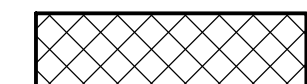
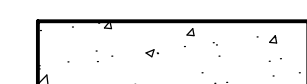

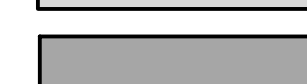
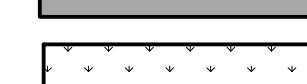
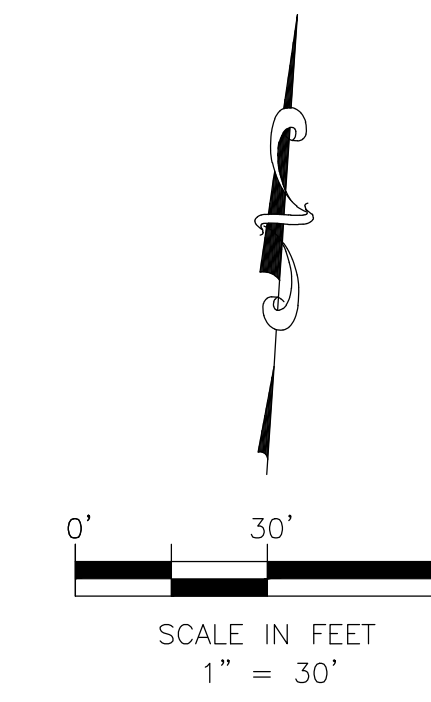


LEGEND

-  PROPOSED HEAVY DUTY CONCRETE PAVEMENT
-  PROPOSED MEDIUM DUTY CONCRETE PAVEMENT
-  PROPOSED LIGHT DUTY CONCRETE PAVEMENT
-  PROPOSED SIDEWALK
-  PROPOSED LANDSCAPE AREA



BENCHMARK

MONUMENT NAME 10 GPS MONU 1995 IS A BRASS CAP SET IN CONCRETE STAMPED "CITY OF PEARLAND 10 GPS MONU, 1995" LOCATED ON THE SOUTH BOUND HIGHWAY 288 APPROXIMATELY 2,400 FEET SOUTH OF F.M. 518 AND 21 FEET WEST FROM THE WEST EDGE OF ASPHALT. ELEV.=59.29' (NGVD 1929, 1987 ADJUSTMENT).

TBM A: BOX CUT ON H2-INLET LOCATED ON THE NORTH SIDE OF COUNTY ROAD 101 SOUTH OF THE SOUTHWEST CORNER OF THE PROPERTY, AS SHOWN. ELEVATION = 64.44'

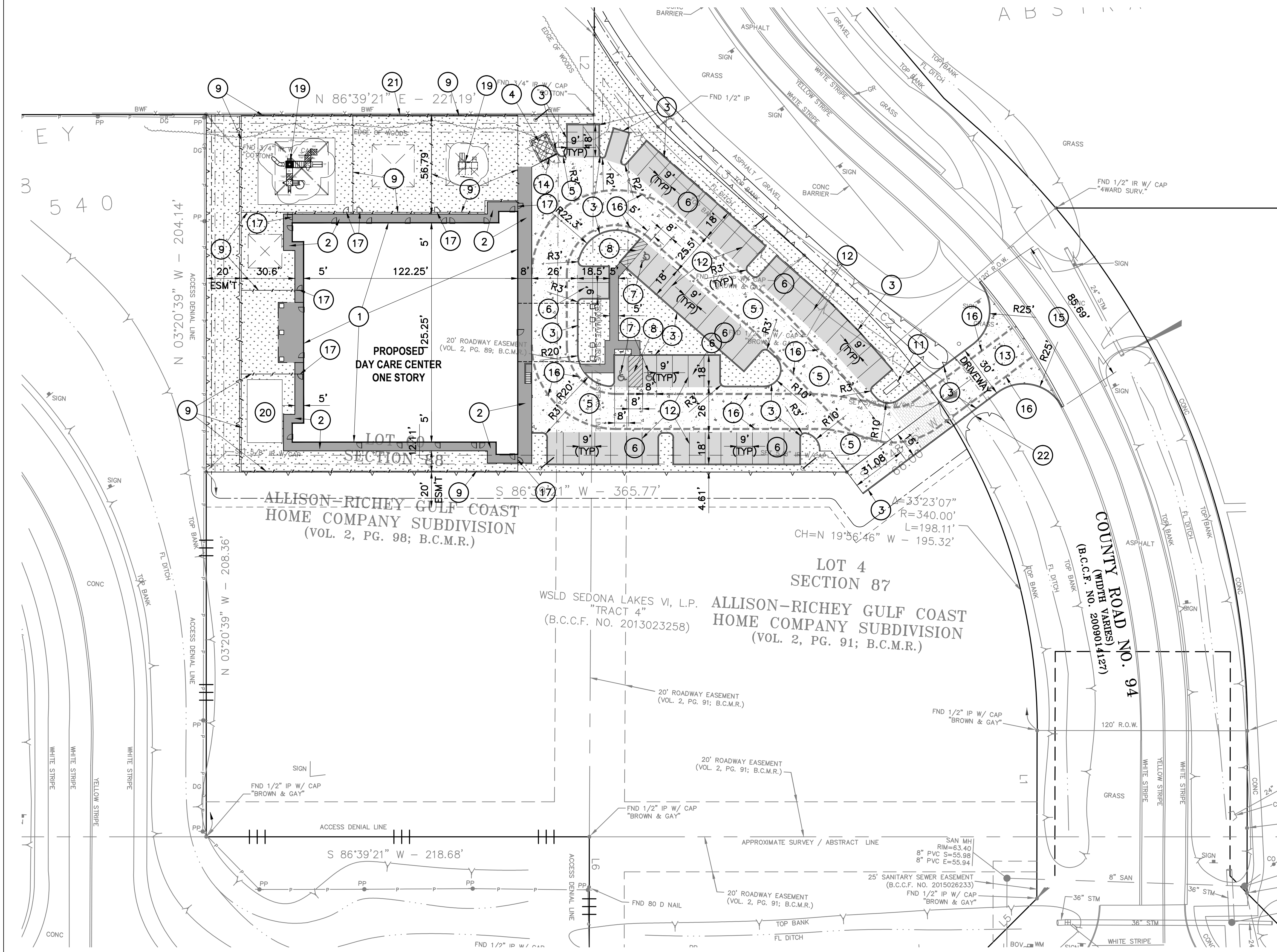
TBM B: BOX CUT ON RCP LOCATED ON THE EAST SIDE OF COUNTY ROAD 94 NEAR THE EAST PORTION OF THE PROPERTY, AS SHOWN. ELEVATION = 61.48'

NOTES:

1. ALL DIMENSIONS ARE TO FACE OF CURB, FACE OF BUILDING, PROPERTY LINE, CENTER OR END OF STRIPPING, UNLESS OTHERWISE NOTED.
2. ALL ACCESSIBLE ROUTES AT SIDEWALKS AND OTHER PAVED AREAS SHALL HAVE A SLOPE OF NO MORE THAN 5% IN THE DIRECTION OF TRAVEL (EXCEPT RAMPS) AND 2% IN THE TRANSVERSE OR CROSSING DIRECTION.
3. SEE ARCHITECTURAL SITE PLAN FOR ADDITIONAL SITE DIMENSIONS, FEATURES, AND LANDSCAPING.

KEY NOTES:

- ① PROVIDE AND PREPARE BUILDING SUBGRADE AS REQUIRED PER CONTRACT DOCUMENTS
- ② PROPOSED SIDEWALK (PRIVATE) RE: SHT C11
- ③ PROPOSED 6" CONC. CURB RE: SHT C11
- ④ PROPOSED 7" HEAVY DUTY PVMT RE: SHT C5
- ⑤ PROPOSED 6" MEDIUM DUTY PVMT RE: SHT C5
- ⑥ PROPOSED 5" LIGHT DUTY PVMT RE: SHT C5
- ⑦ HANDICAP SYMBOL AND SIGNAGE OF ACCESSIBILITY AT EACH ADA SPA (2 TOTAL), RE: ARCH DWG
- ⑧ 4" WIDE WHITE TRAFFIC PAINT STRIPES AT 2' O.C. AT 45° ANGLE (TWO COATS)
- ⑨ PROPOSED FENCE RE: ARCH. DWG.
- ⑩ ADA RAMP, RE: C11
- ⑪ MONUMENT SIGN, RE: ARCH, TO BE PERMITTED SEPARATELY BY COH SIGN ADMINISTRATIVE OFFICE.
- ⑫ 4" WHITE TRAFFIC PAINT STRIPE (TWO COATS)
- ⑬ PROPOSED DRIVEWAY
- ⑭ DUMPSTER SCREEN WALL PAD AND DOORS RE: STRUCTURAL
- ⑮ SAWCUT EXIST PAVEMENT AS NECESSARY TO CONSTRUCT DRIVEWAY
- ⑯ 4" RED FIRE LANE STRIPING OR CURB PAINTED RED WITH WHITE LETTERS INDICATING FIRE LANE
- ⑰ FENCE GATES RE: ARCHITECTURAL
- ⑱ SIDEWALK AT PAVING CURB RE: SHT C11.
- ⑲ PLAYGROUND EQUIPMENT, RE: ARCH. DWG.
- ⑳ CONCRETE SPLASH PAD, USE PRIVATE SIDEWALK DETAIL.
- ㉑ 220 LF CONCRETE RETAINING WALL, RE: SHT. C2.
- ㉒ RE-GRADE ROADSIDE DITCH FOR INSTALLATION OF DRIVEWAY.



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YIFENG ZHUANG
TX # 87950
08/13/2018

DRAWING TITLE
SITE PLAN

DRAWN BY	CHECKED BY
KN	EL

DATE	JOB NO.
08/13/2018	1806251

DRAWING NO.
C1

PROPOSED DRAINAGE CONDITIONS

BASED ON CITY OF MANVEL 5-YEAR STORM.
 $A=1.67$ AC, $b=71.6$, $d=11.08$, $e=0.7704$
 $C=0.80$
 $TC=200/2/60 + 80/3/60 + 10 = 12.11$ MIN.
 $i(5)=71.6/(11.08+12.11)^{0.7704}=6.35$ IN/HR

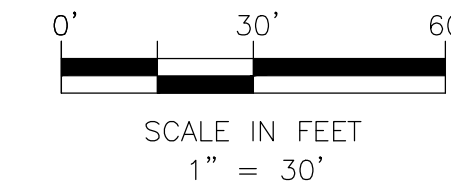
Storm Sewer Calculation Table													
AREA No.	FROM	TO	AREA	TOTAL AREA	C	TC	I	FLOW CFS	PIPE SIZE	GRADE %	MANNINGS n'	ELOCIT ft/s	APACIT Q
1	1	2	0.3169	0.3169	0.80	12.11	6.350	1.61	12	0.31	0.011	2.99	2.35
2	2	4	0.1043	0.4212	0.80	12.11	6.350	2.14	12	0.31	0.011	2.99	2.35
3	3	4	0.0221	0.0221	0.80	12.11	6.350	0.11	8	0.53	0.011	2.99	1.04
4	4	5	0.1333	0.5766	0.80	12.11	6.350	2.93	15	0.23	0.011	2.99	3.67
5	5	6	0.2029	0.7795	0.80	12.11	6.350	3.96	18	0.18	0.011	2.99	5.28
6	6	11	0.1490	0.9285	0.80	12.11	6.350	4.72	18	0.18	0.011	2.99	5.28
7	7	8	0.3844	0.3844	0.80	12.11	6.350	1.95	12	0.31	0.011	2.99	2.35
8	8	9	0.0330	0.4174	0.80	12.11	6.350	2.12	12	0.31	0.011	2.99	2.35
9	9	10	0.1596	0.5770	0.80	12.11	6.350	2.93	15	0.23	0.011	2.99	3.67
10	10	11	0.1106	0.6876	0.80	12.11	6.350	3.49	15	0.23	0.011	2.99	3.67
11	11	12	0.0774	1.6935	0.80	12.11	6.350	8.60	24	0.13	0.011	3.08	9.67

BENCHMARK

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LEGEND

- EXISTING STORM SEWER BY OTHERS
- EXISTING INLET BY OTHERS
- EXISTING SPOT GRADE
- PROPOSED STORM SEWER
- PROPOSED STORM INLET/JUNCTION BOX RE: SHT C7
- DIRECTION OF FLOW OR SWALE
- DRAINAGE AREA BOUNDARY
- AREA (AC) CUMULATIVE AREA (AC)
- RUNOFF (CFS) CUMULATIVE RUNOFF (CFS)
- DIRECTION OF EXTREME EVENT FLOW

NOTES:

1. ALL HDPE STORM SEWERS SHALL BE DOUBLE WALL WITH SMOOTH INTERIOR WALLS, WITH BELL AND SOCKET JOINTS WITH RUBBER GASKETS THAT MEET ASTM F477 (ADS N-12 STIB PIPE OR APPROVED EQUIVALENT).
2. ALL STORM SEWERS ARE HDPE PIPES.
3. COEFFICIENT OF FRICTION VALUES FOR RCP=0.013, HDPE=0.011 AND PVC=0.010
4. PLAYGROUND EQUIPMENT, AND SHADE PYRAMID INSTALLERS MUST DESIGN POSITIVE DRAINAGE SYSTEM TO DIRECT STORM SHEET FLOW AWAY FROM BUILDING, AND PADS OF STRUCTURES. INSTALLERS MUST INSTALL UNDER DRAINS AND CONNECT TO NEARBY STORM DRAIN LINES.
5. INLETS 1, 2, 3, 7 & 8 SHALL BE PARK USA MODEL CB18 OR APPROVED EQUIVALENT. INLETS 4, 5, 6, 9, & 10 SHALL BE PARK USA MODEL CB24 OR APPROVED EQUIVALENT. INLET 11 & 12 SHALL BE PARK USA MODEL CB30 OR APPROVED EQUIVALENT. RE: SHT C8.
6. STORM SEWER WILL BE CONSTRUCTED FROM INLET #12 TO EXISTING STORM SEWER AT SOUTHWEST CORNER OF CR 94 AND CR 101 INTERSECTION BY OTHERS.

PLAN KEY NOTES:

- ① PROVIDE AND INSTALL SPEE-D CHANNEL DRAIN WITH BOTTOM OUTLET.
- ② CONNECT TO OUTLET WITH WATER TIGHT CONNECTION AND CONSTRUCT 4" LATERAL @ 2.00% MIN. SLOPE TO ADJACENT INLET OR STORM SEWER.
- ③ CONNECT TO 6" ROOF DRAIN BELOW GRADE WITH WATER TIGHT CONNECTION. CONSTRUCT 6" PVC STORM @ 1.00% MIN. SLOPE AND CONNECT TO ADJACENT STORM WITH WYE CONNECTION AND 45° BEND
- ④ CONSTRUCT CLEANOUT.
- ⑤ CONNECT TO 8"x8" DOWNSPOUT BELOW GRADE WITH WATER TIGHT CONNECTION. CONSTRUCT 8" PVC LATERAL @ 0.5% MIN. SLOPE AND CONNECT TO ADJACENT STORM WITH WYE CONNECTION AND 45° BEND.
- ⑥ PROVIDE AND INSTALL 4" LATERAL WITH WYE CONNECTION AND 45° BEND AND 4" CAP. SEE NOTE 5 THIS SHT.
- ⑦ CONNECT TO 6" ROOF DRAIN BELOW GRADE WITH WATER TIGHT CONNECTION. CONSTRUCT 6" PVC STORM @ 1.00% MIN. SLOPE AND CONNECT TO ADJACENT STORM WITH WYE CONNECTION AND 45° BEND
- ⑧ 1½" P-TRAP FLOOR DRAIN WITH BRONZE COVER. CONSTRUCT LATERAL PIPE @ 2% SLOPE AND CONNECT TO 12" STM. DRAIN. TYPICAL OF 3

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YIFENG ZHUANG
 TX #87950

08/13/2018

DRAWING TITLE

DRAINAGE PLAN

DRAWN BY KN CHECKED BY EL

DATE 08/13/2018 JOB NO. 1806251

DRAWING NO.

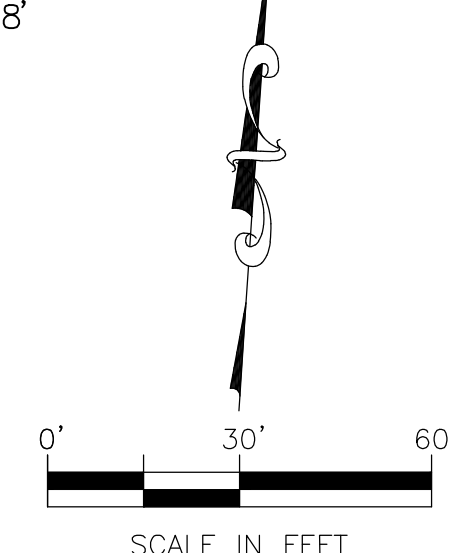
C3

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LEGEND

- PROPOSED GRADE CLEAN-OUT (G.C.O.)
- EXISTING SAN MANHOLE
- EXISTING SAN SEWER
- PROPOSED SAN SEWER
- EXISTING WATER
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET
- EXISTING STORM SEWER
- EXISTING STORM MANHOLE
- EXISTING INLET

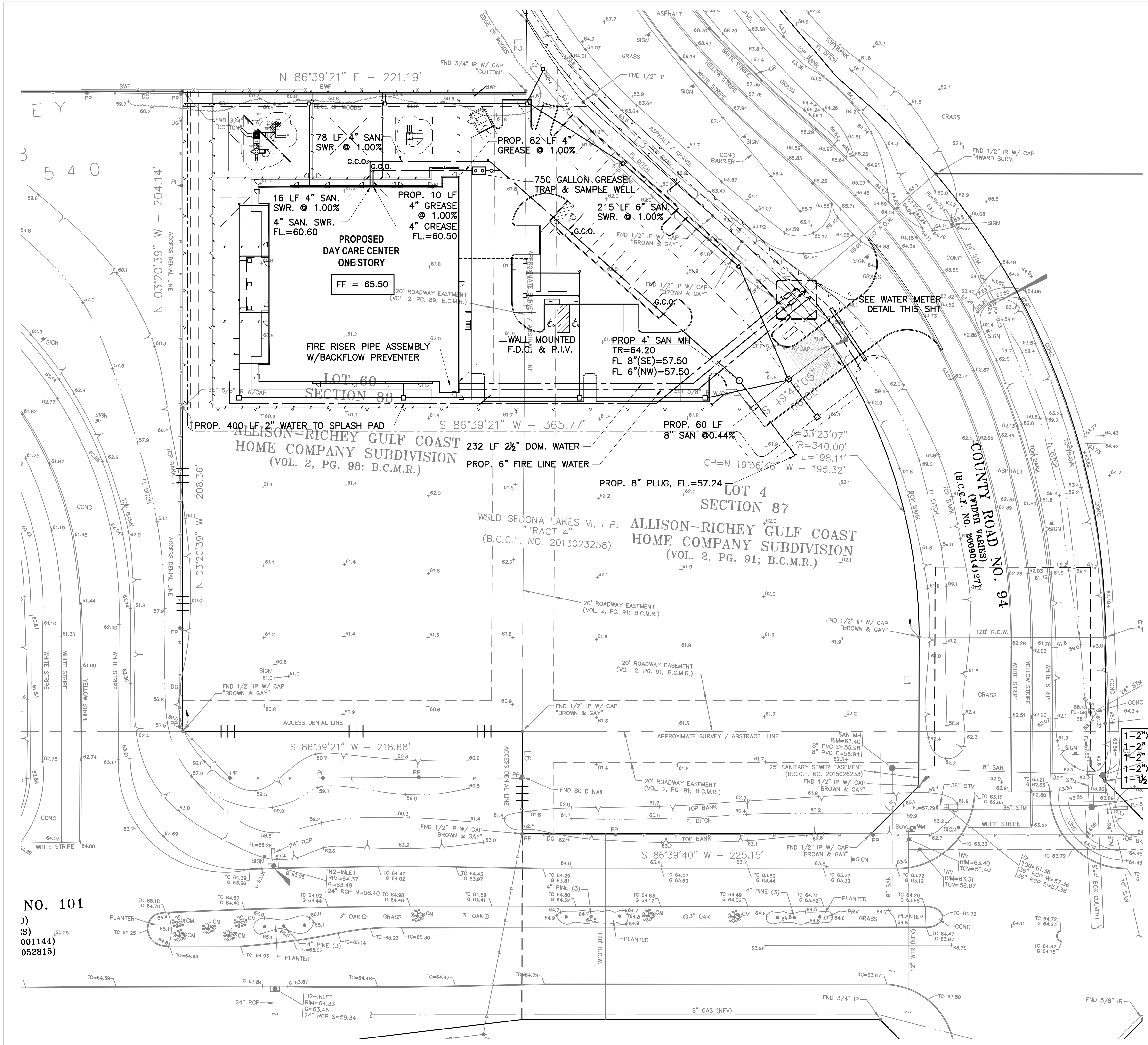
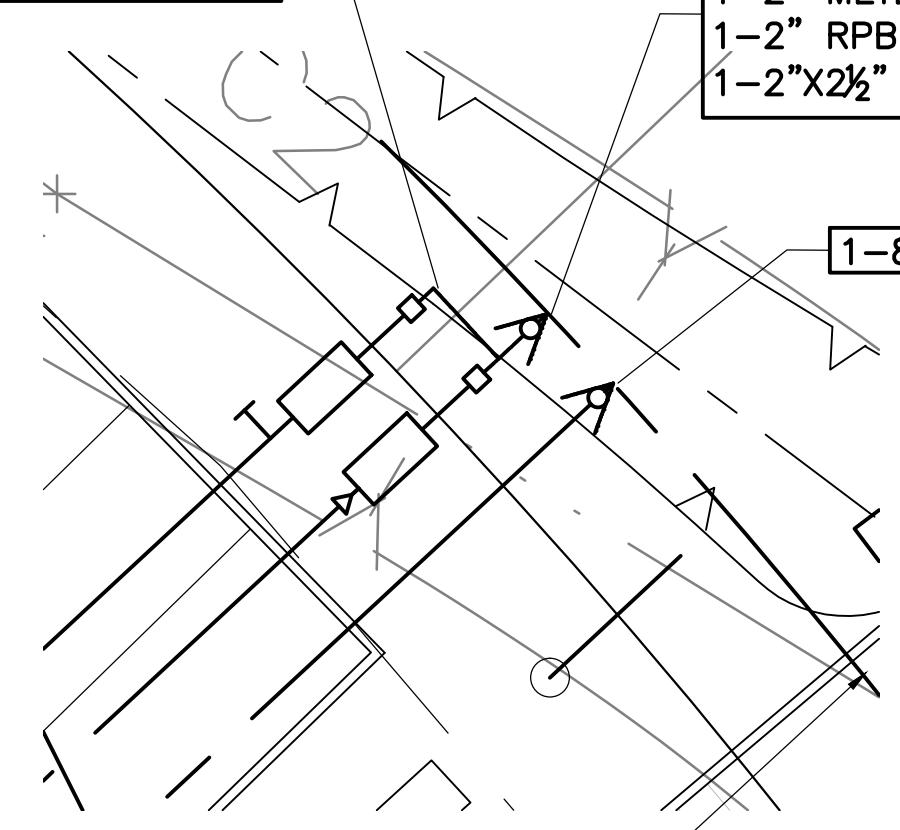
NOTES:

1. ALL SANITARY SEWER AND GREASE LINES SHALL BE PVC SCH. 40.
2. ALL DOMESTIC WATER AND IRRIGATION LINES SHALL BE PVC SCH. 40.
3. 6" FIRE LINE SHALL BE C900 PVC CLASS 150 DR18 PIPE.
4. COORDINATE UTILITY CONNECTIONS AT THE BUILDING WITH PLUMBING PLANS.
5. WATER LINES SHALL BE BACKFILLED PER DETAIL ON SHT C8.
6. SANITARY LINES SHALL BE BACKFILLED PER DETAIL ON SHT C8.

1-2"X90" BEND (IRR.)
 1-2" METER (IRR.)
 1-2" RPBP (IRR.)
 1-2"X1 1/2" TEE (IRR.)
 1-1/2" PLUG & CLAMP

1-2" SERVICE TAP (DOM.)
 1-2"X2" TEE
 1-2" METER (DOM.)
 1-2" RPBP (DOM.)
 1-2"X2 1/2" RED (DOM.)

1-8"X6" TS&V



NO. 101
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YIFENG ZHUANG
 TX # 87950

08/13/2018

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UTILITY PLAN

DRAWN BY
 KN

CHECKED BY
 EL

DATE
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JOB NO.
 1806251

DRAWING NO.

C4

PAVEMENT NOTES:

- 5" THICK CONCRETE PAVING SHALL HAVE 3,500 PSI COMPRESSIVE STRENGTH AT 28 DAYS, AND REINFORCED WITH #4 BARS AT 24-INCHES ON CENTER EACH WAY. CONCRETE SHALL HAVE MINIMUM OF 500 PSI FLEXURAL STRENGTH AT 7 DAYS. REINFORCING STEEL SHOULD CONFORM TO ASTM A615, GRADE 60.
6" THICK CONCRETE PAVING SHALL HAVE 3,500 PSI COMPRESSIVE STRENGTH AT 28 DAYS, AND REINFORCED WITH #4 BARS AT 18-INCHES ON CENTER EACH WAY. CONCRETE SHALL HAVE MINIMUM OF 500 PSI FLEXURAL STRENGTH AT 7 DAYS. REINFORCING STEEL SHOULD CONFORM TO ASTM A615, GRADE 60.
7" THICK CONCRETE PAVING SHALL HAVE 3,500 PSI COMPRESSIVE STRENGTH AT 28 DAYS, AND REINFORCED WITH #4 BARS AT 18-INCHES ON CENTER EACH WAY. CONCRETE SHALL HAVE MINIMUM OF 500 PSI FLEXURAL STRENGTH AT 7 DAYS. REINFORCING STEEL SHOULD CONFORM TO ASTM A615, GRADE 60.
- SUBGRADE FOR CONCRETE PAVEMENT SHOULD BE STABILIZED WITH 7% LIME BY DRY WEIGHT PER TXDOT SPECIFICATION ITEM 260 AND 263, COMPACT TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY (ASTM D 698) AT A MOISTURE CONTENT BETWEEN OPTIMUM AND +3% OF OPTIMUM. STABILIZED SUBGRADE SHALL BE 6-INCHES THICK FOR AREAS WITH 5" AND 6" THICK CONCRETE PAVEMENT. AREAS WITH 7" THICK CONCRETE PAVEMENT SHALL HAVE 8" THICK COMPACTED SUBGRADE.
- SUGGESTED LONGITUDINAL AND TRANSVERSE JOINT SPACING FOR CONCRETE PAVING PLACED ON EXPANSIVE FOUNDATION SOIL IS NOT TO EXCEED 20-FT. THE EXPANSION JOINT SPACING IS NOT TO EXCEED 60-FT.
- CONCRETE FOR 4" CONCRETE SIDEWALK SHALL HAVE 3,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS, AND REINFORCED WITH #3 BARS AT 18-INCHES ON CENTER EACH WAY. INSTALL CONTROL JOINTS EVERY 5 FEET, EXPANSION JOINTS EVERY 20 FEET.
- PLACE 2" BANK SAND BELOW CONCRETE SIDEWALK
- PAVING CONTROL JOINT SPACING: MAXIMUM OF 15 FEET. IF SAWCUT, CONTROL JOINTS SHOULD BE CUT WITHIN 6 TO 12 HOURS OF CONCRETE PLACEMENT.
- CONTRACTOR SHOULD SUBMIT PAVING JOINT LAYOUT FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
- CONCRETE SHALL BE PLACED IN ALTERNATE STRIPS WHERE APPLICABLE.
- FILL SHOULD BE BROUGHT ON SITE TO ACHIEVE PROPOSED GRADE ELEVATION. RANDOM FILL UNDER PARKING LOT PAVING MUST BE APPROVED BY PROJECT GEOTECHNICAL ENGINEER PRIOR TO BEING BROUGHT ONTO SITE.

NOTES:

- ALL DIMENSIONS ARE TO FACE OF CURB, FACE OF BUILDING, PROPERTY LINE, CENTER OR END OF STRIPPING, UNLESS OTHERWISE NOTED.
- SEE ARCHITECTURAL SITE PLAN FOR ADDITIONAL SITE DIMENSIONS, FEATURES, AND LANDSCAPING.

LEGEND

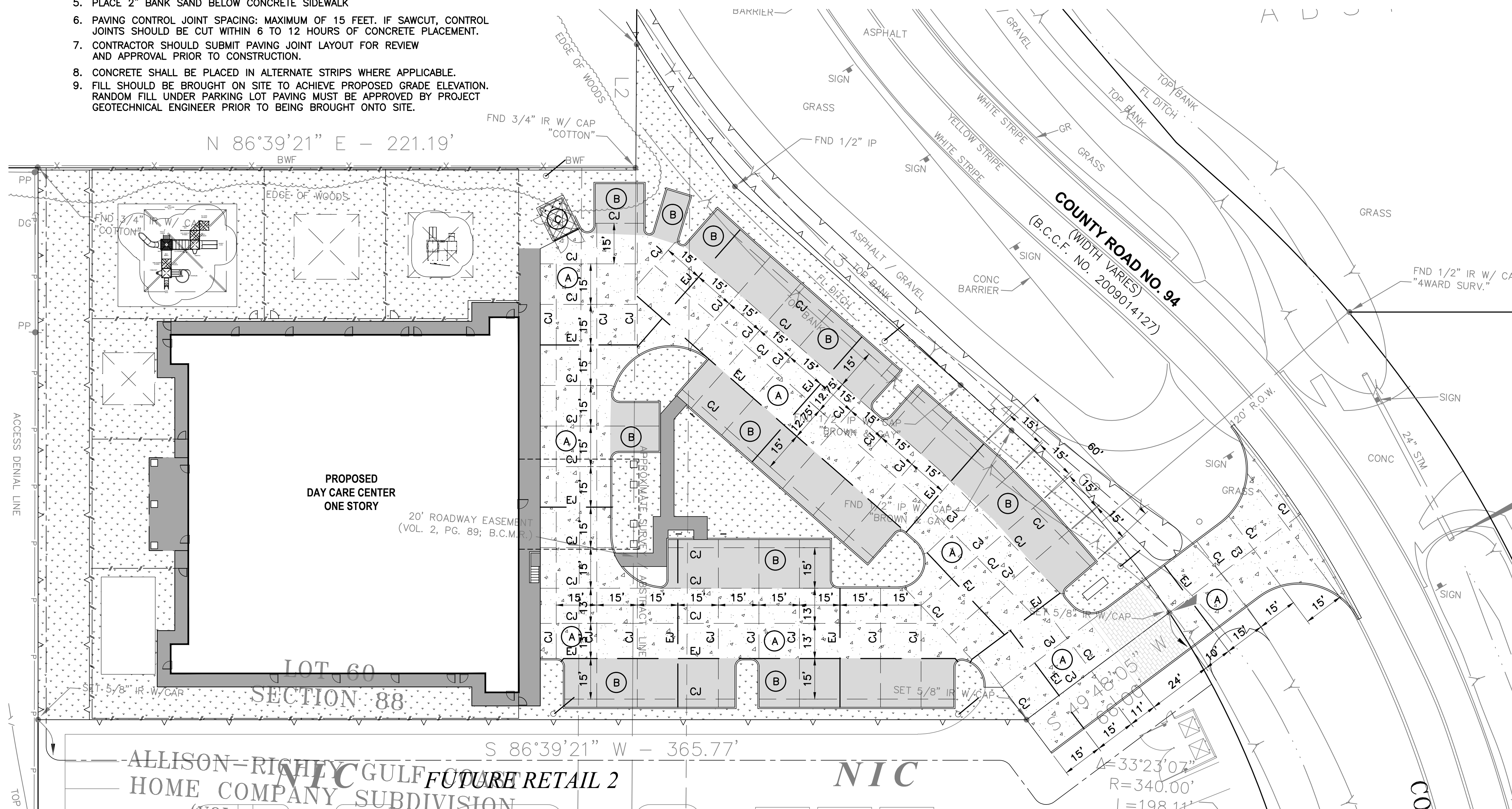
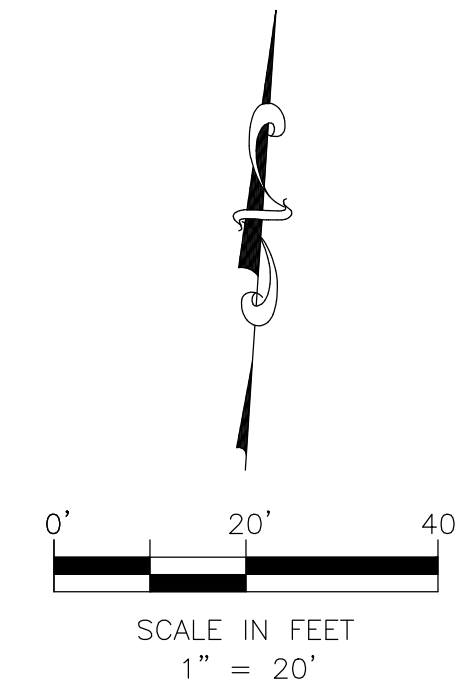
- CJ CONTRACTION/CONSTRUCTION JOINT KEYED
- EJ EXPANSION JOINT WITH DOWELS
- (A) PROPOSED MEDIUM DUTY CONCRETE PAVEMENT
- (B) PROPOSED LIGHT DUTY CONCRETE PAVEMENT
- (C) PROPOSED HEAVY DUTY CONCRETE PAVEMENT

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DRAWING TITLE	
PAVEMENT JOINT LAYOUT PLAN	
DRAWN BY KN	CHECKED BY EL
DATE 08/13/2018	JOB NO. 1806251
DRAWING NO. C5	

UTILITY CONSTRUCTION NOTES FOR SITE WORK:

- REFER TO CIVIL, PLUMBING, AND ELECTRICAL DRAWING FOR ALL UTILITY SERVICES TO AND ON THE SITE.
- CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL & PLUMBING DRAWINGS TO VERIFY LOCATION AND SIZE OF ALL ROOF DRAINS, DOWN SPOUTS AND UTILITY CONNECTIONS. LIMITS OF PROPOSED SITE PLUMBING FACILITIES SHALL BE 5- FEET FROM EDGE OF BUILDING, UNLESS OTHERWISE NOTED.
- MAINTAIN 6-INCH MINIMUM VERTICAL CLEARANCE AT PIPE CROSSINGS UNLESS OTHERWISE NOTED ON THE DRAWING SHEETS.
- WHERE A SANITARY SEWER CROSSES A WATERLINE, CENTER ONE JOINT (MINIMUM 18-FT LENGTH) OF SANITARY SEWER PIPE AND WATER LINE AT THE CROSSING. WATER LINE SHOULD BE LAID OVER SANITARY LINE WITH 2' MINIMUM CLEARANCE.
- THE LENGTHS OF PROPOSED UNDERGROUND UTILITY LINES SHOWN ARE APPROXIMATE ONLY. LENGTHS OF LINES MAY VARY DUE TO FIELD CONDITIONS ENCOUNTERED AT THE TIME OF CONSTRUCTION. CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS NECESSARY FOR UTILITY LINES TO SERVE THEIR INTENDED PURPOSE AND SHALL BE RESPONSIBLE FOR THE ROUTING OF LINES OCCASIONED BY CONFLICTS WITH OTHER UTILITIES AND SITE FEATURES.
- CONTRACTOR SHALL CONSTRUCT ALL GRAVITY SEWER LINES COMMENCING AT THE LOWEST FLOW LINE ELEVATION AND PROCEED IN THE UPSTREAM DIRECTION. CONTRACTOR SHALL VERIFY CLEARANCES WITH ALL UNDERGROUND CONSTRUCTIONS BEFORE LAYING PIPE.
- TOP OF PROPOSED MANHOLES, INLETS, VALVE BOXES, ETC. SHALL BE SET TO MATCH FINISHED GRADE OR PROPOSED TOP OF PAVEMENT. TOP OF EXISTING MANHOLES, VALVE BOXES, ETC., SHALL BE ADJUSTED AS REQUIRED TO MATCH FINISHED GRADE OR PROPOSED TOP OF PAVEMENT. OUTSIDE OF PAVED AREAS SET MANHOLE RIMS AND TOP OF GRATE AT ELEVATIONS SHOWN ON THE PLANS OR 6" ABOVE THE FINISHED GRADE WHEN NOT SHOWN IN THE PLAN.
- ALL TRENCHES, INLETS, MANHOLES, CLEANOUTS, ETC., UNDER, OR WITHIN FIVE FEET OF PAVEMENT SHALL BE BACKFILLED WITH SELECT MATERIAL PLACED IN LOOSE LIFTS NOT EXCEEDING 8-INCHES IN DEPTH AND COMPACTED TO 95% STANDARD PROCTOR BACKFILL SEWER TRENCHES WITH COMPACTED CEMENT STABILIZED SAND TO A POINT ONE FOOT BELOW BOTTOM OF PAVEMENT IN LIEU OF SELECTED MATERIAL.
- ALL TRENCHES NOT UNDER, OR WITHIN FIVE FEET OF, PAVEMENT SHALL BE BACKFILLED WITH SELECT MATERIAL PLACED IN LOOSE LIFTS NOT EXCEEDING 12-INCHES IN DEPTH AND COMPACTED TO THE DENSITY OF NATURAL SURROUNDING SOIL, BUT NOT LESS THAN 90% STANDARD PROCTOR DENSITY (ASTM D698).

STORM WATER POLLUTION PREVENTION PLAN NOTES:

- PROTECT ALL STAGE 1 INLETS WITH FILTER FABRIC BARRIERS.
- PROTECT ALL INLETS IN PAVED ROADWAYS WITH STRAW BALE FENCES.
- PROTECT ALL DESIGNATED SPECIMEN TREES WITH PROTECTIVE FENCING.

GENERAL REQUIREMENTS FOR TPDES STORM WATER QUALITY

OBTAIN "TEXAS COMMISSION ON ENVIRONMENTAL QUALITY" (TCEQ) CONSTRUCTION GENERAL PERMIT (PERMIT NO. TXR150000) PREPARE AND SUBMIT A COPY OF "NOTICE OF INTENT" (NOI) TO TCEQ USING TCEQ'S FORM AT LEAST TWO (2) DAYS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. PREPARE AND SUBMIT A COPY OF "NOTICE OF TERMINATION" (NOT) TO TCEQ AT THE END OF CONSTRUCTION OR AFTER THE SITE HAS REACHED FINAL STABILIZATION. DEVELOP AND IMPLEMENT A "STORM WATER POLLUTION PREVENTION PLAN: (SWP3) PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. REFER TO SHEET NO. C10 FOR IMPLEMENTING SWPPP. "NOI" NEEDS TO BE POSTED AT THE CONSTRUCTION SITE IN LIEU OF A "CONSTRUCTION SITE NOTICE". PAY APPLICABLE FEES, BOTH TO TCEQ AND THE BRAZORIA COUNTY. NOTIFY TCEQ AND BRAZORIA COUNTY AT LEAST TWO (2) DAYS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

NOTES:

- EXECUTION AND CONSTRUCTION METHODS FOR STORM WATER POLLUTION PREVENTION PLAN SHALL BE IN CONFORMANCE WITH THE "STORM WATER MANAGEMENT HANDBOOK FOR CONSTRUCTION ACTIVITIES" BY BRAZORIA COUNTY/BRAZORIA COUNTY DRAINAGE DISTRICT 4 AND CITY OF MANVEL.
- CONTRACTOR SHALL PROVIDE STABILIZED CONSTRUCTION EXIT AT A LOCATION APPROVED BY OWNER. THE MINIMUM SIZE REQUIRED TO KEEP STREET CLEAN AND FREE OF MUD CARRIED BY CONSTRUCTION VEHICLES SHALL BE UTILIZED.
- SEDIMENT CONTROL DEVICES SHALL BE INSTALLED PRIOR TO DISTURBING UPSTREAM AREAS AND SHALL REMAIN UNTIL PERMANENT SOIL STABILIZATION/COVER IS IN PLACE.
- CONTRACTOR SHALL PROTECT ALL STORM SEWER INLETS WITH INLET PROTECTION BARRIER (IPB).
- STORM SEWER INLETS NOT REQUIRED TO MAINTAIN DRAINAGE MAY BE TEMPORARILY CAPPED.

GENERAL CONSTRUCTION NOTES FOR SITE WORK:

- EXISTING UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY BASED ON THE BEST AVAILABLE INFORMATION. CONTRACTOR TO FIELD VERIFY LOCATION OF ANY EXISTING UTILITIES AND OTHER FACILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO LOCATE AND PRESERVE ANY AND ALL EXISTING FACILITIES.
- CONTRACTOR SHALL NOTIFY CITY OF MANVEL PUBLIC WORKS TELEPHONE AT 281-554-1444 AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF WORK WITHIN CENTER STREET RIGHT-OF-WAY OR PUBLIC EASEMENTS.
- CONTRACTOR SHALL VERIFY THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION AND SHALL REPORT DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
- CONTRACTOR SHALL PROTECT ALL EXISTING FACILITIES, PROPERTY, AND UNDERGROUND UTILITIES, AND SHALL REPAIR ANY DAMAGE TO THE SATISFACTION OF THE INJURED PARTY AT NO ADDITIONAL COST TO THE OWNER.
- ANY DAMAGE TO THE SURROUNDING IMPROVEMENTS PUBLIC OR PRIVATE BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY BUILDING PERMITS AND FOR NOTIFICATION OF ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS OR PERSONS IN CHARGE OF PRIVATE OR PUBLIC UTILITIES AFFECTED BY HIS OPERATIONS PRIOR TO COMMENCEMENT OF WORK.
- WATER METERS, UTILITY LINES AND APPURTENANCES, DRIVEWAYS, AND ALL OTHER ITEMS TO BE LOCATED WITHIN THE STREET RIGHT-OF-WAY OR A PUBLIC EASEMENT, ARE TO BE CONSTRUCTED IN STRICT ACCORDANCE WITH CURRENT GOVERNING CITY, COUNTY AND STATE STANDARDS.
- CONTRACTOR SHALL PROVIDE TEMPORARY DRAINAGE FACILITIES TO DIRECT SURFACE DRAINAGE AWAY FROM TRENCHES AND TOWARDS OFF SITE DRAINAGE FACILITIES. PREVENT WATER FROM PONDING ON SITE AND DO NOT BLOCK DRAINAGE FROM OR DIRECT EXCESS DRAINAGE ON TO ADJACENT PROPERTY.
- CONTRACTOR TO BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL BARRICADES, WARNING SIGNS, FLASHING LIGHTS AND TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", (TEXAS M.U.T.C.D. MOST RECENT EDITION AS REVISED) DURING CONSTRUCTION.

- ALL OPEN EXCAVATIONS IN VEHICULAR TRAFFIC AREAS SHALL BE COVERED WITH ANCHORED STEEL PLATES CAPABLE OF SUPPORTING HS 20 LOADING AT END OF EACH DAYS WORK OR WHEN NOT IN USE.
- CONTRACTOR SHALL COMPLY WITH O.S.H.A. REGULATIONS AND STATE OF TEXAS LAW CONCERNING EXCAVATION, TRENCHING AND SHORING. EXCAVATIONS OVER 5 FEET DEEP TO BE SHEETED AND PROTECTED AS REQUIRED BY STATE LAW AND O.S.H.A. FAILURE TO COMPLY WITH THE REQUIREMENTS HEREIN WILL CONSTITUTE AGREEMENT BY THE CONTRACTOR TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO COMPLY. ASSUME TYPE "C" SOIL.
- CONTRACTOR TO TAKE NECESSARY PRECAUTIONS TO PROTECT ROOT SYSTEMS OF SHRUBS, PLANTS AND TREES ALONG THE AREA OF EXCAVATION.
- ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.

BENCHMARK

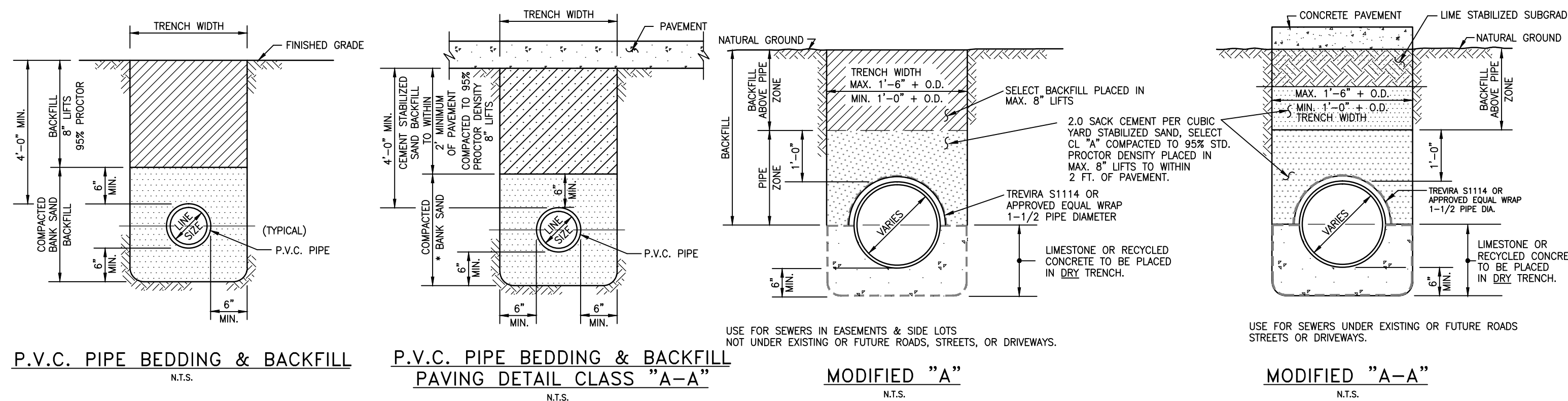
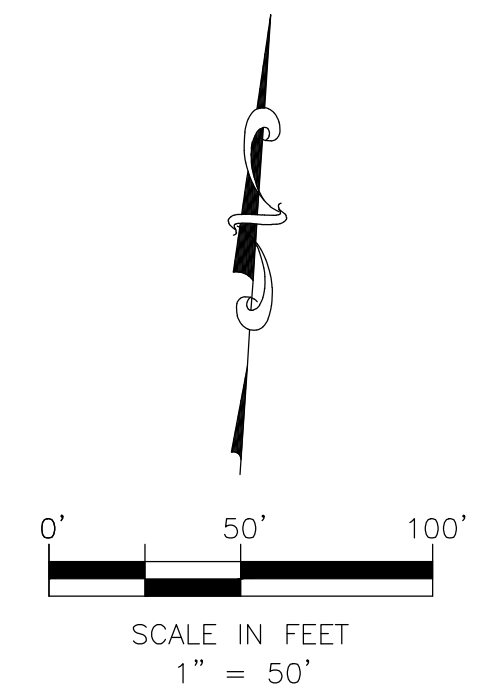
MONUMENT NAME 10 GPS MONU 1995 IS A BRASS CAP SET IN CONCRETE STAMPED "CITY OF PEARLAND 10 GPS MONU, 1995" LOCATED ON THE SOUTH BOUND HIGHWAY 288 APPROXIMATELY 2,400 FEET SOUTH OF F.M. 518 AND 21 FEET WEST FROM THE WEST EDGE OF ASPHALT. ELEV.=59.29' (NGVD 1929, 1987 ADJUSTMENT).

IBM A: BOX CUT ON H2-INLET LOCATED ON THE NORTH SIDE OF COUNTY ROAD 101 SOUTH OF THE SOUTHWEST CORNER OF THE PROPERTY, AS SHOWN. ELEVATION = 64.44'

IBM B: BOX CUT ON RCP LOCATED ON THE EAST SIDE OF COUNTY ROAD 94 NEAR THE EAST PORTION OF THE PROPERTY, AS SHOWN. ELEVATION = 61.48'

LEGEND

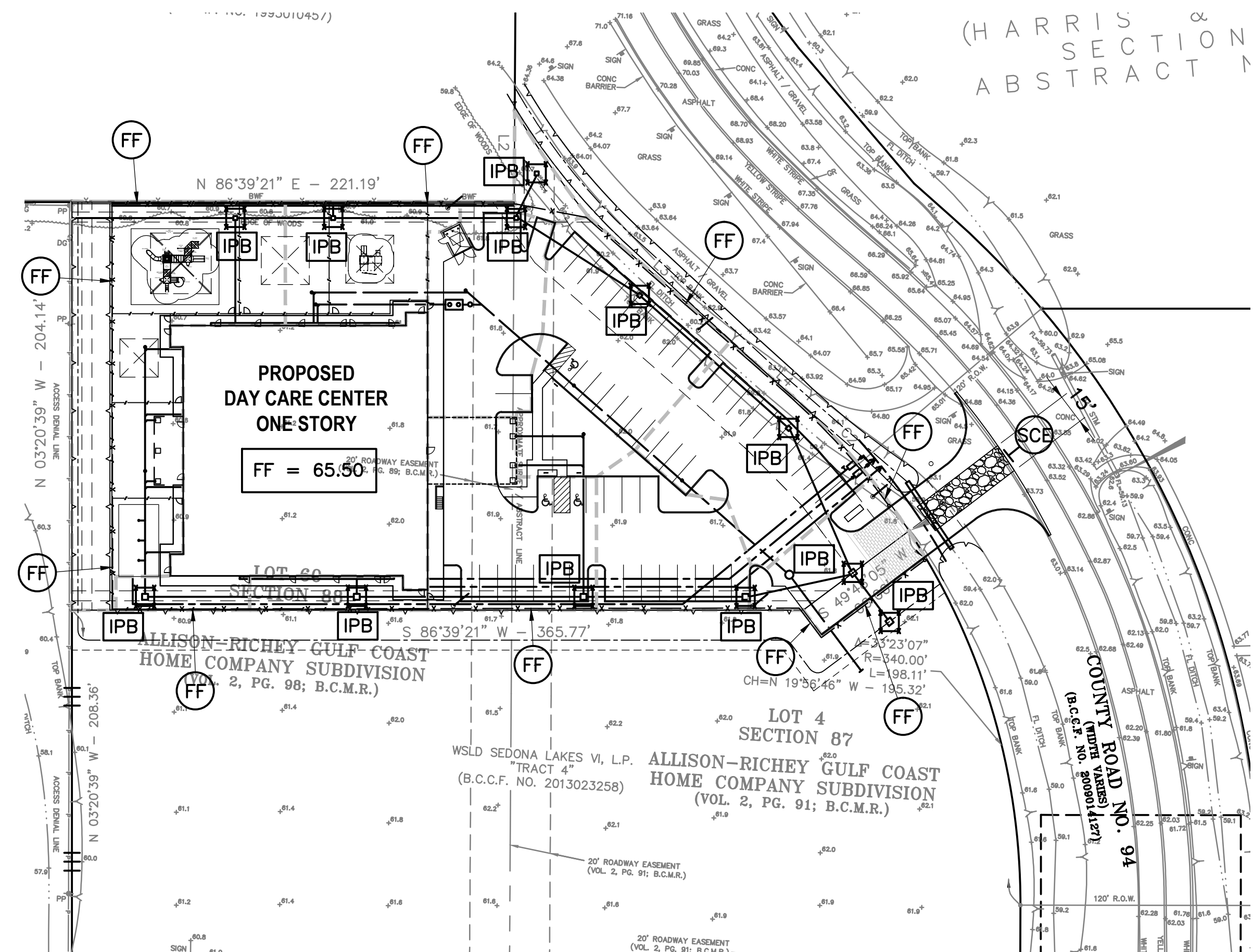
- FILTER FABRIC FENCE, MINIMUM 2 FEET BEHIND CURB
- STABILIZED CONSTRUCTION ACCESS/EXIT
- INLET PROTECTION BARRIER
- PROPOSED TYPE "A" INLET
- REINFORCED FILTER FABRIC BARRIER



SANITARY FORCE MAIN & WATER LINE BEDDING AND BACKFILL

- CONSTRUCTION NOTES**
- CONTRACTOR SHALL CONTACT ENGINEER IMMEDIATELY IF WET SAND CONDITIONS ARE ENCOUNTERED.
 - LIMESTONE AND RECYCLED CONCRETE DIMENSIONS SHOWN ARE TYPICAL BUT MAY BE VARIED BY ORDER OF ENGINEER.
 - LIMESTONE OR RECYCLED CONCRETE SHALL BE IN ACCORDANCE WITH "DOT" SPECIFICATION No. 248 FLEXIBLE BASE, TYPE A, GRADE 2 AGGREGATE.
 - NO LIMESTONE SHALL BE INSTALLED IN WET CONDITIONS. WHEN WELL POINTING OR IN WET SAND CONDITIONS, MAINTAIN GROUND WATER 1 (FT) BELOW BOTTOM OF TRENCH FOR A MINIMUM OF 24-HRS AFTER BEDDING AND BACKFILL IS IN PLACE.
 - ALL MATERIALS SHALL BE FROM THE APPROVED PRODUCTS LIST UNLESS SPECIFICALLY APPROVED BY ENGINEER.
 - SANITARY SEWER BEDDING FOR WET SAND CONDITIONS SHALL BE AS PER MODIFIED "A" OR "A-A".
 - ALL SAND BEDDING FOR WATER LINES SHALL BE CLEAN, MECHANICALLY COMPACTED BANK SAND.

GRAVITY SEWER BEDDING AND BACKFILL



REVISIONS AND ISSUANCE		
NO.	DATE	DESCRIPTION
1	8/13/18	PRICING

IVY KIDS EARLY LEARNING CENTER
 4434 CR 94
 MANVEL, TEXAS 77578

MISSION ENGINEERING INC.
 10370 RICHMOND AVE, #560
 HOUSTON, TEXAS 77042
 [T] 713-981-0018
 [E] dzhuang@missioneng.com
 TPEF Registration No. F-11771

interim review only
 not for permit or
 construction

 YIFENG ZHUANG
 TX # 87950

 08/13/2018

DRAWING TITLE
SWPPP & DETAIL

DRAWN BY KN	CHECKED BY EL
DATE 08/13/2018	JOB NO. 1806251

DRAWING NO.
C6

REVISIONS AND ISSUANCE		
NO.	DATE	DESCRIPTION
1	8/13/18	PRICING

IVY KIDS EARLY LEARNING CENTER
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MISSION ENGINEERING INC.
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08/13/2018

DRAWING TITLE
**CONSTRUCTION
 DETAILS**

DRAWN BY KN	CHECKED BY EL
DATE 08/13/2018	JOB NO. 1806251

DRAWING NO.

C7

GENERAL NOTES:

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISED CITY OF MANVEL DESIGN CRITERIA MANUAL.
- TRENCH SAFETY SYSTEM TO MEET, AS A MINIMUM, THE REQUIREMENTS OF OSHA SAFETY AND HEALTH REGULATIONS, LATEST EDITION.
- THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567 FOR CENTERPOINT AND AT&T TELEPHONE AND TEXAS ONE-CALL SYSTEM (1-800-245-4545) FOR PIPING AND CABLE TV.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE DEPTH, ELEVATIONS, LOCATION AND EXISTENCE OF ALL EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD BEFORE COMMENCING WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPORT ANY AND ALL DISCREPANCIES TO THE OWNER AND THE ENGINEER IN A TIMELY MANNER.
- CONTRACTOR SHALL ADEQUATELY PROTECT EXISTING STRUCTURES, UTILITIES, TREES, SHRUBS, OTHER PERMANENT OBJECTS AND ADJOINING PROPERTY.
- NO OPEN EXCAVATIONS SHALL BE LEFT OPEN OVERNIGHT. ALL EXCAVATIONS WHICH CANNOT BE BACKFILLED OVERNIGHT SHALL BE COVERED, AS A MINIMUM, WITH STEEL PLATING WHEN IN PAVED AREAS; 3/4" INCH PLYWOOD, WOOD PLANKING WITH OSHA ORANGE PLASTIC EXPANDED MESH BARRIER AROUND PERIMETER IN UNPAVED AREAS, OR AS APPROVED BY THE CITY OF MANVEL.
- EXISTING PAVEMENT, CURBS, SIDEWALKS AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION BY THE CONTRACTOR FOR THEIR CONVENIENCE SHALL BE REPLACED PER CURRENT DESIGN CRITERIA MANUAL BY THE CONTRACTOR AT THEIR EXPENSE.
- CONTRACTOR SHALL PLAN, SCHEDULE, AND PERFORM THEIR WORK SO AS TO PROVIDE AND MAINTAIN SAFE PUBLIC TRAFFIC (INGRESS AND EGRESS) AS WELL AS NON-CONVENIENCE TO ALL PROPERTY OWNERS ALONG THE PROJECT RIGHT OF WAY DURING CONSTRUCTION PERIOD.
- FOR LOCATIONS WHERE OPEN CUT CONSTRUCTION IS REQUIRED IN STREETS THE CONTRACTOR SHALL FURNISH AND MAINTAIN ADEQUATE BARRICADES, WARNING AND DIRECTING SIGNS, FLAGS, AND LIGHTS, NOTIFY CITY OF MANVEL PERMIT DEPARTMENT (281-489-0630).
- ALL SIGNS, BARRICADES, PAVEMENT MARKINGS, TRAFFIC SIGNALS, AND CHANNELIZING DEVICES USED TO HANDLE TRAFFIC SHALL BE SHOWN ON A TRAFFIC CONTROL PLAN TO BE APPROVED BY THE CITY OF MANVEL AND SHALL CONFORM TO THE LATEST REVISIONS OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), PART VI-TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS.
- CONTRACTOR SHALL NOTIFY THE CITY OF MANVEL PERMIT DEPARTMENT (281-489-0630) 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
- NO INSPECTABLE WORK CAN BE CONDUCTED ON SATURDAYS.

PAVING:

- PAVEMENT SUBGRADE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISIONS.
- CONTRACTOR SHALL NOTIFY THE CITY OF MANVEL PERMIT DEPARTMENT (281-489-0630), TWENTY-FOUR (24) HOURS PRIOR TO ALL LIVING AND PAVING OPERATIONS.
- ALL RETURNS SHALL HAVE A TWENTY-FIVE (25) FOOT RADIUS AT BACK OF CURB UNLESS OTHERWISE NOTED.
- GUIDELINES SET FORTH IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES SHALL BE OBSERVED.
- ALL FILL IN EXISTING OR PROPOSED RIGHTS-OF-WAY, INCLUDING BACKCROSSING BEHIND THE CURB, SHALL BE PLACED IN MAXIMUM LOOSE LIFTS OF EIGHT (8) INCHES OR LESS AND COMPACTED TO NINETY-FIVE PERCENT (95%) STANDARD PROCTOR DENSITY WITH A MOISTURE CONTENT OF ± THREE PERCENT (3%) OF OPTIMUM MOISTURE.
- MINIMUM PAVEMENT REINFORCEMENT REQUIREMENT SHALL BE GRADE SIXTY (60), NO. FOUR (4) REBAR, SPACED AT EIGHTEEN (18) INCH ON CENTERS EACH WAY.
- ALL PAVEMENT TO BE A MINIMUM OF SIX (6) INCHES THICK REINFORCED CONCRETE UNLESS OTHERWISE NOTED.
- PAVING EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM OF SIXTY FEET (60).
- ALL CONCRETE USED FOR PAVEMENT SHALL BE CLASS 'A' CONCRETE AND A MINIMUM 4,000 PSI COMPRESSIVE STRENGTH AT TWENTY-EIGHT (28) DAYS, UNLESS OTHERWISE NOTED.
- CLASS 'A' HYDRATED LIME SHALL BE APPLIED FOR SUBGRADE STABILIZATION AT A MINIMUM OF SIX PERCENT (6%) BY WEIGHT.
- CONTRACTOR SHALL INSTALL STREET SIGNS AND STOP SIGNS PER CITY OF MANVEL DESIGN CRITERIA MANUAL.
- ALIGNMENTS, CENTERLINE CURVE DATA, AND STATIONING FOR ALL CONSTRUCTION SHALL BE DETERMINED FROM SUBDIVISION PLAT.
- FOR ALL CONCRETE TO BE REMOVED, A TWO (2) INCH DEEP SAW CUT SHALL BE PROVIDED PRIOR TO REMOVAL.
- REPRESENTATIVES FROM THE CITY OF MANVEL, THE OWNER AND THE TESTING LABORATORY SHALL BE PRESENT FOR ALL DENSITY TESTS, LIME OPERATIONS AND PLACEMENT OF CONCRETE PAVING. NO INSPECTABLE WORK CAN BE CONDUCTED ON SATURDAYS.
- UNDER NO CIRCUMSTANCES SHALL WATER BE ADDED TO A CONCRETE LOAD AFTER SLUMP TEST AND/OR CONCRETE CYLINDERS HAVE BEEN TAKEN.
- BLUE REFLECTORIZED PAVEMENT MARKERS SHALL BE PLACED AT FIRE HYDRANT LOCATIONS AND OFFSET SIX (6) INCHES FROM THE CENTERLINE OF THE ROADWAY. REFLECTORS SHALL FACE FLOW OF TRAFFIC.
- FOR PAVEMENT WIDTHS LESS THAN OR EQUAL TO TWENTY-EIGHT (28) FEET B/B OF CURB:
 - MINIMUM STABILIZED SUBGRADE THICKNESS SHALL BE SIX (6) INCHES.
 - MINIMUM CONCRETE SLAB THICKNESS SHALL BE SIX (6) INCHES.
- FOR PAVEMENT WIDTHS GREATER THAN TWENTY-EIGHT (28) FEET B/B OF CURB AND ALL MAJOR ARTERIAL THOROUGHFARES:
 - MINIMUM STABILIZED SUBGRADE THICKNESS SHALL BE EIGHT (8) INCHES.
 - MINIMUM CONCRETE SLAB THICKNESS SHALL BE SEVEN (7) INCHES.
- BLOCKOUTS SHALL BE INSTALLED AROUND ALL MANHOLES, JUNCTION BOXES, WATER VALVES, ETC. THAT LIE WITHIN THE PAVEMENT AREA. BLOCKOUTS SHALL EXTEND A MINIMUM OF SIX (6) INCHES PAST THE LARGEST DIMENSION OF THE ITEM THAT IS BEING BLOCKED OUT AND SHALL HAVE AN EXPANSION JOINT BETWEEN THE BLOCKOUT AND THE PAVING.

WATER LINES:

- WATER LINE CONSTRUCTION AND TESTING IS TO BE PERFORMED IN ACCORDANCE WITH CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISION.
- ALL WATER MAINS SHALL HAVE A MINIMUM COVER OF FOUR (4) FEET MEASURED FROM CENTERLINE OF STREET OR EXISTING NATURAL GROUND WHICHEVER DEPTH IS GREATER, UNLESS OTHERWISE NOTED. WATER MAINS 1" AND LARGER SHALL HAVE A MINIMUM OF 5 FEET OF COVER.
- PRESSURE TEST OF ALL WATER LINES SHALL BE AT 150 PSI FOR FOUR (4) HOURS AND WITNESSED BY THE CITY OF MANVEL PROJECT MANAGER, EXCEPT FIRE LINES WHICH SHALL BE TESTED AT 200 PSI FOR TWO (2) HOURS AND SHALL BE WITNESSED BY THE FIRE MARSHAL.
- SINGLE METER SERVICE LINES SHALL BE ONE (1) INCH MINIMUM I.D., C.T.S. POLYETHYLENE, SDR-9.
- CONTRACTOR TO FURNISH AND INSTALL SINGLE SERVICE METER BOXES AT FINISH GRADE.
- FIRE HYDRANT ASSEMBLIES SHALL INCLUDE ONE (1) EACH ONE INCH SIZE BY SIX (6) INCH TEE, ONE (1) EACH SIX (6) INCH GATE VALVE AND BOX, ONE (1) EACH FIRE HYDRANT WITH SIX (6) INCH LEAD PIPING AND THE BOXES. SP-302 CONNECTIONS ARE REQUIRED ON ALL HYDRANTS.
- WATER VALVES ON MAIN LINES SHALL BE LOCATED AS CLOSE AS POSSIBLE TO EXTENDED PROPERTY LINE AND SHALL CONFORM TO AWWA C-900, OPEN COUNTER CLOCKWISE (LEFT), EQUIPPED WITH TWO (2) INCH SQUARE OPERATING NUT. OPERATING NUT SHALL BE A MAXIMUM OF FIVE (5) FEET BELOW FINISH GRADE.
- WATER LINES FOUR (4) INCH THROUGH TWELVE (12) INCH I.D. SHALL COMPLY THE REQUIREMENTS OF AWWA STANDARD C-900-75, CLASS 235, SDR-18, WITH CAST IRON OUTSIDE DIAMETER AND GASKET BELT END. FITTINGS ARE TO BE MECHANICAL JOINTS IN ACCORDANCE WITH AWWA C-100 OR C-110.
- ALL CONCRETE THRUST BLOCKING SHALL BE PLACED TO FORM A SOLID CONNECTION BETWEEN FITTINGS, VALVES, AND FIRE HYDRANTS AND UNDISTURBED EARTH. CONCRETE FOR THRUST BLOCKING SHALL BE CLASS 'C' AND HAVE A MINIMUM OF 2,500 PSI COMPRESSIVE STRENGTH AT TWENTY-EIGHT (28) DAYS AND CONFORM TO CITY OF MANVEL DESIGN CRITERIA MANUAL.
- DUCTILE IRON FITTINGS SHALL CONFORM TO AWWA C-110 AND END JOINTS OF FITTINGS AND MAIN VALVES SHALL CONFORM TO AWWA C-110 AND END JOINTS TO FITTINGS AND MAIN LINE VALVES SHALL CONFORM TO AWWA C-111 FOR RUBBER GASKETED JOINTS. DUCTILE IRON FITTINGS SHALL BE CEMENT LINER OR EPDM COATED.
- MINIMUM BURY FOR ALL FIRE HYDRANTS SHALL BE FOUR (4) FEET UNLESS OTHERWISE NOTED. ALL FIRE HYDRANTS AND VALVE BOXES ARE TO BE ADJUSTED TO FINISH GRADE AFTER PAVING IS COMPLETE. PUMPER SERVICE CONNECTION TO FACE CURB.
- INSTALL CONCRETE BLOCK BENEATH FIRE HYDRANTS BEFORE PLACING CONCRETE THRUST BLOCKING TO INSURE THAT FIRE HYDRANTS ARE INSTALLED LEVEL.
- CONTRACTOR SHALL NOTIFY CITY OF MANVEL PROJECT MANAGER SEVENTY-TWO (72) HOURS PRIOR TO START OF CONSTRUCTION.
- ALL WATER LINES TO BE BACKFILLED TO ONE (1) FOOT ABOVE TOP OF PIPE WITH BANK SAND. FOR PORTIONS OF PIPE LOCATED UNDER PAVEMENT, BACKFILL FROM INITIAL BACKFILL OF BANK SAND TO ONE (1) FOOT BELOW PROPOSED SUBGRADE UNDER PAVEMENT WITH CEMENT-STABILIZED SAND (1.1 SACKS OF CEMENT PER TON OF SAND).
- ALL FIRE HYDRANTS ARE TO BE LOCATED AS SHOWN ON THE PLANS AND SET THREE (3) FEET BEHIND THE CURB, ONE (1) FOOT FROM PROPERTY LINE FOR STREETS WITH DITCHES OR AT AN APPROVED LOCATION ON RURAL SECTION ROADS. ALL FIRE HYDRANTS SHALL BE ADDED, SANDBLASTED AND PAINTED AS PER CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISION.
- ALL TAPPING SLEEVES SHALL BE STAINLESS STEEL FULL CIRCLE WITH MECHANICAL JOINT TAPPING SLEEVE.
- THE CONTRACTOR SHALL NOT OPERATE EXISTING CITY WATER VALVES. THE CONTRACTOR SHALL NOTIFY THE CITY PROJECT MANAGER AND CONTACT THE PUBLIC WORKS DEPARTMENT TWENTY-FOUR (24) HOURS MINIMUM, FOR ANY VALVE OPERATION NECESSARY FOR THE PROJECT. IF ANY VALVE CLOSING RESULTS IN INTERRUPTED SERVICE TO RESIDENTS OR BUSINESSES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PROPER NOTICE TO THE AFFECTED PARTIES TWENTY-FOUR (24) HOURS IN ADVANCE OF THE INTERRUPTION.
- FOR ALL CONSTRUCTION WATER USAGE ON THE PROJECT, A FIRE HYDRANT METER SHALL BE OBTAINED FROM THE CITY. A DEPOSIT SHALL BE REQUIRED FOR THE METER AND A FEE SHALL BE CHARGED FOR ALL METERED WATER USAGE. THE CONTRACTOR SHALL SUPPLY A BACKFLOW PREVENTER FOR THE FIRE HYDRANT METER.
- ALL WATER VALVES SHALL TURN ON IN THE COUNTER CLOCK WISE DIRECTION.
- CONTRACTOR TO INSTALL TRACING LINE ON ALL PUBLIC WATER LINES AND SERVICE LINES UP TO THE PUBLIC ROW OR WATERLINE EASEMENT BOUNDARY.
- ALL ROAD AND CREEK CROSSINGS SHALL BE CASED WITH A LARGER DIAMETER SDR PVC PIPE.

SANITARY SEWERS

- FINISHED ELEVATION ON SANITARY MANHOLE RIMS SHALL BE THREE (3) INCHES ABOVE FINISHED GRADE WITHIN THE UTILITY EASEMENT. IF MANHOLE IS LOCATED ADJACENT TO A PUBLIC STREET, THE FINAL ELEVATION OF THE MANHOLE RIM SHALL BE TWO (2) INCHES ABOVE THE CURB OR CENTERLINE OF STREET FOR STREETS WITHOUT PERIMETER CURB.
- WATER LINES AND SANITARY SEWERS SHALL BE INSTALLED IN SEPARATE TRENCHES AND BE A MINIMUM SEPARATION OF NINE (9) FEET.
- POLYVINYL CHLORIDE (PVC) SHALL BE IN ACCORDANCE WITH ASTM D3034, SDR 26 FOR ALL DEPTHS.
- ALL PVC PIPES (ALL TYPES AND SDR/OR WALL THICKNESS TO BE USED) SHALL HAVE A RUBBER GASKET EQUIPPED BALL AND SPOOT JOINTS CONFORMING TO ASTM D3212. THE GASKET MATERIAL SHALL CONFORM TO ASTM F477, SOLVENT WELDED JOINTS WILL NOT BE APPROVED FOR CITY SANITARY SEWER LINES.
- ALL DUCTILE IRON (DI) PIPE SHALL BE 150 PSI WITH EIGHT (8) MIL BLACK VIRGIN POLYETHYLENE WRAP AS SPECIFIED IN ANSII/AWWA A21.5C105.
- SANITARY SEWER MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISION. CONTRACTOR TO FURNISH TEST PLUGS AND RISERS. ALL SANITARY SEWER LINES TO BE AIR TESTED IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL.
- SANITARY SEWER TRENCHES UNDER OR WITHIN ONE (1) FOOT OF PROPOSED OR FUTURE PAVEMENT ARE TO BE BACKFILLED WITH CEMENT-STABILIZED SAND BACKFILL, AS SPECIFIED, TO WITHIN ONE (1) FOOT OF SUBGRADE. BEDDING WILL BE CEMENT-STABILIZED SAND BACKFILL (1.1 SACKS CEMENT PER TON OF SAND) FOR ALL SANITARY SEWERS.
- WATER LINE/NEW SEWER LINE SEPARATION. WHEN NEW SANITARY SEWERS ARE INSTALLED, THEY SHALL BE INSTALLED NO CLOSER TO WATER LINES THAN NINE (9) FEET IN ALL DIRECTIONS. SEWERS THAT PARALLEL TO WATER LINES MUST BE INSTALLED IN SEPARATE TRENCHES. WHEN NINE (9) FEET OF SEPARATION CANNOT BE MAINTAINED, THE FOLLOWING GUIDELINES APPLY:
 - WHEN THE SANITARY SEWER PARALLELS A WATER LINE, THE SANITARY SEWER SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC MEETING ASTM SPECIFICATIONS WITH A PRESSURE RATING FOR BOTH THE PIPE AND JOINTS OF 150 PSI. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF TWO (2) FEET BETWEEN OUTSIDE DIAMETERS AND THE HORIZONTAL SEPARATION SHALL BE A MINIMUM OF FOUR (4) FEET BETWEEN OUTSIDE DIAMETERS. THE SANITARY SEWER SHALL BE LOCATED BELOW THE WATER LINE.
 - WHEN A SANITARY SEWER CROSSES A WATER LINE AND THE SEWER IS CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI, AN ABSOLUTE MINIMUM OF SIX (6) INCHES BETWEEN OUTSIDE DIAMETERS SHALL BE MAINTAINED. THE SANITARY SEWER SHALL BE LOCATED BELOW THE WATER LINE WHEN POSSIBLE AND ONE (1) LENGTH OF THE SANITARY SEWER PIPE MUST BE CENTERED ON THE WATER LINE.
 - WHEN A SANITARY SEWER CROSSES UNDER A WATER LINE AND THE SEWER IS CONSTRUCTED OF ADS TRUSS PIPE, SIMILAR SEMI-RIGID PLASTIC COMPOSITE PIPE, CLAY PIPE OR CONCRETE PIPE WITH GASKETED JOINTS, A MINIMUM OF TWO (2) FEET OF SEPARATION SHALL BE MAINTAINED. THE INITIAL BACKFILL SHALL BE CEMENT-STABILIZED SAND (MINIMUM 1.1 SACKS OF CEMENT PER TON OF SAND) FOR ALL SECTIONS OF SANITARY SEWER WITHIN NINE (9) FEET OF THE WATER LINE. THE INITIAL BACKFILL SHALL BE FROM 1/2 DIAMETER BELOW THE CENTERLINE OF THE PIPE TO ONE PIPE DIAMETER, (BUT NOT LESS THAN TWELVE (12) INCHES) ABOVE THE PIPE.
 - WHEN A SANITARY SEWER CROSSES OVER A WATER LINE, ALL PORTIONS OF THE SANITARY SEWER WITHIN NINE (9) FEET OF THE WATER LINE SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC PIPE WITH A PRESSURE RATING OF AT LEAST 150 PSI USING APPROPRIATE ADAPTERS. IN LIEU OF THIS PROCEDURE THE NEW WATERLINE MAY BE ENCASED IN A JOINT OF 150 PSI PRESSURE CLASS PIPE AT LEAST EIGHTEEN (18) FEET LONG AND TWO (2) NOMINAL SIZES LARGER THAN THE NEW WATERLINE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT INTERVALS OF FIVE (5) FEET WITH SPACERS OR BE FILLED TO THE SPONGING WITH WASHED SAND. THE ENCASMENT PIPE SHOULD BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH NON-SHRINK CEMENT GROUT OR WITH A MANUFACTURED SEAL.
- ALL PROPOSED SANITARY SEWER LINES SHALL BE DUCTILE IRON OR SDR 26 PVC. DUCTILE IRON PIPE SHALL NOT BE USED AS APPROVED BY THE CITY OF MANVEL.
- FOR ALL PVC PIPE, USE MANHOLE WATER STOP GASKET AND CLAMP ASSEMBLY AT MANHOLE CONNECTIONS.
- SANITARY SEWER MANHOLES SHALL BE STANDARD TYPE, UNLESS OTHERWISE NOTED. ALL SANITARY SEWER MANHOLES SHALL BE AT LEAST THREE (3) INCHES ABOVE FINISHED GRADE OR ABOVE 100-YEAR BASE FLOOD ELEVATION (BFE). FOR MANHOLES LOCATED IN THE 100-YEAR FLOOD PLAIN, VENT AND SEAL BOLTED MANHOLE LID WITH FOUR (4) BOLTS, NO HOLES IN THE LID; THE MANHOLE TOP AND PROVIDE INFLOW PROTECTION INSIDE UNDER COVER. SECTIONS OF PRECAST MANHOLES SHALL BE JOINED WITH "RAM-NOK" IN FLOOD PLAIN.
- SANITARY SEWER LINE IN PIPE ZONE INSIDE LOT EASEMENT SHALL BE BACKFILLED WITH CEMENT-STABILIZED SAND OR SELECT FILL MATERIAL WITH A PI BETWEEN 20 AND 40.
- IF WET SAND IS ENCOUNTERED IN TRENCH, USE SPECIAL BEDDING.
- SANITARY SEWERS CROSSING UTILITIES OTHER THAN WATER LINES SHALL HAVE A MINIMUM CLEARANCE OF SIX (6) INCHES.
- ALL PRECAST MANHOLES SHALL HAVE THE TOP ADJUSTMENT CONSTRUCTED OF PRECAST PCC RINGS NO GREATER THAN TWENTY-FOUR (24) INCHES IN HEIGHT, SEALED WITH NON-SHRINK GROUT INSIDE AND OUT. BRICK MANHOLES SHALL NOT BE ALLOWED.
- ALL SANITARY SEWER MANHOLE COVERS MUST INCLUDE THE WORDS "SANITARY SEWER" AND "CITY OF MANVEL". THEY MUST ALSO HAVE THE CITY SEAL.
- SANITARY SEWER MANHOLE COVERS SHALL BE A MINIMUM OF THIRTY-TWO (32) INCHES IN DIAMETER.
- ALL SANITARY SEWER MANHOLES SHALL HAVE AN INFLOW PROTECTOR.
- CONTRACTOR TO INSTALL TRACING LINE ON ALL PUBLIC FORCE MAINS.
- ALL INTERIOR CONCRETE ABOVE THE MANHOLE INVERT SHALL BE COATED COMPLETE WITH RAVEN 405 PROTECTIVE COATING WITH A MINIMUM THICKNESS OF 1/25 MIL OR APPROVED EQUAL.
- ALL MANHOLES WITHIN ANY FLOODZONE OTHER THAN ZONE X AND SHADED X SHALL HAVE THEIR COVERS BOLTED TO THE FRAME.

STORM SEWERS:

- STORM SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF MANVEL DESIGN CRITERIA MANUAL, LATEST REVISIONS.
- ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE (RCP), ASTM C76, CLASS III, TONGUE AND GROOVE, RAM-NOK JOINTS UNLESS OTHERWISE NOTED.
- REINFORCED CONCRETE STORM SEWER (PIPE, BOX, ETC.) SHALL BE INSTALLED, BEDDED AND BACKFILLED IN CONFORMITY WITH CITY OF MANVEL STANDARD DETAILS. STORM SEWER PIPE INSTALLED UNDER CURB WITHIN ONE (1) FOOT OF PROPOSED OR EXISTING PAVEMENT SHALL BE BACKFILLED WITH CEMENT-STABILIZED SAND, (1.1 SACKS OF CEMENT PER TON OF SAND), TO THE BOTTOM OF THE SUBGRADE.
- CONCRETE FOR INLETS AND MANHOLES SHALL BE CLASS 'A' AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT TWENTY-EIGHT (28) DAYS.
- ALL MANHOLES SHALL BE ADJUSTED TO FINISHED GRADE AFTER PAVING IS COMPLETE.
- MINIMUM STORM SEWER SIZE IS TWENTY-FOUR (24) INCH DIAMETER. MINIMUM UPSTREAM ROADSIDE DITCH CULVERT SIZE IS EIGHTEEN (18) INCH DIAMETER.
- ALL STORM SEWER MANHOLE COVERS MUST INCLUDE THE WORDS, "STORM SEWER" AND "CITY OF MANVEL" AND HAVE THE "CITY SEAL" MANHOLE COVERS SHALL BE THIRTY-TWO (32) INCHES IN DIAMETER EXCEPT AT CURB INLET COVERS WHICH ARE TWENTY-FOUR (24) INCHES.
- CONTRACTOR SHALL PROVIDE A MINIMUM OF SIX (6) INCHES CLEARANCE AT ALL UTILITY CROSSINGS WITH STORM SEWERS.
- ALL INLETS IN RESIDENTIAL DEVELOPMENTS TO BE TYPE "A-2" OR TYPE "B-B" WITH GRATES. ALL INLETS IN COMMERCIAL DEVELOPMENTS AND ON MAJOR THOROUGHFARES TO BE TYPE "A-2" ONLY, UNLESS OTHERWISE APPROVED BY THE CITY OF MANVEL.
- ALL DISTURBED AREAS IN DRAINAGE EASEMENTS OR DETENTION PONDS, SHALL BE HYDROMULCHED.

TESTING:

- EXCAVATION AND BACKFILL FOR UTILITIES:
 - BACKFILL SHALL BE PLACED IN MAXIMUM LIFTS OF EIGHT (8) INCHES AND COMPACTED TO A DENSITY OF NOT LESS THAN 95% STANDARD PROCTOR WITH A MOISTURE CONTENT OF PLUS (+) OR MINUS (-) THREE PERCENT (3%) OF OPTIMUM MOISTURE OR AS OTHERWISE SPECIFIED BY THE SOILS LABORATORY. TEST SHALL BE TAKEN EVERY LIFT, EVERY SOO LINEAR FEET, OR BETWEEN MANHOLES, WHICHEVER RESULTS IN THE GREATEST NUMBER OF DENSITY TESTS.
 - FIELD MOISTURE/DENSITY TEST SHALL BE PERFORMED AT A FREQUENCY OF AT LEAST ONE (1) TEST PER 500 SQUARE YARDS OF COMPACTED LIFT. THE DENSITY SHALL NOT BE LESS THAN 95% OF STANDARD PROCTOR OR A MOISTURE CONTENT OF PLUS (+) OR MINUS (-) THREE PERCENT (3%) OF OPTIMUM MOISTURE, OR AS DETERMINED BY SOILS LABORATORY. MAXIMUM LIFT FOR TESTING COMPACTED FILL SHALL NOT EXCEED TWELVE (12) INCHES.

CAUTION: AT&T CABLES

THE LOCATION OF AT&T FACILITIES ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. CONTRACTOR 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.

THE CONTRACTOR SHALL CALL 1-800-344-4377 A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.

WHEN EXCAVATING WITH TWENTY-FOUR (24) INCHES OF AT&T FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING THE CONTRACTOR SHALL EXPOSE THE AT&T FACILITIES.

WHEN AT&T TELEPHONE FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.

CAUTION: UNDERGROUND GAS FACILITIES

LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE UNIT GAS TRANSMISSION AND/OR INDUSTRIAL GAS SUPPLY CORPORATION WHERE APPLICABLE) ARE SHOWN IN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFIDENT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 713-223-4567 OR 1-800-668-0344 A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE CALL 713-967-8037 (7:00 AM TO 4:30 PM) FOR STATUS OF LINE LOCATION. REQUEST BEFORE EXCAVATION BEGINS.

WHEN EXCAVATING WITH TWENTY-FOUR (24) INCHES OF THE INDICATED LOCATION OF CENTER ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.

CAUTION: UNDERGROUND GAS FACILITIES (CONT.)

WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.

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

CAUTION: OVERHEAD POWER LINES

TEXAS LAW ARTICLE 1436C, PROHIBITS ALL ACTIVITIES IN WHICH PERSONS OR EQUIPMENT MAY COME WITHIN SIX (6) FEET OF ENERGIZED OVERHEAD POWER LINES, AND FEDERAL REGULATIONS, TITLE 29, PART 191 (O, 180) (1) AND PART 1926.550 (A) (5) REQUIRE A MINIMUM CLEARANCE OF TEN (10) FEET FROM THESE FACILITIES. THE ABOVE LAWS CARRY BOTH CRIMINAL AND CIVIL LIABILITIES. IF THE CONTRACTOR PERFORMS ANY WORK NEAR OVERHEAD POWER LINES HE MUST CALL 281-496-0483 FOR THE LINES TO BE DE-ENERGIZED AND/OR MOVED AT HIS EXPENSE PRIOR TO PERFORMING THE WORK.

NOTE: LOCATION OF CENTERPOINT ENERGY POWER COMPANY FACILITIES ARE APPROXIMATE AND HAVE NOT BEEN VERIFIED BY ACTUAL FIELD CHECK.

OVERHEAD LINES MAY EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THESE LINES SINCE THEY ARE CLEARLY VISIBLE. BUT CONTRACTOR SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH AND SAFETY CODE, FORBIDS ALL ACTIVITIES WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTORS ARE LEGALLY RESPONSIBLE FOR SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY POWER COMPANY.

CONTRACTOR TO NOTIFY THE UNDERGROUND UTILITY COORDINATING COMMITTEE TELEPHONE 713-223-4567 FORTY-EIGHT (48) HOURS BEFORE STARTING WORK IN STREET RIGHTS-OF-WAY OR EASEMENTS.



GENERAL CONSTRUCTION
NOTES

DATE APPROVED:	MARCH 2017
SCALE:	NTS REVISED DATE: MARCH 2017

PROJECT NUMBER:	DATE SUBMITTED:	SHEET:
		XX OF XX

REVISIONS AND ISSUANCE		
NO.	DATE	DESCRIPTION
1	8/13/18	PRICING

IVY KIDS EARLY LEARNING CENTER
 4434 CR 94
 MANVEL, TEXAS 77578

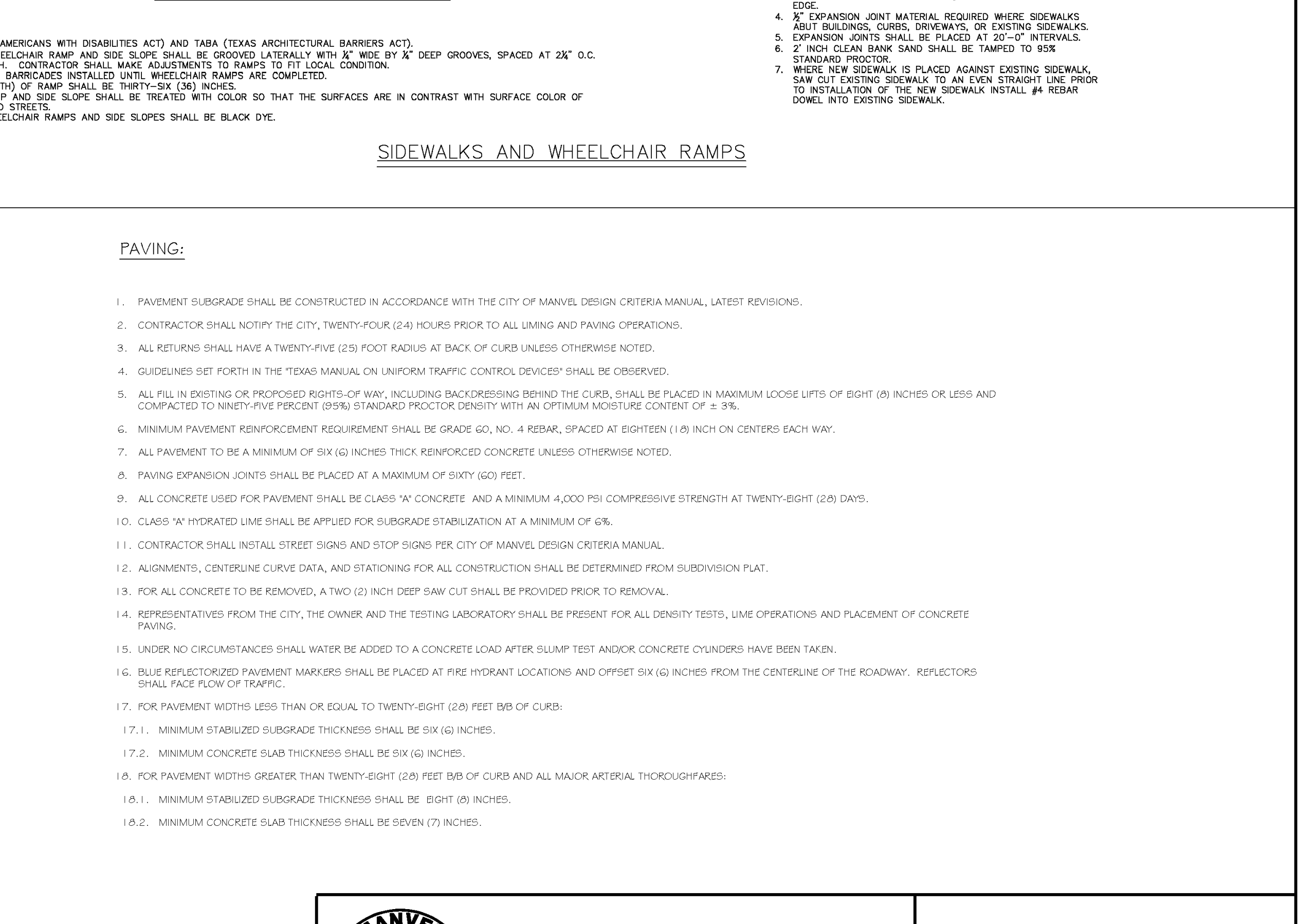
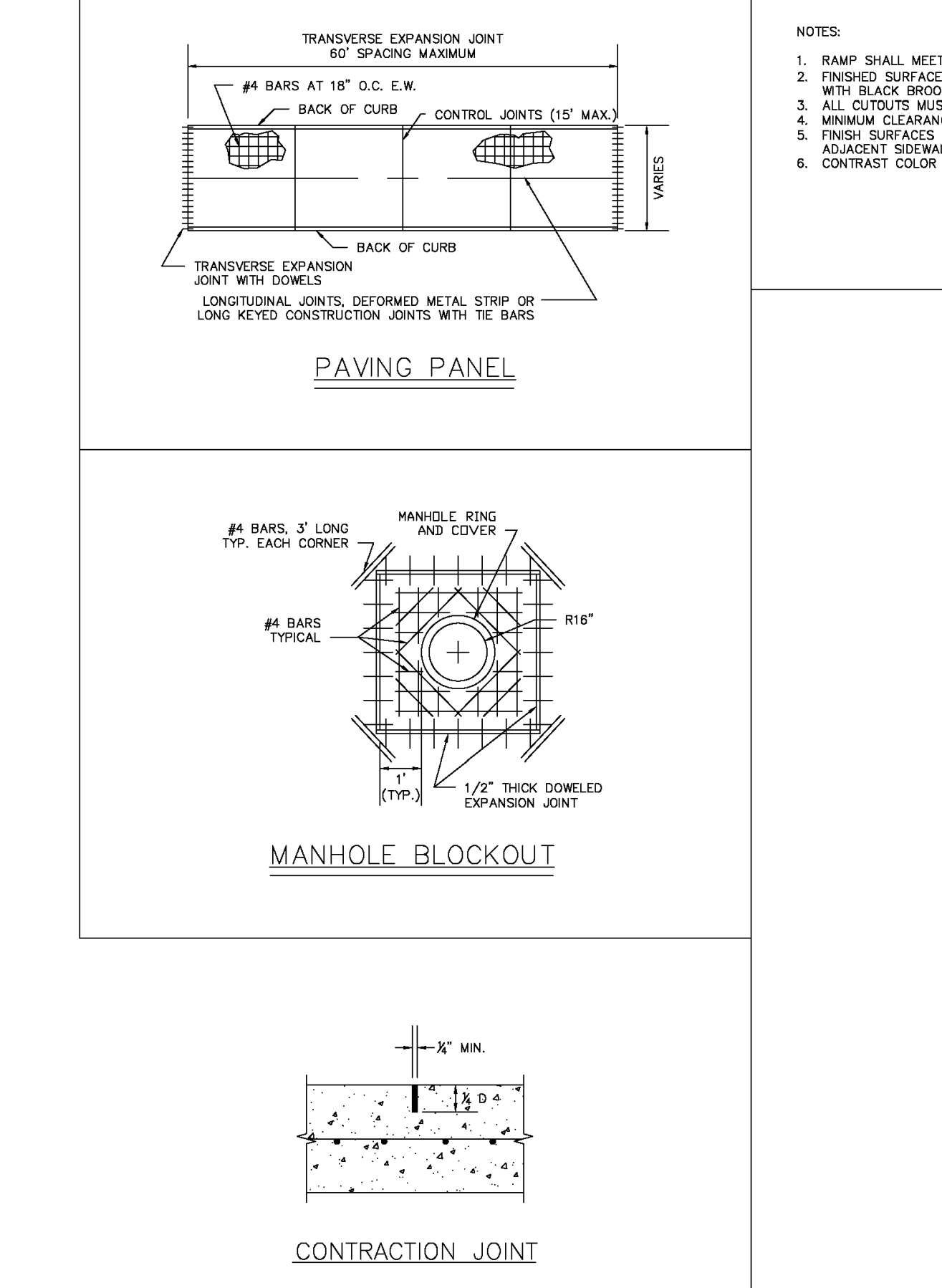
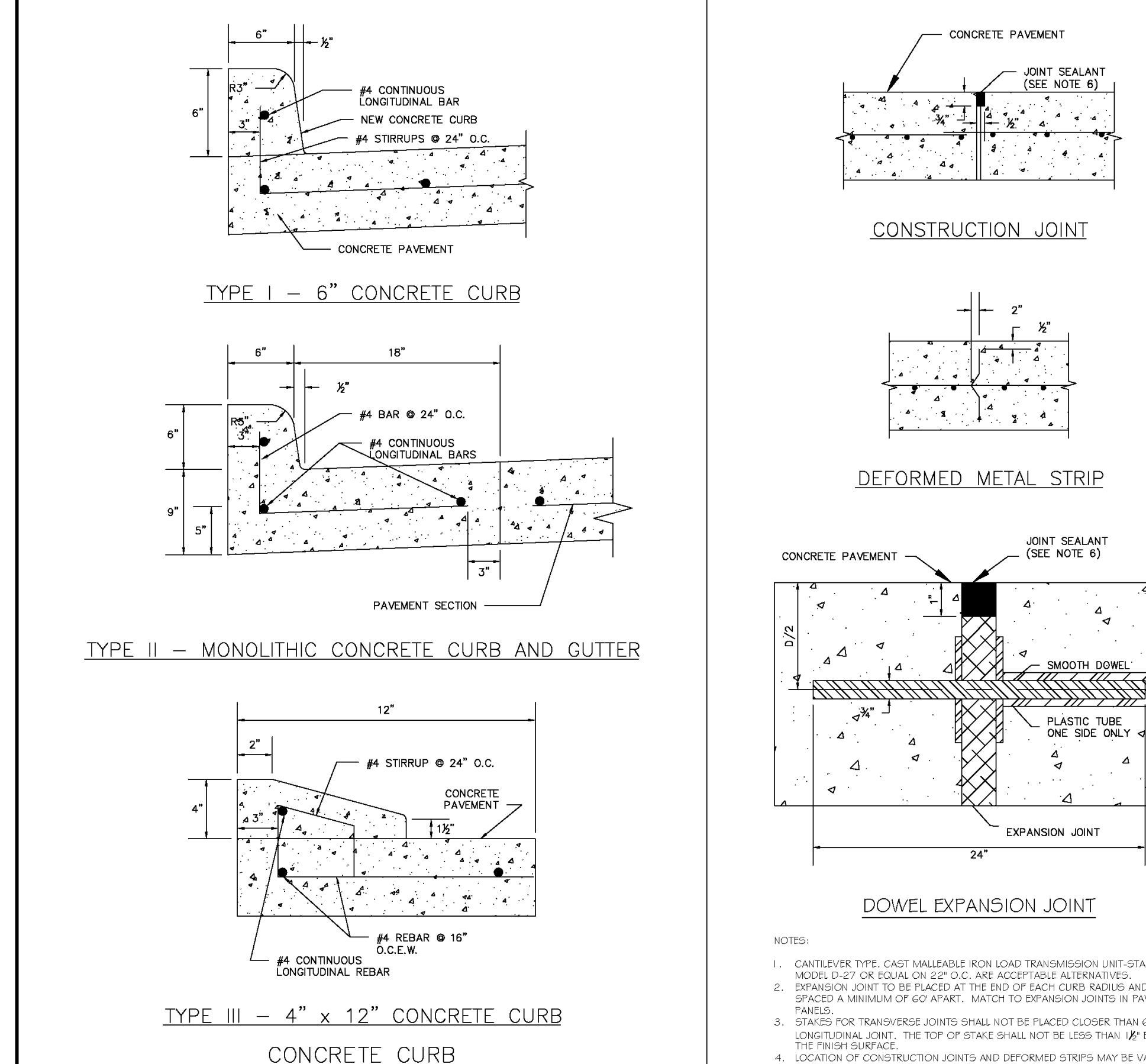
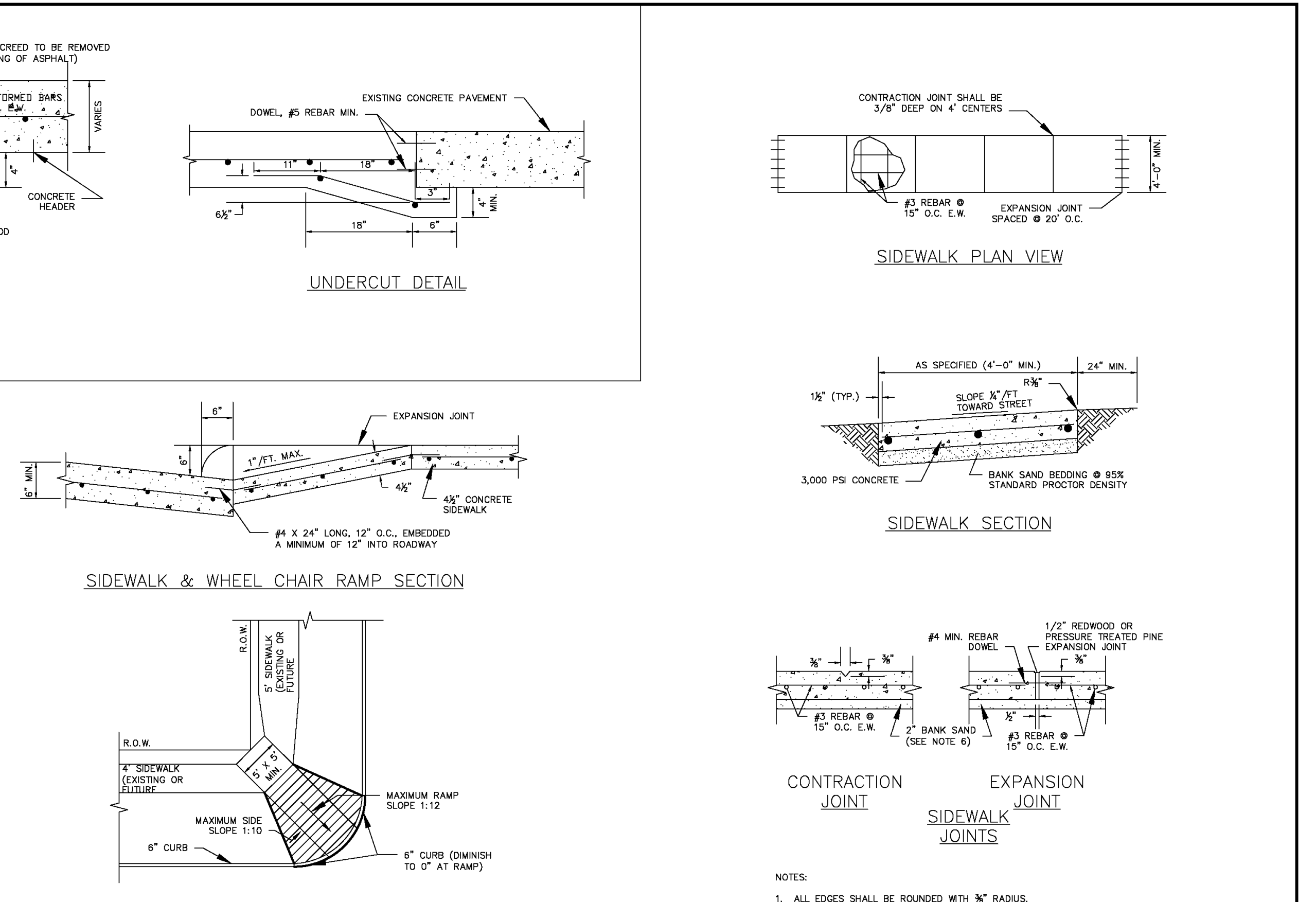
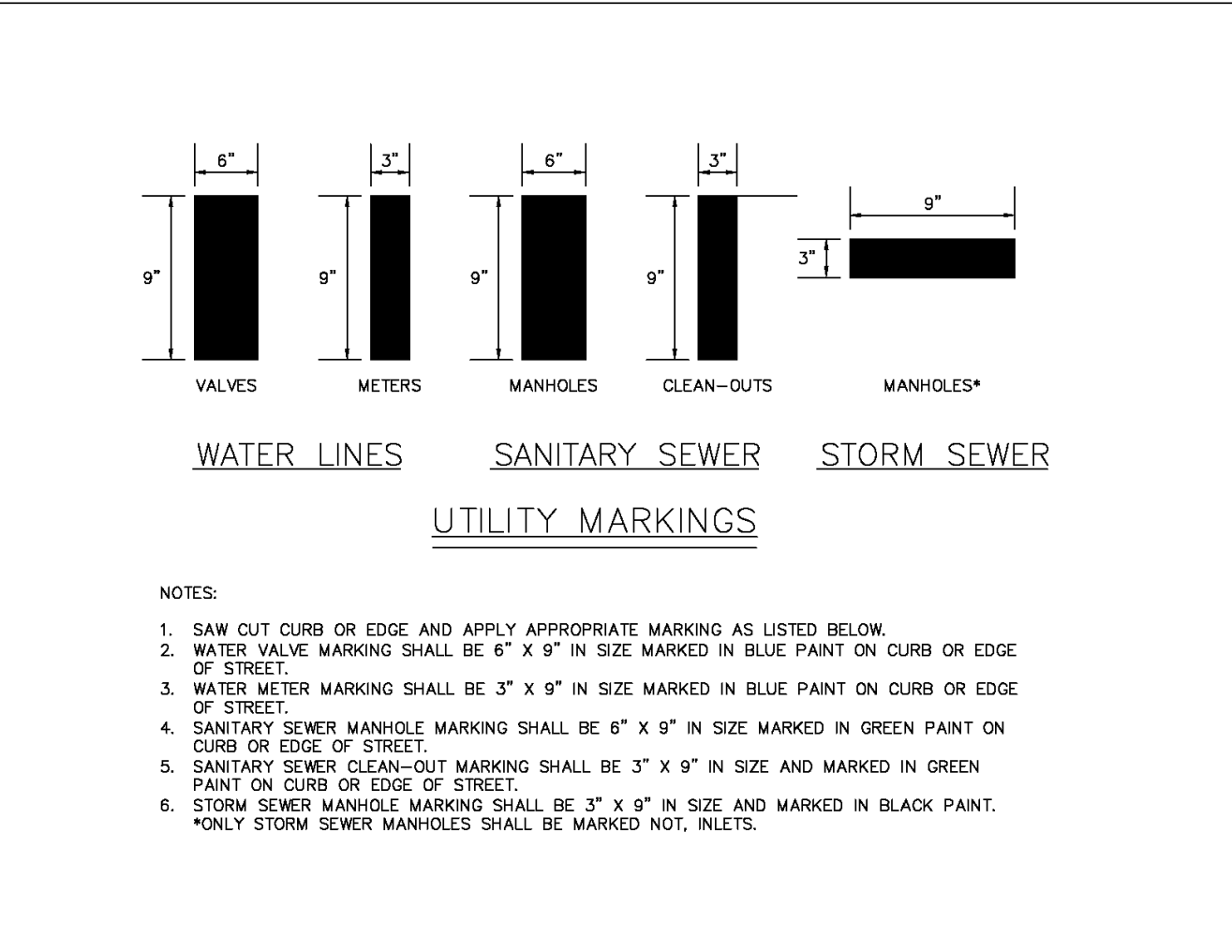
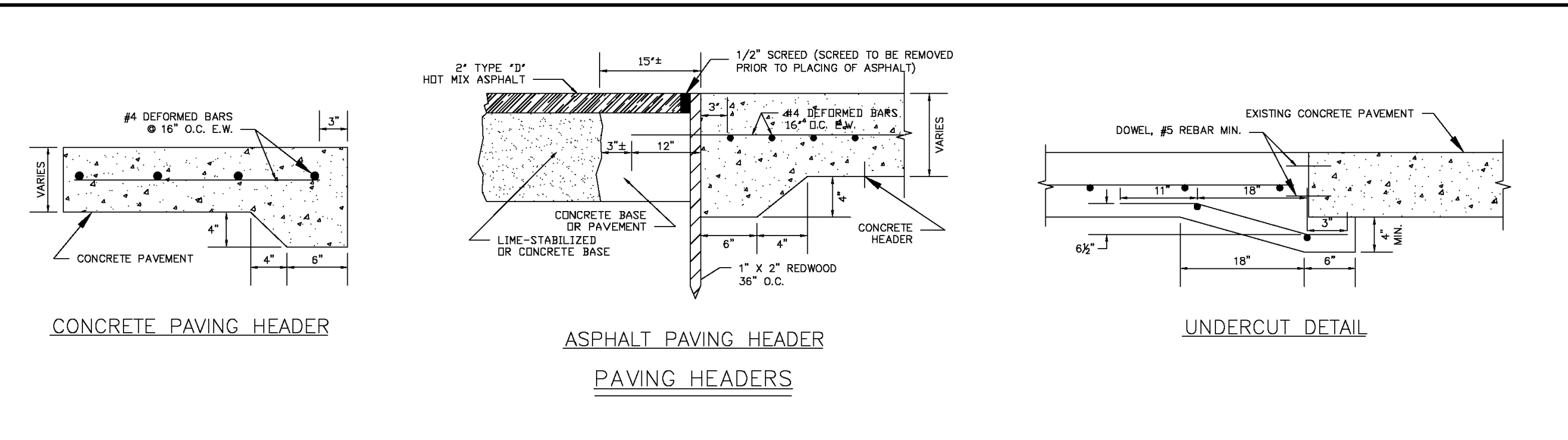
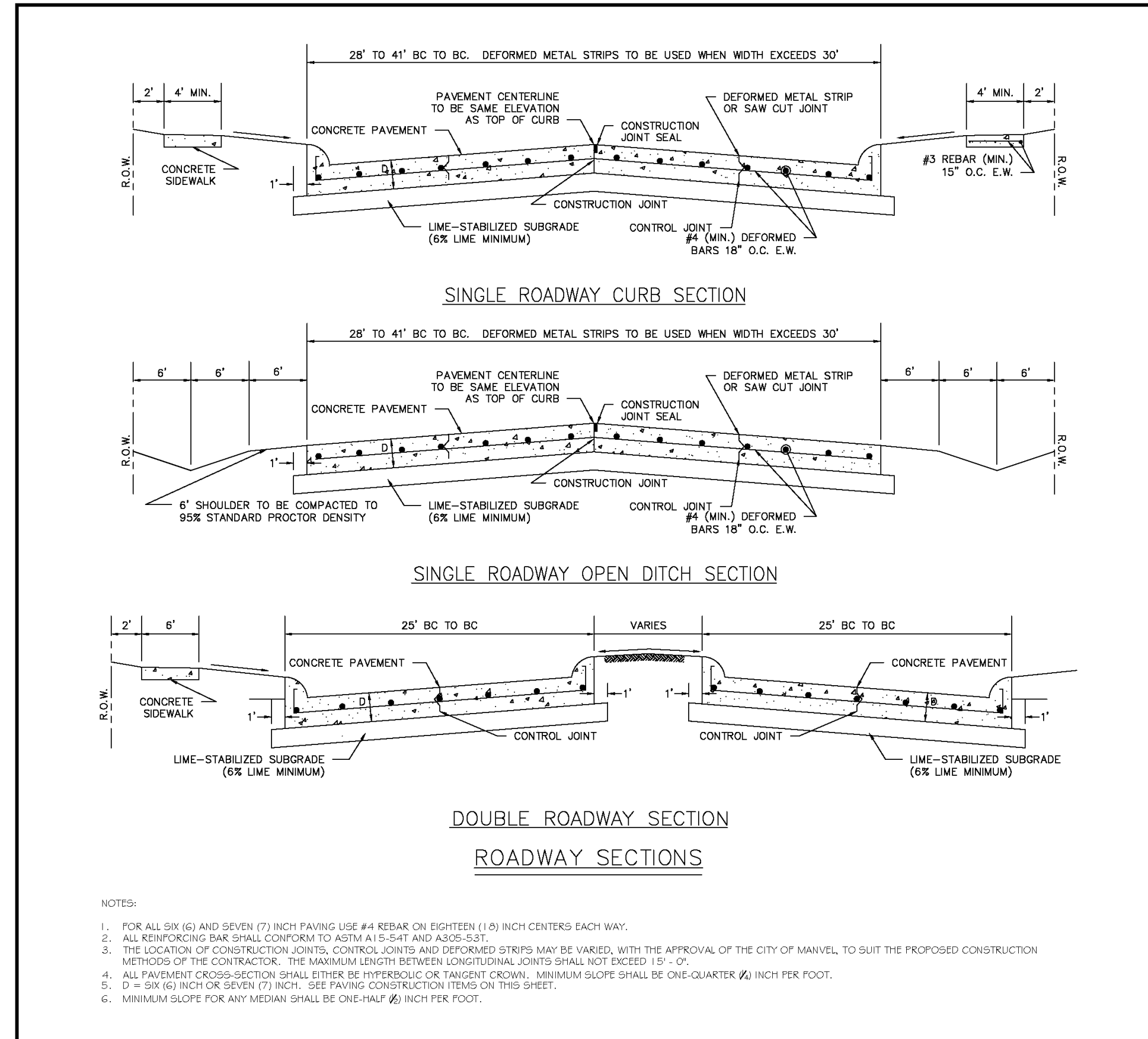
MISSION ENGINEERING INC.
 10370 RICHMOND AVE, #560
 HOUSTON, TEXAS 77042
 (713) 981-0018
 [E] dzhuang@missioneng.com
 TPEF Registration No. F-11771


interim review only
 not for permit or
 construction

 YIFENG ZHUANG
 TX # 87950

 08/13/2018

DRAWING TITLE	
CONSTRUCTION DETAILS	
DRAWN BY KN	CHECKED BY EL
DATE 08/13/2018	JOB NO. 1806251
DRAWING NO.	
C8	





MANVEL CITY TEXAS
ON THE RISE

PAVING STANDARD DETAILS

DATE APPROVED: MARCH 2017
 SCALE: NTS REVISED DATE: MARCH 2017

PROJECT NUMBER:	DATE SUBMITTED:	SHEET:
		XX OF XX

PAVEMENT JOINTS

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08/13/2018

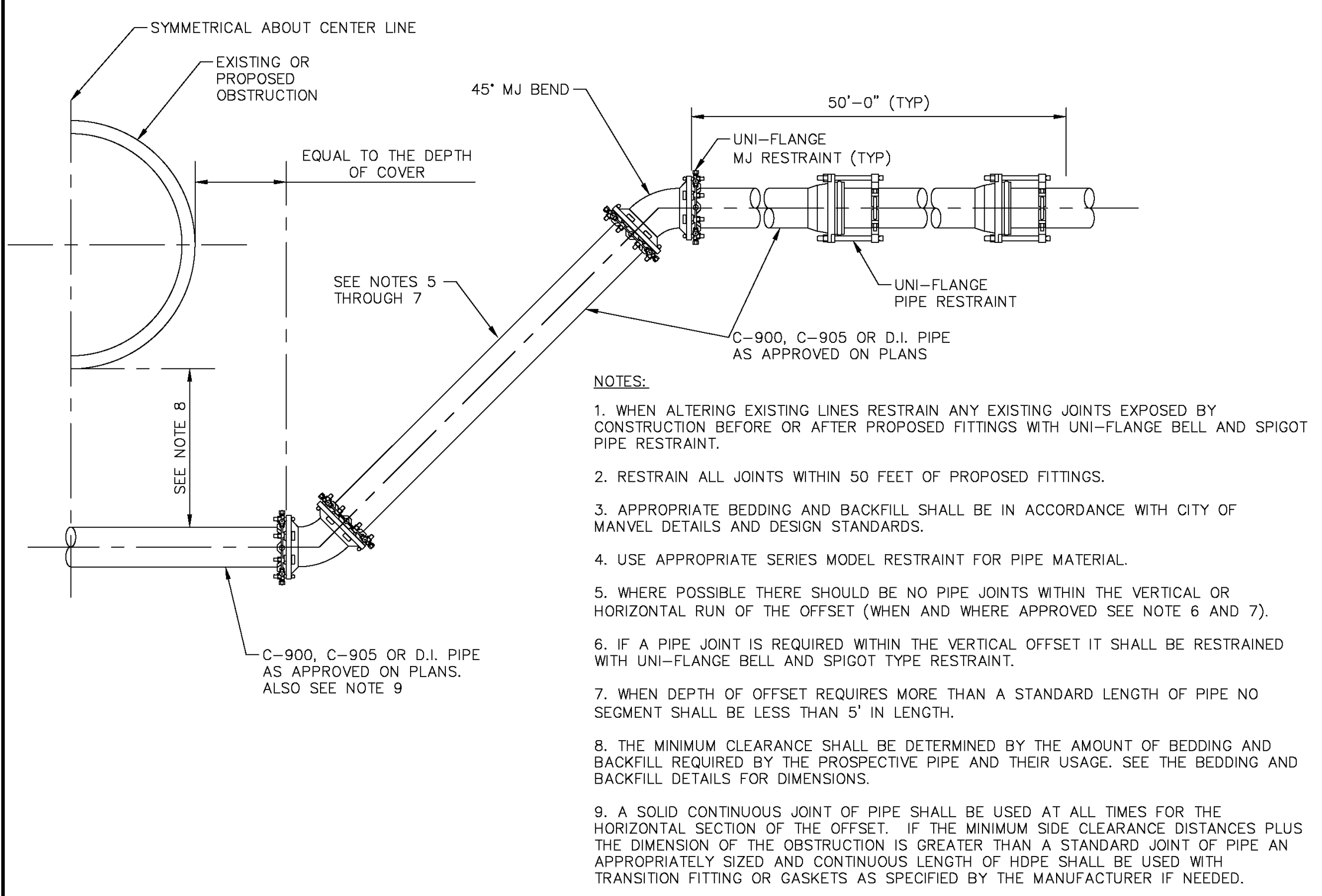
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**CONSTRUCTION
DETAILS**

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DATE 08/13/2018	JOB NO. 1806251

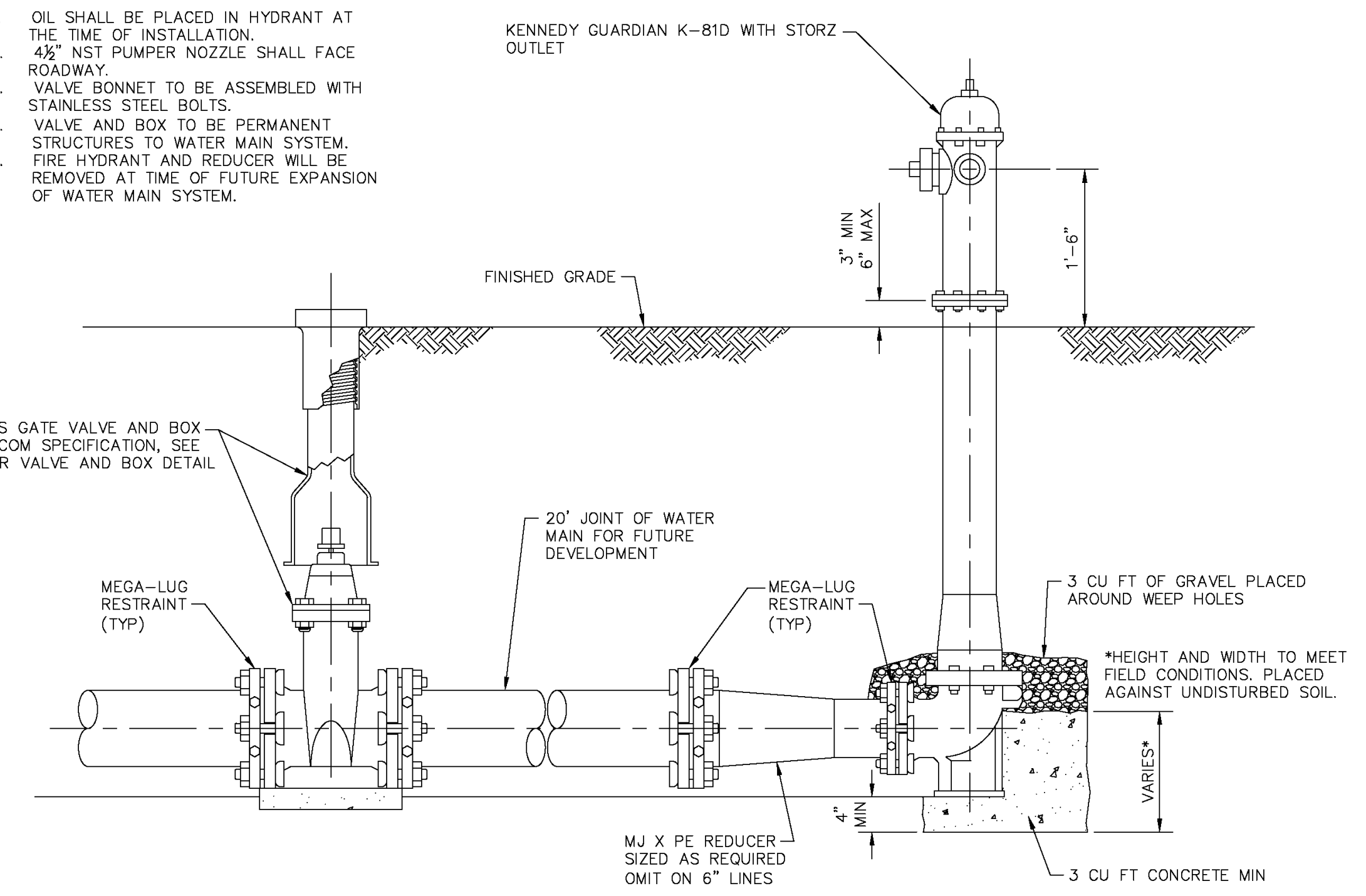
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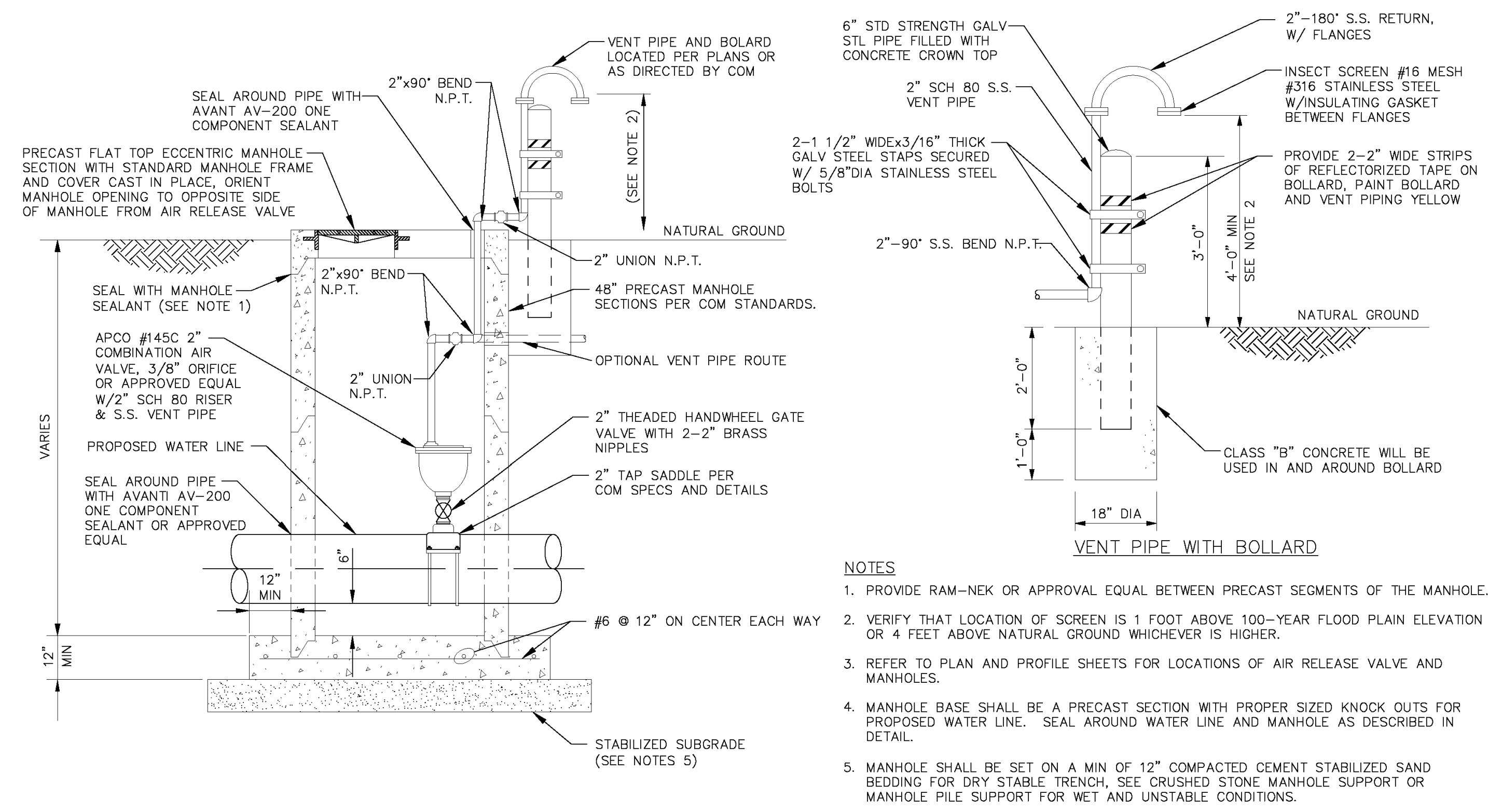


RESTRAINED MECHANICAL JOINT VERTICAL OFFSET
NTS

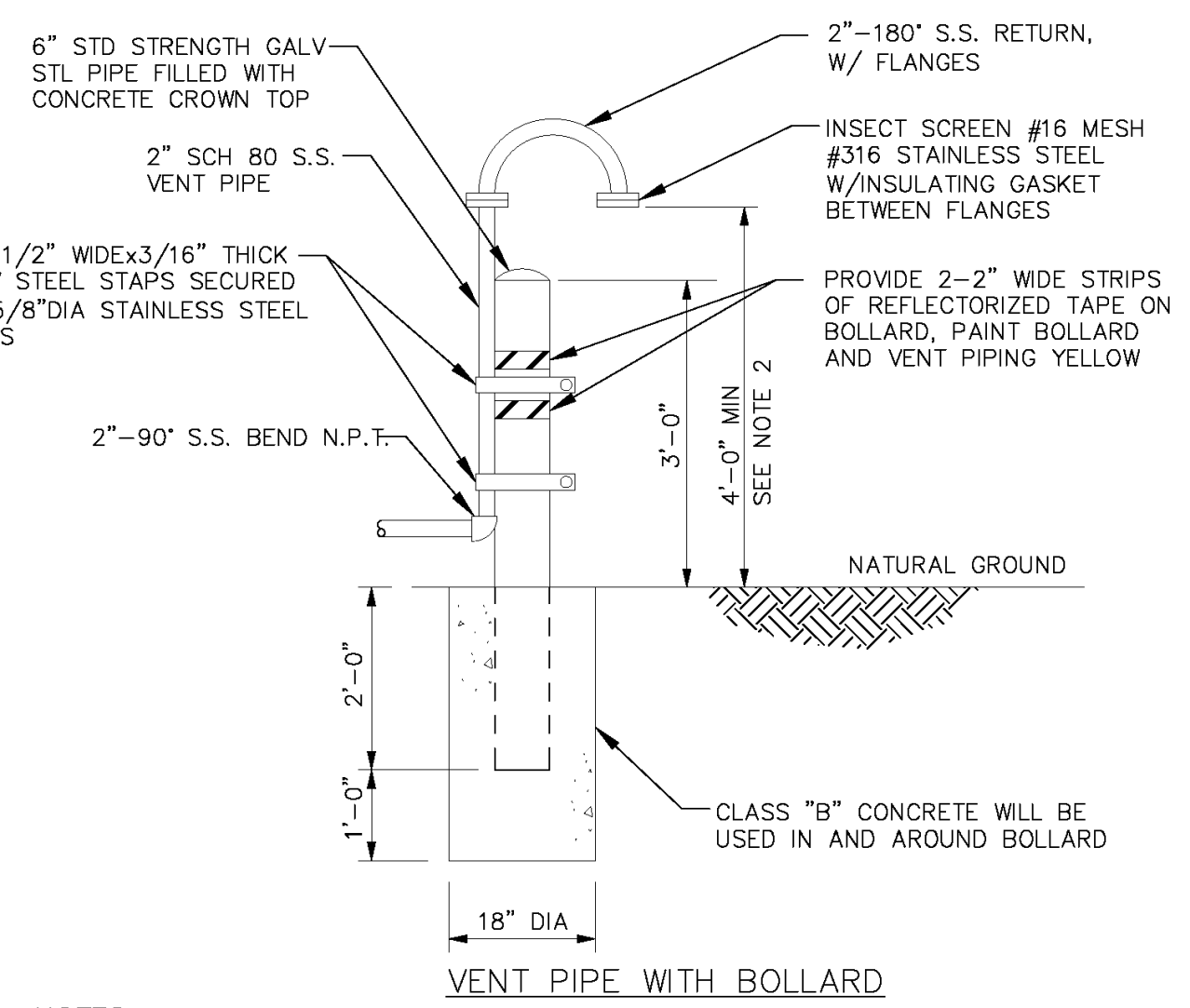
- NOTES:**
- OIL SHALL BE PLACED IN HYDRANT AT THE TIME OF INSTALLATION.
 - 4 1/2" NST PUMPER NOZZLE SHALL FACE ROADWAY.
 - VALVE BONNET TO BE ASSEMBLED WITH STAINLESS STEEL BOLTS.
 - VALVE AND BOX TO BE PERMANENT STRUCTURES TO WATER MAIN SYSTEM.
 - FIRE HYDRANT AND REDUCER WILL BE REMOVED AT TIME OF FUTURE EXPANSION OF WATER MAIN SYSTEM.



END OF LINE FIRE HYDRANT AND VALVE FOR FUTURE LINE EXTENSION
NTS

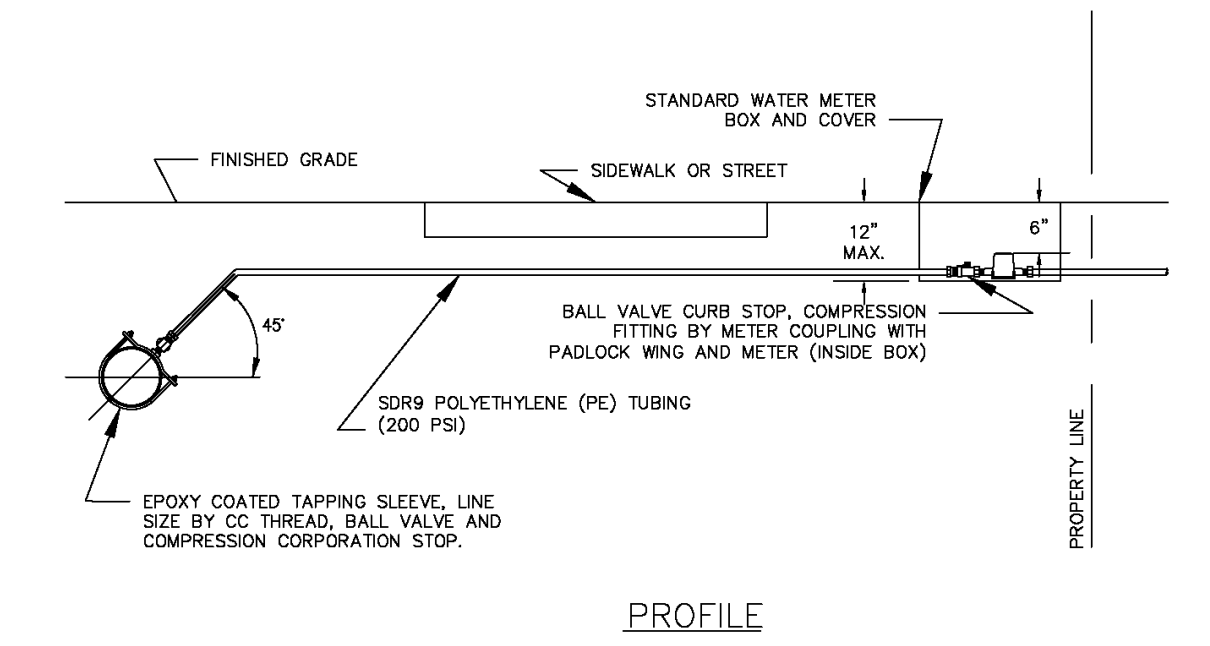


COMBINATION AIR RELEASE/AIR VACUUM VALVE ASSEMBLY DETAIL
NTS

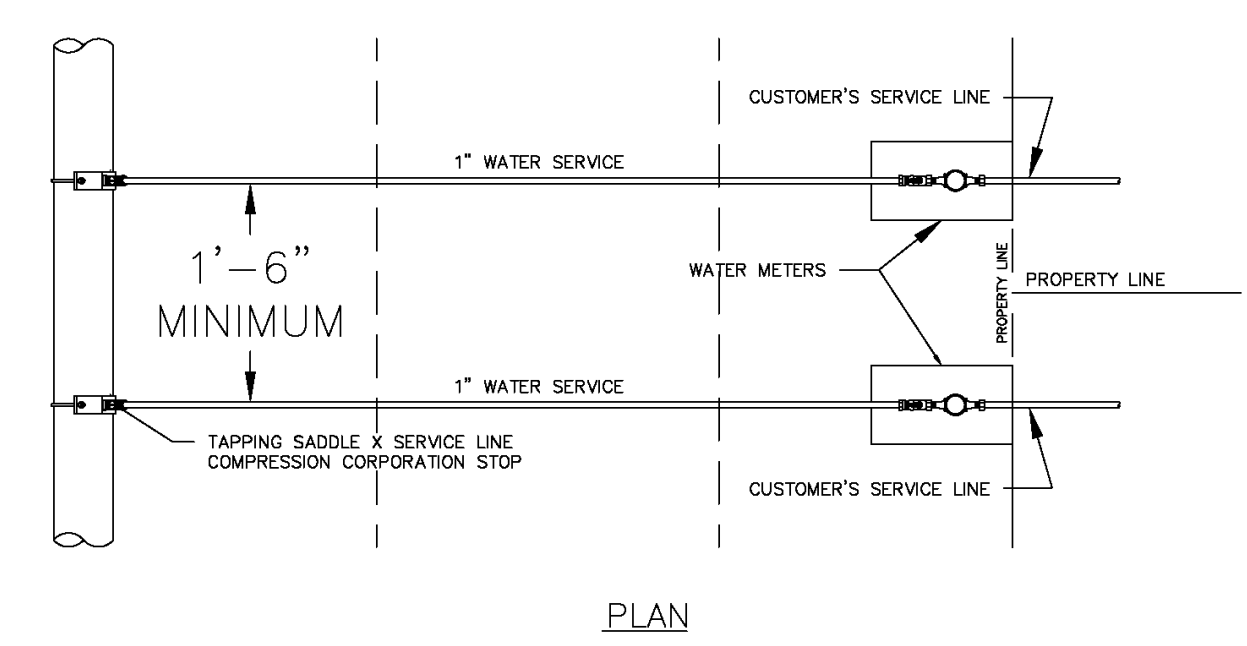


VENT PIPE WITH BOLLARD

- NOTES:**
- PROVIDE RAM-NEK OR APPROVAL EQUAL BETWEEN PRECAST SEGMENTS OF THE MANHOLE.
 - VERIFY THAT LOCATION OF SCREEN IS 1 FOOT ABOVE 100-YEAR FLOOD PLAIN ELEVATION OR 4 FEET ABOVE NATURAL GROUND WHICHEVER IS HIGHER.
 - REFER TO PLAN AND PROFILE SHEETS FOR LOCATIONS OF AIR RELEASE VALVE AND MANHOLES.
 - MANHOLE BASE SHALL BE A PRECAST SECTION WITH PROPER SIZED KNOCK OUTS FOR PROPOSED WATER LINE. SEAL AROUND WATER LINE AND MANHOLE AS DESCRIBED IN DETAIL.
 - MANHOLE SHALL BE SET ON A MIN OF 12" COMPACTED CEMENT STABILIZED SAND BEDDING FOR DRY STABLE TRENCH, SEE CRUSHED STONE MANHOLE SUPPORT OR MANHOLE PILE SUPPORT FOR WET AND UNSTABLE CONDITIONS.



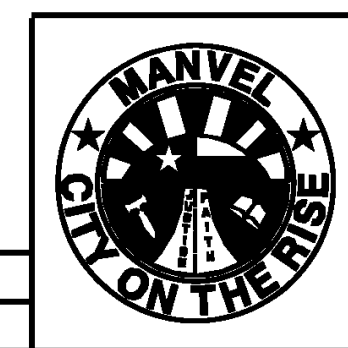
PROFILE



PLAN

- NOTES:**
- ONLY SINGLE SERVICE CONNECTIONS SHALL BE ALLOWED FOR WATER SERVICE CONNECTIONS.
 - WATER SERVICE LEADS SHALL BE 1" UNLESS OTHERWISE NOTED. SERVICE LEADS SHALL HAVE 2" SERVICE LEAD SLEEVES FOR ROAD CROSSINGS.
 - WATER METERS SHALL BE 3/4" UNLESS OTHERWISE NOTED.

WATER SERVICE CONNECTIONS



WATER DISTRIBUTION
STANDARD DETAILS 2

DATE APPROVED: MARCH 2017	REVISD DATE: MARCH 2017
SCALE: NTS	

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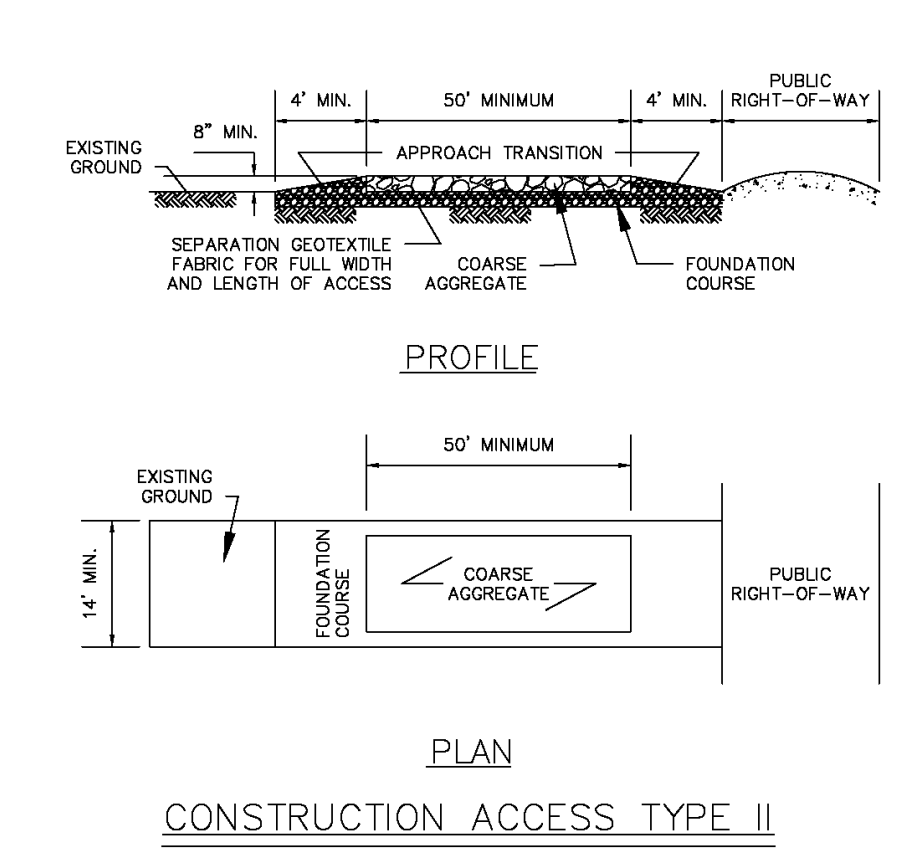
08/13/2018

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**CONSTRUCTION
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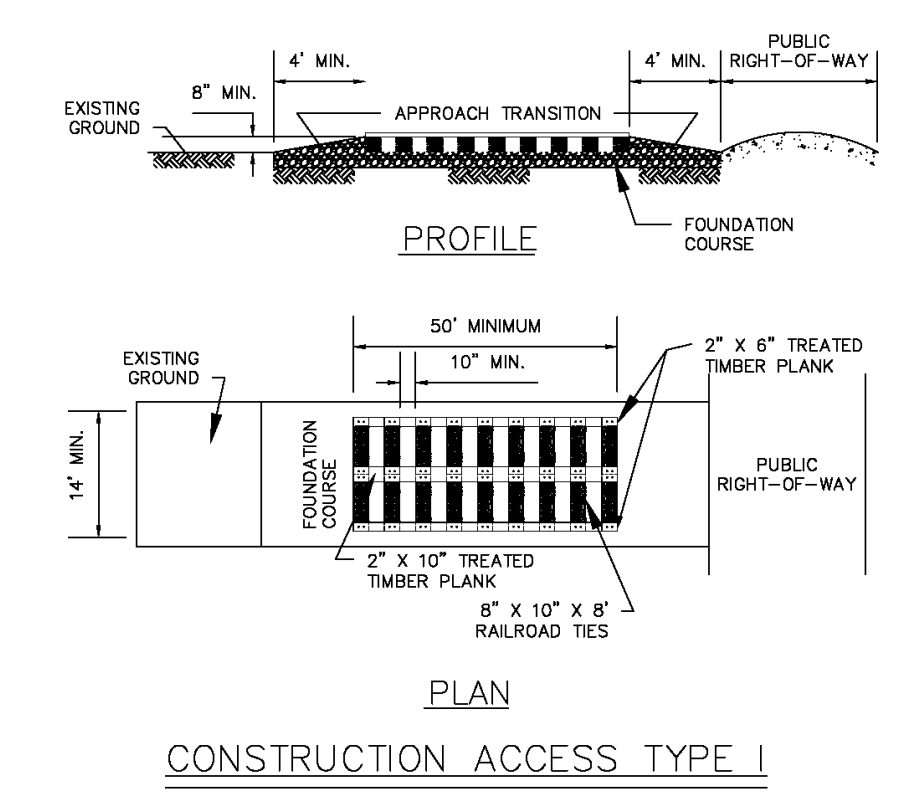
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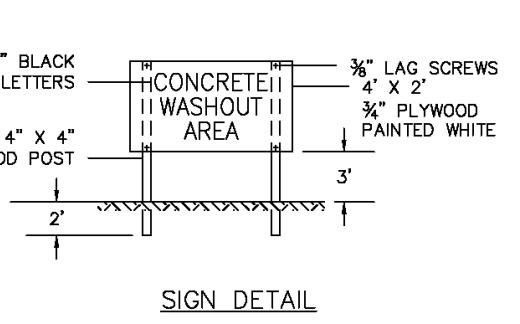
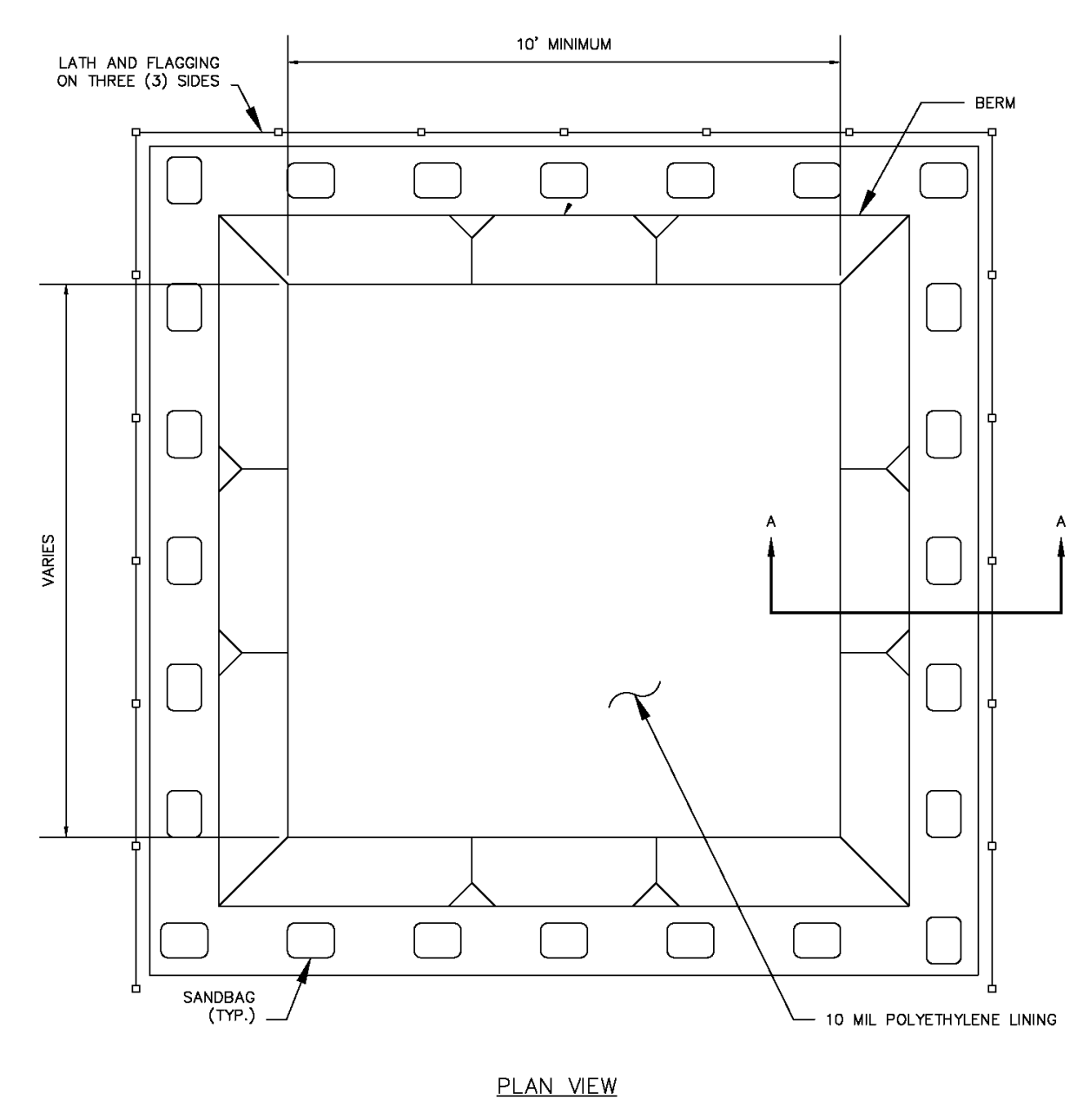
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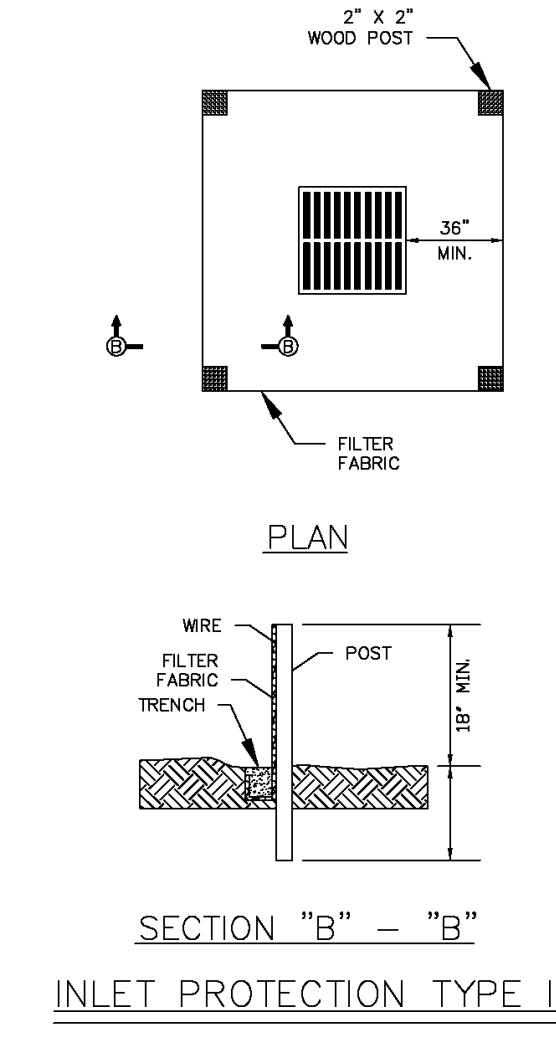
- NOTES:
- LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN FIFTY (50) FEET.
 - THICKNESS SHALL BE A MINIMUM OF EIGHT (8) INCHES.
 - WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS AND EGRESS.
 - APPROACH TRANSITION SHALL BE A MINIMUM OF EIGHT (8) INCHES IN DEPTH AND 8:1 SLOPE MINIMUM.
 - FOUNDATION COURSE SHALL BE A MINIMUM OF SIX (6) INCHES. FOUNDATION COURSE MATERIAL SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL APPROVED BY THE CITY.
 - ACCESS SHALL BE GRADED TO PREVENT RUN-OFF FROM LEAVING SITE, ALLOWING DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
 - CONSTRUCTION ACCESS SHALL ADHERE TO CITY OF MANVEL SPECIFICATION 02020 - STABILIZED CONSTRUCTION ACCESS, ROADS, PARKING AND WASH AREAS.
 - 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.
 - STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMMODATE TRUCK WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR TRUCK WASHING AREA.
 - STABILIZED CONSTRUCTION ACCESS SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.



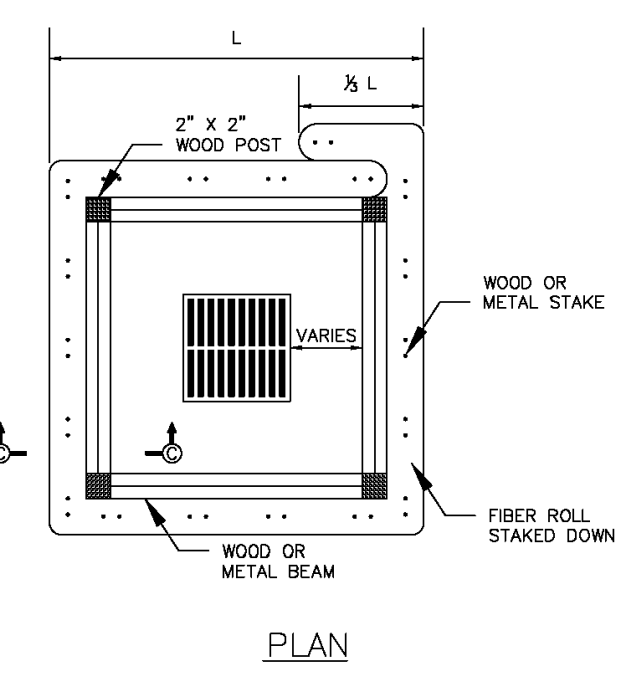
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 - WIDTH SHALL BE NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS AND EGRESS.
 - THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH 5/8\"/>
 - APPROACH TRANSITION SHALL BE A MINIMUM OF SIX (6) INCHES IN DEPTH AND 8:1 SLOPE MINIMUM.
 - FOUNDATION COURSE SHALL BE A MINIMUM OF SIX (6) INCHES. FOUNDATION COURSE MATERIAL SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIAL APPROVED BY THE CITY.
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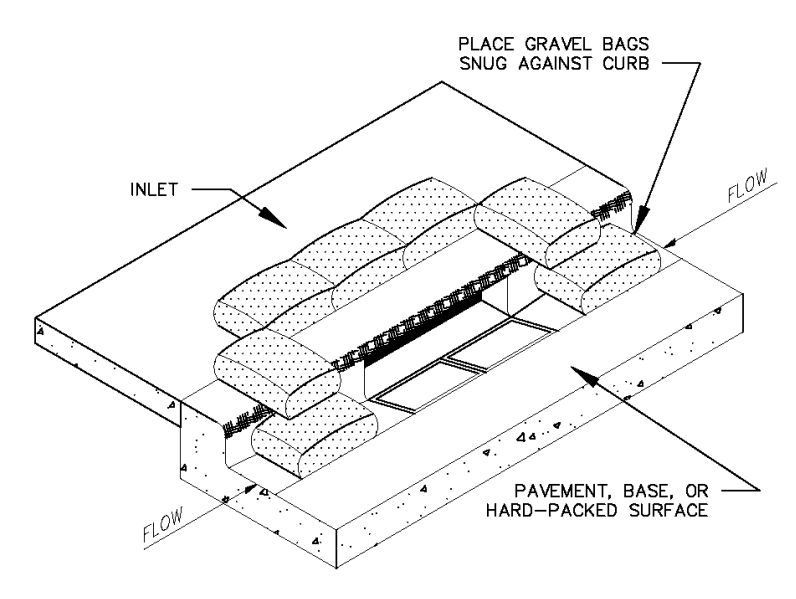
- NOTES:
- ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
 - THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN THREE (3) FEET OF THE CONCRETE WASHOUT FACILITY.



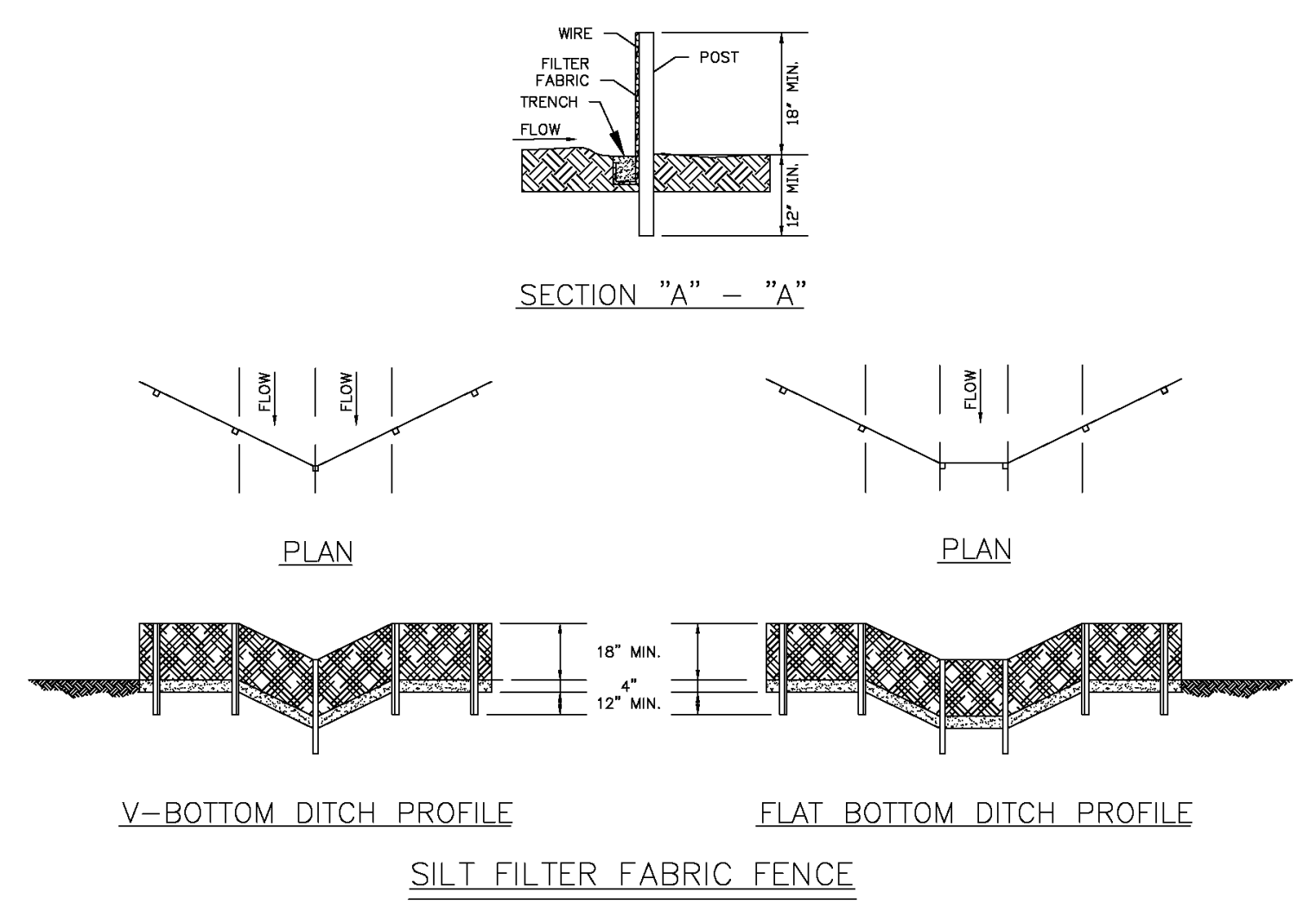
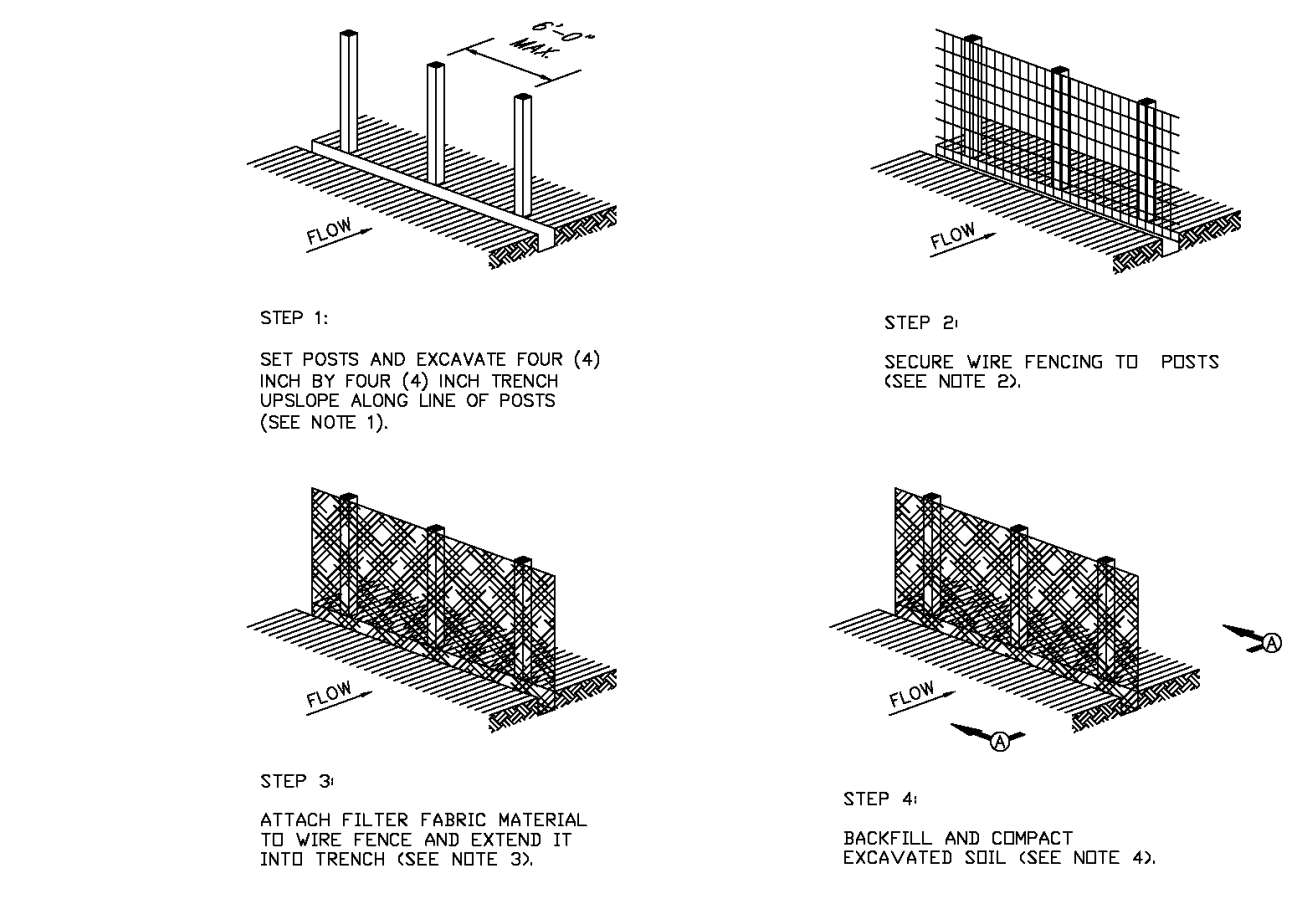
- NOTES:
- MAXIMUM POST SPACING SHALL BE FOUR (4) FEET. ADDITIONAL POSTS MAY BE ADDED AS NEEDED. POSTS SHALL BE PLACED A MINIMUM AT EACH CORNER AS SHOWN.
 - PLACEMENT OF FILTER FABRIC BARRIER FROM INLET SHALL VARY ACCORDING TO SITE CONDITIONS. TYPICAL PLACEMENT SHALL BE A MINIMUM OF THIRTY-SIX (36) INCHES FROM INLET EDGE.



- NOTES:
- MAXIMUM POST SPACING SHALL BE FOUR (4) FEET. ADDITIONAL POSTS MAY BE ADDED AS NEEDED. POSTS SHALL BE PLACED A MINIMUM AT EACH CORNER AS SHOWN.
 - PLACEMENT OF FIBER ROLL FROM INLET SHALL VARY ACCORDING TO SITE CONDITIONS. TYPICAL PLACEMENT SHALL BE TWENTY-FOUR (24) INCHES FROM INLET.
 - FIBER ROLLS SHALL BE UTILIZED ONLY WHEN SITE CONDITIONS DO NOT PERMIT THE USE OF FILTER FABRIC BARRIER.
 - IF UNDERLYING MATERIAL IS BASE OR OTHER HARD-PACKED MATERIAL, THEN FIBER ROLLS MAY BE PLACED ON HARD PACKED SURFACE AND WEIGHTED DOWN WITH GRAVEL BASE.



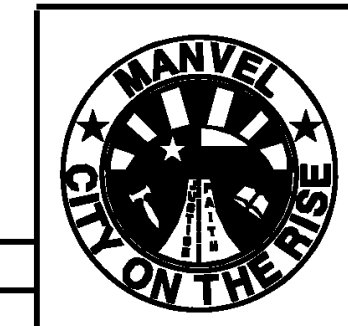
- NOTES:
- IPB TYPE III SHALL BE USED FOR EXISTING OR PROPOSED STAGE II TYPE 'B', 'B-B' AND '1'-2\"/>
 - PLACE GRAVEL BAG IN THE GUTTER ON EACH SIDE OF THE INLET OPENING. GRAVEL BAG SHALL BE PLACED TIGHTLY AGAINST THE FACE OF CURB.
 - PLACE GRAVEL BAGS AT BACK OF CURB ALONG INLET.
 - DO NOT PLACE BAGS TO BLOCK THROAT OF INLET, UNLESS DIRECTED BY THE ENGINEER AND APPROVED BY THE CITY OF MANVEL.



- NOTES:
- SET TWO (2) INCH BY TWO (2) INCH WOODEN STAKES EMBEDDED TWELVE (12) INCHES INTO GROUND. SPACING SHALL BE A MAXIMUM OF SIX (6) FEET APART FOR REINFORCED FILTER FABRIC FENCE AND A MAXIMUM OF THREE (3) FEET APART FOR NON-REINFORCED FILTER FABRIC FENCE.
 - REINFORCED FILTER FABRIC FENCE SHALL HAVE WOVEN WIRE FENCE WHICH SHALL BE FASTENED SECURELY TO FENCE POSTS.
 - FASTEN FILTER FABRIC FENCE AS FOLLOWS:
 - NON-REINFORCED FILTER FABRIC FENCE SHALL BE FASTENED AT EVERY WOOD POST AT TOP AND MIDDLE SECTION.
 - REINFORCED FILTER FABRIC FENCE SHALL BE FASTENED AT EVERY WOOD POST AT TOP AND MIDDLE SECTION.
 - MINIMUM HEIGHT OF FILTER FABRIC SHALL BE EIGHTEEN (18) INCHES ABOVE NATURAL GROUND AND A MAXIMUM OF THIRTY-SIX (36) INCHES ABOVE NATURAL GROUND.
 - FILTER FABRIC SHALL EXTEND INTO THE FOUR (4) INCH BY FOUR (4) INCH TRENCH DOWN THE SIDE CLOSEST TO THE WOODEN POSTS, ACROSS THE BOTTOM OF THE TRENCH AND HALF WAY UP THE OPPOSITE SIDE.
 - ALL INSTALLATIONS OF SILT FENCE SHALL BE IN ACCORDANCE WITH THE CITY OF MANVEL TECHNICAL SPECIFICATION SECTION 02005 - FILTER FABRIC SILT FENCE.
 - METAL STAKES OR T-POSTS MAY BE USED IN LIEU OF WOOD POSTS.

	STABILIZED CONSTRUCTION EXIT
	FILTER FABRIC SILT FENCE
	REINFORCED FILTER FABRIC BARRIER
	INLET PROTECTION BARRIER TYPE I
	INLET PROTECTION BARRIER TYPE II
	INLET PROTECTION BARRIER TYPE III
	CONCRETE WASHOUT AREA - ABOVE GROUND
	CONCRETE WASHOUT AREA - BELOW GROUND

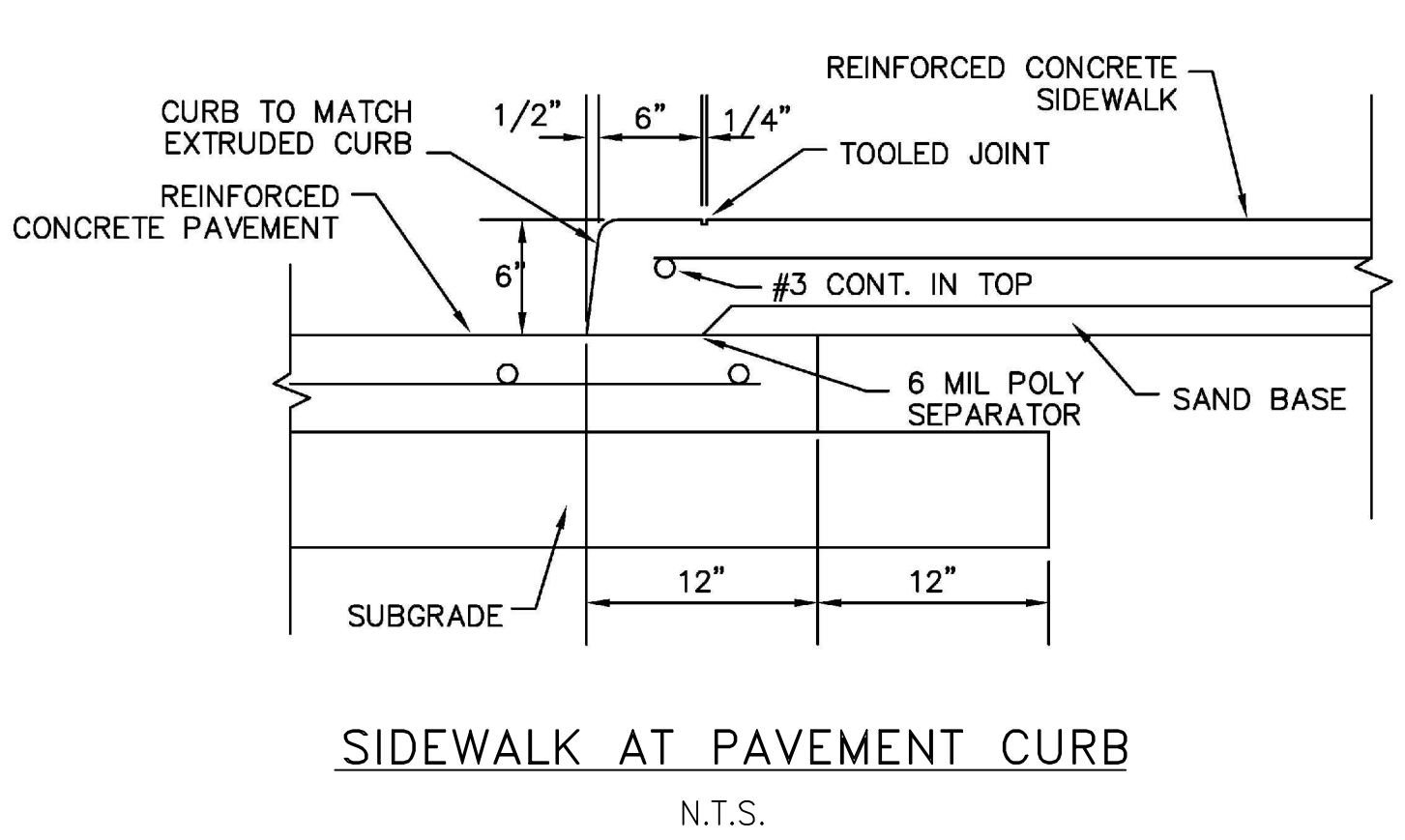
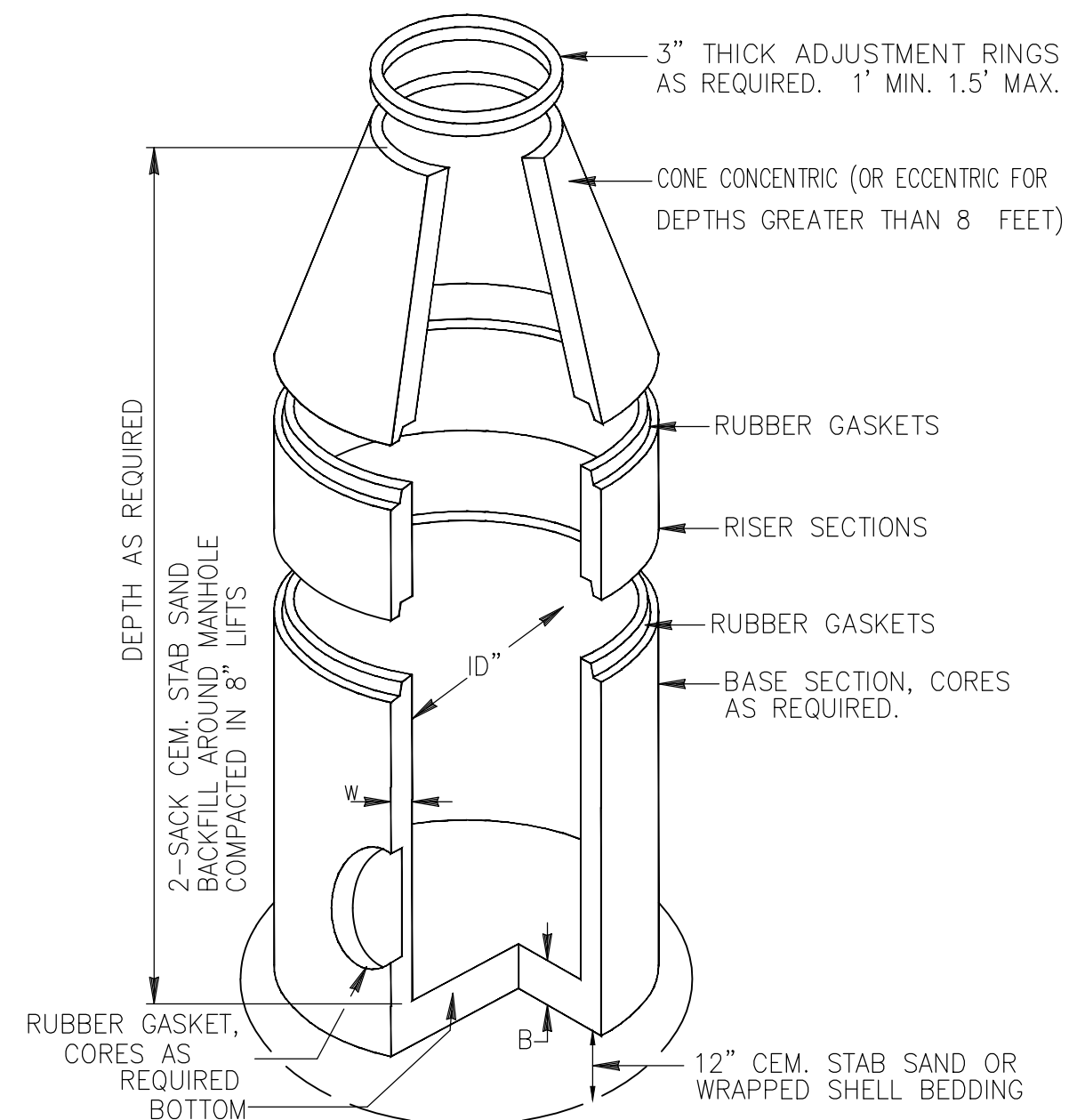
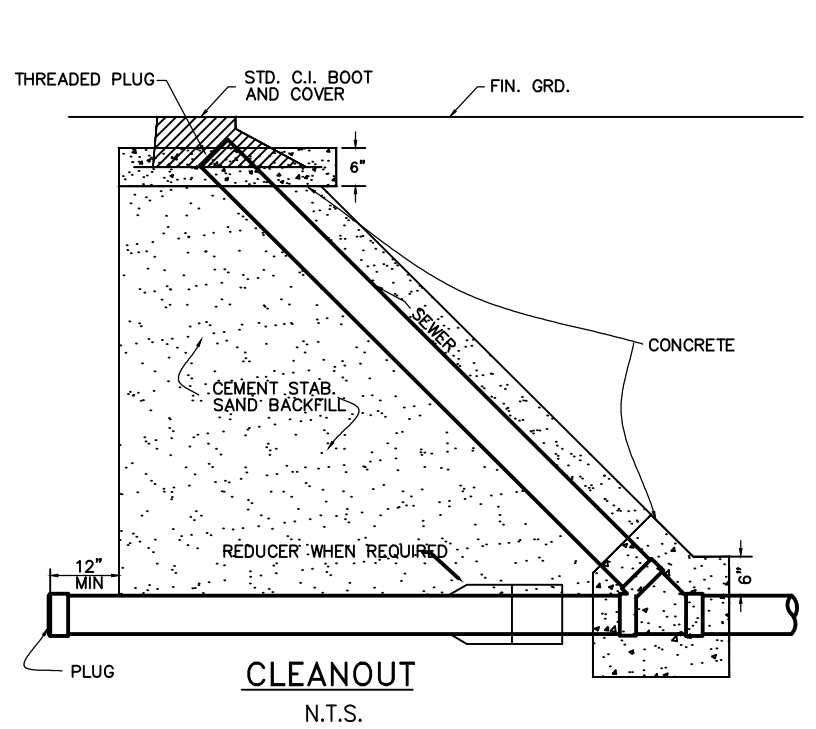
SWPPP SYMBOLS



STORM WATER POLLUTION
PREVENTION PLAN (SWPPP)
STANDARD DETAILS

DATE APPROVED: MARCH 2017
SCALE: NTS REVISED DATE: MARCH 2017

PROJECT NUMBER:	DATE SUBMITTED:	SHEET:
		XX OF XX



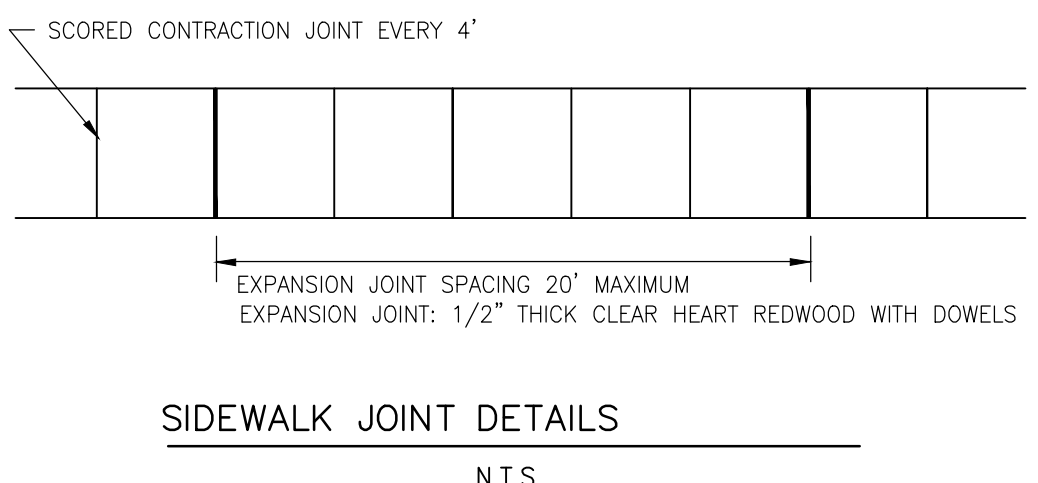
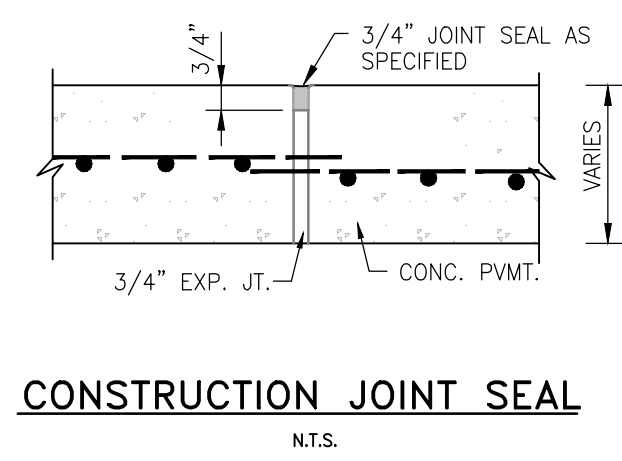
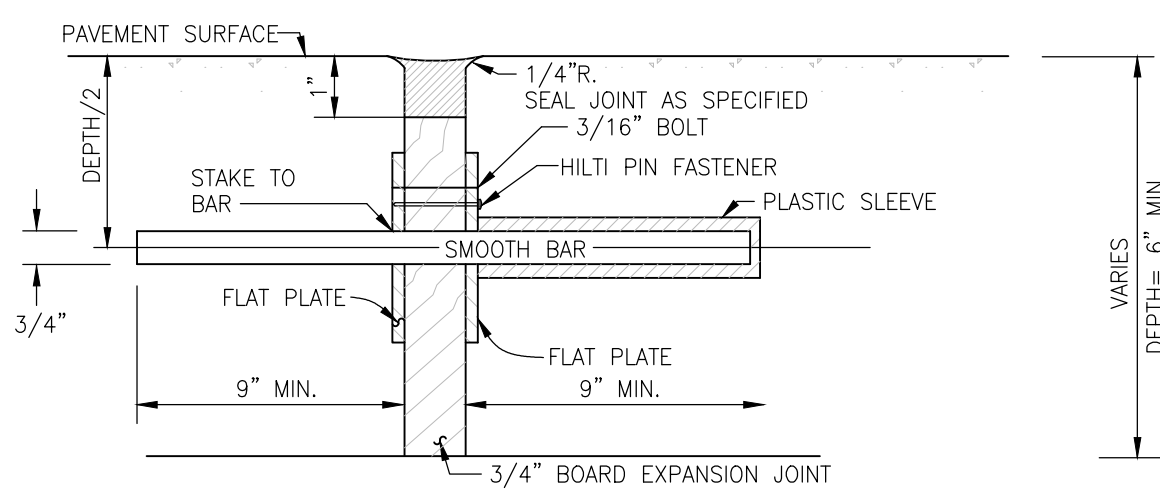
MODEL #	JUNCTION BOX #	W1	W2	H1	H2	T1	KO	GRATE SIZE	WEIGHT LBS
CB12	JB12	15"	10"	21"	18"	2"	10"	12"x12"x1"	180
CB14	JB14	20"	14"	28"	24"	4"	12"	14"x14"x1"	600
CB18	JB18	24"	18"	34"	30"	4"	12"	18"x18"x1"	1,000
CB20	JB20	26"	18"	34"	30"	4"	17"	20"x20"x1"	1,335
CB24	JB24	32"	22"	41"	36"	5"	22"	24"x24"x2"	2,245
CB27	JB27	37"	25"	42"	36"	6"	24"	27"x27"x2"	2,875
CB30	JB30	42"	30"	42"	36"	6"	30"	32"x32"x2"	3,675
CB36	JB36	48"	36"	42"	36"	6"	32"	38"x38"x2"	4,585

1. CB12 CATCHBASIN IS RATED FOR PEDESTRIAN LOADING. ALL OTHERS ARE TRAFFIC DUTY.
2. ALL JUNCTION BOXES ARE STANDARD PEDESTRIAN DUTY OR OPTIONAL TRAFFIC DUTY.

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"Expect the Best"

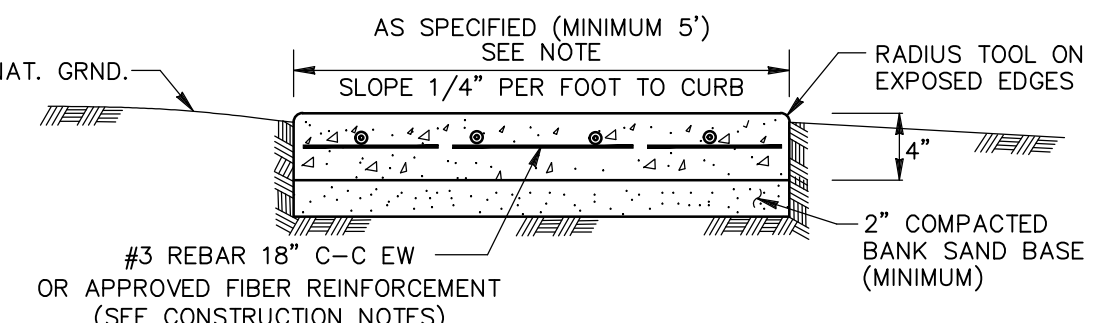
CATCHBASIN MODEL CB - 12" THRU 36"
JUNCTION BOX MODEL JB - 12" THRU 36"

SCALE	NONE	DWG. NO.	REV.
DATE	01/08	CBJB36	A

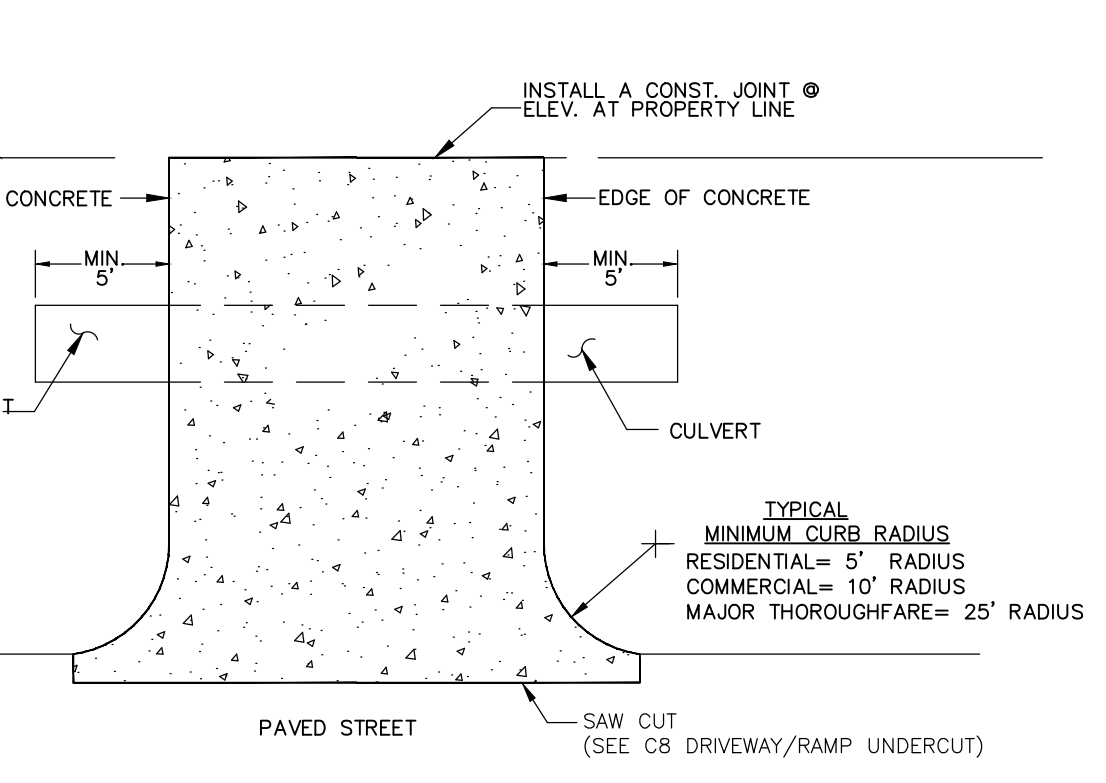
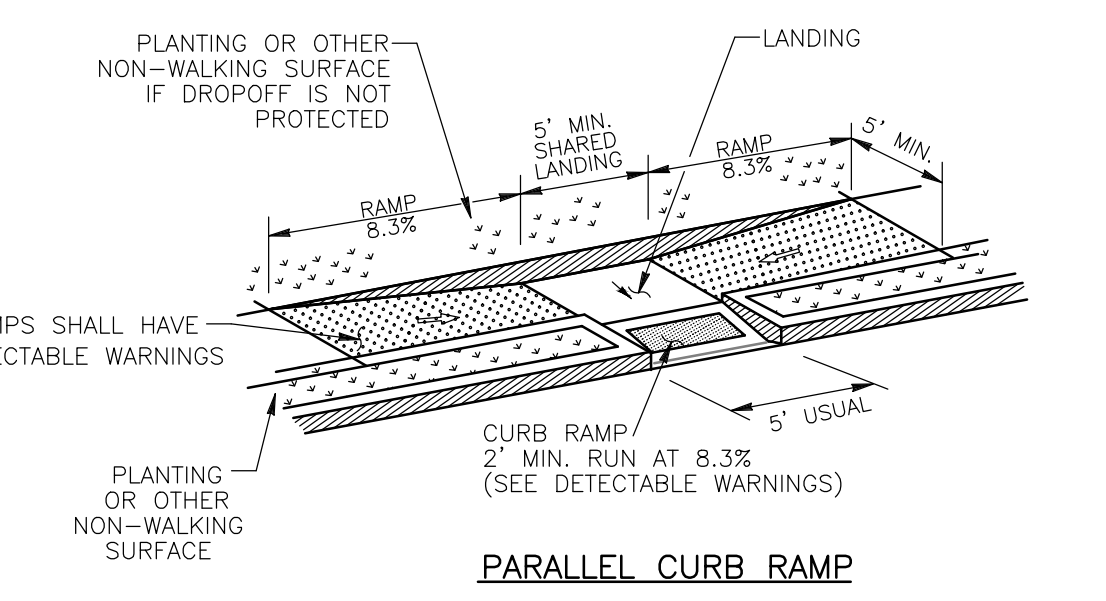


STEEL TO MEET ASTM STD. SPEC. FOR CONC. REBAR UNIT TO BE 24" C-C., AND 10" MIN.

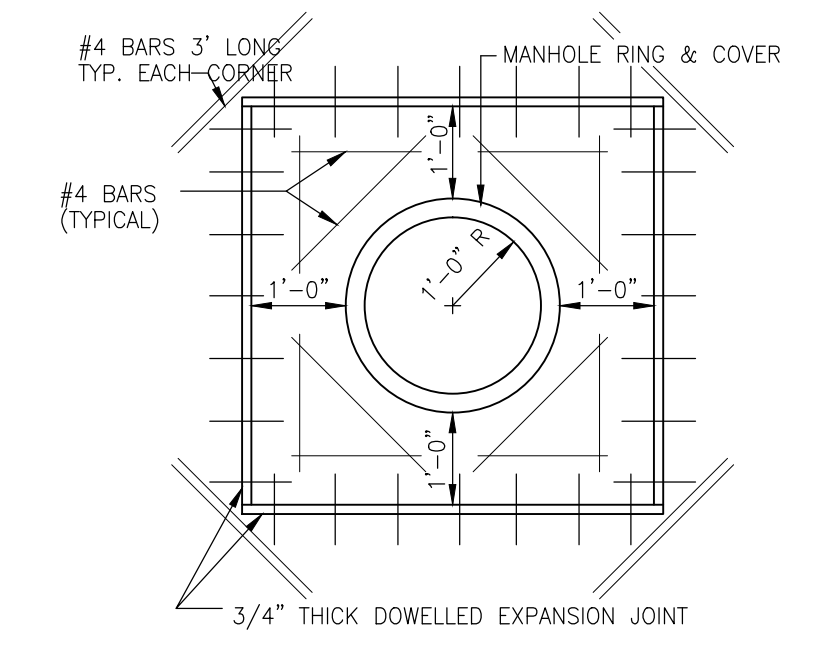
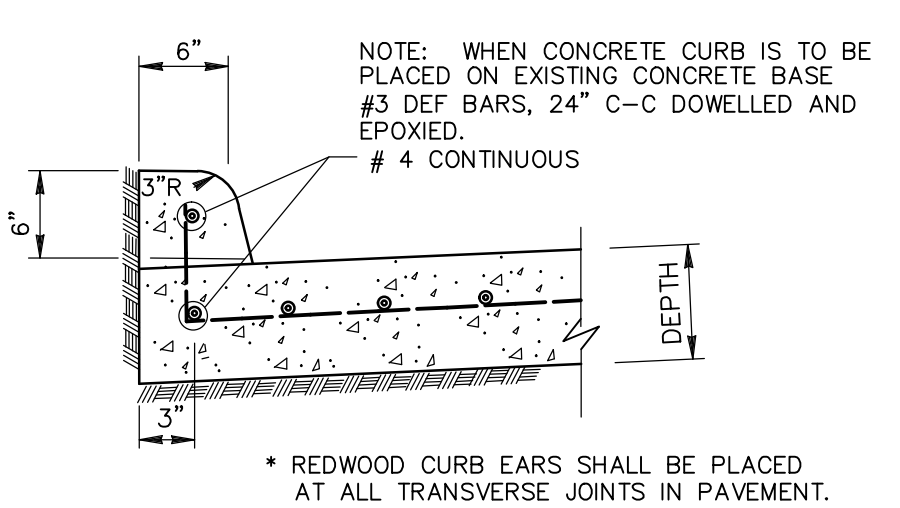
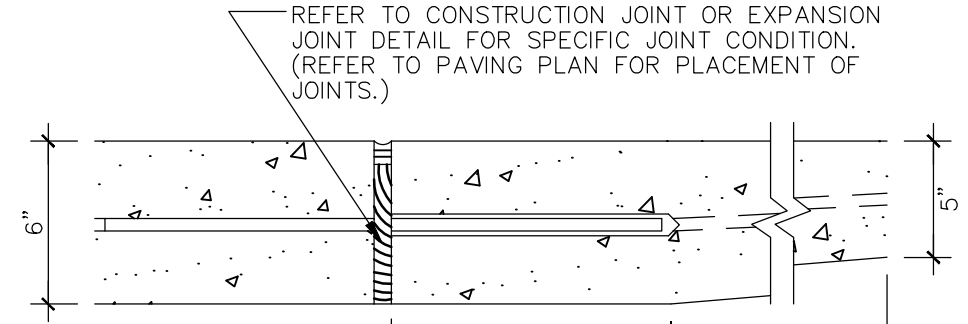
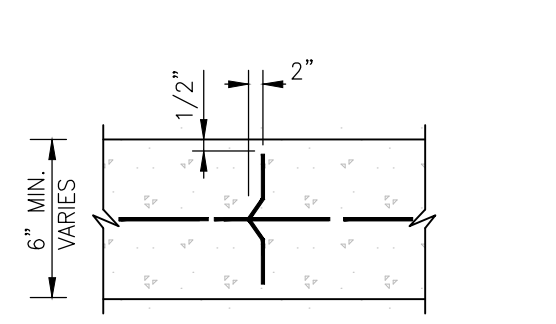
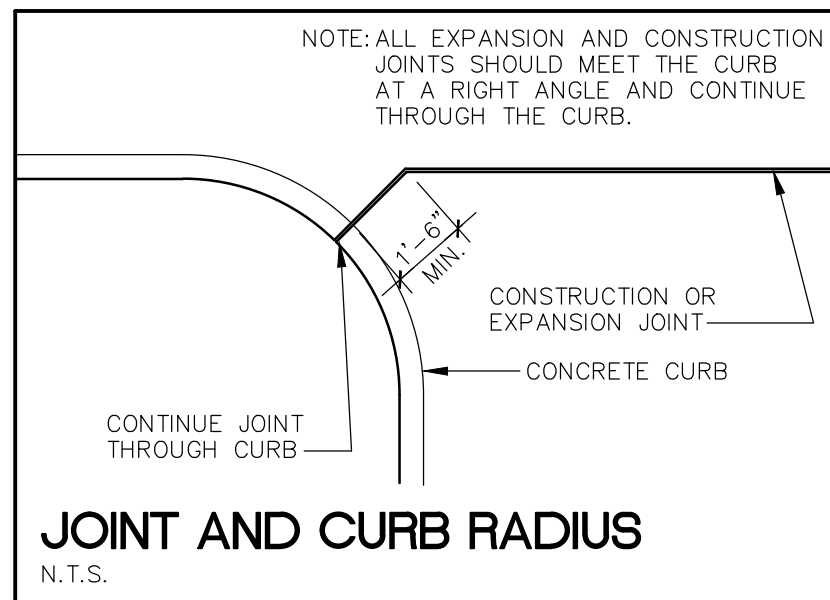
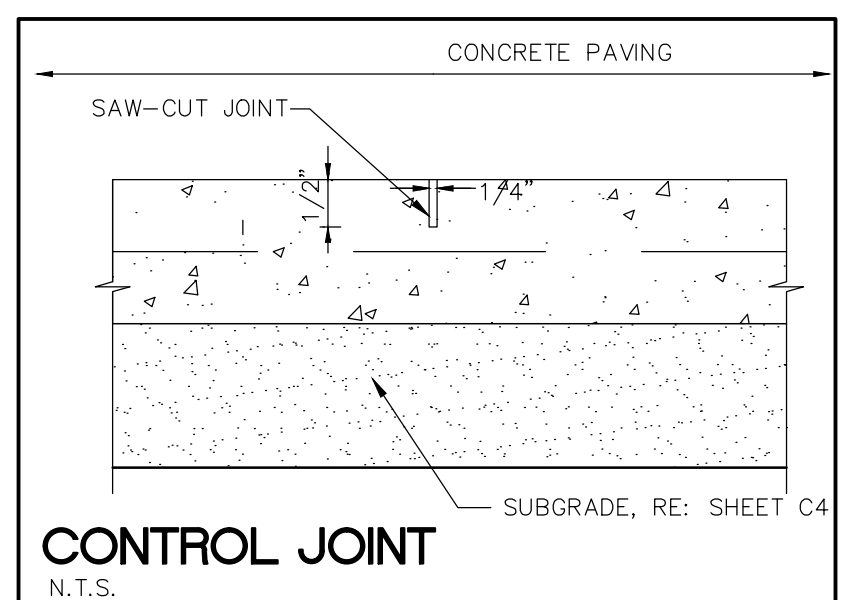
THE LOCATION OF CONSTRUCTION JOINTS AND DEFORMED STRIPS MAY BE VARIED, WITH THE APPROVAL OF THE DEPARTMENT OF PUBLIC WORKS, TO SUIT THE PROPOSED CONSTRUCTION METHODS OF THE CONTRACTOR. MAXIMUM SPACING FOR LONGITUDINAL CONTROL JOINTS IS 15'-0".



NOTE: BANK SAND IS DEFINED AS A WELL-GRADED SAND, FREE OF SILT, CLAY, LOAM, FRAGILE OR SOLUBLE MATERIALS AND ORGANIC MATTER, MEETING THE UNIFIED SOILS CLASSIFICATION SYSTEM GROUP SYMBOL SW CRITERIA W/A PLASTICITY INDEX OF ≤ 10, AND NO MORE THAN 12% OF MATERIAL CAN PASS THE No. 200 SIEVE.



INSTALL A CONST. JOINT @ ELEV. AT PROPERTY LINE



Specifications
CONCRETE: Class 1 concrete with design strength of 4500 PSI at 28 days.
REINFORCEMENT: Grade 60 reinforced. Steel rebar conforming to ASTM A615 on required centers or equal.

Typical Applications
RP devices are used to protect against high hazard (toxic) fluids in water services to industrial plants, hospital facilities, morgues, mortuaries, and chemical plants. They are also used in irrigation systems, solar feed, water lines and other installations requiring maximum protection.

Engineering Data
The backflow assembly shall be factory assembled on pad & hydrostatically tested prior to delivery. Field excavation & preparation shall be complete prior to delivery. Pipe, valves and fittings of the assembly shall be approved by one or more of the following associations:

PROJECT:
CUSTOMER:
ARCHITECT:
ENGINEER:
ORDER #:
DATE:

PARK ENVIRONMENTAL EQUIPMENT
800-256-8041
www.park-usa.com
"Expect the Best"

REDUCED PRESSURE BACKFLOW PREVENTER ON PRECAST CONCRETE PAD

SCALE	NONE	DWG. NO.	REV.
DATE	01/02	RPBPAE-1	A

REVISIONS AND ISSUANCE		
NO.	DATE	DESCRIPTION
1	8/13/18	PRICING

IVY KIDS EARLY LEARNING CENTER
4434 CR 94
MANVEL, TEXAS 77578

MISSION ENGINEERING INC.
10370 RICHMOND AVE, #560
HOUSTON, TEXAS 77042
[T] 713-981-0018
[E] dzhuang@missioneng.com
TPEF Registration No. F-11771

interim review only
not for permit or
construction

YIFENG ZHUANG
TX # 87950

08/13/2018

DRAWING TITLE

DETAILS

DRAWN BY: KN
CHECKED BY: EL

DATE: 08/13/2018
JOB NO.: 1806251

DRAWING NO.

C11