

CONSTRUCTION PLANS

FOR

DRAINAGE IMPROVEMENTS

FOR

WILLOW PARK OFFICE CONDOMINIUMS

AT FM 2920

LOCATED IN

SPRING WEST M.U.D.

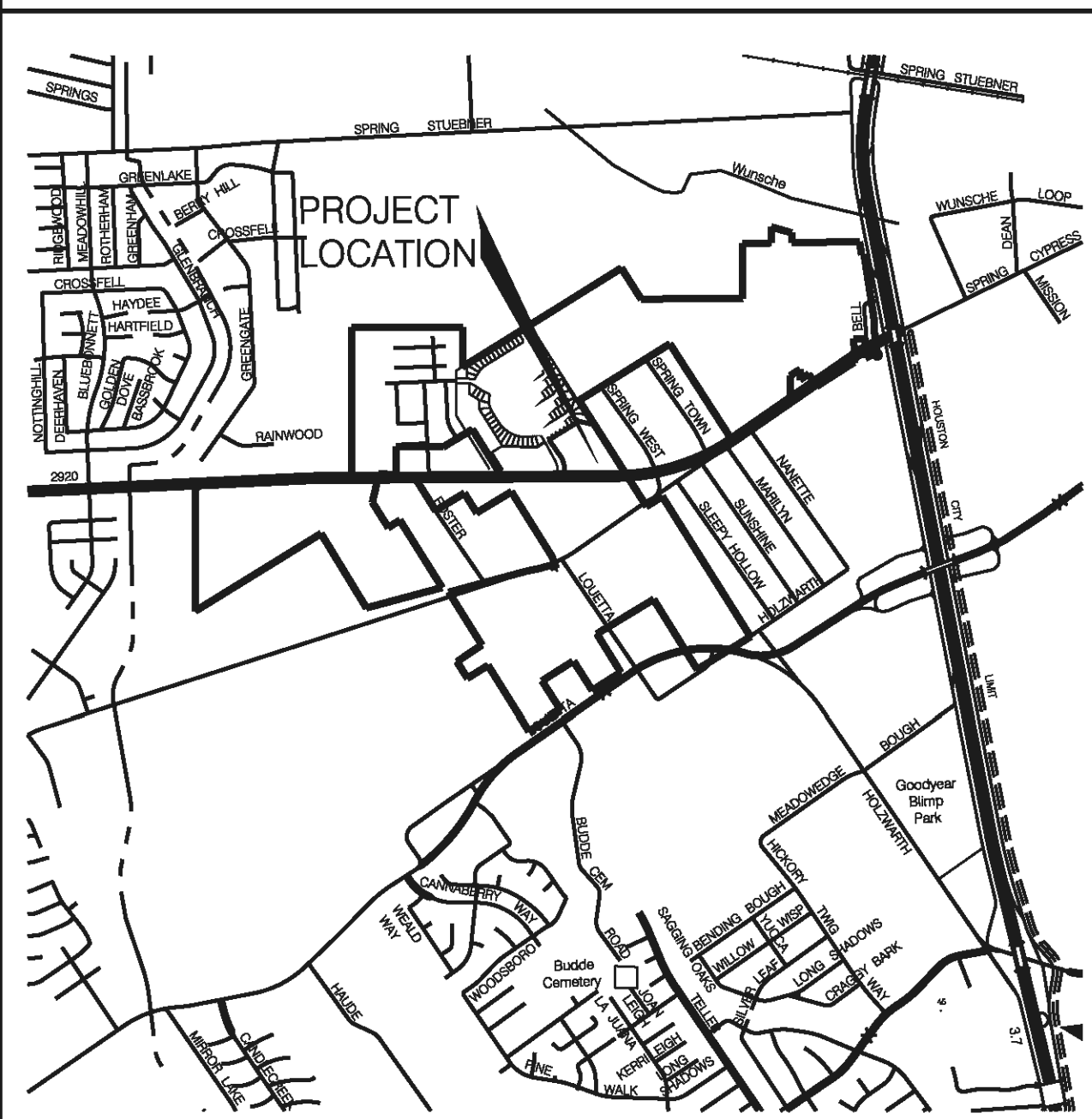
IN

HARRIS COUNTY, TEXAS

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VICINITY MAP
N.T.S.

P:\WILLOW PARK CONDOS\DCN\01_COVER SHEET.dgn 12/23/2021

JOB NO. 2021271 - CONSTRUCTION PLANS FOR DRAINAGE IMPROVEMENTS FOR WILLOW PARK OFFICE CONDOMINIUMS AT FM 2920 LOCATED IN SPRING WEST M.U.D. IN HARRIS COUNTY, TEXAS



Engineering and Surveying
2107 CityWest Blvd., 3rd Floor
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TYPE FIRM REG. No. 290
TBPLS FIRM REG. No. 100486

JOB NO. 20201033
DECEMBER, 2021



**Know what's below.
Call before you dig.**



GENERAL CONSTRUCTION NOTES

1. IT IS THE INTENT OF THE CONTRACT DOCUMENTS TO BE CONSISTENT IN THEIR ELEMENTS TO DESCRIBE AND PROVIDE FOR A COMPLETE PROJECT. IN THE EVENT OF A CONFLICT BETWEEN THE CONSTRUCTION PLANS AND THE TECHNICAL SPECIFICATIONS, TECHNICAL SPECIFICATION SECTION 02200 SHALL SUPERCEDE THE CONSTRUCTION PLANS WITH THE EXCEPTION THAT 2 1/2 SACK PER CUBIC YARD CEMENT STABILIZED SAND MIXTURE WILL ALWAYS BE REQUIRED FOR BACKFILL BETWEEN WATER AND SANITARY CROSSINGS AS IS INDICATED ON SHEET C-11. IN THE EVENT OF A CONFLICT BETWEEN THE CONSTRUCTION PLANS AND ANY TECHNICAL SPECIFICATION OTHER THAN TECHNICAL SPECIFICATION SECTION 02200, THE CONSTRUCTION PLANS SHALL SUPERCEDE THE TECHNICAL SPECIFICATIONS. IN ALL SITUATIONS WHERE SPECIAL PROVISIONS ARE INDICATED IN THE TECHNICAL SPECIFICATION, THE SPECIAL PROVISION WILL SUPERCEDE THE TECHNICAL SPECIFICATIONS.
2. THE CONTRACTOR SHALL CONTACT THE OWNER'S REPRESENTATIVES, AND THE APPROPRIATE CITY OF HOUSTON DEPARTMENTS 48-HOURS PRIOR TO THE START OF ANY CONSTRUCTION. THE CONTRACTOR SHALL FURNISH APPROPRIATE TEST DATA TO THE GEOTECHNICAL ENGINEER FOR ANY REQUIRED BORROW SOURCE BEFORE MOBILIZING TO THE SITE.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ARRANGE FOR THE PURCHASE OF ANY CONSTRUCTION WATER. ANY CONSTRUCTION WATER REQUIRED ON SITE SHALL BE METERED IN A MANNER APPROPRIATE TO ALLOW THE CITY OF HOUSTON TO BILL FOR THAT WATER USE. THE CONTRACTOR SHALL NOT OPERATE ANY EXISTING GATE VALVES ON PUBLIC WATER LINES (UNLESS NECESSITATED BY EMERGENCY). THE OPERATION OF THE PUBLIC WATER SYSTEM MUST BE BY THE CITY OF HOUSTON.
4. ALL UNSATISFACTORY AND/OR WASTE MATERIALS INCLUDING VEGETATION, ROOTS, STRIPPINGS, CONCRETE, AND DEBRIS SHALL BE HAULED OFF SITE BY THE CONTRACTOR. TREES AND BRUSH ARE NOT INDICATED ON THE CONSTRUCTION PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VISIT THE SITE AND DETERMINE THE EXTENT OF ANY TREE/BRUSH REMOVAL REQUIRED. UNLESS DESIGNATED TO REMAIN ON EITHER THE CIVIL DRAWINGS OR THE LANDSCAPE DRAWINGS, ALL TREES, ROOTS AND HEAVY BRUSH MUST BE REMOVED FROM THE PROJECT SITE.
5. THE CONTRACTOR SHALL MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES DURING CONSTRUCTION OF PROPOSED FACILITIES. THE CONTRACTOR SHALL SUBMIT A DRAINAGE PLAN SHOWING PROPOSED DITCHES, SUMPS AND PUMPS THROUGHOUT THE PROJECT AS SITE PREPARATION IS UNDERWAY. SUBGRADES SHALL BE SLOPED TO DRAIN AND THE SUBGRADES SHALL BE SEALED BY COMPACTING WITH A RUBBER TIRE ROLLER AT THE END OF EACH DAY OR WHEN RAIN IS IMMINENT.
6. ALL EXISTING UTILITIES MAY NOT BE INDICATED. THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING FACILITIES PRIOR TO CONSTRUCTION OF PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY UTILITIES 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTACT TEXAS ONE-CALL 713-223-4567. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE DEPTHS OF ALL EXISTING UTILITY LINES ON THE PROJECT. DO NOT DAMAGE EXISTING OR NEW UTILITY LINES. ANY DAMAGE TO THESE LINES AS A RESULT OF CONSTRUCTION WILL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE AND TO THE APPROVAL OF THE OWNER. THIS NOTE INCLUDES IRRIGATION LINES WITHIN THE RIGHT-OF-WAY.

ALL EXISTING IRRIGATION LOCATED IN THE STREET RIGHT-OF-WAY WHICH IS DAMAGED, SHALL BE REPAIRED BY THE CONTRACTOR.
7. ALL EXISTING LANDSCAPING, SIDEWALKS, FENCES, UTILITIES AND OTHER EXISTING FACILITIES WHICH SHALL REMAIN AND ARE DAMAGED DURING CONSTRUCTION WILL BE REPLACED OR REPAIRED TO THEIR ORIGINAL CONDITION BY THE CONTRACTOR AT HIS EXPENSE.
8. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE OWNER.
9. THE CONTRACTOR SHALL CONFINE ALL WORK WITHIN THE DESIGNATED AREA (BOUNDARY AND EASEMENTS SHOWN ON PLANS) UNLESS SPECIFICALLY AUTHORIZED BY OWNER. EXTREME CARE SHOULD BE EXERCISED NEAR ADJACENT PROPERTY TO PROTECT ANY EXISTING TREES AND PROPERTY.
10. ALL CONSTRUCTION WHICH HINDERS TRAFFIC OR REQUIRES TRAFFIC DIVERSION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE CONTRACTOR WILL BE REQUIRED TO PREPARE, SUBMIT AND OBTAIN CITY OF HOUSTON APPROVAL OF A TRAFFIC CONTROL PLAN FOR THE WORK PERFORMED WITHIN CITY OF HOUSTON RIGHT-OF-WAY.

WORK WITHIN THE TXDOT RIGHT-OF-WAY SHALL NOT COMMENCE UNTIL THIS PHASE OF WORK IS SPECIFICALLY AUTHORIZED BY THE OWNER. WORK IN THE TXDOT RIGHT-OF-WAY WILL BE DELAYED UNTIL RECEIPT OF THE PERMIT FROM TXDOT. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE TXDOT PERMIT.
11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ALIGN THE GRATE TOPS HORIZONTALLY TO CONFORM TO THE PROPOSED PARKING ROWS AS INDICATED ON THE DRAWINGS.
12. MAINTAIN A MINIMUM OF 6-INCH CLEARANCE BETWEEN ALL UTILITIES UNLESS OTHERWISE INDICATED ON THE CONSTRUCTION PLANS.
13. PRIOR TO COMMENCING WORK IN ANY AREA, THE CONTRACTOR SHALL MOW AND STRIP THE VEGETATION IN ALL AREAS WHERE WORK IS TO BE PERFORMED, OR IN ANY LOCATION WHERE CONSTRUCTION MACHINES OR TRUCKS ARE TO BE OPERATING. ALL AREAS PROPOSED TO BE DISTURBED IN ANY FASHION ARE TO BE STRIPPED. STRIPPING IS DEFINED AS REMOVING ALL GRASS AND THE ORGANIC ZONE (A MINIMUM OF 4-INCHES).
14. THE CONTRACTOR SHALL EXECUTE THE REQUIRED POLLUTION PREVENTION PLAN (PPP) AND ASSOCIATED NOTICE OF INTENT (NOI) FORM FOR THIS PROJECT AND SHALL BE RESPONSIBLE FOR CONSTRUCTING AND MAINTAINING ALL ITEMS IDENTIFIED IN THE PPP UNTIL THIS PROJECT IS SUBSTANTIALLY COMPLETE. THE CONTRACTOR SHALL PREPARE WEEKLY INSPECTION REPORTS AS REQUIRED BY THE PPP.
15. CONTRACTOR IS TO OBTAIN ALL REQUIRED CITY OF HOUSTON PERMITS PRIOR TO START OF CONSTRUCTION.
16. ALL FINAL MANHOLE RIM ELEVATIONS IN LANDSCAPE AREAS ARE TO BE SET AT FOUR-INCHES ABOVE FINISHED GRADE (I.E. AFTER LANDSCAPING IS COMPLETE).
17. ALL CEMENT STABILIZED SAND UTILIZED ON THIS PROJECT SHALL CONFORM WITH THE GRADATION INDICATED IN THE TECHNICAL SPECIFICATIONS AND BE MIXED WITH TWO SACKS OF CEMENT PER CUBIC YARD OF SAND.
18. ALL EXISTING DITCHES PROPOSED FOR FILL (OR THOSE FILLED DURING THE COURSE OF THE PROJECT) SHALL BE COMPLETELY STRIPPED (A MINIMUM OF 6-INCHES) AND MUCKED OUT IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER. REMOVED MATERIAL (STRIPPING AND MUCKING) SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF IN A LEGAL MANNER. ALL SOIL TO FILL EXISTING DITCHES OR TO MAKE GRADE FOR PROPOSED PARKING IMPROVEMENTS SHALL BE OBTAINED FROM EXCESS UTILITIES/PARKING EXCAVATION OR BE HAULED TO THE SITE BY THE CONTRACTOR. ANY MATERIAL HAULED TO THE SITE MUST BE A STRUCTURAL FILL MATERIAL (P.I. BETWEEN 8 AND 22 AND A LIQUID LIMIT LESS THAN 42). ALL FILL SHALL BE PLACED IN MAXIMUM 6-INCH LOOSE LIFTS AND COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR MAXIMUM DRY DENSITY AT A MOISTURE CONTENT WITHIN +/- 2 PERCENTAGE POINTS OF OPTIMUM AS DETERMINED BY ASTM D698.

19. REFERENCE IS MADE IN SUBSEQUENT NOTES AND DETAILS REGARDING THE PLACEMENT OF CEMENT STABILIZED SAND UNDER OR WITHIN 3 FEET OF PROPOSED PAVEMENT. BY DEFINITION, THIS MEANS ALL AREAS BENEATH OR WITHIN 3 FEET OF PAVEMENT IN ADDITION TO A LINE STARTING AT 3 FEET FROM PAVEMENT AND EXTENDING AWAY FROM THE PAVEMENT ON A DOWNWARD SLOPE OF ONE FOOT HORIZONTAL TO ONE FOOT VERTICAL.
20. THESE PLANS, PREPARED BY COSTELLO, INC., DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE REGISTERED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THESE PLANS. THE CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING THE PLANS AND SPECIFICATIONS REQUIRED BY THE HOUSE BILLS 652 AND 665 ENACTED BY THE TEXAS LEGISLATURE IN THE 70TH LEGISLATURE REGULAR SESSION AND CURRENT OSHA STANDARDS FOR TRENCH SAFETY. DESIGN OF TRENCH SAFETY SYSTEMS SEALED BY A LICENSED PROFESSIONAL ENGINEER, SHALL BE SUBMITTED BY THE CONTRACTOR PRIOR TO EXECUTION OF A CONTRACT FOR THIS WORK.
21. ALL CONTRACTOR VEHICLES, INCLUDING EMPLOYEE'S VEHICLES, SHALL PARK WITHIN THE PROJECT SITE TO MINIMIZE TRAFFIC ON THE PUBLIC STREETS ADJACENT TO THE WORK SITE ENTRANCE. CONTRACTOR WILL PROVIDE SUFFICIENT PARKING AREAS TO ACCOMMODATE HIS VEHICLES. THE CONTRACTOR SHALL, ON A DAILY BASIS, CLEAN ALL STREETS IN THE VICINITY OF THE WORK SITE ENTRANCE TO ENSURE THAT NO DIRT FROM THE PROJECT ACCUMULATES IN THE EXISTING STREETS.

STORM SEWER CONSTRUCTION NOTES

1. STORM SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF HOUSTON DESIGN STANDARDS AS CURRENTLY AMENDED UNLESS SPECIFIED OTHERWISE ON PLANS OR TECHNICAL SPECIFICATIONS.
2. ALL STORM SEWER 24-INCH AND GREATER IN DIAMETER SHALL BE HDPE UNLESS OTHERWISE NOTED ON THE PLANS. BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF HOUSTON DESIGN STANDARDS, UNLESS OTHERWISE INDICATED ON PLANS OR TECHNICAL SPECIFICATIONS. ALL STORM SEWERS SHALL HAVE RUBBER GASKET JOINTS. ALL STORM SEWER PIPE AND FITTINGS UP TO 15-INCHES IN DIAMETER SHALL BE CONSTRUCTED OF PVC SDR 35 CONFORMING TO ASTM D3034. ALL STORM SEWER 18-INCHES IN DIAMETER SHALL BE, AT CONTRACTORS OPTION, REINFORCED CONCRETE PIPE (C-76 CLASS III) OR PVC SDR 35 CONFORMING TO ASTM F 679. ALL PVC JOINTS SHALL CONFORM TO ASTM D3212. JOINTS SHALL BE BELL AND SPIGOT TYPE WITH RUBBER GASKET CONFORMING TO ASTM 477. CHEMICALLY WELDED PVC PIPE JOINTS ARE NOT ACCEPTABLE.
3. ALL STORM SEWERS UNDER OR WITHIN THREE (3) FEET OF PROPOSED OR FUTURE PAVEMENT SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND TO PAVEMENT SUBGRADE.
4. STORM SEWER MANHOLE COVERS SHALL BE LABELED STORM SEWER.

HARRIS COUNTY PERMIT NOTES

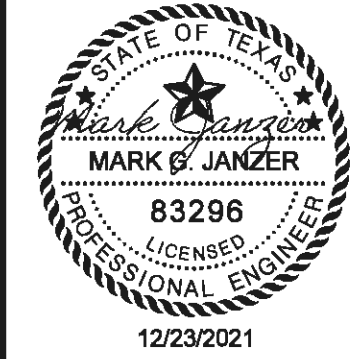
1. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY REGULATION OF HARRIS COUNTY TEXAS FOR FLOOD PLAIN MANAGEMENT PRIOR TO STARTING CONSTRUCTION.
2. OWNER TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITY AND/OR CULVERTS WITHIN HARRIS COUNTY ROAD RIGHT OF WAY.
3. THE PROPERTY OWNER OR THE CONTRACTOR SHALL CONTRACT THE HARRIS COUNTY STORM WATER QUALITY PERMITTING SECTION AT 713-956-3000 FOR A PRE-CONSTRUCTION INSPECTION PRIOR TO COMMENCING ANY CLEARING OR CONSTRUCTION ACTIVITIES ON THE SITE.
4. UPON COMPLETION OF CONSTRUCTION, THE OIL, GRIT & TRASH (HYDRO-DYNAMIC) SEPARATOR WILL BE CLEANED OF ALL SEDIMENTS AND DEBRIS THAT MAY HAVE ACCUMULATED. THIS MUST BE DONE PRIOR TO SUBMITTING AN "AS-BUILT CERTIFICATE" AND CALLING FOR A FINAL INSPECTION. HARRIS COUNTY WILL NOT ACCEPT THE "AS-BUILT CERTIFICATE", PERFORM THE FINAL INSPECTION, OR ISSUE A CERTIFICATE OF COMPLIANCE UNTIL THE REQUIRED FINAL CLEAN OUT HAS BEEN COMPLETED. THE DEVELOPMENT CANNOT BE OCCUPIED UNTIL A CERTIFICATE OF COMPLIANCE IS ISSUED.
5. "AUTHORIZATION NOTICE ISSUED BY HARRIS COUNTY PUBLIC INFRASTRUCTURE ENGINEERING DEPARTMENT PERMIT OFFICE REQUIRED PRIOR TO CONSTRUCTION OF UTILITIES OR LEFT TURN LANES WITHIN HARRIS COUNTY RIGHT-OF-WAY." CONTACT HARRIS COUNTY PERMIT OFFICE (713-956-3000).

WILLOW PARK CONDOMINIUMS

CONSTRUCTION NOTES

Costello

Engineering and Surveying
2107 CityWest Blvd., 3rd Floor
Houston, Texas 77042
(713) 783-7789 (713) 783-3590, Fax
TBE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

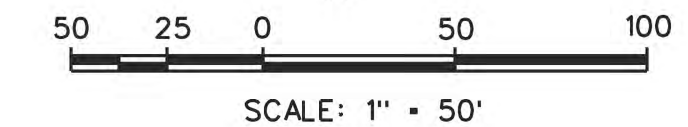


DRAWING SCALE:

SHEET
3
OF 16 SHEETS
JOB NO. 2021-271

P:\WILLOW PARK CONDOMINIUMS\NOTES.dgn 10/4/2021 12:23:20 PM

JOB NO. 2021-271 WILLOW PARK OFFICE CONDO



LEGEND

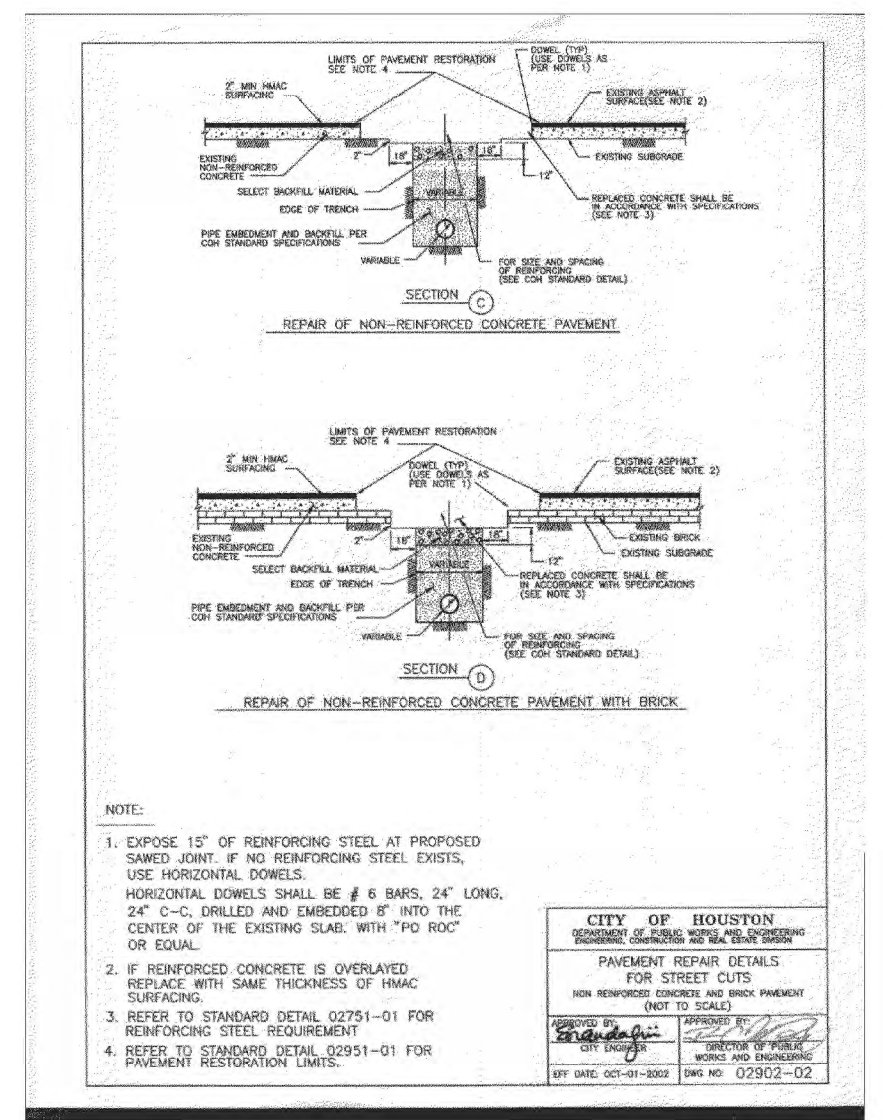
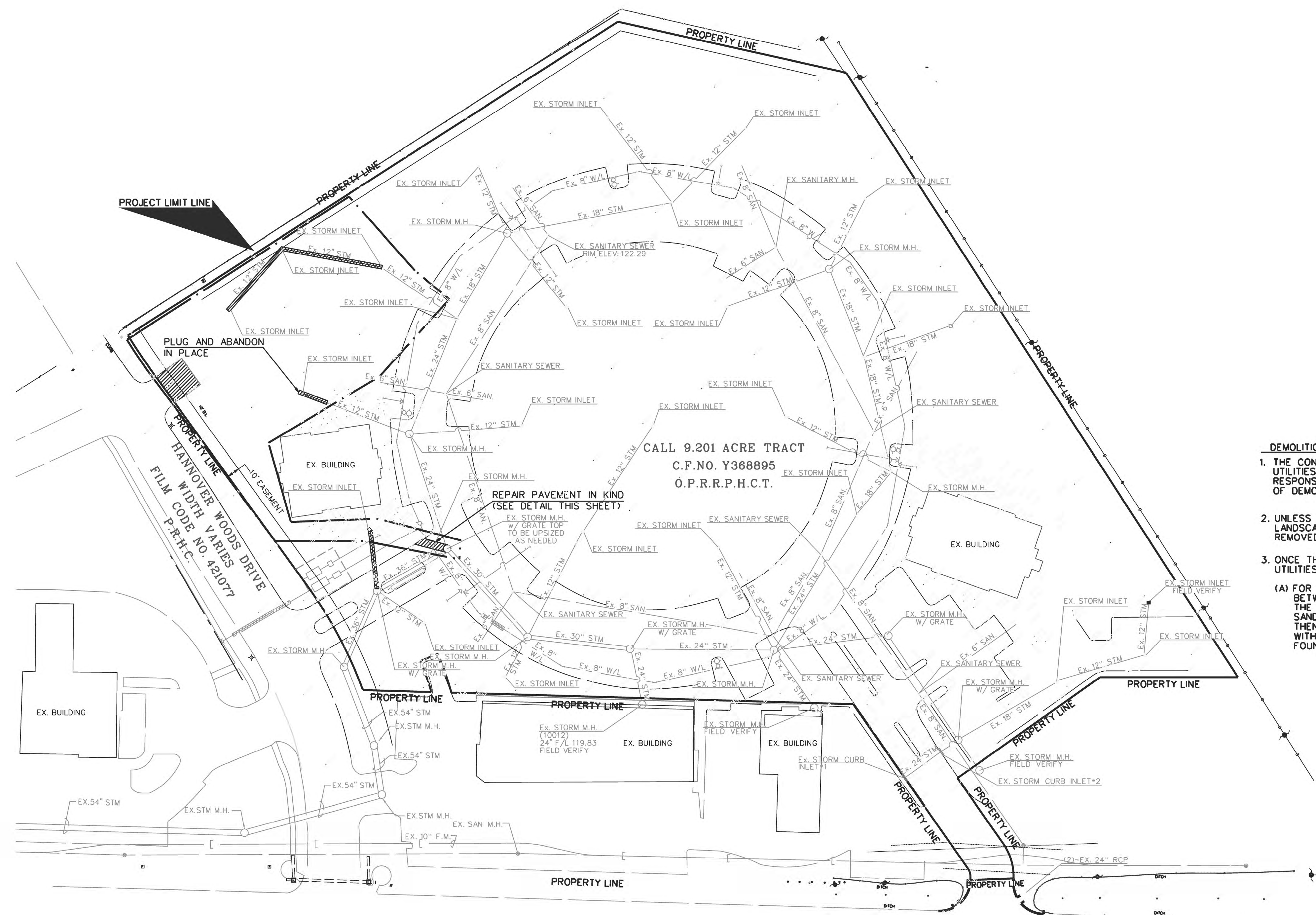
- • Ex. BACK OF 6-INCH CONC. CURB
- STM. MANHOLE INLET —•— • EXIST. STORM SEWER
- SAN. MANHOLE —•— • EXIST. SANITARY SEWER
- GATE VALVE —•— • EXIST. WATER LINE
- FLUSH VALVE —•— • EXIST. POWER POLE
- P— • EXIST. OVERHEAD POWER
- • EXIST. TREE
- • EXIST. FENCELINE

DEMOLITION LEGEND

- TO BE DEMOLISHED
- - - - - INDICATES SAWCUT

DEMOLITION NOTES:

1. THE CONTRACTOR SHALL BE AWARE THAT ALL EXISTING UTILITIES ARE NOT SHOWN, IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE PRIOR TO COMMENCEMENT OF DEMOLITION TO DETERMINE THE EXTENT OF DEMOLITION REQUIRED.
2. UNLESS OTHERWISE NOTED ON THE PLANS, ALL TREES AND LANDSCAPING WITHIN THE PARKING LOT AREA ARE TO BE REMOVED. REMOVED TREES SHALL HAVE ENTIRE ROOT BALL REMOVED FROM THE SITE.
3. ONCE THE CONTRACTOR HAS REMOVED EXISTING UTILITIES, THE TRENCHES SHALL BE BACKFILLED AS FOLLOWS:
 - (A) FOR TRENCHES BENEATH THE BUILDING FOOTPRINT OR BETWEEN THE BUILDING FOOTPRINT OR PROPOSED CURBLINE, THE TRENCH SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND UP TO THE BASE OF THE PROPOSED BUILDING FOUNDATION, THEN THE REMAINDER OF THE TRENCH SHALL BE BACKFILLED WITH SELECT FILL. (REFERENCE STRUCTURAL DRAWINGS FOR PROPOSED FOUNDATION ELEVATION).



CONTROL BENCHMARK
 H.C.F.C. DISC STAMPED K120-01 BMP5 ON HEADWALL AT DOWNSTREAM END AT BOX CULVERT AT LOUETTA RD. AND SINGER GULLY. ELEV. +115.83' 1973 ADJUSTMENT.
 TBM 1597-17-1 NORTHEAST BOLT ON TOP FLANGE OF FIRE HYDRANT ON SOUTHWEST SIDE OF HANNOVER WOODS DRIVE. ELEV. 129.44
 TBM 1597-17-2 BENCH TIE IS SOUTHWEST FACE OF POWER POLE AT THE NORTHEAST CORNER OF THE WILLOW PARK OFFICE CONDOMINIUM SITE. ELEV. 128.72
 TBM 1597-17-3 BENCH TIE IN WEST FACE OF POWER POLE AT THE SOUTHEAST CORNER OF THE WILLOW PARK OFFICE CONDOMINIUM SITE. ELEV. 123.40
 TBM 1597-18-4 "LL" IN MUELLER ON FIRST FIRE HYDRANT ON NORTH SIDE OF FM 2920 WEST OF HANNOVER WOODS DRIVE. ELEV. 127.47

NO.	REVISION	DATE	BY

DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____

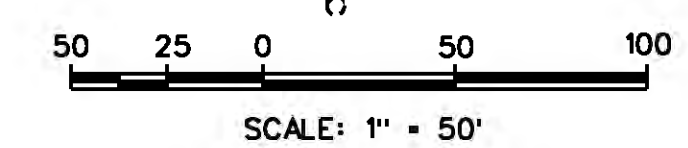
WILLOW PARK CONDOMINIUMS

TOPOGRAPHICAL & DEMOLITION LAYOUT

Costello
 Engineering and Surveying
 2107 CityWest Blvd., 3rd Floor
 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax
 TBPE FIRM REG. No. 280
 TBPLS FIRM REG. No. 100486



DRAWING SCALE: 1" = 50'	
SHEET	4
OF 16 SHEETS	
JOB NO. 2021-271	



LEGEND

- PROP. STORM SEWER
- EXIST. STORM SEWER
- EXIST. SANITARY SEWER
- EXIST. WATER LINE
- EXIST. BACK OF CURB
- EXIST. FENCELINE
- SIGNIFIES LINE "A" OVER LINE "B"
- 100 YEAR OVERLAND FLOW
- DRAINAGE BOUNDARY
- ACRES

CONTROL BENCHMARK
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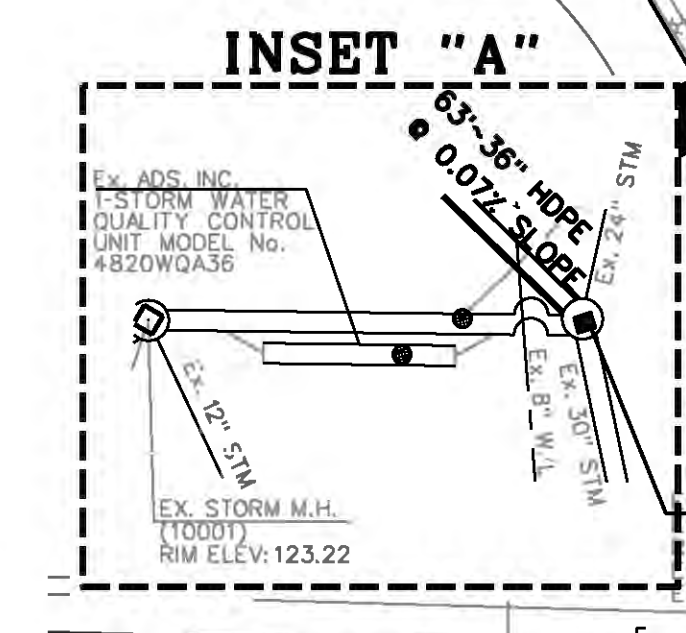
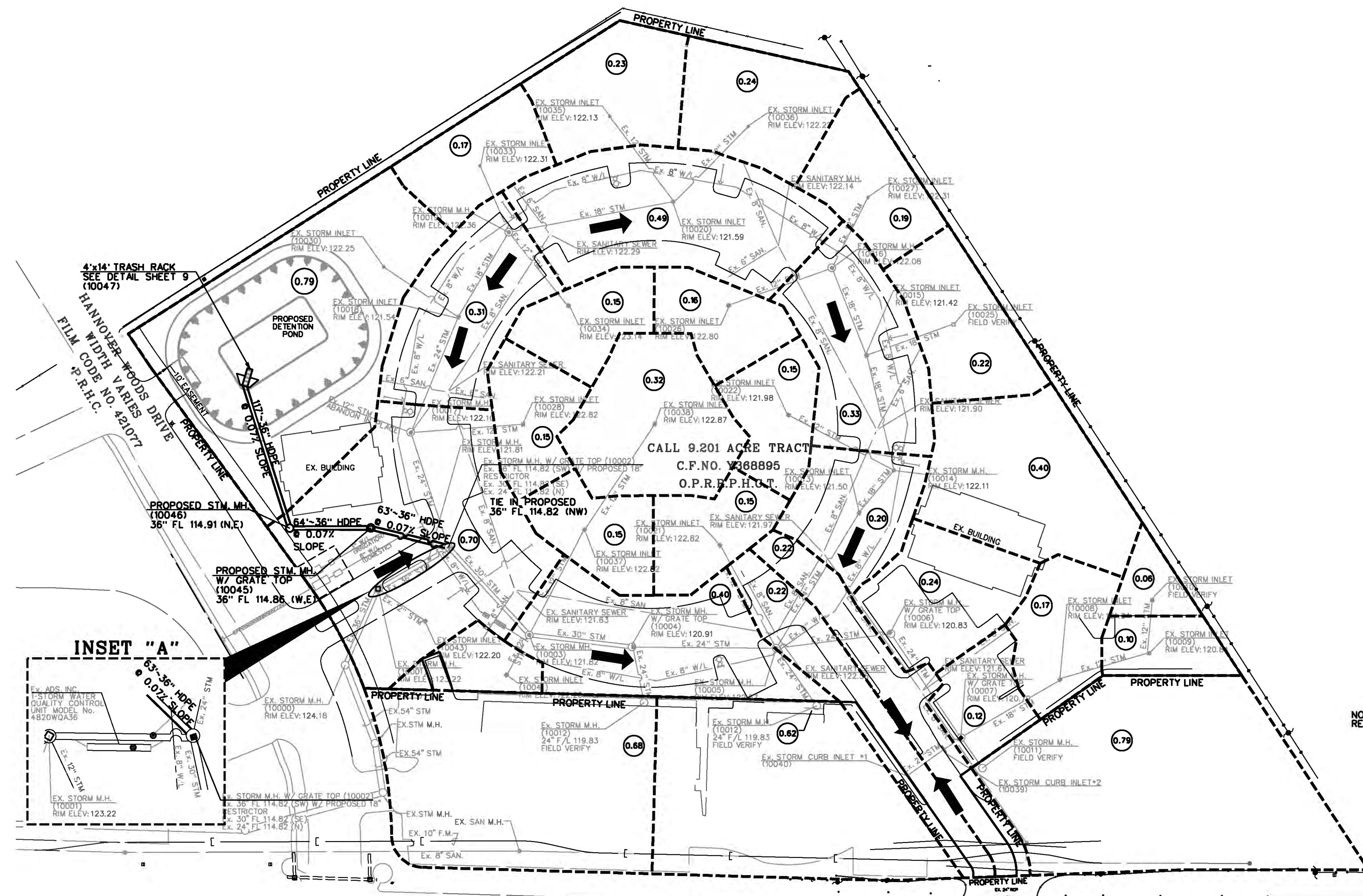
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WILLOW PARK CONDOMINIUMS

DRAINAGE LAYOUT

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 TBPB FIRM REG. No. 290
 TBPLS FIRM REG. No. 100486



NOTE: SITE IS LOCATED ENTIRELY IN SHADED FLOOD ZONE X. REFER TO FEMA PANEL #48201C0255L DATED 6/18/2007

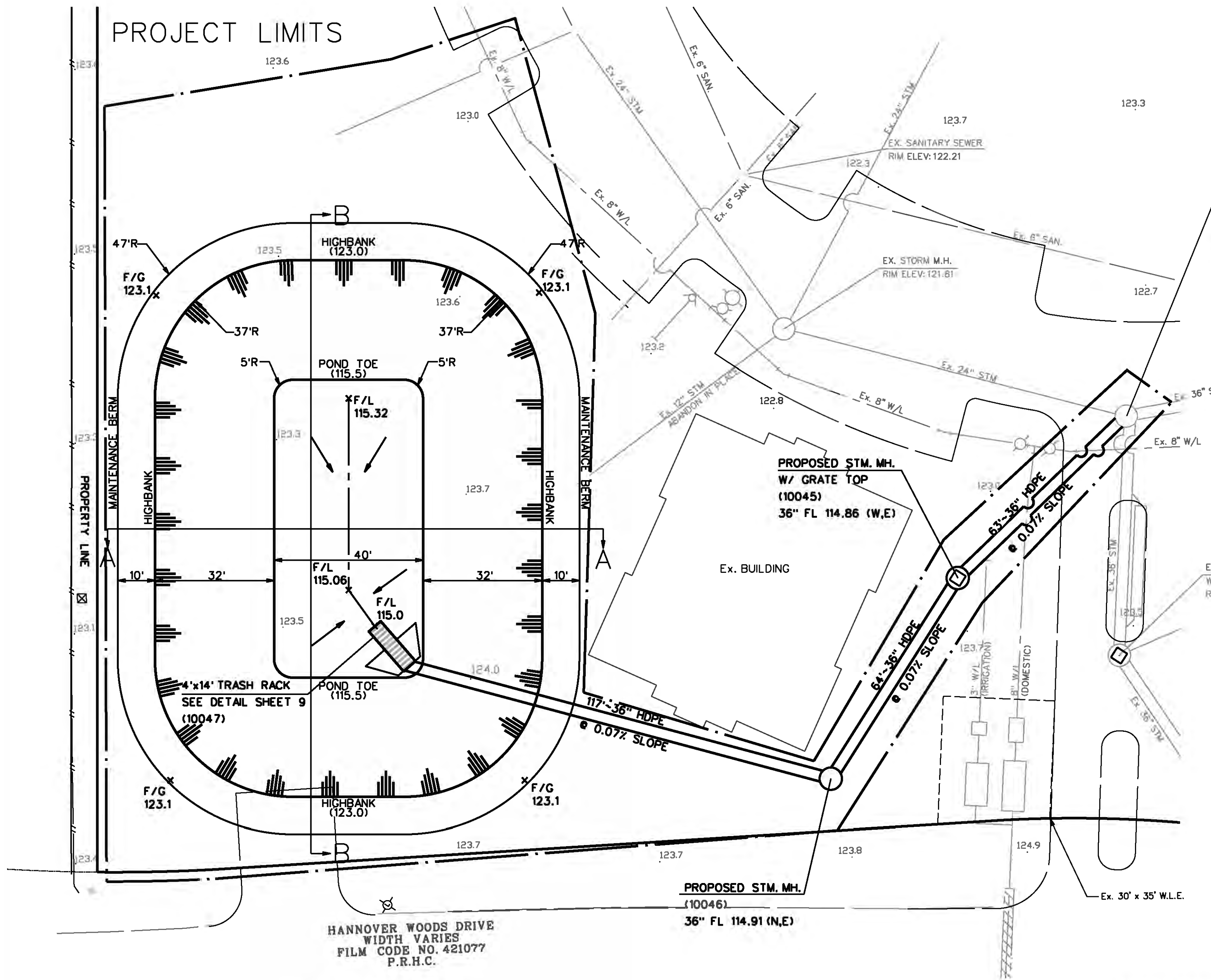
FM 2920
 WIDTH VARIES
 120' WIDE
 C.F. NO. D052426 &
 C.F. NO. D271215
 O.P.R.R.P.H.C.

- NOTE:**
- ALL STORM SEWERS ARE HOPE MATERIAL UNLESS OTHERWISE NOTED.
 - THE CONTRACTOR IS RESPONSIBLE FOR ALL TRANSITIONS FROM STORM SEWER FOR BUILDING TO PROP. TRUNK LINE.
 - CONTRACTOR SHALL CONSTRUCT A TWO FOOT STRIP OF CONCRETE ALL AROUND INLETS THAT ARE LOCATED IN GRASS AREAS. CONCRETE SHALL BE 4-INCHES THICK WITH MINIMUM #4 BAR AT 12-INCHES C-C.
 - THE CONTRACTOR SHALL BE AWARE THAT EXISTING UTILITIES ARE PRESENT IN THE AREA. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE EXTENT OF DEMOLITION AND UTILITY RELOCATION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
 - CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATION OF DOWNSPOUTS FOR THE ROOF DRAINS.
 - CONTRACTOR IS RESPONSIBLE FOR TYING THE STORM SEWER TO THE DOWNSPOUTS.
 - ALL STORM WATER PIPING SHALL BE OF AN APPROVED TYPE PER CITY OF HOUSTON'S ORDINANCE.

DRAWING SCALE: 1" = 50'

SHEET	5
OF	16 SHEETS
JOB NO. 2021-271	

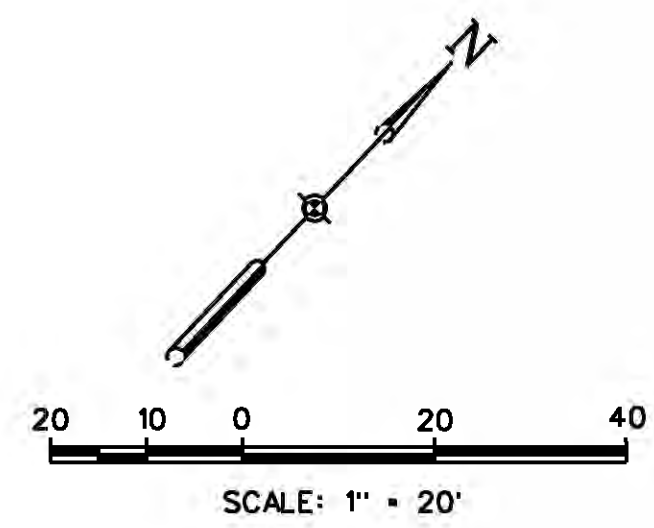
PROJECT LIMITS



Ex. STORM M.H. W/ GRATE TOP (10002)
 Ex. 36" FL 114.82 (SW) W/ PROPOSED 18" RESTRICTOR
 Ex. 30" FL 114.82 (SE)
 Ex. 24" FL 114.82 (N)
TIE IN PROPOSED 36" FL 114.82 (NW) Ex. STORM M.H.

PROPOSED STM. MH. W/ GRATE TOP (10045)
 36" FL 114.86 (W,E)

PROPOSED STM. MH. (10046)
 36" FL 114.91 (N,E)



LEGEND

- RPOP. HIGH BANK
- PROP. TOE
- PROP. MAINTENANCE BERM
- PROP. STORM SEWER
- EXIST. BACK OF PAVEMENT
- EXIST. STORM SEWER
- EXIST. SANITARY SEWER
- EXIST. WATER LINE
- F/G - FINISHED GRADE
- 123.7 - EXIST. GROUND SHOTS

CONTROL BENCHMARK
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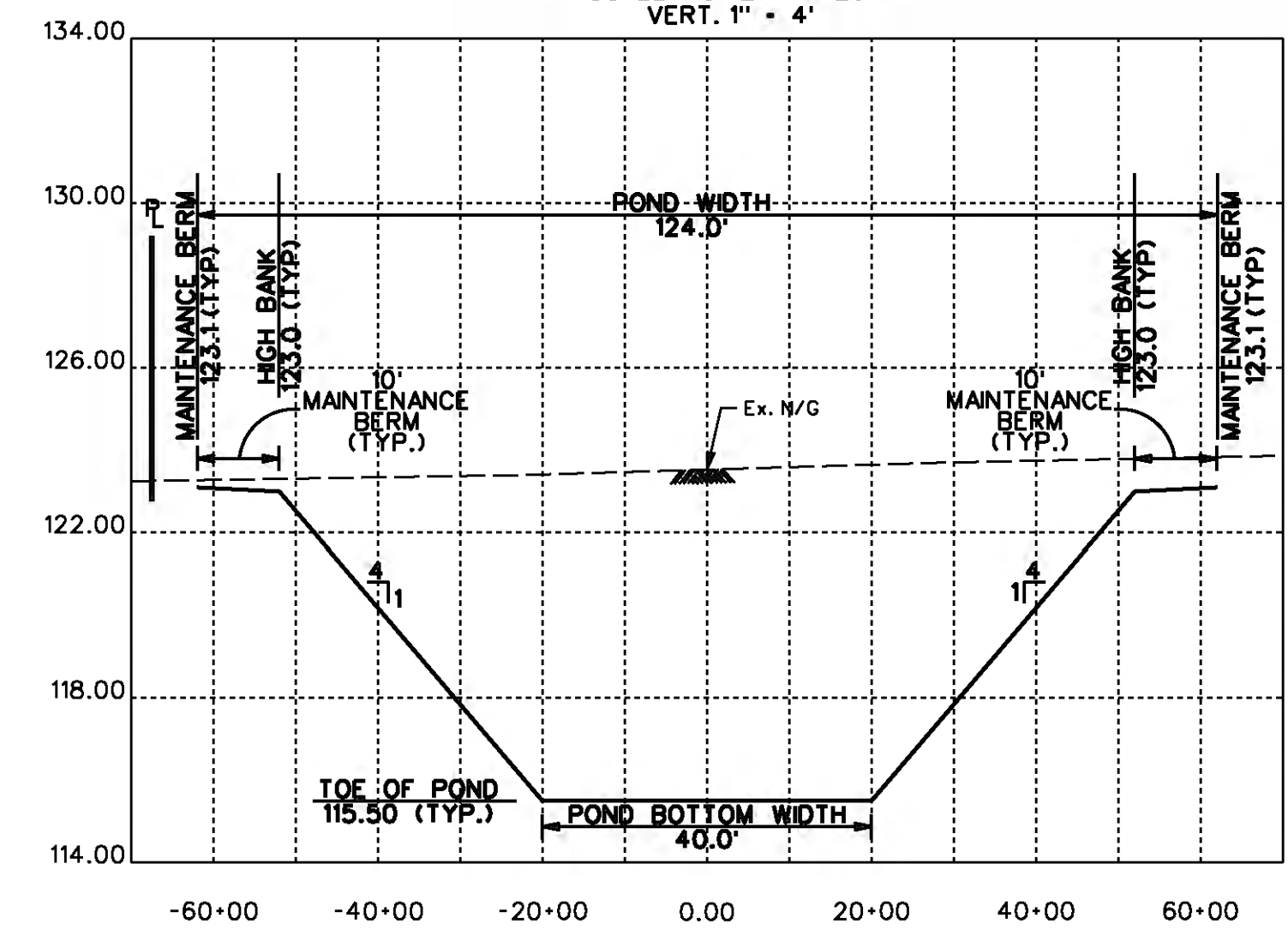
WILLOW PARK CONDOMINIUMS

DETENTION POND LAYOUT

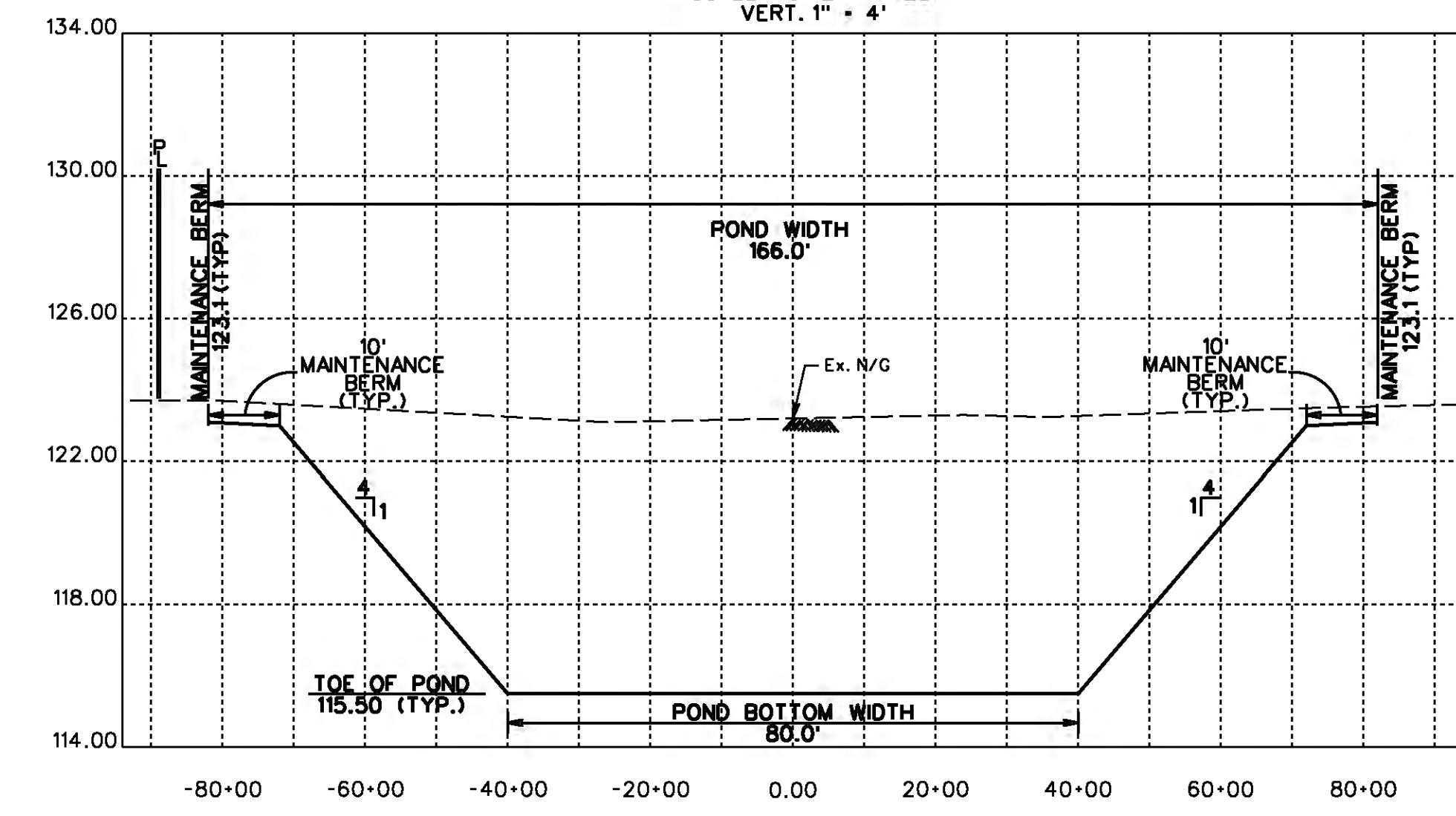
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 TBPB FIRM REG. No. 280
 TBPB FIRM REG. No. 100486

CROSS-SECTION A-A TYPICAL POND 1
 SCALE: HORIZ. 1" = 20'
 VERT. 1" = 4'



CROSS-SECTION B-B TYPICAL POND 1
 SCALE: HORIZ. 1" = 20'
 VERT. 1" = 4'



P:\WILLOW PARK CONDOMINIUMS\66 DETENTION POND LAYOUT.dgn 10:48:23 AM 12/23/2021

DRAWING SCALE: 1" = 20'

SHEET	6
OF 16 SHEETS	
JOB NO. 2021-271	

JOB NO. 2021-271 WILLOW PARK OFFICE CONDO

STORM SEWER CALCULATIONS
CITY OF HOUSTON / HARRIS COUNTY CRITERIA
Storm Event: 2-YEAR
Project: Willow Park Office Condo
Date: December 2021
By: CQ

Select Rainfall Data: Atlas 14 HC Reg 3

COH I-D-F Coefficients: Return Freq (yr) = 2

Fixed Curb Height @ Inlet (ft) = 0.50

COH I-D-F Coefficients: Return Freq (yr) = 100

Starting TW (Soffit) = @ Outfall

Starting 10-year TW (@ Outfall) = NA

Allowable 100-yr HGL Above Inlet = 1.00



DEVELOPMENT TYPES		Contributing Drainage Area				Time of Concentration				Pipe Hydraulic Data & Design Capacities				Pipe Elevation Data				2-year Design Computations				Elevations @ Inlet Location				100-Year Analysis Calculations				HGL Above (+) / Below (-) T/C @ Inlets (ft)		100-yr Analysis Check @ Inlet Location																	
FROM M.H. #	TO M.H. #	0.18	0.90			Delta T _c	Total	Intensity	Runoff Flow	Reach	No. of Spans	Pipe Diameter (Inches)	Manning's Coefficient "N"	X-Section of Pipe/Box	Hydraulic Radius (ft)	Flowline Slope (%)	Design Velocity (fps)	Design Capacity (cfs)	Full In Pipe	M.H. Drop to D/S	Pipe Flowline Elevation @ U/S M.H.	Pipe Flowline Elevation @ D/S M.H.	U/S (ft)	D/S (ft)	Actual Velocity (ft/s)	Velocity Check	Hydraulic Gradient Slope (%)	Headloss (ft)	U/S (ft)	D/S (ft)	Top of Curb (ft)	Gutter (ft)	Natural Ground @ R.O.W. (ft)	HGL Above (+) / Below (-) @ Inlets (ft)	2-year Design Check at Inlet Location	Delta or Trib. T _c	Total	Flow Computations	Runoff (cfs)	Actual Velocity (ft/s)	Velocity Check	Hydraulic Gradient Slope (%)	Headloss (ft)	U/S (ft)	D/S (ft)	HGL Above (+) / Below (-) T/C @ Inlets (ft)	100-yr Analysis Check @ Inlet Location		
CB 10010	CB 10009	0.06	0.00	0.06	0.06	1.800	0.01	21.1	21.1	4.10	0.04	42	12	RCP	0.013	0.79	0.250	0.320	2.6	2.02	0.13	0.000	118.28	118.15	119.28	119.15	0.06	Vel-OK	0.000	0.000	119.27	119.27	NA	120.84	NA	-1.572	OK	21.1	21.1	9.27	0.10	0.13	Vel-OK	0.001	0.00	121.50	121.50	0.662	Method 1 - OK
POND	JB 10045	0.15	0.55	0.70	0.70	0.7457	0.52	24.4	24.4	3.80	1.98	117	36	RCP	0.013	7.07	0.750	0.070	2.5	17.65	0.08	0.000	114.99	114.91	117.99	117.91	0.28	Vel-OK	0.001	0.001	117.99	117.99	NA	123.50	NA	-5.512	OK	24.4	24.4	8.64	4.51	0.64	Vel-OK	0.005	0.01	118.48	118.47	-5.024	Method 1 - OK

NO.	REVISION	DATE	BY

DESIGNED BY: _____
DESIGN CHECKED BY: _____
DRAWN BY: _____
COGO CHECKED BY: _____
SURVEY CHECKED BY: _____
QA/QC BY: _____ DATE: _____
QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

DRAINAGE CALCULATIONS

Engineering and Surveying
2107 CityWest Blvd., 3rd Floor
Houston, Texas 77042
(713) 763-7786 (713) 763-3580, Fax
TBPES FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

12/23/2021

DRAWING SCALE: _____

SHEET
7
OF 16 SHEETS
JOB NO. 2021-271

Orifice Discharge

$Q=cA(2*g*h)^{1/2}$

Max Allowable Q (cfs) = 22.9
Target WSEL (100-yr) = 122.00
D/S Tailwater = 118.00 @ Top of Pipe
h = 4.00 ft
c = 0.80
Orifice Diameter = 1.50 ft 18" orifice

Q (cfs) = 22.19 At Max Head

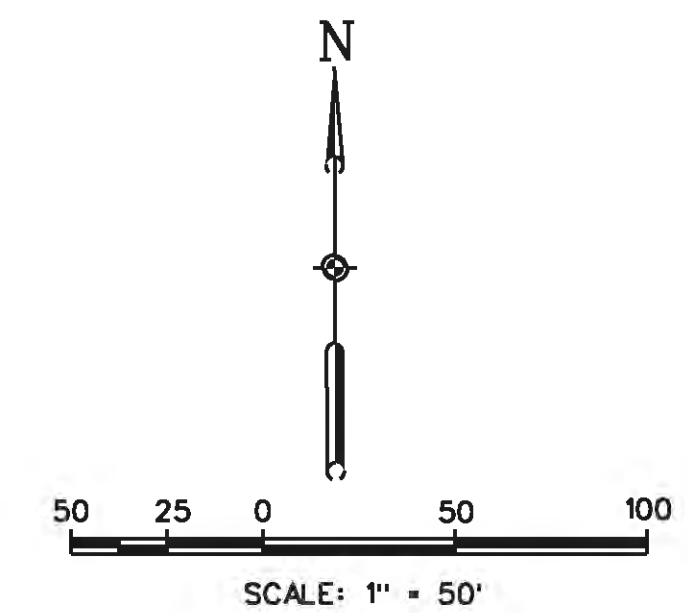
WILLOW PARK OFFICE CONDO

DETENTION POND VOLUME				
ELEVATION	DEPTH	AREA	INC. VOL	CUMULATIVE VOL
	(FT)	(AC)	(AC-FT)	(AC-FT)
115	0	0.07	0.00	0.00
122	7	0.30	1.30	1.30

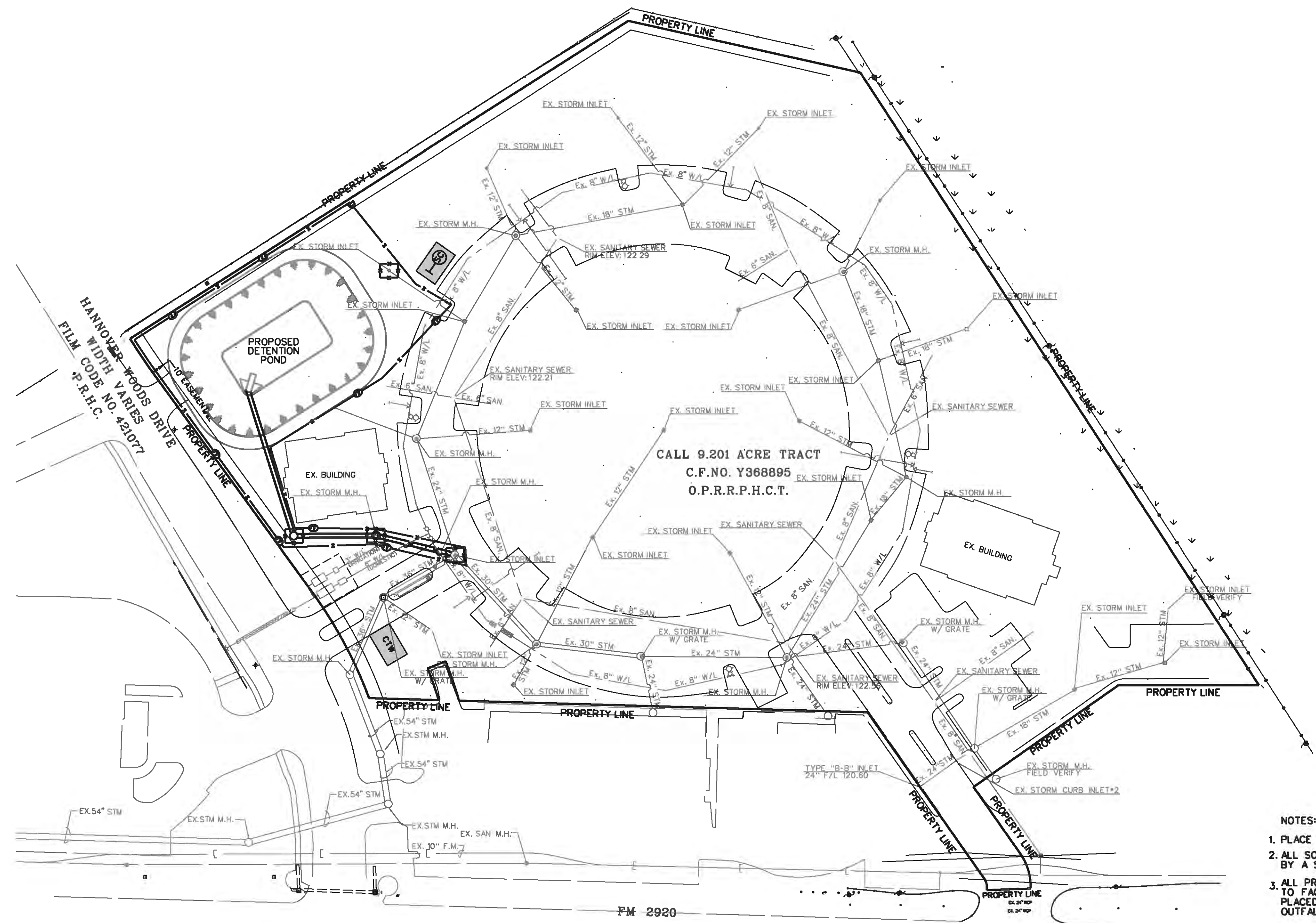
DETENTION POND A SUMMARY	
SITE AREA (AC) =	6.87
DETENTION RATE (AC-FT/AC) =	0.18
DETENTION REQUIRED (AC-FT) =	1.24
DETENTION PROVIDED (AC-FT) =	1.30
AVG TOE ELEVATION =	115
MAXIMUM DESIGN WSE =	122
HIGHBANK ELEVATION =	123
POND FOOTPRINT (AC) =	0.34

P:\WILLOW PARK CONDOS\DRGN07 DRAINAGE CALCULATION.dgn
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JOB NO. 2021-271 WILLOW PARK OFFICE CONDO



- LEGEND**
- PROPOSED FILTER FABRIC FENCE (MINIMUM 2' BEHIND BACK OF CURB)
 - INLET PROTECTION BARRIER (STAGE I) GRAVEL BAGS (STAGE II)
 - EXIST. BACK OF PROP. 6-INCH CONC. CURB
 - PROP. STORM SEWER
 - EXIST. STORM SEWER
 - EXIST. SANITARY SEWER
 - EXIST. WATER LINE
 - STABILIZED CONSTRUCTION ENTRANCE/EXIT
 - CONCRETE TRUCK WASHOUT AREA



CONTROL BENCHMARK
 H.C.F.C. DISC STAMPED K120-01 BMP5 ON HEADWALL AT DOWNSTREAM END AT BOX CULVERT AT LOUETTA RD. AND SINGER GULLY. ELEV. +115.83' 1973 ADJUSTMENT.
 TBM 1597-17-1 NORTHEAST BOLT ON TOP FLANGE OF FIRE HYDRANT ON SOUTHWEST SIDE OF HANNOVER WOODS DRIVE. ELEV. 129.44
 TBM 1597-17-2 BENCH TIE IS SOUTHWEST FACE OF POWER POLE AT THE NORTHEAST CORNER OF THE WILLOW PARK OFFICE CONDOMINIUM SITE. ELEV. 128.72
 TBM 1597-17-3 BENCH TIE IN WEST FACE OF POWER POLE AT THE SOUTHEAST CORNER OF THE WILLOW PARK OFFICE CONDOMINIUM SITE. ELEV. 123.40
 TBM 1597-18-4 "LL" IN MUELLER ON FIRST FIRE HYDRANT ON NORTH SIDE OF FM 2920 WEST OF HANNOVER WOODS DRIVE. ELEV. 127.47

NO.	REVISION	DATE	BY

DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

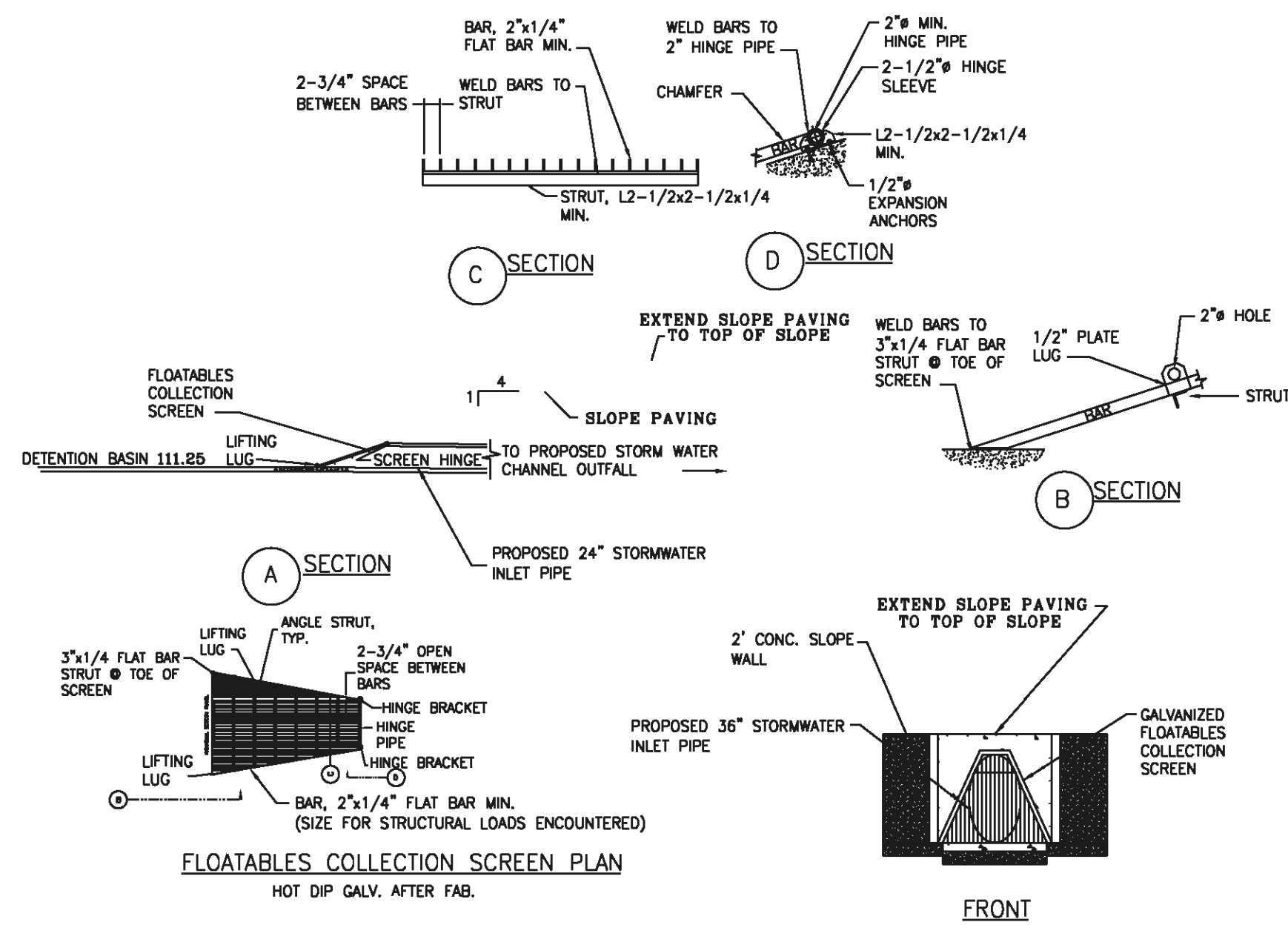
STORM WATER POLLUTION PREVENTION PLAN LAYOUT

Engineering and Surveying
 2107 CityWest Blvd., 3rd Floor
 Houston, Texas 77042
 (713) 783-7789 (713) 783-3590, Fax
 TBPB FIRM REG. NO. 280
 TBPB FIRM REG. NO. 100486

- NOTES:**
- PLACE FILTER FABRIC SILT FENCE +/- 5 FEET AROUND ALL INLETS.
 - ALL SOIL STOCKPILES OF SIGNIFICANT SIZE SHALL BE ENCOMPASSED BY A SILT FENCE.
 - ALL PROPOSED SWALES TO BE CONSTRUCTED BY THE CONTRACTOR TO FACILITATE SITE DRAINAGE SHALL HAVE SILT FENCES PLACED ACROSS THE ENTIRE SWALE JUST UPSTREAM OF THE OUTFALL LOCATION.
 - A VEHICLE WASH-DOWN AREA MAY BE LOCATED BY THE CONTRACTOR TO FACILITATE THE PROJECT. WHILE UTILIZING THE WASH-DOWN AREA, THE CONTRACTOR SHALL PROTECT THE INLET WHERE THE WASH-DOWN WATER IS DIRECTED AS PER PPP TEXT. THE LOCATION OF THE WASH-DOWN IS AT THE CONTRACTOR'S OPTION.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL FACILITIES INDICATED ON THIS PLAN.
 - THE CONTRACTOR SHALL CONSTRUCT SILT BARRIERS INDICATED ON THIS PLAN IN ADDITION TO CONFORMING WITH ALL ITEMS DISCUSSED IN THE WRITTEN STORMWATER POLLUTION PREVENTION PLAN TEXT.
 - UPON PROJECT COMPLETION, THE ENTIRE DISTURBED AREA NOT PROPOSED FOR IMMEDIATE RECONSTRUCTION SHALL BE RESEED AS PER THE POLLUTION PREVENTION PLAN.
 - UPON PROJECT COMPLETION AND FINAL STABILIZATION, ALL SILT FENCE SHALL BE REMOVED AND DISPOSED OF.

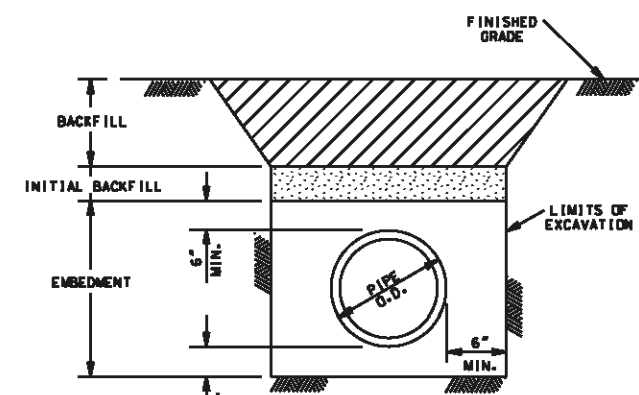
DRAWING SCALE: 1" = 50'

SHEET	8
OF 16 SHEETS	
JOB NO. 2021-271	



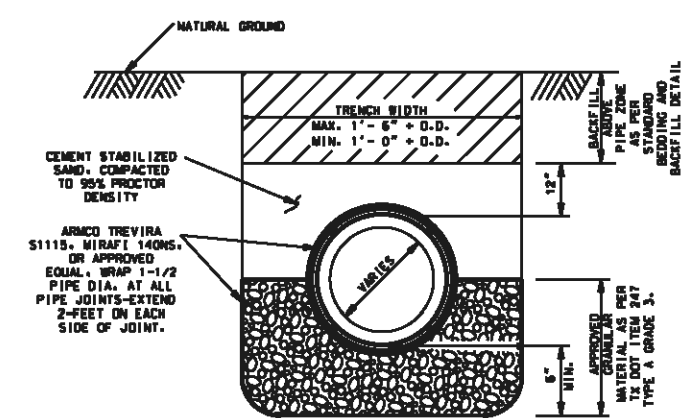
FLOATABLE COLLECTION SCREEN CALCULATIONS

SCREEN AREA REQUIRED
 $Q_{100}(\text{cfs}) = 55.65 \text{ cfs}$
 MINIMUM SCREEN AREA (s.f.) = $Q (\text{cfs}) / 0.92$
 $= 51.20 \text{ cfs} / 0.92$
 $= 55.65 \text{ sf}$
 SCREEN SIZE
 WIDTH = 4.0 ft
 LENGTH = 14.0 ft
 AREA OF SCREEN = 56.0 sf
 • SCREENS NEEDED = $55.65 \text{ sf} / 56.0 \text{ sf} = 1.0$
 SCREEN AREA PROVIDED = 56 sf

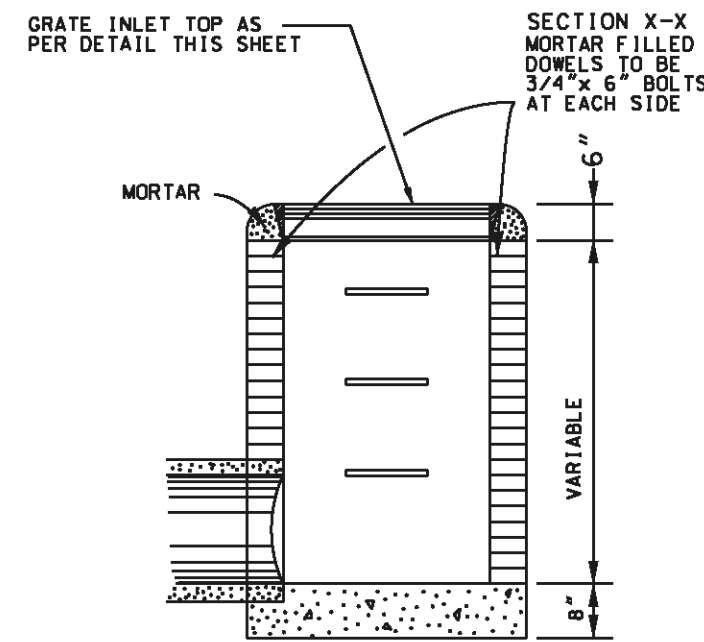


- NOTES:
 1. BACKFILL SHALL BE NATIVE SOIL, FREE OF DEBRIS, COMPACTED TO 95% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED UNDER PAVEMENT.
 2. INITIAL BACKFILL SHALL BE UNIFORMLY GRADED MATERIAL (MAXIMUM SIZE 3/4" DIA.) PLACED IN 6" LIFTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY, EXCEPT AS REQUIRED UNDER PAVEMENT.
 3. EMBEDMENT SHALL BE CEMENT STABILIZED SAND (2.0 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 SURFACE SHALL BE CEMENT STABILIZED SAND (2.0 SACKS PER CUBIC YARD) COMPACTED TO 95% STANDARD PROCTOR DENSITY.
 5. TRENCH SHORING IN ACCORDANCE WITH OSHA SHALL BE INSTALLED WHERE NECESSARY.
 6. SOIL IN THE RIVE ZONE SHALL CONSIST OF NON-WATERWEARING, COHESIVE SOILS WITH A SHEAR STRENGTH OF 1000 PSF OR GREATER. BEST PRACTICE SHORING SHALL BE INSTALLED.

STORM SEWER BEDDING & BACKFILL



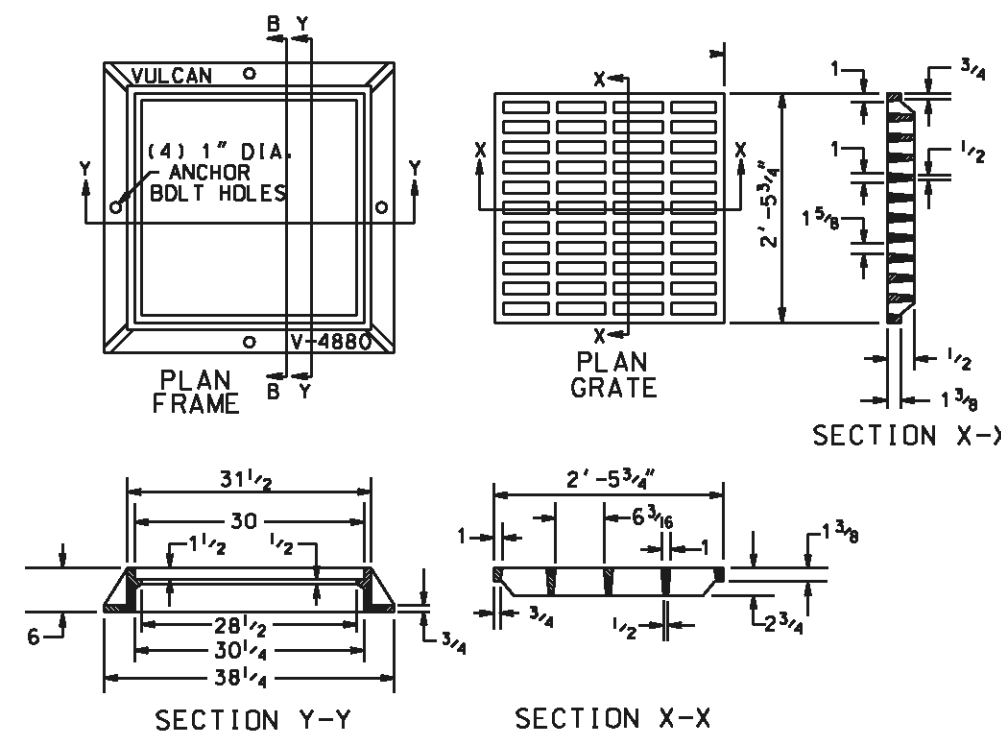
MODIFIED "A-A" BEDDING & BACKFILL
 N.T.S.



SECTION B-B
 NOTE: WALLS TO BE CONSTRUCTED OF 8" BRICK MASONRY, OR PRECAST.

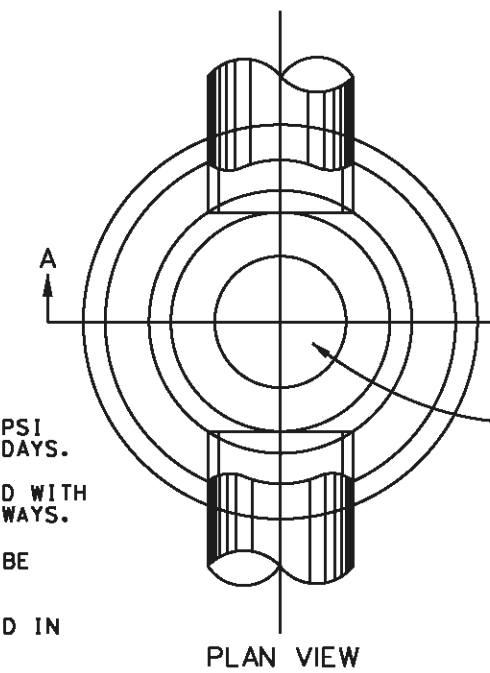
CATCH BASIN

N.T.S.
 (VULCAN FOUNDRY INC. - LOAD RATING: HEAVY DUTY)
 (CATALOG NUMBER V-4880-3)

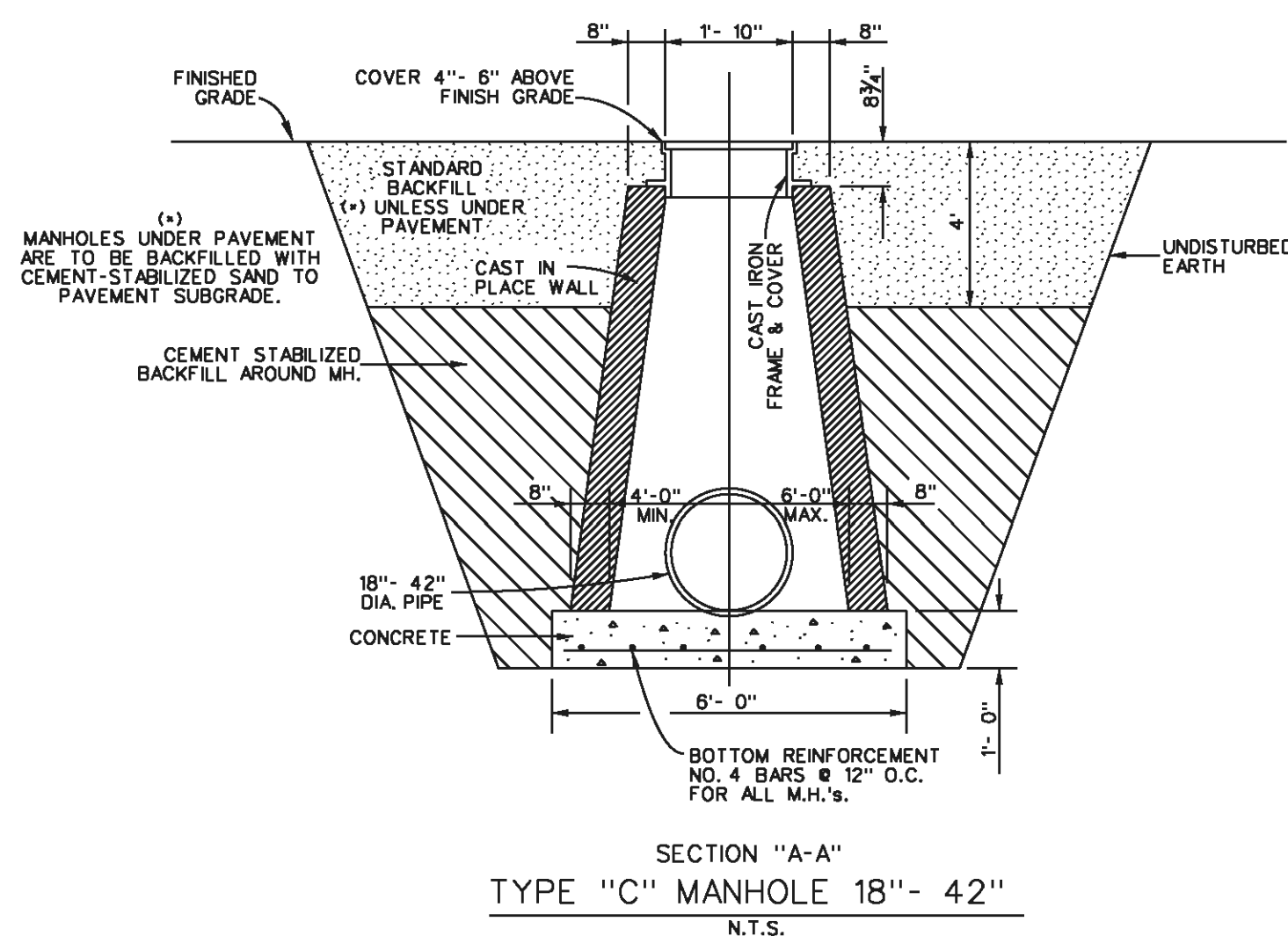


GRATE INLET TOP DETAIL

N.T.S.
 (VULCAN FOUNDRY INC. - LOAD RATING: HEAVY DUTY)
 (CATALOG NUMBER V-4880-3)



- NOTES:
 1. CONCRETE SHALL OBTAIN 4000 PSI COMPRESSION STRENGTH AT 28 DAYS.
 2. CONCRETE SHALL BE REINFORCED WITH NO. 4 BARS AT 12" C-C BOTH WAYS.
 3. ALL MANHOLE CHIMNEYS SHALL BE ADJUSTED WITH THRDAT RINGS.
 4. PRECAST MANHOLES MAY BE USED IN LIEU OF CAST IN PLACE.



SECTION "A-A"
 TYPE "C" MANHOLE 18" - 42"
 N.T.S.

WILLOW PARK CONDOMINIUMS

DRAINAGE DETAILS



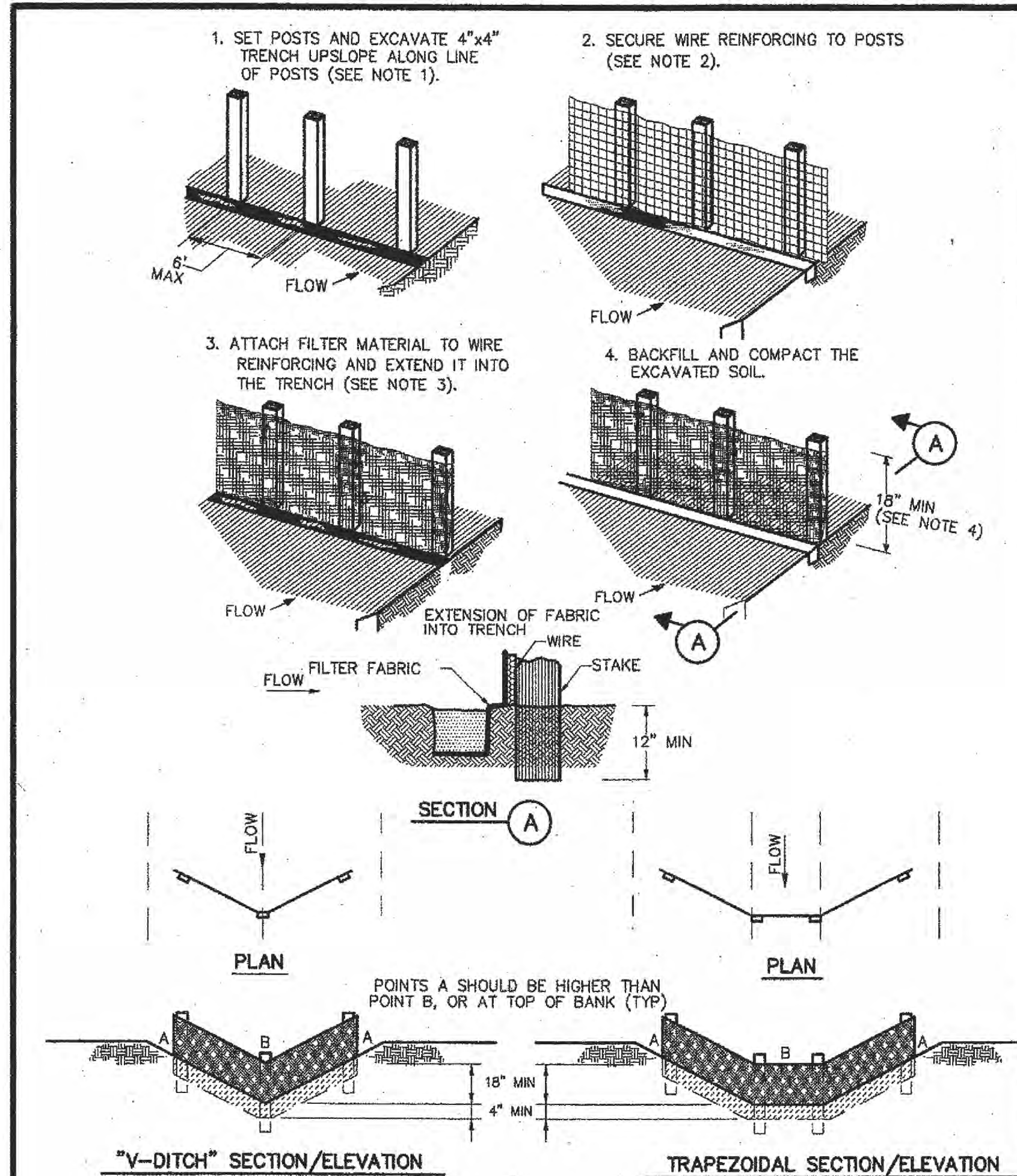
Engineering and Surveying
 2107 CityWest Blvd., 3rd Floor
 Houston, Texas 77042
 (713) 783-7789 (713) 783-3590, Fax
 TBPB FIRM REG. No. 290
 TBPB FIRM REG. No. 100486



DRAWING SCALE:

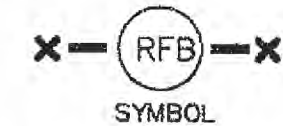
SHEET
 9
 OF 16 SHEETS
 JOB NO. 2021-271

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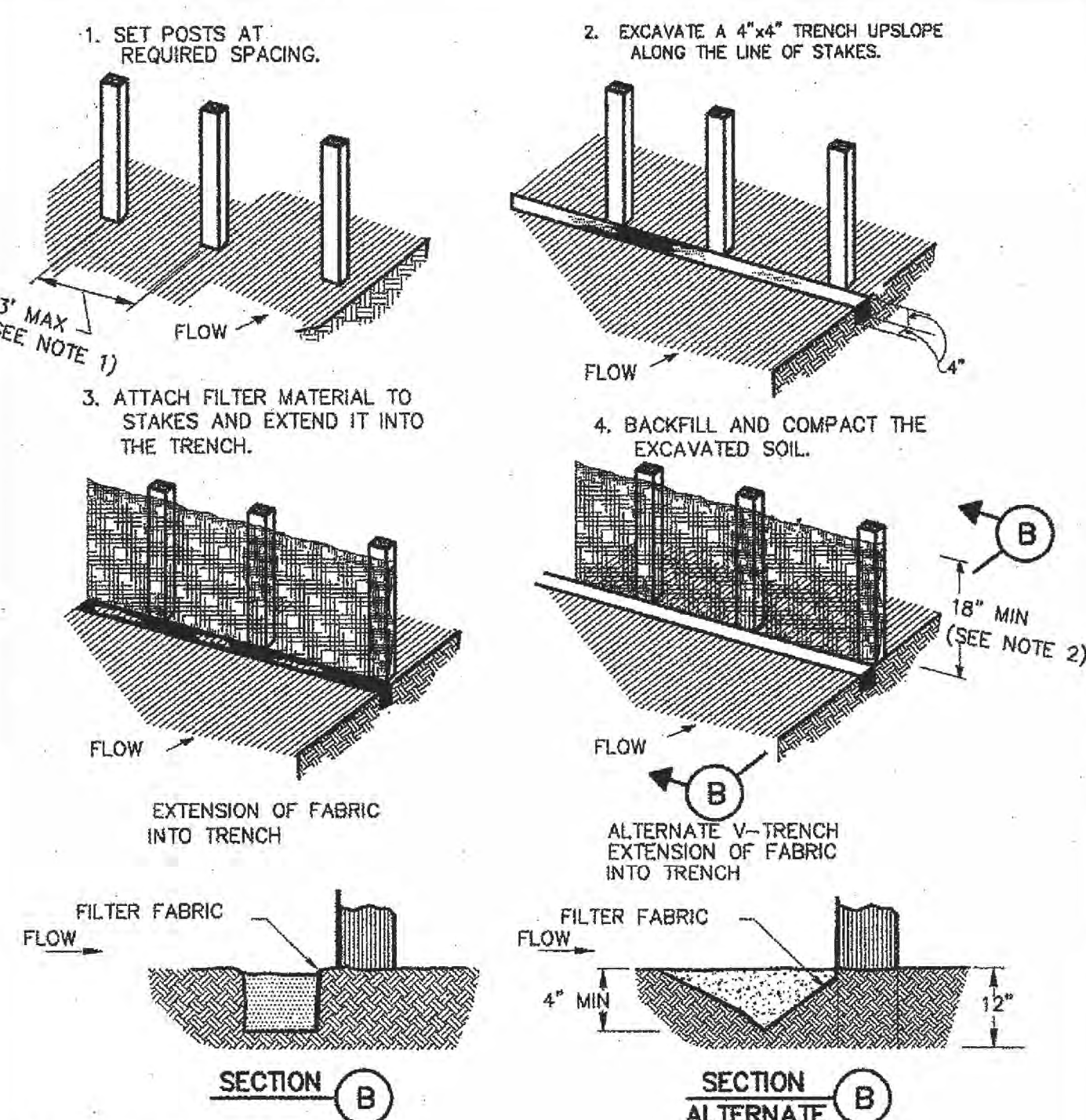
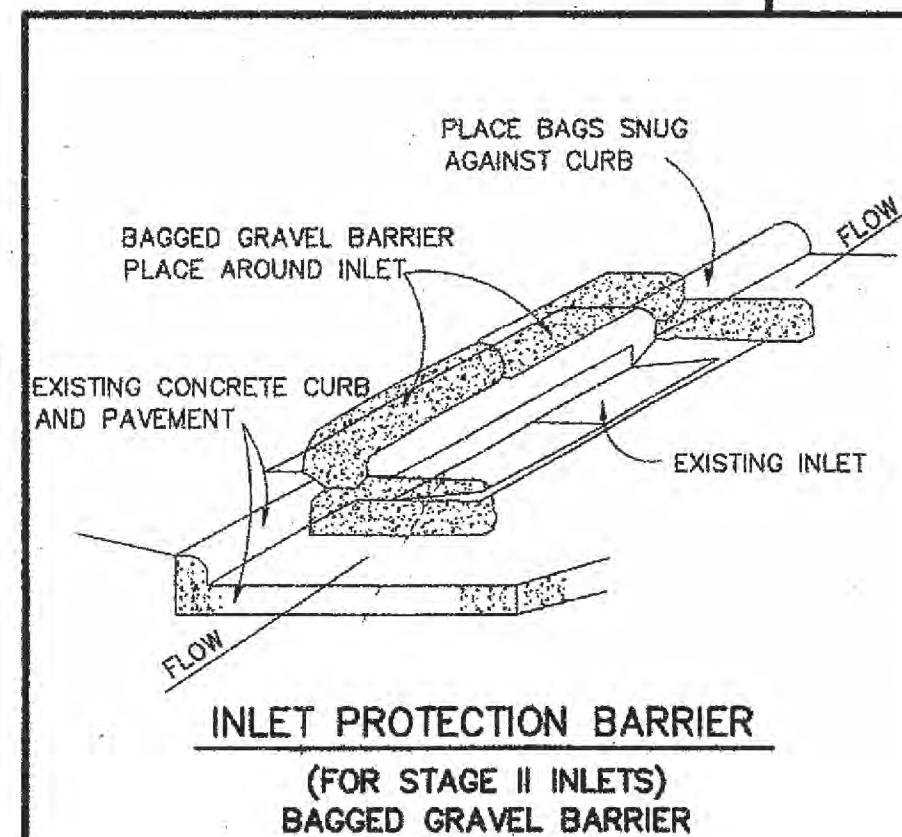


CONSTRUCTION NOTES:

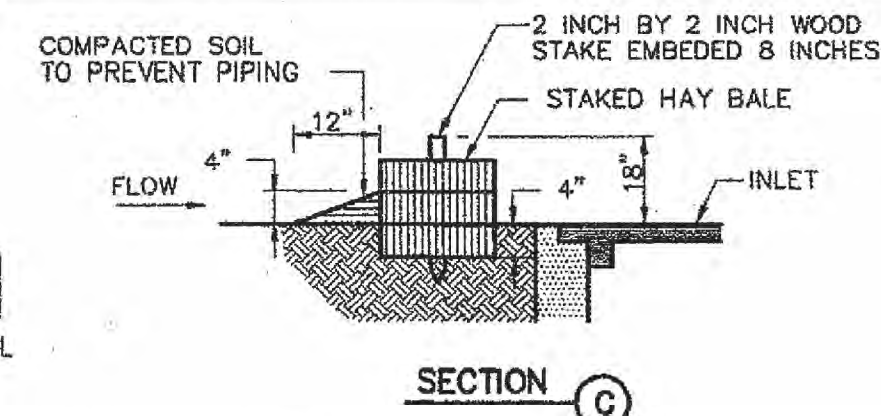
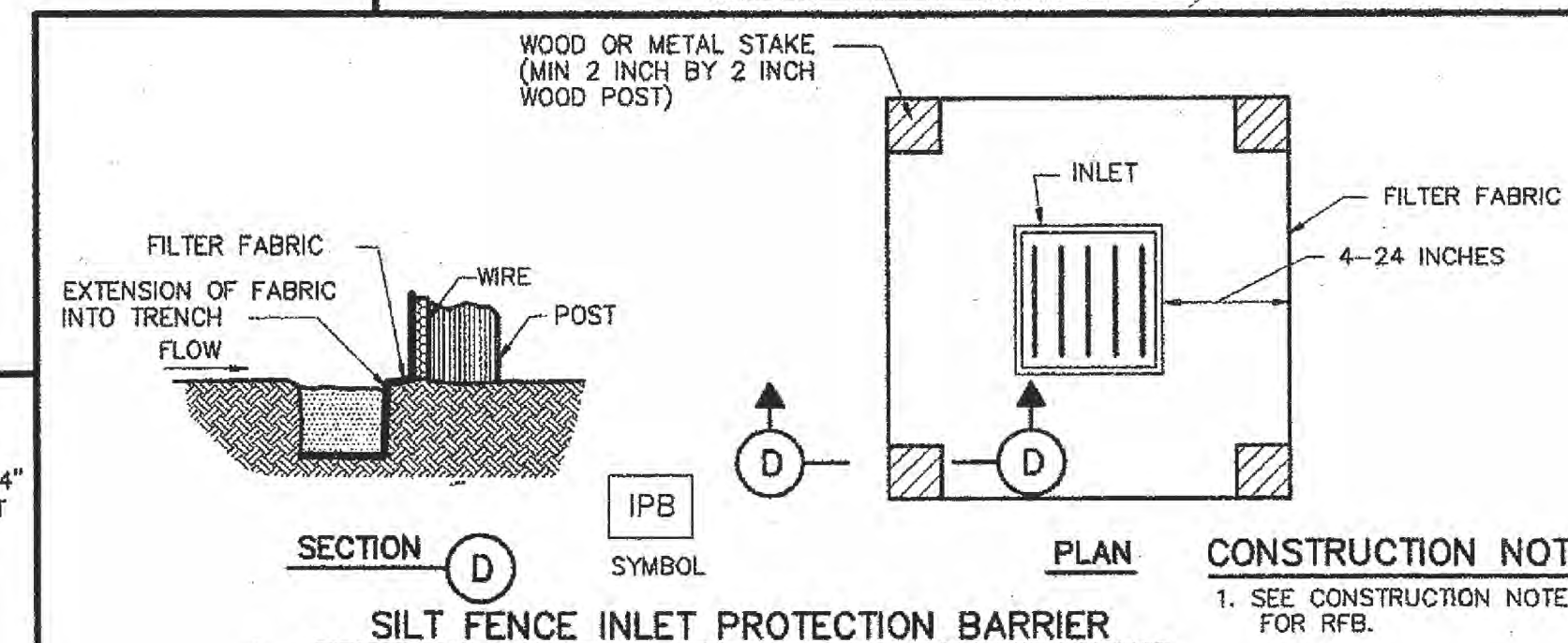
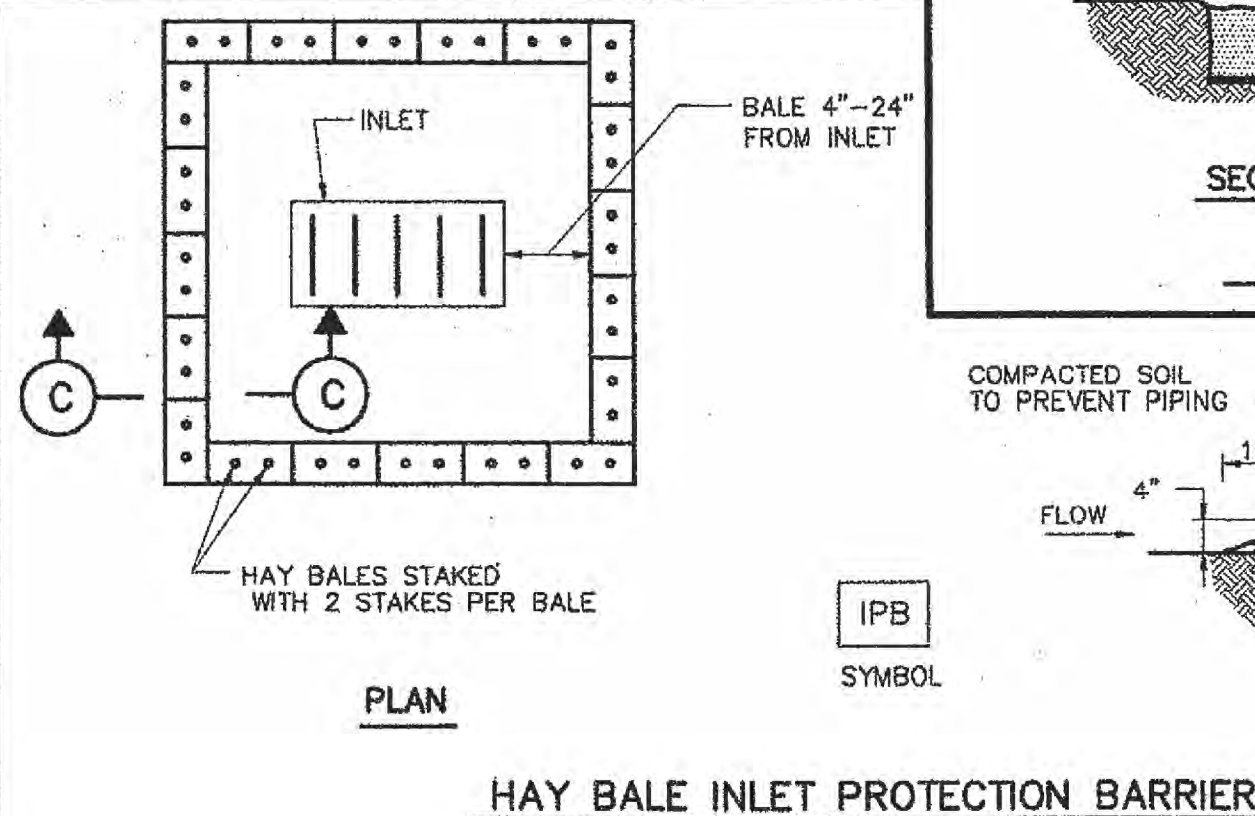
1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACED A MAX OF 6 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
2. WOVEN WIRE REINFORCING TO BE FASTENED SECURELY TO BARRIER POSTS WITH STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE REINFORCING, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
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.



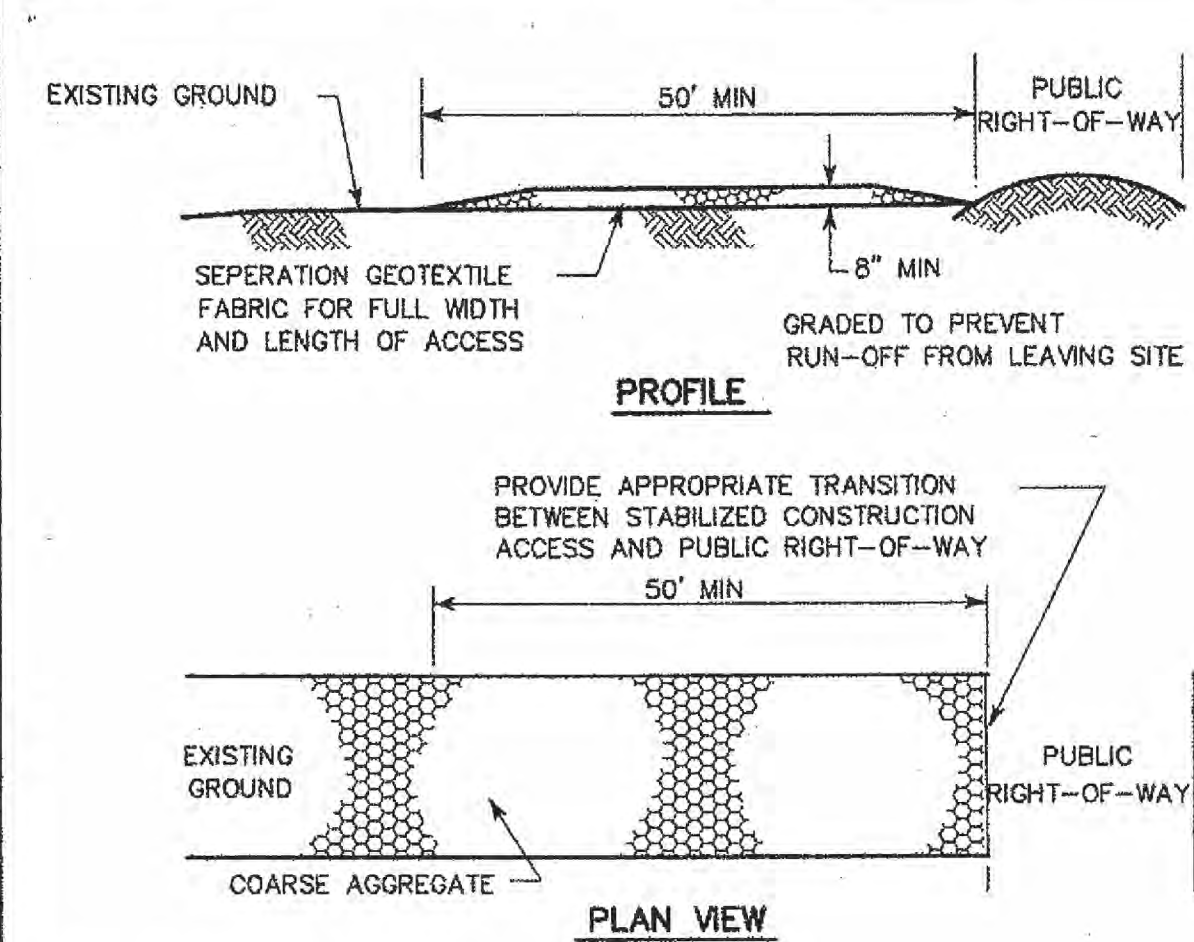
REINFORCED FILTER FABRIC BARRIER



FILTER FABRIC BARRIER

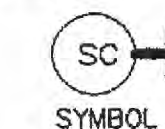


HAY BALE INLET PROTECTION BARRIER



CONSTRUCTION NOTES:

1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION ACCESS, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMMODATE 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.



STABILIZED CONSTRUCTION ACCESS

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

STORM WATER POLLUTION PREVENTION PLAN DETAILS

(NOT TO SCALE)

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

CL CURVE DATA

NO.	REVISION	DATE	BY

DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

STORM WATER POLLUTION PREVENTION PLAN DETAILS



Engineering and Surveying
2107 CityWest Blvd., 3rd Floor
Houston, Texas 77042
(713) 763-7788 (713) 763-3680, Fax
TBPES FIRM REG. No. 280
TBPES FIRM REG. No. 100486



DRAWING SCALE:

SHEET
10
OF 16 SHEETS
JOB NO. 2021-271

JOB NO. 2021-271 WILLOW PARK OFFICE CONDO



WILLOW PARK OFFICE
 CONDOMINIUMS AT FM 2920
 HOUSTON, TEXAS

1. **PAVING**
 I. DESIGN THICKNESS OF PAVING: 6-INCH
 II. STABILIZED SUBGRADE TO A DEPTH OF: 6-INCH
 III. DESIGN STRENGTH OF CONCRETE: 3500
 IV. TYPE AND PLACEMENT OF STEEL: 24" C-C

2. **SUBDIVISION DRAINAGE**
 I. DRAINAGE SYSTEM TYPE
 STORM SEWER
 ROADSIDE DITCH

3. **SITE DRAINAGE**
 I. PROPOSED DRAINAGE AREA
 NEW DEVELOPMENT AREA: 9.20008
 RE-DEVELOPMENT AREA (AMOUNT INCREASED IMPERVIOUS AREA): _____

4. **WATER AND WASTEWATER**
 I. TYPE OF SERVICE PROPOSED
 MUNICIPALITY _____
 MUNICIPAL UTILITY DISTRICT: SPRING WEST M.U.D.
 OTHER DISTRICT: _____

5. **DESCRIPTION OF PROPERTY**
 I. LEGAL DESCRIPTION / PLAT NAME (PROPOSED OR RECORDED):
WILLOW PARK OFFICE CONDOMINIUMS AT FM 2920, CONTAINING 9.2008 ACRES, 0 LOTS IN 1 BLOCKS AND 4 RESERVES.

6. **STORM WATER QUALITY**
 I. CONSTRUCTION PROTECTIVE MEASURES
 SWPPP SITE PLAN AND DETAILS ON SHEET(S) 6-11 & 6-13

7. **FLOOD CONTROL DISTRICT CRITERIA**
 I. DETENTION SUMMARY
 DETENTION BASIN DRAINAGE AREA = 116.8 ACRES

RAINFALL EXENT PROBABILITY	PRE-DEVELOPED PEAK RAINFALL (CFS)	POST-DEVELOPED PEAK RAINFALL (CFS)	DETENTION BASIN PEAK OUTFLOW (CFS)	MAXIMUM WATER SURFACE ELEVATION (LOE-10-FT) (AS-FT)	PEAK STORAGE (AS-FT)	STORAGE RATE (AS-FT PER DAY)
1% EXCEEDANCE (10-YEAR)	217	205	217	121.25	N/A	N/A
1% EXCEEDANCE (100-YEAR)	321	300	300	123.41	66.41	0.57

8. **FLOOD PLAIN STATUS**
 I. GENERAL INFORMATION
 FIRM PANEL(S) FOR PROPERTY: 21820C0255L
 FIRM PANEL(S) DATE: 08-09-08

9. **WHEEL CHAIR RAMPS / SIDEWALK**
 WHEEL CHAIR RAMPS PROPOSED: YES NO
 SIDEWALKS PROPOSED: YES NO

HCPID SIGNATURE BLOCK
 PROJECT KNOWN AS:
WILLOW PARK OFFICE CONDOMINIUMS
 WAS ACCEPTED BY THE FOLLOWING GROUPS FOR THE PURPOSES LISTED BELOW:

ENGINEERING DIVISION

BY: _____ DATE: _____
 AS TO FLOOD HAZARD DATA ONLY

BY: Shannon C. Watson DATE: 10/19/08
 AS TO LOCATION OF ITEMS IN COUNTY RIGHT-OF-WAY

BY: Shannon C. Watson DATE: 10/19/08
 AS TO STORM WATER QUALITY

HARRIS COUNTY FLOOD CONTROL DISTRICT

BY: Diana B. Bell DATE: 12-16-06
 FOR ITEMS LOCATED OUTSIDE OF HCFCD RIGHT-OF-WAY

BY: _____ DATE: _____
 FOR ITEMS LOCATED WITHIN EXISTING HCFCD RIGHT-OF-WAY

BY: _____ DATE: _____
 FOR ITEMS LOCATED WITHIN PROPOSED HCFCD RIGHT-OF-WAY

ADDITIONAL COMMENTS: _____

ENGINEER'S CERTIFICATION
 I, JOHN PICKENS, JR., A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS DO HEREBY CERTIFY THAT THE INFORMATION PRESENTED ON THIS SHEET IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

THE COMPLETED PROJECT CONSISTS OF DRAWING SHEETS 1 THRU 15.

REVISIONS

DATE	SHEET NO.	DESCRIPTION	ACKNOWLEDGMENT

REQUEST NO. 1004030 APPLICANT NO. _____ SHEET NUMBER C-2 OF 15

HARRIS COUNTY
 PUBLIC INFRASTRUCTURE DEPARTMENT
 EXPRESS REVIEW SHEET

VERSION 10.0 / JAN. 3, 2006
 VERSION 10.0 / REVISED NOTE "5, DESCRIPTION OF PROPERTY" / JAN. 3, 2006

DESIGNED BY: DMC
 DESIGN CHECKED BY: JDP
 DRAWN BY: DMC
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____
 QA/QC REVISIONS BY: _____
 DATE: JUNE 2008

SCALE: N.T.S.

HARRIS COUNTY REVIEW SHEET

SHEET: C-2

JOB NO. 2008061-001

NO.	REVISION	DATE	BY

DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

WILLOW PARK CONDOMINIUMS
 HARRIS COUNTY
 REVIEW SHEET

Costello

Engineering and Surveying
 2107 CityWest Blvd., 3rd Floor
 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax
 TBPE FIRM REG. No. 280
 TBPLS FIRM REG. No. 100486

DRAWING SCALE: _____

SHEET

11

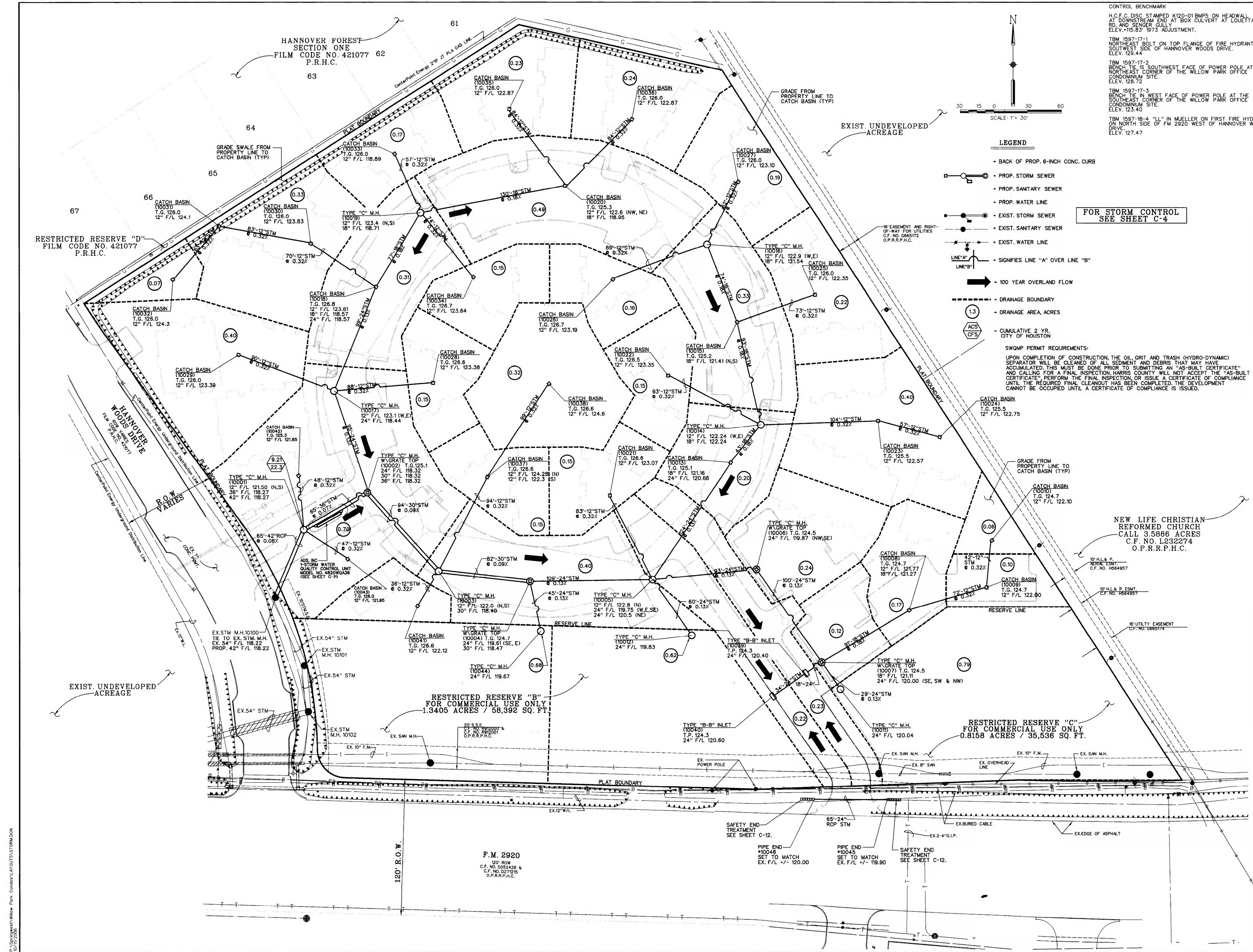
OF 16 SHEETS

JOB NO. 2021-271

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FOR REFERENCE ONLY

JOB NO. 2021-271 WILLOW PARK OFFICE CONDO



Costello, Inc.
Engineering and Surveying
2107 CityWest Blvd., 3rd Floor
Houston, Texas 77042
(713) 783-7788 (713) 783-3580 Fax

WILLOW PARK OFFICE CONDOMINIUMS AT FM 2920 HOUSTON, TEXAS

NO.	REVISION	DATE	BY

DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

WILLOW PARK CONDOMINIUMS DRAINAGE LAYOUT



Engineering and Surveying
2107 CityWest Blvd., 3rd Floor
Houston, Texas 77042
(713) 783-7788 (713) 783-3580 Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

NO.	DESCRIPTION	DATE



DESIGNED BY: **DMC**
 DESIGN CHECKED BY: **JDP**
 DRAWN BY: **DMC**
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____
 QA/QC REVISIONS BY: _____
 DATE: **JUNE 2008**

SCALE **SCALE 1"=30'**

CIVIL
DRAINAGE & SWQMP

SHEET **C-B**

JOB NO. 2006081-001

DRAWING SCALE:

SHEET	
12	
OF	16 SHEETS
JOB NO. 2021-271	

FOR REFERENCE ONLY



WILLOW PARK OFFICE
CONDOMINIUMS AT FM 2920
HOUSTON, TEXAS

2-YEAR STORM SEWER CALCULATIONS PER COH 2002 CRITERIA

Willow Park Office Condos

C.I. JOB NO. 2006061-001

Date: September 25, 2006

From	To	Drainage Area (acres)		Runoff "C"	Sum of C*A	Intensity "I" (in/hr)	Sum of Flows (cfs)	Time of Concentration		Reach (ft.)	Diameter or Span X Height	Area of Pipe/Box	Hydraulic Radius (ft.)	Slope (%)	Manning's Coefficient "n"	Design Capacity (cfs)	Design Velocity (fps)
		Delta	Total					Delta	Total								
10016	10015	0.35	0.35	0.80	0.28	3.53	0.99	--	23.31	74	18	1.77	0.38	0.18	0.011	5.27	3.0
10015	10014	0.55	0.90	0.80	0.72	3.37	2.43	2.21	25.52	93	18	1.77	0.38	0.18	0.011	5.27	3.0
10014	10013	0.55	1.45	0.80	1.16	3.30	3.83	1.13	26.65	43	18	1.77	0.38	0.18	0.011	5.27	3.0
10013	10005	0.20	1.65	0.80	1.32	3.28	4.32	0.33	26.98	124	24	3.14	0.50	0.13	0.011	9.64	3.1
10020	10019	0.96	0.96	0.80	0.77	3.41	2.62	--	24.93	130	18	1.77	0.38	0.18	0.011	5.27	3.0
10019	10018	0.32	1.28	0.80	1.02	3.31	3.39	1.46	26.39	77	18	1.77	0.38	0.18	0.011	5.27	3.0
10018	10017	0.71	1.99	0.80	1.59	3.27	5.21	0.67	27.06	99	24	3.14	0.50	0.13	0.011	9.64	3.1
10017	10002	0.55	2.54	0.80	2.03	3.21	6.52	1.00	28.05	95	24	3.14	0.50	0.13	0.011	9.64	3.1
10010	10009	0.09	0.09	0.80	0.07	3.66	0.26	--	21.54	42	12	0.79	0.25	0.32	0.011	2.38	3.0
10009	10008	0.12	0.21	0.80	0.17	3.50	0.59	2.08	23.63	72	12	0.79	0.25	0.32	0.011	2.38	3.0
10008	10007	0.19	0.40	0.80	0.32	3.39	1.09	1.60	25.23	91	18	1.77	0.38	0.18	0.011	5.27	3.0
10007	10006	1.42	1.82	0.80	1.46	3.23	4.71	2.47	27.70	100	24	3.14	0.50	0.13	0.011	9.64	3.1
10006	10005	0.24	2.06	0.80	1.65	3.17	5.22	1.11	28.81	93	24	3.14	0.50	0.13	0.011	9.64	3.1
10005	10004	2.34	4.40	0.80	3.52	3.11	10.95	0.93	29.75	109	24	3.14	0.50	0.13	0.011	9.64	3.1
10004	10003	1.08	5.48	0.80	4.38	3.08	13.51	0.52	30.27	82	30	4.91	0.63	0.09	0.011	14.54	3.0
10003	10002	0.49	5.97	0.80	4.78	3.06	14.59	0.50	30.76	94	30	4.91	0.63	0.09	0.011	14.54	3.0
10002	10001	3.24	9.21	0.80	7.37	3.03	22.30	0.53	31.29	65	36	7.07	0.75	0.07	0.011	20.86	3.0
10001	10100	0.00	9.21	0.80	7.37	2.98	21.95	0.93	32.22	65	42	9.62	0.88	0.08	0.013	28.46	3.0

REVISIONS

NO.	DESCRIPTION	DATE

DESIGNED BY: DMC
 DESIGN CHECKED BY: JDP
 DRAWN BY: DMC
 COGO CHECKED BY:
 SURVEY CHECKED BY:
 QA/QC BY:
 DATE: JUNE 2008

SCALE: N.T.S.

CITY OF HOUSTON
DRAINAGE CALCULATION

SHEET C-9
 JOB NO. 2006061-001

NO.	REVISION	DATE	BY

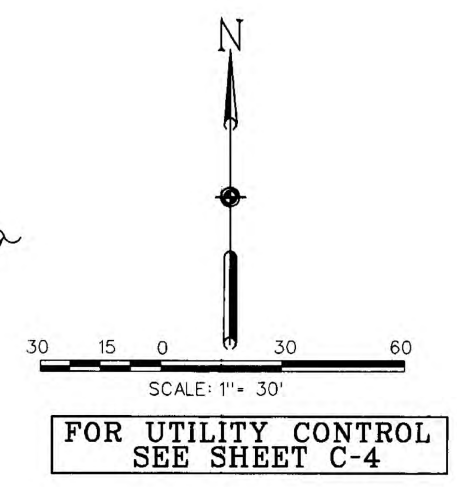
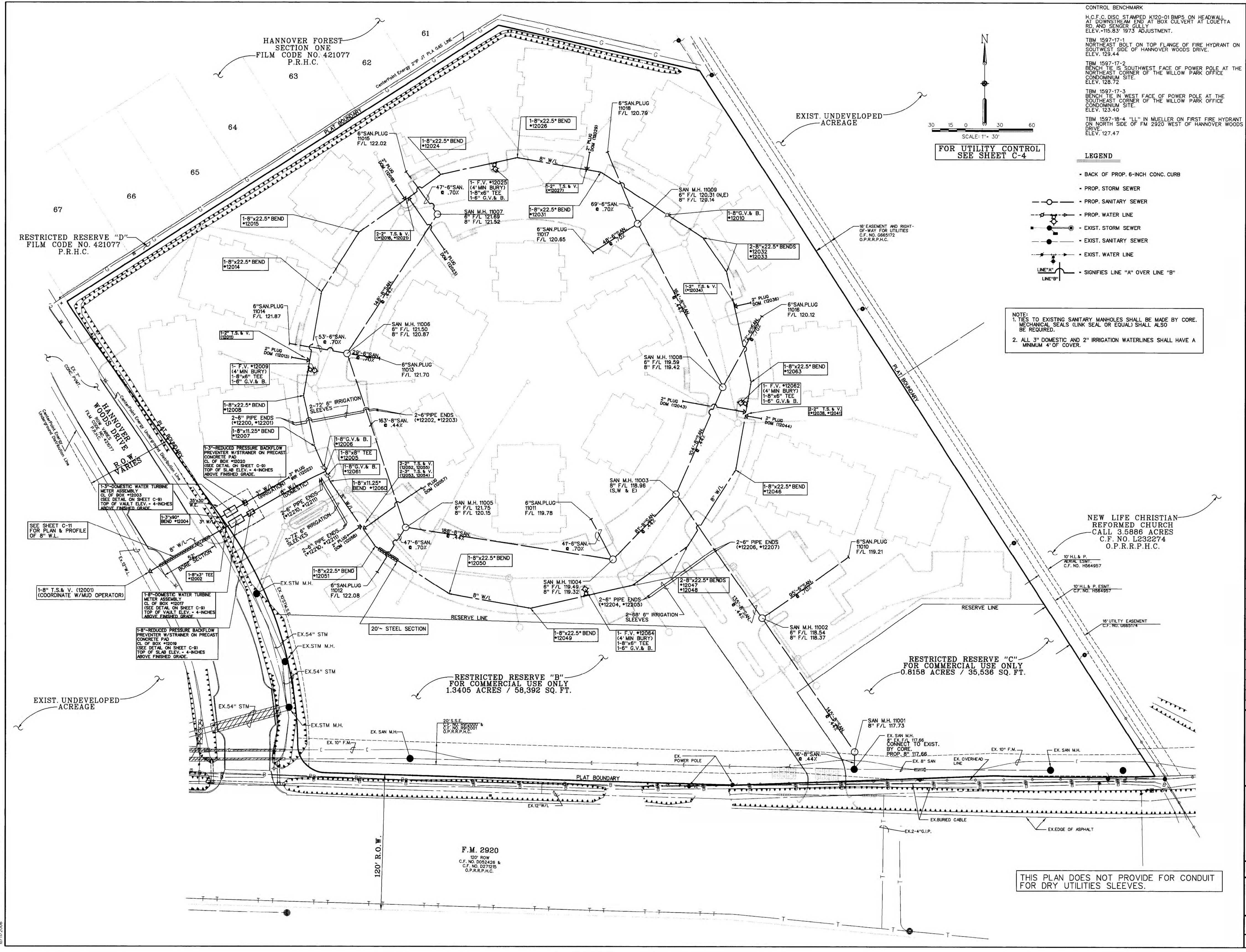
DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

WILLOW PARK
CONDOMINIUMS
DRAINAGE
CALCULATIONS



FOR REFERENCE ONLY



CONTROL BENCHMARK
H.C.F. DISC STAMPED K120-01 BMP5 ON HEADWALL AT DOWNSTREAM END AT BOX CULVERT AT LOUETTA RD. AND SENDER GULLY ELEV. 115.83' 1973 ADJUSTMENT.
TM 1597-17-1
NORTHEAST BOLT ON TOP FLANGE OF FIRE HYDRANT ON NORTHEAST CORNER OF THE WILLOW PARK OFFICE CONDOMINIUM SITE. ELEV. 129.44
TM 1597-17-2
BENCH TIE IS SOUTHWEST FACE OF POWER POLE AT THE NORTHEAST CORNER OF THE WILLOW PARK OFFICE CONDOMINIUM SITE. ELEV. 128.72
TM 1597-17-3
BENCH TIE "A" WEST FACE OF POWER POLE AT THE SOUTHWEST CORNER OF THE WILLOW PARK OFFICE CONDOMINIUM SITE. ELEV. 123.40
TM 1597-18-4
"LL" IN MUELLER ON FIRST FIRE HYDRANT ON NORTH SIDE OF FM 2920 WEST OF HANNOVER WOODS DRIVE. ELEV. 127.47

- LEGEND
- BACK OF PROP. 6-INCH CONC. CURB
 - PROP. STORM SEWER
 - PROP. SANITARY SEWER
 - PROP. WATER LINE
 - EXIST. STORM SEWER
 - EXIST. SANITARY SEWER
 - EXIST. WATER LINE
 - SIGNIFIES LINE "A" OVER LINE "B"

NOTE:
1. TIES TO EXISTING SANITARY MANHOLES SHALL BE MADE BY CORE. MECHANICAL SEALS (LIN SEAL OR EQUAL) SHALL ALSO BE REQUIRED.
2. ALL 3" DOMESTIC AND 2" IRRIGATION WATERLINES SHALL HAVE A MINIMUM 4" OF COVER.



WILLOW PARK OFFICE
CONDOMINIUMS AT FM 2920
HOUSTON, TEXAS

NO.	REVISION	DATE	BY

DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

WILLOW PARK
CONDOMINIUMS
WATER & SANITARY
LAYOUT

Costello
Engineering and Surveying
2107 CityWest Blvd., 3rd Floor
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. No. 280
TBPLS FIRM REG. No. 100486

NO.	DESCRIPTION	DATE



DESIGNED BY: DMC
 DESIGN CHECKED BY: JDP
 DRAWN BY: DMC
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____
 DATE: JUNE 2008
 SCALE: SCALE 1"=30'

CIVIL WATER & SANITARY LAYOUT

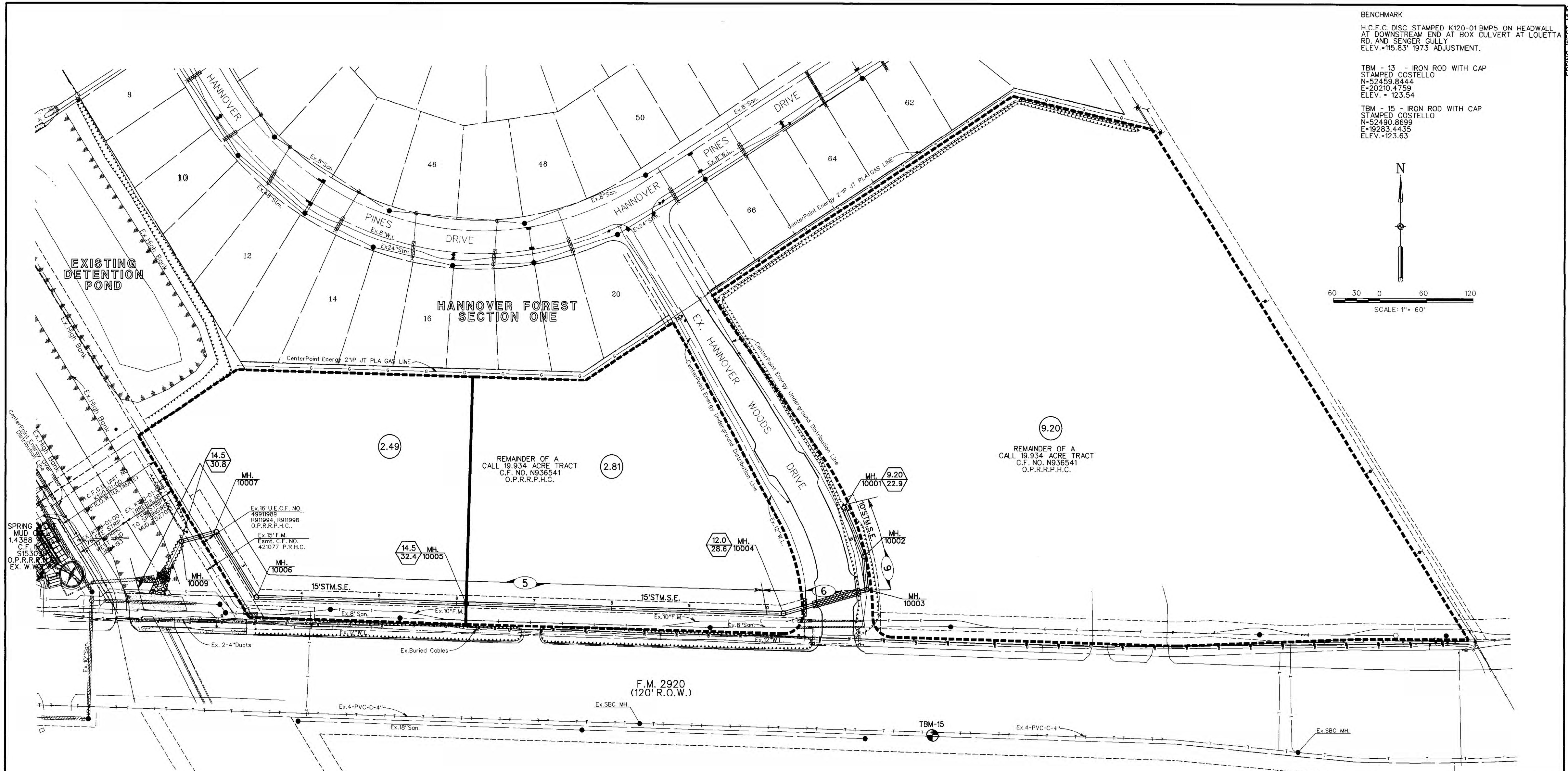
SHEET C-10
 JOB NO. 2008061-001

DRAWING SCALE:

SHEET	14
OF	16 SHEETS
JOB NO.	2021-271

FOR REFERENCE ONLY

P:\WILLOW PARK CONDOS\DWG\15 - REFERENCE 5 SPRING WEST MUD OFFSITE STORM SEWER LINE.dgn
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BENCHMARK
H.C.F.C. DISC STAMPED K120-01 BMP5 ON HEADWALL AT DOWNSTREAM END AT BOX CULVERT AT LOUETTA RD. AND SENDER GULLY
ELEV. = 115.83' 1973 ADJUSTMENT.

TBM - 13 - IRON ROD WITH CAP
STAMPED COSTELLO
N-52459.8444
E-20210.4759
ELEV. = 123.54

TBM - 15 - IRON ROD WITH CAP
STAMPED COSTELLO
N-52490.8699
E-19283.4435
ELEV. = 123.63

SCALE: 1" = 60'

2-YEAR STORM SEWER CALCULATIONS PER COH 2002 CRITERIA
OFFSITE STORM SEWER ALONG F.M. 2920 SERVING WILLOW PARK CONDOMINIUMS
C.I. JOB NO. 2005132-04
April 2006

M.H. From	M.H. To	Delta Area	Total Area	Runoff "C"	C/A	"1" Flows (in/hr)	Sum of Flows (cfs)	Delta Time	Total Time	Reach (ft.)	Area of Radius (sq. ft.)	Hydr. Slope (%)	Mann. "n"	Design Capac. (cfs)	Design Vel. (fps)	Fall Drop (ft.)	M.H. Drop (ft.)	FL Elevation Up	Actual Vel. (fps)	Hydr. Grad. (%)	Head Loss (ft.)	Hydr. Gradient Up	Nat. Ground Up	Delta (ft.)	Soff#				
10001	10004	9.20	9.20	0.80	7.36	3.11	22.89	29.78	218	54	15.90	1.13	0.10	0.013	62.19	3.91	0.22	118.22	118.00	1.44	0.01	0.03	122.72	122.50	126.7	125.9	3.98	122.50	
10004	10005	2.81	12.01	0.80	9.61	2.97	28.58	2.53	32.31	409	54	15.90	1.13	0.10	0.013	62.19	3.91	0.41	118.00	117.59	1.80	0.02	0.09	122.50	122.09	124.9	124.9	3.40	122.09
10005	10009	2.49	14.50	0.80	11.60	2.79	32.41	3.79	36.10	414	54	15.90	1.13	0.10	0.013	62.19	3.91	0.41	117.59	117.17	2.04	0.03	0.11	122.08	121.67	124.9	125.4	2.82	121.67
10009	OUT		14.50	0.80	11.60	2.65	30.76	3.39	39.46	55	60	CHP	19.63	1.25	0.17	0.024	58.89	3.00	0.09	0.50	116.67	116.57	1.57	0.05	0.03	121.66	121.57	125.4	121.57
							0.58	40.07																					

RECORD DRAWINGS

LEGEND

- EXISTING LINE SIZE: 24" R.C.P.
- PROPOSED LINE SIZE: 24" R.C.P.
- MANHOLE INLET
- MANHOLE INLET
- DRAINAGE BOUNDARY
- SHEET REFERENCE
- ACS - CUMULATIVE DRAINAGE AREA (ACRES)
- CFS - 2 YR. FREQUENCY STORM RUNOFF
- EXISTING BACKSLOPE SWALE
- EXISTING HIGH BANK

PRIVATE UTILITY LINE APPROVALS

S.B.C. APPROVED FOR UNDERGROUND CONDUIT FACILITIES ONLY. SIGNATURE VALID FOR ONE YEAR.

DATE: 4/25/06

DATE: 4/25/06

CITY OF HOUSTON
DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

WATER: [Signature] 4/25/06

STREET & BRIDGE: [Signature] 4/25/06

TRAFFIC: [Signature] 4/25/06

STORM WATER QUALITY: [Signature] 4/25/06

FILE NO: [Blank]

FOR CITY OF HOUSTON USE ONLY

DRAWING SCALE: [Blank]

HORIZ: [Blank]

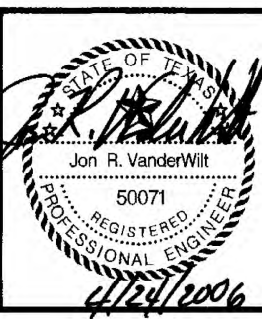
VERT: [Blank]

SHEET No: 4 OF 10

41819

NO.	REVISION	DATE	BY

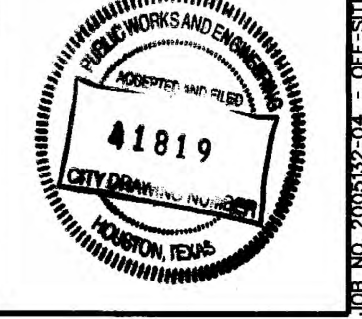
DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____



Costello, Inc.

Engineering and Surveying
 9990 Richmond Avenue, Suite 450
 North Building
 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax

SPRING WEST MUD OFFSITE STORM SEWER LINE DRAINAGE LAYOUT



NO.	REVISION	DATE	BY

DESIGNED BY: _____
 DESIGN CHECKED BY: _____
 DRAWN BY: _____
 COGO CHECKED BY: _____
 SURVEY CHECKED BY: _____
 QA/QC BY: _____ DATE: _____
 QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

SPRING WEST MUD OFFSITE STORM SEWER LINE

Costello

Engineering and Surveying
 2107 CityWest Blvd., 3rd Floor
 Houston, Texas 77042
 (713) 783-7788 (713) 783-3580, Fax
 TBPE FIRM REG. No. 280
 TBPLS FIRM REG. No. 100466

FILE NO: [Blank]

DRAWING SCALE: [Blank]

HORIZ: [Blank]

VERT: [Blank]

SHEET No: 4 OF 10

41819

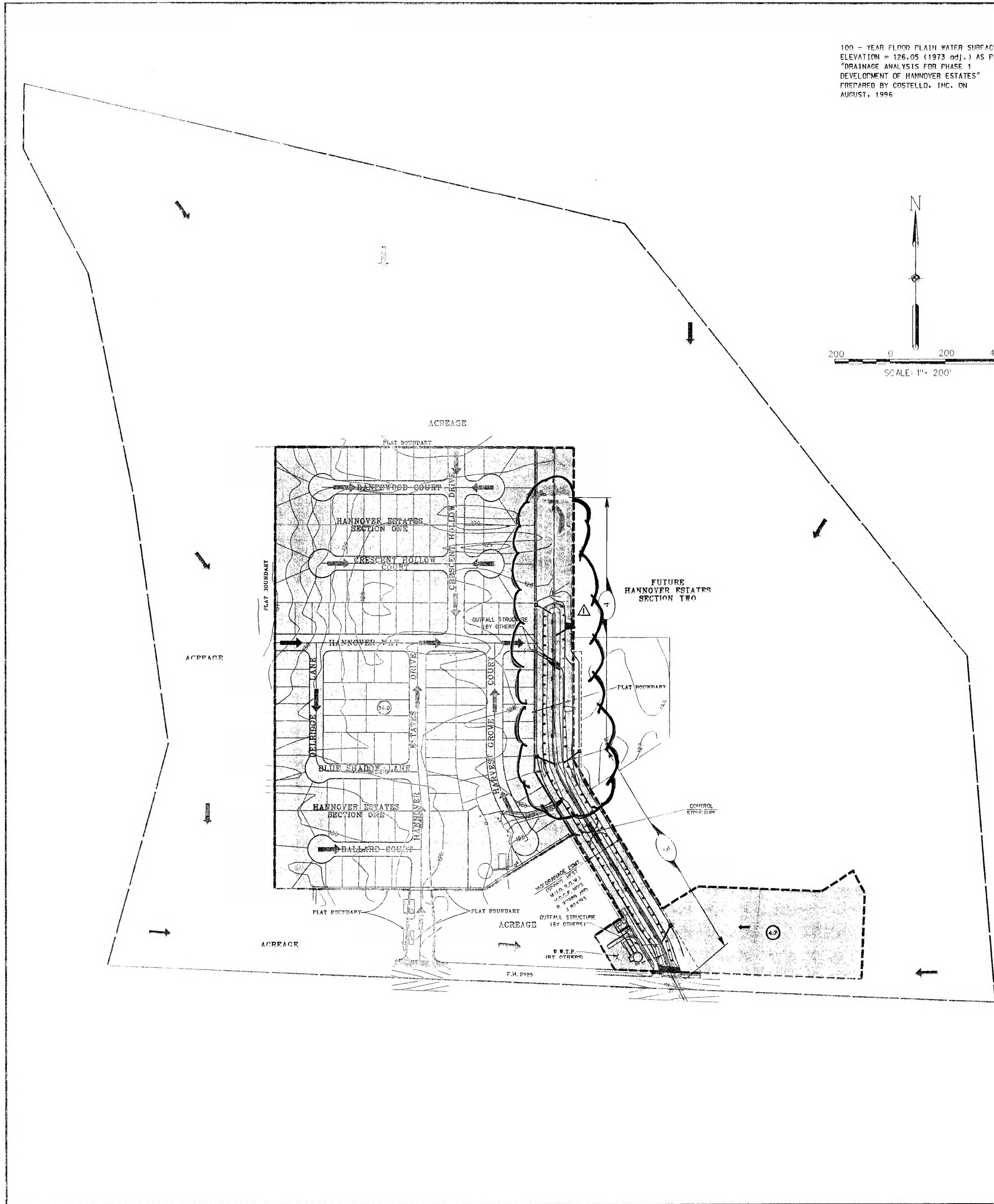
DRAWING SCALE:

SHEET	15
OF	16 SHEETS
JOB NO.	2021-271

FOR REFERENCE ONLY

JOB NO. 2021-271 WILLOW PARK OFFICE CONDO

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100 - YEAR FLOOD PLAIN WATER SURFACE ELEVATION = 126.05 (1973 adj.) AS PER DRAINAGE ANALYSIS FOR PHASE I DEVELOPMENT OF HANNOVER ESTATES PREPARED BY COSTELLO, INC. ON AUGUST, 1999

- GENERAL CONSTRUCTION NOTES**
- THERE WILL BE NO SEPARATE PAYMENT FOR WORK SHOWN ON THESE PLANS UNLESS SPECIFICALLY ESTABLISHED IN THE CONTRACT DOCUMENTS.
 - CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY REGULATION OF HARRIS COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT PRIOR TO STARTING CONSTRUCTION.
 - CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION.
 - OWNER TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITY AND/OR CULVERTS WITHIN HARRIS COUNTY ROAD RIGHTS OF WAY.
 - CONTRACTOR SHALL GIVE ENGINEER TWO (2) WORKING DAYS NOTICE FOR CONSTRUCTION CONTROL STAKING, AND FORTY-EIGHT (48) HOURS NOTICE IN ADVANCE OF BEGINNING CONSTRUCTION.
 - ALL UNSATISFACTORY AND/OR WASTE MATERIALS INCLUDING VEGETATION, ROOTS, CONCRETE, AND DEBRIS SHALL BE HAULED OFF SITE BY THE CONTRACTOR. INCLUDE COST OF THIS WORK, INCLUDING HAUL, IN OTHER ITEMS OF THIS PROJECT.
 - CONTRACTOR SHALL MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES DURING CONSTRUCTION OF PROPOSED FACILITIES.
 - CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING FACILITIES PRIOR TO CONSTRUCTION OF PROPOSED FACILITIES. CONTRACTOR SHALL NOTIFY UTILITIES 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CONTACT TEXAS ONE-CALL AT 223-4567
 - CONTRACTOR SHALL CONFINED ALL WORK EFFORTS WITHIN THE DESIGNATED AREA UNLESS SPECIFICALLY AUTHORIZED BY THE OWNER. EXTREME CARE SHOULD BE EXERCISED NEAR ADJACENT PROPERTY TO PROTECT ANY EXISTING TREES, FENCES, LANDSCAPING AND OTHER EXISTING FEATURES.
 - ALL EXISTING LANDSCAPING, SIDEWALKS, FENCES, UTILITIES AND OTHER EXISTING FACILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPLACED OR REPAIRED TO THEIR ORIGINAL CONDITION BY THE CONTRACTOR AT HIS EXPENSE.
 - ALL CONSTRUCTION WHICH HINDERS TRAFFIC OR REQUIRES TRAFFIC DIVERSION SHALL BE IN CONFORMANCE WITH THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR PURCHASING ANY WATER NEEDED FOR CONSTRUCTION OR TESTING. THE PURCHASE OF WATER FOR CONSTRUCTION OR TESTING WILL BE CONSIDERED INCIDENTAL TO THE VARIOUS OTHER ITEMS OF WORK.
 - ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE COUNTY OF HARRIS, THE HARRIS COUNTY FLOOD CONTROL DISTRICT, THE CITY OF HOUSTON, THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION, AND THE ENGINEER.
 - UPON PROJECT COMPLETION AND PRIOR TO FINAL RELEASE OF RETAINAGE, CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF "PROJECT'S RECORD DOCUMENTS" OF THE CONTRACT AS THEY RELATE TO THE RESPECTIVE CONTRACTOR (AND SEPARATE PAY).
 - DELIVERY TICKETS FOR ALL MATERIALS (E.G., CONCRETE, CEMENT STABILIZED SAND, ETC.) SHALL BE MAINTAINED BY THE CONTRACTOR AND UPON REQUEST, BE MADE AVAILABLE FOR REVIEW BY THE ENGINEER.
 - PRIOR TO THE RELEASE OF THE RETAINAGE, THE CONTRACTOR SHALL PROVIDE A NOTARIZED CERTIFICATION THAT ALL MATERIALS INSTALLED IN THE PROJECT ARE COMPLETE IN PLACE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS.
 - OWNER WILL PROVIDE CONTROL STAKING ONLY. CONTRACTOR TO BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING SUPERVISED BY A LICENSED SURVEYOR IN THE STATE OF TEXAS. SURVEYOR MUST CARRY ERROR AND OMISSIONS INSURANCE. INCLUDE THE COST FOR CONSTRUCTION STAKING IN THE BASE BID (AND SEPARATE PAY).
 - THESE PLANS, PREPARED BY COSTELLO, INC., DO NOT EXTEND TO OR INCLUDE DESIGN OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE REGISTERED PROFESSIONAL ENGINEER(S) HEREON DOES NOT EXTEND TO ANY SUCH SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED IN THESE PLANS. THE CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING THE PLANS AND SPECIFICATION REQUIRED BY THE HOUSTON BILL 659 AND RES ENACTED BY THE TEXAS LEGISLATURE IN THE 70TH LEGISLATURE REGULAR SESSION AND CURRENT OSHA STANDARDS FOR TRENCH SAFETY. DESIGN OF TRENCH SAFETY SYSTEM, SEALED BY A LICENSED PROFESSIONAL ENGINEER, SHALL BE SUBMITTED BY THE CONTRACTOR PRIOR TO EXECUTION OF A CONTRACT FOR THIS WORK.

CONTROL TBM:
H.C.F.C. DISC STAMPED K120-01-00 ON HEADWALL AT DOWNSTREAM END AT BOX CULVERT AT LAMBERTA RD. AND SENNER CULVERT.
ELEVATION: 115.00' 1978 ADJUSTMENT.

SITE TBM:
1'-00" BRASS DISC ON HEADWALL AT C/A 1/4" IN BOX CULVERTS, DOWNSTREAM SIDE OF SENNER CULVERT AT F.M. 2920.
ELEVATION: 128.45' 1978 ADJUSTMENT.

NOTE: TO CONVERT FROM 1978 ADJ. TO 1973 ADJ., ADD 0.23 FEET TO ELEVATIONS SHOWN ON PLANS.

- HARRIS COUNTY FLOOD CONTROL DISTRICT CONSTRUCTION NOTES**
- HARRIS COUNTY FLOOD CONTROL DISTRICT, WATERSHED MANAGEMENT DEPARTMENT, SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO CONSTRUCTION (713-783-3580). A COPY OF THE APPROVED CONSTRUCTION DRAWING IS REQUIRED AT THIS TIME.
 - ENGINEER SHALL SUBMIT LETTER AND RECORD DRAWINGS TO HARRIS COUNTY FLOOD CONTROL DISTRICT, WATERSHED MANAGEMENT DEPARTMENT, REQUESTING INSPECTION AND ACCEPTANCE OF ITEMS CONSTRUCTED IN HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT-OF-WAY PRIOR TO REQUESTING INSPECTION. THE DRAINAGE RIGHT-OF-WAY AND/OR EASEMENTS SHALL BE STAKED AND FLAGGED.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING, MAINTAINING AND RESTORING BACKSLOPE DRAINAGE SYSTEMS.
 - ALL DISTURBED AREAS WITHIN THE HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT-OF-WAY, EXCEPT THE CHANNEL BOTTOM, SHALL BE SEED AS PER HARRIS COUNTY FLOOD CONTROL SPECIFICATION SECTION 2851, PLURP ESTABLISHMENT.
 - BACKFILL TO BE COMPACTED TO NO GREATER THAN 8-INCH LIFTS TO THE DENSITY OF THE UNDISTURBED ADJACENT SOIL.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR EXCAVATING CHANNEL FLOWLINE TO DESIGN ELEVATION AS SHOWN ON PLANS AND DOWNSTREAM AS NECESSARY TO INSURE NO WATER IN STORM SEWER DURING "DRY" CONDITIONS.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING FLOW IN CHANNEL DURING CONSTRUCTION AND RESTORING CHANNEL TO ITS ORIGINAL CONDITION.
 - ALL EXCAVATED MATERIAL IS TO BE REMOVED FROM THE H.C.F.C.D. RIGHT-OF-WAY. NO FILL IS TO BE PLACED WITHIN A DESIGNATED FLOOD PLAIN AREA WITHOUT FIRST OBTAINING A FILL PERMIT.
 - CONTRACTOR, WITH THE ASSISTANCE OF THE ENGINEER, IF NECESSARY, SHALL BE RESPONSIBLE FOR OBTAINING ALL APPLICABLE CITY, COUNTY, STATE, AND FEDERAL PERMITS, INCLUDING PERMITS REQUIRED BY HARRIS COUNTY FOR FLOOD PLAIN MANAGEMENT PRIOR TO STARTING CONSTRUCTION.

DETENTION SUMMARY

- Detention Service Area = 38.7 acres
Total Area Within K120-01-00 Subwatershed = 178.5 Ac. (North Of F.M. 2920)
- Detention Storage Rate = $C_s = 0.40$
- Detention Storage Volume Required = 15.5 acre-feet
- Detention Storage Volume Provided = 15.5 acre-feet
- Maximum Design Water Surface Elevation -
Upstream Of Control Structure = 126.05
Downstream Of Control Structure = 123.68
- Maximum Outflow Rate Allowed = 330 cfs
- Maximum Outflow Rate Provided = 326 cfs
- Restrictor Size = 2'-6"x3'-R.C.R.

INTERPOSE NO OBJECTION
FINAL APPROVAL BY OTHERS
[Signature]
Harris County Flood Control District
12/23/96
Date

INTERPOSE NO OBJECTION
FINAL APPROVAL BY OTHERS
[Signature]
Harris County Flood Control District
10/17/96
Date

- LEGEND**
- AREA SERVED BY DETENTION POND
 - K120-01-00 DRAINAGE BOUNDARY (AREA NORTH OF F.M. 2920)
 - ACREAGE (SERVE BY DETENTION POND)
 - EXTREME EVENT SHEET FLOW

CITY OF HOUSTON
DEPT. OF PUBLIC WORKS & ENGINEERING
ENGINEERING, CONSTRUCTION AND REAL ESTATE GROUP

[Signatures and Dates]

DATE: 11/4/96
DATE: 11-8-96

SUBMITTED: [Signature]
SCALE: 1" = 100'
DATE: AUGUST, 1999
SURVEYED BY: [Signature]
P.D. NO.:

DESIGNED BY: [Signature]
DRAWN BY: [Signature]
CHECKED BY: [Signature]
CITY: HOUSTON, TEXAS

REVISION	DATE	DESCRIPTION
1	12-19-96 M.G.R.	REVISED DETENTION POND CONFIGURATION

Costello, Inc.

ENGINEERING AND SURVEYING
2077 S. GESSNER, SUITE 225
HOUSTON, TEXAS 77068
(713) 788-7788 (713) 788-3580, FAX

[Professional Engineer Seal]

**HANNOVER ESTATES SECTION ONE
DETENTION POND**

DRAINAGE AREA MAP

NO.	REVISION	DATE	BY

DESIGNED BY: _____
DESIGN CHECKED BY: _____
DRAWN BY: _____
COGO CHECKED BY: _____
SURVEY CHECKED BY: _____
QA/QC BY: _____ DATE: _____
QA/QC REVISIONS BY: _____

WILLOW PARK CONDOMINIUMS

**HANNOVER ESTATES
PHASE I
DETENTION POND**

Costello

Engineering and Surveying
2107 CityWest Blvd., 3rd Floor
Houston, Texas 77042
(713) 783-7788 (713) 783-3580, Fax
TBPE FIRM REG. NO. 280
TBPLS FIRM REG. NO. 100486

DRAWING SCALE:

SHEET	16
OF 16 SHEETS	
JOB NO. 2021-271	

FOR REFERENCE ONLY

JOB NO. 2021-271 WILLOW PARK OFFICE CONDO