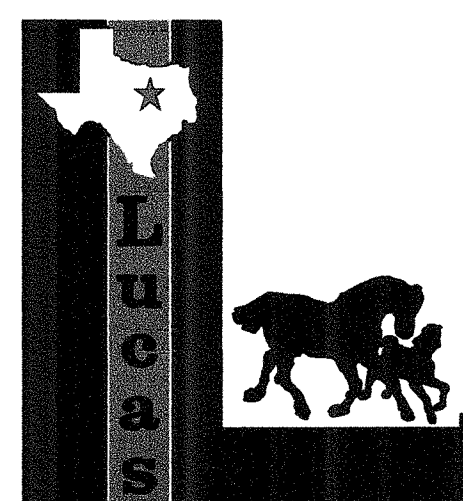


# CITY OF LUCAS

## CONSTRUCTION PLANS FOR

# WATER SYSTEM IMPROVEMENTS

# BROOKHAVEN DRIVE WATER LINE AND BROCKDALE PARK ROAD WATER LINE



MAYOR  
BILL CARMICKLE

CITY COUNCIL

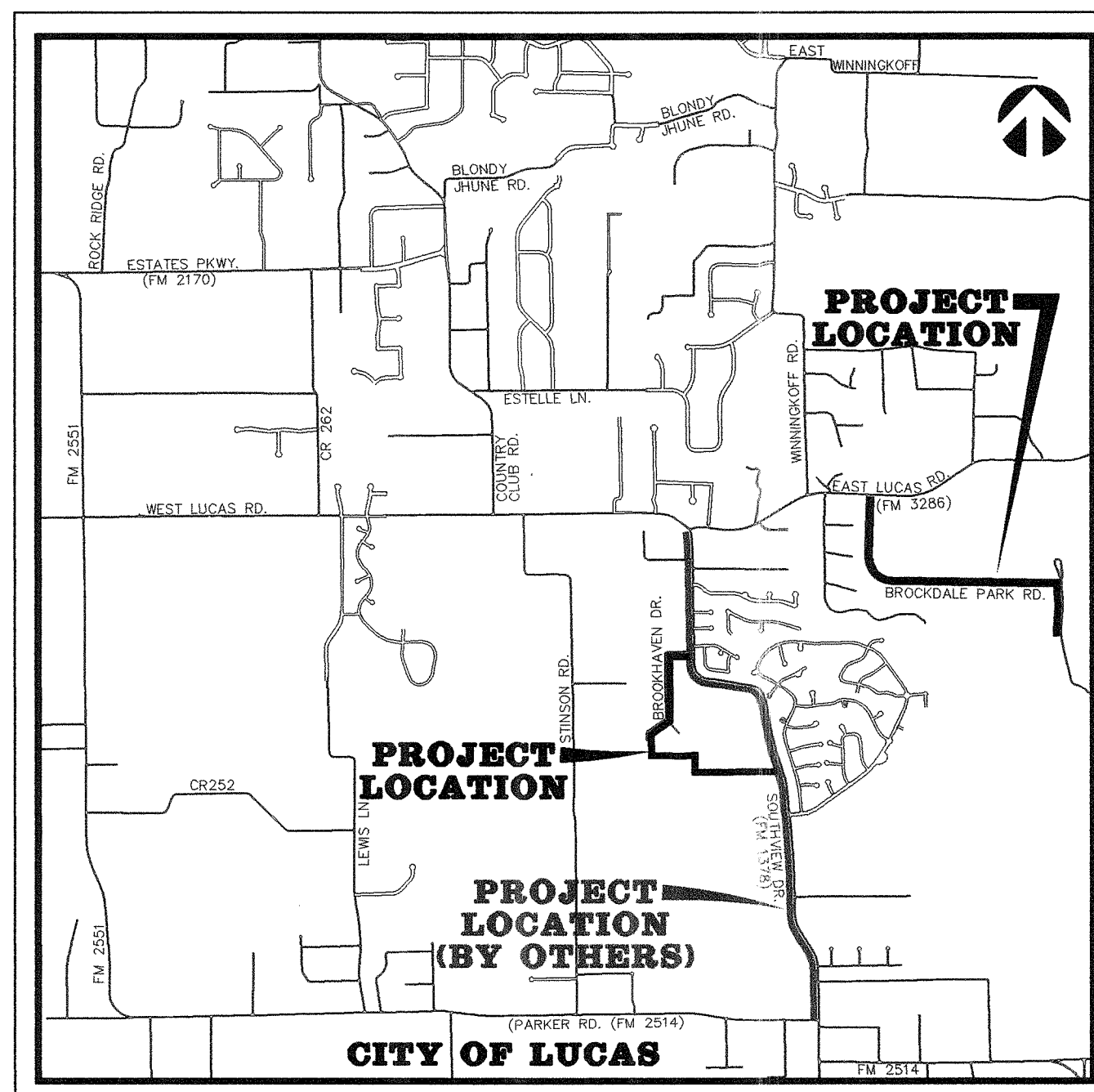
MARK BARRATT	DEBBIE FISHER
REBECCA MARK	WAYNE MILLSAP
KATHLEEN PEELE	DON ZRINY

CITY MANAGER  
ROBERT PATRICK

DIRECTOR OF PUBLIC WORKS  
STACY CAUDELL, P.E.

CONTRACTOR

SABER DEVELOPMENT CORPORATION  
COMPLETED FEBRUARY 2011



VICINITY MAP

BW2 JOB NO. 09-1350

APRIL 2010

**ADDENDA INCORPORATED**

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

**OWNER:**

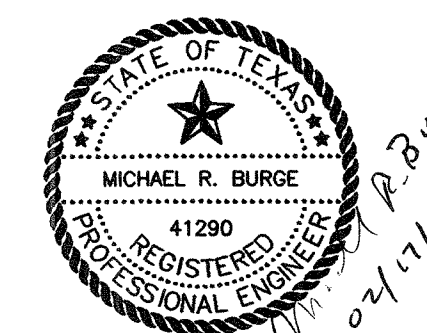
CITY OF LUCAS  
665 COUNTRY CLUB ROAD  
LUCAS, TEXAS 75002

**ENGINEER:**



**BW2 ENGINEERS, INC.**

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





**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 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 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 will 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 the 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-establish on all roads in the construction area at the end of each workday.
- All blind flanges shown on the plans shall be MJ plugs.

**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.

**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:
  - Short 1" service lines from proposed water line to existing meters where existing meters are on the same side of the road as the proposed water lines.
  - Long 1" service lines from proposed water line to existing meters across Brookhaven Drive and Brockdale Park Road.
- 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.

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

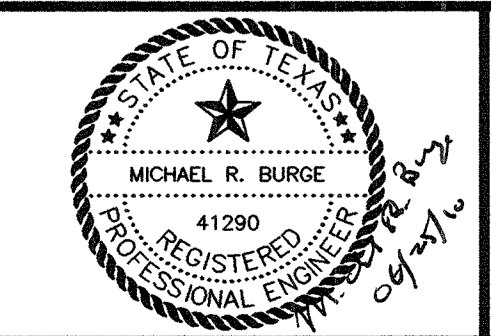
**!! CAUTION !!**  
 THERE ARE EXISTING AND/OR PROPOSED UTILITIES IN PROJECT AREA. UTILITY INFORMATION SHOWN ON PLANS REPRESENTS APPROXIMATE LOCATIONS OF EXISTING UTILITIES AND IS NOT NECESSARILY ALL-INCLUSIVE. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING EXACT LOCATIONS OF ALL EXISTING UTILITIES AND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

6			
5			
4			
3			
2			
1	6/25/10	REVISED PER ADDENDUM NO. 1.	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN:                      **BW2**  
 DESIGN:                      **MRB**  
 REVIEWED:                      **JFW**  
 SCALE:                      **NO SCALE**  
 DATE:                      **APRIL 2010**  
 DWG. NAME: **1350GENNOTE-BROOK**



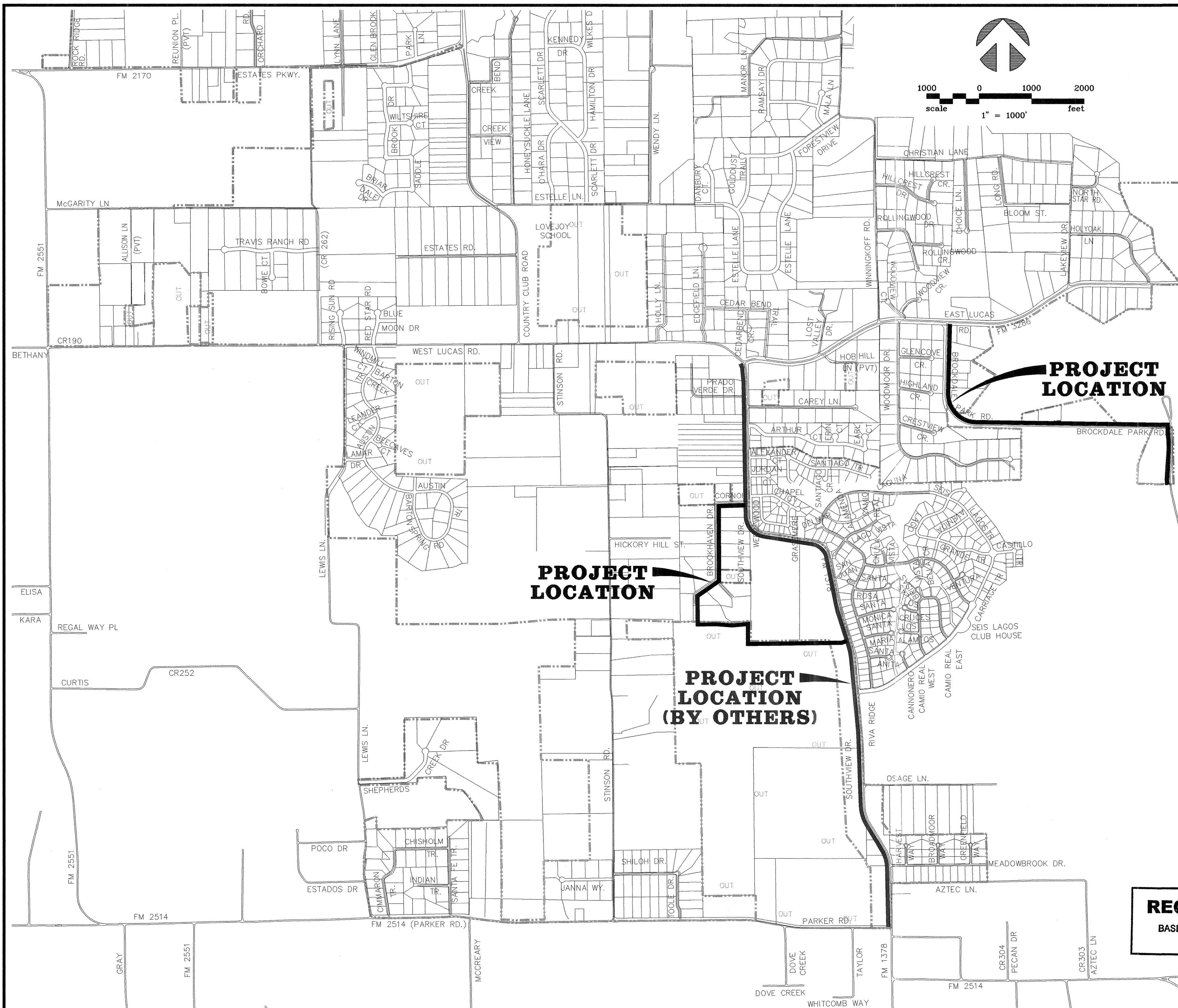
**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS  
 BROOKHAVEN DRIVE WATER LINE AND  
 BROCKDALE PARK ROAD WATER LINE**  
 GENERAL NOTES  
**CITY OF LUCAS**

SHEET NO. **1**  
 OF **35** SHEETS  
 JOB NO. **09-1350**





**PROJECT LOCATION**

**PROJECT LOCATION**

**PROJECT LOCATION  
(BY OTHERS)**

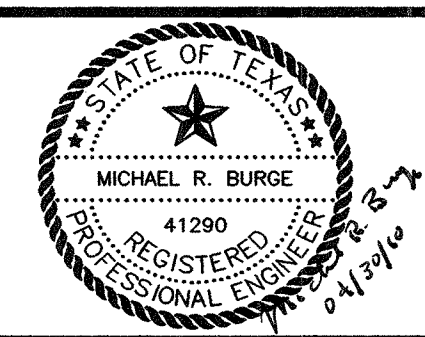
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DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
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 DATE: APRIL 2010  
 DWG. NAME: \_1350LQCMAP-SYIEW

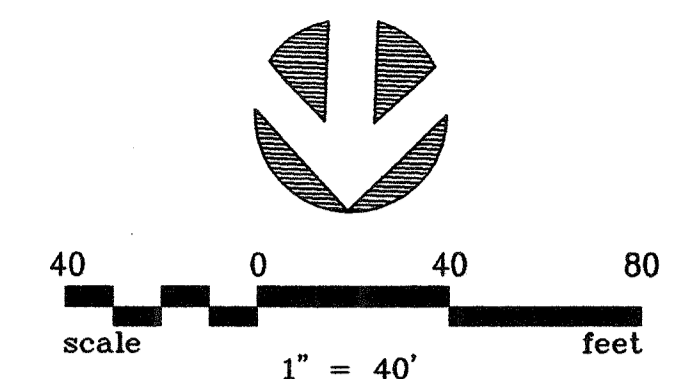
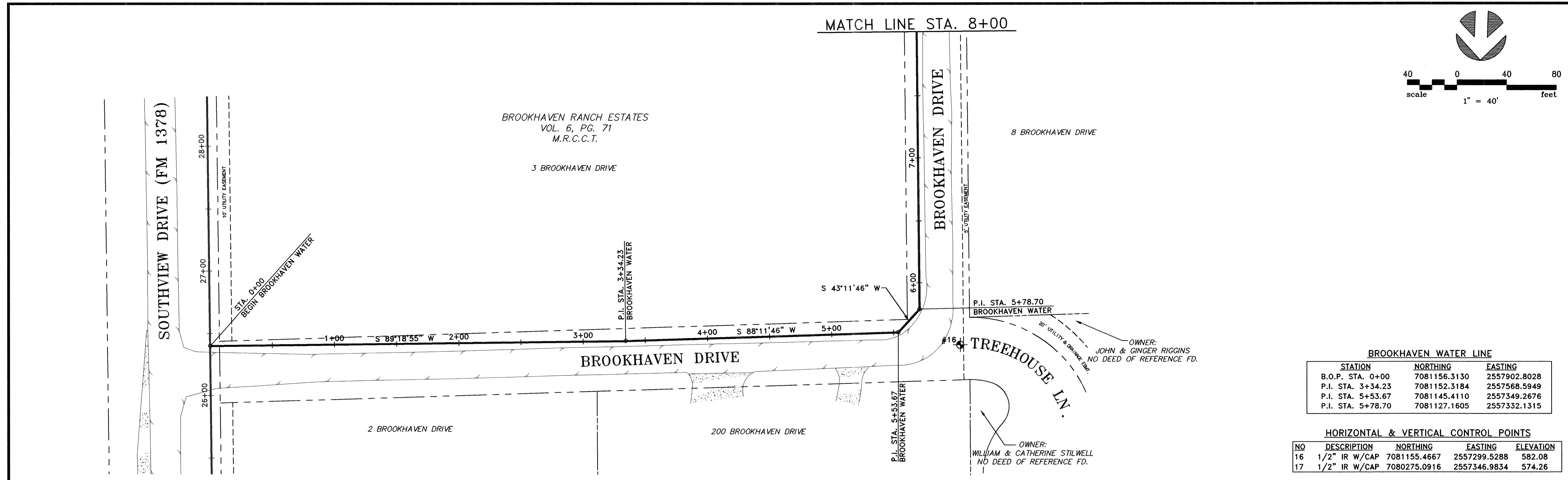


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WATER SYSTEM IMPROVEMENTS  
 BROOKHAVEN DRIVE WATER LINE AND  
 BROCKDALE PARK ROAD WATER LINE  
 PROJECT LOCATION MAP  
**CITY OF LUCAS**

SHEET NO. 2  
 OF 35 SHEETS  
 JOB NO. 09-1350

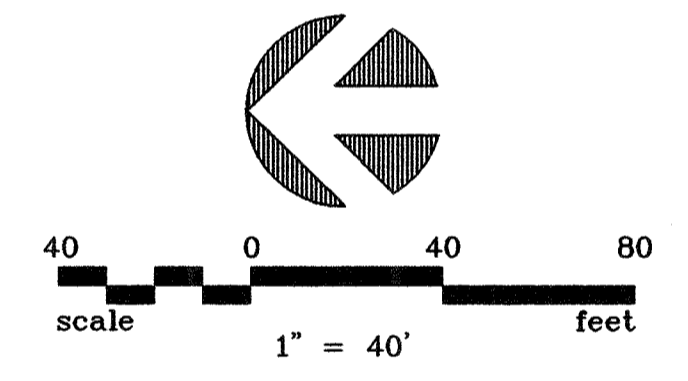
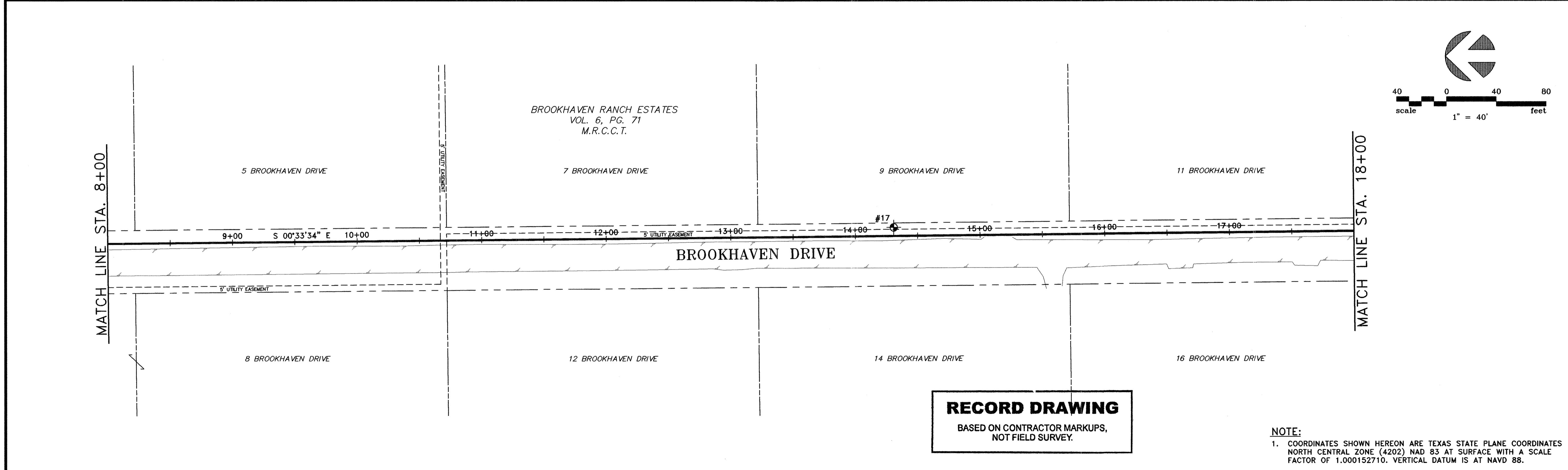


**BROOKHAVEN WATER LINE**

STATION	NORTHING	EASTING
B.O.P. STA. 0+00	7081156.3130	2557902.8028
P.I. STA. 3+34.23	7081152.3184	2557568.5949
P.I. STA. 5+53.67	7081145.4110	2557349.2676
P.I. STA. 5+78.70	7081127.1605	2557332.1315

**HORIZONTAL & VERTICAL CONTROL POINTS**

NO	DESCRIPTION	NORTHING	EASTING	ELEVATION
16	1/2" IR W/CAP	7081155.4667	2557299.5288	582.08
17	1/2" IR W/CAP	7080275.0916	2557346.9834	574.26



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

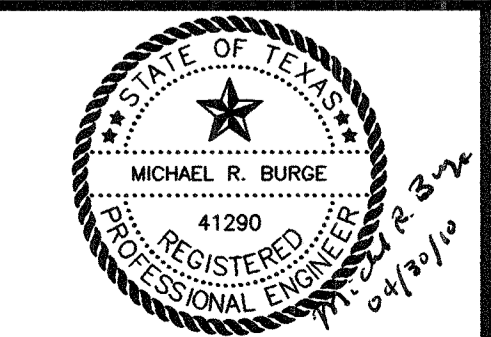
**NOTE:**  
 1. COORDINATES SHOWN HEREON ARE TEXAS STATE PLANE COORDINATES NORTH CENTRAL ZONE (4202) NAD 83 AT SURFACE WITH A SCALE FACTOR OF 1.000152710. VERTICAL DATUM IS AT NAVD 88.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 40'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOK-HRZCT01



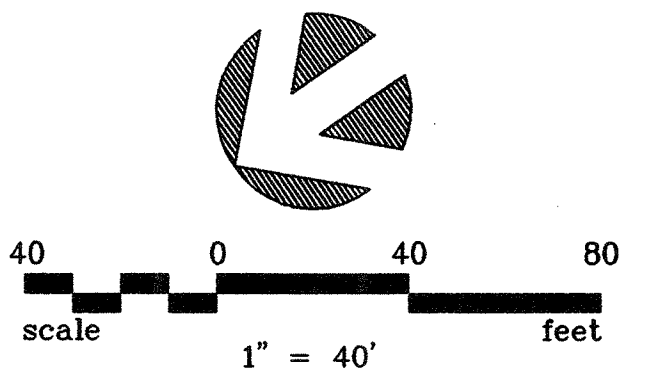
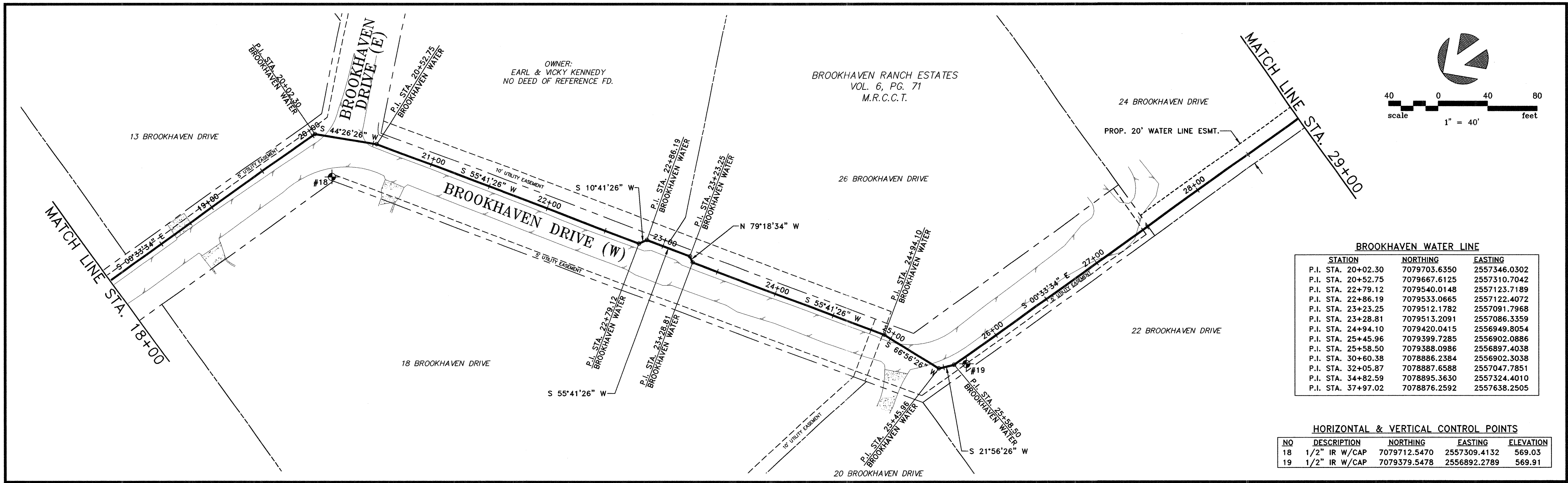
**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
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 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
**HORIZONTAL & VERTICAL CONTROL PLAN - 1**  
**CITY OF LUCAS**

SHEET NO. **3**  
 OF **35** SHEETS  
 JOB NO. 09-1350



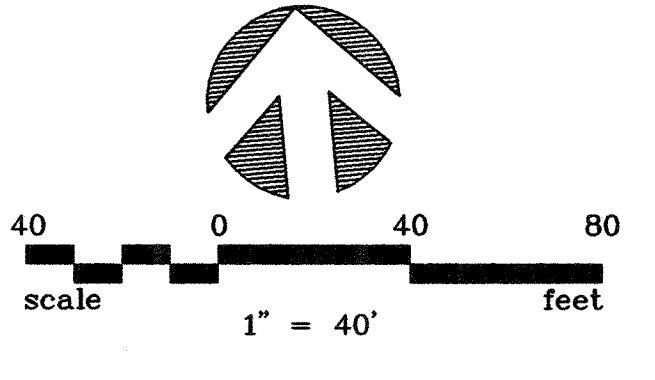
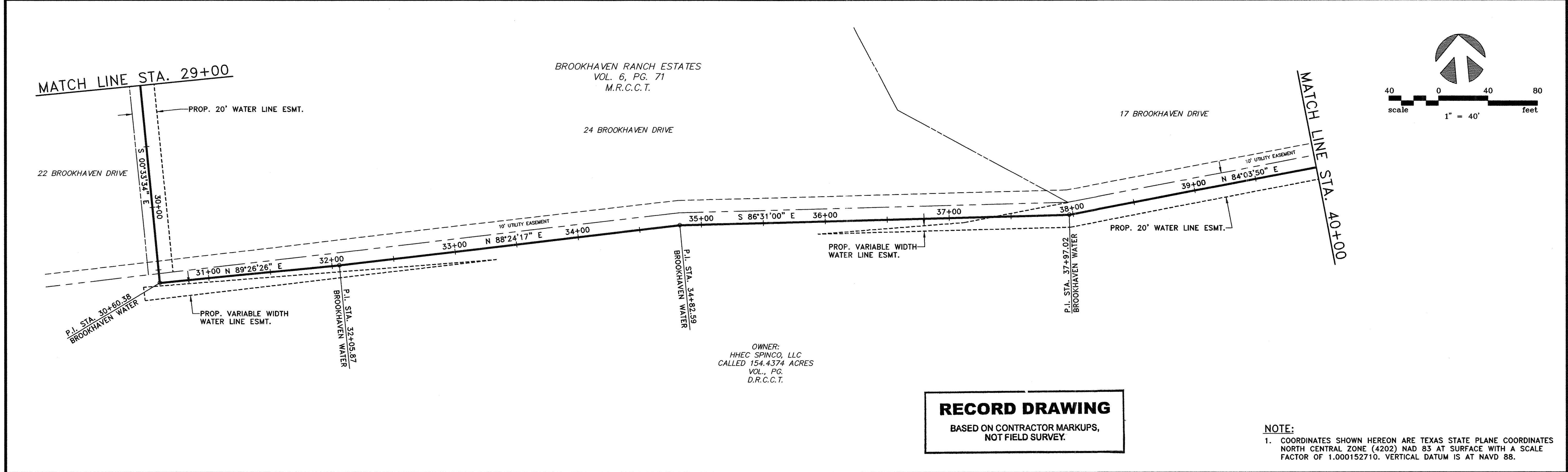


**BROOKHAVEN WATER LINE**

STATION	NORTHING	EASTING
P.I. STA. 20+02.30	7079703.6350	2557346.0302
P.I. STA. 20+52.75	7079667.6125	2557310.7042
P.I. STA. 22+79.12	7079540.0148	2557123.7189
P.I. STA. 22+86.19	7079533.0665	2557122.4072
P.I. STA. 23+23.25	7079512.1782	2557091.7968
P.I. STA. 23+28.81	7079513.2091	2557086.3359
P.I. STA. 24+94.10	7079420.0415	2556949.8054
P.I. STA. 25+45.96	7079399.7285	2556902.0886
P.I. STA. 25+58.50	7079388.0986	2556897.4038
P.I. STA. 30+60.38	7078886.2384	2556902.3038
P.I. STA. 32+05.87	7078887.6588	2557047.7851
P.I. STA. 34+82.59	7078895.3630	2557324.4010
P.I. STA. 37+97.02	7078876.2592	2557638.2505

**HORIZONTAL & VERTICAL CONTROL POINTS**

NO	DESCRIPTION	NORTHING	EASTING	ELEVATION
18	1/2" IR W/CAP	7079712.5470	2557309.4132	569.03
19	1/2" IR W/CAP	7079379.5478	2556892.2789	569.91



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

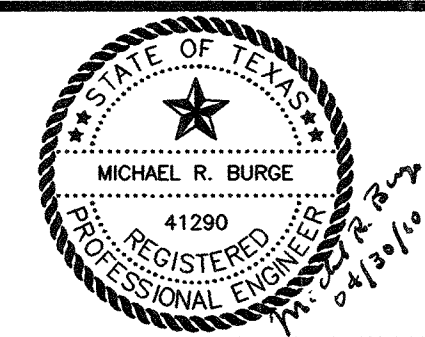
**NOTE:**  
 1. COORDINATES SHOWN HEREON ARE TEXAS STATE PLANE COORDINATES NORTH CENTRAL ZONE (4202) NAD 83 AT SURFACE WITH A SCALE FACTOR OF 1.000152710. VERTICAL DATUM IS AT NAVD 88.

NO.	DATE	REVISION	REVIEWED
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DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 40'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOK-HRZCT02

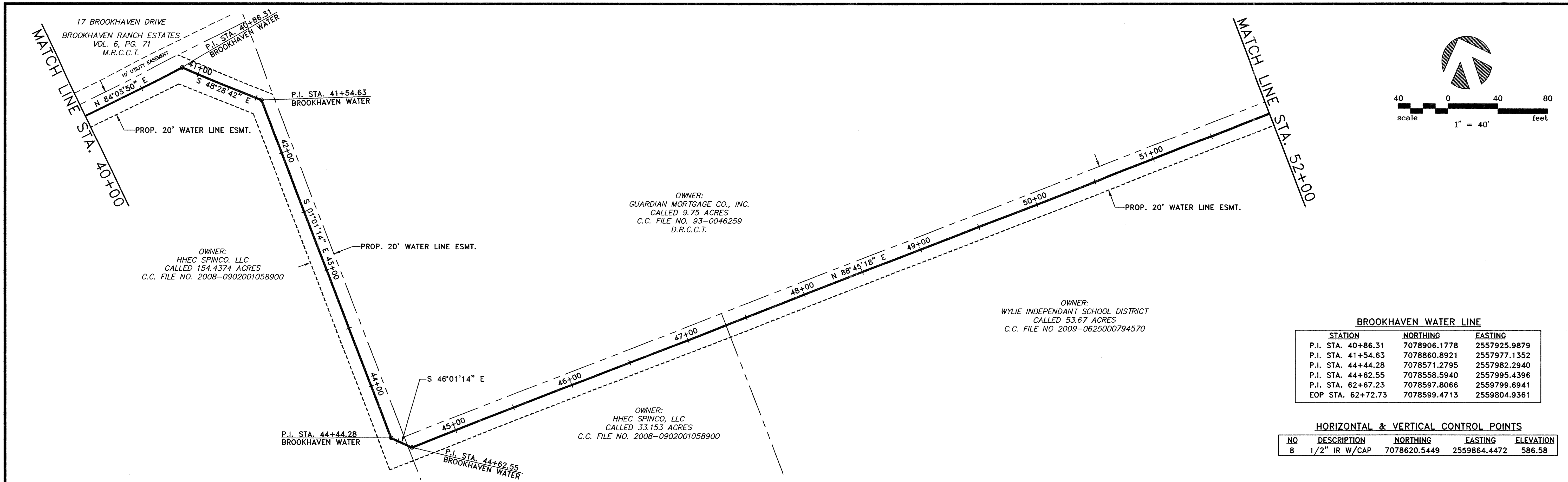


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 1919 S. Shiloh Road  
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 Garland, Texas 75042  
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 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
 HORIZONTAL & VERTICAL CONTROL PLAN - 2  
**CITY OF LUCAS**

SHEET NO. 4  
 OF 35 SHEETS  
 JOB NO. 09-1350

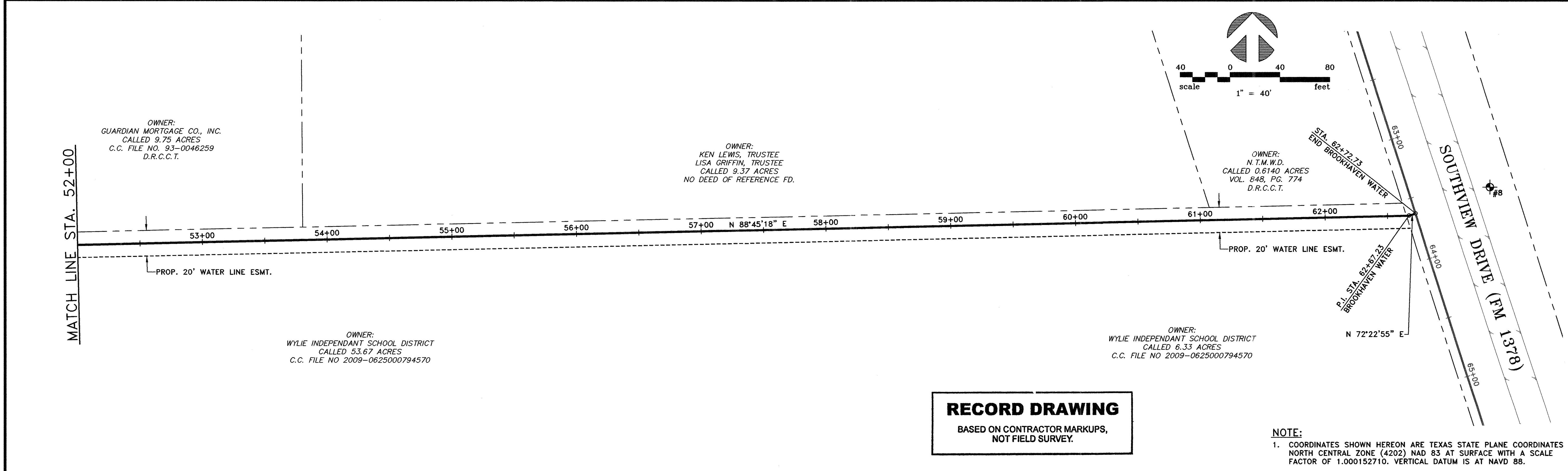


**BROOKHAVEN WATER LINE**

STATION	NORTHING	EASTING
P.I. STA. 40+86.31	7078906.1778	2557925.9879
P.I. STA. 41+54.63	7078860.8921	2557977.1352
P.I. STA. 44+44.28	7078571.2795	2557982.2940
P.I. STA. 44+62.55	7078558.5940	2557995.4396
P.I. STA. 62+67.23	7078597.8066	2559799.6941
EOP STA. 62+72.73	7078599.4713	2559804.9361

**HORIZONTAL & VERTICAL CONTROL POINTS**

NO	DESCRIPTION	NORTHING	EASTING	ELEVATION
8	1/2" IR W/CAP	7078620.5449	2559864.4472	586.58



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

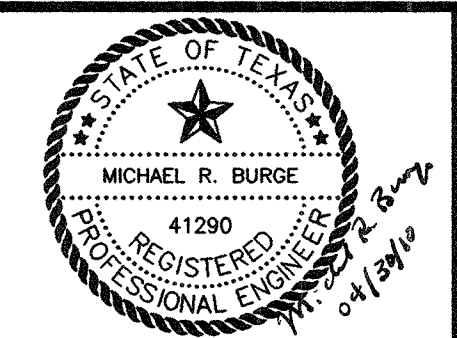
**NOTE:**  
 1. COORDINATES SHOWN HEREON ARE TEXAS STATE PLANE COORDINATES NORTH CENTRAL ZONE (4202) NAD 83 AT SURFACE WITH A SCALE FACTOR OF 1.000152710. VERTICAL DATUM IS AT NAVD 88.

NO.	DATE	REVISION	REVIEWED
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DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
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 SCALE: \_\_\_\_\_ 1" = 40'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOK-HRZCT03



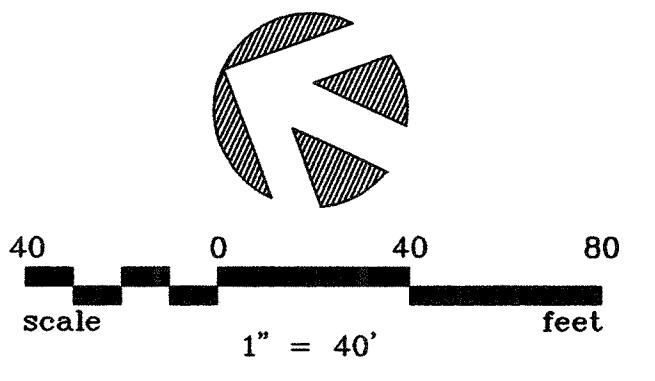
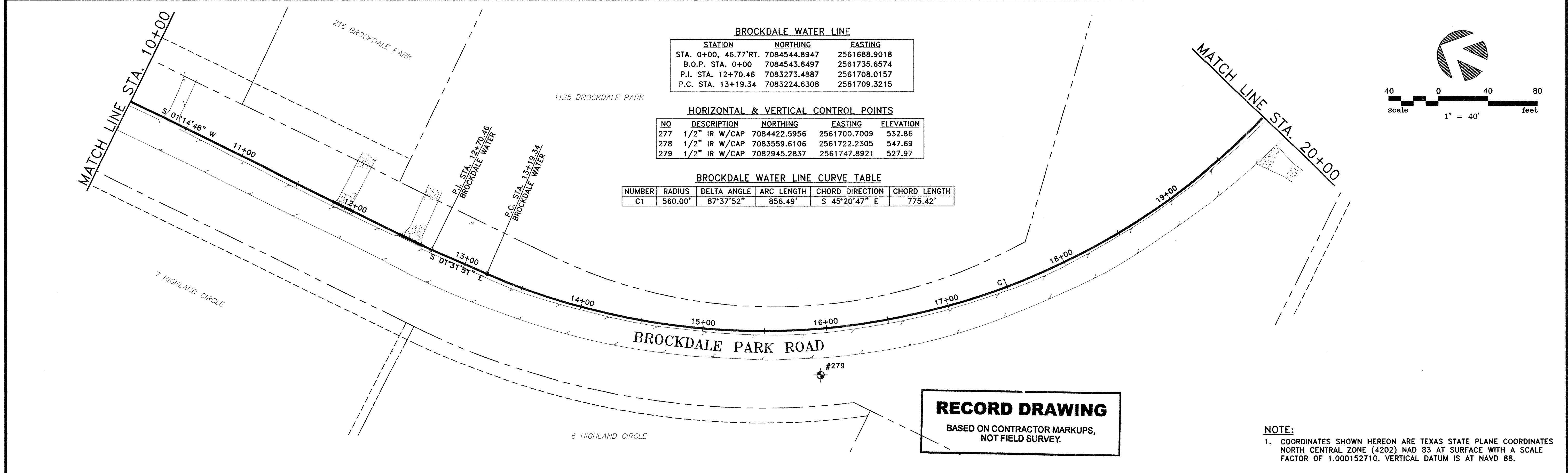
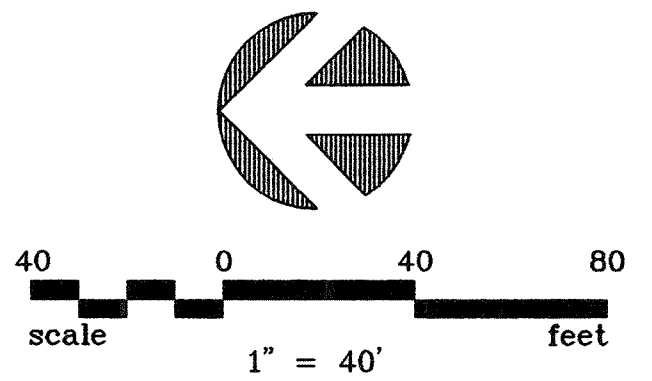
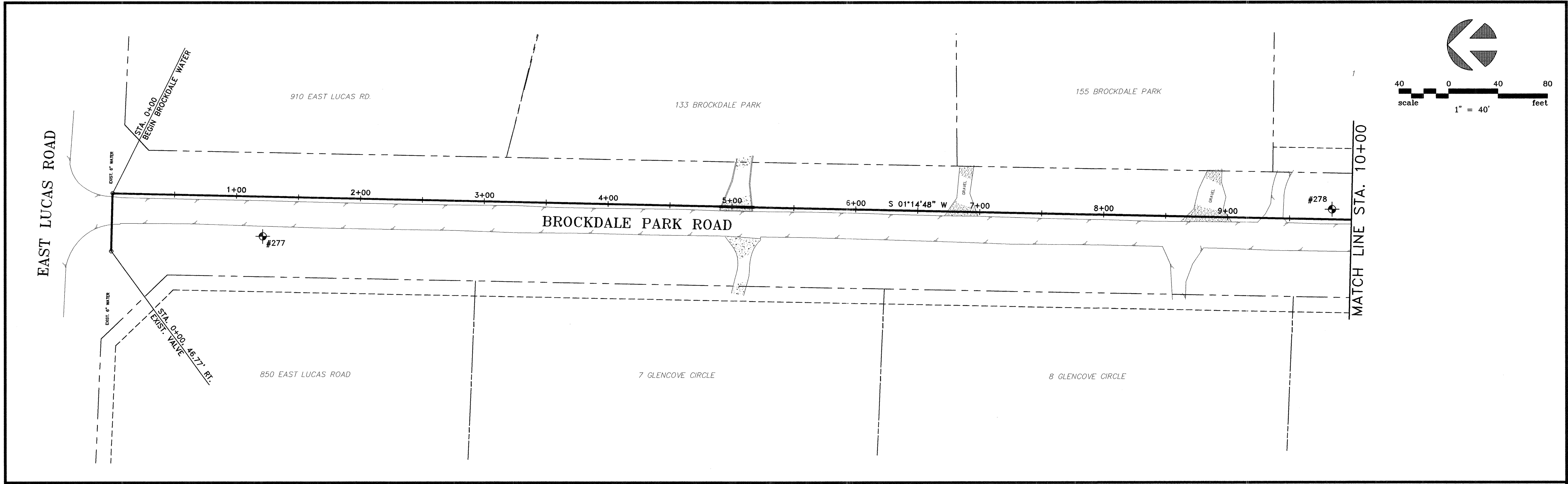
**BW2 Engineers, Inc.**  
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**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
**HORIZONTAL & VERTICAL CONTROL PLAN - 3**  
**CITY OF LUCAS**

SHEET NO. **5**  
 OF **35** SHEETS  
 JOB NO. 09-1350





**BROCKDALE WATER LINE**

STATION	NORTHING	EASTING
STA. 0+00, 46.77' RT.	7084544.8947	2561688.9018
B.O.P. STA. 0+00	7084543.6497	2561735.6574
P.I. STA. 12+70.46	7083273.4887	2561708.0157
P.C. STA. 13+19.34	7083224.6308	2561709.3215

**HORIZONTAL & VERTICAL CONTROL POINTS**

NO	DESCRIPTION	NORTHING	EASTING	ELEVATION
277	1/2" IR W/CAP	7084422.5956	2561700.7009	532.86
278	1/2" IR W/CAP	7083559.6106	2561722.2305	547.69
279	1/2" IR W/CAP	7082945.2837	2561747.8921	527.97

**BROCKDALE WATER LINE CURVE TABLE**

NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C1	560.00'	87°37'52"	856.49'	S 45°20'47" E	775.42'

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

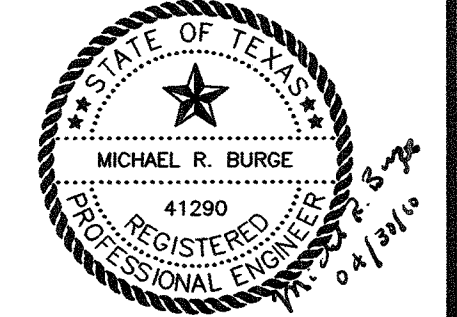
**NOTE:**  
 1. COORDINATES SHOWN HEREON ARE TEXAS STATE PLANE COORDINATES NORTH CENTRAL ZONE (4202) NAD 83 AT SURFACE WITH A SCALE FACTOR OF 1.000152710. VERTICAL DATUM IS AT NAVD 88.

NO.	DATE	REVISION	REVIEWED
6			
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DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 40'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROCK-HRZCT01

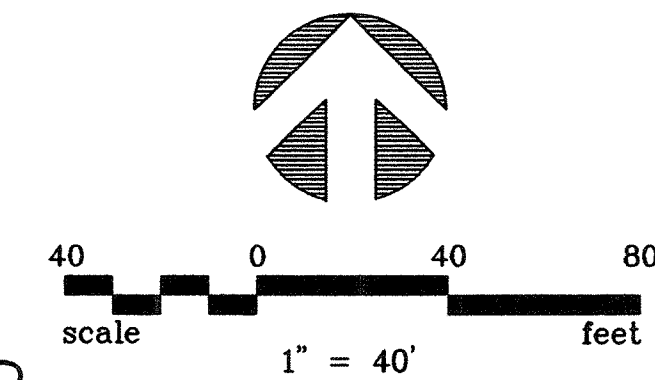
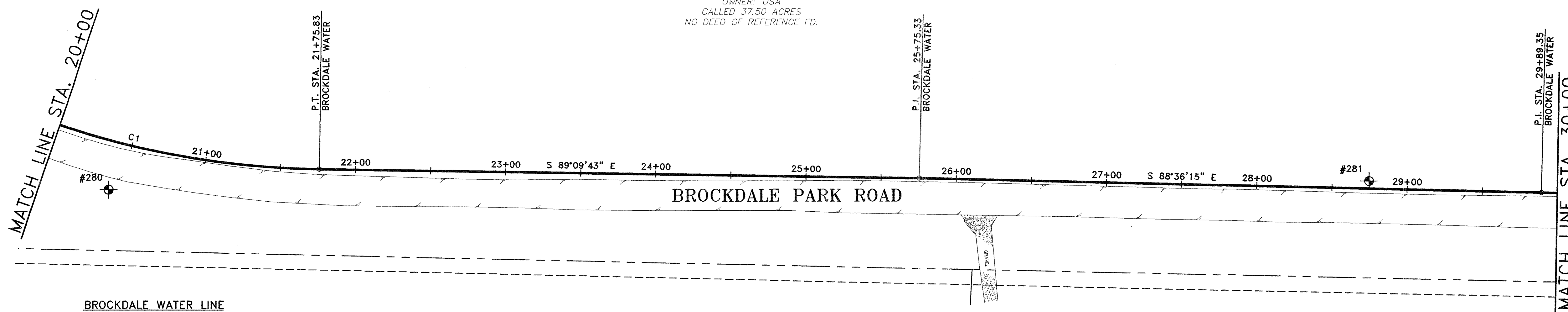


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 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
**HORIZONTAL & VERTICAL CONTROL PLAN - 4**  
**CITY OF LUCAS**

SHEET NO. **6**  
 OF **35** SHEETS  
 JOB NO. 09-1350



**BROCKDALE WATER LINE**

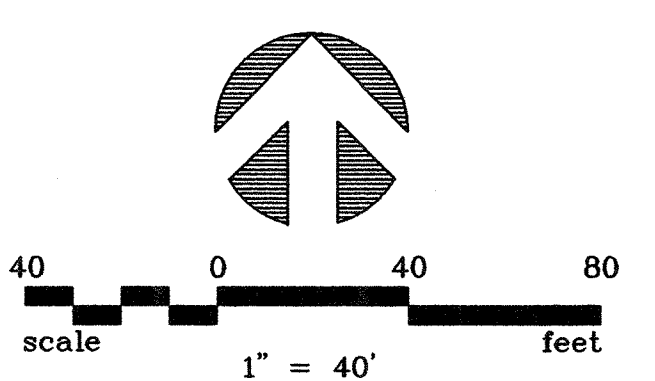
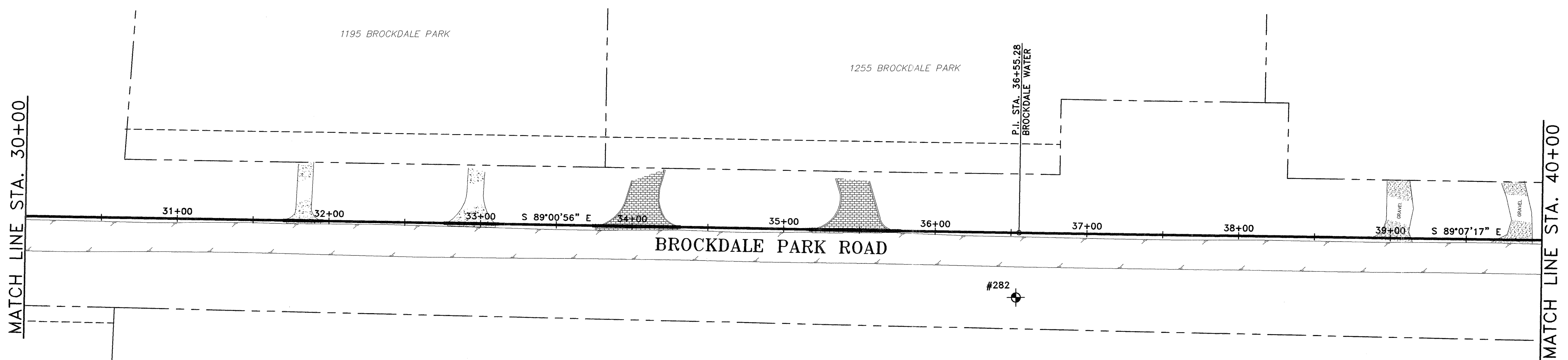
STATION	NORTHING	EASTING
P.T. STA. 21+75.83	7082679.6518	2562260.9320
P.I. STA. 25+75.33	7082673.8094	2562660.3940
P.I. STA. 29+89.35	7082663.7252	2563074.2848
P.I. STA. 36+55.28	7082652.2844	2563740.1133

**HORIZONTAL & VERTICAL CONTROL POINTS**

NO	DESCRIPTION	NORTHING	EASTING	ELEVATION
280	1/2" IR W/CAP	7082666.1112	2562120.7915	512.78
281	1/2" IR W/CAP	7082671.3879	2562959.6672	511.61
282	1/2" IR W/CAP	7082609.9061	2563737.9498	547.35

**BROCKDALE WATER LINE CURVE TABLE**

NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C1	560.00'	87°37'52"	856.49'	S 45°20'47" E	775.42'



OWNER:  
BROCKDALE PARK ESTATES, LTD.  
CALLED 61.56 ACRES  
NO DEED OF REFERENCE FD.

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

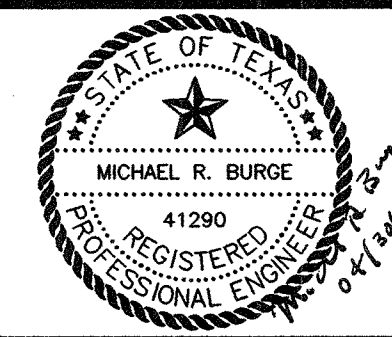
**NOTE:**  
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NO.	DATE	REVISION	REVIEWED
6			
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DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: \_\_\_\_\_ 1" = 40'  
DATE: \_\_\_\_\_ APRIL 2010  
DWG. NAME: 1350BROCK-HRZCT02



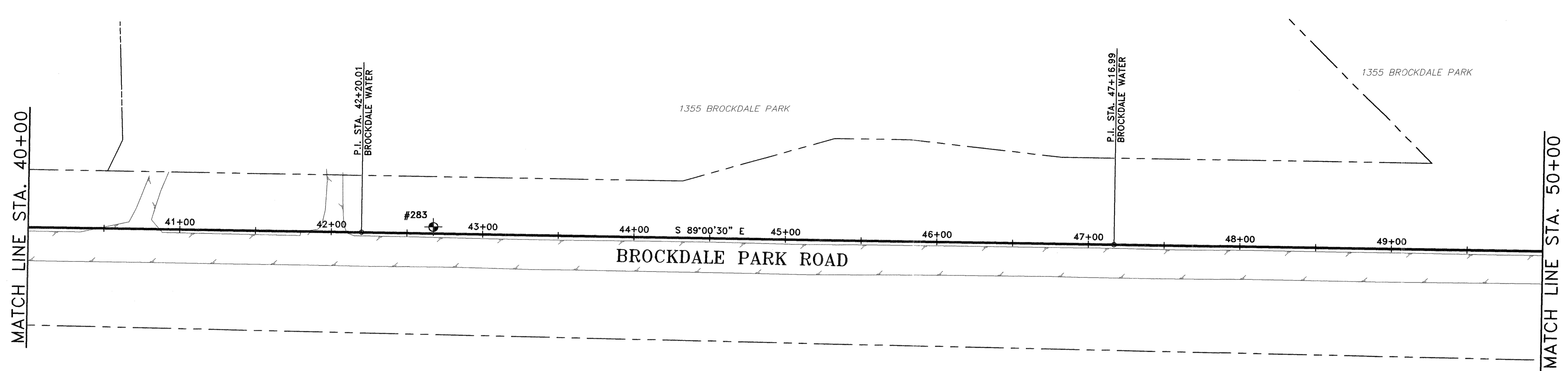
**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
**HORIZONTAL & VERTICAL CONTROL PLAN - 5**  
**CITY OF LUCAS**

SHEET NO. 7  
OF 35 SHEETS  
JOB NO. 09-1350





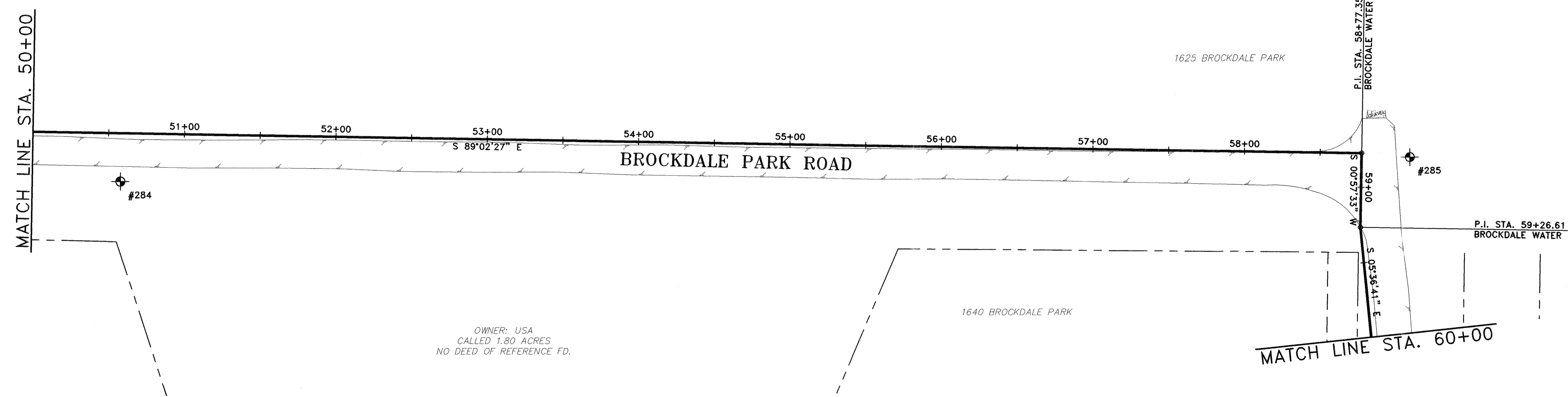
OWNER:  
BROCKDALE PARK ESTATES, LTD.  
CALLED 61.56 ACRES  
NO DEED OF REFERENCE FD.

**BROCKDALE WATER LINE**

STATION	NORTHING	EASTING
P.I. STA. 42+20.01	7082643.6236	2564304.7792
P.I. STA. 47+16.99	7082635.0229	2564801.6845
P.I. STA. 58+77.35	7082615.6007	2565961.8894
P.I. STA. 59+26.61	7082566.3494	2565961.0649

**HORIZONTAL & VERTICAL CONTROL POINTS**

NO	DESCRIPTION	NORTHING	EASTING	ELEVATION
283	1/2" IR W/CAP	7082647.0854	2564352.2234	542.80
284	1/2" IR W/CAP	7082597.1854	2565142.3193	519.84
285	1/2" IR W/CAP	7082612.9309	2565993.6868	538.67



OWNER: USA  
CALLED 1.80 ACRES  
NO DEED OF REFERENCE FD.

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

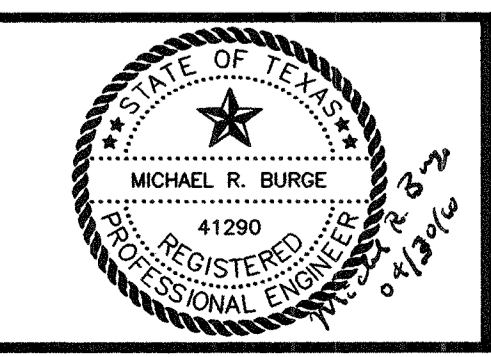
**NOTE:**  
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NO.	DATE	REVISION	REVIEWED
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DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: \_\_\_\_\_ 1" = 40'  
DATE: \_\_\_\_\_ APRIL 2010  
DWG. NAME: 1350BROCK-HRZCT03

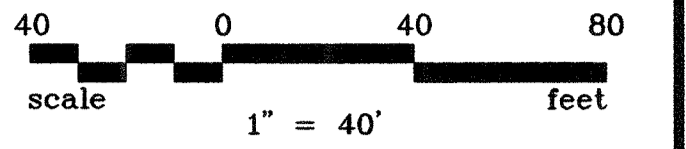
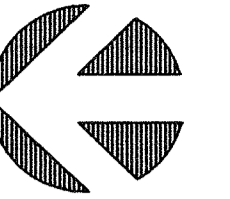


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Garland, Texas 75042  
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Firm Registration No. F-5290



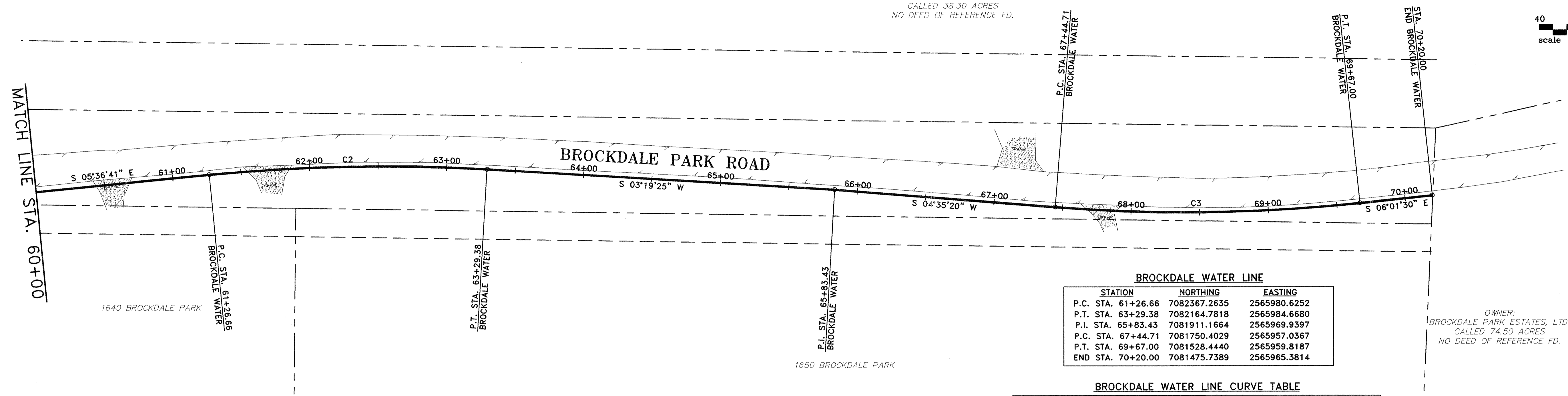
**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
**HORIZONTAL & VERTICAL CONTROL PLAN - 6**  
**CITY OF LUCAS**

SHEET NO. **8**  
OF **35** SHEETS  
JOB NO. 09-1350



OWNER: USA  
CALLED 38.30 ACRES  
NO DEED OF REFERENCE FD.

MATCH LINE STA. 60+00



**BROCKDALE WATER LINE**

STATION	NORTHING	EASTING
P.C. STA. 61+26.66	7082367.2635	2565980.6252
P.T. STA. 63+29.38	7082164.7818	2565984.6680
P.I. STA. 65+83.43	7081911.1664	2565969.9397
P.C. STA. 67+44.71	7081750.4029	2565957.0367
P.T. STA. 69+67.00	7081528.4440	2565959.8187
END STA. 70+20.00	7081475.7389	2565965.3814

OWNER:  
BROCKDALE PARK ESTATES, LTD.  
CALLED 74.50 ACRES  
NO DEED OF REFERENCE FD.

**BROCKDALE WATER LINE CURVE TABLE**

NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C2	1300.00'	08°56'06"	202.73'	S 01°08'38" E	202.52'
C3	1200.00'	10°36'50"	222.29'	S 00°43'05" E	221.98'

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

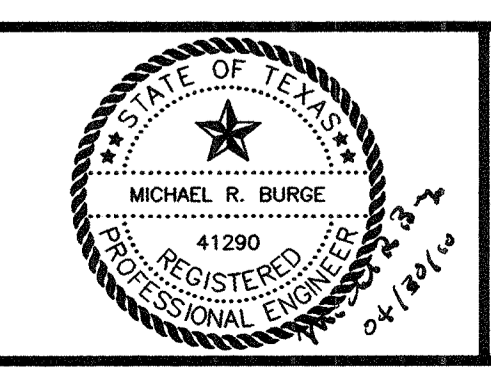
**NOTE:**  
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NO.	DATE	REVISION	REVIEWED
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DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: 1" = 40'  
DATE: \_\_\_\_\_ APRIL 2010  
DWG. NAME: 1350BROCK-HRZCT04



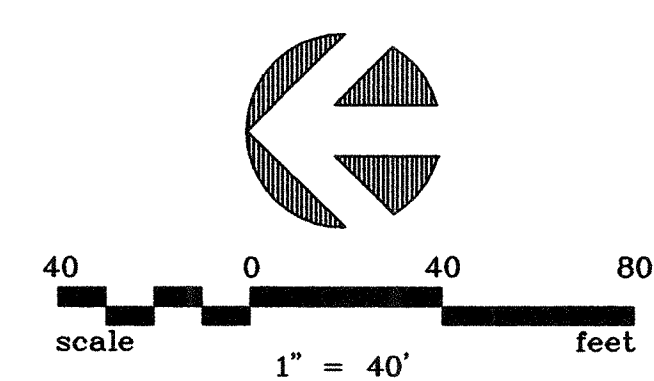
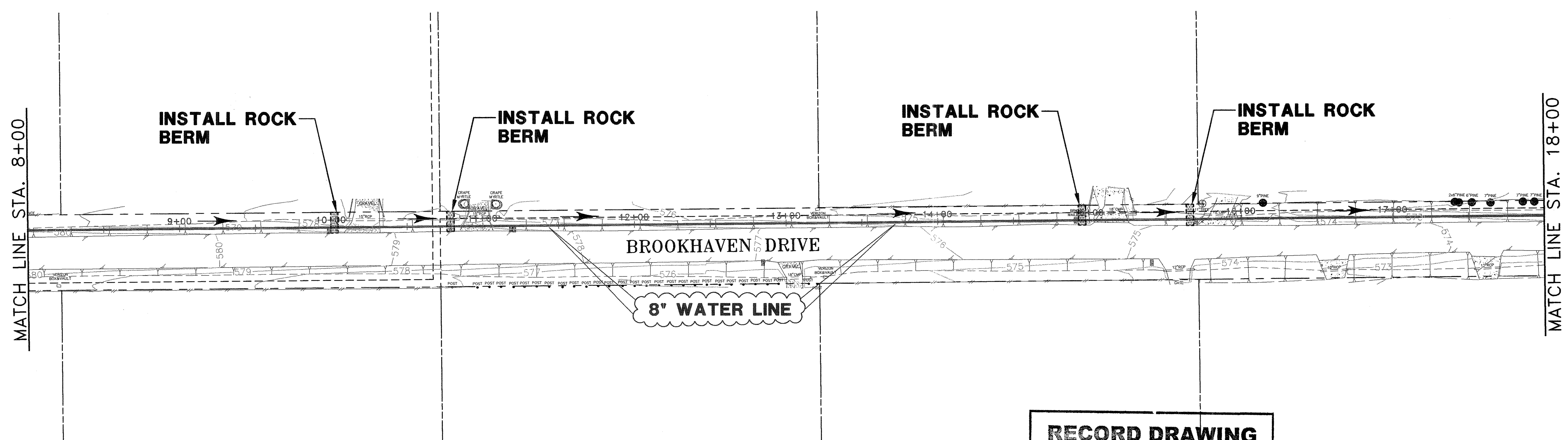
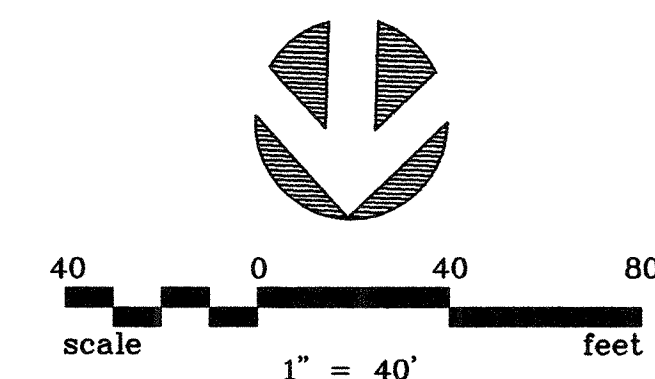
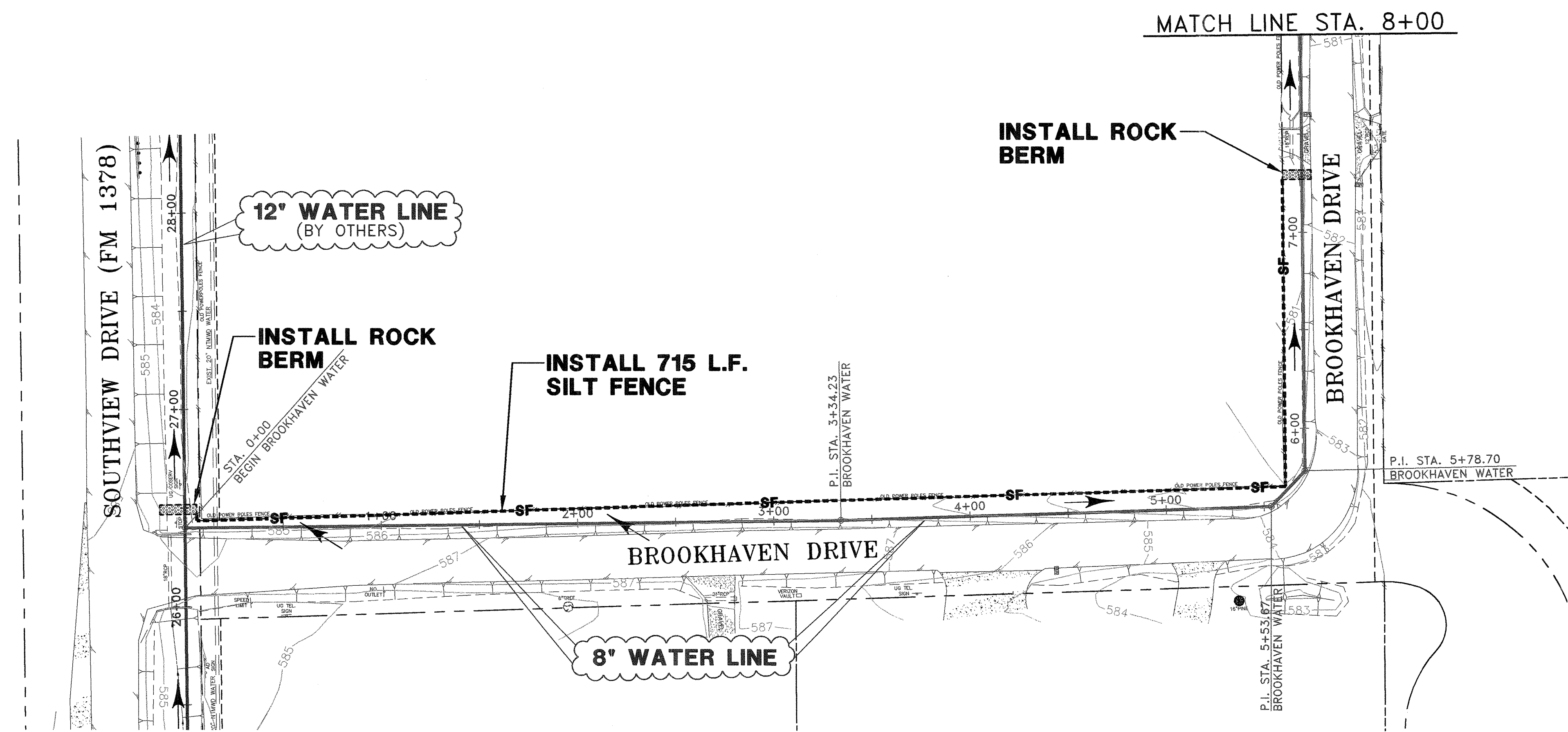
**BW2 Engineers, Inc.**  
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Garland, Texas 75042  
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Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
**HORIZONTAL & VERTICAL CONTROL PLAN - 7**  
**CITY OF LUCAS**

SHEET NO. 9  
OF 35 SHEETS  
JOB NO. 09-1350





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

**LEGEND:**

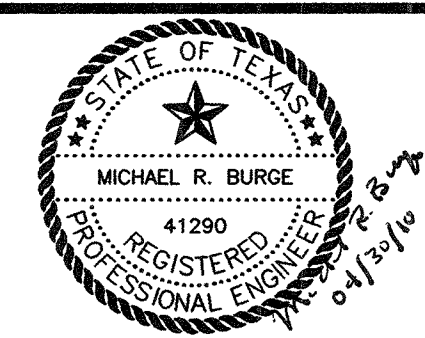
---SF---	SILT FENCE
[Hatched Box]	ROCK BERM
←	FLOW DIRECTION

NO.	DATE	REVISION	REVIEWED
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DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
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 SCALE: \_\_\_\_\_ 1" = 40'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOK-EROCT01

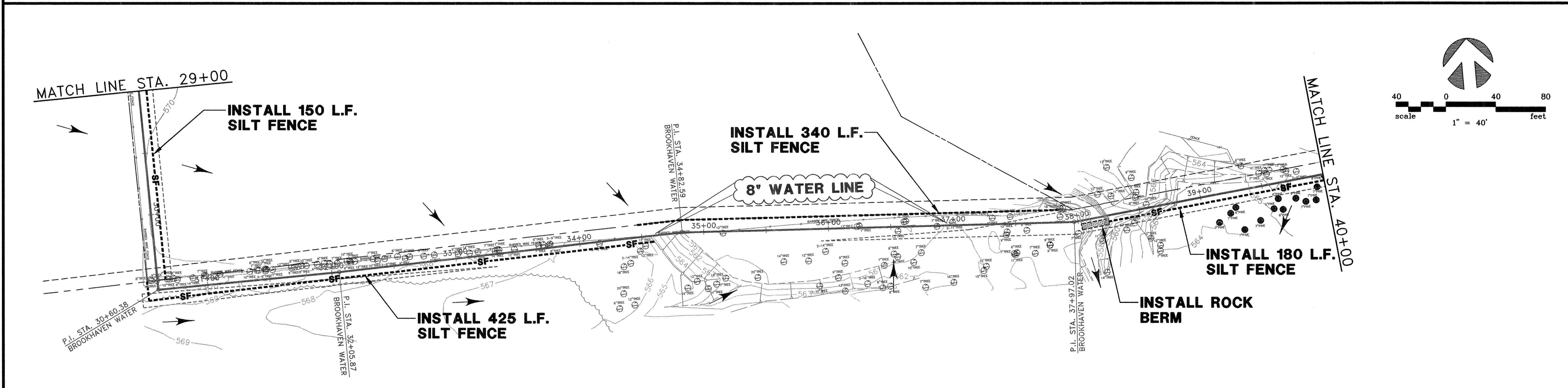
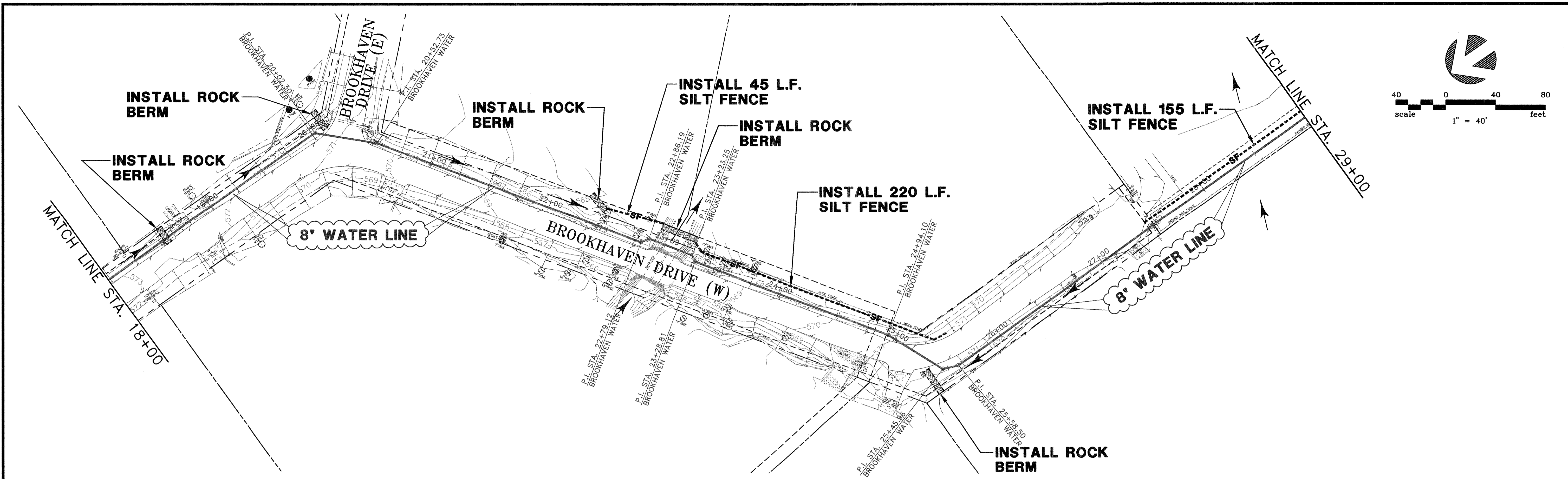


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 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
**EROSION CONTROL PLAN - 1**  
**CITY OF LUCAS**

SHEET NO. 10  
 OF 35 SHEETS  
 JOB NO. 09-1350



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

**LEGEND:**

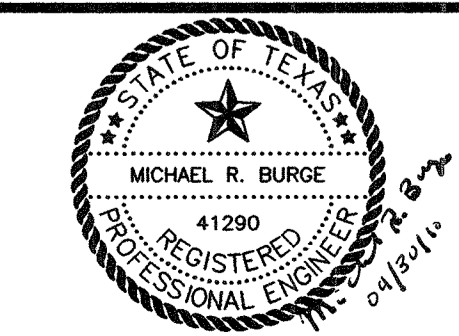
---SF---	SILT FENCE
[Hatched Box]	ROCK BERM
←	FLOW DIRECTION

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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
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 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOK-EROCT02



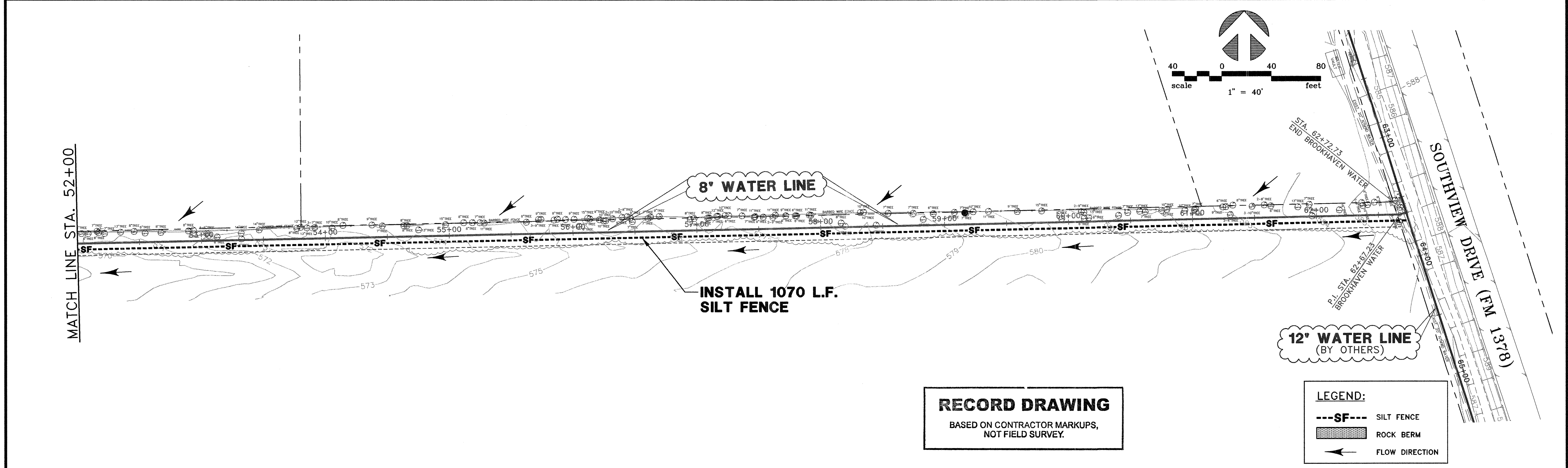
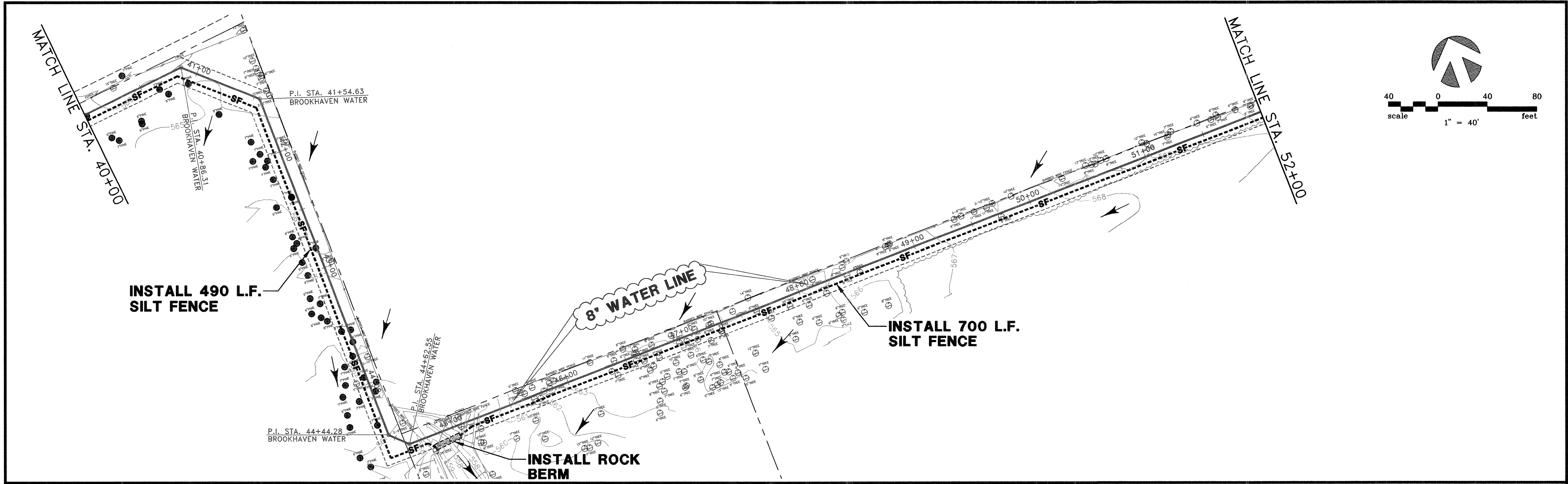
**BW2 Engineers, Inc.**  
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 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
**EROSION CONTROL PLAN - 2**  
**CITY OF LUCAS**

SHEET NO. 11  
 OF 35 SHEETS  
 JOB NO. 09-1350





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

**LEGEND:**

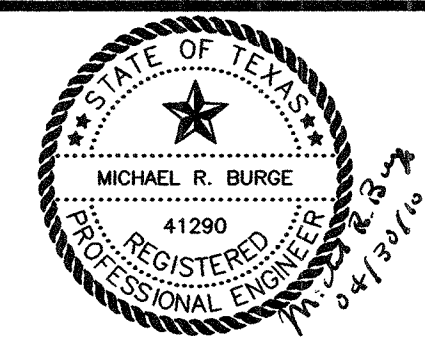
---SF---	SILT FENCE
[Hatched Box]	ROCK BERM
←	FLOW DIRECTION

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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 40'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOK-EROCT03

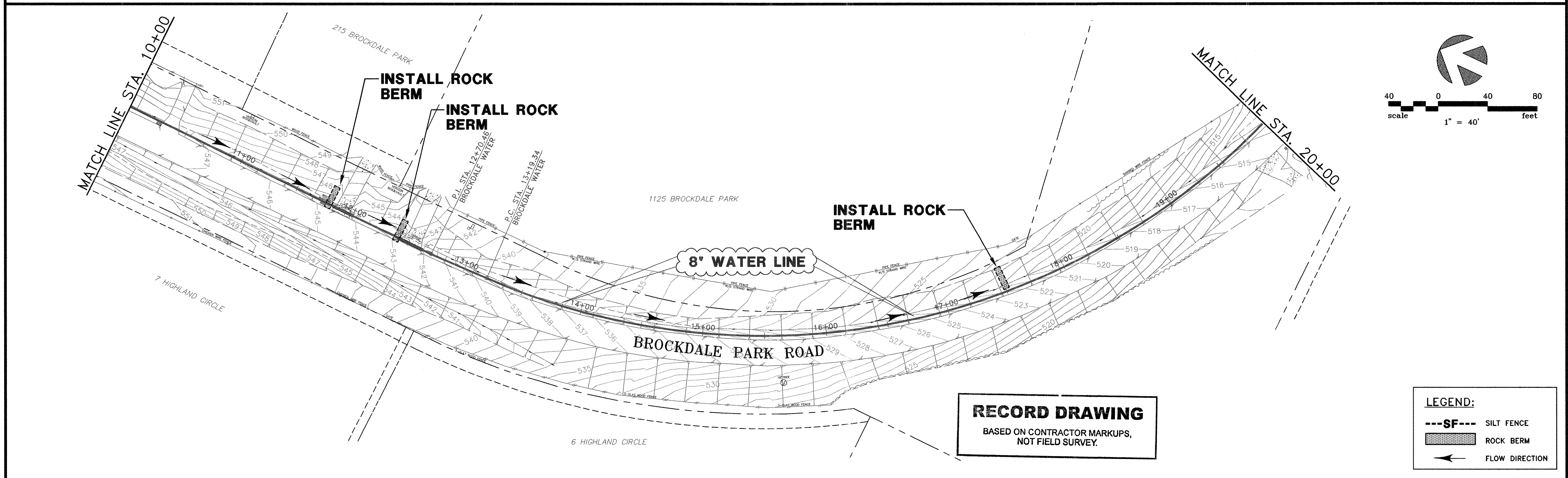
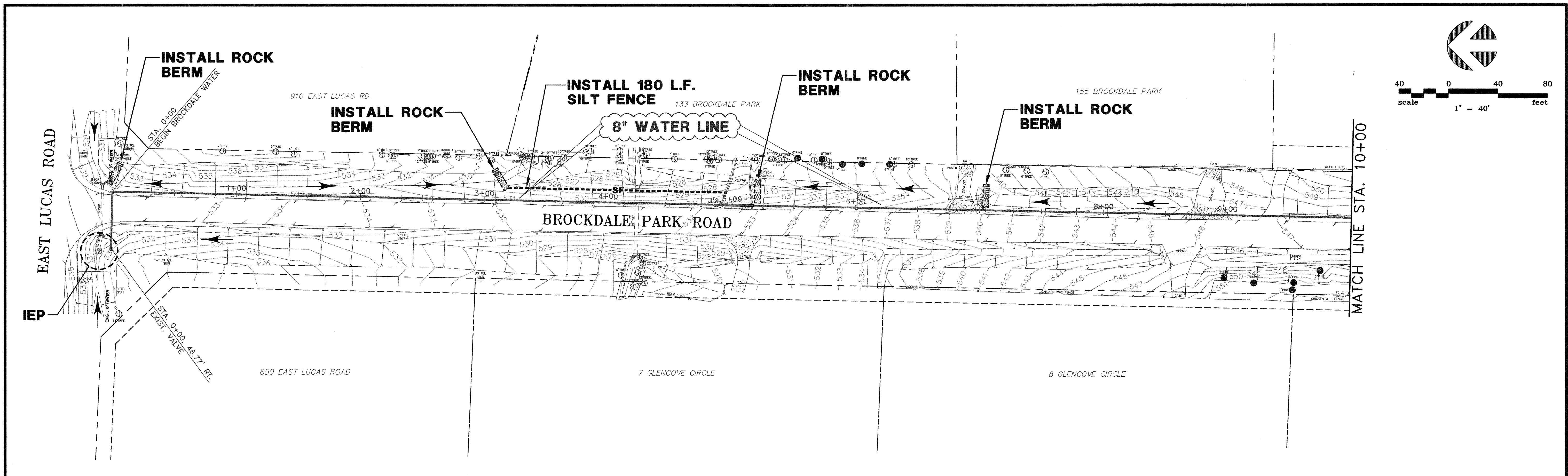


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 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
**EROSION CONTROL PLAN - 3**  
**CITY OF LUCAS**

SHEET NO. 12  
 OF 35 SHEETS  
 JOB NO. 09-1350



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

**LEGEND:**

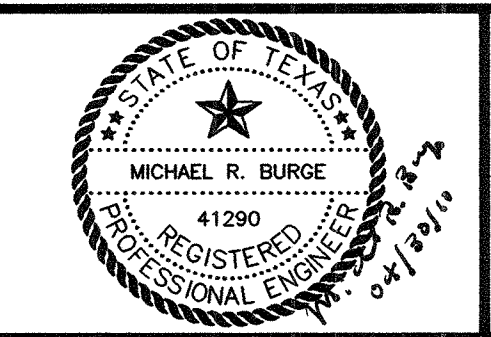
---SF---	SILT FENCE
[Hatched Box]	ROCK BERM
←	FLOW DIRECTION

NO.	DATE	REVISION	REVIEWED
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DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 40'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROCK-EROCT01



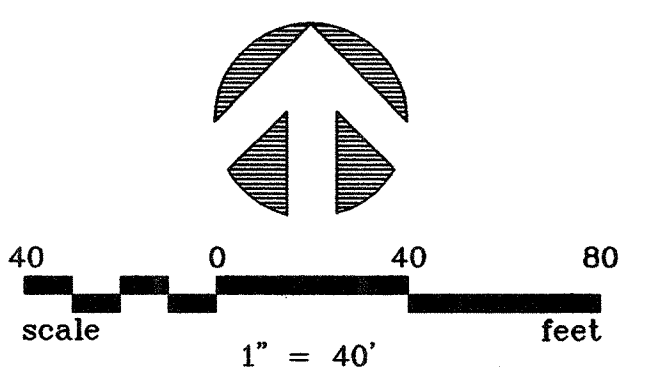
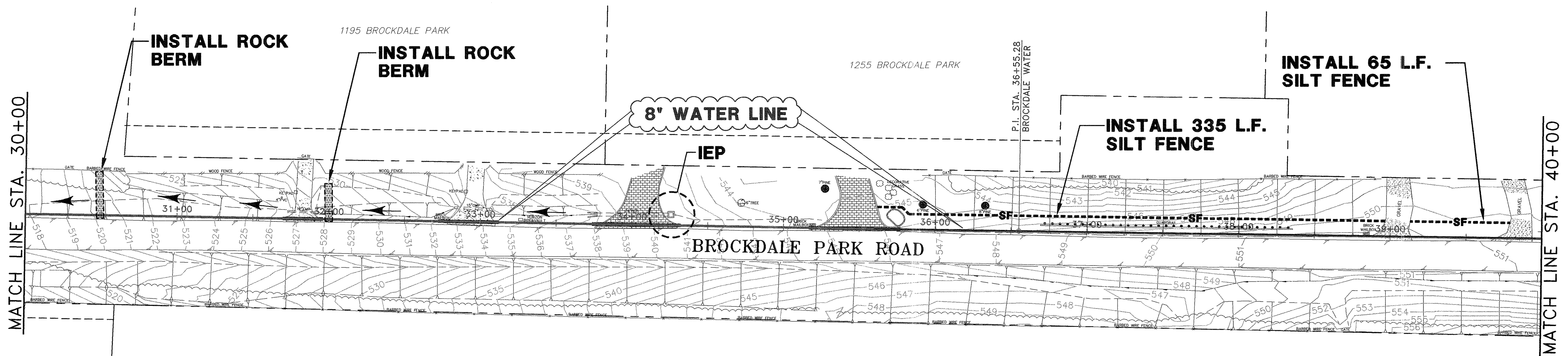
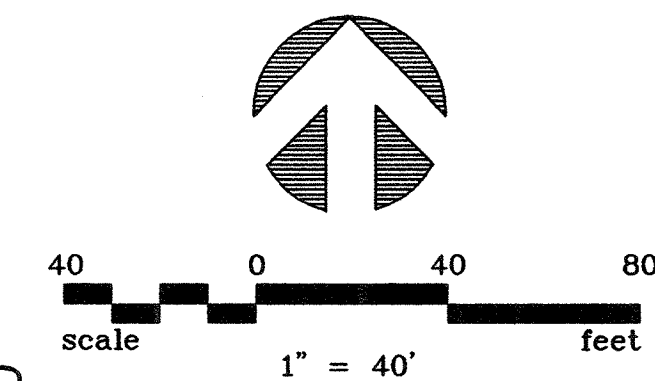
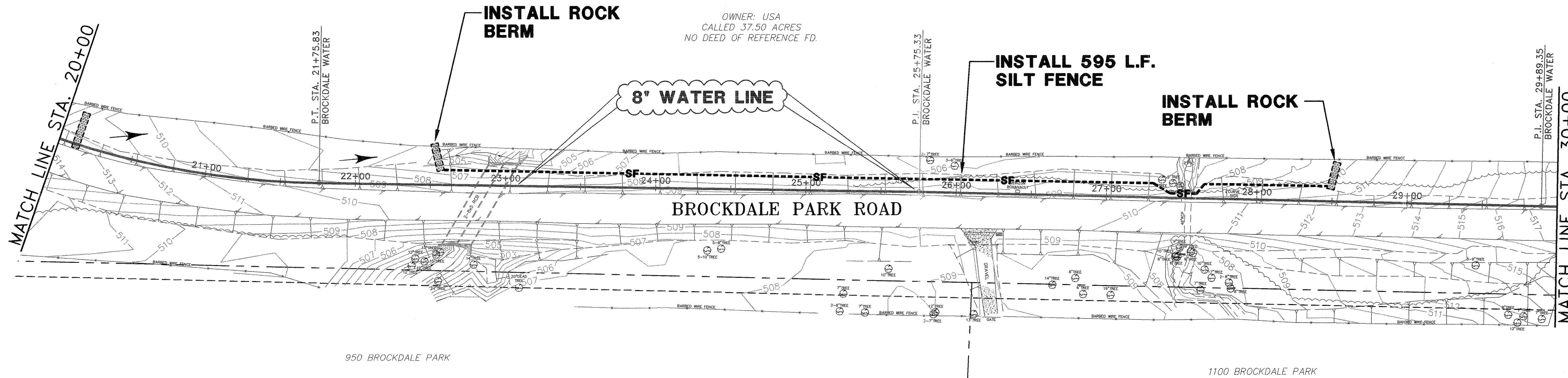
**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
**EROSION CONTROL PLAN - 4**  
**CITY OF LUCAS**

SHEET NO. 13  
 OF 35 SHEETS  
 JOB NO. 09-1350





OWNER: USA  
CALLED 37.50 ACRES  
NO DEED OF REFERENCE FD.

OWNER:  
BROCKDALE PARK ESTATES, LTD.  
CALLED 61.56 ACRES  
NO DEED OF REFERENCE FD.

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

**LEGEND:**

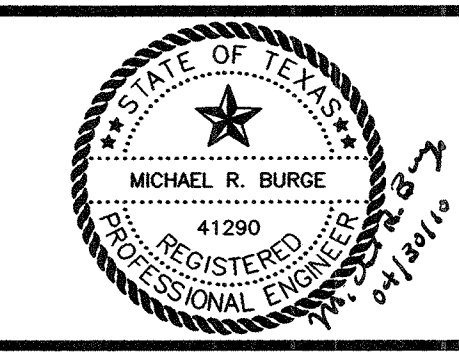
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- [Hatched Box] ROCK BERM
- ← FLOW DIRECTION

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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
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SCALE: \_\_\_\_\_ 1" = 40'  
DATE: \_\_\_\_\_ APRIL 2010  
DWG. NAME: 1350BROCK-EROCT02

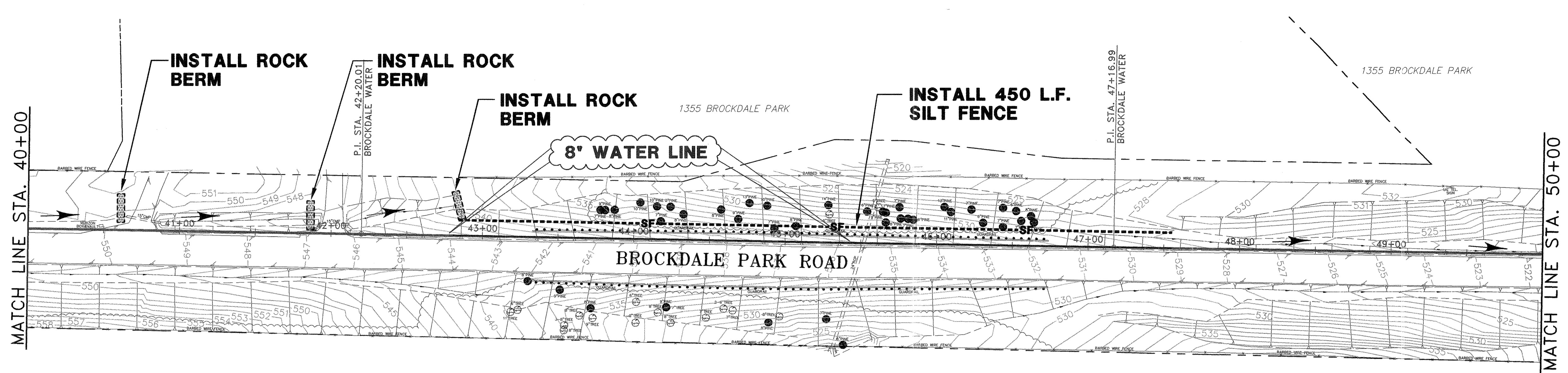


**BW2 Engineers, Inc.**  
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Suite 500, L.B. 27  
Garland, Texas 75042  
(972) 864-8200 (T) (972) 864-8220 (F)  
Firm Registration No. F-5290

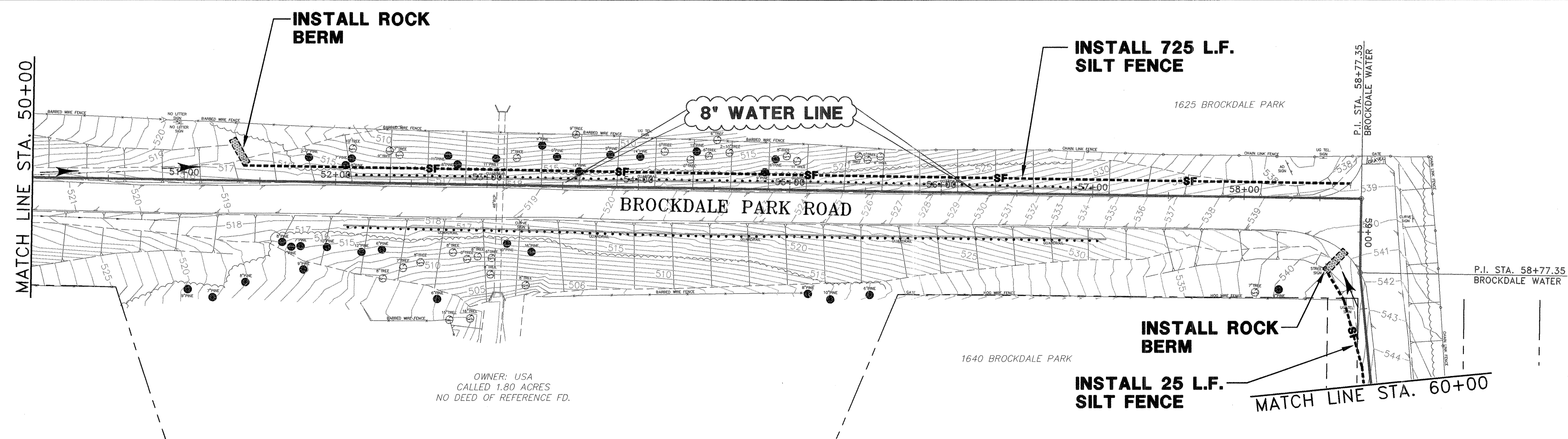


**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
**EROSION CONTROL PLAN - 5**  
**CITY OF LUCAS**

SHEET NO. 14  
OF 35 SHEETS  
JOB NO. 09-1350



OWNER:  
 BROCKDALE PARK ESTATES, LTD.  
 CALLED 61.56 ACRES  
 NO DEED OF REFERENCE FD.



OWNER: USA  
 CALLED 1.80 ACRES  
 NO DEED OF REFERENCE FD.

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

**LEGEND:**

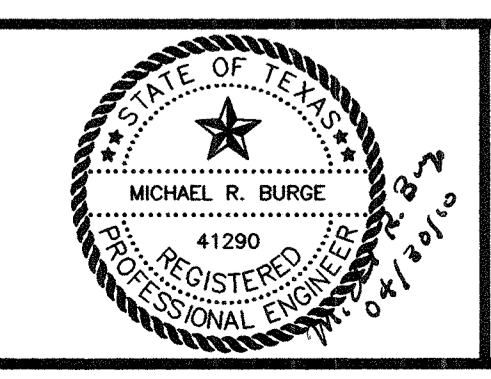
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[Hatched Box]	ROCK BERM
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 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 40'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROCK-EROCT03



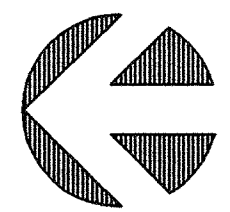
**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
**EROSION CONTROL PLAN - 6**  
**CITY OF LUCAS**

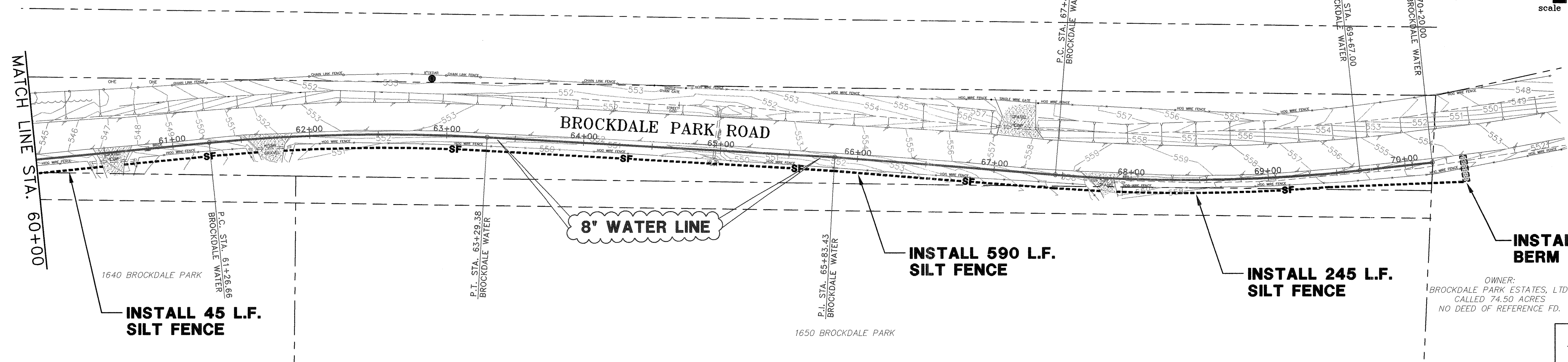
SHEET NO. 15  
 OF 35 SHEETS  
 JOB NO. 09-1350





40 0 40 80  
 scale 1" = 40' feet

OWNER: USA  
 CALLED 38.30 ACRES  
 NO DEED OF REFERENCE FD.



OWNER:  
 BROCKDALE PARK ESTATES, LTD.  
 CALLED 74.50 ACRES  
 NO DEED OF REFERENCE FD.

**LEGEND:**

- SF--- SILT FENCE
- [Hatched Box] ROCK BERM
- ← FLOW DIRECTION

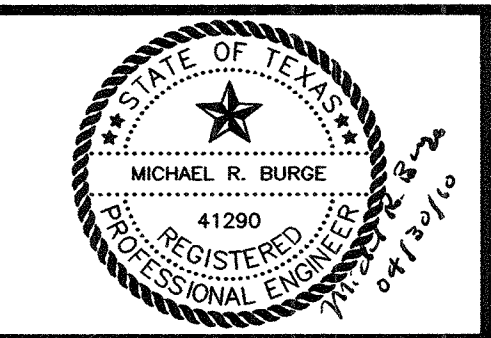
**RECORD DRAWING**  
 BASED ON CONTRACTOR MARKUPS,  
 NOT FIELD SURVEY.

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 DESIGN: \_\_\_\_\_ MRB  
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 SCALE: 1" = 40'  
 DATE: APRIL 2010  
 DWG. NAME: 1350BROCK-EROCT04



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 Suite 500, L.B. 27  
 Garland, Texas 75042  
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 Firm Registration No. F-5290

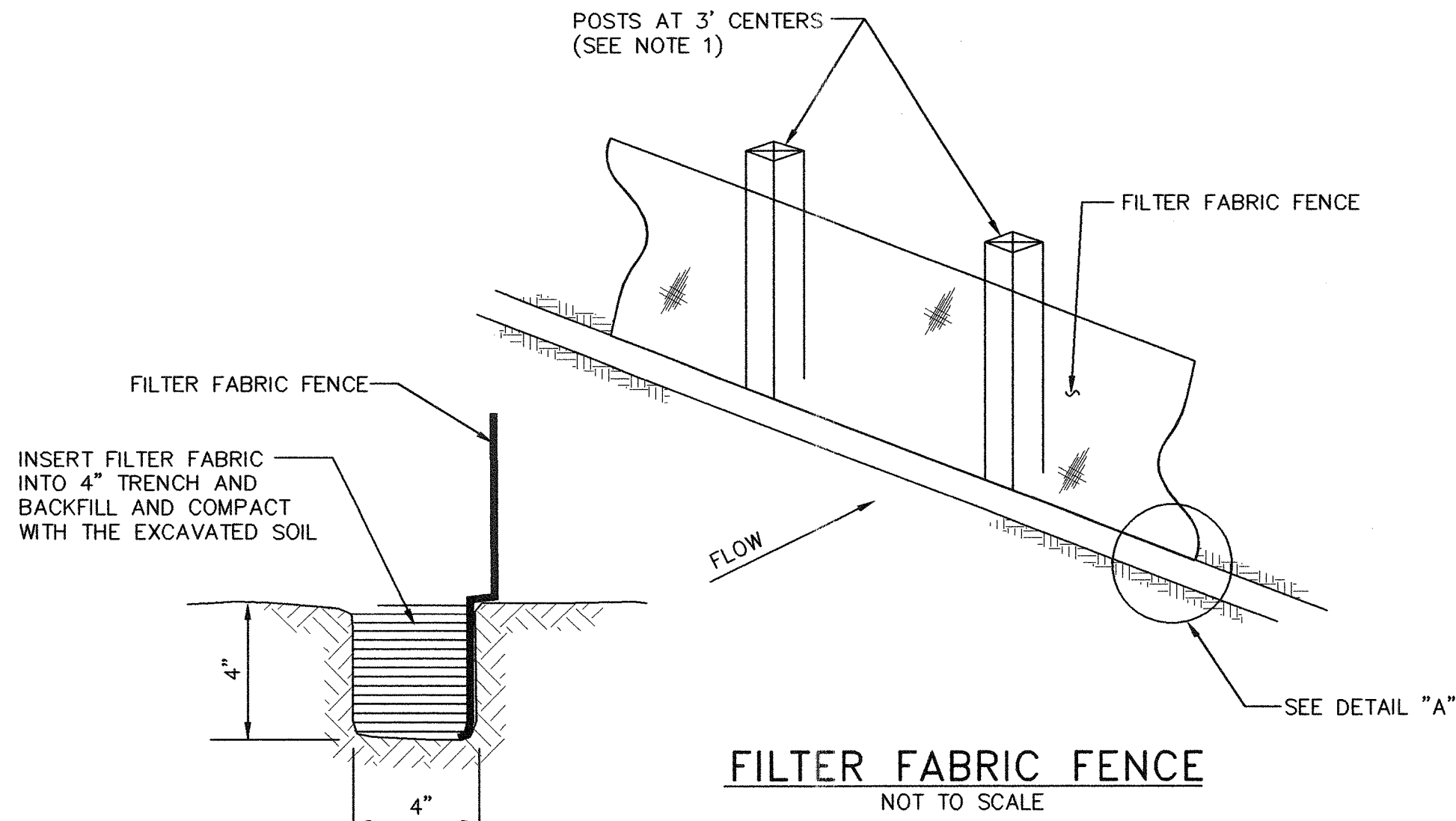


WATER SYSTEM IMPROVEMENTS  
 BROCKDALE PARK ROAD WATER LINE  
 EROSION CONTROL PLAN - 7  
**CITY OF LUCAS**

SHEET NO. 16  
 OF 35 SHEETS  
 JOB NO. 09-1350

**EROSION CONTROL NOTES:**

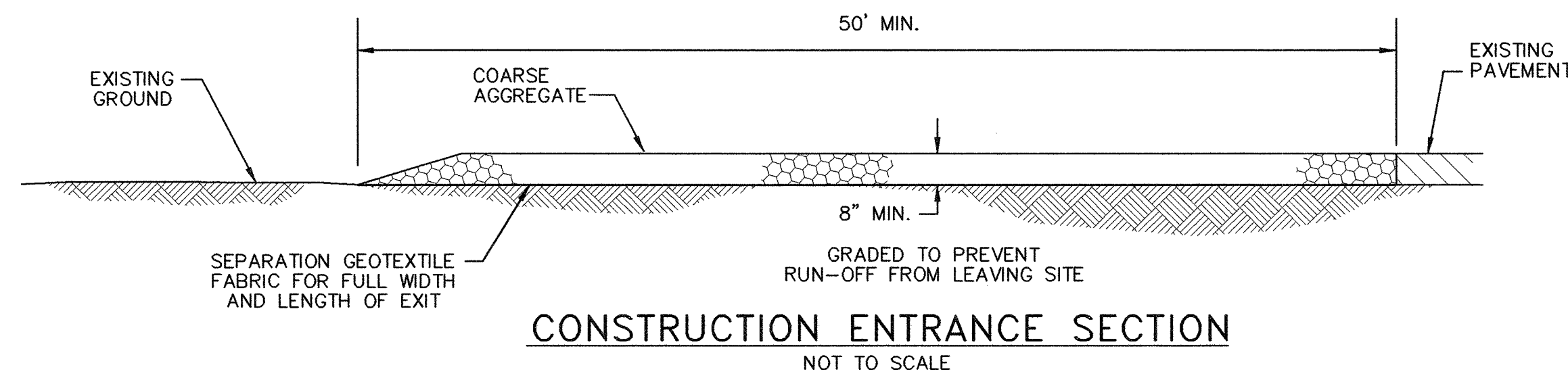
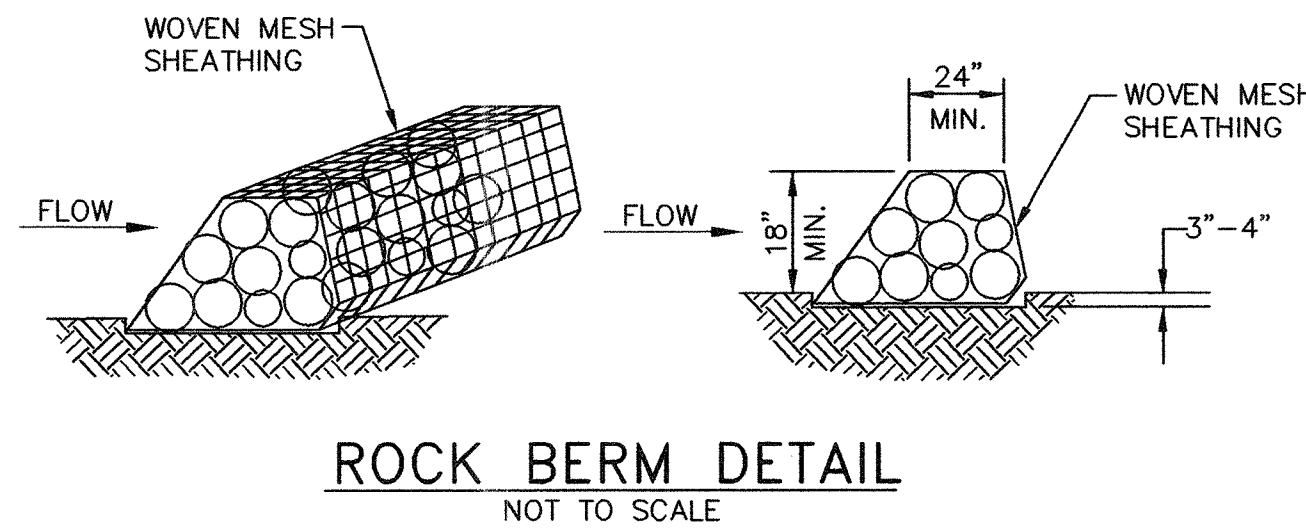
1. EROSION CONTROL DEVICES AS SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBING ACTIVITIES ON THE PROJECT.
2. ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT. CHANGES ARE 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" COURSE 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).



**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.

**DETAIL "A"**  
NOT TO SCALE



**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.

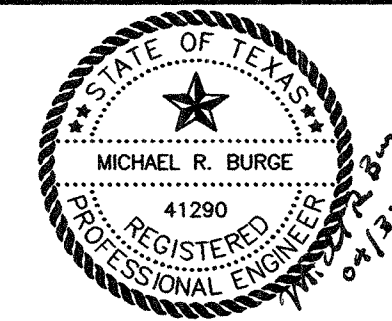
**RECORD DRAWING**  
BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
DESIGN: \_\_\_\_\_ MRB  
REVIEWED: \_\_\_\_\_ JFW  
SCALE: \_\_\_\_\_ NOT TO SCALE  
DATE: \_\_\_\_\_ APRIL 2010  
DWG. NAME: \_\_\_\_\_ 1350EROC-DET



**BW2 Engineers, Inc.**  
1919 S. Shiloh Road  
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Garland, Texas 75042  
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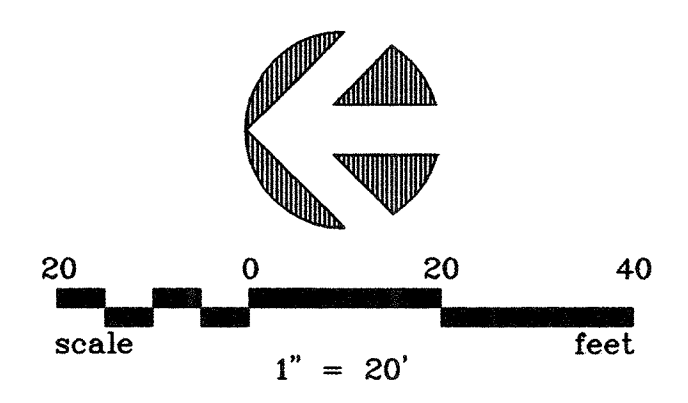
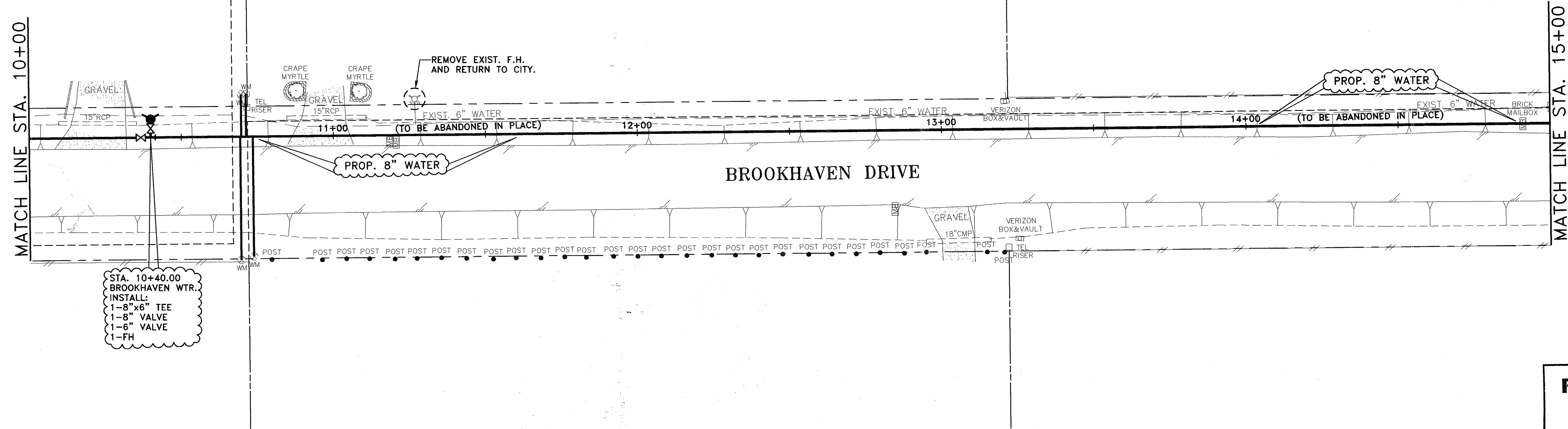


WATER SYSTEM IMPROVEMENTS  
BROOKHAVEN DRIVE WATER LINE AND  
BROCKDALE PARK ROAD WATER LINE  
EROSION CONTROL NOTES AND DETAILS  
**CITY OF LUCAS**

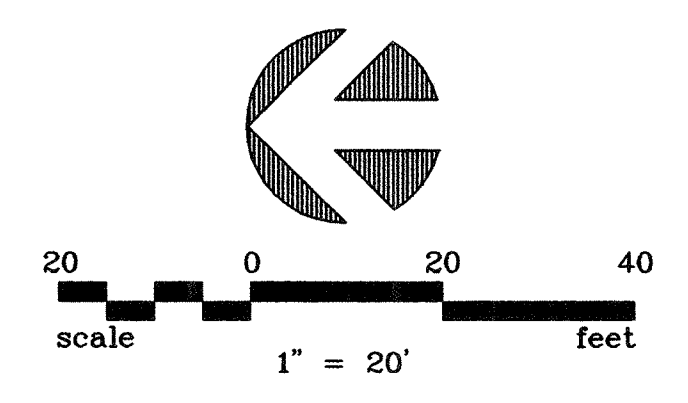
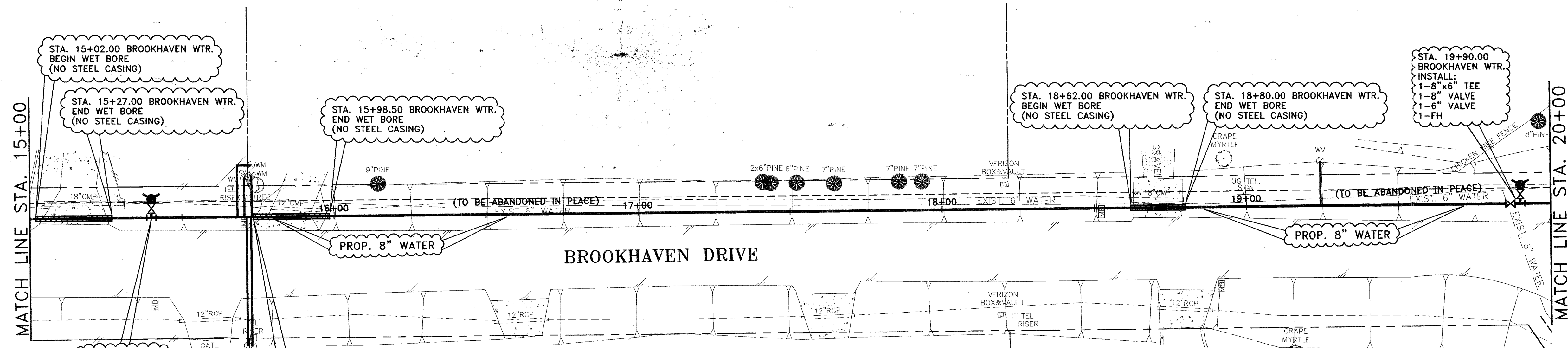
SHEET NO. 17  
OF 35 SHEETS  
JOB NO. 09-1350







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



STA. 10+40.00 BROOKHAVEN WTR. INSTALL: 1-8"x6" TEE, 1-8" VALVE, 1-6" VALVE, 1-FH

STA. 15+02.00 BROOKHAVEN WTR. BEGIN WET BORE (NO STEEL CASING)

STA. 15+27.00 BROOKHAVEN WTR. END WET BORE (NO STEEL CASING)

STA. 15+98.50 BROOKHAVEN WTR. END WET BORE (NO STEEL CASING)

STA. 15+40.00 BROOKHAVEN WTR. INSTALL: 1-8"x6" TEE, 1-6" VALVE, 1-FH

STA. 15+73.50 BROOKHAVEN WTR. BEGIN WET BORE (NO STEEL CASING)

STA. 18+62.00 BROOKHAVEN WTR. BEGIN WET BORE (NO STEEL CASING)

STA. 18+80.00 BROOKHAVEN WTR. END WET BORE (NO STEEL CASING)

STA. 19+90.00 BROOKHAVEN WTR. INSTALL: 1-8"x6" TEE, 1-8" VALVE, 1-6" VALVE, 1-FH

- 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").

**!! 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.**

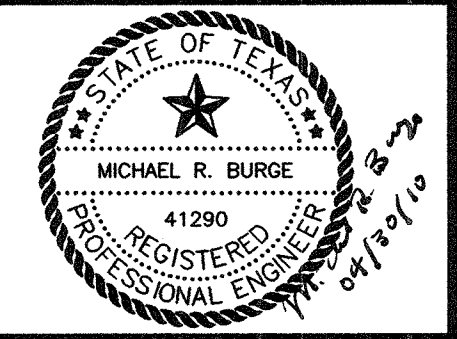
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: \_\_\_\_\_ 1350BROOKWTR02



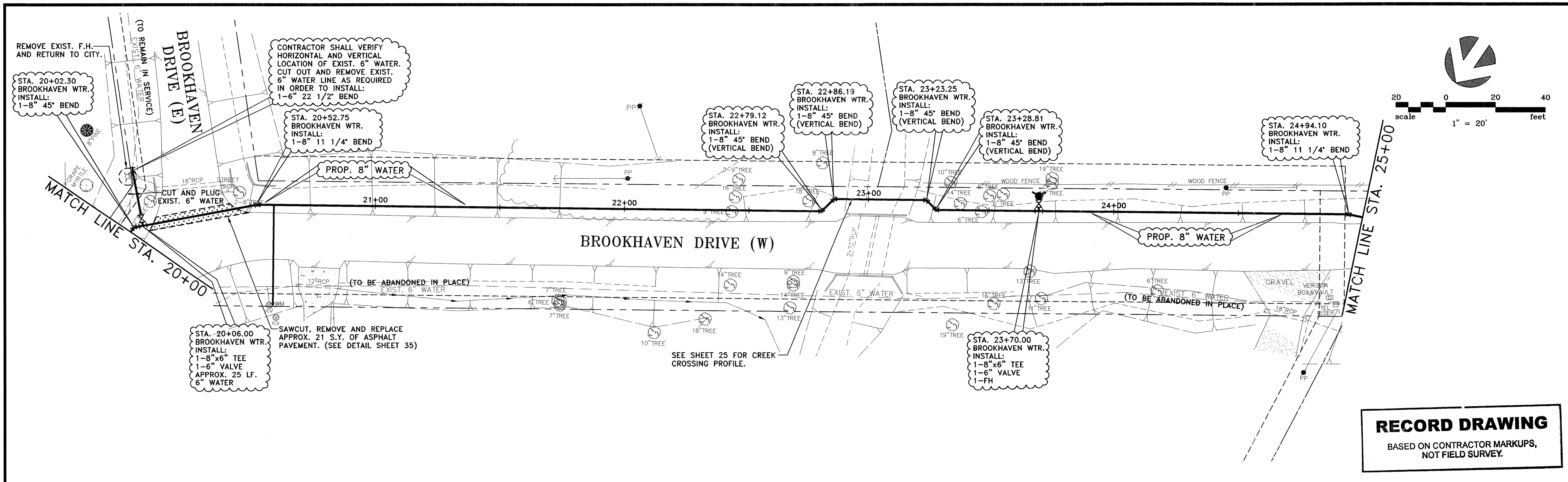
**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
 Suite 500, L.B. 27  
 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



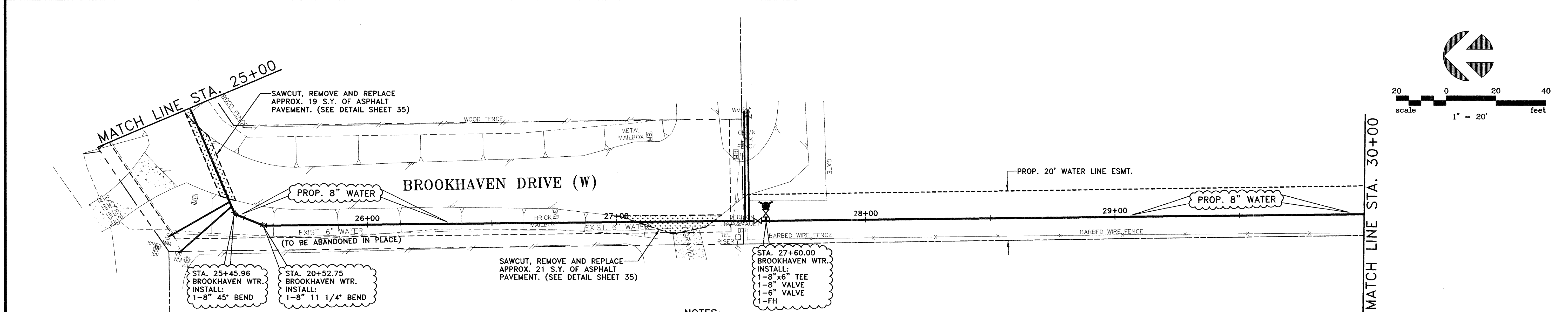
**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
 BROOKHAVEN WATER - STA. 10+00 TO STA. 20+00  
**CITY OF LUCAS**

SHEET NO. 19  
 OF 35 SHEETS  
 JOB NO. 09-1350





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



**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 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").

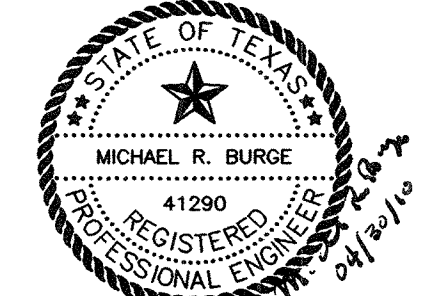
**!! CAUTION !!**  
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**PRIOR TO ANY EXCAVATION, CONTRACTOR SHALL CONTACT DIG-TESS, TEXAS ONE CALL, LONE STAR NOTIFICATION AND OTHERS AS REQUIRED TO LOCATE EXISTING UTILITIES.**  
 CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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 DESIGN:                    MRB  
 REVIEWED:                 JFW  
 SCALE:                    1" = 20'  
 DATE:                      APRIL 2010  
 DWG. NAME:                1350BROOKWTR03

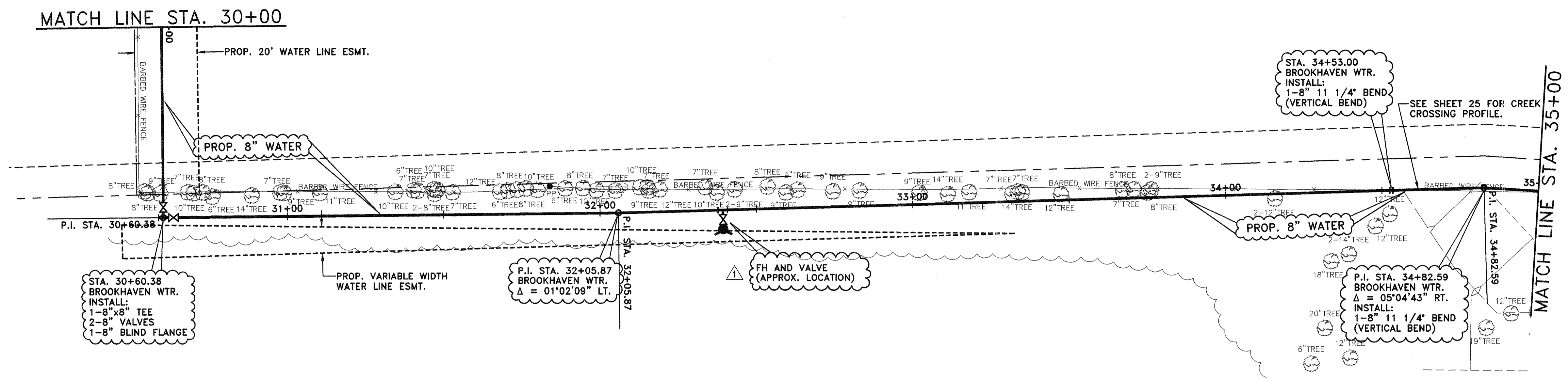
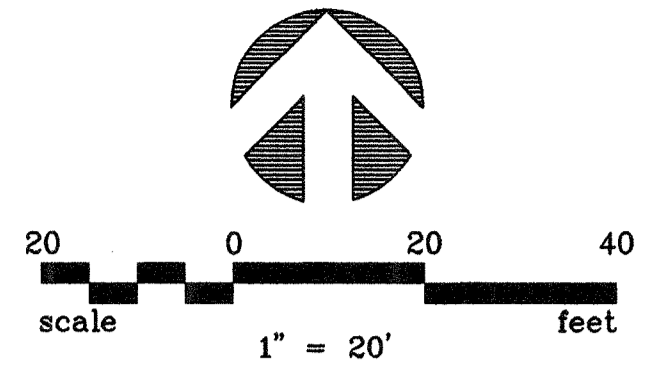


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 Firm Registration No. F-5290

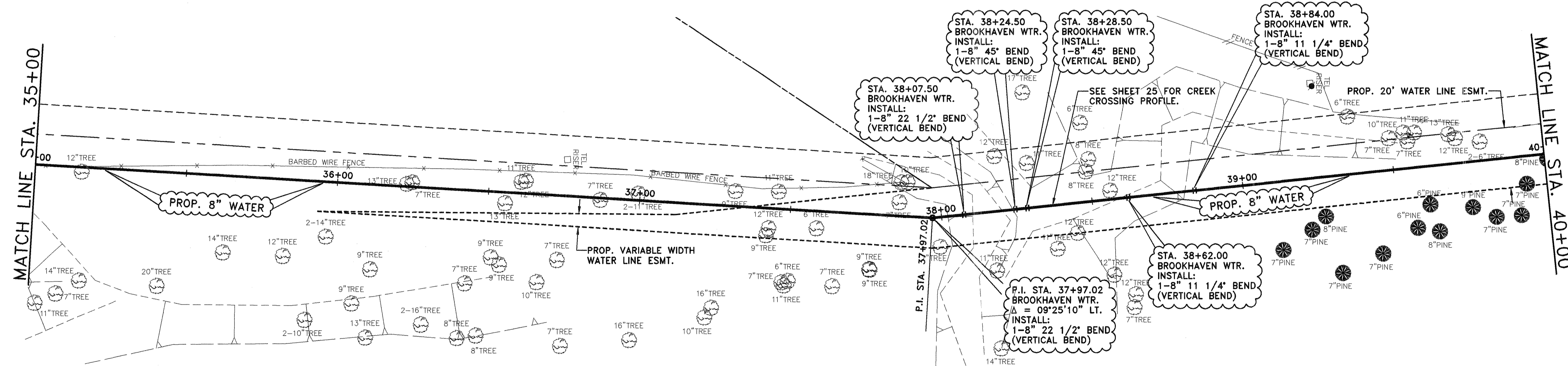
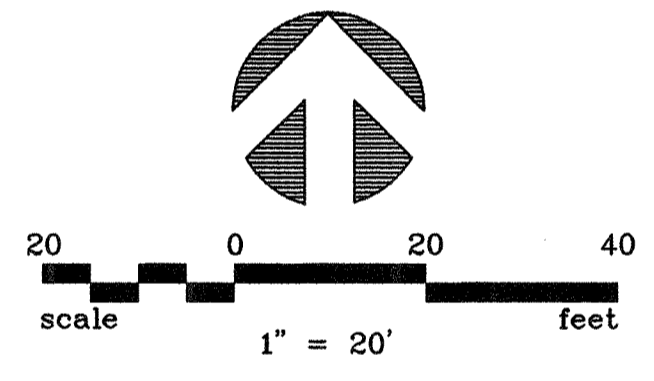


**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
 BROOKHAVEN WATER - STA. 20+00 TO STA. 30+00  
**CITY OF LUCAS**

SHEET NO.            20  
 OF            35 SHEETS  
 JOB NO. 09-1350



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



**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").

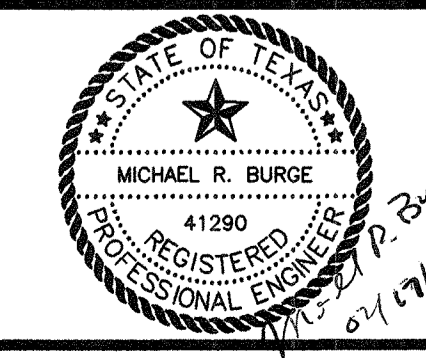
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 CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

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1	2/17/11	REVISED PER CONTRACTOR MARKUPS	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOKWTR04



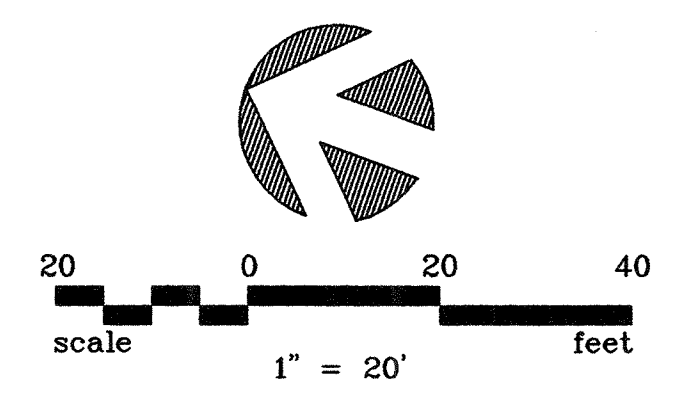
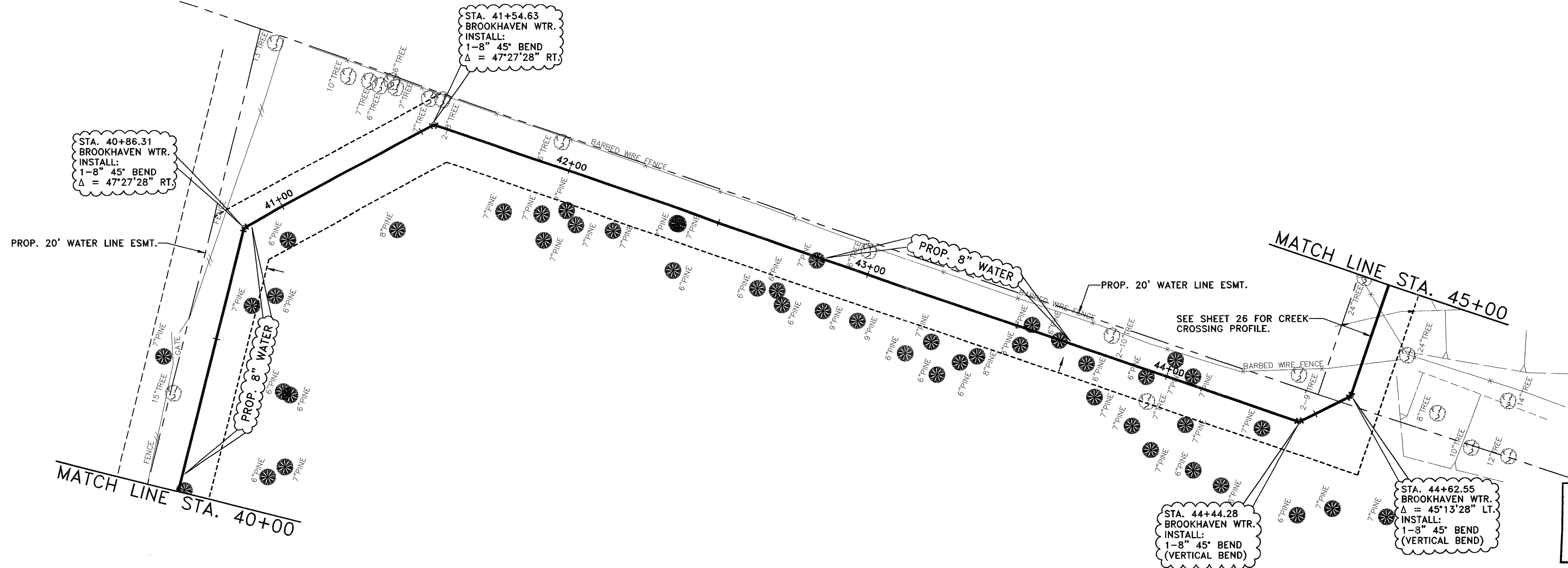
**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
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 Garland, Texas 75042  
 (972) 864-8200 (T) (972) 864-8220 (F)  
 Firm Registration No. F-5290



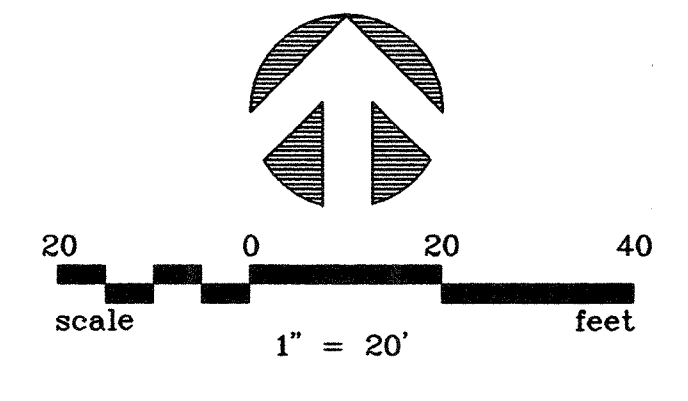
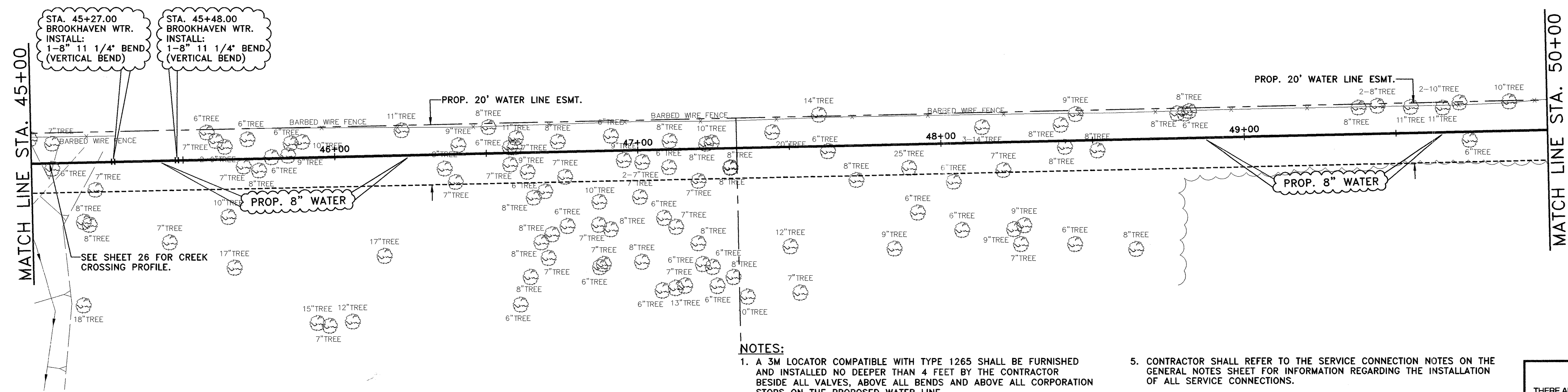
**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
 BROOKHAVEN WATER - STA. 30+00 TO STA. 40+00  
**CITY OF LUCAS**

SHEET NO. 21  
 OF 35 SHEETS  
 JOB NO. 09-1350





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



**NOTES:**

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8. WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900. MINIMUM COVER FOR WATER LINE SHALL BE FORTY TWO INCHES (42").

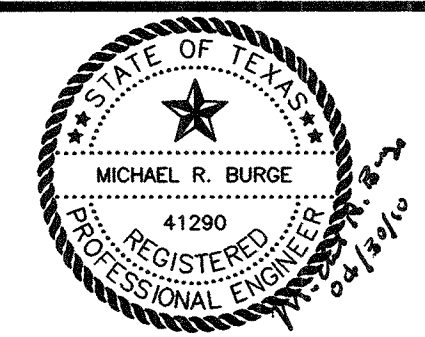
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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOKWTR05

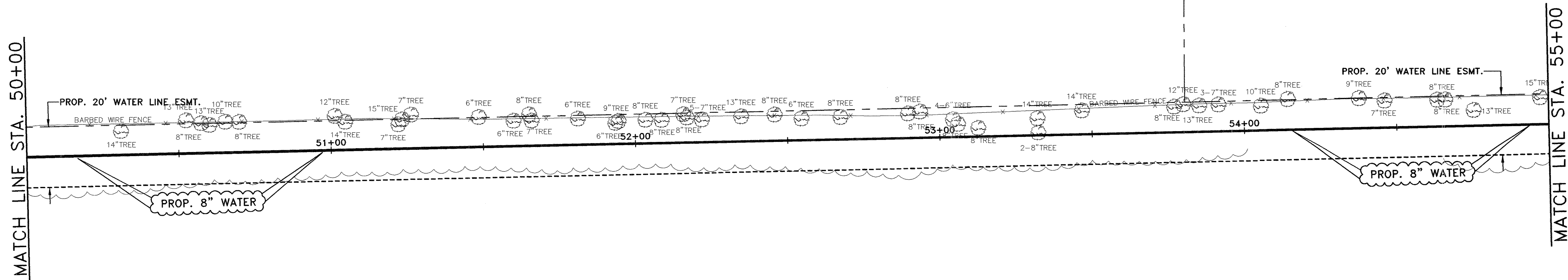
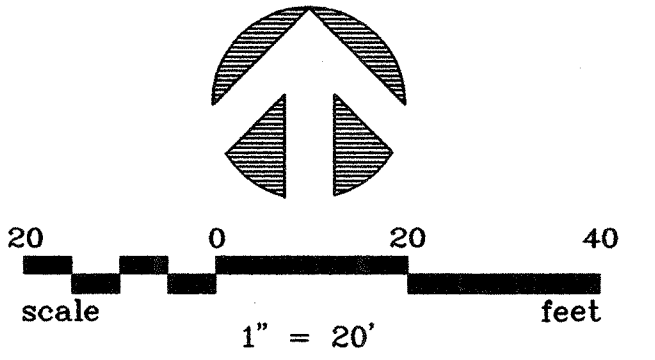


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 Firm Registration No. F-5290

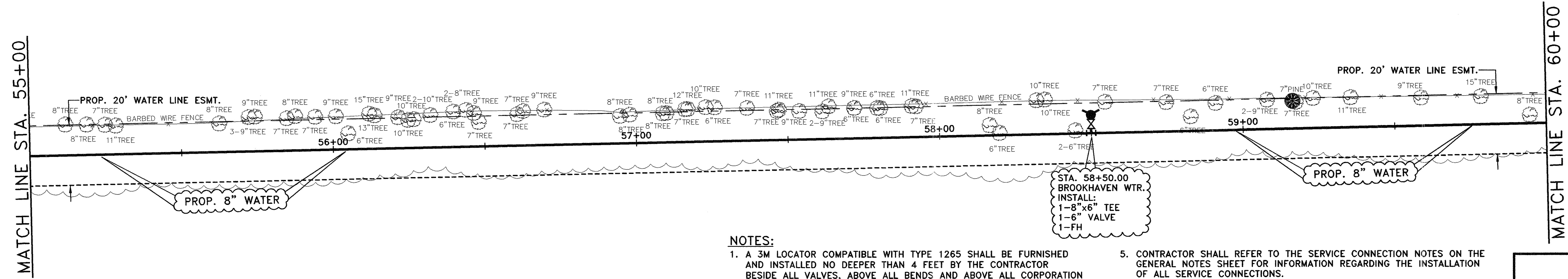
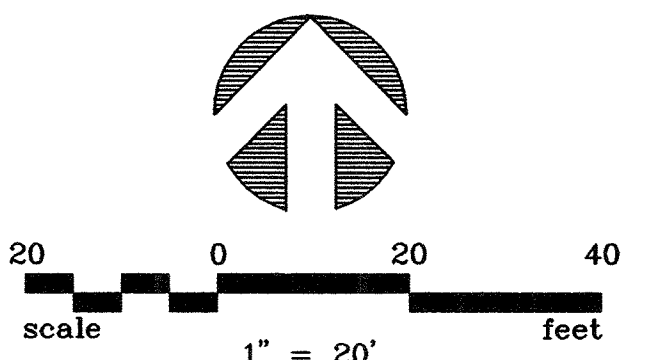


**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
 BROOKHAVEN WATER - STA. 40+00 TO STA. 50+00  
**CITY OF LUCAS**

SHEET NO. 22  
 OF 35 SHEETS  
 JOB NO. 09-1350



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



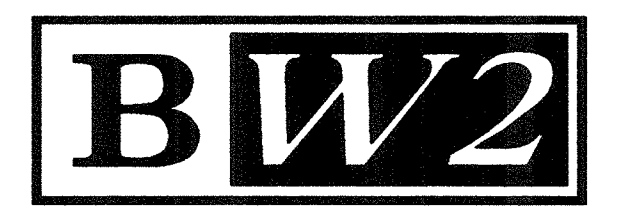
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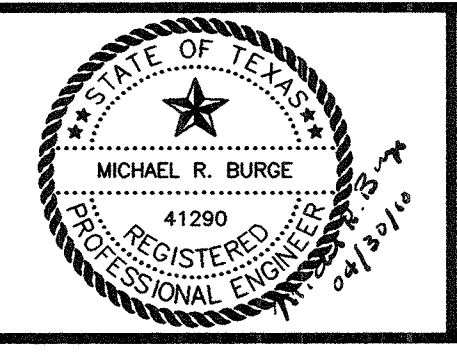
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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROOKWTR06



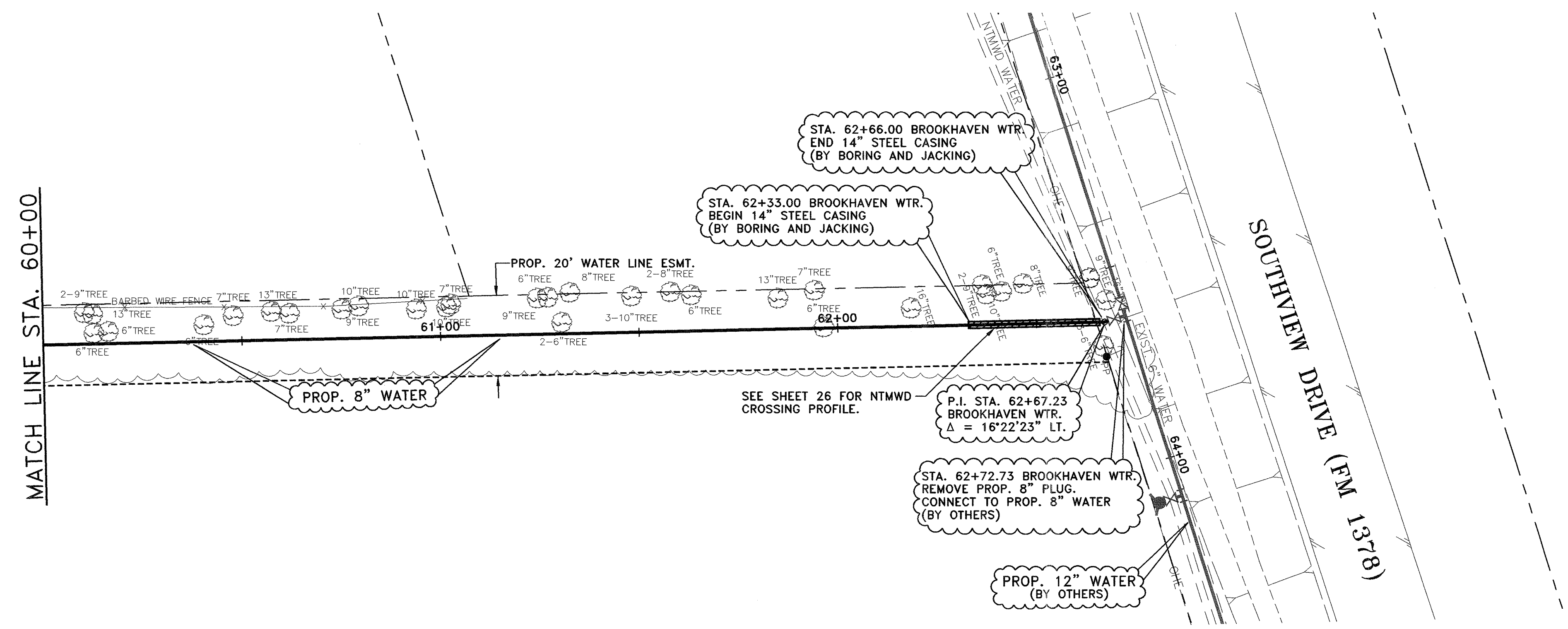
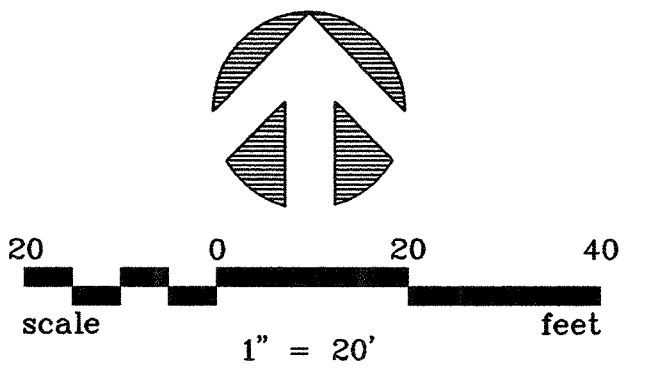
**BW2 Engineers, Inc.**  
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 Garland, Texas 75042  
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 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
 BROOKHAVEN WATER - STA. 50+00 TO STA. 60+00  
**CITY OF LUCAS**

SHEET NO. 23  
 OF 35 SHEETS  
 JOB NO. 09-1350





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

**NOTES:**

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7. SEE GENERAL NOTES (SHEET NO. 1) FOR NTMWD NOTES.
8. 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.
9. WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900. MINIMUM COVER FOR WATER LINE SHALL BE FORTY TWO INCHES (42").
10. THE PROPOSED 8-INCH PLUG AND 8-INCH WATER LINE (BY OTHERS) SHOWN AT STA. 62+72.73 ARE NOT EXISTING AT THIS TIME. THESE ITEMS WILL BE CONSTRUCTED AS PART OF THE SOUTHVIEW DRIVE WATER LINE (BY OTHERS) WHICH WILL BE UNDER CONSTRUCTION DURING THE SAME TIME PERIOD AS THE BROOKHAVEN DRIVE WATER LINE.
11. AN 8"x8" TEE SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR ON THE PROPERTY JUST WEST OF SOUTHVIEW DR. (FM 1378). THE EXACT LOCATION OF THIS PROPOSED 8"x8" TEE SHALL BE DETERMINED BY THE CITY.

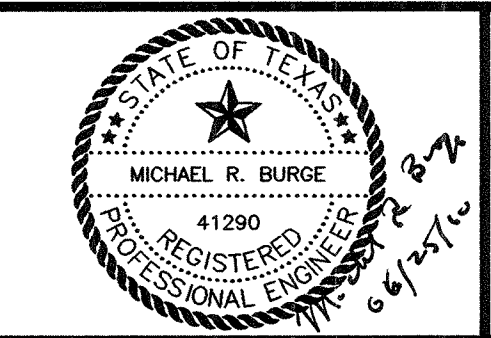
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1	6/25/10	REVISED PER ADDENDUM NO. 1.	MRB
NO.	DATE	REVISION	REVIEWED

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 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: \_\_\_\_\_ 1350BROOKWTR07

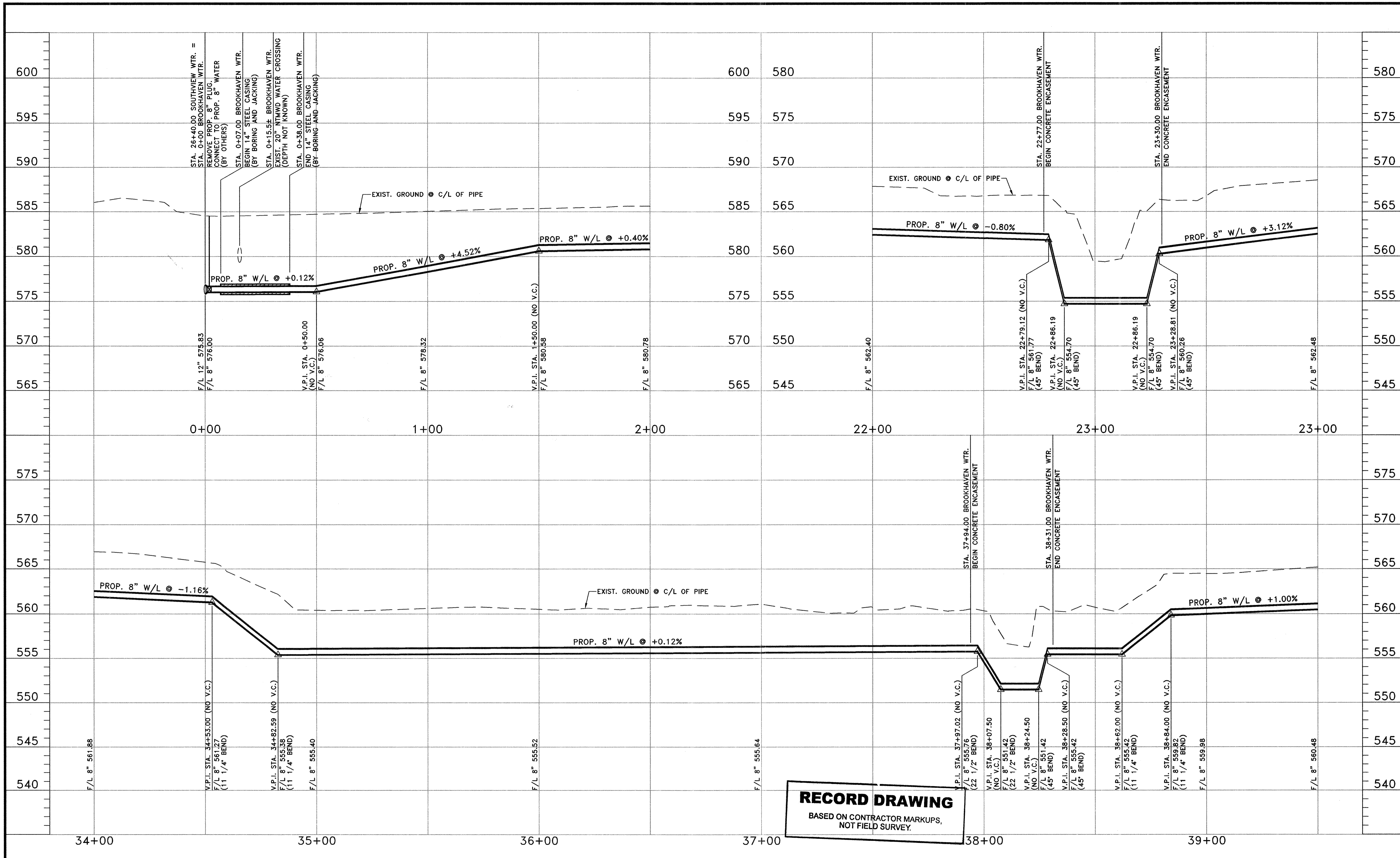


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 Firm Registration No. F-5290



WATER SYSTEM IMPROVEMENTS  
 BROOKHAVEN DRIVE WATER LINE  
 BROOKHAVEN WATER - STA. 60+00 TO STA. 62+72.73  
**CITY OF LUCAS**

SHEET NO. 24  
 OF 35 SHEETS  
 JOB NO. 09-1350



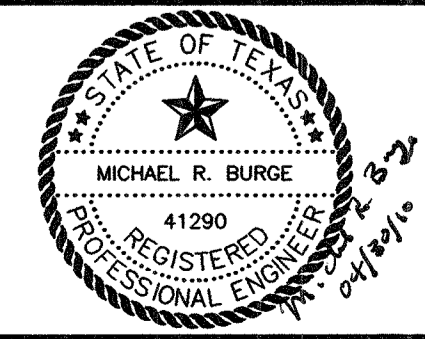
**RECORD DRAWING**  
 BASED ON CONTRACTOR MARKUPS,  
 NOT FIELD SURVEY.

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NO.	DATE	REVISION	REVIEWED

DRAWN:            BW2  
 DESIGN:            MRB  
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 SCALE: (H)1"=20', (V)1"=5'  
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 DWG. NAME:            1350BROOK-PROF01



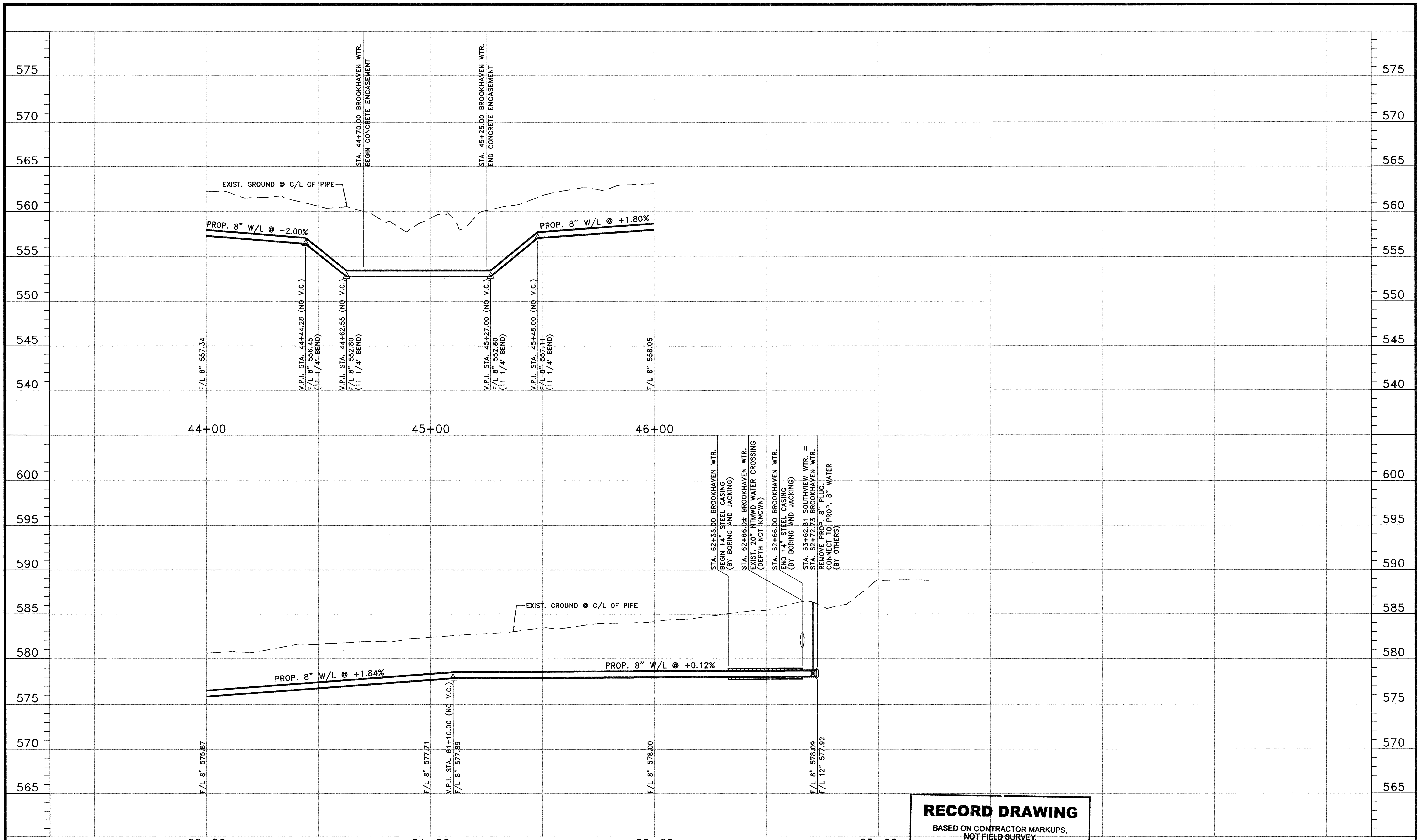
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**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
 NTMWD AND CREEK CROSSING PROFILES - 1  
**CITY OF LUCAS**

SHEET NO. 25  
 OF 35 SHEETS  
 JOB NO. 09-1350





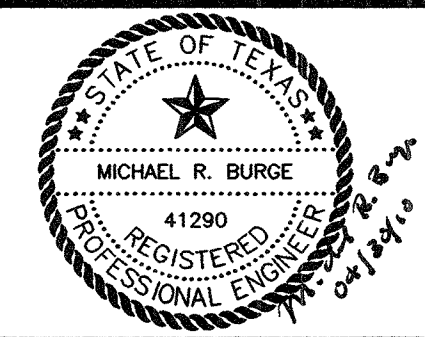
**RECORD DRAWING**  
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NO.	DATE	REVISION	REVIEWED

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 DWG. NAME: 1350BROOK-PROF02

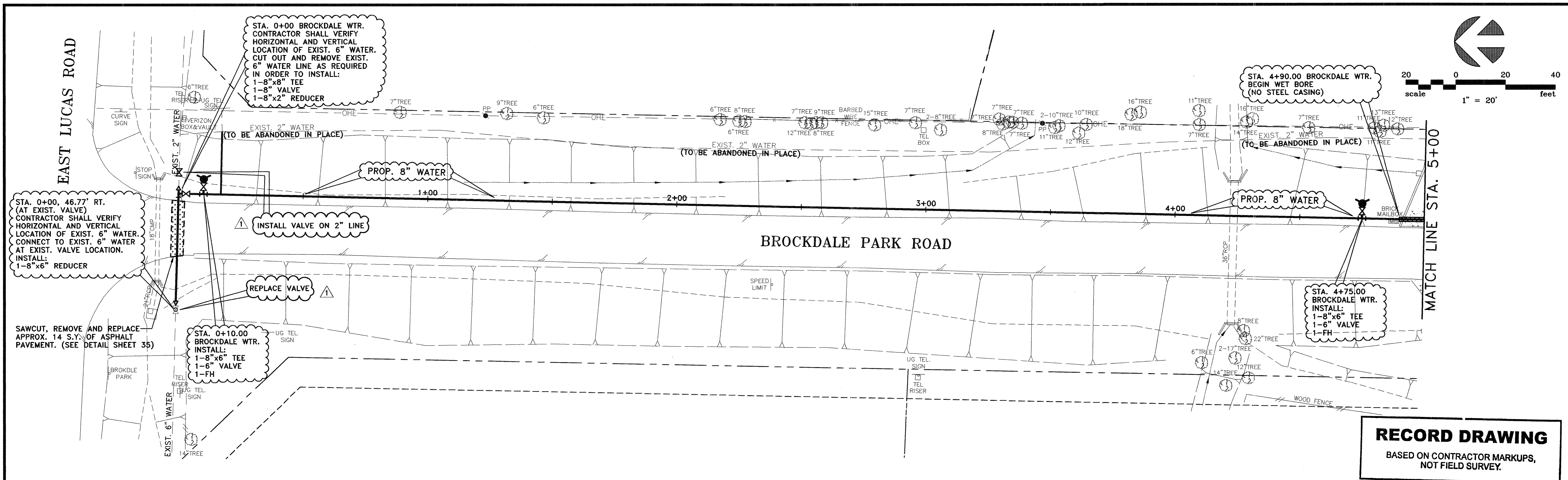


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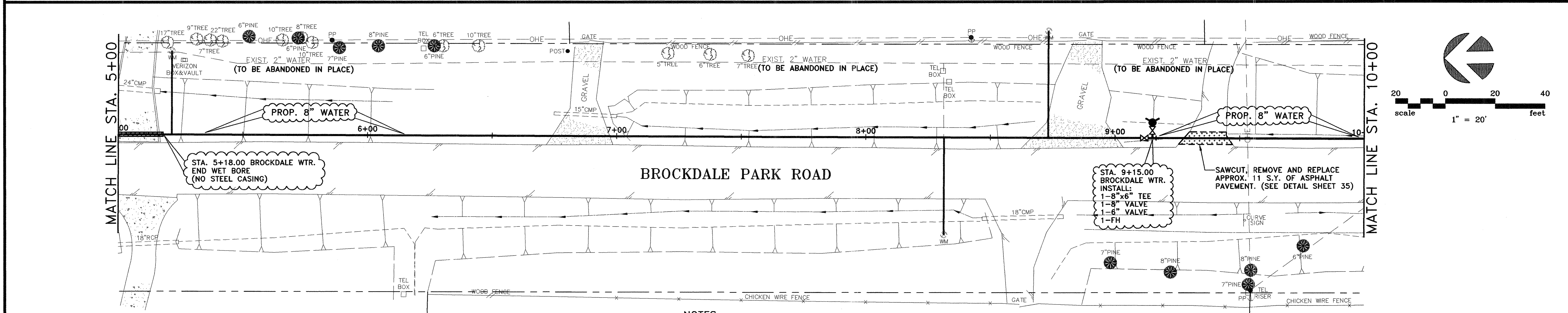


**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE**  
 NTMWD AND CREEK CROSSING PROFILES - 2  
**CITY OF LUCAS**

SHEET NO. 26  
 OF 35 SHEETS  
 JOB NO. 09-1350



**RECORD DRAWING**  
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**RECORD DRAWING**  
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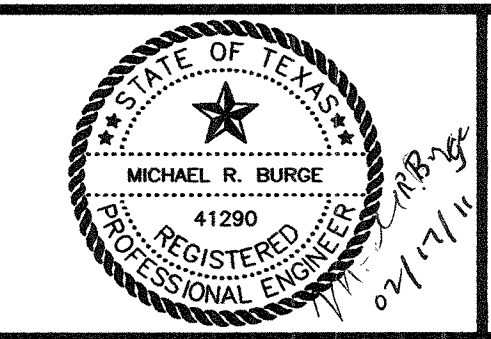
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 DATE:            APRIL 2010  
 DWG. NAME:            1350BROCKWTR01



**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



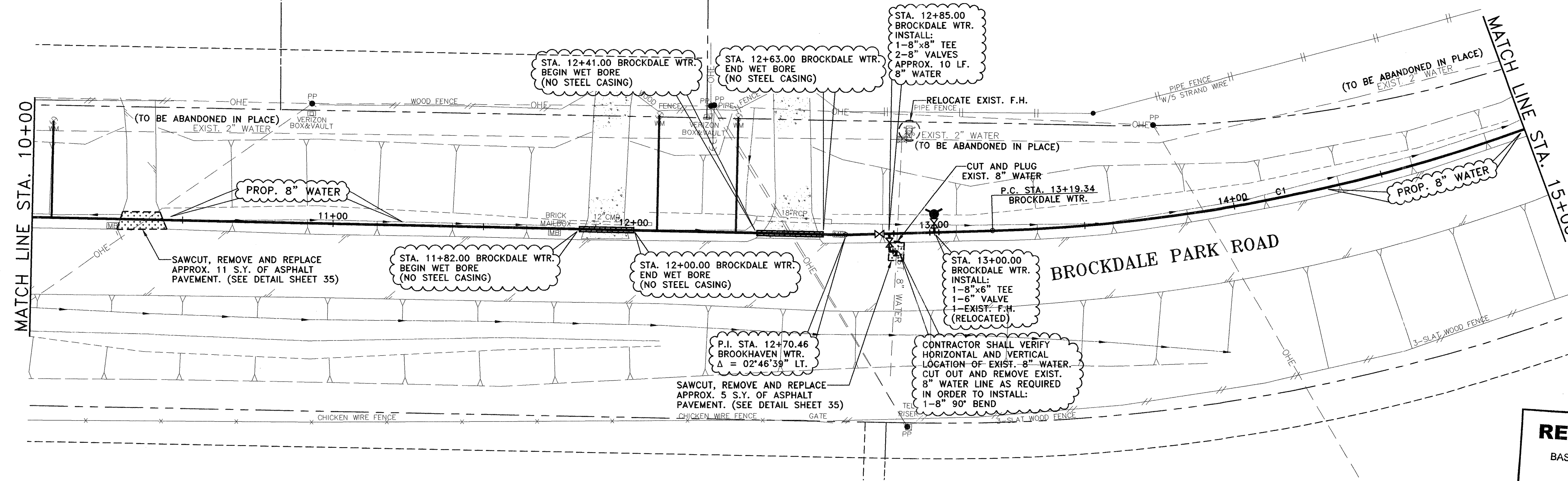
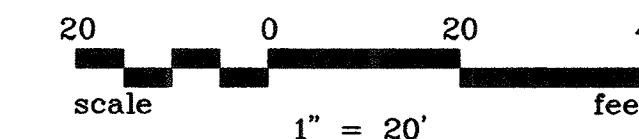
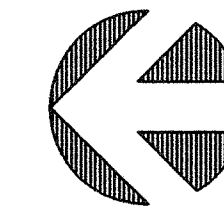
**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
 BROCKDALE WATER - STA. 0+00 TO STA. 10+00  
**CITY OF LUCAS**

SHEET NO. 27  
 OF 35 SHEETS  
 JOB NO. 09-1350

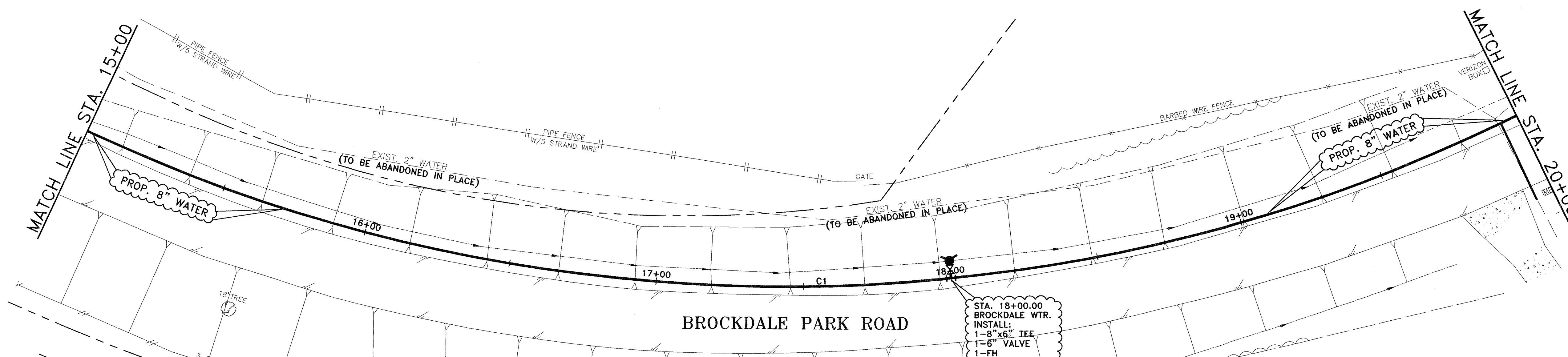
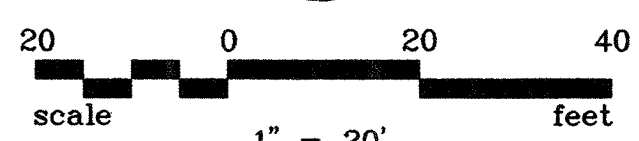
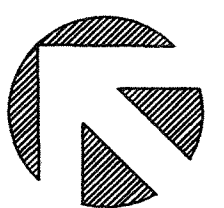


C/L BROCKDALE WATER LINE CURVE TABLE

NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C1	560.00'	87°37'52"	856.49'	S 45°20'47" E	775.42'



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



**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.
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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").

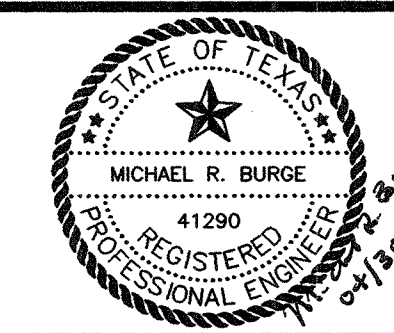
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 CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

NO.	DATE	REVISION	REVIEWED
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DRAWN:                      BW2  
 DESIGN:                      MRB  
 REVIEWED:                      JFW  
 SCALE:                      1" = 20'  
 DATE:                      APRIL 2010  
 DWG. NAME:                      1350BROCKWTR02



**BW2 Engineers, Inc.**  
 1919 S. Shiloh Road  
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 Garland, Texas 75042  
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 Firm Registration No. F-5290

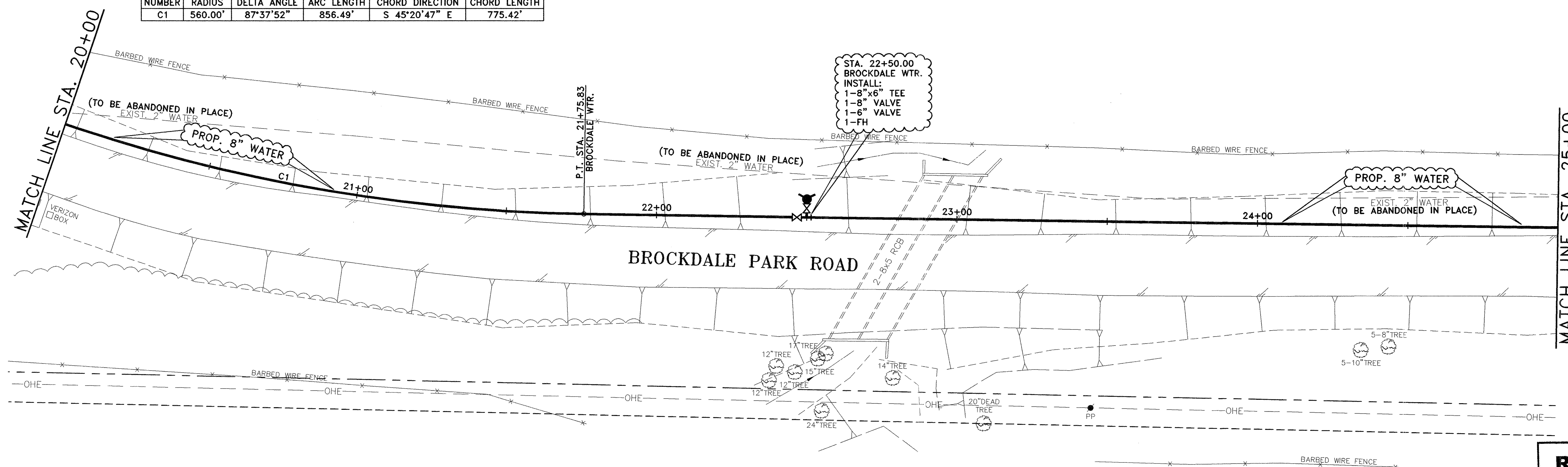
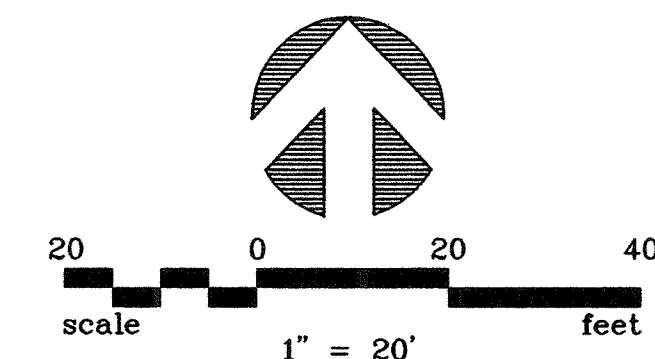


**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
 BROCKDALE WATER - STA. 10+00 TO STA. 20+00  
**CITY OF LUCAS**

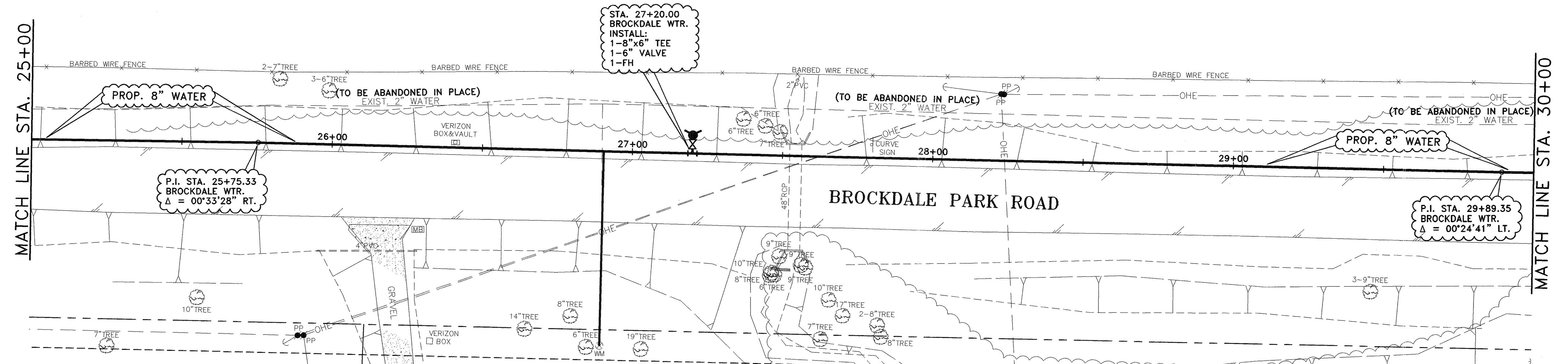
SHEET NO. **28**  
 OF **35** SHEETS  
 JOB NO. 09-1350

C/L BROCKDALE WATER LINE CURVE TABLE

NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C1	560.00'	87°37'52"	856.49'	S 45°20'47" E	775.42'



**RECORD DRAWING**  
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 NOT FIELD SURVEY.



**NOTES:**

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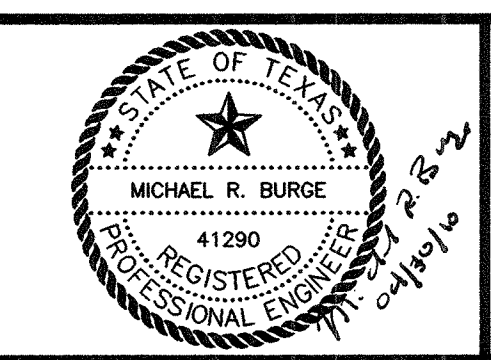
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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: \_\_\_\_\_ 1350BROCKWTR03



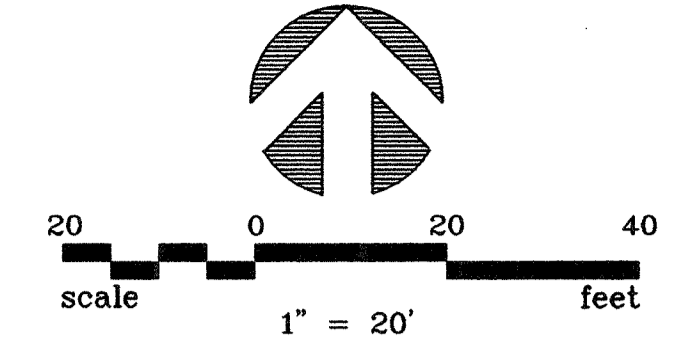
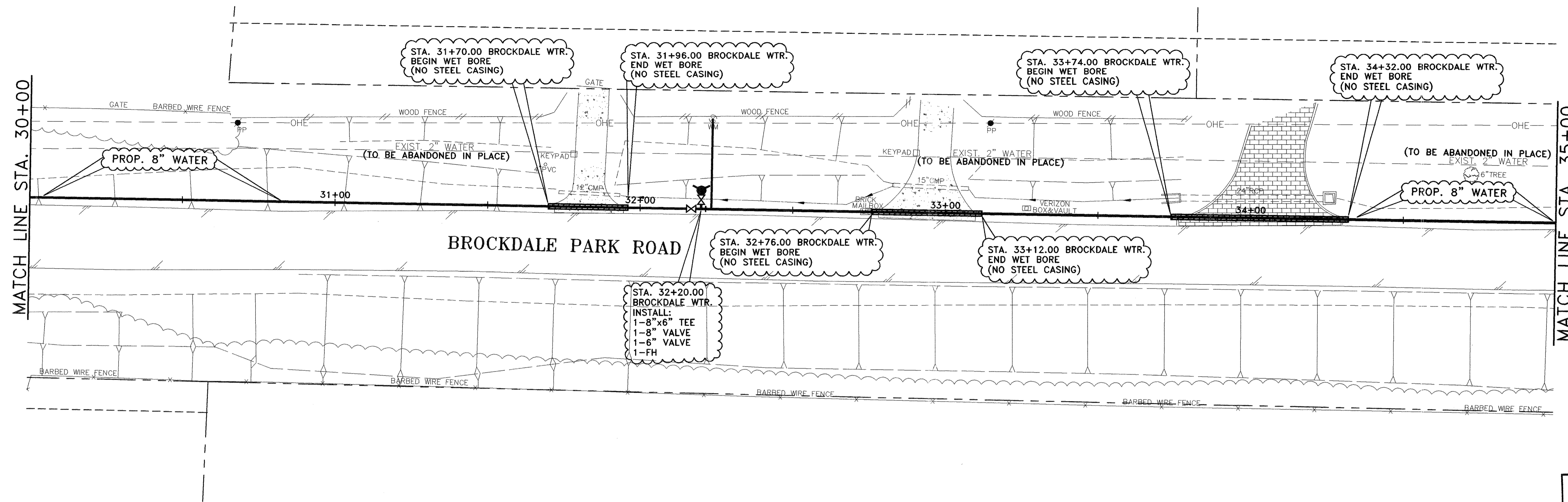
**BW2 Engineers, Inc.**  
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 (972) 864-8200 (T) (972) 864-8220 (F)  
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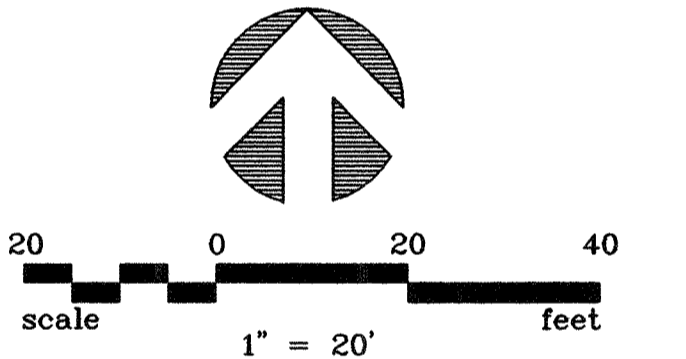
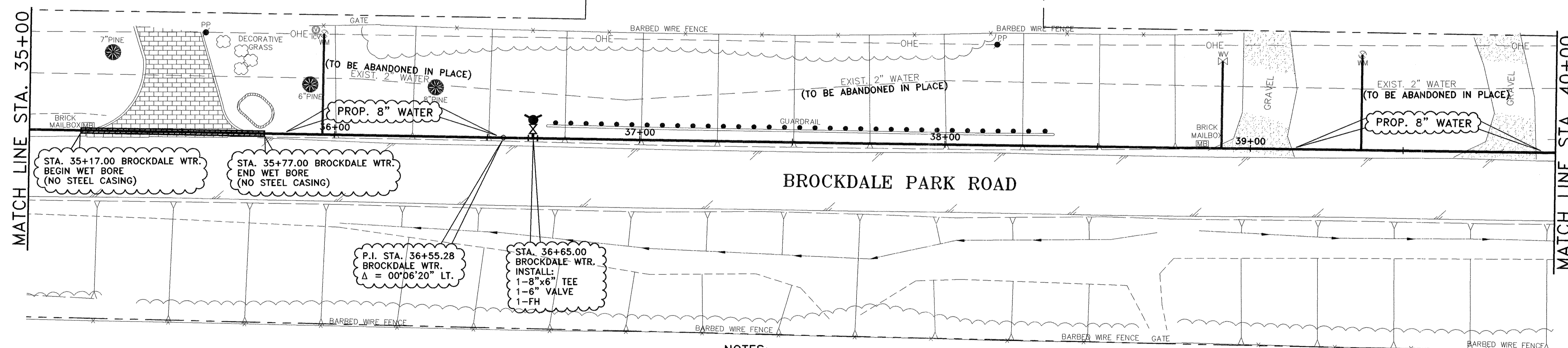
WATER SYSTEM IMPROVEMENTS  
 BROCKDALE PARK ROAD WATER LINE  
 BROCKDALE WATER - STA. 20+00 TO STA. 30+00  
**CITY OF LUCAS**

SHEET NO. 29  
 OF 35 SHEETS  
 JOB NO. 09-1350





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



**NOTES:**

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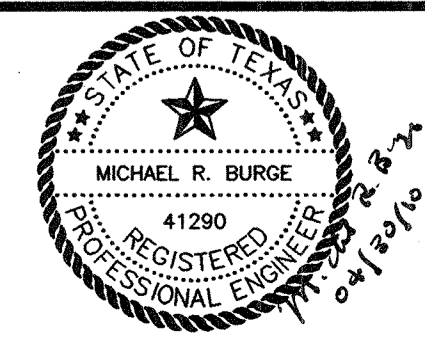
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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROCKWTR04

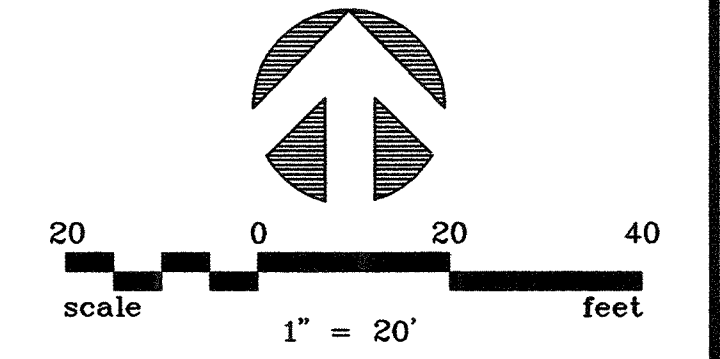
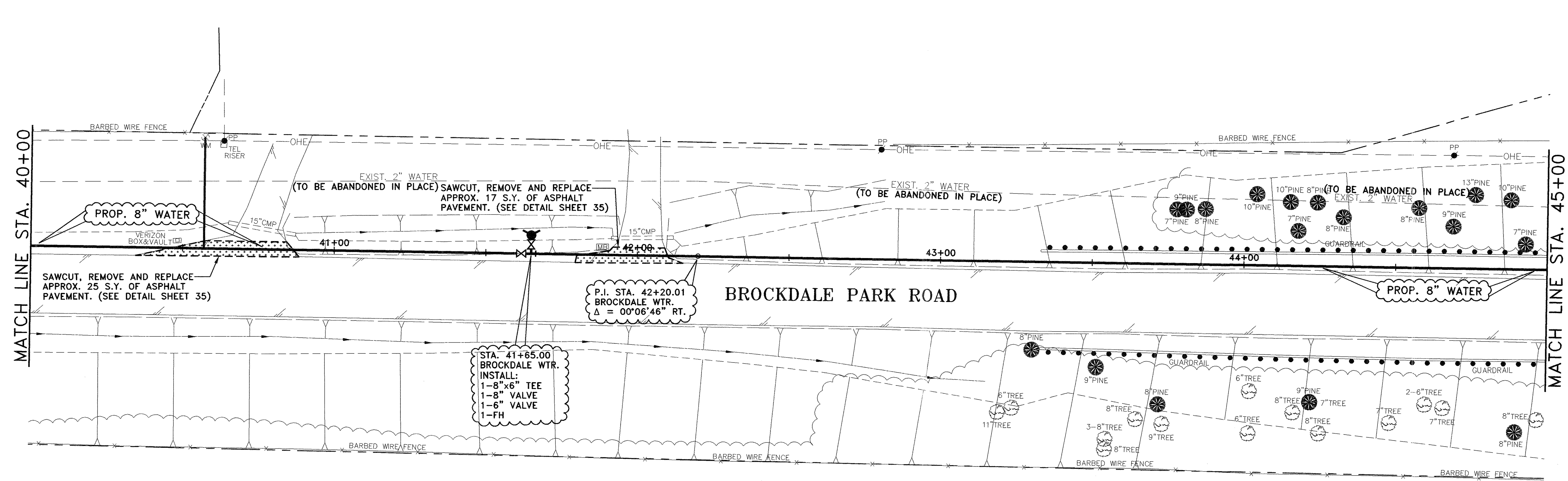


**BW2 Engineers, Inc.**  
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 Garland, Texas 75042  
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 Firm Registration No. F-5290

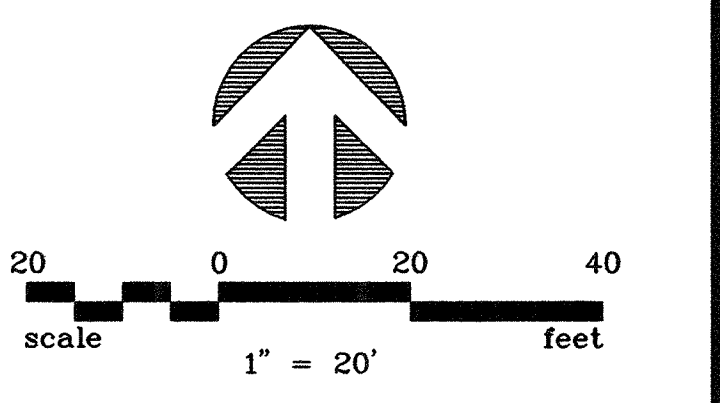
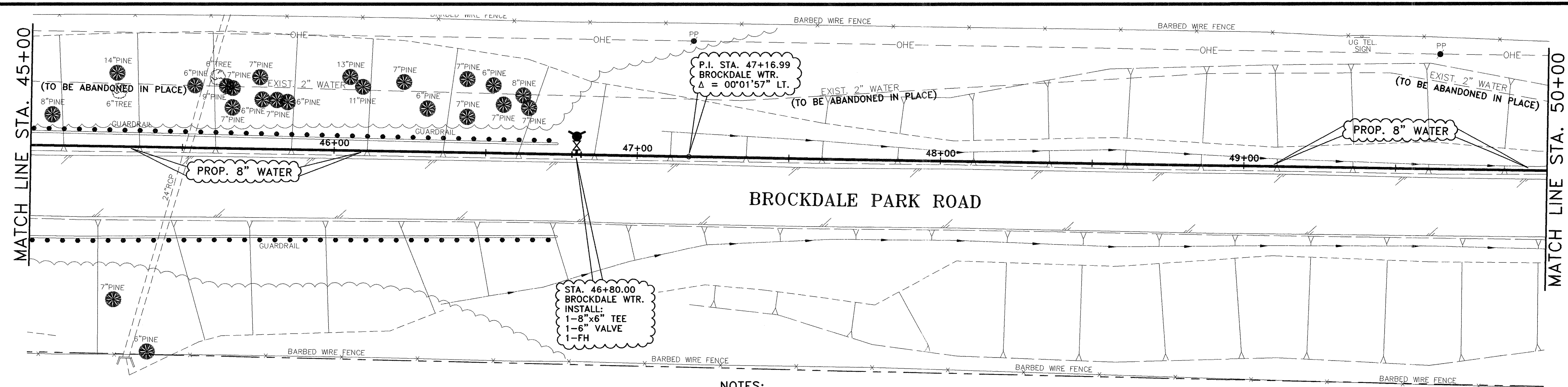


**WATER SYSTEM IMPROVEMENTS  
 BROCKDALE PARK ROAD WATER LINE  
 BROCKDALE WATER - STA. 30+00 TO STA. 40+00  
 CITY OF LUCAS**

SHEET NO. 30  
 OF 35 SHEETS  
 JOB NO. 09-1350



**RECORD DRAWING**  
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 NOT FIELD SURVEY.



**NOTES:**

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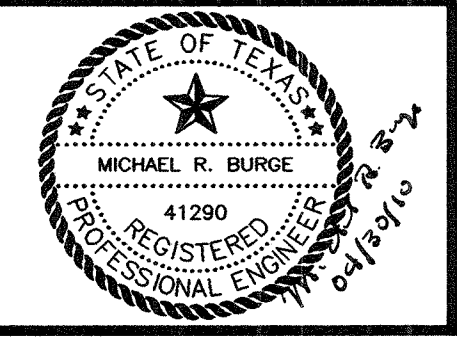
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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: \_\_\_\_\_ 1350BROCKWTR05



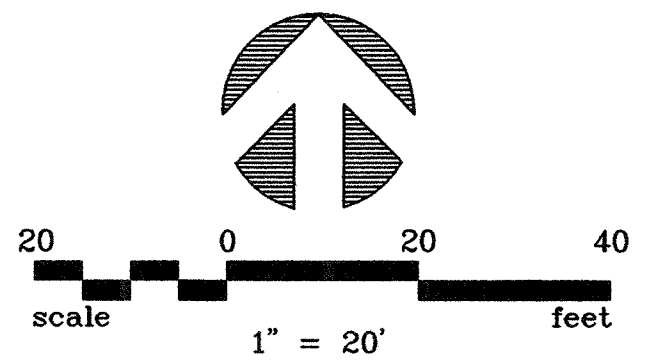
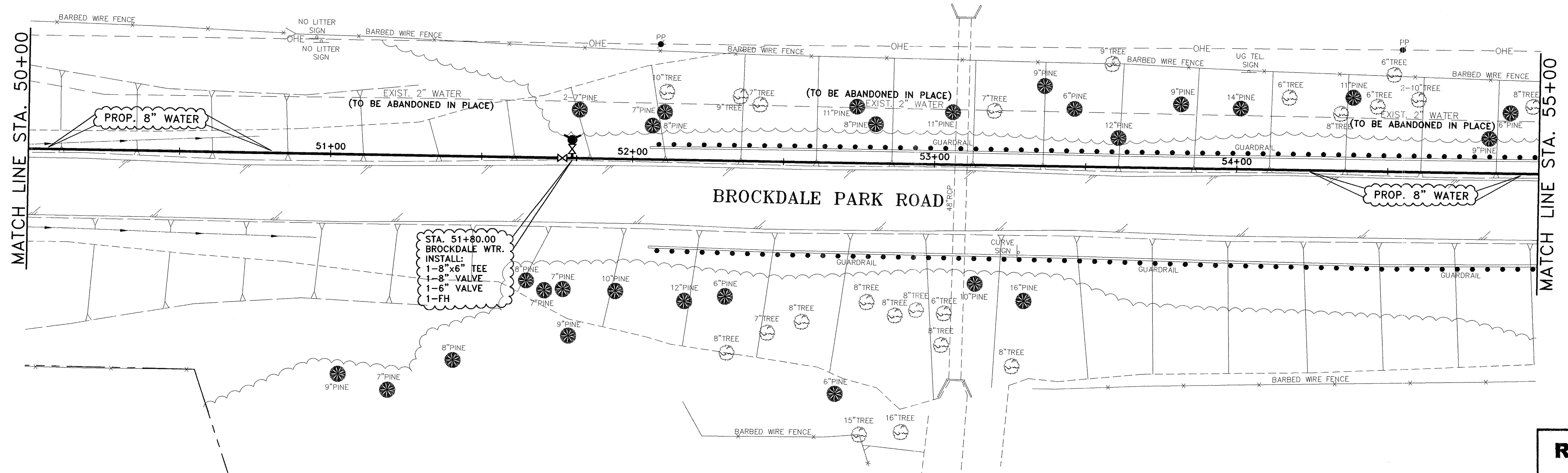
**BW2 Engineers, Inc.**  
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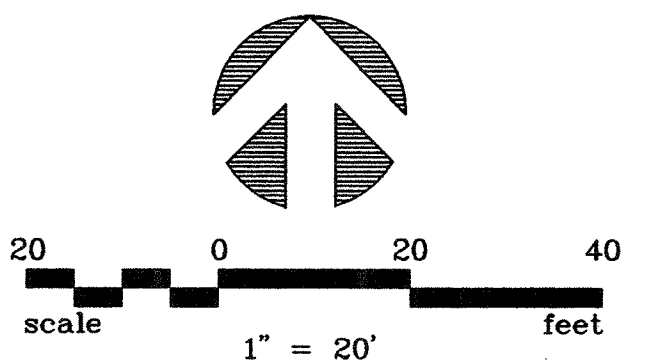
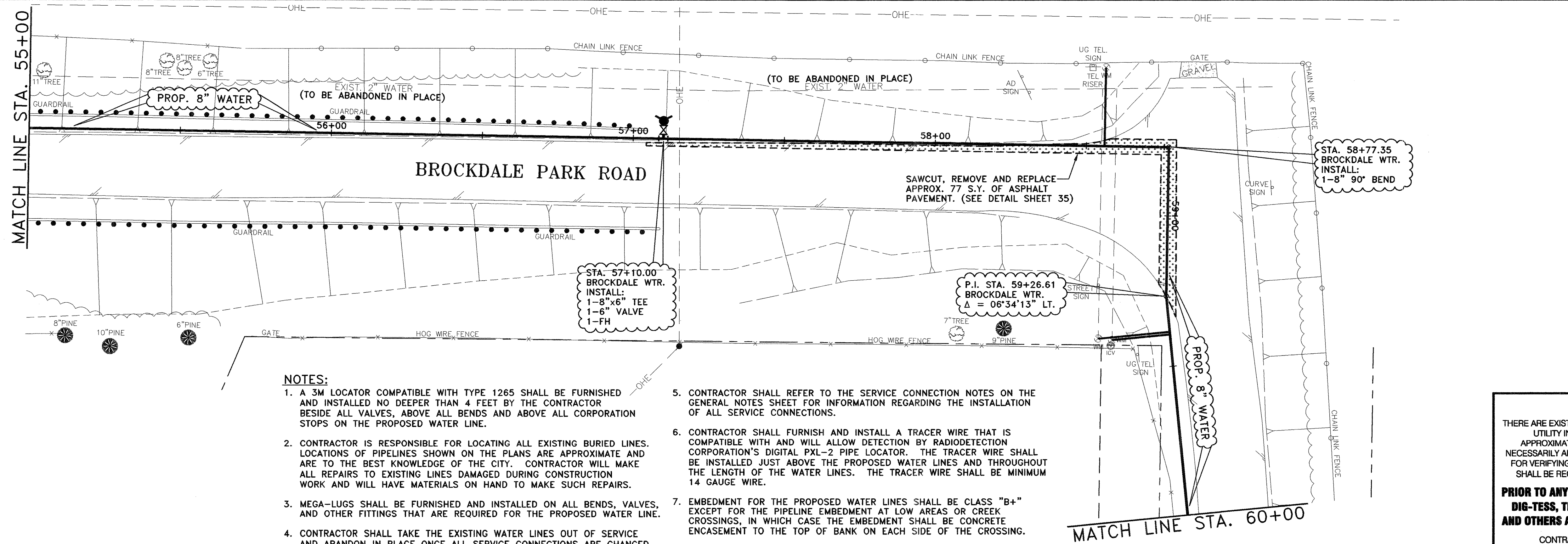
**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
 BROCKDALE WATER - STA. 40+00 TO STA. 50+00  
**CITY OF LUCAS**

SHEET NO. 31  
 OF 35 SHEETS  
 JOB NO. 09-1350





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



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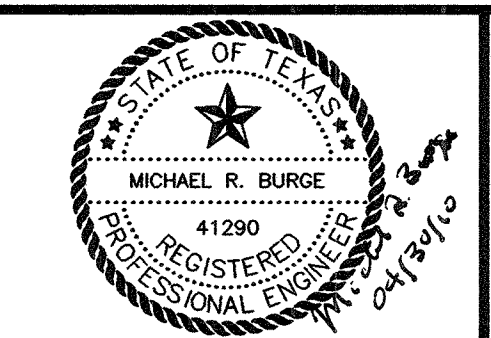
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NO.	DATE	REVISION	REVIEWED

DRAWN: \_\_\_\_\_ BW2  
 DESIGN: \_\_\_\_\_ MRB  
 REVIEWED: \_\_\_\_\_ JFW  
 SCALE: \_\_\_\_\_ 1" = 20'  
 DATE: \_\_\_\_\_ APRIL 2010  
 DWG. NAME: 1350BROCKWTR06



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 Firm Registration No. F-5290

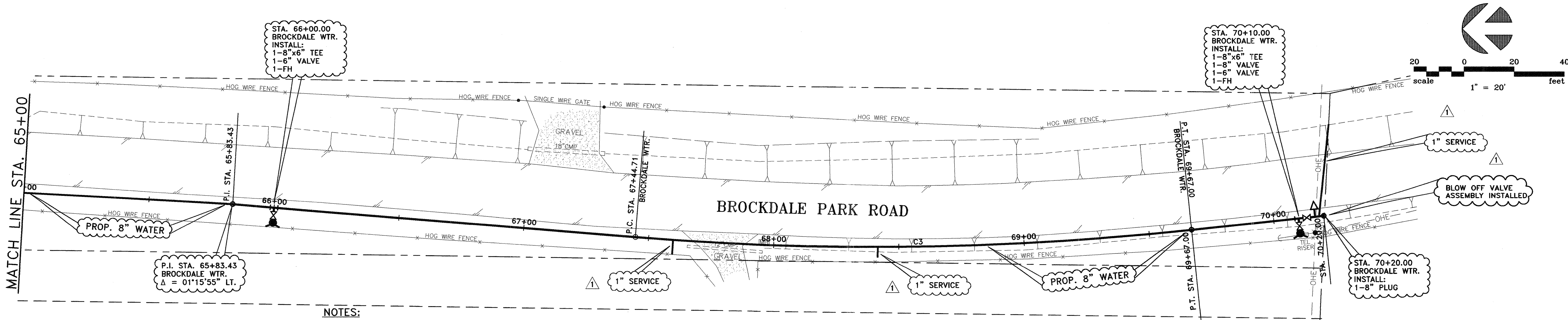
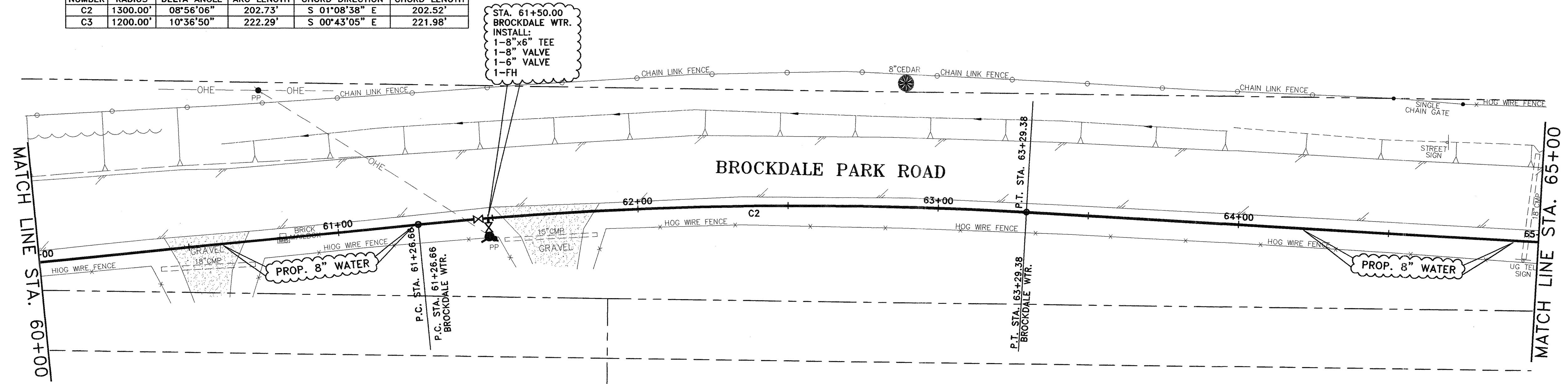
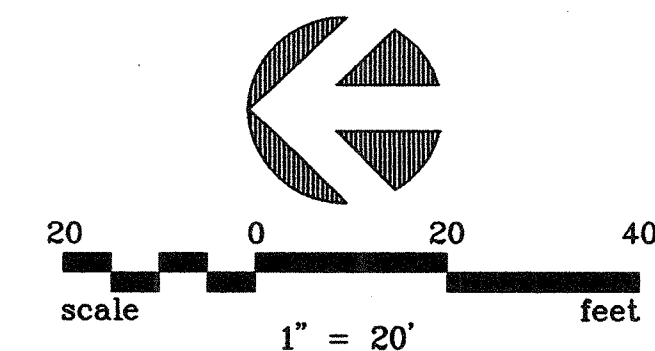


**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
 BROCKDALE WATER - STA. 50+00 TO STA. 60+00  
**CITY OF LUCAS**

SHEET NO. 32  
 OF 35 SHEETS  
 JOB NO. 09-1350

**C/L BROCKDALE WATER LINE CURVE TABLE**

NUMBER	RADIUS	DELTA ANGLE	ARC LENGTH	CHORD DIRECTION	CHORD LENGTH
C2	1300.00'	08°56'06"	202.73'	S 01°08'38" E	202.52'
C3	1200.00'	10°36'50"	222.29'	S 00°43'05" E	221.98'



- 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 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.
  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").

**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.**

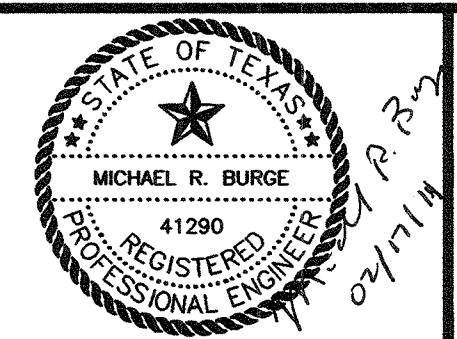
CONTRACTOR SHALL ALSO CONTACT APPROPRIATE CITY UTILITY DEPARTMENT FOR FIELD LOCATES OF MUNICIPAL INFRASTRUCTURE 48 HOURS PRIOR TO CONSTRUCTION.

NO.	DATE	REVISION	REVIEWED
6			
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2			
1	02/17/11	REVISED PER CONTRACTOR MARKUPS	MRB

DRAWN:            BW2  
 DESIGN:            MRB  
 REVIEWED:            JFW  
 SCALE:            1" = 20'  
 DATE:            APRIL 2010  
 DWG. NAME:            1350BROCKWTR07



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 Firm Registration No. F-5290



**WATER SYSTEM IMPROVEMENTS**  
**BROCKDALE PARK ROAD WATER LINE**  
 BROCKDALE WATER - STA. 60+00 TO STA. 70+20  
**CITY OF LUCAS**

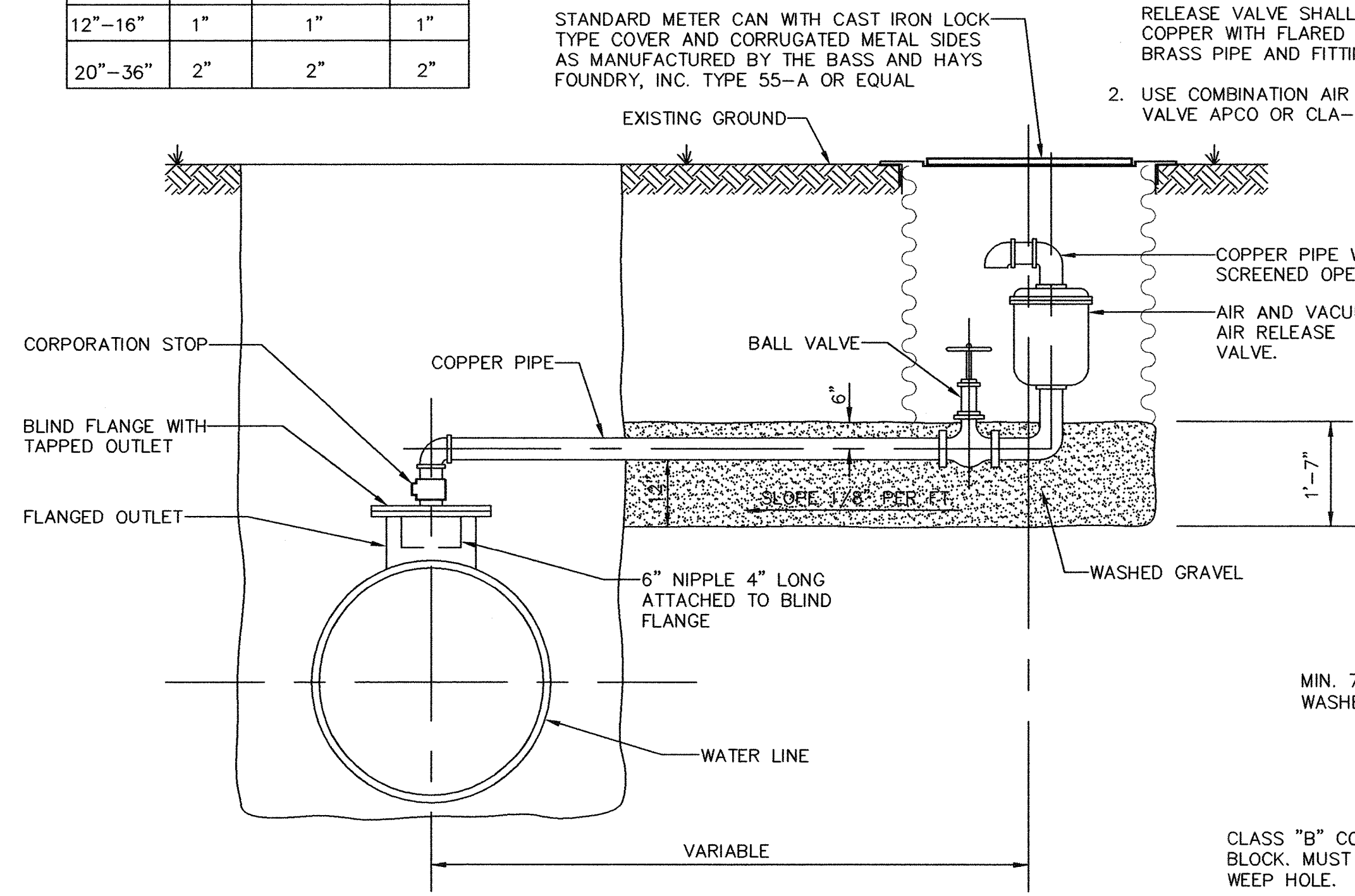
SHEET NO. **33**  
 OF **35** SHEETS  
 JOB NO. 09-1350



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

**NOTES:**

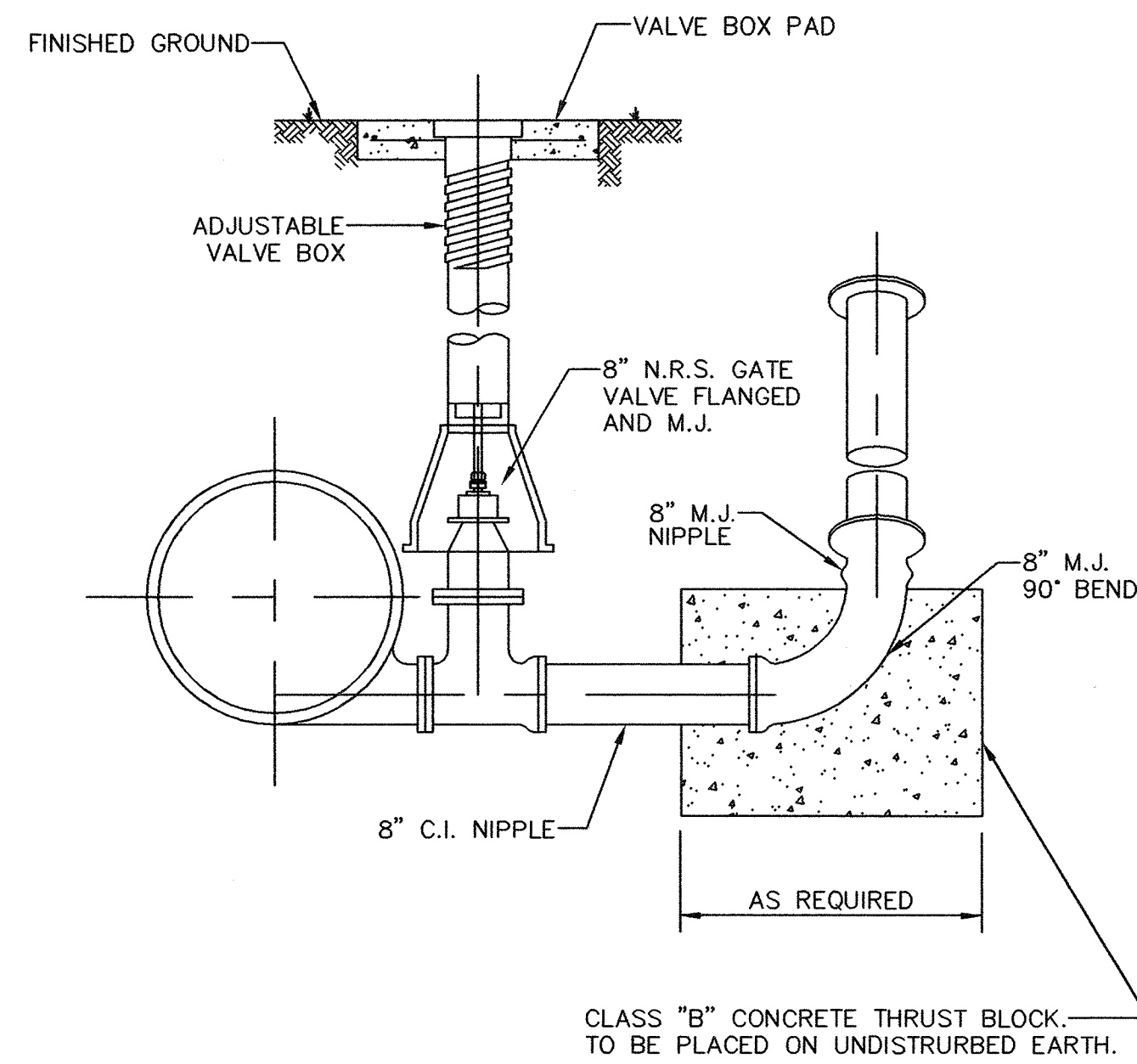
1. PIPING AND FITTINGS FOR AIR AND VACUUM-AIR RELEASE VALVE SHALL BE 3/8" TYPE "K" SOFT COPPER WITH FLARED CONNECTIONS OR THREADED BRASS PIPE AND FITTINGS.
2. USE COMBINATION AIR AND VACUUM-AIR RELEASE VALVE APCO OR CLA-VAL OR APPROVED EQUAL.



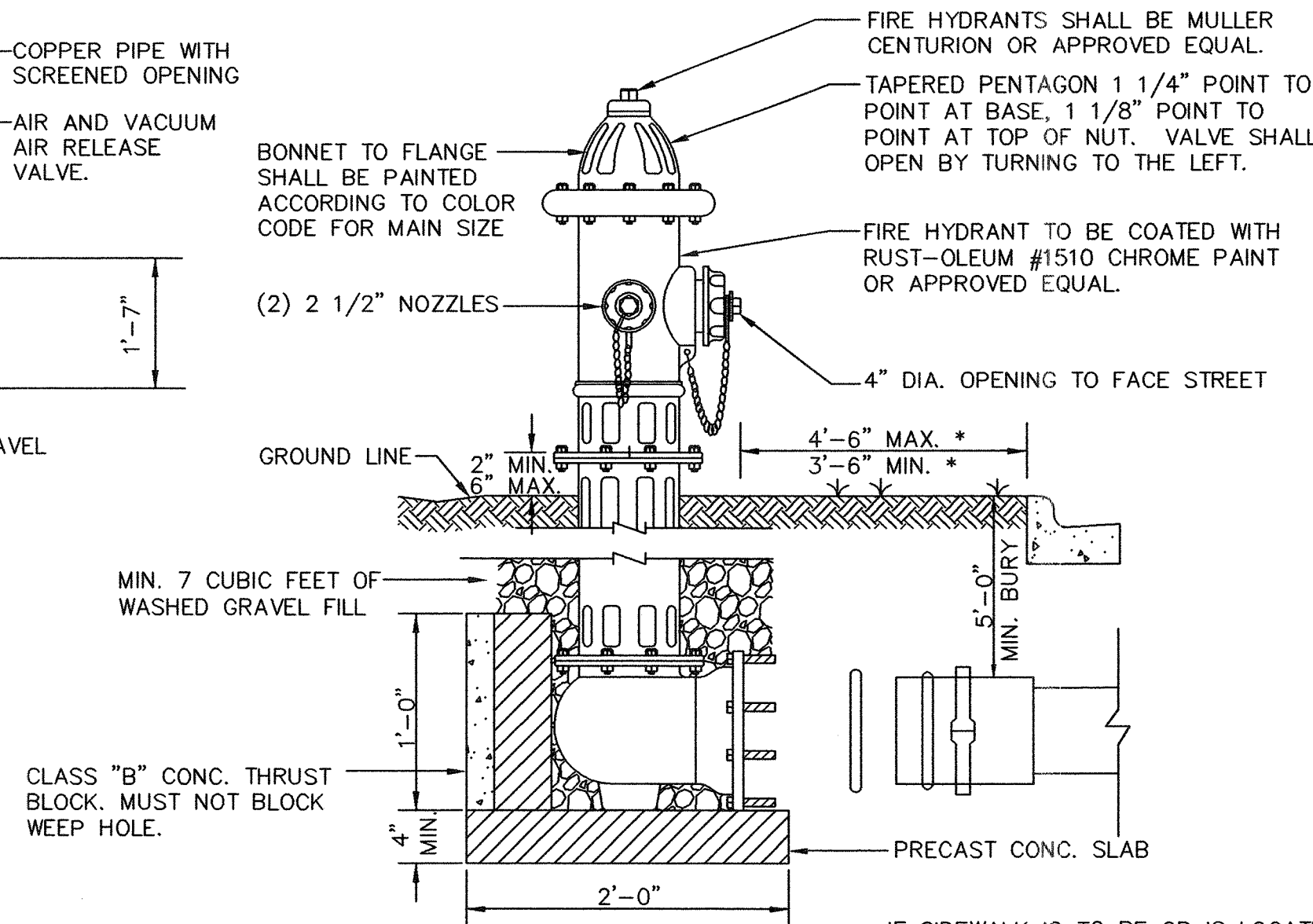
**TYPICAL AIR AND VACUUM-AIR RELEASE VALVE INSTALLATION**  
N.T.S.

**NOTE:**

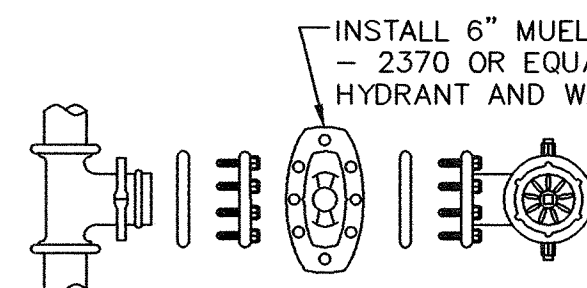
A PERMANENTLY ATTACHED VALVE EXTENSION STEM SHALL BE REQUIRED FOR ANY VALVE WHERE THE OPERATOR NUT IS LOCATED IN EXCESS OF 48 INCHES BELOW FINISH GRADE. THIS EXTENSION SHALL BE OF SUFFICIENT LENGTH TO INSURE THAT THE OPERATOR NUT IS WITHIN 48 INCHES OF THE FINISH GRADE.



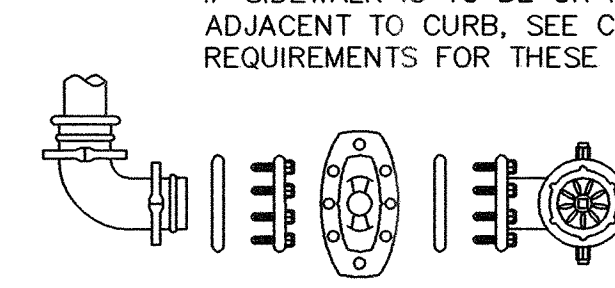
**BLOW OFF VALVE DETAIL**  
N.T.S.



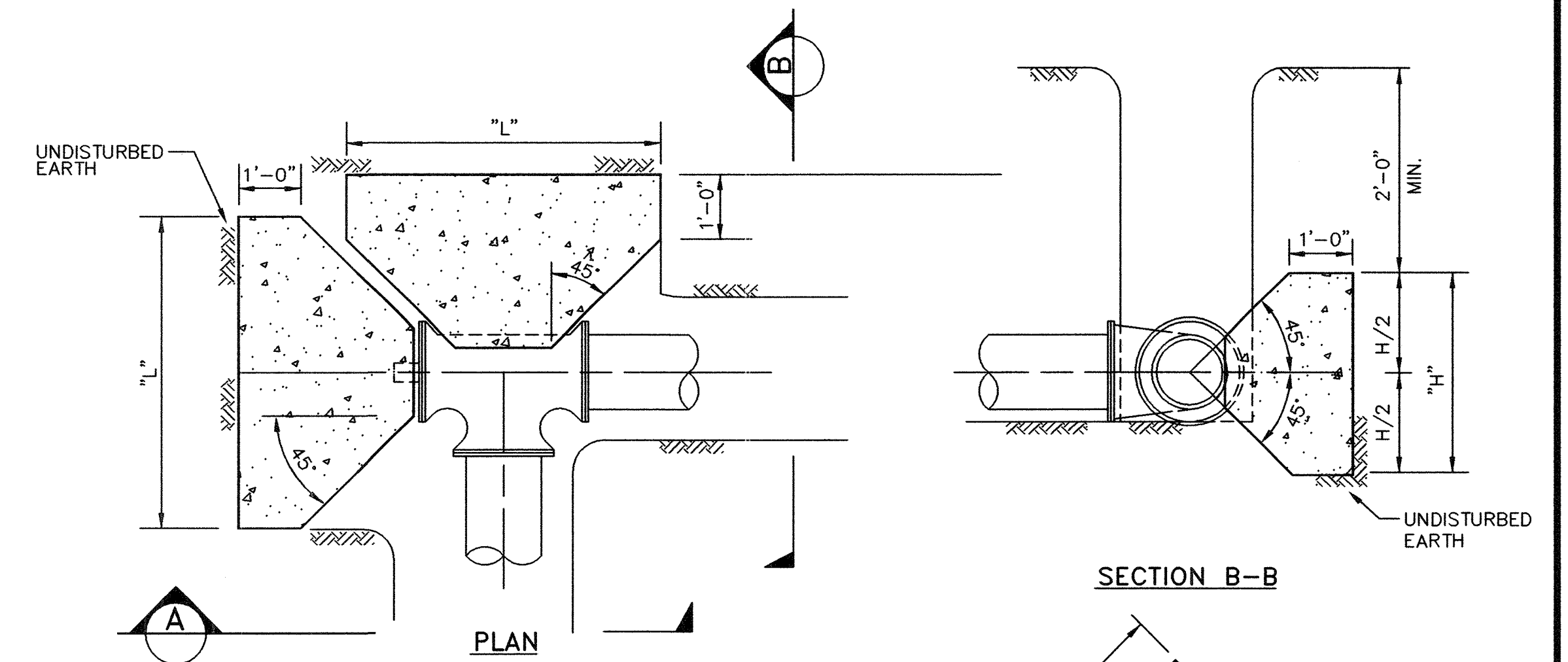
**FIRE HYDRANT INSTALLATION**  
N.T.S.



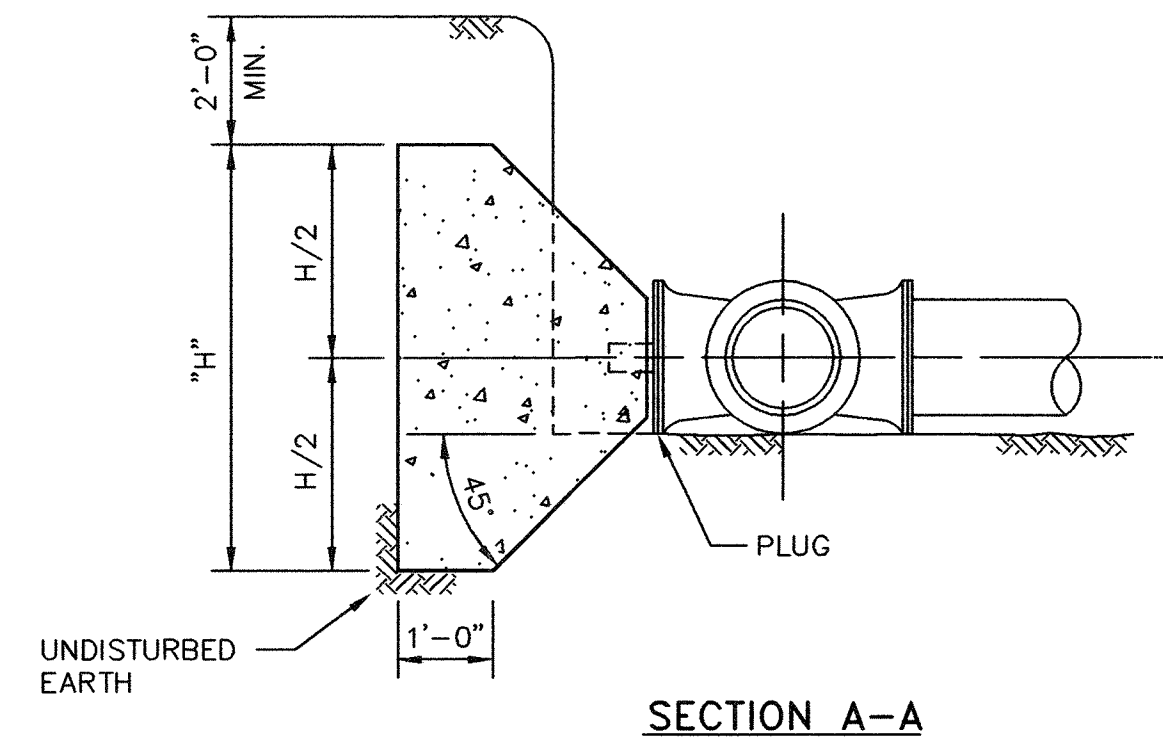
INSTALL 6" MUELLER R.S.G.V. A-2370 OR EQUAL BETWEEN FIRE HYDRANT AND WATER MAIN



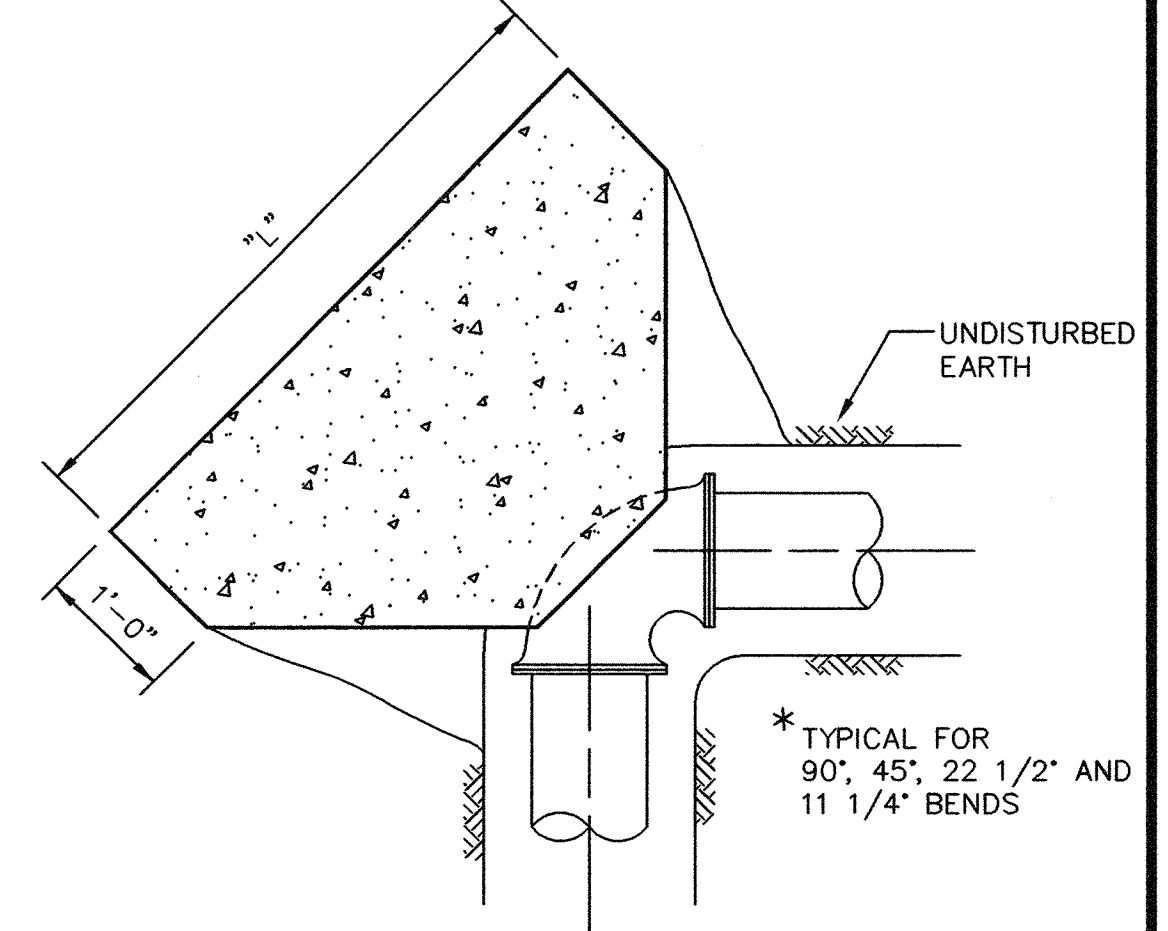
SWIVELxSWIVEL 90° ELL-MJxFLANGE VALVE-FLANGE HYDRANT



**PLUGS & TEES**



**SECTION A-A**



**SECTION B-B**

\* TYPICAL FOR 90°, 45°, 22 1/2° AND 11 1/4° BENDS

**GENERAL NOTES:**

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

**PLAN BENDS**

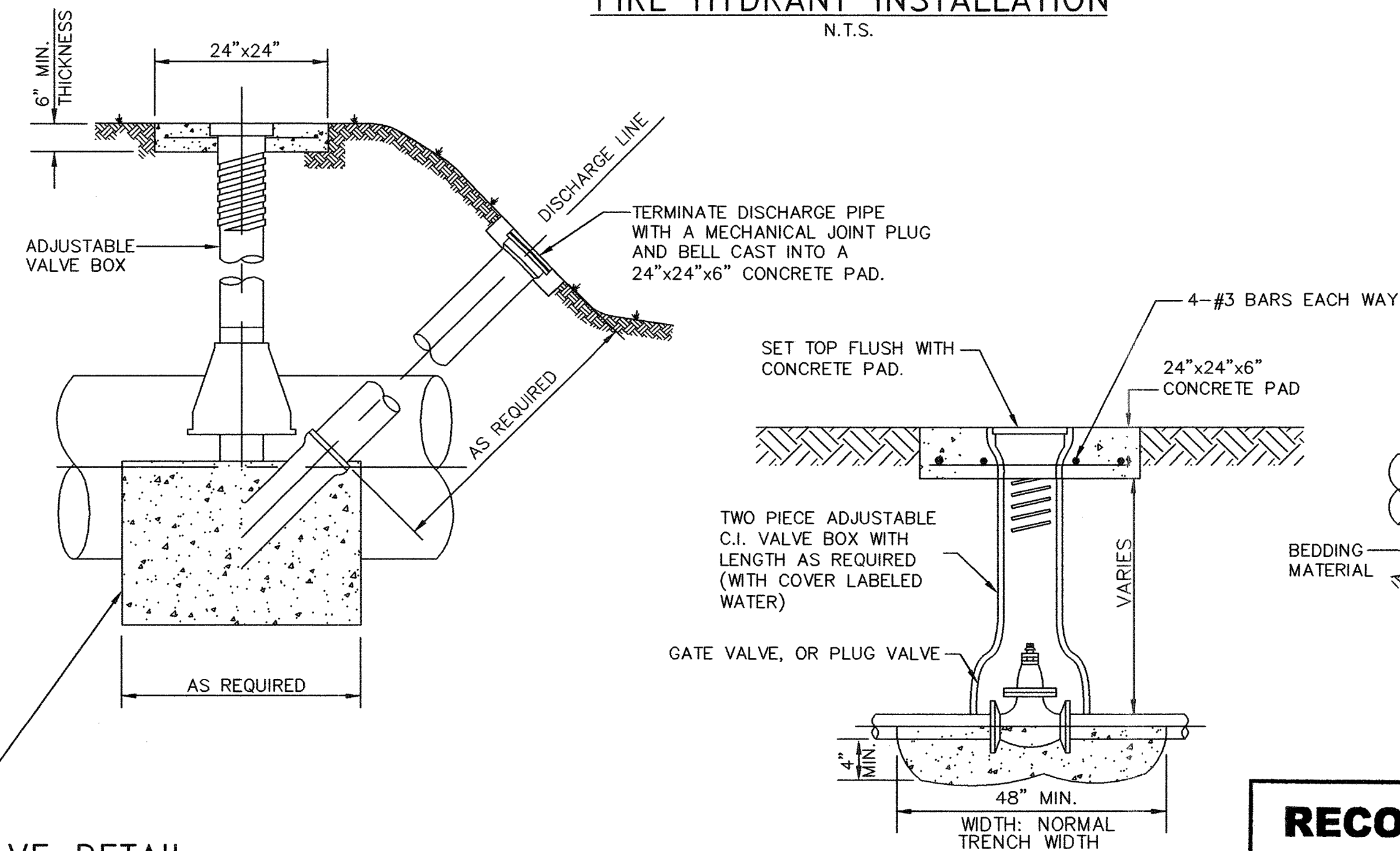
PIPE SIZE (INCHES)	DEGREE OF BEND (DEGREE)	MINIMUM CONCRETE ANCHOR BLOCK			
		EARTH (FEET)		ROCK (FEET)	
		"L"	"H"	"L"	"H"
6, 8	11 1/4	1.0	1.5	1.0	1.0
10, 12*	22 1/2	1.5	1.5	1.0	1.0
16**	45	2.0	2.0	1.5	1.5
	90	5.0	1.5	2.0	2.0

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

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

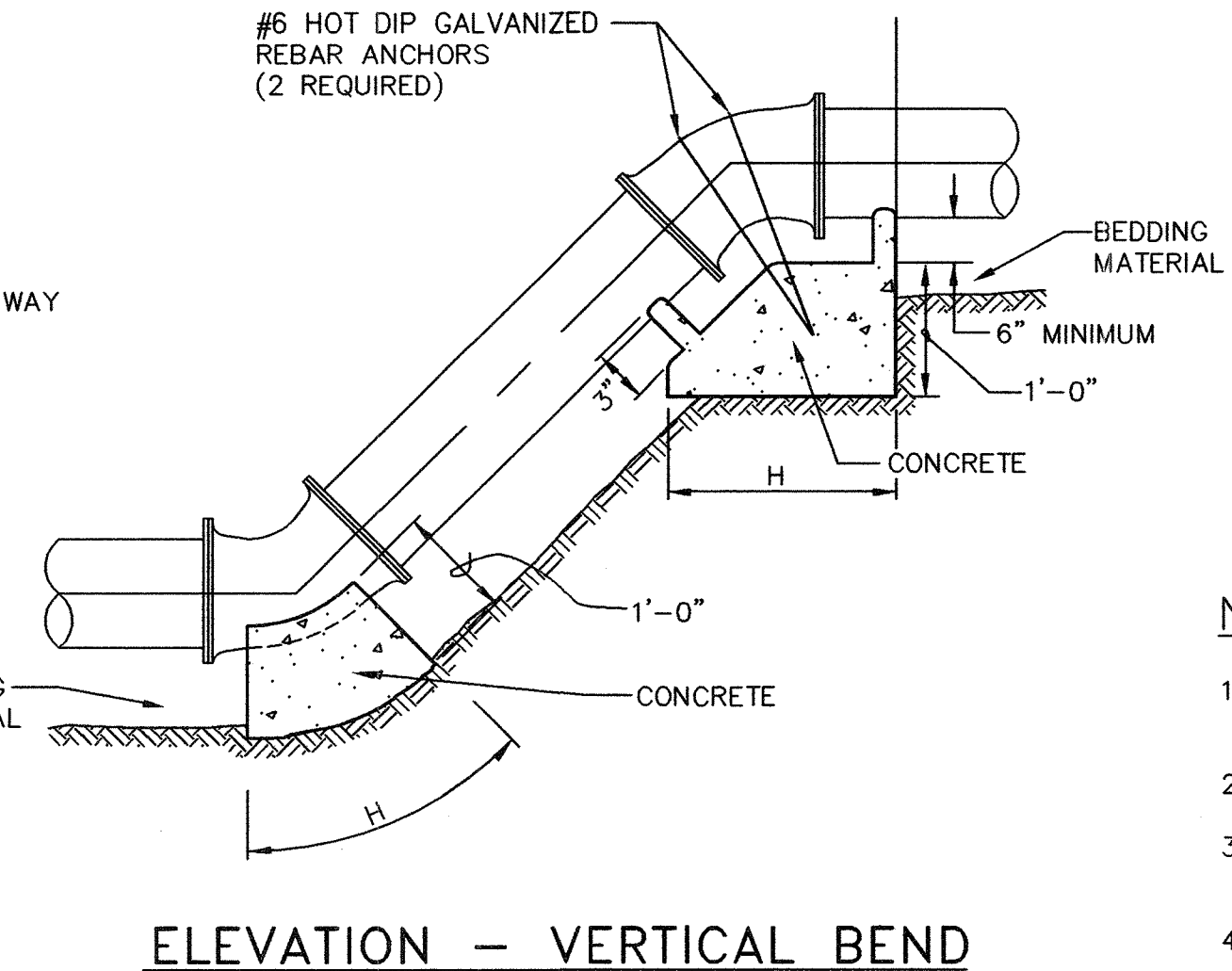
**NOTES:**

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.



**BURIED VALVE DETAIL**  
N.T.S.

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



**ELEVATION - VERTICAL BEND**

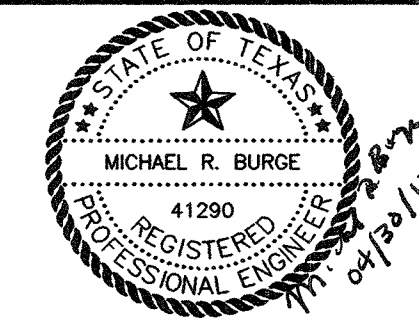
**CONCRETE ANCHOR BLOCKS**  
N.T.S.

NO.	DATE	REVISION	REVIEWED
6			
5			
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DRAWN:                      BW2  
DESIGN:                      MRB  
REVIEWED:                    JFW  
SCALE:                      N.T.S.  
DATE:                      APRIL 2010  
DWG. NAME:                1350DET1-BROOK

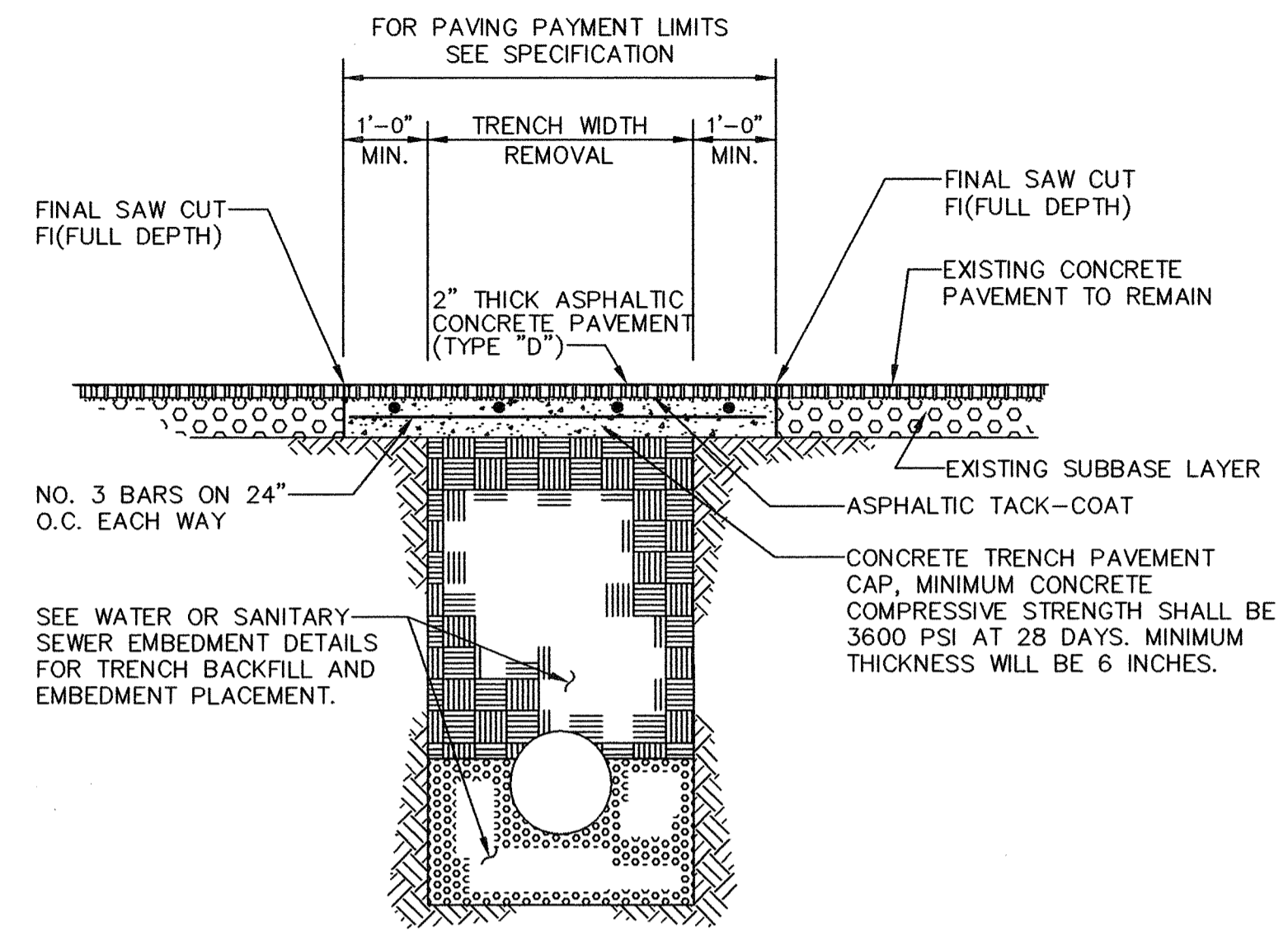


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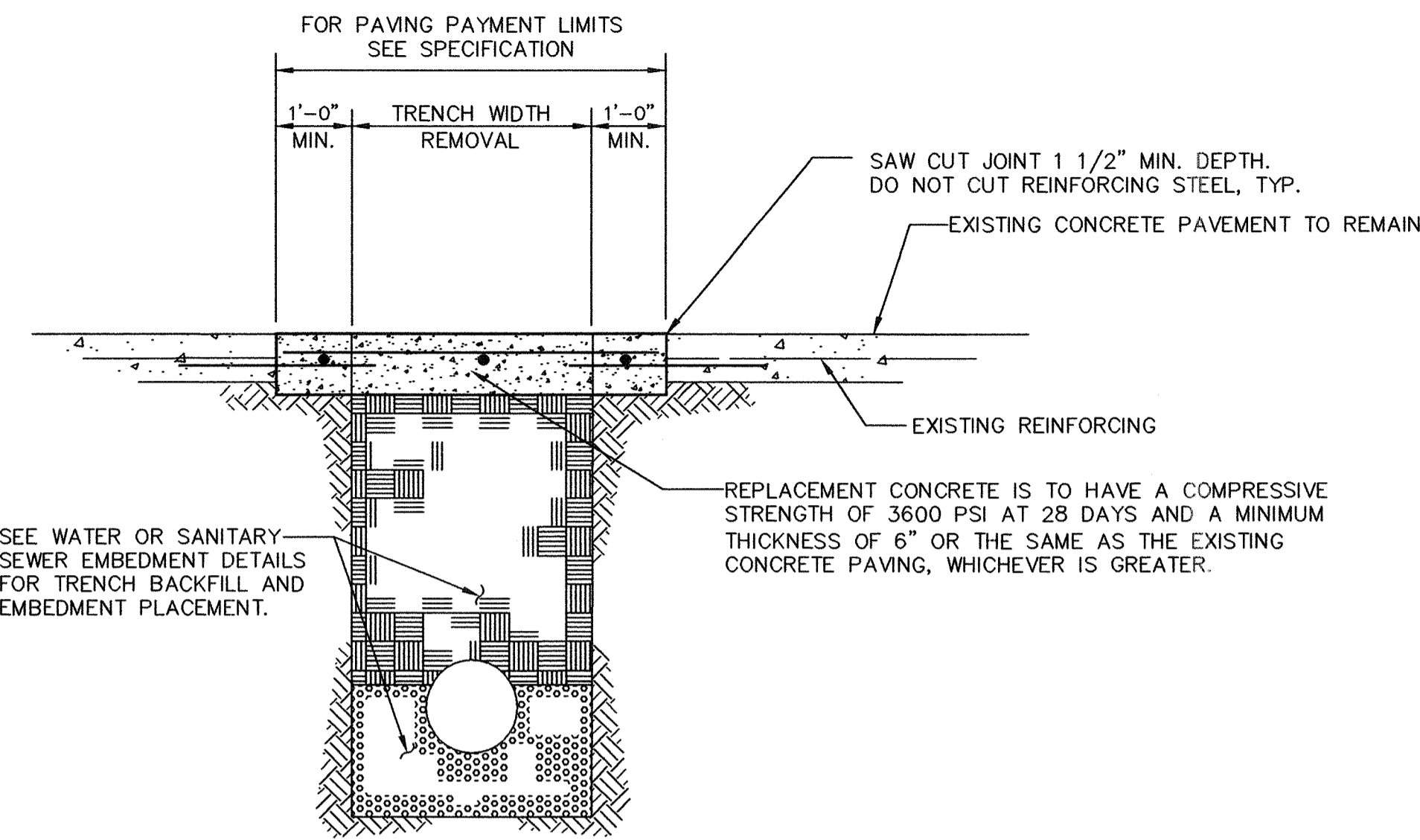


**WATER SYSTEM IMPROVEMENTS**  
**BROOKHAVEN DRIVE WATER LINE AND**  
**BROCKDALE PARK ROAD WATER LINE**  
GENERAL CONSTRUCTION DETAILS - SHEET 1  
**CITY OF LUCAS**

SHEET NO. **34**  
OF **35** SHEETS  
JOB NO. 09-1350



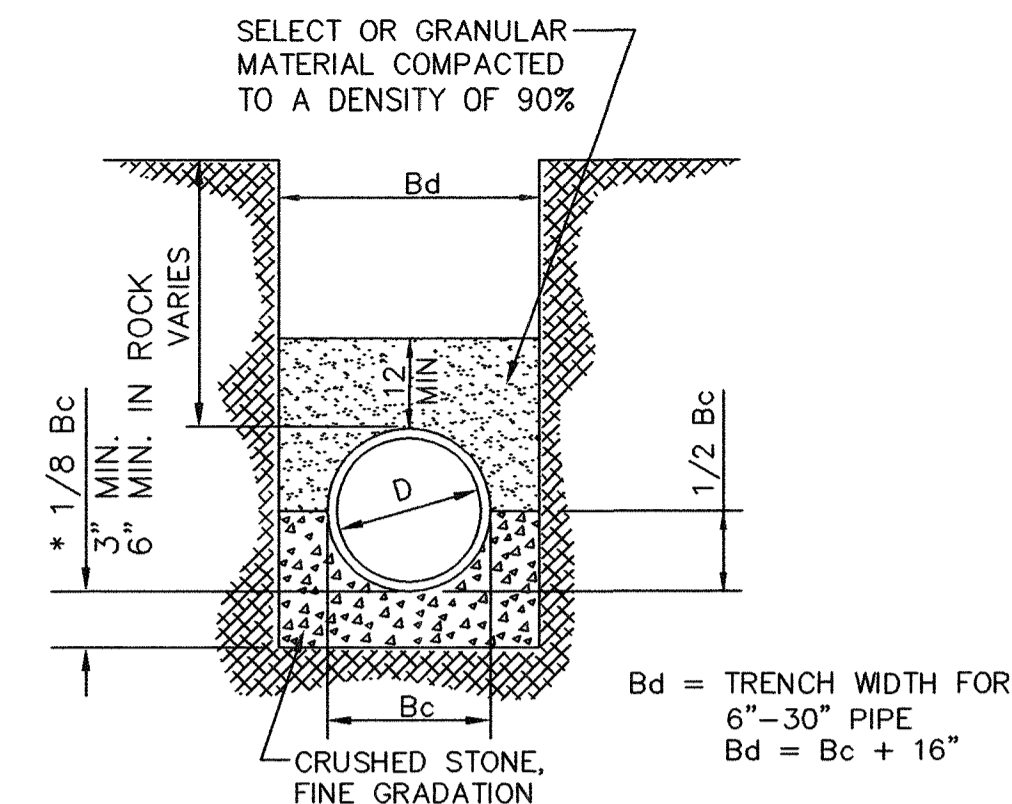
**FLEXIBLE BASE AND ASPHALTIC CONCRETE SURFACE**



**REINFORCED CONCRETE PAVEMENT**

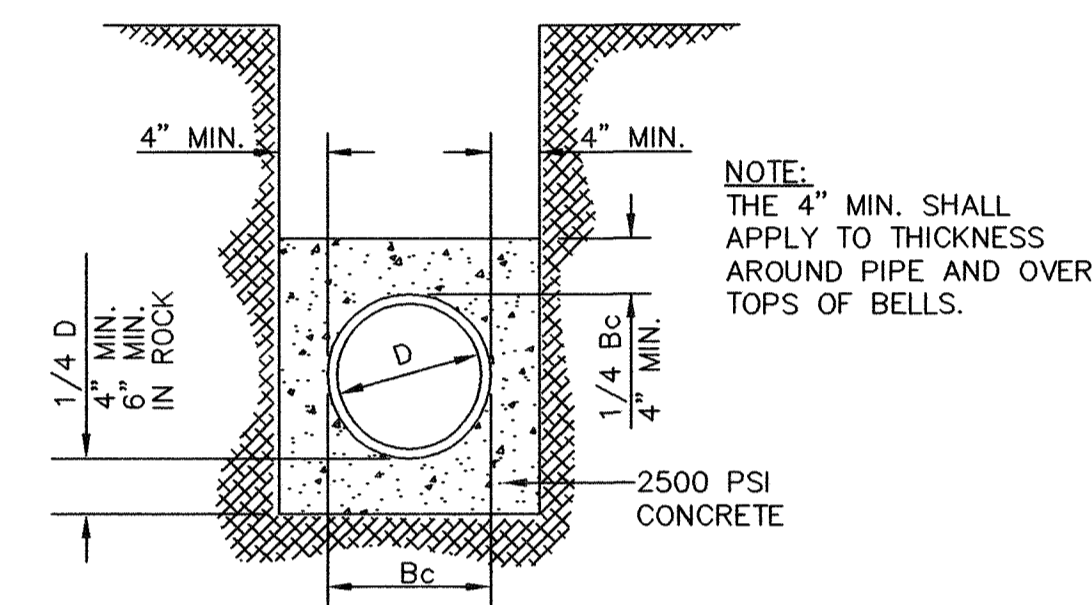
**TYPICAL PAVEMENT REPAIR DETAILS**

N.T.S.



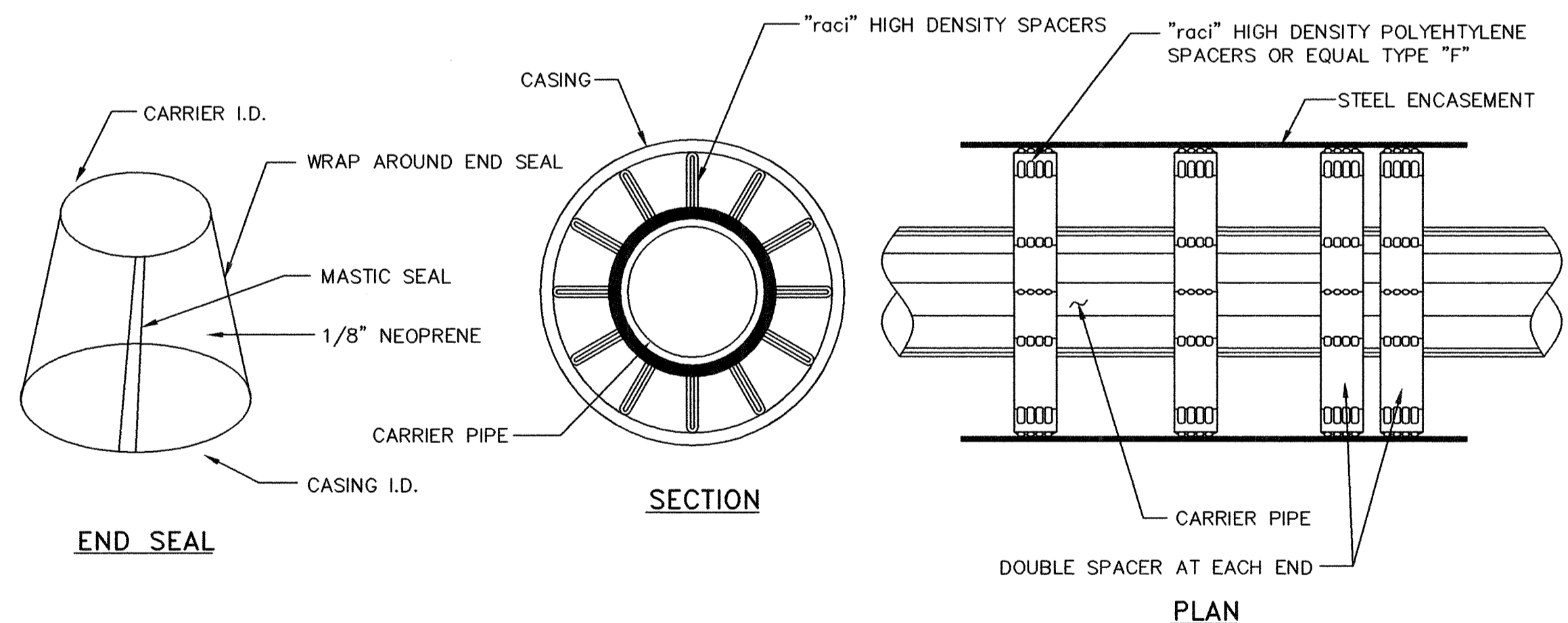
**CLASS "B+" EMBEDMENT**

N.T.S.



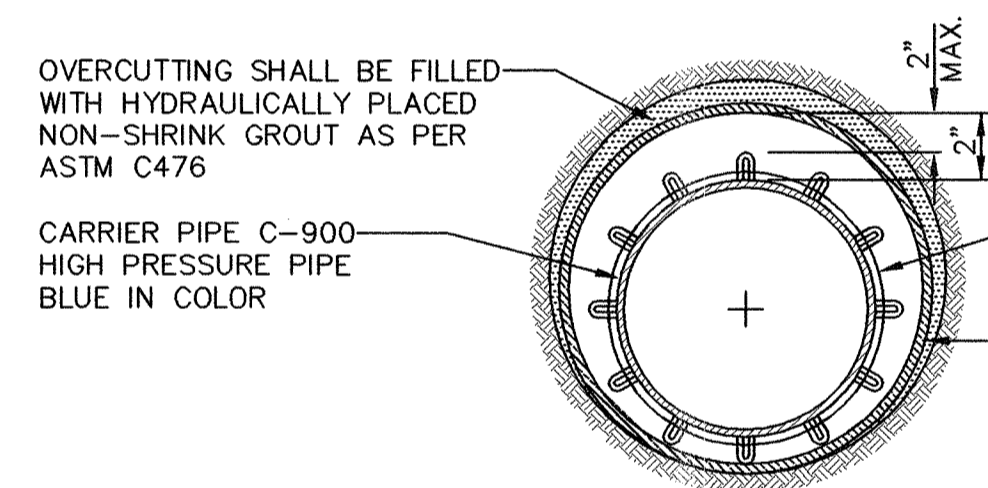
**CLASS "G" EMBEDMENT (CONCRETE ENCASEMENT)**

N.T.S.



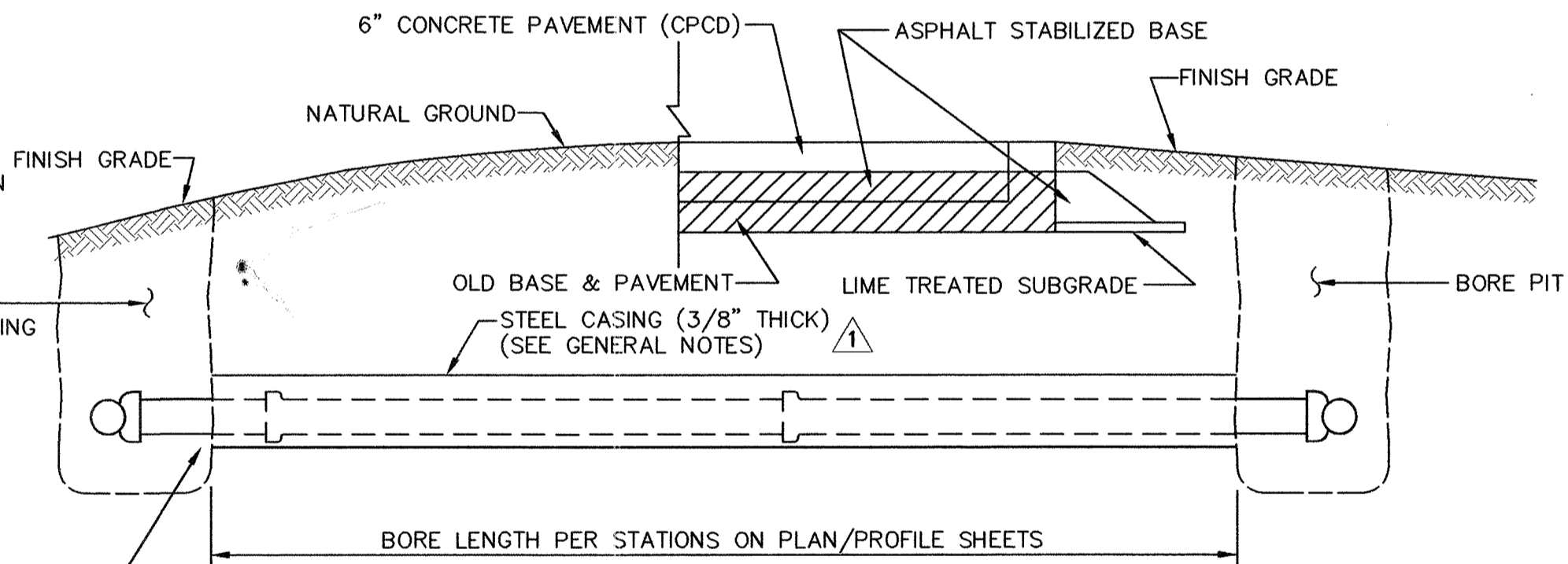
**PIPE CASING SPACERS DETAIL**

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.

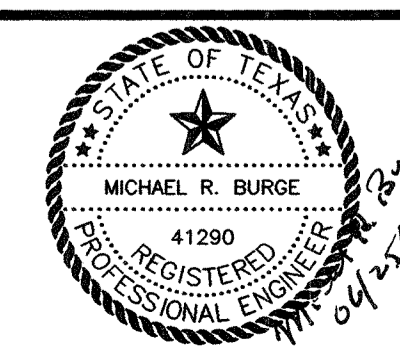
**RECORD DRAWING**  
BASED ON CONTRACTOR MARKUPS,  
NOT FIELD SURVEY.

6			
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1	6/25/10	REVISED PER ADDENDUM NO. 1.	MRB
NO.	DATE	REVISION	REVIEWED

DRAWN:                      BW2  
DESIGN:                      MRB  
REVIEWED:                    JFW  
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DATE:                      APRIL 2010  
DWG. NAME:                1350DET2-BROOK



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**WATER SYSTEM IMPROVEMENTS  
BROOKHAVEN DRIVE WATER LINE AND  
BROCKDALE PARK ROAD WATER LINE  
GENERAL CONSTRUCTION DETAILS - SHEET 2  
CITY OF LUCAS**

SHEET NO. **35**  
OF **35** SHEETS  
JOB NO. 09-1350