REVIEW BY FORT BEND COUNTY COMMISSIONERS COURT

On this 24th day of May, 2016, Commissioners Court came on to be heard and reviewed the accompanying notice
of Salvador Guerra / W. W. Payton Corporation
Job Location 19705 1/2 Terrazza Lake Ln., Richmond, TX 77407
Date 3/29/2016 Bond No. 46BSBGJ8122, Permit No. 2016-6467 to make use of certain Fort Bend County property subject to, "A Revised Order Regulating the Laying, Construction, Maintenance, and Repair of Buried Cables, Conduits, and Pole Lines, In, Under, Across or Along Roads, Streets, Highways, and Drainage Ditches in Fort Bend County, Texas, Under the Jurisdiction of the Commissioners Court of Fort Bend County, Texas," as passed by the Commissioners Court of Fort Bend County, Texas the 3rd day of August, 1987, recorded in Volume _____ of the Minutes of the Commissioners Court of Fort Bend County, Texas, to the extent that such order is not inconsistent with Article 1436a, Vernon's Texas Civil Statutes. Upon Motion of Commissioner Meyers, seconded by Commissioner Patterson, duly put and carried, it is ORDERED, ADJUDGED AND DECREED that said notice of said above purpose is hereby acknowledged by the Commissioners Court of Fort Bend County, Texas, and that said notice be placed on record according to the regulation order thereof.

Notes:

1. Evidence of review by the Commissioners Court must be kept on the job site and failure to do so constitutes grounds for job shutdown.
2. Written notices are required:
    a. 48 hours in advance of construction start up, and
    b. when construction is completed and ready for final inspection

    Mail notices to: Permit Administrator
    Fort Bend County Engineering
    301 Jackson Street
    Richmond, Texas 77469
    281-633-7500
3. This permit expires one (1) year from date of permit if construction has not commenced.

By: for Charles D. Dell
County Engineer

By: N/A
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.
Recorded in Volume
5-24-16 13D
Minutes of Commissioners Court

Clerk of Commissioners Court
By: Linda Wilder
Deputy

County of Fort Bend

Engineering Department

301 Jackson Street
Richmond, Texas 77469

Johnny Ortega
Permit Administrator

Phone: (281) 633-7500

Permit Application Review Form For
Cable, Conduit, and Pole Line Activity
In Fort Bend County

Permit No. 2016-6467

The following "Notice of Proposed Cable, Conduit, and/or Pole Line activity in Fort Bend County" and accompanying attachments have been reviewed and the notice conforms to appropriate regulations set by Commissioner's Court of Fort Bend County, Texas.

X (1) Complete Application Form:

- X a. Name of road, street, and/or drainage ditch affected.
- X b. Vicinity map showing course of directions
- X c. Plans and specifications

X (2) Bond:

District Attorney, approval when applicable.

Perpetual bond currently posted.

No:

Amount:

X Performance bond submitted.

No: 46BSBGJ8122

Amount: $5,000.00

Cashier's Check

No:

Amount:

____ (3) Verbal permission given for emergencies, to start construction before approved in Commissioner's Court.

Precinct Engineer Acknowledgment — Date

Precinct Commissioner Acknowledgment — Date

(4)

Drainage District Approval when applicable

We have reviewed this project and agree it meets minimum requirements.

Johnny Ortega CFM/Permit Administrator — Date: 3/29/2016

PERFORMANCE BOND COVERING ALL CABLE, CONDUIT AND/OR POLE LINE ACTIVITY IN, UNDER, ACROSS OR ALONG FORT BEND COUNTY ROAD

AUTHORIZED

BOND NO 46BSBGJ8122

THE STATE OF TEXAS §

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF FORT BEND §

THAT WE, W. W. Payton Corporation **whose address is** P.O. Box 1056, Katy, TX 77492-1056 **Texas, hereinafter called the Principal, And** Hartford Casualty Insurance Company**, a Corporation existing under and by virtue of the laws of the state of** Indiana **and authorized to do an indemnifying business in the state of Texas, and whose principal office is located at** Hartford, Connecticut**, whose officer residing in the State of Texas, authorized to accept service in all suits and actions brought whining said state is** Michael Heidrick **and Whose address is** Hartford, 3000 Internet Blvd., #600, Frisco, TX 75034**, hereinafter called the Surety, and held and firmly bound unto , Robert e. Hebert, County Judge of Fort Bend County, Texas, or his successors in office, in the full sum of** Five Thousand and No/100--------- **Dollars ($** 5,000.00 **) current, lawful money of the United Stated of America, to be paid to said Robert E. Hebert, County Judge of Fort Bend County, Texas, or his successors in office, to which payment well and truly to be made and done, we, the undersigned, bind ourselves and each of us, our heirs, executors, administrators, successors, assigns, and legal representatives, jointly and severally, by these presents.**

THE CONDITION OF THIS BOND IS SUCH THAT, WHEREAS, the above bounden principal contemplates laying, constructing, maintaining and/or repairing one or more cables, conduits, and/or pole lines in, under, across and/or along roads, streets and highways, commercial driveway and median openings or modifications in the County of Fort Bend, and the State of Texas, under the jurisdiction of the Commissioners' Court of Fort Bend County, Texas, pursuant to the Commissioners' Court order adopted on the 1st day of December, A.D. 1980, recorded in Volume 13, of the Commissioners' Court Minutes of Fort Bend County, Texas, regulating same, which Commissioners' Court order is hereby referred to and made a part hereof for all purposes as though fully set out herein;

AND WHEREAS, the principal desires to provide Fort Bend County with a performance bond covering all such cable, conduit and/or pole line activity, commercial driveway and median openings or modifications;

NOW, THEREFORE, if the above bounden principal shall faithfully perform all its cable, conduit and/or pole line activity (including, but not limited to the laying, construction, maintenance and/or repair of cables, conduits and/or pole lines) in, under, across and/or along roads, streets and highways, commercial driveway and median openings or modifications in the County of Fort Bend and State of Texas, under the jurisdiction of the Commissioners Court of Fort Bend County, Texas, pursuant to and in accordance with minimum requirements and conditions of the above mentioned Commissioners' Court order set forth and specified to be by said principal done and performed, at the time and in the manner therein specified, and shall pay over and make good and reimburse Fort Bend County, all loss and damages which Fort Bend County may sustain by reason of any failure or default on the part of said principal, then this obligation shall be null and void, otherwise to remain in full force and effect.

This bond is payable at the County Courthouse in the County of Fort Bend and State of Texas.

It is understood that at any time Fort Bend County deems itself insecure under this bond, it may require further and/or additional bonds of the principal.

EXECUTED this 29th **day of** March**,** 20 16**.**

W. W. Payton Corporation
PRINCIPAL

BY Wesley W. Payton, President

Hartford Casualty Insurance Company
SURETY

BY Sharon Cavanaugh Attorney-in-Fact

POWER OF ATTORNEY

Direct Inquiries/Claims to:
THE HARTFORD
BOND, T-4
One Hartford Plaza
Hartford, Connecticut 06155
call: 888-266-3488 *or fax:* 860-757-5835

KNOW ALL PERSONS BY THESE PRESENTS THAT: **Agency Code: 61-610074 & 46-505987**

- [X] **Hartford Fire Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [X] **Hartford Casualty Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [X] **Hartford Accident and Indemnity Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Hartford Underwriters Insurance Company**, a corporation duly organized under the laws of the State of Connecticut
- [ ] **Twin City Fire Insurance Company**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of Illinois**, a corporation duly organized under the laws of the State of Illinois
- [ ] **Hartford Insurance Company of the Midwest**, a corporation duly organized under the laws of the State of Indiana
- [ ] **Hartford Insurance Company of the Southeast**, a corporation duly organized under the laws of the State of Florida

having their home office in Hartford, Connecticut, (hereinafter collectively referred to as the "Companies") do hereby make, constitute and appoint, ***up to the amount of unlimited:***

Andrew J. Janda, C. W. Adams, Sue Kohler, Leland L. Rauch, Sharon Cavanaugh, Cheryl R. Colson, Michael Cole, Kurt A. Risk, James Wynne Tomforde
of
Houston, TX

their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign its name as surety(ies) only as delineated above by ☒, and to execute, seal and acknowledge any and all bonds, undertakings, contracts and other written instruments in the nature thereof, on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

In Witness Whereof, and as authorized by a Resolution of the Board of Directors of the Companies on January 22, 2004 the Companies have caused these presents to be signed by its Assistant Vice President and its corporate seals to be hereto affixed, duly attested by its Assistant Secretary. Further, pursuant to Resolution of the Board of Directors of the Companies, the Companies hereby unambiguously affirm that they are and will be bound by any mechanically applied signatures applied to this Power of Attorney.

Wesley W. Cowling, Assistant Secretary

M. Ross Fisher, Assistant Vice President

STATE OF CONNECTICUT } ss. Hartford
COUNTY OF HARTFORD }

On this 12th day of July, 2012, before me personally came M. Ross Fisher, to me known, who being by me duly sworn, did depose and say: that he resides in the County of Hartford, State of Connecticut; that he is the Assistant Vice President of the Companies, the corporations described in and which executed the above instrument; that he knows the seals of the said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed by authority of the Boards of Directors of said corporations and that he signed his name thereto by like authority.

Kathleen T. Maynard
Notary Public
My Commission Expires July 31, 2016

CERTIFICATE

I, the undersigned, Assistant Vice President of the Companies, DO HEREBY CERTIFY that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is still in full force effective as of March 29, 2016
Signed and sealed at the City of Hartford.

Gary W. Stumper, Assistant Vice President

Inquiries Regarding Claims

Hartford Fire Insurance Company
Hartford Casualty Insurance Company
Hartford Accident and Indemnity Company
Hartford Underwriters Insurance Company
Twin City Insurance Company
Hartford Insurance Company of Illinois
Hartford insurance Company of the Midwest
Hartford Insurance Company of the Southeast

Please address inquiries regarding **Claims** for all surety and fidelity products issued by The Hartford's underwriting companies to the following:

Phone Number	:	888-266-3488
Fax - Claims	:	860-757-5835 or 860-547-8265
E-mail	:	claims@1stepsurety.com
Mailing Address	:	The Hartford The Hartford Fidelity & Bonding (BOND) Hartford Plaza 690 Asylum Avenue Hartford, CT 06115

IMPORTANT NOTICE

To obtain information or make a complaint:

You may contact your agent.

You may call Hartford Insurance Group at the toll free telephone number for information or to make a complaint at:

1-800-392-7805

You may also write to The Hartford:

The Hartford
Hartford Financial Products
2 Park Avenue, 5th Floor
New York, New York 10016
1-212-277-0400

You may contact the Texas Department of Insurance to obtain information on companies, coverages, rights or complaints at:

1-800-252-3439

You may write the Texas Department of Insurance

P.O. Box 149104
Austin, TX 78714-9104
Fax Number (512) 475-1771
Web: http://www.tdi.state.tx.us
E-mail: ConsumerProtection@tdi.state.tx.us

PREMIUM OR CLAIMS DISPUTES: Should you have a dispute concerning your premium or about a claim you should contact the agent first. If the dispute is not resolved, you may contact the Texas Department of Insurance.

ATTACH THIS NOTICE TO YOUR POLICY: This notice is for your information only and does not become a part or condition of the attached document.

AVISO IMPORTANTE

Para obtener informacion o para someter una queja.

Puede comunicarse con su agente.

Usted puede llamar al numero de telefono gratis de The Hartford Insurance Group para indormacion o para someter una queja al

1-800-392-7805

Usted tambien puede escribir a The Hartford.

The Hartford
Hartford Financial Products
2 Park Avenue, 5th Floor
New York, New York 10016
1-212-277-0400

Puede comunicarse con el Departamento de Seguros de Texas para obtener informacion acerca de compañías, coberturas, derechos o quejas al:

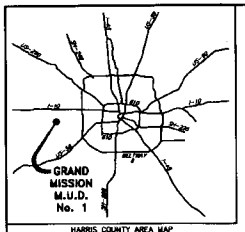
1-800-252-3439

Puede escribir al Departamento de Seguros de Texas

P.O. Box 149104
Austin, TX 78714-9104
Fax Number (512) 475-1771
Web: http://www.tdi.state.tx.us
E-mail: ConsumerProtection@tdi.state.tx.us

DISPUTAS SOBRE PRIMAS O RECLAMOS: Si tiene una disputa concerniente a su prima o a un reclamo, debe comunicarse con su agente primero. Si no se resuelve la disputa, puede entonces comunicarse con el departamento (TDI).

UNA ESTE AVISO A SU POLIZA: Este aviso es solo para proposito de informacion y no se convierte en parte o condicion del documento adjunto.



HARRIS COUNTY AREA MAP

CONSTRUCTION

OF

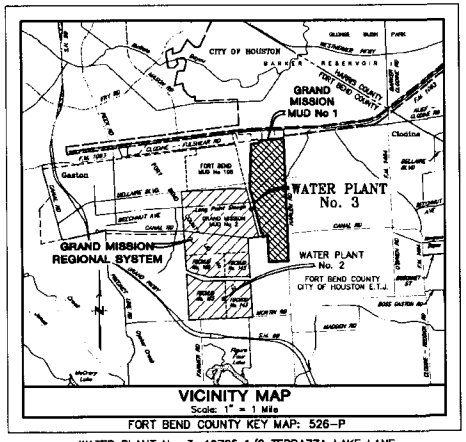
WATER PLANT No. 3 - PHASE 1

FOR

GRAND MISSION MUNICIPAL UTILITY DISTRICT No. 1

FORT BEND COUNTY, TEXAS

INDEX OF DRAWINGS



FORT BEND COUNTY KEY MAP: 526–P

WATER PLANT No. 3: 19705 1/2 TERRAZZA LAKE LANE
RICHMOND, TX 77407

CALL BEFORE YOU DIG!!!
Texas811
1–800–344–8377 or
Lone Star Notification Center
1–800–669–8344
(at least two days prior to excavation)

Contractor shall notify the City of Houston, Department of Public Works and Engineering, Office of the City Engineer, 48 hours before starting work on this project. Phone No. (832) 394–9098

Water Plant No. 3:
Flood Insurance Rate Map
Panel 140 of 515
Map No. 48157C0140L
Base Flood Elev = 92.00'

I, TOBY W. MCQUEARY, a Professional Engineer licensed in the State of Texas do hereby certify that this project is entirely located outside the area with 100–year flood frequency.

OCTOBER 2015
JC JOB No. 05133–0208–00

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

ET.J DETENTION PLANS INFORMATION

1. Storm Water Detention Plans
   Is provided in Construction of Detention Basin Excavation Phase II (COH Log No. 06–1438, COH DWO No. 42935)
   Engineering Firm: Jones & Carter, Inc.
   Date Signed and Approved By February 2007
2. Storm Water Drainage Design Report
   Drainage and Detention Analysis for 640 Acre Development
   February 2000 Jones & Carter, Inc.
   Date of Acknowledgement by FBCDD July 5, 2006
   Amendment:
   Date: December 2008
   Engineering Firm: Jones & Carter, Inc.
   Date of Acknowledgement by Fort Bend County LID No. 12: January 2007
3. Increased Impervious Cover = 0.254 Acres
   Detention Rate Required = 0.60 Acres–Feet/Acre
   Detention Rate Provided = 0.67 Acres–Feet/Acre

NOTES:
These plans were prepared to meet or exceed the specifications and requirements of the City of Houston, Texas and Fort Bend County, Texas as currently amended, whichever is more stringent.
Approval by Fort Bend County will be deemed void if construction has not begun within one year of approval date.
Construction shall not begin before the plat of this section is filed in the Fort Bend County Map Records.
Construction will be monitored by a registered professional engineer of JONES AND CARTER, INC.
Contractor shall notify the Fort Bend County Engineering Department at least 48 hours prior to commencement at construction@fortbendcountytx.gov

I, TOBY W. MCQUEARY, a Professional Engineer licensed in the State of Texas do hereby certify that these plans were prepared under my supervision to meet or exceed the specifications and requirements of Fort Bend County, Texas.

TOBY W. MCQUEARY, P.E. — Date: 10-21-2015

FORT BEND COUNTY ENGINEER

ENGINEER: For Richard W. Stolleis, P.E.
DATE: 11/3/15

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN ONE (1) YEAR FROM DATE OF APPROVAL.

APPROVED: for DEVELOPMENT COORDINATOR
DATE: 12/3/15

*NOTES:
No known proposed wastewater line work is included.

ILMS No. 15092114
C.O.H. LOG No. 15–1168

STATE OF TEXAS — TOBY W. McQUEARY — 68710 — LICENSED PROFESSIONAL ENGINEER

SURVEYED BY: FB NO.:
NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC & TRANSPORTATION
WASTEWATER *	STORM WATER QUALITY
STORM	FACILITIES
STREET & BRIDGE	
CITY ENGINEER	FOR CITY OF HOUSTON USE ONLY
DIRECTOR OF PUBLIC WORKS AND ENGINEERING	

CITY OWNED — 54993 — CITY DRAINAGE FACILITY

SHEET No: 1 OF 46

COH 6U REV. JAN 2006

GRAND MISSION M.U.D. No. 1 – WATER PLANT No. 3 – PHASE 1

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

P:\PROJECTS\05133-GMMUD No. 1\0208 00 Water Plant No. 3 Phase 1\CAD\Const Dwgs\CVR.dwg Dec 22,2015 – 10:33am JBV

GENERAL CONSTRUCTION NOTES:

1. Wastewater collection systems, water, paving, traffic signals, drainage systems and all groundwater plant facilities shall be constructed in accordance with the most current editions of the following City of Houston documents. These documents are "STANDARD CONSTRUCTION SPECIFICATIONS" (most recent issue January 2011) and "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" (most recent issue January 2011) with all subsequent amendments added thereto unless otherwise noted and approved on these plans. The design must agree with the minimum standards established in the "INFRASTRUCTURE DESIGN MANUAL" (most recent issue January 2011). Note that plan signatures and letters of capacity availability for storm, wastewater and water expire after one (1) year and the latest editions of design rules, specifications, standard details and manuals shall govern as of the dates for resigning. It is the responsibility of the Contractor to verify that he/she has the most recent editions. As of 11/8/12 the most recent editions of these documents are dated January 2011. These documents may be obtained from the City of Houston Department of Public Works, 611 Walker, Houston, Texas.
2. Groundwater plants have been designed in accordance with the City of Houston, Department of Public Works and Engineering's "GROUNDWATER PLANT DESIGN GUIDELINES" manual dated January 2011. The standards required in the "GROUNDWATER PLANT DESIGN GUIDELINES" manual shall supercede those of the "INFRASTRUCTURE DESIGN MANUAL" when in conflict.
3. The Contractor shall be fully responsible for any and all damage to existing public or private utility lines, including but not limited to paving, water lines, wastewater collection systems, storm sewer and traffic signals during construction. All damages shall be repaired in accordance with the most current editions of the City of Houston standard construction specifications, design details and design manuals. Repairs shall be made at no cost to the City of Houston, the Public or the Owner.
4. The approximate location of existing utilities are given for reference only. Before commencing the work on this contract, the Contractor shall verify by field investigation the actual locations of all utility facilities within and adjacent to the limits of the work that may be affected by the work. Conflicts which result due to negligence by the Contractor to locate, horizontally and vertically, existing utilities which are shown on the construction drawings, or which the Contractor has been given notice or has knowledge, shall be the sole responsibility of the Contractor.
5. Contractor is to contact the DIG TESS Co. at (713) 223-4567 or 1-(800) 669-8344 for location of existing facilities that may not be shown on the plans at least 24 hours prior to commencement of any construction activities.
6. The cost of remedial work, removal of portions of the work or extensive design changes occasioned by failure of the Contractor to verify the location of existing utilities as described in Note 5 above shall be borne by the Contractor.
7. Contractor, with the assistance of the Engineer if necessary, shall obtain all applicable City, County, State and Federal permits. Contractor shall provide copies of all obtained permits to the Construction Office of Jones and Carter, Inc.
8. Contractor shall comply with the most current editions of O.S.H.A. Regulations and Texas State Law concerning trench safety systems.
9. Contractor to follow construction details if drawings deviate from City of Houston standards.
10. The Contractor shall be responsible for protecting, maintaining and restoring all existing facilities or any off-site areas affected by this construction project to existing or better condition, unless otherwise noted, at no additional cost to the Owner.
11. All existing sanitary sewers within 100 feet are shown.
12. This project is within the City of Houston E.T.J. and Fort Bend County, Texas.
13. Contractor shall perform work in a manner to limit noise from construction to acceptable levels for properties adjacent to the construction area.
14. Contractor shall keep existing streets and roads open to all traffic and cleaned daily of material deposited by construction vehicles.
15. Contractor is responsible for establishing and maintaining site drainage at all times at no additional cost to the Owner, whether by grading or pumping.
16. During construction, the Contractor shall maintain adequate drainage and safe access to adjacent properties, regardless of the weather conditions. Do not obstruct roadways, drainageways, sidewalks or passageways adjacent to the construction area.
17. Contractor to obtain all permits required by Fort Bend County, Texas prior to starting construction of utilities and/or culverts within Fort Bend County road rights-of-way.
18. Adequate drainage shall be maintained at all times during construction and any drainage ditch or structure disturbed during construction shall be restored to the satisfaction of the Owning Authority.
19. The Contractor shall only clear and grub areas within the project construction area of the water plant site boundary lines as required to construct the proposed plant facilities, unless directed otherwise by the Owner or Engineer. Unless otherwise specified, all cleared and grubbed material becomes the property of the Contractor, to be removed from the plant site or disposed of in a manner not to damage the Owner. Burning or burying of cleared and grubbed materials on the Owner's property is not permitted.
20. The Contractor is responsible for providing "red line" record drawings and "Operation & Maintenance" (O&M) manuals at the completion of this project, as per the Contract Specifications, prior to final payment.
21. Contractor to contact Mr. Albert Lozcano, P.E. with Jones and Carter, Inc. at (832) 913-4000 at least 48 hours prior to commencing work.
22. Contractor to make arrangements with the equipment manufacturer for calibration of the proposed analyzer. Contractor shall coordinate and have results back in 24 hours. Contractor will be responsible for all costs associated with calibration testing.

WATER PLANT CONSTRUCTION NOTES:

1. All internal plant piping shall be ductile iron pipe or welded steel pipe rated for an internal working pressure of 150 psi. Pipe used with threaded or flanged connections shall be thickness Class 53 (min). Pipe used with compression-type push-on connections shall be thickness Class 51 (min). All piping shall be supplied and installed in accordance with the last revision of AWWA C150.
2. Flanged connections and/or compression-type push-on connections shall be rated for an internal working pressure of 150 psi. All flanges shall be supplied and installed in accordance with the latest revision of AWWA C115.
3. All aboveground ductile iron pipe connections shall be flanged. Underground ductile iron piping connections to be boltless and push-on after the first flanged fitting below ground.
4. All underground flanges shall have stainless steel bolts and nuts.
5. All internal water plant valves shall open counterclockwise. Valves within public street rights-of-way shall open clockwise. All water valves shall be supplied and installed in accordance with the latest revisions of AWWA C509 and C504.
6. All aboveground valves 12 inches (12") and smaller shall be flanged O.S.&Y. gate valves with resilient seats. Gate valves inside existing booster pump room shall be N.R.S. type with resilient seats.
7. All underground valves 12 inches (12") and smaller shall be mechanical joint N.R.S. gate valves with resilient seats, gasketed and hub-ends, except where flanged ends are called out on the plans.
8. All above ground valves larger than 12 inches (12") shall be gasketed, flanged water butterfly valves. All aboveground butterfly valves shall have post indicator and handwheel.
9. All buried valves are to be equipped with valve boxes adjusted to their final elevation after finished grading is complete.
10. Six-inch (6") to 12-inch (12") water lines shall have a minimum cover of four feet (4'). Water lines larger than 12 inches (12") shall have a minimum cover of five feet (5').
11. All pressure/altitude gauges shall be 4-1/2" face diameter, liquid filled, stainless steel case with 1/2" bottom connection.
12. Isolation kits are required between all dissimilar metals.
13. Concrete thrust blocks shall be provided at all underground tees, bends, laterals and plugs. They should be built in accordance with the details in the Contract Construction Plans and Specifications to prevent pipe movement.
14. Provide protective coatings for all the proposed water plant facilities, and any adjacent areas disturbed during construction, in accordance with Section 09920 of the Contract Specifications.
15. Concrete splash blocks and pads shall be constructed as shown in Contract Construction Plans unless directed otherwise by the Engineer.
16. Hydro-mulch seed all disturbed areas on, or adjacent to, the existing water plant site in accordance with Section 02801 of the Contract Specifications.
17. Reinforcing welded wire fabric will be provided in sheets. Rolled welded wire fabric is not allowed.
18. Waterline fittings shall be cast or ductile iron unless otherwise noted.
19. Waterlines shall be constructed so that all crosses, tees and valves are not located under pavement or future plant facilities unless directed otherwise by the Engineer.
20. All existing and proposed plant piping, conduit or duct bank crossings shall be constructed with a minimum of 12-inches (12") clearance between outside surfaces of the said crossing utilities unless directed otherwise by the Engineer.
21. Waterlines shall be bank sand-bedded and backfilled in accordance with the details included in the Contract Construction Plans and Specifications.
22. All newly installed pipes, coatings, and related products shall conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) international standards and must be certified by an organization accredited by ANSI. All these materials must be NSF International standards 60 and 61 certified.
23. All plant piping under or within one (1) foot of future, proposed or existing pavement shall be backfilled with 1-1/2 sack/CY cement-sand to a point immediately below the subgrade. Backfill remaining depth with suitable material in 8-inch (8") layers compacted to 95% standard proctor density per AASHTO test Method T-99. Moisture content shall be as specified (no separate pay).
24. Hand dig as required around existing utilities. The Contractor shall be fully responsible for any and all damage to existing electrical, control and utility lines during construction. The current Owner of any existing utilities disturbed during construction of this project shall be notified immediately of any damages and lines shall be repaired in a timely manner to avoid any lengthy disruption of service. Repairs shall be made at no cost to the Public or the Owner.

PRIVATE UTILITY COMPANY NOTES:

WARNING: OVERHEAD ELECTRICAL LINES

Overhead lines may exist on the property. The location of overhead lines has not been shown on these drawings as the lines are clearly visible, but you should locate them prior to beginning any construction. Texas Law, Section 752, Health & Safety Code forbids activities that occur in close proximity to high voltage lines, specifically:

- Any activity where persons or things may come within six (6) feet of five overhead high voltage lines; and
- Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of five overhead high voltage lines.

Parties responsible for the work, including contractors, are legally responsible for the safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or removed call CenterPoint Energy at (713) 207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE or EASEMENT PROPERTY

No approval to use, cross or occupy CenterPoint fee or easement property is given. If you need to use CenterPoint property, please contact our Surveying & Right of Way Division at (713) 207-6248 or (713) 207-5769.

STORM SEWER CONSTRUCTION NOTES:

1. Storm sewers shall be reinforced concrete pipe (C-76, Class III), and shall be installed, bedded, and backfilled in accordance with the City of Houston drawing Nos. 02317-02, 02317-03, 02317-05, 02317-06, and 02317-07 (Oct. 2002) as applicable unless otherwise shown on the drawings.
2. All sewer under proposed or future pavement and to a point one (1) foot back of all proposed or future curbs shall be backfilled with 1-1/2" sack cement/C.Y. stabilized sand to with in one (1) foot of subgrade. The remaining depth of trench shall be backfilled with suitable earth material.
3. All trench backfill shall be in 8" lifts, with tests taken at 100 foot intervals on each lift, and mechanically compacted to a density of not less than 95% of the maximum dry density as determined by the standard proctor compaction test (ASTM D-698/AASHTO T99).
4. Circular and elliptical reinforced concrete pipe shall be installed using rubber gasket joints conforming to ASTM C443 and ASTM C877 respectively.
5. All proposed pipe stub-outs and inlets are to be plugged with 8" brick walls unless otherwise noted.
6. Contractor shall provide 12" minimum clearance at storm sewer and water line crossings.
7. Adjust manhole covers to grade conforming to requirements of section 02086-adjusting manholes, inlets and valve boxes to grade.
8. All ditches shall be regraded to proposed elevations to insure proper drainage. All outfalls shall be properly backfilled an compacted. All disturbed area shall be regraded, seeded, and fertilized.

EROSION AND SEDIMENTATION CONTROL NOTES:

1. Prior to start of construction, Contractor shall install erosion and sedimentation controls at locations shown on Contract Construction Plans.
2. Contractor shall inspect all erosion and sedimentation control systems specified herein, at a minimum of once a week.
3. Contractor shall maintain, repair and/or replace damaged erosion and sedimentation control system throughout the duration of the contract (no separate pay).
4. Contractor shall provide protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials.
5. Contractor shall locate fuel/material storage areas away from storm water conveyance systems. Contractor shall use silt fencing, hay bales, or berms around fuel storage areas (no separate pay).
6. Contractor shall advise Owner immediately, verbally, and in writing, of any fuel or toxic material spills onto the project/construction area and the action taken to remedy the problem.
7. Contractor is responsible for disposing of his fuels, materials, and contaminated excavations in a legally approved manner (no separate pay).
8. Contractor is responsible for complying with all applicable environmental laws.
9. Contractor is responsible for providing adequately maintained sanitary facilities.
10. At completion of the contract, Owner and/or Owner's representative with the Contractor shall examine erosion and sedimentation control system before relieving Contractor of his maintenance responsibilities.
11. Contractor shall be responsible for street cleaning, on a daily basis, all mud and dirt deposited on the existing pavement due to his construction activity.

DISINFECTION SYSTEM CONTROL STRATEGY

SURFACE WATER GST FILL LINE:

This site currently plans to fill the GST with water from the surface water fill line from the North Fort Bend Water Authority (NFBWA). The water supply has already been treated and should have an existing chloramine residual. Because of autodecomposition in the water transmission lines, the water may contain a free available ammonia (FAA) residual. The surface water chloramination system is designed to operate in two modes:

1. Residual-initiated feed forward chlorine and LAS proportional to flow.
2. Compound loop chlorination with feed forward LAS.

Switching between the control schemes is accomplished by placing the chloramination PLC in the appropriate mode and valving the sample feed lines to draw water from upstream or downstream of the chemical feed injection points. This system is designed to give the Operator the most flexibility since it is anticipated that the future source water characteristics will change with time.

RESIDUAL-INITIATED FEED FORWARD CONTROL:

This control mode monitors the total available chlorine (TAC) residual in the source water and if the level drops below a User defined set point, the PLC causes chlorine and LAS to be fed proportionately to the flow rate. The LAS pump is interlocked with the chlorinator through the PLC and can increase or decrease the feed rate proportionately to the chlorine feed rate. The stroke length is manually set to encompass the operational envelope and the required chlorine to LAS ratio. The stroke frequency is controlled by the chlorinator through the PLC. Handheld test kit results will be used to trim the dosage curve to ensure that overdosing is avoided. The residual analyzer will also monitor the TAC, FAA and Monochloramine (Mono) residuals prior to entering the water distribution system.

COMPOUND LOOP CHLORINATION WITH FEED FORWARD LAS:

This mode changes the sample location to downstream of the chemical injection points so that the effect of chemical dosing can be measured. The residual analyzer will monitor the source water TAC residual and will initiate dosing if the level falls below a User defined target residual. Dosing will be controlled by the flow rate and feedback from the analyzer. A User definable deadband will prevent the system from "hunting" and a User definable maximum residual set point will halt dosing if the residual is excessive.

DISINFECTION SYSTEM CONTROL STRATEGY CONT.

In this mode, the LAS feed pump is interlocked with the chlorinator through the PLC and doses at a fixed ratio which is set by the stroke length. The Operator sets this length based on handheld test kit results and the PLC varies the frequency proportionately to the chlorinator feed rate. The PLC will adjust the feed rates to maintain the target residual. Due to the limitations of the LAS feed pump turndown ratio and stroke frequency, the chlorinator feed rate must be scaled such that the ratio of chlorine to LAS is maintained from 4-20mA range. Due to the wide ranges in flow that may be encountered, scaling of both the chlorine and LAS feed ranges may need to be performed in the PLC. Provisions for this must be made in the PLC programming to allow this to be done through the touch screen interface.

In all modes, the ability to generate false residuals shall be incorporated to allow testing and calibration.

FORT BEND COUNTY CONSTRUCTION - GENERAL NOTES:

1. Fort Bend County must be invited to the Pre-Construction Meeting.
2. Contractor shall notify Fort Bend County Engineering Department 48 hours prior to commencing construction and 48 hour notice to any construction activity within the limits of the paving at Construction@fortbendcountytx.gov.
3. Contractor is responsible for obtaining all permits required from Fort Bend COunty prior to commencing construction of any improvements within County road right of ways..
4. All Paving Improvements shall be constructed in accordance with Fort Bend County "Rules, Regulations and Requirements relating to the Approval and Acceptance of Improvements in Subdivisions as currently amended.
5. All road widths, curb radii and curb alignment shown indicates back of curb.
6. A continuous longitudinal reinforcing bar shall be used in the curbs.
7. All concrete pavement shall be 5 1/2 sack cement with a minimum compressive strength of 3500 psi at 28 days. Transverse expansion joints shall be installed at each curb return and at a maximum spacing of 60 feet.
8. All weather access to all existing streets and driveways shall be maintained at all times.
9. 4"x12" reinforced concrete curb shall be placed in front of single family lots only. All other areas shall be 6" reinforced concrete curb.
10. At all intersection locations, Type 7 ramps shall be place in accordance with TXDOT Ped-12a standard detail sheet. A.D.A.-Handicap Ramps shall be installed with street paving at all intersections and comply with current A.D.A. regulations.
11. Curb headers are required at curb connections to Handicap Ramps, with no construction joint within 5' of ramps.
12. All intersections utilizing Traffic Control measures shall have A.D.A. wheel chair ramps installed.
13. Guidelines are set forth in the Texas "Manual on Uniform Traffic Control Devices", as currently amended, shall be observed. The Contractor shall be responsible for providing adequate flagmen, signing, striping and warning devices, etc., during construction-both day and night.
14. All R1-1 stop signs shall be 30"x30" with diamond grade sheeting. Street name signs shall be upper and lower case letters with diamond grade sheeting.
15. A Blue Double Reflectorized button shall be placed at all Fire Hydrant locations. The Button shall be placed 12 inches off of the centerline of the street on the same side as the hydrant.

APPROVED: DeWayne Dan for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/15	ISSUED FOR CONSTRUCTION	[illegible]
1	10/22	ISSUED FOR BIDDING	[illegible]

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gaitfion, Suite 100 • Houston, Texas / FOLL • 713.777.5337

WATER PLANT No. 3 - PHASE I

GENERAL CONSTRUCTION NOTES

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER
DEPUTY DIRECTOR
WATER WASTEWATER
PROJECT MANAGER
STREET & DRAINAGE

FILE NO:
JOB NO: 05133-0208-00

DATE: OCTOBER 2015
DSN. BY: JWV
DWG. BY: RBR
SCALE: AS SHOWN

Sheet No. 2 OF 46

FOR CITY OF HOUSTON USE ONLY
KEY MAP
54998

TERRY W. MCQUEARY
68210
LICENSED
PROFESSIONAL ENGINEER

C.O.H. LOG No. 15-1168

CCN BLK KEY JAN 2006

P:\PROJECTS\05133-0208-00 Water Plant No. 3 Phase 1\Civil\Const Dwgs\WP3C01.dwg Dec 22,2015 - 10:33am JWV

INSTRUMENT IDENTIFICATION LETTERS:

AI	AMPERAGE INDICATOR
AIT	ANALYTICAL INDICATING TRANSMITTER
CGE	CHLORINE GAS SENSOR ELEMENT
DOE	DISSOLVED OXYGEN SENSOR ELEMENT
DOIT	DISSOLVED OXYGEN INDICATING TRANSMITTER
ES	EMERGENCY STOP
ETM	ELAPSED TIME METER
FE	FLOW RATE SENSOR ELEMENT
FI	FLOW RATE INDICATOR
FIC	FLOW RATE INDICATING CONTROLLER
FIT	FLOW RATE INDICATING TRANSMITTER
FS	FLOW SWITCH
FSL	FLOW SWITCH LOW
HMS	HAND MOMENTARY SWITCH
HS	HAND SWITCH
KS	TIMED SWITCH
LC	LEVEL CONTROLLER
LE	LEVEL SENSOR ELEMENT
LI	LEVEL INDICATOR
LIT	LEVEL INDICATING TRANSMITTER
LKS	LOCK STOP
LS	LEVEL SWITCH
LSH	LEVEL SWITCH HIGH
LSL	LEVEL SWITCH LOW
LT	LEVEL TRANSMITER
MF	MOTOR FAILURE
MP	MOMENTARY PUSH BUTTON
MS	MOTORIZED SWITCH
PAH	PRESSURE ALARM HIGH
PE	PRESSURE ELEMENT
PI	PRESSURE INDICATOR
PIT	PRESSURE INDICATING TRANSMITTER
PR	PROBE RELAY
PS	PRESSURE SWITCH
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
SS	SIGNAL SPLITTER
TE	TEMPERATURE ELEMENT
TF	TEMPERATURE FAILURE
TI	TEMPERATURE INDICATOR
TS	TEMPERATURE SENSOR
VI	VACUUM INDICATOR
VS	VACUUM SWITCH
WE	WEIGHT ELEMENT
WI	WEIGHT INDICATOR
YA	STATE ALARM
YF	SEAL FAILURE
YH	STATE OPENED
YI	STATE INDICATED
YIT	STATE INDICATING TRANSMITTER
YL	INDICATING LIGHT
YS	STATE CLOSED

EQUIPMENT ABBREVIATIONS:

3W	THREE WAY VALVE
4W	FOUR WAY VALVE
ACK	AIR CHECK VALVE
ADV	AUTOMATIC DRAIN VALVE
AL	AIR LIFT PUMP
ANV	ANGLE VALVE
APR	ANGLE PRESSURE RELIEF VALVE
ARV	AIR RELEASE VALVE
ASV	AUTOMATIC SWITCHOVER VALVE
AVV	AIR & VACUUM VALVE
BCV	BALL CHECK VALVE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BS	BASKET STRAINER
BV	BALL VALVE
CKV	CHECK VALVE
CS	CORPORATION STOP
DA	DECANT ARM
DBS	DUPLEX BASKET STRAINER
DCV	DOUBLE CHECK VALVE
DIP	DUCTILE IRON PIPE
DS	DIAPHRAGM SEAL
EPV	ECCENTRIC PLUG VALVE
EXBPR	BACKPRESSURE REGULATOR WITH EXTERNAL PRESSURE TAP
FCV	FLOW CONTROL VALVE
GCKV	GATE CHECK VALVE
GLB	GLOBE VALVE
GS	GALVANIZED STEEL
GST	GROUND STORAGE TANK
GTV	GATE VALVE
HB	HOSE BIBB
HPR	HORIZONTAL PRESSURE RELIEF VALVE
HPT	HYDROPNEUMATIC TANK
INJ	INJECTOR
IP	INDUCTION PUMP
IRP	INTERNAL RECYCLE PUMP
ISV	ISOLATION VALVE
JP	JOCKEY PUMP
MXR	MIXER
MUD	MUD VALVE
NDV	NEEDLE VALVE
PCBPR	PUMP CONTROL BACKPRESSURE VALVE
PD	PULSTATION DAMPENER
PET	POLYETHYLENE TUBING
PRPS	PRESSURE REDUCING PRESSURE SUSTAINING VALVE
PRR	PRESSURE REDUCING REGULATOR
PV	PLUG VALVE
RLP	ROTARY LOBE PUMP
RM	ROTAMETER
SAAV	SINGLE ACTING ALTITUDE VALVE
SC	SECONDARY CLARIFIER
SCK	SILENT CHECK VALVE
SCPR	SELF-CONTAINED PRESSURE REGULATOR
SCBPR	SELF-CONTAINED BACKPRESSURE REGULATOR
SLDAR	SLUDGE AIR RELEASE VALVE
SLDAV	SLUDGE AIR AND VACUUM VALVE
SLG	SLUDGE GRINDER PUMP
SP	SUBMERSIBLE PUMP
STP	SLUDGE TRANSFER PUMP
SV	SOLENOID VALVE
SWC	SWING CHECK VALVE
TAL	TRANSFER AIR LIFT
TV	TELESCOPIC VALVE
VR	VACUUM REGULATOR
WS	WYE STRAINER
WSP	WELDED STEEL PIPE

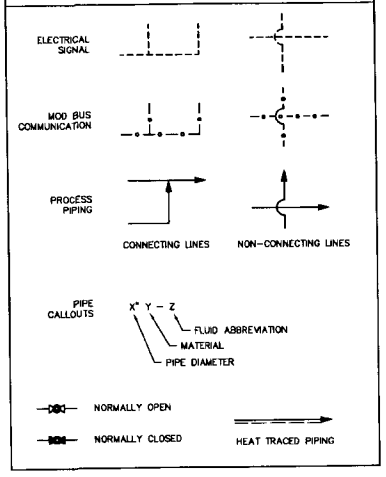
FLUID ABBREVIATIONS:

A	AIR
CE	CLARIFIED EFFLUENT
CGV	CHLORINE GAS VACUUM
CS	CHLORINE SOLUTION
DL	DRAIN LINE
DS	DIGESTED SLUDGE
DW	DISTRIBUTION WATER
FE	FINAL EFFLUENT
FM	FORCE MAIN
GW	GROUND WATER
IR	INTERNAL RECYCLE
LAS	LIQUID AMMONIUM SULFATE
ML	MIXED LIQUOR
NPW	NON-POTABLE WATER
POLY	POLYETHYLENE
PW	POTABLE WATER
RAS	RETURN ACTIVATED SLUDGE
RS	RAW SEWAGE
SA	SAMPLE
SB	SODIUM BISULFITE
SC	SCUM
SE	SECONDARY EFFLUENT
SH	SODIUM HYPOCHLORITE (BLEACH)
SI	SCREENED INFLUENT
SN	SUPERNATE
SW	SURFACE WATER
WAS	WASTE ACTIVATED SLUDGE

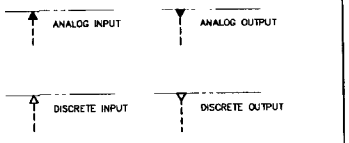
GENERAL ABBREVIATIONS:

DO	DISSOLVED OXYGEN
EL	ELEVATION
FAA	FREE AVAILABLE AMMONIA
FF	FINISHED FLOOR
FT	FEET
FT/S	FEET PER SECOND
GAL	GALLONS
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HOA	HAND OFF AUTO
HP	HORSE POWER
HR	HOUR
LCP	LOCAL CONTROL PANEL
LF	LINEAR FEET
mA	MILLIAMP
MONO	MONOCHLORAMINE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
ORP	OXYDATION REDUCTION POTENTIAL
SST	STAINLESS STEEL
TAA	TOTAL AVAILABLE AMMONIA
TAC	TOTAL AVAILABLE CHLORINE
TDH	TOTAL DYNAMIC HEAD
TOB	TOP OF BANK
TOC	TOP OF CONCRETE
TOS	TOP OF SLAB
TOW	TOP OF WALL
V	VOLTS

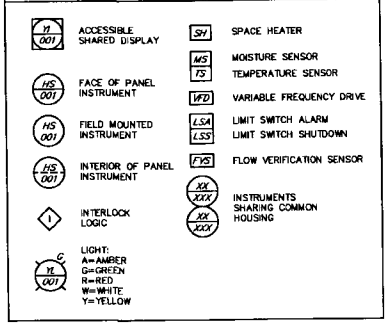
FLOW STREAM & INSTRUMENT LINE SYMBOLS:



INPUTS & OUTPUTS TO SHARED OR PROGRAMMABLE LOGIC CONTROLLER:



INSTRUMENT & FUNCTION SYMBOLS:



APPROVED: _____ for F.B.C.D. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP
2	12/15	ISSUED FOR CONSTRUCTION	TJMM
1	10/22	ISSUED FOR BIDDING	TJMM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

PROCESS & INSTRUMENTATION DIAGRAM LEGEND SHEET 1 OF 2

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TRAFFIC & TRANSPORTATION: _____ 10-29-15
WATER: _____ 10-29-15
STORM: _____ 10-29-15
STREET & DRAINAGE: _____
WASTE WATER QUALITY: _____
FACILITIES: _____ 10-29-15

FILE NO:
JOB NO: 35133-0208-00
DATE: OCTOBER 2015
DSN. BY: JMV
DWG. BY: JAO
SCALE: NO SCALE
SHEET No. 3 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO. 54993

NOTE: For Electrical & Instrumentation Only
BEAN E. McMALLAN 104711 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
10/22/15

NOTE: For Process Only
TOBY W. McELROY 68710 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
10-22-2015

C.O.H. LOG No. 15-1168

P:\PROJECTS\35133-0208-00 No. 1\0208-00 Water Plant No. 3 Phase 1\Civil\Const Dwgs\35133-0208-00 P&ID\P&ID DWG\LEG.dwg Dec 22,2015 - 10:33am JMV

CONFORMED DOCUMENTS

MISCELLANEOUS SYMBOLS:

- PLUG VALVE (NORMALLY OPEN)
- PLUG VALVE (NORMALLY CLOSED)
- BALL VALVE (NORMALLY OPEN)
- BALL VALVE (NORMALLY CLOSED)
- BUTTERFLY VALVE
- CHECK VALVE
- GATE CHECK VALVE
- SILENT CHECK VALVE
- SWING CHECK VALVE
- BALL CHECK VALVE
- GATE VALVE (NORMALLY OPEN)
- GATE VALVE (NORMALLY CLOSED)
- GLOBE VALVE (NORMALLY OPEN)
- GLOBE VALVE (NORMALLY CLOSED)
- SAMPLE COCK (NORMALLY CLOSED)
- NEEDLE VALVE (NORMALLY OPEN)
- NEEDLE VALVE (NORMALLY CLOSED)
- ANGLE VALVE (NORMALLY OPEN)
- THREE-WAY VALVE (ONE PORT CLOSED)
- THREE-WAY VALVE (NORMALLY OPEN)
- FOUR-WAY VALVE (NORMALLY OPEN)
- AIR RELEASE VALVE
- SLUDGE AIR RELEASE VALVE
- HORIZ PRESSURE RELIEF VALVE
- ANGLE PRESSURE RELIEF VALVE
- SOLENOID VALVE
- BACKPRESSURE REGULATOR, SELF-CONTAINED
- PRESSURE REGULATOR, SELF-CONTAINED
- BACKPRESSURE REGULATOR W/EXTERNAL PRESSURE TAP
- PRESSURE REDUCING REGULATOR W/INTEGRAL OUTLET PRESSURE RELIEF VALVE
- FLOW CONTROL VALVE
- PRESSURE REDUCING PRESSURE SUSTAINING VALVE
- VACUUM REGULATOR
- PUMP CONTROL/ BACKPRESSURE VALVE

- 480 VAC ELECTRICAL SUPPLY
- 240 VAC ELECTRICAL SUPPLY
- 120 VAC ELECTRICAL SUPPLY
- CURRENT TRANSFORMER
- ELECTRICAL OUTLET
- ELECTRICAL PLUG
- ULTRASONIC LEVEL TRANSDUCER
- SUBMERSIBLE PRESSURE TRANSDUCER
- FLOAT SWITCH
- PVC COATED WEIGHT
- FLANGED CONNECTION
- SLIDE GATE (NORMALLY OPEN)
- SLIDE GATE (NORMALLY CLOSED)
- PIVOT GATE (NORMALLY OPEN)
- PIVOT GATE (NORMALLY CLOSED)
- PULL GATE (NORMALLY OPEN)
- PULL GATE (NORMALLY CLOSED)
- OVERFLOW BAFFLE
- UNDERFLOW BAFFLE
- V-NOTCH WEIR

- PROPELLER TYPE FLOW METER
- MAGNETIC TYPE FLOW METER
- TURBINE FLOW METER
- DRAIN
- DRAIN INLET (SCREENED)
- DRAIN INLET (OPEN)
- TUBING ADAPTER
- FLEXIBLE COUPLING
- EXPANSION COUPLING
- SLEEVE COUPLING
- MECHANICAL COUPLING (VICTAULIC)
- QUICK CONNECT
- THREADED CAP
- BLIND FLANGE
- UNION
- SLUDGE DRAW-OFF
- AIR LIFT PUMP
- MALE CAM & GROOVE QUICK COUPLING
- DIAPHRAGM SEAL
- ANNULAR DIAPHRAGM
- AIR INTAKE FILTER
- PULSATION DAMPENER
- SINGLE DROP COARSE AIR DIFFUSER (PROFILE)
- SINGLE DROP COARSE AIR DIFFUSER (PLAN)
- SUBMERGED FINE AIR DIFFUSERS
- SUBMERGED COARSE WIDE BAND AIR DIFFUSERS (PLAN)
- WELL SCREEN STRAINER
- BASKET STRAINER
- DUPLEX BASKET STRAINER

- DISCHARGE AIR FILTER
- DISCHARGE SILENCER
- HEAT TRACING
- CALIBRATION TUBE/COLUMN
- VAPORIZOR
- ANALYZER
- INJECTOR
- EJECTOR
- HEAT EXCHANGER
- TRAP
- FLOW STRAIGHTENER
- PULSATION DAMPENER
- MIXER
- STATIC MIXER
- RUPTURE DISK (PRESSURE RELIEF)
- RUPTURE DISK (VACUUM RELIEF)
- PLATE & FRAME HEAT EXCHANGE
- DEGASSING VALVE
- BULK STORAGE TANK
- DOUBLE WALLED BULK STORAGE TANK

- ROTARY LOBE/ SCREW POSITIVE DISPLACEMENT BLOWER
- PERISTALTIC PUMP
- MOTOR SUBMERSIBLE PUMP
- VERTICAL TURBINE BOOSTER PUMP
- CENTRIFUGAL PUMP (WET PIT)
- CENTRIFUGAL PUMP (DRY PIT)
- CENTRIFUGAL PUMP (SELF PRIMING)
- GENERAL FAN
- CENTRIFUGAL COMPRESSOR OR BLOWER
- RECIPROCATING COMPRESSOR (POSITIVE DISPLACEMENT)
- ROTARY COMPRESSOR (POSITIVE DISPLACEMENT)
- POSITIVE DISPLACEMENT BLOWER
- ROTARY LOBE PUMP
- DUAL PISTON PUMP
- SCREW PUMP
- HOSE PUMP
- POSITIVE DISPLACEMENT PUMP
- SOLENOID METERING PUMP
- METERING PUMP
- PROGRESSIVE CAVITY PUMP
- GRINDER PUMP

- MUD VALVE
- TELESCOPIC VALVE
- WYE STRAINER
- MOTOR
- CORPORATION STOP
- DOUBLE CHECK BACKFLOW PREVENTER
- FOOT VALVE
- WINCH
- LOCAL DISCONNECT
- EMERGENCY EYE WASH & SHOWER
- PERFORATED PLATE
- ODOR CONTROL DEVICE
- TRAVELING BRIDGE CRANE
- MOTOR VERTICAL TURBINE PUMP (WATER WELL)
- FLAP VALVE

APPROVED: _____ for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/2/15	ISSUED FOR CONSTRUCTION	JWH
0	10/22	ISSUED FOR BIDDING	JWH

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6330 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

PROCESS & INSTRUMENTATION DIAGRAM LEGEND SHEET 2 OF 2

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER
DRAIN AND ROAD
FACILITIES

FILE NO:
JOB NO. 05133-0208-00
DATE: OCTOBER 2015
DGN. BY: JMH
DWG. BY: JAD
SCALE: NO SCALE
SHEET No. 4 OF 46

FOR CITY OF HOUSTON USE ONLY
APPROVED
54993

NOTE: For Electrical & Instrumentation Only
BEAN E. MAMILLAN 104178 LICENSED PROFESSIONAL ENGINEER

NOTE: For Process Only
TOBY W. MCCLEARY 98710 LICENSED PROFESSIONAL ENGINEER

C.O.H. LOG No. 15-1168

P:\PROJECTS\05133-0208-00 No. 1\0208-00 Water Plant No. 3 Phase I\Cad\Const Engr\05133-0208-00 P&ID\PID DWG\LEG.dwg Dec 22,2015 - 10:34am JMH

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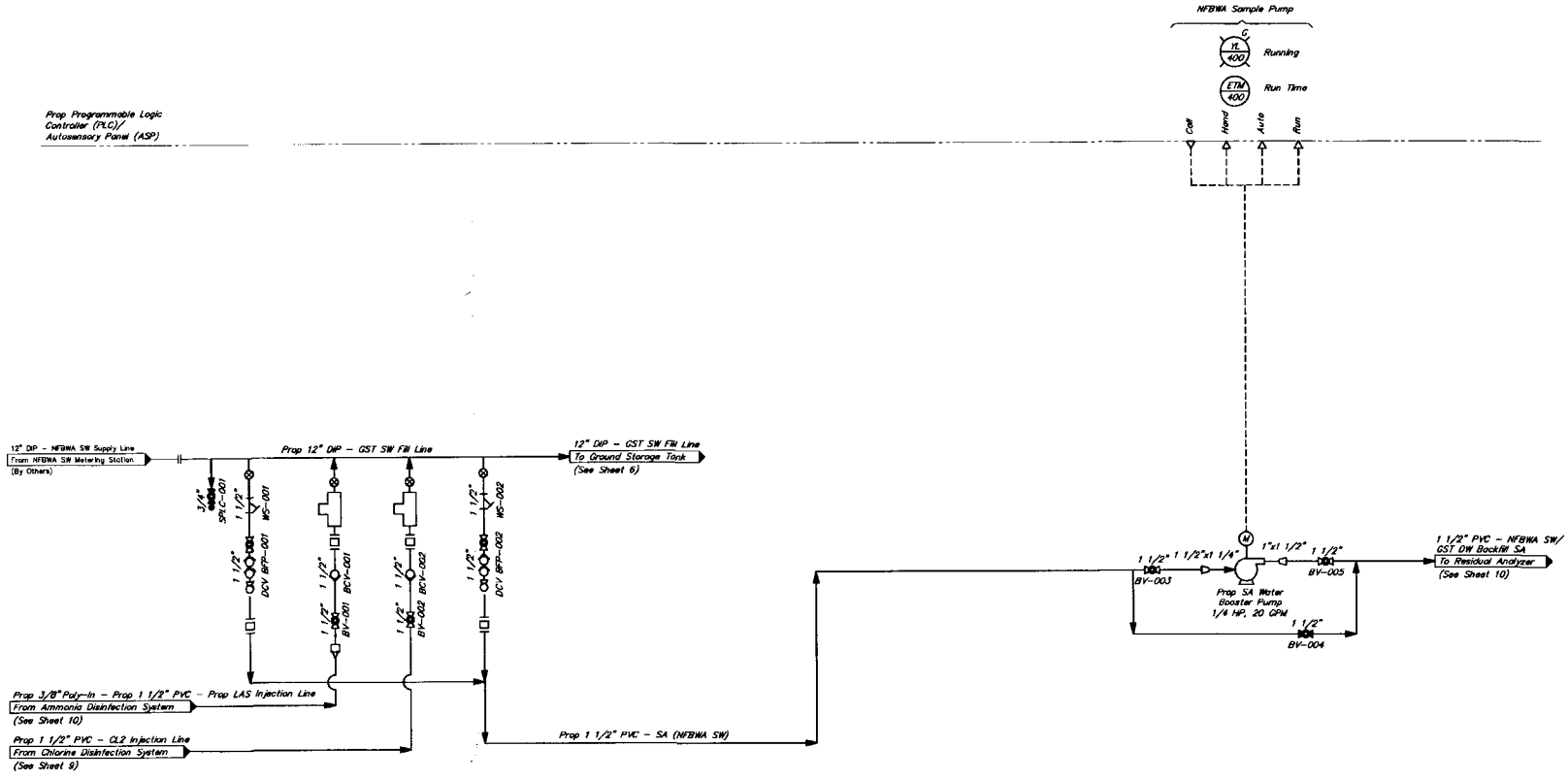
CONFORMED DOCUMENTS



APPROVED: DeWayne Dai
For F.B.C. DEVELOPMENT COORDINATOR
DATE: 12/3/15

NO.	DATE	REVISIONS	APP
1	11/22	ISSUED FOR CONSTRUCTION	JWH
2	10/22	ISSUED FOR BIDDING	JWH

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

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WATER PLANT No. 3 – PHASE I

SURFACE WATER SUPPLY LINE P&ID

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER
STORM WATER QUALITY
FIGURES

FILE NO:
JOB NO: 35133-0208-90
DATE: OCTOBER 2015
DSN. BY: JWH
DWG. BY: JMD
SCALE: NO SCALE
SHEET No. 5 OF 48

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54993

NOTE: For Electrical & Instrumentation Only
SEAN E. McMILLAN 104711 LICENSED PROFESSIONAL ENGINEER 10/22/15

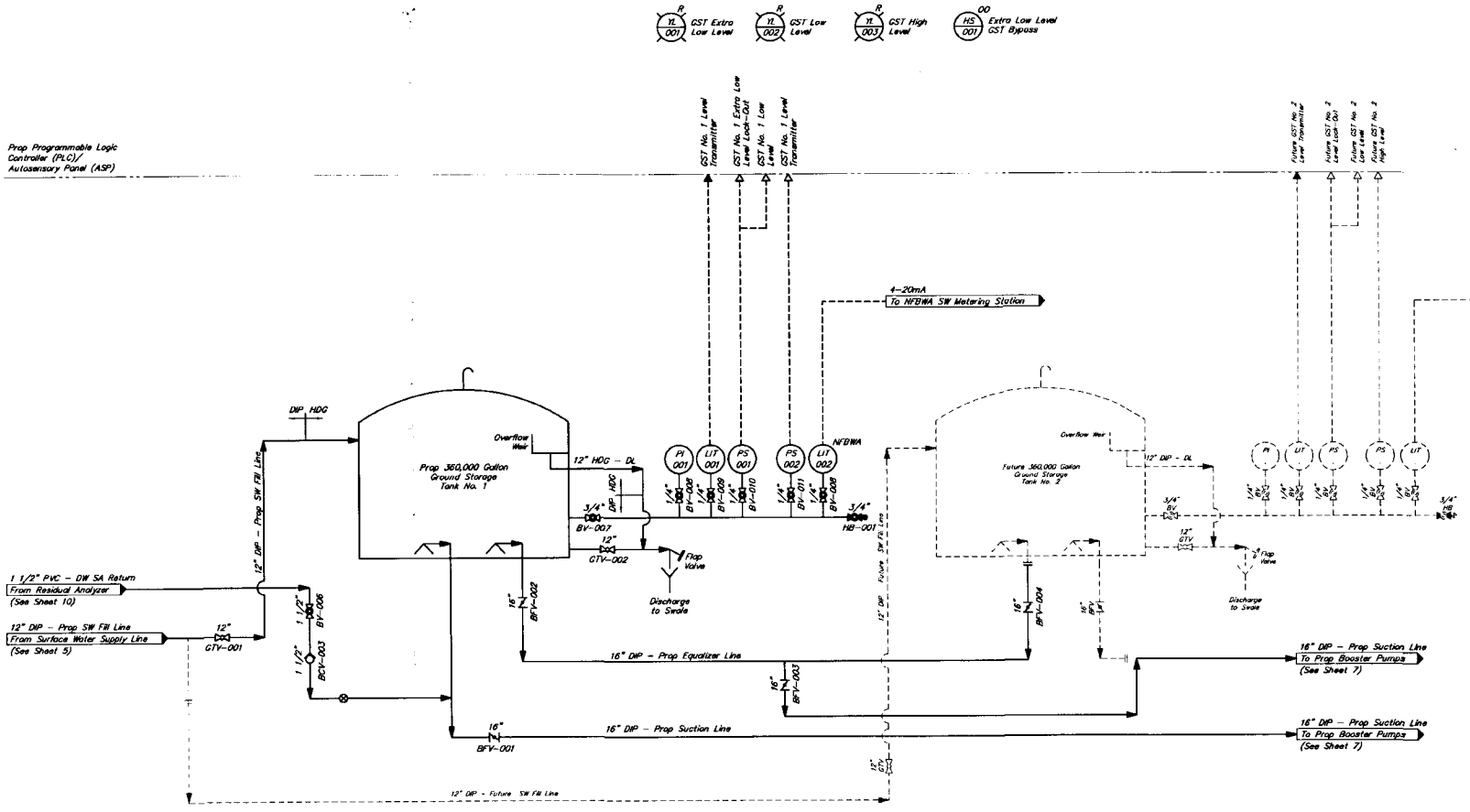
NOTE: For Process Only
TOBY W. McELEARY 68218 LICENSED PROFESSIONAL ENGINEER 10/22/15

C.O.H. LOG No. 15-1168

P:\PROJECTS\35133-GMMUD No. 1\0208-00 Water Plant No. 3 Phase 1\Civil\Const Dwgs\35133-0208-90 Pack\PID Dwgs\WP3 dwg Jun 22, 2015 - 10:34am JWH

CON BLK REV Jul 2006

CONFORMED DOCUMENTS



NOTE: For Electrical & Instrumentation Only

STATE OF TEXAS SEAN E. McMILLAN 104711 LICENSED PROFESSIONAL ENGINEER 10/27/15

NOTE: For Process Only

STATE OF TEXAS TERRY W. McCLEARY 66710 LICENSED PROFESSIONAL ENGINEER

APPROVED: _____ for P.E. DEVELOPMENT COORDINATOR

DATE: 12/8/15

NO.	DATE	REVISIONS	APP.
1	12/22	ISSUED FOR CONSTRUCTION	
2	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

GROUND STORAGE TANKS P&ID

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER
TRAFFIC & TRANSPORTATION
SIGNAL WATER QUALITY
FACILITIES
STREET & BRIDGE

FILE NO:
JOB NO: 05133-0208-00

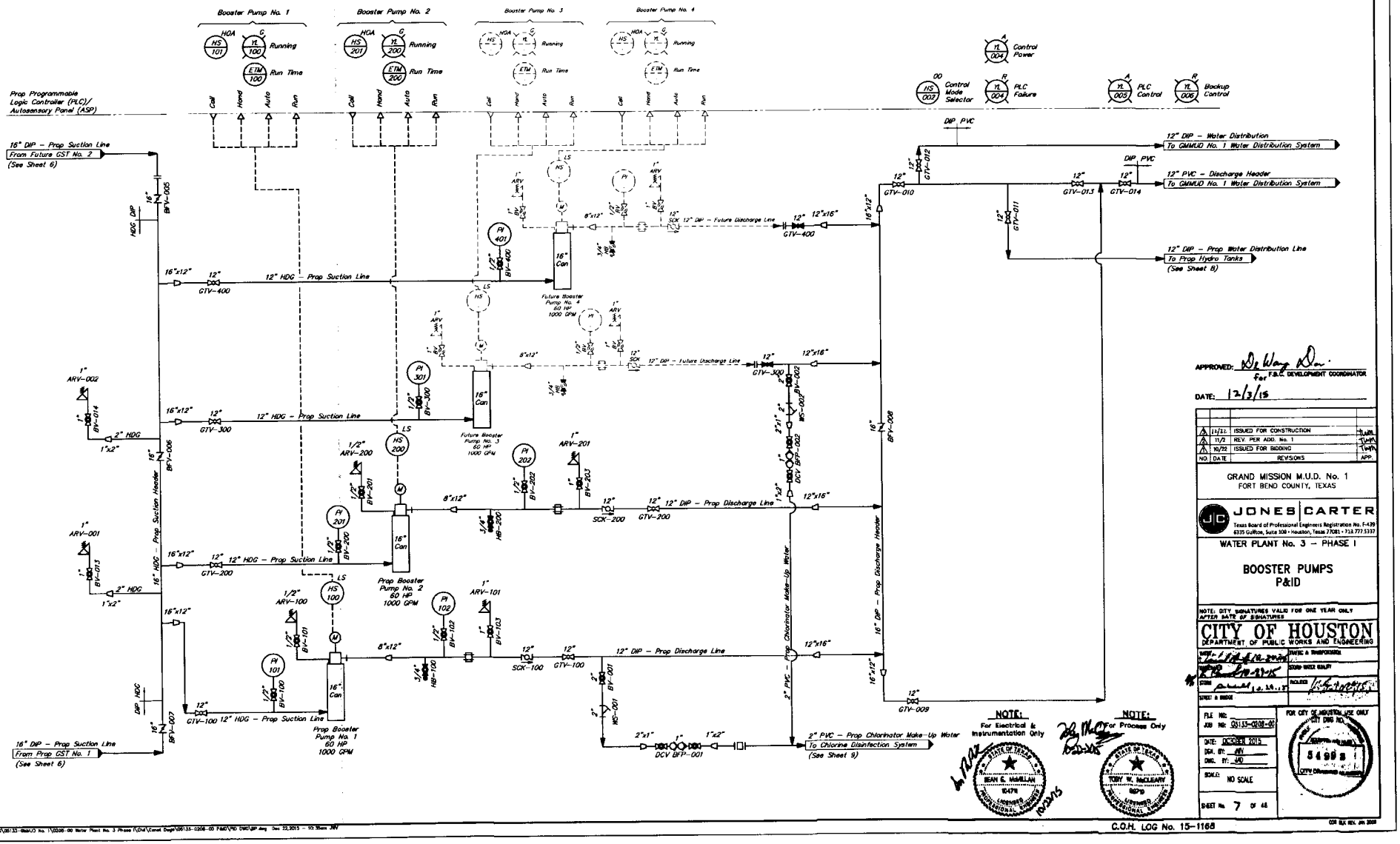
DATE: OCTOBER 2015
DSN. BY: JMV
DWG. BY: JO

SCALE: NO SCALE

SHEET No. 6 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54983

C.O.H. LOG No. 15-1168



NOTE: For Electrical & Instrumentation Only

NOTE: For Process Only

APPROVED: _____ For F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
3	12/15	ISSUED FOR CONSTRUCTION	TMM
2	11/2	REV. PER ADD. No. 1	TMM
1	10/22	ISSUED FOR BIDDING	TMM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 308 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

BOOSTER PUMPS
P&ID

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

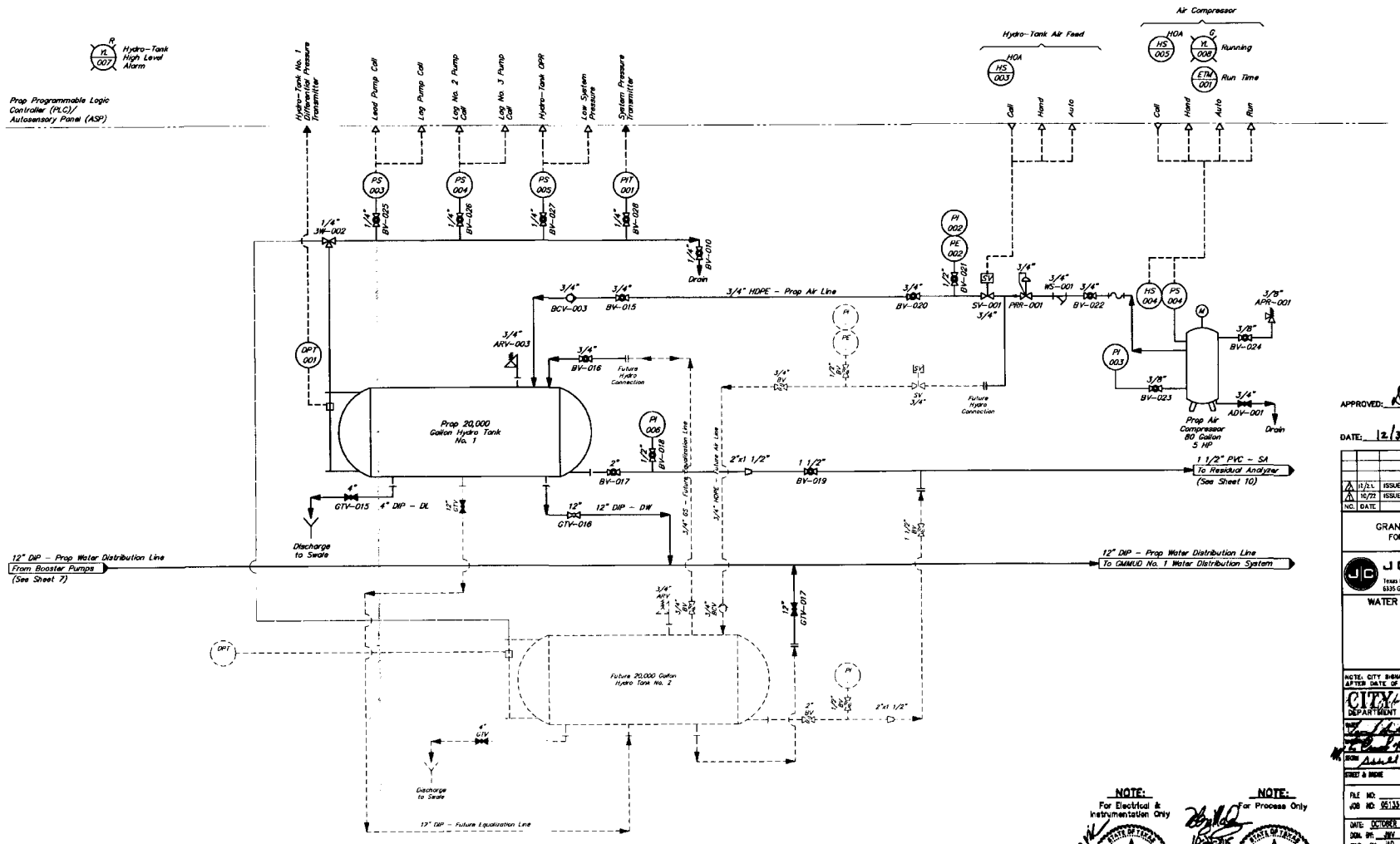
WATER & WASTEWATER
STORM WATER QUALITY
FACILITIES
STREET & BRIDGE

FILE NO:
JOB NO: 0315-0208-00
DATE: DECEMBER 2015
DSN. BY: MN
DWG. BY: MD
SCALE: NO SCALE
SHEET No. 7 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54998

C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS



APPROVED: _____ for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/2/15	ISSUED FOR CONSTRUCTION	
1	10/7/15	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
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WATER PLANT No. 3 – PHASE I

HYDRO TANKS
P&ID

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER	
STORM WATER QUALITY	
STREET & DRAINE	INCLUDED

FILE NO:
JOB NO: 0613-0208-00
DATE: OCTOBER 2015
DSGN. BY: JMV
DWG. BY: JMD
SCALE: NO SCALE
SHEET No. 8 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG
54998

NOTE:
For Electrical & Instrumentation Only
SEAN E. MCMILLAN 104711 LICENSED PROFESSIONAL ENGINEER
10/28/15

NOTE:
For Process Only
TOBY W. MCCLEARY 88713 LICENSED PROFESSIONAL ENGINEER
10-28-2015

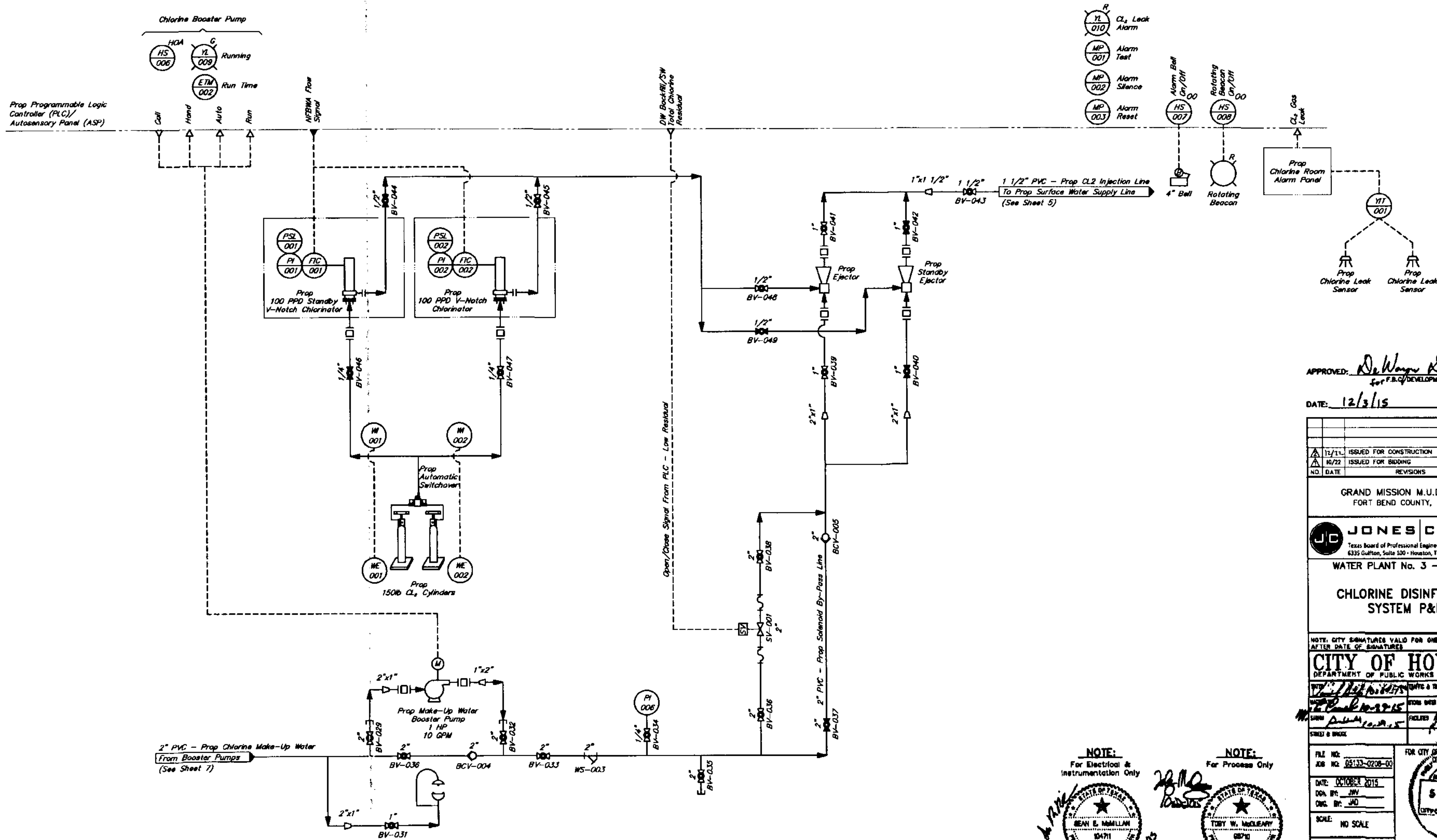
P:\PROJECTS\0613-00-00 P1\0208-00 Water Plant No. 3 Phase I\Civil Dwgs\0613-0208-00 P&ID\PID DWG\V1.dwg Dec 22,2015 – 10:35am JMV

C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS

NOTE:

1. All chlorine gas from chlorine solution and water piping to chlorine injectors shall be schedule 80 PVC with solvent-welded joints.



Chlorine Booster Pump
HOA
HS 006
YL 009 Running
ETM 002 Run Time
Prop Programmable Logic Controller (PLC)/ Autosensory Panel (ASP)
Call
Hand
Auto
Run
NFBWA Flow Signal
DW Backfill/SW Total Chlorine Residual
YL 010 CL2 Leak Alarm
MP 001 Alarm Test
MP 002 Alarm Silence
MP 003 Alarm Reset
HS 007 Alarm Bell On/Off
HS 008 Rotating Beacon On/Off
CL2 Gas Leak
4" Bell
Rotating Beacon
Prop Chlorine Room Alarm Panel
YIT 001
Prop Chlorine Leak Sensor
Prop Chlorine Leak Sensor
PSL 001
PI 001
FIC 001
Prop 100 PPD Standby V-Notch Chlorinator
PSL 002
PI 002
FIC 002
Prop 100 PPD V-Notch Chlorinator
1/2" BV-044
1/2" BV-045
1/4" BV-046
1/4" BV-047
WI 001
WI 002
Prop Automatic Switchover
WE 001
WE 002
Prop 150lb CL2 Cylinders
1"x1 1/2"
1 1/2" BV-043
1 1/2" PVC - Prop CL2 Injection Line To Prop Surface Water Supply Line (See Sheet 5)
1" BV-041
1" BV-042
Prop Ejector
Prop Standby Ejector
1/2" BV-048
1/2" BV-049
1" BV-039
1" BV-040
2"x1"
2"x1"
Open/Close Signal From PLC - Low Residual
2" BCV-005
2" BV-038
SV SV-001 2"
2" PVC - Prop Solenoid By-Pass Line
2" BV-036
2" BV-037
M
2"x1"
1"x2"
Prop Make-Up Water Booster Pump 1 HP 10 GPM
2" BV-029
2" BV-032
2" PVC - Prop Chlorine Make-Up Water From Booster Pumps (See Sheet 7)
2" BV-030
2" BCV-004
2" BV-033
2" WS-003
1/4" BV-034
PI 006
2" BV-035
2"x1"
1" BV-031

APPROVED: [signature] for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	12/1	ISSUED FOR CONSTRUCTION	[initials]
	10/22	ISSUED FOR BIDDING	[initials]

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

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Texas Board of Professional Engineers Registration No. F-439
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WATER PLANT No. 3 – PHASE I

CHLORINE DISINFECTION SYSTEM P&ID

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

FILE NO.:
JOB NO.: 05133-0208-00
DATE: OCTOBER 2015
DSN. BY: JWV
DWG. BY: JAD
SCALE: NO SCALE
SHEET No. 9 of 46

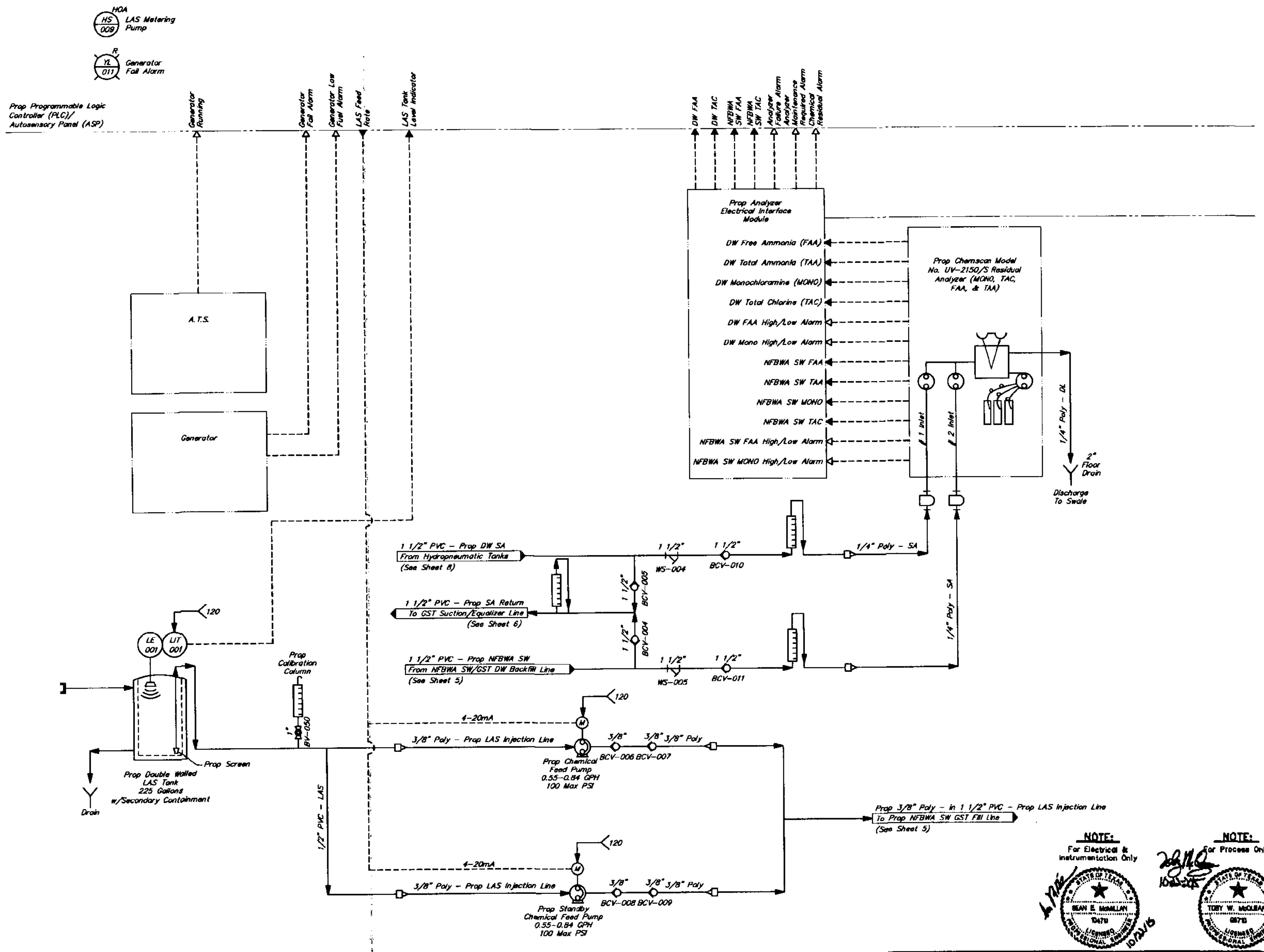
FOR CITY OF HOUSTON USE ONLY
CITY CNP NO. 54993

NOTE: For Electrical & Instrumentation Only
SEAN E. McMILLAN 104711 LICENSED PROFESSIONAL ENGINEER

NOTE: For Process Only
TOBY W. McCLEARY 98710 LICENSED PROFESSIONAL ENGINEER

C.O.H. LOG No. 15-1188

P:\PROJECTS\05133-GMMUD No. 1\0208-00 Water Plant No. 3 Phase 1\Civil\Const Dwgs\05133-0208-00 P&ID\PID DWG\P&ID.dwg Dec 22,2015 - 10:38am JWV



HOA
HS 009 LAS Metering Pump
R
YL 011 Generator Fail Alarm
Prop Programmable Logic Controller (PLC)/ Autosensory Panel (ASP)
Generator Running
Generator Fail Alarm
Generator Low Fuel Alarm
LAS Feed Rate
LAS Tank Level Indicator
DW FAA
DW TAC
NFBWA SW FAA
NFBWA SW TAC
Analyzer Failure Alarm
Analyzer Maintenance Required Alarm
Chemical Residual Alarm
A.T.S.
Generator
Prop Analyzer Electrical Interface Module
DW Free Ammonia (FAA)
DW Total Ammonia (TAA)
DW Monochloramine (MONO)
DW Total Chlorine (TAC)
DW FAA High/Low Alarm
DW Mono High/Low Alarm
NFBWA SW FAA
NFBWA SW TAA
NFBWA SW MONO
NFBWA SW TAC
NFBWA SW FAA High/Low Alarm
NFBWA SW MONO High/Low Alarm
Prop Chemscan Model No. UV-2150/S Residual Analyzer (MONO, TAC, FAA, & TAA)
1 Inlet
2 Inlet
1/4" Poly – DL
2" Floor Drain
Discharge To Swale
1 1/2" PVC – Prop DW SA
From Hydropneumatic Tanks
(See Sheet 8)
1 1/2" PVC – Prop SA Return
To GST Suction/Equalizer Line
(See Sheet 6)
1 1/2" PVC – Prop NFBWA SW
From NFBWA SW/GST DW Backfill Line
(See Sheet 5)
1 1/2"
BCV-005
BCV-004
WS-004
WS-005
BCV-010
BCV-011
1/4" Poly – SA
120
LE 001
LIT 001
Prop Calibration Column
1"
BV-050
Prop Double Walled LAS Tank 225 Gallons w/Secondary Containment
Prop Screen
Drain
1/2" PVC – LAS
4-20mA
M
3/8" Poly – Prop LAS Injection Line
Prop Chemical Feed Pump 0.55-0.84 GPH 100 Max PSI
3/8"
3/8" Poly
BCV-006 BCV-007
Prop Standby Chemical Feed Pump 0.55-0.84 GPH 100 Max PSI
BCV-008 BCV-009
Prop 3/8" Poly – in 1 1/2" PVC – Prop LAS Injection Line
To Prop NFBWA SW GST Fill Line
(See Sheet 5)

NOTE: For Electrical & Instrumentation Only

SEAN E. McMILLAN 104710 LICENSED PROFESSIONAL ENGINEER

10/23/15

NOTE: For Process Only

TOBY W. McCLEARY LICENSED PROFESSIONAL ENGINEER

10-23-15

APPROVED: DeWayne Dai for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/12	ISSUED FOR CONSTRUCTION	
2	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
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WATER PLANT No. 3 – PHASE I

LAS DISINFECTION SYSTEM P&ID

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

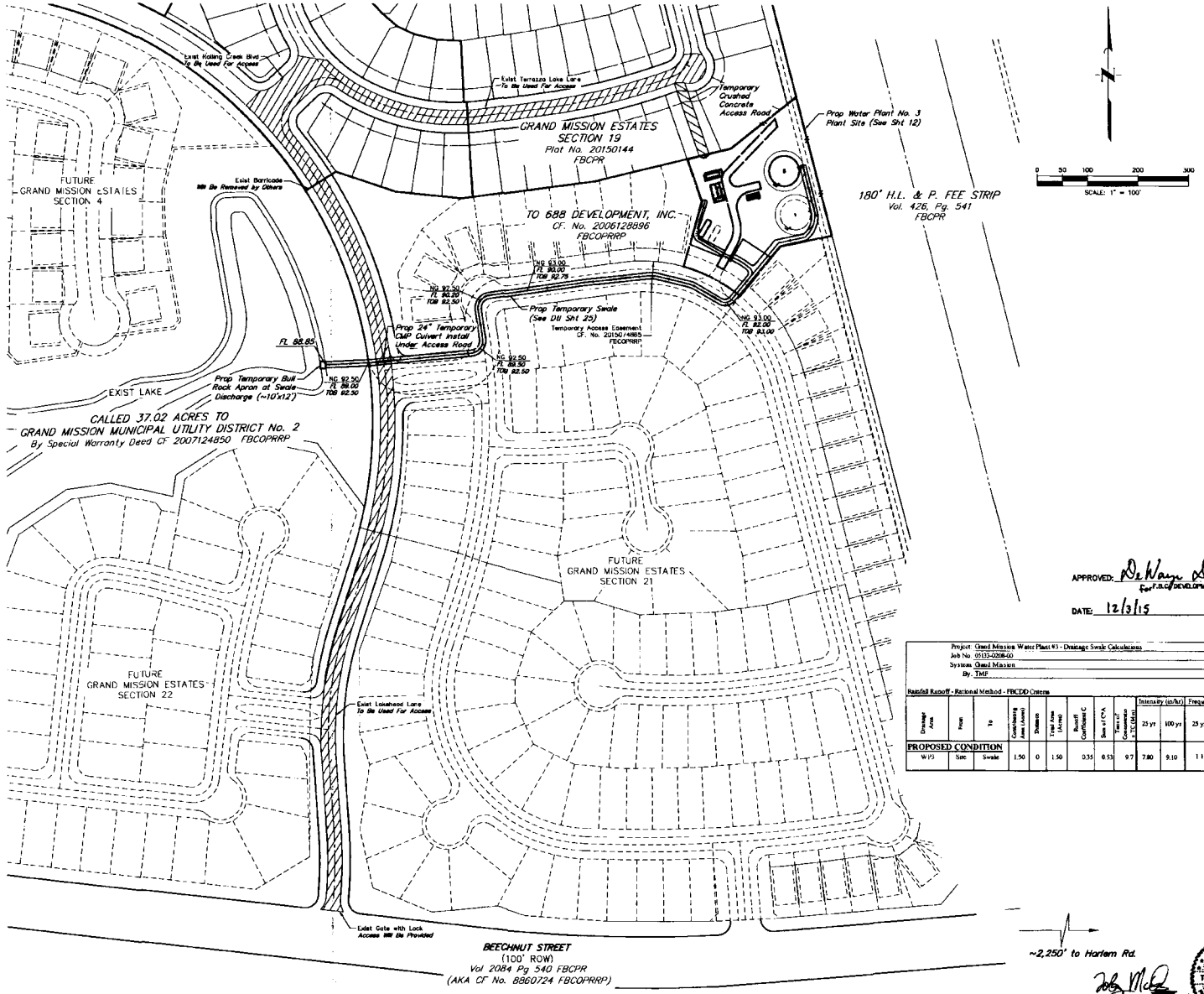
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TRAFFIC & TRANSPORTATION
STORM WATER QUALITY
STORM
HOUSTON
STREET & BRIDGE

FILE NO.:
JOB NO.: 05133-0208-00
DATE: OCTOBER 2015
DSN. BY: JWY/MCM
DWG. BY: JAD
SCALE: NO SCALE
SHEET No. 10 OF 44

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54983

C.O.H. LOG No. 15-1188



BENCH MARK

Elevations shown hereon are based on National Geodetic Survey Monument Designation HGCSD 88, PID No. AW5411 having published information as follows:

Latitude 29°43'58.13317" North
Longitude 95°50'40.86836" West NAD 83
Elevatin 136.8 feet NAVD 88

T.B.M. "B"

Being a cut square located on the back of curb on the north side of the westbound lane of Bellaire Boulevard, 1 foot from the end of back of curb at the dead end.

Elevation = 96.18, NAVD 88

T.B.M. "D"

Being a square on the bullnose of the median on Beechnut Street at the West entrance to David Crockett Middle School.

Elevation = 93.70, NAVD 88

FLOODPLAIN INFORMATION

ACCORDING TO MAP NO. 48157C0140L OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAPS FOR FORT BEND COUNTY, TEXAS, DATED APRIL 2, 2014, THE SUBJECT TRACT IS SITUATED WITHIN "ZONE X," AN AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD PLAIN. THE NEAREST 100-YEAR FLOODPLAIN IS APPROXIMATELY 1,300 FT. AWAY AT AN ELEVATION OF 82.0 FT.

LEGEND:

PROPOSED

	PROPERTY BOUNDARY
	TOP OF BANK
	EDGE OF PAVEMENT
	DRAINAGE SWALE CENTERLINE
No.	NUMBER
CF	CLERK'S FILE
UE	UTILITY EASEMENT
Vol.	VOLUME
Pg.	PAGE
FBCDR	FORT BEND COUNTY DEED RECORDS
FBCOPRRP	FORT BEND COUNTY OFFICIAL PUBLIC RECORDS OF REAL PROPERTY
FBCPR	FORT BEND COUNTY PLAT RECORDS
	PROP TEMPORARY ACCESS ROAD
	TEMPORARY ACCESS ROAD BY OTHERS

APPROVED: DeWayne Dokes
for P.E./C DEVELOPMENT COORDINATOR

DATE: 12/3/15

Project: Grand Mission Water Plant #3 - Drainage Swale Calculations
Job No: 05133-0208-00
System: Grand Mission
By: TMF

Rainfall Runoff - Rational Method - FBCDD Criteria

Drainage Area	From	To	Contributing Area (Acres)	Distance	Total Area (Acres)	Runoff Coefficient C	Sum of CA	Tc (min)	Concentration Tc (C) (Min)	Intensity (in/hr) 25 yr	Intensity (in/hr) 100 yr	Frequency Factor 25 yr	Frequency Factor 100 yr	Flow (cfs) 25 yr	Flow (cfs) 100 yr
PROPOSED CONDITION															
W-P3	Site	Swale	1.50	0	1.50	0.35	0.53	9.7		7.80	9.10	1.1	1.25	4.34	6.01

12/3/15	ISSUED FOR CONSTRUCTION	Tuttle
10/22	ISSUED FOR BIDDING	Tuttle
NO. DATE	REVISIONS	APP.

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
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WATER PLANT No. 3 – PHASE I

OVERALL SITE PLAN

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

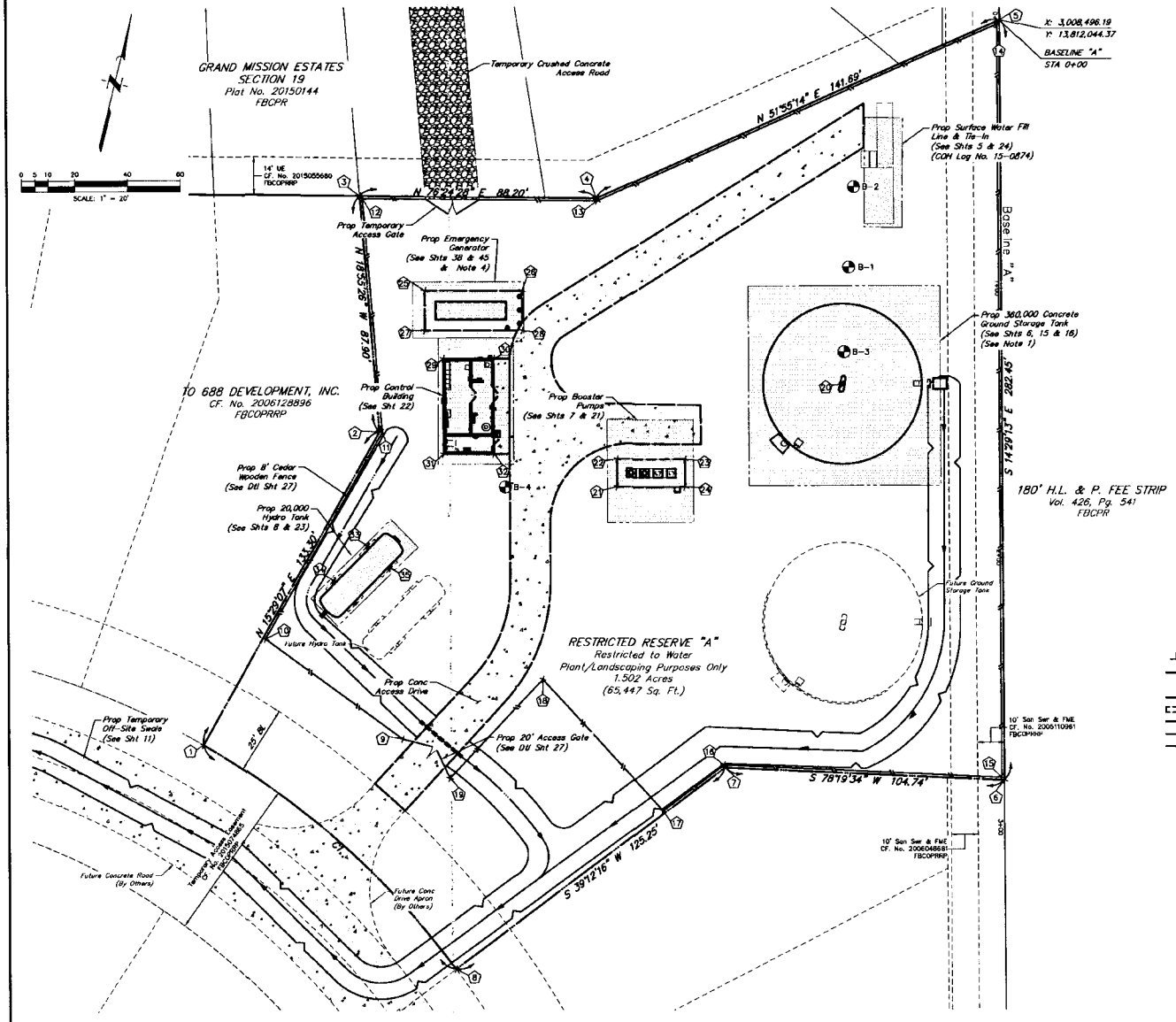
TRAFFIC & TRANSPORTATION — 10-29-15
CHIEF WATER SURVEY — 10-29-15
DESIGNER — 10/29/15

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DGN. BY: JMV
DWG. BY: JAD
SCALE: 1" = 100'
SHEET No. 11 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
MAPPING SECTION
54993
CITY OF HOUSTON ENGINEERING

STATE OF TEXAS
TOBY W. MCELHANY
89770
LICENSED PROFESSIONAL ENGINEER
10-29-2015

C.O.N. LOG No. 15-1168



CURVE	DELTA ANGLE	RADIUS	ARC LENGTH	TANGENT	CHORD BEARING	CHORD LENGTH
C1	23°45'47"	305.00'	126.50'	64.17'	N 26°40'37" W	125.59'

PLANT BOUNDARY LINE STATION/OFFSETS:

NUMBER	STATION (FT)	OFFSET (FT)
1	2+67.75	299.18' Rt
2	1+52.28	232.56' Rt
3	0+64.84	239.36' Rt
4	0+66.02	151.17' Rt
5	0+00.00	0.00' Rt
6	2+82.45	0.00' Lt
7	2+77.31	104.61' Rt
8	3+51.48	205.55' Rt

SITE PERIMETER FENCE LINE STATION/OFFSETS:

NUMBER	STATION (FT)	OFFSET (FT)
9	2+66.25	224.74' Rt
10	2+28.96	275.63' Rt
11	1+52.51	231.54' Rt
12	0+65.66	238.28' Rt
13	0+67.03	150.97' Rt
14	0+01.53	1.00' Rt
15	2+81.40	1.00' Lt
16	2+76.29	104.92' Rt
17	2+93.17	127.89' Rt
18	2+44.50	172.37' Rt
19	2+80.80	207.26' Rt

PLANT FOUNDATION/BUILDING STATION/OFFSETS:

NUMBER	STATION (FT)	OFFSET (FT)
20	1+35.20	59.66' Rt
21	1+73.14	144.10' Rt
22	1+62.81	144.09' Rt
23	1+62.85	118.75' Rt
24	1+73.18	118.77' Rt
25	1+00.13	215.39' Rt
26	1+00.26	179.06' Rt
27	1+14.86	215.44' Rt
28	1+15.01	179.11' Rt
29	1+25.30	208.61' Rt
30	1+25.33	189.95' Rt
31	1+60.63	208.67' Rt
32	1+60.66	190.01' Rt
33	1+94.60	237.26' Rt
34	2+07.34	249.99' Rt
35	2+03.07	228.76' Rt

LEGEND:

PROPOSED

	PROPERTY BOUNDARY
	CONCRETE PIPE SUPPORT
	TOP OF BANK
	CULVERT PIPE
	EDGE OF PAVEMENT
	DRAINAGE SWALE CENTERLINE
	WOODEN FENCE
	SOIL BORING (See Geotechnical Report)
No.	NUMBER
BL	BUILDING LINE
CF	CLERK'S FILE
CONC	CONCRETE
DTL	DETAIL
SHT	SHEET
FME	FORCE MAIN EASEMENT
SAN SEW	SANITARY SEWER
UE	UTILITY EASEMENT
Vol.	VOLUME
Pg.	PAGE
FBCDR	FORT BEND COUNTY DEED RECORDS
FBCOPRRP	FORT BEND COUNTY OFFICIAL PUBLIC RECORDS OF REAL PROPERTY
FBCPR	FORT BEND COUNTY PLAT RECORDS
NFBWA	NORTH FORT BEND WATER AUTHORITY

BENCH MARK

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Longitude 95°50'45.96836" West NAD 83
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T.B.M. "B"

Being a cut square located on the back of curb on the north side of the westbound lane of Beltaire Boulevard, 1 foot from the end of back of curb at the dead end.

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Being a square on the bullnose of the median on Beechnut Street at the West entrance to David Crockett Middle School.

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FLOODPLAIN INFORMATION

ACCORDING TO MAP NO. 48157C0140L OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S FLOOD INSURANCE RATE MAPS FOR FORT BEND COUNTY, TEXAS, DATED APRIL 2, 2014, THE SUBJECT TRACT IS SITUATED WITHIN "ZONE X," AN AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD PLAIN. THE NEAREST 100-YEAR FLOODPLAIN IS APPROXIMATELY 1,300 FT. AWAY AT AN ELEVATION OF 92.0 FT.

NOTES:

1. The Base Bid includes construction of a concrete ground storage tank (See Sheet 15 & 16). Alternative Bid Item A1 is to construct a welded steel ground storage tank (See Sheet 17 & 18). Alternative Bid Item A2 is to construct a galvanized steel ground storage tank (See Sheet 19 & 20).
2. Contractor shall perform work in a manner to limit noise from construction to acceptable levels for properties adjacent to the construction area.
3. All bore locations shown are approximate and are from the Geotechnical Report performed by Terracon Consultants, Inc. in June 2015.
4. Generator shall have a decibel rating of 73 dB at 23 feet away (the plant boundary).

APPROVED: for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/11	ISSUED FOR CONSTRUCTION	
2	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ENLARGED SITE AND DIMENSION PLAN

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER — 10-29-15
STORM WATER QUALITY — 10-29-15
PLANNING — 10-29-15
BRIDGE & BRIDGE — 10-29-15

FILE NO:
JOB NO: 0513-02-08-00

DATE: OCTOBER 2015
DSN. BY: JMV
DWG. BY: JAD

SCALE: 1" = 20'

SHEET No. 12 OF 46

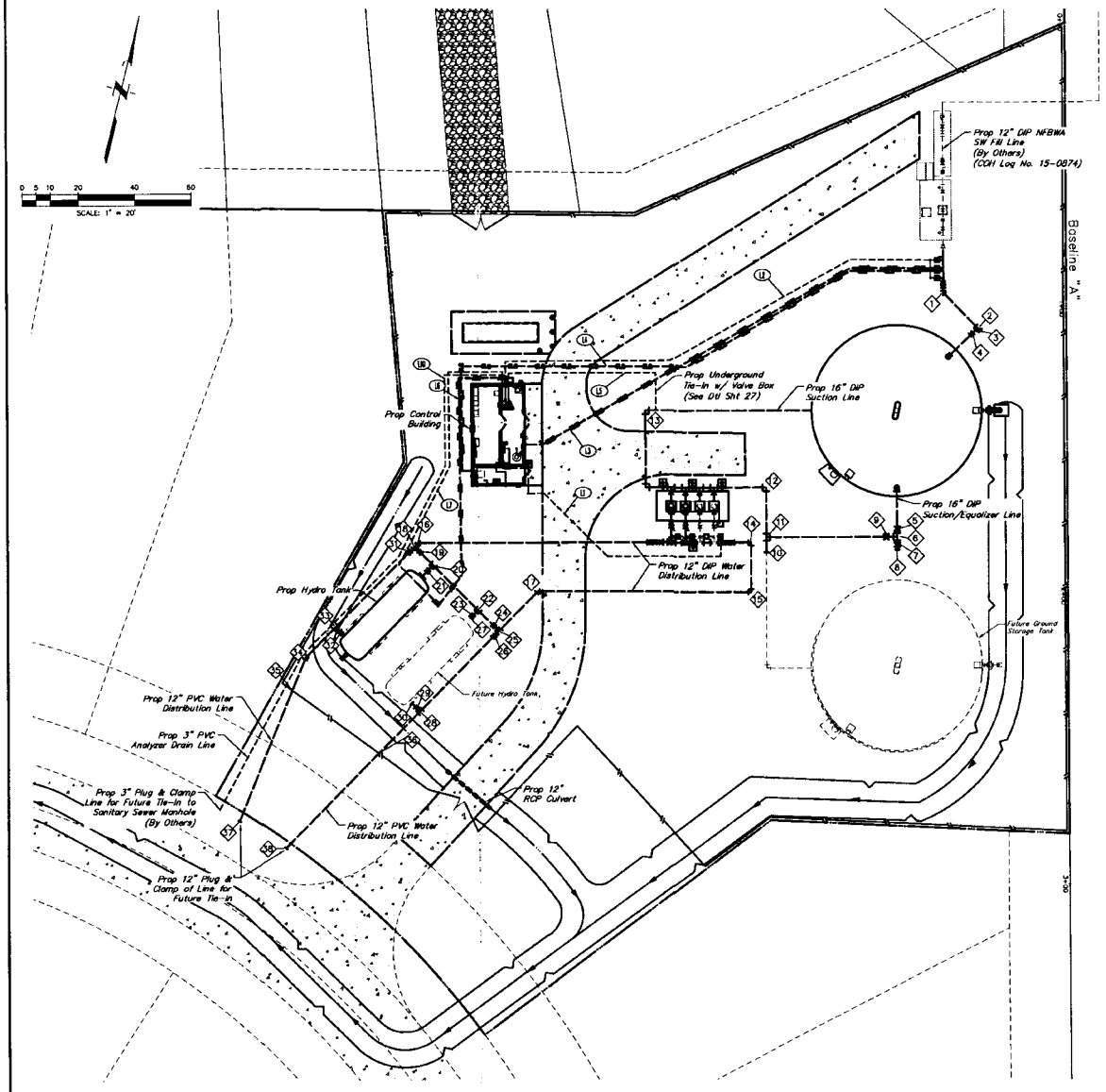
FOR CITY OF HOUSTON USE ONLY
DEPT. DWG. No.
54993

10-23-2015

TOBY W. McCLEARY
68790
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS



PIPING LOCATION TABLE

NUMBER	FITTING	STATION (FT)	OFFSET (FT)
1	153	0+84.24	43.00' RT
2	154	1+06.65	31.08' RT
3	200	1+07.60	30.18' RT
4	199	1+08.68	33.21' RT
5	198	1+76.22	59.74' RT
6	161	1+79.01	59.74' RT
7	160	1+81.80	59.75' RT
8	159	1+83.63	59.75' RT
9	162	1+79.00	63.50' RT
10	165	1+84.34	105.59' RT
11	164	1+78.92	105.58' RT
12	166	1+61.63	105.54' RT
13	163	1+34.84	147.78' RT
14	156	1+80.75	110.92' RT
15	155	1+98.02	111.00' RT
16	153	1+80.55	227.66' RT
17	153	1+97.82	185.83' RT
18	154	1+81.84	228.96' RT
19	199	1+83.75	227.06' RT
20	152	1+88.32	222.49' RT
21	198	1+90.32	224.49' RT
22	156	2+04.00	206.82' RT
23	198	2+05.97	208.79' RT
24	199	2+09.40	201.45' RT
25	156	2+11.30	199.55' RT
26	198	2+13.12	201.38' RT
27	199	2+06.60	209.42' RT
28	156	2+39.11	227.45' RT
29	198	2+37.85	228.72' RT
30	199	2+36.27	230.30' RT
31	198	1+83.67	230.79' RT
32	198	2+11.48	254.99' RT
33	153	2+09.63	256.84' RT
34	152	2+20.14	267.38' RT
35	198	2+31.53	272.12' RT
36	154	2+45.59	233.95' RT
37	198	2+76.52	290.84' RT
38	198	2+86.20	274.89' RT

SMALL PIPING LINE CHART:

- (LI) 2" Sch. 80 PVC Water Supply/ Make-Up Water Line to Safety Eye Wash/ Shower Station/ Chlorinator & Analyzer
- (L2) 1-1/2" Sch. 80 PVC SW Sample Line to Analyzer
- (L3) 3/8" Poly-Tube LAS Injection in 1 1/2" Sch. 80 PVC Conduit
- (L4) 1-1/2" Sch. 80 PVC CL_2 Solution Injection Line
- (L5) 1-1/2" Sch. 80 PVC DW Sampler Return
- (L6) 3/4" HDPE Air Line
- (L7) 1-1/2" Sch. 80 PVC DW Sample Line
- (L8) 3" Sch. 80 PVC Analyzer Drain Line

PIPING CHART:

- (198) 12" DIP/PVC Adapter
- (199) 12" Plug & Clamp, MJ w/ 2" NPT Tap & 2" Blow Off Assembly (See Dtl Sht 26)
- (152) 12"x12" Tee, PO
- (153) 12"x45° Bend, PO
- (154) 12"x90° Bend, PO
- (155) 12"x22 1/2° Bend, PO
- (156) 12" Resilient Seat Gate Valve, MJ W/Valve Box
- (200) 16" Plug & Clamp, MJ w/ 2" NPT Tap & 2" Blow Off Assembly (See Dtl Sht 26)
- (164) 16"x22 1/2° Bend, PO
- (163) 16"x16" Tee, PO
- (165) 16"x90° Bend, PO
- (166) 16" Butterfly Valve, MJ W/Valve Box

LEGEND:

FUTURE	PROPOSED	
	GI	TYP PIPE FITTING (VERTICAL)
	J	TYP PIPE FITTING (HORIZ)
	M	TYPICAL PIPE VALVE
		CONCRETE PIPE SUPPORT
		UNDERGROUND PLANT PIPING => 4"
		UNDERGROUND PLANT PIPING < 4"
		ABOVEGROUND PLANT PIPING
		EDGE OF PAVEMENT
	W	WOODEN FENCE
	AIR	AIR LINE
	LAS	LIQUID AMMONIA SULFATE LINE
	CS	CHLORINE SOLUTION LINE
	DIP	DUCTILE IRON PIPE
	HDPE	HIGH DENSITY POLYETHYLENE PIPING
	PVC	POLYVINYL CHLORIDE PIPING

APPROVED: Dr. Wayne Dai for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	12/15	ISSUED FOR CONSTRUCTION	TWM
1	10/32	ISSUED FOR BIDDING	TWM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ENLARGED PIPING PLAN

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER ... PUBLIC & TRANSPORTATION ... 10-29-15 ... TRAFFIC ... STREET & DRAINAGE ...

FILE NO:
JOB NO: 0513-0208-00
DATE: OCTOBER 2015
DSN. BY: JMV
DWG. BY: JMD
SCALE: 1" = 20'
SHEET No. 13 OF 46

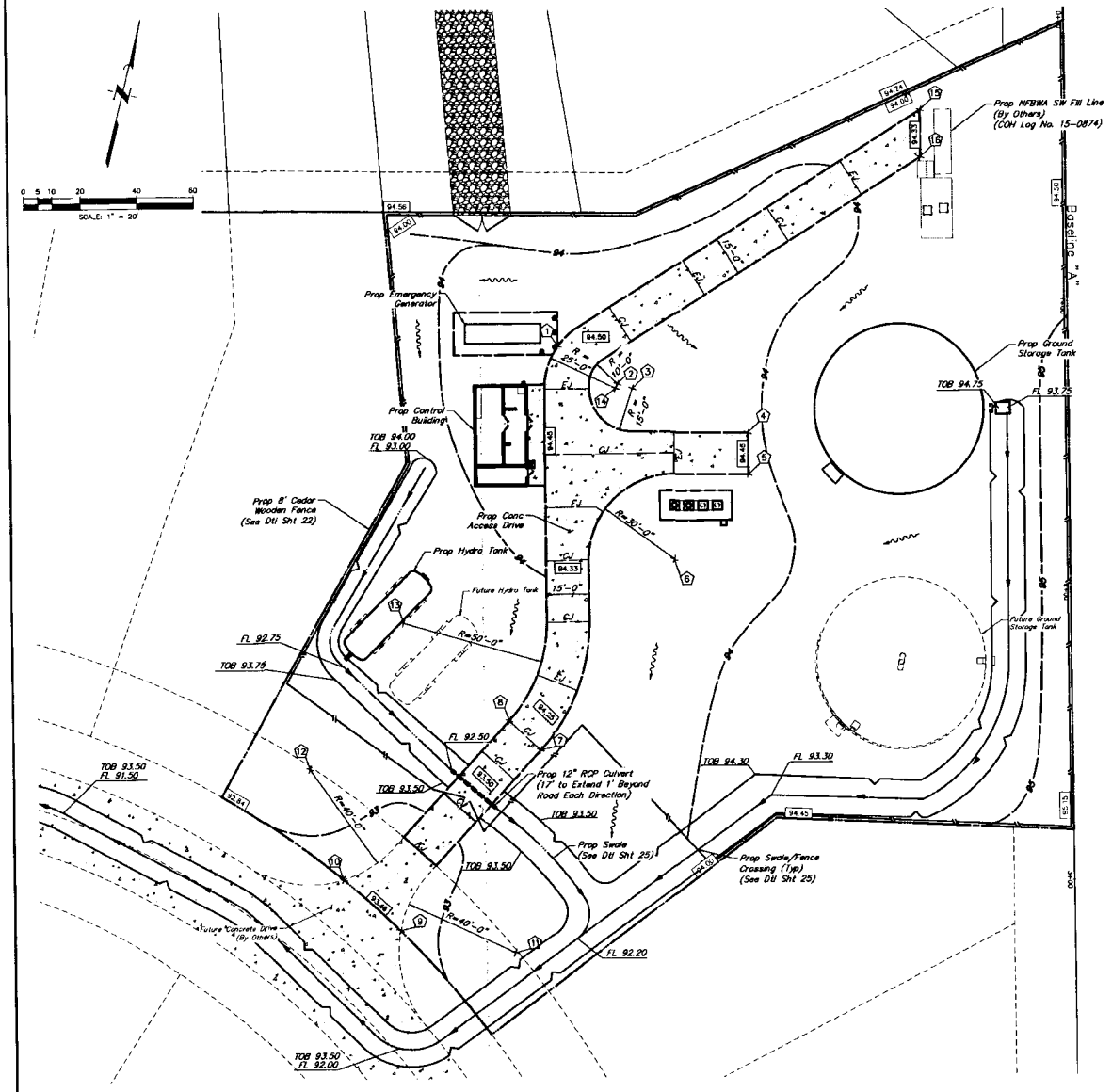
FOR CITY OF HOUSTON USE ONLY
54983

TOBY W. McCLEARY 68710 REGISTERED PROFESSIONAL ENGINEER

10-22-15

C.O.H. LOG No. 15-1168

P:\PROJECTS\05133-GMMUD No. 1\0208-00 Water Plant No. 3 Phase I\Civil\Const Docs\EPE.dwg Dec 22,2015 - 10:36am JMV



PAVING/GRADING STATION/OFFSETS:

NUMBER	STATION (FT)	OFFSET (FT)
1	1+12.15	179.10' Rt
2	1+25.48	158.34' Rt
3	1+27.10	153.28' Rt
4	1+42.78	112.87' Rt
5	1+57.32	112.75' Rt
6	1+87.02	139.16' Rt
7	2+53.08	186.91' Rt
8	2+42.80	197.83' Rt
9	3+15.25	236.82' Rt
10	2+97.30	256.63' Rt
11	3+22.73	197.93' Rt
12	2+58.93	267.94' Rt
13	2+08.54	234.24' Rt
14	1+26.97	159.09' Rt
15	0+31.06	51.01' Rt
16	0+47.43	51.01' Rt

LEGEND:

	CULVERT PIPE
	EDGE OF PAVEMENT
	DRAINAGE SWALE
	WOODEN FENCE
125	PROPOSED CONTOUR
108.0	PROPOSED GRADE ELEVATION
[108.0]	EXISTING GRADE ELEVATION
CJ	CONTROL JOINT
EJ	EXPANSION JOINT
FL	FLOWLINE
KJ	KEY JOINT
TOB	TOP OF BANK
RCP	REINFORCED CONCRETE PIPE
	SLOPE TO DRAIN

APPROVED: DeWayne Dennis for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/2	ISSUED FOR CONSTRUCTION	TWH
1	10/27	ISSUED FOR BIDDING	TWH

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

PAVING & GRADING PLAN

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER: 12-8-15 — TRAFFIC & TRANSPORTATION
SEWER: 12-9-15 — STORM WATER QUALITY
STORM: 12-14-15 — FACILITIES
STREET & DRAINAGE

FILE NO:
JOB NO: 3513-0208-00

DATE: OCTOBER 2015
DSN. BY: JMV
DWG. BY: MD
SCALE: 1" = 20'
SHEET No. 14 OF 46

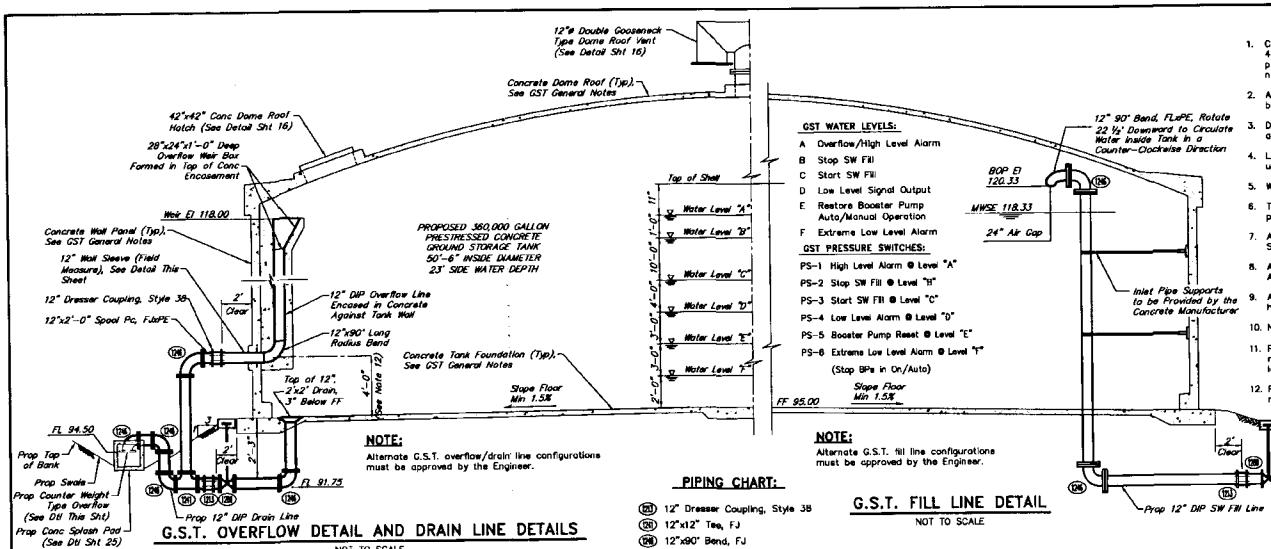
FOR CITY OF HOUSTON USE ONLY
KEY MAP NO. 54893

STATE OF TEXAS — TOBY W. MCCLEARY — 85270 — LICENSED PROFESSIONAL ENGINEER

10-22-2015

C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS



NOTE:
Alternate G.S.T. overflow/drain line configurations must be approved by the Engineer.

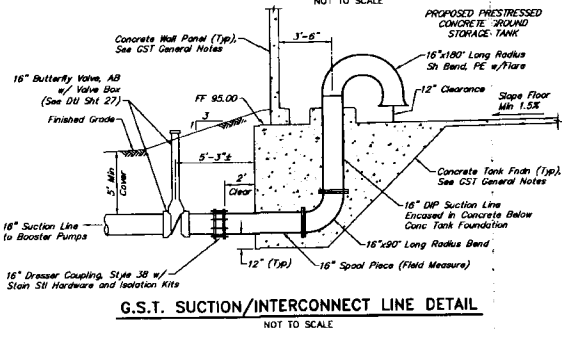
G.S.T. OVERFLOW DETAIL AND DRAIN LINE DETAILS
NOT TO SCALE

NOTE:
Alternate G.S.T. fill line configurations must be approved by the Engineer.

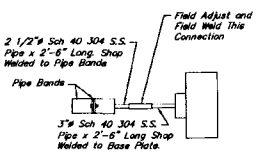
G.S.T. FILL LINE DETAIL
NOT TO SCALE

PIPING CHART:

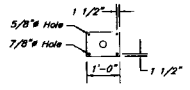
(121) 12" Dresser Coupling, Style 38
(126) 12"x12" Tee, FJ
(128) 12"x90° Bend, FJ
(138) 12" Resilient Seat Gate Valve, MJ



G.S.T. SUCTION/INTERCONNECT LINE DETAIL
NOT TO SCALE

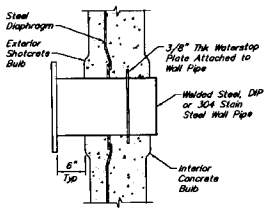


TYPICAL SECTION "A-A"

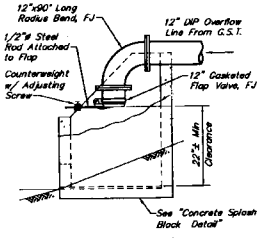


TYPICAL SECTION "B-B"

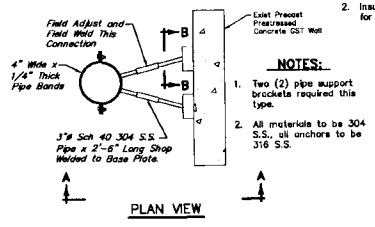
NOTE:
Weight of the counter weight shall be equal to the weight of the flap. There shall not be a gap below the flap valve and opening.



TYPICAL WALL PANEL PIPE PENETRATION DETAIL
NOT TO SCALE



COUNTER WEIGHT TYPE OVERFLOW
NOT TO SCALE

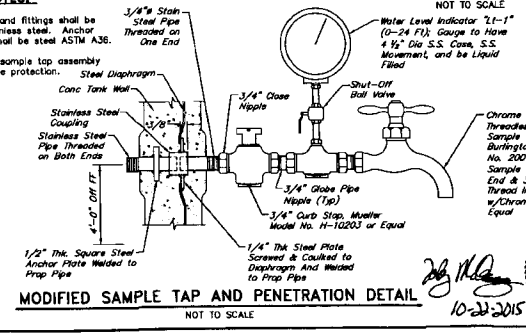


NOTES:
1. Two (2) pipe support brackets required this type.
2. All materials to be 304 S.S., all anchors to be 316 S.S.

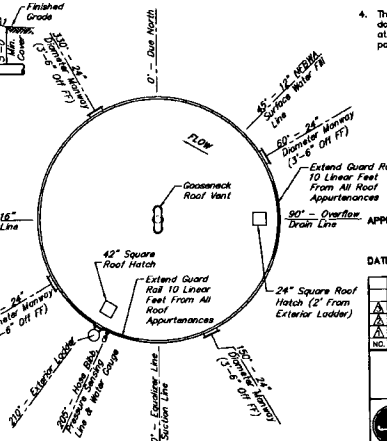
PLAN VIEW

INLET PIPE SUPPORT BRACKET
NOT TO SCALE

NOTES:
1. All pipe and fittings shall be 304 stainless steel. Anchor plates shall be steel ASTM A36.
2. Insulate sample tap assembly for freeze protection.



MODIFIED SAMPLE TAP AND PENETRATION DETAIL
NOT TO SCALE



MODIFIED F9 GST NO. 1 CONCRETE G.S.T. ACCESSORY DETAIL – PLAN VIEW
NOT TO SCALE

G.S.T GENERAL NOTES:

1. Concrete for tank wall panels, dome roof, and riser pipe encasements shall test 4,000 psi minimum at 28 days. Concrete for tank floor, foundation and floor pipe encasements shall test 3,500 psi minimum at 28 days. Other non-structural tank concrete shall test 3,000 psi minimum at 28 days.
2. All concrete reinforcing bars shall conform to ASTM A615 grade 60, except no. 3 bars may conform to grade 40.
3. Detailing and fabrication of concrete reinforcement and accessories shall be in accordance with ACI-315 latest edition.
4. Lap all continuous reinforcing bars 36 diameters at splices, corners and tees, unless noted otherwise.
5. Where called, use welded wire sheets. Welded wire rolls are not acceptable.
6. The use of heat to facilitate the bending of reinforcing bars will not be permitted.
7. All structural steel details and connections shall conform to the latest A.I.S.C. Standards.
8. All structural steel rolled shapes, steel plates and bars shall conform to ASTM A36 latest edition.
9. All steel members and connections exposed to earth or weather shall be hot-dipped galvanized.
10. No engineering drawing may be reproduced for use as shop drawings.
11. Provide wall panel or dome roof reinforcing as per tank manufacturer's recommendations for all inlets, outlets, manways, roof vents, cleanouts and ladders.
12. Pipe penetrations through walls shall have the centerline location determined as recommended by the tank manufacturer and confirmed by the Engineer.

GST OPERATION NOTES:

1. Under normal operating conditions, the level indicating transmitter (LIT) will close the distribution water (DW) GST backfill line flow control valve (FCV) or surface water (SW) FCV @ Level "B", approx. 12 inches (12") before the water level reaches Level "A". The LIT will send a "HIGH LEVEL ALARM" signal to the Operator @ Level "A", 6 inches (6") before the water level reaches the top of the overflow weir box.
2. When the GSTs are being filled by the DW backfill line, the FCV will only open if the system pressure is above 40 psi and the water level is below Level "C". The FCV will close if the system pressure falls below 40 psi or if the water level reaches Level "B". These are preliminary settings to be adjusted as needed, after construction is complete, for the District to maintain the desired volume of water in the storage tank for average daily flow and fire protection.
3. The plant operator must set the "Hand-Off-Auto" (HOA) switch for either FCV into "HAND" mode to manually open the DW backfill line FCV or SW FCV long enough to overflow the GST while performing periodic maintenance on the GSTs. Once water surface cleaning is completed, the water level will be dropped back to below Level "A" and the HOA will be placed back into "AUTO" mode. Under no other circumstances will the GSTs be allowed to exceed water Level "A" during normal operation.
4. The Contractor shall provide record documentation of all the water level settings at the completion of this project prior to final payment.

APPROVED: DeWayne Dei
for F.B.C. DEVELOPMENT COORDINATOR
DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/11	ISSUED FOR CONSTRUCTION	LWM
2	11/2	REV. PER ADD. No. 1	LWM
3	10/22	ISSUED FOR BIDDING	LWM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
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WATER PLANT No. 3 – PHASE I

CONCRETE GST DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER
STORM WATER QUALITY
STREET & BRIDGE
BOILING

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DSN BY: JMV
DWG. BY: JMJ
SCALE: AS SHOWN
SHEET No. 15 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
5498.3

STATE OF TEXAS
TOBY W. MACILEARY
93210
LICENSED PROFESSIONAL ENGINEER
10-22-2015

C.O.H. LOG No. 15-1168

CON ELS REV JAN 2015

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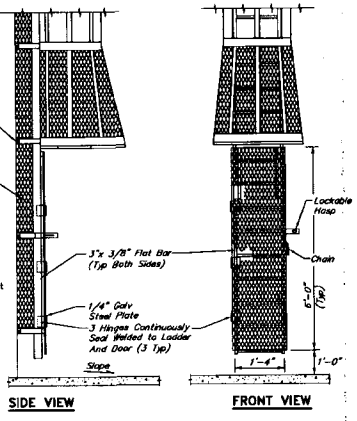
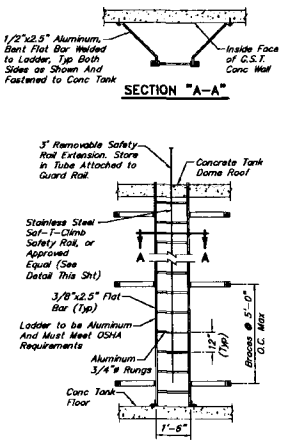
CONFORMED DOCUMENTS



NOTES:
1. Locate Hinge to Avoid Conflict Between Locking Cover and Aerator Structural Members.
2. Isolate Dissimilar Metals With Insulation Kits.

SIDE VIEW FRONT VIEW

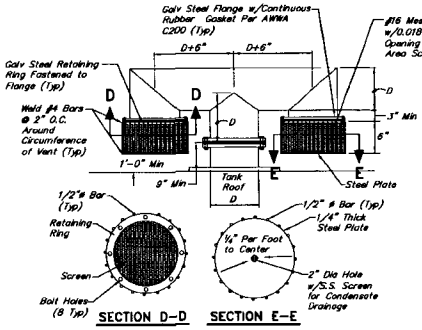
SECURITY DOOR FOR CAGED LADDER
NOT TO SCALE



SECTION "A-A"

MODIFIED F12 - INTERIOR G.S.T. LADDER
NOT TO SCALE

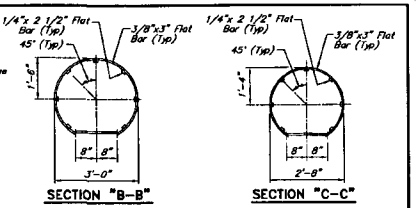
LADDER NOTES:
1. Ladders and components shall be 6061-T6 aluminum.
2. All hardware to be stainless steel.
3. All aluminum surfaces in contact with concrete shall receive a PVC shim.
4. Ladders shall be fastened to tank using stainless steel wedge anchors.
5. OSHA approved fall protection device to be installed (stainless steel).



SECTION D-D SECTION E-E

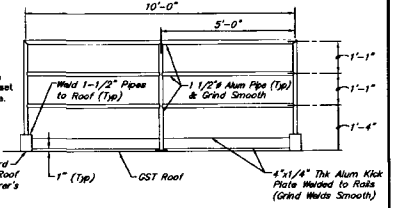
MODIFIED F8 - ROOF VENT DETAIL
NOT TO SCALE

ROOF VENT NOTES:
1. Vent to be fabricated from thin wall schedule 10 steel pipe and hot dipped galvanized or aluminum.
2. Isolation kit required between all dissimilar metals.
3. "D" is the pipe diameter equal to 20 inches (20").
4. Roof vent should be set off center in between roof rafters.



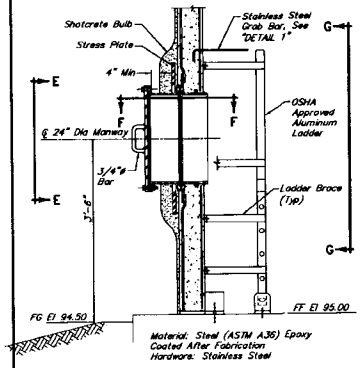
SECTION "B-B" SECTION "C-C"

SAFETY CAGE DETAIL
NOT TO SCALE

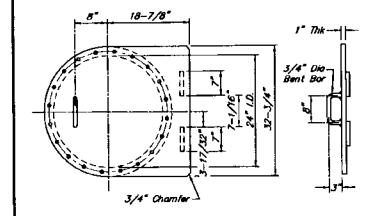


NOTE:
Handrail to be rolled to curvature of tank and set 1-3/4" back from edge.

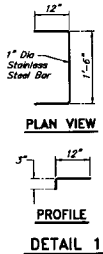
MODIFIED F13 - GUARD RAIL DETAIL
NOT TO SCALE



Material: Steel (ASTM A36) Epoxy Coated After Fabrication
Hardware: Stainless Steel

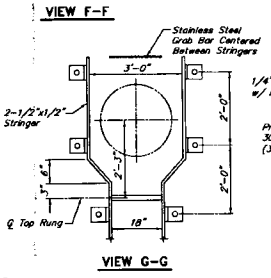


VIEW E-E



PLAN VIEW PROFILE

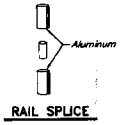
DETAIL 1
NOT TO SCALE



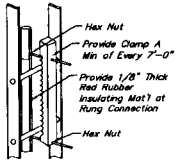
VIEW G-G

24" DIA. MANWAY DETAILS
NOT TO SCALE

NOTE:
Provide two (2) OSHA approved, full body climbing harnesses (buckle type).

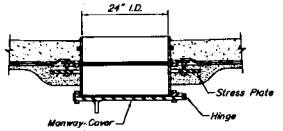


RAIL SPLICE

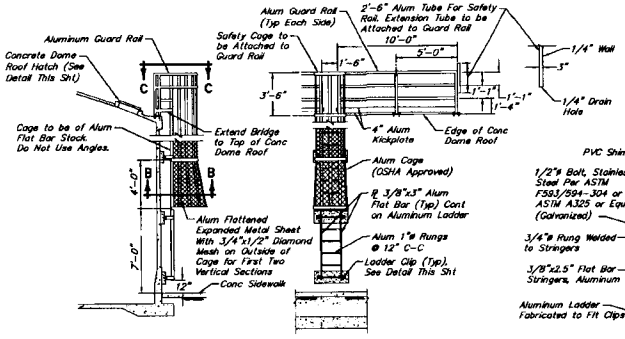


LADDER RUNG CLAMP

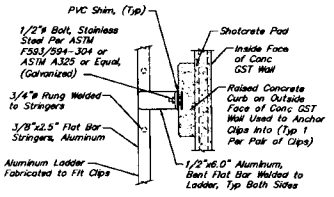
MODIFIED F12 - SAFETY RAIL DETAIL
NOT TO SCALE



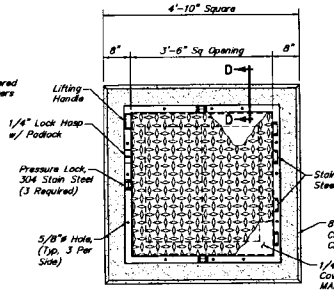
VIEW F-F



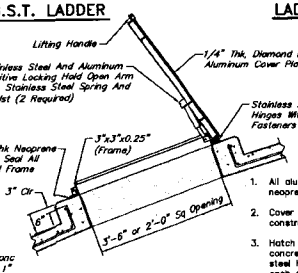
MODIFIED F11 - EXTERIOR G.S.T. LADDER
NOT TO SCALE



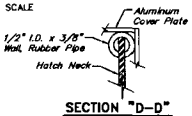
LADDER CLIP DETAIL
NOT TO SCALE



PLAN VIEW



TYPICAL SECTION



SECTION "D-D"

NOTES:
1. All aluminum shall be isolated from concrete by a neoprene gasket.
2. Cover hatch with polyethylene for protection during construction.
3. Hatch to be secured to concrete curb with stainless steel Hilti Kwik bolts on each side of frame with minimum 2-1/4" embedment. (12 required)
4. Roof hatches to be located so that hatch opens away from tank roof accessories.

MODIFIED F10 - 42"x42"/24"x24" DOME HATCH DETAIL CONCRETE TANK
NOT TO SCALE

APPROVED: for F.B.C. DEVELOPMENT COORDINATOR
DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/15	ISSUED FOR CONSTRUCTION	TJM
0	10/22	ISSUED FOR BIDDING	TJM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 - PHASE I

CONCRETE GST MISCELLANEOUS DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER — APPD 10-29-15
TRAFFIC & TRANSPORTATION — APPD 10-29-15
STORM WATER QUALITY — SIGNED 10/29/15
STREET & BRIDGE — SIGNED 10/29/15

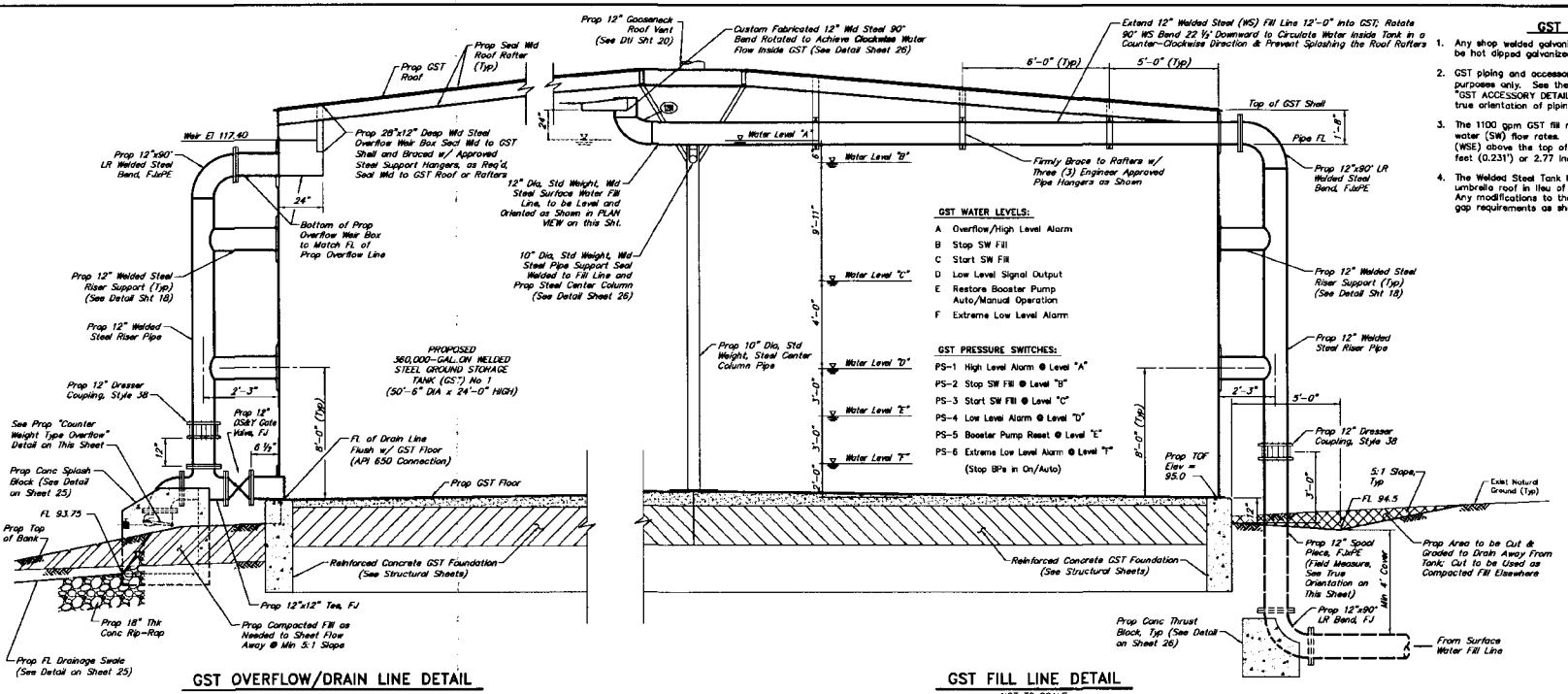
FILE NO:
JOB NO: 0513-3-0208-00
DATE: OCTOBER 2015
DSN. BY: JMW
DWG. BY: JAO
SCALE: AS SHOWN
SHEET No. 16 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.

TOBY W. McCLEARY — 85293 — LICENSED PROFESSIONAL ENGINEER — STATE OF TEXAS — 10-30-2015

C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS



GST OVERFLOW/DRAIN LINE DETAIL

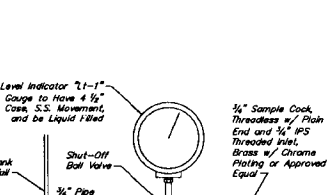
NOT TO SCALE

GST CONSTRUCTION NOTES:

1. Any shop welded galvanized steel GST interior piping or components shall be hot dipped galvanized after fabrication is completed.
2. GST piping and accessories are shown in profile views for detail purposes only. See the "ENLARGED PIPING PLAN" on Sheet 13 and the "GST ACCESSORY DETAIL – PLAN VIEW" on this sheet for location and true orientation of piping and accessories.
3. The 1100 gpm GST fill rate is based on the maximum designed surface water (SW) flow rates. The maximum rise of water surface elevation (WSE) above the top of the overflow weir will be approximately 0.231 feet (0.231') or 2.77 inches (2.77").
4. The Welded Steel Tank Manufacturer is allowed to bid a self-supporting umbrella roof in lieu of a tank with a center support and roof rafters. Any modifications to the roof, fill line, supports for the fill line, and air gap requirements as shown must be approved by Engineer.

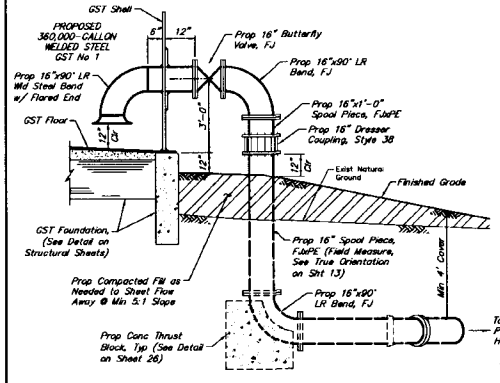
GST OPERATION NOTES:

1. Under normal operating conditions, the level indicating transmitter (LIT) will close the distribution water (DW) GST backfill line flow control valve (FCV) or surface water (SW) FCV @ Level "B", approx. 12 inches (12") before the water level reaches Level "A". The LIT will send a "HIGH LEVEL ALARM" signal to the Operator @ Level "A", 6 inches (6") before the water level reaches the top of the overflow weir box.
2. When the GSTs are being filled by the DW backfill line, the FCV will only open if the system pressure is above 40 psi and the water level is below Level "C". The FCV will close if the system pressure falls below 40 psi or if the water level reaches Level "B". These are preliminary settings to be adjusted as needed, after construction is complete, for the District to maintain the desired volume of water in the storage tank for average daily flow and fire protection.
3. The plant operator must set the "Hand-Off-Auto" (HOA) switch for either FCV into "HAND" mode to manually open the DW backfill line FCV or SW FCV long enough to overflow the GST while performing periodic maintenance on the GSTs. Once water surface cleaning is completed, the water level will be dropped back to below Level "A" and the HOA will be placed back into "AUTO" mode. Under no other circumstances will the GSTs be allowed to exceed water Level "A" during normal operation.
4. The Contractor shall provide record documentation of all the water level settings at the completion of this project prior to final payment.



GST FILL LINE DETAIL

NOT TO SCALE



GST SUCTION AND EQUALIZER LINE DETAIL

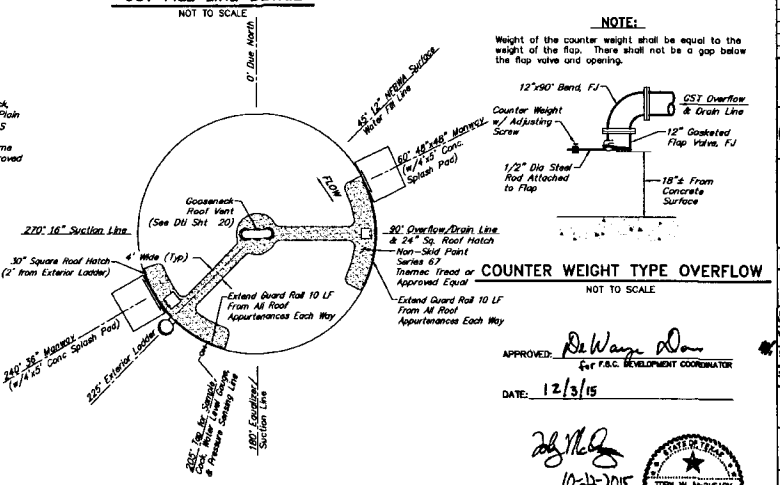
NOT TO SCALE

NOTE:
Insulate entire assembly for freeze protection.

MODIFIED GST SAMPLE TAP DETAIL

NOT TO SCALE

NOTE:
Weight of the counter weight shall be equal to the weight of the flap. There shall not be a gap below the flap valve and opening.



COUNTER WEIGHT TYPE OVERFLOW

NOT TO SCALE

GST No. 1 ACCESSORY DETAIL – PLAN VIEW

NOT TO SCALE

APPROVED: DeWayne Dan for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

10-26-2015

NO.	DATE	REVISIONS	APP.
1	11/12	ISSUED FOR CONSTRUCTION	TLeB
2	11/2	REV. PER ADD. No. 1	TLeB
3	10/22	ISSUED FOR BIDDING	TLeB

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713 777 5337

WATER PLANT No. 3 – PHASE I

ALT 1 WELDED STEEL GST DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER — 10-26-15
TRAFFIC & TRANSPORTATION — 12-09-15
STORM WATER QUALITY — 10-15-15
FACILITIES — 10-15-15
STREET & DRAINAGE

FILE NO:
JOB NO: 0513-0208-00
DATE: OCTOBER 2015
DGN. BY: JMV
DWG. BY: JAD
SCALE: AS SHOWN
SHEET No. 17 OF 46

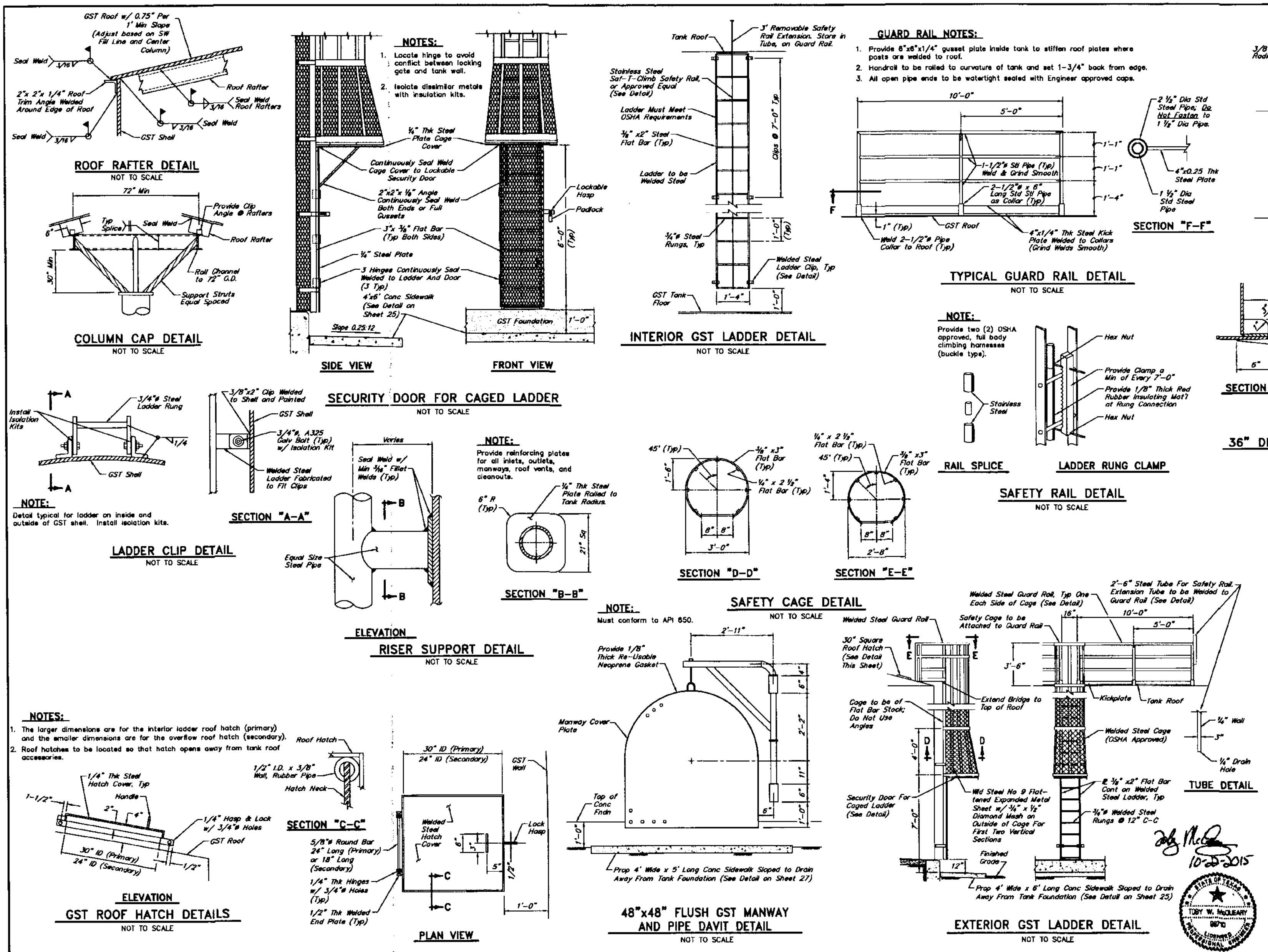
FOR CITY OF HOUSTON USE ONLY
CITY DWG No.
54093
KEY MAP

C.O.H. LOG No. 15-1158

P:\PROJECTS\0513-0208.00 No. 11\0208-00 Water Plant No. 3 Phase 1\Civil\Const Dwgs\GST#2.dwg Dec 22,2015 – 10:36am JMV

DGN BLK REV: JAN 2008

CONFORMED DOCUMENTS



ROOF RAFTER DETAIL
NOT TO SCALE
COLUMN CAP DETAIL
NOT TO SCALE
SIDE VIEW
FRONT VIEW
SECURITY DOOR FOR CAGED LADDER
NOT TO SCALE
INTERIOR GST LADDER DETAIL
NOT TO SCALE
TYPICAL GUARD RAIL DETAIL
NOT TO SCALE
SECTION "F-F"
FRONT ELEVATION
SECTION "C-C"
HINGE DETAIL
36" DIAMETER GST SHELL MANWAY
NOT TO SCALE
LADDER CLIP DETAIL
NOT TO SCALE
SECTION "A-A"
SECTION "B-B"
ELEVATION
RISER SUPPORT DETAIL
NOT TO SCALE
SECTION "D-D"
SECTION "E-E"
SAFETY CAGE DETAIL
NOT TO SCALE
RAIL SPLICE
LADDER RUNG CLAMP
SAFETY RAIL DETAIL
NOT TO SCALE
ELEVATION
SECTION "C-C"
PLAN VIEW
GST ROOF HATCH DETAILS
NOT TO SCALE
48"x48" FLUSH GST MANWAY AND PIPE DAVIT DETAIL
NOT TO SCALE
EXTERIOR GST LADDER DETAIL
NOT TO SCALE
TUBE DETAIL

NOTES:
1. Locate hinge to avoid conflict between locking gate and tank wall.
2. Isolate dissimilar metals with insulation kits.

GUARD RAIL NOTES:
1. Provide 8"x8"x1/4" gusset plate inside tank to stiffen roof plates where posts are welded to roof.
2. Handrail to be rolled to curvature of tank and set 1-3/4" back from edge.
3. All open pipe ends to be watertight sealed with Engineer approved caps.

NOTE:
Provide two (2) OSHA approved, full body climbing harnesses (buckle type).

NOTE:
Detail typical for ladder on inside and outside of GST shell. Install isolation kits.

NOTE:
Provide reinforcing plates for all inlets, outlets, manways, roof vents, and cleanouts.

NOTE:
Must conform to API 650.

NOTES:
1. The larger dimensions are for the interior ladder roof hatch (primary) and the smaller dimensions are for the overflow roof hatch (secondary).
2. Roof hatches to be located so that hatch opens away from tank roof accessories.

APPROVED: [signature] F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	11/12	ISSUED FOR CONSTRUCTION	
1	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I
ALT 1 WELDED STEEL GST
CITY OF HOUSTON
GROUNDWATER PLANT
DESIGN DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DSGN. BY: JWV
DWG. BY: JAD
SCALE: AS SHOWN
SHEET No. 18 OF 46

FOR CITY OF HOUSTON USE ONLY

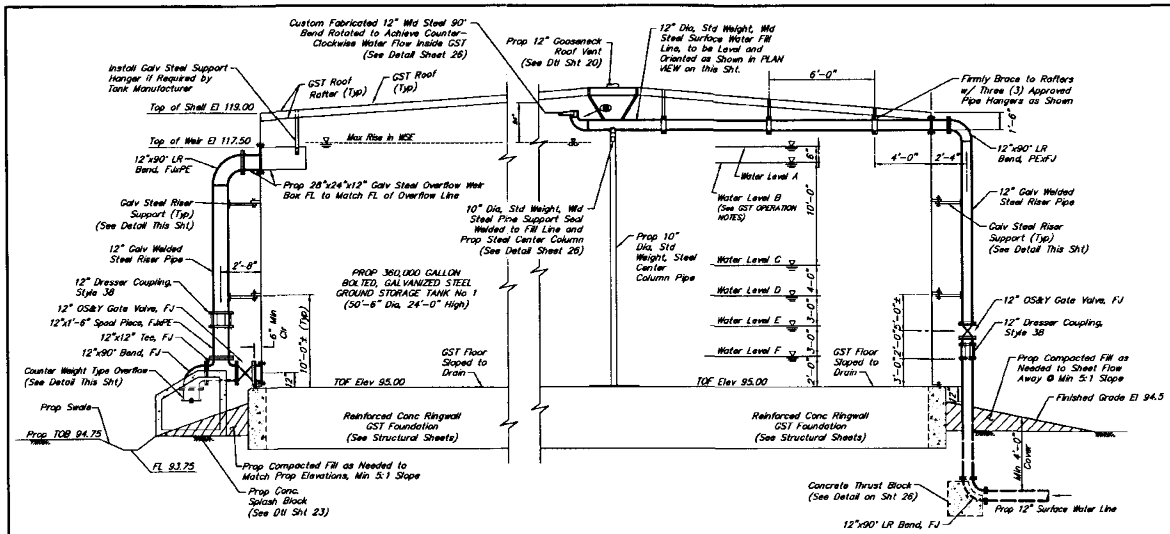
54993

TOBY W. McCLEARY
98710

10-20-2015

C.O.H. LOG No. 15-1168

P:\PROJECTS\05133-GMMUD No. 1\0208-00 Water Plant No. 3 Phase 1\Civil\Const Dwgs\SITE.dwg Dec 22,2015 – 10:37am JWV



GST OVERFLOW/DRAIN LINE DETAIL

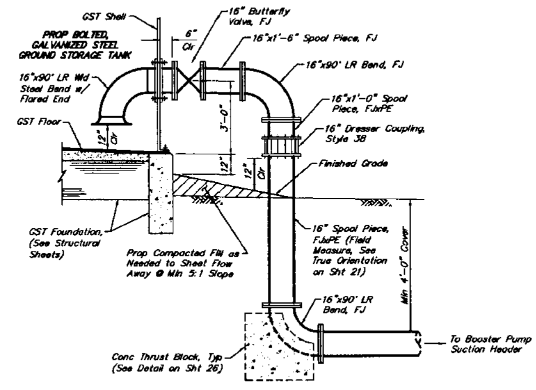
SCALE: 1/4"=1'-0"

GST SURFACE WATER LINE DETAIL

SCALE: 1/4"=1'-0"

GST WATER LEVELS

- A Overflow/High Level Alarm
- B Close DW Flow Control Valve (Restore Booster Pump Auto/Manual Operation)
- C Open DW Flow Control Valve (Stop All Booster Pumps)
- D Low Level Signal Output
- E Restore Booster Pump Auto/Manual Operation
- F Extreme Low Level Alarm

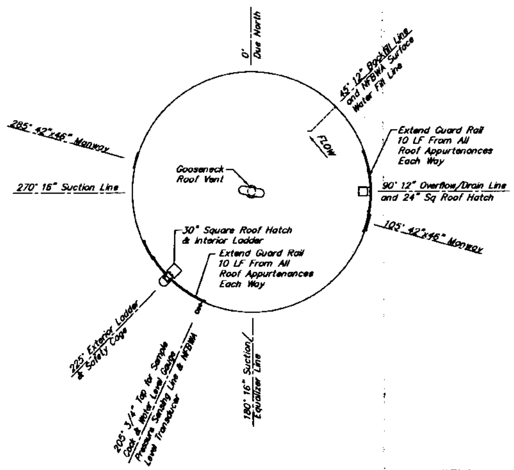


GST SUCTION AND EQUALIZER LINE DETAIL

NOT TO SCALE

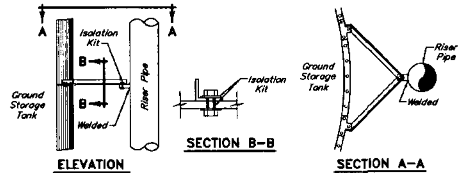
GST CONSTRUCTION NOTES:

1. All shop welded steel GST interior piping and components shall be hot dipped galvanized after fabrication is completed.
2. GST piping and accessories are shown in profile views for detail purposes only. See the "ENLARGED PIPING PLAN" on Sheet 13 and the "GST ACCESSORY DETAIL – PLAN VIEW" on Sheet 20 for location and true orientation of piping and accessories.
3. The 1,100 gpm GST fill rate is based on the max. designed distribution water (DW)/NFBWA surface water (SW) 1,100 gpm flow rate. The max. rise of water surface elevation (WSE) above the top of the overflow weir will be approx. 0.231 feet (0.231') or 2.77 inches (2.77").



MODIFIED F9 – GST ACCESSORY DETAIL – PLAN VIEW

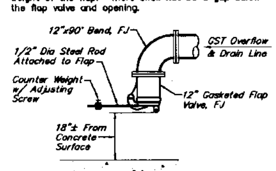
NOT TO SCALE



RISER SUPPORT DETAIL

NOT TO SCALE

NOTE:
Weight of the counter weight shall be equal to the weight of the flap. There shall not be a gap below the flap valve and opening.



COUNTER WEIGHT TYPE OVERFLOW

NOT TO SCALE

GST OPERATION NOTES:

1. Under normal operating conditions, the level indicating transmitter (LIT) will close the distribution water (DW) GST backfill line flow control valve (FCV) or surface water (SW) FCV @ Level "B", approx. 12 inches (12") before the water level reaches Level "A". The LIT will send a "HIGH LEVEL ALARM" signal to the Operator @ Level "A", 6 inches (6") before the water level reaches the top of the overflow weir box.
2. When the GSTs are being filled by the DW backfill line, the FCV will only open if the system pressure is above 40 psi and the water level is below Level "C". The FCV will close if the system pressure falls below 40 psi or if the water level reaches Level "B". These are preliminary settings to be adjusted as needed, after construction is complete, for the District to maintain the desired volume of water in the storage tank for average daily flow and fire protection.
3. The plant operator must set the "Hand–Off–Auto" (HOA) switch for either FCV into "HAND" mode to manually open the DW backfill line FCV or SW FCV long enough to overflow the GST while performing periodic maintenance on the GSTs. Once water surface cleaning is completed, the water level will be dropped back to below Level "A" and the HOA will be placed back into "AUTO" mode. Under no other circumstances will the GSTs be allowed to exceed water Level "A" during normal operation.
4. The Contractor shall provide record documentation of all the water level settings at the completion of this project prior to final payment.

APPROVED: [signature] for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/11	ISSUED FOR CONSTRUCTION	
	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
8335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ALT 2 GALVANIZED BOLTED STEEL GST & PIPING DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DGN BY: JMV
DWG BY: JAD
SCALE: AS SHOWN
SHEET No. 19 of 46

FOR CITY OF HOUSTON USE ONLY

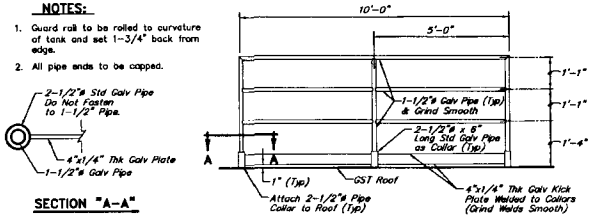
TOBY W. McQUARY 98710 LICENSED PROFESSIONAL ENGINEER
10-22-2015

C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS

NOTES:

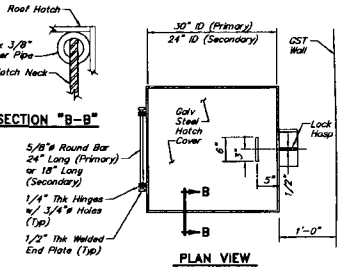
1. Guard rail to be rolled to curvature of tank and set 1-3/4" back from edge.
2. All pipe ends to be capped.



SECTION "A-A"

MODIFIED F13 – GUARD RAIL DETAIL

NOT TO SCALE

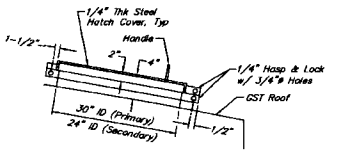


SECTION "B-B"

PLAN VIEW

NOTES:

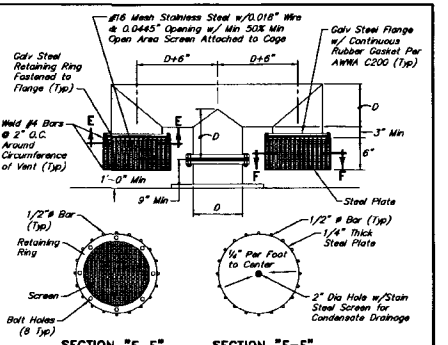
1. The larger dimensions are for the interior ladder roof hatch (primary) and the smaller dimensions are for the overflow roof hatch (secondary).
2. Roof hatches to be located so that hatch opens away from tank roof accessories.



ELEVATION

MODIFIED F10 – ROOF HATCH DETAILS

NOT TO SCALE



SECTION "E-E"

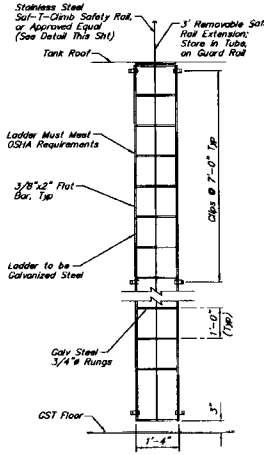
SECTION "F-F"

ROOF VENT NOTES:

1. "D" is the pipe diameter equal to 20 inches (20").
2. Vent to be fabricated from thin wall schedule 10 steel pipe and hot-dip galvanized after fabrication.
3. Secure vent screen flanges with eight (8) 5/8" diameter galvanized steel bolts, nuts and double flat washers. Do not coat fasteners.
4. Secure vent at tank nozzle flange with eight (8) 5/8" diameter galvanized steel bolts, nuts and double flat washers. Do not coat fasteners.
5. All joints and seams in piping shall be continuously seal welded.
6. Hot-dip security cage after fabrication.

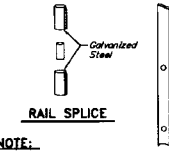
MODIFIED F8 – GOOSENECK-TYPE ROOF VENT DETAIL

NOT TO SCALE



MODIFIED F12
INTERIOR GST LADDER DETAIL

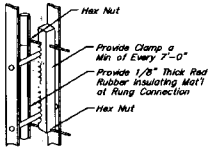
NOT TO SCALE



RAIL SPLICE

NOTE:

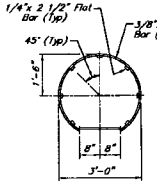
Provide two (2) OSHA approved, full body climbing harnesses (buckle type).



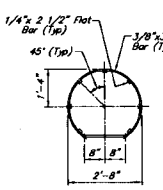
LADDER RUNG CLAMP

MODIFIED F12 – SAFETY RAIL DETAIL

NOT TO SCALE



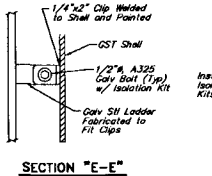
SECTION "D-D"



SECTION "C-C"

SAFETY CAGE DETAIL

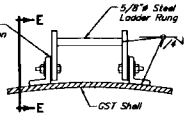
NOT TO SCALE



SECTION "E-E"

NOTE:

Detail typical for ladder on inside and outside of G.S.T. shell. Install isolation kits.

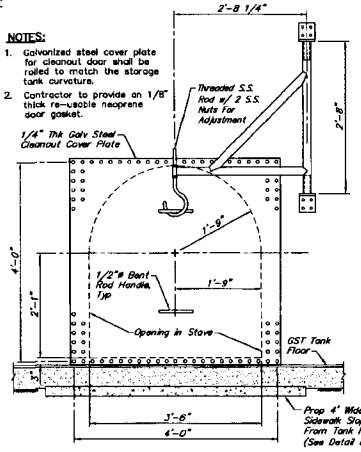


LADDER CLIP DETAIL

NOT TO SCALE

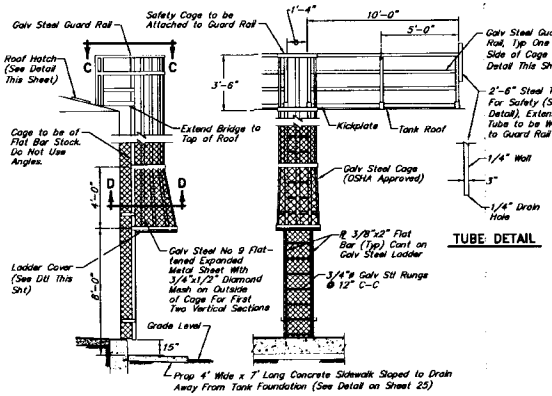
NOTES:

1. Galvanized steel cover plate for cleanout door shall be rolled to match the storage tank curvature.
2. Contractor to provide an 1/8" thick re-usable neoprene door gasket.



MODIFIED F14
42"x46" CLEANOUT AND PIPE DAVIT ARM DETAIL FOR A BOLTED GST

NOT TO SCALE

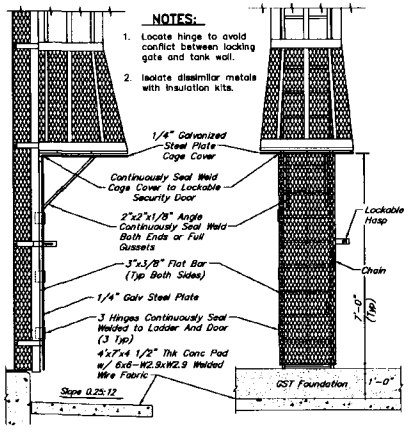


MODIFIED F11 – EXTERIOR GST LADDER DETAIL

NOT TO SCALE

NOTES:

1. Locate hinge to avoid conflict between locking gate and tank wall.
2. Isolate dissimilar metals with insulation kits.

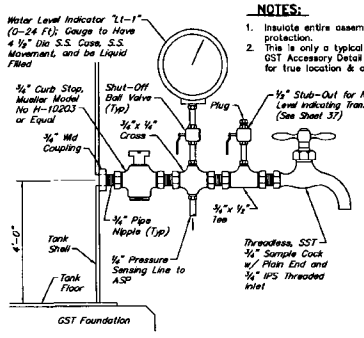


SIDE VIEW

FRONT VIEW

SECURITY DOOR FOR CAGED LADDER

NOT TO SCALE



NOTES:

1. Insulate entire assembly for freeze protection.
2. This is only a typical detail. See GST Accessory Detail on this sheet for true location & orientation.

MODIFIED F3 – SAMPLE TAP DETAIL

NOT TO SCALE

APPROVED: DeWayne Dai
for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/12	ISSUED FOR CONSTRUCTION	TAM/JAD
2	10/22	ISSUED FOR BIDDING	TAM/JAD

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gaston, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ALT 2 GALVANIZED BOLTED STEEL GST
CITY OF HOUSTON
GROUNDWATER PLANT DESIGN DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STREET & DRAINAGE
TRAFFIC & TRANSPORTATION
WATER & WASTEWATER
WATER QUALITY
FACILITIES

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DSN. BY: JAN
DWG. BY: JAD
SCALE: AS SHOWN
SHEET No. 20 OF 46

FOR CITY OF HOUSTON USE ONLY
APP'D DWG NO.
54992

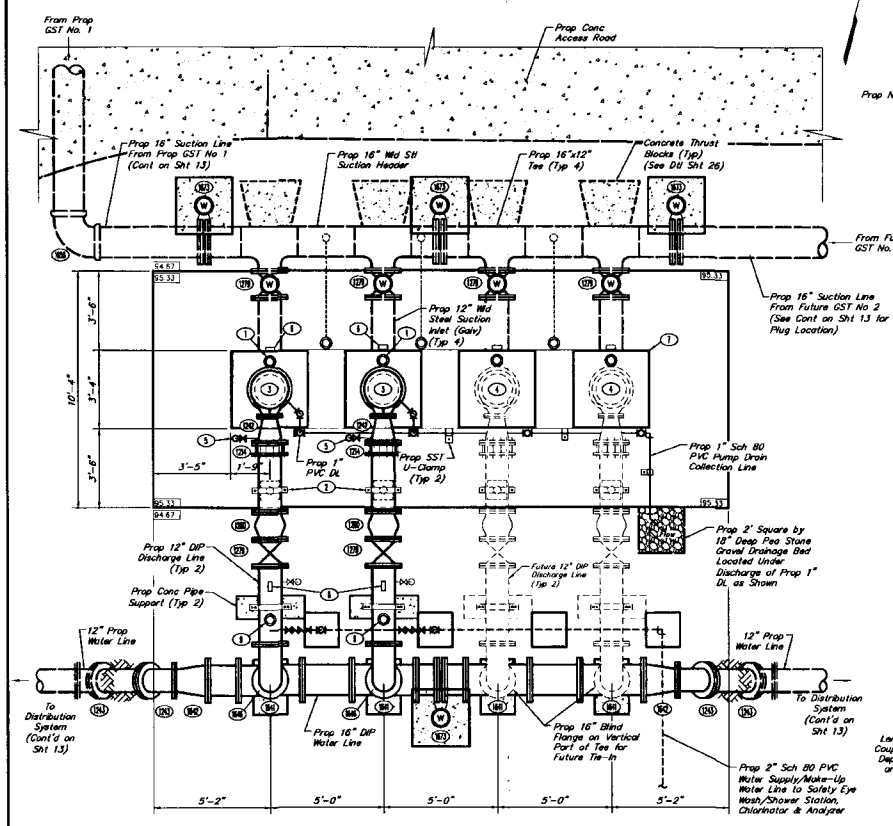
10-22-2015

STATE OF TEXAS
TOBY W. McCRARY
68210
LICENSED PROFESSIONAL ENGINEER

C.O.H. LOG No. 15-1168

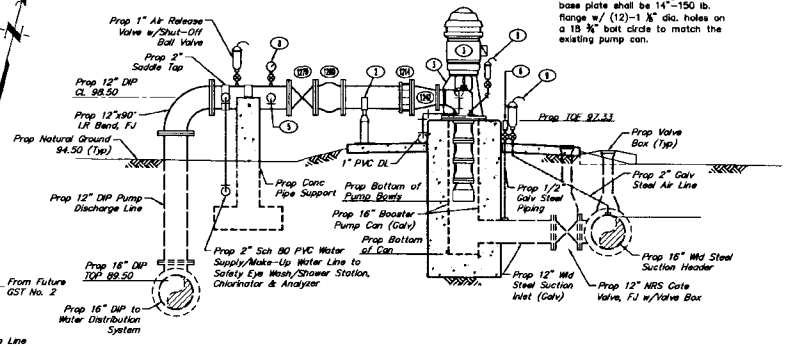
CSH BLK REV. JAN 2008

P:\PROJECTS\05133-Grand Mission MUD No 1\0208-00 Water Plant No. 3 Phase 1\Draft\Const Dwgs\SHT.dwg Dec 22, 2015 - 10:37am JAN



BOOSTER PUMP PIPING DETAILS – PLAN VIEW

SCALE: 3/8" = 1'-0"

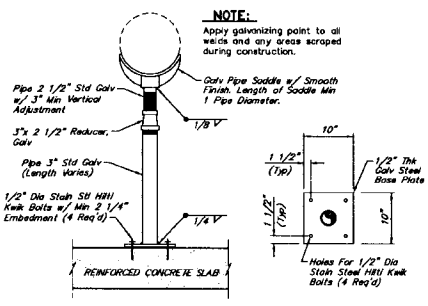


NOTE:
Proposed pump discharge head base plate shall be 14"–150 lb. flange w/ (12)–1 ⅛" dia. holes on a 18 ¾" bolt circle to match the existing pump can.

BOOSTER PUMP PIPING DETAILS – PROFILE VIEW

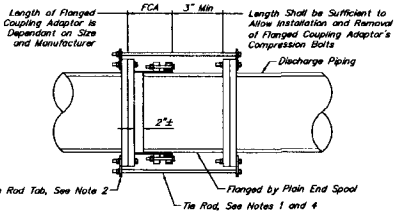
SCALE: 3/8" = 1'-0"

NOTE:
Apply galvanizing paint to all welds and any areas scraped during construction.



ADJUSTABLE STEEL PIPE SUPPORT

NOT TO SCALE



NOTES:

1. Provide a number of tie rods equal to 1/2 the number of flange bolts. Evenly space installation of tie rods. Diameter of tie rods to be equal to the diameter of flange bolts. Length of tie rods to be determined by Contractor based on size and manufacturer of flanged coupling adaptor and final length of spool piece.
2. Provide 316 S.S. tab for attachment of tie rods. Size to be determined by Contractor.
3. Contractor to submit details during shop drawing submission.
4. All hardware and tie rods shall be 316 stainless steel. Tie rods should be threaded.
5. This restraint does not replace thrust blocks to be provided at other locations.

TYPICAL FLANGED COUPLING ADAPTOR RESTRAINT DETAIL

NOT TO SCALE

APPROVED: DeWayne Dai for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

PIPING CHART:

(12H)	12" Flanged Coupling Adapter
(12x8)	12"x8" Concentric Reducer, FJ
(12x45)	12"x45° Bend, FJ
(12R)	12" OS&Y Gate Valve, FJ
(12SB)	12" Silent Globe Check Valve, FJ
(16x12)	16"x12" Tee, FJ
(16x12C)	16"x12" Concentric Reducer, FJ
(16x90)	16"x90° Bend, FJ
(16x90PO)	16"x90° Bend, PO
(16BV)	16" Butterfly Valve, FJ

PIPING NOTES:

1. All pipe to be ductile iron pipe (DIP) unless otherwise noted.

PUMP ACCESSORY CHART:

1. 1/2" Air Release Valve, APCO Model No 50, w/ 3/32" Orifice, No 16 Mesh, 316 Stain Steel Screen on Discharge and Shut-Off Ball Valve. Connect to Booster Pump Can and Securely Brace to Pump Foundation w/ Unistrut as Required.
2. Adjustable Steel Pipe Support (See Detail This Sheet)
3. 1000-GPM Vertical Turbine Booster Pump w/ 60-HP Motor
4. 16" Booster Pump can w/blind flange and 12" Welded Steel Inlet, PExFJ. Can and inlet pipe shall be one-piece construction and as-dipped galvanized after fabrication
5. 3/4" Sample Cock Assembly (See Detail This Sheet)
6. Pressure Gauge (0–30psi) w/Shut-Off Ball Valve (See Dtl Sht 27)
7. Isolation Joint (See Detail Sheet 25)
8. Pressure Gauge (0–100 psi) w/Shut-Off Ball Valve (See Dtl Sht 27)
9. 1" Air Release Valve, APCO Model No 50, w/ 3/32" Orifice, No 16 Mesh, 316 Stain Steel Screen on Discharge and Shut-Off Ball Valve

NO.	DATE	REVISIONS	APP.
1	7/15	ISSUED FOR CONSTRUCTION	TWH
1	11/2	REV. PER ADD. No. 1	TWH
1	10/22	ISSUED FOR BIDDING	TWH

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

BOOSTER PUMP PIPING & DETAILS

NOTE, CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

PROJECT MANAGER: 12-17-15 — WATER & WASTEWATER
DESIGN ENGINEER: 12-17-15 — WATER MAIN QUALITY
MANAGER & ENGINEER: 12-17-15 — FACILITIES

FILE NO:
JOB NO: 05133-0208-00

DATE: OCTOBER 2015
DSN. BY: JAH
DWG. BY: JAD

SCALE: AS SHOWN

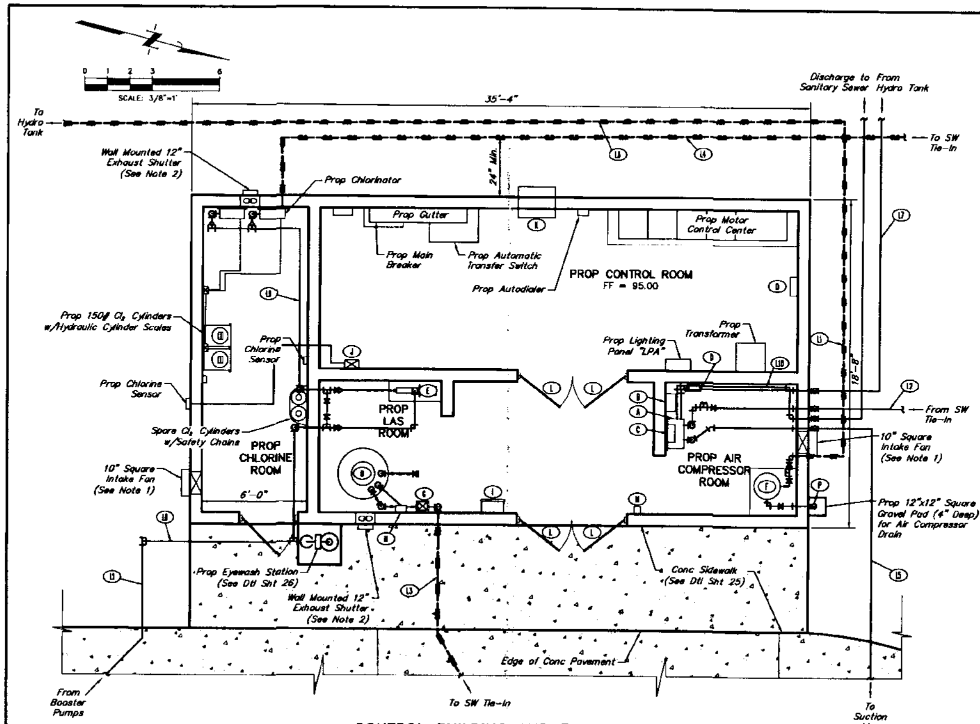
SHEET No. 21 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG No. 54993

TOBY W. McQUEARY — 98718 — LICENSED PROFESSIONAL ENGINEER — STATE OF TEXAS

C.O.H. LOG No. 15-1168

CON BM REV. JAN 2009



CONTROL BUILDING AND EQUIPMENT LAYOUT

SCALE: 3/8" = 1'-0"

EQUIPMENT CHART:

- (A) Prop Wall Mounted ChemScan Model No UV-2150/S Chloramination Analyzer
- (B) Prop ChemScan NEMA-4 Electronics Module (Interface) Enclosure
- (C) Prop APC Back-UPS 900VA (Part No BR900) Uninterruptible Power Supply Above Analyzer, or Pre-Approved Equal (See Electrical Sht 33)
- (D) Prop 1/4 HP Sample Booster Pump Floor Mounted on 4" Conc Housekeeping Pad
- (E) Prop 1.0 HP Chlorine Booster Pump
- (F) Prop 5.0 HP Vertical Air Compressor w/ 80 Gallon Reservoir (See Detail Sheet 23)
- (G) Two (2) Prop Automatically Controlled Pumps for Distribution Water (DW) Backfill Fill Line and Future Surface Water (SW) LAS Injection Systems
- (H) Prop 225 Gallon Double Wall Vertical LAS Storage Tank (47"ø x 61" Tall) Assmann Model No IMT 250 or Pre-Approved Equal
- (I) Prop Self-Contained Breathing Apparatus w/ Wall Mounted Cabinet
- (J) Prop Chlorine Gas Detection Monitor
- (K) Prop Through-the-Wall Air Conditioner (See Note 3 on This Sheet)
- (L) Prop 36"x84" Dual Fiberglass (FRP) Doors & Frame w/ 12" Sq Clear Safety Glass Windows; Manufacturer Coated; Insulated & Flush Mounted (Chem-Pruf Door Co, Ltd or Approved Equal) (See Dtl Sht 26)
- (M) Prop Fire Extinguisher
- (N) Prop Ultrasonic Non-Contact Liquid Level Transmitter (Sensor) w/ Wall Mounted LED Display Level Controller
- (O) Prop Data Logger (See Electrical Shts)
- (P) Prop 3/8" Air Compressor Automatic Drain

SMALL PIPING LINE CHART:

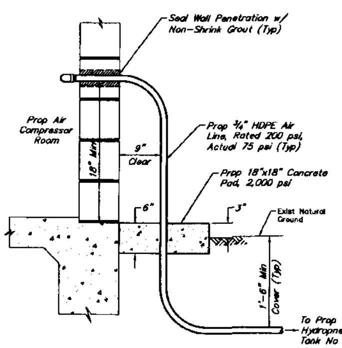
- (L1) Prop 2" Sch 80 PVC Water Line to Supply Eye/Face Wash & Shower Safety Station and Make-Up Water for Chlorinators From Booster Pump Discharge Lines (Cont on Sheet 13)
- (L2) Prop 1-1/2" Sch 80 PVC Water Sample Line to ChemScan Analyzer From DW Backfill Line & Supply Line (Cont on Sheet 13)
- (L3) Prop 3/8" Poly-Tube LAS Injection Line Inside 1-1/2" Sch 80 PVC Elec Conduit to SW Fill Line (Cont on Sheet 13)
- (L4) Prop 1-1/2" Sch 80 PVC CL2 Solution Injection Line for SW Fill Lines (Cont on Sheet 13)
- (L5) Prop 1-1/2" Sch 80 PVC Water Sample Return Line From ChemScan Analyzer to GST No. 1 Suction/Equalizer Line (Cont on Sheet 13)
- (L6) Prop 3/4" Galv Steel Air Supply Line to HPT No. 1 (Cont on Sheet 13)
- (L7) Prop 1-1/2" Sch 80 PVC Water Feed Line from Hydrotank Water Sample Line to ChemScan Analyzer (Cont on Sheet 13)
- (L8) Prop 1" Sch 80 PVC Water Supply Line for Eye/Face Wash & Shower Safety Station
- (L9) Prop 2" Sch 80 PVC Make-Up Water Line for Prop DW/SW Chlorinators
- (L10) Prop 3" Sch 90 PVC Analyzer Drain Line

CONTROL BUILDING EQUIPMENT NOTES:

1. Provide and install two (2) wall-mounted, automatic shutter mounted air intake fan with aluminum propellers, capable of delivering a minimum 370 CFM free air flow at ¼-inch (0.25") static pressure (SP), and rated at no more than one twentieth horsepower (1/20 HP) in the chlorine storage room. Contractor shall furnish an OSHA approved, corrosion resistant, wire mesh safety guard and a corrosion and UV resistant weatherproof fan shroud with removable aluminum framed fiberglass (FRP) insect screen for wall fan. The fan motor shall be a single speed, totally enclosed, sleeve or ball bearing 115-volt, 60-hertz type or approved substitute. Locate and mount fan as shown in details on Sheet 26 and as specified in the contract specifications.
2. Provide and install two (2) 12-inch (12") square, wall-mounted, gravity operated aluminum air exhaust shutter in the chlorine storage room. Shutter shall be capable of providing a minimum 370 CFM free air flow at 0.25" SP. Contractor shall furnish a removable aluminum framed fiberglass (FRP) insect screen over wall opening for each shutter. Locate and mount shutter as shown in details on Sheet 26 and as specified in the contract specifications.
3. Provide and install one (1) through the wall electric heat air conditioner, Friedrich Model No UE12D33C or approved equal, capable of a minimum 11,500 btu heater output and 11,000 btu air conditioner output. Mount the unit in the control room using a through wall sleeve, Grainger Stock No 2RLC7 or approved equal, with top of unit approx. six-foot (6') above the finished floor. Furnish the power cord, filter and paint the wall sleeve to match the finished building color and verified by Engineer.

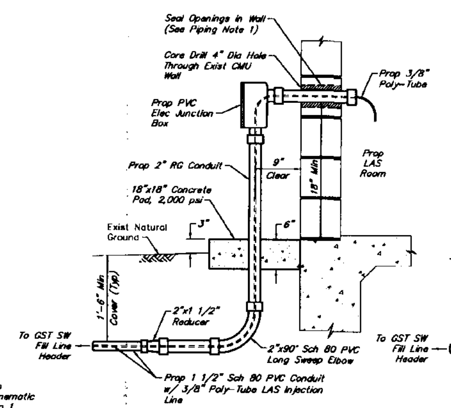
PIPING NOTES:

1. All wall penetrations through existing control building walls shall be tightly sealed with an approved chemical resistant non-shrink grout.
2. All aboveground lines shall be insulated.



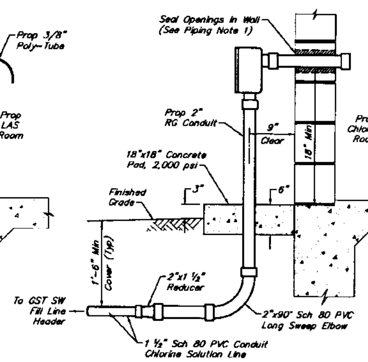
AIR LINE WALL PENETRATION DETAIL

NOT TO SCALE



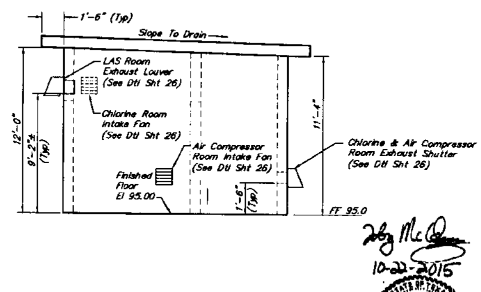
LAS INJECTION LINE WALL PENETRATION DETAIL

NOT TO SCALE



CHLORINE SOLUTION LINE WALL PENETRATION DETAIL

NOT TO SCALE



BUILDING ELEVATION – NORTH SIDE (LOOKING SOUTH)

NOT TO SCALE

APPROVED: DeWayne Davis (signature) for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/22	ISSUED FOR CONSTRUCTION	TWM
1	10/22	ISSUED FOR BIDDING	TWM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
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WATER PLANT No. 3 – PHASE I

CONTROL BUILDING EQUIPMENT PLAN & DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER / TRAFFIC & TRANSPORTATION / WASTEWATER / STORM WATER QUALITY / STORM / FACILITIES / STREET & BRIDGE

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DGN. BY: JWV
DWG. BY: JAD
SCALE: AS SHOWN
SHEET No. 22 OF 46

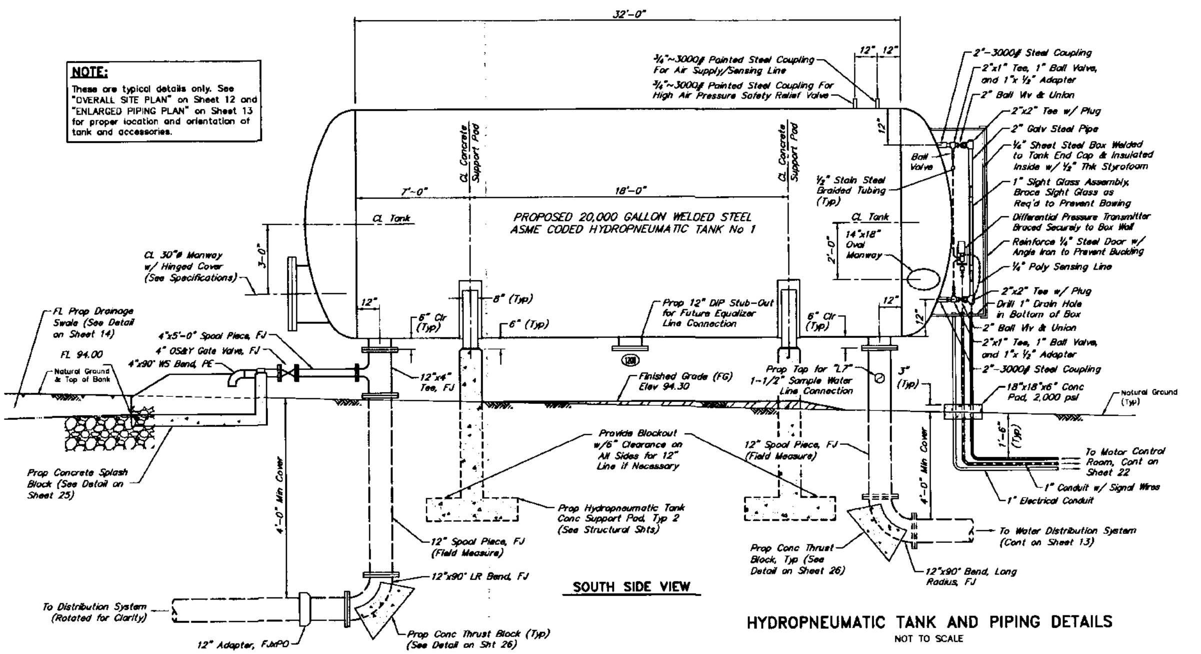
FOR CITY OF HOUSTON USE ONLY
CITY DWG NO. 54908

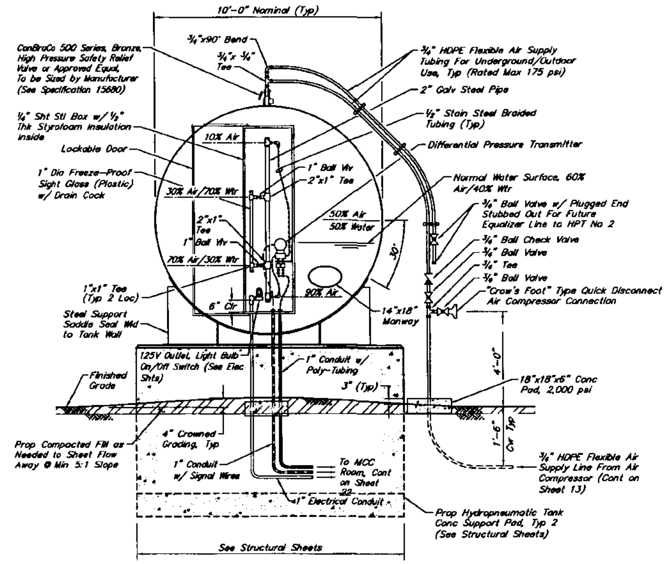
TOBY W. McQUEARY (seal), signed 10-22-2015

C.O.H. LOG No. 15-1188

COH BLK REV. JAN 2008

NOTE:
These are typical details only. See "OVERALL SITE PLAN" on Sheet 12 and "ENLARGED PIPING PLAN" on Sheet 13 for proper location and orientation of tank and accessories.


32'-0"
PROPOSED 20,000 GALLON WELDED STEEL
ASME CODED HYDROPNEUMATIC TANK No 1
¾"-3000# Painted Steel Coupling For Air Supply/Sensing Line
¾"-3000# Painted Steel Coupling For High Air Pressure Safety Relief Valve
CL 30"ø Manway w/ Hinged Cover (See Specifications)
FL Prop Drainage Swale (See Detail on Sheet 14)
FL 94.00
4"x5'-0" Spool Piece, FJ
4" OS&Y Gate Valve, FJ
4"x90° WS Bend, PE
Prop Concrete Splash Block (See Detail on Sheet 25)
To Distribution System (Rotated for Clarity)
12" Adapter, FJxPO
12"x4" Tee, FJ
12" Spool Piece, FJ (Field Measure)
12"x90° LR Bend, FJ
Prop Conc Thrust Block (Typ) (See Detail on Sht 26)
Provide Blockout w/6" Clearance on All Sides for 12" Line If Necessary
Prop Hydropneumatic Tank Conc Support Pad, Typ 2 (See Structural Shts)
Prop 12" DIP Stub-Out for Future Equalizer Line Connection
Finished Grade (FG) Elev 94.30
Prop Tap for "L7" 1-1/2" Sample Water Line Connection
Prop Conc Thrust Block, Typ (See Detail on Sheet 26)
12"x90° Bend, Long Radius, FJ
To Water Distribution System (Cont on Sheet 13)
2"-3000# Steel Coupling
2"x1" Tee, 1" Ball Valve, and 1"x ½" Adapter
2" Ball Vlv & Union
2"x2" Tee w/ Plug
2" Galv Steel Pipe
¼" Sheet Steel Box Welded to Tank End Cap & Insulated Inside w/ ½" Thk Styrofoam
1" Sight Glass Assembly, Brace Sight Glass as Req'd to Prevent Bowing
Differential Pressure Transmitter Braced Securely to Box Wall
Reinforce ¼" Steel Door w/ Angle Iron to Prevent Buckling
½" Poly Sensing Line
Drill 1" Drain Hole in Bottom of Box
18"x18"x6" Conc Pad, 2,000 psi
To Motor Control Room, Cont on Sheet 22
1" Conduit w/ Signal Wires
1" Electrical Conduit
SOUTH SIDE VIEW


10'-0" Nominal (Typ)
ConBraCo 500 Series, Bronze, High Pressure Safety Relief Valve or Approved Equal, To be Sized by Manufacturer (See Specification 15680)
¾"x90° Bend
¾"x ¾" Tee
¾" HDPE Flexible Air Supply Tubing For Underground/Outdoor Use, Typ (Rated Max 175 psi)
2" Galv Steel Pipe
½" Stain Steel Braided Tubing (Typ)
Differential Pressure Transmitter
Normal Water Surface, 60% Air/40% Wtr
¾" Ball Valve w/ Plugged End Stubbed Out For Future Equalizer Line to HPT No 2
¾" Ball Check Valve
"Crow's Foot" Type Quick Disconnect Air Compressor Connection
14"x18" Manway
18"x18"x6" Conc Pad, 2,000 psi
¾" HDPE Flexible Air Supply Line From Air Compressor (Cont on Sheet 13)
Prop Hydropneumatic Tank Conc Support Pad, Typ 2 (See Structural Sheets)
See Structural Sheets
Prop Compacted Fill as Needed to Sheet Flow Away @ Min 5:1 Slope
125V Outlet, Light Bulb On/Off Switch (See Elec Shts)
To MCC Room, Cont on Sheet 22
EAST END VIEW

HYDROPNEUMATIC TANK AND PIPING DETAILS

NOT TO SCALE

HYDROPNEUMATIC TANK PRESSURE	PIT SETTINGS	
DESCRIPTION	On/Open (psi)	Off/Closed (psi)
Start and Stop Prop Lead Booster Pump	60	70
Start and Stop Prop 1st Lag Booster Pump	55	65
Start and Stop Future 2nd Lag Booster Pump	53	63
Start and Stop Future 3rd Lag Booster Pump	51	61
Open and Close Air Compressor Purge Valve	50	75
Spare With Globe Valve		

LEVEL CONTROLLER SWITCH SETTINGS	
LS1	Provides Operational Sensing For Hydro-Tank at 60% Air, 40% Water Level.
LS2	Provides High Level Alarm at 25% Air, 75% Water Level.

PRESSURE TRANSMITTER OPERATION:

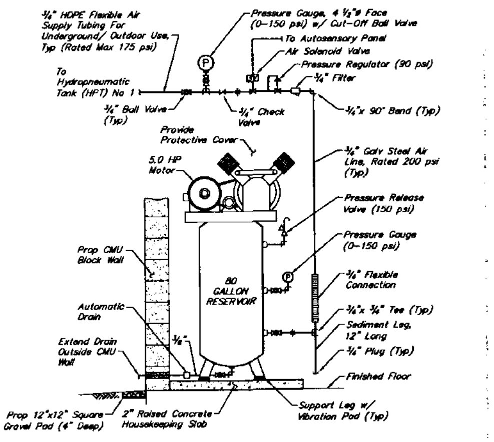
1. When the water level is at or above the pressure transmitter high water level pressure setting, we have a permissive circuit.
2. If the pressure at this time is below the setting at the existing air compressor purge valve (75 psi), then a time delay relay is activated.
3. If these two situations exist for one minute or more, the existing air compressor purge valve will open until either the pressure is restored or the water level drops below high water level pressure setting.

TANK CONSTRUCTION NOTES:

1. The ASME stamped hydropneumatic tank shall conform to the latest edition of Section VIII, Division 1, American Society of Mechanical Engineers Boiler and Pressure Vessel Code.
2. See Contract Specification Section 09920 for protective coating procedures.
3. All fasteners shall be stainless steel per ASTM F593/594-304, ASTM A325 or Equal (Galvanized).
4. Latch on hydropneumatic tank door must be within five feet (5') of finished grade.
5. Hydropneumatic tank door must open easily without binding.
6. The system must be able to operate on both proposed and future tanks together using an equalizer line or on either tank independently using manual cut-offs. Therefore, separate air lines and sensing lines are required for each tank.
7. Tank shall have 12" stub-out flange in order to connect to future hydro tank.

TANK STRUCTURAL NOTES:

1. All concrete shall test 4000 PSI at 28 days.
2. Detailing and fabrication of concrete reinforcement and accessories shall be in accordance with ACI-315 latest edition.
3. All structural steel details and connections shall conform to the standard of the A.I.S.C.
4. All steel members and connections exposed to earth or weather shall be hot-dipped galvanized.
5. Field paint all welds on galvanized steel with "Galvweld" or approved equal.
6. No Engineering drawings may be reproduced for use as shop drawings.
7. See Structural Sheets for concrete supports.


¾" HDPE Flexible Air Supply Tubing For Underground/ Outdoor Use, Typ (Rated Max 175 psi)
To Hydropneumatic Tank (HPT) No 1
¾" Ball Valve (Typ)
Pressure Gauge, 4 ½"ø Face (0-150 psi) w/ Cut-Off Ball Valve
To Autosensory Panel
Air Solenoid Valve
Pressure Regulator (90 psi)
¾" Filter
¾" Check Valve
¾"x 90° Bend (Typ)
Provide Protective Cover
5.0 HP Motor
¾" Galv Steel Air Line, Rated 200 psi (Typ)
Pressure Release Valve (150 psi)
Pressure Gauge (0-150 psi)
80 GALLON RESERVOIR
¾" Flexible Connection
¾"x ¾" Tee (Typ)
Sediment Leg, 12" Long
¾" Plug (Typ)
Finished Floor
Prop CMU Block Wall
Automatic Drain
Extend Drain Outside CMU Wall
Prop 12"x12" Square Gravel Pad (4" Deep)
2" Raised Concrete Housekeeping Slab
Support Leg w/ Vibration Pad (Typ)

VERTICAL AIR COMPRESSOR DETAILS

NOT TO SCALE

APPROVED: [signature] For F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	12/22	ISSUED FOR CONSTRUCTION	[initials]
0	10/22	ISSUED FOR BIDDING	[initials]

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

HYDROPNEUMATIC TANK & PIPING DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER / TRAFFIC & TRANSPORTATION / WASTEWATER / STORM WATER QUALITY / STORM / FACILITIES / STREET & BRIDGE

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DSN. BY: JWY
DWG. BY: JAD
SCALE: AS SHOWN
SHEET No. 23 OF 46

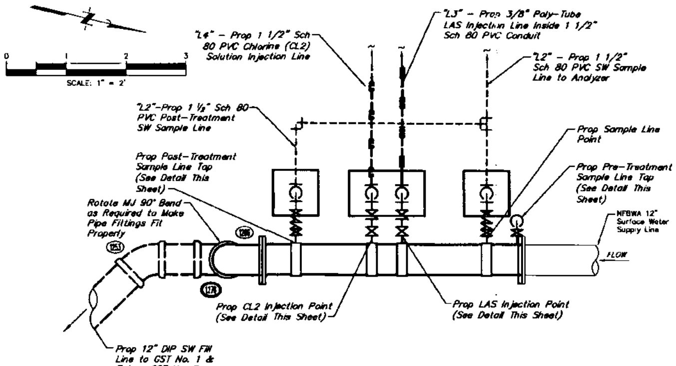
FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54992

STATE OF TEXAS — TOBY W. McCLEARY — 98710 — LICENSED PROFESSIONAL ENGINEER
10-22-2015

C.O.H. LOG No. 15-1168

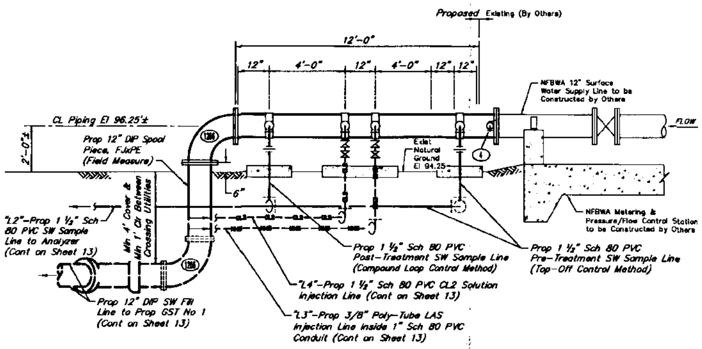
COH BLK REV. JAN 2008

CONFORMED DOCUMENTS



SCALE: 1" = 2'
"L4" - Prop 1 1/2" Sch 80 PVC Chlorine (CL2) Solution Injection Line
"L3" - Prop 3/8" Poly-Tube LAS Injection Line Inside 1 1/2" Sch 80 PVC Conduit
"L2" - Prop 1 1/2" Sch 80 PVC SW Sample Line to Analyzer
"L2"-Prop 1 ½" Sch 80 PVC Post-Treatment SW Sample Line
Prop Sample Line Point
Prop Post-Treatment Sample Line Tap (See Detail This Sheet)
Prop Pre-Treatment Sample Line Tap (See Detail This Sheet)
Rotate MJ 90° Bend as Required to Make Pipe Fittings Fit Properly
NFBWA 12" Surface Water Supply Line
FLOW
Prop CL2 Injection Point (See Detail This Sheet)
Prop LAS Injection Point (See Detail This Sheet)
Prop 12" DIP SW Fill Line to GST No. 1 & Future GST No. 2

PLAN VIEW



Proposed Existing (By Others)
12'-0"
12" 4'-0" 12" 4'-0" 12" 12"
NFBWA 12" Surface Water Supply Line to be Constructed by Others
CL Piping El 96.25'±
FLOW
2'-0"±
Prop 12" DIP Spool Piece, FJxPE (Field Measure)
Exist Natural Ground El 94.25
Min 4' Cover & Min 1' Clr Between Crossing Utilities
6"
NFBWA Metering & Pressure/Flow Control Station to be Constructed by Others
"L2"-Prop 1 ½" Sch 80 PVC SW Sample Line to Analyzer (Cont on Sheet 13)
Prop 1 ½" Sch 80 PVC Post-Treatment SW Sample Line (Compound Loop Control Method)
Prop 1 ½" Sch 80 PVC Pre-Treatment SW Sample Line (Top-Off Control Method)
"L4"-Prop 1 ½" Sch 80 PVC CL2 Solution Injection Line (Cont on Sheet 13)
"L3"-Prop 3/8" Poly-Tube LAS Injection Line Inside 1" Sch 80 PVC Conduit (Cont on Sheet 13)
Prop 12" DIP SW Fill Line to Prop GST No 1 (Cont on Sheet 13)

PROFILE VIEW

G.S.T. SURFACE WATER FILL LINE DETAIL

SCALE: 3/8" = 1'-0"

PIPING CHART:

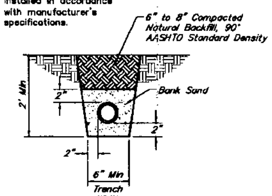
- (4) ¾" Sample Cock Assembly (See Detail Sheet 27)
- (125) 12"x45° Bend, PO
- (190) 12"x90° Bend, Long Radius, FJ

PIPING NOTES:

1. All pipe to be ductile iron pipe (DIP) unless otherwise noted.
2. Contractor shall construct ALL POLY-TUBE solution lines encased in Schedule 80 PVC electrical conduit and use only long sweep elbows to allow tubing to be easily repaired and/or replaced in the future.
3. All chemical injection lines and taps shall be constructed as per the referenced detail drawings unless approved otherwise by the Engineer prior to making any changes.
4. Contractor shall stencil labels on all piping taps per Specification 09920. Provide SST tags attached to small diameter piping.

NOTE:

All PVC piping to be installed in accordance with manufacturer's specifications.

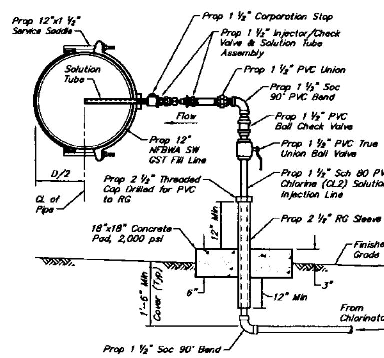


BEDDING FOR SMALL DIAMETER (<3") PIPING DETAIL

NOT TO SCALE

NOTES:

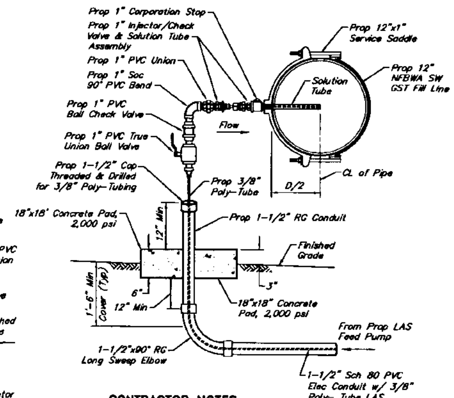
1. All proposed aboveground chemical injection lines exposed to weather are to be insulated.
2. "D" is equal to the pipe diameter.



Prop 12"x1 ½" Service Saddle
Prop 1 ½" Corporation Stop
Prop 1 ½" Injector/Check Valve & Solution Tube Assembly
Prop 1 ½" PVC Union
Solution Tube
Flow
Prop 1 ½" Soc 90° PVC Bend
Prop 1 ½" PVC Ball Check Valve
Prop 12" NFBWA SW GST Fill Line
Prop 1 ½" PVC True Union Ball Valve
D/2
CL of Pipe
Prop 2 ½" Threaded Cap Drilled for PVC to RG
Prop 1 ½" Sch 80 PVC Chlorine (CL2) Solution Injection Line
Prop 2 ½" RG Sleeve
18"x18" Concrete Pad, 2,000 psi
12" Min
Finished Grade
6"
3"
1'-6" Min Cover (Typ)
12" Min
From Chlorinator
Prop 1 ½" Soc 90° Bend

SURFACE WATER (SW) G.S.T. FILL LINE CHLORINE (CL2) INJECTION TAP DETAIL

NOT TO SCALE



Prop 1" Corporation Stop
Prop 1" Injector/Check Valve & Solution Tube Assembly
Prop 1" PVC Union
Prop 1" Soc 90° PVC Bend
Prop 1" PVC Ball Check Valve
Prop 1" PVC True Union Ball Valve
Prop 1-1/2" Cap Threaded & Drilled for 3/8" Poly-Tubing
Prop 12"x1" Service Saddle
Solution Tube
Prop 12" NFBWA SW GST Fill Line
Flow
Prop 3/8" Poly-Tube
D/2
CL of Pipe
18"x18" Concrete Pad, 2,000 psi
Prop 1-1/2" RG Conduit
12" Min
Finished Grade
3"
6"
1'-6" Min Cover (Typ)
12" Min
18"x18" Concrete Pad, 2,000 psi
From Prop LAS Feed Pump
1-1/2"x90° RG Long Sweep Elbow
1-1/2" Sch 80 PVC Elec Conduit w/ 3/8" Poly-Tube LAS Injection Line

CONTRACTOR NOTES:

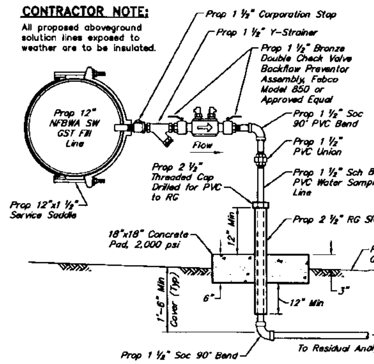
1. All proposed aboveground chemical injection lines exposed to weather are to be insulated.
2. "D" is equal to the pipe diameter.

TYPICAL LAS INJECTION POINT DETAIL

NOT TO SCALE

CONTRACTOR NOTE:

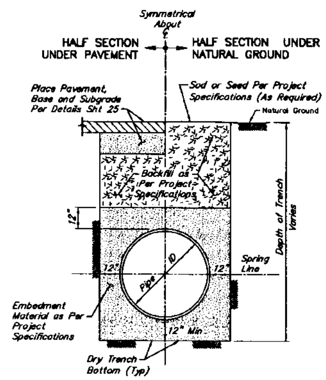
All proposed aboveground solution lines exposed to weather are to be insulated.



Prop 1 ½" Corporation Stop
Prop 1 ½" Y-Strainer
Prop 1 ½" Bronze Double Check Valve Backflow Preventor Assembly, Febco Model 850 or Approved Equal
Prop 12" NFBWA SW GST Fill Line
Flow
Prop 1 ½" Soc 90° PVC Bend
Prop 1 ½" PVC Union
Prop 2 ½" Threaded Cap Drilled for PVC to RG
Prop 1 ½" Sch 80 PVC Water Sample Line
Prop 12"x1 ½" Service Saddle
Prop 2 ½" RG Sleeve
18"x18" Concrete Pad, 2,000 psi
12" Min
Finished Grade
6"
3"
1'-6" Min Cover (Typ)
12" Min
To Residual Analyzer
Prop 1 ½" Soc 90° Bend

SURFACE WATER (SW) G.S.T. FILL LINE SAMPLE LINE TAP DETAIL

NOT TO SCALE



Symmetrical About
HALF SECTION UNDER PAVEMENT
HALF SECTION UNDER NATURAL GROUND
Place Pavement, Base and Subgrade Per Details Sht 25
Sod or Seed Per Project Specifications (As Required)
Natural Ground
Backfill as Per Project Specifications
12"
12"
12"
Pipe
ID
12" Min
Spring Line
Depth of Trench Varies
Embedment Material as Per Project Specifications
Dry Trench Bottom (Typ)

WATER LINE BEDDING AND BACKFILL FOR OPEN-CUT TRENCHES

NOT TO SCALE

APPROVED: [signature] for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	12/21	ISSUED FOR CONSTRUCTION	[initials]
	10/22	ISSUED FOR BIDDING	[initials]

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

G.S.T. SURFACE WATER FILL LINE PIPING DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DGN BY: JWV
DWG BY: JAO
SCALE: AS SHOWN
SHEET No. 24 OF 46

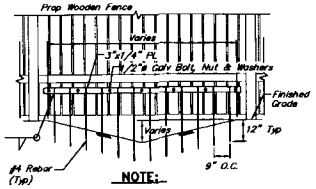
FOR CITY OF HOUSTON USE ONLY
CITY DWG No.
54993

TOBY W. McCLEARY
86710
LICENSED PROFESSIONAL ENGINEER
10-22-2015

C.O.H. LOG No. 15-1168

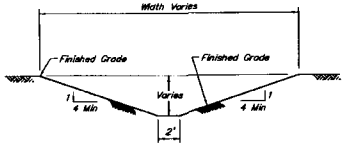
P:\PROJECTS\05133-GMMUD No. 1\0208-00 Water Plant No. 3 Phase I\CAD\Const Dwgs\SFIL.dwg Dec 22,2015 – 12:37am JWV

COH BLK REV JAN 2008



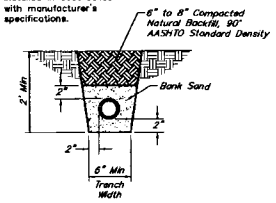
NOTE:
Galonize entire assembly after fabrication.

SWALE CROSSING FENCE DETAIL
NOT TO SCALE

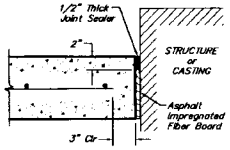


TYPICAL DRAINAGE SWALE DETAIL
NOT TO SCALE

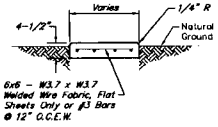
NOTE:
All PVC piping to be installed in accordance with manufacturer's specifications.



BEDDING FOR SMALL DIAMETER (<3") PIPING DETAIL
NOT TO SCALE

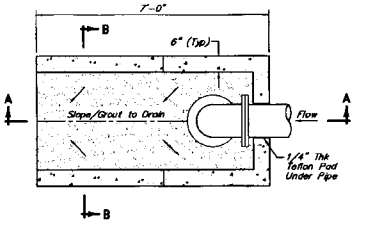


ISOLATION JOINT
NOT TO SCALE

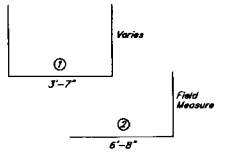


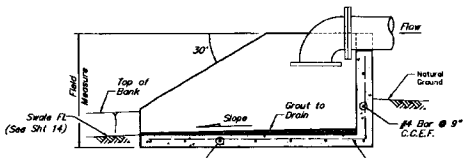
NOTES:
1. Provide tooled or saw-cut control or keyed construction joints at every 4'. (See details on this sheet)
2. Slope concrete sidewalk 1/4" per foot to drain away from generator pad (See detail on Sheet ?).

TYPICAL CONCRETE SIDEWALK DETAIL
NOT TO SCALE

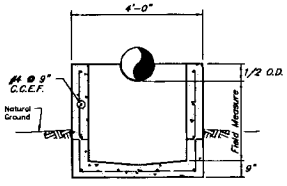


PLAN VIEW



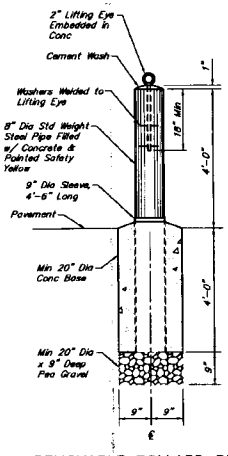


SECTION "A-A"

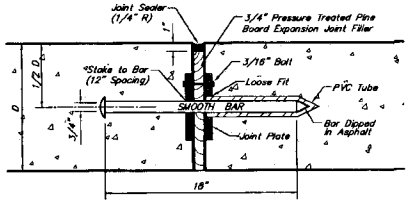


SECTION "B-B"

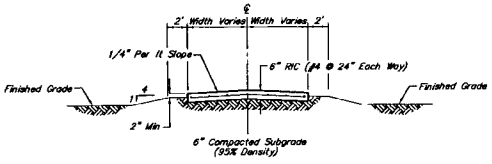
CONCRETE SPLASH BLOCK DETAIL
NOT TO SCALE



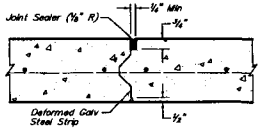
REMOVABLE BOLLARD DETAIL
NOT TO SCALE



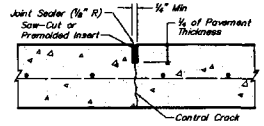
PAVEMENT EXPANSION JOINT
NOT TO SCALE



STANDARD CONCRETE DRIVEWAY DETAIL
NOT TO SCALE



KEYED CONSTRUCTION JOINT
NOT TO SCALE



SAW-CUT CONTROL JOINT
NOT TO SCALE

APPROVED: DeWayne Dai
for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	
1	11/15	ISSUED FOR CONSTRUCTION	TWH
0	10/15	ISSUED FOR BIDDING	TWH

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
5535 Guffon, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

PAVING & DRAINAGE DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER
TRAFFIC & TRANSPORTATION
DRAINAGE & UTILITY COORDINATION
STREET & BRIDGE

FILE NO:
JOB NO: 00133-0028-00

DATE: OCTOBER 2015
DGN. BY: JBV
DRG. BY: JAD
SCALE: AS SHOWN

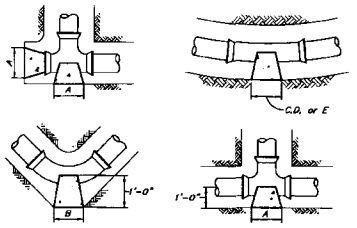
FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54993

SHEET No. 25 OF 46

10-22-2015

STATE OF TEXAS
TOBY W. MACLEARY
103713
LICENSED PROFESSIONAL ENGINEER

C.O.H. LOG No. 15-1168



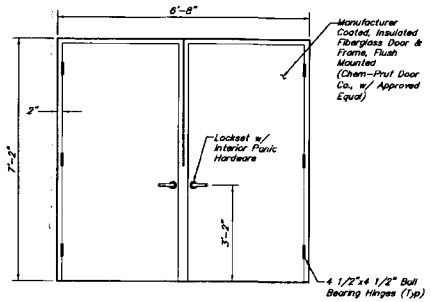
PIPE SIZE	"A" Plugs & Tees	"B" 90° Bend	"C" 45° Bend	"D" 22° 30' Bend	"E" 11° 15' Bend
4"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
6"	1'-0"	1'-6"	1'-2"	1'-2"	1'-2"
8"	1'-3"	1'-9"	1'-6"	1'-6"	1'-3"
12"	2'-6"	3'-0"	2'-3"	2'-3"	2'-3"
16"	3'-6"	4'-3"	3'-0"	2'-6"	2'-6"

NOTES:

1. Heights of all blocks shall be equal to "A","B","C","D" or "E" dimension called for.
2. All concrete to be poured against firm, undisturbed soil.

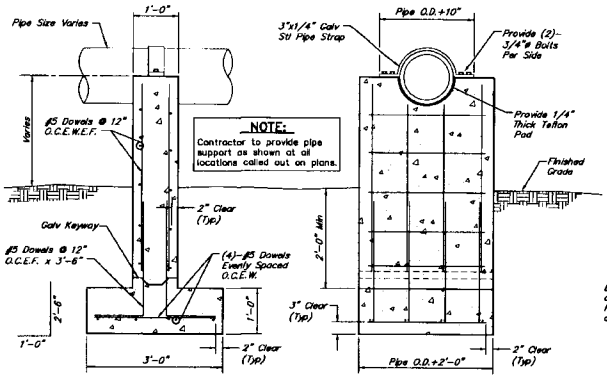
MODIFIED F7 – THRUST BLOCK DETAILS

NOT TO SCALE



DOOR DETAIL

SCALE: 1/2"=1'-0"



CONCRETE PIPE SUPPORT DETAIL

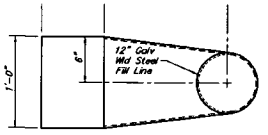
NOT TO SCALE

NOTES:

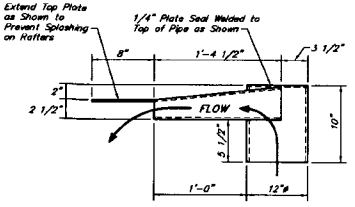
Fabricated steel bend shall be constructed of minimum 1/4" thick plate and continuously seal welded with minimum 3/16" fillet welds.

The custom 90° welded steel bend assembly shall be coated only after fabrication is completed. The assembly shall be hot dipped galvanized as specified in Contract Specification 09920, see for more details.

See true orientation of 90° bend discharge to surface water fill line inside each GST in "Plan Views" on Sheet 17 and 19 prior to final shop fabrication.



PLAN VIEW



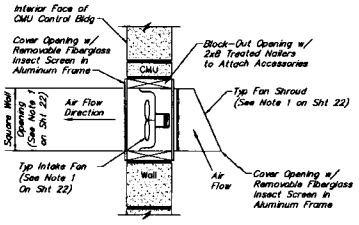
PROFILE VIEW

12" FABRICATED 90° BEND DETAIL

NOT TO SCALE

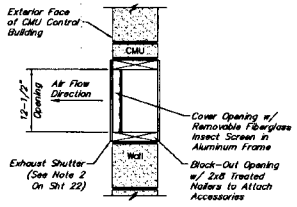
APPROVED: DeWayne Dai for F.B.C.D. DEVELOPMENT COORDINATOR

DATE: 12/3/15



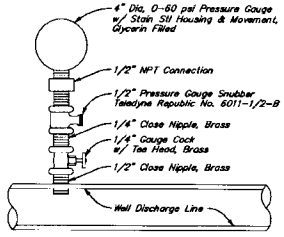
CHLORINE ROOM INTAKE FAN SCHEMATIC

NOT TO SCALE



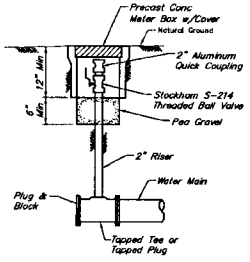
CHLORINE ROOM EXHAUST SHUTTER SCHEMATIC

NOT TO SCALE



PRESSURE GAUGE DETAIL

NOT TO SCALE



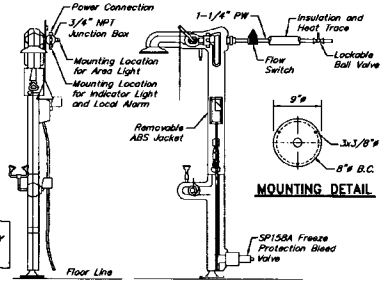
2" BLOW OFF WITH BOX

NOT TO SCALE

NOTES:

1. At the Contractor's option and depending on location of water supply location, the water supply can be connected at either manufacturer provided supply connection, top or bottom.
2. Interior shower same, except without removable abs jacket and insulation w/heat trace.
3. Drenching shower and eye wash per Specification 15201
4. Eyewash station shall be mounted to concrete pad with stainless steel, bolts.

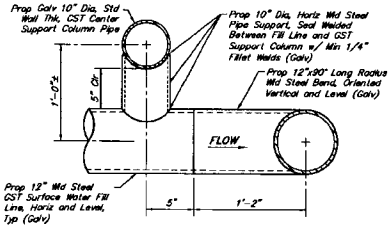
IMPORTANT: POTABLE WATER SUPPLY MUST BE HEAT TRACED AND INSULATED



MOUNTING DETAIL

EMERGENCY SHOWER/EYEWASH DETAIL

NOT TO SCALE



NOTES:

1. The shop welded steel fill line support assembly shall be hot dipped galvanized after fabrication is completed.
2. Galvanized steel surfaces disturbed during the field fabrication or installation of this support assembly shall have the surface prepared as specified in the contract documents and coated with Galv-Weld Alloy or approved equal.

GST INTERIOR 12" FILL LINE SUPPORT DETAIL

NOT TO SCALE

10-23-15

TERRY W. McELEARY 85710 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

NO.	DATE	REVISIONS	APP.
1	12/22	ISSUED FOR CONSTRUCTION	TWM
2	10/22	ISSUED FOR BIDDING	TWM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 · Houston, Texas 77081 · 713.777.5337

WATER PLANT No. 3 – PHASE I

MISCELLANEOUS DETAILS
SHEET 1 OF 2

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER | TRAFFIC & TRANSPORTATION
STORM | STORM WATER QUALITY
STREET & DRAIN | INSPECTOR

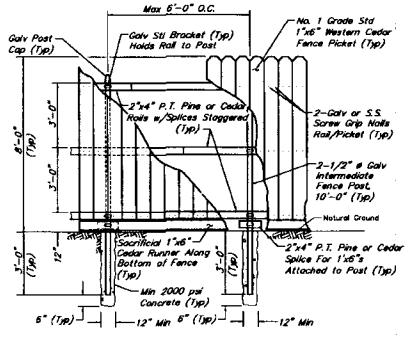
FILE NO:
JOB NO: 05133-0208-00

DATE: OCTOBER 2015
DGN. BY: JMV
DWG. BY: RBR
SCALE: AS SHOWN

FOR CITY OF HOUSTON USE ONLY
CITY ENGINEER
5-14-993

SHEET No. 26 OF 46

C.O.H. LOG No. 15-1166

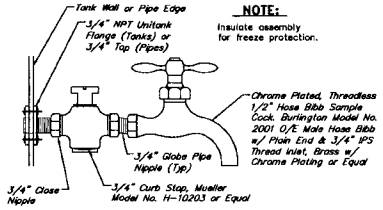


NOTE:

All fence & gate posts to be schedule 40 galvanized steel.

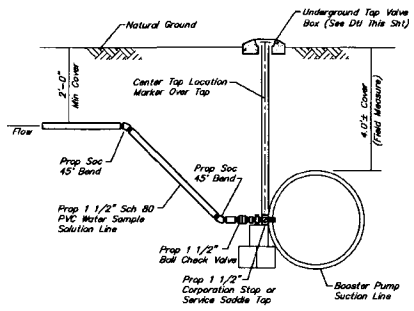
WOOD FENCE DETAIL

NOT TO SCALE



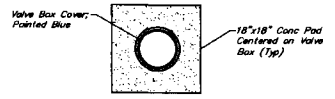
SAMPLE TAP DETAIL

NOT TO SCALE

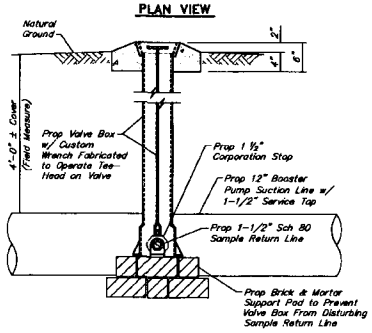


TYPICAL UNDERGROUND WATER SAMPLE RETURN LINE TAP DETAIL

NOT TO SCALE



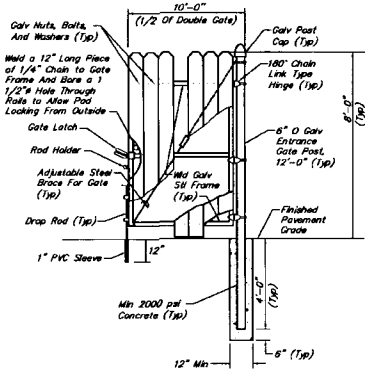
PLAN VIEW



PROFILE VIEW

UNDERGROUND TAP VALVE BOX DETAIL

NOT TO SCALE

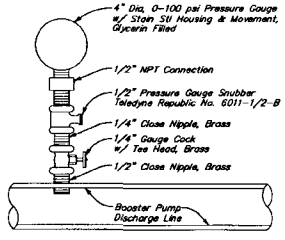


NOTE:

All fence & gate posts to be schedule 40 galv. steel.

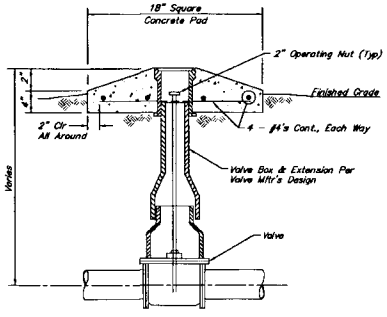
WOOD GATE DETAIL

NOT TO SCALE



PRESSURE GAUGE DETAIL

NOT TO SCALE



TYPICAL VALVE WITH BOX DETAIL

NOT TO SCALE

APPROVED: _____ for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO	DATE	REVISIONS	APP.
2	12/15	ISSUED FOR CONSTRUCTION	TWH
1	10/12	ISSUED FOR BIDDING	TWH

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

MISCELLANEOUS DETAILS SHEET 2 OF 2

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER | TRAFFIC & TRANSPORTATION
STORM WATER QUALITY
STORM | HOURLES
STREET & BRIDGE

FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DGN. BY: JMV
DWG. BY: RBR
SCALE: AS SHOWN

FOR CITY OF HOUSTON USE ONLY
CITY ENG. NO.
54993

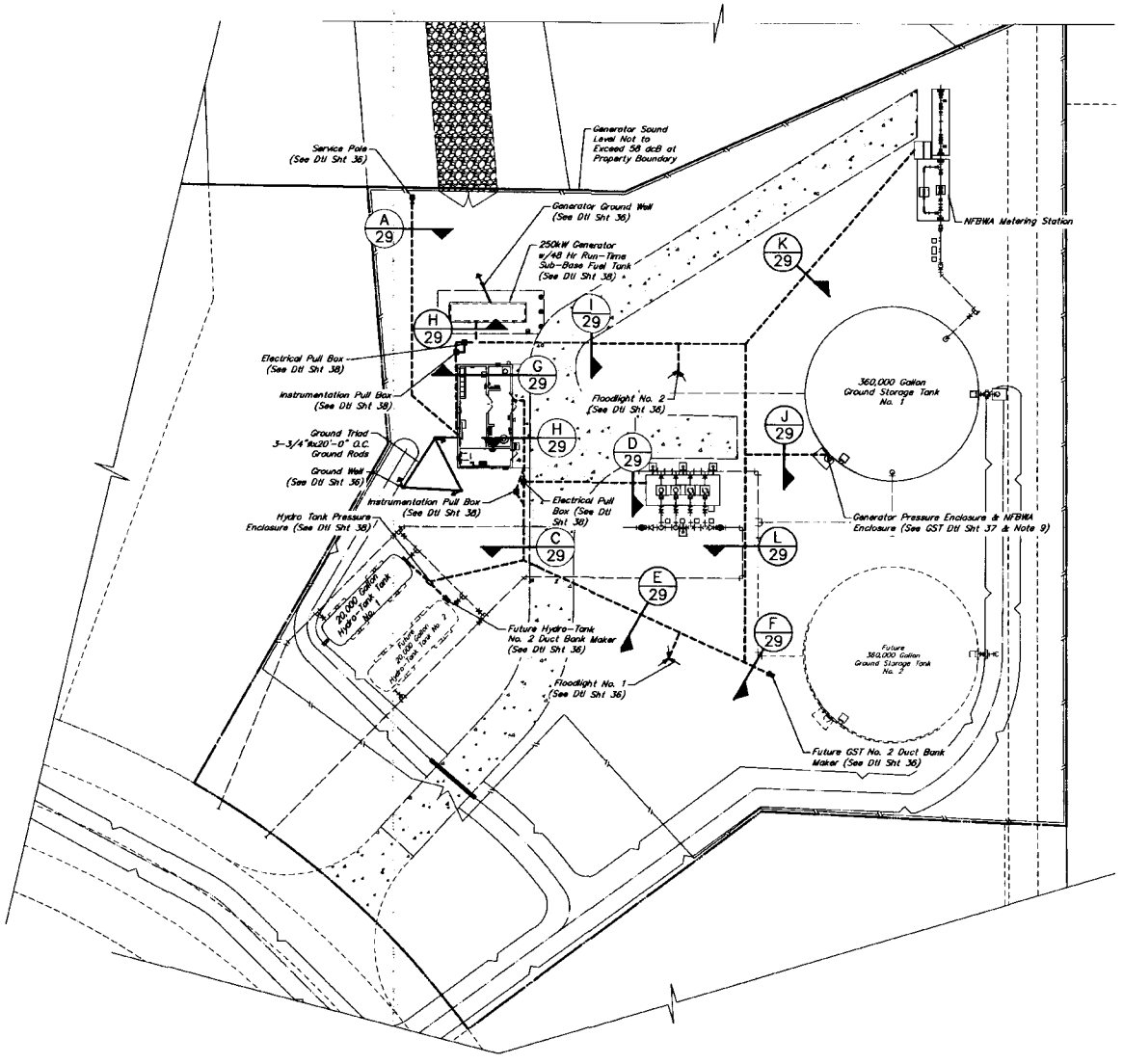
SHEET No. 27 OF 46

TOBY W. McELWAY
68240
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

10-22-2015

C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS



0 5 10 20 40 60
SCALE: 1" = 20'

NOTES:

1. All construction shall comply with local and national codes and requirements.
2. Conduits shall not be routed across walkways, paths of access, travel, or egress. Route beneath gratings, in concrete structures, or around equipment. Do not route in conflict with other piping, conduits, equipment, or structures.
3. Contractor shall be responsible for obtaining any and all permits associated with the work. The costs of the permits, if any, shall be borne by the Contractor.
4. All exterior above grade conduit shall be rigid galvanized steel conduit. Conduits within the chemical rooms are to be Sch. 80 PVC. All conduit in duct bank shall be Sch. 40 PVC except for riser. Duct bank elbow shall be rigid galvanized steel conduit. All mounting hardware to be stainless steel.
5. All aspects of this installation must comply with the latest Utility Company's standards. Review this project's service requirements of location, ratings, and methods with utility company prior to beginning construction.
6. Field verify exact location of all underground pipes, conduits, and structures before digging. Repair any damage done to original condition.
7. All power and instrumentation conductors shall be installed in separate conduits. Instrumentation & power conduits must have a minimum of 12" of spacing. Route power and instrumentation conductors in separate pull boxes.
8. The cost of connecting new service shall be provided by the owner. Contractor shall provide and install all necessary slabs, conduits, conductors, fittings and other equipment necessary to energize the plant. Installation shall meet Utility Company requirements and all applicable local and national codes.
9. Install GST tap for proposed NFBWA pressure transmitter 12" above GST foundation. See detail sheet 37.

LEGEND:

PROPOSED

- ELECTRICAL DUCT BANK MARKER (SEE DTL SHT 36)
- ELECTRICAL PULL BOX (SEE DTL SHT 38)
- ELECTRICAL DUCT BANK (SEE DTL SHT 36)
- GROUND CONDUCTOR
- CAPPED ELECTRICAL CONDUIT
- GROUND WELL (SEE DTL SHT 36)
- FLOODLIGHT (SEE DTL SHT 36)
- WEATHERHEAD (SEE DTL SHT 36)
- SERVICE POLE (SEE DTL SHT 36)

APPROVED: _____ for F.B.C.D. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/4/15	ISSUED FOR CONSTRUCTION	JBM
1	10/22	ISSUED FOR BIDDING	JBM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ELECTRICAL SITE LAYOUT

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER
STORM WATER QUALITY
FACILITIES

FILE NO:
JOB NO: 0513.13-0208-00

DATE: OCTOBER 2015
DSN. BY: MCM
DRG. BY: MAK

SCALE: 1"=20'

SHEET No. 28 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY SYM. NO.

54998

STATE OF TEXAS
BEAN ERIC MCMILLAN
104711
LICENSED PROFESSIONAL ENGINEER
12/3/15

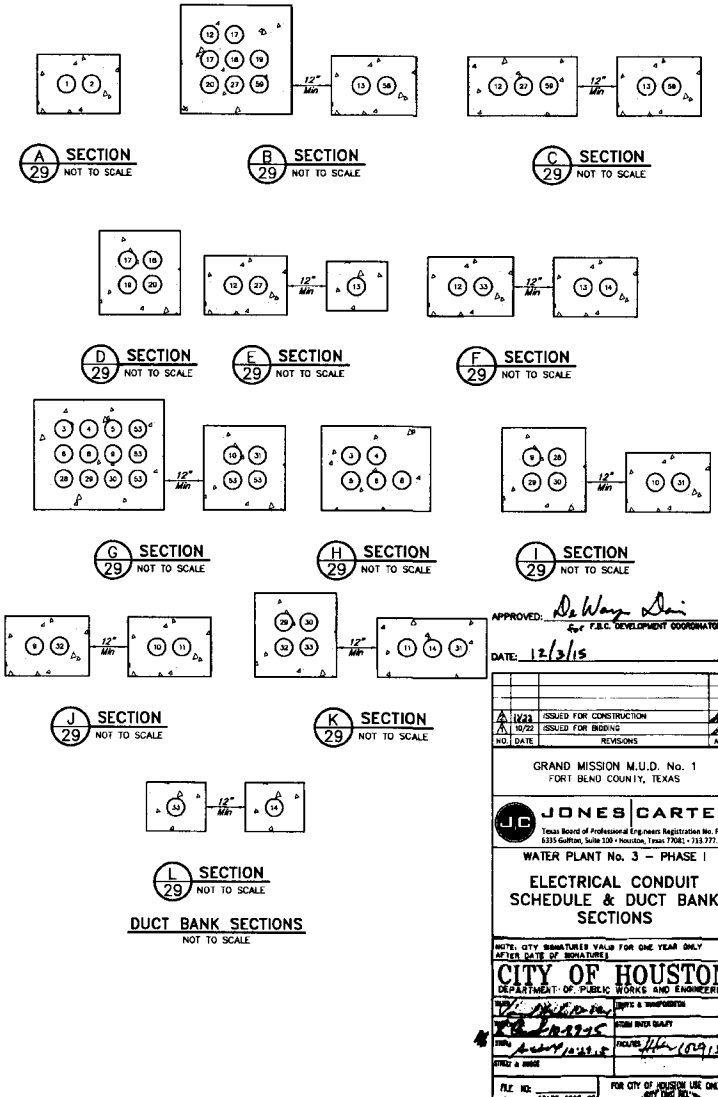
C.O.H. LOG No. 15-1188

CSH BLK REV. JAN 2008

P:\PROJECTS\0513.13-CMUD No. 1\0208-00 Water Plant No. 3 Phase I\Civil\Const Drwgs\ELEC.dwg Dec 02,2015 - 10:38am JMH

CONDUIT SCHEDULE

NO.	SIZE & CONDUCTORS	DESCRIPTION	FROM	TO
1	3" C, W/3-350 MCM + #3/0 NEU	INCOMING SERVICE	SERVICE POLE	MAIN BREAKER
2	3" C, W/3-350 MCM + #3/0 NEU	INCOMING SERVICE	SERVICE POLE	MAIN BREAKER
3	3" C, W/3-350 MCM + #3/0 NEU + #3/0 GND	GENERATOR POWER	GENERATOR	A.T.S.
4	3" C, W/3-350 MCM + #3/0 NEU + #3/0 GND	GENERATOR POWER	GENERATOR	A.T.S.
5	1" C, W/ANNUNCIATOR CABLE	GENERATOR ANNUNCIATOR	GENERATOR	A.T.S.
6	1" C, W/8-#14 + #12 GND	GENERATOR MISCELLANEOUS CONTROLS	GENERATOR	A.T.S.
7	1" C, W/8-#14 + #12 GND	GENERATOR MISCELLANEOUS CONTROLS	A.T.S.	AUTOSENSORY PANEL
8	1 1/2" C, W/3-#3 + #6 GND	GENERATOR MISCELLANEOUS POWER	LIGHTING PANEL "A"	GENERATOR
9	1" C, W/4-#12 + 8-#14 + #12 GND	G.S.T. No. 1 HEAT TRACE RECEPTACLE & CONTROLS	LIGHTING PANEL "A" & AUTOSENSORY PANEL	G.S.T. No. 1
10	1" C, W/#16 SHIELDED TWISTED PAIR + #12 GND	G.S.T. No. 1 PRESSURE TRANSMITTER	G.S.T. No. 1	AUTOSENSORY PANEL
11	1" C, W/#16 SHIELDED TWISTED PAIR + #12 GND	NFBWA G.S.T. No. 1 PRESSURE TRANSMITTER	NFBWA ANALOG JUNCTION BOX	G.S.T. No. 1
12	1" E.C. W/PULL STRING	FUTURE G.S.T. No. 2 HEAT TRACE RECEPTACLE & CONTROLS	LIGHTING PANEL "A" & AUTOSENSORY PANEL	FUTURE G.S.T. No. 2 DUCT BANK MARKER
13	1" E.C. W/PULL STRING	FUTURE G.S.T. No. 2 PRESSURE TRANSMITTER	AUTOSENSORY PANEL	FUTURE G.S.T. No. 2 DUCT BANK MARKER
14	1" E.C. W/PULL STRING	FUTURE NFBWA G.S.T. No. 2 PRESSURE TRANSMITTER	NFBWA ANALOG JUNCTION BOX	FUTURE G.S.T. No. 2 DUCT BANK MARKER
15	3" C, W/3-350 MCM + #3/0 GND	MCC POWER FEED	A.T.S.	MOTOR CONTROL CENTER
16	3" C, W/3-350 MCM + #3/0 GND	MCC POWER FEED	A.T.S.	MOTOR CONTROL CENTER
17	1 1/2" C, W/3-#3 + 2-#12 + 2-#14 + #8 GND	BOOSTER PUMP No. 1	MOTOR CONTROL CENTER & LIGHTING PANEL "A"	BOOSTER PUMP No. 1
18	1 1/2" C, W/3-#3 + 2-#12 + 2-#14 + #8 GND	BOOSTER PUMP No. 2	MOTOR CONTROL CENTER & LIGHTING PANEL "A"	BOOSTER PUMP No. 2
19	1 1/2" E.C. W/PULL STRING	FUTURE BOOSTER PUMP No. 3	MOTOR CONTROL CENTER & LIGHTING PANEL "A"	FUTURE BOOSTER PUMP No. 3
20	1 1/2" E.C. W/PULL STRING	FUTURE BOOSTER PUMP No. 4	MOTOR CONTROL CENTER & LIGHTING PANEL "A"	FUTURE BOOSTER PUMP No. 4
21	1" C, W/2-#12 + 11-#14 + #12 GND	HYDRO TANK No. 1 RECEPTACLE & CONTROLS	HYDRO TANK No. 1	HYDRO TANK PRESSURE ENCLOSURE
22	1" C, W/2-#16 SHIELDED TWISTED PAIR + #12 GND	HYDRO TANK No. 1 DIFF. PRESSURE TRANSMITTER	HYRDO TANK PRESSURE ENCLOSURE	HYDRO TANK No. 1
23	1" C, W/ 1/4" POLYTUBE SENSING LINE	HYDRO TANK No. 1 PRESSURE TRANSMITTER	HYDRO TANK No. 1	HYDRO TANK PRESSURE ENCLOSURE
24	1" E.C. W/PULL STRING	FUTURE HYDRO TANK No. 2 RECEPTACLE & CONTROLS	FUTURE HYDRO TANK No. 2 DUCT BANK MARKER	HYDRO TANK PRESSURE ENCLOSURE
25	1" E.C. W/PULL STRING	FUTURE HYDRO TANK No. 2 DIFF. PRESSURE TRANSMITTER	HYDRO TANK PRESSURE ENCLOSURE	FUTURE HYDRO TANK No. 2 DUCT BANK MARKER
26	1" E.C. W/PULL STRING	FUTURE HYDRO TANK No. 2 PRESSURE TRANSMITTER	FUTURE HYDRO TANK No. 2 DUCT BANK MARKER	HYDRO TANK PRESSURE ENCLOSURE
27	1" C, W/2-#12 + #12 GND	FLOODLIGHT No. 1 POWER	LIGHTING PANEL "A"	FLOODLIGHT No. 1
28	1" C, W/2-#12 + #12 GND	FLOODLIGHT No. 2 POWER	LIGHTING PANEL "A"	FLOODLIGHT No. 2
29	1 1/2" C, W/3-#6 + #6 GND	NFBWA CONTROL PANEL POWER	LIGHTING PANEL "A"	NFBWA JUNCTION BOX
30	1" C, W/8-#12 + #12 GND	NFBWA DISCRETE SIGNAL CONTROLS	NFBWA JUNCTION BOX	AUTOSENSORY PANEL
31	2" C, W/4-#18 SHIELDED TWISTED PAIR + #12 GND	NFBWA ANALOG SIGNAL CONTROLS	NFBWA ANALOG JUNCTION BOX	AUTOSENSORY PANEL
32	1" C, W/2-#12 + #12 GND	NFBWA G.S.T. No. 1 PRESSURE TRANSMITTER HEAT TRACE RECEPTACLE	NFBWA JUNCTION BOX	G.S.T. No. 1
33	1" E.C. W/PULL STRING	FUTURE NFBWA G.S.T. No. 2 PRESSURE TRANSMITTER HEAT TRACE RECEPTACLE	NFBWA JUNCTION BOX	FUTURE G.S.T. No. 2 DUCT BANK MARKER
34	1" C, W/3-#12 + 4-#14 + #12 GND	AIR COMPRESSOR POWER & CONTROLS	MOTOR CONTROL CENTER & AUTOSENSORY PANEL	AIR COMPRESSOR
35	1" C, W/3-#12 + #12 GND	CHLORINE BOOSTER PUMP	MOTOR CONTROL CENTER	CHLORINE BOOSTER PUMP
36	1 1/2" C, W/2-#3 + #3 GND	TRANSFORMER POWER	MOTOR CONTROL CENTER	TRANSFORMER
37	2 1/2" C, W/2-#4/0 + #4/0 NEU + #4/0 GND	LIGHTING PANEL "A" POWER	TRANSFORMER	LIGHTING PANEL "A"
38	2" C, W/4-#16 SHIELDED TWISTED PAIR + #12 GND	DATA LOGGER SIGNALS	AUTOSENSORY PANEL	VIDEO DATA LOGGER
39	1" C, W/2-#14 + #12 GND	BEACON	AUTOSENSORY PANEL	BEACON
40	1" C, W/4-#14 + #12 GND	CHLORINATOR SOLENOID VALVES	CHLORINATOR SOLENOID VALVES	AUTOSENSORY PANEL
41	1" C, W/4-#14 + #12 GND	LAS DISCRETE CONTROL SIGNALS	LAS METERING PUMPS	AUTOSENSORY PANEL
42	1" C, W/2-#16 SHIELDED TWISTED PAIR + #12 GND	LAS ANALOG CONTROL SIGNALS	LAS METERING PUMPS	AUTOSENSORY PANEL
43	1" C, W/4-#14 + #12 GND	ANALYZER DISCRETE CONTROL SIGNALS	ANALYZERS	AUTOSENSORY PANEL
44	1" C, W/2-#16 SH PR + 1-600V CAT5E ETHERNET + #12 GND	ANALYZER ANALOG CONTROL SIGNALS	ANALYZERS	AUTOSENSORY PANEL
45	1" C, W/#16 SHIELDED TWISTED PAIR + #12 GND	LAS TANK LEVEL TRANSMITTER	LAS LEVEL INDICATOR	AUTOSENSORY PANEL
46	1" C, W/2-#10 + #12 GND	CHLORINE ROOM SPACE HEATER	LIGHTING PANEL "A"	SPACE HEATER
47	1" C, W/3-#10 + #12 GND	AIR CONDITIONER POWER	MOTOR CONTROL CENTER	WALL MOUNTED AIR CONDITIONER
48	1" C, W/2-#12 + #12 GND	GAS DETECTOR UNIT	LIGHTING PANEL "A"	GAS DETECTOR UNIT
49	1" C, W/3-#10 + #10 GND	BOOSTER PUMP POWER FACTOR CORRECTING CAPACITOR	MOTOR CONTROL CENTER	BP POWER FACTOR CORRECTING CAPACITOR
50	3" C, W/3-350 MCM + #3/0 NEU + #3/0 GND	ATS UTILITY POWER	MAIN BREAKER	A.T.S.
51	3" C, W/3-350 MCM + #3/0 NEU + #3/0 GND	ATS UTILITY POWER	MAIN BREAKER	A.T.S.
52	1 1/2" C, W/44-#14 + #12 GND	AUTODIALER ALARMS	AUTOSENSORY PANEL	AUTODIALER
53	1" E.C.	SPARE	AUTOSENSORY PANEL	PULL BOX
54	1" C, W/2-#12 + #12 GND	SAMPLE PUMP COMBINATION STARTER	LIGHTING PANEL "A"	SAMPLE PUMP
55	1" C, W/8-#14 + #12 GND	SAMPLE PUMP DISCRETE CONTROLS	SAMPLE PUMP	AUTOSENSORY PANEL
56	2" C, W/4-#18 SHIELDED TWISTED PAIR + #12 GND	SURFACE WATER CL2 FEED RATES	CHLORINATORS	AUTOSENSORY PANEL
57	1" C, W/2-#14 + #12 GND	CL2 ALARM	CL2 GAS DETECTOR	AUTOSENSORY PANEL
58	1" C, W/2-#16 SHIELDED TWISTED PAIR + #12 GND	HYDRO TANK ANALOG SIGNALS	AUTOSENSORY PANEL	HYRDO TANK PRESSURE ENCLOSURE
59	1" C, W/4-#12 + 9-#14 + #12 GND	HYDRO TANK POWER & DISCRETE CONTROLS	LIGHTING PANEL "A" & AUTOSENSORY PANEL	HYRDO TANK PRESSURE ENCLOSURE



DUCT BANK SECTIONS
NOT TO SCALE

APPROVED: DeWayne Dini for P.E.C. DEVELOPMENT COORDINATOR
DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	11/23	ISSUED FOR CONSTRUCTION	
1	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 110 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ELECTRICAL CONDUIT SCHEDULE & DUCT BANK SECTIONS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURE

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

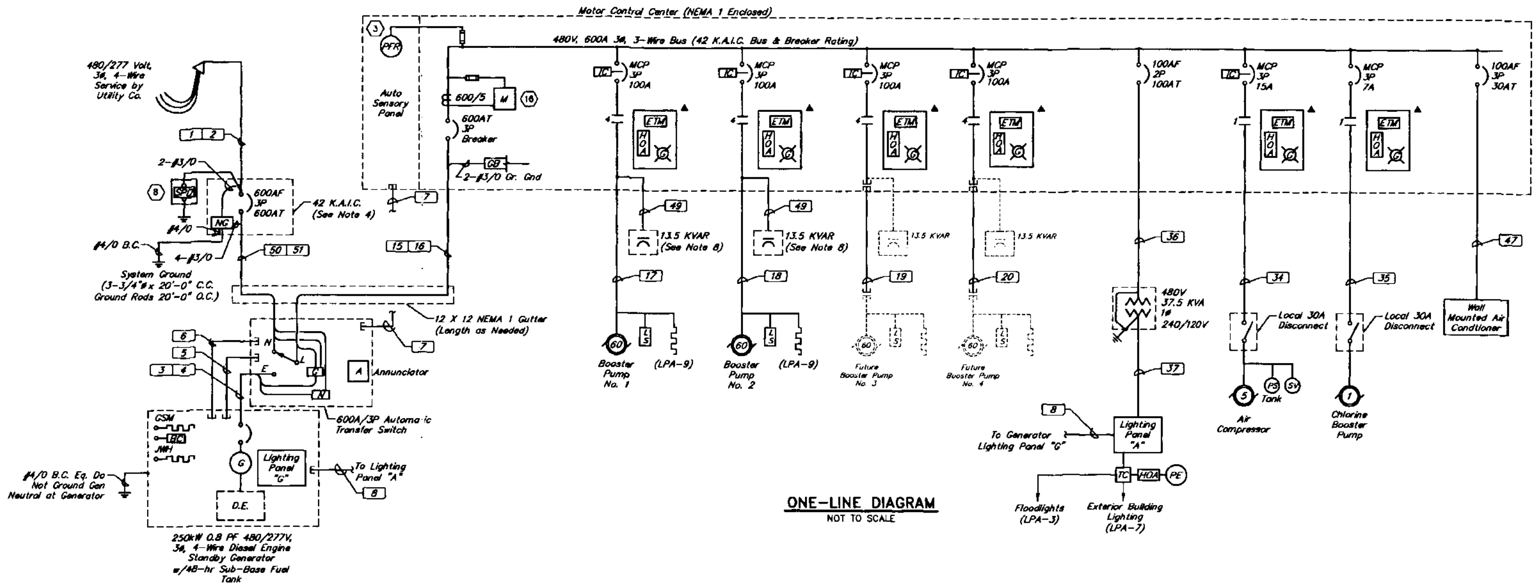
PWE | DEPT. & TRANSPORTATION
ITEM INTO QUALITY
FACILITIES 10/09/15

FILE NO:
JOB NO: 08133-0208-00
DATE: OCTOBER 2015
DSN. BY: MCM
DWG. BY: MAK
SCALE: AS SHOWN
SHEET No. 29 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY ENG. NO. 54998

BEAN ERIC MCMILLAN 104791 LICENSED PROFESSIONAL ENGINEER

C.O.H. LOG No. 15-1168



ONE-LINE DIAGRAM
NOT TO SCALE

PANEL LPA

BUS AMPS 225A MLO ____
MAIN BRKR. AMPS 200 WIRE SIZE #4/0
VOLTS 240/120 A/C ____
PHASE 1 WIRE 3 SN ✓

NOTES:
1. Breakers 1P/20A unless marked otherwise.
2. Adj. ckts. to bal. pnl.
3. Surface mount, NEMA 1

CKT. DESCRIPTION	WIRE	LOAD	BKR.	A B		BKR.	LOAD	WIRE	CKT. DESCRIPTION
CONTROL POWER	12	500	15	1	2	15	500	12	PLC POWER
SITE FLOOD LIGHTS	12	1250	20	3	4	20	1100	12	CONTROL ROOM LIGHTS
SAMPLE PUMP	12	550	20	5	6	20	720	12	CONTROL ROOM RECEPTACLES
EXTERIOR BUILDING LIGHTING	12	1200	20	7	8	20	550	12	CHLORINE ROOM LIGHTS AND FAN
BOOSTER PUMP SPACE HEATERS	12	1400	20	9	10	20	650	12	CHLORINE ROOM RECPTACLES
GENERATOR LIGHTING PANEL "G"	6	6200	100	11	12	40	3500	6	NFBWA CONTROL PANEL POWER
GENERATOR LIGHTING PANEL "G"	6		2P	13	14	2P		6	NFBWA CONTROL PANEL POWER
GST NO. 1 & NO. 2 HEAT TRACE RECEPTACLE	12	500	20	15	16	30	200	12	LAS METERING PUMP (NFBWA)
VIDEO DATA LOGGER	12	100	20	17	18	20	500	12	HPT NO. 1 & NO. 2 HEAT TRACE RECEPTACLES
GAS DETECTOR UNIT	12	500	20	19	20	20	100	12	AUTODIALER
CHLORINE ROOM SPACE HEATER	10	3000	30	21	22	20	–	–	SPARE
LIGHTING CONTROLS	12	500	20	23	24	20	–	–	SPARE
SPARE	–	–	20	25	26	20	–	–	SPARE
SPARE	–	–	20	27	28	20	–	–	SPARE
SPARE	–	–	20	29	30	20	–	–	SPARE
SPARE	–	–	20	31	32	20	–	–	SPARE
SPACE	–	–	–	33	34	20	–	–	SPARE
SPACE	–	–	–	35	36	–	–	–	SPACE
SPACE	–	–	–	37	38	–	–	–	SPACE
SPACE	–	–	–	39	40	–	–	–	SPACE
SPACE	–	–	–	41	42	–	–	–	SPACE

N

ELECTRICAL LOAD ANALYSIS

LOAD		AMPS ØA	ØB	ØC	SBKW
BOOSTER PUMP No. 1	60 HP	77	77	77	50
BOOSTER PUMP No. 2	60 HP	77	77	77	50
FUTURE BOOSTER PUMP No. 3	60 HP	77	77	77	50
FUTURE BOOSTER PUMP No. 4	60 HP	77	77	77	50
CL2 BOOSTER PUMP	1 HP	2.1	2.1	2.1	1
AIR COMPRESSOR	5 HP	8	8	8	4.5
TRANSFORMER	37.5 KVA	78	–	78	37.5
25% OF LARGEST MOTOR		19.25	19.25	19.25	
TOTAL LOAD		415.35	337.35	415.35	243
SERVICE AMPACITY @ 480 VOLT		600	600	600	
SPARE AMPACITY		184.65	262.65	184.65	
FAULT CURRENT					< 42KAIC

NOTES:

1. All work shall be in compliance with latest edition of National Electric Code and in accordance with local codes.
2. See specification for wire types.
3. Items shown in bold are proposed, all other items are future.
4. Provide Switchboard Style 600A breaker with L.S.I. solid state trip. 42 K.A.I.C. 100% rated, suitable as service disconnect.
5. Provide all conduit entering MCC & other enclosure from bottom with grounding bushing & bond wire per N.E.C. Do not double lug.
6. The cost of connecting new service shall be provided by the owner. Contractor shall provide and install all necessary slabs, conduits, conductors, fittings and other equipment necessary to energize the plant. Installation shall meet Utility Company requirements and all applicable local and national codes.
7. All mounting hardware unless otherwise shown shall be stainless steel.
8. Mount capacitors on top of the motor control center. Support with P1000 unistrut as required. Capacitor size shown is typical. Provide maximum capacitor size not to exceed motor nameplate max KVAR.
9. Provide traditional "NEMA" devices as defined in NEMA Standards Publication No. ICS 2.4-2003. IEC Components are not allowed.

ONE-LINE DIAGRAM LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	MOLDED CASE CIRCUIT BREAKER	PFR	PHASE FAILURE RELAY	NG	NEUTRAL/GROUND PAD	PS	PRESSURE SWITCH
	COMBINATION "MCP" MOTOR STARTER	ETM	ELAPSED TIME METER		SPECIAL DEVICE		TRANSFORMER
	SOLID STATE REDUCED VOLTAGE MOTOR STARTER	LS	LOCK-STOP STATION (MAINTAINED CONTACT)	GB	GROUND BUS	TC	TIME CLOCK
PE	PHOTO ELECTRIC SWITCH		INDICATING LIGHT (COLOR AS NOTED) (L.E.D.)		SYSTEM GROUND		FUSE
HOA	HAND-OFF-AUTO SWITCH		SPACE HEATER		SERVICE HEAD	J	JUNCTION BOX
			3 PHASE MOTOR (HORSEPOWER NOTED)	LC	MICRO-SWITCH - STARTER DISCONNECT TO PREVENT CONTROL OPERATION WHEN MOTOR IS DE-ENERGIZED		CURRENT TRANSFORMER
			SURGE SUPPRESOR	▲	ITEM LOCATED ON FACE OF AUTO SENSORY PANEL	M	SYSTEM TRANSFORMER
				OS	OILER SOLENOID		CAPACITOR

APPROVED: DeWayne Davis
for F.B.C. DEVELOPMENT COORDINATOR
DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/22	ISSUED FOR CONSTRUCTION	DM
1	10/22	ISSUED FOR BIDDING	DM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ELECTRICAL ONE-LINE DIAGRAM

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TRAFFIC & TRANSPORTATION
STORM WATER QUALITY
STORM
FACILITIES
STREET & BRIDGE

FILE NO.
JOB NO. 05133-0208-00
DATE: OCTOBER 2015
DGN. BY: MCM
DWG. BY: MAK
SCALE: AS SHOWN
SHEET No. 30 OF 46

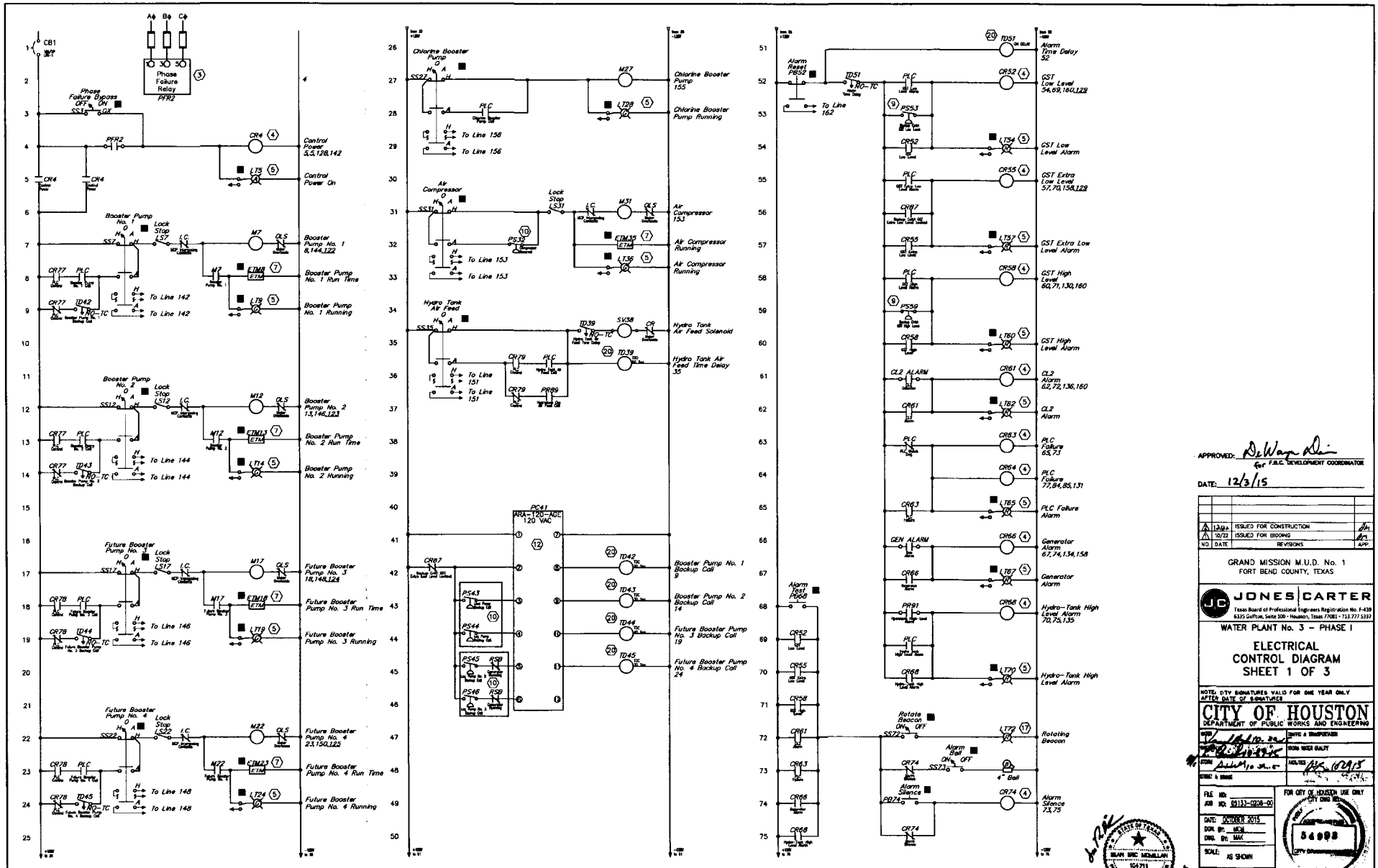
FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54993

SEAN ERIC MCMILLAN 104711 LICENSED PROFESSIONAL ENGINEER

C.O.H. LOG No. 15-1168

P:\PROJECTS\05133-GMMUD No. 1\0208-00 Water Plant No. 3 Phase I\Civil\Const Dwgs\E.LC.dwg Dec 22,2015 - 10:38am

CONFORMED DOCUMENTS



APPROVED: for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/15	ISSUED FOR CONSTRUCTION	
1	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 300 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ELECTRICAL CONTROL DIAGRAM SHEET 1 OF 3

NOTE: DTV SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

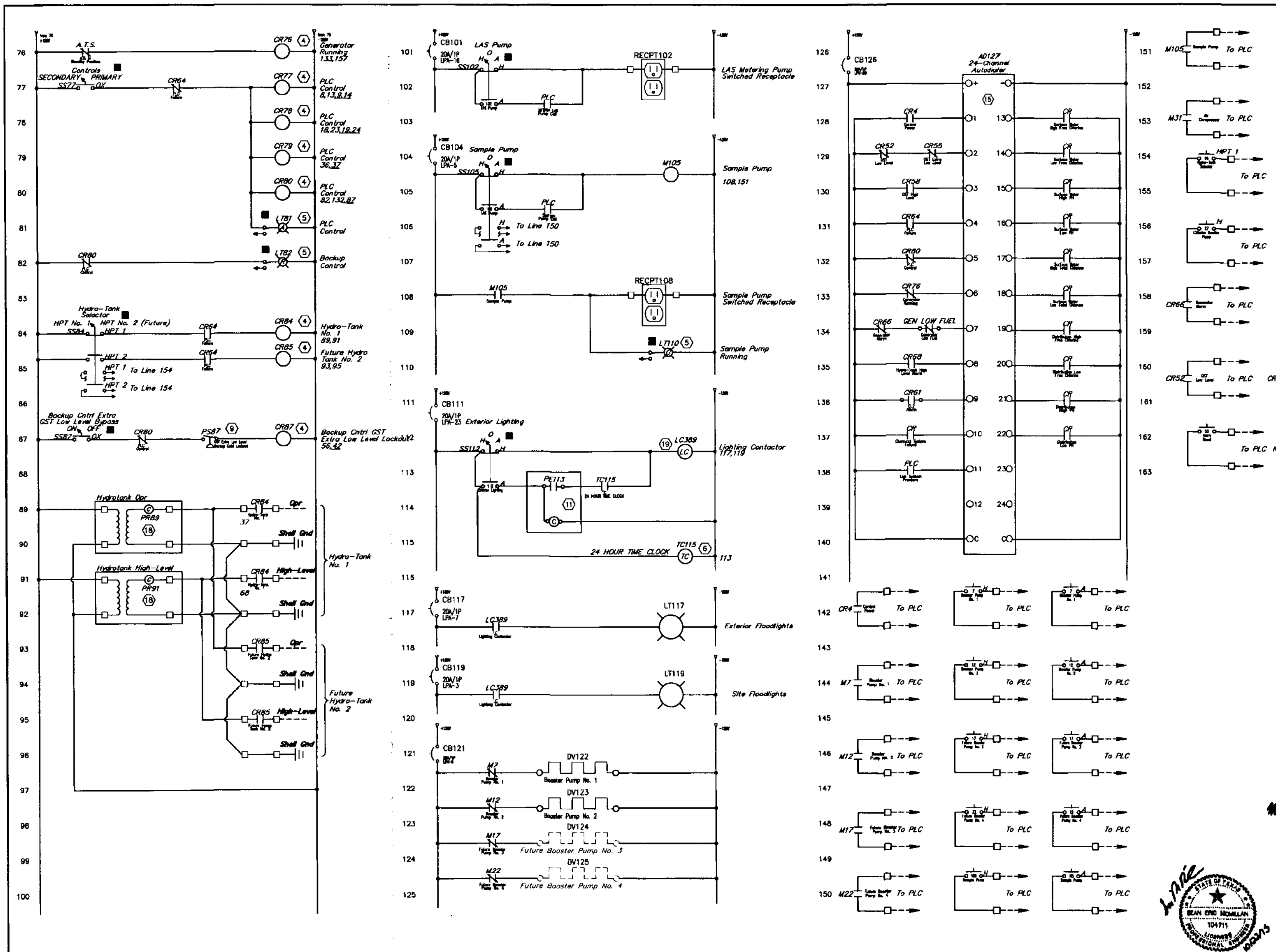
APPROVED
DIRECTOR & ENGINEER
HOUSTON WATER QUALITY
DATE/TIME
STORM & DRAINAGE

FILE NO:
JOB NO: 09133-0208-00
DATE: OCTOBER 2015
DSN. BY: MDL
DWG. BY: MAK
SCALE: AS SHOWN
SHEET No. 31 OF 48

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO:
54998

BRIAN ERIC MCMILLAN
104711
LICENSED PROFESSIONAL ENGINEER
12/3/15

C.O.H. LOG No. 15-1168


A.T.S.
Controls
SECONDARY PRIMARY
SS77
CR64
CR76
CR77
CR78
CR79
CR80
LT81
LT82
Generator Running 133,157
PLC Control 8,13,9,14
PLC Control 18,23,19,24
PLC Control 36,37
PLC Control 82,132,87
PLC Control
Backup Control
Hydro-Tank Selector
HPT No. 1 HPT No. 2 (Future)
SS84
To Line 154
CR84
CR85
Hydro-Tank No. 1 89,91
Future Hydro Tank No. 2 93,95
Backup Cntrl Extra GST Low Level Bypass
SS87
PS87
CR87
Backup Cntrl GST Extra Low Level Lockout 56,42
Hydrotank Opr
PR89
Hydrotank High-Level
PR91
Opr
Shell Gnd
High-Level
Hydro-Tank No. 1
Future Hydro-Tank No. 2
CB101
LAS Pump
SS102
RECPT102
LAS Metering Pump Switched Receptacle
CB104
Sample Pump
SS105
M105
Sample Pump 108,151
To Line 150
RECPT108
Sample Pump Switched Receptacle
LT110
Sample Pump Running
CB111
Exterior Lighting
SS112
PE113
TC115
LC389
Lighting Contactor 117,119
24 HOUR TIME CLOCK
CB117
LT117
Exterior Floodlights
CB119
LT119
Site Floodlights
CB121
DV122
Booster Pump No. 1
DV123
Booster Pump No. 2
DV124
Future Booster Pump No. 3
DV125
Future Booster Pump No. 4
CB126
AD127
24-Channel Autodialer
CR4
CR52
CR55
CR58
CR64
CR80
CR76
CR66
GEN LOW FUEL
CR68
CR61
PLC
M105
M31
HPT 1
HPT 2
M27
CR76
CR66
CR55
CR52
CR58
CR61
NFBW
CR4
M7
M12
M17
M22
To PLC

APPROVED: [signature] for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/22	ISSUED FOR CONSTRUCTION	
1	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ELECTRICAL CONTROL DIAGRAM SHEET 2 OF 3

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TRAFFIC & TRANSPORTATION
STORM WATER QUALITY
STORM
FACILITIES
STREET & BRIDGE

FILE NO.
JOB NO. 06133-0206-00
DATE OCTOBER 2015
DGN. BY: MCM
DWG. BY: HAK
SCALE: AS SHOWN
SHEET No. 32 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54993

C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS

DIGITAL INPUT COMBINATION MODULE SCHEDULE

NO.	DESCRIPTION
1	CONTROL POWER
2	BOOSTER PUMP NO. 1 HAND
3	BOOSTER PUMP NO. 1 AUTO
4	BOOSTER PUMP NO. 1 RUNNING
5	BOOSTER PUMP NO. 2 HAND
6	BOOSTER PUMP NO. 2 AUTO
7	BOOSTER PUMP NO. 2 RUNNING
8	FUTURE BOOSTER PUMP NO. 3 HAND
9	FUTURE BOOSTER PUMP NO. 3 AUTO
10	FUTURE BOOSTER PUMP NO. 3 RUNNING
11	FUTURE BOOSTER PUMP NO. 4 HAND
12	FUTURE BOOSTER PUMP NO. 4 AUTO
13	FUTURE BOOSTER PUMP NO. 4 RUNNING
14	SAMPLE PUMP HAND
15	SAMPLE PUMP AUTO
16	SAMPLE PUMP RUNNING
17	HYDRO TANK AIR FEED HAND
18	HYDRO TANK AIR FEED AUTO
19	AIR COMPRESSOR HAND
20	AIR COMPRESSOR AUTO
21	AIR COMPRESSOR RUNNING
22	HYDRO TANK NO. 1 SELECTOR
23	HYDRO TANK NO. 2 SELECTOR
24	CHLORINE BOOSTER PUMP HAND
25	CHLORINE BOOSTER PUMP AUTO
26	CHLORINE BOOSTER PUMP RUNNING
27	GENERATOR RUNNING
28	GENERATOR FAIL
29	GENERATOR LOW FUEL ALARM
30	GST EXTRA LOW LEVEL ALARM
31	GST LOW LEVEL ALARM
32	GST HIGH LEVEL ALARM
33	CL2 LEAK ALARM
34	ALARM RESET
35	NFBWA CHLORINATOR RUNNING
36	NFBWA LAS METERING PUMP RUNNING

DIGITAL OUTPUT COMBINATION MODULE SCHEDULE

NO.	DESCRIPTION
1	BOOSTER PUMP NO. 1 CALL
2	BOOSTER PUMP NO. 2 CALL
3	FUTURE BOOSTER PUMP NO. 3 CALL
4	FUTURE BOOSTER PUMP NO. 4 CALL
5	HYDRO TANK AIR FEED CALL
6	CHLORINE BOOSTER PUMP CALL
7	NFBWA LAS PUMP CALL
8	NFBWA SAMPLE PUMP CALL
9	GST EXTRA LOW LEVEL ALARM
10	GST LOW LEVEL ALARM
11	GST HIGH LEVEL ALARM
12	HYDRO TANK HIGH LEVEL ALARM
13	PLC WATCH DOG

ANALOG INPUT COMBINATION MODULE SCHEDULE

NO.	DESCRIPTION
1	GST NO. 1 PRESSURE TRANSMITTER
2	FUTURE GST NO. 2 PRESSURE TRANSMITTER
3	HYDRO TANK NO. 1 DIFFERENTIAL PRESSURE TRANSMITTER
4	FUTURE HYDRO TANK NO. 2 DIFFERENTIAL PRESSURE TRANSMITTER
5	SYSTEM PRESSURE TRANSMITTER
6	NFBWA FLOW RATE
7	LAS LEVEL TRANSMITTER
8	NFBWA LAS FEED RATE
9	NFBWA CHLORAMINE RESIDUAL
10	NFBWA FREE AMMONIA RESIDUAL
11	NFBWA CHLORINATOR FEED RATE

ANALOG OUTPUT COMBINATION MODULE SCHEDULE

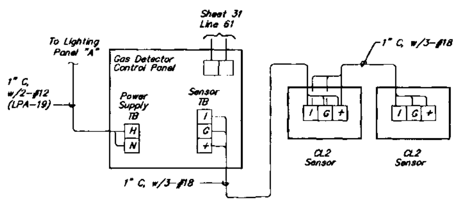
NO.	DESCRIPTION
1	GST LEVEL
2	CL2 FEED RATE
3	LAS FEED RATE
4	NFBWA TOTAL CHLORAMINE
5	NFBWA FREE AMMONIA

CONTROL DIAGRAM LEGEND

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
M 3 O/L'S	MAGNETIC MOTOR STARTER
CR	CONTROL RELAY–4 POLE UNIVERSAL – PLUG IN
TD	TIME DELAY RELAY
SV	SOLENOID VALVE
W	INDICATING LIGHT: W–WHITE; R–RED; G–GREEN (L.E.D.)
	THERMOSTAT
ETM	ELAPSED TIME METER
	SPACE HEATER
L.S.	LOCK STOP
TD TDC	CONTACT ON TIME DELAY RELAY TIME DELAY CLOSE AFTER ENERGIZATION
ON–OFF	ON–OFF SWITCH
PS	PRESSURE SWITCH
	PUSHBUTTON
M M	HOLDING COIL CONTACT (NORMALLY OPEN–NORMALLY CLOSED)
CR CR	CONTROL RELAY CONTACT (NORMALLY OPEN–NORMALLY CLOSED)
1	ITEM MARK (SEE SPECIAL DEVICE SCHEDULE)
	TWO POSITION SELECTOR SWITCH
■	ITEM LOCATED ON FACE OF AUTO–SENSORY PANEL
H O A	HAND–OFF–AUTO SWITCH
LC	MICRO SWITCH – STARTER DISCONNECT TO PREVENT CONTROL OPERATION WHEN MOTOR IS DE–ENERGIZED
ATS	MECHANICAL CONTACT ON AUTO TRANSFER. ALL CONTACTS SHOWN IN NORMAL POWER POSTION. IF MECHANICAL NOT AVAILABLE, USE RELAY AND ACTUATE BY MECAHANICAL
C	INDUCTION RELAY

SPECIAL DEVICE SCHEDULE

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	24 VDC POWER SUPPLY – PHOENIX CONTACT QUINT SERIES – SIZE 50% GREATER THAN LOAD	11	PHOTOELECTRIC SWITCH – INTERMATIC SERIES K1100, 120 VOLT – MODEL #K1121
2	DIFFERENTIAL PRESSURE TRANSMITTER – ROSEMOUNT #2051CD3A22A1AS1B4K5M4, –1000 to 1000 In H2O, WITH INTERNAL LCD OUTPUT, INSTALL TO STAINLESS STEEL REMOTE DIAPHRAGM SEALS WITH 1/2" STAINLESS STEEL CAPILLARIES OR FOXBORO OR ENDRUS–HAUSER EQUAL	12	QUADROPLEXOR – DIVERSIFIED ELECTRONICS ARM–120–AJE
3	PHASE FAILURE RELAY – DIVERSIFIED ELECTRONICS #SLD–440–ALE, 480 VOLT, 3 PHASE	13	PRESSURE TRANSMITTER – ROSEMONT MODEL #3051TG2A2BAHR5M4 0–150 PSI MAX WITH INTERNAL LCD OUTPUT OR APPROVED FOXBORO OR ENDRESS–HAUSER EQUAL
4	CONTROL RELAY – WITH 4 S.P.D.T. SWITCHES RATED 10 AMPS AT 120 VOLT, 120 VOLT COIL, PLUG IN BASE AND SOCKET	14	PRESSURE TRANSMITTER – ROSEMONT MODEL #3051TG1A2BAHR5M4 0–30 PSI MAX WITH INTERNAL LCD OUTPUT OR APPROVED FOXBORO OR ENDRESS–HAUSER EQUAL
5	INDICATING LIGHT – 30MM, PUSH TO TEST, LED, ALLEN BRADLEY BOOT TYPE, GLASS LENS, 120 VOLT, 60 Hz. – COLOR AS INDICATED	15	CELLULAR AUTODIALER – SEE SPECIFICATION
6	TIME CLOCK – INTERMATIC SERIES V45000CR WITH ASTRONOMIC DIAL, & SPRING WOUND CARRY–OVER MECHANISM, 120–VOLT, 60HZ, 3PST SWITCH RATED AT 40A, MODEL No. V45471CR30	16	POWER SYSTEM MONITOR – SQUARE D CLASS 3020, TYPE CM–2350 w/WAVE FORM CAPTURE OR APPROVED EQUAL
7	ELAPSED TIME METER – CRAMER #635S, 120 VOLT	17	FLASHING BEACON – 65FPM, 120 VOLT, RED, ACRYLIC DOME LENS, EDWARDS #105XBRMR120A
8	SURGE PROTECTION DEVICE – SEE SPECIFICATION 16615	18	INDUCTION RELAY – WARRICK SEIRES I, 120 VOLT, 60 HZ
9	PRESSURE SWITCH – MERCOID SERIES EDA, MODEL No. EDAW–N1E1–03T0, 0–60 PSI RANGE, AUTOMATIC RESET, TWO (2) SPDT SWITCHES RATED 5 AMPS AT 120 VOLTS	19	LIGHTING CONTACTOR – 120V RATED COIL WITH 20A RATED CONTACTS, 4 POLE MINIMUM
10	PRESSURE SWITCH – MERCOID SERIES EDA, MODEL No. EDAW–N1E1–04T0, 0–100 PSI RANGE, AUTOMATIC RESET, TWO (2) SPDT SWITCHES RATED 5 AMPS AT 120 VOLTS	20	TIME DELAY RELAY – WITH 2 S.P.D.T. SWITCHES RATED 7 AMPS AT 120 VOLT, CONTACTS AND COIL, PLUG IN BASE AND SOCKET, 3 RANGES, 0.1 TO 100 SEC, ATC, MODEL No. 319D–134



GAS DETECTOR WIRING
NOT TO SCALE

APPROVED: DeWayne Dai for F.B.C. DEVELOPMENT COORDINATOR
DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	9/22	ISSUED FOR CONSTRUCTION	dn
1	10/22	ISSUED FOR BIDDING	dn

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ELECTRICAL
CONTROL DIAGRAM
SHEET 3 OF 3

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

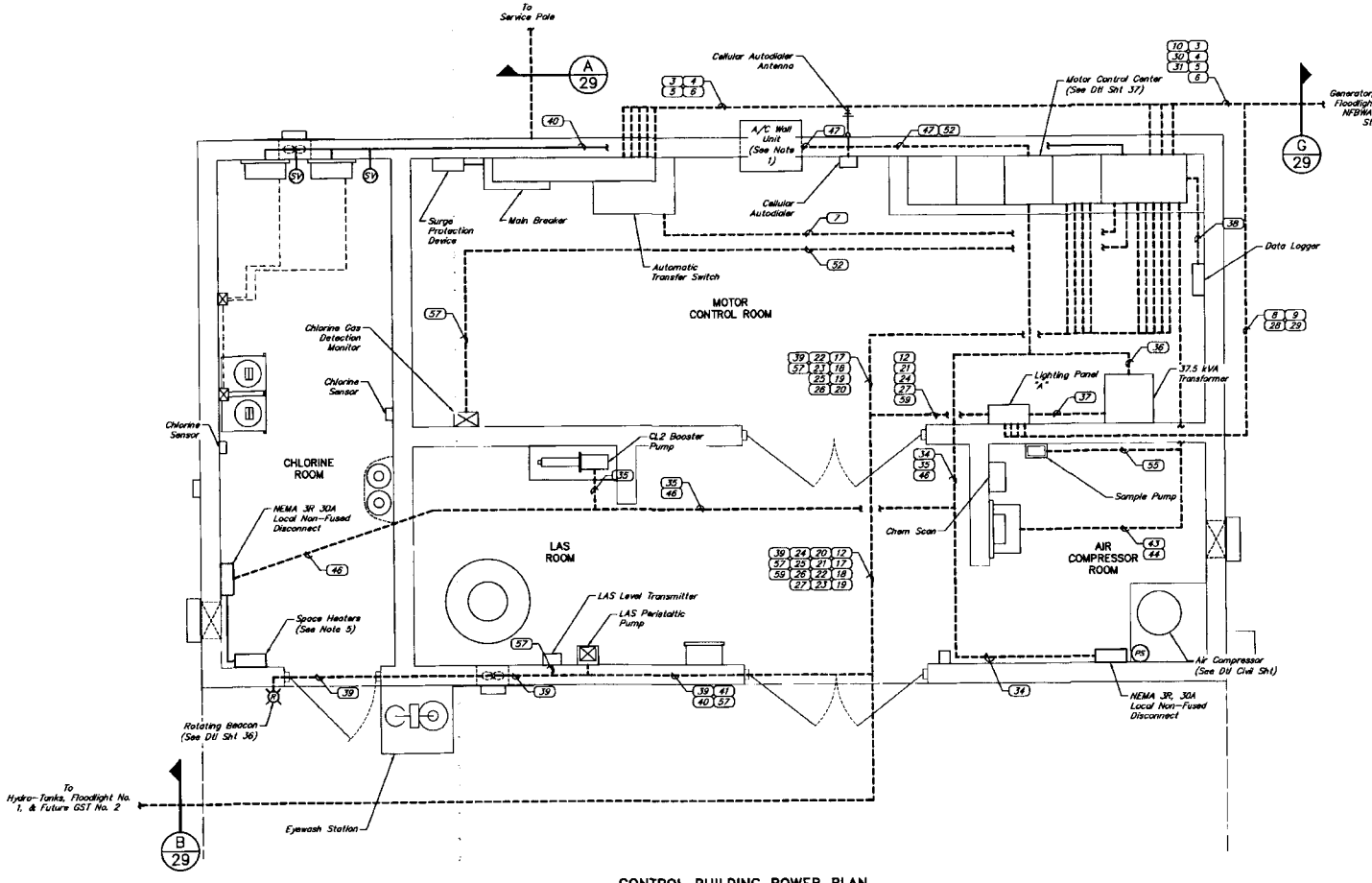
FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2013
DGN. BY: MCM
DWG. BY: MAK
SCALE: AS SHOWN
SHEET No. 33 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54993

SEAN ERIC MCMILLAN
104711
LICENSED PROFESSIONAL ENGINEER

C.O.H. LOG No. 15-1168

F:\PROJECTS\05133-GMMUD no. 1\0208-00 Water Plant No. 3 Phase I\Dwg\Const Dwgs\ELEC.dwg Dec 22,2015 – 10:38am



CONTROL BUILDING POWER PLAN
SCALE: 1/2"=1'-0"

SCALE: 1/2" = 1'

NOTES:

1. Provide and install a through-the-wall electric heat air conditioner, Friedrich Model No. UE12D33C or approved equal, capable of a minimum of 11,500 btu heater output and 11,000 btu air conditioner output. Mount the unit in the control room using a through wall sleeve, Grainger Stock No. 2RLC7 or approved equal, with top of unit approx. six-foot (6') above the finished floor. Furnish the power cord, filter and paint the wall sleeve to match proposed building color and verified by the Engineer.
2. All power and instrumentation conductors shall be installed in separate conduits. Instrumentation & power conduits must have a minimum of 12" of spacing. Route power and instrumentation conductors in separate pull boxes. Route all polytube conduits around pull boxes.
3. Seal all conduits entering CL2 room with cementitious grout.
4. Plan view conduit routing is diagrammatic only. Route best way minimizing bends.
5. Provide 3 KW heavy duty unit heater, wall mount bracket and wall mounted line voltage control thermostat, 120 volt, single phase, fan and adjustable outlet louvers, dayton or approved equal. Set controls at 6' – 6" above finished floor.

LEGEND:

- ABOVE GROUND CONDUIT
- ELECTRICAL DUCTBANK (SEE DTL SHT 36)
- CELLULAR ANTENNA

APPROVED: DeWayne Dai for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
3	10/22	ISSUED FOR CONSTRUCTION	AM
2	11/2	REV. PER ADD. No. 2	AM
1	10/22	ISSUED FOR BIDDING	AM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
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WATER PLANT No. 3 – PHASE I

CONTROL BUILDING POWER PLAN

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER | TRAFFIC & TRANSPORTATION | STORM WATER QUALITY | FACILITIES | STREET & BRIDGE

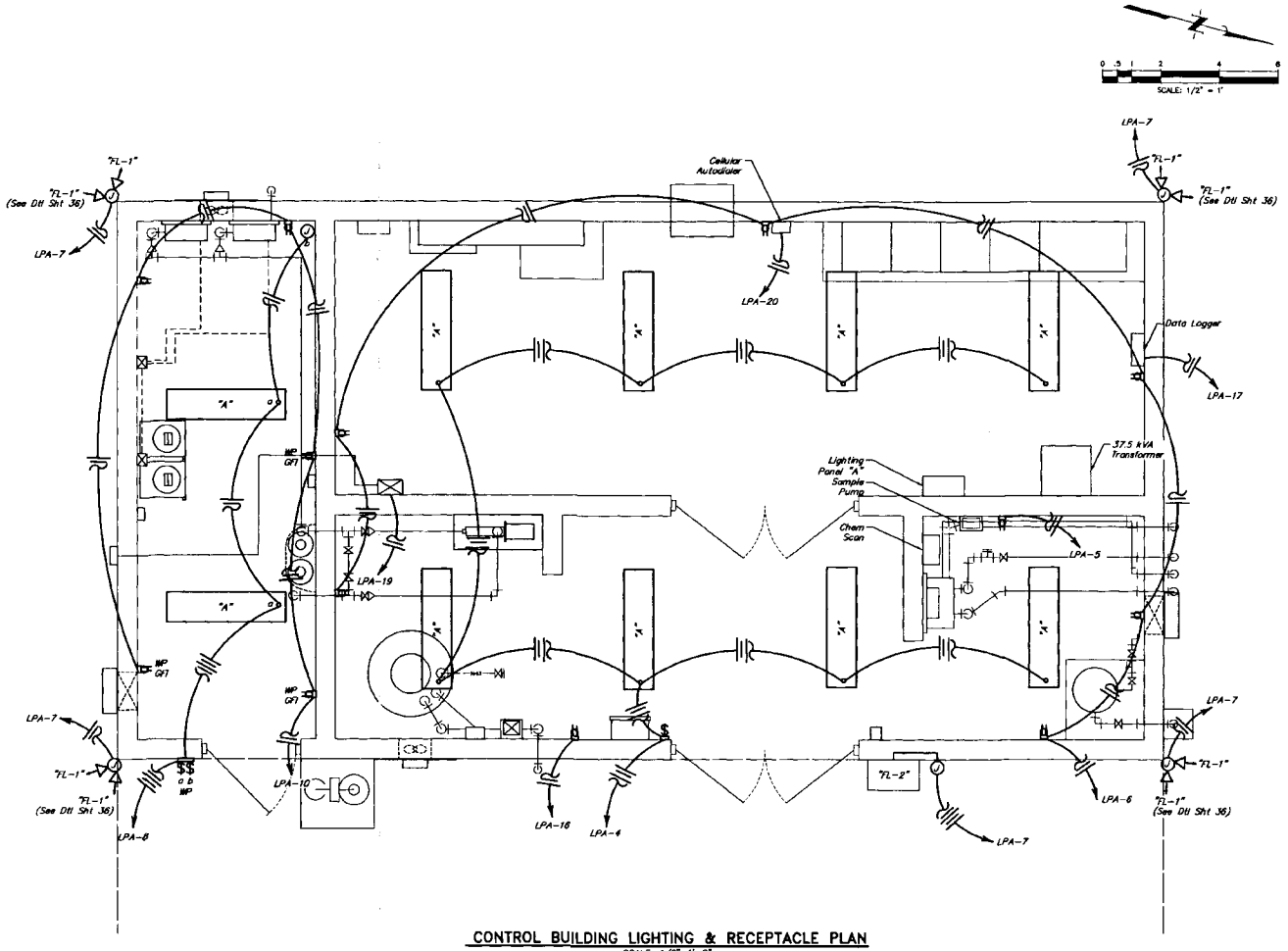
FILE NO:
JOB NO: 05133-0209-00

DATE: OCTOBER 2015
DSN. BY: MCN
DWG. BY: MAK
SCALE: 1/2" = 1'-0"
SHEET No. 34 OF 48

FOR CITY OF HOUSTON USE ONLY
CITY ENGINEER NUMBER 54806

STATE OF TEXAS
SEAN ERIC NOWLAN
104774
LICENSED PROFESSIONAL ENGINEER
10-30-15

C.O.H. LOG No. 15-1168



CONTROL BUILDING LIGHTING & RECEPTACLE PLAN
SCALE: 1/2"=1'-0"

NOTES:

1. Install exterior receptacles a maximum of two (2) ft. from finished grade. Secure conduit and receptacle to control building using stainless steel straps.

LEGEND:

o o	PROP LIGHTING FIXTURE (SEE LIGHTING FIXTURE SCHEDULE THIS SHEET FOR DETAILS)
WP GFI	125V/15A GFI TYPE RECEPTACLE WITH A WEATHERPROOF "WHILE-IN-USE" COVER
	125V/20A RECEPTACLE
WP	125V/20A WEATHERPROOF SWITCH
	NEMA 3R JUNCTION BOX

APPROVED: DeWayne Dimke for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	9/24	ISSUED FOR CONSTRUCTION	
2	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 300 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

CONTROL BUILDING LIGHTING & RECEPTACLE PLAN

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TRAFFIC & TRANSPORTATION

STORM WATER QUALITY

FACILITIES

SHEET & GRADE

FILE NO:
JOB NO: 0133-0208-00

DATE: OCTOBER 2015
DSN. BY: MCM
DWG. BY: MAK

SCALE: 1/2" = 1'-0"

SHEET No. 35 OF 46

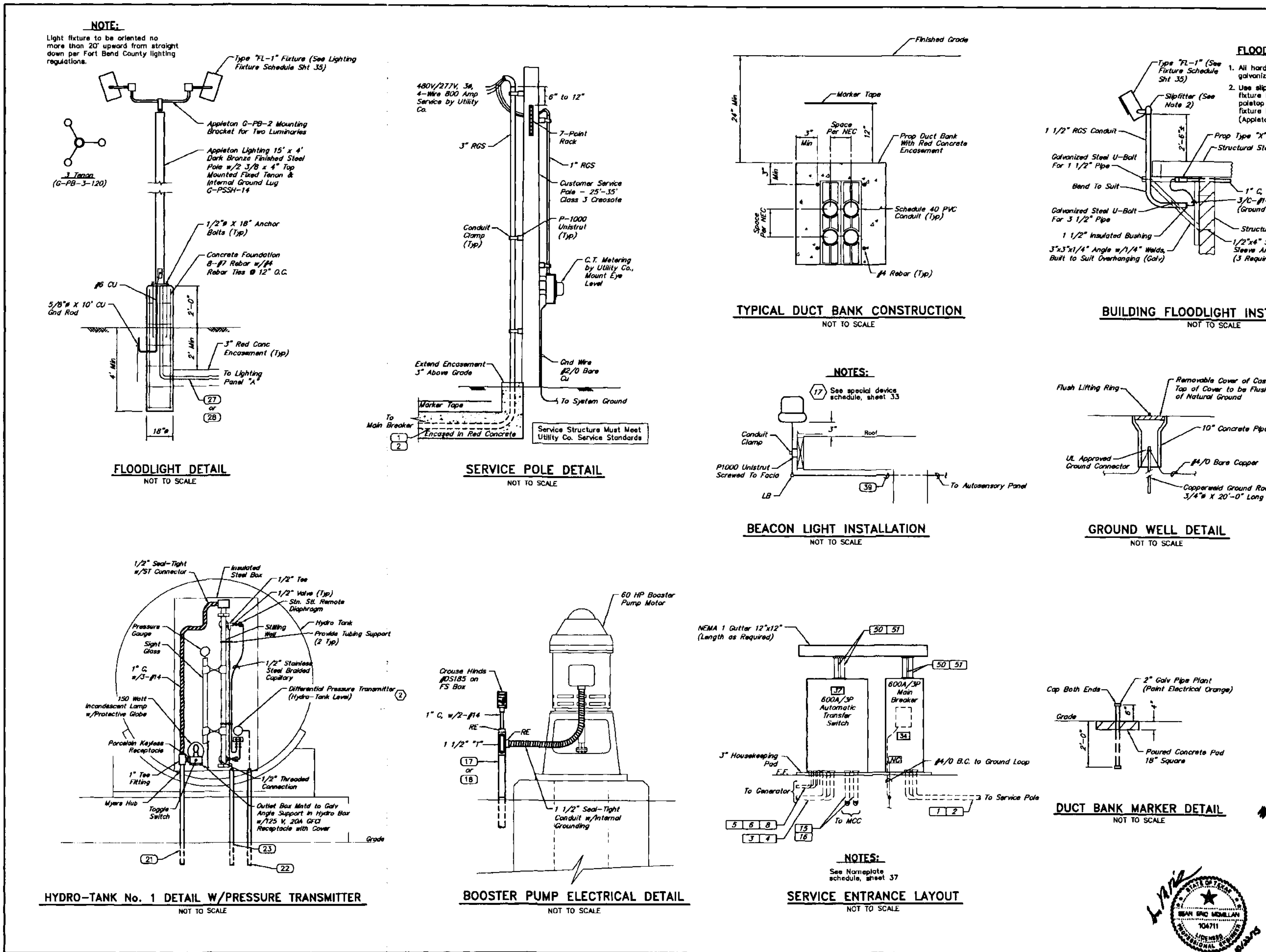
FOR CITY OF HOUSTON USE ONLY
CITY CONT. NO. 54993

TYPE	MANUFACTURER	VOLTAGE	MOUNTING	LAMPS NO.	LAMPS TYPE	REMARKS
A	LITHONIA SB-2-32-MVOLT-GEB10IS	120	CEILING	2	LED T-8	2 LAMP ENCLOSED STRIP
FL-1	APPLETON AMLED77-BUI1-D W/POLE TOP SLIPFITTER AND VANDAL SHIELD (G-AM-6-VS)	120	SLIP-FITTER	1	LED 13,500 LUMENS	AREAMASTER W/VANDAL SHIELD, SEE DETAIL SHT. xx FOR USE ON FILTER CANOPY
FL-2	LITHONIA OLW-23	120	WALL	1	2720 LUMENS	2 LAMP ENCLOSED

LUIS A. PIÑA — STATE OF TEXAS — 104711 — LICENSED PROFESSIONAL ENGINEER — 12-3-15

C.O.H. LOG No. 15-1188

CONFORMED DOCUMENTS


NOTE:
Light fixture to be oriented no more than 20° upward from straight down per Fort Bend County lighting regulations.
Type "FL-1" Fixture (See Lighting Fixture Schedule Sht 35)
Appleton G-PB-2 Mounting Bracket for Two Luminaries
3 Tenon (G-PB-3-120)
Appleton Lighting 15' x 4' Dark Bronze Finished Steel Pole w/2 3/8 x 4" Top Mounted Fixed Tenon & Internal Ground Lug G-PSSH-14
1/2"ø X 18" Anchor Bolts (Typ)
Concrete Foundation 8-#7 Rebar w/#4 Rebar Ties @ 12" O.C.
#6 CU
5/8"ø X 10' CU Gnd Rod
3" Red Conc Encasement (Typ)
To Lighting Panel "A"
27 or 28
18"ø
FLOODLIGHT DETAIL
NOT TO SCALE
480V/277V, 3ø, 4-Wire 800 Amp Service by Utility Co.
6" to 12"
7-Point Rack
3" RGS
1" RGS
Customer Service Pole - 25'-35' Class 3 Creosote
P-1000 Unistrut (Typ)
Conduit Clamp (Typ)
C.T. Metering by Utility Co., Mount Eye Level
Extend Encasement 3" Above Grade
Gnd Wire #2/0 Bare Cu
To System Ground
Marker Tape
To Main Breaker
Encased in Red Concrete
Service Structure Must Meet Utility Co. Service Standards
SERVICE POLE DETAIL
NOT TO SCALE
Finished Grade
24" Min
Marker Tape
Space Per NEC
3" Min
Prop Duct Bank With Red Concrete Encasement
Schedule 40 PVC Conduit (Typ)
#4 Rebar (Typ)
TYPICAL DUCT BANK CONSTRUCTION
NOT TO SCALE
Type "FL-1" (See Fixture Schedule Sht 35)
Slipfitter (See Note 2)
1 1/2" RGS Conduit
Prop Type "X" Conduit Body
Structural Steel Roof Beam
Galvanized Steel U-Bolt For 1 1/2" Pipe
Bend To Suit
1" C, w/2-#12
3/C-#14 S.O. Cord (Ground Fixture)
Galvanized Steel U-Bolt For 3 1/2" Pipe
Structural Steel Beam
1 1/2" Insulated Bushing
3"x3"x1/4" Angle w/1/4" Welds, Built to Suit Overhanging (Galv)
1/2"x4" Stainless Steel Sleeve Anchors (3 Required)
FLOODLIGHT NOTES:
1. All hardware to be hot dip galvanized.
2. Use slipfitter for single fixture installation, use polestop bracket for two fixture installation (Appleton #G-PB-2).
BUILDING FLOODLIGHT INSTALLATION
NOT TO SCALE
NOTES:
17 See special device schedule, sheet 33
Conduit Clamp
Roof
P1000 Unistrut Screwed To Facia
LB
39
To Autosensory Panel
BEACON LIGHT INSTALLATION
NOT TO SCALE
Flush Lifting Ring
Removable Cover of Cast Iron, Top of Cover to be Flush w/Top of Natural Ground
10" Concrete Pipe
UL Approved Ground Connector
#4/0 Bare Copper
Copperweld Ground Rod 3/4"ø X 20'-0" Long
GROUND WELL DETAIL
NOT TO SCALE
1/2" Seal-Tight w/ST Connector
Insulated Steel Box
1/2" Tee
1/2" Valve (Typ)
Stn. Stl. Remote Diaphragm
Hydro Tank
Stilling Well
Provide Tubing Support (2 Typ)
Pressure Gauge
Sight Glass
1" C, w/3-#14
1/2" Stainless Steel Braided Capillary
Differential Pressure Transmitter (Hydro-Tank Level)
150 Watt Incandescent Lamp w/Protective Globe
Porcelain Keyless Receptacle
1" Tee Fitting
1/2" Threaded Connection
Myers Hub
Toggle Switch
Outlet Box Mntd to Galv Angle Support in Hydro Box w/125 V, 20A GFCI Receptacle with Cover
Grade
21
22
23
HYDRO-TANK No. 1 DETAIL W/PRESSURE TRANSMITTER
NOT TO SCALE
60 HP Booster Pump Motor
Crouse Hinds #DS185 on FS Box
1" C, w/2-#14
RE
1 1/2" "T"
17 or 18
1 1/2" Seal-Tight Conduit w/Internal Grounding
BOOSTER PUMP ELECTRICAL DETAIL
NOT TO SCALE
NEMA 1 Gutter 12"x12" (Length as Required)
50 51
600A/3P Automatic Transfer Switch
600A/3P Main Breaker
3" Housekeeping Pad
F.F.
To Generator
To MCC
#4/0 B.C. to Ground Loop
To Service Pole
NOTES:
See Nameplate schedule, sheet 37
SERVICE ENTRANCE LAYOUT
NOT TO SCALE
Cap Both Ends
2" Galv Pipe Plant (Paint Electrical Orange)
Grade
2'-0"
Poured Concrete Pad 18" Square
DUCT BANK MARKER DETAIL
NOT TO SCALE

APPROVED: [signature] Dir F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
3	12/22	ISSUED FOR CONSTRUCTION	
2	11/1	REV. PER ADD. No. 2	
1	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

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Texas Board of Professional Engineers Registration No. F-439
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WATER PLANT No. 3 – PHASE I

ELECTRICAL DETAILS
SHEET 1 OF 3

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

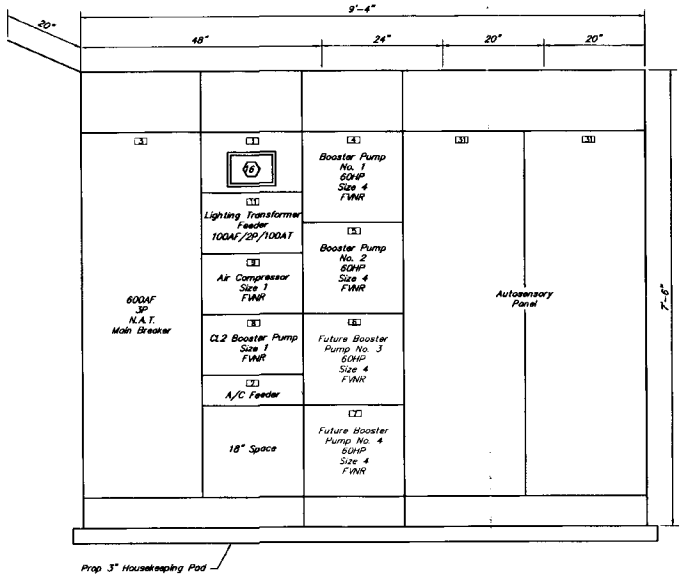
FILE NO:
JOB NO: 05133-0208-00
DATE: OCTOBER 2015
DSN BY: NCM
DRG BY: MAK
SCALE: AS SHOWN
SHEET No. 36 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG No.
54993

BEAN ERIC MCMILLAN
104711
LICENSED PROFESSIONAL ENGINEER

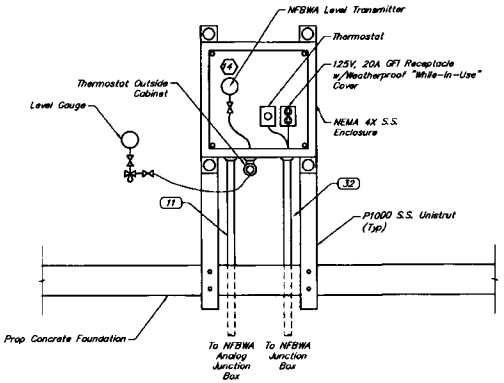
C.O.H. LOG No. 15-1168

CONFORMED DOCUMENTS



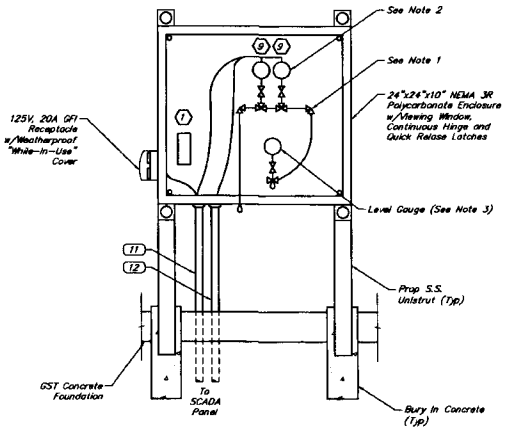
MOTOR CONTROL CENTER ELEVATION

SCALE: 1" = 1'-0"



NFBWA GST LEVEL TRANSMITTER ENCLOSURE DETAIL

NOT TO SCALE

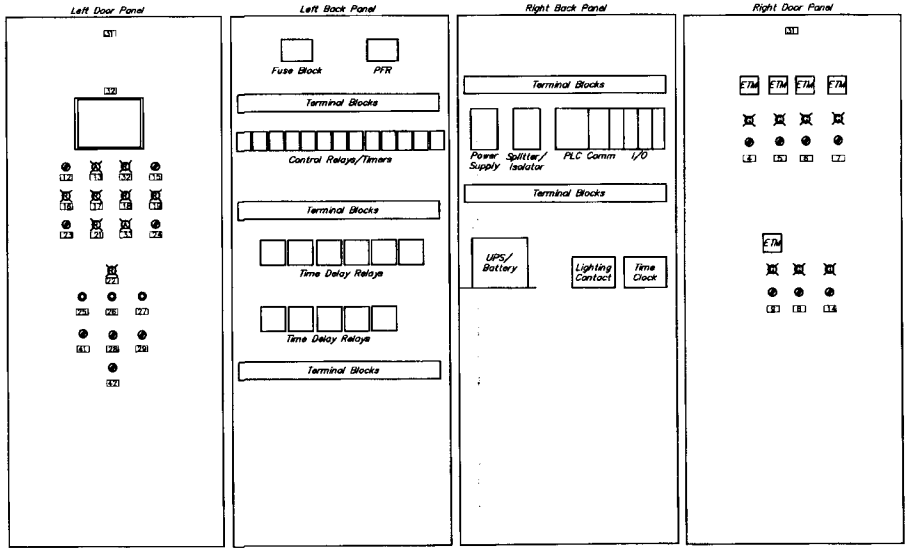


GST PRESSURE ENCLOSURE DETAIL

NOT TO SCALE

NOTES:

1. Contractor shall install 304 stainless steel tubing with stainless steel swagelok fittings and ball valves (typical).
2. Provide manufacturers panel mount support for mounting to interior back panel of enclosure.
3. See Civil Sheets for level gauge location.



AUTOSENSORY PANEL

NOT TO SCALE

NAMEPLATE SCHEDULE

NO.	DESCRIPTION	NO.	DESCRIPTION
1	POWER MONITOR	20	NOT USED
2	AIR CONDITIONER FEEDER	21	CL2 ALARM
3	MAIN BREAKER	22	PLC FAIL
4	BOOSTER PUMP NO. 1	23	ROTATING BEACON ON-OFF
5	BOOSTER PUMP NO. 2	24	ALARM BELL ON-OFF
6	FUTURE BOOSTER PUMP NO. 3	25	ALARM SILENCE
7	FUTURE BOOSTER PUMP NO. 4	26	ALARM TEST
8	CL2 BOOSTER PUMP	27	ALARM RESET
9	AIR COMPRESSOR	28	CONTROL MODE SELECTOR
10	NOT USED	29	FLOODLIGHTS H-O-A
11	37.5 KVA TRANSFORMER FEEDER	30	HMI
12	PHASE FAILURE RELAY BYPASS	31	AUTOSENSORY PANEL
13	CONTROL POWER	32	GENERATOR ALARM
14	SAMPLE PUMP	33	PLC CONTROL
15	EXTRA LOW LEVEL GST BYPASS	34	MAIN DISCONNECT
16	GST EXTRA LOW LEVEL ALARM	35	HYDRO TANK AIR FEED
17	GST LOW LEVEL ALARM	36	PRIMARY BACKUP
18	GST HIGH LEVEL ALARM	37	AUTOMATIC TRANSFER SWITCH
19	HYDRO-TANK HIGH LEVEL ALARM		

NOTE:

Nameplates shall be constructed from laminated plastic material a minimum of 1/16" thick. Letters shall be gothic 3/16" high minimum, use two lines if description will cause length to exceed 2 1/2". Alarm nameplates shall be white letters on red background; others shall be white letters on black background. Affix nameplates to panel using self-tapping stainless steel screws. Submit details of Autosensory Panel including, but not limited to, dimensional drawings, nameplate schedule, wiring out panel layout, back panel layout and wiring and control schematics. These shall be included as part of Specification No. 01300.

APPROVED: DeWayne Dini for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
2	12/15	ISSUED FOR CONSTRUCTION	MM
1	10/22	ISSUED FOR BIDDING	MM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

ELECTRICAL DETAILS SHEET 2 OF 3

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER & WASTEWATER
12-2-15
STORM WATER QUALITY
ROADWAY
STREET & BRIDGE
PROJECT NO. 104915

FILE NO:
JOB NO: 05133-0308-00

DATE: OCTOBER 2015
DGN. BY: WCM
CHK. BY: MM

SCALE: AS SHOWN

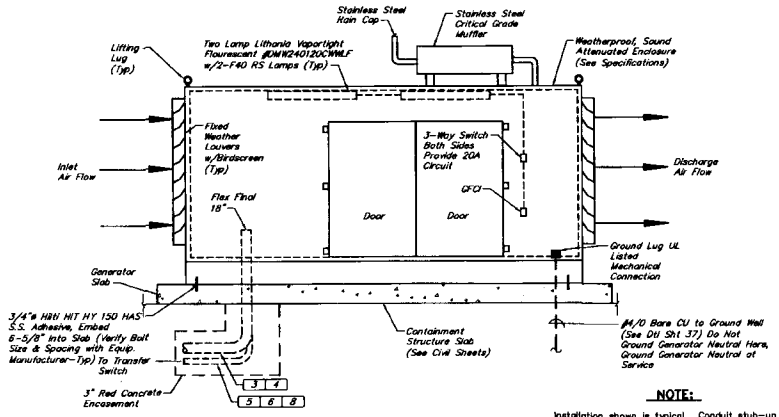
SHEET No. 37 OF 48

FOR CITY OF HOUSTON USE ONLY
CITY ENG. No. 54993

STATE OF TEXAS
SEAN ERIC MCMILLAN
104711
LICENSED PROFESSIONAL ENGINEER
12/3/15

C.O.H. LOG No. 15-1168

CSH ELE REV. JUL 2008

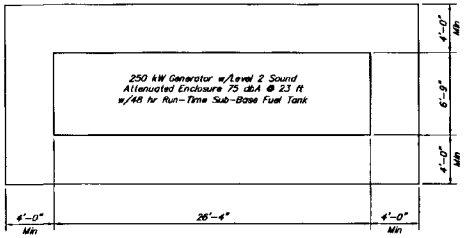


GENERATOR INSTALLATION DETAIL

NOT TO SCALE

NOTE:

Installation shown is typical. Conduit stub-up location, panel access, orientation, and controls may vary according to generator manufacturer. Modify installation accordingly.

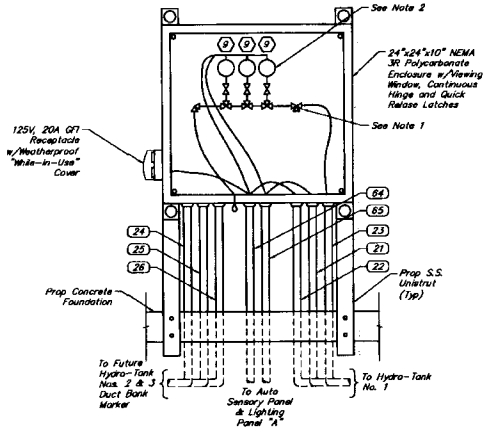


GENERATOR PLAN VIEW

SCALE: 1"=5'

NOTE:

1. See structural sheets for details.

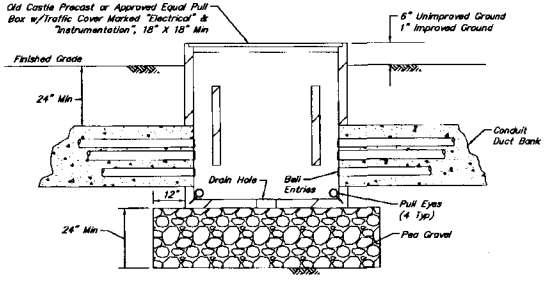


NOTES:

1. Contractor shall install 304 stainless steel tubing with stainless steel swagelok fittings and ball valves (typical).
2. Provide manufacturers panel mount support for mounting to interior back panel of enclosure.

HYDRO-TANK PRESSURE ENCLOSURE DETAIL

NOT TO SCALE



ELECTRICAL PULL BOX INSTALLATION

NOT TO SCALE

APPROVED: DeWayne Dai for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/24	ISSUED FOR CONSTRUCTION	
0	10/22	ISSUED FOR BIDDING	

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WATER PLANT No. 3 – PHASE I

ELECTRICAL DETAILS SHEET 3 OF 3

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

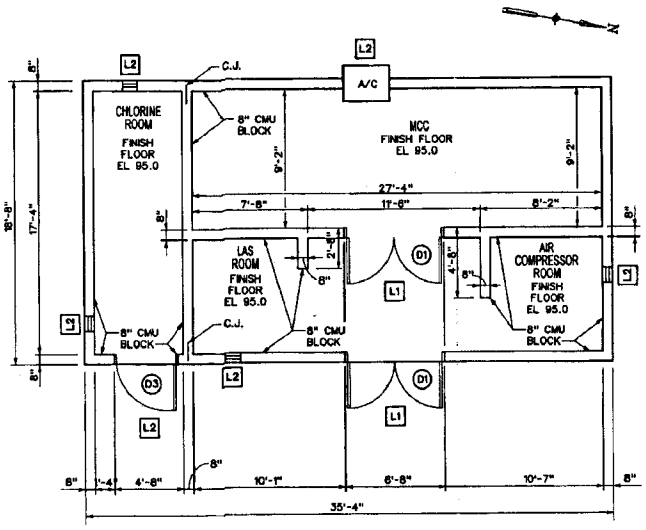
CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

FILE NO:	
JOB NO:	06133-0208-00
DATE:	OCTOBER 2015
DSN. BY:	MCM
DRG. BY:	MAK
SCALE:	AS SHOWN
SHEET No.	38 OF 46

FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54998

STATE OF TEXAL SEAN ERIC MCMILLAN 104711 LICENSED PROFESSIONAL ENGINEER 12/04/15

C.O.H. LOG No. 15-1168



1. WALL PLAN
SCALE: 1/4"-1'-0"

STRUCTURAL NOTES:

1. THE STRUCTURAL DRAWINGS AS PRESENTED HEREIN HAVE BEEN PREPARED TO CONFORM TO THE INTERNATIONAL BUILDING CODE.
2. THE DESIGN ROOF LIVE LOAD ASSUMED FOR THIS PROJECT IS 20 PSF; THE DESIGN FLOOR LOAD ASSUMED IS 520 PSF (DEAD AND LIVE LOAD). THE ULTIMATE WIND PRESSURE ON THE STRUCTURE WAS BASED ON A BASIC WIND VELOCITY OF 120 MPH.

STRUCTURAL AND REINFORCING STEEL NOTES:

1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE FOR STEEL CONSTRUCTION (AISC) SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
2. STRUCTURAL STEEL PLATES AND ANGLE SECTIONS SHALL CONFORM TO THE ASTM DESIGNATION A36, HAVING A MINIMUM YIELD STRENGTH OF 36 KSI.
3. ALL WELDED CONNECTIONS SHALL BE SHOP FABRICATED AND CONSTRUCTED USING E70XX SERIES ELECTRODES; SAID WORK SHALL CONFORM TO THE STRUCTURAL WELDING CODE OF THE AMERICAN WELDING SOCIETY.
4. ALL REINFORCING STEEL SHALL BE GRADE 60 STEEL AS PER ASTM A615 "STANDARD SPECIFICATION FOR DEFORMED AND PLAIN CARBON-STEEL BARS FOR CONCRETE REINFORCEMENT". ALL LAP SPLICES FOR CONTINUOUS REINFORCING SHALL BE 30 BAR DIAMETERS UNLESS OTHERWISE SPECIFIED. ALL REINFORCING SHOWN TO BE HOOKED SHALL HAVE STANDARD HOOKS AS PER ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT".

PRECAST CONCRETE SLAB UNIT NOTES:

1. SUPERIMPOSED LOADS THAT SHALL BE CONSIDERED IN THE DESIGN AND FABRICATION OF THE HOLLOW-CORE PRESTRESSED CONCRETE PLANKS SHALL INCLUDE THE FOLLOWING:
   A. SELF-WEIGHT OF SLAB UNIT
   B. 25 PSF DEAD LOAD
   C. 20 PSF LIVE LOAD
2. SHOP DRAWING FOR EACH TYPE OF PRECAST SECTION SHALL BE SUBMITTED SHOWING SETTING PLAN, SECTION DIMENSIONS AND PROPERTIES, REINFORCING AND RELATED DETAILS. DESIGN CALCULATIONS FOR PRESTRESSED UNITS SHALL BE PREPARED AND SEALED BY A TEXAS LICENSED PROFESSIONAL ENGINEER AND SUBMITTED WITH THE SHOP DRAWINGS.

CONCRETE MASONRY UNIT NOTES:

1. MASONRY CONSTRUCTION SHALL CONFORM TO ACI 530, "BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES". THE COMPRESSIVE STRENGTH OF MASONRY SHALL BE 1,500 PSI.
2. REINFORCED CMU WALL CONSTRUCTION SHALL CONSIST OF WALL BLOCKS CONFORMING TO ASTM C90 STANDARD SPECIFICATIONS FOR LOAD-BEARING CONCRETE MASONRY UNITS.
3. MORTAR FOR MASONRY WORK SHALL BE TYPE S MORTAR BY PROPORTION IN ACCORDANCE WITH ASTM C270 STANDARD SPECIFICATION FOR MORTAR FOR UNIT MASONRY. GROUT FOR MASONRY SHALL BE COARSE GROUT BY PROPORTION IN ACCORDANCE WITH ASTM C476 STANDARD SPECIFICATION FOR GROUT FOR MASONRY.
4. CONTINUOUS WIRE JOINT REINFORCEMENT CONFORMING TO ASTM A-82 SHALL BE USED WITH EVERY OTHER COURSE (16" MAXIMUM SPACING) OF CONCRETE BLOCKS. WITH THE FIRST LAYER OF SAID REINFORCEMENT BEING INSTALLED BETWEEN THE FIRST AND SECOND COURSE OF CONCRETE BLOCKS. MINIMUM 6" LAP SHALL BE PROVIDED AT THE JOINING OF WIRE JOINT REINFORCEMENT SECTIONS.
5. THE MASONRY WALLS SHALL BE PAINTED BOTH INSIDE AND OUTSIDE AS FOLLOWS. APPLY "DEVOE BLOXFIL 4000 INT./EXT. HEAVY DUTY ACRYLIC BLOCK FILLER," OR APPROVED EQUAL, AT THE RATE OF 50-75 SQ.FT. PER GALLON OR AS TO FILL AND SMOOTH THE SURFACE OF THE MASONRY AFTER MORTAR JOINTS HAVE CURED AT LEAST 30 DAYS. TWO COATS OF PAINT (DEVOE DEVFLEX 4206 INTERIOR/EXTERIOR WATERBORNE ACRYLIC SEMI-GLOSS ENAMEL OR APPROVED EQUAL) SHALL BE APPLIED AFTERWARDS AT THE RATE OF 330-430 SQ.FT. PER GALLON. ALL WORK SHALL BE PERFORMED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
6. FLOOR SHALL BE PAINT COATED USING COATING SYSTEM DC 11 PER DEVOE OR APPROVED EQUAL, WHICH SHALL CONSIST OF PRE-PRIME 167 PENETRATING SEALER WITH DEVRAN 124 CHEMICAL RESISTANT FLOOR COATING. PREPARATION OF SUBSTRATE AND MIL THICKNESS OF EACH COATING APPLICATION SHALL BE AS PER MANUFACTURER'S REQUIREMENTS.

TIMBER NOTES:

1. ALL TIMBER BOLTING SHALL BE DESIGNATED A307 USING HEX NUTS AND WASHERS (UNLESS OTHERWISE NOTED). BOLT HOLES SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER. NUTS SHOULD BE TIGHTENED SNUGLY, BUT NOT SO TIGHTLY AS TO CAUSE CRUSHING OF THE WOOD UNDER THE WASHER OR PLATE.
2. LUMBER USED FOR THE FASCIA NAILING BOARD SHALL BE PRESERVATIVELY PRESSURE TREATED IN ACCORDANCE WITH AWPA STANDARDS.

ROOF NOTES:

1. ROOFING SYSTEM SHALL BE AN ASPHALT GLASS-FIBER FELT 4-PLY ROOF MEMBRANE WITH AGGREGATE SURFACE AS PER SECTION ENTITLED, "BUILT-UP ROOFING".
2. ROOFING CONTRACTOR SHALL BE A CERTIFIED INSTALLER WITH MANUFACTURER OF ROOFING SYSTEM AND SHALL PRESENT EVIDENCE OF SUCH CERTIFICATION PRIOR TO THE ROOF SYSTEM'S PLACEMENT.
3. CONTRACTOR SHALL PRESENT A ROOF SYSTEM SAMPLE AND TECHNICAL DATA AND SPECIFICATIONS, ALONG WITH A COPY OF THE MANUFACTURER'S WARRANTY AGREEMENT FOR APPROVAL.
4. CONTRACTOR SHALL ADHERE TO THE ROOF SYSTEM AND RIGID INSULATION MANUFACTURER'S REQUIREMENTS FOR INSTALLATION. CONTRACTOR SHALL PROVIDE, FOR APPROVAL, TERMINATION AND FLASHING DETAILS THAT ARE ACCEPTABLE BY THE MANUFACTURER.
5. CONTRACTOR SHALL MAKE ARRANGEMENTS TO HAVE THE ROOF SYSTEM MANUFACTURER'S REPRESENTATIVE VISIT THE JOB SITE TO ASCERTAIN COMPLIANCE OF MANUFACTURER'S REQUIREMENTS FOR INSTALLATION.

LINTEL SCHEDULE

MARK	SIZE	SPAN	REMARKS
L1	16" high; 2-#5 AT BOTTOM; 8" wide; 1½"	6'-8" (MAX. OPENING)	AT MCC ROOM EXTERIOR DOUBLE DOOR OPENING
L2	2-#5 AT BOTTOM; 8" high; 8" wide; 1½"	2'-8" (MAX. OPENING)	AT MCC INTERIOR DOOR & A.C. OPENING, AT AIR COMPRESSOR ROOM EXTERIOR DOOR. AT CHLORINE ROOM EXTERIOR DOOR, EXHAUST OPENING AND SUPPLY FAN

DOOR SCHEDULE

MARK	SIZE	HARDWARE	REMARKS
D1	DOUBLE 3' X 9' DOOR	2- SET BUTT HINGES 2- DOOR STOPS AND HOLDERS 1- HIGH QUALITY HASP 2- FLUSH BOLTS 1- DUSTPROOF STRIKE 1- LATCH SET SCHLAGE C SERIES	STEEL HOLLOW METAL, FLUSH 18 GA. FACES, FLUSH TOP. POLYSTYRENE CORE INSUL. GAL. & SHOP PRIMED. THRESHOLD & WEATHER STRIPING TO BE PROVIDED.
D2	3' X 9' DOOR	1- SET BUTT HINGES 1- DOOR STOPS & HOLDER 1- FLUSH BOLTS 1- LATCH SET SCHLAGE C SERIES	NOT USED
D3	3' X 9' DOOR	STAINLESS STEEL HARDWARE. 1- SET S.S. HINGES, STANLEY FBB191 1- SET S.S. PANIC HARDWARE 1- LATCH SET SCHLAGE C SERIES	CORROSION RESISTANT FIBERGLASS REINFORCED PLASTIC DOOR AND FRAME WITH STAINLESS STEEL HARDWARE. 20" x 20" WIRE SAFETY GLASS WINDOW.

NO.	DATE	REVISIONS	APP.
1	11/15	ISSUED FOR CONSTRUCTION	[illegible]
0	10/22	ISSUED FOR BIDDING	[illegible]

GRAND MISSION M.U.D. No. 1

Costello

JONES | CARTER

WATER PLANT No. 3 – PHASE I

MCC BUILDING FLOOR PLAN, NOTES AND SCHEDULES

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

S1

FILE NO:
JOB NO: 05133-0208
DATE: OCT 2015
DSN. BY:
DWG. BY:
SCALE:
SHEET No. 39 OF 46

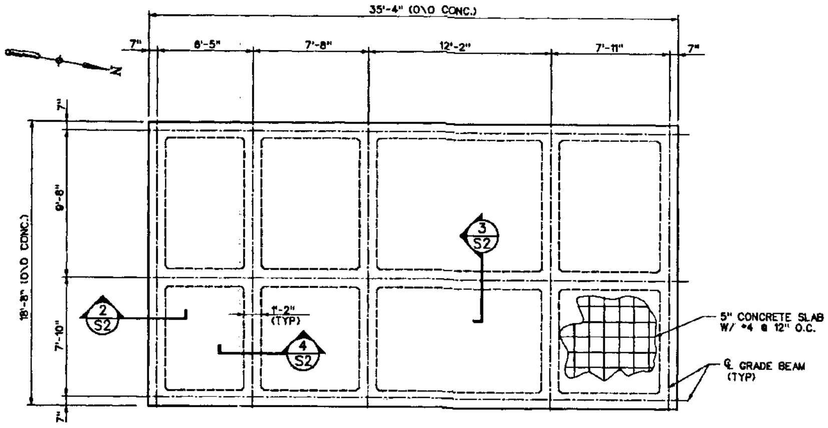
FOR CITY OF HOUSTON USE ONLY
CITY DWG NO.
54993

CORBETT L. FREEMAN 86913 LICENSED PROFESSIONAL ENGINEER
10/22/15

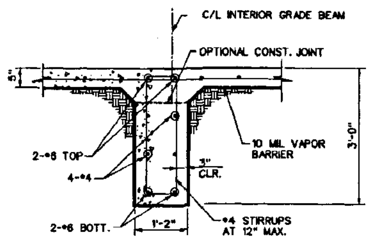
12/3/15

C.O.H. LOG No. 15-1168

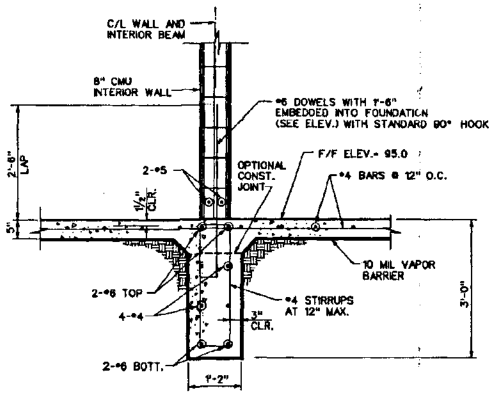
CONFORMED DOCUMENTS



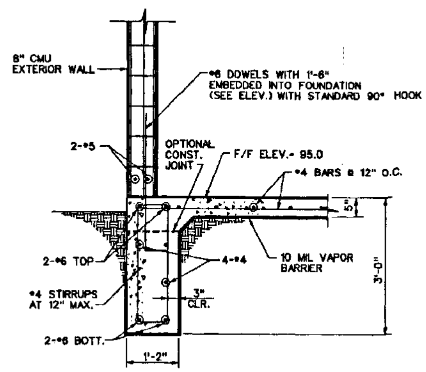
1 FOUNDATION PLAN
SCALE : 1/4" = 1'-0"



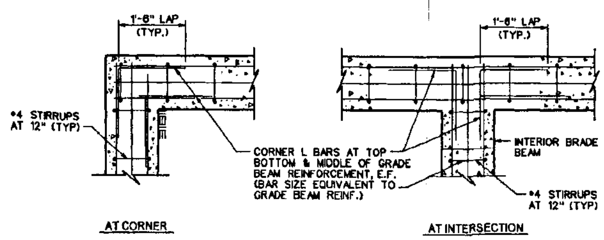
3 INTERIOR GRADE BEAM
SCALE : 3/4" = 1'-0"



4 INTERIOR GRADE BEAM AT WALL
SCALE : 3/4" = 1'-0"



2 EXTERIOR GRADE BEAM
SCALE : 3/4" = 1'-0"



5 GRADE BEAM CORNER DETAILS
SCALE : 3/4" = 1'-0"

BUILDING FOUNDATION NOTES:

1. FOR MOTOR CONTROL BUILDING SLAB-ON-GRADE FOUNDATION, EXCAVATE TO 4 FEET BELOW EXISTING GRADE. EXCAVATION LIMITS SHALL EXTEND AT LEAST 3 FEET BEYOND BUILDING LINE. COMPACT THE UPPER 8 INCHES AT THE BASE OF THE EXCAVATION CUT TO 97% ASTM D698 WITHIN PLUS OR MINUS 2% OF OPTIMUM MOISTURE. FILL WITH SELECT FILL TO FINAL PAD GRADE. THE UPPER 12 INCHES OF FILL IN UNPAVED AREAS ADJACENT TO THE BUILDING SHALL CONSIST OF ON-SITE CLAY COMPACTED IN 8-INCH LIFTS TO 95% ASTM D698. COMPACT SELECT FILL IN 8-INCH LIFTS TO 97% ASTM D698 WITHIN PLUS OR MINUS 2% OF OPTIMUM MOISTURE.
2. SELECT FILL SHALL BE OF LOW TO MODERATE SHRINK-SWELL POTENTIAL AS DEFINED BY THE TEX 124-E FOR DETERMINING POTENTIAL VERTICAL RISE. SAID SELECT FILL SHALL HAVE A PLASTICITY INDEX LESS THAN 30. THE PAD OF SELECT FILL SHALL SLOPE AWAY FROM THE STRUCTURE FOR PROPER DRAINAGE.

CONCRETE NOTES:

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE PROJECT SPECIFICATIONS AND ACI 318 BUILDING CODE FOR REINFORCED CONCRETE. WHERE THE PROJECT SPECIFICATIONS CONFLICTS WITH ACI 318, THE STRICTER SPECIFICATION SHALL GOVERN.
2. ALL CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM 28-DAY STRENGTH OF 3,000 PSI WHEN TESTED IN ACCORDANCE WITH ASTM DESIGNATION C39. CALCIUM CHLORIDE SHALL NOT BE USED AS ADDITIVES.
3. CONCRETE PLACEMENT IN HOT OR COLD WEATHER SHALL CONFORM TO THE PROVISIONS OF ACI 305R OR 306R, RESPECTIVELY.
4. ALL REINFORCING STEEL SHALL BE GRADE 60 STEEL AS PER ASTM A615. ALL LAP SPLICES FOR CONTINUOUS REINFORCING STEEL SHALL BE 30 BAR DIAMETERS UNLESS OTHERWISE SPECIFIED. ALL REINFORCING SHOWN TO BE HOOKED SHALL HAVE STANDARD HOOKS AS PER ACI 315.
5. VAPOR BARRIER MEMBRANE FOR FOUNDATION CONSTRUCTION SHALL BE 10-MIL POLYETHYLENE. JOINTS ALONG SAID MEMBRANE SHALL BE LAPPED 6 INCHES AND SEALED WITH ADHESIVE TO PROVIDE A CONTINUOUS MOISTURE BARRIER UNDER THE ENTIRE SLAB. CARE SHALL BE TAKEN NOT TO PUNCTURE MEMBRANE.
6. ANCHOR BOLTS SHALL CONFORM TO ASTM A193 B8 CLASS 2 STAINLESS STEEL.
7. THE LATEST REVISIONS OF THE FOLLOWING AMERICAN SOCIETY FOR TESTING AND MATERIALS STANDARDS SHALL BE USED FOR REINFORCED CONCRETE MATERIALS:
   1.1 "SPECIFICATION FOR CONCRETE AGGREGATES" (ASTM C33)
   1.2 "SPECIFICATION FOR PORTLAND CEMENT" (ASTM C150)
   1.3 "SPECIFICATION FOR READY-MIXED CONCRETE" (ASTM C94)
   1.4 "SPECIFICATION FOR DEFORMED AND PLAIN CARBON STEEL BARS FOR CONCRETE REINFORCEMENT" (ASTM A615, GRADE 60)

NO.	DATE	REVISIONS	APP.
	11/12	ISSUED FOR CONSTRUCTION	
	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1

Costello

JONES | CARTER

WATER PLANT No. 3 – PHASE I

MCC BUILDING
FOUNDATION PLAN &
STRUCTURAL DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

FOR CITY OF HOUSTON USE ONLY

FILE NO.:
JOB NO.: 05133-0208
DATE: OCT 2015
DSN. BY:
DWG. BY:
SCALE:

S2

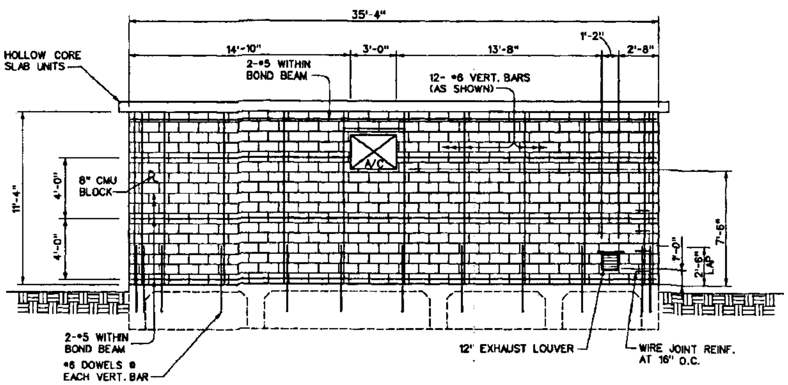
SHEET No. 40 OF 46

C.O.H. LOG No. 15-1168

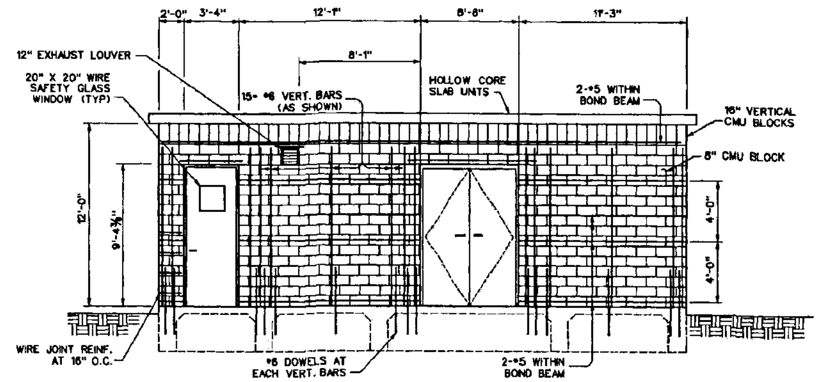
CORBETT L. FREEMAN
86913

T:\Private Clients\2015-147 Water Plants\GRAND MISSION WP 3\DGN\Grand Mission MUD No.1_S2_FOUNDATION.dgn
10/22/2015 8:46:01 AM

CONFORMED DOCUMENTS



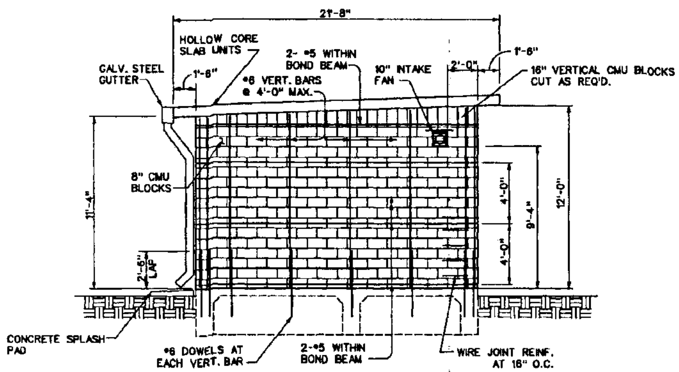
1. WEST BUILDING ELEVATION
SCALE: 1/4"=1'-0"



2'-0"
3'-4"
12'-1"
8'-8"
11'-3"
8'-1"
12" EXHAUST LOUVER
20" X 20" WIRE SAFETY GLASS WINDOW (TYP)
15- #6 VERT. BARS (AS SHOWN)
HOLLOW CORE SLAB UNITS
2-#5 WITHIN BOND BEAM
16" VERTICAL CMU BLOCKS
8" CMU BLOCK
12'-0"
9'-4 3/8"
4'-0"
4'-0"
WIRE JOINT REINF. AT 16" O.C.
#6 DOWELS AT EACH VERT. BARS
2-#5 WITHIN BOND BEAM

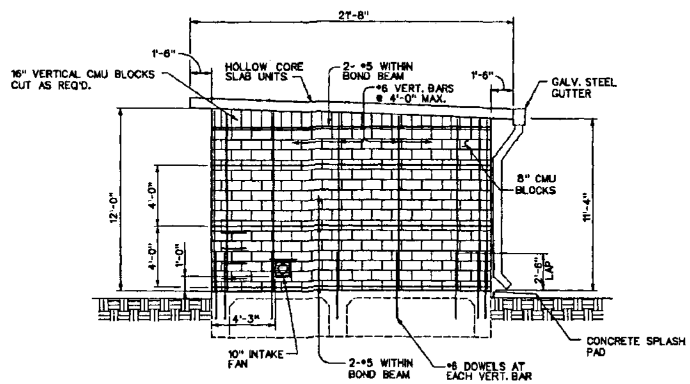
2. EAST BUILDING ELEVATION
SCALE: 1/4"=1'-0"

NOTE: SEE SHEET S1 FOR LINTEL SCHEDULE



27'-8"
HOLLOW CORE SLAB UNITS
2- #5 WITHIN BOND BEAM
#6 VERT. BARS @ 4'-0" MAX.
10" INTAKE FAN
2'-0"
1'-6"
16" VERTICAL CMU BLOCKS CUT AS REQ'D.
GALV. STEEL GUTTER
1'-6"
8" CMU BLOCKS
11'-4"
2'-6" LAP
4'-0"
4'-0"
9'-4"
12'-0"
CONCRETE SPLASH PAD
#6 DOWELS AT EACH VERT. BAR
2-#5 WITHIN BOND BEAM
WIRE JOINT REINF. AT 16" O.C.

3. SOUTH BUILDING ELEVATION
SCALE: 1/4"=1'-0"



4. NORTH BUILDING ELEVATION
SCALE: 1/4"=1'-0"

NO.	DATE	REVISIONS	APP.
1	11/...	ISSUED FOR CONSTRUCTION	TWA
	10/22	ISSUED FOR BIDDING	TWA

GRAND MISSION M.U.D. No. 1

Costello

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WATER PLANT No. 3 – PHASE I

MCC BUILDING ELEVATIONS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

S3

FILE NO:
JOB NO: 05133-0208
DATE: OCT 2015
DGN. BY:
DWG. BY:
SCALE:

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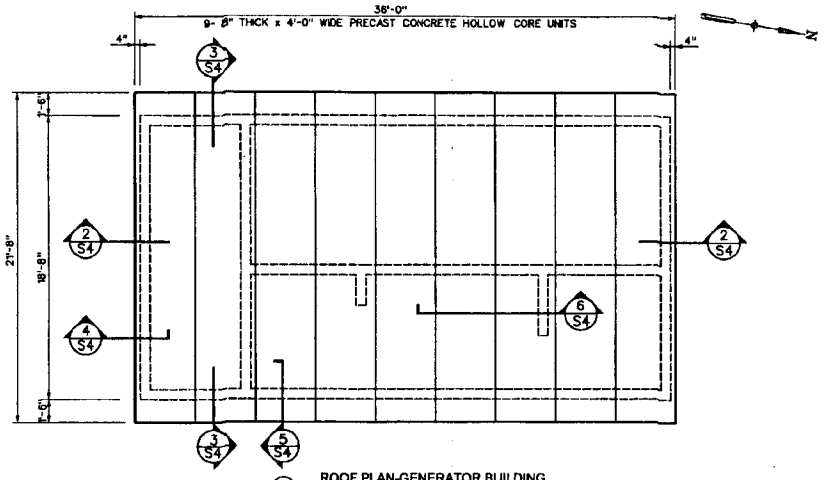
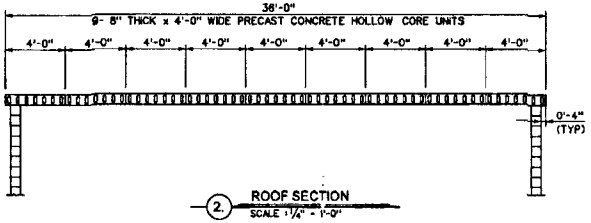
SHEET No. 41 OF 46

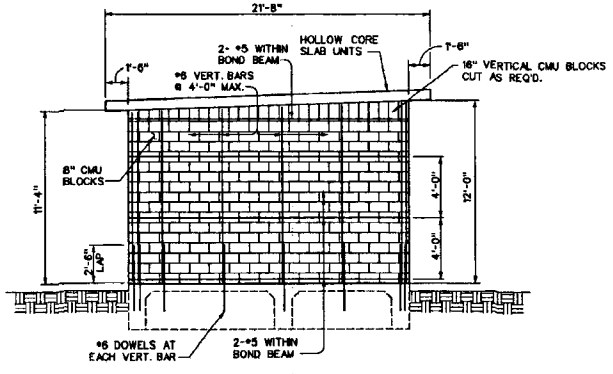
C.O.H. LOG No. 15-1168



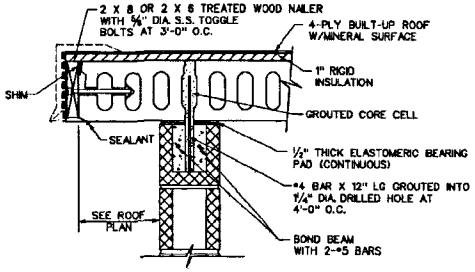
1. ROOF PLAN-GENERATOR BUILDING
SCALE : 1/4" = 1'-0"



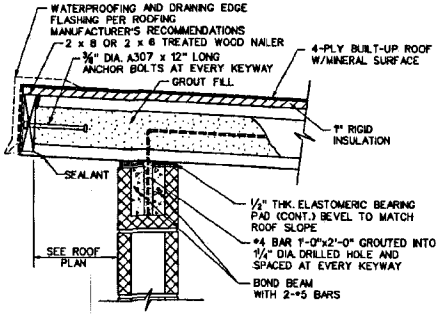
2. ROOF SECTION
SCALE : 1/4" = 1'-0"



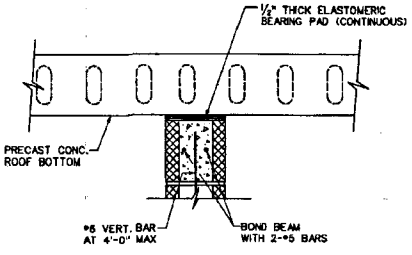
3. ELEVATION AT THE INTERIOR WALL
SCALE : 1/4" = 1'-0"



4. SECTION AT ROOF
SCALE : 1 1/2" = 1'-0"



5. SECTION AT ROOF
SCALE : 1 1/2" = 1'-0"



6. LATERAL BRACE FOR INT. WALL
SCALE : 3" = 1'-0"

12/3/15

NO.	DATE	REVISIONS	APP.
1	11/15	ISSUED FOR CONSTRUCTION	MWA
0	10/22	ISSUED FOR BIDDING	MWA

GRAND MISSION M.U.D. No. 1

Costello
Engineering and Surveying
6500 Rialmont Avenue, Suite 400
North Building
Houston, Texas 77081
(713)783-7784 (713)783-2690, Fax
TBPE FIRM REG. No. 240
TBPLS FIRM REG. No. 101486

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

MCC BUILDING ROOF PLAN & DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WWO: [signature] 10-29-15 — TRAFFIC & WASTEWATER
[signature] 10-29-15 — WATER QUALITY
STORM: [signature] 10-29-15 — HOUSING: [signature] 10/29/15
SHEET # BRIDGE:

FILE NO:
JOB NO. 0633-02-038
DATE: OCT 2015
DGN. BY:
DWN. BY:
SCALE:
SHEET No. 42 OF 46

FOR CITY OF HOUSTON USE ONLY
STRUCTURAL — CITY DIG NO.
54993

S4

STATE OF TEXAS — CORBETT L. FREEMAN — 86913 — LICENSED PROFESSIONAL ENGINEER
10/22/15

C.O.H. LOG No. 15-1168

CSH ELK REV. JAN 2005

T:\Projects Clients\2015-127 Water Plants\GRAND MISSION WP 3\DGN\Grand Mission M.U.D. No. 1_S4_ROOF PLAN.dgn
10/22/2015
8:34:04 AM

CONFORMED DOCUMENTS

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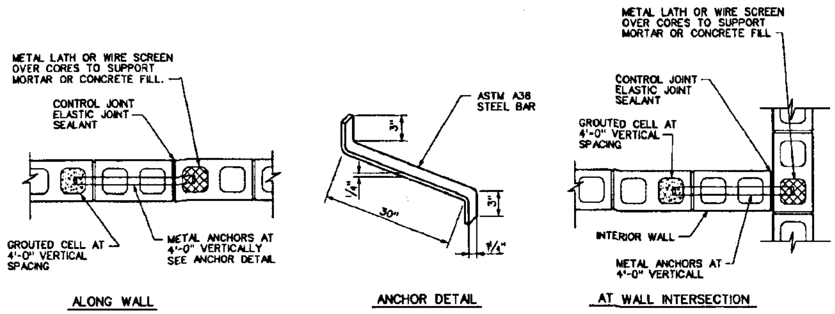
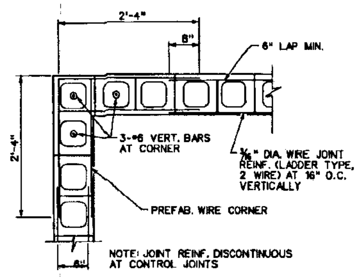
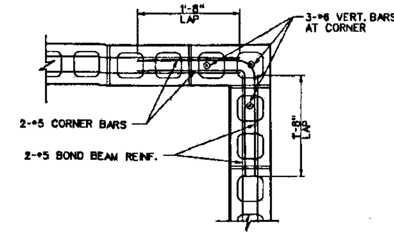


METAL LATH OR WIRE SCREEN OVER CORES TO SUPPORT MORTAR OR CONCRETE FILL.
CONTROL JOINT ELASTIC JOINT SEALANT
GROUTED CELL AT 4'-0" VERTICAL SPACING
METAL ANCHORS AT 4'-0" VERTICALLY SEE ANCHOR DETAIL
ALONG WALL
ASTM A36 STEEL BAR
3"
1/4"
30"
ANCHOR DETAIL
INTERIOR WALL
METAL ANCHORS AT 4'-0" VERTICALL
AT WALL INTERSECTION

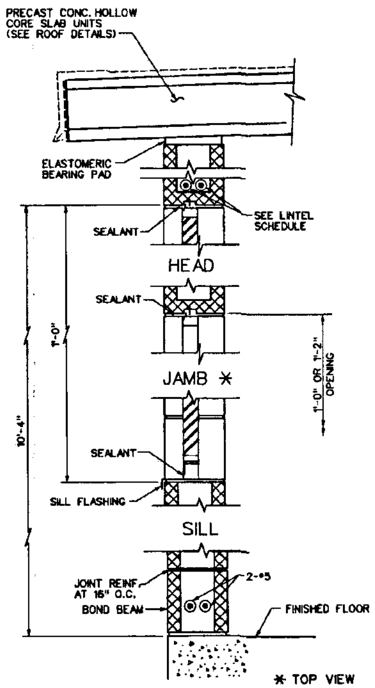
1. CONTROL JOINT DETAILS
SCALE : 1" = 1'-0"



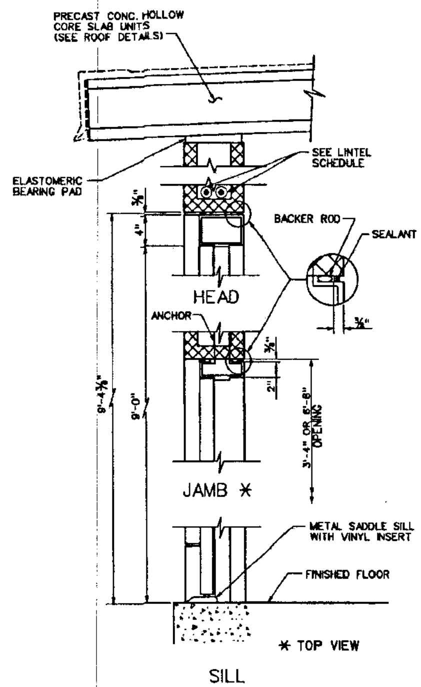
2. CORNER WIRE JOINT REINF.
SCALE : 1" = 1'-0"



3. CORNER BOND BEAM REINF.
SCALE : 1" = 1'-0"



4. LOUVER FRAME SECTION
SCALE : 1 1/2" = 1'-0"



5. DOOR FRAME SECTION
SCALE : 1 1/2" = 1'-0"

12/3/15

NO.	DATE	REVISIONS	APP.
1	12/22	ISSUED FOR CONSTRUCTION	
	10/22	ISSUED FOR BIDDING	

GRAND MISSION M.U.D. No. 1

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Engineering and Surveying

JONES | CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

MCC BUILDING
MISCELLANEOUS
WALL DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

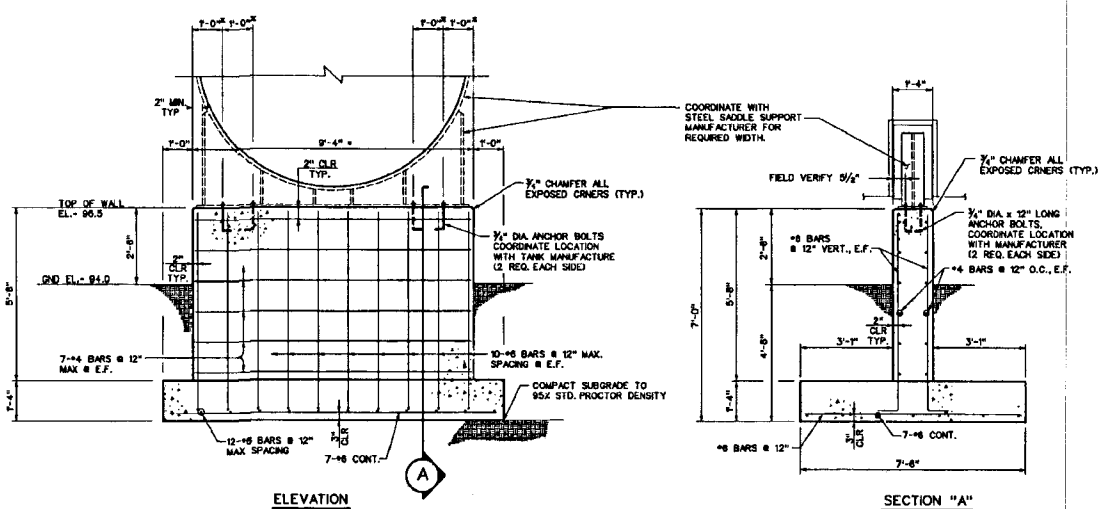
S5

FILE NO.
JOB NO. 05133-0208
DATE: OCT 2015
DGN. BY:
DWG. BY:
SCALE:
SHEET No. 43 OF 46

STATE OF TEXAS
CORBETT L. FREEMAN
86913
LICENSED PROFESSIONAL ENGINEER
10/22/15

FOR CITY OF HOUSTON USE ONLY
54993

C.O.H. LOG No. 15-1168



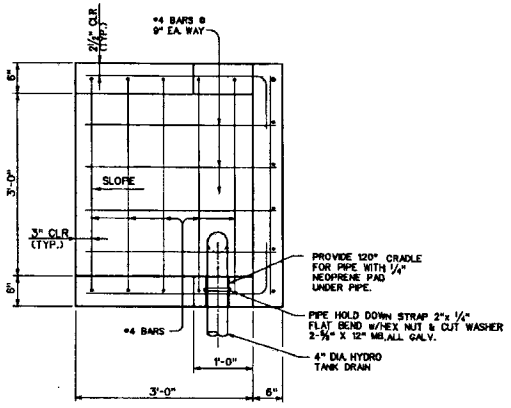
ELEVATION

SECTION "A"

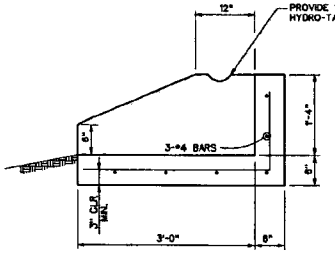
NOTE: OTHER FOUNDATION SIMILAR BUT OPPOSITE HAND

1. HYDROPNEUMATIC TANK FOOTING

SCALE: ½" = 1'-0"



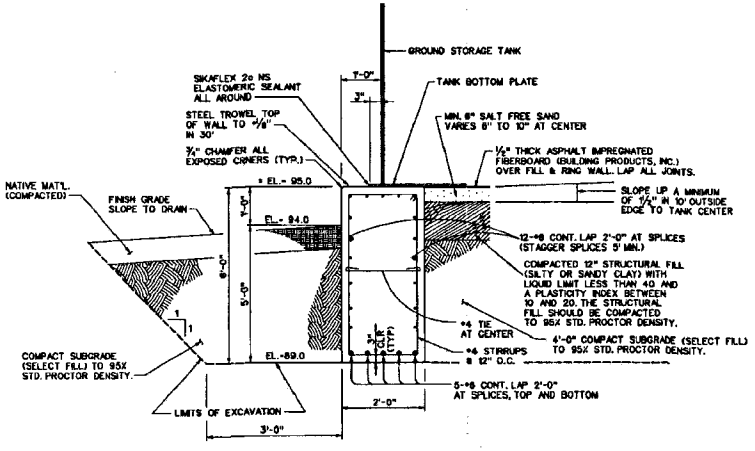
PLAN



SECTION

3. SPLASH PAD FOR HYDROPNEUMATIC TANK DRAIN

SCALE: 1"=1'-0"



* ELEVATION SHOWN IS THE DESIRED FINAL ELEVATION AFTER INITIAL SETTLEMENT.

2. CONCRETE RETAINER RING

SCALE: N.T.S.

GENERAL NOTES:

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE PROJECT SPECIFICATIONS AND THE ACI 318 BUILDING CODE FOR REINFORCED CONCRETE. WHERE THE PROJECT SPECIFICATIONS CONFLICTS WITH ACI 318, THE MORE STRICT SPECIFICATION SHALL GOVERN.
2. ALL CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM 28-DAY STRENGTH OF 3,500 PSI WHEN TESTED IN ACCORDANCE WITH ASTM DESIGNATION C39. CALCIUM CHLORIDE SHALL NOT BE USED AS ADDITIVES.
3. CONCRETE PLACEMENT IN HOT OR COLD WEATHER SHALL CONFORM TO THE PROVISIONS OF ACI 305R OR 308R, RESPECTIVELY.
4. ALL REINFORCING STEEL SHALL BE GRADE 60 STEEL AS PER ASTM A615. ALL LAP SPLICES FOR CONTINUOUS REINFORCING STEEL SHALL BE 30 BAR DIAMETERS UNLESS OTHERWISE SPECIFIED. ALL REINFORCING SHOWN TO BE HOOKED SHALL HAVE STANDARD HOOKS AS PER ACI 318.
5. ANCHOR BOLTS SHALL CONFORM TO ASTM A193 B8 CLASS 2 STAINLESS STEEL.
6. USE SPREAD FOOTING FOUNDED AT A MINIMUM DEPTH OF 4 FEET BELOW EXISTING GRADE. ALLOWABLE BEARING CAPACITY AT 3,000 PSF PER THE PROJECT GEOTECHNICAL REPORT. COMPACT SUBGRADE TO 95% STD. PROCTOR DENSITY.

SUBGRADE PREPARATION FOR TANK FOUNDATIONS:

ABOVE GROUND STORAGE TANK: EXCAVATE TO 3 FEET BELOW EXISTING GRADE. EXCAVATION LIMITS SHALL EXTEND 3 FEET BEYOND EDGE OF FOUNDATION. COMPACT THE UPPER 8 INCHES AT THE BASE OF THE EXCAVATION CUT TO 95% ASTM D698 WITHIN PLUS OR MINUS 2% OF OPTIMUM MOISTURE. FILL WITH SELECT FILL TO FINAL PAD GRADE. THE UPPER 8 INCHES OF FILL IN UNPAVED AREAS ADJACENT TO THE TANK SHALL CONSIST OF ON-SITE CLAY COMPACTED IN 4-INCH LIFTS TO 95% ASTM D698. COMPACT SELECT FILL IN 8-INCH LIFTS TO 95% ASTM D698 WITH PLUS OR MINUS 2%. ALLOWABLE BEARING CAPACITY AT 1,375 PSF PER THE PROJECT GEOTECHNICAL REPORT.

12/3/15

CORBETT L. FREEMAN 86913 LICENSED PROFESSIONAL ENGINEER

10/22/15

NO.	DATE	REVISIONS	APP.
2	12/3/15	ISSUED FOR CONSTRUCTION	LWM
1	10/22	ISSUED FOR BIDDING	LWM

GRAND MISSION M.U.D. No. 1

Costello

JONES | CARTER

WATER PLANT No. 3 – PHASE I

HYDROPNEUMATIC TANK FOUNDATION DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

APPROVED: [signature] 10-22-15 PROJECT ENGINEER
[signature] 10-22-15 DEPUTY DIRECTOR
DESIGNED: [signature] 10-22-15 FACILITIES [signature] 10/22/15
DRAWN: [signature] 10-22-15
CHECKED: [signature]

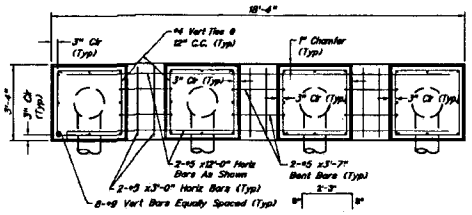
S6

FILE NO:
JOB NO. 85133-0208
DATE: OCT 2015
DESIGNED BY:
DRAWN BY:
SCALE:
SHEET No. 44 OF 46

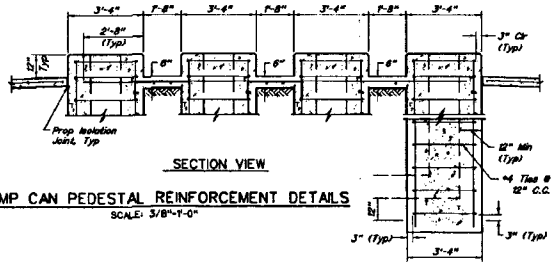
FOR CITY OF HOUSTON USE ONLY
GARY DING
54993

C.O.H. LOG No. 15-1168

T:\Projects (Clients)\2013-107 Water Plants\GRAND MISSION WP 3\DWG\Grand Mission MUD No.1_SA_HYDRO TANK FDN DTLS.dgn 10/22/2015 8:58:28 AM



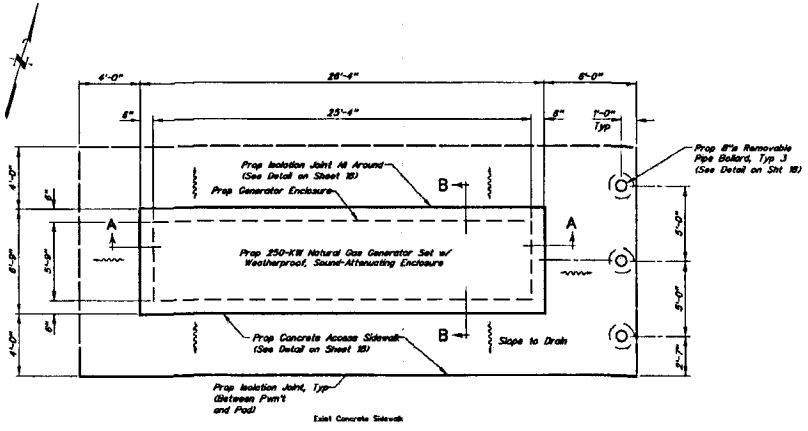
PLAN VIEW



SECTION VIEW

PUMP CAN PEDESTAL REINFORCEMENT DETAILS

SCALE: 3/8"=1'-0"



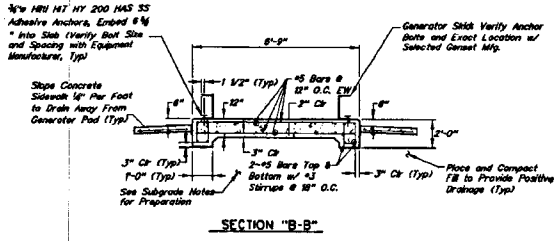
PLAN VIEW

SUBGRADE NOTES:

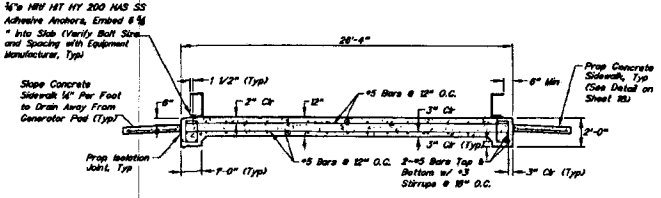
1. Prior to the placing of concrete, or before any fill is placed, all traces of organic, loose or obviously compressible material must be removed. Tree roots greater than 0.5 inches should be also removed. The subgrade should be proof rolled until the grade offers a relatively unyielding surface and the specified degree of compaction has been achieved. Areas of excessive yielding should be excavated and backfilled with a clean compacted soil. Specified compaction: ninety-five percent (95%) of maximum dry density as determined by the standard proctor test (ASTM D-698).
2. Any additional material used to increase the elevation of the site should be a relatively nonexpansive sandy clay material with a liquid limit of 28 or more, plasticity index in the range of 10 to 20, and should be placed in layers of not more than eight (8) inches in thickness, at moisture contents at or above optimum, and compacted to densities of at least ninety-five percent (95%) of standard proctor density ASTM D-698.

GENERATOR SLAB NOTES:

1. Turndown is continuous around perimeter of slab, width varies (see plan view).
2. Minimum generator slab dimensions shall be 6'-9" x 26'-4". Contractor shall verify slab dimensions with the selected equipment manufacturer. Required adjustments to the slab dimensions shall be made at no cost to the Owner and shall be submitted to Engineer for approval prior to commencing construction.
3. Secure genset to slab with AISI 304/316 stainless steel hardware based on manufacturer's recommendations.
4. Slope generator slab 1/8" per foot to drain away from generator.
5. Slope concrete sidewalk 1/4" per foot to drain away from generator pad (see generator slab detail this sht).
6. Generator slab elevation to be 8" above natural ground.



SECTION "B-B"



SECTION "A-A"

PROPOSED GENERATOR SLAB DETAILS

NOT TO SCALE

12/3/15

CONSETT L. FREEMAN 86913 LICENSED PROFESSIONAL ENGINEER — 10/22/15

NO.	DATE	REVISIONS	APP.
1	11/...	ISSUED FOR CONSTRUCTION	...KH
2	10/22	ISSUED FOR BIDDING	CLM

GRAND MISSION M.U.D. No. 1

Costello — Engineering and Surveying, 8401 Richmond Avenue, Suite 400, Houston, Texas 77063, (713)783-7383 (713)783-3666, Fax, TBPE Firm# 9906, TBPLS Firm# 10110600

JONES | CARTER — Texas Board of Professional Engineers Registration No. F-439, 6335 Gulfton, Suite 160 - Houston, Texas 77081 - 713.777.5337

WATER PLANT No. 3 – PHASE I

BOOSTER PUMP AND GENERATOR SLAB DETAILS

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER	TRAFFIC & TRANSPORTATION
10-29-15	STORM WATER QUALITY
STORM 10-29-15	FACILITIES 10/29/15
BRIDGE & BRIDGE	

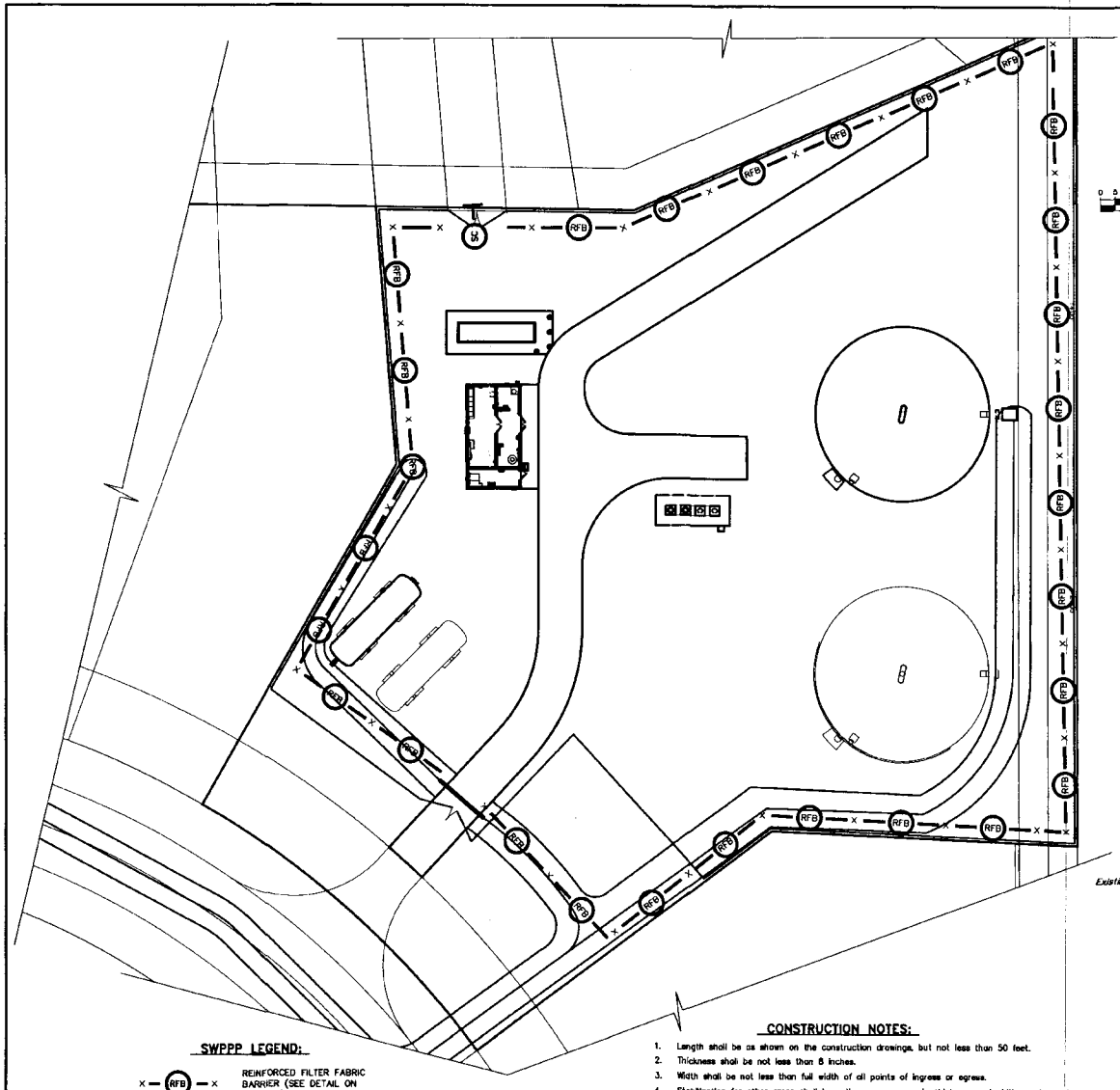
FILE NO:
JOB NO: 0133-0208
DATE: OCT 2015
DSN. BY:
DWG. BY:
SCALE:

FOR CITY OF HOUSTON USE ONLY
DEPT DWG NO.
54993

SHEET No. 45 OF 48

S7

C.O.H. LOG No. 15-1168



SCALE: 1" = 20'

SWPPP LEGEND:

- RFB — REINFORCED FILTER FABRIC BARRIER (SEE DETAIL ON SHEET 2)
- SC — STABILIZED CONSTRUCTION EXIT (SEE DETAIL ON SHEET 2)

CONSTRUCTION NOTES:

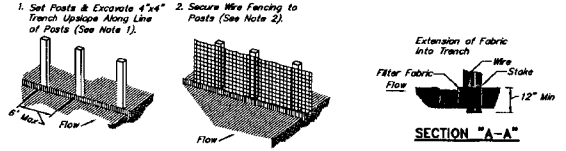
1. Length shall be as shown on the construction drawings, but not less than 50 feet.
2. Thickness shall be not less than 8 inches.
3. Width shall be not less than full width of all points of ingress or egress.
4. Stabilization for other areas shall have the same aggregate thickness and width requirements as the stabilized construction exit, unless otherwise shown on the construction drawings.
5. Stabilized area may be widened or lengthened to accommodate a truck washing area. an outlet sediment trap must be provided for the truck washing area.
6. Stabilized construction exit shall be maintained free of sediment for the duration of the project.

STABILIZED CONSTRUCTION EXIT

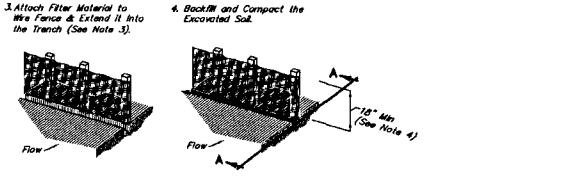
NOT TO SCALE

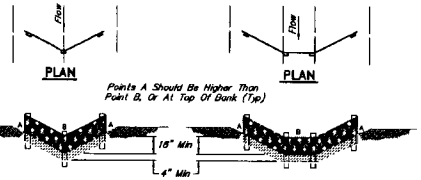
CONSTRUCTION NOTES:

1. Set 2"x2" wooden stakes spaced a maximum of 8' apart & embedded 12" min.
2. Woven wire fence to be fastened securely to fence posts with staples.
3. Filter cloth to be fastened to woven wire fence with ties spaced every 24" at top & midsection.
4. Minimum height of filter should be 18" & a maximum of 36" above natural ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped 6" at the posts, & folded.



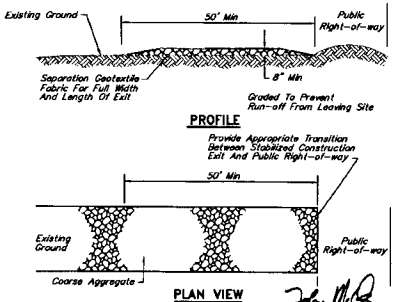
SECTION "A-A"





REINFORCED FILTER FABRIC BARRIER

NOT TO SCALE



APPROVED: for F.B.C. DEVELOPMENT COORDINATOR

DATE: 12/3/15

NO.	DATE	REVISIONS	APP.
1	11/15	ISSUED FOR CONSTRUCTION	TWM
0	10/22	ISSUED FOR BIDDING	TWM

GRAND MISSION M.U.D. No. 1
FORT BEND COUNTY, TEXAS

JONES|CARTER
Texas Board of Professional Engineers Registration No. F-439
6335 Gulfton, Suite 100 • Houston, Texas 77081 • 713.777.5337

WATER PLANT No. 3 – PHASE I

STORMWATER POLLUTION PREVENTION PLAN

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

MGR. 12-22-15 — TRAFFIC & DRAINAGE
10-22-15 — WATER WATER QUALITY
10-22-15 — ROADWAY 12/2015
SIGNATURES

FILE NO:
JOB NO. 05133-0206-00

DATE: OCTOBER 2015
DGN. BY: JMV
DWG. BY: JMD
SCALE: 1" = 20'

SHEET No. 46 OF 48

FOR CITY OF HOUSTON USE ONLY
CITY OF HOUSTON
54993

TERRY W. MALBARY
69710
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

10-22-2015

C.O.H. LOG No. 15-1188

P:\PROJECTS\05133-0206-00 Water Plant No. 3 Phase I\Civil\Const Dwgs\SITE.dwg Dec 22,2015 - 10:36am JMV