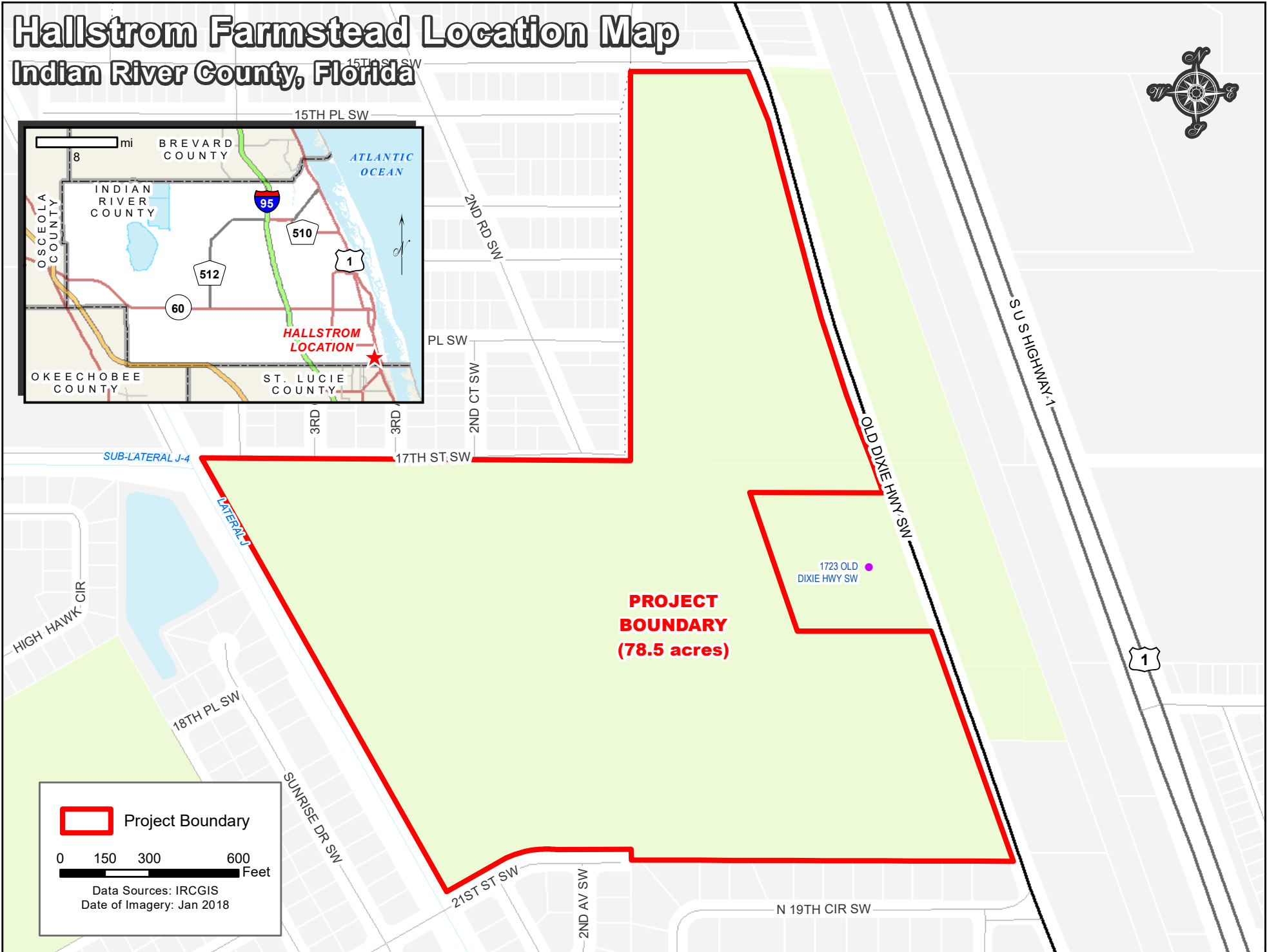


Hallstrom Farmstead Location Map

Indian River County, Florida



 Project Boundary

0 150 300 600 Feet

Data Sources: IRCGIS
Date of Imagery: Jan 2018

**PROJECT
BOUNDARY
(78.5 acres)**

HALLSTROM FARMSTEAD CONSERVATION AREA

SECTIONS 30 & 31, TOWNSHIP 33, RANGE 40
INDIAN RIVER COUNTY, FLORIDA

JUNE 2021
REVISED AUGUST 2021

OWNER / APPLICANT



INDIAN RIVER COUNTY PARKS DIVISION

5500 77TH STREET
VERO BEACH, FL 32967
PH: (772) 226-1883
MS. BETH POWELL, ASSISTANT DIRECTOR

ENGINEER



CIVIL ■ STRUCTURAL ■ SURVEYING ■ ENVIRONMENTAL

1835 20TH STREET
VERO BEACH, FL 32960
PH: (772) 569-0035
MELBOURNE, FL - PH: (321) 253-1510
FT. PIERCE, FL - PH: (772) 468-9055

SURVEYOR

HAYHURST LAND SURVEYING INC.

445 9TH STREET S.W. UNIT-7
VERO BEACH, FL 32962
PH: (772) 569-6680

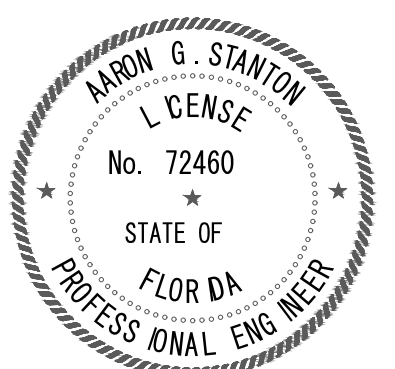
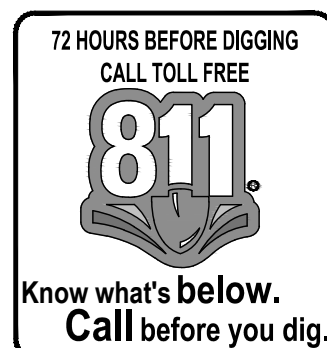
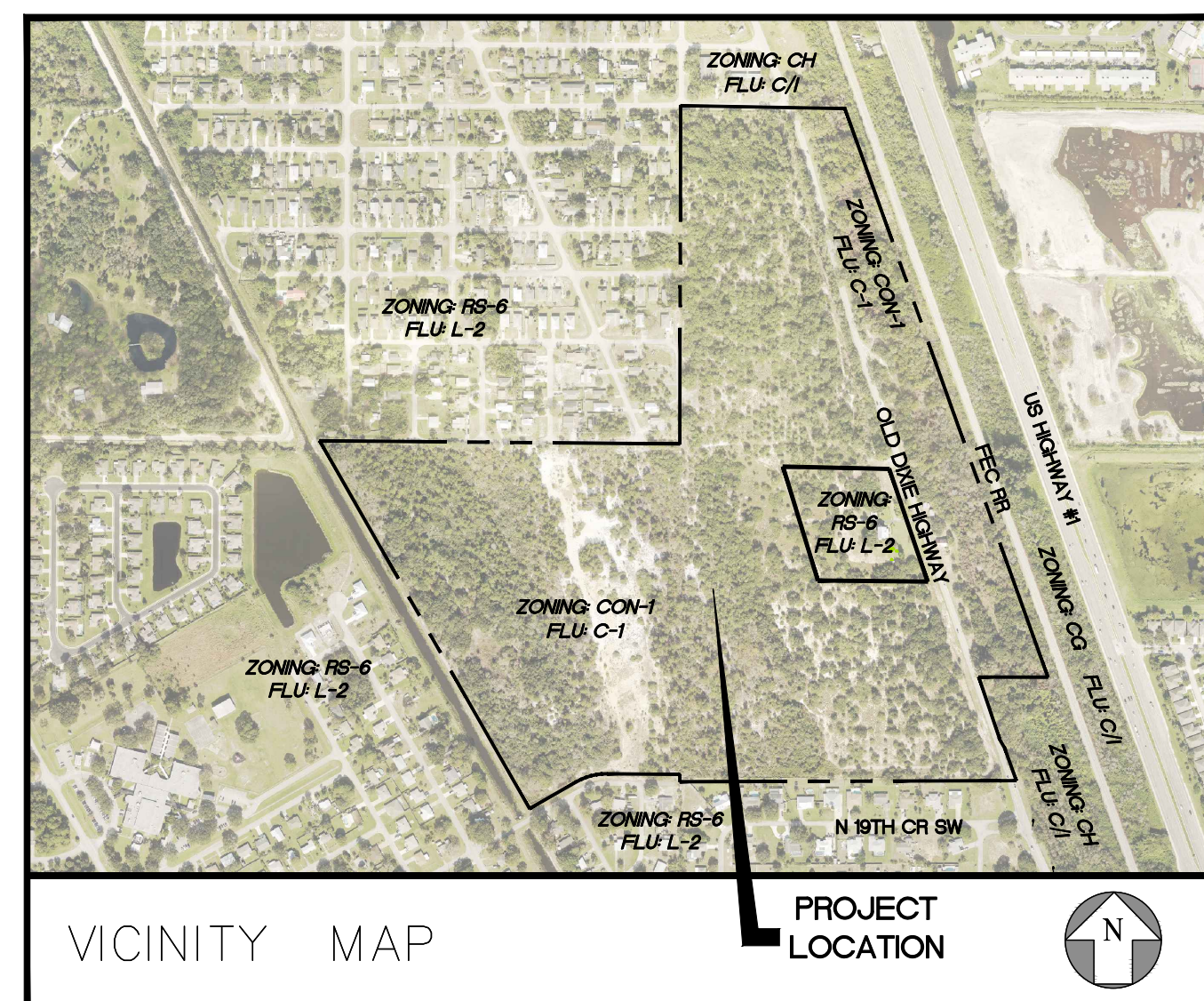
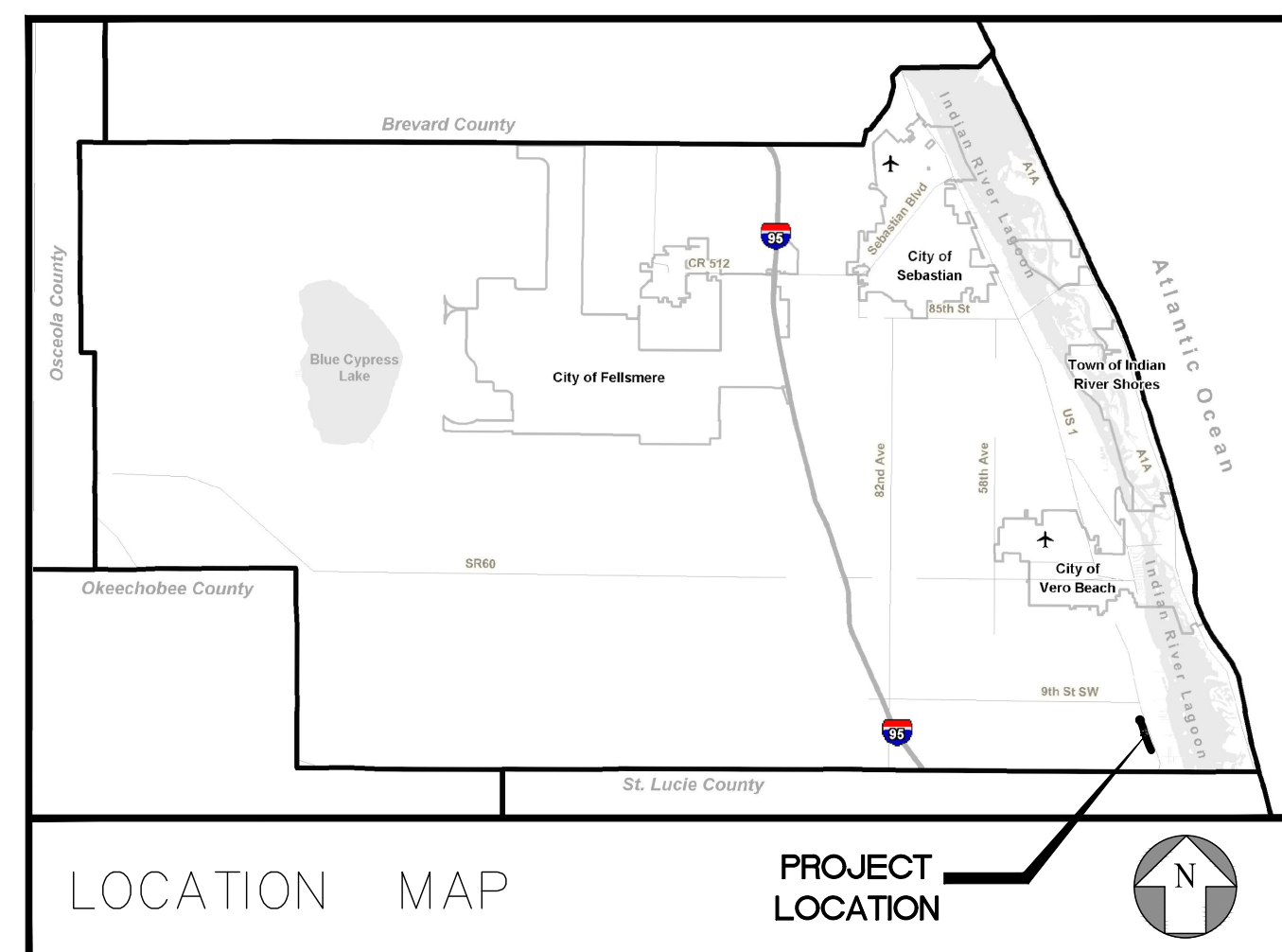
ARCHITECT

EDB ARCHITECTS & ASSOCIATES, P.A.

65 ROYAL PALM POINTE, SUITE D
VERO BEACH, FL 32960
PH: (772) 569-4320

INDEX OF DRAWINGS

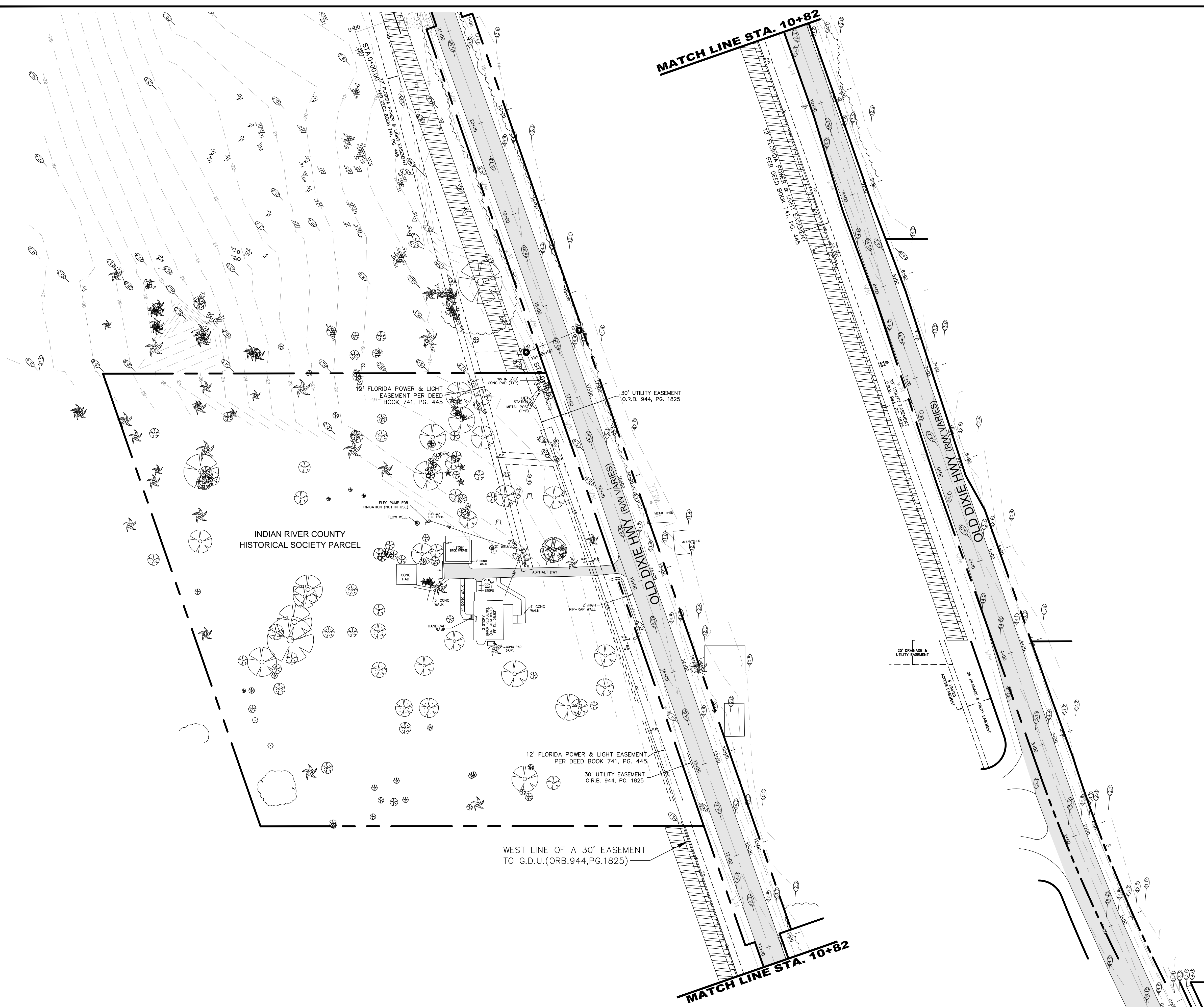
- C1 COVER SHEET
- C2 GENERAL NOTES
- C3 EXISTING CONDITIONS PLAN
- C4 EROSION CONTROL AND DEMOLITION PLAN
- C5 OVERALL SITE PLAN
- C6 SITE PLAN
- C7 PAVING, GRADING, AND DRAINAGE PLAN
- C8 ON-SITE UTILITY PLAN
- C9 OLD DIXIE HIGHWAY OFF-SITE UTILITY PLAN AND PROFILE
- C10 OLD DIXIE HIGHWAY OFF-SITE UTILITY PLAN AND PROFILE
- C11 PAVING, GRADING, DRAINAGE & EROSION CONTROL DETAILS
- C12 UTILITY DETAILS
- C13 UTILITY DETAILS
- C14 LIFT STATION DETAILS
- C15 LANDSCAPE PLANS
- C16 LANDSCAPE DETAILS
- C17 LANDSCAPE SPECIFICATIONS



AARON G. STANTON
FL. P.E. #72460

DATE:
PROJECT: 20-0240

SHEET
C1



LEGAL DESCRIPTION
 ALL THAT PORTION OF NE 1/4 OF NW 1/4 OF SECTION 31-30-40, LYING WEST OF R/W FOR OLD DIXIE HWY & LESS 5 AC PCL CONVEYED TO IRC HISTORICAL SOCIETY BY WD REC IN OR. BK. 1341 PG 776, TOGETHER WITH N 1/2 OF NE 1/4 OF NW 1/4.

VERO BEACH HIGHLANDS UNIT 1 REPLAT TRACT A PBI 7-40.

ALL THAT PORTION OF SE 1/4 OF SECTION 30-33-40, LYING WEST OF THE FECCR R/W, LESS & EXCEPT R/W FOR OLD DIXIE HWY.

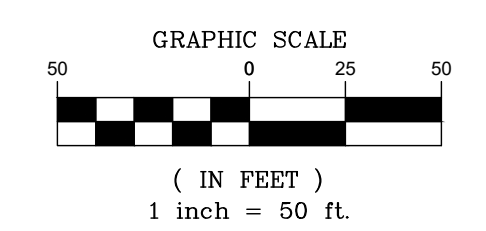
- SURVEY NOTES:**
- LANDS SHOWN HEREON WERE NOT ABSTRACTED FOR RIGHTS-OF-WAY AND/OR EASEMENTS OR RECORD.
 - THE SURVEY INFORMATION ON THIS PLAN WAS PROVIDED BY HAYHURST LAND SURVEYING, INC. ON 2/21/2021.
 - LEGAL DESCRIPTION SUPPLIED BY CLIENT.
 - SO. FT. OF HOUSE (IF SHOWN) SUPPLIED BY CLIENT.
 - NO STRUCTURES OR UTILITIES THAT ARE BENEATH THE SURFACE HAVE BEEN LOCATED.
 - ALL SET CAPS LABELED PSM WEH 4416 ARE SUPPORTED WITH AN 18" LONG #5 REBAR.
 - ALL FOUND CAPS ARE A 5/8" ROD WITH A CAP AS LABELED ON SURVEY.
 - ALL LOT DIMENSIONS ARE PLAT AND MEASURED UNLESS OTHERWISE NOTED.
 - BEARING BASE ON ORIGINAL IRC BM: NAVD 88.
 - ELEVATIONS (IF SHOWN) HEREON ARE BASED ON N.A.V.D. (1988), UNLESS OTHERWISE NOTED.

LEGEND OF SURVEY ABBREVIATIONS:

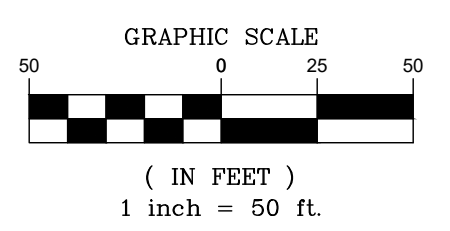
A	DELTA ANGLE	L	LENGTH		10" EXISTING PALM TREES
A/C	AIR CONDITIONER	M	MEASURE		12" EXISTING PINE TREES
AVE.	AVENUE	M.H.	MANHOLE		10" EXISTING OAK TREES
AVG.	AVERAGE	M.H.W.	MEAN HIGH WATER LEVEL		EXISTING GRADE
B.B.	BEARING BASE	MON.	MONUMENT		
B.M.	BENCH MARK	N&D	NAIL & DISK		
BLK.	BLOCK	N	NORTH		
BLVD.	BOULEVARD	No.	NUMBER		
C.	CURVE	N.I.C.	NOT INCLUDED		
C.B.	CHORD BEARING	O.H.W.	OVERHEAD WIRES		
C.B.S.	CONCRETE BLOCK	PG.	PAGE		
C.D.	CHORD DISTANCE	P.K.	PARKER KALON NAIL		
C	CENTERLINE	P	PLAT		
C.L.F.	CHAIN LINK FENCE	P.C.	POINT OF CURVATURE		
C.M.	CONCRETE MONUMENT	P.C.P.	PERMANENT CONTROL POINT		
CONC.	CONCRETE	P.I.	POINT OF INTERSECTION		
C.O.	CLEAN OUT	P.L.	PROPERTY LINE		
C.R.	COUNTY ROAD	P.M.	POWER METER		
CT.	COURT	P.O.B.	POINT OF BEGINNING		
C/S	CONCRETE SLAB	P.O.C.	POINT OF COMMENCEMENT		
COR.	CORNER	PRC	POINT OF REVERSE CURVE		
D.	DEED	P.R.M.	PERMANENT REFERENCE MONUMENT		
D.B.	DEED BOOK	"CD"	POWER POLE		
DEP.	DEPARTMENT OF	RAD.	RADIAL OR RADIUS		
DIST.	DISTANCE	R/W	RIGHT OF WAY		
DNR	DEPARTMENT OF	S.	SOUTH		
DR.	DRIVE	SEC.	SECTION		
E.	EAST	SO.FT.	SQUARE FOOT		
ESMT.	EASEMENT	S.R.	STATE ROAD		
ELEC.	ELECTRICAL	ST.	STREET		
EL.	ELEVATION	ST.	STATION		
E.O.W.	EDGE OF WATER	STRUC.	STRUCTURE		
F.F.	FIRST FLOOR	SUB.	SUBDIVISION		
FND.	FOUND	T.B.M.	TEMPORARY BENCH MARK		
F.F.L.	FIRE HYDRANT	TELE.	TELEPHONE		
F.P.L.	FLORIDA POWER & LIGHT	T.O.B.	TOP OF BANK		
I.P.	IRON PIPE	TOPO.	TOPOGRAPHICAL		
I.R.	IRON ROD	TR.	TRACT		
INV.	INVERT	TWSP.	TOWNSHIP		
F/N	FOUND NAIL	U.R.	UNREADABLE		
GOV'T	GOVERNMENT	U & D	UTILITY & DRAINAGE		
GR.	GRADE	W.	WEST		
GND.	GROUND	WM	WATER METER		
HORZ.	HORIZONTAL	WV	WATER VALVES		
H.W.	HEAD WALL	WV	WATER VALVES		



EXISTING CONDITIONS PLAN (NORTH)



EXISTING CONDITIONS PLAN (SOUTH)



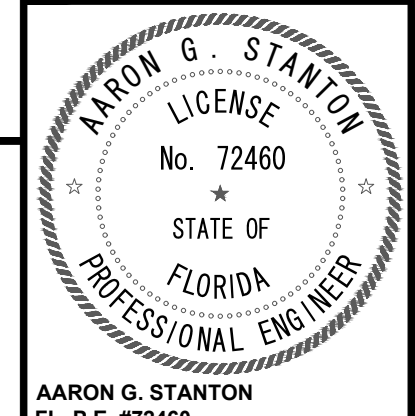
ALL ELEVATIONS IN NAVD 88

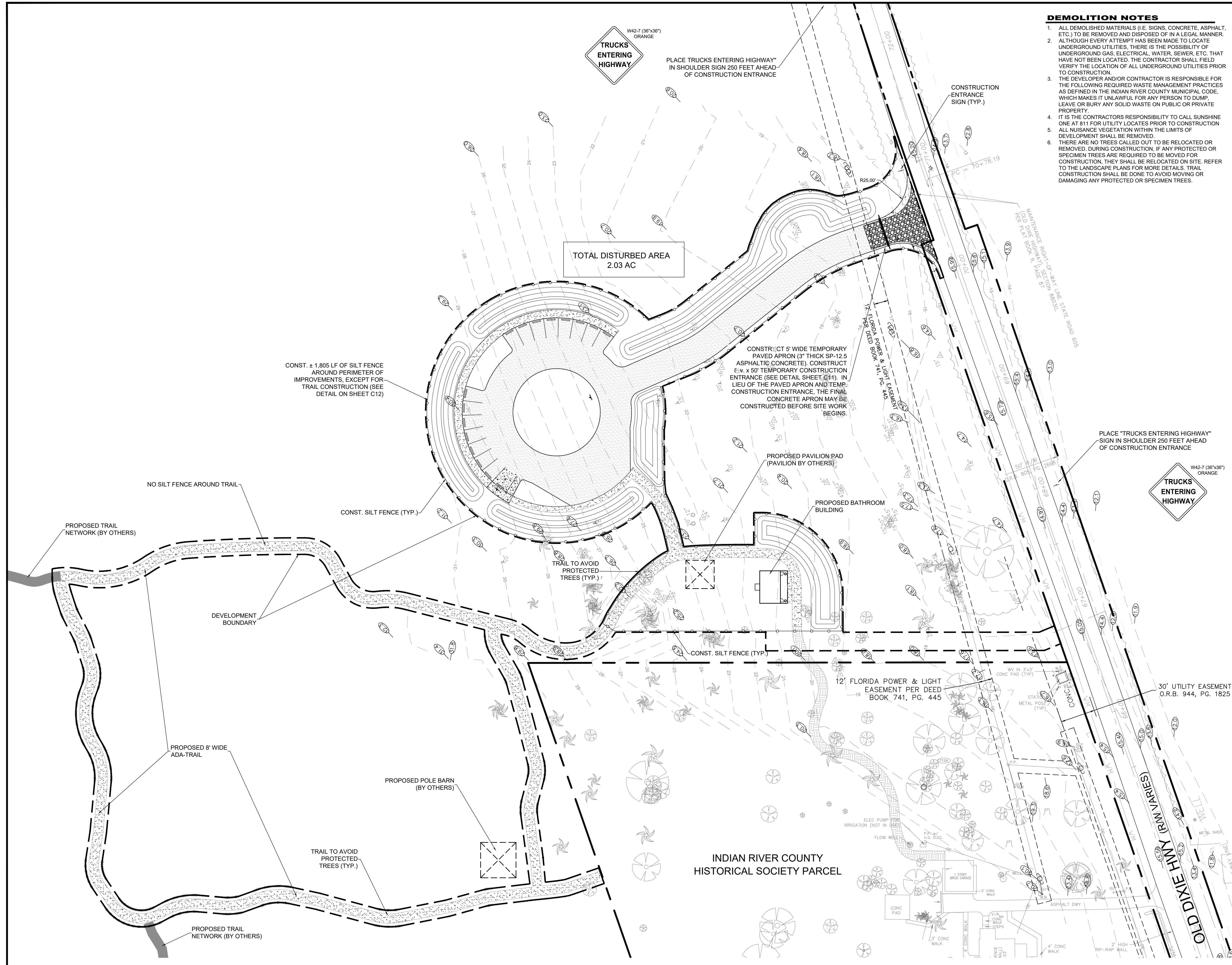
JOB NO.	DESIGNED	DRAWN	CHECKED	DATE ISSUED
20-0240	AS	JIB	TH	6/11/2021

MBV ENGINEERING, INC.
 MOHA BOWLES VILLALBAZAR & ASSOCIATES
 ENGINEERING & SURVEYING
 1835 W. BEACH, SUITE 201, VERO BEACH, FL 32960
 TEL: (772) 778-3817 FAX: (772) 778-3817

EXISTING CONDITIONS PLAN

HALLSTROM FARMSTEAD CONSERVATION AREA





DEMOLITION NOTES

1. ALL DEMOLISHED MATERIALS (I.E. SIGNS, CONCRETE, ASPHALT, ETC.) TO BE REMOVED AND DISPOSED OF IN A LEGAL MANNER.
2. ALTHOUGH EVERY ATTEMPT HAS BEEN MADE TO LOCATE UNDERGROUND UTILITIES, THERE IS THE POSSIBILITY OF UNDERGROUND GAS, ELECTRICAL, WATER, SEWER, ETC. THAT HAVE NOT BEEN LOCATED. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
3. THE DEVELOPER AND/OR CONTRACTOR IS RESPONSIBLE FOR THE FOLLOWING REQUIRED WASTE MANAGEMENT PRACTICES AS DEFINED IN THE INDIAN RIVER COUNTY MUNICIPAL CODE, WHICH MAKES IT UNLAWFUL FOR ANY PERSON TO DUMP, LEAVE OR BURY ANY SOLID WASTE ON PUBLIC OR PRIVATE PROPERTY.
4. IT IS THE CONTRACTORS RESPONSIBILITY TO CALL SUNSHINE ONE AT 811 FOR UTILITY LOCATES PRIOR TO CONSTRUCTION.
5. ALL NUISANCE VEGETATION WITHIN THE LIMITS OF DEVELOPMENT SHALL BE REMOVED.
6. THERE ARE NO TREES CALLED OUT TO BE RELOCATED OR REMOVED, DURING CONSTRUCTION, IF ANY PROTECTED OR SPECIMEN TREES ARE REQUIRED TO BE MOVED FOR CONSTRUCTION, THEY SHALL BE RELOCATED ON SITE. REFER TO THE LANDSCAPE PLANS FOR MORE DETAILS. TRAIL CONSTRUCTION SHALL BE DONE TO AVOID MOVING OR DAMAGING ANY PROTECTED OR SPECIMEN TREES.

EROSION AND SEDIMENT CONTROL NOTES

- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FDEP AND INDIAN RIVER COUNTY EROSION AND SEDIMENT CONTROL REGULATIONS.
1. IF NECESSARY, SLOPES, WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.
 2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
 3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED EVERY (7) SEVEN DAYS OR AFTER EVERY 0.5 INCH RAINFALL EVENT, BUT IN NO CASE LESS THAN ONCE EVERY WEEK. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN INAPPROPRIATELY, OR INCORRECTLY, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION REQUIRED TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.
 4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.
 5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION, IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED.
 6. SEDIMENT SHALL BE REMOVED FROM BEHIND THE SILT FENCING WHEN IT BECOMES 6 INCHES DEEP AT THE FENCE. THE FENCING WILL BE PREPARED AS NECESSARY TO MAINTAIN A SUFFICIENT BARRIER.
 7. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE TRACKING OF MUD ONTO PAVED ROADWAYS FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.
 8. CONSTRUCTION DRIVES SHALL SLOPE AWAY FROM THE ROADWAY AT A MINIMUM SLOPE OF 2% TO A DISTANCE OF NOT LESS THAN 10 FT. FROM THE EDGE OF PAVEMENT. THE MAXIMUM WIDTH OF THE DRIVE SHALL BE 30 FT. WITH #57 STONE, 6" THICK. SIGNS SHALL BE PLACED IN ACCORDANCE WITH CITY AND STATE REQUIREMENTS TO WARN APPROACHING DRIVERS AND PEDESTRIANS.
 9. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORMWATER DISCHARGES.
 10. A COPY OF THE SWPPP, INSPECTIONS RECORDS, AND RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT FINAL STABILIZATION IS REACHED.
 11. INITIATE STABILIZATION MEASURES ON ANY EXPOSED STEEP SLOPE (3:1 V OR GREATER) WHERE LAND-DISTURBING ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED, AND WILL NOT RESUME FOR A PERIOD OF 7 CALENDAR DAYS.
 12. MINIMIZE SOIL COMPACTION AND, UNLESS INFEASIBLE, PRESERVE TOPSOIL.
 13. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE.
 14. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OF TRENCHES AND EXCAVATED AREAS. THESE DISCHARGES ARE TO BE ROUTED THROUGH APPROPRIATE BMPs (SEDIMENT BASINS, FILTER BAGS, ETC.)
 15. THE FOLLOWING DISCHARGES FROM SITES ARE PROHIBITED:
 - A. WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY AN APPROPRIATE CONTROL.
 - B. WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS.
 - C. FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE, AND
 - D. SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING.
 16. AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTIONS MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK AND MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.
 17. IF EXISTING BMPs NEED TO BE MODIFIED OR IF ADDITIONAL BMPs ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION GENERAL PERMIT (SCR100 AND/OR SCS WATER QUALITY STANDARDS), IMPLEMENTATION MUST BE COMPLETED BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE. IF IMPLEMENTATION BEFORE THE NEXT STORM EVENT IS IMPRACTICABLE, THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPs MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.
 18. A PRE-CONSTRUCTION CONFERENCE MUST BE HELD FOR EACH CONSTRUCTION SITE WITH AN APPROVED ON-SITE SWPPP PRIOR TO THE IMPLEMENTATION OF CONSTRUCTION ACTIVITIES.
 19. ALL DISTURBED AREAS NOT TO BE LANDSCAPED MUST BE GRASSED.
 20. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AS NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.
 21. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL A PERMANENT GROUND COVER HAS BEEN ESTABLISHED.
 22. REFER TO DETAILS ON SHEET C11.

LEGEND

	EXISTING PAVEMENT		PROPOSED STABILIZED PARKING
	EXISTING CONCRETE		PROPOSED CONCRETE
	TO BE DEMOLISHED		PROPOSED ADA-WALKING TRAIL
	EXISTING PALM TREES		PROPOSED WALKING TRAIL (BY OTHERS)
	EXISTING PINE TREES		PROPOSED MARL PATH (BY OTHERS)
	EXISTING OAK TREES		DEVELOPMENT BOUNDARY
	PROPOSED STABILIZED CONSTRUCTION ENTRANCE		
	PROPOSED SILT FENCE		
	EXISTING GRADE		
	PROPERTY BOUNDARY / RIGHT OF WAY		

NO.	DATE	REVISIONS
8	6/11/2021 <td>DATE ISSUED</td>	DATE ISSUED
7	6/11/2021 <td>DATE CHECKED</td>	DATE CHECKED
6	6/11/2021 <td>DATE DRAWN</td>	DATE DRAWN
5	6/11/2021 <td>DATE DESIGNED</td>	DATE DESIGNED
4	6/11/2021 <td>DATE</td>	DATE
3	6/11/2021 <td>ADD SOD QUANTITIES</td>	ADD SOD QUANTITIES
2	6/11/2021 <td>RC COMMENTS</td>	RC COMMENTS
1	6/11/2021 <td>RC COMMENTS</td>	RC COMMENTS

MBV ENGINEERING, INC.
 ENGINEERING & ASSOCIATES
 MOA, BONNIE VILLAZAR & ASSOCIATES
 ENGINEERING CA #3728
 1850 W. BEACH, P.O. BOX 32860
 MIAMI, FL 33134
 PHONE: (305) 953-1510
 FAX: (305) 953-1511
 FT. PIERCE, FL - PH: (772) 468-9055

EROSION CONTROL AND DEMOLITION PLAN

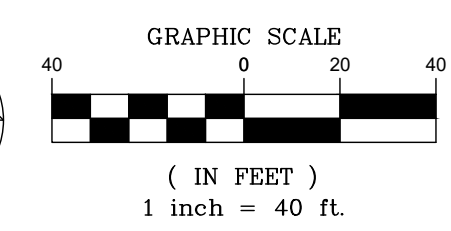
HALLSTROM FARMSTEAD CONSERVATION AREA

AARON G. STANTON
 LICENSE No. 72460
 STATE OF FLORIDA
 PROFESSIONAL ENGINEER

SHEET
C4
 20-0240



EROSION CONTROL AND DEMOLITION PLAN





SITE INFORMATION

SITE ADDRESS
 1701 OLD DIXIE HIGHWAY, SW
 VERO BEACH, FLORIDA 32962
 RESTROOMS: BLDG. A
 24' x 24' PAVILION: BLDG. B
 30' x 30' PAVILION: BLDG. C

ARCHITECT
 EDB ARCHITECTS & ASSOCIATES, P.A.
 65 ROYAL PALM POINTE, SUITE D
 VERO BEACH, FLORIDA 32960
 PHONE (772) 569-4320

OWNER/APPLICANT
 INDIAN RIVER COUNTY PARKS DIVISION
 5500 77TH STREET
 VERO BEACH, FLORIDA 32967
 PHONE (772) 226-1883

SURVEYOR
 HAYHURST LAND SURVEYING, INC.
 445 9TH STREET S.W. UNIT 7
 VERO BEACH, FLORIDA 32962
 PHONE (772) 569-6880

ENGINEER
 MBV ENGINEERING, INC.
 1635 20TH STREET
 VERO BEACH, FLORIDA 32960
 PHONE (772) 569-0035

TAX PARCEL I.D. NUMBER(S)
 33-40-31-00000-1000-00003.3.33-40-31-00004-0001-00001.0 & 33-40-30-00000-5000-00009.1

PROJECT DESCRIPTION
 CONSTRUCTION OF WALKING TRAILS, PARKING, BATHROOM, AND PAVILION PAD, WITH ASSOCIATED PARKING, STORMWATER MANAGEMENT AREAS AND UTILITIES ON CONSERVATION LAND. THE DRIVEWAY, PARKING AND ADA-ACCESSIBLE TRAILS ARE TO BE CONSTRUCTED OF SEMI-PERVIOUS MATERIAL. THE STORMWATER IS TO BE DRY RETENTION SWALES AND PONDS. THE UTILITIES WILL INCLUDE WATER AND SEWER SERVICE FOR THE BATHROOM BUILDING. THE SEWER SERVICE SHALL BE VIA GRINDER STATION WITH PRESSURE CONNECTION TO THE EXISTING FORCEMAIN, LOCATED APPROXIMATELY 2,000 LINEAR FEET SOUTH ON THE EAST SIDE OF OLD DIXIE HWY.

CON-1	C-1
MINIMUM DENSITY	---
MINIMUM LOT SIZE	---
MINIMUM LOT WIDTH	---
BUILDING SETBACKS	---
FRONT (EAST)	50'
SIDE (NORTH)	50'
SIDE (SOUTH)	50'
REAR (WEST)	50'
MAXIMUM BUILDING HEIGHT	35'
MAXIMUM LOT COVERAGE	---
MAXIMUM OPEN SPACE	---

BUILDING DATA	REQUIRED	PROPOSED
MAXIMUM DENSITY	---	---
MINIMUM LOT SIZE	---	---
MINIMUM LOT WIDTH	---	---
BUILDING SETBACKS	---	---
FRONT (EAST)	50'	198.44'
SIDE (NORTH)	50'	1,348.20'
SIDE (SOUTH)	50'	50.27'
REAR (WEST)	50'	1,413.90'
MAXIMUM BUILDING HEIGHT	35'	94'
MAXIMUM LOT COVERAGE	---	---
MAXIMUM OPEN SPACE	---	---

EXISTING SITE DATA

TOTAL SITE AREA	= 3,859,852 SF	= 88.61 Ac	= 100.00 %
EXISTING BUILDING AREA	= 0 SF	= 0.00 Ac	= 0.00 %
EXISTING PAVEMENT AND CONCRETE AREA	= 0 SF	= 0.00 Ac	= 0.00 %
TOTAL IMPERVIOUS AREA	= 0 SF	= 0.00 Ac	= 0.00 %
TOTAL OPEN AREA	= 3,859,852 SF	= 88.61 Ac	= 100.00 %

PROPOSED SITE DATA

TOTAL SITE AREA	= 3,859,852 SF	= 88.61 Ac	= 100.00 %
DEVELOPED AREA	= 88,574 SF	= 2.03 Ac	= 2.29 %
EXISTING BUILDING AREA	= 0 SF	= 0.00 Ac	= 0.00 %
EXISTING PAVEMENT AND CONCRETE AREA	= 1,228 SF	= 0.03 Ac	= 0.03 %
PROPOSED BUILDING AREA	= 1,852 SF	= 0.04 Ac	= 0.05 %
PROPOSED HANDICAP STALL	= 18,270 SF	= 0.42 Ac	= 0.47 %
PROPOSED PARKING & DRIVEWAY	= 12,780 SF	= 0.29 Ac	= 0.33 %
70% IMPERVIOUS AREA	= 16,491 SF	= 0.38 Ac	= 0.43 %
PROPOSED STABILIZED TRAIL	= 11,544 SF	= 0.26 Ac	= 0.30 %
70% IMPERVIOUS AREA	= 27,411 SF	= 0.63 Ac	= 0.71 %
TOTAL IMPERVIOUS AREA	= 3,832,441 SF	= 87.98 Ac	= 99.29 %
NET NEW IMPERVIOUS AREA	= 27,411 SF	= 0.63 Ac	= 0.71 %

PERMITS REQUIRED

- INDIAN RIVER COUNTY MAJOR SITE PLAN
- INDIAN RIVER COUNTY SPECIAL EXCEPTION USE APPROVAL
- INDIAN RIVER COUNTY CONDITIONAL & FINAL CONCURRENCY
- INDIAN RIVER COUNTY LAND CLEARING
- INDIAN RIVER COUNTY TREE REMOVAL
- INDIAN RIVER COUNTY STORMWATER
- INDIAN RIVER COUNTY RIGHT-OF-WAY
- INDIAN RIVER COUNTY UTILITIES CONSTRUCTION PERMIT
- INDIAN RIVER COUNTY FIRE DEPARTMENT APPROVAL
- FDEP DOMESTIC WASTEWATER
- FDEP NPDES NOI
- SI/RWMD 10-2 SELF CERTIFICATION

PARKING REQUIREMENTS

PARKING REQUIRED: PUBLIC PARKING = 2 SP / ACRE OF OPEN SPACE GENERATING DEMAND (2 X 8 ACRES) = 16 SPACES
 ADA PARKING REQUIRED: 1 SPACE UP TO 25 PARKING SPACES
 PARKING PROVIDED: 16 SPACES, INCLUDING 1 ADA SPACE

TRIP GENERATION

PER ITE, 10th ADDITION
 (411) PUBLIC PARK
 88.61 ACRES x 0.78 TRIPS/AC = 69 AVERAGE DAILY TRIPS

DESIGN SPEED

DESIGN: 45 MPH
 POSTED: 40 MPH

FLOOD ZONE

THE SUBJECT PROPERTY LIES IN FLOOD ZONE 'AE' (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - BASE ELEVATION DETERMINED) AND UNSHADE FLOOD ZONE 'X' (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN), AS SCALED FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAPS, No. 12061C0359H AND 12061C0378H, EFFECTIVE DECEMBER 4, 2012.

CONSTRUCTION SCHEDULE

CONSTRUCTION START: OCTOBER 2021
 CONSTRUCTION END: APRIL 2022

LEGAL DESCRIPTION

ALL THAT PORTION OF NE 1/4 OF NW 1/4 OF SECTION 31-30-40, LYING WEST OF R/W FOR OLD DIXIE HWY & LESS 5 AC PCL CONVEYED TO IRC HISTORICAL SOCIETY BY WD REC IN OR. BK. 1341 PG 776. TOGETHER WITH N 1/2 OF NE 1/4 OF NW 1/4.

VERO BEACH HIGHLANDS UNIT 1 REPLAT TRACT A PBI 7-40.

ALL THAT PORTION OF SE 1/4 OF SECTION 30-33-40, LYING WEST OF THE FECRR R/W, LESS & EXCEPT R/W FOR OLD DIXIE HWY.

CONSTRUCTION SCHEDULE

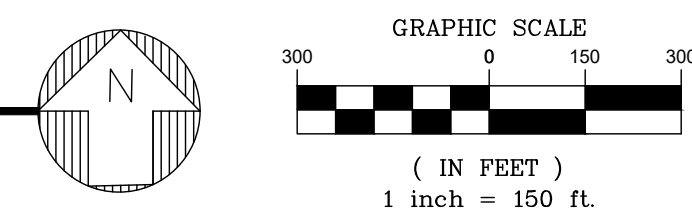
LEGAL DESCRIPTION

CONSTRUCTION SCHEDULE

LEGAL DESCRIPTION

CONSTRUCTION SCHEDULE

OVERALL SITE PLAN



SITE LEGEND

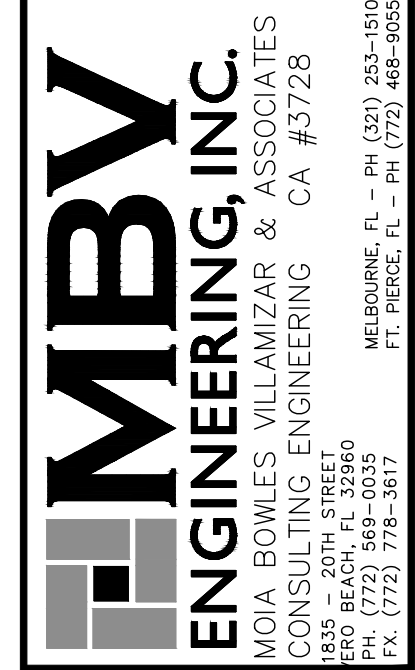
- EXISTING ASPHALT
- PROPOSED CONCRETE
- PROPOSED STABILIZED PARKING
- PROPOSED ADA-WALKING TRAIL
- PROPOSED WALKING TRAIL (BY OTHERS)
- PROPOSED MARL PATH (BY OTHERS)
- DEVELOPMENT BOUNDARY



ALL ELEVATIONS IN NAVD 88

JOB NO.	DESIGNED	DRAWN	DATE	CHECKED	DATE	ISSUED
20-0240	AS	JIB	JUNE 2021	TH	6/11/2021	
8	7	6	5	4	3	2

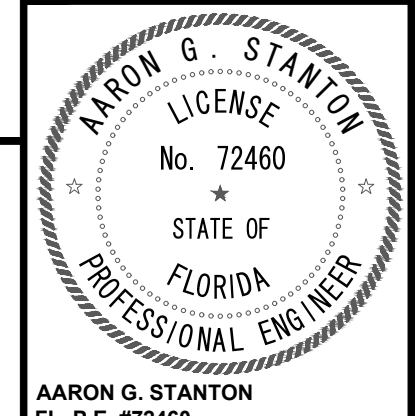
ADD SOD QUANTITIES	REVISIONS
3	1
2	2
1	3



OVERALL SITE PLAN

HALLSTROM FARMSTEAD CONSERVATION AREA

INDIAN RIVER COUNTY, FLORIDA



SHEET
C5
 20-0240

SIGNAGE, STRIPING AND RAMPS LEGEND

①	(R1-1) STOP SIGN
②	24" SOLID WHITE STOP BAR, THERMOPLASTIC
③	25LF 6" DOUBLE YELLOW STRIPING
④	(R8-2) ONE WAY SIGN, 24"x30"

SITE LEGEND

	EXISTING ASPHALT
	PROPOSED CONCRETE
	PROPOSED STABILIZED PARKING
	PROPOSED ADA-WALKING TRAIL
	PROPOSED WALKING TRAIL (BY OTHERS)
	PROPOSED MARL PATH (BY OTHERS)
	SIGHT LINE AREA*
	DEVELOPMENT BOUNDARY
	PROPERTY BOUNDARY / RIGHT OF WAY LINE

TREE LEGEND

	EXISTING PALM TREES
	EXISTING PINE TREES
	EXISTING OAK TREES

NOTES:
 * AS PER THE REQUIREMENTS FOUND UNDER IRC LDR CODE, SECTION 926.09(5), THE CONTRACTOR SHALL TRIM ANY VEGETATION WITHIN THE SIGHT LINE AREA BETWEEN A LEVEL OF 2.5 FEET AND 10 FEET ABOVE GRADE, AND REMOVE ANY VEGETATION EXCEPT GROUND COVER AND GRASSES WITHIN 6 FEET OF THE ACCESS EDGE OF PAVEMENT. THE ENGINEER AND COUNTY STAFF SHALL BE NOTIFIED AT LEAST 24 HOURS BEFORE THIS WORK COMMENCES.

NO.	DATE	REVISIONS
8	6/11/2021	DATE ISSUED
7		
6		
5		
4		
3	10/19/2021	ADD SOD QUANTITIES
2	9/23/2021	REVIS COMMENTS
1	8/12/2021	IRC COMMENTS

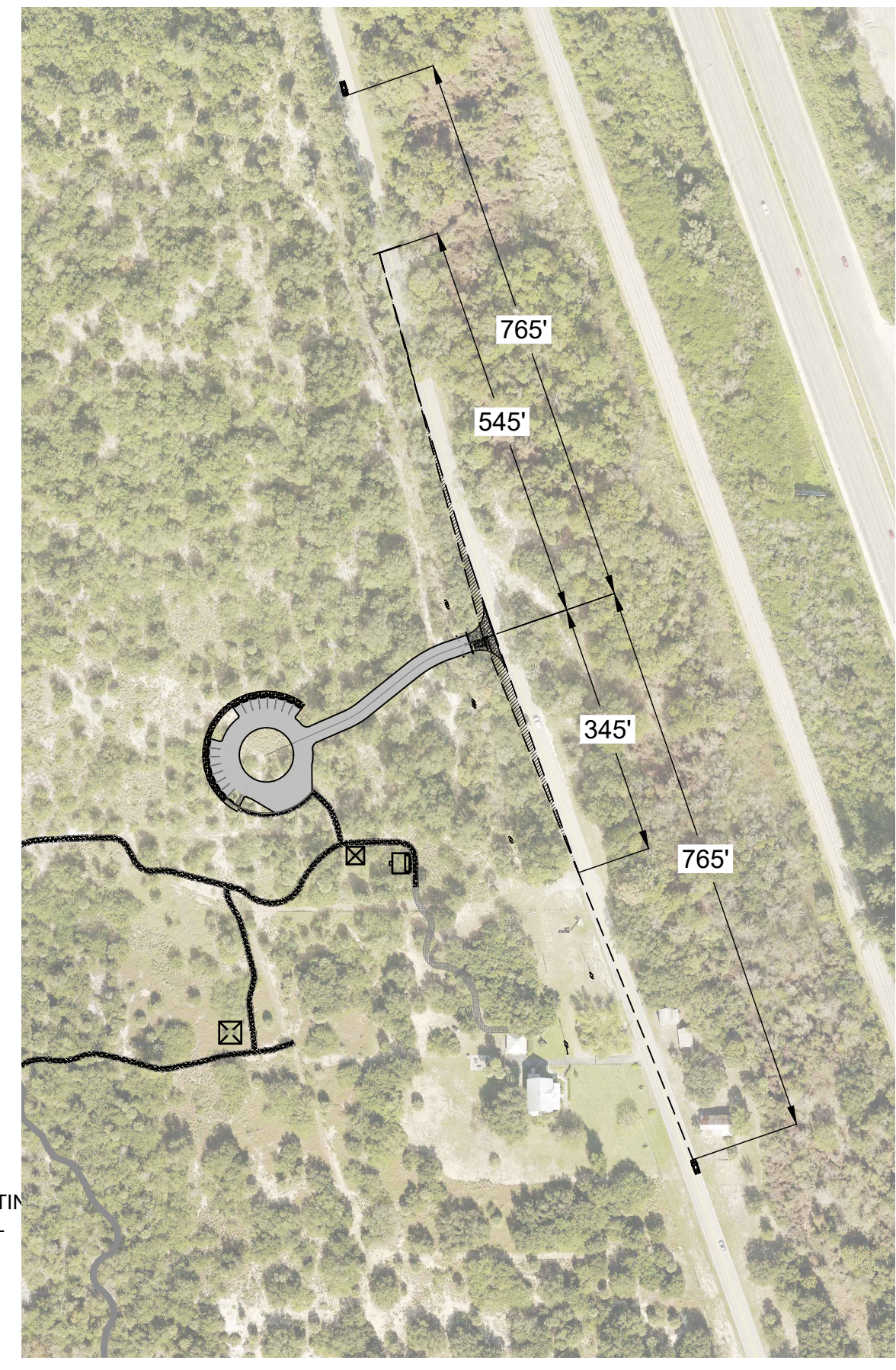
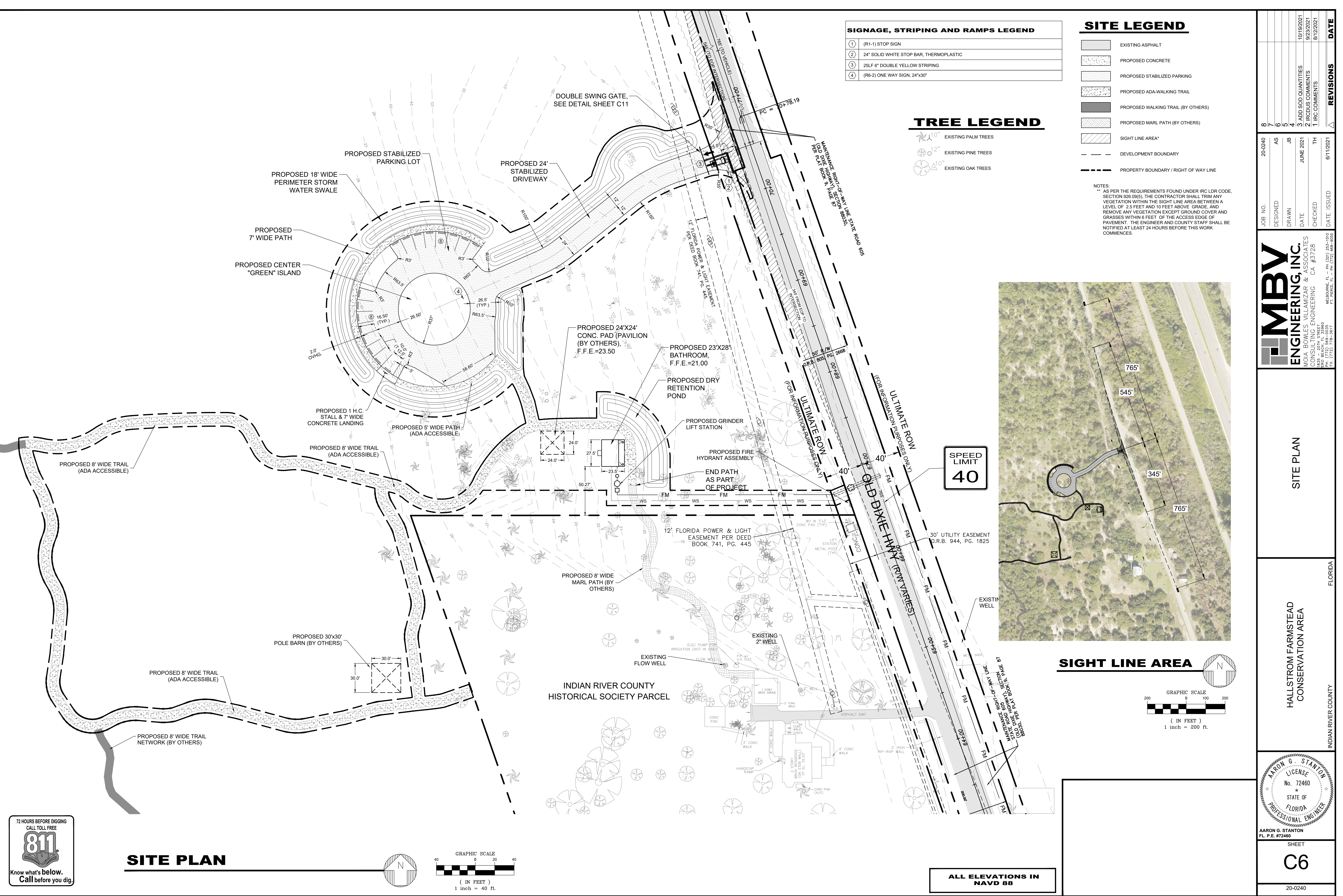
MBV ENGINEERING, INC.
 MOHA BOWLES VILLAMIZAR & ASSOCIATES
 ENGINEERING CA #57128
 1835 W. 20TH STREET
 BREVARD COUNTY, FL 32960
 TEL: (321) 953-1510
 FT. PIERCE, FL - PH: (772) 468-9025

SITE PLAN

HALLSTROM FARMSTEAD
 CONSERVATION AREA
 FLORIDA
 INDIAN RIVER COUNTY

AARON G. STANTON
 LICENSE No. 72460
 STATE OF FLORIDA
 PROFESSIONAL ENGINEER

SHEET
C6
 20-0240



SIGHT LINE AREA

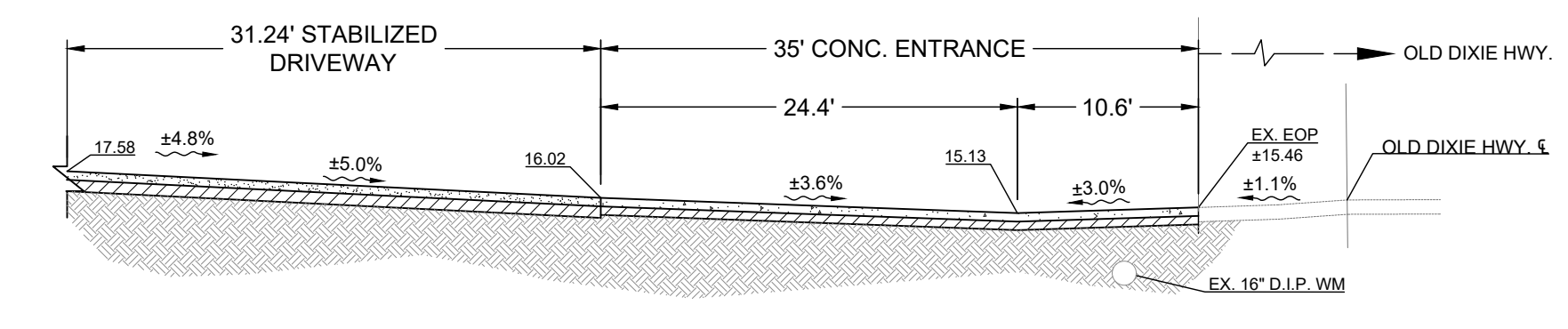
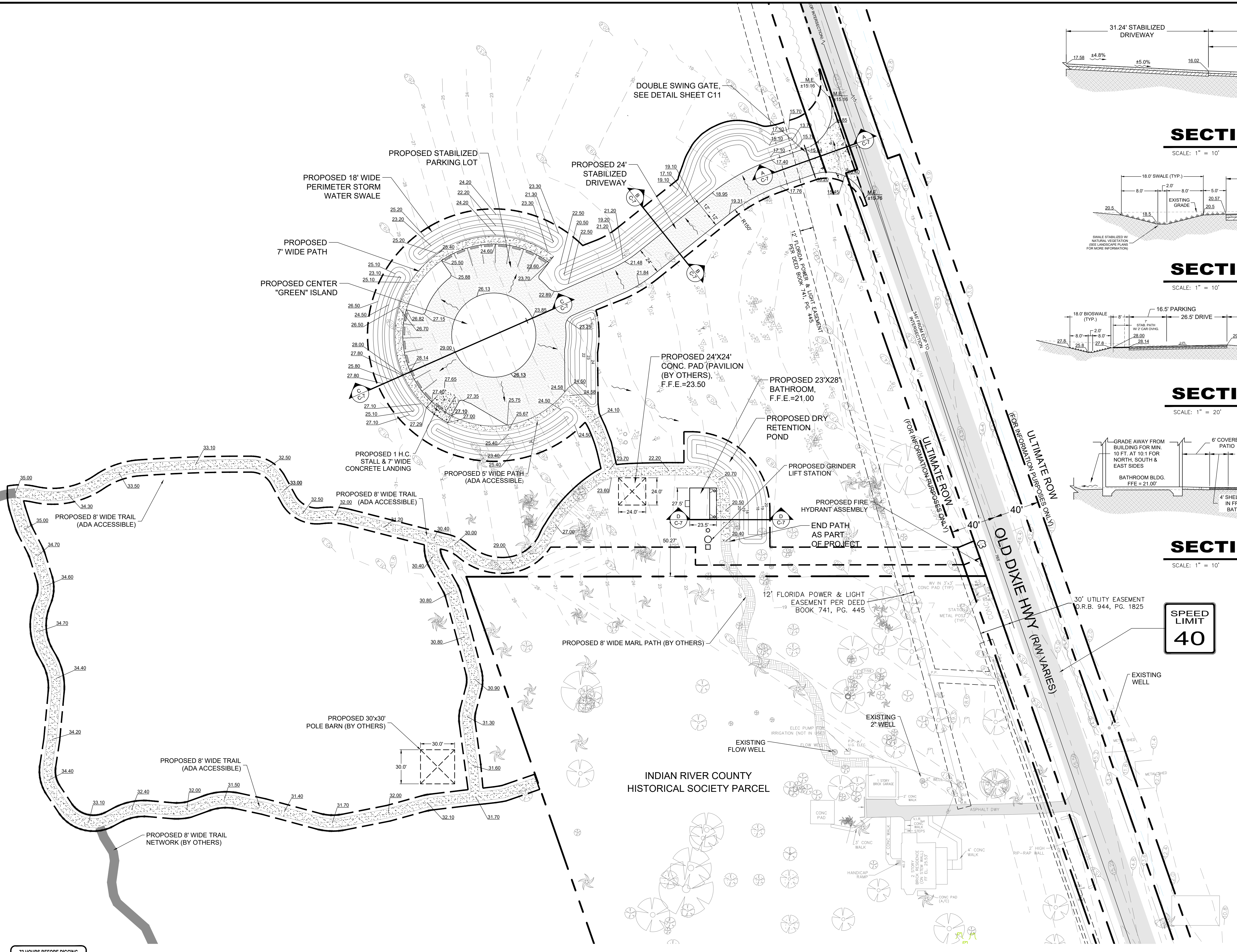
GRAPHIC SCALE
 0 100 200
 (IN FEET)
 1 inch = 200 ft.

72 HOURS BEFORE DIGGING
 CALL TOLL FREE
811
 Know what's below.
 Call before you dig.

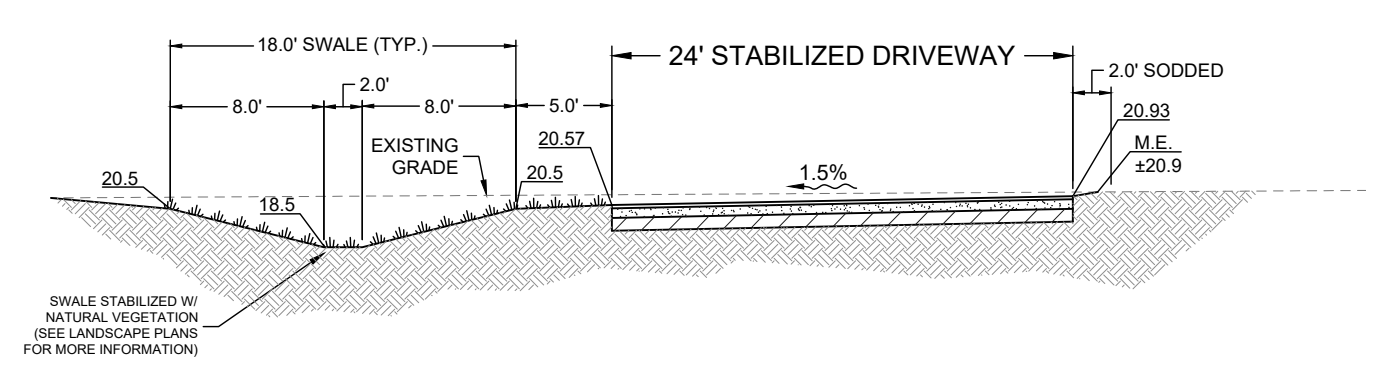
SITE PLAN

GRAPHIC SCALE
 0 20 40
 (IN FEET)
 1 inch = 40 ft.

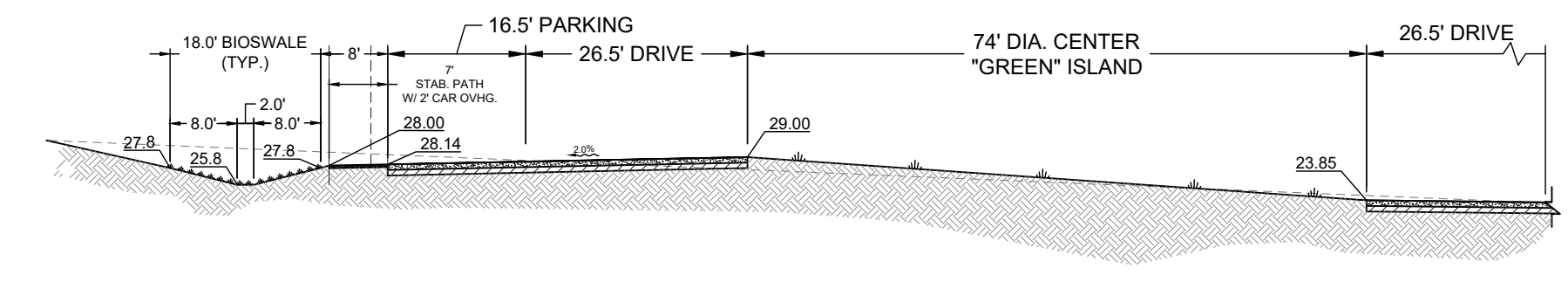
ALL ELEVATIONS IN NAVD 88



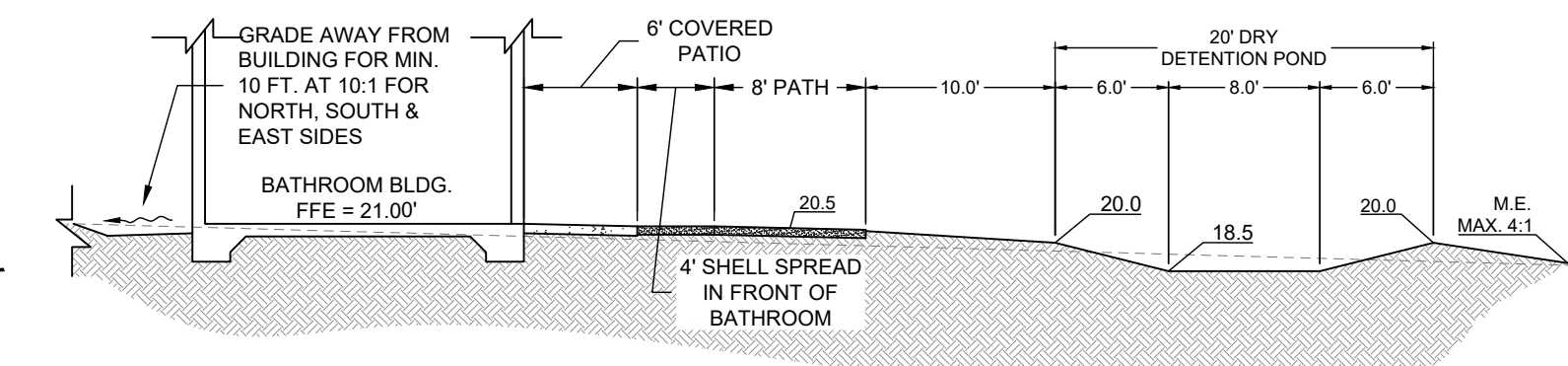
SECTION A-A
SCALE: 1" = 10'



SECTION B-B
SCALE: 1" = 10'



SECTION C-C
SCALE: 1" = 20'



SECTION D-D
SCALE: 1" = 10'

PGD NOTES:

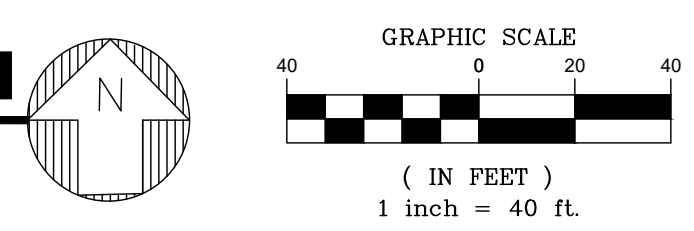
1. GRADING FOR THE ADA-PORTION OF TRAIL SHALL COMPLY WITH CROSS-SLOPES NO GREATER THAN 2.0% AND LONGITUDINAL SLOPES NO GREATER THAN 5.0%.

SITE LEGEND

- EXISTING ASPHALT
- PROPOSED CONCRETE
- PROPOSED STABILIZED PARKING
- PROPOSED ADA-WALKING TRAIL
- PROPOSED WALKING TRAIL (BY OTHERS)
- PROPOSED MARL PATH (BY OTHERS)
- SIGHT LINE AREA
- DEVELOPMENT BOUNDARY
- PROPERTY BOUNDARY / RIGHT OF WAY LINE
- EXISTING ELEVATION
- PROPOSED ELEVATION
- DRAINAGE FLOW PATTERN



PAVING, GRADING, AND DRAINAGE PLAN



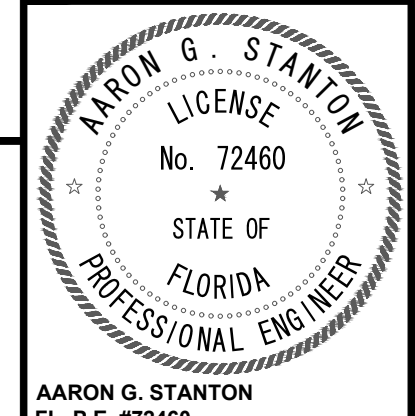
ALL ELEVATIONS IN NAVD 88

JOB NO.	DESIGNED	DRAWN	DATE	CHECKED	DATE ISSUED	DATE
20-0240	AS	JIB	JUNE 2021	TH	6/11/2021	

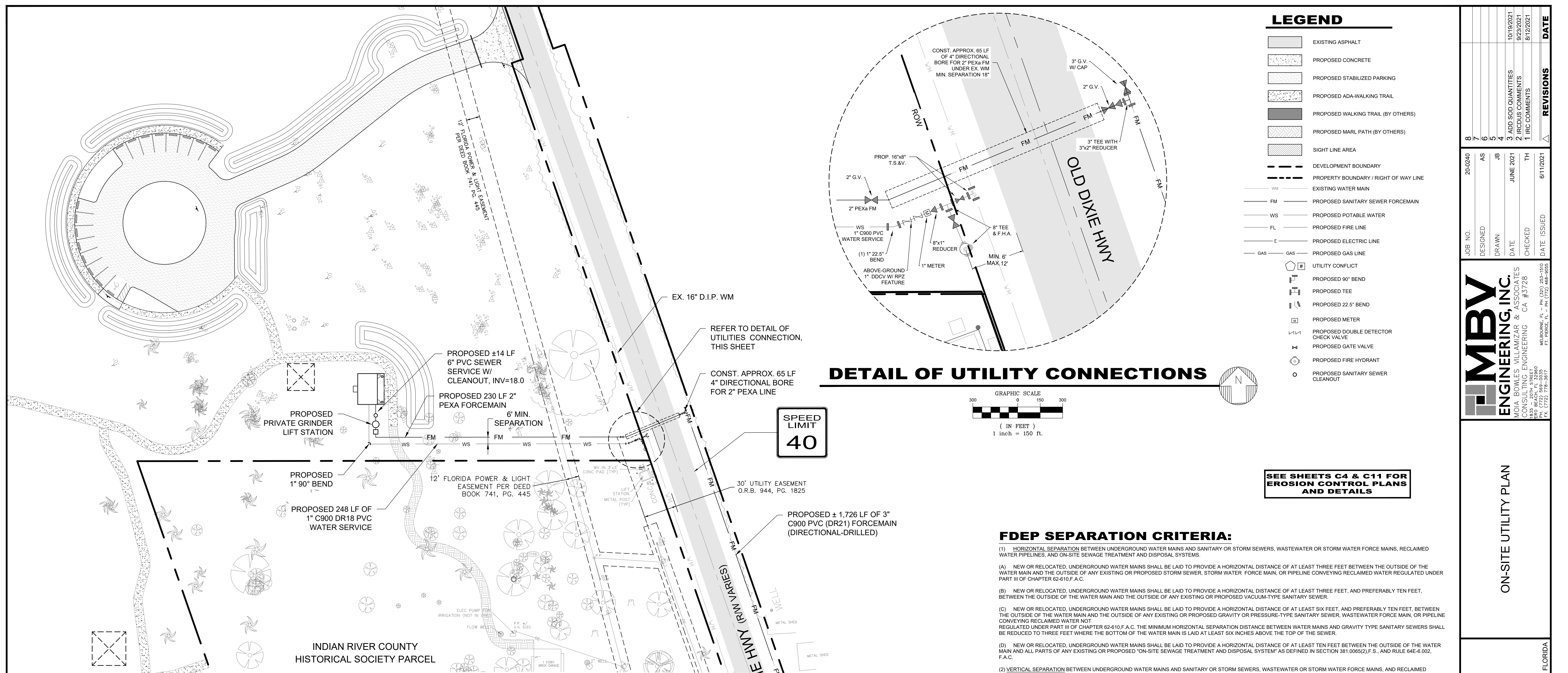
MBV ENGINEERING, INC.
 MOA BONLES-VILLAMIZAR & ASSOCIATES
 ENGINEERING & CA #57128
 1830 S. 20TH STREET
 BOCA RATON, FL 33480
 TEL: (561) 993-1510
 FAX: (561) 993-3817

PAVING, GRADING AND DRAINAGE PLAN

HALLSTROM FARMSTEAD CONSERVATION AREA



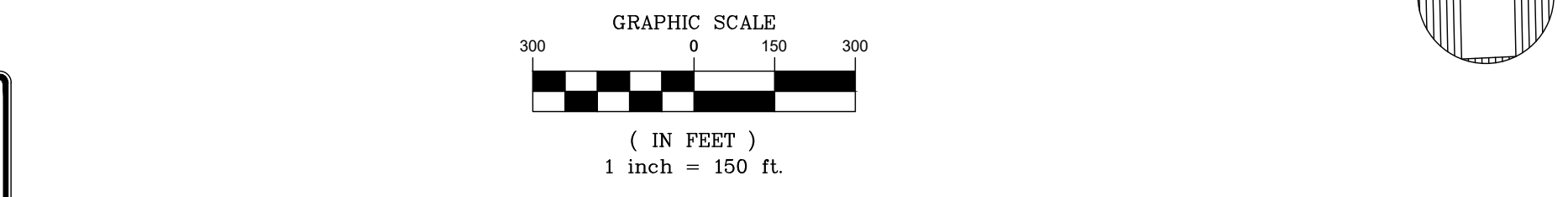
AARON G. STANTON
 FL. P.E. #72460
 SHEET
C7
 20-0240



LEGEND

- EXISTING ASPHALT
- PROPOSED CONCRETE
- PROPOSED STABILIZED PARKING
- PROPOSED ADA-WALKING TRAIL
- PROPOSED WALKING TRAIL (BY OTHERS)
- PROPOSED MARL PATH (BY OTHERS)
- SIGHT LINE AREA
- DEVELOPMENT BOUNDARY
- PROPERTY BOUNDARY / RIGHT OF WAY LINE
- EXISTING WATER MAIN
- PROPOSED SANITARY SEWER FORCEMAIN
- PROPOSED POTABLE WATER
- PROPOSED FIRE LINE
- PROPOSED ELECTRIC LINE
- PROPOSED GAS LINE
- UTILITY CONFLICT
- PROPOSED 90° BEND
- PROPOSED TEE
- PROPOSED 22.5° BEND
- PROPOSED METER
- PROPOSED DOUBLE DETECTOR CHECK VALVE
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER CLEANOUT

DETAIL OF UTILITY CONNECTIONS



SEE SHEETS C4 & C11 FOR EROSION CONTROL PLANS AND DETAILS

FDEP SEPARATION CRITERIA:

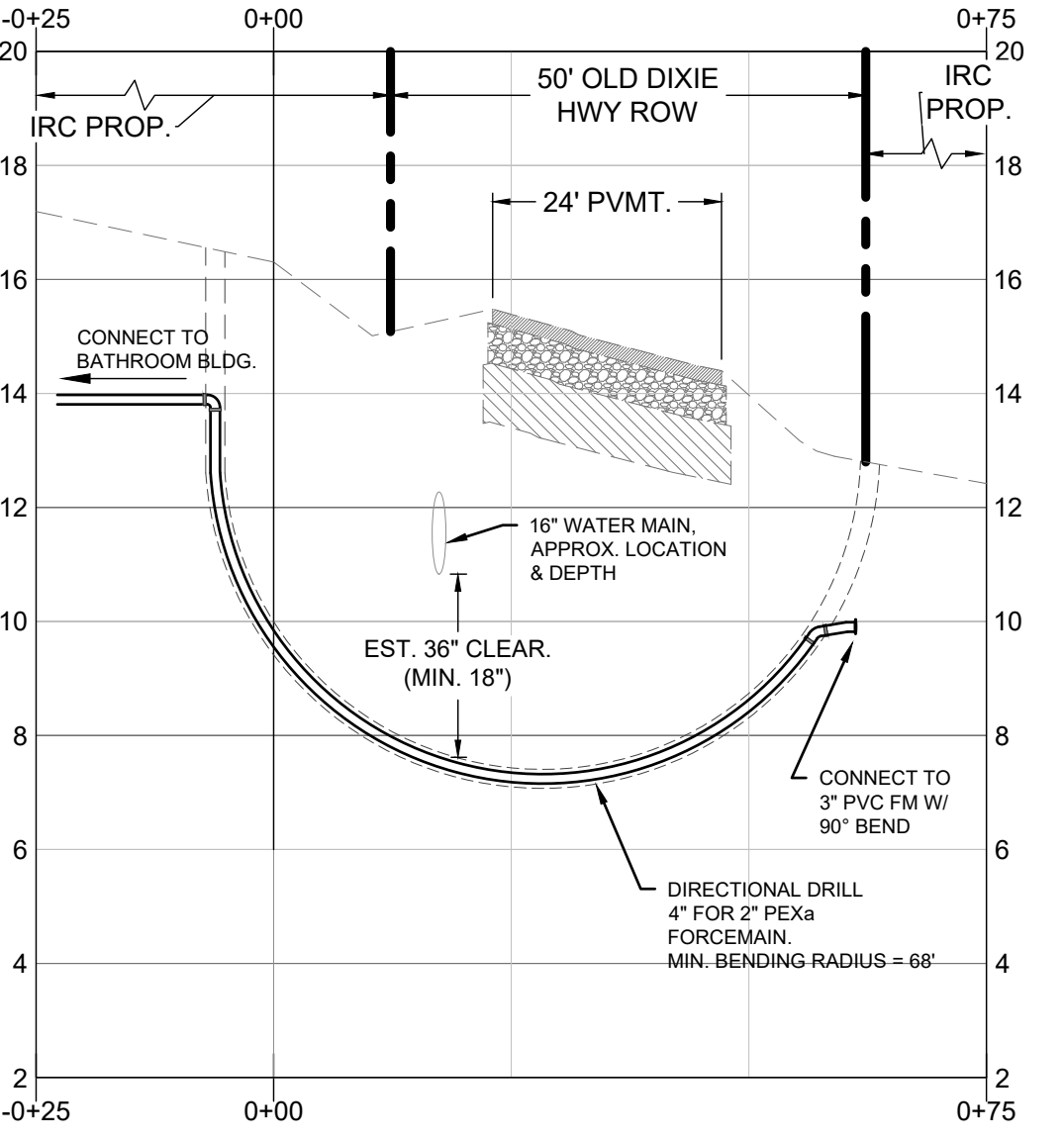
- (1) HORIZONTAL SEPARATION BETWEEN UNDERGROUND WATER MAINS AND SANITARY OR STORM SEWERS, WASTEWATER OR STORM WATER FORCE MAINS, RECLAIMED WATER PIPELINES, AND ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS.
 - (A) NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST THREE FEET BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED STORM SEWER, STORM WATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C.
 - (B) NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST THREE FEET, AND PREFERABLY TEN FEET, BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED VACUUM-TYPE SANITARY SEWER.
 - (C) NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST SIX FEET, AND PREFERABLY TEN FEET, BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF ANY EXISTING OR PROPOSED GRAVITY OR PRESSURE-TYPE SANITARY SEWER, WASTEWATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C. THE MINIMUM HORIZONTAL SEPARATION DISTANCE BETWEEN WATER MAINS AND GRAVITY TYPE SANITARY SEWERS SHALL BE REDUCED TO THREE FEET WHERE THE BOTTOM OF THE WATER MAIN IS LAID AT LEAST SIX INCHES ABOVE THE TOP OF THE SEWER.
 - (D) NEW OR RELOCATED, UNDERGROUND WATER MAINS SHALL BE LAID TO PROVIDE A HORIZONTAL DISTANCE OF AT LEAST TEN FEET BETWEEN THE OUTSIDE OF THE WATER MAIN AND ALL PARTS OF ANY EXISTING OR PROPOSED "ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEM" AS DEFINED IN SECTION 381.0065(2), F.S., AND RULE 64E-6.002, F.A.C.
- (2) VERTICAL SEPARATION BETWEEN UNDERGROUND WATER MAINS AND SANITARY OR STORM SEWERS, WASTEWATER OR STORM WATER FORCE MAINS, AND RECLAIMED WATER PIPELINES.
 - (A) NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED GRAVITY OR VACUUM-TYPE SANITARY SEWER OR STORM SEWER SHALL BE LAID SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST SIX INCHES, AND PREFERABLY TEN FEET, ABOVE OR AT LEAST 12 INCHES BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE.
 - (B) NEW OR RELOCATED, UNDERGROUND WATER MAINS CROSSING ANY EXISTING OR PROPOSED PRESSURE-TYPE SANITARY SEWER, WASTEWATER OR STORM WATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER SHALL BE LAID SO THE OUTSIDE OF THE WATER MAIN IS AT LEAST 12 INCHES ABOVE OR BELOW THE OUTSIDE OF THE OTHER PIPELINE. HOWEVER, IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE OTHER PIPELINE.
 - (C) AT THE UTILITY CROSSINGS DESCRIBED IN PARAGRAPHS (A) AND (B) ABOVE, ONE FULL LENGTH OF WATER MAIN PIPE SHALL BE CENTERED ABOVE OR BELOW THE OTHER PIPELINE SO THE WATER MAIN JOINTS WILL BE AS FAR AS POSSIBLE FROM THE OTHER PIPELINE. ALTERNATIVELY, AT SUCH CROSSINGS, THE PIPES SHALL BE ARRANGED SO THAT ALL THE WATER MAIN JOINTS ARE AT LEAST THREE FEET FROM ALL JOINTS IN VACUUM-TYPE SANITARY SEWERS, STORM SEWERS, STORM WATER FORCE MAINS, OR PIPELINES CONVEYING RECLAIMED WATER REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C., AND AT LEAST SIX FEET FROM ALL JOINTS IN GRAVITY OR PRESSURE-TYPE SANITARY SEWERS, WASTEWATER FORCE MAINS, OR PIPELINES CONVEYING RECLAIMED WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C.
- (3) SEPARATION BETWEEN WATER MAINS AND SANITARY OR STORM SEWER MANHOLES
 - (A) NO WATER MAIN SHALL PASS THROUGH, OR COME INTO CONTACT WITH, ANY PART OF A SANITARY SEWER MANHOLE.
 - (B) EFFECTIVE AUGUST 28, 2003, WATER MAINS SHALL NOT BE CONSTRUCTED OR ALTERED TO PASS THROUGH, OR COME INTO CONTACT WITH, ANY PART OF A STORM SEWER MANHOLE OR INLET STRUCTURE.
- (4) SEPARATION BETWEEN FIRE HYDRANT DRAINS AND SANITARY OR STORM SEWERS, WASTEWATER OR STORM WATER FORCE MAINS, RECLAIMED WATER PIPELINES, AND ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS. NEW OR RELOCATED FIRE HYDRANTS WITH UNDERGROUND DRAINS SHALL BE LOCATED SO THAT THE DRAINS ARE AT LEAST THREE FEET FROM ANY EXISTING OR PROPOSED STORM SEWER, STORM WATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C., AT LEAST THREE FEET, AND PREFERABLY TEN FEET, FROM ANY EXISTING OR PROPOSED VACUUM-TYPE SANITARY SEWER, AT LEAST SIX FEET, AND PREFERABLY TEN FEET, FROM ANY EXISTING OR PROPOSED GRAVITY OR PRESSURE-TYPE SANITARY SEWER, WASTEWATER FORCE MAIN, OR PIPELINE CONVEYING RECLAIMED WATER NOT REGULATED UNDER PART III OF CHAPTER 62-610, F.A.C.; AND AT LEAST TEN FEET FROM ANY EXISTING OR PROPOSED "ON-SITE SEWAGE TREATMENT AND DISPOSAL SYSTEM" AS DEFINED IN SECTION 381.0065(2), F.S., AND RULE 64E-6.002, F.A.C.

UTILITY PLAN

UTILITY NOTES:

1. THE LOCATION OF ANY FORCEMAIN REDIRECTION PITS SHALL BE PROVIDED BY THE CONTRACTOR AT THE PRE-CONSTRUCTION MEETING.

DIRECTIONAL BORE SECTION



ALL ELEVATIONS IN NAVD 88

JOB NO. 20-0240		DESIGNED AS	DRAWN JIB	DATE JUNE 2021	CHECKED TH	DATE ISSUED 6/11/2021
3 ADD SOD QUANTITIES		2 IRC COMMENTS		1 IRC COMMENTS		DATE 10/19/2021
3 ADD SOD QUANTITIES		2 IRC COMMENTS		1 IRC COMMENTS		DATE 9/23/2021
3 ADD SOD QUANTITIES		2 IRC COMMENTS		1 IRC COMMENTS		DATE 8/12/2021
3 ADD SOD QUANTITIES		2 IRC COMMENTS		1 IRC COMMENTS		DATE 8/12/2021

REVISIONS

NO.	DATE	DESCRIPTION
1	8/12/2021	ISSUED

MBV ENGINEERING, INC.
 MOHA BOWLES VILLANIZAR & ASSOCIATES
 ENGINEERING & CA #57128
 1835 N. 20TH STREET
 BOCA RATON, FL 33480
 TEL: (561) 993-1510
 FAX: (561) 993-1511
 FT. PIERCE, FL - PH (772) 468-9055

ON-SITE UTILITY PLAN

HALLSTROM FARMSTEAD CONSERVATION AREA

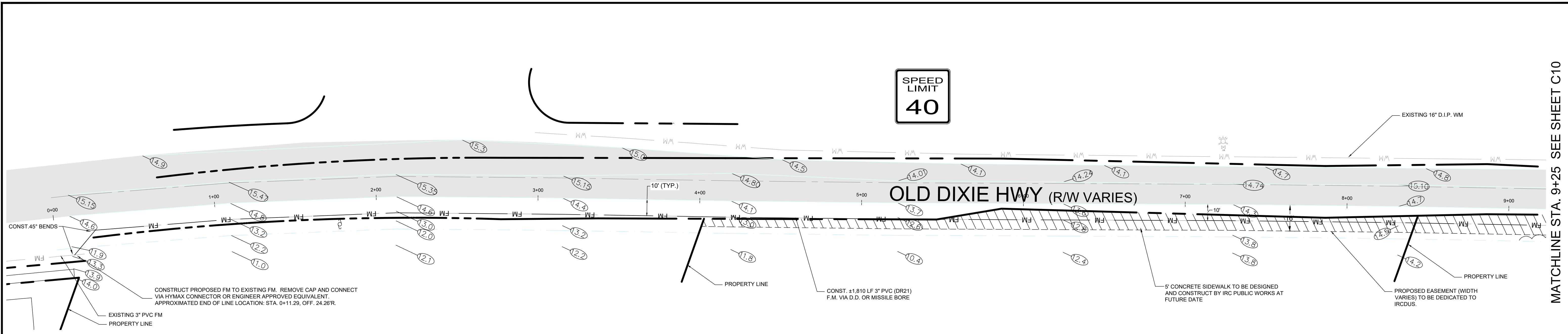
INDIAN RIVER COUNTY, FLORIDA

AARON G. STANTON
 LICENSE No. 72460
 STATE OF FLORIDA
 PROFESSIONAL ENGINEER

SHEET
C8

20-0240

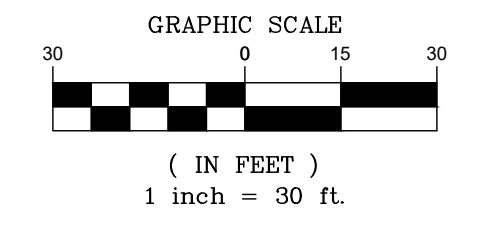




LEGEND

- EXISTING ASPHALT
- EXISTING ASPHALT
- PROPERTY BOUNDARY / RIGHT OF WAY LINE
- EXISTING WATER MAIN
- PROPOSED SANITARY SEWER FORCEMAIN
- EXISTING GRADE

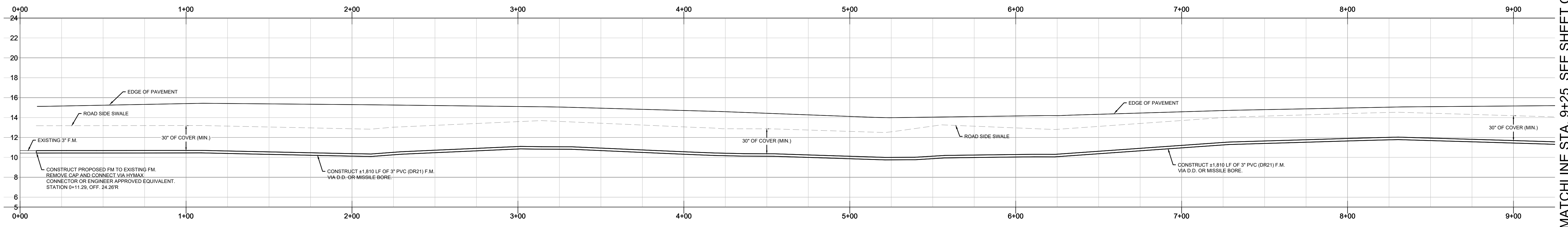
OLD DIXIE HIGHWAY OFF-SITE PLAN VIEW



MATCHLINE STA. 9+25 SEE SHEET C10

NO.	DATE	REVISIONS
8	6/11/2021	DATE ISSUED
7		CHECKED
6		DATE
5		DESIGNED
4		DRAWN
3		JOB
2		TH
1		DATE

MBV ENGINEERING, INC.
 MOA BOWLES-VILLANIZAR & ASSOCIATES
 ENGINEERING CA #3728
 1830 20TH STREET
 BREVARD COUNTY, FL 32960
 TEL: (772) 778-3817
 FAX: (772) 778-3817
 MICHIGAN: P.E. #11
 FLORIDA: P.E. #72460



NOTES

- EXISTING 3" F.M. END LOCATION IS APPROXIMATED FROM COUNTY ASBUILTS IN PDF FORMAT. CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION.
- F.M. EXTENSION ALONG OLD DIXIE SHALL BE VIA DIRECTIONAL OR MISSILE BORE.

OLD DIXIE HIGHWAY OFF-SITE PROFILE VIEW (0+00 - 9+25)

SCALE: 1" = 30' H.
1" = 10' V.

MATCHLINE STA. 9+25 SEE SHEET C10

OLD DIXIE HIGHWAY OFF-SITE PLAN & PROFILE

HALLSTROM FARMSTEAD CONSERVATION AREA
INDIAN RIVER COUNTY, FLORIDA

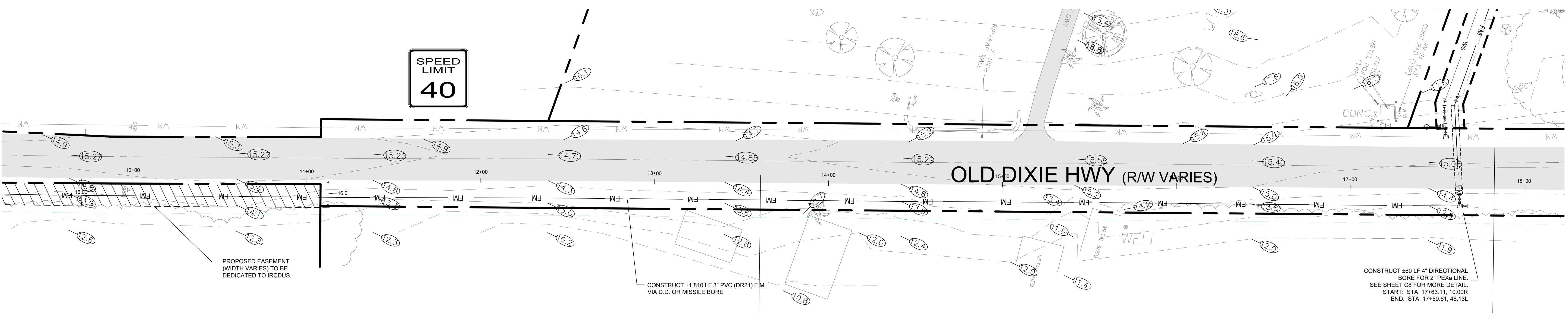
AARON G. STANTON
 LICENSE No. 72460
 STATE OF FLORIDA
 PROFESSIONAL ENGINEER
 AARON G. STANTON
 FL. P.E. #72460

SHEET
C9
20-0240

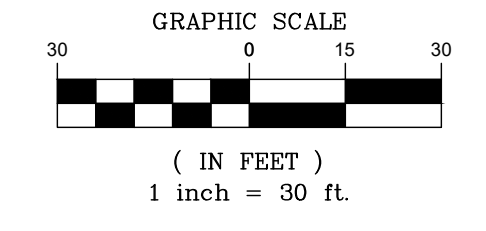


ALL ELEVATIONS IN NAVD 88

MATCHLINE STA. 9+25 SEE SHEET C9



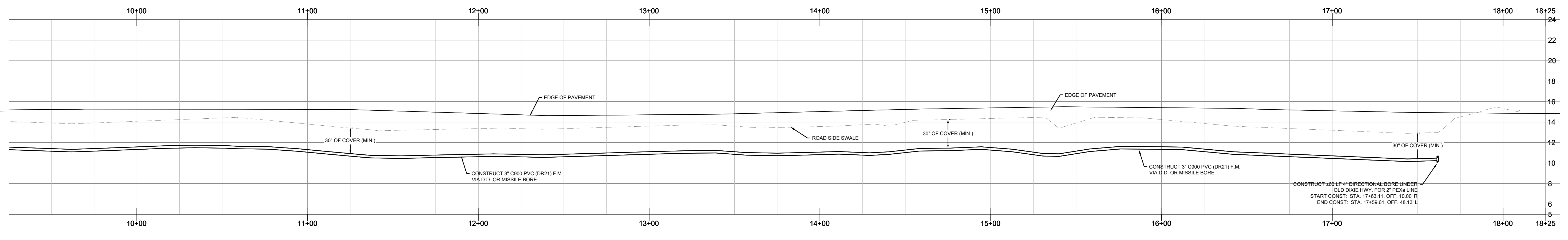
OLD DIXIE HIGHWAY OFF-SITE PLAN VIEW



LEGEND

- EXISTING ASPHALT
- EXISTING ASPHALT
- PROPERTY BOUNDARY / RIGHT OF WAY LINE
- EXISTING WATER MAIN
- PROPOSED SANITARY SEWER FORCEMAIN
- EXISTING GRADE

MATCHLINE STA. 9+25 SEE SHEET C9



NOTES

1. EXISTING 3" FM END LOCATION IS APPROXIMATED FROM COUNTY ASBUILTS IN PDF FORMAT. CONTRACTOR SHALL FIELD LOCATE ALL UTILITIES IN THE FIELD PRIOR TO CONSTRUCTION.
2. FM EXTENSION ALONG OLD DIXIE SHALL BE VIA DIRECTIONAL OR MISSILE BORE.

OLD DIXIE HIGHWAY OFF-SITE PROFILE VIEW (9+25 - 18+25)

SCALE: 1" = 30' H.
1" = 10' V.

ALL ELEVATIONS IN NAVD 88



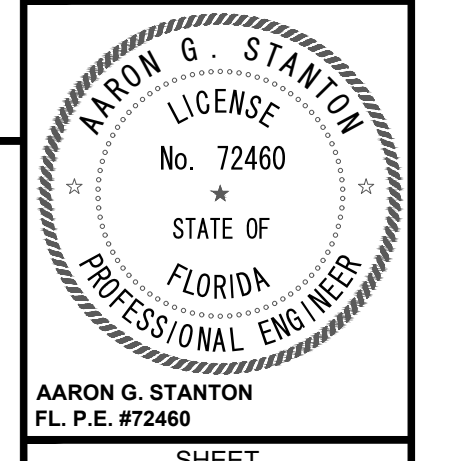
DESIGNED	AS	JOB	20-0240
DRAWN	JIB	DATE	JUNE 2021
CHECKED	TH	DATE ISSUED	6/11/2021
DATE	10/19/2021	3. ADD SOD QUANTITIES	
	9/23/2021	2. IRC/DUS COMMENTS	
	8/12/2021	1. IRC COMMENTS	

REVISIONS

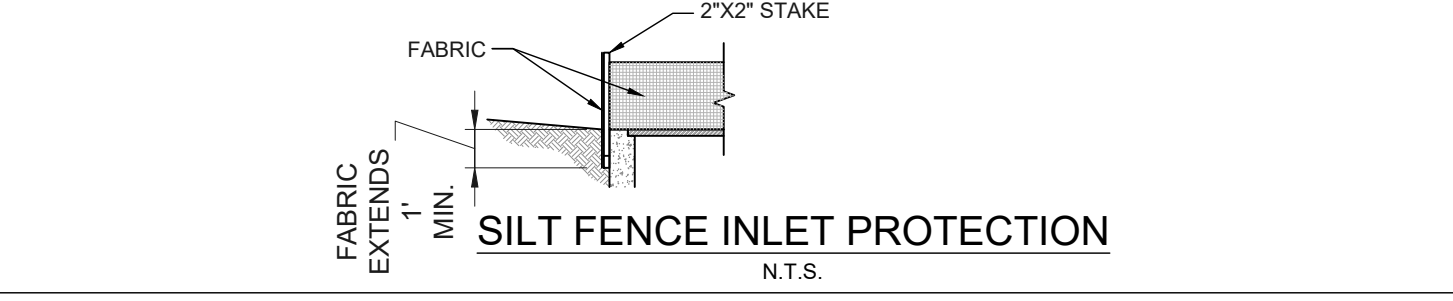
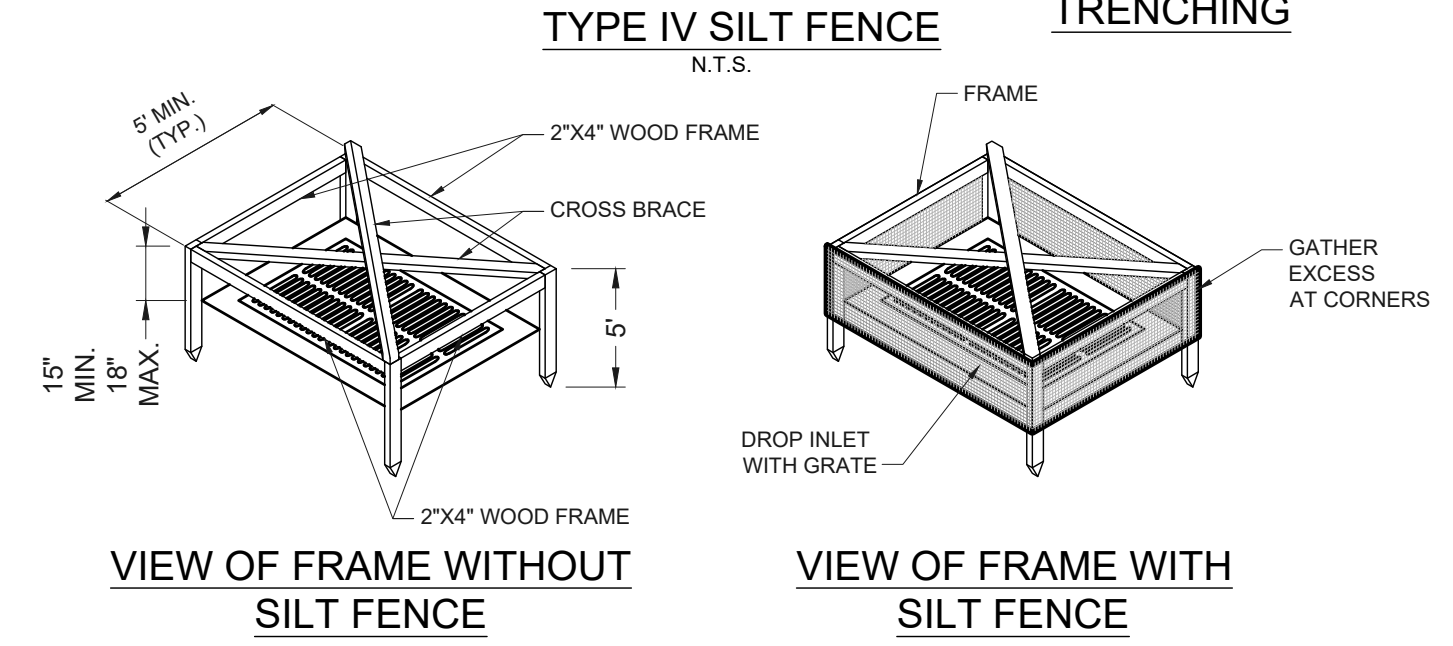
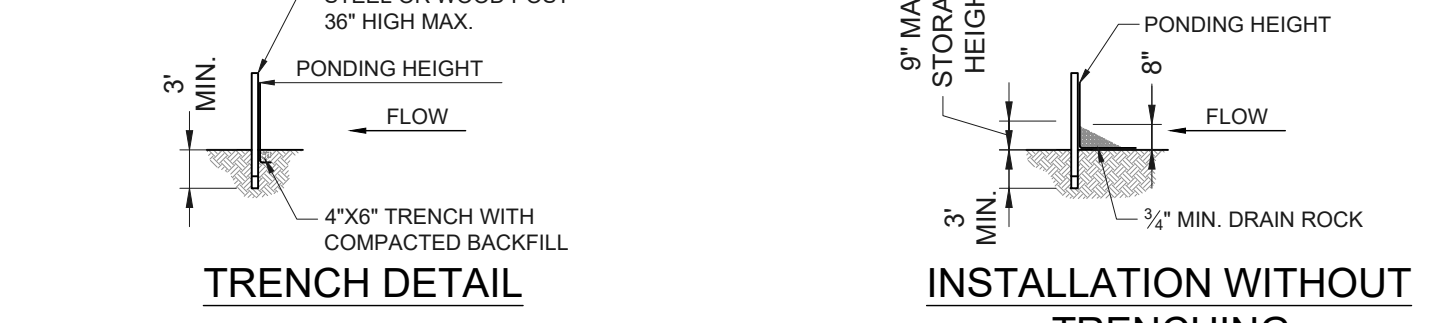
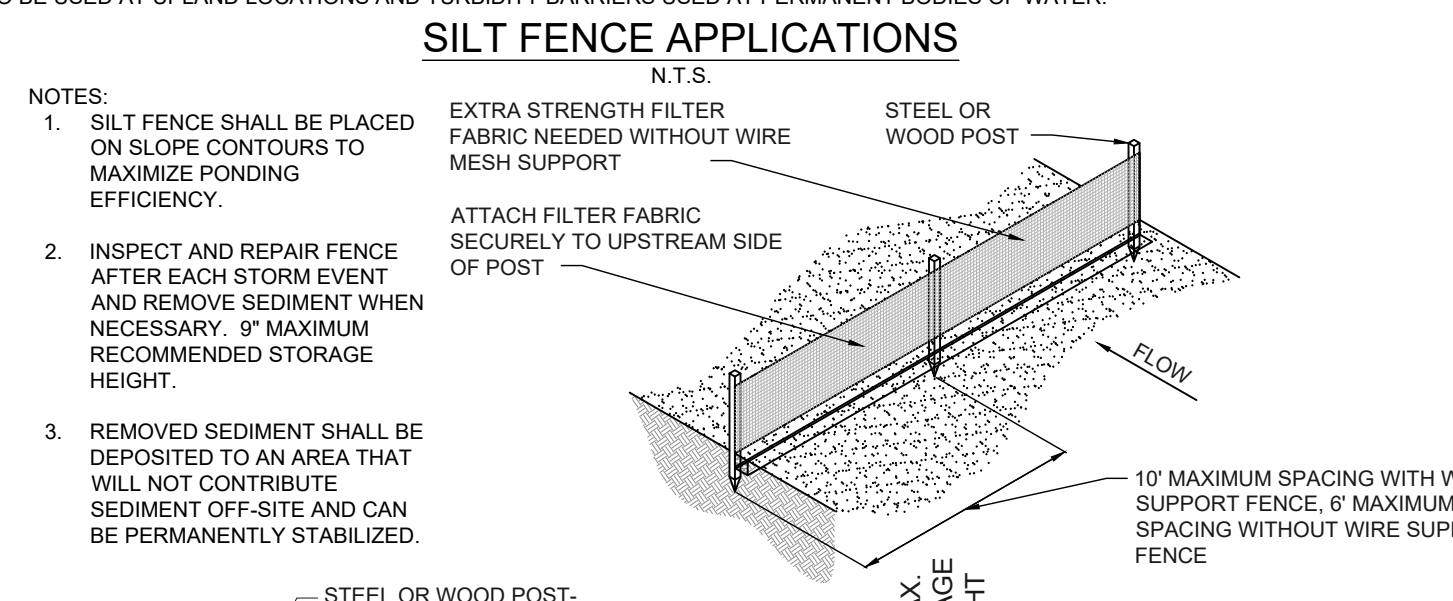
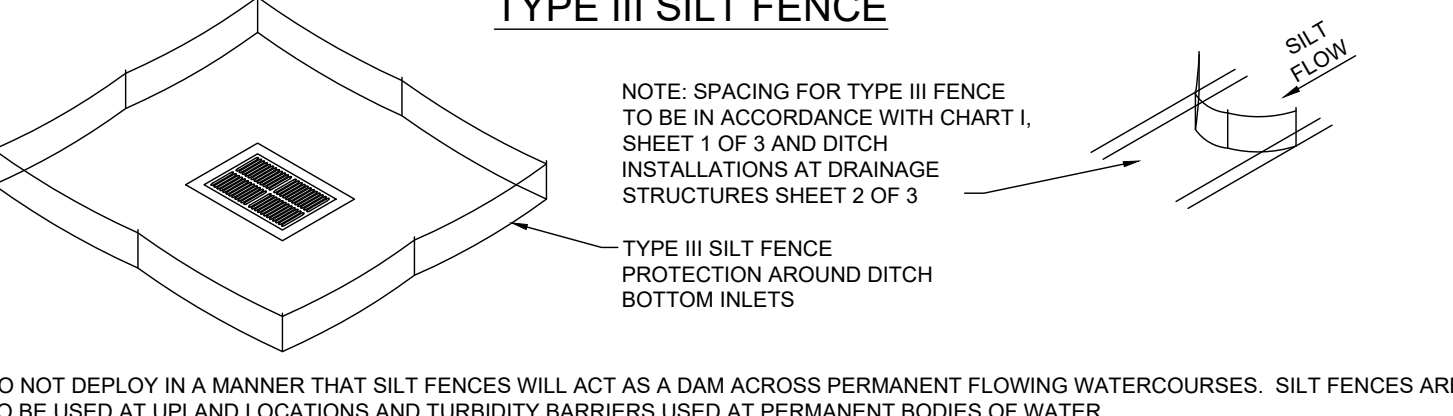
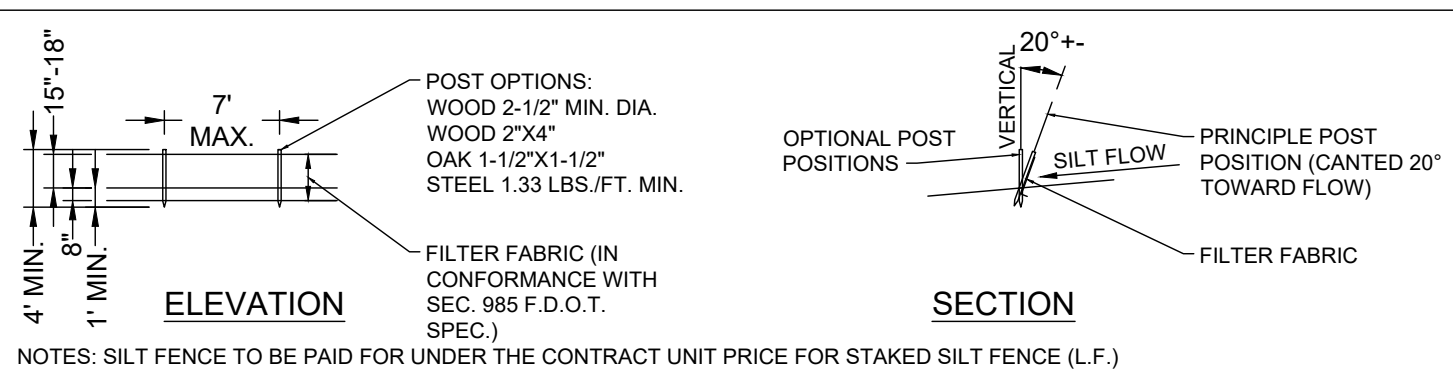
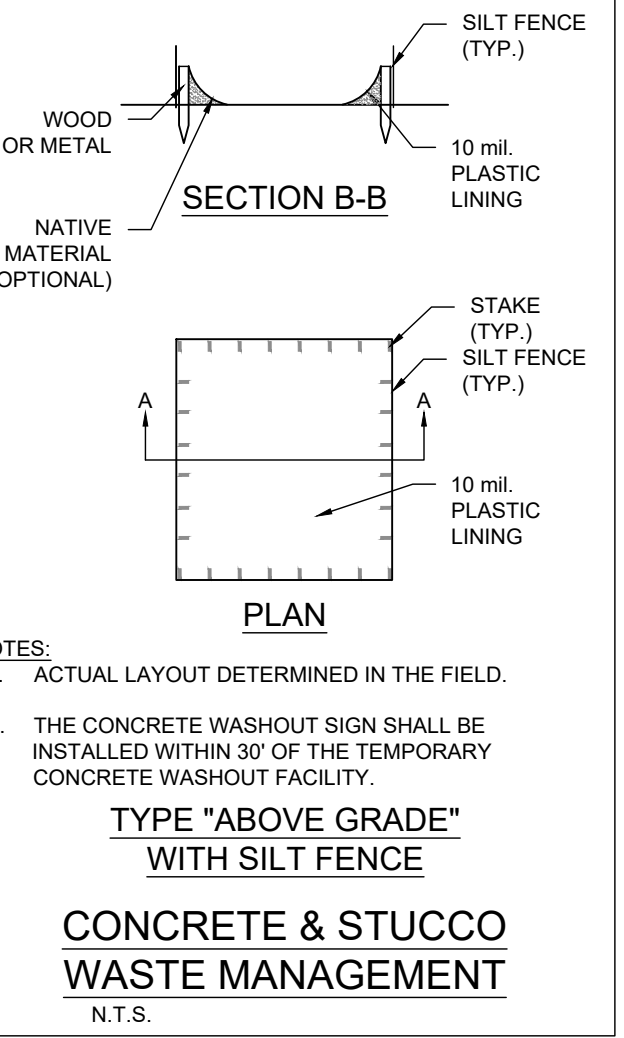
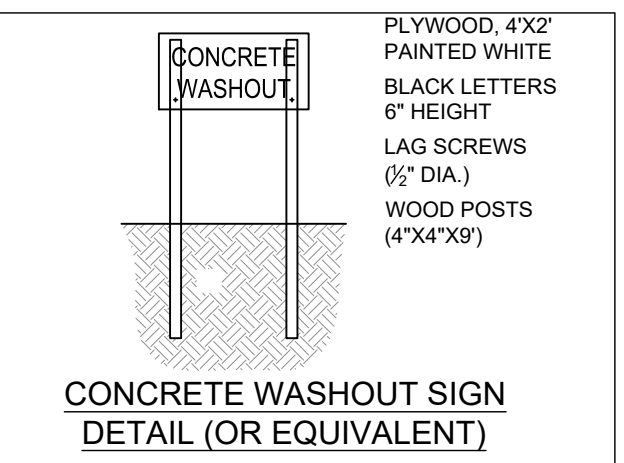
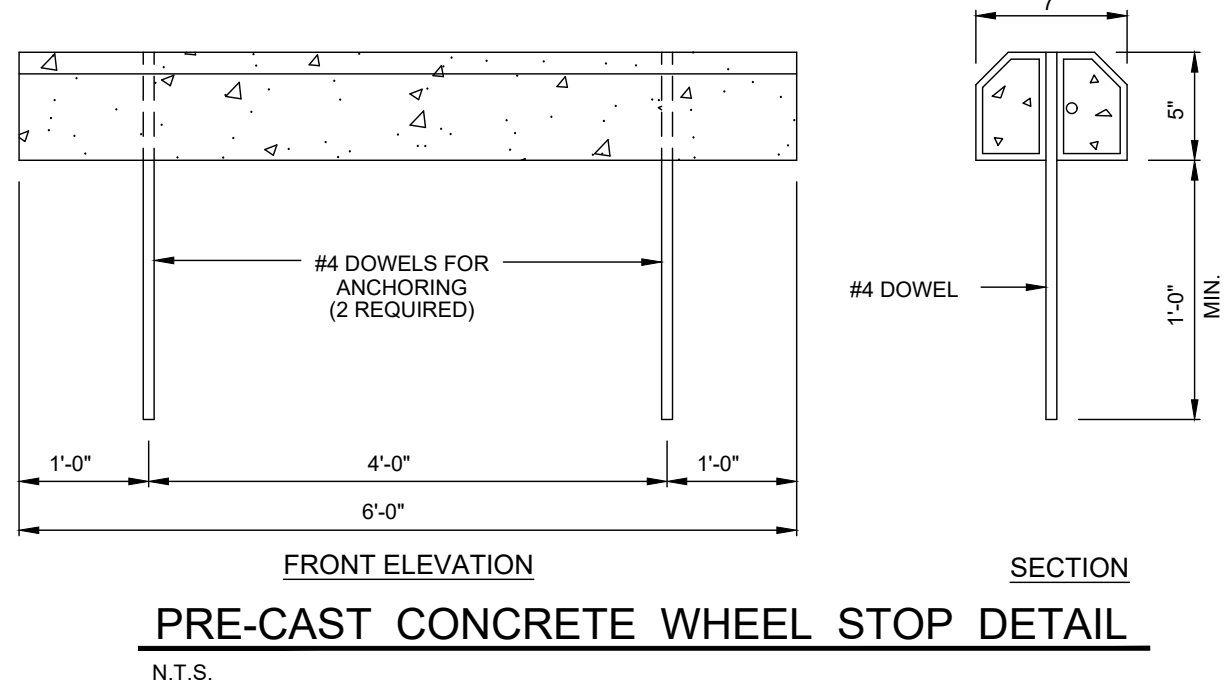
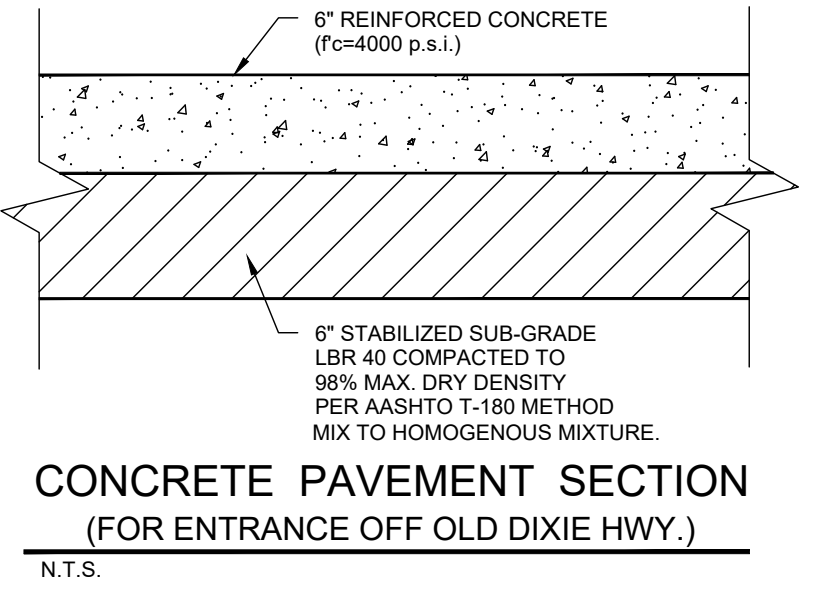
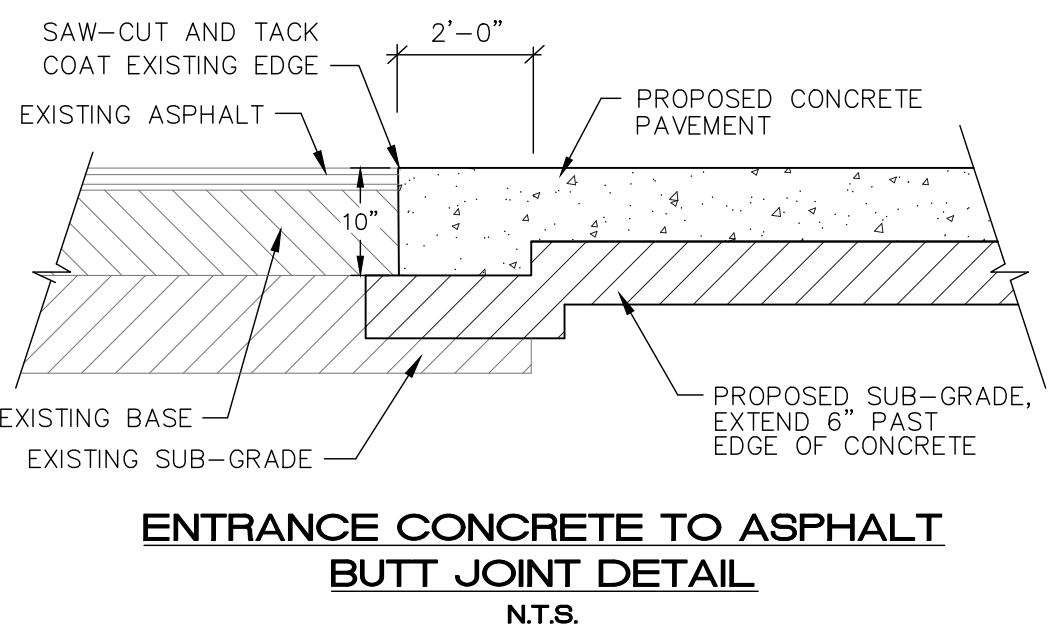
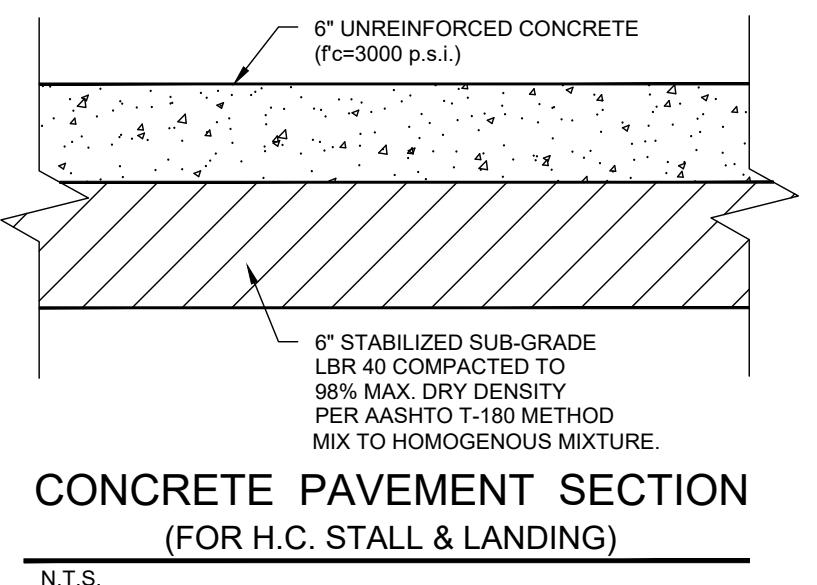
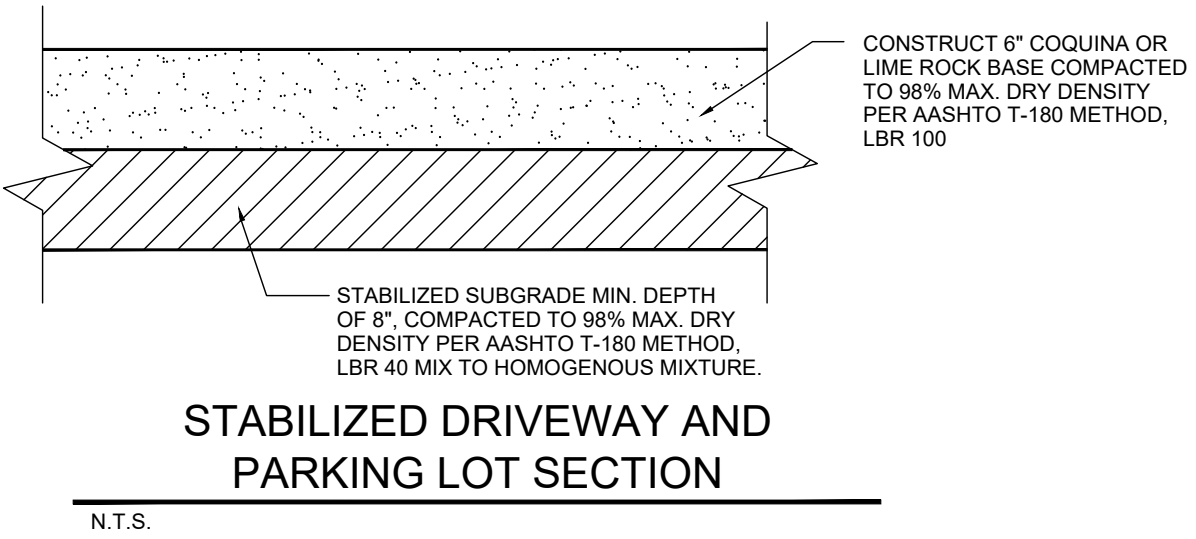
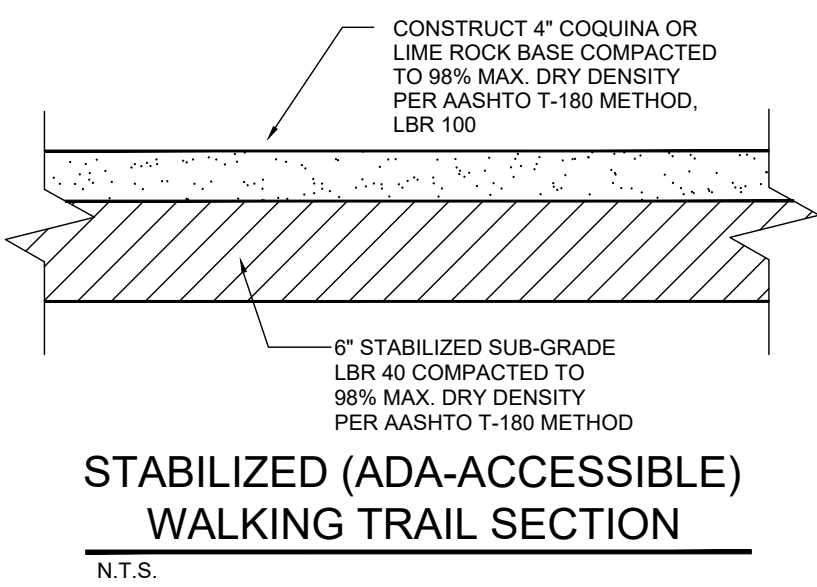
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MBV ENGINEERING, INC.
 ENGINEERING & ASSOCIATES
 MOA BOWLES-VILLAMIZAR & ASSOCIATES
 ENGINEERING & ASSOCIATES
 1835 W. 20TH STREET
 BOCA RATON, FL 33480
 TEL: (561) 993-1510
 FAX: (561) 993-1511

INDIAN RIVER COUNTY
 HALLSTROM FARMSTEAD
 CONSERVATION AREA
 OLD DIXIE HIGHWAY OFF-SITE
 PLAN & PROFILE
 FLORIDA

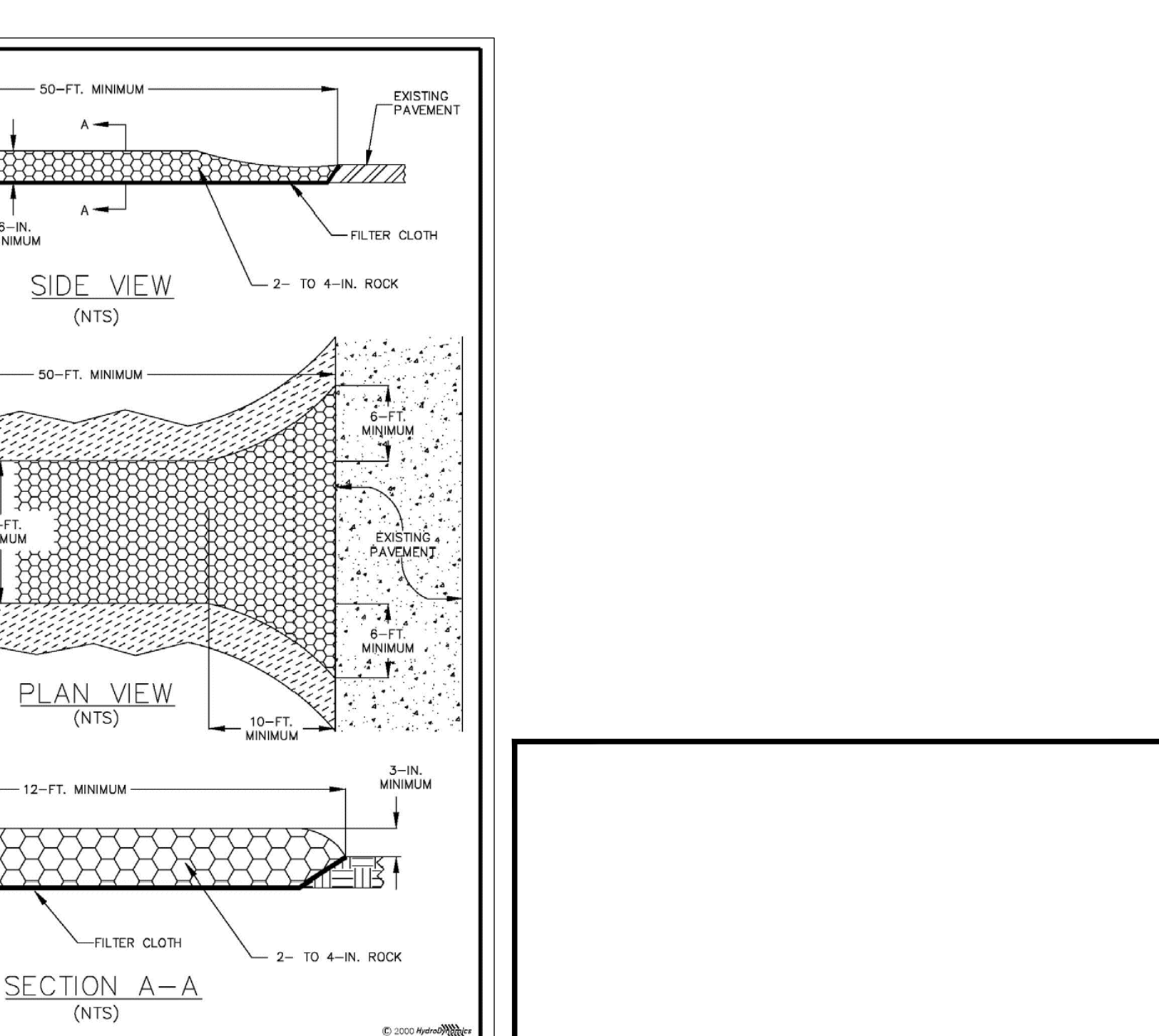
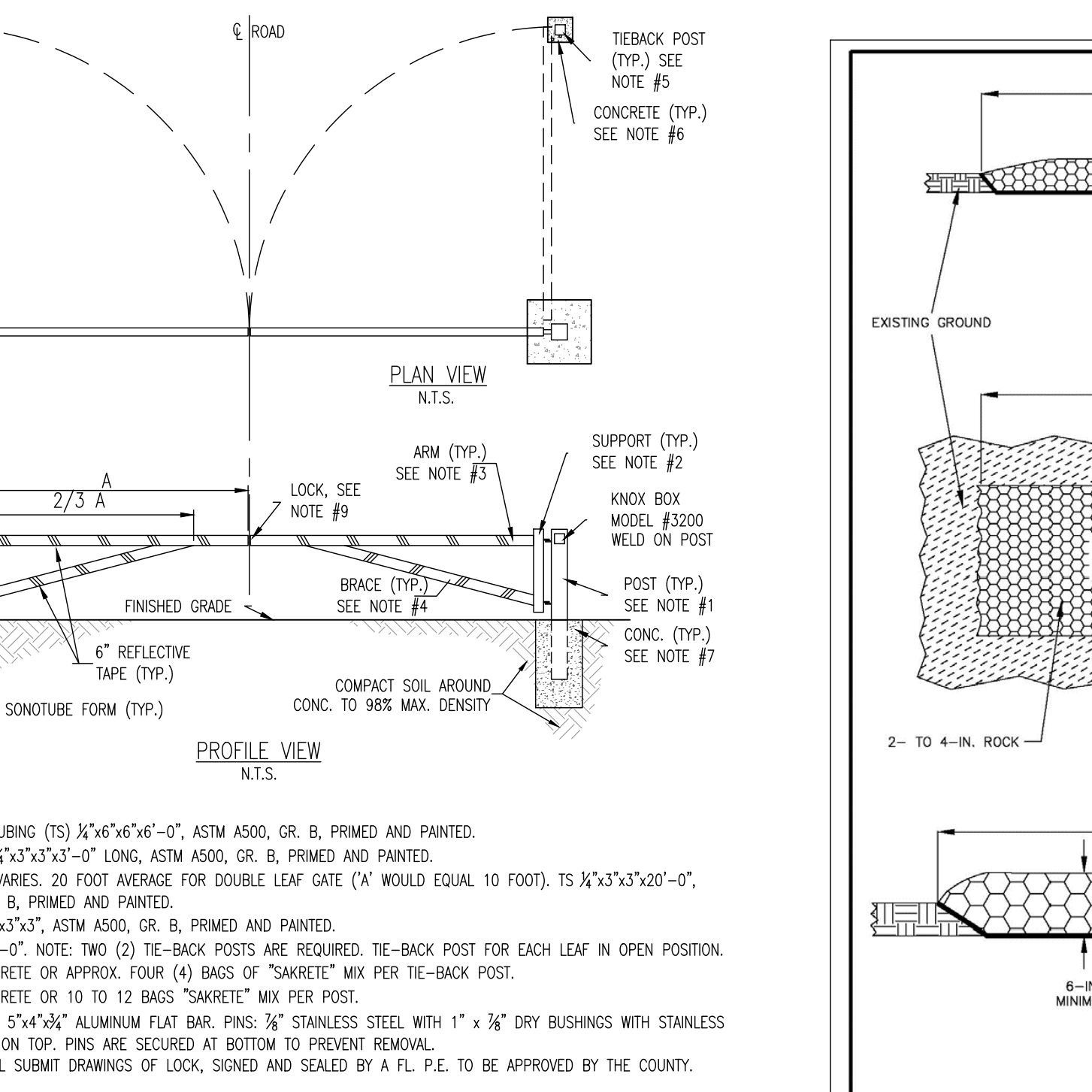
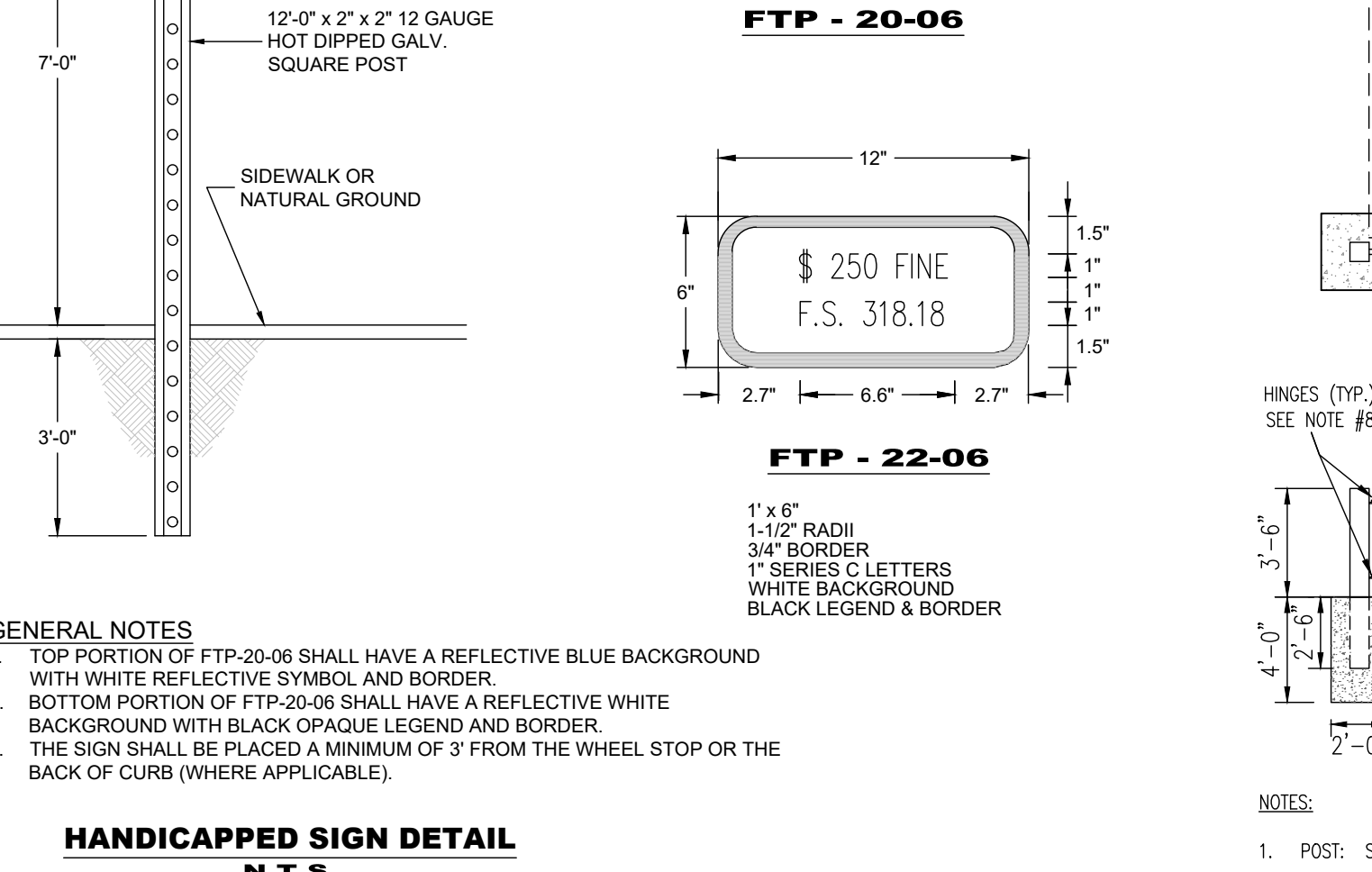
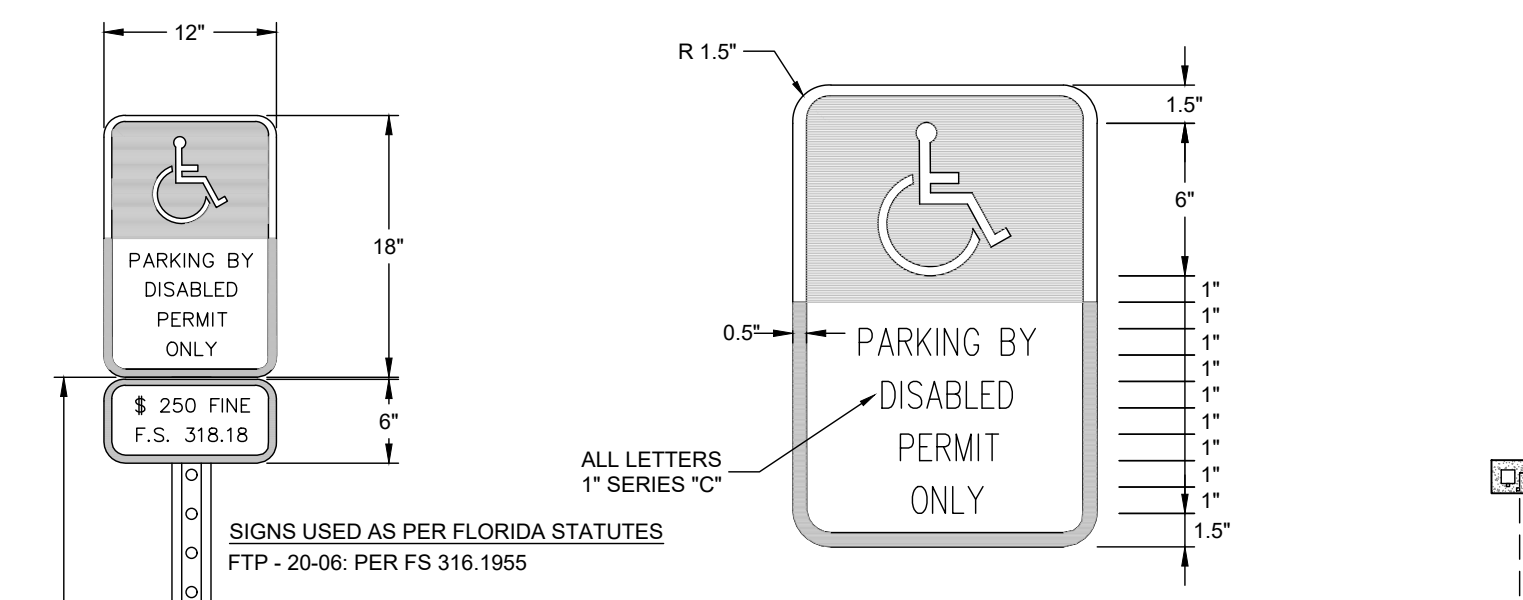
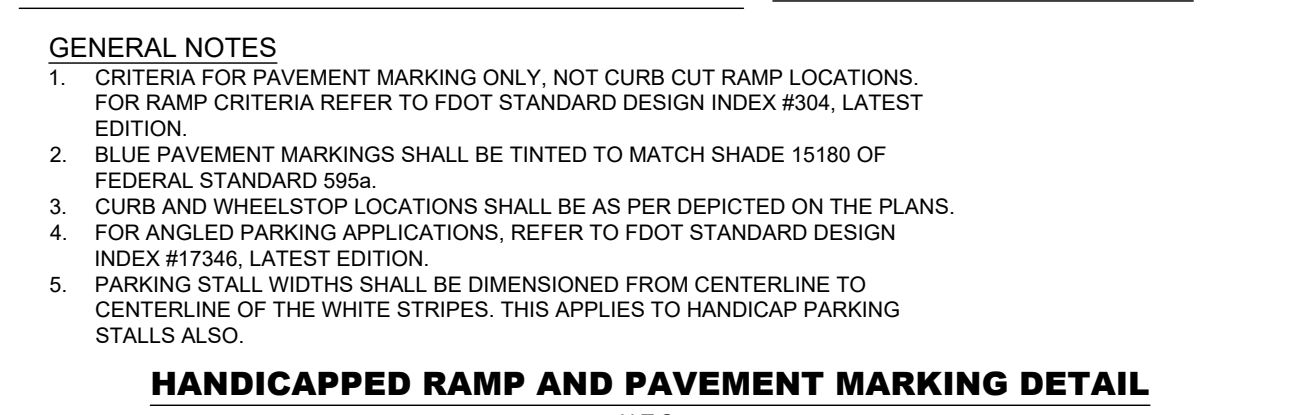
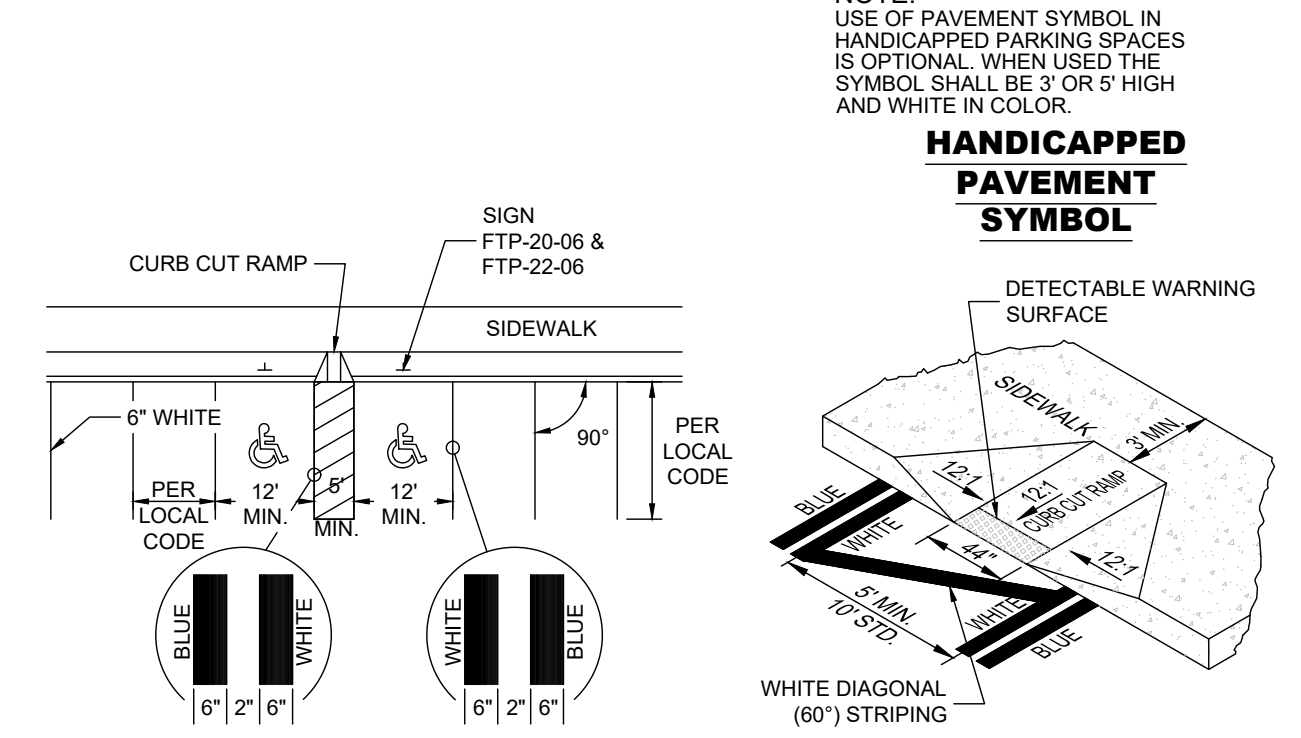
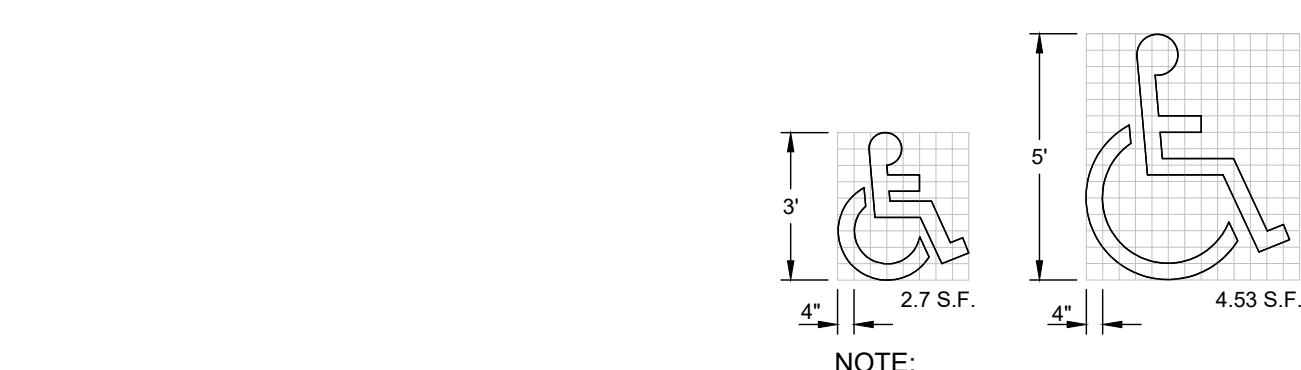


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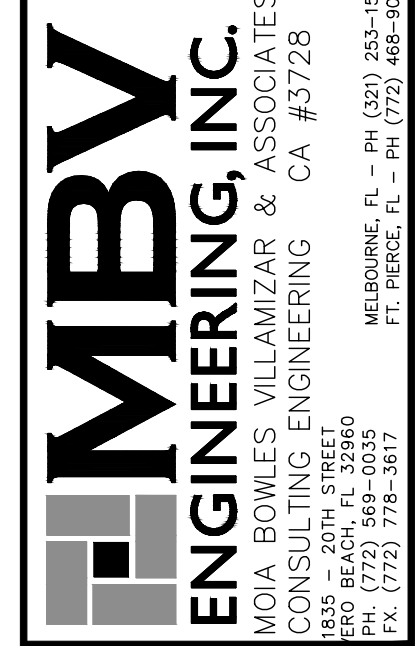
EROSION AND SEDIMENTATION CONTROL NOTES
CONSTRUCTION ACTIVITIES CAN RESULT IN THE GENERATION OF SIGNIFICANT AMOUNTS OF POLLUTANTS WHICH MAY REACH SURFACE OR GROUND WATERS. ONE OF THE PRIMARY POLLUTANTS OF SURFACE WATERS IS SEDIMENT DUE TO EROSION. EXCESSIVE QUANTITIES OF SEDIMENT WHICH REACH WATER BODIES OF FLOOD PLAINS HAVE BEEN SHOWN TO ADVERSELY AFFECT THEIR PHYSICAL, BIOLOGICAL AND CHEMICAL PROPERTIES. TRANSPORTED SEDIMENT CAN OBSTRUCT STREAM CHANNELS, REDUCE HYDRAULIC CAPACITY OF WATER BODIES OF FLOOD PLAINS, REDUCE THE DESIGN CAPACITY OF CULVERTS AND OTHER WORKS, AND ELIMINATE BENTHIC INVERTEBRATES AND FISH SPAWNING SUBSTRATES BY SILTATION. EXCESSIVE SUSPENDED SEDIMENTS REDUCE LIGHT PENETRATION AND THEREFORE, REDUCE PRIMARY PRODUCTIVITY.

- MINIMUM STANDARDS**
- SEDIMENT BASIN AND TRAPS, PERIMETER DIKES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MADE FUNCTIONAL BEFORE UNLARGE LAND DISTURBANCE TAKES PLACE.
 - ALL SEDIMENT CONTROL MEASURES ARE TO BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND BE CONSTRUCTED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON BALANCE OF SITE. PERIMETER SEDIMENT BARRIERS SHALL BE CONSTRUCTED TO PREVENT SEDIMENT OR TRASH FROM FLOWING OR FLOATING ON TO ADJACENT PROPERTIES.
 - PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENURED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENURED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN UNDISTURBED FOR LONGER THAN 30 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT UNDISTURBED FOR MORE THAN ONE YEAR.
 - DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL, INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.
 - A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENURED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT, IN THE OPINION OF THE REVIEWER, IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.
 - STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
 - SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE SEDIMENT BASIN SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE THE ANTICIPATED SEDIMENT LOADING FROM THE LAND-DISTURBING ACTIVITY. THE OUTFALL DEVICE OR SYSTEM DESIGN SHALL TAKE INTO ACCOUNT THE TOTAL DRAINAGE AREA FLOWING THROUGH THE DISTURBED AREA TO BE SERVED BY THE BASIN.
 - AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES WILL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
 - CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.
 - WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.
 - SEDIMENT WILL BE PREVENTED FROM ENTERING ANY STORM DRAIN SYSTEM, DITCH OR CHANNEL. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LOADED WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
 - BEFORE TEMPORARY OR NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LININGS SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.
 - WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.
 - WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES, A TEMPORARY STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIAL SHALL BE PROVIDED.
 - THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.
 - PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES MUST BE PROVIDED TO ENSURE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE CONTINUALLY RESPONSIBLE FOR ALL SEDIMENT LEAVING THE PROPERTY. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
 - UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA.
 - NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
 - EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
 - EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
 - RESTALLATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
 - WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PUBLIC ROAD SURFACE WITH CURBS AND GUTTERS, THE ROAD SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL SUBDIVISION LOTS AS WELL AS TO LARGER LAND-DISTURBING ACTIVITIES.
 - ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 90 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, IN THE OPINION OF THE REVIEWER. DISTURBED SOIL AREAS RESULTING FROM THE DISPOSITION OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION AND SEDIMENTATION.
 - PROPERTIES AND WATERWAYS DOWNSTREAM FROM CONSTRUCTION SITE SHALL BE PROTECTED FROM SEDIMENT DISPOSITION AND EROSION.
 - PHASED PROJECTS SHOULD BE CLEARED IN CONJUNCTION WITH CONSTRUCTION OF EACH PHASE.
 - EROSION CONTROL DESIGN AND CONSTRUCTION SHALL FOLLOW THE REQUIREMENTS IN INDEX NOS. 104 AND 105 OF FOOT ROADWAY AND TRAFFIC DESIGN STANDARDS.
 - THE REVIEWER MAY APPROVE MODIFICATIONS OR ALTER PLANS TO THESE EROSION CONTROL CRITERIA DUE TO SITE SPECIFIC CONDITIONS.



NO.	DATE	DESCRIPTION
1	8/12/2021	1. RC COMMENTS
2	9/23/2021	2. ADD SOD QUANTITIES
3	10/19/2021	3. ADD SOD COMMENTS
4		4. JIB
5		5. AS
6		6. DESIGNED
7		7. JOB
8		8. 20-0240

NO.	DATE	DESCRIPTION
1	6/11/2021	1. RC COMMENTS
2		2. CHECKED
3		3. DATE
4		4. JUNE 2021
5		5. DRAWN
6		6. AS
7		7. JOB
8		8. 20-0240



PAVING, GRADING, DRAINAGE & EROSION CONTROL DETAILS

HALLSTROM FARMSTEAD CONSERVATION AREA

INDIAN RIVER COUNTY, FLORIDA

AARON G. STANTON
LICENSE No. 72460
STATE OF FLORIDA
PROFESSIONAL ENGINEER

AARON G. STANTON
FL. P.E. #72460

SHEET
C11

20-0240

PROPOSED ±46,000 SF LANDSCAPE MAINTENANCE AREA OUTSIDE THE LIMITS OF DEVELOPMENT. INCLUDES REGULAR TREATMENTS FOR EXOTIC REMOVAL AND REPLANTING NATIVE VEGETATION AS NECESSARY.

PROPOSED ±1,645 SY BAHIA SOD FOR RETENTION AREA SIDE SLOPES, BUT NOT BOTTOMS (TYP.)

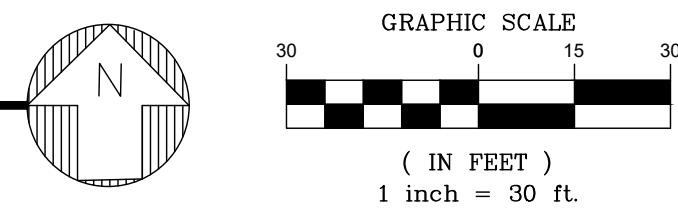
PROPOSED 5,996 SF INTERIOR PARKING LANDSCAPED AREA

PROPOSED WOOD TIMBERS AROUND LANDSCAPE PERIMETER

20 LF THOROUGHFARE BUFFER

NOTE: ALL PROTECTED TREES SHALL BE AVOIDED DURING CONSTRUCTION OF THE TRAIL NETWORK

LANDSCAPE PLAN



LANDSCAPING LEGEND

- PROPOSED INTERIOR PARKING LANDSCAPED AREAS
- PROPOSED 40' WIDE MAINTENANCE AREA WHERE INVASIVE VEGETATION WILL BE REMOVED AND NATIVE VEGETATION PLANTED

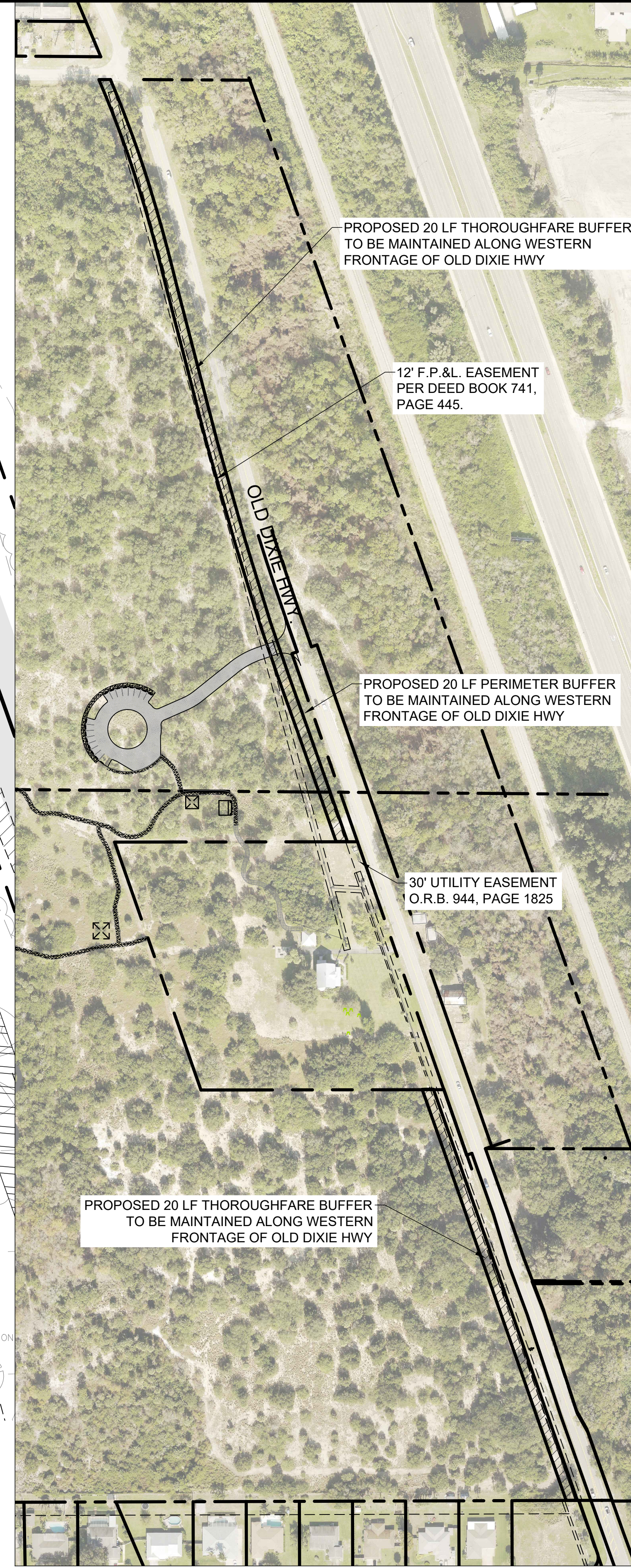
CALLOUT SYMBOL LEGEND

- SPECIES
- M = MITIGATION TREE
- R = RELOCATED TREE
- QUANTITY

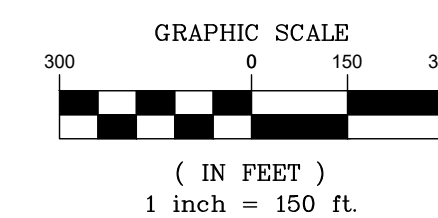
LANDSCAPE MATERIAL SCHEDULE									
TREES									
SYM	QTY	BOTANICAL NAME	COMMON NAME	SIZE	HGT	OTHER	NATIVE	DROUGHT TOLERANCE	MISCELLANEOUS
QV	2	Quercus virginiana	Live Oak	7 GAL.	-	15' SPREAD, 5' C.T.	YES	HIGH	
QG	2	Quercus geminata	Sand Live Oak	3 GAL.	-	15' SPREAD, 5' C.T.	YES	HIGH	
CF	2	Carya floridana	Scrub Hickory	3 GAL.	-	15' SPREAD, 5' C.T.	YES	HIGH	
PE	3	Pinus elliottii	Slash Pine	7 GAL.	-	15' SPREAD, 5' C.T.	YES	HIGH	
GROUND COVER									
SOD	1,645 SY	Paspalum notatum	Bahia Grass	-	-	100% Insect/disease free			



SPEED LIMIT 40



OLD DIXIE HWY. BUFFER



ALL ELEVATIONS IN NAVD 88

SITE LEGEND

- PROPOSED INTERIOR PARKING LANDSCAPE AREA
- PROPOSED LANDSCAPE MAINTENANCE AREA
- PROPOSED 20' THOROUGHFARE BUFFER (150' SCALE)
- PROPOSED 20' THOROUGHFARE BUFFER (30' SCALE)
- PROPOSED SIGHT LINE AREA (30' SCALE)
- PROPOSED STABILIZED PARKING
- PROPOSED ADA-WALKING TRAIL
- PROPOSED MARL PATH (BY OTHERS)
- PROPOSED BAHIA SOD
- PROPERTY BOUNDARY / RIGHT OF WAY LINE

TREE LEGEND

- EXISTING PALM TREES
- EXISTING PINE TREES
- EXISTING OAK TREES

LANDSCAPE POINT SYSTEM

DESIGN OPTIONS	POINTS
(1)(1) FLORIDA NATIVE LANDSCAPE	30
ONE HUNDRED (100) PERCENT OF LANDSCAPE AREA IS PRESERVED OR RE-ESTABLISHED FLORIDA NATIVE VEGETATION, OR NEW NATIVE PLANTINGS OF SPECIES LISTED IN APPENDIX A AND APPENDIX C. PLAN MUST INCLUDE TREES, UNDERSTORY, AND GROUND COVER WITH A MAXIMUM OF FIFTY (50) PERCENT OF SITE SODDED/GRASSED	
TOTAL	30

LANDSCAPE CALCULATIONS

- BUFFERS**
 - EAST PROPERTY LINE** (IRC LDC SECTION 926)
 - REQUIRED: 20' WIDE THOROUGHFARE PLAN ROAD BUFFER ALONG OLD DIXIE HWY.
 - 2,305 LF EAST PERIMETER
 - 2,305 LF - 24 LF DRIVEWAY = 2,281 LF
 - 4.0 CANOPY TREES PER 100 LF = 92 CANOPY TREES
 - 5.0 UNDERSTORY TREES PER 100 LF = 114 UNDERSTORY TREES
 - 60 SHRUBS PER 100 LF = 1,440 SHRUBS
 - PROVIDED: THE EXISTING BUFFER IS MUCH WIDER THAN 20 FT AND CONTAINS A NATIVE SCRUB HABITAT INCLUDING LIVE OAKS AND CABBAGE PALMETTOS, AND A THICK UNDERSTORY OF SMALLER TREES AND SAW PALMETTOS.
- SOUTH PROPERTY LINE** (IRC LDC SECTION 926)
 - REQUIRED: NONE
 - PROVIDED: EXISTING VEGETATION TO REMAIN
- WEST PROPERTY LINE** (IRC LDC SECTION 926)
 - REQUIRED: NONE
 - PROVIDED: EXISTING VEGETATION TO REMAIN
- NORTH PROPERTY LINE** (IRC LDC SECTION 926)
 - REQUIRED: NONE
 - PROVIDED: EXISTING VEGETATION TO REMAIN
- OFF STREET PARKING AREAS** (IRC LDC SECTION 926.09)
 - REQUIRED: TWELVE (12) PERCENT OF THE TOTAL PAVED AREA (DRIVING AISLES, DRIVEWAYS, PARKING SPACES, LOADING AREAS) SHALL BE PLANTED WITH INTERIOR LANDSCAPING
 - 20,810 SF OF DRIVE AISLE & PARKING SPACES X 12% = 2,498 SF OF REQUIRED INTERIOR LANDSCAPING
 - (INTERIOR LANDSCAPE AREA) / 300 SF = # OF REQUIRED TREES = 2,498 / 300 = 9 TREES
 - PROVIDED: 6,026 SF OF LANDSCAPE AREA
 - CANOPY TREES: = 9 TREES
- FOUNDATION PLANTING AREAS** (IRC LDC SECTION 911)
 - REQUIRED: NONE
 - PROVIDED: ALL EXISTING VEGETATION TO REMAIN
- NONVEHICULAR LANDSCAPE AREAS** (IRC LDC SECTION 926)
 - REQUIRED: NONE
 - PROVIDED: ALL EXISTING VEGETATION TO REMAIN

IRRIGATION SOURCE WATER TRUCK TO ESTABLISH

JOB NO.	DESIGNED	DRAWN	DATE	CHECKED	DATE	ISSUED	DATE
20-0240	AS	JIB	JUNE 2021	TH	6/11/2021		

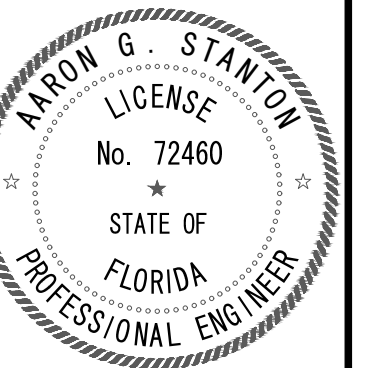
MBV ENGINEERING, INC.
 MOA BONLES VILLAMIZAR & ASSOCIATES
 ENGINEERING & CA #57128
 1830 S. 20TH STREET
 MIAMI BEACH, FL 33166
 TEL: (305) 953-1510
 FAX: (772) 778-3817
 MIAMI, FL - PH (772) 468-9055

LANDSCAPING PLAN

HALLSTROM FARMSTEAD CONSERVATION AREA

FLORIDA

INDIAN RIVER COUNTY

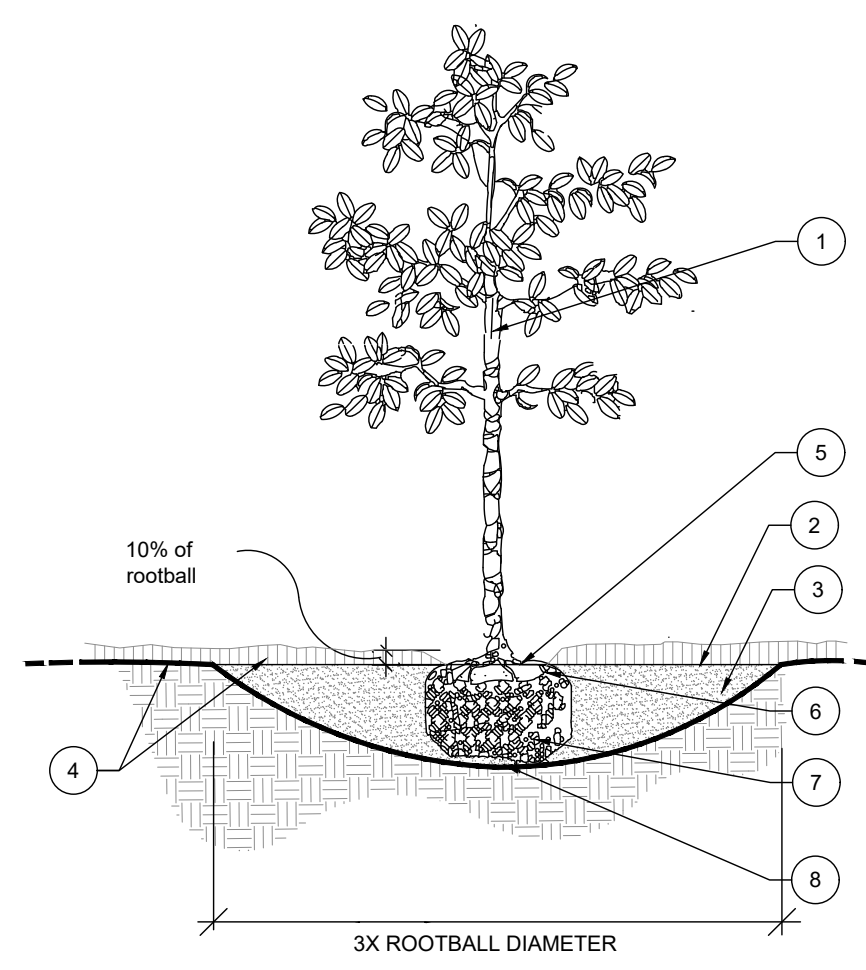


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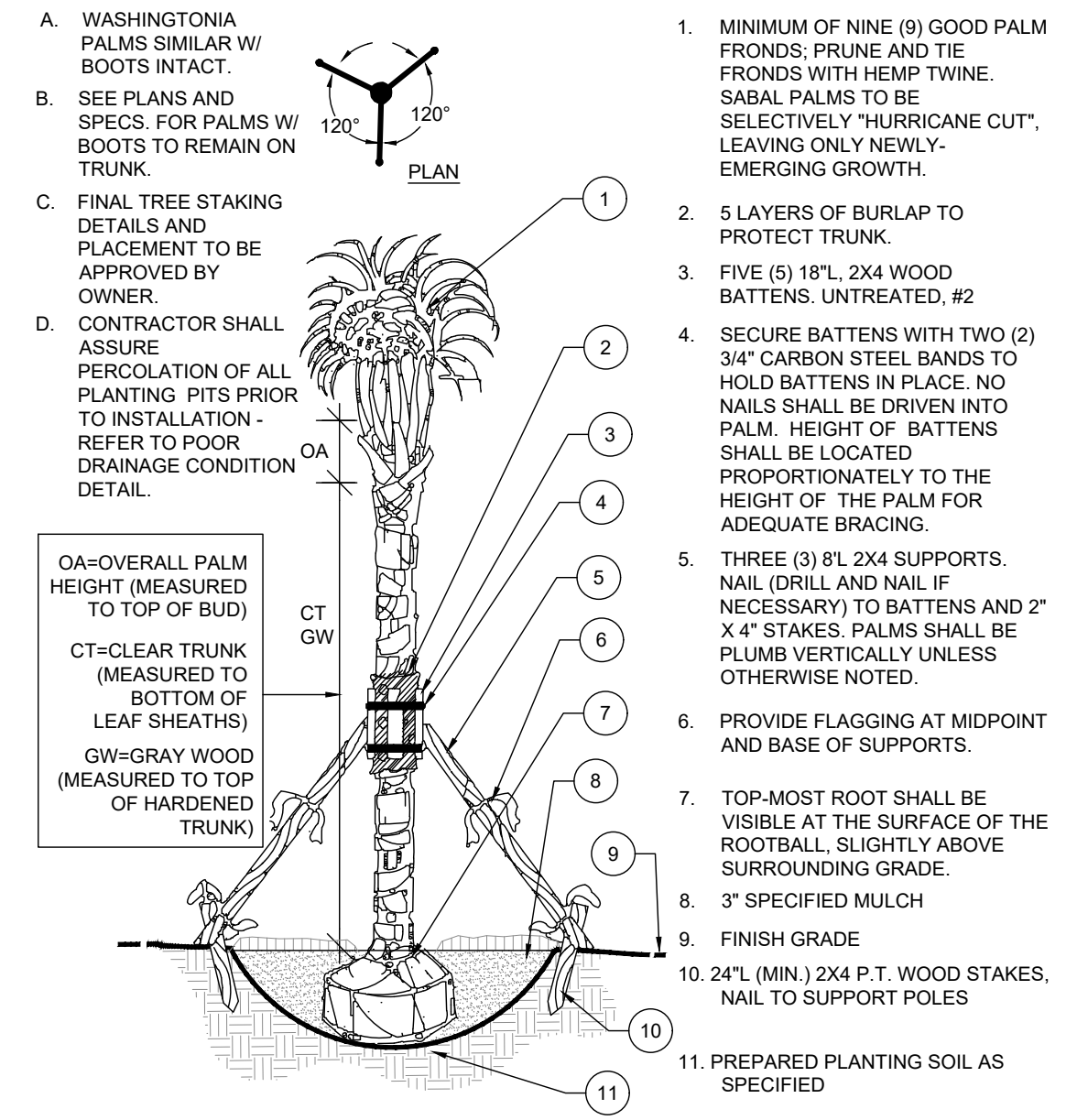
20-0240



1. TRUNK
 2. 3" MINIMUM OF MULCH AS SPECIFIED. WHERE TREES ARE PLACED IN SOD, MULCH RING FOR TREES COVER ROOTBALL SIDES AND EXTEND 18" BEYOND ON ALL SIDES. NO MULCH SHALL BE PLACED OVER TRUNK.
 3. SHALLOW WIDE PLANT HOLE; TOP SHALL BE 3X THE SIZE OF ROOTBALL.
 4. FINISHED GRADE - LANDSCAPE SOIL
 5. FIND TOP-MOST ROOT ON ROOTBALL; POSITION ROOTBALL SO THIS TOP ROOT IS 1-2" ABOVE LANDSCAPE SOIL (APPROX. 10% OF ROOTBALL SHALL BE ABOVE LANDSCAPE SOIL.)
 6. B & B OR CONTAINER (SEE SPECIFICATIONS FOR ROOT BALL REQUIREMENTS)
 7. REMOVE ALL SYNTHETIC MATERIALS FROM ROOTBALL.
 8. ROOTBALLS SHALL BE PLACED ON UNDISTURBED SOIL TO PREVENT SETTLING.
- NOTES:
- A. CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING PITS PRIOR TO INSTALLATION.
 - B. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
 - C. SEE PRE-APPROVED STAKING METHODS, THIS SHEET

TREE PLANTING

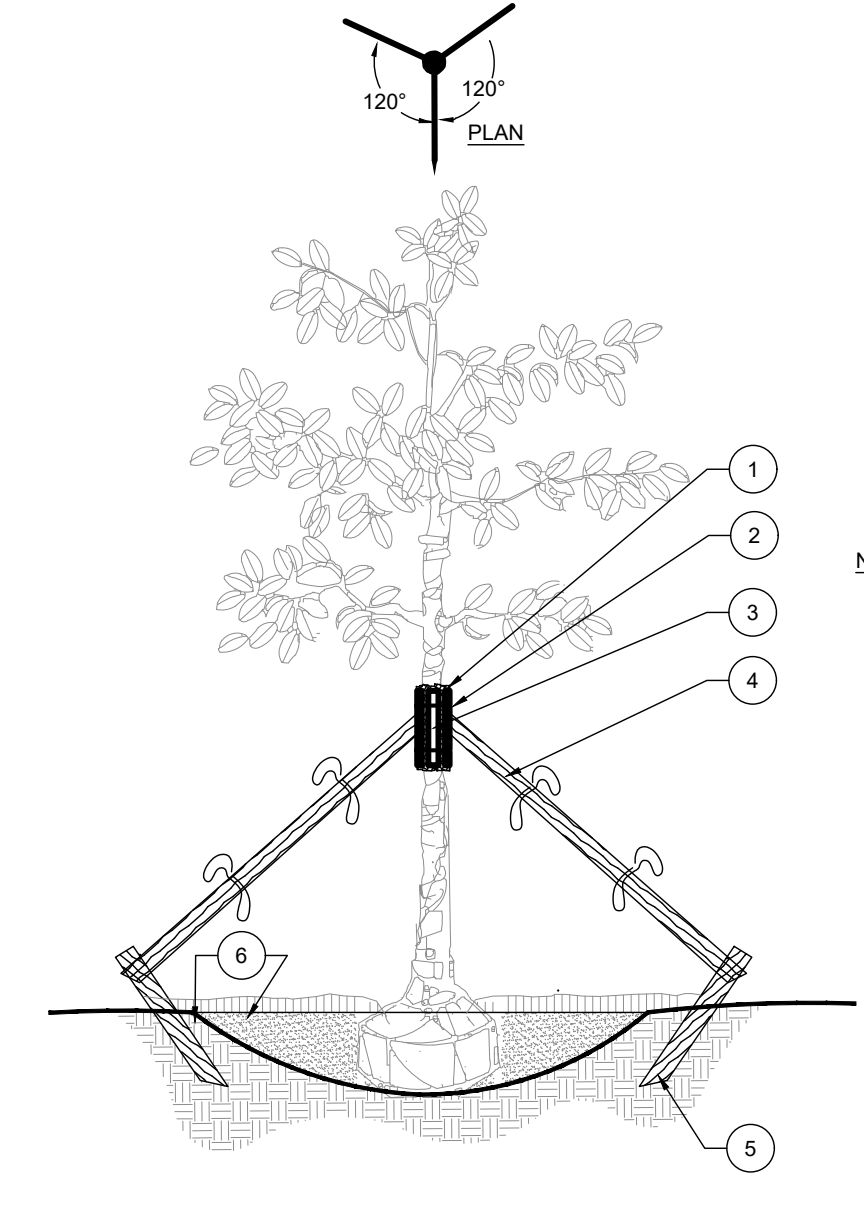
SECTION NTS



1. MINIMUM OF NINE (9) GOOD PALM FRONDS; PRUNE AND TIE FRONDS WITH HEMP TWINE. SABAL PALMS TO BE SELECTIVELY "HURRICANE CUT," LEAVING ONLY NEWLY-EMERGING GROWTH.
 2. 5 LAYERS OF BURLAP TO PROTECT TRUNK.
 3. FIVE (5) 18"L x 2 1/4" WOOD BATTENS, UNTREATED, #2
 4. SECURE BATTENS WITH TWO (2) 3/4" CARBON STEEL BANDS TO HOLD BATTENS IN PLACE. NO NAILS SHALL BE DRIVEN INTO PALM. HEIGHT OF BATTENS SHALL BE LOCATED PROPORTIONATELY TO THE HEIGHT OF THE PALM FOR ADEQUATE BRACING.
 5. THREE (3) 8L 2X4 SUPPORTS, NAIL (DRILL AND NAIL IF NECESSARY) TO BATTENS AND 2" X 4" STAKES. PALMS SHALL BE PLUMB VERTICALLY UNLESS OTHERWISE NOTED.
 6. PROVIDE FLAGGING AT MIDPOINT AND BASE OF SUPPORTS.
 7. TOP-MOST ROOT SHALL BE VISIBLE AT THE SURFACE OF THE ROOTBALL, SLIGHTLY ABOVE SURROUNDING GRADE.
 8. 3" SPECIFIED MULCH
 9. FINISH GRADE
 10. 24" (MIN.) 2X4 P.T. WOOD STAKES, NAIL TO SUPPORT POLES
 11. PREPARED PLANTING SOIL AS SPECIFIED
- NOTES:
- A. ALL TREES SHALL BE PLUMB VERTICALLY WITHIN A TOLERANCE OF THREE DEGREES, UNLESS OTHERWISE DIRECTED BY OWNER'S REPRESENTATIVE.
 - B. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
 - C. ALTERNATE TREE ANCHORING SYSTEMS MAY BE SUBSTITUTED FOR WOOD STAKING SYSTEM UPON APPROVAL BY OWNER OR OWNER'S REPRESENTATIVE.
 - D. RUBBER HOSE/WIRE SYSTEMS ARE NOT ALLOWED.

PALM PLANTING AND STAKING

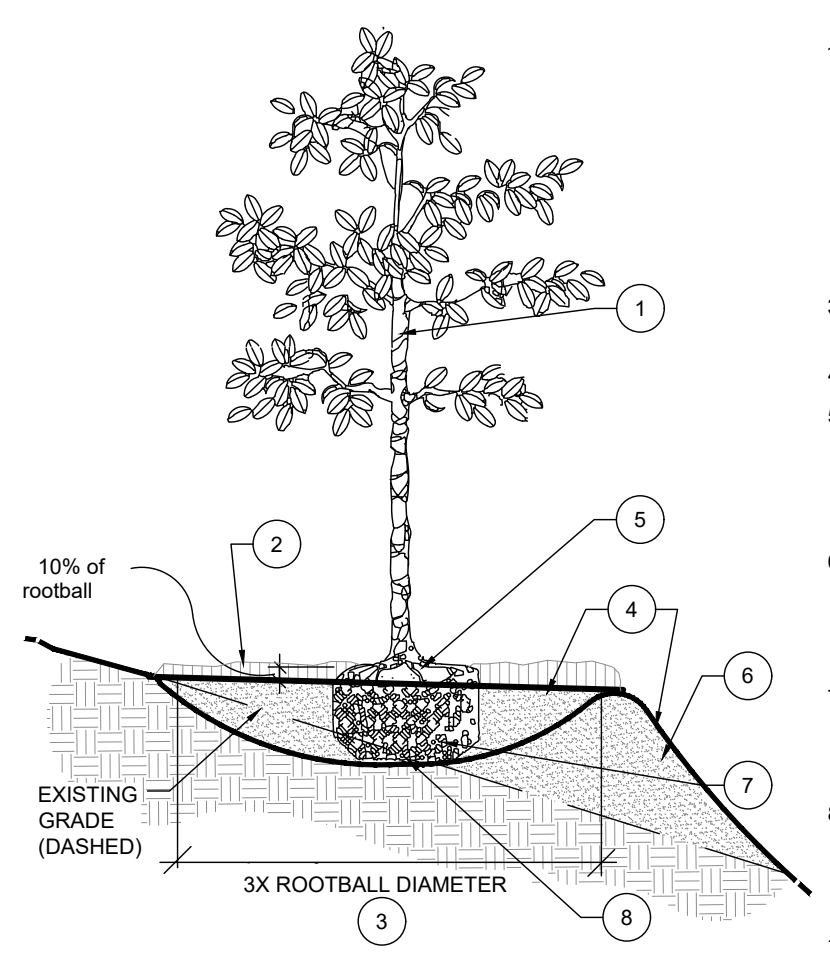
SECTION NTS



1. FIVE (5) LAYERS OF BURLAP TO PROTECT TRUNK
 2. TWO STEEL BANDS TO SECURE BATTENS
 3. FIVE 2 X 4 X 18" L WOOD BATTENS
 4. THREE (3) 2" X 8" LODGE POLES. DRILL, USING GALVANIZED SCREWS, TO BATTENS AND 2" X 4" STAKES. NO SCREWS SHALL PENETRATE TREE. FLAG AT MIDPOINT AND AT BASE.
 5. 2" x 4" x 3" (MIN.) P.T. WOOD STAKES BURIED 3" BELOW FINISHED GRADE.
 6. FINISHED GRADE (SEE GRADING PLAN)
- NOTES:
- A. ALL TREES SHALL BE PLUMB VERTICALLY WITHIN A TOLERANCE OF THREE DEGREES, UNLESS OTHERWISE DIRECTED BY OWNER'S REPRESENTATIVE.
 - B. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
 - C. ALTERNATE TREE ANCHORING SYSTEMS MAY BE SUBSTITUTED FOR WOOD STAKING SYSTEM UPON APPROVAL BY OWNER OR OWNER'S REPRESENTATIVE.
 - D. RUBBER HOSE/WIRE SYSTEMS ARE NOT ALLOWED.

LARGE TREE STAKING - 100 GAL + OR B&B 4" +

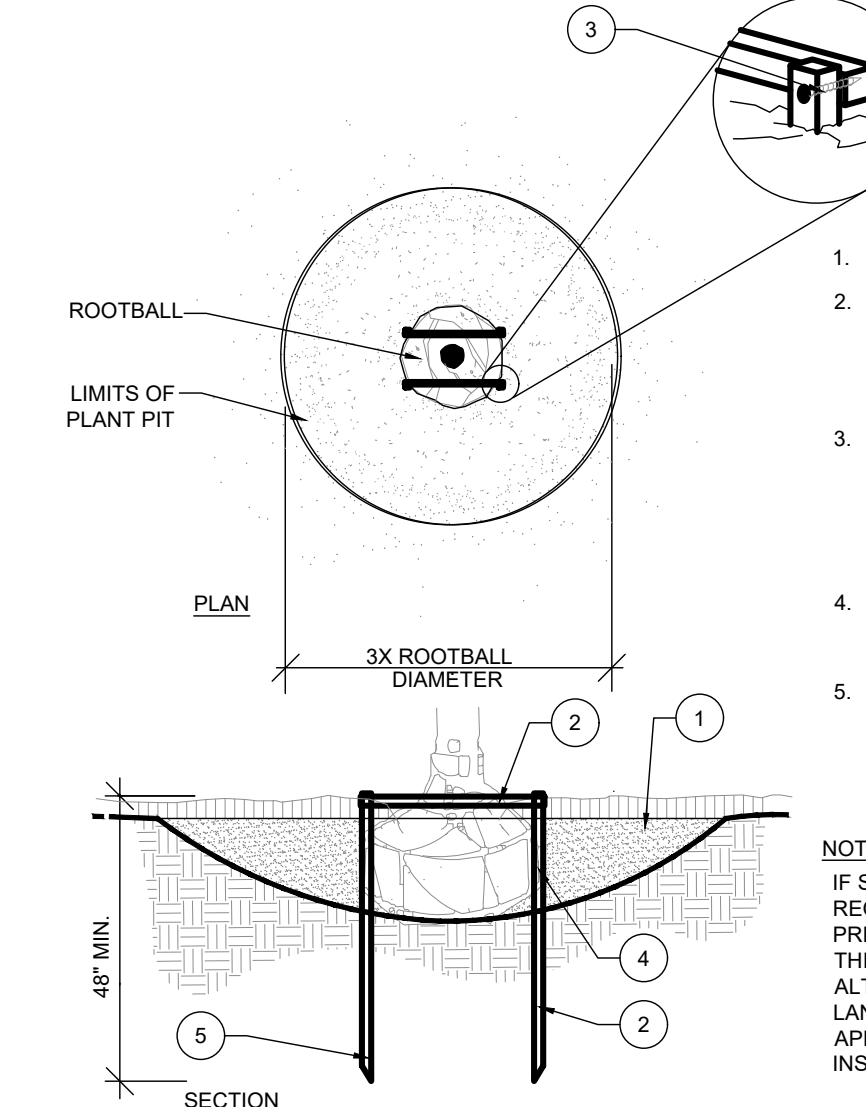
SECTION NTS



1. TREES, PALMS, AND LARGE SHRUBS (15 GAL OR GREATER) SHALL BE PLANTED IN SIMILAR MANNER
 2. 3" MINIMUM OF MULCH AS SPECIFIED. WHERE TREES ARE PLACED IN SOD, MULCH RING FOR TREES COVER ROOTBALL SIDES AND EXTEND 18" BEYOND ON ALL SIDES. NO MULCH SHALL BE PLACED OVER TRUNK.
 3. SHALLOW WIDE PLANT HOLE; TOP SHALL BE 3X THE SIZE OF ROOTBALL.
 4. FINISHED GRADE - LANDSCAPE SOIL
 5. FIND TOP-MOST ROOT ON ROOTBALL; POSITION ROOTBALL SO THIS TOP ROOT IS 1-2" ABOVE LANDSCAPE SOIL (APPROX. 10% OF ROOTBALL SHALL BE ABOVE LANDSCAPE SOIL.)
 6. BERM SOIL SO THAT TOP OF BERM IS JUST BELOW THE TOP 10% OF THE TOP OF THE ROOTBALL. SLOPE DOWNHILL PORTION OF BERM AS REQUIRED TO MEET EXISTING GRADE.
 7. B & B OR CONTAINER REMOVE ALL SYNTHETIC MATERIALS FROM ROOTBALL (SEE SPECIFICATIONS FOR OTHER ROOT BALL REQUIREMENTS)
 8. ROOTBALLS SHALL BE PLACED ON UNDISTURBED SOIL TO PREVENT SETTLING.
- NOTES:
- A. CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING PITS PRIOR TO INSTALLATION.
 - B. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
 - C. SEE PRE-APPROVED STAKING METHODS, THIS SHEET

PLANTING ON A SLOPE

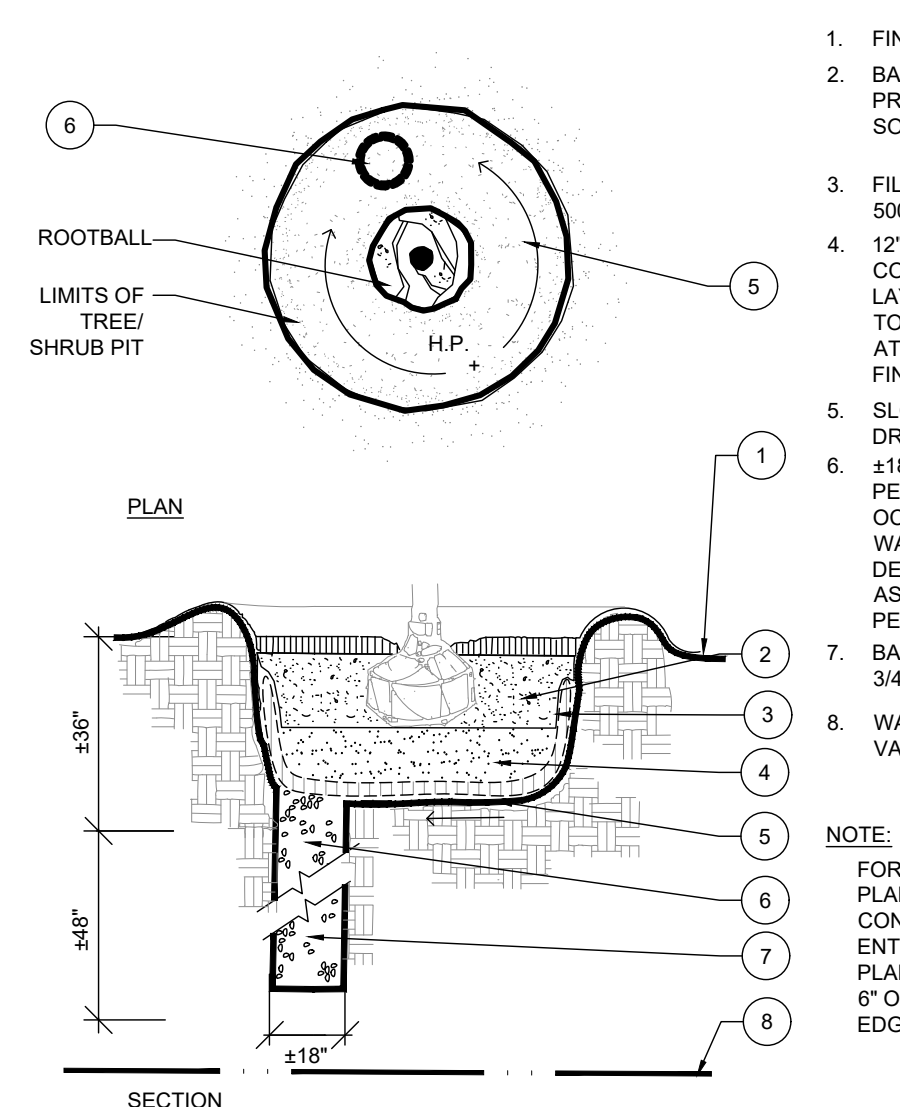
SECTION NTS



1. FINISH GRADE
 2. HORIZONTAL 2X2 SCREWED TO 2X2 STAKE. ALL WOOD SHALL BE #2 UNTREATED.
 3. 3-1/2" DRYWALL SCREW, THREAD SIZE 12, SHARP POINT, FULL THREAD, BLACK PHOSPHATE FINISH
 4. VERTICAL STAKES SHALL ABUT SIDE OF ROOTBALL
 5. STAKES TO EXTEND INTO NATIVE SOIL BY 1-1/2 X THE ROOTBALL DEPTH MIN.
- NOTE:
- IF SPATIAL REQUIREMENTS PRECLUDE STAKING WITH THIS METHOD, SUBMIT ALTERNATE FOR LANDSCAPE ARCHITECT'S APPROVAL PRIOR TO INSTALLING PLANT.

STAKING - UP TO 65 GAL. OR B&B TO 3-1/2" CAL.

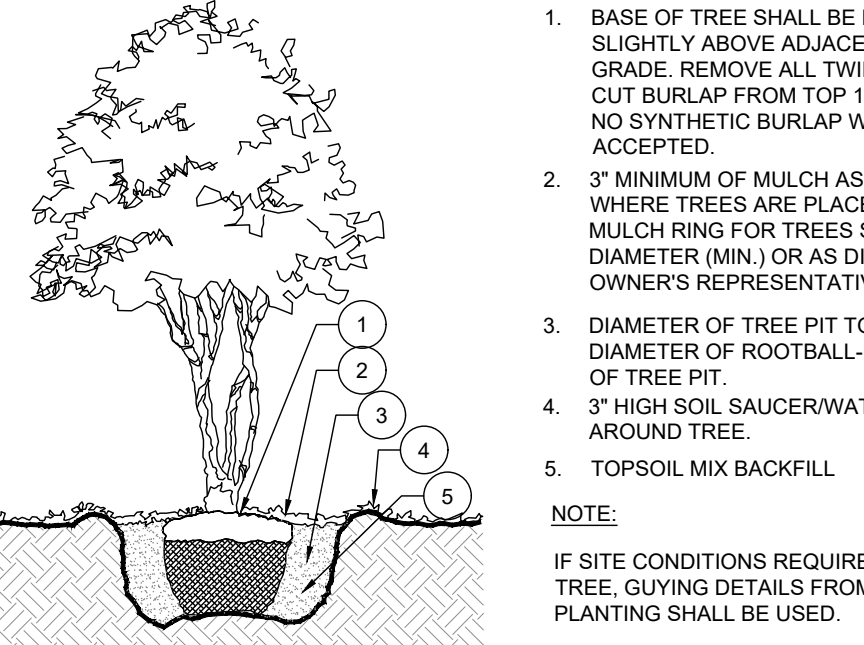
PLAN/SECTION NTS



1. FINISH GRADE
 2. BACKFILL WITH PREPARED PLANTING SOIL MIX AS SPECIFIED.
 3. FILTER CLOTH, MIRAFI 500X OR BETTER
 4. 12" CLEAN SAND, COMPACTED. ADJUST LAYER THICKNESS SO TOP OF ROOTBALL IS AT LEAST 1" ABOVE FINISHED GRADE.
 5. SLOPE BOTTOM TO DRAIN
 6. 1/8" AUGURED HOLE PENETRATE THROUGH OCCCLUDING LAYER TO WATER TABLE OR TO A DEPTH OF 7' TO ASSURE PROPER PERCOLATION.
 7. BACKFILL WITH 1/2" - 3/4" GRAVEL.
 8. WATER TABLE. (DEPTH VARIES)
- NOTE:
- FOR A PARKING ISLAND PLANTING SITUATION, CONTRACTOR TO BACKFILL ENTIRE LENGTH OF PLANTING AREA TO WITHIN 6" OF BACK OF CURB OR EDGE OF PAVEMENT.

POOR DRAINAGE CONDITION

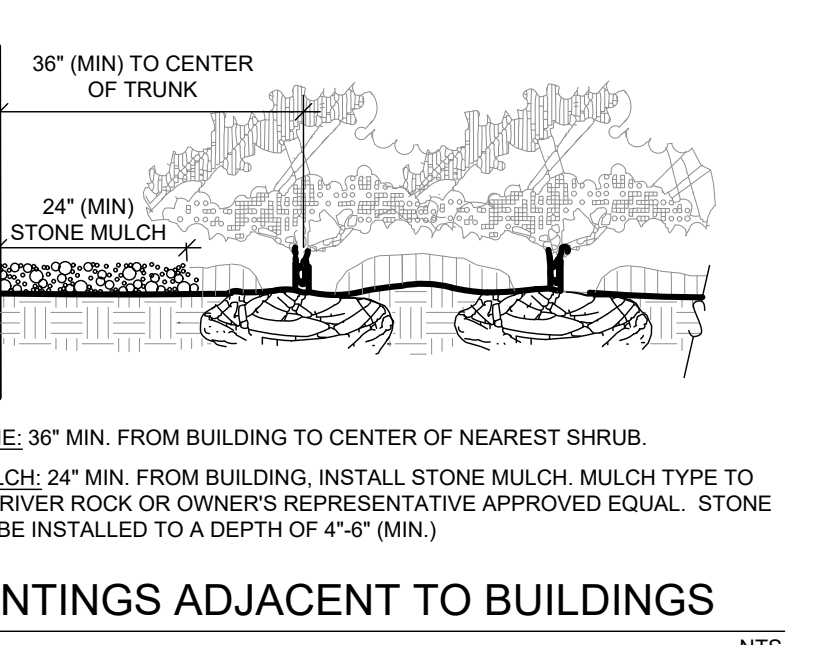
PLAN/SECTION NTS



1. BASE OF TREE SHALL BE PLANTED SLIGHTLY ABOVE ADJACENT FINISH GRADE. REMOVE ALL TWINE & STRAPS & CUT BURLAP FROM TOP 1/3 OF ROOTBALL. NO SYNTHETIC BURLAP WILL BE ACCEPTED.
 2. 3" MINIMUM OF MULCH AS SPECIFIED. WHERE TREES ARE PLACED IN SOD, MULCH RING FOR TREES SHALL BE 8" DIAMETER (MIN.) OR AS DIRECTED BY OWNER'S REPRESENTATIVE.
 3. DIAMETER OF TREE PIT TO BE TWICE THE DIAMETER OF ROOTBALL-ROUGHEN SIDES OF TREE PIT.
 4. 3" HIGH SOIL SAUCER/WATER RING AROUND TREE.
 5. TOPSOIL MIX BACKFILL
- NOTE:
- IF SITE CONDITIONS REQUIRE GUYING OF THE TREE, GUYING DETAILS FROM SMALL TREE PLANTING SHALL BE USED.

MULTI-TRUNK TREE PLANTING DETAIL

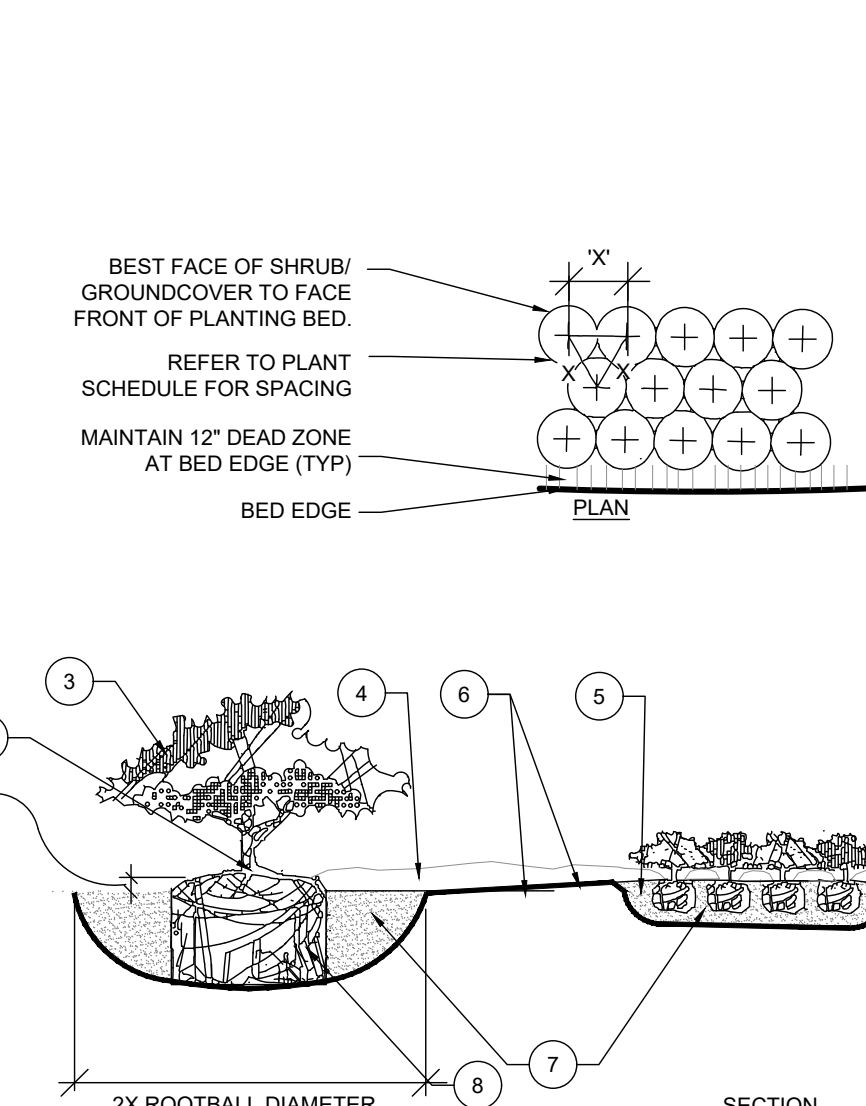
SECTION NTS



1. CLEAR ZONE; 36" MIN. FROM BUILDING TO CENTER OF NEAREST SHRUB
2. STONE MULCH; 24" MIN. FROM BUILDING. INSTALL STONE MULCH. MULCH TYPE TO BE RUSTIC RIVER ROCK OR OWNER'S REPRESENTATIVE APPROVED EQUAL. STONE MULCH TO BE INSTALLED TO A DEPTH OF 4"-6" (MIN.)

PLANTINGS ADJACENT TO BUILDINGS

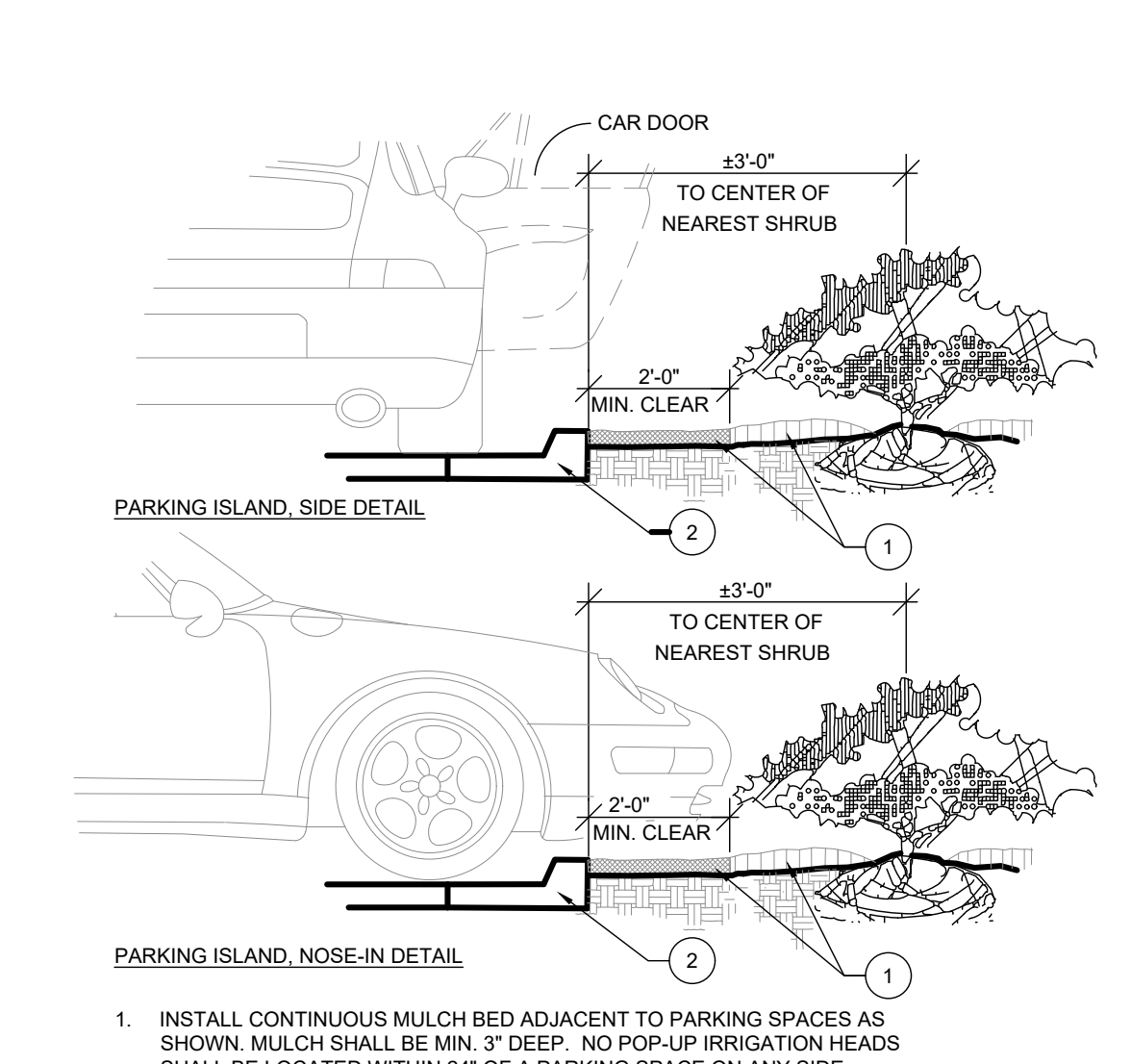
SECTION NTS



1. FIND POINT WHERE TOPMOST ROOT EMERGES FROM TRUNK WITHIN 2' OF SURFACE. CLEAR EXCESS SOIL IF NECESSARY.
 2. TOP 10% OF SHRUB AND GROUNDCOVER ROOTBALLS TO BE PLANTED ABOVE THE LANDSCAPE GRADE. DO NOT COVER EXPOSED 10% ON SIDES WITH SOIL.
 3. PRUNE ALL LIVE SHRUBS WITHIN A PLANTED MASS TO ACHIEVE A UNIFORM MASS/HEIGHT.
 4. 3" MINIMUM MULCH AS SPECIFIED - DO NOT COVER ENTIRE SHRUB ROOTBALL OR CREATE WATER RINGS' ONLY COVER SIDES OF ROOTBALL WITH MULCH
 5. EXCAVATE ENTIRE BED SPECIFIED FOR GROUNDCOVER BED.
 6. FINISHED GRADE (SEE GRADING PLAN)
 7. PREPARED PLANTING SOIL AS SPECIFIED. NOTE: WHEN GROUND-COVERS AND SHRUBS USED IN MASSES, ENTIRE BED TO BE AMENDED WITH PLANTING SOIL MIX AS SPECIFIED.
 8. SCARIFY ROOTBALL SIDES AND BOTTOM.
- NOTE:
- ALL SHRUBS AND GROUNDCOVERS SHALL BE PLUMB VERTICALLY, UNLESS OTHERWISE DIRECTED BY OWNER'S REPRESENTATIVE.

SHRUB / GROUNDCOVER PLANTING

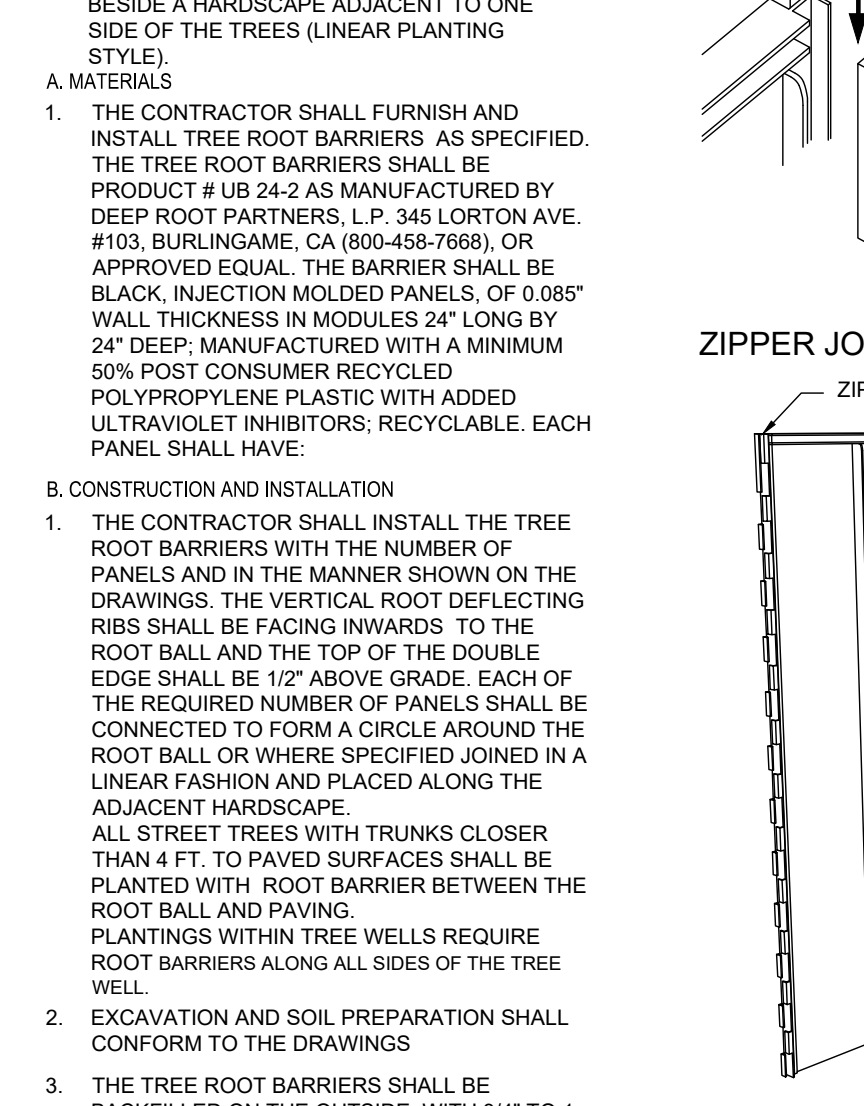
SECTION NTS



1. INSTALL CONTINUOUS MULCH BED ADJACENT TO PARKING SPACES AS SHOWN. MULCH SHALL BE MIN. 3" DEEP. NO POP-UP IRRIGATION HEADS SHALL BE LOCATED WITHIN 24" OF A PARKING SPACE ON ANY SIDE
2. CURB OR PARKING LOT EDGE, BY OTHERS

PARKING SPACE/CURB PLANTING

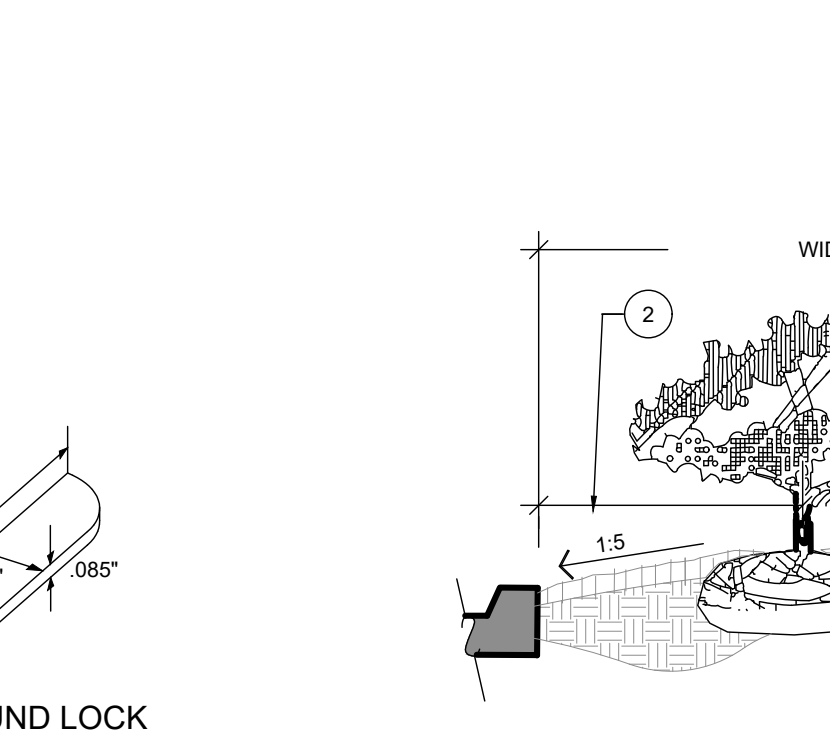
SECTION NTS



1. THE CONTRACTOR SHALL FURNISH AND INSTALL TREE ROOT BARRIERS AS SPECIFIED. THE TREE ROOT BARRIERS SHALL BE PRODUCT # UB 24-2 AS MANUFACTURED BY DEEP ROOT PARTNERS, L.P. 345 LORTON AVE. #103, BURLINGAME, CA (800-458-7668), OR APPROVED EQUAL. THE BARRIER SHALL BE BLACK, INJECTION MOLDED PANELS OF 0.085" WALL THICKNESS IN MODULES 24" LONG BY 24" DEEP. MANUFACTURED WITH A MINIMUM 50% POST CONSUMER RECYCLED POLYPROPYLENE PLASTIC WITH ADDED ULTRAVIOLET INHIBITORS; RECYCLABLE. EACH PANEL SHALL HAVE:
2. CONSTRUCTION AND INSTALLATION
3. THE CONTRACTOR SHALL INSTALL THE TREE ROOT BARRIERS WITH THE NUMBER OF PANELS AND IN THE MANNER SHOWN ON THE DRAWINGS. THE VERTICAL ROOT DEFLECTING RIBS SHALL BE FACING INWARDS TO THE ROOT BALL AND THE TOP OF THE DOUBLE EDGE SHALL BE 1/2" ABOVE GRADE. EACH OF THE REQUIRED NUMBER OF PANELS SHALL BE CONNECTED TO FORM A CIRCLE AROUND THE ROOT BALL OR WHERE SPECIFIED JOINED IN A LINEAR FASHION AND PLACED ALONG THE ADJACENT HARDSCAPE.
4. ALL STREET TREES WITH TRUNKS CLOSER THAN 4 FT. TO PAVED SURFACES SHALL BE PLANTED WITH ROOT BARRIER BETWEEN THE ROOT BALL AND PAVING.
5. PLANTINGS WITHIN TREE WELLS REQUIRE ROOT BARRIERS ALONG ALL SIDES OF THE TREE WELL.
6. EXCAVATION AND SOIL PREPARATION SHALL CONFORM TO THE DRAWINGS
7. THE TREE ROOT BARRIERS SHALL BE BACKFILLED ON THE OUTSIDE WITH 3/4" TO 1 1/2" GRAVEL OR CRUSHED ROCK AS SHOWN ON THE DRAWINGS. NO GRAVEL BACKFILL IS REQUIRED FOR A LINEAR PLANTING

24" DEEPROOT TREE ROOT BARRIERS

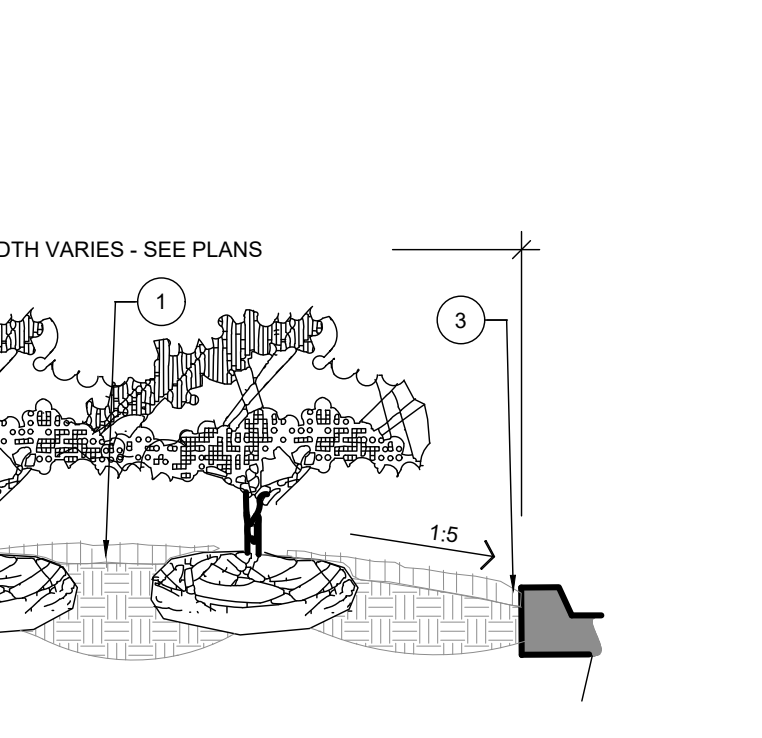
SECTION NTS



1. THE CONTRACTOR SHALL FURNISH AND INSTALL TREE ROOT BARRIERS AS SPECIFIED. THE TREE ROOT BARRIERS SHALL BE PRODUCT # UB 24-2 AS MANUFACTURED BY DEEP ROOT PARTNERS, L.P. 345 LORTON AVE. #103, BURLINGAME, CA (800-458-7668), OR APPROVED EQUAL. THE BARRIER SHALL BE BLACK, INJECTION MOLDED PANELS OF 0.085" WALL THICKNESS IN MODULES 24" LONG BY 24" DEEP. MANUFACTURED WITH A MINIMUM 50% POST CONSUMER RECYCLED POLYPROPYLENE PLASTIC WITH ADDED ULTRAVIOLET INHIBITORS; RECYCLABLE. EACH PANEL SHALL HAVE:
2. CONSTRUCTION AND INSTALLATION
3. THE CONTRACTOR SHALL INSTALL THE TREE ROOT BARRIERS WITH THE NUMBER OF PANELS AND IN THE MANNER SHOWN ON THE DRAWINGS. THE VERTICAL ROOT DEFLECTING RIBS SHALL BE FACING INWARDS TO THE ROOT BALL AND THE TOP OF THE DOUBLE EDGE SHALL BE 1/2" ABOVE GRADE. EACH OF THE REQUIRED NUMBER OF PANELS SHALL BE CONNECTED TO FORM A CIRCLE AROUND THE ROOT BALL OR WHERE SPECIFIED JOINED IN A LINEAR FASHION AND PLACED ALONG THE ADJACENT HARDSCAPE.
4. ALL STREET TREES WITH TRUNKS CLOSER THAN 4 FT. TO PAVED SURFACES SHALL BE PLANTED WITH ROOT BARRIER BETWEEN THE ROOT BALL AND PAVING.
5. PLANTINGS WITHIN TREE WELLS REQUIRE ROOT BARRIERS ALONG ALL SIDES OF THE TREE WELL.
6. EXCAVATION AND SOIL PREPARATION SHALL CONFORM TO THE DRAWINGS
7. THE TREE ROOT BARRIERS SHALL BE BACKFILLED ON THE OUTSIDE WITH 3/4" TO 1 1/2" GRAVEL OR CRUSHED ROCK AS SHOWN ON THE DRAWINGS. NO GRAVEL BACKFILL IS REQUIRED FOR A LINEAR PLANTING

ZIPPER JOINING SYSTEM

SECTION NTS



1. CROWN ISLANDS @ 5:1 SLOPES (OR AS SPECIFIED ON THE LANDSCAPE PLANS)
 2. CLEAR ZONE; 36" MIN. FROM BACK OF CURB TO CENTER OF NEAREST SHRUB. CLEAR ZONE SHALL CONTAIN 3" CONTINUOUS MULCH OR TURF. SEE PLANS. SEE DETAIL "F" FOR PLANTER MEDIANS ADJACENT TO PARKING SPACES.
 3. 1" MIN VERTICAL CLEARANCE, TOP OF CURB TO TOP OF MULCH.
- EXCAVATE CONTINUOUS 36" DEEP (FROM TOP OF CURB) FOR ENTIRE LENGTH AND WIDTH OF ISLAND & BACKFILL WITH APPROVED PLANTING MIX. PROTECT AND RETAIN ALL CURBS AND BASE. COMPACTED SUBGRADE TO REMAIN FOR STRUCTURAL SUPPORT OF CURB SYSTEM (TYP).
- ALL ISLANDS SHALL UTILIZE POOR DRAINAGE DETAIL WHEN PERCOLATION RATES ARE 2" PER HOUR OR LESS.

PLANTER ISLAND NOTES

SECTION NTS

72 HOURS BEFORE DIGGING
CALL TOLL FREE
811
Know what's below.
Call before you dig.

EMBV ENGINEERING, INC.
MOA, BONNIES VILLANIZAR & ASSOCIATES
ENGINEERING & ARCHITECTURE
1850 W. 20TH STREET
SUITE 200
MIAMI, FL 33135
TEL: (305) 953-1510
FAX: (305) 953-1511
FL. REG. NO. 11772
FL. REG. NO. 11772

LANDSCAPE DETAILS

HALLSTROM FARMSTEAD CONSERVATION AREA

AARON G. STANTON
LICENSE
No. 72460
STATE OF FLORIDA
PROFESSIONAL ENGINEER
AARON G. STANTON
FL. P.E. #72460
SHEET
C16
20-0240

JOB NO.	DESIGNED	DRAWN	DATE	CHECKED	TH	DATE ISSUED	REVISIONS	DATE	
20-0240	AS	JIB	10/19/2021	3	ADD SOD QUANTITIES	9/23/2021	2	RC COMMENTS	8/12/2021
				1	RC COMMENTS		1		

GENERAL LANDSCAPE SPECIFICATIONS AND NOTES

A. SCOPE OF WORK

1. THE WORK CONSISTS OF: FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, TRANSPORTATION, AND ANY OTHER APPURTENANCES NECESSARY FOR THE COMPLETION OF THIS PROJECT AS SHOWN ON THE DRAWINGS, AS INCLUDED IN THE PLANT LIST, AND AS HEREIN SPECIFIED.

B. PROTECTION OF EXISTING STRUCTURES

ALL EXISTING BUILDINGS, WALKS, WALLS, PAVING, PIPING, OTHER SITE CONSTRUCTION ITEMS, AND PLANTING ALREADY COMPLETED OR ESTABLISHED SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. ALL DAMAGE RESULTING FROM NEGLIGENCE SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER, AT NO COST TO THE OWNER.

C. PROTECTION OF EXISTING PLANT MATERIALS OUTSIDE LIMIT OF WORK

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UNAUTHORIZED CUTTING OR DAMAGE TO TREES AND SHRUBS EXISTING OR OTHERWISE, CAUSED BY CARELESS EQUIPMENT OPERATION, MATERIAL STOCKPILING, ETC. THIS SHALL INCLUDE COMPACTION BY DRIVING OR PARKING INSIDE THE DRIP-LINE AND SPILLING OIL, GASOLINE, OR OTHER DELETERIOUS MATERIALS WITHIN THE DRIP-LINE. NO MATERIALS SHALL BE BURNED WHERE HEAT WILL DAMAGE ANY PLANT. EXISTING TREES KILLED OR DAMAGED SO THAT THEY ARE MISSHAPEN AND/OR UNSIGHTLY SHALL BE REPLACED AT THE COST TO THE CONTRACTOR OF ONE HUNDRED DOLLARS (\$100) PER CALIPER INCH ON AN ESCALATING SCALE WHICH ADDS AN ADDITIONAL TWENTY (20) PERCENT PER INCH OVER FOUR (4) INCHES CALIPER AS FIXED AND AGREED LIQUIDATED DAMAGES. CALIPER SHALL BE MEASURED SIX (6) INCHES ABOVE GROUND LEVEL FOR TREES UP TO AND INCLUDING FOUR (4) INCHES IN CALIPER AND TWELVE (12) INCHES ABOVE GROUND LEVEL FOR TREES OVER FOUR (4) INCHES IN CALIPER.

D. MATERIALS

1. GENERAL MATERIAL SAMPLES LISTED BELOW SHALL BE SUBMITTED FOR APPROVAL, ON THE SITE OR AS OTHERWISE DETERMINED BY THE OWNER. UPON SAMPLES' APPROVAL, DELIVERY OF MATERIALS MAY COMMENCE.

- MATERIAL MULCH ONE (1) CUBIC FOOT TOPSOIL MIX ONE (1) CUBIC FOOT PLANTS ONE (1) OF EACH VARIETY (OR TAGGED IN NURSERY)
a. PLANT SPECIES AND SIZE SHALL CONFORM TO THOSE INDICATED ON THE DRAWINGS. NOMENCLATURE SHALL CONFORM TO STANDARDIZED PLANT NAMES, 1942 EDITION. ALL NURSERY STOCK SHALL BE IN ACCORDANCE WITH GRADERS AND STANDARDS FOR NURSERY PLANTS, LATEST EDITION, PUBLISHED BY THE FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES. ALL PLANTS SHALL BE FLORIDA GRADE NO. 1 OR BETTER AS DETERMINED BY THE FLORIDA DIVISION OF PLANT INDUSTRY. ALL PLANTS SHALL BE HEALTHY, WELL-BRANCHED, AND FREE OF DISEASE AND INSECTS. INSECT EGGS AND LARVAE AND SHALL HAVE ADEQUATE ROOT SYSTEMS. TREES FOR PLANTING IN ROWS SHALL BE UNIFORM IN SIZE AND SHAPE. ALL MATERIALS SHALL BE SUBJECT TO APPROVAL BY THE OWNER, WHERE ANY REQUIREMENTS ARE OMITTED FROM THE PLANT LIST. THE PLANTS FURNISHED SHALL BE NORMAL FOR THE AREA AND SHALL BE APPROVED PRIOR TO DELIVERY ONLY WITH APPROVAL FROM OWNER OR OWNER'S REPRESENTATIVE. NO SUBSTITUTIONS SHALL BE MADE WITHOUT WRITTEN PERMISSION FROM THE OWNER'S REPRESENTATIVE.

b. MEASUREMENTS: THE HEIGHT AND/OR WIDTH OF TREES SHALL BE MEASURED FROM THE GROUND OR ACROSS THE NORMAL SPREAD OF BRANCHES WITH THE PLANTS IN THEIR NORMAL POSITION. THIS MEASUREMENT SHALL NOT INCLUDE THE IMMEDIATE TERMINAL GROWTH PLANTS LARGER IN SIZE THAN SPRAYS, AND ALL OTHER OPERATIONS (SUCH AS RE-STAKING OR REPAIRING GUY SUPPORTS) NECESSARY TO INSURE A HEALTHY PLANT CONDITION BY THE CONTRACTOR UNTIL CERTIFICATION OF ACCEPTABILITY BY THE OWNER'S REPRESENTATIVE. FAILURE TO DO SO BEFORE PLANTING SHALL MAKE THE CORRECTIVE MEASURES THE RESPONSIBILITY OF THE CONTRACTOR.

c. INSPECTION: PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, OR UPON DELIVERY TO THE SITE, AS DETERMINED BY THE OWNER. FOR QUALITY, SIZE, AND VARIETY. SUCH APPROVAL SHALL NOT IMPAIR THE RIGHT OF INSPECTION AND REJECTION AT THE SITE DURING PROGRESS OF THE WORK OR AFTER COMPLETION FOR SIZE AND CONDITION OF ROOT BALLS OR ROOTS, LATENT DEFECTS OR INJURIES. REJECTED PLANTS SHALL BE REMOVED IMMEDIATELY FROM THE SITE. NOTICE REQUESTING INSPECTION SHALL BE SUBMITTED IN WRITING BY THE CONTRACTOR AT LEAST ONE (1) WEEK PRIOR TO ANTICIPATED DATE.

E. SOIL MIXTURE (PLANTING MEDIUM, PLANTING MIX, TOPSOIL MIX)

- 1. SOIL MIXTURE (PLANTING MEDIUM FOR PLANT PITS) SHALL CONSIST OF TWO PARTS OF TOPSOIL AND ONE PART SAND, AS DESCRIBED BELOW.
2. TOPSOIL FOR USE IN PREPARING SOIL MIXTURE FOR BACKFILLING PLANT PITS SHALL BE FERTILE, FRIABLE, AND OF A LOAMY CHARACTER; REASONABLY FREE OF SUBSOIL, CLAY LUMPS, BRUSH WEEDS AND OTHER LITTER; FREE OF ROOTS, STUMPS, STONES LARGER THAN 2" IN ANY DIRECTION, AND OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH. IT SHALL CONTAIN THREE (3) TO FIVE (5) PERCENT OF DECOMPOSED ORGANIC MATTER AND A PH BETWEEN 5.5 AND 7.0. SUBMIT SAMPLE AND PH TESTING RESULTS FOR APPROVAL.
3. SAND SHALL BE COARSE, CLEAN, WELL-DRAINING, NATIVE SAND. CONTRACTOR SHALL SUBMIT RESULTS OF SOIL TESTS FOR TOPSOIL AND SAND PROPOSED FOR USE UNDER THIS CONTRACT FOR APPROVAL BY THE OWNER.
4. TREES SHALL BE PLANTED IN THE EXISTING NATIVE SOIL ON SITE, UNLESS DETERMINED TO BE UNSUITABLE. AT WHICH POINT THE CONTRACTOR SHALL CONTACT ENGINEER TO DISCUSS ALTERNATE RECOMMENDATION PRIOR TO PLANTING.
5. CONTRACTOR TO SUBMIT SAMPLES OF SOIL MIXTURE FOR OWNER'S REPRESENTATIVE APPROVAL PRIOR TO PLANT INSTALLATION OPERATIONS COMMENCE.

F. WATER

WATER NECESSARY FOR PLANTING AND MAINTENANCE SHALL BE OF SATISFACTORY QUALITY TO SUSTAIN AN ADEQUATE PLANT GROWTH AND SHALL NOT CONTAIN HARMFUL, NATURAL OR MAN-MADE ELEMENTS DETRIMENTAL TO PLANTS. WATER MEETING THE ABOVE STANDARD SHALL BE OBTAINED ON THE SITE FROM THE OWNER, IF AVAILABLE, AND THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE ARRANGEMENTS FOR ITS USE BY HIS TANKS, HOSES, SPRINKLERS, ETC. IF SUCH WATER IS NOT AVAILABLE AT THE SITE, THE CONTRACTOR SHALL PROVIDE SATISFACTORY WATER FROM SOURCES OFF THE SITE AT NO ADDITIONAL COST TO THE OWNER.
*WATERING/IRRIGATION RESTRICTIONS MAY APPLY. REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.
A CERTIFICATION THAT THE IRRIGATION SYSTEM WILL COMPLY WITH SECTION 926.11 OF THE COUNTY'S LAND DEVELOPMENT REGULATIONS AND THE IRRIGATION RESTRICTION ESTABLISHED BY S.J.R.W.M.D.

G. FERTILIZER

CONTRACTOR SHALL PROVIDE FERTILIZER APPLICATION SCHEDULE TO OWNER, AS APPLICABLE TO SOIL TYPE, PLANT INSTALLATION TYPE, AND SITE'S PROPOSED USE. SUGGESTED FERTILIZER TYPE SHALL BE ORGANIC OR OTHERWISE NATURALLY-DERIVED. APPLICATION IS TO BE IN ACCORDANCE WITH FLORIDA GREEN INDUSTRIES BEST MANAGEMENT PRACTICES.
*FERTILIZER RESTRICTIONS MAY APPLY. REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.

H. MULCH

MULCH MATERIAL SHALL BE MOISTENED AT THE TIME OF APPLICATION TO PREVENT WIND DISPLACEMENT, AND APPLIED AT A MINIMUM DEPTH OF 3 INCHES. CLEAR MULCH FROM EACH PLANT'S CROWN (BASE). SEE PLANT LIST FOR TYPE OF MATERIAL. (FLORIMULCH, EUCALYPTUS MULCH, OR PINE STRAW) AND GRADE.

I. DIGGING AND HANDLING

- 1. PROTECT ROOTS OR ROOT BALLS OF PLANTS AT ALL TIMES FROM SUN, DRYING WINDS, WATER AND FREEZING, AS NECESSARY UNTIL PLANTING. PLANT MATERIALS SHALL BE ADEQUATELY PACKED TO PREVENT DAMAGE DURING TRANSIT. TREES TRANSPORTED MORE THAN TEN (10) MILES OR WHICH ARE NOT PLANTED WITHIN THREE (3) DAYS OF DELIVERY TO SITE SHALL BE SPRAYED WITH AN ANTI-TRANSPIRANT PRODUCT ("WILT-PRU" OR EQUAL) TO MINIMIZE TRANSPIRATIONAL WATER LOSS.
2. BALLED AND BURLAPPED PLANTS (BAB) SHALL BE DUG WITH FIRM, NATURAL BALLS OF SOIL OF SUFFICIENT SIZE TO ENCOMPASS THE FIBROUS AND FEEDING ROOTS OF THE PLANTS. NO BALLS MOVED WITH A ROOT BALL SHALL BE PLANTED IF THE BALL IS CRACKED OR BROKEN. PLANTS BALLED AND BURLAPPED OR CONTAINER GROWN SHALL NOT BE HANDLED BY STEMS.
3. PLANTS MARKED "B" IN THE PLANT LIST SHALL BE DUG WITH BARE ROOTS, COMPLYING WITH FLORIDA GRADERS AND STANDARDS FOR NURSERY PLANTS, CURRENT EDITION. CARE SHALL BE EXERCISED THAT THE ROOTS DO NOT DRY OUT DURING TRANSPORTATION AND PRIOR TO PLANTING.
4. PROTECTION OF PALMS: IF A MINIMUM OF FRONDS SHALL BE REMOVED FROM THE CROWN OF THE PALM TREES TO FACILITATE MOVING AND HANDLING. CLEAR TRUNK (CT) SHALL BE AS SPECIFIED AFTER THE MINIMUM OF FRONDS HAVE BEEN REMOVED. ALL PALMS SHALL BE BRACED PER PALM PLANTING DETAIL.
5. EXCAVATION OF TREE PITS SHALL BE PERFORMED USING EXTREME CARE TO AVOID DAMAGE TO SURFACE AND SUBSURFACE ELEMENTS SUCH AS UTILITIES OR HARDSCAPE ELEMENTS, FOOTERS AND PREPARED SUB-BASES.

J. CONTAINER GROWN STOCK

- 1. ALL CONTAINER GROWN MATERIAL SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED PLANTS ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THE PLANTS SHALL HAVE TOPS WHICH ARE OF GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION. FLORIDA #1 OR BETTER.
2. AN ESTABLISHED CONTAINER GROWN PLANT SHALL BE TRANSPLANTED INTO A CONTAINER AND GROWN IN THAT CONTAINER SUFFICIENTLY LONG FOR THE NEW FIBROUS ROOTS TO HAVE DEVELOPED SO THAT THE ROOT MASS WILL RETAIN ITS SHAPE AND HOLD TOGETHER WHEN REMOVED FROM THE CONTAINER. CONTAINER GROWN STOCK SHALL NOT BE HANDLED BY THEIR STEMS.
3. PLANT ROOTS BEING IN CONTAINERS ARE NOT ACCEPTABLE.
4. SUBSTITUTION OF NON-CONTAINER GROWN MATERIAL FOR MATERIAL EXPLICITLY SPECIFIED TO BE CONTAINER GROWN WILL NOT BE PERMITTED WITHOUT WRITTEN APPROVAL IS OBTAINED FROM THE OWNER OR OWNER'S REPRESENTATIVE.

K. COLLECTED STOCK

WHEN THE USE OF COLLECTED STOCK IS PERMITTED AS INDICATED BY THE OWNER OR OWNER'S REPRESENTATIVE, THE MINIMUM SIZES OF ROOTBALLS SHALL BE EQUAL TO THAT SPECIFIED FOR THE NEXT LARGER SIZE OF NURSERY GROWN STOCK OF THE SAME VARIETY.

L. NATIVE STOCK

PLANTS COLLECTED FROM WILD OR NATIVE STANDS SHALL BE CONSIDERED NURSERY GROWN WHEN THEY HAVE BEEN SUCCESSFULLY RE-ESTABLISHED IN A NURSERY ROW AND GROWN UNDER REGULAR NURSERY CULTURAL PRACTICES FOR A MINIMUM OF TWO (2) GROWING SEASONS AND HAVE ATTAINED ADEQUATE ROOT AND TOP GROWTH TO INDICATE FULL RECOVERY FROM TRANSPLANTING INTO THE NURSERY ROW.

M. MATERIALS LIST

QUANTITIES NECESSARY TO COMPLETE THE WORK ON THE DRAWINGS SHALL BE FURNISHED BY THE CONTRACTOR. QUANTITY ESTIMATES HAVE BEEN MADE CAREFULLY, BUT THE ENGINEER OR OWNER ASSUMES NO LIABILITY FOR OMISSIONS OR ERRORS. SHOULD A DISCREPANCY OCCUR BETWEEN THE PLANS AND THE PLANT LIST QUANTITY, THE ENGINEER SHALL BE NOTIFIED FOR CLARIFICATION PRIOR TO ORDERING OR INSTALLATION. ALL DIMENSIONS AND/or SIZES SPECIFIED SHALL BE THE MINIMUM ACCEPTABLE SIZE.

N. FINE GRADING

- 1. FINE GRADING UNDER THIS CONTRACT SHALL CONSIST OF FINAL FINISHED GRADING OF LAWN AND PLANTING AREAS THAT HAVE BEEN ROUGH GRADED IN ACCORDANCE WITH THE DRAWINGS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL FINE GRADE THE LAWN AND PLANTING AREAS TO BRING THE ROUGH GRADE UP TO FINAL FINISHED GRADE ALLOWING FOR THICKNESS OF SOIL AND MULCH DEPTH. THIS CONTRACTOR SHALL FINE GRADE BY HAND AND/OR WITH ALL EQUIPMENT NECESSARY INCLUDING A GRADING TRACTOR WITH FRONT-END LOADER FOR TRANSPORTING SOIL WITHIN THE SITE.
3. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED FOR POSITIVE DRAINAGE TO SURFACE DRAINAGE SYSTEMS TO ACCEPTABLE TYPICAL BUILDINGS SHALL SLOPE AWAY FROM THE BUILDINGS. REFER TO CIVIL ENGINEER'S PLANS FOR FINAL GRADINGS.

O. PLANTING PROCEDURES

- 1. CLEANING UP BEFORE COMMENCING WORK: THE CONTRACTOR SHALL CLEAN WORK AND SURROUNDING AREAS OF ALL RUBBISH OR OBJECTABLE MATTER, ALL MORTAR, CEMENT, AND TOXIC MATERIAL SHALL BE REMOVED FROM THE SURFACE OF ALL PLANT BEDS. THESE MATERIALS SHALL NOT BE MIXED WITH THE SOIL. SHOULD THE CONTRACTOR FIND SUCH SOIL CONDITIONS BENEATH THE SOIL WHICH WILL IN ANY WAY ADVERSELY AFFECT THE PLANT GROWTH, HE SHALL IMMEDIATELY CALL IT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE. FAILURE TO DO SO BEFORE PLANTING SHALL MAKE THE CORRECTIVE MEASURES THE RESPONSIBILITY OF THE CONTRACTOR.
2. VERIFY LOCATIONS OF ALL UTILITIES, CONDUITS, SUPPLY LINES AND CABLES, INCLUDING BUT NOT LIMITED TO: ELECTRIC, GAS (LINE AND TANKS), WATER, SANITARY SEWER, STORMWATER SYSTEMS, CABLE, AND TELEPHONE. PROPERLY MAINTAIN AND PROTECT EXISTING UTILITIES. CALL NATIONAL ONE CALL - 811 - TO LOCATE UTILITIES.
3. SUBGRADE EXCAVATION: CONTRACTOR IS RESPONSIBLE TO REMOVE ALL EXISTING AND IMPORTED LIMEROCK AND LIMEROCK SUB-BASE FROM ALL LANDSCAPE PLANTING AREAS TO A MINIMUM DEPTH OF 36". CONTRACTOR IS RESPONSIBLE TO BACKFILL THESE PLANTING AREAS TO ROUGH FINISHED GRADE WITH CLEAN TOPSOIL FROM AN ON-SITE SOURCE OR AN IMPORTED SOURCE. IF LIMEROCK OR OTHER ADVERSE CONDITIONS OCCUR IN PLANTED AREAS AFTER 36" DEEP EXCAVATION BY THE CONTRACTOR, AND POSITIVE DRAINAGE CAN NOT BE ACHIEVED, CONTRACTOR SHALL UTILIZE PLANTING DETAIL THAT ADDRESSES POOR DRAINAGE.
4. NURSERY NURSERY'S CERTIFICATE OF COMPLIANCE WITH ALL REQUIREMENTS AS HEREIN SPECIFIED AND INSPECTED, INSPECT AND SELECT PLANT MATERIALS BEFORE PLANTS ARE DUG AT NURSERY OR GROWING SITE.
5. GENERAL: COMPLY WITH APPLICABLE FEDERAL, STATE, COUNTY, AND LOCAL REGULATIONS GOVERNING LANDSCAPE MATERIALS AND WORK CONFORMANCE TO ACCEPTED HORTICULTURAL PRACTICES AS USED IN THE TRADE. UPON ARRIVAL AT THE SITE, PLANTS SHALL BE THOROUGHLY WATERED AND PROPERLY MAINTAINED UNTIL PLANTED, PLANTS STORED ON-SITE SHALL NOT REMAIN UNPLANTED FOR A PERIOD EXCEEDING TWENTY-FOUR (24) HOURS. AT ALL TIMES WORKMANLIKE METHODS CUSTOMARY IN GOOD HORTICULTURAL PRACTICES SHALL BE EXERCISED.
6. THE WORK SHALL BE COORDINATED WITH OTHER TRADES TO PREVENT CONFLICTS. COORDINATE PLANTING WITH IRRIGATION WORK TO ASSURE AVAILABILITY OF WATER AND PROPER LOCATION OF IRRIGATION APPURTENANCES AND PLANTS.
7. ALL PLANTING PITS SHALL BE EXCAVATED TO SIZE AND DEPTH IN ACCORDANCE WITH THE USA STANDARD FOR NURSERY STOCK 260.1, UNLESS SHOWN OTHERWISE ON THE DRAWINGS, AND BACKFILLED WITH THE PREPARED PLANTING SOIL MIXTURE AS SPECIFIED IN SECTION E. TEST ALL TREE PITS WITH WATER BEFORE PLANTING TO ASSURE PROPER DRAINAGE PERCOLATION IS AVAILABLE. NO ALLOWANCE WILL BE MADE FOR LOST PLANTS DUE TO IMPROPER DRAINAGE. IF POOR DRAINAGE EXISTS, UTILIZE "POOR DRAINAGE CONDITION" PLANTING DETAIL. TREES SHALL BE SET PLUMB AND HELD IN POSITION UNTIL THE PLANTING MIXTURE HAS BEEN FLUSHED INTO PLACE WITH A SLOW, FULL HOSE STREAM. ALL PLANTING SHALL BE PERFORMED BY PERSONNEL FAMILIAR WITH PLANTING PROCEDURES AND UNDER THE SUPERVISION OF A QUALIFIED LANDSCAPE FOREMAN. PROPER "JETTING IN" SHALL BE ASSURED TO ELIMINATE AIR POCKETS AROUND THE ROOTS. "JET STICK" OR EQUAL, IS RECOMMENDED.
8. TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO BUILDINGS AND BUILDING STRUCTURES WHILE INSTALLING TREES.
9. SOIL MIXTURE SHALL BE AS SPECIFIED IN SECTION E OF THESE SPECIFICATIONS.
10. TREES AND SHRUBS SHALL BE SET STRAIGHT AT AN ELEVATION THAT, AFTER SETTLEMENT, THE PLANT CROWN WILL STAND ONE (1) TO TWO (2) INCHES ABOVE GRADE. EACH PLANT SHALL BE SET IN THE CENTER OF THE PIT. PLANTING SOIL MIXTURE SHALL BE BACKFILLED, THOROUGHLY TAMPED AROUND THE BALL, AND SETTLED BY WATER (AFTR TAMPING).
11. AMEND PINE AND OAK PLANT PITS WITH ECTOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. ALL OTHER PLANT PITS SHALL BE AMENDED WITH ENDOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. PROVIDE PRODUCT INFORMATION SUBMITTAL PRIOR TO INSTALLATION.
12. FILL HOLE WITH SOIL MIXTURE, MAKING CERTAIN ALL SOIL IS SATURATED. TO DO THIS, FILL HOLE WITH WATER AND ALLOW TO SOAK MINIMUM TWENTY (20) MINUTES, STIRRING IF NECESSARY TO GET SOIL THOROUGHLY WET. PACK LIGHTLY WITH FEET. ADD MORE WET SOIL MIXTURE. DO NOT COVER TOP OF BALL WITH SOIL MIXTURE. ONLY WITH MULCH. ALL BURLAP, ROPE, WIRES, BASKETS, ETC. SHALL BE REMOVED FROM THE SIDES AND TOPS OF BALLS, BUT NO BURLAP SHALL BE PULLED FROM UNDERNEATH.
13. PRUNING: TREES SHALL BE PRUNED, AT THE DIRECTION OF THE OWNER OR OWNER'S REPRESENTATIVE, TO PRESERVE THE NATURAL CHARACTER OF THE PLANT. ALL SOFT WOOD OR SUCKER GROWTH AND ALL BROKEN OR BADLY DAMAGED BRANCHES SHALL BE REMOVED WITH A CLEAN CUT. ALL PRUNING TO BE PERFORMED BY LICENSED ARBORIST, IN ACCORDANCE WITH ANSI A-300.
14. SHRUBS AND GROUND COVER PLANTS SHALL BE EVENLY SPACED IN ACCORDANCE WITH THE DRAWINGS AND AS INDICATED THEREIN. CULTIVATE ALL PLANTING AREAS TO A MINIMUM DEPTH OF 6". REMOVE AND DISPOSE ALL DEBRIS. MIX TOP 4" OF THE PLANTING SOIL MIXTURE AS SPECIFIED IN SECTION E. THOROUGHLY WATER ALL PLANTS AFTER INSTALLATION.
15. TREE GUYING AND BRACING SHALL BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH THE PLANS TO INSURE STABILITY AND MAINTAIN TREES IN AN UPRIGHT POSITION. IF THE CONTRACTOR AND OWNER DECIDE TO WAIVE THE TREE GUYING AND BRACING, THE OWNER SHALL NOTIFY THE ENGINEER IN WRITING AND AGREE TO INDEMNIFY AND HOLD HARMLESS THE ENGINEER IN THE EVENT UNSUPPORTED TREES PLANTED UNDER THIS CONTRACT FALL AND DAMAGE PERSON OR PROPERTY.
16. MULCHING: PROVIDE A THREE INCH (MINIMUM) LAYER OF SPECIFIED MULCH OVER THE ENTIRE AREA OF EACH SHRUB BED, GROUND COVER, VINE BED, AND TREE PIT PLANTED UNDER THIS CONTRACT.
17. HERBICIDE WEED CONTROL: ALL PLANT BEDS SHALL BE KEPT FREE OF NOXIOUS WEEDS UNTIL FINAL ACCEPTANCE OF WORK. IF DIRECTED BY THE OWNER, "HAND-UP" SHALL BE APPLIED FOR WEED CONTROL BY QUALIFIED PERSONNEL TO ALL PLANTING AREAS IN SPOT APPLICATIONS PER MANUFACTURER'S PRECAUTIONS AND SPECIFICATIONS. PRIOR TO FINAL INSPECTION, TREAT ALL PLANTING BEDS WITH AN APPROVED PRE-EMERGENT HERBICIDE IN ACCORDANCE WITH AN APPLICATION RATE RECOMMENDED BY THE MANUFACTURER (AS ALLOWED BY JURISDICTIONAL AUTHORITY).
18. ROOT BARRIERS SHALL BE PROVIDED FOR CANOPY TREES WITHIN 6" OF ALL HARD-SURFACE IMPROVEMENTS I.E. SIDEWALKS, PARKING LOT, DRIVEWAY.

P. LAWN SODDING

- 1. THE WORK CONSISTS OF LAWN BED PREPARATION, SOIL PREPARATION, AND SODDING COMPLETE, IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND THE APPLICABLE DRAWINGS TO PRODUCE A TURF GRASS LAWN ACCEPTABLE TO THE OWNER.
2. LAWN BED PREPARATION: AREAS THAT ARE TO BE SODDED SHALL BE CLEARED OF ANY ROUGH GRASS, WEEDS, AND DEBRIS, AND THE GROUND BROUGHT TO AN EVEN GRADE. THE ENTIRE SURFACE SHALL BE ROLLED WITH A ROLLER WEIGHING NOT MORE THAN ONE-HUNDRED (100) POUNDS PER FOOT OF WIDTH. DURING THE ROLLING, ALL DEPRESSIONS CAUSED BY SETTLEMENT SHALL BE FILLED WITH ADDITIONAL SOIL, AND THE SURFACE SHALL BE GRADED AND ROLLED UNTIL PRESENTING A SMOOTH AND EVEN FINISH TO THE REQUIRED GRADE.
3. SOIL PREPARATION: PREPARE LOOSE BED FOUR (4) INCHES DEEP. HAND RAKE UNTIL ALL BUMPS AND DEPRESSIONS ARE REMOVED. WEED PREPARED AREA THOROUGHLY.
4. SODDING
a. THE CONTRACTOR SHALL SOD ALL AREAS THAT ARE NOT PAVED OR PLANTED AS DESIGNATED ON THE DRAWINGS WITHIN THE CONTRACT LIMITS, UNLESS SPECIFICALLY NOTED OTHERWISE.
b. THE SOD SHALL BE CERTIFIED TO MEET FLORIDA STATE PLANT BOARD SPECIFICATIONS, ABSOLUTELY TRUE TO VARIETY TYPE, AND FREE FROM WEEDS, FUNGI, INSECTS AND DISEASES OF ANY KIND.
c. SOD PANELS SHALL BE LAID TIGHTLY TOGETHER SO AS TO MAKE A SOLID SODDED LAWN AREA. SOD SHALL BE LAID UNIFORMLY AGAINST THE EDGES OF ALL CURBS AND OTHER HARDSCAPE ELEMENTS, PAVED AND PLANTED AREAS, ADJACENT TO BUILDINGS, A 24 INCH STONE MULCH STRIP SHALL BE PROVIDED - REFER TO DETAILS. IMMEDIATELY FOLLOWING SOD LAYING, THE LAWN AREAS SHALL BE ROLLED WITH A LAWN ROLLER CUSTOMARILY USED FOR SUCH PURPOSES, AND THEN THOROUGHLY IRRIGATED. IF, IN THE OPINION OF THE OWNER, TOP-DRESSING IS NECESSARY AFTER ROLLING TO FILL THE VOIDS BETWEEN THE SOD PANELS AND TO EVEN OUT INCONSISTENCIES IN THE SOD, CLEAN SAND, AS APPROVED BY THE OWNER'S REPRESENTATIVE, SHALL BE UNIFORMLY SPREAD OVER THE ENTIRE SURFACE OF THE SOD AND THOROUGHLY WATERED IN. FERTILIZE INSTALLED SOD AS ALLOWED BY PROPERTY'S JURISDICTIONAL AUTHORITY.
5. DURING DELIVERY, PRIOR TO, AND DURING THE PLANTING OF THE LAWN AREAS, THE SOD PANELS SHALL AT ALL TIMES BE PROTECTED FROM EXCESSIVE DRYING AND UNNECESSARY EXPOSURE OF THE ROOTS TO THE SUN. ALL SOD SHALL BE STACKED SO AS NOT TO BE DAMAGED BY SWEATING OR EXCESSIVE HEAT AND MOISTURE.
6. LAWN MAINTENANCE
a. WITHIN THE CONTRACT LIMITS, THE CONTRACTOR SHALL PRODUCE A DENSE, WELL-ESTABLISHED LAWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AND RE-SODDING OF ALL ERODED, SUNKEN OR BARE SPOTS (LARGER THAN 12"x12") UNTIL CERTIFICATION OF ACCEPTABILITY BY THE OWNER'S REPRESENTATIVE. REPAIRED SODDING SHALL BE ACCOMPLISHED AS IN THE ORIGINAL WORK (INCLUDING RE-GRADING IF NECESSARY).
b. CONTRACTOR RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SOD/LAWN UNTIL ACCEPTANCE BY THE OWNER'S REPRESENTATIVE. PRIOR TO AND UPON ACCEPTANCE, CONTRACTOR TO PROVIDE WATERING/IRRIGATION SCHEDULE TO OWNER. OBSERVE ALL APPLICABLE WATERING RESTRICTIONS AS SET FORTH BY THE PROPERTY'S JURISDICTIONAL AUTHORITY.

Q. CLEANUP

UPON COMPLETION OF ALL PLANTING WORK AND BEFORE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL MATERIAL, EQUIPMENT, AND DEBRIS FROM THE WORK AREA. ALL PAVED AREAS SHALL BE BROOM-CLEANED AND THE SITE LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE.

R. PLANT MATERIAL MAINTENANCE

ALL PLANTS AND PLANTING INCLUDED UNDER THIS CONTRACT SHALL BE MAINTAINED BY WATERING, CULTIVATING, SPRAYING, AND ALL OTHER OPERATIONS (SUCH AS RE-STAKING OR REPAIRING GUY SUPPORTS) NECESSARY TO INSURE A HEALTHY PLANT CONDITION BY THE CONTRACTOR UNTIL CERTIFICATION OF ACCEPTABILITY BY THE OWNER'S REPRESENTATIVE. MAINTENANCE AFTER THE CERTIFICATION OF ACCEPTABILITY SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS IN THIS SECTION. CONTRACTORS ARE REQUESTED TO PROVIDE A BID ESTIMATE TO COVER LANDSCAPE AND IRRIGATION MAINTENANCE FOR A PERIOD OF 90 CALENDAR DAYS COMMENCING AFTER ACCEPTANCE.

S. MAINTENANCE (ALTERNATE BID ITEM)

CONTRACTORS ARE REQUESTED TO PROVIDE A BID ESTIMATE FOR MAINTENANCE FOLLOWING THE INITIAL 90-DAY MAINTENANCE PERIOD ON A COST-PER-MONTH BASIS:

T. FINAL INSPECTION AND ACCEPTANCE OF WORK

FINAL INSPECTION AT THE END OF THE WARRANTY PERIOD SHALL BE ON PLANTING, CONSTRUCTION AND ALL OTHER INCIDENTAL WORK PERTAINING TO THIS CONTRACT. REPLACEMENT AT THIS TIME SHALL BE SUBJECT TO THE SAME ONE (1) YEAR WARRANTY (OR AS SPECIFIED BY THE ENGINEER OR OWNER IN WRITING) BEGINNING WITH THE TIME OF REPLACEMENT AND ENDING WITH THE SAME INSPECTION AND ACCEPTANCE HEREIN DESCRIBED.

U. WARRANTY

- 1. THE LIFE AND SATISFACTORY CONDITION OF ALL 7 GALLON AND LARGER PLANT MATERIAL INSTALLED BY THE LANDSCAPE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A MINIMUM OF ONE (1) CALENDAR YEAR COMMENCING AT THE TIME OF CERTIFICATION OF ACCEPTABILITY BY THE OWNER'S REPRESENTATIVE.
2. THE LIFE AND SATISFACTORY CONDITION OF ALL OTHER PLANT MATERIAL (INCLUDING SOD) INSTALLED BY THE LANDSCAPE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A MINIMUM OF ONE (1) CALENDAR YEAR COMMENCING AT THE TIME OF CERTIFICATION OF ACCEPTABILITY BY THE OWNER'S REPRESENTATIVE.
3. REPLACEMENT: ANY PLANT NOT FOUND IN A HEALTHY GROWING CONDITION AT THE END OF THE WARRANTY PERIOD SHALL BE REMOVED FROM THE SITE AND REPLACED AS SOON AS WEATHER CONDITIONS PERMIT. ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE AS SPECIFIED IN THE PLANT LIST. THEY SHALL BE FURNISHED PLANTED AND MULCHED AS SPECIFIED UNDER "PLANTING", AT NO ADDITIONAL COST TO THE OWNER. WARRANTY IS TO EXCLUDE DAMAGE CAUSED BY FLOODS, LIGHTING STRIKES, FREEZING, WINDS OVER 45 MPH FICE, VANDALISM, HERBIVORE ANIMALS, DISEASE, INSECTS, WATER RESTRICTIONS, GOVERNMENT ACTIONS OR ACTS OF NEGLIGENCE BY THE OWNER OR OTHERS.
4. IN THE EVENT THE OWNER DOES NOT CONTRACT WITH THE CONTRACTOR FOR LANDSCAPE (AND IRRIGATION) MAINTENANCE, THE CONTRACTOR IS ENCOURAGED TO VISIT THE PROJECT SITE PERIODICALLY DURING THE ONE YEAR WARRANTY PERIOD TO EVALUATE MAINTENANCE PROCEDURES BEING PERFORMED BY THE OWNER, AND SHALL NOTIFY THE OWNER IN WRITING OF MAINTENANCE PROCEDURES OR CONDITIONS WHICH THREATEN VIGOROUS AND HEALTHY PLANT GROWTH. IT IS SUGGESTED SUCH SITE VISITS SHALL BE CONDUCTED A MINIMUM OF ONCE PER MONTH FOR A PERIOD OF TWELVE (12) MONTHS FROM THE DATE OF ACCEPTANCE.
5. ALL MATERIAL IN SHOCK MUST BE REPLACED PRIOR TO ISSUANCE OF A C.O.

V. SUBMITTALS

- 1. FOR ALL LANDSCAPE INSTALLATIONS, THE CONTRACTOR SHALL SUBMIT PRODUCT DATA IN THE FORM OF MANUFACTURERS' CUT SHEETS AND CATALOG DATA FOR ALL PRODUCTS, MATERIAL AND EQUIPMENT CLEARLY INDICATING THE SPECIFIC PART OR PRODUCT CATALOG NUMBER(S) FOR APPROVAL AND SUBMIT MATERIALS LIST INDICATING ALL PLANT SPECIES, QUALITY AND SIZE.
2. SUBMIT 6 COPIES OF REQUESTED INFORMATION, NEATLY BOUND AND INDEXED PER CATEGORY.
3. THE CONTRACTOR SHALL SUBMIT A LANDSCAPE COORDINATION DRAWING, INDICATING CONTRACTOR'S PROPOSED LOCATION OF TREES, SHRUBS, GROUNDCOVERS AND MULCH. THIS DRAWING SHOULD BE PREPARED ON A COPY OF THE LANDSCAPE PLAN PROVIDED IN THESE DRAWINGS AND SHALL CLEARLY INDICATE ADJUSTMENTS OR CHANGES THE CONTRACTOR PROPOSES TO THE PLANT SPECIES, SIZE OR LOCATION. THE DRAWINGS SHALL INDICATE ALL PROPOSED SUBSTITUTIONS OF SIZE, AND/OR MATERIAL.
4. ALLOW TWO WEEKS FOR THE ENGINEER TO COMPLETE REVIEW AND APPROVAL OF PRODUCT DATA, AND COORDINATION DRAWINGS. ENGINEER WILL NOT BE RESPONSIBLE FOR PROJECT DELAYS RELATED TO DELIVERY AND TRANSMISSION OF THE INFORMATION AND DOCUMENTATION ONCE INFORMATION HAS LEFT ENGINEER'S OFFICE. ITEMS REQUIRING A LONG LEAD TIME SHOULD BE SUBMITTED AS SOON AS POSSIBLE.
5. WARRANTY: CONTRACTOR SHALL SUBMIT A WARRANTY LETTER TO OWNER, INDICATING THE WARRANTY PERIOD, WARRANTY REQUIREMENTS (AS SPECIFIED IN THESE DRAWING AND SPECIFICATIONS), AND DATES OF WARRANTY PERIOD, WHICH SHALL BEGIN AT THE DATE OF ISSUANCE OF PROJECT CERTIFICATE OF OCCUPANCY, AND END TWELVE (12) MONTHS AFTER.
6. CERTIFICATION: CONTRACTOR SHALL SUBMIT CERTIFICATION STATING THAT: PLANT SPECIES AND SIZE CONFORM TO THOSE INDICATED ON THE DRAWINGS, ALL NURSERY STOCK IS IN ACCORDANCE WITH GRADERS AND STANDARDS FOR NURSERY PLANTS, LATEST EDITION, PUBLISHED BY THE FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, ALL PLANTS ARE FLORIDA GRADE NO. 1 OR BETTER AS DETERMINED BY THE FLORIDA DIVISION OF PLANT INDUSTRY; ALL PLANTS ARE HEALTHY, VIGOROUS, SOUND, WELL-BRANCHED, AND FREE OF DISEASE AND INSECTS, INSECT EGGS AND LARVAE AND HAVE ADEQUATE ROOT SYSTEMS; TREES FOR PLANTING IN ROWS ARE UNIFORM IN SIZE AND SHAPE. THIS CERTIFICATION IS NECESSARY PRIOR TO ACCEPTANCE OF WORK BY THE OWNER.

LANDSCAPE MATERIAL STANDARDS & NOTES

IRC LDC CHAPTER 926 (3) TREES

- (A) CANOPY TREES: EXCEPT FOR NARROW CANOPY TREE SPECIES IDENTIFIED UNDER [SUBSECTION] 926.06(3)(D)1.B., BELOW, SHALL BE SPECIES HAVING AN AVERAGE MATURE CROWN SPREAD OF GREATER THAN FIFTEEN (15) FEET (UNDER LOCAL CLIMATIC CONDITIONS) AND HAVING A TRUNK(S) WITH OVER FIVE (5) FEET OF CLEAR WOOD. "CLEAR WOOD" REFERS TO THAT PORTION OF THE TRUNK BETWEEN THE GROUND AND THE LOWEST LATERAL LIMBS.
2. ALL NEW CANOPY TREES SHALL BE PLANTED IN A PLANTING AREA OF AT LEAST ONE HUNDRED FORTY-FOUR (144) SQUARE FEET, WITH MINIMUM DIMENSIONS BEING AT LEAST TWELVE (12) FEET IN ANY DIRECTION. LARGER AREAS MAY BE REQUIRED BY THE COMMUNITY DEVELOPMENT DIRECTOR OR HIS DESIGNEE FOR NEWLY PLANTED OR EXISTING TREES TO BE PRESERVED, AS REQUIRED BY CHAPTER 927, TREE PROTECTION.
3. CLUSTERS OF PALMS, SUCH AS SABAL PALMS, MAY BE USED AS CANOPY TREES PROVIDED THAT A MINIMUM OF THREE (3) PALMS ARE CLUSTERED TO EQUAL ONE (1) CANOPY TREE. CLUSTERS OF PALMS AND SPECIMEN PALMS (SPECIFIED BELOW), IF USED, SHALL CONSIST OF NO MORE THAN ONE-THIRD (1/3) OF THE TOTAL CANOPY TREE REQUIREMENT.
A. A CANOPY PALM MAY BE SUBSTITUTED FOR ONE (1) CANOPY TREE PROVIDED THAT THE TOTAL HEIGHT OF THE COMBINED CLEAR TRUNKS (GROUND TO LOWEST FROWN, MEASURED ALONG THE TRUCK) IS A MINIMUM OF EIGHTEEN (18) FEET.
B. A CANOPY ISLAND DATE PALM, SYLVESTER PALM, BISMARK PALM, OR PALM WITH A SIMILAR QUALITY LARGE FROND CANOPY BE APPROVED BY PLANNING STAFF. EACH CLEAR TRUNK OF AT LEAST TWO (2) FEET AND AN OVERALL HEIGHT OF AT LEAST TWELVE (12) FEET MAY COUNT AS ONE (1) CANOPY TREE. SUCH A PALM MAY COUNT AS TWO (2) CANOPY TREES IF IT HAS A CLEAR TRUNK OF AT LEAST EIGHT (8) FEET AND AN OVERALL HEIGHT OF AT LEAST EIGHTEEN (18) FEET.
C. A PALM OF THE ROYSTONEA GENUS WITH A MINIMUM CLEAR TRUNK OF TEN (10) FEET MAY BE COUNTED AS ONE (1) CANOPY TREE. A MINIMUM CANOPY TREE SPACING SHALL BE PROVIDED AS FOLLOWS: A BETWEEN FULL CANOPY TREES (E.G. OAK, PINE, BAY); TWENTY-FIVE (25) FEET; B BETWEEN NARROW CANOPY TREE VARIETIES (E.G. CYPRESS AND HOLLY) NOT INCLUDING MAGNOLIA; FIFTEEN (15) FEET; C BETWEEN FULL CANOPY TREES AND NARROW CANOPY TREE VARIETIES (E.G. CYPRESS AND HOLLY) NOT INCLUDING MAGNOLIA. TWENTY (20) FEET. (B) TREES HAVING AN AVERAGE MATURE CROWN SPREAD LESS THAN FIFTEEN (15) FEET MAY BE SUBSTITUTED BY GROUPING THE SAME SO AS TO CREATE THE EQUIVALENT OF A FIFTEEN-FOOT CROWN SPREAD. (C) UNDERSTORY TREES SHALL BE SPECIES DEFINED AS MEDIUM OR SMALL TREES HAVING A MATURE CROWN SPREAD OF FIFTEEN (15) FEET OR LESS. (D) TREE SIZES:
1. REQUIRED CANOPY TREES SHALL BE A MINIMUM OF TWELVE (12) FEET OVERALL IN HEIGHT AND TWO (2) INCH DIAMETER AT ONE-HALF (0.5) FEET ABOVE GRADE WITH A MINIMUM CROWN SPREAD OF FOUR AND ONE-HALF (4.5) FEET, AT THE TIME OF PLANTING, EXCEPT AS FOLLOWS:
A. UNLESS OTHERWISE SPECIFIED IN [SUBSECTION] (3)(A) ABOVE, PALMS USED TOWARD CANOPY TREE CREDIT SHALL HAVE A MINIMUM CLEAR TRUNK (GROUND TO LOWEST FROND, MEASURED ALONG THE TRUNK) OF TEN (10) FEET, WHERE AN ARRANGEMENT OF SUCH PALMS WITH VARYING TRUNK HEIGHTS BETWEEN SIX (6) FEET CLEAR TRUNK AND EIGHTEEN (18) FEET CLEAR TRUNK IS PROPOSED AND THE AVERAGE CLEAR TRUNK OF THE ARRANGEMENT IS TEN (10) FEET, EACH PALM IN THE ARRANGEMENT SHALL COUNT AS ONE (1) TEN-FOOT CLEAR TRUNK PALM FOR TREE CANOPY REQUIREMENT PURPOSES.
B. NARROW, UPRIGHT CANOPY TREE SPECIES, SUCH AS VARIETIES OF CYPRESS, HOLLY, AND MAGNOLIA, SHALL HAVE A MINIMUM SPREAD OF THREE AND ONE-HALF (3.5) FEET AT THREE (3) FEET ABOVE GROUND LEVEL.
C. WHERE A BUILDING BETWEEN TWELVE (12) FEET AND TWENTY-FIVE (25) FEET IN HEIGHT IS PROPOSED TO BE LOCATED WITHIN FIFTY (50) FEET OF A PERIMETER PROPERTY LINE THAT SEPARATES THE DEVELOPMENT PROJECT FROM AN ADJUTING RESIDENTIAL USE LOCATED OUTSIDE THE PROJECT, CANOPY TREES WITHIN REQUIRED BUFFERS (TYPES A-C) LOCATED BETWEEN THE BUILDING AND A SITE PERIMETER SHALL BE A MINIMUM OF FIFTEEN (15) FEET IN HEIGHT WITH A THREE-INCH DIAMETER AT 0.5 FEET ABOVE GRADE AT PLANTING AND A MINIMUM SIX-FOOT SPREAD, WHERE A BUILDING BETWEEN TWELVE (12) FEET AND TWENTY-FIVE (25) FEET IN HEIGHT IS PROPOSED MORE THAN FIFTY (50) FEET FROM A PERIMETER, THE CANOPY TREE HEIGHT REQUIREMENTS OF [SUBSECTION] (D)1. ABOVE, SHALL APPLY TO CANOPY TREES WITHIN THE BUFFER.
2. REQUIRED UNDERSTORY TREES SHALL BE A MINIMUM OF SIX (6) FEET OVERALL IN HEIGHT AND ONE- AND ONE-HALF (1.5) INCHES DIAMETER AT ONE-HALF (0.5) FEET ABOVE GRADE AT THE TIME OF PLANTING. MULTI-TRUNK TREES SHALL HAVE A COMBINED ONE- AND ONE-HALF-INCH CALIPER FOR ALL TRUNKS AT SIX (6) INCHES ABOVE GRADE. PALM TREES USED AS UNDERSTORY TREES SHALL HAVE A MINIMUM OVERALL HEIGHT OF SIX (6) FEET IN HEIGHT AND SHALL NOT COMPRISE MORE THAN ONE-THIRD (1/3) OF THE TOTAL UNDERSTORY TREE REQUIREMENT.

(E) THE NUMBER OF DIFFERENT SPECIES OF TREES, OTHER THAN PALMS, SHALL BE AS FOLLOWS IN TABLE 1 IN SECTION (IRS LDC SECTION 926.06-3(E)). FOR SITES OR PARCELS LOCATED IN A SAND RIDGE OR XERIC SCRUB ENVIRONMENT AS DETERMINED BY COUNTY ENVIRONMENTAL PLANNING STAFF, A MINIMUM OF THREE (3) SPECIES SHALL BE REQUIRED, REGARDLESS OF THE REQUIRED NUMBER OF TREES. SUCH TREES SHALL BE INDIGENOUS TO, AND TOLERANT OF, SAND RIDGE OR XERIC SCRUB CONDITIONS. (F) AT LEAST FIFTY (50) PERCENT OF ALL REQUIRED CANOPY TREES, UNDERSTORY TREES, AND PALMS SHALL BE A NATIVE SPECIES AS LISTED IN APPENDIX A OF THE IRS LDC. SECTION 926. (G) TREES IN PROXIMITY TO PUBLIC WORKS OR EASEMENTS, TREES OF A SPECIES WHOSE ROOTS ARE KNOWN TO CAUSE DAMAGE TO SIDEWALKS, ROADS, OR DRIVEWAYS SHALL NOT BE PLANTED CLOSER THAN SIX (6) FEET TO SUCH STRUCTURES UNLESS A TREE ROOT SYSTEM BARRIER, APPROVED BY THE PUBLIC WORKS DIRECTOR OR HIS DESIGNEE, IS PROVIDED THAT PROTECTS THE STRUCTURES FROM DAMAGE BY THE ROOT SYSTEM. SAID ROOT BARRIER, WHERE REQUIRED, SHALL BE INSTALLED PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY OR CERTIFICATE OF COMPLETION. (H) PROHIBITED TREES: THE INSTALLATION OF ANY OF THE SPECIES LISTED IN APPENDIX B IS PROHIBITED. (I) CREDITS FOR THE USE OF NEWLY PLANTED TREES LARGER THAN THE MINIMUM SIZE SHALL BE AS INDICATED IN TABLE 2 (IRS LDC SECTION 926.06-3(I)) FRACTIONAL MEASUREMENT SHALL BE ATTRIBUTED TO THE NEXT LOWEST CATEGORY. SEE TABLE 3 (IRS LDC SECTION 926.07-2(A)) REGARDING CREDITS FOR TREES PRE-EXISTING OR RELOCATED ON-SITE.

(4) SHRUBS: (A) SHRUBS SHALL BE A MINIMUM OF EIGHTEEN (18) INCHES IN HEIGHT WHEN MEASURED IMMEDIATELY AFTER PLANTING, EXCEPT THAT SHRUBS OF NON-NATIVE VIBURNUM AND LIGUSTRUM SPECIES SHALL BE A MINIMUM OF TWENTY-FOUR (24) INCHES IN HEIGHT IMMEDIATELY AFTER PLANTING. (B) SHRUBS, WHERE REQUIRED, SHALL BE PLANTED IN AN OFFSET DOUBLE ROW AND MAINTAINED SO AS TO FORM A CONTINUOUS, UNBROKEN, SOLID SCREEN, WHERE REQUIRED TO FORM A CONTINUOUS BUFFER TRUNK OF AT LEAST EIGHT (8) FEET AND AN OVERALL HEIGHT OF AT LEAST EIGHTEEN (18) FEET. (C) EVERY LANDSCAPE PLAN SHALL CONTAIN A MINIMUM NUMBER OF SHRUB SPECIES AS INDICATED IN THE TABLE BELOW, EXCLUDING SHRUBS USED IN OPAQUE FEATURES, AT LEAST FIFTY (50) PERCENT OF THE REQUIRED NUMBER OF SHRUBS SHALL BE OF NATIVE SPECIES, LISTED IN APPENDIX A (IRS LDC SECTION 926 APPENDIX A).

(5) VINES: VINES SHALL BE A MINIMUM OF EIGHTEEN (18) INCHES IN HEIGHT IMMEDIATELY AFTER PLANTING AND NO LESS THAN THIRTY (30) INCHES APART. VINES MAY BE USED IN CONJUNCTION WITH FENCES, SCREENS OR WALLS TO MEET PHYSICAL BARRIER REQUIREMENTS AS SPECIFIED. AT LEAST FIFTY (50) PERCENT MUST BE NATIVE. VINES QUALIFYING AS NATIVE ARE LISTED IN APPENDIX A. THE INSTALLATION OF ANY SPECIES LISTED IN APPENDIX B IS PROHIBITED.

(6) MULCH AND GROUND COVERS: THE USE OF CYPRESS MULCH IS PROHIBITED. MULCH THAT IS NOT CYPRESS MAY BE USED. GROUND COVERS (NOT INCLUDING TURF GRASS) SHALL BE PLANTED IN SUCH A MANNER AS TO PRESENT A FINISHED APPEARANCE AND REASONABLY COMPLETE COVERAGE WITHIN ONE YEAR AFTER PLANTING. AT LEAST FIFTY (50) PERCENT OF THE AREA COVERED BY LIVING MATERIAL SHALL BE OF NATIVE SPECIES. REFER TO APPENDIX FOR A LIST OF NATIVE GROUND COVERS AND FLOWERS. THE COMPLETE COVERAGE OF AN AREA BY GROUND COVERS PRECLUDES THE USE OF MULCH THEREAFTER.

(7) TURF GRASS: TURF GRASS AREAS SHALL BE IDENTIFIED ON THE LANDSCAPE PLAN AND SHALL BE LIMITED TO A MAXIMUM OF FIFTY (50) PERCENT OF THE TOTAL IRRIGATED, LANDSCAPED AND VEGETATED PROJECT AREA, EXCLUDING RIGHTS-OF-WAY. ACTIVE RECREATION AREAS (E.G. PLAYFIELDS), AND SLOPES WITH DRY RETENTION AREAS, TURF GRASS SHALL BE PLACED SO THAT IT CAN BE IRRIGATED IN A SEPARATE ZONE. PREFERRED TURF GRASSES ARE THOSE QUALIFYING AS NATIVE AND ARE LISTED IN APPENDIX C.

Table with columns: JOB NO., DESIGNED, DRAWN, DATE, CHECKED, DATE ISSUED, REVISIONS. Includes revision details for 01/20/21 and 01/22/21.

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LANDSCAPE SPECIFICATIONS

HALLSTROM FARMSTEAD CONSER

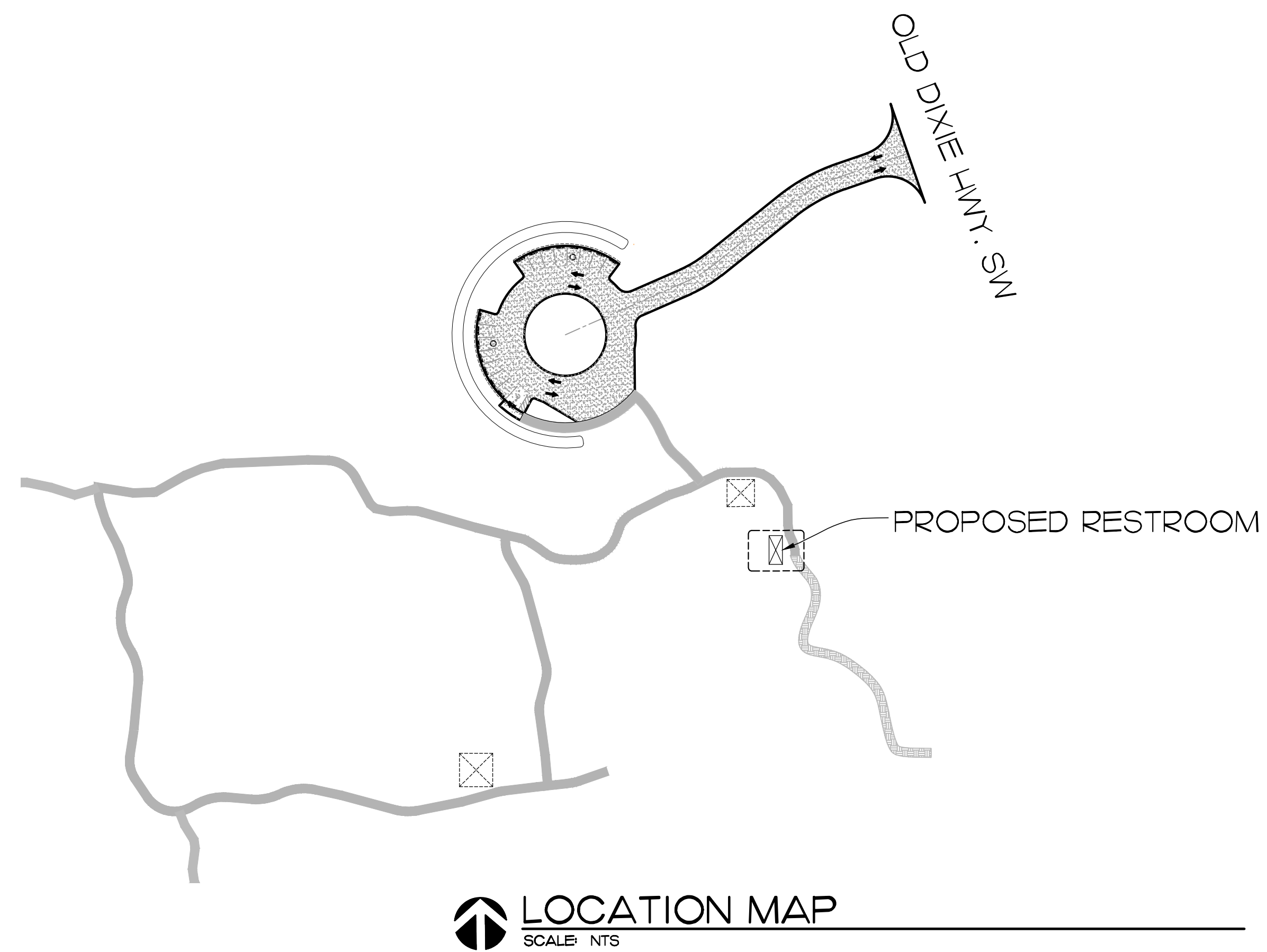
HALLSTROM HOUSE RESTROOM

1601 Old Dixie Highway SW
Vero Beach, FL 32962

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- A-1 FLOOR PLAN/ELEVATIONS
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- MEP-1 MECHANICAL/ELECTRICAL/PLUMBING PLANS

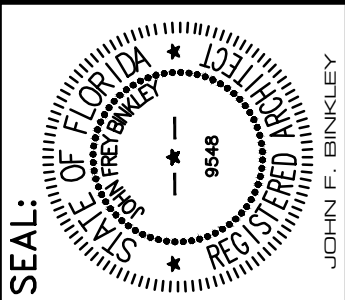
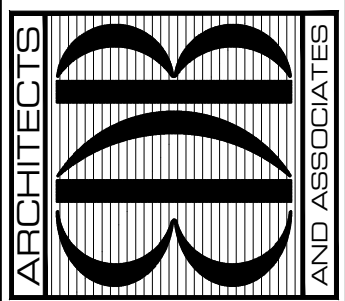


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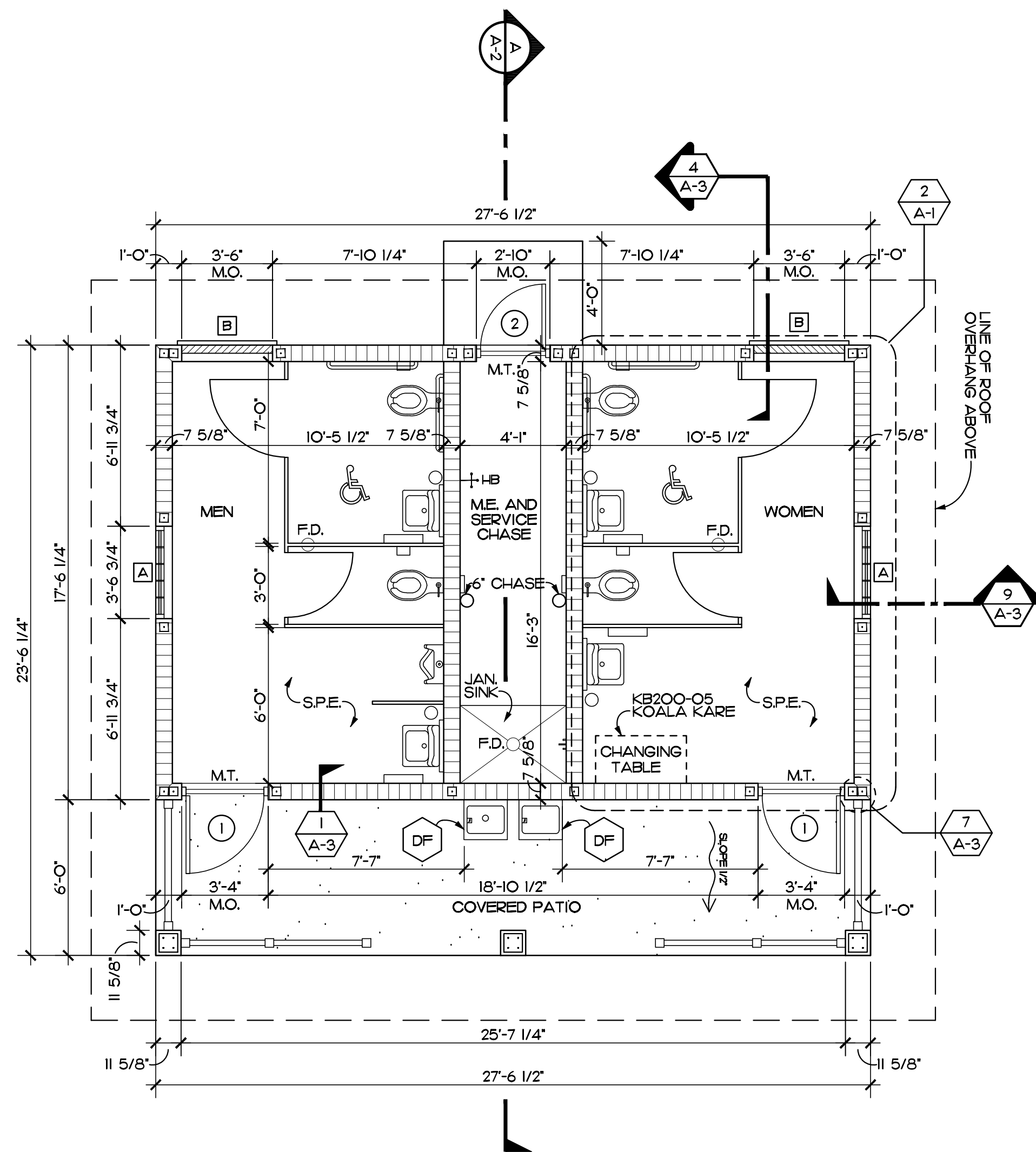
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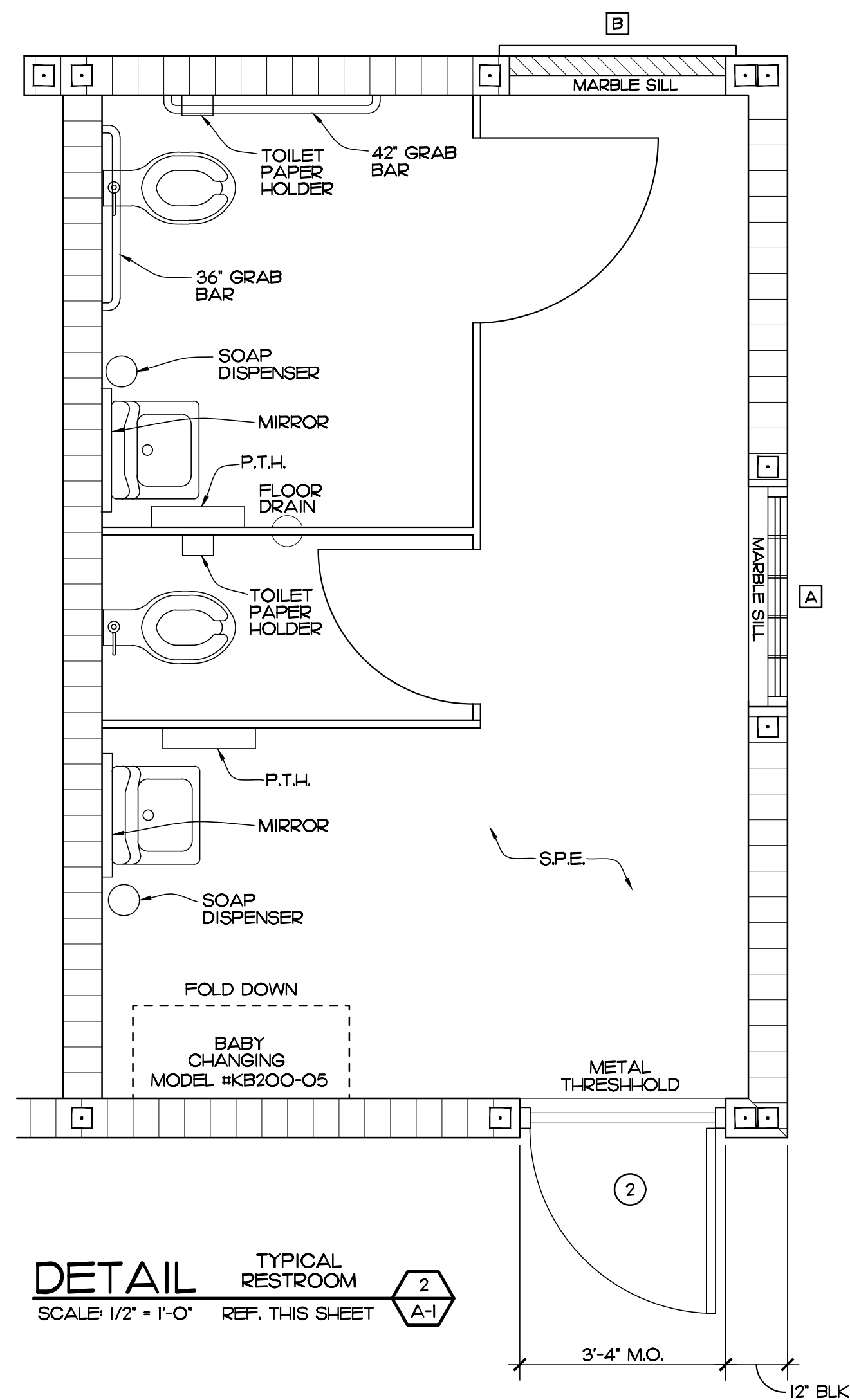
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BY: LJB
CHKD: JFB

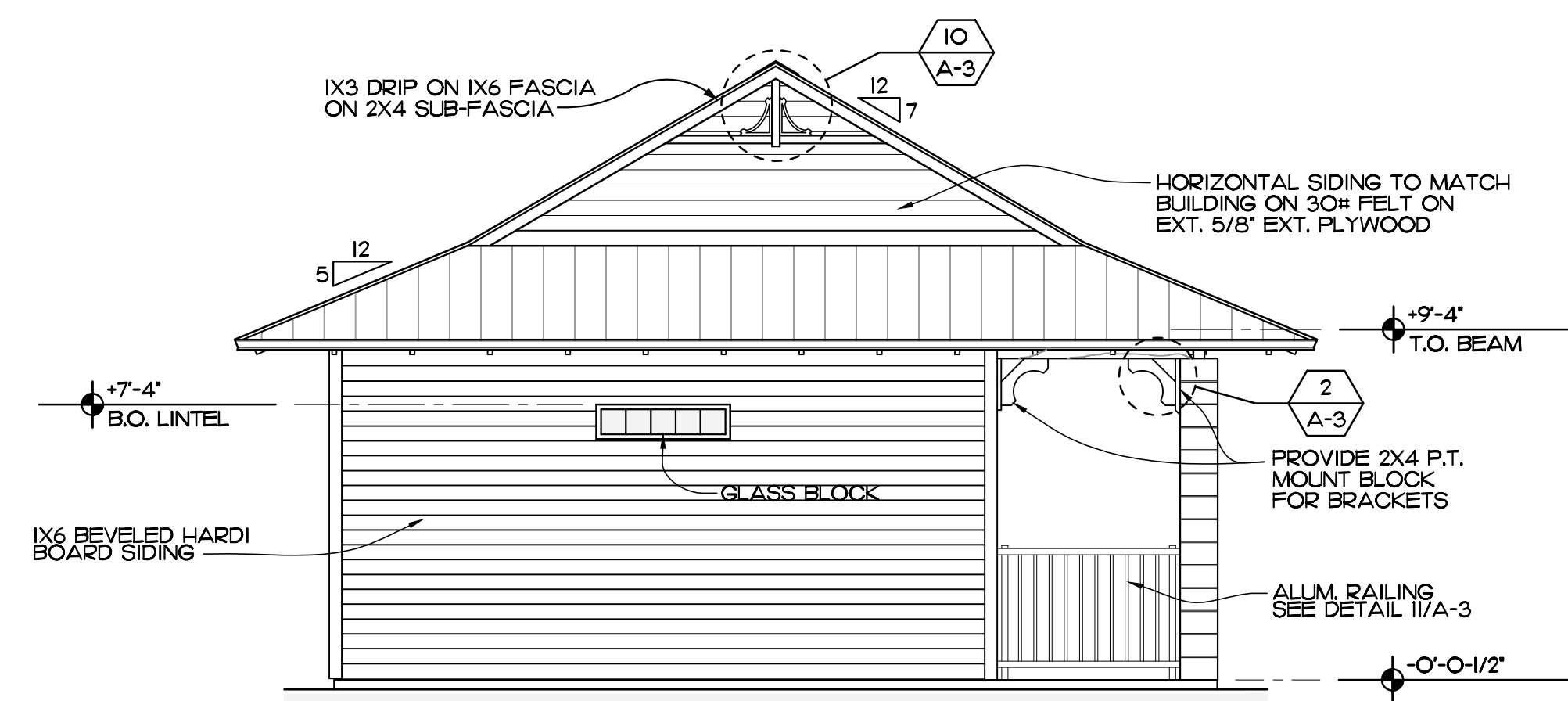
SHEET NO.
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OF ONE



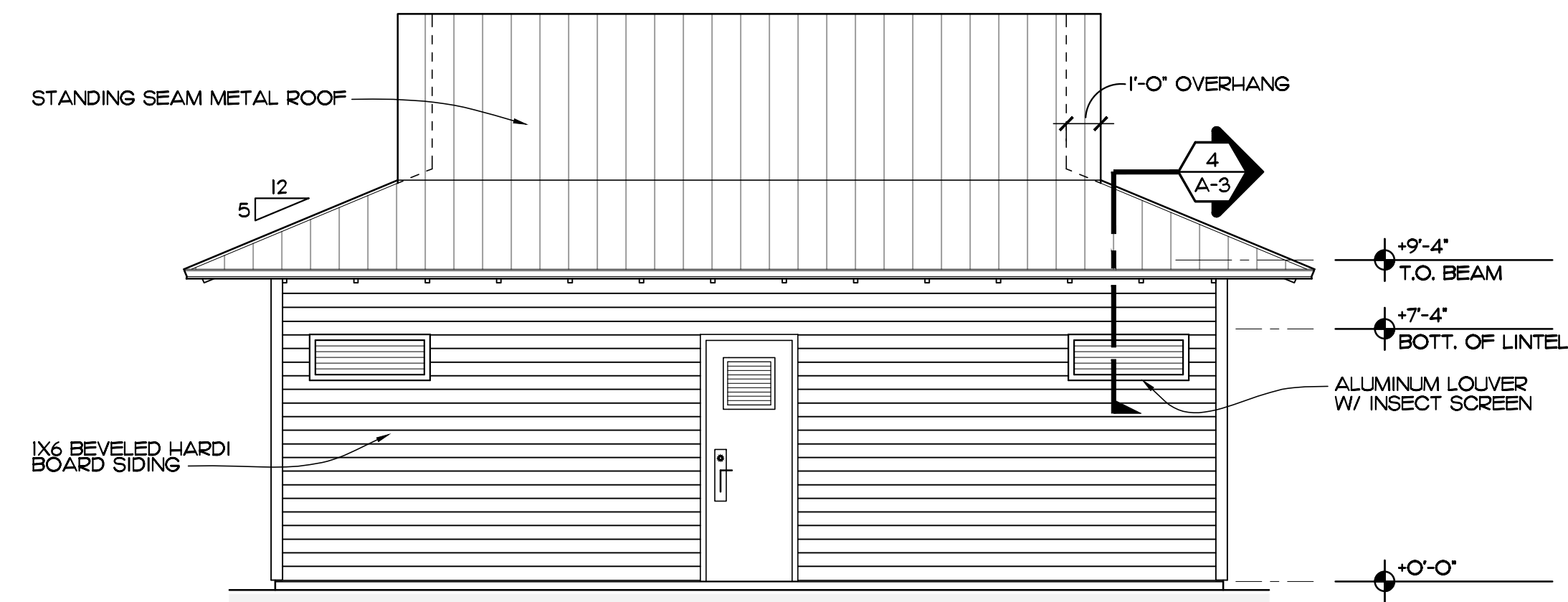
FLOOR PLAN
SCALE: 1/4" = 1'-0"



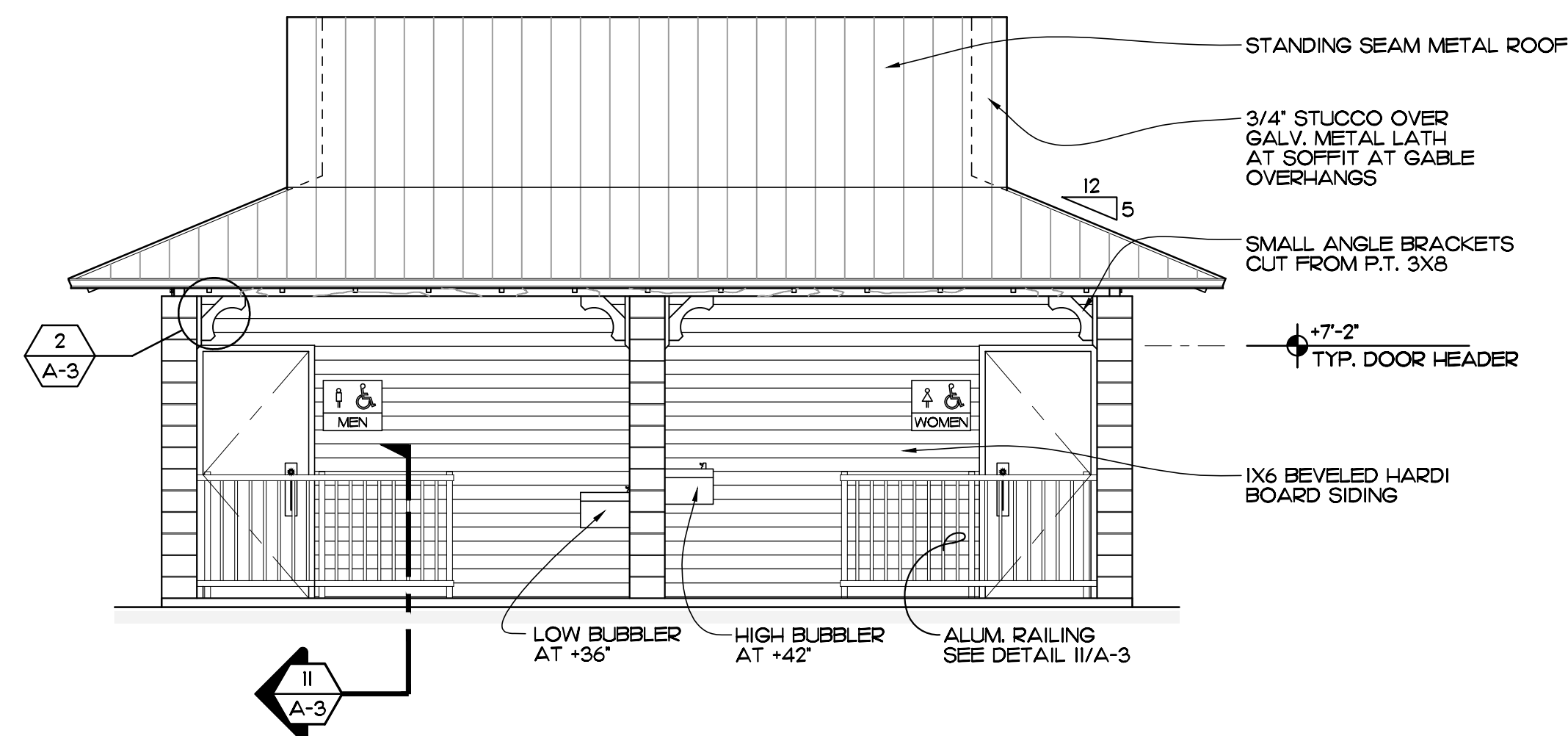
DETAIL TYPICAL RESTROOM
SCALE: 1/2" = 1'-0" REF. THIS SHEET



LEFT SIDE ELEVATION (RIGHT SIDE SIMILAR)
SCALE: 1/4" = 1'-0"



REAR ELEVATION
SCALE: 1/4" = 1'-0"

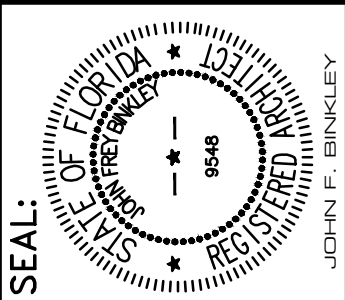
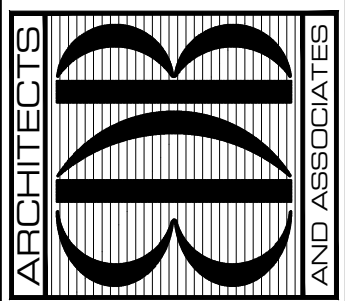


FRONT ELEVATION
SCALE: 1/4" = 1'-0"

LEGEND	
[Pattern]	NEW MASONRY WALL
[Pattern]	CONCRETE FILLED CELL
[Pattern]	CONC. FILLED CELL W/1#5 VERT.
[Symbol]	8" X 8" GLASS BLOCK
[Symbol]	GREENHECK E4H-601D ALUMINUM LOUVER 4'-0" W. X 1'-4" H. INSTALL PER NOA NO. 16-020103
[Symbol]	S.P.E. SINGLE PLY EPOXY FLOORING AND BASE
[Symbol]	M.T. METAL THRESHOLD
[Symbol]	1 3'-0" W. X 7'-0" H. X 1-3/4" 16 GA. GALV. STEEL DOOR IN 16 GA. STEEL FRAME
[Symbol]	2 2'-6" W. X 7'-0" H. X 1-3/4" 16 GA. GALV. STEEL DOOR IN 16 GA. STEEL FRAME WITH FIXED LOUVER W/ BUG SCREEN ON TOP THIRD FOR VENTILATION
[Symbol]	DF ELKAY DRINKING FOUNTAIN MODEL EDPP-14-C W/ PUSH BAR BUBBLER CONTROL. COLOR: STAINLESS STEEL
[Symbol]	P.T.H. PAPER TOWEL HOLDER
[Symbol]	H.B. HOSE BIBB
[Symbol]	F.D. FLOOR DRAIN

- PAINTING AND FINISHING NOTES:**
- 1) ALL INTERIOR AND EXTERIOR WALLS/CEILINGS TO RECEIVE EPOXY PAINT OVER PROPER PRIMERS. REFER TO SPECIFICATIONS.
 - 2) ALL INTERIOR AND EXTERIOR BORAL, RAFTER TAILS, FASCIA, PLYWOOD SOFFITS AND TRIM BOARDS TO BE PRIMED ON ALL FACES AND FINISH PAINTED WITH TWO COATS APPROVED PAINTS PER PLANS AND SPECIFICATIONS.
 - 3) DO NOT APPLY PAINTS TO EXPOSED OR CONCEALED P.T. WOOD PRODUCTS.
 - 4) DO NOT PAINT ANY FLOORS. COVERED PATIO FLOOR CONCRETE TO BE FINISHED WITH A CLEAR CONCRETE SEALER.
 - 5) COLORS AS NOTED OR AS SELECTED BY OWNER. COLORS AND PERCENTAGES OF COLORS SHALL CORRESPOND WITH STATE ROAD 60 CORRIDOR MASTER COLOR LIST REQUIREMENTS PER SECTION 9122 (b) LDR.
 - 6) RESTROOM FLOORS TO BE SINGLE PLY EPOXY WITH BASE TURNED UP 4". COVERED PATIO FLOOR TO BE FLOAT/SPONGE FINISHED CONCRETE.

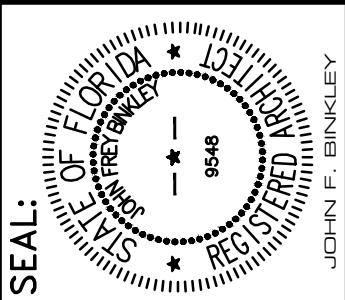
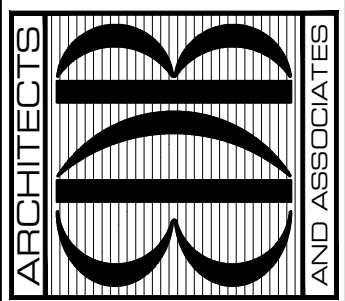
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FOR: HALLSTROM HOUSE RESTROOMS
1601 OLD DYKE HIGHWAY SW
VERO BEACH, FL 32962

NO.	DATE	REVISIONS PER PLAN	REVIEW COMMENTS
1		4AUG23	

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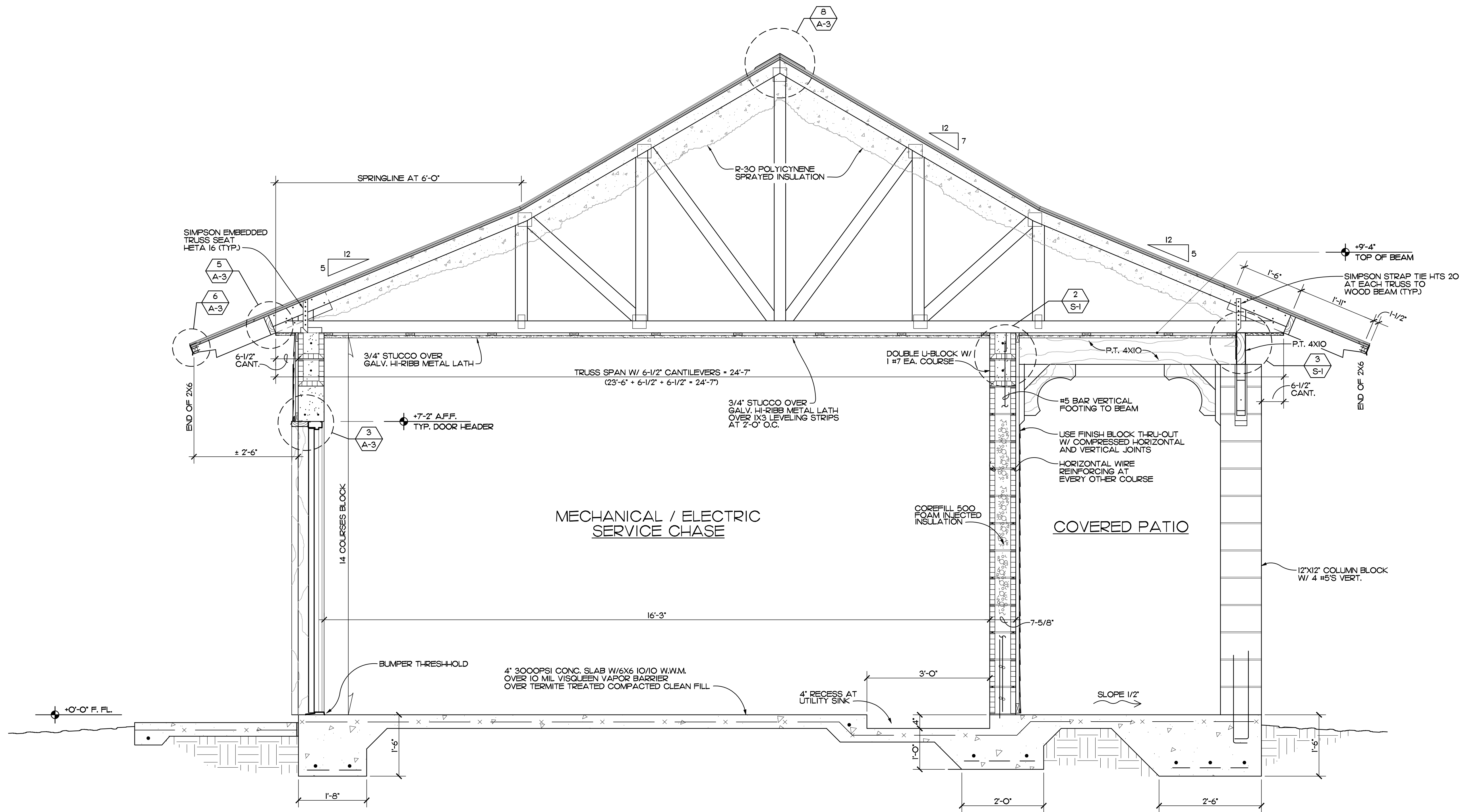
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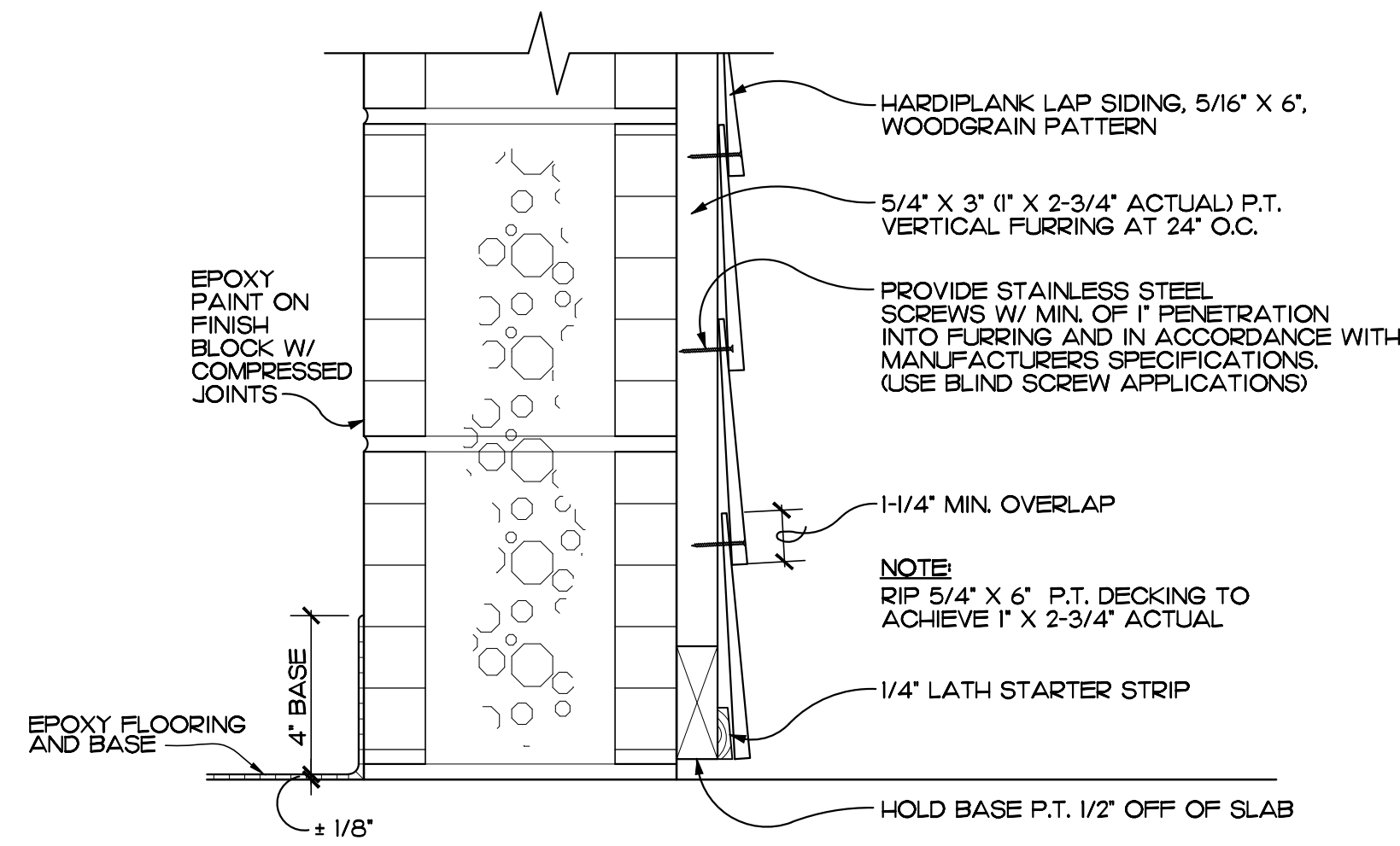
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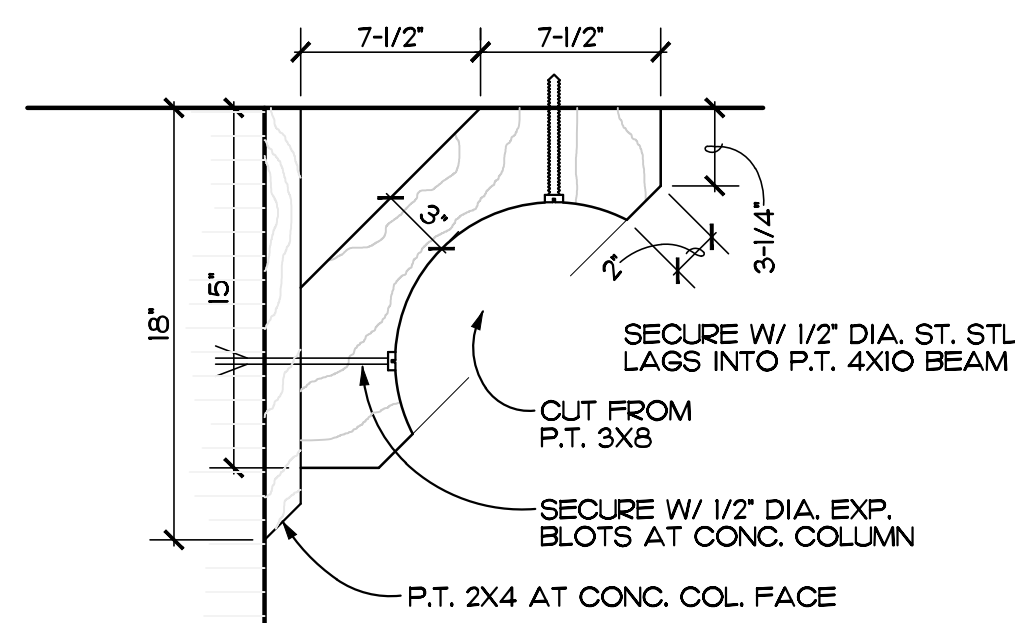
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A-2
 OF THREE



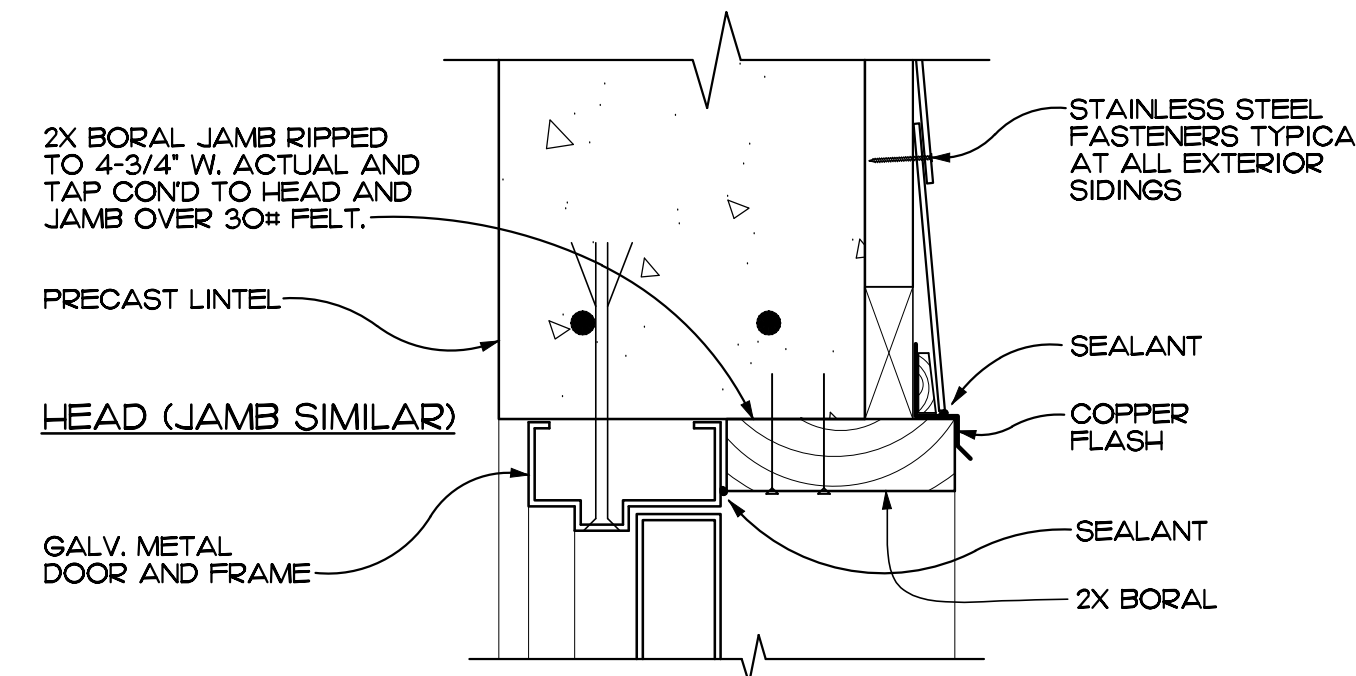
SECTION
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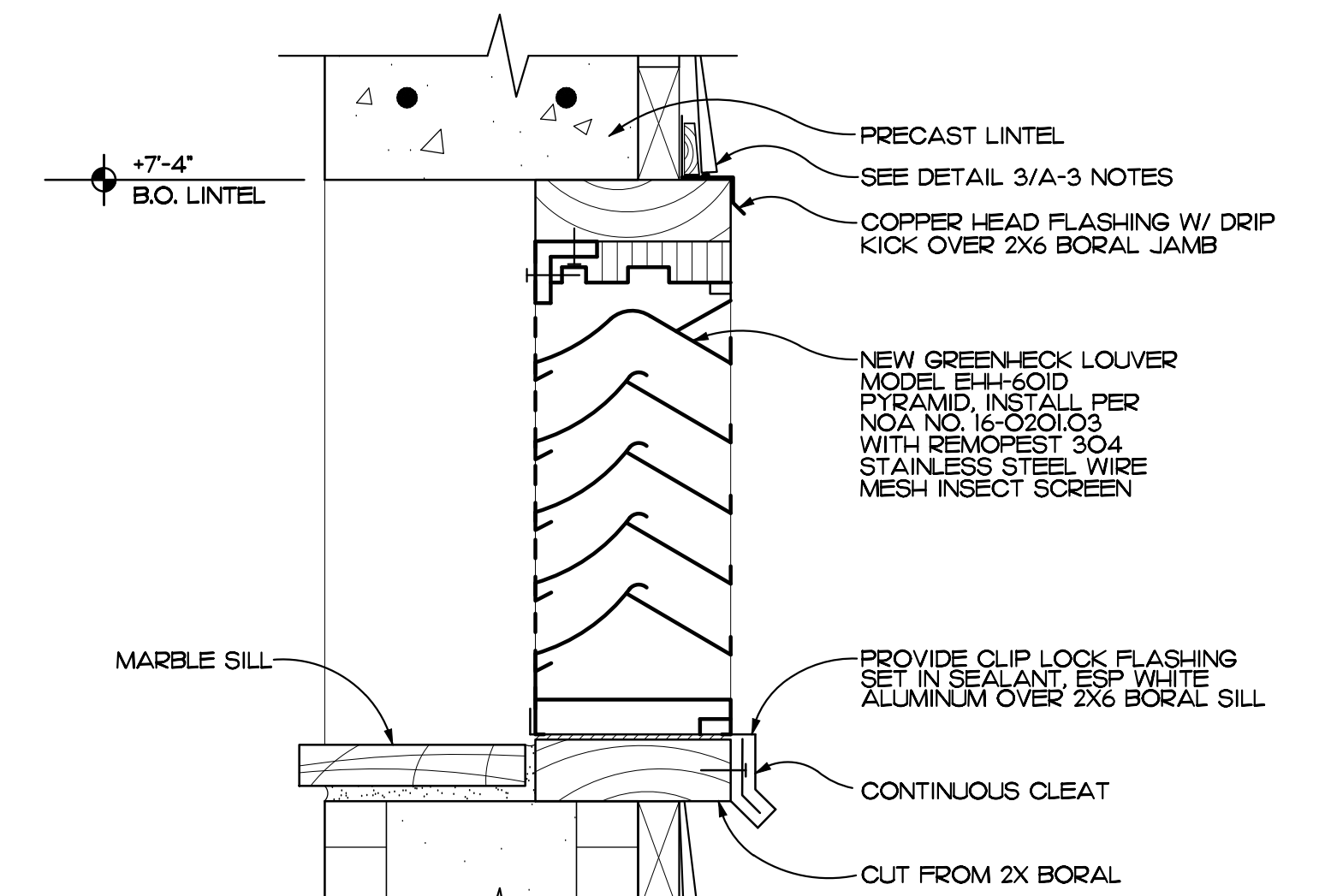
DETAIL
 SCALE: 3" = 1'-0" REF. SHEET A-1 1 A-3



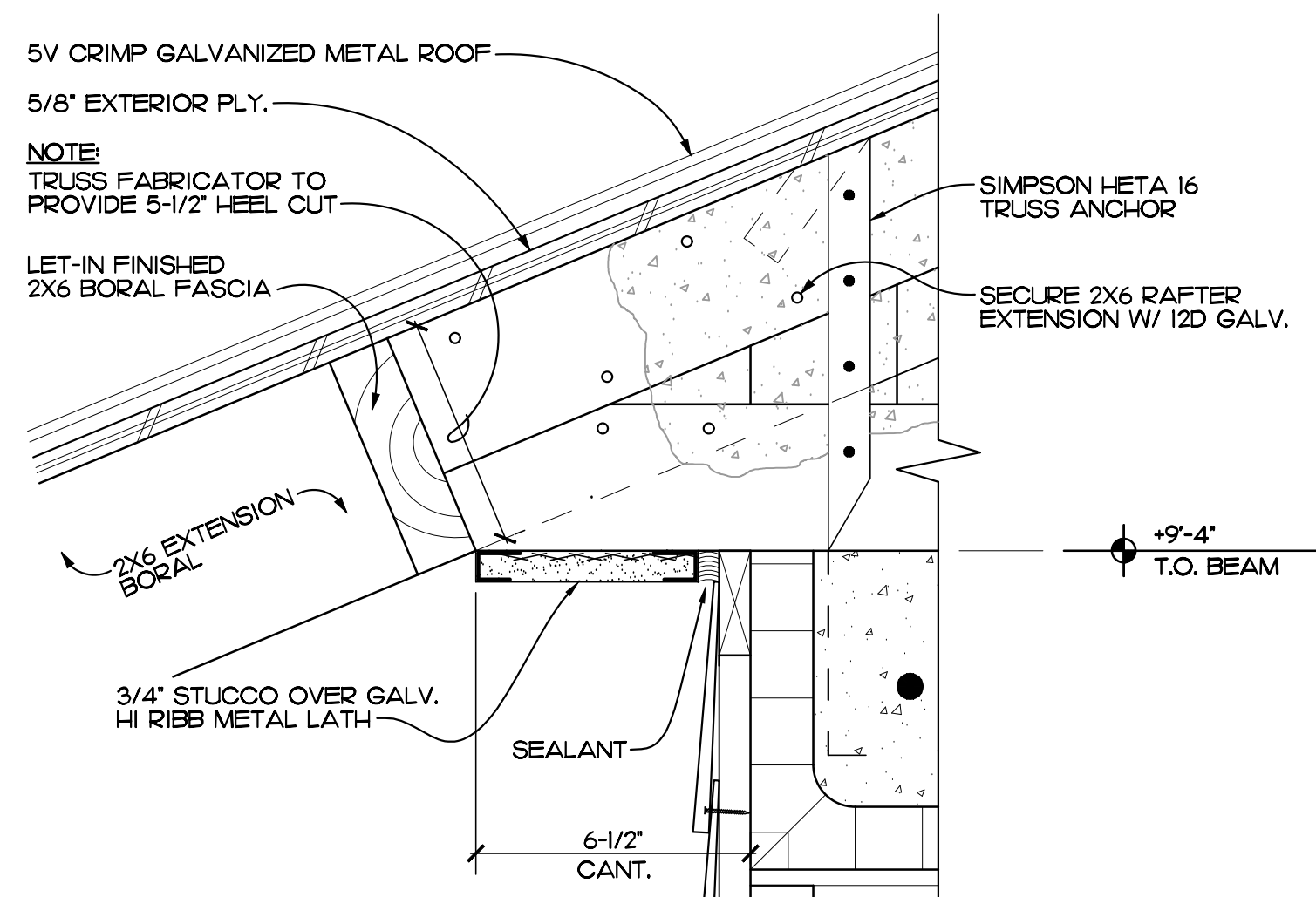
DETAIL (AT BRACKET)
 SCALE: 1-1/2" = 1'-0" REF. THIS SHEET 2 A-3



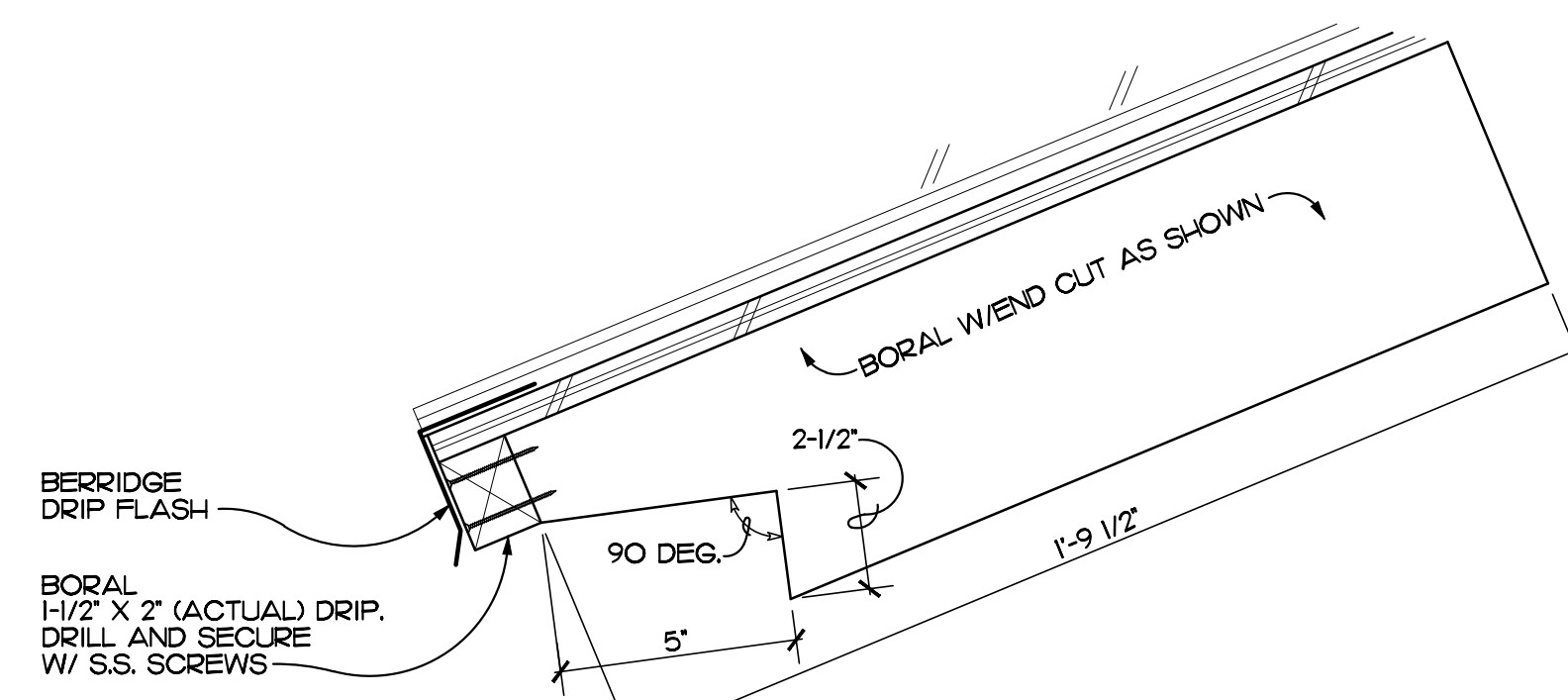
DETAIL
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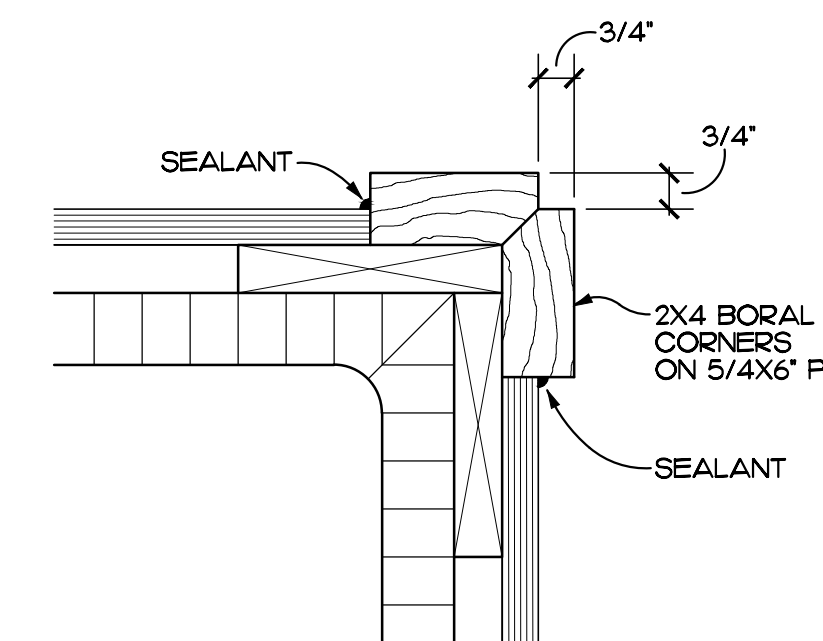
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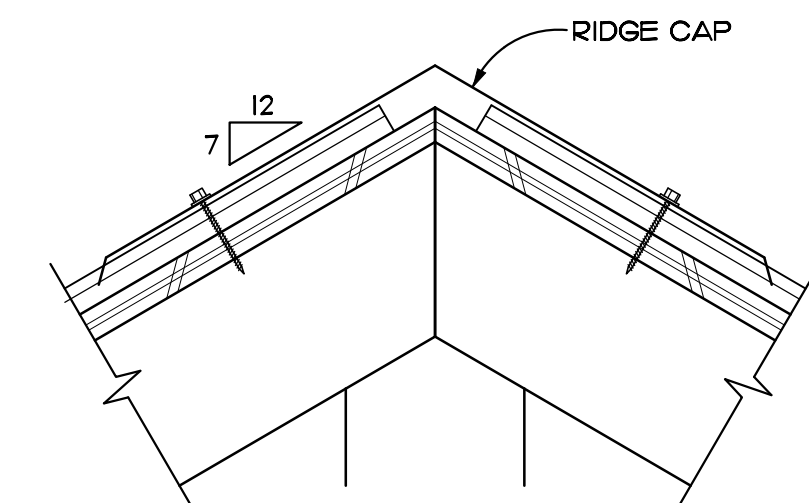
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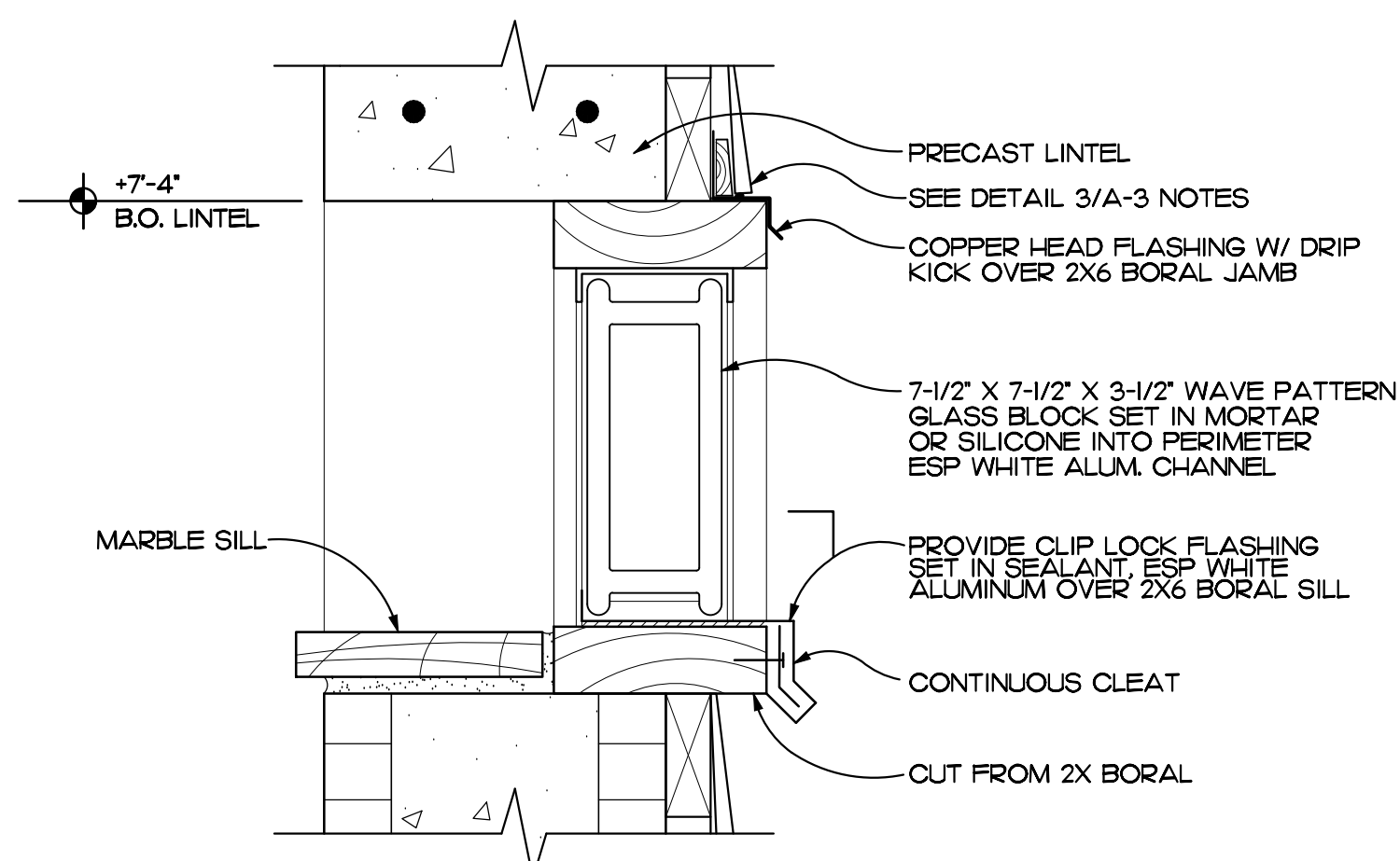
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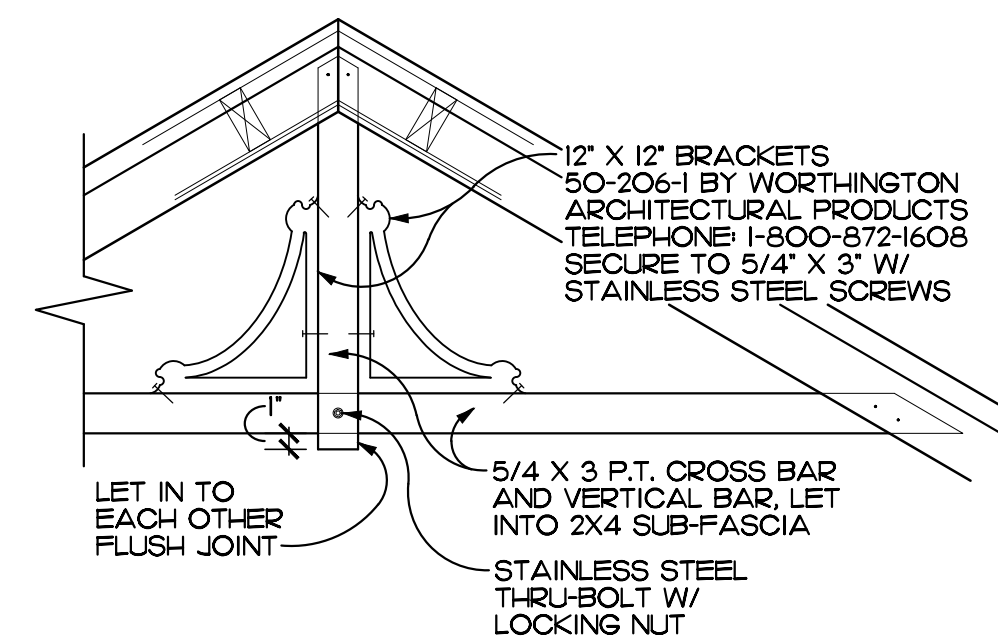
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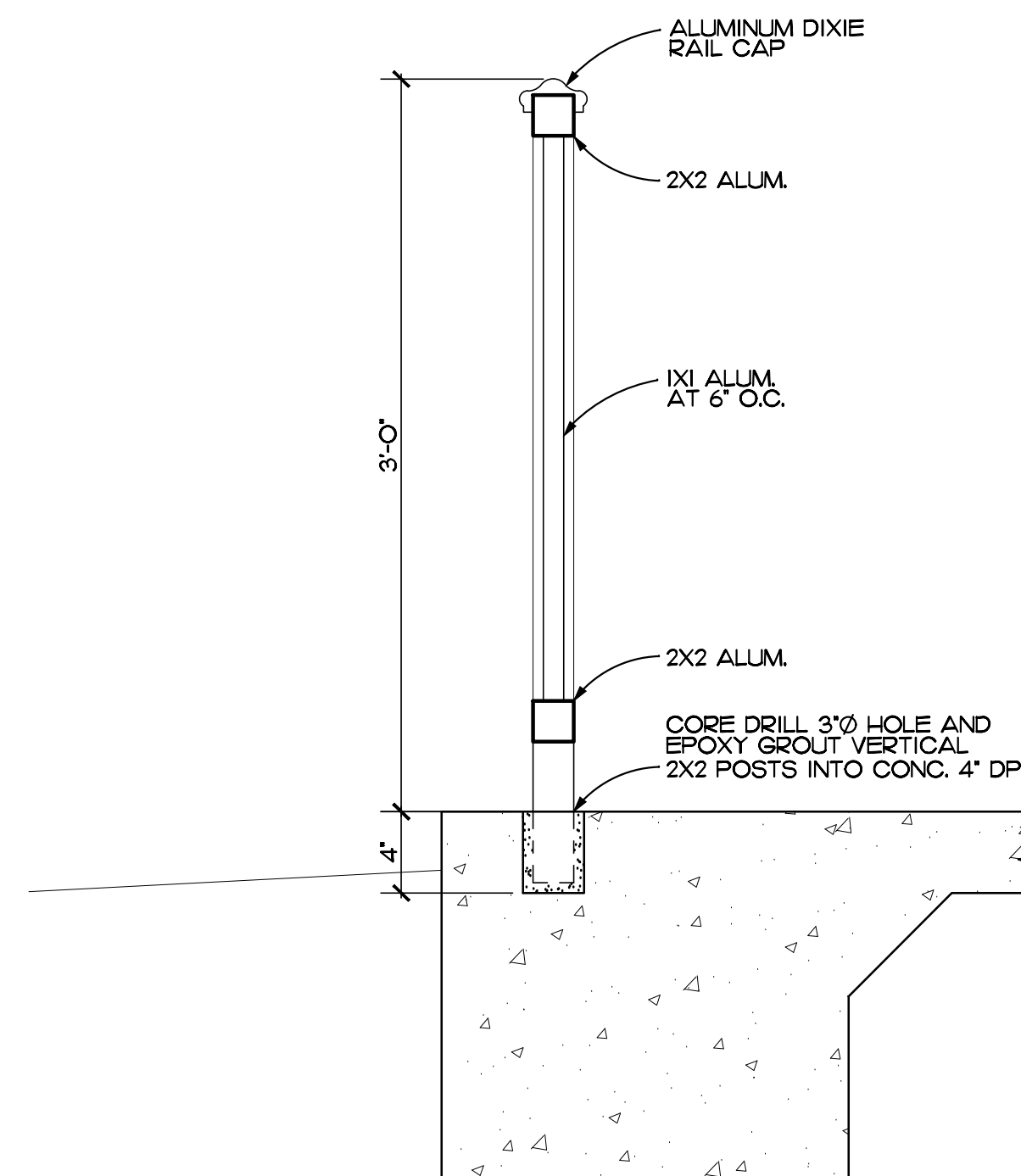
DETAIL
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DETAIL
 SCALE: 3" = 1'-0" REF. SHEET A-1 9 A-3

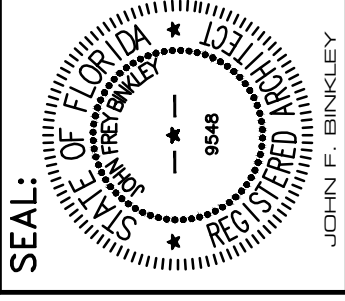
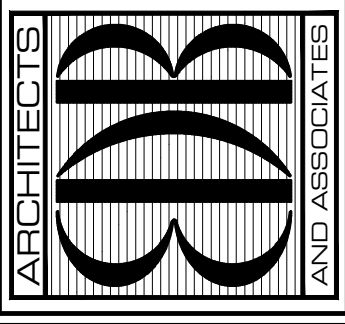


DETAIL
 SCALE: 1" = 1'-0" REF. THIS SHEET 10 A-3



DETAIL
 SCALE: 1 1/2" = 1'-0" REF. THIS SHEET 11 A-3

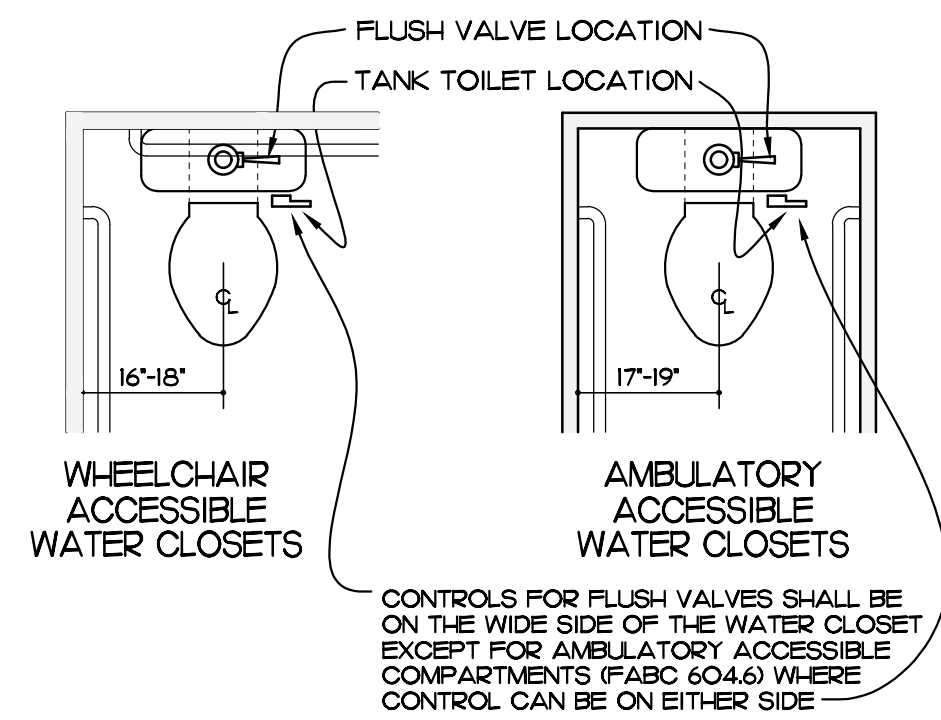
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 HALLSTROM HOUSE RESTROOMS
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 VERO BEACH, FL 32962
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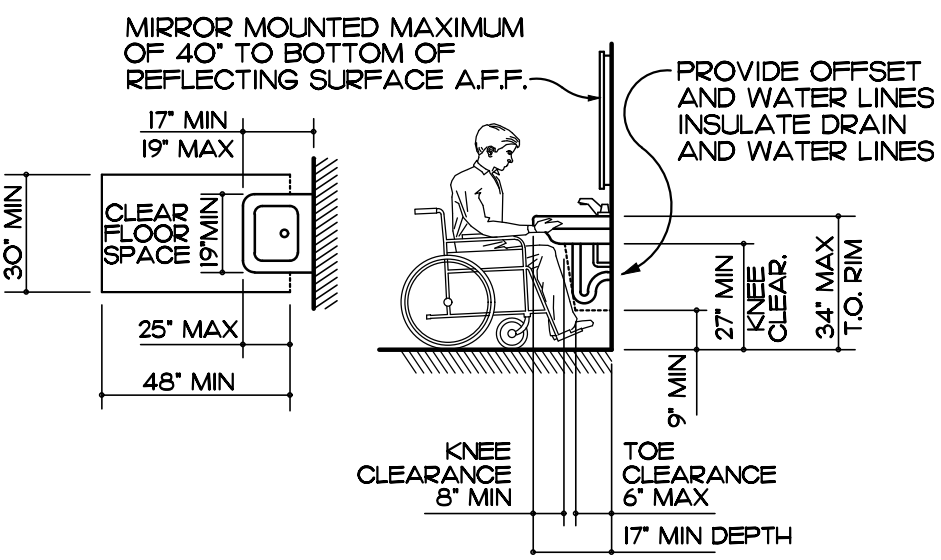
NO.	DATE	REVISIONS

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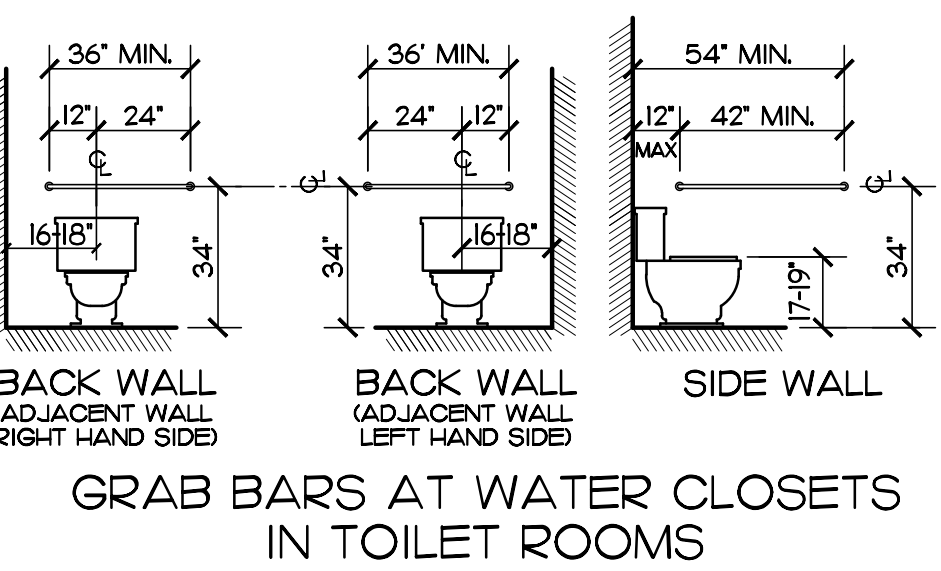


FIXTURE LOCATIONS AND FLUSH VALVE LOCATION

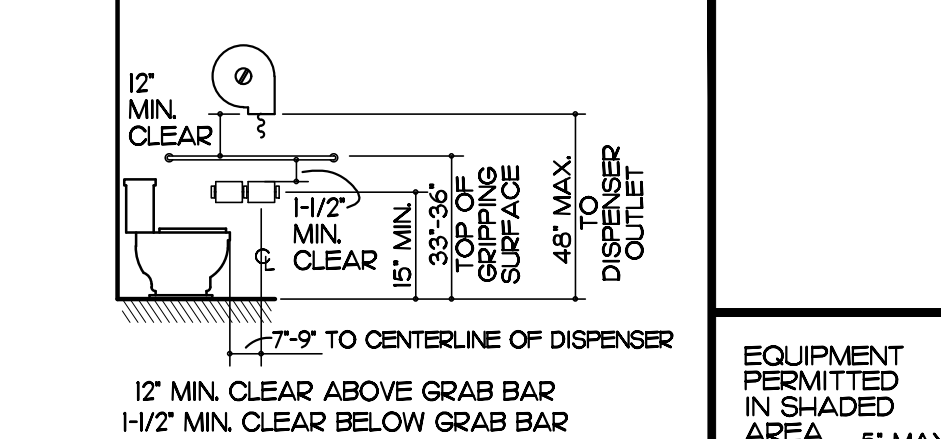
CONTROLS FOR FLUSH VALVES SHALL BE ON THE WIDE SIDE OF THE WATER CLOSET EXCEPT FOR AMBULATORY ACCESSIBLE COMPARTMENTS (FABC 604.6) WHERE CONTROL CAN BE ON EITHER SIDE



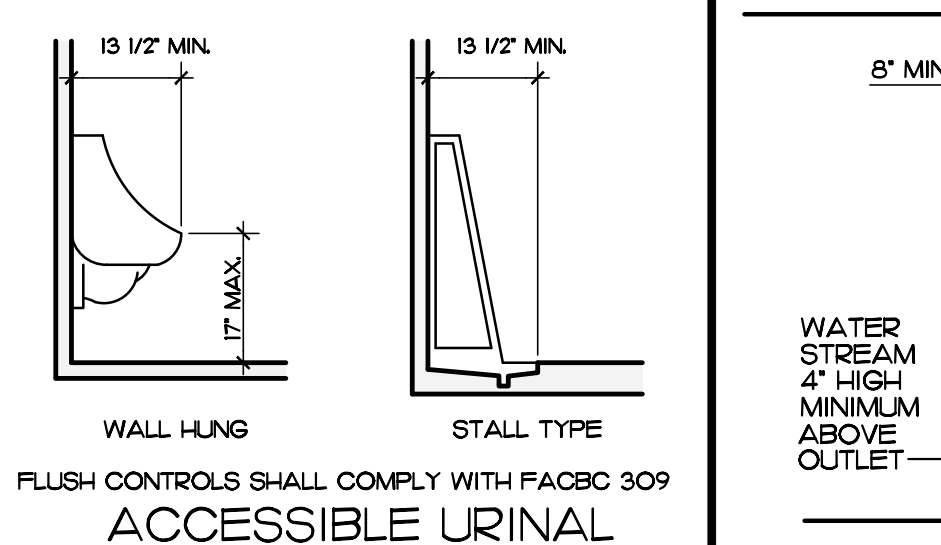
LAVATORY CLEARANCES



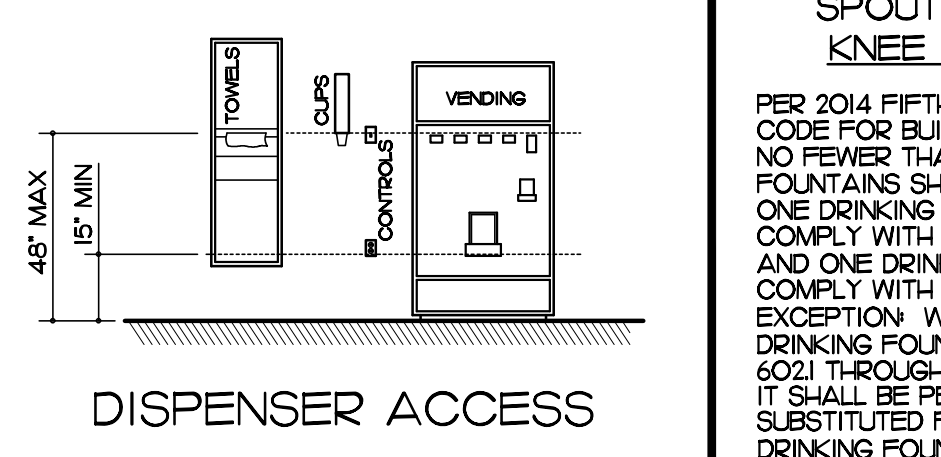
GRAB BARS AT WATER CLOSETS IN TOILET ROOMS



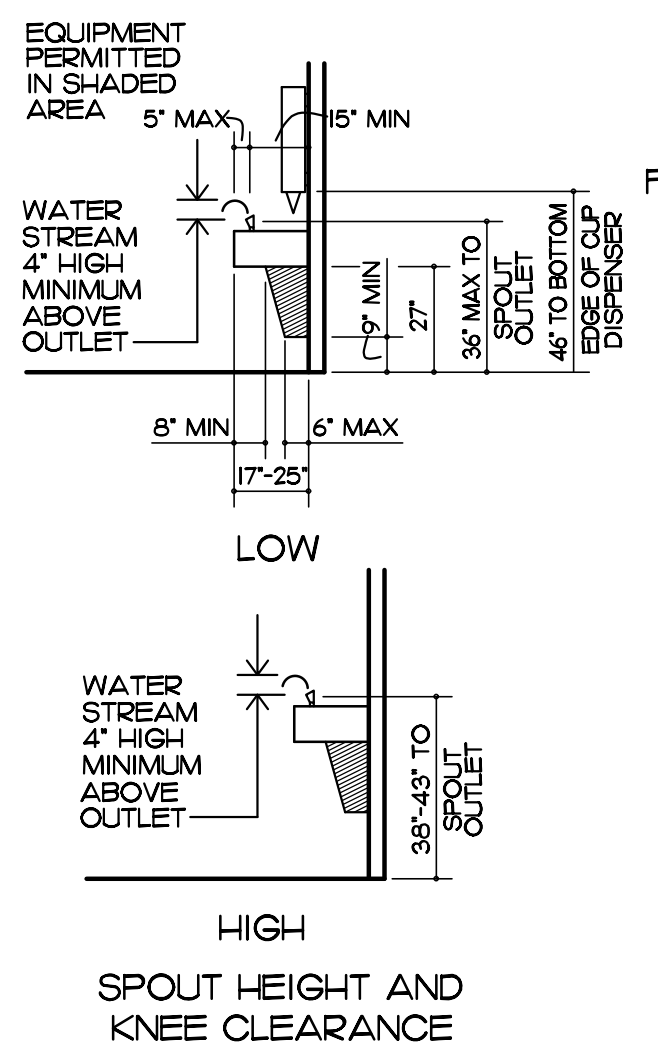
TOILET PAPER DISPENSER OUTLET LOCATION



ACCESSIBLE URINAL

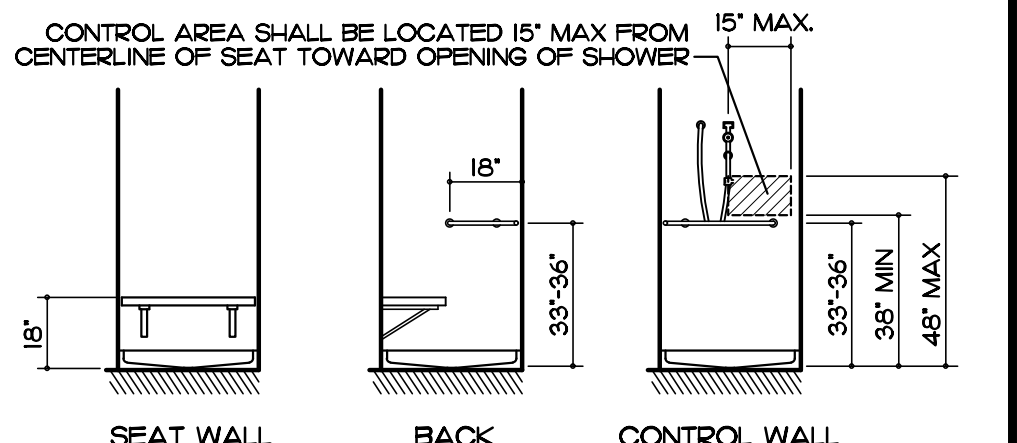


DISPENSER ACCESS

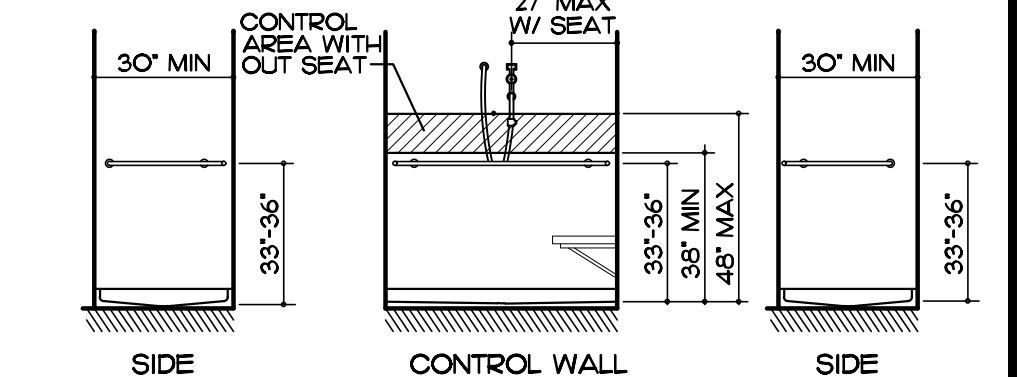


PER 2014 FIFTH EDITION FLORIDA ACCESSIBILITY CODE FOR BUILDING CONSTRUCTION NO FEWER THAN TWO DRINKING FOUNTAINS SHALL BE PROVIDED. ONE DRINKING FOUNTAIN SHALL COMPLY WITH 602.1 THROUGH 602.6 AND ONE DRINKING FOUNTAIN SHALL COMPLY WITH 602.7. EXCEPTION WHERE A SINGLE DRINKING FOUNTAIN COMPLIES WITH 602.1 THROUGH 602.6 AND 602.7 IT SHALL BE PERMITTED TO BE SUBSTITUTED FOR TWO SEPARATE DRINKING FOUNTAINS.

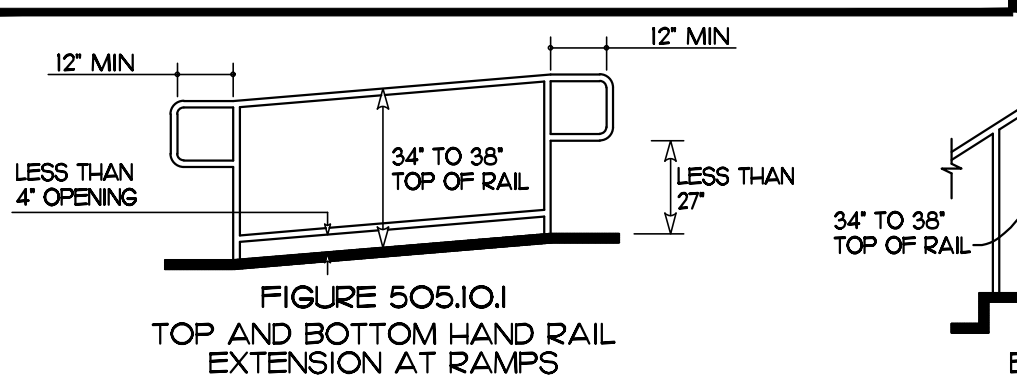
DRINKING FOUNTAINS AND WATER COOLERS



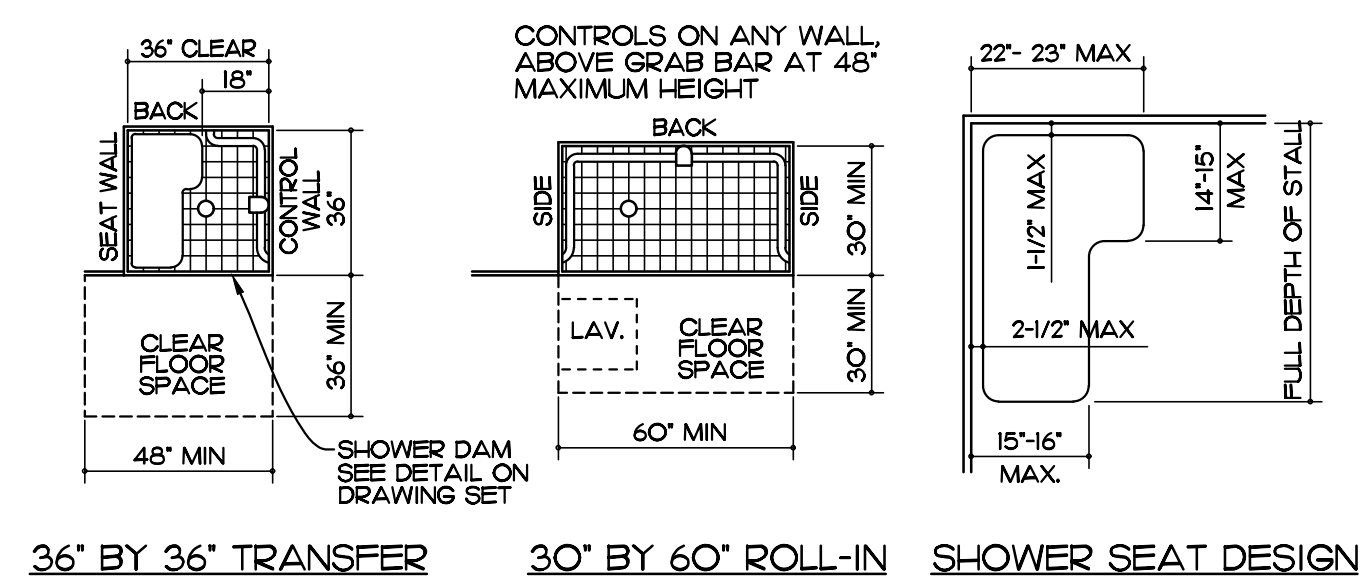
36" BY 36" TRANSFER



30" BY 60" ROLL-IN WITH OUT SEAT



GRAB BARS AT SHOWER STALLS



SHOWER SIZE, CLEARANCES AND SEAT DESIGN

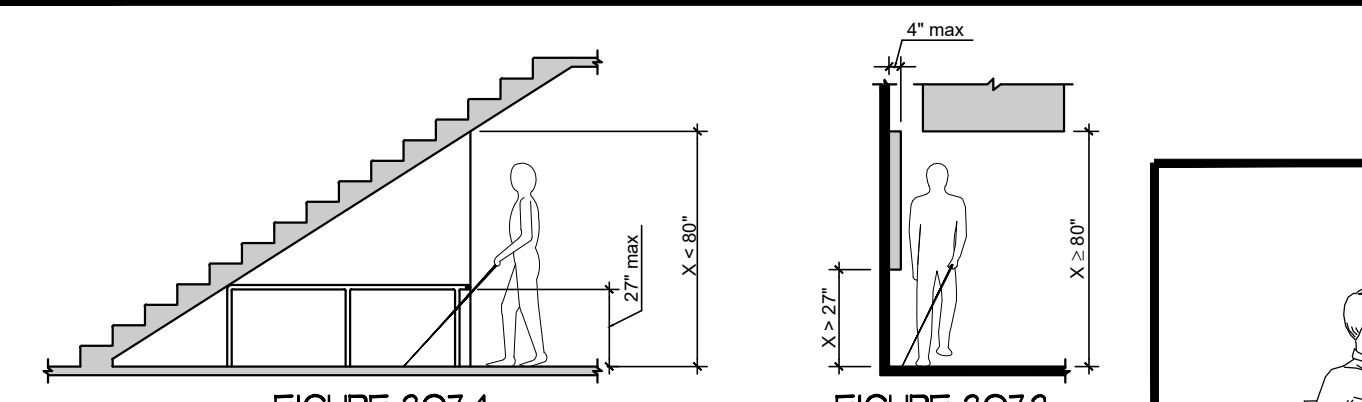


FIGURE 307.4 VERTICAL CLEARANCE

FIGURE 307.2 LIMITS OF PROTRUDING OBJECTS

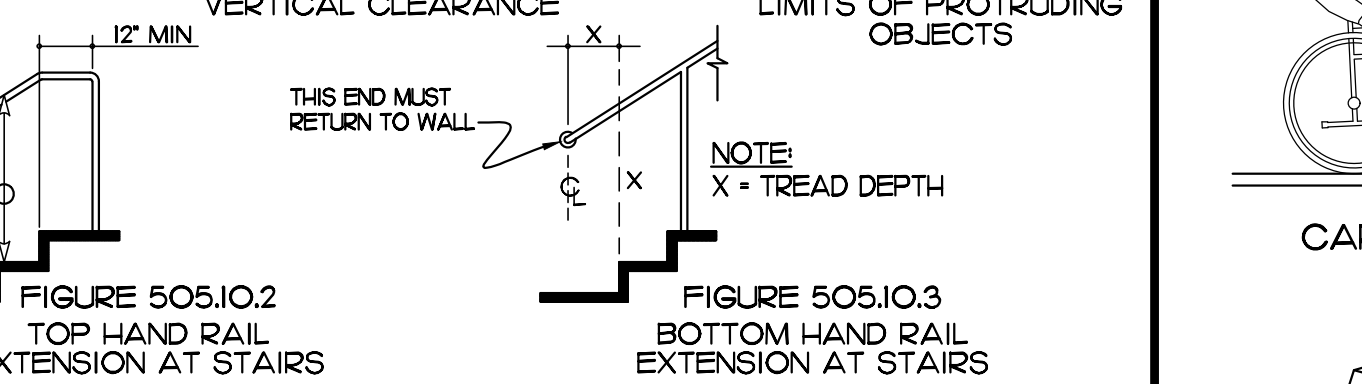


FIGURE 505.10.1 TOP AND BOTTOM HAND RAIL EXTENSION AT RAMP

FIGURE 505.10.2 TOP HAND RAIL EXTENSION AT STAIRS

FIGURE 505.10.3 BOTTOM HAND RAIL EXTENSION AT STAIRS

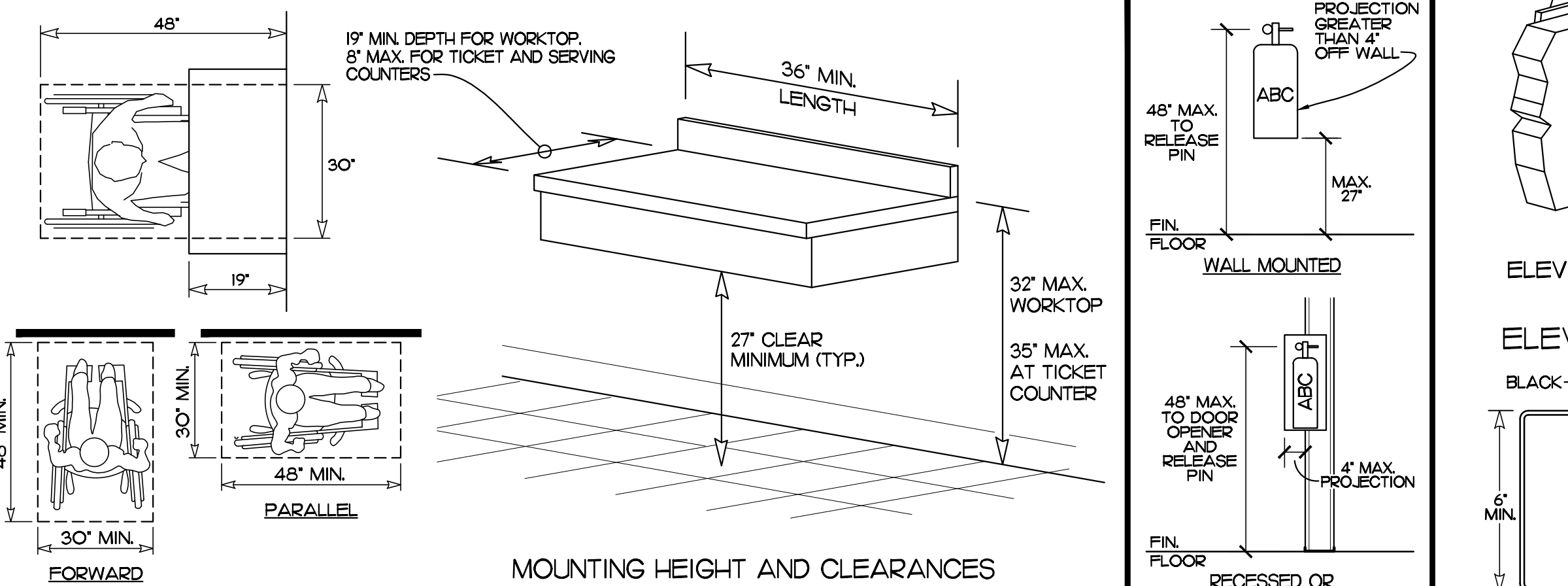
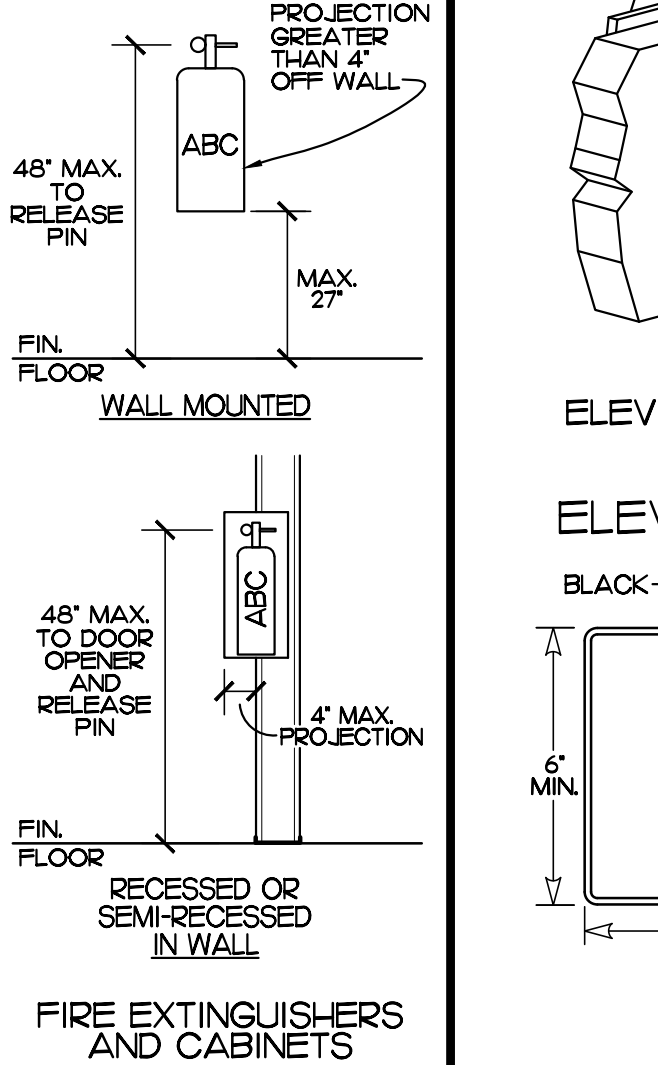
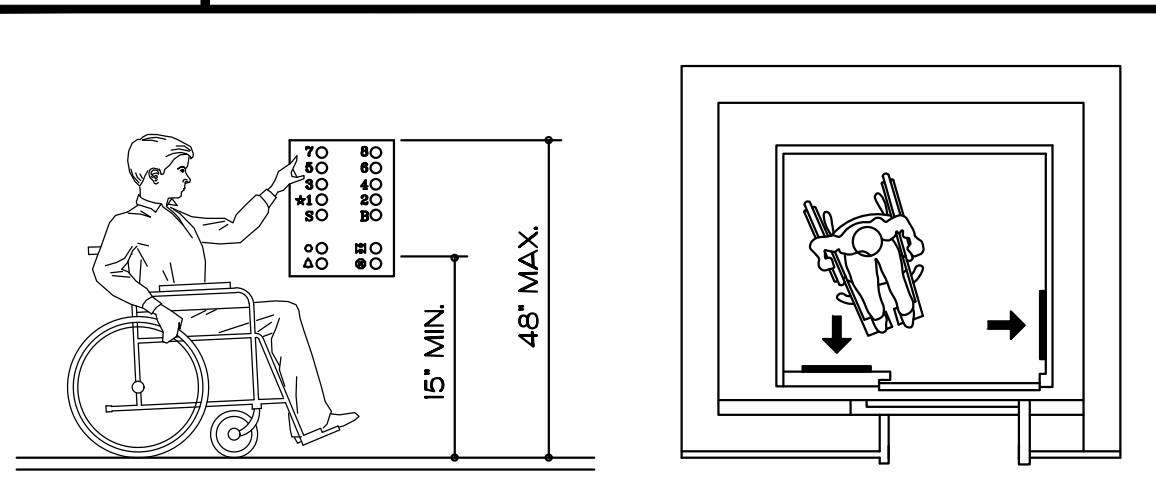


FIGURE 305.5 POSITION OF CLEAR FLOOR OR GROUND SPACE

FIGURE 305.5 MOUNTING HEIGHT AND CLEARANCES FOR TICKET AND SERVING COUNTERS / WORKTOPS

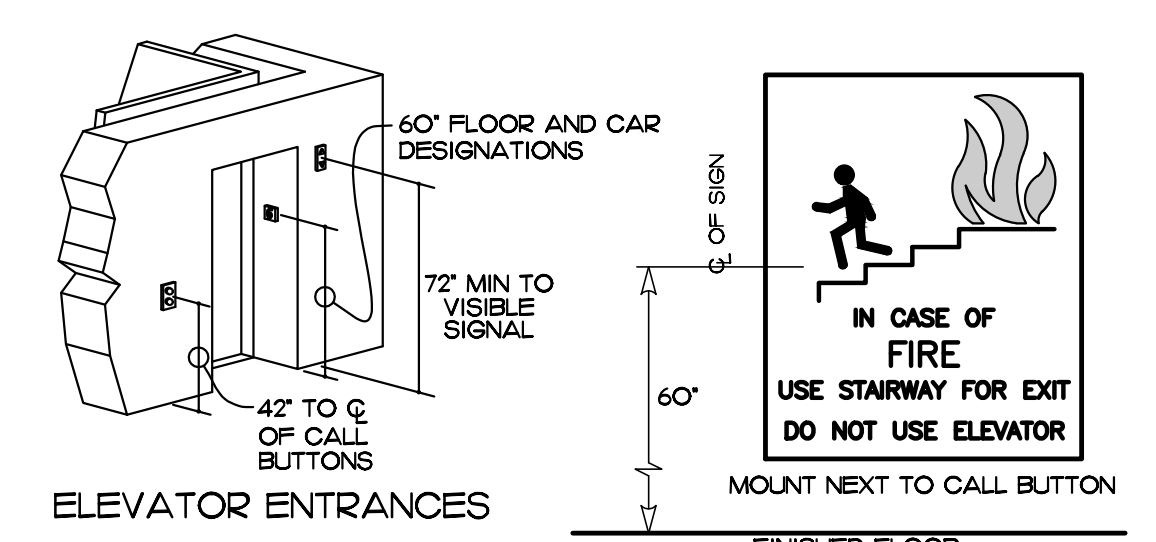


FIRE EXTINGUISHERS AND CABINETS



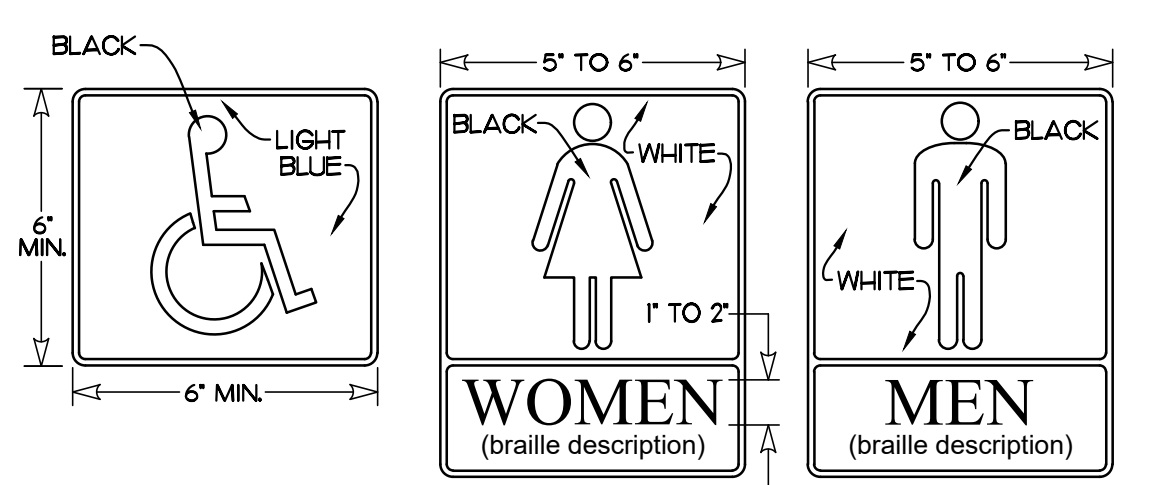
CAR CONTROL HEIGHT

ALTERNATE LOCATIONS OF PANEL WITH SIDE OPENING DOOR



ELEVATOR ENTRANCES

ELEVATOR CAB, CALL AND SIGNAL DETAILS



UNIVERSAL SYMBOLS MOUNT AT 60" A.F.F. TO CENTERLINE

ADA / FACBC REFERENCE GUIDE

SITE WALKWAYS, RAMPS, AISLES, ETC. NOTE: THESE ARE MAXIMUMS. LESS IS BETTER.

- CHAPTER 402.2 ACCESSIBLE ROUTE MAXIMUM SLOPE 1:20 (5%) OR ITS A RAMP
- 403.3 ACCESSIBLE ROUTE CROSS SLOPE MAXIMUM 1:48 (2%)
- 405.8 NO HANDRAILS REQUIRED AS LONG AS GRADE ADJACENT IS FLUSH WITH RAMP. IF NOT FLUSH, A 2" HIGH CURB IS REQUIRED AT EDGE OF RAMP.
- 502.4 PARKING SPACE MAXIMUM SLOPE 1:48 (2%) IN ALL DIRECTIONS.
- 405.3 RAMP CROSS SLOPES MAXIMUM 1:48 (2%)
- 405.2 MAXIMUM RAMP SLOPE IS 1:12 (8.33%)
- 404.2.4 AREAS IN FRONT OF DOORS PER FIG. 25 ARE TO BE LEVEL (CAN BE ≤ 1:48 TO DRAIN PROPERLY)

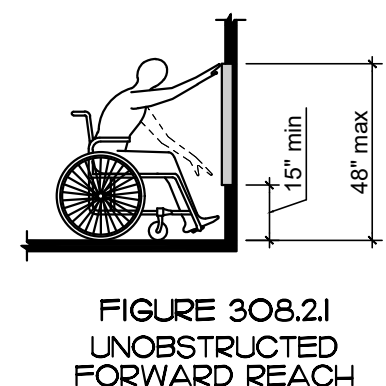


FIGURE 308.2.1 UNOBSTRUCTED FORWARD REACH

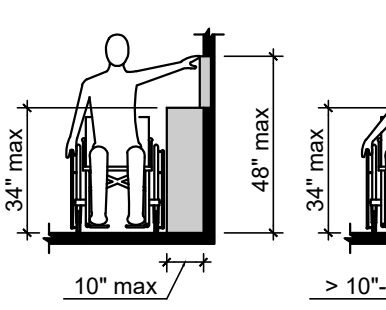


FIGURE 308.3.2 OBSTRUCTED HIGH SIDE REACH

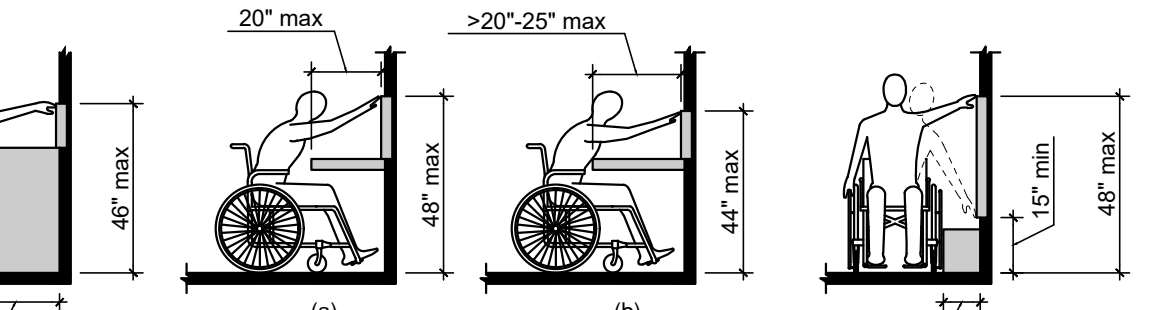
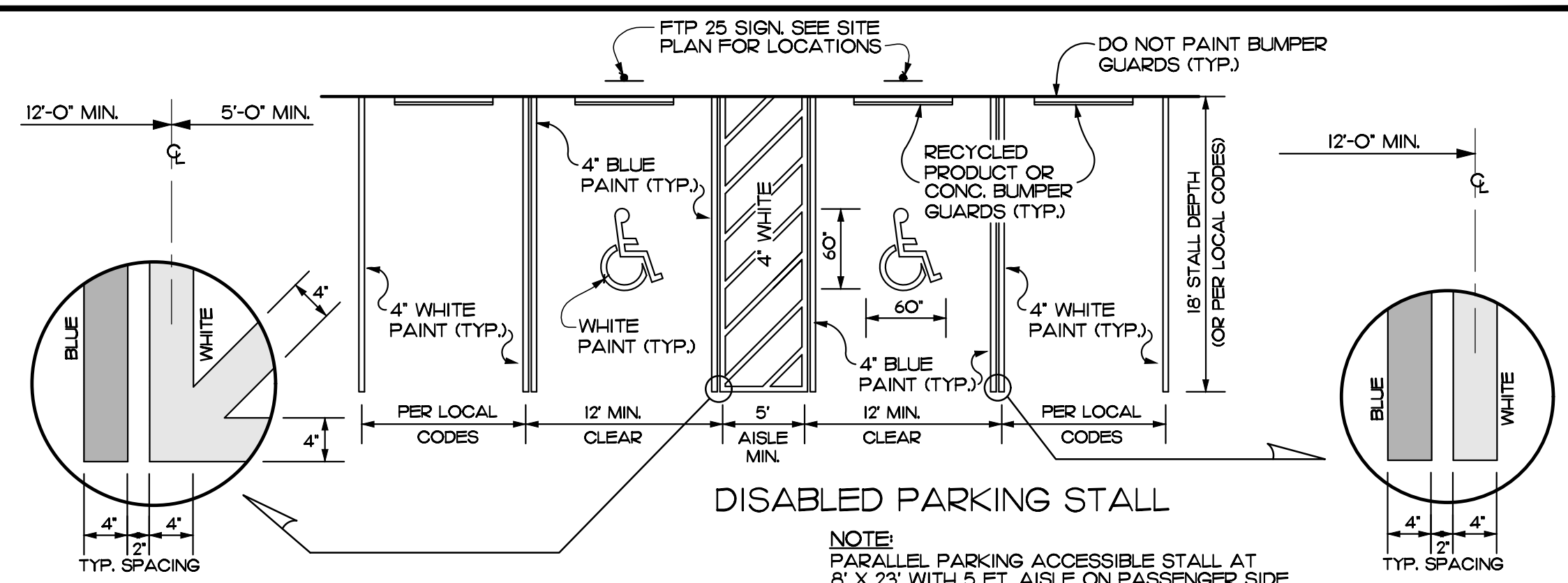


FIGURE 308.2.2 OBSTRUCTED HIGH FORWARD REACH

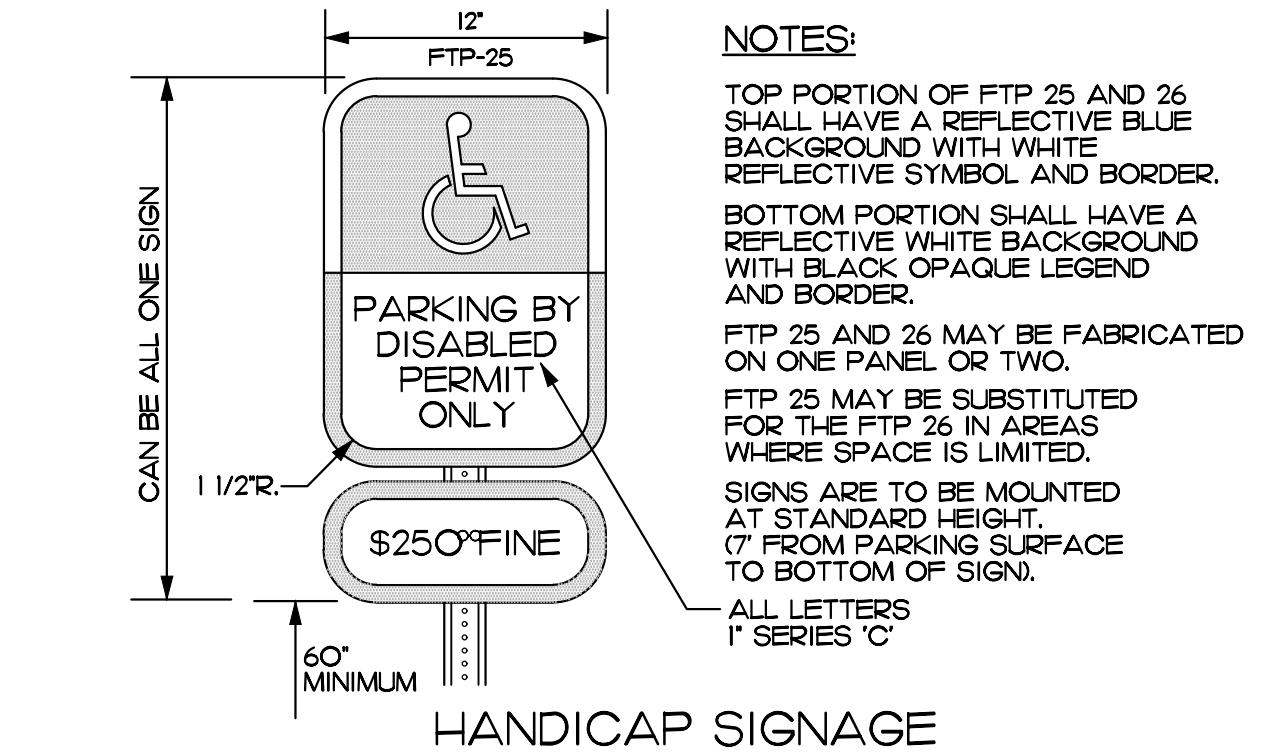
FIGURE 308.3.1 UNOBSTRUCTED SIDE REACH

REACH LIMITS

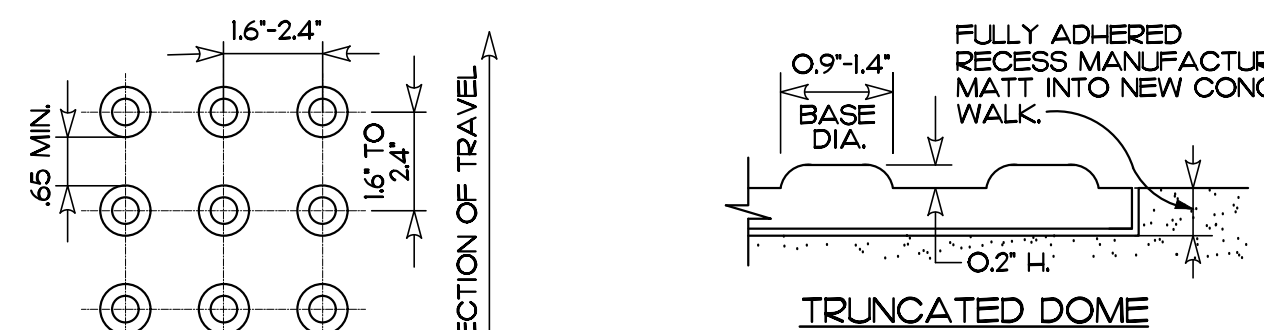


DISABLED PARKING STALL

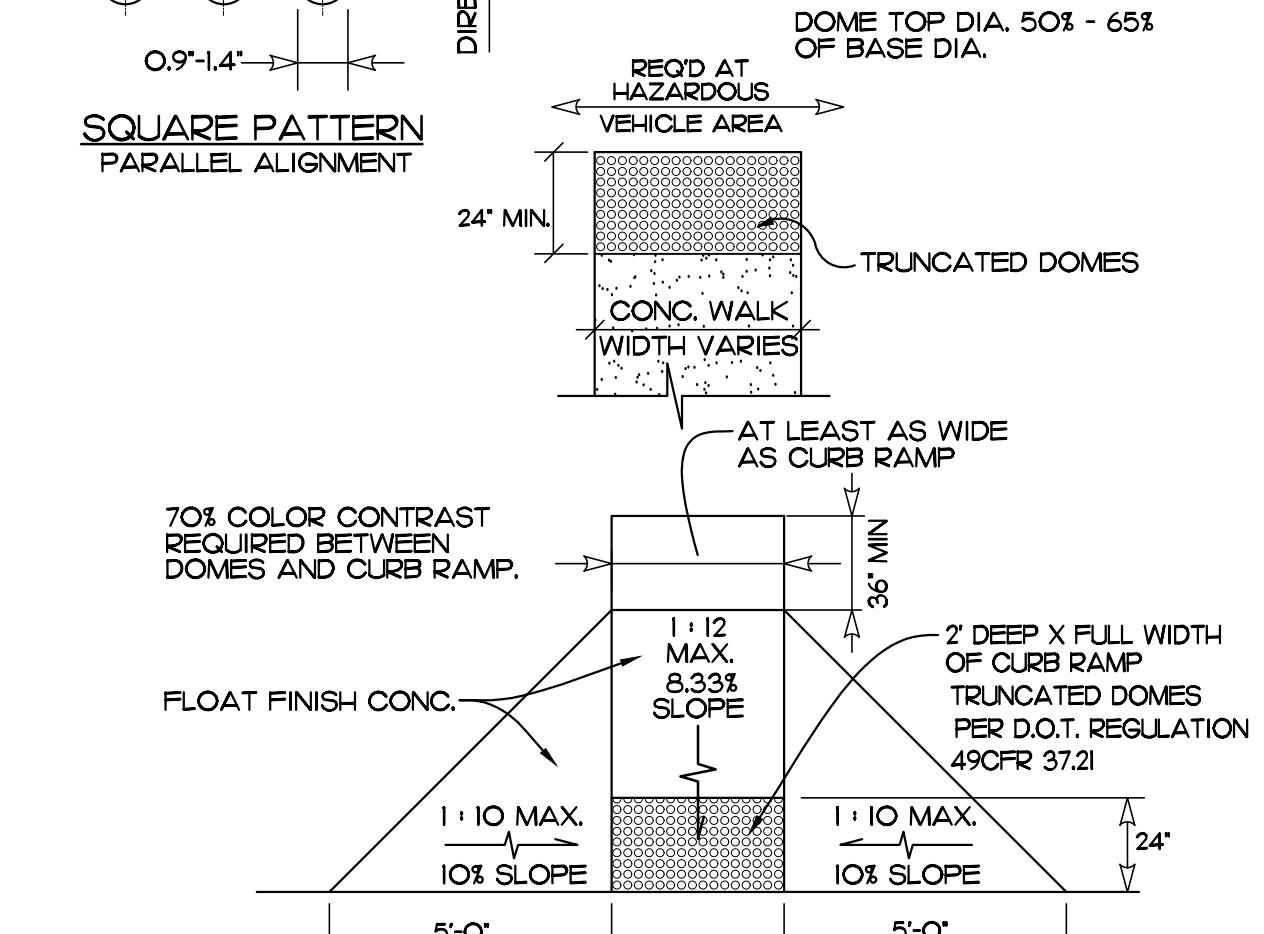
NOTE: PARALLEL PARKING ACCESSIBLE STALL AT 8' X 23' WITH 5 FT. AISLE ON PASSENGER SIDE



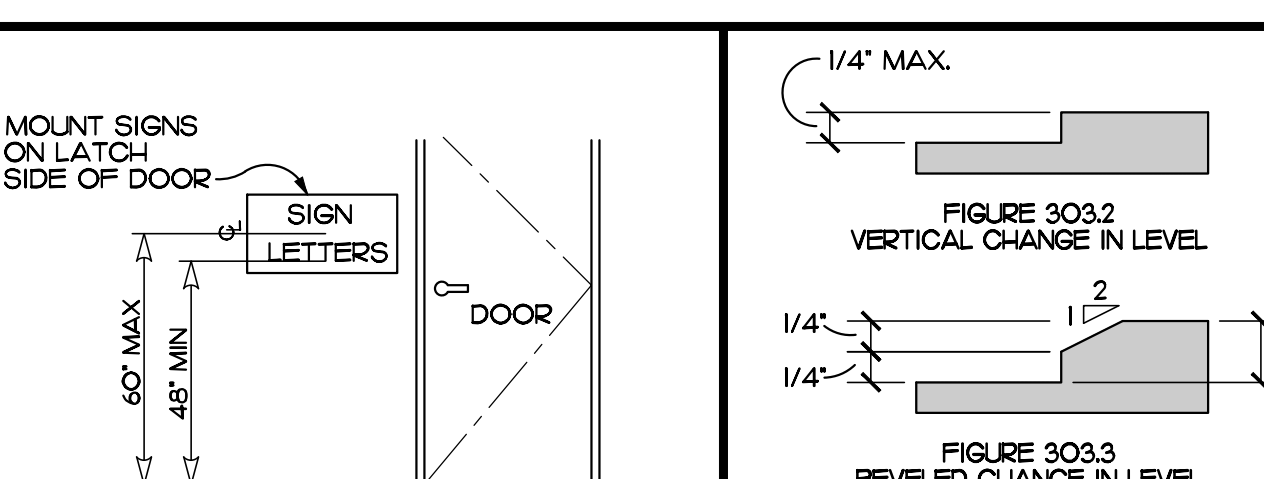
HANDICAP SIGNAGE



TRUNCATED DOME



CURB RAMP SLOPES



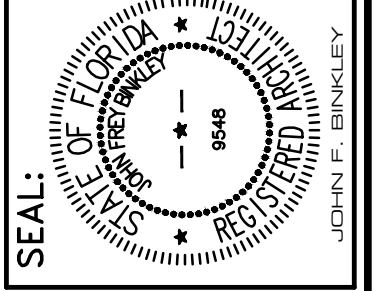
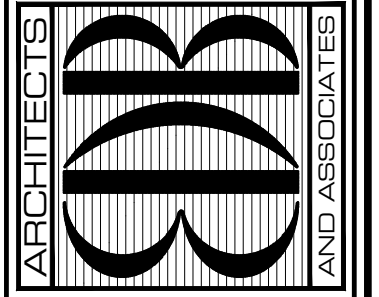
SIGN MOUNTING HEIGHT

ACCESSIBILITY DETAILS

SOME TERMS, SYMBOLS AND SPECIFICATIONS MAY NOT APPLY TO THIS PROJECT.

UPDATED 04 APRIL 2016

EDLUND · DRITENBAS · BINKLEY ARCHITECTS AND ASSOCIATES, P.A.
AR-AA 0000886
65 ROYAL PALM POINTE, SUITE "D"
VERO BEACH, FLORIDA 32960
PHONE: (772) 569-4320



PROJECT: HALLSTROM HOUSE RESTROOMS
HALLSTROM HOUSE RESTROOMS
1601 OLD DIXIE HIGHWAY SW
VERO BEACH, FL 32962

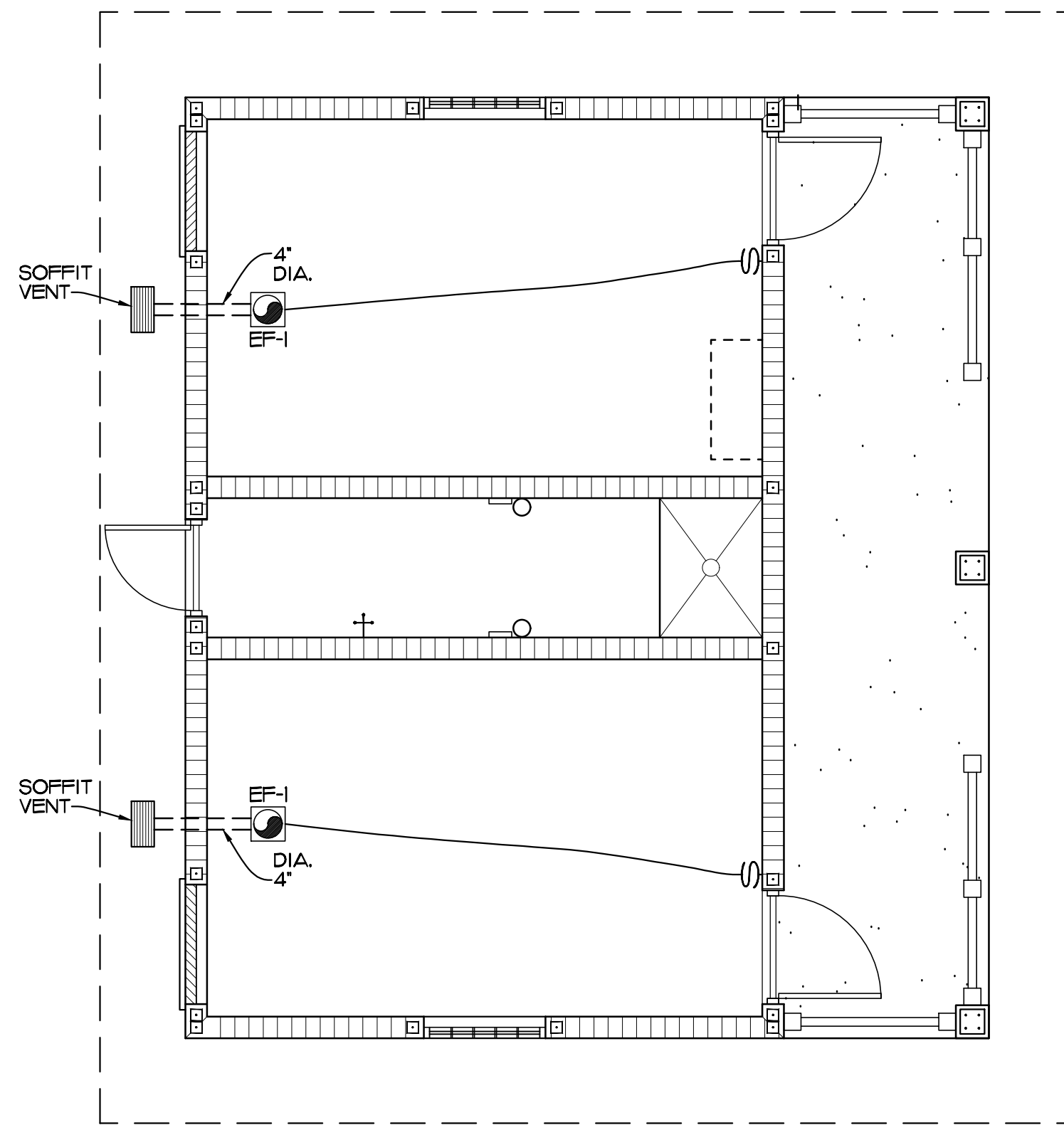
FOR:

NO.	DATE	REVISIONS

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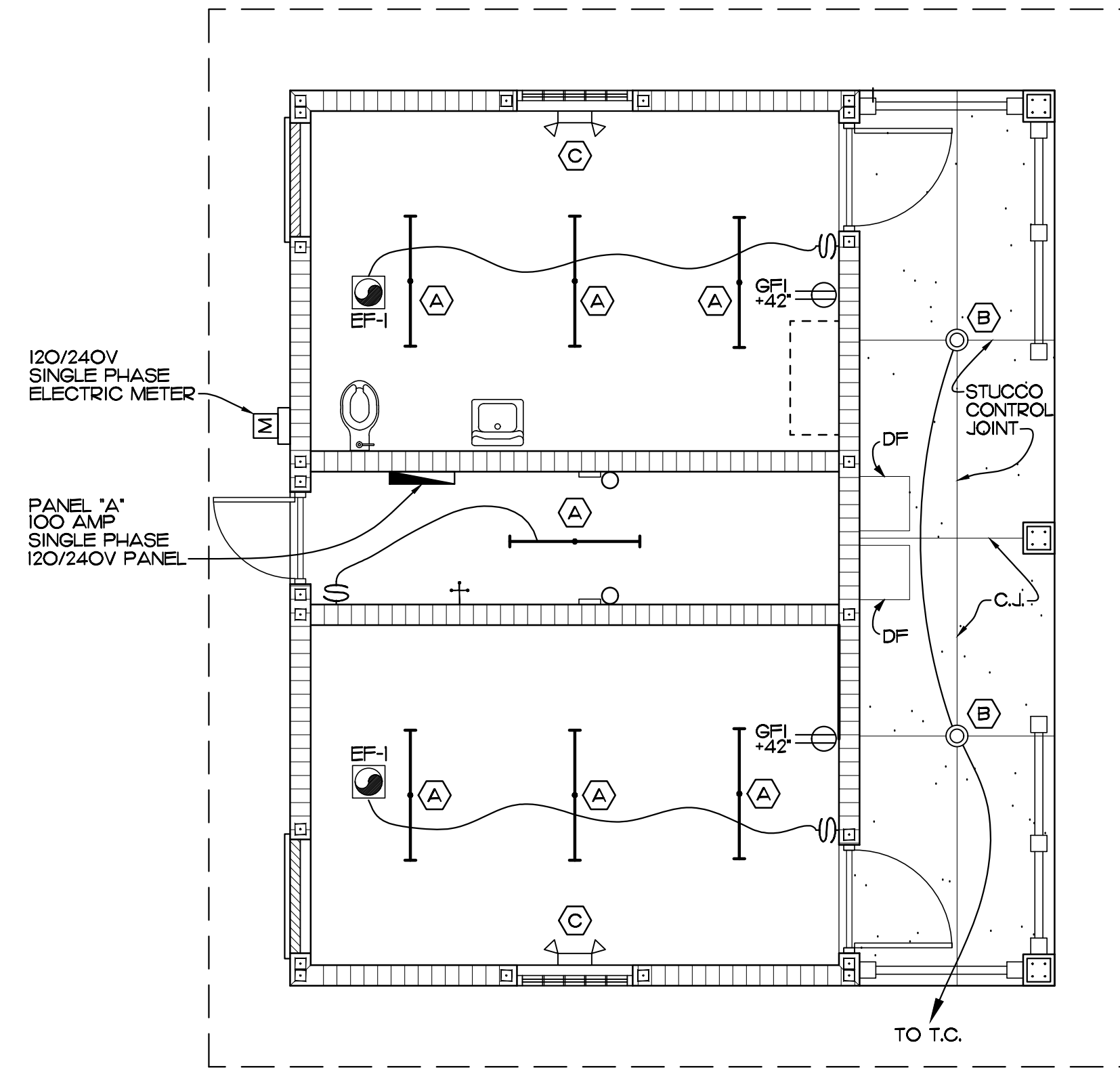
COMM. NO: 07020VB
DATE: OCTOBER 7, 2020
BY: LD
CHKD: JFB

SHEET NO.
ACC
OF ONE



MECHANICAL PLAN

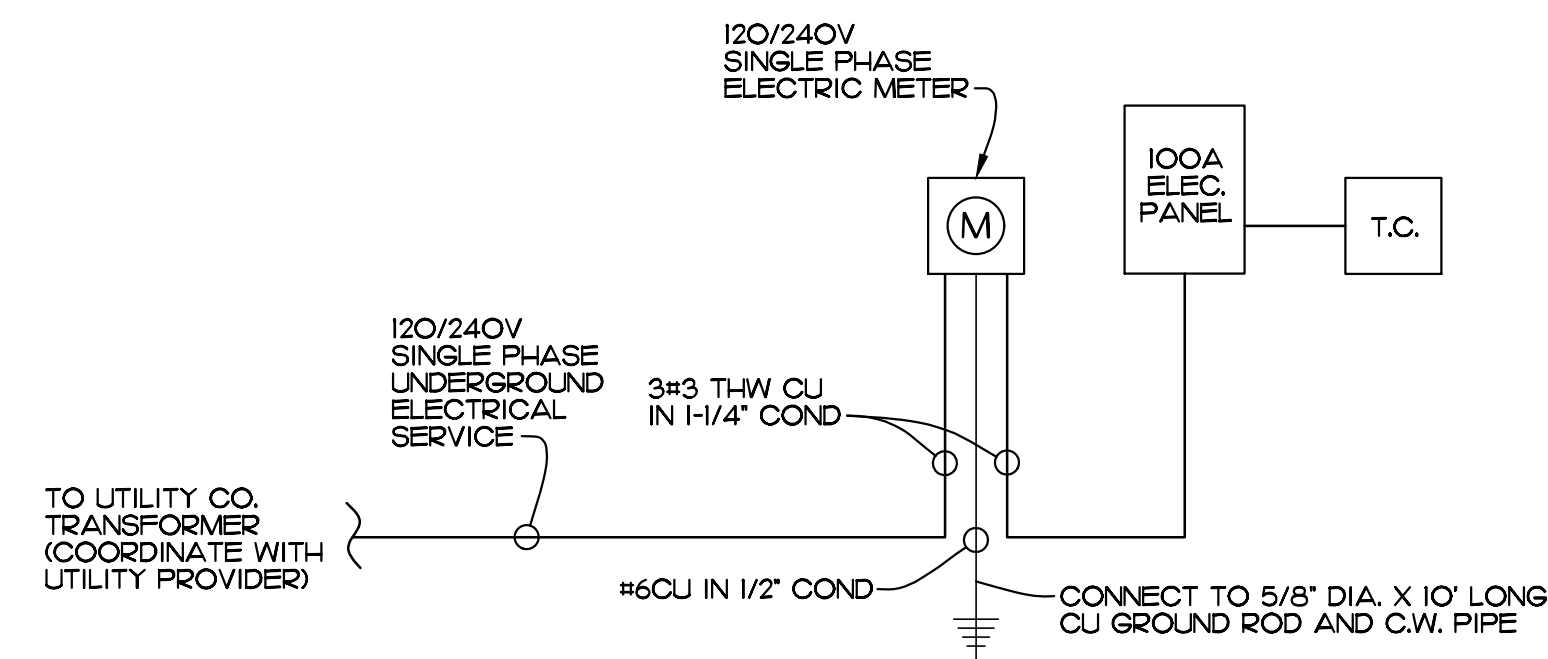
SCALE: 1/4" = 1'-0"
 EF-1 150 CFM EXHAUST FAN - NUTONE OR EQUAL



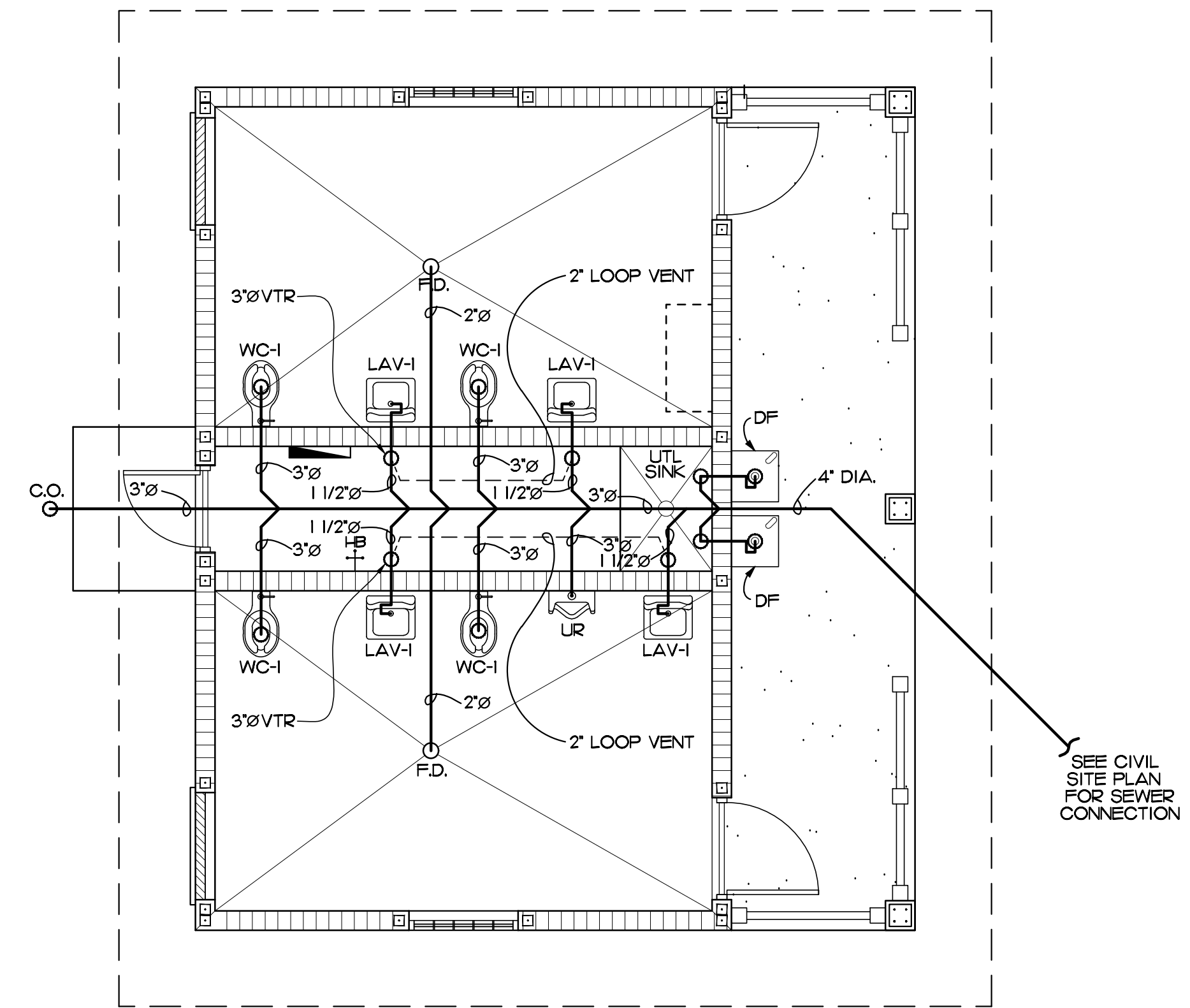
ELECTRICAL PLAN

SCALE: 1/4" = 1'-0"

LIGHT FIXTURE SCHEDULE		
MARK	TYPE	MANUFACTURER
(A)	4 FT. LONG SURFACE MOUNTED LED FIXTURE WITH WEATHER PROOF COVER	H.E. WILLIAMS 75L-4-1.38-840 -A 12125-DRV-UNV OR EQUAL
(B)	RECESSED LED CAN WEATHERPROOF	H.E. WILLIAMS 4DR-TL-120-835 -DIM-UNV-O-W-OF-WETCC OR EQUAL
(C)	EMERGENCY LIGHT DUAL HEAD	BEGHELLI - PE-H TWO LAMP EMERGENCY LIGHTING FIXTURE OR EQUAL



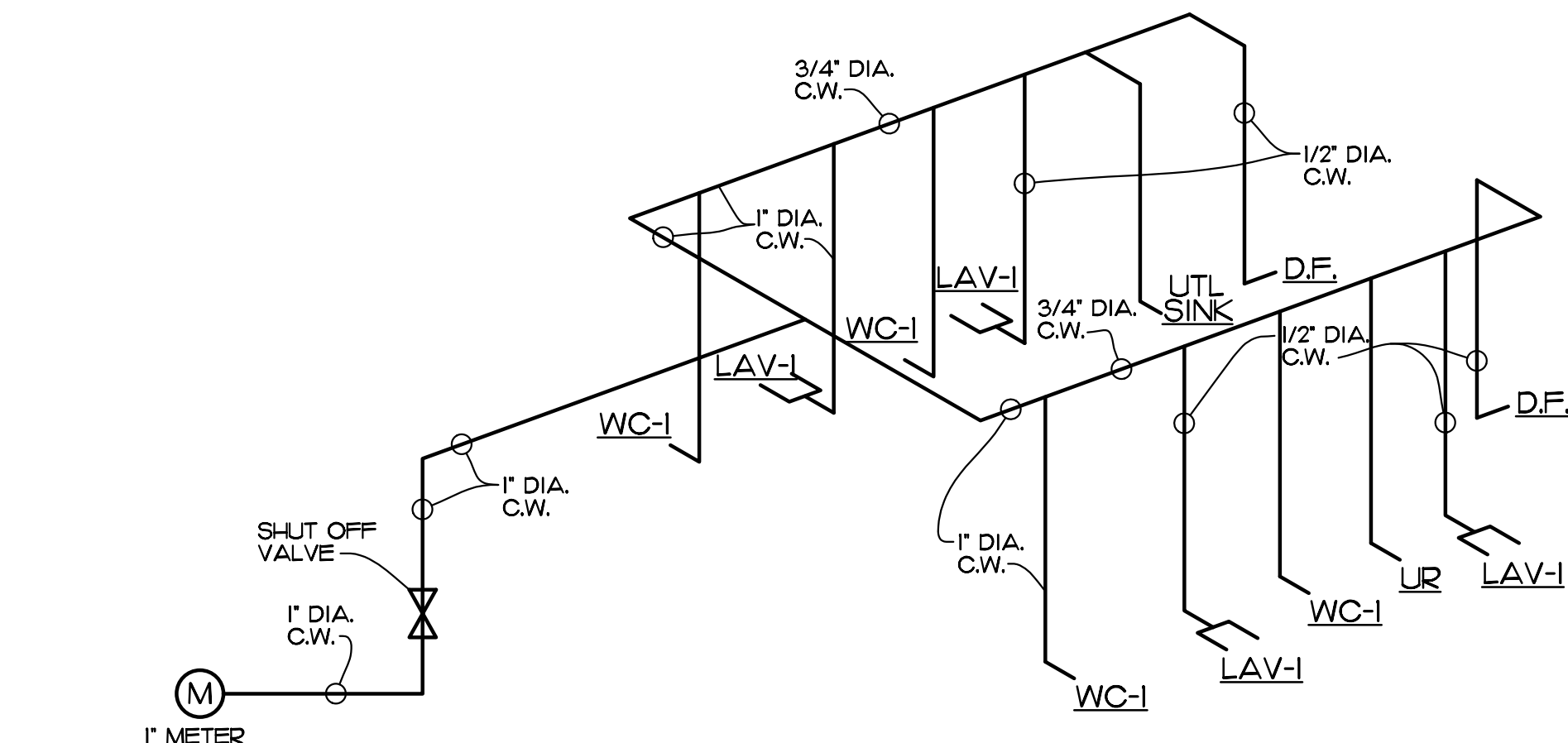
POWER RISER DIAGRAM



PLUMBING PLAN

SCALE: 1/4" = 1'-0"

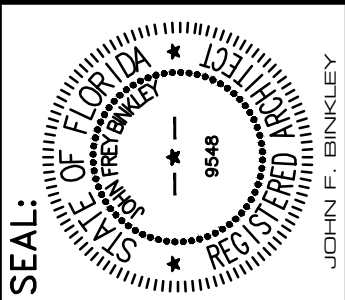
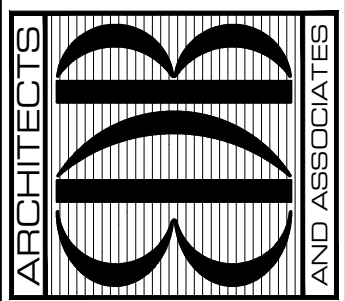
PLUMBING FIXTURE SCHEDULE	
LAV-1	HANDICAP LAVATORY, AMERICAN STANDARD, LUCERNE, LUCERNE WALL HUNG LAVATORY MODEL NO. Q356.028, WHITE WITH TESS BRASS FALCET BS-2701-VF05. CONTRACTOR TO SUPPLY CONCEALED ARM SUPPORT CARRIER FOR MOUNTING OF LAV. WADE MODEL 520-M36. SUPPLY PLUMBEREX MODEL 4333 INSULATION KIT. MUST MEET ADA CODE.
DF.	ELKAY DRINKING FOUNTAIN MODEL EDPP-14-C W/ PUSH BAR BUBBLER CONTROL. COLOR: STAINLESS STEEL
WC-1	HANDICAP WATER CLOSET - FLUSH VALVE BOWL, FLOOR MOUNTED, SIPHON JET VITREOUS CHINA WITH ELONGATED RIM AND 1-1/2" TOP SPUD, 16" HIGH AMERICAN STANDARD 3541.00US ELDERLY NEW CADET AQUAMETER, 126 GPF TOILET WITH SLOAN ROYAL III-1.6 FLUSH VALVE AND CENTCO 50000 OPEN FRONT SEAT LESS COVER.
F.D.	FLOOR DRAIN, JOSAM SERIES 30000A, C.I. BODY, POLISHED BRONZE STRAINER, INTEGRAL TRAP, WITH PRIMER CONNECTION AND TRAP GUARD INSERT BY PROSET.
C.O.	EXTERIOR CLEAN OUT, ADJUSTABLE TOP, INTERNAL CLOSURE PLUG, HEAVY DUTY COVER PLATE.
UR	URINAL AMERICAN STANDARD, WASH-BROOK #6501.01Q, FLUSH VALVE SLOAN ROYAL #186-1, WALL MOUNTED WHITE URINAL, WALL CARRIER, WADE #400AMI-M36. MUST MEET A.D.A. CODE.



NOTE:
 COORDINATE METER SIZE AND LOCATION WITH UTILITY PROVIDER (SEE CIVIL PLANS)

WATER RISER DIAGRAM

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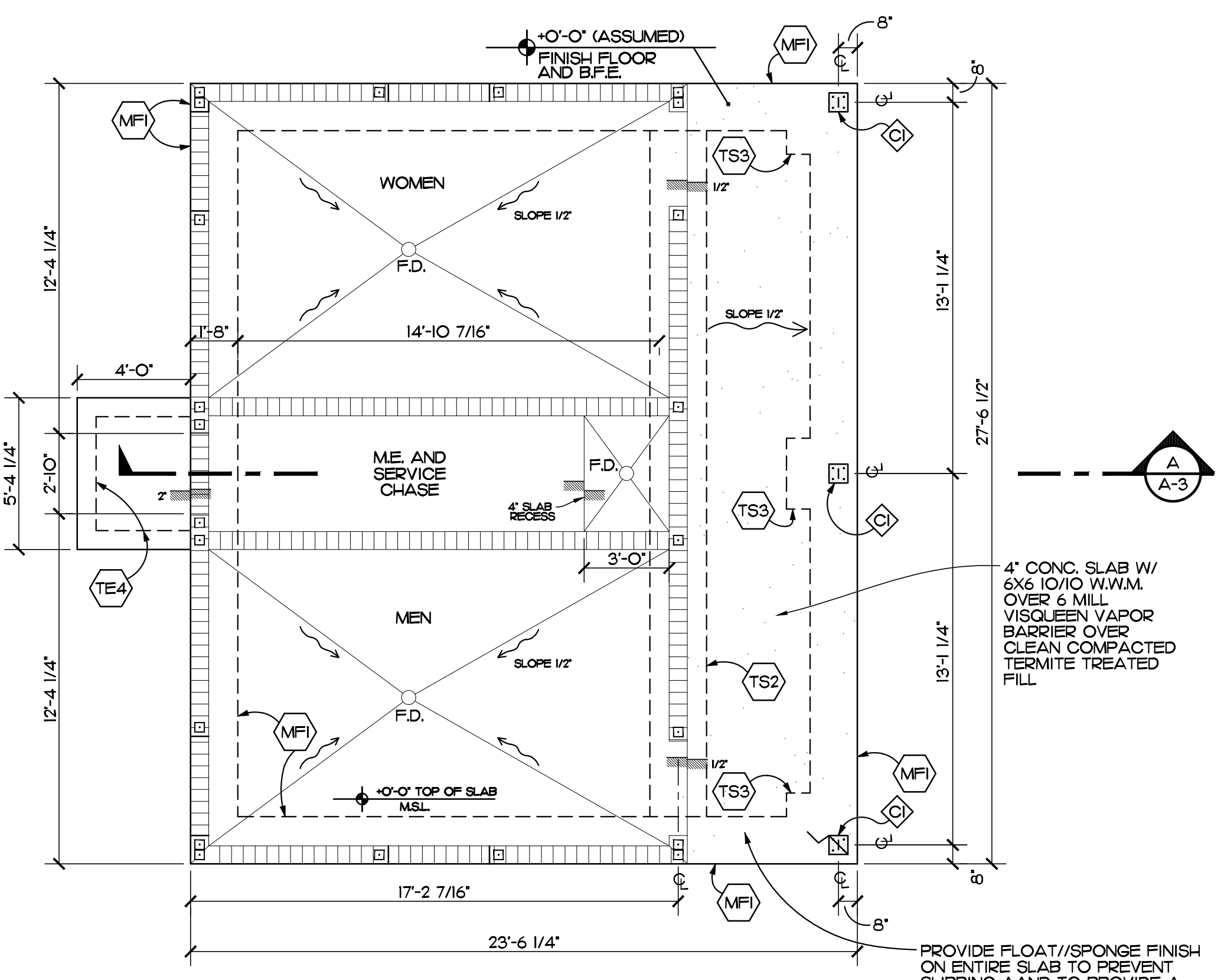
PROJECT: HALLSTROM HOUSE RESTROOMS
 FOR: HALLSTROM HOUSE RESTROOMS
 1601 OLD DIXIE HIGHWAY SW
 VERO BEACH, FL 32962

NO.	DATE	REVISIONS

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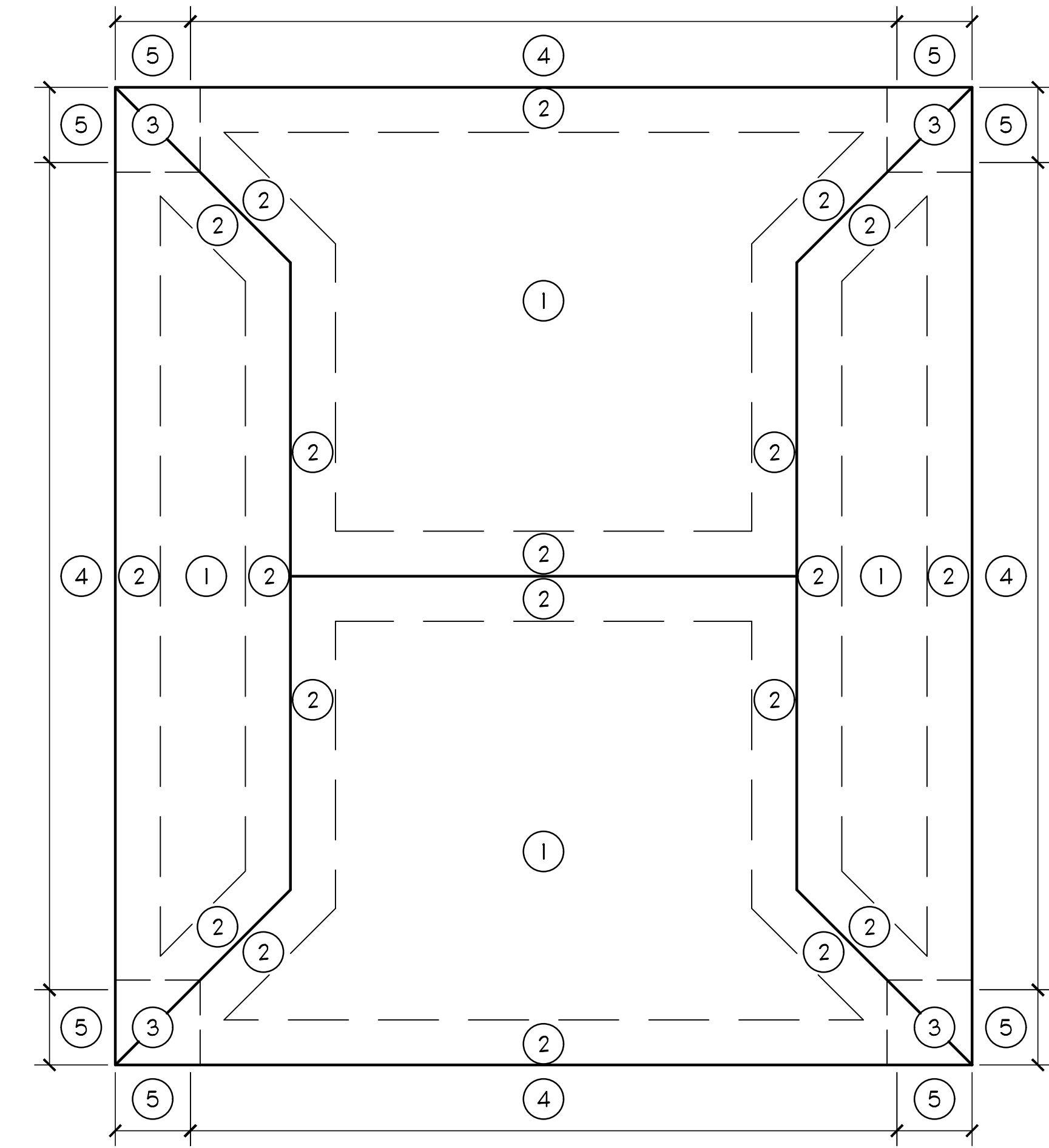
COMM. NO: 070120VB
 DATE: OCTOBER 7, 2020
 BY: LJD
 CHK'D: JFB

SHEET NO.
MEP-1
 OF ONE



FOOTING SCHEDULE			
MARK	SIZE	TYPE	REINFORCING
MF-1	20" W. X 18" DP.	MONOLITHIC FOOTING	2 #5'S CONT. BOTTOM
TS-2	24" W. X 12" DP.	THICKENED SLAB	2 #5'S CONT. BOTTOM
TS-3	2'-6" SQ. X 18" DP.	MONOLITHIC PAD FOOTING	3 #5'S EACH WAY BOTTOM
TE-4	8' X 8' DP.	AT CONC STOOP	1 #5 CONTINUOUS

COLUMN SCHEDULE			
MARK	SIZE	VERTICAL REINFORCING OR CAP R _e AND BOLTS	COLUMN TIES OR BASE R _e AND ANCHOR BOLTS
C-1	12" X 12"	4 #6'S VERT.	#3 TIES AT 8" O.C. VERTICAL



WIND PRESSURE ZONE DIAGRAM
SCALE: NTS

DESIGN CRITERIA

FLORIDA BUILDING CODE, 6TH EDITION (2017) BUILDING

ROOF LOADS

DEAD	20 PSF (METAL ROOF)
LIVE	
TRUSS TOP CHORD	20 PSF
TRUSS BOTTOM CHORD / STORAGE	20 PSF
TRUSS BOTTOM CHORD W/O STORAGE	10 PSF

WIND LOADS

DESIGN CRITERIA PER ASCE-7

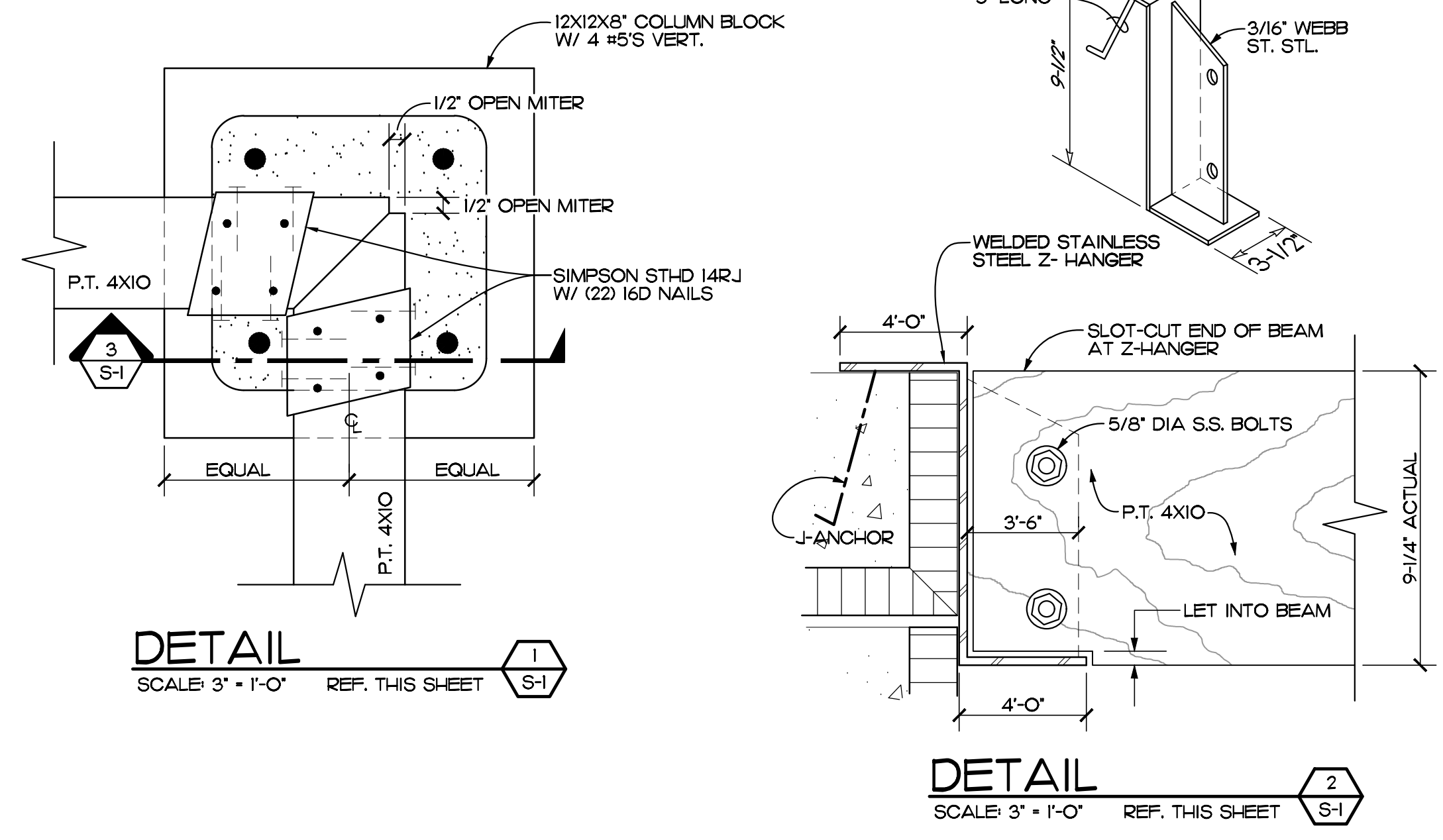
ULTIMATE WIND SPEED REGION, (VULT)	170 MPH
NOMINAL WIND SPEED REGION, (VASD)	132 MPH
WIND BORNE DEBRIS REGION	
ENCLOSED STRUCTURE	
BUILDING HEIGHT	< 20 FT.
ROOF PITCH	7/12
RISK CATEGORY	III
INTERNAL PRESSURE COEFFICIENT	±0.18
EXPOSURE	C
HEIGHT AND EXPOSURE COEFFICIENT	1.29

ZONE	EFFECTIVE AREA (IN SQ. FT.)			
	0 < IO	11 < 20	21 < 50	51 < 100
ROOF 1	+23	-37	+21	-36
ROOF 2	+23	-64	+21	-59
ROOF 3	+23	-95	+21	-89
ROOF 4	+40	-44	+39	-42
ROOF 5	+40	-54	+39	-50
SOFFIT WALL 4	-44	-42	-40	-38
SOFFIT WALL 5	-54	-50	-46	-42

NOTES:

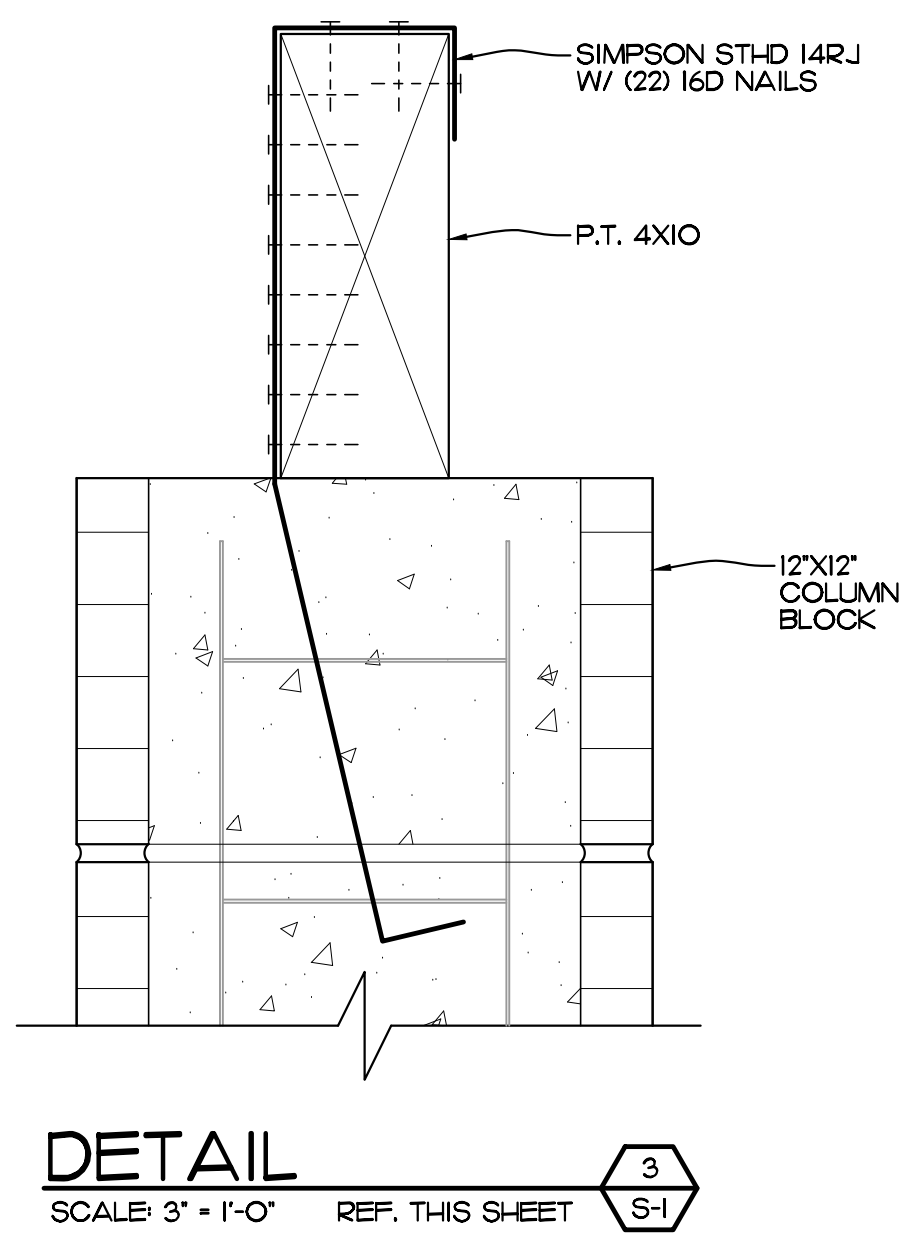
- END ZONE 5 IS WITHIN A DISTANCE (A) = 6'-6" FROM BUILDING CORNERS
- THE PROPOSED STRUCTURE IS LOCATED WITHIN A WINDBORNE DEBRIS AREA.

WOOD TRUSS CONNECTOR SCHEDULE					
MARK	CONNECTORS	FASTENERS	ALLOWABLE UPLIFT	MAX. CALC. UPLIFT	REMARKS
(A)	HETA 16	(9) 10D X 1-1/2"	1810 LBS	580 LBS	TYPICAL TRUSS TO CMU UNLESS NOTED OTHERWISE
(B)	HTS 20	(24) 10D X 1-1/2"	1450 LBS	580 LBS	
(C)	(2) HETA 16	(18) 10 D X 1-1/2" NAILS	3620 LBS	770 LBS	
(D)	(2) HTS 20	(2) 24 16D X 1-1/2"	2900 LBS	770 LBS	
(E)	(2) STD 14FJ	(2) 22 16D X 1-1/2"	2 X 3695 LBS	2900 LBS	



DETAIL
SCALE: 3" = 1'-0" REF. THIS SHEET

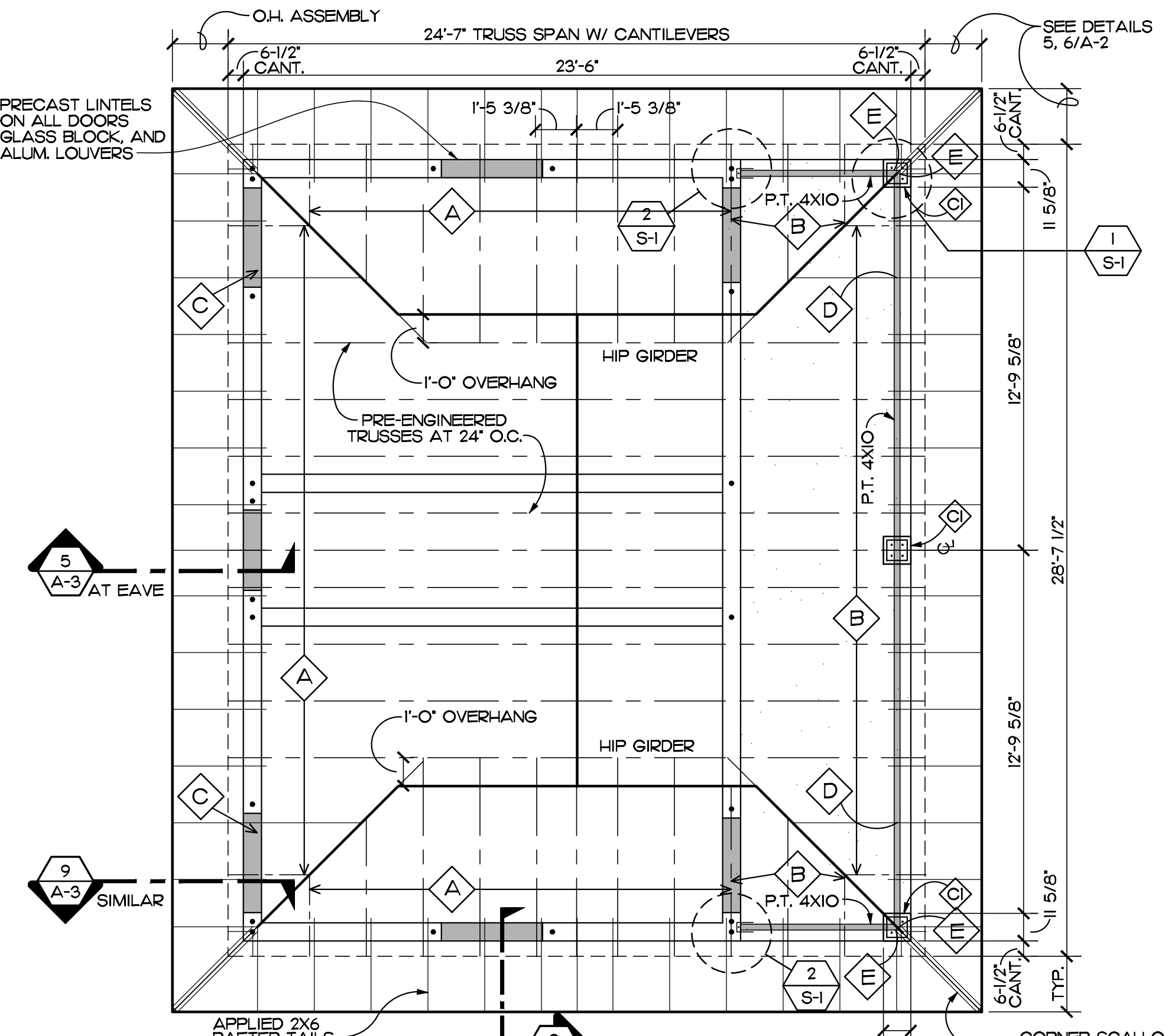
DETAIL
SCALE: 3" = 1'-0" REF. THIS SHEET



DETAIL
SCALE: 3" = 1'-0" REF. THIS SHEET

FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



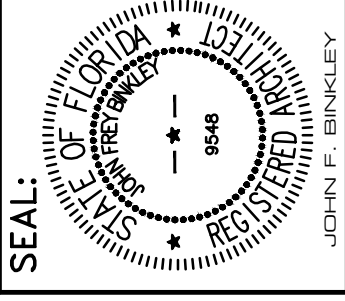
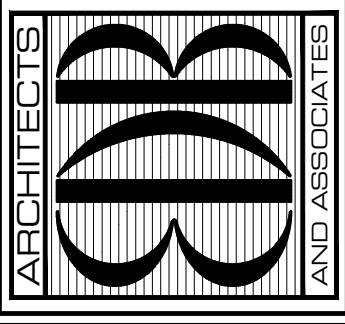
ROOF FRAMING PLAN

SCALE: 1/4" = 1'-0"

NOTE: TRUSS MANUFACTURER TO PROVIDE 5-1/2" HEEL CUTS ON ALL TRUSSES PER DETAIL 5/A-2

CORNER SCALLOPED RAFTER END APPLIED TO BOTH FACES OF CORNER JACK, IN OTHER WORDS, DOUBLED AT 1-1/2" APART.

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PHONE: (772) 569-4320



PROJECT: **HALLSTROM HOUSE RESTROOMS**
FOR: HALLSTROM HOUSE RESTROOMS
1601 OLD DYKE HIGHWAY SW
VERO BEACH, FL 32962

NO.	DATE	REVISIONS

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COMM. NO: 070120VB
DATE: OCTOBER 7, 2020
BY: LJD
CHK'D: JFB

SHEET NO.
S-1
OF ONE

Headquarters
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Orlando
723 Progress Way
Sanford, FL. 32771



Mailing
P.O. Box 78-1377
Sebastian, FL. 32978
Phone: 772-589-0712
C.A. # 5693
KSMengineering.net

September 16, 2020

Beth Powell
Indian River County Parks & Conservation Resources
5500 77th Street
Vero Beach, FL 32967

**Re: Hallstrom House (FTC No. 01-055-FF1)
Old Dixie Highway SW, North of 1st Street SE
Vero Beach, Florida
KSM Project #: 204419-b**

Dear Ms. Powell:

As requested, KSM Engineering & Testing has performed a subsurface investigation at the referenced site. Presentation of the data gathered during the investigation, together with our geotechnical related opinions, are included in this report.

At the time of drilling, the site was flat with moderate surface vegetation and few oak trees.

Project Description:

A pavilion and a restroom building, 900 sf and 315 sf, are planned to be constructed on the site as part of a new nature trail network project. Loads from the structures will be transferred to the ground by conventional shallow footings. We anticipate maximum wall loads for the structures will be less than 1,500 pounds per linear foot along the wall foundation and less than 10 kips for any individual column load. Roadways and stabilized walking paths will be constructed as part of this project.

Some site fill may be required to reach the desired grades.

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Hallstrom House
Vero Beach, Florida

-2-

September 16, 2020

Site Investigation:

The site investigation program consisted of performing two (2) Standard Penetration Test borings (SPT), and two (2) hand-auger borings on the site. The borings were terminated at depths of 10 to 14 feet below existing grade. The locations of the borings are shown on the attached location plan.

The SPT borings were completed in accordance with procedures described in ASTM D 1586. A standard 1.5 inch I.D., 2 inch O.D. split-spoon sampler is driven into the soil by successive blows of a 140 pound hammer freely falling 30 inches. The number of blows required to drive the sampler 1 foot, after seating 6 in., is designated the penetration Resistance, or "N" value. At regular intervals the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. Also, the groundwater table was allowed to stabilize and the depth of the groundwater elevation recorded from existing grade.

The records of the soils encountered, the penetration resistances and groundwater level are shown on the attached logs.

Engineering Evaluation and Conclusions:

Based on the information obtained from this site investigation we are pleased to offer the following evaluation:

The boring logs indicate the subsurface soils from the surface to a depth of approximately 6 feet consist of very loose fine-grained sand with typical surface roots. Below the very loose surface soil, medium-dense layers of fine-grained sand were found. Please refer to the soil boring logs for specific information relative to the soil description.

The very loose layers of sand would cause settlement to the planned structures. This settlement, in our opinion, would be too excessive and beyond the general accepted safe limits for the structure. Therefore, our recommendations are concerned with removing the very soft soils and replacing them with compacted sand.

The following sections provide recommendations for the site preparation and foundation design.

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Hallstrom House
Vero Beach, Florida

-3-

September 16, 2020

Site Preparation:

Excavate the very loose sand from within the proposed building limits and five feet beyond the perimeter of the building. Based on the boring logs, this would require removing approximately 4 feet of soils in order to get compaction to 6 feet below grade. Excavated fine sand may be stockpiled and re-used provided that it is not mixed with organic or other unsuitable material. All over-excavation of unsuitable soils, replacement, and compaction of suitable clean fine sand backfill material should take place in the "dry". After the very loose soils have been removed and the bottom layer has been properly compacted to a depth of 2 feet below grade, the site may be filled to the desired grades.

Structural fill shall consist of clean granular sand containing less than 10% material passing the U.S. Standard No. 200 mesh sieve. Fill should be placed in layers of 12 inches in thickness. Compact each lift to at least 95 percent of its modified Proctor value (ASTM D 1557).

After excavating for the footings, the disturbed footing subgrade should be recompact to 95 percent (minimum) of its modified dry Proctor value. This can be best achieved by making several passes with a relatively light-weight walk-behind vibratory sled or roller. Tests in the excavated footings should be conducted prior to placement of any steel or concrete and conducted at every column footing and once for every 100 linear feet of footing trench.

In-place density of the compacted soil can be verified using a nuclear density gauge. The subgrade and each lift of fill should be tested for compaction at a frequency no less than one test per 2,500 sf of building area, per lift and one test per 10,000 sf of roadway area, per lift with a minimum of 4 tests in each area prepared. Due to the material, moisture may need to be introduced to achieve compaction, consult with onsite soils technician if difficulty achieving compaction is evident.

Excavation:

Excavations should be sloped as necessary to prevent slope failure and to allow backfilling. As a minimum, temporary excavations below 4-foot depth should be sloped in accordance with OSHA regulations. Where lateral confinement will not permit slopes to be laid back, the excavation should be shored in accordance with OSHA requirements. During excavation, excavated material should not be stockpiled at the top of the slope within a horizontal distance equal to the excavation depth. Provisions for maintaining workman safety within excavations is the sole responsibility of the contractor.

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Hallstrom House
Vero Beach, Florida

September 16, 2020

Foundation:

Providing our recommendations for site preparation are followed, the proposed structures may be supported on conventional concrete, steel reinforced footings designed for an allowable soil bearing pressure of 2,000 pounds per square foot, or less.

With the foundation properly designed and the site properly prepared, we anticipate total settlements less than 1/2 of an inch and differential settlements of less than 1/4 of an inch. The majority of the settlement should occur during construction.

Floor Slabs:

A conventional slab-on-grade can be used in the "at grade" portion of the structures. We recommend the disturbed subgrade below the floor slab be re-compacted to 95 percent of the modified Proctor maximum dry density (ASTM D 1557) prior to placement of the concrete. An estimated modulus of subgrade reaction of 150 pounds per cubic inch (pci) can be used for design of the slab-on-grade. We recommend that control joints be incorporated in the slab at frequent intervals to control shrinkage cracks.

A moisture barrier is recommended beneath the floor slab to prevent moisture migration from the underlying soil resulting in dampness of the slab.

Drives and Parking Areas: (Standard Duty Only)

We performed two (2) hand-augers in the proposed roadway to evaluate the soils in relation to the proposed pavement. We did not find any "muck" or other unsuitable material in the test borings. Penetrometer readings recorded during the investigation indicates the existing soil density is loose on the surface to firm. The relationship of the static cone penetrometer readings which are shown on the logs to the relative density is listed below:

Relative Density	Static Penetrometer Reading
Very Loose or Soft	<15
Loose	15 – 40
Medium Dense	40 – 70
Dense	70+

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September 16, 2020

Although a comprehensive pavement evaluation was not within the scope of this study the site may be prepared to support a flexible pavement or rigid concrete pavement. The pavement should be designed for the anticipated loads and frequencies. The minimum pavement design for standard duty asphalt should include the following:

Clear the roadway area of any surface debris, including vegetation, roots and organic matter. Stumps shall be removed entirely. The cleared areas should be graded level and proof rolled. Any soft yielding areas shall be excavated and replaced with clean compacted fill. Sufficient passes should be made during compaction operations to produce a density no less than 95 percent of its modified dry Proctor value (AASHTO T180) to a depth of two feet. This is especially important on this site due to the amount of loose surface soils.

Additional fill shall consist of clean granular sand containing less than 10% material passing the U.S. Standard No. 200 mesh sieve and placed in loose layers of 12 inches and compacted to the above densities.

Eight inches of suitable clayed soil having a Limerock Bearing Ratio (LBR) of 40 should be used for the stabilized subgrade and compacted to 98 percent of its modified dry Proctor value (AASHTO T180).

The base course shall be six inches of cemented coquina rock (LBR of 100) or limerock and compacted to 98 percent of its modified dry Proctor value (AASHTO T180). A minimum of 16 inches separation should be maintained between the bottom of the base and the high seasonal groundwater table.

The asphalt wearing surface should consist of 1 ½" of type S-3 in accordance with the Florida Department of Transportation Standard Specification for Road and Bridge Construction.

Standard duty pavement areas are considered car and pickup truck loading conditions and a few medium trucks such as delivery and garbage truck loading conditions.

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-6-

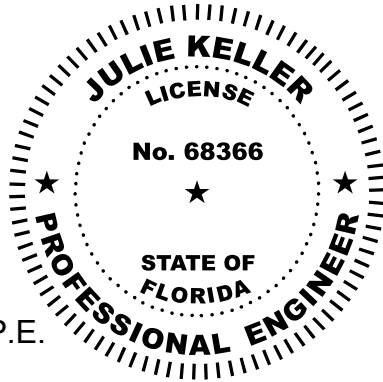
September 16, 2020

Closure:

This report has been prepared in accordance with generally accepted soil and foundation engineering practice based on the results of the test borings and assumed loading conditions. This report does not reflect any variations which may occur between the borings. If variations appear evident during the course of construction, it would be necessary to re-evaluate the recommendations of this project.

We are pleased to be of assistance to you on this phase of your project. When we may be of further service to you or should you have any questions, please feel free to contact the office.

Respectfully,



Julie E. Keller, P.E.
President
P.E. # 68366

JEK/cv

Email to: aarons@mbveng.com



KSM Engineering & Testing
 P.O. Box 78-1377
 Sebastian, FL 32978
 Tel: (772)-589-0712
 Fax: (772)-589-6469

BORING NUMBER B-1

CLIENT Indian River County Parks & Conservation Resources **PROJECT NAME** Hallstrom House (FTC No. 01-055-FF1)
PROJECT NUMBER 204419-p&b **PROJECT LOCATION** Vero Beach, Florida
DATE STARTED 9/15/20 **COMPLETED** 9/15/20 **GROUND ELEVATION** _____ **HOLE SIZE** inches
DRILLING CONTRACTOR _____ **GROUND WATER LEVELS:**
DRILLING METHOD Split Spoon Sample **AT TIME OF DRILLING** 8.42 ft
LOGGED BY DP/JY **CHECKED BY** JEK **AT END OF DRILLING** ---
NOTES See Attached Location Plan **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲		
								20	40	60
0		Brown Sand with Traces of Roots								
		Yellowish Brown Sand	X SS		1-1-2 (3)					
			X SS		1-2-2 (4)					
5			X SS		2-1-2 (3)					
			X SS		2-2-2 (4)					
			X SS		2-2-3 (5)					
10		Grayish Brown Sand	X SS							

Bottom of borehole at 10.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 9/18/20 08:13 - K:\KSM FILES\20 DOCS (KSM-SERVER)\204419-P&B.GPJ



KSM Engineering & Testing
 P.O. Box 78-1377
 Sebastian, FL 32978
 Tel: (772)-589-0712
 Fax: (772)-589-6469

BORING NUMBER B-2

CLIENT Indian River County Parks & Conservation Resources
PROJECT NUMBER 204419-p&b
DATE STARTED 9/15/20 **COMPLETED** 9/15/20
DRILLING CONTRACTOR _____
DRILLING METHOD Split Spoon Sample
LOGGED BY DP/JY **CHECKED BY** JEK
NOTES See Attached Location Plan

PROJECT NAME Hallstrom House (FTC No. 01-055-FF1)
PROJECT LOCATION Vero Beach, Florida
GROUND ELEVATION _____ **HOLE SIZE** inches
GROUND WATER LEVELS:
 ▽ **AT TIME OF DRILLING** 8.75 ft
AT END OF DRILLING ---
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲		
								20	40	60
								PL MC LL 20 40 60 80		
								<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20 40 60 80		
0		Brown Sand with Traces of Roots								
		Yellowish Brown Sand	SS		2-2-2 (4)					
			SS		2-1-2 (3)					
5			SS		2-1-2 (3)					
			SS		1-2-2 (4)					
		Grayish Brown Sand	SS		1-2-2 (4)					
10			SS		4-5-6 (11)					
		Light Gray Sand	SS		5-5-5 (10)					

Bottom of borehole at 14.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 9/18/20 08:13 - K:\KSM FILES\20 DOCS (KSM-SERVER)\204419-P&B.GPJ



KSM Engineering & Testing
 P.O. Box 78-1377
 Sebastian, FL 32978
 Tel: (772)-589-0712
 Fax: (772)-589-6469

BORING NUMBER HA-1

CLIENT Indian River County Parks & Conservation Resources **PROJECT NAME** Hallstrom House (FTC No. 01-055-FF1)

PROJECT NUMBER 204419-p&b **PROJECT LOCATION** Vero Beach, Florida

DATE STARTED 9/15/20 **COMPLETED** 9/15/20 **GROUND ELEVATION** _____ **HOLE SIZE** inches

DRILLING CONTRACTOR _____ **GROUND WATER LEVELS:**

DRILLING METHOD _____ **AT TIME OF DRILLING** 6.00 ft

LOGGED BY DP/JY **CHECKED BY** JEK **AT END OF DRILLING** ---

NOTES See Attached Location Plan **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲	
								PL	MC LL
								20	40 60 80
0		Brown Sand with Traces of Roots				20			20 40 60 80
		Yellowish Brown Sand				24			
						22			
						25			
5						27			
						26			

Bottom of borehole at 6.0 feet.



KSM Engineering & Testing
 P.O. Box 78-1377
 Sebastian, FL 32978
 Tel: (772)-589-0712
 Fax: (772)-589-6469

BORING NUMBER HA-2

CLIENT Indian River County Parks & Conservation Resources **PROJECT NAME** Hallstrom House (FTC No. 01-055-FF1)

PROJECT NUMBER 204419-p&b **PROJECT LOCATION** Vero Beach, Florida

DATE STARTED 9/15/20 **COMPLETED** 9/15/20 **GROUND ELEVATION** _____ **HOLE SIZE** inches

DRILLING CONTRACTOR _____ **GROUND WATER LEVELS:**

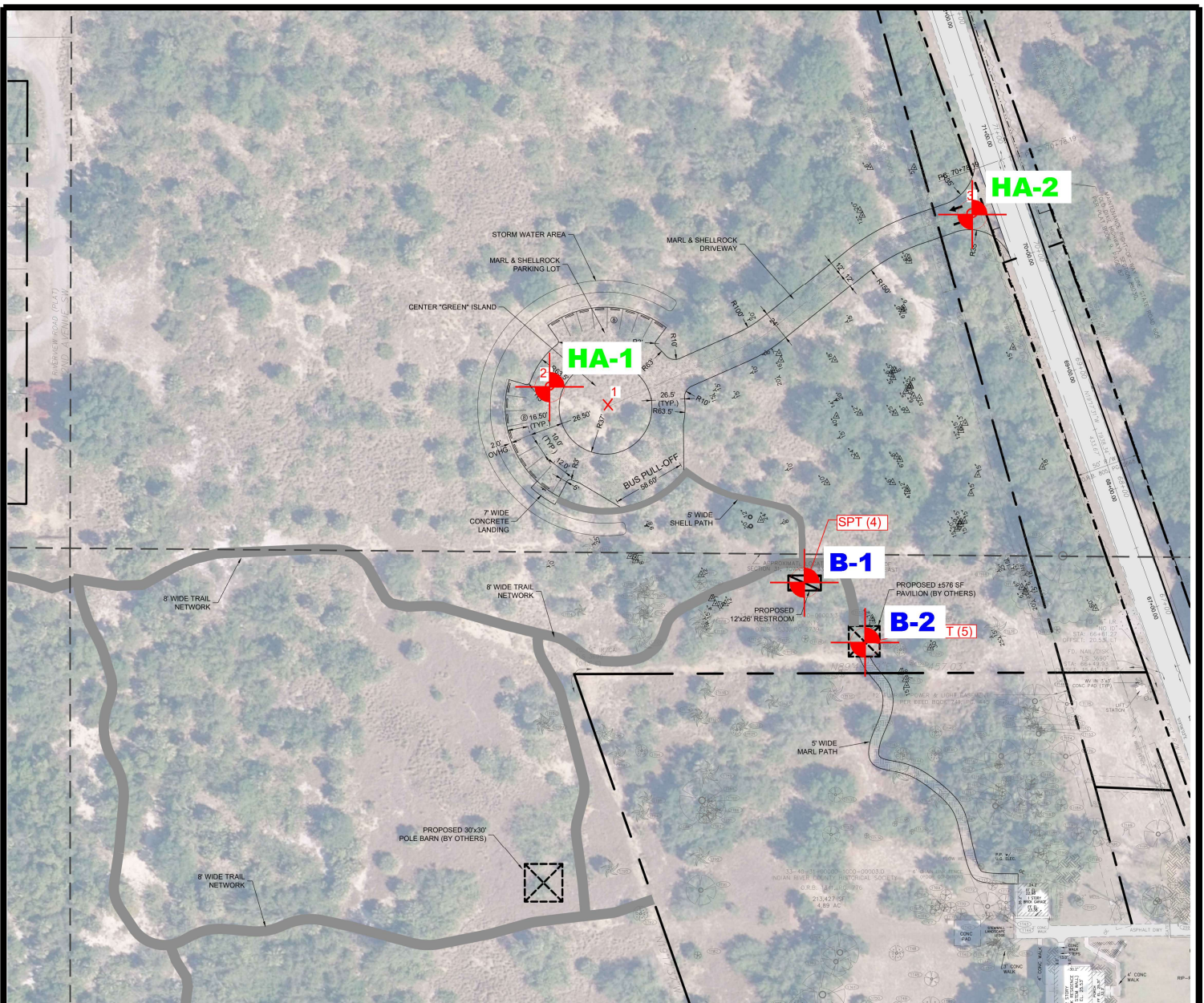
DRILLING METHOD _____ **AT TIME OF DRILLING** 6.00 ft

LOGGED BY DP/JY **CHECKED BY** JEK **AT END OF DRILLING** ---

NOTES See Attached Location Plan **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲	
								PL	MC LL
0								20	40 60 80
		Gray Sand with Traces of Roots				24			
		Light Gray Sand				27			
		Yellowish Brown Sand				26			
5						28			
						28			
						27			

Bottom of borehole at 6.0 feet.



 **LOCATION OF TESTS**

PROJECT: Hallstrom House (FTC No. 01-055-FF1), Old Dixie Highway SW, N. of 1st Street SE, Vero Beach, Florida

SHEET 1 OF 1
 PERMIT #:
 PROJECT #: 204419-b



DRAWN BY: C.V.
DESIGNED BY: J.K.
DATE: 20200918
SCALE: NONE

Headquarters
11345 U.S. Highway 1
Sebastian, FL. 32958
Orlando
723 Progress Way
Sanford, FL. 32771



Mailing
P.O. Box 78-1377
Sebastian, FL. 32978
Phone: 772-589-0712
C.A. # 5693
KSMengineering.net

September 16, 2020

Beth Powell
Indian River County Parks & Conservation Resources
5500 77th Street
Vero Beach, FL 32967

**Re: Hallstrom House (FTC No. 01-055-FF1)
Old Dixie Highway SW, North of 1st Street SE
Vero Beach, Florida
KSM Project #: 204419-p**

Dear Ms. Powell:

Enclosed are the permeability test results and soil profile for the referenced project.

A Hydraulic Conductivity Test was performed in the field by the 'Usual Open-Hole Test' method.

The horizontal and vertical permeability flow rates were determined by excavating a test pit adjacent to the soil profiles and obtaining undisturbed shelly tube samples. We then performed a permeability test on the field samples in our laboratory.

All these tests were performed to evaluate the drainage characteristics of the soils for this particular test location.

The following table indicates the usual Open Hole Hydraulic Conductivity test results:

TEST LOCATION (See Location Plan)	HYDRAULIC CONDUCTIVITY (CFS/Sq. Ft. – Ft. Head)
P-1	9.7×10^{-4}

Headquarters
 11345 U.S. Highway 1
 Sebastian, FL. 32958
 Orlando
 723 Progress Way
 Sanford, FL. 32771



Mailing
 P.O. Box 78-1377
 Sebastian, FL. 32978
 Phone: 772-589-0712
 C.A. # 5693
 KSMengineering.net

Hallstrom House
 Vero Beach, Florida

-2-

September 16, 2020

The following table indicates the horizontal and vertical flow rates for the test location. These tests were performed in accordance with ASTM D-2434 and are performed in a saturated condition.

TEST LOCATION (See Location Plan)	HORIZONTAL FLOW RATE	VERTICAL FLOW RATE
P-1	27.2 Ft/Day @ (0"-8") Depth	25.0 Ft/Day @ (0"-8") Depth
P-1	115.5 Ft/Day @ (8"-132") Depth	105.9 Ft/Day @ (8"-132") Depth

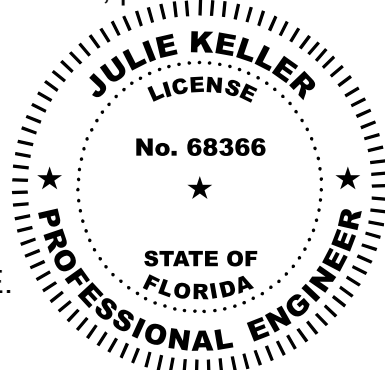
The following table indicates the measured water table along with our estimated normal wet season water table and normal dry season water table for the test location:

TEST LOCATION (See Location Plan)	MEASURED WATER TABLE	ESTIMATED WET SEASON WATER TABLE	ESTIMATED DRY SEASON WATER TABLE
P-1, PB-1	148" Below Grade	136" Below Grade	172" Below Grade

This estimate is based upon our interpretation of existing site conditions and a review of the USDA Soil Survey for Indian River County, Florida. The majority of the site soils are mapped as (4) Immokalee fine sand, (8) Paola sand, 0 to 5 percent slopes, (11) St. Lucie sand, 0 to 8 percent slopes, (12) Archbold sand, 0 to 5 percent slopes, (21) Pomello sand, 0 to 5 percent slopes, and (33) Astatula sand, 0 to 5 percent slopes, according to the Soil Survey Map of Indian River County, Florida.

If you have any questions, please feel free to contact the office.

Respectfully,



Julie E. Keller, P.E.
 President
 P.E. # 68366

JEK/cv
 Email to: aarons@mbveng.com



KSM Engineering & Testing
 P.O. Box 78-1377
 Sebastian, FL 32978
 Tel: (772)-589-0712
 Fax: (772)-589-6469

BORING NUMBER PB-1

CLIENT Indian River County Parks & Conservation Resources
PROJECT NUMBER 204419-p&b
DATE STARTED 9/15/20 **COMPLETED** 9/15/20
DRILLING CONTRACTOR _____
DRILLING METHOD Split Spoon Sample
LOGGED BY DP/JY **CHECKED BY** JEK
NOTES See Attached Location Plan

PROJECT NAME Hallstrom House (FTC No. 01-055-FF1)
PROJECT LOCATION Vero Beach, Florida
GROUND ELEVATION _____ **HOLE SIZE** inches
GROUND WATER LEVELS:
 ▽ **AT TIME OF DRILLING** 12.33 ft
AT END OF DRILLING ---
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲				
								20	40	60	80	
0		Brown Sand with Traces of Roots										
		Yellowish Brown Sand	SS		1-2-2 (4)							
			SS		2-2-1 (3)							
5			SS		2-1-2 (3)							
			SS		2-1-2 (3)							
10		Grayish Brown Sand	SS		2-2-2 (4)							
		Light Gray Sand	SS		2-3-4 (7)							
					4-6-7 (13)							

Bottom of borehole at 14.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 9/18/20 08:41 - K:\KSM FILES\20 DOCS (KSM-SERVER)\204419-P&B.GPJ



LOCATION OF TESTS

PROJECT: Hallstrom House (FTC No. 01-055-FF1), Old Dixie Highway SW, N. of 1st Street SE, Vero Beach, Florida

SHEET 1 OF 2
 PERMIT #:
 PROJECT #: 204419-p



DRAWN BY: C.V.
DESIGNED BY: J.K.
DATE: 20200918
SCALE: NONE



USDA SOILS SURVEY

4-Immokalee Fine Sand

8-Paola Sand, 0 to 5 Percent Slopes

11-St. Lucie Sand, 0 to 8 Percent Slopes

12-Archbold Sand, 0 to 5 Percent Slopes

21-Pomello Sand, 0 to 5 Percent Slopes

33-Astatula Sand, 0 to 5 Percent Slopes

PROJECT: Hallstrom House (FTC No. 01-055-FF1), Old Dixie Highway SW, N. of 1st Street SE, Vero Beach, Florida

SHEET 2 OF 2
 PERMIT #:
 PROJECT #: 204419-soils



DRAWN BY: C.V.
 DESIGNED BY: J.K.
 DATE: 20200918
 SCALE: NONE

#	Permit Type	Application Fee	Permit Fee	Comments
1	New Buildings, Alterations, Mobile and Modular Homes	\$200.00	0.4334% of ICC Building Valuation over \$46,146.75	Base permit fee includes subcontractor work (electrical, plumbing, mechanical, insulation, alarm, and irrigation) if subcontractor work is shown on the permit documents, if the value of the subcontractor work is included as part of the aggregate construction value and if subcontractor affidavits are submitted with the application. Commercial Site work and all Accessory Structures are excluded.
2	Additions, Alterations, Misc. Commercial			

Residential / Commercial Trade Permits				EFFECTIVE 10/11/21	
#	Permit Fee	Comments			
3	Aboveground Swimming Pool	\$75.00	Additional permit fee of 0.4334% of contract / work order valuation over \$17,305; permit fee due at time of application. Fee Includes one inspection. Trade permits requiring plan review subject to a \$55 plan review fee.		
4	Burglar Alarm	\$75.00			
5	Electric	\$75.00			
6	Electrical	\$75.00			
7	Electrical Service Change	\$75.00			
8	Electrical Temporary Pole	\$75.00			
9	Fence	\$75.00			
10	Fuel Gas	\$75.00			
11	In-fill Screening	\$75.00			
12	Insulation	\$75.00			
13	Irrigation System	\$75.00			
14	Mechanical	\$75.00			
15	Plumbing	\$75.00			
16	Pool Barrier (excluding screened enclosure)	\$75.00			
17	Pre-fabricated detached accessory structure	\$75.00			
18	Residential Paving (Driveway, Patio Slab)	\$75.00			
19	Solar water or PV	\$75.00			
Residential Specialty Permits					
#	Permit Type	Permit Fee	Comments		
20	Door / Window - Replacement / Hurricane Shutters	\$75.00	Fee includes up to 4 components or openings	Additional permit fee of 0.4334% of contract / work order valuation over \$17,305; permit fee due at time of application. Fee Includes one inspection. Trade permits requiring plan review subject to a \$55 plan review fee.	
21	Door / Window - Replacement / Hurricane Shutters	\$200.00	Greater than 4 components or openings	Additional permit fee of 0.4334% of contract / work order valuation over \$46,146.75; permit fee due at time of application.	
22	Garage door replacement - (1Door)	\$75.00	\$25 for each additional door in the same building / unit	Additional permit fee of 0.4334% of contract / work order valuation over \$17,305; permit fee due at time of application. Fee Includes one inspection. Trade permits requiring plan review subject to a \$55 plan review fee.	

Level-1 Specialty Permits					
#	Permit Type	Permit Application Fee	Comments		
23	Aluminum Structures	\$200.00	Additional permit fee of 0.4334% of contract / work order valuation over \$46,146.75; permit fee due at time of application.		
24	Sign	\$200.00			
25	Demolition	\$200.00			
26	Deck, Dock or Seawall	\$200.00			
27	Door or window replacement- Commercial	\$200.00			
28	Garage doors replacement – Commercial	\$200.00			
29	House Moving	\$200.00			Separate Alteration permit required for foundation and improvements at relocation site.
30	Hurricane Shutters - Commercial	\$200.00			
31	Site-Built Accessory Structure	\$200.00			
32	Commercial Paving	\$200.00			
Level-2 Residential and Commercial Specialty Permits					
#	Permit Type	Application Fee	Permit Fee	Comments	
33	Miscellaneous Permits: e.g: Fixed Station Generator		\$225.00	Additional permit fee of 0.4334% of contract / work order valuation over \$51,916; permit fee due at time of application.	
34	Re-roofing		\$225.00		
35	Residential Pool		\$225.00		
36	Commercial Pool	\$200.00	\$250.00	Additional permit fee of 0.4334% of contract / work order valuation over \$57,685; permit fee due at time of application.	
INSPECTION RELATED FEES					
		FEE			
37	Re-inspection fee	\$45.00		[1] failure to comply with code/plan requirements. [2] unproductive inspector trip (unable to access the work or not ready for inspection). [3] Advisory Inspection requested by contractor or owner.	
38	After-Hour Inspections	\$50 / hour. Minimum 4-hour charge		Must be arranged 2 days in advance.	

	Plan Review	FEE		Comments	
39	1st and 2nd Application / Plan Rejection / Modification	\$100 each		When content fails to meet sufficiency Requirement Check List (per state statute).	EFFECTIVE 10/11/24
40	3rd and subsequent Application / Plan Rejection / Modification	Four (4) times the original plan review fee (1/3 permit fee)		When content fails to meet sufficiency Requirement Check List (per state statute).	
41	Revision - small format	\$50.00		one 8.5 x 11 sheet	
42	Revision - large format	\$100.00		plan sheets - large format - or more than one 8.5x11	
43	Pre-Application Design Review	\$100.00			
Contractor Licensing					
		FEE			
44	Competency Card Application Fee	\$50.00			
45	Competency Card Renewal Fee	\$50.00			
Administrative Service Fees					
		FEE		Comments	
46	Microfilm / Microfiche Document Requests Document Research	See Archive Request form			
47	Digital Document requests	See Archive Request form			
48	Paper documents from database or copier	0.25* / 0.50** per page fee		8.5x11*, 8.5x14*, 11x17**	
49	Change of contractor	\$50.00			
50	Change of sub-contractor	\$20.00			
GENERAL INFORMATION					
	Valuation methodology	Valuation is based on the greater of contract value or latest ICC valuation table or as otherwise acceptable to the Building Official for specialty work not addressed by the ICC valuation table. The job valuation must include labor, overhead and profit. Valuation of total improvement (excluding land) shall be used.			
	Penalties (statutory).	Any person who commences any work requiring a permit before obtaining the permit shall be subject to a penalty of one hundred percent (100%) (Double) of the standard permit fee. The payment of such penalty shall not relieve any person(s) from complying with the requirement of the Building Code, the IRC Code of Ordinances, any applicable laws, or this resolution			
	Multiple Buildings	Multiple Buildings on one property: Work in common areas of buildings is individually permitted per building not per property.			
	Refunds	Permit and Permit Application fees are non-refundable.			
	Private Provider Fee Reductions	A fee reduction for Private Provider related permits will be calculated as follows: 10% reduction in fees if a "Private Provider" is utilized for Permit Plan Review, and 25% reduction in fees if a "Private Provider" is utilized for Permit related Inspections.			
	Credit Card Service Fee	Credit card payments are subject to a 2.5% per transaction fee with a \$2 minimum			



FLORIDA DEPARTMENT OF Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor
Carlos Lopez-Canera
Lt. Governor
Noah Valenstein
Secretary

February 26, 2019

Ms. Beth Powell
Conservation Lands Manager
Indian River County
5500 77th Street
Vero Beach, FL 32960-5523

Re: Hallstrom Farmstead Conservation Area Improvements
LWCF Project No. 12-00695

Dear Ms. Powell:

The attached contains the fully executed grant agreement for the above referenced project. Moreover, please visit our website at: <https://floridadep.gov/ooo/land-and-recreation-grants>, to read and familiarize yourself with the LWCF Manual, the LWCF Florida Administrative Rule, the required Commencement Documentation Checklist, as well as the Project Status Report Form.

In addition, the Reimbursement Schedules and the Project Completion Documentation Checklist can be found on our website when that time approaches.

This information has been provided for your review, as it will be extremely helpful and ensure compliance with the administrative requirements of this grant.

Reminders:

1. Construction or acquisition cannot begin until all project commencement documentation has been submitted and approved by this office. This process should be completed by **August 21, 2019**; again the **commencement checklist** and other forms may be found at <https://floridadep.gov/ooo/land-and-recreation-grants> under **LWCF Administrative Forms**.
1. Quarterly status reports are required - **January 5, May 5, and September 5**. Please be sure to summarize work accomplished, problems encountered (if any), and provided color photographs of development progression and the final as-built product.
2. The Department will not process your reimbursements request until the Grantee completes the project and staff reviews and approves all Completion Documentation.

Ms. Beth Powell
Page Two
February 26, 2019

3. The project should be completed before the completion date set forth in the grant agreement **May 31, 2022** and all reimbursement requests and closeout documents submitted within thirty days after completion.

5. If the project cannot be completed on time, a written request for an extension should be submitted at least sixty (60) days prior to the completion date. Please state the reason for the extension and the additional time needed to complete the project.

If you have any questions, please contact our office at (850) 245-2501. We look forward to working with you on this project.

Sincerely,

A handwritten signature in black ink that reads "Tamika Bass". The signature is written in a cursive, flowing style.

Tamika Bass
Community Assistant Consultant
Land and Recreation Grants Section
Office of Operations
Mail Station #585

**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Standard Grant Agreement**

This Agreement is entered into between the Parties named below, pursuant to Section 215.971, Florida Statutes:

1. Project Title (Project): Hallstrom Farmstead Conservation Area Improvements Agreement Number: LW695

2. Parties State of Florida Department of Environmental Protection,
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000 (Department)

Grantee Name: Indian River County Entity Type: A Local Government
Grantee Address: 5500 77th Street, Vero Beach, FL 32960-5523 FEID: 59-6000674 (Grantee)

3. Agreement Begin Date: September 24, 2018 Date of Expiration: September 30, 2022

4. Project Number: LW695 Project Location(s): 1601 Old Dixie Highway SW, Vero Beach, FL 32962
(If different from Agreement Number)

Project Description: Install a 30' x 30' pavilion with concrete floor (includes survey, earthwork and construction),
a 24' x 24' pavilion/outdoor classroom with stabilized pervious base floor (includes survey, earthwork and construction); Survey and construct a boardwalk; Create a .3 mile
ADA accessible loop trail and a 1.1 mile nature trail; Construct a parking area.

5. Total Amount of Funding:	Funding Source?	Award #s or Line Item Appropriations:	Amount per Source(s):
\$148,500.00	<input type="checkbox"/> State <input checked="" type="checkbox"/> Federal	Line Item No. 1686, GAA, FY 2018-2019	\$148,500.00
	<input type="checkbox"/> State <input type="checkbox"/> Federal		
	<input checked="" type="checkbox"/> Grantee Match		\$148,500.00
Total Amount of Funding + Grantee Match, if any:			\$297,000.00

6. Department's Grant Manager Name: Tarnika Bass or successor
Address: 3900 Commonwealth Boulevard
MS# 585
Tallahassee, FL 32399
Phone: 850-245-2501
Email: tarnika.bass@floridadep.gov

Grantee's Grant Manager Name: Ms. Beth Powell or successor
Address: 5500 77th Street
Vero Beach, FL 32960-5523
Phone: 772-226-1873
Email: bpowell@ircgov.com

7. The Parties agree to comply with the terms and conditions of the following attachments and exhibits which are hereby incorporated by reference:

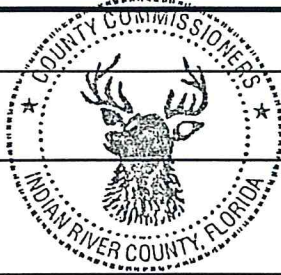
<input checked="" type="checkbox"/> Attachment 1: Standard Terms and Conditions Applicable to All Grants Agreements
<input checked="" type="checkbox"/> Attachment 2: Special Terms and Conditions
<input checked="" type="checkbox"/> Attachment 3: Grant Work Plan
<input checked="" type="checkbox"/> Attachment 4: Public Records Requirements
<input checked="" type="checkbox"/> Attachment 5: Special Audit Requirements
<input checked="" type="checkbox"/> Attachment 6: Program-Specific Requirements
<input checked="" type="checkbox"/> Attachment 7: LW695 Grant Award Terms (Federal) *Copy available at https://facts.fldfs.com , in accordance with §215.985, F.S.
<input checked="" type="checkbox"/> Attachment 8: Federal Regulations and Terms (Federal)
<input type="checkbox"/> Additional Attachments (if necessary):
<input checked="" type="checkbox"/> Exhibit A: Progress Report Form
<input type="checkbox"/> Exhibit B: Property Reporting Form
<input checked="" type="checkbox"/> Exhibit C: Payment Request Summary Form
<input type="checkbox"/> Exhibit D: Quality Assurance Requirements for Grants
<input type="checkbox"/> Exhibit E: Advance Payment Terms and Interest Earned Memo
<input type="checkbox"/> Additional Exhibits (if necessary):

8. The following information applies to Federal Grants only and is identified in accordance with 2 CFR 200.331(a)(1):

Federal Award Identification Number(s) (FAIN):	P18AP00600
Federal Award Date to Department:	9/24/18
Total Federal Funds Obligated by this Agreement:	\$148,500.00
Federal Awarding Agency:	National Park Service
Award R&D?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A

IN WITNESS WHEREOF, this Agreement shall be effective on the date indicated by the Agreement Begin Date above or the last date signed below, whichever is later.

Indian River County



GRANTEE

Grantee Name

By

Bob Solari
(Authorized Signature)

February 5, 2019

Date Signed

Bob Solari, Chairman

Print Name and Title of Person Signing

State of Florida Department of Environmental Protection

DEPARTMENT

By

Cathy DeHaven
Secretary or Designee

2-21-2019

Date Signed

Cathy DeHaven Director Division of State Lands - DEP

Print Name and Title of Person Signing

ATTEST: Jeffrey R. Smith, Clerk
of Court and Comptroller

Additional signatures attached on separate page.

BY:

Randi Wauerton
Deputy Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

BY

[Signature]
DYLAN REINGOLD
COUNTY ATTORNEY

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STANDARD TERMS AND CONDITIONS
APPLICABLE TO GRANT AGREEMENTS

ATTACHMENT 1

1. Entire Agreement.

This Grant Agreement, including any Attachments and Exhibits referred to herein and/or attached hereto (Agreement), constitutes the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior agreements, whether written or oral, with respect to such subject matter. Any terms and conditions included on Grantee's forms or invoices shall be null and void.

2. Grant Administration.

- a. Order of Precedence. If there are conflicting provisions among the documents that make up the Agreement, the order of precedence for interpretation the Agreement is as follows:
- i. Standard Grant Agreement
 - ii. Attachments other than Attachment 1, in numerical order as designated in the Standard Grant Agreement
 - iii. Attachment 1, Standard Terms and Conditions
 - iv. The Exhibits in the order designated in the Standard Grant Agreement
- b. All approvals, written or verbal, and other written communication among the parties, including all notices, shall be obtained by or sent to the parties' Grant Managers. All written communication shall be by electronic mail, U.S. Mail, a courier delivery service, or delivered in person. Notices shall be considered delivered when reflected by an electronic mail read receipt, a courier service delivery receipt, other mail service delivery receipt, or when receipt is acknowledged by recipient. If the notice is delivered in multiple ways, the notice will be considered delivered at the earliest delivery time.
- c. If a different Grant Manager is designated by either party after execution of this Agreement, notice of the name and contact information of the new Grant Manager will be submitted in writing to the other party and maintained in the respective parties' records. A change of Grant Manager does not require a formal amendment or change order to the Agreement.
- d. This Agreement may be amended, through a formal amendment or a change order, only by a written agreement between both parties. A formal amendment to this Agreement is required for changes which cause any of the following: (1) an increase or decrease in the Agreement funding amount; (2) a change in Grantee's match requirements; (3) a change in the expiration date of the Agreement; and/or (4) changes to the cumulative amount of funding transfers between approved budget categories, as defined in Attachment 3, Grant Work Plan, that exceeds or is expected to exceed twenty percent (20%) of the total budget as last approved by Department. A change order to this Agreement may be used when: (1) task timelines within the current authorized Agreement period change; (2) the cumulative transfer of funds between approved budget categories, as defined in Attachment 3, Grant Work Plan, are less than twenty percent (20%) of the total budget as last approved by Department; and/or (3) fund transfers between budget categories for the purposes of meeting match requirements. This Agreement may be amended to provide for additional services if additional funding is made available by the Legislature.
- e. All days in this Agreement are calendar days unless otherwise specified.

3. Agreement Duration.

The term of the Agreement shall begin and end on the dates indicated in the Standard Grant Agreement, unless extended or terminated earlier in accordance with the applicable terms and conditions. The Grantee shall be eligible for reimbursement for work performed on or after the date of execution through the expiration date of this Agreement, unless otherwise specified in Attachment 2, Special Terms and Conditions. However, work performed prior to the execution of this Agreement may be reimbursable or used for match purposes if permitted by the Special Terms and Conditions.

4. Deliverables.

The Grantee agrees to render the services or other units of deliverables as set forth in Attachment 3, Grant Work Plan. The services or other units of deliverables shall be delivered in accordance with the schedule and at the pricing outlined in the Grant Work Plan. Deliverables may be comprised of activities that must be completed prior to Department making payment on that deliverable. The Grantee agrees to perform in accordance with the terms and conditions set forth in this Agreement and all attachments and exhibits incorporated by the Standard Grant Agreement.

5. Performance Measures.

The Grantee warrants that: (1) the services will be performed by qualified personnel; (2) the services will be of the kind and quality described in the Grant Work Plan; (3) the services will be performed in a professional and workmanlike manner in accordance with industry standards and practices; (4) the services shall not and do not infringe upon the intellectual property rights, or any other proprietary rights, of any third party; and (5) its employees, subcontractors, and/or subgrantees shall comply with any security and safety requirements and processes, if provided by Department, for work done at the Project Location(s). The Department reserves the right to investigate or inspect at any time to determine whether the services or qualifications offered by Grantee meet the Agreement requirements. Notwithstanding any provisions herein to the contrary, written acceptance of a particular deliverable does not foreclose Department's remedies in the event deficiencies in the deliverable cannot be readily measured at the time of delivery.

6. Acceptance of Deliverables.

- a. Acceptance Process. All deliverables must be received and accepted in writing by Department's Grant Manager before payment. The Grantee shall work diligently to correct all deficiencies in the deliverable that remain outstanding, within a reasonable time at Grantee's expense. If Department's Grant Manager does not accept the deliverables within 30 days of receipt, they will be deemed rejected.
- b. Rejection of Deliverables. The Department reserves the right to reject deliverables, as outlined in the Grant Work Plan, as incomplete, inadequate, or unacceptable due, in whole or in part, to Grantee's lack of satisfactory performance under the terms of this Agreement. The Grantee's efforts to correct the rejected deliverables will be at Grantee's sole expense. Failure to fulfill the applicable technical requirements or complete all tasks or activities in accordance with the Grant Work Plan will result in rejection of the deliverable and the associated invoice. Payment for the rejected deliverable will not be issued unless the rejected deliverable is made acceptable to Department in accordance with the Agreement requirements. The Department, at its option, may allow additional time within which Grantee may remedy the objections noted by Department. The Grantee's failure to make adequate or acceptable deliverables after a reasonable opportunity to do so shall constitute an event of default.

7. Financial Consequences for Nonperformance.

- a. Withholding Payment. In addition to the specific consequences explained in the Grant Work Plan and/or Special Terms and Conditions, the State of Florida (State) reserves the right to withhold payment when the Grantee has failed to perform/comply with provisions of this Agreement. None of the financial consequences for nonperformance in this Agreement as more fully described in the Grant Work Plan shall be considered penalties.
- b. Corrective Action Plan. If Grantee fails to correct all the deficiencies in a rejected deliverable within the specified timeframe, Department may, in its sole discretion, request that a proposed Corrective Action Plan (CAP) be submitted by Grantee to Department. The Department request that Grantee specify the outstanding deficiencies in the CAP. All CAPs must be able to be implemented and performed in no more than sixty (60) calendar days.
 - i. The Grantee shall submit a CAP within ten (10) days of the date of the written request from Department. The CAP shall be sent to Grant Manager for review and approval. Within ten (10) days of receipt of a CAP, Department shall notify Grantee in writing whether the CAP proposed has been accepted. If the CAP is not accepted, Grantee shall have ten (10) days from receipt of Department letter rejecting the proposal to submit a revised proposed CAP. Failure to obtain Department approval of a CAP as specified above may result in Department's termination of this Agreement for cause as authorized in this Agreement.
 - ii. Upon Department's notice of acceptance of a proposed CAP, Grantee shall have ten (10) days to commence implementation of the accepted plan. Acceptance of the proposed CAP by Department does not relieve Grantee of any of its obligations under the Agreement. In the event the CAP fails to correct or eliminate performance deficiencies by Grantee, Department shall retain the right to require additional or further remedial steps, or to terminate this Agreement for failure to perform. No actions approved by Department or steps taken by Grantee shall preclude Department from subsequently asserting any deficiencies in performance. The Grantee shall continue to implement the CAP until all deficiencies are corrected. Reports on the progress of the CAP will be made to Department as requested by Department's Grant Manager.
 - iii. Failure to respond to a Department request for a CAP or failure to correct a deficiency in the performance of the Agreement as specified by Department may result in termination of the Agreement.

8. Payment.

- a. **Payment Process.** Subject to the terms and conditions established by the Agreement, the pricing per deliverable established by the Grant Work Plan, and the billing procedures established by Department, Department agrees to pay Grantee for services rendered in accordance with Section 215.422, Florida Statutes (F.S.).
- b. **Taxes.** The Department is exempted from payment of State sales, use taxes and Federal excise taxes. The Grantee, however, shall not be exempted from paying any taxes that it is subject to, including State sales and use taxes, or for payment by Grantee to suppliers for taxes on materials used to fulfill its contractual obligations with Department. The Grantee shall not use Department's exemption number in securing such materials. The Grantee shall be responsible and liable for the payment of all its FICA/Social Security and other taxes resulting from this Agreement.
- c. **Maximum Amount of Agreement.** The maximum amount of compensation under this Agreement, without an amendment, is described in the Standard Grant Agreement. Any additional funds necessary for the completion of this Project are the responsibility of Grantee.
- d. **Reimbursement for Costs.** The Grantee shall be paid on a cost reimbursement basis for all eligible Project costs upon the completion, submittal, and approval of each deliverable identified in the Grant Work Plan. Reimbursement shall be requested on Exhibit C, Payment Request Summary Form. To be eligible for reimbursement, costs must be in compliance with laws, rules, and regulations applicable to expenditures of State funds, including, but not limited to, the Reference Guide for State Expenditures, which can be accessed at the following web address: www.myfloridacfo.com/aadir/reference_guide/.
- e. **Invoice Detail.** All charges for services rendered or for reimbursement of expenses authorized by Department pursuant to the Grant Work Plan shall be submitted to Department in sufficient detail for a proper pre-audit and post-audit to be performed. The Grantee shall only invoice Department for deliverables that are completed in accordance with the Grant Work Plan.
- f. **Interim Payments.** Interim payments may be made by Department, at its discretion, if the completion of deliverables to date have first been accepted in writing by Department's Grant Manager.
- g. **Final Payment Request.** A final payment request should be submitted to Department no later than sixty (60) days following the expiration date of the Agreement to ensure the availability of funds for payment. However, all work performed pursuant to the Grant Work Plan must be performed on or before the expiration date of the Agreement.
- h. **Annual Appropriation Contingency.** The State's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Legislature. This Agreement is not a commitment of future appropriations. Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of Department if the Legislature reduces or eliminates appropriations.
- i. **Interest Rates.** All interest rates charged under the Agreement shall be calculated on the prevailing rate used by the State Board of Administration. To obtain the applicable interest rate, please refer to: www.myfloridacfo.com/Division/AA/Vendors/default.htm.
- j. **Refund of Payments to the Department.** Any balance of unobligated funds that have been advanced or paid must be refunded to Department. Any funds paid in excess of the amount to which Grantee or subgrantee is entitled under the terms of the Agreement must be refunded to Department.

9. Documentation Required for Cost Reimbursement Grant Agreements and Match.

If Cost Reimbursement or Match is authorized in Attachment 2, Special Terms and Conditions, the following conditions apply. Supporting documentation must be provided to substantiate cost reimbursement or match requirements for the following budget categories:

- a. **Salary/Wages.** Grantee shall list personnel involved, position classification, direct salary rates, and hours spent on the Project in accordance with Attachment 3, Grant Work Plan in their documentation for reimbursement or match requirements.
- b. **Overhead/Indirect/General and Administrative Costs.** If Grantee is being reimbursed for or claiming match for multipliers, all multipliers used (i.e., fringe benefits, overhead, indirect, and/or general and administrative rates) shall be supported by audit. If Department determines that multipliers charged by Grantee exceeded the rates supported by audit, Grantee shall be required to reimburse such funds to Department within thirty (30) days of written notification. Interest shall be charged on the excessive rate.
- c. **Contractual Costs (Subcontractors).** Match or reimbursement requests for payments to subcontractors must be substantiated by copies of invoices with backup documentation identical to that required from Grantee. Subcontracts which involve payments for direct salaries shall clearly identify the personnel involved, salary rate per hour, and hours spent on the Project. All eligible multipliers used (i.e., fringe benefits, overhead, indirect,

and/or general and administrative rates) shall be supported by audit. If Department determines that multipliers charged by any subcontractor exceeded the rates supported by audit, Grantee shall be required to reimburse such funds to Department within thirty (30) days of written notification. Interest shall be charged on the excessive rate. Nonconsumable and/or nonexpendable personal property or equipment costing \$1,000 or more purchased for the Project under a subcontract is subject to the requirements set forth in Chapters 273 and/or 274, F.S., and Chapter 69I-72, Florida Administrative Code (F.A.C.) and/or Chapter 69I-73, F.A.C., as applicable. The Grantee shall be responsible for maintaining appropriate property records for any subcontracts that include the purchase of equipment as part of the delivery of services. The Grantee shall comply with this requirement and ensure its subcontracts issued under this Agreement, if any, impose this requirement, in writing, on its subcontractors.

- i. For fixed-price (vendor) subcontracts, the following provisions shall apply: The Grantee may award, on a competitive basis, fixed-price subcontracts to consultants/contractors in performing the work described in Attachment 3, Grant Work Plan. Invoices submitted to Department for fixed-price subcontracted activities shall be supported with a copy of the subcontractor's invoice and a copy of the tabulation form for the competitive procurement process (e.g., Invitation to Bid, Request for Proposals, or other similar competitive procurement document) resulting in the fixed-price subcontract. The Grantee may request approval from Department to award a fixed-price subcontract resulting from procurement methods other than those identified above. In this instance, Grantee shall request the advance written approval from Department's Grant Manager of the fixed price negotiated by Grantee. The letter of request shall be supported by a detailed budget and Scope of Services to be performed by the subcontractor. Upon receipt of Department Grant Manager's approval of the fixed-price amount, Grantee may proceed in finalizing the fixed-price subcontract.
 - ii. If the procurement is subject to the Consultant's Competitive Negotiation Act under section 287.055, F.S. or the Brooks Act, Grantee must provide documentation clearly evidencing it has complied with the statutory or federal requirements.
- d. Travel. All requests for match or reimbursement of travel expenses shall be in accordance with Section 112.061, F.S.
- e. Direct Purchase Equipment. For the purposes of this Agreement, Equipment is defined as capital outlay costing \$1,000 or more. Match or reimbursement for Grantee's direct purchase of equipment is subject to specific approval of Department, and does not include any equipment purchased under the delivery of services to be completed by a subcontractor. Include copies of invoices or receipts to document purchases, and a properly completed Exhibit B, Property Reporting Form.
- f. Rental/Lease of Equipment. Match or reimbursement requests for rental/lease of equipment must include copies of invoices or receipts to document charges.
- g. Miscellaneous/Other Expenses. If miscellaneous or other expenses, such as materials, supplies, non-excluded phone expenses, reproduction, or mailing, are reimbursable or available for match or reimbursement under the terms of this Agreement, the documentation supporting these expenses must be itemized and include copies of receipts or invoices. Additionally, independent of Grantee's contract obligations to its subcontractor, Department shall not reimburse any of the following types of charges: cell phone usage; attorney's fees or court costs; civil or administrative penalties; or handling fees, such as set percent overages associated with purchasing supplies or equipment.
- h. Land Acquisition. Reimbursement for the costs associated with acquiring interest and/or rights to real property (including access rights through ingress/egress easements, leases, license agreements, or other site access agreements; and/or obtaining record title ownership of real property through purchase) must be supported by the following, as applicable: Copies of Property Appraisals, Environmental Site Assessments, Surveys and Legal Descriptions, Boundary Maps, Acreage Certification, Title Search Reports, Title Insurance, Closing Statements/Documents, Deeds, Leases, Easements, License Agreements, or other legal instrument documenting acquired property interest and/or rights. If land acquisition costs are used to meet match requirements, Grantee agrees that those funds shall not be used as match for any other Agreement supported by State or Federal funds.
10. Status Reports.

The Grantee shall submit status reports quarterly, unless otherwise specified in the Attachments, on Exhibit A, Progress Report Form, to Department's Grant Manager describing the work performed during the reporting period, problems encountered, problem resolutions, scheduled updates, and proposed work for the next reporting period. Quarterly status reports are due no later than twenty (20) days following the completion of the quarterly reporting period. For the purposes of this reporting requirement, the quarterly reporting periods end on March 31, June 30, September 30 and December 31. The Department will review the required reports submitted by Grantee within thirty (30) days.

11. Retainage.

The following provisions apply if Department withholds retainage under this Agreement:

- a. The Department reserves the right to establish the amount and application of retainage on the work performed under this Agreement up to the maximum percentage described in Attachment 2, Special Terms and Conditions. Retainage may be withheld from each payment to Grantee pending satisfactory completion of work and approval of all deliverables.
- b. If Grantee fails to perform the requested work, or fails to perform the work in a satisfactory manner, Grantee shall forfeit its right to payment of the retainage associated with the work. Failure to perform includes, but is not limited to, failure to submit the required deliverables or failure to provide adequate documentation that the work was actually performed. The Department shall provide written notification to Grantee of the failure to perform that shall result in retainage forfeiture. If the Grantee does not to correct the failure to perform within the timeframe stated in Department's notice, the retainage will be forfeited to Department.
- c. No retainage shall be released or paid for incomplete work while this Agreement is suspended.
- d. Except as otherwise provided above, Grantee shall be paid the retainage associated with the work, provided Grantee has completed the work and submits an invoice for retainage held in accordance with the invoicing procedures under this Agreement.

12. Insurance.

- a. Insurance Requirements for Sub-Grantees and/or Subcontractors. The Grantee shall require its sub-grantees and/or subcontractors, if any, to maintain insurance coverage of such types and with such terms and limits as described in this Agreement. The Grantee shall require all its sub-grantees and/or subcontractors, if any, to make compliance with the insurance requirements of this Agreement a condition of all contracts that are related to this Agreement. Sub-grantees and/or subcontractors must provide proof of insurance upon request.
- b. Deductibles. The Department shall be exempt from, and in no way liable for, any sums of money representing a deductible in any insurance policy. The payment of such deductible shall be the sole responsibility of the Grantee providing such insurance.
- c. Proof of Insurance. Upon execution of this Agreement, Grantee shall provide Department documentation demonstrating the existence and amount for each type of applicable insurance coverage *prior to* performance of any work under this Agreement. Upon receipt of written request from Department, Grantee shall furnish Department with proof of applicable insurance coverage by standard form certificates of insurance, a self-insured authorization, or other certification of self-insurance.
- d. Duty to Maintain Coverage. In the event that any applicable coverage is cancelled by the insurer for any reason, or if Grantee cannot get adequate coverage, Grantee shall immediately notify Department of such cancellation and shall obtain adequate replacement coverage conforming to the requirements herein and provide proof of such replacement coverage within ten (10) days after the cancellation of coverage.

13. Termination.

- a. Termination for Convenience. When it is in the State's best interest, Department may, at its sole discretion, terminate the Agreement in whole or in part by giving 30 days' written notice to Grantee. The Department shall notify Grantee of the termination for convenience with instructions as to the effective date of termination or the specific stage of work at which the Agreement is to be terminated. The Department must submit all invoices for work to be paid under this Agreement within thirty (30) days of the effective date of termination. The Department shall not pay any invoices received after thirty (30) days of the effective date of termination.
- b. Termination for Cause. The Department may terminate this Agreement if any of the events of default described in the Events of Default provisions below occur or in the event that Grantee fails to fulfill any of its other obligations under this Agreement. If, after termination, it is determined that Grantee was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of Department. The rights and remedies of Department in this clause are in addition to any other rights and remedies provided by law or under this Agreement.
- c. Grantee Obligations upon Notice of Termination. After receipt of a notice of termination or partial termination unless as otherwise directed by Department, Grantee shall not furnish any service or deliverable on the date, and to the extent specified, in the notice. However, Grantee shall continue work on any portion of the Agreement not terminated. If the Agreement is terminated before performance is completed, Grantee shall be paid only for that work satisfactorily performed for which costs can be substantiated. The Grantee shall not be entitled to recover any cancellation charges or lost profits.
- d. Continuation of Prepaid Services. If Department has paid for any services prior to the expiration, cancellation, or termination of the Agreement, Grantee shall continue to provide Department with those services for which it

has already been paid or, at Department's discretion, Grantee shall provide a refund for services that have been paid for but not rendered.

- e. Transition of Services Upon Termination, Expiration, or Cancellation of the Agreement. If services provided under the Agreement are being transitioned to another provider(s), Grantee shall assist in the smooth transition of Agreement services to the subsequent provider(s). This requirement is at a minimum an affirmative obligation to cooperate with the new provider(s), however additional requirements may be outlined in the Grant Work Plan. The Grantee shall not perform any services after Agreement expiration or termination, except as necessary to complete the transition or continued portion of the Agreement, if any.

14. Notice of Default.

If Grantee defaults in the performance of any covenant or obligation contained in the Agreement, including, any of the events of default, Department shall provide notice to Grantee and an opportunity to cure that is reasonable under the circumstances. This notice shall state the nature of the failure to perform and provide a time certain for correcting the failure. The notice will also provide that, should the Grantee fail to perform within the time provided, Grantee will be found in default, and Department may terminate the Agreement effective as of the date of receipt of the default notice.

15. Events of Default.

Provided such failure is not the fault of Department or outside the reasonable control of Grantee, the following non-exclusive list of events, acts, or omissions, shall constitute events of default:

- a. The commitment of any material breach of this Agreement by Grantee, including failure to timely deliver a material deliverable, failure to perform the minimal level of services required for a deliverable, discontinuance of the performance of the work, failure to resume work that has been discontinued within a reasonable time after notice to do so, or abandonment of the Agreement;
- b. The commitment of any material misrepresentation or omission in any materials, or discovery by the Department of such, made by the Grantee in this Agreement or in its application for funding;
- c. Failure to submit any of the reports required by this Agreement or having submitted any report with incorrect, incomplete, or insufficient information;
- d. Failure to honor any term of the Agreement;
- e. Failure to abide by any statutory, regulatory, or licensing requirement, including an entry of an order revoking the certificate of authority granted to the Grantee by a state or other licensing authority;
- f. Failure to pay any and all entities, individuals, and furnishing labor or materials, or failure to make payment to any other entities as required by this Agreement;
- g. Employment of an unauthorized alien in the performance of the work, in violation of Section 274 (A) of the Immigration and Nationality Act;
- h. Failure to maintain the insurance required by this Agreement;
- i. One or more of the following circumstances, uncorrected for more than thirty (30) days unless, within the specified 30-day period, Grantee (including its receiver or trustee in bankruptcy) provides to Department adequate assurances, reasonably acceptable to Department, of its continuing ability and willingness to fulfill its obligations under the Agreement:
 - i. Entry of an order for relief under Title 11 of the United States Code;
 - ii. The making by Grantee of a general assignment for the benefit of creditors;
 - iii. The appointment of a general receiver or trustee in bankruptcy of Grantee's business or property; and/or
 - iv. An action by Grantee under any state insolvency or similar law for the purpose of its bankruptcy, reorganization, or liquidation.

16. Suspension of Work.

The Department may, in its sole discretion, suspend any or all activities under the Agreement, at any time, when it is in the best interest of the State to do so. The Department shall provide Grantee written notice outlining the particulars of suspension. Examples of reasons for suspension include, but are not limited to, budgetary constraints, declaration of emergency, or other such circumstances. After receiving a suspension notice, Grantee shall comply with the notice. Within 90 days, or any longer period agreed to by the parties, Department shall either: (1) issue a notice authorizing resumption of work, at which time activity shall resume; or (2) terminate the Agreement. If the Agreement is terminated after 30 days of suspension, the notice of suspension shall be deemed to satisfy the thirty (30) days' notice required for a notice of termination for convenience. Suspension of work shall not entitle Grantee to any additional compensation.

17. Force Majeure.

The Grantee shall not be responsible for delay resulting from its failure to perform if neither the fault nor the negligence of Grantee or its employees or agents contributed to the delay and the delay is due directly to acts of God, wars, acts of public enemies, strikes, fires, floods, or other similar cause wholly beyond Grantee's control, or for any of the foregoing that affect subcontractors or suppliers if no alternate source of supply is available to Grantee. In case of any delay Grantee believes is excusable, Grantee shall notify Department in writing of the delay or potential delay and describe the cause of the delay either (1) within ten days after the cause that creates or will create the delay first arose, if Grantee could reasonably foresee that a delay could occur as a result; or (2) if delay is not reasonably foreseeable, within five days after the date Grantee first had reason to believe that a delay could result. **THE FOREGOING SHALL CONSTITUTE THE GRANTEE'S SOLE REMEDY OR EXCUSE WITH RESPECT TO DELAY.** Providing notice in strict accordance with this paragraph is a condition precedent to such remedy. No claim for damages, other than for an extension of time, shall be asserted against Department. The Grantee shall not be entitled to an increase in the Agreement price or payment of any kind from Department for direct, indirect, consequential, impact or other costs, expenses or damages, including but not limited to costs of acceleration or inefficiency, arising because of delay, disruption, interference, or hindrance from any cause whatsoever. If performance is suspended or delayed, in whole or in part, due to any of the causes described in this paragraph, after the causes have ceased to exist Grantee shall perform at no increased cost, unless Department determines, in its sole discretion, that the delay will significantly impair the value of the Agreement to Department, in which case Department may: (1) accept allocated performance or deliveries from Grantee, provided that Grantee grants preferential treatment to Department with respect to products subjected to allocation; (2) contract with other sources (without recourse to and by Grantee for the related costs and expenses) to replace all or part of the products or services that are the subject of the delay, which purchases may be deducted from the Agreement quantity; or (3) terminate Agreement in whole or in part.

18. Indemnification.

- a. The Grantee shall be fully liable for the actions of its agents, employees, partners, or subcontractors and shall fully indemnify, defend, and hold harmless Department and its officers, agents, and employees, from suits, actions, damages, and costs of every name and description arising from or relating to:
 - i. personal injury and damage to real or personal tangible property alleged to be caused in whole or in part by Grantee, its agents, employees, partners, or subcontractors; provided, however, that Grantee shall not indemnify for that portion of any loss or damages proximately caused by the negligent act or omission of Department;
 - ii. the Grantee's breach of this Agreement or the negligent acts or omissions of Grantee.
- b. The Grantee's obligations under the preceding paragraph with respect to any legal action are contingent upon Department giving Grantee: (1) written notice of any action or threatened action; (2) the opportunity to take over and settle or defend any such action at Grantee's sole expense; and (3) assistance in defending the action at Grantee's sole expense. The Grantee shall not be liable for any cost, expense, or compromise incurred or made by Department in any legal action without Grantee's prior written consent, which shall not be unreasonably withheld.
- c. Notwithstanding sections a. and b. above, the following is the sole indemnification provision that applies to Grantees that are governmental entities: Each party hereto agrees that it shall be solely responsible for the negligent or wrongful acts of its employees and agents. However, nothing contained herein shall constitute a waiver by either party of its sovereign immunity or the provisions of Section 768.28, F.S. Further, nothing herein shall be construed as consent by a state agency or subdivision of the State to be sued by third parties in any matter arising out of any contract or this Agreement.
- d. No provision in this Agreement shall require Department to hold harmless or indemnify Grantee, insure or assume liability for Grantee's negligence, waive Department's sovereign immunity under the laws of Florida, or otherwise impose liability on Department for which it would not otherwise be responsible. Any provision, implication or suggestion to the contrary is null and void.

19. Limitation of Liability.

The Department's liability for any claim arising from this Agreement is limited to compensatory damages in an amount no greater than the sum of the unpaid balance of compensation due for goods or services rendered pursuant to and in compliance with the terms of the Agreement. Such liability is further limited to a cap of \$100,000.

20. Remedies.

Nothing in this Agreement shall be construed to make Grantee liable for force majeure events. Nothing in this Agreement, including financial consequences for nonperformance, shall limit Department's right to pursue its remedies for other types of damages under the Agreement, at law or in equity. The Department may, in addition to

other remedies available to it, at law or in equity and upon notice to Grantee, retain such monies from amounts due Grantee as may be necessary to satisfy any claim for damages, penalties, costs and the like asserted by or against it.

21. Waiver.

The delay or failure by Department to exercise or enforce any of its rights under this Agreement shall not constitute or be deemed a waiver of Department's right thereafter to enforce those rights, nor shall any single or partial exercise of any such right preclude any other or further exercise thereof or the exercise of any other right.

22. Statutory Notices Relating to Unauthorized Employment and Subcontracts.

- a. The Department shall consider the employment by any Grantee of unauthorized aliens a violation of Section 274A(e) of the Immigration and Nationality Act. If Grantee/subcontractor knowingly employs unauthorized aliens, such violation shall be cause for unilateral cancellation of this Agreement. The Grantee shall be responsible for including this provision in all subcontracts with private organizations issued as a result of this Agreement.
- b. Pursuant to Sections 287.133 and 287.134, F.S., the following restrictions apply to persons placed on the convicted vendor list or the discriminatory vendor list:
 - i. **Public Entity Crime.** A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a Grantee, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, F.S., for CATEGORY TWO for a period of 36 months following the date of being placed on the convicted vendor list.
 - ii. **Discriminatory Vendors.** An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity.
 - iii. **Notification.** The Grantee shall notify Department if it or any of its suppliers, subcontractors, or consultants have been placed on the convicted vendor list or the discriminatory vendor list during the life of the Agreement. The Florida Department of Management Services is responsible for maintaining the discriminatory vendor list and posts the list on its website. Questions regarding the discriminatory vendor list may be directed to the Florida Department of Management Services, Office of Supplier Diversity, at (850) 487-0915.

23. Compliance with Federal, State and Local Laws.

- a. The Grantee and all its agents shall comply with all federal, state and local regulations, including, but not limited to, nondiscrimination, wages, social security, workers' compensation, licenses, and registration requirements. The Grantee shall include this provision in all subcontracts issued as a result of this Agreement.
- b. No person, on the grounds of race, creed, color, religion, national origin, age, gender, or disability, shall be excluded from participation in; be denied the proceeds or benefits of; or be otherwise subjected to discrimination in performance of this Agreement.
- c. This Agreement shall be governed by and construed in accordance with the laws of the State of Florida.
- d. Any dispute concerning performance of the Agreement shall be processed as described herein. Jurisdiction for any damages arising under the terms of the Agreement will be in the courts of the State, and venue will be in the Second Judicial Circuit, in and for Leon County. Except as otherwise provided by law, the parties agree to be responsible for their own attorney fees incurred in connection with disputes arising under the terms of this Agreement.

24. Scrutinized Companies.

- a. Grantee certifies that it is not on the Scrutinized Companies that Boycott Israel List or engaged in a boycott of Israel. Pursuant to Section 287.135, F.S., the Department may immediately terminate this Agreement at its sole option if the Grantee is found to have submitted a false certification; or if the Grantee is placed on the Scrutinized Companies that Boycott Israel List or is engaged in the boycott of Israel during the term of the Agreement.
- b. If this Agreement is for more than one million dollars, the Grantee certifies that it is also not on the Scrutinized Companies with Activities in Sudan, Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or engaged with business operations in Cuba or Syria as identified in Section 287.135, F.S. Pursuant to

Section 287.135, F.S., the Department may immediately terminate this Agreement at its sole option if the Grantee is found to have submitted a false certification; or if the Grantee is placed on the Scrutinized Companies with Activities in Sudan List, or Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or engaged with business operations in Cuba or Syria during the term of the Agreement.

- c. As provided in Subsection 287.135(8), F.S., if federal law ceases to authorize these contracting prohibitions then they shall become inoperative.

25. Lobbying and Integrity.

The Grantee agrees that no funds received by it under this Agreement will be expended for the purpose of lobbying the Legislature or a State agency pursuant to Section 216.347, F.S., except that pursuant to the requirements of Section 287.058(6), F.S., during the term of any executed agreement between Grantee and the State, Grantee may lobby the executive or legislative branch concerning the scope of services, performance, term, or compensation regarding that agreement. The Grantee shall comply with Sections 11.062 and 216.347, F.S.

26. Record Keeping.

The Grantee shall maintain books, records and documents directly pertinent to performance under this Agreement in accordance with United States generally accepted accounting principles (US GAAP) consistently applied. The Department, the State, or their authorized representatives shall have access to such records for audit purposes during the term of this Agreement and for five (5) years following the completion date or termination of the Agreement. In the event that any work is subcontracted, Grantee shall similarly require each subcontractor to maintain and allow access to such records for audit purposes. Upon request of Department's Inspector General, or other authorized State official, Grantee shall provide any type of information the Inspector General deems relevant to Grantee's integrity or responsibility. Such information may include, but shall not be limited to, Grantee's business or financial records, documents, or files of any type or form that refer to or relate to Agreement. The Grantee shall retain such records for the longer of: (1) three years after the expiration of the Agreement; or (2) the period required by the General Records Schedules maintained by the Florida Department of State (available at: <http://dos.myflorida.com/library-archives/records-management/general-records-schedules/>).

27. Audits.

- a. Inspector General. The Grantee understands its duty, pursuant to Section 20.055(5), F.S., to cooperate with the inspector general in any investigation, audit, inspection, review, or hearing. The Grantee will comply with this duty and ensure that its sub-grantees and/or subcontractors issued under this Agreement, if any, impose this requirement, in writing, on its sub-grantees and/or subcontractors, respectively.
- b. Physical Access and Inspection. Department personnel shall be given access to and may observe and inspect work being performed under this Agreement, with reasonable notice and during normal business hours, including by any of the following methods:
 - i. Grantee shall provide access to any location or facility on which Grantee is performing work, or storing or staging equipment, materials or documents;
 - ii. Grantee shall permit inspection of any facility, equipment, practices, or operations required in performance of any work pursuant to this Agreement; and,
 - iii. Grantee shall allow and facilitate sampling and monitoring of any substances, soils, materials or parameters at any location reasonable or necessary to assure compliance with any work or legal requirements pursuant to this Agreement.
- c. Special Audit Requirements. The Grantee shall comply with the applicable provisions contained in Attachment 5, Special Audit Requirements. Each amendment that authorizes a funding increase or decrease shall include an updated copy of Exhibit 1, to Attachment 5. If Department fails to provide an updated copy of Exhibit 1 to include in each amendment that authorizes a funding increase or decrease, Grantee shall request one from the Department's Grants Manager. The Grantee shall consider the type of financial assistance (federal and/or state) identified in Attachment 5, Exhibit 1 and determine whether the terms of Federal and/or Florida Single Audit Act Requirements may further apply to lower tier transactions that may be a result of this Agreement. For federal financial assistance, Grantee shall utilize the guidance provided under 2 CFR §200.330 for determining whether the relationship represents that of a subrecipient or vendor. For State financial assistance, Grantee shall utilize the form entitled "Checklist for Nonstate Organizations Recipient/Subrecipient vs Vendor Determination" (form number DFS-A2-NS) that can be found under the "Links/Forms" section appearing at the following website: <https://apps.fldfs.com/ksaa>.
- d. Proof of Transactions. In addition to documentation provided to support cost reimbursement as described herein, Department may periodically request additional proof of a transaction to evaluate the appropriateness of costs to the Agreement pursuant to State and Federal guidelines (including cost allocation guidelines). Allowable costs and uniform administrative requirements for federal programs can be found under 2 CFR 200. The Department

may also request a cost allocation plan in support of its multipliers (overhead, indirect, general administrative costs, and fringe benefits). The Grantee must provide the additional proof within thirty (30) days of such request.

- e. **No Commingling of Funds.** The accounting systems for all Grantees must ensure that these funds are not commingled with funds from other agencies. Funds from each agency must be accounted for separately. Grantees are prohibited from commingling funds on either a program-by-program or a project-by-project basis. Funds specifically budgeted and/or received for one project may not be used to support another project. Where a Grantee's, or subrecipient's, accounting system cannot comply with this requirement, Grantee, or subrecipient, shall establish a system to provide adequate fund accountability for each project it has been awarded.
- i. If Department finds that these funds have been commingled, Department shall have the right to demand a refund, either in whole or in part, of the funds provided to Grantee under this Agreement for non-compliance with the material terms of this Agreement. The Grantee, upon such written notification from Department shall refund, and shall forthwith pay to Department, the amount of money demanded by Department. Interest on any refund shall be calculated based on the prevailing rate used by the State Board of Administration. Interest shall be calculated from the date(s) the original payment(s) are received from Department by Grantee to the date repayment is made by Grantee to Department.
 - ii. In the event that the Grantee recovers costs, incurred under this Agreement and reimbursed by Department, from another source(s), Grantee shall reimburse Department for all recovered funds originally provided under this Agreement and interest shall be charged for those recovered costs as calculated on from the date(s) the payment(s) are recovered by Grantee to the date repayment is made to Department.
 - iii. Notwithstanding the requirements of this section, the above restrictions on commingling funds do not apply to agreements where payments are made purely on a cost reimbursement basis.

28. Conflict of Interest.

The Grantee covenants that it presently has no interest and shall not acquire any interest which would conflict in any manner or degree with the performance of services required.

29. Independent Contractor.

The Grantee is an independent contractor and is not an employee or agent of Department.

30. Subcontracting.

- a. Unless otherwise specified in the Special Terms and Conditions, all services contracted for are to be performed solely by Grantee.
- b. The Department may, for cause, require the replacement of any Grantee employee, subcontractor, or agent. For cause, includes, but is not limited to, technical or training qualifications, quality of work, change in security status, or non-compliance with an applicable Department policy or other requirement.
- c. The Department may, for cause, deny access to Department's secure information or any facility by any Grantee employee, subcontractor, or agent.
- d. The Department's actions under paragraphs b. or c. shall not relieve Grantee of its obligation to perform all work in compliance with the Agreement. The Grantee shall be responsible for the payment of all monies due under any subcontract. The Department shall not be liable to any subcontractor for any expenses or liabilities incurred under any subcontract and Grantee shall be solely liable to the subcontractor for all expenses and liabilities incurred under any subcontract.
- e. The Department will not deny Grantee's employees, subcontractors, or agents access to meetings within the Department's facilities, unless the basis of Department's denial is safety or security considerations.
- f. The Department supports diversity in its procurement program and requests that all subcontracting opportunities afforded by this Agreement embrace diversity enthusiastically. The award of subcontracts should reflect the full diversity of the citizens of the State. A list of minority-owned firms that could be offered subcontracting opportunities may be obtained by contacting the Office of Supplier Diversity at (850) 487-0915.
- g. The Grantee shall not be liable for any excess costs for a failure to perform, if the failure to perform is caused by the default of a subcontractor at any tier, and if the cause of the default is completely beyond the control of both Grantee and the subcontractor(s), and without the fault or negligence of either, unless the subcontracted products or services were obtainable from other sources in sufficient time for Grantee to meet the required delivery schedule.

31. Guarantee of Parent Company.

If Grantee is a subsidiary of another corporation or other business entity, Grantee asserts that its parent company will guarantee all of the obligations of Grantee for purposes of fulfilling the obligations of Agreement. In the event Grantee

is sold during the period the Agreement is in effect, Grantee agrees that it will be a requirement of sale that the new parent company guarantee all of the obligations of Grantee.

32. Survival.

The respective obligations of the parties, which by their nature would continue beyond the termination or expiration of this Agreement, including without limitation, the obligations regarding confidentiality, proprietary interests, and public records, shall survive termination, cancellation, or expiration of this Agreement.

33. Third Parties.

The Department shall not be deemed to assume any liability for the acts, failures to act or negligence of Grantee, its agents, servants, and employees, nor shall Grantee disclaim its own negligence to Department or any third party. This Agreement does not and is not intended to confer any rights or remedies upon any person other than the parties. If Department consents to a subcontract, Grantee will specifically disclose that this Agreement does not create any third-party rights. Further, no third parties shall rely upon any of the rights and obligations created under this Agreement.

34. Severability.

If a court of competent jurisdiction deems any term or condition herein void or unenforceable, the other provisions are severable to that void provision, and shall remain in full force and effect.

35. Grantee's Employees, Subcontractors and Agents.

All Grantee employees, subcontractors, or agents performing work under the Agreement shall be properly trained technicians who meet or exceed any specified training qualifications. Upon request, Grantee shall furnish a copy of technical certification or other proof of qualification. All employees, subcontractors, or agents performing work under Agreement must comply with all security and administrative requirements of Department and shall comply with all controlling laws and regulations relevant to the services they are providing under the Agreement.

36. Assignment.

The Grantee shall not sell, assign, or transfer any of its rights, duties, or obligations under the Agreement, or under any purchase order issued pursuant to the Agreement, without the prior written consent of Department. In the event of any assignment, Grantee remains secondarily liable for performance of the Agreement, unless Department expressly waives such secondary liability. The Department may assign the Agreement with prior written notice to Grantee of its intent to do so.

37. Execution in Counterparts and Authority to Sign.

This Agreement, any amendments, and/or change orders related to the Agreement, may be executed in counterparts, each of which shall be an original and all of which shall constitute the same instrument. In accordance with the Electronic Signature Act of 1996, electronic signatures, including facsimile transmissions, may be used and shall have the same force and effect as a written signature. Each person signing this Agreement warrants that he or she is duly authorized to do so and to bind the respective party to the Agreement.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Special Terms and Conditions
AGREEMENT NO. LW695

ATTACHMENT 2

These Special Terms and Conditions shall be read together with general terms outlined in the Standard Terms and Conditions, Attachment 1. Where in conflict, these more specific terms shall apply.

1. Scope of Work.

The Project funded under this Agreement is Hallstrom Farmstead Conservation Area Improvements. The Project is defined in more detail in Attachment 3, Grant Work Plan.

2. Duration.

- a. Reimbursement Period. The reimbursement period for this Agreement begins on or after September 24, 2018, through May 31, 2022, which shall be defined as the Project Completion Date. All work, eligible for reimbursement under this Agreement, must be completed by the Project Completion Date.
- b. Extensions. There are extensions available for this Project.
- c. Service Periods. Additional service periods are not authorized under this Agreement.

3. Payment Provisions.

- a. Compensation. This is a cost reimbursement Agreement. The Grantee shall be compensated under this Agreement as described in Attachment 3.
- b. Invoicing. Invoicing will occur after approval of the final deliverable(s).
- c. Advance Pay. Advance Pay is not authorized under this Agreement.

4. Cost Eligible for Reimbursement or Matching Requirements.

Reimbursement for costs or availability for costs to meet matching requirements shall be limited to the following budget categories, as defined in the Reference Guide for State Expenditures, as indicated:

<u>Reimbursement</u>	<u>Match</u>	<u>Category</u>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Salaries/Wages
		Overhead/Indirect/General and Administrative Costs:
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	a. Fringe Benefits, N/A.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	b. Indirect Costs, N/A.
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Contractual (Subcontractors)
<input type="checkbox"/>	<input type="checkbox"/>	Travel
<input type="checkbox"/>	<input type="checkbox"/>	Equipment
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Rental/Lease of Equipment
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Miscellaneous/Other Expenses
<input type="checkbox"/>	<input type="checkbox"/>	Land Acquisition

5. Travel.

Additional compensation for travel is not authorized under this Agreement.

6. Equipment Purchase.

No Equipment purchases shall be funded under this Agreement.

7. Land Acquisition.

There will be no Land Acquisitions funded under this Agreement.

8. Match Requirements

This Agreement requires at least a fifty percent (50%) non-federal match from the Grantee towards the work funded under this Agreement. Therefore, the Grantee is responsible for providing \$148,500.00 towards the Project funded

under this Agreement. It is understood that any additional funds necessary for the completion of this project are the responsibility of the Grantee.

All required matching funds shall meet the federal requirements established in 2 CFR § 200.306 and other federal statutory requirements, as applicable. Grantee acknowledges and agrees to provide eligible match types as set forth in the LWCF Federal Financial Assistance Manual <https://www.nps.gov/subjects/lwcf/lwcf-manual.htm>. Grantee acknowledges and agrees not to provide ineligible match sources, including real property acquired or funds obtained from any of the following sources:

- a. Florida Recreation Development Assistance Program (FRDAP), Recreation Trails Program (RTP), and LWCF;
- b. Donated value of real property acquired prior to Department approval or through Land and Water Conservation Fund; and
- c. Other state or federal grant or land acquisition programs such as: legislative special interest projects, Save Our Coast Program, Preservation 2000, Florida Forever, Conservation and Recreation Lands Program, Save Our Rivers Program, and Land Acquisition Trust Fund.

Real property donated as all, or part of the Grantee's required match must be appraised prior to commencement of the Project. Pursuant to subsection 62D-5.071(9), F.A.C., the Grantee shall submit appraisal(s), obtained at its own expense and prepared in accordance with the Uniform Appraisal Standards for Federal Land Acquisitions ("UASFLA"). The appraisal must establish the fair market value of the Project site. Property appraised at \$500,000 or less requires one (1) appraisal. Property exceeding \$500,000 in appraised value requires a second appraisal. The appraisal(s) shall be dated no earlier than six (6) months prior to the closing date of the LWCF application submission period. The appraisal must be prepared by an appraiser on the list of approved appraisers maintained by the Department's Division of State Lands under the provisions of Sections 253.025(6)(b), 259.041(7)(c), F.S., and Rule 18-1.007, F.A.C. Property value is based on the purchase price or appraised value, whichever is lower; if two (2) appraisals are required, the property value is lowest of the two appraisals or the purchase price. Appraisal costs shall not be reimbursed under the terms and conditions of this Agreement. If the negotiated purchase price or approved appraised value is greater than the annual appropriation by USDOJ, NPS and the Florida Legislature, the Grantee must pay the additional cost.

9. Insurance Requirements

Required Coverage. At all times during the Agreement the Grantee, at its sole expense, shall maintain insurance coverage of such types and with such terms and limits described below. The limits of coverage under each policy maintained by the Grantee shall not be interpreted as limiting the Grantee's liability and obligations under the Agreement. All insurance policies shall be through insurers licensed and authorized to issue policies in Florida, or alternatively, Grantee may provide coverage through a self-insurance program established and operating under the laws of Florida. Additional insurance requirements for this Agreement may be required elsewhere in this Agreement, however the minimum insurance requirements applicable to this Agreement are:

- a. **Commercial General Liability Insurance.**
The Grantee shall provide adequate commercial general liability insurance coverage and hold such liability insurance at all times during the Agreement. The Department, its employees, and officers shall be named as an additional insured on any general liability policies. The minimum limits shall be \$250,000 for each occurrence and \$500,000 policy aggregate.
- b. **Commercial Automobile Insurance.**
If the Grantee's duties include the use of a commercial vehicle, the Grantee shall maintain automobile liability, bodily injury, and property damage coverage. Insuring clauses for both bodily injury and property damage shall provide coverage on an occurrence basis. The Department, its employees, and officers shall be named as an additional insured on any automobile insurance policy. The minimum limits shall be as follows:

\$200,000/300,000	Automobile Liability for Company-Owned Vehicles, if applicable
\$200,000/300,000	Hired and Non-owned Automobile Liability Coverage
- c. **Workers' Compensation and Employer's Liability Coverage.**
The Grantee shall provide workers' compensation, in accordance with Chapter 440, F.S., and employer's liability insurance with minimum limits of \$100,000 per accident, \$100,000 per person, and \$500,000 policy aggregate. Such policies shall cover all employees engaged in any work under the Agreement.
- d. **Other Insurance.** None.

10. Quality Assurance Requirements.

There are no special Quality Assurance requirements under this Agreement.

11. Retainage.

Retainage is permitted under this Agreement. Retainage may be up to a maximum of ten percent (10%) of the total amount of the Agreement.

12. Subcontracting.

The Grantee may subcontract work under this Agreement without the prior written consent of the Department's Grant Manager except for certain fixed-price subcontracts pursuant to this Agreement, which require prior approval. The Grantee shall submit a copy of the executed subcontract to the Department prior to submitting any invoices for subcontracted work. Regardless of any subcontract, the Grantee is ultimately responsible for all work to be performed under this Agreement.

13. State-owned Land.

The work will not be performed on State-owned land.

14. Office of Policy and Budget Reporting.

There are no special Office of Policy and Budget reporting requirements for this Agreement.

15. Additional Terms.

None.

ATTACHMENT 3
GRANT WORK PLAN
LAND AND WATER CONSERVATION FUND PROGRAM (LWCF)
 Project Name: Hallstrom Farmstead Conservation Area Improvements
 Grantee Name: Indian River County
 LWCF Project # LW695

SUMMARY: The Grantee shall complete the Project Element(s), which were approved by the Department through the LWCF Application Evaluation Criteria, pursuant to Chapter 62D-5, Florida Administrative Code (F.A.C.). Any alteration(s) to the Project Element(s) as identified in the Grant Work Plan resulting in a change in the total point score of Grantee's Application as it appears on the Recommended Application Priority List for FY17/18 is considered a significant change and must be pre-approved by the Department and requires a formal Amendment to this Agreement. All work must be completed in accordance with the LWCF Program, and local, state and federal laws, the approved Project plans, all required permits, and the Florida Building Code. Prior to the Department issuing a "Notice to Commence" to the Grantee, as specified in Attachment 6 of the Agreement, Program Specific Requirements, the Department must receive evidence of and have approved all Deliverables in Task 1.

For the purpose of this Agreement, the terms "Project Element" and "Project Task" are used interchangeably to mean an identified facility within the Project.

The Project is located at 1601 Old Dixie Highway SW, Vero Beach, FL 32962 and is considered a "Development Project" pursuant to subsection 62D-5.070(5)(b), F.A.C.

Project Completion: The Project Completion Date for this Agreement is May 31, 2022.

Budget: Reimbursement for allowable costs for the Project shall not exceed the maximum Grant Award Amount outlined below. Required match for development projects will be provided by cash, in-kind services, or donated real property, as set forth in subparagraph 62D-5.070(6)(b)1., F.A.C. Required match for acquisition projects will be provided by cash or real property donated, as set forth in subparagraph 62D-5.070(6)(b)2., F.A.C. The total estimated Project cost provided below is based on the approved LWCF Application. A detailed cost analysis will be provided in the Deliverables for Task 1, prior to the Department issuing the "Notice to Commence." All final Project Costs shall be submitted to the Department with the payment request.

Maximum Grant Award Amount:	\$148,500.00
Required Grantee Match Amount:	\$148,500.00
Total Estimated Project Cost:	\$297,000.00
Match Ratio:	50%

Scope of Work/Tasks	Deliverables	Due Date	Financial Consequences
TASK 1 1.A. Development of Commencement Documentation Checklist (DRP-122) ¹ . 1.B. A Cost Analysis Form, with detailed budget (and In-House Cost Schedule(s), if applicable).	DELIVERABLE 1 The Department will issue "Notice to Commence" upon receipt and approval of: 1.A. All applicable Project specific Commencement documentation listed on Commencement Documentation Checklist (DRP-122) 1.B. A Cost Analysis Form, with detailed budget (and In-House Cost Schedule(s), if applicable). Project planning expenses, such as application preparation, architectural and engineering fees, permitting fees, Project	180 calendar days after Execution of Agreement ²	The Department shall terminate the Project Agreement if the required Deliverables are not submitted and approved by the Department.

	inspection, and other similar fees are eligible for reimbursement. However, reimbursement, if requested, shall not exceed fifteen (15%) of total Project cost, and shall be invoiced upon Project completion, in accordance with the Payment Request Schedule. The Grantee may not proceed with development of the Project until Notice to Commence has been issued.		
TASK 2 2.A. Development of Primary and Support Project Elements, which includes: Install a 30' x 30' pavilion with concrete floor (includes survey, earthwork and construction), a 24' x 24' pavilion/outdoor classroom with stabilized pervious base floor (includes survey, earthwork and construction); Survey and construct a boardwalk; Create a .3 mile ADA accessible loop trail and a 1.1 mile nature trail; Construct a parking area. 2.B. Development of Completion of Documentation Checklist (DRP-125). 2.C. Completion of Final Status Report (DRP-109).	DELIVERABLE 2 The Grantee may request reimbursement upon Department receipt and approval of: 2.A. Development of required Project Elements. 2.B. All applicable Project specific Completion documentation listed on Completion Documentation Checklist (DRP-125) 2.C. Final Status Report (DRP-109). The Grantee may request reimbursement for allowable budgeted expenses and costs pursuant to the Agreement that are directly related to the successful development of the Project site. Reimbursement shall not exceed the Grant Award Amount, less any reimbursement requested for in Deliverable 1, and shall be invoiced upon Project completion, in accordance with the Payment Request Schedule below. Ten percent (10%) of the Grant Award will be retained until the Project is designated complete by the Department.	Due May 31, 2022, which shall also be the Project Completion Date ³	No reimbursement will be made for Deliverable(s) deemed unsatisfactory by the Department. Payment(s) will not be made for unsatisfactory or incomplete work. In addition, a Task may be terminated for Grantee's failure to perform.

Project Task Performance Standard: The Department's Grant Manager will review the Project Completion Certificate and the Deliverables to verify compliance with the requirements for funding under LWCF; approved plans and application approved for funding. Upon review and written acceptance by the Department's Grant Manager of the Project Completion Certificate and the Deliverables under each Project Task, the Grantee may proceed with the payment request submittal.

Payment Request Schedule: Following Department approval of all Deliverables, the Grantee may submit a single payment request on Exhibit C, Payment Request Summary Form, DRP-115, along with all required documentation as outlined in the Financial Reporting Procedures (DRP-110), as applicable, to support payment. A payment request submitted as part of the reimbursement process must correspond with the Cost Analysis and supporting documents provided under Project Tasks.

Endnotes:

1. LWCF documentation is available at <https://floridadep.gov/lands/land-and-recreation-grants/content/land-and-water-conservation-fund-program> and/or from the Land and Recreational Grants Section, State of Florida Department of Environmental Protection, 3900 Commonwealth Boulevard, MS# 585, Tallahassee, Florida, 32399-3000.
2. Project Agreement is subject to termination if Commencement documentations under Task 1 are not received and approved by the Department within 180 calendar days of the Project Agreement execution.
3. Due Date will not be extended beyond the Grant Period as outlined in Rule 62D-5.073, F.A.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Public Records Requirements

Attachment 4

1. Public Records.

- a. If the Agreement exceeds \$35,000.00, and if Grantee is acting on behalf of Department in its performance of services under the Agreement, Grantee must allow public access to all documents, papers, letters, or other material, regardless of the physical form, characteristics, or means of transmission, made or received by Grantee in conjunction with the Agreement (Public Records), unless the Public Records are exempt from section 24(a) of Article I of the Florida Constitution or section 119.07(1), F.S.
- b. The Department may unilaterally terminate the Agreement if Grantee refuses to allow public access to Public Records as required by law.

2. Additional Public Records Duties of Section 119.0701, F.S., If Applicable.

For the purposes of this paragraph, the term "contract" means the "Agreement." If Grantee is a "contractor" as defined in section 119.0701(1)(a), F.S., the following provisions apply and the contractor shall:

- a. Keep and maintain Public Records required by Department to perform the service.
- b. Upon request, provide Department with a copy of requested Public Records or allow the Public Records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, F.S., or as otherwise provided by law.
- c. A contractor who fails to provide the Public Records to Department within a reasonable time may be subject to penalties under section 119.10, F.S.
- d. Ensure that Public Records that are exempt or confidential and exempt from Public Records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the contractor does not transfer the Public Records to Department.
- e. Upon completion of the contract, transfer, at no cost, to Department all Public Records in possession of the contractor or keep and maintain Public Records required by Department to perform the service. If the contractor transfers all Public Records to Department upon completion of the contract, the contractor shall destroy any duplicate Public Records that are exempt or confidential and exempt from Public Records disclosure requirements. If the contractor keeps and maintains Public Records upon completion of the contract, the contractor shall meet all applicable requirements for retaining Public Records. All Public Records stored electronically must be provided to Department, upon request from Department's custodian of Public Records, in a format specified by Department as compatible with the information technology systems of Department. These formatting requirements are satisfied by using the data formats as authorized in the contract or Microsoft Word, Outlook, Adobe, or Excel, and any software formats the contractor is authorized to access.
- f. **IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, F.S., TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THE CONTRACT, CONTACT THE DEPARTMENT'S CUSTODIAN OF PUBLIC RECORDS AT:**

Telephone: (850) 245-2118

Email: public.services@floridadep.gov

Mailing Address: Department of Environmental Protection
ATTN: Office of Ombudsman and Public Services
Public Records Request
3900 Commonwealth Boulevard, MS 49
Tallahassee, Florida 32399

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Special Audit Requirements

Attachment 5

The administration of resources awarded by the Department of Environmental Protection (*which may be referred to as the "Department", "DEP", "FDEP" or "Grantor", or other name in the agreement*) to the recipient (*which may be referred to as the "Recipient", "Grantee" or other name in the agreement*) may be subject to audits and/or monitoring by the Department of Environmental Protection, as described in this attachment.

MONITORING

In addition to reviews of audits conducted in accordance with OMB Circular A-133, as revised, 2 CFR Part 200, Subpart F, and Section 215.97, F.S., as revised (see "AUDITS" below), monitoring procedures may include, but not be limited to, on-site visits by Department staff, limited scope audits as defined by OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F, and/or other procedures. By entering into this Agreement, the recipient agrees to comply and cooperate with any monitoring procedures/processes deemed appropriate by the Department of Environmental Protection. In the event the Department of Environmental Protection determines that a limited scope audit of the recipient is appropriate, the recipient agrees to comply with any additional instructions provided by the Department to the recipient regarding such audit. The recipient further agrees to comply and cooperate with any inspections, reviews, investigations, or audits deemed necessary by the Chief Financial Officer or Auditor General.

AUDITS

PART I: FEDERALLY FUNDED

This part is applicable if the recipient is a State or local government or a non-profit organization as defined in OMB Circular A-133, as revised (for fiscal year start dates prior to December 26, 2014), or as defined in 2 CFR §200.330 (for fiscal year start dates after December 26, 2014).

1. In the event that the recipient expends \$500,000 (\$750,000 for fiscal year start dates after December 26, 2014) or more in Federal awards in its fiscal year, the recipient must have a single or program-specific audit conducted in accordance with the provisions of OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F. EXHIBIT 1 to this Attachment indicates Federal funds awarded through the Department of Environmental Protection by this Agreement. In determining the Federal awards expended in its fiscal year, the recipient shall consider all sources of Federal awards, including Federal resources received from the Department of Environmental Protection. The determination of amounts of Federal awards expended should be in accordance with the guidelines established by OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F. An audit of the recipient conducted by the Auditor General in accordance with the provisions of OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F, will meet the requirements of this part.
2. In connection with the audit requirements addressed in Part I, paragraph 1, the recipient shall fulfill the requirements relative to auditee responsibilities as provided in Subpart C of OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F.
3. If the recipient expends less than \$500,000 (or \$750,000, as applicable) in Federal awards in its fiscal year, an audit conducted in accordance with the provisions of OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F, is not required. In the event that the recipient expends less than \$500,000 (or \$750,000, as applicable) in Federal awards in its fiscal year and elects to have an audit conducted in accordance with the provisions of OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F the cost of the audit must be paid from non-Federal resources (i.e., the cost of such an audit must be paid from recipient resources obtained from other than Federal entities).

4. The recipient may access information regarding the Catalog of Federal Domestic Assistance (CFDA) via the internet at www.cfda.gov

PART II: STATE FUNDED

This part is applicable if the recipient is a nonstate entity as defined by Section 215.97(2)(n), Florida Statutes.

1. In the event that the recipient expends a total amount of state financial assistance equal to or in excess of \$750,000 in any fiscal year of such recipient, the recipient must have a State single or project-specific audit for such fiscal year in accordance with Section 215.97, Florida Statutes; applicable rules of the Department of Financial Services; and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General. EXHIBIT 1 to this Attachment indicates state financial assistance awarded through the Department of Environmental Protection by this Agreement. In determining the state financial assistance expended in its fiscal year, the recipient shall consider all sources of state financial assistance, including state financial assistance received from the Department of Environmental Protection, other state agencies, and other nonstate entities. State financial assistance does not include Federal direct or pass-through awards and resources received by a nonstate entity for Federal program matching requirements.
2. In connection with the audit requirements addressed in Part II, paragraph 1; the recipient shall ensure that the audit complies with the requirements of Section 215.97(7), Florida Statutes. This includes submission of a financial reporting package as defined by Section 215.97(2), Florida Statutes, and Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General.
3. If the recipient expends less than \$750,000 in state financial assistance in its fiscal year, an audit conducted in accordance with the provisions of Section 215.97, Florida Statutes, is not required. In the event that the recipient expends less than \$750,000 in state financial assistance in its fiscal year, and elects to have an audit conducted in accordance with the provisions of Section 215.97, Florida Statutes, the cost of the audit must be paid from the non-state entity's resources (i.e., the cost of such an audit must be paid from the recipient's resources obtained from other than State entities).
4. For information regarding the Florida Catalog of State Financial Assistance (CSFA), a recipient should access the Florida Single Audit Act website located at <https://apps.fldfs.com/fsaa> for assistance. In addition to the above websites, the following websites may be accessed for information: Legislature's Website at <http://www.leg.state.fl.us/Welcome/index.cfm>, State of Florida's website at <http://www.myflorida.com/>, Department of Financial Services' Website at <http://www.fldfs.com/> and the Auditor General's Website at <http://www.myflorida.com/audgen/>.

PART III: OTHER AUDIT REQUIREMENTS

(NOTE: This part would be used to specify any additional audit requirements imposed by the State awarding entity that are solely a matter of that State awarding entity's policy (i.e., the audit is not required by Federal or State laws and is not in conflict with other Federal or State audit requirements). Pursuant to Section 215.97(8), Florida Statutes, State agencies may conduct or arrange for audits of State financial assistance that are in addition to audits conducted in accordance with Section 215.97, Florida Statutes. In such an event, the State awarding agency must arrange for funding the full cost of such additional audits.)

PART IV: REPORT SUBMISSION

1. Copies of reporting packages for audits conducted in accordance with OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F and required by PART I of this Attachment shall be submitted, when required by Section .320 (d), OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F, by or on behalf of the recipient directly to each of the following:

- A. The Department of Environmental Protection at one of the following addresses:

By Mail:

Audit Director
Florida Department of Environmental Protection
Office of the Inspector General, MS 40
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Electronically:

FDEPSingleAudit@dep.state.fl.us

- B. The Federal Audit Clearinghouse designated in OMB Circular A-133, as revised, and 2 CFR §200.501(a) (the number of copies required by Sections .320 (d)(1) and (2), OMB Circular A-133, as revised, and 2 CFR §200.501(a) should be submitted to the Federal Audit Clearinghouse), at the following address:

Federal Audit Clearinghouse
Bureau of the Census
1201 East 10th Street
Jeffersonville, IN 47132

Submissions of the Single Audit reporting package for fiscal periods ending on or after January 1, 2008, must be submitted using the Federal Clearinghouse's Internet Data Entry System which can be found at <http://harvester.census.gov/facweb/>

- C. Other Federal agencies and pass-through entities in accordance with Sections .320 (e) and (f), OMB Circular A-133, as revised, and 2 CFR §200.512.

2. Pursuant to Section .320(f), OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F, the recipient shall submit a copy of the reporting package described in Section .320(c), OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F, and any management letters issued by the auditor, to the Department of Environmental Protection at one the following addresses:

By Mail:

Audit Director
Florida Department of Environmental Protection
Office of the Inspector General, MS 40
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Electronically:

FDEPSingleAudit@dep.state.fl.us

3. Copies of financial reporting packages required by PART II of this Attachment shall be submitted by or on behalf of the recipient directly to each of the following:

- A. The Department of Environmental Protection at one of the following addresses:

By Mail:

Audit Director
Florida Department of Environmental Protection
Office of the Inspector General, MS 40
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Electronically:
FDEPSingleAudit@dep.state.fl.us

B. The Auditor General's Office at the following address:

State of Florida Auditor General
Room 401, Claude Pepper Building
111 West Madison Street
Tallahassee, Florida 32399-1450

4. Copies of reports or management letters required by PART III of this Attachment shall be submitted by or on behalf of the recipient directly to the Department of Environmental Protection at one of the following addresses:

By Mail:

Audit Director
Florida Department of Environmental Protection
Office of the Inspector General, MS 40
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Electronically:
FDEPSingleAudit@dep.state.fl.us

5. Any reports, management letters, or other information required to be submitted to the Department of Environmental Protection pursuant to this Agreement shall be submitted timely in accordance with OMB Circular A-133, as revised, and 2 CFR Part 200, Subpart F, Florida Statutes, or Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, as applicable.
6. Recipients, when submitting financial reporting packages to the Department of Environmental Protection for audits done in accordance with OMB Circular A-133, as revised and 2 CFR Part 200, Subpart F, or Chapters 10.550 (local governmental entities) or 10.650 (nonprofit and for-profit organizations), Rules of the Auditor General, should indicate the date that the reporting package was delivered to the recipient in correspondence accompanying the reporting package.

PART V: RECORD RETENTION

The recipient shall retain sufficient records demonstrating its compliance with the terms of this Agreement for a period of five (5) years from the date the audit report is issued, and shall allow the Department of Environmental Protection, or its designee, Chief Financial Officer, or Auditor General access to such records upon request. The recipient shall ensure that audit working papers are made available to the Department of Environmental Protection, or its designee, Chief Financial Officer, or Auditor General upon request for a period of three (3) years from the date the audit report is issued, unless extended in writing by the Department of Environmental Protection.

EXHIBIT – 1

FUNDS AWARDED TO THE RECIPIENT PURSUANT TO THIS AGREEMENT CONSIST OF THE FOLLOWING:

Federal Resources Awarded to the Recipient Pursuant to this Agreement Consist of the Following:					
Federal Program Number	Federal Agency	CFDA Number	CFDA Title	Funding Amount	State Appropriation Category
Original Agreement	U.S. Department of Interior, National Park Service	15.916	Outdoor Recreation, Acquisition, Development and Planning – Land and Water Conservation Fund Grants	\$148,500.00	14001

State Resources Awarded to the Recipient Pursuant to this Agreement Consist of the Following Matching Resources for Federal Programs:					
Federal Program Number	Federal Agency	CFDA	CFDA Title	Funding Amount	State Appropriation Category

State Resources Awarded to the Recipient Pursuant to this Agreement Consist of the Following Resources Subject to Section 215.97, F.S.:						
State Program Number	Funding Source	State Fiscal Year	CSFA Number	CSFA Title or Funding Source Description	Funding Amount	State Appropriation Category

Total Award				\$148,500.00	
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For each program identified above, the recipient shall comply with the program requirements described in the Catalog of Federal Domestic Assistance (CFDA) [www.cfda.gov] and/or the Florida Catalog of State Financial Assistance (CSFA) [<https://apps.fldfs.com/fsaa/searchCatalog.aspx>]. The services/purposes for which the funds are to be used are included in the Agreement’s Grant Work Plan. Any match required by the Recipient is clearly indicated in the Agreement.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
PROGRAM SPECIFIC REQUIREMENTS

LAND AND WATER CONSERVATION FUND PROGRAM

ATTACHMENT 6

1. Project Submittal Forms.

Grantees can find the Administrative Forms, Reimbursement Forms, and Guidelines referenced in this Agreement at <https://floridadep.gov/lands/land-and-recreation-grants/content/land-and-water-conservation-fund-program>, or by contacting the Department's Grant Manager.

2. Notice to Commence.

Prior to starting the Project, the Grantee will provide to the Department all documentation listed on the Commencement Documentation Checklist, DRP-122. Once the commencement documentation is approved, the Department will issue a written "Notice to Commence" to the Grantee. **The Grantee MAY NOT proceed until the Department issues a "Notice to Commence."** The Grantee must start work on the Project **within 180 days** after the Department issues a "Notice to Commence" unless this deadline is extended by the Department for good cause. Until the Department issues the "Notice to Commence," the Department is not obligated to reimburse Grantee for fees, costs, or general expenses of any kind.

3. Site Plans.

Project site facilities must be attractive for public use and compatible with the environment. Plans and specifications for Project site improvements and facilities must be in accordance with current engineering and architectural standards. Grantees should emphasize the health and safety of users, accessibility to the general public, and the protection of the recreational and natural values of the area. A Grantee may alter a conceptual site plan only after written approval by the Department and National Park Service (NPS). All utility lines installed within the Project site must be placed underground.

The Grantee shall have final site plans (site, engineering, and architectural) prepared for the Project and sealed by a registered architect or engineer licensed in accordance with the laws of the State of Florida (collectively the "Project Plans"). The Grantee must deliver a complete original, signed, and sealed set of the Project Plans to the Department as a condition of and prior to beginning the Project.

4. The following supplements paragraph 2.d., Attachment 1, Standard Terms and Conditions:

The Department may, and in certain circumstances the NPS must, approve any changes to this Agreement. The Grantee may submit a request for an amendment to the Department's Grant Manager, who will determine whether the request requires NPS approval. This Agreement may be amended to provide for additional services if additional funding is made available by USDOJ, NPS, and the Florida Legislature.

5. The following paragraphs is added to paragraph 2, Attachment 1, Standard Terms and Conditions:

- f. The costs must meet all requirements and financial reporting of the LWCF Program and rules and regulations applicable to expenditures of federal and state funds. These rules and regulations are hereby adopted and incorporated by reference.
- g. This Agreement is not transferable.

6. The following replaces paragraph 8.d, Attachment 1, Standard Terms and Conditions:

d. Reimbursement for Costs.

Project costs will be reimbursed as provided in paragraph 62D-5.073(2)(a), F.A.C., the LWCF Manual, and in the Project Agreement. Project costs must be incurred between the effective date of this Agreement and the Project Completion Date. The Grantee will be paid on a cost reimbursement basis for all eligible Project costs upon the completion, submittal, and approval of each deliverable identified in the Grant Work Plan. Reimbursement must be requested on Exhibit C, Payment Request Summary Form. To be eligible for reimbursement, cost(s) must meet all LWCF requirements, financial reporting requirements, and rules and regulations applicable to expenditures of state funds, including, but not limited to, the Reference Guide for State

Expenditures, which can be accessed at the following web address: www.myfloridacfo.com/aadir/reference-guide/. If the total cost of the Project exceeds the grant amount and the required match, the Grantee must pay the excess cost. If the total cost of the Project exceeds the grant amount and the required match (if applicable), Grantee must pay the excess cost.

7. The following paragraph is added to paragraph 8, Attachment 1, Standard Terms and Conditions:
 - k. Cost Limits. Pursuant to paragraph 62D-5.073(2)(b), F.A.C., project planning expenses, such as application preparation, surveys (boundary and topographic), title searches, project signs, architectural and engineering fees, permitting fees, project inspection fees, and other similar fees are eligible Project costs provided that they do not exceed fifteen percent (15%) of the total Project cost.
 8. The following replaces paragraph 8.h, Attachment 1, Standard Terms and Conditions:
 - h. Annual Appropriation Contingency. The State of Florida's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Florida Legislature and the availability of funding and grants from the USDOJ and NPS. This Agreement is not a commitment of future appropriations. Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of the Department if USDOJ, NPS, and/or the Florida Legislature reduces or eliminates appropriations. It is further understood that Grant Awards may be revised by the Department due to the availability of LWCF Program Funds.
 9. The following replaces paragraph 10, Attachment 1, Standard Terms and Conditions:
- Status Reports.**
- a. The Grantee must utilize Project Status Report Form, DRP-109, available online and incorporated herein by reference, to describe the work performed during the reporting period, problems encountered, problem resolutions, and to schedule updates and proposed work for the next reporting period. The Project Status Reports must be submitted to the Department's Grant Manager no later than January 5, May 5, and September 5. The Department's Grant Manager has thirty (30) calendar days to review the required reports and deliverables submitted by the Grantee.
 - b. Additionally, the Grantee shall comply with the reporting and inventory requirements set forth in the Statewide Comprehensive Outdoor Recreation Plan (SCORP), available online: <https://floridadep.gov/parks/florida-scorp-outdoor-recreation-florida> and hereby incorporated by reference, by updating the Florida Outdoor Recreation Inventory (FORI) system (<https://floridadep.gov/parks/florida-outdoor-recreation-inventory>).

10. Site Dedication.

The interest in land developed or acquired by the Grantee with LWCF Program Funds shall be subject to the site dedication requirements set forth in Chapter 62D-5, F.A.C. and of the LWCF Act, specifically Section 6(f)(3), as codified in 36 CFR § 59.3. Pursuant to the LWCF Act and general requirements of the LWCF Program, land owned by the Grantee that is developed or acquired with LWCF Program Funds shall be dedicated in perpetuity as an outdoor recreation site for the use and benefit of the public. Land that is leased from the federal government or another public agency by Grantee must include safeguards to ensure the perpetual use requirement contained in the LWCF Act. Safeguards include such things as joint sponsorship of the Project or an agreement between the Parties that the lessor will assume compliance responsibility for the Project site in the event of default by the lessee (Grantee) or termination or expiration of the lease. Execution of this Agreement by the Department constitutes an acceptance of a Project site(s) dedication on behalf of the public of the State of Florida. These dedications must be recorded in the county's public property records by the Grantee in accordance with subsection 62D-5.074(1), F.A.C.

11. Management of Project Sites.

- a. Site Inspections. Department staff will periodically inspect LWCF Projects to ensure compliance with subsections 62D-5.074(1)-(3), F.A.C., and section 675.9 of the LWCF manual. Grantees must ensure by site inspections that the property acquired or developed through the LWCF is being operated and maintained for outdoor recreation purposes.
- b. Management. All projects must be open at reasonable times and be managed in a safe and attractive manner appropriate for public use. Facilities must be kept in reasonable repair for a minimum of 25 years from the date set forth on the project completion certificate to prevent undue deterioration.
- c. Non-Compliance. Before a project is closed, the Department and the NPS have the right to terminate a project agreement and demand return of the program funds for non-compliance by a grantee. Failure by a grantee to

comply with the Agreement will result in the Department declaring the grantee ineligible for further participation in LWCF until the Grantee comes into compliance as determined by the Department under this rule and the LWCF Manual.

- d. **Survival.** This provision shall survive termination, cancellation, or expiration of this Agreement.

12. Procurement Requirements for Grantee.

The Grantee must secure all goods and services for the Project according to its adopted procurement procedures.

13. Project Completion Certification.

Project completion means the Project is open and available for use by the public. To certify completion, the Grantee will submit to the Department the Project Completion Certification, DRP-126, available online and incorporated herein by reference. The Project must be designated complete prior to the Department releasing final reimbursement.

14. Signage.

Grantee must erect a permanent information sign on the Project site that credits funding, or a portion thereof, to the Florida Department of Environmental Protection and the Land and Water Conservation Fund Program. Use of the LWCF Logo on the permanent Project signs is required. Grantee is encouraged to position signage acknowledging LWCF assistance at entrances to outdoor recreation sites, at other appropriate on-site locations, and in folders and park literature. The acknowledgement of LWCF assistance will be checked during compliance inspections. The sign must be installed on the Project site and approved by the Department before the final Project reimbursement request is processed. The required LWCF Logo, LWCF Terms of Use, and sample sign are available online: <https://floridadep.gov/lands/land-and-recreation-grants/content/land-and-water-conservation-fund-program>. This provision shall survive termination, cancellation, or expiration of this Agreement.

15. Termination and Ineligibility.

In addition to the remedies provided elsewhere in this Agreement, if the Grantee fails to comply with the terms stated in this Agreement or with any provisions in Rule Chapter 62D-5, F.A.C., the Department will terminate this Agreement and demand return of the LWCF program funds (including interest). Furthermore, the Department will declare the Grantee ineligible for further participation in LWCF until the Grantee is in compliance pursuant to subsection 62D-5.074(4), F.A.C. Further, the Grantee agrees to ensure that all necessary permits are obtained prior to implementing any Grant Work Plan activity that may fall under applicable federal, state, or local laws. This provision shall survive termination, cancellation, or expiration of this Agreement.

16. Conversion.

This Project site acquired and/or developed with LWCF assistance must be retained and used for public outdoor recreation. This Project site so acquired and/or developed may not be wholly or partly converted to other than public outdoor recreation uses without the written approval of the NPS pursuant to the conversion provisions of Section 6(f)(3) of the LWCF Act, 36 CFR Part 59, the LWCF Manual, and all other applicable regulations. All conversion provisions and guidelines apply to each area or facility for which LWCF assistance is obtained, regardless of the extent of participation of the Project in the assisted area or facility and consistent with the contractual agreement between USDOJ, NPS, and the State of Florida.

Should Grantee convert all or part of the Project site to other than public outdoor recreational uses, the Grantee is required to replace the area, facilities, resource, or Project site at its own expense with an acceptable project of comparable or greater value, scope, and quality pursuant to LWCF mandates. All conversions require amendments to the original Project agreement (36 CFR § 59.3(c)). Therefore, amendment requests should be submitted concurrently with conversion requests. Project boundary maps must be submitted with the amendment request to identify the changes to the original area caused by the proposed conversion and to establish a new Project area pursuant to the substitution. Once conversion has been approved, replacement property should be immediately acquired. When it is not possible for replacement property to be acquired immediately, an express commitment to satisfy Section 6(f)(3) substitution requirements with a specified period, normally not to exceed one (1) year following conversion approval, is required. This commitment will be in the form of an amendment to the original Agreement. This provision shall survive termination, cancellation, or expiration of this Agreement.

ATTACHMENT 8
Contract Provisions for DOI-Funded Agreements

The Department, as a Non-Federal Entity as defined by 2 CFR §200.69, shall comply with the following provisions, where applicable. For purposes of this Grant Agreement between the Department and the Grantee, the term "Recipient" shall mean "Grantee."

Further, the Department, as a pass-through entity, also requires the Grantee to pass on these requirements to all lower tier subrecipients, and to comply with the provisions of the award, including applicable provisions of the OMB Uniform Guidance (2 CFR Part 200), and all associated terms and conditions. Therefore, Grantees must include these requirements in all related subcontracts and/or sub-awards. Grantees can include these requirements by incorporating this Attachment in the related subcontract and/or sub-awards, however for all such subcontracts and sub-awards, the Grantee shall assume the role of the Non-Federal Entity and the subrecipients shall assume the role of the Recipient.

2 CFR PART 200 APPENDIX 2 REQUIREMENTS

1. Administrative, Contractual, and Legal Remedies

The following provision is required if the Agreement is for more than \$150,000. In addition to any of the remedies described in the elsewhere in the Agreement, if the Recipient materially fails to comply with the terms and conditions of this Contract, including any Federal or State statutes, rules or regulations, applicable to this Contract, the Non-Federal Entity may take one or more of the following actions.

- i. Temporarily withhold payments pending correction of the deficiency by the Recipient.
- ii. Disallow (that is, deny both use of funds and any applicable matching credit for) all or part of the cost of the activity or action not in compliance.
- iii. Wholly or partly suspend or terminate this Contract.
- iv. Take other remedies that may be legally available.

The remedies identified above, do not preclude the Recipient from being subject to debarment and suspension under Presidential Executive Orders 12549 and 12689. The Non-Federal entity shall have the right to demand a refund, either in whole or part, of the funds provided to the Recipient for noncompliance with the terms of this Agreement.

2. Termination for Cause and Convenience

Termination for Cause and Convenience are addressed elsewhere in the Agreement.

3. Equal Opportunity Clause

The following provision applies if the agreement meets the definition of "federally assisted construction contract" as defined by 41 CFR Part 60-1.3:

During the performance of this Agreement, the Recipient agrees as follows:

- i. The Recipient will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Recipient will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:
 - a. Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Recipient agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- ii. The Recipient will, in all solicitations or advertisements for employees placed by or on behalf of the Recipient, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- iii. The Recipient will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired

about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Recipient's legal duty to furnish information.

- iv. The Recipient will send to each labor union or representative of workers with which he has a collective bargaining agreement or other Agreement or understanding, a notice to be provided advising the said labor union or workers' representatives of the Recipient's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- v. The Recipient will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- vi. The Recipient will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- vii. In the event of the Recipient's noncompliance with the nondiscrimination clauses of this Agreement or with any of the said rules, regulations, or orders, this Agreement may be canceled, terminated, or suspended in whole or in part and the Recipient may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- viii. The Recipient will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Recipient will take such action with respect to any subcontractor purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

4. Davis Bacon Act

If the Agreement is a prime construction contract in excess of \$2,000 awarded by the Recipient, and if required by the Federal Legislation, the Recipient must comply with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). In accordance with the statute, contractors must pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in a wage determination made by the Secretary of Labor. In addition, contractors must pay wages not less than once a week. The Recipient must comply with the Copeland "Anti-Kickback" Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each Recipient or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled.

5. Contract Work Hours and Safety Standards Act

Where applicable, if the Agreement is in excess of \$100,000 and involves the employment of mechanics or laborers, the Recipient must comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each Recipient must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not

less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

6. Rights to Inventions Made Under Agreement

If the Federal award meets the definition of "funding agreement" under 37 CFR §401.2 (a) and the Non-Federal Entity or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the Non-Federal Entity or subrecipient must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

7. Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387)

If the Agreement is in excess of \$150,000, the Recipient shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Awarding Agency and the Regional Office of the Environmental Protection Agency (EPA).

8. Debarment and Suspension (Executive Orders 12549 and 12689)

The Recipient certifies that it is not listed on the governmentwide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension."

9. Byrd Anti-Lobbying Amendment (31 U.S.C. 1352)

The Recipient certifies that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. If applicable, the Recipient shall disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award, using form SF-LLL, available at:

https://apply07.grants.gov/apply/forms/sample/SFLLL_1_2_P-V1.2.pdf.

10. Procurement of Recovered Materials

The Recipient must comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act as described in 2 CFR part 200.322.

ADMINISTRATIVE

11. General Federal Regulations

Recipients shall comply with the regulations listed in 2 CFR 200, 48 CFR 31, and 40 U.S.C. 1101 *et sequence*.

12. Rights to Patents and Inventions Made Under a Contract or Agreement

Rights to inventions made under this assistance agreement are subject to federal patent and licensing regulations, which are codified at Title 37 CFR Part 401 and Title 35 U.S.C. 200 through 212.

13. Compliance with the Trafficking Victims Protection Act of 2000 (2 CFR Part 175)

Recipients, their employees, subrecipients under this award, and subrecipients' employees may not:

- i. Engage in severe forms of trafficking in persons during the period of time that the award is in effect;
- ii. Procure a commercial sex act during the period of time that the award is in effect; or
- iii. Use forced labor in the performance of the award or subawards under the award.

14. Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234)

Recipients must comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234), if applicable. This act requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.

15. Water Resources Reform and Development Act (WRRDA) P.L. 113-121

Recipients must comply with the Water Resources Reform and Development Act (WRRDA) P.L. 113-121, if applicable. This act provides for improvements to the rivers and harbors of the United States, to provide for the conservation and development of water and related resources.

16. Whistleblower Protection

Recipients shall comply with U.S.C. §4712, Enhancement of Recipient and Subrecipient Employee Whistleblower Protection. This requirement applies to all awards issued after July 1, 2013 and effective December 14, 2016 has been permanently extended (Public Law (P.L.) 114-261).

(a) This award, related subawards, and related contracts over the simplified acquisition threshold and all employees working on this award, related subawards, and related contracts over the simplified acquisition threshold are subject to the whistleblower rights and remedies in the pilot program on award recipient employee whistleblower protections established at 41 U.S.C. 4712 by section 828 of the National Defense Authorization Act for Fiscal Year 2013 (P.L. 112-239).

(b) Recipients, their subrecipients, and their contractors awarded contracts over the simplified acquisition threshold related to this award, shall inform their employees in writing, in the predominant language of the workforce, of the employee whistleblower rights and protections under 41 U.S.C. 4712.

(c) The Recipient shall insert this clause, including this paragraph (c), in all subawards and in contracts over the simplified acquisition threshold related to this award; best efforts should be made to include this clause, including this paragraph (c) in any subawards and contracts awarded prior to the effective date of this provision.

17. Notification of Termination (2 CFR § 200.340)

In accordance with 2 CFR § 200.340, in the event that the Agreement is terminated prior to the end of the period of performance due to the Recipient's or subcontractor's material failure to comply with Federal statutes, regulations or the terms and conditions of this Agreement or the Federal award, the termination shall be reported to the Office of Management and Budget (OMB)-designated integrity and performance system, accessible through System for Award Management (SAM) currently the Federal Awardee Performance and Integrity Information System (FAPIS). The Non-Federal Entity will notify the Recipient of the termination and the Federal requirement to report the termination in FAPIS. See 2 CFR § 200.340 for the requirements of the notice and the Recipient's rights upon termination and following termination.

18. Additional Lobbying Requirements

(a) The Recipient certifies that no funds provided under this Agreement have been used or will be used to engage in the lobbying of the Federal Government or in litigation against the United States unless authorized under existing law.

(b) The Lobbying Disclosure Act of 1995, as amended (2 U.S.C. §1601 *et seq.*), prohibits any organization described in Section 501(c)(4) of the Internal Revenue Code, from receiving federal funds through an award, grant (and/or subgrant) or loan unless such organization warrants that it does not, and will not engage in lobbying activities prohibited by the Act as a special condition of such an award, grant (and/or subgrant), or loan. This restriction does not apply to loans made pursuant to approved revolving loan programs or to contracts awarded using proper procurement procedures.

(c) Pursuant to 2 CFR §200.450 and 2 CFR §200.454(e), the Recipient is hereby prohibited from using funds provided by this Agreement for membership dues to any entity or organization engaged in lobbying activities.

COMPLIANCE WITH ASSURANCES

19. Assurances

Recipients shall comply with any and all applicable assurances made by the Department or the Recipient to the Federal Government during the Grant application process.

FEDERAL REPORTING REQUIREMENTS

Grant Recipients awarded a new Federal grant greater than or equal to \$30,000 awarded on or after October 1, 2015, are subject to the FFATA the Federal Funding Accountability and Transparency Act ("FFATA") of 2006. The FFATA legislation requires that information on federal awards (federal financial assistance and expenditures) be made available to the public via a single, searchable website, which is www.USASpending.gov. The Grantee agrees to provide the information necessary, within one (1) month of execution, for the Department to comply with this requirement.

DEPARTMENT OF INTERIOR-SPECIFIC

20. Department of Interior (DOI) General Terms and Conditions

Recipients shall comply with DOI General Terms and Conditions available at https://www.doi.gov/pam/programs/financial_assistance/TermsandConditions, and incorporated by reference.

21. DOI Regulations

Recipients shall comply with the following regulations: 2 CFR 1400-1402, 43 CFR 9, 43 CFR 17, 43 CFR 18, 43 CFR 41, and 43 CFR 44.

22. Drug-Free Workplace

Recipients must make an ongoing, good faith effort to maintain a drug-free workplace pursuant to the specific requirements set forth in Title 2 CFR Part 1401. Additionally, in accordance with these regulations, the recipients must identify all known workplaces under its federal awards, and keep this information on file during the performance of the award.

23. Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act

As applicable, Recipient shall comply with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) to provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

24. Deposit of Publications Produced under Grants

Pursuant to Departmental Manual 505 DM4 (DOI) and Service Manual FW1 (USFWS), any grant or cooperative agreement that will produce a publication (other than those listed as exceptions) must provide two copies of each publication to the Department of Interior's Natural Resources Library. For a list of exceptions, transmittal requirements, and delivery information see Departmental Manual 505 DM 4, Deposit of Publications Produced under Grants at: <http://elips.doi.gov/ELIPS/DocView.aspx?id=1671>.

UNITED STATES FISH & WILDLIFE SERVICE-SPECIFIC

25. USFWS Financial Assistance Award Terms and Conditions

Recipients shall comply with the USFWS Financial Assistance Award Terms and Conditions applicable to the specific Federal Award funding source, available at <https://www.fws.gov/grants/atc.html>, and incorporated by reference.

NATIONAL PARKS SERVICE LAND AND WATER CONSERVATION FUND STATE ASSISTANCE PROGRAM-SPECIFIC

26. LWCF Federal Financial Assistance Manual

As applicable, Recipients shall comply with the LWCF Federal Financial Assistance Manual Effective October 1, 2008, or later, available at <https://www.nps.gov/subjects/lwcf/lwcf-manual.htm>, and incorporated by reference.

27. Historic Preservation.

As applicable, Recipients shall comply with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), E.O. 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469a-1 *et seq.*).

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Florida Department of Environmental Protection

EXHIBIT A
Land and Water Conservation Fund Program
Florida Recreation Development Assistance Program
Recreational Trails Program
Project Status Report

Required Signatures: Adobe Signature

Project Name: _____ Project Number: _____

Project Sponsor: _____

Identify primary and support recreation areas and facilities to be constructed. (50% of total costs must be in primary facilities).

PROVIDE PHOTOS OF WORK IN PROGRESS

PRIMARY FACILITIES/ELEMENTS:

Project Elements	Work Accomplished	% Completed

SUPPORT FACILITIES/ELEMENTS:

Project Elements	Work Accomplished	% Completed

PROBLEMS ENCOUNTERED:

Period Covered (Check Appropriate Period):

January through April:

May through August:

September through December:

Due May 5th

Due September 5th

Due January 5th

LIAISON: _____
Signature

_____ Date



EXHIBIT C
PAYMENT REQUEST SUMMARY FORM
 Land and Water Conservation Fund Program Florida
 Recreation Development Assistance Program
 Recreational Trails Program

Required Signatures: Adobe Signature

Date: _____

Grantee: _____

Project Name and Number: _____

Billing Period: _____

Billing #: _____

DEP Division: _____

DEP Program: _____

	Project Costs This Billing	Cumulative Project Costs
Contractual Services DRP-116		
Grantee Labor DRP-117		
Employee Benefits (_____ % of Salaries)		
Direct Purchases: Materials & Supplies DRP-118		
Grantee Stock DRP-120		
Equipment DRP-119		
Land Value		
Indirect Costs (15% of Grantee Labor)		
TOTAL PROJECT COSTS	\$ _____	\$ _____

CERTIFICATION: I hereby certify that the above expenses were incurred for the work being accomplished in the attached progress reports.

Project Administrator

Date

CERTIFICATION: I hereby certify that the documentation has been maintained as required to support the project expenses as reported above and is available for audit upon request.

Project Financial Officer

Date

DEP USE ONLY

STATE FUNDING PARTICIPATION: _____ %

Total project costs to date	\$
State Obligation to date	\$
State retainage (_____ %)	\$
State obligation remaining	\$
State funds previously disbursed	\$
State funds due this billing	\$

Reviewed and approved by:

DEP Project Administrator

Date

Division Director or Designee

Date



INDIAN RIVER COUNTY TRAFFIC ENGINEERING DIVISION SPECIAL CONDITIONS FOR RIGHT-OF-WAY CONSTRUCTION

SPECIAL CONDITIONS:

1. All work performed under this permit shall be in accordance with the Florida Department of Transportation Design Standards (<https://www.fdot.gov/design/standardplans/current/default.shtm>), Indices 102-600 and the Manual on Uniform Traffic Control Devices.
2. All special conditions listed are in addition to the attached Indian River County Traffic Engineering Regulations for Maintenance of Traffic.
3. It shall be the contractor's responsibility to contact Sunshine State One Call System (1-800-432-4770) at least 72 hours in advance of commencing construction work to coordinate traffic control and obtain locations of underground traffic signal conduit for the County's Computerized Traffic Signal Coordination System.
4. The contractor shall be responsible for using the applicable Traffic Control Plan for the type of work being performed. All job supervisors shall have a copy of the control plan on site at all times and shall be familiar with the correct set-up of the plan.
5. At least one lane of traffic shall be maintained at all times. One-lane traffic shall be controlled with at least two (2) flagmen. Flagmen shall use STOP/SLOW paddles at all times. Flags shall not be used for one-lane traffic control.
6. **After proper notification to Traffic Engineering**, consideration will be given to the contractor to close roadways to through traffic on a daily basis during daylight hours on narrow roadways where maintaining one-lane traffic would be difficult. The roadway shall be open to traffic at the end of each work day and on weekends. It shall be the contractor's responsibility to provide all necessary construction signs and traffic control devices to close the road and provide a detour route in accordance with Indian River County standards. Signing shall be installed that clearly indicates the time periods the road is closed to traffic.
7. There shall be no construction work after dark.
8. All open excavations shall be back filled before the close of each work day.
9. A compacted roadway shall be provided at the end of each work day. Disrupted roadways shall be clearly marked as a construction area.
10. Refer to the attached Traffic Engineering Regulations for construction work on Indian River County roadways for maintenance of traffic inspection policy and procedure
11. All construction equipment, materials, etc. shall be stored outside of the clear zone. Equipment and construction materials that are stored within the clear zone shall be clearly marked with Type II barricades with flashing yellow lights.
12. All projects and work within Indian River County right-of-way shall have an approved Traffic Control Plan (TCP). All work shall be executed under the established TCP and Indian River County approved procedures. The TCP shall provide the proposed detour route, traffic control devices, and other pertinent information for the proposed project and shall be submitted for review and approval by the Public Works Department.
The TCP shall be prepared by personnel with a minimum of an Intermediate Maintenance of Traffic current certification in the State of Florida. (Denote on the TCP, certification number and name of the certified personnel that prepared the MOT plan.)
For full road closures, a TCP is required to be submitted by the contractor a minimum of two (2) weeks prior to the proposed road closure.
All traffic control devices shall be in accordance with the Florida Department of Transportation (FDOT) Design Standards, Indices 102-600, FY 2019-2020, and the Manual on Uniform Traffic Control Devices, 2009 Edition.
13. For full road closures, Portable Changeable Message Signs are required to pre-advertise the roadway closure, a minimum of seven (7) days in advance of the road closure and during the duration of the road closure. The use of Portable Changeable Message Signs for lane closures on thoroughfare plan roadways will be required. Messages are to be approved by the Public Works Department and shown on the TCP.

TRAFFIC ENGINEERING REGULATIONS

Maintenance and Protection of Traffic:

It shall be the responsibility of the contractor to provide for the maintenance and protection of traffic in accordance with the applicable indices in the most current edition of the Florida Department of Transportation Roadway and Traffic Design Standards and the Federal Highway Administration Manual on Uniform Traffic Control Devices. The indices shall be considered the minimum standards and a

Special Conditions for Right of Way Construction

Page 2

more extensive work zone set-up or modifications may be required by the County Public Work Director or his designee for the protection of personnel in the work area as well as the traveling public.

It shall be the responsibility of the contractor to ensure that all subcontractors are in full compliance with all traffic control regulations. It shall be the responsibility of the contractor working on County roadways or within Right-of-Ways to establish maintenance of traffic prior to any work being performed. The contractor shall frequently monitor the work zone set-up to ensure that all signing is properly placed and that warning signs remain at the proper advance posting distance from the work area. Any signs that do not apply to the work zone shall be removed or covered. The contractor shall remove the work zone set-up at the conclusion of the work.

Traffic Engineering shall be notified a minimum of seventy-two (72) hours in advance of any lane closings and ten (10) days in advance of any road closures.

Lane closures are restricted to outside the normal peak hours of traffic, lane closures shall occur during the hours of 9:00 AM to 4:00 PM unless otherwise approved by the Public Works Director or his designee.

Traffic Engineering staff shall inspect the Maintenance of Traffic prior to construction commencement to ensure compliance with the approved Traffic Control Plan.

It is the policy of the Traffic Engineering Division to randomly monitor the contractor's compliance with all regulations while working on County roadways and within right-of-ways. Matters of public safety shall be attended to immediately upon notification by the County Public Work Director or his designee.

If the contractor is found to be negligent in maintaining proper work zone set-up in accordance with the County's Right-of-Way ordinance (Chapter 312), the County Public Work Director or his designee shall impose penalties in the amount of \$250.00 for working without the proper traffic control.

Construction at or Near Signalized Intersections:

The contractor shall have full responsibility for any work performed at or near any traffic signals in Indian River County. The contractor shall request that the County locate buried interconnect conduit and cable, loop sensors, and pull boxes prior to commencing construction. Any damage to the interconnect conduit, loop sensors, and pull boxes or any other traffic signal equipment shall be repaired at the contractor's expense. It shall be the responsibility of the contractor to notify Traffic Engineering Division a minimum of 72 hours prior to any work being performed near a signalized intersection or flashing beacon.

Once the proper notification and locate procedures are satisfied, the contractor working in or near signalized intersections or around traffic signal poles, signal cabinets, or flashing beacons shall be advised of the following regulations:

1. No excavation shall be performed within a 15-foot radius of any traffic signal pole. If excavation is necessary within a 15-foot radius, it will be the contractors responsibility to provide the following:
 - a. In a manner approved by the County Public Works Director or his designee, the contractor shall provide constant support of the traffic signal pole to prevent movement during excavation and backfill operations.
 - b. Compaction around the excavation site to a 98% density, bringing the backfill up in 1 foot lifts.
 - c. Density reports from a licensed testing company provided to the County Public Works Director.
 - d. Restore the traffic signal and all support equipment to original condition or better.
2. There shall be no pavement cuts made within 500 feet of a signal or flashing beacon without contacting Indian River County Traffic Engineering Division at (772-226-1547), 72 hours prior to construction.
3. Any traffic signal, loop sensors, conduit, interconnect cable, or any support equipment damaged by a contractor shall be repaired/replaced at the contractor's expense.
4. Any contractor that works at or in the vicinity of a signalized intersection shall have full responsibility for any liability incurred by causing damage to signal equipment that results in the failure of the traffic signal functions. If such a failure occurs, the contractor shall notify the police and the Traffic Engineering Division immediately at (772-226-1547).

ORDINANCE NO. 2013 - 012

AN ORDINANCE OF THE BOARD OF COUNTY COMMISSIONERS OF INDIAN RIVER COUNTY, FLORIDA, AMENDING THE CODE OF INDIAN RIVER COUNTY TO ESTABLISH A NEW CHAPTER 316, ENTITLED "FERTILIZER AND LANDSCAPE MANAGEMENT;" ADOPTING THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S MODEL ORDINANCE FOR FLORIDA-FRIENDLY USE OF FERTILIZER ON URBAN LANDSCAPES, WITH MODIFICATIONS; MAKING FINDINGS AND PROVIDING FOR SEVERABILITY, CODIFICATION; DIRECTING COUNTY ATTORNEY'S OFFICE TO POST SUMMARY ON COUNTY WEBSITE, AND AN EFFECTIVE DATE.

WHEREAS, as a result of impairment to Indian River County's surface waters caused by excessive nutrients, or, as a result of increasing levels of nitrogen in the surface and/or ground water within the aquifers or canals within the boundaries of Indian River County, the Board of County Commissioners has determined that the use of fertilizers on lands within Indian River County creates a risk of contributing to adverse effects on surface and/or ground water; and

WHEREAS, in order to address this risk, the Board of County Commissioners has determined that it is not only critical to adopt the Florida Department of Environmental Protection's Model Ordinance for Florida-Friendly Use of Fertilizer on Urban Landscapes, but that as part of Indian River County's science-based, and economically and technically feasible, comprehensive program to address nonpoint sources of nutrient pollution, additional and more stringent standards are necessary in order to adequately address urban fertilizer contributions to nonpoint source nutrient loading to the surface and/or ground water of Indian River County; and

WHEREAS, this ordinance regulates the proper use of fertilizers by any applicator; requires proper training of Commercial Fertilizer Applicators and Institutional Fertilizer Applicators; establishes training and licensing requirements; establishes a Prohibited Application Period; and specifies allowable fertilizer application rates and methods, fertilizer-free zones, low maintenance zones, and exemptions. The ordinance requires the use of Best Management Practices which provide specific management guidelines to minimize negative secondary and cumulative environmental effects associated with the misuse of fertilizers. These secondary and cumulative effects have been observed in and on Indian River County's natural and constructed stormwater conveyances, rivers, creeks, canals, lakes, estuaries and other water bodies. Collectively, these water bodies are an asset critical to the environmental, recreational, cultural and economic well-being of Indian River County residents and the health of the public. Overgrowth of algae and vegetation hinder the effectiveness of flood attenuation provided by natural and constructed stormwater conveyances. Regulation of nutrients, including both phosphorus and nitrogen contained in fertilizer, will help improve and maintain water and habitat quality,

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NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF INDIAN RIVER COUNTY, FLORIDA, THAT:

Section 1. Enactment Authority.

Article VIII, §1 of the Florida Constitution and Chapter 125, Florida Statutes vest broad home rule powers in counties to enact ordinances, not inconsistent with general or special law, for the purpose of promoting the public health, safety and welfare of the residents of the county. The Board specifically determines that the enactment of this ordinance is consistent with general or special law, and is necessary and appropriate to promote the health, safety and welfare of the residents of Indian River County.

Section 2. Findings.

The Board finds that the above “Whereas” clauses are true and correct, and hereby incorporates such clauses as findings of the Board.

Section 3. Adoption of Chapter 316 of the Code of Indian River County (the “Code”).

Chapter 316 of the Code is hereby adopted, as follows (new language is indicated by underline):

Section 316.1. Title.

This chapter shall be known as the “Indian River County Fertilizer and Landscape Management Ordinance.”

Section 316.2. Definitions.

For the purposes of this chapter, the following terms shall have the following meanings:

“Administrator” shall mean the County Administrator, or an administrative official of the County designated by the County Administrator to administer and enforce the provisions of this chapter.

“Application” or “apply” shall mean the actual physical deposit of fertilizer to turf or landscape plants.

“Applicator” shall mean any Person who applies fertilizer on turf and/or landscape plants in Indian River County.

“Board” shall mean the Indian River County Board of County Commissioners.

“Best Management Practices” shall mean turf and landscape practices or combination of practices based on research, field-testing, and expert review, determined to be the most effective

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and practicable on-location means, including economic and technological considerations, for improving water quality, conserving water supplies and protecting natural resources.

“Chapter 85-427” shall mean The Indian River County Environmental Control Act, Chapter 85-427, Special Acts, Laws of Florida.

“Code Enforcement Officer shall mean any designated employee or agent of Indian River County whose duty it is to enforce codes and ordinances enacted by Indian River County.

“Commercial Fertilizer Applicator,” except as provided in §482.1562(9), Florida Statutes, shall mean any person who applies fertilizer for payment or other consideration to property not owned by the person or firm applying the fertilizer or the employer of the applicator.

“Code” shall mean The Code of Indian River County.

“Environmental Control Officer” shall mean the Indian River County Environmental Control Officer appointed by the Board pursuant to Chapter 85-427, and Chapter 303 (Part I) of this Code, and his or her designees.

“Fertilize,” “fertilizing,” or “fertilization” shall mean the act of applying fertilizer to turf, specialized turf, or landscape plants.

“Fertilizer” shall mean any substance or mixture of substances that contains one or more recognized plant nutrients and promotes plant growth, or controls soil acidity or alkalinity, or provides other soil enrichment, or provides other corrective measures to the soil.

“Heavy rain” shall mean rainfall greater than 2 inches in a 24 hour period.

“Institutional Fertilizer Applicator” shall mean any person, other than a private, non-commercial applicator or a Commercial Fertilizer Applicator (unless such definitions also apply under the circumstances), that applies fertilizer for the purpose of maintaining turf and/or landscape plants. Institutional Fertilizer Applicators shall include, but shall not be limited to, owners, managers or employees of public lands, schools, parks, religious institutions, utilities, industrial or business sites and any residential properties maintained in condominium and/or common ownership.

“Landscape plant” shall mean any native or exotic tree, shrub, or groundcover (excluding turf).

“Low maintenance zone” shall mean an area a minimum of ten feet wide adjacent to water courses which is planted and managed in order to minimize the need for fertilization, watering, mowing, etc.

“Person” shall mean any natural person, business, corporation, limited liability company, partnership, limited partnership, association, club, organization, and/or any group of people acting as an organized entity.

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"Restricted Season" shall mean June 1 through September 30.

"Saturated soil" shall mean a soil in which the voids are filled with water. Saturation does not require flow. For the purposes of this chapter, soils shall be considered saturated if standing water is present or the pressure of a person standing on the soil causes the release of free water.

"Slow Release Nitrogen" shall mean nitrogen in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant longer than a reference rapid or quick release product.

"Turf," "sod," or "lawn" shall mean a piece of grass-covered soil held together by the roots of the grass.

"Urban landscape" shall mean pervious areas on residential, commercial, industrial, institutional, highway rights-of-way, or other nonagricultural lands that are planted with turf or horticultural plants. For the purposes of this section, agriculture has the same meaning as in §570.02, Florida Statutes.

Section 316.3. Timing of fertilizer application.

No applicator shall apply fertilizers containing nitrogen and/or phosphorus to turf and/or landscape plants during the Restricted Season, to saturated soils, or during a period in which a Flood Watch or Warning, or a Tropical Storm Watch or Warning, or a Hurricane Watch or Warning is in effect for any portion of Indian River County, issued by the National Weather Service, or if heavy rain is likely.

Section 316.4. Fertilizer-free zones.

Fertilizer shall not be applied within ten feet of any pond, stream, watercourse, lake, canal, or wetland as defined by the Florida Department of Environmental Protection (Chapter 62-340, Florida Administrative Code) or from the top of a seawall. If more stringent Indian River County Code regulations apply, this provision does not relieve the requirement to adhere to the more stringent regulations. Newly planted turf and/or landscape plants may be fertilized in this zone only for a 60-day period beginning thirty days after planting if needed to allow the plants to become well established. Caution shall be used to prevent nutrients from being directly deposited into the water.

Section 316.5. Low maintenance zones.

A voluntary ten foot low maintenance zone is strongly recommended, but not mandated, from any pond, stream, water course, lake, wetland or from the top of a seawall. A swale/berm system is recommended for installation at the landward edge of this low maintenance zone to capture and filter runoff. If more stringent Indian River County Code regulations apply, this provision

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does not relieve the requirement to adhere to the more stringent regulations. Notwithstanding the voluntary nature of the above sentences, no mowed or cut vegetative material may be deposited or left remaining in this zone or deposited in the water. Care should be taken to prevent the over-spray of aquatic weed products in this zone.

Section 316.6. Fertilizer content and application rates.

(a) No fertilizer containing phosphorous shall be applied to turf or landscape plants in Indian River County unless a soil or plant tissue deficiency is verified by a University of Florida, Institute of Food and Agriculture Sciences, approved testing methodology. In the case that a deficiency has been verified, the application of a fertilizer containing phosphorous shall be in accordance with the rates and directions for the Central Region of Florida as provided by Rule 5E-1.003(2), Florida Administrative Code. Deficiency verification shall be no more than 2 years old. However, recent application of compost, manure, or top soil shall warrant more recent testing to verify current deficiencies.

(b) The nitrogen content of fertilizer applied to turf or landscape plants within Indian River County shall contain at least 50% slow release nitrogen per guaranteed analysis label.

(c) Fertilizers applied to an urban lawn or turf within Indian River County shall be applied in accordance with requirements and directions set forth on the label or tag for packaged fertilizer products, or in the printed information accompanying the delivery of bulk fertilizer products, as provided by Rule 5E-1.003(2), Florida Administrative Code, *Labeling Requirements For Urban Turf Fertilizers*. All packaged and bulk fertilizer products sold in Indian River County shall be sold in packages with labels or tags, or, if sold in bulk, be accompanied by printed information, which complies with the requirements of Rule 5E-1.003(2), Florida Administrative Code.

(d) Fertilizer containing nitrogen or phosphorus shall not be applied before seeding or sodding a site, and shall not be applied for the first 30 days after seeding or sodding, except when hydro-seeding for temporary or permanent erosion control in an emergency situation (wildfire, etc.), or in accordance with the Stormwater Pollution Prevention Plan for that site.

Section 316.7. Application practices.

(a) Spreader deflector shields are required when fertilizing via rotary (broadcast) spreaders. Deflectors must be positioned such that fertilizer granules are deflected away from all impervious surfaces, fertilizer-free zones and water bodies, including wetlands.

(b) Fertilizer shall not be applied, spilled, or otherwise deposited on any impervious surfaces.

(c) Any fertilizer applied, spilled, or deposited, either intentionally or accidentally, on any impervious surface shall be immediately and completely removed to the greatest extent practicable.

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(d) Fertilizer released on an impervious surface must be immediately contained and either legally applied to turf or any other legal site, or returned to the original or other appropriate container.

(e) In no case shall fertilizer be washed, swept, or blown off impervious surfaces into stormwater drains, ditches, conveyances, or water bodies.

Section 316.8. Management of grass clippings and vegetative materials.

In no case shall grass clippings, vegetative material, and/or vegetative debris be washed, swept, or blown off into stormwater drains, ditches, conveyances, water bodies, wetlands, or sidewalks or roadways. Any material that is accidentally so deposited shall be immediately removed to the maximum extent practicable.

Section 316.9. Exemptions.

The provisions set forth above in this chapter shall not apply to:

(a) bona fide farm operations as defined in the Florida Right to Farm Act, § 823.14, Florida Statutes;

(b) other properties not subject to or covered under the Florida Right to Farm Act that have pastures used for grazing livestock;

(c) any lands used for bona fide scientific research, including, but not limited to, research on the effects of fertilizer use on urban stormwater, water quality, agronomics, or horticulture.;

(d) golf courses when landscaping is performed within the provisions of the Florida Department of Environmental Protection document, “Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses”, these provisions shall be followed when applying fertilizer to golf course practice and play areas;

(e) athletic fields at public parks and school facilities that apply the concepts and principles embodied in the Florida Green BMPs, while maintaining the health and function of their specialized turf areas;

(f) vegetable gardens owned by individual property owners or a community, and trees grown for their edible fruit.

Section 316.10. Training.

(a) Within the time period set forth in section 316.12 of this Chapter, all Commercial Fertilizer Applicators and Institutional Fertilizer Applicators within Indian River County shall abide by and successfully complete the six-hour training program in the “Florida-friendly Best

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Management Practices for Protection of Water Resources by the Green Industries” offered by the Florida Department of Environmental Protection through the University of Florida Extension “Florida-Friendly Landscapes” program, or an approved equivalent.

(b) Private, non-commercial applicators are encouraged to follow the recommendations of the University of Florida Institute of Food and Agriculture Sciences Florida Yards and Neighborhoods program when applying fertilizers.

Section 316.11. General education program.

The Public Works Department shall have an employee who shall address issues pertaining to this Chapter. This employee shall implement a program to inform the general public of the requirements of this chapter, which program shall include, among other things, informative postings on the County website, printing and distributing informative brochures and other print materials, and speaking engagements at community associations, civic organizations, etc. The program shall also include, to the extent practicable, use of any materials from the Be Floridian program and coordination and collaboration with University of Florida Institute of Food and Agriculture Sciences educational activities. Any claimed or alleged deficiency in the County’s general education program shall not constitute a defense to any action brought to enforce the provisions of this chapter.

Section 316.12. Licensing of commercial fertilizer applicators.

(a) No later than December 31, 2013, all Commercial Fertilizer Applicators within Indian River County, shall abide by and successfully complete training and continuing education requirements in the “Florida-friendly Best Management Practices for Protection of Water Resources by the Green Industries,” offered by the Florida Department of Environmental Protection through the University of Florida Institute of Food and Agriculture Sciences “Florida-friendly Landscapes” program, or an approved equivalent program, prior to obtaining an Indian River County Local Business Tax Certificate for any category of occupation which may apply any fertilizer to turf and/or landscape plants. Commercial Fertilizer Applicators shall provide proof of completion of the program to the Indian River County Tax Collector’s Office within 180 days of the effective date of this ordinance.

(b) After December 31, 2013, all Commercial Fertilizer Applicators within Indian River County shall have and carry in their possession at all times when applying fertilizer, evidence of certification by the Florida Department of Agriculture and Consumer Services as a Commercial Fertilizer Applicator per Rule 5E-14.117(18), Florida Administrative Code.

(c) All businesses applying fertilizer to turf and/or landscape plants (including but not limited to residential lawns, golf courses, commercial properties, and multi-family and condominium properties) must ensure that at least one employee has a “Florida-friendly Best Management Practices for Protection of Water Resources by the Green Industries” training certificate prior to the business owner obtaining a Local Business Tax Certificate. Owners for any category of

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occupation which may apply any fertilizer to turf and/or landscape plants shall provide proof of completion of the program to the Indian River County Tax Collector's Office.

Section 316.13. Enforcement.

This chapter may be enforced by the Code Enforcement Officer in the Public Works Department who is devoted to issues pertaining to this Chapter, pursuant to Chapter 162, Florida Statutes, and §103.07 of this Code. In addition, this chapter may be enforced by the Environmental Control Officer pursuant to Chapter 85-427, Special Acts, Laws of Florida, and §303.14 of this Code. Penalties and remedies for violations shall be as set forth in §100.05 of this Code, and, to the extent applicable, Chapter 85-427, Special Acts, Laws of Florida. Funds generated by penalties imposed under this section shall be used by Indian River County for the administration and enforcement of §403.9337, Florida Statutes, and the corresponding sections of this chapter, and to further water conservation and nonpoint pollution prevention activities.

Section 316.14. References to state law.

Any references in this chapter to Florida Statutes, rules or regulations shall refer to such statutes, rules or regulations, as amended from time to time.

Section 316.15. Applicability.

This chapter shall be applicable to and shall regulate any and all applicators of fertilizer and areas of application of fertilizer within the area of Indian River County, unless such applicator is specifically exempted; provided, however, that this chapter shall not apply within the limits of any municipality which has adopted an ordinance regulating the same subject matter. This chapter shall be prospective only, and shall not impair any existing contracts.

Section 4. Severability.

If any part of this ordinance is held to be invalid or unconstitutional by a court of competent jurisdiction, the remainder of this ordinance shall not be affected by such holding and shall remain in full force and effect.

Section 5. Codification.

It is the intention of the Board of County Commissioners that the provisions of this ordinance shall become and be made part of the Indian River County Code, and that the sections of this ordinance may be renumbered or re-lettered and the word ordinance may be changed to section, article or such other appropriate word or phrase in order to accomplish such intention.

ORDINANCE NO. 2013 - 012

Section 6. Directing County Attorney's Office to Post Summary on County Website.

The County Attorney's Office is directed to post a summary of this ordinance on the County's website within 15 days of the filing of this ordinance with the Florida Department of State.

Section 7. Effective Date.

This ordinance shall become effective 45 days after the filing of the ordinance with the Florida Department of State.

This ordinance was advertised in the Vero Beach Press Journal, on the 8th day of July, 2013, for a public hearing to be held on the 18th day of July, 2013, and on the 10th day of August, 2013 for an additional public hearing to be held on the 20th day of August, 2013, at which time it was moved for adoption by Commissioner Solari, seconded by Commissioner O'Bryan, and adopted by the following vote:

Chairman Joseph E. Flescher	<u>AYE</u>
Vice Chairman Wesley S. Davis	<u>AYE</u>
Commissioner Peter D. O'Bryan	<u>AYE</u>
Commissioner Bob Solari	<u>AYE</u>
Commissioner Tim Zorc	<u>AYE</u>

The Chairman thereupon declared the ordinance duly passed and adopted this 20th day of August, 2013.



**BOARD OF COUNTY COMMISSIONERS
INDIAN RIVER COUNTY, FLORIDA**

By: Joseph E. Flescher
Joseph E. Flescher, Chairman

ATTEST: Jeffrey R. Smith, Clerk and Comptroller

Approved as to form and legal sufficiency:

By: Jeffrey R. Smith
Deputy Clerk

Dylan Reingold
Dylan Reingold, County Attorney

EFFECTIVE DATE: This ordinance was filed with the Florida Department of State on the _____ day of _____, 2013.

Indian River County Department of Utility Services



Water & Wastewater Utility Standards

May 2019

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W-2	Fire Hydrant Detail
W-2 A	Fire Hydrant Detail Notes
W-3	Manual 2" Blow-Off
W-4	Water Service (Inside Right-of-Way)
W-4 A	Water Service (Outside Right-of-Way)
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W-5 A	Meter Box Typical Pre-Plumbed (Enclosed)
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S-2	Modified Riser Lateral (Deep Sewer)
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S-13	Force Main Tie-In to Manhole

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S-14 A	Wetwell/Valve Vault – Concrete Structure Details - Section View - Typical Wastewater Pumping Station
S-15	Wetwell/Valve Vault - Pump, Piping and Mechanical Detail – Plan View - Typical Wastewater Pumping Station
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S-19 A	Pumping Station General Notes (Continued) - Typical Wastewater Pumping Station
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M-17 A	Route Survey Requirements (Continued)

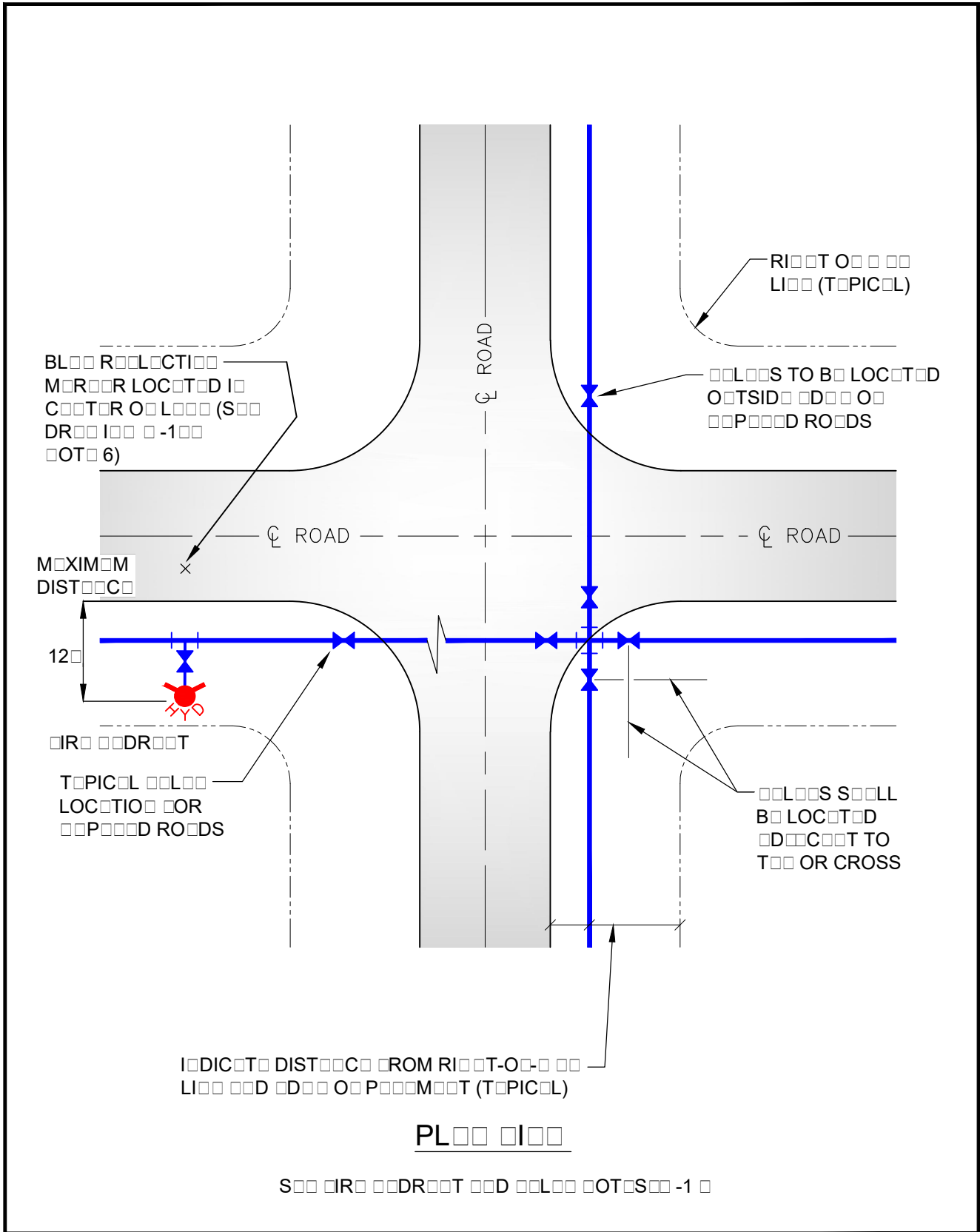
III. SPECIFICATIONS

SECTIONS NUMBERS

1. Water Mains – Ductile Iron Pipes (DIP) and Fittings
2. Water Mains – Polyvinyl Chloride (PVC) Pipe and Fittings
3. Water Services - Crosslinked Polyethylene (PEXa) Tubing and Water Mains - High Density Polyethylene Pipe (HDPE)
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7. Wastewater Force Mains – Polyvinyl Chloride Pipes (PVC) and Fittings
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IV. PERMIT APPLICATIONS & CHECK LIST

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- B. Industrial Waste Permit Application Form
- C. Utilities Construction Check Lists



INDICATE RIGHT OF WAY
 DEPARTMENT OF
 UTILITIES SERVICES

RIGHT OF WAY AND
 LANE LOCATIONS

DRIVE IN
 -1

NOTES

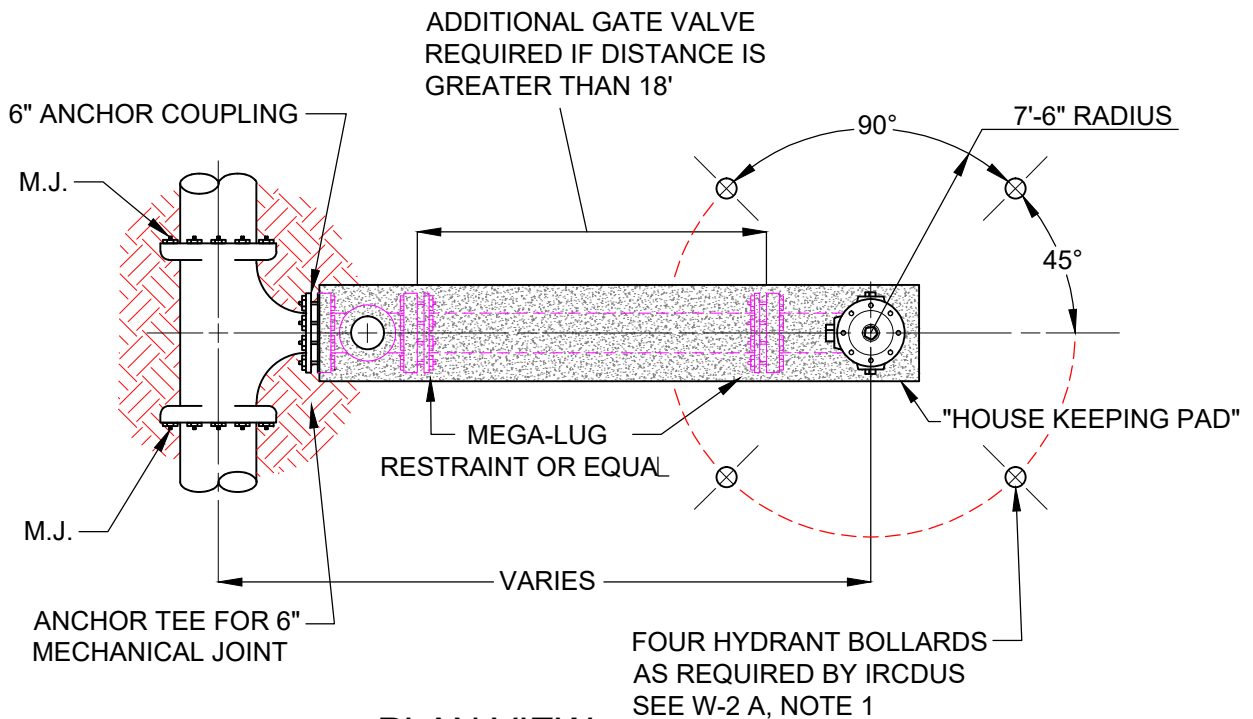
1. ALL SPECIFICATIONS OR OTHER MATERIALS SHALL NOT EXCEED 1000.
2. MINIMUM COVER OR 36" IS REQUIRED ABOVE THE TOP OF ALL PIPE BUILDS.
3. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF BLIND REFLECTOR MIRRORS (RPM) INDICATING FIRE EXITS ABOVE REFLECTOR MIRROR SHALL BE LOCATED IN THE CENTERLINE OF THE LANE CLOSEST TO THE EXITS.
4. DOD AND LISTS SHALL BE RESTRICTED.
5. ALL LISTS SHALL BE A MINIMUM 10 FEET FROM BUILDINGS.
6. REFLECTOR MIRROR (RPM) OR FIRE EXITS SHALL BE BLIND.
7. REFLECTOR MIRRORS SHALL BE INDEXED TO PERMITS IT IS A DOT APPROVED PRODUCT.
8. SEE DRAWING S-6 FOR M-6 LANE BOX AND M-7 LANE BOX PLAN.
9. ALL FIRE EXITS AND LANE COVERS SHALL BE PAINTED RED ALL IN-LINE AND LANE COVERS SHALL BE PAINTED BLUE.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

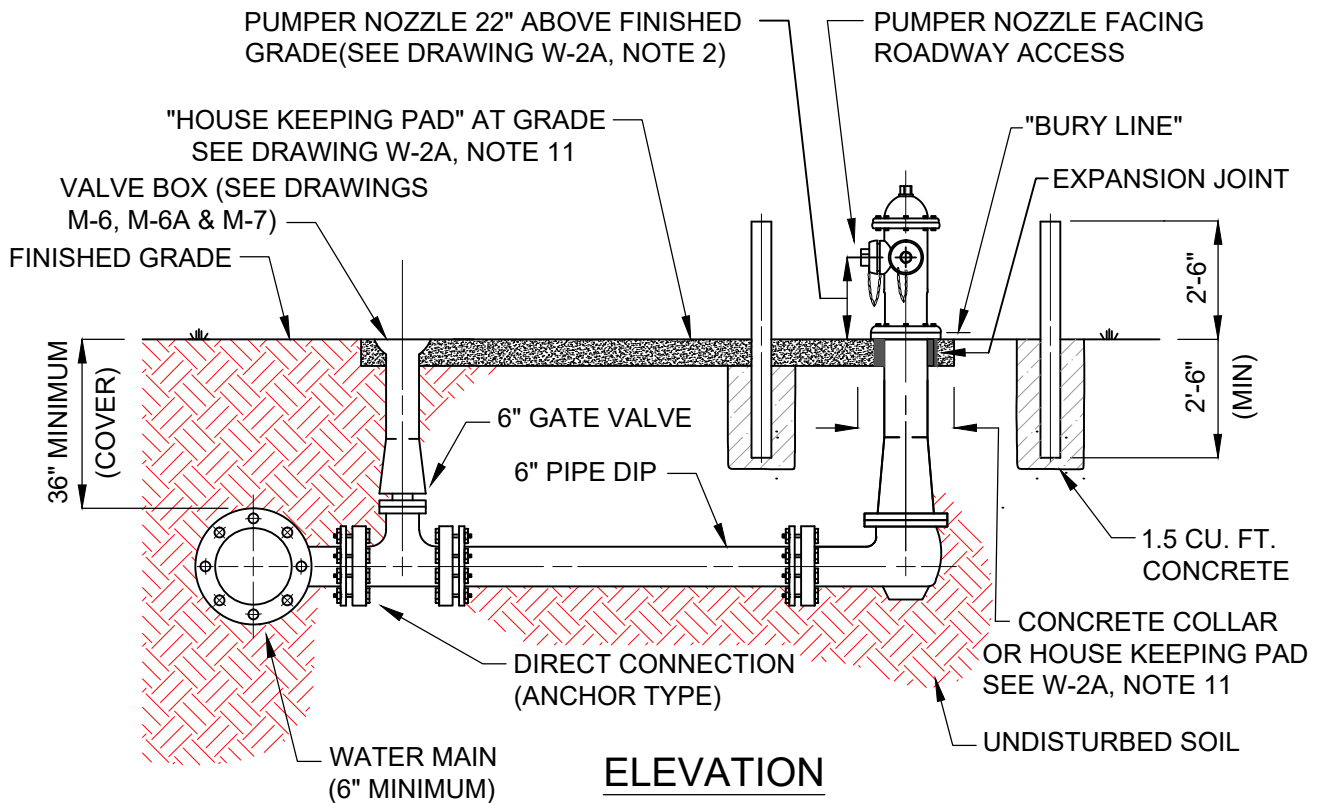
FIRE EXITS AND
ALL NOTES

DRAWING
NO.
-1
□

MAY 2010



PLAN VIEW



ELEVATION

SEE DRAWING, No. W-2 A, FIRE HYDRANT DETAIL NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

FIRE HYDRANT
DETAIL

DRAWING
NO.

W-2

MAY 2019

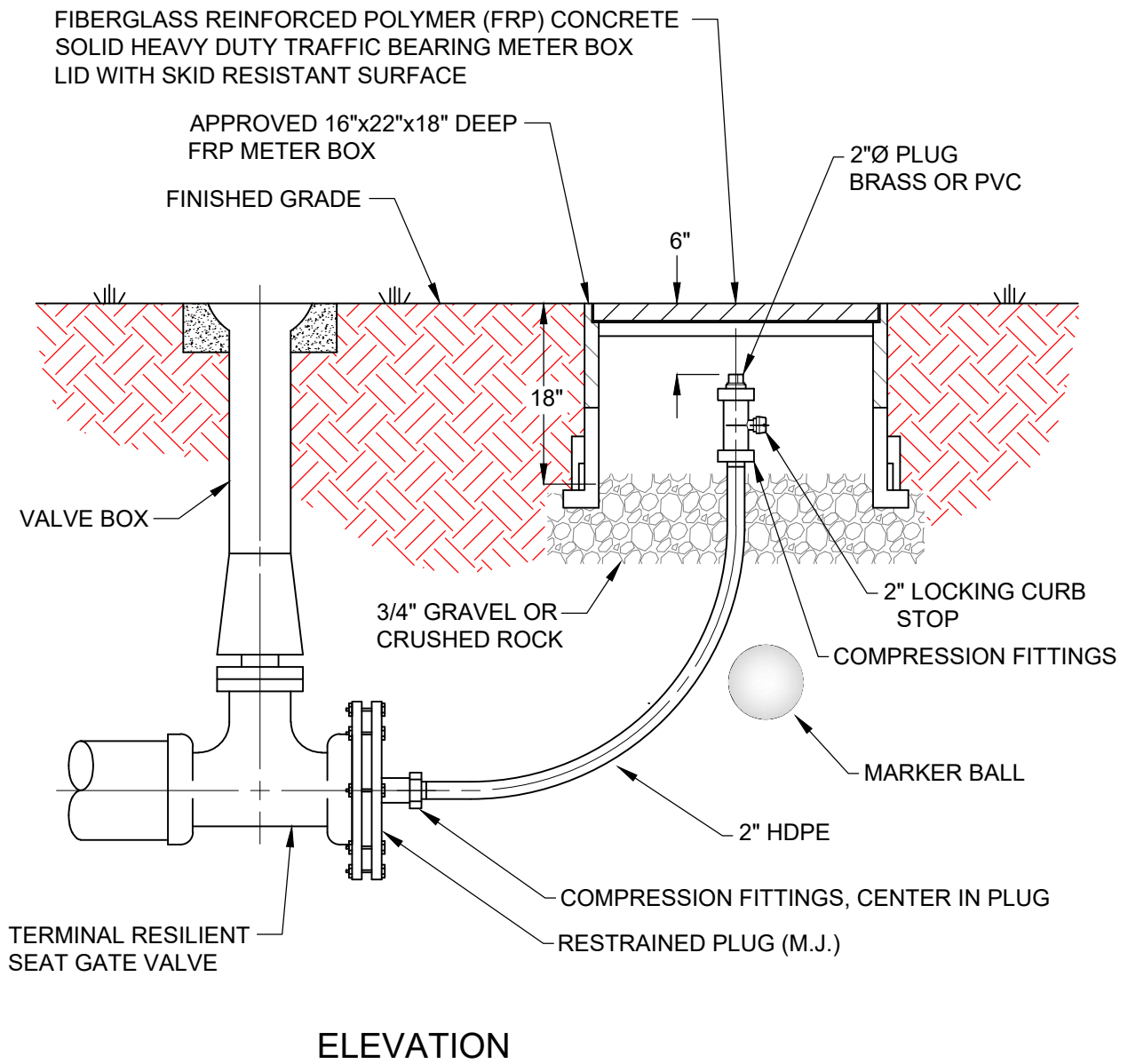
NOTES

1. DRIP BOLLARD TO BE 4" DIAMETER ALUMINUM STAINLESS STEEL OR DUCTILE IRON PIPE FILLED WITH CONCRETE OR OTHER REQUIRED BACKFILL TO BE POINTED ROUNDSOME DRIPOTS AND LOW CORNER
2. THE DRIP SHOULD BE SET SUCH THAT THE "BORN LINE" OF THE DRIP BARRREL IS SET AT LEAST 2" OR MORE FROM THE OPERATING PART OF THE PUMP OR OTHER MINIMUM OF 22" ABOVE LEAST 2"
3. ALL DRIPOTS SHALL BE TRAPIC BARREREL TOP
4. COMPLETE COORD IR DRIP ASSEMBLY MAY BE UTILIZED IN LINE OF BARREREL
5. IR DRIP SHOULD BE LOCATED MINIMUM 3" FROM MAXIMUM 12" FROM END OF PIPING OR OTHER POSSIBLE
6. ALL MATERIALS ARE TO BE PER IRCDS APPROVED MANUFACTURERS PRODUCT LIST
7. TRAP IR TO BE INSTALLED AS PER DRIP ILLUSTRATION M-14 TRAP IR DETAIL (OR CLARITY THE TRAP IR IS NOT SHOWN IN DRIP ILLUSTRATION -2 IR DRIP DETAIL)
8. MATERIAL CLEARANCE RADIUS OF 7'6" AROUND DRIP PERPENDICULAR TO ROAD OR CURB EDGE (EXAMPLE MUST BE CLEAR OF SIDEWALKS, STAIRS, TRASH CANS, UTILITIES, ETC.)
9. DRIPOTS AND PROTECTION DEVICES SHALL BE CLEARANCE OF 7'6" IN FRONT AND TO THE SIDES OF THE IR DRIP ITSELF 4" MINIMUM CLEARANCE TO THE REAR OF THE DRIP UNLESS THE LOCAL (MUNICIPALITY OR JURISDICTION) REGULATIONS REQUIRE CLEARANCE
10. SAND DRIP ILLUSTRATION M-6 SHALL BE BOX DETAIL M-6 SHALL BE BOX DETAIL NOTES AND M-7 SHALL BE BOX PAD
11. OCS PIPE PAD IS REQUIRED OCS PIPE PAD SHALL BE 6" THICK x 2' ID (MINIMUM) AND LOCATED AT LEAST 2" FROM BARREREL OR ALUMINUM SHALL BE 2" ABOVE OCS PIPE PAD (SAND DRIP ILLUSTRATION -2 IR DRIP DETAIL)

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

IR DRIP
DETAIL NOTES

DRIP
-2



NOTES:

1. BLOW-OFF TO BE LOCATED AT ALL DEAD END LINES AND ALIGNED WITH PROPERTY LINES AS REQUIRED BY IRCBUS.
2. ALL MATERIALS ARE TO BE PER IRCBUS APPROVED MANUFACTURERS' PRODUCT LIST.
3. METHODS OF RESTRAINT AS APPROVED BY IRCBUS.
4. TRACE WIRE TO BE INSTALLED PER DRAWING, No. M-14, TRACE WIRE DETAILS.
5. ELECTRONIC MARKER BALLS ARE TO BE LOCATED ADJACENT TO ALL BOXES AND PLACED IN ALL METER BOXES WITHIN 24" FROM SURFACE.
6. ALL BLOW-OFFS SHALL BE LOCATED FROM 4'-6' OF THE TERMINAL VALVE.

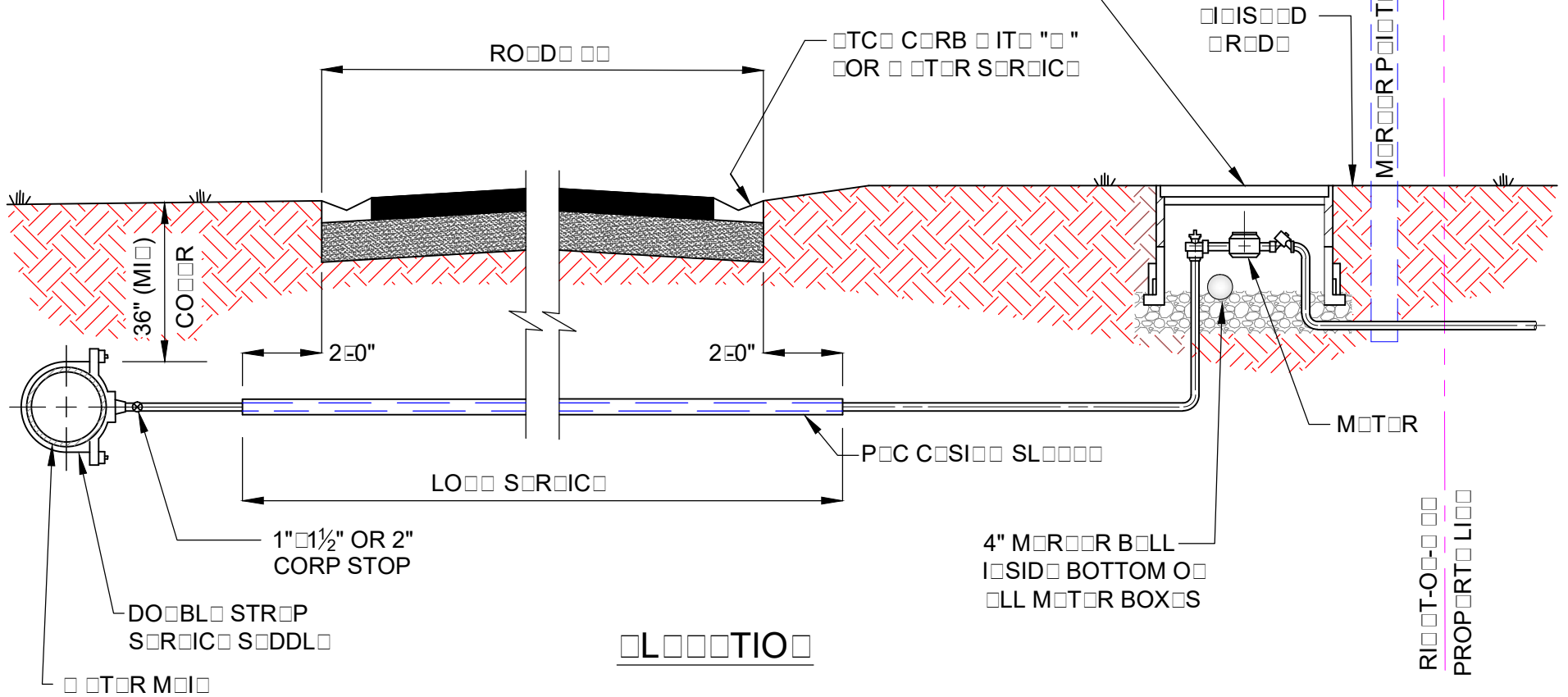
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

MANUAL
2" BLOW-OFF

DRAWING
NO.
W-3

MOTORS SHALL BE LOCATED IMMEDIATELY INSIDE TO THE RIGHT OF THE
 CLASSIFICATION IS DIRECTED BY IRCD'S

MOTOR BOX IT SHALL BE CONCRETE OR POLYMER (GRP) CONCRETE
 SOLID DUCT TRAFFIC BARRIER MOTOR BOX LID IT SHALL RESIST
 SERRATED SLIT 315 SS PILES DRILLING -6



LEGEND

SDRILLING -6 B
 TOR SERVICE PITS

INDIRECT REPAIR CONTACT
 DEPARTMENT OF
 TILIT SERVICES

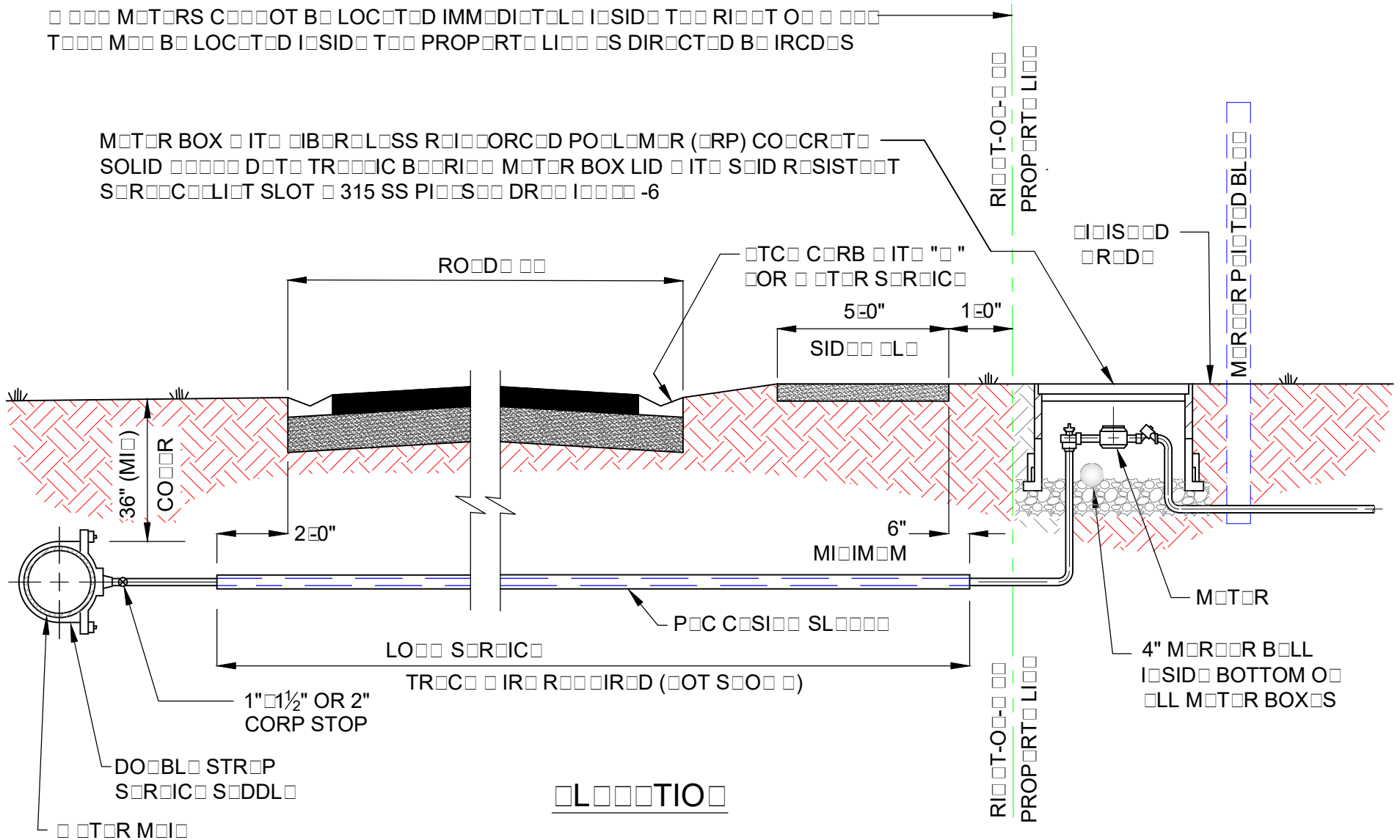
TOR SERVICE
 INSIDE OF RIGHT OF WAY

DRAWING NO.
-4

MO 2011

MOTORS CANNOT BE LOCATED IMMEDIATELY INSIDE TOWER RIGHT OF WAY
 TOWER MUST BE LOCATED INSIDE TOWER PROPERTY LINE AS DIRECTED BY RCDS

MOTOR BOX IS TO BE REINFORCED POLYMER (FRP) CONCRETE
 SOLID REINFORCED CONCRETE MOTOR BOX LID IS TO BE SOLID REINFORCED
 SERRATED SLOT 315 SS PIPES DRIP -6



MAY 2010

DRAWING NO. -4

SERVICES -4 B
 SERVICES NOTES

INDIAN RIVER COUNTY
 DEPARTMENT OF
 UTILITIES

TOWER SERVICE
 OUTSIDE OF RIGHT OF WAY

NOTES:

1. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE A MINIMUM OF 18" ON CENTER.
2. ALL SERVICES REQUIRE 36" MINIMUM COVER.
3. MINIMUM SERVICE SIZE SHALL NOT BE LESS THAN 1" Ø. DUAL SERVICES SHALL BE A MINIMUM OF 1 ½" Ø. TRIPLE SERVICES SHALL BE 1 MINIMUM OF 2" Ø. QUADRUPLE SERVICES SHALL BE APPROVED BY IRCDUS.
4. 1" Ø & 1 ½" Ø LONG SERVICES REQUIRE A 2" MINIMUM I.D. CASING SLEEVE. 2" Ø LONG SERVICES REQUIRE A 3" MINIMUM CASING SLEEVE. CASING SLEEVE SHALL BE SCHEDULE 40 P.V.C.
5. ALL METERS 2" Ø OR SMALLER SHALL BE SUPPLIED AND INSTALLED BY IRCDUS. ALL METERS GREATER THAN 2" Ø SHALL BE SUPPLIED AND INSTALLED BY THE DEVELOPER PROPERTY OWNER. REFER TO APPROVED MANUFACTURERS' PRODUCT LIST FOR METERS GREATER THAN 2" Ø.
6. PIN LOCKS WITH PLASTIC DUST CAPS SHALL BE PURCHASED BY THE DEVELOPER AND/OR CONTRACTOR AND SHALL BE INSTALLED ON ALL LOCKING CURB STOPS INSIDE METER BOX, SAMPLING POINTS, AND WATER SERVICE CONNECTIONS AT THE TIME OF ACTIVATING ALL WATER MAINS OR AT SUCH TIME AS DIRECTED BY IRCDUS.
7. CURB STOPS SHALL BE THE SAME SIZE AS THE METERS THAT ARE INSTALLED.
8. TRACE WIRE TO BE INSTALLED AS PER DRAWING, No. M-14, TRACE WIRE DETAILS.
9. PLACE A 4" ELECTRONIC MARKER BALL INSIDE BOTTOM OF ALL METER BOXES.
10. ALL RESIDENTIAL AND ONE ERU SERVICES SHALL BE 5/8" METERS.
11. OPEN BOTTOM AND PRE-PLUMBED (ENCLOSED) METER BOXES ARE ACCEPTABLE.
12. ALL METER BOXES TO BE PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.
13. AN UNOBSTRUCTED CLEAR ZONE IS REQUIRED AROUND ALL METER BOXES. (SEE DRAWING, No. W-6 A.)

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

WATER SERVICE
NOTES

DRAWING
NO.
W-4
B

MAY 2019

NOTES

1. ALL BUILDINGS WITH FIRE PROTECTION SYSTEMS MUST HAVE AN IRCD'S APPROVED DETECTOR CIRCUMFERENCE MOTOR INSTALLED ON THEIR PROPERTY DETECTOR CIRCUMFERENCE SHALL BE INSTALLED IN ACCORDANCE WITH STATE FIRE MARSHALL CODE AND IRCD'S STANDARDS CIRCUMFERENCE MOTOR SHALL BE MOUNTED ABOVE ROOF
2. DOUBLE DETECTOR CIRCUMFERENCE ASSEMBLIES SHALL BE INSPECTED TESTED CERTIFIED AND REPORTED ON AN ANNUAL BASIS IN ACCORDANCE WITH THE IIDI RRIR COMMITTEE CROSS CONNECTION CONTROL PROGRAM REQUIREMENTS
3. THE IIDI RRIR COMMITTEE CROSS CONNECTION CONTROL PROGRAM REQUIREMENTS CAN BE FOUND AT ircutilities.com/ccp.htm
4. COCRETE PAD SHALL BE CONSTRUCTED WITH 3000 PSI COMMERCIAL GRADE REBAR MESH COCRETE PAD SHALL BE MINIMUM 6" THICK (LAP TO BE REBAR)
5. MINIMUM 4" SCHEDULE TOP REBAR WITH 4" GAP BETWEEN
6. ALL PIPE AND FITTINGS SHALL BE LAPPED DUCTILE IRON PER IRCD'S APPROVED MANUFACTURERS PRODUCT LIST
7. OPEN SECTION OF DUCTILE IRON PIPE IS REBAR ON EACH SIDE OF DOUBLE-CIRCUMFERENCE ASSEMBLY
8. ALL ABOVE GROUND PIPE AND FITTINGS SHALL BE LAPPED MOTOR ASSEMBLY SHALL BE PAINTED WITH RED POLYURETHANE COATING
9. DETAILS SHOWN IN DRAWING -10 DOUBLE-DETECTOR CIRCUMFERENCE ASSEMBLY CAN BE MODIFIED AND APPROVED BY IRCD'S OR IIDI IDIOL PROJECT

TEMPORARY JUMPER DETAIL NOTES

1. A TEMPORARY JUMPER CONNECTION IS TO BE USED FOR FILLING ANY NEW WATER MAIN OF ANY SIZE FROM THE EXISTING ACTIVE WATER MAINS AND FOR THE FLUSHING OF NEW MAINS UP TO 6" DIAMETER (2.5 FPS MINIMUM VELOCITY) AND FOR PULLING BACTERIOLOGICAL SAMPLES FROM ANY NEW WATER MAIN OF ANY SIZE.
2. TIE-IN VALVE SHALL BE OPERATED BY IRCDUS PERSONNEL ONLY AND IN THE PRESENCE OF THE ENGINEER OF RECORD.
3. IRCDUS SHALL PROVIDE METER FOR SERVICE AFTER APPLICATION, DEPOSIT AND ALL FEES HAVE BEEN PAID.
4. A 2" TEMPORARY JUMPER TO BE USED UNLESS OTHERWISE DIRECTED BY IRCDUS.
5. ALL INSTALLATION AND MAINTENANCE OF THE TEMPORARY JUMPER CONNECTION AND ASSOCIATED BACKFLOW PREVENTION DEVICE, FITTINGS, VALVES, ETC., SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. ALL MATERIALS TO BE PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.
7. PIPE AND FITTINGS USED FOR CONNECTING THE NEW PIPE TO THE EXISTING PIPE SHALL BE DISINFECTED WITH LIQUID CHLORINE (SODIUM HYPOCHLORITE) PRIOR TO INSTALLATION IN ACCORDANCE WITH AWWA C651, LATEST EDITION. THE TAPPING SLEEVE AND EXTERIOR OF THE MAIN TO BE TAPPED SHALL BE DISINFECTED BY SPRAYING OR SWABBING PER AWWA C651 SECTION TWO. THE USE OF CHLORINE TABLETS IS STRICTLY PROHIBITED.
8. THE JUMPER CONNECTION SHALL ALSO BE USED TO MAINTAIN A MINIMUM PRESSURE OF 20 PSI IN THE NEW MAINS CONTINUOUSLY AFTER DISINFECTION AND UNTIL FDEP CLEARANCE LETTER IS OBTAINED.
9. PRESSURE GAUGES ARE REQUIRED ON EACH SIDE OF THE 2" GATE OR BALL VALVE.
10. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION DEMONSTRATING THAT THE REDUCED PRESSURE ZONE BACKFLOW PREVENTER (RPZ) IS IN GOOD WORKING ORDER AT THE TIME OF INSTALLATION, AND PROVIDE DOCUMENTATION THAT THE RPZ HAS BEEN TESTED BY A QUALIFIED BACKFLOW TECHNICIAN AS APPROVED BY IRCDUS. THE CONTRACTOR SHALL HAVE EACH RPZ TESTED PRIOR TO USE ON EACH PROJECT.
11. EXCEPT AS REQUIRED TO FLUSH LINES GREATER THAN 6" DIAMETER, THE TIE-IN VALVE SHALL REMAIN CLOSED AND SHALL BE LOCKED IN THE CLOSED POSITION BY THE UTILITY COMPANY. THE TIE-IN VALVE SHALL REMAIN LOCKED CLOSED UNTIL THE NEW SYSTEM HAS BEEN CLEARED FOR USE BY THE FDEP.
12. THE JUMPER CONNECTION SHALL BE MAINTAINED UNTIL CLEARANCE FOR USE FROM THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) AND OTHER PERTINENT AGENCIES HAS BEEN RECEIVED.
13. UPON RECEIPT OF CLEARANCE FOR USE BY FDEP, THE CONTRACTOR SHALL REMOVE TEMPORARY JUMPER CONNECTION. THE CORPORATION STOPS ARE TO BE CLOSED AND PLUGGED WITH 2" BRASS OR PVC PLUGS.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

TEMPORARY JUMPER
DETAIL NOTES

DRAWING
NO.

W-13

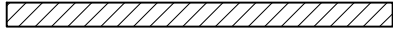
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MAY 2019

IBRLOSS RORCORD POLMR (RP) COCRT LID
 IT SID RESISTOT SRC

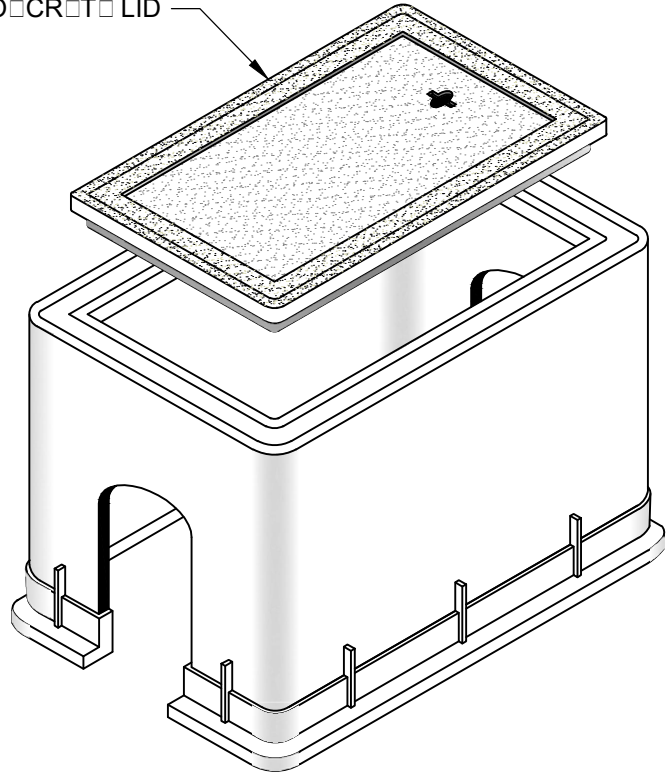


IBRLOSS RORCORD POLMR (RP) COCRT LID



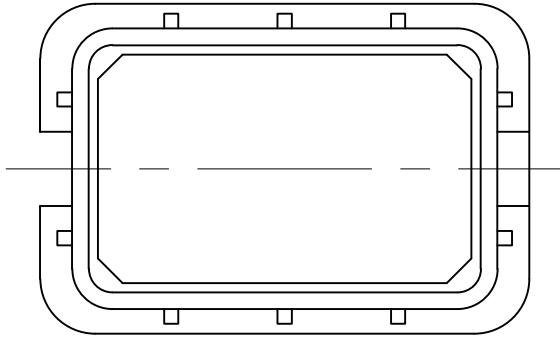
SOLID MOTOR BOX LID
 -7 OT 7

RADIO RORCORD MOTOR BOX LID
 BRORCORD SRC -7 OT 8

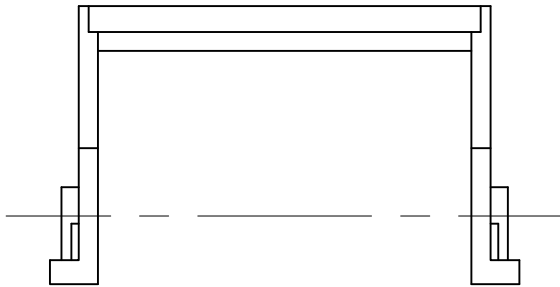


MOTOR BOX IT LID

IBRLOSS RORCORD POLMR (RP) COCRT TOP BOTTOM MOTOR BOX



TOP



SECTION

SDR I -4B TR SRC OTS

IDI RR CO
 DPTM O
 TILIT SRC

MOTOR BOX
TYPICAL OP BOTTOM

DR I
 O

-5

FIBERGLASS REINFORCED POLYMER (FRP) CONCRETE LID WITH SKID RESISTANT SURFACE

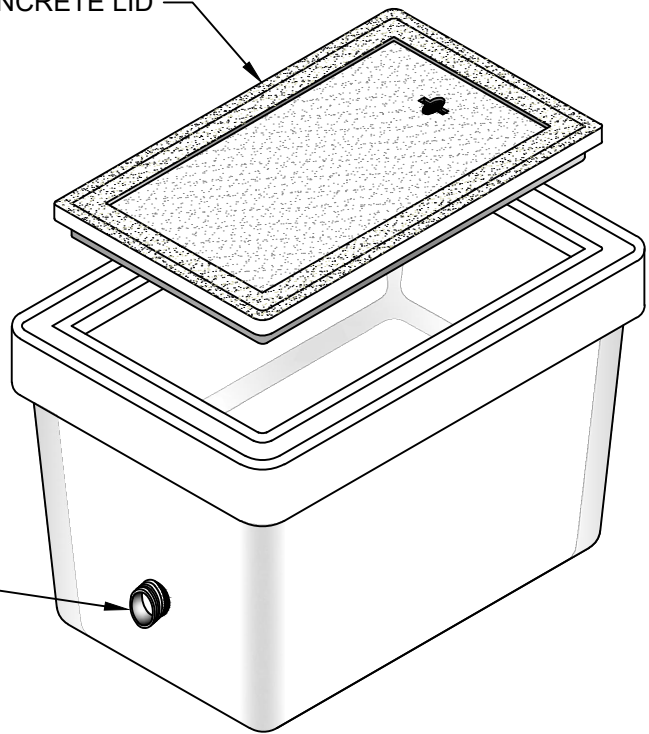
HINGED CAST IRON METER BOX LID

HEAVY DUTY, SOLID METER BOX LID
SEE W-7A NOTE 7

RADIO READ METER BOX LID MAY BE REQUIRED. SEE W-7A NOTE 8

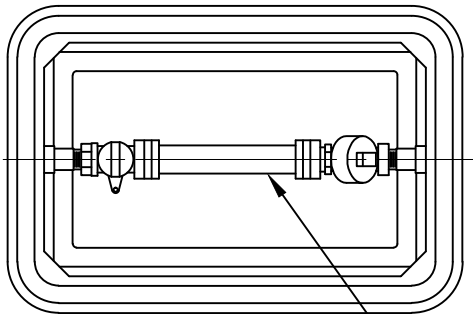
METER BOX LID

PRE-INSTALLED WATER TIGHT GASKET



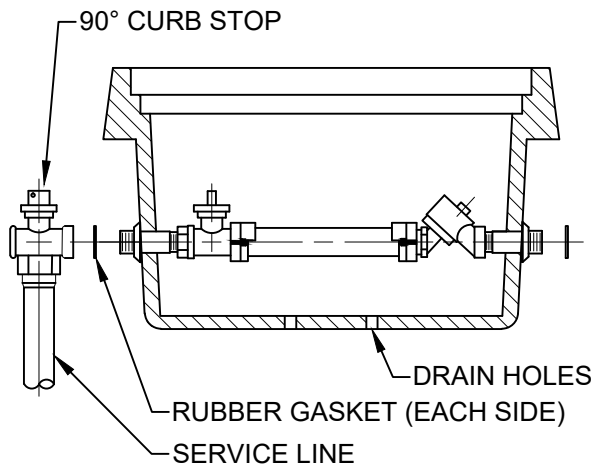
METER BOX WITH LID

FIBERGLASS REINFORCED POLYMER (FPR) CONCRETE, OPEN BOTTOM METER BOX

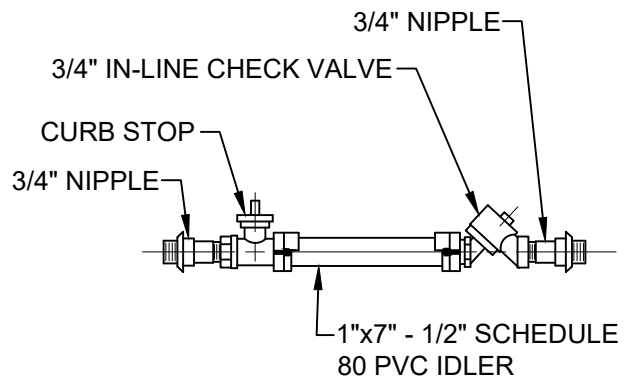


TOP VIEW

— IDLER (SEE DETAIL "A")



SECTION VIEW



DETAIL "A"

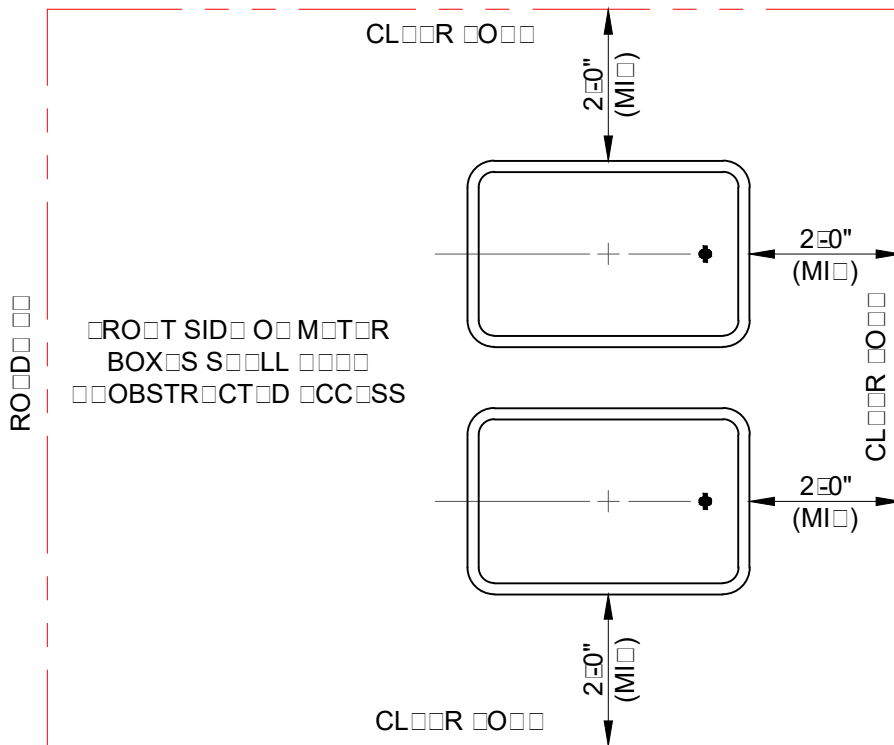
SEE DRAWING, No. W-4B, WATER SERVICE NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

METER BOX
TYPICAL PRE-PLUMBED
(ENCLOSED)

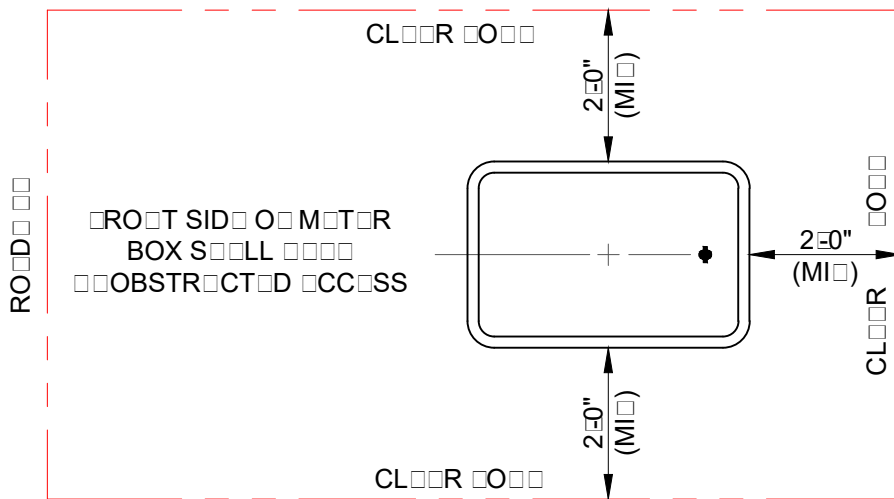
DRAWING
NO.
W-5
A

MAY 2019



CLEAR FOR MOTOR BOXES OR
 OBSTRUCTION OTHER THAN SOD

DRAWING



SIDE DRAWING

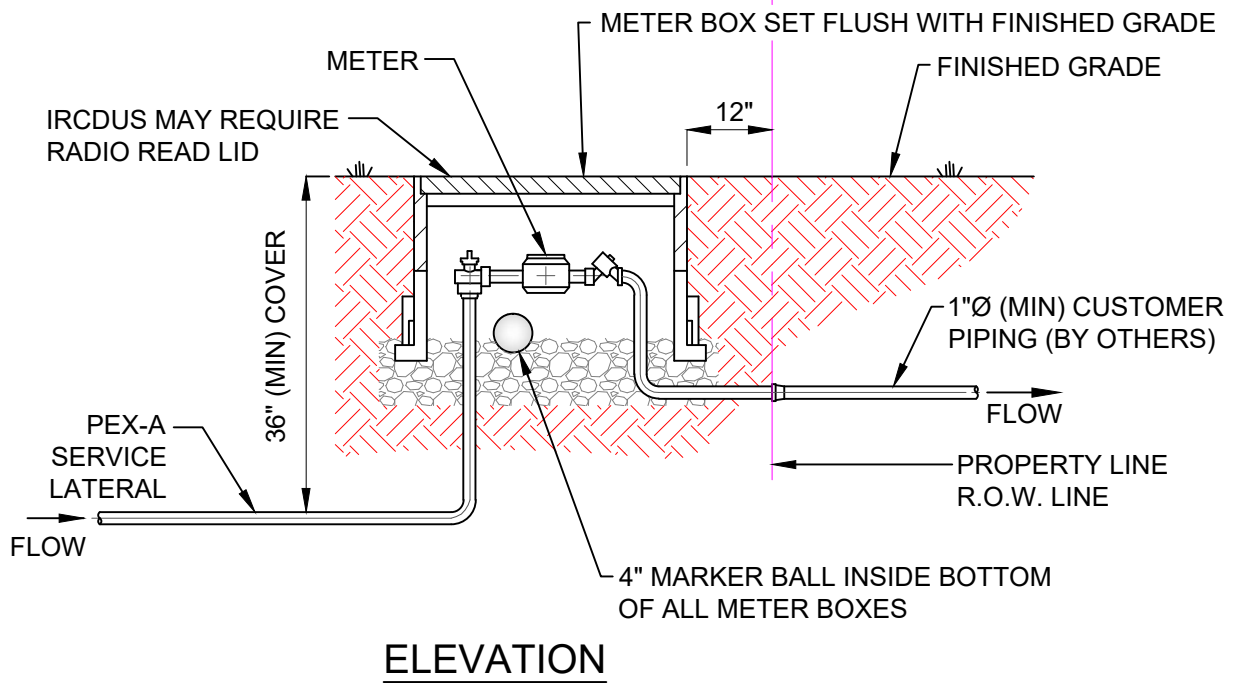
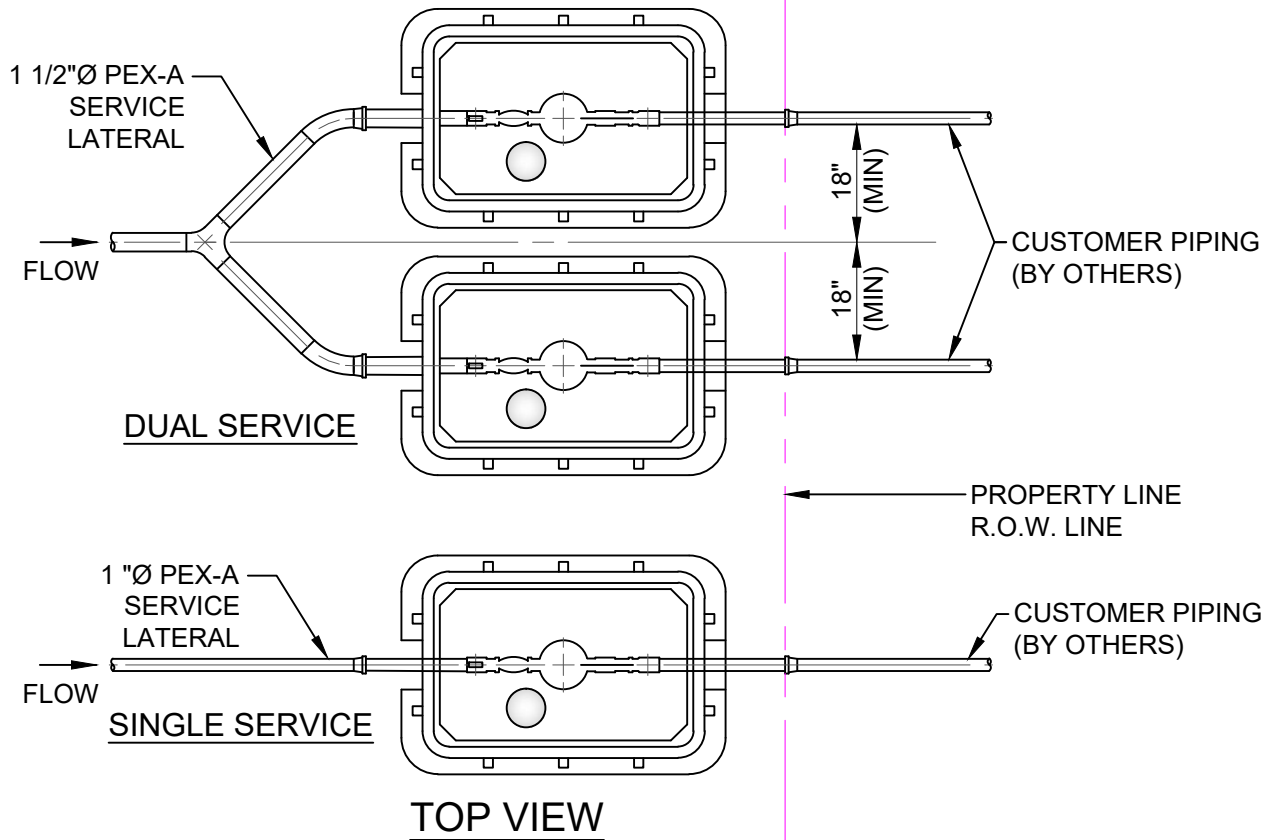
TOP VIEW

SEE DRAWING 4-B FOR MOTOR BOX ACCESS OTHER THAN 12

INDICATE RIGHT CORNER
 DEPARTMENT OF
 TILTING SERVICES

MOTOR BOX
 ACCESS

DRAWING
 NO.
 -6



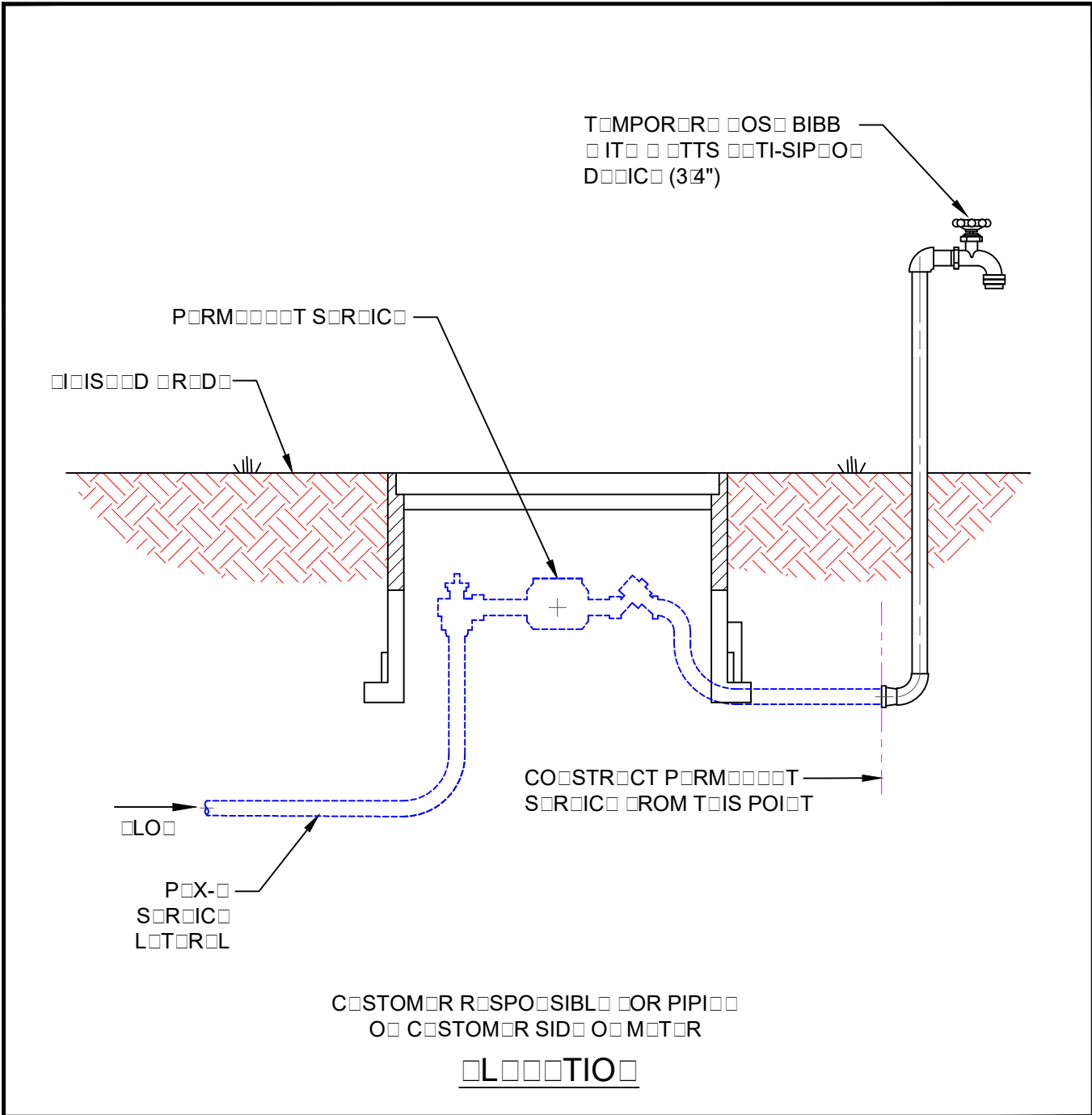
SEE DRAWING, No. W-4B, WATER SERVICE NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

METER BOX
INSTALLATION

DRAWING
NO.

W-6



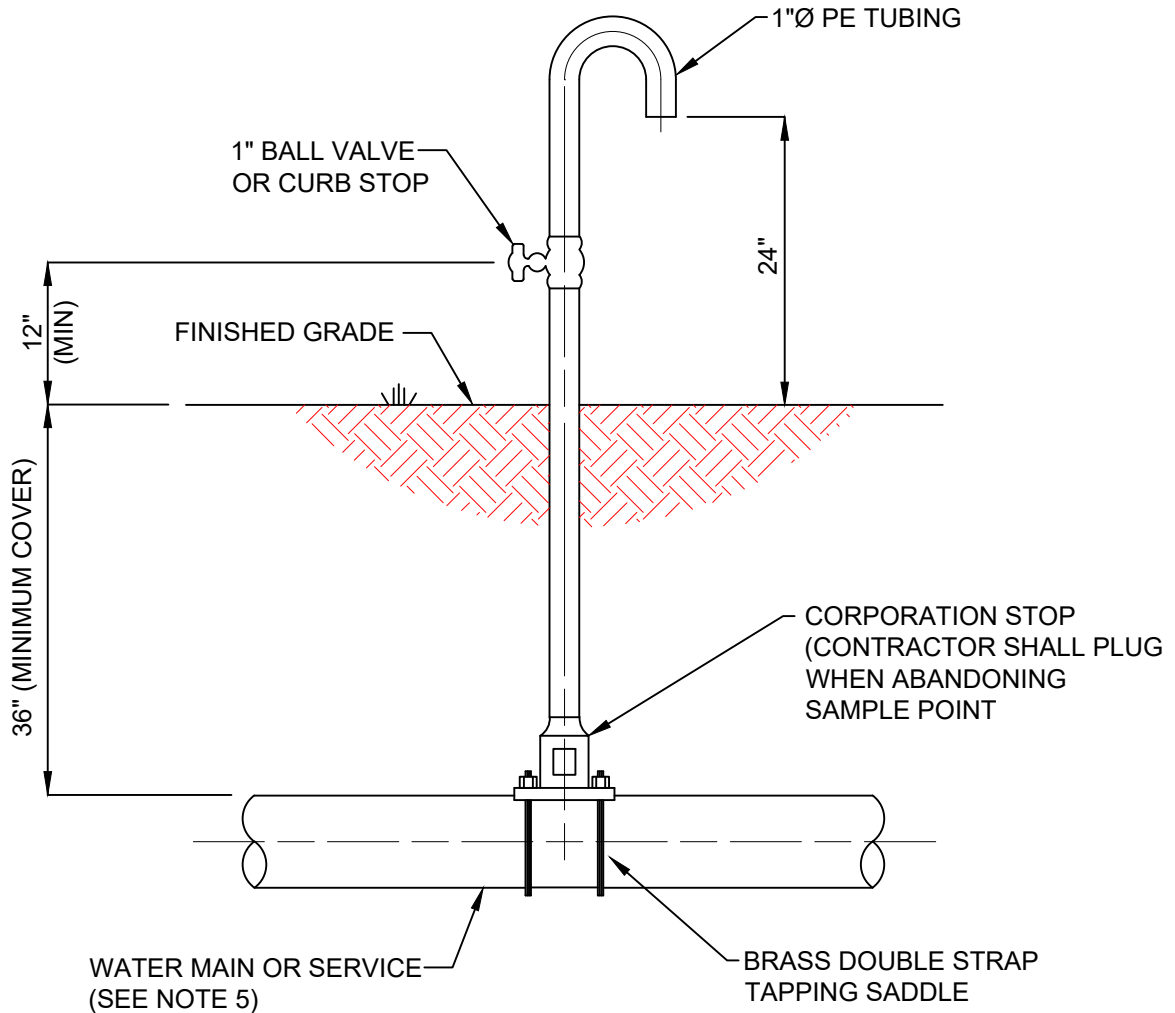
- NOTES**
1. IRCDs TO INSTALL A TEMPORARY BISS BIBB TO SUPPLY MATERIALS TO THE CONTRACTOR
 1. PRIOR TO ANY IRCDs INSPECTION THE CONTRACTOR SHALL REMOVE THE TEMPORARY BISS BIBB AND MAKE THE CONTRACTOR TO THE BUILDING PER CURRENT IRCDs CONSTRUCTION STANDARDS
 2. CONTRACTOR SHALL NOT DISTURB UTILITIES AT METER BOX
 3. CONTRACTOR SHALL REMOVE BIBB RISER AND CONTACT PERMITS SERVICE AT LOCATION INDICATED

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

TEMPORARY BISS BIBB
(FOR CONSTRUCTION)

DR 100
00
-7

A CORPORATION STOP SHALL BE INSTALLED WITH A LENGTH OF 1" Ø COPPER TUBING EXTENDING ABOVE THE FINISHED GRADE. THE TUBING SHALL BE INSTALLED WITH A 180° DOWNTURN BEND.



ELEVATION

NOTES

1. TEMPORARY SAMPLING POINT SHALL BE CONSTRUCTED USING A SERVICE LINE WHEN POSSIBLE. SCHEDULE 40 PVC OR OTHER MATERIALS CAN BE USED, AS APPROVED BY IRCDUS.
2. NO SAMPLE POINTS SHALL BE CONSTRUCTED ON FIRE HYDRANTS.
3. CERTIFICATION OF PRESSURE TEST, TWO CONSECUTIVE DAYS OF SUCCESSFUL BACTERIOLOGICAL TESTS, AND CLEARANCE FROM THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION IS REQUIRED BEFORE THE SAMPLE TAP CAN BE ABANDONED.
4. WHEN SAMPLING IS COMPLETE, TUBING SHALL BE REMOVED AND CORPORATION STOP PLUGGED.
5. USE A SERVICE FOR A SAMPLE POINT WHEN/WHERE POSSIBLE.

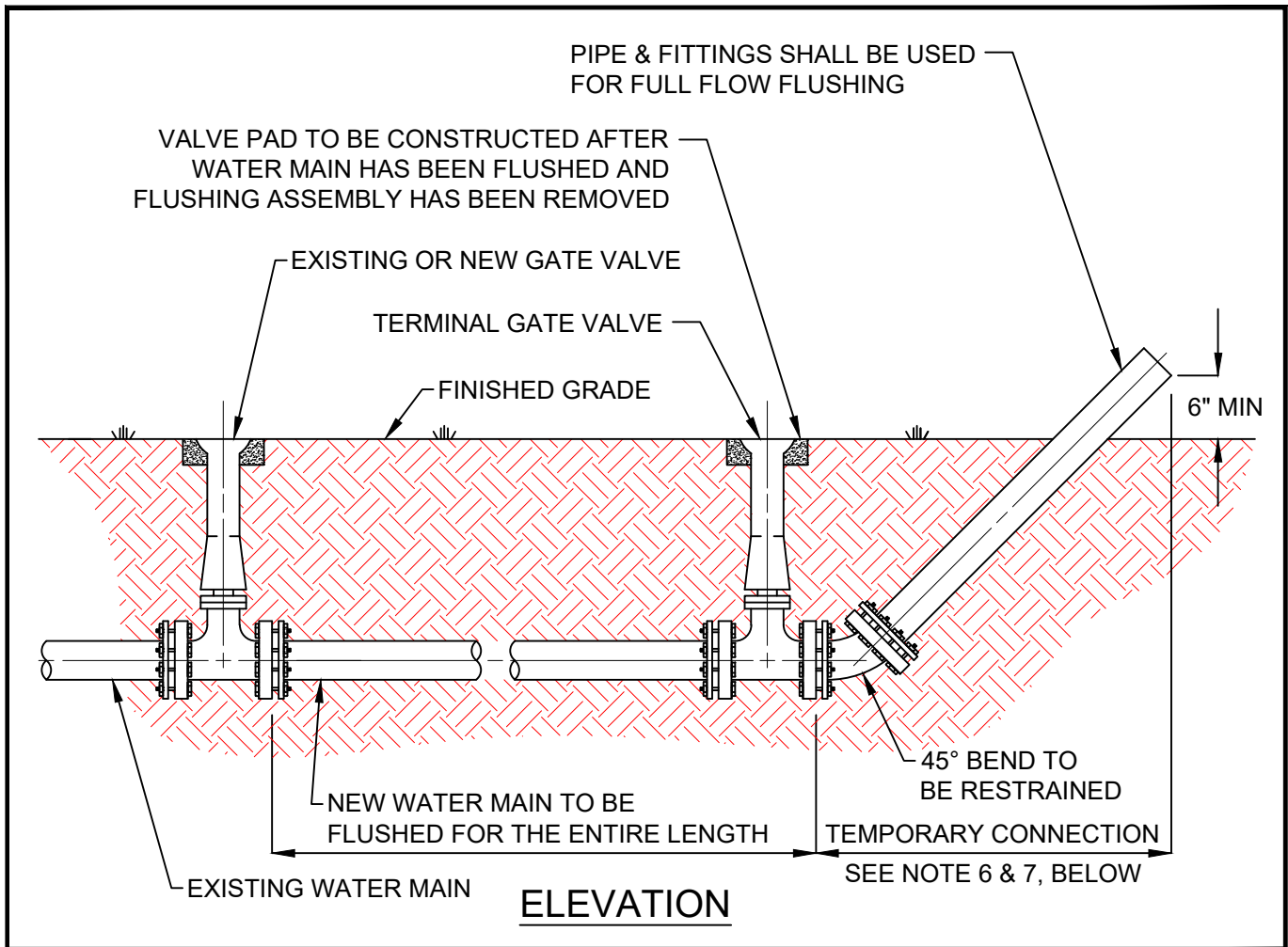
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

TEMPORARY SAMPLING
POINT (BACTERIOLOGICAL)

DRAWING
NO.

W-8

MAY 2019



NOTES

1. A FULL BORE FLUSH IS THE ONLY FLUSHING METHOD APPROVED FOR MAINS. ALL FIRE HYDRANTS AND DETECTOR CHECK VALVES SHALL BE INSPECTED AND TESTED TO ENSURE THAT NO FOREIGN OBJECTS IMPEDE THE FLOW OF WATER. FOR DETAILS ON LINE FILLING SEE DRAWINGS, No. W-13 & W-13A (TEMPORARY JUMPER DETAILS).
2. A PRESSURE GAUGE SHALL BE INSTALLED UPSTREAM OF THE FLUSHING POINT. PRESSURE UPSTREAM SHALL NOT FALL BELOW 20 P.S.I.
3. PROVIDE ALL NECESSARY JOINT RESTRAINTS SUCH AS MEGALUGS, RESTRAINED JOINT HARNESS, OR APPROVED EQUAL IN ACCORDANCE WITH IRCDUS CONSTRUCTION STANDARDS.
4. IRCDUS PERSONNEL, SHALL BE PRESENT FOR ALL FLUSHING ACTIVITIES AND SHALL OPERATE ALL EXISTING VALVES.
5. FOR TRANSMISSION MAINS 12" Ø OR GREATER, "PIGGING" IS REQUIRED.
6. TEMPORARY CONNECTION FOR FLUSHING SHALL BE SAME DIAMETER PIPE AS THE NEW MAIN AND VALVE.
7. CONTRACTOR SHALL PROVIDE ADEQUATE PROTECTION AGAINST EROSION DOWNSTREAM OF EXIT PIPE DURING FLUSHING OF MAIN TO MEET THE APPROVAL OF IRCDUS.
8. WHEN FLUSHING IS COMPLETE, THE TEMPORARY FLUSHING ASSEMBLY SHALL BE REMOVED AND THE GATE VALVE SHALL BE PLUGGED.
9. FIELD INSPECTION BY IRCDUS IS REQUIRED BEFORE UTILITIES ARE ACCEPTED.

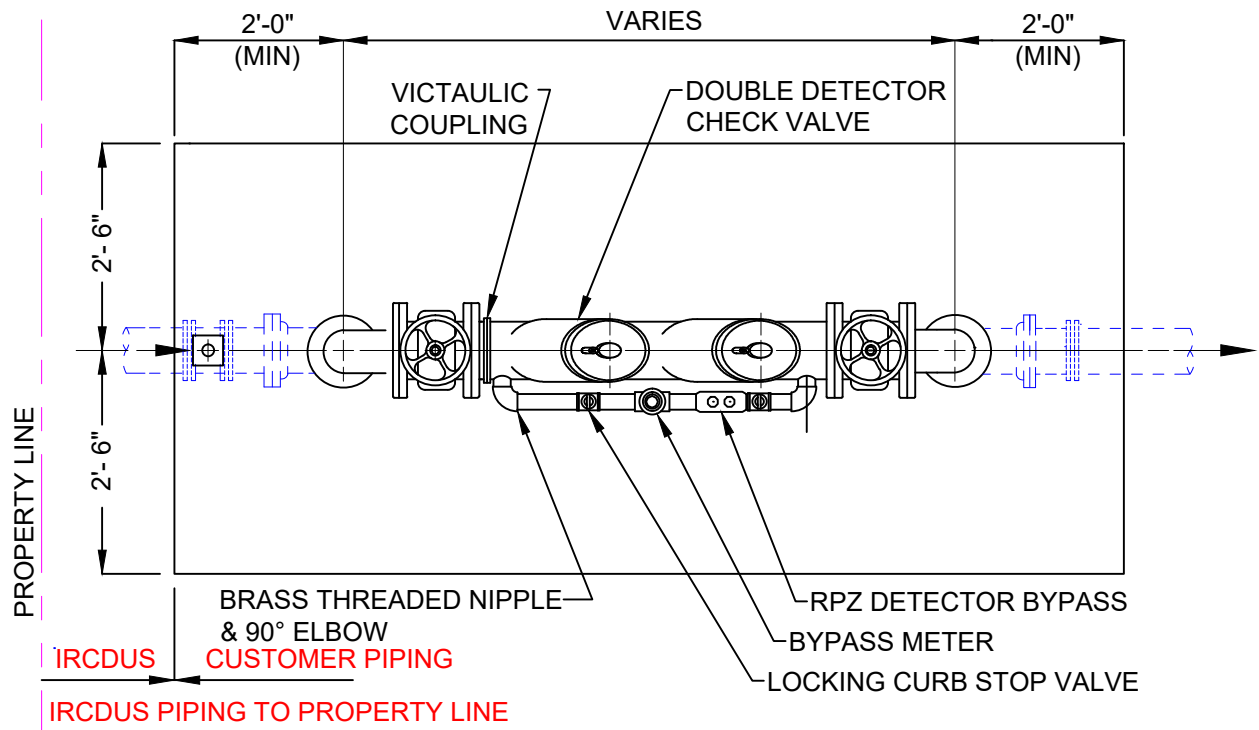
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

FULL BORE FLUSHING CONNECTION

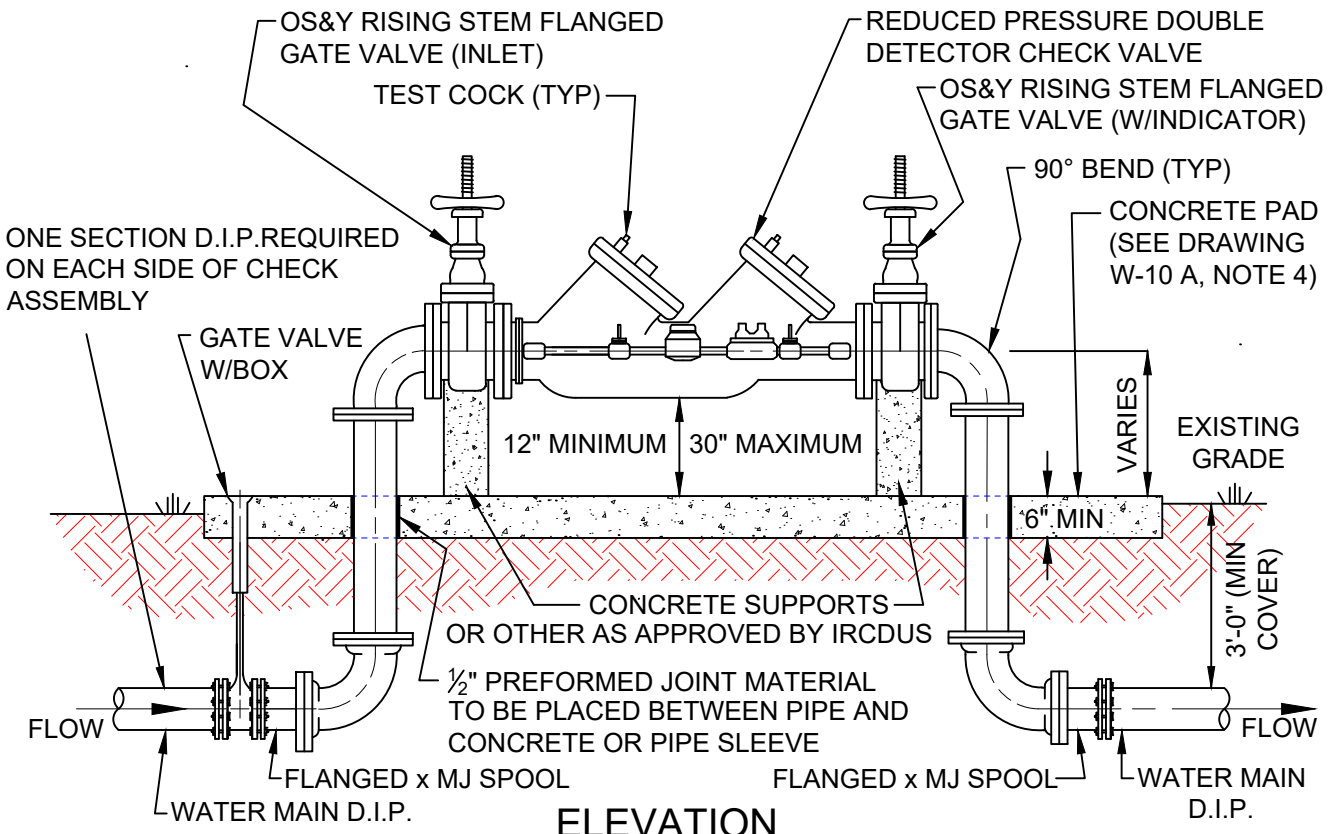
DRAWING
NO.

W-9

MAY 2019



PLAN VIEW



ELEVATION

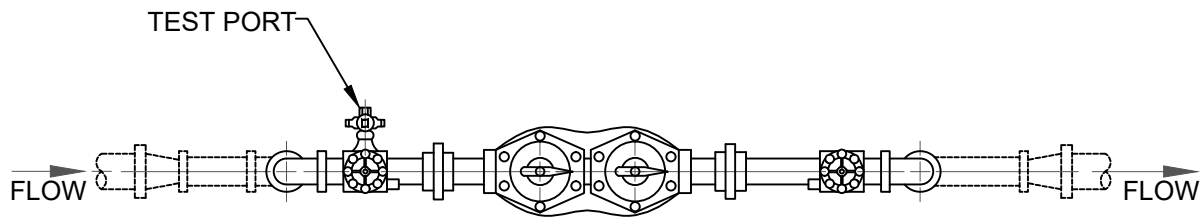
SEE DRAWING W-10A DOUBLE-DETECTOR CHECK VALVE ASSEMBLY NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

**DOUBLE-DETECTOR
CHECK VALVE ASSEMBLY W-10**

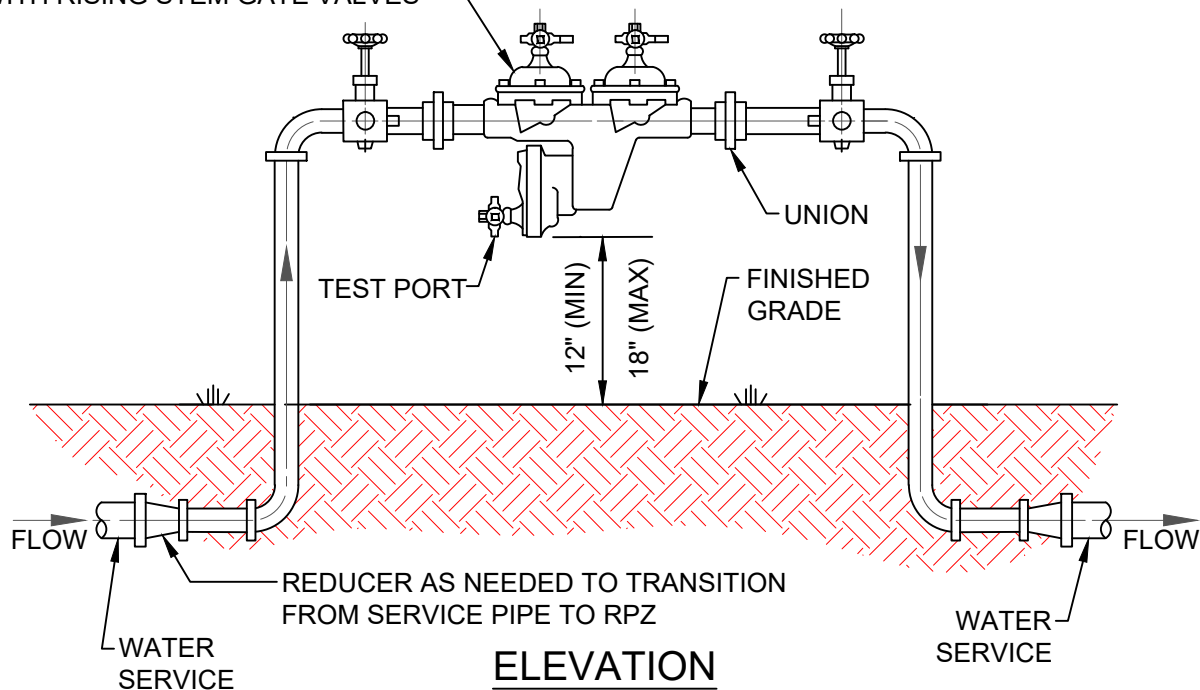
DRAWING
NO.

MAY 2019



PLAN VIEW

REDUCED PRESSURE
BACKFLOW PREVENTER (RPZ)
WITH RISING STEM GATE VALVES



ELEVATION

NOTES:

1. ALL BUILDINGS WITH FIRE SPRINKLER SYSTEMS INCLUDING COMMERCIAL, SINGLE FAMILY RESIDENTIAL, AND MULTI-FAMILY ARE REQUIRED TO INSTALL A DOUBLE CHECK BACKFLOW PREVENTER WITH A REDUCED PRESSURE ZONE (RPZ) FEATURE AS DETERMINED BY IRCDUS.
2. ALL FASTENERS SHALL BE 316 STAINLESS STEEL (OR APPROVED EQUAL).
3. APPROVED EQUALS HAVING FULL UL, USC, AND AWWA CERTIFICATIONS MAY BE INSTALLED ONLY AFTER SPECIFIC APPROVAL BY IRCDUS.
4. SUPPORT BACKFLOW PREVENTER FROM WALL, IF REQUIRED, WITH APPROVED PIPE SUPPORT SYSTEM. PIPE SUPPORT SYSTEM SHALL BE BRASS, COPPER OR D.I.P., AS APPROVED BY IRCDUS.
5. PIPING 2 1/2" Ø OR GREATER SHALL BE FLANGED DUCTILE IRON PIPE.
6. ALL MATERIALS ARE TO BE PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.
7. RPZ'S SHALL BE INSPECTED, CERTIFIED AND REPORTED ON AN ANNUAL BASIS IN ACCORDANCE WITH THE INDIAN RIVER COUNTY CONNECTION CONTROL PROGRAM REQUIREMENTS.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

**REDUCED PRESSURE
BACKFLOW PREVENTER
RPZ**

DRAWING
NO.

W-11

MAY 2019

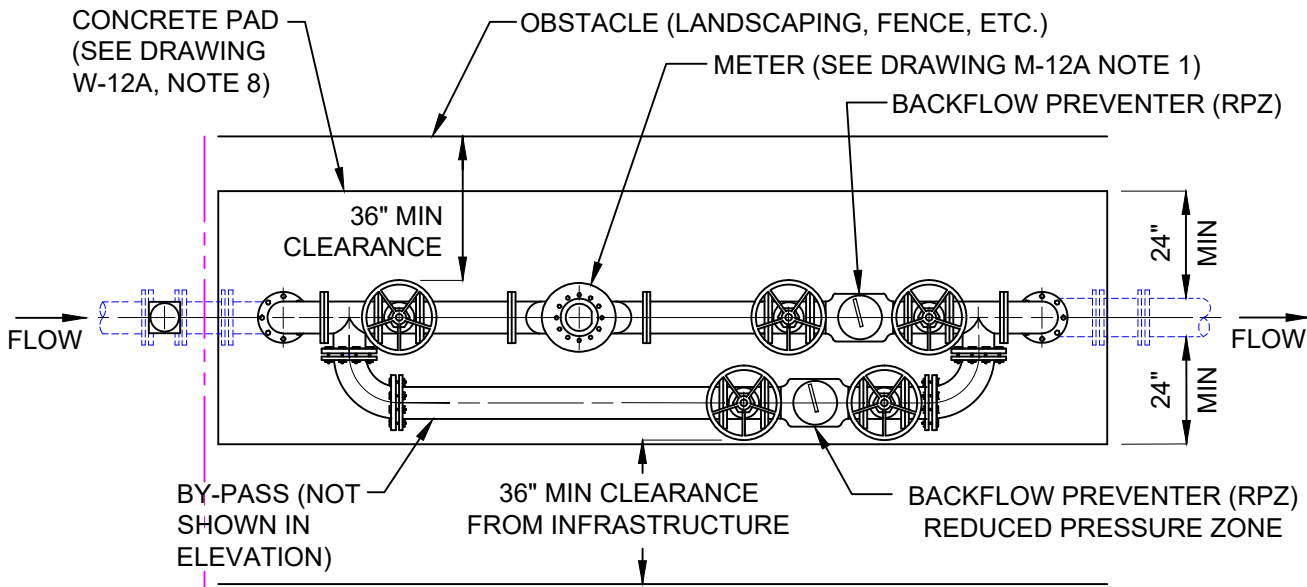
NOTES

1. ALL ABOVE RATED PIPE SHALL BE QUALIFIED DUCTILE IRON OR SECTION OF DUCTILE IRON PIPE RATED OR OVER SIZE OF CLASS OF ASSEMBLY
2. B-PASS PIPE DIAMETER SHALL BE DETERMINED PER MANUFACTURER RECORD
3. FIELD BRICATED QUALITY MUST BE APPROVED BY IRCD'S INSPECTOR
4. DUE TO BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS
5. ASSEMBLY TO BE PRIMED WITH REST INHIBITIVE PRIMER AND DISK POINTED BLOW AFTER INSTALLATION (SEE APPROVED MANUFACTURERS' PRODUCT LIST)
6. TO SECURE LOCAL CUSTOMER TO SUPPLY LOCAL IRCD'S TO SUPPLY LOCAL
7. RPS SHALL BE INSPECTED/CERTIFIED AND REPORTED ON AN ANNUAL BASIS IN ACCORDANCE WITH THE IRI RIR CONTRACT CROSS CONNECTION PROGRAM RIRIMETS
8. COATED PIPES SHALL BE A MINIMUM OF 6" THICK LAYER OF S RIRID
9. TAP OR MOTOR SHALL BE APPROVED BY IRCD'S

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

MOTOR MOTOR
COMBINATION ASSEMBLY
NOTES

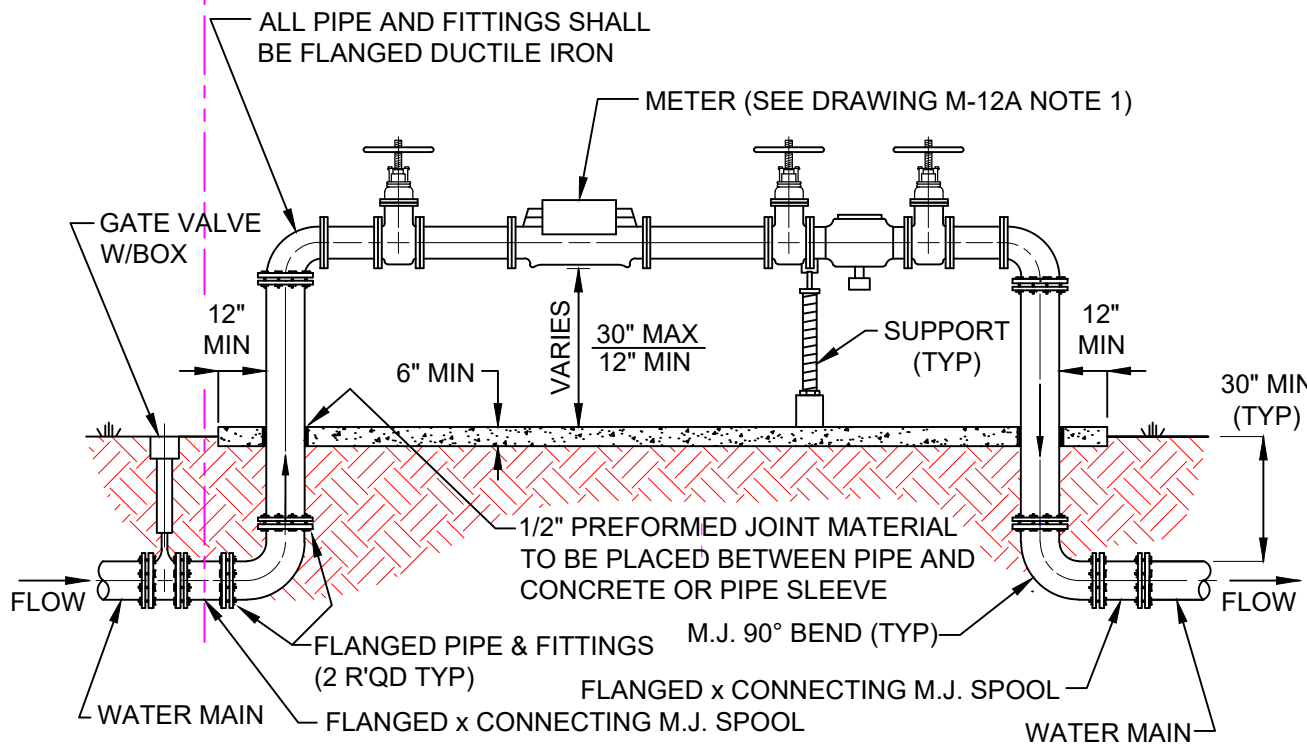
DRINKING
WATER
-12
□



PLAN VIEW

IRCDUS ← **CUSTOMER RESPONSIBILITY**

CUSTOMER SHALL BE RESPONSIBLE FOR ALL MAINTENANCE WITH THE EXCEPTION OF THE METER WHICH IS THE PROPERTY OF IRCDUS



ELEVATION

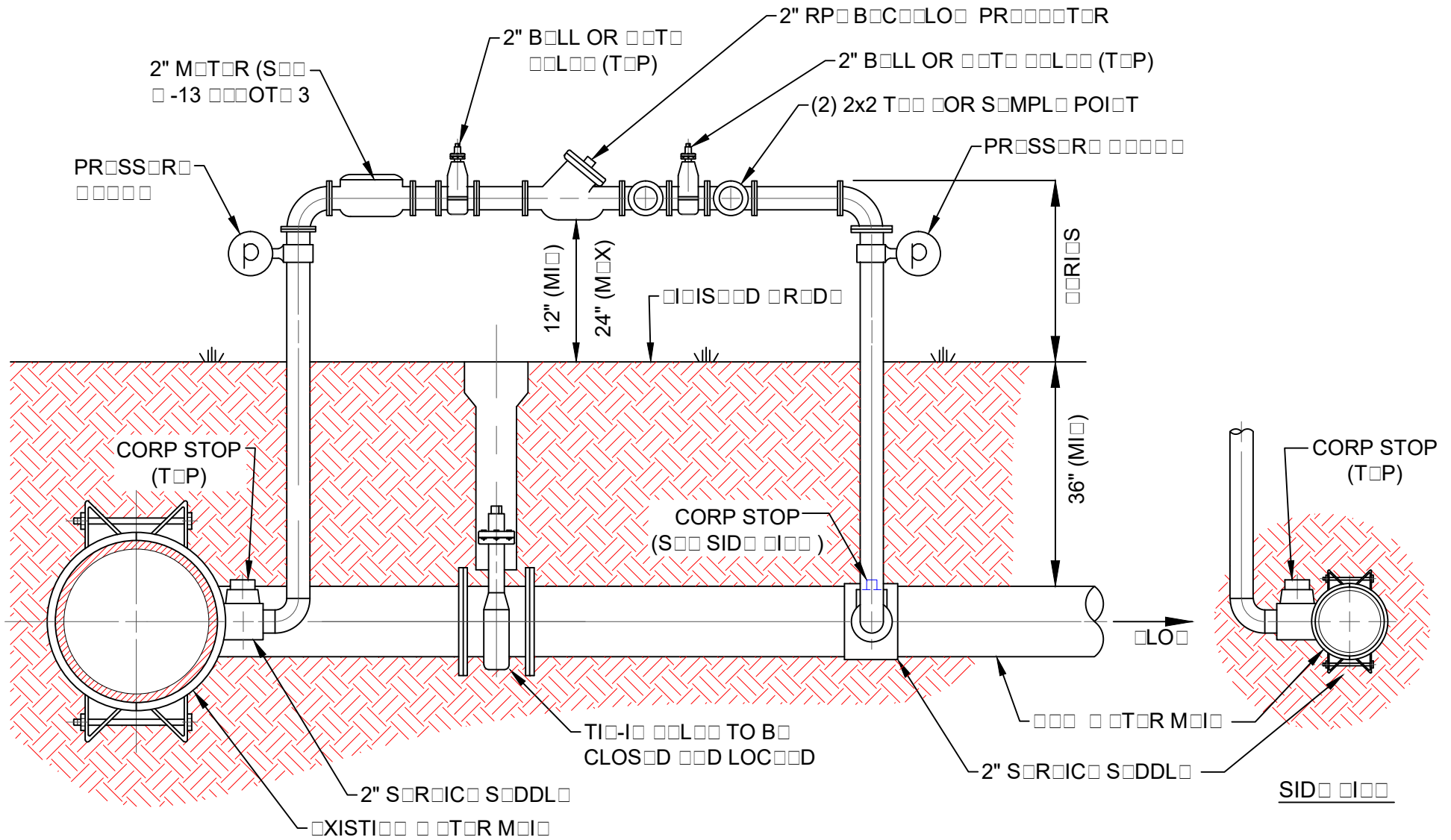
BY-PASS NOT SHOWN FOR CLARITY

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

**MASTER METER
COMBINATION ASSEMBLY**
(3" OR LARGER)

DRAWING
NO.
W-12

MAY 2019



LEGEND

PRESSURES MOVED ON TOP OR SIDE (S -13 NOT 10)

MAY 2011

-13
DRAWING NO.

SDR 10
-13 B
TEMPORARY
MATERIALS

**INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITIES**

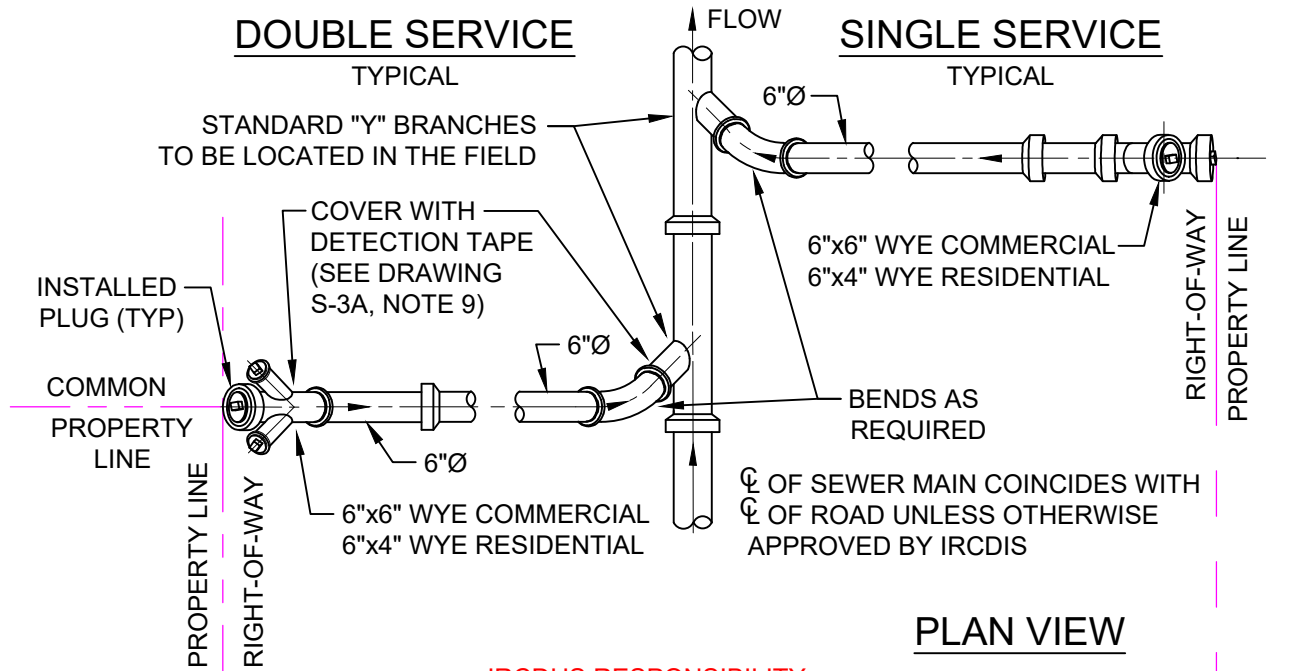
**TEMPORARY IMPROVEMENT
DETAIL**

DOUBLE SERVICE

TYPICAL

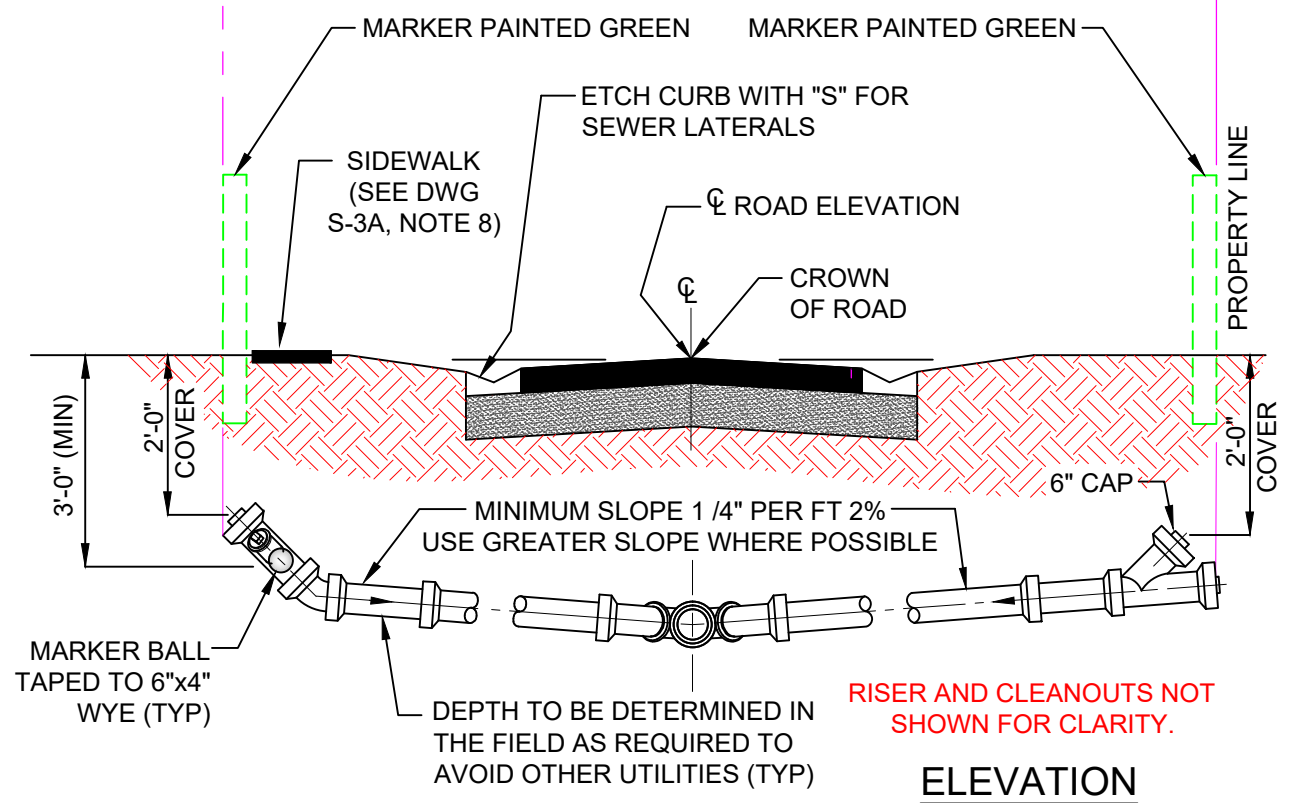
SINGLE SERVICE

TYPICAL



PLAN VIEW

**IRCDUS RESPONSIBILITY
EASEMENT OR R.O.W.**



ELEVATION

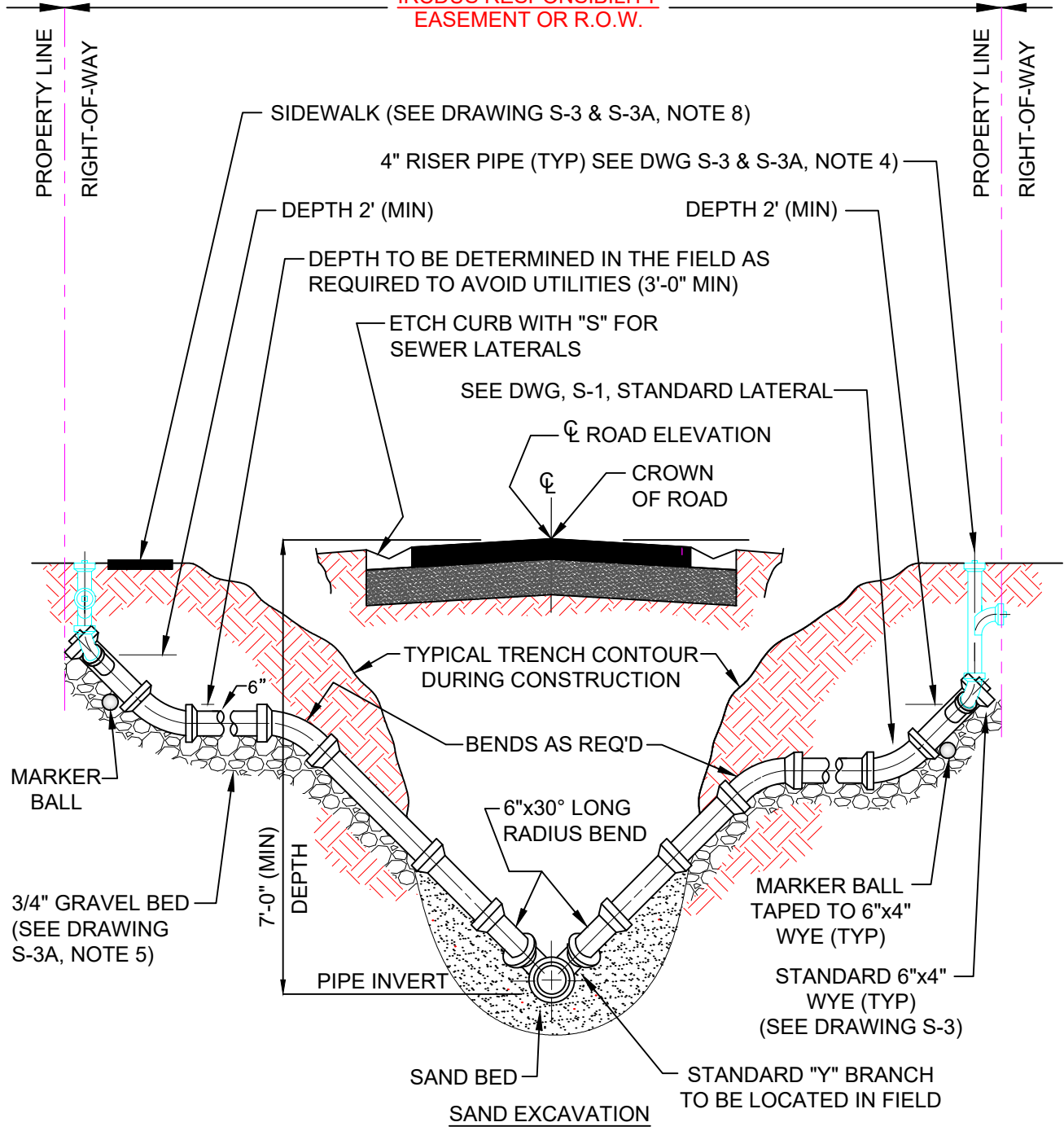
SEE DRAWING, No. S-3A SEWER LATERAL NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

STANDARD LATERAL
(SHALLOW SEWER)

DRAWING
NO.
S-1

**IRCDUS RESPONSIBILITY
EASEMENT OR R.O.W.**



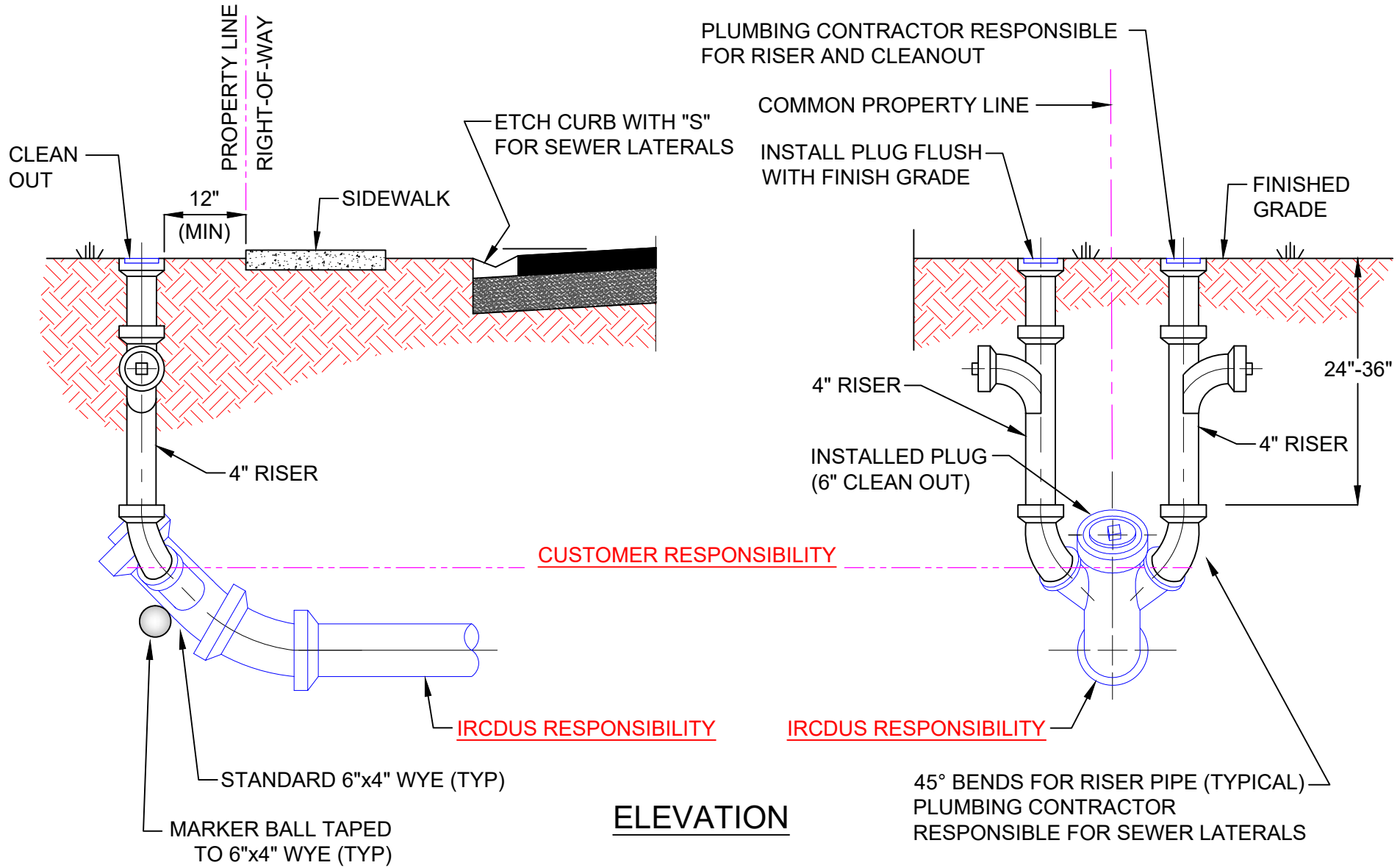
ELEVATION

SEE DRAWING, No. S-3A SEWER LATERAL NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

MODIFIED RISER LATERAL
(DEEP SEWER)

DRAWING NO.
S-2



PLUMBING CONTRACTOR RESPONSIBLE FOR RISER AND CLEANOUT

COMMON PROPERTY LINE

INSTALL PLUG FLUSH WITH FINISH GRADE

FINISHED GRADE

24"-36"

4" RISER

INSTALLED PLUG (6" CLEAN OUT)

4" RISER

CUSTOMER RESPONSIBILITY

IRCDUS RESPONSIBILITY

IRCDUS RESPONSIBILITY

STANDARD 6"x4" WYE (TYP)

MARKER BALL TAPED TO 6"x4" WYE (TYP)

45° BENDS FOR RISER PIPE (TYPICAL) — PLUMBING CONTRACTOR RESPONSIBLE FOR SEWER LATERALS

ELEVATION

SEE DRAWING, No. S-3A, SEWER LATERAL NOTES

MAY 2019

S-3
DRAWING NO.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

SEWER LATERAL RISER
(DETAILS)

NOTES:

1. ALL SEWER LATERALS (SINGLE OR DOUBLE) SHALL HAVE A RISER PIPE WITH BENDS AS REQUIRED FOR SERVICE CONNECTIONS AND WITH A 4"Ø CLEANOUT AT GRADE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR RISER PIPE WITH BEND FOR SERVICE CONNECTION AND FOR SETTING 4"Ø SEWER CLEANOUT TO FINISH GRADE PRIOR TO CONNECTION.
3. SANITARY SEWER LATERAL LATERALS SHALL BE A MINIMUM OF 6" IN DIAMETER.
4. GRAVEL (3/4") BEDDING SHALL BE USED FOR EXCAVATION ON ROCK. SAND BEDDING SHALL BE USED FOR EXCAVATION IN SAND. (SEE DRAWING, No. S-2, MODIFIED SEWER LATERAL, DEEP SEWER.)
5. GRAVEL (3/4") BED SHALL CONTINUE UNDER AND PARALLEL TO SEWER LATERAL PIPE INTO UNDISTURBED SOIL AT THE PROPERTY LINE. (SEE DRAWING, No. S-2, MODIFIED SEWER LATERAL, DEEP SEWER.)
6. FOR RISERS AND CLEANOUTS SEE DRAWING, No. S-3, SEWER LATER RISER.
7. FOR CUTTING IN SEWER LATERAL CLEANOUT TO FINISH GRADE SEE DRAWING, No S-3, SEWER LATER RISER.
8. RISERS AND CLEANOUT SHALL NOT BE CONSTRUCTED WITHIN 12" OF SIDEWALK.
9. MAGNETIC DETECTION TAPE SHALL BE INSTALLED OVER TOP OF ALL SEWER MAINS AND SERVICE LATERALS.
10. ELECTRONIC MARKER BALLS, 4"Ø, SHALL BE TAPED TO 6"x4" WYE, 24" BELOW FINISHED GRADE.
11. ALL MATERIALS ARE TO BE PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.

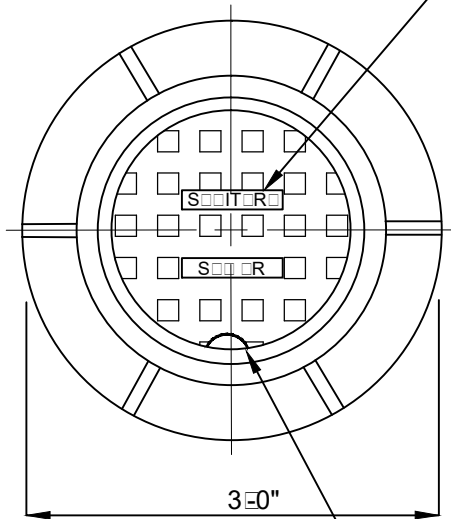
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

STANDARD LATERAL NOTES

DRAWING
NO.
S-3
A

MAY 2019

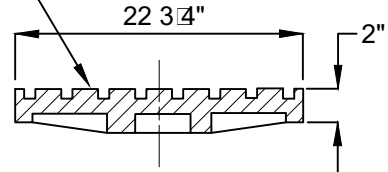
CAST IRON
MOLDED COOR - LETTERS TO
B M R D "S O I T R S O R"



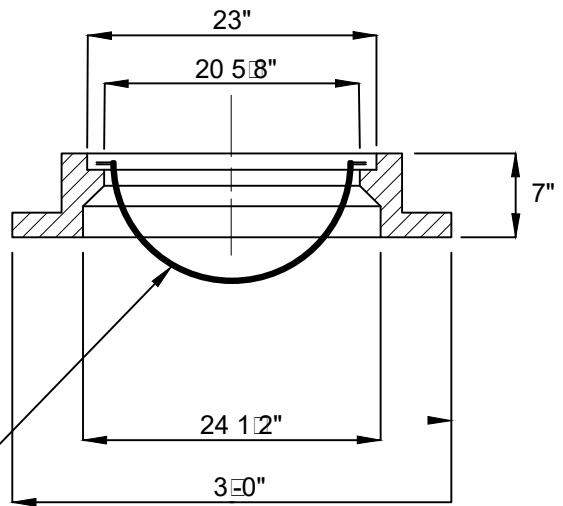
PROPORTION
PARTIAL PICTURE

PLATE

PARTIAL BOOT
RIB BAND
(S R I R D)



MOLDED COOR - SECTION



MOLDED FORM - SECTION

NOTES

1. PARTIAL BOOT RIB BAND SHALL BE PROVIDED FOR ALL FORM COORS AND BE APPROVED BY IRCD'S
2. ALL MATERIALS SHALL BE PER IRCD'S APPROVED MANUFACTURERS PRODUCT LIST
3. ISOODR 420 RIB BAND "C" COOR IS SOO I BOODR I

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITIES SERVICES

STANDARD MOLDED
CASTING

DRAWING
NO.

S-4

MANHOLE NOTES

1. REINFORCING AREA OF 0.20 SQ. IN./FT. FOR WALL SECTION, MINIMUM TO MEET OR EXCEED A.S.T.M. A-185.
2. ALL CEMENT MORTAR TO BE TYPE I OR TYPE II.
3. ALL CEMENT FOR PRECAST MANHOLES TO BE MINIMUM 3,000 P.S.I. TO MEET OR EXCEED A.S.T.M. C-478.
4. BOTTOMS AND CHANNELS OF ALL MANHOLES TO BE A MINIMUM OF 2,5000 P.S.I. FILL CONCRETE SHALL BE FINISHED SMOOTH WITH STEEL TROWEL.
5. CONCRETE MANHOLES TO HAVE A MINIMUM WALL THICKNESS OF 8".
6. INSIDE AND OUTSIDE OF MANHOLE SHALL BE COATED WITH TWO COATS OF EW-1 WATER BASED EPOXY, BLACK, WITH THE IRCDUS INSPECTOR PRESENT.
7. CHANNELS TO BE FORMED IN ALL MANHOLES TO ACCEPT T.V.CAMERA.
8. ORIENT ECCENTRIC CONE AS REQUIRED BY IRCDUS INSPECTOR IN FIELD.
9. BOTTOM SECTION TO BE MONOLITHIC POUR EXCEPT WHERE DROP CONNECTION REQUIRED.
10. CONNECTIONS TO EXISTING MANHOLE AND LIFT STATION WET WELL STRUCTURES SHALL BE BY MEANS OF BORING A PENETRATION IN THE STRUCTURE, RATHER THAN PUNCHING. THE CONTRACTOR SHALL TAKE POSITIVE MEASURES TO PREVENT ANY CONCRETE OR CONSTRUCTION DEBRIS FROM ENTERING THE WASTEWATER SYSTEM.
11. BUOYANCY CALCULATIONS SHALL BE REQUIRED FOR ALL MANHOLES.
12. NO. 4Ø BARS, 9" O.C. REQUIRED EACH WAY IN SLAB (TOP AND BOTTOM).
13. 2 COURSES BRICK MINIMUM, 6 COURSES MAXIMUM REQUIRED BETWEEN ALL PRECAST MANHOLE TOPS AND CASINGS.
14. 3 /4" CRUSHED STONE FOUNDATION FOR A MINIMUM DEPTH OF 12" SHALL BE PROVIDED AS REQUIRED BY IRCDUS.
15. MANHOLE LID SHALL BE TRAFFIC BEARING (H-20 LOADING).
16. SEWER PIPE INVERTS AT BOTTOM OF MANHOLES SHALL HAVE AS INVERT ELEVATION DIFFERENTIAL OF 0.1 FEET FOR A CHANGE IN DIRECTION AND 0.05 FEET FOR A STRAIGHT RUN.
17. A WATERTIGHT RAIN GUARD BOOT, TO BE PER IRCDUS APPROVED MANUFACTURER'S PRODUCT LIST, SHALL BE PROVIDED FOR ALL MANHOLE FRAME/COVERS.
18. MATERIALS FOR LINING MANHOLES, WHERE REQUIRED, TO BE PER IRCDUS, APPROVED MANUFACTURER'S PRODUCT LIST. MANHOLE LINERS SHALL BE INSTALLED ON ALL MANHOLES RECEIVING PUMPED SEWAGE, PLUS 5 MANHOLES IN EACH DIRECTION. (AS DIRECTED BY IRCDUS.)
19. PUMP OUT MANHOLE SHALL BE LOCATED WITHIN 20' OF LIFT STATION AND CONSTRUCTED OUT OF RIGHT-OF-WAY.
20. ALL EXISTING MANHOLES, LIFT STATION WET WELLS, VALVE VAULTS, JOINTS AND COURSES OF BRICK SHALL BE SEALED.
21. SLOPES ON ALL CHANNEL BOTTOMS TO BE EQUAL TO SLOPES OF PIPE ENTERING AND EXITING MANHOLE.
22. DIAMETERS OF MANHOLES SHALL BE:

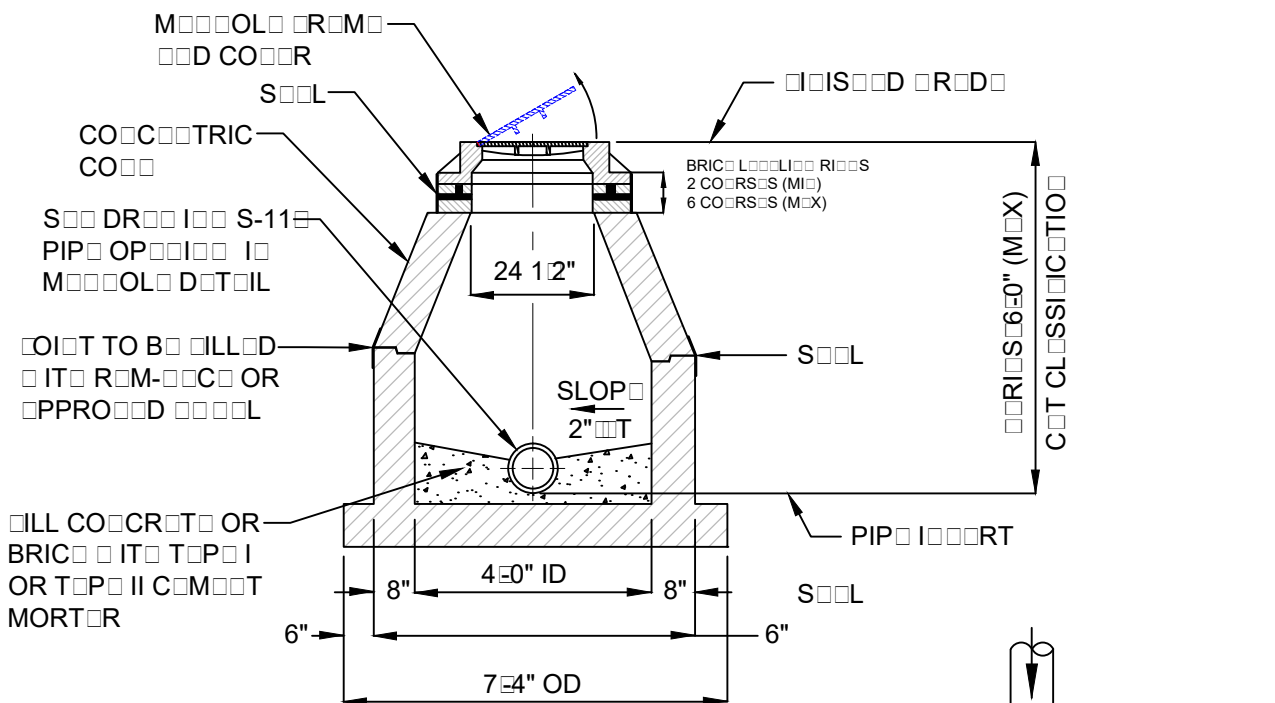
DEPTH OF MANHOLE	LESS THAN 10'	GREATER THAN 10'
DIAMETER	4'	5'

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

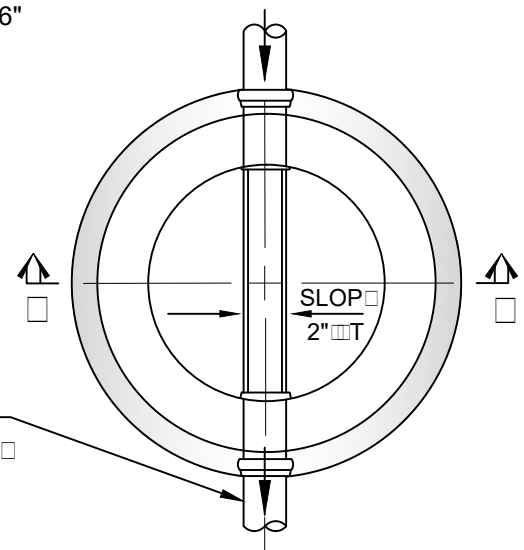
MANHOLE NOTES

DRAWING
NO.

S-5



L...TIO
S...CTIO... -



PL... I...

TO B... S...D... C...T CL...SSI...C...TIO... IS 6'-0" OR L...SS

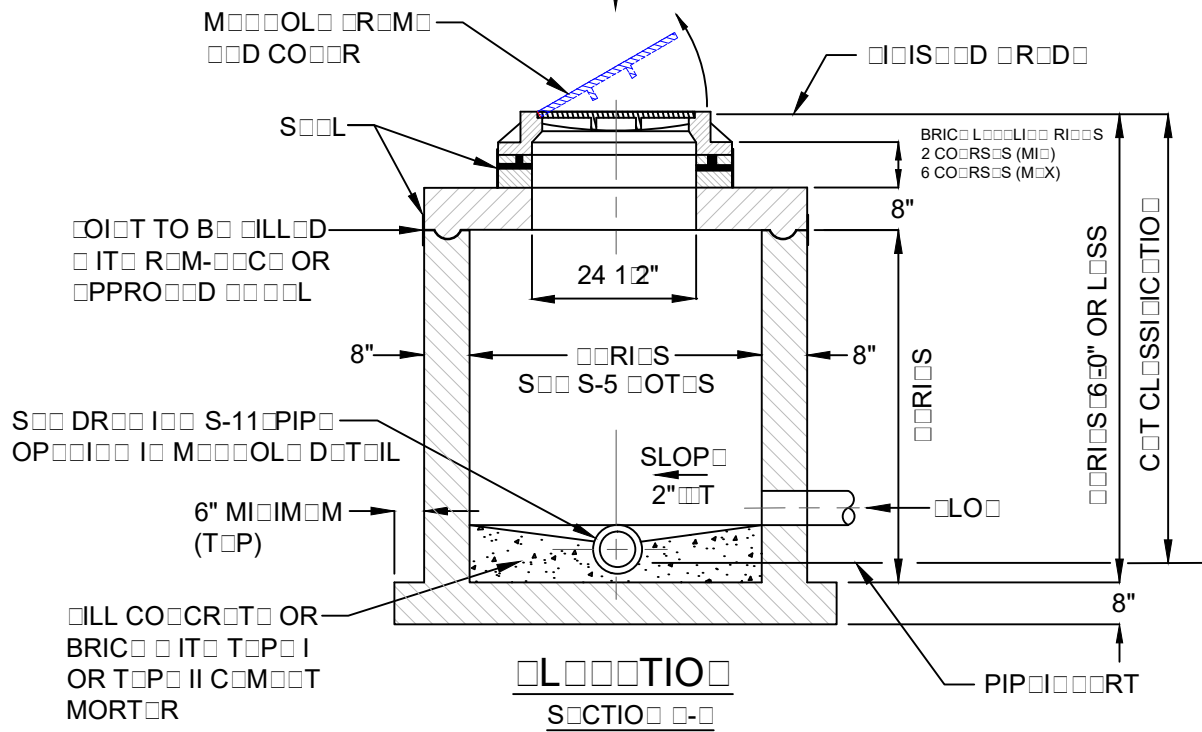
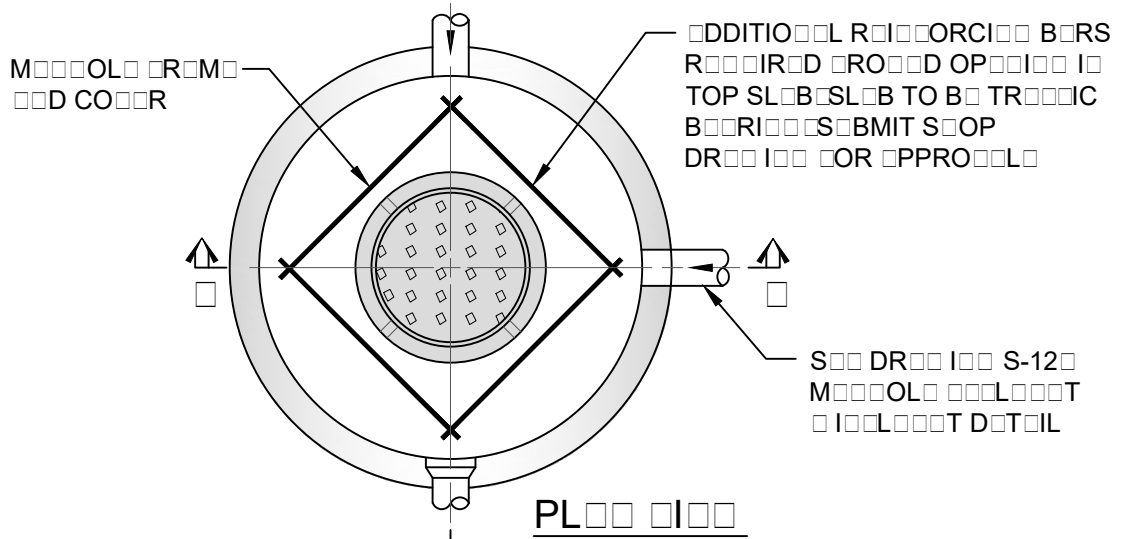
NOTES

- 1 S... DR... I... S-4...ST...D...RD M...OL... C...STI...
- 2 S... DR... I... S-5...M...OL... OT...
- 3 S... DR... I... S-11...PIP... OP... I... D...IL
- 4 S... DR... I... S-12...M...OL... ...L...OT... D... I...L...OT... D...IL
- 5 S...L S...LL B...S...D...T... ALL COITS...S... DR... I... S-5...OT... 20'

IDI... RI...R CO...T...
D...P...RTM...T O...
TILIT... S...R...IC...S

M...OL...
ST...D...RD S...LLO...

DR... I...
O...
S-6



TO BE USED WHEN CUT CLASSIFICATION IS 6" OR LESS

NOTES

1. SODR I S-4 STANDARD RIM CONSTRUCTION
2. SODR I S-5 MASONRY RINGS
3. SODR I S-11 PIPE OPENING DETAIL
4. SODR I S-12 MASONRY DETAIL
5. MASONRY ISID DIMOTOR (ID) RINGS DEPENDENT ON DEPTH
6. SILL SHALL BE SET AT ALL POINTS SODR I S-5 20"

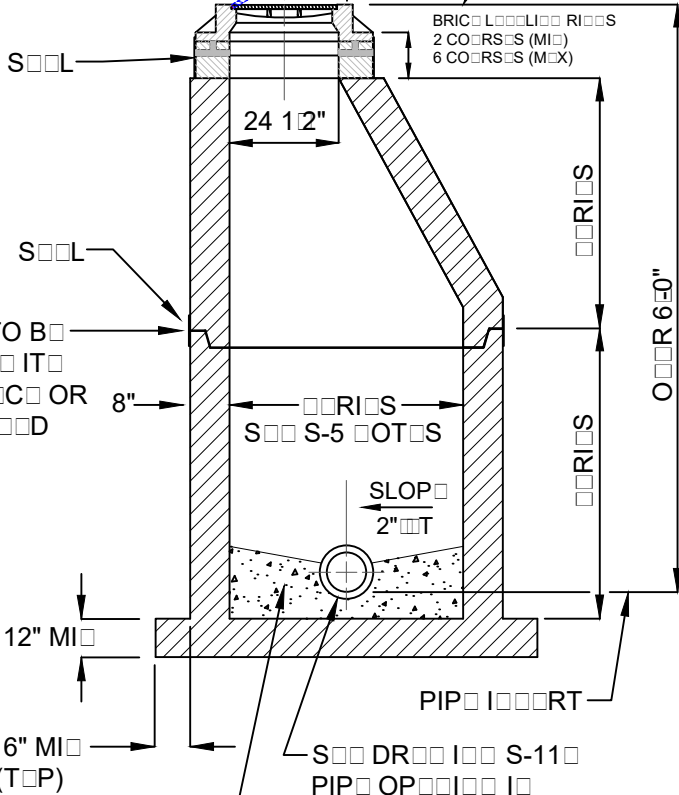
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITIES SERVICES

MASONRY
SLAB-TOP DETAILS

DR I
O
S-7

Masonry Mortar
 Solid Core

Insulation



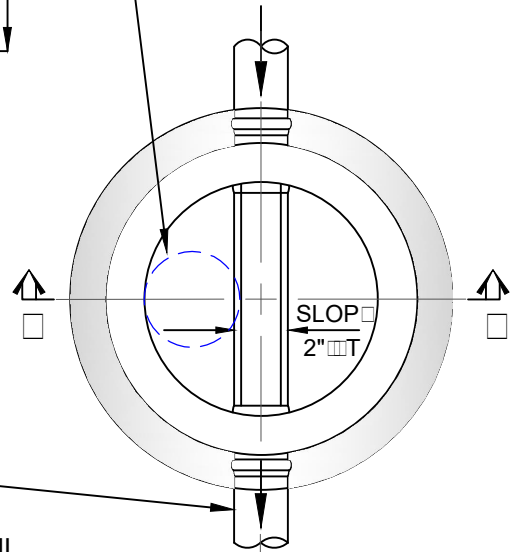
Joint to Bottom
 Filled with
 Mortar or
 Portland
 Cement

Fill concrete or
 brick with top
 or top of cement
 mortar

SECTION

Standard S-12
 Masonry
 Insulation Detail

Concentric Masonry
 Deep or Rooter



Masonry Mortar
 Joint Seal or Grit

PL

TO BOTTOM OF THE TRAP IS 6'-0" DEEP

NOTES

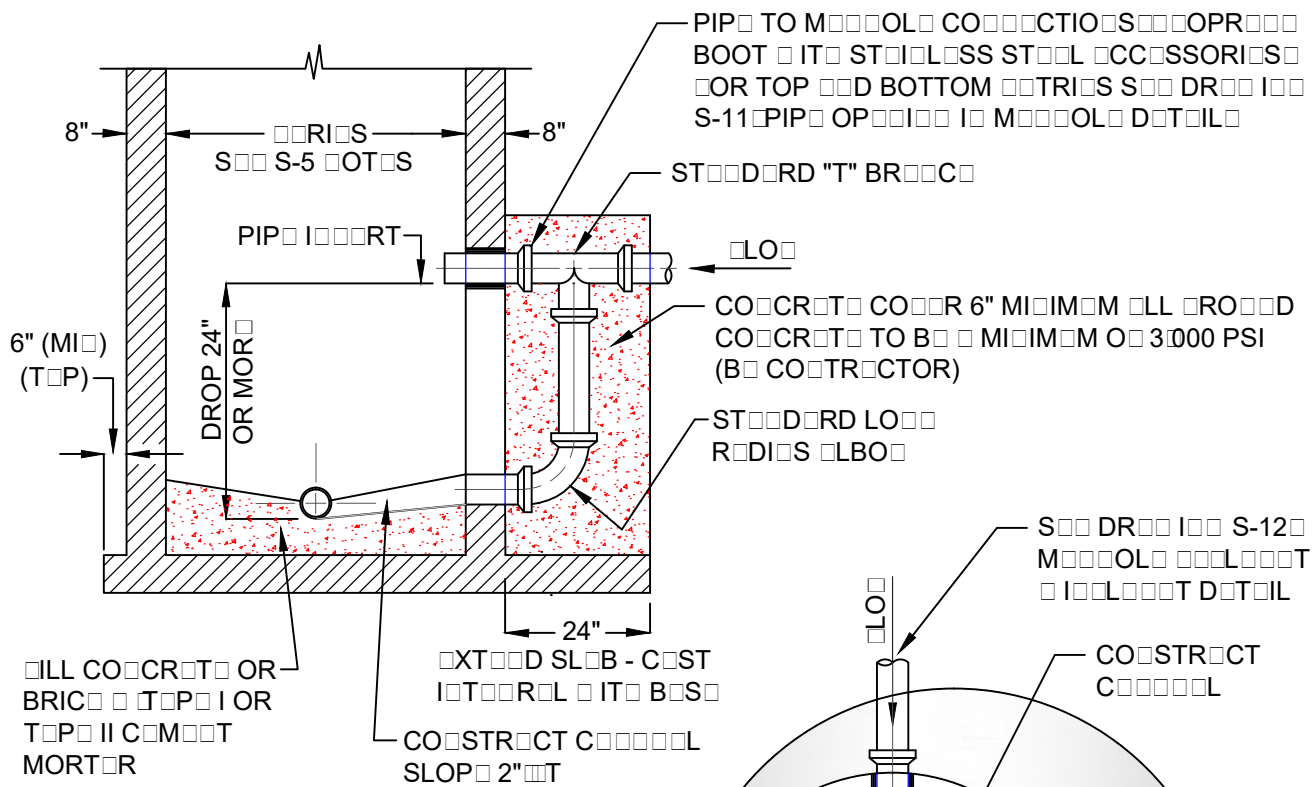
- Standard Masonry Construction
- Standard Masonry
- Standard S-11 Pipe Opening Detail
- Standard S-12 Masonry Insulation Detail
- Masonry Insulation (ID) Details
- Standard Bottom of Trap S-5 Detail

INDIAN RIVER COUNTY
 DEPARTMENT OF
 UTILITIES SERVICES

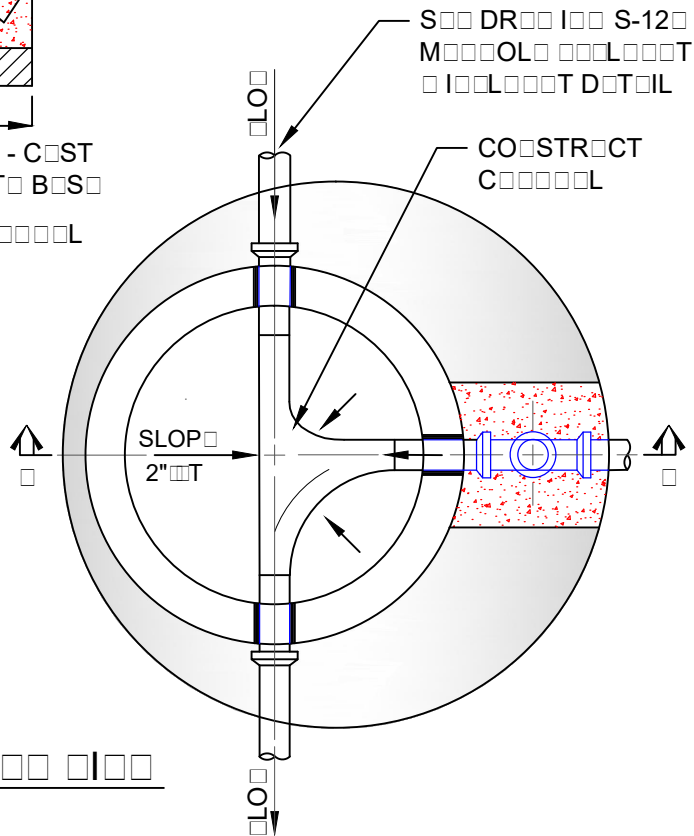
MASONRY
 STANDARD DEEP

DR

S-8



SECTION



TO BE SAVED OR DROP IS 2" OR MORE

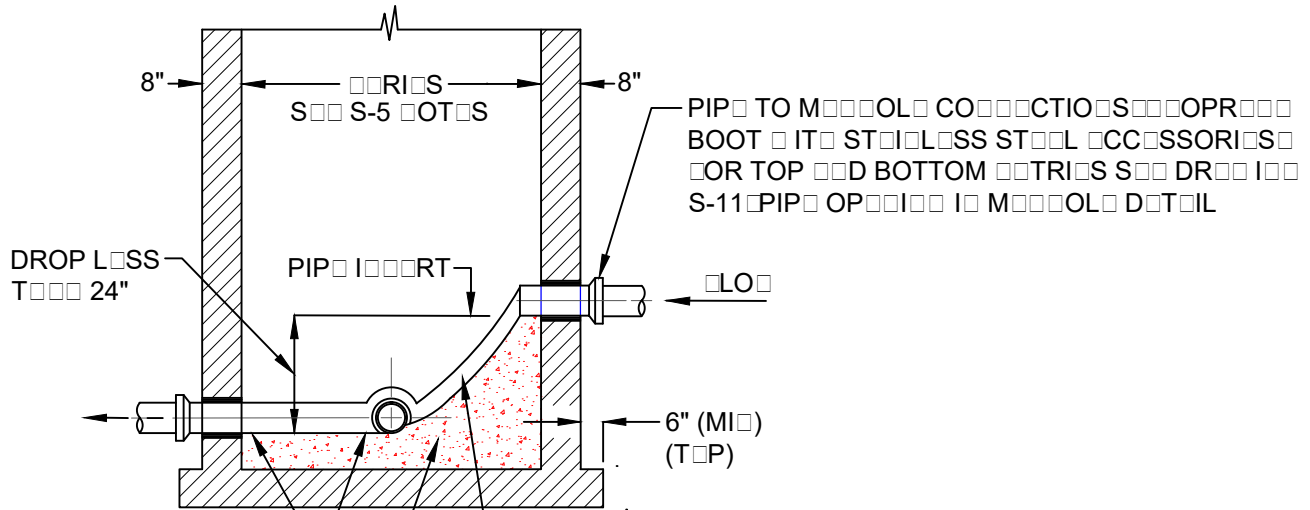
NOTES

1. SCHEDULE 40 S-5 HANGERS
2. SCHEDULE 40 S-11 PIPE OPPOSITE DETAIL
3. SCHEDULE 40 S-12 HANGERS AND ISOLATED DETAIL
4. SOLID CONCRETE SHALL NOT BE USED FOR DROPS
5. SCHEDULE 40 RISERS SHALL NOT BE CONNECTED DIRECTLY TO MANGERS

**INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITIES SERVICES**

**MANGERS
OUTSIDE DROP**

**DRIP
S-**



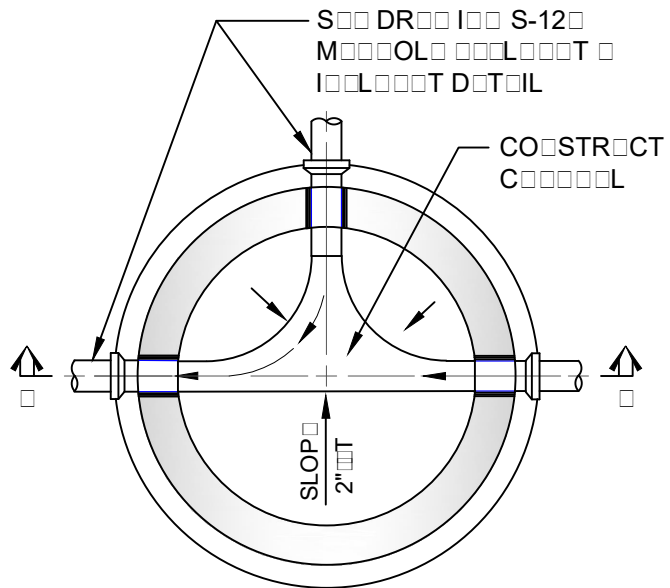
S-11 PIPE OPPOSITE TO
MOLDED DETAIL

ALL CONCRETE OR
BRICK TYPICAL OR
TYPICAL CEMENT
MORTAR

SECTION

PIPE TO MOLDED CONNECTIONS
BOOT IT SHALL BE ACCESSED
OR TOP AND BOTTOM TRIS
S-11 PIPE OPPOSITE TO MOLDED DETAIL

CONSTRUCT CONCRETE
SLOPE 2" FT



PLAN

TO BE USED FOR DROP IS LESS THAN 2'

NOTES

1. S-5 MOLDED DETAIL
2. S-11 PIPE OPPOSITE TO MOLDED DETAIL
3. S-12 MOLDED DETAIL

INDICATED CONNECTION
DEPARTMENT OF
TILTING SERVICES

MOLDED
SIDE DROP

DRIP
CO

S-10

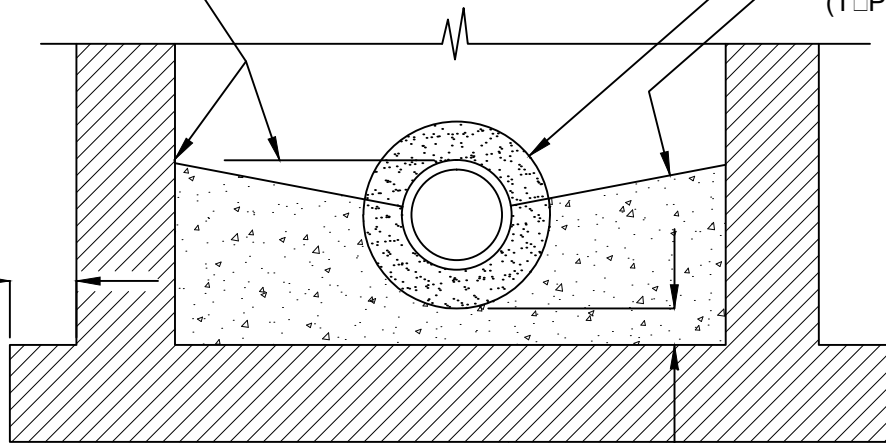
SPACE PROVIDED OUTSIDE OF PIP SHALL BE COMPLETELY FILLED
 WITH O-SURIFORM ROOT REMOVAL CONCRETE AND BOND
 EXPOSED EXISTING REINFORCED STEEL PROVIDED OUTSIDE OF PIP
 (OR OLD INSTALLATION)

PIP CONNECTION TO BOPR BOOT
 WITH STEEL CLASS STEEL 316 ACCESSORIES

PRELATION OF FILL CONCRETE
 TO BE SAME AS OD OF PIP

SLOPE 2" FT
 (TYPICAL)

6" (MIN)
 (TYP)



3" (MINIMUM)

MINIMUM BASE

INSTALLATION

NOTES

1. SEE DRAWING S-5 MINIMUM NOTES NOTES 2, 4, 5, 7, 10 AND 16
2. ALL MATERIALS REFER TO BO PER IRCD'S APPROVED MANUFACTURERS PRODUCT LIST

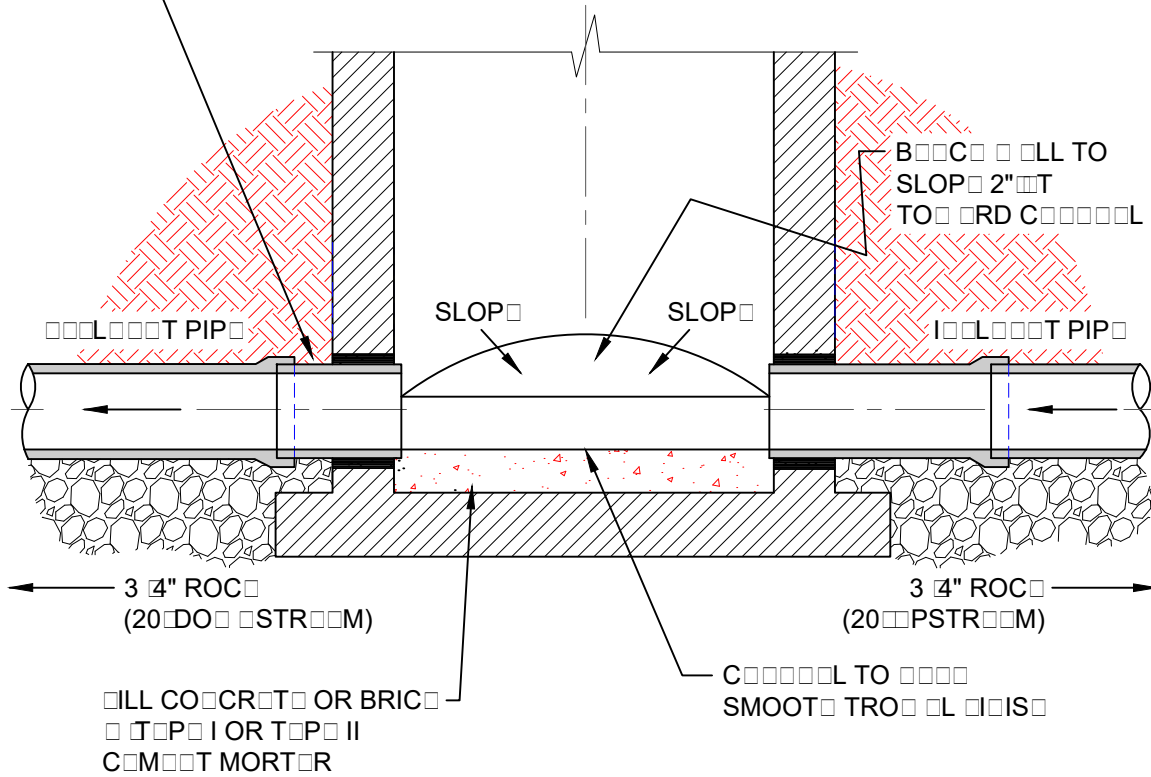
INDIAN RIVER COUNTY
 DEPARTMENT OF
 UTILITIES SERVICES

PIP OPERATIONAL
 MANUAL DETAIL

DRAWING
 NO.

S-11

PIP TO MASONRY CONNECTION TO BOPR BOOT
 IT SHALL BE STAINLESS STEEL ACCESSORIES AND DRIP
 S-11 PIP OPERATIONAL MASONRY DETAIL



PIPE JOINT DETAIL AT MASONRY
RELATION

NOTES

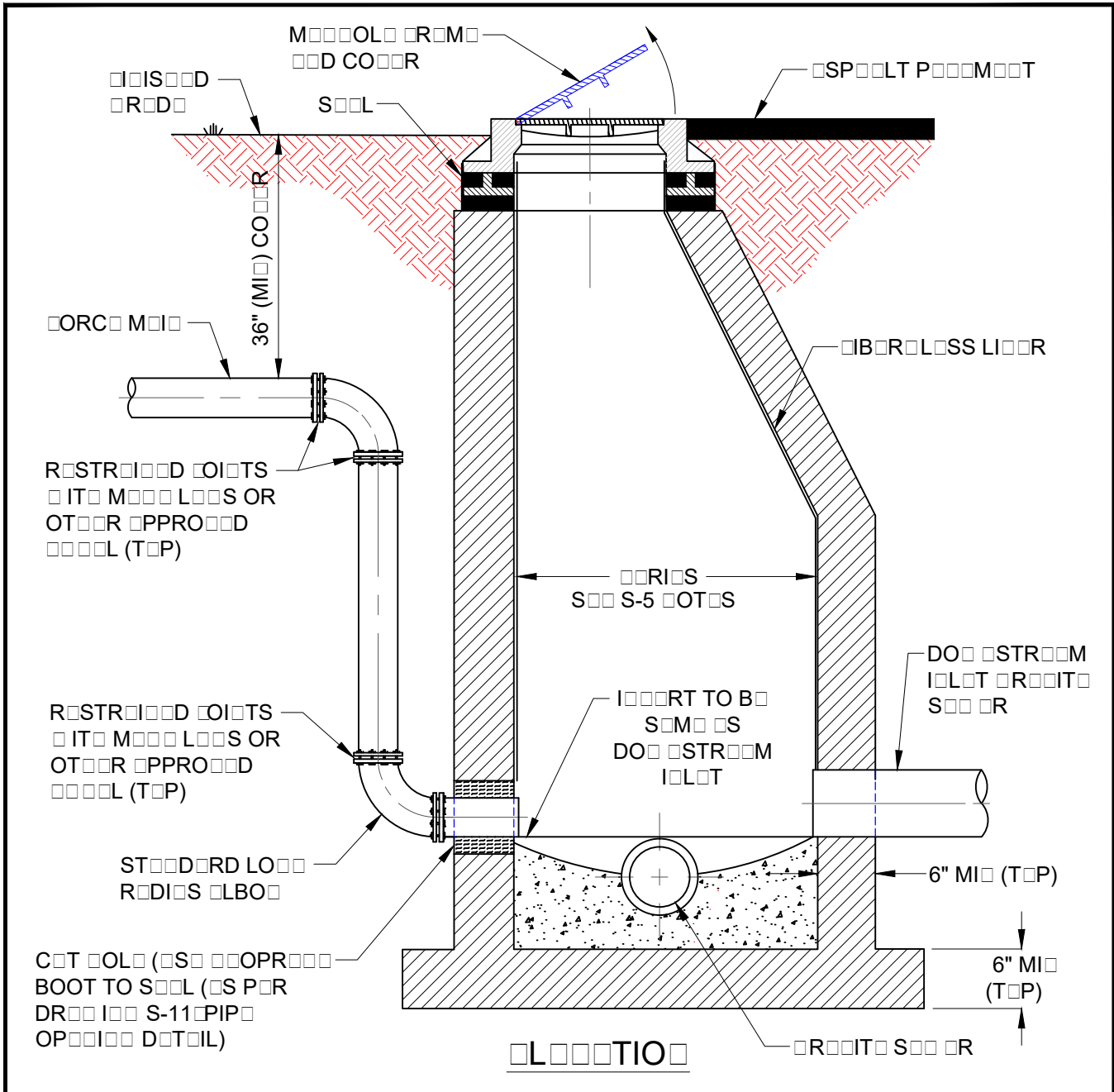
1. PIPE JOINT DETAIL IS TYPICAL FOR ALL PIPE TO MASONRY CONNECTIONS
2. ALL MATERIALS ARE TO BE PER IRCD'S APPROVED MANUFACTURERS' PRODUCT LIST
3. 3/4" ROC SHALL BE 3/4" S BODDIE OR 20" PSTROM OR 20" DO STRM O MASONRY
4. SEE DRIP ACCESSORIES-5 MASONRY NOTES 16

INDIAN RIVER COUNTY
 DEPARTMENT OF
 UTILITIES SERVICES

MASONRY INSTALL
 RELATION PIPE
 DETAIL

DRIP
 CO

S-12



NOTES

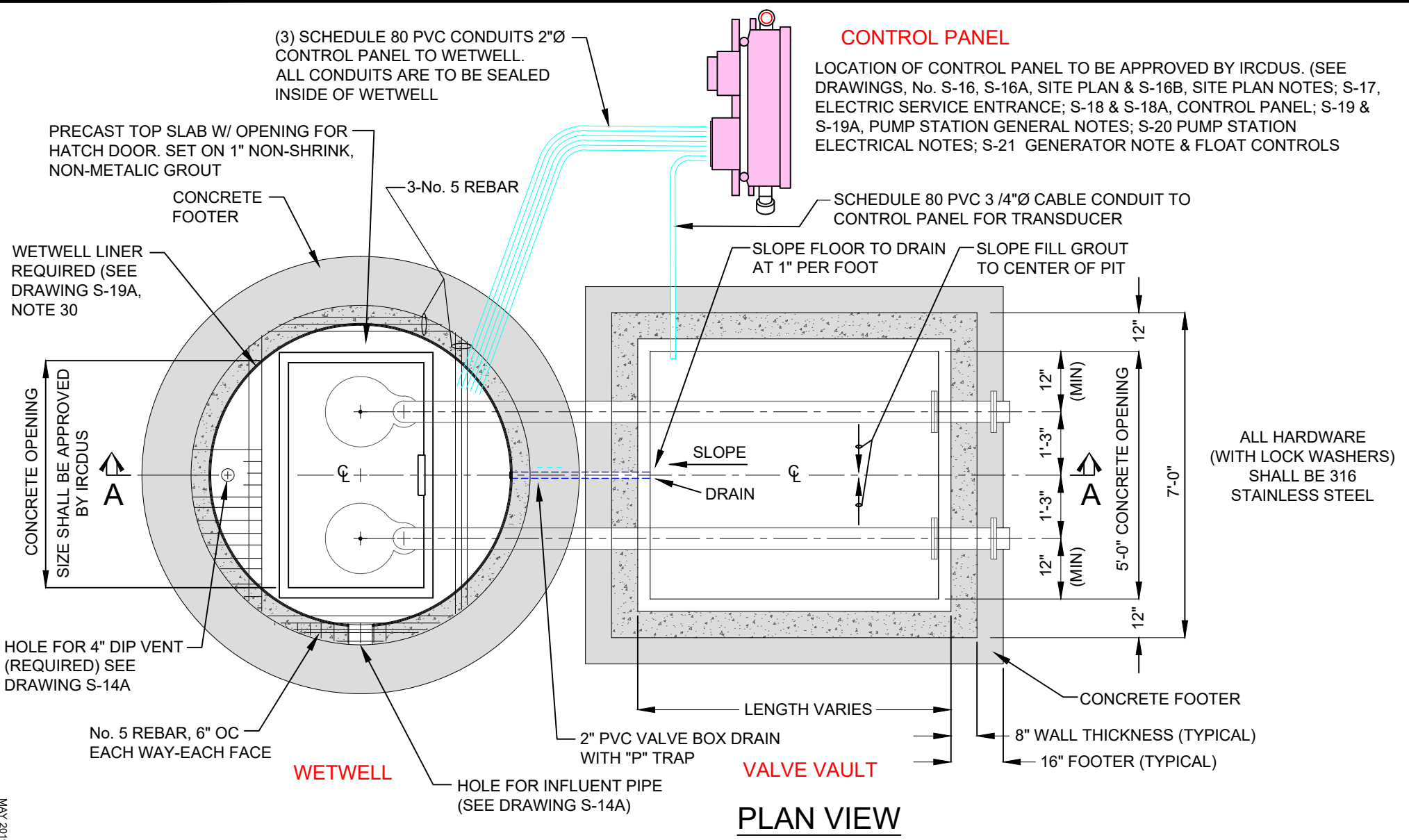
1. SEE DRAWING S-5 MANHOLE NOTES
2. SEE DRAWING S-12 PIPE OPPOSITE DETAIL
3. SEE DRAWING S-12 MANHOLE LAYOUT AND INSTALL DETAIL
4. INSIDE DROP WILL ACCEPT COR CORC M TI-IS
5. MATERIALS FOR LINING MANHOLES SHALL BE PERMITTED TO THE MANUFACTURED BY ASSOCIATED BIRLOSS PERMITS OR APPROVED PERMITS AND SHALL BE PERMITTED TO STANDARD 16,000-POUNDS VERTICAL DYNAMIC PERMITS LOAD (S-20) BIRLOSS LINERS SHALL BE INSTALLED ON ALL MANHOLES RECEIVED FROM PUMPED SOURCE SHALL BE SET AT ALL JOINTS SEE DRAWING S-5 MANHOLE NOTES
6. SHALL BE SET AT ALL JOINTS SEE DRAWING S-5 MANHOLE NOTES

INDIAN RIVER COUNTY
 DEPARTMENT OF
 UTILITIES SERVICES

CORC M TI-IS
 TO MANHOLE

DRAWING NO.

S-13



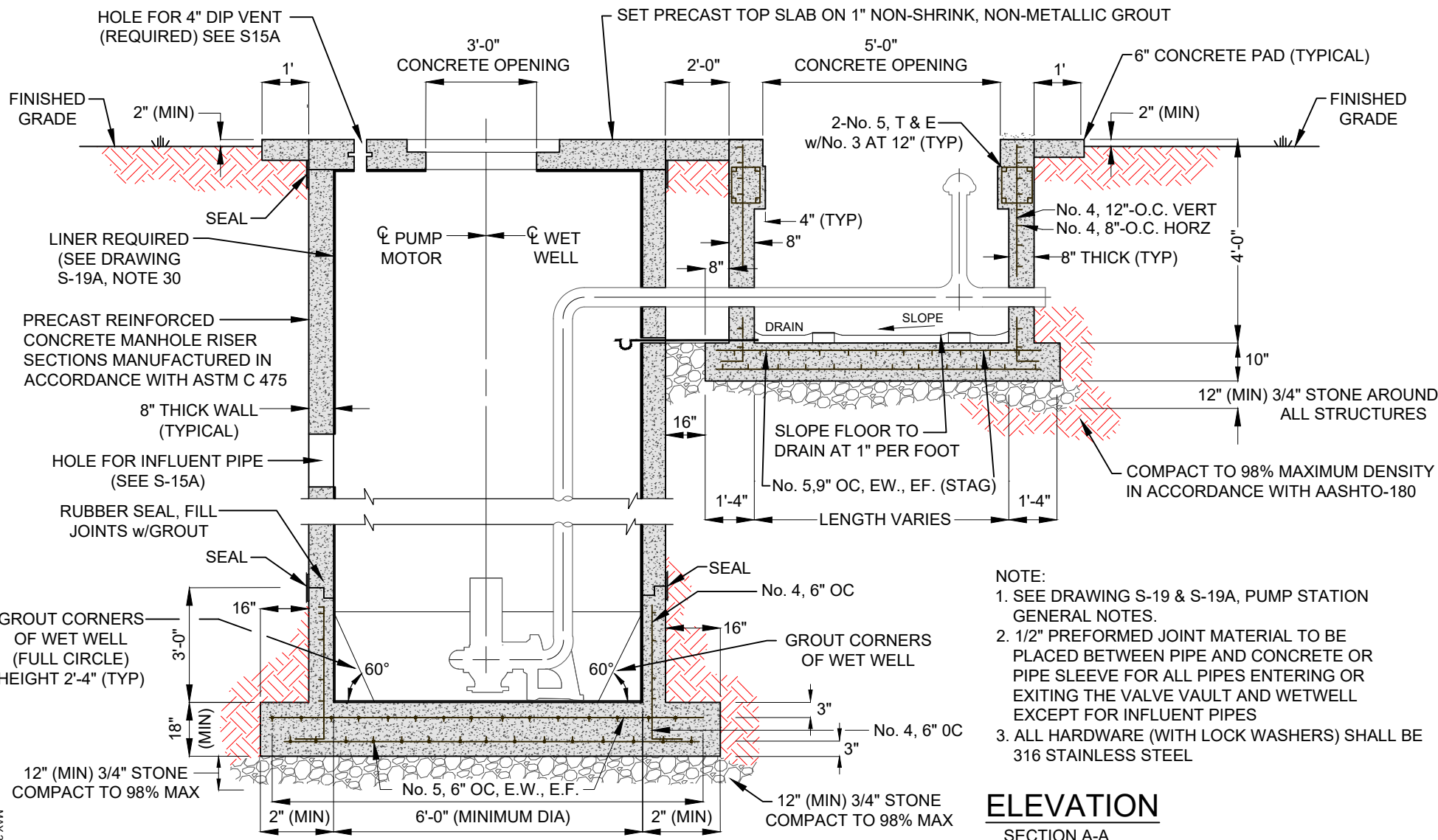
MAY 2019

S-14
DRAWING NO.

SCHEMATIC: NOT INTENDED FOR CONSTRUCTION. SEE PROJECT PLANS.

INDIAN RIVER COUNTY DEPARTMENT OF UTILITY SERVICES

WET WELL/VALVE VAULT
CONCRETE STRUCTURE DETAILS - PLAN VIEW
TYPICAL WASTEWATER PUMPING STATION



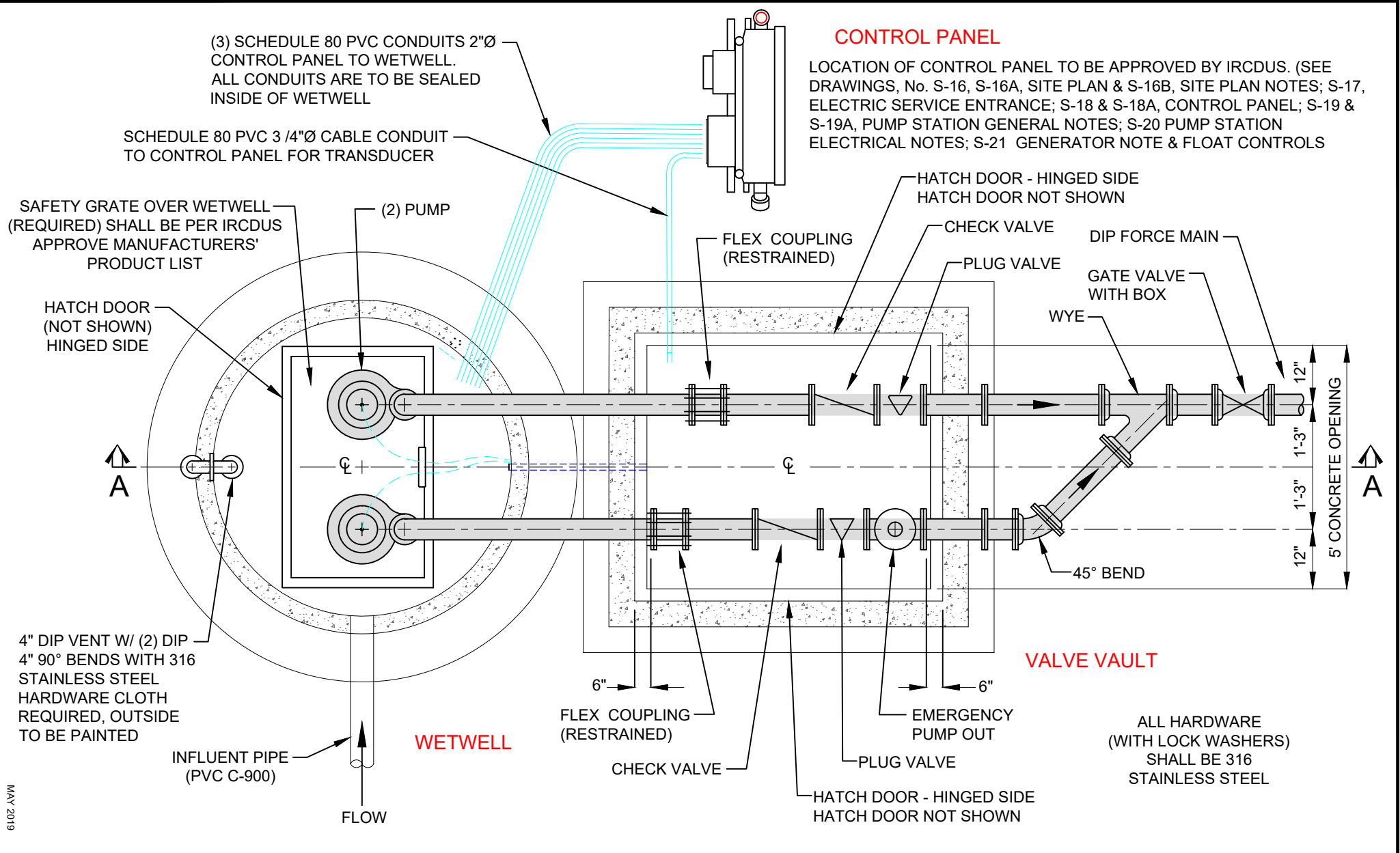
MAY 2019

DRAWING NO. S-14 A

SCHEMATIC NOT INTENDED FOR CONSTRUCTION. SEE PROJECT PLANS

INDIAN RIVER COUNTY DEPARTMENT OF UTILITY SERVICES

WET WELL/VALVE VAULT CROSS SECTION
CONCRETE STRUCTURE DETAILS - SECTION VIEW
TYPICAL WASTEWATER PUMPING STATION



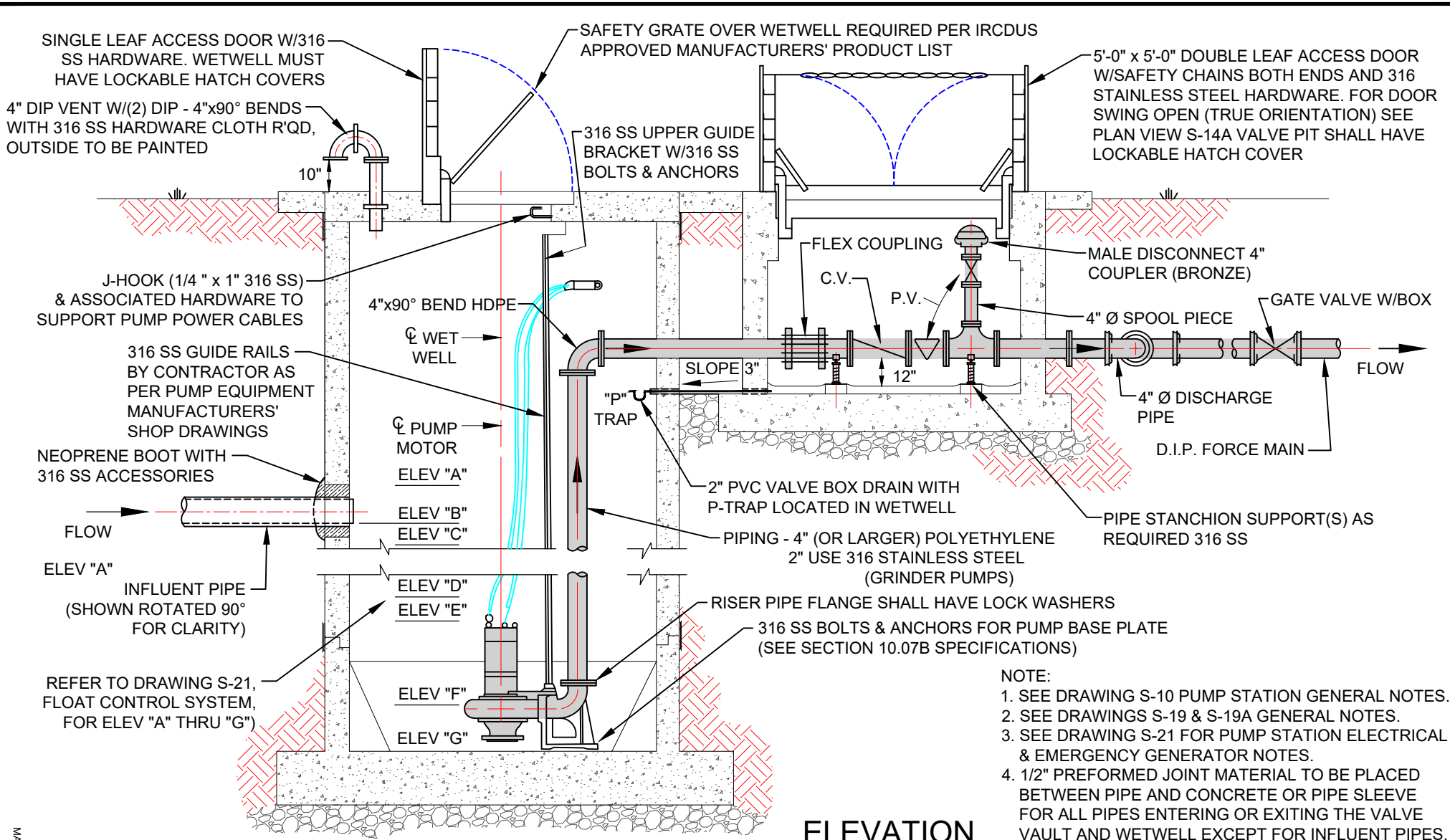
MAY 2019

S-15
DRAWING
NO.

**SCHEMATIC: NOT
INTENDED FOR
CONSTRUCTION. SEE
PROJECT PLANS.**

**INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES**

WET WELL/VALVE VAULT
**PUMP, PIPING & MECHANICAL
DETAILS - PLAN VIEW**
TYPICAL WASTEWATER PUMPING STATION



- NOTE:**
1. SEE DRAWING S-10 PUMP STATION GENERAL NOTES.
 2. SEE DRAWINGS S-19 & S-19A GENERAL NOTES.
 3. SEE DRAWING S-21 FOR PUMP STATION ELECTRICAL & EMERGENCY GENERATOR NOTES.
 4. 1/2" PREFORMED JOINT MATERIAL TO BE PLACED BETWEEN PIPE AND CONCRETE OR PIPE SLEEVE FOR ALL PIPES ENTERING OR EXITING THE VALVE VAULT AND WETWELL EXCEPT FOR INFLUENT PIPES.
 5. ALL HARDWARE (WITH LOCK WASHERS) SHALL BE 316 STAINLESS STEEL

ELEVATION
SECTION A-A

MAY 2019

DRAWING NO. S-15 A

SCHEMATIC NOT INTENDED FOR CONSTRUCTION. SEE PROJECT PLANS

INDIAN RIVER COUNTY DEPARTMENT OF UTILITY SERVICES

WET WELL/VALVE VAULT CROSS SECTION PUMP, PIPING & MECHANICAL DETAILS - SECTION VIEW
TYPICAL WASTEWATER PUMPING STATION

NOTES:

1. REINFORCED CONCRETE SLAB 6" THICK (MINIMUM), SHALL HAVE A FINISHED PAD ELEVATION 4" ABOVE FINISHED GRADE ELEVATION.
2. EXPANSION AND CONTRACTION JOINTS SHALL BE REQUIRED AT WETWELL, VALVE VAULT AND MANHOLE AS APPLICABLE.
3. CONCRETE SLAB CONSTRUCTION TO CONFORM TO ACI 318 STANDARD.
4. NATURAL GAS TO BE USED TO POWER GENERATOR IF AVAILABLE.
5. LOCATION OF CONTROL PANEL PER IRCDUS INSPECTOR.
6. CONTROL PANEL TO MEET NEC CODE 1.10.26A STANDARD. SEE DRAWING S-20, ELECTRICAL NOTES.
7. THREE SCHEDULE 80 PVC CABLE CONDUITS (2"Ø) REQUIRED FROM WETWELL TO CONTROL PANEL FOR POWER/INSTRUMENTATION. ONE CONDUIT (3/4"Ø) REQUIRED FROM VALVE VAULT TO CONTROL PANEL FOR TRANSDUCER. ONE CONDUIT (1"Ø) FOR TELEMETRY EQUIPMENT. ONE SCHEDULE 80 PVC CABLE CONDUIT (2"Ø) REQUIRED FOR ELECTRICAL SERVICE. TOTAL OF FIVE (5) CONDUITS.
8. A 6' FOOT HIGH CHAIN LINK FENCE WITH 12 FOOT WIDE, DOUBLE SWING GATES, ACROSS THE DRIVE IS TO BE INSTALLED WHERE REQUIRED BY IRCDUS.
9. DATA FLOW TOWER FOUNDATION TOP SHALL BE 6" ABOVE FINISHED GRADE. LOCATION TO BE APPROVED BY IRCDUS.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

SITE PLAN - NOTES
TYPICAL WASTEWATER PUMPING STATION

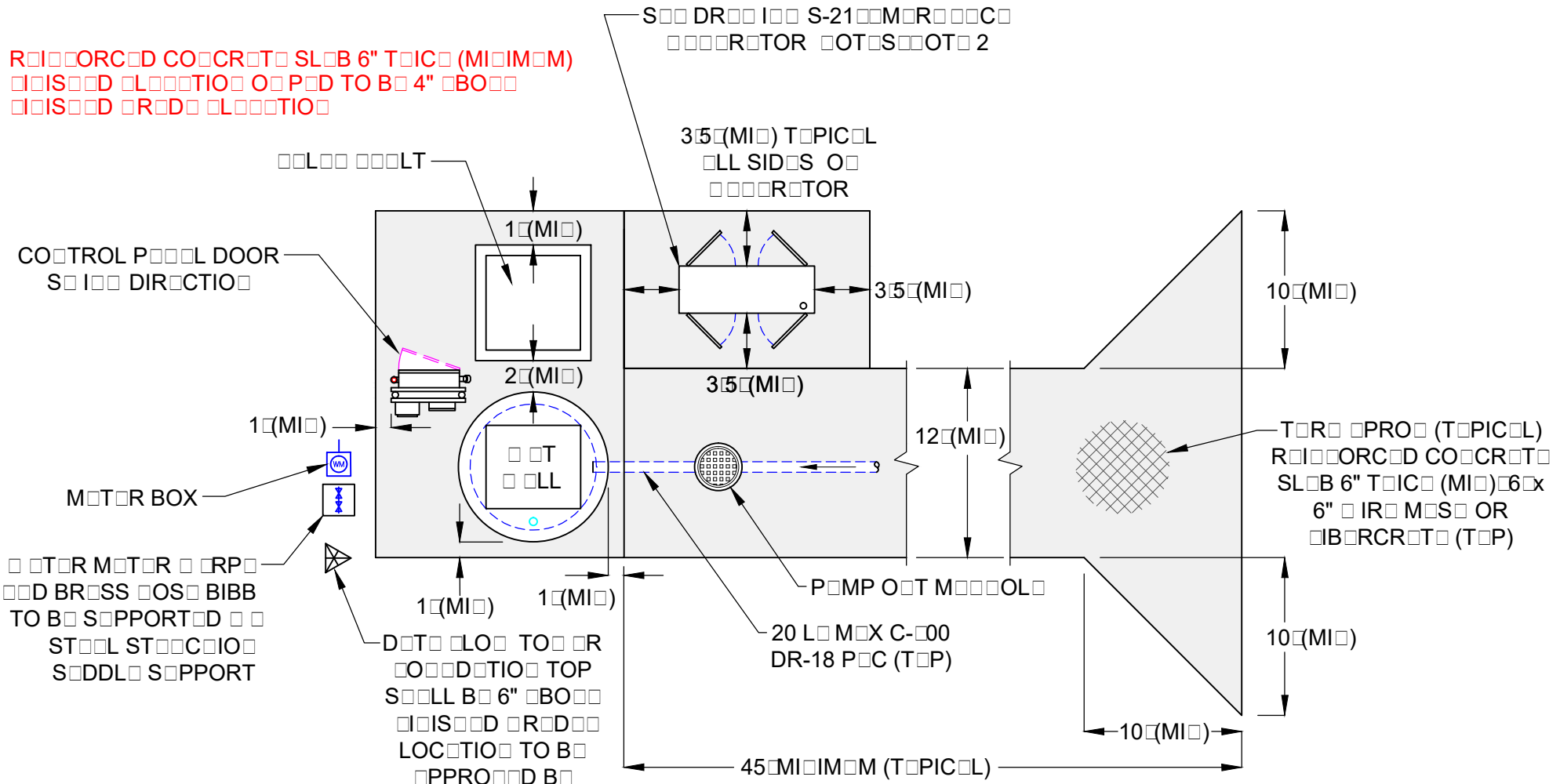
MAY 2019

DRAWING
NO.

S-16

B

REINFORCED CONCRETE SLAB 6" THICK (MINIMUM)
 INSULATED LAYOUT ON PAD TO BE 4" ABOVE
 INSULATED REINFORCED LAYOUT



600mm CIRCULAR LIGHT FITTING
 12 FOOT DOUBLE END TO OT TOP
 DRINKING WATER IS TO BE INSTALLED PER REQUIREMENTS OF THE IRCD'S

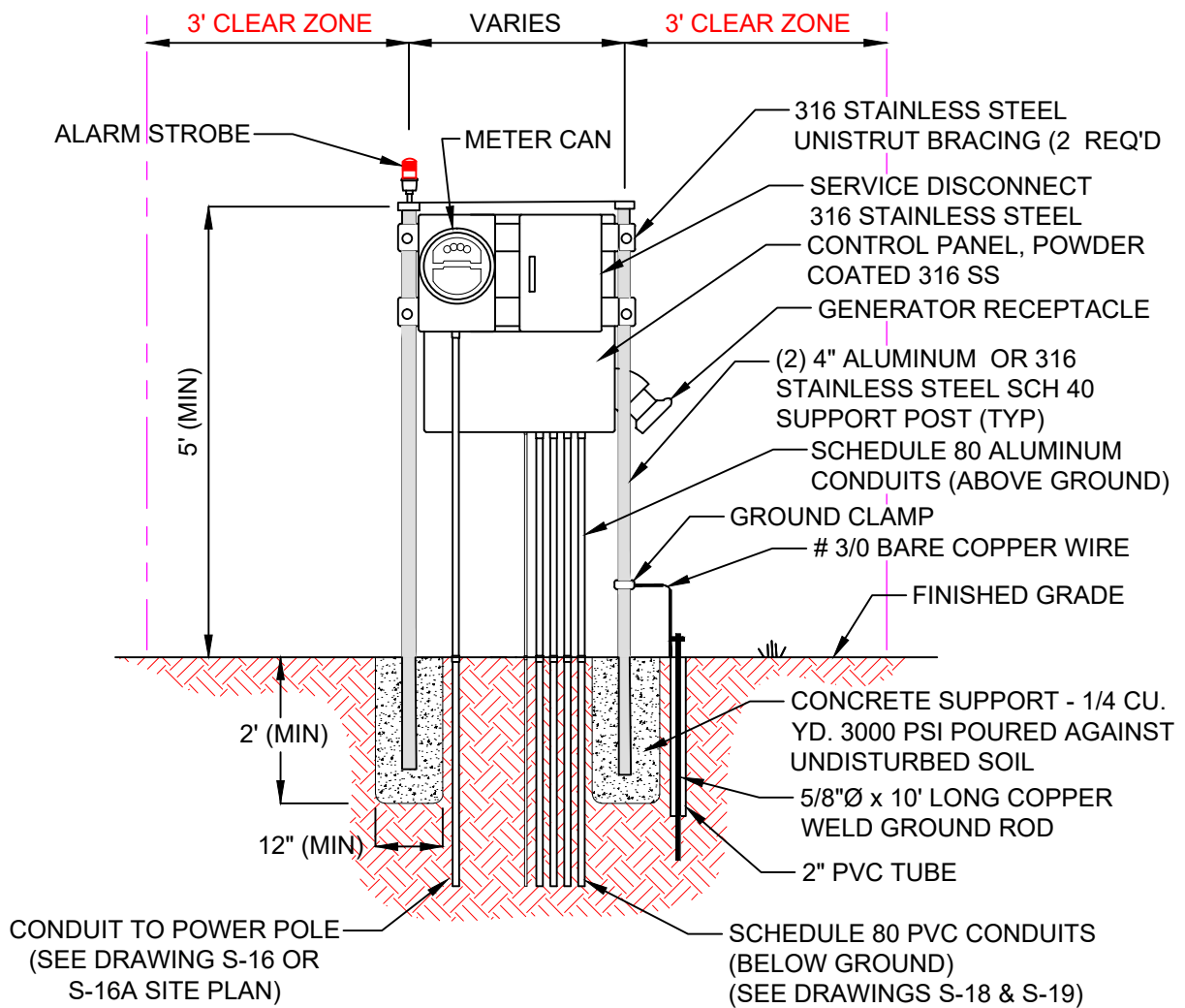
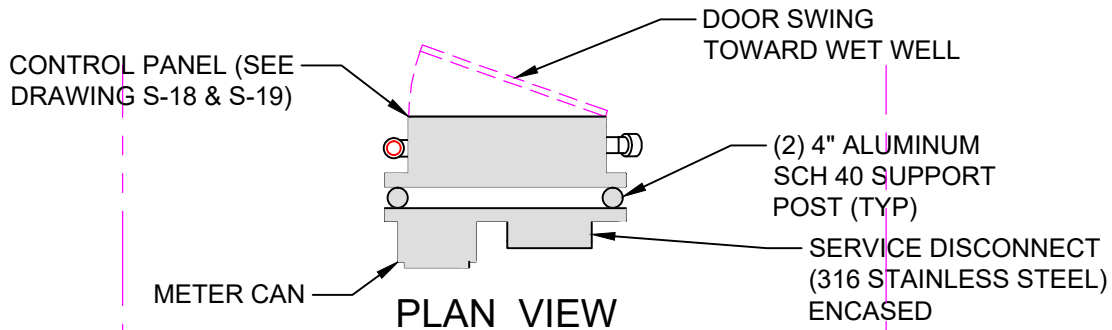
SCHEDULED ITEM S-16B SITE PLANT NOTES

S-16
 DRAWING NO.

SCHEMATIC NOT INTENDED FOR CONSTRUCTION PROJECT PLANS

INDIAN RIVER COUNTY
 DEPARTMENT OF
 UTILITIES SERVICES

SIT PLAN - ELECTRICAL
 TOPICAL STATION PUMPING STATION



REFER TO SPECIFICATIONS
SECTION 10
SUBMERSIBLE WASTEWATER
PUMPING STATION

FRONT ELEVATION

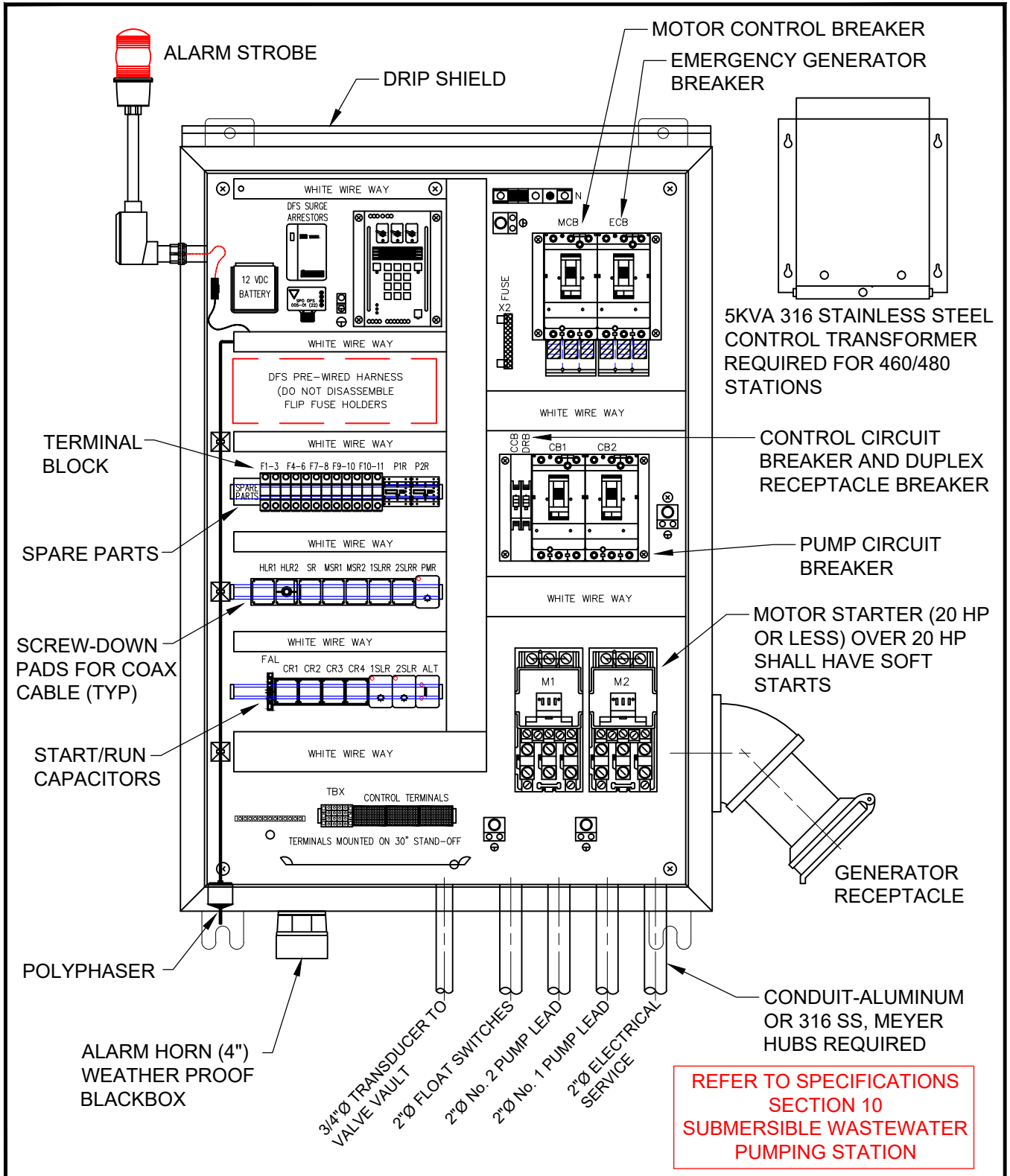
SERVICE STRUCTURE LOCATION TO BE APPROVED BY IRCDUS
SEE DRAWING S-20, TYPICAL WASTEWATER PUMP STATION ELECTRICAL NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

ELECTRIC SERVICE ENTRANCE
METER/PANEL BOX
TYPICAL WASTEWATER PUMPING STATION

DRAWING
NO.

S-17



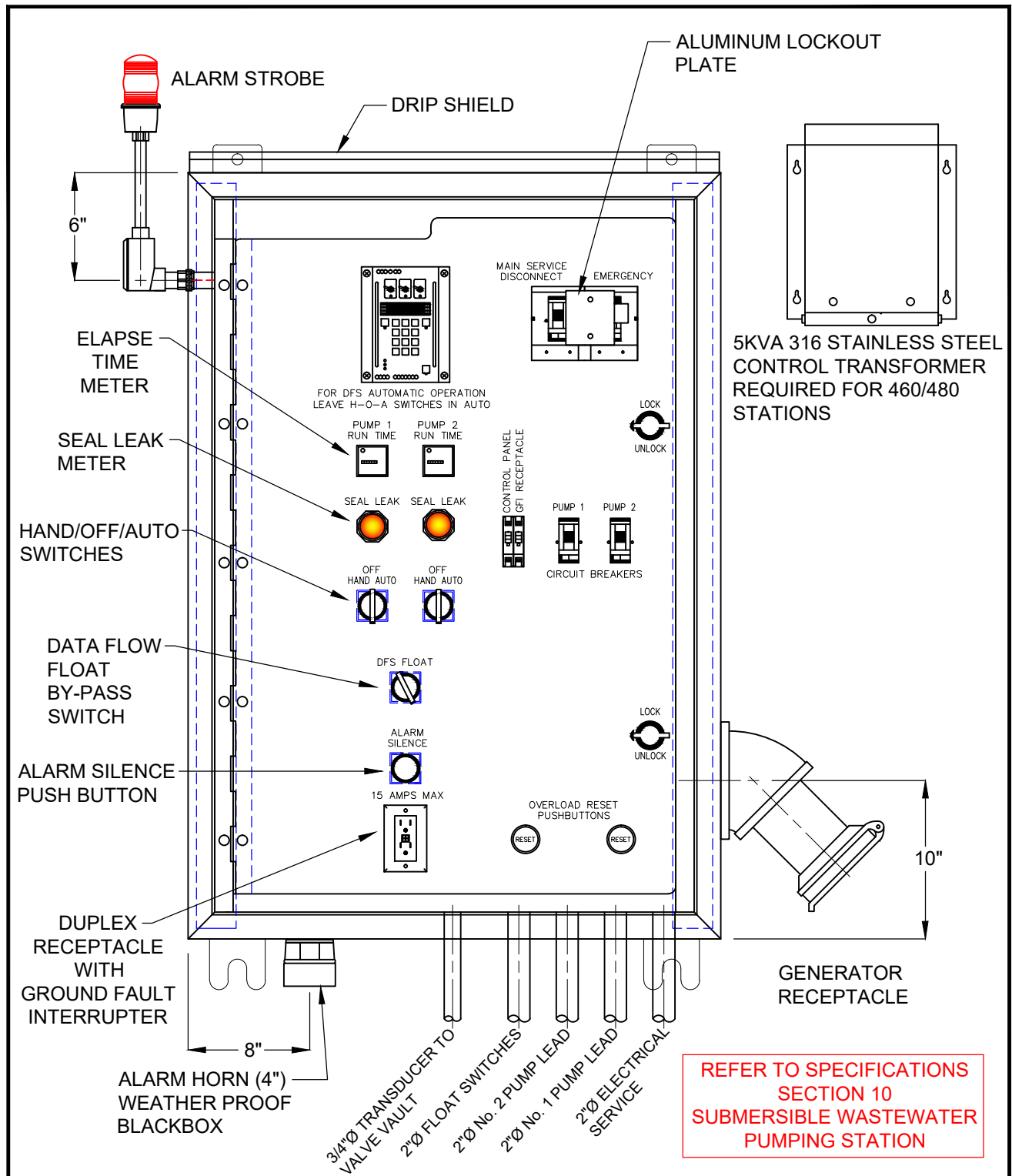
DUPLEX PUMPING STATION

SEE DRAWING S-20, TYPICAL WASTEWATER PUMP STATION ELECTRICAL NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

CONTROL PANEL
BACK PANEL LAYOUT
TYPICAL WASTEWATER PUMPING STATION

DRAWING
NO.
S-18



DUPLEX PUMPING STATION

SEE DRAWING S-20, TYPICAL WASTEWATER PUMP STATION ELECTRICAL NOTES

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

CONTROL PANEL
INNER DOOR LAYOUT
TYPICAL WASTEWATER PUMPING STATION

DRAWING
NO.
S-18
A

MAY 2019

PUMP STATION GENERAL NOTES

1. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS AGAINST FLOATATION OF WET WELL UNTIL ALL BACKFILL IS IN PLACE.
2. ALL CONCRETE SHALL BE CLASS A-A (4,000 PSI FOR PRECAST AND 3,000 PSI FOR CAST-IN-PLACE) UNLESS OTHERWISE SPECIFIED.
3. REINFORCING STEEL SHALL BE GRADE 60 FABRICATED AND PLACED IN ACCORDANCE WITH ACI CODE SPLICES AND SHALL BE SIX (6) TIMES THE BAR DIAMETER NUMBER SIZE OR 18" MINIMUM UNLESS OTHERWISE NOTED (STAG. SPL., TYP).
4. ALL BACKFILL AROUND THE PUMP STATION SITE SHALL BE COMPACTED @ 98% OF MAXIMUM DENSITY, PER AASHTO-T-180.
5. CHAMFER EXPOSED CONCRETE EDGES 3/4" (TYP).
6. WETWELL WALL SHALL CONTAIN A MINIMUM OF .022 SQ IN/LINEAR FOOT REINFORCEMENT, EACH WAY TOP TO BOTTOM.
7. ALL PIPING AT THE PUMP STATION SITE SHALL BE RESTRAINED.
8. ALL PUMPS AND PUMPING EQUIPMENT - SEE IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.
9. STAINLESS STEEL (316) CABLE HOLDER SHALL BE LOCATED ON OPPOSITE SIDE OF WETWELL FROM THE INFLUENT PIPE.
10. BUOYANCY CALCULATIONS SHALL BE REQUIRED FOR ALL PUMP STATIONS ALONG WITH THE REQUIRED PUMP STATION CALCULATIONS.
11. NO UNI-FLANGE PIPE CONNECTIONS ALLOWED.
12. MAINTAIN MINIMUM OF 6" BETWEEN ANY PIPING, FITTINGS ETC. AND PRECAST CONCRETE.
13. FIBERGLASS LINERS SHALL BE INSTALLED ON ALL PUMP STATION WETWELLS AND MANHOLES RECEIVING PUMPED SEWAGE, PLUS 5 MANHOLES IN EACH DIRECTION.
14. ALL NEW MANHOLES SHALL BE COATED PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.
15. PUMP STATION CONTROL PANEL SHALL BE PROVIDED WITH APPROPRIATE LIGHTNING ARRESTOR. VERIFY ALL DRIVEN GROUNDING GRIDS PER N.E.C. 250.56 AND SCADA (LATEST STANDARDS).
16. AN ACCESS DRIVE SHALL BE PROVIDED TO ALL IRCDUS MAINTAINED LIFT STATIONS. ALL ACCESS DRIVES SHALL BE A MINIMUM OF 12' WIDE, 45' LONG. IF FENCE IS INSTALLED, SWING GATE SHALL HAVE A 12' OPENING.
17. ALL PROPOSED PRIVATE STATION OWNERS ARE TO SIGN AN AGREEMENT ACKNOWLEDGING STATION IS TO REMAIN PRIVATE UNLESS SUBJECT STATION IS CONSTRUCTED TO IRCDUS STANDARDS.
18. PUMPS SHALL BE DESIGNED TO PROVIDE A MINIMUM PUMP RUN TIME EQUAL TO HALF THE CYCLE TIME.
19. PUMPS SHALL BE DESIGNED TO PROVIDE A MAXIMUM CLEARANCE OF TEN FEET OUTSIDE OF LIFT STATION WETWELL FOR FUTURE MAINTENANCE.
20. ALL RE-PUMP STATIONS SHALL HAVE BIO-CUBE ODOR CONTROL SYSTEMS AS REQUIRED BY MANUFACTURER, AND APPROVED BY IRCDUS.
21. LIFT STATION IS TO BE LOCATED IN A DEDICATED UTILITY EASEMENT, 50' AWAY FROM HOMES, CUL-DE-SACS AND SURFACE BODY WATER.
22. A SAFETY GRATE WITH STAINLESS STEEL (316) HARDWARE IS REQUIRED FOR ALL WETWELLS.

REFER TO SPECIFICATIONS
SECTION 10
SUBMERSIBLE WASTEWATER
PUMPING STATION

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

PUMPING STATION
GENERAL NOTES
TYPICAL WASTEWATER PUMPING STATION

DRAWING
NO.

S-19

MAY 2019

PUMP STATION GENERAL NOTES

(CONTINUED)

- 23. CONTRACTOR TO INSTALL PERMANENT SIGNAGE AT CONTACT INFORMATION PROVIDED NUMBER AT ALL IRCD'S AND PRIOR TO LIST STATIONS CONTRACTOR TO PROVIDE SECURITY FOR PRIOR TO LIST STATIONS PER IRCD'S PLANS ROOMS SECURITY TO INCLUDE BUT NOT LIMITED TO LOCKABLE ETC COVER LIDS FOR TOP OF ALL AND BELOW PIT
- 24. CONTRACTOR TO CONTACT IRCD'S INSPECTOR PRIOR TO PUMP STATION CONSTRUCTION
- 25. SEE TOPICAL AND STATION PUMPING STATION DRAWINGS S-14 S-14 PLANS AND DRAWING S-15 S-15 CROSS SECTION FOR GENERAL LAYOUT OF ALL AND BELOW AND BELOW STATION DRAWING S-16 S-16 AND S-16B FOR TOPICAL PUMPING STATION SITE PLANS GENERAL LAYOUT STATION DRAWING S-17 S-18 S-18 S-18 S-18 FOR ELECTRICAL DETAILS
- 26. STRUCTURE DIMENSIONS MAY VARY APPROXIMATELY TO IRCD'S DRAWING TO BOUNDARY COMPASSION OR OTHER REQUIREMENTS
- 27. ALL WALLS TO BE LOCATED AT CORNER MARKER SECTION
- 28. STAINLESS STEEL (316) LIFTING BAILS SHALL BE USED FOR PUMPS IN LIST STATIONS AND RIGID PUMPS SHALL BE A MAXIMUM OF 50 LB LESS OTHER IS APPROXIMATELY IRCD'S
- 30. ELECTRICAL CONTROL PANEL (MAY BE 4XPO FOR CONTROL 316 STAINLESS STEEL) SHALL CONFORM TO PUMP MANUFACTURERS SCHEDULE SYSTEM REQUIREMENTS
- 31. ALL WET WALLS SHALL BE LIQUIDS SPECIFIC SECTION 10
- 32. ALL WET WALLS 15" DEEP OR ROOTER TRAP 10" DIAMETER MUST BE APPROXIMATELY IRCD'S REQUIREMENTS
- 33. OUTSIDE WALLS AND INSIDE WALLS OF ALL TOP SLAB AND BELOW BOX SHALL BE PAINTED WITH (2) TOP COATS OF EPOXY
- 34. ALL WET WALLS TO BE 316 STAINLESS STEEL
- 35. PUMP STATION POWER SUPPLY FROM FLORIDA POWER AND LIGHT ELECTRICAL POWER POLARITY OR TRANSFORMER TO THE PUMP STATION ELECTRICAL PANEL SHALL BE INCLUDED ON THE RECORD DRAWING
- 36. PAINT OUTSIDE WALLS AND INSIDE WALLS OF ALL TOP SLAB AND BELOW AND BELOW WALLS OF ALL TOP COATS OF EPOXY

REFER TO SPECIFICATIONS
 SECTION 10
 SUBMERSIBLE AND STATION
 PUMPING STATION

INDIVIDUAL REVIEW CONTACT
 DEPARTMENT OF
 UTILITIES SERVICES

PUMPING STATION
GENERAL NOTES
 TOPICAL AND STATION PUMPING STATION

DRAWING NO.
S-1

PUMP STATION ELECTRICAL NOTES

1. A MINIMUM 3' CLEAR ZONE IS REQUIRED AROUND THE ELECTRICAL AREA. THE MINIMUM WORKSPACE REQUIREMENTS SHALL ADHERE TO THE NATIONAL ELECTRICAL CODE (NEC), SECTION 110.26(A).
2. A 3/4" CONDUIT SHALL BE INSTALLED BETWEEN THE CONTROL PANEL AND THE VALVE VAULT FOR THE TRANSDUCER.
3. THREE (3) SCHEDULE 80, 2" CONDUITS SHALL BE INSTALLED BETWEEN THE CONTROL PANEL AND THE WET WELL FOR NO. 1 PUMP LEAD, NO. 2 PUMP LEAD AND THE FLOAT SWITCHES.
4. ALL BURIED CONDUIT SHALL BE SCHEDULE 80 PVC. ALL EXPOSED CONDUIT SHALL BE STAINLESS STEEL (316) OR ALUMINUM. CONDUIT TO BE SEALED.
5. A MASTIC COATING IS REQUIRED WHERE PANEL POST AND ALUMINUM OR STAINLESS STEEL (316) CONDUIT IS IN DIRECT CONTACT WITH CONCRETE.
6. THE CONTROL PANEL DOOR MUST OPEN TOWARD THE WET WELL.
7. ELECTRIC SERVICE SHALL BE 3 PHASE.
8. ALARM HORN SHALL BE SEALED TO PREVENT LEAKAGE.
9. CONTROL PANEL SHALL BE APPROVED BY IRCDUS BEFORE INSTALLATION.
10. REFER TO SECTION 10 FOR PUMPING STATION SPECIFICATIONS.
11. BOTTOM OF CONTROL PANEL TO BE 28" TO 34" ABOVE GROUND.
12. ALL HARDWARE AND FASTENERS TO BE STAINLESS STEEL (316).
13. TOOLS AND SPARE PARTS ARE REQUIRED (SEE SECTION 10.05).
14. CONTROL PANEL SHALL MEET THE REQUIREMENTS OF SERVICE ENTRANCE BY PROPERLY BONDING OR SHALL BE UL SERVICE ENTRANCE RATED.
15. CONTROL PANEL SHALL HAVE A DATA FLOW, FLOAT BY-PASS SWITCH.
16. THE MAXIMUM HORSEPOWER RATING FOR A 120/240 VOLT WASTEWATER PUMPING STATION PANEL IS 20 HP. ANY PUMP SIZE GREATER THAN 20 HP SHALL HAVE 480 VOLT SERVICE AND BE DESIGNED BY AN ELECTRICAL ENGINEER.
17. THE CONTROL PANEL SHALL BE 4X NEMA, WHITE POWDER COATED STAINLESS STEEL.
18. A WATER SERVICE LINE (1"Ø) WITH REDUCED PRESSURE BACKFLOW PREVENTER, WATER METER AND HOSE BIBB IS REQUIRED.
19. ALL PENETRATIONS INTO ELECTRIC CONTROL PANEL REQUIRE MEYER HUBS. CORROSIVE MATERIALS WILL NOT BE ALLOWED.
20. DISCONNECT BETWEEN METER AND PANEL TO BE 316 STAINLESS STEEL, NON-FUSABLE. STATIONS WITH GENERATORS SHALL BE FUSED.
21. PUMP STATION CONTROL PANEL SHALL BE PROVIDED WITH APPROPRIATE LIGHTNING ARRESTOR. VERIFY ALL DRIVEN GROUNDING GRIDS PER N.E.C. 250.56 AND SCADA (LATEST STANDARDS).

REFER TO SPECIFICATIONS
SECTION 10
SUBMERSIBLE WASTEWATER
PUMPING STATION

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

PUMPING STATION
ELECTRICAL NOTES
TYPICAL WASTEWATER PUMPING STATION
MAY 2019

DRAWING
NO.

S-20

PUMP STATION EMERGENCY GENERATOR NOTES

1. OCSI DOLMOTS 200 OR MORE SITS SHALL PROVIDE BACKUP MOTOR SETS OR MOTORC S S RORROR SALL B PROIDED IT OTOMOTIC TORO OR SITC TTT SSSS PO R ITERRPTIO FROM T M PO R SORCSTRTS T RORROR SD SITS TPO R S PPL TO T LIT STATIO FROM T RORROR
2. LOSS T 200 OMS R COSTRUCTD IITILLBT I OTR P S S T BILD-OT IS 200 OMS R RORROR M RORROR RORROR ILL B RORROR T POMPI STATIO SALL B COSTRUCTD IT SP C ILLBL OR M RORROR RORROR TO B ISTALLD O 200 OMS R COSTRUCTD
3. IRCD S M COOCT ADDITIOAL DOLMOTS ITO PROPOS POMPI STATIO D M RORROR M RORROR RORROR
4. OTR L S TO B SD OR PO R O ILLBL
5. S S S CTIO 17 I DRI RORROR SITS OR SPICICTIOS

PUMPING STATION DATA TABLE			
LIFT STATION NUMBER			
PRIMARY CONDITION	PUMPING CAPACITY	GPM	0
	TOTAL HEAD ±	FEET	0
	EFFICIENCY	%	0%
INTERMEDIATE CONDITION	PUMPING CAPACITY	GPM	0
	TOTAL HEAD ±	FEET	0
	EFFICIENCY	%	0%
SECONDARY CONDITION	PUMPING CAPACITY	GPM	0
	TOTAL HEAD	FEET	0
	EFFICIENCY	%	0%
MINIMUM SOLIDS PASS. IMPELLER		INCHES	0"
PUMP MODEL NUMBER		NO.	00-00-0
PUMP IMPELLER		INCHES	XX-00
PUMP SPEED (DESIGN)		R.P.M.	0000
MOTOR NAMEPLATE H.P.		H.P.	0
MAXIMUM PUMP BRAKE H.P.		H.P.	± 0.0
MAXIMUM NPSHR @ SECONDARY		FEET	0000
MAXIMUM MOTOR SPEED		R.P.M.	0000
INITIAL INFLUENT FLOW RATE PEAK		G.P.M.	00
MINIMUM PUMP CYCLE TIME		MINS.	0000
ALARM SIGNAL ON ELEVATION		ELEV. "A"	0.00
INFLUENT PIPE INVERT ELEVATION		ELEV. "B"	0.00
LAG PUMP ON ELEVATION		ELEV. "C"	0.00
LEAD PUMP ON ELEVATION ±		ELEV. "D"	0.00
PUMPS OFF ELEVATION		ELEV. "E"	0.00
ALARM SIGNAL ON ELEVATION		ELEV. "F"	0.00
BOTTOM OF WET WELL		ELEV. "G"	0.00
PUMP MANUFACTURER			

← PMP SHALL OPERATE BT O O PRIMR S COODR POINTS

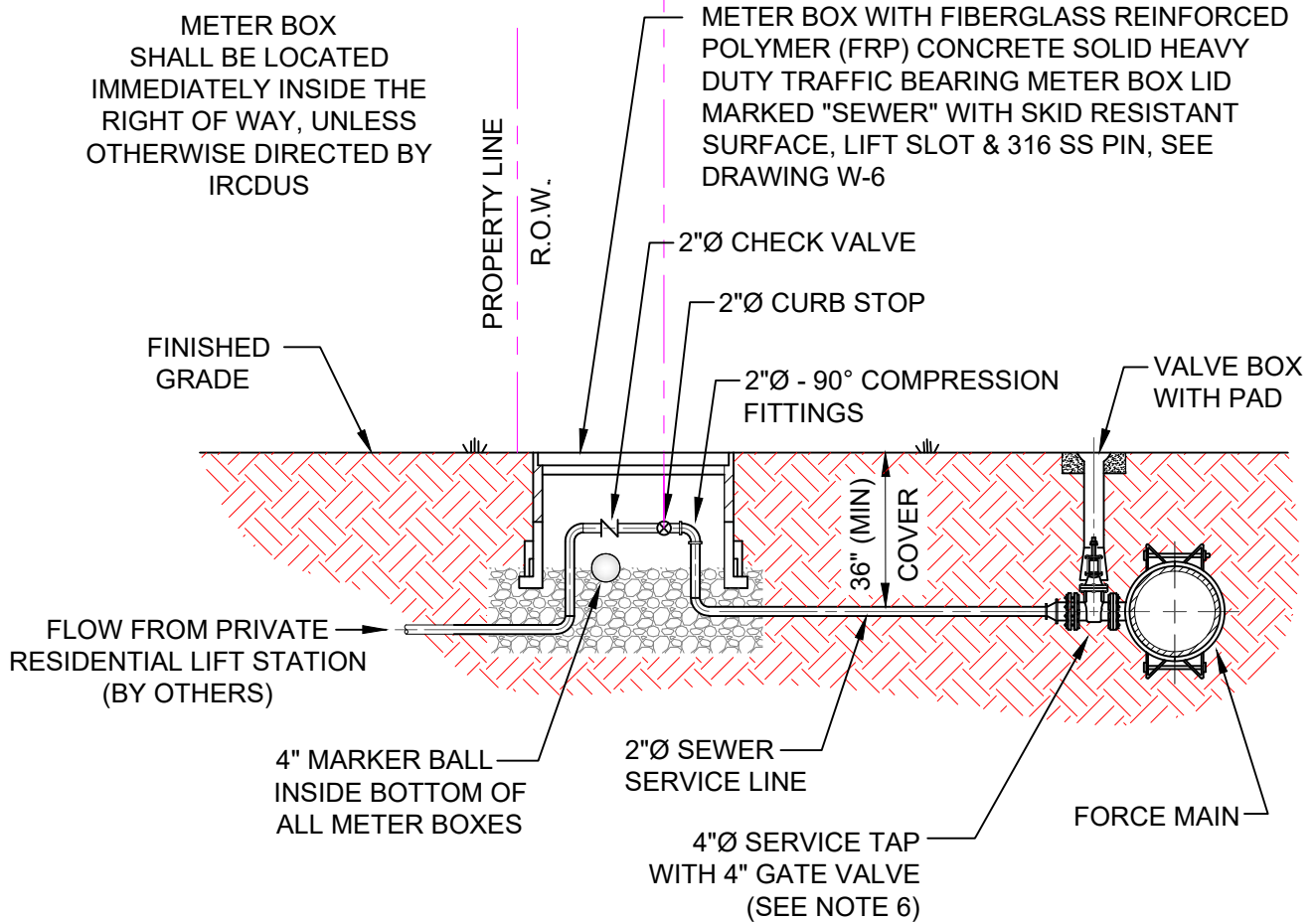
FLOAT CONTROL SYSTEM

S DR I S-15 PMPPIPI MOCICL DDTILS - S CTIO I OR OTR L ORROR M OT O LOT CONTROL SITCS

RORR TO SPICICTIOS
S CTIO 10
S B M R S I B L O C S T O T R
P M P I O S T A T I O

CUSTOMER RESPONSIBILITY

IRCDUS RESPONSIBILITY



ELEVATION

NOTES:

1. PRIVATE PUMPING STATIONS SHALL BE APPROVED BY IRCDUS.
2. PRIVATE PUMPING STATION, INCLUDING PUMP, ALL PIPING TO THE SEWER METER BOX, CONTROLS AND ELECTRICAL CONTROL PANEL SHALL BE CONSTRUCTED BY THE OWNER AT NO EXPENSE TO IRCDUS.
3. OWNER SHALL BE RESPONSIBLE FOR ALL COST ASSOCIATED WITH THE OPERATION AND MAINTENANCE OF A PRIVATE PUMPING STATION.
4. OWNER OF PROPOSED PRIVATE PUMPING STATION SHALL SIGN AN AGREEMENT ACKNOWLEDGING PUMPING STATION IS TO REMAIN PRIVATE.
5. ALL PRIVATE PUMPING STATION EQUIPMENT SHALL BE PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.
6. COMMERCIAL PRIVATE PUMPING STATIONS SHALL HAVE A 4"Ø SERVICE TAP CONNECTION TO THE FORCE MAIN WITH A 4" GATE VALVE. RESIDENTIAL PRIVATE PUMPING STATIONS SHALL HAVE A 2"Ø SERVICE TAP CONNECTION WITH A 2"Ø CORP STOP.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

FORCE MAIN SERVICE
FOR TYPICAL PRIVATE
PUMPING STATION

DRAWING
NO.

S-22

MAY 2019

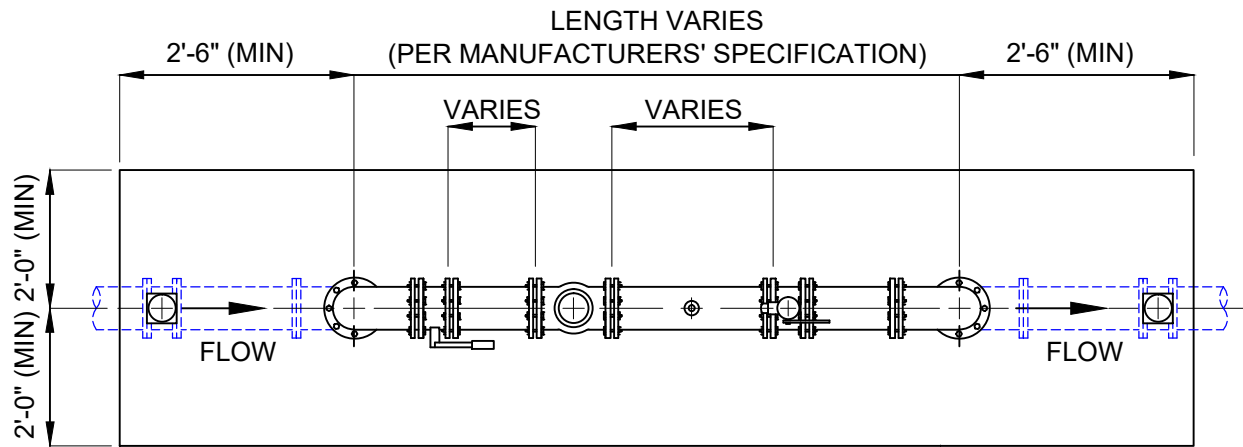
NOTES

- 1. ALL BOARDS ROOF PIPES AND HILLS SHALL BE LAPPED DUCTILE IRO PIPES
- 2. ALL BOARDS ROOF PIPES HILLS AND BOX LIDS SHALL BE PIPES
Pipes to be PARPL (522C)
- 3. PROVIDE PLACARDS MOUNTED ON STANDARD " " SOPS SIGN POSTS NOT LOOSE IT
THESE WORDS "RECLAIMED MOTOR IS" PLACARDS SHALL BE PLACED DIRECT TO
THE RECLAIMED MOTOR MOTOR ASSEMBLY AND BE THE DISCREET
STILLING ALL
- 4. PROPELLER OR MOTOR SHALL BE LIKED TO IRCD'S REMOTE TRANSMITTER UNIT
(RT) OR REMOTE MONITORING BY IRCD'S THE MOTOR SHALL REPORT IN ALLOYS
PERMITTING PLASMA SALL BE REMOTE CONTROLLED BY IRCD'S AND BE
PRESSURE TRANSDUCER IN LAMP PLASMA SALL REPORT "PERCUTTING OP"
POSITIONING THE ALL LOGIC IN IRCD'S SCDD SYSTEM
- 5. THERMISTOR AND MONITORING DEVICE IS REQUIRED AT DISCREET DEVICE TO BE
INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS
- 6. DISCREET REPORT TO BE ON PIP DIMETER (MIMM) BOARDS MOTOR TO MOUNTING
- 7. ELECTRICAL PANEL SHALL BE PER LIST STATION PANEL SPECIFICATIONS SEE DETAIL
DRAWINGS S-17 S-18 S-18 S-18 S-18 ELECTRICAL PANEL TO BE LOCATED AS
CLOSE TO THE MOTOR AS PRACTICAL
- 8. BAR ROTATION OR TOP OF STILLING ALL SHALL BE LOMIMBORI BAR
SPECIES 1188" CROSS BAR SPECIES 4" OR 15" OR AS APPROVED BY IRCD'S
ALL MATERIALS OR TO BE PER IRCD'S APPROVED MANUFACTURERS PRODUCT LIST

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITIES SERVICES

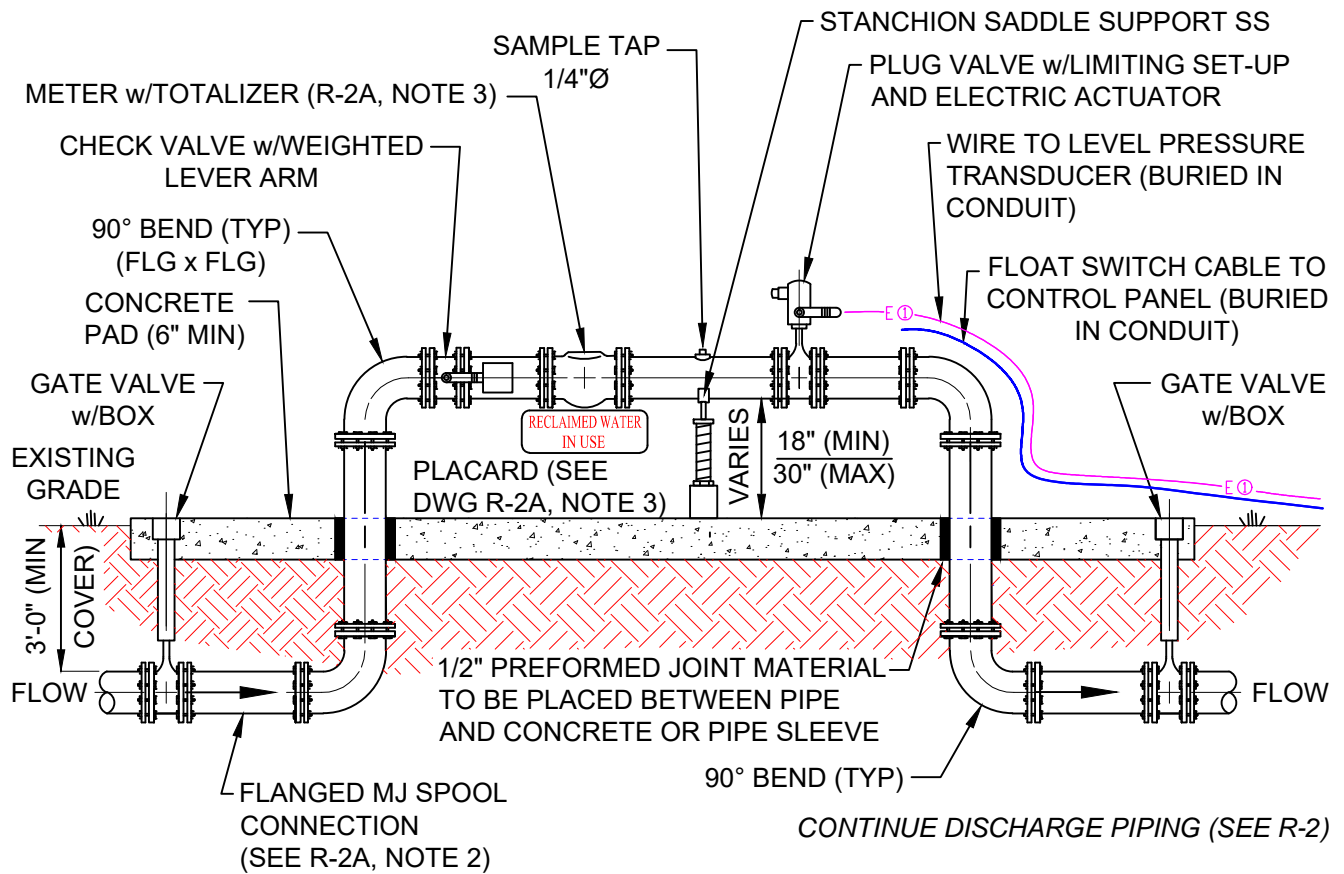
RECLAIMED MOTOR
NOTES

DRIVE
R-2
□



CONCRETE PAD - 3,000 PSI COMMERCIAL GRADE FIBER MESH
 CONCRETE (6" THICK MINIMUM, LENGTH AS REQUIRED)

PLAN VIEW



ELEVATION

SEE RECLAIMED WATER NOTES, R-2A

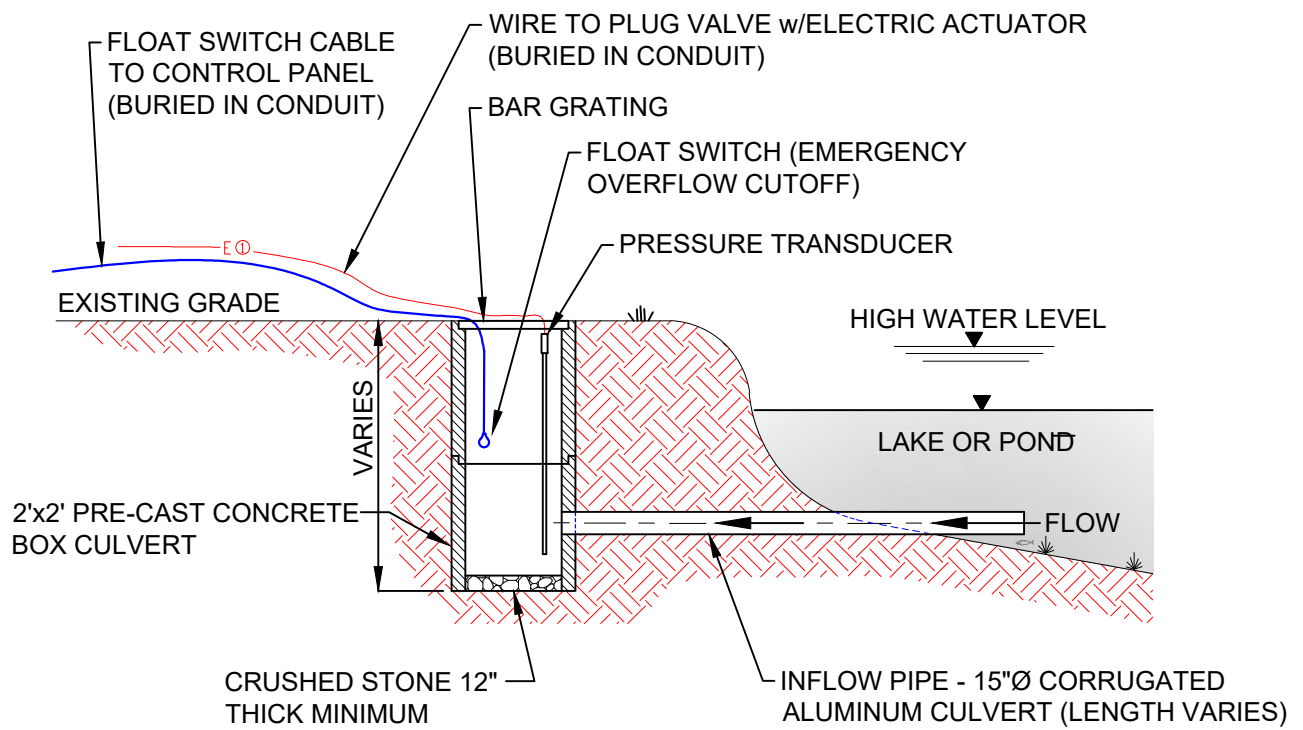
INDIAN RIVER COUNTY
 DEPARTMENT OF
 UTILITY SERVICES

RECLAIMED WATER METER
 VALVE ASSEMBLY DETAIL

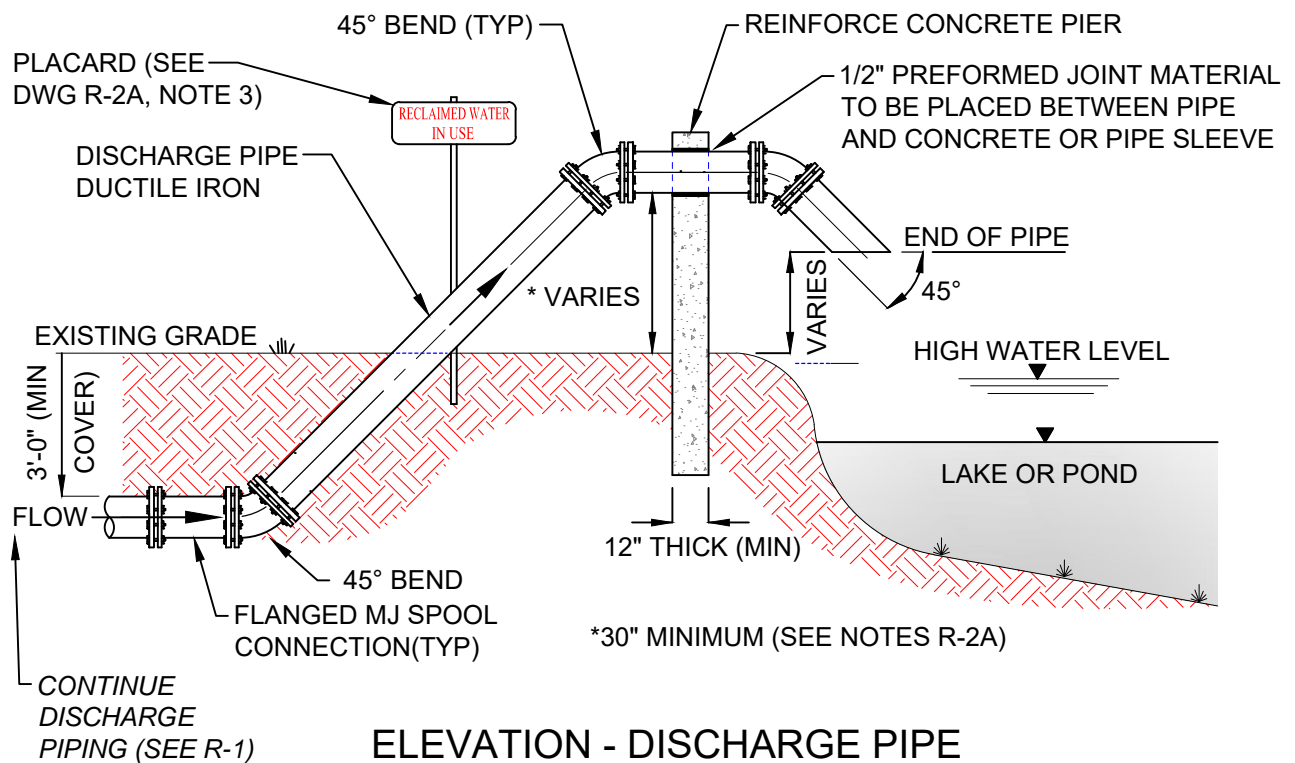
DRAWING
 NO.

R-1

MAY 2019



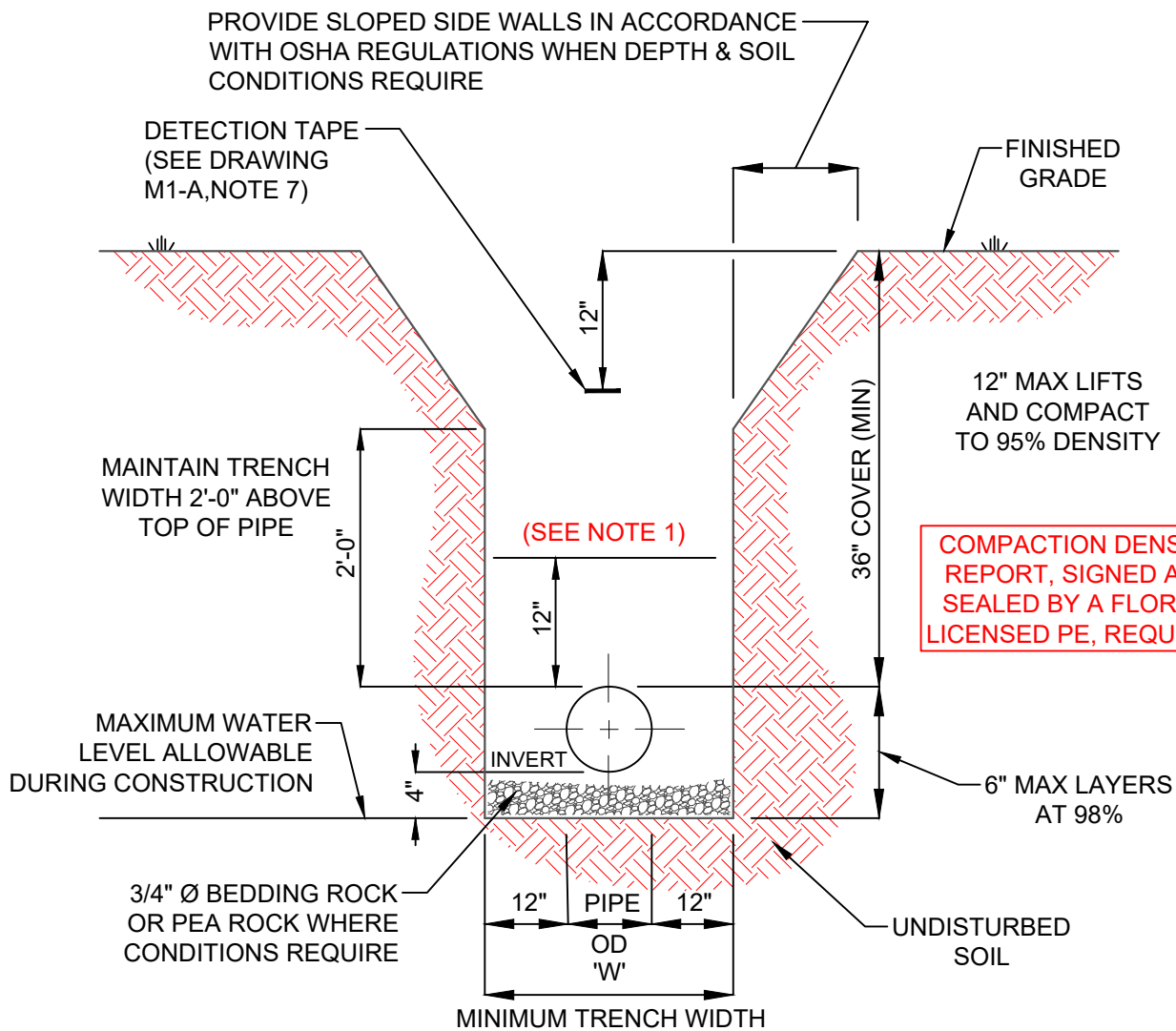
ELEVATION STILLING WELL



ELEVATION - DISCHARGE PIPE

SEE RECLAIMED WATER NOTES, R-2A

<p>INDIAN RIVER COUNTY DEPARTMENT OF UTILITY SERVICES</p>	<p>RECLAIMED WATER DISCHARGE & STILLING WELL DETAIL</p>	<p>DRAWING NO. R-2</p> <p>MAY 2019</p>
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ELEVATION

SEE TRENCH DETAIL NOTES DRAWING M-1A

NOTES:

1. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL OTHER THAN HAND VIBRATORY MEANS.
2. ALL RESTORATION IN EASEMENTS OR RIGHT-OF-WAYS OR WHEN REQUIRED BY OTHER JURISDICTIONAL AGENCIES SHALL CONFORM TO IRCBUS SPECIFICATIONS OR THE OTHER JURISDICTIONAL AGENCY SPECIFICATION, WHICHEVER IS MORE STRINGENT.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

**TRENCH DETAIL
(UNPAVED EASEMENT)**

DRAWING
NO.
M-1

NOTES

1. ALL SOIL CONDITIONS CANNOT BE MEASURED AS SHOWN BY STANDARD METHOD OF CONSTRUCTION TO IRCD'S OR APPROVAL
2. SOMETIMES WILL BE REQUIRED AS DETERMINED IN THE FIELD IN ACCORDANCE WITH OSO REGULATIONS
3. COMPACTION PERCENTAGES SHOWN ARE REFER TO ASTM T-180 MODIFIED PROCTOR METHOD
4. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL OTHER THAN VIBRATOR METHODS
5. COMPACTION REPORTS REQUIRED
6. MINIMUM TRUCK WIDTH " " PIP O.D. PL. 2.0"
7. 2" DETECTION TAP TO ITS METALLIC BACKING TO BE INSTALLED OVER MIN 6" BELOW BOTTOM OF BASE COURSE TO BE MARKED "COTIO-0" OR LIE BELOW " " "COTIO-ORC" MIN BELOW "OR "COTIO-R" MIN BELOW "TRC" OR SHALL BE SOD CONTIGUOUSLY ON ALL PIPES DR. I.D. 14" TRC OR IR DETAIL
8. ALL RESTORATION IS SUBJECTS OR RIGHT-OF-WAYS OR ARE REQUIRED BY OTHER JURISDICTIONAL AGENCIES SHALL CONFORM TO IRCD'S SPECIFICATIONS OR THE OTHER JURISDICTIONAL AGENCY SPECIFICATIONS WHICH IS MORE STRINGENT
9. ALL PIP TO BE LOCATED MINIMUM OF 5.0' (TOPICAL) FROM EDGE OF PAVEMENT
10. EXCEPTABLE CLOSURE WILL IS ALLOWED ONLY PRIOR APPROVAL OF PROPOSED MATERIAL STRUCTURE BE COMPLETED PUBLIC WORKS OFFICER OR DESIGNER

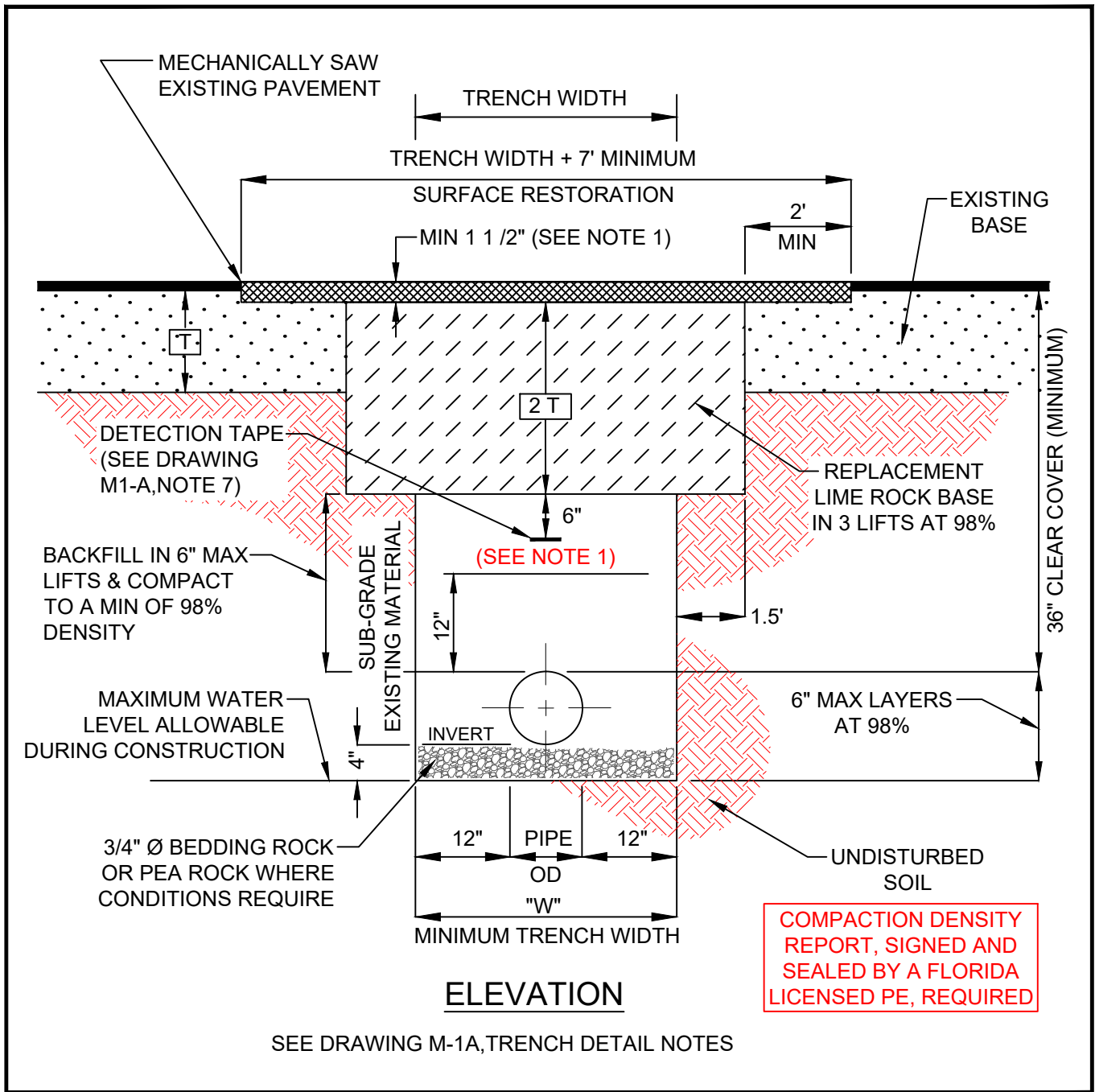
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

TRUCK DETAIL
NOTES

DRAWING
NO.

M-1





NOTES:

1. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL OTHER THAN HAND VIBRATORY MEANS.
2. NEW SURFACE MATERIALS SHALL BE CONSISTENT IN DEPTH WITH EXISTING MATERIALS AND SHALL HAVE LAPPED JOINTS, (1 1/2" MINIMUM THICKNESS). PAVEMENT MATERIAL TO BE SPECIFIED.
3. MINIMUM TRENCH WIDTH "W" = PIPE OD PLUS 2'-0".
4. EXCAVATABLE FLOWABLE FILL IS ALLOWED WITH PRIOR APPROVAL OF PROPOSED MATERIAL STRENGTH BY COUNTY PUBLIC WORKS ENGINEER OR DESIGNEE.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

**TRENCH DETAIL (PAVED
AREAS & SHOULDERS)**

DRAWING
NO.

M-2

RESTRAINED LENGTH IN FEET EACH SIDE OF BEND								
PIPE DIAMETER (INCHES)	D.I.P.				P.V.C.			
	90°	45°	22 1/2°	11 1/4°	90°	45°	22 1/2°	11 1/4°
3"	30'	15'	10'	5'	40'	20'	10'	5'
4"	35'	15'	10'	5'	55'	25'	15'	10'
6"	55'	25'	10'	5'	80'	35'	20'	10'
8"	65'	30'	15'	10'	90'	40'	20'	10'
10"	80'	35'	20'	10'	110'	50'	25'	15'
12"	95'	40'	20'	10'	130'	55'	30'	15'
16"	120'	50'	25'	15'	165'	70'	35'	20'
20"	150'	65'	30'	15'	200'	85'	40'	20'
24"	180'	70'	35'	20'	210'	90'	45'	25'
30"	190'	80'	40'	20'	250'	105'	50'	25'
36"	220'	95'	45'	25'	0	0	0	0
42"	245'	105'	50'	25'	0	0	0	0
48"	260'	120'	60'	30'	0	0	0	0

RESTRAINED LENGTHS FOR DEAD ENDS AND BRANCHES FROM TEES SHALL BE THE SAME AS FOR 90° BENDS

RESTRAINED LENGTH IN FEET EACH SIDE FOR REDUCER										
PIPE DIAMETER (INCHES)										
	3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
3"	0	0	0	0	0	0	0	0	0	0
4"	40'	0	0	0	0	0	0	0	0	0
6"	50'	45'	0	0	0	0	0	0	0	0
8"	75'	70'	40'	0	0	0	0	0	0	0
10"	95'	90'	70'	40'	0	0	0	0	0	0
12"	120'	115'	100'	75'	40'	0	0	0	0	0
16"	160'	155'	140'	125'	100'	70'	0	0	0	0
20"	200'	195'	185'	170'	150'	130'	75'	0	0	0
24"	160'	155'	150'	140'	135'	120'	90'	50'	0	0
30"	195'	190'	185'	180'	170'	160'	120'	105'	70'	0
36"	225'	220'	215'	210'	205'	195'	180'	150'	125'	70'
42"	245'	240'	235'	230'	225'	220'	205'	180'	155'	105'
48"	255'	250'	245'	240'	235'	230'	215'	195'	175'	125'

RESTRAINED LENGTHS FOR LARGER DIAMETER PIPES

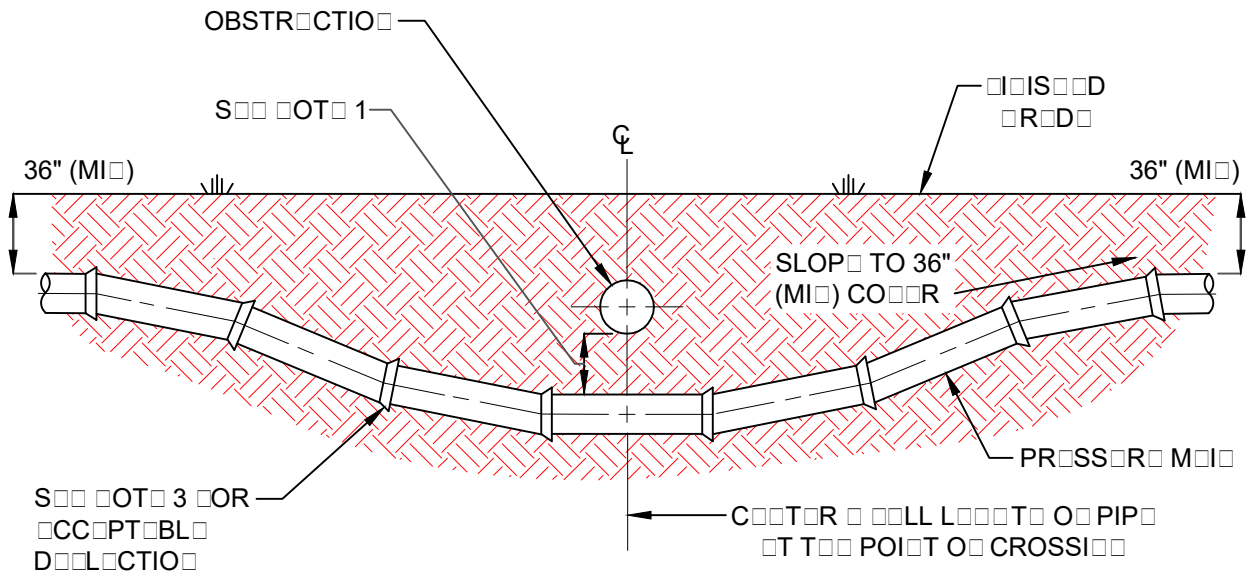
ALL RESTRAINED LENGTHS ARE BASED ON THE FOLLOWING ASSUMPTIONS:
 1. IT IS RESTRAINED PIPE WITH TEES OR PIPES TO DOORS

INDIAN RIVER COUNTY
 DEPARTMENT OF
 UTILITIES SERVICES

RESTRAINED PIPE
 LENGTHS AND SCHEMATIC
 NOTES

DR 100
 100

M-3



INSTALLATION

NOTES

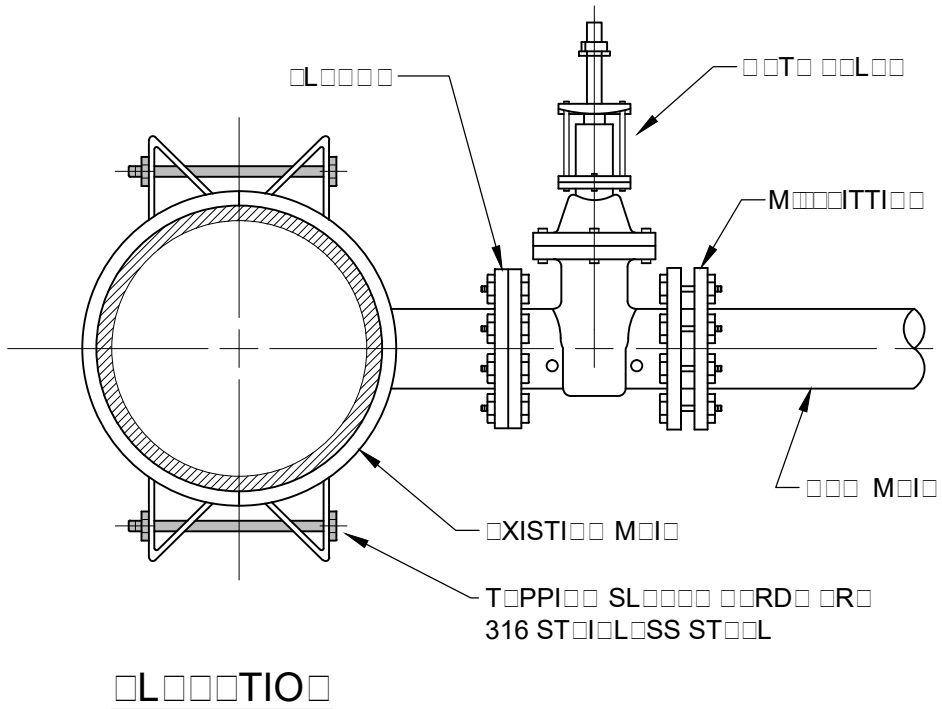
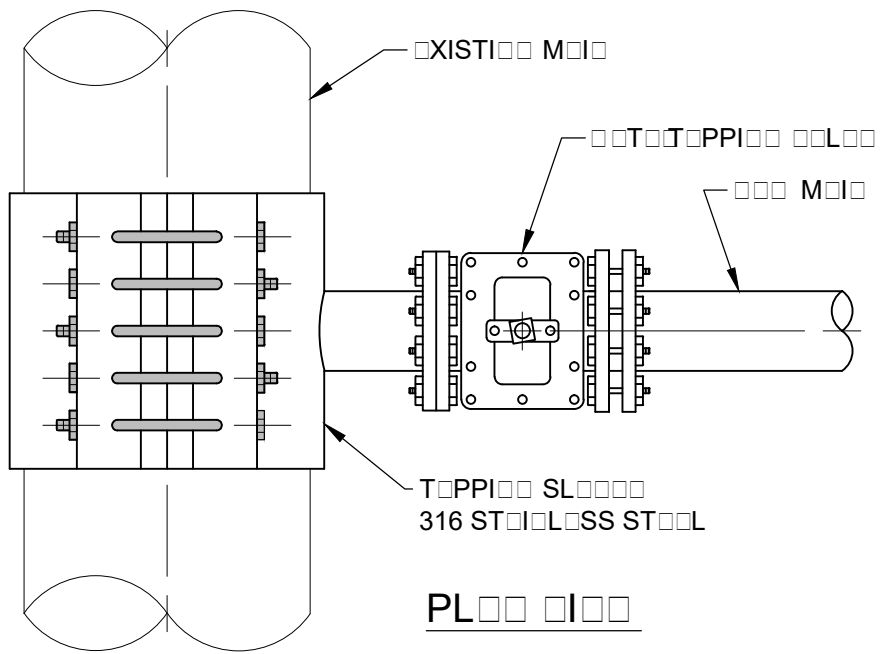
1. ALL OR RELOCATED DRAINAGE OR OTHER MAJOR CROSSINGS SHALL EXIST OR PROPOSED PRIOR TO COMMENCEMENT OF SITEWORK. SHALL RESTORE SURFACE OR PROPOSED TOP SURFACE SHALL BE AS STRENGTH OF RESTORED OR CORRECT MAJOR PIPELINE COORDINATE RECLAIMED OR SHALL BE LIFTED SO THAT OTHER MAJOR IS AT LEAST 6" ABOVE PROPOSED 12" ABOVE OR MINIMUM OF 12" ABOVE BELOW THE OTHER PIPELINE. IT IS PROPOSED TO LIFT THE OTHER MAJOR ABOVE THE OTHER PIPELINE TO 36" MINIMUM COVER. CAN BE MAINTAINED ABOVE THE OTHER MAJOR WITH 6" OF SEPARATION BETWEEN THE OTHER MAJOR AND THE OTHER PIPELINE.
2. AT UTILTY CROSSINGS SHALL BE LIFTED OR OTHER MAJOR PIPE SHALL BE CORRECTED ABOVE OR BELOW THE OTHER PIPELINE SO THAT OTHER MAJOR JOINTS WILL BE AS POSSIBLE FROM THE OTHER PIPELINE. ALL UTILTY CROSSINGS SHALL BE CORRECTED SO THAT ALL OTHER MAJOR JOINTS ARE AT LEAST THREE FEET FROM ALL JOINTS IN COMMON TOPE SITEWORK SHALL RESTORE SURFACE OR CORRECT OTHER CORRECT MAJOR PIPELINE COORDINATE RECLAIMED OR SHALL BE AT LEAST SIX FEET FROM ALL JOINTS IN REPAIR OR PROPOSED TOP SURFACE SHALL RESTORE OR CORRECT MAJOR PIPELINE COORDINATE RECLAIMED OR SHALL BE
3. CONSTRUCT STANDARD CROSSING NOT TO EXCEED 75% OF THE MAXIMUM JOINT DEFLECTION.
4. OTHER METHODS OF RESTRAINT MAY BE USED AS APPROVED BY IRCD'S IN LINE OF DEFLECTION THE PIPE IS SET IN ABOVE.
5. TRUCKS OR IR SHALL BE INSTALLED ABOVE THE PIPE (SEE DRAWING 10000-M-14)
6. ALL OTHER MAJOR SHALL BE LOCATED MINIMUM ORIGINAL SEPARATION EQUAL TO THE DEPTH OF THE PIPE PLUS THE DIAMETER OF THE PIPE FROM THE PERMANENT ABOVE ROAD STRUCTURES (INCLUDING STRUTS, STRUTS, STORM PIPES, ETC.) AND MINIMUM ORIGINAL SEPARATION EQUAL TO FOUR (4) FEET FROM THE DRAINAGE OR OTHER UTILITIES (INCLUDING MAINS, TAP, LINES, CABLE LINES, IRRIGATION MAINS, ETC.)
7. IRCD'S MAY REMOVE OR RELOCATE OR OTHER SIDE OF UTILTY CROSSINGS.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILTY SERVICES

UTILTY CROSSINGS

DRAWING
NO.

M-4



NOTES

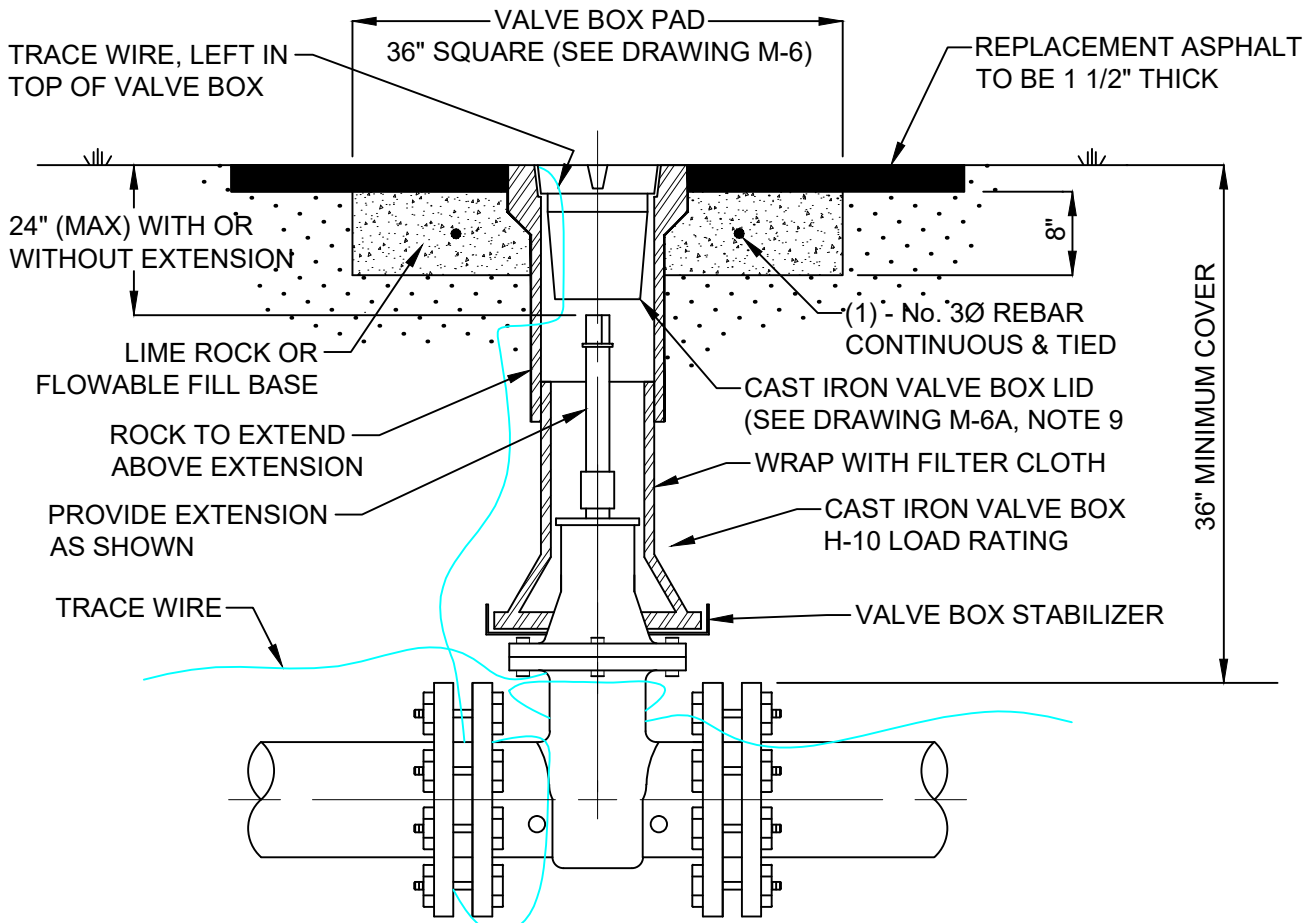
1. MATERIAL SHALL BE RESTRICTED PER IRCD'S AND/OR RESTRICTION BLOC OR EXISTING MATERIAL TOPPI SL LOCATION MATERIAL BE REVERSED
2. ALL MATERIALS SHALL BE PER IRCD'S APPROVED MATERIALS PRODUCT LIST

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITIES SERVICES

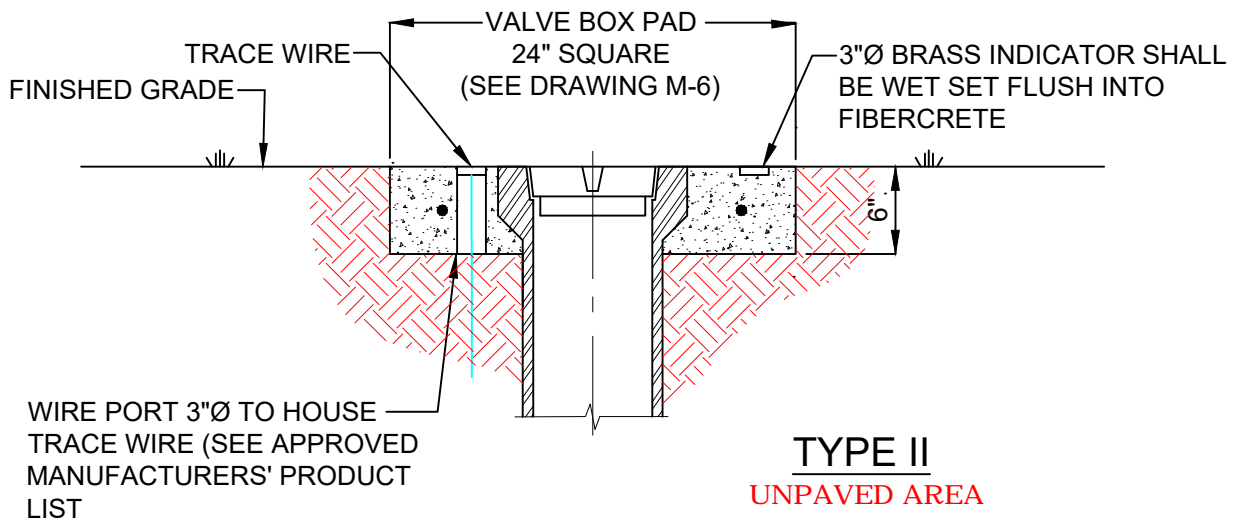
TOPPI SL 316
L SS MBL

DR I
O

M-5



TYPE I
PAVED AREA



TYPE II
UNPAVED AREA

ELEVATION

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

VALVE AND BOX
DETAIL

DRAWING
NO.

M-6

MAY 2019

NOTES

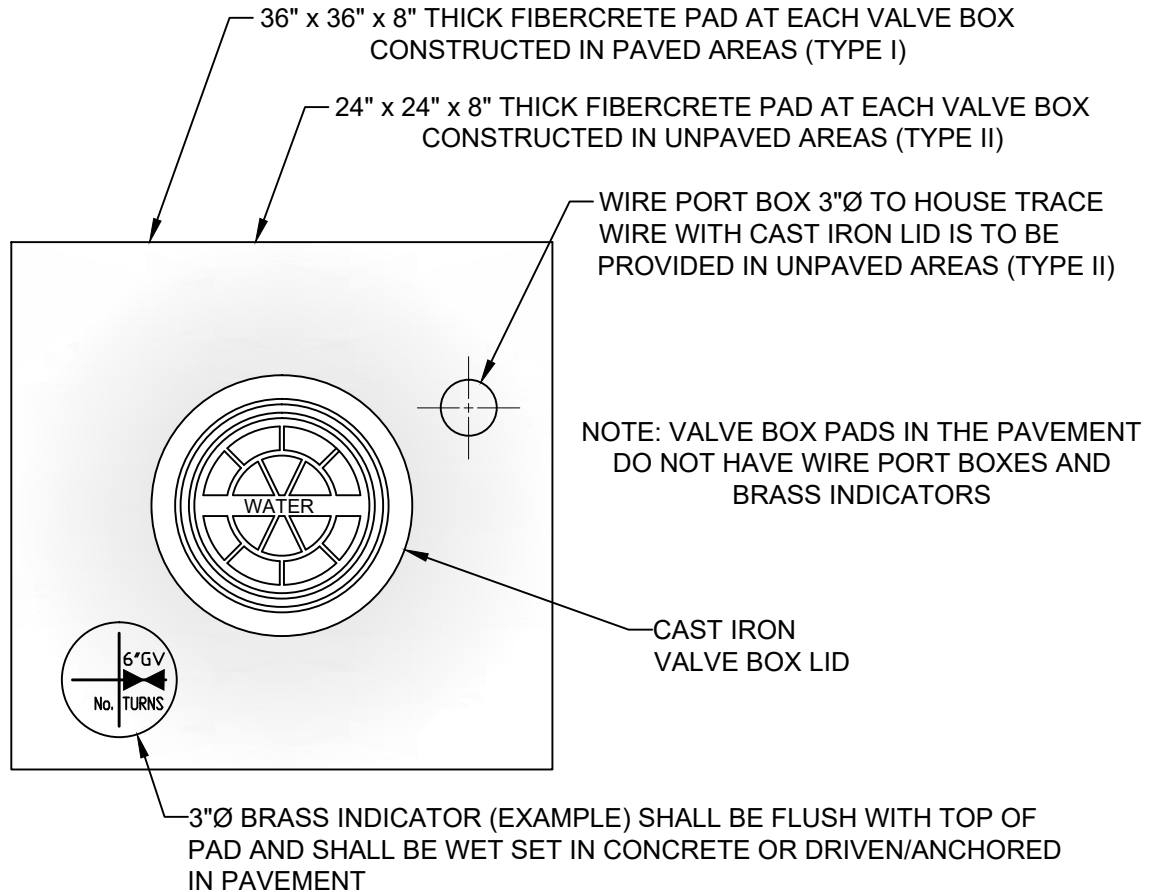
1. ALL BOXES SHALL BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS
2. ALL ALL BOXES SHALL BE SMOOTH SCREW TOP AND CANNOT REST ON TOP ALL
3. ALL ALL BOLTS SHALL BE STAINLESS STEEL OR IT BRASS NUTS
4. ALL ALL MIRRORS ARE TO BE INSTALLED ACCORD TO ALL ALLS IN
APPENDIX AS DIRECTED BY IRCD(S) (SEE DRAWING M-10 ALL MIRROR)
5. ALL ALL ROOFS SHALL BE PLUMB COORDINATES
6. TRUCK AIR IS REQUIRED (SEE DRAWING M-14 TRUCK AIR DETAIL)
7. BLEW REFLECTOR MIRRORS (RPM'S) ARE TO BE LOCATED IN MID-LENGTH OF ROAD OR
ALL DRIFT ALLS (SEE DRAWING M-1 AIR DRIFTS ALL LOCATIONS)
8. REFLECTOR MIRRORS SHALL NOT BE PLACED IN BLIND SPOTS
ALL ALL BOX LID LOCATED IN PROMPT SHALL BE A MINIMUM 24 LBS OR A MINIMUM 6"
LONG TROUGH
10. ALL ALL BOX SHALL COMPLY WITH DOT STANDARDS AS APPLICABLE
11. ALL ALL EXTENSIONS OVER 36" ROOFS IRCD(S) AND IRRIGATION APPROVAL
12. ALL ALL SPECIFIC OR OTHER MATERIALS SHALL NOT EXCEED 1000 MAXIMUM

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

ALL ALL BOX DETAIL
NOTES

DRAWING
NO.
M-6

SEE DRAWING M-6, VALVE AND BOX DETAIL



PLAN VIEW

NOTES:

1. VALVE BOX LIDS SHALL BE PAINTED:
BLUE - WATER
FIRE HYDRANTS - RED
FORCE MAINS - GREEN
REUSE MAINS - PURPLE
BRINE - BROWN
2. IN UNPAVED AREAS (SEE DRAWING, No. M-6, TYPE II) A BRASS VALVE INDICATOR IS TO BE PROVIDED. WITH ENGRAVED DIAGRAM OF VALVE LOCATION AND DESCRIPTION. (SEE EXAMPLE ABOVE) INDICATOR SHALL BE FLUSH WITH VALVE PAD.
3. VALVE BOX LID LOCATED IN PAVEMENT SHALL BE A CAST IRON, STAY-PUT COVER, MINIMUM 24 LBS. WITH A MINIMUM 6" LONG THROAT AND SHALL BE MARKED WITH RAISED LETTERS: "WATER". "SEWER", "BRINE", OR "REUSE WATER" AS APPLICABLE.
4. VALVE BOX SHALL COMPLY WITH FDOT STANDARDS AS APPLICABLE.
5. NO VALVE RINGS ARE TO BE USED.
6. IN TYPE I, PAVED AREAS, THE VALVE BOX PAD TOP ELEVATION SHALL BE EVEN WITH THE ROCK GRADE TO ALLOW BOTH LAYERS OF ASPHALT TO COVER THE VALVE BOX PAD WITH THE FINAL ASPHALT LAYER FLUSH WITH THE TOP OF THE VALVE BOX. (SEE DRAWING, No, M-6, VALVE AND BOX DETAIL)

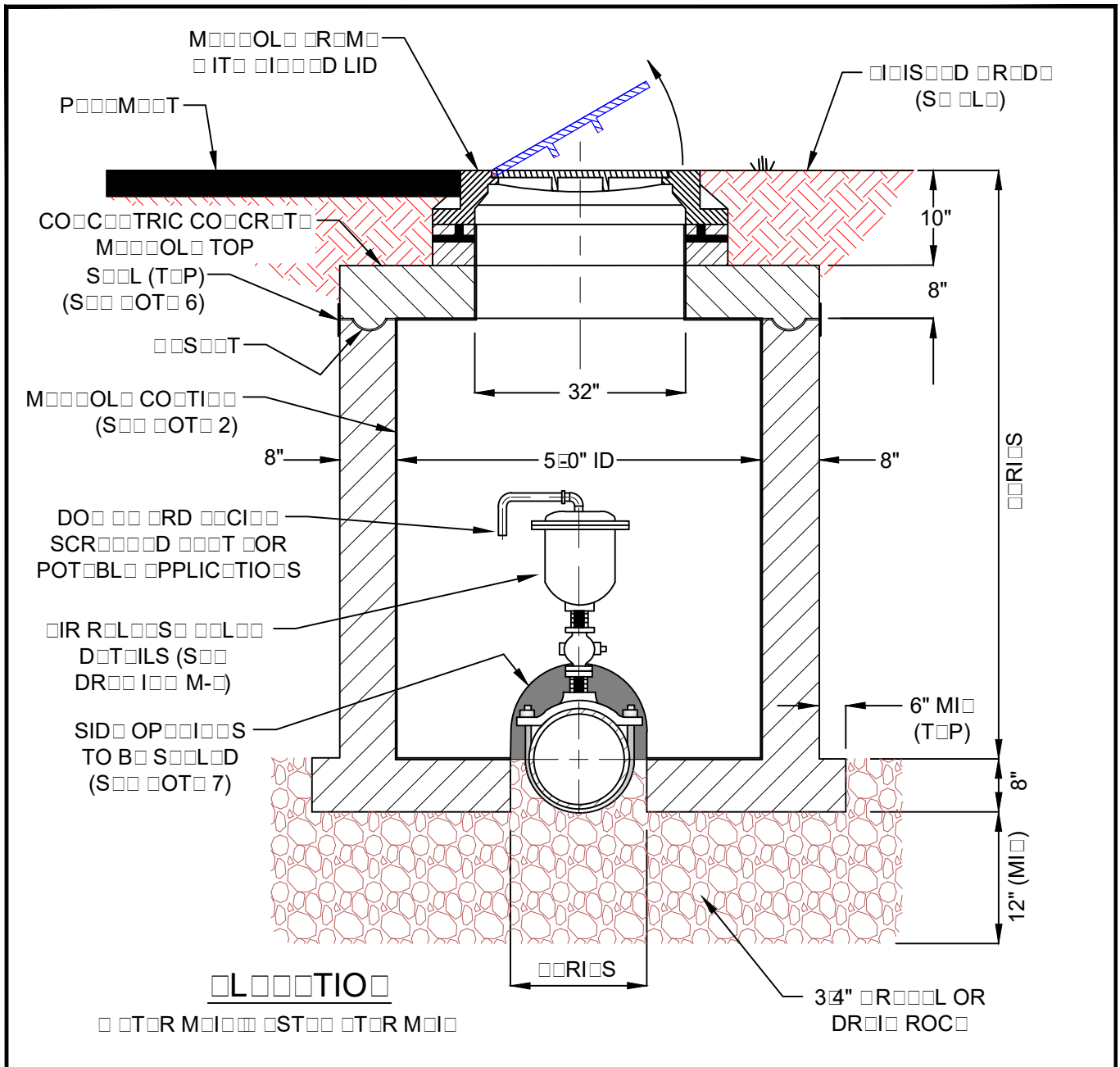
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

VALVE BOX PAD

DRAWING
NO.

M-7

MAY 2019

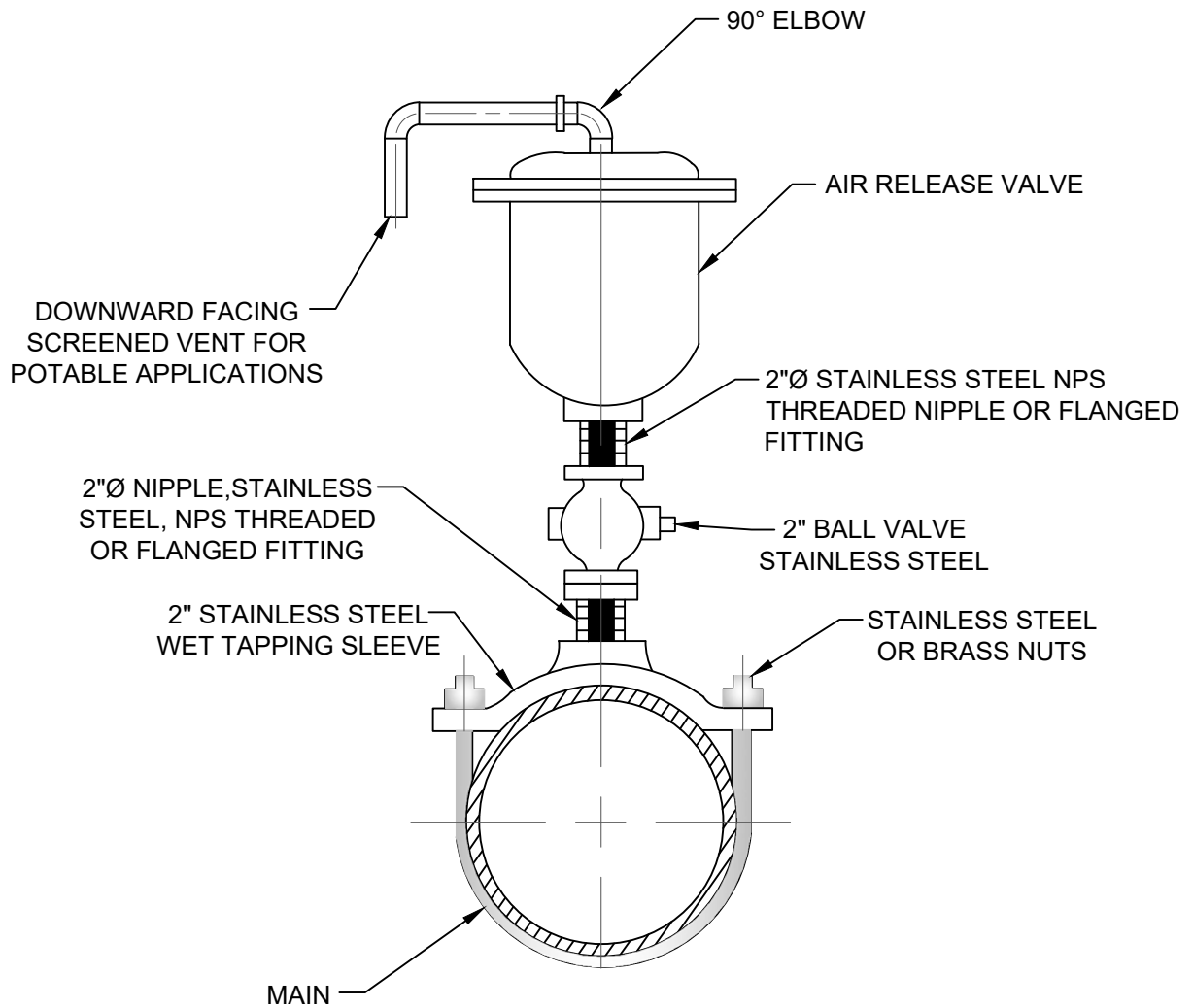


- NOTES**
- I^R R^{EL} S^{ILL} IS TO B^{LOC} I^S S^{IDE} CO^{CR} M^{ANHOLE} I^{NSIDE} L^{ID} P^{RO} IRCD^S AP^{PRO} M^{ATERIAL} R^{ES} P^{RO} D^{UCT} L^{IST}
 - M^{ANHOLE} S^{ILL} OR S^{ILL} OR CO^{CR} M^{ANHOLE} S^{ILL} B^{CO}TTI^{NG} CO^{TTI} M^{ATERIAL} S^{ILL} B^P IRCD^S AP^{PRO} M^{ATERIAL} R^{ES} P^{RO} D^{UCT} L^{IST}
 - S^{ILL} DR^{ILL} I^{NSIDE} M^{ANHOLE} I^R R^{EL} S^{ILL} B^{CO}TTI^{NG} (OTHOM^{ATIC} OTHER S^{PEC} OTHER)
 - S^{ILL} DR^{ILL} I^{NSIDE} M^{ANHOLE} I^R D^{ET} I^L S^{ILL}
 - OTHER S^{PEC} OTHER L^{ID} S^{ILL} B^{CO}TTI^{NG}
 - S^{ILL} S^{ILL} B^S S^{IDE} AT ALL CO^{IN}T^{ACT} S^{ILL} DR^{ILL} I^{NSIDE} M^{ANHOLE} OTH S^{ILL}
 - OP^{ENS} AT BOT^{OM} S^{IDE} OF T^{HE} M^{ANHOLE} TO B^S S^{ILL} I^{NSIDE} M^{ATERIAL} P^{RO} IRCD^S AP^{PRO} M^{ATERIAL} R^{ES} P^{RO} D^{UCT} L^{IST}

I^{NDI}AN R^{IVER} CO^{MM}
 DE^{PAR}TM^{ENT} OF
 UTILITY S^{ER}VIC^{ES}

I^R R^{EL} S^{ILL}
 M^{ANHOLE} B^{LO} R^{OLL}
 (OTHOM^{ATIC} OTHER S^{PEC} OTHER)

DR^{ILL} I^{NSIDE}
 OTH
M-8
 M^{AY} 201²



ELEVATION

WATER MAIN/WASTEWATER MAIN

NOTES:

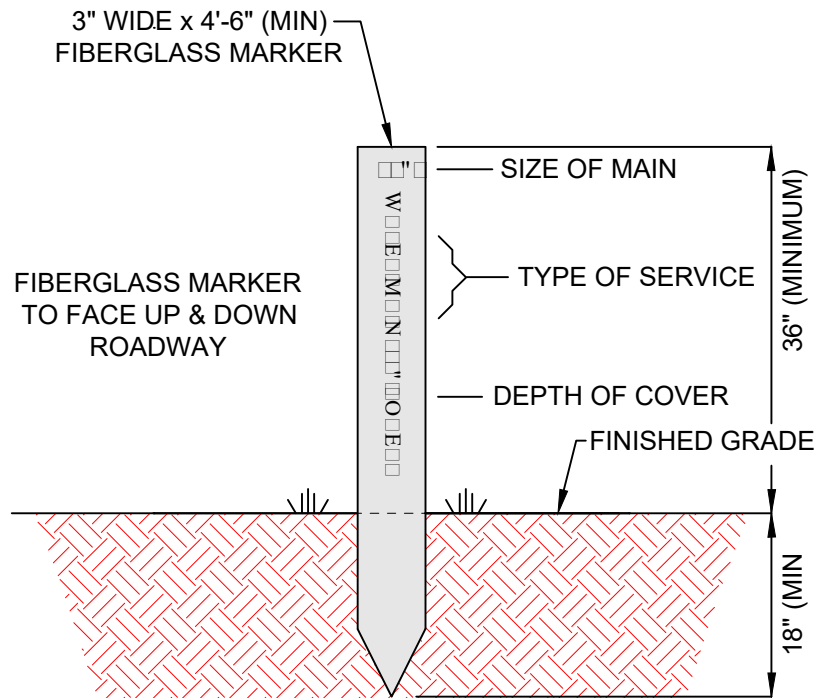
1. AUTOMATIC AIR RELEASE VALVE TO BE LOCATED ONLY WHERE CONDITIONS MAKE IT INACCESSIBLE OR AS REQUIRED BY THE IRCUDS.
2. AIR RELEASE RISERS TO BE IN A VERTICAL PLUMB POSITION AND PLACED AT SUMMITS IN THE SYSTEM. FOR DIRECTIONAL BORES, AIR RELEASE VALVES ARE TO BE PLACED ON EITHER SIDE OF THE CROSSING.
3. SEE DRAWING, No. M-14, TRACE WIRE DETAILS.
4. FOR AIR RELEASE VALVES LARGER THAN 2" CONSULT IRCUDS.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

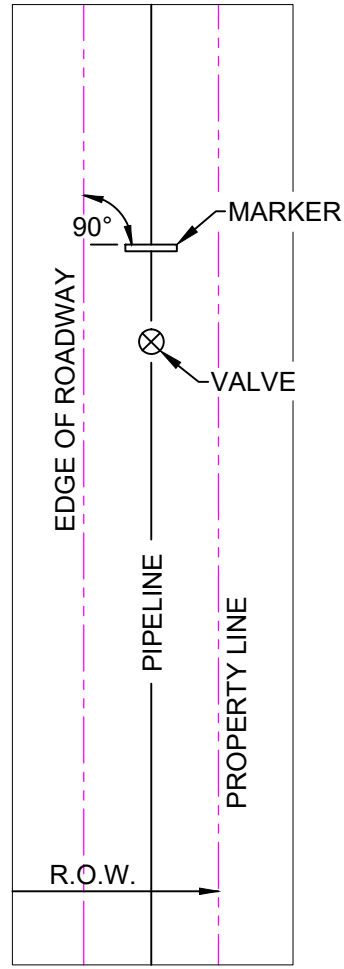
**AIR RELEASE VALVE
ASSEMBLY ABOVE GROUND**
(AUTOMATIC/WASTEWATER)

DRAWING
NO.
M-9

MAY 2019



ELEVATION



PLAN

NOTES:

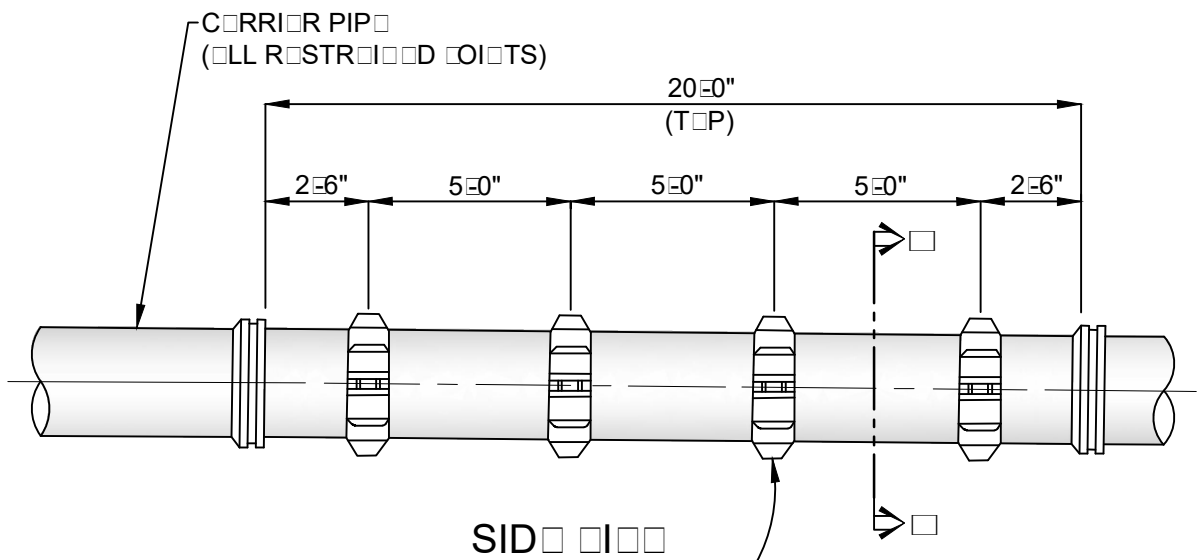
1. MARKER TO BE PLACED PERPENDICULAR, AT A 90° ANGLE, TO ROADWAY AND DIRECTLY OVER PIPE, ADJACENT TO VALVE, AS DIRECTED BY IRCDUS.
2. MARKER TO BE USED AT ALL CANAL CROSSINGS AND AS DIRECTED BY IRCDUS.
3. MARKER TO BE PLACED ADJACENT TO WATER MAIN VALVES, FORCE MAIN VALVES RE-USE MAIN VALVES AND BRINE VALVES AS DIRECTED BY IRCDUS.
4. ALL MATERIAL TO BE PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.
5. MARKERS SHALL BE PAINTED:
 - BLUE - WATER
 - RED - FIRE HYDRANTS
 - GREEN - FORCE MAINS
 - PURPLE - REUSE MAINS
 - BROWN - BRINE

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

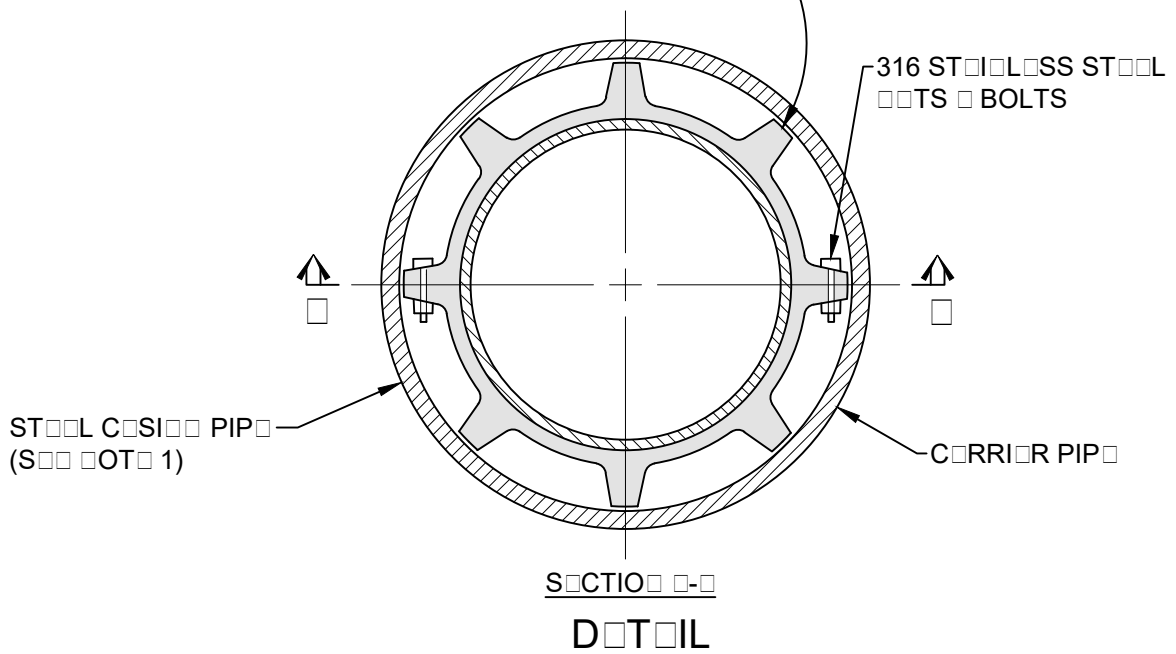
VALVE MARKER

DRAWING
NO.

M-10



CARRIER ISOLATOR IT REQUIRED NOT
TO BE LARGER THAN SO THAT IT DOES
NOT INTERFERE WITH THE PIPE
RESTRICTION POINTS



NOTES

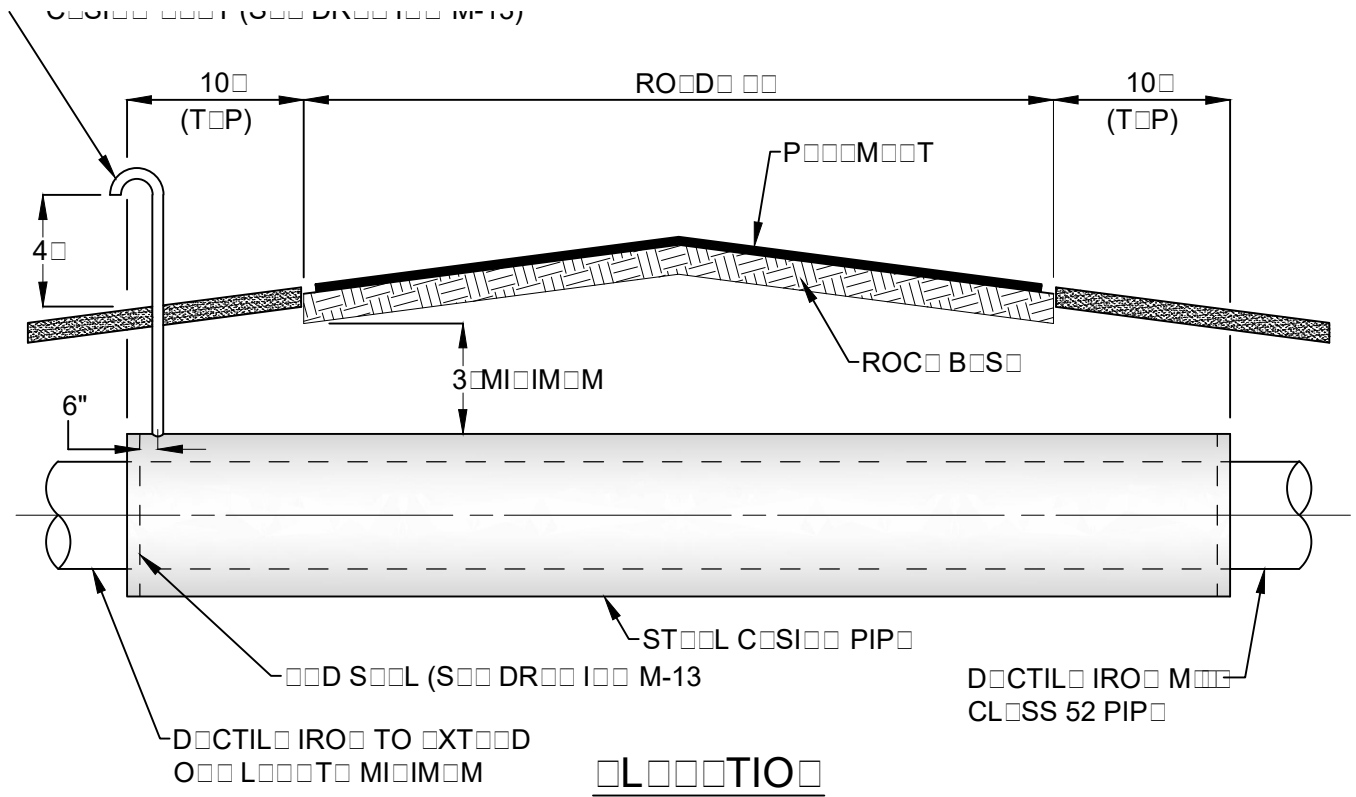
1. STEEL CARRIER PIPE SHALL MEET ASTM A133 OR D B REQUIREMENTS IT MINIMUM WELD STRENGTH OF 35,000 PSI
2. CARRIER ISOLATOR SHALL BE WELDED TO PROVIDE TIGHT JOINTS
3. ISOLATORS OR SPACERS TO BE PER IRCDS APPROVED MANUFACTURERS PRODUCT LIST

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

CAND BOR DETAIL
CARRIER ISOLATOR SPACER

DRG NO
00

M-11



CARRIER PIPE SIZE	STEEL CASING	MINIMUM WALL THICKNESS
4"	12"	0.188
6"	14"	0.250
8"	16"	0.250
10"	20"	0.250
12"	24"	0.250
16"	32"	0.375
20"	40"	0.375
24"	48"	0.500
30"	60"	0.625
36"	72"	0.625
42"	84"	0.625
48"	94"	0.625

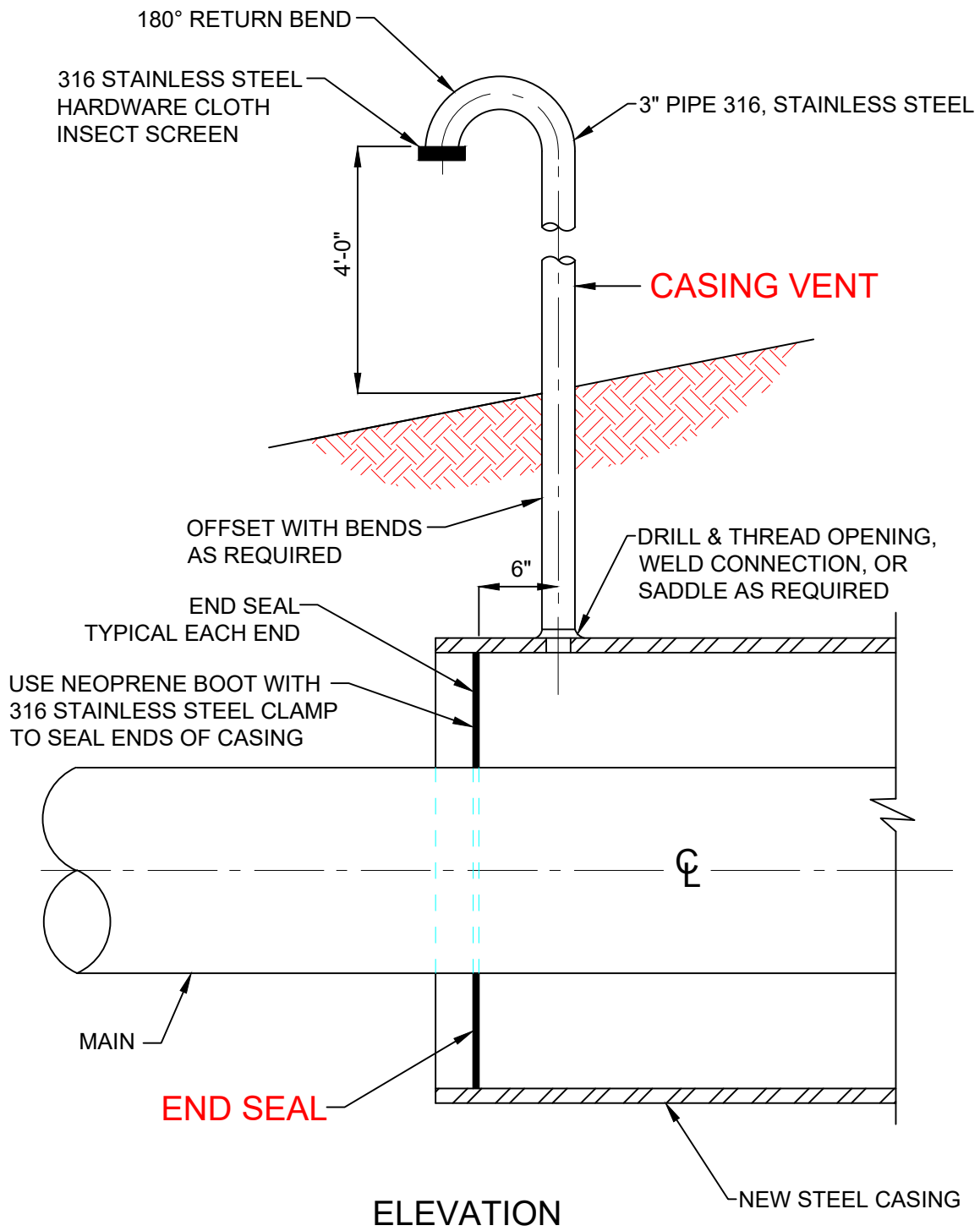
NOTES

1. ROTATIONAL LOADS OR ROTATIONAL CASING SHALL BE DETERMINED ACCORDING TO
2. INSTALL CASING BEFORE BORING TOWER. THE CASING SHALL BE INSTALLED SIMULTANEOUSLY WITH THE CASING
3. MATERIALS TO BE USED FOR ROCK BASE, ROCK BLANKET, PROTECTIVE LAYER, PITS, AND DRILL CONDITION SHALL BE AS PER PMP'S OR OTHER METHODS APPROVED BY IRCD'S
4. THE CASING SHALL BE PROVIDED WITH SUFFICIENT STRENGTH FOR THE CASING TO BE USED FOR DRILLING IN ACCORDANCE WITH THE OS&R REGULATIONS

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITIES SERVICES

**CASING INSTALLATION
DETAILS**

DRILLING
M-12



NOTES:

1. LOCATION OF CASING VENTS TO BE DETERMINED BY THE IRCDUS ENGINEER IN THE FIELD. CONTRACTOR TO PROVIDE FITTINGS AS REQUIRED.
2. NEOPRENE END SEAL TO BE PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.

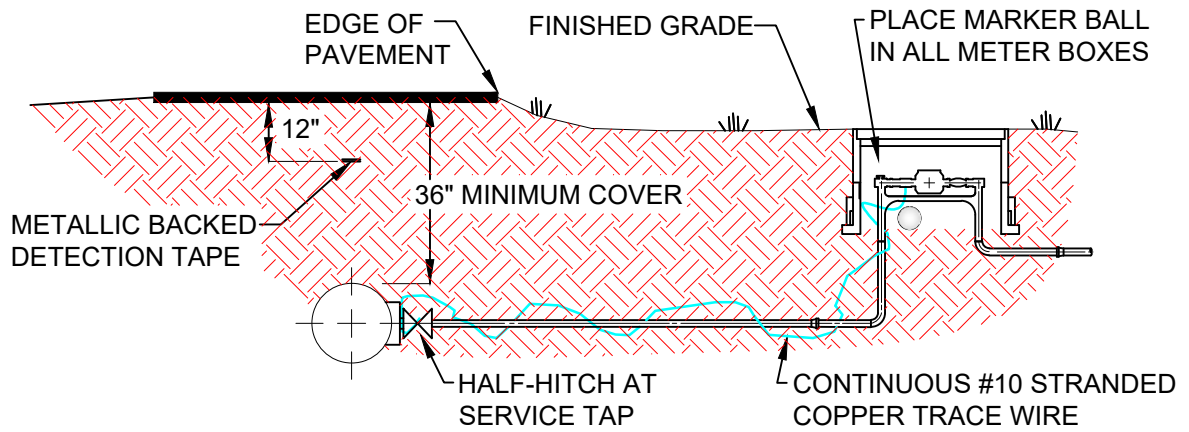
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

**JACK AND BORE CASING
VENT & END SEAL DETAILS**

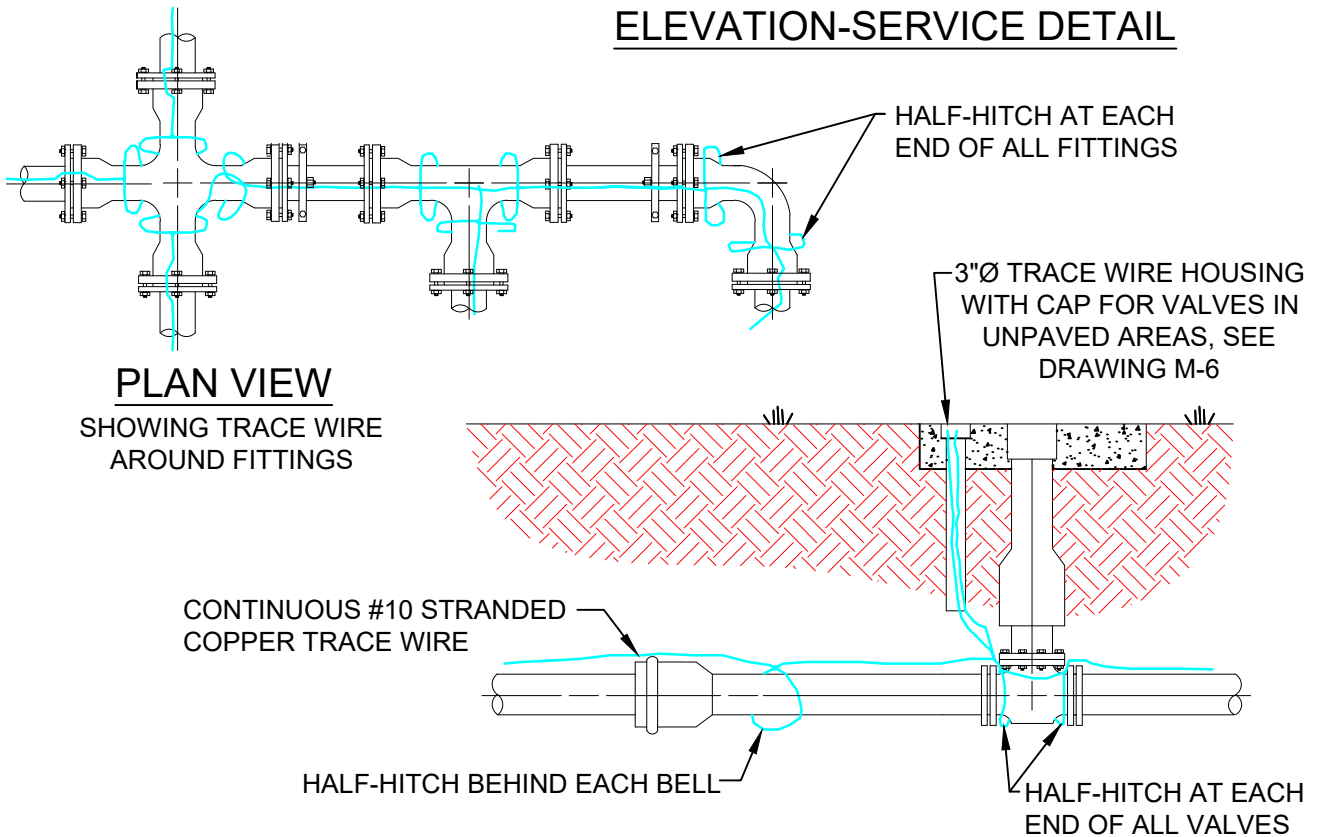
DRAWING
NO.

M-13

MAY 2019



ELEVATION-SERVICE DETAIL



ELEVATION-VALVE BOX DETAIL

NOTES:

1. TRACE WIRE IS REQUIRED ON ALL PIPES REGARDLESS OF MATERIAL.
2. INCLUDE ALL COST OF MATERIAL AND LABOR TO INSTALL TRACE WIRE IN PRICE OF PIPE.
3. CONTRACTOR IS RESPONSIBLE FOR CONTINUITY THROUGHOUT ENTIRE PROJECT OF ALL TRACE WIRE.
4. ALL CONNECTIONS SHALL BE MADE WITH DIRECT BURY CONNECTORS.
5. ALL MATERIALS ARE TO BE PER IRCDUS APPROVED MANUFACTURERS' PRODUCT LIST.
6. COLOR OF TRACE WIRE SHALL BE: BLUE FOR WATER, GREEN FOR SEWER, AND PURPLE FOR RECLAIMED WATER.

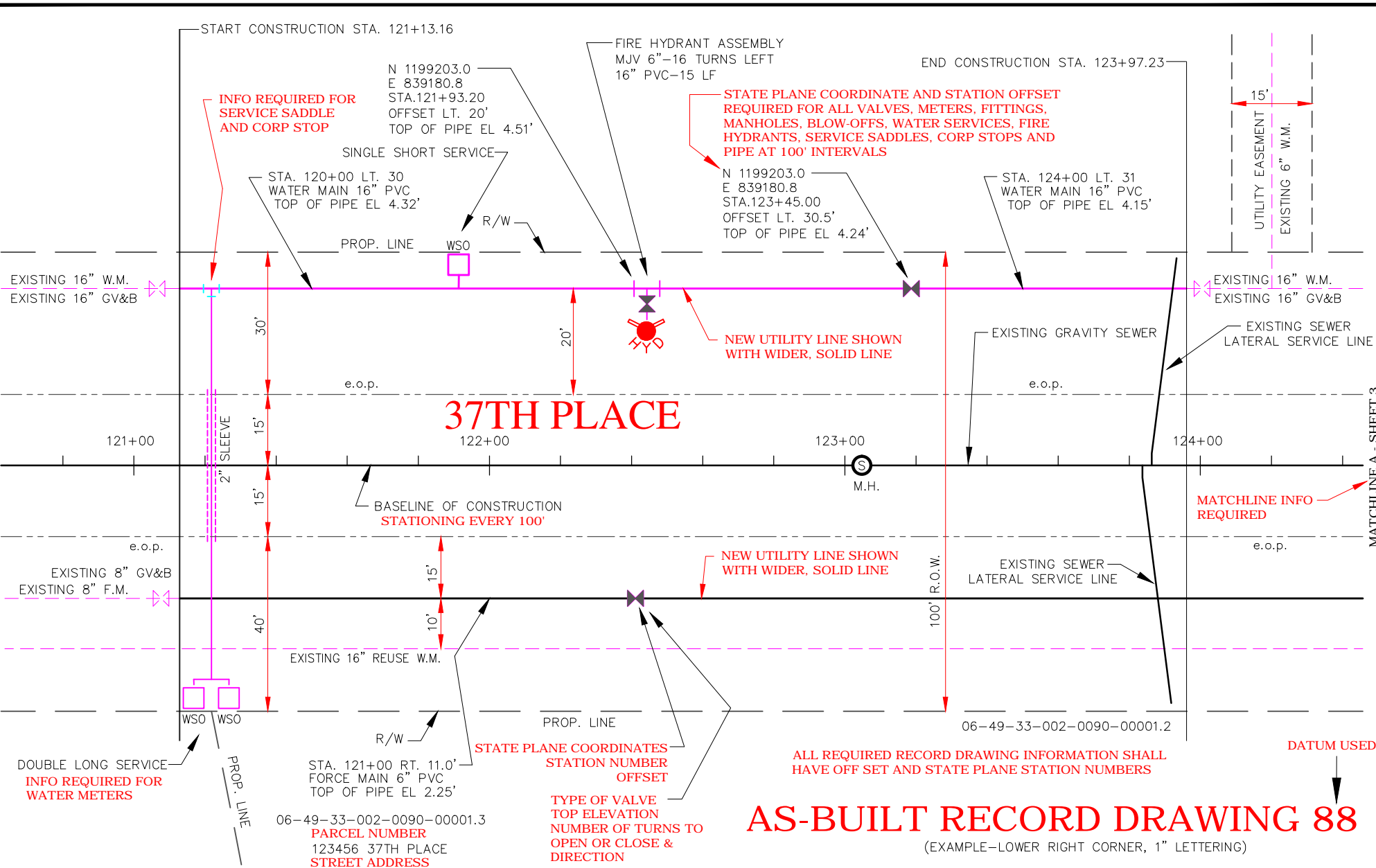
INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

TRACE WIRE DETAILS

DRAWING
NO.

M-14

MAY 2019



AS-BUILT RECORD DRAWING 88

(EXAMPLE-LOWER RIGHT CORNER, 1" LETTERING)

MAR 2010

M-15
DRAWING NO.

This represents the basic style and format for As-Built Record Drawings to be received by the Indian River County Department of Utilities Services. Refer to drawings M-16 and M-17 for the minimum information requirements to be provided by the engineer's record to IRCDSS.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITIES SERVICES

AS-BUILT RECORD
DRAWING (EXAMPLE)

START CONSTRUCTION STA. 121+13.16

END CONSTRUCTION STA. 123+97.23

INFO REQUIRED FOR SERVICE SADDLE AND CORP STOP

STATE PLANE COORDINATE AND STATION OFFSET REQUIRED FOR ALL VALVES, METERS, FITTINGS, MANHOLES, BLOW-OFFS, WATER SERVICES, FIRE HYDRANTS, SERVICE SADDLES, CORP STOPS AND PIPE AT 100' INTERVALS

N 1199203.0
E 839180.8
STA.121+93.20
OFFSET LT. 20'
TOP OF PIPE EL 4.51'

N 1199203.0
E 839180.8
STA.123+45.00
OFFSET LT. 30.5'
TOP OF PIPE EL 4.24'

STA. 124+00 LT. 31
WATER MAIN 16" PVC
TOP OF PIPE EL 4.15'

EXISTING 16" W.M.
EXISTING 16" GV&B

EXISTING 16" W.M.
EXISTING 16" GV&B

37TH PLACE

121+00

122+00

123+00

124+00

e.o.p.

e.o.p.

e.o.p.

e.o.p.

EXISTING 8" GV&B
EXISTING 8" F.M.

EXISTING SEWER LATERAL SERVICE LINE

EXISTING 16" REUSE W.M.

EXISTING SEWER LATERAL SERVICE LINE

STATE PLANE COORDINATES
STATION NUMBER
OFFSET

ALL REQUIRED RECORD DRAWING INFORMATION SHALL HAVE OFF SET AND STATE PLANE STATION NUMBERS

TYPE OF VALVE
TOP ELEVATION
NUMBER OF TURNS TO
OPEN OR CLOSE &
DIRECTION

DATUM USED

06-49-33-002-0090-0001.3
PARCEL NUMBER
123456 37TH PLACE
STREET ADDRESS

STA. 121+00 RT. 11.0'
FORCE MAIN 6" PVC
TOP OF PIPE EL 2.25'

DOUBLE LONG SERVICE
INFO REQUIRED FOR WATER METERS

PROP. LINE

R/W

PROP. LINE

06-49-33-002-0090-0001.2

MATCHLINE A - SHEET 3

GENERAL NOTES

- 1 ALL AS-BUILT RECORD DRAWINGS SHALL MEET THE MINIMUM REQUIREMENTS OF THE COMPUTER AIDED DESIGN ADMINISTRATION CODE PERTAINING TO SECTION 472 OF THE FLORIDA STATUTES
 - 2 ALL AS-BUILT RECORD DRAWINGS SHALL BE IN STATE PLAN COORDINATES STATE PLAN COORDINATES SHALL BE BASED ON THE FLORIDA STATE PLAN GEODETIC DATUM (NAD 83) - LOCAL DATUMS FOR THE MOST CORRECT DATUM ADOPTED BY THE REGIONAL COMMISSION
 - 3 FLORIDA STATE PLAN GEODETIC DATUM AND STATION OFFSET SHALL BE TIED TO LOCAL MATERS ATTACHED TO BLOOMINGDALE - OAKS WATER SERVICE AIR RIGHTS SERVICE SADDLES CORP STOPS AND PIP (PIPE AT 200 FEET RADIUS)
 - 4 ALL ELEVATIONS SHALL BE BASED ON 1088 AND (PORT MARIETTA ARTIFICIAL DATUM)
 - 5 ALL AS-BUILT RECORD DRAWINGS SHALL BE TIED TO A MINIMUM OF ONE (1) PERMANENT REFERENCE MONUMENT (PRM) AT THE END OF EACH PROJECT OR PERMANENTLY BE TIED TO A MINIMUM OF ONE (1) SECTION CORNER OR OR-PORTER (14) SECTION CORNER WHICH IS CLOSEST TO THE PROJECT STATE PLAN COORDINATES SHALL BE BASICALLY SO THAT THE DRAWING IS NEXT TO THE PERMANENT
 - 6 GEODETIC CONTROL MONUMENTATION FOR UTILITY LINES SHALL BE A MINIMUM OF TWO (2) POINTS AT A MAXIMUM OF 1400 FEET BETWEEN POINTS AND SO ON ALL PLANS
 - 7 ARTIFICIAL CONTROL (AS REQUIRED) FOR UTILITY LINES SHALL BE AS SET BY THE SURVEYOR SHALL BE A MAXIMUM OF 1400 FEET BETWEEN EXISTING CONSTRUCTION OR ESTABLISHED BENCHMARKS
- NOT PRIOR TO SUBMITTING THE ELECTRIC COPIES (1) COPY OF EACH AS-BUILT SHALL BE SUBMITTED FOR REVIEW AND APPROVAL
- 8 THE ALL APPROVALS SHALL INCLUDE RECORD DRAWINGS SHALL BE RECORDED ON A CD AS AN ELECTRIC COPY TO BE TO BE 2015 OR LATEST VERSION IT IS TIED TO A MINIMUM OF TWO (2) STATE PLAN COORDINATES (1) ONE (24"x36") SIGNED AND SEALED COPY OF EACH AS-BUILT SHALL BE SUBMITTED ALL RECORD DRAWINGS SHALL STATE IN 12" LETTERING "RECORD DRAWING" AND THE DATUM USED (12" LETTERING) IN THE LOWER RIGHT HAND SIDE OF THE ORIGINAL DRAWING OR COPY LOOSE IT THE AS-BUILT DATUM ALL RECORD DRAWINGS SHALL BE IN A MINIMUM SCALE OF 1"=40' MINIMUM TEXT SHALL BE 1/8"
- THE ELECTRIC COPY OF RECORD DRAWINGS SHALL BE FORMATTED WITH ALL THE LOCAL CONSTRUCTION IRCD'S UTILITIES IN THE FOLLOWING ORDER STATES

AUTOCAD LAYER NAME	DATA TO BE CONTAINED IN LAYER
WATER MAIN	WATER MAIN ONLY
WATER FITTINGS	WATER FITTINGS, METERS, VALVES, SERVICES LATERALS, ETC.
GRAVITY SEWER	GRAVITY SEWER MAIN ONLY
SEWER FORCE MAINS	SEWER FORCE MAIN ONLY
SEWER FITTINGS	SEWER FITTINGS, MANHOLES, SERVICE LATERALS, VALVES, ETC.
R/O CONCENTRATE	MAINS, FITTINGS, VALVES, ETC.
RECLAIMED WATER	MAINS, FITTINGS, VALVES, ETC.

REGIONAL COMMISSION
DEPARTMENT OF
UTILITY SERVICES

AS-BUILT RECORD DRAWINGS
GENERAL NOTES

DRAWING
NO.

M-16

GENERAL NOTES

(continued)

10. A MINIMUM TEXT SIZE OF 1/8" IS REQUIRED ON ALL CONSTRUCTION/ROUTE SURVEY AND RECORD DRAWINGS.
11. ALL AS-BUILT RECORD DRAWINGS SHALL BE CERTIFIED BY THE PROJECT ENGINEER OR CONTRACTING SURVEYOR.
12. ALL AS-BUILT RECORD DRAWINGS SHALL CLEARLY DEPICT UTILITY LINES THAT WERE CONSTRUCTED ALONG THEIR RESPECTIVE EASEMENT (IF REQUIRED). AS-BUILT RECORD DRAWINGS WILL NOT BE ACCEPTED UNLESS THE VERBIAGE "PROPOSED" AND/OR "TO BE CONSTRUCTED" HAVE BEEN DELETED ON THE DRAWING. AS-BUILT RECORD DRAWINGS WITH "PROPOSED" OR "TO BE CONSTRUCTED" TERMINOLOGY WILL NOT BE ACCEPTED.
13. ALL NEW UTILITY CONSTRUCTION LOCATED WITHIN THE RIGHTS-OF-WAY, EASEMENTS AND ALIKE SHALL BE TIED TO THE RESPECTIVE RIGHTS-OF-WAY, EASEMENTS, ETC. EVERY 1,000 FEET AND CHANGE OF DIRECTION.
14. ALL AS-BUILT RECORD DRAWINGS SHALL BE COMPLETE AND APPROVED BEFORE COMMENCEMENT OF FIELD TEST.
15. BASELINE OF CONSTRUCTION AND STATION OF ITEMS TO BE LOCATED ON THE CENTER OF THE ROADWAY, UNLESS CONDITIONS WARRANT AND APPROVED BY IRCDUS. BASELINE STATIONING SHALL BE EVERY 100', CONTROL POINTS SET AT EVERY 500' AND ANGLE CHANGE OF DIRECTION.
16. ALL NEW UTILITY CONSTRUCTION LINES ON ALL AS-BUILT RECORD DRAWINGS SHALL BE SHOWN WITH A WIDER, SOLID LINE. EXISTING UTILITY LINES SHALL BE SHOWN WITH A THINNER, DASHED LINE.
17. TOP OF PIPE ELEVATIONS & STATIONING TO BE TYPED, LISTED, SEALED & SUBMITTED BY THE ENGINEER FOR LOCATING THE AIR RELEASE VALVES AS CONSTRUCTION PROCEEDS.
18. SHOW TOP ELEVATION OF THE UTILITY LINES THAT WERE CONSTRUCTED AND SHOW EXISTING UTILITY LINES FOR ALL UTILITY CROSSINGS.
19. PUMP STATION POWER SUPPLY FROM FP&L OR COVB ELECTRIC POWER POLE OR TRANSFORMER TO THE PUMP STATION ELECTRIC PANEL SHALL BE INCLUDED ON THE AS-BUILT RECORD DRAWING.
20. ALL FIRE HYDRANTS AND FIRE HYDRANT VALVES SHALL BE LOCATED BY STATE PLANE COORDINATES, STATION NUMBER AND OFFSET AND SHALL BE CLEARLY IDENTIFIED ON AS-BUILT RECORD DRAWING.
21. ALL NEWLY CONSTRUCTED VALVES SHALL BE CLEARLY IDENTIFIED BY SIZE, TYPE, TOP ELEVATION AND DIRECTION/NUMBER OF TURNS TO OPEN OR CLOSE VALVE.

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

AS-BUILT RECORD DRAWING
GENERAL NOTES

CONTINUED

MAY 2019

DRAWING
NO.
M-16
A

ROUTE SURVEY REQUIREMENTS

- 1 ALL INCOMING ROUTE SURVEYS THAT ARE REQUIRED FOR AN INDIVIDUAL DESIGN SHALL BE RECEIVED ON A CD OR AN ELECTRONIC COPY NOT LATER THAN 2015 FORM OR LATEST EDITION ELECTRONIC COPY OF ROUTE SURVEY SHALL NOT CONTAIN EXCESSIVE NOTES OR COMMENTS OR LETTERS OR NOTES THAT DO NOT PERTAIN TO THE ROUTE SURVEY RECORDS. ALSO, IT IS AN ELECTRONIC EDITION (3) THREE (24"x36") SHOWN AND SHOWN COPIES OF ROUTE SURVEYS SHALL BE SUBMITTED AND SHALL BE IN A MINIMUM SCALE OF 1"=40'
- 2 ALL SURVEYS THAT ARE REQUIRED FOR AN INDIVIDUAL DESIGN SHALL BE LOCATED WITHIN A DISTANCE OF ONE (1) MILE FROM THE IDENTIFIED RIGHT OF WAY LOCAL POSITIONING SYSTEM (GPS) CONTROL POINT MONUMENTS SHALL BE TIED INTO THE GPS MONUMENT FROM ONE (1) PERMANENT REFERENCE POINT OR THE SUBDIVISION CORNER THAT IS CLOSEST TO THE SURVEY ROUTE AND SHALL BE TIED TO THE SURVEY BENCH MARK
- 3 SHOW EXISTING RIGHT-OF-WAY LIMITS AND/OR EASEMENTS WITHIN THE LIMITS OF CONSTRUCTION
- 4 SHOW SURVEY BENCH MARK STATIONING AND/OR 100' CONTROL POINTS SET AND/OR 500' AND AT 100' INTERVALS IN DIRECTION
- 5 SHOW CROSS SECTION SPOT ELEVATIONS AT ROAD AND/OR 100' OR GREATER SPACING OR LINE CONSTRUCTION AND 100' OR GREATER LINE AND/OR CORNER MARK CONSTRUCTION ELEVATIONS THAT REFLECT THE SIGNIFICANT CHANGES IN ROAD BATHYMETRY THE PROPOSED STATED FOOTING SHALL BE SHOWN ON PLOTS
- 6 SHOW EXISTING PARCELS TRACTS AND LOT CORNER LOCATIONS SHOW WITHIN THE RIGHT OF WAY DIMENSIONS PER PLOT AND PLOTTED IN CONSTRUCTION PROJECT IS CLOSE TO BENCH MARKS AND LOT DIMENSIONS
- 7 SHOW EXISTING ROADS AND/OR ON PAVED OR UNPAVED OR DIRT ROADS
- 8 SHOW EXISTING UTILITIES AS LOCATED IN FIELD (ELECTRIC, GAS, WATER, TELEPHONE, CABLE TELEVISION, LIGHTS, ETC.) (NOTES SHALL BE MADE TO BE CONTACTED BY SURVEYOR FIRM PRIOR TO SURVEY LOCATIONS IT IS THE INTENT OF CONTRACTOR TO EXCEPT)
- 9 SHOW EXISTING UTILITIES AS ASSOCIATED WITHIN 6' BOUNDARY (EXEMPTED FROM MAPPING)
- 10 SHOW EXISTING CURBSIDE AND/OR DRIVEWAY AND/OR IDENTICAL TOPS
- 11 SHOW EXISTING DRAINAGE PIPES CROSSINGS AND/OR BASIC MAPPING AND/OR DRIVEWAY AND/OR COLLECTS (TOPS AND/OR IDENTICAL LOCATIONS)
- 12 SHOW EXISTING SPACES AND/OR DITCHES AND/OR CROSS SECTION SPOT ELEVATIONS AND/OR 100' AT TOP AND BOTTOM IN FIELD AND/OR CONSTRUCTION

IDENTIFIED RIGHT OF WAY DEPARTMENT OF UTILITIES SERVICES	ROUTE SURVEY REQUIREMENTS	DRAWING NO. M-17
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ROUTE SURVEY REQUIREMENTS

(continued)

13. SOO EXISTING OCCAS

14. SOO EXISTING TRS OR SORBBOR

15. ALL OTHER O-MOBL ITEMS SC S MAILBOXES POLSOTC

16. ALL STREET SMS STREET SMS SOLL APPOR O ORR PRIOTBL SOTT

17. ALL COMMERCIAL SD SILLMULTI MIL RESIDEC MST PRCAL IDDD
STREET ADDRESS INDICTD OT PL

18. ALL IR DROTS SD IR DROT LSS SOLL B CLORL IDTD

19. ALL UTILIT LSS SOLL B CLORL IDTD

20. ROUT SRS PERFORMD OR OTR SSSMPT PROCTS MROR
RESIDTIAL ALL LOCOS

INDIAN RIVER COUNTY
DEPARTMENT OF
UTILITY SERVICES

ROUTE SURVEY
REQUIREMENTS
CONTINUED

MAY 2010

DRAWING
NO
M-17
□

Section 1

Water Mains - Ductile Iron Pipe (DIP) and Fittings

Section 1

Water Mains – Ductile Iron Pipes (DIP) and Fittings

1.01 General

- A. DIP shall be allowed for use as water pipe where compatible with the specific conditions of the project. The use of material other than ductile iron may be required by IRCDUS during construction permit review or by IRCDUS field personnel during construction, if it is determined that DIP is unsuitable for the particular application.
- B. All DIP shall be manufactured in accordance with AWWA Specification C150 (A21.50-96), or latest revision and shall be pressure Class 300 or 350 minimum as depicted on Table 1.1 on page 1-2. All DIP crossings under roadways and other traffic areas shall be pressure Class 350 minimum.
- C. Unless specifically indicated otherwise, restrained push-on joint underground piping shall be manufactured restrained bell and spigot and above ground piping shall be flanged.
- D. Cutting of DIP shall be by sawing only.

1.02 Pipe

- A. DIP shall be bell and spigot cast in accordance with AWWA Specification C150 (ANSI A21.50-96), or latest revision. Cast ductile iron shall have a minimum tensile strength of 60,000 psi with a minimum yield strength of 42,000 psi. Pipe wall thicknesses shall be computed in accordance with AWWA Specification C150 (ANSI A21.51-96), or latest revision, using the physical characteristics cited above with a minimum working pressure of 200 psi and a Laying Condition "Type 2." Unless otherwise indicated or specified herein, the pipe shall have the minimum wall thickness according to class designation for diameters shown. All pipe shall be given a minimum factory hydrostatic test of 500 psi.

**Table 1.1
Pressure Class 300 and 350**

Nominal Size Diameter (Inches)	Actual Outside Diameter (Inches)	300 psi Wall Thickness (Inches)	350 psi Wall Thickness (Inches)
3	3.96	---	0.25
4	4.80	---	0.25
6	6.90	---	0.25
8	9.05	---	0.25
10	11.10	---	0.26
12	13.20	---	0.28
14	15.30	0.30	0.31
16	17.40	0.32	0.34
18	19.50	0.34	0.36
20	21.60	0.36	0.38
24	25.80	0.40	0.43
30	32.00	0.45	0.49
36	38.30	0.51	0.56
42	44.50	0.52	0.63
48	50.80	0.64	0.70
54	57.56	0.72	0.79
60	61.61	0.76	0.83
64	65.67	0.80	0.87

1.03 Fittings

- A. All underground fittings shall be either push-on, restrained, or mechanical joint. Mechanical joints shall conform to AWWA Specification C110 (ANSI 21.10-98) or C153 (ANSI 21.53-00), or latest revisions. All aboveground fittings shall be flanged joint.
- B. The pressure rating shall be 350 psi (Class 350 Pipe).
- C. Joint restraints, when required, shall be in accordance with IRCDUS Approved Manufacturers' Products List or an approved equal.
- D. All fittings shall be lined with the same material as specified for the pipe as per paragraph 1.04.

1.04 Lining and Coating

- A. Unless otherwise indicated, all DIP shall be factory lined and coated.
- B. All pipe shall be cement mortar lined and seal coated in accordance with AWWA Standard C104 (ANSI A21.4-95), or latest revision unless double lining is required by IRCDUS.

- C. Unless specified otherwise, all ductile iron pipe shall be bituminous coated outside to a dry film thickness of at least 1 mil.
- D. Anywhere that the coating is removed purposely or accidentally, the area shall be cleaned of any rust, grease, and dirt and re-coated to a minimum dry film as specified for the individual piece.
- E. If and where directed by IRCDUS's Engineer, a polyethylene encasement shall be provided around pipe, fittings, and valves. The material, installation, and workmanship shall conform to applicable sections of AWWA C105 (ANSI A21.5-99), or latest revision. Installation methods A or B shall be employed using flat tube polyethylene. The Contractor shall make provisions to keep the polyethylene from direct exposure to sunlight prior to installation. Backfilling following installation shall be completed without delay to avoid exposure to sunlight.
- F. All exposed (i.e. aerial crossings) DIP water mains shall be primed and painted "blue" as per IRCDUS Approved Manufacturers' Products List or equal.

1.05 Bell and Spigot Connections

- A. Joints in bell and spigot pipe shall be push-on, mechanical, or restrained joints in accordance with AWWA Standard C111 (ANSI 21.11-00), or latest revision. Pipe restraints shall also be in accordance with IRCDUS Standards or as directed by IRCDUS's Engineer.

1.06 Flanged Connections

- A. All flanged pipe barrels shall comply with the physical and chemical requirements as set forth in the Handbook of DIP of the Cast Iron Pipe Research Association, latest revisions. Flanges shall be in accordance with ANSI Specification B16.1 for Class 125 flanges. Bolts shall comply with ANSI Specification B18.2.
- B. Flanged pipe shall be faced and drilled to the American Standard Drilling, unless special drilling is called for or required. Where tap or stud bolts are required, flanges shall be tapped. Flanges shall be accurately faced and drilled smooth and true, at right angles to the pipe axis and shall be covered with zinc dust and tallow or a rust preventive compound immediately after facing and drilling.
- C. Flanged pipe with screwed-on flanges shall be furnished with long hubs, and the flanges shall be screwed on the threaded end of the pipe in the shop, and the face of the flange and end of pipe refaced together. There shall be no leakage through the pipe threads and the flanges shall be designed to prevent corrosion of the threads from outside.

- D. Flanged joints shall be made with bolts or stud bolts and nuts. Bolts, stud bolts, and nuts shall conform to American Standard heavy dimensions, semi-finished with square or hexagonal heads and cold punched hexagonal nuts, meeting the requirements of ASTM Designation A-316SS. Bolt sizes shall be American Standard for the flanges specified, and bolts and nuts shall have good, true threads.
- E. Gaskets shall be in accordance with AWWA Standard C115 (ANSI A21.15-99), latest revision.

1.07 Submittals

- A. Before starting fabrication of the DIP and fittings, the Contractor shall submit one set of complete working drawings (shop drawings) to the Engineer of Record and IRCDUS for approval. Such drawings shall show the pipe, fittings, valves, expansion joints, hangers, supports, and other appurtenances to be installed. Where special fittings are required, they shall be shown in large detail with all the necessary dimensions. The Engineer of Record shall review the drawings and notify IRCDUS of the drawings approved and not approved. IRCDUS will also review the drawings and coordinate approvals and disapprovals with the Engineer of Record and Contractor. The drawings submitted shall show flanged jointed sections placed so as to be removable without disturbance to the main pipe sections.

1.08 Marking

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details Drawing M-13 for specifications regarding installation.
- B. Trace wire is required over or around all pipes unless otherwise approved by IRCDUS.
- C. Location tape is required over all pipes. Tape is to be installed 12” below proposed grade and additional tape shall be adhered directly on top of the pipe if required by IRCDUS engineering.

1.09 Installation

- A. Handling and Protection of Pipe: Unless otherwise noted on the drawings or in other sections of this specification, the pipe shall be handled and installed in strict accordance with the manufacturers’ instructions and with the applicable provisions of AWWA C600-99, latest revision. If a conflict exists between the manufacturers’ instructions and the AWWA Standards, the manufacturers’ instructions shall govern. The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder the operation of the pipeline.

Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment. All piping shall be placed in a dry trench, unless otherwise approved by IRCDUS.

- B. Depth of Cover and Pipe Elevation: Unless otherwise shown on the drawings, or otherwise approved by IRCDUS, all pipe shall have a minimum cover of 36 inches. Contractor shall determine top of pipe elevation and top of ground elevation for every two joints of pipe installed using a level. Pipe must have the minimum cover described above and must be within +/- 0.2 feet of the top of pipe elevation indicated on the drawings. Installed pipe, which does not meet these requirements, shall be reinstalled until it does meet these requirements. Contractor shall record top of pipe and top of ground elevations and the locations of where these elevations were determined and submit this information to IRCDUS. IRCDUS reserves the right to have Contractor excavate and check top of pipe and top of ground elevations to see if they conform to the aforementioned requirements, at no cost to IRCDUS.

END OF SECTION

Section 2

Water Mains

Polyvinyl Chloride (PVC) Pipe and Fittings

Section 2

Water Mains Polyvinyl Chloride Pipe (PVC) and Fittings

2.01 General

- A. PVC pipe shall be allowed for use as potable water pipe where compatible with the specific conditions of the project. IRCDUS may require the use of material other than PVC during construction permit review or by IRCDUS field personnel during construction, if it is determined that PVC pipe is unsuitable for the particular application.
- B. The pipe shall be identified by its nominal pipe size, plastic pipe material code, SDR class, pressure rating, ASTM Designation, manufacturers' name, production code, and the National Sanitation Foundation seal for potable water (NSF-pw).

2.02 Pipe for Sizes 3 Inches in Diameter and Smaller

- A. All pipe intended for conveying or transmitting potable water shall be designed for a minimum working pressure of 350 psi.
- B. PVC pipe shall conform to the ASTM 2241, latest revision. Pipe shall be SDR 21 with a pressure rating of 200 psi. Joint design tested to the requirements of ASTM D 3139. Rubber rings shall conform to ASTM F 477 and D 1869. Pipe to be made to exceed the requirements of the material section of ASTM D 2241.
- C. PVC pipe shall be in accordance with IRCDUS Approved Manufacturers' Products List or equal.
- D. The pipe shall be "blue" in color.
- E. No solvent weld joints are permitted.

2.03 Pipe for Sizes 4 Inches Through 12 Inch in Diameter

- A. All pipe intended for conveying or transmitting potable water shall be designed for a minimum working pressure of 350 psi.
- B. PVC pipe shall conform to AWWA Standard Specifications C900-97, or latest revision, or C909-98, or latest revision and ASTM D1784 and D2241, latest revision. PVC pressure pipe shall be made from Class 12454-A or Class 12454-B material and conform

to the outside diameter of cast iron pipe with a minimum wall thickness of DR18.

- C. PVC pipe shall be in accordance with IRCDUS Approved Manufacturers' Products List or equal.
- D. The pipe shall be "blue" in color.
- E. The pipe shall be identified by its nominal pipe size, plastic pipe material code, DR class, pressure rating, ASTM Designation, manufacturers' name, code, and the National Sanitation Foundation seal for potable water (NSF-pw).

2.04 Pipe for Sizes 14 Inches through 36 Inches in Diameter

- A. All pipe intended for conveying or transmitting potable water shall be designed for a minimum working pressure of 350 psi.
- B. PVC pipe shall conform to AWWA Standard Specifications C900-97 and ASTM D1784, or latest revisions. PVC pressure pipe shall be made from Class 12454-A or Class 12454-B material and conform to the outside diameter of cast iron pipe with a minimum wall thickness of DR18.
- C. PVC pipe shall be in accordance with IRCDUS Approved Manufacturers' Products List or equal.
- D. The pipe shall be "blue" in color.
- E. The pipe shall be identified by its nominal pipe size, plastic pipe material code, DR class, pressure rating, ASTM Designation, manufacturers' name, code, and the National Sanitation Foundation seal for potable water (NSF-pw).

2.05 Joints

- A. Joints for PVC pipe shall be bell and spigot push-on rubber gasket type only unless otherwise approved by IRCDUS. No solvent weld or threaded joints will be permitted.
- B. Restraining joints, when required, shall be in accordance with IRCDUS Approved Manufacturers' Products List or equal.

2.06 Fittings

- A. All fittings shall be ductile iron mechanical joint and shall conform to AWWA Standard Specifications C110/A21.10-98 or C153/A 21.53-00, or latest revisions. Fittings shall be cement mortar lined and seal-coated in accordance with AWWA Standard Specifications C104/A21.4-95, or latest revision.

- B. The pressure rating shall be 350 psi (Class 350).
- C. Joint restraint, when required, shall be in accordance with IRCDUS Approved Manufacturers' Products List or equal.

2.07 Submittals

- A. Before starting installation of the PVC pipe and fittings, the Contractor shall submit one set of complete working drawings (shop drawings) to the Engineer of Record and IRCDUS for approval. Such drawings shall show the pipe, fittings, valves, hydrants, blow-offs, services, and other appurtenances to be installed. Where special fittings are required, they shall be shown in large detail with all the necessary dimensions. The Engineer of Record shall review the drawings and notify IRCDUS of the drawings approved and not approved. IRCDUS shall also review the drawings and coordinate approvals and disapprovals with the Engineer of Record and Contractor.

2.08 Marking

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details Drawing M-13 for specifications regarding installation.
- B. Trace wire is required over or around all pipes.
- C. Location tape is required over all pipes. Tape is to be installed 12" below proposed grade and additional tape shall be adhered directly on top of the pipe if required by IRCDUS engineering.

2.09 Storage

- A. PVC pipes are not to be stored where exposed to direct sunlight because of possible ultraviolet light degradation. Pipes stored on the jobsite are to be covered. PVC pipes that exhibit discoloration or fading from their original color will be rejected by IRCDUS field representatives.

2.10 Installation

- A. Handling and Protection of Pipe: Unless otherwise noted on the drawings or in other sections of these standards, the pipe shall be handled and installed in strict accordance with the manufacturers' instructions and with the applicable provisions of AWWA Standard Specifications C605-94, or latest revision. If a conflict exists between the manufacturers' instructions and the AWWA Standard Specifications, the manufacturers' instructions shall govern. The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is

above the bottom of the trench, the Contractor shall provide suitable dewatering equipment. All piping shall be placed in a dry trench, unless approved by IRCDUS.

- B. Depth of Cover and Pipe Elevation: Unless otherwise shown on the drawings, or otherwise authorized by IRCDUS, all pipe shall have a minimum depth of cover of 36 inches. Contractor shall determine top of pipe elevation and top of finished grade elevation for every two joints of pipe installed using a level. Pipe must have the minimum cover described above and must be within +/- 0.2 feet of the top of pipe elevation indicated on the drawings. Installed pipe, which does not meet these requirements, shall be reinstalled until it does meet these requirements. Contractor shall record top of pipe and top of ground elevations and the locations of where these elevations were determined and submit this information to Engineer or his representative. IRCDUS reserves the right to have Contractor excavate and check top of pipe and top of ground elevations to see if they conform to the aforementioned requirements.

END OF SECTION

Section 3

**Water Services - Crosslinked Polyethylene (PEXa) Tubing
and
Water Mains - High Density Polyethylene Pipe (HDPE)**

Section 3

Water Services Crosslinked Polyethylene Tubing (PEXa)

3.01 General

Crosslinked polyethylene (PEXa) tubing shall be allowed for use as potable water pipe where compatible with the specific conditions of the project. IRCDUS may require the use of material other than PEXa during construction permit review or by IRCDUS field personnel during construction if it is determined that PEXa pipe is unsuitable for the particular application.

3.02 Polyethylene (PEXa) Tubing 3 inches Diameter and Smaller

- A. This specification requires PEXa to be designated as PEXa, high pressure peroxide method.
- B. PEXa tubing shall comply with applicable requirements for extrusion compound PEXa plastic material as stated in AWWA Standard Specifications C904, or latest revision, and shall comply with the following:
 - 1. Tubing shall have a working pressure of 200 psi at 73.4° F.
 - 2. Tubing surfaces shall be glass smooth, and shall be free from bumps and irregularities. Materials must be completely homogeneous and uniform in appearance.
 - 3. Tubing dimensions and tolerances shall correspond with values listed in ASTM D-2239, with a standard outside dimension ratio (SDR) of 9.
 - 4. Tubing shall carry the following markings every (3) feet: Manufacturers' name or trademark, nominal size, PEXa 3306 (material designation) SDR (standard dimension ratio), POTABLE TUBING, ASTM F876/F877/F2080, CSA B137.5, NSF-pw, UP Code 200psi/73.4°F 100psi/180°F, manufacturing date and footage mark.

3.03 Joints

- A. Joints for PEXa tubing shall be of the compression type or compression-sleeve type, utilizing a totally confined grip seal and coupling nut, unless otherwise approved by IRCDUS. Stainless steel tube stiffener inserts shall also be used for PEXa tubing services.

3.04 Installation

- A. Backfill shall be free of rocks and debris.
- B. Bending radius shall be large enough so that tubing is not crimped or damaged and so that the flow of water is not restricted. Manufacturers' minimum radius recommendations are to be utilized during installation of PEXa tubing.
- C. PEXa tubing shall have ability for kink repair using a heat gun.

3.05 Marking

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details M-14 for specifications regarding installation.
- B. Trace wire is required over or around all pipes.
- C. Location tape is required over all pipes. Tape is to be installed 12" below proposed grade and additional tape adhered directly on top of the pipe if required by IRCDUS engineering.

3.06 Pressure PEXa Pipe

- A. PEXa pipe shall be allowed for use as all pressure utility pipes where compatible with the specific conditions of the project. The use of material other than PEXa pipe may be required by IRCDUS during construction permit review or by IRCDUS field personnel, if it is determined that PEXa is unsuitable for the particular application.
- B. Documentation from the resin's manufacturer showing results of the following tests for resin identification:
 - 1. Melt Flow Index ASTM D 1238
 - 2. Density ASTM F876
- C. All PEXa pipe and fittings shall be from a single manufacturer on the Approved Manufacturers' Product List. The pipe shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these Specifications. See Approved Manufacturers' Product List.
- D. Finished Product Evaluation
 - 1. Production staff for the items listed below shall check each length of pipe produced. The results of all measurements shall be recorded on production sheets that become part of the manufacturers' permanent records.

- a. Pipe in process shall be checked visually, inside and out for cosmetic defects (grooves, pits, hollows, etc.)
- b. Pipe outside diameter shall be measured using a suitable periphery tape to ensure conformance with ASTM F714 or ASTM D-3035 whichever is applicable.
- c. Pipe wall thickness shall be measured at 12 equally spaced locations around the circumference at both ends of the pipe to ensure conformance with ASTM F714 or ASTM D-3035, whichever is applicable.
- d. Pipe length shall be measured.
- e. Pipe marking shall be examined and checked for accuracy.
- f. Pipe ends shall be checked to ensure they are cut square and clean.
- g. Subject inside surface to a "reverse bend test" to ensure the pipe is free of oxidation (brittleness).

E. Stress Regression Testing

- 1. The PEXa pipe manufacturer shall provide certification that stress regression testing has been performed on the specific PEXa resin being utilized in the manufacturing of this product. This stress regression testing shall have been done in accordance with ASTM D2837 and the manufacturer shall provide a product supplying a minimum Hydrostatic Design Basis (HDB) of 1,600 psi as determined in accordance with ASTM D2837.

F. Developer is responsible for compatibility between pipe materials, fittings and appurtenances.

G. The pipe manufacturer shall provide a warranty against manufacturing defects of material and workmanship for a period of ten (10) years after the final acceptance of the project by the IRCDUS. The manufacturer shall replace at no expense to IRCDUS any defective pipe material including labor within the warranty period.

3.07 Materials for High Density Polyethylene Pipe (HDPE) Sizes 3 inch in Diameter and Smaller

- A. Materials used for the manufacture of HDPE pipe and fittings shall be made from a PE 3408 PE resin compound meeting cell classification 334434D per ASTM D3350; and meeting Type III, Class C, Category 5, Grade P34 per ASTM D1248
- B. HDPE pipe shall comply with AWWA Standard Specifications C906-99 or latest revision.

- C. If rework compounds are required, only those generated in the manufacturers' own plant from resin compounds of the same class and type from the same raw material supplier shall be used.
- D. Dimensions and workmanship shall be as specified by ASTM F714. HDPE fittings and transitions shall meet ASTM D3261. HDPE pipe shall have a minimum density of 0.955 grams per cubic centimeter. All HDPE pipe and fittings shall have a Hydrostatic Design Basis (HDB) of 1,600 psi.
- E. HDPE pipe and accessories 3" and smaller in diameter, shall be 160 psi at 73.4° F meeting the requirements of Standard Dimension Ratio (SDR) 11 as minimum strength.
- F. The pipe manufacturer must certify compliance, with the above requirements.
- G. HDPE flange adapters at pipe material transitions shall be backed up by stainless steel flanges conforming to ANSI B16.1 and shaped as necessary to suit the outside dimensions of the pipe. The flange adapter assemblies shall be connected with corrosion resisting bolts and nuts of Type 316 Stainless Steel as specified in ASTM A726 and ASTM A307. All bolts shall be tightened to the manufacturers' specified torques. Bolts shall be tightened alternatively and evenly.

3.08 Materials for High Density Polyethylene Pipe (HDPE) Sizes 4 inches in Diameter and Larger

- A. Materials used for the manufacture of HDPE pipe and fittings shall be made from a PE 3408 resin compound meeting cell classification 345434C per ASTM D3350; and meeting Type 111, Class C, Category 5, Grade P34 per ASTM D1248.
- B. HDPE pipe shall comply with AWWA Standard Specifications C901-96 or latest revision.
- C. If rework compounds are required, only those generated in the manufacturers' own plant from resin compounds of the same class and type from the same raw material supplier shall be used.
- D. Dimensions and workmanship shall be as specified by ASTM D-3035. HDPE fittings and transitions shall meet ASTM D3261. PE pipe shall have a minimum density of 0.955 grams per cubic centimeter. All HDPE pipe and fittings shall have a Hydrostatic Design Basis (HDB) of 1,600 psi.
- E. HDPE pipe and accessories 4" and larger in diameter, shall be 160 psi at 73.4° F meeting the requirements of Standard Dimension Ratio (SDR) 9 as minimum strength.

- F. The pipe manufacturer must certify compliance with the above requirements.

3.09 Fittings

- A. All molded fittings and fabricated fittings shall be fully pressure rated to match the pipe SDR pressure rating to which they are made. All fittings shall be molded or fabricated by the manufacturer. No fabricated fittings shall be used unless approved by IRCUDS.
- B. The manufacturer of the HDPE pipe shall supply or specify all HDPE fittings and accessories as well as any adapters and/or specials required to perform the work as shown on the drawings and specified herein.
- C. All transitions from HDPE pipe to PVC or ductile iron shall be made per the HDPE, PVC, or ductile iron pipe manufacturers' recommendations and specifications whichever is more stringent. A molded flange connector adapter within a carbon steel back-up ring assembly shall be used for pipe type transitions. Ductile iron back-up rings shall mate with cast iron flanges per ANSI B16.1. A 316 stainless steel back-up ring shall mate with a 316 stainless flange per ANSI B16.1.
- D. The pipe manufacturer must certify compliance with the above requirements.

3.10 Joints

- A. The HDPE pipe shall be joined with butt, heat fusion joints. All joints shall be made in strict compliance with the manufacturers' recommendations.
- B. Lengths of pipe shall be assembled into suitable installation lengths by the butt-fusion process. All pipes so joined shall be made from the same class and type of raw material made by the same raw material supplier. Pipe shall be furnished in standard lay lengths not to exceed 50 feet.
- C. All above ground HDPE pipe shall have flange adapters. Below ground shall be MJ adapters. Stainless Steel inserts allowed on water main only 4" to 6". FM 4" and larger MJ adapter only with no insert. Pipe material transitions shall be backed up by stainless steel flanges conforming to ANSI B16.1 and shaped as necessary to suit the outside dimensions of the pipe. The flange adapter assemblies shall be connected with corrosion resisting bolts and nuts of Type 316 Stainless Steel as specified in ASTM A726 and ASTM A307. All bolts shall be tightened to the

manufacturers' specified torques. Bolts shall be tightened alternatively and evenly.

3.11 Pipe Identification

- A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding 5-ft.
 - 1. Name and/or trademark of the pipe manufacturer.
 - 2. Nominal pipe size.
 - 3. Dimension ratio.
 - 4. The letters PE followed by the polyethylene grade in accordance with ASTM D1248, followed by the hydrostatic design basis in 160's of psi, e.g., PE 3408.
 - 5. Manufacturing standard reference, e.g., ASTM F714 or D-3035, as required.
 - 6. A production code from which the date and place of manufacture can be determined.
 - 7. HDPE pipe used for potable water will have a "blue" stripe and reclaim water will have a "purple" stripe, continuous along the entire length of pipe.

- B. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of all pipe and fittings. See Trace Wire Details Drawing M-13 for specifications regarding installation.

3.12 Installation by Open Cut Method

- A. HDPE Pipe shall be installed in accordance with the instruction of the manufacturer, as shown on the Drawings and as specified herein. A factory qualified joining technician as designated by the pipe manufacturer shall do all heat fusion joints.

- B. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe. Pipe or fittings shall not be dropped. All pipe or fittings shall be examined before installation, and no piece shall be installed which is found to be defective. Any damage to the pipe shall be repaired as directed by the Engineer of Record and IRCDUS. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner by the Contractor, at his own expense.

- C. Under no circumstances shall the pipe or accessories be dropped into the trench.

- D. Care shall be taken during transportation of the pipe such that it will not be cut, kinked, or otherwise damaged.

- E. Ropes, fabric, or rubber protected slings and straps shall be used when handling pipes. Chains, cables, or hooks inserted into the

pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe.

- F. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects, which could damage the pipe. Stacking of the PE pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.
- G. Care shall be exercised when lowering pipe into the trench to prevent damage or twisting of the pipe.
- H. Pipe shall be laid to lines and grade shown on the Drawings with bedding and backfill as shown on the Drawings.
- I. When installation of pipe is not in progress, including lunchtime, the open ends of the pipe shall be closed by fabricated plugs, or by other approved means.
- J. Pipe shall be stored on clean level ground to prevent undue scratching or gouging. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. The maximum allowable depth of cuts, scratches or gouges on the exterior of the pipe is 5 percent of wall thickness. Sections of pipe with cuts, scratches or gouges exceeding five percent of the pipe wall thickness shall be removed completely and the ends of the pipeline rejoined. The interior pipe surface shall be free of cuts, gouges or scratches.
- K. HDPE pipe shall be joined by the method of thermal butt fusion, as outlined in ASTM D2657. All joints shall be made in strict compliance with the manufacturers' recommendations.
- L. Mechanical connections of the HDPE pipe to auxiliary equipment such as valves, pumps and tanks shall be through flanged connections which shall consist of the following:
 - 1. An HDPE flange shall be thermally butt-fused to the stub end of the pipe. A stainless steel or ductile iron back-up ring shall be used on both sides of the connection prior to thermally butt-fusing the PE flange.
 - 2. A 316 stainless steel back-up ring shall mate with a 316 stainless steel flange.
 - 3. Ductile iron back-up rings shall mate with cast iron flanges.
- M. Flange connections shall be provided with a full-face neoprene gasket.

- N. All HDPE pipe must be at the temperature of the surrounding soil at the time of backfilling and compaction.
- O. No single piece of pipe shall be laid unless it is straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16-in per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.
- P. If a defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner. All pipe and fittings shall be thoroughly cleaned before installation, shall be kept clean until they are used in the work and when laid, shall conform to the lines and grades required.
- Q. As soon as the excavation is complete to normal grade of the bottom of the trench, bedding shall be placed, compacted and graded to provide firm, uniform and continuous support for the pipe. Bell holes shall be excavated so that only the barrel of the pipe bears upon the bedding. The pipe shall be laid accurately to the lines and grades indicated on the Construction Plans. Blocking under the pipe will not be permitted. Bedding shall be placed evenly on each side of the pipe to mid-diameter and hand tools shall be used to force the bedding under the haunches of the pipe and into the bell holes to give firm continuous support for the pipe. Bedding shall then be placed to 12-in above the top of the pipe. The initial 3 feet of backfill above the bedding shall be placed in 1 foot layers and carefully compacted. Generally the compaction shall be done evenly on each side of the pipe and compaction equipment shall not be operated directly over the pipe until sufficient backfill has been placed to ensure that such compaction equipment will not have a damaging effect on the pipe. The pipe manufacturers' representative prior to use shall approve equipment used in compacting the initial 3 feet of backfill. Pipe shall be installed per IRCUDS Drawing M-1 or M-2, Trench Details.
- R. Good alignment shall be preserved during installation. The deflection at joints shall not exceed that recommended by manufacturer. Fittings, in addition to those shown on the Drawings, shall be provided, if required, in crossing of utilities that may be encountered upon opening the trench.
- S. Each length of the pipe shall have the assembly mark aligned with the pipe previously laid and held securely until enough backfill has cramped.
- T. Before any joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and

that the inverts are matched and conform to the required grade. The pipe shall not be driven down to grade by striking it.

- U. Precautions shall be taken to prevent flotation of the pipe in the trench.
- V. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be used in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the backfill. Trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below the top of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, pipe bedding shall be placed to fill any voids created and the backfill shall again be compacted to provide uniform side support for the pipe.
- W. Sheeting and shoring will be required as determined in the field in accordance with OSHA regulations.
- X. Restrained joints shall be installed where shown on the Construction Plans, as required by IRCDUS Standards, or otherwise as directed by IRCDUS.

3.13 Marking

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details, M-13 for specifications regarding installation.
- B. Trace wire is required over or around all pipes.
- C. Location tape is required over all pipes. Tape is to be installed 12" below proposed grade and additional tape shall be adhered directly on top of the pipe if required by IRCDUS.

3.14 Trenchless Installation of High Density Polyethylene (HDPE) Pressure Mains by Directional Bore

- A. Description
 - 1. Portions of the pressure mains shall be installed by the directional bore method within the limits indicated of the contract plans and as specified here in. Generally, as a minimum, the pressure main is to be located within the road right-of-way and shall be installed by directional boring.
 - 2. This section includes material, performance and installation standards, and the contractor's responsibilities associated with the furnishing of labor, material, equipment, and identical required to install, complete, required trenchless installation of

pressure mains, as shown on the Drawings and as specified herein.

B. Experience

1. The Contractor must demonstrate expertise in trenchless method by providing a list of ten utility references for which similar work has been performed in the last two years. The references should include a name and phone number where the contact can be made to verify the Contractor's capability. The Contractor must provide documentation showing successful completion of the projects used for reference. Conventional trenching experience will not be considered applicable.
2. Supervisory personnel must be adequately trained and shall have at least four years of experience in directional boring. The Contractor shall submit the names and resumes of all supervisory field personnel prior to construction.
3. Directional boring equipment shall be capable of installing the minimum pipe diameter noted on the drawings.

C. Submittals

1. Submit technical data for equipment including clay slurry material, method of installation with working drawings, and proposed sequence of construction for approval by the IRCDUS.
2. Prior to approval for directional boring, the Contractor must submit the names of supervisory personnel, and history information of the directional boring experience. In addition, the Contractor must submit for approval the nameplate, data for the drilling equipment, mobile spoils removal units and Material Safety Data Sheets (MSDS) for the drilling slurry compounds.
3. The Contractor is required to bring to the attention of the engineer any known design discrepancies with actual tunneling methods that the contractor will be performing. This shall be stated in writing to the Engineer at the pre-construction meeting.

D. Installation

1. Installation shall be in a trenchless manner producing continuous bores.
2. The tunneling system shall be remotely steerable and permit electronic monitoring of tunnel depth and location. Accurate

placement of pipe within a +/- 2-inch window is required both horizontally and vertically. Turning capability of 90-degrees radius in 40 feet is required. Continuous monitoring of the boring head is required, including across open water if necessary.

3. The directional boring Contractor shall submit certification, by a Professional Engineer licensed in the State of Florida, that the directional boring has been performed in accordance to the construction drawings, and shall submit signed and sealed drawings. AS-Built Record Drawings shall be provided both in electronic format and hard paper copy.
4. Tunneling shall be performed by a fluid-cutting process (high pressure-low volume) utilizing liquid clay i.e. bentonite. The clay lining will maintain tunnel stability and provide lubrication in order to reduce frictional drag while the pipe is being installed. In addition, the clay fluid must be totally inert and contain no environmental risk. The Contractor must also have a mobile vacuum spoils recovery vehicle on site to remove the drilling spoils from the access pits. The spoils must then be transported from the job site and be properly disposed off the site. The drilling spoils shall not, under any circumstances, be disposed into a sanitary sewer, storm, or other public or private drainage system. Spoils may be transported to the County's Solid Waste Facility and the cost of disposal shall be at the Contractor's expense.
5. Liquid clay type colloidal drilling fluid shall consist of at least 10 percent of high-grade carefully processed bentonite to consolidate cuttings of the soil, to seal the walls of the hole, and to furnish lubrication for subsequent removal of cuttings. The slurry that is heavier than the surrounding material, is high in colloids of the bentonite type and it will deposit a thin filter cake of low permeability material on the walls of the bore. This will allow only a small amount of the fluid to pass into the surrounding soils and will stabilize the bore. The colloidal content of the fluid imparts excellent lubricating qualities to the slurry that is a distinct aid to the removal of the soil cuttings.
6. Pneumatic or water-jetting methods will be considered unacceptable due to the possibility of surface subsidence.
7. After an initial bore has been completed, a reamer will be installed at the termination pit and the pipe shall be pulled back to the starting pit. The reamer shall be capable of discharging liquid clay to facilitate the installation of the pipe into a stabilized and lubricated tunnel.

8. A minimum of two insulated #6 stranded conductor copper tracer wire shall be wrapped or affixed to the top of the pipe and fittings along with the HDPE pipe. The tracer wire shall be tested for continuity or traceability upon completed installation. Should both tracer wires fail to test for continuity then the test shall be considered a failure and the wires shall be replaced.
9. Upon completion of boring and pipe installation, the Contractor shall remove all spoils from the starting and termination pits. All pits shall be restored to their original condition.
10. Restoration shall be as required by IRCDUS. The shoulders, ditches, banks, and slopes of roads and railroads crossed and paralleled shall not wash out before becoming accepted.

END OF SECTION

Section 4

**Gravity Sanitary Sewers
Ductile Iron Pipe (DIP) and Fittings**

Section 4

Gravity Sanitary Sewers Ductile Iron Pipe (DIP) and Fittings

4.01 General

- A. DIP shall be allowed for use as gravity sewer pipe where compatible with the specific conditions of the project. IRCDUS may require the use of material other than ductile iron during construction permit review or by IRCDUS field personnel during construction, if it is determined that DIP is unsuitable for the particular application.
- B. All DIP shall be manufactured in accordance with AWWA Standard Specifications C150/A21.50-96 and C151/A21.51-96, or latest revisions, and shall be pressure Class 300 or 350 minimum, as depicted on Table 4.1 on page 4-2. All DIP crossings under roadways and other traffic areas shall be pressure Class 350 minimum.
- C. Unless specifically indicated otherwise, restrained push-on joint underground piping shall be manufactured restrained bell and spigot and above ground piping shall be flanged.
- D. Cutting of DIP shall be by sawing only.

4.02 Pipe

- A. DIP shall be bell and spigot cast in accordance with the latest AWWA Standard Specifications C150/A21.50-96 and C151/A21.51-96. Cast ductile iron shall have a minimum tensile strength of 60,000 psi with a minimum yield strength of 42,000 psi. Pipe wall thicknesses shall be computed in accordance with AWWA Standard Specifications C150/A21.50-96, latest revision, using the physical characteristics cited above with a minimum working pressure of 200 psi and a Laying Condition "Type 2". Unless otherwise indicated or specified herein, the pipe shall have the minimum wall thickness according to class designation for diameters shown. All pipes shall be given a minimum factory hydrostatic test of 500 psi.

**Table 4.1
Pressure Class 300 and 350**

Nominal Size Diameter (Inches)	Actual Outside Diameter (Inches)	300 PSI Wall Thickness (Inches)	350 PSI Wall Thickness (Inches)
3	3.96	---	0.25
4	4.80	---	0.25
6	6.90	---	0.25
8	9.05	---	0.25
10	11.10	---	0.26
12	13.20	---	0.28
14	15.30	0.30	0.31
16	17.40	0.32	0.34
18	19.50	0.34	0.36
20	21.60	0.36	0.38
24	25.80	0.40	0.43
30	32.00	0.45	0.49
36	38.30	0.51	0.56
42	44.50	0.52	0.63
48	50.80	0.64	0.70
54	57.56	0.72	0.79
60	61.61	0.76	0.83
64	65.67	0.80	0.87

4.03 Fittings

- A. All underground fittings shall be either push-on, restrained, or mechanical joint. Mechanical joints shall conform to AWWA Standard Specifications C110/A21.10-98 or C153/A21.53-00, or latest revisions. All aboveground fittings shall be flanged joint.
- B. The pressure rating shall be 350 psi (Class 350 Pipe).
- C. All fittings shall be lined with the same materials as specified for the pipe, as per paragraph 4.04.
- D. Joint restraints, when required, shall be in accordance with IRCDUS Approved Manufacturers' Products List or an approved equal.

4.04 Lining and Coating

- A. Unless otherwise indicated, all DIP shall be factory lined and coated.
- B. For 4" and larger, the interior protective coating shall be an amine cured novalac epoxy (Protecto 401 or similar). The epoxy material shall be applied in 1 coat with a minimum dry film thickness of 40.0 mils and shall be per the Approved Manufacturers' Products List.

- C. Unless otherwise specified, the exterior of the pipe shall have a bituminous coating to a minimum dry film thickness of 1.0 mil.
- D. Lining Inspection:
 - 1. All DIP and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined SSPC-PA-2 film thickness rating.
 - 2. The interior lining of all pipe and fittings shall be tested for pinholes with a nondestructive 2,500-volt test.
 - 3. Each pipe joint and fitting shall be marked with the date of application of the lining system and with its numerical sequence of application on that date.
- E. The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified, and that the material was applied as required by the specification.
- F. Anywhere that the coating is removed purposely or accidentally, the area shall be cleaned of any rust, grease, and dirt and re-coated to a minimum dry film as specified for the individual piece.
- G. If and when directed by the Engineer of Record and IRCDUS, a polyethylene encasement shall be provided around pipe, fittings, and valves. The material, installation, and workmanship shall conform to applicable sections of AWWA Standard Specifications C105/A21.5-99, or latest revision. Installation methods A or B shall be employed using flat tube polyethylene. The Contractor shall make provisions to keep the polyethylene from direct exposure to sunlight prior to installation. Backfilling following installation shall be completed without delay to avoid exposure to sunlight.
- H. All exposed sewer DIP shall be coated (painted) green per the Approved Manufacturers' Product List.

4.05 Bell and Spigot Connections

- A. Unless specifically indicated otherwise, restrained push-on joint underground piping shall be manufactured restrained bell and spigot and above ground piping shall be flanged in accordance with AWWA Standard Specifications C111/A21.11-00, or latest revision. Pipe restraints shall also be in accordance with IRCDUS Standards or as directed by Engineer or IRCDUS.

4.06

Submittals

- A. Before starting fabrication of the DIP and fittings, the Contractor shall submit one set of complete detailed working drawings (shop drawings) to the Engineer of Record and IRCDUS for approval. Such drawings shall show the pipe, fittings, valves, expansion joints, hangers, supports, and other appurtenances to be installed. Where special fittings are required, they shall be shown in large detail with all the necessary dimensions. The Engineer of Record shall review the drawings and notify IRCDUS of the drawings approved and not approved. IRCDUS shall also review the drawings and coordinate approvals and disapprovals with the Engineer of Record and Contractor. The drawings submitted shall show flanged jointed sections placed so as to be removable without disturbance to the main pipe sections.

4.07

Marking

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details Drawing M-13 for specifications regarding installation.
- B. Trace Wire is required over or around all pipes.
- C. Location tape is required over all pipes. Tape is to be installed 12" below proposed finished grade and additional tape shall be adhered directly on top of the pipe if required by IRCDUS.

4.08

Installation

- A. Handling and Protection of Pipe: Unless otherwise noted on the drawings or in other sections of these standards, the pipe shall be handled and installed in strict accordance with the manufacturers' instructions. The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering. All piping shall be placed in a dry trench, unless IRCDUS approves wet trench installation.
- B. Depth of Cover and Pipe Elevation: Unless otherwise shown on the drawings, or otherwise authorized by IRCDUS, all pipe shall have a minimum cover of 36 inches. Contractor shall determine top of pipe elevation and top of ground elevation for every two joints of pipe installed using a level. Pipe must have the minimum cover described above and must be within +/- 0.2 feet of the top of pipe elevation indicated on the drawings. Installed pipe, which does not meet these requirements, shall be reinstalled until it does meet these requirements. Contractor shall record top of pipe and top of ground elevations and the locations of where these elevations were

determined and submit this information to IRCDUS. IRCDUS reserves the right to have Contractor excavate and check top of pipe and top of ground elevations to see if they conform to the aforementioned requirements, at no cost to IRCDUS.

END OF SECTION

Section 5

**Gravity Sanitary Sewers
Polyvinyl Chloride (PVC) Pipe and Fittings**

Section 5

Gravity Sanitary Sewers Polyvinyl Chloride (PVC) Pipe and Fittings

5.01 General

- A. PVC pipe shall be allowed for use as gravity sewer pipe where compatible with the specific conditions of the project. IRCDUS may require the use of material other than PVC during construction permit review or by IRCDUS field personnel during construction, if it is determined that PVC pipe is unsuitable for the particular application.
- B. PVC gravity sewer pipe can be used up to a depth of sixteen feet as specified herein. All pipe used for depths greater than 16 feet, shall be approved by IRCDUS.

5.02 Pipe and Fittings

- A. Gravity sewer mains and laterals shall be extra strength PVC pipe and shall conform to the latest ASTM Designation D3034-SDR26. Fittings installed in PVC pipe shall conform to the same specifications as the pipe in which they are installed.
- B. In addition to the requirements of ASTM specifications, the pipe shall not be out-of-round or crooked in alignment as determined by the Engineer of Record and/or IRCDUS. Any length of pipe 6 inches or greater in diameter whose inside diameters measured at right angles to each other vary more than ¼ inch may be rejected.
- C. PVC pipe shall be a maximum of 20 feet in length and shall be in accordance with IRCDUS Approved Manufacturers' Products List.
- D. Material shall meet or exceed the requirements of ASTM Designation 1784, Type 1, Grade 1 (12454-B). All P.V.C. materials shall be stored in accordance with the manufacturers' specifications (not in direct sunlight). PVC pipe and fittings, which show signs of ultraviolet degradation, are considered substandard and unfit for use, and will be rejected by the IRCDUS's Engineer.
- E. All wyes, fittings, laterals, and manhole couplings shall be manufactured by same manufacturing company as the pipe or approved equal, see Approved Manufacturers' Product List. Adapters shall be compatible to the approved pipe and appurtenances. All joints shall be rubber gasketed.
- F. The pipe shall be "green" in color.

5.03 Pipe Joint Seals

- A. Joint seals in PVC pipe and fittings shall comply with ASTM Designation D3212.
- B. The joint shall remain sealed by its own compression. Adhesives shall not be necessary to weld or fuse the gaskets together. No solvent weld joints are permitted.
- C. The compressive stress which is developed in the gasket material shall be as high as is permitted by the strength of the bell in ring tension, with due regard to factor of safety, and this stress shall be at its maximum value when the joint is completely assembled.

5.04 Retrofitting Sewer Laterals

- A. Gravity sewer systems shall be designed such that laterals are provided to serve all units and lots. In cases where sewer laterals must be added to a gravity sewer main, connections shall be made by installing a sewer service wye branch and a sleeve-type adapter, whichever is specified by IRCDUS for the particular application.

5.05 Submittals

- A. Before starting fabrication of the PVC pipe and fittings, the Contractor shall submit one set of complete working drawings (shop drawings) to the Engineer of Record and IRCDUS for approval. Such drawings shall show the pipe, fittings, manholes, and any other appurtenances to be installed. Where special fittings are required, they shall be shown in large detail with all the necessary dimensions. The Engineer of Record shall review the drawings and notify IRCDUS of the drawings approved and not approved. IRCDUS shall also review the drawings and coordinate approvals and disapprovals with the Engineer of Record and Contractor.

5.06 Marking

- A. Location tape is required over all pipes. Tape is to be installed 12" below proposed finished grade and additional tape shall be adhered directly on top of the pipe if required by IRCDUS engineering.

5.07 Storage

- B. PVC pipes are not to be stored where exposed to direct sunlight because of possible ultraviolet light degradation. Pipes stored on the jobsite are to be covered. PVC pipes that exhibit discoloration or fading from their original color will be rejected by IRCDUS field representatives.

5.08

Installation

- A. Handling and Protection of Pipe: Unless otherwise noted on the drawings or in other sections of this specification, the pipe shall be handled and installed in strict accordance with the manufacturers' instructions. The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment at no additional cost to the Owner. All piping shall be placed in a dry trench, unless otherwise approved by IRCDUS.
- B. Depth of Cover and Pipe Elevation: Unless otherwise shown on the drawings, or otherwise authorized by IRCDUS, all pipe shall have a minimum cover of 36 inches. Contractor shall determine top of pipe elevation and top of ground elevation for every two joints of pipe installed using a level. Pipe must have the minimum cover described above and must be within +/- 0.2 feet of the top of pipe elevation indicated on the drawings. Installed pipe, which does not meet these requirements, shall be reinstalled until it meets these requirements. Contractor shall record top of pipe and top of ground elevations and the locations of where these elevations were determined and submit this information to IRCDUS. IRCDUS reserves the right to have Contractor excavate and check top of pipe and top of ground elevations to see if they conform to the aforementioned requirements, at no additional cost to IRCDUS.

END OF SECTION

Section 6

**Wastewater Force Mains
Ductile Iron Pipe (DIP) and Fittings**

Section 6

Wastewater Force Mains Ductile Iron Pipe (DIP) and Fittings

6.01 General

- A. DIP shall be allowed for use as wastewater force main pipe where compatible with the specific conditions of the project. The use of material other than ductile iron may be required by IRCDUS during construction permit review or by IRCDUS field personnel during construction, if it is determined that DIP is unsuitable for the particular application.
- B. All DIP shall be manufactured in accordance with AWWA Standard Specifications C150/A21.50-96 and C151/A51-96, or latest revisions, and shall be pressure Class 300 or 350 minimum as depicted on Table 6.1 on page 6-2. All DIP crossings under roadways and other traffic areas shall be pressure Class 350 minimum.
- C. Unless specifically indicated otherwise, restrained push-on underground piping shall be manufactured bell and spigot and above ground piping shall be flanged.
- D. Cutting of DIP shall be by sawing.
- E. All exposed DIP shall be painted "green" per Approved Manufacturers' Products List.

6.02 Pipe

- A. DIP shall be bell and spigot cast in accordance with AWWA Standard Specifications C150/A21.50-96 and C151/A51-96, or latest revisions. Cast DIP shall have a minimum tensile strength of 60,000 psi with a minimum yield strength of 42,000 psi. Pipe wall thicknesses shall be computed in accordance with AWWA Standard Specification C150/A21.50-96, or latest revision, using the physical characteristics cited above with a minimum working pressure of 200 psi and a Laying Condition "Type 2." Unless otherwise indicated or specified herein, the pipe shall have the minimum wall thickness according to class designation for diameters shown. All pipe shall be given a minimum factory hydrostatic test of 500 pounds per square inch.

**TABLE 6.1
Pressure Class 300 and 350**

Nominal Size Diameter (Inches)	Actual Outside Diameter (Inches)	300 PSI Wall Thickness (Inches)	350 PSI Wall Thickness (Inches)
3	3.96	---	0.25
4	4.80	---	0.25
6	6.90	---	0.25
8	9.05	---	0.25
10	11.10	---	0.26
12	13.20	---	0.28
14	15.30	0.30	0.31
16	17.40	0.32	0.34
18	19.50	0.34	0.36
20	21.60	0.36	0.38
24	25.80	0.40	0.43
30	32.00	0.45	0.49
36	38.30	0.51	0.56
42	44.50	0.52	0.63
48	50.80	0.64	0.70
54	57.56	0.72	0.79
60	61.61	0.76	0.83
64	65.67	0.80	0.87

6.03 Fittings

- A. All underground fittings shall be either push-on, restrained, or mechanical joint. Mechanical joints shall conform to AWWA Standard Specification C110/A21.10-98) or C153/A21.53-00), or latest revisions. All aboveground fittings shall be flanged joint.
- B. The pressure rating shall be 350 psi (Class 350 Pipe).
- C. All fittings shall be lined with the same material as specified for the pipe, as per paragraph 6.04.
- D. Joint restraints, when required, shall be in accordance with IRCDUS Approved Manufacturers' Products List or approved equal.

6.04 Lining and Coating

- A. Unless otherwise indicated, all DIP shall be factory lined and coated.
- B. For 4 inches and larger, the interior protective coating shall be an amine cured novalac epoxy (Protecto 401 or similar). The epoxy material shall be applied in 1 coat with a minimum dry film

thickness of 40.0 mils, in accordance with IRCDUS Approved Manufacturers' Products List

- C. Unless otherwise specified, the exterior of the pipe shall have a bituminous coating to a minimum dry film thickness of 1.0 mil. See Approved Manufacturers' Products list for coating material.
- D. Lining Inspection:
 - 1. All DIP and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined SSPC-PA-2 film thickness rating.
 - 2. The interior lining of all pipe and fittings shall be tested for pinholes with a nondestructive 2,500-volt test.
 - 3. Each pipe joint and fitting shall be marked with the date of application of the lining system and with its numerical sequence of application on that date.
- E. The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified, and that the material was applied as required by the specification.
- F. Anywhere that the coating is removed purposely or accidentally, the area shall be cleaned of any rust, grease, and dirt and re-coated to a minimum dry film as specified for the individual piece.
- G. If and when directed by IRCDUS's Engineer, a polyethylene encasement shall be provided around pipe, fittings, and valves. The material, installation, and workmanship shall conform to applicable sections of AWWA Standard Specifications C105/A21.5-99, or latest revision. Installation methods A or B shall be employed using flat tube polyethylene. The Contractor shall make provisions to keep the polyethylene from direct exposure to sunlight prior to installation. Backfilling following installation shall be completed without delay to avoid exposure to sunlight.

6.05 Bell and Spigot Connections

- A. Joints in bell and spigot pipe shall be push-on, mechanical, or restrained joints in accordance with AWWA Standard Specifications C111/A21.11-00, or latest revision. Pipe restraints shall also be in accordance with IRCDUS Standards or as directed by IRCDUS's Engineer.

6.06

Flanged Connections

- A. All flanged pipe barrels shall comply with the physical and chemical requirements as set forth in the Handbook of Ductile Iron Pipe Research Association. Flanges shall be in accordance with ANSI Specification B16.1 for Class 125 flanges. Bolts shall be 316 stainless steel and comply with ANSI Specification B18.2.
- B. Flanged pipes shall be faced and drilled to the American Standard Drilling, unless special drilling is called for or required. Where tap or stud bolts are required, flanges shall be tapped. Flanges shall be accurately faced and drilled smooth and true, at right angles to the pipe axis, and shall be covered with zinc dust and tallow or a rust preventive compound immediately after facing and drilling.
- C. Flanged pipe with screwed-on flanges shall be furnished with long hubs, and the flanges shall be screwed on the threaded end of the pipe in the shop and the face of the flange and end of pipe refaced together. There shall be no leakage through the pipe threads and the flanges shall be designed to prevent corrosion of the threads from outside.
- D. Flanged joints shall be made with bolts or stud bolts and nuts. Bolts, stud bolts, and nuts shall conform to American Standard heavy dimensions, semi-finished with square or hexagonal heads and cold punched hexagonal nuts, 316SS. Bolt sizes shall be American Standard for the flanges specified, and bolts and nuts shall have good, true threads.
- E. Gaskets shall be in accordance with AWWA Standard Specifications C115/A21.15-99, or latest revisions.

6.07

Submittals

- A. Before starting fabrication of the DIP and fittings, the Contractor shall submit one set of complete working drawings (shop drawings) to the Engineer of Record and IRCDUS for approval. Such drawings shall show the pipe, fittings, valves, expansion joints, hangers, supports, and other appurtenances to be installed. Where special fittings are required, they shall be shown in large detail with all the necessary dimensions. The Engineer of Record shall review the drawings and notify IRCDUS of the drawings approved and not approved. IRCDUS shall also review the drawings and coordinate approvals and disapprovals with the Engineer of Record and Contractor. The drawings submitted shall show flanged jointed sections placed so as to be removable without disturbance to the main pipe sections.

6.08

Marking

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details Drawing M-13 for specifications regarding installation.
- B. Trace Wire is required over or around all pipes.
- C. Location tape is required over all pipes. Tape is to be installed 12" below proposed finished grade and additional tape shall be adhered directly on top of the pipe if required by IRCDUS engineering.

6.09

Installation

- A. Handling and Protection of Pipe: Unless otherwise noted on the drawings or in other sections of this specification, the pipe shall be handled and installed in strict accordance with the manufacturers' instructions. The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment at no additional cost to the IRCDUS. All piping shall be placed in a dry trench, unless IRCDUS approves wet trench installation.
- B. Depth of Cover and Pipe Elevation: Unless otherwise shown on the drawings, or otherwise authorized by the Engineer, all pipe shall have a minimum cover of 36 inches. Contractor shall determine top of pipe elevation and top of ground elevation for every two joints of pipe installed using a level. Pipe must have the minimum cover described above and must be within +/- 0.2 feet of the top of pipe elevation indicated on the drawings. Installed pipe, which does not meet these requirements, shall be reinstalled until it does meet these requirements. Contractor shall record top of pipe and top of ground elevations and the locations of where these elevations were determined and submit this information to IRCDUS. IRCDUS reserves the right to have Contractor excavate and check top of pipe and top of ground elevations to see if they conform to the aforementioned requirements, at no cost to the IRCDUS.

END OF SECTION

Section 7

**Wastewater Force Mains
Polyvinyl Chloride Pipes (PVC) and Fittings**

Section 7

Wastewater Force Mains Polyvinyl Chloride Pipe (PVC) and Fittings

7.01 General

- A. PVC pipe shall be allowed for use as wastewater force main pipe where compatible with the specific conditions of the project. IRCDUS may require the use of material, other than PVC, during construction permit review or by IRCDUS field personnel during construction, if it is determined that PVC pipe is unsuitable for the particular application.
- B. The pipe used for wastewater shall be “green” in color.
- C. All pipe shall be identified by its nominal pipe size, plastic pipe material code, SDR class, pressure rating, ASTM Designation, manufacturers’ name, production code, and the National Sanitation Foundation seal for potable water (NSF-pw).

7.02 Pipe for Sizes 12 Inches and Smaller in Diameter

- A. All pipe intended for conveying or transmitting wastewater shall be designed for a minimum working pressure of 150 psi.
- B. PVC chloride pressure pipe shall conform to AWWA Standards Specifications C900 latest revision, or C909, latest revision and ASTM D1784 and D2241, latest revision. PVC pressure pipe shall be made from Class 12454-A or Class 12454-B material and conform to the outside diameter of cast iron pipe.
- C. PVC pressure pipe less than 4” diameter shall be DR-21, PR-200
- D. PVC pipe shall be purchased in accordance with IRCDUS Approved Manufacturers’ Products List.

7.03 Pipe for Sizes 14 Inches through 36 Inches in Diameter

- A. All pipe intended for conveying or transmitting wastewater shall be designed for a minimum working pressure of 150 psi.
- B. PVC pressure pipe shall conform to the latest AWWA Standards Specifications C900-97 and ASTM D1784, latest revisions. PVC pressure pipe shall be made from Class 12454-A or Class 12454B material and conform to the outside diameter of cast iron pipe with a minimum wall thickness of DR18.
- C. PVC pipe shall be purchased in accordance with IRCDUS Approved Manufacturers’ Products List.

7.04**Joints**

- A. Joints for PVC pressure pipe shall be bell and spigot push-on rubber gasket type only. No solvent weld or threaded joints will be permitted.
- B. IRCDUS may consider other type joints for specific installation upon submission of specifications and approval.
- C. Restraint joints, when required, shall be in accordance with IRCDUS Approved Manufacturers' Products List.

7.05**Fittings**

- A. All underground fittings shall be either ductile iron push-on, restrained, or mechanical joint. Mechanical joints shall conform to AWWA Standard Specifications C110/A21.10 or C153/A21.53 latest revisions. Fittings shall be fusion-bonded ceramic epoxy lined. The epoxy material shall be applied in one coat with a minimum dry film thickness of 40.0 mils and shall be Protecto 401 or approved equal. All aboveground exposed fittings shall be flanged.
- B. The pressure rating shall be 350 psi (Class 350).
- C. Joint restraint, when required; shall be in accordance with IRCDUS Approved Manufacturers' Products List.

7.06**Submittals**

- A. Before starting fabrication of the PVC pipe and fittings, the Contractor shall submit one set of complete working drawings (shop drawings) to the Engineer of Record and IRCDUS for approval. Such drawings shall show the pipe, fittings, valves, and other appurtenances to be installed. Where special fittings are required, they shall be shown in large details with all the necessary dimensions. The Engineer of Record shall review the drawings and notify IRCDUS of the drawings approved and not approved. IRCDUS shall also review the drawings and coordinate approvals and disapprovals with the Engineer of Record and Contractor.

7.07**Marking**

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details Drawing M-13 for specifications regarding installation.
- B. Trace wire is required over or around all pipes.

- C. Location tape is required over all pipes. Tape is to be installed 12” below proposed grade and additional tape shall be adhered directly on top of the pipe if required by IRCDUS engineering.

7.08 Storage

- A. PVC pipes are not be stored where exposed to direct sunlight because of possible ultraviolet light degradation. Pipes stored on the jobsite are to be covered. PVC pipes that exhibit discoloration or fading from their original color will be rejected by IRCDUS field representatives.

7.09 Installation

- A. Handling and Protection of Pipe: Unless otherwise noted on the drawings or in other sections of this specification, the pipe shall be handled and installed in strict accordance with the manufacturers’ instructions. The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment at no additional cost to IRCDUS. All piping shall be placed in a dry trench, unless otherwise approved by IRCDUS.
- B. Depth of Cover and Pipe Elevation: Unless otherwise shown on the drawings, or otherwise authorized by IRCDUS, all pipe shall have a minimum cover of 36 inches. Contractor shall determine top of pipe elevation and top of ground elevation for every two joints of pipe installed using a level. Pipe must have the minimum cover described above and must be within +/- 0.2 feet of the top of pipe elevation indicated on the drawings. Installed pipe, which does not meet these requirements, shall be reinstalled until it does meet these requirements. Contractor shall record top of pipe and top of ground elevations and the locations of where these elevations were determined and submit this information to IRCDUS. IRCDUS reserves the right to have Contractor excavate and check top of pipe and top of ground elevations to see if they conform to the aforementioned requirements, at no cost to IRCDUS.

END OF SECTION

Section 8

**Reclaimed Water Mains
Ductile Iron Pipe (DIP) and Fittings**

Section 8
Reclaimed Water Mains
Ductile Iron Pipe (DIP) and Fittings

8.01 General

- A. DIP shall be allowed for use as reclaimed water main pipe where compatible with the specific conditions of the project. The use of material other than ductile iron may be required by Indian River County Department of Utility Services (IRCDUS) during construction permit review or by IRCDUS field personnel during construction, if it is determined that DIP is unsuitable for the particular application.
- B. All DIP shall be manufactured in accordance with AWWA Standard Specifications C150/A21.50-96 and C151/A51-96, or latest revisions, and shall be pressure Class 300 or 350 minimum as depicted in Table 6.1 on page 6-2. All DIP crossings under roadways and other traffic areas shall be pressure Class 350 minimum.
- C. Unless specifically indicated otherwise, restrained push-on underground piping shall be bell and spigot and above ground piping shall be flanged.
- D. Cutting of DIP shall be by sawing.
- E. All DIP used for Reclaimed water shall be painted “purple” in accordance with IRCDUS Approved Manufacturers’ Products List.

8.02 Pipe

- A. DIP shall be bell and spigot cast in accordance with AWWA Standard Specifications C150/A21.50-96 and C151/A51-96, or latest revisions. Cast DIP shall have a minimum tensile strength of 60,000 psi with a minimum yield strength of 42,000 psi. Pipe wall thicknesses shall be computed in accordance with AWWA Standard Specification C150/A21.50-96, or latest revision, using the physical characteristics cited above with a minimum working pressure of 200 psi and a Laying Condition “Type 2.” Unless otherwise indicated or specified herein, the pipe shall have the minimum wall thickness according to class designation for diameters shown. All pipe shall be given a minimum factory hydrostatic test of 500 pounds per square inch.

**Table 6.1
Pressure Class 300 and 350**

Nominal Size Diameter (inches)	Actual Outside Diameter (inches)	300 PSI Wall Thickness (inches)	350 PSI Wall Thickness (inches)
3	3.96	---	0.25
4	4.80	---	0.25
6	6.90	---	0.25
8	9.05	---	0.25
10	11.10	---	0.26
12	13.20	---	0.28
14	15.30	0.30	0.31
16	17.40	0.32	0.34
18	19.50	0.34	0.36
20	21.60	0.36	0.38
24	25.80	0.40	0.43
30	32.00	0.45	0.49
36	38.30	0.51	0.56
42	44.50	0.52	0.63
48	50.80	0.64	0.70
54	57.56	0.72	0.79
60	61.61	0.76	0.83
64	65.67	0.80	0.87

8.03 Fittings

- A. All underground fittings shall be either push-on, restrained, or mechanical joint. Mechanical joints shall conform to AWWA Standard Specification C110/A21.10-98) or C153/A21.53-00), or latest revisions. All aboveground fittings shall be flanged joint.
- B. The pressure rating shall be 350 psi (Class 350 pipe).
- C. All fittings shall be lined with the same material as specified for the pipe, as per paragraph 8.05.
- D. Joint restraints, when required, shall be in accordance with IRCDUS Approved Manufacturers' Products List or approved equal.

8.04 Lining and Coating

- A. Unless otherwise indicated, all DIP shall be factory lined and coated.
- B. For 4 inches and larger, the interior protective coating shall be an amine cured novalac epoxy (Protecto 401 or similar). The epoxy material shall be applied in 1 coat with a minimum dry film

thickness of 40.0 mils, in accordance with IRCDUS Approved Manufacturers' Products List

- C. Unless otherwise specified, the exterior of the pipe shall have a bituminous coating to a minimum dry film thickness of 1.0 mil. See IRCDUS Approved Manufacturers' Products List for coating material.
- D. Lining Inspection:
 - 1. All DIP and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined SSPC-PA-2 film thickness rating.
 - 2. The interior lining of all pipe and fittings shall be tested for pinholes with a nondestructive 2,500-volt test.
 - 3. Each pipe joint and fitting shall be marked with the date of application of the lining system and with its numerical sequence of application on that date.
- E. The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified, and that the material was applied as required by the specification.
- F. Anywhere that the coating is removed purposely or accidentally, the area shall be cleaned of any rust, grease, and dirt and re-coated to a minimum dry film as specified for the individual piece.
- G. If and when directed by IRCDUS, a polyethylene encasement shall be provided around pipe, fittings, and valves. The material, installation, and workmanship shall conform to applicable sections of AWWA Standard Specifications C105/A21.5-99, or latest revision. Installation methods A or B shall be employed using flat tube polyethylene. The Contractor shall make provisions to keep the polyethylene from direct exposure to sunlight prior to installation. Backfilling following installation shall be completed without delay to avoid exposure to sunlight.

8.05 Bell and Spigot Connections

- A. Joints in bell and spigot pipe shall be push-on, mechanical, or restrained joints in accordance with AWWA Standard Specifications C111/A21.11-00, or latest revision. Pipe restraints shall also be in accordance with IRCDUS Standards or as directed by IRCDUS.

8.06 Flanged Connections

- A. All flanged pipe barrels shall comply with the physical and chemical requirements as set forth in the Handbook of Ductile Iron Pipe Research Association. Flanges shall be in accordance with ANSI Specification B16.1 for Class 125 flanges. Bolts shall be stainless and comply with ANSI Specification B18.2.
- B. Flanged pipes shall be faced and drilled to the American Standard Drilling, unless special drilling is called for or required. Where tap or stud bolts are required, flanges shall be tapped. Flanges shall be accurately faced and drilled smooth and true, at right angles to the pipe axis, and shall be covered with zinc dust and tallow or a rust preventive compound immediately after facing and drilling.
- C. Flanged pipe with screwed-on flanges shall be furnished with long hubs, and the flanges shall be screwed on the threaded end of the pipe in the shop and the face of the flange and end of pipe refaced together. There shall be no leakage through the pipe threads and the flanges shall be designed to prevent corrosion of the threads from outside.
- D. Flanged joints shall be made with bolts or stud bolts and nuts. Bolts, stud bolts, and nuts shall conform to American Standard heavy dimensions, semi-finished with square or hexagonal heads and cold punched hexagonal nuts, 316SS. Bolt sizes shall be American Standard for the flanges specified, and bolts and nuts shall have good, true threads.
- E. Gaskets shall be in accordance with AWWA Standard Specifications C115/A21.15-99, or latest revision.

8.07 Submittals

- A. Before starting fabrication of the DIP and fittings, the Contractor shall submit one set of complete working drawings (shop drawings) to the Engineer of Record and IRCDUS for approval. Such drawings shall show the pipe, fittings, valves, expansion joints, hangers, supports, and other appurtenances to be installed. Where special fittings are required, they shall be shown in large detail with all the necessary dimensions. The Engineer of Record shall review the drawings and notify IRCDUS of the drawings approved and not approved. IRCDUS shall also review the drawings and coordinate approvals and

disapprovals with the Engineer of Record and Contractor. The drawings submitted shall show flanged jointed sections placed so as to be removable without disturbance to the main pipe sections.

8.08 Marking

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details Drawing M-13 for specifications regarding installation.
- B. Trace Wire is required over or around all pipes.
- C. Location tape is required over all pipes. Tape is to be installed 12" below proposed finished grade and additional tape adhered directly to top of the pipe if required by IRCDUS engineering.

8.09 Installation

- A. Handling and Protection of Pipe: Unless otherwise noted on the drawings or in other sections of this specification, the pipe shall be handled and installed in strict accordance with the manufacturers' instructions. The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment at no additional cost to the IRCDUS. All piping shall be placed in a dry trench, unless otherwise approved by IRCDUS.
- B. Unless otherwise shown on the drawings, or otherwise authorized by the IRCDUS, all pipe shall have a minimum cover of 36 inches. Contractor shall determine top of pipe elevation and top of ground elevation for every two joints of pipe installed using a level. Pipe must have the minimum cover described above and must be within +/- 0.2 feet of the top of pipe elevation indicated on the drawings. Installed pipe, which does not meet these requirements, shall be reinstalled until it does meet these requirements. Contractor shall record top of pipe and top of ground elevations and the locations of where these elevations were determined and submit this information to IRCDUS. IRCDUS reserves the right to have Contractor excavate and check top of pipe and top of ground elevations to see if they conform to the aforementioned requirements, at no cost to the IRCDUS.

END OF SECTION

Section 9

**Reclaimed Water Mains
Polyvinyl Chloride (PVC) Pipes and Fittings**

Section 9

Reclaimed Water Mains Polyvinyl Chloride (PVC) Pipes and Fittings

9.01 General

- A. PVC pipe shall be allowed for use as reclaimed water pipe where compatible with the specific conditions of the project. IRCDUS may require the use of material other than PVC during construction permit review or by IRCDUS field personnel during construction, if it is determined that PVC pipe is unsuitable for the particular application.
- B. The pipe used for reclaimed mains shall be “purple” in color.
- C. PVC pipe shall be identified by its nominal pipe size, plastic pipe material code, SDR class, pressure rating, ASTM Designation, Manufacturer’s name, production code, and the National Sanitation Foundation seal for potable water (NSF-pw).

9.02 Pipe for Sizes 12 Inches and Smaller in Diameter

- A. All pipe intended for conveying or transmitting reclaimed pipe shall be designed for a minimum working pressure of 150 psi.
- B. PVC pressure pipe shall conform to AWWA Standards Specifications C900 latest revision, or C909, latest revision and ASTM D1784 and D2241, latest revision. PVC pressure pipe shall be made from Class 12454-A or Class 12454-B material and conform to the outside diameter of cast iron pipe.
- C. PVC pressure pipe less than 4” diameter shall be DR-21, PR-200
- D. PVC pipe shall be purchased in accordance with IRCDUS Approved Manufacturers’ Products List.

9.03 Pipe and Fittings for Sizes 14 Inches Through 36 Inches in Diameter

- A. All pipe and fittings intended for conveying or transmitting reclaimed water shall be designed for a minimum working pressure of 150 psi.
- B. PVC pressure pipe shall conform to the latest AWWA Standards Specifications C900-97 and ASTM D1784, latest revisions. PVC pressure pipe shall be made from Class 12454-A or Class 12454B material and conform to the outside diameter of cast iron pipe with a minimum wall thickness of DR18.
- C. PVC pipe shall be purchased in accordance with IRCDUS Approved Manufacturers’ Products List.

9.04 Joints

- A. Joints for PVC pressure pipe shall be bell and spigot push-on rubber gasket type only. No solvent weld or threaded joints will be permitted.
- B. IRCDUS may consider other type joints for specific installation upon submission of specifications and approval.
- C. Restraint joints, when required, shall be in accordance with IRCDUS Approved Manufacturers' Products List.

9.05 Fittings

- A. All underground fittings shall be either ductile iron push-on, restrained, or mechanical joint. Mechanical joints shall conform to AWWA Standard Specifications C110/A21.10 or C153/A21.53 latest revisions. Fittings shall be fusion-bonded ceramic epoxy lined. The epoxy material shall be applied in one coat with a minimum dry film thickness of 40.0 mils and shall be Protecto 401 or approved equal. All aboveground exposed fittings shall be flanged.
- B. The pressure rating shall be 350 psi (Class 350).
- C. Joint restraint, when required; shall be in accordance with IRCDUS Approved Manufacturers' Products List.

9.06 Submittals

- A. Before starting installation of the PVC pipe and fittings, the Contractor shall submit one set of complete working drawings (shop drawings) to the Engineer of Record and IRCDUS for approval. Such drawings shall show the pipe, fittings, valves, hydrants, blowoffs, services, and other appurtenances to be installed. Where special fittings are required, they shall be shown in large detail with all the necessary dimensions. The Engineer of Record shall review the drawings and notify IRCDUS of the drawings approved and not approved. IRCDUS shall also review the drawings and coordinate approvals and disapprovals with the Engineer of Record and Contractor.

9.07 Marking

- A. Number 10 stranded conductor copper trace wire shall be spiral wrapped or affixed to the top of the pipe. See Trace Wire Details Drawing M-13 for specifications regarding installation.
- B. Trace Wire is required over or around all pipes.

- C. Location tape is required over all pipes. Tape is to be installed 12” below proposed finished grade and additional tape shall be adhered directly on top of the pipe if required by IRCDUS.

9.08 Storage

- A. PVC pipes are not to be stored where exposed to direct sunlight because of possible ultraviolet light degradation. Pipes stored on the jobsite are to be covered. PVC pipes that exhibit discoloration or fading from their original color will be rejected by IRCDUS field representatives.

9.09 Installation

- A. Handling and Protection of Pipe: Unless otherwise noted on the drawings or in other sections of these standards, the pipe shall be handled and installed in strict accordance with the manufacturer’s instructions. The Contractor shall use every precaution during construction to protect the pipe against the entry of non-potable water, dirt, wood, small animals, and any other foreign material that would hinder the operation of the pipeline. Where the groundwater elevation is above the bottom of the trench, the Contractor shall provide suitable dewatering equipment at no additional cost to IRCDUS. All piping shall be placed in a dry trench, unless otherwise approved by IRCDUS.
- B. Depth of Cover and Pipe Elevation: Unless otherwise shown on the drawings, or otherwise authorized by IRCDUS, all pipe shall have a minimum cover of 36 inches. Contractor shall determine top of pipe elevation and top of ground elevation for every two joints of pipe installed using a level. Pipe must have the minimum cover described above and must be within +/- 0.2 feet of the top of pipe elevation indicated on the drawings. Installed pipe, which does not meet these requirements, shall be reinstalled until it does meet these requirements. Contractor shall record top of pipe and top of ground elevations and the locations of where these elevations were determined and submit this information to IRCDUS. IRCDUS reserves the right to have Contractor excavate and check top of pipe and top of ground elevations to see if they conform to the aforementioned requirements, at no cost to IRCDUS.

END OF SECTION

Section 10

Submersible Wastewater Pumping Station

Section 10

Submersible Wastewater Pumping Station

10.01 General

- A. The station shall be complete with pumps, motors, piping, valves, and electrical work, including motor controls, structure, connections and all other needed appurtenances. The station shall be tested and ready for service prior to the sign off or acceptance by IRCDUS.
- B. These specifications are intended to give a general description of what is required, but do not cover all details, which will vary in accordance with the requirements of the equipment as offered. It is, however, intended to cover the furnishing, shop testing, delivery and complete installation and field testing of all materials, equipment and appurtenances for the complete pumping units as herein specified, whether specifically mentioned in these specifications or not.
- C. For all units, there shall be furnished and installed all necessary and desirable accessory equipment and auxiliaries, whether specifically mentioned in these specifications or not, and as required for an installation incorporating the highest standard for the type of service, including field testing of the entire installation and instructing the IRCDUS's regular operating personnel in the care, operation, and maintenance of all equipment. All Operation and Maintenance Manuals, along with warranty information shall be supplied to IRCDUS.
- D. All private lift stations must provide a repair company name and emergency telephone number on the electrical panel in case of a malfunction of the station. If a name and number is not provided, the IRCDUS reserves the right to call a company of its choosing to make a service call and repair the malfunctioning station. All charges to repair said station shall be charged to the owner of the station.
- E. A manhole shall be constructed within 20' upstream of a lift station. There shall be only one pipe connection from this manhole to the lift station. The pipe between the lift station and manhole shall be C-900, DR-18 PVC pipe.
- F. Paint outside walls, underside of wetwell top slab and valve vault with two coats of water base epoxy.

10.02 Description of Systems

- A. The pump station shall be comprised of a concrete wet well, concrete valve vault, Remote Telemetry Unit (RTU), at least two submersible

wastewater pumps and controls, discharge piping and all appurtenances as specified herein or needed. The pump station will pump raw, unscreened, domestic wastewater into a force main.

10.03 Qualification

- A. To assure unity of responsibility, the motors and control system shall be furnished and coordinated by the pump manufacturer. The Engineer of Record shall assume responsibility for the satisfactory installation and operation of the entire pumping system, including pumps, motors, and controls as specified.
- B. The pumps covered by these specifications are intended to be standard pumping equipment of proven ability as manufactured by a reputable manufacturer having extensive experience in the production of such pumps. The pumps furnished shall be designed, constructed and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed. Pumps shall be manufactured in accordance with the Hydraulic Institute Standards.
- C. The control system shall have an established record of successful performance for similar service and be approved by IRCDUS.
- D. All equipment furnished under this specification shall be new, and shall be the standard product of manufacturers having a successful record of manufacturing and servicing the equipment and systems specified herein for a minimum of five years.
- E. The pumps shall be furnished complete with controls and accessories required, and shall be as on the Approved Manufacturers' Products List. Grinder pumps shall be permitted for pumps 5.0 HP or less, unless otherwise approved by IRCDUS. Three phase electrical power will be required for all pumping stations. 120/240 volt service will be required for pump stations up to 20 HP. 277/480 volt service will be required for pump stations larger than 20 HP.

10.04 Operating Instructions

- A. Operating and maintenance manuals shall be furnished. The manuals shall be prepared specifically for the installation and shall include all required cut sheets, drawings, equipment lists, descriptions, etc., that are required to instruct operating and maintenance personnel unfamiliar with such equipment.
- B. An authorized representative of all major component parts of the lift station, with complete knowledge of proper operation and maintenance, shall be present on start-up of the lift station to instruct IRCDUS personnel on proper operation and maintenance of the station, and to provide operation manuals. If there are

difficulties in operation of the equipment due to the manufacturers design or fabrication, the authorized representative shall be responsible for all corrective action to the satisfaction of IRCDUS. This service shall be provided at no cost to IRCDUS.

10.05 Tools and Spare Parts

- A. Any special tools required shall be provided.
- B. The manufacturer shall furnish a complete set of recommended spare parts necessary for the first three years of operation of the pumping system, which shall include at least the following:
 - 1. 1 set of upper bearings for the pumps
 - 2. 1 set of lower bearings for the pumps
 - 3. 1 set of upper and lower shaft seals for the pumps
 - 4. 1 relay and phase monitor for each type supplied with the pump control panel for each station
 - 5. Grinder Pump Station (2 Complete Sets) Impeller and Bottom Plate is one set.
 - 6. Solids Handling Pumps (2 Impellers)
 - 7. 1 –TCU001 Programmed to the corresponding Frequency
 - 8. Impeller puller.
- C. Spare parts shall be properly bound and labeled for easy identification without opening the packaging, and suitably protected for long-term storage.

10.06 Warranty

- A. The Contractor and the equipment manufacturers shall warrant all equipment supplied under this section for a period of five years. Warranty period shall commence on final date when IRCDUS accepts the project.
- B. The equipment shall be warranted to be free from defects in workmanship, design and materials. If any part of the equipment should fail during the warranty period, it shall be replaced in the machine(s) and the unit(s) restored to service at no expense to IRCDUS.
- C. The manufacturer's warranty period shall run concurrently with the Contractor's warranty period. No exception to the provision shall be allowed.

10.07 Materials and Equipment

- A. The pumping units required under this section shall be complete, including pumps and motors with proper alignment and balancing of the individual units. All parts shall be so designed and proportioned as to have liberal strength, stability, and stiffness,

and to be especially adapted for the work to be done. Ample room shall be provided for inspection, repairs, and adjustments.

- B. Each foundation plate for each pump shall be rigidly and accurately anchored into position. The same pump manufacturer shall furnish all necessary foundation bolts, plates, nuts, and washers for installation by the Contractor. Each foundation plate shall be ½" thick Type 316 stainless steel. Foundation bolts, nuts, washers, and spare parts shall be Type 316 stainless steel.
- C. Stainless steel nameplates giving the name of the manufacturer, head, speed, and all other pertinent data shall be attached to each pump and motor.

10.08 Pumps

A. General

- 1. The pumps shall be totally submersible centrifugal pumps with close-coupled motors designed to pump sewage. The design shall be such that the pumping units shall be automatically connected to the discharge piping when lowered into place on the discharge connection. The pumps shall be easily removable for inspection or service, requiring no bolts, nuts or other fastenings to be removed for this purpose, or need for personnel to enter the wet well. Each pump shall be fitted with a 316 stainless steel lifting cable of adequate strength, and shall be five (5) feet longer than wet well depth to control panel to permit raising the pump for inspection and removal.
- 2. The impeller shall be constructed of nodular iron SP (spheroidal graphite). The hydraulic design shall incorporate a single vane centrifugal impeller. The design shall permit low liquid velocities and gradual acceleration and change of flow direction of the pumped media. The impeller/casing design shall result in a passage free of surfaces to which solid or fibrous materials can adhere. The overall pump design shall combine high efficiency, low required Net Positive Suction Head (NPSH), large ball passage and the ability to handle high solids concentrations efficiently. All other parts shall be of close grain gray iron construction, with all parts coming into contact with sewage protected by a coat of rubber-asphalt paint. All external bolts and nuts shall be of Type 316 stainless steel. The impeller shall be of a centrifugal type, capable of passing 3-inch minimum diameter solids, fibrous material, and heavy sludge. If riser pipes are less than 3 inches in diameter in the wet well, then the pumps must be grinder pumps.

3. Each pump shall be provided with a tandem double mechanical seal running in an oil reservoir, composed of two separate lapped face seals, each consisting of one stationary and one rotating tungsten-carbide or silicon carbide ring with each pair held in contact by a separate spring, so that the outside pressure assists spring compression in preventing the seal faces from opening. The compression spring shall be protected against exposure to the pumped liquid. The pumped liquid shall be sealed from the oil reservoir by one face seal and sealed from the oil reservoir from the motor chamber by the other. The seals shall require neither maintenance nor adjustment, and shall be easily replaced. Conventional double mechanical seals with a single spring between the rotating faces, requiring constant differential pressure to effect sealing and subject to opening and penetration by pumping forces, shall not be considered equal to tandem seal specified and required.
4. A sliding guide bracket shall be an integral part of the pumping unit, and the pump casing shall have a machined connecting flange to connect with the cast iron discharge connection, which shall be bolted to the floor of the wet well with stainless steel anchor bolts and so designed as to receive the pump connection without the need of any bolts or nuts. Sealing of the pumping units to the discharge connection shall be accomplished by a simple linear downward motion of the pump, with the entire weight of the pumping unit guided by 316 stainless steel guide rails which will press it tightly against the discharge connection. No portion of the pump shall bear directly on the floor of the sump, and no rotary motion of the pump shall be required for sealing.
5. Pump motors shall be housed in an air-filled, watertight casing. Motors shall be a NEMA Design B with a 1.15 service factor. Insulation shall be moisture-resistant NEMA Class F with a maximum temperature rise of 90 degrees Celsius above ambient temperature (4 degrees Celsius). Motor characteristics are noted on the Drawings. Pump motors shall have cooling characteristics suitable to permit continuous operation, in a totally, partially or non-submerged condition. Each motor shall incorporate an ambient temperature compensated overheat sensing device and a moisture sending device wired in series. The protective devices shall be wired into the pump controls in such a way that if either device operates, the pump will shut down. The devices shall be self-resetting. The cable shall be fixed to the pump using a watertight trumpet assembly. The pump shall be capable of running continuously in a totally dry condition under full load,

without damage, for extended periods. Before final acceptance, a field running test demonstrating this ability, with four hours of continuous operation (water supplied by the contractor) under the above conditions, shall be performed for all pumps being supplied, if required by the IRCDUS. Pump motor cables shall be suitable for submersible pump applications and shall be properly sealed.

6. Motor windings shall be treated with a mildew preventative.
- B. Each pumping unit and its driving equipment shall be designed and constructed to withstand the maximum turbine runaway speed of the unit due to backflow through the pump.
- C. Performance Requirements, refer to IRCDUS Standards, Pumping Station Data Table on Drawing No. S-21.

10.09 Access and Frame Guides

- A. The pumping station shall be furnished with the necessary aluminum access frames, complete with hinged and hasp-equipped covers, stainless steel upper guide rail holder, power cable holder and level sensor cable holder. The frames shall be securely mounted above the pumps. Access covers shall have safety locking handles in open position. Access covers shall be of aluminum-checkered plate with 316 stainless steel hinges and hardware. The access cover and frame shall be as sized on the Drawings.
- B. Lower guide rail holders shall be integral with the discharge connection. Guide rails shall be of Schedule 40, 2" Welded 316 stainless steel pipe of the size indicated on the Approved Drawings and of the length required by the pump manufacturer.
- C. A safety grate with 316 stainless steel hardware is required for all wet wells and shall be in accordance with IRCDUS Approved Manufacturers' Products List.

10.10 Pump Control System-Manual System (Non-remote Telemetry Unit)

- A. General
 1. A pump controller shall be provided for the wastewater pumping station. The controller shall respond to the liquid level sensor to automatically start and stop pumps to pace pump station influent flow, and shall be approved by IRCDUS.
 2. The pump controller shall be the standard system of the manufacturer as modified for this application. The wet well

levels to be used in operation are as shown on Detail Drawings S-15 and S-21 of the IRCUDS Standards.

B. Operation Requirements

1. The control panels shall consist of a main circuit breaker and generator breaker with mechanical interlock, an emergency generator receptacle, a motor control breaker (MCB) and magnetic starter for each pump motor, and 20 ampere, 120/240 volt circuit breakers as required. The motor control panel (MCP) shall meet all requirements of service entrance by properly bonding neutral or shall be Underwriters Laboratories service entrance rated. A low and high level alarm and pump shutoff shall be accomplished by float type, liquid level control system, with all components mounted in one common enclosure. Control switches shall provide means to operate each pump manually or automatically. When operated in the automatic mode, the control assembly shall provide means to manually select or automatically alternate the position of the "lead" and "lag" pumps after each pumping cycle. A three position alternate switch labeled "hands-off-auto" (H-O-A) shall be provided to manually select which pump shall be the lead pump, when necessary, and also be able to test the alternator to see if it is still operational.
2. A float type liquid level control system shall continuously monitor wet well liquid level and control operation of the low-level cutoff for the pumps, and shall operate on a 24-volt circuit.
3. A non-fused safety switch shall be installed between the meter and panel. This switch shall be in a NEMA 4X, UL rated, stainless steel waterproof enclosure, in accordance with IRCUDS Approved Manufacturers' Products List. Amperage shall be at least equal to that of the main breaker.

C. Construction

1. The electrical control equipment shall be mounted within a modified NEMA 4X, UL rated, white powder coated stainless steel (316), dead front enclosure. The enclosure shall be equipped with a door and may incorporate a removable back panel on which control components shall be mounted. Back panel shall be secured to enclosure with collar studs. All lines entering the enclosure shall be protected by conduit seal bushings (supplied by pump manufacturer) at the source and shall be behind the dead front enclosure, entering from the side or bottom only. The seals shall prevent moisture and gas from entering the

enclosure. Two cable connectors (shall be in accordance with IRCDUS Approved Manufacturers' Products List) shall be provided to terminate the motor cables in the control panel. The connectors shall be suitable for a 2" conduit with a seal bushing suitable for the motor cables.

2. Components

- a. All motor branch circuit breakers, motor starters, and control relays shall be of highest industrial quality, securely fastened to the removable back panels with screws and lock washers. Back panels shall be tapped to accept all mounting screws. Self-tapping screws shall not be used to mount any component. A non-corrosive material shall be utilized for wire connection locations within the box.
- b. A thermal-magnetic air circuit breaker, per Approved Manufacturers' Products List, shall be furnished for the main breaker. The manufacturer shall seal all circuit breakers after calibration to prevent tampering. A Motor Control Breaker (MCB) shall be provided for each motor starter. Each MCB shall be adequately sized to meet the pump motor and station operating conditions.
- c. An open frame, across-the-line, NEMA rated, magnetic motor starter, Class 8536, in accordance with IRCDUS Approved Manufacturers' Products List, shall be furnished for each pump motor. Reduced voltage motor starters, Class 8606, per Approved Manufacturers' Products List, are required for all 30 HP and larger motors. All motor starters shall be equipped to provide under-voltage release and overload protection on all three phases. Motor starter contacts shall be easily replaceable without removing the motor starter from its mounted position. Overload reset push buttons shall be located on the inside of the control compartment door.
- d. An emergency generator receptacle (EGR) shall be installed in the side of the control panel and connected to the line side of the generator breaker. The receptacle shall be in accordance with IRCDUS Approved Manufacturers' Products List.
- e. A ground fault interrupter (GFI) duplex utility receptacle providing 120 volt, 20 amp, 60 hertz, single phase current shall be mounted on the internal door.

- f. The control panel shall include an adjustable time delay relay to prevent both pumps from starting simultaneously. Time delay relays shall be electronic type.

3. Operating Controls and Instruments

- a. All operating controls and instruments shall be securely mounted on the control compartment door. All controls and instruments shall be clearly labeled to indicate function.
- b. Pump mode selector switches shall be Hand-Off-Auto type to permit override of automatic level control and manual actuation of shutdown of either pump motor. Operation of pumps in manual mode shall bypass all safety shutdown circuits except pump motor overload shutdown. Switches shall be oil-tight, in accordance with IRCDUS Approved Manufacturers' Products List, providing three switch positions, each of which shall be clearly labeled according to function. Separate indicator lamps, which shall operate at 115 volts input, shall be provided mounted above H.O.A. selector switches. Lamps shall be easily replaceable from the front of control compartment door without removing switch modules from their mounted positions.
- c. Indicator lamps shall be mounted in oil-tight modules, in accordance with IRCDUS Approved Manufacturers' Products List. Lamp modules shall be equipped to operate at 115-volt input. Lamps shall be easily replaceable from the front of the control compartment door without removing lamp module from its mounted position.
- d. A six digit, non-reset elapsed time meter shall be connected to each motor starter to indicate the total running time of each pump in "hours" and "tenth of hours." The elapsed time meters shall be in accordance with IRCDUS Approved Manufacturers' Products List.

10.11 Pump Control System (Remote Telemetry Unit)

- A. A Remote Telemetry Unit (RTU) shall be supplied with the pump control system. The RTU shall be capable of acquiring analog and discrete data for transmission to the Central Telemetry Unit (CTU). The RTU shall also be capable of receiving instructions from the

CTU for the operation of the pumps. See IRCDUS Approved Manufacturers' Products List for the separate components.

10.12 Shop Painting

- A. Before exposure to weather and prior to shop painting, all surfaces shall be thoroughly cleaned, dry and free from all mill-scale, rust, grease, dirt and other foreign matter.
- B. All pumps and motors shall be shop primed with primer compatible with the field painting.
- C. All nameplates shall be properly protected during painting.
- D. Gears, bearing surfaces, and other similar surfaces obviously not to be painted shall be given a heavy shop coat of grease or other suitable rust-resistant coating. This coating shall be maintained as necessary to prevent corrosion during periods of storage and erection, and shall be satisfactory to IRCDUS up to the time of final acceptance test.
- E. Control Panels shall be made of stainless steel (316).

10.13 Field Painting

- A. The primer and paint used in the shop shall be products of the same manufacturer as the field paint to assure compatibility.
- B. All nameplates shall be properly protected during painting.

10.14 Lift Station- General

- A. The Lift Station Wet Wells shall conform to the following size:

Depth (ft)	Diameter (ft)
0-10	6
11-15	8
16-20	10
21-25	12

or as approved by IRCDUS's Engineer.

10.15 Lift Station Liners-General

- A. A protective liner for the concrete shall be installed in the lift station/wet wells, re-pump lift stations, receiving manholes, drop manholes, and manholes as required by IRCDUS.
- B. After the lift station lining operation has been completed, the Contractor in the presence of the IRCDUS's representative shall visually inspect the lift station. In addition, at IRCDUS request, the

Contractor shall be required within one year to visually inspect the lift stations that were lined. The Contractor shall redo any work that has become defective.

10.16 Lift Station Liners- HDPE

- A. The Lift Station Liner shall be High Density Polyethylene (HDPE) with a minimum thickness of 2 mm. All HDPE liner sheets shall be extruded with a large number of anchoring studs, a minimum of **39ft²**, manufactured during the extrusion process in one piece with the sheet so there is no welding and no mechanical finishing work to attach the studs to the sheet. The liner shall have a pull out of 112.5 lbs./anchoring stud.
- B. Flat liner sheet, non anchored, used for overlapping joints, shall have a minimum thickness of 3mm. All joints shall be sealed by means of thermal welding performed by certified welders.
- C. The lining shall have good impact resistance, shall be flexible, and shall have an elongation sufficient to bridge up to a 1/4-inch settling crack, without damage to the lining. The liner shall be able to bridge any expansion cracks that may occur.
- D. Lining shall be repairable at any time during the life of the structure.
- E. A certified fabricator shall custom fit the liner to the form work in order to protect the concrete surfaces from sewer gases. The interior surfaces to be protected shall include the walls, ceiling, and pipe entries.
- F. For all lined manholes the use of HDPE Grade rings shall be used in lieu of brick or precast grade rings. Grade rings shall meet HS-25 load rating. Butyl sealant shall be used between each ring to make a watertight joint. The first grade ring shall be welded to the liner to provide a gas tight seal.
- C. Upon request, the manufacturer shall provide written certification that the liner used meets or exceeds the requirement of this specification.
- D. Provide a five year unlimited warranty on all workmanship and products. The work includes the surface preparation and application of the liner system, shall protect the structure for at least five years from all leaks, and from failure due to corrosion from exposure to corrosive gases such as hydrogen sulfide.

10.17 Lift Station Liners – Fiberglass

- A. The lift station liner shall meet all requirements of ASTM Specifications D-3753 for glass fiber reinforced polyester manholes or lift stations. See IRCDUS Approved Manufacturers' Products List

- C. Fiberglass liners shall have a three year warranty period.

END OF SECTION

Section 11

Miscellaneous Valves and Appurtenances

Section 11

Miscellaneous Valves and Appurtenances

11.01 General

- A. All of the types of valves and appurtenances shall be on the IRCDUS Approved Manufacturers' Products List.
- B. All valves and appurtenances shall be designed, constructed, and installed in accordance with the best practices and methods and shall comply with these specifications as applicable.
- C. All valves and appurtenances shall have the name of the manufacturer, year manufactured, and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.
- D. All buried valves and appurtenances shall be mechanical joint. All aboveground/exposed valves and appurtenances shall be flanged.
- E. Gate valves shall be used on water, sewer, reclaimed, and brine mains.
- F. Plug valves may be used in lift station valve vaults as approved by IRCDUS.
- G. IRCDUS, on a case-by-case basis, may approve valves and appurtenances other than those specifically called out in this Section for use. Criteria for approval shall include the interchangeability of the valve or appurtenance, or its parts, with those brands specifically called out in these specifications.
- H. All exposed valves and appurtenances shall be painted in accordance with IRCDUS Approved Manufacturers' Products List. Water mains shall be painted blue, force mains shall be painted "green", reuse mains shall be painted "purple" and brine shall be painted "brown".

11.02 Gate Valves – 3 Inches and Larger

- A. All buried gate valves shall meet the requirements of AWWA Standard Specification C509-C515, or latest revision. Valves shall be rated for 150-psi working pressure and a minimum 300-psi test pressure. Valves shall be ductile iron body, bronze-mounted, resilient seated, non-rising stem type fitted with "O-Ring" seals. All bolts to be used in valve bonnet are to be 316 stainless steel. The operating nuts shall be Standard AWWA 2" square. All valves shall open counterclockwise. Stuffing boxes shall be the "O-Ring" type. Gate valves shall be mechanical joint, ANSI Standards 21.11, except where shown otherwise.

- B. Gate valves shall be provided with a valve box, cover, and concrete pad. Box cover opening shall be for valve stem and nut. The Contractor shall provide valve wrenches and extension stems from the same manufacturer as the valve to actuate the valves. The box and cover shall be in accordance with IRCUDS Approved Manufacturers' Products List. (See Drawing M-5 and M-6 for details on the valve box, cover, and concrete pad.)

11.03 Check Valves

- A. Check valves for ductile iron pipelines shall be swing type and shall meet the material requirements of AWWA Standard Specifications C508-01, or latest revision. The valves shall be iron body, bronze mounted, single disc, 150 psi working water pressure, non-shock, and non-slam, slow closing, and hydrostatically tested at 300 psi. Ends shall be 125 pound ANSI B16.1 flanges or 125 pound ANSI B2.1 threaded fittings, depending upon location.
- B. When there is no flow through the line, the disc shall hang lightly against its seat. When open, the disc shall swing clear of the waterway.
- C. Check valves shall have bronze seat and body rings, extended bronze hinge pins, and bronze nuts on the bolts of bolted covers.
- D. Valves shall be so constructed that disc and body seat may easily be removed and replaced without removing the valve from the line. Valves shall be fitted with an extended hinge arm with outside lever and weight, as necessary.
- E. Check valves for PVC pipe less than 3" in diameter shall be of PVC Type 1, Series BC, with union, socket, threaded, or flanged ends, as required and shall be per the Approved Manufacturers' Products List.

11.04 Plug Valves

- A. Plug valves shall be non-lubricated eccentric type with semi-steel bodies, resilient faced plugs, and stainless steel or nickel seats in the body. Port area shall be at least 80 percent of full pipe area for valves 20 inches and smaller. Port area shall be 70 percent for all valves 24 inches and larger. All valves 4 inches and larger shall be of the bolted design. All exposed nuts, bolts, springs, and washers shall be hot dipped galvanized, except exposed hardware for submerged valves shall be of stainless steel. Valve bodies shall be semi-steel with 125-pound ANSI Standard flanged ends for interior or aboveground service; mechanical joint for buried service and for use with threaded cast iron or ductile iron piping shall have screwed end connections. The plug shall be one

piece and of sufficient design so as not to require a stiffening member opposite the face plug.

- B. Plug valves 6 inches or greater in diameter shall be equipped with gear actuators, which shall clearly indicate valve position and an adjustable stop shall be provided. Construction of actuator housing shall be semi-steel. All gearing shall be enclosed, suitable for running in oil with seals provided on all shafts to prevent entry of dirt and water into the actuator. All shaft bearings shall be furnished with permanently lubricated bearing bushings.
- C. Three-way plug valves shall be non-lubricated gear operated. Valve bodies shall be semi-steel with 125-pound ANSI Standard flanges, and plugs shall be resilient faced. Three-way valves shall be 3-way, 3-port, 270-degree turn.
- D. Plug valves and actuators shall be as per the Approved Manufacturers' Products List.

11.05 Air Release Valves

- A. The air release valves shall be installed as shown on the Drawings. Valves shall be provided with a vacuum check to prevent air from re-entering the line. Above ground air release valves for wastewater shall be per the Approved Manufacturers' Products List. (See Drawing M-8.)
- B. The fittings shall be threaded. Belowground air release valves for wastewater shall be as on the Approved Manufacturers' Products List. (See Drawing M-7.) Air release valves for water lines shall be as per the Approved Manufacturers' Products List.

11.06 Fire Hydrants

Fire hydrants shall be traffic type, 5¼" valve opening and manufactured per the Approved Manufacturers' Products List. (See Drawing M-8.) Fire hydrants shall comply with the current AWWA Standard Specification C502-94, or latest revision, for fire hydrants for water works service. Each hydrant shall have 6" mechanical joint ends with harnessing lugs ("dog ears") and shall open by turning to the left (counterclockwise). Fire hydrant shall be of ample length for 18" clearance between the center of all nozzles and finished grade. Hydrant should be set so that the "bury line" on the barrel is set at finished grade. It shall be provided with two 2½" hose nozzles and one 5¼" pumper nozzle, all having National Standard hose threads. Nozzles shall have caps attached by chains. Operating nuts shall be AWWA Standard (pentagonal, measuring 1½" point to flat). Fire hydrants shall be equipped with "O-Ring" packing. Fire hydrant shall be painted "Federal Safety Red".

11.07 Backflow Preventers

All backflow preventers shall be mounted aboveground, in non-traffic areas on the customer's side of the meter. Above ground piping shall be flanged ductile iron. Brass or Copper pipe may be used for pipe 2" in diameter or smaller. Backflow preventers shall be of reduced pressure/double check type with two (2) independently operating check valves, and shall be designed to operate in a horizontal flow mode. An independent relief valve shall be located between the two check valves. Reduced pressure feature shall be included in all commercial applications. Preventers shall be University of Southern California (USC) approved as per the Approved Manufacturers' Products List.

11.08 Valve Boxes

- A. All buried valves shall have cast iron two or three-piece valve boxes with cast iron covers. Valve boxes shall be provided with suitable heavy bonnets and extend to match finished grade surface as directed by the Engineer. The barrel shall be one or two-piece, screw or slide type, having 5¼" shaft. Covers shall have "WATER" cast into the top for all water mains, "SEWER" cast into the top for all wastewater force mains and "REUSE" cast into the top for all reuse mains. All valves shall have actuating nuts extended to within 24 inches of the top of the valve box cover. (See Drawing M-5.)
- B. Valve boxes shall be provided with a concrete pad around the top of the box. A nameplate with a suitable anchor for casting in concrete shall be installed in valve pads in unpaved areas. Nameplate shall be 3" diameter brass disk with engraved lettering 1/8" deep, as shown on the Drawing M-6. and manufactured per the Approved Manufacturers' Products List.
- C. A 3" diameter wire port box to house the trace wire shall be installed in valve boxes in unpaved areas.
- D. Valve boxes shall be installed in a concrete pad, as specified in Drawings Detail M-5 & M-6.
- E. Valve boxes shall be manufactured domestically (i.e.: "Made in USA") per the Approved Manufacturer's List.

11.09 Water Service

- A. All water service fittings, including saddles, corporation stops, curb stops, and angled meter stops shall be no-lead brass or bronze suitable for 150 psi operating pressure, shall be iron pipe or AWWA tapered thread design, shall be of sizes required and/or noted on the Drawings, and comply with the Approved Manufacturer's Products List.

- B. Saddles shall be no-lead brass/bronze bodies with double stainless steel strap.

11.10 Flexible Couplings

- A. Flexible couplings shall be either the split type or the sleeve type.
 - 1. Split type coupling shall be used with all interior piping and with exterior piping as noted. The couplings shall be mechanical type for radius groove piping. The couplings shall mechanically engage and lock grooved pipe ends in a positive couple and allow for angular deflection and contraction and expansion.
 - 2. Couplings shall consist of ductile iron, ASTM Specification A47, Grade 32510 housing clamps in two or more parts, a single chlorinated butyl composition sealing gasket with a "C" shaped cross-section and internal sealing lips projecting diagonally inward, and two or more oval track head type bolts with hexagonal heavy nuts conforming to ASTM Specification A183 and A194 to assemble the housing clamps. Bolts and nuts shall be 316 stainless steel.
 - 3. Sleeve type couplings shall be used with all buried piping. The couplings shall be of ductile iron and shall be per the Approved Manufacturers' Products List. The coupling shall be provided with 316 stainless steel bolts and nuts, unless indicated otherwise.
 - 4. All couplings shall be furnished with the pipe stop removed.
 - 5. Couplings shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.
 - 6. Ductile iron followers and middle rings conform to ASTM A-536, Grade 65-45-12, NSF-61 fusion bonded powder epoxy coating, testing per AWWA C-219 (ANSI A21-11), rating 200 psi working pressure per AWWA C-219, compounded gaskets conform to compression test ASTM D-395 Method A & B, approved for water application.

11.11 Steel Casing Pipe

- A. Steel casings shall conform to the requirements of ASTM Designation A139 Grade "B" with a minimum yields strength of 35,000 psi and shall be coated inside and outside by a black bituminous coating, minimum 5 mils thick. The casing pipes shall

have the minimum nominal diameter and wall thickness as indicated below.

Casing Pipe Inside Diameter Inches	Casing Pipe Wall Thickness Inches
6-16	.250
18-20	.312
22-24	.375
26-28	.437
30-34	.500
36-38	.562
40-50	.625
52-58	.750
60-78	.813
84-90	.875
96-102	.937
108-114	1.000
120	1.125

- B. Field and shop welds of the casing pipes shall conform to the American Welding Society Standard Specifications. Field welds shall be complete penetration, single-vee groove or single-bevel groove type joints.

11.12 Tapping Sleeves and Valves

- A. See Section 11.02 for Tapping (Gate) Valves.
- B. Tapping sleeves shall be fully-passivated stainless steel wraparound type per the Approved Manufacturers' Products List.
- C. All force main taps shall be a minimum of 4" diameter.
- D. All taps shall be performed under supervision of IRCDUS Inspector. A pre-construction meeting may be held on-site at Inspector's discretion.
- E. Tapping contractor MUST be approved by IRCDUS.
- F. Tapping machine shall be disinfected prior to tap per AWWA C651.
- G. No taps will be performed on Fridays or days preceding holidays.
- H. Tapping saddle and valve shall be hydrostatically tested at a minimum 150 psi for 15 minutes duration. Any loss of pressure during the test period shall indicate failure.

END OF SECTION

Section 12
Aerial Crossings

Section 12

Aerial Crossings - New and/or Replacement

12.01 General

- A. There are two industry-accepted methods of constructing aerial crossings: ductile iron and welded steel. Joints are usually constructed using flanges or push-on pipe. In the case of ductile iron, flanges are screwed onto the pipe. For steel pipe, all flanges are to be factory welded. No field welding is allowed.
- B. Where there is a new or existing utility bridge shelf, the aerial crossing shall be constructed of flanged or push-on Ductile Iron Pipe (D.I.P). The crossing shall be constructed in place on concrete cradles. Pre-assembly of ductile iron pipe and then lifting into place will not be allowed. DIP shall be saw cut only; no torch cutting is allowed.
- C. Where there is a bridge hanger installed for the aerial crossing, steel pipe with factory welded flanges shall be used. All flanges are to be joined using 316 stainless steel bolts, nuts and washers. The steel pipe crossing will be preassembled and then lifted into place onto the hangers. If the total span length is such that it cannot be shipped without special conditions, the span shall be constructed in two or more sections having factory-welded flanges on both ends.

12.02 Pipe

- A. DIP specifications for ductile iron utility pipe are given in Sections 1 and 4 of the standards.
- B. Steel pipe for aerial crossings shall be the size as shown on construction plans and shall be in shop-finished lengths. No field cutting and fitting will be allowed. If no plans are available, it will be specified by the design engineer. If an existing aerial pipe is to be replaced and exact finished length cannot be determined without lifting the steel section into place for measurement, the flanged steel section length will be estimated and assembled leaving it about 3 feet short of the total span length. A 5 to 10 feet section of flanged DIP shall be secured to the end of the steel flange for measurement and cut to fit. The plain end of the DIP will be secured to a mechanical joint fitting using a gasket and mega lug restraint.
- C. Pipe shall be seamless carbon steel pipe ASTM A53, Grade B, Schedule 80 with a circumferential weld meeting the requirements of AWWA Standard C200 "Steel Water Pipe 6" and Larger". Steel Pipe and Flanges (welded to the pipe by the

manufacturer) are to be welded by a certified welder. Flanges are to be AWWA C207-07, 150# E-Ring Plate, FF-SO. In all cases, the minimum wall thickness of pipe shall be ½ inch.

12.03 Lining and Coating

- A. All coatings and linings shall be factory installed.
- B. Lining: All DIP water pipe shall be cement mortar lined as described in Section 1 and sewer pipe shall be epoxy lined as described in Section 4. All linings shall be factory installed. Steel pipe shall be prepared for linings/coatings per the manufacturers' recommendations. Lining shall be Tnemec Pota-Pox N140 or V140 or approved equal.
- C. DIP shall be coated according to specifications described in Sections 1 and 4. Steel pipe shall be polyurethane coating, or approved equal, per AWWA C222 and paint manufacturers' recommendations. Coating repairs shall be per AWWA C222 and paint manufacturers' recommendations.
- D. Ferrous, Nonferrous Metals, and Galvanized Metals; Exterior Non-submerged:
 - 1. Surface Preparation: Outside surface of pipe to be cleaned and/or blasted per the paint manufacturers' recommendation.
 - 2. Product and Manufacturer-Provide one of the following:
 - a. Tnemec:
 - 1) Shop Primer: 66-1211 Epoxy – 1 or 2 coats, 3.0-5.0 dry mils per coat.
 - 2) Shop Primer: 90-97 & H90-97 – 1 or 2 coats zinc-rich "lead free" primer 2.5-3.5 dry mils per coat.
 - 3) Shop Primer or Field Touch-Up (Top Coat): 66-1211 Epoxy - 1 coat, 3.0-5.0 dry miles per coat.
 - 4) Shop Finish or Field Touch-Up (Top Coat): 66 H.B. Epoxoline - 2 coats, 3.0-4.0 dry mils per coat.
 - 5) Shop Finish (Top Coat): Endura-Shield II 1074 & 1074U 2 coats 2 to 5 dry mils.

- b. KOP-COAT:
 - 1) Shop Primer:
 - a) Ferrous Metals: 340 Gold Epoxy – 1.5-2.0 dry mils per coat.
 - b) Nonferrous and Galvanized: None.
 - 2) Intermediate: Hi-Gard - 1 coat, 4.0-5.0 dry mils.
 - 3) Shop Finish or Field Touch-Up: 1122BRS Polyester Polyurethane - 1 coat, 1.5-2.5 dry mils per coat, 360-540 square feet per gallon.
- c. MAB Paint:
 - 1) Shop Primer: Ply-Tile 520-W-45 - 1 coat, 2.0-3.0 dry mils per coat.
 - 2) Field Primer or Touch-up (Top Coat): Ply-Tile 520-W-45 - 1 coat, 2.0-3.0 dry mils per coat
 - 3) Shop Finish or Field Touch-Up (Top Coat): Series 031 Ply-Tile 520 HB Epoxy - 2 coats, 6.0-8.0 dry mils per coat.
- d. Or approved equal.

3. Color of Pipe Lines:

- a. All pipelines and equipment shall be painted in conformity with the requirements of this section. Final coats of paint shall be color-coded.
- b. General Color Code

<u>Pipe Line</u>	<u>Color</u>
Finished or Potable	Blue
Sewer (Sanitary or Other)	Black or Green
Reclaim	Purple
Brine	Brown

END OF SECTION

Section 13

**Testing and Inspection of Water Mains,
Reclaimed Mains, Wastewater Force Mains, and Gravity Sewer Lines**

Section 13

Testing and Inspection of Water Mains, Reclaimed Mains, Wastewater Force Mains, and Gravity Sewer Lines

13.01 Pressure and Leakage Tests of Underground Pressure Piping

- A. No testing will be permitted until record drawings have been submitted and approved by IRCDUS.
- B. Prior to conducting pressure and leakage tests, all new water and reclaimed water pipelines shall be full bore flushed (see Drawing W-9) and all pipelines including wastewater force mains shall be thoroughly cleaned to remove all dirt, stones, pieces of wood, and any other materials that may have entered the pipeline during construction, and all dirty water and/or discolored water from the pipelines. After this cleaning, if any obstructions remain, they shall be removed. All debris cleaned from the pipelines shall be removed from the job site. Hydrostatic pressure and leakage tests shall conform to AWWA Standard Specifications C-605-94, or latest edition, for PVC pipe. Hydrostatic pressure and leakage tests shall conform to AWWA Standard Specifications C-600-99, or latest revision, for DIP. The Contractor shall furnish all gauges, meters, pressure pumps and other equipment needed to test the line. IRCDUS shall be present during all testing, televising, and final inspections.

The pressure required for the field hydrostatic pressure test shall be not less than 150 psi for water mains, reclaimed water mains and for sewer force mains. The Contractor shall provide temporary plugs and blocking necessary to maintain the required test pressure. Corporation cocks at least 1 inch in diameter, pipe riser and angle globe valves shall be provided at each pipe dead-end in order to bleed air from the line. Duration of pressure test shall be at least 2 hours.

Allowable amount of makeup water for expansion during the pressure test of the pipe shall conform to Plastic Pipe Institute (PPI) Handbook of Polyethylene Pipe; Inspection, Tests, and Safety Considerations, unless otherwise approved by IRCDUS. The Operating Safety Considerations, Post Installation, Hydrostatic Testing, Monitored Make-up Water Test, Table III, is on Pages 24 and 25 of the Handbook.

- C. The leakage test may be conducted concurrently with the hydrostatic pressure test and shall be of not less than 2 hours duration. All leaks evident at the surface shall be repaired and leakage eliminated regardless of total leakage as shown by test. Lines that fail to meet tests shall be repaired and re-tested as necessary until satisfactory test requirements are complied. Defective materials, pipes, valves and accessories shall be removed and replaced. The pipelines shall be tested in such sections as may be directed by IRCDUS by shutting valves or installing temporary plugs as required. The line shall be filled with water and all air removed and the test pressure shall be maintained in the pipe for the entire test period by means of a force pump to be furnished by the

Contractor. Accurate means shall be provided for measuring the water required to maintain this pressure. The amount of water required is a measure of the leakage. Testing shall be in accordance with the applicable provisions as set forth in Section 13 of AWWA Standard Specification C-600-99, or latest revision. The allowable rate of leakage shall be less than the number of gallons per hour determined by the following formula:

$$L = \frac{ND \times (P)^{1/2}}{7400}$$

L = allowable leakage in gallons per hour

N = number of joints in the section tested

D = nominal diameter of the pipe in inches

P = average test pressure maintained during the leakage test in pounds per square inch gauge

- D. The Contractor shall remove and adequately dispose of all blocking material and equipment after completion and acceptance of the field hydrostatic test, unless otherwise directed by IRCDUS. The Contractor shall repair any damage to the pipe coating. Lines shall be totally free and clean prior to final acceptance.
- E. IRCDUS must be present during testing.
- F. If thrust blocks have been approved for use, thrust blocks shall not be backfilled until inspected by IRCDUS.
- G. At the beginning of the testing period, thoroughly clean all new pipelines by whatever means necessary, including flushing, to remove all dirt, stones, pieces of wood, other material that may have entered during the construction period, and any dirty or discolored water from the lines. If, after this cleaning, any obstructions remain, they shall be removed. All debris cleaned from the lines shall be removed from the job site.
- H. All PE water mains and service lines shall be field-tested. The Contractor shall supply all labor, equipment, material, gauges, pumps, meters and incidentals required for testing. The Contractor shall pressure test each water main upon completion of the pipe laying and backfilling operations, including placement of any required temporary roadway surfacing.
- I. All water mains shall be tested to a minimum of 150 psi. The test pressure shall be measured on site in the presence of IRCDUS personnel during the test period.
- J. Testing shall be conducted after backfilling has been completed and before placement of permanent surface.

- K. Allowable amount of makeup water for expansion during the pressure test of the pipe shall conform to Plastic Pipe Institute (PPI) Handbook of Polyethylene Pipe; Inspection, Tests, and Safety Considerations, unless otherwise approved by IRCDUS. The Operating Safety Considerations, Post Installation, Hydrostatic Testing, Monitored Make-up Water Test, Table III, is on Pages 24 and 25 of the Handbook.
- L. In any test of pipe laid, disclosed leakage or significant pressure drop greater than that allowed, the Contractor shall, at its own expense, locate and repair the cause of leakage and retest the line. The amount of leakage that may be permitted shall be in accordance with AWWA Standard Specifications.
- M. All visible leaks are to be repaired regardless of the amount of leakage.

13.02 Disinfecting Potable Water Lines

- A. Before being placed in service, all potable water pipelines shall be disinfected in accordance with AWWA Standard Specifications C-651-99, or latest revision. The location of the chlorination and sampling points will be as shown on the drawings. The Contractor shall uncover and backfill taps for chlorination and sampling, as required.
- B. The general procedure for chlorination shall be first to flush all dirty or discolored water from the lines, and then introduce chlorine in approved dosages in accordance with Table 10-1 through a tap at one end, while water is being withdrawn at the other end of the line. The chlorine solutions shall remain in the pipeline for no less than 24 hours.
- C. The use of chlorine tablets is strictly prohibited.
- D. Following the chlorination period, all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system. The Contractor's lab shall then make bacteriological sampling and analysis of the replacement water in full accordance with AWWA Standard Specifications C-651, or latest revision. The Contractor will be required to re-chlorinate, if necessary. The line shall not be placed in service until all the requirements of the Florida Department of Environmental Protection are met and a letter of clearance issued with a copy provided to IRCDUS.
- E. Special disinfecting procedures shall be used in connections to existing mains where the method outlined above is not practical.
- F. The Contractor shall make all arrangements necessary with an independent commercial laboratory approved by the National Environmental Laboratory Accreditation Program (NELAP) for the collection and examination of samples of water from disinfected water mains. Note: The Contractor may not collect his own samples. These samples shall be examined for compliance with the Florida Department of Environmental Protection's requirements. Sampling shall be made daily

and continuously until two successive examinations are found satisfactory. Should one examination be found unsatisfactory, the line shall be flushed and disinfected again. Certified copies of all laboratory analyses shall be provided to the IRCDUS. The cost of all sampling, flushing and disinfecting shall be included in the contract price. IRCDUS shall operate all valves and be present to determine and control the volume of water used for flushing.

Table 10-1

**Chlorine Required to Produce a 25 mg/l
Concentration in 100 feet of Pipe**

Pipe Diameter (inches)	100% Chlorine (pounds)	1% Chlorine Solution (gallons)
4	0.013	0.16
6	0.030	0.36
8	0.054	0.65
10	0.085	1.02
12	0.120	1.44
16	0.217	2.60
Greater than 16	See AWWA Standards Specifications C-651-99	

13.04 Testing of Gravity Sewer Lines

- A. No testing will be permitted until record drawings have been submitted and approved by IRCDUS.
- B. Leakage test by exfiltration and infiltration, as described below, shall be made on all pipes.
- C. Exfiltration tests shall be made on all pipes after backfilling. All sewers shall be tested such that water is filled to the rim of the lowest manhole being tested within each section being tested, as directed by the IRCDUS. Mechanical plugs shall be used on the gravity sewer system in such a manner that the air can be released from the sewer while it is being filled with water. The test shall be continued for one hour and provisions shall be made for measuring the amount of water required to maintain the water at a constant level during this period. If test results are unsatisfactory, IRCDUS may direct that additional test be made on any section or the entire pipe.
- D. If any joint shows an appreciable amount of leakage, the jointing material shall be removed and joint remade. If any pipe is defective, it shall be removed and replaced. If the quantity of water required to maintain a constant level in the sewer for one hour does not exceed 100 gallons per inch of diameter per day per mile of sewer and if all the leakage is not

confined to a few joints, the workmanship shall be considered satisfactory. If the amount of leakage indicates defective joints or broken pipes, the Contractor shall correct them.

- E. Pipe shall be tested for infiltration after the backfill has been placed. Infiltration tests shall be made under the supervision IRCDUS. The length of line to be tested shall be as directed by IRCDUS. The allowable infiltration shall be 100 gallons per inch of diameter per day per mile of sewer.
- F. Rate of infiltration shall be determined by means of V-notch weirs, pipe spigot or by plugs in the end of the pipe, to be provided and installed by the Contractor in an approved manner and at such times and locations as may be directed by IRCDUS.
- G. In an inspection of the completed sewer or any part thereof shows any manholes, pipes or joints that allow the infiltration of water in a noticeable stream or jet, the defective work or material shall be replaced or repaired, as directed by IRCDUS.
- H. Leakage between two adjacent manholes may be double the amount above stated, provided the average leakage for a total length of any size does not exceed the amount first stated and provided there are not gushing or spurting leaks.
- I. All water used in testing and flushing shall be furnished at the Contractor's expense. The minimum amount of water to be used is two times the volume of the pipe.
- J. The Contractor may use an air test in lieu of the exfiltration test as described above. If he elects to do this, he shall submit his proposed method to the IRCDUS for approval.
- K. If the results of the air test are unsatisfactory, as determined by IRCDUS, the Contractor shall be required to perform the exfiltration test as outlined above.
- L. At the conclusion of the work, the Contractor shall thoroughly clean the entire inside of the pipe by flushing with water or other means to remove all dirt, stones, and pieces of wood or other material that may have entered during the construction period. Debris cleaned from the lines shall be removed from the lowest outlet. If, after this outlet cleaning, obstructions remain, they shall be removed. After the pipe is cleaned and if the groundwater level is above the pipe, or following a heavy rain, the IRCDUS will examine the pipe for leaks. If defective pipes or joints are discovered at this time, the Contractor shall repair them at no expense to IRCDUS.
- M. Upon completion of the work, the sewer system or selected sections therein shall be subjected to a final test and inspection. All work in the system or sections therein being tested shall be complete, cleaned and

ready for use. Tests shall be as specified herein and shall meet all requirements as to line, grade, clean lines, infiltration, exfiltration and workmanship.

- N. Inspection of mains shall be by use of a self-contained television system and lamping upon satisfactory completion and acceptance of final road base material. The facilities shall be provided and operated by the Contractor as specified below:

The Contractor shall provide IRCDUS with a video record, on CD format, of the interior of all main line gravity sewers and the interior of all sewer laterals. The CD shall be contained in a proper container to prevent damage to the CD. The video shall be obtained by pulling a television camera through the line along the axis of the pipe. The television equipment shall consist of a self-contained camera and a monitoring unit connected by a coaxial cable. These videos shall be done during the inspection of the mains. Monitors shall be available to IRCDUS during these inspections. Monitors shall also be provided with a stop action camera, so that as may be requested by IRCDUS. Photographs shall be made of a particular portion of the main being viewed. The video shall be properly exposed and the camera shall be in proper focus so that good, clear recordings showing detail are produced. The visual recordings shall be identified by audio recordings noting the manhole numbers, distances to service lateral connections, direction of lateral connection and any leaks, cracks or pipe defects. Each CD shall be clearly marked as to the contents and number, with an index of all CD's. The CD's of the completed mains shall be delivered to IRCDUS. The Contractor shall provide any assistance required by the IRCDUS.

- O. A maximum tolerance of ½" dip will be accepted in gravity sewer construction.

END OF SECTION

SECTION 14

GENERAL DESIGN and CONSTRUCTION DATA

SECTION 14

GENERAL DESIGN DATA

14.01 GRAVITY SEWERS

- A. A manhole shall be constructed 20 feet upstream of the lift station. There shall be only one pipe connection from the manhole to the lift station. The pipe between the lift station and the manhole shall be C-900 PVC, DR18 pipe.
- B. All sanitary sewers shall be constructed as required by the IRCUDS. Design to be done according to Recommended 10 State Standards for Wastewater Facilities, latest edition, and current regulatory agencies requirements.
- C. Gravity sewers shall be designed for estimated peak flow at build-out of development, which shall be the product of a selected peaking factor and the projected or known average daily flow at ultimate system development.
- D. Projections of average daily flow shall be made using a per capita sewage flow of 100 gallons per day and in accordance with Indian River County ordinances. Peak hour (design) flows shall be estimated using a peaking factor as outlined within Recommended 10 State Standards for Wastewater Facilities, latest edition.
- E. All sewers shall be sized to provide ample capacity for peak design flows. The minimum allowable pipe size shall be 8-inch for collection lines and 6-inch for service laterals. Sewers shall be designed at slopes providing minimum velocities of 2 feet per second when flowing full or half-full, using a Manning's Roughness Coefficient (n) of 0.013. In general, the following minimum slopes shall be provided for sewer sizes 8-inch to 24-inch or approved by IRCUDS:

Pipe Diameter (inches)	Design Slope	Min Constructed
8	0.35%*	0.30%
10	0.28%	0.22%
12	0.22%	0.17%
16	0.15%	0.12%
18	0.12%	0.10%
24	0.08%	0.07%

The minimum design slope for the upper run of an 8-inch gravity sewer main is 0.40% with the minimum acceptable constructed slope being 0.35%.

- F. Manholes shall be installed at the end of each line, at all changes in grade, size or alignment, at all junctions (excluding service laterals) and at distances no greater than 400 feet apart.

- G. Sewer laterals shall not be connected directly into manholes unless approved by IRCDUS. IRCDUS will direct industrial wastewater into manholes on case-by-case basis.
- H. Gravity sewers must be installed in front (under driveway/roadway pavement) of new buildings and/or under roadway pavement in dedicated Right-of-Way, all accessible to maintenance equipment.
- I. Gravity mains shall be installed a minimum of 10 feet from any existing or proposed structure (walls, trees, transformer pads, etc.).
- J. All sanitary manholes shall have a rain guard installed. Rain guards shall be corrosion proof, and have a relief valve, lifting strap and insert gasket. The relief valve shall relieve at a pressure of 1 psi and have a water leak rate of not more than 5 gallons per 24 hours.

14.02 WASTEWATER PUMPING STATIONS

- A. A Remote Telemetry Unit (RTU) shall be included in all pump stations that are to be dedicated to Indian River County.
- B. Wastewater pumping stations shall be designed to peak ultimate development flow from all contributory areas, in accordance with the Indian River County Wastewater Master Plan. Design average daily flow and peak hour flow shall be as set forth in Section 14.01.
- C. Design of private lift stations that may be dedicated to the County at a later date shall meet IRCDUS design standards and shall be approved by IRCDUS. Any private station that does not meet IRCDUS design standards will not be taken over by the IRCDUS. Owners of private stations shall sign a form acknowledging future upgrade requirements if Owner is to dedicate a private station to the IRCDUS at a later date.
- D. The County allows owners of single commercial properties, who wish to manage their own sewage collection on-site and transfer to the County's regional distribution collection system, to install and maintain a private lift station. The County does not permit more than one property to connect to a private lift station or private gravity sewer system, regardless if all the properties involved are owned by the same entity or not. If a developer proposes to extend sewer laterals from a private sanitary sewage collection system to other properties, then the properties must be unified as one parcel. If the properties cannot be unified, then each property must have their own private lift station, or the developer may install and dedicate to the County, a regional lift station that is constructed in accordance to IRCDUS design standards.
- E. At least 2 pumps shall be provided for stations handling flows of 700 gallons per minute (gpm) or less. A minimum of 3 pumps shall be provided in stations where peak design flow exceeds 700 gpm unless otherwise approved by IRCDUS. In

all cases, standby-pumping capability shall be provided such that if any one pump is out of service, an alternate unit is available at equal or greater capacity.

- F. The sewage pump system shall be capable of pumping the design peak flow at the maximum computed system total dynamic head. Maximum residual head within existing force mains shall be obtained and coordinated through IRCDUS.
- G. Pumps shall be capable of passing spheres of at least 3-inches in diameter, and pump suction and discharge piping shall be at least 4-inches in diameter. Grinder pumps shall be used when riser pipes in wet well are less than 3-inches. Minimum valve (all types) size is 4-inches.
- H. Wet wells shall be a minimum of 6-feet in diameter (ID). All wet wells shall be sized to provide a minimum pump cycle of 15 minutes. Pumps shall be designed to provide a minimum pump run time equal to half the cycle time. Additionally, wet wells shall provide sufficient space for installed equipment and required suction pipe submergence and spacing. The wet well floor shall have a minimum slope of one-to-one to the hopper bottom.
- I. A separate valve vault shall be provided to house the gate valves, check valves and the emergency pump connection. The vault shall be of sufficient size to allow for installation, removal and maintenance of the valves. The top of the valve vault shall be a minimum of 12-inches above the high water level of the associated development. The wet well top elevation and the valve vault top elevation shall be a minimum of 12-inches above the associated elevations shown on the FIRM (Flood Insurance Rate Map) or 12 inches above the 25-year – 24-hour storm event elevation, whichever is greater.
- J. In IRCDUS maintained lift station, pumps shall be per the Approved Manufacturers' Product List. If a grinder pump is proposed, see Approved Manufacturers' Product List. Only grinder pumps under 5.0 hp are permitted unless approved by IRCDUS.
- K. Lift Station Calculation Checklist (all assumptions shall be listed in calculations and in an orderly fashion):
 - 1. Design flow
 - 2. Downstream force main size & down stream head pressure (in psi or feet of water)
 - 3. Total Dynamic Head (TDH) of pumps shall exceed system head curve
 - 4. Pump selection make, model, HP, impeller
 - 5.
 - a. Wet well dimensions
 - b. Operating cycle and draw down time
 - 6. Buoyant Computations Documentation:
 - a. Buoyant force
 - b. Downward force
 - c. Safety factor
 - d. Depth to water table
 - 7. Designer name, date, design firm, Indian River County project number, project name, designer name of revisions

- L. Only one influent gravity main is allowed into the lift station. The first upstream manhole from the lift station must be located within 20 feet +/- 1-foot of the lift station and as approved by IRCDUS.
- M. The owner of a private lift station must have a maintenance agreement with a qualified firm (individual) to maintain the lift station. A label must be posted on the lift station stating the name and 24-hour phone number of the responsible firm before lift station may be placed into operation. A copy of a maintenance contract is to be submitted prior to issuance of the Utility Construction Permit. Maintenance contract must be renewed annually with copies of said contract submitted to IRCDUS

14.03 WATER DISTRIBUTION

- A. All water mains shall be constructed in accordance with the Indian River County Water Master Plan, latest edition, or current AWWA Standard Specifications and current regulatory agencies requirements.
- B. All distribution systems shall be properly looped, where feasible, and valved to provide maximum flexibility in providing service.
- C. Design shall be based on an average daily consumption of 100-gallons per capita per day, a maximum day (MD) factor of 2.25 times average day and a peak hour factor of 4.5 times average day, per Indian River County Ordinance.
- D. Distribution systems shall be sized to provide for 100 percent of the combined required fire flow and maximum day demand rate, while maintaining a 20-psi residual pressure in the distribution system.
- E. All water mains shall be designed to provide a minimum pressure of 25-psi at ground level at all points in the distribution system under all conditions of flow (except as noted in D above).
- F. Dead-end 4-inch water distribution system mains may be used to serve up to 10 ERU's, but shall not exceed 300 linear feet and down stream of last Fire Hydrant Assembly.
- G. Fire flow requirements shall be as outlined within the Insurance Service Office (ISO) Fire Flow Requirements.
- H. The minimum size main in diameter serving fire hydrants shall not be less than 6-inches in diameter for residential (single family) areas and 8-inches in diameter for commercial areas and multifamily residential areas.
- I. Maximum fire hydrant spacing shall not exceed 1000-feet in single-family residential areas and 600-feet in commercial areas and multiple-family residential areas. No fire hydrant shall be over 500-feet from a single-family residence, multifamily residence, or commercial building.
- J. All public fire hydrants shall be painted "**Federal Safety Red**". Private fire hydrants shall have the body painted red with a white painted bonnet.

- K. All fire mains shall be equipped with a double detector check valve assembly as shown in IRCDUS Standards Detail W-10.
- L. A gate valve must be installed on the same water main as the fire hydrant. An additional gate valve is required if the distance between the first gate valve and the hydrant is greater than 18-feet as shown in IRCDUS Standards Detail W-2.
- M. It shall be demonstrated that the water distribution system can supply the required demand rate and fire flow prior to acceptance by IRCDUS, and an on-site fire flow test shall be conducted by the Indian River County Fire Department or EMS. Prior to acceptance by IRCDUS, the fire hydrant shall be bagged as "OUT OF SERVICE".
- N. Service connections and fittings shall be located outside of pavement, concrete curb, and/or concrete sidewalk areas unless otherwise approved by the IRCDUS.
- O. Water mains and services shall be installed in front easements or in dedicated Rights-of-Way (not under pavement) accessible to maintenance equipment.

14.04 EARTHWORK AND BACKFILL

- A. Excavation for all utilities and/or house connections shall be adequately guarded with barricades and lights, so as to protect the public from hazard. Streets, sidewalks, driveways, curbs, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the IRCDUS and/or Public Works.
- B. Foundation material used for pipe bedding, from a minimum 6-inch distance below the pipe invert to the bottom 12-inches above the top of the pipe, shall be bank run sand and gravel.
- C. All gravity sewer installation procedures must be in accordance with pipe manufacturers' recommendations. All mains shall be installed to have a minimum depth of 36-inches to the top of the pipe. Installation of gravity sewers shall be controlled by use of a laser to maintain proper grade. A maximum tolerance of ½" dip will be accepted in gravity sewer construction.
 - 1. Trench – Trench width shall be kept to a minimum necessary for pipe installation and shall comply with current OSHA requirements. The trench bottom shall be graded uniformly to match the slope of the pipe.
 - 2. Backfill – Only good quality backfill, free of stones, hardpan materials, roots, rocks, broken cement or other debris that might be damaging to the pipe shall be used. Backfill shall be placed in the trench in uniform lifts of 12-inches (maximum).
 - 3. Compaction – All pipe must be compacted by hand tamping to the centerline, under the pipe. Backfill shall be compacted in lifts up to the surface to achieve a minimum compaction of 98% of maximum density in

roadways and shoulders. Easements shall be 95% density, in accordance with AASHTO Specifications T-180 and ASTM D-2167.

4. Dewatering – Construction shall be accomplished in a dry trench. Well pointing may be required, as necessary. All water entering excavations or other parts of the work shall be contained, collected and pumped to suitable places for disposal as permitted by the Local, State or Water Management District.
 5. Sheeting – Sheeting and shoring shall be installed as may be necessary for the protection of the work, preservation of adjacent property and structures and the safety of employees. Sheeting and bracing shall be uniform to OSHA requirements.
- D. Installation of force mains (sewer or reused water) shall be in accordance with latest AWWA Standard Specifications C-600 and the installation specifications for water lines in the Water Distribution Section, irrespective of the type of pipe selected. Location tape shall be placed continuously in the trench over all pipes, 12-inches below grade. Trace wire shall be wrapped on all pipes, valves, fittings, and all appurtenances, per Detail M-13.
1. Trench – Trench width shall be kept to a minimum necessary for pipe installation and shall comply with current OSHA requirements. The trench bottom shall be graded and alignment shall be parallel with roadway, where possible.
 2. Backfill – Only good quality backfill, free of stones, roots, rocks, broken cement or other material that might be damaging to the pipe shall be used. Backfill shall be placed in the trench in uniform lifts of 12-inches (maximum).
 3. Compaction – All pipe must be compacted by hand tamping to the centerline, under the pipe. Backfill shall be compacted in lifts up to the surface to achieve a minimum compaction of 98% of maximum density in roadways and shoulders. Easements shall be 95% density, in accordance with AASHTO Specifications T-180 and ASTM D-2167.
 4. Dewatering – Construction shall be accomplished in a dry trench. Well pointing may be required, as necessary. All water entering excavations or other parts of the work shall be contained, collected and pumped to suitable places for disposal as permitted by the Local, State or Water Management District.
 5. Sheeting – Sheeting and shoring shall be installed as may be necessary for the protection of the work, preservation of adjacent property and structures and the safety of employees. Sheeting and bracing shall be uniform to OSHA requirements.
- E. Installation of water mains and brine mains must be in accordance with latest AWWA Standard Specifications C-600 Series, irrespective of the type of pipe selected. All installation procedures must also be in conformance with pipe

manufacturers' recommendations. Minimum depth of cover shall be 36-inches over the top of the pipe. Location tape shall be placed continuously in the trench over all pipes, 12-inches below grade. Trace wire shall be wrapped on all pipes, valves, fittings, and all appurtenances, per Detail M-13. Allowable deflection of the pipe joints and curvature of PVC pipe shall not exceed the manufacturers' specifications.

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14.05 RESTRAINED JOINTS

- A. Restrained joints shall be used on lines per the Table of the IRC DUS Standards Drawing M-3. Section of piping having restrained joints or those requiring restrained joints shall be constructed using pipe and fittings with restrained “locked-type” joints and the joints shall be capable of holding against withdrawal for line pressures up to 150 pounds per square inch (psi). The pipe fittings shall be as shown for restrained push-on joints or restrained mechanical joints on Page 416 in Section VI, in the Handbook of Cast Iron Pipe, 4th Edition. In all cases, restrained joints must be used per Section C below, with thrust blocks, per contract drawings.
- B. Restrained pipe joints that achieve restraint by incorporating cutout sections installed in the bell of the pipe shall have a minimum wall thickness at the point of cutout that corresponds with the minimum specified wall thickness for the rest of the pipe.

- C. The minimum number of restrained joints required for resisting forces at fittings and changes in direction of pipe shall be determined from the length of restrained pipe on each side of fittings and changes in direction necessary to develop adequate resisting friction with the soil. Drawing and formula below are provided for the Contractor as a guideline.

Where:

$$L = \frac{1.5PA(1-\text{COS } X)}{F_w}$$

- L = Length of pipe on each side of fittings or change in direction
P = 150 psi, unless otherwise noted
A = Cross-sectional area in square inches based on outside diameter (O.D.) of pipe
X = Angle of bend or change in direction in degrees
f = Coefficient of friction = 0.4 (maximum)
W = W (earth) + W (pipe) + W (water in pipe)
W (earth) = unit weight of soil in pounds = (density of soil*) (depth of cover in feet) (O.D. in feet)
W (pipe) = unit weight of pipe in pounds
W (water in pipe) = unit weight of water in pipe

* Maximum 12-lbs/cubic ft above maximum water table elevation and 60-lbs/cubic ft below maximum water table

- D. Bolts and nuts for restrained joints shall be 304 stainless steel.
E. The Contractor shall also provide restrained joints in accordance with the above criteria wherever below ground fittings are on lines 12-inches in diameter or less.

14.06 HORIZONTAL SEPARATION

- A. All water, reclaimed water and/or sewer utilities shall be located a minimum horizontal separation equal to the depth of the pipe plus the diameter of the pipe from any permanent above ground structures (i.e., walls, trees, transformer pads, etc.).
B. A minimum 4-foot separation is required between water/sewer utilities and other underground utilities such as telephone, gas, cable, irrigation, etc.
C. All water and/or sewer utilities shall be located a minimum horizontal separation equal to 2 times the depth of the pipe plus the diameter of the pipe from the top of bank of any bodies of water (i.e., storm water ponds, canals, etc.).

- D. All water mains shall be located a minimum horizontal separation of 3 ft. from storm sewer, stormwater force main or reclaimed water main.
- E. All water mains shall be located a minimum horizontal separation of 3 ft., with 10 ft. preferred, from vacuum sanitary sewer mains.
- F. All water mains shall be located a minimum horizontal separation of 6 ft., with 10 ft. preferred, from gravity or pressure sanitary sewer, sanitary sewer force main or reclaimed water main.

14.07 VERTICAL SEPARATION

- A. Maintain 18" vertical clearance between any water/sewer utility and any other underground utilities such as telephone, gas, cable, irrigation, etc.
- B. All water mains shall maintain a minimum 6" vertical clearance between storm sewer, vacuum sewer system and gravity sewer with 12" vertical clearance preferred. A 12" vertical clearance shall be maintained between all water mains and pressure sewer systems, stormwater force mains and reclaimed water mains.

END OF SECTION

Section 15

Procedures for Submittal, Permitting, Construction and Acceptance of Private Development Projects

Section 15

Procedures for Submittal, Permitting, Construction and Acceptance of Private Development Projects

15.01 Submittal

- A. The applicant shall submit the following items for a project to be considered for a utility construction permit:
1. Completed Utility Construction Permit application, copy of Department of Environmental Protection (FDEP) permit applications (if applicable), copy of Department of Transportation (FDOT) permit application (if applicable), Indian River County Right-of-Way permit, legal description, and proof of payment of all applicable fees.
 2. Three sets of 24 inch x 36 inch construction plans, signed and sealed by a Professional Engineer registered in the State of Florida, shall be submitted with application. Plans shall include a plan view of the water, wastewater, and/or reclaimed systems with all elevations and inverts, sewer profiles (gravity and force mains), all appropriate details, the location of all existing and/or proposed drainage facilities including catch basins, manholes, pipes, and top elevations and pipe inverts for same, and water line profiles where the water main crosses other utilities. All IRCDUS utility lines shall be stationered on the plans. All existing and proposed rights-of-ways, easements, and property lines shall be shown. Also, an accurate location map is to be provided. The limits of proposed dedication of the system(s) to IRCDUS shall be specified on the plans.
 3. A complete engineer's design report, signed and sealed by a Professional Engineer registered in the State of Florida, setting forth the basis of design, shall contain the following, as a minimum:
 - a. Water distribution system:
 - (1) Description of geographic area to be served.
 - (2) Existing and predicted population of areas to be served.
 - (3) The effect of the proposed water distribution system on existing or proposed water distribution facilities.
 - (4) The estimated daily flow.
 - (5) Fire flow calculations for all hydrants being fed by lines smaller than 8 inch, or as required by IRCDUS.
 - (6) Description of materials to be used.
 - (7) A preliminary cost estimate.
 - (8) An estimated completion date.
 - (9) Any other factors which would affect design and use of the water distribution system.

- b. Gravity sewer system:
 - (1) Description of geographic area to be served.
 - (2) Existing and predicted population of areas to be served.
 - (3) The effect of the proposed gravity sewer collection system on existing and proposed gravity sewer collection systems or pumping stations and force mains. Pump stations shall be modeled, and all in-line pumping stations and force mains receiving these additional flows shall be considered.

- c. The effect of the proposed gravity sewer collection system on the wastewater treatment plant receiving the flows.
 - (1) The estimated daily flow.
 - (2) Description of materials to be used.
 - (3) A preliminary cost estimate.
 - (4) Any other factors which would affect design and use of the sewer system.

- d. Pumping station and force main system:
 - (1) Description of geographical area to be served.
 - (2) Existing and predicted population of area to be served.
 - (3) Calculations for projected flows, wet well sizing, pump sizing and selection, force main sizing, and buoyancy of wet well.
 - (4) The effect of the proposed pumping station and force main system on existing or proposed pumping station and force main systems or gravity sewer systems receiving these additional flows. Pump stations shall be hydraulically modeled, along with all in-line pumping stations and force mains.
 - (5) The effects of the proposed pumping station and force main systems on the wastewater treatment plant receiving these flows.
 - (6) Description of materials to be used.
 - (7) A preliminary cost estimate.
 - (8) The estimated completion date
 - (9) Any other factor which would affect design and use of the pumping station and force main system.

- 4. A review fee, as set forth in the current rate schedule.

- 5. One original signed and sealed Department of Environmental Protection permit application for IRCDUS records.

15.02 Construction Permit

- A. Prior to permit issuance and scheduling of a pre-construction meeting, three sets of construction plans and specifications shall be submitted, signed and sealed by a Professional Engineer registered in the State of Florida, to be approved, stamped, and signed by IRCDUS. One set shall be retained for

IRCDUS records, one set shall be delivered to the IRCDUS inspector, and one set shall be returned to the Engineer of Record.

- B. Utility Construction Permits expire one year from the date of issuance and may be granted an extension for one year thereafter for a fee of \$150. Only one extension will be granted. After the extension has expired, the Utility Construction Permit process will start over. IRCDUS reserves the right to request changes or modifications to utility designs that have been previously approved.
- C. Payment of fees shall not constitute automatic approval of original plans.
- D. The Utility Construction Permit does not constitute a permit for operation.
- E. Construction shall not begin until the IRCDUS Utility Construction Permit is approved, and a copy of the Indian River County Right-of-Way Permit, Florida Department of Environmental Protection Permit, and any other required permits are submitted to IRCDUS.

15.03 Construction

- A. Any contractor or sub-contractor constructing public underground water, sewer, and reclaimed utilities must be a licensed Underground Utility Contractor or licensed General Contractor in the State of Florida and Indian River County. A sub-contractor shall not qualify for an IRCDUS construction contract under the license of another General Contractor or Underground Utility Contractor. Any contractor or sub-contractor must qualify on their own merits.
- B. IRCDUS reserves the right to request references and a list of projects performed in the last three years that are similar in nature to the project in which the contractor is proposing to construct.
- C. The Engineer of Record shall have a pre-construction meeting with IRCDUS a minimum of five working days before beginning construction, whereupon construction plans shall be reviewed, and a minimum of three sets of shop drawings shall be provided. One set is to be provided to Indian River County Utilities Department, one set to the IRCDUS inspector and the remaining set to the Engineer of Record. No appurtenances shall be installed until approved by IRCDUS.
- D. The Contractor and Engineer of Record shall notify IRCDUS a minimum of 48 hours prior to beginning construction or performing any system tests.
- E. The water distribution system shall be constructed, flushed, disinfected, and tested in accordance with FDEP and IRCDUS Specifications.
- F. All fire hydrant assemblies shall be bagged and tagged as "Out of Service" until final acceptance.

- G. All equipment, materials, and workmanship shall meet or exceed all current Indian River County Water, Wastewater and Reclaimed Water Utility Construction Standards and shall be subject to the unconditional inspection and approval by IRCDUS.
- H. The Engineer of Record shall have an on-site inspector who shall witness and document all materials used, installation procedures, problems encountered, and witness and certify all tests specified by the operation permit checklists. Daily construction reports shall be submitted monthly to IRCDUS, and no later than seven days after completion of the construction. Indian River County has unconditional rights to inspect the construction and materials at any time.
- I. Where water outages will occur, a minimum of five (5) working days notice to IRCDUS and the public is required. The IRCDUS water plant operator shall be notified a minimum of five (5) working days prior to flushing of lines. Five (5) working days' notice is required for access to private property.
- J. The Property Owner, Developer, Engineer of Record, and Contractor shall hold Indian River County harmless in any suits, claims, and/or liabilities arising from subject construction.
- K. All connections to the IRCDUS water system shall be made in the presence of IRCDUS. For the purpose of flushing, testing, and putting the system on line, IRCDUS shall operate all valves on the IRCDUS systems.

15.04 Acceptance

- A. No system shall be cleared for use by IRCDUS until all requirements of the operation permit checklist have been satisfied and approved by IRCDUS. See Part IV of these Standards for the requirements for IRCDUS Utility Construction Check Lists for Potable Water Distribution System and Wastewater Collection/Distribution System.
- B. When a constructed potable water system or sewer system lies dormant for a period of more than six months, regardless of having received FDEP clearance or not, the system will be subjected to rigorous inspection, testing and cleaning, by methods to be determined by IRCDUS and in accordance with AWWA Standards C-651-99 or latest revision. Pressure testing, flushing and chlorination will be required. No potable water main shall be placed into service until bacteriological sampling and analysis have been made. Any constructed gravity sanitary sewer main and/or sewer lift station will be subject to the same methods as stated above, including but not limited to cleaning, television inspection, infiltration/exfiltration, or other methods to be determined by IRCDUS. Any deficiencies in construction shall be corrected immediately upon discovery and shall meet current IRCDUS Water and Wastewater Standards.

END OF SECTION

Section 16

Water and Wastewater Treatment Plants

Section 16

Water and Wastewater Treatment Plants

16.01 General

This section sets forth the general requirements for design and installation of water and wastewater treatment plants to be constructed within Indian River County, hereinafter referred to as the "County".

16.02 Design Standards

Facilities shall comply with the design and installation requirements as established by the Florida Department of Environmental Protection and additional specific requirements stated in these standards. The criteria set forth in the "Ten State Standards-Recommended Standards for Water Works", latest edition, should be used as a design guide for water treatment facilities. The criteria set forth in the "Ten State Standards-Recommended Standards for Wastewater Facilities", latest edition, shall be used as a design guide for sewage treatment facilities.

16.03 Standard Requirements

A. Building and Structure Sites

1. Clear and remove obstructions within building sites only as necessary to provide adequate workspace and/or facilitate the specified construction. The removal of trees or permanent structures within the specified construction areas shall be done only as approved or directed by the County. Should the removal of valuable trees or shrubs be required, this work shall be done in cooperation with the local communities in which the work takes place in order that they may be replanted, if so desired.
2. Grubbing shall be performed where required, including, but not limited to, areas where fill will be placed, structures erected, or where other installation is required. It shall include the complete removal of all obstructions resting on or protruding through the surface of the existing ground to a depth of three feet below finished grade. Where excavation is done, all stumps, roots and deleterious material thereby exposed shall be removed to a depth of three feet minimum below the excavated surface.
3. All refuse from clearing and grubbing operations shall be disposed of either by burning or removal to a dump area approved by the County. Burning shall be done at locations, and at times as directed, in a manner that will avoid all hazards. Permits shall be obtained from all applicable authorities for burning and burning shall be kept under constant attendance until the fires have burned out or have been extinguished. Burning operations shall be done in compliance with all applicable regulations.

4. All muck or other unsuitable material within the limits of building sites, or other designated areas, shall be excavated and removed. Depth of removal shall be that required to reach an approved suitable material. Removal and subsequent backfilling shall be maintained within the limits of the designated construction area unless specifically approved otherwise by the County. Sheeting shall be installed and left in place along the site boundary, where required, in order to preclude infringement on adjacent property and prevent damage by future de-mucking. The Contractor shall dispose of muck or other unsuitable material.
5. Suitable fill material shall be placed and compacted where muck or other unsuitable material has been removed and as required to elevate the site to finished grade. Fill material shall conform to the Florida Department of Transportation and as approved by a testing laboratory and the Indian River County Public Works Division. Fill shall be placed in successive layers of not more than 12 inches, loose measure, and suitably compacted to 95% minimum of maximum density, as determined by AASHTO Specifications T-180, unless higher percentage is necessary in specific locations, especially under structure sites where a minimum of 98% of maximum density is required. Side slopes shall not exceed 3 horizontal to 1 vertical, unless otherwise approved by IRCDUS, and shall be protected from erosion by staggered solid grass sodding, or other approved method. An approved, Florida State Certified testing laboratory shall make density tests for determination of the specified compaction.
6. All building sites shall be properly graded, including all cutting and filling necessary for the construction. Finish building site elevations shall be as required to preclude flooding and shall receive prior approval from IRCDUS. Filling shall be accomplished, if necessary, to provide acceptable site elevations. Finish surface grades shall eliminate potholes, abrupt changes in grade and bring the ground to an even surface, and shall provide adequate drainage for the complete site. The grade shall be sloped evenly to provide drainage away from the building walls in all directions at $\frac{1}{4}$ inch per foot minimum (2%) for at least 10 feet from the building walls. Drainage swales shall have a minimum flow-line grade of not less than $\frac{1}{8}$ inch per foot (1%). Rounding shall be provided at top and bottom of banks and at other breaks in grade.
7. Driveways, parking locations and other vehicular traffic areas at building sites shall be paved with an asphaltic concrete surface course of a 1 inch minimum thickness, Type II, having a prime coat of RC-70 or RC-250 (rapid curing cutback asphalt) applied at a rate of 0.10 gallons per square yard. The dimensions for said surfacing shall be in accordance with good engineering practice and suitable for the designated service. Roadbed stabilization

shall be 6 inch minimum below the base course and shall have a minimum Limerock Bearing Ratio of 100 pounds per square inch. Base course shall be limerock or soil-cement, placed to 6-inch minimum thickness.

8. In order to provide an all-weather surface for foot traffic ways, concrete walks shall be provided between points of frequent travel. Walks shall be minimum 4 feet wide by 4 inches thick. The base material shall be thoroughly compacted to 95% of maximum density per AASHTO Specification T-180. Walks shall be provided with expansion joints at structures and/or intervals not exceeding 18 feet, with dummy groove joints at 6-foot intervals. A broom finish shall be provided. Concrete shall be a minimum compressive strength of 2500 psi with fiber mesh reinforcement.

9. Fencing

- a. All building sites shall be totally enclosed by protective fencing, unless specifically excluded from this requirement by the County. Said fence shall consist of 6 feet high chain link fabric. Fence shall be fabricated and installed in accordance with good standard practices and shall be complete, including top rail; stretcher bars and clips; all end, corner, pull and gate posts; post braces; ornamental post tops; and other necessary items. All fencing materials shall be hot dipped galvanized as specified below in 9b. The fence shall include a minimal of one gate opening 12 feet in width, consisting of two 6 feet wide locking, 180 degree, swing gates, with total height equal to the fence.

- b. Fencing shall be fabricated in compliance with the following minimum material standards:

Chain Link Fabric – 2” mesh woven from 9 gage steel wire.

End, Corner and Pull posts – 2-½” Schedule 40 steel pipe.

Gate Posts – 6” maximum width: 2-½” Schedule 40 steel pipe; and, 6’ to 12’ width; 3-½” Schedule 40 steel pipe.

Gate Frames and Intermediate Posts – 1.875” outside diameter (O.D.), 2.71 pounds per foot (Lb./Ft.) steel tube.

Post Braces and Top Rails – 1.625” O.D., 2.27 Lb./Ft. steel tube.

Accessories – Steel.

Coatings – Hot dip galvanized with 1.2 ounces of zinc per square foot, applied after weaving for fabric and following fabrication for all other ferrous metal items.

Concrete – 2,500 pounds per square inch compressive strength.

- c. The fencing shall be installed to proper grade, alignment and plumb, with corner posts and bracing provided at all angles in alignment. Posts shall be set 2 feet deep in concrete footings: 1 foot 4 inches in diameter for line posts and 2 feet in diameter for gate and corner posts.

10. Landscaping and Grassing

- a. Building sites shall be suitably landscaped in order to be harmonious with the existing or projected adjacent development, provide screening plants and, in general, present a pleasing appearance. Plants shall equal or exceed Standards for Florida No. 1, as given in “Grades and Standards for Nursery Plants,” Part I (1963) and Part II, State of Florida Department of Agriculture. The landscaper shall install the approved planting (grass, trees and shrubbery) in accordance with Indian River County Code Type A buffer and maintain said items until hardy growth has been established.

- 1 The Contractor shall provide IRCDUS with landscaping plans for approval prior to installation. Said plan shall be prepared by an experienced landscaping company and shall include only such plants which are established for the area of construction and which require minimal maintenance.

- 2 The Contractor shall place solid sod, where not covered by structures or surfacing, over the total area of small facility sites (pumping stations, etc.) and over the prime area of large sites (Treatment Facilities), with additional placement, as required for erosion control. Where not solid-sodded, balance of the site area shall be totally grassed by plugging. Unless approved otherwise by the IRCDUS, the grass shall be Argentine Bahia. Sod and plugs shall be fresh and uninjured to time of installation, and sod shall be clean, have a well-matted root system, and have a minimum thickness of 2 inches.

11. Buildings and Structures

- a. Excavation shall not proceed until building lines have been surveyed and staked. The Contractor shall remove and dispose of all unwanted material, supply all fill material, and install all dewatering facilities, shoring and/or bracing needed.

Bearing capacity of surfaces in excavations or on compacted fill shall be adequate to support the building or structure to be placed thereon. IRCDUS shall require testing by an independent testing laboratory to verify adequacy of the foundation design and/or to require special foundation features, such as larger footings, piles, increased compactions, etc.

Fill and backfill shall be compacted to a minimum of 98% of maximum density at optimum moisture, as determined by ASTM D-1557, Method D, or AASHTO Specification Method T-180.

Building site shall be kept clear of rubble and any material, which may be hazardous to persons or impede construction progress.

- b. When structures are to be constructed of, or are to contain, any wood or wood products, soil treatment shall be required for termite control.

Chemicals shall be one of the following water-based emulsions, uniform in composition, containing a dye that will be readily seen to the naked eye after application to the soil, and containing in concentration by weight:

- 1 Dieldrin, 0.5 percent
- 2 Aldrin, 0.5 percent
- 3 Heptochlor, 0.5 percent
- 4 Or equal

Application of chemical selected shall be made to all areas along foundation walls, around piers and under all concrete slabs at the following rates:

- 5 Foundation walls and piers, all sides, 4 gallons per 10 linear feet, mixed with backfill, to a depth of one foot below finished grade for concrete; for masonry, increase application rate proportionately by depth of foundation or piers.
 - 6 Within voids of masonry foundation walls or piers, apply to void at or near bottom of foundation at rate of 2 gallons for each 10 linear feet.
 - 7 Under all concrete slabs less than 6 feet below finish grade, one gallon per 10 square feet.
- c. Design, material, workmanship and practices shall conform to American Concrete Institute Manual of Standard Practice (ACI 315) and the Code of Standard Practice of the Concrete Reinforcing Steel Institute (CRSI).

Field and laboratory tests shall be conducted by independent testing laboratory on structural concrete pours for buildings to ascertain that concrete design slumps and strengths are attained.

Applicable standards shall include latest editions of the following:

- 1 Southern Standard Building Code
- 2 Building Code Requirements for Reinforced Concrete – ACI 318
- 3 Concrete proportions and placing – ACI 211.1 and ACI 301
- 4 Concrete design for sanitary engineering structures – ACI Committee 350 Report 68-50
- 5 Formwork – ACI 347
- 6 Reinforcing bars – ASTM A-615, Grade 60
- 7 Stirrups and ties – ASTM A-615, Grade 40
- 8 Welded wire fabric – ASTM A-185
- 9 Cement for concrete not exposed to sewage – ASTM C-150, Type I
- 10 Cement for concrete exposed to sewage – ASTM C-150, Type II, or ASTM C-150, Type I, with sulfate resistant properties equal to Type II if Type II is not available and the design engineer affirms the acceptability of Type I
- 11 Watertight and chemical resistant concrete – ACI 614
- 12 Aggregate – ASTM C-33, salt free
- 13 Water – potable (free from oil, alkali, acid, salt, organic matter, etc.)
- 14 Ready-mix – ASTM C-94
- 15 Slump test – ASTM C-143
- 16 Compression Test – ASTM C-39, at cylinder ages of 7 days, 28 days and finally, if indicated and directed by design engineer, at extended time period, not to exceed 45 days
- 17 Test Cylinders-ASTM C-31 minimum of 3 per 50 cubic yard of pour or fraction thereof.

Water stops and vapor barriers shall be provided as follows:

- 18 Water stops shall be installed at all construction joints in concrete structures retaining liquid and at all construction joints at or below ground level in concrete structures required to remain dry.
- 19 Damp check or waterproof membranes shall be installed under and around all concrete slabs to be placed against soil, with joints lapped a minimum of 6 inches.

- d. Concrete masonry units shall be of a modular design and conform to ASTM C-90, Grade U-1.

Brick masonry units shall be clay and conform to ASTM C-216, Grade SW for below groundwork and grade MW for the above groundwork.

Reinforcement of all masonry unit walls shall be provided at alternate courses with “Dur-O-Wall,” “Wal-lock,” “Block-Lok” or approved equal.

Anchors and ties shall be of ferrous metal, with zinc coating conforming to ASTM A-153, Class B-1, B-2, or B-3, as appropriate, and as follows:

- 1 Rigid steel: 1 inch x ¼ inch x 24 inch, with ends turned down 3 inches
- 2 Wire mesh: 16 gage, ½-inch mesh, 3 inches x 16 inches
- 3 Veneer ties: No. 6 W & M gage wire bent 90 degrees to form 2 inch hook for mortar embedment, or 22 U.S. gage corrugated sheet metal.
- 4 Spacing of ties shall be such that each tie shall not support more than 3 square feet of wall area with vertical spacing not more than 24 inches, and with additional ties at wall openings.

Mortar shall conform to ASTM C-270 (except that slag cements shall not be used), Type M or S. Type N may be used for non-bearing interior walls and partitions above grade.

- e. Waterproofing

Waterproofing shall be provided in two coats on all exterior surfaces of subgrade concrete or masonry walls, with outside lap of vapor barriers, damp checks or waterproof membranes thoroughly sealed into the sidewall waterproofing material.

Waterproofing material shall be an asphalt base coating applied in accordance with manufacturers’ recommendations – Tnemec Co. No. 461, “Foundation Coating” (black) or approved equal.

Minimum film thickness when dry after application shall be 8.0 mils for the first coat and 6.0 mils for the second coat.

- f. Complete architecture plans and specifications for building shall be submitted for approval by the County prior to construction. In no case shall a structure be planned or designed without regard to aesthetic appearance and maintenance costs.

Exterior wall finishes for permanent above-grade buildings or structures shall comply with one or more of the following selection of materials:

- 1 Stucco/stucco brick
- 2 Rubbed concrete
- 3 Brick, over masonry or sturdy wood frame
- 4 Stone aggregate on masonry
- 5 Stone
- 6 Asbestos-cement on masonry substrate

g. Steel or other ferrous materials shall conform to the following:

- 1 Structural shapes and plates – ASTM A-36
- 2 Pipe – ASTM A-53
- 3 Bolts, machine – ASTM A-307
- 4 Bolts, high tensile – ASTM A-325
- 5 Galvanizing – ASTM A-123 or A-153, as applicable
- 6 Iron castings – ASTM A-48, Class 25
- 7 Abrasive cast iron (nosings) – American Abrasive Metals Co. “Feralun,” or approved equal.
- 8 Cast steel – ASTM A-27, Grade N2
- 9 Stainless steel – Type 304, unless otherwise required or specified
- 10 Fabrication and erection – AISC Manual of Steel Construction.

Aluminum materials shall conform to the following:

- 11 Rolled shapes, smooth or checkered plates and extruded pipe – ALCOA 6061-T6 or approved equal
- 12 Other extruded shapes – ALCOA 6063-T5 or approved equal
- 13 Sheets -- ALCOA 3003 or approved equal
- 14 Pipe hand railing – ASTM B-429

h. Natural light is preferred for all buildings, and use of common sizes, spaced for adequate natural lighting of interiors is encouraged.

Windows and frames shall conform to quality standards ANSI A-34 and AAMS 30 for high performance series.

Frames shall be basic aluminum 6063-T5 with fasteners of aluminum or stainless steel.

Plate glass shall be a minimum thickness of 7/32” and set in vinyl glazing material.

All windows shall be sealed all around, both sides, with a non-shrink silicone-base caulk.

- i. Door frames shall be a combination buck and frame type, with adjustable anchors for masonry applications. Frames shall be filled with sand-cement grout when installed.

Doors shall be constructed of honeycomb material with metal laminated facing. Minimum door thickness is 1 $\frac{3}{4}$ ". Height is 6'–8".

All doors and frames shall be mortised and reinforced to receive hardware. Non-ferrous metal should be used at all areas exposed to corrosive atmosphere.

All door frames shall be sealed all around, both sides, with a non-shrink silicone base caulk.

- j. Finished Hardware shall be heavy duty type with non-magnetic accessories and compatible with door and frame materials.

Panic exit devices shall be provided in all areas of corrosive or hazardous atmosphere that may be encountered by occupants.

Finished hardware shall include:

- 1 Locksets – cylinder type with dead latch, suitable for master keying
- 2 Butt hinges – 1 $\frac{1}{2}$ pairs per door, ball bearing type preferred
- 3 Door closers, holders and silencers
- 4 Thresholds – aluminum
- 5 Flush bolts
- 6 Panic exit devices, as indicated

- k. All carpentry components shall be of high quality, with galvanized fasteners and treated wood where in contact with all masonry, metal or exposed to weather.

Rough Carpentry of construction grade lumber shall conform to standards as follows:

- 1 National Lumber Association – Specification for stress grade lumber and its fasteners
- 2 American Institute of Timber Construction - Uniform Specifications
- 3 Truss Plate Institute Specifications

Finish carpentry or millwork shall be of "B" or better yard grade seasoned lumber, conforming to applicable requirements of

the Architectural Woodwork Institute. Shelving, cabinet doors, tops and ends shall be a minimum of ¾" plywood with all exposed edges trimmed with hardwood. Joints shall be tight and formed to conceal shrinkage.

- I. Moisture controls methods and materials for roofing shall be similar to Johns-Manville or Bird Specifications or approved equal for built-up and shingle roofs.

Flat roofs shall have a minimum slope of 1/16 inch per foot, with 5 ply built-up roofing meeting the requirements for a 20 year bond. All built-up roofs on concrete slabs or metal decking shall be applied to 1 inch rigid insulation board.

Pitched shingle roofs shall have a minimum pitch of 3-½ inches vertical to 12 inch horizontal, with seal down type asphalt or fiberglass shingles at 300 lb. per square on two) layers of 15 pound underlayment, meeting requirements for a minimum of 15 year warranty. As an alternative to shingle roofs, metal roofs are acceptable upon approval by IRCUDS and the County Building Department.

Fascia, gravel stops and soffits shall be of low maintenance materials, architectural metal or masonry preferred.

Flashing and trim shall be either galvanized steel, 24 gage minimum thickness, conforming to Fed. Spec. QQ-S775, Type I, Class C; or aluminum 0.019" minimum thickness.

Gutters and downspouts shall be provided on all permanent buildings. Screen protection from debris and concrete splash blocks are required for all downspouts. Materials shall be as follows:

- 1 Gutters shall be 24 gage galvanized steel or 0.032" anodized aluminum
- 2 Downspouts shall be 26 gage galvanized steel or 0.025" anodized aluminum
- 3 Hanger straps shall be the same material as gutters, and 3 feet on centers, with blocking behind downspouts

- m. Stairs shall be of reinforced concrete or all-welded structural aluminum. Nosing and treads shall be non-skid. Tread widths and riser heights shall conform to applicable codes wherever possible. The use of ship-ladders or vertical ladders is discouraged.

Handrails shall be of all-welded 1 ½ inch outside diameter aluminum pipe, 42 inches high with intermediate rails. Rail

post spacing shall not exceed 8 feet. Kick plates shall be used on all areas above the first floor.

Grating and checkered plate shall be of aluminum, and designed to carry a uniform live load of 200 pounds per square foot with a safety factor of 5, based on ultimate strength. Reinforcing shall be utilized to preclude deflections greater than 1/160 of span. All grating and plates shall have non-skid surfaces.

Plumbing fixtures shall include, but not necessarily be limited to water closets and lavatories. IRC/DUS may require shower, water heater and drinking fountain at larger facilities. Appropriate toilet partitions and stainless steel accessories shall be provided as indicated. Provide handicap facilities as required.

Fire extinguishers shall be 10 pound type ABC rechargeable units, provided and spaced as applicable in all buildings and structures.

Other safety equipment shall be provided wherever hazardous materials or equipment are utilized, such as eyewash fountains, gas masks, emergency lighting, etc.

16.04 Painting

A. General

This section includes the general requirements for painting materials and workmanship, as applicable to all sewer and water facilities.

Painting materials shall be delivered to the work site in the original and unbroken containers, marked with the manufacturer name, type of material and analysis of the product, and stored at one location. Special care shall be exercised in the handling and maintenance of painting materials, and all applicable safety regulations shall be followed.

Table 1 on page 16-14 shall be included in the project specifications for specific facility items and surfaces. Said schedule shall include, but not be limited to, the specific surface to be coated and specified painting system, with minimum dry mil thickness per coat required.

1. Materials

All paints and painting materials shall be high-grade products of manufacturers of established reputation and shall be "Approved" for the intended use.

To ensure a satisfactory end product, it is essential that paint coats be mutually compatible; both shop and field applications. To this end, insofar as possible, all paints applied to a given surface shall be the product of a single manufacturer.

The paint material set forth in Table 1 shall be the minimum acceptable type for the application indicated.

2. Application

The Contractor shall do a complete painting job throughout the project in accordance with generally approved modern practice for work of high quality. Additionally, surface preparation and application shall be in strict compliance with the manufacturers' recommendations, and paint shall not be extended or modified.

Factory finish coatings shall be inspected following installation and any mars or blemishes shall be touched up in the field with the original color and type of paint.

3. Painting Requirements

Table I, on page 16-14, specifies in general the surfaces to be painted; service conditions for the indicated surfaces; finish paint coating for the specific surface and service condition; and other special requirements. The total painting system (surface treatment, primer, finish coat and other necessary applications) and minimum dry mil thickness per coat required to achieve the specified finish for the specific surface and service condition shall be in strict compliance with the paint manufacturers' recommendations.

For convenience of description and as a standard for a quality comparative reference, Table 1 indicates the finish coating by name, number, or both, for products manufactured by Tnemec Company, Inc. or an approved equal, for the subject manufacturer, and approved equal products are acceptable.

In addition to the data contained herein, painting for water storage tanks shall comply with AWWA Standard Specifications D102-97, or latest revision, "Coatings for Steel Water Storage Tanks."

Unless specifically indicated under "Pipe Color Code", the color for surfaces to be painted shall be as selected by the IRCDUS and in compliance with OSHA regulation. The finish paint color for exposed sewerage and water facilities piping shall be as follows for the specified service:

Pipe Color Code:

Sewage—Gray (Solid)

Sludge—Brown (Solid)
Potable Water—Blue (Solid)
Raw Water (water facilities)—Blue (with 2-inch bright orange bands spaced 24 inches apart)
Reclaim—Pantone Purple
Brine—Orange
Non-Potable Water (Plant)—(Bright Orange (Solid)
Gas or Fuel Oil—Red (Solid)
Compressed Air—Green (Solid)
Chlorine Gas—Yellow (Solid)
Chlorine or other chemical solutions—Yellow (with 24 inch red bands spaced 24 inches apart)
Other Services—As directed by the County
Note: Banding shall be accomplished by painting or approved durable plastic adhesive tape.

Surfaces which shall not require painting (unless service color coding, or other specific coatings are required), are as follows: exterior piping, below ground; factory finished equipment; galvanized fencing; stainless steel; aluminum and brass; plastic or rubber; concrete floors and stair treads; interior of concrete below grade dry pits; and exterior concrete surfaces.

Table 1
Paint Schedule

General Applications

<u>Surface to be Painted</u>	<u>Service Conditions</u>	<u>Finish Paint Coating</u>
Masonry and Concrete, Walls and Ceilings	Interior Above Grade Normal Conditions	Series 6 or 7
Masonry and Concrete, Buildings and Tanks	Exterior Above Grade Normal Conditions	Series 6 or Series 156/157
Wood	Interior Normal Conditions	Ponkote 300 Enamel Primer 36-601 Finish Series 66
Wood	Exterior Normal Conditions	Finish Series 73
Metal, Machinery, Piping, Systems, etc.	Interior, Normal Conditions Non-submerged	Primer 50-330 Finish Series 66
Metal, Machinery, Piping, Systems, etc.	Exterior, Normal Conditions	Primer 50-30 Finish Series 73
Metal, Machinery, Piping, Systems, etc.	Severe Moisture and Condensation	Primer 50-30 Finish Series 73
Metal, Large areas, Tank Structural Steel, etc.	Exterior- Moderate to Normal Conditions	Primer 66-1211 Finish Series 73

Wastewater Facilities

<u>Surface to be Painted</u>	<u>Service Conditions</u>	<u>Finish Paint Coating</u>
Concrete, Wet well, Channels, etc.	Submerged or Severe Conditions	Series 46-413 Coal Color-Rigortex 3324 Enamel Tar 104-Series 104
Metal, Equipment, Piping, Tanks, Etc.	Submerged, Intermittently Submerged	Primer 66-1211 Finish 46-413 (2 Coats, 8 mils each) or Finish 46H (1 coat 16 mils)
Metal, Moving parts Chains, Gates, etc.	Submerged Intermittently Submerged	Grease coating

Water Facilities

<u>Surface to be Painted</u>	<u>Service Conditions</u>	<u>Finish Paint Coating</u>
Concrete, Tanks, Troughs, Basins, etc.	Submerged Intermittently Submerged	Primer 20-1255 Beige 3-5 mils Filler Series 63-1500 Finish 20-BB82 4-6 mils
Metal, Tanks, Piping, Equipment, etc.	Submerged Intermittently Submerged	Primer 20-1255 Beige 3-5 mils Filler Series 63-1500 Finish 20-BB82 4-6 mils

Special Notes:

1. All galvanized or other nonferrous surfaces requiring painting shall be pretreated with an approved conditioner or passivator, as recommended by the paint manufacturer, prior to application of the painting system.
2. Bituminous coated pipe shall be coated with Inertol Tar Stop or approved equal, as recommended prior to application of the painting system.
3. Metal surfaces, in contact with concrete or masonry, shall be protected with Tnemec46-413 Coal Tar coating or approved equal, as recommended. This provision shall not apply to concrete reinforcement, piping and fittings, or conduits and accessories.

16.05

Electric

A. General

The provisions of this Section, including other specific design considerations, shall be the minimum standards as applicable to all sewage and water facilities.

It shall be the responsibility of the Contractor to advise the Florida Power and Light Company or the City of Vero Beach regarding the proposed facility prior to installation and to make the necessary provisions for service thereto.

In accordance with the provisions of the General Conditions, complete shop drawings and technical data shall be submitted to IRCDUS including, but not limited to, motor control centers and control systems, with wiring diagrams and components; manufacturers' data for switches, transformers, relays, lighting fixtures and other accessories; panel boards; and all other applicable information.

B. Materials, Equipment and Installation

General Requirements: Materials, equipment and workmanship shall conform to the applicable portions of the codes, specifications, standards and statutes listed below:

National Fire Protection Association:
NFPA No. 70 National Electrical Code

Local Codes:
At the place of the work, all applicable local codes, regulations and ordinances that are in effect will apply.

National Electrical Manufacturers Association:
AB 1 Circuit Breakers – Molded Case
FB 1 Conduit Fittings, Cable Fittings and Accessories
IC 1 Industrial Control
SGB 1 Connectors – Electric Power
KS 1 Enclosed Switches
PB 1 Panel boards
TR 1 Transformers
SG 8.2 Connectors for Copper Conductors
IC 4 Industrial Enclosures
WC 5 Thermoplastic – Insulated Wire & Cable

American National Standards Institute:
C80.1 Rigid Steel Conduit
C6.1 Terminal Markings for Electrical Apparatus

Underwriters' Laboratories, Inc.

Standards for Cabinets and Boxes
Standards for Service Equipment
Standard for Industrial Control Equipment
Standard for Thermoplastic-Insulated Wire

Illuminating Engineering Society:

IES Lighting Handbook

United States Federal Government:

Williams–Steiger Occupational Safety and Health Act of
1970 (OSHA)

C. Special Requirements:

Phase rotation of electrical service shall be: L1, L2, L3 (A, B, C) left to right when facing equipment.

Generator receptacles for portable emergency power connection shall be provided for all electrically operated facilities and shall be as described in the lift station portion of the standards. (Refer to Section 10.10 “B1” and Section 10.10 “C2d” and Drawing S-18).

Motors shall have enclosure types which provide safe protection from exposure to unusual environments such as chemical fumes, damp places, outdoors, poorly ventilated rooms or places with restricted air circulation. In general, enclosures shall be NEMA standardized motor types.

Motor insulation materials shall be Class F Systems.

Motors for non-submersible service shall be sized such that the nameplate horsepower rating shall not be less than 1.2 times the required shaft brake horsepower output. Appropriate NEMA design shall be used to provide torque and/or other load requirements.

Motor electrical rating shall be compatible with station electrical service.

Motor mounts shall be of standard NEMA design and shall be compatible with the driven apparatus.

Motors shall be controlled by NEMA standard controllers for all across the line or reduced voltage starting. Where variable speed pumping is required, the specifications or variable speed pumping is required, the specifications or variable speed control equipment shall be coordinated with the County. In general, motors shall be equipped with all necessary controls and devices for complete and operable systems.

END OF SECTION

Section 17

Engine Driven Generator Sets

Section 17

Engine Driven Generator Sets

17.1.01 General

- A. This specification defines the requirements for an emergency or standby Electric Generator Set for wastewater pumping stations. The generator set shall consist of a diesel or natural gas-powered engine directly coupled to an electric generator, together with the necessary controls and accessories to provide electric power for the duration of any failure of the normal power supply.

Any and all local or state requirements for standby power systems not covered by this specification will be the responsibility of the Contractor, supplier and manufacturer to meet.

- B. Housing developments of 200 or more units shall provide backup generator sets for emergency use as required (Note #2 on Drawing S-21). Generator shall be provided with automatic throw over (transfer) switch that senses power interruption from the main power source, starts the generator and shifts the power supply to the lift station from the generator.

17.1.02 Design Standards

- A. The equipment covered by these specifications shall be designed, tested, rated, assembled and installed in strict accordance with all applicable standards of ANSI, NEC, ISO, U.L., IEEE and NEMA.
- B. The Contractor shall provide a complete integrated emergency generator system. The system consists of a diesel generator set with related component accessories and Automatic Transfer Switch(es) as specified herein.

- C. The generator set shall have the following characteristics:
- | | |
|--------------|---------------------------------------|
| Voltage | 240/480 (As Required By Power Supply) |
| Phase | 3 |
| Connection | Y |
| Wire | 4 |
| Hertz | 60 |
| Power Factor | 0.8 |

The generator set shall be capable of starting and running the existing loads and proposed loads without exceeding the maximum voltage and frequency variations specified herein, or the maximum temperature limitations of the engine and generator. The generator set shall be capable of starting all motor loads, with the non-inductive load applied first.

- A. Terminals on all terminal blocks shall be individually identified.

17.1.03 Acceptable Manufacturers

- A. Quality and Experience: All materials and parts of the generator set shall be new and unused. Each component shall be of current manufacture from a firm regularly engaged in the production of such equipment, as listed in the Approved Manufacturers' Products List, Section 18. Units and components offered under these specifications shall be covered by the manufacturers' standard warranty on new machines, a copy of which shall be included in the submittal.
- B. There shall be one source responsibility for warranty, parts and service through a local representative with factory trained service personnel.

17.1.04 Submittals

- A. Engine-generator submittals shall include the following information:
 1. Factory published specification sheet indicating standard and optional accessories, ratings, etc.
 2. Manufacturers' catalog cut sheets of all auxiliary components such as Automatic Transfer Switches, battery charger, control panel, enclosure, main circuit breaker, etc.
 3. Dimensional elevation and layout drawings of the generator set, enclosure and transfer switchgear and related accessories.
 4. Weights of all equipment.
 5. Concrete pad recommendation, layout and stub-up locations of electrical and fuel systems.
 6. Interconnect wiring diagram of complete emergency system, including generator, switchgear, day tank, remote pumps, battery charger, jacket water heater, remote alarm indications.
 7. The bidder shall submit with his submittal an estimate of engine mechanical data including heat rejection, exhaust gas flows, combustion air and ventilation air flows, noise data, fuel consumption, etc. when operating at 100% load. These estimates shall be based on manufacturers' data.
 8. Generator electrical data including temperature and insulation data, cooling requirements, excitation ratings, voltage regulation, voltage regulator, efficiencies, waveform distortion and telephone influence factor.
 9. Generator resistances, reactances, and time constants.
 10. Generator motor starting capability.
 11. Control panel schematics.
 12. Oil sampling analysis, laboratory location, and information.
 13. Manufacturers' and dealer's written warranty.

- B. Operation and Maintenance Information. The system supplier shall furnish five sets of operating, maintenance and parts manuals to IRCDUS covering all components for the generator set system. The supplier shall also instruct the Owner and/or IRCDUS in operation and maintenance of the unit.

17.1.05 Warranty

- A. The manufacturers’ standard warranty shall in no event be for a period of less than five (5) years from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Submittals received without written warranties as specified will be rejected in their entirety.

17.1.06 Parts and Service Qualifications

- A. Engine driven generator sets which can be properly maintained and serviced without causing IRCDUS either to carry expensive parts stock or to be subjected to the inconvenience of long periods of interrupted service because of lack of available parts. The supplier shall specify the nearest location of permanent parts outlets from which parts may be obtained.
- B. The engine-generator supplier shall have service facilities within 75 miles of the project site and maintain 24-hour parts and service capability. The distributor shall stock parts as needed to support the generator set package for this specific project.
- C. The dealer shall maintain qualified, factory trained service personnel that can respond to an emergency call within 2 hours of notification, 24 hours per day.

PART 2 – PRODUCTS

17.2.01 GENERAL REQUIREMENTS

- A. The equipment supplied and installed shall meet the requirements of the NEC and all applicable local codes and regulations. All equipment shall be of new and current production by a MANUFACTURER who has 25 years of experience building this type of equipment. Units and components offered under these specifications shall be covered by the manufacturers’ standard warranty on new machines, a copy of which shall be included in the submittal. Manufacturer shall be ISO9001 certified.

- B. The system shall be free of injurious torsional and bending vibrations within a speed range from 10% below to 10% above synchronous speed.
- C. The system shall be adequately guarded both physically and electrically for protection of operating personnel.

17.2.02 ENGINE

- A. General Description. The engine shall be of the internal combustion type equipped to operate on natural gas, at locations where natural gas is available or No. 2 diesel fuel.
- B. Engine Power Rating. The rated net horsepower of the engine at the generator synchronous speed, with all accessories, shall not be less than that required to produce the KW required. The horsepower rating shall take into account generator efficiency and all parasitic losses such as fan, battery charger, etc. The generator set shall be capable of producing the required KW (without overload) for the duration of the power outage (standby rating), under the following ambient conditions:

Altitude, feet	1000
Ambient temperature range, °F	0-100
Humidity at max. ambient temp. %	80

- C. Fuel and Oil Consumption. Accompanying the supplier's bid, the bidder shall supply fuel and oil consumption estimates based on engine manufacturers' data, a copy of which shall be included in the submittal.
- D. Governor (Engine Speed Control). The engine shall be equipped with a suitable governor to maintain frequency within limits, as specified below, by controlling engine and generator speed.
 - 1. Type: isochronous
 - 2. Stability: 1/4% maximum steady state frequency variation at any constant load from no load to full load.
 - 3. Regulation: 1/4% maximum frequency deviation between no-load steady state and full-load steady state.
 - 4. Transient: 5% maximum frequency dip on most severe motor starting condition.
 - 5. Transient: 2 seconds maximum recovery time for maximum motor start.
 - 6. The manual speed adjusting control shall be mechanical or electrical if located on the generator set or electrical if located in a remote control panel.
- E. Engine Crank-Start System. The engine shall be electric start, provided with a solenoid energized motor, with either positive engagement or clutch drive to the engine.

1. Lead-calcium batteries shall be furnished to provide power to the engine cranking motor. The batteries shall be designed for operation at a minimum ambient temperature of 0 °F.
2. The voltage shall be as required by the engine manufacturer.
3. The batteries shall be capable of a minimum of four crank cycles (rolling) of the specified prime mover and have sufficient current available for "break-away" currents for the particular engine used at the specified worse case temperature.
4. A float type battery charger, compatible with the batteries selected, shall be furnished which shall maintain the starting batteries at full charge. The charging system shall permit charging from either the normal or the emergency power source. It shall have a high rate and low rate charging system. A voltmeter shall indicate the charge rate and the circuit will be protected by either fuses or circuit breakers. The charger or charging circuit shall be so designed that it will not be damaged during the engine cranking, achieved, for example, by a current limiting charger or a crank disconnect relay. It shall also be capable of recharging a discharged battery in 12 hours while carrying normal loads.

F. Engine Cooling System. The engine shall be liquid cooled. The type of liquid cooling system shall be a unit mounted radiator. The radiator capacity shall be suitable for operation in the ambient temperature specified in paragraph 17.2.02, plus the air temperature rise across the engine.

G. Air Supply/Exhaust System.

1. Cleaner: An air cleaner and silencer shall be furnished as recommended by the engine manufacturer and shall be located and mounted as recommended by the engine manufacturer.
2. Exhaust: An exhaust system of suitable size, configuration and material in accordance with engine manufacturers' recommendations shall connect the exhaust outlet of the engine to the silencer. The type of silencer shall meet the requirements of engine manufacturers and shall be residential silencing type.
 - a. The exhaust system and silencer shall have the configuration shown on the drawings, and shall be of such size that back pressure on the system will not exceed the back pressure permitted by the manufacturers' recommendation. A flexible connection shall be mounted at the engine exhaust outlet and the discharge end of the exhaust line shall be protected against entry of precipitation. Piping within reach of personnel shall be protected by screening or suitable lagging. All exhaust piping shall be gas tight.

H. Engine Protective Devices. The following engine protective devices shall be provided, and an indicator light shall be supplied for use with each device specified.

1. Alarm system for high water temperature and/or low oil pressure.
2. Automatic engine shutdown for high water temperature and/or low oil pressure.
3. Combination alarm and shutdown system for high water temperature and/or low oil pressure.
4. Engine overspeed automatic shutdown device.
5. Engine failed to start indicator light (overcrank).
6. Alarm for low coolant level.
7. A shunt trip and undervoltage trip shall be incorporated to cause the circuit breaker to open simultaneously with any automatic shutdown of the engine.

I. Fuel Supply for Engine.

1. Main Fuel Storage Tank:

A fuel storage tank shall be manufactured of corrosion resistant material and sized to allow full capacity generator operation for a minimum of seventy-two hours without refilling with a maximum fuel capacity of 500 gallons. A fuel storage tank shall be located in the place indicated on the plans and shall be complete with all piping and fittings connected. The tank shall be new and unused, and no galvanized material shall be used in the tank or system. The tank shall be furnished with faucet valve located in the supply pipe of the tank and a check valve incorporated to ensure prime is maintained. The tank shall be vented to atmosphere. Location and installation of the fuel storage shall be in accordance with applicable government, insurance restrictions, and local building code. A fuel level gauge shall be located at the tank.)

2. Main Fuel Delivery System: A system shall be supplied to deliver an adequate amount of fuel to the engine from the storage tank. Pipe sizes shall be no smaller than the minimum recommended by the engine manufacturer to avoid fuel flow restriction. The engine supply and return line shall be equipped with a length of flexible fuel lines, unions and gate valves. No copper lines are acceptable.
3. The system shall include an engine driven transfer pump of sufficient lift and capacity to deliver fuel at the maximum required rate from the storage tank to the engine. A check valve shall be furnished in supply line at engine.

17.2.03

GENERATOR

- A. Description. The generator shall meet all requirements of NEMA MG-1, Part 22, in design, performance and factory test procedures. The regulator shall be factory wired and tested with the generator. The generator shall have the characteristics and ratings required by paragraph 22.10.
- B. Excitation System. The generator shall be equipped with a permanent magnet generator (PMG) excitation system. Both the PMG and the rotating brushless exciter shall be mounted outboard of the bearing. The system shall supply a minimum short circuit support current of 300% of the standby rating for 10 seconds. The rotating exciter shall use a three phase full wave rectifier assembly with hermetically sealed silicon diodes protected against abnormal transient conditions by a multi-plate selenium surge protector.
- C. Construction. The insulation system of both the rotor and stator shall be of NEMA Class H materials and shall be synthetic and non-hygroscopic. Field windings shall be on the rotor, and the rotor core shall be shrunk-fit and keyed to the shaft. The stator winding shall be of 2/3 pitch design to eliminate the third harmonic. Units rated above 1500 kW or 601 volts or higher shall be form wound.
 - 1. The temperature rise of both the rotor and the stator shall be in accordance with the applicable sections of NEMA MG-1-22, BS-5000 part 99, or CSA C22.2, for the type of service intended. The generator shall be self-ventilated.
- D. Conduit Box. Load connections shall be made in the front-end mounted junction box. The generator construction will allow connection to the load through the top, bottom or either side of the junction box.
 - 1. The conduit box shall contain two compartments: one to house the rotating rectifier and PMG, and the other to house the connection area and regulator. This is to separate the rotating elements from the load connection and voltage regulator adjustments.
- E. Verification of Performance. All performance and temperature rise data submitted by the bidder shall be the result of the actual test of the same or duplicate generators. Temperature rise data shall be the result of full load, 0.8 power factor heat runs at the rated voltage and hertz. All performance testing shall be done in accordance with MIL-STD-705 and/or IEEE Standard-115.

- F. Efficiency. The generator efficiency shall be determined in accordance with NEMA MG-1, paragraph 22.44. All test results shall be submitted to the Engineer for approval.

17.2.04 VOLTAGE REGULATION

- A. The generator shall be equipped with a voltage regulator to maintain voltage within limits as specified below:
 - 1. Stability: 1/2% maximum voltage variation at any constant load from no load to full load.
 - 2. Regulation: 1% maximum voltage between no load steady state and full load steady state.
 - 3. Transient: 20% maximum voltage dip in most severe motor starting condition. See paragraph 1.01.
 - 4. Transient: Two (2) seconds maximum voltage recovery time with application or removal of 0.8 power factor full load.
- B. The regulator shall be a solid state type using transistors or SCR's. The unit shall include volts/hertz underspeed protection, three-phase RMS sensing, and overexcitation protection. The regulator shall also provide loss of sensing protection, regulator current limit, temperature protection and an engine unloading circuit. EMI suppression shall be provided meeting MIL-STD-461B, part 9 standards.

17.2.05 GENERATOR FULL MAIN LINE CIRCUIT BREAKER

- A. A generator main circuit breaker shall be provided rated at manufacturers recommended amperes minimum frame size, and volts, 100% rated. The interrupting capability shall be greater than the generator short circuit capability, but not less than 60,000/30,000 symmetrical amperes at 240/480 volts. The breaker continuous current trip rating shall be selected to provide overload protection for the generator.
- B. The breaker shall be provided with a shunt trip device. The generator starting circuit battery system will be used as the power source for the shunt trip circuit. The shunt trip coil voltage shall be suitable for use on the starting circuit.
- C. The breaker shall include three (3) normally open and three (3) normally closed auxiliary contacts.
- D. The breaker shall be a NEMA 4X.

17.2.06 AUTOMATIC START AND STOP CONTROLS

- A. General Description. Automatic starting and stopping controls shall be furnished to start the engine automatically when the normal electric

power fails or falls below specific limits and to stop the engine automatically after the normal power supply resumes. The signal for starting or stopping the engine shall be from an external auxiliary contact. The controls shall be capable of operating at 50% of normal DC system supplied voltage.

- B. Engine Cranking Control. Crank control and time delay relays shall provide at least one cranking period. If only one cranking period is provided, its duration shall be at least 15 seconds. If more than one cranking attempt is provided, each cranking period shall be for at least seven (7) seconds, and the cranking attempts shall be separated by appropriate rest periods. A sensing device shall automatically disconnect the starting circuit when the engine has started. If the engine has not started at completion of the starting program, the overcranking signal shall so indicate. The engine starting controls shall be locked out and no further starting attempts shall take place until the overcranking device has been manually reset.
- C. Selector Switch. A selector switch shall be incorporated in the automatic engine start and stop controls. It shall include an "off" position that prevents manual or automatic starting of the engine, a "manual" or "handcrank" position that permits the engine to be started manually by the pushbutton on the control cabinet and run unloaded; an "automatic" position which readies the system for automatic start or stop on demand of the automatic load transfer switch or a programmed exerciser.
- D. Manual Test Operation. It shall be possible to start the engine manually and run it unloaded by a manual pushbutton on the control cabinet that causes the engine to start, run and stop through the automatic start and stop controls.

17.2.07

INSTRUMENTATION

- B. Instruments and Controls. The following engine and generator instruments and controls shall be furnished and installed:
 - 1. A.C. ammeter
 - 2. A.C. voltmeter
 - 3. Governor speed adjusting control
 - 4. Water temperature gauge
 - 5. Oil Pressure gauge
 - 6. Manual start/stop control
 - 7. Voltmeter/ammeter phase selector switch
 - 8. Elapsed time meter
 - 9. Panel lights
 - 10. Indicator lights for engine alarm

All wiring and interconnections shall be in accordance with commercial

electrical standards.

C. Location

1. All of the foregoing instruments, lights and controls shall be mounted in a control panel on the generator set. All instrumentation must be isolated from engine generator set vibration.
2. In addition, an ammeter, voltmeter, and "generator ready" light, a start/stop control, and an audible alarm and alarm light shall be provided in a generator control panel to be remotely wall mounted. The audible alarm and alarm light shall operate for any of the engine or generator alarms provided on the local control panel. Cable between the local and remote control panels shall be provided.

D. Panel Design. All instruments, controls and indicating lights shall be properly identified. All wires shall be individually identified and must agree with wiring diagrams provided.

17.2.08 ACCESSORIES

A. Enclosure. The entire engine-generator assembly, including the battery, battery charger, day tank, lift pump, control panel, and radiator shall be enclosed in an aluminum sound attenuated enclosure suitable for an outdoor environment. The enclosure shall attenuate to a decibel level of 65-70 dB at a distance of 7 meters horizontally in any direction around the entire generator enclosure. The enclosure shall meet all local, state and federal wind load standards. Provisions shall be made on the enclosure for mounting the engine exhaust silencer. Louvers or dampers shall be provided to allow adequate radiator ventilation during operation without reducing the rating of the engine-generator unit. Doors shall be provided as required for access to the engine and control panel. Generator pad / platform shall have a maintenance walk a minimum of 3'-0" wide around three sides of the generator, also see plans. Stairs shall be provided from grade to the pad / platform where the elevation difference is greater than 1' - 0" from final grade to the top of the generator pad / platform.

B. Block Heater. An engine block heater shall be provided to keep the engine coolant at a temperature of 85° F with the ambient temperature at the minimum specified in paragraph 2.02. The heater shall be suitable for operation at 120/240 (**NOTE TO DESIGNER Select desired voltage**) volts AC, single phase.

C. Control Panel Heater. A heater shall be provided in the control panel to keep the interior of the panel above 40° F when at the minimum ambient temperature specified in paragraph 17.2.02. The heater shall be operated by a thermostat, and shall be suitable for operation at 120

volts ac, single phase.

17.2.09 TRANSFER SWITCH

- A. Automatic Transfer (Throw Over) Switches required with a stainless steel 4X breaker disconnect cabinet, as approved by IRCDUS Engineer.

17.2.10 TELEMETRY

- A. Telemetry equipment required as approved by IRCDUS Engineer.

PART 3 – EXECUTION

17.3.01 INSTALLATION

- A. Install equipment in accordance with manufacturers' recommendations, the project drawings and specifications, and all applicable codes. Installation of the system includes but is not limited to pouring a concrete pad for the generator set and automatic transfer switch, receiving and offloading the equipment, providing all labor, permits and material to install the total system.
- B. Mounting. The mounting of the generator set shall be sufficiently rigid to maintain alignment and to minimize the engine and generator stresses. The floor loading shall not exceed 5000 lbs. per sq. ft. A suitable number of spring type, vibration, rubber type, and fiberglass isolators shall be inserted between the engine generator set and the floor.
- C. Placement on Site. Refer to Drawing S-16 for typical placement of emergency generators on wastewater pumping station sites in Plan Views "A" and "B".

17.3.02 START-UP AND TESTING

- A. Acceptance Test. A complete system load test shall be performed after all equipment is installed. The extent of testing shall be at the discretion of the engineer. The completed generator set shall be tested at 1.0 power factor for a period of one hour at full load prior to shipment to the job site. In addition, the generator set supplier shall include in his bid the cost of an on site, full load test (using portable resistive type load banks or building load or combination thereof) for a minimum of four hours in the presence of a representative of the Owner and/or Engineer before final acceptance.
- B. Coordinate all start-up and testing activities with the Engineer, Owner, and IRCDUS.

C. After installation is complete and normal power is available, the manufacturers' local dealer shall perform the following:

1. Verify that the equipment is installed properly.
2. Check all auxiliary devices for proper operation, including battery charger, jacket water heater(s), generator space heater, remote annunciator, etc.
3. Test all alarms and safety shutdown devices for proper operation and annunciation.
4. Check all fluid levels.
5. Start engine and check for exhaust, oil, fuel leaks, vibrations, etc.
6. Verify proper voltage and phase rotation at the transfer switch before connecting to the load.
7. Connect the generator to building load and verify that the generator will start and run all designated loads in the plant.

D. Perform a 4 hour load bank test at full nameplate load using a load bank and cables supplied by the local generator dealer. Observe and record the following data at 15 minute intervals:

1. Service meter hours
2. Volts AC - All phases
3. Amps AC - All phases
4. Frequency
5. Power factor or Vars
6. Jacket water temperature
7. Oil Pressure
8. Fuel pressure
9. Ambient temperature

E. Operation and Maintenance Manuals

1. Provide TWO (2) sets of operation and maintenance and manuals covering the generator, switchgear, and auxiliary components. Include parts manuals, final as-built wiring interconnect diagrams, start-up test reports, and recommended preventative maintenance schedules.
2. Ventilation Requirements. The bidder shall submit with his submittal an estimate of air flow requirements for cooling and combustion, plus an estimate of heat rejection of the engine and generator when operating at 100% load. These estimates shall be based on manufacturers' data.

F. Training

1. Provide one day of on-site training to instruct the Owner's personnel in the proper operation and maintenance of the equipment. Review operation and maintenance manuals, parts

manuals, and emergency service procedures.

- G. The CONTRACTOR shall provide a full tank of diesel fuel for the completion of all testing.

END OF SECTION

SECTION 18

Approved Manufacturers' Products List

Air Release Valves – Sewer

- A.R.I.

Air Release Valves – Water

- APCO
- A.R.I.
- GA Industries
- Val-Matic

Backflow Preventer (RPZ) and Double Detector Check Valves with RPZ Assembly

- AMES Fire and Waterworks -Silver Bullet Series
- FEBCO
- Watts
- Wilkins

Blow-Off Valves

- John C. Kupferle Foundry Co. – Model Eclipse #85 or approved equal

Bronze Gate Valves

- American Valve Inc.
- East Jordan
- NIBCO
- Red-White Valve Corp.
- United Brass Works

Casing Spacers/Insulators

- APS- Advance Product &Systems
- Cascade Waterworks Mfg.
- GPT
- Raci North America

Check Valves- Weight & Lever Resilient Seat

- American Darling
- Clow Valve Company
- Kennedy Valve
- M&H Valve
- Mueller Co.
- Val-Matic

Corporation Stops

- A.Y. McDonald Mfg. Co
- The Ford Meter Box Co. Inc. - FB1100 x G-NL Style, FB1700
- Mueller Co. Part #'s H-15028 & H10046

Couplings

- EBAA-Iron
- Krausz-HYMAX
- Smith-Blair (Pump Stations EZ with Seal and Restraint)
- Wal-Rich Dresser™ Pipeline Solutions

Curb Stops

- The Ford Meter Box Co. Inc. - KV43-342WG, KV43444WG, BA43342WG, BA43444WG, B41666WG, B41777WG, BFA43-666WG * & BFA43777WG - NL
- AY McDonald: (Equal to Ford Part Numbers)
- Mueller: (Equal to Ford Part Numbers)

Ductile Iron Pipe

Water: Cement Lined Class 350/50

Sewer/Force Main: Protecto 401 Lines Class 350/50

- American Pipe and Supply
- Clow Valve Co.
- Griffin Pipe Products Co.
- McWane
- U.S. Pipe

Ductile Iron Fittings

Water: Cement Lined Class 350/50

Sewer/Force Main: Protecto 401 Lines Class
350/50

- American Valve
- Clow
- McWane Ductile
- Star Pipe Products
- Tyler Union
- U.S. Pipe

Electrical Equipment as listed or approved equal

- Crouse-Hinds
 1. Cable Connectors “CGB” Series
 2. Emergency Power Receptacle – 3W, No. AR1042-S22 with AR610 Panel Adaptor for pumps less than 25hp, AR2042-S22 with AR610 Panel Adaptor for pumps greater than 25hp
- Eagle Signal Bulletin 705
 1. HK series Elapsed Timer Meter
- Square D
 1. Unfused Safety Switch
 2. Thermal Magnetic Air Circuit Breaker
 3. Magnetic Motor Starter
 4. Reduced Voltage Motor Starter
 5. Pump Mode Selector Switch
 6. Indicator Lamps

Fire Hydrants 5 ¼” Valve Opening

- Clow – Medallion F2545
- East Jordan Iron Works – Part no. 5CD250
- Mueller-Centurion 250

Generator Sets

1000 KW or Greater

- Caterpillar
- Cummins/Onan
- Detroit Diesel

1000 KW or Less

- Atlas-Copco
- Katolight
- Kohler Power
- Tradewinds Power
- Winco

Lift Station Access Door

- Bilco – Type J-AL Single Leaf with Stainless Steel Hardware-Waterproof
- Halliday Products – Single Leaf with Stainless Steel Hardware-Waterproof

Lift Station Control Panels

- ECS (Economy Control Systems, Jacksonville, FL)

Lift Station Joint Sealer

- Marbri Supply Co.
 1. Embeco 636 Grout
 2. Embeco 885 Grout

Lift Station and Manhole Sealant and Coatings

- Pro-Tech EW-1 Water Base Epoxy
- CANUSA WRAPID SEAL

Lift Station Submersible Pumps

- ABS Pump - If a grinder pump is proposed, only ABS type grinder pumps under 5.0 hp are permitted. ABS V2 Pirana Grinder Pumps are not permitted
- Xylem Flygt.

Lift Station Valve Pit Access Door

- Bilco
- Halliday Products

Lift Station Valve Pit Quick Disconnect

- Kamloc Male Kwik Disconnect
- Kamloc Coupler 4"

Lift Station Valve Pit Safety Grate

- Halliday Products
- Bilco

Line Setter for Meter Boxes

6" – Part # Retro-2BVBHH-NL
5/8" X 3/4" Meter Retrosetter

12" – Part # VHH42-12W-NL
5/8" X 3/4" Meter Retrosetter
No Lead 3/4" Key Valve
By Dual Check Valve

- Ford Meter Box

Marker Balls Electronic

- 3M – Water 3M 1403XR, Sewer 3M 1404XR

Manhole Frames and Covers

- U. S. Foundry – Drawing No. 420-C
- PAM –Pamrex Hinged Manhole Cover and Frame

Manholes Flexible Plastic Gaskets

- Press Seal Gasket Corp
- Ram-Nek

Manhole and Lift Station Linings

- AP/M Permaform
- Associated Fiberglass Enterprises
- GU Florida
- LF Manufacturing Co. Inc.

Manhole Pipe Connection (Boot)

- Kor-N-Seal –Neoprene Boot with Stainless Steel Accessories
- PBX (Press Seal Gasket Corp)

Manhole Watertight Rain Guard Boot

- LF Manufacturing Co. Inc.
- Parson Environmental Products

Mechanical Joint Restraints

- EBAA –Megalugs and Bell Restraints
- SIGMA Corp
- Star Pipe Products
- U.S. Pipe – Field Lock Gaskets

Meter Boxes

Polymer Concrete & Fiberglass sizes 11”X18”, 13”X24”, 17”X30”, 24”X36”

- CDR Systems Corp.
- GlasMasters, Pre-Plumbed Box
- Hubbell

Meters for Potable Water

- Octave (Stainless Steel Body)

Meters for Sewer Force Mains and Reuse Mains

- Mag-Meter (on a case by case basis)
- The Abb Group/Fisher Porter

PE Pipe & Tubing

3/4"to 2" SDR 9 CTS
3" to 48" DR11 DIPS

- Chevron-Phillips
- Flying W Plastics Inc.
- JM Eagle
- Municiplex
- Polypipe

Plug Valves

- Clow Valve Co
- DeZurik-Series 100
- Henry Pratt Co.
- Kennedy Valve
- M&H Valve Co.
- Val-Matic-Series 1500

PVC Pipe & Fittings

Water/Force Main - DR18 C900/C909 (for Fittings,
see Ductile Iron Fittings on Page 18-2)

Sewer - SDR 26 3034 (for Fittings, see Sewer
Fittings ASTM D-3034 on Page 18-7)

- Diamond Plastics
- ETI Pipe and Supply
- Freedom Plastics
- J-M Manufacturing Co. Inc.
- National Pipe and Plastic
- North American Pipe Corp.

Reduce Pressure Backflow Preventer Assembly

- AMES Fire and Waterworks - 400SS & 4000SS
- Wilkins –Part No. 975
- FEBCO- Part No. LF825Y

- Watts – Part No. LF909

Remote Telemetry Unit

- DataFlow Systems Inc. - Model TAC II telemetry unit, complete with Model PCU-001 pump control module, BPR backpack radio/TAC pack, power supply with battery backup, Model RTU-03 enclosure, cable and antenna

Resilient Seat Gate Valves

- American Flow Control
- Clow Valve Co.
- Kennedy Valve
- M&H Valve Co.
- Mueller Co.

Service Saddles-Stainless Steel Straps

- The Ford Meter Box Co.
- JCM Industries
- Romac Industries Inc.

Sewer Fittings ASTM D-3034

- The Harrington Corp./HARCO
- Multi Fittings
- Royal Building Products

Sleeve Type Couplings

- The Ford Meter Box Co.
- Smith-Blair - Style 413
- JCM Industries

Tapping Sleeves- Stainless Steel

- The Ford Meter Box Co. – Style FTSS
- JCM Industries- Model 432
- Smith-Blair – Style 663
- Romac Industries Inc.

Tie Rods

All tie rods shall be stainless steel all-thread rods

Trace Wire Covering

- King Innovation –Dryconn Weatherproof Connectors

- SKRINK WRAP
 - a) 3M-ScotchKote Weatherproofing Compound
 - b) 3M- Scotch 33 tape

Trace Wire Port

- Snake Pit (Cast Iron Cover)

Valve Boxes (Domestic Heavy Duty)

- Bingham & Taylor
- East Jordan Iron Works – Long Throat Lid General Foundries Inc
- Tyler Union-USA
- U. S. Foundry

Valve Name Plate

- LF Mfg. Co
- Shiedow Bronze Corp.
- Wager Co.

INDIAN RIVER COUNTY
DEPARTMENT OF UTILITY SERVICES
1801 27th Street, Vero Beach, Florida 32960



UTILITY CONSTRUCTION PERMIT

Permit Issuance Date: Choose an item. Choose an item., Choose an item.

UCP #: [Redacted]

IRC Project #:

Project Name:

Project Location:

Owner/Developer:

Engineer-of-Record: Choose an item. Choose an item.

IRCDUS Inspector: Choose an item.

Project Description: Choose an item.

Services:

- | | | |
|--|---|---|
| <input type="checkbox"/> County Water | <input type="checkbox"/> County Gravity Sewer | <input type="checkbox"/> County Wastewater Force Main |
| <input type="checkbox"/> County Lift Station | <input type="checkbox"/> Private Lift Station | <input type="checkbox"/> County Reuse Water |

General:

This Utility Construction Permit authorizes the above-named Owner/Developer to construct a Choose an item. Choose an item. for the project as shown on the construction plans prepared by Choose an item., and signed and sealed on Choose an item. Choose an item., Choose an item.. Permit Issuance is contingent upon construction being performed by personnel currently licensed in the State of Florida to perform such work. All work shall be performed in accordance with Indian River County Utilities Standards, latest edition and applicable regulatory agency. Utility work shall not commence until all necessary easements and/or permits are acquired, including an Indian River County R-O-W Permit if working within its limits. The limits of construction are delineated by these plans. This permit is valid for a period of twelve (12) consecutive months from the date of issuance and is subject to the special provisions and completion of associated checklist items as provided in Attachment A; this permit does not constitute a permit for operation.

Special Conditions:

If you have any questions, please do not hesitate to contact me at (772) 567-8000, ext. Choose an item.

Sincerely,

Choose an item.

Enclosure: Choose an item.

cc: Vincent Burke, PE, Director of Utility Services (via email)
Richard B. Szpyrka, PE, Director of Public Works (via email)
Stan Boling, AICP, Director of Community Development (via email)
Choose an item. (w/ Enclosure)
Utility Project File UCP # (w/ Enclosure)

ATTACHMENT A

UTILITY CONSTRUCTION PERMIT – SPECIAL PROVISIONS

1. The Owner/Developer or his duly authorized representative, the Engineer-of-Record, property owner and construction contractor shall hold Indian River County harmless in any suits, claims, and/or liabilities arising from subject construction.
2. The Owner/Developer or his duly authorized representative, the Engineer-of-Record and the construction contractor shall have a pre-construction meeting with Indian River County Department of Utility Services (IRCDUS) a minimum of five working days before beginning construction.
3. The contractor shall notify Customer Service, IRCDUS, at (772) 567-8000 a minimum of 48 hours prior to beginning construction or performing any system tests.
4. All water and sewer utility locations are to be coordinated with other utilities such as, but not limited to electric, cable, telephone, irrigation, etc. Minimum setback requirements from water and sewer utilities, as outlined below, must be adhered to prior to acceptance of the water and sewer utilities.

Type of Object	Min. Horizontal Separation between Utility Water/Sanitary Lines and other Utilities & Objects
a) Aboveground permanent objects (i.e. walls, trees, transformer pads, etc.).	Pressure Pipes = Depth of the pipe plus diameter of the pipe Gravity Sewer – ten (10) feet
b) Underground utility lines (i.e., telephone, power, drainage, etc.)	Four (4) feet
c) Surface water body top of bank (i.e. lakes, ponds, canals, etc.).	Two times the depth of the pipe plus the diameter of the pipe

FINAL ACCEPTANCE OF WATER AND SEWER IS CONTINGENT UPON A FINAL INSPECTION BY THE UTILITIES DEPARTMENT AFTER ALL OTHER ON-SITE UTILITIES HAVE BEEN INSTALLED SO THAT MINIMUM SEPARATION REQUIREMENTS, AS OUTLINED ABOVE, CAN BE VERIFIED.

5. This Utility Construction Permit does not eliminate the necessity to obtain a right-of-way permit from Indian River County Public Works Department or other permits that are required by the Florida Department of Environmental Protection (FDEP) or any other county, state, or federal agencies.
6. No construction shall begin until all required easements have been acquired.
7. All applicable permits allowing utilities construction inside any right-of-way shall be submitted prior to commencement of construction. The Land Development Permit must be obtained, if applicable, prior to commencement of any utility construction.
8. Capacity Charges must be paid in full prior to commitment of capacity or issuance of building permit whichever comes first. THERE IS NO GUARANTEE THAT CAPACITY WILL BE AVAILABLE AT TIME OF REQUEST.
9. County Inspection Services: The County’s hours of peration for this project is limited to between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday, excluding holidays. The DEVELOPER shall coordinate needed inspection services between these hours of operation. Should the DEVELOPER require County inspection services beyond the designated hours then the DEVELOPER shall pay the inspectors’ hourly prevailing rate times an overtime direct multiplier of 1.5 times the hourly rate. The DEVELOPER shall not have the right to declare this Agreement in default because it disagrees with the fees and charges imposed for the extended use of the County Inspectors.

ATTACHMENT A

UTILITY CONSTRUCTION PERMIT – SPECIAL PROVISIONS

10. All equipment, materials, and workmanship shall meet or exceed current Indian River County Water and Wastewater Utility Standards and shall be subject to the unconditional inspection and approval of the Indian River County Department of Utility Services.
11. Only IRCDUS approved appurtenances shall be used in construction.
12. Shop drawings shall be provided and reviewed by IRCDUS prior to construction.
13. The Engineer-of-Record (EOR) shall have an on-site representative (inspector) whom shall witness and document all materials used, installation procedures, problems encountered and all tests specified by the Utility Construction Permit Checklist. Daily construction reports shall be submitted not less than monthly to IRCDUS. The daily reports shall be signed and sealed by the EOR. The daily construction reports shall be submitted to IRCDUS no later than seven days after completion of that portion of construction requiring clearance. Indian River County has unconditional rights to inspect the construction and materials at any time.
14. All connections to the IRCDUS system and operation of utility system valves and equipment shall be made under the direct observation of personnel from IRCDUS. Where loss of utility service will occur, a minimum of a 48-hour notice to IRCDUS and the public is required. A 48-hour notice is required for access to private property.
15. No testing of potable water or sanitary sewer system shall commence until Record Drawings have been submitted, approved, and accepted by the Department of Utility Services.
16. Upon completion of construction, utility system shall be flushed, disinfected, and tested in accordance with the current IRCDUS Specifications.
17. Project Closeout: At the time of final completion, an inspection shall be held by IRCDUS in the presence of the property owner, DEVELOPER, Contractor and Engineer-of-Record. At this time, the DEVELOPER shall provide all necessary documentation as required by the Utility Construction Permit and regulatory agencies, such as the FDEP. At the time of completion of all utility work, a final inspection shall be held. The DEVELOPER shall make arrangements with the Owner, Contractor, Engineer-of-Record and IRCDUS for a joint follow-up inspection and shall send a written notice to said parties to inform them of the date and time of the inspection. After the inspection, IRCDUS, through the Engineer-of-Record, shall inform the DEVELOPER of any corrections required.
18. The one-year maintenance period shall not commence until a final Certification-of-Construction – Completion and Request for Clearance to Place Permitted Components Into Operation (FDEP Form 62-555.900) has been prepared and approved by FDEP, and a Memo of Acceptance has been issued by IRCDUS.
19. Partial Utilization: IRCDUS shall have the right to utilize or place into service any utility equipment pursuant to FDEP Certificate-of-Construction Completion (FDEP Form 62-555.900) or other usable portion of the work prior to completion of the work. In such case, IRCDUS, identifying the specific portion or portions of the work to be so utilized or otherwise placed into service, will notify the DEVELOPER in writing. The DEVELOPER shall understand that until such written notification is issued, all responsibility for ownership, care and maintenance of the work shall be borne by the DEVELOPER. Upon issuance of said written notice of partial utilization, the DEVELOPER accept full responsibility for the protection and maintenance of all such items or portions of the work described in the written notice until final acceptance by IRCDUS. The DEVELOPER shall retain full responsibility for satisfactory completion of the work, regardless of whether a portion thereof has been partially utilized by IRCDUS and the

ATTACHMENT A

UTILITY CONSTRUCTION PERMIT – SPECIAL PROVISIONS

DEVELOPER'S one-year correction period shall commence only after the date of Substantial Completion for the work. DEVELOPER shall be further responsible for submitting a final Certification-of-Construction Completion to FDEP for any outstanding portion of the work.

20. ALL IRCDUS REQUIRED DOCUMENTS / SUBMISSIONS MUST BE PROVIDED BY THE DEVELOPER PRIOR TO IRCDUS'S RELEASE OF THE PROJECT. Upon completion of construction and prior to placing the utility system into service, the requirements of IRCDUS's water and wastewater system Utility Construction Permit Checklist shall be satisfied. This shall include but is not limited to record drawings, easement dedications, bill-of-sales, etc.



**INDIAN RIVER COUNTY
DEPARTMENT OF UTILITY SERVICES
UTILITY CONSTRUCTION PERMIT CHECKLIST**

Choose an item.

Received	Description
	1. One (1) signed and dated, approved or red-lined set of as-built construction drawings by the project's County Inspector for approval by Utilities Engineering, prior to the submittal of the Final Record Drawings. Submittal of Final Record Drawings should consist of one (1) set of reproducible mylars, one (1) electronic disc and three (3) sets of blue/black line prints signed and sealed by the Engineer-of-Record or Licensed Surveyor. The Engineer-of-Record must be registered to practice in the State of Florida.
	2. Copy of a satisfactory hydrostatic pressure test signed by the Engineer-of-Record.
	3. One complete set of daily field inspection records prepared by the on-site inspector certified by the Engineer-of-Record to be submitted seven (7) days after completion of that portion requiring clearance.
	4. Copy of a satisfactory bacteriological main clearance certified by the Engineer-of-Record.
	5. Copy of a satisfactory trench backfill and compaction density test reports signed by the Engineer-of-Record.
	6. Certification by the Engineer-of-Record that the water line was sanitized in accordance with County specifications.
	7. Certification by the Engineer-of-Record that the construction of the water distribution system is complete and in accordance with County construction and material specifications. Any deviation from the approved construction drawings or County specifications must be specifically identified and justified by the Engineer.
	8. Copy of the Notice of Acceptance of Completion from the Florida Department of Environmental Protection (FDEP) authorizing the water distribution system to be placed into service.
	9. Backflow Preventer Certification(s), which includes domestic and fire lines and proof that the certification has been filed in accordance with the County Cross Connection Control Program's Backflow Management and Inspection Database. See http://www.ircutilities.com/CCCP.htm for further information.
	10. <u>Bill of Sale & Easement</u> - Dedication of the water distribution system and accompanying easements. The dedication is to include an itemized list of all materials along with total materials, construction and engineering costs. <i>This should be coordinated through the IRC Attorney's Office.</i>
	11. <u>Bill of Sale</u> - Where the water distribution system is located in established easements or road rights-of-way, the attached bill of sale is to be executed along with an itemized list of all materials to include materials and construction costs. <i>This should be coordinated through the IRC Attorney's Office.</i>
	12. Complete on-site inspection by a County utility inspector with confirmation that the water distribution system appears acceptable.
	13. Arrangements for payment of all capacity charges and other costs of connections.

Received	Description
	14. Release of lien(s) from each Contractor, Subcontractor and Vendor.
	15. A one-year maintenance bond in an amount equaling 25% of the total cost for construction of the system if construction costs exceed \$10,000. If total construction costs are less than \$10,000, then a one-year warranty letter is required. The warranty letter can be issued by the developer or contractor.



**INDIAN RIVER COUNTY
DEPARTMENT OF UTILITY SERVICES
UTILITY CONSTRUCTION PERMIT CHECKLIST**

Choose an item.

Received	Description
	1. One (1) signed and dated, approved or red-lined set of as-built construction drawings by the project's County Inspector for approval by Utilities Engineering, prior to the submittal of the Final Record Drawings. Final Record Drawings submittal should consist of one (1) set of reproducible mylars, one (1) electronic disc and three (3) sets of blue/black line prints signed and sealed by the Engineer-of-Record or Licensed Surveyor. The Engineer-of-Record must be registered to practice in the State of Florida.
	2. Copy of a satisfactory hydrostatic pressure test or infiltration/exfiltration test signed by the Engineer-of-Record.
	3. One complete set of daily field inspection records prepared by the on-site inspector certified by the Engineer-of-Record to be submitted seven (7) days after completion of construction of that portion requiring clearance.
	4. Copy of a satisfactory television test and a certified report by the Engineer-of-Record.
	5. Copy of a satisfactory trench backfill and compaction density test reports signed by the Engineer-of-Record.
	6. Certification by the Engineer-of-Record that the construction of the wastewater collection/transmission system is complete and in accordance with County construction and material specifications. Any deviation from the approved construction drawings or County specifications must be specifically identified and justified by the Engineer.
	7. Copy of the Notice of Acceptance of Completion from the Florida Department of Environmental Protection (FDEP) authorizing the wastewater collection/transmission system to be placed into service.
	8. <u>Bill of Sale & Easement</u> - Dedication of the wastewater collection/transmission system and accompanying easements. The dedication is to include an itemized list of all materials along with total materials, construction and engineering costs. <i>This should be coordinated through the IRC Attorney's Office.</i>
	9. <u>Bill of Sale</u> - Where the wastewater collection/transmission system is located in established easements or road rights-of-way, the attached bill of sale is to be executed along with an itemized list of all materials to include materials and construction costs. <i>This should be coordinated through the IRC Attorney's Office.</i>
	10. Complete on-site inspection by a County utility inspector with confirmation that the wastewater collection/transmission system appears acceptable.
	11. Arrangements for payment of all capacity charges and other costs of connections.
	12. Release of lien(s) from each Contractor, Subcontractor and Vendor.
	13. A one-year maintenance bond in an amount equaling 25% of the total cost for construction of the system if construction costs exceed \$10,000. If total construction costs are less than \$10,000, then a one-year warranty letter is required. The warranty letter can be issued by the developer or contractor.

Received	Description
	14. A set of lift station specifications (if applicable), two sets of operations and maintenance manuals, warranty, and all spare parts as required by IRCDUS standards.
	15. Transfer of lift station's electric account from Developer to County.
	16. If a PRIVATE Lift Station, an acknowledgment letter from Engineer/Owner, and copy of 24/7 lift station maintenance agreement with a qualified service and repair company having lift station maintenance experience.

Lift Station Start-Up and Testing Form

COUNTY OF INDIAN RIVER
Department of Utilities

Location: _____
 Wet Well Size: _____
 Date: _____

Station #: _____
 Pumps: _____
 Owner: _____

Other

Wet Well Diameter	36"	48"	60"	72"	84"	96"	108"	
Gal. Per / Ft.	53.04	84.36	146.04	211.44	287.76	375.84	475.68	
Gal. Per / Inches	4.42	7.03	12.17	17.62	23.98	31.32	39.64	

Serial No: _____ Design Amperage: _____ Amps Pump # _____ N E S W (Circle One)	Serial No.: _____ Design Amperage: _____ Amps Pump # _____ N E S W (Circle One)
---	--

Current Balance Check T 1 = _____ Amps T 2 = _____ Amps T 3 = _____ Amps	Current Balance Check T 1 = _____ Amps T 2 = _____ Amps T 3 = _____ Amps
---	---

DRAW DOWN TEST

Water Level (Ref. Point _____) Finish _____ Inches _____ Time Start _____ Inches _____ Time Difference _____ Inches _____ Time In. draw down = Diff. ÷ Pump time (min) <small>[Pump flow/GPM = In. draw down x Gal. per in.\station size]</small> _____ x _____ = _____ GPM Gage reading Pump discharge: _____ PSI	Water Level (Ref. Point _____) Finish _____ Inches _____ Time Start _____ Inches _____ Time Difference _____ Inches _____ Time In. draw down = Diff. ÷ Pump time (min) <small>[Pump flow/GPM = In. draw down x Gal. per in.\station size]</small> _____ x _____ = _____ GPM Gage reading Pump discharge: _____ PSI
--	--

DESIGN

DESIGN

HP _____ GPM _____ TDH (Ft.)

HP _____ GPM _____ TDH (Ft.)

Comments: _____

Manufacturer's Rep. _____ Utility Rep. _____

Contractor's Rep. _____ Engineer _____

Public Works Rep. _____

Project Name: _____

Project Location: _____

Inspected By: _____ Date: _____

SECTION A: WET WELL

	Yes	No
A1. All inspections require the wet well to be completely dry and free of any construction debris.	<input type="checkbox"/>	<input type="checkbox"/>
A2. Does wet well appear to be at proper elevation?	<input type="checkbox"/>	<input type="checkbox"/>
A3. Are all joints sealed properly with Ram-neck or other approved preformed gasket Material and/or non-shrinking, non-metallic grout?	<input type="checkbox"/>	<input type="checkbox"/>
A4. Have all joints been sealed over properly with non-shrink wrap?	<input type="checkbox"/>	<input type="checkbox"/>
A5. Has bottom bench wall been installed correctly?	<input type="checkbox"/>	<input type="checkbox"/>
A6. Have the base plates been installed correctly and inspected by lift station personnel? (Lift station mechanic initials for approval: _____)	<input type="checkbox"/>	<input type="checkbox"/>
A7. Has wet well been lined properly?	<input type="checkbox"/>	<input type="checkbox"/>
A8. Has the vent been installed properly with the approved materials?	<input type="checkbox"/>	<input type="checkbox"/>
A9. Has the vent been installed in the proper location and height?	<input type="checkbox"/>	<input type="checkbox"/>
A10. Has stainless steel insect screen been installed in the vent?	<input type="checkbox"/>	<input type="checkbox"/>
A11. Does the access cover operate properly?	<input type="checkbox"/>	<input type="checkbox"/>
A12. Is H2O loading required for the access cover?	<input type="checkbox"/>	<input type="checkbox"/>
A13. If required, is the access cover rated properly?	<input type="checkbox"/>	<input type="checkbox"/>
A14. Does the access cover have any broken hardware?	<input type="checkbox"/>	<input type="checkbox"/>
A15. Were there any leaks in the wet well?	<input type="checkbox"/>	<input type="checkbox"/>
A16. Have all leaks been repaired properly?	<input type="checkbox"/>	<input type="checkbox"/>
A17. Have lifting rings been removed and grouted?	<input type="checkbox"/>	<input type="checkbox"/>
A18. Did I notify Contractor and Engineer about any and all items checked "No" in Section A?	<input type="checkbox"/>	<input type="checkbox"/>
A19. Has concrete been poured around the hold down collar at the bottom of the wet well to counteract buoyancy?	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS:

Project Name: _____

Project Location: _____

Inspected By: _____ Date: _____

SECTION B: VALVE VAULT

	<u>Yes</u>	<u>No</u>
B1. Is the valve box free of dirt and debris?	<input type="checkbox"/>	<input type="checkbox"/>
B2. Does valve vault appear to be at the proper elevation?	<input type="checkbox"/>	<input type="checkbox"/>
B3. Is the valve vault the correct size and type according to IRCDUS standards?	<input type="checkbox"/>	<input type="checkbox"/>
B4. Was the valve vault access cover installed correctly?	<input type="checkbox"/>	<input type="checkbox"/>
B5. Does the access cover operate properly?	<input type="checkbox"/>	<input type="checkbox"/>
B6. Does the access cover have any broken hardware?	<input type="checkbox"/>	<input type="checkbox"/>
B7. Has the valve vault been painted properly?	<input type="checkbox"/>	<input type="checkbox"/>
B8. Has the valve vault drain been installed according to IRCDUS standards?	<input type="checkbox"/>	<input type="checkbox"/>
B9. Have lifting rings been removed and grouted?	<input type="checkbox"/>	<input type="checkbox"/>
B10. Did I notify Contractor and Engineer about any and all items checked "No" in Section B?	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS:

Project Name: _____

Project Location: _____

Inspected By: _____ Date: _____

SECTION C: PIPING GENERAL

- | | <u>Yes</u> | <u>No</u> |
|---|--------------------------|--------------------------|
| C1. All piping shall be in accordance with IRCDUS standards. | <input type="checkbox"/> | <input type="checkbox"/> |
| C2. Is all discharge piping flanged pipe ductile iron? | <input type="checkbox"/> | <input type="checkbox"/> |
| C3. Are all bolts and nuts stainless steel? | <input type="checkbox"/> | <input type="checkbox"/> |
| C4. Has all electrical conduit and piping entering or exiting wet well and valve box been properly grouted and painted? | <input type="checkbox"/> | <input type="checkbox"/> |
| C5. Does all piping appear to be plumbed and straight? | <input type="checkbox"/> | <input type="checkbox"/> |
| C6. Are all clearances between piping and pre-cast (concrete) according to IRCDUS standards? | <input type="checkbox"/> | <input type="checkbox"/> |
| C7. Are all piping materials approved by IRCDUS? (i.e., check valves, plug valves, etc.) | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C1: WATER SERVICE PIPING

- | | | |
|---|--------------------------|--------------------------|
| C8. Is water available at lift station site? | <input type="checkbox"/> | <input type="checkbox"/> |
| C9. Is copper or brass piping used for service? | <input type="checkbox"/> | <input type="checkbox"/> |
| C10. Has a R.P.Z. type back-flow preventer been installed? | <input type="checkbox"/> | <input type="checkbox"/> |
| C11. Has the water service been installed by or attached to the panel assembly in an approved manner? (No stainless steel hose clamps.) | <input type="checkbox"/> | <input type="checkbox"/> |
| C12. Is the back-flow preventer leaking? | <input type="checkbox"/> | <input type="checkbox"/> |
| C13. Has the back-flow preventer been tested and certified? | <input type="checkbox"/> | <input type="checkbox"/> |
| C14. Has hose bibb been installed? | <input type="checkbox"/> | <input type="checkbox"/> |
| C15. Did I notify Contractor and Engineer about any and all items checked "No" in Section C? | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS:

Project Name: _____

Project Location: _____

Inspected By: _____ Date: _____

SECTION D: GENERAL APPEARANCE

	Yes	No
D1. Does station require a fence?	<input type="checkbox"/>	<input type="checkbox"/>
D2. If fence is required, is fence installed properly?	<input type="checkbox"/>	<input type="checkbox"/>
D3. Does fence material conform to IRCDUS standards?	<input type="checkbox"/>	<input type="checkbox"/>
D4. Is the fence gate the proper size?	<input type="checkbox"/>	<input type="checkbox"/>
D5. Is gate installed in the proper location?	<input type="checkbox"/>	<input type="checkbox"/>
D6. Does grading around station appear to be smooth and clear of any construction debris?	<input type="checkbox"/>	<input type="checkbox"/>
D7. Has sod been installed?	<input type="checkbox"/>	<input type="checkbox"/>
D8. Does sod appear to be installed in a satisfactory manner?	<input type="checkbox"/>	<input type="checkbox"/>
D9. Did I notify the Contractor and Engineer about any and all items checked "No" in Section D?	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS:

Project Name: _____

Project Location: _____

Inspected By: _____ Date: _____

SECTION E: ELECTRICAL CONTROL PANEL

	<u>Yes</u>	<u>No</u>
E1. Are all electrical component supplies (i.e., panel, disconnect) installed in accordance with IRCDUS standards?	<input type="checkbox"/>	<input type="checkbox"/>
E2. Is the panel supplied for the proper size?	<input type="checkbox"/>	<input type="checkbox"/>
E3. Is the panel set up for a Remote Telemetry Unit (R.T.U.)?	<input type="checkbox"/>	<input type="checkbox"/>
E4. Is the R.T.U. installed?	<input type="checkbox"/>	<input type="checkbox"/>
E5. Are the panel support posts (schedule 40 min.) stainless steel?	<input type="checkbox"/>	<input type="checkbox"/>
E6. Is the panel the proper height above finished grade?	<input type="checkbox"/>	<input type="checkbox"/>
E7. Is the mounting hardware (i.e., bolts, nuts, fasteners, strut, conduit straps) stainless steel (no galvanized) or aluminum?	<input type="checkbox"/>	<input type="checkbox"/>
E8. Is the disconnect stainless steel?	<input type="checkbox"/>	<input type="checkbox"/>
E9. Is the disconnect non-fusible?	<input type="checkbox"/>	<input type="checkbox"/>
E10. Is the panel installed in the proper location?	<input type="checkbox"/>	<input type="checkbox"/>
E11. Are all electrical conduits installed according to IRCDUS standards?	<input type="checkbox"/>	<input type="checkbox"/>
E12. Have all conduit penetrations into wet well been grouted and coated?	<input type="checkbox"/>	<input type="checkbox"/>
E13. Have conduits inside wet well been sealed properly? Check for seal fittings.	<input type="checkbox"/>	<input type="checkbox"/>
E14. Have the conduits inside the control panel been properly sealed?	<input type="checkbox"/>	<input type="checkbox"/>
E15. Does main electrical supply enter inside top of panel?	<input type="checkbox"/>	<input type="checkbox"/>
E16. Is all wiring copper?	<input type="checkbox"/>	<input type="checkbox"/>
E17. Has concrete been poured around each panel post?	<input type="checkbox"/>	<input type="checkbox"/>
E18. Are all motor and float leads the proper lengths?	<input type="checkbox"/>	<input type="checkbox"/>
E19. Is the motor and float lead hanger installed properly?	<input type="checkbox"/>	<input type="checkbox"/>
E20. Is the motor and float lead hanger installed in the correct location?	<input type="checkbox"/>	<input type="checkbox"/>
E21. Have spare parts been received?	<input type="checkbox"/>	<input type="checkbox"/>

Project Name: _____

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	Yes	No
E22. Does panel open away from station?	<input type="checkbox"/>	<input type="checkbox"/>
E23. Does panel appear to be level, straight and sturdy?	<input type="checkbox"/>	<input type="checkbox"/>
E24. Did I notify Contractor and Engineer of any and all items checked "No" in Section E?	<input type="checkbox"/>	<input type="checkbox"/>
E25. Have the hours been recorded on both Elapsed Time Meters at start-up?	<input type="checkbox"/>	<input type="checkbox"/>
E26. Have the Hand-Off-Automatic Switches been checked to see if they operate properly?	<input type="checkbox"/>	<input type="checkbox"/>
E27. Do the indicator lights light up for each pump when operating?	<input type="checkbox"/>	<input type="checkbox"/>
E28. Does the Lock Out Plate for the Motor Control Breaker and the Emergency Generator Breaker work properly?	<input type="checkbox"/>	<input type="checkbox"/>
E29. Does the alternating relay for both pumps function properly?	<input type="checkbox"/>	<input type="checkbox"/>
E30. Does the alarm light and horn function properly?	<input type="checkbox"/>	<input type="checkbox"/>
E31. Does the Alarm Silence button shut off the alarm?	<input type="checkbox"/>	<input type="checkbox"/>
E32. Has the Ground Fault Interrupter on the Duplex Receptacle been tested and does it work properly?	<input type="checkbox"/>	<input type="checkbox"/>
E33. If the lift station is private, is there a label posted on the station stating the name and 24-hour emergency phone number of the firm responsible for operation and maintenance?	<input type="checkbox"/>	<input type="checkbox"/>
E34. Are the spare fuses located inside the control panel for the control circuit?	<input type="checkbox"/>	<input type="checkbox"/>
E35. Are all the wires tight on the terminal blocks and motor starters?	<input type="checkbox"/>	<input type="checkbox"/>
E36. Does the panel door shut securely rendering the panel watertight?	<input type="checkbox"/>	<input type="checkbox"/>
E37. Is there a lightning arrestor or surge protector in the control panel?	<input type="checkbox"/>	<input type="checkbox"/>
E38. Is there a copper ground rod for the panel and is the lift station properly connected to it?	<input type="checkbox"/>	<input type="checkbox"/>
E39. Prior to start-up, have the check valves in the valve vault been checked to see if they are in the open position?	<input type="checkbox"/>	<input type="checkbox"/>
E40. Prior to start-up, have the check valves in the valve vault been checked to see if they have been installed in the right direction of flow?	<input type="checkbox"/>	<input type="checkbox"/>
E41. Prior to start-up, have the pumps been properly seated on their base elbows at the bottom of the wet well?	<input type="checkbox"/>	<input type="checkbox"/>

Project Name: _____

Project Location: _____

Inspected By: _____ Date: _____

	<u>Yes</u>	<u>No</u>
E42. Upon start-up, if the pumps do not draw down the liquid level in the wet well, have they been checked for an air lock in the volute?	<input type="checkbox"/>	<input type="checkbox"/>
E43. Upon start-up, does the liquid level control system function properly for the lead pump on, the lag pump on, the high level alarm, and shut off levels?	<input type="checkbox"/>	<input type="checkbox"/>
E44. Is there a safety grate installed over the wet well?	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS:
