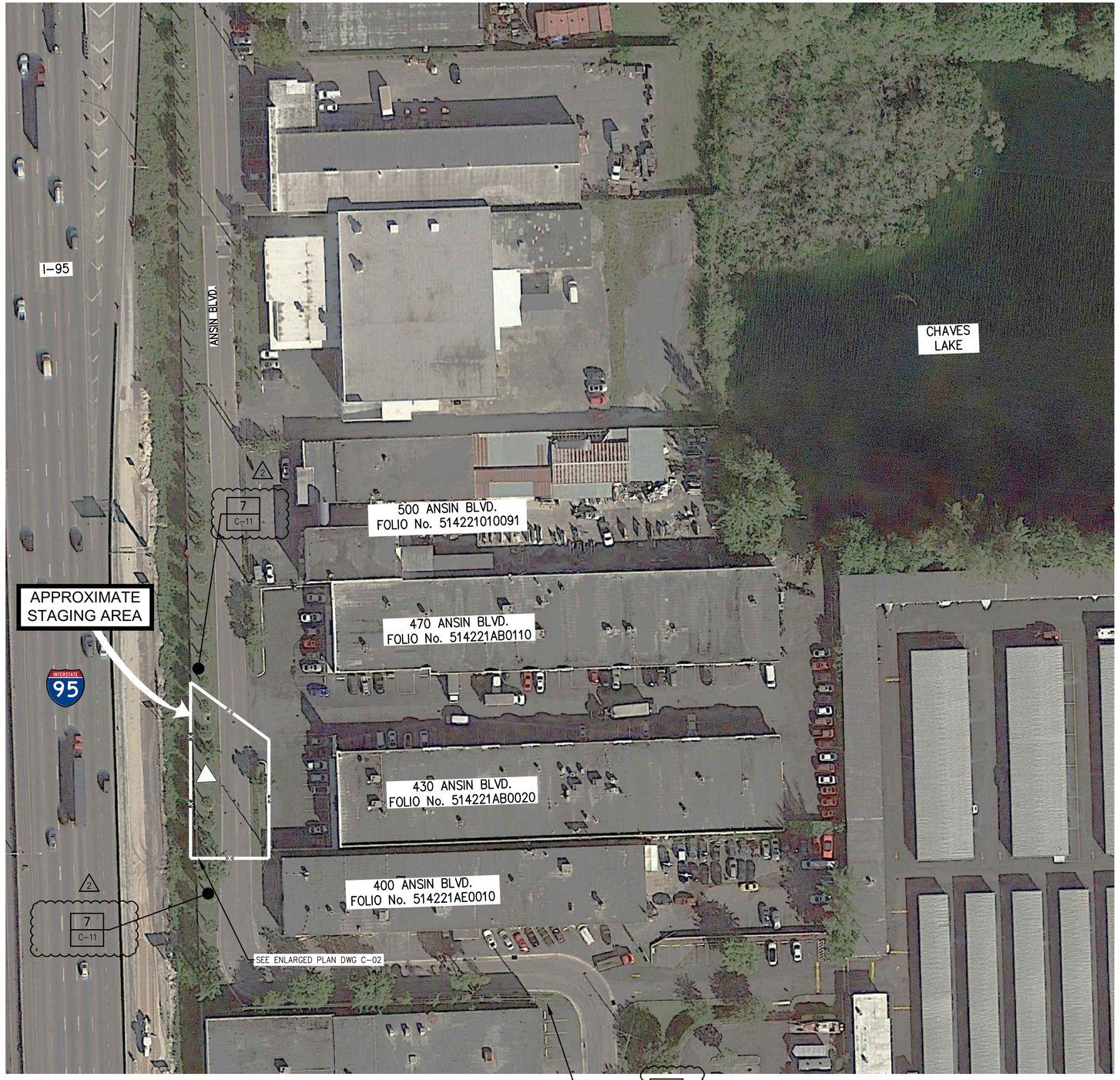

N

GENERAL NOTES:

1. THE SIZE AND LAYOUT OF THE CONSTRUCTION STAGING AREA SHOWN IS FOR CONCEPTUAL PURPOSES. THE ACTUAL SIZE AND LAYOUT OF THE STAGING AREA SHALL BE DESIGNED BY THE CONTRACTOR.
2. ADDITIONAL STAGING AREA AT THE OWNER'S "SLUDGE HANDLING AREA" IS AVAILABLE WITHIN 1 MILE OF THE WELL SITE ON THE NORTH SIDE OF CHAVES LAKE.
3. STAGING AREA SHALL BE WITHIN 50' RIGHT-OF-WAY OF ANSIN BOULEVARD.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING THE STAGING AREA TO ITS ORIGINAL CONDITION (FURNISH AND INSTALL GRADING, SOD, LANDSCAPING, ASPHALT PAVEMEN, ETC.) AT THE END OF CONSTRUCTION AND PRIOR TO FINAL INSPECTION AND ACCEPTANCE BY THE OWNER.
5. SUCH DAMAGE INCLUDES BUT IS NOT LIMITED TO CRACKING AND RUTTING OF PAVED SURFACES AND CURBS, DIRT AND DEBRIS, DAMAGE TO PAVEMENT MARKINGS OR COMPACTION OF LANDSCAPE AREAS.

LEGEND:

▲ APPROXIMATE LOCATION OF PROPOSED PRODUCTION WELL PW-9

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www.callsunshine.com

1. PRIOR TO BEGINNING ANY WORK, CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES THAT HAVE FACILITIES WITHIN THE PROJECT AREA.

UTILITY LOCATES

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

DESIGNED G.A.B.
DRAWN L.M.S.
CHECKED J.N.M.
PROJ. ENGR. G.A.B.

GEORGE A. BROWN P.E.
No. 56076

Hazen
HAZEN AND SAWYER
4000 HOLLYWOOD BOULEVARD, SUITE 750N
HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: -
ENGINEERS PROJECT: 40612-030
CAD REFERENCE: 40612-030BP4-C01

Hallandale Beach PROGRESS. INNOVATION. OPPORTUNITY.
CITY OF HALLANDALE BEACH
UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9
STAGING PLAN

DATE: FEBRUARY 2020
SHEET: 4 OF 42
DRAWING: C-01

BID SET

PLOT DATE: 3/12/2020 9:42 AM BY: MNIEMIEC

XREFs= C:\bms\hazen-pw\hs-mniemiec\dms49216\40612-030-BP4TB,..\dms49208\SP-ST-X

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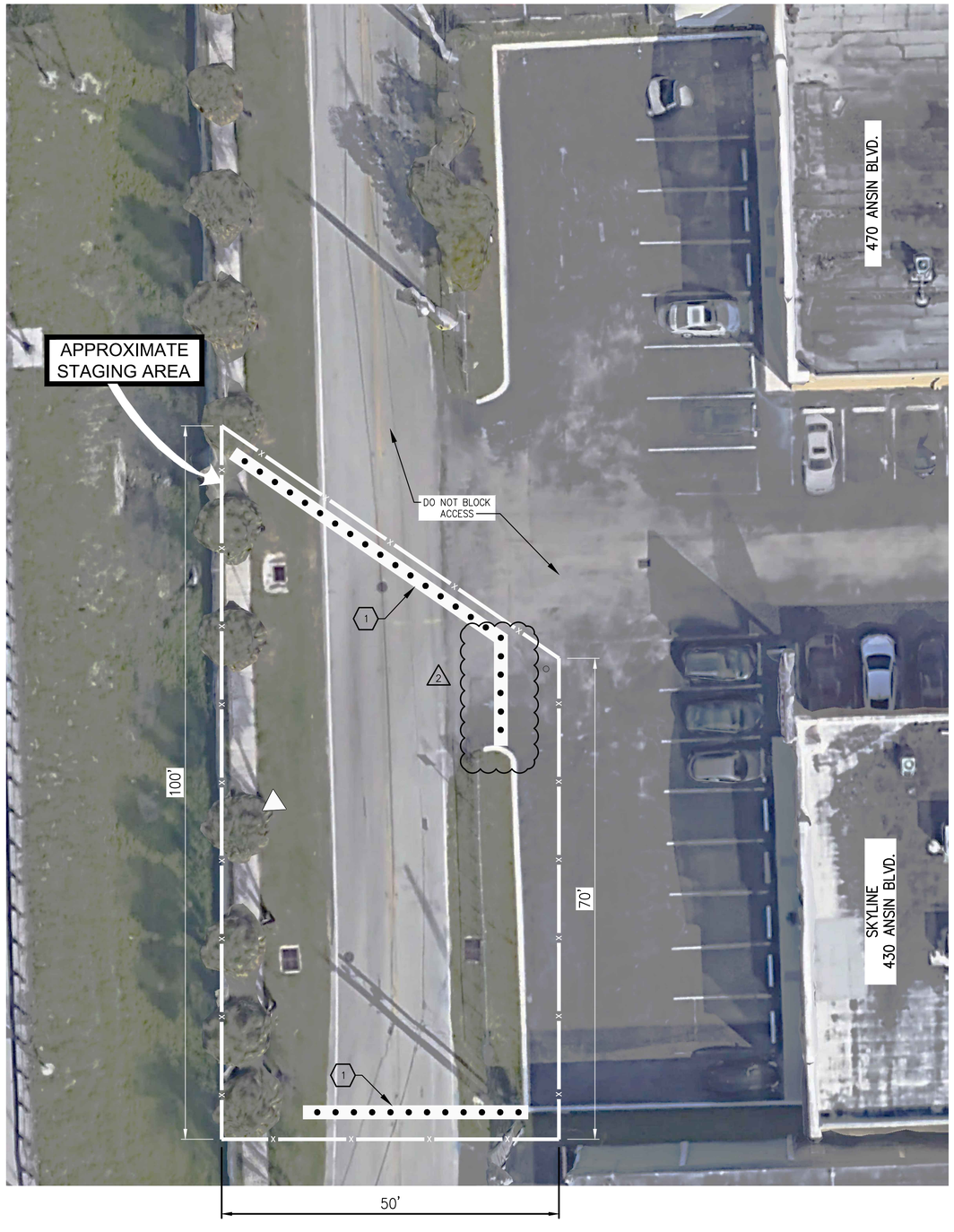

N

2

MAINTENENCE OF TRAFFIC NOTES:

1. IT IS THE ENGINEER-OF-RECORD'S DESIGN INTENT THAT THE TRAFFIC BARRIERS SHOWN ON THIS DRAWING BE LEFT IN PLACE CONTINUOUSLY DURING THE WELL DRILLING PHASE AND OTHER CONSTRUCTION PHASES AS DEEMED NECESSARY BY THE CONTRACTOR.
2. LEAVING THE BARRIERS IN PLACE FOR AN EXTENDED DURATION WILL RESULT IN CLOSING THE ROAD (AND SIDEWALK) IN THE VICINITY OF THE CONSTRUCTION SITE FROM VEHICLE AND PEDESTRIAN TRAFFIC.
3. THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY OF HALLANDALE BEACH ENGINEERING DIVISION IN ACCORDANCE WITH TECHNICAL SPECIFICATION 01570.
4. THE CONTRACTOR'S TRAFFIC CONTROL PLAN SHALL REQUEST PERMISSION TO LEAVE THE TRAFFIC BARRIERS IN PLACE FOR AN EXTENDED DURATION.
5. THE TRAFFIC CONTROL PLAN SHALL DEFINE DETOUR REQUIREMENTS (SEE TECHNICAL SPECIFICATION 01570) TO ENSURE THAT VEHICLES AND PEDESTRIANS CAN REACH BUSINESSES ON EITHER SIDE OF THE REQUESTED TEMPORARY ROAD CLOSURE.

GENERAL NOTES:

1. THE SIZE AND LAYOUT OF THE CONSTRUCTION STAGING AREA LIMITS SHOWN IS FOR CONCEPTUAL PURPOSES. THE ACTUAL SIZE AND LAYOUT OF THE STAGING AREA SHALL BE DESIGNED BY THE CONTRACTOR.
2. ADDITIONAL STAGING AREA AT THE OWNER'S "SLUDGE HANDLING AREA" IS AVAILABLE WITHIN 1 MILE OF THE WELL SITE ON THE NORTH SIDE OF CHAVES LAKE.
3. STAGING AREA SHALL BE WITHIN 50' RIGHT-OF-WAY OF ANSIN BOULEVARD.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING THE STAGING AREA TO ITS ORIGINAL CONDITION (FURNISH AND INSTALL GRADING, SOD, LANDSCAPING, ASPHALT PAVEMEN, ETC.) AT THE END OF CONSTRUCTION AND PRIOR TO FINAL INSPECTION AND ACCEPTANCE BY THE OWNER.
5. SUCH DAMAGE INCLUDES BUT IS NOT LIMITED TO CRACKING AND RUTTING OF PAVED SURFACES AND CURBS, DIRT AND DEBRIS, DAMAGE TO PAVEMENT MARKINGS OR COMPACTION OF LANDSCAPE AREAS.

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UTILITY LOCATES

KEYED NOTE:

1 FURNISH AND INSTALL PLASTIC WATER FILLED BARRIER.

LEGEND:

APPROXIMATE LOCATION OF PROPOSED WELL PRODUCTION PW-9

PHOTO # | DWG # — ARROW INDICATES DIRECTION AND POINT OF VIEW OF PHOTO

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

DESIGNED G.A.B.
DRAWN L.M.S.
CHECKED J.N.M.
PROJ. ENGR. G.A.B.

GEORGE A. BROWN P.E.
No. 56076

Hazen
HAZEN AND SAWYER
4000 HOLLYWOOD BOULEVARD, SUITE 750N
HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-C02

Hallandale Beach PROGRESS. INNOVATION. OPPORTUNITY.
CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9
ENLARGED STAGING PLAN

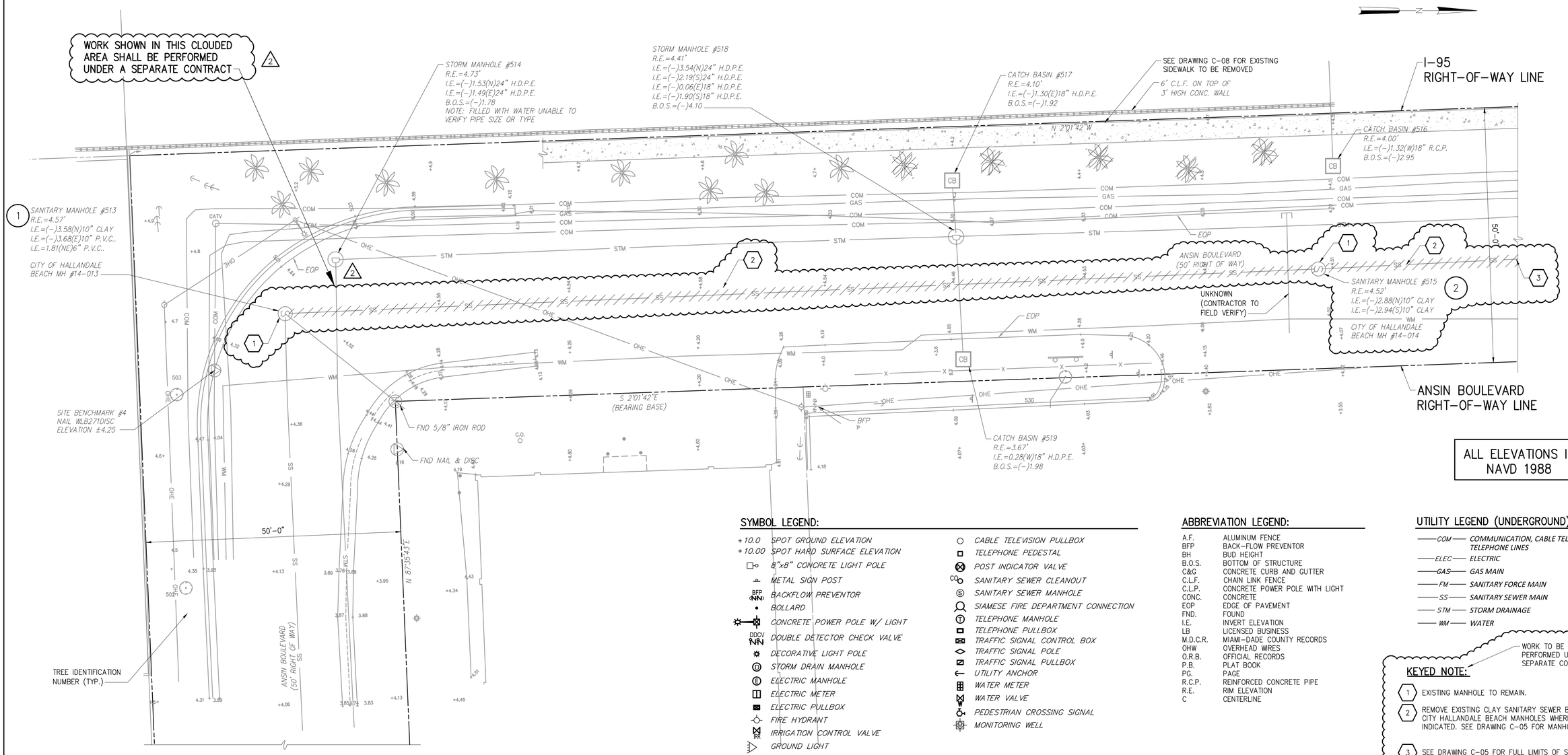
DATE: FEBRUARY 2020
SHEET: 5 OF 42
DRAWING: C-02

BID SET

PLOT DATE: 3/12/2020 9:59 AM BY: MNIEMIEC

XREFs= ..\dms49216\40612-030-BP4TB

File = C:\bms\hazen-pw\hs-mniemiec\dms49209\40612-030BP4-C02 Saved by MNiemiec Save date = 3/12/2020 9:32 AM



SYMBOL LEGEND:

- +10.0 SPOT GROUND ELEVATION
- +10.00 SPOT HARD SURFACE ELEVATION
- 8"x8" CONCRETE LIGHT POLE
- METAL SIGN POST
- BFP (NN) BACKFLOW PREVENTOR
- BOLLARD
- CONCRETE POWER POLE W/ LIGHT
- DDCV (NN) DOUBLE DETECTOR CHECK VALVE
- DECORATIVE LIGHT POLE
- STORM DRAIN MANHOLE
- ELECTRIC MANHOLE
- ELECTRIC METER
- ELECTRIC PULLBOX
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- GROUND LIGHT
- SHADE TREE
- PALM TREE
- CABLE TELEVISION PULLBOX
- TELEPHONE PEDESTAL
- POST INDICATOR VALVE
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- SIAMESE FIRE DEPARTMENT CONNECTION
- TELEPHONE MANHOLE
- TELEPHONE PULLBOX
- TRAFFIC SIGNAL CONTROL BOX
- TRAFFIC SIGNAL POLE
- TRAFFIC SIGNAL PULLBOX
- UTILITY ANCHOR
- WATER METER
- WATER VALVE
- PEDESTRIAN CROSSING SIGNAL
- MONITORING WELL

ABBREVIATION LEGEND:

A.F.	ALUMINUM FENCE
BFP	BACK-FLOW PREVENTOR
BH	BUD HEIGHT
B.O.S.	BOTTOM OF STRUCTURE
C&G	CONCRETE CURB AND GUTTER
C.L.F.	CHAIN LINK FENCE
C.L.P.	CONCRETE POWER POLE WITH LIGHT
CONC.	CONCRETE
EOP	EDGE OF PAVEMENT
FND.	FOUND
I.E.	INVERT ELEVATION
LB	LICENSED BUSINESS
M.D.C.R.	MIAMI-DADE COUNTY RECORDS
OHW	OVERHEAD WIRES
O.R.B.	OFFICIAL RECORDS
P.B.	PLAT BOOK
PG.	PAGE
R.C.P.	REINFORCED CONCRETE PIPE
R.E.	RIM ELEVATION
C	CENTERLINE

UTILITY LEGEND (UNDERGROUND):

- COM — COMMUNICATION, CABLE TELEVISION TELEPHONE LINES
- ELEC — ELECTRIC
- GAS — GAS MAIN
- FM — SANITARY FORCE MAIN
- SS — SANITARY SEWER MAIN
- STM — STORM DRAINAGE
- WM — WATER

KEYED NOTE:

WORK TO BE PERFORMED UNDER A SEPARATE CONTRACT

1. EXISTING MANHOLE TO REMAIN.
2. REMOVE EXISTING CLAY SANITARY SEWER BETWEEN CITY HALLANDALE BEACH MANHOLES WHERE INDICATED. SEE DRAWING C-05 FOR MANHOLE 3
3. SEE DRAWING C-05 FOR FULL LIMITS OF SANITARY SEWER REMOVAL.

LEGEND:

EXISTING

TO BE REMOVED

1"=10'-0" 10 5 0 10'

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1. PRIOR TO BEGINNING ANY WORK, CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES THAT HAVE FACILITIES WITHIN THE PROJECT AREA.
2. THE ABOVE NOTICE SHALL APPEAR ON THE COVER SHEET OF ALL CONSTRUCTION PLANS SUBMITTED TO THE COUNTY.

UTILITY LOCATES

MANHOLE SCHEDULE

MARK	CITY OF HALLANDALE BEACH SANITARY MANHOLE NUMBER	MANHOLE NUMBER FROM CRAVEN THOMPSON SURVEY
1	14-013	# 513
2	14-014	# 515
3	14-015	NOT APPLICABLE

SCHEDULE OF TREES TO BE RELOCATED

TREE ID No.	TREE TYPE	CALIPER	BUD HEIGHT
673	SABAL PALM	10"	24'
674	SABAL PALM	10"	20'
675	SABAL PALM	12"	22'
676	SABAL PALM	10"	26'
077	SABAL PALM	12"	26'

NOTE:

1. TREES TO BE RELOCATED ABOUT 1,000 FEET NORTH IN THE SWALE AT LOCATIONS SELECTED BY THE OWNER.

NOTE:

1. THIS DRAWINGS IS BASED ON THE TOPOGRAPHIC SURVEY PREPARED BY CRAVEN THOMPSON AND ASSOCIATES INC. PROJECT No. 14-0063-001-01.
2. ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND REFERENCED TO NATIONAL GEODETIC SURVEY (NGS) BENCHMARK PID #AC4695, NGS BRASS DISC STAMPED "MORRIS No. 4", SET IN CONCRETE SIDEWALK ALONG WEST SIDE OF A PARKING LOT152' WEST OF THE CENTERLINE OF NW 9 AVENUE, SOUTHEAST OF THE SOUTHEAST CORNER OF HALLANDALE HIGH SCHOOL. ELEVATION = 8.72.

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

DESIGNED G.A.B.
DRAWN L.M.S.
CHECKED J.N.M.
PROJ. ENGR. G.A.B.

GEORGE A. BROWN P.E.
No. 56076

Hazen
HAZEN AND SAWYER
4000 HOLLYWOOD BOULEVARD, SUITE 750N
HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-C03

Hallandale Beach PROGRESS. INNOVATION. OPPORTUNITY.

CITY OF HALLANDALE BEACH
UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9

EXISTING SITE PLAN

DATE: FEBRUARY 2020
SHEET: 6 OF 42
DRAWING: C-03

BID SET

PLOT DATE: 3/12/2020 9:42 AM BY: MNIEMIEC

XREFs= C:\bms\hazen-pw\hs-mniemiec\dms49216\40612-030-BP4TB,C:\bms\hazen-pw\hs-mniemiec\dms49208\SP-ST-X

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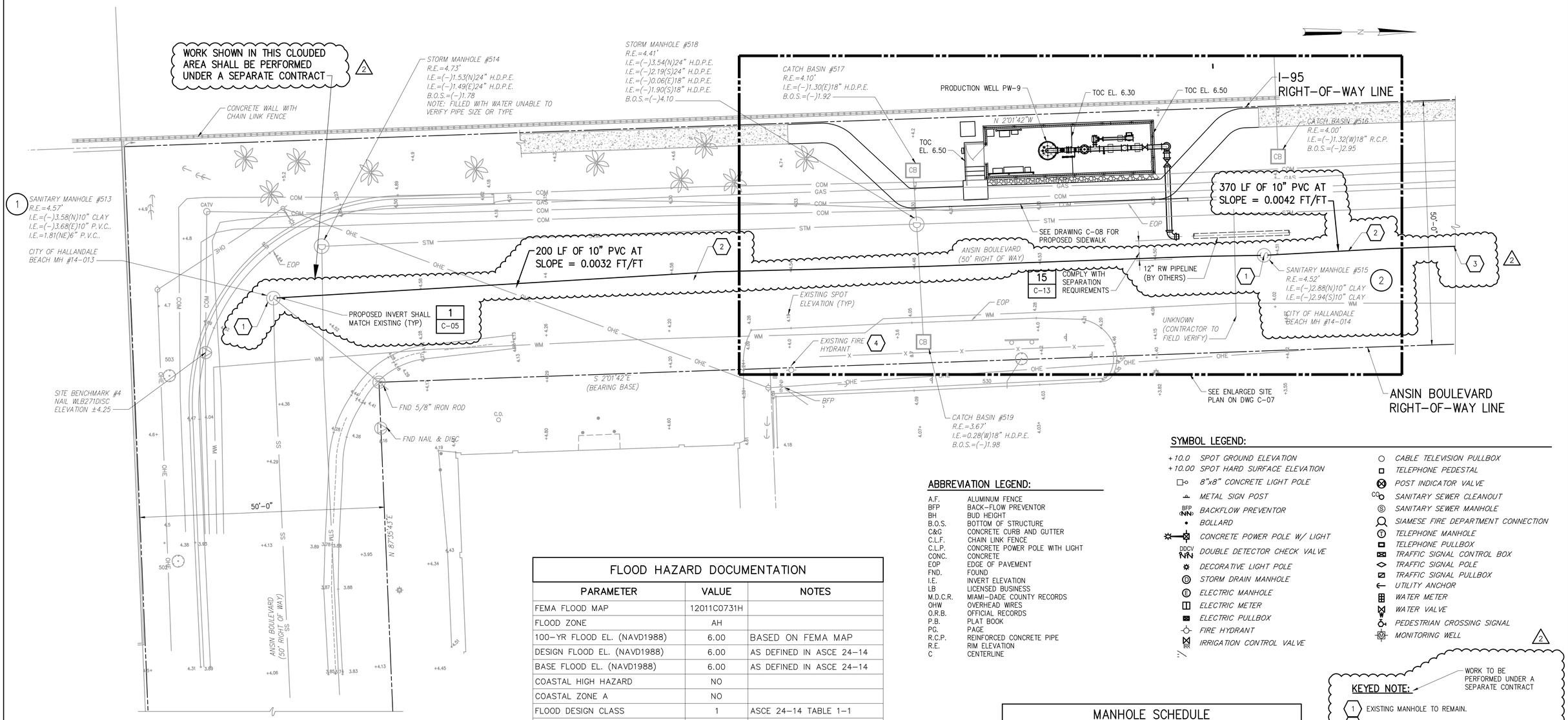

SYMBOL LEGEND:

- +10.0 SPOT GROUND ELEVATION
- +10.00 SPOT HARD SURFACE ELEVATION
- 8"x8" CONCRETE LIGHT POLE
- METAL SIGN POST
- BFP (NN) BACKFLOW PREVENTOR
- BOLLARD
- CONCRETE POWER POLE W/ LIGHT
- DDCV (NN) DOUBLE DETECTOR CHECK VALVE
- DECORATIVE LIGHT POLE
- STORM DRAIN MANHOLE
- ELECTRIC MANHOLE
- ELECTRIC METER
- ELECTRIC PULLBOX
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- CABLE TELEVISION PULLBOX
- TELEPHONE PEDESTAL
- POST INDICATOR VALVE
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- SIAMESE FIRE DEPARTMENT CONNECTION
- TELEPHONE MANHOLE
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C.L.F.	CHAIN LINK FENCE
C.L.P.	CONCRETE POWER POLE WITH LIGHT
CONC.	CONCRETE
EOP	EDGE OF PAVEMENT
FND.	FOUND
I.E.	INVERT ELEVATION
LB	LICENSED BUSINESS
M.D.C.R.	MIAMI-DADE COUNTY RECORDS
OHW	OVERHEAD WIRES
O.R.B.	OFFICIAL RECORDS
P.B.	PLAT BOOK
PG.	PAGE
R.C.P.	REINFORCED CONCRETE PIPE
R.E.	RIM ELEVATION
C	CENTERLINE

FLOOD HAZARD DOCUMENTATION

PARAMETER	VALUE	NOTES
FEMA FLOOD MAP	12011C0731H	
FLOOD ZONE	AH	
100-YR FLOOD EL. (NAVD1988)	6.00	BASED ON FEMA MAP
DESIGN FLOOD EL. (NAVD1988)	6.00	AS DEFINED IN ASCE 24-14
BASE FLOOD EL. (NAVD1988)	6.00	AS DEFINED IN ASCE 24-14
COASTAL HIGH HAZARD	NO	
COASTAL ZONE A	NO	
FLOOD DESIGN CLASS	1	ASCE 24-14 TABLE 1-1
MINIMUM FLOOR EL. CRITERION REQUIRED VALUE DESIGN VALUE COMPLIES	 DFE 6.00 6.50 YES	ASCE 24-14 TABLE 2-1
MINIMUM EQUIPMENT EL. CRITERION REQUIRED VALUE DESIGN VALUE COMPLIES	 DFE 6.00 7.40 YES	ASCE 24-14 TABLE 7-1

ASCE 24-14: AMERICAN SOCIETY OF CIVIL ENGINEERS STANDARD TITLED "FLOOD RESISTANT DESIGN AND CONSTRUCTION".
NAVD: NORTH AMERICAN VERTICAL DATUM

MANHOLE SCHEDULE

MARK	CITY OF HALLANDALE BEACH SANITARY MANHOLE NUMBER	MANHOLE NUMBER FROM CRAVEN THOMPSON SURVEY
1	14-013	# 513
2	14-014	# 515
3	14-015	NOT APPLICABLE

ALL ELEVATIONS IN NAVD 1988

KEYED NOTE:

WORK TO BE PERFORMED UNDER A SEPARATE CONTRACT

1. EXISTING MANHOLE TO REMAIN.
2. REPLACE EXISTING SANITARY SEWER. SEE DRAWING C-05
3. SEE DRAWING C-05 FOR FULL LIMITS OF SANITARY SEWER REPLACEMENT.
4. INSTALL OWNER SUPPLIED FLOW METER AT HYDRANT. FURNISH AND INSTALL BACKFLOW PREVENTER AND ALL NECESSARY TEMPORARY VALVES AND PIPING TO SUPPLY WATER FOR CONSTRUCTION.

LEGEND:
EXISTING
PROPOSED

1"=10'-0" 10 5 0 10'

KNOW WHAT'S BELOW ALWAYS CALL 811 BEFORE YOU DIG
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www.callsunshine.com

1. PRIOR TO BEGINNING ANY WORK, CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES THAT HAVE FACILITIES WITHIN THE PROJECT AREA.

UTILITY LOCATES

UTILITY LEGEND (UNDERGROUND):

- COM — COMMUNICATION, CABLE TELEVISION TELEPHONE LINES
- ELEC — ELECTRIC
- GAS — GAS MAIN
- FM — SANITARY FORCE MAIN
- SS — SANITARY SEWER MAIN
- STM — STORM DRAINAGE
- WM — WATER

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

DESIGNED G.A.B.
DRAWN L.M.S.
CHECKED J.N.M.
PROJ. ENGR. G.A.B.

GEORGE A. BROWN P.E.
No. 56076

Hazen
HAZEN AND SAWYER
4000 HOLLYWOOD BOULEVARD, SUITE 750N
HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-C04

Hallandale Beach PROGRESS. INNOVATION. OPPORTUNITY.
CITY OF HALLANDALE BEACH
UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9

PROPOSED SITE PLAN

DATE: FEBRUARY 2020
SHEET: 7 OF 42
DRAWING: C-04

BID SET

PLOT DATE: 3/12/2020 9:42 AM BY: MNIEMIEC

XREFs= C:\bms\hazen-pw\hs-mniemiec\dms49216\40612-030-BP4TB,C:\bms\hazen-pw\hs-mniemiec\dms49208\PW-PT-MP,C:\bms\hazen-pw\hs-mniemiec\dms49208\PW-PT-SP,C:\bms\hazen-pw\hs-mniemiec\dms49208\SP-ST-X,C:\bms\hazen-pw\hs-mniemiec\dms49208\PW-PT-EP,C:\bms\hazen-pw\hs-mniemiec\dms49208\PW-SF-SP,C:\bms\hazen-pw\hs-mniemiec\dms49208\SP-YP-P

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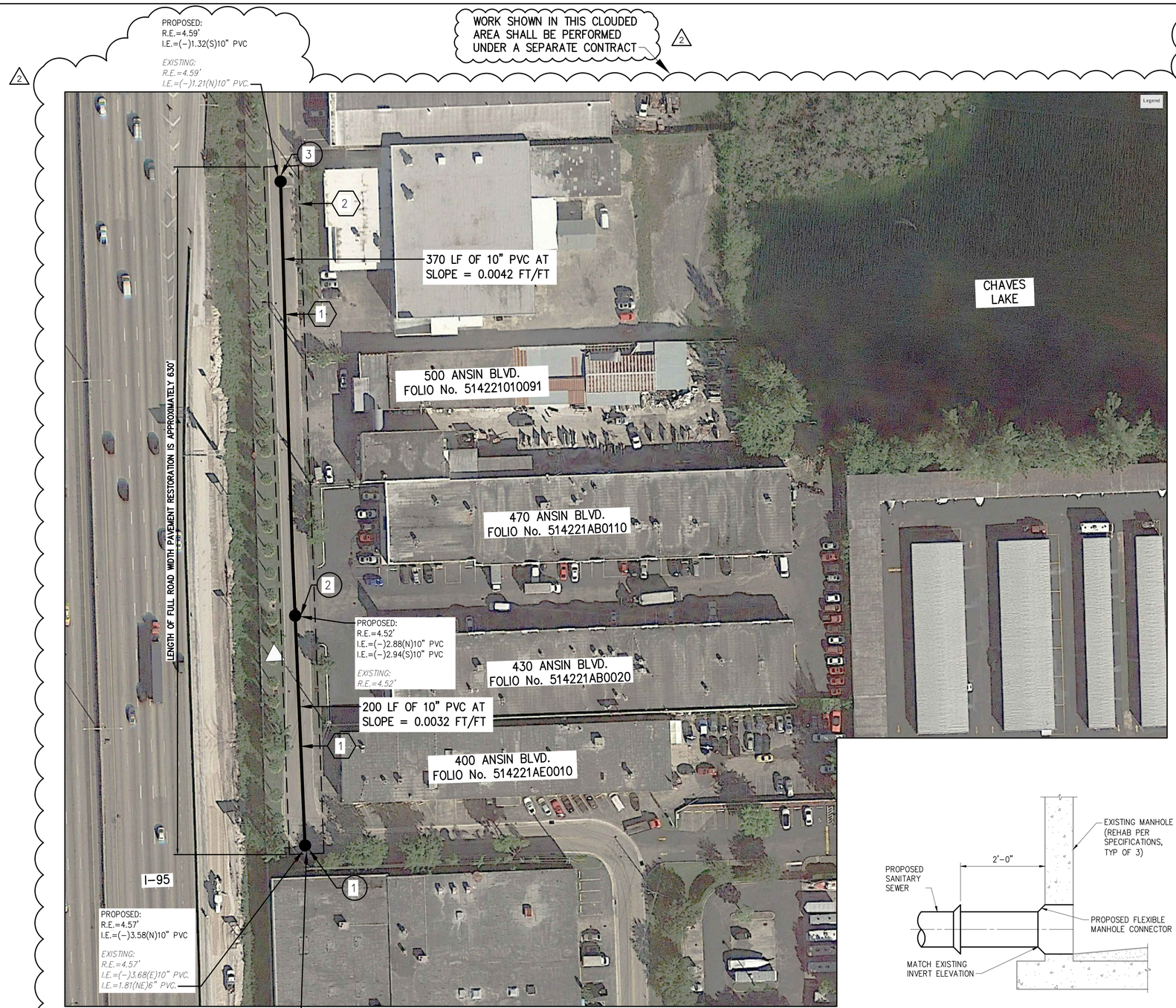

SANITARY SEWER REPLACEMENT PLAN

NTS

SEE DRAWING C–06 FOR PROFILE OF PROPOSED SEWER

MANHOLE SCHEDULE		
MARK	CITY OF HALLANDALE BEACH SANITARY MANHOLE NUMBER	MANHOLE NUMBER FROM CRAVEN THOMPSON SURVEY
1	14–013	# 513
2	14–014	# 515
3	14–015	NOT APPLICABLE

GENERAL NOTES:

1. PROPOSED SANITARY SEWER PIPE INVERTS SHALL MATCH EXISTING INVERTS.
2. RESTRAIN ALL JOINTS.
3. PRESSURE TEST PROPOSED SANITARY SEWER TO 150–PSI.

KEYED NOTE:

1. REMOVE THE EXISTING GRAVITY SANITARY SEWER PIPE (ASSUMED TO BE 10" DIAMETER CLAY) AND REPLACE WITH PVC PIPE THAT CONFORMS TO THE FOLLOWING:
   A. COMPLY WITH AWWA C900
   B. PRESSURE CLASS 165; DR=25
   C. TEST PIPE FOLLOWING INSTALLATION (BUT PRIOR TO FINAL CONNECTION WITH THE MANHOLES) TO 150 PSI TEST PRESSURE
   D. MATCH DIAMETER AND SLOPE OF THE EXISTING PIPE BEING REPLACED. FOR THE PURPOSE OF BIDDING ASSUME THAT THE REPLACEMENT PIPE WILL BE 10" DIAMETER.
2. RESTORE PAVEMENT FOR FULL ROAD WIDTH AS INDICATED IN THE CIVIL DETAILS.

NOTES:

1. FLEXIBLE MANHOLE CONNECTOR SHALL BE KOR–N–SEAL OR EQUAL.
2. ENLARGE EXISTING HOLE IN MANHOLE WALL IF NEEDED FOR THE PROPOSED 10–INCH SANITARY SEWER.
3. USE NON–SHRINK GROUT TO CREATE A SMOOTH SURFACE IN THE HOLE OF THE MANHOLE WALL AS RECOMMENDED BY THE BOOT MANUFACTURER.
4. PATCH ANY VOIDS (BUG HOLES) WITH NON–SHRINK GROUT.
5. REMOVE ANY WIRE PROTRUDING UP INTO THE HOLE AND PATCH WITH NON–SHRINK GROUT.

DETAIL 1 – NTS

LEGEND:

▲ APPROXIMATE LOCATION OF PROPOSED PRODUCTION WELL PW–9

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UTILITY LOCATES

LEGEND:

EXISTING
PROPOSED

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

DESIGNED G.A.B.
DRAWN L.M.S.
CHECKED J.N.M.
PROJ. ENGR. G.A.B.

GEORGE A. BROWN P.E.
No. 56076

Hazen
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4000 HOLLYWOOD BOULEVARD, SUITE 750N
HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612–030
CAD REFERENCE:40612–030BP4–C05

Hallandale Beach PROGRESS. INNOVATION. OPPORTUNITY.
CITY OF HALLANDALE BEACH
UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW–9

PROPOSED SANITARY SEWER REPLACEMENT PLAN

DATE: FEBRUARY 2020
SHEET: 8 OF 42
DRAWING: C–05

BID SET

PLOT DATE: 3/12/2020 9:43 AM BY: MNIEMIEC

XREFs= C:\bms\hazen-pw\hs-mniemiec\dms49216\40612-030-BP4TB

File = C:\bms\hazen-pw\hs-mniemiec\dms49209\40612-030BP4-C05 Saved by tbacas Save date = 3/3/2020 11:42 AM

1	2
C-10	C-10

PLAN
1"=20'

2

WORK SHOWN IN THIS CLOUDED AREA SHALL BE PERFORMED UNDER A SEPARATE CONTRACT

2

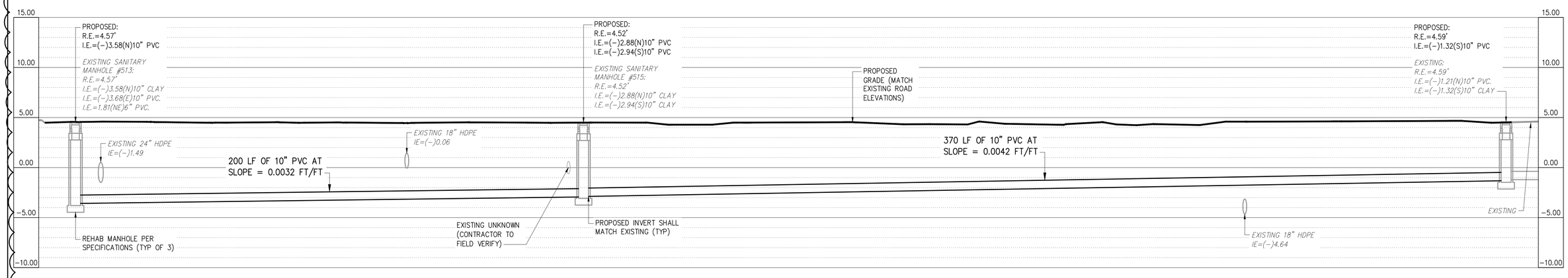
LEGEND

EXISTING

PROPOSED

1"=20'-0" 20 10 0 20'

1"=5'-0" 5 2.5 0 5'



PROFILE
HORI: 1"=20'
VERT: 1"=5'

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

DESIGNED G.A.B.
DRAWN T.B.
CHECKED J.N.M.
PROJ. ENGR. G.A.B.

GEORGE A. BROWN P.E.
No. 56076

Hazen
HAZEN AND SAWYER
4000 HOLLYWOOD BOULEVARD, SUITE 750N
HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: -
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-C06

Hallandale Beach PROGRESS. INNOVATION. OPPORTUNITY.

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9

PROPOSED SANITARY SEWER PLAN AND PROFILE

DATE: FEBRUARY 2020
SHEET: 9 OF 42
DRAWING: C-06

BID SET

PLOT DATE: 3/12/2020 9:43 AM BY: MNIEMIEC

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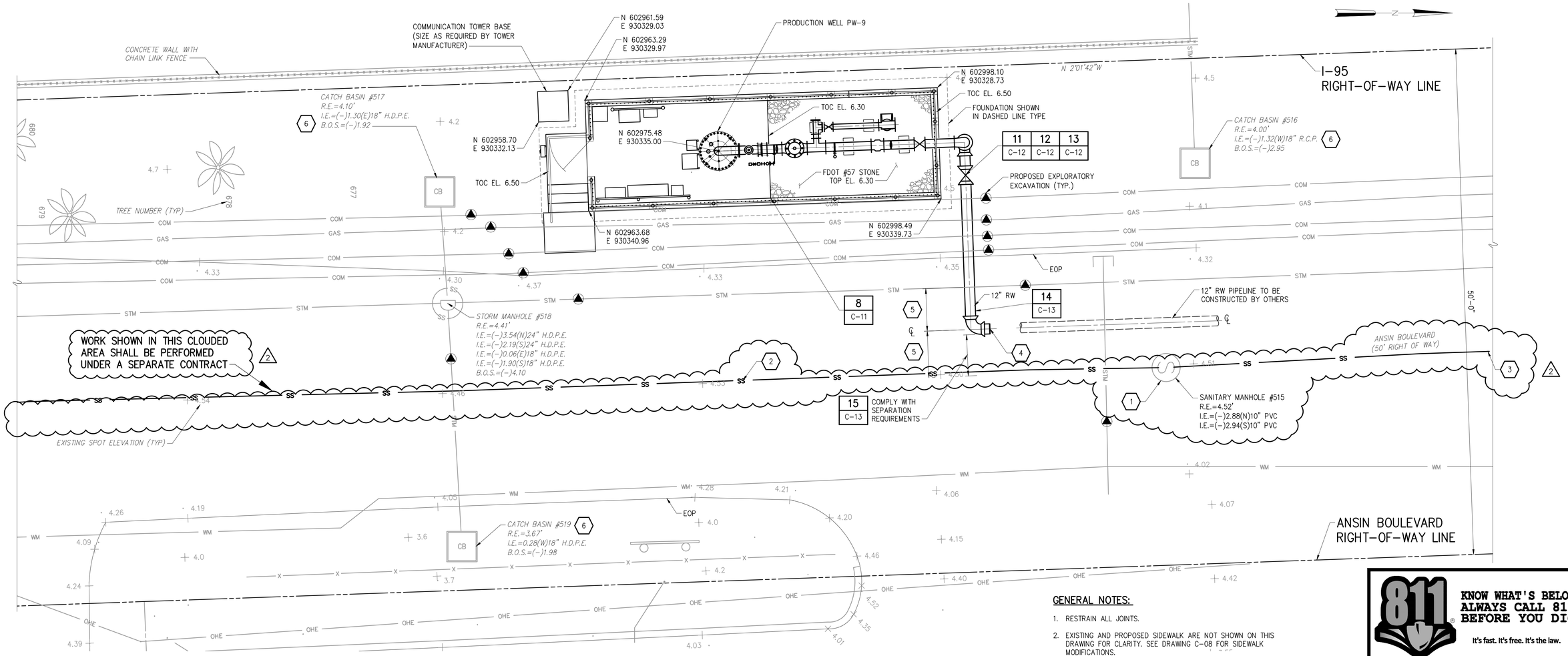

SYMBOL LEGEND:

- +10.0 SPOT GROUND ELEVATION
- +10.00 SPOT HARD SURFACE ELEVATION
- 8"x8" CONCRETE LIGHT POLE
- METAL SIGN POST
- BFP (NN) BACKFLOW PREVENTOR
- BOLLARD
- CONCRETE POWER POLE W/ LIGHT
- DDCV (NN) DOUBLE DETECTOR CHECK VALVE
- DECORATIVE LIGHT POLE
- STORM DRAIN MANHOLE
- ELECTRIC MANHOLE
- ELECTRIC METER
- ELECTRIC PULLBOX
- FIRE HYDRANT
- IRRIGATION CONTROL VALVE
- GROUND LIGHT
- SHADE TREE
- PALM TREE
- CABLE TELEVISION PULLBOX
- TELEPHONE PEDESTAL
- POST INDICATOR VALVE
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- SIAMESE FIRE DEPARTMENT CONNECTION
- TELEPHONE MANHOLE
- TELEPHONE PULLBOX
- TRAFFIC SIGNAL CONTROL BOX
- TRAFFIC SIGNAL POLE
- TRAFFIC SIGNAL PULLBOX
- UTILITY ANCHOR
- WATER METER
- WATER VALVE
- PEDESTRIAN CROSSING SIGNAL
- MONITORING WELL

ABBREVIATION LEGEND:

A.F.	ALUMINUM FENCE
BFP	BACK-FLOW PREVENTOR
BH	BUD HEIGHT
B.O.S.	BOTTOM OF STRUCTURE
C&G	CONCRETE CURB AND GUTTER
C.L.F.	CHAIN LINK FENCE
C.L.P.	CONCRETE POWER POLE WITH LIGHT
CONC.	CONCRETE
EOP	EDGE OF PAVEMENT
FND.	FOUND
I.E.	INVERT ELEVATION
LB	LICENSED BUSINESS
M.D.C.R.	MIAMI-DADE COUNTY RECORDS
OHW	OVERHEAD WIRES
O.R.B.	OFFICIAL RECORDS
P.B.	PLAT BOOK
PG.	PAGE
R.C.P.	REINFORCED CONCRETE PIPE
R.E.	RIM ELEVATION
C	CENTERLINE

UTILITY LEGEND (UNDERGROUND):

- COM — COMMUNICATION, CABLE TELEVISION TELEPHONE LINES
- ELEC — ELECTRIC
- GAS — GAS MAIN
- FM — SANITARY FORCE MAIN
- SS — SANITARY SEWER MAIN
- STM — STORM DRAINAGE
- WM — WATER

KEYED NOTE:

1. EXISTING MANHOLE TO REMAIN. REHAB MANHOLE PER SPECIFICATIONS.
2. REPLACE EXISTING SANITARY SEWER.
3. SEE DRAWING C-05 FOR FULL LIMITS OF SANITARY SEWER REPLACEMENT.
4. MECHANICAL JOINT PLUG RESTRAINED WITH MEGA-LUG SHOWN. CONTRACTOR SHALL REMOVE PLUG AND MAKE FINAL CONNECTION WITH THE 10-INCH RAW WATER PIPELINE CONSTRUCTED BY OTHERS. FURNISH AND INSTALL A SOLID SLEEVE COUPLING, A MINIMUM OF 10-FEET OF 10-INCH RAW WATER PIPE AND RESTRAINING DEVICES FOR ALL JOINTS.
5. CENTER THE PROPOSED 10-INCH RAW WATER PIPE BETWEEN THE EXISTING STORM DRAINAGE PIPE AND THE PROPOSED SANITARY SEWER.
6. PROTECT ALL CATCH BASINS WITH STRAW BALE SEDIMENT FILTERS. AT COMPLETION OF CONSTRUCTION REMOVE ALL DEBRIS AND SEDIMENTS FROM THE CATCH BASIN STRUCTURES.

GENERAL NOTES:

1. RESTRAIN ALL JOINTS.
2. EXISTING AND PROPOSED SIDEWALK ARE NOT SHOWN ON THIS DRAWING FOR CLARITY. SEE DRAWING C-08 FOR SIDEWALK MODIFICATIONS.
3. PERFORM ALL NECESSARY EXPLORATORY EXCAVATIONS TO VERIFY THE LOCATION, ELEVATION AND ALIGNMENT OF EXISTING UNDERGROUND UTILITIES THAT MAY INTERFERE WITH THE PROPOSED IMPROVEMENTS.
4. THE OWNERS OF THE EXISTING UNDERGROUND COMMUNICATION LINES AND GAS MAIN NEARBY WELL PW-9 ARE UNKNOWN. THE CONTRACTOR SHALL COORDINATE WITH SERVICE PROVIDERS AND DETERMINE OWNERSHIP OF THESE UTILITIES.
5. THE CONTRACTOR SHALL COORDINATE WITH THE OWNERS OF THE EXISTING UNDERGROUND COMMUNICATION LINES AND GAS MAIN TO RELOCATE ITS UTILITIES AS REQUIRED TO AVOID CONFLICT WITH THE PROPOSED WELL PW-9.
6. THE CONTRACTOR SHALL CONTACT THE OWNERS OF THE EXISTING UNDERGROUND COMMUNICATION LINES AND GAS MAIN AS SOON AS POSSIBLE AFTER ITS NOTICE TO PROCEED TO INITIATE THE RELOCATION OF CONFLICTING UTILITIES.
7. THE OWNERS OF THE EXISTING UNDERGROUND COMMUNICATION LINES AND GAS MAIN SHALL BE PAID FOR THE RELOCATION BY THE CITY OF HALLANDALE BEACH THROUGH AN ALLOWANCE BID ITEM TITLED "UTILITY RELOCATION ALLOWANCE". THE CONTRACTOR SHALL SUBMIT INVOICES FROM THE UTILITY OWNERS DOCUMENTING ITS COSTS.
8. ALL CONTRACTOR WORK RELATED TO THE RELOCATION OF THE UNDERGROUND COMMUNICATION LINES AND GAS MAIN (I.E., COORDINATION, EXPLORATORY EXCAVATIONS, AND OTHER ASSOCIATED COSTS) SHALL BE PAID FOR THROUGH AN ALLOWANCE BID ITEM TITLED " UTILITY RELOCATION ALLOWANCE". THE AMOUNT TO BE PAID SHALL BE NEGOTIATED AND AGREED TO BY THE CONTRACTOR AND THE CITY OF HALLANDALE BEACH.

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1. PRIOR TO BEGINNING ANY WORK, CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES THAT HAVE FACILITIES WITHIN THE PROJECT AREA.

UTILITY LOCATES

ALL ELEVATIONS IN NAVD 1988

LEGEND:

- EXISTING
- PROPOSED
- TO BE CONSTRUCTED BY OTHERS
- PROPOSED EXPLORATORY EXCAVATION

1"=5' 5 2.5 0 5'

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

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HOLLYWOOD, FLORIDA 33021
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THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: -
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-C07

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CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9

ENLARGED SITE PLAN

DATE: FEBRUARY 2020
SHEET: 10 OF 42
DRAWING: C-07

BID SET

PLOT DATE: 3/12/2020 9:43 AM BY: MNIEMIEC

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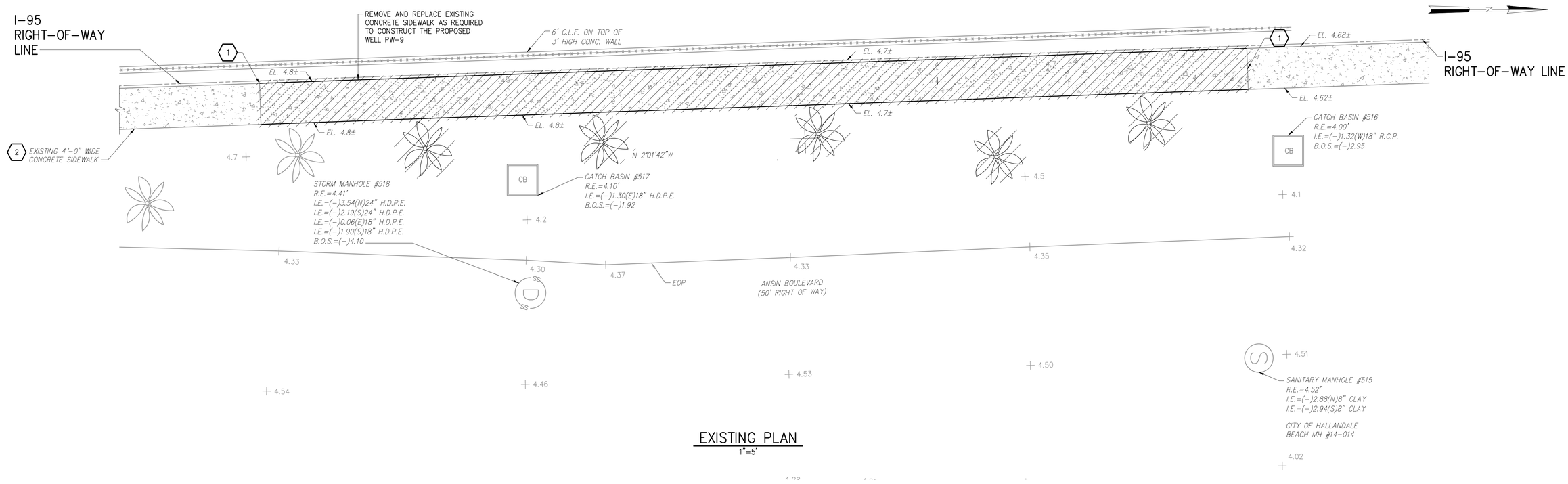
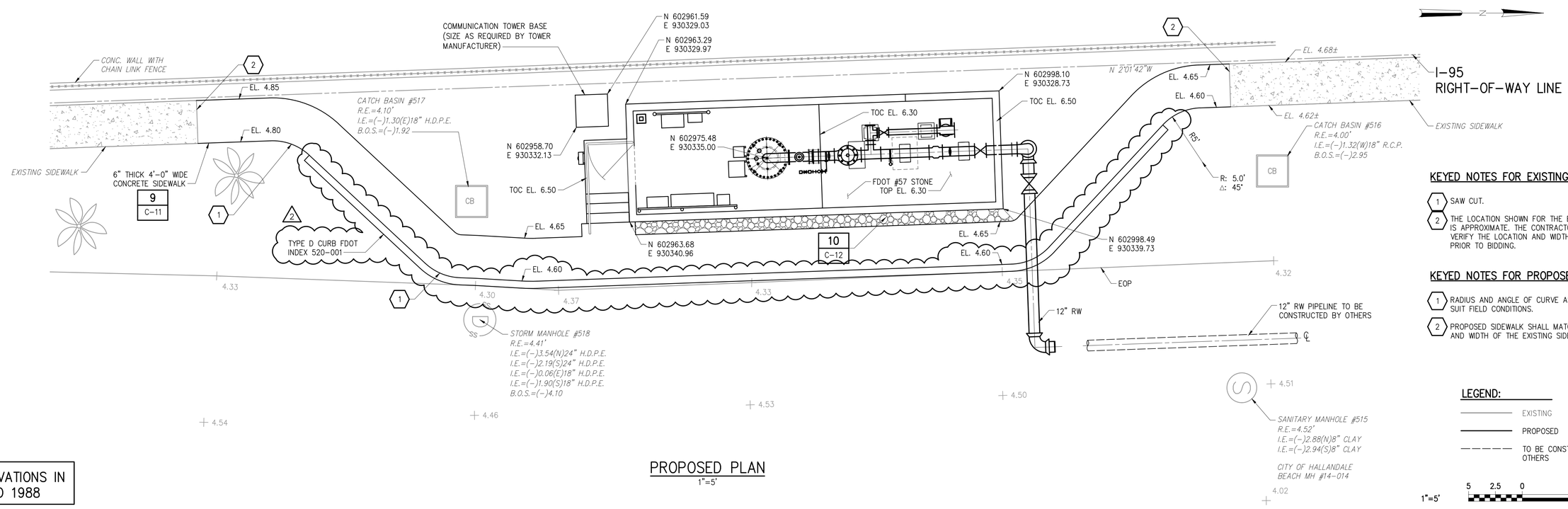


EXISTING PLAN
1"=5'



PROPOSED PLAN
1"=5'

KEYED NOTES FOR EXISTING PLAN:

1. SAW CUT.
2. THE LOCATION SHOWN FOR THE EXISTING SIDEWALK IS APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND WIDTH OF SIDEWALK PRIOR TO BIDDING.

KEYED NOTES FOR PROPOSED PLAN:

1. RADIUS AND ANGLE OF CURVE AS REQUIRED TO SUIT FIELD CONDITIONS.
2. PROPOSED SIDEWALK SHALL MATCH THE ELEVATION AND WIDTH OF THE EXISTING SIDEWALK.

LEGEND:

- EXISTING
- PROPOSED
- TO BE CONSTRUCTED BY OTHERS

1"=5' 5 2.5 0 5'

ALL ELEVATIONS IN NAVD 1988

NO.	DATE	ISSUED FOR	BY
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1	01/21/2020	BID SET	GAB

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DRAWN G.B.
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HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-C08

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UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9

SIDEWALK RELOCATION PLAN

DATE: FEBRUARY 2020
SHEET: 11 OF 42
DRAWING: C-08

BID SET

PLOT DATE: 3/12/2020 9:43 AM BY: MNIEMIEC

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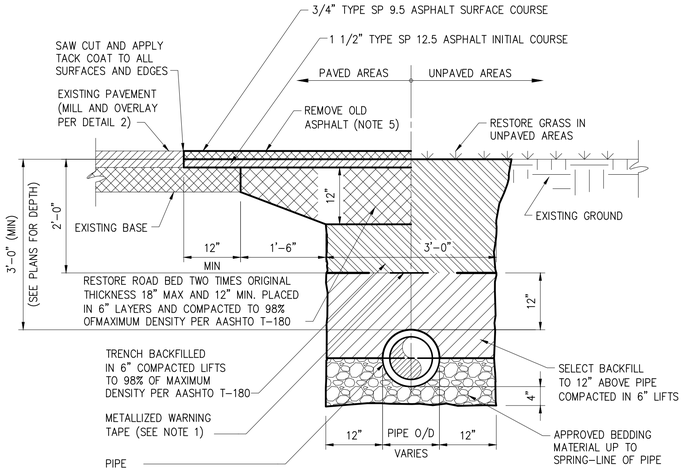
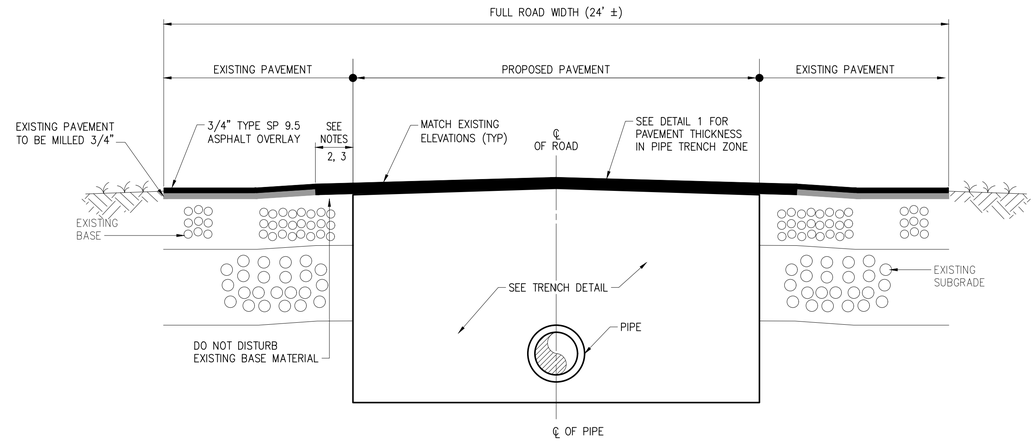


NOTES:

1. METALLIZED WARNING TAPES SHALL BE INSTALLED 24" BELOW FINISH GRADE CENTERED ABOVE THE PIPE.
2. SELECTED BACKFILL MATERIAL SHALL BE FREE OF STONES LARGER THAN 3/4" DIA.
3. REPLACE ALL LANE MARKINGS AND REFLECTIVE MARKERS.
4. DEPTH OF PIPE VARIES. SEE PIPING PLANS FOR PROPOSED DEPTHS. MINIMUM DEPTH OF COVER SHALL BE 36 INCHES
5. ASSUME ASPHALT DEPTH AVERAGES TWO INCHES.

TYPICAL TRENCH AND PAVEMENT RESTORATION

DETAIL 1
NTS –



NOTES:

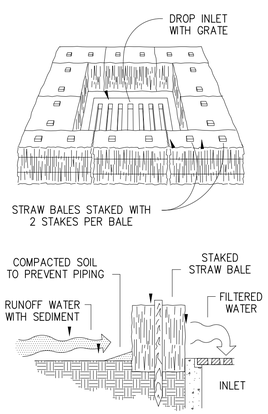
1. RESTORE PAVEMENT ALONG ENTIRETY OF PROPOSED SANITARY SEWER REPLACEMENT IN ACCORDANCE WITH THIS DETAIL.
2. BASE MATERIAL SHALL HAVE A MINIMUM CARBONATE OF 70%.
3. AT LOCATIONS WHERE PROPOSED PAVEMENT WILL TIE– IN TO EXISTING PAVEMENT, CONTRACTOR SHALL MECHANICALLY SAW–CUT A CLEAN STRAIGHT EDGE AND REMOVE 6" OF THE EXISTING PAVEMENT (TYP) ALONG THE PROPOSED ROAD, AND MATCH THE THICKNESS OF THE EXISTING PAVEMENT.

ROAD RESTORATION

DETAIL 2
NTS –

2

DETAIL 4
NTS –

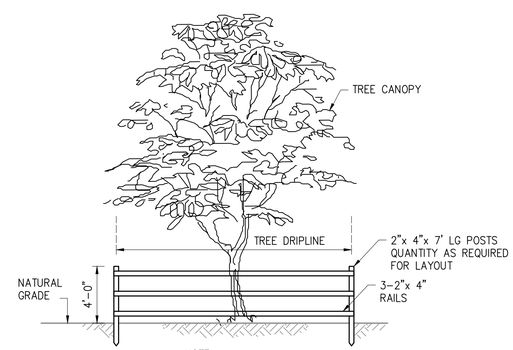


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 CFS) ARE TYPICAL. THIS METOD SHALL NOT APPLY TO INLETS RECIEVEING CONCENTRAED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

STRAW BALE DROP INLET SEDIMENT FILTER

DETAIL 4
NTS –

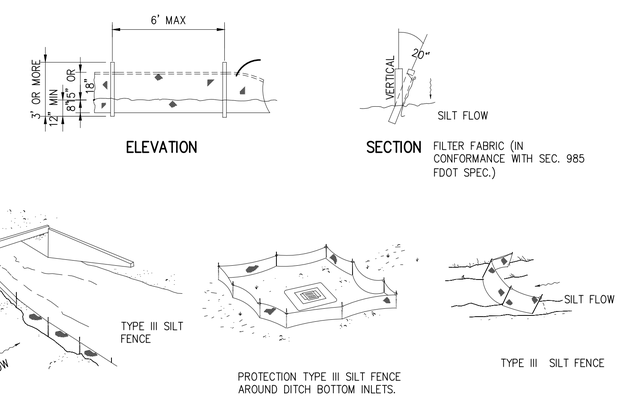


NOTE:

BEFORE SITE CLEARING BEGINS PROVIDE NECESSARY MEASURES TO ASSURE SURVIVAL OF VEGETATION.

TEMPORARY TREE PROTECTION BARRIER

DETAIL 5
NTS –



DO NOT DEPLOY IN A MANNER THAT SILT FENCES WILL ACT AS A DAM ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE USED AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.

APPLICATIONS

SILT FENCE

DETAIL 6
NTS –

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HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-C10

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CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9
CIVIL DETAILS – SHEET 1

DATE: FEBRUARY 2020
SHEET: 13 OF 42
DRAWING: C-10

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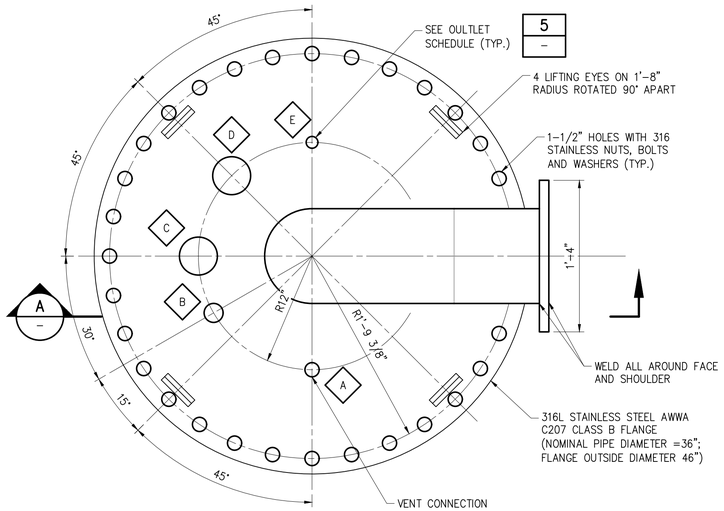
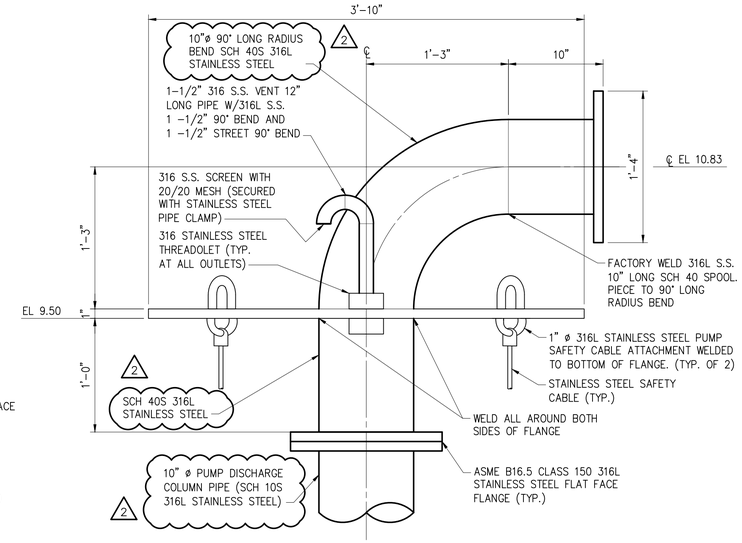


PLAN
1-1/2"=1'-0"



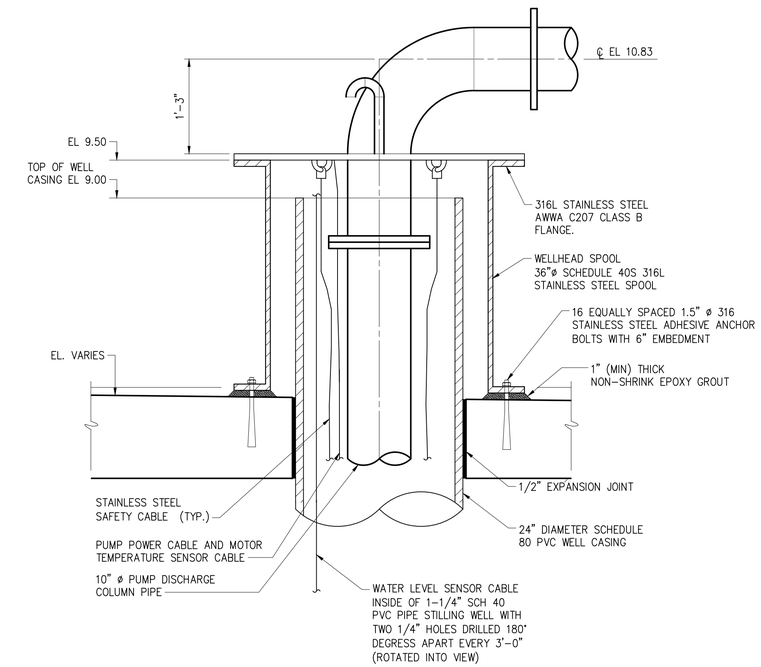
SECTION A
1-1/2"=1'-0"

WELLHEAD NOTES:

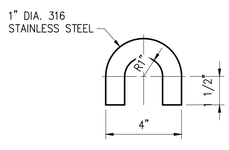
1. ALL MATERIAL SHALL BE ASTM A240 AND/OR ASTM A403 316L STAINLESS STEEL. WELLHEAD FABRICATION SHALL BE PICKLED AND PASSIVATED PER ASTM A380. THE WELLHEAD SHALL HAVE A UNIFORM 2D FINISH.
2. ~~PIPE AND NIPPLES SHALL BE SCHEDULE 40S.~~ NOT USED
3. WELDERS SHALL BE CERTIFIED BY THE AMERICAN WELDING SOCIETY.
4. ALL OUTLES SHALL HAVE THREADOLETS ABOVE AND BELOW THE FLANGE.
5. FURNISH AND INSTALL NEOPRENE GASKET.

WELLHEAD DISCHARGE
DETAIL 2
1 1/2" = 1'-0" M-01

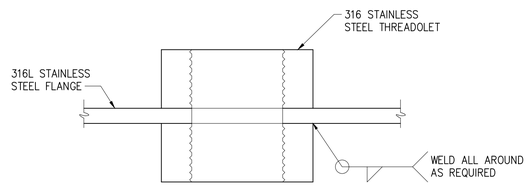
WELLHEAD OUTLET SCHEDULE		
ID MARK	DESCRIPTION	OUTLET DIAMETER
A	VENT PIPE CONNECTION	1.5"
B	SPARE (WITH WATER TIGHT CAP)	2"
C	MOTOR POWER CABLE	4"
D	SPARE (WITH WATER TIGHT CAP)	4"
E	WATER LEVEL SENSOR	1.25"



DETAIL 4
1" = 1'-0" M-02



LIFTING EYE DETAIL
DETAIL 3
3" = 1'-0" –



OUTLET DETAIL – SECTION VIEW
DETAIL 5
NTS –

1"=1'-0" 12" 6 0 1'
1 1/2"=1'-0" 4" 0 1'
3"=1'-0" 2" 0 2 4 6"

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CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-M04

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CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9
MECHANICAL DETAILS – SHEET 2

DATE: FEBRUARY 2020
SHEET: 20 OF 42
DRAWING: M-04

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PLOT DATE: 3/12/2020 9:43 AM BY: MNIEMIEC

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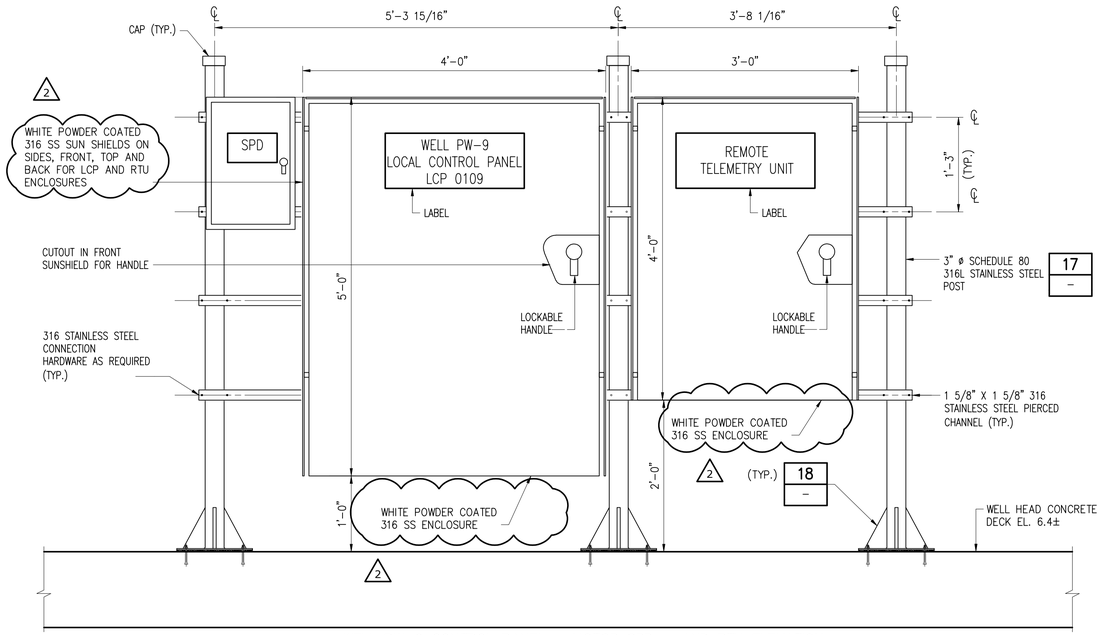
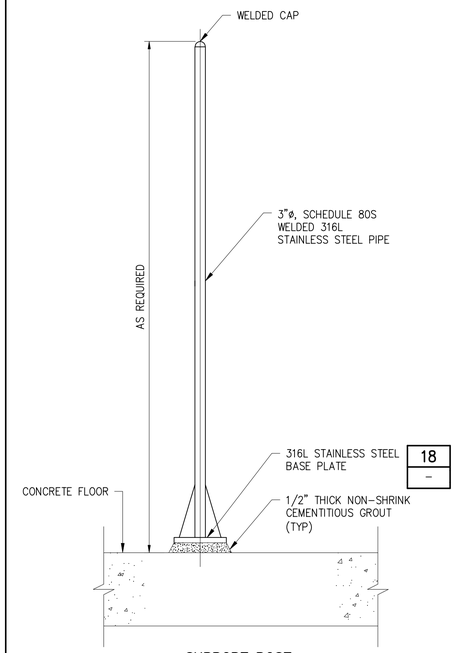


WELL PW-9 CONTROL PANEL – MOTOR SPD – AND RTU ELEVATION

DETAIL 16 / 1" = 1'-0" –



SUPPORT POST

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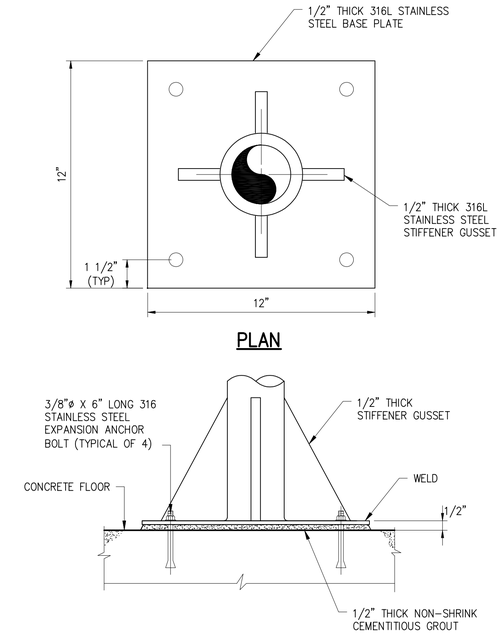
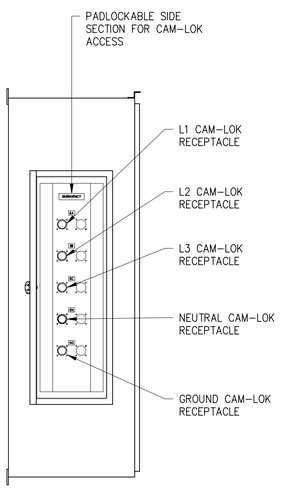
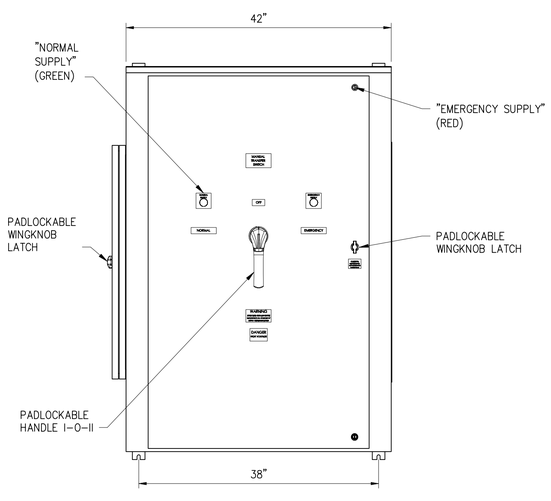


BASE PLATE

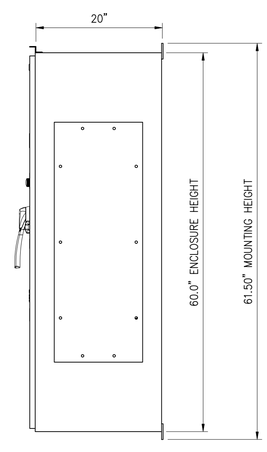
DETAIL 18 / NTS –



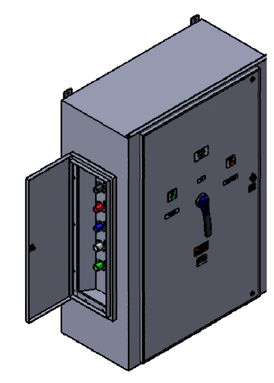
LEFT SIDE VIEW



FRONT VIEW



RIGHT SIDE VIEW



DIMETRIC VIEW

400A FUSIBLE, 4-POLE, NEMA 3R MANUAL TRANSFER SWITCH

DETAIL 19 / NTS E-09

SPECIFICATIONS:

MAX VOLTAGE – 600VAC 3Ø
RATED CURRENT – 400 A
STANDARDS – UL508A
ENCLOSURE RATING – NEMA 3R, 304 SS
REF. ES100145BF
DURABILITY – 6050 CYCLES
COLOR – WHITE POWDER COATED
EST SHIPPING WEIGHT – 450LBS

MODEL
STS400N3RBF4CL
BY PSI CONTROL SOLUTIONS

NOTES:

1. MANUAL TRANSFER SWITCH SHALL BE SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT.
2. SHORT CIRCUIT CURRENT RATING SHALL BE 22,000 AMPERES RMS SYMMETRICAL, MINIMUM.
3. MANUFACTURER SHALL COORDINATE FUSE SIZING AND TYPES, AS REQUIRED.
4. CONTRACTOR SHALL PROVIDE CLEAR ACCESS TO TRANSFER SWITCH GENERATOR TERMINATIONS.

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

DESIGNED JMB
DRAWN JMB
CHECKED JCB
PROJ. ENGR. JCB

JOHN C. BURKE P.E.
No. 17301

Hazen
HAZEN AND SAWYER
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HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612-030
CAD REFERENCE:40612-030BP4-E09

Hallandale Beach
PROSPERITY, INNOVATION, OPPORTUNITY

CITY OF HALLANDALE BEACH
UTILITIES DEPARTMENT

CITY OF HALLANDALE BEACH UTILITIES DEPARTMENT
PRODUCTION WELL PW-9

ELECTRICAL DETAILS – SHEET 3

DATE: FEBRUARY 2020
SHEET: 37 OF 42
DRAWING: E-09

BID SET

PLOT DATE: 3/10/2020 3:04 PM BY: TBOCAS

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File = C:\bms\hazen-pw\dms49210\40612-030BP4-E09 Saved by tbocas Save date = 3/10/2020 2:12 PM

SECTION 17132 - REMOTE TERMINAL UNIT

PART 1 GENERAL

1.01 THE REQUIREMENT

~~**A. The specific attention of the Contractor is directed to the fact that the Owner has an existing TAC II SCADA System manufactured by Data Flow Systems, Inc. (DFS), of Melbourne, Florida (321) 259-5009. For compatibility purposes, the Contractor will be required to obtain the Remote Terminal Unit (RTU) specified herein from DFS.**~~

~~**B. The Contractor shall coordinate tower and antenna requirements with DFS and shall provide station(s) physical location information to DFS for radio communication study purposes. Information shall be provided in the form of GPS readings or street map with actual site location(s) clearly marked. A complete radio survey shall be conducted by DFS to verify antenna and tower height requirements. DFS shall license the new RTU with the FCC for operation under the existing radio frequency.**~~

C. These specifications are intended to cover the furnishing, the shop testing, the delivery, complete installation and field testing of all equipment and appurtenances for the complete RTU **(remote telemetry unit)** system herein specified, whether specifically mentioned in the Specifications or not.

D. The ~~**unit**~~ **RTU** shall be furnished and installed with all necessary and desirable accessory equipment and auxiliaries whether specifically mentioned in these specifications or not. This installation shall include field-testing of the entire installation.

E. The RTU shall be ~~**supplied with a NEMA 4X enclosure and**~~ mounted as shown on the Drawings. The RTU shall support the input/output signals specified in Section 17920.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 17000 - Control and Information System Scope and General Requirements

B. Section 17560 – Transient Voltage Surge Suppression Devices

C. Section 17920 – Control System Input/Output Schedules

PART 2 PRODUCTS

2.01 REMOTE TERMINAL UNIT (RTU)

~~**A. The remote terminal unit shall be a PLC based data collection and dissemination subsystem. Communications The remote terminal unit shall communicate with the central site (or forwarding terminal unit) via a Data Flow Systems two-way radio link. The RTU shall be capable of operating in a temperature ranging from -10 to 60 Degrees Celsius (14 to 140 Degrees Fahrenheit).**~~

~~**B. The RTUs shall meet or exceed the quality, reliability, performance and versatility of those manufactured by Data Flow Systems, Inc. of Melbourne, Florida.**~~

A. The RTU (Remote Terminal Unit) panel shall be a PLC based data collection and dissemination subsystem that communicates with the central site (or forwarding terminal unit) via a two-way radio link. The complete RTU panel as shown on the P&IDs and as described in Division 17 shall be provided by the instrumentation and controls subcontractor, with the exception of the RTU unit.

B. The RTU unit shall be equipped with a compact backplane, PLC module, power supply and radio interface module. The RTU unit shall be furnished by Data Flow Systems, Inc. (DFS), of Melbourne, Florida (321) 259-5009. For compatibility purposes, the Contractor will be required to obtain the RTU unit specified herein from DFS. DFS shall ship the RTU unit to the instrumentation and controls subcontractor.

C. The Contractor shall coordinate tower and antenna requirements with DFS and shall provide station(s) physical location information to DFS for radio communication study purposes. Information shall be provided in the form of GPS readings or street map with actual site location(s) clearly marked. A complete radio survey shall be conducted by DFS to verify antenna and tower height requirements. DFS shall license the new RTU with the FCC for operation under the existing radio frequency.

D. The contractor shall facilitate coordination between the instrumentation and controls subcontractor, DFS and the City as required for a fully functioning RTU System.

E. DFS shall coordinate with the instrumentation subcontractor and configure the DFS RTU equipment in the RTU-0109 enclosure provided by the instrumentation subcontractor to establish a modbus serial (RS-485) communications link between the DFS RTU (radio) in RTU-0109 and the instrumentation and controls subcontractor furnished PLC.

F. DFS shall develop new HMI screen graphics and modify existing DFS HMI graphics for well No. 9 in the existing Hyper-V SCADA system. DFS shall configure the Hyper-V SCADA server DFS communications driver, DFS master radio and DFS RTU unit as required to fully integrate the new DFS RTU unit into the existing DFS network.

G. The instrumentation subcontractor shall:

a. Develop the RTU PLC logic, and configure the WTP's existing VTSCADA SCADA HMI software as required to facilitate Well No. 9 status and control signal communication over the DFS radio link.

b. Develop one or more SCADA HMI graphic screens and modify existing SCADA HMI screens as required to incorporate Well No. 9 into the SCADA system.

c. Develop new pump controller faceplate graphics or modify an existing faceplate template as required to control and monitor the well pump from SCADA.

H. SCADA software modifications performed shall adhere to the WTPs current HMI graphics standards and have the same general look and feel of the existing HMI graphics. Submit the PLC logic and HMI graphics screens to Engineer and City for review and approval by prior to system startup in accordance with Section 17030.

I. RTU shall be capable of operating in a temperature ranging from -10 to 60 Degrees Celsius (14 to 140 Degrees Fahrenheit).

J. Refer to Instrumentation Drawing I-02 for additional requirements.

2.02 RTU SERIAL INTERFACE PORTS

A. The remote terminal unit shall support one or more local serial interface ports. The local serial interface shall provide local access to all the functions of the remote terminal unit. The local serial interface shall support the monitoring of the radio communications link. The system shall support an automatic antenna alignment function utilizing the local serial interface.

B. The PLC specified herein shall communicate all input/output signal data with the RTU via an RS-485 serial **modbus** communications link as shown on Drawing I-02. **The instrumentation supplier and DFS shall coordinate to establish the RS-485 communications link.**

2.03 RTU POWER SUPPLY

A. All function modules in the remote terminal unit shall run off DC voltage from +7.5 volts to +13 volts. The power supply module shall supply +12 volts. A battery backup shall be provided to operate the system for a minimum of 120 minutes in event of power failure. The power supply shall be surge protected. The power supply shall be short circuit protected by current limiting. Normal operation shall automatically resume when the short circuit overload is removed. The power supply shall be sized to operate the system with the battery removed. The power supply module shall provide a battery backed, isolated bias voltage source. The isolated bias voltage source shall be utilized to monitor the high well alarm so as to make sure the alarm is detected and reported during power outages. The circuit breaker for the power supply module shall be part of the power supply module. Neither the use of tools nor the disconnection of any wires shall be required to replace the power supply module.

2.04 RTU SURGE PROTECTION

A. Multiple staged surge protection shall be provided for all power supply and power monitoring circuits. One stage of protection shall be equipped with both energy limiting and clamping circuits with slow blow fuses designed for overload conditions. This design shall provide a very high level of non-destructive transient immunity. With the exception of a direct lightning strike, the device shall protect the RTU power supply and power

monitoring circuits from damage due to voltage transients. The unit shall provide circuit protection to withstand multiple transients in excess of 6,500 volts, 3,250 amps, without damage. Damage shall be limited to a blown fuse when exposed to larger transients. The device shall be transient-tested to ANSI standard C62.41. The unit shall meet or exceed the quality, reliability and performance of the Transient Filter Shield TFS001 as manufactured by Data Flow Systems. The AC power input protection shall meet or exceed the quality, reliability and performance of the Single Phase Suppresser, SPS001 (or, if three phase power is in use, the Three Phase Suppresser, TPS001) as manufactured by Data Flow Systems. See Section 17560 for additional requirements.

2.05 RTU BATTERIES

A. The RTU **radio** shall have ~~the~~ **a built-in** uninterruptible power supply (UPS) ~~**function built in**~~. The unit's internal power supply shall keep the batteries at a float charge. The batteries shall not be damaged by deep discharges.

2.06 PROGRAMABLE LOGIC CONTROLLERS (PLC)

A. Provide a PLC in the RTU enclosure that shall function as the main controller for the RTU. All Well Pump Local Control Panel LCP-0109 input and output signals shall be wired to the PLC I/O. The PLC shall send well pump and well instrumentation status signals to the DFS RTU radio interface module and shall receive remote control signals from the DFS RTU radio interface module via RS-485 serial communications.

B. Instrumentation **and controls** subcontractor shall provide all PLC programing required for a fully functioning RTU system. PLC logic shall be well organized with detailed documentation of all PLC logic segment functionality clearly defined within the logic file.

C. The PLC shall be equipped with 12 digital fast 24V dc inputs, 8 digital normal 24V dc inputs, 12 relays outputs, 4 Analog (12 bits) inputs, 2 Analog (12 bits) outputs and shall be supplied by 110/240V AC power. The PLC shall be an Allen-Bradley MicroLogix 1400, model 1766-L32BWAA as manufactured by Rockwell Automation. Provide 1762 Series Expansion I/O modules as required to meet all primary and spare PLC I/O requirements. Refer to Section 17920 for input/output requirements.

D. All PLC 4-20mA analog inputs connected to field instruments shall be surge protected by analog surge suppressors. See Section 17560 for surge suppressor requirements.

E. Provide a minimum of 20% active, prewired spare digital and analog PLC outputs and inputs with all required fuses and surge suppression.

F. Provide redundant 120Vac to 24Vdc control power supplies with auto-failover as required.

G. **Instrumentation and controls subcontractor shall provide a UPS to provide PLC and control power.** ~~Provide~~ **UPS shall be** ~~a~~ 120Vac UPS with minimum 10 minutes of PLC backup time and UPS common fault status output wired to a PLC digital input.

2.07 RTU RADIO INTERFACE MODULE

A. Each remote terminal unit utilizing radio communications shall require one radio interface module (RIM). The RIM shall control the terminal radio during the polling sequence. The

radio interface module shall have a service port to provide communications link monitoring. The service port shall also provide the capability to directly monitor and/or control each module in the remote terminal unit. The radio interface module utilized at the remote terminal units shall be interchangeable with the radio interface module at the central site. The system shall be capable of utilizing up to 505 radio interface modules per communications link and up to 15 function modules per radio interface module. All communications shall be in ASCII and utilize an error detecting and correction data transfer protocol. Each radio interface module shall have a radio transceiver mounted to it. The radio shall be an FM transceiver. The radio interface module shall measure and transmit to the central site computer system the received signal strength (RSS). Replacement of the radio interface module shall trigger an automatic configuration of the new module to accommodate the site address and function (plug & play).

2.08 ENCLOSURES

A. ~~**Each**~~ **The** RTU shall be housed in a NEMA 4X-316 stainless steel enclosure with removable steel lifting eyes, drip shields and sunshields. Both the enclosure and sunshields shall be polyester powder coated white.

B. The enclosure shall be no more than 36 inches in width. Other panel dimensions shall be increased as required to allow for proper heat dissipation to ensure that enclosure internal temperature does not exceed the limits of any of the hardware inside the RTU enclosure, including, but not limited to the RTU radio, PLC, UPS and DC power supplies.

C. All mounting hardware utilized shall be stainless steel.

D. The enclosure door shall be equipped with a 3-point latching mechanism with a pad lockable handle. A foldable laptop shelf and a sleeve with a laminated copy of the final as-built RTU electrical schematics shall be mounted on the inside of the enclosure door.

E. The enclosure shall have a Hoffman H20MIT vent drain, catalog number: AVDR4SS4 or approved equal at the bottom corner of the control panel. Vent drain shall be NEMA 4X stainless steel type.

F. Provide a 120Vac service receptacle.

G. Provide a PaneLite LED Enclosure Light, as manufactured by Hoffman. The panel light shall be wired to turn on when the intrusion switch is activated (door is open).

H. Refer to Electrical Drawings for additional requirements.

2.09 ANTENNA SUBSYSTEM

A. A high gain directional antenna shall be used to transmit and receive data at the Remote Terminal Units. The directional antennas shall have all welded aluminum elements, and a single radiator element connected to a type N female connector. Element connections utilizing nuts and bolts are not acceptable. The antennas shall meet or exceed the quality, reliability and performance of the RTA series as provided by Data Flow Systems, Inc. of Melbourne, Florida. When an antenna mast/pole is utilized, it shall be hot dipped galvanized for corrosion protection. All mounting hardware shall be made of stainless steel. The mast shall meet or exceed the quality and reliability of the AG20 manufactured

by Rohn. The coax cable shall be the type that utilizes an inert semi-liquid compound to flood the copper braid. The coax cable shall be of the RG-8 construction type and have the RF-loss characteristic of foam flex. The coax cable shall meet or exceed the quality, reliability and performance of RTC 400 as supplied by Data Flow Systems, Inc. of Melbourne, Florida. Type N connectors shall be utilized at both ends of the coax. The Type N connectors shall be sealed with 3-inch sections of Alpha FIT321-1-0 sealant shrink tubing. The coax cable shall be secured to the mast/pole with EVA-coated 316 stainless steel cable ties. The cable ties shall meet or exceed the quality, reliability and performance of AE112 cable ties manufactured by Band-It. The RTU shall be protected from electrical surge or transients entering through the coaxial cable by use of a coaxial cable surge protector. The coaxial cable surge protector shall meet or exceed the quality, reliability and performance of the IS-B50LN-C2 manufactured by Polyphaser.

2.10 WARRANTY

A. The **instrumentation and controls subcontractor** ~~**system supplier**~~ **shall** warrant**y** all hardware and ~~**software**~~ **PLC logic** provided under this contract against all defects in material and workmanship for a period of one year. The **instrumentation and controls subcontractor** ~~**system supplier**~~ shall warrant the SCADA software **modifications** to be free of defects for as long as it is in operation by the Owner. ~~**The RTU supplier shall also provide free RTU SCADA Software updates for the life of the system.**~~

B. The ~~**function modules utilized in the remote terminal units**~~ **RTU radio furnished by DFS** shall carry an additional 2-year return-to-factory warranty. The 2-year return-to-factory warranty shall cover damage due to lightning and surge.

~~**2.11 SERVICE**~~

~~**A. The system supplier shall offer full factory support of the installed system through the use of factory-trained employees. The Owner shall have 24-hour per day access to service personnel through a pager and/or cell phone.**~~

2.12 SPARES

A. One spare of each type of Data Flow System module supplied, including but not limited to radio interface modules, controllers and serial communications modules.

B. Provide one spare of each type of Data Flow Systems backup battery.

C. One spare complete PLC with CPU and all required expansion I/O modules shall be supplied. The current PLC logic program shall pre-loaded on the spare PLC CPU.

D. One spare 24VDC control power supply.

E. One spare main AC input surge suppressor.

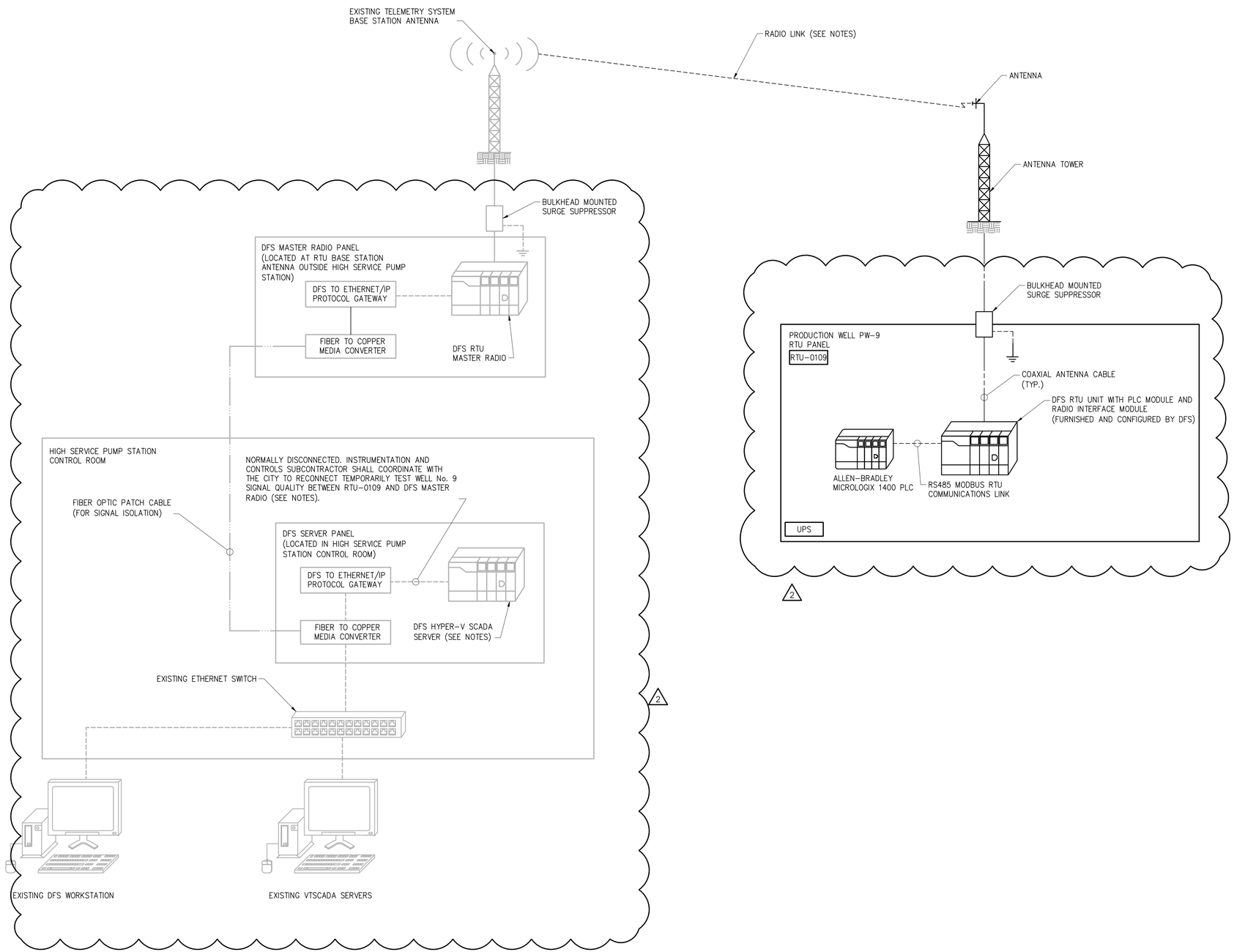
F. Three spare PLC analog input surge suppressors.

G. Five spare fuses of each make/model provided.

PART 3 EXECUTION

(NOT USED)

- END OF SECTION -



SEQUENCE OF REQUIRED MODIFICATIONS;

1. RTU-0109 RADIO TOWER SHALL BE FURNISH AND INSTALLED BY CONTRACTOR.
2. RTU-0109 RADIO ANTENNA, ANTENNA CABLE, SURGE SUPPRESSOR AND ALL REQUIRED ACCESSORIES SHALL BE FURNISHED AND INSTALLED BY INSTRUMENTATION AND CONTROLS SUBCONTRACTOR.
3. DFS (DATA FLOW SYSTEMS) SHALL UPDATE EXISTING FCC RADIO LICENSE AS REQUIRED TO INCLUDE THE DFS RADIO IN RTU-0109 IN THE CITY'S DFS NETWORK.
4. DFS SHALL FURNISH A DFS RTU UNIT WITH A PLC MODULE WITH BACKPLANE, POWER SUPPLY/UPS, RADIO MODULE AND CABLES REQUIRED TO COMMUNICATE WITH THE INSTRUMENTATION AND CONTROLS SUBCONTRACTOR FURNISHED ALLEN-BRADLEY MICROLOGIX 1400 PLC. THE UNIT SHALL BE SHIPPED BY DFS TO THE INSTRUMENTATION AND CONTROLS SUBCONTRACTOR A MINIMUM OF 2 WEEKS PRIOR TO FACTORY TESTING OF RTU-0109.
5. INSTRUMENTATION AND CONTROLS SUBCONTRACTOR SHALL FURNISH THE COMPLETE RTU-0109 PANEL AND SHALL WARRANTY ALL COMPONENTS FOR A PERIOD OF NO LESS THAN ONE YEAR FROM COMMISSIONING WITH THE EXCEPTION OF THE DFS RADIO, WHICH SHALL BE WARRANTED BY DFS FOR A PERIOD OF NO LESS THAN 2 YEARS FROM THE DATE OF COMMISSIONING.
6. INSTRUMENTATION AND CONTROLS SUBCONTRACTOR SHALL UPDATE THE VTSCADA WORKSTATION DATABASE AND GRAPHICS TO INTEGRATE RTU-0109 INTO THE WTP SCADA SYSTEM.
7. ONCE RTU-0109 HAS BEEN INSTALLED AND POWERED UP INSTRUMENTATION AND CONTROLS SUPPLIER SHALL COORDINATE WITH THE CITY TO TEMPORARILY DISCONNECT THE DFS MASTER RADIO FROM THE VTSCADA NETWORK AND CONNECT THE DFS MASTER RADIO TO DFS HYPER-V SERVER FOR TESTING THE QUALITY OF THE RADIO SIGNAL BETWEEN THE DFS MASTER RADIO AND THE DFS PLC RADIO IN RTU-0109. INSTRUMENTATION AND CONTROL SUBCONTRACTOR SHALL CONFIRM THAT THE DFS RADIO LINK BETWEEN RTU-0109 AND DFS MASTER RADIO, ALL OTHER RTU PANELS, IS FULLY FUNCTIONAL, INDEPENDENT OF THE VTSCADA SCADA SYSTEM. THE INSTRUMENTATION SUBCONTRACTOR, IN COORDINATION WITH THE CITY, SHALL DISCONNECT THE DFS HYPER-V SCADA SERVER AND RECONNECT THE DFS MASTER RADIO TO THE VTSCADA SCADA NETWORK.
8. INSTRUMENTION AND CONTROL SUPPLIER SHALL PERFORM ALL PROGRAMMING OF THE VTSCADA SCADA SYSTEM AND MICROLOGIX 1400 PLC IN RTU-0109 AND SHALL COORDINATE WITH DFS TO ESTABLISH THE COMMUNICATIONS LINK BETWEEN THE DFS PLC AND THE MICROLOGIX 1400 PLC.
9. DFS SHALL PERFORM ALL PROGRAMMING AND CONFIGURATION OF DFS EQUIPMENT AND COORDINATE WITH THE INSTRUMENTATION AND CONTROLS SUPPLIER AS REQUIRED TO ESTABLISH A FULLY OPERATIONAL COMMUNICATIONS LINK BETWEEN THE DFS RTU IN RTU-0109 AND THE MICROLOGIX 1400 PLC IN RTU-0109.
10. INSTRUMENTATION AND CONTROLS SUBCONTRACTOR SHALL PERFORM A PRELIMINARY LOOP CHECKOUT AND VERIFY ALL INPUTS AND OUTPUTS SHOWN ON THE P&IDS AND LISTED IN THE SPECIFICATIONS ARE FULLY FUNCTIONING PRIOR TO SCHEDULING THE LOOP CHECKOUT WITH CITY AND ENGINEER.
11. REFER TO DIVISION 17 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

2

NO.	DATE	ISSUED FOR	BY
2	03/02/2020	ADDENDUM	GAB
1	01/21/2020	BID SET	GAB

DESIGNED E.P.C.
DRAWN L.M.S.
CHECKED G.A.B.
PROJ. ENGR. G.A.B.

KEITH R. DINNEN P.E.
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HOLLYWOOD, FLORIDA 33021
CERTIFICATE OF AUTHORIZATION NO. : 2771

THE SCALE BAR SHOWN BELOW MEASURES ONE INCH LONG ON THE ORIGINAL DRAWING.

CLIENTS PROJECT: –
ENGINEERS PROJECT: 40612-030
CAD REFERENCE: 40612-030BP4-I02

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UTILITIES DEPARTMENT

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PRODUCTION WELL PW-9

SYSTEM BLOCK DIAGRAM

DATE: FEBRUARY 2020
SHEET: 39 OF 42
DRAWING: I-02

BID SET

PLOT DATE: 3/10/2020 4:03 PM BY: TBOCAS

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SECTION 17000 - CONTROL AND INFORMATION SYSTEM, GENERAL

PART 1 -- GENERAL

1.01 SCOPE

A. The Contractor shall provide, through the services of the instrumentation and control system subcontractor, all components, system installation services, as well as all required and specified ancillary services in connection with the Instrumentation, Control and Information System. The System includes all materials, labor, tools, fees, charges and documentation required to furnish, install, test and place in operation a complete and operable instrumentation, control and information system as shown and/or specified. The system shall include all measuring elements, signal converters, transmitters, control panels, cabinets, digital hardware and software, operator interface terminals, signal and data transmission systems, interconnecting wiring, brackets, supports, piping, tubing, valves, mounting hardware, and such accessories as shown, specified, and/or required to provide the functions indicated.

B. The Contractor shall take note that the Section entitled "Summary of Work'" includes specific construction sequencing restrictions that impact the performance of the Work as specified in Division 17. The Contractor shall coordinate sequence requirements between its various Project subcontractors as necessary to meet all requirements as specified in the contract documents.

C. The general scope of work to be performed under this Division includes, but is not limited to, the following:

1. The Contractor shall retain overall responsibility for the instrumentation and control system as specified herein.

2. Furnish and install process instrumentation and associated taps, nipples, valves, tubing, and supports as scheduled or shown on the Drawings, unless otherwise noted or supplied by equipment vendors.

3. Furnish and install control equipment, field panels and associated cabinets and control panels as shown on the drawings and as specified in this Division.

4. Furnish and install digital control system hardware and software as specified in this Division, including but not limited to:

a. One (1) complete ~~**Data Flow Systems (DFS)**~~ remote terminal unit (RTU) **panel** with Allen-Bradley MicroLogix 1400 and appurtenances **provided by the instrumentation and controls subcontractor**. An **RTU unit with PLC and radio module shall be furnished separately by Data Flow Systems.**

b. Radio telemetry antenna, cable, tower and appurtenances.

c. Modification of the existing DFS Hyper SCADA Server and workstation to incorporate the new RTU. **Modifications are to be performed by DFS.**

d. Modification of the existing VTSCADA SCADA Server and workstation to incorporate the new RTU.

e. Refer to Section 17131 and Instrumentation Drawing I-02 for additional requirements.

5. Final termination and testing of all instrumentation and control system signal wiring and power supply wiring at equipment furnished under this Division.

6. Furnish and install transient voltage surge suppression systems for all digital equipment, data communications equipment, local control panels, and field instruments provided under this Division, including connections to grounding system(s) provided under Division 16.

7. Coordinate grounding requirements with the electrical subcontractor for all digital equipment, local control panels, and field instrumentation provided under this Division. Terminate grounding system cables at all equipment provided under this Division.

8. Provide system testing, calibration, training and startup services as specified herein and as required to make all systems fully operational.

9. Furnish and install embedded supports, instrument stands, brackets, mounting hardware, piping, tubing, isolation valves and related items required for instrumentation and equipment furnished under Division 17.

10. The Contractor shall coordinate all work specified herein with related work specified in other Divisions, and shall schedule the work to minimize downtime of equipment and controls as described in the Section entitled “Maintenance of Utility Operations During Construction”. The Contractor shall provide temporary equipment and interconnecting cables as described herein and as shown on the Drawings.

D. It is the intent of the Contract Documents to construct a complete and working installation. Items of equipment or materials that may reasonably be assumed as necessary to accomplish this end shall be supplied whether or not they are specifically stated herein.

1.02 RELATED ITEMS

A. Field mounted switches, torque switches, limit switches, valve and gate operator position transmitters, sump pump controls and other instrumentation and controls furnished with mechanical or electrical equipment not listed in the instrument schedule shall be furnished, installed, tested and calibrated as specified under other Divisions.

B. Additional and related work performed under Division 16 includes the following:

1. Conduit and raceways for all instrumentation and control system signal wiring, grounding systems, special cables and data highway cables.

2. Instrumentation and control system signal wiring. See termination requirements below.

4. Install (pull in conduit system) Ethernet data highway network and fiber optic data communications cables.

5. Furnish and install grounding systems for all digital equipment, local control panels, and field instrumentation provided under Division 17. Grounding systems shall be complete to the equipment provided under Division 17, ready for termination by the instrumentation subcontractor.

6. Termination of all instrumentation and control system grounding, signal and data communications cables, wiring and surge suppression devices at the equipment end of all equipment furnished under other Divisions of the Specifications. Wiring systems shall be installed complete to the equipment provided under Division 17, ready for termination by the instrumentation subcontractor.

7. Final wiring and termination to A.C. grounding systems and to A.C. power sources (e.g. panelboards, motor control centers, and other sources of electrical power).

1.03 GENERAL INFORMATION AND DESCRIPTION

A. Where manufacturers are named for a particular item of equipment, it is intended as a guide to acceptable quality and performance and does not exempt such equipment from the requirements of these Specifications or Drawings.

B. In order to centralize responsibility, it is required that all equipment (including field instrumentation and control system hardware and software) offered under this Division shall be furnished and installed by the instrumentation subcontractor, or under the supervision of the instrumentation subcontractor, who shall assume complete responsibility for proper operation of the instrumentation and control system equipment, including that of coordinating all signals, and furnishing all appurtenant equipment.

C. The Contractor shall retain total responsibility for the proper detailed design, fabrication, inspection, test, delivery, assembly, installation, activation, checkout, adjustment and operation of the entire instrumentation and control system as well as equipment and controls furnished under other Divisions of the Specifications. The Contractor shall be responsible for the delivery of all detailed drawings, manuals and other documentation required for the complete coordination, installation, activation and operation of mechanical equipment, equipment control panels, local control panels, field instrumentation, control systems and related equipment and/or systems and shall provide for the services of a qualified installation engineer to supervise all activities required to place the completed facility in stable operation under full digital control.

D. The instrumentation and control system shall be capable of simultaneously implementing all real-time control and information system functions, and servicing all operator service requests as specified, without degrading the data handling and processing capability of any system component. It shall also be possible to simultaneously generate displays on all workstations and print out data on all printers without degradation of system performance.

E. Control system inputs and outputs are listed in the Input/Output Schedule. This information, together with the control strategy descriptions, process and instrumentation diagrams, and electrical control schematics, describes the real-time monitoring and control functions to be performed. In addition, the system shall provide various man/machine interface and data reporting functions as specified in the software sections of this Specification.

F. The mechanical, process, and electrical drawings indicate the approximate locations of field instruments, control panels, systems and equipment as well as field-mounted equipment provided by others. The instrumentation subcontractor shall examine the mechanical, process and electrical drawings to determine actual size and locations of process connections and wiring requirements for instrumentation and controls furnished under this Contract. The instrumentation subcontractor shall inspect all equipment, panels, instrumentation, controls and appurtenances either existing or furnished under other Divisions of the Specifications to determine all requirements to interface same with the control and information system. The Contractor shall coordinate the completion of any required modifications with the associated supplier of the item furnished.

G. The instrumentation subcontractor shall review and approve the size and routing of all instrumentation and control cable and conduit systems furnished by the Electrical Contractor for suitability for use with the associated cable system.

H. The Contractor shall coordinate the efforts of each supplier to aid in interfacing all systems. This effort shall include, but shall not be limited to, the distribution of approved shop

drawings to the Electrical Contractor and to the instrumentation subcontractor furnishing the equipment under this Division.

I. The Contractor shall be responsible for providing a signal transmission system free from electrical interference that would be detrimental to the proper functioning of the instrumentation and control system equipment.

J. The Owner shall have the right of access to the subcontractor's facility and the facilities of its equipment suppliers to inspect materials and parts; witness inspections, tests and work in progress; and examine applicable design documents, records and certifications during any stage of design, fabrication and tests. The instrumentation subcontractor and its equipment suppliers shall furnish office space, supplies and services required for these surveillance activities.

K. The terms "Instrumentation", "Instrumentation and Control System", and "Instrumentation, Control and Information System" shall hereinafter be defined as all equipment, labor, services and documents necessary to meet the intent of the Specifications.

1.04 INSTRUMENTATION AND CONTROL SYSTEM SUBCONTRACTORS

A. Instrumentation and control system subcontractors shall be regularly engaged in the detailed design, fabrication, installation, and startup of instrumentation and control systems for municipal water treatment facilities. Instrumentation and control system subcontractors shall have a minimum of five years of such experience, and shall have completed a minimum of three projects of similar type and size as that specified herein. As used herein, the term “completed” shall mean that a project has been brought to final completion and final payment has been made. Any instrumentation and control system subcontractor that has been subject to litigation or the assessment of liquidated damages for nonperformance on any project within the last five calendar years shall not be acceptable.

1.05 DEFINITIONS

A. Solid State: Wherever the term solid state is used to describe circuitry or components in the Specifications, it is intended that the circuitry or components shall be of the type that convey electrons by means of solid materials such as crystals or that work on magnetic principles such as ferrite cores. Vacuum tubes, gas tubes, slide wires, mechanical relays, stepping motors or other devices will not be considered as satisfying the requirements for solid state components of circuitry.

B. Bit or Data Bit: Whenever the terms bit or data bit are used in the Specification, it is intended that one bit shall be equivalent to one binary digit of information. In specifying data transmission rate, the bit rate or data bit rate shall be the number of binary digits transmitted per second and shall not necessarily be equal to either the maximum pulse rate or average pulse rate.

C. Integrated Circuit: Integrated circuit shall mean the physical realization of a number of circuit elements inseparably associated on or within a continuous body to perform the function of a circuit.

D. Mean Time Between Failures (MTBF): The MTBF shall be calculated by taking the number of system operating hours logged during an arbitrary period of not less than six months and dividing by the number of failures experienced during this period plus one.

E. Mean Time to Repair (MTTR): The MTTR shall be calculated by taking the total system down time for repair over an arbitrary period of not less than six months coinciding with

that used for calculation of MTBF and dividing by the number of failures causing down time during the period.

F. Availability: The availability of a non-redundant device or system shall be related to its MTBF and MTTR by the following formula:

A = 100 x (MTBF/(MTBF + MTTR)) Percent

The availability of a device or system provided with an automatically switched backup device or system shall be determined by the following formula:

A = A2 + 1 - ((1-A1) x (1-A1))

where:

A1 = availability of non-redundant device or system

A2 = availability of device or system provided with an automatically switched backup device or system

G. Abbreviations: Specification abbreviations include the following:

A	-	Availability
ADC	-	Analog to Digital Converter
AVAIL	-	Available
ATA	-	Advanced Technology Attachment
BCD	-	Binary Coded Decimal
CSMA/CD	-	Carrier Sense Multiple Access/Collision Detect
CPU	-	Central Processing Unit
CRC	-	Cyclic Redundancy Check
CRT	-	Cathode Ray Tube
CS	-	Control Strategy
DAC	-	Digital to Analog Converter
DBMS	-	Data Base Management System
DDR	-	Double Data Rate
DIMM	-	Dual In-line Memory Module
DMA	-	Direct Memory Access
DPDT	-	Double Pole, Double Throw
DVD	-	Digital Video Disc
DVE	-	Digital to Video Electronics
ECC	-	Error Correction Coding
EPROM	-	Erasable Programmable Read Only Memory
FDM	-	Frequency Division Multiplexing
FSK	-	Frequency Shift Keyed
GB	-	Gigabyte

Gbps	-	Gigabits per second
HMI	-	Human Machine Interface
I/O	-	Input/Output
LAN	-	Local Area Network
LCD	-	Liquid Crystal Display
LED	-	Light Emitting Diode
MB	-	Megabyte
Mbps	-	Megabits per second
MCC	-	Motor Control Center
MTBF	-	Mean Time Between Failures
MTTR	-	Mean Time To Repair
OS	-	Operating System
OIT	-	Operator Interface Terminal
PCB	-	Printed Circuit Board
PLC	-	Programmable Logic Controller
RAID	-	Redundant Array of Inexpensive Discs
PROM	-	Programmable Read Only Memory
RAM	-	Random Access Memory
RMSS	-	Root Mean Square Summation
ROM	-	Read Only Memory
RTU	-	Remote Telemetry Unit
SATA	-	Serial ATA
SCADA	-	Supervisory Control and Data Acquisition
SDRAM	-	Synchronous Dynamic Random Access Memory
SIMM	-	Single In-line Memory Module
SPDT	-	Single Pole, Double Throw
TB	-	Terabyte
TDM	-	Time Division Multiplexing
TFT	-	Thin Film Transistor
USB	-	Universal Serial Bus
UPS	-	Uninterruptible Power Supply
WAN	-	Wide Area Network

H. To minimize the number of characters in words used in textual descriptions on displays, printouts and nameplates, abbreviations may be used subject to Engineer approval. If a specified abbreviation does not exist for a particular word, an abbreviation may be generated using the principles of masking and or vowel deletion. Masking involves

retaining the first and last letters in a word and deleting one or more characters (usually vowels) from the interior of the word.

1.06 ENVIRONMENTAL CONDITIONS

A. Instrumentation equipment and enclosures shall be suitable for ambient conditions specified. All system elements shall operate properly in the presence of telephone lines, power lines, and electrical equipment.

B. Inside control rooms and climate-controlled electrical rooms, the temperature will normally be 20 to 25 degrees Celsius; relative humidity 40 to 80 percent without condensation and the air will be essentially free of corrosive contaminants and moisture. Appropriate air filtering shall be provided to meet environmental conditions (i.e., for dust).

C. Other indoor areas may not be air conditioned/heated; temperatures may range between 0 and 40 degrees Celsius with relative humidity between 40 and 95 percent.

D. Outdoor equipment including instrumentation and panels may be subjected to wind, rain, lightning, and corrosives in the environment, with ambient temperatures from -20 to 40 degrees Celsius and relative humidity from 10 to 100 percent. All supports, brackets and interconnecting hardware shall be aluminum or Type 316 stainless steel as shown on the installation detail drawings.

PART 2 -- PRODUCTS

2.01 NAMEPLATES

A. All items of equipment listed in the instrument schedule, control panels, and all items of digital hardware shall be identified with nameplates. Each nameplate shall be located so that it is readable from the normal observation position and is clearly associated with the device or devices it identifies. Nameplates shall be positioned so that removal of the device for maintenance and repair shall not disturb the nameplate. Nameplates shall include the equipment identification number and description. Abbreviations of the description shall be subject to Engineer approval.

B. Nameplates shall be made of 1/16-inch thick machine engraved laminated phenolic plastic having white numbers and letters not less than 3/16-inch high on a black background.

C. Nameplates shall be attached to metal equipment by stainless steel screws and to other surfaces by an epoxy-based adhesive that is resistant to oil and moisture. In cases where the label cannot be attached by the above methods, it shall be drilled and attached to the associated device by means of stainless steel wire.

PART 3 -- EXECUTION

3.01 SCHEDULE OF PAYMENT

A. Payment to the Contractor for Control and Information System materials, equipment, and labor shall be in accordance with the General and Supplementary Conditions. The schedule of values submitted as required by the General and Supplementary Conditions shall reflect a breakdown of the work required for completion of the Control and Information System. The breakdown shall include sufficient detail to permit the Engineer to administer payment for the Control and Information System including, but not necessarily limited to, the following items:

1. Mobilization

2. Shop Drawing Submittals
3. Process Instrumentation
4. Control Panels
5. Programming
6. Process Instrumentation Testing and Startup
7. Control Panel Loop Testing
8. Process Control Strategy Testing and Startup
9. Training
10. Final System Acceptance Testing
11. Final Acceptance

B. Requests for payment for materials and equipment that are not installed on site, but are required for shop fabrication and testing (e.g., digital hardware), or are properly stored as described in the Contract Documents and herein, shall be accompanied by invoices from the original supplier to the Contractor or instrumentation subcontractor substantiating the cost of the materials or equipment.

C. No payment for programming shall be paid prior to approval of associated shop drawings. Upon approval of programming shop drawings, up to 50% of programming shall be payable. Upon completion of on-site loop checkout, up to 70% of programming shall be payable. Upon completion of functional tests, up to 90% of programming shall be payable. The remaining 10% shall be payable upon completion of the Final Acceptance Test.

D. Any balance remaining within the schedule of values for field instruments and other materials installed on the site, or for other materials, for which payment is made by invoice, will be considered due upon completion of the Final Acceptance Test.

3.02 CLEANING

A. The Contractor shall thoroughly clean all soiled surfaces of installed equipment and materials.

B. Upon completion of the instrumentation and control work, the Contractor shall remove all surplus materials, rubbish, and debris that has accumulated during the construction work. The entire area shall be left neat, clean, and acceptable to the Owner.

3.03 FINAL ACCEPTANCE

A. Final acceptance of the Instrumentation, Control and Information System will be determined complete by the Engineer, and shall be based upon the following:

1. Receipt of acceptable start up completion and availability reports and other documentation as required by the Contract Documents.
2. Completion of the Availability Demonstration of the System as a whole.
3. Completion of all punch-list items.

B. Refer to the Section entitled “Project Closeout” for additional requirements.

- END OF SECTION -

Hallandale Beach
PROGRESS. INNOVATION. OPPORTUNITY.

ADDENDUM # 2
BID # FY 2019-2020-002 CITY OF HALLANDALE BEACH
RAW WATER WELL # 9

Please ensure you check the City's website for the latest addendum released for this project. Below find the link to the City's website: www.cohb.org\solicitations.

Proposing firms must provide this Addendum # 2 form signed by an authorized officer of the firm to acknowledge receipt of ADDENDUM # 2. The form must be provided with firm's response.

PLEASE NOTE:

QUESTION #1.
There is a bid schedule at the front of the technical specs section 00002. There is also a bid schedule in the bid forms in the ITB. Please confirm which one we are to use.

ANSWER #1.
Pricing is to be provided by utilizing pages 10-11 of the Bid Price Sheet. Please ignore the pricing section found in Exhibit A.

QUESTION #2.
Is builder's risk insurance actually required for this project? It is in the ITB.

ANSWER #2.
Builders Risk Insurance is **not** required for this Bid. Please ignore section 3.4.10 of the Agreement on page 43.

QUESTION #3.
What is the estimated cost of construction?

ANSWER #3.
Excluding the allowance items listed in "Bid Price Sheet" on page 10 of 90 on the Invitation to Bid, the Engineer-of-Record's construction cost estimate is $1.1 million.

QUESTION #4.
Are any permits required for temporary discharge of the well development water?

ANSWER #4.
See Article 8.1 of the "Construction Contract".

See Exhibit A technical specification 01010 Article 1.07.

See NEW Exhibit C issued with this addendum.

QUESTION #5.
Is a temporary fence required around the work area?

ANSWER #5.
See requirements in Exhibit A technical specifications 02832 and Exhibit A specification section 01510-1.05.

QUESTION #6.
Spec section 10525 does not appear to apply to this project, please advise.

ANSWER #6.
Exhibit A specification section 10525 applies to this project.

QUESTION #7.
Spec section 12400 does not appear to apply to this project, please advise.

ANSWER #7.
Exhibit A specification section 12400 applies to this project.

QUESTION #8.
Can the MOT barriers, etc. be left in place continuously or do they have to be removed at the end of each work day and put back up the following day?

ANSWER #8.
See "Maintenance of Traffic Notes" added to revised Drawing C-02 issued with this Addendum.

QUESTION #9.
Section 02100 part 3.04 does this apply to sanitary sewer manholes or just storm drains and manholes?

ANSWER #9.
Exhibit A specification section 02100 part 3.04 applies only to storm drainage catch basins and storm drainage manholes.

QUESTION #10.
Dwg C-07 keyed note 1 refers to manhole rehabilitation specifications. There do not appear to be any manhole rehab specs included in the bid docs. Please advise.

ANSWER # 10.
See revised drawings C-03, C-04, C-05, C-06 and C-07 issued with this addendum.

QUESTION #11.
Is any bypass pumping required for the sanitary sewer pipe replacement?

ANSWER # 11
See revised drawings C-03, C-04, C-05, C-06 and C-07 issued with this addendum.

QUESTION #12.
Note 2 on M-04 says all pipe shall be schedule 40 but M-02 calls out the 10" drop pipe as schedule 10. Please confirm schedule of the drop pipe.

ANSWER # 12.
See revised drawing M-04 issued with this addendum.

QUESTION #13.
Detail 3/C-10 is for bollards but I cannot locate any bollards required on the plans.

ANSWER # 13.
See revised drawing C-10 issued with this addendum.

QUESTION #14.
General note 3 on dwg C-05 calls for 150 PSI pressure testing of sanitary sewer pipe. This is an unusual requirement. Please confirm that this note is correct.

ANSWER # 14.
See revised drawings C-03, C-04, C-05, C-06 and C-07 issued with this addendum.

QUESTION #15.

Is a curb required near the new sidewalk due to the proximity of the new sidewalk to the road?

ANSWER # 15.
See revised drawing C-08 issued with this addendum.

QUESTION #16.
VT SCADA computer/software is shown on diagram, DFS does not provide services for VT SCADA. A separate I & C subcontractor will need to be acquired to provide services on VT SCADA.

ANSWER # 16.
See revised Technical Specification Sections 17000 and 17132 issued with this addendum. See revised drawing I-02 issued with this addendum.

QUESTION #17.
What work, other than station configuration, is to be done on the DFS SCADA server?

ANSWER # 17.
See revised Technical Specification Sections 17000 and 17132 issued with this addendum. See revised drawing I-02 issued with this addendum.

QUESTION #18.
It is noted (17000 1.01 C 4) that the RTU is expected to contain a MicroLogix 1400 PLC. DFS does not provide, install, service or support non-DFS automations system. DFS cannot maintain our warranty and service obligation using third party automation devices. DFS has used 1400 PLC as protocol converters, but not for site primary automation. With this said, DFS will not be providing the 1400 PLC within the RTU and a separate I & C subcontractor will need to be acquired to provide these services:

a. Who is expected to provide the PLC and Programming?
b. Where is the PLC expected to be located, outside the RTU?
c. A DFS PLC must be in the RTU in order to communicate with the MicroLogix via a protocol, <u>the native industrial protocol DFS can use to communicate will be Modbus.</u>

ANSWER # 18.
See revised Technical Specification Sections 17000 and 17132 issued with this addendum. See revised drawing I-02 issued with this addendum.

QUESTION #19.
As DFS will only be providing the RTU and not be providing the Automation System. The specification will need to call for DFS to be the "RTU provider" responsible for Section 17132 only. A separate Instrumentation and Control System Subcontractor will need to be called out to provide the instrumentation, PLC and other services outside section 17132.

ANSWER # 19.

See revised Technical Specification Sections 17000 and 17132 issued with this addendum. See revised drawing I-02 issued with this addendum.

PLEASE NOTE RECEIPT OF ADDENDUM # 2 BY SIGNING BELOW AND INCLUDE WITH YOUR FIRM'S SUBMISSION.

I ACKNOWLEDGE RECEIPT OF ADDENDUM # 2:

Company	
Name	
Title	
Signature	
Date	

Sincerely,

Andrea Lues

Andrea Lues, Director, Procurement Department