CITY OF LUCAS

CONSTRUCTION PLANS FOR

WATER SYSTEM IMPROVEMENTS

NORTH PUMP STATION
GROUND STORAGE TANKS & PUMP IMPROVEMENTS

MAYOR
BOB SANDERS

CITY COUNCIL

BILL CARMICKLE — KATHLEEN PEELE

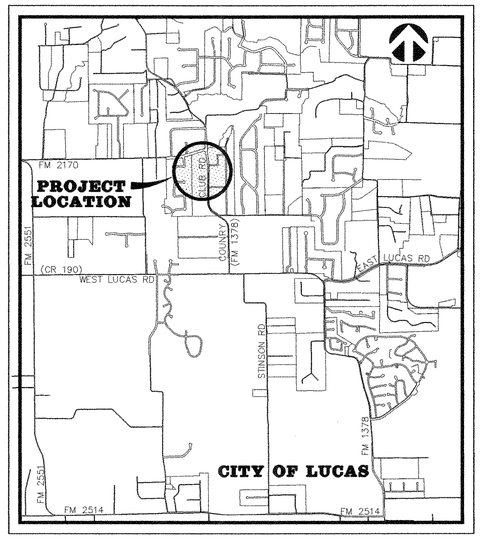
DEBBIE FISHER — DON ZRINY

CITY ADMINISTRATOR
CHARLES FENNER, CPM, AICP, CHRM

DIRECTOR OF PUBLIC WORKS
STACY CAUDELL, P.E.

CONTRACTOR

TANK BUILDERS, INC.
COMPLETED DECEMBER 2009



VICINITY MAP

BW2 JOB NO. 06-1207

APRIL 2007

"REVISED PER ADDENDA"

SHEET INDEX

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
12/28/09

OWNER:

CITY OF LUCAS
151 COUNTRY CLUB ROAD
LUCAS, TEXAS 75002

ENGINEER:

BW2 ENGINEERS, INC.

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

WATER SYSTEM IMPROVEMENTS – NORTH PUMP STATION GROUND STORAGE TANKS & PUMP IMPROVEMENTS – 06-1207

GENERAL NOTES:

1. It is the CONTRACTOR's responsibility to maintain neat and accurate plans of record.
2. The CONTRACTOR is responsible for maintaining adequate site drainage throughout the duration of this project.
3. The CONTRACTOR is responsible for obtaining all necessary permits and approvals before construction begins.
4. The CONTRACTOR shall replace all fence removed during construction in as good as or better condition than before construction.
5. 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.
6. The CONTRACTOR shall restore all property including driveways, public streets, sidewalks and all other improvements removed or damaged inside and outside the project limits during construction to as good as or better condition than before construction. Restoration shall be made immediately after the property no longer interferes with construction.
7. 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.
8. 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.
9. All streets within the scope of the Contract shall be kept accessible to fire trucks, ambulances and other emergency vehicles.
10. 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.
11. 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.
12. The CONTRACTOR shall use the public right–of–ways and existing utility easements for access to the job site.
13. 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.
14. 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.
15. 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.
16. 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.
17. No existing sprinkler/irrigations systems have been shown on the plans; however, they may exist in certain areas. It is the CONTRACTORS responsibility to locate any existing irrigation systems within the project limits and determine if they will be affected by this construction. If CONTRACTOR encounters any sprinkler systems during construction, he shall repair and/or replace in as good as or better condition than before construction.
18. The CONTRACTOR shall maintain adequate sanitary facilities for use by workers throughout construction.
19. 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.
20. Ground storage tank shall be constructed in accordance with current AWWA Standards and TCEQ requirements, including requirements for roof vent, manways, drains, sample connections, access ladders, overflows, liquid level indicators, and other appurtenances. 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.
21. No existing trees shall be removed without approval of the City of Lucas.
22. CONTRACTOR shall provide all necessary construction staking.
23. 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.:

24. 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.
25. All existing water lines and service lines to remain in service during construction. At times when water has to be cut–off, the CONTRACTOR shall coordinate with the OWNER to notify the affected area at least 48 hours prior to water cut–off.
26. 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.
27. Water line shall be polyvinyl chloride (PVC) AWWA C900. New water service line shall be copper pipe with compression type fittings. Main line valves and fittings shall be cast iron.
28. 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.
29. The CONTRACTOR is responsible for keeping streets, parking areas, sidewalks, etc., adjacent to the project free of mud and debris from construction.
30. 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.
31. 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.
32. Arrangements for construction water shall be made through the City of Lucas.
33. 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.
34. PVC pipe shall be manufactured from a low filler PVC component capable of meeting the highest performance standards of the ASTM specifications.
35. 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.
36. 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.
37. 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.
38. CONTRACTOR shall comply with all applicable Texas Department of Transportation (TXDOT) requirements during any construction activities in the vicinity of F.M. 1378 right–of–way.

△1 39. Per a set of sealed plans for the existing facilities, it appears that the existing motors to be removed are 75hp motors.

△1 40. Per a report prepared on the water system for the City, it appears that the existing pumps to be removed are 1,000 gpm pumps.

△2 41. CONTRACTOR shall utilize the existing valves and piping in the pump building. The control valves shall be adjusted as necessary to accommodate the additional flow from the new pumps.

△2 42. Elevations shown on Sheet No. 11 of the plans shall be revised to match elevations shown on Sheet No. 9.

△2 43. Location of tank accessories shown on Sheet No. 11 of the plans shall be revised to match location of tank accessories on Sheet No. 9.

GENERAL TRAFFIC CONTROL NOTES

1. 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).
2. 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.
3. Any existing conflicting markings shall be removed prior to shifting traffic.
4. 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.
5. 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.
6. 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.
7. 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.
8. The posted speed for warning signage is to be determined at the site by the City of Lucas.
9. Reduced speed warning signage should be placed prior to and at regular intervals within the construction zone.
10. 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.
11. 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".
12. CONTRACTOR shall be required to place temporary pavement markings and/or buttons as needed to mantain 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".

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
△2	08/28/07	REVISED PER ADDENDUM NO. 3	MRB
△1	08/28/07	REVISED PER ADDENDUM NO. 2	MRB

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: NO SCALE
DATE: APRIL 2007
DWG. NAME: 1207GENNOTE

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1919 S. Shiloh Road
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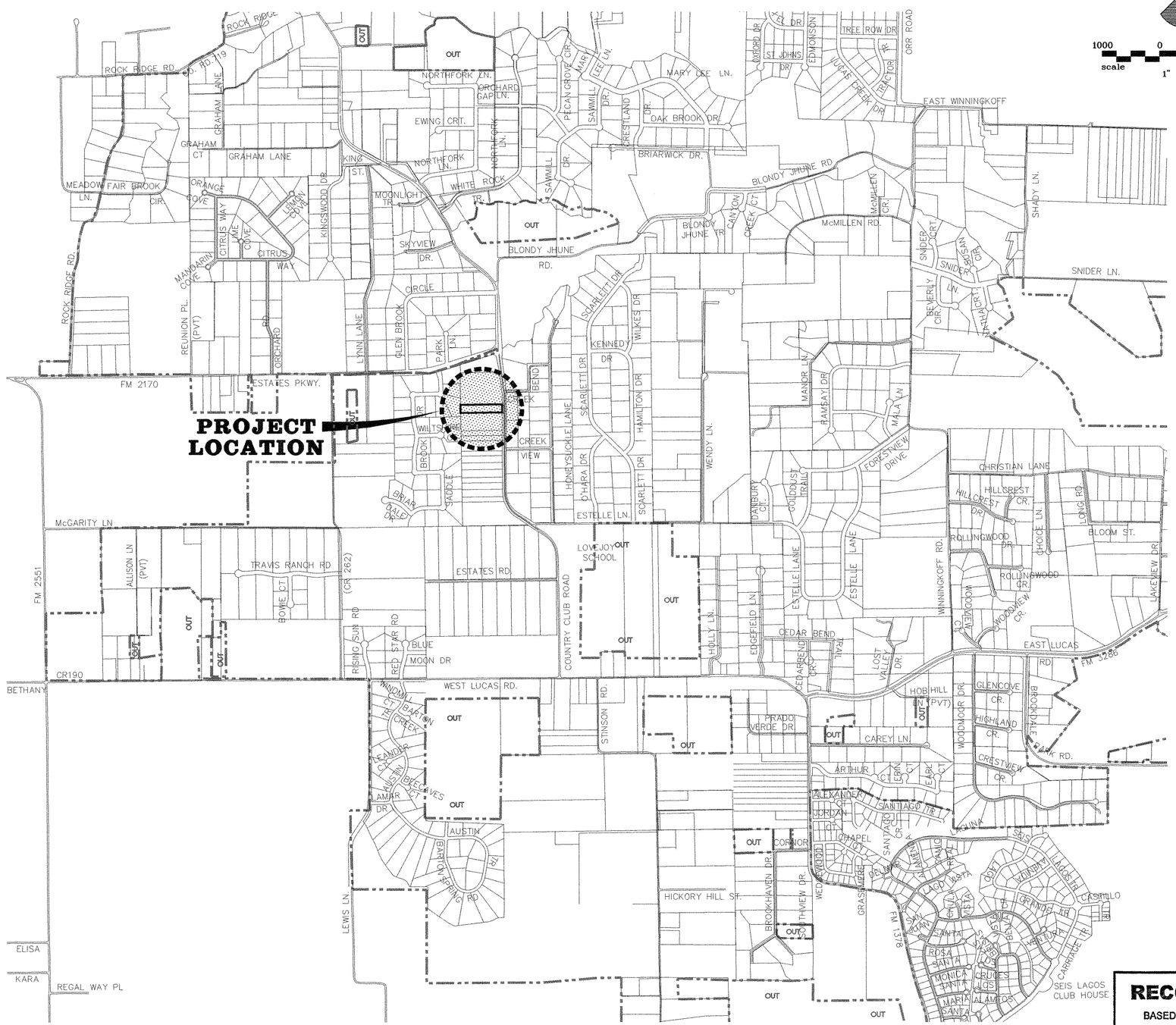
(972) 864-8220 (fax)

STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
07/24/07

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GENERAL NOTES
CITY OF LUCAS

SHEET NO. 1 OF 17 SHEETS
JOB NO. 06–1207



SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	Estimated Quantities
1	Mobilization, bonds, insurance	L.S.	1
2	Furnish and install ground storage tank, foundation, related piping and valves and appurtenances	L.S.	1
3	Furnish site grading	L.S.	1
4	Furnish and install concrete splash pad	L.S.	1
5	Furnish and install 3/4" chlorine line, connection to proposed suction line, and valve on chlorine line	L.S.	1
6	Furnish and install 12" polyvinyl chloride (PVC) AWWA C900, DR-18 piping, including embedment	L.F.	380
7	Furnish and install 10" polyvinyl chloride (PVC) AWWA C900, DR-18 piping, including embedment	L.F.	155
8	Furnish and install 12" x 12" tee	EA.	1
9	Furnish and install 12" x 10" tee	EA.	1
10	Furnish and install 12" x 10" reducer	EA.	1
11	Furnish and install 12" x 8" reducer	EA.	1
12	Furnish and install 12"- 45 degree bend	EA.	3
13	Furnish and install 12" blind flange	EA.	1
14	Furnish and install 10"- 45 degree bend	EA.	2
15	Furnish and install 10" blind flange	EA.	1
16	Furnish and install 12" valve	EA.	2
17	Furnish and install 10" valve	EA.	2
18	Connect to existing 12" pipe	EA.	1
19	Connect to existing 8" pipe	EA.	1
20	Furnish and install chain link fence	L.F.	720
21	Furnish and install chain link gate	EA.	2
22	Traffic control measures, including, but not limited to, construction sequencing, barricading and signs	L.S.	1
23	Temporary erosion control including operational control of SW3P	L.S.	1
24	Furnish and install fire hydrant	EA.	1
25	3/4" chlorine line and associated equipment	L.S.	1
26	Erosion control blanket (North American Green SC 150 w/ staple pattern 'D')	S.Y.	450
27	Install 30-inch Class IV RCP	L.F.	48
28	Install TxDOT Std. CH-PW-0 headwall	EA.	2
29	Furnish and install hydromulch	S.Y.	3090
30	Furnish and install trench safety system	L.F.	583
31	Pumping units, including pumps, motor and accessories	EA.	2
32	Unclassified excavation	C.Y.	95
33	Remove existing asphalt pavement, incl. hauling and disposal	S.Y.	590
34	Install 1-1/2" Type 'D' HMAC pavement	S.Y.	742
35	Install 4-1/2" Type 'B' HMAC pavement (in two 2-1/4" courses)	S.Y.	742
36	Prime coat (0.3 gal/S.Y.)	GAL	223
37	Tack coat (0.05 gal/S.Y.)	GAL	37
38	Install 6" lime stabilized subgrade	S.Y.	794
39	Hydrated lime (@32 lbs./S.Y.)	TON	13
40	Furnish and install concrete thrust blocking	C.Y.	8

RECORD DRAWING

BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
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DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: 1" = 1000'
DATE: APRIL 2007
DWG. NAME: 1207LOCMAP

BW2 Engineers, Inc.
1919 S. Shiloh Road
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STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
04/14/10

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
LOCATION MAP AND SUMMARY OF QUANTITIES
CITY OF LUCAS

SHEET NO. 2
OF 17 SHEETS
JOB NO. 06-1207

COORDINATE TABLE

NUMBER	NORTHING	EASTING
1	7088314.3905	2552331.8908
2	7088312.7098	2552181.8259
3	7088171.6380	2552183.4059
4	7088161.2026	2552173.2016
5	7088161.0899	2552163.1382
6	7088139.6529	2552163.3782
7	7088141.5619	2552333.8265
8	7088184.8768	2552333.3414
9	7088313.2128	2552494.6183
10	7088311.0441	2552300.9790
11	7088236.0937	2552227.6888
12	7088239.2275	2552409.4376
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14	7088197.7535	2552314.7059
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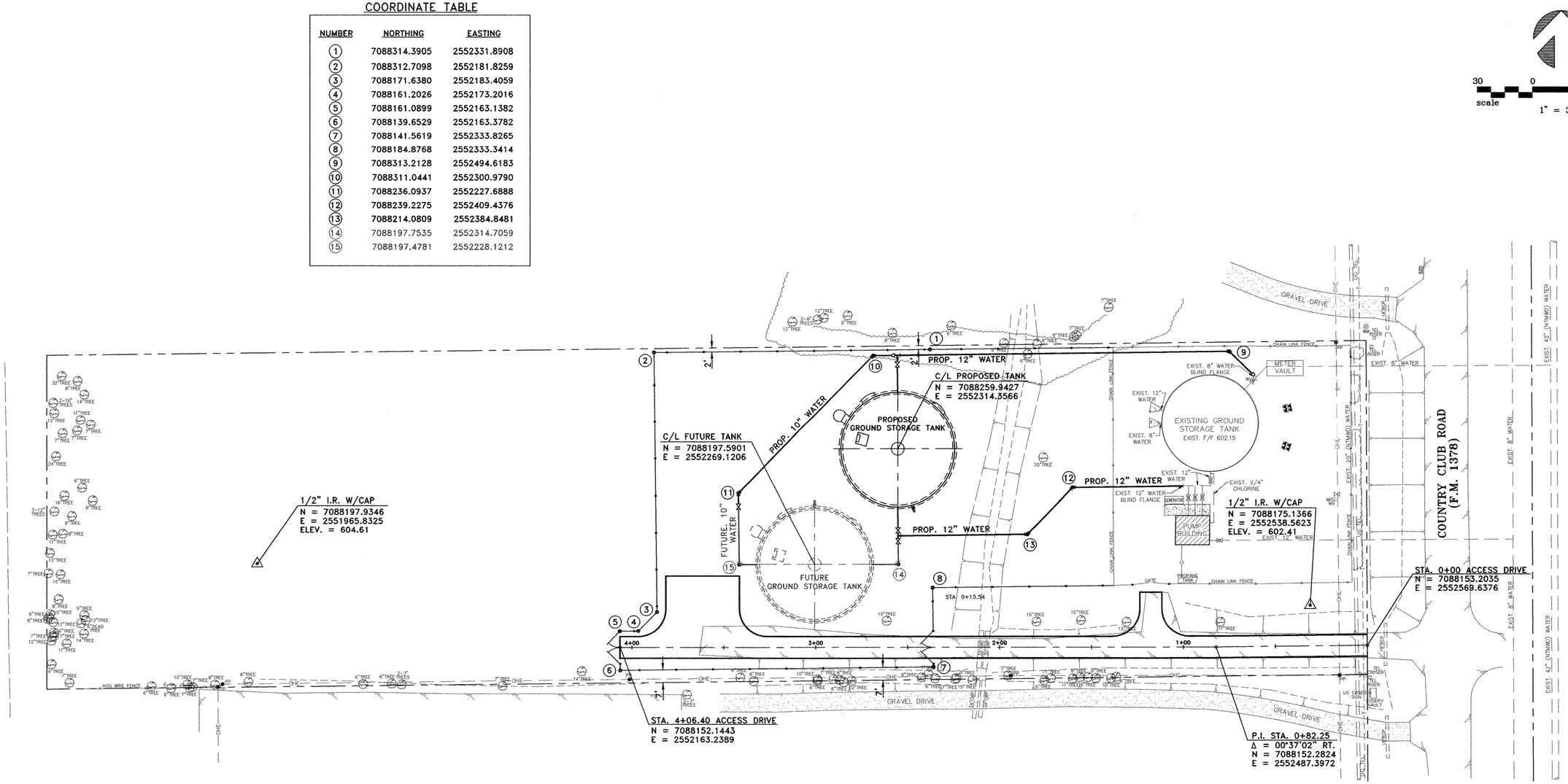

RECORD DRAWING

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" = 30'
DATE: APRIL 2007
DWG. NAME: 1207HORZCONT

BW2 Engineers, Inc.
1919 S. Shiloh Road
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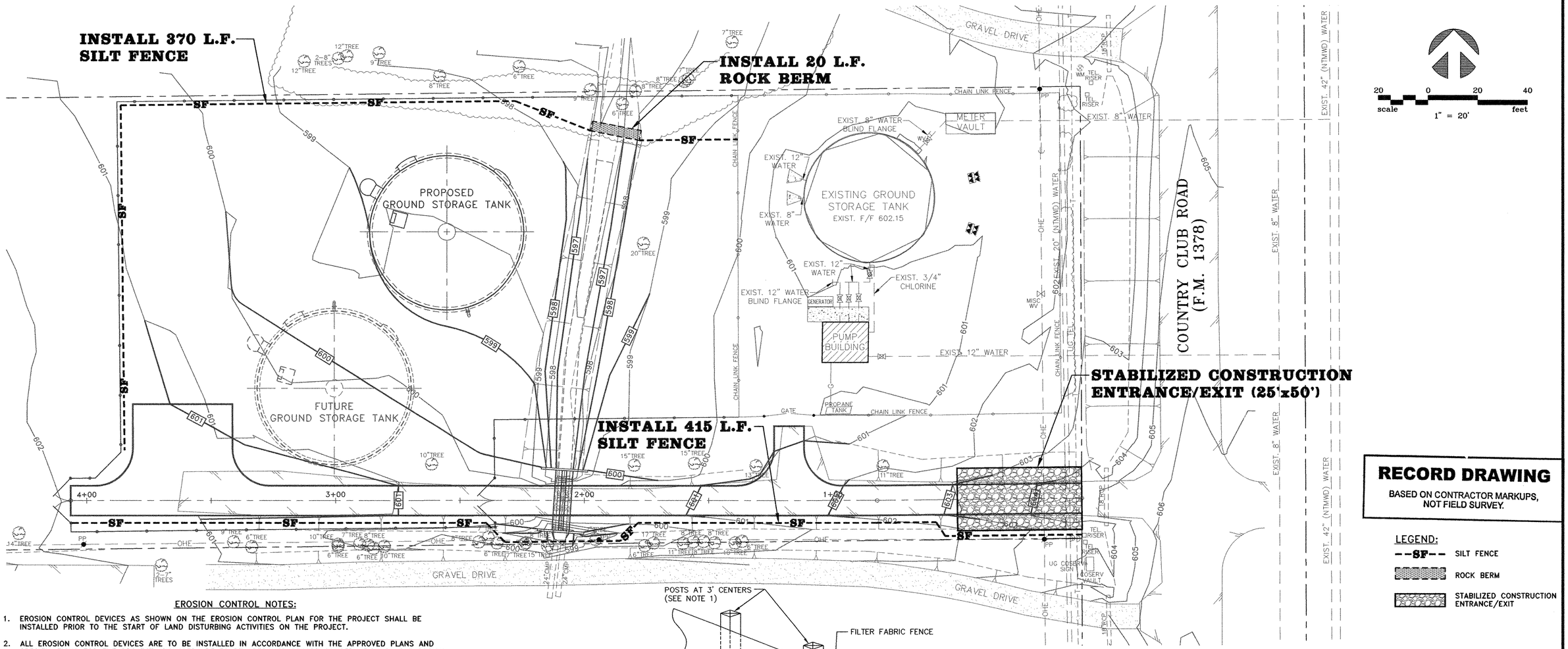
STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
04/11/07

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
HORIZONTAL AND VERTICAL CONTROL PLAN

CITY OF LUCAS

SHEET NO. 3
OF 17 SHEETS
JOB NO. 06-1207



RECORD DRAWING

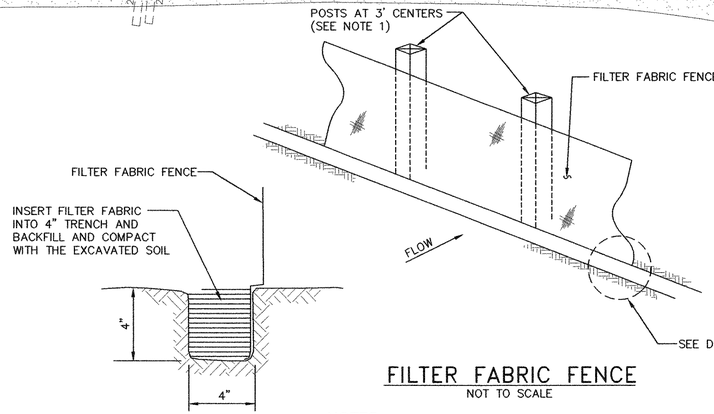
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

LEGEND:

- SF — SILT FENCE
- ROCK BERM
- STABILIZED CONSTRUCTION ENTRANCE/EXIT

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. OFF-SITE BORROW AND SPOIL AREAS ARE CONSIDERED A PART OF THE PROJECT SITE AND THEREFORE SHALL COMPLY WITH THE CITY OF LUCAS'S EROSION CONTROL REQUIREMENTS. THESE AREAS 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.
6. ALL NON-IMPERVIOUS AREAS AFTER CONSTRUCTION SHALL BE COVERED WITH SOD IN ACCORDANCE WITH GENERAL NOTE 16 AND 37 ON SHEET 1. ALL OTHER DISTURBED AREAS OUTSIDE THE LIMITS SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
7. TEMPORARY STONE STABILIZED CONSTRUCTION ENTRANCE SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS: 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.

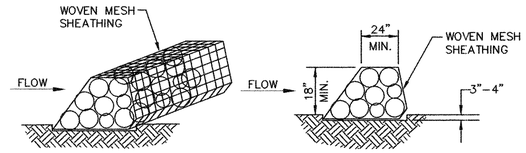


FILTER FABRIC FENCE
NOT TO SCALE

DETAIL "A"
NOT TO SCALE

NOTES:

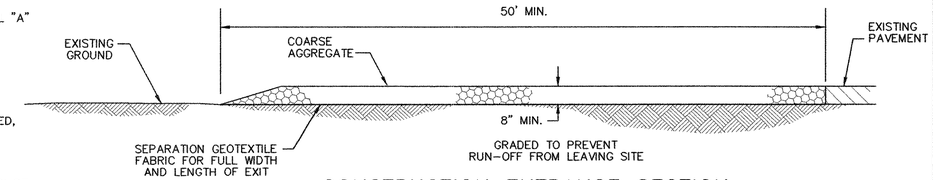
1. IF FACTORY PREASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POSTS MAY INCREASE TO 8' MAXIMUM.
2. FILTER FABRIC SHALL BE AS PER ASTM D4833.
3. WHEN TWO SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, PROVIDE 6" OF OVERLAP AT THE POST AND FOLD.



ROCK BERM DETAIL
NOT TO SCALE

CONSTRUCTION ENTRANCE NOTES:

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL NOT BE LESS THAN 8 INCHES.
3. WIDTH SHALL NOT BE LESS THAN 25 FEET.
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.



CONSTRUCTION ENTRANCE SECTION
NOT TO SCALE

NO.	DATE	REVISION	REVIEWED
6			
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DRAWN: BW2
DESIGN: JCT
REVIEWED: JFW
SCALE: 1" = 20'
DATE: APRIL 2007
DWG. NAME: 1207EROS

BW2

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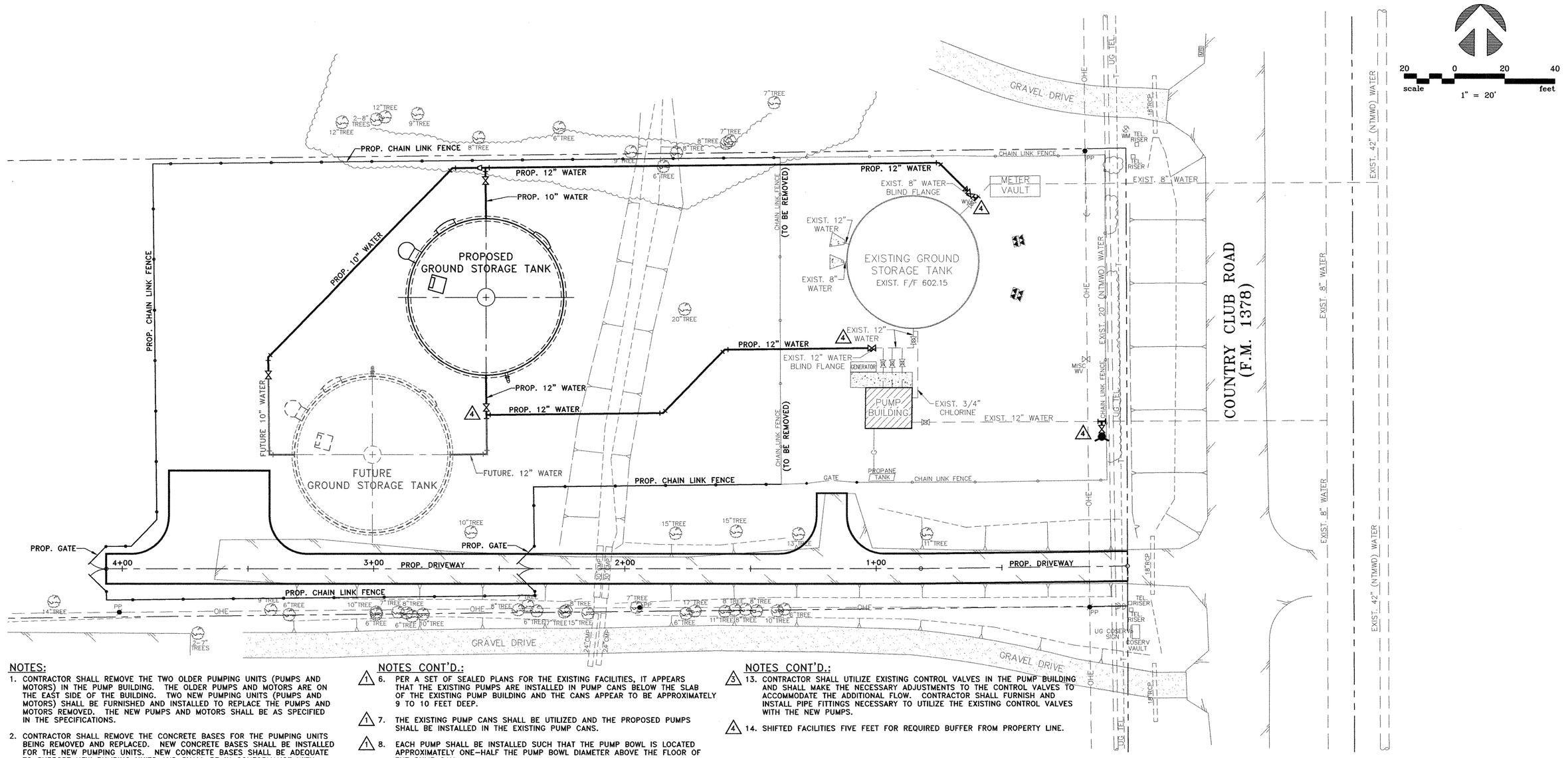
(972) 864-8220 (fax)

STATE OF TEXAS
84025
LICENSED
PROFESSIONAL ENGINEER
JEFFREY C. THOMAS
5/21/07

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK - EROSION CONTROL PLAN
CITY OF LUCAS

SHEET NO. 4
OF 17 SHEETS
JOB NO. 06-1207



NOTES:

1. CONTRACTOR SHALL REMOVE THE TWO OLDER PUMPING UNITS (PUMPS AND MOTORS) IN THE PUMP BUILDING. THE OLDER PUMPS AND MOTORS ARE ON THE EAST SIDE OF THE BUILDING. TWO NEW PUMPING UNITS (PUMPS AND MOTORS) SHALL BE FURNISHED AND INSTALLED TO REPLACE THE PUMPS AND MOTORS REMOVED. THE NEW PUMPS AND MOTORS SHALL BE AS SPECIFIED IN THE SPECIFICATIONS.
2. CONTRACTOR SHALL REMOVE THE CONCRETE BASES FOR THE PUMPING UNITS BEING REMOVED AND REPLACED. NEW CONCRETE BASES SHALL BE INSTALLED FOR THE NEW PUMPING UNITS. NEW CONCRETE BASES SHALL BE ADEQUATE TO SUPPORT NEW PUMPING UNITS AND SHALL BE IN CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. EXISTING PIPING AND VALVES IN THE PUMP STATION BUILDING SHALL BE UTILIZED FOR THE NEW PUMPING UNITS.
4. CONTRACTOR SHALL FURNISH AND INSTALL A NEW FIRE HYDRANT ON THE 12" DISCHARGE LINE. FIRE HYDRANT SHALL BE IN CONFORMANCE WITH CITY SPECIFICATIONS AND SHALL BE INSTALLED AT SPECIFIC LOCATION AS DIRECTED BY OWNER. INSTALLATION SHALL INCLUDE CONNECTION AND 6" LEAD LINE AND 6" VALVE. ALL ASSOCIATED COSTS SHALL BE INCLUDED IN THE BID ITEM FOR THE FIRE HYDRANT.
5. CONTRACTOR SHALL INSTALL A 3/4" CHLORINE LINE FROM THE EXISTING CHLORINE LINE TO THE NEW SUCTION LINE AT A LOCATION JUST BEFORE NEW SUCTION LINE CONNECTS TO EXISTING SUCTION LINE. CONTRACTOR SHALL FURNISH AND INSTALL LINE AND EQUIPMENT AS REQUIRED TO INJECT CHLORINE INTO NEW SUCTION LINE. ASSOCIATED COSTS SHALL BE INCLUDED IN BID ITEM FOR THE CHLORINE LINE.

NOTES CONT'D.:

1 6. PER A SET OF SEALED PLANS FOR THE EXISTING FACILITIES, IT APPEARS THAT THE EXISTING PUMPS ARE INSTALLED IN PUMP CANS BELOW THE SLAB OF THE EXISTING PUMP BUILDING AND THE CANS APPEAR TO BE APPROXIMATELY 9 TO 10 FEET DEEP.

1 7. THE EXISTING PUMP CANS SHALL BE UTILIZED AND THE PROPOSED PUMPS SHALL BE INSTALLED IN THE EXISTING PUMP CANS.

1 8. EACH PUMP SHALL BE INSTALLED SUCH THAT THE PUMP BOWL IS LOCATED APPROXIMATELY ONE-HALF THE PUMP BOWL DIAMETER ABOVE THE FLOOR OF THE PUMP CAN.

2 9. THE EXISTING CONCRETE PADS IN THE PUMP BUILDING WILL BE REUSED FOR THE NEW PUMPING UNITS.

2 10. THE BASE PLATES ON THE TOP OF THE EXISTING CONCRETE PADS SHALL BE NEW FABRICATED STEEL OR CAST IRON PLATES (SAME SIZE AS EXISTING) OR THE EXISTING BASE PLATES CAN BE REUSED IF ADEQUATELY REFURBISHED AND ACCEPTABLE TO THE OWNER. IF NEW BASE PLATES ARE FURNISHED AND INSTALLED THEY SHALL HAVE THE SAME BOLT PATTERNS AS THE EXISTING BASE PLATES.

2 11. THE CENTERLINE OF THE DISCHARGE HEADS OF THE NEW PUMPS SHALL MATCH THE CENTERLINE OF THE EXISTING PUMPS SUCH THAT THE EXISTING PIPING FOR THE PUMPS CAN BE UTILIZED.

2 12. THE PROPOSED MOTORS SHALL BE 75 HP MOTORS AND SHALL BE NON-OVERLOADING AT THE DESIGN POINT. IF NECESSARY, THE MOTORS CAN EXCEED 75 HP AT FLOW RATES HIGHER THAN THE DESIGN POINT AS LONG AS THE MOTORS ARE OPERATING WELL WITHIN THE CAPACITY OF THE PROPOSED ELECTRICAL SYSTEM.

NOTES CONT'D.:

5 13. CONTRACTOR SHALL UTILIZE EXISTING CONTROL VALVES IN THE PUMP BUILDING AND SHALL MAKE THE NECESSARY ADJUSTMENTS TO THE CONTROL VALVES TO ACCOMMODATE THE ADDITIONAL FLOW. CONTRACTOR SHALL FURNISH AND INSTALL PIPE FITTINGS NECESSARY TO UTILIZE THE EXISTING CONTROL VALVES WITH THE NEW PUMPS.

4 14. SHIFTED FACILITIES FIVE FEET FOR REQUIRED BUFFER FROM PROPERTY LINE.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4	12/28/09	REVISED PER CONTRACTOR MARKUPS	MRB
3	08/28/07	REVISED PER ADDENDUM NO. 6	MRB
2	08/28/07	REVISED PER ADDENDUM NO. 3	MRB
1	08/28/07	REVISED PER ADDENDUM NO. 2	MRB

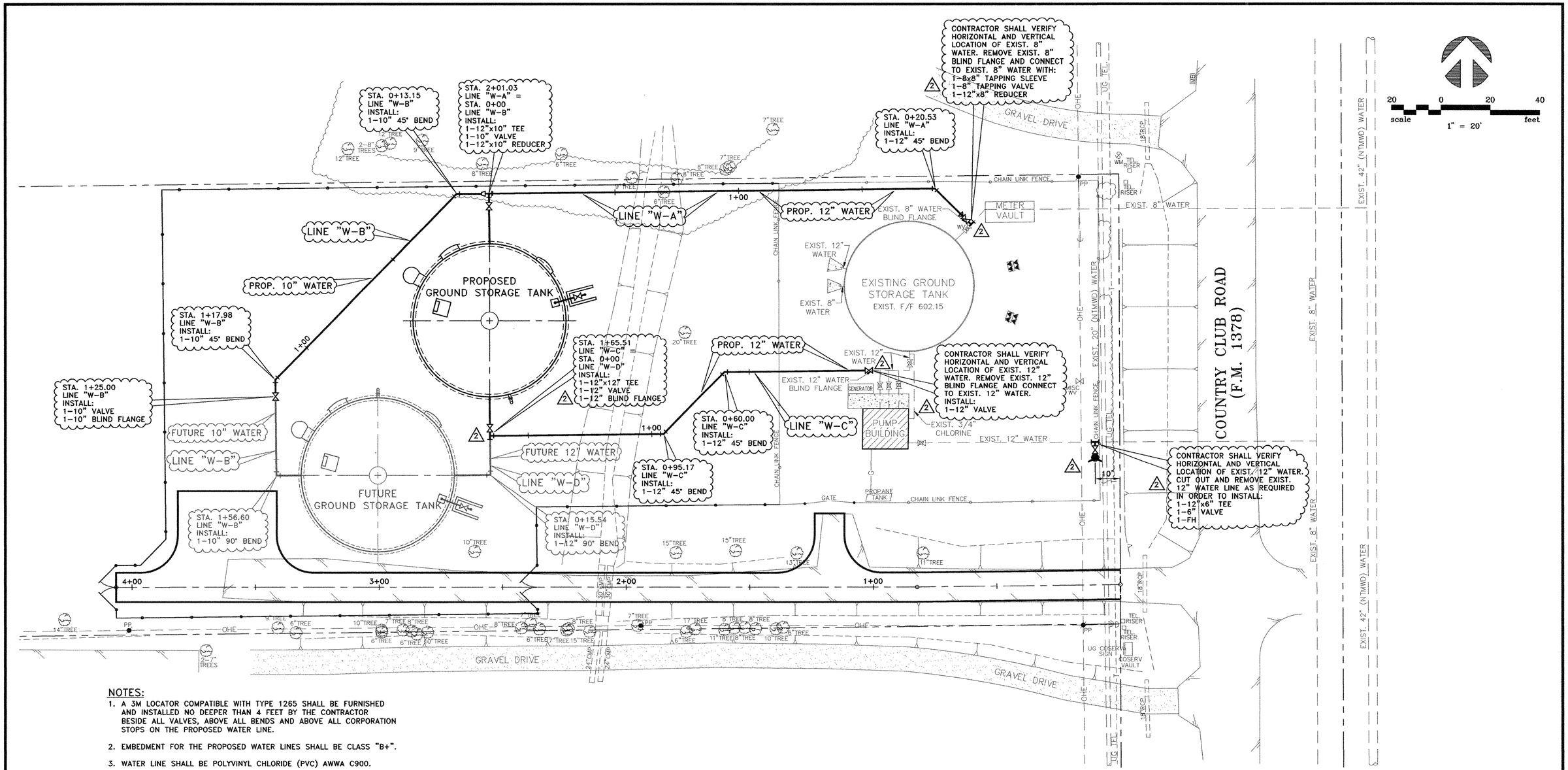
DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: 1" = 20'
DATE: APRIL 2007
DWG. NAME: 1207SITE

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

STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
10/26/09

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK - SITE PLAN
CITY OF LUCAS

SHEET NO. 5
OF 17 SHEETS
JOB NO. 06-1207



NOTES:

1. A 3M LOCATOR COMPATIBLE WITH TYPE 1265 SHALL BE FURNISHED AND INSTALLED NO DEEPER THAN 4 FEET BY THE CONTRACTOR BESIDE ALL VALVES, ABOVE ALL BENDS AND ABOVE ALL CORPORATION STOPS ON THE PROPOSED WATER LINE.
2. EMBEDMENT FOR THE PROPOSED WATER LINES SHALL BE CLASS "B+".
3. WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) AWWA C900.
4. ALL WATER MAINS SHALL HAVE A MINIMUM 42" COVER UNLESS SHOWN OTHERWISE ON PROFILE.
5. 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.
6. MEGA-LUGS SHALL BE FURNISHED AND INSTALLED ON ALL BENDS, VALVES, AND OTHER FITTINGS THAT ARE REQUIRED FOR THE PROPOSED WATER LINE.
7. 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.
8. ACCESS FOR WORK ON THE PUMPS AND MOTORS AND ASSOCIATED ELECTRICAL WORK SHALL BE THROUGH THE ACCESS DOOR TO THE PUMP BUILDING ON THE WEST SIDE OF THE BUILDING.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2	12/28/09	REVISED PER CONTRACTOR MARKUPS	MRB
1	08/28/07	REVISED PER ADDENDUM NO. 3	MRB

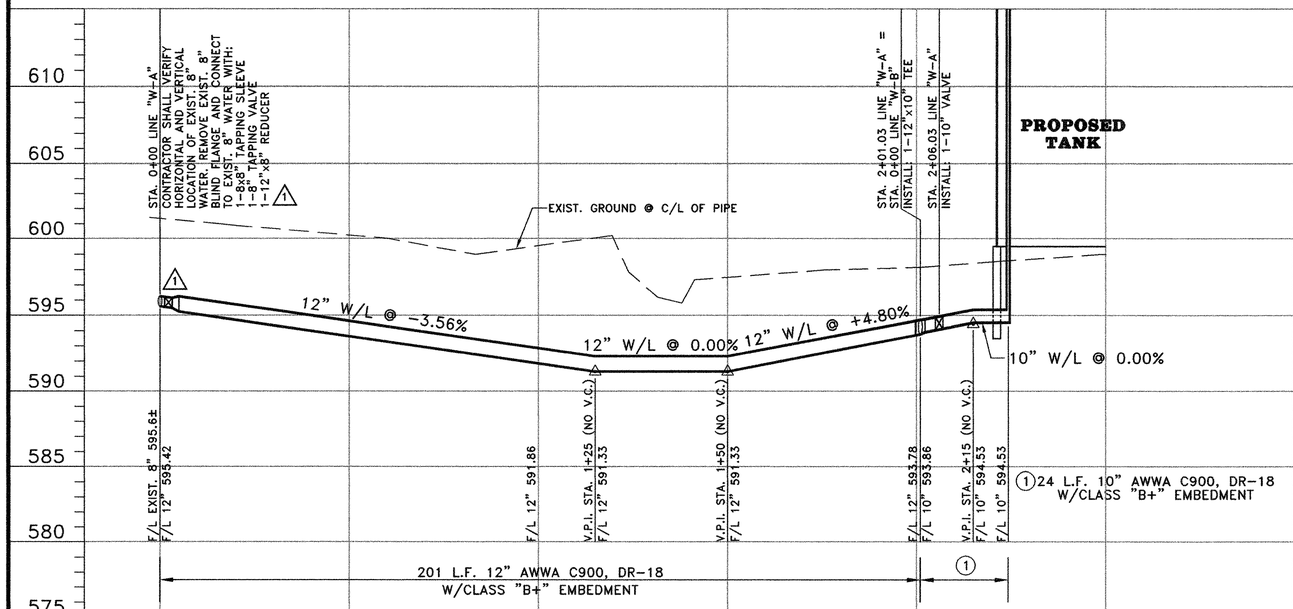
DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: 1" = 20'
DATE: APRIL 2007
DWG. NAME: 1207YARDPIPE

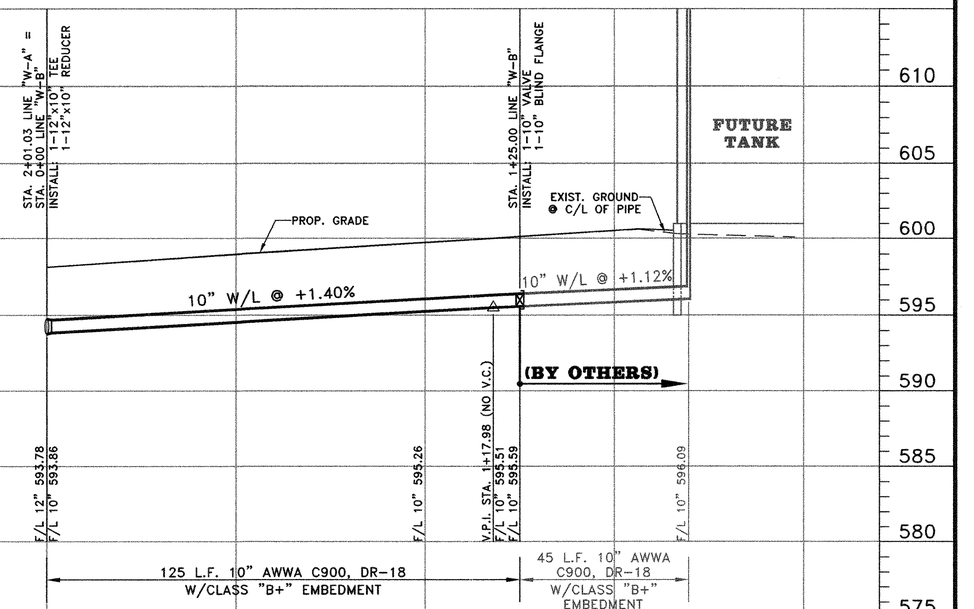
BW2 Engineers, Inc.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (tel)
(972) 864-8220 (fax)

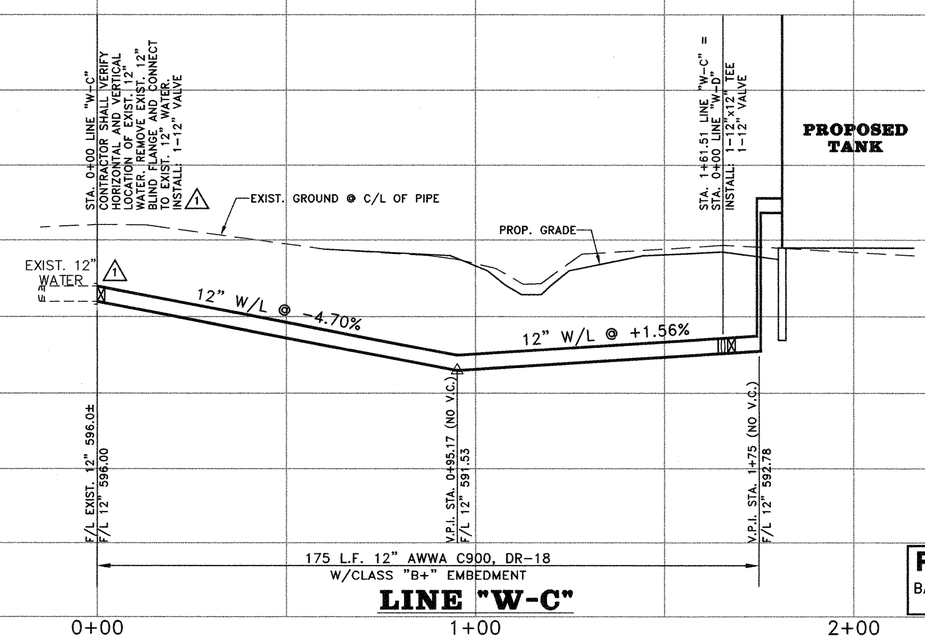
STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
12-23-09

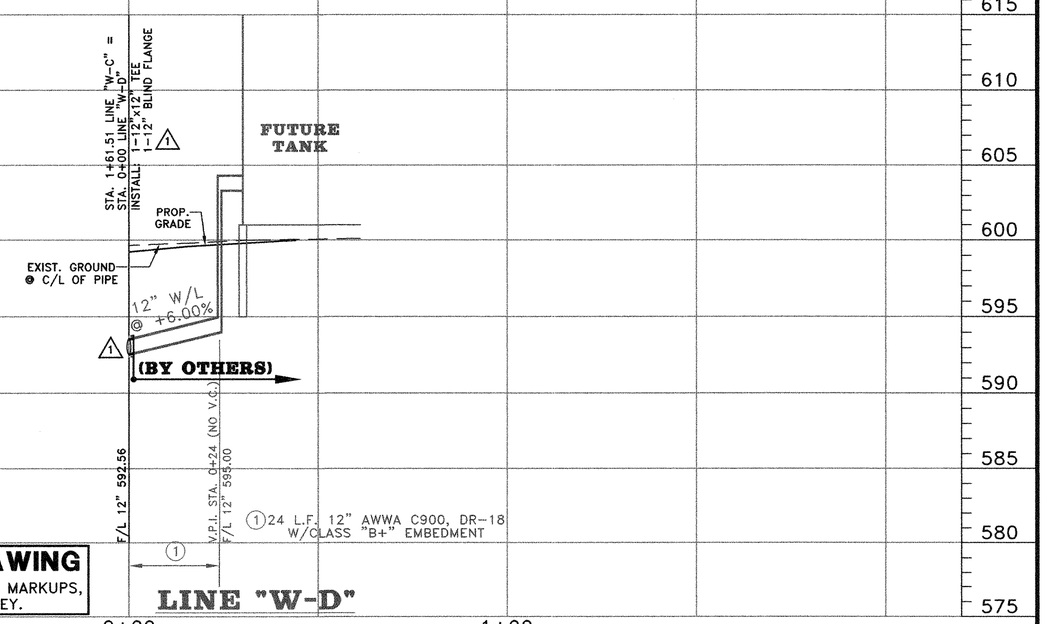
WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK - YARD PIPING PLAN
CITY OF LUCAS

SHEET NO. 6A
OF 17 SHEETS
JOB NO. 06-1207









RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1	12/28/09	REVISED PER CONTRACTOR MARKUPS	MRB

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: (H)1"=20', (V)1"=5'
DATE: MAY 2007
DWG. NAME: 1207WTRPROF

BW2 Engineers, Inc.
1919 S. Shiloh Road
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STATE OF TEXAS
MICHAEL R. BURGE
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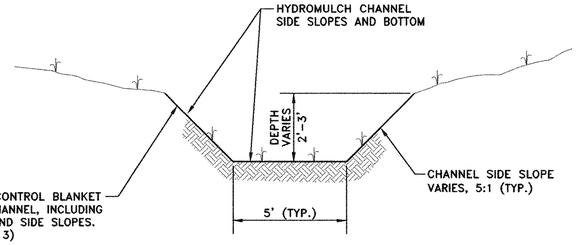
REGISTERED PROFESSIONAL ENGINEER
5/14/10

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK - WATER LINE PROFILES
CITY OF LUCAS

SHEET NO. 6B
OF 17 SHEETS
JOB NO. 06-1207



TYPICAL CHANNEL SECTION
N.T.S.

NOTES:

1. EROSION CONTROL BLANKET (ECB) SHALL BE NORTH AMERICAN GREEN SC 150 WITH STAPLE PATTERN 'D', OR APPROVED EQUAL.
2. HYDROMULCH ALL DISTURBED AREAS.
3. IN AREAS WITH GABION MATTRESSES, ECB'S SHALL BE USED FOR THE CHANNEL SIDE SLOPES. THE EDGES OF THE ADJOINING ECB'S SHALL BE ANCHORED TO THE UNDERSIDE OF THE GABION MATTRESSES.

20 0 20 40
scale 1" = 20' feet

PROPOSED GROUND STORAGE TANK
F.F. 599.50
599.00
598.50
598.25
5' (TYP.)

FUTURE GROUND STORAGE TANK
F.F. 601.00

EXISTING GROUND STORAGE TANK
EXIST. F/F 602.15

MATCH EXIST. CHANNEL BOTTOM F/L 596.07±

INSTALL 9 S.Y. 12" THICK GABION MATTRESS (PVC-COATED) ON CHANNEL BOTTOM (LIMITS AS SHOWN)

C/L STA. 2+07.88, 11.97' RT.
INSTALL TxDOT STD. CH-PW-O HDWL.
F/L 2-30" 596.70

REMOVE EXIST. 2-30" CMP'S

C/L STA. 2+09.49, 11.97' LT.
INSTALL TxDOT STD. CH-PW-O HDWL.
F/L 2-30" 596.82

INSTALL 2-30" CL. IV RCP CULVERTS @ 0.50% (24 L.F. EA.)

METER VAULT
EXIST. 8" WATER BLIND FLANGE
EXIST. 12" WATER
EXIST. 8" WATER
EXIST. 12" WATER BLIND FLANGE
EXIST. 3/4" CHLORINE
GENERATOR
PUMP BUILDING
EXIST. 12" WATER
PROPANE TANK
GATE
CHAIN LINK FENCE
GRAVEL DRIVE
EXIST. 8" WATER
EXIST. 20" (NTMWD) WATER
EXIST. 42" (NTMWD) WATER
COUNTRY CLUB ROAD (F.M. 1378)
OHE
UG TEL
WM
TEL RISER
MISC WV
UG CONSERV SIGN
CONSERV VAULT
PP
T/P 601.26
T/P 600.89
T/P 601.9±
T/P 601.9±
T/P 601.18
T/P 600.80
T/P 600.98
T/P 600.57
T/P 600.77
T/P 604.7±
T/P 604.7±
3+00
2+00
1+00
20" TREE
14" TREE
10" TREE
15" TREE
13" TREE
11" TREE
9" TREE
8" TREE
7" TREE
6" TREE
5" TREE
2-8" TREES
12" TREE
18" RCP
24" CMP

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN: BW2
DESIGN: JCT
REVIEWED: JFW
SCALE: 1" = 20'
DATE: APRIL 2007
DWG. NAME: 1207GRADE

BW2 Engineers, Inc.
1919 S. Shiloh Road
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(972) 864-8200 (tel)
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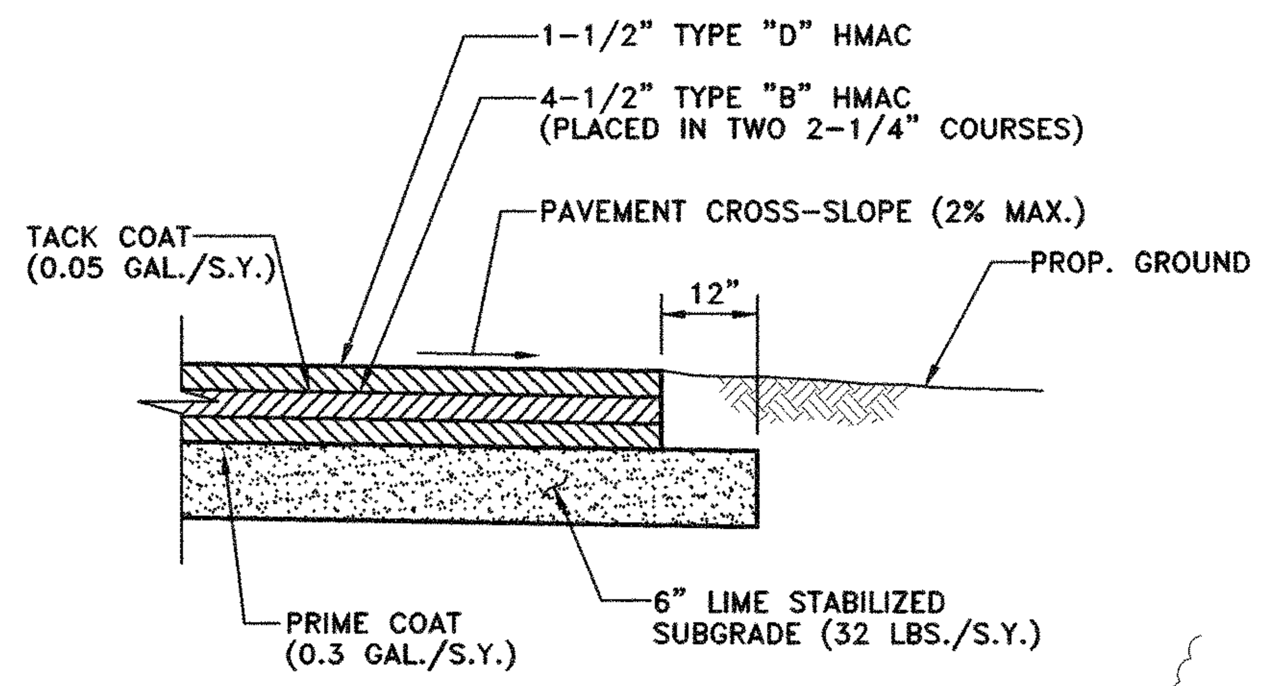
STATE OF TEXAS
JEFFREY C. THOMAS
84025
LICENSED
PROFESSIONAL
ENGINEER
5/24/07

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK - GRADING PLAN
CITY OF LUCAS

SHEET NO. 7
OF 17 SHEETS
JOB NO. 06-1207



ACCESS DRIVE ASPHALT PAVEMENT SECTION

NOT TO SCALE


PROPOSED GROUND STORAGE TANK
FUTURE GROUND STORAGE TANK
EXISTING GROUND STORAGE TANK
EXIST. F/F 602.15
PUMP BUILDING
GENERATOR
METER VAULT
COUNTRY CLUB ROAD (F.M. 1378)
GRAVEL DRIVE
CHAIN LINK FENCE
EXIST. 8" WATER BLIND FLANGE
EXIST. 12" WATER
EXIST. 8" WATER
EXIST. 12" WATER BLIND FLANGE
EXIST. 3/4" CHLORINE
EXIST. 12" WATER
EXIST. 20" (NTMWD) WATER
EXIST. 42" (NTMWD) WATER
EXIST. 8" WATER
STA. 3+41.40, 39' RT. END ASPHALT PAVEMENT
STA. 3+41.40, 21' RT. DRIVE RETURN
STA. 3+81.40, 39' RT. END ASPHALT PAVEMENT
STA. 3+81.40, 21' RT. DRIVE RETURN
STA. 3+96.40, 6' RT. DRIVE RETURN
STA. 3+26.40, 6' RT. DRIVE RETURN
STA. 4+06.40 ACCESS DRIVE END ASPHALT PAVEMENT
STA. 1+23.64, 30' RT. END ASPHALT PAVEMENT
STA. 1+23.64, 21' RT. DRIVE RETURN
STA. 1+38.64, 6' RT. DRIVE RETURN
STA. 1+11.64, 30' RT. END ASPHALT PAVEMENT
STA. 1+11.64, 21' RT. DRIVE RETURN
STA. 0+96.64, 6' RT. DRIVE RETURN
STA. 0+00 ACCESS DRIVE BEGIN ASPHALT PAVEMENT AT PROPERTY LINE MATCH EXIST. PAVEMENT
EXIST. CULVERT TO REMAIN
EXIST. ASPHALT PAVEMENT TO REMAIN
P.I. STA. 0+82.25 Δ = 00°37'02" RT.
PROP. EDGE OF PAVEMENT
15'R.
GATE
PROPANE TANK
OHE
UG TEL
20 0 20 40
scale feet
1" = 20'

LEGEND:

6" ASPHALT PAVEMENT OVER 6" LIME TREATED BASE (95% ASTM D 689, -2 TO +4% OF MATERIALS OPTIMUM MOISTURE

ASPHALT PAVEMENT REMOVAL

RECORD DRAWING

BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN: BW2
DESIGN: JCT
REVIEWED: JFW
SCALE: 1" = 20'
DATE: APRIL 2007
DWG. NAME: 1207PAVE

BW2 Engineers, Inc.
1919 S. Shiloh Road
Suite 500, L.B. 27
Garland, Texas 75042
(972) 864-8200 (tel)
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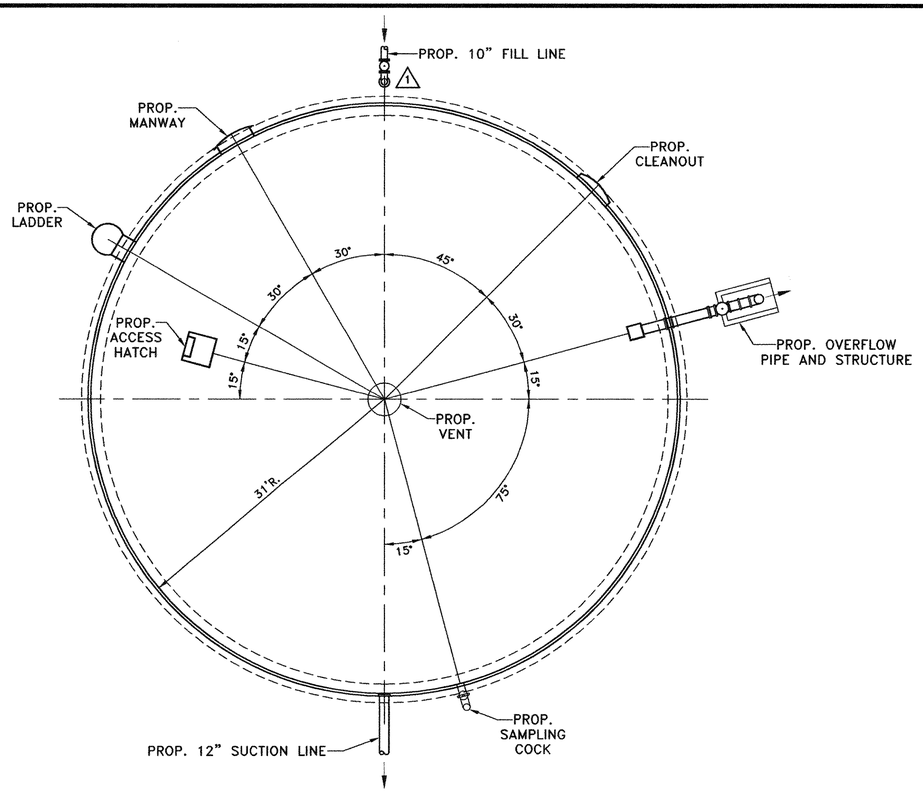
STATE OF TEXAS — JEFFREY C. THOMAS — 84025 — LICENSED PROFESSIONAL ENGINEER

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK - PAVING PLAN
CITY OF LUCAS

SHEET NO. 8 OF 17 SHEETS

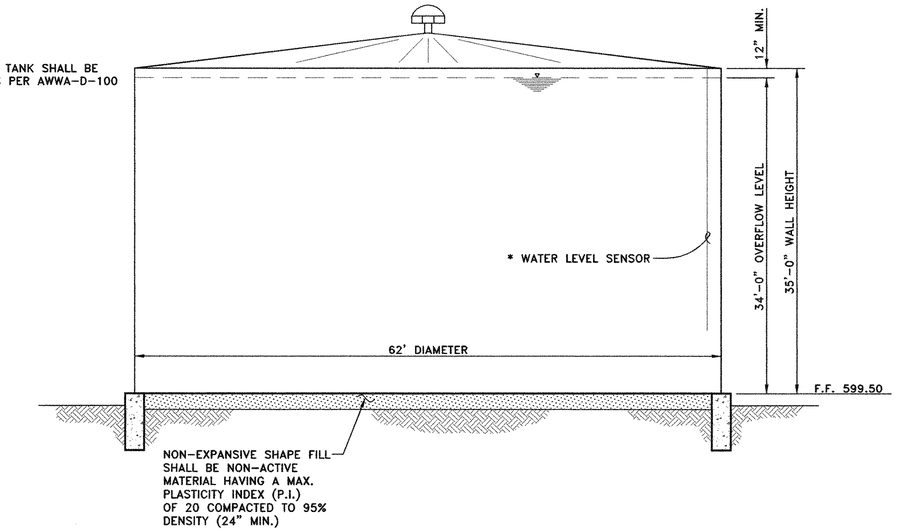
JOB NO. 06-1207



PROPOSED GROUND STORAGE TANK – PLAN

N.T.S.

NOTE:
GROUND STORAGE TANK SHALL BE STEEL WELDED AS PER AWWA-D-100



PROPOSED GROUND STORAGE TANK – ELEVATION

N.T.S.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NOTES:
1. PROPOSED TANK SHALL BE CONSTRUCTED AT ELEVATIONS SHOWN ON THIS SHEET.
2. TANK ACCESSORIES SHALL BE LOCATED ON TANK AS SHOWN ON THIS SHEET.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1	11/16/07	REVISED 10" FILL LINE CONNECTION PER FIELD CHANGES.	MRB

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: APRIL 2007
DWG. NAME: 1207TANKPLAN1

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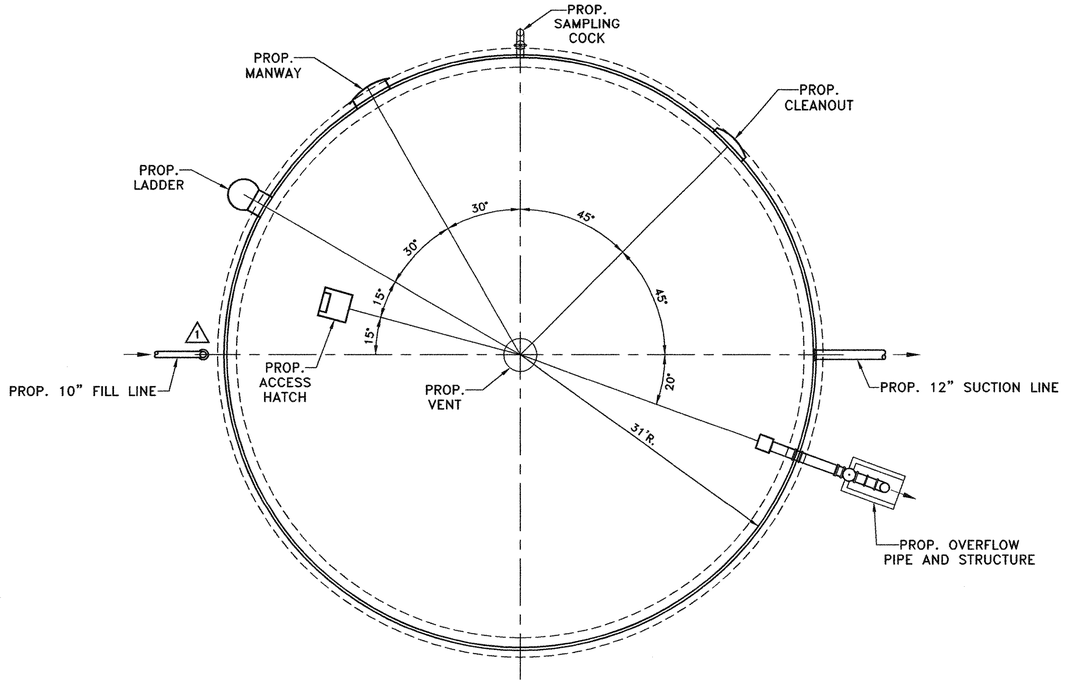
STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
11/16/07

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK - PLAN AND ELEVATION
CITY OF LUCAS

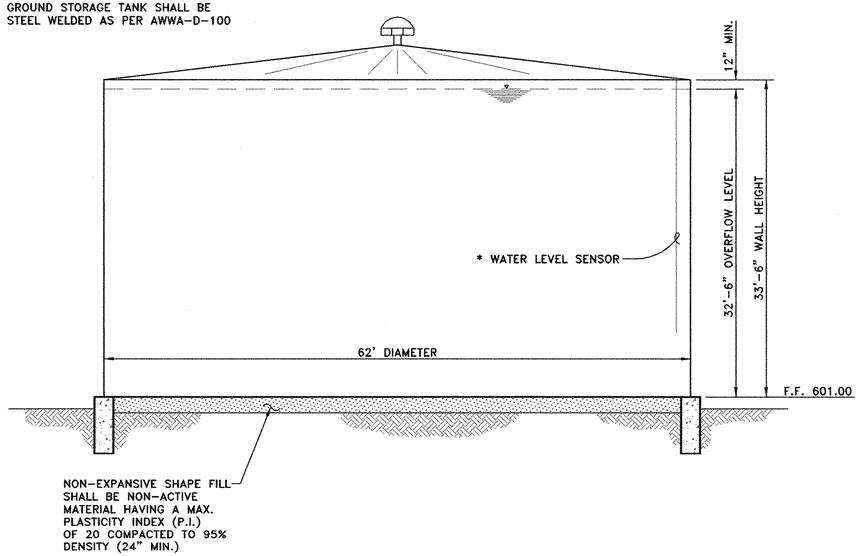
SHEET NO. 9
OF 17 SHEETS
JOB NO. 06-1207



FUTURE GROUND STORAGE TANK – PLAN

N.T.S.

NOTE:
GROUND STORAGE TANK SHALL BE STEEL WELDED AS PER AWWA-D-100



FUTURE GROUND STORAGE TANK – ELEVATION

N.T.S.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NOTES:
1. FUTURE TANK SHALL BE CONSTRUCTED AT ELEVATIONS SHOWN ON THIS SHEET.
2. TANK ACCESSORIES SHALL BE LOCATED ON TANK AS SHOWN ON THIS SHEET.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1	11/16/07	REVISED 10" FILL LINE CONNECTION PER FIELD CHANGES.	MRB

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: APRIL 2007
DWG. NAME: 1207TANKPLANFUT

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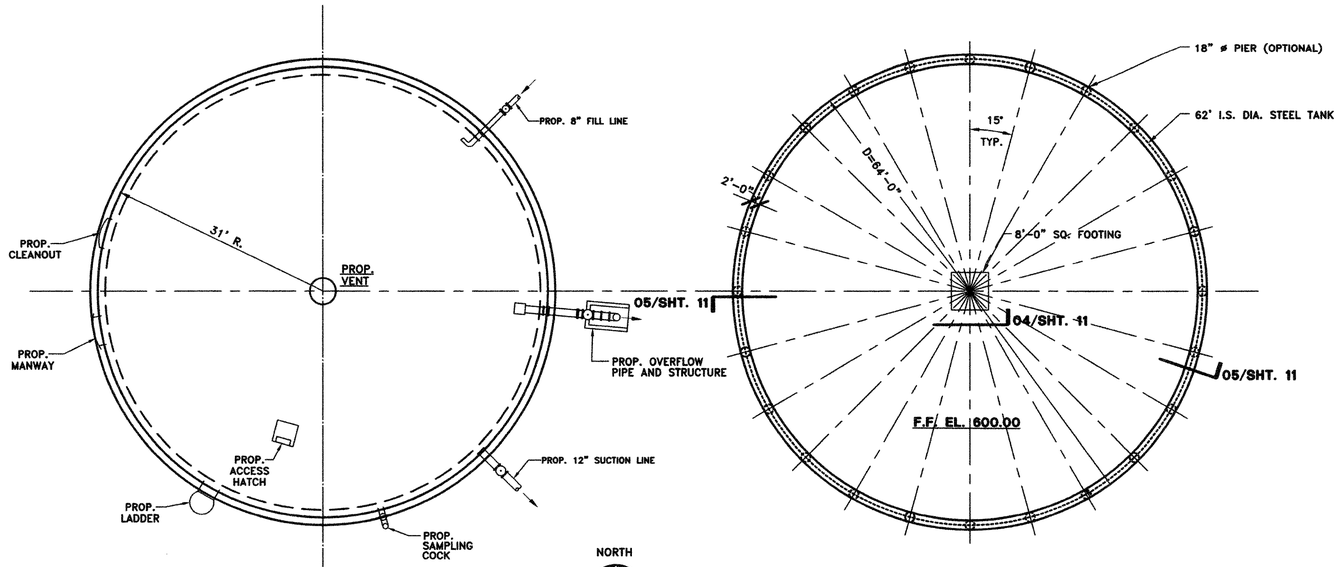
(972) 864-8220 (fax)

STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
11/16/07

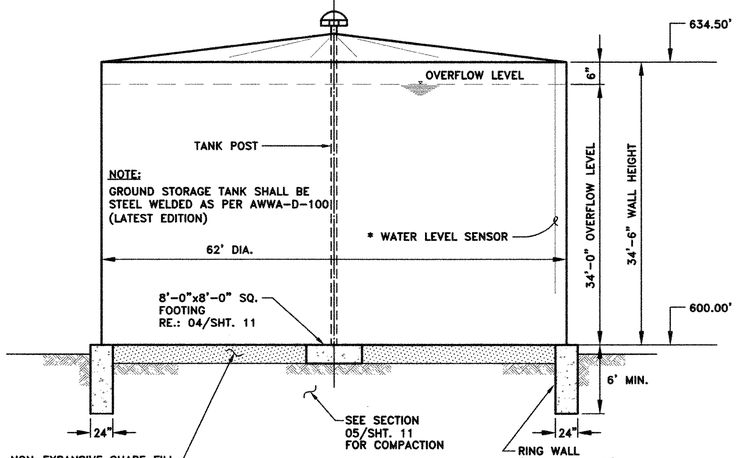
WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
FUTURE GROUND STORAGE TANK - PLAN AND ELEVATION
CITY OF LUCAS

SHEET NO. 10
OF 17 SHEETS
JOB NO. 06-1207



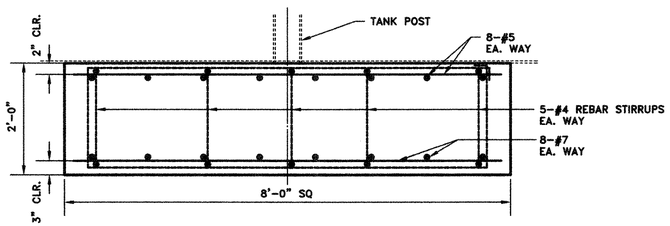
01 PLAN
NOT TO SCALE

03 TANK FOUNDATION
Scale: 1/16"=1'-0"

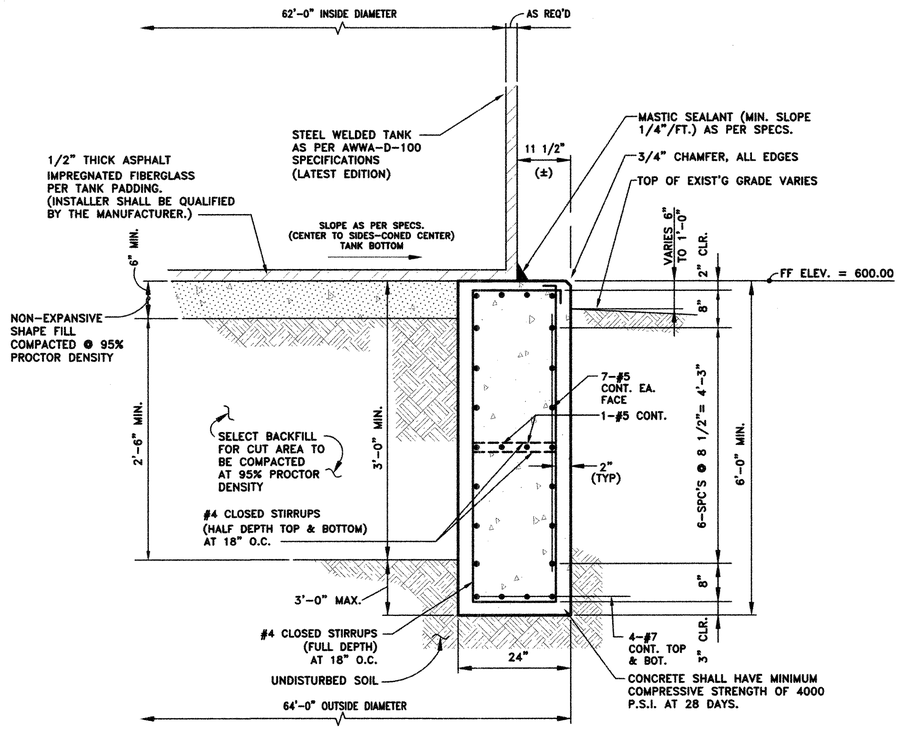


NOTE:
GROUND LINE ELEVATION AROUND THE GROUND STORAGE TANK VARIES. SEE THE GRADING PLAN ADDITIONAL DETAILS.

02 ELEVATION
N.T.S.



04 SECTION
Scale: 3/4"=1'-0"



NOTES:
1. SPLICE LAP LENGTHS SHALL BE 5'-0" FOR #7 BAR AND 3'-0" FOR #5 BAR.
2. SPLICE LAP SHALL BE STAGGERED AT LEAST A LAP LENGTH.

05 RINGWALL DETAIL
Scale: 3/4"=1'-0"

NOTE: SEE OPTIONAL PIER/GR. BM. DETAIL 1/SHT. 13

NOTES:
1. TANK MANUFACTURER SHALL BE RESPONSIBLE FOR THE DESIGN OF THE TANK PER THE SPECIFICATIONS.
2. THE DESIGN SHALL INCLUDE THE WALL, FLOOR AND ROOF PLATE THICKNESSES AS REQUIRED.
3. INCREASE THE PLATE THICKNESS AND PLATE DIMENSIONS WHERE REQUIRED.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOE P. HILL, P.E. 34297 ON FEBRUARY 12, 2007 .

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

Jph
JOE P. HILL, P.E.
CONSULTING STRUCTURAL ENGINEERING
4131 North Central Expressway
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(214) 528-3091
FAX (214) 528-3093
Jph, P.E. Job No. 06232

REFER TO SHEET 13 OF 17 FOR "GENERAL STRUCTURAL NOTES"

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN:
DESIGN:
REVIEWED:
SCALE: AS SHOWN
DATE: JANUARY 2007
DWG. NAME: 1207TANKSTRUCT1

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1919 S. Shiloh Road
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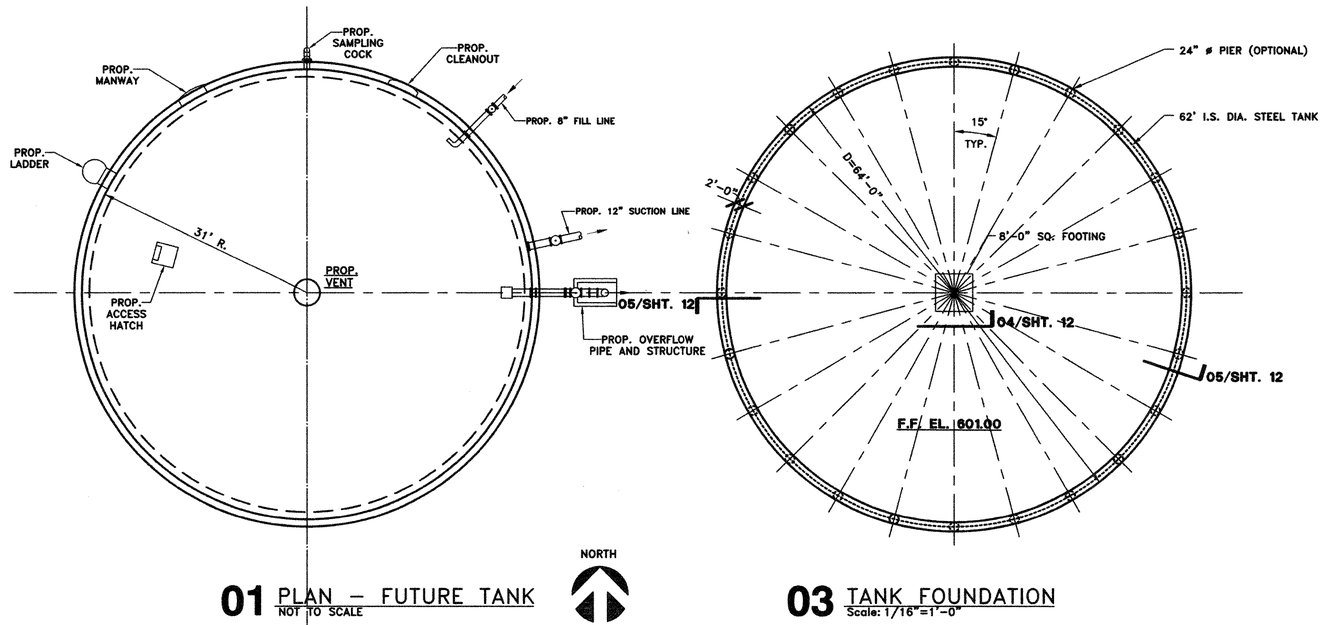
(972) 864-8220 (fax)

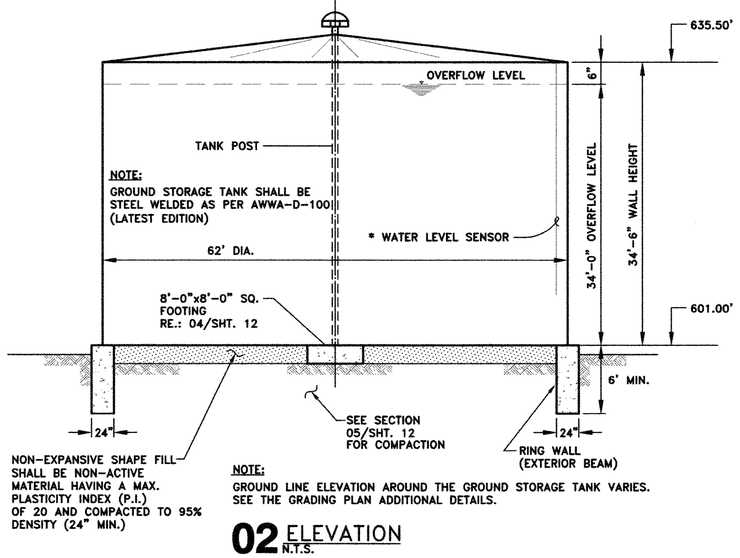
WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK - STRUCTURAL
CITY OF LUCAS

SHEET NO. 11
OF 17 SHEETS
JOB NO. 06-1207

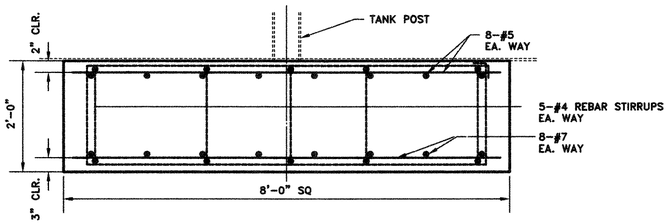


01 PLAN – FUTURE TANK
NOT TO SCALE

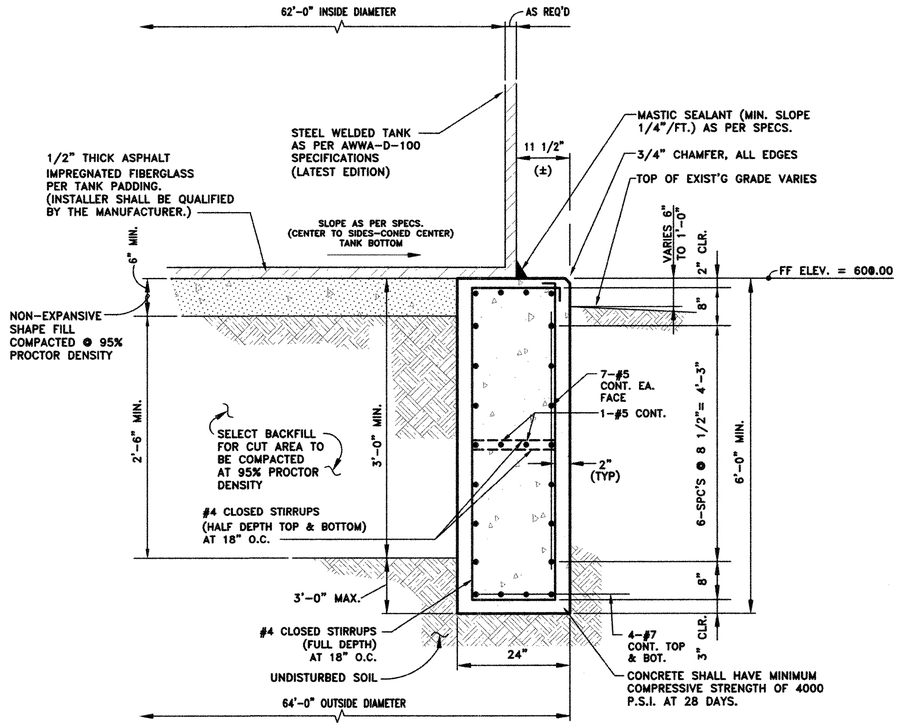
03 TANK FOUNDATION
Scale: 1/16"=1'-0"



02 ELEVATION
N.T.S.



04 SECTION
Scale: 3/4"=1'-0"



NOTES:
1. SPLICE LAP LENGTHS SHALL BE 5'-0" FOR #7 BAR AND 3'-0" FOR #5 BAR.
2. SPLICE LAP SHALL BE STAGGERED AT LEAST A LAP LENGTH.

05 RINGWALL DETAIL
Scale: 3/4"=1'-0"

NOTE: SEE OPTIONAL PIER/GR. BM. DETAIL 1/SHT. 13

NOTES:
1. TANK MANUFACTURER SHALL BE RESPONSIBLE FOR THE DESIGN OF THE TANK PER THE SPECIFICATIONS.
2. THE DESIGN SHALL INCLUDE THE WALL, FLOOR AND ROOF PLATE THICKNESSES AS REQUIRED.
3. INCREASE THE PLATE THICKNESS AND PLATE DIMENSIONS WHERE REQUIRED.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOE P. HILL, P.E. 34297 ON FEBRUARY 12, 2007 .

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

Jph
JOE P. HILL, P.E.
CONSULTING STRUCTURAL ENGINEERING
4131 North Central Expressway
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(214) 528-3091
FAX (214) 528-3093
Jph, P.E. Job No. 06232

REFER TO SHEET 13 OF 17 FOR "GENERAL STRUCTURAL NOTES"

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN:
DESIGN:
REVIEWED:
SCALE: AS SHOWN
DATE: JANUARY 2007
DWG. NAME: 1207TANKSTRUCTFUT

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

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
FUTURE GROUND STORAGE TANK - STRUCTURAL
CITY OF LUCAS

SHEET NO. 12
OF 17 SHEETS
JOB NO. 06-1207

GENERAL STRUCTURAL NOTES:

FOUNDATION:

1. THE FOUNDATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE SOILS REPORT PREPARED BY CMJ ENGINEERING, INC. DATED NOV. 28, 2006. PROJECT NO. 877-06-02.
2. THE CONTRACTOR AND ALL SUBCONTRACTORS SHOULD BE TOTALLY FAMILIAR WITH THE CONTENTS OF THE SOILS REPORT.
3. ANY CONDITION FOUND, PRIOR TO OR DURING CONSTRUCTION, THAT IS DIFFERENT THAN THAT DESCRIBED IN THE SOILS REPORT AND THAT WOULD AFFECT THE FOUNDATIONS AS DESIGNED, SHALL BE BROUGHT TO THE ATTENTION OF BW2 ENGINEERS AND/OR JOE P. HILL, P. E., INC.
4. IN NO CASE SHALL CONSTRUCTION PROCEED IF THE PERFORMANCE OF THE FOUNDATIONS, AS DESIGNED, WILL BE COMPROMISED.
5. PRIOR TO ANY NEW CONSTRUCTION, THE SITE SHALL BE CLEARED OF ANY AND ALL OBSTRUCTIONS THAT WOULD HINDER THE PROPER PREPARATION OF THE SITE FOR CONSTRUCTION.
6. IN THE AREA OF BORING NO. 8, ALL THE EXISTING FILL DEBRIS MATERIAL SHALL BE REMOVED DOWN TO FIRM INSITU CLAY SOILS.
7. ALL CLEARED DEBRIS SHALL BE REMOVED AND DISPOSED OF PROPERLY OFFSITE, AND SUITABLE ONSITE SOIL OR ACCEPTABLE FILL BE PLACED.
8. MINIMUM PREPARATION OF THE TANK PADS SHALL BE THE COMPLETE REMOVAL OF THE TOP THREE (3) FEET OF SURFICIAL SOILS WITHIN THE TANK AREA AND TO AT LEAST TEN (10) FEET BEYOND THE TANK EDGE.
9. AFTER REMOVAL OF THE TOP THREE (3) FEET, THE EXPOSED SUBGRADE SHOULD BE SCARIFIED AND COMPACTED AT OR ABOVE OPTIMUM MOISTURE TO A MINIMUM OF 95 PERCENT OF STANDARD PROCTOR DENSITY (ASTM D 698).
10. FILL MATERIALS IN THE DEBRIS REMOVAL AREA THEN SHOULD BE PLACED TO WITHIN THREE (3) FEET OF THE SURFACE USING ONSITE SOILS, COMPACTED TO THE ABOVE STANDARDS.
11. THE EXCAVATED AREA FROM GRADE MINUS THREE (3) FEET TO PAD GRADE SHOULD THEN BE BACKFILLED USING SELECT FILL OR A FLEXIBLE BASE MATERIAL MEETING THE REQUIREMENTS OF TXDOT ITEM 247, TYPE A, GRADES 1 OR 2.
12. THIS MATERIAL SHOULD BE PLACED IN LIFTS OF APPROXIMATELY SIX (6) INCHES AT A MINIMUM OF MINUS TWO (2) TO PLUS THREE (3) PERCENTAGE POINTS OF THE MATERIAL'S OPTIMUM MOISTURE AT A MINIMUM OF 95 PERCENT OF STANDARD PROCTOR DENSITY (ASTM D 698).
13. A LAYER OF COARSE SAND MAY BE PLACED DIRECTLY BELOW THE BOTTOM OF THE TANK TO PROVIDE UNIFORM SUPPORT.
14. ANY FILL MATERIAL USED FOR GENERAL SITE FILL SHALL CONSIST OF ON-SITE MATERIALS OR IMPORTED MATERIALS AS APPROVED BY THE SOILS ENGINEERS.
15. SITE GRADING OPERATIONS, WHERE REQUIRED, SHALL BE PERFORMED IN ACCORDANCE WITH THE RECOMMENDATIONS PROVIDED IN THE SOILS REPORT.
16. SITE GRADING PLANS AND CONSTRUCTION SHALL STRIVE TO ACHIEVE POSITIVE DRAINAGE AROUND ALL SIDES OF THE PROPOSED STRUCTURE.
17. INADEQUATE DRAINAGE AROUND STRUCTURES BUILT ON GRADE CAN CAUSE EXCESSIVE VERTICAL DIFFERENTIAL MOVEMENTS TO OCCUR.
18. THE GEOTECHNICAL ENGINEER SHALL MONITOR FOUNDATION CONSTRUCTION TO VERIFY CONDITIONS ARE AS ANTICIPATED.
19. FOUNDATION EXCAVATION SHALL BE DRY AND FREE OF LOOSE MATERIAL.
20. EXCAVATION FOR FOUNDATIONS SHALL BE FILLED WITH CONCRETE BEFORE THE END OF THE WORKDAY OR SOONER IF NECESSARY TO PREVENT DETERIORATION OF THE BEARING SURFACE.
21. ALL EXCAVATIONS SHALL BE SLOPED, SHORED OR SHIELDED IN ACCORDANCE WITH OSHA REQUIREMENTS.

CONCRETE:

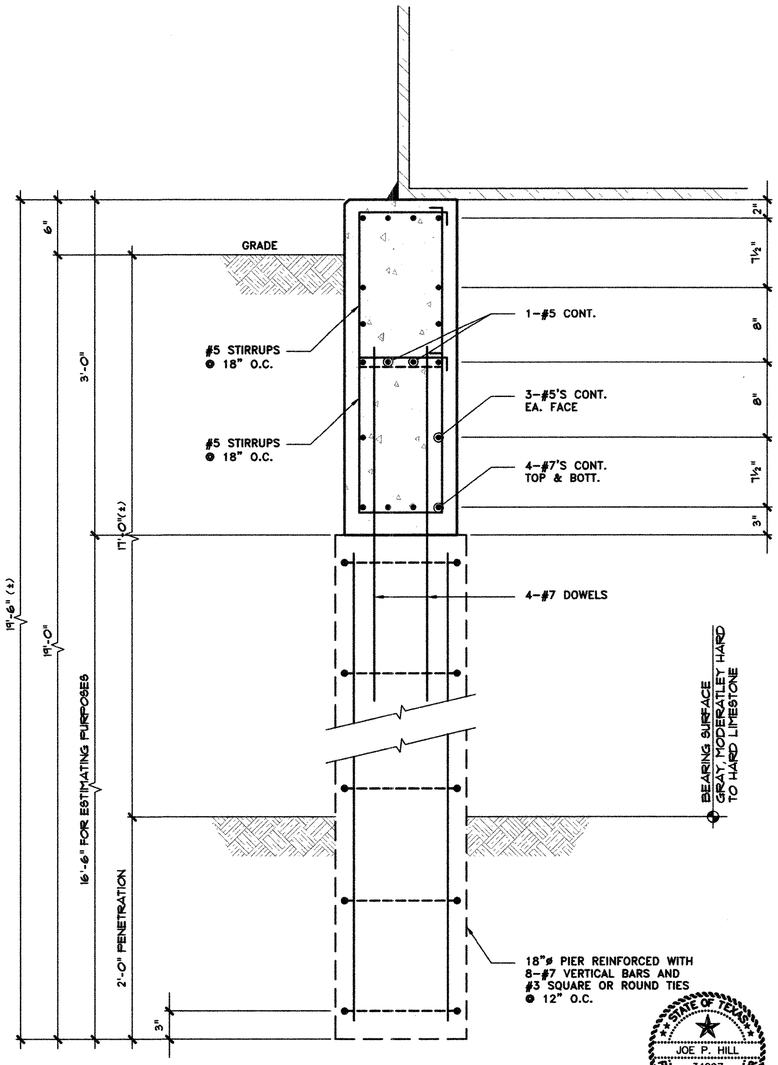
1. CONCRETE WORK SHALL BE EXECUTED IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE BUILDING CODE (ACI 381-02).
2. CONCRETE AND REINFORCING SPECIFICATIONS AS FOLLOWS:

	28 DAY STRENGTH	SACK CONTENT	AGGREGATE	SLUMP
Typical	4,000 PSI	6/C.Y.	H.R.	4" TO 6"
Piers	3,000 PSI	5/C.Y.	H.R.	5" TO 7"

3. PORTLAND CEMENT SHALL CONFORM TO ASTM C-33.
4. REINFORCING STEEL SHALL CONFORM TO ASTM 615, GRADE 60; GRADE 40 FOR STIRRUPS AND TIES.
5. ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM A82, GRADE 60.
6. REINFORCING STEEL SHALL BE DESIGNED, DETAILED, FABRICATED, AND PLACED IN ACCORDANCE WITH THE LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI 315).
7. SLAB REINFORCING SHALL BE LOCATED IN THE SLABS AS NOTED ON THE DRAWINGS.
8. ALL GRADE BEAM REINFORCING TO BE AS SHOWN IN SECTIONS ON THE DRAWINGS.
9. PROVIDE 2 - #5 BARS EACH SIDE OF ALL OPENINGS. EXTEND BARS TWO (2) FEET PAST OPENINGS EACH DIRECTION.
10. CORNER REINFORCING BARS SHALL BE USED AT ALL CORNERS AND INTERSECTIONS.
11. REINFORCING SPLICES SHALL OCCUR AT POINTS OF MINIMUM STRESS AND LAP THIRTY (30) BAR DIAMETERS UNLESS OTHERWISE NOTED.
12. LAP ALL WELDED WIRE FABRIC EIGHT (8) INCHES MINIMUM.
13. THE INTERIOR FLOOR AREAS THAT DO NOT RECEIVE RESILIENT FLOORING OR SURFACE MATERIAL SHALL BE SEALED. THE TIMING OF THE APPLICATION OF THIS MATERIAL MUST BE APPROVED BY THE ENGINEER. THE MATERIAL IS TO BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS. (TWO COATS MINIMUM).
14. ALL INTERIOR CONCRETE FLOOR WORK SHALL BE COATED WITH CURING COMPOUND. APPLICATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS.
15. ALL EXTERIOR CONCRETE WALKS AND DRIVES SHALL BE CONSTRUCTED USING AIR-ENTRAINED CONCRETE. SUFFICIENT AIR-ENTRAINING AGENT SHALL BE USED TO REDUCE THE WEIGHT OF THE CONCRETE BY 6% TO 8%.
16. SEE ARCHITECTURAL AND MECHANICAL PLANS FOR VERIFICATION OF ALL DEPRESSIONS, OPENINGS, CAST-IN-PLACE ACCESSORIES, ETC.

TANK:

1. THE TANK STRUCTURE SHALL BE DESIGNED BY THE TANK VENDOR.
2. SHOP DRAWINGS, INCLUDING THE DESIGN CALCULATIONS, SHALL BE SUBMITTED IN ORDER THAT THE ENCLOSED TANK FOUNDATION DESIGN CAN BE VERIFIED.
3. THE SUBMITTED CALCULATIONS SHALL CLEARLY AND SPECIFICALLY DESIGNATE THE VERTICAL AND LATERAL LOADS THAT NEED TO BE RESISTED BY THE TANK SUPPORT RING.
4. THE CONTRACTOR SHALL ROUGH GRADE THE AREA AS HE DEEMS NECESSARY TO FACILITATE ACCESS AND PROPER CONSTRUCTION OF THE TANK AND ITS FOUNDATION.
5. ANY SLOPE SHAPING AND ROUGH GRADING SHALL BE IN ACCORDANCE WITH ALL PREVAILING OSHA STANDARDS AND REQUIREMENTS.



01 PIER DETAIL
Scale: N.T.S.

OPTIONAL TANK SUPPORT
SPACE PIERS @ 15° AROUND CIRCULAR

STATE OF TEXAS
JOE P. HILL
34297
REGISTERED
PROFESSIONAL
ENGINEER
2/12/07

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOE P. HILL, P.E. 34297 ON FEBRUARY 12, 2007 .

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

Jph
JOE P. HILL, P.E.
CONSULTING STRUCTURAL ENGINEERING
4131 North Central Expressway
Suite 230, Dallas, Texas 75204
(214) 528-3091
FAX (214) 528-3093
Jph, P.E. Job No. 06232

NO.	DATE	REVISION	REVIEWED
6			
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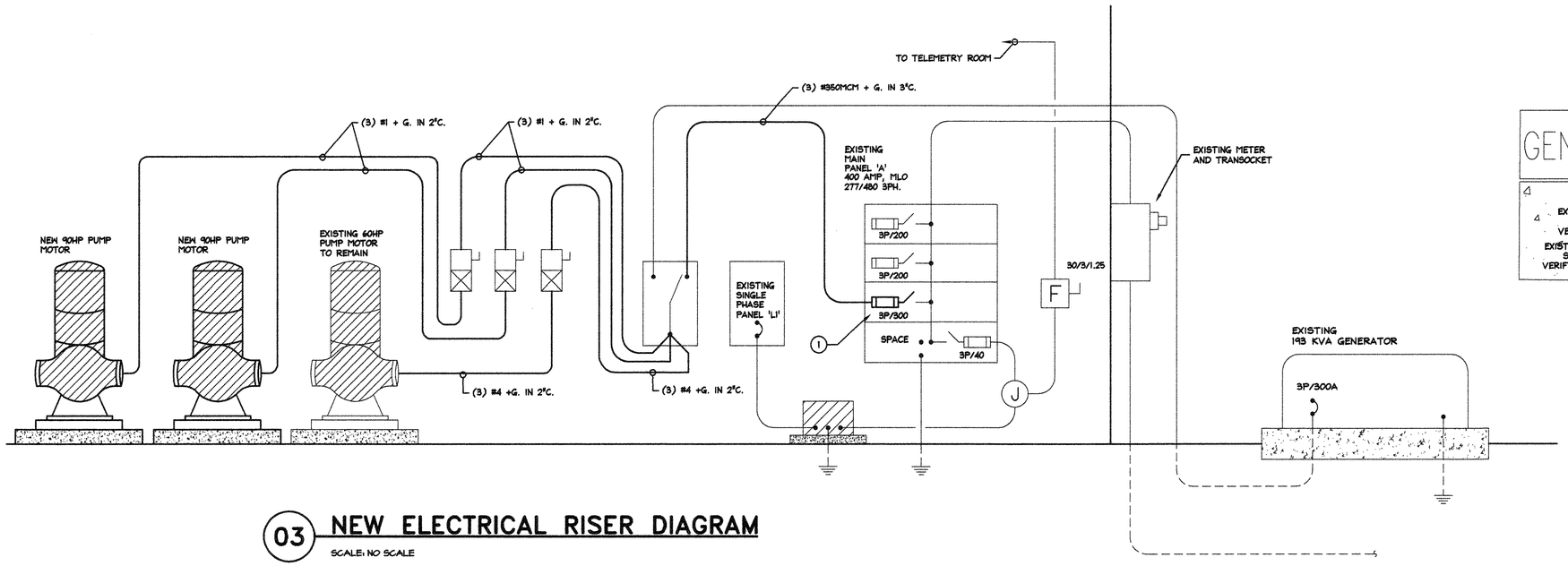
DRAWN:
DESIGN:
REVIEWED:
SCALE: NO SCALE
DATE: JANUARY 2007
DWG. NAME: 1207STRUCNOTE

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

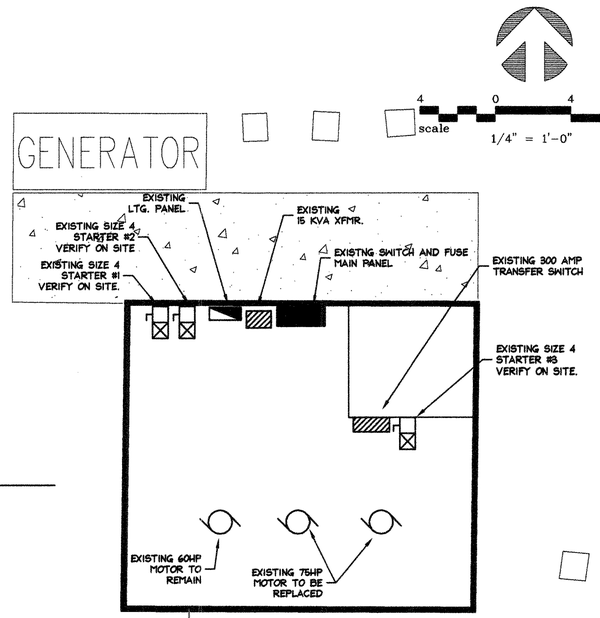
WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GENERAL STRUCTURAL NOTES
CITY OF LUCAS

SHEET NO. 13
OF 17 SHEETS
JOB NO. 06-1207



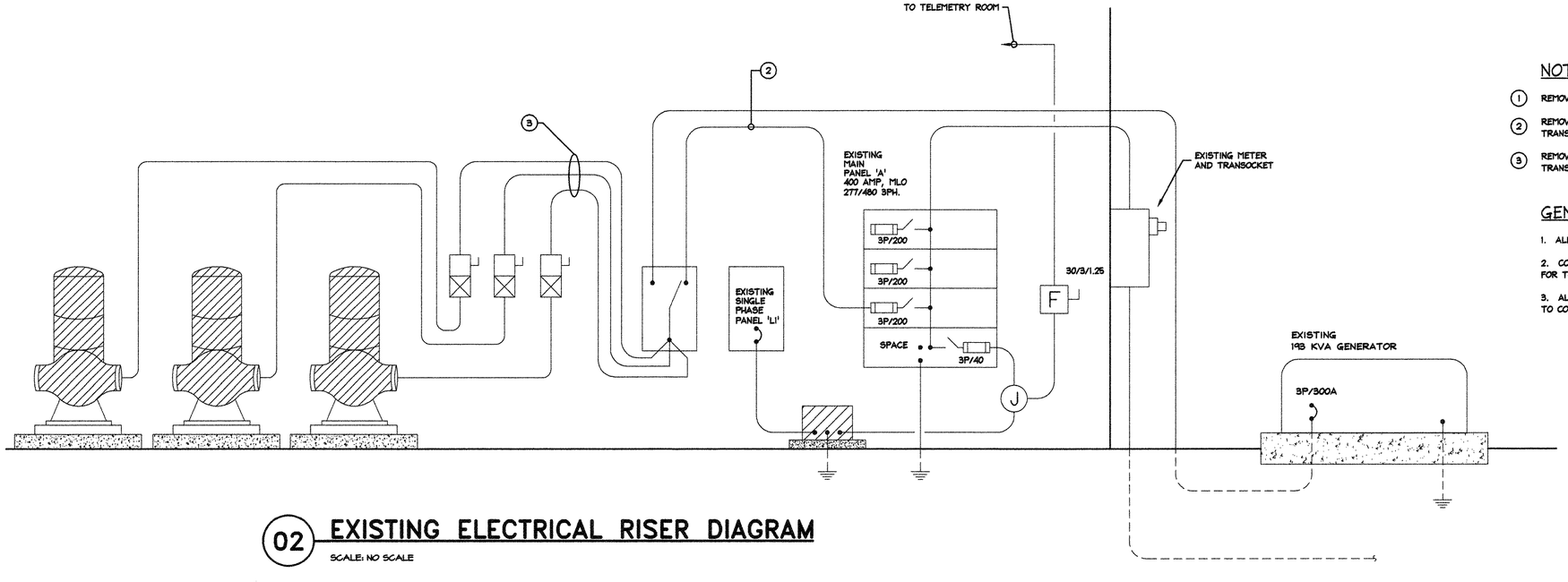
03 NEW ELECTRICAL RISER DIAGRAM

SCALE: NO SCALE



01 FLOOR PLAN – POWER

SCALE: NO SCALE



02 EXISTING ELECTRICAL RISER DIAGRAM

SCALE: NO SCALE

NOTES BY SYMBOL:

(1) REMOVE EXISTING 200 AMP SWITCH AND INSTALL NEW 400 AMP SWITCH WITH 300 AMP FUSING.

(2) REMOVE EXISTING CONDUITS AND CONDUCTORS SERVING THE NORMAL SIDE OF THE AUTOMATIC TRANSFER SWITCH AND INSTALL NEW CONDUITS AND CONDUCTORS AS SHOWN IN 03/E1.

(3) REMOVE EXISTING CONDUITS AND CONDUCTORS SERVING THE MOTOR STARTERS FROM THE AUTOMATIC TRANSFER SWITCH AND INSTALL NEW CONDUITS AND CONDUCTORS AS SHOWN IN 03/E1.

GENERAL NOTES:

1. ALL CONDUITS SHALL CONTAIN A HOT, NEUTRAL AND GROUND UNLESS OTHERWISE NOTED.
2. CONTRACTOR TO VERIFY SIZE AND CONDITION OF MOTOR STARTER ON SITE. MOTOR STARTERS FOR THE NEW 90 HP MOTORS SHALL BE SIZE 4.
3. ALL CONDUIT SHALL BE RIGID METAL CONDUIT WITH THE EXCEPTION OF THE FLEX CONDUIT USED TO CONNECT THE MOTOR. REFERENCE ELECTRICAL PERFORMANCE SPECIFICATIONS #16110.

STATE OF TEXAS
Samuel G. Toub
36988
REGISTERED
PROFESSIONAL ENGINEER

Samuel G. Toub
2007.05.22 10:56:27 -05'00'

RECORD DRAWING

BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

Project # 3878
S. Toub & Associates Inc.
Consulting Engineers Mechanical / Electrical
13641 Omega Road, Dallas, Texas 75244
972/386-5629

NO.	DATE	REVISION	REVIEWED
6			
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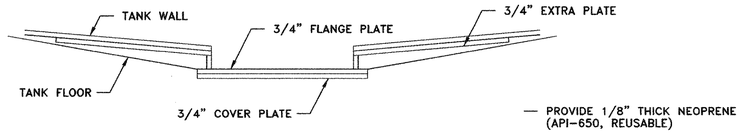
1			

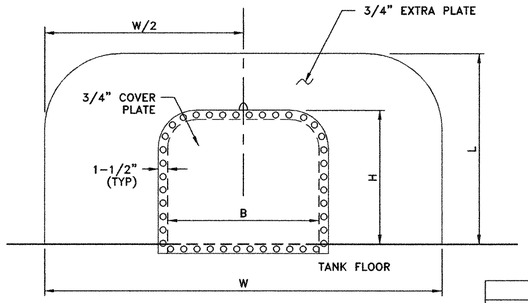
DRAWN: BW2
DESIGN: RLN
REVIEWED: SGT
SCALE: 1/4"= 1'-0"
DATE: MAY 2007
DWG. NAME: ELECTRICAL

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

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
ELECTRICAL
CITY OF LUCAS

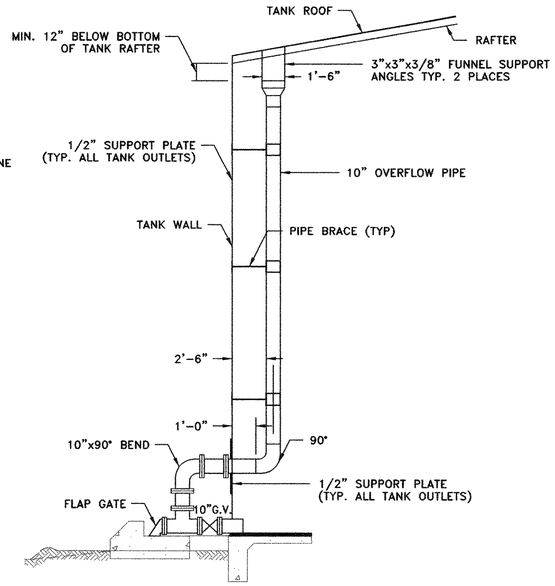
SHEET NO. 14 OF 17 SHEETS
JOB NO. 06-1207



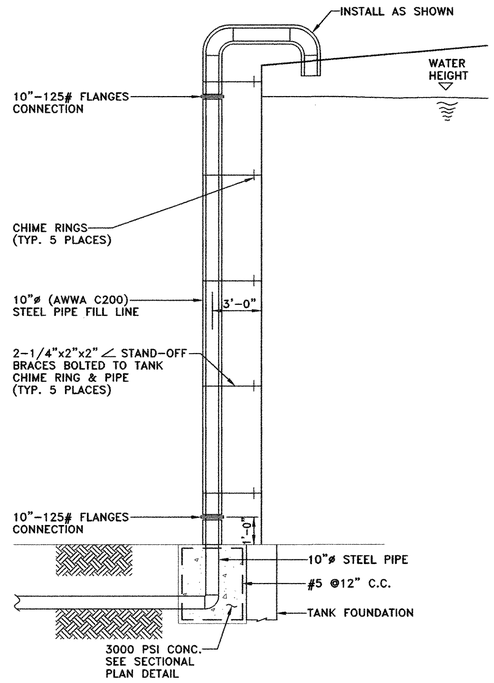


	B	H	W	L
30"x30"	30"	30"	84"	48"
48"x48"	48"	48"	125"	72"

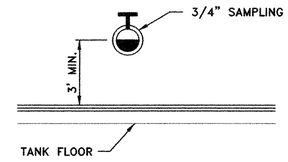
FLUSH TYPE CLEANOUT DOOR DETAIL
(PER API 650)
N.T.S.



OVERFLOW AND DRAIN DETAIL
N.T.S.

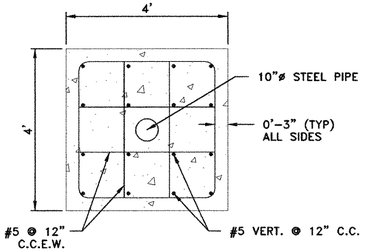


⚠ 10"ø FILL LINE CONNECTION SECTION DETAIL
N.T.S.

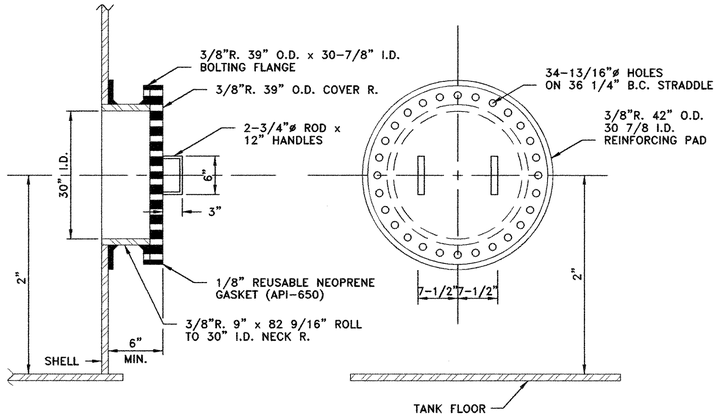


NOTE:
4-1/2" ALTITUDE GAUGE WITH 0 TO 30 ON A 3/4" VALVED OPENING IN TANK. THE ALTITUDE GAUGE SHALL BE INSTALLED ONE (1) FOOT FROM THE BOTTOM OF THE TANK.

SAMPLING COCK DETAIL
N.T.S.

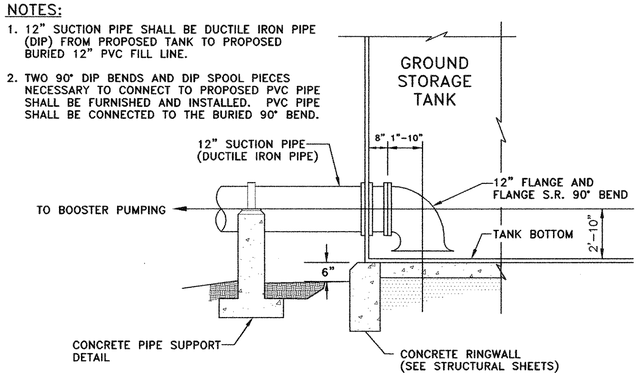


SECTIONAL PLAN
N.T.S.

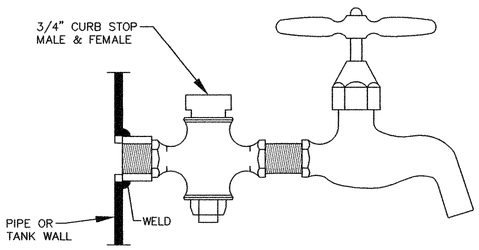


TANK MANWAY
N.T.S.

NOTES:
1. 12" SUCTION PIPE SHALL BE DUCTILE IRON PIPE (DIP) FROM PROPOSED TANK TO PROPOSED BURIED 12" PVC FILL LINE.
2. TWO 90° DIP BENDS AND DIP SPOOL PIECES NECESSARY TO CONNECT TO PROPOSED PVC PIPE SHALL BE FURNISHED AND INSTALLED. PVC PIPE SHALL BE CONNECTED TO THE BURIED 90° BEND.

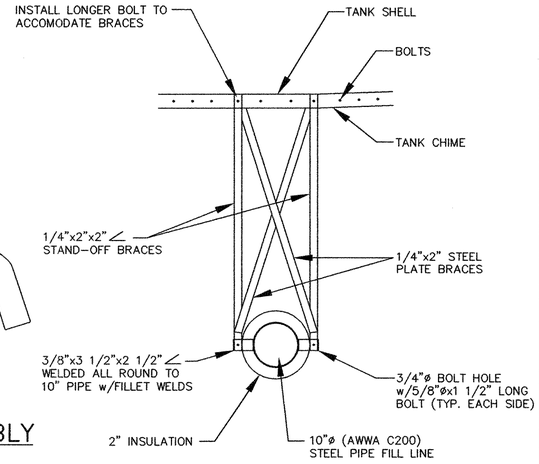


OUTLET CONNECTION (SUCTION PIPE) DETAIL
N.T.S.



3/4" SAMPLING COCK ASSEMBLY
N.T.S.

NOTE:
SAMPLE COCK, CHROME PLATED THREADLESS HOSE BIB BURLINGTON MODEL 2001 O/E, MALE HOSE WITH PLAIN END AND 3/4" IPS THREAD INLET BRASS WITH CROME PLATING.



STAND-OFF BRACE DETAIL SECTION
N.T.S.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
⚠	11/16/07	REVISED 10" FILL LINE CONNECTION SECTION DETAIL PER FIELD CHANGES.	MRB

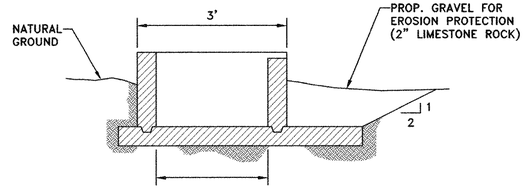
DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: APRIL 2007
DWG. NAME: 1207TANKDET1

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

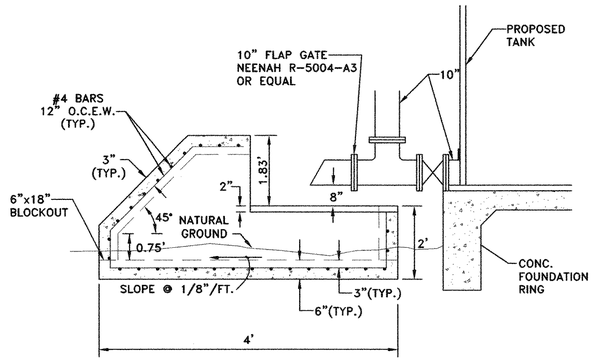
STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
11/16/07

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK DETAILS - SHEET 1
CITY OF LUCAS

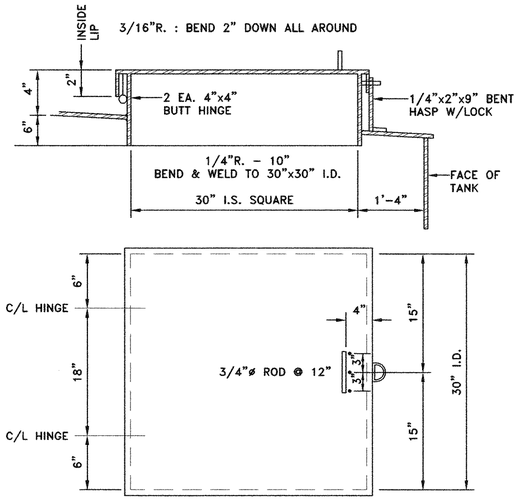
SHEET NO. 15A
OF 17 SHEETS
JOB NO. 06-1207



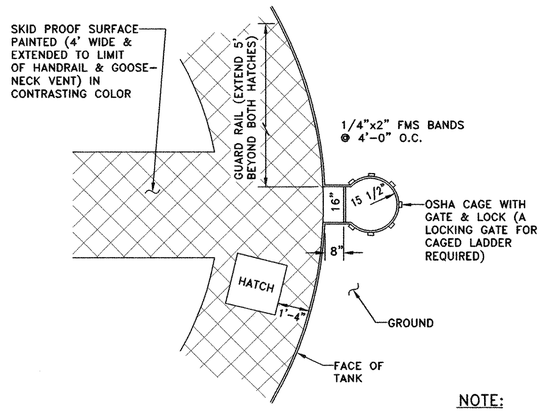
SECTION 'A-A'
N.T.S.

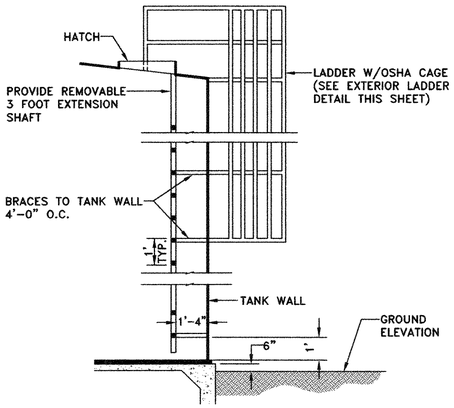


ELEVATION
N.T.S.



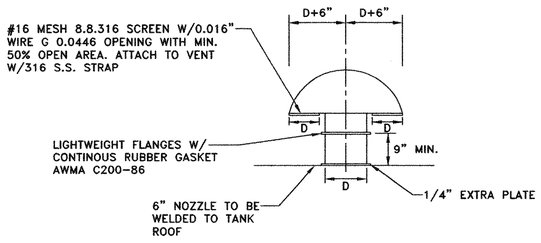
ROOF HATCH DETAIL
N.T.S.





NOTE:
INTERIOR & EXTENSION LADDER TO BE ATTACHED TO TANK WALL WITH FULL PERIMETER SEAL. WELD ALL CONNECTIONS (WELD TO BE 1/4" FILLET).

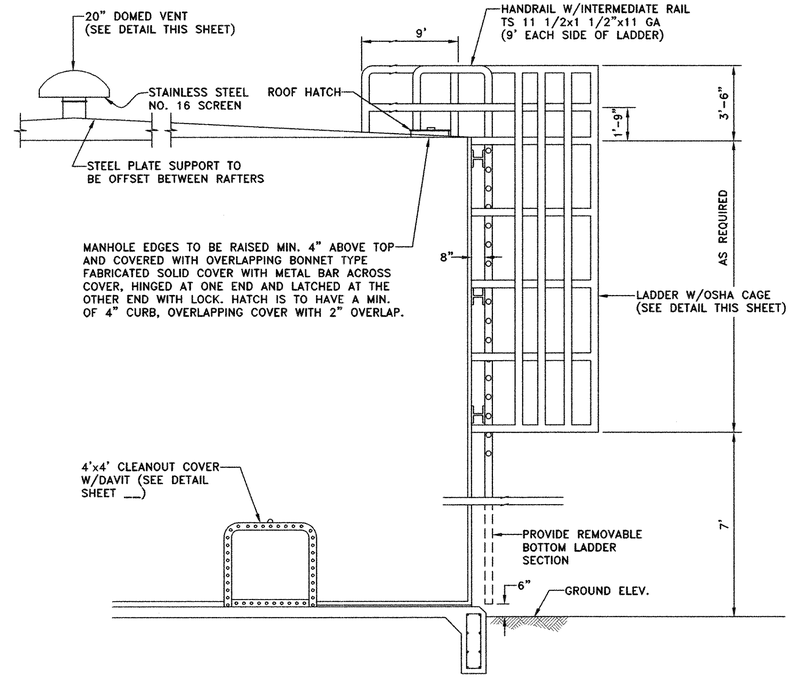
STAINLESS STEEL SAFETY-T-CLIMB
SAFETY RAIL REQUIRED
SAFETY BELT REQUIRED



ROOF VENT DETAIL
N.T.S.

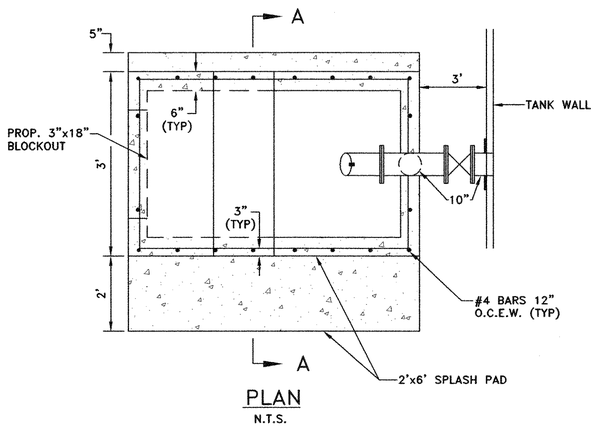
NOTES:

1. VENT TO BE FABRICATED FROM THIN WALL SCHEDULE 10 STEEL PIPE.
2. VENT TO BE COATED INSIDE WITH SAME SYSTEM SPECIFIED FOR INSIDE OF TANK.
3. VENT TO BE COATED ON OUTSIDE WITH SAME SYSTEM SPECIFIED FOR TANK EXTERIOR.
4. "D" IS THE DIAMETER IN INCHES AS CALLED OUT ON EACH TANK.
5. CENTER VENT BETWEEN RAFTERS. OUT ON EACH TANK.



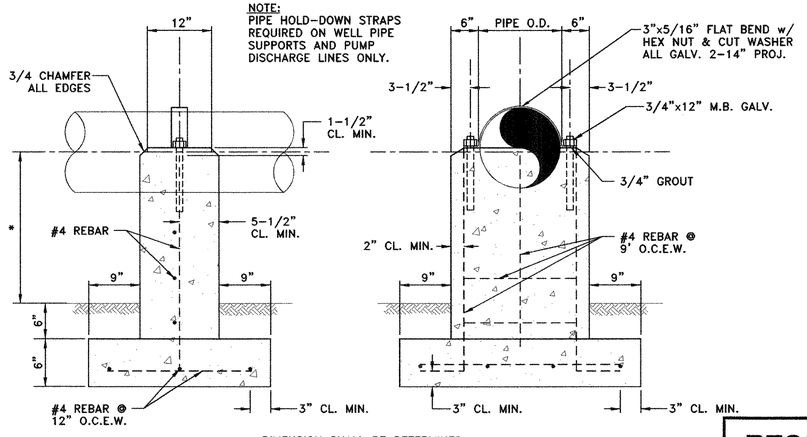
EXTERIOR LADDER DETAIL

STORAGE TANK LADDER DETAIL
N.T.S.



PLAN
N.T.S.

PROP. SPLASH BOX DETAIL
N.T.S.



SIDE VIEW

* DIMENSION SHALL BE DETERMINED BY CONTRACTOR WITH CERTIFIED SHOP DRAWINGS.

FRONT VIEW

CONCRETE PIPE SUPPORT DETAIL
N.T.S.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: APRIL 2007
DWG. NAME: 1207TANKDET2

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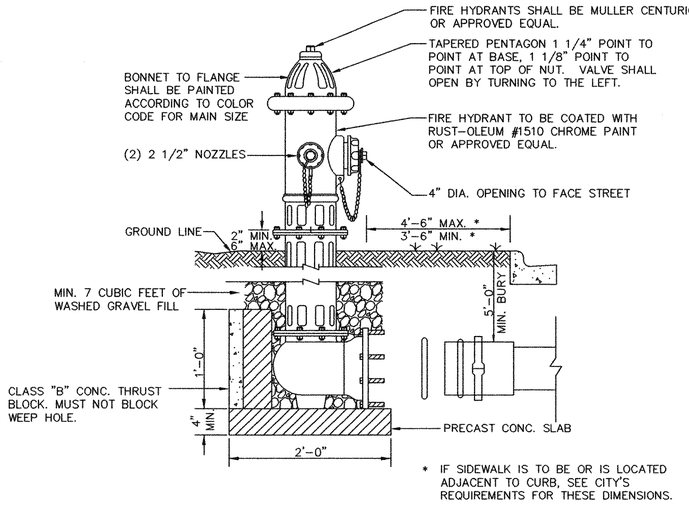
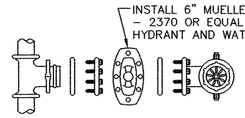
STATE OF TEXAS — MICHAEL R. BURGE — 41290 — REGISTERED PROFESSIONAL ENGINEER — 07/11/13

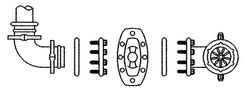
WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GROUND STORAGE TANK DETAILS - SHEET 2
CITY OF LUCAS

SHEET NO. 15B
OF 17 SHEETS
JOB NO. 06-1207





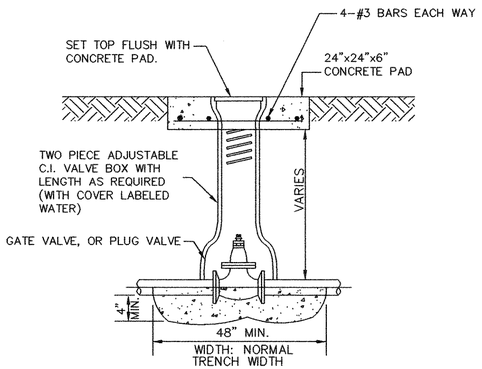
SWIVEL HYDRANT TEE-MJxFLANGE VALVE-FLANGE HYDRANT



SWIVELxSWIVEL 90° ELL-MJxFLANGE VALVE-FLANGE HYDRANT

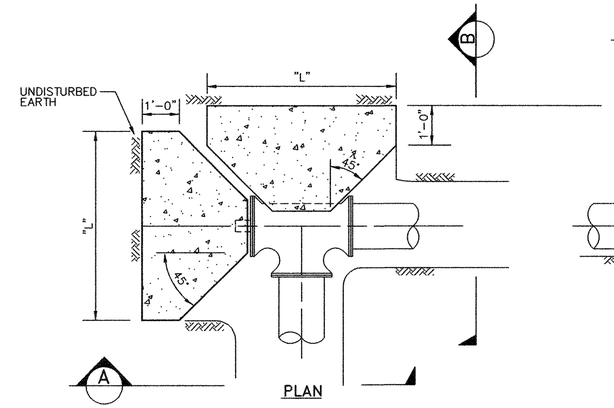
FIRE HYDRANT INSTALLATION

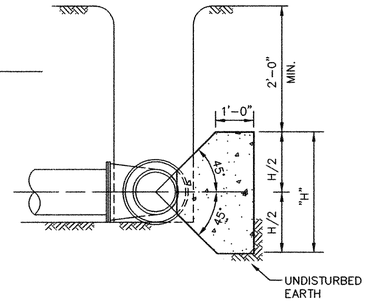
N.T.S.



BURIED VALVE DETAIL

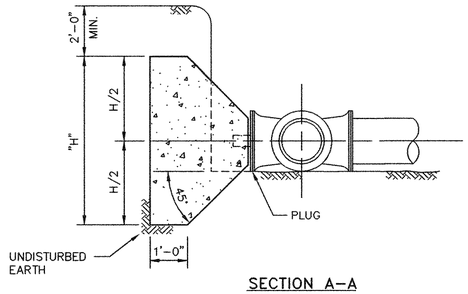
N.T.S.



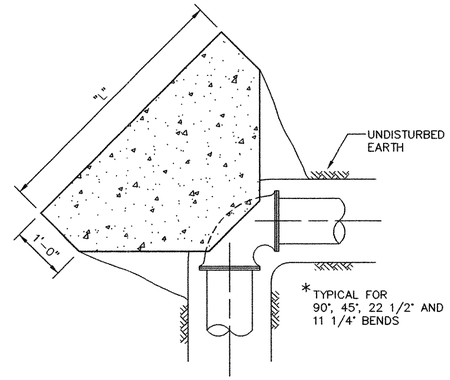


SECTION B-B

PLUGS & TEES



SECTION A-A

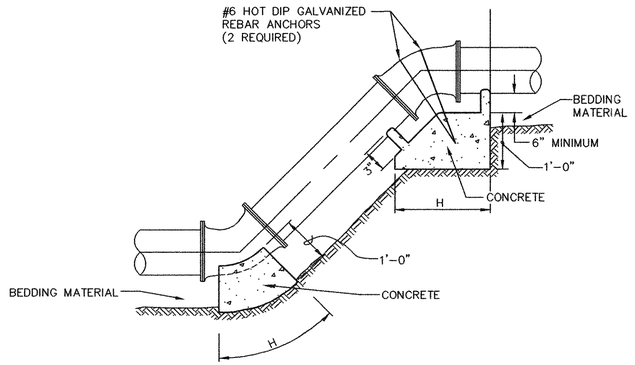


PLAN

BENDS

GENERAL NOTES:

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



ELEVATION - VERTICAL BEND

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

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

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

NOTES:

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

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

CONCRETE ANCHOR BLOCKS

N.T.S.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: APRIL 2007
DWG. NAME: 1207DET1

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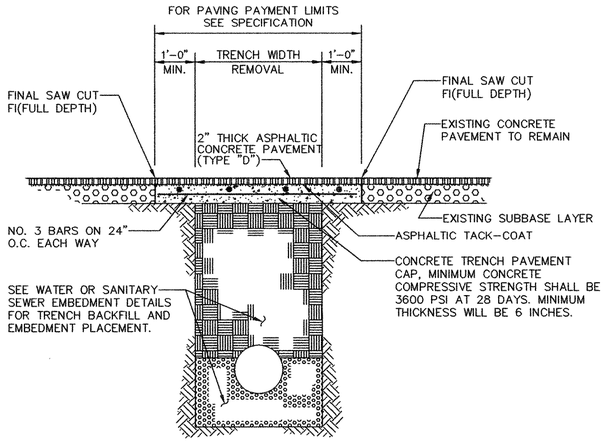
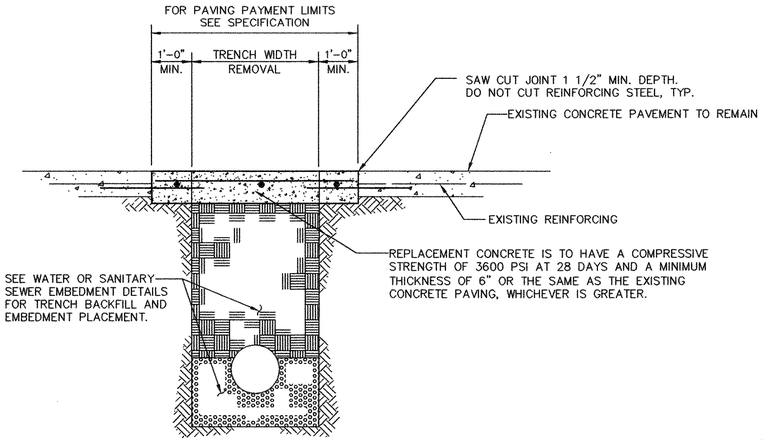
STATE OF TEXAS
MICHAEL R. BURGE
41290
REGISTERED PROFESSIONAL ENGINEER
04-11-07

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GENERAL CONSTRUCTION DETAILS - SHEET 1
CITY OF LUCAS

SHEET NO. 16
OF 17 SHEETS
JOB NO. 06-1207

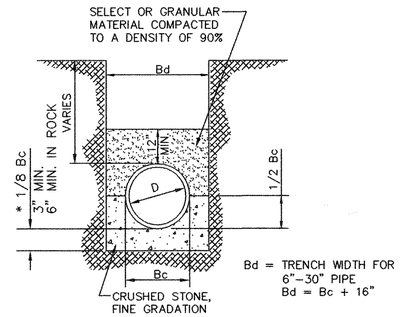


FLEXIBLE BASE AND ASPHALTIC CONCRETE SURFACE



REINFORCED CONCRETE PAVEMENT

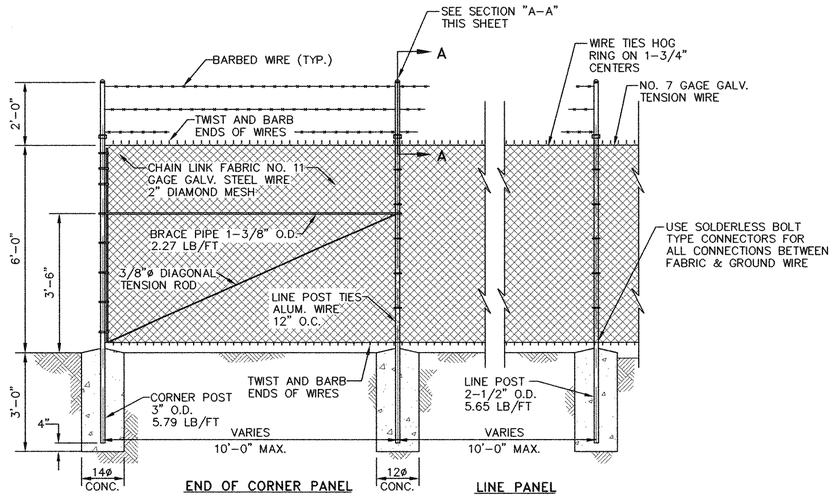
TYPICAL PAVEMENT REPAIR DETAILS
N.T.S.



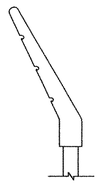
CLASS "B+" EMBEDMENT
N.T.S.

TRENCH BACKFILL AND EMBEDMENT NOTES:

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



TYPICAL CHAIN LINK FENCE
N.T.S.



SECTION "A-A"
N.T.S.

NOTE: THE BARBED SECTION AT THE GATE SHALL BE STRAIGHT UP.

RECORD DRAWING
BASED ON CONTRACTOR MARKUPS, NOT FIELD SURVEY.

NO.	DATE	REVISION	REVIEWED
6			
5			
4			
3			
2			
1			

DRAWN: BW2
DESIGN: MRB
REVIEWED: JFW
SCALE: N.T.S.
DATE: APRIL 2007
DWG. NAME: 1207DET2

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STATE OF TEXAS
MICHAEL R. BURGE
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5/11/07

WATER SYSTEM IMPROVEMENTS
GROUND STORAGE TANKS & PUMP IMPROVEMENTS
GENERAL CONSTRUCTION DETAILS - SHEET 2
CITY OF LUCAS

SHEET NO. 17
OF 17 SHEETS
JOB NO. 06-1207