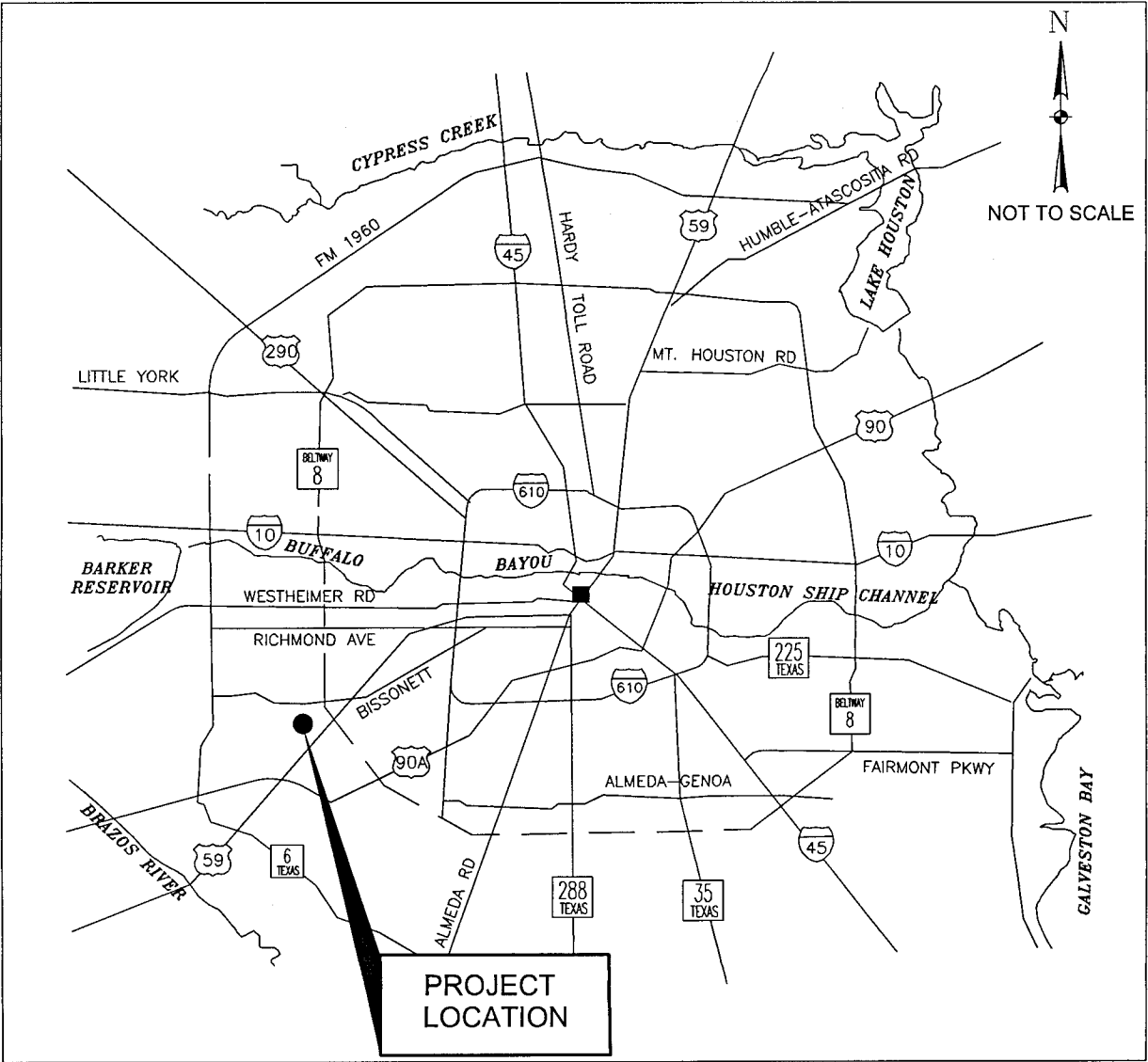
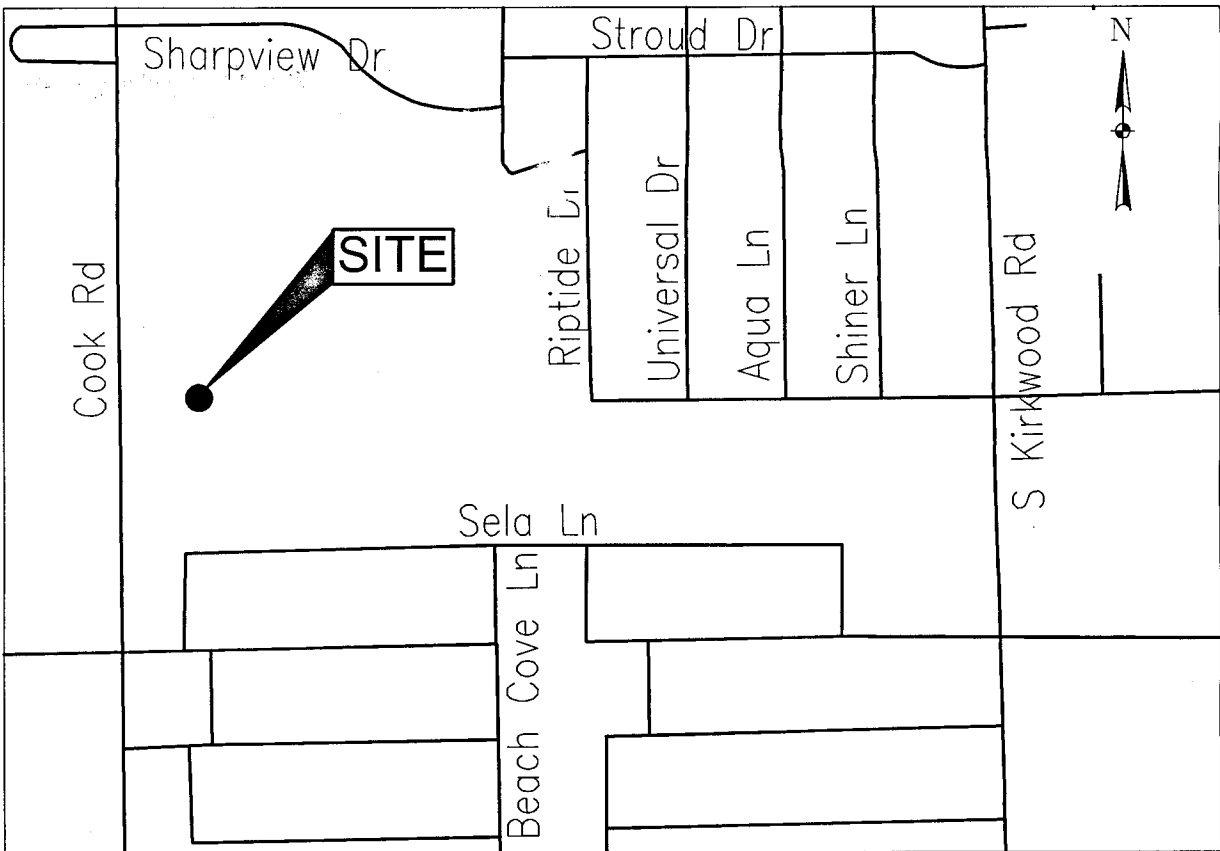


COOK RD APT
7515 COOK ROAD IN SOUTHWEST. HOUSTON TX 77072

DRAINAGE PLAN PACKAGE
08/05/19



LOCATION MAP



VICINITY MAP
KEY MAP NO 529 J
GIMS MAP NO 5854 B

FIRM
MAP# 48201C 0830L
ZONE: UNSHADED ZONE AE
EFFECTIVE DATE: 06/18/2007

NOTE TO CONTRACTOR:
CONTRACTOR SHALL NOTIFY THE CITY OF HOUSTON, HOUSTON PUBLIC WORKS, OFFICE OF THE CITY ENGINEER, 48 HOURS BEFORE STARTING WORK ON THIS PROJECT, TELEPHONE 832-394-9098.


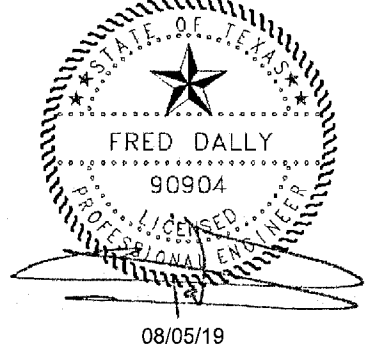
SHEET INDEX	
Number	Description
1 OF 14	COVER SHEET
2 OF 14	TOPOGRAPHIC SURVEY
3 OF 14	LAYOUT PLAN
4 OF 14	DRAINAGE PLAN EXISTING
5 OF 14	DRAINAGE EXISTING CALCS 2-YEARS
6 OF 14	DRAINAGE EXISTING CALCS 100-YEARS
7 OF 14	DRAINAGE PLAN PROPOSED
8 OF 14	DRAINAGE PROPOSED CALCS 2-YEARS
9 OF 14	DRAINAGE PROPOSED CALCS 100-YEARS
10 OF 14	DETENTION CALCULATIONS
11 OF 14	DETENTION UNDERGROUND CROSS-SECTION
12 OF 14	MITIGATION CUT AND FILL CALCULATIONS
13 OF 14	MITIGATION CUT AND FILL PROFILE
14 OF 14	MITIGATION CUT AND FILL PROFILE

NOTE:
DRAINAGE PLAN IS CONCEPTUAL IN NATURE AND FINAL DRAINAGE DESIGN SHALL BE IN CONFORMANCE WITH THE LATEST CITY OF HOUSTON INFRASTRUCTURE DESIGN MANUAL

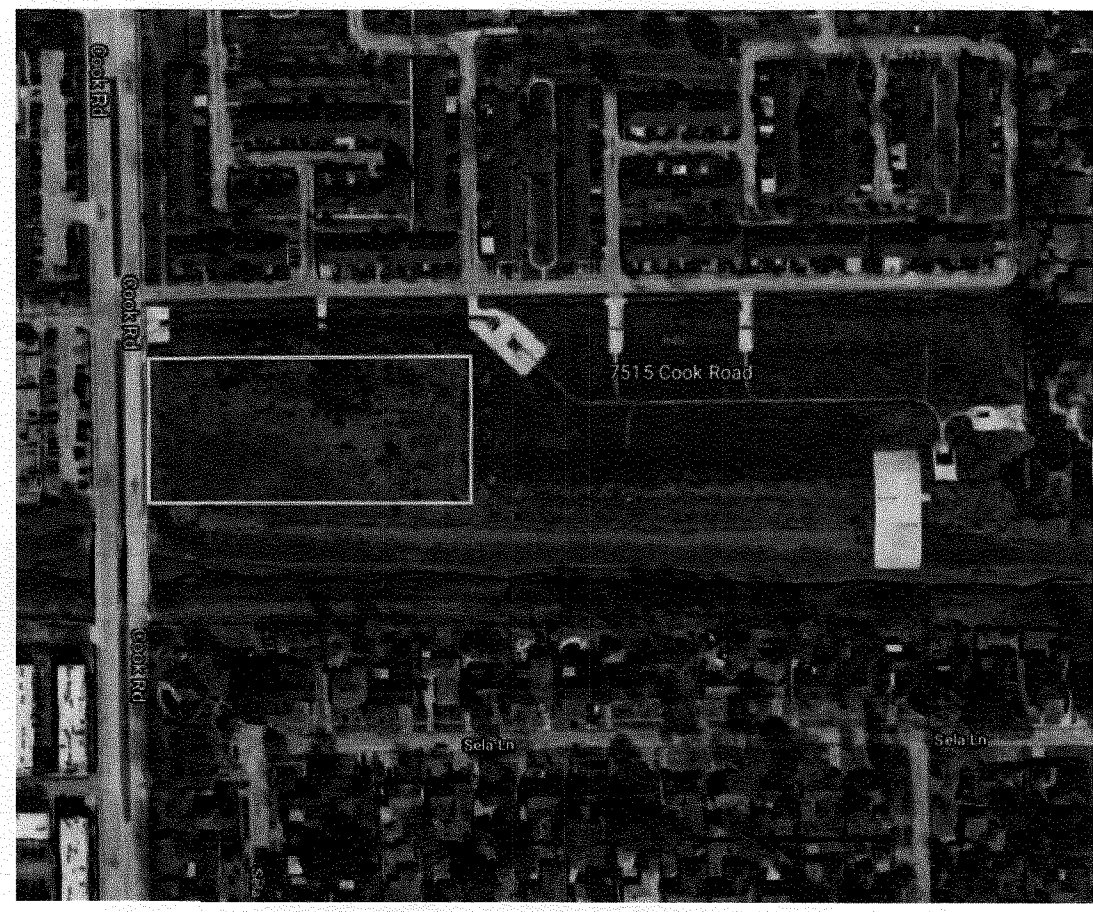
BASE FLOOD ELEVATION

PROPOSED BUILDING
BFE FOR 100 YEAR = 77 FT
BFE FOR 500 YEAR = 79 FT

DRAINAGE PLAN
OR FLOODPLAIN PROJEC
FLOODPLAIN GRCL
APPROVED FOR PLAT
Date: 8/12/19
By: Abdulaziz H. Hage
Phone:
ENGINEERING SERVICES SECTION
APPROVED FOR PLAT
08/08/2019
Sylvia Thakur

NO.	DATE	REVISION	APP.
		PROJECT MANAGER: JOSE DIEGO MONROY, CFM PROJECT ENGINEER: FRED DALLY, P.E. 9800 Richmond Ave., Suite 460 Houston, TX 77042 (713) 337-8881 o (713) 337-8882 f www.dallyassociates.com Texas Registered Engineering Firm F-003426	
NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES			
CITY OF HOUSTON HOUSTON PUBLIC WORKS			
WATER		STORM WATER QUALITY	
WASTE WATER		FACILITIES	
STORM WATER		TRAFFIC & TRANSPORTATION/ STREET & BRIDGE	
CITY ENGINEER		DATE	
DIRECTOR OF HOUSTON PUBLIC WORKS		DATE	
SHEET NO 01 OF 14 SHEETS			

ILMS NO. 19077685
COH LOG NO.



AERIAL or DIGITAL
NOT TO SCALE

ABSTRACTING NOTE:

Survey was performed without the benefit of a current Title Report at the client's request. There may be other easements or encumbrances that affect Subject property that are not shown.

BOUNDARY NOTE:

Boundary information shown hereon is based on the 2.11 acre land title survey performed by Advance Survey, Inc. Dated 10-09-14, as provided by client.

GENERAL NOTES:

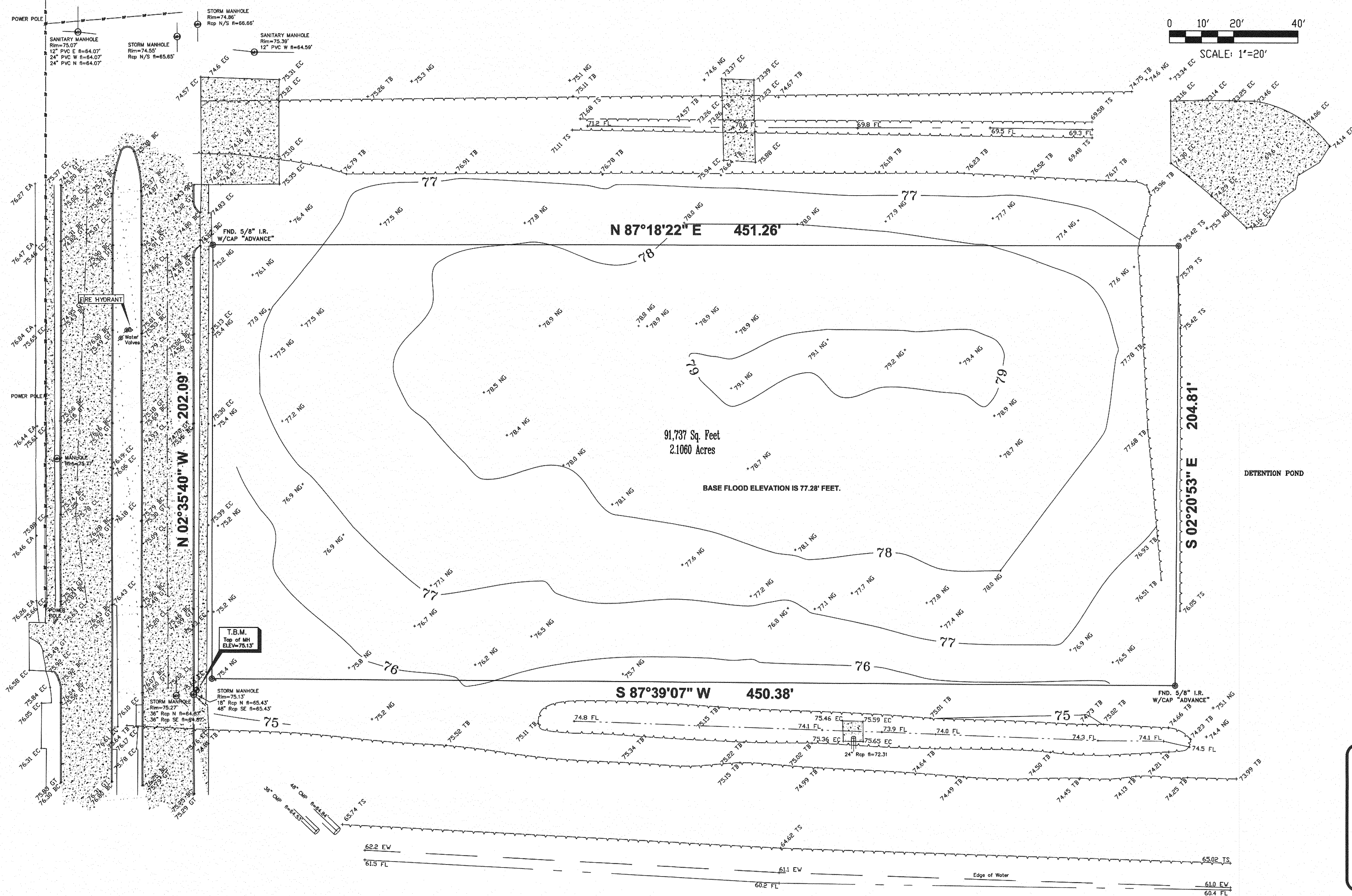
- 1) Subject Parcel lies within the City of Houston or it's ETJ and therefore subject to building requirements and ordinances regarding use of solid property, more specifically, but not limited to City of Houston ordinance No. 1999-262 regarding setback requirements and platting regulations. Additional Information may be found in the City of Houston building codes. Ultimate approval rests with the City of Houston Planning Commission.
- 2) Survey depicts only visible and apparent evidence of improvement and utility location. Location of Sub-surface utilities are beyond the scope of this survey unless otherwise noted.
- 3) The location, and existence of, utilities other than depicted on this survey, cannot be certified to. Utilities depicted on this survey are a compilation of field observation and records available through other sources.
- 4) No observable evidence of site use as a solid waste dump, sump or landfill.
- 5) No observable evidence of cemeteries, earth work moving, building construction or building additions within recent months.
- 6) The subject property has access to, and from a duly dedicated and accepted public street or highway as indicated on the survey.

IMPORTANT NOTE:

Prior to Commencing grading or on-site utilities work, contractor shall field verify location & depth of all off-site utilities to ascertain that proposed connections can be made as indicated in any construction drawings. Inform surveyors of any discrepancies or conflicts that may impact work described herein.

LEGEND:

AC	Air Conditioner Unit
BO	Boiler
CO	Clean Out
DG	Down Guy
FM	Fire Hydrant
GM	Gas Meter
GV	Gas Valve
IP	Iron Pipe
IR	Iron Rod
LS	Light Standard
PP	Power Pole
MH	Manhole
SN	Sign
TBM	Temporary Benchmark
TCB	Traffic Control Box
WM	Water Meter
WV	Water Valve
I.C.V.	Irrigator Control Valve
HP	Handicap Parking



BENCHMARK INFORMATION:

PROJECT BENCHMARK:

RM 040565 is a BRASS ALUM DISC Stamped "040565" on bridge at Southbound of South Kirkwood Road.

ELEVATION = 74.47' Feet
NAVD 1988, 2001 ADJUSTMENT

SITE BENCHMARK (TBM):

Top of Manhole, Located at Southwest corner of the Subject Property as shown on the hereon map of project.

ELEVATION = 75.13' Feet
NAVD 1988, 2001 ADJUSTMENT

**TOPOGRAPHIC SURVEY
OF COOK PLACE, LLC.**

Being a 2.11 acres more or less, in the H.T. & B.R.R. company survey, abstract no. 405, Harris County, Texas, being a part of lot 126 Dairy subdivisions and town, recorded in Volume 1, Page. 23 of H.C.M.R., said 2.11 acres being remainder of that certain 7.995 acre tract described under Harris County Clerk's file no. Z085418, save and except that 5.93 acre tract condemned by the city of Houston in Eminent domain proceedings under Harris County cause no. 982647.

Date: 06-22-18
Field Work: PC
Drawn By: KTN
Project No.: C1833

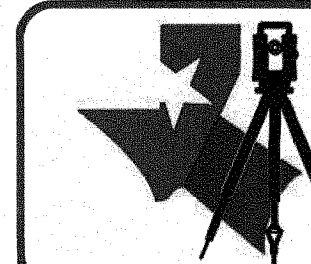
Prepared For: COOK PLACE, LLC.
Attn: LONG CHAU

Project Location:
7515 Cook Road
Houston, TX 77072

Key Map: 529J

FLOOD DATA

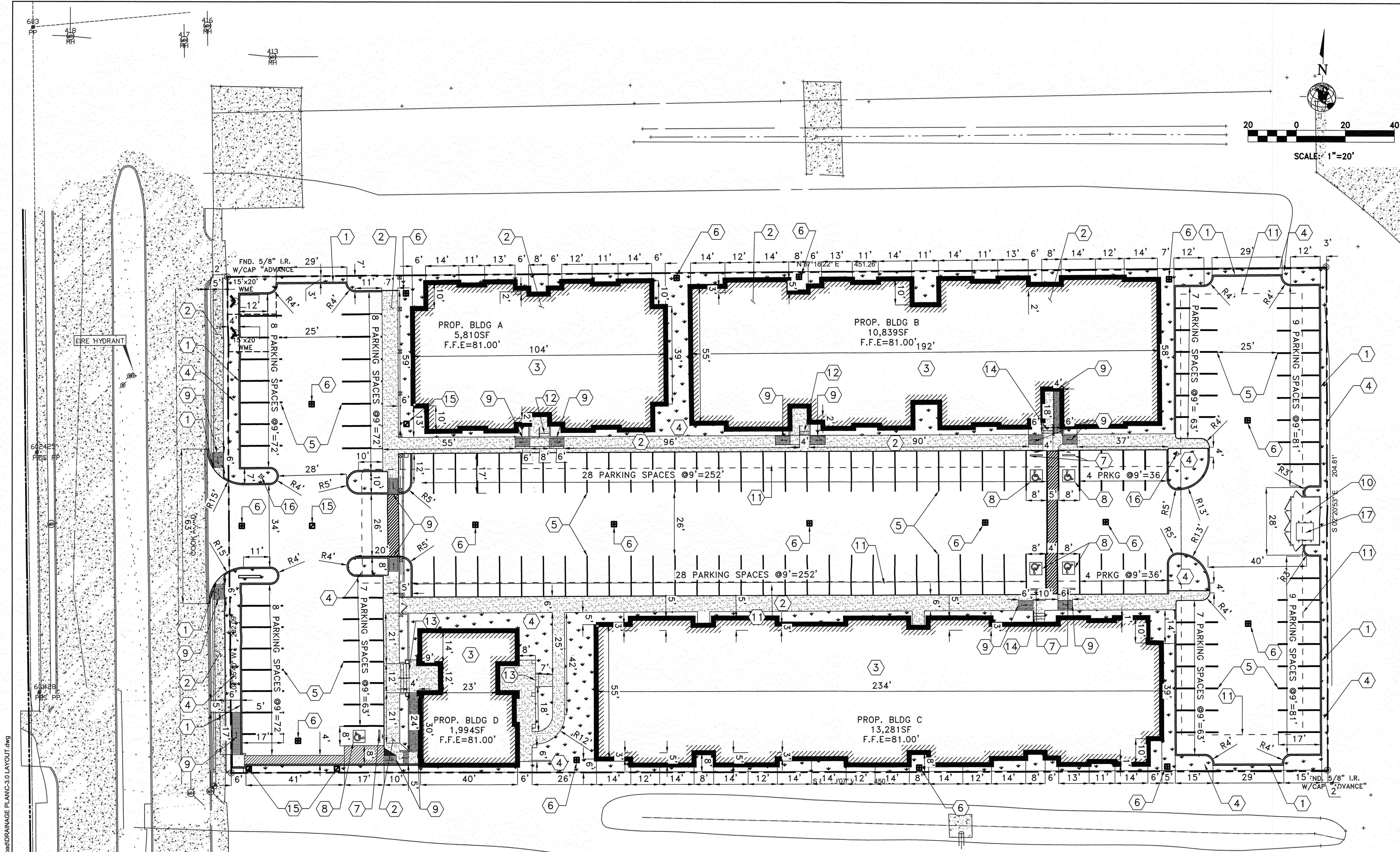
PROPERTY LIES WITHIN FLOOD ZONE "AE"
ACCORDING TO F.I.R.M. MAP NO. 48501C 0630J
DATED 06-18-07 BY GRAPHIC PLOTTING ONLY.
THIS PROPERTY IS IN THE 100 YEAR FLOOD ZONE.



BOWDEN SURVEY

Professional Land Services
1830 S KIRKWOOD RD. STE. 103
Houston, Texas 77077
Phone: (281) 531-1900 Fax: (281) 531-4900

TBPLS Firm Registration No. 10127400



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* When excavating within eighteen inches (18") of the indicated location of Center Point Energy facilities, all excavation must be accomplished using non-mechanized excavation procedures.
* When Center Point Energy facilities are exposed, sufficient support must be provided to the facilities to prevent excessive stress on the piping.
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* Any activities where persons or things may come within six (6) feet of live overhead high voltage lines, and
* Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of live overhead high voltage lines.
Parties responsible for the work, including contractors, are legally responsible for the safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or removed call CenterPoint Energy at 713-207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
No approval to use, cross, or occupy CenterPoint fee or easement property is given. If you need to use CenterPoint property, please contact our Surveying & Right of Way Division at 713-207-5348 or 713-207-5769.

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NO.	DATE	REVISIONS	APP.
		CENTERPOINT ENERGY ID: 1404643276	
		AT&T TEXAS / SWBT LOG NUMBER: 122018MG06	

NOTICE:
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VERIFICATION OF PRIVATE UTILITY LINES
Date _____

CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not to be used for conflict verification.
Signature valid for six months.

Date _____

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities - not to be used for conflict verification)
Signature valid for six months.

Date _____

Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.

Dally
+ ASSOCIATES
STRUCTURAL / CIVIL
9800 Richmond Ave., Suite 460
Houston, TX 77045
(713) 357-8881 • (713) 337-8882 f
www.dallyassociates.com
Texas Registered Engineering
Firm E-003425

TEXAS REGISTERED ENGINEERING
FIRM E-003425

COOK ROAD APT CIVIL PROJECT DRAINAGE PLAN LAYOUT PLAN

7515 COOK ROAD,
HOUSTON TX 77072

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ:	
VERT:	
SHEET NO. 03 OF 14	

SITE LAYOUT NOTES

1. THE HORIZONTAL AND VERTICAL LOCATION OF EXISTING SUBSURFACE UTILITIES HAVE BEEN DETERMINED FROM DATA PROVIDED BY OTHERS. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL EXISTING UTILITIES WITHIN THE AREA OF CONSTRUCTION THAT ARE TO REMAIN IN SERVICE. CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
2. ALL DIMENSIONS ARE FROM FACE OF CURB UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS ARE TO FACE OF BUILDING. REFER TO ARCHITECTURAL PLANS FOR BUILDING DIMENSIONS.
4. REFER TO ARCHITECTURAL PLANS FOR ALL STAIRS, HANDICAPPED RAMP AND RETAINING WALL DETAILS.
5. REFER TO LANDSCAPE ARCHITECT PLANS FOR DETAILS AND DIMENSIONS OF LANDSCAPE AND HARDSCAPE AREAS.

LAYOUT KEY NOTES

- 1 PROPOSED 6" CONCRETE CURB PER PAVEMENT DETAILS.
- 2 PROPOSED 4.5" CONCRETE SIDEWALK PER PAVEMENT DETAILS.
- 3 PROPOSED BUILDING PER STRUCTURAL AND ARCHITECTURAL DRAWINGS. REFER TO ARCHITECTURAL, DRAWINGS FOR LAYOUT, DIMENSIONS, DETAILS AND SPECIFICATIONS.
- 4 PROPOSED LANDSCAPE/GRASS AREA PER LANDSCAPE DRAWINGS. REFER TO ARCHITECTURAL, DRAWINGS FOR LAYOUT, DIMENSIONS, DETAILS AND SPECIFICATIONS.
- 5 PROPOSED 4" YELLOW STRIPPING PER PAVEMENT DETAILS.
- 6 PROPOSED STORM DRAIN INLET TYPE "A" AND "B" PER STORM DRAIN DETAILS.
- 7 PROPOSED PARKING WHEEL-STOP AT ADA PARKING SPACE PER PAVEMENT DETAILS.
- 8 PROPOSED ADA SIGN PER PAVEMENT DETAILS.
- 9 PROPOSED ADA RAMPS PER PAVEMENT DETAILS.
- 10 PROPOSED DUMPSTER LOCATION. DUMPSTER ENCLOSURE BY OTHERS.

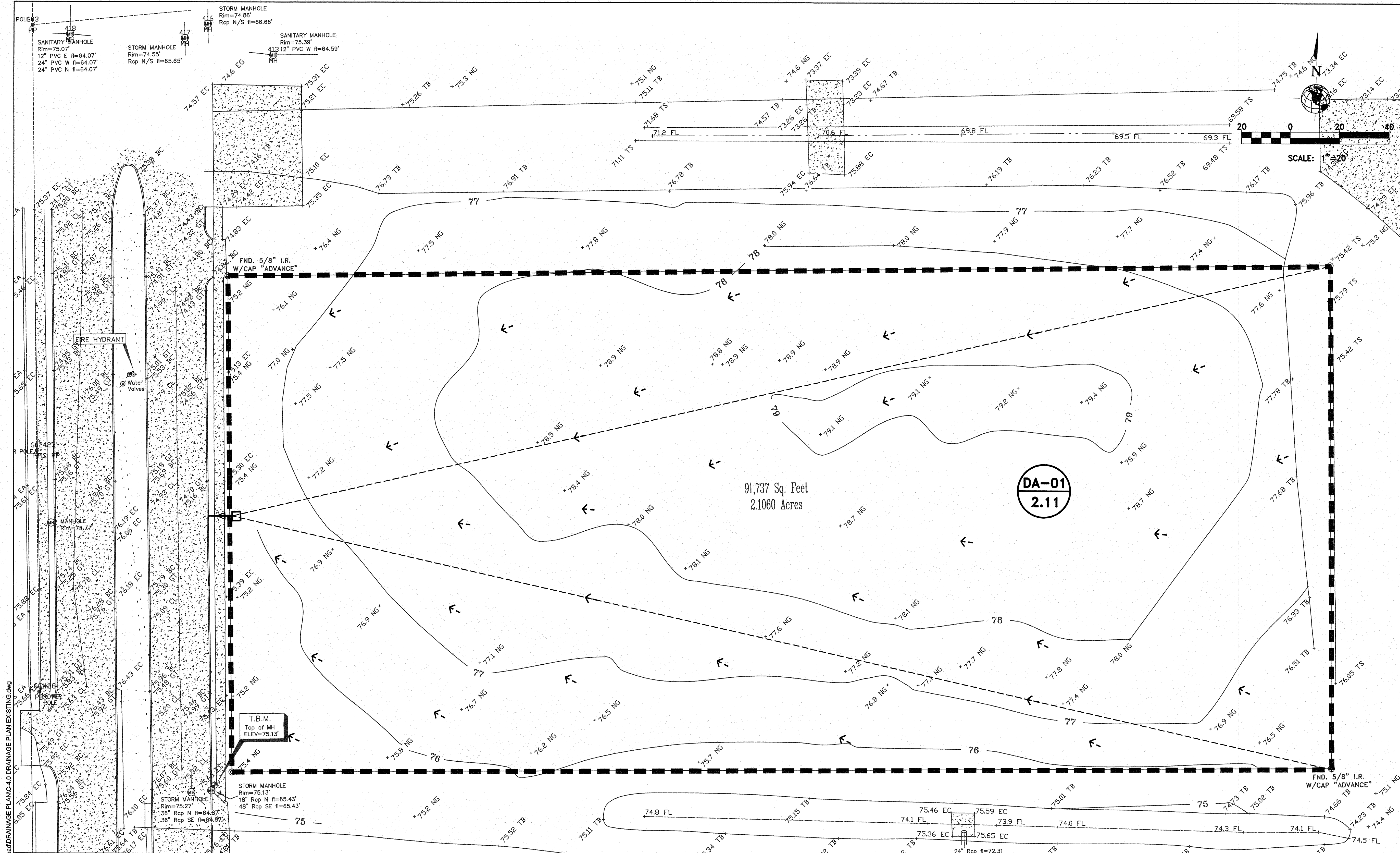
- 11 PROPOSED UNDERGROUND DETENTION POND PER DETENTION CALCULATIONS.
- 12 PROPOSED STAIRS TYPE 1 PER PAVEMENT DETAILS. REFER TO ARCHITECTURAL DRAWINGS FOR LAYOUT, DIMENSIONS, DETAILS AND SPECIFICATIONS.
- 13 PROPOSED STAIRS TYPE 2 PER PAVEMENT DETAILS. REFER TO ARCHITECTURAL DRAWINGS FOR LAYOUT, DIMENSIONS, DETAILS AND SPECIFICATIONS.
- 14 PROPOSED STAIRS TYPE 3 PER PAVEMENT DETAILS. REFER TO ARCHITECTURAL DRAWINGS FOR LAYOUT, DIMENSIONS, DETAILS AND SPECIFICATIONS.
- 15 PROPOSED JUNCTION BOX PER STORM DRAIN DETAILS.
- 16 PROPOSED FIRE HYDRANT.
- 17 PROPOSED BOLLARD PER PAVEMENT DETAILS.

HATCH LEGEND

- PROPOSED BUILDING
- PROPOSED GREEN AREA

DRAINAGE PLAN
APPROVED FOR PLAT
8/2/19
Abdulaziz M. Aljaze
ENGINEERING SERVICES SECTION
APPROVED FOR PLAT
Date: 08/08/2019
Ziphah Thakur

C.O.H. LOG No.:
I.L.M.S. No.:



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NO.	DATE	REVISIONS	APP.
CENTERPOINT ENERGY ID: 1404643276			
AT&T TEXAS / SWBT LOG NUMBER: 122018MG06			
NOTICE: FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS SIGNATURE DOES NOT FULFILL YOUR OBLIGATION TO CALL 811			
VERIFICATION OF PRIVATE UTILITY LINES			
Date			
Signature valid for six months.			
Date			
CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This signature verifies existing underground facilities - not to be used for conflict verification)			
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Date			
Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year.			
Dally + ASSOCIATES STRUCTURAL & CIVIL 9800 Richmond Ave., Suite 460 Houston, TX 77043 (713) 337-8881 or (713) 537-8882 www.dally.com Texas Registered Engineering Firm F-003426		TEXAS REGISTERED ENGINEERING FIRM F-003426 FRED DALLY 90804 LICENSED PROFESSIONAL ENGINEER 06/20/19	

COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN
DRAINAGE PLAN EXISTING
7515 COOK ROAD,
HOUSTON TX 77072

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ:	
VERT:	
SHEET NO. 04 OF 14	

DA1
0.01

DRAINAGE SUB-AREA
DRAINAGE SUB-AREA ACREAGE

DRAINAGE AREA LIMITS

RUNOFF FLOW DIRECTION

STORM WATER FLOW DIRECTION

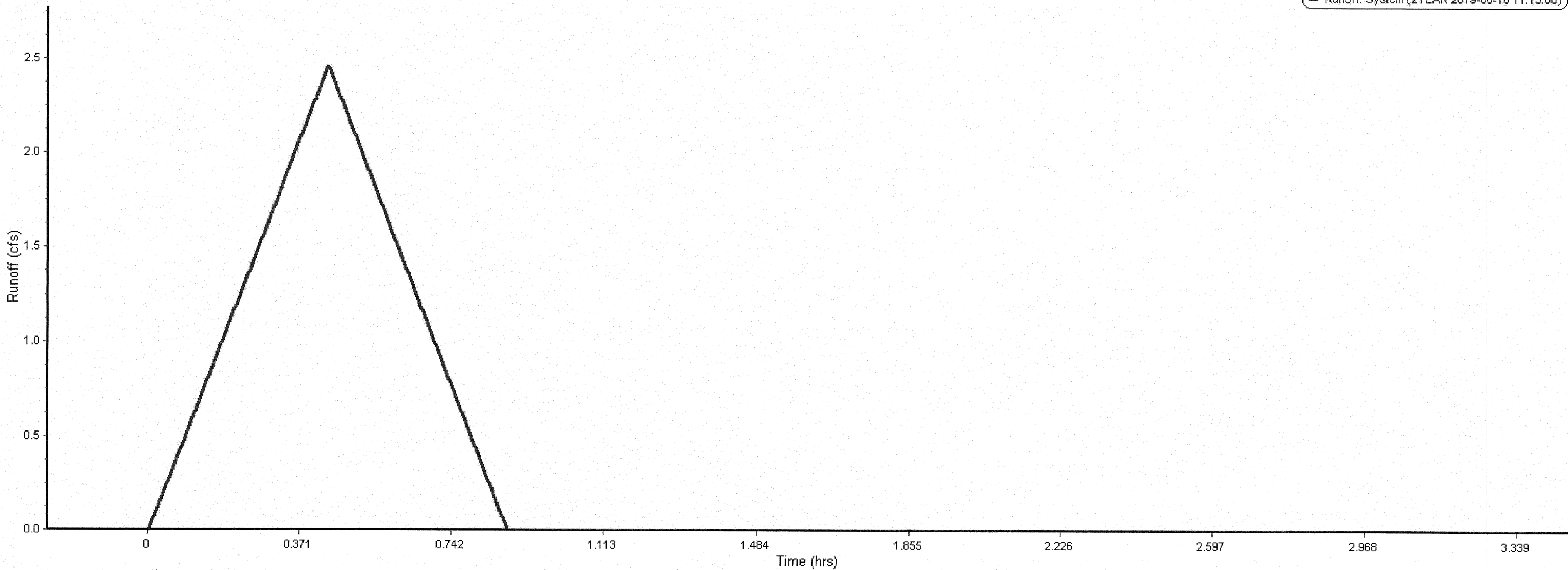
PROPOSED TYPE 'A' INLET

PIPE A-1
STORM DRAIN PIPE ID FOR HYDRAULICS CALCULATIONS

DRAINAGE PLAN
FOR FLOODPLAIN PROJECT
FLOODPLAIN GROUP
APPROVED FOR PLAT
Date: 8/12/19
By: Abdulaziz N. N. N.
Phone:
ENGINEERING SERVICES SECTION
APPROVED FOR PLAT
Date: 08/08/2019
By: Ziphah Thakur

Jun 18, 2019 - 12:21pm \\192.168.0.114\Public\CI18-043-00 Cook Rd apt civil project\Cook Road\DRAINAGE PLAN\NC-5.0 DRAINAGE CALC\EXISTING FOR 2-YEAR.dwg

2 YEAR – ANALYSIS EXISTING AREA



Runoff Summary Table

Time period

From: 12/18/2018, 12:00:00 AM
To: 12/19/2018, 12:00:00 AM

Element ID	System
Maximum Runoff (cfs)	2.47
Minimum Runoff (cfs)	0.00
Event Mean Runoff (cfs)	0.05

TOTAL RUNOFF: 3,898 ft³ / 0.09 Acre-ft / 29,161 Gal

RATIONAL METHOD: 2-YEAR STORM ANALYSIS FOR EXITING DRAINAGE AREAS									
Element ID	Area	Drainage Node ID	Impervious Area	Impervious Coefficient	Accumulated Precipitation	Total Runoff	Peak Runoff	Rainfall Intensity	Time of Concentration
	(acres)		(%)		(inches)	(inches)	(cfs)	(inches/hr)	(days hh:mm:ss)
DA-01	2.11	Inlet-01	45.00	0.35	1.47	0.51	2.47	3.341	0 00:26:24

DRAINAGE PLAN
FOR FLOODPLAIN PROJECT

FLOODPLAIN PROJECT
APPROVED FOR PLAT

Date: 8/12/19
By: Abdulaziz Ndige
Phone:

ENGINEERING SERVICES SECTION
APPROVED FOR PLAT

Date: 08/09/2019
By: Ziphor Thakal

C.O.H. LOG No.:
I.L.M.S. No.:

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NO.	DATE	REVISIONS	APP.

CENTERPOINT ENERGY ID: 1404843276
AT&T TEXAS / SWBT LOG NUMBER: 122018MG06

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Dally
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9800 Richmond Ave., Suite 460
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(713) 337-8881 or (713) 337-8882 f
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Texas Registered Engineering
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TEXAS REGISTERED ENGINEERING
FIRM E-003426

FRED DALLY
90904
06/20/19

COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN

7515 COOK ROAD,
HOUSTON TX 77072

NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER
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CITY OF HOUSTON
HOUSTON PUBLIC WORKS

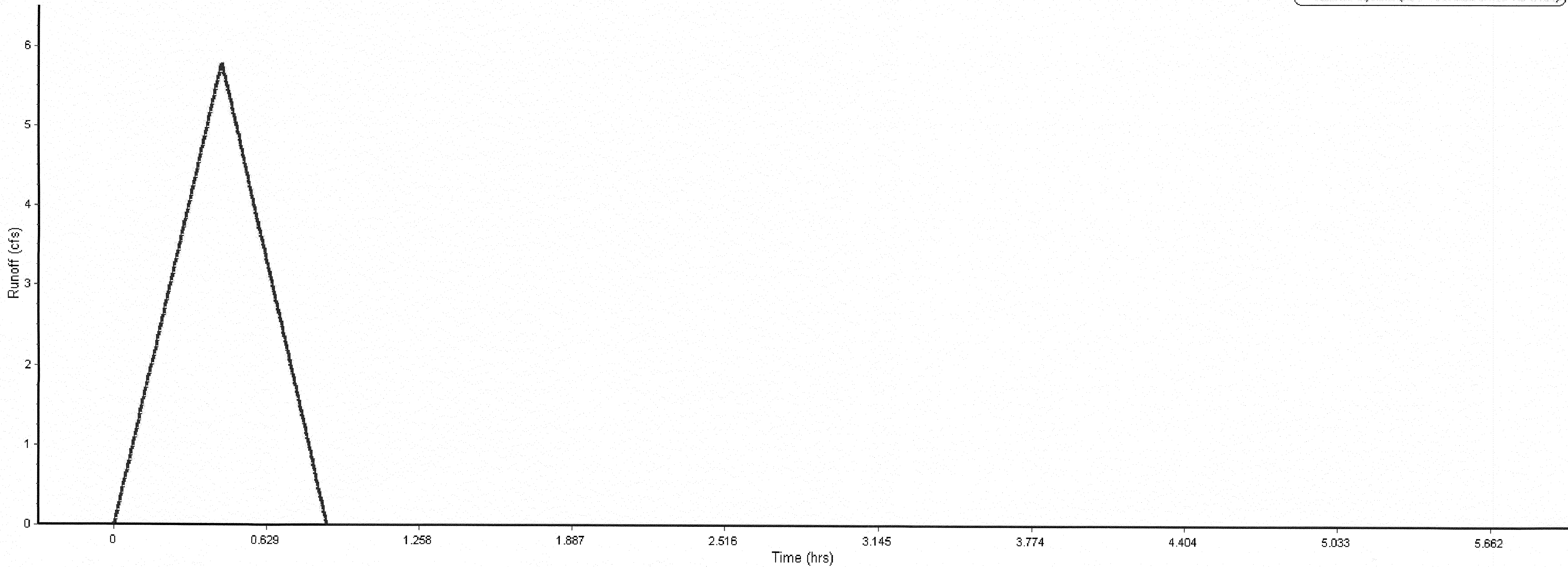
WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE

HORIZ:
VERT:
SHEET NO. 05 OF 14

Jun 18, 2019 - 12:18pm \\192.168.0.114\Publico\C18-043-00 Cook rd apt civil project\Cook Road\RAINAGE PLAN\C18-043-00 DRAINAGE CALCS EXISTING FOR 100-YEAR.dwg

100 YEAR – ANALYSIS FOR EXISTING AREA



Runoff Summary Table		
Time period	Element ID	System
From: 12/18/2018, 12:00:00 AM	Maximum Runoff (cfs)	5.79
To: 12/19/2018, 12:00:00 AM	Minimum Runoff (cfs)	0.00
	Event Mean Runoff (cfs)	0.11

TOTAL RUNOFF: 9,147.86 ft³ / 0.21 Acre-ft / 68,435.14 Gal

RATIONAL METHOD: 100-YEAR STORM ANALYSIS FOR EXISTING DRAINAGE AREAS									
Element	Area	Drainage	Impervious	Impervious	Accumulated	Total	Peak	Rainfall	Time
ID		Node ID	Area	Coefficient	Precipitation	Runoff	Runoff	Intensity	of
	(acres)		(%)		(inches)	(inches)	(cfs)	(inches/hr)	Concentration
DA-01	2.11	Inlet-01	45.00	0.35	3.44	1.20	5.79	7.840	0 00:26:24

DRAINAGE PLAN
FOR FLOODPLAIN PROJECT
FLOODPLAIN GRCL™
APPROVED FOR PLAT
Date: 8/12/19
By: Abdulaziz Aljainy
Phone: _____
ENGINEERING SERVICES SECTION
APPROVED FOR PLAT
Date: 08/08/2019
By: Zihler Thakal

CAUTION: UNDERGROUND GAS FACILITIES
The contractor shall contact the Utility Coordinating Committee at 1-800-545-6005 or 811 a minimum of 48 hours prior to construction to have main and lines field located.
When Center Point Energy pipe line markings are not visible, call 713-207-5463 or 713-945-8037 (7:00 am to 4:30 pm) for status of line location request before excavation begins.
When excavating within eighteen inches (18") of the indicated location of Center Point Energy facilities, all excavation must be accomplished using non-mechanized excavation procedures.
When Center Point Energy facilities are exposed, sufficient support must be provided to the facilities to prevent excessive stress on the piping.
For emergencies regarding gas lines call 713-659-3552 or 713-207-4200. The contractor is fully responsible for any damages caused by the contractor's failure to exactly locate and preserve these underground facilities.

WARNING: OVERHEAD ELECTRICAL LINES
Overhead lines may exist on the property. The location of overhead lines has not been shown on these drawings as the lines are clearly visible, but you should locate them prior to beginning any construction. Texas law, Section 752, Health and Safety Code, forbids activities that occur in close proximity to high-voltage lines, specifically:
Any activities where persons or things may come within six (6) feet of live overhead high voltage lines, and
Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of live overhead high voltage lines.
Parties responsible for the work, including contractors, are legally responsible for the safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or removed call CenterPoint Energy at 713-207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
No approval to use, cross, or occupy CenterPoint fee or easement property is given. If you need to use CenterPoint property, please contact our Surveying & Right of Way Division at 713-207-6348 or 713-207-5769.

WARNING: AT&T TEXAS/SWBT FACILITIES
1. The locations of AT&T Texas/SWBT facilities are shown in an approximate way only. The contractor shall determine the exact location before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by this failure to exactly locate and preserve these underground utilities.
2. The contractor shall call 1-800-344-8377 (TEXAS 811) a minimum of 48 hours prior to construction to have underground lines field located.
3. When excavating within eighteen inches (18") of the indicated location of AT&T Texas/SWBT facilities, all excavations must be accomplished using non-mechanized excavation procedures. When boring, the contractor shall expose the AT&T Texas/SWBT facilities.
4. When AT&T Texas/SWBT facilities are exposed, the contractor will provide support to prevent damage to the conduit ducts or cables. When excavating near telephone poles the contractor shall brace the pole for support.
5. The presence or absence of AT&T Texas/SWBT underground conduit facilities or buried cable facilities shown on these plans does not mean that there are no direct buried cables or other cables in conduit in the area.
6. Please contact the AT&T Texas Damage Prevention Manager Roosevelt Lee Jr. at (713)567-4552 or e-mail him at rj259@att.com, if there are questions about boring or excavating near our AT&T Texas/SWBT facilities.

NO.	DATE	REVISIONS	APP.
CENTERPOINT ENERGY ID: 1404643276			
AT&T TEXAS / SWBT LOG NUMBER: 122018MG06			
NOTICE:			
FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS SIGNATURE DOES NOT FULFILL YOUR OBLIGATION TO CALL 811.			
VERIFICATION OF PRIVATE UTILITY LINES			
Date			
CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not be used for conflict verification.			
Signature valid for six months.			
Date			
CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This signature verifies existing underground facilities – not to be used for conflict verification)			
Signature valid for six months.			
Date			
Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year.			

9800 Richmond Ave., Suite 460
Houston, TX 77056
(713) 337-8881 • (713) 337-8882 f
www.dallyassociates.com
Texas Registered Engineering Firm F-003426

TEXAS REGISTERED ENGINEERING FIRM F-003426
FRED DALLY
90904
06/20/19

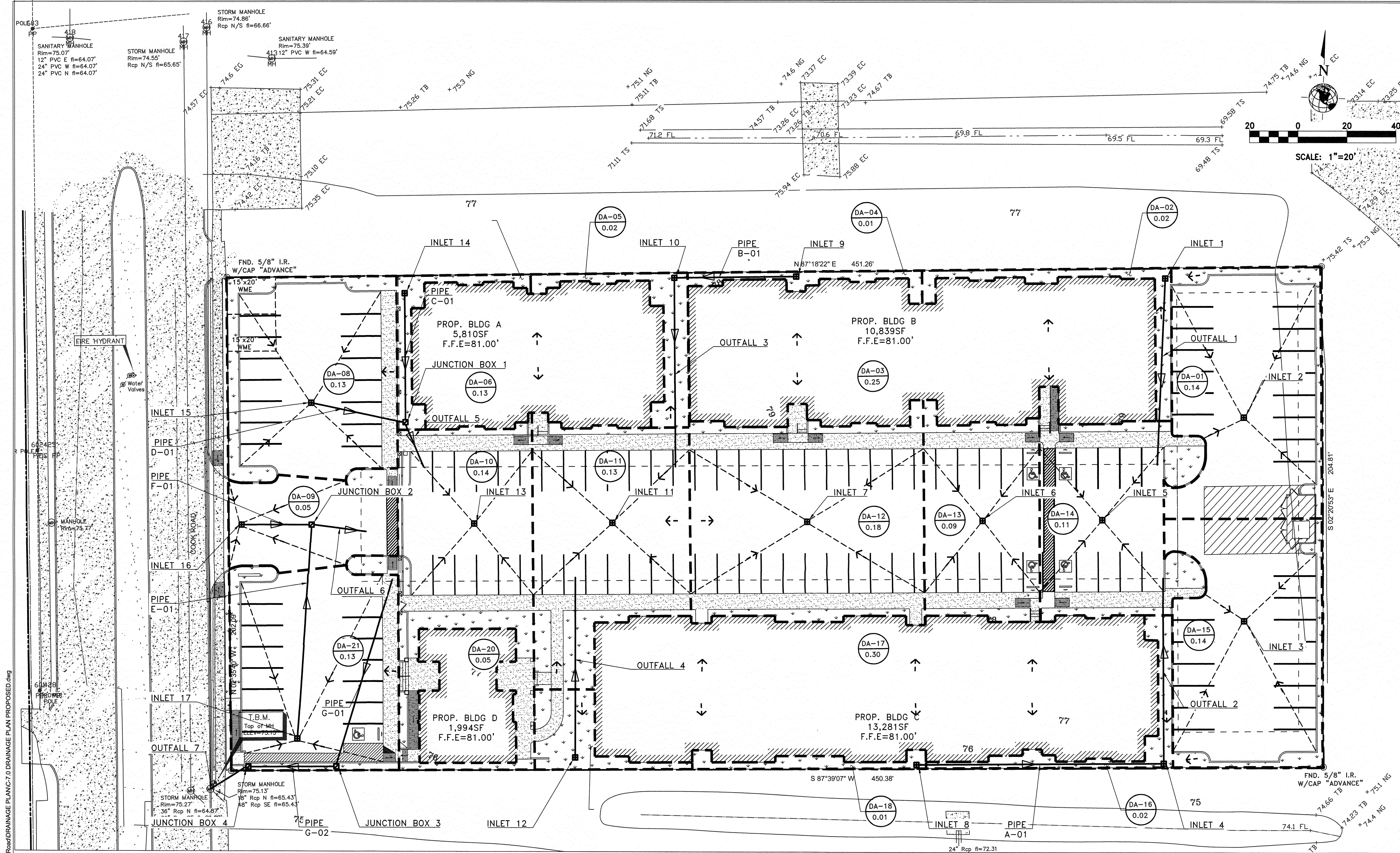
**COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN**
**DRAINAGE CALCS EXISTING
FOR 100 YEAR**
**7515 COOK ROAD,
HOUSTON TX 77072**

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ:	
VERT:	
SHEET NO. 06 OF 14	

C.O.H. LOG No.:
I.L.M.S. No.:



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Daily
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9800 Richmond Ave., Suite 460
Houston, TX 77062
(713) 337-8881 • (713) 337-8882 f
www.dailyassociates.com
Texas Registered Engineering
Firm P-003426

TEXAS REGISTERED ENGINEERING
FIRM 003426

06/20/19

**COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN**

DRAINAGE PLAN PROPOSED

**7515 COOK ROAD,
HOUSTON TX 77072**

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ:	
VERT:	
SHEET NO. 07 OF 14	

DA1
0.01

DRAINAGE SUB-AREA
DRAINAGE SUB-AREA ACREAGE

DRAINAGE AREA LIMITS

→

RUNOFF FLOW DIRECTION

→

STORM WATER FLOW DIRECTION

□

PROPOSED TYPE 'A' INLET

PIPE A-1

STORM DRAIN PIPE ID FOR
HYDRAULICS CALCULATIONS

DRAINAGE PLAN
FOR FLOODPLAIN PROJECT

FLOODPLAIN GRCL™
APPROVED FOR PLAT

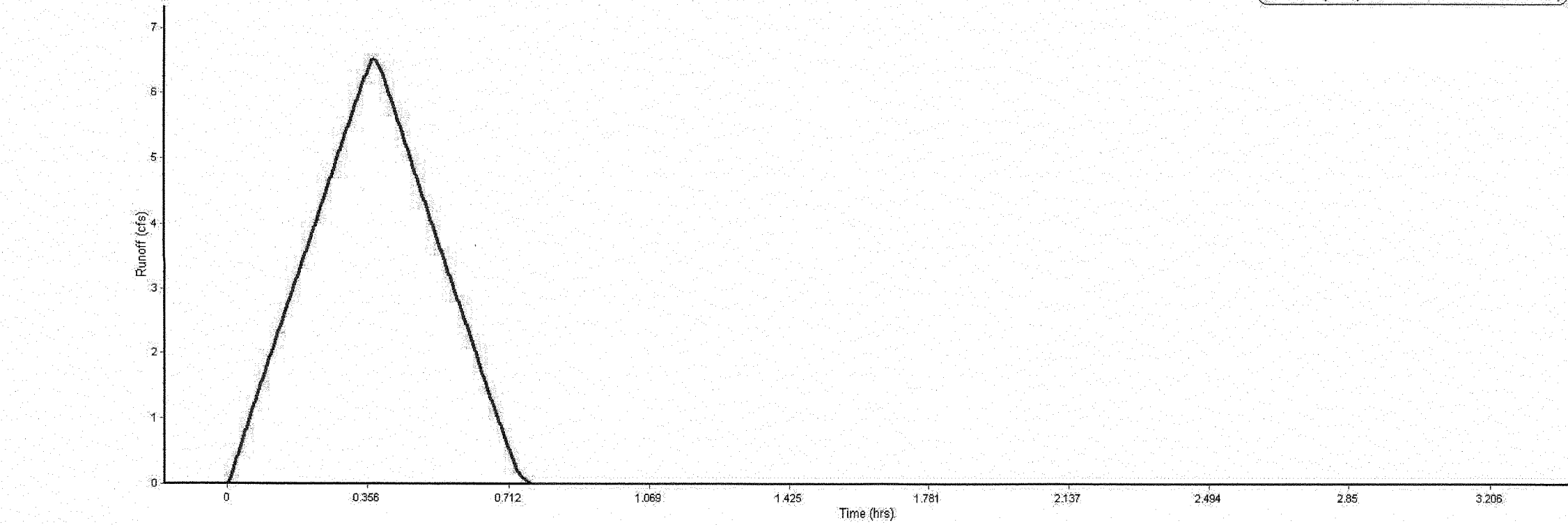
Date: 8/12/19
By: Abdulaziz M. Hage

Phone: _____

ENGINEERING SERVICES SECTION
APPROVED FOR PLAT

Date: 08/08/2019
By: Ziphah Thakad

2 YEAR - ANALYSIS FOR PROPOSED AREA



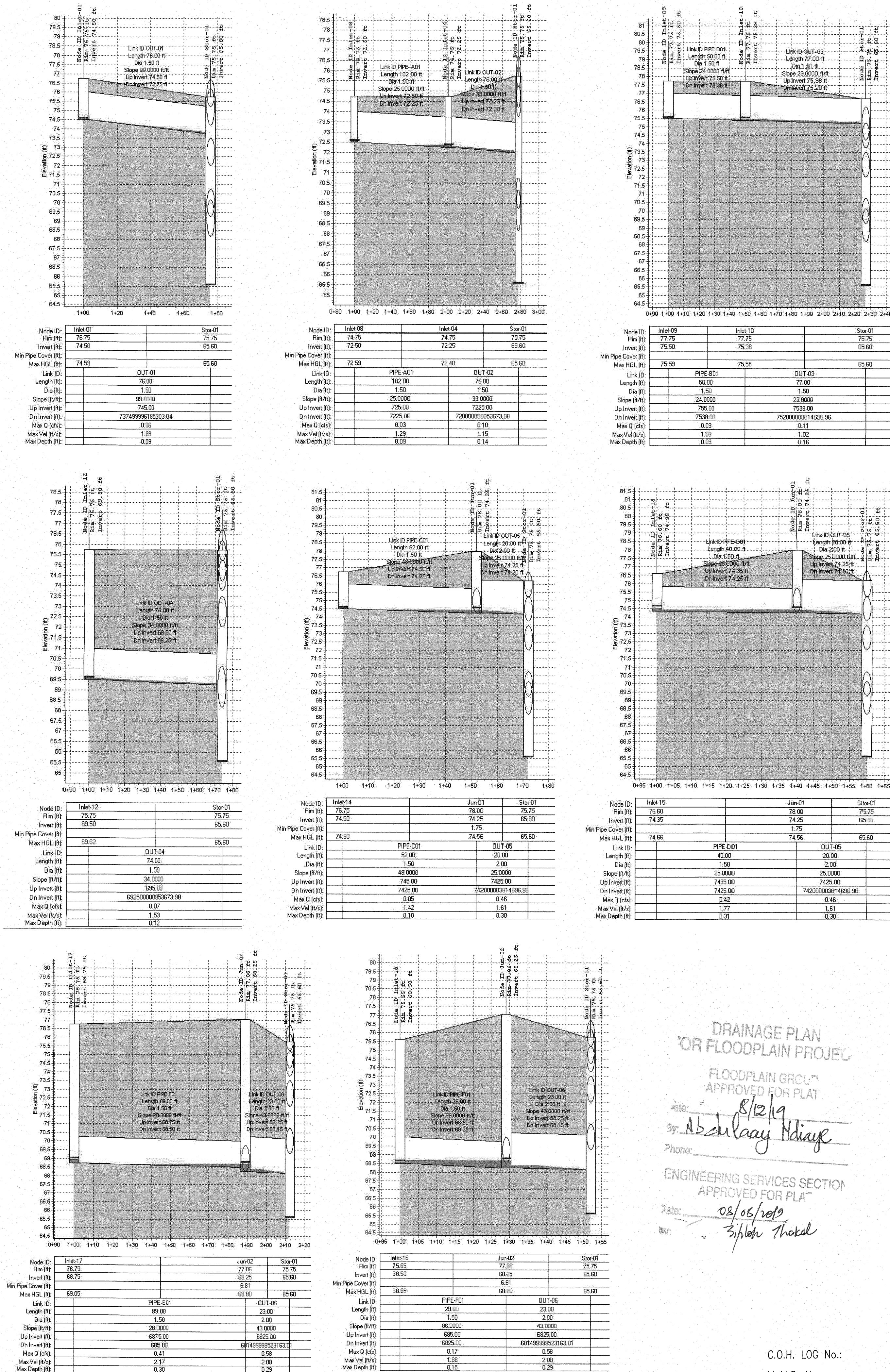
Time period		Element ID		System	
From:	05/23/2019, 12:00:00 AM	Maximum Runoff (cfs)	6.52		
To:	05/23/2019, 12:00:00 AM	Minimum Runoff (cfs)	0.00		
Thresholds		Event Mean Runoff (cfs)	0.10		
Exceedences		Duration of Exceedences (hrs)	N/A		
Deficit	0	Number of Exceedences	N/A		
Detention storage		Volume of Exceedences (ft³)	N/A		
Max flow	0	Volume of Deficit (ft³)	N/A		
		Total Runoff (ft³)	8850.13		
		Detention Storage (ft³)	N/A		

TOTAL RUNOFF: 8,850.13 ft³ / 66,207.82 Gal/ 0.2032 Acre-ft.

RATIONAL METHOD: 2-YEAR STORM ANALYSIS FOR PIPES																			
Element ID	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Total Drop	Average Slope	Pipe Shape	Pipe Diameter or Height	Pipe Width	Pipe Manning's Roughness	Peak Flow Occurrence	Time of Flow Velocity	Max Flow Capacity	Design Flow Ratio	Max Flow Depth / Total Depth	Max Flow Surcharged Depth	Reported Condition	
			(ft)	(ft)	(ft)	(ft)	(%)		(inches)	(inches)		(cfs) (days hh:mm)	(ft/sec) (min)	(cfs)		Ratio	(ft)		
OUT-01	Inlet-01	Stor-01	76.00	74.50	73.75	0.75	0.9900	CIRCULAR	18.000	18.00	0.0150	0.06 0 00:20	1.89	0.67	9.04	0.01	0.06	0.00	0.09 Calculated
OUT-02	Inlet-04	Stor-01	76.00	72.25	72.00	0.25	0.3300	CIRCULAR	18.000	18.00	0.0150	0.10 0 00:21	1.15	1.10	5.22	0.02	0.10	0.00	0.14 Calculated
OUT-03	Inlet-10	Stor-01	77.00	75.38	75.20	0.18	0.2300	CIRCULAR	18.000	18.00	0.0150	0.11 0 00:21	1.02	1.26	4.40	0.02	0.11	0.00	0.16 Calculated
OUT-04	Inlet-12	Stor-01	74.00	69.50	69.25	0.25	0.3400	CIRCULAR	18.000	18.00	0.0150	0.07 0 00:20	1.53	0.81	5.29	0.01	0.08	0.00	0.12 Calculated
OUT-05	J/B1	Stor-01	20.00	74.25	74.20	0.05	0.2500	CIRCULAR	24.000	24.00	0.0150	0.46 0 00:22	1.61	0.21	9.80	0.05	0.15	0.00	0.30 Calculated
OUT-06	J/B2	Stor-01	23.00	68.25	68.15	0.10	0.4300	CIRCULAR	24.000	24.00	0.0150	0.58 0 00:22	2.08	0.18	12.93	0.04	0.14	0.00	0.29 Calculated
PIPE-A01	Inlet-08	Inlet-04	102.00	72.50	72.25	0.25	0.2500	CIRCULAR	18.000	18.00	0.0150	0.03 0 00:20	1.29	1.32	4.51	0.01	0.06	0.00	0.09 Calculated
PIPE-B01	Inlet-09	Inlet-10	50.00	75.50	75.38	0.12	0.2400	CIRCULAR	18.000	18.00	0.0150	0.03 0 00:20	1.09	0.76	4.46	0.01	0.06	0.00	0.09 Calculated
PIPE-C01	Inlet-14	J/B1	52.00	74.50	74.25	0.25	0.4800	CIRCULAR	18.000	18.00	0.0150	0.05 0 00:20	1.42	0.61	6.31	0.01	0.07	0.00	0.10 Calculated
PIPE-D01	Inlet-15	J/B1	40.00	74.35	74.25	0.10	0.2500	CIRCULAR	18.000	18.00	0.0150	0.42 0 00:22	1.77	0.38	4.55	0.09	0.20	0.00	0.31 Calculated
PIPE-E01	Inlet-17	J/B2	89.00	68.75	68.50	0.25	0.2800	CIRCULAR	18.000	18.00	0.0150	0.41 0 00:22	2.17	0.68	4.82	0.09	0.20	0.00	0.30 Calculated
PIPE-F01	Inlet-16	J/B2	29.00	68.50	68.25	0.25	0.8600	CIRCULAR	18.000	18.00	0.0150	0.17 0 00:21	1.88	0.26	8.45	0.02	0.10	0.00	0.15 Calculated

RATIONAL METHOD: 2-YEAR STORM ANALYSIS FOR INLETS																	
Element ID	Catchbasin Invert Elevation	Max (Rim) (ft)	Max (Rim) Offset (ft)	Initial Water Elevation (ft)	Ponded Water Depth (ft)	Area (ft²)	Grate Clogging Factor (%)	Peak Flow (cfs)	Peak Storm Inflow (cfs)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Maximum Occurrence (days hh:mm)	Total Flooded Volume (ac-inches)	Total Time Flooded (minutes)		
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft²)	(%)	(cfs)	(cfs)		(ft)						
Inlet-01	74.50	76.75	2.25	74.50	0.00	10.00	25.00	0.06	0.06	0.00	76.76	0.01	00:20	0.00	0.00		
Inlet-02	75.75	78.50	2.75	75.50	0.00	10.00	25.00	0.45	0.45	0.00	78.56	0.06	00:00	0.00	0.00		
Inlet-03	75.75	78.50	2.75	75.25	0.00	10.00	25.00	0.45	0.45	0.00	78.56	0.06	00:00	0.00	0.00		
Inlet-04	72.25	74.75	2.50	72.75	0.00	10.00	25.00	0.07	0.07	0.00	74.76	0.01	00:20	0.00	0.00		
Inlet-05	75.75	78.50	2.75	75.75	0.00	10.00	25.00	0.36	0.36	0.00	78.55	0.05	00:00	0.00	0.00		
Inlet-06	75.75	78.50	2.75	75.50	0.00	10.00	25.00	1.04	1.04	0.00	78.60	0.10	00:00	0.00	0.00		
Inlet-07	75.75	78.50	2.75	75.75	0.00	10.00	25.00	1.49	1.49	0.00	78.60	0.10	00:00	0.00	0.00		
Inlet-08	72.50	74.75	2.25	72.50	0.00	10.00	25.00	0.03	0.03	0.00	74.75	0.00	00:19	0.00	0.00		
Inlet-09	75.50	77.75	2.25	75.50	0.00	10.00	25.00	0.03	0.03	0.00	77.75	0.00	00:19	0.00	0.00		
Inlet-10	75.38	77.75	2.37	75.38	0.00	10.00	25.00	0.07	0.07	0.00	77.76	0.01	00:20	0.00	0.00		
Inlet-11	75.75	78.25	2.50	75.75	0.00	10.00	25.00	0.85	0.85	0.00	78.34	0.09	00:00	0.00	0.00		
Inlet-12	69.50	75.75	6.25	69.50	0.00	10.00	25.00	0.07	0.07	0.00	75.76	0.01	00:20	0.00	0.00		
Inlet-13	75.75	77.75	2.00	75.75	0.00	10.00	25.00	0.59	0.59	0.00	77.82	0.07	00:00	0.00	0.00		
Inlet-14	74.50	76.75	2.25	74.50	0.00	10.00	25.00	0.05	0.05	0.00	76.76	0.01	00:20	0.00	0.00		
Inlet-15	74.35	76.60	2.25	74.35	0.00	10.00	25.00	0.42	0.42	0.00	76.65	0.05	00:22	0.00	0.00		
Inlet-16	68.50	75.65	7.15	68.50	0.00	10.00	25.00	0.17	0.17	0.00	75.67	0.02	00:21	0.00	0.00		
Inlet-17	68.75	76.75	8.00	68.75	0.00	10.00	25.00	0.42	0.42	0.00	76.80	0.05	00:22	0.00	0.00		

RATIONAL METHOD: 2-YEAR STORM ANALYSIS FOR DRAINAGE AREAS									
Element ID	Area Drainage Node ID	Impervious Area	Impervious Coefficient	Accumulated Precipitation	Total Runoff	Peak Runoff	Rainfall Intensity	Time of Concentration	
	(acres)	(%)		(inches)	(inches)	(cfs)	(inches/hr)	(days hh:mm:ss)	
DA-01	0.14	Inlet-02	45.00	0.80	1.46	1.17	0.45	3.978	0 00:22:04
DA-02	0.02	Inlet-01	45.00	0.80	1.39	1.12	0.06	4.182	0 00:19:58
DA-03	0.25	Inlet-06	45.00	0.80	1.49	1.19	0.78	3.912	0 00:22:49
DA-04	0.01	Inlet-09	45.00	0.80	1.38	1.10	0.03	4.240	0 00:19:26
DA-05	0.02	Inlet-10	45.00	0.80	1.40	1.12	0.07	4.169	0 00:20:06
DA-06	0.13	Inlet-11	45.00	0.80	1.46	1.17	0.42	3.984	0 00:22:00
DA-07	0.02	Inlet-14	45.00	0.80	1.39	1.11	0.05	4.198	0 00:19:49
DA-08	0.13	Inlet-15	45.00	0.80	1.46	1.17	0.42	3.986	0 00:21:59
DA-09	0.05	Inlet-16	45.00	0.80	1.43	1.14	0.17	4.083	0 00:20:57
DA-11	0.13	Inlet-11	45.00	0.80	1.46	1.17	0.43	3.983	0 00:22:01
DA-12	0.18	Inlet-07	45.00	0.80	1.47	1.18	0.56	3.951	0 00:22:22
DA-13	0.09	Inlet-06	45.00	0.80	1.44	1.16	0.28	4.029	0 00:21:31
DA-14	0.11	Inlet-05	45.00	0.80	1.46	1.17	0.36	4.004	0 00:21:47
DA-15	0.14	Inlet-03	45.00	0.80	1.47	1.18	0.45	3.977	0 00:22:05
DA-16	0.02	Inlet-04	45.00	0.80	1.39	1.11	0.07	4.178	0 00:20:01
DA-17	0.30	Inlet-07	45.00	0.80	1.50	1.20	0.95	3.887	0 00:23:06
DA-18	0.01	Inlet-08	45.00	0.80	1.38	1.10	0.03	4.240	0 00:19:26
DA-19	0.02	Inlet-12	45.00	0.80	1.40	1.12	0.07	4.169	0 00:20:06
DA-20	0.05	Inlet-13	45.00	0.80	1.42	1.14	0.15	4.098	0 00:20:48
DA-21	0.13	Inlet-17	45.00	0.80	1.46	1.17	0.42	3.986	0 00:21:59
DA-10	0.14	Inlet-13	45.00	0.80	1.46	1.17	0.45	3.978	0 00:22:04



DRainage Plan
OR FLOODPLAIN PROJECT
APPROVED FOR PLAT
8/2/19
By: Abdulaziz Ndijaye
Phone: 813-455-1111
ENGINEERING SERVICES SECTION
APPROVED FOR PLAT
08/06/2019
By: Ziphah Thokel

C.O.H. LOG No.:
I.L.M.S. No.:

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Overhead lines may exist on this property. The location of overhead lines has not been shown on these drawings as the lines are clearly visible, but you should locate them prior to beginning any construction. Texas law, Section 752, Health and Safety Code, forbids activities that occur in close proximity to high voltage lines, specifically:
• Any activities where persons or things may come within six (6) feet of live overhead high voltage lines, and
• Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of live overhead high voltage lines.
Parties responsible for the work, including contractors, are legally responsible for the safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or removed call CenterPoint Energy at 713-207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
No approval to use, cross, or occupy CenterPoint fee or easement property is given. If you need to use CenterPoint property, please contact our Surveying & Right of Way Division at 713-207-6348 or 713-207-5769.

WARNING: AT&T TEXAS/SWBT FACILITIES
1. The locations of AT&T Texas/SWBT facilities are shown in an approximate way only. The contractor shall determine the exact location before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by this failure to exactly locate and preserve these underground utilities.
2. The contractor shall call 1-800-344-8377 (TEXAS 811) a minimum of 48 hours prior to construction to have underground lines field located.
3. When excavating within eighteen inches (18") of the indicated location of AT&T Texas/SWBT facilities, all excavations must be accomplished using non-mechanized excavation procedures. When boring, the contractor shall expose the AT&T Texas/SWBT facilities.
4. When AT&T Texas/SWBT facilities are exposed, the contractor will provide support to prevent damage to the conduit ducts or cables. When excavating near telephone poles the contractor shall brace the pole for support.
5. The presence or absence of AT&T Texas/SWBT underground conduit facilities or buried cable facilities shown on these plans does not mean that there are no direct buried cables or other cables in conduit in the area.
6. Please contact the AT&T Texas Damage Prevention Manager Roosevelt Lee Jr. at (713)567-4552 or e-mail him at r7259@att.com, if there are questions about boring or excavating near our AT&T Texas/SWBT facilities.

NO.	DATE	REVISIONS	APP.
		CENTERPOINT ENERGY ID: 1404643276	
		AT&T TEXAS / SWBT LOG NUMBER: 122018MG06	
		NOTICE:	
		FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS SIGNATURE DOES NOT FULFILL YOUR OBLIGATION TO CALL 811	
		VERIFICATION OF PRIVATE UTILITY LINES	
		Date	
		CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not be used for conflict verification.	
		Signature valid for six months.	
		Date	
		CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This signature verifies existing underground facilities - not to be used for conflict verification)	
		Signature valid for six months.	
		Date	
		Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year.	
		TEXAS REGISTERED ENGINEERING	
		Dially + ASSOCIATES STRUCTURAL / CIVIL 9880 Richmond Ave., Suite 400 Houston, TX 77042 (713) 337-8881 or (713) 337-8882 f www.diallyassociates.com Texas Registered Engineering Firm F-034326	
		FRED DALLY 90904 06/20/19	

**COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN
DRAINAGE PROPOSED CALCS
FOR 2 YEAR
7515 COOK ROAD,
HOUSTON TX 77072**

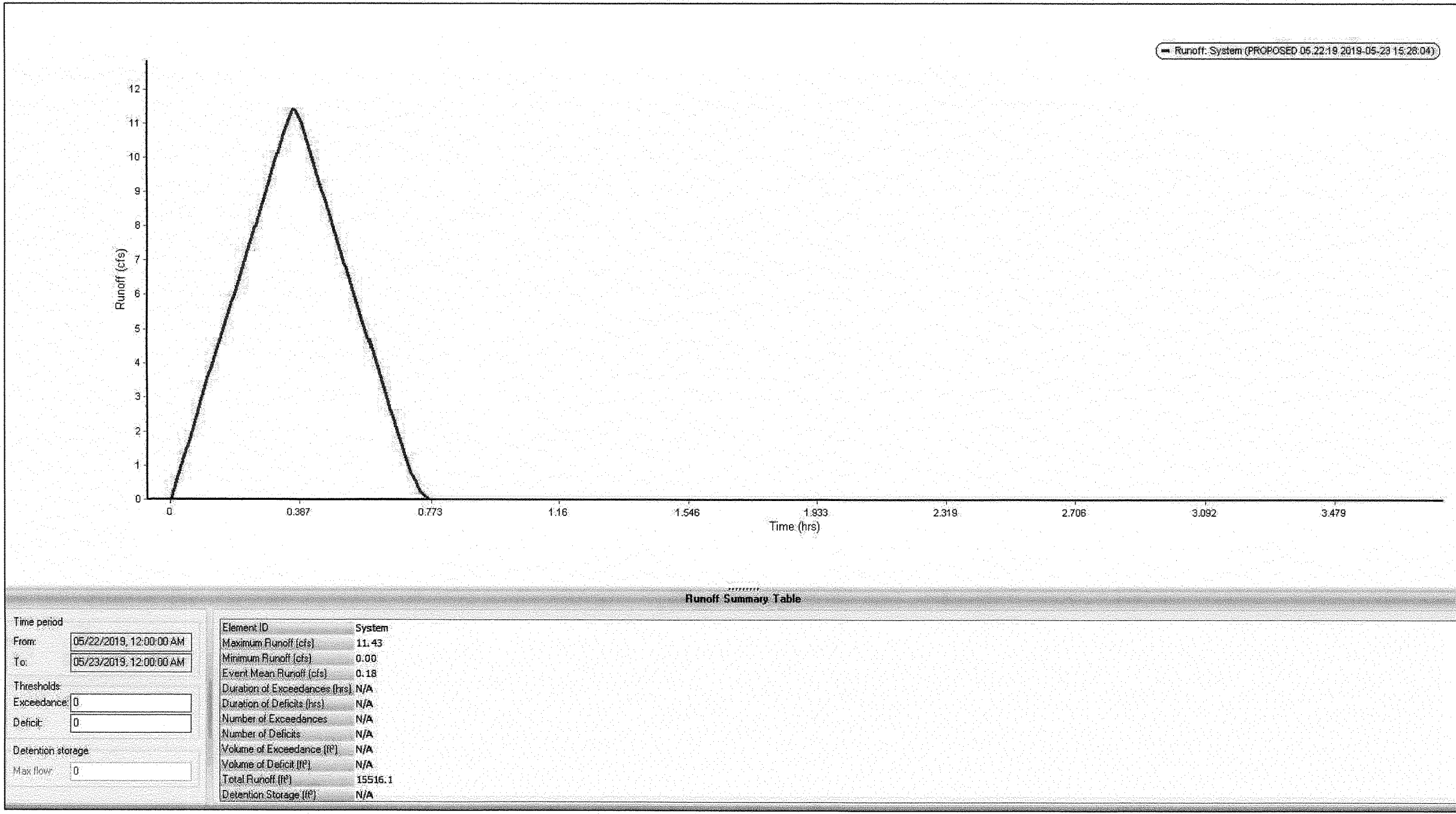
NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE
HORIZ:
VERT:
SHEET NO. 08 OF 14

100 YEAR – ANALYSIS FOR PROPOSED AREA

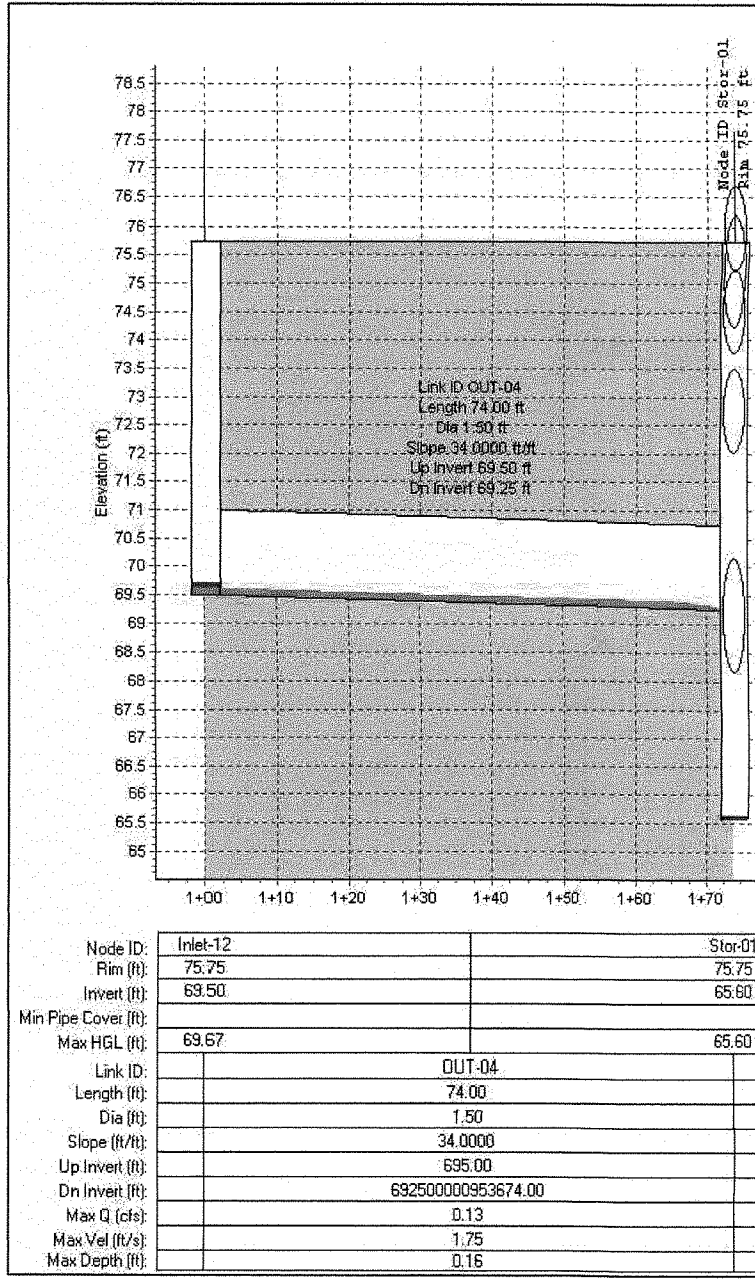
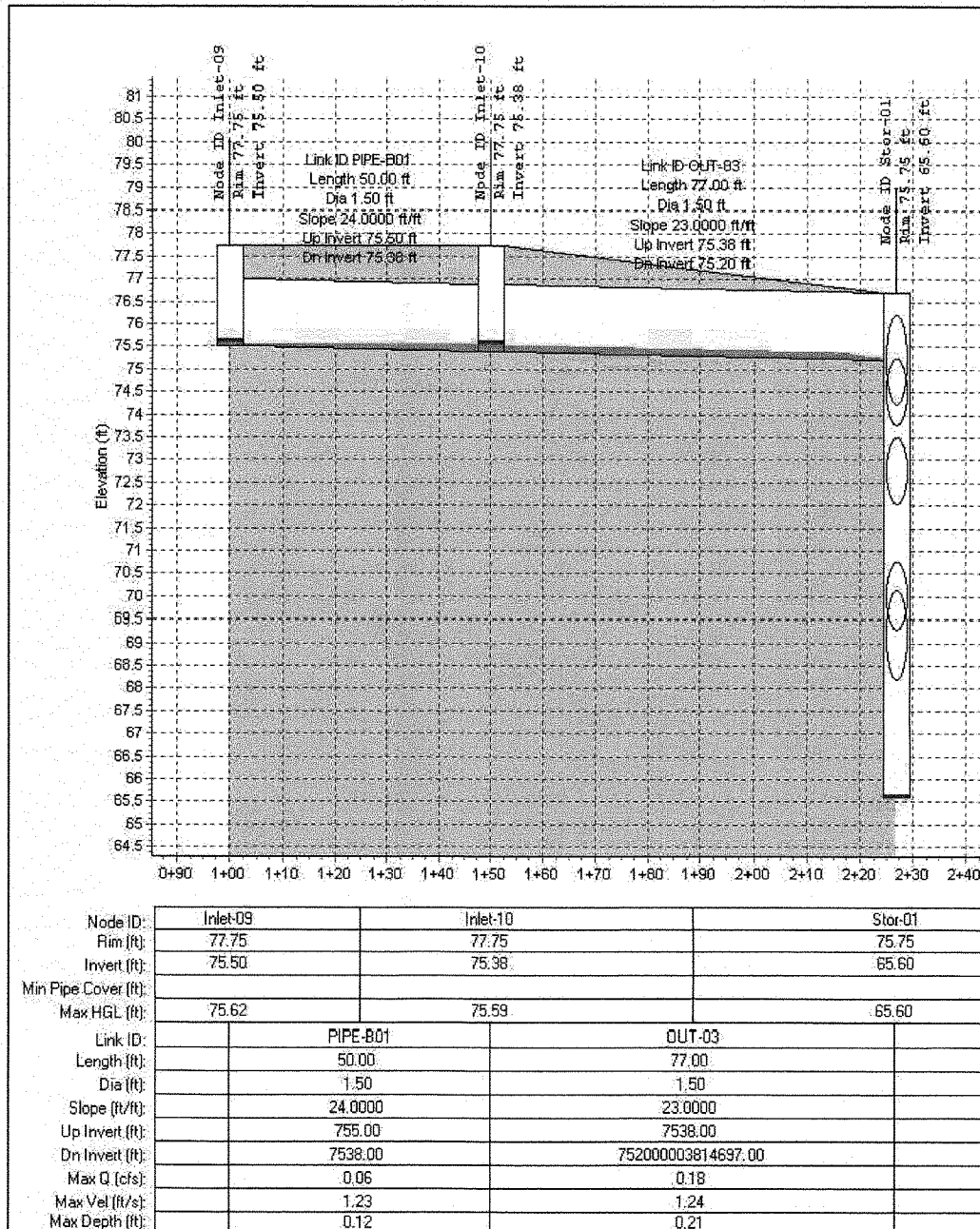
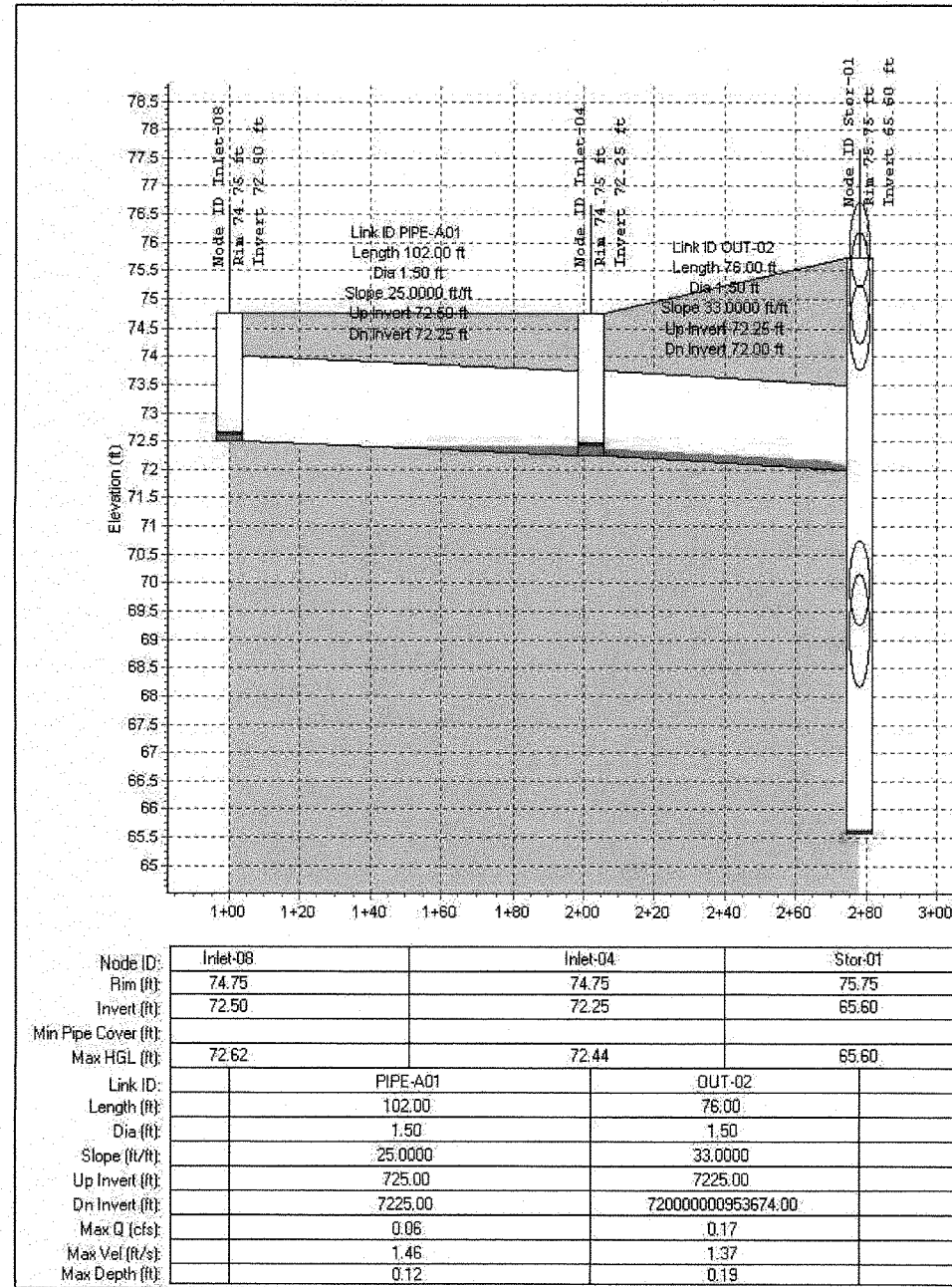
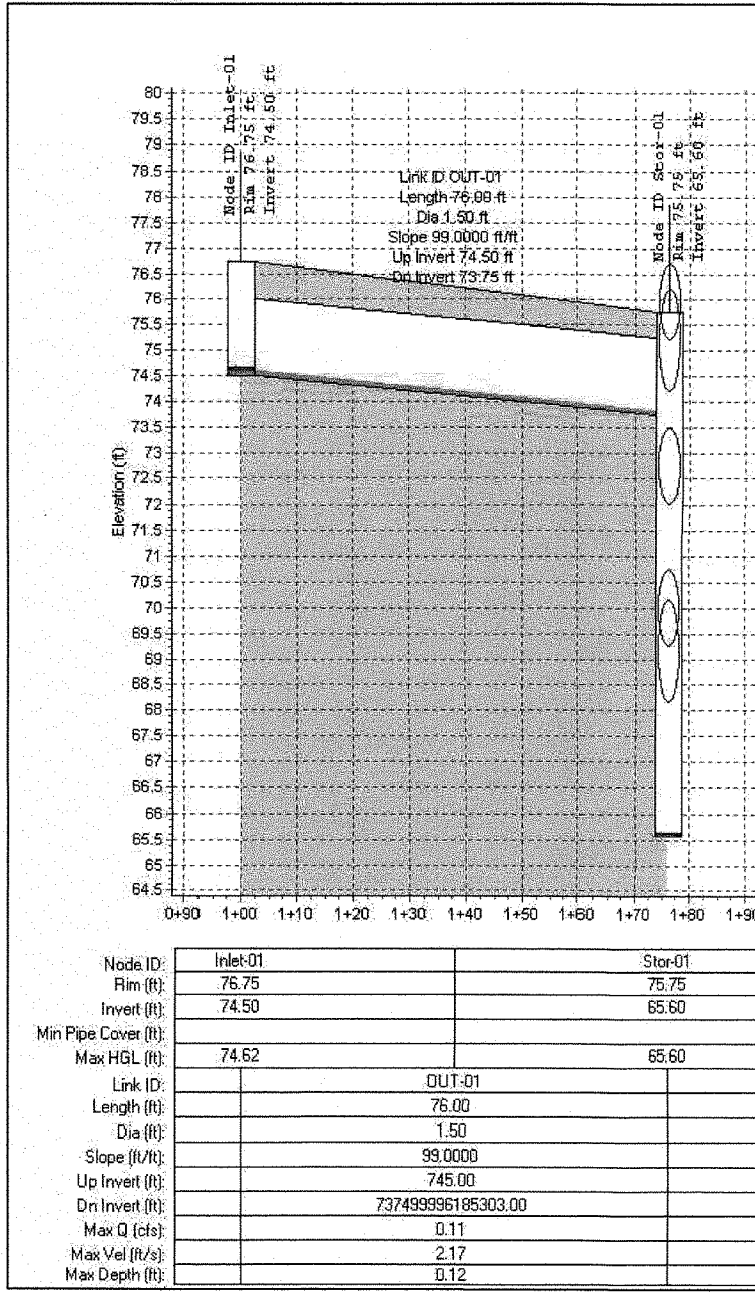


TOTAL RUNOFF: 15,516.10 ft³ / 116,075.9441 Gal/ 0.3562 Acre–ft.

RATIONAL METHOD: 100-YEAR STORM ANALYSIS FOR PIPES																					
Element ID	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Outlet Invert Elevation	Total Drop	Average Slope	Pipe Shape	Pipe Diameter or Height	Pipe Width	Pipe Manning's Roughness	Peak Flow	Time of Peak Flow	Max Flow Velocity	Travel Time	Design Flow Capacity	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surched	Max Flow Depth	Reported Condition
			(ft)	(ft)	(ft)	(ft)	(%)		(Inches)	(Inches)		(cfs)	(days h:mm)	(ft/sec)	(min)	(cfs)			(min)	(ft)	
OUT-01	Inlet-01	Stor-01	76.00	74.50	73.75	0.75	0.9900	CIRCULAR	18.000	18.00	0.0150	0.11	00:20	2.17	0.58	9.04	0.01	0.08	0.00	0.12	Calculated
OUT-02	Inlet-04	Stor-01	76.00	72.25	72.00	0.25	0.3300	CIRCULAR	18.000	18.00	0.0150	0.17	00:20	1.37	0.92	5.22	0.03	0.12	0.00	0.19	Calculated
OUT-03	Inlet-10	Stor-01	77.00	75.38	75.00	0.38	0.2300	CIRCULAR	18.000	18.00	0.0150	0.18	00:20	1.24	1.03	4.40	0.04	0.14	0.00	0.21	Calculated
OUT-04	Inlet-12	Stor-01	74.00	69.50	69.25	0.25	0.3400	CIRCULAR	18.000	18.00	0.0150	0.13	00:20	1.75	0.70	5.29	0.02	0.11	0.00	0.16	Calculated
OUT-05	/J81	Stor-01	20.00	74.25	74.20	0.05	0.2500	CIRCULAR	24.000	24.00	0.0150	0.81	00:22	1.89	0.18	9.80	0.08	0.19	0.00	0.39	Calculated
OUT-06	/J82	Stor-01	23.00	68.25	68.15	0.10	0.4300	CIRCULAR	24.000	24.00	0.0150	1.01	00:22	2.45	0.16	12.93	0.08	0.19	0.00	0.38	Calculated
PIPE-A01	Inlet-08	Inlet-04	102.00	72.50	72.25	0.25	0.2500	CIRCULAR	18.000	18.00	0.0150	0.06	00:20	1.46	1.16	4.51	0.01	0.08	0.00	0.12	Calculated
PIPE-B01	Inlet-09	Inlet-10	50.00	75.50	75.38	0.12	0.2400	CIRCULAR	18.000	18.00	0.0150	0.06	00:20	1.23	0.68	4.46	0.01	0.08	0.00	0.12	Calculated
PIPE-C01	Inlet-14	/J81	52.00	74.50	74.25	0.25	0.4800	CIRCULAR	18.000	18.00	0.0150	0.09	00:20	1.62	0.53	6.31	0.01	0.08	0.00	0.13	Calculated
PIPE-D01	Inlet-15	/J81	40.00	74.35	74.25	0.10	0.2500	CIRCULAR	18.000	18.00	0.0150	0.73	00:22	1.99	0.34	4.55	0.16	0.27	0.00	0.41	Calculated
PIPE-E01	Inlet-17	/J82	89.00	68.75	68.50	0.25	0.2800	CIRCULAR	18.000	18.00	0.0150	0.73	00:22	2.46	0.60	4.82	0.15	0.26	0.00	0.39	Calculated
PIPE-F01	Inlet-16	/J82	29.00	68.50	68.25	0.25	0.8600	CIRCULAR	18.000	18.00	0.0150	0.30	00:21	2.26	0.21	8.45	0.04	0.13	0.00	0.19	Calculated

RATIONAL METHOD: 100-YEAR STORM ANALYSIS FOR INLETS																	
Element ID	Catchbasin Invert Elevation	Max (Rim) Elevation	Max (Rim) Offset	Initial Water Elevation	Initial Water Depth	Ponded Area	Grate Clogging Factor	Peak Flow	Peak Lateral Inflow	Storm Allowable Spread	Max Gutter Spreading	Max Gutter Water Level during Peak Flow	Max Gutter Water Depth during Peak Flow	Time of Occurrence	Total Flooded Volume	Total Time Flooded	
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft²)	(%)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(days hh:mm)	(ac-inches)	(minutes)	
Inlet-01	74.50	76.75	2.25	74.50	0.00	10.00	25.00	0.11	0.11	7.00	0.00	76.76	0.01	00:20:20	0.00	0.00	
Inlet-02	75.75	78.50	2.75	75.75	0.00	10.00	25.00	0.78	0.78	7.00	0.00	78.58	0.08	00:00:00	0.00	0.00	
Inlet-03	75.75	78.50	2.75	75.75	0.00	10.00	25.00	0.79	0.79	7.00	0.00	78.58	0.08	00:00:00	0.00	0.00	
Inlet-04	72.25	74.75	2.50	72.25	0.00	10.00	25.00	0.12	0.12	7.00	0.00	74.77	0.02	00:20:20	0.00	0.00	
Inlet-05	75.75	78.50	2.75	75.75	0.00	10.00	25.00	0.62	0.62	7.00	0.00	78.57	0.07	00:00:00	0.00	0.00	
Inlet-06	75.75	78.50	2.75	75.75	0.00	10.00	25.00	1.83	1.83	7.00	0.00	78.64	0.14	00:00:00	0.00	0.00	
Inlet-07	75.75	78.50	2.75	75.75	0.00	10.00	25.00	2.61	2.61	7.00	0.00	78.64	0.14	00:00:00	0.00	0.00	
Inlet-08	72.50	74.75	2.25	72.50	0.00	10.00	25.00	0.06	0.06	7.00	0.00	74.76	0.01	00:19:19	0.00	0.00	
Inlet-09	75.50	77.75	2.25	75.50	0.00	10.00	25.00	0.06	0.06	7.00	0.00	77.76	0.01	00:19:19	0.00	0.00	
Inlet-10	75.38	77.75	2.37	75.38	0.00	10.00	25.00	0.13	0.13	7.00	0.00	77.77	0.02	00:20:20	0.00	0.00	
Inlet-11	75.75	78.25	2.50	75.75	0.00	10.00	25.00	1.49	1.49	7.00	0.00	78.38	0.13	00:00:00	0.00	0.00	
Inlet-12	69.50	75.75	6.25	69.50	0.00	10.00	25.00	0.13	0.13	7.00	0.00	75.77	0.02	00:20:20	0.00	0.00	
Inlet-13	75.75	77.75	2.00	75.75	0.00	10.00	25.00	1.03	1.03	7.00	0.00	77.85	0.10	00:00:00	0.00	0.00	
Inlet-14	74.50	76.75	2.25	74.50	0.00	10.00	25.00	0.09	0.09	7.00	0.00	76.76	0.01	00:20:20	0.00	0.00	
Inlet-15	74.35	76.60	2.25	74.35	0.00	10.00	25.00	0.73	0.73	7.00	0.00	76.68	0.08	00:22:22	0.00	0.00	
Inlet-16	68.50	75.65	7.15	68.50	0.00	10.00	25.00	0.30	0.30	7.00	0.00	75.69	0.04	00:21:21	0.00	0.00	
Inlet-17	68.75	76.75	8.00	68.75	0.00	10.00	25.00	0.73	0.73	7.00	0.00	76.83	0.08	00:22:22	0.00	0.00	

RATIONAL METHOD: 100-YEAR STORM ANALYSIS FOR DRAINAGE AREAS									
Element ID	Area (acres)	Impervious (%)	Area Coefficient	Precipitation (inches)	Runoff (inches)	Intensity (inches/hr)	Time of Concentration (days h:mm:ss)	Peak Flow (cfs)	Peak Flow (cfs)
DA-01	0.14	45.00	0.80	2.56	2.05	0.78	0 00:22:04	6.974	6.974
DA-02	0.02	45.00	0.80	2.43	1.94	0.11	0 00:19:58	0.991	0.991
DA-03	0.25	45.00	0.80	2.62	2.09	1.36	0 00:22:49	6.876	6.876
DA-04	0.01	45.00	0.80	2.39	1.91	0.06	0 00:19:26	0.7361	0.7361
DA-05	0.02	45.00	0.80	2.44	1.95	0.13	0 00:20:05	0.7256	0.7256
DA-06	0.13	45.00	0.80	2.56	2.05	0.74	0 00:22:00	6.982	6.982
DA-07	0.03	45.00	0.80	2.41	1.93	0.08	0 00:19:49	0.7299	0.7299
DA-08	0.13	45.00	0.80	2.56	2.05	0.73	0 00:21:59	6.985	6.985
DA-09	0.05	45.00	0.80	2.50	2.00	0.30	0 00:20:57	7.129	7.129
DA-10	0.14	45.00	0.80	2.56	2.05	0.78	0 00:22:04	6.974	6.974
DA-11	0.13	45.00	0.80	2.56	2.05	0.75	0 00:22:01	6.981	6.981
DA-12	0.18	45.00	0.80	2.58	2.06	0.99	0 00:22:22	6.993	6.993
DA-13	0.09	45.00	0.80	2.53	2.02	0.90	0 00:21:31	7.049	7.049
DA-14	0.11	45.00	0.80	2.55	2.04	0.62	0 00:21:47	7.012	7.012
DA-15	0.14	45.00	0.80	2.58	2.06	0.79	0 00:22:05	6.971	6.971
DA-16	0.02	45.00	0.80	2.42	1.94	0.12	0 00:20:01	7.270	7.270
DA-17	0.30	45.00	0.80	2.64	2.11	1.66	0 00:23:06	6.839	6.839
DA-18	0.01	45.00	0.80	2.39	1.91	0.06	0 00:19:26	0.7361	0.7361
DA-19	0.02	45.00	0.80	2.44	1.95	0.13	0 00:20:05	0.7256	0.7256
DA-20	0.05	45.00	0.80	2.48	1.99	0.26	0 00:20:48	7.151	7.151
DA-21	0.13	45.00	0.80	2.56	2.05	0.73	0 00:21:59	6.985	6.985



0% Impervious	100% Pervious
---------------	---------------

[illegible]

Stormwater Detention Volume Required =	5.68 AC-FT
	247,552 CF
	1,856,640 GALLONS

Where		
VT=	41,123	Total Detention for the proposed project (cf)
All=	1.89	Disturbed Area Impervious Cover (acres)

Stormwater Detention Volume Provided =	5.76 AC-FT
	250,924 CF
	1,881,927 GALLONS

Detention Pond Volume Calculations				
Elevation (ft)	Surface Area (sf)	Average Volume (cf)	Average Volume (ac-ft)	Description
WSE-75.75			-	
WSE-75.00	24,722	18,541.15	0.43	
WSE-74	24,722	24,721.53	0.57	
WSE-73	24,722	24,721.53	0.57	
WSE-72	24,722	24,721.53	0.57	
WSE-71	24,722	24,721.53	0.57	
WSE-70	24,722	24,721.53	0.57	
WSE-69	24,722	24,721.53	0.57	
WSE-68	24,722	24,721.53	0.57	
WSE-67	24,722	24,721.53	0.57	
WSE-66	24,722	24,721.53	0.57	
WSE-65.60	24,722	9,888.61	0.23	
		-	-	
		250,924	5.76	Detention Pond Volume

Outflow Rate at 75% WSE Provided for High Flow
 $Q_{h2} = 2.01 \text{ cfs} > Q_{h1}$

RESTRICTORS/OUTLET:	
Low Level Restrictor (25% flow)	
Total Drainage Area=	2.107 ac
Outflow Rate Allowed for Low Flow QL=	1.05 csf (based on 0.5 cfs/ac)
Head Ht. (water surface differential) for Low Flow=	2.5375 ft
Calculated Low level Restrictor Size DL=	4.34 inches
Provided/Designed Low level Restrictor Size DL1=	6 inches (min. 6 inches)

High Level Restrictor (75% flow):		
Total Drainage Area=	2.107	ac
Total Outflow Rate Allowed (100%) Q=	4.214	cfs (based on 2 cfs/ac)
Re-calculated Head HL2 (Water surface differential for	10.15	ft
Re-calculated Low Flow Q12 for Low=	4.02	cfs (based on actual DL1 and
Outflow Rate Allowed for High Flow Qh1 (75%)=	0.20	cfs (based Q and Q12)
Head Hh (water surface differential) for High Flow	2.5375	ft
Calculated High Level Restrictor Size Dh=	1.88	inches
Provided/Designed High Level Restrictor Size Dh1	6	inches
Outflow Rate Provided for High Flow Qh2=	2.01	cfs (actual flow based on Dh,

Mitigation Study	CF	AC-FT
Cut Volume	4791.96	0.110008
Fill Volume	206428.77	4.738952
Mitigation Volume Required	206428.77	4.738952
Total Detention Volume Required	247,551.95	5.68

DETENTION SUMMARY		
AREA SERVICED =	2.11	AC
DETENTION STORAGE RATE = C/S =	0.50	AC-FT-AC
DETENTION STORAGE VOLUME REQUIRED =	5.68	AC-FT
MITIGATION DETENTION VOLUME REQUIRED=	4.74	AC-FT
TOTAL DETENTION VOLUME REQUIRED=	5.68	AC-FT
DETENTION STORAGE VOLUME PROVIDED =	5.76	AC-FT
MAXIMUM OUTFALL RATE ALLOWED =	1.05	CFS
MAXIMUM OUTFALL RATE PROVIDED =	1.05	CFS
PRIMARY RESTRICTOR SIZE =	6	INCHES
SECONDARY RESTRICTOR SIZE=	6	INCHES
OUTFALL PIPE SIZE =	36	INCHES


3. The locations of AT&T Texas/SWBT facilities are shown in an approximate way only. The contractor shall determine the exact locations of all facilities. He agrees to be fully responsible for any and all damages which might be occasioned by this failure to exactly locate and preserve these underground facilities.
4. The contractor shall call 1-800-344-5377 (TEXAS 811) a minimum of 48 hours prior to any excavation to have underground facilities located.
5. When excavating within eighteen inches (18") of the indicated location of AT&T Texas/SWBT facilities, all excavations must be accomplished using non-mechanized excavation procedures. When boring, the contractor shall expose the AT&T Texas/SWBT facilities.
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7. When the contractor observes any underground conduit facilities or buried cable facilities on these plans does not mean that there are no direct buried cables or other cables in conduit in the area.
8. The Prevention Manager Roosevelt Lee, Jr., at (713)567-4552 or e-mail him at DT75926@aol.com, if there are questions about boring or excavating near our AT&T Texas/SWBT facilities.

Dally
+ ASSOCIATES
STRUCTURAL | CIVIL

9800 Richmond Ave., Suite 460
Houston, TX 77043
(713) 337-8881 o (713) 337-8882 f
www.dallyassociates.com

Texas Registered Engineering
Firm F-003426

06/20/19

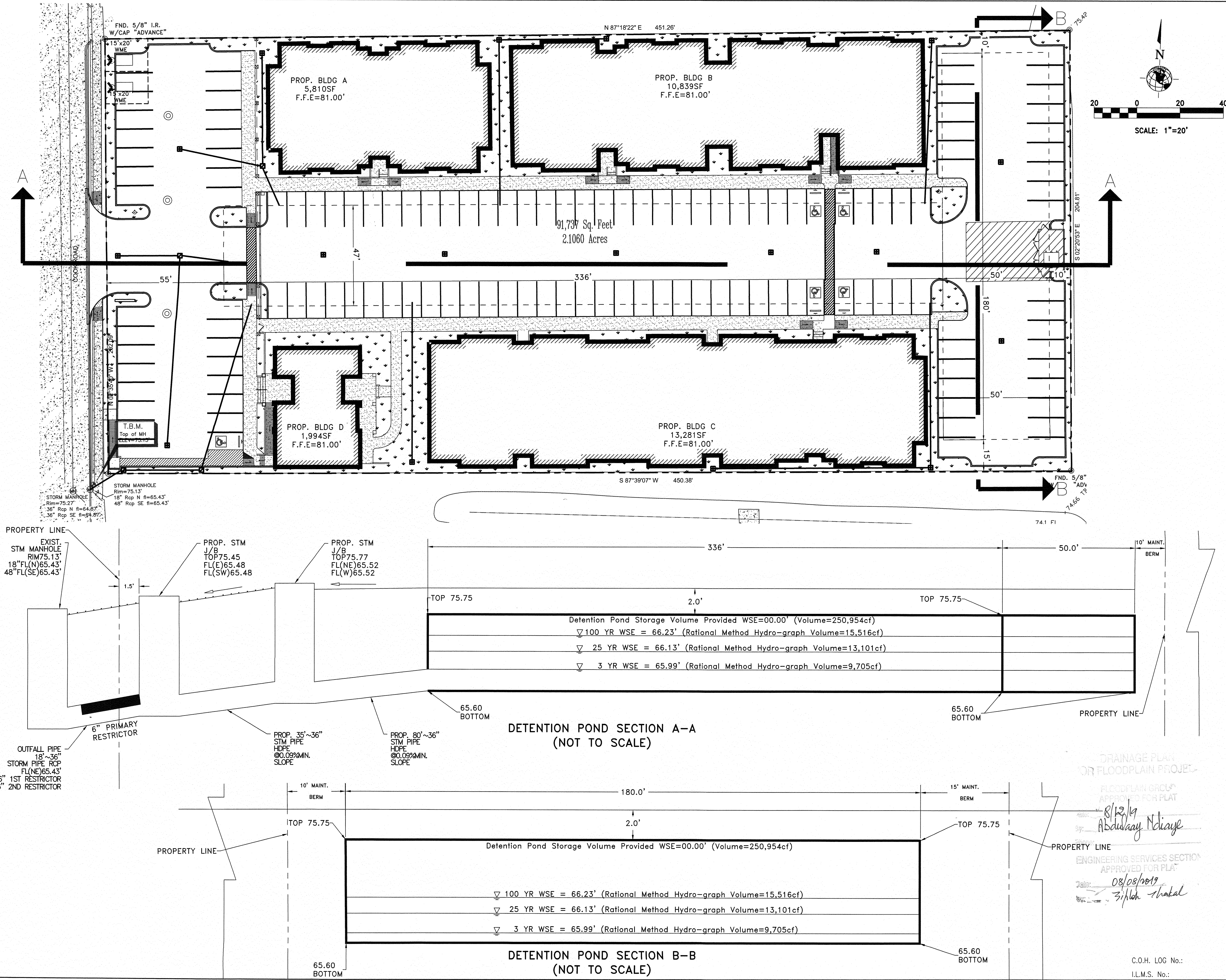
A circular professional engineer seal for the State of Texas. The outer ring contains the text "STATE OF TEXAS" at the top and "PROFESSIONAL ENGINEER" at the bottom. Inside the ring, the name "FRED DALLY" is at the top, the number "90904" is in the center, and "MECHANICAL ENGINEERING" is at the bottom. The seal is stamped over a signature.

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

<p>_____</p> <p>WATER</p>	<p>_____</p> <p>STORM WATER QUALITY</p>
<p>_____</p> <p>WASTE WATER</p>	<p>_____</p> <p>FACILITIES</p>
<p>_____</p> <p>STORM WATER</p>	<p>_____</p> <p>TRAFFIC & TRANSPORTATION/ STREET & BRIDGE</p>
<p>FILE NO.</p>	<p>FOR CITY OF HOUSTON USE ONLY</p>
<p>DRAWING SCALE</p>	
<p>HORIZ:</p>	
<p>VERT:</p>	
<p>SHEET NO. 10 OF 14</p>	

I.L.M.S. No.

08/08/2019
Biplob Chakal



CAUTION: UNDERGROUND GAS FACILITIES
The contractor shall contact the Utility Coordinating Committee at 1-800-545-6005 or 811 a minimum of 48 hours prior to construction to have main and lines field located.
• When Center Point Energy pipe line markings are not visible, call 713-207-5463 or 713-945-8037 (7:00 am to 4:30 pm) for status of line location request before excavation begins.
• When excavating within eighteen inches (18") of the indicated location of Center Point Energy facilities, all excavation must be accomplished using non-mechanized excavation procedures.
• When Center Point Energy facilities are exposed, sufficient support must be provided to the facilities to prevent excessive stress on the piping.
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• Any activities where persons or things may come within six (6) feet of live overhead high voltage lines, and
• Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of live overhead high voltage lines.
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6. Please contact the AT&T Texas Damage Prevention Manager Roosevelt Lee Jr. at (713)567-4552 or e-mail him at r7259@att.com, if there are questions about boring or excavating near our AT&T Texas/SWBT facilities.

NO.	DATE	REVISIONS	APP.
		CENTERPOINT ENERGY ID: 1404643276	
		AT&T TEXAS / SWBT LOG NUMBER: 122018MG06	

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VERIFICATION OF PRIVATE UTILITY LINES

Date _____

CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not to be used for conflict verification.
Signature valid for six months.

Date _____

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities - not to be used for conflict verification)
Signature valid for six months.

Date _____

Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.

Dally + ASSOCIATES
STRUCTURAL | CIVIL
9800 Richmond Ave., Suite 460
Houston, TX 77042
(713) 337-8881 • (713) 337-8882 f
www.dallyassociates.com
Texas Registered Engineering Firm F-003426

06/20/19

**COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN
DETENTION UNDERGROUND
CROSS SECTION**

**7515 COOK ROAD,
HOUSTON TX 77072**

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

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

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

FILE NO. _____ FOR CITY OF HOUSTON USE ONLY

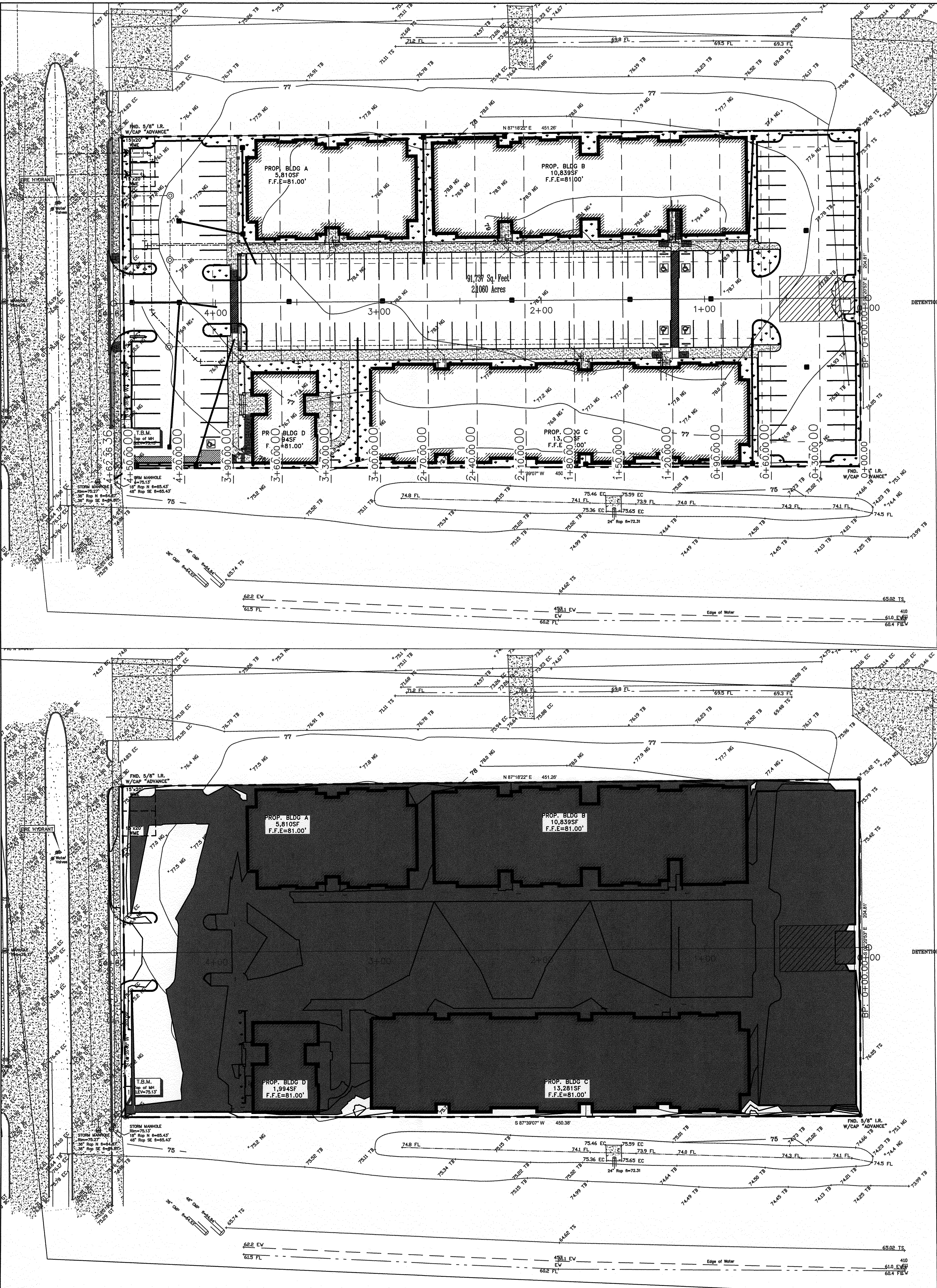
DRAWING SCALE

HORIZ: _____
VERT: _____

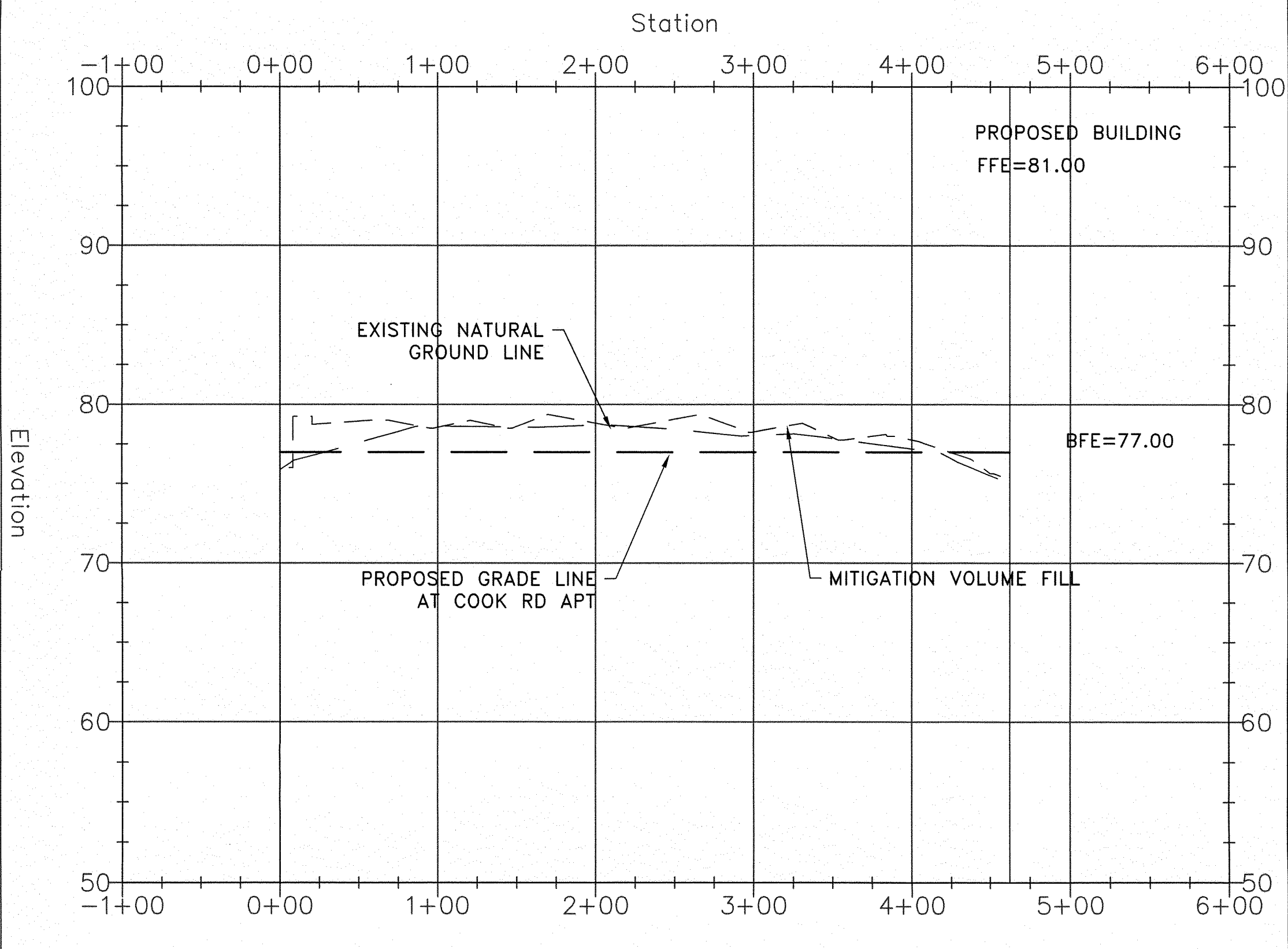
SHEET NO. 11 OF 14

C.O.H. LOG No.: _____
I.L.M.S. No.: _____

Jun 18, 2019 - 12:20pm I:\192.168.0.114\Projects\18-043-00 Cook rd apt civil project\Cook Road\Drainage Plan\12.0, C-13.0, C-14.0 MITIGATION CUT AND FILL CALCULATIONS.dwg



BFE - FG (1) PROFILE



Drainage Plan
for Floodplain Project

8/12/19
Abdullaay Ndiaje

ENGINEERING SERVICES SECTION
APPROVED FOR PLAT

08/08/2019
Ziphah Thakal

MITIGATION EARTHWORK CALCULATIONS						
ITEM	CUT	FILL	NET VOLUME			
FLOODPLAIN MITIGATION VOLUME FROM N.G. TO BFE	2,836.04	CU YD	943.88	CU YD	1,892.16	CU YD (CUT)
VOLUME FROM BFE TO PROPOSED PARKING AREA, SIDEWALKS & BUILDINGS	177.48	CU YD	7,645.51	CU YD	-7,468.04	CU YD (FILL)

C.O.H. Log No.:
I.L.M.S. No.:

CAUTION: UNDERGROUND GAS FACILITIES
The contractor shall contact the Utility Coordinating Committee at 1-800-545-6005 or 811 a minimum of 48 hours prior to construction to have main and lines field located.
• When Center Point Energy pipe line markings are not visible, call 713-207-5463 or 713-945-8037 (7:00 am to 4:30 pm) for status of line location request before excavation begins.
• When excavating within eighteen inches (18") of the indicated location of Center Point Energy facilities, all excavation must be accomplished using non-mechanized excavation procedures.
• When Center Point Energy facilities are exposed, sufficient support must be provided to the facilities to prevent excessive stress on the piping.
• For emergencies regarding gas lines call 713-659-3552 or 713-207-4200. The contractor is fully responsible for any damages caused by the contractor's failure to exactly locate and preserve these underground facilities.

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• Any activities where persons or things may come within six (6) feet of live overhead high voltage lines, and
• Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of live overhead high voltage lines.
Parties responsible for the work, including contractors, are legally responsible for the safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or removed call CenterPoint Energy at 713-207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
No approval to use, cross, or occupy CenterPoint fee or easement property is given. If you need to use CenterPoint property, please contact our Surveying & Right of Way Division at 713-207-6348 or 713-207-5769.

WARNING: AT&T TEXAS/SWBT FACILITIES
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NO.	DATE	REVISIONS	APP
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CENTERPOINT ENERGY ID: 1404643276
AT&T TEXAS / SWBT LOG NUMBER: 122018MG06

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VERIFICATION OF PRIVATE UTILITY LINES
Date

CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not be used for conflict verification.
Signature valid for six months.

Date
CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY.
(This signature verifies existing underground facilities - not to be used for conflict verification)
Signature valid for six months.

Date
Approved for AT&T Texas/SWBT underground conduit facilities only.
Signature valid for one year.

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Texas Registered Engineering
Firm F-003426

TEXAS REGISTERED ENGINEERING
FIRM F-003426

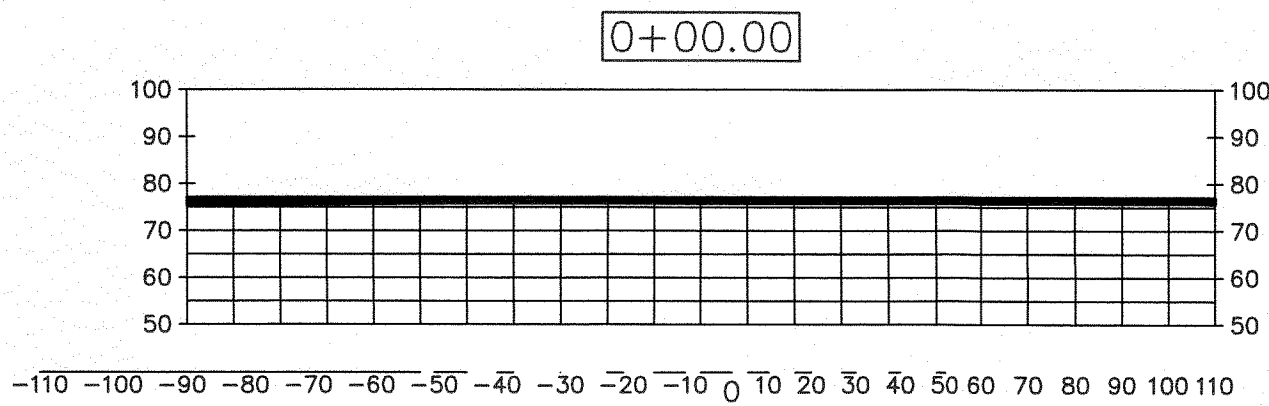
FRED DALLY
90904
06/20/19

**COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN
MITIGATION CUT AND FILL
CALCULATIONS**
**7515 COOK ROAD,
HOUSTON TX 77072**

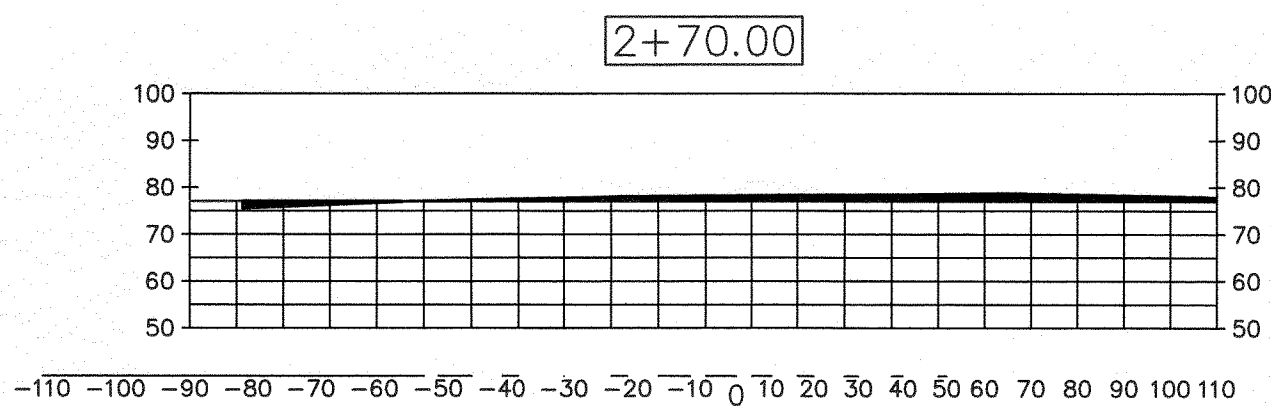
NOTE: CITY SIGNATURES VALID FOR ONE YEAR ONLY AFTER DATE OF SIGNATURES

CITY OF HOUSTON
HOUSTON PUBLIC WORKS

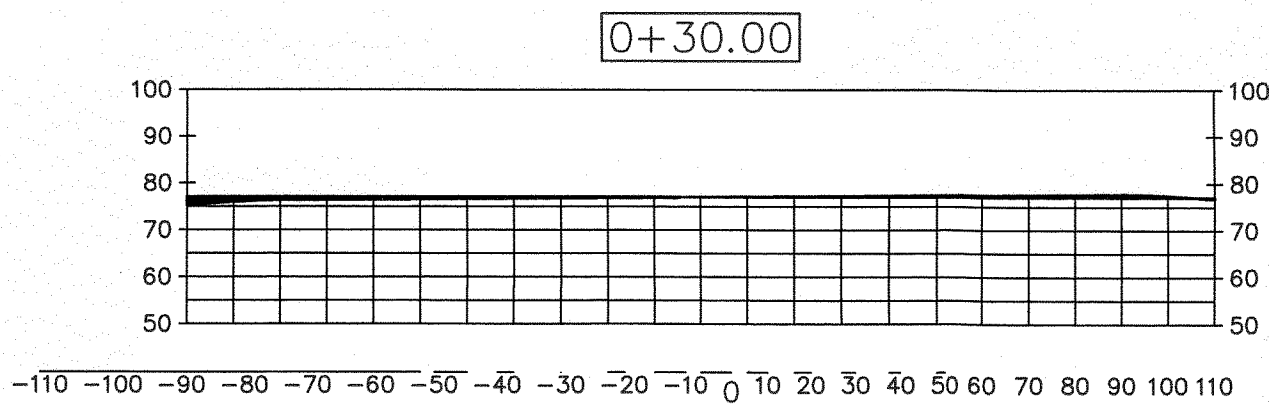
WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ:	
VERT:	
SHEET NO. 12 OF 14	



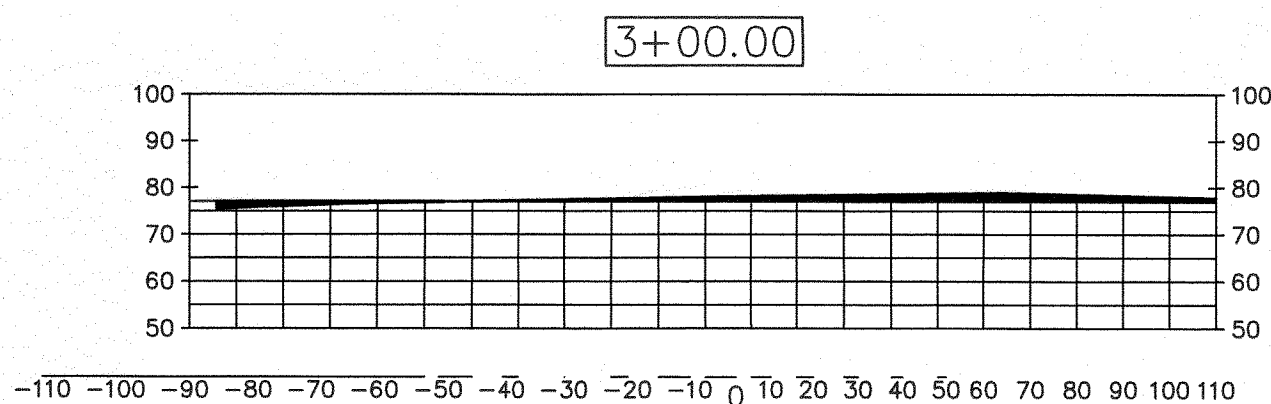
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Material Name	Area	Volume	Cumulative Volume
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CUT	0.00	0.00	0.00



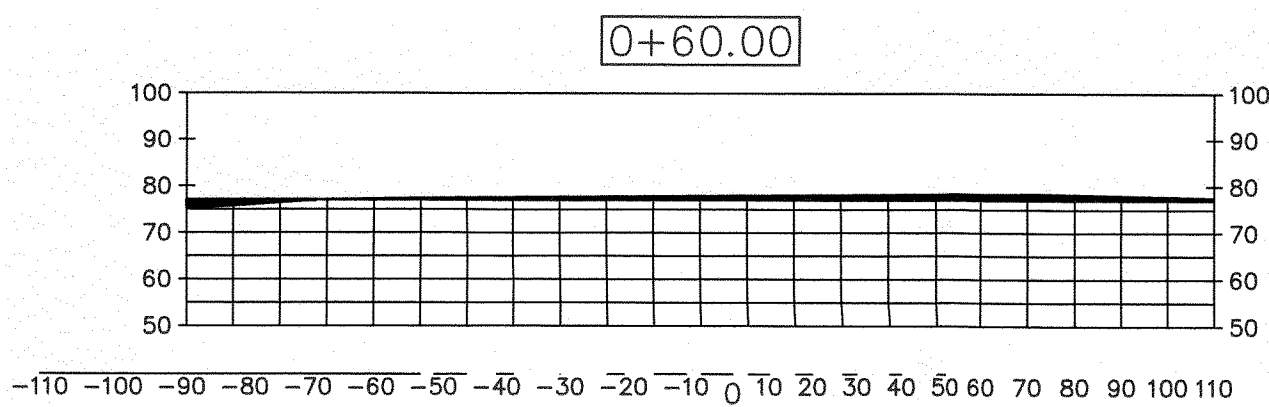
Material(s) at Station 2+70.00			
Material Name	Area	Volume	Cumulative Volume
FILL	22.47	25.98	406.21
CUT	206.29	247.06	2077.74



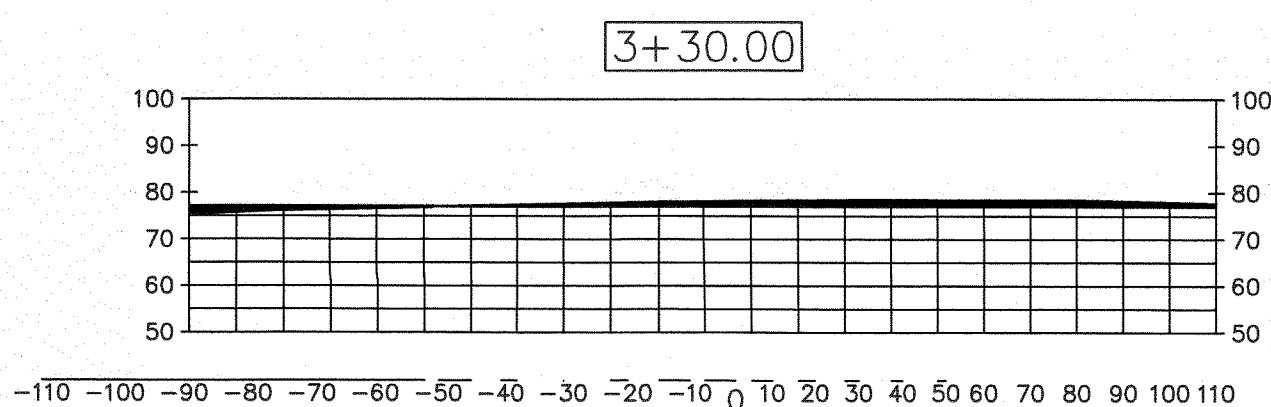
Material(s) at Station 0+30.00			
Material Name	Area	Volume	Cumulative Volume
FILL	47.96	171.64	171.64
CUT	40.04	22.24	22.24



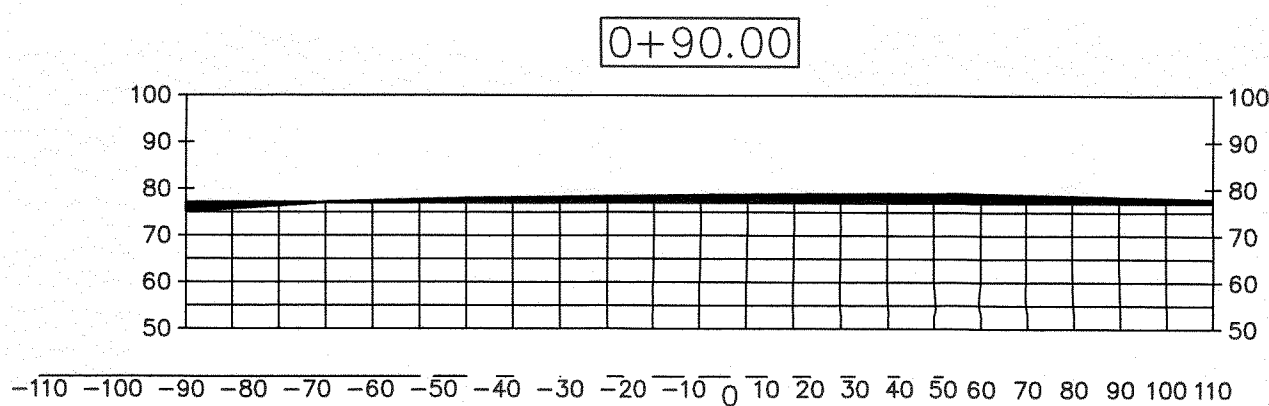
Material(s) at Station 3+00.00			
Material Name	Area	Volume	Cumulative Volume
FILL	27.93	28.00	434.21
CUT	185.10	217.44	2295.18



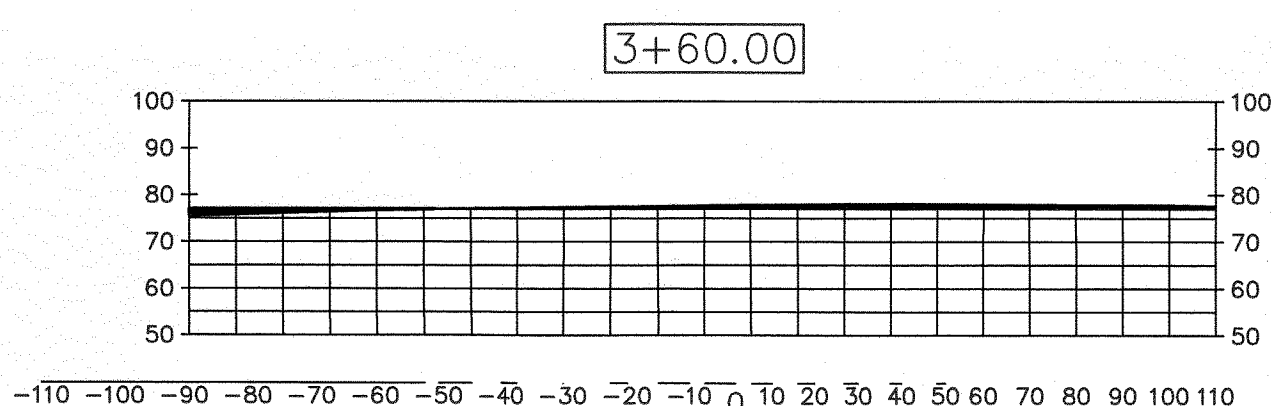
Material(s) at Station 0+60.00			
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FILL	23.08	39.47	211.10
CUT	162.75	112.66	134.90



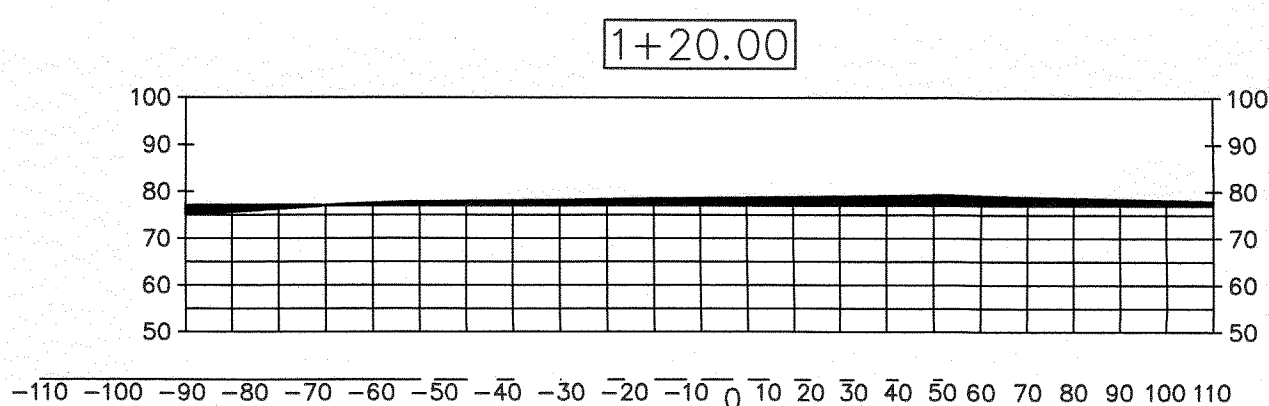
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FILL	32.64	33.65	467.86
CUT	176.76	201.03	2496.21



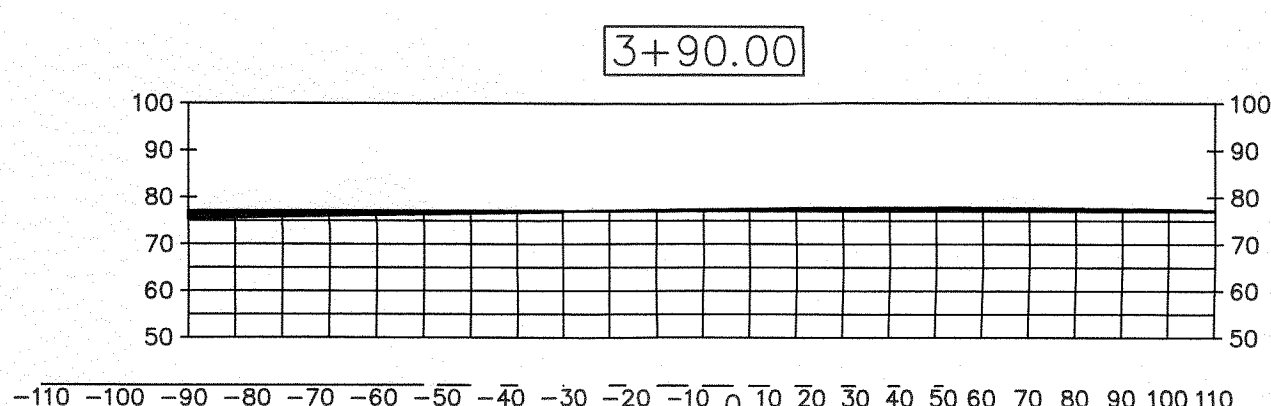
Material(s) at Station 0+90.00			
Material Name	Area	Volume	Cumulative Volume
FILL	24.96	26.69	237.79
CUT	265.73	238.04	372.94



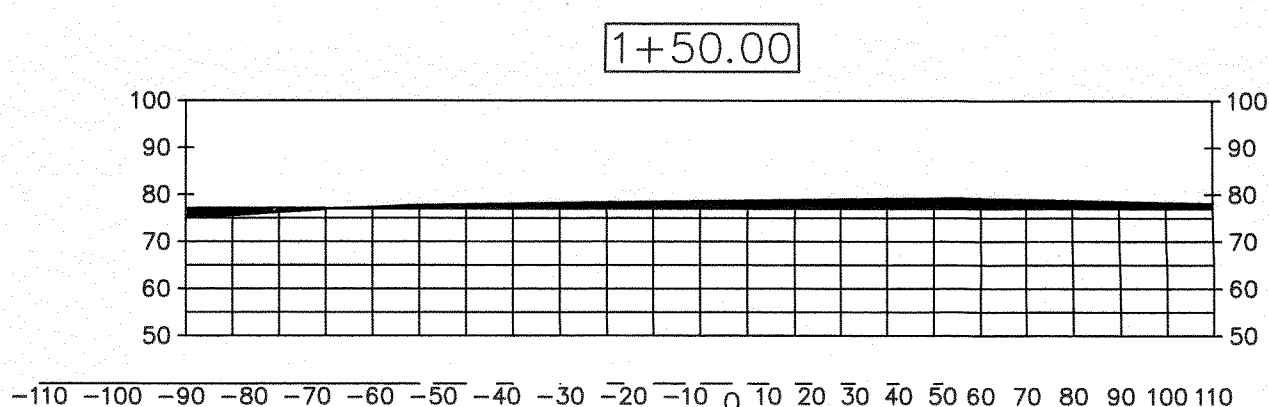
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FILL	32.05	35.94	503.80
CUT	125.18	167.74	2663.96



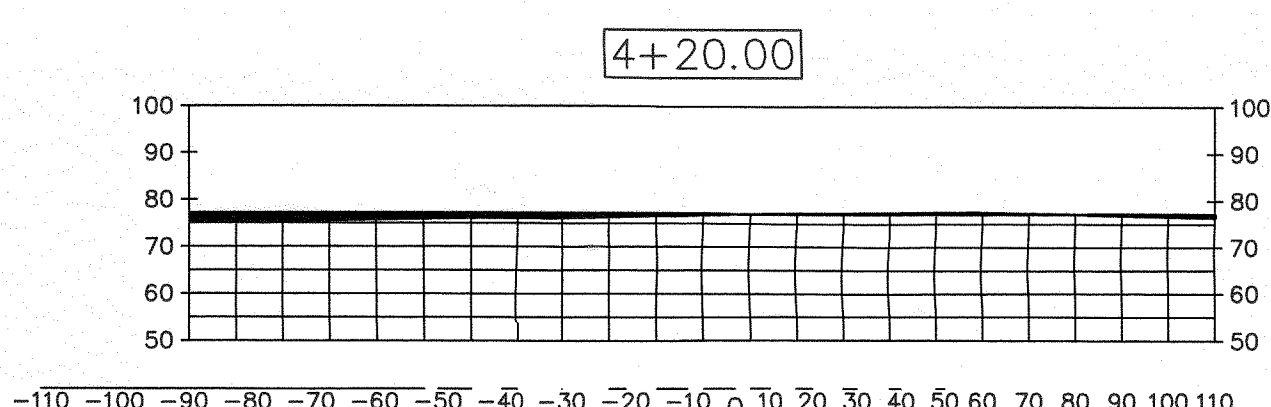
Material(s) at Station 1+20.00			
Material Name	Area	Volume	Cumulative Volume
FILL	26.47	28.57	266.37
CUT	273.97	299.83	672.78



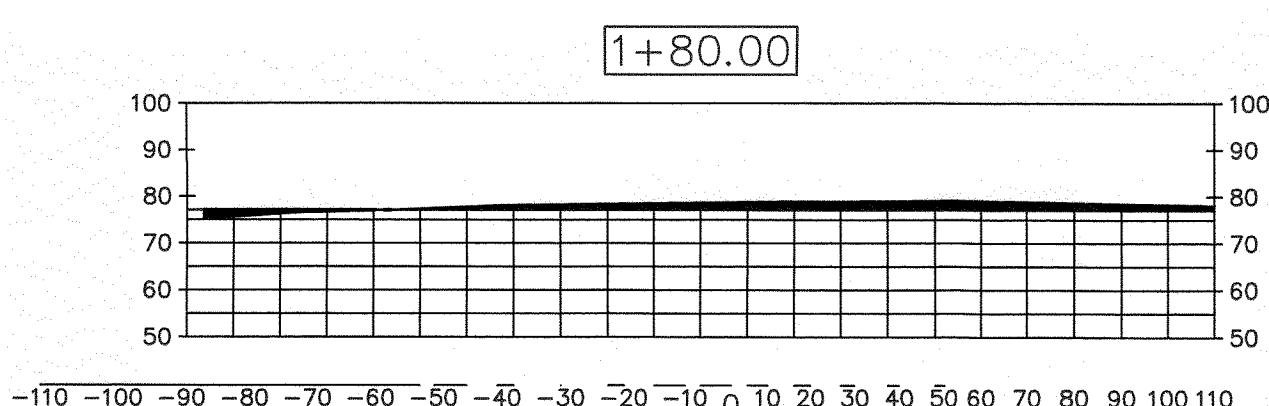
Material(s) at Station 3+90.00			
Material Name	Area	Volume	Cumulative Volume
FILL	57.07	49.51	553.31
CUT	70.63	108.78	2772.73



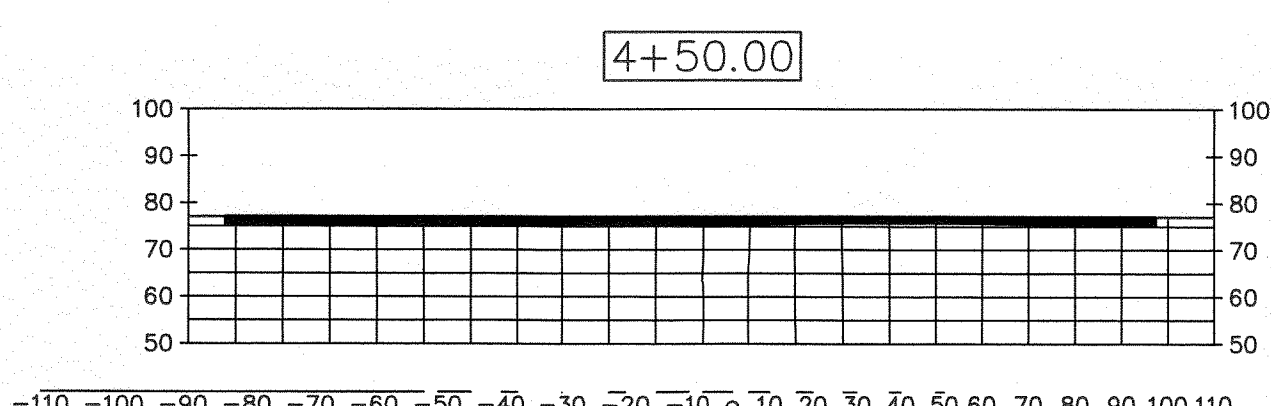
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Material Name	Area	Volume	Cumulative Volume
FILL	26.91	29.65	296.02
CUT	267.92	301.05	973.82



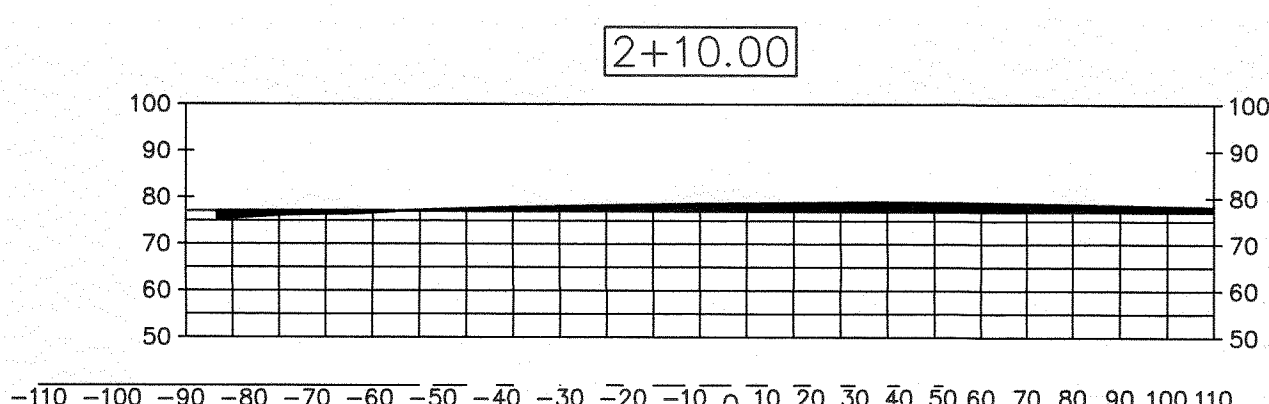
Material(s) at Station 4+20.00			
Material Name	Area	Volume	Cumulative Volume
FILL	114.68	95.42	648.73
CUT	21.66	51.27	2824.01



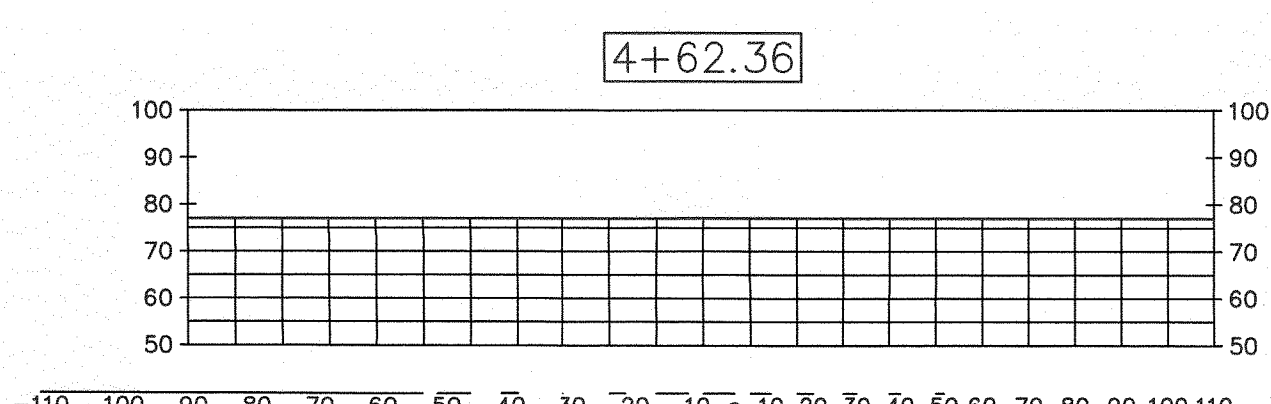
Material(s) at Station 1+80.00			
Material Name	Area	Volume	Cumulative Volume
FILL	24.57	28.60	324.62
CUT	261.68	294.22	1268.04



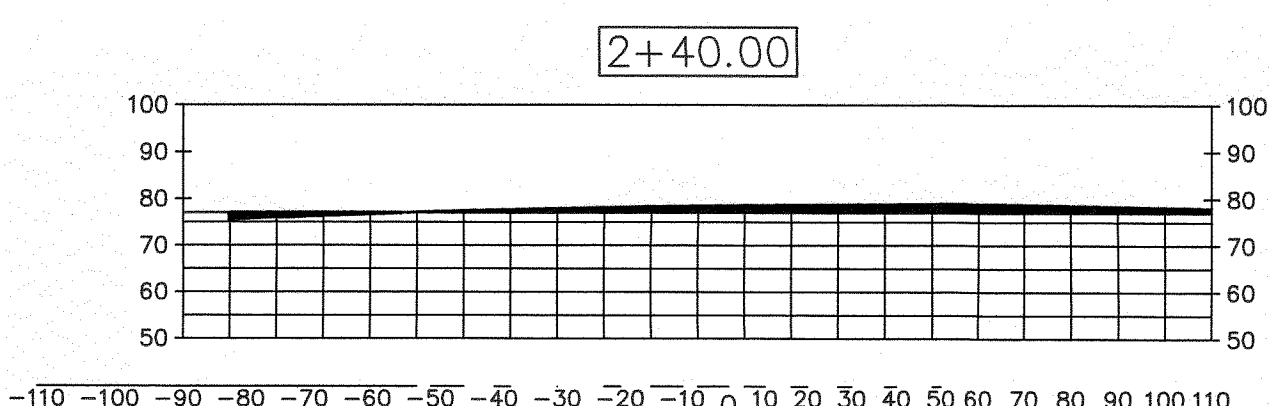
Material(s) at Station 4+50.00			
Material Name	Area	Volume	Cumulative Volume
FILL	295.06	227.63	876.36
CUT	0.00	12.03	2836.04



Material(s) at Station 2+10.00			
Material Name	Area	Volume	Cumulative Volume
FILL	25.62	27.88	352.50
CUT	256.32	287.78	1555.82



Material(s) at Station 4+62.36			
Material Name	Area	Volume	Cumulative Volume
FILL	0.00	67.52	943.88
CUT	0.00	0.00	2836.04



Material(s) at Station 2+40.00			
Material Name	Area	Volume	Cumulative Volume
FILL	24.30	27.73	380.23
CUT	238.42	274.86	1830.68

MITIGATION EARTHWORK CALCULATIONS					
	ITEM	CUT	FILL	NET VOLUME	
	FLOODPLAIN MITIGATION VOLUME FROM N.G. TO BFE	2,836.04	CU YD	943.88	CU YD
	VOLUME FROM BFE TO PROPOSED PARKING AREA, SIDEWALKS & BUILDINGS	177.48	CU YD	7,645.51	CU YD
				-7468.04	CU YD (FILL)

Drainage Plan
OR FLOODPLAIN PROJECT
FLOODPLAIN GROUP
APPROVED FOR PLAT
Date: 8/12/19
By: Abdulaziz Aljaghr
Phone: 281-444-1111
ENGINEERING SERVICES SECTION
APPROVED FOR PLAT
Date: 08/08/2019
By: Zipler Thakal

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Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of live overhead high voltage lines.
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NO.	DATE	REVISIONS	APP.
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AT&T TEXAS / SWBT LOG NUMBER: 122018MG06			
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Firm F-003428

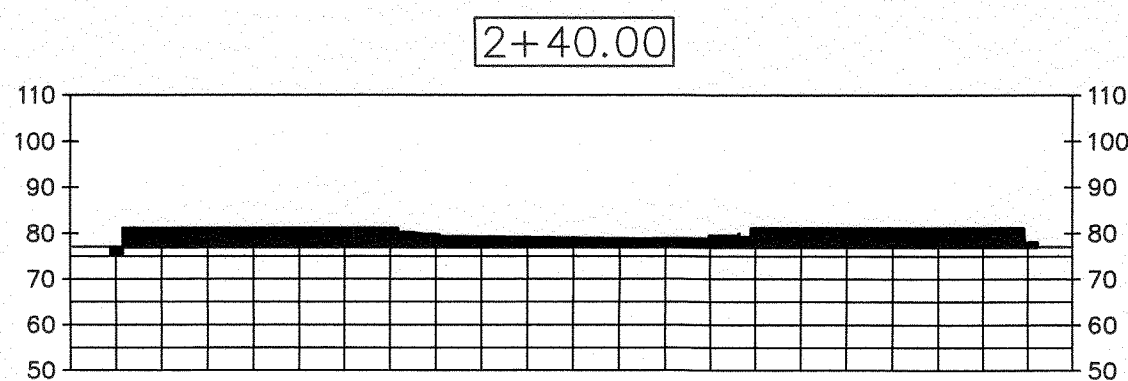
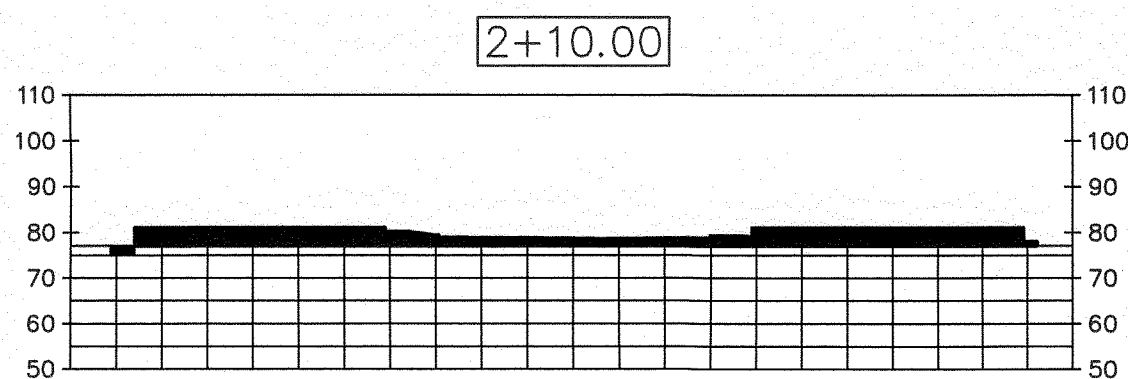
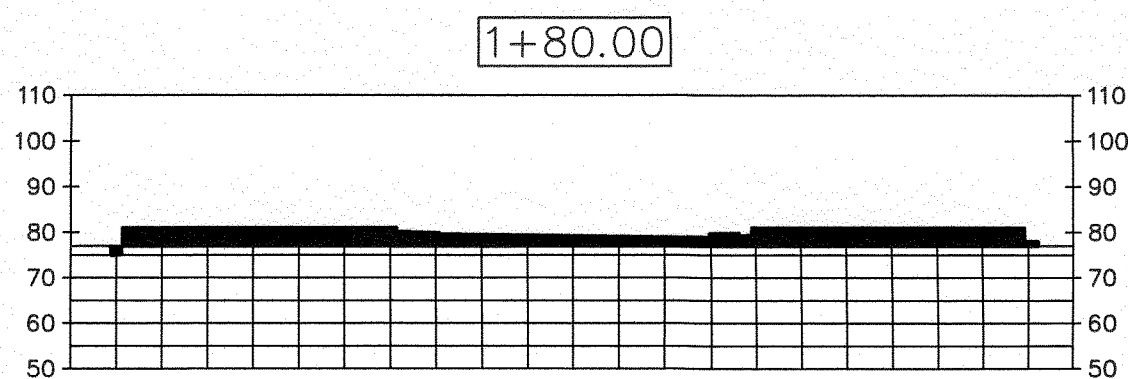
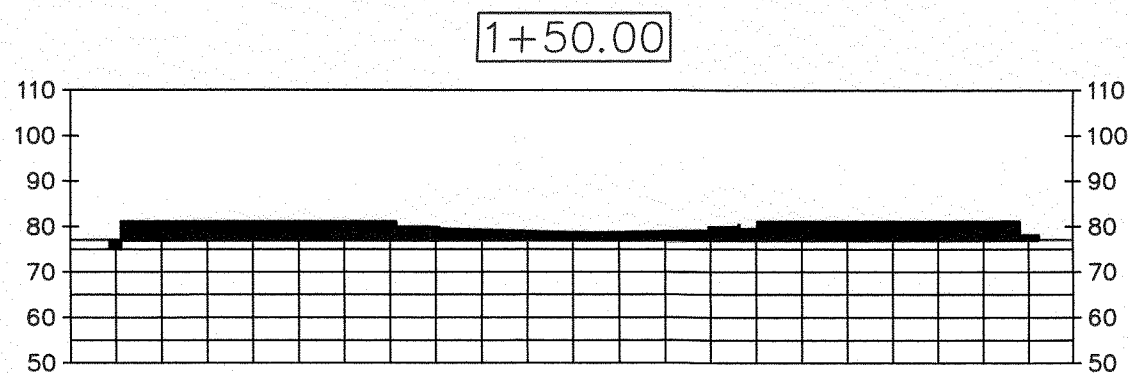
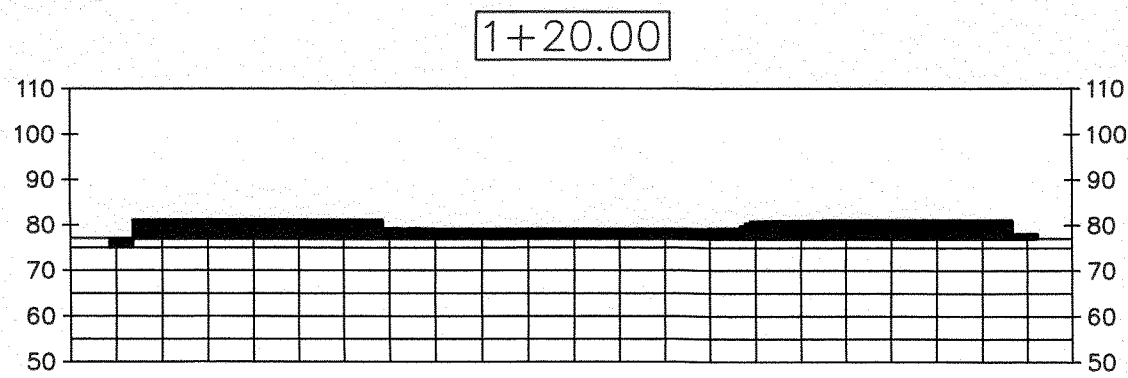
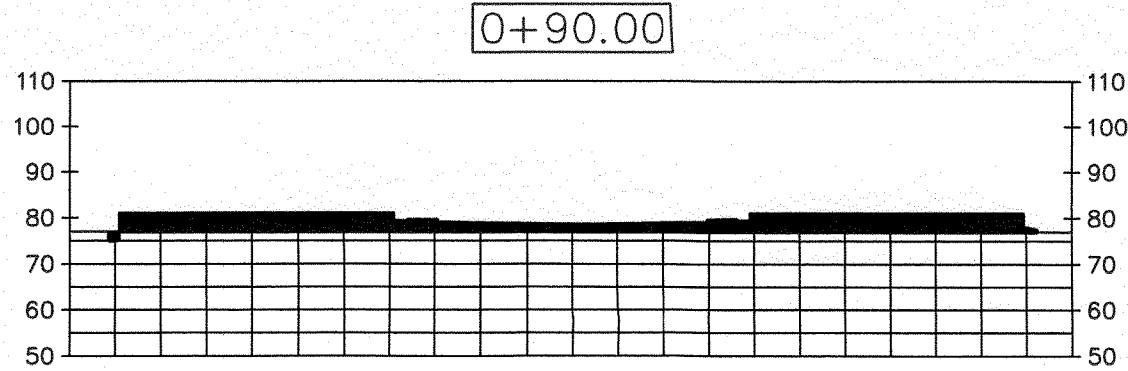
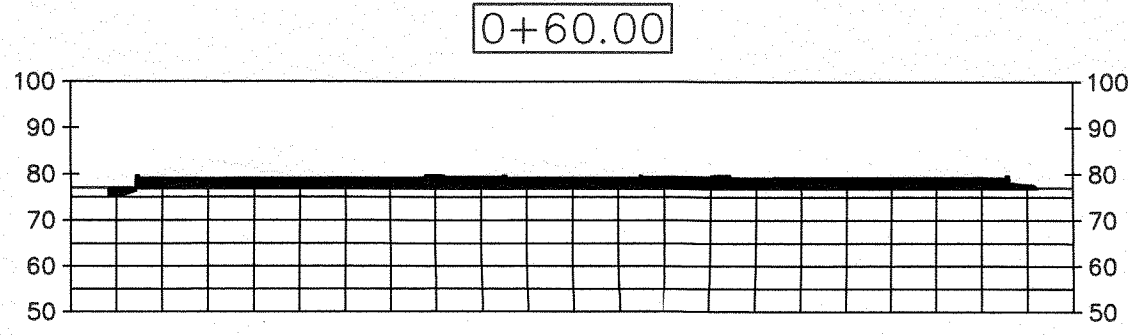
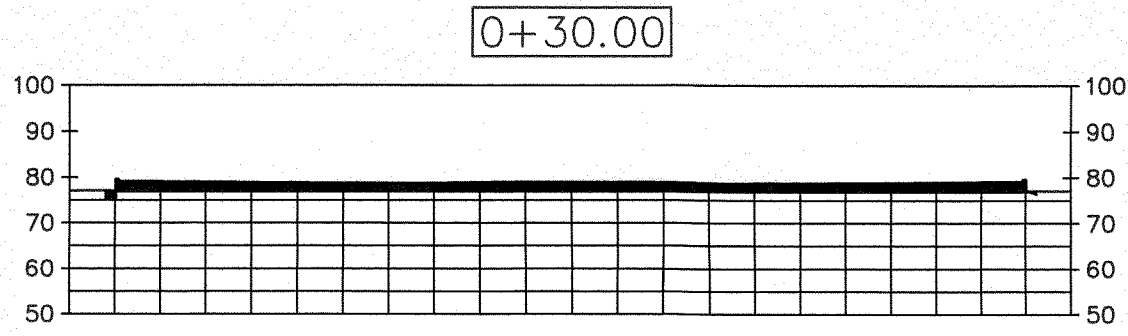
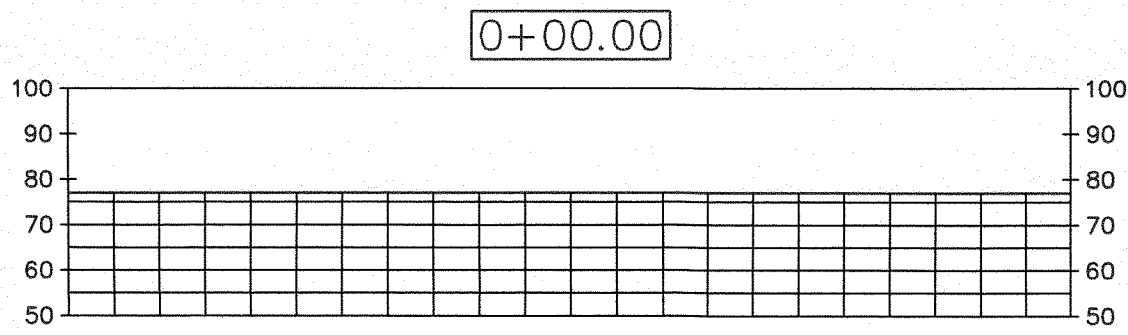
TEXAS REGISTERED ENGINEERING
Firm F-003428

FRED DALLY
90904
LICENSED PROFESSIONAL ENGINEER
MECHANICAL
STATE OF TEXAS
06/20/19

**COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN
MITIGATION CUT AND FILL
PROFILE**
7515 COOK ROAD,
HOUSTON TX 77072

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

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ:	
VERT:	
SHEET NO. 13 OF 14	



Material(s) at Station 0+30.00			
Material Name	Area	Volume	Cumulative Volume
FILL	348.92	0.00	0.00
CUT	5.11	0.00	0.00

Material(s) at Station 0+60.00			
Material Name	Area	Volume	Cumulative Volume
FILL	396.59	414.17	414.17
CUT	9.23	7.96	7.96

Material(s) at Station 0+90.00			
Material Name	Area	Volume	Cumulative Volume
FILL	635.04	573.12	987.30
CUT	5.39	8.12	16.08

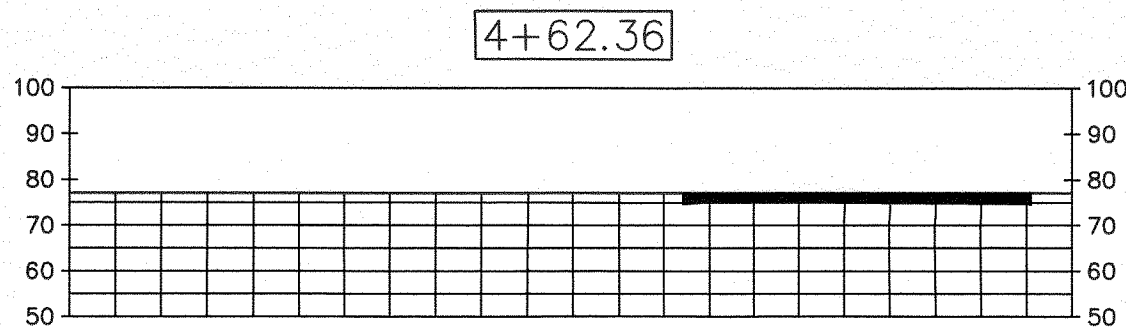
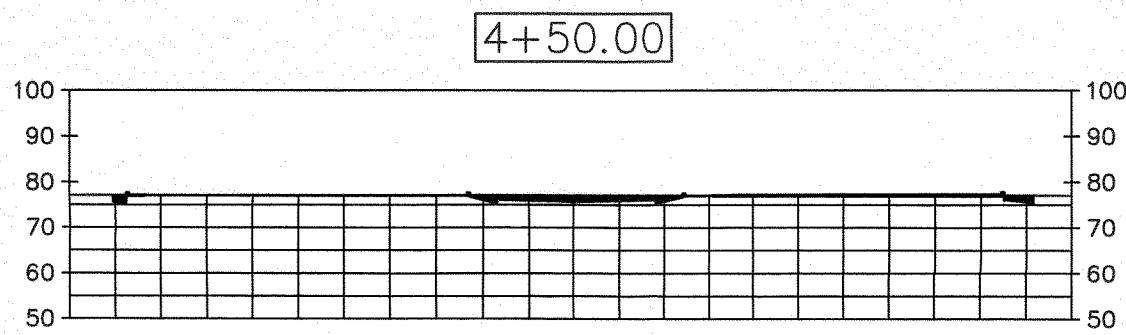
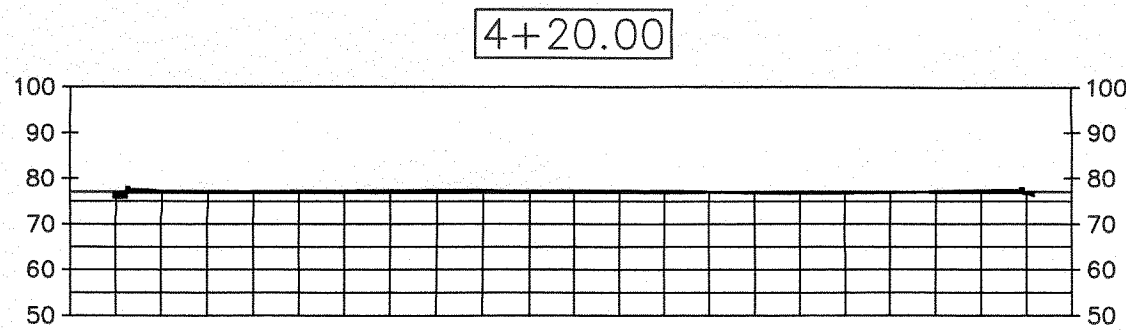
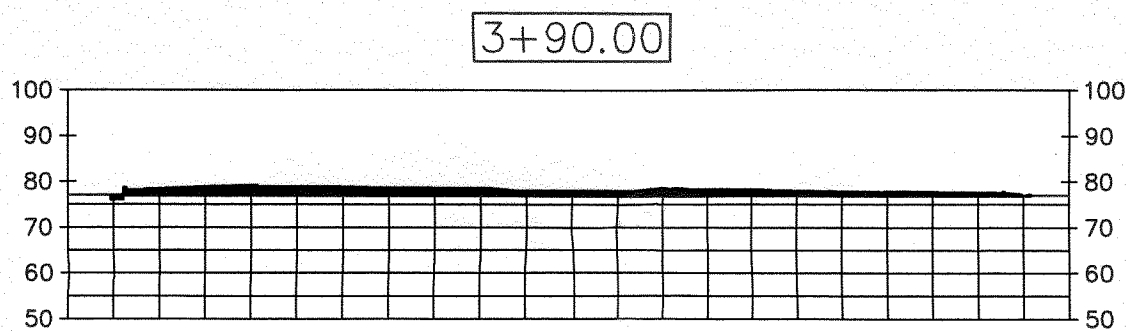
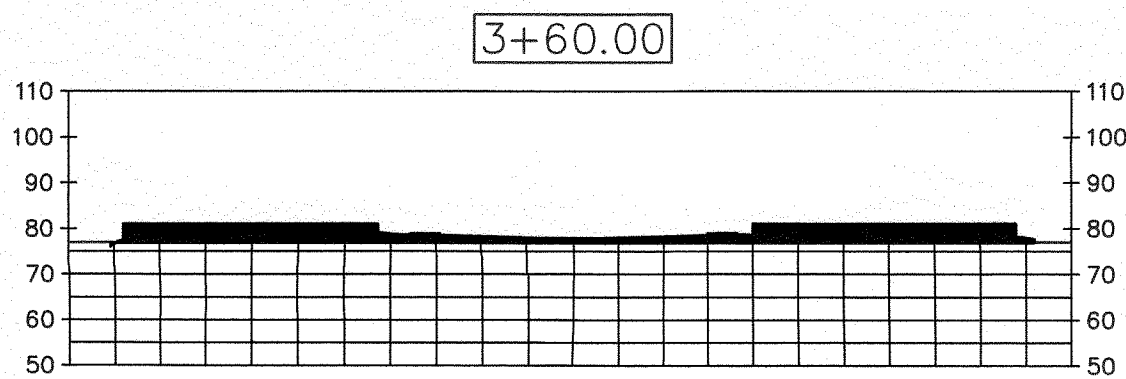
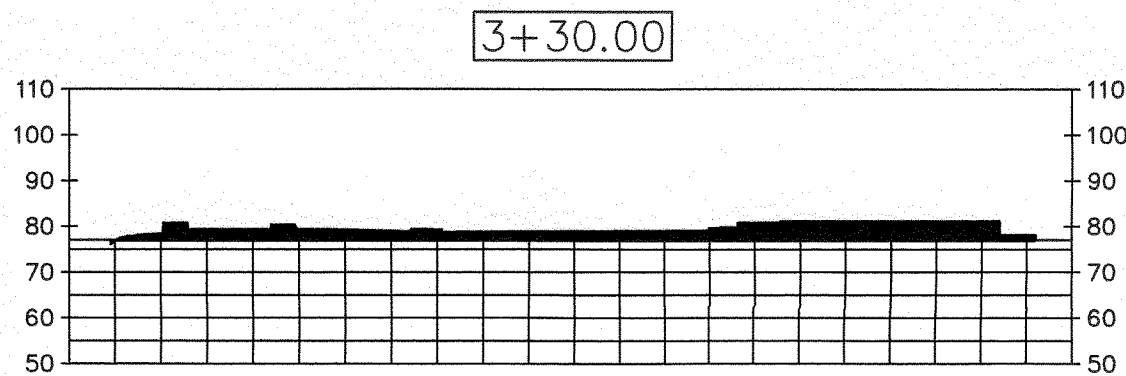
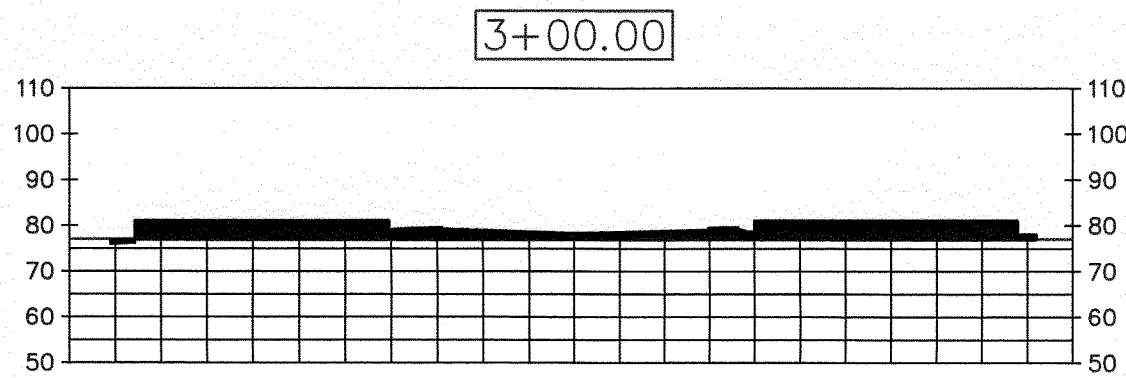
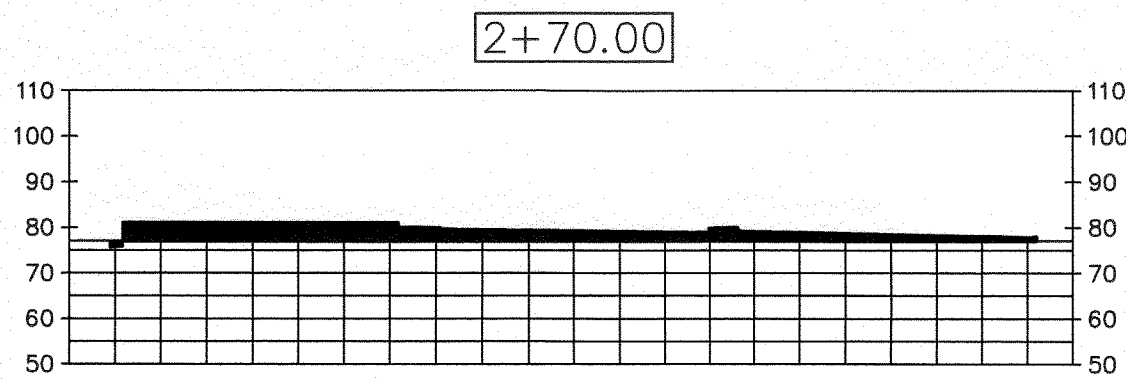
Material(s) at Station 1+20.00			
Material Name	Area	Volume	Cumulative Volume
FILL	616.72	695.42	1682.72
CUT	10.52	8.84	24.92

Material(s) at Station 1+50.00			
Material Name	Area	Volume	Cumulative Volume
FILL	639.59	697.95	2380.66
CUT	5.32	8.80	33.72

Material(s) at Station 1+80.00			
Material Name	Area	Volume	Cumulative Volume
FILL	665.67	725.14	3105.81
CUT	5.64	6.09	39.80

Material(s) at Station 2+10.00			
Material Name	Area	Volume	Cumulative Volume
FILL	619.52	713.99	3819.80
CUT	9.67	8.51	48.31

Material(s) at Station 2+40.00			
Material Name	Area	Volume	Cumulative Volume
FILL	644.94	702.47	4522.28
CUT	4.48	7.86	56.17



Material(s) at Station 2+70.00			
Material Name	Area	Volume	Cumulative Volume
FILL	515.37	644.61	5166.89
CUT	3.80	4.60	60.77

Material(s) at Station 3+00.00			
Material Name	Area	Volume	Cumulative Volume
FILL	601.75	620.62	5787.51
CUT	5.21	5.00	65.78

Material(s) at Station 3+30.00			
Material Name	Area	Volume	Cumulative Volume
FILL	511.63	618.54	6406.05
CUT	0.73	3.30	69.08

Material(s) at Station 3+60.00			
Material Name	Area	Volume	Cumulative Volume
FILL	558.91	594.75	7000.80
CUT	0.73	0.81	69.89

Material(s) at Station 3+90.00			
Material Name	Area	Volume	Cumulative Volume
FILL	242.24	445.08	7445.88
CUT	2.96	2.05	71.94

Material(s) at Station 4+20.00			
Material Name	Area	Volume	Cumulative Volume
FILL	22.01	146.80	7592.69
CUT	14.92	9.94	81.87

Material(s) at Station 4+50.00			
Material Name	Area	Volume	Cumulative Volume
FILL	8.49	16.94	7609.63
CUT	66.23	45.09	126.96

Material(s) at Station 4+62.36			
Material Name	Area	Volume	Cumulative Volume
FILL	0.00	1.94	7611.57
CUT	154.53	50.52	177.48

MITIGATION EARTHWORK CALCULATIONS					
	ITEM	CUT	FILL	NET VOLUME	
	FLOODPLAIN MITIGATION VOLUME FROM N.G. TO BFE	2,836.04	CU YD	943.88	CU YD
	VOLUME FROM BFE TO PROPOSED PARKING AREA, SIDEWALKS & BUILDINGS	177.48	CU YD	7,645.51	CU YD

DRAINAGE PLAN
OR FLOODPLAIN PROJECT
FLOODPLAIN GRCL
APPROVED FOR PLAT
Date: 8/12/19
By: Abdulaziz M. Alsayegh
ENGINEERING SERVICES SECTION
APPROVED FOR PLAT
Date: 08/08/2019
By: Zafar Chahal

CAUTION: UNDERGROUND GAS FACILITIES
The contractor shall contact the Utility Coordinating Committee at 1-800-545-6005 or 811 a minimum of 48 hours prior to construction to have main and lines field located.
• When Center Point Energy pipe line markings are not visible, call 713-207-5463 or 713-945-8037 (7:00 am to 4:30 pm) for status of line location request before excavation begins.
• When excavating within eighteen inches (18") of the indicated location of Center Point Energy facilities, all excavation must be accomplished using non-mechanized excavation procedures.
• When Center Point Energy facilities are exposed, sufficient support must be provided to the facilities to prevent excessive stress on the piping.
• For emergencies regarding gas lines call 713-659-3552 or 713-207-4200. The contractor is fully responsible for any damages caused by the contractor's failure to exactly locate and preserve these underground facilities.

WARNING: OVERHEAD ELECTRICAL LINES
Overhead lines may exist on the property. The location of overhead lines has not been shown on these drawings as the lines are clearly visible, but you should locate them prior to beginning any construction. Texas law, Section 752, Health and Safety Code, forbids activities that occur in close proximity to high voltage lines, specifically:
• Any activities where persons or things may come within six (6) feet of live overhead high voltage lines, and
• Operating a crane, derrick, power shovel, drilling rig, pile driver, hoisting equipment, or similar apparatus within 10 feet of live overhead high voltage lines.
Parties responsible for the work, including contractors, are legally responsible for the safety of construction workers under this law. This law carries both criminal and civil liability. To arrange for lines to be turned off or removed call CenterPoint Energy at 713-207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
No approval to use, cross, or occupy CenterPoint fee or easement property is given. If you need to use CenterPoint property, please contact our Surveying & Right of Way Division at 713-207-6348 or 713-207-5769.

WARNING: AT&T TEXAS/SWBT FACILITIES
1. The locations of AT&T Texas/SWBT facilities are shown in an approximate way only. The contractor shall determine the exact location before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by this failure to exactly locate and preserve these underground utilities.
2. The contractor shall call 1-800-344-8377 (TEXAS 811) a minimum of 48 hours prior to construction to have underground lines field located.
3. When excavating within eighteen inches (18") of the indicated location of AT&T Texas/SWBT facilities, all excavations must be accomplished using non-mechanized excavation procedures. When boring, the contractor shall expose the AT&T Texas/SWBT facilities.
4. When AT&T Texas/SWBT facilities are exposed, the contractor will provide support to prevent damage to the conduit ducts or cables. When excavating near telephone poles the contractor shall brace the pole for support.
5. The presence or absence of AT&T Texas/SWBT underground conduit facilities or buried cable facilities shown on these plans does not mean that there are no direct buried cables or other cables in conduit in the area.
6. Please contact the AT&T Texas Damage Prevention Manager Roosevelt Lee Jr. at (713)567-4552 or e-mail him at r7259@att.com, if there are questions about boring or excavating near our AT&T Texas/SWBT facilities.

NO.	DATE	REVISIONS	APP.
CENTERPOINT ENERGY ID: 1404643276			
AT&T TEXAS / SWBT LOG NUMBER: 122018MG06			
NOTICE: FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS SIGNATURE DOES NOT FULFILL YOUR OBLIGATION TO CALL 811			
VERIFICATION OF PRIVATE UTILITY LINES			
Date			
CenterPoint Energy natural gas utilities shown. (Gas service lines are not shown). This signature not be used for conflict verification. Signature valid for six months.			
Date			
CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This signature verifies existing underground facilities - not to be used for conflict verification) Signature valid for six months.			
Date			
Approved for AT&T Texas/SWBT underground conduit facilities only. Signature valid for one year.			

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TEXAS REGISTERED ENGINEERING
FIRM F-003426
FRED DALLY
90904
LICENSED PROFESSIONAL ENGINEER
06/20/19

**COOK ROAD APT CIVIL PROJECT
DRAINAGE PLAN
MITIGATION CUT AND FILL
PROFILE
7515 COOK ROAD,
HOUSTON TX 77072**

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

CITY OF HOUSTON HOUSTON PUBLIC WORKS	
WATER	STORM WATER QUALITY
WASTE WATER	FACILITIES
STORM WATER	TRAFFIC & TRANSPORTATION/ STREET & BRIDGE
FILE NO.	FOR CITY OF HOUSTON USE ONLY
DRAWING SCALE	
HORIZ:	
VERT:	
SHEET NO. 14 OF 14	