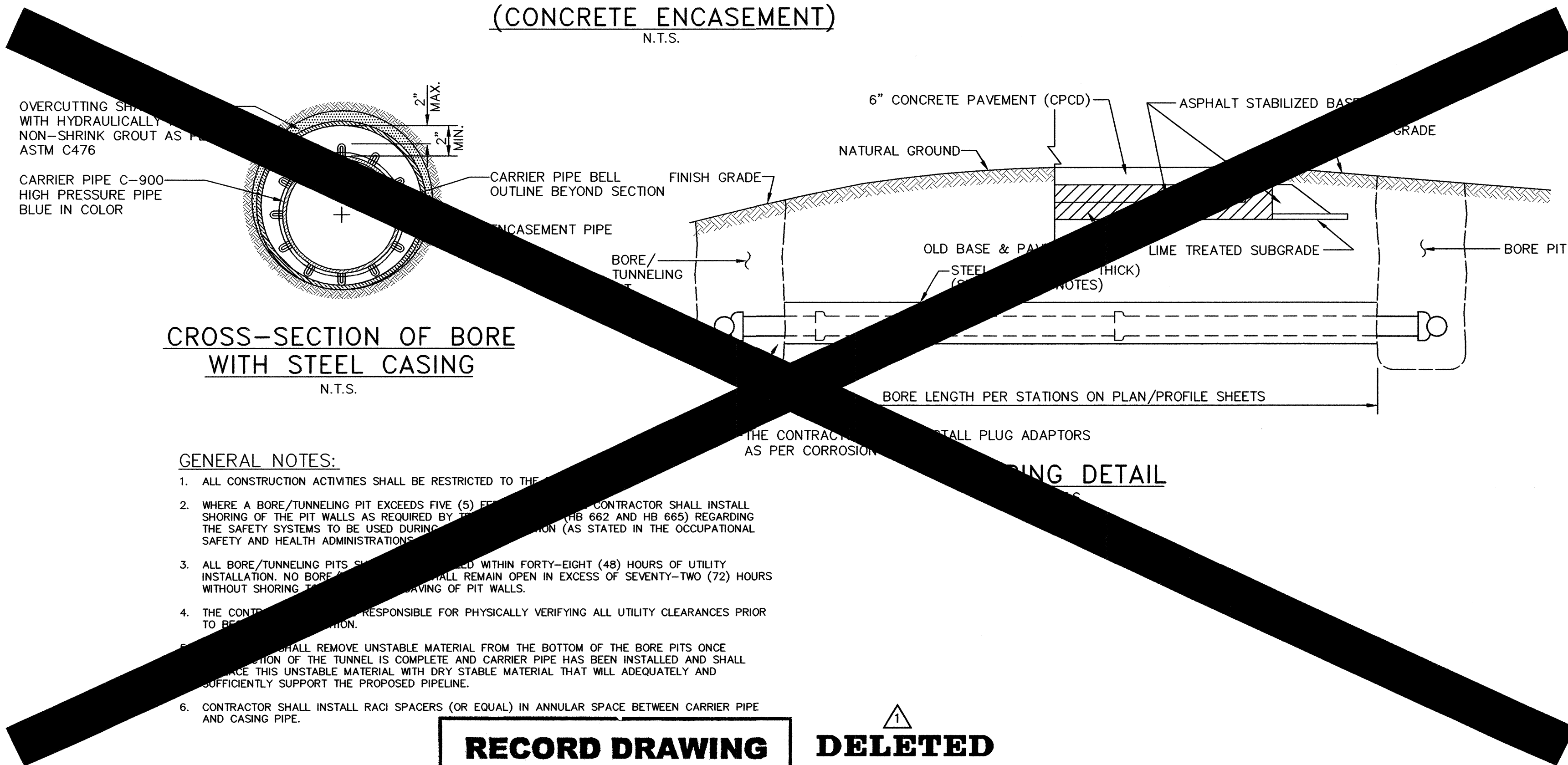
TRENCH BACKFILL AND EMBEDMENT NOTES:

- 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.



PIPE CASING SPACERS DETAIL  
N.T.S.

**DELETED**



CROSS-SECTION OF BORE  
WITH STEEL CASING  
N.T.S.

GENERAL NOTES:

- ALL CONSTRUCTION ACTIVITIES SHALL BE RESTRICTED TO THE BORE PIT AREA.
- WHERE A BORE/TUNNELING PIT EXCEEDS FIVE (5) FEET DEPTH, THE CONTRACTOR SHALL INSTALL SHORING OF THE PIT WALLS AS REQUIRED BY TEXAS RULES (HB 662 AND HB 665) REGARDING THE SAFETY SYSTEMS TO BE USED DURING CONSTRUCTION (AS STATED IN THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S REGULATIONS).
- ALL BORE/TUNNELING PITS SHALL BE COMPLETED WITHIN FORTY-EIGHT (48) HOURS OF UTILITY INSTALLATION. NO BORE/TUNNELING PITS SHALL REMAIN OPEN IN EXCESS OF SEVENTY-TWO (72) HOURS WITHOUT SHORING TO BE USED DURING THE REMOVAL OF PIT WALLS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PHYSICALLY VERIFYING ALL UTILITY CLEARANCES PRIOR TO BORE/TUNNELING.
- THE CONTRACTOR SHALL REMOVE UNSTABLE MATERIAL FROM THE BOTTOM OF THE BORE PITS ONCE THE INSTALLATION 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.

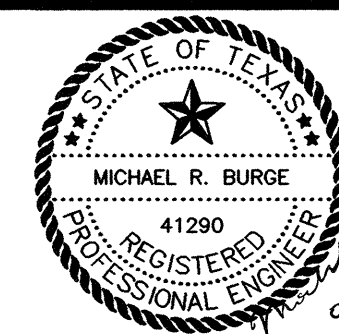
**DELETED**

6			
5			
4			
3			
2			
1	4/12/11	DELETED PER CHANGE ORDER NO. 1	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: BW2  
DESIGN: MRB  
REVIEWED: JFW  
SCALE: N.T.S.  
DATE: NOVEMBER 2010  
DWG. NAME: 1268DET2-ROCK



BW2 Engineers, Inc.  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
Firm Registration No. F-5290



WATER SYSTEM IMPROVEMENTS  
ROCK RIDGE ROAD WATER LINE  
(COUNTRY CLUB ROAD TO EXCHANGE PARKWAY)  
SHADY LANE WATER LINE  
(EAST WINNINGKOFF ROAD TO SNIDER LANE)  
GENERAL CONSTRUCTION DETAILS - SHEET 2  
**CITY OF LUCAS**

SHEET NO. 20  
OF 20 SHEETS  
JOB NO. 07-1268