

NO.	DATE	ISSUES/REVISIONS
0	07/15/2022	ISSUED FOR PERMIT

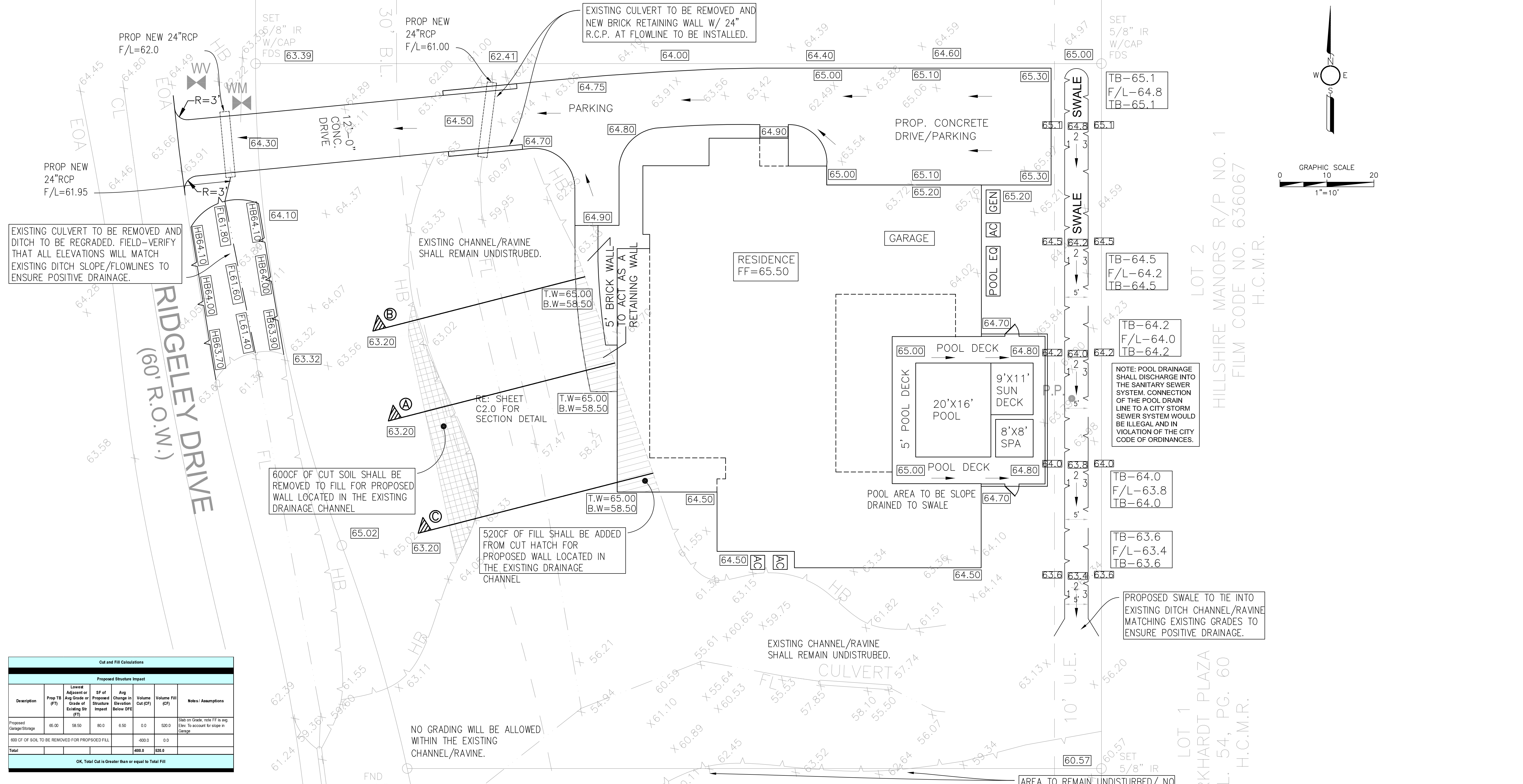
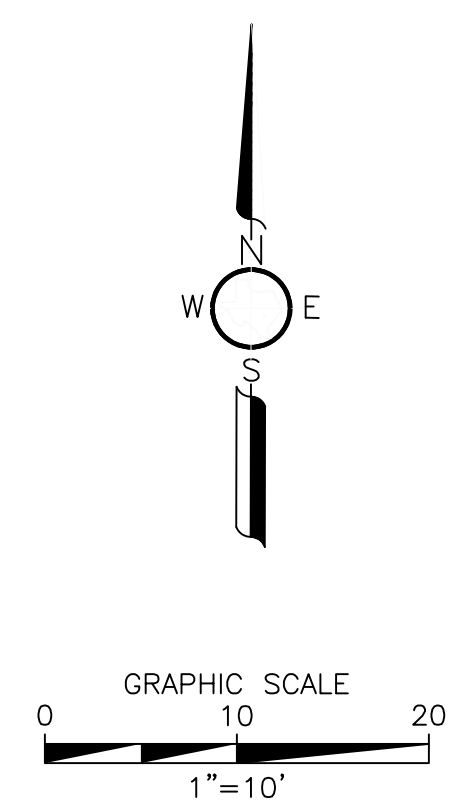
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BEC ENGINEERS AND CONSULTANTS, LLC
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 Suite 440 | Houston, TX 77042
 3200 Wilcrest Dr., Suite 440 | Houston, TX 77042
 PH: 832-460-2724 | TBP# REC-15-118680

**ANDY SHACKOULS
 MCCOLLUM CUSTOM HOMES**
 1210 RIDGELEY DRIVE
 HILLSHIRE VILLAGE, TX, 77055

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REF # 22-1220-0001
 DRN: AS, CKR, FA, DES, XB
DRAINAGE PLAN
 SHEET NO. **C1.0**



Cut and Fill Calculations						
Proposed Structure Impact						
Description	Prop TB (PT)	Level of Adjacent or Avg Grade or Grade of Existing Str (FT)	SF of Proposed Change in Elevation Below DFE	Avg Volume Cut (CY)	Volume Fill (CY)	Notes / Assumptions
Proposed Garage/Storage	65.00	58.50	800	6.50	0.0	Slab on Grade, note FF in and Elev. To account for slope in Garage
400 CF OF SOIL TO BE REMOVED FOR PROPOSED FILL				-600.0	0.0	
Total				400.0	0.0	

OK, Total Cut is Greater than or equal to Total Fill

SCALE: 1"=10' ON 24X36

NOTE:
 AN ADDITIONAL NOTICE WILL BE PROVIDED IN THE FINAL REVIEW LETTER REGARDING ANY OVERAGE OF THE IMPERVIOUS MAXIMUM WILL RESULT IN REMOVAL OF IMPERVIOUS AREA TO MEET THE CITY REQUIREMENTS.

HOUSE & FLATWORK COVERAGE BEHIND BUILDING LINES	
SLAB=	5,497.0 sq.ft.
FLATWORK=	2,659.0 sq.ft.
POOL/EQ/AC/GENERATOR=	1,077.0 sq.ft.
TOTAL=	9,250.0 sq.ft.

LOT COVERAGE	
LOT=	20,122 sq.ft.
COVERAGE=	45.96 %

HOUSE & FLATWORK COVERAGE IN FRONT OF BUILDING LINES	
SLAB=	0 sq.ft.
FLATWORK=	551 sq.ft.
TOTAL=	551 sq.ft.

LOT COVERAGE	
LOT=	4,628.0 sq.ft.
COVERAGE=	11.91 %

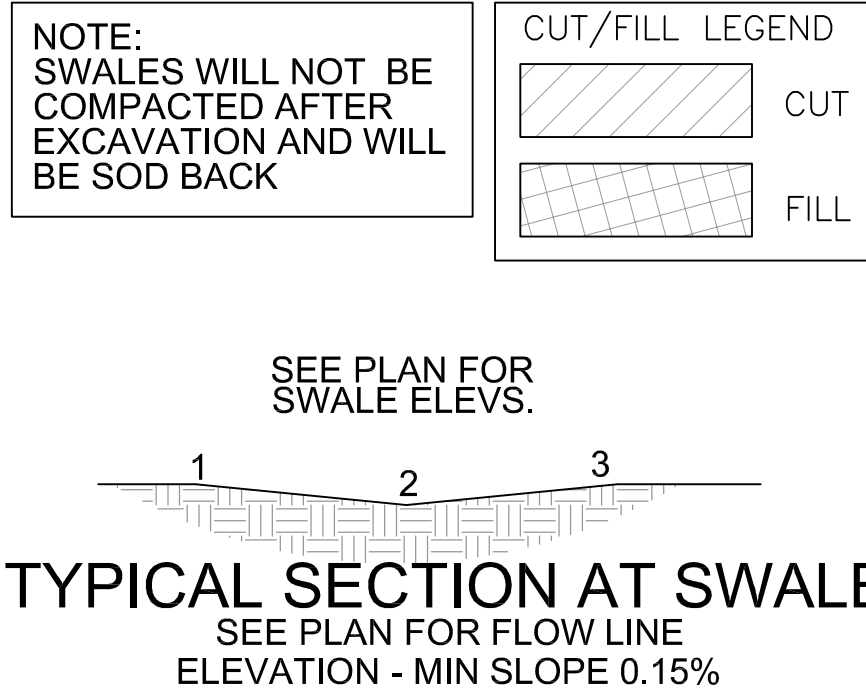
SECTION AT SWALE	
Cross sectional area:	1.5 sq ft
Wetted perimeter:	5 ft
Channel Length:	30 ft
Top flow line:	63.7 ft
Bottom flow line:	63.1 ft
SLOPE:	1.1 %
C = 0.6 * Ia + 0.2	0.4376 acres
TC = 10*A*0.1761 + 15	24.1 min
I = b/(d+tc)*e	3.83 inches/hour
area =	0.57 acres
Q = CIA =	0.95 CFS

Area of Lot	24750
Impervious Area	9801
% Coverage	39.60%

V = (K/n) * R^(2/3) * Sf * 1/2	
Where	
K = 1.49	(English Units)
n = 0.03	(grass Earth channel)
R = 0.300	ft (area/wetted perimeter)
Sf = 0.0200	ft/ft (headloss/length)
therefore	
V = 3.15	ft/sec
Qswale(B) = V * A	
Qswale(B) = 4.72	CFS

NOTE: each swale to convey half of drainage area
 2yr 0.95 CFS

No fill shall be brought to site, no changes shall be made to existing grading or drainage plan (as-built), and there shall be no drainage impact to drainage channel properties. Contractor/builder shall be 100% liable for deviation from these requirements based on City Inspection.

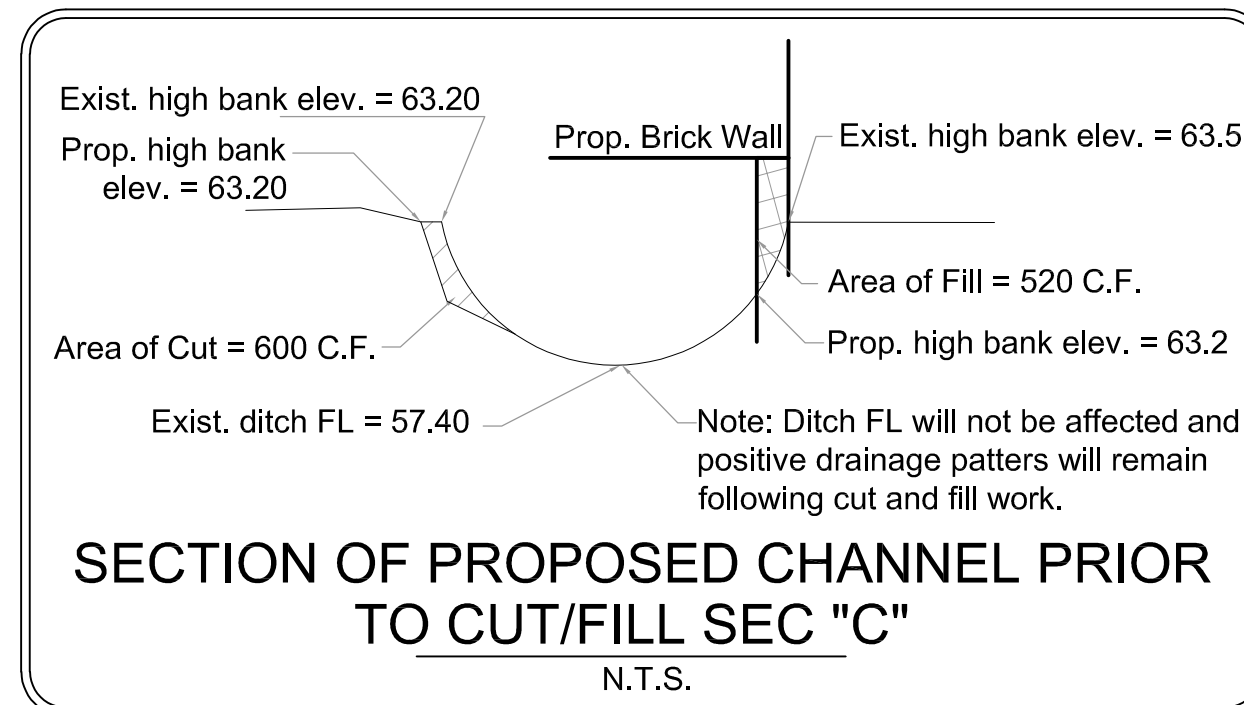
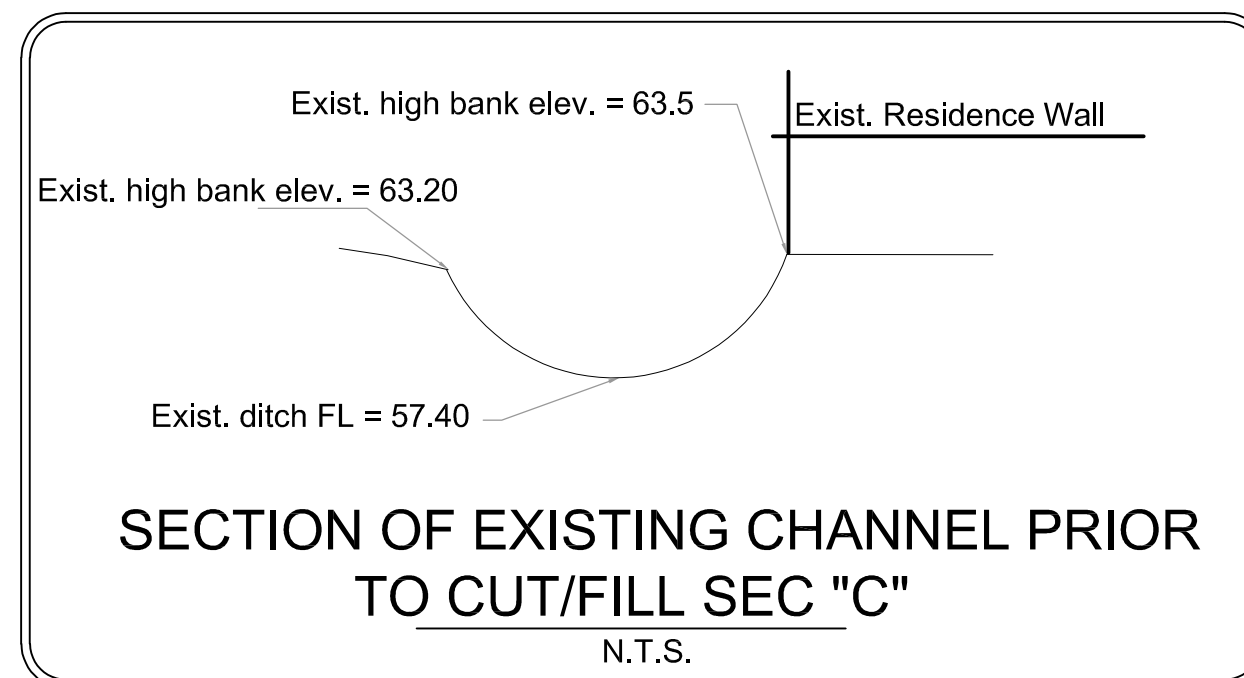
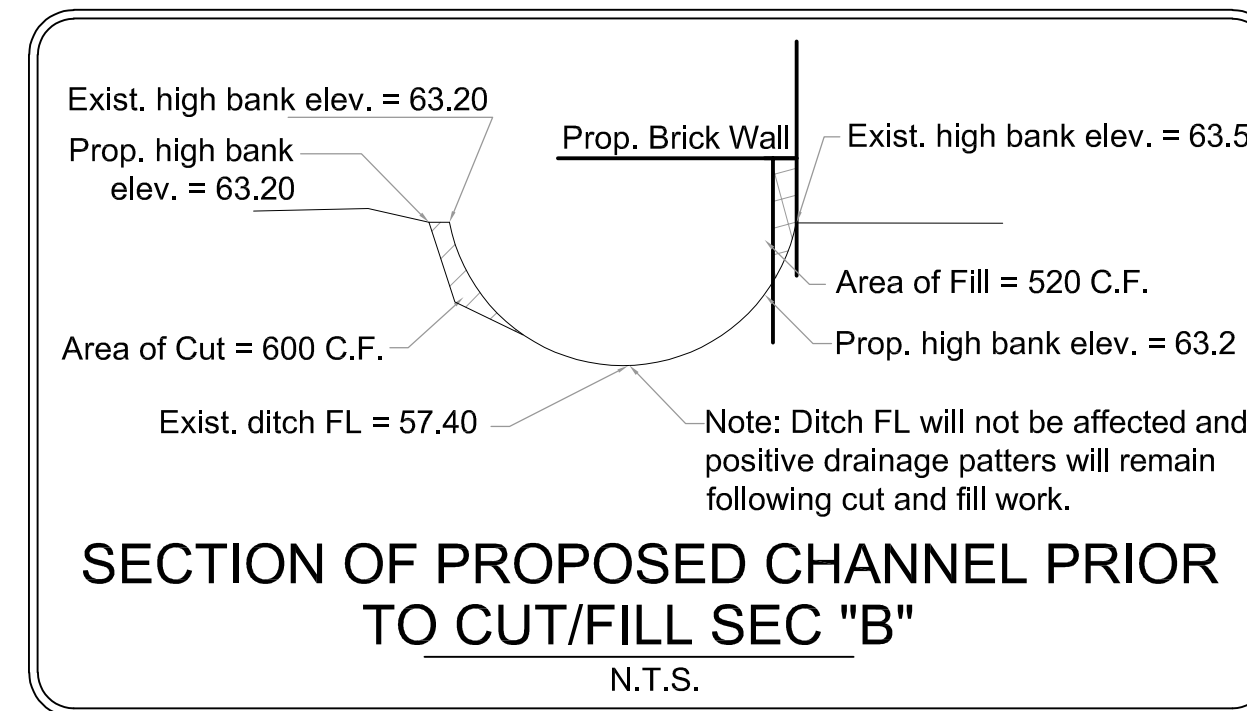
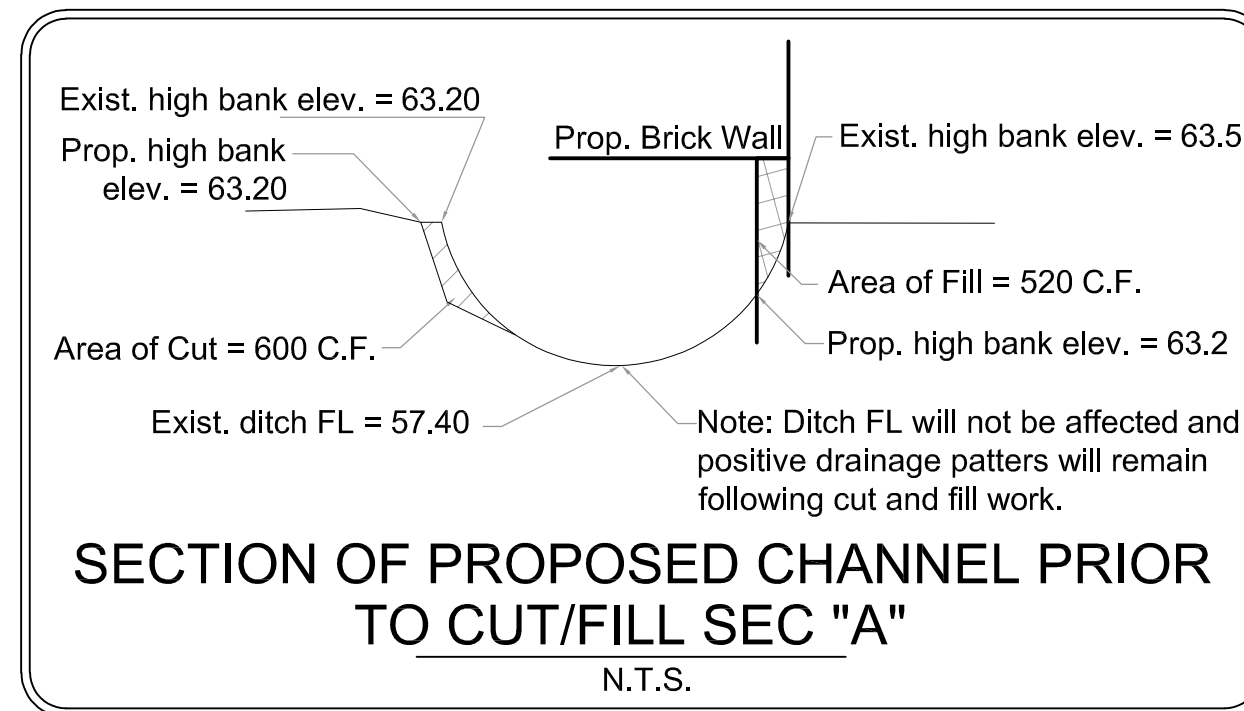
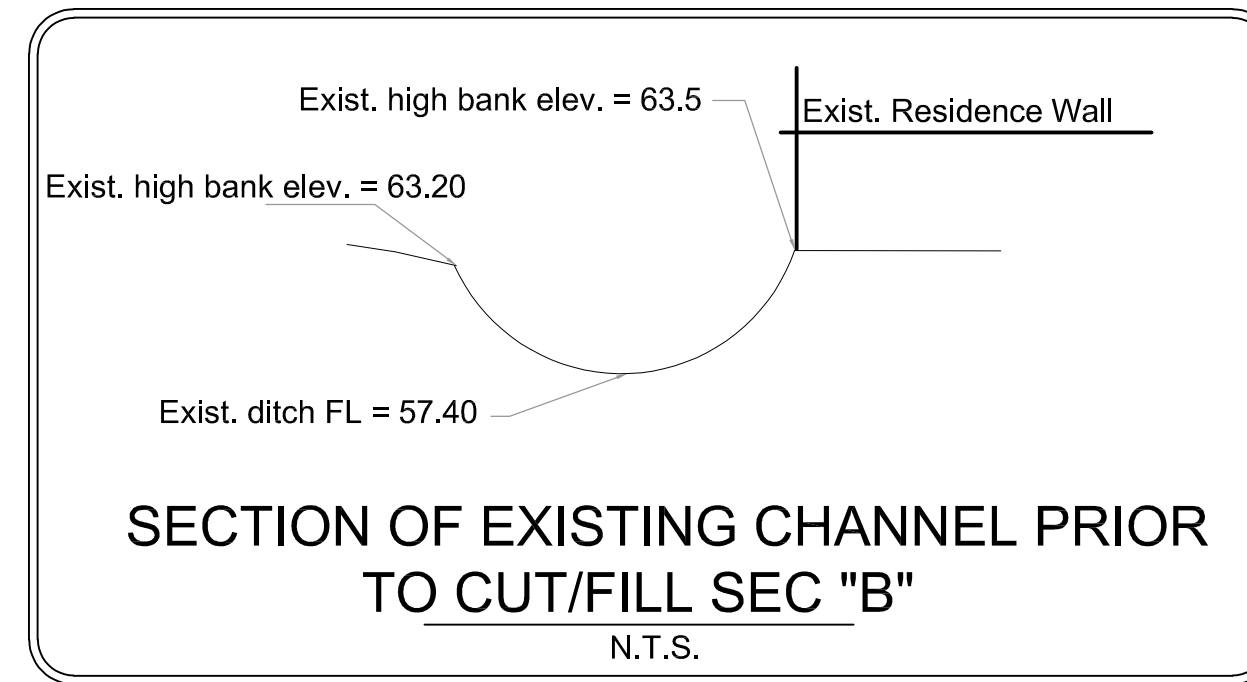
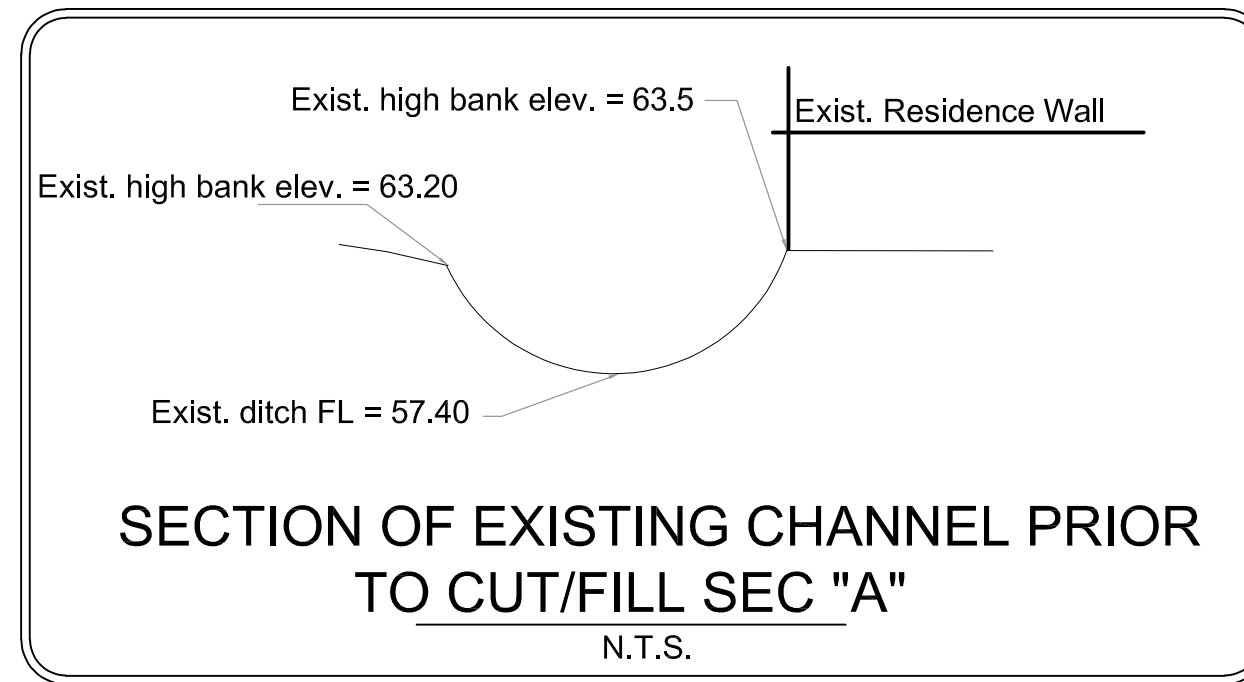


LEGEND	
T/G	= TOP OF GRATE
F/L	= FLOW LINE
XX XX	= PROPOSED ELEVATION
X	= EXISTING ELEVATION
-	= SLOPE DIRECTION
☒	= 12" SQ. CATCH BASIN
FF	= FINISH FLOOR ELEVATION

ELEVATION INFORMATION

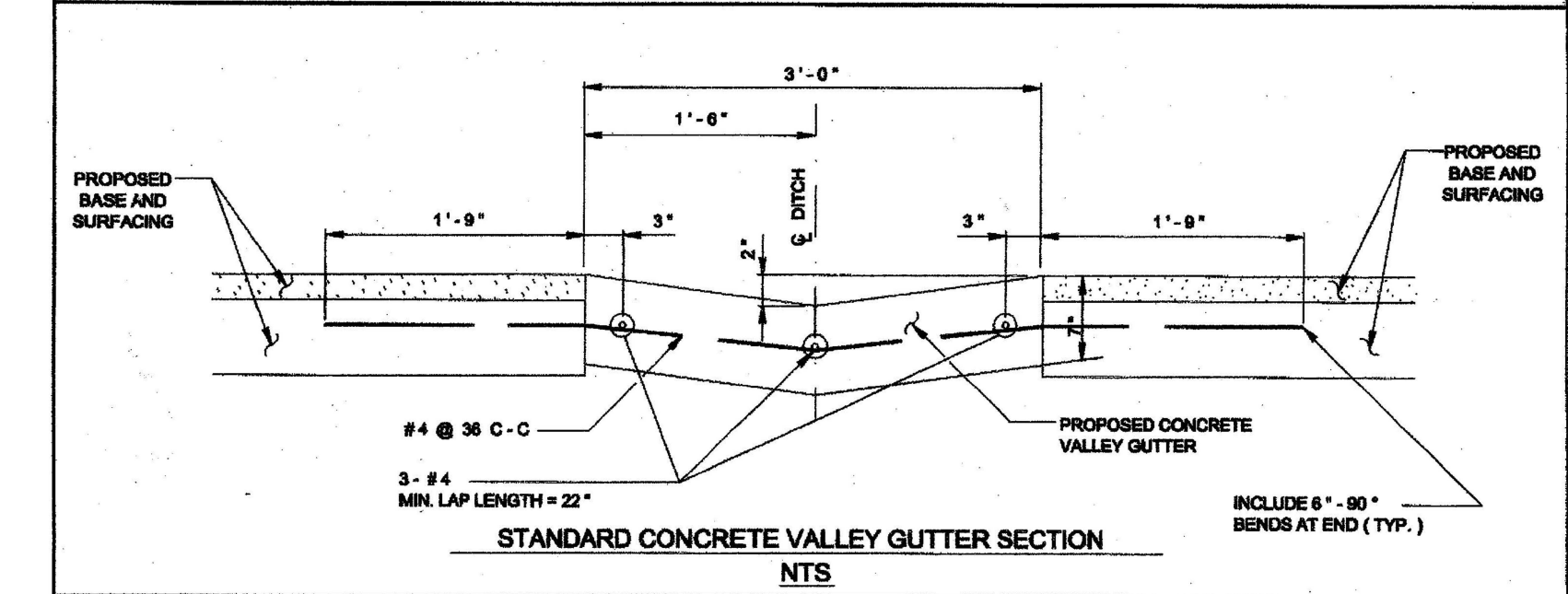
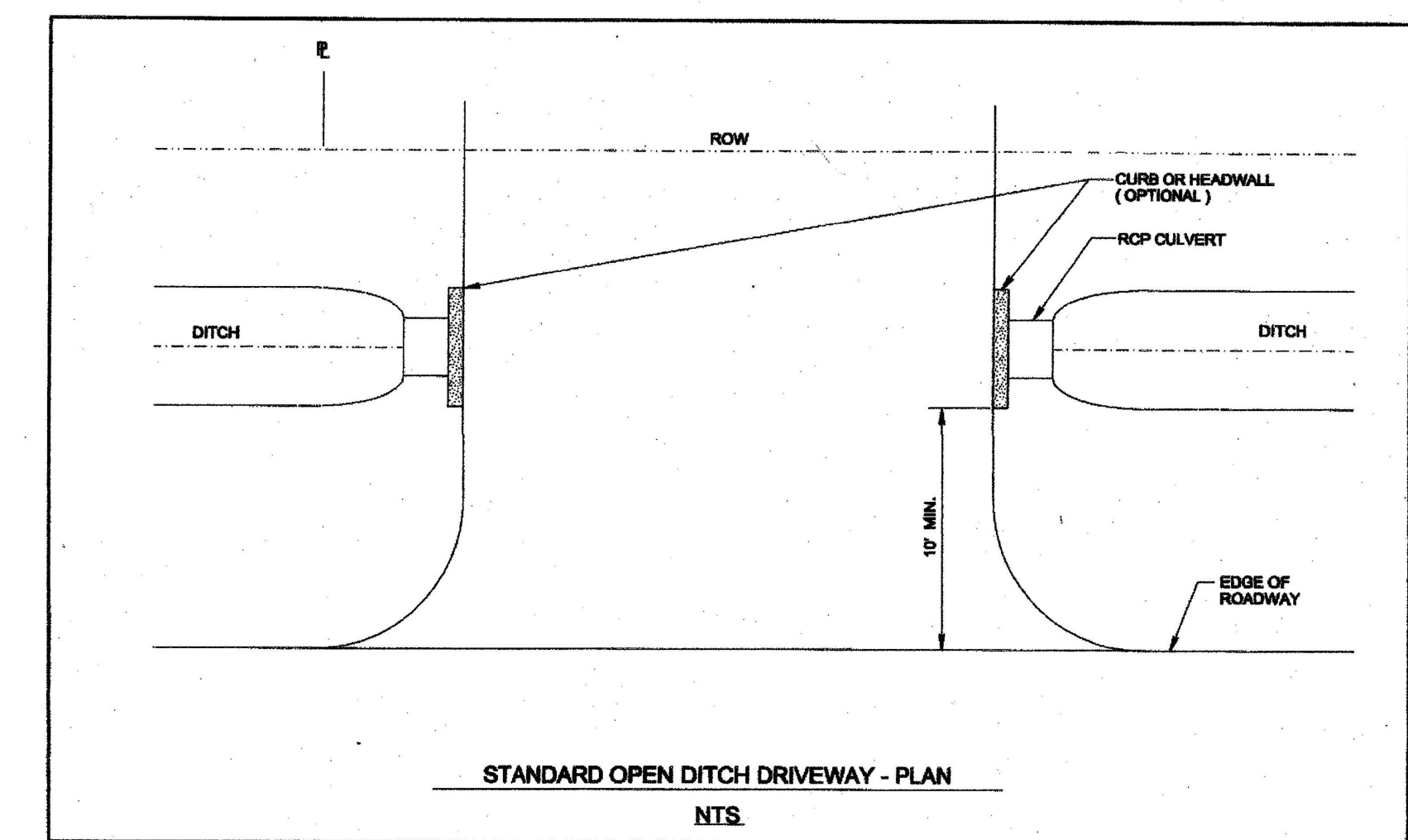
BM:
 FLOODPLAIN REFERENCE MARK NUMBER 210215 IS A HCFO BRASS DISK STAMPED 0210215 IN KEY MAP 451 W IN THE BUFFALO BAYOU WATERSHED NEAR STREAM W 140-00-00, ELEV = 68.31'.
 NAVD 1988, 2001 ADJ.

TBM:
 BASE FLOOD INFORMATION:
 SUBJECT PROPERTY SITES IN ZONE "X UNSHADED"
 AS PER FEMA MAP PANEL # 48201C0665 M
 (N.A.V.D. 1988, 2001 ADJUSTMENT)



EXISTING DITCH:		PROPOSED DITCH:	
B1=	7 ft	B1=	7 ft
B2=	35.5 ft	B2=	35.5 ft
H=	5.7 ft	H=	5.7 ft
Length of Channel=	140 ft	Length of Channel=	140 ft
Cross Sectional Area		Cross Sectional Area	
$((B1+B2)/2)*H=$	121.13 ft ²	$((B1+B2)/2)*H=$	121.13 ft ²
$Q = (K/n)AR^{(2/3)}S^{(1/2)}$		$Q = (K/n)AR^{(2/3)}S^{(1/2)}$	
K=	1.49 (english units)	K=	1.49 (english units)
n=	0.045 (earthen channel)	n=	0.045 (earthen channel)
R=	9.69	R=	9.69
S=	0.0001	S=	0.0001
V=	1.50 f/s	V=	1.50 f/s
Q=	182.29 cfs	Q=	182.29 cfs
Q _{exist} =	182.29	Q _{prop} =	182.29 = Q _{exist} = 182.29
Volume =	16957.50 ft ³	Volume =	16957.50 ft ³

1. ALL EXCAVATED SOIL FROM THE FOUNDATION SHALL BE REMOVED FROM THE CONSTRUCTION SITE PRIOR TO THE START OF FRAMING AND MAY NOT BE USED AS FILL DIRT UNLESS SPECIFICALLY CALLED FOR ON PLANS.
2. CONSTRUCTION SITE IS TO MAINTAINED FREE OF ANY OPEN TRENCHES, PITS HOLES OR OTHER EXCAVATIONS THAT MAY HOLD WATER AND AT NO TIME MAY RUNOFF FROM CONSTRUCTION SITE TRAVERSE NEIGHBORING PROPERTY.
3. RUNOFF SHALL BE FILTERED TO PREVENT SAND, MUD AND DIRT OF ANY KIND FROM ENTERING CITY STORM DRAINAGE SYSTEM.
4. THE PROPERTY WILL BE REQUIRED TO CONTAIN AND CONVEY THEIR STORM DRAINAGE WITHIN THEIR LOT AND FROM THE BACK TO THE FRONT DITCH AT GLOURIE DRIVE. ELEVATIONS TO PROVIDED TO MEET THIS REQUIREMENT. A ROT BOARD INTO THE GROUND CAN BE PROVIDED ALONG THE FENCE LINE AND GRADE PROPERTY TO DRAIN ACCORDINGLY.
5. EXISTING DRAINAGE FROM OTHER PROPERTIES DRAINING INTO AND THROUGH THE LOT TO BE DEVELOPED OR RE-DEVELOPED SHALL BE MAINTAINED DURING AND AFTER CONSTRUCTION ACTIVITIES ARE COMPLETED.
6. PROPOSED LANDSCAPING/ PLANTING AREAS ALONG THE PROPERTY PERIMETER SHALL NOT IMPEDE THE STORM WATER FLOW INTO AND THROUGH SWALES OR STORM SEWER INLETS. NO RAISED FLOWER BEDS WILL BE ALLOWED ALONG THE PERIMETER OF THE PROPERTY. NO LANDSCAPING/ PLANTING WILL BE PERMITTED IN THE DRAINAGE SWALES.
7. PROPOSED OR EXISTING RAIN GUTTER DOWNSPOUTS SHALL NOT BE TIED INTO EXISTING OR PROPOSED UNDERGROUND STORM SEWER LINES THAT DRAIN DIRECTLY INTO THE CITY'S DITCHES ON THE FRONT AND/OR SIDE OF THE OWNER'S PROPERTY, NOR SHALL THEY BE EXTENDED TO TIE DIRECTLY INTO THE CITY'S DITCHES.
8. POSITIVE DRAINAGE TO A CITY DRAINAGE FACILITY MUST BE MAINTAINED AT ALL TIMES
9. NO ELEVATION CHANGES SHALL OCCUR AROUND AND WITHIN 3-FT OF THE PERIMETER OF THE PROPERTY WHICH COULD BECOME A PHYSICAL BARRIER FOR THE NATURAL FLOW OF WATER FROM ADJACENT PROPERTIES INTO THE PROPERTY BEING DEVELOPED OR REDEVELOPED.



1. REINFORCED CONCRETE PIPE (RCP) CULVERTS AND CONCRETE VALLEY GUTTER GRADES SHALL BE SET BY CITY ENGINEER. PROFILE SHOWING THE PROPOSED AND EXISTING DITCH FLOW LINE WILL BE REQUIRED WHERE CONCRETE VALLEY GUTTERS ARE TO BE CONSTRUCTED IN LIEU OF CULVERTS.
2. CULVERT SIZE WILL BE APPROVED BY CITY ENGINEER WITH 24" DIAMETER MINIMUM.
3. SPACING OF TYPE "D" OR "D-1" INLETS SHALL BE DETERMINED BY CITY ENGINEER. SEE DRAWING NO. 02832-07 FOR TYPE "D" OR DRAWING NO. 02832-08 FOR TYPE "D-1".
4. DRIVEWAY MAY BE CONCRETE, ASPHALT OR ANY OTHER MATERIAL WHICH WILL NOT PERMIT WIND OR WATERBORNE EROSION.
5. A 3- FOOT CONCRETE VALLEY GUTTER SECTION SHALL BE CONSTRUCTED THROUGH THE PROPOSED DRIVEWAY WHERE THE CITY ENGINEER DETERMINES THE INSTALLATION OF DITCH CULVERTS TO BE IMPRACTICAL DUE TO INSUFFICIENT DEPTH. THE VALLEY GUTTER SECTION WILL BE CONSTRUCTED OF 5-1/2 SACK CEMENT PER CUBIC YARD OF CONCRETE.

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

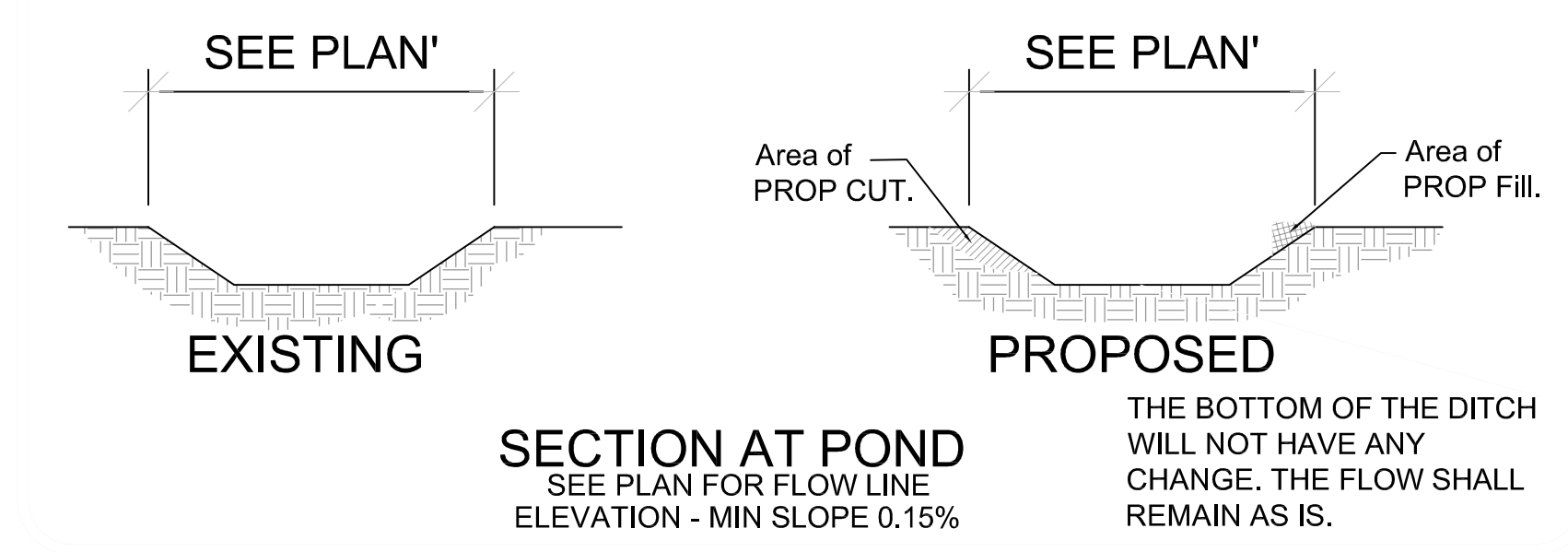
DRIVEWAYS WITH CULVERTS OR VALLEY GUTTERS ON OPEN DITCH TYPE STREETS

(NOT TO SCALE)

APPROVED BY: [Signature]
CITY ENGINEER

APPROVED BY: [Signature]
DIRECTOR OF PUBLIC WORKS AND ENGINEERING

EFF DATE: OCT-01-2009 DWG NO: 02754-02



STATE OF TEXAS
REGISTERED PROFESSIONAL ENGINEER
73425
JOHN BRECICKO
7-15-22

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1210 RIDGELEY DRIVE
HILLSHIRE VILLAGE, TX, 77055

REF #: 22-1220-0001

DRN:	AS	CHK:	FA	DES:	XB
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STANDARD NOTES AND DETAIL

SHEET NO. **C2.0**

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