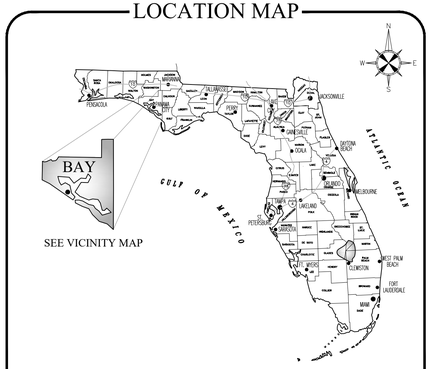
CITY OF
PANAMA CITY BEACH

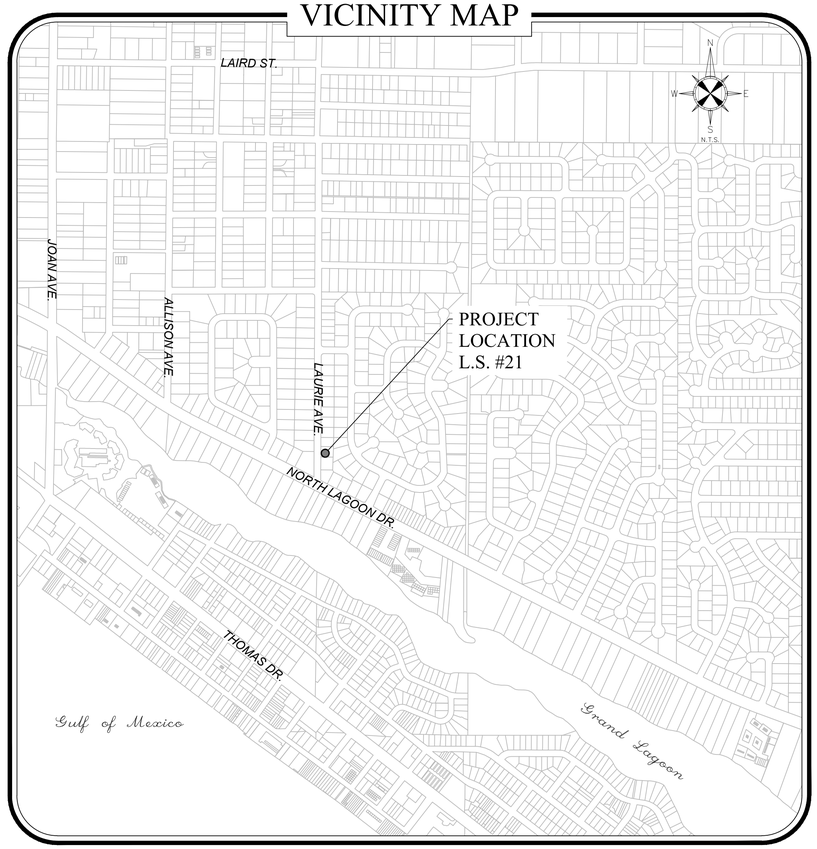
LIFT STATION #21 IMPROVEMENTS

SEPTEMBER 2018

LOCATION MAP



VICINITY MAP



SHEET INDEX

CITY OFFICIALS

MIKE THOMAS	MAYOR
PAUL CASTO	COUNCILMAN - WARD 1
PHIL CHESTER	COUNCILMAN - WARD 2
GEOFF McCONNELL	COUNCILMAN - WARD 3
HECTOR SOLIS	COUNCILMAN - WARD 4
MARIO GISBERT	CITY MANAGER

RELEASE FOR BID

PANAMA CITY BEACH
UTILITY DEPARTMENT

LIFT STATION #21
IMPROVEMENTS

Drawn By: M.A.S.
Designed By: M.E.S.
Date: 08/06/18
Checked By: A.E.S.

Sheet No.:
G-000

SYMBOLS & ABBREVIATIONS:

ID.	=	IDENTIFICATION
L.B.	=	LICENSED BUSINESS
A/C	=	AIR CONDITIONER
R/W	=	RIGHT OF WAY
(F)	=	FIELD MEASUREMENT
(P)	=	PLAT DATA
○	=	SET 1/2" CAPPED IRON ROD L.B. #7137
	=	FIRE HYDRANT
SV	=	SANITARY SEWER VALVE
Ⓢ	=	SANITARY SEWER MANHOLE
	=	TEMPORARY BENCHMARK
→	=	GUY ANCHOR
	=	UTILITY POLE
WV	=	WATER VALVE
⊞	=	WATER METER
	=	FLAG POLE
× 10.38	=	SPOT ELEVATION AT "X"
—10'—	=	CONTOUR ELEVATION AT 1' INTERVALS
—BFO—	=	BURIED FIBER OPTIC CABLE LINE
—SS—	=	BURIED SANITARY SEWER GRAVITY LINE
—FM—	=	BURIED SANITARY SEWER FORCE MAIN
—WM—	=	BURIED WATER MAIN
—OHU—	=	OVERHEAD UTILITY LINE
	=	EXISTING ASPHALT PAVEMENT
	=	EXISTING CONCRETE
	=	EXISTING GRAVEL

GENERAL NOTES

1. THE CONTRACTOR FOR THE PROPOSED CONSTRUCTION SHALL BE PROPERLY LICENSED IN THE STATE OF FLORIDA AS A GENERAL CONTRACTOR OR UNDERGROUND UTILITY AND EXCAVATION CONTRACTOR.

2. BIDDERS ARE CAUTIONED TO VISIT THE SITE AND COMPLETELY FAMILIARIZE HIMSELF WITH THE PROJECT PRIOR TO SUBMITTING A BID. SUBSURFACE CONDITIONS SHALL BE FIELD VERIFIED BY THE CONTRACTOR IF HE DEEMS IT NECESSARY.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF EXISTING UTILITIES AND TO DETERMINE IF OTHER UTILITIES WILL BE ENCOUNTERED DURING THE COURSE OF THE WORK AND TAKE WHATEVER STEPS NECESSARY TO PROVIDE FOR THEIR PROTECTION. IF CONFLICTS OCCUR THAT ARE NOT SPECIFICALLY SHOWN, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND REQUEST DIRECTION AS TO HOW ANY CONFLICTS WILL BE RESOLVED.

4. STAKE OUT SHALL BE PERFORMED BY A REGISTERED LAND SURVEYOR TO ENSURE PROPER PLACEMENT OF PIPE AND/OR STRUCTURES.

5. THE CONTRACTOR SHALL NOTIFY ALL UTILITY OWNERS A MINIMUM OF 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.

6. ALL PROPOSED PROCESS PIPING SHALL BE CONSTRUCTED TO PROVIDE A MINIMUM OF 30 INCHES OF COVER BELOW FINISHED GRADES UNLESS INDICATED OTHERWISE.

7. ALL PIPE SHALL BE INSTALLED IN DRY CONDITIONS. ONLY MATERIALS FREE FROM EXCESSIVE MOISTURE SHALL BE USED FOR FILL OR BACKFILL. CONTRACTOR SHALL REMOVE SOIL MATERIAL TOO WET TO PERMIT PROPER COMPACTION TO THE SPECIFIED DENSITY, SPREAD ON AN AREA APPROVED BY THE OWNER/ENGINEER AND ALLOWED TO DRY.

8. ALL WORK AND MATERIALS AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH THE CITY STANDARDS AND REQUIREMENTS OF THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION. IN THE EVENT OF CONFLICTS OR OMISSIONS FROM THE CONSTRUCTION DOCUMENTS, UTILITY STANDARDS SHALL PREVAIL.

9. EROSION AND SEDIMENTATION CONTROLS SHALL BE PROVIDED BY THE CONTRACTOR AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROJECT COMPLIANCE WITH THE APPLICABLE STATE AND FEDERAL WATER QUALITY STANDARDS DURING CONSTRUCTION. THE CONTRACT DOCUMENTS PROVIDE ONLY MINIMUM REQUIREMENTS FOR EROSION, SEDIMENTATION CONTROL PERMITTING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IMPLEMENT NEEDED CONTROL MEASURES REQUIRED FOR COMPLIANCE NOT INDICATED IN THE CONTRACT DOCUMENTS.

10. THE OWNER/ENGINEER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE OF THE PRESSURE AND LEAKAGE TESTS. PRESSURE TESTING SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.

11. ALL VALVE BOXES SHALL BE SET FLUSH TO FINISHED GRADE AND MARKED AS INDICATED IN THE DRAWING DETAILS.

12. ALL FITTINGS SHALL BE MECHANICALLY RESTRAINED TO THE LENGTHS INDICATED IN THE DRAWING DETAILS.

13. AT TIMES WHEN THE PIPE INSTALLATION IS NOT IN PROGRESS, THE OPEN ENDS OF THE PIPE SHALL BE CLOSED BY APPROVED MEANS AND SHALL REMAIN CLOSED UNTIL CONSTRUCTION OF THAT PIPE SECTION IS RESUMED. NO OPEN TRENCHES SHALL BE ALLOWED WHEN THE PIPE INSTALLATION IS NOT IN PROGRESS. THE TERMINAL JOINT MAY BE LEFT EXPOSED IN AN OPEN TRENCH PROVIDED ADEQUATE SAFETY BARRICADES ARE INSTALLED BY THE CONTRACTOR.

14. CONTRACTOR SHALL NOT INTERFERE WITH THE OPERATION OR MAINTENANCE OF THE EXISTING LIFT STATION. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WELL IN ADVANCE WITH OPERATION STAFF AND OWNER TO ENSURE CONTINUED COMPLIANCE AND MINIMIZE DISRUPTIONS.

15. ALL DISTURBED PROPERTIES SHALL BE RESTORED TO THEIR PRE-CONSTRUCTION CONDITION OR BETTER INCLUDING GRASSING AND PLANTINGS. PLANTINGS AND SODDING SHALL MATCH THE ORIGINAL VARIETIES.

16. ANY LANE CLOSURES OR TRAFFIC CONTROL MEASURES SHALL BE PRE-APPROVED BY BAY COUNTY ENGINEERING PRIOR TO IMPLEMENTATION.

REVISIONS		
NO.	DATE	BY

DATE:	08/06/18
SCALE:	N/A
DESIGNED BY:	M.E.S.
DRAWN BY:	M.A.S.
CHECKED BY:	A.E.S.
FILE NO: LS_21_REPLACE.dwg	

CITY OF
PANAMA CITY BEACH
116 SOUTH ARNOLD ROAD   PANAMA CITY BEACH, FLORIDA 32413

SEAL
MARK E. SHAEFFER
FL. PE #41202

LIFT STATION #21 IMPROVEMENTS
GENERAL NOTES AND LEGEND

SHEET No.
G-001

REMOVE TOP SLAB AND ALL PIPING, HATCHES, FITTINGS AND CONDUIT ABOVE TOP SLAB/UPPER RISER SECTION JOINT

REMOVE TOP SLAB, COVER , HATCHES, CONDUIT AND ALL PIPING ABOVE TOP SLAB/UPPER RISER SECTION JOINT

SALVAGE AND REMOVE MOTOR CONTROL RTU CABINETS AND SUPPORT STANDS AND PROVIDE TO CITY

BELOW TOP SLAB REMOVE ALL PIPING, CABLE HANGER BRACKET, FITTINGS AND ALL OTHER MATERIALS / EQUIPMENT. SALVAGE PUMP FOR RE-INSTALLATION IN MODIFIED STATION

NOTES:

1. ALL MATERIALS, GRIT ACCUMULATIONS, PIPING AND EQUIPMENT REMOVED AS A RESULT OF DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE TRANSPORTED OFF-SITE AND DISPOSED OF PROPERLY IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS AT THE CONTRACTOR'S EXPENSE.
2. ITEMS INDICATED FOR SALVAGE SHALL BE REMOVED AND DELIVERED TO THE OWNERS FACILITY AT 206 NORTH GULF BOULEVARD, PANAMA CITY BEACH, FLORIDA, 32413.

POTENTIAL SEQUENCE OF CONSTRUCTION:

CONTRACTOR IS NOT BOUND TO THIS SEQUENCE AND MAY USE ANY SEQUENCE HE DEEMS APPROPRIATE:

1. THIS PROJECT WILL REQUIRE BY-PASS PUMPING OF ALL FLOWS TO THE LIFT STATION FOR CONSTRUCTION AND BY-PASS PUMPING WILL REQUIRE WITHDRAWAL FROM THE TWO INFLUENT MANHOLES TO THIS LIFT STATION EAST AND WEST OF THE STATION.
2. CONTRACTOR MAY WISH TO CONSIDER USING THE EXISTING BY-PASS CONNECTION FOR HIS PLANNED BY-PASSING DURING CONSTRUCTION AND DEMOLISH IT LATER IN CONSTRUCTION ONCE THE PROPOSED PIPING IS INSTALLED AND TESTED.
3. BY-PASSING WILL LIKELY REQUIRE TWO PUMPING UNITS EACH DEPLOYED AT THE EAST AND WEST INFLUENT MANHOLES.
4. CONTRACTOR SHALL STRINGENTLY OBSERVE ALL BY-PASS PUMPING SOUND ATTENUATION REQUIREMENTS AS THIS IS A RESIDENTIAL AREA WITH HIGH NOISE SENSITIVITY.

N

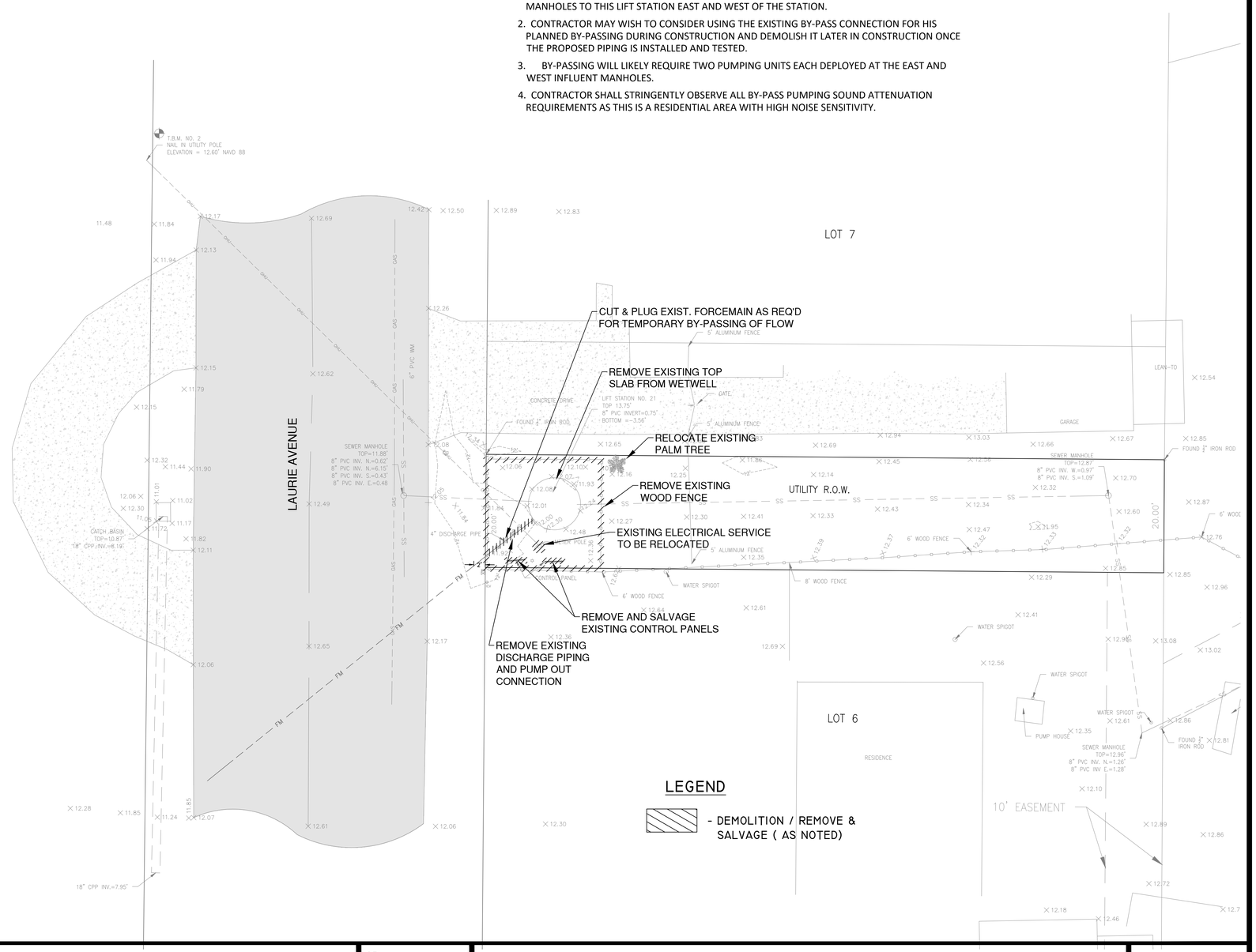
W E

S

GRAPHIC SCALE

10 0 5 10 20

(IN FEET)
1 inch = 10 ft.



LEGEND

▨ - DEMOLITION / REMOVE & SALVAGE (AS NOTED)

REVISIONS			
NO.	DATE	BY	

DATE:	08/06/18
SCALE:	1"=10'
DESIGNED BY:	M.E.S.
DRAWN BY:	M.A.S.
CHECKED BY:	A.E.S.
FILE NO: LS_21_REPLACE.dwg	

CITY OF
PANAMA CITY BEACH
116 SOUTH ARNOLD ROAD PANAMA CITY BEACH, FLORIDA 32413

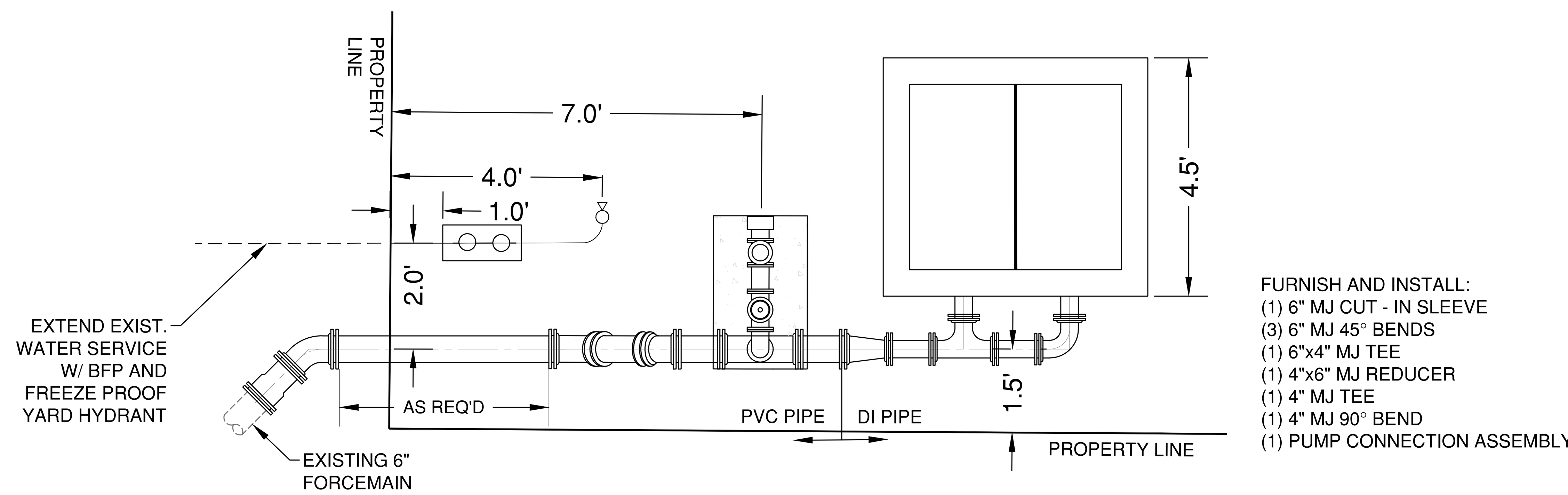
SEAL

MARK E. SHAEFFER
FL. PE #41202

LIFT STATION #21 IMPROVEMENTS
EXISTING SITE AND DEMOLITION PLAN

SHEET No.
C-100

T.B.M. NO. 2
NAIL IN UTILITY POLE
ELEVATION = 12.60' NAVD 88
N
W
E
S
GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.
LOT 7
LAURIE AVENUE
PROPOSED RELOCATED SERVICE POLE
PROPOSED 6' CHAIN-LINK FENCE
UTILITY R.O.W.
PROPOSED SCADA RTU AND CONTROL PANEL
*PROPOSED CONCRETE DRIVEWAY
12' SWING GATE (6' LEAVES)
EXIST. 6" PVC FORCEMAIN
PUMP CONNECTION (SEE DETAIL)
SEE DETAIL THIS SHEET
4" BEDDING ROCK (GRANITE) 1-1/2" MAX SIZE OVER GEOTEXTILE FABRIC (MIRAFI 140-N OR APPROVED EQUAL) ENTIRE AREA INSIDE FENCE
FURNISH AND INSTALL 6" 45° MJ BEND AND CUT - IN SLEEVE
LOT 6
10' EASEMENT
*CONCRETE DRIVEWAY
12-INCH SUBGRADE (SOIL TYPE SP, SP-SM, SW OR SW-SM) COMPACTED TO 98% MAX. DENSITY (ASTM D-1557) 6-INCHES THICK (3000 PSI MIN.)
CONCRETE W/ 6x6 10/10 WELDED WIRE FABRIC (FLAT PANEL), USE EXPANSION JOINT MATERIAL AT ALL PANEL JOINTS.



PROPERTY LINE
7.0'
4.0'
1.0'
2.0'
4.5'
1.5'
EXTEND EXIST. WATER SERVICE W/ BFP AND FREEZE PROOF YARD HYDRANT
AS REQ'D
PVC PIPE
DI PIPE
PROPERTY LINE
EXISTING 6" FORCEMAIN
FURNISH AND INSTALL:
(1) 6" MJ CUT - IN SLEEVE
(3) 6" MJ 45° BENDS
(1) 6"x4" MJ TEE
(1) 4"x6" MJ REDUCER
(1) 4" MJ TEE
(1) 4" MJ 90° BEND
(1) PUMP CONNECTION ASSEMBLY

DETAIL

DISCHARGE PIPING / FORCEMAIN CONNECTION SCALE: 1"=2'

REVISIONS			
NO.	DATE	BY	

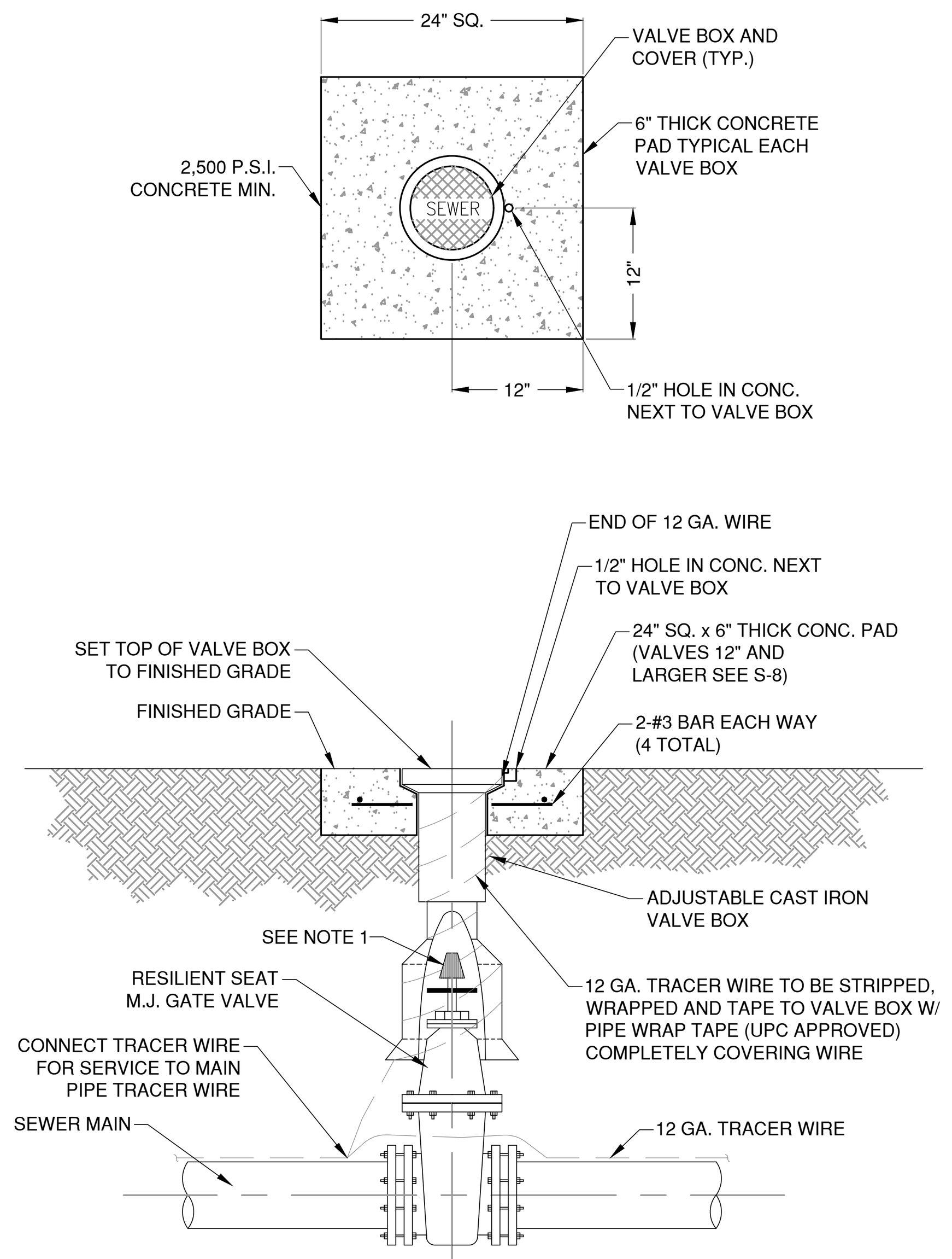
DATE:	07/26/18
SCALE:	1"=10'
DESIGNED BY:	M.E.S.
DRAWN BY:	M.A.S.
CHECKED BY:	A.E.S.
FILE NO: LS_21_REPLACE.dwg	

CITY OF
PANAMA CITY BEACH
116 SOUTH ARNOLD ROAD PANAMA CITY BEACH, FLORIDA 32413

SEAL
MARK E. SHAEFFER
FL. PE #41202

LIFT STATION #21 IMPROVEMENTS
PROPOSED SITE PLAN - LIFT STATION #21

SHEET No.
C-101

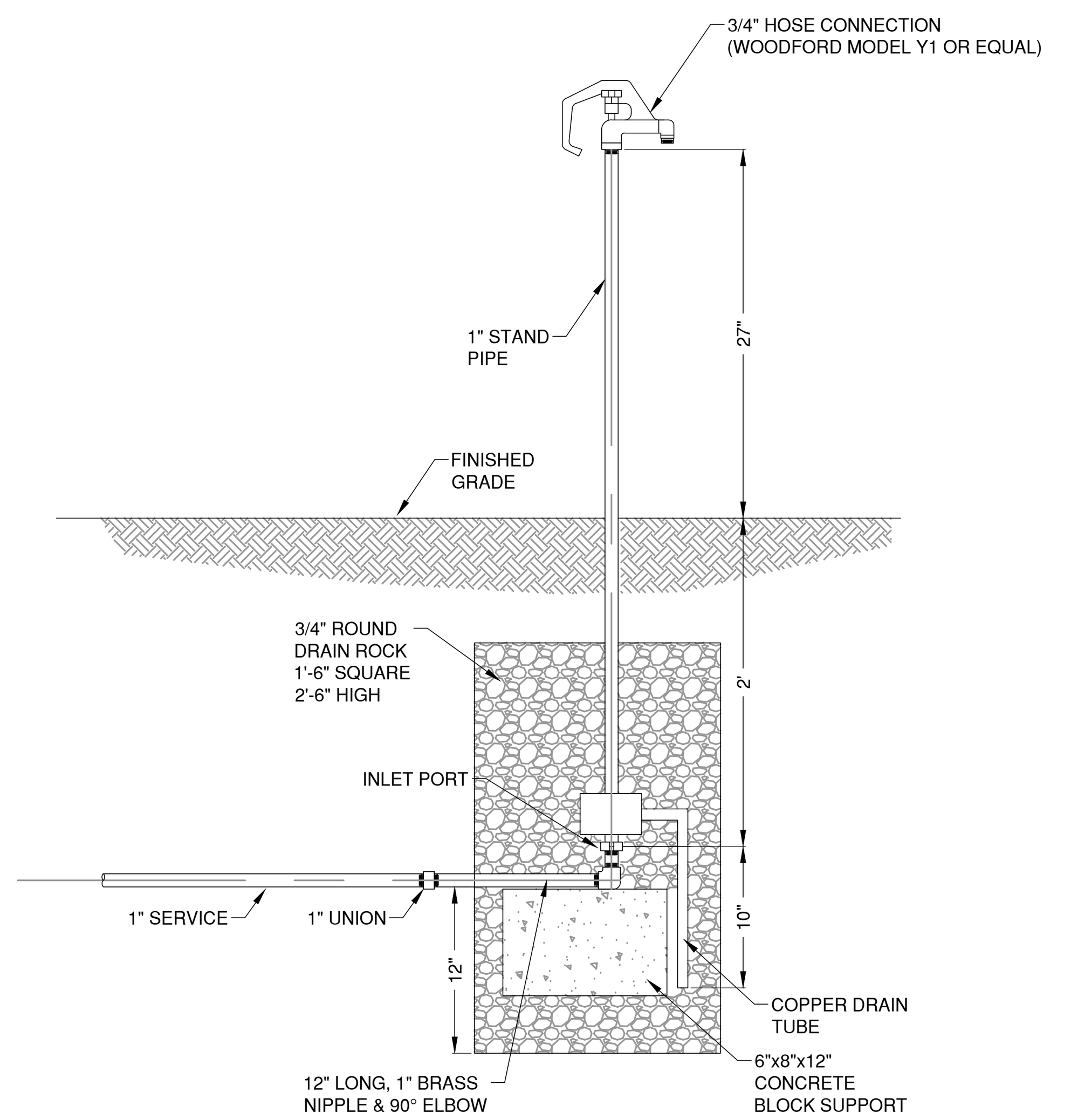


NOTES:

1.) THE ACTUATING NUT FOR DEEPER VALVES SHALL BE EXTENDED TO COME UP TO 4 FOOT DEPTH BELOW FINISHED GRADE.

SEWER GATE VALVE & BOX DETAIL (4" TO 10")

S-7



FREEZE-PROOF YARD HYDRANT

W-19

REQUIRED LENGTH OF RESTRAINED JOINT PIPE FOR P.V.C. PIPE

MAIN PIPE SIZE	HORIZ. BENDS 90°	HORIZ. BENDS 45°	HORIZ. BENDS 22.5°	*TEES (SIZE / LENGTH)					REDUCERS (SIZE / LENGTH)			PLUGS
48	86	36	17	X48 / 117	X42 / 77	X36 / 36	X30 / 1	X24 / 1	X42 / 50	X36 / 93	X30 / 129	214
42	78	33	16	X42 / 100	X36 / 58	X30 / 14	X24 / 1	X20 / 1	X36 / 50	X30 / 93	X24 / 128	193
36	71	30	14	X36 / 81	X30 / 37	X24 / 1	X20 / 1	X16 / 1	X30 / 52	X24 / 94	X20 / 117	171
30	62	26	13	X30 / 61	X24 / 14	X20 / 1	X16 / 1	X12 / 1	X24 / 52	X20 / 81	X16 / 104	148
24	53	22	11	X24 / 40	X20 / 6	X16 / 1	X12 / 1	X10 / 1	X20 / 37	X16 / 68	X12 / 91	124
20	46	19	9	X20 / 25	X16 / 1	X12 / 1	X10 / 1	X8 / 1	X16 / 38	X12 / 67	X10 / 78	106
16	38	16	8	X16 / 9	X12 / 1	X10 / 1	X8 / 1		X12 / 38	X10 / 52	X8 / 64	88
12	30	13	6	X12 / 1	X10 / 1	X8 / 1	X6 / 1		X10 / 20	X8 / 36	X6 / 50	68
10	26	11	6	X10 / 1	X8 / 1	X6 / 1			X8 / 20	X6 / 36	X4 / 47	58
8	22	9	5	X8 / 1	X6 / 34	X4 / 1			X6 / 21	X4 / 35		48
6	17	7	4	X6 / 1	X4 / 1				X4 / 19			37
4	12	5	3	X4 / 1								26

NOTES:

1.) RESTRAIN TO NEXT FULL JOINT BEYOND GIVEN LENGTH.

2.) RESTRAIN 11.25° BENDS 50% OF LENGTH FOR 22.5° BENDS.

3.) ALL VALVES AND FITTINGS SHALL BE RESTRAINED TO THE CONNECTING SECTIONS OF PIPE.

4.) PIPE ADJACENT TO IN-LINE VALVES 10" AND SMALLER SHALL BE RESTRAINED FOR 20' ON EACH SIDE, INCLUDING THE VALVE-TO-PIPE CONNECTION. ALL PIPE ADJACENT TO IN-LINE VALVES 12" AND LARGER SHALL BE RESTRAINED FOR A DISTANCE 1/4 OF REQ'D PLUG (DEAD END) LENGTH ON EACH SIDE, INCLUDING THE VALVE-TO-PIPE CONNECTION.

5.) PIPE SIZES ARE GIVEN IN INCHES.

6.) PIPE LENGTHS ARE GIVEN IN FEET.

7.) LENGTHS SHOWN ARE FOR A TEST PRESSURE OF 100 PSI.

8.) RESTRAINED LENGTHS FOR TEES REPRESENTS LENGTH ON BRANCH. RESTRAINED LENGTHS FOR REDUCERS REPRESENTS LENGTH ON LARGE END OF REDUCER.

9.) RESTRAINED LENGTHS ARE TO BE USED FOR SEWER AND RECLAIM WATER.

10.) THE RESTRAINED LENGTHS SHOWN IN THESE TABLES ARE BASED ON THE USE OF LIGHTLY COMPACTED CLEAN SAND WITH AT LEAST A 95% COARSE PARTICLE CONTENT. ACTUAL SOIL CONDITIONS MUST BE DETERMINED BY THE ENGINEER OF RECORD AND THE RESTRAINED LENGTHS MODIFIED ACCORDINGLY. SAFETY FACTOR OF 1.5:1 TO BE CALCULATED WITH A "SM" SOIL TYPE AND TRENCH TYPE "3".

*MAIN TO BE RESTRAINED 20' ON EACH SIDE OF BRANCH

RESTRAINED LENGTHS FOR P.V.C. SEWER

M-17

MINIMUM TECHNICAL STANDARDS CHECKLIST FOR UTILITY AS-BUILTS

CITY OF PANAMA CITY BEACH
DATED MAY, 2012

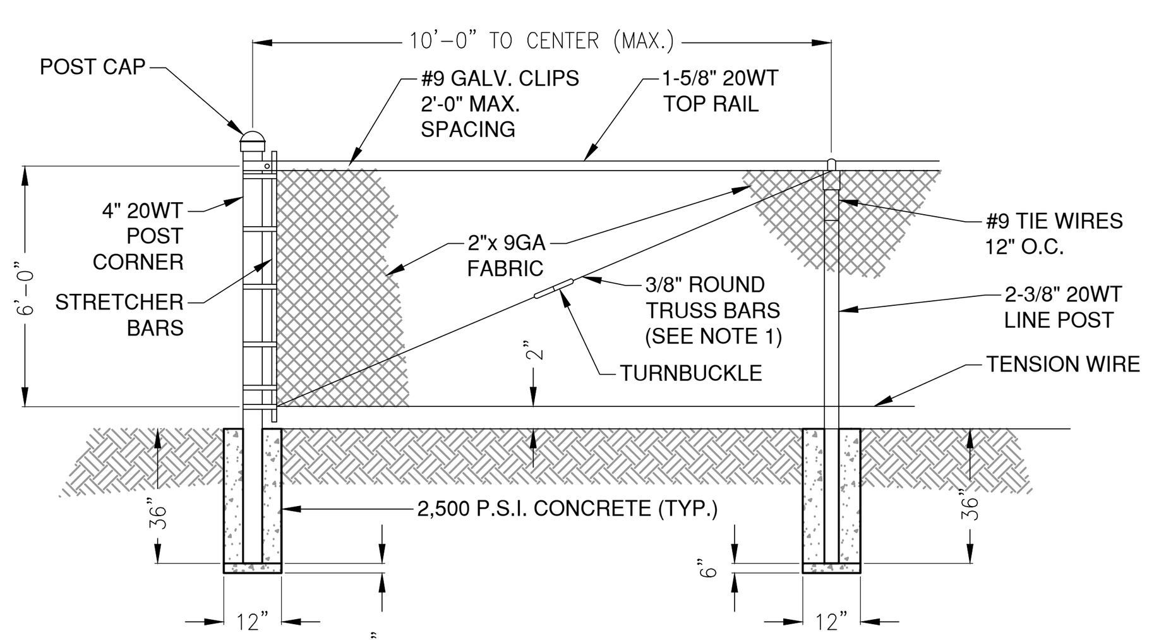
SURVEYORS AND MAPPERS MUST MEET THE FOLLOWING MINIMUM STANDARDS OF ACCURACY, COMPLETENESS, AND QUALITY FOR THE CITY OF PANAMA CITY BEACH TO ACCEPT AS-BUILTS:

1. MUST IDENTIFY THE RESPONSIBLE SURVEYOR AND MAPPER.
2. SHALL STATE THE TYPE OF SURVEY IT DEPICTS AND THE PURPOSE OF THE SURVEY.
3. MUST BEAR THE NAME, CERTIFICATE OF AUTHORIZATION NUMBER, AND STREET AND MAILING ADDRESS OF THE BUSINESS ENTITY ISSUING THE AS-BUILT SURVEY, ALONG WITH THE NAME AND LICENSE NUMBER OF THE SURVEYOR IN RESPONSIBLE CHARGE.
4. MUST REFLECT A SURVEY DATE, WHICH IS THE DATE OF ACQUISITION. WHEN THE GRAPHICS OF THE AS-BUILT SURVEY ARE REVISED, BUT THE SURVEY DATE STAYS THE SAME, THE AS-BUILT SURVEY MUST LIST DATES FOR ALL REVISIONS.
5. MUST BE SIGNED AND SEALED BY THE SURVEYOR IN RESPONSIBLE CHARGE.
6. A DESIGNATED "NORTH ARROW" AND EITHER A STATED SCALE OR GRAPHIC SCALE SHALL BE SHOWN.
7. APPROPRIATE LINE TYPES, LINE WEIGHTS, AND LINE WIDTHS SHALL BE USED ON THE AS-BUILT DRAWING TO DIFFERENTIATE EXISTING FROM PROPOSED AND WATER FROM SEWER, RECLAIM, AND STORM. ALL PHYSICAL ITEMS (I.E. PIPES, VALVES, ETC.), SURVEYED BOUNDARIES, AND EASEMENTS SHOULD BE CLEARLY MARKED, AND DIMENSIONED, AND IDENTIFIED BY SIZE AND MATERIAL.
8. ALL UTILITIES IN THE PUBLIC RIGHT OF WAY AND WITHIN EASEMENTS OR TO THE END OF THE PUBLICLY OWNED PORTION OF THE UTILITY (I.E. METER AND BACKFLOW PREVENTER, CLEANOUT, ETC.) SHALL BE SHOWN WITH ASSOCIATED SIZES LABELED. THIS INCLUDES, BUT IS NOT LIMITED TO, STUB-OUTS/LATERALS, METERS, BFP'S, WATER MAINS, FORCE MAINS, GRAVITY SEWER MAINS, MANHOLES, STORM WATER PIPING AND ASSOCIATED STRUCTURES, VALVES, FIRE HYDRANTS, LIFT STATIONS, ETC. ALL PIPE LINE WORK MUST BE CONNECTED WITHIN THE SITE AS WELL AS THE CONNECTION TO EXISTING UTILITIES ADJACENT TO THE SITE (IT IS THE SURVEYOR'S RESPONSIBILITY TO COORDINATE WITH ALL CONTRACTORS FOR LOCATIONS AND SIZING). ALL UTILITY CONNECTIONS TO THE BUILDINGS MUST BE SHOWN.
9. ALL PROPOSED UTILITY/INGRESS/EGRESS EASEMENTS MUST BE SHOWN ON THE DRAWING AND MUST HAVE THE ASSOCIATED LEGAL DESCRIPTION WRITTEN.
10. EDGE OF PAVEMENT, ROADS (ASPHALT SHADED), CURBS, DRIVEWAY CONNECTIONS, BUILDINGS, PARKING LOTS, RIGHT-OF-WAY, AND STREET NAMES MUST BE SHOWN IN ALL APPLICATIONS. ALL ITEMS MENTIONED ABOVE MUST BE FIELD LOCATED.
11. IF A LIFT STATION IS TO BE DEDICATED TO THE CITY THE PLAN MUST SHOW A DETAIL SCALED AT 1"=10' SHOWING ALL IMPROVEMENTS INCLUDING: WATER AND SEWER SERVICES, MANHOLES, INVERTS, RIMS, BFP'S, YARD HYDRANTS, CONTROL PANELS, FENCING, PARCEL BOUNDARY, LEGAL DESCRIPTION OF PARCEL BOUNDARY, WET WELL, VALVE BOX, FORCE MAIN, FLOW METER (IF APPLICABLE), DRIVEWAY, GATE.
12. PROPERTY BOUNDARY MUST BE CLEARLY LABELED AND DIMENSIONED.
13. INVERTS, GRATES, TOPS, RIMS MUST BE SHOWN FOR ALL STORM WATER DRAINAGE STRUCTURES. INVERTS (PIPES AND CLEANOUTS) AND RIMS MUST BE SHOWN FOR ALL GRAVITY SEWER MANHOLES. SLOPES MUST BE SHOWN ON EACH RUN OF PIPE FOR REVIEW AND APPROVAL.
14. "AS-BUILT" PROFILE OF ALL DIRECTIONAL BORES AND JACK-AND-BORES INDICATING GRADE AND PIPE ELEVATIONS AT 10 FOOT INTERVALS SHALL BE PROVIDED ON AS-BUILT PLAN SHEETS BASED ON BORE LOGS DEVELOPED BY BORING CONTRACTOR DURING INSTALLATION. PROFILES SHALL USE HORIZONTAL STATIONING WHICH TIES TO STATIONING ON PLANS. PROFILES SHALL ALSO SHOW EXISTING SURFACE ELEVATIONS AS WELL AS ANY PROPOSED SURFACE ELEVATIONS ON THE PROFILE. SURFACE PROFILES MUST SHOW ANY PAVEMENT, SIDEWALKS, DITCHES, SWALES ETC. NOTE THAT PROFILES LOCATING PIPE SOLELY BY "DEPTH BELOW EXISTING GROUND" WILL NOT BE ACCEPTED.
15. COASTAL SETBACK LINE OR COASTAL CONSTRUCTION CONTROL LINE SHOULD BE DESIGNATED.
16. ELEVATIONS AND LOCATION OF ANY FLOOD ZONES ALONG THE FLOOD HAZARD BOUNDARIES SHALL BE DELINEATED.
17. NEARBY WETLANDS AND OTHER ENVIRONMENTALLY SIGNIFICANT RESOURCES CLEARLY LABELED.
18. STORM WATER MANAGEMENT SYSTEM FEATURES INCLUDING DIMENSIONS OF : WET AND DRY SWALES, WET AND DRY PONDS, CONVEYANCE SYSTEMS, EASEMENTS, ALONG WITH ALL ASSOCIATED M.E.S. STRUCTURES AND INVERTS, OUTFALL STRUCTURES AND INVERTS, SKIMMERS, DISCHARGE STRUCTURES AND INVERTS AND SLOT ELEVATIONS, TOP OF BANK, SLOPE OF BANK AND BOTTOM OF ALL PONDS, SWALES, CLOSED AND OPEN CONVEYANCES. FOR FEMA LOMR SUBMITTALS ALSO PROVIDE: FINISHED FLOOR ELEVATIONS, SPOT ELEVATIONS AND/OR CONTOURS SHOWING LOWEST LOT ELEVATIONS.
19. THE ENGINEER OF RECORD SHALL REVIEW AND APPROVE THE AS-BUILT PRIOR TO SUBMISSION TO THE CITY FOR FINAL APPROVAL. WRITTEN APPROVAL BY THE ENGINEER OF RECORD SHALL BE NOTED ON A TRANSMITTAL WITH A STATEMENT OF NO EXCEPTIONS TO MINIMUM STANDARDS PROVIDED HEREIN.

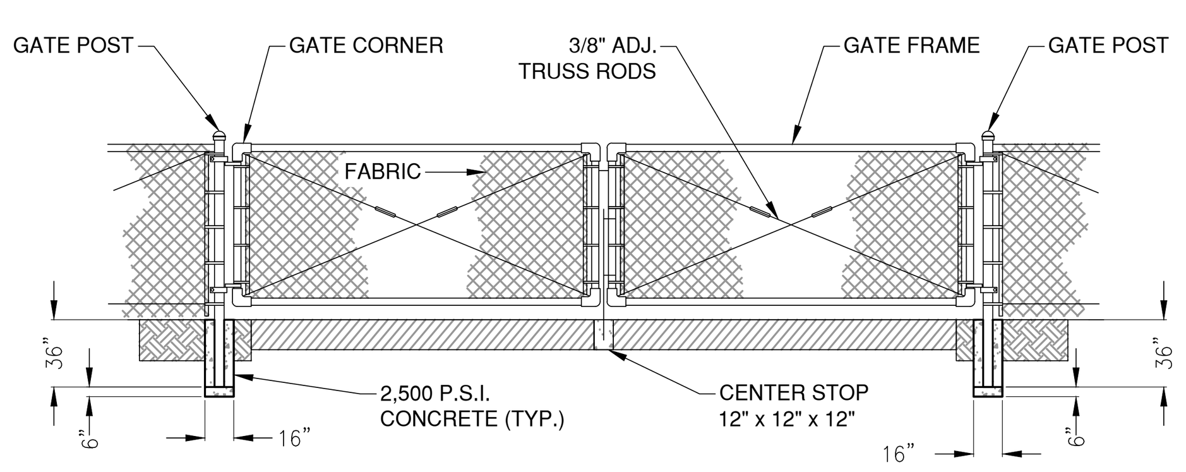
STORM WATER REQUIREMENTS FOR THE AS-BUILT SURVEYS ONLY APPLY TO PARCELS WITHIN CITY LIMITS. PLEASE SUBMIT THREE (3) HARD COPIES AND ONE (1) DIGITAL (AUTOCAD FORMAT & PDF) FOR REVIEW AND APPROVAL.

MINIMUM TECHNICAL STANDARDS FOR AS-BUILTS

M-29



FENCE DETAIL



DOUBLE SWING GATE DETAIL

NOTES:

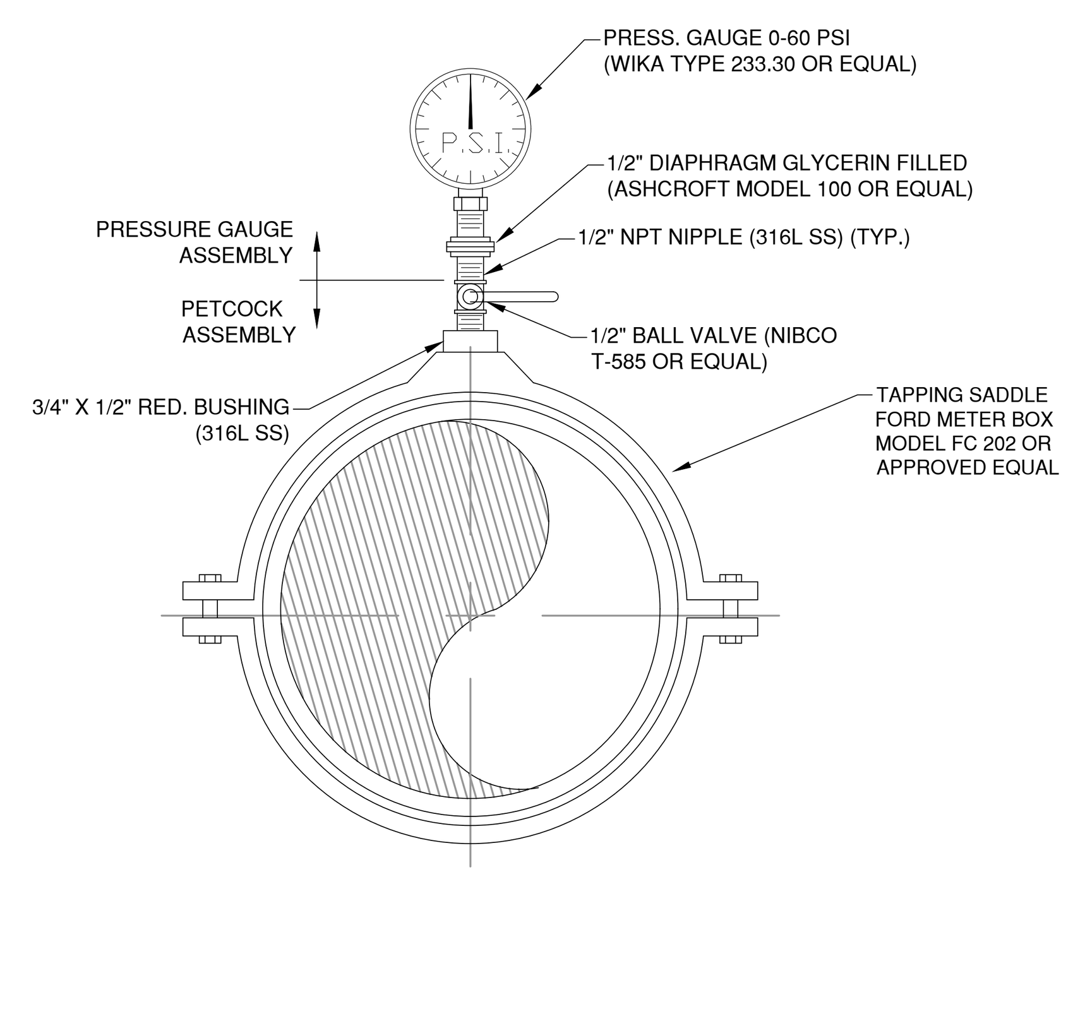
1.) TRUSS BARS ARE REQUIRED FOR EACH GATE SECTION AND THE FIRST SPAN ON EACH SIDE OF A CORNER POST ONLY.

2.) SEE SHEET S-14 FOR PLAN AND CROSS SECTION VIEWS.

3.) FABRIC, POST, RODS & ACCESSORIES SHALL BE GALVANIZED WITH BLACK VINYL COATING.

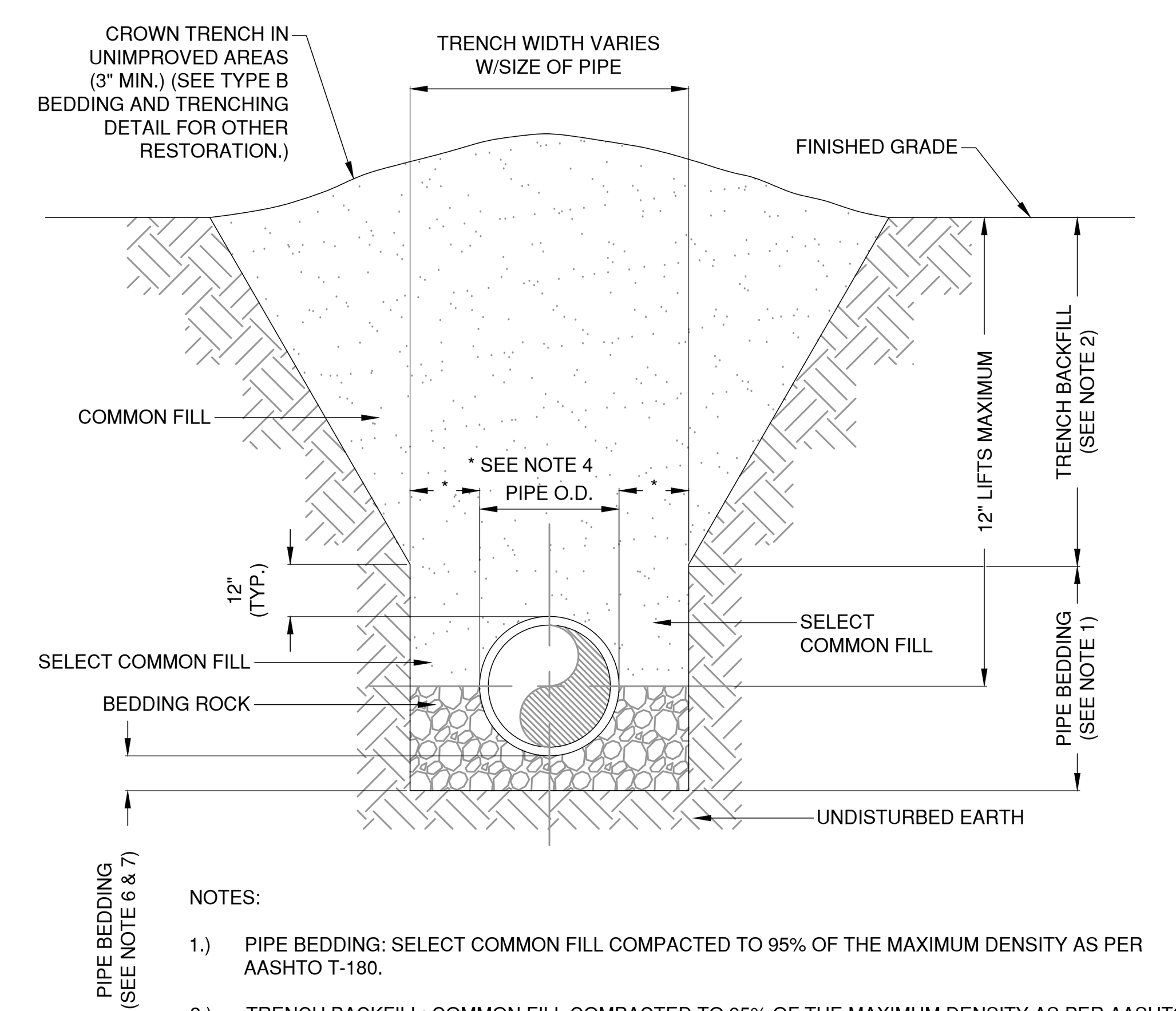
CHAIN LINK FENCE DETAIL

S-13



PETCOCK/ PRESSURE GAUGE ASSEMBLY

S-20



NOTES:

1.) PIPE BEDDING: SELECT COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.

2.) TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% OF THE MAXIMUM DENSITY AS PER AASHTO T-180.

3.) USE TYPE A BEDDING TO BE DETERMINED IN THE FIELD AS DIRECTED BY THE CITY.

4.) (*): 15" MAX. FOR PIPE DIAMETER LESS THAN 24", AND 24" MAX. FOR PIPE DIAMETER 24" AND LARGER.

5.) ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.

6.) GRAVITY SEWERS SHALL UTILIZE TYPE A BEDDING, IF REQUIRED BY THE CITY. BEDDING DEPTH SHALL BE 4" MINIMUM FOR PIPE DIAMETER LESS THAN 15", AND 6" MINIMUM PIPE DIAMETER 16" AND LARGER.

7.) DEPTH FOR REMOVAL OF UNSUITABLE MATERIAL SHALL GOVERN DEPTH OF BEDDING ROCK BELOW THE PIPE. CITY SHALL DETERMINE IN THE FIELD REQUIRED REMOVAL OF UNSUITABLE MATERIAL TO REACH SUITABLE FOUNDATION.

TRENCH DETAIL TYPE A BEDDING

M-1

REVISIONS		
NO.	DATE	BY

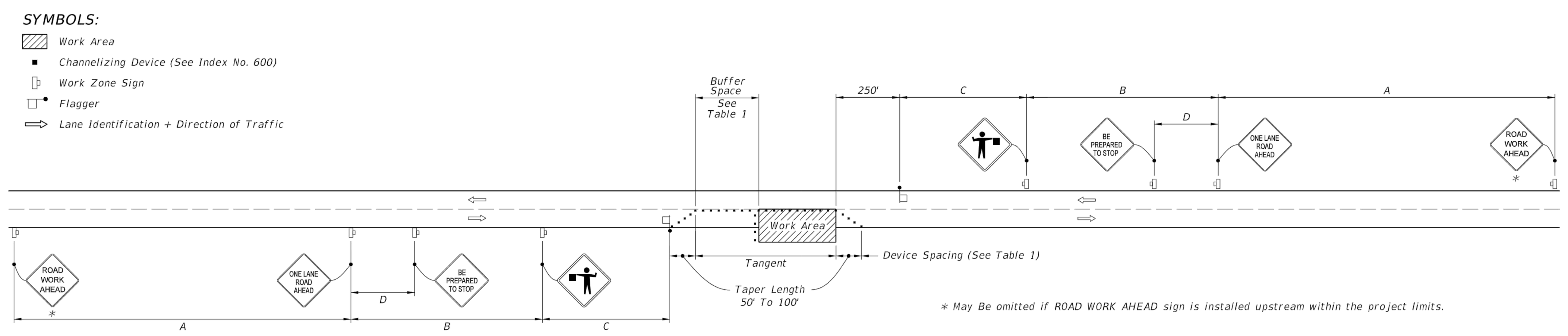
DATE:	08/06/18
SCALE:	N.T.S.
DESIGNED BY:	M.E.S.
DRAWN BY:	M.A.S.
CHECKED BY:	A.E.S.
FILE NO: LS_21_REPLACE.dwg	

CITY OF
PANAMA CITY BEACH
116 SOUTH ARNOLD ROAD PANAMA CITY BEACH, FLORIDA 32413

SEAL
MARK E. SHAEFFER
FL. PE #41202

LIFT STATION #21 REPLACEMENT
STANDARD DETAILS

SHEET No.
C-900



WITHOUT TEMPORARY RAISED RUMBLE STRIPS

GENERAL NOTES:

1. Special Conditions may be required in accordance with these notes and the following sheets:
   A. Railroad Crossings:
      a. If an active railroad crossing is located closer to the Work Area than the queue length plus 300 feet, extend the Buffer Space as shown on Sheet 3.
      b. If the queuing of vehicles across an active railroad crossing cannot be avoided, provide a uniformed traffic control officer or flagger at the highway-rail grade crossing to prevent vehicles from stopping within the highway-rail grade crossing, even if automatic train warning devices are in place.
   B. If the Work Area encroaches on the Centerline, use the Layout for Temporary Lane Shift to Shoulder on Sheet 3 only if the Existing Paved Shoulder width is sufficient to provide for an 11' lane between the Work Area and the Edge of Existing Paved Shoulder. Reduce the posted speed when appropriate.
2. Temporary Raised Rumble Strips:
   A. Use when both of the following conditions are met concurrently:
      a. Existing Posted Speed is 55 mph or greater;
      b. Work duration is greater than 60 minutes.
   B. Use a consistent Strip color throughout the work zone.
   C. Place each Rumble Strip Set transversely across the lane at locations shown.
   D. Use Option 1 or Option 2 as shown on Sheet 2. Use only one option throughout work zone.
3. Additional one-way control may be provided by the following means:
   A. Flag-carrying vehicle;
   B. Official vehicle;
   C. Pilot vehicles;
   D. Traffic signals.

   When flaggers are the sole means of one-way control, the flaggers must be in sight of each other or in direct communication at all times.
4. When a side road intersects the highway within the TTC zone, place additional TTC devices in accordance with other applicable TCZ Indexes.
5. The two channelizing devices directly in front of the work area may be omitted provided vehicles in the work area have high-intensity rotating, flashing, oscillating, or strobe lights operating.
6. When Buffer Space cannot be attained due to geometric constraints, use the greatest attainable length, not less than 200 ft, for posted speeds greater than 25 mph.
7. ROAD WORK AHEAD and the BE PREPARED TO STOP signs may be omitted if all of the following conditions are met:
   A. Work operations are 60 minutes or less.
   B. Speed limit is 45 mph or less.
   C. There are no sight obstructions to vehicles approaching the work area for a distance equal to the Buffer Space shown in Table 1.
   D. Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.
   E. Volume and complexity of the roadway has been considered.
   F. If a railroad crossing is present, vehicles will not queue across rail tracks.
   G. AFADs are not in use.
8. See Index 600 for general TCZ requirements and additional information.
9. Automated Flagger Assistance Devices (AFADs) may be used in accordance with Specifications Section 102, 990 and the APL vendor drawings.

TABLE 1

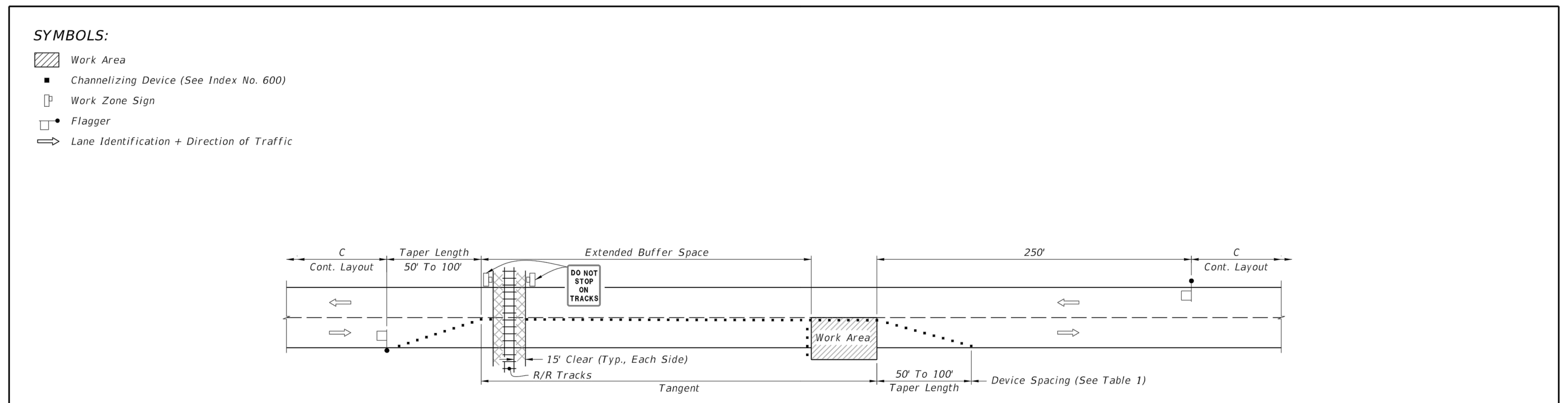
Posted Speed	DEVICE SPACING: Maximum Spacing of Cones or Tubular Markers		DEVICE SPACING: Maximum Spacing of Type I or Type II Barricades/Panels/Drums		Distance Between Signs				Buffer Space
	On a Taper	On a Tangent	On a Taper	On a Tangent	A	B	C	D	
25	20'	50'	20'	50'	200'	200'	200'	100'	155'
30	20'	50'	20'	50'	200'	200'	200'	100'	200'
35	20'	50'	20'	50'	200'	200'	200'	100'	250'
40	20'	50'	20'	50'	200'	200'	200'	100'	305'
45	20'	50'	20'	50'	350'	350'	350'	175'	360'
50	20'	50'	20'	100'	500'	500'	500'	250'	425'
55	20'	50'	20'	100'	2640'	1500'	1000'	500'	495'
60	20'	50'	20'	100'	2640'	1500'	1000'	500'	570'
65	20'	50'	20'	100'	2640'	1500'	1000'	500'	645'
70	20'	50'	20'	100'	2640'	1500'	1000'	500'	730'

CONDITIONS

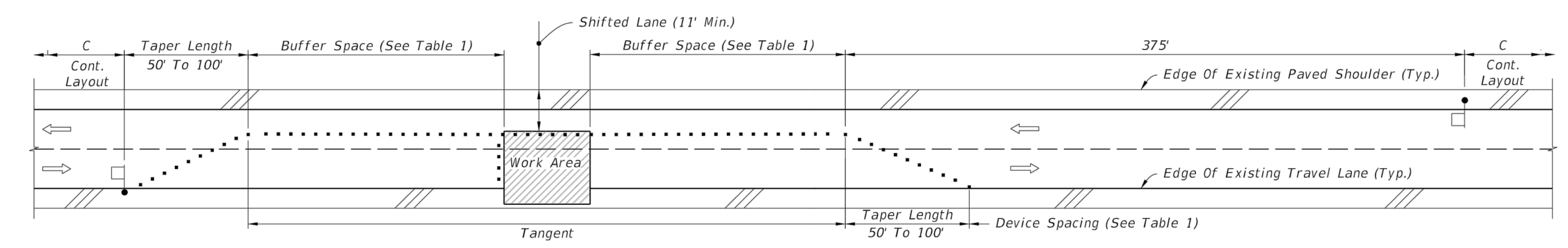
WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA BETWEEN THE CENTERLINE AND A LINE 2' OUTSIDE THE EDGE OF TRAVEL WAY.

10/12/2016 1:07:16 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY	INDEX NO.	SHEET NO.
01/01/16					603	1 of 3



TEMPORARY RAILROAD CROSSING BUFFER SPACE EXTENSION



TEMPORARY LANE SHIFT TO SHOULDER WHEN WORK AREA ENCROACHES ON THE CENTERLINE

SPECIAL CONDITIONS

Cross Rererence:
1. See General Note #1, Sheet 1 for more information.

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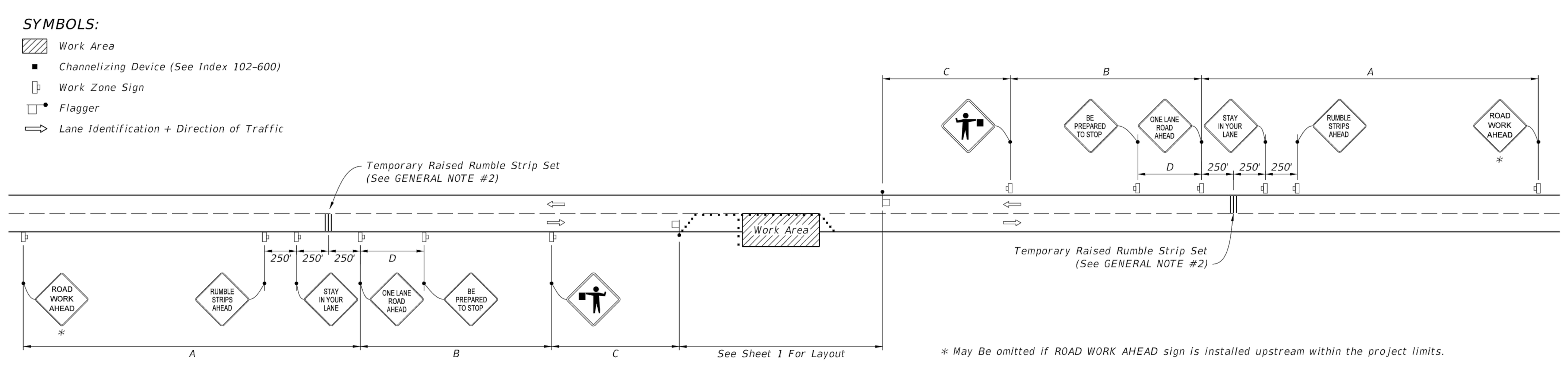
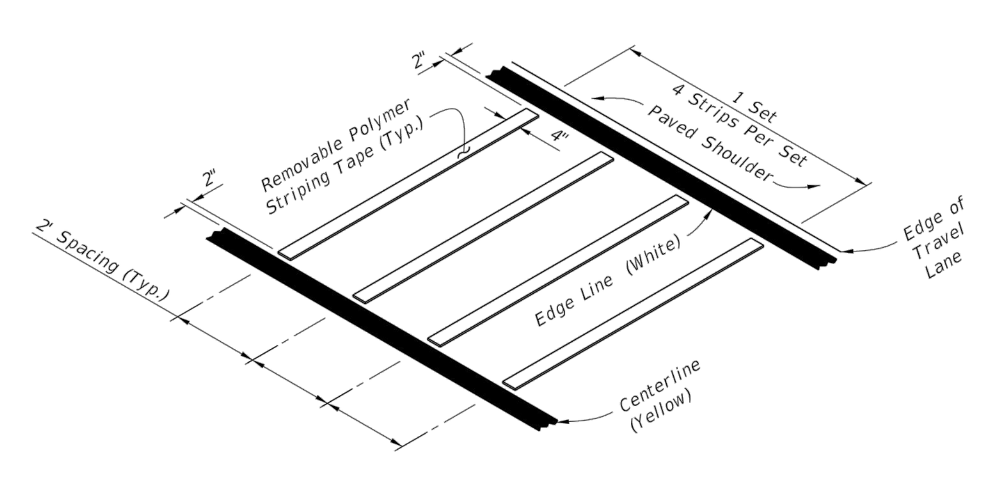
SPECIAL CONDITIONS

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY	INDEX NO.	SHEET NO.
01/01/16					603	3 of 3

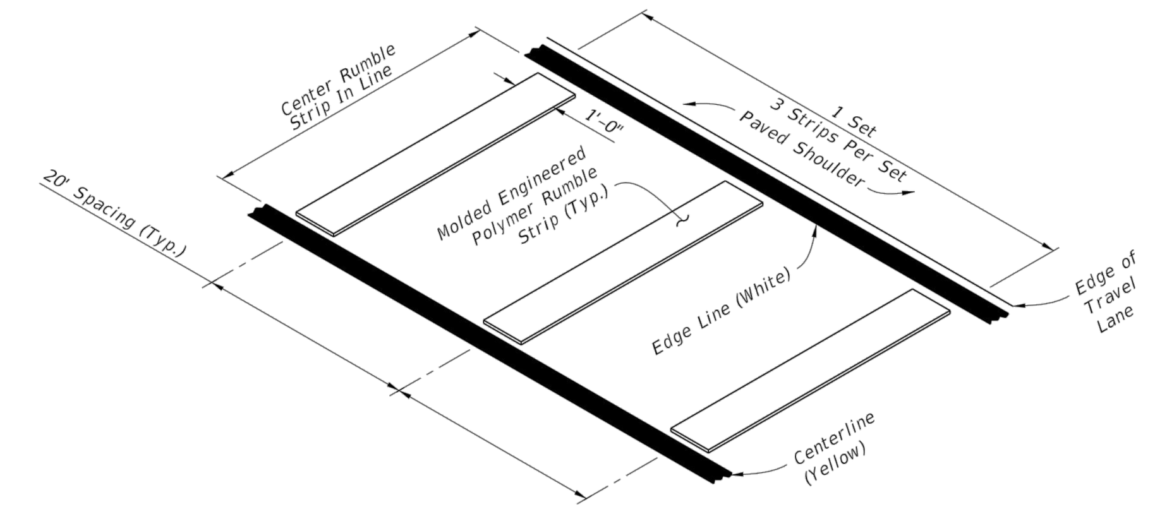


WITH TEMPORARY RAISED RUMBLE STRIPS
(When Required See GENERAL NOTE #2)



REMOVABLE POLYMER STRIPING TAPE

RUMBLE STRIP SET
OPTION - 1

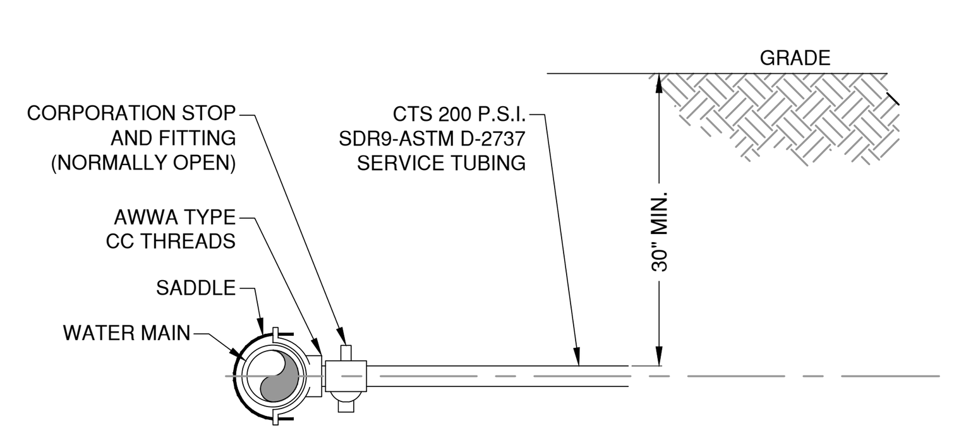


MOLDED ENGINEERED POLYMER SET

RUMBLE STRIP SET
OPTION - 2

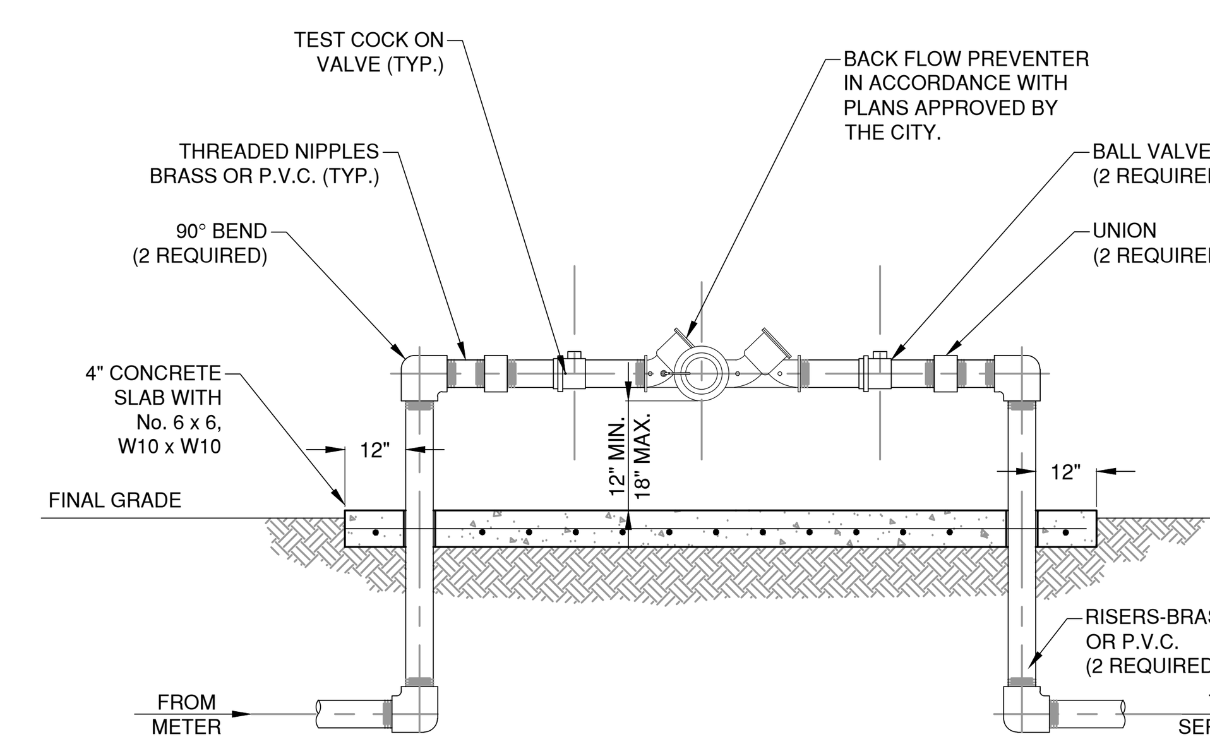
TEMPORARY RAISED RUMBLE STRIPS

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2017-18 DESIGN STANDARDS	TWO-LANE, TWO-WAY, WORK WITHIN THE TRAVEL WAY	INDEX NO.	SHEET NO.
11/01/17					603	2 of 3



NOTES:
1.) ALL FITTINGS SHALL BE BRASS WITH COMPRESSION/PACK JOINT TYPE CONNECTIONS.
2.) NO SERVICE LINE SHALL TERMINATE UNDER A DRIVEWAY.
3.) EACH SERVICE SHALL TERMINATE AT A CURB STOP WHICH SHALL BE FASTENED TO A 1" x 4" x 30" STAKE PAINTED WHITE AND MARKED WITH THE NUMBER OF THE LOT TO BE SERVED.
4.) CURB STOP SHALL BE A FORD BALL METER VALVE B43-342WG, B43-444WG OR CITY APPROVED EQUAL.
5.) ALL SERVICE TAPS TO BE LOCATED IN FIELD. TAPS SHALL BE NO CLOSER THAN AND WILL NOT BE SET IN DRAINAGE SWALES, EASEMENTS OR SIDEWALKS.
6.) CORPORATION STOP SHALL BE FORD CORP. STOP F1000-4 OR CITY APPROVED EQUAL.
7.) ALL SERVICE TAPS SHALL BE NO CLOSER THAN 36" APART AND NOT WITHIN 24" FROM BACK OF PIPE BELL OR SPIGOT INSERTION LINE.
8.) TAPPING SADDLE: MODEL FL202 FORD METER BOX CO.

1" WATER SERVICE
DETAIL



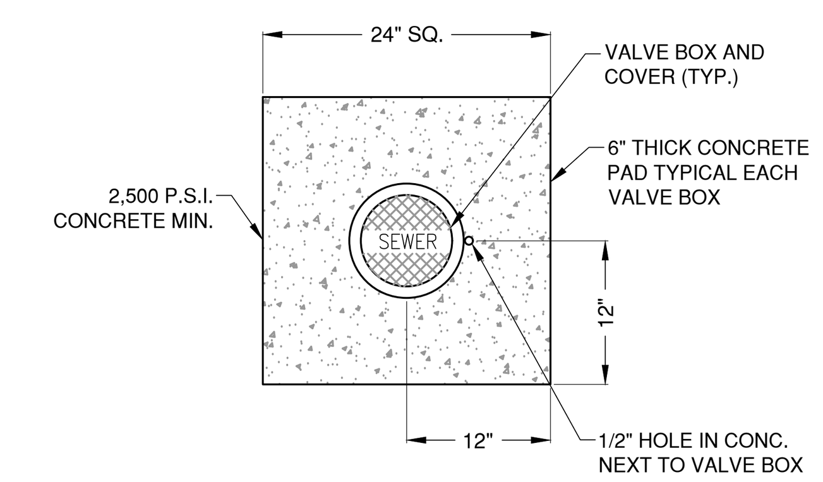
NOTES:

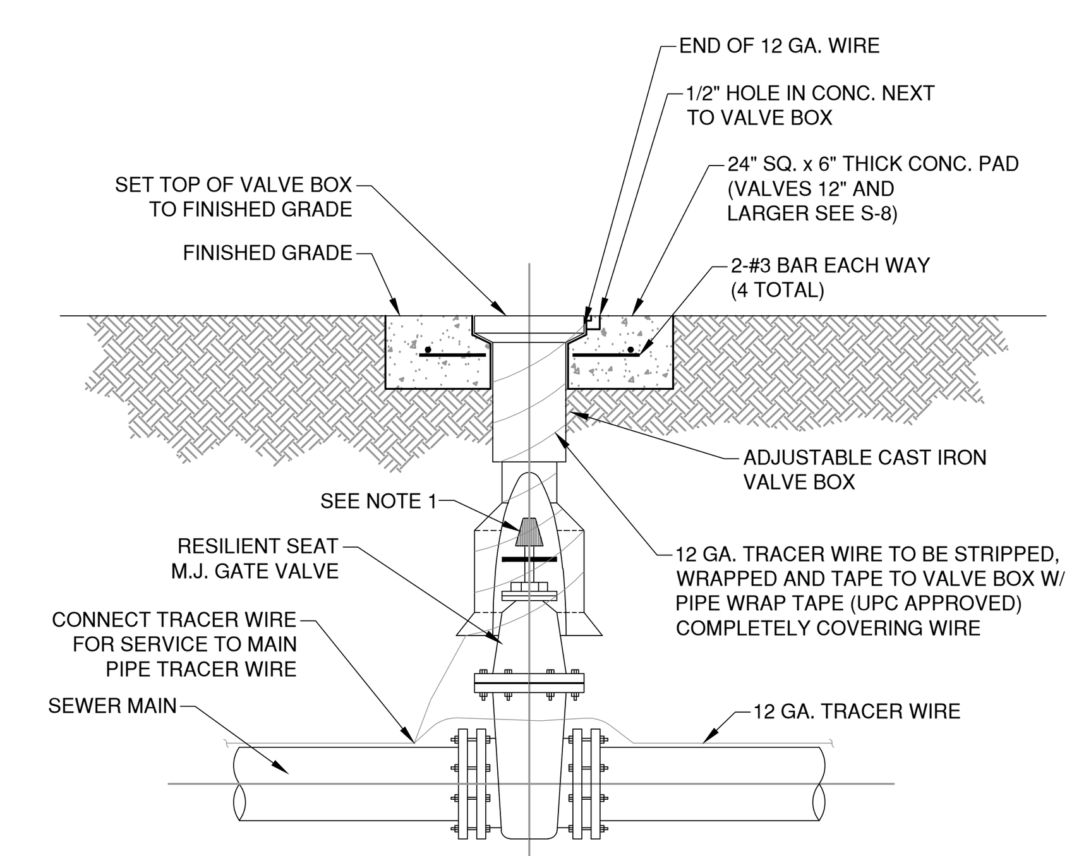
1.) ALL PIPE AND FITTINGS 2" AND SMALLER SHALL BE THREADED SCHEDULE 40 BRASS OR PVC.

2.) PROVIDE PROTECTION AGAINST FREEZING, INSULATION OR "HOTBOX".

REDUCED
PRESSURE BACK
FLOW PREVENTER
FOR 3/4,1,1-1/2 & 2"

W-15





NOTES:

1.) THE ACTUATING NUT FOR DEEPER VALVES SHALL BE EXTENDED TO COME UP TO 4 FOOT DEPTH BELOW FINISHED GRADE.

SEWER GATE VALVE & BOX
DETAIL
(4" TO 10")

S-7

REVISIONS								
NO.	DATE	BY		DATE: 03/03/16	CITY OF PANAMA CITY BEACH	SEAL	LIFT STATION #21 REPLACEMENT STANDARD DETAILS	SHEET No.
				SCALE: N.T.S.				C-901
				DESIGNED BY: M.E.S.				
				DRAWN BY: M.A.S.				
				CHECKED BY: A.E.S.	116 SOUTH ARNOLD ROAD PANAMA CITY BEACH, FLORIDA 32413	MARK E. SHAEFFER FL. PE #41202		
				FILE NO: LS_21_REPLACE.dwg				

PUMPING STATIONS	DIMENSIONS	ELEV. AT CONST.	PUMPING STATIONS	DIMENSIONS	ELEV. AT CONST.
DIM A	EXIST.	N/A	DIM L	3'-0" MIN.	—
DIM B	6'-0"	EXIST.	ELEV M	4'-0" MIN.	
DIM C	N/A	EXIST.	ELEV S	-3.56 FT	EXIST.
DIM D	1'-1"	—	ELEV T	-2.25 FT	
DIM E	2'-6"	—	ELEV U	-2.0 FT	
DIM F	5'-0"	—	ELEV V	0.00 FT	
DIM G	1'-10-1/8"	—	ELEV W	0.25 FT	
DIM H	3'-0"	—	ELEV X	0.5 FT	
DIM J	3'-6" MIN.	—	ELEV Y	13.5 FT	
DIM K	3'-0" MIN.	—	ELEV Z	0.75 FT	EXIST.

* PER PUMP MANUFACTURERS REQUIREMENT

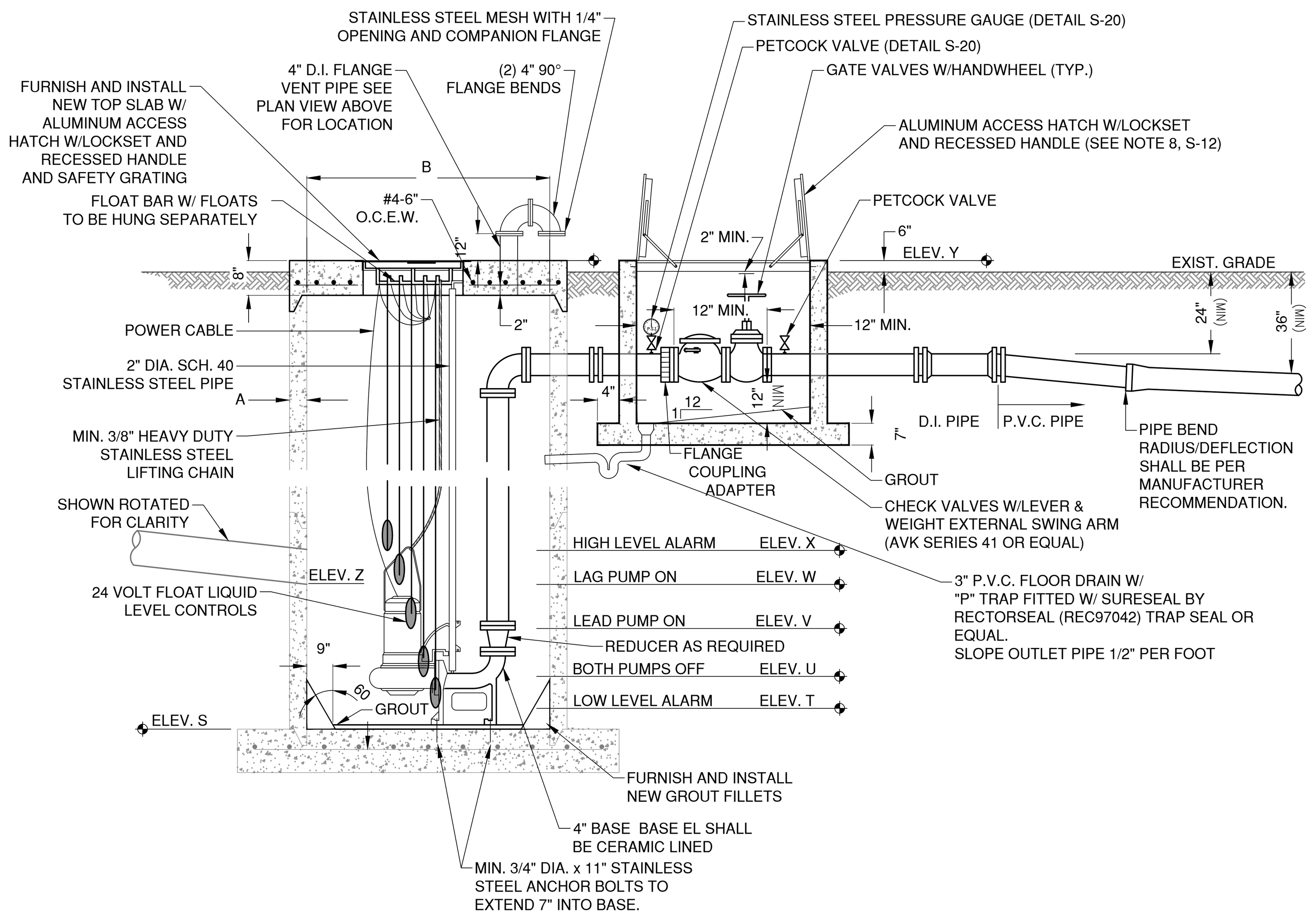
GENERAL NOTES:

1.) ALL EXPOSED METAL SHALL BE PAINTED WITH 2 COATS OF INDUSTRIAL EXTERIOR ENAMEL, GLIDDEN HUNTER GREEN, (HEX#355E3B) OR CITY APPROVED EQUAL.
2.) WET WELL EXTERIOR AND VALVE VAULT (INTERIOR AND EXTERIOR) SHALL BE COATED WITH COAL TAR EXCEPT TOP SURFACE OF COVERS. (TWO COATS, 9 MILS EACH.) WET WELL INTERIOR SHALL BE COATED WITH SPECIALTY COATING PER SPECIFICATIONS.
3.) VALVE VAULT SHALL BE SIZED TO PERMIT EASY REMOVAL OF CHECK VALVE SPINDLES WITH MINIMUM CLEARANCES AS SHOWN FOR 6" DIAMETER PIPE AND SMALLER. CLEARANCES SHALL INCREASE AS REQUIRED FOR LARGER PIPE SIZES.
4.) VALVE VAULT SHALL HAVE SEALED FLOOR AND DRAIN.
5.) ALL LOCATIONS WHERE PIPES ENTER OR LEAVE THE WET WELL OR VALVE VAULT SHALL BE MADE WATERTIGHT WITH WALL SLEEVE OR NON-SHRINK GROUT.
6.) THERE SHALL BE NO VALVES OR ELECTRICAL JUNCTION BOXES IN WET WELL.
7.) WET WELL AND VALVE VAULT COVERS SHALL BE ALUMINUM WITH 316 S.S. HARDWARE AND LOCK BRACKET. SIZE AS REQUIRED BY PUMP MANUFACTURER AND APPROVED BY THE CITY.
8.) FLEXIBLE COUPLING SHALL BE SLEEVE TYPE.
9.) PUMPS ARE:

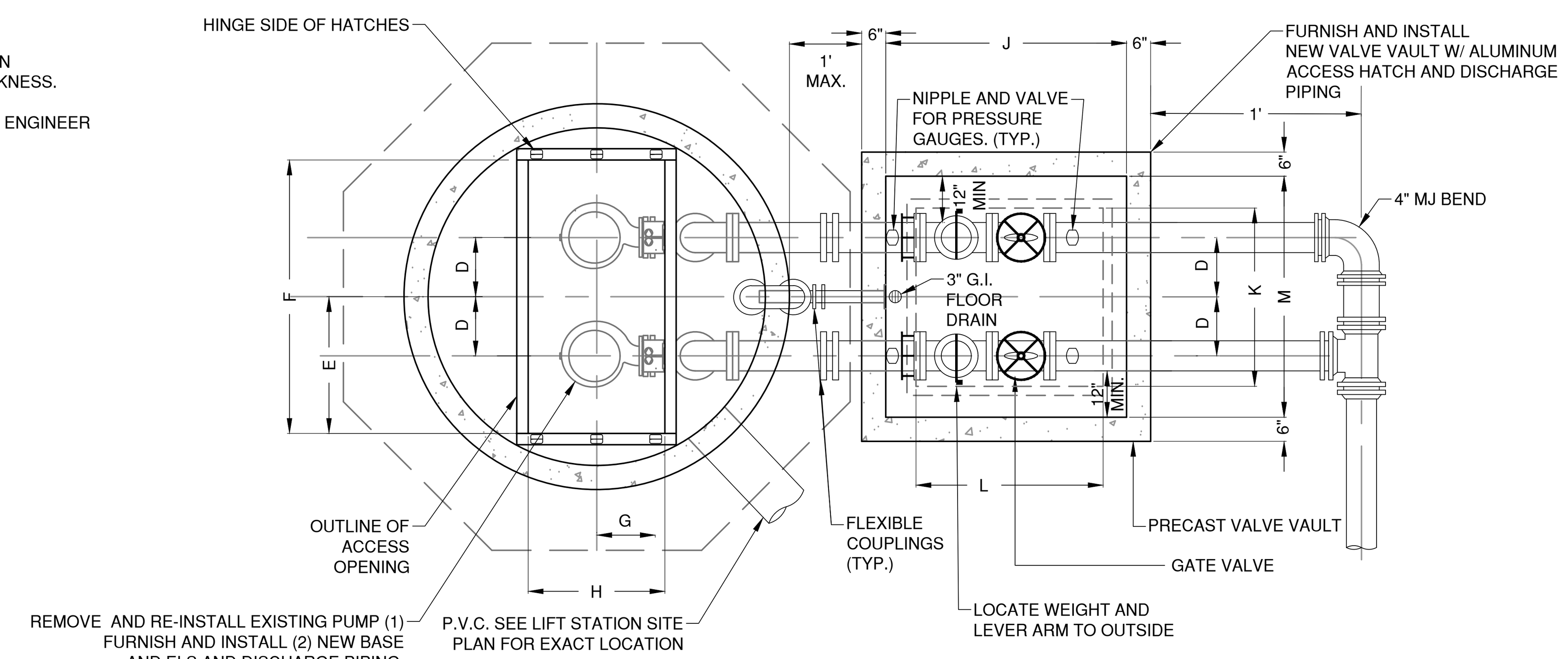
MANUFACTURER: WILO; MODEL: FA 10.33; IMP: ____; DIA: 9.37; INCHES
SPEED: 1740 RPM; DISCHARGE SIZE: 4 IN.; VOLTAGE: 230;
HZ.: 60; PHASE: 3; H.P.: 7.40;
MIN. SOLID SIZE: 3 IN.; CURVE: ____.

10.) OPERATING CONDITIONS SHALL BE 165 GPM AT 77 FEET TDH.
11.) ALL NUTS, BOLTS, WASHERS, ETC. IN WET WELL AND VALVE BOX TO BE 316 STAINLESS STEEL.
12.) APPLY TWO COATS OF CERAMIC EPOXY ON THE ENTIRE INSIDE OF EACH BASE ELBOW IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS INCLUDING COATING THICKNESS. SURFACE PREPARATION SHALL ALSO BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. ACCEPTABLE COATINGS ARE BELZONA CERAMIC CARBIDE NO. 1811 OR ENGINEER APPROVED EQUAL.

PUMP STATION NOTES AND TABLE S-12



PUMP STATION SECTION VIEW S-10



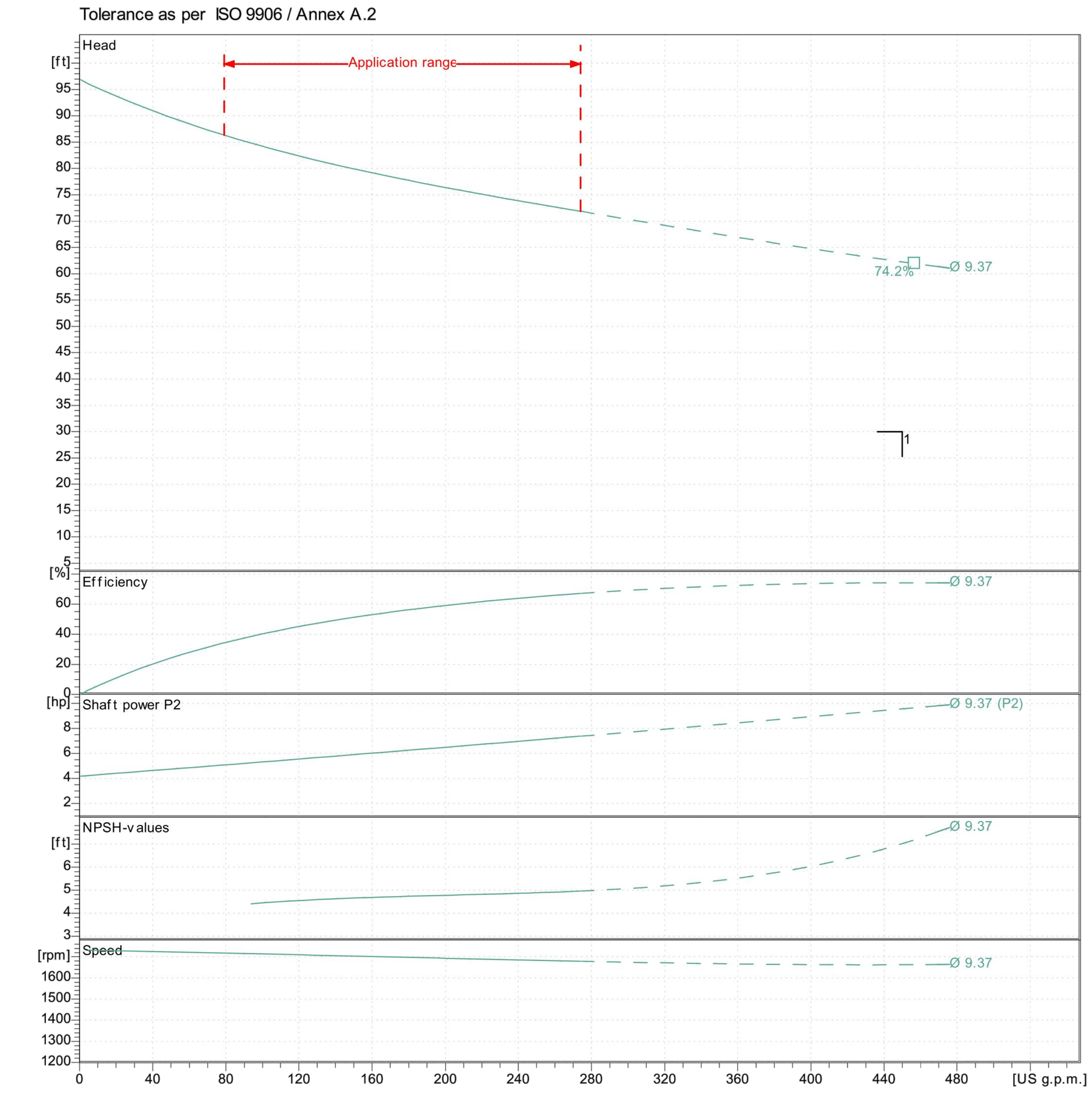
PUMP STATION PLAN VIEW S-11

Project:
Project number:
Created on: 2018-08-07
Created by:

WILO

Performance curves — with motor
Submersible sewage pump FA 10.33E FK 17.1-4/12KEx

Power data referred to: Water, pure [100%] ; 68°F; 62.315lb/ft³; 1.0768E-5ft²/s
Tolerance as per ISO 9906 / Annex A.2



Pump				Duty point data			
Impeller Ø	designed	9 3/8	inch	Volume flow			US g.p.m.
Nominal speed		1740	rpm	Head			ft
Frequency		60	Hz	Shaft power	P_2		hp
Impeller type		Single-channel		Pump efficiency			%
Motor				Power input	P_1		hp
Rated power		7.4	hp	Required pump NPSH			ft
Sel. explosion protection		ATEX		Speed		1663	rpm

REVISIONS			
NO.	DATE	BY	

DATE:	08/06/18
SCALE:	N.T.S.
DESIGNED BY:	M.E.S.
DRAWN BY:	M.A.S.
CHECKED BY:	A.E.S.
FILE NO: LS_21_REPLACE.dwg	

CITY OF
PANAMA CITY BEACH
116 SOUTH ARNOLD ROAD PANAMA CITY BEACH, FLORIDA 32413

SEAL
MARK E. SHAEFFER
FL. PE #41202

LIFT STATION #21 IMPROVEMENTS
PROPOSED PLAN AND SECTIONS

SHEET No.
M-100

BASIC ELECTRICAL REQUIREMENTS

SCOPE

THIS SCOPE COVERS THE FURNISHING, INSTALLATION, TESTING, ADJUSTING AND PLACING IN OPERATION ALL ELECTRICAL EQUIPMENT, DEVICES, FACILITIES, MATERIALS, AND AUXILIARY ITEMS NECESSARY FOR THE COMPLETE AND SUCCESSFUL OPERATION OF ALL ELECTRICAL EQUIPMENT AS HEREIN DESCRIBED, SHOWN ON THE PLANS, OR DEEMED NECESSARY FOR THE COMPLETION OF THE ELECTRICAL PORTION OF THE PROJECT. IT IS THE INTENT TO OUTLINE THE ELECTRICAL REQUIREMENTS OF THE CONTRACT IN ORDER TO PROVIDE THE INFORMATION NECESSARY FOR THE CONSTRUCTION OF A FULLY OPERATIONAL SYSTEM AS SHOWN ON THE PLANS AND AS HEREIN DESCRIBED. A COMPREHENSIVE ELECTRICAL SCOPE OF WORK IS AS FOLLOWS:

POWER/ELECTRICAL SYSTEM
SCADA
LIFT STATION ELECTRICAL
UTILITY WORK
CONNECTION OF ELECTRICALLY POWERED MECHANICAL EQUIPMENT
TEMPORARY CONSTRUCTION POWER
ALL INCIDENTALS NECESSARY FOR A COMPLETE AND FULLY OPERATIONAL ELECTRICAL SYSTEM.

WORKING CLEARANCES

WORKING CLEARANCES AROUND EQUIPMENT REQUIRING ELECTRICAL SERVICES SHALL BE VERIFIED BY CONTRACTOR TO COMPLY WITH CODE REQUIREMENTS. SHOULD THERE BE APPARENT VIOLATIONS OF CLEARANCES, THE CONTRACTOR SHALL NOTIFY THE ENGINEER BEFORE PROCEEDING WITH CONNECTION OR PLACING OF EQUIPMENT.

IN THE CASE OF PANEL BOARDS, SAFETY SWITCHES AND OTHER EQUIPMENT REQUIRING WIRE AND CABLE TERMINATION'S, THE CONTRACTOR SHALL ASCERTAIN THAT LUG SIZES AND WIRING GUTTERS OR SPACE ALLOWED FOR PROPER ACCOMMODATION AND TERMINATION OF THE WIRES AND CABLES ARE ADEQUATE.

WORKMANSHIP

ALL WORK SHALL BE ACCOMPLISHED BY PERSONS SKILLED IN PERFORMANCE OF THE REQUIRED TASK. ALL WORK SHALL BE DONE IN KEEPING WITH CONVENTIONS OF THE TRADE. WORK OF THIS DIVISION SHALL BE CLOSELY COORDINATED WITH WORK OF OTHER TRADES TO AVOID CONFLICT AND INTERFERENCE. ALL CONDUCTORS INSIDE THE LIFT STATION ENCLOSURE SHALL BE IDENTIFIED WITH STANDARD VINYL–CLOTH SELF ADHESIVE CABLE/CONDUCTOR MARKERS OF WRAP–AROUND TYPE. MARKERS SHALL BE PLASTIC COATED AND PRE–NUMBERED TO SHOW CIRCUIT IDENTIFICATION. WRITE–ON TYPE MARKERS WILL NOT BE ACCEPTED. CONDUCTORS AND CABLES IN MANHOLES AND HANDHOLES SHALL BE IDENTIFIED BY BRASS TAGS WITH DIE STAMPED LETTERING.

UTILITIES

ARRANGE WITH GULF POWER FOR THE SERVICES AND INSTALL THE SERVICES IN ACCORDANCE WITH THEIR REQUIREMENTS, REGULATIONS AND RECOMMENDATIONS.

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE ALL OTHER ELECTRICAL SYSTEMS, MATERIALS AND WORKMANSHIP TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE. HE SHALL CORRECT ALL DEFECTS ARISING WITHIN THIS PERIOD UPON NOTIFICATION BY THE OWNER OR ENGINEER, WITHOUT ADDITIONAL COMPENSATION.

MATERIAL STANDARDS

MATERIAL SHALL BE NEW AND COMPLY WITH STANDARDS OF UNDERWRITERS' LABORATORIES, INC., WHERE STANDARDS HAVE BEEN ESTABLISHED FOR THE PARTICULAR PRODUCT AND THE VARIOUS NEMA, ANSI, ASTM, IEEE, AEIC, IPCEA OR OTHER PUBLICATIONS REFERENCED.

TEST EQUIPMENT

THE CONTRACTOR SHALL PROVIDE ALL TEST EQUIPMENT AND SUPPLIES DEEMED NECESSARY BY THE ENGINEER/INSPECTOR AT NO EXTRA COST TO THE OWNER. THESE SUPPLIES SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING: VOLT METERS, AMP METERS, LIGHT METERS, FUEL, GENERATOR LOAD BANKS, WATT METERS, HARMONIC DISTORTION TEST EQUIPMENT, AND OSCILLOSCOPES.

SUBMITTAL

SUBMIT SHOP DRAWING FOR APPROVAL BY THE OWNER. SUBMIT SHOP DRAWINGS AND PRODUCT DATA GROUPED TO INCLUDE COMPLETE SUBMITTAL OF RELATED SYSTEMS, PRODUCTS, AND ACCESSORIES IN A SINGLE SUBMITTAL. NO ELECTRICAL WORK MAY BE PERFORMED UNTIL ALL SHOP DRAWINGS ARE APPROVED. SUBMIT SHOP DRAWINGS ON THE FOLLOWING SYSTEMS AS GROUPED BELOW:

POWER/ELECTRICAL SYSTEM
- CONDUIT
- WIRE
- PULL BOXES
- PANEL BOARDS
- PANEL BOARD LAYOUTS
- BREAKERS
- DISCONNECTS
- FUSES
- CONDUIT SUPPORT SYSTEMS
- WIRING DEVICES
- PUMP STARTERS
- TRANSFORMERS
- SURGE PROTECTION DEVICES

LIFT STATION CONTROL SYSTEM
- PUMP CONTROLLER
- FLOATS
- H–O–A SWITCHES
- HOUR METERS
- NAME PLATES
- PUMP STARTERS
- CONTROL RELAYS
- CONTROL SCHEMATICS

SCADA
- RTUS
- SOFTWARE
- I/O POINTS
- RADIO EQUIPMENT
- SYSTEM DIAGRAMS
- MAIN COMPUTER EQUIPMENT
- FCC INFORMATION
- CAD SCHEMATICS OF RTU
- PRESSURE TRANSMITER

UTILITY WORK
- UTILITY COORDINATION INFORMATION
- UTILITY CONDUIT
- MISC.

MARK DIMENSIONS AND VALUES IN UNITS TO MATCH THOSE SPECIFIED.

REGULATORY REQUIREMENTS

CONFORM TO APPLICABLE SECTIONS OF THE BUILDING CODE FOR THE CITY OF PANAMA CITY BEACH AND ALL LOCAL RULES, REGULATIONS AND ORDINANCES.

FLORIDA DEP FORM 62–604.300(8)(a) NOTIFICATION/APPLICATION FOR CONSTRUCTING A DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEM.

ELECTRICAL: CONFORM TO NFPA 70 NEC (LATEST EDITION).
CONFORM TO NFPA 820 (LATEST EDITION).

OBTAIN PERMITS, AND REQUEST INSPECTIONS FROM AUTHORITY HAVING JURISDICTION.

FINAL INSPECTION AND TESTING

AFTER THE ELECTRICAL INSTALLATION IS COMPLETE, THE CONTRACTOR SHALL DELIVER TO THE ENGINEER THE FOLLOWING INFORMATION WITH HIS REQUEST FOR FINAL INSPECTION.
THE ELECTRICAL WORK SHALL BE THOROUGHLY TESTED TO DEMONSTRATE THAT THE ENTIRE SYSTEM IS IN PROPER WORKING ORDER AND IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. EACH MOTOR WITH ITS CONTROL SHALL BE RUN AS NEARLY AS POSSIBLE UNDER OPERATING CONDITIONS FOR A SUFFICIENT LENGTH OF TIME TO DEMONSTRATE CORRECT ALIGNMENT, WIRING CAPACITY, SPEED AND SATISFACTORY OPERATION. ALL MAIN SWITCHES AND CIRCUIT BREAKERS SHALL BE OPERATED, BUT NOT NECESSARILY AT FULL LOAD. CONTRACTOR MAY BE REQUIRED DURING FINAL INSPECTION, AT THE REQUEST OF THE ENGINEER TO FURNISH TEST INSTRUMENTS FOR USE DURING THE TESTING.

ALL PANEL BOARD AND ALL OTHER MAIN FEEDER CIRCUITS SHALL BE GIVEN A MEGGER TEST USING A 1000 VOLT MEGGER. THIS TEST SHALL BE PERFORMED AFTER CONDUCTORS ARE PULLED, BUT BEFORE FINAL CONNECTIONS ARE MADE. THE ENGINEER SHALL BE GIVEN TWO (2) DAYS' WRITTEN NOTICE OF THE ANTICIPATED TEST DATE SO THAT HE MAY WITNESS THE TEST IF SO DESIRED. IN ANY EVENT, THE CONTRACTOR SHALL RECORD THE CIRCUIT DESIGNATION AND THE MEGGER READING ON EACH PHASE. THIS WRITTEN RECORD SHALL BE SUBMITTED TO THE ENGINEER. THE COST OF THIS TEST OR ANY RETEST CAUSED BY INSUFFICIENT MEGGER READINGS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

AS–BUILT DRAWINGS

THE CONTRACTOR SHALL PROVIDE DETAILED AS–BUILT DRAWINGS FOR ALL WORK INDICATING ALL CONTROL AND POWER WIRING. THE AS–BUILT DRAWINGS SHALL ALSO INCLUDE DETAILED CONTROL SCHEMATIC FOR THE CONTROL SYSTEM. (ALL DRAWINGS SHALL BE DELIVERED TO THE OWNER IN AN AUTOCAD 2011 OR NEWER FORMAT.)

OVER–CURRENT PROTECTION DEVICES

PUMP CIRCUITS SHALL INCLUDE GROUND FAULT CIRCUIT INTERRUPTION PROTECTION. PROVIDE EITHER A THERMAL–MAGNETIC CIRCUIT BREAKER WITH BUILT–IN GFCI OR MOTOR CIRCUIT PROTECTOR WITH EXTERNAL TRIPPING MEANS CONNECTED TO A GROUND–FAULT RELAY CIRCUIT.

SUPPORTING DEVICES

ALL SUPPORTING DEVICES SHALL BE STAINLESS STEEL UNLESS OTHERWISE INDICATED. ALL CABLES WITHIN WET WELL SHALL BE SUPPORTED W/ STAINLESS STEEL CABLE STRAIN RELIEF.

CONDUIT

CONDUIT BELOW GRADE SHALL BE RNC, SCH. 40, CONCRETE ENCASED.
EXPOSED CONDUIT SHALL BE RIGID ALUMINUM. WHERE IN CONTACT WITH CONCRETE OR EARTH, PROTECT CONDUIT WITH 3M SCOTCHRAP PIPE PRIMER AND THEN WRAPPED WITH ONE LAYER OF 3M SCOTCHRAP 51–ALL WEATHER CORROSION PROTECTION TAPE PER MANUFACTURER'S RECOMMENDATIONS.
CONDUIT SUPPORTS SHALL BE STAINLESS STEEL.
CONDUIT SHALL BE SIZED PER THE NEC.

DISCONNECT SWITCHES

ALL DISCONNECT SWITCHES SHALL BE 200,000 AIC FUSED DISCONNECT SWITCHES.
ALL SWITCHES SHALL BE NEMA 4X STAINLESS STEEL.

GROUNDING

ALL CONDUIT RUNS SHALL HAVE A GROUND CONDUCTOR (color green) SIZED PER NEC.
GROUND RODS: 3/4"x10', STEEL COPPER–CLAD

SCADA SYSTEMS

WORK INCLUDED

PROVIDE ALL LABOR, MATERIALS, NECESSARY EQUIPMENT, AND SERVICES TO DESIGN AND INSTALL A FULLY OPERATION SCADA AND CONTROL SYSTEM FOR THE PROPOSED NEW LIFT STATIONS AS INDICATED ON THE DRAWINGS, AND AS SPECIFIED HEREIN OR BOTH.

THE SCADA SYSTEM SUPPLIER SHALL PROVIDE ALL REQUIRED HARDWARE AND SOFTWARE REQUIRED FOR A FULLY OPERATIONAL SYSTEM.

REFERENCES

NEMA – INDUSTRIAL CONTROL

NFPA – 70 & 820

ISA – INSTRUMENT SOCIETY OF AMERICA – STANDARDS AND RECOMMENDED PRACTICES FOR INSTRUMENTATION AND CONTROL

JIC – JOINT INDUSTRIAL COUNCIL

SUBMITTAL

SUBMIT DETAILED POINT–TO–POINT WIRING DIAGRAMS. SUBMIT COMPLETE CATALOG INFORMATION ON ALL PROPOSED SYSTEM COMPONENTS IN A THREE RING BINDER AT THE TIME OF SHOP DRAWINGS FOR APPROVAL.

WARRANTY

ALL EQUIPMENT FURNISHED UNDER THIS SECTION SHALL BE WARRANTED FOR FULL REPLACEMENT BY THE CONTRACTOR AND THE EQUIPMENT MANUFACTURER FOR A PERIOD OF 1 YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER.

CONTRACTOR/MANUFACTURER QUALIFICATIONS

AS BUILT DRAWINGS: THE CONTRACTOR SHALL PROVIDE AUTOCAD 2011 AND NEWER FORMATTED AS–BUILT DRAWINGS OF THE CONTROL EQUIPMENT. THE DRAWINGS SHALL INCLUDE POINT–TO–POINT WIRING DIAGRAMS, CONTROL ALGORITHMS, AND CABINET LAYOUTS. THE CONTRACTOR SHALL ALSO PROVIDE BOTH ELECTRONIC AND PAPER COPIES OF ALL PLC CODE.

AS BUILT ELECTRICAL SCHEMATICS SHALL BE LAMINATED TO THE INTERIOR DOOR OF EACH LIFT STATION ENCLOSURE. ALL CONDUCTORS INSIDE THE LIFT STATION ENCLOSURE SHALL BE IDENTIFIED WITH STANDARD VINYL–CLOTH SELF ADHESIVE CABLE/CONDUCTOR MARKERS OF WRAP–AROUND TYPE. MARKERS SHALL BE PLASTIC COATED AND PRE–NUMBERED TO SHOW CIRCUIT IDENTIFICATION. WRITE–ON TYPE MARKERS WILL NOT BE ACCEPTED. CONDUCTORS AND CABLES IN MANHOLES AND HANDHOLES SHALL BE IDENTIFIED BY BRASS TAGS WITH DIE STAMPED LETTERING.

PROGRAMMABLE LOGIC CONTROLLER

GENERAL: ALL PLC EQUIPMENT SHALL BE THE STANDARD PRODUCTS OF A SINGLE MANUFACTURER WHO HAS BEEN REGULARLY ENGAGED IN THE PRODUCTION OF INDUSTRIAL CONTROL PRODUCTS FOR THE LAST TEN YEARS.

ALL MANUFACTURERS OF ALL PROPOSED CONTROL EQUIPMENT FOR THIS PROJECT MUST MAINTAIN A STOCKING DISTRIBUTOR WITHIN 250 MILES OF THE PROJECT SITE WHICH WILL PROVIDE WARRANTY EQUIPMENT REPLACEMENT.

ENVIRONMENTAL CONDITIONS: ALL PLC EQUIPMENT INSTALLED ON THIS PROJECT SHALL BE CAPABLE OF OPERATING AT A RELATIVE HUMIDITY OF UP TO 95% NON–CONDENSING AND SHALL BE CAPABLE OF OPERATING IN A TEMPERATURE RANGING FROM 0 TO 60 DEGREES CELSIUS. NO SPECIAL ENVIRONMENTAL ENCLOSURES SHALL BE REQUIRED TO MEET THESE ENVIRONMENTAL CONDITIONS.

SURGE PROTECTION: ALL PLC MODULES SHALL HAVE INTEGRAL SURGE PROTECTION EQUIPMENT CAPABLE OF MEETING OR EXCEEDING IEEE–472–1974 AND ANSI C37–90A–1974. DIN RAIL MOUNTED SURGE PROTECTION SHALL BE PROVIDED FOR ALL I/O POINTS. ALL POWER TO THE PLC SHALL BE PROTECTED FROM SURGES IN ACCORDANCE WITH THE PLC MANUFACTURERS RECOMMENDATIONS. ALL 4–20 MA SIGNALS SHALL BE PROTECTED WITH LOOP–POWERED ISOLATORS.

I/O MODULES: EACH I/O MODULE SHALL CONTAIN A STATUS LIGHT TO INDICATED THE MODULES CURRENT COMMUNICATION STATUS WITH THE CPU AND CURRENT STATUS OF ALL I/O FUNCTIONS. ALL ANALOG I/O MODULES SHALL PROVIDE AN ACCURACY OF 99.9%.

POWER SUPPLIES: THE PLC SHALL OPERATE WITH AN ELECTRICAL SERVICE OF 120 VAC SINGLE PHASE IN THE FREQUENCY RANGE OF 47 TO 63 HZ. THE POWER SUPPLY SHALL AUTOMATICALLY SHUT DOWN THE PLC WHENEVER ITS OUTPUT CURRENT IS DETECTED AS BEING EXCESSIVE.

PROGRAM STORAGE: THE PLC SHALL STORE ITS PROGRAM IN A SOLID–STATE BATTERY BACKUP RAM TYPE STORAGE. THE MEMORY SHALL BE CAPABLE OF STORING THE PROGRAM FOR 24 MONTHS UNDER WORST CASE CONDITIONS. (EEPROMS ARE REQUIRED).

WARRANTY: THE PLC MANUFACTURER SHALL PROVIDE A 3 YEAR FACTORY WARRANTY COVERING FULL REPLACEMENT OF THE PROPOSED PLC EQUIPMENT.

MODEMS: 9600 BAUD RADIO FOR LIFT STATIONS.

UPS UNITS: ALL PLC AND COMMUNICATION EQUIPMENT SHALL BE BACKED UP BY A UPS OR BATTERY POWER SUPPLY CAPABLE OF OPERATING THE SUPPLIED EQUIPMENT FOR 24 HOURS IN THE EVENT OF A POWER FAILURE. THE UPS UNITS SHALL BE DESIGNED TO HANDLE THE HEAT AND HUMIDITY ASSOCIATED WITH THIS PROJECT.

BATTERIES SHALL BE: 2 EA SEALED LEAD ACID / ABSORBENT GLASS MAT, 55AH. POWER SONIC PS–12550 OR EQUIVALENT

CPU: MICROLOGIX 1400 PLC (P/N 1766–L32BXB), DC INPUT MODULE (P/N 1762–IQ8) AND ANALOG INPUT MODULE (P/N 1762–IF4).

NEW RADIO EQUIPMENT

SEE RTU PANEL BILL OF MATERIALS NEXT SHEET.

PLC PROGRAMMING

PROGRAMMING SHALL BE IN A SIMPLE LADDER DIAGRAM LANGUAGE OR HIGH LEVEL LANGUAGE (NO ASSEMBLY LANGUAGE ALLOWED). THE NUMBERING SYSTEM SHALL BE UNIFORM AND SHALL BE BASED ON A RACK, CARD, INPUT/OUTPUT SEQUENCE. THE PROGRAM SHALL BE WRITTEN FOR THIS SPECIFIC PROJECT AND SHALL USE THE INFORMATION FROM THE DRAWINGS AND THE SPECIFICATIONS AS A BASIS. THE CONTRACT DOCUMENTS ARE INTENDED AS A GUIDE IN THE CREATION OF THE PROGRAM AND ARE NOT TO BE CONSTRUED AS LIMITATIONS IN THE MANNER IN WHICH THE PROGRAM IS TO BE WRITTEN. THE CONTRACT DOCUMENTS PRESENT A FRAMEWORK AROUND WHICH THE PROGRAM SHALL BE WRITTEN, THEREFORE, THE PROGRAMMER WILL BE EXPECTED TO BECOME INTIMATE WITH THE PROCESS WHICH IS TO BE CONTROLLED.

SCOPE OF CONTROL SYSTEMS

LIFT STATIONS: THE SCADA SYSTEM SHALL BE DESIGNED BY THE CONTRACTOR TO PROVIDE CONTROL OF THE OWNER'S PROPOSED SEWAGE LIFT STATIONS. THE SYSTEM SHALL ALLOW THE OWNER TO MONITOR: PUMP RUN TIMES, PUMP SEAL FAILURES, PUMP OVER TEMPS, WET WELL LEVELS, POWER FAILURES, AND POWER PHASE FAILURES.

THE RTU SHALL CONTROL THE PROPOSED PUMP STATIONS.

REPORTS

ALARM REPORTS
SYSTEM MAINTENANCE REPORTS
FLOW REPORTS
PUMP RUN TIME REPORTS

SPARE PARTS

THE CONTRACTOR SHALL PROVIDE THE OWNER 1 SPARE SETS OF ALL EQUIPMENT USED FOR THE LIFT STATION SCADA SYSTEM. THIS INCLUDES ALL PLC MODULES, RELAYS, ETC.
(TO BE PROVIDED AS AN ALTERNATE BID)

FIELD QUALITY CONTROL

PROVIDE INSTRUCTION ON SITE SYSTEM OPERATION AS REQUIRED BUT NOT LESS THAN 1 DAY. TEST EACH FIELD INPUT AND ASSOCIATED OUTPUT.

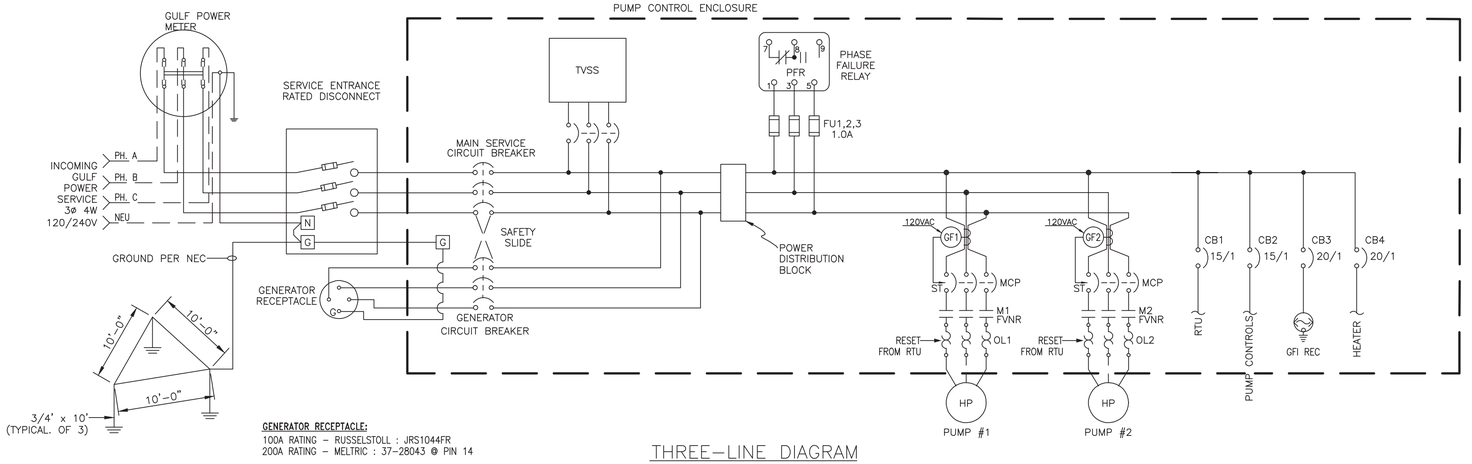
DOCUMENTATION

THE CONTRACTOR OF THE CONTROL SYSTEM SHALL PROVIDE A COMPLETE SET OF OM MANUALS AND SCHEMATICS IN A AUTOCAD 2011 OR NEWER FORMAT. THE OM MANUALS SHALL INCLUDE INFORMATION ON THE PLC EQUIPMENT AS WELL AS SYSTEM TROUBLE SHOOTING INFORMATION.

THE CONTRACTOR SHALL DELIVER DETAILED POINT–TO–POINT DRAWINGS TO THE OWNER IN BOTH A PAPER AND AUTOCAD 2011 AND NEWER FORMAT. THE INTEGRATOR SHALL PROVIDE DOCUMENTED PLC CODE AND DETAILED INSTRUCTIONS FOR THE INSTALLATION OF ADDITIONAL RTUS.

RADIO SURGE PROTECTION

PROVIDE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



GENERATOR RECEPTACLE:
100A RATING – RUSSELSTOLL : JRS1044FR
200A RATING – MELTRIC : 37–28043 @ PIN 14

THREE–LINE DIAGRAM

REVISIONS			
NO.	DATE	BY	

DATE: 9/13/2013
SCALE: N.T.S.
DESIGNED BY: ...
DRAWN BY: M.A.S.
CHECKED BY: K.P.J.
FILE NO: 0–PCB–UTL–DETAILS–1.dwg

CITY OF
PANAMA CITY BEACH
110 SOUTH ARNOLD ROAD PANAMA CITY BEACH, FLORIDA 32413

SEAL

ELECTRICAL NOTES

SHEET NUMBER
E-001

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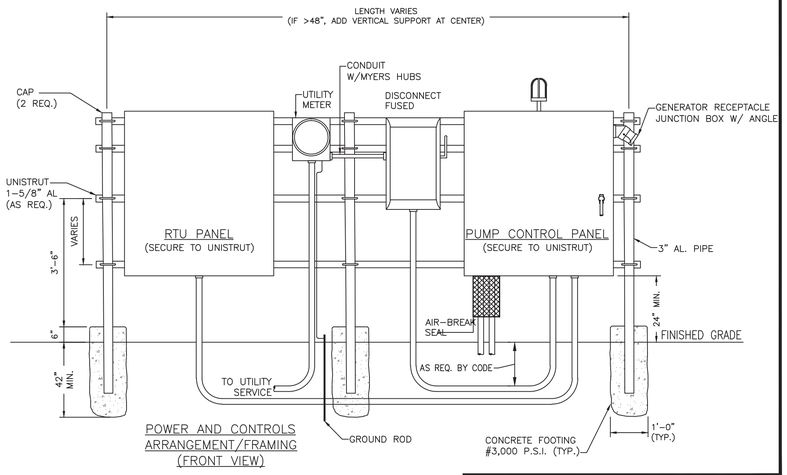
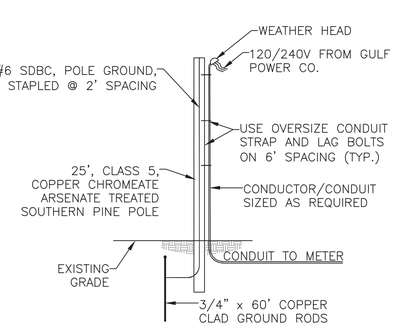


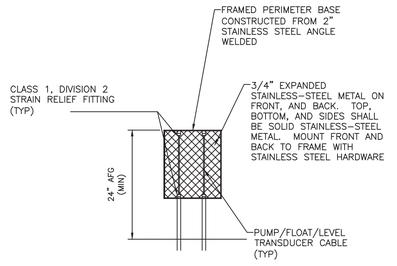
POWER AND CONTROLS ARRANGEMENT/FRAMING (FRONT VIEW)



NOTE:
CONTRACTOR TO COORDINATE WITH GULF POWER CO. AND INSTALL METERING EQUIPMENT IN ACCORDANCE WITH RULES AND REGULATIONS. (IF REQUIRED)

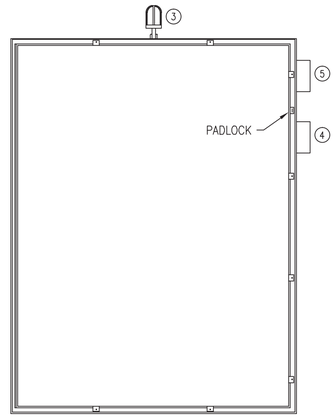
SERVICE POLE DETAIL

NOT TO SCALE

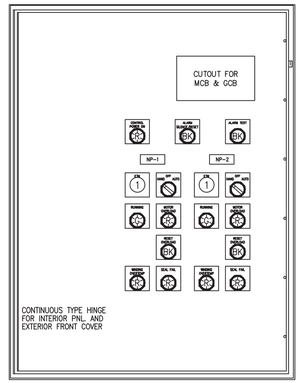


AIR BREAK SEAL DETAIL

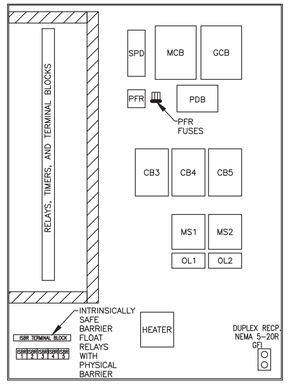
PUMP CONTROL PANEL
NEMA 4XSS (304)



CONTROL PANEL - FRONT ELEVATION

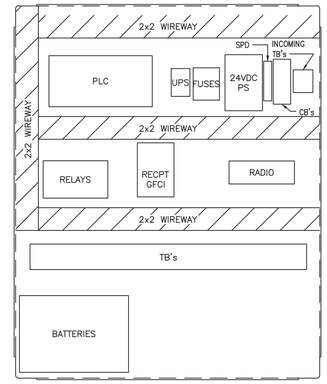


DEAD FRONT LAYOUT



INTERIOR LAYOUT

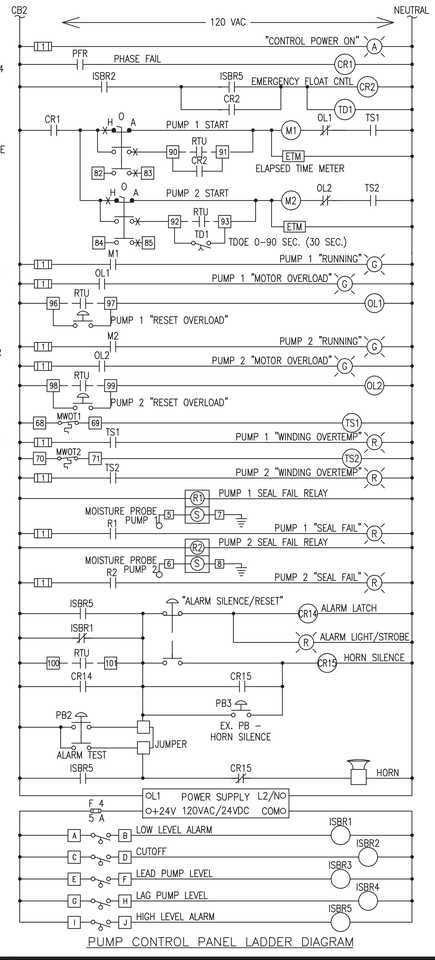
RTU PANEL
NEMA 4XSS (304)



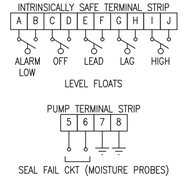
INTERIOR LAYOUT

PUMP CONTROL PANEL B.O.M. INCLUDING, BUT NOT LIMITED TO:

SYMBOL	DESCRIPTION
	NEMA 4X STAINLESS STEEL ENCLOSURE SHALL BE HOFFMAN 304 STAINLESS WITH POWERGLIDE 3-PT LATCHING HANDLE
1	RUNNING TIME METER-SEMI FLUSH MTD., NON-RESET TYPE, TO INDICATE 99999.9 HOURS.
2	SELECTOR SWITCH-HEAVY DUTY, OIL TIGHT TYPE, 3-POS WITH "HAND-OFF-AUTO" LEGEND PLATE.
3	EXTERIOR ALARM LIGHT-WEATHERPROOF BRACKET TYPE WITH CAST ALUM. HOUSING, NEOPRENE GASKET, RED POLY CARBONATE LENS, AND 1-100W I.F. LAMP. (FLASHER STROBE)
4	SIREN, 4", NEMA 4, 120VAC (FEDERAL SIGNAL OR EQUAL)
5	GENERATOR OUTLET 100A RATING - RUSSELLSTOLL : JRS1044FR 200A RATING - MELTRIC : 37-28043 @ PIN 14
6	INDICATOR LIGHTS, 120VAC, COLOR AS SHOWN
NP-1	"PUMP #1"
NP-2	"PUMP #2"
	NAMEPLATES SHALL HAVE 1/4 INCH HIGH BLACK ENGRAVED CHARACTERS ON A FLAT WHITE LAMINATED PLASTIC BACK PLATE AND SHALL BE FASTENED WITH SCREWS.
TDx	TIME-DELAY RELAY - 120VAC, TIME DELAY VALUES AS SHOWN
CRx, TSx	CONTROL RELAY - 120VAC, 10 AMPS, WITH TYPE C CONTACTS, NUMBER OF POLES AS SHOWN. (ICE CUBE STYLE)
R1,R2	SEAL FAIL RELAY PER PUMP MANUFACTURER'S REQUIREMENTS
PFR	PHASE FAILURE RELAY UNIT-ENCLOSED TYPE PLUG-IN 8 PIN STYLE WITH SOCKET. 190 TO 270 VOLT-RANGE (DIVERSIFIED OR EQUAL)
ISBRx	INSTRINSICALLY-SAFE BARRIER RELAY, SIEMENS IS6 OR EQUAL INTRINSIC BARRIER
FLOATS	"ROTO-FLOAT" MODEL #530NONC
FUSES	CURRENT LIMITING TYPE, AMP RATING AS SHOWN, BUSS "KTK", OR EQUAL, WITH SWITCH TYPE MOUNT.
CB	POWER/CONTROL CIRCUIT BREAKERS, SQUARE D TYPE "FAL" OR EQUAL
MCB, GCB	POWER CIRCUIT BREAKERS, SQUARE D POWERPACT
STARTERS	NEMA 600V 3-PHASE



PUMP CONTROL PANEL LADDER DIAGRAM

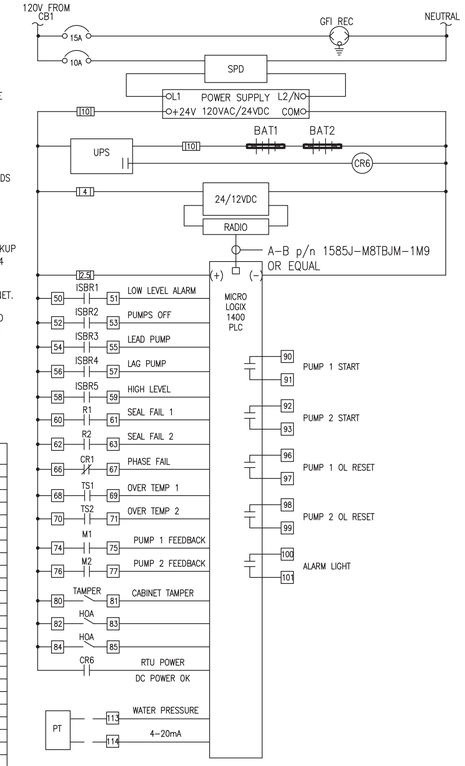


RTU PANEL B.O.M. INCLUDING, BUT NOT LIMITED TO:

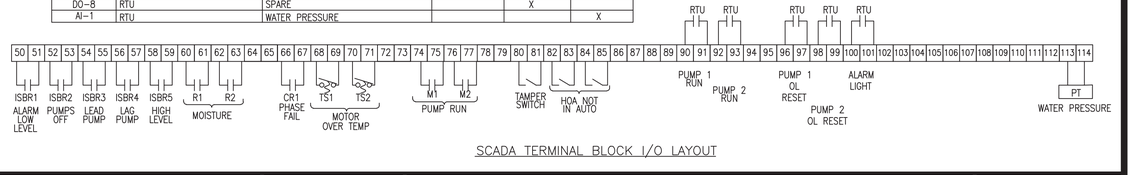
ABBR.	DESCRIPTION
ENCLOSURE	36"x36"x12"D, NEMA 4X, POWDER-COATED WHITE INSIDE AND OUT, POWERGLIDE 3-PT LATCH, LOCKABLE QUARTER TURN HANDLE. HOFFMAN P/N A36H3612SSLP3PTW, OR EQUAL.
RTU	REMOTE TELEMETRY UNIT.
PLC	ALLEN-BRADLEY MICROLOGIX 1400 PLC, 1766-L32BXB, SERIES B, FIRMWARE 11 OR LATER. EXTRA SPACE (5 INCHES) TO THE RIGHT OF PLC TO ALLOW FUTURE ADDITION OF UP TO 3 1762 EXPANSION MODULES.
RADIO	QR450 RADIO MODEM AT 451.1375MHZ. PREFER HORIZONTAL MOUNTING WITH LEDS FACING OUTWARD. RF FEEDLINE ISOLATOR / SURGE SUPPRESSOR. PREFERRED PLACEMENT IS ON RIGHT HAND SIDE BOTTOM.
SPD	SURGE PROTECTION DIN RAIL MOUNTED BY PHOENIX CONTACT OR EQUAL
PS	POWER SUPPLY 24 VOLT POWER SUPPLY TO POWER RTU AND ALL I/O. 24VDC, 10A RATED WITH AN OUTPUT FOR POWER SUPPLY OK.
UPS	BATTERY BACKUP 24 VOLT BATTERY SYSTEM WITH AUTOMATIC CHARGER AND BACKUP POWER ADEQUATE TO SUPPLY RADIO, RTU AND ALL I/O 24 VOLT POWER FOR 24 HOURS. A BUMPLESS BATTERY TRANSFER RELAY, TRANSTRONICS BVUPS-PFA OR EQUIVALENT.
BATTERIES	2 -12V, 55AH BATTERIES. PREFERRED PLACEMENT IS LEFT HAND SIDE OF CABINET. PROVIDE FOR ADEQUATE CLEARANCE BETWEEN BATTERIES.
RELAYS	MINIMUM 8 2PDT OUTPUT RELAYS FOR PLC OUTPUTS. RELAYS WILL HAVE AN LED INDICATION FOR ENERGIZED AND A MANUAL LOCKING TAB TO HOLD CONTACTS IN ENERGIZED POSITION.
RECPT	120 VAC CONVENIENCE RECEPTACLE.
TB	TERMINAL BLOCKS. EXTRA SPACE ON THE TERMINAL STRIP DIN RAIL.
PT	PRESSURE TRANSMITTER SHALL BE WIKA TYPE S-10 PRESSURE TRANSMITTER (0 TO 160 P.S.I.).

SCADA RTU I/O LISTING

			SIGNAL TYPE		
SIGNAL NO.	FROM	DESCRIPTION	24 V INPUT	RELAY OUT	ANALOG IN
DI-1	PUMP CUTOFF FLOAT SWITCH	PUMP CUTOFF (BACKUP)	X		
DI-2	HIGH LEVEL FLOAT SWITCH	HIGH LEVEL INDICATOR (BACKUP)	X		
DI-3	LEAD PUMP FLOAT SWITCH	FLOAT SWITCH	X		
DI-4	LAG PUMP FLOAT SWITCH	FLOAT SWITCH	X		
DI-5	PUMP NO. 1 H-O-A SWITCH	SELECTOR SWITCH IN AUTO	X		
DI-6	PUMP NO. 2 H-O-A SWITCH	SELECTOR SWITCH IN AUTO	X		
DI-7	PUMP NO. 1	SEAL FAIL	X		
DI-8	PUMP NO. 1	MOTOR WINDING TEMP	X		
DI-9	PUMP NO. 1	MOTOR RUNNING FEEDBACK SIGNAL	X		
DI-10	PUMP NO. 1	PUMP OVERLOAD TRIPPED	X		
DI-11	PUMP NO. 2	SEAL FAIL	X		
DI-12	PUMP NO. 2	MOTOR WINDING TEMP	X		
DI-13	PUMP NO. 2	MOTOR RUNNING FEEDBACK SIGNAL	X		
DI-14	PUMP NO. 2	PUMP OVERLOAD TRIPPED	X		
DI-15	CONTROL PANEL	TAMPER SWITCH	X		
DI-16	PHASE FAIL RELAY	POWER FAILURE	X		
DI-17	LOW FLOAT SWITCH	LOW LEVEL ALARM	X		
DO-1	RTU	PUMP NO. 1 START/STOP		X	
DO-2	RTU	PUMP NO. 1 OVERLOAD RESET		X	
DO-3	RTU	PUMP NO. 2 START/STOP		X	
DO-4	RTU	PUMP NO. 2 OVERLOAD RESET		X	
DO-5	RTU	SPARE		X	
DO-6	RTU	SPARE		X	
DO-7	RTU	ALARM LIGHT (FLASHING)		X	
DO-8	RTU	SPARE		X	
AI-1	RTU	WATER PRESSURE			X



RTU PANEL LADDER DIAGRAM



SCADA TERMINAL BLOCK I/O LAYOUT

REVISIONS			
NO.	DATE	BY	

DATE: 9/13/2013
SCALE: N.T.S.
DESIGNED BY: ...
DRAWN BY: M.A.S.
CHECKED BY: K.P.J.
FILE NO: 0-PCB-UTL-DETAILS-1.dwg

CITY OF
PANAMA CITY BEACH

110 SOUTH ARNOLD ROAD
PANAMA CITY BEACH, FLORIDA 32413

SEAL

ELECTRICAL DETAILS

SHEET NUMBER
E-002

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RTU PANEL FOR RETROFIT ONLY

GENERAL SPECIFICATION:

SOME MODIFICATION MAY BE NECESSARY FOR THE INTENDED LIFT STATION. PLEASE CONSULT WITH CITY ENGINEER'S REPRESENTATIVE FOR SPECIFICS OF INDIVIDUAL STATIONS.

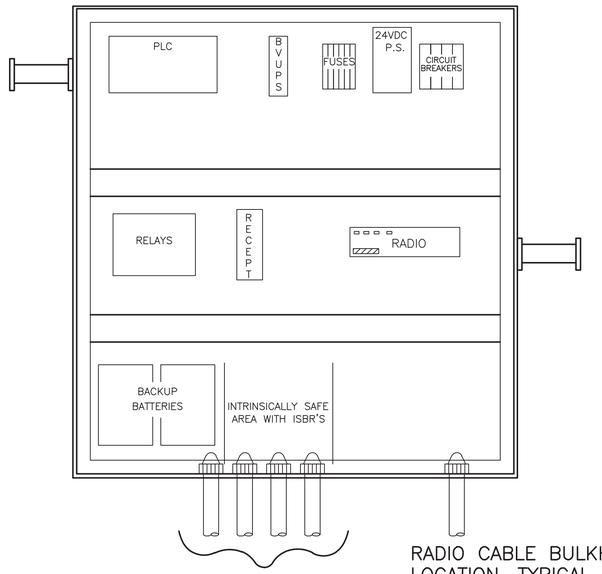
MANUFACTURER OF RTU SHALL FURNISH THE FOLLOWING:

RTU	NEMA 4X STAINLESS STEEL ENCLOSURE TO BE HOFFMAN OR EQUIVALENT 304 STAINLESS WITH POWERGLIDE 3 PT LATCHING HANDLE.
RTU	INCLOSURE TO INCLUDE:
RTU RADIO	REMOTE TELEMETRY UNIT. TO MATCH EXISTING.
SURGE PROTECTION	DIN RAIL MOUNTED BY PHOENIX OR EQUAL.
POWER SUPPLY	24 VOLT POWER SUPPLY TO POWER RADIO RTU AND ALL I/O.
BATTERY BACKUP	24 VOLT BATTERY SYSTEM WITH AUTOMATIC CHARGER AND BACKUP POWER ADEQUATE TO SUPPLY RADIO, RTU AND ALL I/O 24 VOLT POWER FOR 24 HOURS BATTERIES SHALL BE: 2 EA SEALED LEAD ACID / ABSORBENT GLASS MAT, 55AH. POWER SONIC PS-12550 OR EQUIVALENT

CONTRACTOR WILL FURNISH A TYPICAL RTU CABINET THAT WILL HAVE AT LEAST THE FOLLOWING FEATURES

ALLEN-BRADLEY MICROLOGIX 1400 PLC, 1766-L32BXB, SERIES B, FIRMWARE 11 OR LATER
EXTRA SPACE(5 INCHES) TO THE RIGHT OF PLC TO ALLOW FUTURE ADDITION OF UP TO 3 1762 EXPANSION MODULES
QR450 RADIO MODEM AT 451.1375MHZ. PREFER HORIZONTAL MOUNTING WITH LEDS FACING OUTWARD.
2 -12V, 55AH BATTERIES. PREFERRED PLACEMENT IS LEFT HAND SIDE OF CABINET. PROVIDE FOR ADEQUATE CLEARANCE
BETWEEN BATTERIES, TERMINAL BLOCKS AND CONNECTIONS FOR OTHER EQUIPMENT.
24VDC, 10A RATED POWER SUPPLY, WITH AN OUTPUT FOR POWER SUPPLY OK
SURGE SUPPRESSION FOR PLC INPUTS AND 120V POWER
A "BUMPLESS" BATTERY TRANSFER RELAY , TRANSTRONICS BVUPS-PFA OR EQUIVALENT
RF FEEDLINE ISOLATOR / SURGE SUPPRESSOR. PREFERRED PLACEMENT IS ON RIGHT HAND SIDE BOTTOM.
SIEMENS IS6 OR EQUAL INTRINSIC BARRIER
120 VAC CONVENIENCE RECEPTACLE
AT LEAST 8 2PDT OUTPUT RELAYS FOR PLC OUTPUTS RELAYS WILL HAVE AT LEAST AN LED INDICATION FOR ENERGIZED AND A MANUAL LOCKING TAB TO HOLD CONTACTS IN ENERGIZED POSITION
EXTRA SPACE ON THE TERMINAL STRIP DIN RAIL
CABINET WILL HAVE A LOCKABLE QUARTER TURN HANDLE

PREFERED LAYOUT:



CONDUITS AS NEEDED FOR INSTALLATION, SIZE, NUMBER, AND LOCATION VARIES

RADIO CABLE BULKHEAD LOCATION, TYPICAL

NOTE: CAN VARY BY STATION

SCADA RTU I/O LISTING FOR RTU RETRO FIT PANEL

FOR USE WITH MICROLOGIX 1400 PLC, 1766-L32BXB

			SIGNAL TYPE			
SIGNAL NO.	FROM	DESCRIPTION		24 V INPUT	RELAY OUT	ANALOG IN
I:0/0	DC POWER SUPPLY	DC POWER OK		X		
I:0/1	CUTOFF FLOAT	FLOAT SWITCH		X		
I:0/2	LEAD FLOAT (1ST CALL)	FLOAT SWITCH		X		
I:0/3	LAG FLOAT (2ND CALL)	FLOAT SWITCH		X		
I:0/4	HIGH LEVEL ALARM FLOAT	FLOAT SWITCH		X		
I:0/5	LOW LEVEL ALARM FLOAT	FLOAT SWITCH		X		
I:0/6	PUMP 1 HOA SWITCH	PUMP 1 HOA IN AUTO		X		
I:0/7	MOTOR 1 AUX CONTACT	PUMP 1 RUNNING		X		
I:0/8	MOTOR 1 OVERTEMP RELAY	MOTOR 1 OVERTEMP		X		
I:0/9	MOTOR 1 SEAL FAIL RELAY	PUMP 1 SEALFAIL		X		
I:0/10	MOTOR 1 OVERLOAD RELAY	MOTOR 1 OVERLOAD		X		
I:0/11	PUMP 2 HOA SWITCH	PUMP 2 HOA IN AUTO		X		
I:0/12	MOTOR 2 AUX CONTACT	PUMP 2 RUNNING		X		
I:0/13	MOTOR 2 OVERTEMP RELAY	MOTOR 2 OVERTEMP		X		
I:0/14	MOTOR 2 SEAL FAIL RELAY	PUMP 2 SEALFAIL		X		
I:0/15	MOTOR 2 OVERLOAD RELAY	MOTOR 2 OVERLOAD		X		
I:0/16	CONTROL PANEL DOOR SW	CONTROL PANEL INTRUSION		X		
I:0/17	RTU PANEL DOOR SWITCH	RTU PANEL INTRUSION		X		
I:0/18	STATION POWER FAIL	STA. INCOMING POWER FAIL		X		
I:0/19	PUMP ROOM FLOOD	PUMP ROOM FLOOD OR SPARE		X		
O:0/0		START PUMP1			X	
O:0/1		START PUMP2			X	

THE CONTRACTOR WILL:

- COORDINATE WITH THE CITY'S REPRESENTATIVE FOR AN INTERCONNECT DIAGRAM WITH EXISTING CABINET.
- PROVIDE SUITABLE PLC & HMI PROGRAMMING. THE CONTRACTOR WILL PROVIDE SUITABLE MODIFICATIONS TO THE CITY'S MTU (MASTER POLLING STATION PLC) AND SCADA/WONDERWARE.
- THE CONTRACTOR WILL PROVIDE SUITABLE INSTALLATION FOR THE RTU CABINET. THE RTU CABINET WILL HAVE THE DOOR TO OPEN IN A DIRECTION AS OPTIMAL FOR THE INSTALLATION, I.E. OPENING THE DOOR SHALL NOT CAUSE IT TO INTERFERE WITH EXISTING EQUIPMENT. A SITE VISIT TO EACH LIFT STATION IS RECOMMENDED TO AID IN PLANNING THE INSTALLATION. THE CABINET WILL LATCH WITH A HANDLE OR QUARTER TURN FASTENERS. IT WILL BE OF NEMA TYPE SUITED FOR THE PARTICULAR INSTALLATION. THE CONTRACTOR WILL PROVIDE A SUITABLE ANTENNA MAST OF 16' OF 2" RIGID CONDUIT.

THE CITY WILL PROVIDE:

- A TERMINAL STRIP ONTO WHICH TO WIRE THE PROPOSED RTU CABINET TO THE EXISTING LIFT STATION CONTROL CABINET. THE CITY WILL PROVIDE MODIFICATIONS TO THE EXISTING CONTROL CABINET AS NEEDED. ALTHOUGH ALL TELEMETRY INPUTS SHALL BE PROVIDED FOR IN THE RTU CABINET, THE CITY WILL DETERMINE WHICH WILL BE USED AT TIME OF INSTALLATION.
- A YAGI ANTENNA AND A 30' FEEDLINE CABLE FOR THE CONTRACTOR TO INSTALL ON THE MAST.
- A SUITABLE LENGTH OF MULTI-CONDUCTOR /MULTI-COLORED CABLE OR CABLES TO IMPLEMENT WIRING FROM RTU CABINET TO TERMINAL STRIP IN CONTROL CABINET. THIS IS AIMED AT STANDARDIZATION, CONVENIENCE AND EASE OF FUTURE MAINTENANCE.
- PROVIDE AN INTERCONNECT DIAGRAM.

REVISIONS			
NO.	DATE	BY	

DATE: 9/13/2013
SCALE: N.T.S.
DESIGNED BY: ...
DRAWN BY: M.A.S.
CHECKED BY: K.P.J.
FILE NO: 0-PCB-UTL-DETAILS-1.dwg

CITY OF
PANAMA CITY BEACH
110 SOUTH ARNOLD ROAD PANAMA CITY BEACH, FLORIDA 32413

SEAL

ELECTRICAL DETAILS

SHEET NUMBER
E-003

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