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: 2017-11452

Applicant: **Hurtado Construction Company**

Job Location Site: **Bonbrook Plantation South Pond F, Rosenberg, TX 77471**

Bond No. [redacted] **Date of Bond:** **2/21/2017** **Amount:** **$5,000.00**

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 7th day of March, 2017, Upon Motion of Commissioner Meyers, seconded by Commissioner Patterson, duly put and carried, it is ORDERED, ADJUDGED AND DECREED that said notice of said above purpose is hereby acknowledged by the Commissioners Court of Fort Bend County, Texas, and that said notice be placed on record according to the regulation order thereof.

Signature

By: Charly O. [illegible]
for County Engineer

By: Mark Vogler
Drainage District Engineer/Manager

Presented to Commissioners Court and approved.

Date Recorded 3-15-2017 Comm. Court No. 12G

Clerk of Commissioners Court

By: [illegible]
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: 2017-11452

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: $5,000.00
- [ ] 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.

Charly O. Ay
Permit Administrator

2/27/17
Date

REVIEW FORM

On November 16, 2016 the Fort Bend County Drainage District reviewed the:

1. Plans Bonbrook Plantation South Detention Pond "F" (sealed 11/3/16)

2. Plat

3. Permit

and agrees that this project meets with minimum requirements of this department or office. The following comments may need to be addressed or observed.

The proposed project was analyzed in the drainage study titled "Drainage Impact Analysis for 144 Acre Bonbrook South" approved by the Drainage District on Oct. 6, 2016. This phase of the project proposes the construction of Detention Pond "F" (referenced as Detention Pond "B" in the DIA) providing 61.21 acre-feet of storage capacity at a 100-year design WSEL of 81.59' above m.s.l.. The proposed outfall for the pond is a 48" RCP which will allow for a 100-year release rate of 53 cfs under ultimate conditions. The attached no objection letter acknowledges FBCMUD No. 155 will have ownership and maintenance responsibility of the proposed facilities and specifically states no objection to the proposed maintenance berm design. The construction plans specifically state that the contractor shall obtain a permit from the Fort Bend County Engineering Department prior to any work within the FBCDD 160' Gapps Slough right-of-way.

Reviewed by:

Mark Vogler
Signature of Department Head

Based on review of the submitted information and stated conclusions, the Drainage District staff interposes no objection of the proposed drainage plan for the above referenced project.

Please note this does not necessarily mean that the entire supporting data and calculations have been completely checked and verified. However, the report is signed, dated and sealed by a Professional Engineer licensed to practice in the State of Texas, which therefore conveys the engineer's responsibility and accountability.

P. O. Box 1028 • 1124 Blume Road • Rosenberg, Texas 77471 • (281) 342-2863 • Fax (281) 342-9130

Detention Pond F to serve
Bonbrook Plantation South obo

3 PGS
BOND

2017026398

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

BOND NO [redacted]

THE STATE OF TEXAS §

KNOW ALL MEN BY THESE PRESENTS:

COUNTY OF FORT BEND §

THAT WE, Hurtado Construction Company **whose address is** 5629 FM 359 RD S, Brookshire **Texas, hereinafter called the Principal, And** Liberty Mutual Insurance Company**, a Corporation existing under and by virtue of the laws of the state of** MA **and authorized to do an indemnifying business in the state of Texas, and whose principal office is located at** 175 Berkeley Street , Boston, MA 02116**, whose officer residing in the State of Texas, authorized to accept service in all suits and actions brought whining said state is** Michael Ross McCormick/Corporation Service **and Whose address is** 211 East 7th Street,, Suite 620, Austin, Texas 78701**, hereinafter called the Surety, and held and firmly bound unto , Robert e. Hebert, County Judge of Fort Bend County, Texas, or his successors in office, in the full sum of** Five Thousand Dollars and 00/100 **Dollars (**$5,000.00 **) current, lawful money of the United Stated of America, to be paid to said Robert E. Hebert, County Judge of Fort Bend County, Texas, or his successors in office, to which payment well and truly to be made and done, we, the undersigned, bind ourselves and each of us, our heirs, executors, administrators, successors, assigns, and legal representatives, jointly and severally, by these presents.**

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

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

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

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

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

EXECUTED this 21st **day of** February **,** 2017 **.**

Hurtado Construction Company
PRINCIPAL

BY

Liberty Mutual Insurance Company
SURETY

BY Denise Raker , Attorney-in-Fact

CCM 307-17 #126
Fort Bend County Clerk
Return Admin Serv Coord RA

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.
This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 7548127

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, David Stephen Wightman; Denise Raker; Jo Ann Parker

all of the city of Houston, state of TX each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 17th day of November, 2016.

THE OHIO CASUALTY INSURANCE COMPANY INCORPORATED 1919 NEW HAMPSHIRE
LIBERTY MUTUAL INSURANCE COMPANY INCORPORATED 1912 MASSACHUSETTS
WEST AMERICAN INSURANCE COMPANY INCORPORATED 1991 INDIANA

The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 17th day of November, 2016, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.

TERESA PASTELLA COMMONWEALTH OF PENNSYLVANIA NOTARY PUBLIC

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 21st day of February, 2017.

THE OHIO CASUALTY INSURANCE COMPANY INCORPORATED 1919 NEW HAMPSHIRE
LIBERTY MUTUAL INSURANCE COMPANY INCORPORATED 1912 MASSACHUSETTS
WEST AMERICAN INSURANCE COMPANY INCORPORATED 1991 INDIANA

By: Renee Llewellyn
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

LMS_12873_082016

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS

Laura Richard

Laura Richard, County Clerk
Fort Bend County, Texas
March 13, 2017 03:03:15 PM
FEE: $0.00 EW
BOND

2017026398

CONSTRUCTION PLANS FOR

DETENTION POND "F"

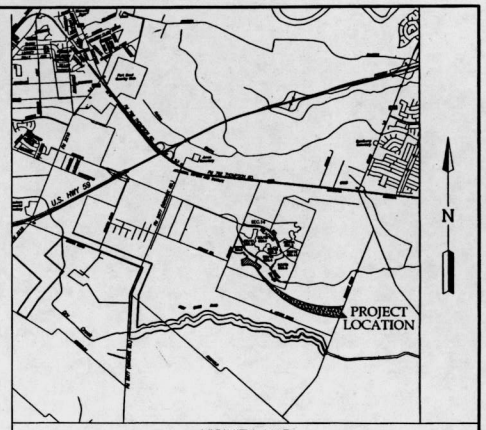
TO SERVE

BONBROOK PLANTATION SOUTH

FORT BEND COUNTY MUD NO. 155
CITY OF ROSENBERG E.T.J.
FORT BEND COUNTY, TEXAS

JOB NO. 1406-4113B

DATE : NOVEMBER 2016



VICINITY MAP
FT BEND COUNTY KEY MAP – 606 W & X

SHEET INDEX

PLAN & PROFILE

DETAILS

NOTES

1. THESE PLANS WERE DESIGNED TO MEET OR EXCEED CITY OF ROSENBERG AND FORT BEND COUNTY SUBDIVISION RULES AND REGULATIONS (AS APPLICABLE) AS CURRENTLY AMENDED

FORT BEND COUNTY ENGINEER

ENGINEER: Neil G Stoughton, PE, PTOE
for RICHARD W. STOLLEIS, P.E.

DATE: 12/15/16

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

APPROVED: Mary Dodd
DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG

APPROVED: John Maresh DATE: 12/6/2016
JOHN MARESH
INTERIM CITY MANAGER

APPROVED: Charles A. Kalkomey DATE: 12/5/16
CHARLES A. KALKOMEY, P.E.
CITY ENGINEER

APPROVAL VOID IF NO PROGRESS HAS BEEN MADE TOWARDS THE COMPLETION OF THE PROJECT WITHIN TWO YEARS FROM DATE OF SIGNATURE.

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER

11/29/2016

APPROVED FOR CONSTRUCTION

BY _____ DATE _____

DEVELOPER:
BEAZER HOMES TEXAS, L.P.

ENGINEER:

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN-F-1386

BONBROOK PLANTATION DETENTION POND "F" – JOB NO. 1406-4113B

Date/Time : Tue, 29 Nov, 2016 - 11:10a
User Name : dgonzalez
Drawing : J:\1406\1406-4113B\Civil\Drawings\Bonbrook Detention Pond F\COVERSHEET.dwg

STORM SEWER NOTES

1. ALL STATIONS ARE CENTERLINE OF STREET RIGHT-OF-WAY STATIONS EXCEPT WHERE STORM SEWER IS IN SIDE LOT EASEMENTS; THIS STATIONING IS BASED ON CENTERLINE OF PIPE.
2. STORM SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ROSENBERG STANDARD DETAIL SHEETS AND LATEST REVISIONS AND/OR AMENDMENTS OF SAME SHALL BE OBSERVED.
3. ALL STORM SEWER 24" AND LARGER TO BE REINFORCED CONCRETE RUBBER GASKET PIPE, A.S.T.M. C-76 CLASS III, INCLUDING INLET LEADS CROSSING UNDER EXISTING OR PROPOSED PAVEMENT.
4. REINFORCED CONCRETE PIPE STORM SEWER SHALL BE INSTALLED, BEDDED AND BACKFILLED IN CONFORMITY WITH CITY OF ROSENBERG STANDARD DETAIL SHEETS. BACKFILL UNDER OR WITHIN 1' (ONE FOOT) OF EXISTING OR PROPOSED PAVEMENT WITH CEMENT STABILIZED SAND (1.5 SACKS PER CUBIC YARD MIX). CEMENT STABILIZED SAND BEDDING AND/OR BACKFILL COMPACTED IN 12" LIFTS FOR INSTALLATION UNDER OR WITHIN 1' (ONE FOOT) OF PAVEMENT SHALL BE CONSIDERED AS SUBSIDIARY TO THE PAY ITEM FOR PIPE AND SHALL NOT BE PAID FOR DIRECTLY. ALL NORMALLY SUBMERGED STORM SEWER PIPE SHALL BE RUBBER GASKETED.
5. CONTRACTOR SHALL PROVIDE A MINIMUM OF 6" (SIX INCHES) CLEARANCE AT STORM SEWER AND WATER LINE CROSSINGS, AND A MINIMUM OF 6" (SIX INCHES) AT STORM SEWER AND SANITARY SEWER CROSSINGS.
6. ALL STORM SEWER MANHOLES SHALL BE CITY OF ROSENBERG TYPE "C" UNLESS OTHERWISE NOTED AND SHALL BE LOCATED A MINIMUM OF 3' BACK OF CURB.
7. ALL INLETS TO BE CITY OF ROSENBERG TYPE "A" WITH CAST IRON GRATES UNLESS OTHERWISE NOTED. STREETS ARE TO HAVE H-2 INLETS.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION.
9. MINIMUM STORM SEWER SIZE IS 24 INCH DIAMETER UNLESS OTHERWISE NOTED IN PLANS.
10. ALL STORM SEWER MANHOLE COVER MUST INCLUDE THE WORD "STORM SEWER".
11. STORM SEWER MANHOLE ADJUSTMENTS SHALL BE BY THROAT RINGS ONLY.
12. ALL STORM SEWER CORRUGATED METAL PIPE MUST BE POLYMER COATED.

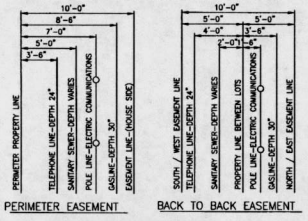
GENERAL NOTES

1. SURFACE RESTORATION: AT THE END OF ALL CONSTRUCTION PROJECTS, THE CONTRACTOR SHALL RESTORE EXISTING FACILITY (I.E. PROPERTY) EQUAL TO OR BETTER THAN EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION.
2. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, AND LABOR FOR EXCAVATION, INSTALLATION, BACKFILLING OF WATER AND/OR SEWER MAINS AND RELATED APPURTENANCES AS SHOWN ON THE PLANS AND/OR DESCRIBED IN THE SPECIAL PROVISIONS.
3. THE LOADING AND UNLOADING OF ALL PIPE, VALVES, HYDRANTS, MANHOLES AND OTHER ACCESSORIES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PRACTICES AND SHALL AT ALL TIMES BE PERFORMED WITH CARE TO AVOID ANY DAMAGE TO THE MATERIAL. THE CONTRACTOR SHALL LOCATE AND PROVIDE THE NECESSARY STORAGE AREAS FOR MATERIALS AND EQUIPMENT.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING AND PROTECTING ALL MATERIAL AND EQUIPMENT STORED ON THE JOBSITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STORAGE OF MATERIALS IN A SAFE AND WORKMANLIKE MANNER TO PREVENT INJURIES, DURING AND AFTER WORKING HOURS, UNTIL PROJECT COMPLETION.
5. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, 1982, AND TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 1980 AND ANY REVISIONS THERETO.
6. CONTRACTOR SHALL PROVIDE SHEETING, SHORING AND BRACING AS NECESSARY TO PROTECT WORKMEN AND EXISTING UTILITIES DURING ALL PHASES OF CONSTRUCTION, AS PER O.S.H.A. REQUIREMENTS.
7. ALL TESTING PROCEDURES USED ON THIS PROJECT SHALL CONFORM TO THE CITY OF ROSENBERG AND FORT BEND COUNTY STANDARDS. THE INITIAL TESTING EXPENSE SHALL BE BORNE BY THE OWNER. IF ANY OF THE TEST RESULTS DO NOT MEET THE TESTING STANDARDS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE OR REPLACE SUCH MATERIAL SO THAT THE TESTING STANDARDS CAN BE MET. ADDITIONAL TESTING TO COMPLY WITH THESE STANDARDS SHALL BE AT THE CONTRACTOR'S EXPENSE.
8. ALL FINISHED GRADES SHALL VARY UNIFORMLY BETWEEN FINISHED ELEVATIONS.
9. CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT ALL "POINTS OF CROSSING" TO DETERMINE IF CONFLICTS EXIST BEFORE COMMENCING ANY CONSTRUCTION. NOTIFY THE ENGINEER AT ONCE OF ANY CONFLICT.
10. TOP OF FOUNDATION (SLAB) SHALL BE A MINIMUM OF 18" ABOVE TOP OF CURB AND/OR 18" ABOVE NATURAL GROUND OR 1' ABOVE 100 YR FLOOD ELEVATION, WHICHEVER IS HIGHER.
11. ALL FINISHED GRADES ARE TO CONFORM TO A MINIMUM SLOPE OF 12" PER 100'. DRAINAGE IS DEPICTED BY ARROWS.
12. THE CONTRACTOR SHALL NOT UNLOAD ANY TRACK-TYPE CONSTRUCTION MACHINERY ON ANY EXISTING PAVEMENT OR CROSS OVER ANY EXISTING PAVEMENT OR CURB DURING ANY PROJECT.
13. IT IS PERMISSIBLE TO USE A BACKHOE FOR TRENCH EXCAVATION IN LIEU OF A TRENCHING MACHINE.
14. CONTRACTOR SHALL NOTIFY CITY OF ROSENBERG UTILITY DEPARTMENT AT (832) 595-3500, CITY ENGINEER AT (281) 342-2033, AND FORT BEND COUNTY ENGINEERING AT CONSTRUCTION@FORTBENDCOUNTYTX.GOV AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR SHALL ALSO CONTACT TEXAS ONE-CALL AT 1-800-245-4545. IN ADDITION TO ONE-CALL, EXXON MOBIL (RA NEWSOME) SHALL BE CONTACTED AT (713) 824-3283 A MINIMUM OF 72 HOURS PRIOR TO PERFORMING ANY WORK IN, ON, UNDER, OVER OR THROUGH EXXON MOBIL EASEMENTS. DPC MIDSTREAM (JOE SCHMICEK) SHALL BE CONTACTED AT (979) 540-7628 A MINIMUM OF 48 HOURS PRIOR TO PERFORMING ANY WORK IN, ON, UNDER, OVER DPC MIDSTREAM'S PIPELINES.
15. CONTRACTOR SHALL NOTIFY CITY OF ROSENBERG UTILITY DEPARTMENT AND CITY ENGINEER AT LEAST 24 HOURS PRIOR TO COMMENCEMENT OF ALL WORK REQUIRING NORMAL CITY INSPECTION AT (832) 595-3500. WORK REQUIRING INSPECTIONS INCLUDES, BUT IS NOT LIMITED TO, CONCRETE PLACEMENT, SUBGRADE STABILIZATION, UTILITY FACILITY BACKFILL, REINFORCING PLACEMENT, ETC.
16. REGULAR INSPECTION HOURS ARE 7 AM THROUGH 5 PM, MONDAY THROUGH FRIDAY, EXCEPT ON CITY HOLIDAYS. ON SATURDAYS, SUNDAYS AND DAYS DESIGNATED AS CITY HOLIDAYS NO WORK WILL BE ALLOWED THAT REQUIRES INSPECTION BY CITY STAFF, UNLESS THE CITY DEEMS THE WORK NECESSARY TO FACILITATE THE TIMELY COMPLETION OF THE PROJECT. ADVANCE WRITTEN NOTICE OF 72 HOURS, IS REQUIRED. ADVANCED NOTICE CAN BE FAXED TO (832) 595-3501. CONTRACTOR SHALL NOTIFY CITY OF ROSENBERG UTILITY DEPARTMENT AT (832) 595-3500 AND CITY ENGINEER AT (281) 342-2033.
17. INFORMATION REGARDING INSPECTION FEES FOR AFTER HOURS AND HOLIDAY INSPECTIONS IS AVAILABLE BY CALLING CITY OF ROSENBERG AT (832) 595-3500 AND CITY ENGINEER AT (281) 342-2033. CONTRACTOR SHALL BE RESPONSIBLE FOR CHARGES ASSOCIATED WITH THESE INSPECTIONS.
18. AREAS TO BE FILLED SHALL BE SCARIFIED AND COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY PER ASTM D-698, TO A DEPTH OF 8" PRIOR TO FILL PLACEMENT. FILL MATERIAL SHALL BE AT PLACED IN MAXIMUM 8" THICK LIFTS (MEASURED LOOSE) AND COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY PER ASTM D-698. MOISTURE CONTENT SHALL BE BETWEEN OPTIMUM AND +3% OF OPTIMUM UNLESS OTHERWISE DIRECTED BY OWNER'S TESTING LAB OR THE ENGINEER. FILL SHALL BE CLEAN EARTH, SAND, OR A COMBINATION, AND BE FREE FROM TRASH , VEGETATION, AND LARGE STONES.
19. ALL BONDING TO BE STANDARD MATERIAL AND PROCEDURE. DENSITY TESTING ON EACH LOT ONLY STANDARD BACKFILL PROCEDURES ARE ALLOWED.
20. CONTACT FORT BEND COUNTY MUNICIPAL UTILITY DISTRICT NO. 155 OPERATOR TO OPERATE EXISTING UTILITIES.
21. CONTACT FORT BEND COUNTY MUNICIPAL UTILITY DISTRICT NO. 155 OPERATOR PRIOR TO MAKING TIE-INS TO EXISTING UTILITIES.
22. WHEN HYDROMULCH IS REQUIRED, CONTRACTOR SHALL KEEP MULCH MOIST AFTER INSTALLATION AND UNTIL AREA SHOWS GROWTH.

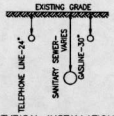
FORT BEND COUNTY GENERAL NOTES

1. FORT BEND COUNTY MUST BE INVITED TO THE PRE-CONSTRUCTION MEETING.
2. CONTRACTOR SHALL NOTIFY FORT BEND COUNTY ENGINEERING DEPARTMENT 48 HOURS PRIOR TO COMMENCING CONSTRUCTION AND 48 HOUR NOTICE TO ANY CONSTRUCTION ACTIVITY WITHIN THE LIMITS OF THE PAVING AT CONSTRUCTION@FORTBENDCOUNTYTX.GOV
3. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FROM FORT BEND COUNTY PRIOR TO COMMENCING CONSTRUCTION OF ANY IMPROVEMENTS WITHIN COUNTY ROAD RIGHT OF WAYS.
4. ALL PAVING IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FORT BEND COUNTY "RULES, REGULATIONS, AND REQUIREMENTS RELATING TO THE APPROVAL AND ACCEPTANCE OF IMPROVEMENTS IN SUBDIVISIONS" AS CURRENTLY AMENDED.
5. ALL ROAD WIDTHS, CURB RADII, AND CURB ALIGNMENT SHOWN INDICATES BACK OF CURB.
6. A CONTINUOUS LONGITUDINAL REINFORCING BAR SHALL BE USED IN THE CURBS.
7. ALL CONCRETE PAVEMENT SHALL BE 5½ SACK CEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT EACH CURB RETURN AND AT A MAXIMUM SPACING OF 60 FEET.
8. ACCESS TO ALL EXISTING STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.
9. 4" X 12" REINFORCED CONCRETE CURB SHALL BE PLACED IN FRONT OF SINGLE FAMILY LOTS ONLY, ALL OTHER AREAS SHALL BE 6" REINFORCED CONCRETE CURB.
10. AT ALL INTERSECTION LOCATIONS, TYPE 7 RAMPS SHALL BE PLACED IN ACCORDANCE WITH TXDOT Ped-12a STANDARD DETAIL SHEET. A.D.A.-HANDICAP RAMPS SHALL BE INSTALLED WITH STREET PAVING AT ALL INTERSECTIONS AND COMPLY WITH CURRENT A.D.A. REGULATIONS.
11. CURB HEADERS ARE REQUIRED AT CURB CONNECTIONS TO HANDICAP RAMPS, WITH NO CONSTRUCTION JOINT WITHIN 5' OF RAMPS.
12. ALL INTERSECTIONS UTILIZING TRAFFIC CONTROL MEASURES SHALL HAVE A.D.A. WHEEL CHAIR RAMPS INSTALLED.
13. GUIDELINES ARE SET FORTH IN THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, SHALL BE OBSERVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE FLAGMEN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION - BOTH DAY AND NIGHT.
14. ALL R1-1 STOP SIGNS SHALL BE 30"X30" WITH DIAMOND GRADE SHEETING. STREET NAMES SHALL BE UPPER AND LOWER CASE LETTERS WITH DIAMOND GRADE SHEETING.
15. STREET NAME SIGNAGE SHALL BE ON A 9" HIGH SIGN FLAT BLADE W/REFLECTIVE GREEN BACKGROUND. STREET NAMES SHALL BE UPPER AND LOWERCASE LETTERING UPPERCASE LETTERS OF 6" MINIMUM AND LOWERCASE LETTERS OF 4.5" MINIMUM. THE LETTERS SHALL BE REFLECTIVE WHITE. STREET NAME SIGNS SHALL E MOUNTED ON STOP SIGN POST.
16. A BLUE DOUBLE REFLECTORIZED BUTTON SHALL BE PLACED AT ALL FIRE HYDRANT LOCATIONS. THE BUTTON SHALL BE PLACED 12 INCHES OFF THE CENTERLINE OF THE STREET ON THE SAME SIDE AS THE HYDRANT.

TEN-FOOT (10') WIDE EASEMENT



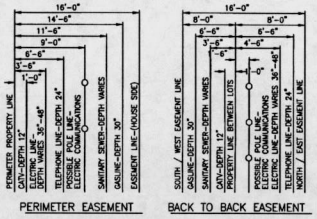
PERIMETER EASEMENT — BACK TO BACK EASEMENT



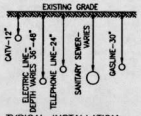
TYPICAL INSTALLATION DEPTHS

UTILITIES ARE NORMALLY INSTALLED AS SHOWN BUT DEPTH MAY VARY DUE TO CUT BY OTHERS
MAINTAIN MINIMUM 4' CLEARANCE BETWEEN ALL UTILITY LINES EXTENDING FROM EASEMENT TO HOUSE/BUILDING

SIXTEEN-FOOT (16') WIDE EASEMENT



PERIMETER EASEMENT — BACK TO BACK EASEMENT



TYPICAL INSTALLATION DEPTHS

UTILITIES ARE NORMALLY INSTALLED AS SHOWN BUT DEPTH MAY VARY DUE TO CUT BY OTHERS
MAINTAIN MINIMUM 4' CLEARANCE BETWEEN ALL UTILITY LINES EXTENDING FROM EASEMENT TO HOUSE/BUILDING

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED PROFESSIONAL ENGINEER
11/29/2016

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET
TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET
INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.
2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: Mary Dol
DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1824

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

GENERAL CONSTRUCTION NOTES

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5028
FRN-F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: NONE SHEET NO. 2 OF 23

BONBROOK PLANTATION DETENTION POND "F" - 1406-4113B

Date/Time : Tue, 29 Nov 2016 - 1:14pm User Name : dbowman
Path/Name : T:\Projects\1406-4113B\CAD\ Sheet Files\2 GENERAL CONSTRUCTION NOTES.dwg

LAKE F SUMMARY TABLE:

SERVICE AREAS:		
SECTION 6	27.10	ACRES
SECTION 7	15.71	ACRES
SECTION 8	18.56	ACRES
SECTION 10	5.61	ACRES
POND F	11.58	ACRES
TOTAL	78.56	ACRES

DETENTION RATE REQUIRED	0.76	ac-ft/ac
DETENTION RATE PROVIDED	0.87	ac-ft/ac
DETENTION VOLUME REQUIRED	59.42	ac-ft
DETENTION VOLUME PROVIDED	61.21	ac-ft
RESTRICTOR SIZE	48 INCHES	
100-Year WSE	81.59	ft.
25-Year WSE	80.53	ft.
Normal WSE	74.50	ft.

Detention Facilities Will Be Owned and Maintained by Fort Bend County Municipal Utility District No. 155

LEGEND

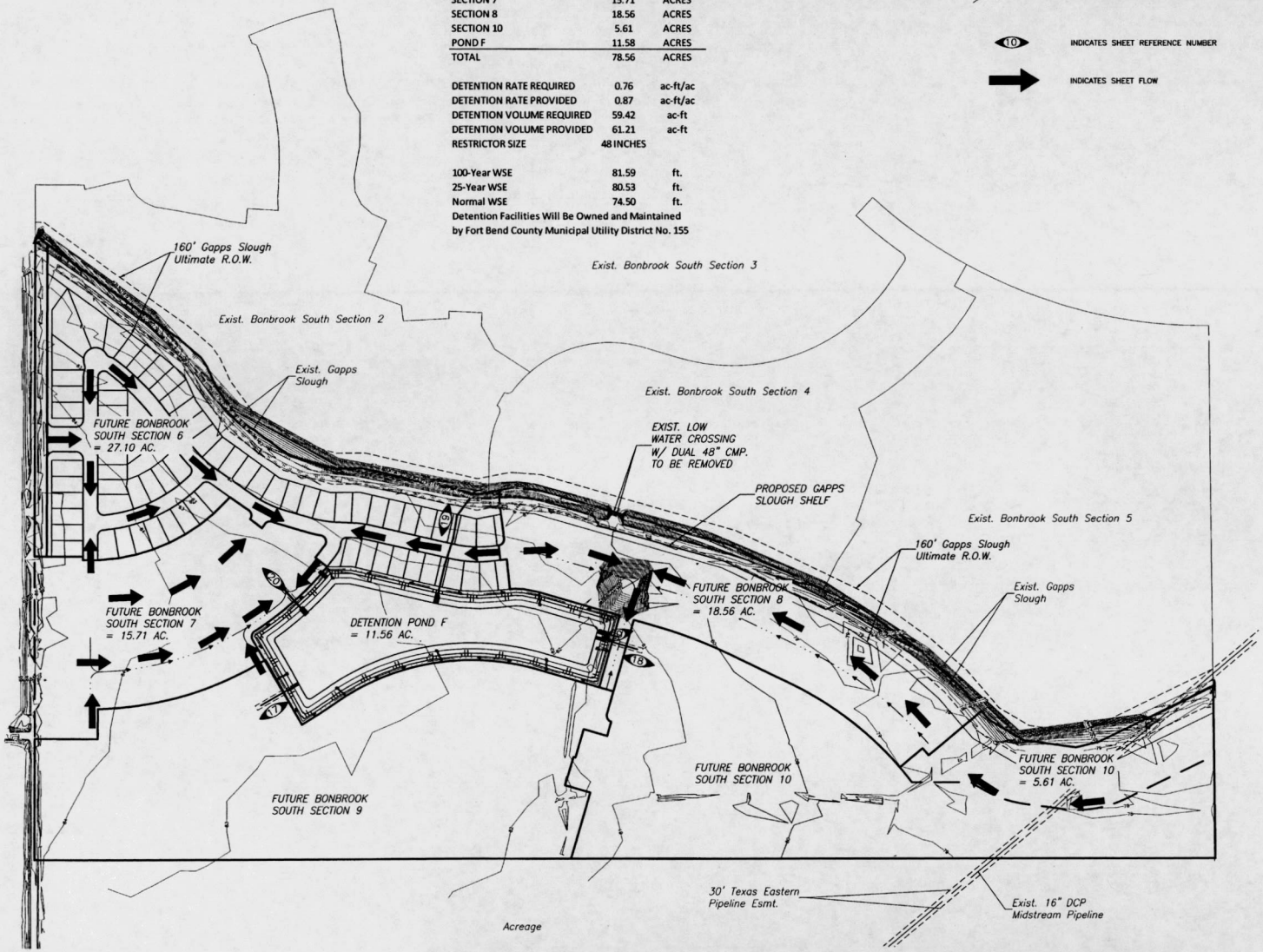
90 — INDICATES EXISTING NATURAL GROUND CONTOURS

10 — INDICATES SHEET REFERENCE NUMBER

INDICATES SHEET FLOW

N

0 200' 400'



BENCHMARK:
A BRASS DISK STAMPED R-1319, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A 3/4-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
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RECORD DRAWING
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BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1828

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

OVERALL LAYOUT & DRAINAGE AREA MAP

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: 1" = 200'

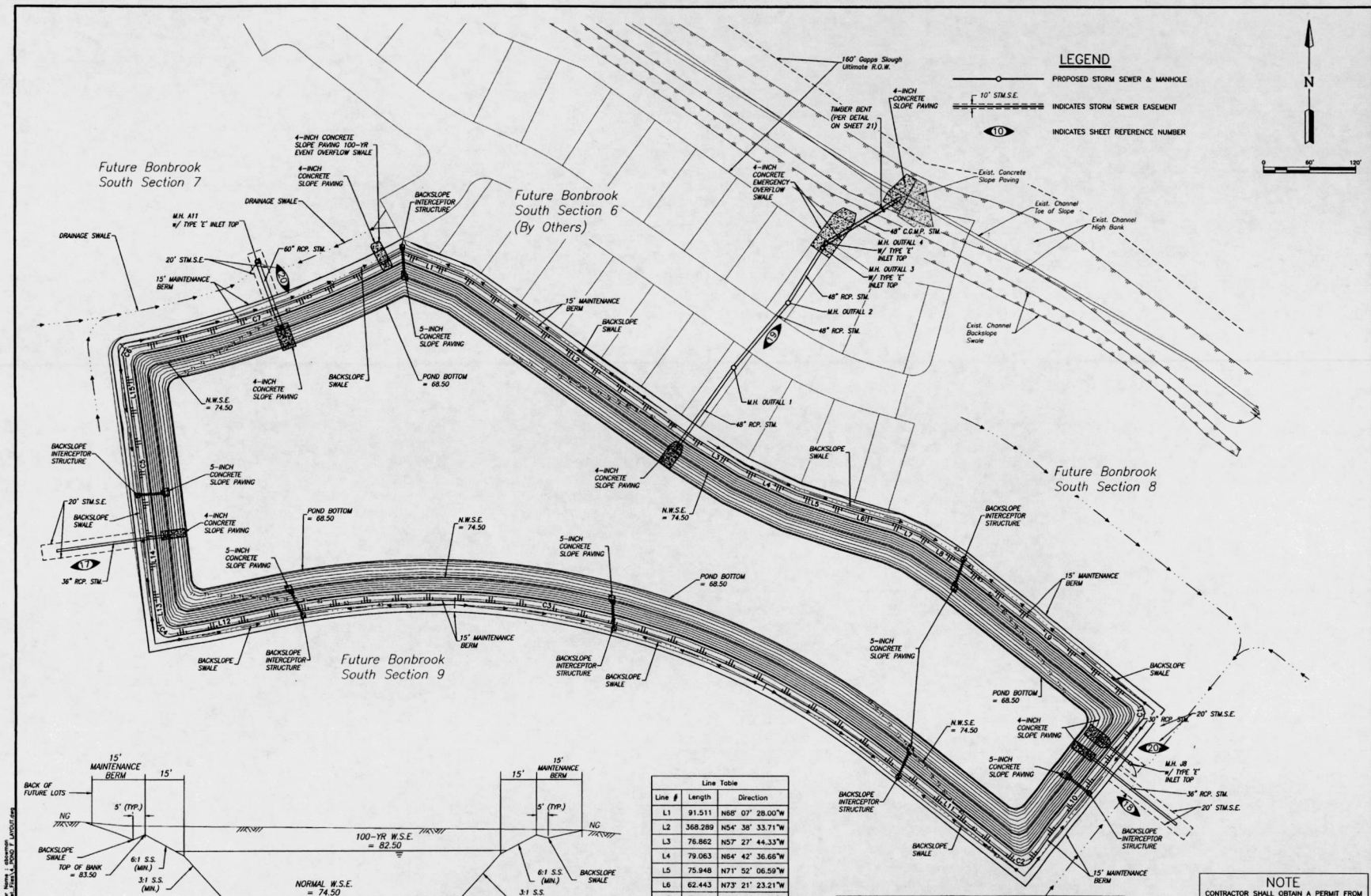
SHEET NO. 3 OF 23

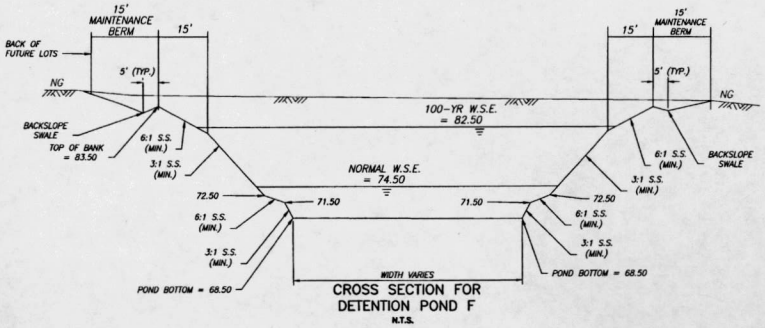
STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER 11/29/2016

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

Date/Time : Tue, 29 Nov, 2016 - 11:14am User Name : abenson
Path\Name : W:\Projects\1406-41130\CAD\ Sheet Files\3_OVERALL AND DAM.dwg

3





CROSS SECTION FOR DETENTION POND F
N.T.S.

Line Table		
Line #	Length	Direction
L1	91.511	N68° 07' 28.00"W
L2	368.289	N54° 38' 33.71"W
L3	76.862	N57° 27' 44.33"W
L4	79.063	N64° 42' 36.66"W
L5	75.948	N71° 52' 06.59"W
L6	62.443	N73° 21' 23.21"W
L7	36.101	N65° 48' 41.51"W
L8	63.037	N56° 04' 36.73"W
L9	304.413	N51° 35' 45.00"W
L10	240.000	N38° 24' 15.00"E
L11	226.910	S51° 35' 45.00"E
L12	148.801	N78° 56' 15.95"E
L13	47.475	S06° 59' 58.92"E
L14	126.332	S06° 28' 52.00"E
L15	94.962	S07° 59' 01.67"E

Curve Table						
Curve #	Length	Radius	Delta	Chord	Tangent	Direction
C1	23.562	15.000	090.0000	21.21'	15.00'	N06° 35' 45.00"W
C2	23.562	15.000	090.0000	21.21'	15.00'	N83° 24' 15.00"E
C3	842.430	965.000	050.0183	815.93'	450.17'	S76° 36' 18.00"E
C4	24.333	15.000	092.9438	21.75'	15.79'	S53° 28' 17.71"E
C5	95.597	3645.000	001.5027	95.59'	47.80'	S07° 13' 56.84"E
C6	15.273	10.000	087.5059	13.83'	9.57'	S35° 46' 08.97"W
C7	385.886	1245.000	017.7588	384.34'	194.50'	S70° 38' 33.86"W

NOTE
CONTRACTOR SHALL OBTAIN A PERMIT FROM THE FORT BEND COUNTY ENGINEERING DEPARTMENT, (281)633-7500, PRIOR TO ANY WORK WITH THE FORT BEND COUNTY DRAINAGE DISTRICT GAPPS SLOUGH R.O.W.

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER
11/23/2016

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD. SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
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NAVD-88(1991 ADJ.) ELEV = 90.758 FEET
INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
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RECORD DRAWING
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BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: Mary Dot
DEVELOPMENT COORDINATOR
DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1883

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

POND "F" LAYOUT

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN-F-1386

LJA PROJECT NO.: 1406-4113B
DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016
SCALE: 1" = 60'
SHEET NO. 4 OF 23

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

Dwg\Dwg - Tue 29 Nov 2016 - 11:19am User Name : dbowman
Path\Name : T:\Projects\1_FDR\41-38\RCAD\ Date, Time & POND F LAYOUT.dwg

FLOODPLAIN MITIGATION CALCULATIONS		
TOTAL MITIGATION REQUIRED	21.52	ac-ft
MITIGATION PROVIDED		
MITIGATION PROVIDED FOR ALL 3 PONDS	21.52	ac-ft

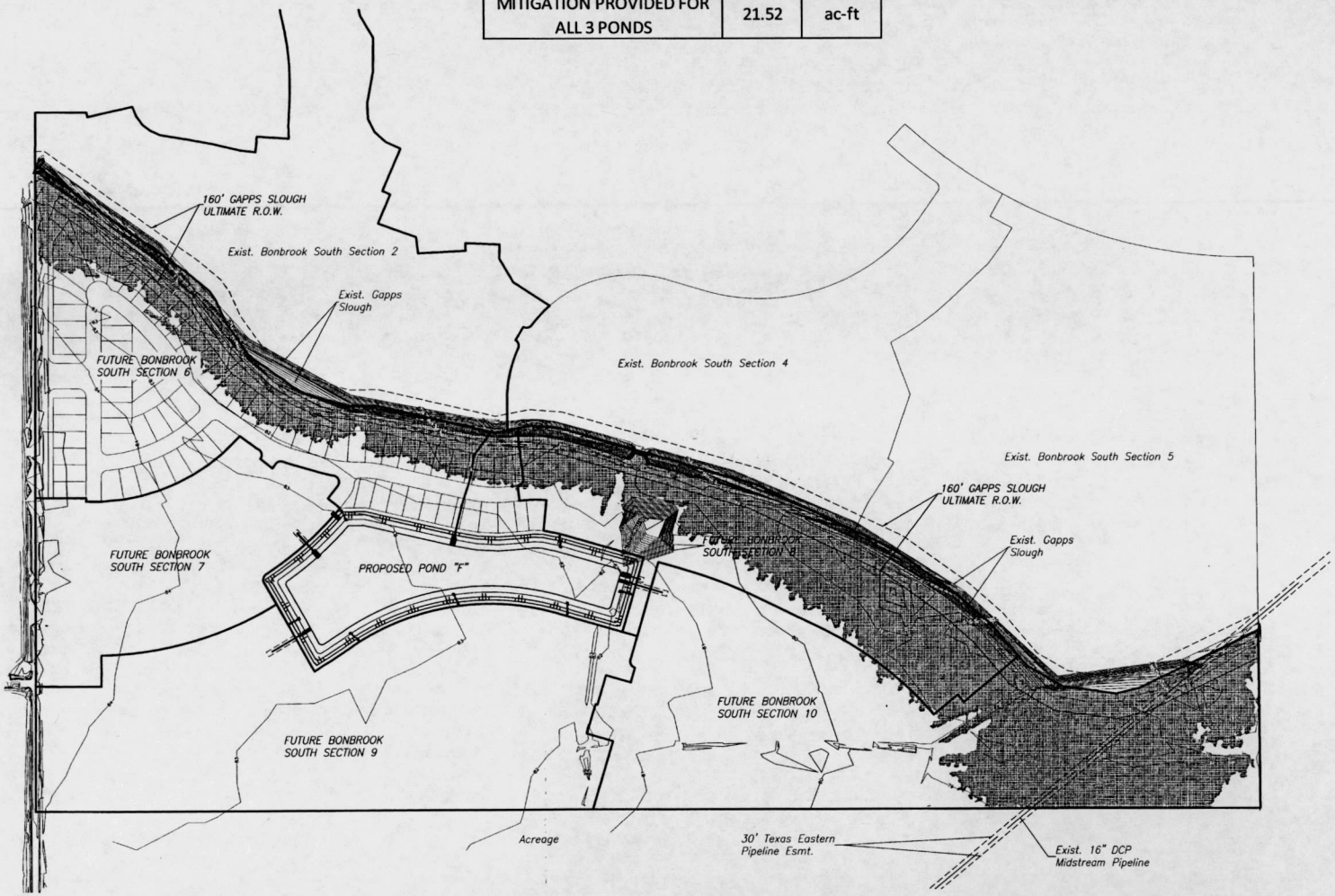
LEGEND

INDICATES 100-YR FLOODPLAIN (BY R.G. MILLER STUDY)

— 72 — INDICATES EXISTING NATURAL GROUND CONTOUR

N

0 200' 400'



BENCHMARK:

A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL. LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
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A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.756 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

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BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1865

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

FLOODPLAIN MITIGATION PLAN

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 500
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5025
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: 1" = 200' SHEET NO. 5 OF 23

STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER 11/29/2016

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

5

Date/Time: Tue, 29 Nov 2016 - 1:15pm User Name: dbarrera
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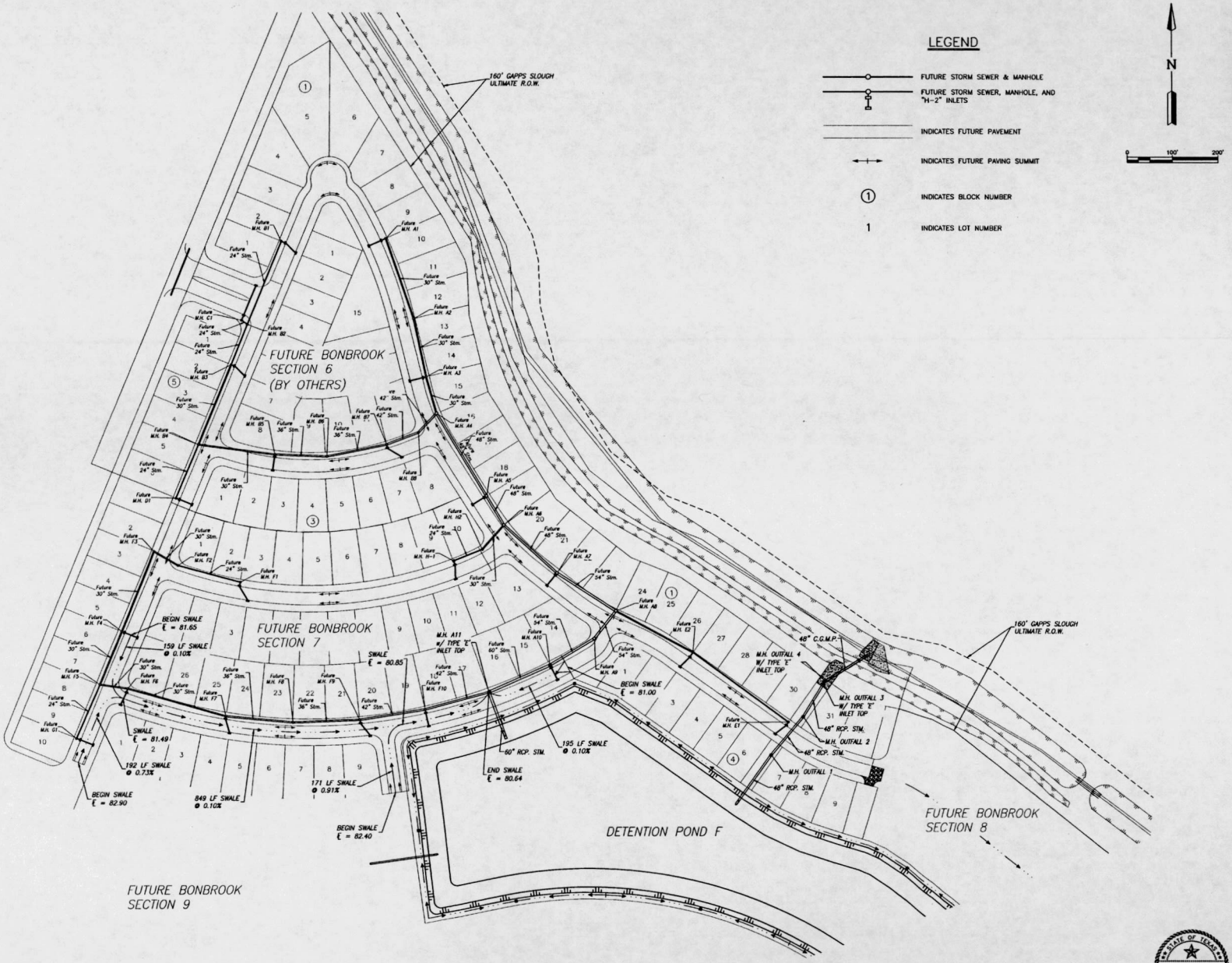

LEGEND

- FUTURE STORM SEWER & MANHOLE
- FUTURE STORM SEWER, MANHOLE, AND "H-2" INLETS
- INDICATES FUTURE PAVEMENT
- INDICATES FUTURE PAVING SUMMIT
- (1) INDICATES BLOCK NUMBER
- 1 INDICATES LOT NUMBER

BENCHMARK:

A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.68 FEET

TBM (LJA 1)
A 5/8-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

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BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: Mary Dodd
DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1885

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

TEMPORARY DRAINAGE SWALES & FUTURE DRAINAGE FACILITIES LAYOUT FOR SECTIONS 6 & 7

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN-F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

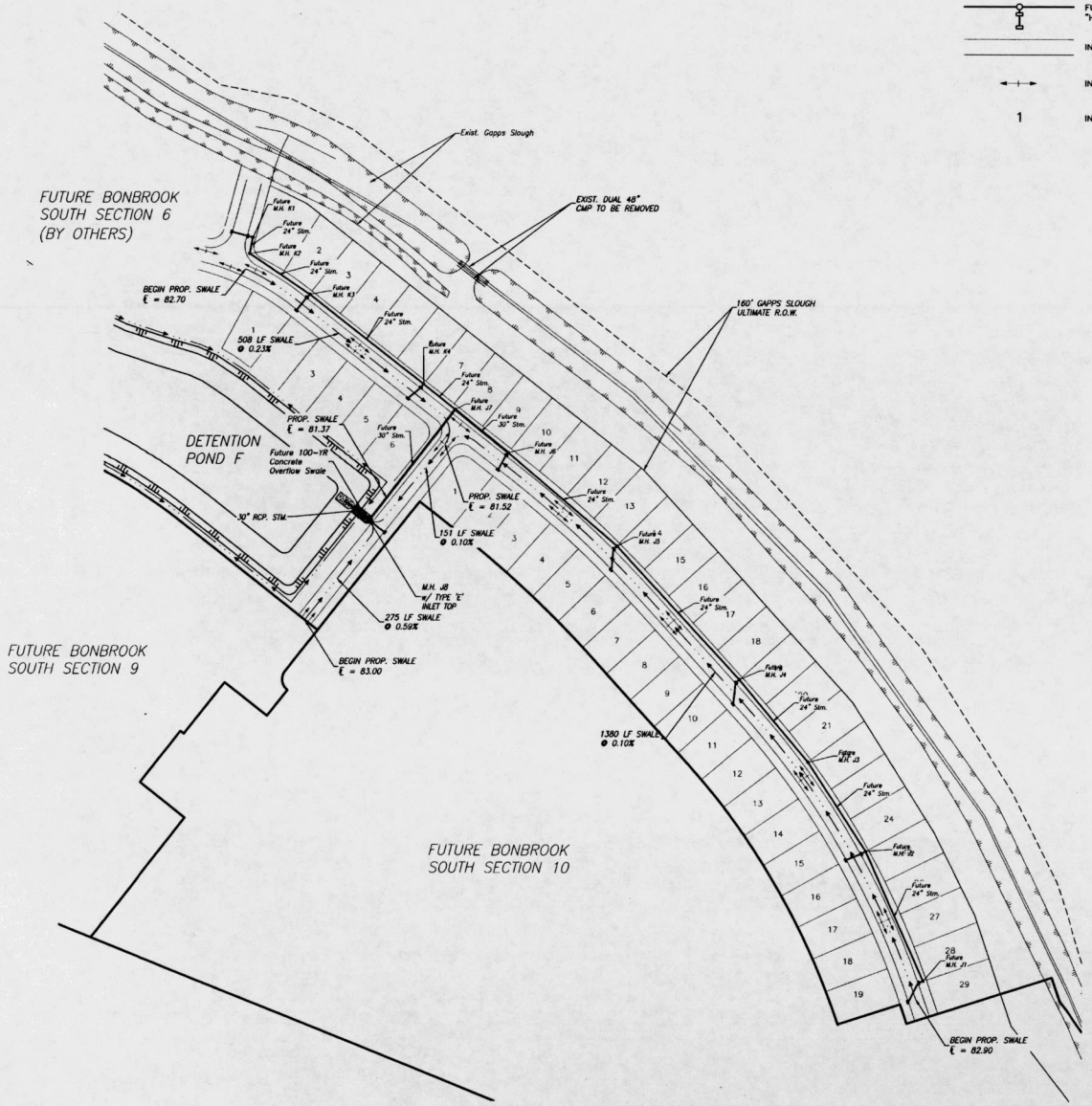
SCALE: 1" = 100'

SHEET NO. 6 OF 23

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER
11/29/16

BONBROOK PLANTATION DETENTION POND "F" - 1406-4113B

Date/Time: Tue, 29 Nov 2016 - 11:15am User Name: dbrennan
File Name: T:\Projects\1406-4113B\CAD_Sheet Files\6_FUTURE DRAINAGE FOR SECTION 6 & 7.dwg



LEGEND

- FUTURE STORM SEWER & MANHOLE
- FUTURE STORM SEWER, MANHOLE, AND "H-2" INLETS
- INDICATES FUTURE PAVEMENT
- INDICATES FUTURE PAVING SUMMIT
- 1 INDICATES LOT NUMBER

N

0 100' 200'

BENCHMARK:

A BRASS DISK STAMPED K-1210, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP, SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEX ROAD, APPROXIMATELY 18.6 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEX ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.36
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:

1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.

2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION

3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: Mary Dot
DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1883

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

TEMPORARY DRAINAGE SWALES & FUTURE DRAINAGE FACILITIES FOR SECTION 8

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: 1" = 100'

SHEET NO. 7 OF 23

STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER

11/29/16

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

Date/Time : Tue, 29 Nov 2016 - 1:15pm User Name : ROGERTC
File Name : I:\Projects\1406-4113B(Cat)_Bonbrook Plant_F_Drainage FOR SECTION 8.dwg

7

Bonbrook Plantation South Section 6
3-YR Storm Calcs

LINE	FROM MH	TO MH	AREA (AC)	TOTAL AREA (AC)	CITY CURVE NO.	Tc (MIN)	CI	Q INPUT (CFS)	Q TOTAL (CFS)	REACH (FT)	SIZE (IN)		LINE MANN. CONST.	SLOPE (%)	DESIGN Q (CFS)	DESIGN V (FPS)	SLOPE FALL (FT)	M.H. DROP (FT)	OTHER LOSS (FT)	FLOWLINE UP-STREAM (FT)	FLOWLINE DOWN-STREAM (FT)	ACTUAL V (FPS)	THEOR. H.G.L. SLOPE (%)	H (FT)	ACTUAL H.G.L. SLOPE (%)	ACTUAL H.G.L. (FT)	DNST. H.G.L. (FT)	UPST. TC ELEV. (FT)	H.G.L. IN RELATION TO TOC (FT)
A	101	102	0.52	0.52	4	10.00	1.15	0.00	0.59	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	78.10	77.90	0.19	0.00	0.00	0.00	80.73	80.73	82.90	-2.17
A	102	1	2.05	2.57	4	10.08	1.15	0.00	2.94	12	24		0.013	0.0081	20.4	6.50	0.10	0.00	0.00	77.90	77.80	0.94	0.02	0.00	0.02	80.73	80.73	82.90	-2.17
A	1	2	0.00	2.57	4	10.11	1.15	0.00	2.94	192	30		0.013	0.0013	14.8	3.02	0.25	0.00	0.00	75.35	75.09	0.60	0.01	0.01	0.01	80.73	80.72	83.01	-2.28
A	2	3	0.00	2.57	4	11.17	1.13	0.00	2.89	134	30		0.013	0.0013	14.8	3.02	0.17	0.00	0.00	75.09	74.92	0.59	0.00	0.01	0.00	80.72	80.71	83.42	-2.70
A	3	4	1.63	4.20	4	11.91	1.12	0.00	4.69	85	30		0.013	0.0013	14.8	3.02	0.11	0.00	0.00	74.92	74.81	0.96	0.01	0.01	0.01	80.71	80.70	83.13	-2.41
A	4	5	9.48	13.67	4	12.38	1.11	0.00	15.17	217	42		0.013	0.0010	31.9	3.32	0.22	0.98	0.00	73.83	73.61	1.58	0.02	0.05	0.02	80.70	80.65	83.39	-2.69
A	5	6	1.10	14.77	4	13.47	1.09	0.00	16.17	76	48		0.013	0.0010	45.5	3.62	0.08	0.00	0.00	73.61	73.53	1.29	0.01	0.01	0.01	80.65	80.64	82.99	-2.33
A	6	7	2.84	17.61	4	13.82	1.09	0.00	19.19	161	48		0.013	0.0010	45.5	3.62	0.16	0.00	0.00	73.53	73.37	1.53	0.02	0.03	0.02	80.64	80.61	83.12	-2.47
A	7	8	1.07	18.68	4	14.56	1.08	0.00	20.19	155	54		0.013	0.0010	62.3	3.92	0.16	0.50	0.00	72.87	72.71	1.27	0.01	0.02	0.01	80.61	80.60	82.86	-2.24
A	8	9	4.80	23.48	4	15.22	1.07	0.00	25.20	73	54		0.013	0.0010	62.3	3.92	0.07	0.00	0.00	72.71	72.63	1.58	0.02	0.01	0.02	80.60	80.59	83.33	-2.73
A	9	10	0.00	23.48	4	15.53	1.07	0.00	25.11	115	54		0.013	0.0010	62.3	3.92	0.12	0.00	0.00	72.63	72.51	1.58	0.02	0.02	0.02	80.59	80.57	82.86	-2.27
A	10	11	1.34	24.83	4	16.02	1.06	0.00	26.42	150	60		0.013	0.0010	82.6	4.21	0.15	0.00	0.50	72.01	71.86	1.35	0.01	0.02	0.01	80.57	80.55	82.45	-1.88
A	11	OUTFALL	9.98	34.81	4	16.62	1.06	0.00	36.82	111	60		0.013	0.0010	82.6	4.21	0.11	0.00	0.00	71.86	71.75	1.88	0.02	0.02	0.02	80.55	80.53	83.27	-2.72
A	301	302	0.76	0.76	4	10.00	1.15	0.00	0.88	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	78.00	77.80	0.28	0.00	0.00	0.00	80.71	80.71	82.80	-2.09
A	302	3	0.87	1.63	4	10.08	1.15	0.00	1.87	9	24		0.013	0.0114	24.2	7.71	0.10	0.00	0.00	77.80	77.70	0.60	0.01	0.00	0.01	80.71	80.71	82.80	-2.09
A	501	502	0.15	0.15	4	10.00	1.15	0.00	0.18	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	77.90	77.70	0.06	0.00	0.00	0.00	80.65	80.65	82.70	-2.05
A	502	5	0.95	1.10	4	10.08	1.15	0.00	1.26	8	24		0.013	0.0128	25.7	8.17	0.10	0.00	0.00	77.70	77.60	0.40	0.00	0.00	0.00	80.65	80.65	82.70	-2.05
H	2	A6	2.84	2.84	4	10.49	1.14	0.00	3.24	74	30		0.0130	0.0013	14.63	3.02	0.10	0.50	0.00	74.63	74.54	0.66	0.01	0.00	0.01	80.65	80.64	82.99	-2.34
A	701	702	0.16	0.16	4	10.00	1.15	0.00	0.18	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	77.89	77.69	0.06	0.00	0.00	0.00	80.61	80.61	82.69	-2.08
A	702	7	0.91	1.07	4	10.08	1.15	0.00	1.22	7	24		0.013	0.0149	27.7	8.81	0.10	0.00	0.00	77.69	77.59	0.39	0.00	0.00	0.00	80.61	80.61	82.69	-2.08
B	101	102	0.89	0.89	4	10.00	1.15	0.00	1.02	30	24		0.013	0.0066	18.4	5.85	0.20	0.00	0.00	78.20	78.00	0.33	0.00	0.00	0.00	80.91	80.91	83.00	-2.09
B	102	1	1.72	2.61	4	10.09	1.15	0.00	2.99	11	24		0.013	0.0091	21.6	6.88	0.10	0.00	0.00	78.00	77.90	0.95	0.02	0.00	0.02	80.91	80.91	83.00	-2.09
B	1	2	0.00	2.61	4	10.11	1.15	0.00	2.99	202	24		0.013	0.0018	9.6	3.06	0.36	0.00	0.00	76.28	75.90	0.95	0.02	0.04	0.02	80.91	80.87	83.32	-2.41
B	2	3	0.48	3.09	4	11.21	1.13	0.00	3.49	98	24		0.013	0.0018	9.6	3.06	0.18	0.00	0.00	75.90	75.72	1.11	0.02	0.02	0.02	80.87	80.85	83.69	-2.82
B	3	4	2.14	5.23	4	11.75	1.12	0.00	5.86	194	30		0.013	0.0013	14.8	3.02	0.25	0.00	0.00	75.72	75.47	1.19	0.02	0.04	0.02	80.85	80.81	83.04	-2.19
B	4	5	1.24	6.48	4	12.82	1.10	0.00	7.14	173	30		0.013	0.0013	14.8	3.02	0.22	0.00	0.00	75.47	75.25	1.46	0.03	0.05	0.03	80.81	80.76	83.16	-2.35
B	5	6	1.54	8.01	4	13.77	1.09	0.00	8.74	116	36		0.013	0.0010	21.1	2.99	0.12	0.50	0.00	74.75	74.63	1.24	0.02	0.02	0.02	80.76	80.74	83.06	-2.32
B	6	7	0.00	8.01	4	14.42	1.08	0.00	8.67	136	36		0.013	0.0010	21.1	2.99	0.14	0.00	0.00	74.63	74.49	1.23	0.02	0.02	0.02	80.74	80.72	83.50	-2.77
B	7	8	1.46	9.48	4	15.18	1.07	0.00	10.17	76	42		0.013	0.0010	31.9	3.32	0.08	0.50	0.00	73.99	73.91	1.06	0.01	0.01	0.01	80.72	80.71	82.96	-2.25
B	8	A4	0.00	9.48	4	15.56	1.07	0.00	10.13	59	42		0.013	0.0010	31.9	3.32	0.06	0.00	0.00	73.91	73.36	1.05	0.01	0.01	0.01	80.71	80.70	83.35	-2.64
C	101	102	0.24	0.24	4	10.00	1.15	0.00	0.28	70	24		0.013	0.0029	12.1	3.86	0.20	0.00	0.00	79.05	78.85	0.09	0.00	0.00	0.25	81.05	80.87	83.85	-2.80
C	102	C1	0.24	0.48	4	10.30	1.14	0.00	0.55	14	24		0.013	0.0074	19.5	6.21	0.10	0.00	0.00	78.85	78.75	0.18	0.00	0.00	0.00	80.87	80.87	83.85	-2.98
C	C1	B2	0.00	0.48	4	10.34	1.14	0.00	0.55	16	24		0.013	0.0018	9.6	3.06	0.03	0.00	0.00	75.93	75.90	0.18	0.00	0.00	0.00	80.87	80.87	83.93	-3.06
B	301	302	1.06	1.06	4	10.00	1.15	0.00	1.21	30	24		0.013	0.0066	18.4	5.87	0.20	0.00	0.00	78.30	78.10	0.39	0.00	0.00	0.00	80.85	80.85	83.10	-2.25
B	302	B3	1.08	2.14	4	10.09	1.15	0.00	2.46	9	24		0.013	0.0112	24.0	7.63	0.10	0.00	0.00	78.10	78.00	0.78	0.01	0.00	0.01	80.85	80.85	83.05	-2.20
D	101	102	0.15	0.15	4	10.00	1.15	0.00	0.18	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	78.15	77.95	0.06	0.00	0.00	0.00	80.82	80.82	82.95	-2.13
D	102	D1	1.09	1.24	4	10.08	1.15	0.00	1.43	9	24		0.013	0.0106	23.3	7.42	0.10	0.00	0.00	77.95	77.85	0.45	0.00	0.00	0.00	80.82	80.82	82.95	-2.13
D	D1	B4	0.00	1.24	4	10.10	1.15	0.00	1.42	131	24		0.013	0.0018	9.6	3.06	0.24	0.00	0.00	77.85	77.61	0.45	0.00	0.01	0.00	80.82	80.81	83.17	-2.35
B	501	502	1.07	1.07	4	10.00	1.15	0.00	1.23	28	24		0.013	0.0072	19.2	6.11	0.20	0.00	0.00	78.10	77.90	0.39	0.00	0.00	0.00	80.76	80.76	82.90	-2.14
B	502	B5	0.47	1.54	4	10.08	1.15	0.00	1.76	7	24		0.013	0.0151	27.9	8.88	0.10	0.00	0.00	77.90	77.80	0.56	0.01	0.00	0.01	80.76	80.76	82.90	-2.14
B	701	702	0.82	0.82	4	10.00	1.15	0.00	0.94	37	24		0.013	0.0054	16.6	5.29	0.20	0.00	0.00	77.95	77.75	0.30	0.00	0.00	0.00	80.72	80.72	82.75	-2.03
B	702	B7	0.64	1.46	4	10.12	1.15	0.00	1.68	9	24		0.013	0.0114	24.3	7.72	0.10	0.00	0.00	77.75	77.65	0.53	0.01	0.00	0.01	80.72	80.72	82.79	-2.07
E	101	102	1.47	1.47	4	10.00	1.15	0.00	1.69	28	24		0.013	0.0070	19.0	6.05	0.20	0.00	0.00	77.60	77.40	0.54	0.01	0.00	0.01	80.68	80.68	82.45	-1.77
E	102	1	1.20	2.67	4	10.08	1.15	0.00	3.06	10	24		0.013	0.0103	23.1	7.34	0.10	0.00	0.00	77.40	77.30	0.98	0.02	0.00	0.02	80.68	80.68	82.45	-1.77
E	1	2	0.00	2.67	4	10.10	1.15	0.00	3.06	263	24		0.013	0.0018	9.6	3.06	0.47	0.00	0.00	75.83	75.36	0.97	0.02	0.05	0.02	80.68	80.63	82.65	-1.96
E	2	A8	2.14	4.80	4	11.53	1.12	0.00	5.39	198	30		0.013	0.0013	14.8	3.02	0.26	0.50	0.00	74.86	74.61	1.10	0.02	0.03	0.02	80.63	80.60	82.63	-1.99
E	201	202	0.98	0.98	4	10.00	1.15	0.00	1.13	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	77.65	77.45	0.36	0.00	0.00	0.71	79.65	79.45	82.40	-2.75
E	202	2	1.15	2.14	4	10.08	1.15	0.00	2.45	10	24		0.013	0.0102	22.9	7.30	0.10	0.00	0.00	77.45	77.35	0.78	0.01	0.00	1.02	79.45	79.35	82.40	-2.95
F	101	102	1.38	1.38	4	10.00	1.15	0.00	1.59	37	24		0.013	0.0054	16.7	5.32	0.20	0.00	0.00	78.00	77.80	0.51	0.00	0.00	0.00	80.71	80.71	82.80	-2.09
F	102	1	1.17	2.55	4	10.12	1.15	0.00	2.93	10	24		0.013	0.0105	23.3	7.41	0.10	0.00	0.00	77.80	77.70	0.93	0.02	0.00	0.02	80.71	80.71	82.85	-2.14
F	1	2	0.00	2.55	4	10.14	1.15	0.00	2.92	145	24		0.013	0.0018	9.6	3.06	0.26	0.00	0.00	76.50	76.24	0.93	0.02	0.02	0.02	80.71	80.68	83.04	-2.33
F	2	3	0.00	2.55	4	10.93	1.13	0.00	2.89	63	30		0.013	0.0013	14.8	3.02	0.08	0.00	0.00	76.24	76.16	0.59	0.00	0.00	0.00	80.68	80.68	83.53	-2.84
F	3	4	0.00	2.55	4	11.28	1.13	0.00	2.87	194	30		0.013	0.0013	14.8	3.02	0.25	0.00	0.00	76.16	75.90	0.59	0.00	0.01	0.00	80.68	80.67	83.83	-3.15
F	4	5	1.71	4.26	4	12.34	1.11	0.00	4.73	129	30		0.013	0.0013	14.8	3.02	0.17	0.00	0.00	75.90	75.74	0.96	0.01	0.02	0.01	80.67	80.66	83.05	-2.38
F	5	6	0.62	4.87	4	13.06	1.10	0.00	5.36	62	30		0.013	0.0013	14.8	3.02	0.08	0.00	0.00	75.74	75.66	1.09	0.02	0.01	0.02	80.66	80.64	83.72	-3.06
F	6	7	0.59	5.47	4	13.40	1.10	0.00	5.99	229	36		0.013	0.0010	21.1	2.99	0.23	0.00	0.00	75.66	75.43	0.85	0.01	0.02	0.01	80.64	80.63	83.70	-3.05
F	7	8	2.11	7.57	4	14.68	1.08	0.00	8.17	150	36		0.013	0.0010	21.1	2.99	0.15	0.00	0.00	75.43	75.28	1.16	0.01	0.02	0.01	80.63	80.60	83.44	-2.81
F	8	9	0.00	7.57	4	15.51	1.07	0.00	8.10	149	36		0.013	0.0010	21.1	2.99	0.15	0.00	0.00	75.28	75.13	1.15	0.01	0.02	0.01	80.60	80.58	83.79	-3.18
F	9	10	1.56	9.13	4	16.34	1.06	0.00	9.68	148	42		0.013	0.0010	31.9	3.32	0.15	0.00	0.00	75.13	74.98	1.01	0.01	0.01	0.01	80.58	80.57	83.31	-2.73
F	10	A11	0.85	9.98	4	17.09	1.05	0.00	10.51	149	42		0.013	0.0010	31.9	3.32	0.15	0.00	0.00	74.98	74.83	1.09	0.01	0.02	0.01	80.57	80.55	83.18	-2.61
F	401	402	0.18	0.18	4	10.00	1.15	0.00	0.20	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	78.10	77.90	0.06	0.00	0.00	0.00	80.67	80.67	82.90	-2.23
F	402	4	1.53	1.71	4	10.08	1.15	0.00	1.96	7	24		0.013	0.0136	26.5	8.43	0.10	0.00	0.00	77.90	77.80	0.62	0.01	0.00	0.01	80.67	80.67	82.90	-2.23
G	101	102	0.09	0.09	4	10.00	1.15	0.00	0.10	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	79.45	79.25	0.03	0.00	0.00	0.71	81.45	81.25	84.25	-2.80
G	102	1	0.53	0.62	4	10.08	1.15	0.00	0.71	10	24		0.013	0.0100	22.7	7.23	0.10	0.00	0.00	79.25	79.15	0.22	0.00	0.00	1.00	81.25	81.15	84.25	-3.00
G	1	F5	0.00	0.62	4	10.10	1.15	0.00	0.71	131	24		0.013	0.0018	9.6	3.06	0.24	0.00	0.00	79.15	78.91	0.22	0.00	0.00	0.38	81.15	80.66	84.45	-3.30
F	601	602	0.36	0.36	4	10.00	1.15	0.00	0.41	28	24		0.013	0.0071	19.1	6.09	0.20	0.00	0.00	78.80	78.60	0.13	0.00	0.00	0.55	80.80	80.64	83.60	-2.80
F	602	6	0.24	0.59	4	10.08	1.15	0.00	0.68	10	24		0.013	0.0097	22.3	7.10	0.10	0.00	0.00	78.60	78.50	0.22	0.00	0.00	0.00	80.64	80.64	83.60	-2.95
F	701	702	1.12	1.12	4	10.00	1.15	0.00	1.28	31	24		0.013	0.0065	18.2	5.80	0.20	0.00	0.00	78.45	78.25	0.41	0.00	0.00	0.00	80.63	80.63	83.25	-2.62
F	702	7	0.99	2.11	4	10.09	1.15	0.00	2.42	7	24		0.013	0.0146	27.4	8.73	0.10	0.00	0.00	78.25	78.15	0.77	0.01	0.00	0.01	80.63	80.63	83.30	-2.67
F	901	902	0.83	0.83	4	10.00	1.15	0.00	0.95	33	24		0.013	0.0050	17.5	5.58	0.20	0.00	0.00	78.30	78.10	0.30	0.00	0.00	0.00	80.58	80.58	83.10	-2.52
F	902	9	0.73	1.56	4	10.10	1.15	0.00	1.79	9	24		0.013	0.0111	23.9	7.62	0.10	0.00	0.00	78.10	78.00	0.57	0.01	0.00	0.01	80.58	80.58	83.13	-2.55
F	1001	1002	0.22	0.22	4	10.00	1.15	0.00	0.25	28	24		0.013	0.0071	19.2	6.10	0.20	0.00	0.00	78.20	78.00	0.08	0.00	0.00	0.00	80.57	80.57	83.00	-2.43
F	1002	10	0.63	0.85	4	10.08	1.15	0.00	0.97	9	24		0.013	0.0111	23.9	7.62	0.10	0.00	0.00	78.00	77.90	0.31	0.00	0.00	0.00	80.57	80.57	83.00	-2.43
H	101	102	1.60	1.60	4	10.00	1.15	0.00	1.83	30	24		0.013	0.0068	18.7	5.94	0.20	0.00	0.00	77.80	77.60	0.58	0.01	0.00	0.01	80.67	80.66	82.60	-1.93
H	102	1	1.24	2.84	4	10.08	1.15	0.00	3.26	11	24		0.013	0.0095	22.1	7.03	0.10	0.00	0.00	77.60	77.50	1.04	0.02	0.00	0.02	80.66	80.66	82.63	-1.97
H	1	2	0.00	2.84	4	10.11	1.15	0.00	3.26	69	24		0.013	0.0018	9.6	3.06	0.13	0.00	0.00	75.26	75.13	1.04	0.02	0.01	0.02	80.66	80.65	82.84	-2.18
H	2	A6	0.00	2.84	4	10.49	1.14	0.00	3.24	74	30		0.013	0.0013	14.8	3.02	0.10	0.50	0.00	74.63	74.54	0.66	0.01	0.00	0.01	80.65	80.64	82.99	-2.34

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 4815700265 L
DATE: APRIL 2, 2014

NOTES:
1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.
2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR
DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1823

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

3-YR DRAINAGE CALCULATIONS FOR SECTIONS 6 & 7

LJA Engineering, Inc.
2929 Briarpark Drive, Suite 600, Houston, Texas 77042
Phone 713.953.5200, Fax 713.953.5028, FRN-F-1386

LJA PROJECT NO.: 1406-4113B
DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016
SCALE: NONE
SHEET NO. 8 OF 23

STATE OF TEXAS — MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER — 12/14/2016

BONBROOK PLANTATION DETENTION POND "F" — 1406-4113B

Date/Time: Tue, 29 Nov 2016 4:11:16pm User: Brian S. Sommer
Drawing: L:\Bonbrook\1406-4113B\Civil\Drainage\Drainage Calcs for 6 & 7.dwg

Bonbrook Plantation South Section 6
3-YR Adj. Storm Calcs

LINE	FROM MH	TO MH	AREA (AC)	TOTAL AREA (AC)	CITY CURVE NO.	Tc (MIN)	CI	Q INPUT (CFS)	Q TOTAL (CFS)	REACH (FT)	SIZE (IN)	LINE MANN. CONST.	LINE SLOPE (%)	DESIGN Q (CFS)	DESIGN V (FPS)	SLOPE FALL (FT)	M.H. DROP (FT)	OTHER LOSS (FT)	FLOWLINE UP-STREAM (FT)	FLOWLINE DOWN-STREAM (FT)	ACTUAL V (FPS)	THEOR. H.G.L. SLOPE (%)	H (FT)	ACTUAL H.G.L. SLOPE (%)	UPST. H.G.L. (FT)	DNST. H.G.L. (FT)	UPST. TC ELEV. (FT)	H.G.L. IN RELATION TO TOC (FT)
A	101	102	0.52	0.52	4	10.00	1.15	0.00	2.28	28	24	0.013	0.0071	19.2	6.10	0.20	0.00	0.00	78.10	77.90	0.72	0.01	0.00	0.01	83.50	83.50	82.90	0.60
A	102	1	2.05	2.57	4	10.08	1.15	0.00	11.30	12	24	0.013	0.0081	20.4	6.50	0.10	0.00	0.00	77.90	77.80	3.60	0.25	0.03	0.25	83.50	83.47	82.90	0.60
A	1	2	0.00	2.57	4	10.11	1.15	0.00	11.29	192	30	0.013	0.0013	14.8	3.02	0.25	0.00	0.00	75.35	75.09	2.30	0.08	0.14	0.08	83.47	83.32	83.01	0.46
A	2	3	0.00	2.57	4	11.17	1.13	0.00	11.11	134	30	0.013	0.0013	14.8	3.02	0.17	0.00	0.00	75.09	74.92	2.26	0.07	0.10	0.07	83.32	83.22	83.42	-0.10
A	3	4	1.63	4.20	4	11.91	1.12	0.00	17.99	85	30	0.013	0.0013	14.8	3.02	0.11	0.00	0.00	74.92	74.81	3.67	0.19	0.16	0.19	83.22	83.06	83.13	0.10
A	4	5	9.48	13.67	4	12.38	1.11	0.00	58.23	217	42	0.013	0.0010	31.9	3.32	0.22	0.98	0.00	73.83	73.61	6.05	0.33	0.72	0.33	83.06	82.34	83.39	-0.33
A	5	6	1.10	14.77	4	13.47	1.09	0.00	62.05	76	48	0.013	0.0010	45.5	3.62	0.08	0.00	0.00	73.61	73.53	4.94	0.19	0.14	0.19	82.34	82.19	82.99	-0.65
A	6	7	2.84	17.61	4	13.82	1.09	0.00	73.67	161	48	0.013	0.0010	45.5	3.62	0.16	0.00	0.00	73.53	73.37	5.86	0.26	0.42	0.26	82.19	81.77	83.12	-0.92
A	7	8	1.07	18.68	4	14.56	1.08	0.00	77.47	155	54	0.013	0.0010	62.3	3.92	0.16	0.50	0.00	72.87	72.71	4.87	0.15	0.24	0.15	81.77	81.53	82.86	-1.08
A	8	9	4.80	23.48	4	15.22	1.07	0.00	96.70	73	54	0.013	0.0010	62.3	3.92	0.07	0.00	0.00	72.71	72.63	6.08	0.24	0.18	0.24	81.53	81.36	83.33	-1.80
A	9	10	0.00	23.48	4	15.53	1.07	0.00	96.39	115	54	0.013	0.0010	62.3	3.92	0.12	0.00	0.00	72.63	72.51	6.08	0.24	0.28	0.24	81.36	81.08	82.86	-1.50
A	10	11	1.34	24.83	4	16.02	1.06	0.00	101.39	150	60	0.013	0.0010	82.6	4.21	0.15	0.00	0.00	72.01	71.86	5.16	0.15	0.23	0.15	81.08	80.86	82.45	-1.37
A	11	OUTFALL	9.98	34.81	4	16.62	1.06	0.00	141.31	111	60	0.013	0.0010	82.6	4.21	0.11	0.00	0.00	71.86	71.75	7.20	0.29	0.33	0.29	80.86	80.53	83.27	-2.41
	Adjustment factor		3.84																									
A	301	302	0.76	0.76	4	10.00	1.15	0.00	3.36	28	24	0.013	0.0071	19.2	6.10	0.20	0.00	0.00	78.00	77.80	1.07	0.02	0.01	0.71	80.00	79.80	82.80	-2.80
A	302	3	0.87	1.63	4	10.08	1.15	0.00	7.19	9	24	0.013	0.0114	24.2	7.71	0.10	0.00	0.00	77.80	77.70	2.29	0.10	0.01	1.14	79.80	79.70	82.80	-3.00
A	501	502	0.15	0.15	4	10.00	1.15	0.00	0.67	28	24	0.013	0.0071	19.2	6.10	0.20	0.00	0.00	77.90	77.70	0.21	0.00	0.00	0.71	79.90	79.70	82.70	-2.80
A	502	5	0.95	1.10	4	10.08	1.15	0.00	4.84	8	24	0.013	0.0128	25.7	8.17	0.10	0.00	0.00	77.70	77.60	1.54	0.05	0.00	1.28	79.70	79.60	82.70	-3.00
H	2	A6	2.84	2.84	4	10.49	1.14	0.00	12.42	74	30	0.0130	0.0013	14.8	3.02	0.10	0.50	0.00	74.63	74.54	2.53	0.09	0.07	0.09	79.76	79.69	82.99	-3.23
A	701	702	0.16	0.16	4	10.00	1.15	0.00	0.70	28	24	0.013	0.0071	19.2	6.10	0.20	0.00	0.00	77.89	77.69	0.22	0.00	0.00	0.71	79.89	79.69	82.69	-2.80
A	702	7	0.91	1.07	4	10.08	1.15	0.00	4.70	7	24	0.013	0.0149	27.7	8.81	0.10	0.00	0.00	77.69	77.59	1.50	0.04	0.00	1.49	79.69	79.59	82.69	-3.00
B	101	102	0.89	0.89	4	10.00	1.15	0.00	3.93	30	24	0.013	0.0086	18.4	5.85	0.20	0.00	0.00	78.20	78.00	1.25	0.03	0.01	0.03	80.42	80.41	83.00	-2.58
B	102	1	1.72	2.61	4	10.09	1.15	0.00	11.48	11	24	0.013	0.0091	21.6	6.88	0.10	0.00	0.00	78.00	77.90	3.65	0.26	0.03	0.26	80.41	80.38	83.00	-2.59
B	1	2	0.00	2.61	4	10.11	1.15	0.00	11.48	202	24	0.013	0.0018	9.6	3.06	0.36	0.00	0.00	76.26	75.90	3.65	0.26	0.52	0.26	80.38	79.86	83.32	-2.93
B	2	3	0.48	3.09	4	11.21	1.13	0.00	13.38	98	24	0.013	0.0018	9.6	3.06	0.18	0.00	0.00	75.90	75.72	4.26	0.35	0.34	0.35	79.86	79.52	83.69	-3.83
B	3	4	2.14	5.23	4	11.75	1.12	0.00	22.48	194	30	0.013	0.0013	14.8	3.02	0.25	0.00	0.00	75.72	75.47	4.58	0.30	0.56	0.30	79.52	78.94	83.04	-3.52
B	4	5	1.24	6.48	4	12.82	1.10	0.00	27.42	173	30	0.013	0.0013	14.8	3.02	0.22	0.00	0.00	75.47	75.25	5.59	0.44	0.77	0.44	78.94	78.18	83.16	-4.21
B	5	6	1.54	8.01	4	13.77	1.09	0.00	33.54	116	36	0.013	0.0010	21.1	2.99	0.12	0.50	0.00	74.75	74.63	4.74	0.25	0.29	0.25	78.18	77.88	83.08	-4.90
B	6	7	0.00	8.01	4	14.42	1.08	0.00	33.29	136	36	0.013	0.0010	21.1	2.99	0.14	0.00	0.00	74.63	74.49	4.71	0.25	0.34	0.25	77.88	77.55	83.50	-5.62
B	7	8	1.46	9.48	4	15.18	1.07	0.00	39.04	76	42	0.013	0.0010	31.9	3.32	0.08	0.50	0.00	73.99	73.91	4.06	0.15	0.11	0.15	77.55	77.43	82.98	-5.42
B	8	A4	0.00	9.48	4	15.56	1.07	0.00	38.88	59	42	0.013	0.0010	31.9	3.32	0.06	0.00	0.00	73.91	73.85	4.04	0.15	0.09	0.15	77.43	77.35	83.35	-5.91
	Adjustment factor		3.84																									
C	101	102	0.24	0.24	4	10.00	1.15	0.00	1.07	70	24	0.013	0.0029	12.1	3.86	0.20	0.00	0.00	79.05	78.85	0.34	0.00	0.00	0.00	81.05	81.05	83.85	-2.80
C	102	C1	0.24	0.48	4	10.30	1.14	0.00	2.12	14	24	0.013	0.0074	19.5	6.21	0.10	0.00	0.00	78.85	78.75	0.68	0.01	0.00	1.48	81.05	80.85	83.85	-2.80
C	C1	B2	0.00	0.48	4	10.34	1.14	0.00	2.12	16	24	0.013	0.0018	9.6	3.06	0.03	0.00	0.00	75.93	75.90	0.68	0.01	0.00	18.56	80.85	77.90	83.93	-3.08
B	301	302	1.06	1.06	4	10.00	1.15	0.00	4.66	30	24	0.013	0.0066	18.4	5.87	0.20	0.00	0.00	78.30	78.10	1.48	0.04	0.01	0.04	80.31	80.30	83.10	-2.79
B	302	B3	1.08	2.14	4	10.09	1.15	0.00	9.43	9	24	0.013	0.0112	24.0	7.63	0.10	0.00	0.00	78.10	78.00	3.00	0.17	0.02	3.35	80.30	80.00	83.05	-2.75
D	101	102	0.15	0.15	4	10.00	1.15	0.00	0.68	28	24	0.013	0.0071	19.2	6.10	0.20	0.00	0.00	78.15	77.95	0.22	0.00	0.00	0.00	80.15	80.15	82.95	-2.80
D	102	D1	1.09	1.24	4	10.08	1.15	0.00	5.47	9	24	0.013	0.0106	23.3	7.42	0.10	0.00	0.00	77.95	77.85	1.74	0.06	0.01	2.11	80.15	79.95	82.95	-2.80
D	D1	B4	0.00	1.24	4	10.10	1.15	0.00	5.47	131	24	0.013	0.0018	9.6	3.06	0.24	0.00	0.00	77.85	77.61	1.74	0.06	0.08	0.26	79.95	79.61	83.17	-3.22
B	501	502	1.07	1.07	4	10.00	1.15	0.00	4.72	28	24	0.013	0.0072	19.2	6.11	0.20	0.00	0.00	78.10	77.90	1.50	0.04	0.01	0.04	80.11	80.10	82.90	-2.79
B	502	B5	0.47	1.54	4	10.08	1.15	0.00	6.77	7	24	0.013	0.0151	27.9	8.88	0.10	0.00	0.00	77.90	77.80	2.15	0.09	0.01	4.54	80.10	79.80	82.90	-2.80
B	701	702	0.82	0.82	4	10.00	1.15	0.00	3.62	37	24	0.013	0.0054	16.6	5.29	0.20	0.00	0.00	77.95	77.75	1.15	0.03	0.01	0.03	79.96	79.95	82.75	-2.79
B	702	B7	0.64	1.46	4	10.12	1.15	0.00	6.44	9	24	0.013	0.0114	24.3	7.72	0.10	0.00	0.00	77.75	77.65	2.05	0.08	0.01	3.43	79.95	79.65	82.79	-2.84
E	101	102	1.47	1.47	4	10.00	1.15	0.00	6.50	28	24	0.013	0.0070	19.0	6.05	0.20	0.00	0.00	77.60	77.40	2.07	0.08	0.02	0.08	82.79	82.77	82.45	0.34
E	102	1	1.20	2.67	4	10.08	1.15	0.00	11.76	10	24	0.013	0.0103	23.1	7.34	0.10	0.00	0.00	77.40	77.30	3.74	0.27	0.03	0.27	82.77	82.74	82.45	0.32
E	1	2	0.00	2.67	4	10.10	1.15	0.00	11.75	263	24	0.013	0.0018	9.6	3.06	0.47	0.00	0.00	75.63	75.36	3.74	0.27	0.71	0.27	82.74	82.03	82.65	0.10
E	2	A8	2.14	4.80	4	11.53	1.12	0.00	20.70	198	30	0.013	0.0013	14.8	3.02	0.26	0.50	0.00	74.86	74.61	4.22	0.25	0.50	0.25	82.03	81.53	82.63	-0.59
E	201	202	0.98	0.98	4	10.00	1.15	0.00	4.33	28	24	0.013	0.0071	19.2	6.10	0.20	0.00	0.00	77.65	77.45	1.38	0.04	0.01	0.04	79.66	79.65	82.40	-2.74
E	202	2	1.15	2.14	4	10.08	1.15	0.00	9.40	10	24	0.013	0.0102	22.9	7.30	0.10	0.00	0.00	77.45	77.35	2.99	0.17	0.02	3.07	79.65	79.35	82.40	-2.75
	Adjustment factor		3.84																									
F	101	102	1.38	1.38	4	10.00	1.15	0.00	6.10	37	24 0	0.013	0.005428	16.7	5.32	0.20	0.00	0.00	78.00	77.80	1.94	0.07	0.03	0.07	83.22	83.19	82.90	0.42
F	102	1	1.17	2.55	4	10.12	1.15	0.00	11.23	10	24	0.013	0.010525	23.3	7.41	0.10	0.00	0.00	77.80	77.70	3.57	0.25	0.02	0.25	83.19	83.17	82.85	0.34
F	1	2	0.00	2.55	4	10.14	1.15	0.00	11.22	145	24	0.013	0.0018	9.6	3.06	0.26	0.00	0.00	76.50	76.24	3.57	0.24	0.36	0.24	83.17	82.81	83.04	0.12
F	2	3	0.00	2.55	4	10.93	1.13	0.00	11.09	63	30	0.013	0.0013	14.8	3.02	0.08	0.00	0.00	76.24	76.16	2.26	0.07	0.05	0.07	82.81	82.77	83.53	-0.72
F	3	4	0.00	2.55	4	11.28	1.13	0.00	11.03	194	30	0.013	0.0013	14.8	3.02	0.25	0.00	0.00	76.16	75.90	2.25	0.07	0.14	0.07	82.77	82.63	83.83	-1.07
F	4	5	1.71	4.26	4	12.34	1.11	0.00	18.14	129	30	0.013	0.0013	14.8	3.02	0.17	0.00	0.00	75.90	75.74	3.70	0.19	0.25	0.19	82.63	82.37	83.05	-0.42
F	5	6	0.62	4.87	4	13.06	1.10	0.00	20.58	62	30	0.013	0.0013	14.8	3.02	0.08	0.00	0.00	75.74	75.66	4.19	0.25	0.16	0.25	82.37	82.22	83.72	-1.34
F	6	7	0.99	5.47	4	13.40	1.10	0.00	22.98	229	36	0.013	0.001	21.1	2.99	0.23	0.00	0.00	75.66	75.43	3.25	0.12	0.27	0.12	82.22	81.95	83.70	-1.48
F	7	8	2.11	7.57	4	14.68	1.08	0.00	31.37	150	36	0.013	0.001	21.1	2.99	0.15	0.00	0.00	75.43	75.28	4.44	0.22	0.33	0.22	81.95	81.62	83.44	-1.49
F	8	9	0.00	7.57	4	15.51	1.07	0.00	31.09	149	36	0.013	0.001	21.1	2.99	0.15	0.00	0.00	75.28	75.13	4.40	0.22	0.32	0.22	81.62	81.30	83.79	-2.17
F	9	10	1.56	9.13	4	16.34	1.06	0.00	37.17	148	42	0.013	0.001	31.9	3.32	0.15	0.00	0.00	75.13	74.98	3.86	0.14	0.20	0.14	81.30	81.09	83.31	-2.02
F	10	A11	0.85	9.98	4	17.09	1.05	0.00	40.33	149	42	0.013	0.001	31.9	3.32	0.15	0.00	0.00	74.98	74.83	4.19	0.16	0.24	0.16	81.09	80.86	83.18	-2.09
	Adjustment factor		3.84																									
F	401	402	0.18	0.18	4	10.00	1.15	0.00	0.78	28	24	0.013	0.007143	19.2	6.10	0.20	0.00	0.00	78.10	77.90	0.25	0.00	0.00	0.00	82.63	82.63	82.90	-0.27
F	402	4	1.53	1.71	4	10.08	1.15	0.00	7.52	7	24	0.013	0.013627	26.5	8.43	0.10	0.00	0.00	77.90	77.80	2.39	0.11	0.01	0.11	82.63	82.63	82.90	-0.27
								0.00	0.00																			
G	101	102	0.09	0.09	4	10.00	1.15	0.00	0.39	28	24	0.013	0.007143	19.2	6.10	0.20	0.00	0.00	79.45	79.25	0.12	0.00	0.00	0.00	82.39	82.39	84.25	-1.86
G	102	1	0.53	0.62	4	10.08	1.15	0.00	2.71	10	24	0.013	0.010027	22.7	7.23	0.10	0.00	0.00	79.25	79.15	0.86	0.01	0.00	0.01	82.39	82.39	84.25	-1.86
G	1	F5	0.00	0.62	4	10.10	1.15	0.00	2.71	131	24	0.013	0.0018	9.6	3.06	0.24	0.00	0.00	79.15	78.91	0.86	0.01	0.02	0.01	82.39	82.37	84.45	-2.06
F	601	602	0.36	0.36	4	10.00	1.15	0.00	1.57	28	24	0.013	0.007114	19.1	6.09	0.20	0.00	0.00	78.80	78.60	0.50	0.00	0.00	0.00	82.22	82.22	83.60	-1.38
F	602	6	0.24	0.59	4	10.08	1.15	0.00	2.61	10	24	0.013	0.00967	22.3	7.10	0.10	0.00	0.00	78.60	78.50	0.83	0.01	0.00	0.01	82.22	82.22	83.60	-1.38
F	701	702	1.12	1.12	4	10.00	1.15	0.00	4.92	31	24	0.013	0.006457	18.2	5.80	0.20	0.00	0.00	78.45	78.25	1.57	0.05	0.01	0.05	81.97	81.95	83.25	-1.28
F	702	7	0.99	2.11	4	10.09	1.15	0.00	9.27	7	24	0.013	0.014624	27.4	8.73	0.10	0.00	0.00	78.25	78.15	2.95	0.17	0.01	0.17	81.96	81.95	83.30	-1.34
F	901	902	0.83	0.83	4	10.00	1.15	0.00	3.64	33	24	0.013	0.005973	17.5	5.58	0.20	0.00	0.00	78.30	78.10	1.16	0.03	0.01	0.03	81.31	81.30	83.10	-1.79
F	902	9	0.73	1.56	4	10.10	1.15	0.00	6.86	9	24	0.013	0.011128	23.9	7.62	0.10	0.00	0.00	78.10	78.00	2.18	0.09	0.01	0.09	81.30	81.30	83.13	-1.83
F	1001	1002	0.22	0.22	4	10.00	1.15	0.00	0.98	28	24	0.013	0.007143	19.2	6.10	0.20	0.00	0.00	78.20	78.00	0.31	0.00	0.00	0.00	81.10	81.10	83.00	-1.90
F	1002	10	0.63	0.85	4	10.08	1.15	0.00	3.74	9	24	0.013	0.011131	23.9	7.62	0.10	0.00	0.00	78.00	77.90	1.19	0.03	0.00	0.03	81.10	81.09	83.00	-1.90
H	101	102	1.60	1.60	4	10.00	1.15	0.00	7.04	30	24	0.0130	0.0068	18.7	5.94	0.20	0.00	0.00	77.80	77.60	2.24	0.10	0.03	0.10	82.53	82.50	82.90	-0.07
H	102	1	1.24	2.84	4	10.08	1.15	0.00	12.50	11	24	0.0130	0.0095	22.1	7.03	0.10	0.00	0.00	77.60	77.50	3.98	0.30	0.03	0.30	82.50	82.47	82.63	-0.13
H	1	2	0.00	2.84	4	10.11	1.15	0.00	12.49	69	24	0.0130	0.0018	9.6	3.06	0.13	0.00	0.00	75.26	75.13	3.98	0.30	0.21	0.30	82.47	82.26	82.84	-0.37
H	2	A8	0.00	2.84	4	10.49	1.14	0.00	12.42	74	30	0.0130	0.0013	14.8	3.02	0.10	0.50	0.00	74.63	74.53	2.53	0.09	0.07	0.09	82.26	82.19	82.99	-0.73
	Adjustment factor		3.84																									

3-YEAR ADJUSTED STORM CALCULATIONS SHOW THE MAXIMUM AMOUNT OF CFS THAT CAN BE HYDRAULICALLY FORCED THROUGH THE PIPES BEFORE THE WATER SHEET FLOWS OVER THE DOWNSTREAM HIGH POINT. THE ADJUSTMENT FACTOR IS CHANGED UNTIL THE HGL IN RELATION TO TOC (LAST COLUMN) IS EQUAL TO THE DIFFERENCE IN HEIGHT OF THE LOW POINT AND THE DOWNSTREAM HIGH POINT.

HERE THAT IS AT INLETS A101 AND A102. THE TOC EQUALS 82.90 AT THE INLETS AND THE DOWNSTREAM HIGH POINT IS AT 83.50. THE ADJUSTMENT FACTOR IS CHANGED UNTIL THE LAST COLUMN VALUE AT INLETS A101 AND A102 IS EQUAL TO 0.60 (83.50 – 82.90) .

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER
12/05/16

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A ¾-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.
2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: Mary Dodd
DEVELOPMENT COORDINATOR
DATE: 12/14/16

CITY OF ROSENBERG
FOUNDED 1839

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

3-YR ADJ. DRAINAGE CALCULATIONS FOR SECTIONS 6 & 7

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: NONE

SHEET NO. 9 OF 23

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

9

Date\Time: Tue, 29 Nov, 2016 + 11:18am
User Name: s. sowerwo
DWG\Name: L:\Projects\1406-4113B\CAD_Sheet_Files\3_3-YR ADJ. DRAINAGE CALCS FOR 6 & 7.dwg

Bonbrook Plantation South Section 6
100-YR Storm Calcs

Area	From MH No.	To MH No.	High TC downstream	Low TC Elev.	Max Elev. Ponding	Height Feet	H + 0.35 Feet	Area (Acres)	Intensity	C Value	100 Yr. = 1.25CIA CFS	3Yr. Upstream	Accum. CFS	CFS Pass Pipe	Difference in CFS to Sheet Flow					Tc (MIN)
A	101	102	83.50	82.90	83.90	0.40	0.75	0.52	9.06	0.55	3.22	0.00	3.22	2.28	0.94					10.00
A	102	1	83.50	82.90	83.90	0.40	0.75	2.05	9.05	0.55	12.74	0.00	15.96	11.30	4.66					10.08
A	1	2	83.50	82.90	83.90	0.40	0.75	0.00	9.04	0.55	0.00	0.00	15.96	11.29	4.67					10.11
A	2	3	83.50	82.80	83.80	0.30	0.65	0.00	8.78	0.55	0.00	0.00	15.96	11.11	4.85					11.17
A	3	4	83.40	82.80	83.80	0.40	0.75	1.63	8.62	0.55	9.67	0.00	25.63	17.99	7.64					11.91
A	4	5	83.40	82.70	83.70	0.30	0.65	9.48	8.52	0.55	55.49	0.00	81.12	58.23	22.89					12.38
A	5	6	83.30	82.70	83.70	0.40	0.75	1.10	8.30	0.55	6.27	0.00	87.40	62.05	25.34					13.47
A	6	7	83.30	82.60	83.60	0.30	0.65	2.84	8.24	0.55	16.07	0.00	103.47	73.67	29.80					13.82
A	7	8	83.10	82.69	83.69	0.59	0.94	1.07	8.10	0.55	5.94	0.00	109.41	77.47	31.94					14.56
A	8	9	83.10	82.45	83.45	0.35	0.70	4.80	7.99	0.55	26.39	0.00	135.80	96.70	39.10					15.22
A	9	10	83.05	82.30	83.30	0.25	0.60	0.00	7.94	0.55	0.00	0.00	135.80	96.39	39.41					15.53
A	10	11	83.05	82.30	83.30	0.25	0.60	1.34	7.86	0.55	7.26	0.00	143.05	101.39	41.67					16.02
A	11	OUTFALL	83.30	83.00	84.00	0.70	1.05	9.98	7.76	0.55	53.27	0.00	196.32	141.31	55.01	*	Worst Case less than 57.05 CFS			16.62
A	301	302	83.40	82.80	83.80	0.40	0.75	0.76	9.06	0.55	4.75	0.00	4.75	3.36	1.39					10.00
A	302	3	83.40	82.80	83.80	0.40	0.75	0.87	9.05	0.55	5.41	0.00	10.16	7.19	2.97					10.08
A	501	502	83.30	82.70	83.70	0.40	0.75	0.15	9.06	0.55	0.95	0.00	0.95	0.67	0.28					10.00
A	502	5	83.30	82.70	83.70	0.40	0.75	0.95	9.05	0.55	5.88	0.00	6.84	4.84	2.00					10.08
H	2	A6	83.28	82.60	83.60	0.32	0.67	2.84	8.94	0.55	17.45	0.00	17.45	12.42	5.03					10.49
A	701	702	83.10	82.60	83.60	0.50	0.85	0.16	9.06	0.55	0.98	0.00	0.98	0.70	0.29					10.00
A	702	7	83.10	82.60	83.60	0.50	0.85	0.91	9.05	0.55	5.65	0.00	6.64	4.70	1.94					10.08
A	INLET 108	INLET 109	83.05	82.30	83.30	0.25	0.60	0.28	9.06	0.55	1.75	0.00	1.75	1.24	0.51					10.00
A	INLET 109	10	83.05	82.30	83.30	0.25	0.60	1.06	9.05	0.55	6.61	0.00	8.36	5.92	2.44					10.08
B	101	102	83.75	83.00	84.00	0.25	0.60	0.89	9.06	0.55	5.56	0.00	5.56	3.93	1.63					10.00
B	102	1	83.75	83.00	84.00	0.25	0.60	1.72	9.04	0.55	10.67	0.00	16.23	11.48	4.74					10.09
B	1	2	83.75	83.00	84.00	0.25	0.60	0.00	9.04	0.55	0.00	0.00	16.23	11.48	4.75					10.11
B	2	3	83.65	83.05	84.05	0.40	0.75	0.48	8.77	0.55	2.92	0.00	19.14	13.38	5.76					11.21
B	3	4	83.65	83.10	84.10	0.45	0.80	2.14	8.65	0.55	12.74	0.00	31.88	22.48	9.40					11.75
B	4	5	83.65	82.90	83.90	0.25	0.60	1.24	8.43	0.55	7.20	0.00	39.08	27.42	11.66					12.82
B	5	6	83.50	82.90	83.90	0.40	0.75	1.54	8.24	0.55	8.71	0.00	47.79	33.54	14.26					13.77
B	6	7	83.50	82.79	83.79	0.29	0.64	0.00	8.13	0.55	0.00	0.00	47.79	33.29	14.50					14.42
B	7	8	83.28	82.79	83.79	0.51	0.86	1.46	8.00	0.55	8.04	0.00	55.83	39.04	16.79					15.18
B	8	A4	83.28	82.70	83.70	0.42	0.77	0.00	7.93	0.55	0.00	0.00	55.83	38.88	16.95					15.56
C	101	102	83.85	83.85	84.85	1.00	1.35	0.24	9.06	0.55	1.51	0.00	1.51	1.07	0.44					10.00
C	102	C1	83.85	83.85	84.85	1.00	1.35	0.24	8.99	0.55	1.49	0.00	3.00	2.12	0.88					10.30
C	C1	B2	83.85	83.85	84.85	1.00	1.35	0.00	8.98	0.55	0.00	0.00	3.00	2.12	0.88					10.34
B	301	302	83.63	83.10	84.10	0.47	0.82	1.06	9.06	0.55	6.58	0.00	6.58	4.66	1.93					10.00
B	302	B3	83.65	83.05	84.05	0.40	0.75	1.08	9.04	0.55	6.74	0.00	13.33	9.43	3.90					10.09
D	101	102	83.63	82.95	83.95	0.32	0.67	0.15	9.06	0.55	0.96	0.00	0.96	0.68	0.28					10.00
D	102	D1	83.65	82.95	83.95	0.30	0.65	1.09	9.05	0.55	6.76	0.00	7.73	5.47	2.26					10.08
D	D1	B4	83.65	82.95	83.95	0.30	0.65	0.00	9.04	0.55	0.00	0.00	7.73	5.47	2.26					10.10
B	501	502	83.50	82.90	83.90	0.40	0.75	1.07	9.06	0.55	6.67	0.00	6.67	4.72	1.95					10.00
B	502	B5	83.50	82.90	83.90	0.40	0.75	0.47	9.05	0.55	2.90	0.00	9.57	6.77	2.80					10.08
B	701	702	83.28	82.75	83.75	0.47	0.82	0.82	9.06	0.55	5.12	0.00	5.12	3.62	1.50					10.00
B	702	B7	83.28	82.79	83.79	0.51	0.86	0.64	9.03	0.55	3.98	0.00	9.10	6.44	2.67					10.12
E	101	102	83.10	82.51	83.51	0.41	0.76	1.47	9.06	0.55	9.19	0.00	9.19	6.50	2.69					10.00
E	102	1	83.10	82.51	83.51	0.41	0.76	1.20	9.04	0.55	7.44	0.00	16.62	11.76	4.87					10.08
E	1	2	83.10	82.51	83.51	0.41	0.76	0.00	9.04	0.55	0.00	0.00	16.62	11.75	4.87					10.10
E	2	A8	83.14	82.41	83.41	0.27	0.62	2.14	8.70	0.55	12.77	0.00	29.39	20.70	8.69					11.53
E	201	202	83.14	82.41	83.41	0.27	0.62	0.98	9.06	0.55	6.12	0.00	6.12	4.33	1.79					10.00
E	202	2	83.14	82.41	83.41	0.27	0.62	1.15	9.05	0.55	7.17	0.00	13.29	9.40	3.89					10.08
F	101	102	83.80	82.80	83.80	0.00	0.35	1.38	9.06	0.55	8.62	0.00	8.62	6.10	2.52					10.00
F	102	1	83.80	82.85	83.85	0.05	0.40	1.17	9.04	0.55	7.25	0.00	15.88	11.23	4.65					10.12
F	1	2	83.80	82.85	83.85	0.05	0.40	0.00	9.03	0.55	0.00	0.00	15.88	11.22	4.65					10.14
F	2	3	83.80	82.90	83.90	0.10	0.45	0.00	8.84	0.55	0.00	0.00	15.88	11.09	4.79					10.93
F	3	4	83.80	82.90	83.90	0.10	0.45	0.00	8.76	0.55	0.00	0.00	15.88	11.03	4.84					11.28
F	4	5	84.40	82.90	83.90	-0.50	-0.15	1.71	8.52	0.55	10.01	0.00	25.88	18.14	7.74					12.34
F	5	6	84.40	83.60	84.60	0.20	0.55	0.62	8.38	0.55	3.55	0.00	29.43	20.58	8.85					13.06
F	6	7	83.80	83.60	84.60	0.80	1.15	0.59	8.31	0.55	3.39	0.00	32.82	22.98	9.83					13.40
F	7	8	83.70	83.30	84.30	0.60	0.95	2.11	8.08	0.55	11.70	0.00	44.51	31.37	13.15					14.68
F	8	9	83.40	83.13	84.13	0.73	1.08	0.00	7.94	0.55	0.00	0.00	44.51	31.09	13.43					15.51
F	9	10	83.40	83.13	84.13	0.73	1.08	1.56	7.81	0.55	8.37	0.00	52.88	37.17	15.71					16.34
F	10	A11	83.46	83.00	84.00	0.54	0.89	0.85	7.69	0.55	4.49	0.00	57.37	40.33	17.04					17.09
F	401	402	84.40	82.90	83.90	-0.50	-0.15	0.18	9.06	0.55	1.10	0.00	1.10	0.78	0.32					10.00
F	402	4	84.40	82.90	83.90	-0.50	-0.15	1.53	9.05	0.55	9.52	0.00	10.62	7.52	3.10					10.08
G	101	102	83.60	83.60	84.60	0.80	1.15	0.09	9.06	0.55	0.55	0.00	0.55	0.39	0.16					10.00
G	102	1	83.80	83.60	84.60	0.80	1.15	0.53	9.05	0.55	3.28	0.00	3.83	2.71	1.12					10.08
G	1	F5	83.80	83.60	84.60	0.80	1.15	0.00	9.04	0.55	0.00	0.00	3.83	2.71	1.12					10.10
F	601	602	83.80	83.60	84.60	0.80	1.15	0.36	9.06	0.55	2.23	0.00	2.23	1.57	0.65					10.00
F	602	6	83.80	83.60	84.60	0.80	1.15	0.24	9.04	0.55	1.46	0.00	3.69	2.61	1.08					10.08
F	701	702	83.70	83.30	84.30	0.60	0.95	1.12	9.06	0.55	6.95	0.00	6.95	4.92	2.03					10.00
F	702	7	83.70	83.30	84.30	0.60	0.95	0.99	9.04	0.55	6.15	0.00	13.11	9.27	3.84					10.09
F	901	902	83.40	83.10	84.10	0.70	1.05	0.83	9.06	0.55	5.15	0.00	5.15	3.64	1.51					10.00
F	902	9	83.40	83.10	84.10	0.70	1.05	0.73	9.04	0.55	4.56	0.00	9.71	6.86	2.84					10.10
F	1001	1002	83.46	83.00	84.00	0.54	0.89	0.22	9.06	0.55	1.38	0.00	1.38	0.98	0.40					10.00
F	1002	10	83.30	83.00	84.00	0.70	1.05	0.63	9.05	0.55	3.90	0.00	5.28	3.74	1.54					10.08
H	101	102	83.28	82.60	83.60	0.32	0.67	1.60	9.06	0.55	9.95	0.00	9.95	0.00	9.95					10.00
H	102	1	83.28	82.63	83.63	0.35	0.70	1.24	9.04	0.55	7.73	0.00	17.67	7.04	10.64					10.08
H	1	2	83.28	82.63	83.63	0.35	0.70	0.00	9.04	0.55	0.00	0.00	17.67	12.50	5.17					10.11
H	2	A6	83.28	82.60	83.60	0.32	0.67	0.00	8.94	0.55	0.00	0.00	17.67	12.49	5.18					10.49

THE CFS PASS PIPE COLUMN IS THE MAXIMUM AMOUNT OF CFS THAT CAN BE HYDRAULICALLY FORCED THROUGH PIPES. THIS NUMBER COMES FROM THE 3-YR. ADJUSTED CFS. THIS IS THEN USED TO SHOW THE AMOUNT OF CFS REMAINING CAN BE CARRIED BY THE STREET USING THE WEIR EQUATION.

Weir Equation for a Rectangular Weir

Q=2.8*(L)*(H+0.35)^3/2

Q= 57.05 cfs

B(Width of Weir) = 26 FT.
H (Height of Weir)= 0.85 FT.

BENCHMARK:
A BRASS DISK STAMPED X-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A ½-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.0 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2003

FIRM PANEL: 48157C0255 L
DATE: APRIL 2, 2014

NOTES:
1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.
2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR
DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1913

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

100-YR DRAINAGE CALCULATIONS FOR SECTIONS 6 & 7

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: NONE

SHEET NO. 10 OF 23

STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER 12/14/16

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

10

Date/Time : Tue, 29 Nov 2016 - 1:17pm User Name : dbowman
Path/Name : I:\Projects\1406\4113B\Docs_Sheet Files\10-100-YR DRAINAGE CALCS FOR 6 & 7.dwg

Bonbrook Plantation South Section 8
3-YR Storm Calcs

LINE	FROM MH	TO MH	AREA (AC)	TOTAL AREA (AC)	CITY CURVE NO.	Tc (MIN)	CI	Q INPUT (CFS)	Q TOTAL (CFS)	REACH (FT)	SIZE (IN)	LINE MANN. CONST.	LINE SLOPE (%)	DESIGN Q (CFS)	DESIGN V (FPS)	SLOPE FALL (FT)	M.H. DROP (FT)	OTHER LOSS (FT)	FLOWLINE UP-STREAM (FT)	FLOWLINE DOWN-STREAM (FT)	ACTUAL V (FPS)	THEOR. H.G.L. SLOPE (%)	H (FT)	ACTUAL H.G.L. SLOPE (%)	UPST. H.G.L. (FT)	DNST. H.G.L. (FT)	UPST. TC ELEV. (FT)	H.G.L. IN RELATION TO TOC (FT)
J	101	102	0.54	0.54	4	10.00	1.15	0.00	0.62	39	24	0.013	0.0018	9.6	3.06	0.07	0.00	0.00	78.55	78.35	0.20	0.00	0.00	0.00	81.65	81.65	83.35	-1.70
J	102	1	0.70	1.24	4	10.21	1.14	0.00	1.41	10	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	78.35	78.25	0.45	0.00	0.00	0.00	81.65	81.64	83.35	-1.70
J	1	2	0.00	1.24	4	10.27	1.14	0.00	1.41	260	24	0.013	0.0018	9.6	3.06	0.47	0.00	0.00	77.75	77.28	0.45	0.00	0.01	0.00	81.64	81.63	83.48	-1.83
J	2	3	2.06	3.30	4	11.68	1.12	0.00	3.69	194	24	0.013	0.0018	9.6	3.06	0.35	0.00	0.00	77.28	76.93	1.17	0.03	0.05	0.03	81.63	81.58	83.41	-1.77
J	3	4	0.00	3.30	4	12.74	1.10	0.00	3.64	197	24	0.013	0.0018	9.6	3.06	0.35	0.00	0.00	76.93	76.58	1.16	0.03	0.05	0.03	81.58	81.53	83.89	-2.31
J	4	5	2.58	5.87	4	13.81	1.09	0.00	6.40	329	24	0.013	0.0018	9.6	3.06	0.59	0.00	0.00	76.58	75.98	2.04	0.08	0.26	0.08	81.53	81.27	83.30	-1.76
J	5	6	1.99	7.87	4	15.60	1.07	0.00	8.41	262	24	0.013	0.0018	9.6	3.06	0.47	0.00	0.00	75.98	75.51	2.68	0.14	0.36	0.14	81.27	80.91	83.19	-1.92
J	6	7	1.59	9.46	4	17.03	1.05	0.00	9.97	125	30	0.013	0.0013	14.8	3.02	0.16	0.00	0.00	75.51	75.35	2.03	0.06	0.07	0.06	80.91	80.84	83.07	-2.16
J	7	8	3.77	13.23	4	17.72	1.05	0.00	13.85	205	30	0.013	0.0013	14.8	3.02	0.27	0.00	0.00	75.35	75.08	2.82	0.11	0.23	0.11	80.84	80.60	83.36	-2.52
J	8	OUTFALL	0.36	13.59	4	18.85	1.04	0.00	14.08	63	30	0.013	0.0013	14.8	3.02	0.08	0.00	0.00	75.08	75.00	2.87	0.12	0.07	0.12	80.60	80.53	83.08	-2.47
J	201	202	0.98	0.98	4	10.00	1.15	0.00	1.13	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	78.50	78.30	0.36	0.00	0.00	0.71	80.50	80.30	83.30	-2.80
J	202	2	1.07	2.06	4	10.15	1.15	0.00	2.36	10	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	78.30	78.20	0.76	0.01	0.00	0.97	80.30	80.20	83.30	-3.00
J	401	402	1.26	1.26	4	10.00	1.15	0.00	1.44	38	24	0.013	0.0018	9.6	3.06	0.07	0.00	0.00	78.32	78.12	0.46	0.00	0.00	0.53	80.32	80.12	83.12	-2.80
J	402	4	1.32	2.58	4	10.21	1.14	0.00	2.95	9	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	78.12	78.02	0.94	0.02	0.00	1.06	80.12	80.02	83.20	-3.08
J	501	502	0.96	0.96	4	10.00	1.15	0.00	1.10	36	24	0.013	0.0018	9.6	3.06	0.07	0.00	0.00	78.28	78.08	0.36	0.00	0.00	0.55	80.28	80.08	83.08	-2.80
J	502	5	1.03	1.99	4	10.20	1.15	0.00	2.28	9	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	78.08	77.98	0.73	0.01	0.00	1.08	80.08	79.98	83.10	-3.02
J	601	602	0.74	0.74	4	10.00	1.15	0.00	0.85	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	78.15	77.95	0.27	0.00	0.00	0.70	80.15	79.95	82.95	-2.80
J	602	6	0.85	1.59	4	10.15	1.15	0.00	1.82	7	24	0.013	0.0018	9.6	3.06	0.01	0.00	0.00	77.95	77.85	0.58	0.01	0.00	1.38	79.95	79.85	83.00	-3.05
J	801	802	0.18	0.18	4	10.00	1.15	0.00	0.21	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	78.20	78.00	0.07	0.00	0.00	0.71	80.20	80.00	83.00	-2.80
J	802	8	0.18	0.36	4	10.15	1.15	0.00	0.41	8	24	0.013	0.0018	9.6	3.06	0.01	0.00	0.00	78.00	77.90	0.13	0.00	0.00	1.28	80.00	79.90	83.00	-3.00
K	101	102	0.19	0.19	4	10.00	1.15	0.00	0.22	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	77.70	77.50	0.07	0.00	0.00	0.71	79.70	79.50	82.50	-2.80
K	102	1	0.19	0.38	4	10.15	1.15	0.00	0.44	11	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	77.50	77.40	0.14	0.00	0.00	0.94	79.50	79.40	82.50	-3.00
K	1	2	0.00	0.38	4	10.21	1.14	0.00	0.44	30	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	77.40	77.35	0.14	0.00	0.00	0.18	79.40	79.35	82.61	-3.21
K	2	3	0.00	0.38	4	10.38	1.14	0.00	0.44	133	24	0.013	0.0018	9.6	3.06	0.24	0.00	0.00	77.35	77.11	0.14	0.00	0.00	0.18	79.35	79.11	82.88	-3.53
K	3	4	1.84	2.23	4	11.10	1.13	0.00	2.52	265	24	0.013	0.0018	9.6	3.06	0.48	0.00	0.00	77.11	76.63	0.80	0.01	0.03	0.18	79.11	78.63	82.75	-3.64
K	4	J7	1.54	3.77	4	12.54	1.11	0.00	4.17	74	24	0.013	0.0018	9.6	3.06	0.13	0.00	0.00	76.63	76.50	1.33	0.03	0.03	0.18	78.63	78.50	82.94	-4.31
K	301	302	0.88	0.88	4	10.00	1.15	0.00	1.01	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	77.85	77.65	0.32	0.00	0.00	0.71	79.85	79.65	82.65	-2.80
K	302	3	0.97	1.84	4	10.15	1.15	0.00	2.11	9	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	77.65	77.55	0.67	0.01	0.00	1.10	79.65	79.55	82.65	-3.00
K	401	401	0.73	0.73	4	10.00	1.15	0.00	0.84	29	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	78.06	77.86	0.27	0.00	0.00	0.70	80.06	79.86	82.86	-2.80
K	401	4	0.81	1.54	4	10.16	1.15	0.00	1.76	9	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	77.86	77.76	0.56	0.01	0.00	1.07	79.86	79.76	82.84	-2.98

Bonbrook Plantation South Section 8
3-YR Adj. Storm Calcs

LINE	FROM MH	TO MH	AREA (AC)	TOTAL AREA (AC)	CITY CURVE NO.	Tc (MIN)	CI	Q INPUT (CFS)	Q TOTAL (CFS)	REACH (FT)	SIZE (IN)	LINE MANN. CONST.	LINE SLOPE (%)	DESIGN Q (CFS)	DESIGN V (FPS)	SLOPE FALL (FT)	M.H. DROP (FT)	OTHER LOSS (FT)	FLOWLINE UP-STREAM (FT)	FLOWLINE DOWN-STREAM (FT)	ACTUAL V (FPS)	THEOR. H.G.L. SLOPE (%)	H (FT)	ACTUAL H.G.L. SLOPE (%)	UPST. H.G.L. (FT)	DNST. H.G.L. (FT)	UPST. TC ELEV. (FT)	H.G.L. IN RELATION TO TOC (FT)
J	101	102	0.54	0.54	4	10.00	1.15	0.00	1.07	39	24	0.013	0.0018	9.6	3.06	0.07	0.000	0.00	78.55	78.48	0.34	0.00	0.00	0.00	83.90	83.90	83.35	0.55
J	102	1	0.70	1.24	4	10.21	1.14	0.00	2.46	10	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	78.35	78.33	0.78	0.01	0.00	0.01	83.90	83.90	83.35	0.55
J	1	2	0.00	1.24	4	10.27	1.14	0.00	2.46	260	24	0.013	0.0018	9.6	3.06	0.47	0.00	0.00	77.75	77.28	0.78	0.01	0.03	0.01	83.90	83.87	83.48	0.42
J	2	3	2.06	3.30	4	11.68	1.12	0.00	6.41	194	24	0.013	0.0018	9.6	3.06	0.35	0.00	0.00	77.28	76.93	2.04	0.08	0.16	0.08	83.87	83.71	83.41	0.46
J	3	4	0.00	3.30	4	12.74	1.10	0.00	6.33	197	24	0.013	0.0018	9.6	3.06	0.35	0.00	0.00	76.93	76.58	2.01	0.08	0.15	0.08	83.71	83.56	83.89	-0.18
J	4	5	2.58	5.87	4	13.81	1.09	0.00	11.13	329	24	0.013	0.0018	9.6	3.06	0.59	0.00	0.00	76.58	75.98	3.54	0.24	0.79	0.24	83.56	82.76	83.30	0.26
J	5	6	1.99	7.87	4	15.60	1.07	0.00	14.61	262	24	0.013	0.0018	9.6	3.06	0.47	0.00	0.00	75.98	75.51	4.65	0.42	1.09	0.42	82.76	81.68	83.19	-0.43
J	6	7	1.59	9.46	4	17.03	1.05	0.00	17.32	125	30	0.013	0.0013	14.8	3.02	0.16	0.00	0.00	75.51	75.35	3.53	0.18	0.22	0.18	81.68	81.45	83.07	-1.40
J	7	8	3.77	13.23	4	17.72	1.05	0.00	24.06	205	30	0.013	0.0013	14.8	3.02	0.27	0.00	0.00	75.35	75.08	4.90	0.34	0.70	0.34	81.45	80.75	83.36	-1.90
J	8	OUTFALL	0.36	13.59	4	18.85	1.04	0.00	24.47	63	30	0.013	0.0013	14.8	3.02	0.08	0.00	0.00	75.08	75.00	4.99	0.35	0.22	0.35	80.75	80.53	83.08	-2.33
Adjustment factor			1.74																									
J	201	202	0.98	0.98	4	10.00	1.15	0.00	1.97	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	78.50	78.45	0.63	0.01	0.00	0.18	80.50	80.45	83.30	-2.80
J	202	2	1.07	2.06	4	10.15	1.15	0.00	4.10	10	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	78.30	78.28	1.31	0.03	0.00	0.18	80.30	80.28	83.30	-3.00
J	401	402	1.26	1.26	4	10.00	1.15	0.00	2.51	38	24	0.013	0.0018	9.6	3.06	0.07	0.00	0.00	78.32	78.26	0.80	0.01	0.00	0.18	80.32	80.26	83.12	-2.80
J	402	4	1.32	2.58	4	10.21	1.14	0.00	5.13	9	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	78.12	78.11	1.63	0.05	0.00	0.18	80.12	80.11	83.20	-3.08
J	501	502	0.96	0.96	4	10.00	1.15	0.00	1.92	36	24	0.013	0.0018	9.6	3.06	0.07	0.00	0.00	78.28	78.21	0.61	0.01	0.00	0.18	80.28	80.21	83.08	-2.80
J	502	5	1.03	1.99	4	10.20	1.15	0.00	3.97	9	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	78.08	78.06	1.26	0.03	0.00	0.18	80.08	80.06	83.10	-3.02
J	601	602	0.74	0.74	4	10.00	1.15	0.00	1.48	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	78.15	78.10	0.47	0.00	0.00	0.18	80.15	80.10	82.95	-2.80
J	602	6	0.85	1.59	4	10.15	1.15	0.00	3.17	7	24	0.013	0.0018	9.6	3.06	0.01	0.00	0.00	77.95	77.94	1.01	0.02	0.00	0.18	79.95	79.94	83.00	-3.05
J	801	802	0.18	0.18	4	10.00	1.15	0.00	0.36	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	78.20	78.15	0.11	0.00	0.00	0.18	80.20	80.15	83.00	-2.80
J	802	8	0.18	0.36	4	10.15	1.15	0.00	0.72	8	24	0.013	0.0018	9.6	3.06	0.01	0.00	0.00	78.00	77.99	0.23	0.00	0.00	0.18	80.00	79.99	83.00	-3.00
Adjustment factor			1.74																									
K	101	102	0.19	0.19	4	10.00	1.15	0.00	0.38	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	77.70	77.65	0.12	0.00	0.00	0.18	79.70	79.65	82.50	-2.80
K	102	1	0.19	0.38	4	10.15	1.15	0.00	0.77	11	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	77.50	77.48	0.24	0.00	0.00	0.18	79.50	79.48	82.50	-3.00
K	1	2	0.00	0.38	4	10.21	1.14	0.00	0.77	30	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	77.40	77.35	0.24	0.00	0.00	0.18	79.40	79.35	82.61	-3.21
K	2	3	0.00	0.38	4	10.38	1.14	0.00	0.76	133	24	0.013	0.0018	9.6	3.06	0.24	0.00	0.00	77.35	77.11	0.24	0.00	0.00	0.18	79.35	79.11	82.88	-3.53
K	3	4	1.84	2.23	4	11.10	1.13	0.00	4.38	265	24	0.013	0.0018	9.6	3.06	0.48	0.00	0.00	77.11	76.63	1.39	0.04	0.10	0.18	79.11	78.63	82.75	-3.64
K	4	J7	1.54	3.77	4	12.54	1.11	0.00	7.25	74	24	0.013	0.0018	9.6	3.06	0.13	0.00	0.00	76.63	76.50	2.31	0.10	0.08	0.18	78.63	78.50	82.94	-4.31
K	301	302	0.88	0.88	4	10.00	1.15	0.00	1.75	28	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	77.85	77.80	0.56	0.01	0.00	0.18	79.85	79.80	82.65	-2.80
K	302	3	0.97	1.84	4	10.15	1.15	0.00	3.67	9	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	77.65	77.63	1.17	0.03	0.00	0.18	79.65	79.63	82.65	-3.00
K	401	401	0.73	0.73	4	10.00	1.15	0.00	1.47	29	24	0.013	0.0018	9.6	3.06	0.05	0.00	0.00	78.06	78.01	0.47	0.00	0.00	0.18	80.06	80.01	82.86	-2.80
K	401	4	0.81	1.54	4	10.16	1.15	0.00	3.07	9	24	0.013	0.0018	9.6	3.06	0.02	0.00	0.00	77.86	77.84	0.98	0.02	0.00	0.18	79.86	79.84	82.84	-2.98
Adjustment factor			1.74																									

3-YEAR ADJUSTED STORM CALCULATIONS SHOW THE MAXIMUM AMOUNT OF CFS THAT CAN BE HYDRAULICALLY FORCED THROUGH THE PIPES BEFORE THE WATER SHEET FLOWS OVER THE DOWNSTREAM HIGH POINT. THE ADJUSTMENT FACTOR IS CHANGED UNTIL THE HGL IN RELATION TO TOC (LAST COLUMN) IS EQUAL TO THE DIFFERENCE IN HEIGHT OF THE LOW POINT AND THE DOWNSTREAM HIGH POINT.

HERE THAT IS AT INLETS J101 AND J102. THE TOC EQUALS 83.35 AT THE INLETS AND THE DOWNSTREAM HIGH POINT IS AT 83.90. THE ADJUSTMENT FACTOR IS CHANGED UNTIL THE LAST COLUMN VALUE AT INLETS J101 AND J102 IS EQUAL TO 0.55 (83.90 −83.35) .

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER
8/24/16

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET
TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.36
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.
2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR
DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1883

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

3-YR & 3-YR ADJ. DRAINAGE CALCULATIONS FOR SECTION 8

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B
DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016
SCALE: NONE
SHEET NO. 11 OF 23

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

Date\Time: Tue, 29 Nov 2016 - 1:17pm User Name : dbennett
Path\Name: T:\Projects\1406-4113B\Calcs\ Sheet Name: 11 - 3-YR & 3-YR ADJ. DRAINAGE CALCS FOR S.dwg

Bonbrook Plantation South Section 8
100-YR Storm Calcs

Area	From MH No.	To MH No.	High TC downstream	Low TC Elev.	Max Elev. Ponding	Height Feet	H + 0.35 Feet	Area (Acres)	Intensity	C Value	100 Yr. = 1.25CIA CFS	3Yr. Upstream	Accum. CFS	CFS Pass Pipe	Difference in CFS to Sheet Flow					Tc (MIN)
J	101	102	83.90	83.35	84.35	0.45	0.80	1.15	9.06	0.55	7.16	0.00	7.16	1.07	6.09					10.00
J	102	1	83.90	83.35	84.35	0.45	0.80	1.14	9.01	0.55	7.09	0.00	14.25	2.46	11.79					10.21
J	1	2	83.90	83.35	84.35	0.45	0.80	1.14	9.00	0.55	7.08	0.00	21.33	2.46	18.87					10.27
J	2	3	83.85	83.30	84.30	0.45	0.80	1.12	8.67	0.55	6.67	0.00	28.00	6.41	21.59					11.68
J	3	4	83.68	83.20	84.20	0.52	0.87	1.10	8.44	0.55	6.41	0.00	34.41	6.33	28.09					12.74
J	4	5	83.68	83.20	84.20	0.52	0.87	1.09	8.24	0.55	6.17	0.00	40.59	11.13	29.46					13.81
J	5	6	83.50	83.10	84.10	0.60	0.95	1.07	7.92	0.55	5.82	0.00	46.41	14.61	31.79					15.60
J	6	7	83.40	83.00	84.00	0.60	0.95	1.05	7.70	0.55	5.58	0.00	51.98	17.32	34.66					17.03
J	7	8	83.54	83.00	84.00	0.46	0.81	1.05	7.60	0.55	5.47	0.00	57.45	24.06	33.39					17.72
J	8	OUTFALL	83.60	83.00	84.00	0.40	0.75	1.04	7.44	0.55	5.30	0.00	62.75	24.47	38.28	*	Worst Case less than 57.05 CFS			18.85
J	201	202	83.85	83.30	84.30	0.45	0.80	1.15	9.06	0.55	7.16	0.00	7.16	1.97	5.19					10.00
J	202	2	83.85	83.30	84.30	0.45	0.80	1.15	9.03	0.55	7.11	0.00	14.27	4.10	10.17					10.15
J	401	402	83.68	83.12	84.12	0.44	0.79	1.15	9.06	0.55	7.16	0.00	7.16	2.51	4.65					10.00
J	402	4	83.68	83.20	84.20	0.52	0.87	1.14	9.01	0.55	7.09	0.00	14.25	5.13	9.12					10.21
J	501	502	83.50	83.08	84.08	0.58	0.93	1.15	9.06	0.55	7.16	0.00	7.16	1.92	5.24					10.00
J	502	5	83.50	83.10	84.10	0.60	0.95	1.15	9.01	0.55	7.10	0.00	14.25	3.97	10.29					10.20
J	601	602	83.40	82.95	83.95	0.55	0.90	1.15	9.06	0.55	7.16	0.00	7.16	1.48	5.68					10.00
J	602	6	83.40	83.00	84.00	0.60	0.95	1.15	9.03	0.55	7.11	0.00	14.27	3.17	11.10					10.15
J	801	802	83.60	83.00	84.00	0.40	0.75	1.15	9.06	0.55	7.16	0.00	7.16	0.36	6.80					10.00
J	802	8	83.60	83.00	84.00	0.40	0.75	1.15	9.03	0.55	7.11	0.00	14.27	0.72	13.55					10.15
K	101	102	83.22	82.50	83.50	0.28	0.63	1.15	9.06	0.55	7.16	0.00	7.16	0.38	6.78					10.00
K	102	1	83.22	82.50	83.50	0.28	0.63	1.15	9.03	0.55	7.11	0.00	14.27	0.77	13.50					10.15
K	1	2	83.22	82.50	83.50	0.28	0.63	1.14	9.01	0.55	7.09	0.00	21.36	0.77	20.60					10.21
K	2	3	83.12	82.65	83.65	0.53	0.88	1.14	8.97	0.55	7.04	0.00	28.40	0.76	27.64					10.38
K	3	4	83.25	82.65	83.65	0.40	0.75	1.13	8.80	0.55	6.83	0.00	35.23	4.38	30.86					11.10
K	4	J7	83.40	82.84	83.84	0.44	0.79	1.11	8.48	0.55	6.46	0.00	41.69	7.25	34.44					12.54
K	301	302	83.25	82.65	83.65	0.40	0.75	1.15	9.06	0.55	7.16	0.00	7.16	1.75	5.41					10.00
K	302	3	83.25	82.65	83.65	0.40	0.75	1.15	9.03	0.55	7.11	0.00	14.27	3.67	10.60					10.15
K	401	401	83.40	82.86	83.86	0.46	0.81	1.15	9.06	0.55	7.16	0.00	7.16	1.47	5.69					10.00
K	401	4	83.40	82.84	83.84	0.44	0.79	1.15	9.02	0.55	7.11	0.00	14.27	3.07	11.20					10.16

THE CFS PASS PIPE COLUMN IS THE MAXIMUM AMOUNT OF CFS THAT CAN BE HYDRAULICALLY FORCED THROUGH PIPES. THIS NUMBER COMES FROM THE 3-YR. ADJUSTED CFS. THIS IS THEN USED TO SHOW THE AMOUNT OF CFS REMAINING CAN BE CARRIED BY THE STREET USING THE WEIR EQUATION.

Weir Equation for a Rectangular Weir

Q=2.8*(L)*(H+0.35)^3/2

Q= 57.05 cfs

B(Width of Weir) = 26 FT.
H (Height of Weir)= 0.85 FT.

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET
TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.
2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: Mary Dent
DEVELOPMENT COORDINATOR
DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1828

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

100-YR DRAINAGE CALCULATIONS FOR SECTION 8

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: NONE

SHEET NO. 12 OF 23

STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER 11/04/16

BONBROOK PLANTATION DETENTION POND "F" - 1406-4113B

Date/Time : Tue, 29 Nov 2016 - 11:17am
User Name : dbowman
Path/Name : P:\Projects\1406\4113B\ACAD\ Sheet_Files\12-100-YR DRAINAGE CALCS FOR 8.dwg

LEGEND

—72— INDICATES EXISTING NATURAL GROUND CONTOUR

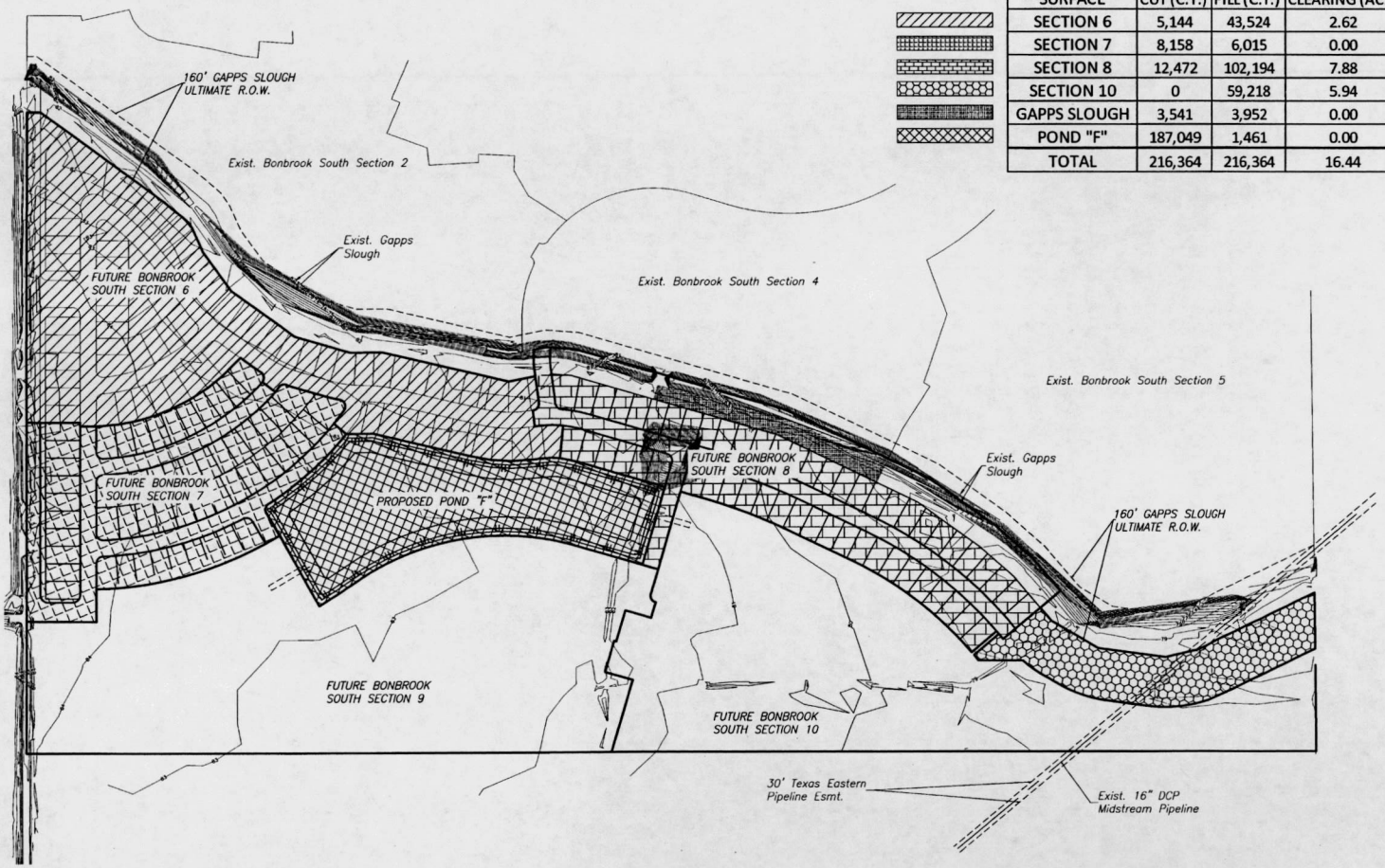
N

0 200' 400'

NOTE

CONTRACTOR SHALL OBTAIN A PERMIT FROM THE FORT BEND COUNTY ENGINEERING DEPARTMENT, (281)633-7500, PRIOR TO ANY WORK WITH THE FORT BEND COUNTY DRAINAGE DISTRICT GAPPS SLOUGH R.O.W.

SURFACE	CUT (C.Y.)	FILL (C.Y.)	CLEARING (AC.)	STRIPPING (AC.)
SECTION 6	5,144	43,524	2.62	24.48
SECTION 7	8,158	6,015	0.00	15.72
SECTION 8	12,472	102,194	7.88	10.48
SECTION 10	0	59,218	5.94	0
GAPPS SLOUGH	3,541	3,952	0.00	1.27
POND "F"	187,049	1,461	0.00	11.56
TOTAL	216,364	216,364	16.44	63.51



BENCHMARK:

A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.89 FEET

TBM (LJA 1)
A ½-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACER ROAD, APPROXIMATELY 18.0 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACER ROAD
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 78.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:

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RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1913

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

OVERALL GRADING & CLEARING PLAN

STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

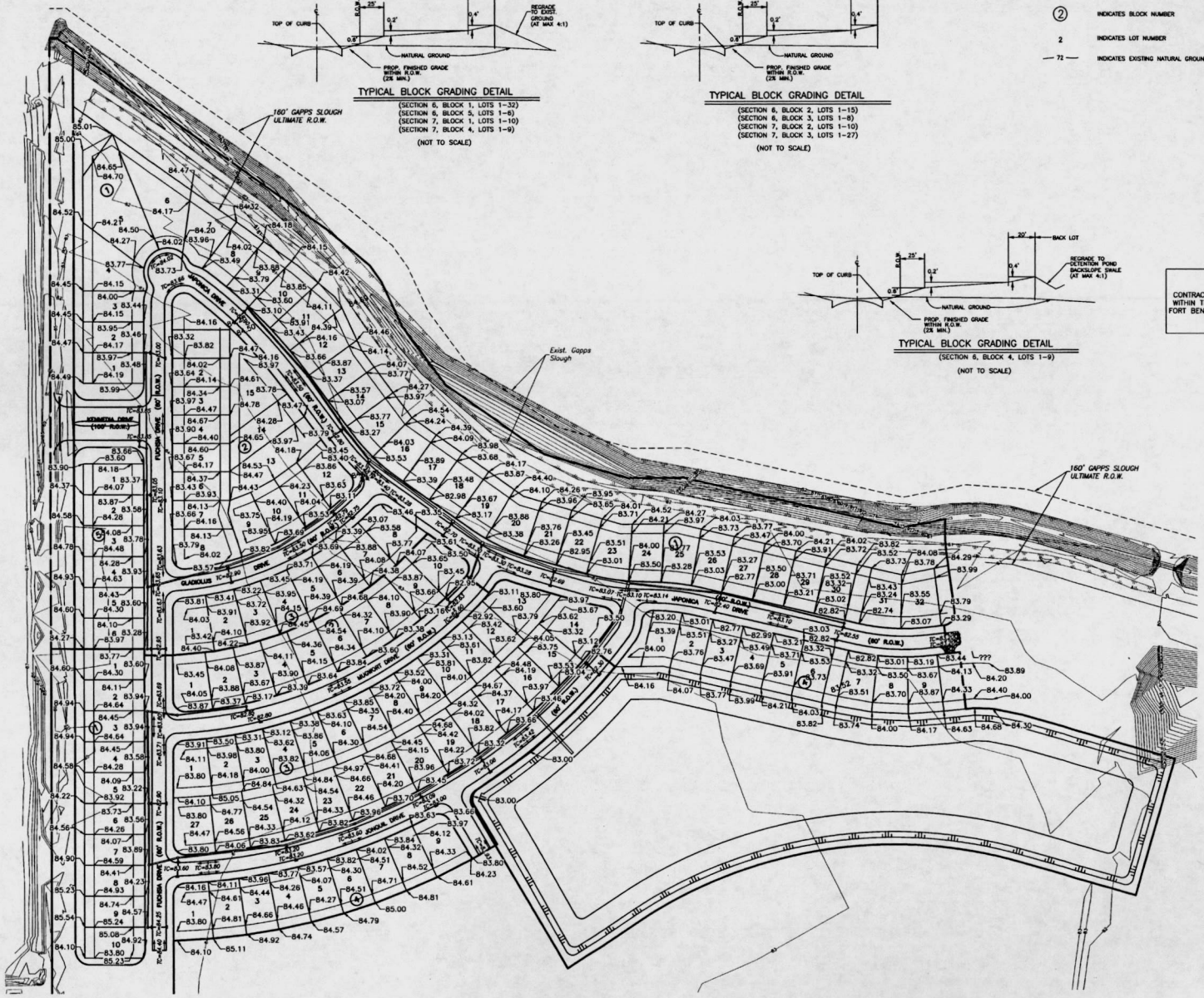
DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: 1" = 200' SHEET NO. 13 OF 23

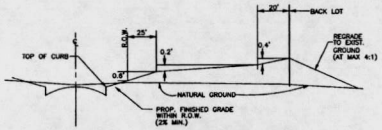
BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

13

Date\Time : Tue, 29 Nov 2016 - 1:18pm User Name : abowman
Path\Name : X:\projects\1406\4113B\DGNs_Sheet Files\13_GRADING LAYOUT.dwg



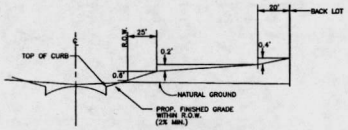
TYPICAL BLOCK GRADING DETAIL



(SECTION 6, BLOCK 1, LOTS 1–32)
(SECTION 6, BLOCK 5, LOTS 1–6)
(SECTION 7, BLOCK 1, LOTS 1–10)
(SECTION 7, BLOCK 4, LOTS 1–9)

(NOT TO SCALE)

TYPICAL BLOCK GRADING DETAIL



(SECTION 6, BLOCK 2, LOTS 1–15)
(SECTION 6, BLOCK 3, LOTS 1–8)
(SECTION 7, BLOCK 2, LOTS 1–10)
(SECTION 7, BLOCK 3, LOTS 1–27)

(NOT TO SCALE)

TYPICAL BLOCK GRADING DETAIL

(SECTION 6, BLOCK 4, LOTS 1–9)

(NOT TO SCALE)

LEGEND

TC=71.50	TOP OF CURB ELEVATION
(2)	INDICATES BLOCK NUMBER
2	INDICATES LOT NUMBER
— 72 —	INDICATES EXISTING NATURAL GROUND CONTOUR

N

0 100' 200'

NOTE

CONTRACTOR SHALL COORDINATE ALL WORK WITHIN THE BENTON ROAD R.O.W. WITH THE FORT BEND COUNTY ROAD AND BRIDGE DEPT. (281) 342-4513.

BENCHMARK:

A BRASS DISK STAMPED E-1219, SET IN A CONCRETE HEADWALL LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
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FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:

1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.

2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION

3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1891

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

SECTION 6 & 7 GRADING PLAN

STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER 11/29/2016

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

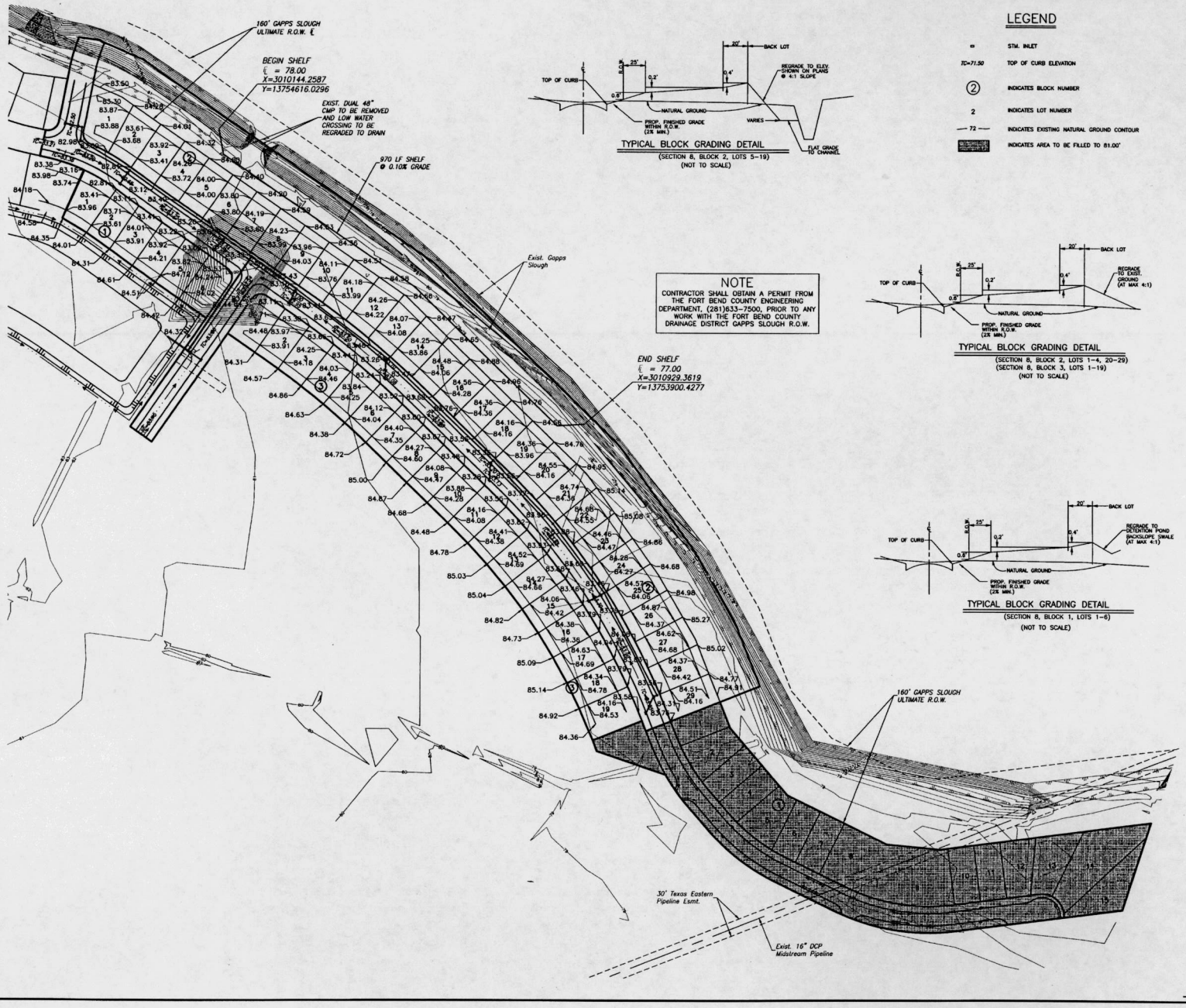
LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: 1" = 100' SHEET NO. 14 OF 23

BONBROOK PLANTATION DETENTION POND "F" - 1406-4113B

Date/Time : Tue, 29 Nov, 2016 - 1:13pm User Name : dbennion
Path/Name : P:\Projects\1406-4113B\CAD_Sheet Files\14-SECTION 6 & 7 GRADING PLAN LAYOUT.dwg



NOTE

CONTRACTOR SHALL OBTAIN A PERMIT FROM THE FORT BEND COUNTY ENGINEERING DEPARTMENT, (281)633-7500, PRIOR TO ANY WORK WITH THE FORT BEND COUNTY DRAINAGE DISTRICT GAPPS SLOUGH R.O.W.

LEGEND

▭	STM. INLET
TC=71.50	TOP OF CURB ELEVATION
(2)	INDICATES BLOCK NUMBER
2	INDICATES LOT NUMBER
—72—	INDICATES EXISTING NATURAL GROUND CONTOUR
	INDICATES AREA TO BE FILLED TO 81.00'

TYPICAL BLOCK GRADING DETAIL
(SECTION 8, BLOCK 2, LOTS 5-19)
(NOT TO SCALE)

TYPICAL BLOCK GRADING DETAIL
(SECTION 8, BLOCK 2, LOTS 1-4, 20-29)
(SECTION 8, BLOCK 3, LOTS 1-19)
(NOT TO SCALE)

TYPICAL BLOCK GRADING DETAIL
(SECTION 8, BLOCK 1, LOTS 1-6)
(NOT TO SCALE)

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEX ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEX ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:

1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.

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RECORD DRAWING

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BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1869

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

SECTION 8 & 10 GRADING PLAN

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED PROFESSIONAL ENGINEER
11/29/16

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

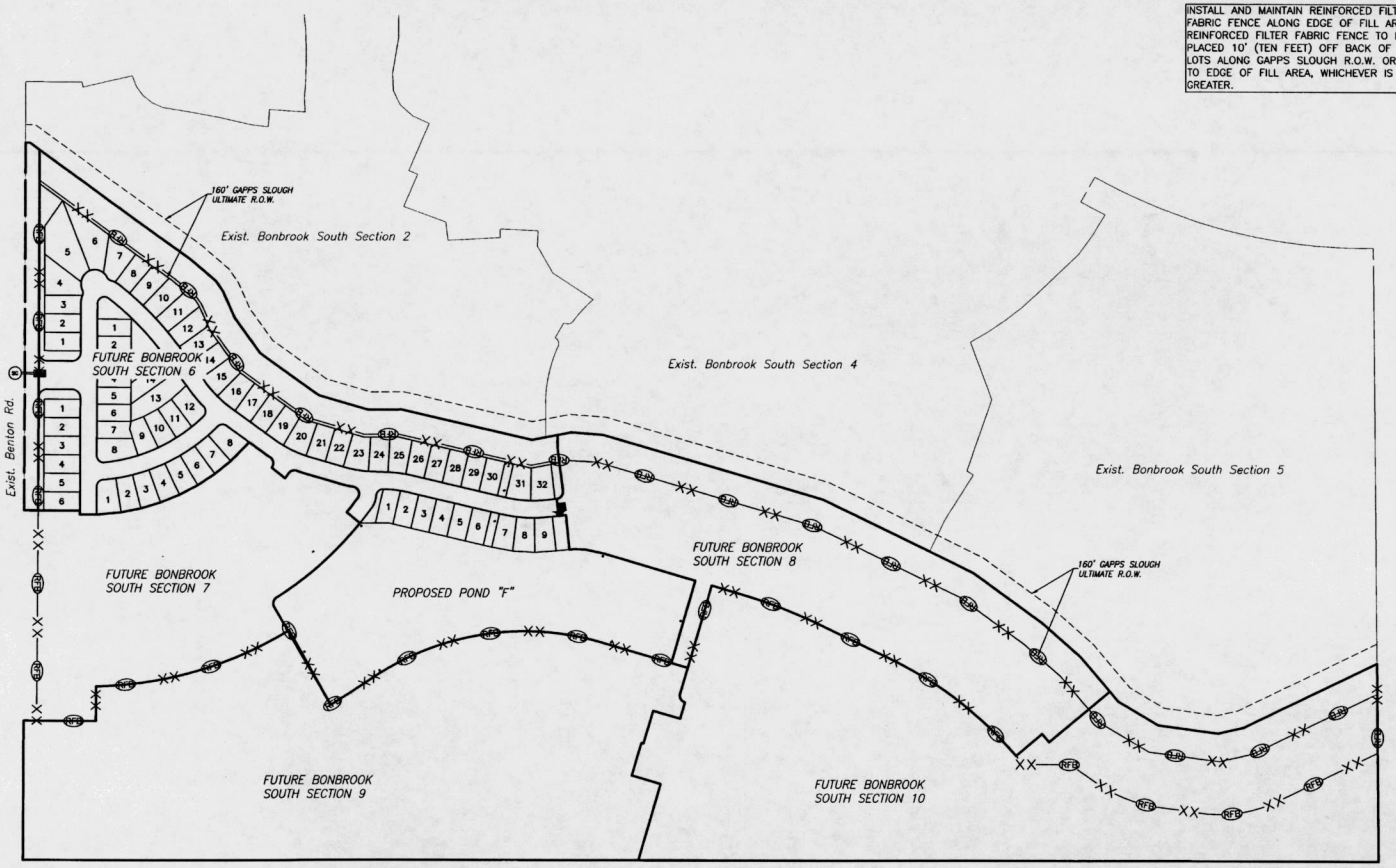
SCALE: 1" = 100'

SHEET NO. 15 OF 23

BONBROOK PLANTATION DETENTION POND "F" - 1406-4113B

Date/Time: Tue, 29 Nov, 2016 4:13pm User Name: rdomingo
Drawing: T:\Projects\1406-4113B\CAD\ Sheet Plan: LS-SECTION 8 & 10 GRADING PLAN LAYOUT.dwg

15



LEGEND

= STABILIZED CONSTRUCTION EXIT

XX—RFD—XX = REINFORCED FABRIC FENCE

N

0 200' 400'

INSTALL AND MAINTAIN REINFORCED FILTER FABRIC FENCE ALONG EDGE OF FILL AREA. REINFORCED FILTER FABRIC FENCE TO BE PLACED 10' (TEN FEET) OFF BACK OF LOTS ALONG GAPPS SLOUGH R.O.W. OR TO EDGE OF FILL AREA, WHICHEVER IS GREATER.

BENCHMARK:

A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEX ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEX ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0285 L
DATE: APRIL 2, 2014

NOTES:

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BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1883

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

STORM WATER POLLUTION PREVENTION PLAN

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: 1" = 200' SHEET NO. 16 OF 23

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

Date\Time: Tue, 29 Nov 2016 4:13:10pm User Name: adamsp
Drawing: J:\PROJECTS\1406-4113B\Civil\Sheet Plans\16-SWPPP LAYOUT.dwg

Point Table			
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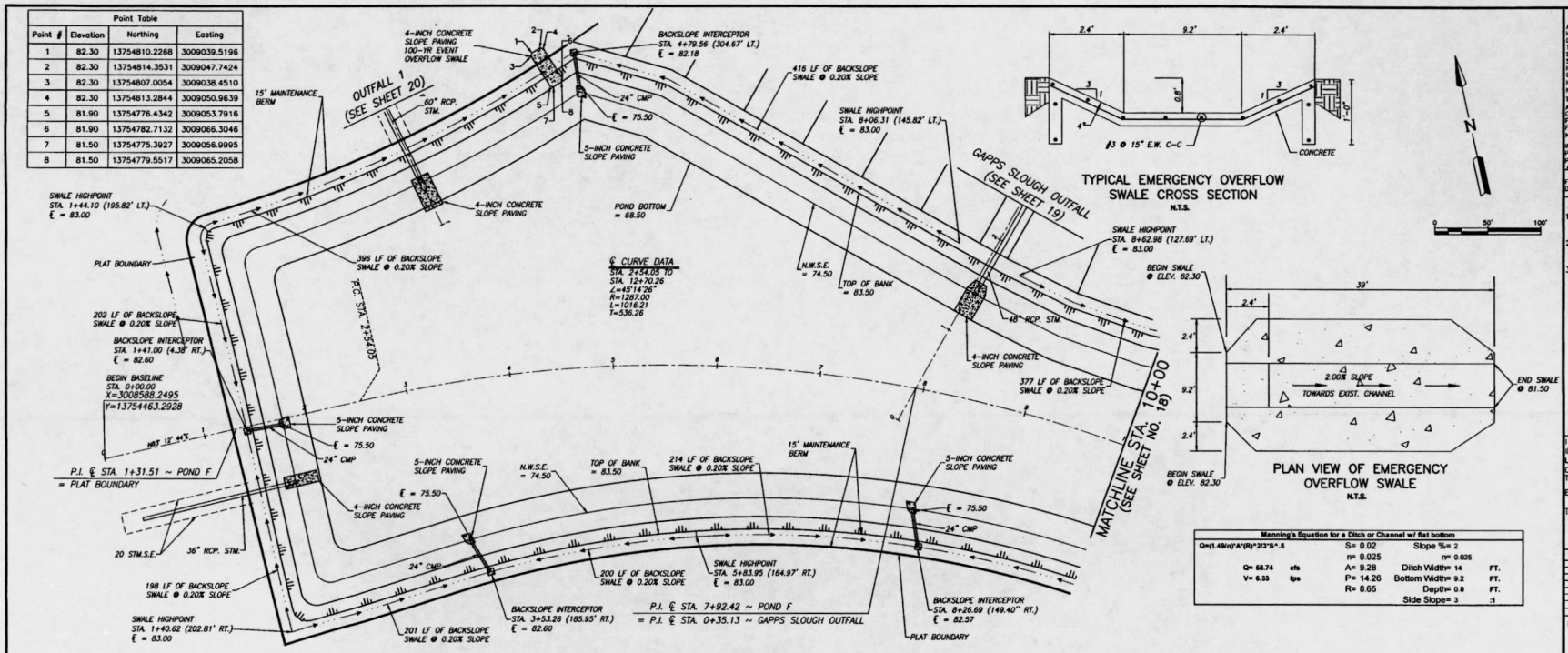
1	82.30	13754810.2268	3009039.5196
2	82.30	13754814.3531	3009047.7424
3	82.30	13754807.0054	3009038.4510
4	82.30	13754813.2844	3009050.9639
5	81.90	13754776.4342	3009053.7916
6	81.90	13754782.7132	3009066.3046
7	81.50	13754775.3927	3009056.9995
8	81.50	13754779.5517	3009065.2058

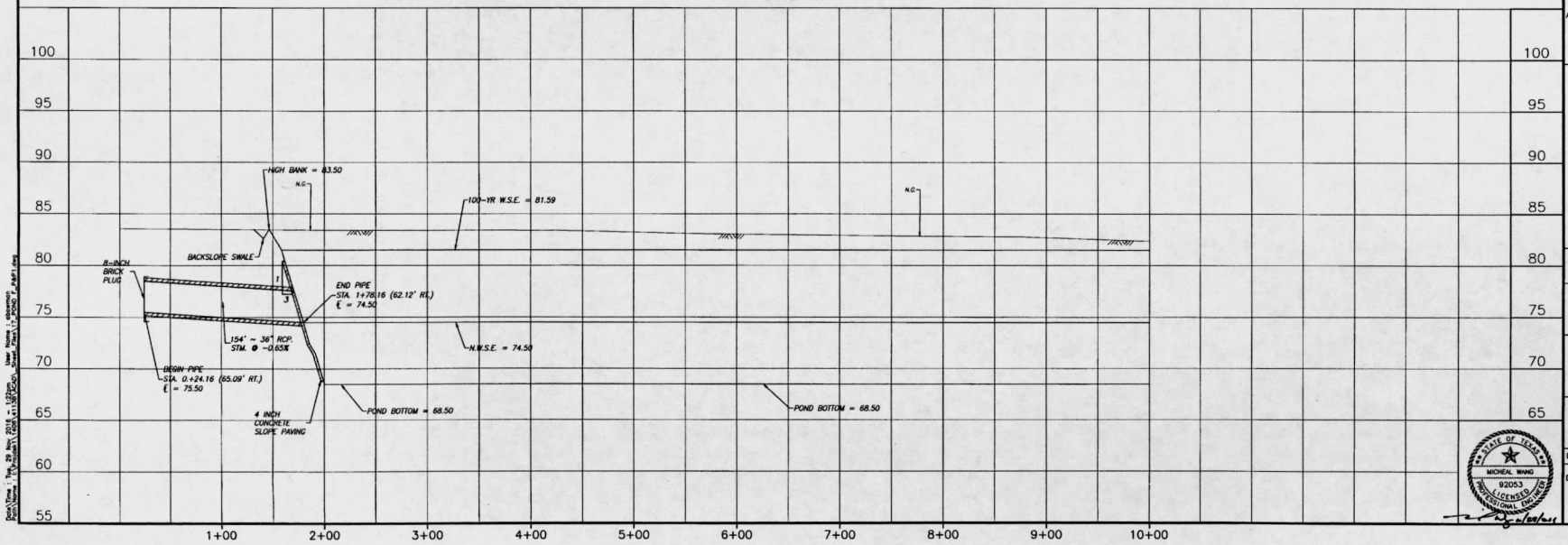


POND F

TYPICAL EMERGENCY OVERFLOW SWALE CROSS SECTION
N.T.S.

PLAN VIEW OF EMERGENCY OVERFLOW SWALE
N.T.S.

Manning's Equation for a Ditch or Channel w/ flat bottom					
Q=(1.49/n)*A*(R)^2/3*S^.5		S= 0.02	Slope %= 2		
		n= 0.025	n= 0.025		
Q= 68.74	cfs	A= 9.28	Ditch Width= 14	FT.	
V= 6.33	fps	P= 14.26	Bottom Width= 9.2	FT.	
		R= 0.65	Depth= 0.8	FT.	
			Side Slope= 3	:1	



BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET
TBM (LJA 1)
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NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.36
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
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RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: Marci Dent
DEVELOPMENT COORDINATOR
DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1885

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

POND "F"
STA. 0+00 TO 10+00

STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B
DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016
HORZ: 1" = 50'
VERT: 1" = 5'
SHEET NO. 17 OF 23

BONBROOK PLANTATION DETENTION POND "F" - 1406-4113B

17

Date/Time : Tue, 29 Nov, 2016 - 12:29pm
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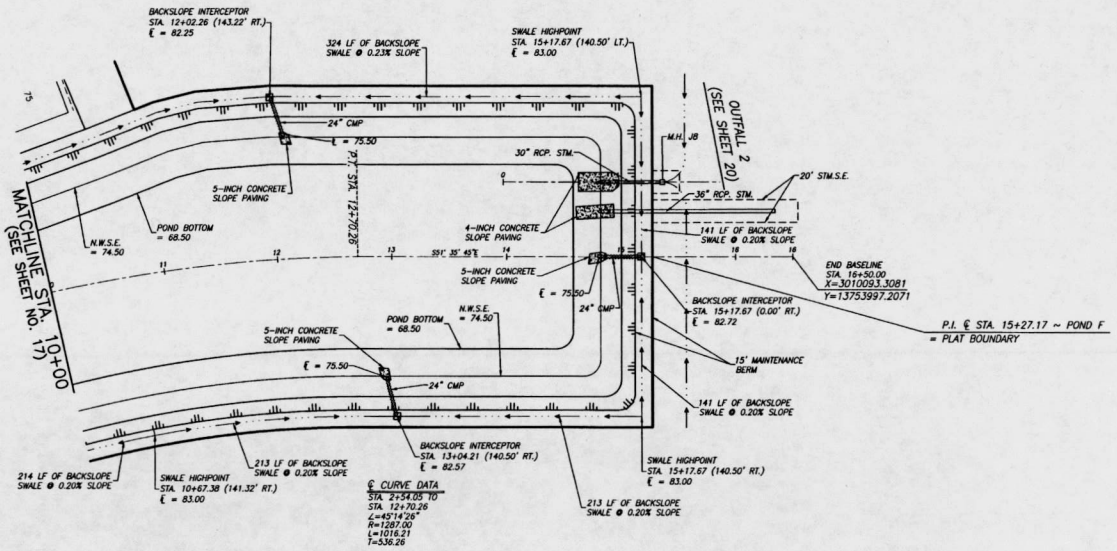
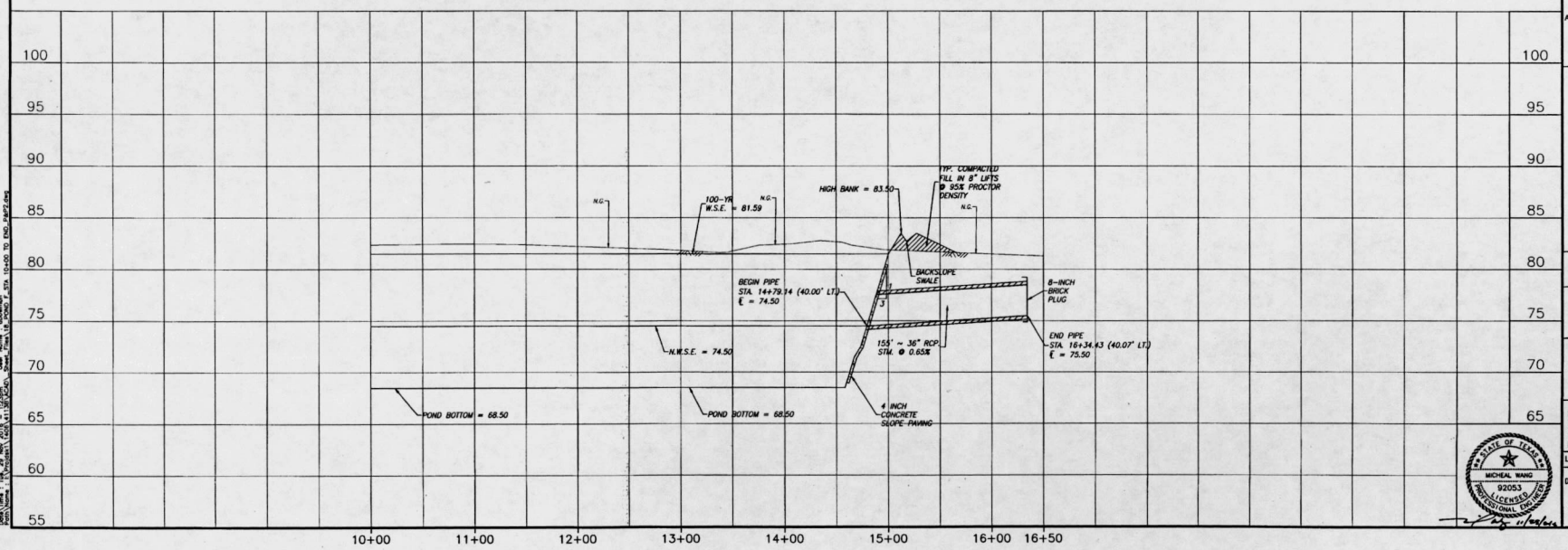
User Name : abowman



POND "F"



BENCHMARK:

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OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
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NAVD-88(1991 ADJ.) ELEV = 90.798 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

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BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1865

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH
DETENTION POND "F"

POND "F"
STA. 10+00 TO 16+50

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

HORZ: 1" = 50'
VERT: 1" = 5'

SHEET NO. 18 OF 23

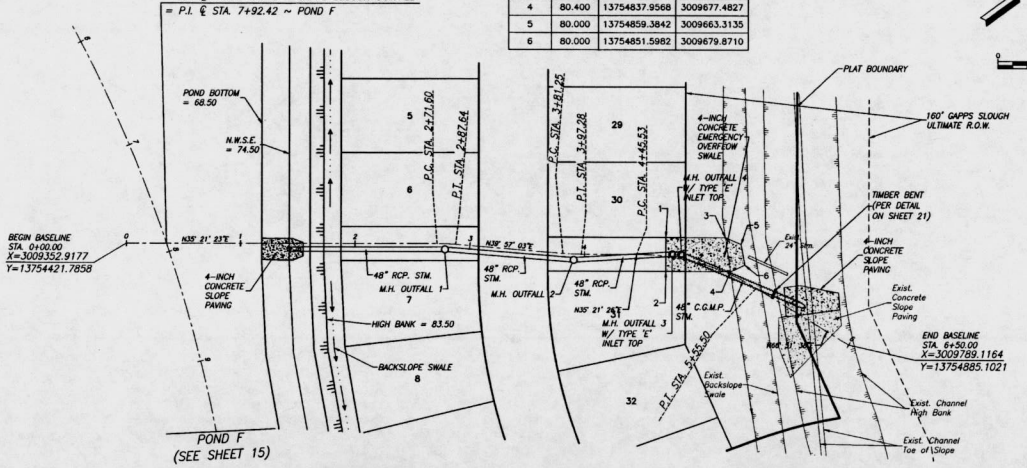
STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER
11/08/16

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

Date\Time: Tue, 29 Nov 2016 - 12:23pm User Name : abowman
Path\Name: Y:\Projects\1406-4113B\CAD_Sheet_Files\18-POND F_STA 10+00 TO END_PMP2.dwg

Overflow Swale Point Table			
Point #	Elevation	Northing	Easting
1	83.500	13754809.2295	3009620.1180
2	83.500	13754791.8693	3009644.5848
3	80.400	13754851.5986	3009650.4135
4	80.400	13754837.9568	3009677.4827
5	80.000	13754859.3842	3009663.3135
6	80.000	13754851.5982	3009679.8710

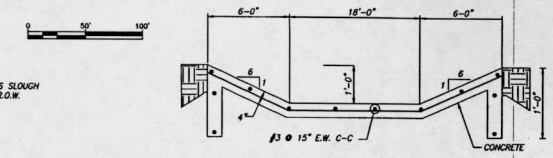
Manning's Equation for a Ditch or Channel w/ flat bottom				
Q=(1.49/n)*A*(R)^2/3*S^.5		S= 0.033	Slope %= 3.33	
		n= 0.025	n= 0.025	
Q= 224.12	cfs	A= 24.00	Ditch Width= 30	FT.
V= 9.34	fps	P= 30.17	Bottom Width= 18	FT.
		R= 0.80	Depth= 1	FT.
			Side Slope= 6	:1



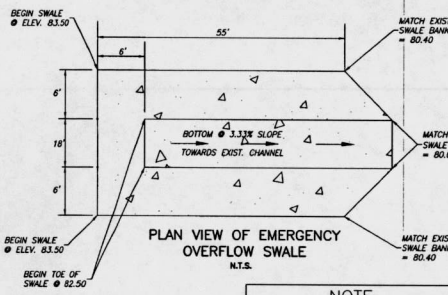
℄ CURVE DATA
STA. 2+71.60 TO STA. 2+87.64
∠=4°35'41"
R=200.00
L=16.04
T=8.02

℄ CURVE DATA
STA. 3+81.25 TO STA. 3+97.28
∠=4°35'37"
R=200.00
L=16.03
T=8.02

℄ CURVE DATA
STA. 4+45.53 TO STA. 5+55.50
∠=31°30'12"
R=200.00
L=109.97
T=56.41



TYPICAL EMERGENCY OVERFLOW SWALE CROSS SECTION
N.T.S.



PLAN VIEW OF EMERGENCY OVERFLOW SWALE
N.T.S.

NOTE
CONTRACTOR SHALL OBTAIN A PERMIT FROM THE FORT BEND COUNTY ENGINEERING DEPARTMENT, (281)633-7500, PRIOR TO ANY WORK WITH THE FORT BEND COUNTY DRAINAGE DISTRICT GAPPS SLOUGH R.O.W.

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
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INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
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RECORD DRAWING
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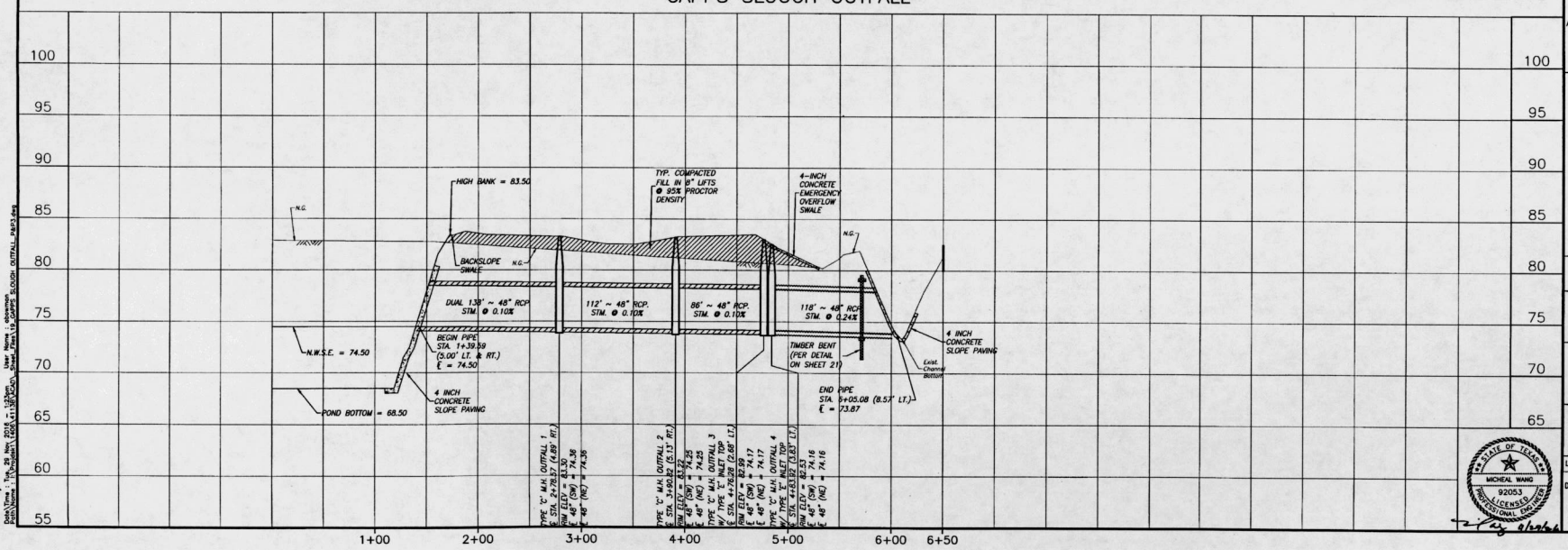
BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR
DATE: 12/14/16

GAPPS SLOUGH OUTFALL



STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER
8/24/16

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

GAPPS SLOUGH OUTFALL
STA. 0+00 TO 6+50

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B
DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016
HORZ: 1" = 50'
VERT: 1" = 5'
SHEET NO. 19 OF 23

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

Date/Time : 11th, 28 Nov, 2016 at 11:26am User Name : sbarnes
Drawing : J:\1406-4113B(Gapps Slough)\Dwg\Plan\19-GAPPS SLOUGH OUTFALL P&P3.dwg

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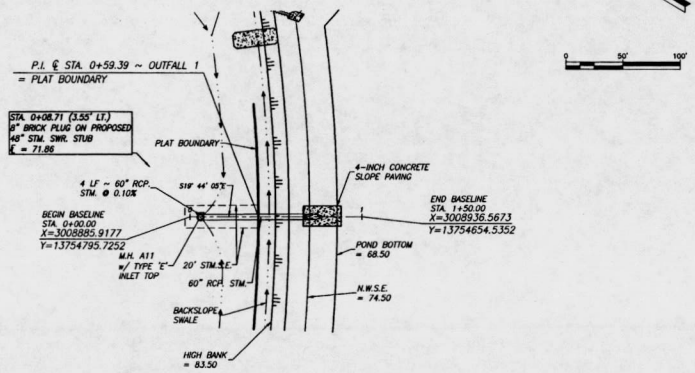
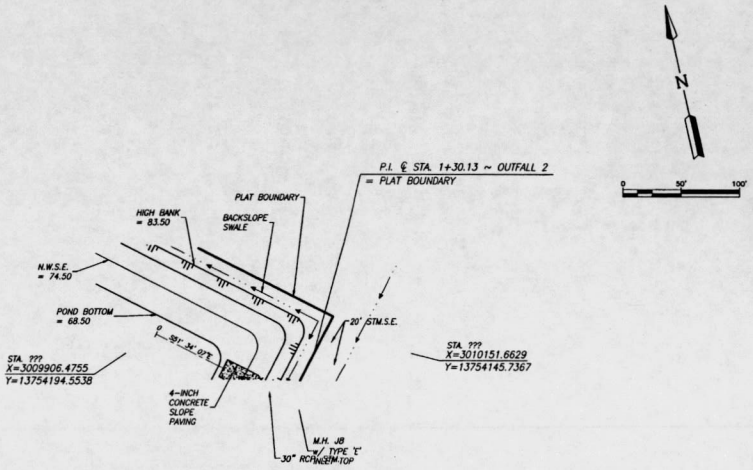
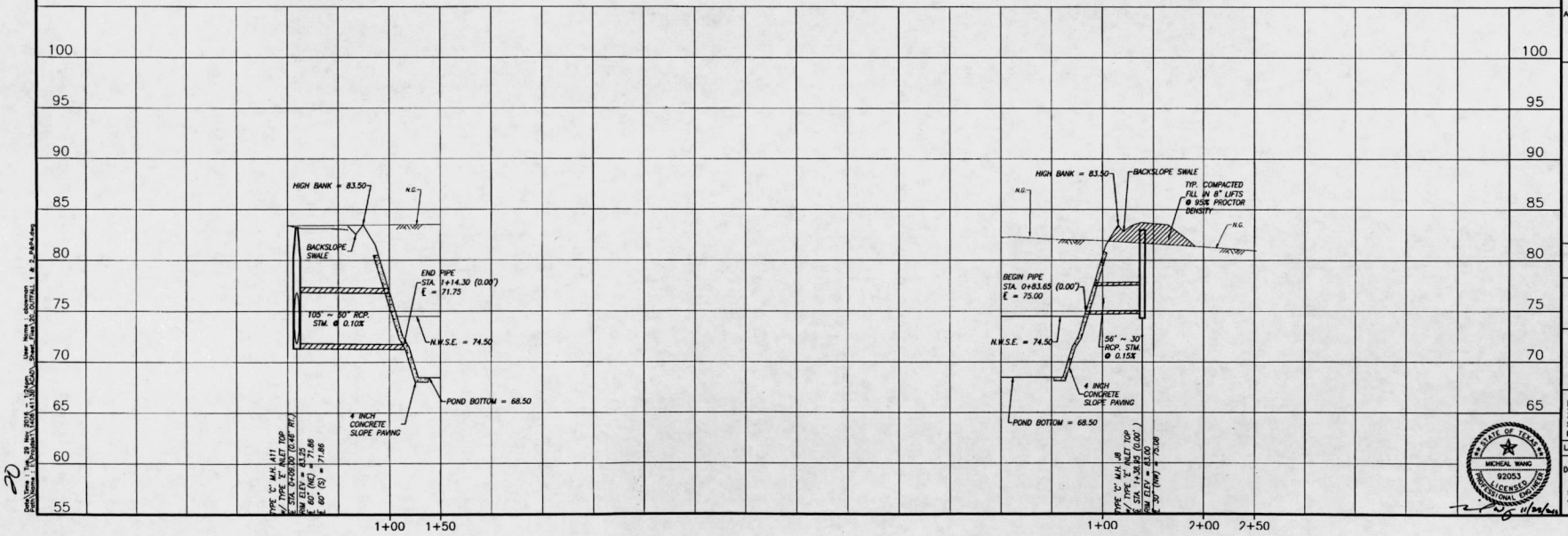




OUTFALL 1



OUTFALL 2

BENCHMARK:

A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET
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A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACEK ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACEK ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY MUD 150, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:

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RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: Mary Dot
DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1891

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH
DETENTION POND "F"

OUTFALL 1
STA. 0+00 TO 1+50
OUTFALL 2
STA. 0+00 TO 2+50

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN-F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

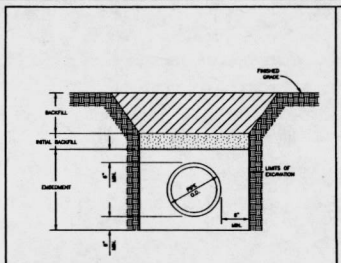
HORZ: 1" = 50'
VERT: 1" = 5'

SHEET NO. 20 OF 23

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER
11/09/2016

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

Date/Time: 11/9/2016 - 1:19:30pm User Name: adamson
Drawing: J:\Projects\1406-4113B\CAD\ Sheet: Plan 20: OUTFALL 1 & 2-PS24.dwg



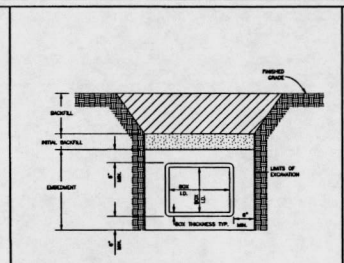
NOTES:

1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, COMPACTED TO 95% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED UNDER PAVEMENT.
2. INITIAL BACKFILL SHALL BE UNIFORMLY GRADED MATERIAL (MAXIMUM SIZE, 2" DIAMETER), PLACE IN 6" LIFTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED UNDER PAVEMENT.
3. EMBEDMENT SHALL BE CEMENT STABILIZED SAND (1.5 SACKS PER CUBIC YARD) COMPACTED TO 95% STANDARD PROCTOR DENSITY.
4. UNDER PAVING OR WITHIN 3' OF PAVEMENT, THE INITIAL BACKFILL AND ALL BACKFILL UP TO THE PAVEMENT SUBGRADE SHALL BE CEMENT STABILIZED SAND (1.5 SACKS PER CUBIC YARD) COMPACTED TO 95% STANDARD PROCTOR DENSITY.
5. TRENCH SHORING IN ACCORDANCE WITH OSHA, SHALL BE INSTALLED WHERE REQUIRED.
6. SOIL IN THE PIPE ZONE SHALL CONSIST OF NON-WATERBEARING, CONCRETE SOILS WITH A SHEAR STRENGTH OF 1000 PSF OR GREATER. WHEN WET SAND EXISTS IN THE PIPE ZONE, MODIFIED BEDDING SHALL BE INSTALLED.

THE CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS
DEPARTMENT OF PUBLIC WORKS

STORM SEWER BEDDING & BACKFILL

CW	SWF	WS	11/16	P-108a



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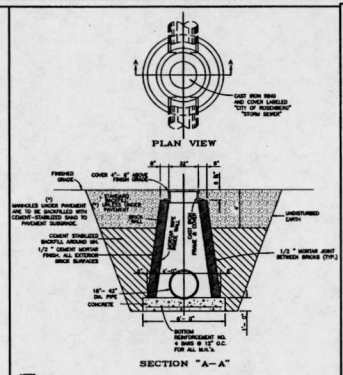
THE CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS
DEPARTMENT OF PUBLIC WORKS

STORM SEWER BEDDING & BACKFILL

CW	SWF	WS	11/16	P-108b



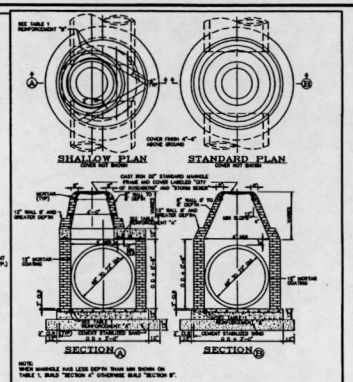
NOTES:

1. BRICK WALLS 8'- 0" BELOW CASTING TO BE 12" THICK.
2. ALL BRICK MATERIAL SHALL CONFORM WITH ASTM C32, GRADE MA, EXCEPT WATER WORK, THAN THE GRADE ABSORPTION WILL BE PERMIT.
3. ALL MANHOLE CHAMBER SHALL BE BRICK OR PRECAST RING.

THE CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS
DEPARTMENT OF PUBLIC WORKS

BRICK
TYPE "C" MANHOLE 18"- 42"

CW	SWF	WS	11/16	P-110



NOTE:
WHEN MANHOLE HAS LESS DEPTH THAN MIN SHOWN ON TABLE 1, BUILD "SECTION A" OTHERWISE BUILD "SECTION B".

TABLE 1
DATA FOR VARIOUS PIPE DIAMETERS

PIPE DIA. (INCHES)	MIN DEPTH	REINFORCEMENT ("A")	REINFORCEMENT ("B")
16"	4'-0"	# 5 @ 6 O.C.	# 5 @ 6
18"	4'-0"	# 5 @ 6 O.C.	# 5 @ 6
24"	4'-0"	# 5 @ 6 O.C.	# 5 @ 6
30"	4'-0"	# 5 @ 6 O.C.	# 5 @ 6
36"	4'-0"	# 5 @ 6 O.C.	# 5 @ 6
42"	4'-0"	# 5 @ 6 O.C.	# 5 @ 6

THE CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS
DEPARTMENT OF PUBLIC WORKS

STORM SEWER
MANHOLE TYPE "C" FOR 48" TO 72" DIAMETER RCP

CW	SWF	WS	11/16	P-114

BENCHMARK:
A BRASS DISK STAMPED K-1219, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
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OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
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FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

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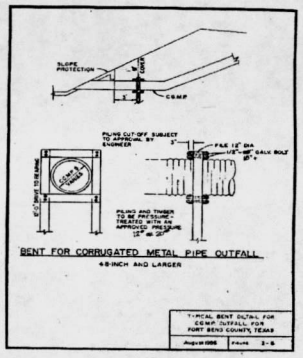


TYPICAL BENT OUTFALL FOR CSMP OUTFALL FOR FORT BEND COUNTY, TEXAS

August 1998	FIGURE 2-5

STORM DRAIN MARKER
ITEM NO. SD-4
1 COLOR: BLUE, 4" DISC
MATERIAL: STAINLESS STEEL
SYMBOL: FISH
MANUFACTURED BY:
ALERTE DESIGNS, INC.
WWW.ALERTEDESIGNS.COM
800-222-1754

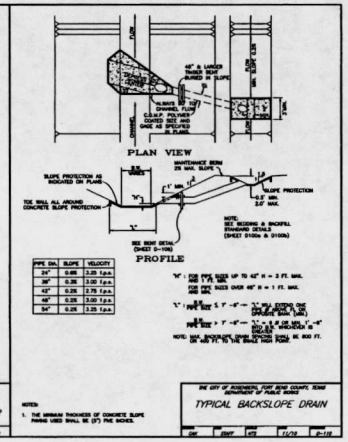
NOTES:

1. Surface installation requires the surface to brushed with a wire brush and all dust blown off that surface.
2. Install marker with [3M]-[4M] Structural Adhesive using a dispense caulking tube gun. Place the adhesive on the back side of the marker in a circular manner from the outside edge to the center. Place the marker firmly onto the surface in place and apply pressure to the face of the marker.
3. Surface may be applied to concrete, asphalt or steel. The City of Rosenberg requires the marker to be placed on the inside of every catch basin on all storm drain.

THE CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS
DEPARTMENT OF PUBLIC WORKS

NO DUMPING
METAL STORM DRAIN MARKER

CW	SWF	WS	11/16	P-115



PIPE DIA.	SLOPE	VELOCITY
24"	0.48	3.25 f.p.s.
30"	0.35	3.50 f.p.s.
42"	0.25	3.75 f.p.s.
48"	0.25	3.50 f.p.s.
54"	0.25	3.25 f.p.s.

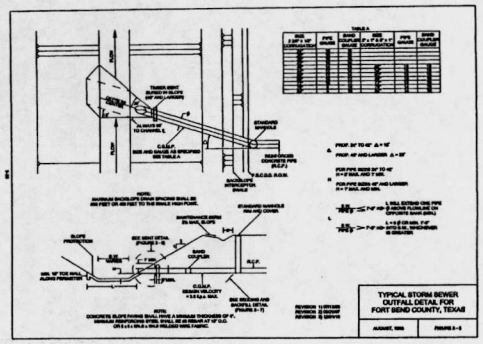
NOTE:
SEE BEDDING & BACKFILL STANDARD DETAILS (SHEET D100a & D100b)

NOTE:
1. THE MINIMUM THICKNESS OF CONCRETE SLOPE PAVING USED SHALL BE (3") FIVE INCHES.

THE CITY OF ROSENBERG, FORT BEND COUNTY, TEXAS
DEPARTMENT OF PUBLIC WORKS

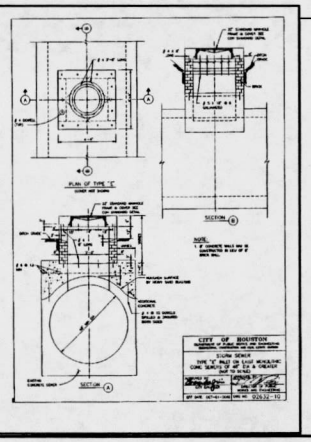
TYPICAL BACKSLOPE DRAIN

CW	SWF	WS	11/16	P-116



TYPICAL STORM SEWER OUTFALL DETAIL FOR FORT BEND COUNTY, TEXAS

AUGUST, 1998	FIGURE 2-6



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BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____
DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1885

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

STORM SEWER CONSTRUCTION DETAILS

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: AS SHOWN

SHEET NO. 21 OF 23

STATE OF TEXAS
MICHEAL WANG
92053
LICENSED
PROFESSIONAL ENGINEER
11/29/2016

BONBROOK PLANTATION DETENTION POND "F" - 1406-4113B

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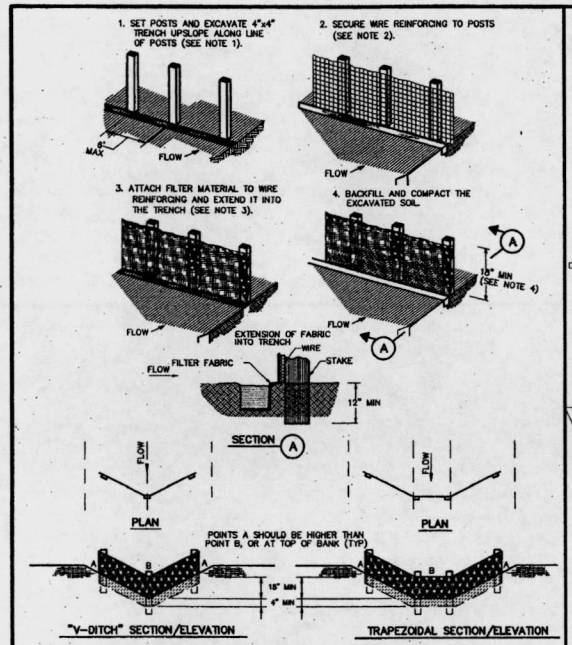
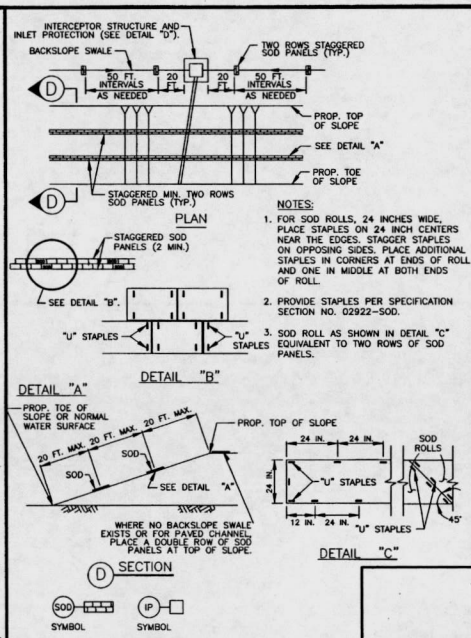


CONSTRUCTION NOTES:

1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 6 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

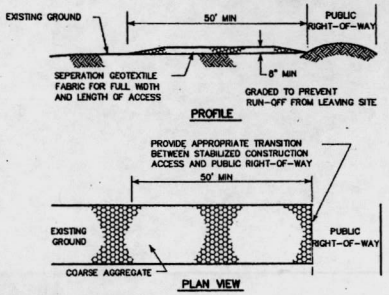
REINFORCED FILTER FABRIC BARRIER



NOTES:

1. FOR SOD ROLLS, 24 INCHES WIDE, PLACE STAPLES ON 24 INCH CENTERS NEAR THE EDGES. STAGGER STAPLES ON OPPOSING SIDES. PLACE ADDITIONAL STAPLES IN CORNERS AT ENDS OF ROLL AND ONE IN MIDDLE AT BOTH ENDS OF ROLL.
2. PROVIDE STAPLES PER SPECIFICATION SECTION NO. 02922-SOD.
3. SOD ROLL AS SHOWN IN DETAIL "C" EQUIVALENT TO TWO ROWS OF SOD PANELS.

SODDING

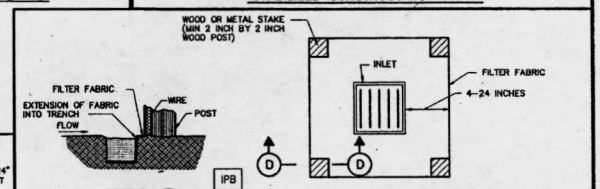


CONSTRUCTION NOTES:

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

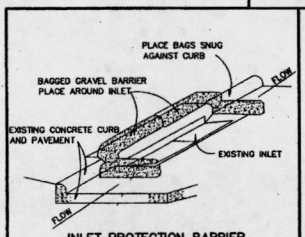
STABILIZED CONSTRUCTION ACCESS



SILT FENCE INLET PROTECTION BARRIER

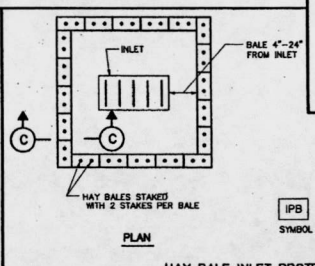
CONSTRUCTION NOTE:

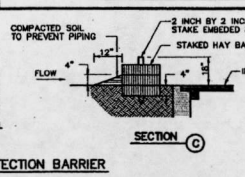
1. SEE CONSTRUCTION NOTES FOR RFB.



INLET PROTECTION BARRIER

(FOR STAGE II INLETS)
BAGGED GRAVEL BARRIER





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
APPROVED: DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: JULY-01-2010 DWG NO: 01571-01

STATE OF TEXAS — MICHEAL WANG — 92053 — LICENSED PROFESSIONAL ENGINEER — 6/20/16

BENCHMARK:
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FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

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BY _____ DATE _____
TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: DEVELOPMENT COORDINATOR
DATE: 12/14/16

CITY OF ROSENBERG — FOUNDED 1895

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

STORM WATER POLLUTION PREVENTION PLAN DETAILS

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1406-4113B
DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016
SCALE: AS SHOWN SHEET NO. 22 OF 23

BONBROOK PLANTATION DETENTION POND "F" – 1406-4113B

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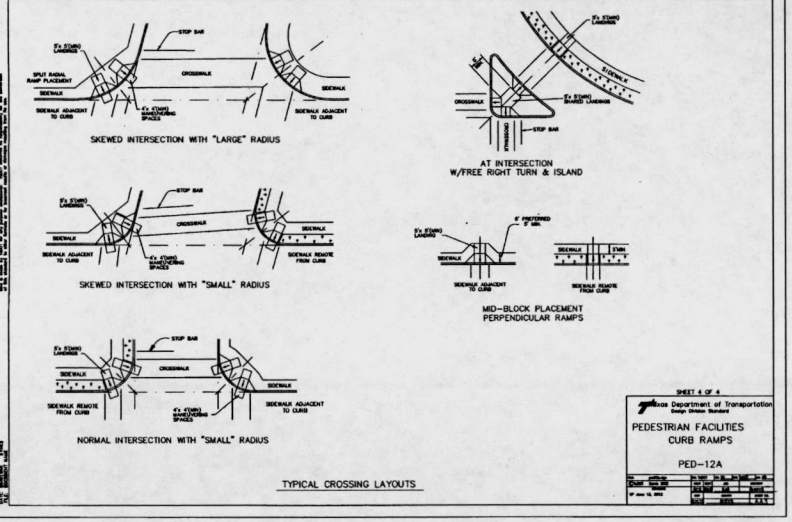
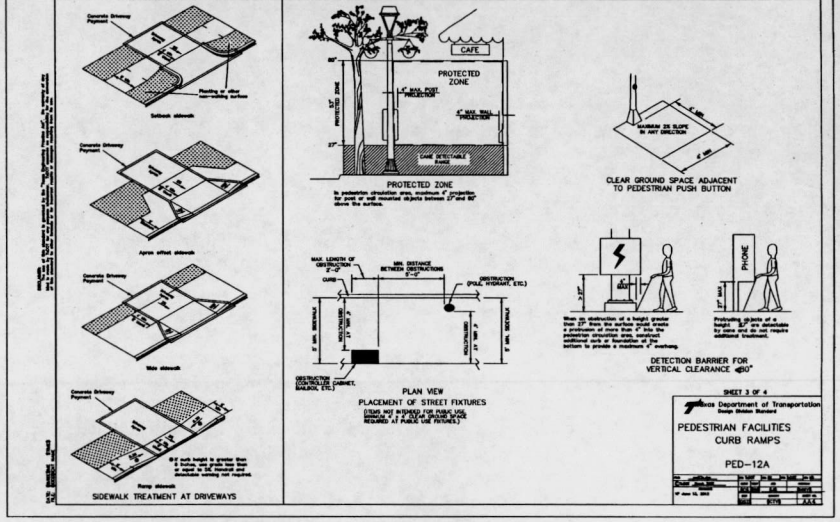
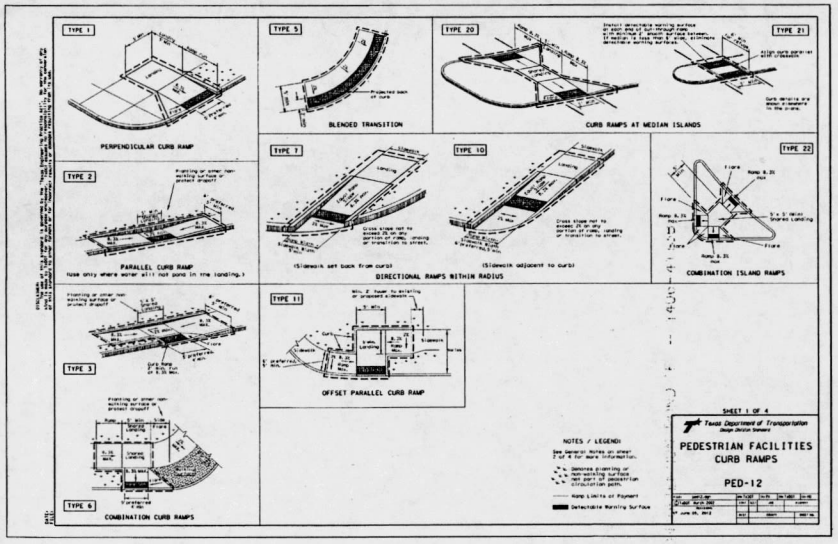
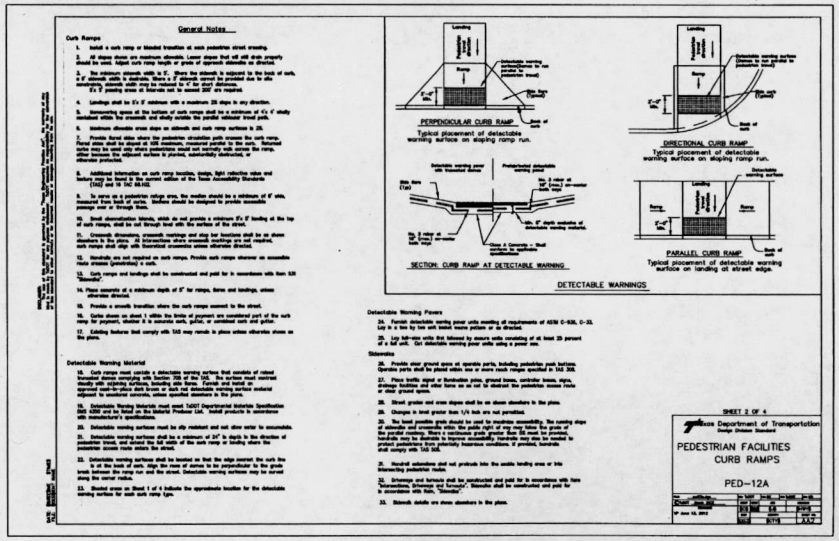
22









BENCHMARK:
A BRASS DISK STAMPED K-1218, SET IN A CONCRETE HEADWALL, LOCATED IN FORT BEND COUNTY, 0.15 MILE SOUTH OF
THE INTERSECTION OF STATE HIGHWAY 36 AND MEYER ROAD, SET IN THE TOP OF A CONCRETE HEADWALL AND 1.7 FEET SOUTH OF THE NORTH END OF THE EAST CONCRETE HEADWALL
OF A CULVERT, 24 FEET EAST OF THE CENTERLINE OF STATE HIGHWAY 36, AND LEVEL WITH THE HIGHWAY'S SURFACE.
NAVD-88 (1991 ADJ.) ELEV = 91.69 FEET

TBM (LJA 1)
A ⅝-INCH IRON ROD WITH CAP SET AT THE INTERSECTION OF BRYAN ROAD AND SPACER ROAD, APPROXIMATELY 18.8 FEET NORTH OF THE CENTERLINE OF BRYAN ROAD AND 40.4 FEET WEST OF THE CENTERLINE OF SPACER ROAD.
NAVD-88(1991 ADJ.) ELEV = 90.758 FEET

INTERNAL 100-YR FLOOD ELEV = 79.38
PER LJA REPORT "MASTER DRAINAGE PLAN FOR BONBROOK PLANTATION DEVELOPMENT" FORT BEND COUNTY M.U.D 155, JAN. 2005

FIRM PANEL: 48157C0265 L
DATE: APRIL 2, 2014

NOTES:
1) ALL UTILITIES ARE PROPOSED UNLESS OTHERWISE NOTED.
2) THIS CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
3) CAUTION:
THERE ARE EXISTING UTILITIES WITHIN THE PROJECT AREA. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL EXISTING UTILITIES AFFECTING PROPOSED UTILITIES PRIOR TO CONSTRUCTION. IN THE EVEN OF CONFLICT BETWEEN EXISTING UTILITIES AND PROPOSED UTILITIES, THE CONTRACTOR SHALL SUSPEND CONSTRUCTION IN THE VICINITY OF THE CONFLICT, AND SHALL COMMENCE ONLY UPON AUTHORIZATION BY OWNER.

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

FORT BEND COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ DEVELOPMENT COORDINATOR

DATE: 12/14/16

CITY OF ROSENBERG FOUNDED 1828

BEAZER HOMES TEXAS, L.P.

BONBROOK PLANTATION SOUTH DETENTION POND "F"

TXDOT PEDESTRIAN FACILITIES PED-12A

STATE OF TEXAS MICHEAL WANG 92053 LICENSED PROFESSIONAL ENGINEER

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN-F-1386

LJA PROJECT NO.: 1406-4113B

DRAWN: A.B. DESIGN: A.B. DATE: NOVEMBER 2016

SCALE: AS SHOWN SHEET NO. 23 OF 23

BONBROOK PLANTATION DETENTION POND "F" - 1406-4113B

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