Fort Bend County
Engineering Department
301 Jackson Suite 401
Richmond, Texas 77469
281.633.7500
Permits@fortbendcountytx.gov

REVIEW BY FORT BEND COUNTY COMMISSIONERS COURT

[X] **Right of Way Permit**

[ ] **Commercial Driveway Permit**

Permit No: 2018-19121

Applicant: **Mallard Underground Utilities, LLC**

Job Location Site: **25500 Westheimer Parkway, Katy, TX 77494**

Bond No. [redacted] **Date of Bond:** **2/26/2018** **Amount:** **$28,000.00**

The above applicant came to make use of certain Fort Bend County property subject to, "The 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, of the Minutes of the Commissioners Court of Fort Bend County, Texas, to the extent that such order is not inconsistant with Chapter 181, Vernon's Texas Statutes and Codes Annoted.

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, submit notification to Permit Administrator thru MyGovernmentOnline.org portal.
3. This permit expires one (1) year from date of permit if construction has not commenced.

On this 27th day of March, 2018, Upon Motion of Commissioner _____, seconded by Commissioner _____, 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.

Signature

By: Rick J Staigle, PE, PTOE
County Engineer

N/A
By: _____
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.

Date Recorded _____ Comm. Court No. _____

Clerk of Commissioners Court

By: _____
Deputy

Fort Bend County
Engineering Department
301 Jackson Suite 401
Richmond, Texas 77469
281.633.7500
Permits@fortbendcountytx.gov

PERMIT APPLICATION REVIEW FORM FOR CABLE, CONDUIT, AND POLE LINE ACTIVITY IN FORT BEND COUNTY

[X] **Right of Way Permit**

[ ] **Commercial Driveway Permit**

Permit No: 2018-19121

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.

(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

(2) BOND:

- [ ] County Attorney, approval when applicable.
- [ ] Perpetual bond currently posted. Bond No: _____ Amount: _____
- [X] Performance bond submitted. Bond No: [redacted] Amount: $28,000.00
- [ ] Cashier's Check Check No: _____ Amount: _____

(3) DRAINAGE DISTRICT APPROVAL (WHEN APPLICABLE):

Drainage District Approval _____ Date _____

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

Rick J Staigle, PE, PTOE
Permit Administrator

3/16/2018
Date

PERFORMANCE BOND COVERING ALL CABLE, CONDUIT AND/OR POLE LINE ACTIVITY IN, UNDER, ACROSS OR ALONG FORT BEND COUNTY ROAD, COMMERCIAL DRIVEWAY AND MEDIAN OPENINGS OR MODIFICATIONS (AUTHORIZED)

BOND NO [redacted]

THE STATE OF TEXAS §

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF FORT BEND §

THAT WE, Mallard Underground Utilities, LLC whose (*address, phone*) is (281) 356-6960, 48 Tall Oaks Drive, Humble Texas, hereinafter called the Principal, and Philadelphia Indemnity Insurance Company, a Corporation existing under and by virtue of the laws of the state of Pennsylvania and authorized to do an indemnifying business in the state of Texas, and whose principal office is located at (*name/address/phone*) (605)809-8442, One Bala Plaza, Suite 100, Bala Cynwyd, PA 19004-0950, whose officer residing in the State of Texas, authorized to accept service in all suits and actions brought whining said state is Texas and whose address is 3840 Corporate Center Drive, Bryan, TX 77802, 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 Twenty Eight Thousand Dollars ($ 28,000) current, lawful money of the United States 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 26th day of February , 2018 .

PRINCIPAL Mallard Underground Utilities, LLC

President

BY

SURETY Philadelphia Indemnity Insurance Company

Donna Beeler

BY Donna Beeler, Power of Attorney

PHILADELPHIA INDEMNITY INSURANCE COMPANY
One Bala Plaza, Suite 100
Bala Cynwyd, PA 19004-0950

Power of Attorney

KNOW ALL PERSONS BY THESE PRESENTS: That **PHILADELPHIA INDEMNITY INSURANCE COMPANY** (the Company), a corporation organized and existing under the laws of the Commonwealth of Pennsylvania, does hereby constitute and appoint **Bradley Hurt, Donna Beeler and/or Eliana Milioto of Service Insurance Group, Inc.**, its true and lawful Attorney-in-fact with full authority to execute on its behalf bonds, undertakings, recognizances and other contracts of indemnity and writings obligatory in the nature thereof, issued in the course of its business and to bind the Company thereby, in an amount not to exceed **$25,000,000**.

This Power of Attorney is granted and is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of PHILADELPHIA INDEMNITY INSURANCE COMPANY on the 14th of November, 2016.

RESOLVED: That the Board of Directors hereby authorizes the President or any Vice President of the Company: (1) Appoint Attorney(s) in Fact and authorize the Attorney(s) in Fact to execute on behalf of the Company bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof and to attach the seal of the Company thereto; and (2) to remove, at any time, any such Attorney-in-Fact and revoke the authority given. And, be it

FURTHER RESOLVED: That the signatures of such officers and the seal of the Company may be affixed to any such Power of Attorney or certificate relating thereto by facsimile, and any such Power of Attorney so executed and certified by facsimile signatures and facsimile seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN TESTIMONY WHEREOF, PHILADELPHIA INDEMNITY INSURANCE COMPANY HAS CAUSED THIS INSTRUMENT TO BE SIGNED AND ITS CORPORATE SEALTO BE AFFIXED BY ITS AUTHORIZED OFFICE THIS 14TH DAY OF NOVEMBER, 2016.

(Seal)

Robert D. O'Leary Jr., President & CEO
Philadelphia Indemnity Insurance Company

On this 14th day of November, 2016, before me came the individual who executed the preceding instrument, to me personally known, and being by me duly sworn said that he is the therein described and authorized officer of the **PHILADELPHIA INDEMNITY INSURANCE COMPANY**; that the seal affixed to said instrument is the Corporate seal of said Company; that the said Corporate Seal and his signature were duly affixed.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Nora Howard, Notary Public
Lower Merion Twp., Montgomery County
My Commission Expires Jan. 8, 2018
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

Notary Public: Nora Howard

residing at: Bala Cynwyd, PA

(Notary Seal)

My commission expires: January 8, 2018

I, Edward Sayago, Corporate Secretary of PHILADELPHIA INDEMNITY INSURANCE COMPANY, do hereby certify that the foregoing resolution of the Board of Directors and this Power of Attorney issued pursuant thereto on this 14th day of November, 2016 are true and correct and are still in full force and effect. I do further certify that Robert D. O'Leary Jr., who executed the Power of Attorney as President, was on the date of execution of the attached Power of Attorney the duly elected President of PHILADELPHIA INDEMNITY INSURANCE COMPANY,

In Testimony Whereof I have subscribed my name and affixed the facsimile seal of each Company this 26th day of February, 2018.

Edward Sayago, Corporate Secretary
PHILADELPHIA INDEMNITY INSURANCE COMPANY

IMPORTANT NOTICE

To obtain information or make a complaint: You may call the Surety's toll free telephone number for information or to make a complaint at:

1-877-438-7459

You may also write Philadelphia Indemnity Insurance Company at:

One Bala Plaza, Suite 100
Bala Cynwyd, PA 19004
Attention: Senior Vice President and Director of Surety

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

1-800-252-3439

You may write the Texas Department of Insurance at:

P.O. Box 149104
Austin, TX 78714-9104
Fax# 512-475-1771
Web: http://www.tdi.state.tx.us
Email: ConsumerProtection@tdi.state.tx.us

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

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

ADVISO IMPORTANTE

Para obener informacion o para someter una queja: Usted puede llamar al numero de telefono gratis de para informacion o para someter una queja al:

1-877-438-7459

Usted tanbien puede escribir a Philadelphia Indemnity Insurance Company:

One Bala Plaza, Suite 100
Bala Cynwyd, PA 19004
Attention: Senior Vice President and Director of Surety

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

1-800-252-3439

Puede escribir al Departmento de Seguros de Texas:

P.O. Box 149104
Austin, TX 78714-9104
Fax# 512-475-1771
Web: http://www.tdi.state.tx.us
Email: 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 el Surety primero. Si no se resuelve la disputa, puede entonces comunicarrse con el departamento (TDI).

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

SOLEA CINCO RANCH

WITHIN

FORT BEND COUNTY, TEXAS

25500 WESTHEIMER PARKWAY KATY, TEXAS 77494

CONSTRUCTION PLANS

FOR PROPOSED

WATER DISTRIBUTION, SANITARY SEWER, PAVING & DRAINAGE

WATER DISTRIBUTION, SANITARY SEWER, PAVING & DRAINAGE PLANS FOR SOLEA CINCO RANCH

DRAWING INDEX

CIVIL

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C1.0	GENERAL NOTES
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C3.2	STORM WATER POLLUTION PREVENTION PLAN DETAILS
C4.1	DIMENSION CONTROL PLAN (1 OF 2)
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C5.1	GRADING PLAN (1 OF 2)
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C6.3	PLAN & PROFILE "A, B, & C" - PUBLIC UTILITIES
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C11.1	PAVEMENT DETAILS (1 OF 3)
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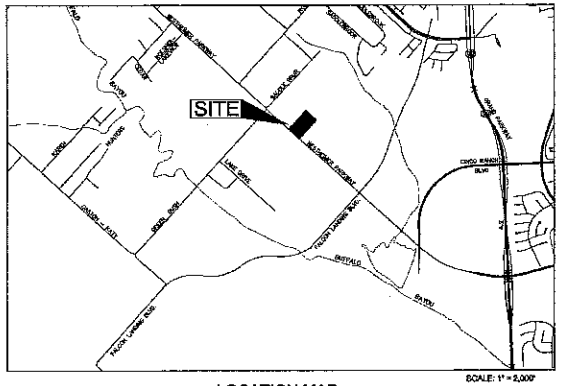
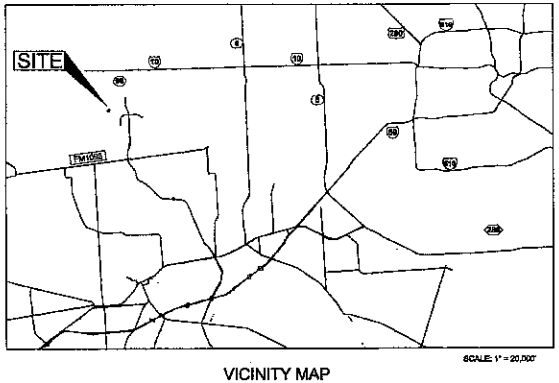
LIFT STATION

SHEET NO.	TITLE
1	LIFT STATION PLAN & SECTION
2	GENERAL NOTES & DETAILS (1 OF 2)
3	GENERAL NOTES & DETAILS (2 OF 2)



LOCATION MAP



VICINITY MAP

KEY MAP NO. 534E ZIP: 77004

CONTRACTOR SHALL CONTACT THE DISTRICT'S OPERATOR MDS, BUILDER SERVICES DEPARTMENT (281-290-6500) OPTION 2, OR VIA EMAIL AT BLDRSERVICES@MUNICIPALDISTRICTSERVICES.COM 48-HOURS PRIOR TO CONSTRUCTION AND TO REQUEST REQUIRED INSPECTIONS. ALL SITE SANITARY SEWER AND GREASE LINES SHALL BE INSPECTED BY MDS PRIOR TO BACKFILL.

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

TYLER RAY 114409 LICENSED PROFESSIONAL ENGINEER

1/23/18

WGA

WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9734
3600 Tanglewilde, Suite 160
Houston, Texas 77063
713.783.1500

JANUARY 2018

WGA PROJECT No. 00024-024

FORT BEND COUNTY ENGINEER
ENGINEER: for RICHARD W. STOLLENWERK, P.E., P.E. DATE: 2/7/18

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED WITHIN 180 DAYS FROM DATE OF APPROVAL.

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

GENERAL CONSTRUCTION NOTES

1. CONTRACTOR SHALL VERIFY ALL EXISTING BENCHMARKS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. IF NO VERIFICATION IS CONDUCTED CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY.
2. WATER LINES, WASTEWATER COLLECTIONS SYSTEMS AND DRAINAGE SYSTEMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF HOUSTON DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "STANDARD CONSTRUCTION SPECIFICATIONS" DATED MAY 2012, AND "STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING" DATED JULY 2012 WITH ALL SUBSEQUENT AMENDMENTS ADDED THERETO UNLESS OTHERWISE NOTED AND AS SHOWN ON THESE PLANS. THE DESIGN MUST AGREE WITH THE MINIMUM STANDARDS ESTABLISHED IN THE "INFRASTRUCTURE DESIGN MANUAL" DATED JULY 2012. NOTE THAT PLAN & PROFILE VIEWS ARE AFTER 1 YEAR AND THE LATEST EDITIONS OF DESIGN RULES, SPECIFICATIONS & MANUALS SHALL GOVERN AS OF THE BEGINNING.
3. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO THE EXISTING PUBLIC OR PRIVATE UTILITY LINES, INCLUDING BUT NOT LIMITED TO WATER LINES, WASTEWATER COLLECTION SYSTEMS AND STORM SEWERS, DURING CONSTRUCTION. ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "STANDARD CONSTRUCTION SPECIFICATIONS" WITH LATEST ADDENDA AND AMENDMENTS THERETO, WITH NO COST TO THE PUBLIC.
4. EXISTING UTILITY INFORMATION SHOWN IS NOT GUARANTEED TO BE ACCURATE AND ALL INCLUSIVE. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES AND OTHER FACILITIES PRIOR TO CONSTRUCTION. ANY CONFLICT OR DISCREPANCY DISCOVERED MUST BE IMMEDIATELY BROUGHT TO THE ENGINEER'S ATTENTION.
5. THE CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON ENGINEERING DEPARTMENT, FORT BEND COUNTY ENGINEERING DEPARTMENT, CENTERPOINT ENERGY AND ALL OTHER APPLICABLE AGENCIES AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF WORK. NOTIFICATIONS SHALL BE FOLLOWED WITH A LETTER. COPIES OF WHICH SHALL BE SENT TO THE ENGINEER.
6. THE CONTRACTOR, ON BEHALF OF THE OWNER, IS TO OBTAIN ALL NECESSARY PERMITS REQUIRED BY THE CITY OF HOUSTON OR FORT BEND COUNTY, PRIOR TO STARTING CONSTRUCTION.
7. GUIDELINES 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 FLAG MEN, SIGNAGE, BARRICADES, WARNING DEVICES, ETC., DURING CONSTRUCTION - BOTH DAY AND NIGHT.
8. THE LOCATIONS AND UNLOADING OF PIPE, VALVES, HYDRANTS, MANHOLES, AND OTHER ACCESSORIES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDED PRACTICES AND SHALL AT ALL TIMES BE PROPERLY SUPPORTED TO PREVENT DAMAGE TO THE MATERIAL. THE CONTRACTOR SHALL LOCATE AND PROVIDE THE NECESSARY STORAGE AREAS FOR THE MATERIAL AND EQUIPMENT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SHIPPING AND STORING OF ALL MATERIALS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE SUCH MATERIAL AT THE POINT OF DELIVERY AND TO REJECT ALL DEFECTIVE MATERIAL. ANY DEFECTIVE MATERIAL INCORPORATED INTO THE WORK SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. THERE SHALL BE NO PAYMENT MADE FOR STORED MATERIAL.
10. ALL PIPE AND REINFORCEMENT BARS SHALL BE KEPT FREE OF DIRT AND OTHER DEBRIS. ANY DAMAGE TO THE COATING OF THE VARIOUS MATERIALS MUST BE REPAIRED.
11. 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. ALL CONSTRUCTION STORM RUNOFF SHALL COMPLY WITH THE FINAL DRAFT OF STORMWATER MANAGEMENT HANDBOOK FOR CONSTRUCTION ACTIVITIES AS PREPARED BY FORT BEND COUNTY ENGINEERING, AND THE CITY OF HOUSTON AS IN COMPLIANCE WITH THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) REQUIREMENTS.
12. ACCESS TO ALL EXISTING STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
13. CONTRACTOR TO MAINTAIN A CLEAN PROJECT AREA, FREE FROM WORKMAN TRASH AND REFUSE, AT ALL TIMES.
14. THE CONTRACTOR IS REQUIRED TO FOLLOW ALL APPLICABLE OSHA RULES AND REGULATIONS. TRENCH SAFETY SHALL BE DONE IN ACCORDANCE WITH OSHA STANDARDS.
15. ALL STATIONS ARE CENTERLINE OF STREET RIGHT-OF-WAY UNLESS OTHERWISE NOTED.
16. ALL GEOTECHNICAL REPORTS (IF ANY) ON THIS PROJECT ARE AVAILABLE FOR REFERENCE AT THE OFFICE OF THE ENGINEER.
17. SURFACE RESTORATION: AT THE END OF ALL CONSTRUCTION PROJECTS, THE CONTRACTOR SHALL RESTORE THE EXISTING FACILITIES, I.E. THE PROPERTY, EQUAL TO OR BETTER THAN EXISTING WITH CONDITIONS PRIOR TO THE CONSTRUCTION. ALL FINISHED GRADES SHALL MATCH UNIFORMLY BETWEEN THE FINISHED ELEVATIONS SHOWN.

WATERLINE CONSTRUCTION NOTES

1. WATER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING STANDARD SPECIFICATIONS, OCTOBER, 2002 AND STANDARD CONSTRUCTION DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET PAVING, OCTOBER, 2002.
2. 4" THRU 12" WATER LINES SHALL BE P.V.C. CLASS 150, DR-18, AWWA C-900. SMALLER THAN 4" WATER MAINS SHALL BE SCH. 40 P.V.C. PIPE.
3. ALL WATERLINES, AFTER INSTALLATION, SHALL BE THOROUGHLY FLUSHED AND DISINFECTED ACCORDING TO AWWA SPECIFICATION C-651 AND THEN FLUSHED BEFORE BEING PLACED INTO SERVICE. AT LEAST ONE WATER SAMPLE PER 1000 FEET OF FINISHED LINE MUST BE COLLECTED AND SUBMITTED FOR BACTERIOLOGICAL ANALYSIS TO A LABORATORY CERTIFIED BY THE TEXAS DEPARTMENT OF HEALTH AND MUST MEET DEPARTMENT OF HEALTH AND CITY OF HOUSTON REQUIREMENTS PRIOR TO PLACING LINES INTO SERVICE.
4. HYDROSTATIC TESTING: ALL WATER PIPE SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH AWWA C-600, SHARON STANDARDS FOR A DURATION OF NOT LESS THAN TWO HOURS. LEAKAGE SHALL BE DEFINED AS THE QUANTITY OF WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF, TO MAINTAIN PRESSURE WITHIN 5 PSI OF THE SPECIFIED TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR HAS BEEN EXPELLED. THE TEST PRESSURE SHALL BE EITHER A MINIMUM OF 125 PSIG OR 1.5 TIMES THE MAXIMUM DESIGN PRESSURE, WHICHEVER IS GREATER. THE MAXIMUM LEAKAGE SHALL BE CALCULATED USING THE FORMULA AS FOLLOWS:

$$L = (SD)(P)^{1/2}/133,200$$

WHERE L = ALLOWABLE LEAKAGE IN GALLONS
S = LENGTH OF PIPE TESTED IN FEET
D = NOMINAL DIAMETER OF PIPE IN INCHES
P = PRESSURE IN POUNDS PER SQUARE INCH (GAUGE)

5. CONCRETE THRUST BLOCKS SHALL BE PROVIDED AT ALL UNDERGROUND TEED BENDS AND INTERMALS THAT SHALL BE BUILT AS PER THE STANDARD PRINCIPLES TO PREVENT PIPE MOVEMENT.
6. ALL ABOVE GROUND DUCTILE IRON PIPE CONNECTIONS SHALL BE FLANGED. UNDERGROUND DUCTILE IRON PIPE CONNECTIONS SHALL BE MOTLESS AND PUSH ON AFTER THE FIRST FLANGED FITTING BELOW GRADE, UNLESS NOTED OTHERWISE ON THE PLANS.
7. ALL FLANGED BELOW GRADE SHALL HAVE STAINLESS STEEL BOLTS AND NUTS AND SHALL BE INSULATED.
8. ALL WATER VALVES SHALL OPEN COUNTER CLOCKWISE. ALL WATER VALVES SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF AWWA C-500 AND SHALL BE OF THE RESILIENT SEAT TYPE.
9. ALL BELOW GRADE VALVES SHALL BE GASKETED, HUB END GATE VALVES WITH A CAST IRON BOX, EXCEPT WHERE FLANGES ARE CALLED OUT ON THE PLANS.
10. MAINTAIN MINIMUM 9 FOOT HORIZONTAL CLEARANCE BETWEEN OUTSIDE OF SANITARY SEWER MANHOLE AND WATERLINE.
11. WATER LINES PARALLEL TO SANITARY LINES SHALL BE INSTALLED WITH AT LEAST A 9-FOOT CLEARANCE AND IN SEPARATE TRENCHES.
12. SANITARY PRECAUTIONS MUST BE TAKEN DURING WATERLINE CONSTRUCTION, PER AWWA STANDARDS. PRECAUTIONS INCLUDE KEEPING THE PIPE CLEAN AND CAPPING OR OTHERWISE EFFECTIVELY COVERING OPEN PIPELINES TO EXCLUDE INSECTS, ANIMALS OR OTHER SOURCES OF CONTAMINATION FROM UNFINISHED PIPELINES AT TIMES WHEN CONSTRUCTION IS NOT IN PROGRESS.
13. CONTRACTOR SHALL PROVIDE FOR A MINIMUM OF 5 FEET CLEARANCE AT THE STORM SEWER AND WATER LINE CROSSINGS AND SANITARY SEWER AND WATER LINE CROSSINGS. THE WATER LINE SHALL BE LOCATED AT A HIGHER LEVEL THAN THE SANITARY SEWER WHENEVER POSSIBLE.
14. ALL WATER LINE FITTINGS SHALL BE DUCTILE IRON COMPACT FITTINGS PER AWWA 153, UNLESS OTHERWISE NOTED.
15. THE CENTER OF FIRE HYDRANTS ARE TO BE LOCATED 24" BEHIND THE BACK OF CURBS UNLESS OTHERWISE SHOWN. THE STEAMER NOZZLE SHALL BE A MINIMUM OF 18 (AND A MAXIMUM OF 30) INCHES ABOVE FINISHED GRADE, AND SHALL FACE THE STREET PAVEMENT UNLESS OTHERWISE SHOWN. ALL FIRE HYDRANTS SHALL BE PAINTED IN ACCORDANCE WITH THE CITY OF HOUSTON STANDARDS.

PAVING CONSTRUCTION NOTES

1. CONTRACTOR SHALL OBTAIN ENGINEERS OR OWNERS APPROVAL OF GRADES PRIOR TO PLACEMENT OF ANY PAVEMENT. IF APPROVAL IS NOT OBTAINED CONTRACTOR SHALL BE RESPONSIBLE FOR PAVEMENT PLACED.
2. ALL TEMPORARY AND PERMANENT DRAINAGE MUST COMPLY WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, MOST RECENT EDITION WITH REVISIONS.
3. ALL PAVING WIDTHS, CURB RADII, AND CURB ALIGNMENT SHOWN INDICATE FACE OF CURB. T.C. INDICATES TOP OF CURB. T.F. INDICATES TOP OF PAVEMENT ELEVATIONS.
4. THE CONTRACTOR SHALL PROTECT ALL EXISTING SIDEWALKS, PAVEMENT, ETC. AND SHALL REPAIR OR REPLACE AT HIS EXPENSE ANY FACILITIES DAMAGED DURING PAVING OR GRADING OPERATIONS.
5. DRIVEWAY CONNECTIONS IN CITY OF HOUSTON STREET RIGHT-OF-WAY SHALL COMPLY WITH CITY OF HOUSTON DRAWING NO. 1720-1-1 AND DRIVEWAY DETAILS ON THESE PLANS.
6. AREAS TO BE FILLED SHALL BE SCARIFIED AND COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY (ASTM D698) OF THE MATERIAL NOW THERE WITHIN 6 INCHES TO A DEPTH OF 8' PRIOR TO FILL PLACEMENT. FILL MATERIAL SHALL BE PLACED IN MAXIMUM 8" THICK LIFTS (MEASURED LOOSE) AND COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY (+/- 2% OF OPTIMUM MOISTURE) PER ASTM D-698. FILL SHALL BE CLEAN EARTH AND BE FREE FROM TRASH, VEGETATION AND LARGE STONES. TEST REPORTS SHALL BE SUBMITTED PRIOR TO PLACEMENT OF PAVEMENT.
7. NECESSARY TESTING OF SUBGRADE AND PAVEMENT TO PROVE THAT THESE USING MEET REQUIREMENTS SHALL BE DONE BY A COMMERCIAL TESTING LABORATORY ENGAGED BY THE CONTRACTOR.
8. WHERE PROPOSED PAVEMENT IS TO MEET EXISTING PAVEMENT, THE EXISTING REBAR OR DOWELS SHALL BE CLEANED AND BENT INTO THE PROPOSED PAVEMENT, USING A MINIMUM OF 30 BAR DIAMETERS LAP. WHERE PROPOSED CONCRETE ENDS AT A CONSTRUCTION JOINT OR EXPANSION JOINT, THE REBAR SHALL BE EXTENDED A MINIMUM LENGTH OF 30 BAR DIAMETERS, COATED WITH ASPHALT AND WRAPPED WITH BURLAP.
9. ALL CONCRETE PAVEMENT SHALL BE OF SPECIFIED THICKNESS SHOWN. ALL CONCRETE SHALL BE A 3 BAGS MIX WITH A MINIMUM 28 DAY FLEXURAL STRENGTH AT 7 DAYS AND A MINIMUM 3600 P.S.I. COMPRESSIVE STRENGTH AT 28 DAYS. REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60.
10. ALL CUL-DE-SAC ISLANDS AND MEDIANS SHALL HAVE STANDARD 6" CONCRETE CURBS.
11. SIDEWALKS SHALL BE BUILT IN ACCORDANCE WITH CITY OF HOUSTON AND FORT BEND COUNTY DESIGN STANDARDS AND IN CONJUNCTION WITH HOUSTON AND FORT BEND COUNTY SIDEWALKS AND RAMPS IN CONFORMANCE WITH THE GOVERNORS OFFICE OF TRAFFIC SAFETY MEMORANDUM DATED MAY 5, 1998 (HIGHWAY SAFETY ACT, 1973, SEC 402). AMERICANS WITH DISABILITIES ACT (ADA) AND TEXAS ACCESSIBILITY STANDARDS (TAS) SHALL BE COMPLIED WITH IN ALL ADDITIONAL CONSTRUCTION.
12. CONCRETE WASH OUT AREAS ARE TO BE PROVIDED BY THE CONTRACTOR AT A LOCATION ACCEPTABLE TO THE OWNER UNDER NO CIRCUMSTANCES IS THE CONTRACTOR TO PERMIT CONCRETE TRUCKS TO WASH AT ANY AREA OTHER THAN THAT DESIGNATED.
13. STREET NAME SIGNS SHALL BE BUILT IN ACCORDANCE WITH CITY OF HOUSTON REQUIREMENTS AND SPECIFICATIONS, AND SHALL STREET NAMES AS PER SUBDIVISION PLAT.
14. A DOUBLE-REFLECTORIZED BLUE TRAFFIC MARKER SHALL BE PLACED ON A ONE FOOT OFFSET OF THE PAVEMENT CENTERLINE AT ALL FIRE HYDRANT LOCATIONS BY THE CONTRACTOR. HYDRANTS LOCATED AT INTERSECTIONS SHALL HAVE A MARKER PLACED ON EACH STREET. THERE WILL BE NO SEPARATE PAYMENT FOR THESE MARKERS.

STORM SEWER CONSTRUCTION NOTES

1. ALL STORM SEWERS SHALL BE EITHER REINFORCED CONCRETE PIPE CONFORMING TO ASTM C76 CLASS III WITH RUBBER GASKET JOINTS, OR HIGH DENSITY POLYETHYLENE PIPE WITH SMOOTH INTERIOR CONFORMING TO AASHTO M294 WITH ELASTOMERIC COMPOUND GASKET JOINTS PER ASTM D3212.
2. CIRCULAR AND ELLIPTICAL REINFORCED CONCRETE PIPE SHALL BE INSTALLED USING RESILIENT GASKET JOINTS CONFORMING TO ASTM C443 AND ASTM C361 RESPECTIVELY.
3. ALL STORM SEWER MANHOLES SHALL BE STANDARD CITY OF HOUSTON TYPE "C" MANHOLES UNLESS OTHERWISE NOTED ON PLANS AND MUST INCLUDE THE WORDS "STORM SEWER".
4. ALL INLETS SHALL BE CITY OF HOUSTON TYPE B-4 UNLESS OTHERWISE NOTED ON ALL THE PLANS. GRATE OF INLETS SHALL BE INCREASED BEGINNING AT 2-4' AND AS NECESSARY TO ACCOMMODATE THE DIAMETER AND ANGLE OF THE EXIT PIPE.
5. ALL STORM SEWER PIPES AND INLET LEADS WITHIN PUBLIC R.O.W. SHALL BE 24-INCH AND LARGER, R.C.P., P.V.C. CLASS III.
6. ALL PROPOSED PIPE STUB-OUTS FROM MANHOLES AND INLETS ARE TO BE PLUGGED WITH 8" BRICK WALLS UNLESS OTHERWISE NOTED.
7. STORM SEWERS SHALL BE INSTALLED, BEDDED, AND BACKFILLED IN ACCORDANCE WITH THE CITY OF HOUSTON DRAWING NOS. 02317-02, 02317-03, 02317-05, AND 02717-01 (OCT 2002) AS APPLICABLE UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
8. ALL SENSOR SNIPER (HECO 5000) GRID SYSTEM PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL PROPOSED ASPHALT LINE CURBS SHALL BE BACKFILLED WITH 1-2" SACK CEMENTITIOUS STABILIZED SAND TO WITHIN ONE (1) FOOT OF SUBGRADE. THE REMAINING DEPTH OF TRENCH SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL.
9. CONTRACTOR SHALL PROVIDE 12" MINIMUM CLEARANCE AT STORM SEWER AND WATER LINE CROSSINGS.
10. ALL TRENCH BACKFILLS SHALL BE IN 8" LIFTS, WITH TESTS TAKEN AT 120 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).
11. ADJUST MANHOLE COVERS TO GRADE CONFORMING TO REQUIREMENTS OF SECTION 02666-ADJUSTING MANHOLES, INLETS AND VALVE BOXES TO GRADE.
12. ALL DITCHES SHALL BE REGRADED TO PROPOSED CUT/FILL TO ENSURE PROPER DRAINAGE. ALL CUT/FILL SHALL BE PROPERLY BACKFILLED AND COMPACTED. ALL DISTURBED AREA SHALL BE REGRADED, SEEDED, AND FERTILIZED.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING AND RESTORING ANY BACK SLOPE DRAINAGE SYSTEM DISTURBED AS A RESULT OF HIS WORK.
14. ALL DRIVEWAYS WILL BE LOCATED TO AVOID EXISTING CURB INLET STRUCTURES.

SANITARY SEWER CONSTRUCTION NOTES

1. 8" AND LARGER SANITARY SEWER PIPE AND FITTINGS TO BE SOLID PVC PIPE MEETING ASTM SPECIFICATION D3034 WITH RUBBER GASKET JOINTS UNLESS OTHERWISE NOTED. 6" AND SMALLER SANITARY SEWER PIPE TO BE SCH. 40 P.V.C. PIPE.
2. NO CONNECTION SHALL BE MADE TO THE EXISTING SANITARY SEWER LINES UNTIL ALL PROPOSED SEWER LINES HAVE BEEN THOROUGHLY CLEANED, TESTED AND APPROVED BY THE ENGINEER. THE ENGINEER SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO THE CONTRACTOR CONNECTING TO ANY EXISTING SEWER LINES.
3. DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE AND SEMI-RIGID PIPE, EXCEPT SERVICE LEADS. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS. NO PIPE SHALL EXHIBIT A DEFLECTION OF 5%. THE TEST IS TO BE RUN USING A SANDREL HAVING AN OUTSIDE DIAMETER EQUAL TO 95% OF THE INSIDE DIAMETER OF THE PIPE. THE TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES.
4. SANITARY LINES CROSSING WATER LINES ARE TO BE GREEN P.V.C. CLASS 150, DR-18, AWWA D-2241 AND MUST HAVE A FULL LENGTH JOINT (20' NOMINAL) CENTERED AT THE CROSSING WITH A MINIMUM SEPARATION DISTANCE OF 2 FEET.
5. ALL SEWER LINES (INCLUDING SERVICE LEADS) ENTERING A MANHOLE AT A FLOWLINE HIGHER THAN 24 INCHES ABOVE THE MANHOLE INVERT MUST BE PROVIDED WITH A DROP PIPE AND HAVE THE INVERT FILLETED.
6. ALL SANITARY SEWER MANHOLES SHALL BE PRE-CAST TYPE ONLY AND SHALL INCLUDE THE WORD "SANITARY" ON THE COVER AND SHALL INCLUDE THE WORDS "CITY OF HOUSTON" ON THE COVER.
7. INFILTRATION/EXFILTRATION TEST: EITHER OF THE FOLLOWING INFILTRATION/EXFILTRATION TESTS SHALL BE PERFORMED WITHIN THE SPECIFIED TOLERANCES ON ALL GRAVITY SEWERS.
   A. WATER TEST: TOTAL LEAKAGE SHALL NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF 2 FEET.
   B. LOW - PRESSURE AIR TEST: PERFORM TEST ACCORDING TO UNI-B-6 OR OTHER APPROPRIATE PROCEDURES. MINIMUM ALLOWABLE TIME FOR PRESSURE DROP FROM 3.5 PSIG TO 2.5 PSIG SHALL BE AS FOLLOWS:
      8": 480 SECONDS OR 1.72(NL) FOR TEST LENGTHS GREATER THAN 298'
      10": 594 SECONDS OR 2.57(NL) FOR TEST LENGTHS GREATER THAN 238'
      12": 708 SECONDS OR 3.86(L) FOR TEST LENGTHS GREATER THAN 198'
8. PRIVATE SAN. SWRS. ARE TO BE PRIVATELY OWNED, OPERATED AND MAINTAINED BY DESIGNED PROPERTY OWNER.

STANDARD PERMIT NOTES

A. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY REGULATION OF FORT BEND COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT PRIOR TO STARTING CONSTRUCTION.
B. OWNER TO OBTAIN ALL PERMITS REQUIRED BY FORT BEND COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITY, ROADWAY CULVERTS WITHIN FORT BEND COUNTY ROAD RIGHT OF WAY.

PRIVATE UTILITY NOTES

CAUTION: OVERHEAD ELECTRICAL FACILITIES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THOSE LINES SINCE THEY 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:

1. ANY ACTIVITY WHERE PERSONS OR THINGS MAY COME WITHIN 10(10) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
2. OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE 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 MOVED, CALL CENTERPOINT ENERGY AT 713-207-2222.

CAUTION: TELEPHONE FACILITIES

1. THE LOCATIONS OF TELEPHONE UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. NO PARTIES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY ITS FAILURE TO EXACTLY LOCATE AND PRESERVE THOSE UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL CALL 1-800-344-8377 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND UNDER FIELD LOCATED.
3. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF AT&T TEXAS/SWBT FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES, WHEN BEYOND THE CONTRACTOR SHALL EXPOSE THE AT&T TEXAS/SWBT FACILITIES.
4. WHEN TELEPHONE FACILITIES ARE EXPOSED, THE CONTRACTOR SHOULD PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT CIRCUITS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.
5. THE PRESENCE OR ABSENCE OF A TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES OR BURIED CABLE FACILITIES WITHIN AN INTERSECTING AREA (DUE TO NEAR THAT LINE) ARE NO DIRECT BURIED CABLES OR OTHER CABLES IN CONDUIT IN THE AREA.

CAUTION: UNDERGROUND GAS FACILITIES

LOCATIONS OF CENTERPOINT ENERGY GAS LINES (TO INCLUDE CENTERPOINT ENERGY, INTERGATE PIPELINE AND ENERGY PIPELINE) ARE SHOWN IN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION IF DOES NOT SUFFICIENTLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 713-223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL 713-207-6037 (7:30 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.

WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.

WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT DAMAGES TO THE ISSUE ON THE REPAIR.

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

TRAFFIC NOTES

1. CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TEXAS MUTCD), MOST RECENT EDITION WITH REVISIONS DURING CONSTRUCTION.
2. PER FORT BEND COUNTY, GUIDELINES SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE OBSERVED.
3. NO LANES SHALL BE CLOSED DURING THE HOURS OF 7:00 AM TO 9:00 AM AND 4:00 PM TO 6:30 PM MONDAY THRU FRIDAY.
4. OFF DUTY POLICE OFFICERS/FLAGMEN ARE REQUIRED TO DIRECT TRAFFIC WHEN LANES ARE BLOCKED.
5. CONTRACTOR SHALL COVER THE EXCAVATION WITH STEEL PLATES ANCHORED PROPERLY DURING NON-WORKING HOURS AND ALLOW NORMAL TRAFFIC FLOW. IF COVERING IS NOT FEASIBLE, USE TRAFFIC FILL OR SPX 30" DELINEATOR OR APPROVED EQUAL WITH SHEETING AND BASE EXPOSED TO PAVEMENT NEXT TO EXCAVATION DURING NON-WORKING HOURS.
6. APPROVED COPIES OF "TRAFFIC CONTROL PLANS" SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES.
7. IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT METHOD OF TRAFFIC CONTROL PLAN DURING THE CONSTRUCTION THAN WHAT IS OUTLINED IN THE CONTRACT DRAWINGS, (S)HE SHALL BE RESPONSIBLE TO PREPARE AND SUBMIT ALTERNATE PLANS TO TRAFFIC SECTION OF HCPD FOR APPROVAL TEN WORKING DAYS PRIOR TO IMPLEMENTATION
8. THESE PLANS SHALL BE DRAWN TO SCALE OR REPRODUCIBLE MYLARS AND SEALED BY A LICENSED ENGINEER IN THE STATE OF TEXAS. PLANS WILL BECOME A PART OF THIS CONTRACT DRAWINGS.

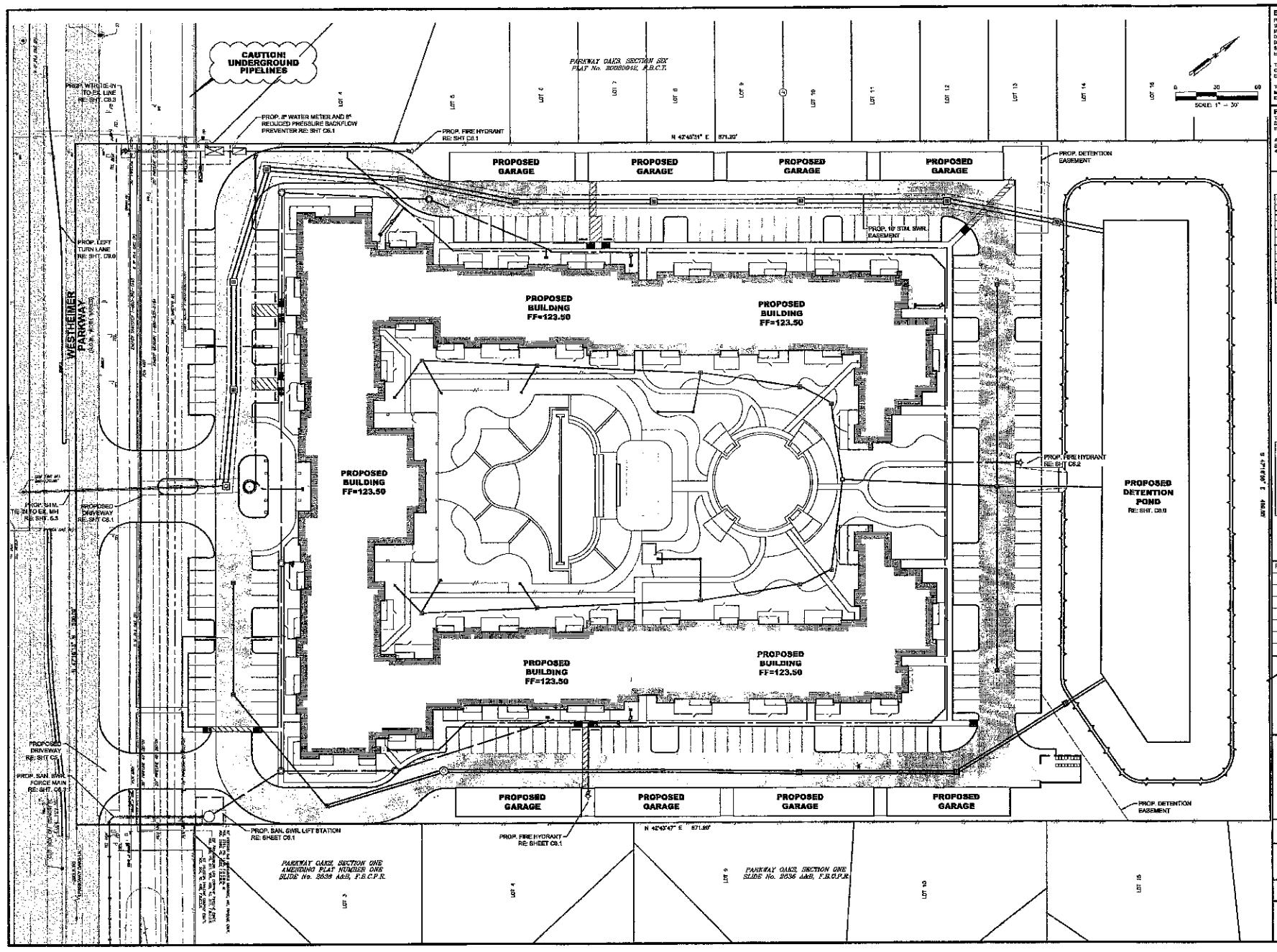
SWPPP CONSTRUCTION NOTES

1. CONTRACTOR SHALL IMPLEMENT INLET PROTECTION DEVICES AND REINFORCED FILTER FABRIC BARRIER ALONG ROAD AND SIDE DITCHES AT LOCATIONS SHOWN ON THE TYPICAL STORM WATER POLLUTION PREVENTION (SWPPP) PLANS TO KEEP SILT AND/OR EXCAVATED MATERIALS FROM ENTERING INTO THE STORM WATER INLETS AND DITCHES EVENTUALLY POLLUTING THE RECEIVING STORM.
2. DURING THE EXCAVATION PHASE OF THE PROJECT, CONTRACTOR SHALL SCHEDULE THE WORK IN SHORT SEGMENTS SO THAT EXCAVATED MATERIAL CAN BE QUICKLY HAULED AWAY FROM THE SITE AND TO PREVENT IT FROM STAYING UNCOLLECTED ON THE EXISTING PAVEMENT. ANY LOOSE EXCAVATED MATERIAL WHICH FALL ON PAVEMENTS OR DRIVEWAYS SHALL BE SWEPT BACK INTO THE EXCAVATED AREA.
3. CONTRACTOR SHALL CLEAN UP THE EXISTING STREET IN INTERSECTIONS AND DRIVEWAYS DAILY, AS NECESSARY, TO REMOVE ANY EXCESS MUD, SILT OR ROCK TRACKED FROM THE EXCAVATED AREA.
4. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING THE CONSTRUCTION OF THE PROJECT, ALWAYS CLEANING UP DIRT AND LOOSE MATERIAL AS CONSTRUCTION PROGRESSES.
5. CONTRACTOR TO INSPECT AND MAINTAIN THE AREAS LISTED BELOW AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DATES AND WITHIN 24 HOURS OF THE END OF A RAINFALL EVENT OF 0.5 INCHES OR GREATER.
   A) DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
   B) AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.
   C) STRUCTURAL CONTROL MEASURES.
   D) LOCATIONS WHERE VEHICLES ENTER ON THE SITE.
6. CONTRACTOR TO BE RESPONSIBLE TO MAINTAIN EXISTING DITCHES AND/OR CULVERTS FOR UNOBSTRUCTED DRAINAGE AT ALL TIMES. WHERE SODDING IS DISTURBED BY EXCAVATION OR MAINTAINING OPERATIONS, SUCH AREAS SHALL BE REPAIRED BY SODDING OR SODDING. SLOPES 4:1 OR STEEPER SHALL BE REPLACED BY BLOCK SODDING.

FORT BEND COUNTY CONSTRUCTION NOTES

CONSTRUCTION - GENERAL NOTES

1. FORT BEND COUNTY MUST BE INVITED TO THE PRE-CONSTRUCTION MEETING.
2. CONTRACTOR SHALL NOTIFY FORT BEND COUNTY ENGINEERING 48 HOURS PRIOR TO COMMENCING CONSTRUCTION AND 48 HOUR NOTICE TO ANY CONSTRUCTION ACTIVITY WITHIN THE LIMITS OF THE PARKS AT CONSTRUCTIONREPORTS@FORTBENDCO



BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 16G0272, BEING A BRASS DISK STAMPED 16G0272 ON BRIDGE AT BARKER RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALL ON NORTHEAST CORNER OF BRIDGE IN KEYMAP 485J IN THE BARKER WATERSHED NEAR STATION 7+00-00-00.
ELEV=[illegible] NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT SQUARE ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=125.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.26 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0045 L & 48157C0210 L, REVISED APRIL 2, 2014.

OVERALL LAYOUT LEGEND:

	PROPOSED LARGE DIAMETER STORM SEWER AND GRATE INLET
	PROPOSED STORM SEWER AND GRATE INLET
	PROPOSED SANITARY SEWER AND MANHOLE
	PROPOSED WATER LINE
	PROPOSED DETENTION POND HIGH BANK
	FIRE LANE REF. DETAIL SHT. C10.0

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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER RAY
111489
LICENSED
PROFESSIONAL ENGINEER
1/23/18

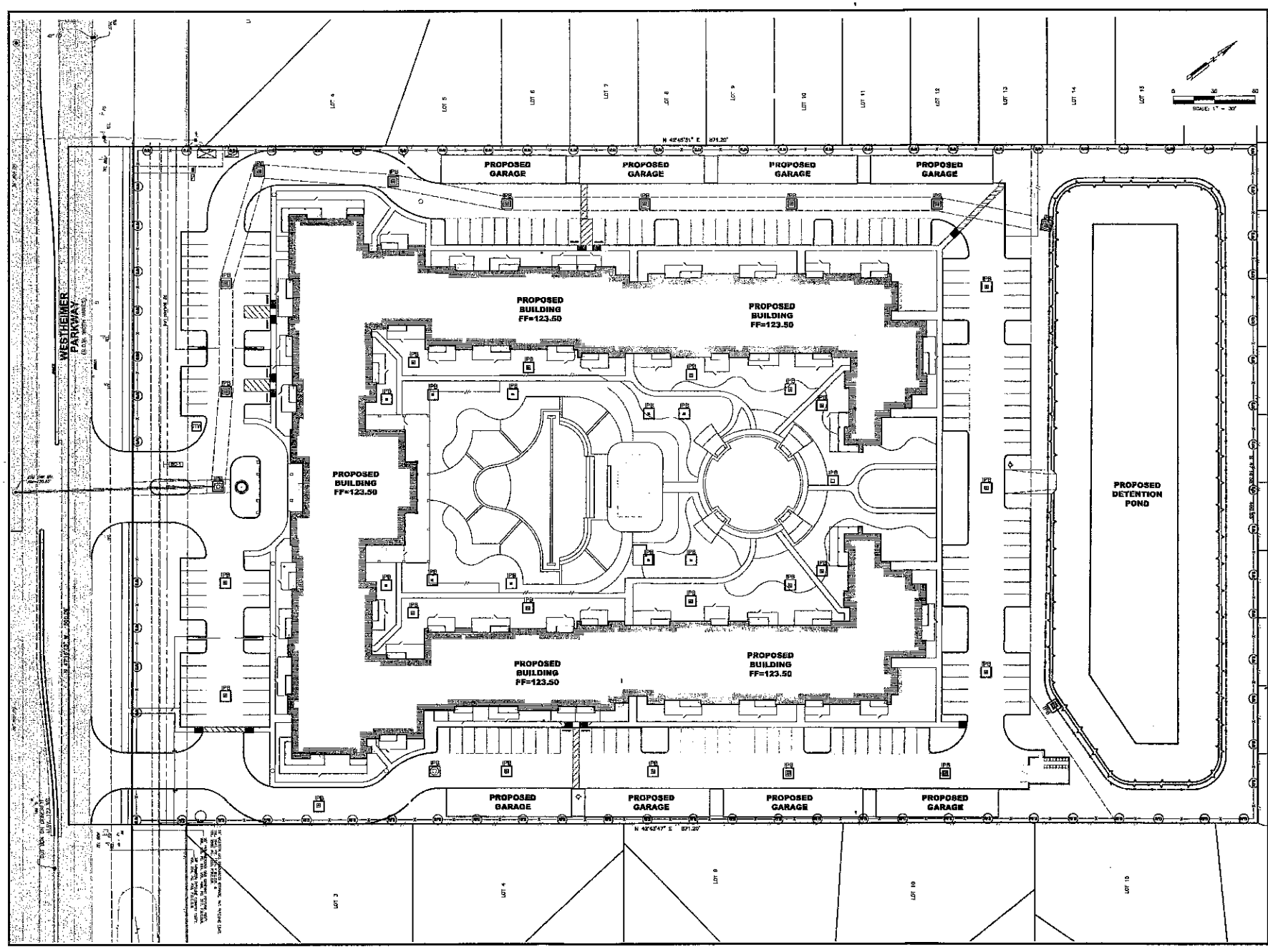
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9746
2500 Tanglewilde, Suite 190
Houston, Texas 77063
713.780.1962

SOLEA CINCO RANCH

OVERALL SITE PLAN

SCALE	DESIGN	DRAWN
1"=30'	TSWTR	TD

C2.0



BENCHMARKS:

PROJECT BENCHMARKS IN FLOODPLAIN REFERENCE MARK NO. 1904025, BEING A BRASS CAP STAMPED 1904025 ON BRIDGE AT MARION RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALK ON NORTHEAST CORNER OF BRIDGE IN 10.0MAP-1452 ON THE BARKER WATERSHED NEAR STREAM 1100-00-00.
ELEV=123.51 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=125.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=132.56 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0045 L & 48157C0110 L, REVISED APRIL 2, 2014.

EROSION CONTROL SCHEDULE AND SEQUENCING

I. ROUGH GRADING
GRADING CONSTRUCTION ENTRANCE/EXIT, SILT FENCE PROTECTORS, AND STONE EROSION OFFICTURES SHALL BE INSTALLED PRIOR TO THE INITIATION OF ROUGH GRADING, AS NEEDED.

I. UTILITY INSTALLATION
ALL PHSOV EROSION CONTROL MEASURES INSTALLED ABOVE TO BE MAINTAINED AS NECESSARY DURING UTILITY INSTALLATION. INLET PROTECTION SHALL BE INSTALLED AS STORM DRAINAGE SYSTEM IS CONSTRUCTED.

III. PAVING
ALL PHSOV EROSION CONTROL MEASURES INSTALLED ABOVE TO BE MAINTAINED AS NECESSARY DURING PAVING AND THROUGHOUT THE REMAINDER OF THE PROJECT.

IV. FINAL GRADING/SOD.
STABILIZATION ALL TEMPORARY EROSION CONTROL MEASURES TO BE REMOVED AT THE CONCLUSION OF THE PROJECT ONCE FINAL STABILIZATION HAS BEEN ACHIEVED.

SWPPP NOTE:

ANY OFF-SITE STAGING AREA UTILIZED BY THE OPERATOR OF THIS SITE MUST BE INCLUDED IN THE SWPPP NARRATIVE PLAN AND TO SWPPP SITE PLAN AS REQUIRED BY THE TPDES TEXAS GENERAL PERMIT CONSTRUCTION F.L. ANY SUCH AREA NOT LISTED IN THE SWPPP WILL BE TREATED BY THE OPERATOR AS ANY OTHER PART OF THE CONSTRUCTION ACTIVITY FOR THE PURPOSES OF STORM WATER POLLUTION PREVENTION.

SWPPP LEGEND:

	STABILIZED CONSTRUCTION EXIT
	REINFORCED FILTER FABRIC FENCE
IPB	INLET PROTECTION BARRIER
STW	CONCRETE TRUCK WASHOUT AREA

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

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS — TYLER RAY — 114496 — LICENSED PROFESSIONAL ENGINEER
1/23/18

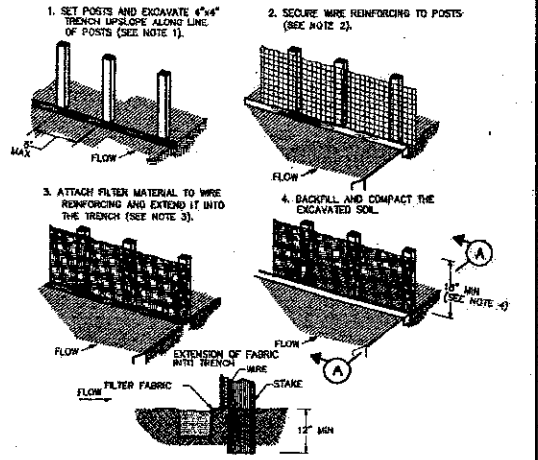
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9756
2500 Tanglewilde, Suite 120
Houston, Texas 77063
713.528.1500

SOLEA CINCO RANCH

STORM WATER POLLUTION PREVENTION PLAN

SCALE	DESIGN	DRAWN
1"=30'	TDVR	TD

C3.1

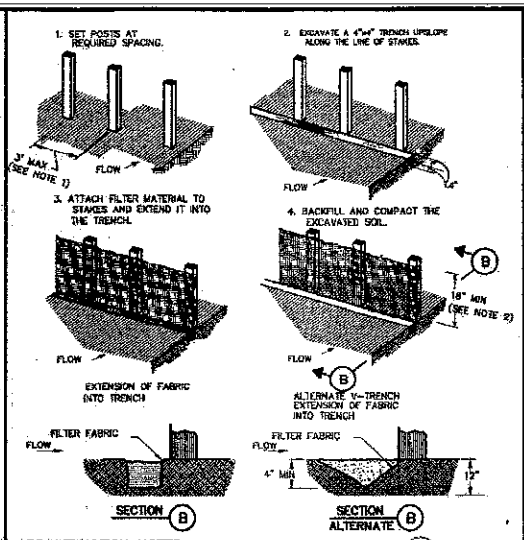


CONSTRUCTION NOTES:

1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 8 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
2. WOVEN WIRE REINFORCING TO BE FASTENED SECURELY TO BARRIER POSTS WITH STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE REINFORCING, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
6. SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

X—(RFB)—X
SYMBOL

REINFORCED FILTER FABRIC BARRIER

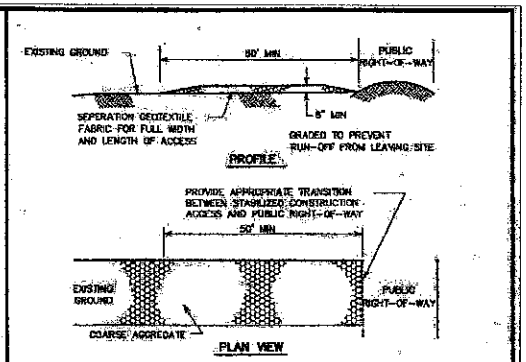


CONSTRUCTION NOTES:

1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 8 INCHES. IF PREASSEMBLED BARRIER WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODEN STAKES. FILTER FABRIC BARRIER SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS, AND FOLDED.
4. SEE COH STANDARD SPECIFICATION FOR FILTER FABRIC BARRIER.

X—(FF)—X
SYMBOL

FILTER FABRIC BARRIER

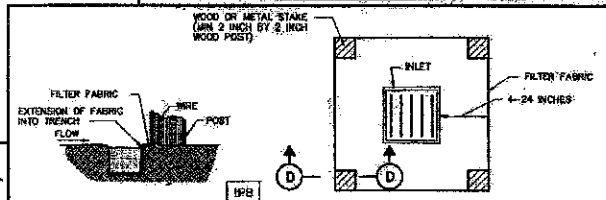


CONSTRUCTION NOTES:

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 ACCESS, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMODATE A WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE WASHING AREA.
6. COH STANDARD SPECIFICATION FOR STABILIZED CONSTRUCTION ACCESS.
7. STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

(SC)
SYMBOL

STABILIZED CONSTRUCTION ACCESS

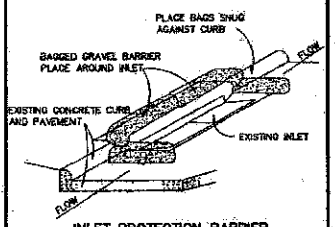


(IPB)
SYMBOL

SILT FENCE INLET PROTECTION BARRIER

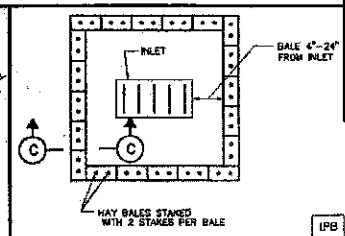
CONSTRUCTION NOTE:

1. SEE CONSTRUCTION NOTES FOR RFB.

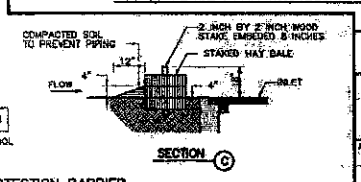


INLET PROTECTION BARRIER

(FOR STAGE II INLETS)
BAGGED GRAVEL BARRIER



(IPB)
SYMBOL



HAY BALE INLET PROTECTION BARRIER

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STORM WATER POLLUTION PREVENTION PLAN DETAILS
(NOT TO SCALE)

APPROVED: CITY ENGINEER	DIRECTOR OF PUBLIC WORKS AND ENGINEERING
EFF DATE: JULY-01-2010	DWG NO: 01571-01

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN (1) YEARS FROM DATE OF APPROVAL.
APPROVED: DEVELOPMENT COORDINATOR
DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER RAY
114459
LICENSED PROFESSIONAL ENGINEER
1/23/18

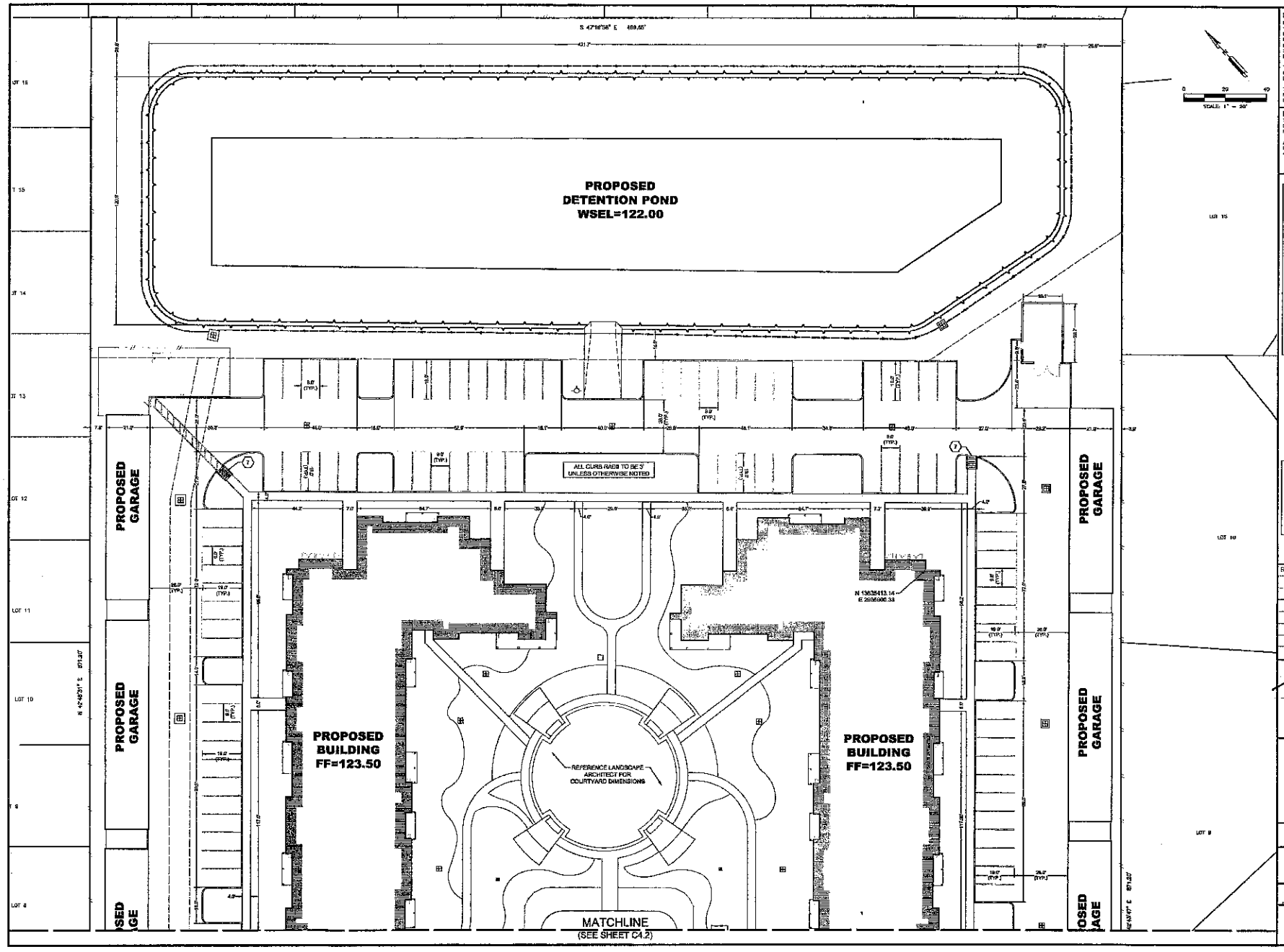
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-8756
5500 Tanglewilde, Suite 150
Houston, Texas 77063
713.780.1900

SOLEA CINCO RANCH

STORM WATER POLLUTION PREVENTION PLAN DETAILS

SCALE	DESIGN	DRAWN
N.T.S.	TGETS	TD

C3.2



BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1W0035, BEING A BRASS DISK STAMPED 1W035 ON BRIDGE AT MASON RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALK, ON NORTHEAST CORNER OF BRIDGE IN RESTRAINT AREA IN THE BARKER WATERSHED NEAR STREAM [illegible]
ELEV=[illegible] (NAVD88, 2001ADJ).

TEMPORARY BENCHMARK "A" BEING A CUT SQX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=[illegible] (NAVD88, 2001ADJ).

TEMPORARY BENCHMARK "B" BEING A CUT SQX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=[illegible] (NAVD88, 2001ADJ).

FLOOD PLAIN NOTE:

THIS BUSINESS TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0040 L & 48157C0110 L, REVISED APRIL 2, 2014.

SHEET NOTES:

1. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
2. REFERENCE ARCHITECTURAL PLANS FOR EXACT BUILDING DIMENSIONS.
3. PROPOSED HANDICAP SIGN. SEE PAVEMENT DETAILS.
4. PROPOSED SIGN. REFERENCE LANDSCAPE ARCHITECT PLANS FOR DETAILS.
5. CONTRACTOR SHALL REFERENCE THE LANDSCAPE ARCHITECTURAL PLANS FOR ALL COURTYARD DETAILS.
6. CROSS SLOPE THROUGH DRIVEWAYS SHALL NOT EXCEED 2% IN ACCORDANCE WITH A.D.A.
7. EXISTING SURVEY WAS DONE BY WINDROSE LAND SERVICES, INC. WITH THEIR CONTACT INFORMATION AS FOLLOW:

Windrose Land Services, Inc.
3200 Wilcrest, Suite 325 Houston, Texas 77042
Phone (713) 460-2261 Fax (713) 461-1151

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

APPROVED: (DEVELOPMENT COORDINATOR)

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/25/2018

STATE OF TEXAS
TYLER RAY
114499
LICENSED
PROFESSIONAL ENGINEER
1/29/18

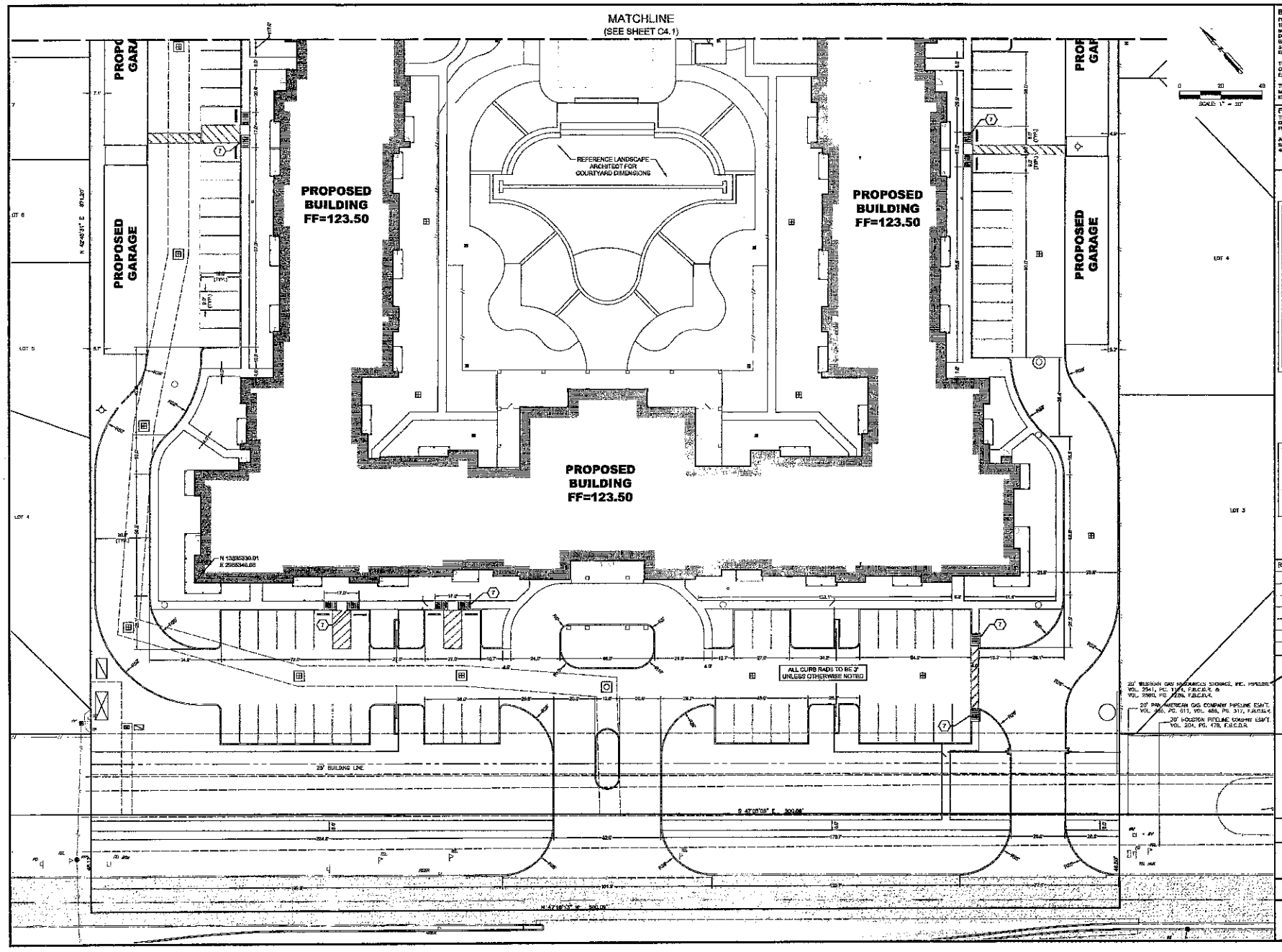
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9786
2500 Tanglewilde, Suite 190
Houston, Texas 77063
713.780.1900

SOLEA CINCO RANCH

DIMENSION CONTROL PLAN (1 OF 2)

SCALE	DESIGN	DRAWN
1"=20'	TD/TR	TD

C4.1



BENCHMARKS:

PROJECT BENCHMARK IN FLOODPLAIN REFERENCE MARKING TEXAS, BCM2 A BRASS DISK STAMPED 1B005 ON BRIDGE AT MASON RD AND UPPER BUFFALO BAYOU LOCATED ON BOWNE FRONT CONCRETE WALL ON NORTHEAST CORNER OF BRIDGE IN KETKAP 462X IN THE BARGE WATERWAYS NEAR STREAM 1B00-00-00.
ELEV=103.51 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEMO A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=122.01 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEMO A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.38 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0045 G & 48157C0110 G, REVISED APRIL 2, 2014.

SHEET NOTES:

1. ALL DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
2. REFERENCE ARCHITECTURAL PLANS FOR EXACT BUILDING DIMENSIONS.
3. PROPOSED HANDICAP SIGN. SEE PAVEMENT DETAILS.
4. PROPOSED SIGN. REFERENCE LANDSCAPE ARCHITECT PLANS FOR DETAILS.
5. CONTRACTOR SHALL REFERENCE THE LANDSCAPE ARCHITECTURAL PLANS FOR ALL COURTYARD DETAILS.
6. CROSS SLOPE THROUGH DRIVEWAYS SHALL NOT EXCEED 2% IN ACCORDANCE WITH A.D.A.
7. ALL RAMPS TO BE 8' LONG, UNLESS OTHERWISE NOTED.
8. EXISTING SURVEY WAS DONE BY WINDROSE LAND SERVICES, INC. WITH THEIR CONTACT INFORMATION AS FOLLOW:

Windrose Land Services, Inc.
3200 Wilcrest, Suite 335 Houston, Texas 77042
Phone (713)408-2261 Fax (713)401-1131

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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER RAY
114800
LICENSED PROFESSIONAL ENGINEER
1/23/18

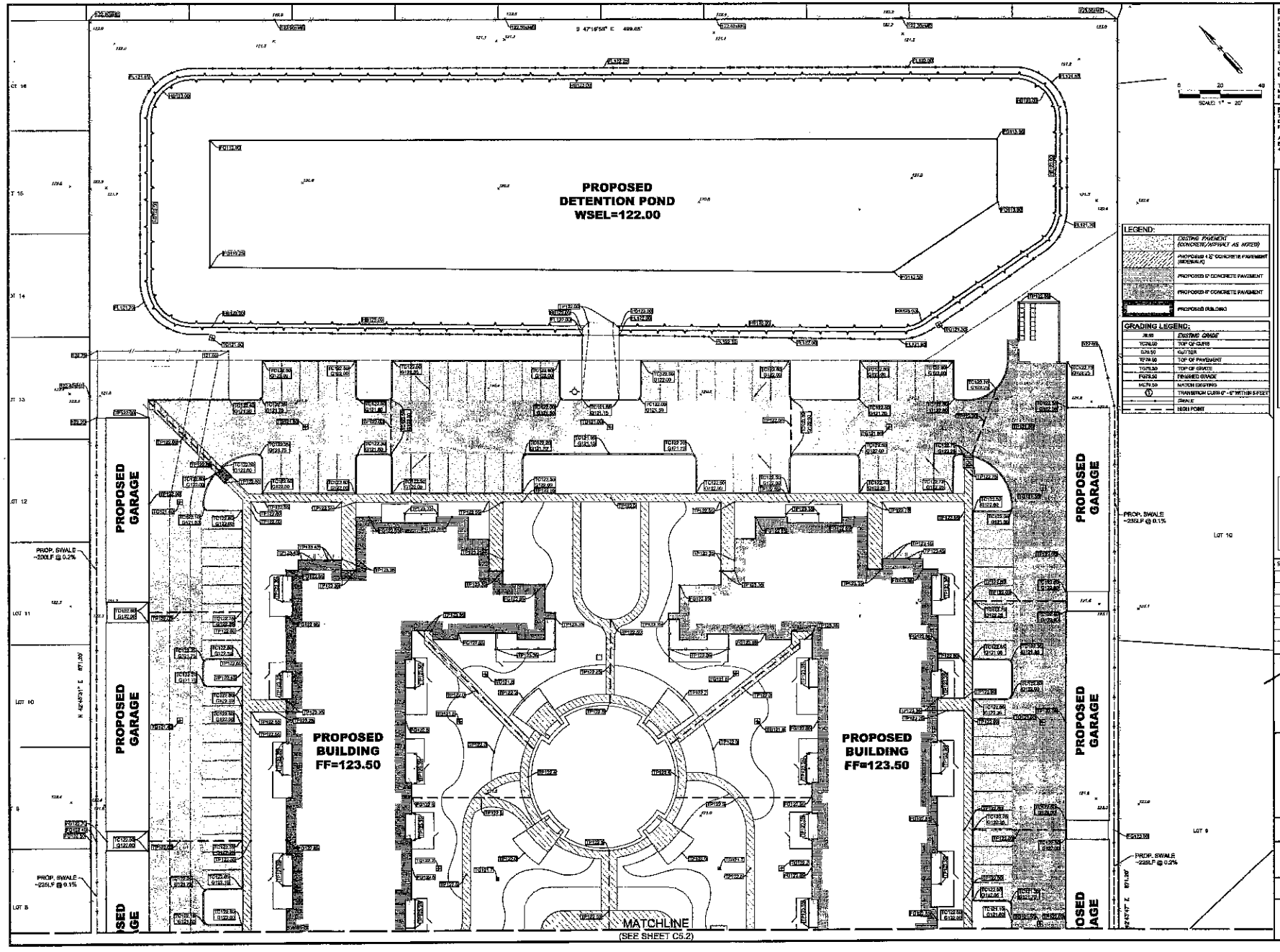
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9786
2500 Tanglewilde, Suite 170
Houston, Texas 77063
713.783.1900

SOLEA CINCO RANCH

DIMENSION CONTROL PLAN (2 OF 2)

SCALE	DESIGN	DRAWN
1"=20'	TB/RR	TD

C4.2



BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK (AE) MR6663, BEING A BRASS DISK STAMPED "MR6663 ON BRIDGE AT MASON RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALL ON NORTHEAST CORNER OF BRIDGE IN KEYMAP 483J IN TIE BARKER WATERSHED NEAR STREAM T-09-00-00
ELEV=103.04 NAVD88, 2004ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX OR INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=126.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.26 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS PARCEL IS NOT LIES IN MINIMAL RISK ZONE "X". (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN).

AS DESIGNATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0295 L & 48157C0310 L, REVISED APRIL, 2, 2014.

GRADING NOTES:

1. ALL SPOT ELEVATIONS ARE TO TOP OF PAVEMENT UNLESS OTHERWISE NOTED.
2. ALL SIDEWALKS AND ACCESSIBLE ROUTES, INCLUDING DRIVEWAY CROSSWALKS, SHALL CONFORM TO ALL APPLICABLE ANDRIGHAN WITH DISCRIMITER ACT STANDARDS AND THE TEXAS ACCESSIBILITY STANDARDS. IF ANY DISCREPANCY IS DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO POURING ANY PAVEMENT.
3. ALL SIDEWALKS AND ACCESSIBLE ROUTES, INCLUDING DRIVEWAY CROSSWALKS, SHALL NOT EXCEED A RUNNING SLOPE OF 5% (1:20) WITHOUT A RAMP, AND SHALL NOT EXCEED A 2% CROSS SLOPE (1:50).
4. THE ACCESSIBLE PARKING AND PASSENGER LOADING AREAS SHALL NOT EXCEED A SLOPE OF 2% (1:50) IN ANY DIRECTION.
5. ALL EXISTING APPURTENANCES ON SITE SHALL BE ADJUSTED TO PROPOSED GRADE AS APPLICABLE.
6. CONTRACTOR SHALL REFERENCE GEOTECHNICAL REPORT AND ALL ADDENDUM FOR BUILDING PAD LIMITS AND PREPARATION REQUIREMENTS.
7. CONTRACTOR SHALL ENSURE THERE IS POSITIVE DRAINAGE FROM THE PROPOSED BUILDINGS AND NO PONDING IN PAVED AREAS, AND SHALL NOTIFY ENGINEER IF ANY GRADING DISCREPANCIES ARE FOUND IN THE EXISTING AND PROPOSED GRADES PRIOR TO PLACEMENT OF PAVEMENT OR STRUCTURES.

LEGEND:

	EXISTING PAVEMENT (CONCRETE/ASPHALT AS NOTED)
	PROPOSED 4 1/2" CONCRETE PAVEMENT (SIDEWALK)
	PROPOSED 6" CONCRETE PAVEMENT
	PROPOSED 8" CONCRETE PAVEMENT
	PROPOSED BUILDING

GRADING LEGEND:

26.00	EXISTING GRADE
TC26.00	TOP OF CURB
G26.50	GUTTER
TP26.00	TOP OF PAVEMENT
TG26.00	TOP OF GRATE
FG26.00	FINISHED GRADE
NG26.00	NATIVE GRADING
T	TRANSITION CURB 6" - 6" WITHIN 5 FEET
	SWALE
	HIGH POINT

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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER RAY
114499
LICENSED
PROFESSIONAL ENGINEER
1/23/18

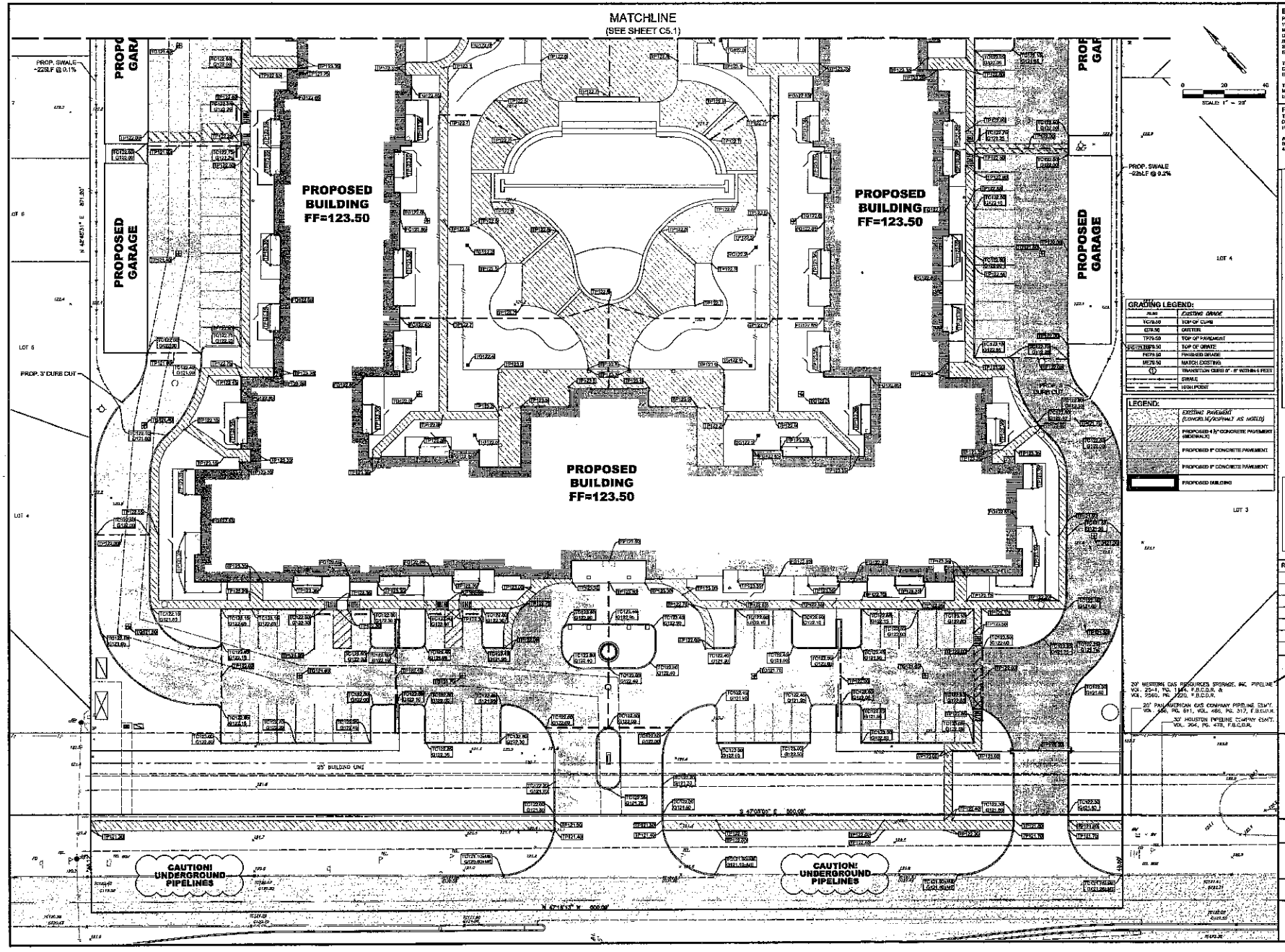
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9756
7500 Tanglewilde, Suite 100
Houston, Texas 77063
713.789.1886

SOLEA CINCO RANCH

GRADING PLAN (1 OF 2)

SCALE	DESIGN	DRAWN
1"=20'	TD/TR	TD

C5.1



BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1100025, BEING A BRASS DISK STAMPED 1100025 ON BRIDGE AT MASON RD AND MIPOR (BUFFALO BAYOU) LOCATED ON UPSTREAM CONCRETE RETWALL ON NORTHEAST CORNER OF BRIDGE IN KEYMAP 492, IN THE BARKER WATERSHED NEAR STATION 7108-00-00.
ELEV=122.51 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=129.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.35 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NO. 48157C0045 L & 48157C0110 L, REVISED APRIL 2, 2014.

GRADING NOTES:

1. ALL SPOT ELEVATIONS ARE TO TOP OF 6" PAVEMENT UNLESS OTHERWISE NOTED.
2. ALL SIDEWALKS AND ACCESSIBLE ROUTES, INCLUDING DRIVEWAY CROSSWALKS, SHALL COMPORM TO ALL APPLICABLE AMERICANS WITH DISABILITIES ACT STANDARDS AND THE TEXAS ACCESSIBILITY STANDARDS. IF ANY SUBCHANGE IS DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO POURING ANY PAVEMENT.
3. ALL SIDEWALKS AND ACCESSIBLE ROUTES, INCLUDING DRIVEWAY CROSSWALKS, SHALL NOT EXCEED A RUNNING SLOPE OF 5% (1:20) WITHOUT A RAMP, AND SHALL NOT EXCEED A 2% CROSS SLOPE (1:50).
4. THE ACCESSIBLE PARKING AND PASSENGER LOADING AREAS SHALL NOT EXCEED A SLOPE OF 2% (1:50) IN ANY DIRECTION.
5. ALL EXISTING APPURTENANCES ON SITE SHALL BE ADJUSTED TO PROPOSED GRADE AS APPLICABLE.
6. CONTRACTOR SHALL REFERENCE GEOTECHNICAL REPORT AND ALL ADDENDA FOR BUILDING PAD LIMITS AND PREPARATION REQUIREMENTS.
7. CONTRACTOR SHALL ENSURE THERE IS POSITIVE DRAINAGE FROM THE PROPOSED BUILDINGS AND NO PONDING IN PAVED AREAS, AND SHALL NOTIFY ENGINEER IF ANY GRADING DISCREPANCIES ARE FOUND IN THE EXISTING AND PROPOSED GRADES PRIOR TO PLACEMENT OF PAVEMENT OR UTILITIES.

GRADING LEGEND:

123.00	EXISTING GRADE
TC/123.00	TOP OF CURB
GT/123.00	GUTTER
TP/123.00	TOP OF PAVEMENT
TG/123.00	TOP OF GRATE
FG/123.00	FINISHED GRADE
MC/123.00	MATCH EXISTING
(1)	TRANSITION CURB 6" - 0" WITHIN 5 FEET
	SWALE
	HIGH POINT

LEGEND:

	EXISTING PAVEMENT (CONCRETE/ASPHALT AS NOTED)
	PROPOSED 4 1/2" CONCRETE PAVEMENT (SIDEWALK)
	PROPOSED 6" CONCRETE PAVEMENT
	PROPOSED 8" CONCRETE PAVEMENT
	PROPOSED BUILDING

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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

TYLER RAY
114469
LICENSED PROFESSIONAL ENGINEER
1/23/18

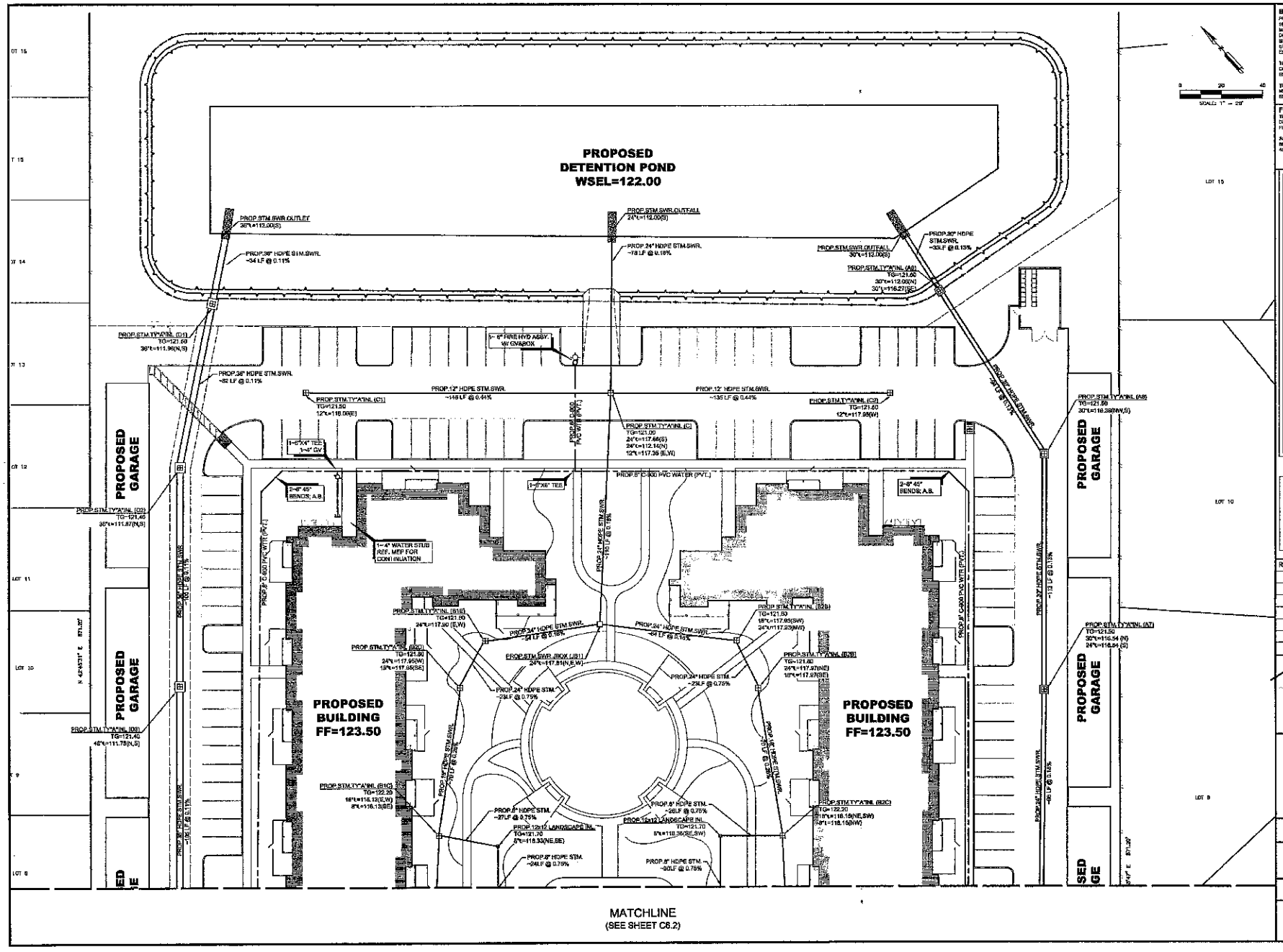
W|G|A
WARD, GETZ & ASSOCIATES, L.L.P.
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9754
2008 Tanglewilde, Suite 120
Houston, Texas 77063
713.785.1000

SOLEA CINCO RANCH

GRADING PLAN (2 OF 2)

SCALE	DESIGN	DRAWN
1"=20'	TGR/TR	TD

C5.2



MATCHLINE
(SEE SHEET C6.2)

BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1M0002, BEING A BRASS DISK STAMPED 1M0002 ON BRIDGE AT MADDEN RD AND LAWSON BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALL, ON NORTHEAST CORNER OF BRIDGE IN RATHMAP AREA IN THE MANDER WATERSHED NEAR CREEKMOUTH NAVD88.
ELEV=123.81 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WEST HEIMER PARKWAY.
ELEV=126.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WEST HEIMER PARKWAY.
ELEV=125.36 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0095 L & 48157C0101 L, REVISED APRIL 2, 2014.

UTILITY NOTES:

1. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ENGINEER OF ANY CONFLICT OR DISCREPANCIES.
2. CONTRACTOR TO COORDINATE WITH UTILITY COMPANIES FOR SERVICE ORIGINATION AND CONNECTION.
3. CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE ANY EXISTING ITEMS ON-SITE.
4. CONTRACTOR SHALL KEEP THE SITE CLEAN OF DEBRIS AND ANY EROSION CONTROL MEASURES ARE ADEQUATELY PLACED.
5. CONTRACTOR TO COORDINATE LOCATIONS OF UNDERGROUND IRRIGATION SLEEVING PRIOR TO PAVING. SEE LANDSCAPE PLANS.
6. CONTRACTOR TO COORDINATE LOCATIONS OF UNDERGROUND CONDUIT FOR SITE LIGHTING PRIOR TO PAVING.
7. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION. COPIES OF OSHA STANDARDS MAY BE PURCHASED FROM THE U.S. GOVERNMENT PRINTING OFFICE. INFORMATION AND RELATED REFERENCE MATERIALS MAY BE PURCHASED FROM OSHA, 903 SAN JACINTO, RM 319, AUSTIN, TX, 78701. TEL: (512) 916-5783.
8. ALL SANITARY SEWER, GRAVITY WATER LINES WITH A 9 INCHES TO 9 FEET CLEARANCE SHALL HAVE A MINIMUM OF 18" (DIA) OF 150 P.S.I. SDR 26 PVC PIPE MEETING ASTM SPECIFICATION D2241 CENTERED ON WATER LINE. WHEN WATER LINE IS BELOW SANITARY SEWER PROVIDE MINIMUM 2 FOOT SEPARATION.
9. REFERENCE MEP PLANS FOR UTILITY CONDUIT LOCATIONS.

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN (3) YEARS FROM DATE OF APPROVAL.

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/22/2018

STATE OF TEXAS
TYLER RAY
115480
LICENSED
1/22/18

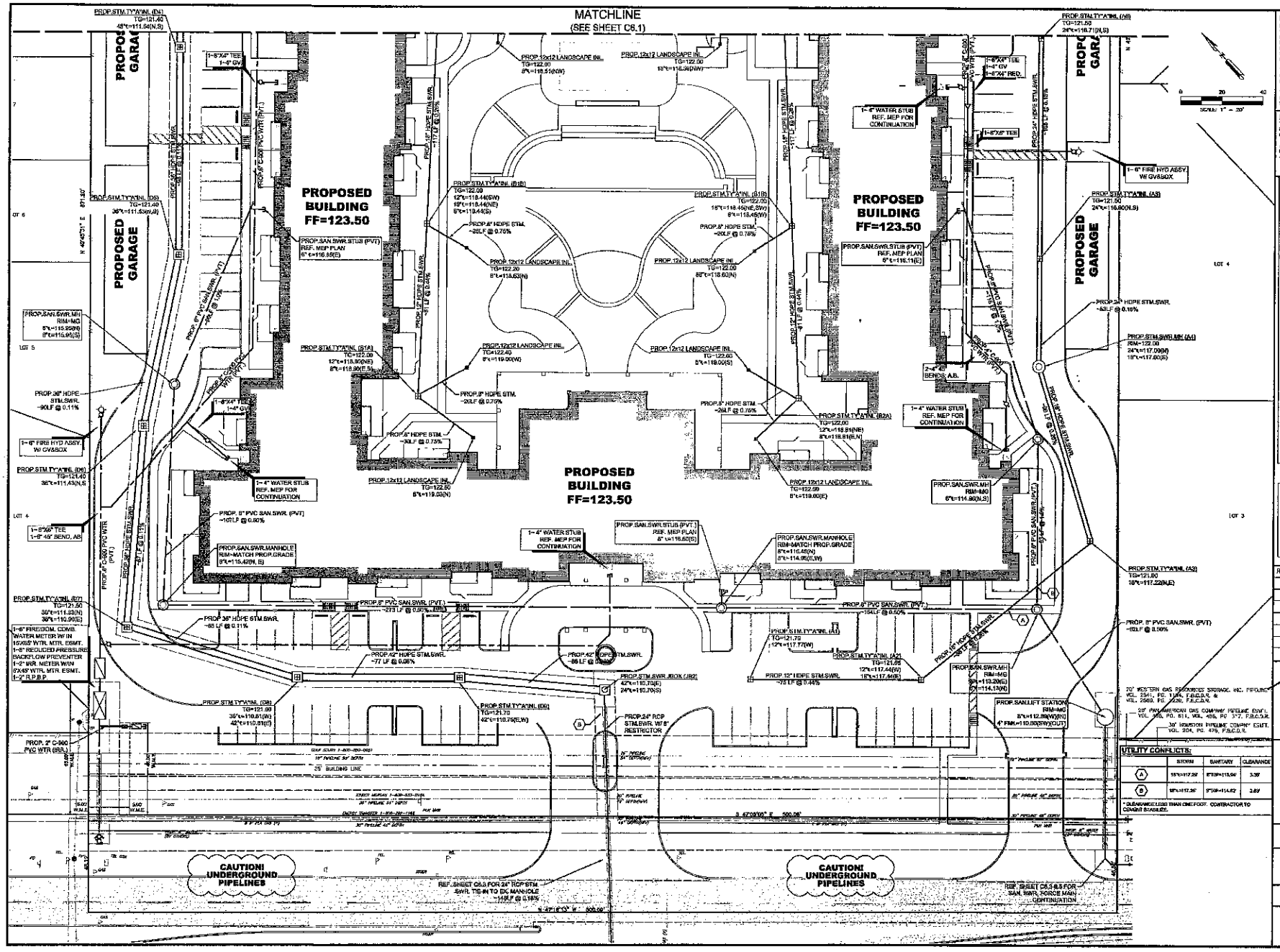
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9756
2500 Tanglewilde, Suite 185
Houston, Texas 77063
713.266.1366

SOLEA CINCO RANCH

UTILITY PLAN
(1 OF 2)

SCALE	DESIGN	DRAWN
1"=20'	TR/ER	TD

C6.1



BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1[illegible]G, BEING A BRASS DISK STAMPED 1[illegible]G ON BRIDGE AT MASON ROAD OVER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALK, ON NORTHEAST CORNER OF BRIDGE, BENCHMARK 4152 IN THE GARRETT WATERSHED NEAR S INGRAM TXDOT-0040. ELEV=[illegible] NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY. ELEV=120.23 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY. ELEV=120.36 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X". (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DEPICTED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0245 & 48157C0110 L, REVISED APRIL, 2, 2014.

UTILITY NOTES:

1. UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ENGINEER OF ANY CONFLICT OR DISCREPANCIES.
2. CONTRACTOR TO COORDINATE WITH UTILITY COMPANIES FOR SERVICE ORIGINATION AND CONNECTION.
3. CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE ANY EXISTING ITEMS OUTSIDE.
4. CONTRACTOR SHALL KEEP THE SITE CLEAN OF DEBRIS AND ANY EROSION CONTROL MEASURES ARE ADEQUATELY PLACED.
5. CONTRACTOR TO COORDINATE LOCATIONS OF UNDERGROUND IRRIGATION SLEEVING PRIOR TO PAVING. SEE LANDSCAPE PLANS.
6. CONTRACTOR TO COORDINATE LOCATIONS OF UNDERGROUND CONDUIT FOR SITE LIGHTING PRIOR TO PAVING.
7. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION. COPIES OF OSHA STANDARDS MAY BE PURCHASED FROM THE U.S. GOVERNMENT PRINTING OFFICE. INFORMATION AND RELATED REFERENCE MATERIALS MAY BE PURCHASED FROM OSHA, 903 SAN JACINTO, RM 319, AUSTIN, TX. 78701. TEL: (512) 916-5783.
8. ALL SANITARY SEWERS CROSSING WATER LINES WITH A 18 INCHES TO 9 FEET CLEARANCE SHALL HAVE A MINIMUM OF 18 JOINT OF 150 P.S.I. SDR 26 PVC PIPE MEETING ASTM SPECIFICATION D2241 CENTERED ON WATER LINE. WHEN WATER LINE IS BELOW SANITARY SEWER PROVIDE MINIMUM 2 FOOT SEPARATION.
9. REFERENCE MEP PLANS FOR UTILITY CONDUIT LOCATIONS.

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

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/22/2018

UTILITY CONFLICTS:

	STORM	SANITARY	CLEARANCE
A	18"t=117.52'	8"t=114.04'	3.38'
B	18"t=117.35'	8"t=114.42'	2.93'

* CLEARANCE LESS THAN ONE FOOT. CONTRACTOR TO CONSULT ENGINEER.

STATE OF TEXAS
TYLER RAY
114499
LICENSED PROFESSIONAL ENGINEER
1/22/18

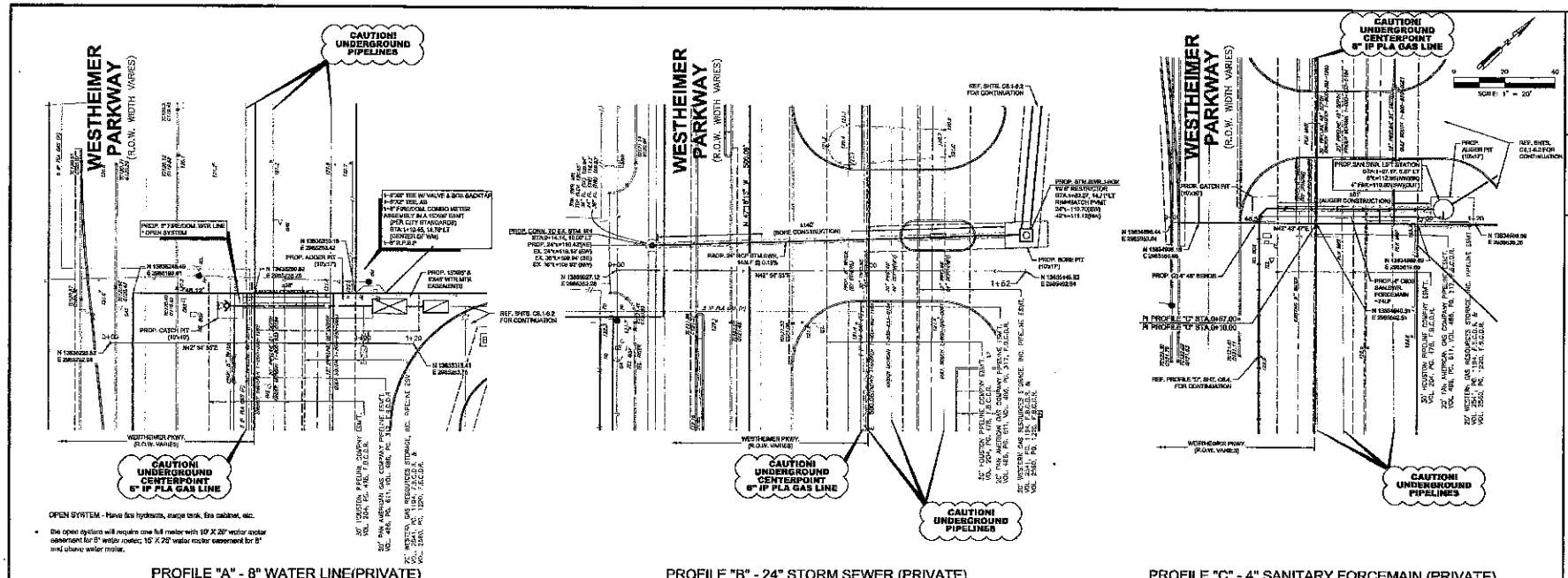
W|G|A
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9356
3500 Ringwood Dr., Suite 193
Sugar Land, Texas 77498
713.795.1600

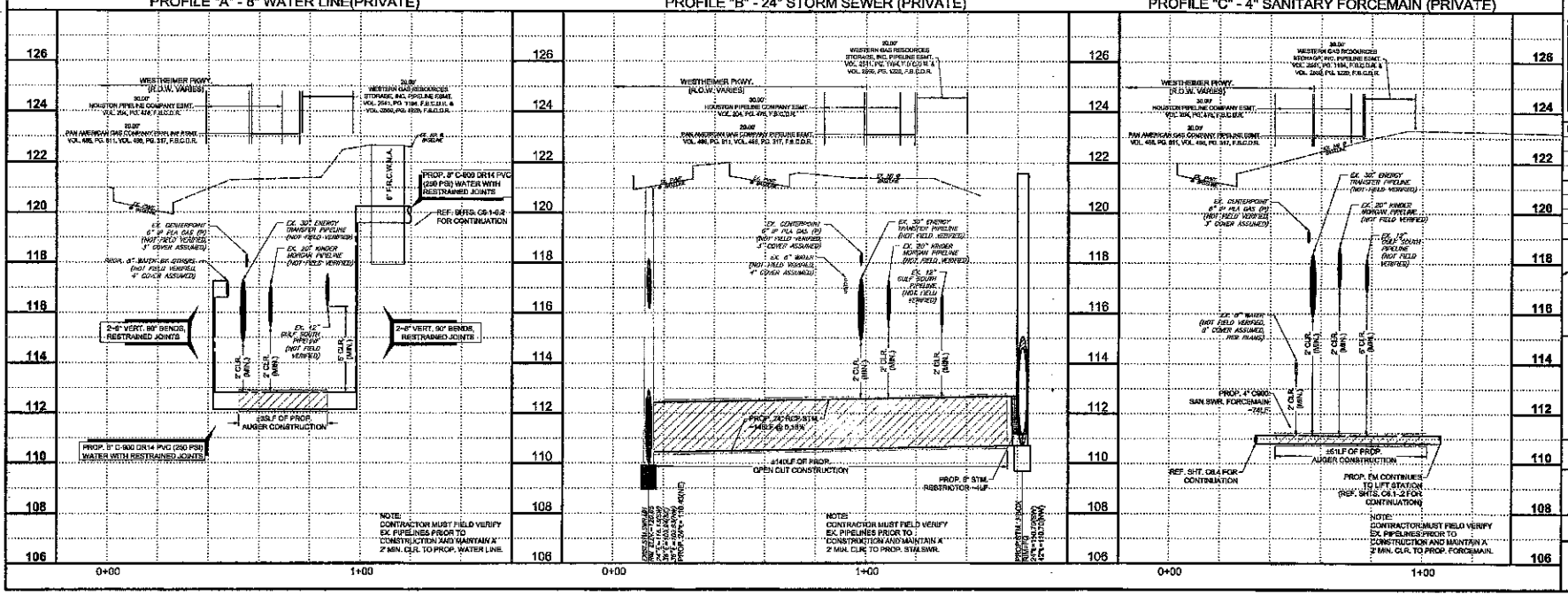
SOLEA CINCO RANCH

UTILITY PLAN (2 OF 2)

SCALE	DESIGN	DRAWN
1"=20'	TDVER	TD

C6.2





BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1300625, BEING A BRASS DISK STAMPED 1300625 ON BRIDGE AT MASON RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONSTRUCTION WALL, ON NORTHEAST CORNER OF BRIDGE AT MEYAR 4652 IN THE BRIDGE STATE SERVED NEAR STREAM T100-00-00.
ELEV=105.51 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX OB DIST LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=122.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.36 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS CLEARLY INDICATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0245 L & 48157C0130 L, REVISED APRIL, 2, 2014.

ATTENTION

ALL EXISTING UTILITIES ARE REPRESENTED TO THE BEST OF THE ENGINEER'S KNOWLEDGE. THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF A CONFLICT ARISES.

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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

THERRY 114939 LICENSED PROFESSIONAL ENGINEER 1/23/18

WGA

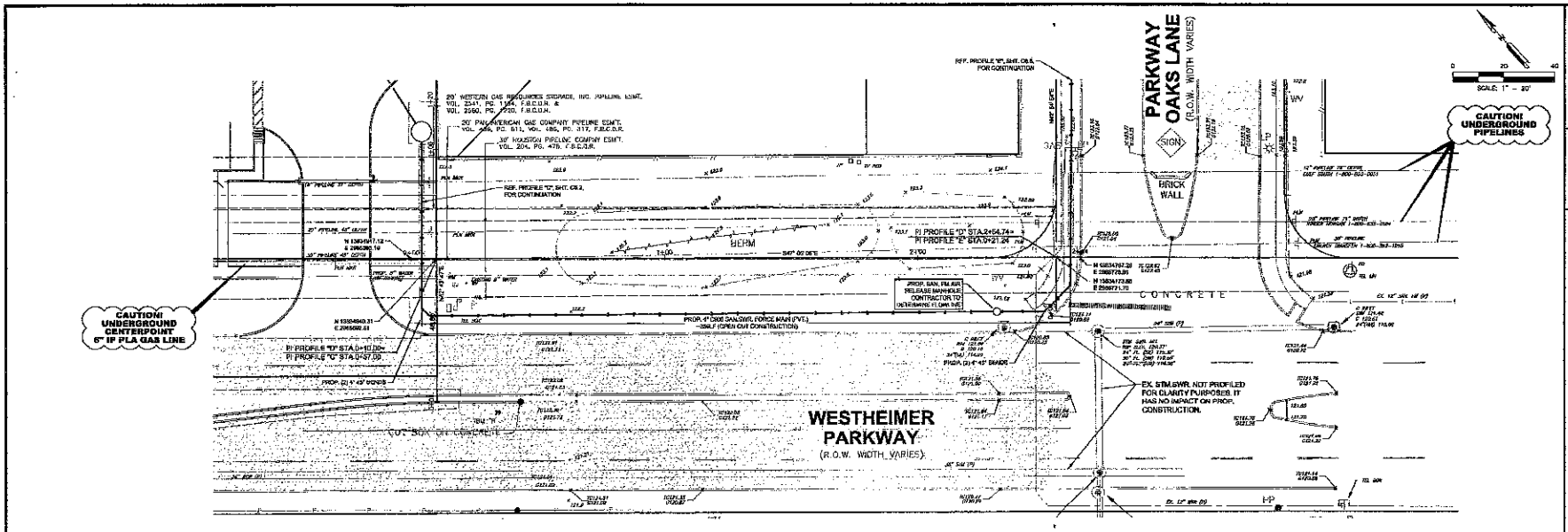
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9784
2540 Tanglewilde, Suite 180
Houston, Texas 77063
713.785.1808

SOLEA CINCO RANCH

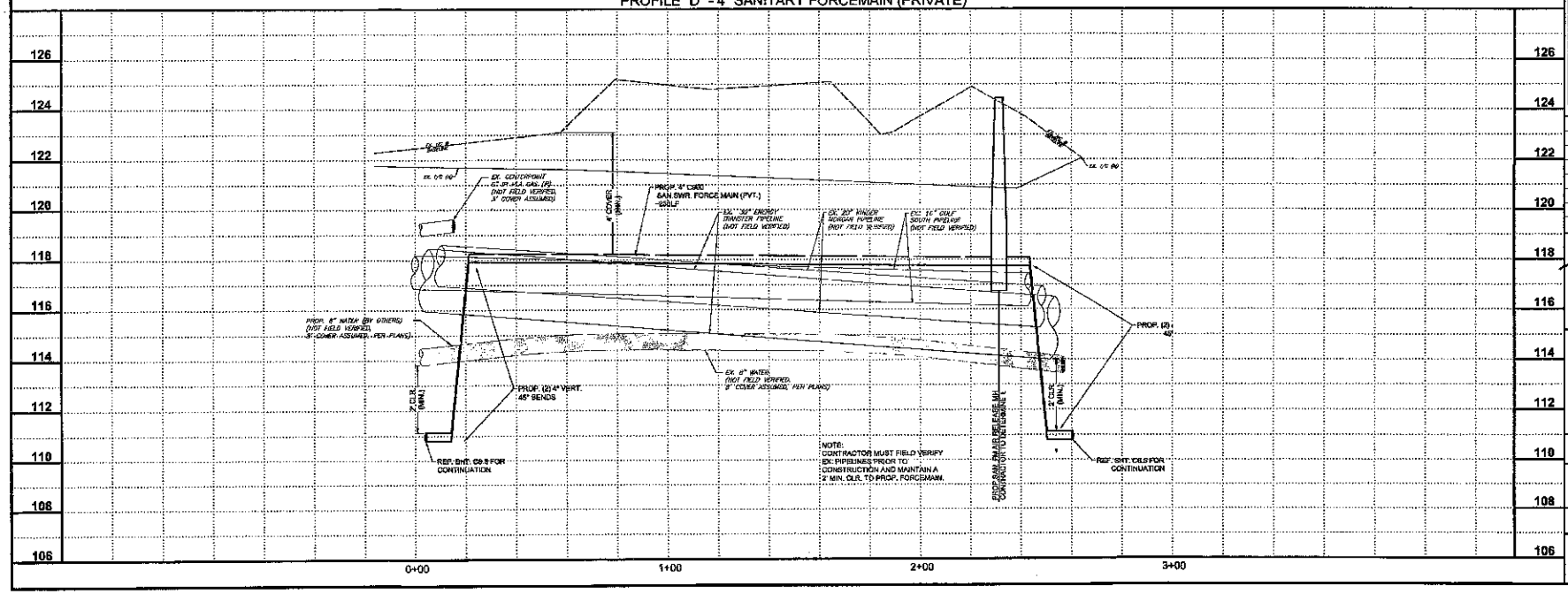
PLAN & PROFILE "A,B,&C" - PUBLIC UTILITIES

SCALE	DESIGN	DRAWN
1"=20'	TCWR	TG

C6.3



PROFILE "D" - 4" SANITARY FORCEMAIN (PRIVATE)



BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1X0205, BEING A BRASS DISK STAMPED 1X0205 ON BRIDGE AT MADONNA RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALK, ON NORTHEAST CORNER OF BRIDGE IN KERMIT AVE WITH EL BARRIO MATURIDAD NEAR STREAM TRIBUTARY.
ELEV=105.81 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT X ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=131.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT X ON LOCATED ON THE NE CORNER OF WESTHEIMER PARKWAY.
ELEV=132.30 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0240 L & 48157C0210 L, REVISED APRIL 2, 2014.

ATTENTION

ALL EXISTING UTILITIES ARE REPRESENTED TO THE BEST OF THE ENGINEER'S KNOWLEDGE. THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF A CONFLICT ARISES.

FORT BEND COUNTY ENGINEER
ENGINEER: RICHARD W. STOLLEUZ, P.E.
DATE:
THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED WITHIN (1) YEAR FROM DATE OF APPROVAL.
APPROVED: DEVELOPMENT COORDINATOR
DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER RAY
114480
LICENSED
PROFESSIONAL ENGINEER
1/23/18

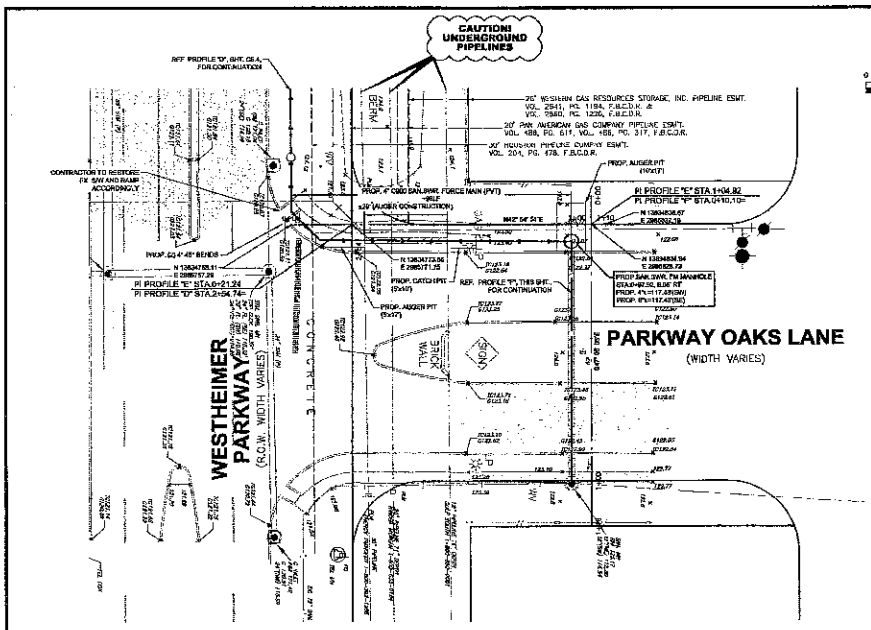
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9754
3300 Timmons Ln, Suite 120
Houston, Texas 77027
713.780.1969

SOLEA CINCO RANCH

PLAN & PROFILE "D" - 4" SANITARY FORCEMAIN

SCALE	DESIGN	DRAWN
1"=20'	TDR	TD

C6.4



BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN BENCHMARK MARK NO. 1N0H26, BEING A BRASS DISK STAMPED 1N0H26 ON BRIDGE AT WASSON RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALK ON NORTHEAST CORNER OF BRIDGE IN ROTARY 492' N THE BANKER WATERSHED NEAR STREAM T180-00-00.
ELEV=126.51 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH BERM-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV.=120.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.36 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

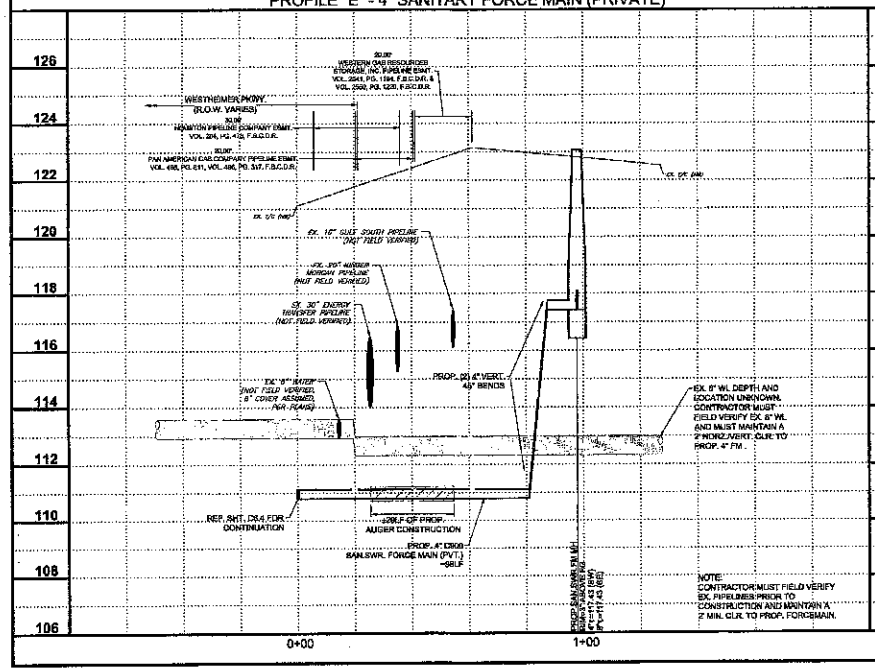
THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0443 L & 48157C0131 L, REVISED APRIL 2, 2014.

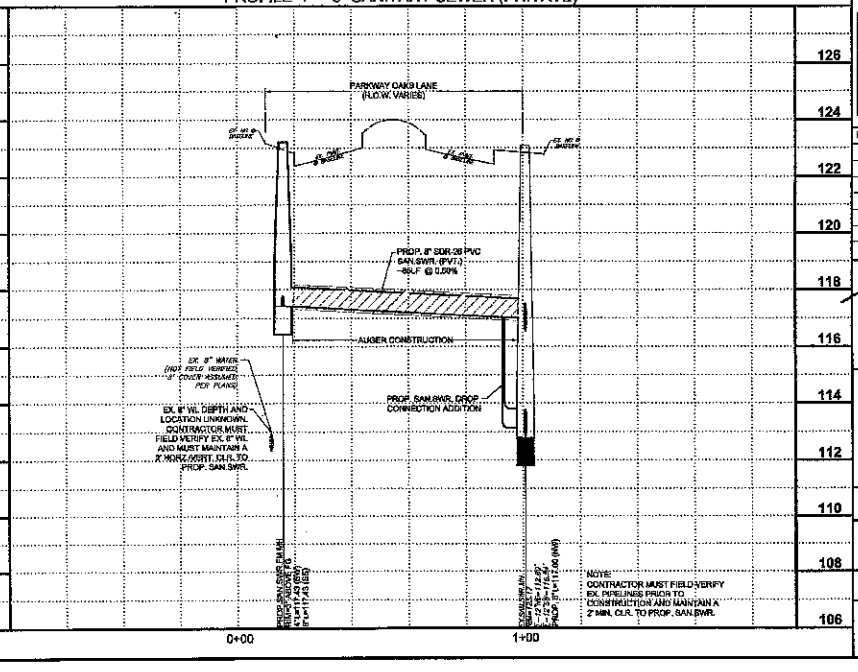
"ATTENTION"

ALL EXISTING UTILITIES ARE REPRESENTED TO THE BEST OF THE ENGINEER'S KNOWLEDGE. THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF A CONFLICT ARISES.

PROFILE "E" - 4" SANITARY FORCE MAIN (PRIVATE)



PROFILE "F" - 8" SANITARY SEWER (PRIVATE)



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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER MAY
114488
LICENSED PROFESSIONAL ENGINEER
1/23/18

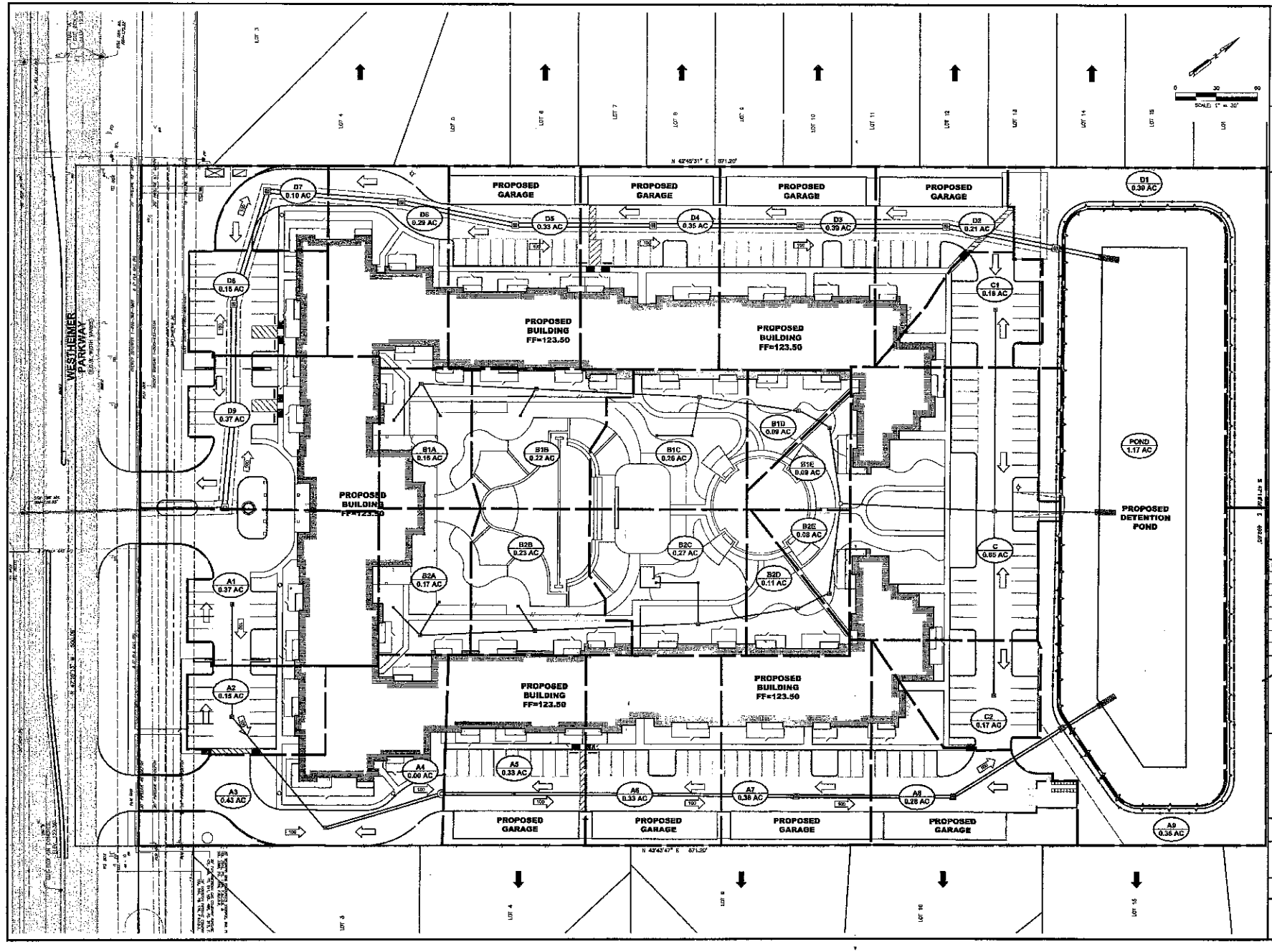
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9754
5500 Telephone Rd., Suite 100
Houston, Texas 77063
713.789.1900

SOLEA CINCO RANCH

PLAN & PROFILE "E&F" - 4" SANITARY FORCEMAIN & 8" SANITARY SEWER

SCALE	DESIGN	DRAWN
1"=20'	TGR	TD

C6.5



BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1909625, BEING A BRASS DISK STAMPED 1909625 ON BRIDGE AT MASON RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CORNER IN SALE, ON NORTHEAST CORNER OF BRIDGE IN NOTAMP-2002 IN THE BARKER WATERSHED NEAR STREAM T100400 00.
ELEV.=125.55 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT SQUARE INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV.=130.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT SQUARE LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
EL EV.=123.38 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THE SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NO. 48157C0445 G, 8-4-2010 (FIS L, REVISED APRIL 2, 2014.

DRAINAGE AREA MAP LEGEND:

A 1.52 AC	DRAINAGE AREA AREA IN ACRES
	DRAINAGE BOUNDARY
	OFF-SITE SHEET FLOW
100	100-YEAR FLOW
	EXTREME EVENT SHEET FLOW (IN EXCESS OF 100-YEAR EVENT)

MAXIMUM PONDING OVER INLETS = 6.0 INCHES

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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
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STATE OF TEXAS
TYLER RAY
114458
LICENSED
PROFESSIONAL ENGINEER
1/22/18

WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-8756
2500 Tanglewilde, Suite 120
Houston, Texas 77063
713.780.1900

SOLEA CINCO RANCH

DRAINAGE AREA MAP

SCALE	DESIGN	DRAWN
1"=30'	TD/TR	TD

C7.1

STORM SEWER CALCULATIONS (3-YR STORM EVENT)

FORT BEND COUNTY

Z:\00024 (Schoeb Realty)\024 (Solea Cinco Ranch)\024C3-YR Storm Event.xlsx\Storm Sewer Calculations

Project: Solea Cinco Ranch
Job No: 00024-024
PM: TR

Date: January 5, 2018
Land Use Category: Residential Districts (Apartment Dwelling Areas)

3-YR
b = 48.35
d = 10.84
e = 0.805

From MH	To MH	Sub Area Acres	Total Area Acres	Sub Runoff Coeff. C	Cf	C*Cf	C*CFA	Time of Conc. min.	Intensity I (in / hr.)	Sum of Flows cfs Q	Pipe Size (in)	Shape Sewer Material	Pipe Length L (ft)	Pipe Slope (%)	Pipe area (sq ft)	# of Pipes	Slope %	Manning's "n"	Capacity cfs	Velocity fps	Actual Velocity fps	Hydraulic Gradient %	Change in Head ft.	Elev. Up Stream	Elev. Down Stream	Gutter Elevation Upstream	Gutter Elevation Downstream	Bowline upstream	Bowline downstream	(downstream) top of pipe
SYSTEM A																														
A1	A2	0.37	0.37	0.75	1.00	0.75	0.28	10.00	5.98	1.68	PIPE	HDPE	76	12 in	0.79	1	0.44	0.010	3.07	3.91	5.98	0.128	0.098	120.39	120.27	121.00	121.15	117.77	117.64	118.64
A2	A3	0.16	0.52	0.75	1.00	0.75	0.39	10.34	5.89	2.30	PIPE	HDPE	86	18 in	1.77	1	0.28	0.010	6.95	3.94	3.61	0.038	0.024	120.27	120.24	121.15	121.00	117.44	117.22	118.72
A3	A4	0.43	0.95	0.75	1.00	0.75	0.71	10.73	5.81	4.14	PIPE	HDPE	86	18 in	1.77	1	0.28	0.010	6.95	3.94	4.10	0.052	0.075	120.24	120.15	121.00	121.00	117.22	116.99	118.49
A4	A5	0.00	0.95	0.75	1.00	0.75	0.71	10.86	5.77	4.11	PIPE	HDPE	93	24 in	3.14	1	0.18	0.010	12.48	3.97	3.54	0.020	0.018	120.19	120.15	121.00	121.00	116.99	116.93	118.00
A5	A6	0.33	1.28	0.75	1.00	0.75	0.96	11.39	5.67	5.45	PIPE	HDPE	105	24 in	3.14	1	0.18	0.010	12.48	3.97	3.83	0.024	0.055	120.15	120.12	121.00	121.00	116.93	116.71	118.71
A6	A7	0.30	1.61	0.75	1.00	0.75	1.21	11.78	5.59	6.75	PIPE	HDPE	95	24 in	3.14	1	0.18	0.010	12.48	3.97	4.04	0.053	0.050	120.12	120.07	121.00	121.00	116.71	116.54	118.54
A7	A8	0.30	1.97	0.75	1.00	0.75	1.48	12.27	5.50	8.13	PIPE	HDPE	113	30 in	4.91	1	0.13	0.010	19.23	3.92	3.74	0.033	0.038	120.07	120.04	121.00	121.00	116.54	116.39	118.39
A8	A9	0.28	2.25	0.75	1.00	0.75	1.69	12.67	5.42	9.15	PIPE	HDPE	94	30 in	4.91	1	0.13	0.010	19.23	3.92	3.86	0.036	0.028	120.04	120.01	121.00	121.00	116.39	116.27	118.77
A9	POND	0.35	2.60	0.75	1.00	0.75	1.95	12.81	5.40	10.53	PIPE	HDPE	33	30 in	4.91	1	0.13	0.010	19.23	3.92	3.90	0.039	0.013	120.01	120.00	121.00	121.00	116.27	116.23	118.73
SYSTEM B																														
B2A	B2B	0.17	0.17	0.75	1.00	0.75	0.13	10.00	5.98	0.75	PIPE	HDPE	61	12 in	0.79	1	0.44	0.010	3.07	3.91	3.20	0.027	0.033	120.24	120.21	122.00	122.00	118.00	118.04	118.84
B2B	B2C	0.23	0.40	0.75	1.00	0.75	0.30	10.00	5.75	1.73	PIPE	HDPE	117	18 in	1.77	1	0.44	0.010	9.64	5.50	3.61	0.045	0.050	120.21	119.95	122.00	122.00	118.04	118.13	119.63
B2C	B2D	0.27	0.67	0.75	1.00	0.75	0.50	12.00	5.66	2.79	PIPE	HDPE	70	18 in	1.77	1	0.44	0.010	9.05	5.13	4.51	0.062	0.096	120.95	120.20	122.00	121.69	118.13	117.82	119.32
B2D	B2E	0.11	0.78	0.75	1.00	0.75	0.59	13.00	5.58	3.14	PIPE	HDPE	23	18 in	1.77	1	0.28	0.010	6.00	3.39	3.84	0.053	0.012	120.22	120.21	121.69	121.69	117.82	117.78	119.28
B2E	JB1	0.08	0.87	0.75	1.00	0.75	0.65	13.27	5.51	3.59	PIPE	HDPE	94	24 in	3.14	1	0.18	0.010	12.48	3.97	3.48	0.017	0.011	120.21	120.20	121.80	122.00	117.78	117.65	119.05
SYSTEM C																														
B1A	B1B	0.16	0.16	0.75	1.00	0.75	0.12	10.00	5.98	0.72	PIPE	HDPE	61	12 in	0.79	1	0.44	0.010	3.07	3.91	3.14	0.024	0.019	120.23	120.21	122.00	122.00	118.00	118.04	118.84
B1B	B1C	0.22	0.38	0.75	1.00	0.75	0.28	11.00	5.73	1.64	PIPE	HDPE	117	18 in	1.77	1	0.44	0.010	9.05	5.13	3.53	0.043	0.047	119.95	119.91	122.00	122.00	118.04	118.13	119.63
B1C	B1D	0.28	0.64	0.75	1.00	0.75	0.48	12.00	5.58	2.66	PIPE	HDPE	70	18 in	1.77	1	0.44	0.010	9.00	5.13	4.45	0.058	0.087	119.91	120.20	122.00	121.69	118.13	117.82	119.32
B1D	B1E	0.09	0.73	0.75	1.00	0.75	0.55	13.00	5.36	2.94	PIPE	HDPE	23	18 in	1.77	1	0.28	0.010	6.00	3.39	3.76	0.045	0.011	119.27	119.26	121.69	121.69	117.82	117.78	119.28
B1E	JB1	0.08	0.82	0.75	1.00	0.75	0.62	13.23	5.32	3.04	PIPE	HDPE	54	24 in	3.14	1	0.18	0.010	12.48	3.97	3.45	0.015	0.008	120.21	120.20	121.80	122.00	117.78	117.65	119.05
JB1	C	0.00	1.69	0.75	1.00	0.75	1.27	13.43	5.29	7.34	PIPE	HDPE	143	24 in	3.14	1	0.18	0.010	12.48	3.97	4.18	0.062	0.089	120.20	120.11	122.00	120.75	117.65	117.55	119.05
SYSTEM C																														
C1	C	0.18	0.18	0.75	1.00	0.75	0.12	10.00	5.98	0.72	PIPE	HDPE	115	12 in	0.79	1	0.44	0.010	3.07	3.91	3.14	0.024	0.045	120.15	120.11	121.00	120.75	118.00	117.93	118.53
C2	C	0.17	0.17	0.75	1.00	0.75	0.13	10.00	5.98	0.75	PIPE	HDPE	135	12 in	0.79	1	0.44	0.010	3.07	3.91	3.20	0.027	0.037	120.16	120.11	121.00	120.75	117.96	117.38	118.38
C	POND	0.64	2.85	0.75	1.00	0.75	2.00	11.16	5.72	11.42	PIPE	HDPE	76	24 in	3.14	1	0.18	0.010	12.48	3.97	4.50	0.064	0.110	120.11	120.00	120.75	120.53	117.14	112.00	114.00
SYSTEM D																														
POND	D1	1.17	5.43	0.75	1.00	0.75	4.07	14.00	5.06	20.61	PIPE	HDPE	34	36 in	7.07	1	0.13	0.010	31.26	4.42	5.01	0.019	0.006	115.60	115.59	121.30	121.70	112.00	111.90	114.60
D1	D2	0.38	6.02	0.75	1.00	0.75	4.52	15.31	4.90	20.30	PIPE	HDPE	92	36 in	7.07	1	0.13	0.010	31.26	4.42	5.04	0.021	0.099	115.59	115.46	121.70	121.00	111.90	111.65	114.65
D2	D3	0.21	7.93	0.75	1.00	0.75	5.72	16.23	4.82	20.57	PIPE	HDPE	105	36 in	7.07	1	0.13	0.010	31.26	4.42	5.04	0.025	0.131	115.46	115.33	121.00	121.00	111.65	111.21	114.71
D3	D4	0.39	7.42	0.75	1.00	0.75	5.57	16.93	4.73	21.01	PIPE	HDPE	106	36 in	7.07	1	0.13	0.010	31.26	4.42	5.04	0.025	0.142	115.33	115.19	121.00	121.00	111.21	111.04	114.68
D4	D5	0.36	7.77	0.75	1.00	0.75	5.83	17.47	4.65	22.07	PIPE	HDPE	98	36 in	7.07	1	0.13	0.010	31.26	4.42	5.00	0.025	0.142	115.19	115.05	121.00	121.00	111.04	111.45	114.45
D5	D6	0.33	8.10	0.75	1.00	0.75	6.08	17.81	4.59	23.93	PIPE	HDPE	90	36 in	7.07	1	0.13	0.010	31.26	4.42	4.90	0.023	0.136	115.05	114.91	121.00	121.00	111.45	111.33	114.33
D6	D7	0.29	8.39	0.75	1.00	0.75	6.29	18.14	4.52	24.77	PIPE	HDPE	87	36 in	7.07	1	0.13	0.010	31.26	4.42	4.92	0.021	0.149	114.91	114.77	121.00	121.00	111.33	111.22	114.22
D7	D8	0.10	8.49	0.75	1.00	0.75	6.37	18.46	4.46	24.79	PIPE	HDPE	86	36 in	7.07	1	0.13	0.010	31.26	4.42	4.93	0.021	0.132	114.77	114.63	121.00	121.15	111.22	111.11	114.11
D8	D9	0.18	8.67	0.75	1.00	0.75	6.50	18.78	4.41	25.18	PIPE	HDPE	77	36 in	7.07	1	0.13	0.010	31.26	4.42	4.96	0.025	0.122	114.63	114.51	121.15	121.00	111.11	111.01	114.01
D9	JB2	0.37	9.04	0.75	1.00	0.75	6.78	19.09	4.37	29.58	PIPE	HDPE	65	42 in	9.62	1	0.06	0.010	38.99	3.85	4.58	0.017	0.059	114.51	114.46	121.00	121.00	111.01	110.98	114.48
JB2	OUT	0.00	9.04	0.75	1.00	0.75	6.78	19.63	4.28	29.01	PIPE	HDPE	148	42 in	9.62	1	0.06	0.010	38.99	3.85	4.39	0.024	0.119	114.46	114.34	121.00	121.00	110.98	110.94	114.34

STORM SEWER CALCULATIONS (100-YR STORM EVENT)

FORT BEND COUNTY

Z:\00024 (Schoeb Realty)\024 (Solea Cinco Ranch)\024C100-YR Storm Event.xlsx\Storm Sewer Calculations

Project: Solea Cinco Ranch
Job No: 00024-024
PM: TR

Date: January 5, 2018
Land Use Category: Residential Districts (Apartment Dwelling Areas)

100-YR
b = 140.18
d = 15.12
e = 0.7851

From MH	To MH	Sub Area Acres	Total Area Acres	Sub Runoff Coeff. C	Cf	C*Cf	C*CFA	Time of Conc. min.	Intensity I (in / hr.)	Sum of Flows cfs Q	Pipe Size (in)	Shape Sewer Material	Pipe Length L (ft)	Pipe Slope (%)	Pipe area (sq ft)	# of Pipes	Slope %	Manning's "n"	Capacity cfs	Velocity fps	Actual Velocity fps	Hydraulic Gradient %	Change in Head ft.	Elev. Up Stream	Elev. Down Stream	Gutter Elevation Upstream	Gutter Elevation Downstream	Bowline upstream	Bowline downstream	(downstream) top of pipe	Grate Area (SF)	Max. Head (ft)	Inlet Capacity	Q Required (cfs)
SYSTEM A																																		
A1	A2	0.37	0.37	0.75	1.25	0.94	0.35	10.00	11.63	4.04	PIPE	HDPE	76	12 in	0.79	1	0.44	0.010	3.07	3.91	5.14	0.259	0.069	122.80	121.64	121.70	121.65	117.77	117.44	118.64	3.52	0.50	10.00	4.04
A2	A3	0.16	0.52	0.75	1.25	0.94	0.49	10.42	11.47	5.66	PIPE	HDPE	107	18 in	1.77	1	0.28	0.010	5.95	3.94	4.37	0.166	0.179	121.64	121.46	121.65	121.00	117.44	117.15	118.65	3.52	0.50	10.00	1.98
A3	A4	0.43	0.95	0.75	1.25	0.94	0.89	10.83	11.36	10.10	PIPE	HDPE	93	18 in	1.77	1	0.28	0.010	5.95	3.94	5.72	0.348	0.421	121.46	120.89	121.00	121.00	117.15	116.94	118.44	3.52	0.50	10.00	4.57
A4	A5	0.00	0.95	0.75	1.25	0.94	0.89	11.04	11.27	10.04	PIPE	HDPE	93	24 in	3.14	1	0.18	0.010	12.48	3.97	4.40	0.118	0.062	120.89	120.83	121.00	121.00	116.94	116.84	118.04	3.52	0.50	10.00	0.00
A5	A6	0.33	1.28	0.75	1.25	0.94	1.20	11.46	11.12	13.35	PIPE	HDPE	105	24 in	3.14	1	0.18	0.010	12.48	3.97	4.92	0.205	0.216	120.83	120.71	121.00	121.00	116.84	116.55	118.55	3.52	0.50	10.00	5.44
A6	A7	0.30	1.61	0.75	1.25	0.94	1.51	11.88	10.99	16.59	PIPE	HDPE	95	24 in	3.14	1	0.18	0.010	12.48	3.97	5.26	0.318	0.303	120.71	120.44	121.00	121.00	116.55	116.40	118.40	3.52	0.50	10.00	3.40
A7	A8	0.30	1.91	0.75	1.25	0.94	1.80	12.36	10.84	20.02	PIPE	HDPE	113	30 in	4.91	1	0.13	0.010	19.23	3.92	4.45	0.141	0.159	120.41	120.25	121.00	121.00	116.40	116.24	118.24	3.52	0.50	10.00	2.00
A8	A9	0.28	2.25	0.75	1.25	0.94	2.11	12.76	10.72	22.61	PIPE	HDPE	94	30 in	4.91	1	0.13	0.010	19.23	3.92	4.91	0.190	0.178	120.25	120.06	121.00	121.50	116.24	116.11	118.71	3.52	0.50	10.00	2.81
A9	POND	0.35	2.60	0.75	1.25	0.94	2.44	12.90	10.66	26.03	PIPE	HDPE	33	30 in	4.91	1	0.13	0.010	19.23	3.92	5.30	0.256	0.079	120.06	120.00	121.00	121.00	116.21	116.17	118.67	3.52	0.50	10.00	3.50
SYSTEM B																																		
B2A	B2B	0.17	0.17	0.75	1.25	0.94	0.16	10.00	11.63	1.65	PIPE	HDPE	61	12 in	0.79	1	0.44	0.010	3.07	3.91	4.00	0.160	0.160	121.73	121.60	122.00	122.00	118.00	118.45	119.45	3.52	0.50	10.00	1.66
B2B	B2C	0.23	0.40	0.75	1.25	0.94	0.38	10.00	11.26	4.23	PIPE	HDPE	117	18 in	1.77	1	0.28	0.010	6.95	3.94	4.12	0.086	0.112	121.60	121.46	122.00	122.00	118.45	118.15	119.65	3.52	0.50	10.00	2.48
B2C	B2D	0.27	0.67	0.75	1.25	0.94	0.63	10.80	10.95	6.86	PIPE	HDPE	70	18 in	1.77	1	0.28	0.010	6.95	3.94	4.49	0.264	0.178	121.46	121.34	122.00	121.69	118.15	117.87	119.47	3.52	0.50	10.00	3.77
B2D	B2E	0.11	0.78	0.75	1.25	0.94	0.73	11.80	10.65	7.79	PIPE	HDPE	23	18 in	1.77	1	0.18	0.010	12.48	3.97	4.18	0.070	0.018	121.31	121.29	121.69	121.69	117.87	117.83	119.33	3.52	0.50	10.00	1.10
B2E	JB1	0.08	0.87	0.75	1.25	0.94	0.82	12.27	10.54	8.41	PIPE	HDPE	64	24 in	3.14	1	0.18	0.010	12.48	3.97	4.35	0.102	0.065	121.29	121.22	121.80	122.00	117.83	117.61	119.61	3.52	0.50	10.00	0.97
SYSTEM C																																		
B1A	B1B	0.16	0.16	0.75	1.25	0.94	0.15	10.00	11.63	1.75	PIPE	HDPE	61	12 in	0.79	1	0.44	0.010	3.07	3.91	4.01	0.162	0.158	121.67	121.55	122.00	122.00	118.00	118.45	119.45	3.52	0.50	10.00	1.75
B1B	B1C	0.22	0.38	0.75	1.25	0.94	0.36	11.00	11.38	4.02	PIPE	HDPE	117	18 in	1.77	1	0.28	0.010	6.95	3.94	4.07	0.087	0.101	121.55	121.45	122.00	122.00	118.45	118.13	119.63	3.52	0.50	10.00	2.53
B1C	B1D	0.28	0.64	0.75	1.25	0.94	0.60	12.00	10.95	6.57	PIPE	HDPE	70	18 in	1.77	1	0.28	0.010	6.95	3.94	4.49	0.262	0.183	121.45	121.29	122.00	121.69	118.13	117.85	119.45	3.52	0.50	10.00	2.67
B1D	B1E	0.09	0.73	0.75	1.25	0.94	0.68	13.00	10.65	7.29	PIPE	HDPE	23	24 in	3.14	1	0.18	0.010	12.48	3.97	4.10	0.061	0.014	121.29	121.27	121.69	121.69	117.85	117.80	119.00	3.52	0.50	10.00	0.90
B1E	JB1	0.08	0.82	0.75	1.25	0.94	0.77	13.23	10.56	8.08	PIPE	HDPE	54	24 in	3.14	1	0.18	0.010	12.48	3.97	4.30	0.091	0.049	121.27	121.22	121.80	122.00	117.80	117.61	119.61	3.52	0.50	10.00	0.87
JB1	C	0.00	1.69	0.75	1.25	0.94	1.59	13.43	11.34	17.97	PIPE	HDPE	143	24 in	3.14	1	0.18	0.010	12.48	3.97	5.72	0.379	0.534	121.22	120.69	122.00	121.00	117.61	117.05	119.05				
SYSTEM C																																		
C1	C	0.18	0.18	0.75	1.25	0.94	0.15	10.00	11.63	1.75	PIPE	HDPE	115	12 in	0.79	1	0.44	0.010	3.07	3.91	4.01	0.162	0.242	120.90	120.69	121.50	121.00	118.00	117.95	118.35	3.52	0.50	10.00	1.75
C2	C	0.17	0.17	0.75	1.25	0.94	0.16	10.00	11.63	1.96	PIPE	HDPE	135	12 in	0.79	1	0.44	0.010	3.07	3.91	4.09	0.180	0.219	120.91	120.69	121.00	121.00	117.96	117.38	118.38	3.52	0.50	10.00	1.96
C	POND	0.64	2.85	0.75	1.25	0.94	2.49	11.16	11.23	28.01	PIPE	HDPE	76	24 in	3.14	1	0.18	0.010	12.48	3.97	6.92	0.907	0.686	120.69	120.00	121.00	121.00	117.14	112.00	114.00	3.52	0.50	10.00	6.34
SYSTEM D																																		
POND	D1	1.17	5.43	0.75	1.25	0.94	5.03	16.00	11.03	70.13	PIPE	HDPE	34	36 in	7.07	1	0.11	0.010	28.78	4.07	9.22	0.664	0.232	121.66	121.66	122.00	121.50	112.00	111.98	114.98	3.52	0.50	15.00	2.45
D1	D2	0.39	6.02	0.75	1.25	0.94	5.66	16.31	11.02	73.97	PIPE	HDPE	79	36 in	7.07	1	0.11	0.010	28.78	4.07	10.49	0.722	0.546	121.66	121.11	121.60	121.40	111.98	111.66	114.65	3.52	0.50	15.00	4.21
D2	D3	0.21	7.93	0.75	1.25	0.94	6.69	16.73	11.00	74.98	PIPE	HDPE	101	36 in	7.07	1	0.11	0.010	28.78	4.07	10.61	0.746	0.756	121.11	120.35	121.40	121.40	111.66	111.77	114.77	3.52	0.50	15.00	2.24
D3	D4	0.39	7.42	0.75	1.25	0.94	6.96	17.14	11.00	76.15	PIPE	HDPE	102	36 in	7.07	1	0.11	0.010	28.78	4.07	11.06	0.812	0.828	120.35	119.53	121.40	121.40	111.77	111.68	114.68	3.52	0.50	15.00	4.11
D4	D5	0.36	7.77	0.75	1.25	0.94	7.28	17.54	11.10	80.69	PIPE	HDPE	95	36 in	7.07	1	0.11	0.010	28.78	4.07	11.44	0.876	0.895	119.53	118.69	121.40	121.40	111.68	111.56	114.56	3.52	0.50	15.00	3.64
D5	D6	0.33	8.10	0.75	1.25	0.94	7.59	17.96	11.00	83.52	PIPE	HDPE	90	36 in	7.07	1	0.11	0.010	28.78	4.07	11.82	0.939	0.942	118.69	117.93	121.40	121.40	111.56	111.45	114.45	3.52	0.50	15.00	3.40
D6	D7	0.29	8.39	0.75	1.25	0.94	7.87	18.39	10.98	86.35	PIPE	HDPE	87	36 in	7.07	1	0.11	0.010	28.78	4.07	12.10	0.974	0.918	117.93	117.03	121.40	121.40	111.45	111.36	114.36	3.52	0.50	15.00	2.99
D7	D8	0.10	8.49	0.75	1.25	0.94	7.96	18.68	10.77	86.76	PIPE	HDPE	81	36 in	7.07	1	0.11	0.010	28.78	4.07	12.19	0.978	0.792	117.03	116.24	121.40	121.60	111.36	111.27	114.27	3.52	0.50	15.00	1.08
D8	D9	0.18	8.67	0.75	1.25	0.94	8.13	18.88	10.69	88.83	PIPE	HDPE	74	36 in	7.07	1	0.11	0.010	28.78	4.07	12.28	1.000	0.742	116.24	115.50	121.60	121.60	111.27	111.19	114.19	3.52	0.50	15.00	1.92
D9	JB2	0.37	9.04	0.75	1.25	0.94	8.48	19.19	10.60	98.06	PIPE	HDPE	65	42 in	9.62	1	0.09	0.010	38.99	3.85	5.34	0.472	0.307	115.50	115.19	121.60	121.75	111.19	111.14	114.64	3.52	0.50	15.00	3.09
JB2	OUT	0.00	9.04	0.75	1.25	0.94	8.48	19.79	10.42	98.30	PIPE	HDPE	148	42 in	9.62	1	0.09	0.010	38.99	3.85	5.15	0.469	0.674	115.19	114.32	121.75	121.90	111.14	111.02	114.52				

BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO 16902B, BEING A BRASS DISK STAMPED 1902J1 ON BRIDGE AT MASON ROAD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALL ON NORTHEAST CORNER OF BRIDGE IN KETAPAP-ASZ IN THE BARKER WATERSHED NOAH STREAM T189-00-02.
ELEV=102.21 NAVD88, 2001A03.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=126.21 NAVD88, 2001A03.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.06 NAVD88, 2001A03.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "C" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0045 L & 48157C0110 L, REVISED APRIL, 2, 2014.

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

APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/05/2018

STATE OF TEXAS
TYLER RAY
114600
LICENSED
01/05/18

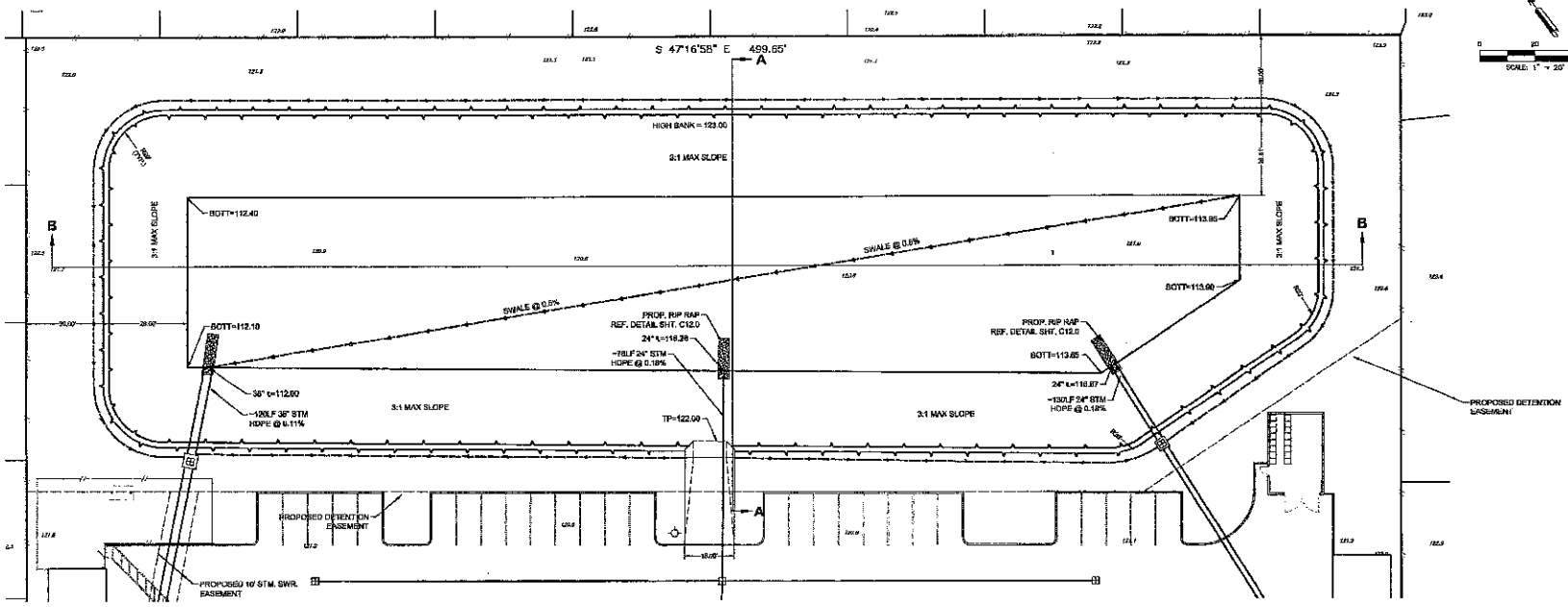
WGA
WARD, GRTZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-3776
8540 Tanglebrite Suite 100
Houston, Texas 77063
713.789.1900

SOLEA CINCO RANCH

DRAINAGE AREA MAP CALCULATIONS

SCALE	DESIGN	DRAWN
1"=30'	TCR/TR	TD

C7.2



PROPOSED DETENTION POND
(TO BE PRIVATELY OWNED AND MAINTAINED)

DETENTION POND CALCULATIONS

DETENTION CALCULATIONS SUMMARY:

TOTAL SERVICE AREA 411,868 SQ.FT. = 9.4549 AC
REQUIRED IMPERVIOUS COVER 267,310 SQ.FT. = 6.2259 AC
PERCENT OF IMPERVIOUS COVER = 72%
CALCULATED DETENTION RATE = 0.899

REQUIRED DETENTION VOLUME = TOTAL SERVICE AREA X DETENTION RATE
= 367,490 CU.FT. = 8.21 AC-FT

REQUIRED DETENTION VOLUME= 367,490 CU.FT. = 8.21 AC-FT
PROVIDED DETENTION VOLUME= 368,652 CU.FT.= 8.42 AC-FT

EXISTING CAPACITY

PER APPROVED DRAINAGE REPORT TITLED GREENSUSON ROAD ROADWAY IMPROVEMENT PROJECT, PREPARED BY CCNB FENDLEY ENGINEERS, DATED 09/15/2009 (ATTACHED):

DRAINAGE AREA CAO SERVES 18.89 AC. HAS CAPACITY FOR 25-YR FREQUENCY
THEREFORE DRAINAGE AREA CAO CAPACITY: 26.50 CFS/18.89 AC = 1.40 CFS/AC

RESTRICTOR CALCULATIONS

ALLOWABLE OUTFLOW RELEASE RATE = 1.40 CFS/AC
$Q_{ALLOWABLE}$ = (1.40 CFS/AC) * (9.4549 AC) = 13.32 CFS

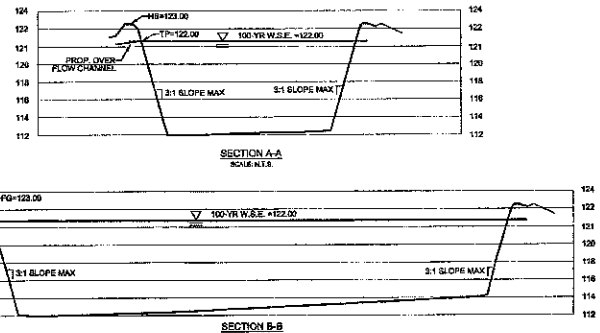
100% DETENTION POND DEPTH = 121.50 FT
TOP ELEVATION OF OUTFALL PIPE= 111.20 FT

H = 121.50 - 111.20 = 10.30 FT

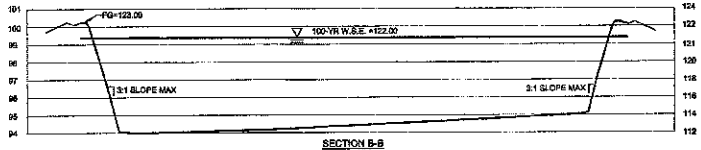
RESTRICTOR SIZE D = 6" INCH

$Q = CA\sqrt{2gH}$
$Q = 0.6(\pi(D^2/4))\sqrt{2(32.2)(10.3)}$
Q = 1.05 CFS

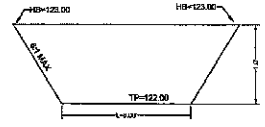
Q=6.40 CFS < $Q_{ALLOWABLE}$=13.32 CFS



SECTION A-A
SCALE: N.T.S.



SECTION B-B
SCALE: N.T.S.



EXTREME OVERFLOW CHANNEL
SCALE: N.T.S.

PROPOSED 100-YR SITE RUNOFF

Q = C*A*Ci
C = 0.75
Tc = 10 MIN.
i = 11.53 IN/HR
A = 9.4549 AC
Cf = 1.25

Q = (0.75) (11.53) (1.25) (9.4549)
=103.09 CFS

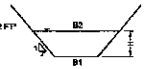
PROPOSED EXTREME OVERFLOW CHANNEL

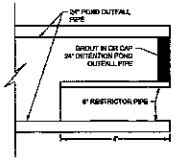
$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$; WHERE: $R = \frac{A}{P_{WET}}$

$n_{CHANNEL}$ = 0.013
$A_{CHANNEL} = \frac{1}{2}(B1+B2)*H = \frac{1}{2}(8+18)*1.0 = 12\ FT^2$
$P_{WET\ CHANNEL} = B1 + \sqrt{(B2-B1)^2 + H^2}$
$= 8 + \sqrt{(10)^2 + (1.0)^2} = 11.29\ FT$

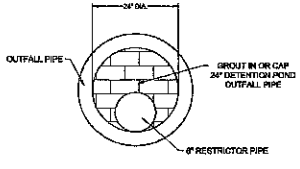
$R_{CHANNEL} = 12\ FT^2 / 11.29\ FT = 1.06\ FT$
S = 0.6% = 0.006 FT/FT

$Q_{CHANNEL} = \frac{1.49}{0.013} * 12 * 1.06^{2/3} * 0.006^{1/2} = 111.30\ CFS$
$Q_{DESIGN} = 110.78\ CFS$





DETENTION POND RESTRICTOR DETAIL
N.T.S.



DETENTION POND RESTRICTOR DETAIL
N.T.S.

BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 48029025. DENIS A BARKS DISK STAMPED 16025 ON BRIDGE AT MASON RD AND UPPER BUFFALO BAYOU LOCATED ON MOWING INCAM CONCRETE WINGK ON NORTHEAST CORNER OF BRIDGE IN KATMAP -9902 IN THE BARKER WATERSHED NOAA STREAM T1003-03-00.
ELEV=132.01 NAVD88, 2010ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=130.21 NAVD88, 2010ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=132.28 NAVD88, 2010ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0465 L & 48157C0110 L, REVISED APRIL 2, 2014.

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN (5) YEARS FROM DATE OF APPROVAL.

APPROVED: DEVELOPMENT COORDINATOR
DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER RAY
114468
LICENSED
PROFESSIONAL ENGINEER
1/23/18

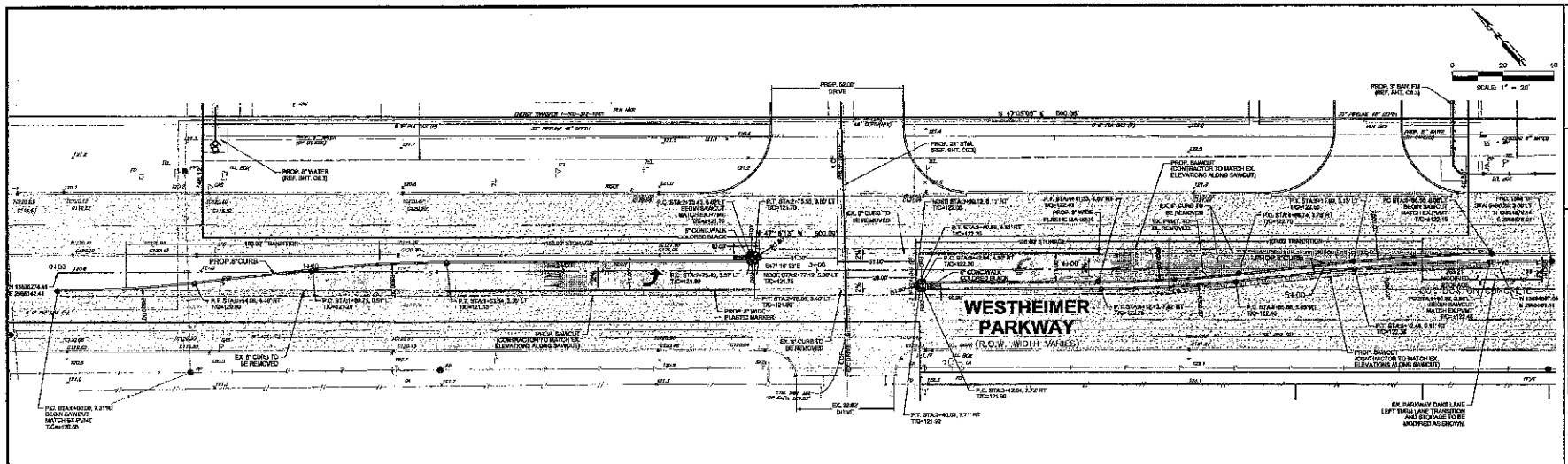
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9755
2500 Tanglewilde, Suite 160
Houston, Texas 77063
713.789.1900

SOLEA CINCO RANCH

DETENTION POND AND CALCULATIONS

SCALE	DESIGN	DRAWN
1"=30'	TG/TR	TD

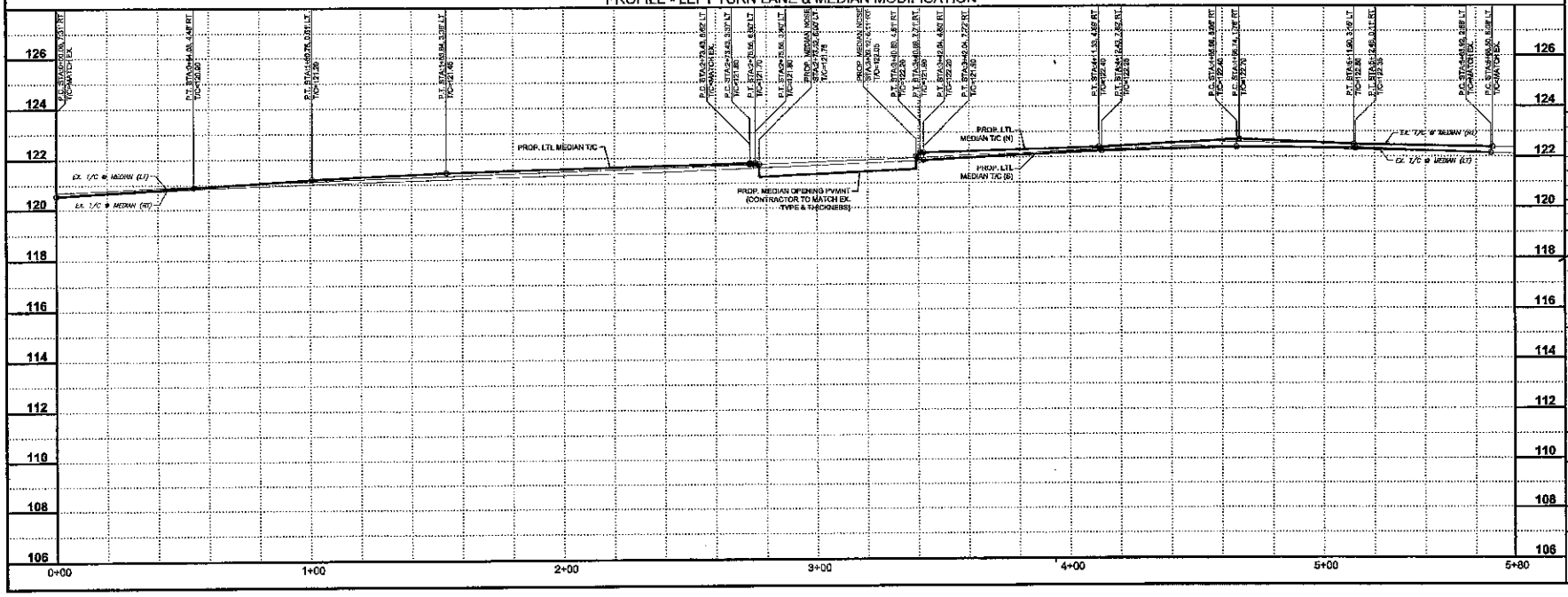
C8.0



CONTRACTOR RESPONSIBLE FOR OBTAINING ALL PERMITS FOR RIGHT-OF-WAY WORK

CONSTRUCTION OF FACILITIES AND/OR PAVING WORK WITHIN RIGHT-OF-WAY
NOTIFICATION (PERMIT) ISSUED BY HARRIS COUNTY PUBLIC INFRASTRUCTURE DEPARTMENT-PERMITS OFFICE IS REQUIRED FOR PROPOSED WORK WITHIN HARRIS COUNTY RIGHT-OF-WAY. THE PROJECT MUST BE APPROVED PRIOR TO OBTAINING THE REQUIRED NOTIFICATION. BE ADVISED THAT A NOTIFICATION MUST BE OBTAINED SEPARATELY FROM SITE DEVELOPMENT PERMIT PACKAGE. FOR ADDITIONAL INFORMATION, PLEASE VISIT H:\[BUILDING ORGANIZATION]\SAMPLE NOTIFICATION OF CONSTRUCTION.HTML OR CONTACT PUBLIC REVIEW INSPECTIONS DEPARTMENT @ (713-274-3931)

PROFILE - LEFT TURN LANE & MEDIAN MODIFICATION



BENCHMARKS:
PROJECT BLNCI BANKS IS FLOODPLAIN BENCHMARKS MARK NO. 1903033, BEING A BRASS DISK STAMPED 1903033 ON BRIDGE AT MASON RD AND UPPER BUFFALO WATCH LOCATED ON DOWNSTREAM CONCRETE WALK, ON NORTHEAST CORNER OF BRIDGE IN STAMP AND IN THE BARREL WATERSHED NEAR STREAM 1100-00-00.
ELEV=131.81 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=125.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.36 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:
THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0045 L & 48157C0110 L, REVISED APRIL 2, 2014.

1. MEDIAN NOSE CURBS TO BE PAINTED YELLOW
2. CONTRACTOR TO HYDROMULCH PROPOSED LEFT TURN LANE & LEFT TUN LANE MODIFICATION

"ATTENTION"
ALL EXISTING UTILITIES ARE REPRESENTED TO THE BEST OF THE ENGINEER'S KNOWLEDGE. THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF A CONFLICT ARISES.

LEGEND:	
	EXISTING PAVEMENT (CONCRETE/ASPHALT AS NOTED)
	PROPOSED PAVEMENT (MATCH EXISTING THICKNESS)

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

APPROVED: DEVELOPMENT COORDINATOR
DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

TYLER RAY 114499 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS
1/23/18

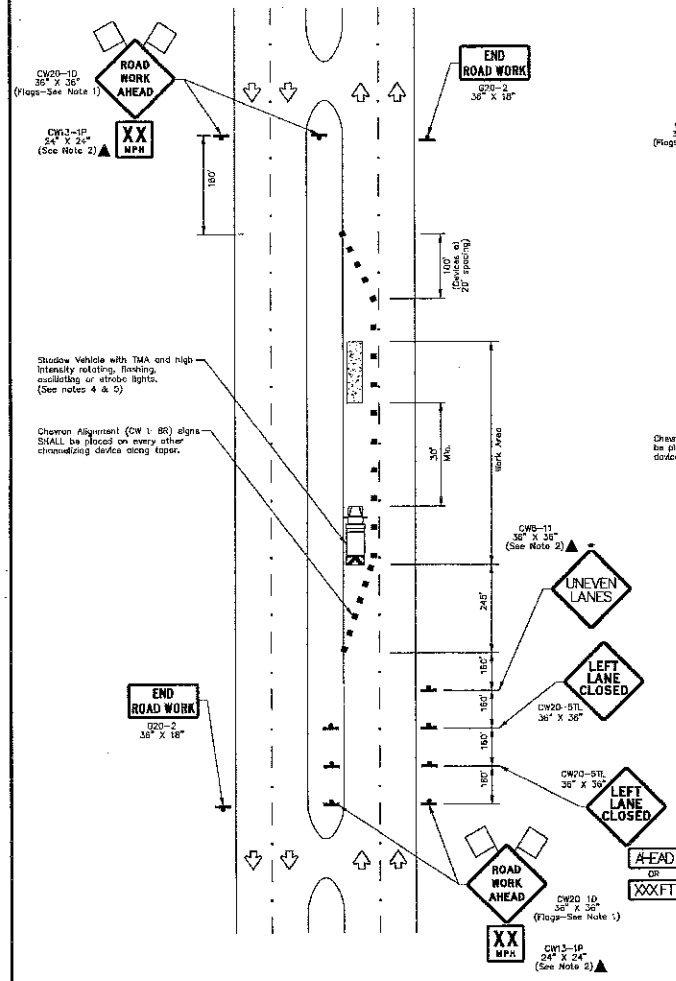
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9716
2500 Tanglewilde, Suite 120
Houston, Texas 77063
713.780.1000

SOLEA CINCO RANCH

PLAN & PROFILE - LEFT TURN LANE & MEDIAN MODIFICATION

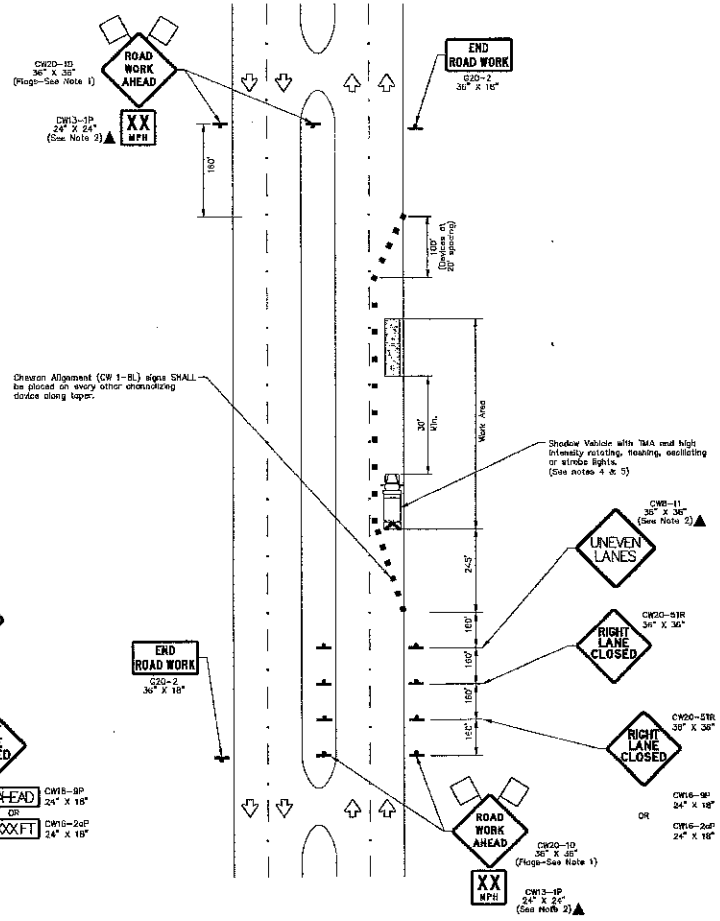
SCALE	DESIGN	DRAWN
1"=20'	TDYR	TD

C9.0



LEFT LANE CLOSURE (4 LANE BOULEVARD ROAD)

PHASE I



RIGHT LANE CLOSURE (4 LANE BOULEVARD ROAD)

PHASE II

TRAFFIC CONTROL PLAN SECTION SHALL BE COMPLETED BY ENGINEER

ROADWAY	POSTED SPEED	TAPER LENGTH	SPACING CHANNELIZING DEVICES		SIGN SPACING	BUFFER SPACE
			TAPER	TANGENT		
WESTHEIMER PARKWAY	35 MPH	245' MIN.	35' MAX	70' MAX	160' MIN.	120'

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths "L" **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" * Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only

** Taper lengths have been rounded off.

L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

GENERAL NOTES

1. Flags attached to signs where shown are OPTIONAL.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol are OPTIONAL.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. Contractor shall provide and install traffic control devices in conformance with part VI of Texas Manual on Uniform Traffic Control Devices (TMUTCD – Latest edition with revisions) during construction.
7. No lanes shall be blocked from 7am to 9am and 4pm to 6:30pm Monday thru Friday.
8. Off duty police officers/flaggers are required to direct traffic when applicable.
9. If project is within 400 feet from a signalized intersection, the Contractor shall contact Harris County Engineering Department, Traffic Signal Maintenance at (713) 881-3210 five (5) days prior to the start of construction.

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

APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

LICENSED PROFESSIONAL ENGINEER
TYLER RAY
114499
LICENSED
PROFESSIONAL ENGINEER
1/23/18

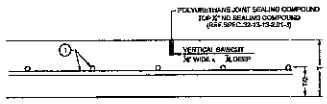
WGA
WARD, GETZ & ASSOCIATES, L.L.P
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9156
2800 Kingsbridge, Suite 120
Houston, Texas 77043
713.788.1000

SOLEA CINCO RANCH

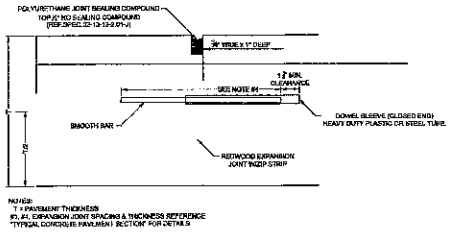
TRAFFIC CONTROL PLAN

SCALE	DESIGN	DRAWN
1"=30'	TSR	TD

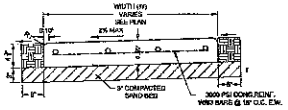
C10.0



(A) SAWED DUMMY (CONTROL) JOINT
N.T.S.

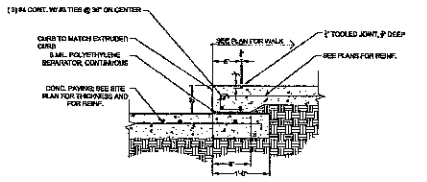


(C) EXPANSION JOINT
N.T.S.

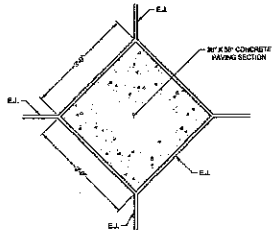


① CONTRACTOR SHALL PROVIDE A SAWED JOINT SPACED EQUAL TO WIDTH (W) AND EXPANSION JOINTS TO BE PLACED @ 4 X W

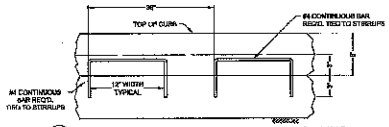
(A) CONCRETE SIDEWALK DETAIL
N.T.S.



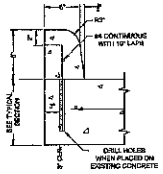
(A) SIDEWALK CURB AT CONC. PAVEMENT DET.



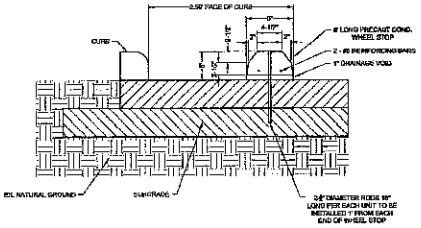
(A) PAVING EXPANSION JOINT INTERSECTION
N.T.S



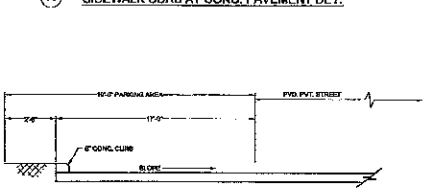
(A) TYPICAL 6" CONCRETE CURB REINFORCING
N.T.S.



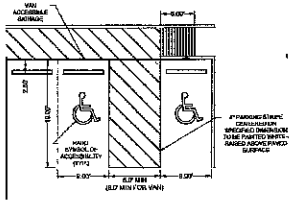
(B) TYPICAL 6" CONCRETE CURB REINFORCING
N.T.S.



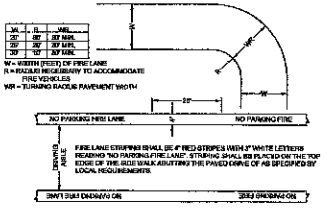
(B) WHEEL STOP DETAIL
N.T.S.



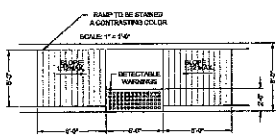
(A) TYPICAL PARKING SECTION
N.T.S

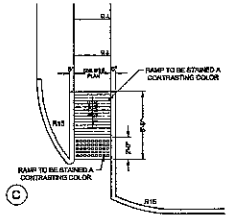


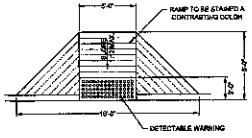
TYP - ACCESSIBLE PARKING SPACE
N.T.S.



(E) FIRE STRIPING DETAIL

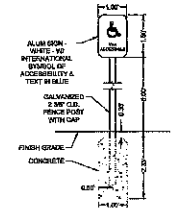




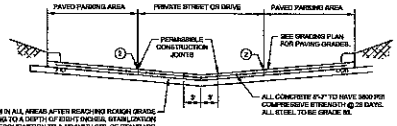


NOTE:
1. DETECTABLE WARNINGS SHALL CONSIST OF RAISED TRUNCATED DOMES WITH A DIAMETER OF NOMINAL 0.9", A HEIGHT OF NOMINAL 0.2" AND A CENTER TO CENTER SPACING OF NOMINAL 0.15" AND SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. DETECTABLE WARNINGS USED ON INTERIOR SURFACES SHALL DIFFER FROM ADJOINING WALKING SURFACES IN RESILIENCY OR SOUND-ON-CANE CONTACT.
2. THE SURFACE OF A WHEEL CHAIR RAMP IS BE GROVED LATERALLY WITH 2" WIDE BY 4" DEEP GROOVES, SPACED 0.141" O-C, AND ROUGHENED NO LESS THAN A BROOM FINISH TO PREVENT SLIPPING, AND TO DIFFERENTIATE TEXTURE FROM SEAT OF STANDARD SIDEWALK.

CONCRETE PEDESTRIAN RAMP
N.T.S.



(D) TYP - ACCESSIBLE PARKING SIGNAGE
N.T.S.



SUBGRADE PREPARATION IN ALL AREAS AFTER REACHING ROUGH GRADE SHALL CONSIST OF SCARIFYING TO A DEPTH OF EIGHT (8) INCHES, STABILIZATION IF NECESSARY, THEN RECOMPACTION TO A MINIMUM 95% OF STANDARD PROCTOR DENSITY AS DETERMINED BY THE ASTM D-698 PROCEDURE, AT OPTIMUM MOISTURE CONTENT (8 TO +03%)

IF WET CONDITIONS EXISTS AT TIME OF CONSTRUCTION, AND STABILIZATION IS REQUIRED, IT SHOULD BE PERFORMED USING LIME-FLY ASH STABILIZATION.

1. REINFORCING STEEL: 6" THICK CONCRETE PAVEMENT TO HAVE #3 BARS SPACED AT 24" O-C EACH WAY OR 10x10 #6/#6 WELDED WIRE FABRIC. 8" THICK CONCRETE PAVEMENT TO HAVE #3 BARS SPACED AT 18" O-C EACH WAY OR 10x10 #6/#6 WELDED WIRE FABRIC. 7" THICK CONCRETE PAVEMENT TO HAVE #3 BARS SPACED AT 18" O-C EACH WAY OR 10x10 #6/#6 WELDED WIRE FABRIC.
2. *CONTROL JOINT SPACING: 30 TIMES PAVING THICKNESS UP TO MAXIMUM OF 15'
3. EXPANSION JOINT: MAXIMUM OF 60 FEET
4. DOWELS AT EXPANSION JOINTS: X THE SLAB THICKNESS, 18" IN LENGTH, SPACED AT 12" CENTERS AT EACH JOINT, AND BE EMBEDDED AT LEAST 9"

*CONTROL JOINTS CUT WITHIN 6-12 HOURS OF CONCRETE PLACEMENT

TYPICAL CONCRETE PAVEMENT SECTION
N.T.S.

SEE GEOTECHNICAL ENGINEERING REPORT BY GORRONDONA & ASSOCIATES, INC. (PROJECT No. 13-00457, DATED MARCH, 2014)

THESE SIGNATURES ARE VOID IF CONSTRUCTION HAS NOT COMMENCED IN (3) YEARS FROM DATE OF APPROVAL.

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER RAY
114499
LICENSED PROFESSIONAL ENGINEER
1/23/18

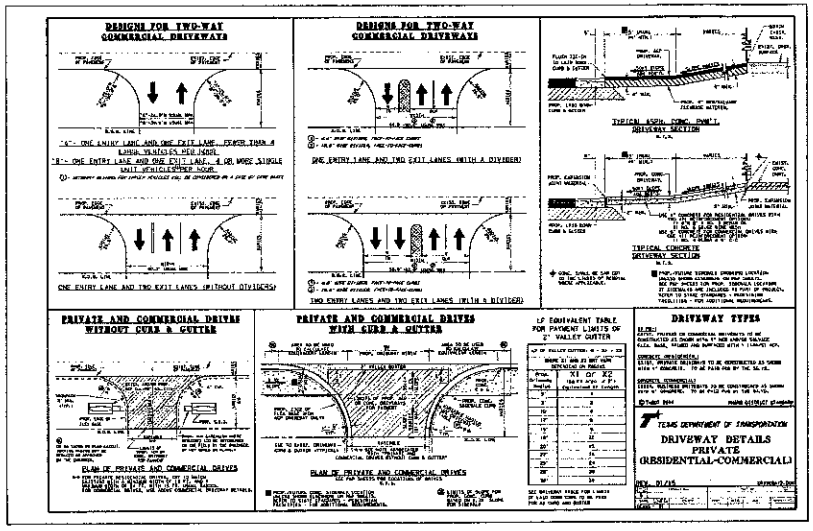
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS ASSOCIATED ENGINEERING FIRM F-9726
3809 Tanglewilde, Suite 190
Houston, Texas 77063
713.780.1900

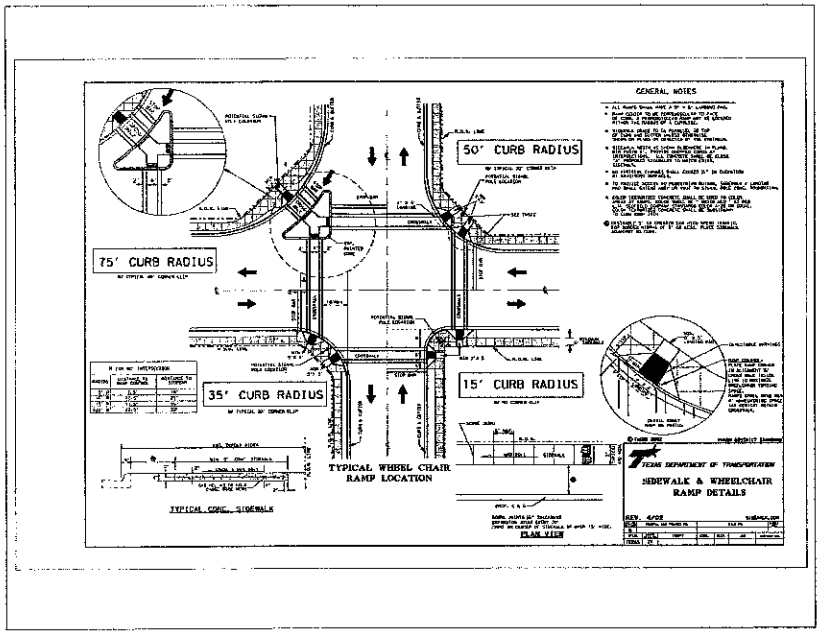
SOLEA CINCO RANCH

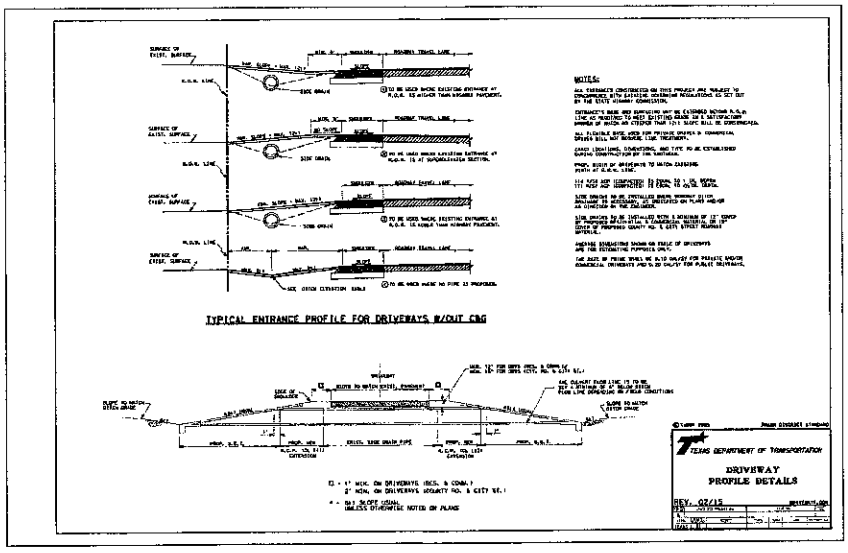
PAVING DETAILS

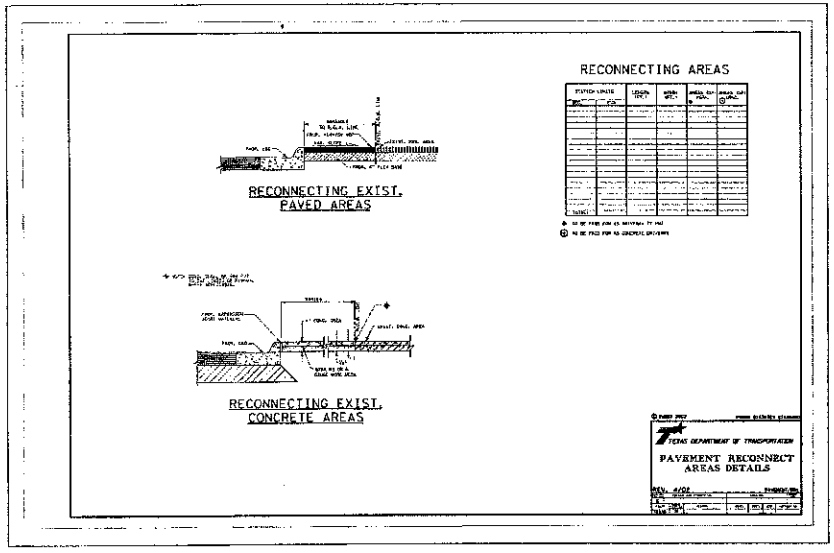
SCALE	DESIGN	DRAWN
N.T.S.	TD/TR	TD

C11.1









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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS — TYLER RAY — 114486 — LICENSED PROFESSIONAL ENGINEER — 02/01/18

WGA

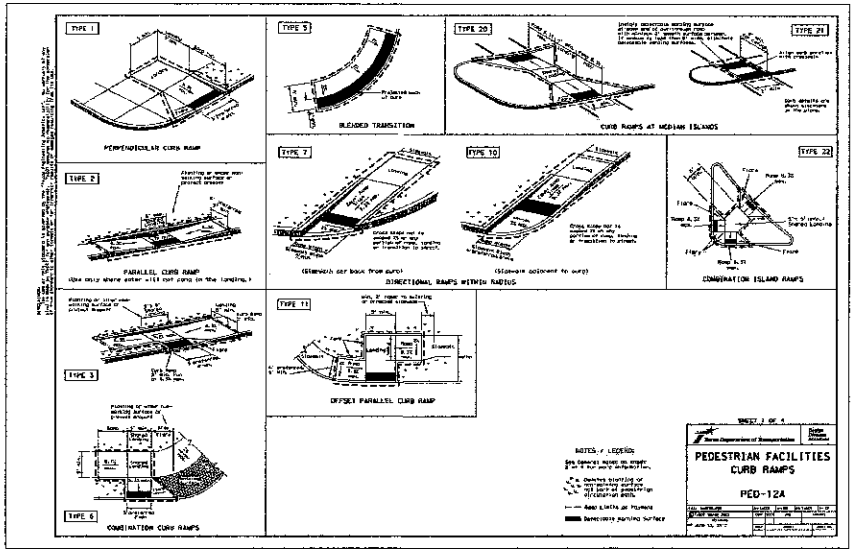
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9756
2500 Tanglewilde, Suite 180
Houston, Texas 77063
713.780.1900

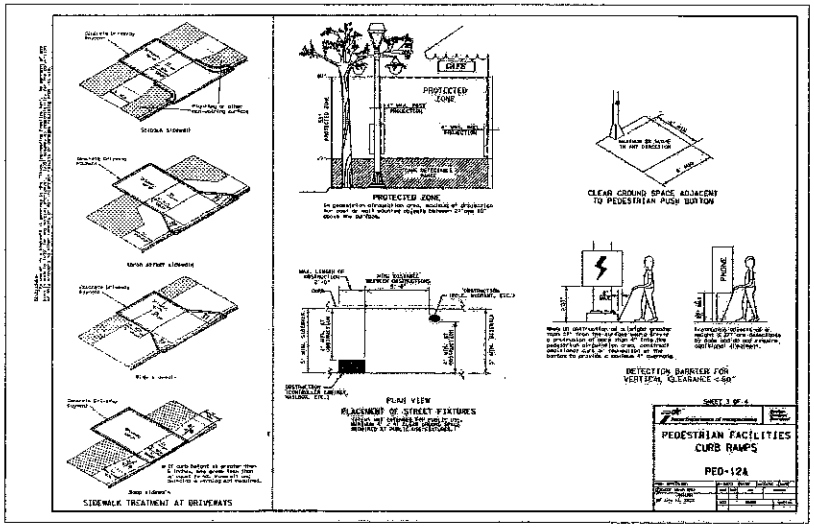
SOLEA CINCO RANCH

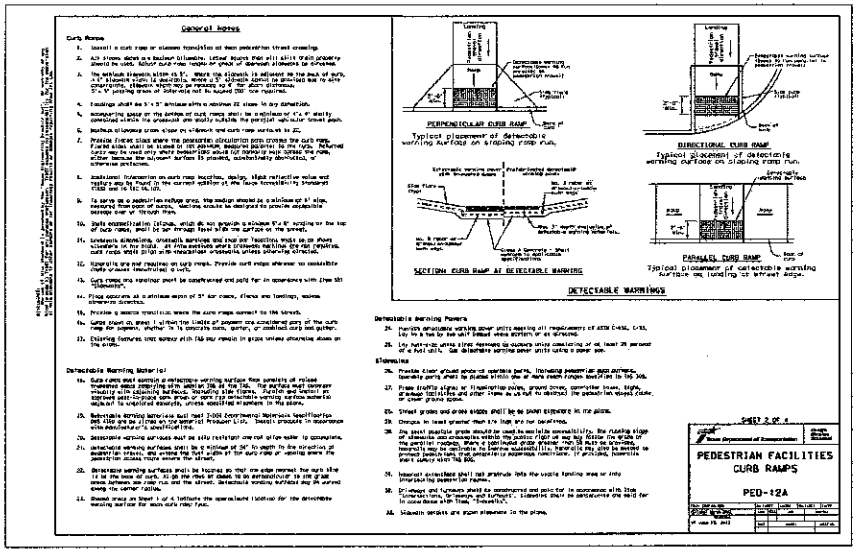
PAVING DETAILS

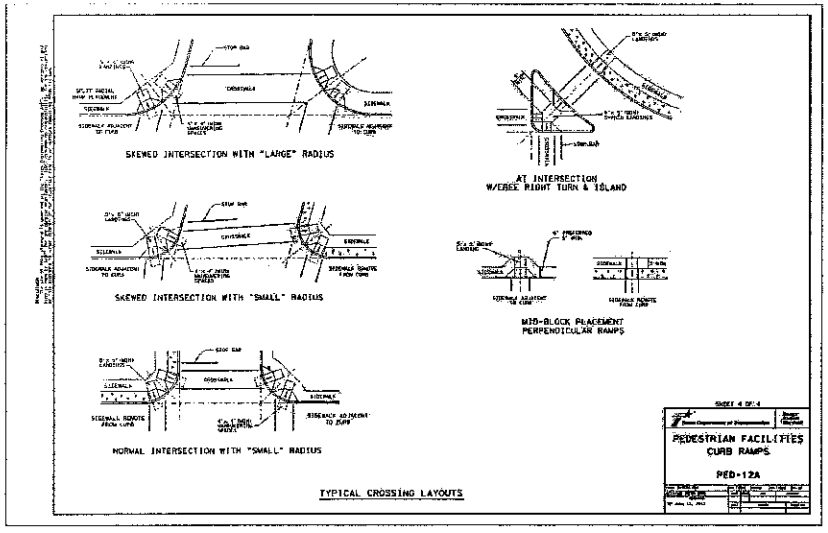
SCALE	DESIGN	DRAWN
N.T.S.	TDR	TD

C11.2









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

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/23/2018

STATE OF TEXAS
TYLER RAY
144489
LICENSED
PROFESSIONAL ENGINEER
1/23/18

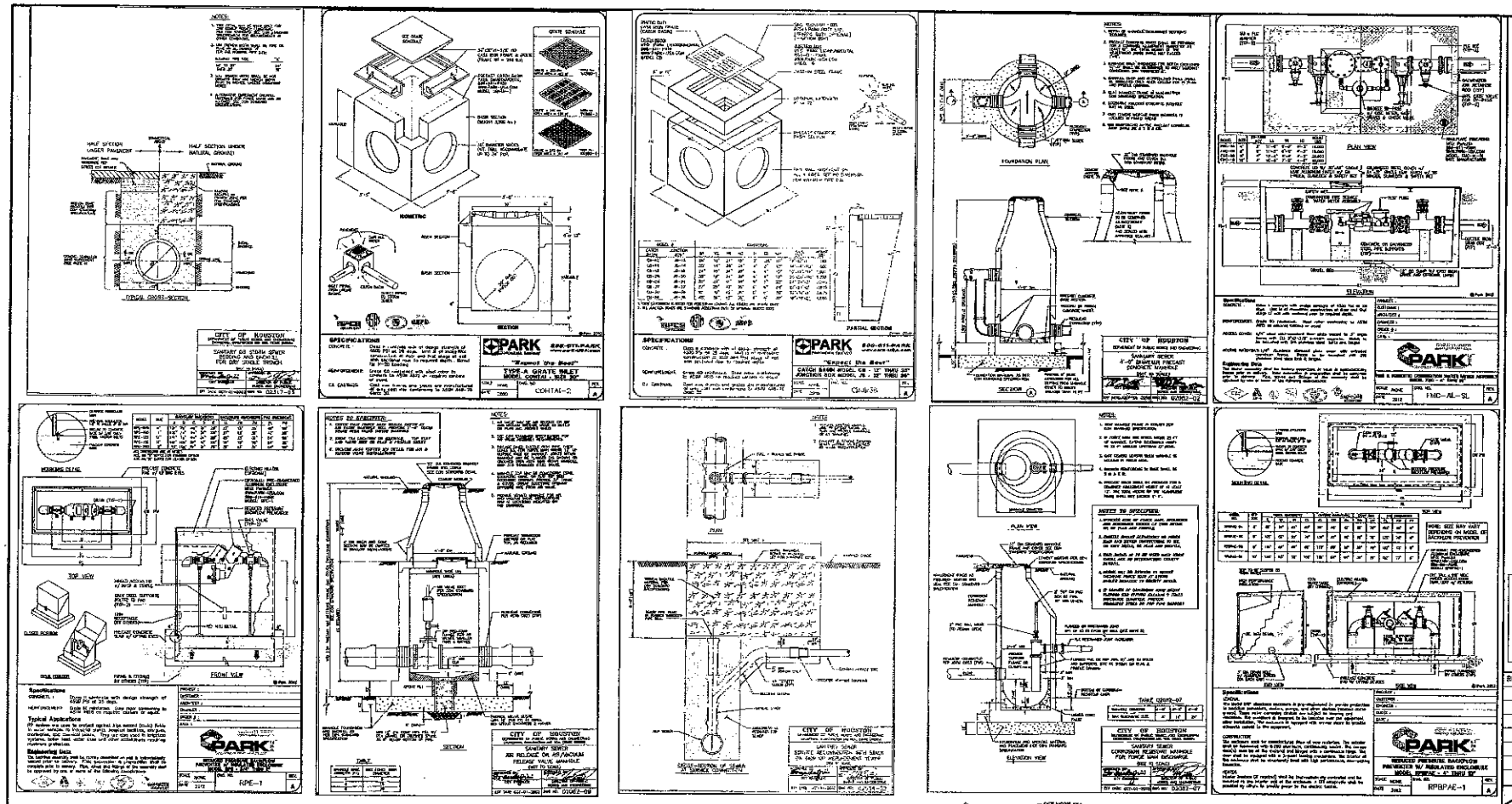
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9734
2500 Tanglewilde, Suite 120
Houston, Texas 77063
713.780.1984

SOLEA CINCO RANCH

PAVING DETAILS

SCALE	DESIGN	DRAWN
N.T.S.	TDVR	TD

C11.3



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

APPROVED: _____
DEVELOPMENT COORDINATOR

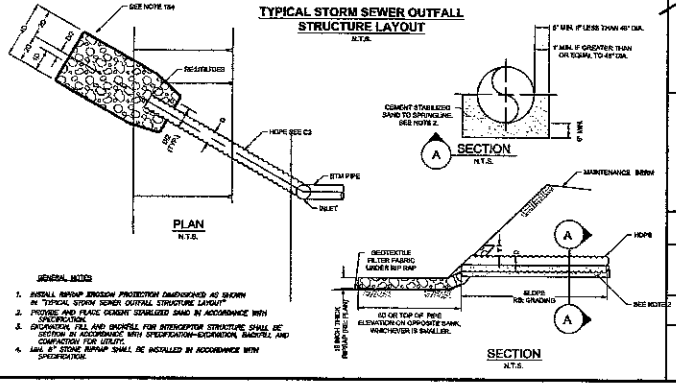
DATE: 2/1/18

REV	DESCRIPTION	DATE
	ISSUE FOR PERMIT	01/22/2018

TYLER HAY
111499
LICENSED
PROFESSIONAL ENGINEER
1/22/18

TYPICAL STORM SEWER OUTFALL STRUCTURE LAYOUT

N.T.S.



GENERAL NOTES

1. INSTALL RIPRAP EROSION PROTECTION DIMENSIONED AS SHOWN IN TYPICAL STORM SEWER OUTFALL STRUCTURE LAYOUT.
2. PROVIDE AND PLACE CEMENT STABILIZED SAND IN ACCORDANCE WITH SPECIFICATION.
3. EXCAVATION, FILL AND BACKFILL FOR INTERCEPTOR STRUCTURE SHALL BE SECTION 01 ACCORDANCE WITH SPECIFICATION—EXCAVATION, BACKFILL AND COMPACTION FOR UTILITY.
4. MIN. 8" STONE RIPRAP SHALL BE INSTALLED IN ACCORDANCE WITH SPECIFICATION.

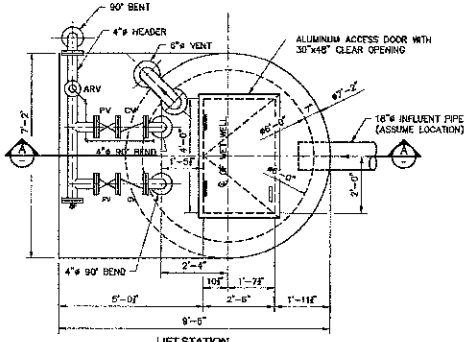
WGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9734
7330 Tanglewilde, Suite 150
Houston, Texas 77063
713.266.7440

SOLEA CINCO RANCH

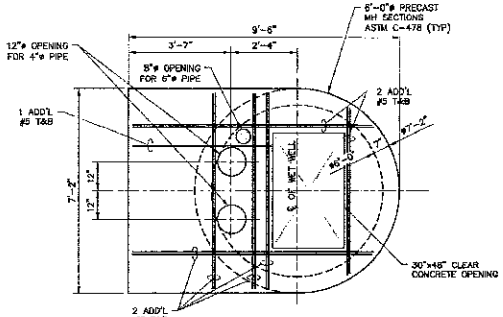
UTILITY DETAILS

SCALE	DESIGN	DRAWN
N.T.S.	TD/TR	TD

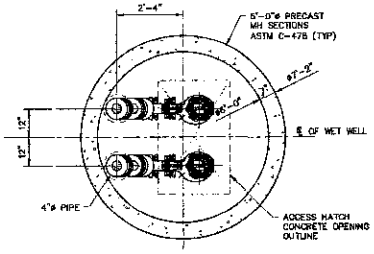
C12.0



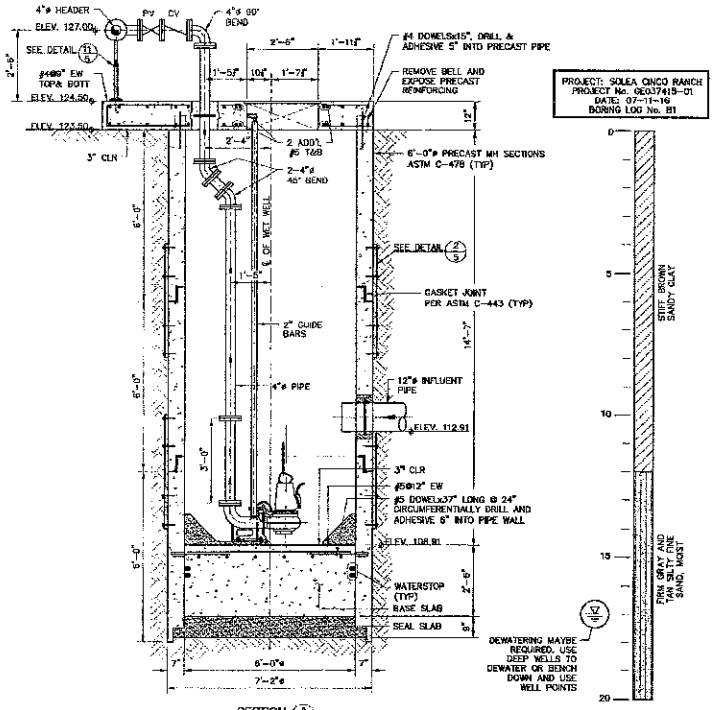
LIFT STATION
1/2"=1'-0"



LIFT STATION ADDITIONAL REINFORCING
1/2"=1'-0"



LIFT STATION ADDITIONAL REINFORCING
1/2"=1'-0"



SECTION A
1/2"=1'-0"

PROJECT: SOLEA CINCO RANCH
PROJECT No. GE037415-01
DATE: 07-11-16
BORING LOG No. B1

LEGEND:

CV= CHECK VALVE
PV= PLUG VALVE
BF= BLIND FLANGE
ARV=AIR RELEASE/VACUUM VALVE ASSEMBLY

PRIVATE LIFT STATION

BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1900G3, BEING A BRASS DISK STAMPED 1900G3 ON STRIDGE AT MASONRY AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALK, ON NORTHEAST CORNER OF BRIDGE IN KOMAR ADD IN THE BARKER WATERSHED NEAR STREAM 1100-99-00.
ELEV=133.51 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT 6OX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=128.21 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "B" BEING A CUT 6OX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=132.36 NAVD88, 2001ADJ.

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0240 L & 48157C0310 L, REVISED APRIL 2, 2014.

SHEET NOTES:

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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/13

STIVER ENGINEERING
1309 Pecan Street
Houston, Texas 77008
P [713] 225-3478
F [713] 225-5262
stiverengr.com
TX Registration No. F-190

WGA
WARD, GRTZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9734
2500 Tanglewood, Suite 120
Houston, Texas 77063
713.785.1900

SOLEA CINCO RANCH

LIFT STATION
PLAN & SECTION

SCALE	DESIGN	DRAWN
AS SHOWN	JMS/MVK	MR

SHEET 1 OF 3

GENERAL NOTES:

1. CONCRETE:
   A. CONCRETE SHALL BE PROPORTIONED IN ACCORDANCE WITH ACI 301, SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS, AND ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
   B. CONCRETE MINIMUM COMPRESSIVE STRENGTH.

CLASS	CEMENT TYPE	MIN STRENGTH @ 28 DAYS	MAXIMUM W/C	DESCRIPTION
"A"	I OR II	4,000PSI	0.45	STRUCTURAL
"B"	I OR II	1,500PSI		SEAL SLAB

   C. CONCRETE MIX DESIGN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE MINIMUM CEMENT CONTENT SHALL BE DETERMINED BY TRIAL MIXES BASED ON THE PROPOSED AGGREGATE, CEMENT, AND ADMIXTURES.
   D. ADMIXTURES SHALL BE SELECTED BASED ON THEIR ABILITY TO REDUCE CONCRETE SHRINKAGE.
   E. ENTRAINED AIR IS NOT REQUIRED.

2. REINFORCING STEEL: ASTM A615, GRADE 60

3. SPLICE LENGTHS:

BAR SIZE	VERTICAL DEFORMED BARS 4 KSI A	VERTICAL DEFORMED BARS 4 KSI B	HORIZONTAL DEFORMED BARS 4 KSI A	HORIZONTAL DEFORMED BARS 4 KSI B
3	14	18	18	24
4	18	25	25	32
5	24	31	31	40
6	28	37	37	48
7	42	54	54	70
8	47	62	62	80
9	54	70	70	90
10	60	78	78	102
11	67	87	87	113

LAP SPLICES OF DEFORMED BARS IN TENSION SHALL BE CLASS B SPLICES EXCEPT THAT CLASS A SPLICES ARE ALLOWED WHEN:
(a) THE AREA OF REINFORCEMENT PROVIDED IS AT LEAST TWICE THAT REQUIRED BY ANALYSIS OVER THE ENTIRE LENGTH OF THE SPLICE, AND
(b) ONE-HALF OR LESS OF THE TOTAL REINFORCEMENT IS SPLICED WITHIN THE REQUIRED LAP LENGTH.

4. POUR SCHEDULE AND SEQUENCE:
   A. POUR EACH LIFT CONTINUOUSLY AND COMPLETE WITHOUT VERTICAL JOINTS. POUR DIRECTLY INTO FORMS WITHOUT USING HOPPER OR TREMIE HOSE.
   B. HORIZONTAL JOINTS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS OR AS REQUIRED.
   C. VIBRATE EACH LIFT THOROUGHLY AND ALLOW THE VIBRATOR TO EXTEND WELL INTO THE PREVIOUS LIFT. DO NOT UNDER-VIBRATE.

5. PROVIDE WATERSTOP WHERE INDICATED ON THE DRAWINGS. WATERSTOP SHALL BE HYDROPHILIC WATERSTOP (WS) AS MANUFACTURED BY ADEKA (P-201). INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. USE ADEKA (P-201) ONLY WHERE 2" OR MORE COVER IS PROVIDED. WHERE LESS THAN 2" OF COVER USE ADEKA (P-101).

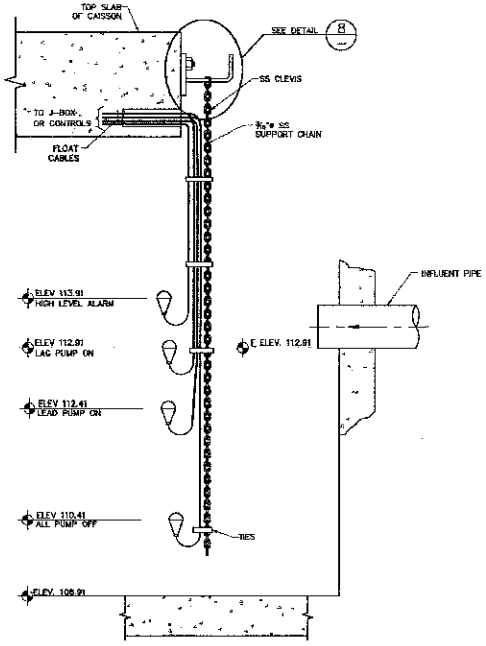
6. CAREFULLY CLEAN JOINT BETWEEN WALL AND BASE SLAB TO REMOVE ANY SOIL AND LOOSE MATERIAL.

7. PROVIDE 2" MINIMUM CLEAR DISTANCE FOR REINFORCING STEEL IN WALLS. PROVIDE 3" MINIMUM CLEAR DISTANCE TO TOP OF BOTTOM SLAB AND BOTTOM OF TOP SLAB.

8. IF REQUIRED, DEWATER SOILS BELOW THE STRUCTURE TO PREVENT UNSTABLE CONDITIONS IN THE BOTTOM OF THE EXCAVATION DURING CONSTRUCTION AND TO PROVIDE SUITABLE BEARING TO ALLOW THE STRUCTURE TO COME TO A REST AT THE REQUIRED ELEVATION.

9. INSTALL PUMP BASE DIRECTLY ON STRUCTURAL GROUT OR BASE SLAB. USE CAST-IN-PLACE ANCHOR BOLTS OR EPOXY ANCHORING SYSTEM WITH A MINIMUM EMBEDMENT DEPTH OF 12" INTO THE BASE SLAB (DO NOT INCLUDE THE DEPTH OF ANY LEVELING GROUT). SEE DETAIL.

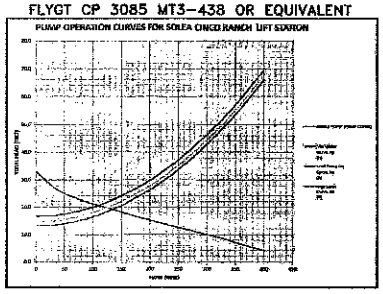
10. THESE DRAWINGS ARE INTENDED TO SUPPLEMENT OR MODIFY THE DESIGN FOR THE LIFT STATION AS DESIGNED BY WARD, GETZ & ASSOCIATES, LLP, INC. FOR THE CITY OF HUMBLE, TEXAS TO SHOW THE DETAILS REQUIRED TO CONSTRUCT THE STRUCTURE AS A CAISSON. SEE THE ENGINEER'S DRAWINGS FOR DIMENSIONS, MECHANICAL, PIPING, GROUTING, ELECTRICAL, INSTRUMENTATION, SITE WORK AND OTHER DETAILS THAT ARE NOT SHOWN HERE. COORDINATE EQUIPMENT INSTALLATION REQUIREMENTS PRIOR TO CONSTRUCTION OF STRUCTURE.



LIQUID LEVEL FLOATS DETAILS 1

NOTE:
ALL STAINLESS STEEL SHALL BE TYPE 316.

FLYGT CP 3085 MT3-438 OR EQUIVALENT



STATION OPERATION TABLE

RISING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
112.41	LEAD PUMP TURNS ON	LEAD PUMP ON
112.91	LAC PUMP TURNS ON	ALL PUMPS ON
113.91	HIGH LEVEL ALARM TURNS ON ALARM	ALL PUMPS ON

FALLING LEVEL CYCLE		
WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
113.91	HIGH LEVEL TURNS OFF ALARM	ALL PUMPS ON
110.41	LEAD PUMP TURNS OFF	ALL PUMPS OFF-STANDBY PUMP SWITCHES TO LEAD PUMP

PUMPS TO BE SUPPLIED WITH LIFTING CHAIN AND POWER CABLES.

NOTES:

1. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL VERIFY.
2. SEE DETAIL AND STRUCTURAL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
3. PUMP ANCHOR BOLTS ARE TO BE ADHESIVE TYPE, AND EMBEDDED IN CONCRETE SLAB. CONTRACTOR TO SUBMIT DESIGN OF PUMP ANCHOR BOLTS AND PATTERN, INCLUDING CALCULATIONS, DURING SHOP DRAWING SUBMISSION.
4. CONTRACTOR TO PROVIDE ADHESIVE ANCHORS IN LIEU OF WEDGE ANCHORS FOR ALL SUBMERGED CONDITIONS, AND SUBMIT DESIGN OF ANCHOR BOLTS DURING SHOP DRAWING SUBMISSION.
5. ALL PIPING IN THE WET WELL SHALL BE FLANGED. NO FLANGED COUPLING ADAPTORS, OR METALLIC STYLE COUPLINGS SHALL BE PERMITTED INSIDE THE WET WELL.

PUMP DATA TABLE

PUMP CHARACTERISTICS	PUMP NO. 1	PUMP NO. 2
MOTOR DATA NOMINAL SIZE (HP) MAX SPEED (RPM)	3 HP 1700 RPM	3 HP 1700 RPM
SOLIDS PASSAGE MIN SPHERE (IN)	3 IN	3 IN
CAPACITY (GPM) DESIGN RUNOUT	430 GPM	430 GPM
DISCHARGE HEAD (FT) DESIGN RUNOUT SHUT OFF	3 FT	3 FT
EFFICIENCY (%) DESIGN	33.7%	33.7%
NPSHR (FT) DESIGN RUNOUT	23.4 FT	23.4 FT

SINGLE PUMP HEAD & FLOW RATE

MIN HEAD CONDITION (FT) PUMP RATE (GPM)	19 FT 135 GPM
MAX HEAD CONDITION (FT) PUMP RATE (GPM)	21 FT 100 GPM

BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARK NO. 1995G5X, BEING A BRASS DISK STAMPED 1995G5 ON BRIDGE AT MASON RD. AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE WALL ON NORTHEAST CORNER OF BRIDGE 38.45'EAST 46.0' IN THE SHRUBS WATERWARD NEAR STREAM (1103.00.00)
ELEV=INLET NAVD88, 2001AD.)

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=123.21 NAVD88, 2001AD.)

TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.35 NAVD88, 2001AD.)

FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NOS. 48157C0245 L & 48157C0270 L, REVISED APRIL 2, 2014.

SHEET NOTES:

THIS DRAWING WAS USED IN CONSTRUCTION AND NOT COMMENCED IN (1) YEAR FROM DATE OF APPROVAL.

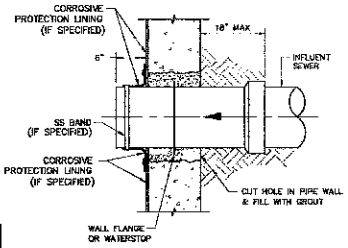
APPROVED: _____ DEVELOPMENT COORDINATION

DATE: 2/1/18

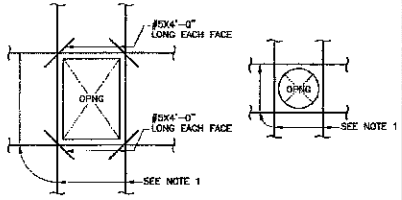
DESIGN NOTES:

1. DESIGN IS BASED ON THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-02) AND ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES (ACI 350R-89)
2. DESIGN LOADS:

A. MINIMUM ALLOWABLE TOTAL GRAVITY BEARING PRESSURE FOR THE BASE OF THE LIFT STATION	3.0 KSF
B. DESIGN GROUND WATER ELEVATION, MSL	123.50
C. AVERAGE UNIFORM LATERAL EARTH PRESSURE (EQUIVALENT FLUID DENSITY)	125 PCF
D. TOP SLAB LIVELOAD (NON TRAFFIC RATED)	300 PSF
E. FACTOR OF SAFETY FOR BUOYANCY DL ONLY	1.13
DEAD + SOIL	2.10

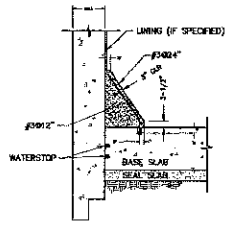


INFLUENT PIPE 3
(PRECAST PIPE)



1. ADDITIONAL REINFORCING AS SHOWN ON DRAWINGS.
2. WHEN CIRCUMFERENTIAL BARS ARE INTERRUPTED, PLACE ADDITIONAL BARS EQUAL TO ONE-HALF OF THE NUMBER OF BARS INTERRUPTED AT EACH SIDE OF THE OPENING AT 3" C-C SPACING. THESE BARS SHOULD BE THE ORIGINAL SIZES AND LENGTH OF THOSE OF THE INTERRUPTED BARS OR THE BARS WHOSE TOTAL AREA IS EQUAL TO OR GREATER THAN THE AREA OF THE INTERRUPTED BARS.

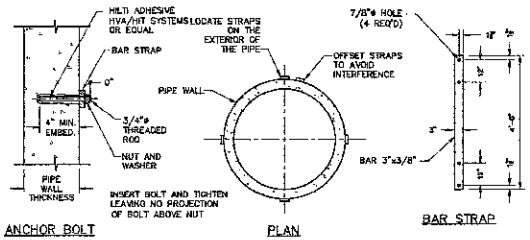
TYPICAL OPENING REINFORCING IN WALLS AND SLAB 4



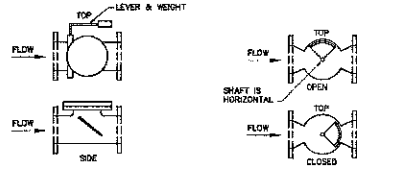
NOTES:

1. CONCRETE FILL SHALL BE 3000 PSI MINIMUM.
2. REINFORCEMENT: ASTM A 615, GRADE 60, 3" MINIMUM CLEAR DISTANCE DRILL #3@24" INTO BASE SLAB AND GROUT IN-PLACE. BEND REBAR TO MATCH SLOPE OF FILLET. PLACE HORIZONTAL REBAR (#3@12" AS REQUIRED)
3. FINISH SURFACE TO A METAL TROWEL FINISH.
4. FORM BOTTOM EDGE OF FILLET AND HAND TROWEL TOP FILLET.
5. EXTEND LINING A MINIMUM OF 12" BELOW TOP OF FILLET.

TYPICAL FILLET DETAIL 5
PRECAST PIPE

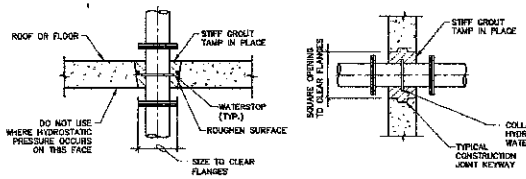


PIPE STRAP DETAIL 2



LEVER & WEIGHT CHECK VALVE INSTALLATION

ECCENTRIC PLUG VALVE INSTALLATION



BLOCKOUTS FOR PIPE 6
(USE WHEN PIPE CAN NOT BE INSTALLED

STIVER ENGINEERING
1205 Pecan Street
Rosenberg, Texas 77471
(O) (713) 340-9478
(F) (713) 525-6532
stiver-eng.com
TBPE Registration No. F-1198

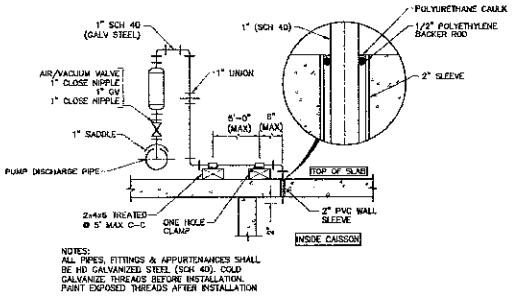
WIGA
WARD, GETZ & ASSOCIATES, LLP
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-9754
2500 Tanglewilde, Suite 120
Houston, Texas 77063
713.784.1500

SOLEA CINCO RANCH

GENERAL NOTES & DETAILS
(SHEET 1 OF 2)

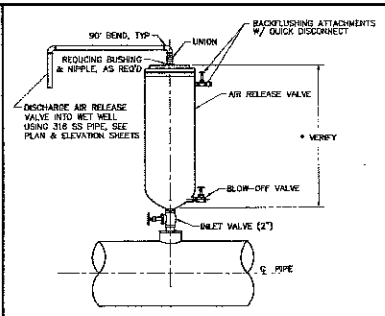
SCALE	DESIGN	DRAWN
AS SHOWN	JBR/SMK	MR

SHEET 2 OF 3

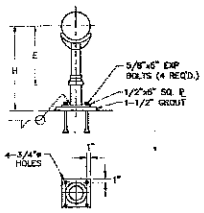


NOTES:
ALL PIPES, FITTINGS & APPURTENANCES SHALL BE HD GALVANIZED STEEL (SCH 40). COLD GALVANIZE THREADS BEFORE INSTALLATION. PAINT EXPOSED THREADS AFTER INSTALLATION

AIR RELEASE VALVE ASSEMBLY (7)



AIR VALVE ASSEMBLY (8)



DIAMETER INCHES	MAXIMUM E, INCHES			MINIMUM H, INCHES		
	ELCEN	TOLCO	GRINNELL	ELCEN	TOLCO	GRINNELL
3	11-3/4	11-3/4	13-1/4	13-3/4	13-3/4	15-1/4
4	14-3/4	14-3/4	14	16-3/4	16-3/4	16
6	16	16	15-1/4	18	18	17-1/4
8	18	18	18-1/2	20	20	18-1/2
10	19	19	19-1/4	21	21	20-1/4
12	20	20	19-3/4	22	22	21-3/4
16	24-1/4	24-3/4	22-1/4	25-1/4	25-3/4	24-1/4
18	26-3/4	26-3/4	24	28-3/4	28-3/4	26
20	27-3/4	27-3/4	25-1/2	29-3/4	29-3/4	27-1/2
24	31	31	28-1/4	33	33	30-1/4
30	34	34	31-1/2	36	36	33-1/2
36	37	37	34-3/4	39	39	36-3/4

LOCATION IN PLAN SHOWN BY A "▲"

(GRINNELL FIG 264, ELCEN No. 48 & 508 OR EQUAL. HD GALV, CLEAN THREADS AFTER GALVANIZING)

ADJUSTABLE PIPE SADDLE SUPPORT (9)

BENCHMARKS:

PROJECT BENCHMARK IS FLOODPLAIN REFERENCE MARKING. HAVING BEING A BRASS DISK STAMPED 1B005 ON BRIDGE AT MASON RD AND UPPER BUFFALO BAYOU LOCATED ON DOWNSTREAM CONCRETE VAULT ON NORTHEAST CORNER OF BRIDGE IN RETAINAP-4102 IN THE BARKER WATERSHED NEAR STREAM T106-00-00.
ELEV=103.51 NAVD88, 2001ADJ.

TEMPORARY BENCHMARK "A" BEING A CUT BOX ON INLET LOCATED ON THE NORTH RIGHT-OF-WAY LINE OF WESTHEIMER PARKWAY.
ELEV=126.21 NAVD88, 2001ADJ.

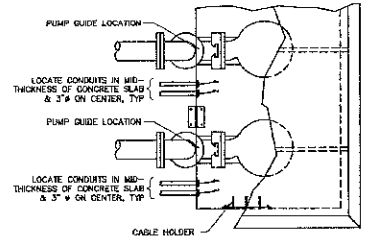
TEMPORARY BENCHMARK "B" BEING A CUT BOX LOCATED ON THE MEDIAN OF WESTHEIMER PARKWAY.
ELEV=122.38 NAVD88, 2001ADJ.

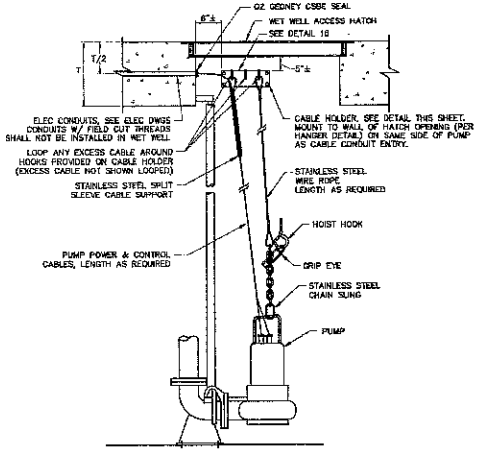
FLOOD PLAIN NOTE:

THIS SUBJECT TRACT LIES IN UNSHADED ZONE "X", (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN)

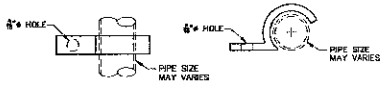
AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR FORT BEND COUNTY, TEXAS AND INCORPORATED AREAS, MAP NO. 48157C0240 L & 48157C0110 L, REVISED APRIL 2, 2014.

SHEET NOTES:

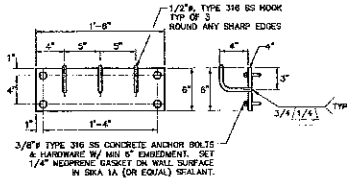




PUMP LIFTING & CABLING DETAIL (10)

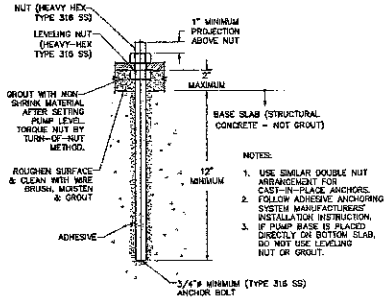


ONE HOLE CLAMP (11)
(3/8" THROUGH 4")
USE 1/4"ø x 1-1/2"± MIN EXPANSION ANCHOR



3/8"ø TYPE 316 SS CONCRETE ANCHOR BOLTS & HARDWARE W/ MIN 6" EMBEDMENT. SET 1/4" NEOPRENE GASKET ON WALL SURFACE IN SIKA 1A (OR EQUAL) SEALANT.

CABLE HOLDER ASSY (12)



NOTES:
1. USE SIMILAR DOUBLE NUT ARRANGEMENT FOR CAST-IN-PLACE ANCHORS.
2. FOLLOW ADHESIVE ANCHORING SYSTEM MANUFACTURERS' INSTALLATION INSTRUCTION.
3. IF PUMP BASE IS PLACED DIRECTLY ON BOTTOM SLAB, DO NOT USE LEVELING NUT OR GROUT.

PUMP BASE ANCHORING (13)
(HVA OR HIT ADHESIVE SYSTEM BY HILTI OR APPROVED EQUAL)

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

APPROVED: DEVELOPMENT COORDINATOR

DATE: 2/1/18

STIVER ENGINEERING
1306 Fannin Street
Houston, Texas 77002
P (713) 526-5475
F (713) 526-5483
stiverep.com
TBE Registration No. F-1180

WGA
WARD, GETZ & ASSOCIATES, L.L.P
CONSULTING ENGINEERS
TEXAS REGISTERED ENGINEERING FIRM F-2735
2500 Tanglewilde, Suite 130
Houston, Texas 77063
713.789.1900

SOLEA CINCO RANCH

GENERAL NOTES & DETAILS (SHEET 2 OF 2)

SCALE	DESIGN	DRAWN
AS SHOWN	JMS/MK	MR

SHEET 3 OF 3