

# CITY OF KEY WEST

## RICHARD A. HEYMAN

### ENVIRONMENTAL PROTECTION FACILITY AERATION SYSTEM UPGRADE AND ELECTRICAL SWITCHGEAR REPLACEMENT

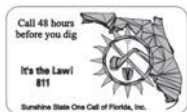
CITY OF KEY WEST PROJECT NO.:SE35042002

CITY OF KEY WEST ITB NO.:21-006

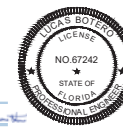
FEBRUARY 2021



| DISCIPLINE                | SHT | DWG  | DESCRIPTION                                                                      |
|---------------------------|-----|------|----------------------------------------------------------------------------------|
| <b>GENERAL</b>            |     |      |                                                                                  |
|                           | 01  | G-01 | COVER SHEET                                                                      |
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|                           | 27  | I-06 | DETAILS                                                                          |



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This seal has been digitally signed and sealed by Lucas Boyer on the date apparent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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**Black & Veatch Corporation**  
3111 North University Drive, Suite 700  
Coral Springs, FL 33065 Certificate No. 8132

0 1/2 1  
1" = 10' (THIS SCALE DOES NOT MEASURE 1")  
OTHER DIMENSIONS TO BE NOT TO FULL SCALE

**199322**  
SHEET  
1 OF 27

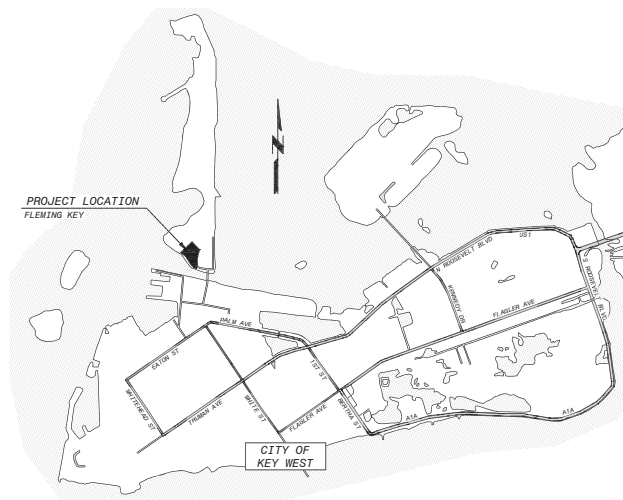
1. ALL CONSTRUCTION MATERIALS AND TESTING SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE CITY OF KEY WEST, LOCAL, MONROE COUNTY, STATE OF FLORIDA, AND NATIONAL CODES.
2. IF SPECIFICATIONS OR DRAWINGS CONFLICT, CONTRACTOR SHALL NOTIFY THE CITY OF KEY WEST FOR MORE INFORMATION PRIOR TO PROCEEDING WITH THE WORK.
3. REVIEW OF THE SHOP DRAWINGS BY THE CITY OF KEY WEST OR AUTHORIZED REPRESENTATIVE IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE SITE FOR INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION, PROCESSES, OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION AND FOR COORDINATION OF THE WORK OF ALL TRADES.
4. "SCREENED" (LIGHT) DELINEATION INDICATED ON THE DRAWINGS DENOTES EXISTING FACILITIES. "OR SCREENED" INFORMATION IS FOR REFERENCE ONLY, AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO THE ORDERING OF MATERIALS AND BEGINNING OF CONSTRUCTION. "BOLD" DELINEATION IS NEW WORK TO BE CONSTRUCTED UNDER THIS CONTRACT.
5. EXISTING UTILITIES AND STRUCTURES (UNDERGROUND, SURFACE, OR OVERHEAD) ARE INDICATED ONLY TO THE EXTENT THAT SUCH INFORMATION WAS KNOWN, OR MADE AVAILABLE TO THE CONTRACTOR BY A PROFESSIONAL ENGINEER IN PREPARING THE DRAWINGS. THE LOCATIONS, CONFIGURATIONS, AND ELEVATIONS OF SUBSURFACE FACILITIES AND UTILITIES ARE APPROXIMATE, AND NOT ALL UTILITIES AND STRUCTURES MAY BE SHOWN.

1. CALL BEFORE YOU DIG. CONTRACTOR SHALL VERIFY PRECISE LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STRUCTURES, WHETHER INDICATED ON THE DRAWINGS OR NOT, IN THE FIELD IN ADVANCE OF EXCAVATING. THE CONTRACTOR SHALL CONTACT FLORIDA SUNSHINE ONE TO VERIFY UNDER GROUND UTILITIES WITHIN THE PROJECT SITE. THE FLORIDA SUNSHINE ONE TELEPHONE NUMBER IS 811.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL, DEMOLITION, RECONSTRUCTION, AND RECONNECTION OF EXISTING FACILITIES AS REQUIRED TO COMPLETE THE WORK EXPEDITED AFTER FIELD VERIFICATION. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO DETERMINE ANY NECESSARY MODIFICATIONS TO THE PROPOSED NEW WORK.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF REPAIRING ALL DAMAGED UTILITIES.
4. BEFORE CONSTRUCTION IS STARTED, CONTRACTOR SHALL COORDINATE WITH THE OWNER OF EACH UTILITY AND DEFINE THE REQUIREMENTS AND METHODS TO ACCOMMODATE THE PROTECTION, TEMPORARY SUPPORT, ADJUSTMENT, OR RELOCATION OF UTILITIES AND STRUCTURES.

1. ALL EXISTING FEATURES TO REMAIN UNLESS OTHERWISE NOTED ON THE DRAWINGS.
2. CONTRACTOR SHALL COMPLY WITH THE GOVERNING AGENCY NEARBY CONSTRUCTION REQUIREMENTS AND SHALL PROVIDE APPROPRIATE MITIGATION MEASURES OR PROTECTION AND RESTORATION AT ALL LOCATIONS AS REQUIRED BY THEIR OPERATIONS, AND AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION. CONTRACTOR SHALL MAINTAIN AND REPAIR EROSION AND SEDIMENT CONTROL DEVICES THROUGHOUT THE DURATION OF CONSTRUCTION.
3. CLEAR THE SITE USING STANDARD CLEARING AND GRUBBING PROCEDURES.
4. SOD ALL DISTURBED AREAS.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY CONSTRUCTION DEBRIS TO AN APPROVED FACILITY.
6. CONTRACTOR SHALL USE CAUTION WHEN WORKING NEAR OVERHEAD OR UNDER GROUND UTILITIES.
7. CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING TREES, SHRUBS, AND PLANTS UNLESS OTHERWISE NOTED.
8. FINISHED GRADE ELEVATION AT ANY STRUCTURE, WHERE NOT ADJACENT TO PAVERMENT, SHALL BE APPROXIMATELY 6 INCHES BELOW FINISHED FLOOR ELEVATION UNLESS OTHERWISE NOTED.
9. THE CONTRACTOR'S OPERATIONS SHALL CONFORM TO THE RULES AND REGULATIONS OF THE STATE CONSTRUCTION SAFETY ORDERS PERTAINING EXCAVATION AND TRENCHING.
10. IF ANY SIGNAGE IS DEMOLISHED OR DAMAGED DURING CONSTRUCTION THE CONTRACTOR WILL REPLACE IT IN KIND PER CITY OF KEY WEST SPECIFICATIONS.

|                                                                                   |                                      |                                                                                   |                                                                                                     |
|-----------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|  | BUILDINGS,<br>STRUCTURES             |  | SECTION NUMBER OR DETAIL LETTER                                                                     |
|  | STRUCTURES<br>UNDERGROUND            |  | DRAWING NUMBER ON WHICH SECTION<br>OR DETAIL APPEARS; OR WHERE<br>SECTION IS CUT OR DETAIL IS NOTED |
|  | EXISTING<br>BUILDINGS,<br>STRUCTURES |  | WALL ELEVATION, PHOTO VIEW                                                                          |
|  | PROPERTY LINE                        |                                                                                   |                                                                                                     |

|          |                                |
|----------|--------------------------------|
| 0        | AT                             |
| ABDN     | ABANDON                        |
| CB       | BOTTOM                         |
| CB       | CATCH BASIN                    |
| CLDIP    | CEMENT LINED DUCTILE IRON PIPE |
| CONC     | CONCRETE                       |
| CPE      | CORRUGATED POLYETHYLENE        |
| DF       | DRAINAGE FORCE MAIN            |
| DIR      | DIRECT                         |
| DIP      | DUCTILE IRON PIPE              |
| DIP      | DRIVE, DIMENSION RATIO         |
| DRN      | E                              |
| E        | EAST                           |
| EL       | ELEVATION                      |
| EW       | EACH WAY                       |
| EX, EXST | EXISTING                       |
| FL       | FLANGE                         |
| FM       | FORCE MAIN                     |
| HORIZ    | HORIZONTAL                     |
| INVERT   | INVERT                         |
| IP       | IRON POST                      |
| LT       | LEFT                           |
| MAX      | MAXIMUM                        |
| MH       | MANHOLE                        |
| MIN      | MINIMUM                        |
| MJ       | MECHANICAL JOINT               |
| N        | NORTH                          |
| NO       | NUMBER                         |
| NTS      | NOT TO SCALE                   |
| OC       | ON CENTER                      |
| OD       | OUTSIDE DIAMETER               |
| PROP     | PROPOSED LINE                  |
| PP       | POWER POLE                     |
| PVC      | POLYVINYLCHLORIDE              |
| RCF      | REINFORCED CONCRETE PIPE       |
| REQD     | REQUIRED                       |
| RES      | RESTRAINED JOINT               |
| RT       | RIGHT                          |
| R/W      | RIGHT OF WAY                   |
| S        | SOUTH                          |
| SD       | STORM DRAIN                    |
| SDR      | STANDARD DIMENSION RATIO       |
| SPECD    | SPECIFIED                      |
| ST       | STEEL                          |
| SS, SST  | STAINLESS STEEL                |
| STA      | STATION                        |
| STW      | STORM                          |
| T, TEL   | TELEPHONE                      |
| Typ      | TYPICAL                        |
| W        | WEST                           |
| WT       | WEIGHT                         |



| CODE CLASSIFICATION TABLE             |                                                       |                     |                       |                        |       |                 |
|---------------------------------------|-------------------------------------------------------|---------------------|-----------------------|------------------------|-------|-----------------|
| STRUCTURE, ROOM OR AREA               |                                                       | NFPA 820            |                       | FIRE CODE REQUIREMENTS | CLASS | ELECTRICAL CODE |
| NAME                                  |                                                       | TABLE, ROW, & LINE  | FIRE PROTECT MEASURES |                        |       |                 |
| OPERATIONS BUILDING - ELECTRICAL ROOM |                                                       | TABLE 5.2.2, ROW 27 |                       |                        |       |                 |
| BLOWERS AREA                          | UNCLASSIFIED                                          |                     | H                     |                        |       |                 |
|                                       | UNCLASSIFIED AREA - BEYOND 10 FEET OF THE BASIN WALL  |                     | FE                    |                        |       |                 |
|                                       | CLASSIFIED AREA - WITHIN 10 FEET OF THE BASIN WALL(1) | TABLE 5.2.2, ROW 7C | H                     |                        |       |                 |
| ABBREVIATIONS                         |                                                       |                     |                       |                        |       |                 |
| CQD = COMBUSTIBLE GAS DETECTORS       |                                                       |                     |                       |                        |       |                 |
| FDS = FIRE DETECTION SYSTEM           |                                                       |                     |                       |                        |       |                 |
| FAS = FIRE ALARM SYSTEM               |                                                       |                     |                       |                        |       |                 |
| FE = PORTABLE FIRE EXTINGUISHERS      |                                                       |                     |                       |                        |       |                 |
| FSS = FIRE SUPPRESSION SYSTEM         |                                                       |                     |                       |                        |       |                 |
| H = HYDRANT PROTECTION                |                                                       |                     |                       |                        |       |                 |
| N/A = NOT APPLICABLE                  |                                                       |                     |                       |                        |       |                 |

(1) INTERIOR OF THE TANK FROM THE MINIMUM OPERATING WATER SURFACE TO THE TOP OF THE TANK WALL; ENVELOPE 0.46 M (18 IN.) ABOVE THE TOP OF THE TANK AND EXTENDING 0.46 M (18 IN.) BEYOND THE EXTERIOR WALL; ENVELOPE 0.46 M (18 IN.) ABOVE GRADE EXTENDING 3 M (10 FT) HORIZONTALLY FROM THE EXTERIOR TANK WALLS

[illegible]

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CITY OF KEY WEST  
D A. HEYMAN ENVIRONMENTAL PROTECTION  
ILITY AERATION SYSTEM UPGRADE AND  
ECTRICAL SWITCHGEAR REPLACEMENT

GENERAL  
NOTES, LEGENDS, ABBREVIATIONS  
AND LOCATION MAP

DESIGNED: M/M  
 DETAILED: D/JN  
 CHECKED: MW, LB  
 APPROVED:  
 DATE: FEBRUARY 2021

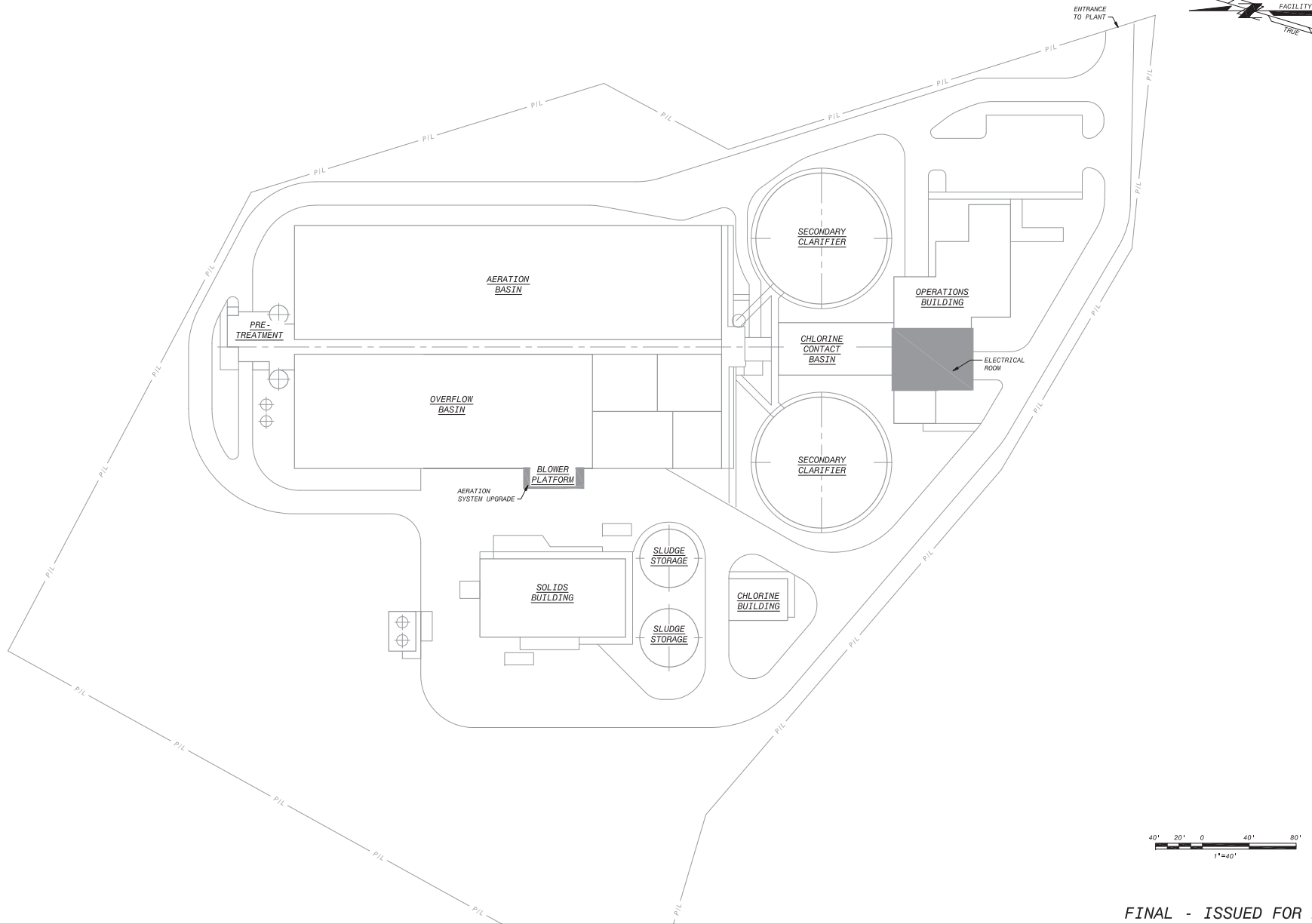
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IF THIS BAR DOES NOT  
 MEASURE 1" THEN DRAWING IS  
 NOT TO FULL SCALE

PROJECT NO.  
 199322

G-02  
 SHEET  
 2 OF 27

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1/20/22



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|                                                                               |  |
|-------------------------------------------------------------------------------|--|
| DESIGNED: HAH                                                                 |  |
| DETAILED: DJW                                                                 |  |
| CHECKED: HW, LB                                                               |  |
| APPROVED:                                                                     |  |
| DATE: FEBRUARY 2021                                                           |  |
| IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE             |  |
| PROJECT NO. 199322                                                            |  |
| SHEET 3 OF 27                                                                 |  |
| C-01                                                                          |  |
| OVERALL SITE PLAN                                                             |  |
| CIVIL                                                                         |  |
| ELECTRICAL SWITCHGEAR REPLACEMENT                                             |  |
| RICHARD A. HEENAN ENVIRONMENTAL UPGRADE AND ELECTRICAL SWITCHGEAR REPLACEMENT |  |
| CITY OF KEY WEST                                                              |  |
| BLACK & VEATCH                                                                |  |
| Black & Veatch Corporation                                                    |  |
| 3111 North Unkenally Drive, Suite 700                                         |  |
| Coral Springs, FL 33065                                                       |  |
| Certificate No. 8132                                                          |  |
| Engineer of Record                                                            |  |
| LUCAS BOTTO                                                                   |  |
| Florida License No. 1001242                                                   |  |
| Date: 02/01/2021                                                              |  |
| State of FL                                                                   |  |
| Professional Seal                                                             |  |
| NO. 027242                                                                    |  |
| REVISIONS AND RECORD OF USE                                                   |  |
| DATE                                                                          |  |
| NO.                                                                           |  |
| BY                                                                            |  |
| FOR APPROV.                                                                   |  |



1. USE NOMINAL 2 INCH X 4 INCH LUMBER.
2. STANDARD STRENGTH FILTER FABRIC REQUIRES REINFORCEMENT VIA WIRE FENCE OR AN EXTRA STRENGTH AND MAXIMUM MESH SPACING OF 6 INCHES. MINIMUM STRENGTH FILTER FABRIC WITH 6 FEET POST SPACING (AS APPROVED BY ENGINEERS) DOES NOT REQUIRE THE WIRE MESH SUPPORT FENCE.)
3. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USE MEETS THE REQUIREMENTS IN SECTION 204.4.
4. PLACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
5. PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEXTILE.
6. KEEP SILT FENCE TAUT AND SECURELY STAPLE TO THE UPROLE SIDE OF UPRIGHT SUPPORTS. EXTEND GEOTEXTILE UNDER 2x4.
7. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, FOLD, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL. ATTACH LATHE.
8. PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEXTILE, AND 2x4 TO PREVENT SEDIMENT-LADEN WATER FROM ESCAPING BENEATH SILT FENCE INSTALLATION.
9. SECURE ROADSIDE TO PAVEMENT WITH 400 S INCH MINIMUM LENGTH NAILS.
10. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES SIX INCHES IN HEIGHT. REPLACE GEOTEXTILE IF TORN, AND REPLACE TIE RODS IF NECESSARY. REPLACE STONE IF DISPLACED.

Site plan of the Wastewater Treatment Plant Upgrade Project. The plan shows various treatment components including a Pre-Treatment area, Aeration Basin, Overflow Basin, Blower Platform, Solids Building, Sludge Storage, Chlorine Contact Basin, Secondary Clarifiers, Operations Building, and an Electrical Room. A hatched area indicates the Project Area(s). A line with circles represents the Silt Fence. A scale bar shows 0 to 80 feet at 1 inch = 40 feet. The plan is bounded by P/L lines.

**LEGEND**

- PROJECT AREA(S)
- SILT FENCE, SEE DETAIL A

Scale: 1" = 40'

0 20' 40' 80'

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**CITY OF KEY WEST**  
**RICHARD A. HEYMAN ENVIRONMENTAL PROTECTION**  
**FACILITY AERATION SYSTEM UPGRADE AND**  
**ELECTRICAL SWITCHGEAR REPLACEMENT**

CIVIL  
STORMWATER POLLUTION PREVENTION PLAN

DESIGNED: NLM  
 DETAILED: DJW  
 CHECKED: NLM, LB  
 APPROVED:  
 DATE: FEBRUARY 201



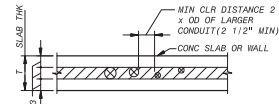
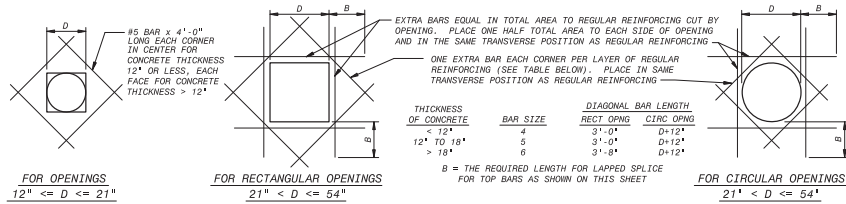
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PROJECT NO.  
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C-02  
 SHEET  
 4 OF 27





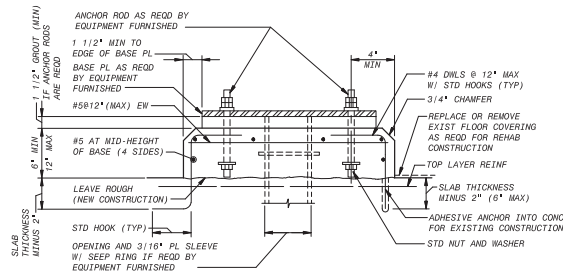


### CONDUIT PLACING DETAIL

NO SCALE

### TYPICAL EXTRA REINFORCING AT OPENINGS 12" TO ≤ 54"

(TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS)



### EQUIPMENT BASE

NO SCALE

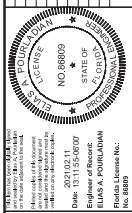
| LENGTH OF LAPPED SPLICES FOR REINFORCEMENT (INCHES) |                 |        |               |        | CONCRETE COVER FOR REINFORCEMENT |                                                                                                             |
|-----------------------------------------------------|-----------------|--------|---------------|--------|----------------------------------|-------------------------------------------------------------------------------------------------------------|
| (f'c=4000 PSI)                                      |                 |        |               |        | LOCATION                         | MINIMUM COVER                                                                                               |
| BAR SIZE                                            | BEAMS & COLUMNS |        | WALLS & SLABS |        | BAR SIZE                         |                                                                                                             |
|                                                     | **TOP BARS      | OTHERS | **TOP BARS    | OTHERS |                                  |                                                                                                             |
| 3                                                   | 16              | 16     | 16            | 16     | 3                                | UNFORMED SURFACES ADJACENT TO EXCAVATION                                                                    |
| 4                                                   | 19              | 19     | 19            | 19     | 4                                | SURFACES INSIDE OF OZONE CONTACTORS EXPOSED TO OZONE IN WATER OR AIR                                        |
| 5                                                   | 24              | 18     | 24            | 19     | 5                                | TOP SURFACES OF SLABS THAT ARE SUBMERGED                                                                    |
| 6                                                   | 33              | 26     | 29            | 22     | 6                                | FORMED SURFACES THAT ARE SUBMERGED, AND FORMED OR TOP SURFACES EXPOSED TO WEATHER, SATURATED AIR, OR EARTH. |
| 7                                                   | 55              | 42     | 48            | 37     | 7                                | OTHER LOCATIONS:                                                                                            |
| 8                                                   | 69              | 53     | 60            | 46     | 8                                | BEAMS OR GIRDERS                                                                                            |
| 9                                                   | 84              | 65     | 74            | 57     | 9                                | SLABS, WALLS AND JOISTS                                                                                     |
| 10                                                  | 103             | 79     | 91            | 70     | 10                               | #5 AND LARGER                                                                                               |
| 11                                                  | 122             | 94     | 108           | 83     | 11                               | #5 AND SMALLER                                                                                              |

\* LAP SPLICE LENGTH FOR BARS OF DIFFERENT SIZES SHALL BE THE GREATER OF THE SMALL BAR LAP LENGTH OR 0.75x THE LARGER BAR LAP LENGTH.

\*\* TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAP LENGTHS AS REQUIRED FOR TOP BARS. VERTICAL BARS MAY BE CONSIDERED AS OTHER BARS.

NOTES:  
1. COVER IS MEASURED TO NEAREST BAR, STIRRUP, TIE, OR SPIRAL, AS APPLICABLE.  
2. TOLERANCES FOR CONCRETE COVER AND THE FABRICATION AND PLACING OF REINFORCEMENT SHALL CONFORM TO ACI 117.

| REV | DESCRIPTION | DATE | BY | CHK |
|-----|-------------|------|----|-----|
|     |             |      |    |     |
|     |             |      |    |     |
|     |             |      |    |     |
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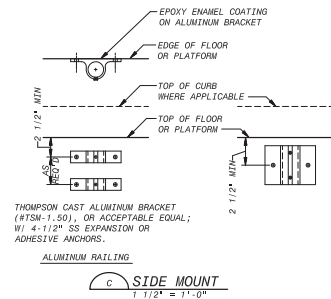
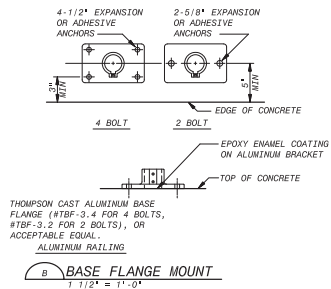
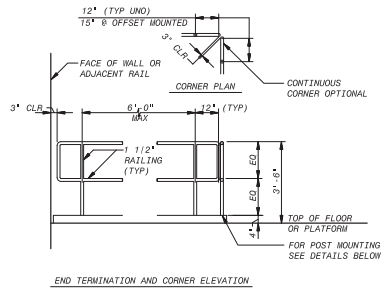


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RICHARD A. HEENAN ENGINEER AND ARCHITECT  
PROTECTIVE SYSTEMS AND ELECTRICAL SWITCHGEAR REPLACEMENT  
STRUCTURAL  
STANDARD GRATING STAIR DETAILS

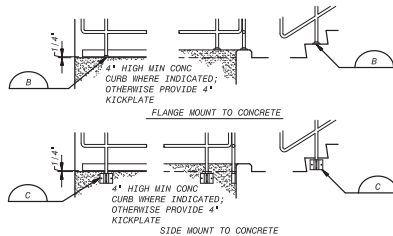
DESIGNED: -  
DETAILED: -  
CHECKED: MM, LB  
APPROVED: -  
DATE: FEBRUARY 2021  
PROJECT NO. 199322  
S-02  
SHEET 6 OF 27

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# NOTES:

1. RAILING MATERIAL AND FABRICATION SHALL BE AS INDICATED ON THE DESIGN DRAWINGS AND IN THE PROJECT SPECIFICATIONS FOR HANDRAILING AND GUARDRAILING.
2. ALL RAILING AND MOUNTINGS SHALL BE DESIGNED AND FABRICATED IN COMPLIANCE WITH THE MOST STRINGENT REQUIREMENTS OF THE RAILING SPECIFICATIONS, THE APPLICABLE LOCAL BUILDING CODE AND ALL PERTINENT OSHA AND LOCAL SAFETY REGULATIONS.
3. GUARDRAIL AND HANDRAIL SHALL BE DESIGNED AND FABRICATED IN CONFIGURATIONS REQUIRED TO FIT THE LOCATIONS INDICATED ON THE DESIGN DRAWINGS. CONTRACTOR SHALL VERIFY FINAL DIMENSIONS BEFORE FABRICATION.
4. THE GUARDRAIL AND HANDRAIL CONFIGURATIONS ON THIS SHEET WILL NOT SATISFY ADA REQUIREMENTS FOR HANDICAPPED ACCESSIBILITY. AT LOCATIONS ON THE DESIGN DRAWINGS WHERE CONFORMANCE WITH ADA REQUIREMENTS IS SPECIFICALLY NOTED, THE RAILING SUPPLIER SHALL MODIFY THE CONFIGURATIONS TO COMPLY WITH THE MOST STRINGENT REQUIREMENTS OF ANSI 117.1 UNIFORM FEDERAL ACCESSIBILITY STANDARDS AND THE ACCESSIBILITY STANDARDS OF THE AMERICANS WITH DISABILITIES ACT (ADA).



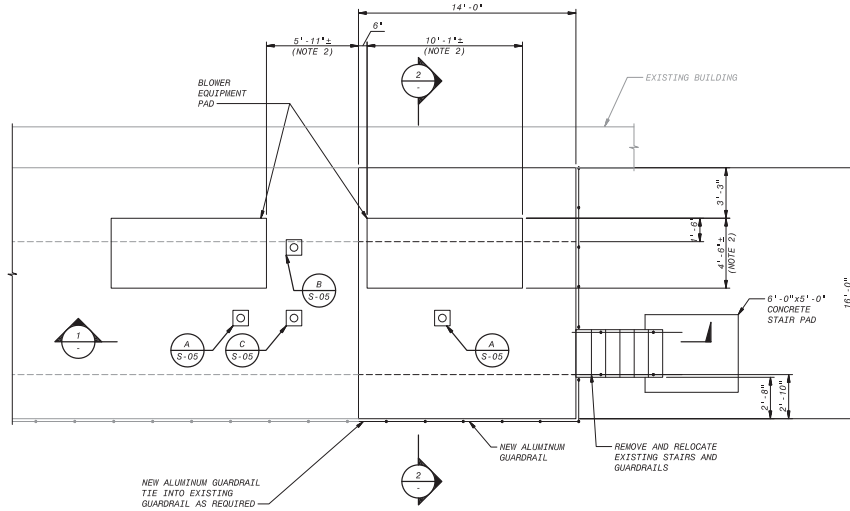
# POST MOUNTED TO CONCRETE

|                                                                                           |  |                       |
|-------------------------------------------------------------------------------------------|--|-----------------------|
| DESIGNED: EAP<br>DETAILED: JPS<br>CHECKED: MM, LB<br>APPROVED: EAP<br>DATE: FEBRUARY 2021 |  | PROJECT NO.<br>199322 |
| IF THIS BAR DOES NOT MEASURE 1\"/>                                                        |  | SHEET<br>7 OF 27      |
| FINAL - ISSUED FOR BID                                                                    |  |                       |

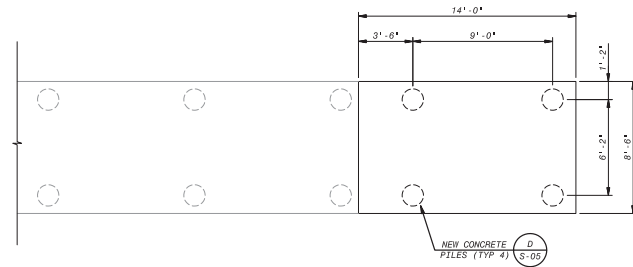
CITY OF KEY WEST  
 RICHARD A. HEWITT ENVIRONMENTAL AND  
 FACILITY IMPROVEMENT PROJECT  
 ELECTRICAL SWITCHGEAR REPLACEMENT

STRUCTURAL  
 STANDARD GUARDRAIL DETAILS

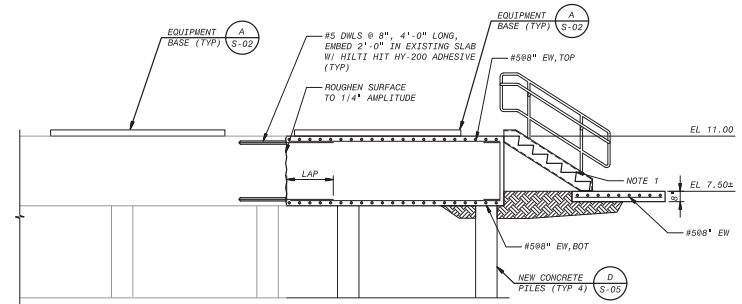
BLACK & VEATCH  
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 3111 North Unimark Drive, Suite 700  
 Coral Springs, FL 33065  
 Certificate No. 8132



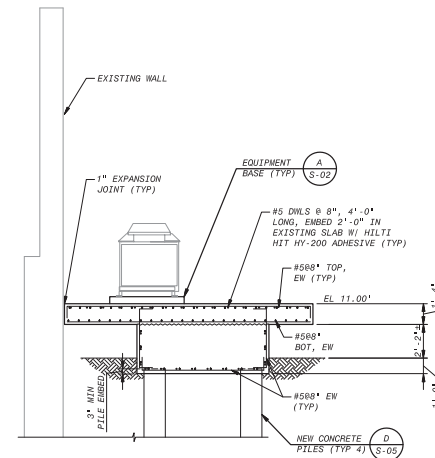
**TOP SLAB  
PLAN**  
1/4" = 1'-0"



**FOUNDATION  
PLAN**  
1/4" = 1'-0"



**SECTION 1**  
1/4" = 1'-0"



**SECTION 2**  
1/4" = 1'-0"

**NOTES:**

1. CONTRACTOR SHALL CAREFULLY REMOVE EXISTING STAIRS AND GUARDRAILS AND RE-USE THEM AS SHOWN ON THE PLAN. NEW GUARDRAILS WILL BE FURNISHED AND INSTALLED ON THE NEW FOUNDATION.
2. VERIFY PAD SIZE AND LOCATION WITH EQUIPMENT PROVIDED.
3. CONTRACTOR SHALL DEMOLISH EXISTING PAVEMENT TO EXTENTS OF PROPOSED WORK IN THESE DRAWINGS.

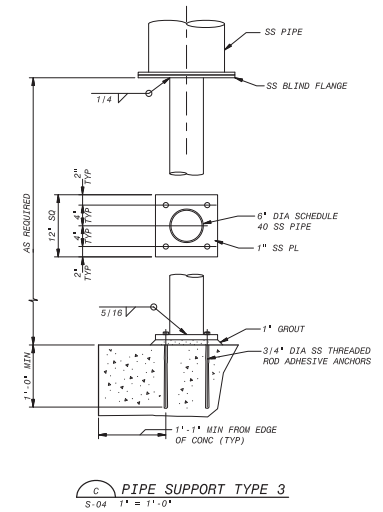
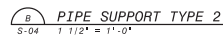
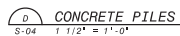
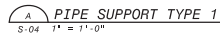
**FINAL - ISSUED FOR BID**

|                                                                          |              |                     |
|--------------------------------------------------------------------------|--------------|---------------------|
| DESIGNED: EAP                                                            | CHECKED: JPS | DATE: FEBRUARY 2021 |
| APPROVED: EAP                                                            | CHECKED: JPS | DATE: FEBRUARY 2021 |
| <p>IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE</p> |              |                     |
| <p>PROJECT NO. 199322</p>                                                |              |                     |
| <p>SHEET 8 OF 27</p>                                                     |              |                     |

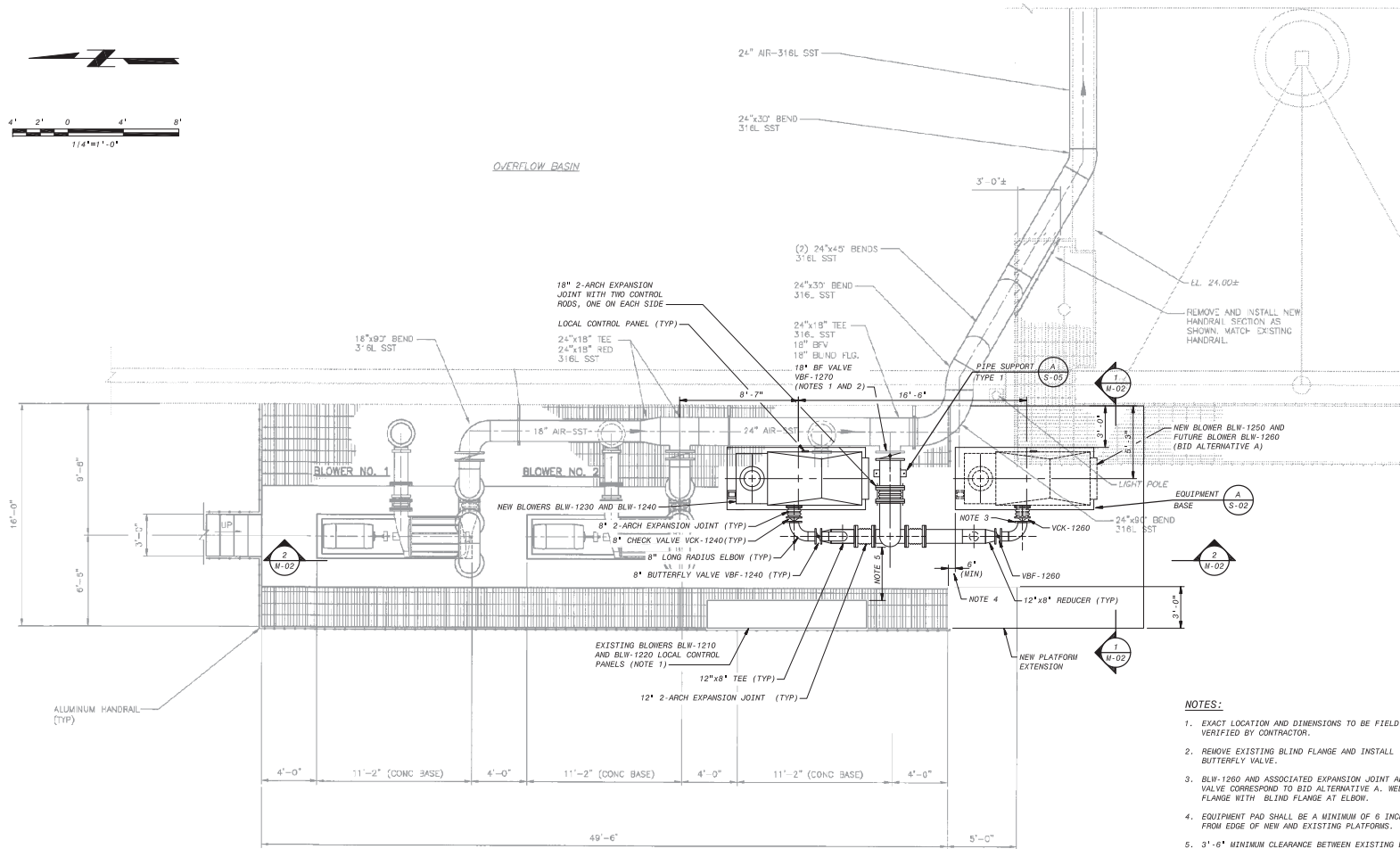
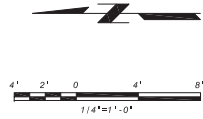
**CITY OF KEY WEST**  
RICHARD A. HEENAN ENGINEERING AND ARCHITECTURE  
ELECTRICAL SWITCHGEAR REPLACEMENT

**BLACK & VEATCH**  
Black & Veatch Corporation  
3111 North Unkenhale Drive, Suite 700  
Coral Springs, FL 33065  
Florida License No. 8132

**STRUCTURAL**  
BLOWER FOUNDATION PLAN, SECTIONS & DETAILS



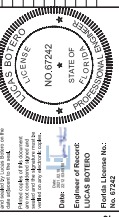
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| DESIGNED: EAP                                                                                                                                                          |
| DETAILED: JPS                                                                                                                                                          |
| CHECKED: MW, LB                                                                                                                                                        |
| APPROVED: EAP                                                                                                                                                          |
| DATE: FEBRUARY 2021                                                                                                                                                    |
|  <p>IF THIS BAR DOES NOT<br/>MEASURE 1" THEN DRAWING IS<br/>NOT TO FULL SCALE</p> |
| PROJECT NO.<br>199322                                                                                                                                                  |
| S-05<br>SHEET<br>9 OF 27                                                                                                                                               |



#### NOTES:

1. EXACT LOCATION AND DIMENSIONS TO BE FIELD VERIFIED BY CONTRACTOR.
2. REMOVE EXISTING BLIND FLANGE AND INSTALL BUTTERFLY VALVE.
3. BLW-1260 AND ASSOCIATED EXPANSION JOINT AND CHECK VALVE CORRESPOND TO BID ALTERNATIVE A. WELD FLANGE WITH BLIND FLANGE AT ELBOW.
4. EQUIPMENT PAD SHALL BE A MINIMUM OF 6 INCHES AWAY FROM EDGE OF NEW AND EXISTING PLATFORMS.
5. 3'-6\"/>

| NO. | DATE | BY | REVISED AND RECORD OF USE |
|-----|------|----|---------------------------|
|     |      |    |                           |
|     |      |    |                           |
|     |      |    |                           |
|     |      |    |                           |



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**CITY OF KEY WEST**  
 RICHARD A. HEENAN ENVIRONMENTAL AND  
 PLANNING DEPARTMENT  
 MECHANICAL PROCESS  
 AERATION SYSTEM UPGRADE PLAN

DESIGNED: HRT  
 DETAILED: DJW  
 CHECKED: HW, LB  
 APPROVED:  
 DATE: FEBRUARY 2021  
 IF THIS BAR DOES NOT  
 MEASURE 1\"/>

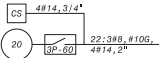
FINAL - ISSUED FOR BID

M-01  
 SHEET  
 10 OF 27





### ONE-LINE DIAGRAM LEGEND



TRANSFORMER WITH PRIMARY AND SECONDARY  
VOLTAGE, AND KVA RATING AS NOTED

CIRCUIT NO.22 WITH 3#8 INSULATED CONDUCTORS AND 1#10 GROUND WIRE FOR A 20HP MOTOR WITH 3 POLE, 60A, MOTOR DISCONNECT SWITCH AND 4#14 INSULATED CONDUCTORS FOR AUXILIARY ITEM, AS FOR EXAMPLE A CONTROL STATION, ALL IN 2" CONDUIT.

CONDUCTORS FOR AUXILIARY ITEM  
SHALL NOT PASS THROUGH MOTOR  
DISCONNECT SWITCH.

ONE-LINE SHOWING POWER AND CONTROL TO A PACKAGE UNIT, AS FOR EXAMPLE A STEAM GENERATOR OR AN AIR HANDLING UNIT, SHALL IMPLY THAT ANY AND ALL ASSOCIATED EQUIPMENT SHALL ALSO BE INSTALLED AND WIRED AS REQUIRED BY THE EQUIPMENT FURNISHED.

INDICATES THAT ALL OR PART OF  
CIRCUIT MAY BE ROUTED IN DUCT BANK  
OR UNDERGROUND. CONDUIT SIZE SHOWN  
ON ONE-LINE IS ABOVE GROUND AND/OR  
INSIDE OF STRUCTURE. SEE DUCT BANK  
SCHEDULE AND SECTIONS FOR CONDUIT  
SIZE OF UNDERGROUND PORTION OF  
CIRCUIT.

HIGH VOLTAGE DRAWOUT AIR OR  
VACUUM CIRCUIT BREAKER

LOW VOLTAGE AIR CIRCUIT  
BREAKER, 3 POLE, 20 AMPERE

SIZE 4 COMBINATION  
MAGNETIC MOTOR STARTER

SIZE 4 COMBINATION  
MAGNETIC MOTOR STARTER

LOW VOLTAGE DRAWOUT AIR  
CIRCUIT BREAKER

### HIGH VOLTAGE DRAWOUT CONTACTOR

### FUSE AND DISCONNECT SWITCH

SIZE 2 COMBINATION MAGNETIC MOTOR  
STARTER, REVERSING OR 2 SPEED

SIZE 1 COMBINATION REDUCED

### POTENTIAL TRANSFORMER

CURRENT TRANSFORMER

CURRENT OR POTENTIAL TEST SWITCH

GENERATOR

### KIRK KEY INTERLOCK

### ELECTRICAL INTERLOCK

RESISTOR

PROTECTION RELAY WITH IED  
DEVICE FUNCTION AS SHOWN

### SINGLE-FUNCTION METER

SURGE OR LIGHTNING ARRESTER

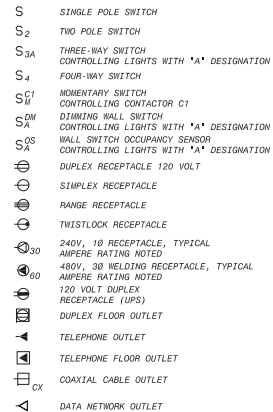
**SURGE ARRESTER WITH SURGE CAPACITOR**

GROUND CONNECTION

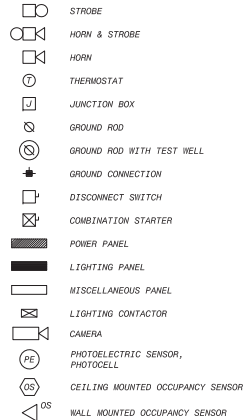
### SCHEMATIC SYMBOLS



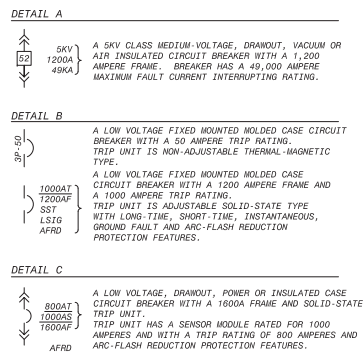
## SWITCH & OUTLET SYMBOLS



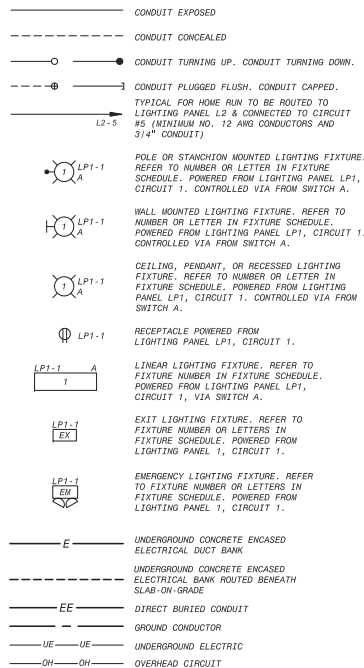
### MISCELLANEOUS SYMBOLS



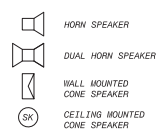
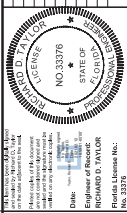
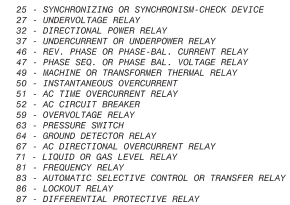
### BREAKER DETAILS



### CONDUIT & WIRING INSTALLATION LEGEND



## COMMUNICATION SYMBOLS

**PROTECTION/RELAY DEVICE NUMBERS**

**CITY OF KEY WEST**  
**CHARD A. HEYMAN ENVIRONMENTAL PROTECTION**  
**FACILITY AERATION SYSTEM UPGRADE AND**  
**ELECTRICAL SWITCHGEAR REPLACEMENT**

DESIGNED: DG  
 DETAILED: AMJ  
 CHECKED: ADT  
 APPROVED:  
 DATE: FEBRUARY 2021

IF THIS BAR DOES NOT  
 MEASURE 1" THEN DRAWING IS  
 NOT TO FULL SCALE

PROJECT NO.  
 199322

**E-01**  
 SHEET  
 12 OF 27

# ELECTRICAL ABBREVIATIONS & NOTES

## ELECTRICAL GENERAL NOTES

- SOLID LINES ( ————— ) INDICATE NEW WORK OR EQUIPMENT.
- SCREENED LINES ( ————— ) INDICATE EXISTING WORK OR EQUIPMENT.
- DASHED LINES ( - - - - - ) INDICATE FUTURE WORK OR EQUIPMENT.
- REFER TO INDIVIDUAL DISCIPLINE CONTRACT DRAWINGS FOR ADDITIONAL ABBREVIATIONS, DETAILS, AND GENERAL DESIGN NOTES.
- LEGEND SHEETS ARE GENERAL. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES.
  - ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
  - FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
  - SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
  - DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE, CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

## AREA DESIGNATIONS

THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

|              |                                                                                                                                                                 |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AREA TYPE 1A | CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED SCHEDULE 80 PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES AND ACCESSORIES. |
| AREA TYPE 4  | INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEDDOM AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.     |
| AREA TYPE 7A | CLASS 1, DIVISION 1 AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.                                              |
| AREA TYPE 7B | CLASS 1, DIVISION 2, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.                   |
| AREA TYPE 12 | INDOOR, DRY, DIRTY AREA. REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.                          |

## GENERAL REQUIREMENTS

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATION.
  - SPARE WIRES SHALL BE TAPED AND COILED AND LABELED TO INDICATE WHERE OTHER END OF SPARE WIRE IS LOCATED.
  - IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
  - LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
  - IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC. NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.
- A**
- ALTERNATING CURRENT  
AIR CIRCUIT BREAKER  
ACCESS CARD READER  
AMPERE FRAME  
ADJUSTABLE FREQUENCY DRIVE  
ARC FLASH REDUCTION DEVICE  
AMMETER  
ANNUNCIATOR  
ALARM RELAY  
AMMETER SWITCH, AMPERE SENSOR  
AMPERE TRIP  
AUTOMATIC TRANSFER SWITCH  
AUXILIARY  
AMERICAN WIRE GAUGE
- B**
- BUS  
BATTERY CHARGER  
BREAKER  
BRAKE  
BEARING TEMPERATURE
- C**
- CLOSE, COUNTER, CONTACTOR, CONTROL,  
CCTV CAMERA  
CAPACITOR  
CIRCUIT BREAKER  
CIRCUIT BREAKER AUXILIARY CONTACT  
(OPEN WHEN BREAKER IS OPEN)  
CIRCUIT BREAKER AUXILIARY CONTACT  
(CLOSED WHEN BREAKER IS OPEN)  
CONTROL DAMPER  
CELL INTERLOCK  
CIRCUIT  
CHLORINE  
CABLE OPERATED SWITCH  
CONTROL PANEL  
CONTROL POWER TRANSFORMER  
CURRENT OF CONTROL RELAY, CARD READER  
CONTROL STATION  
CYCLE TIMER OR CURRENT TRANSFORMER  
CYCLE TIMER CLUTCH  
CYCLE TIMER MONITOR  
2 CONDUCTOR  
4" CONDUIT
- D**
- DIRECT CURRENT, DOOR CONTACT  
DOOR INTERLOCK  
DAMPER MOTOR, DEMAND METER,  
DIMMER SWITCH  
DOUBLE POLE DOUBLE THROW  
DOUBLE POLE SINGLE THROW  
DIFFERENTIAL PRESSURE REGULATOR  
DIFFERENTIAL PRESSURE SWITCH  
DISCONNECT SWITCH, DOOR SWITCH,  
DESKTOP STATION  
DISCHARGE VALVE LIMIT SWITCH
- DVLS**
- DISCHARGE VALVE LIMIT SWITCH
- E**
- ELECTRIC OPERATOR FOR CONTROL DAMPER  
OR VALVE  
EMPTY CONDUIT  
ELECTRICAL DOOR STRIKE  
ELEVATION, EMERGENCY LIGHT  
ELECTRICAL MANHOLE  
ELECTRODE RELAY  
END SWITCH, REQUEST TO EXIT SENSOR  
EMERGENCY STOP  
ELAPSED TIME METER  
EXISTING  
EXPLOSION PROOF
- F**
- FORWARD, FIELD  
FIBER OPTIC  
FEEDER PROTECTION RELAY  
FLOW SWITCH
- G**
- GREEN, GROUND, GENERATOR,  
GROUND FAULT  
GROUND DETECTOR  
GENERATOR  
GROUND FAULT CURRENT INTERRUPTOR,  
GROUND FAULT INTERRUPTOR  
GEARED LIMIT SWITCH  
GENERATOR PROTECTION RELAY  
GROUND  
#8 GROUND WIRE
- H**
- HIGH, HUMIDISTAT  
HANDHOLE  
HIGH MOTOR TEMPERATURE  
HAND-OFF-AUTO  
HAND-OFF-REMOTE  
HORSEPOWER  
HAND STATION  
HIGH WATER CUTOFF  
HERTZ (CYCLE)
- I**
- INPUT/OUTPUT  
INSTANTANEOUS  
INTERCOM JUNCTION BOX
- J**
- JUNCTION BOX
- K**
- KEY INTERLOCK  
THOUSAND AMPERES INTERRUPTING CURRENT  
THOUSAND CIRCULAR MIL  
KEY OPERATED  
KILOVOLT  
KILOVOLT AMPERE  
KILOVAR  
KILOWATT  
KILOWATT HOUR
- L**
- LOW, LEVEL, LONG-TIME  
LIGHTNING ARRESTER  
LOCAL AREA NETWORK  
LIGHTING CONTRACTOR  
LIGHTING CONTACTOR ENCLOSURE  
LIGHTING CONTROL ENCLOSURE  
LOCAL CONTROL PANEL  
LOCAL CONTROL STATION  
LOCAL-OFF-AUTO  
LOCAL-ON-REMOTE  
LOCK OUT STOP  
LIGHTING PANEL  
LIMIT OR LEVEL SWITCH  
LIGHTING  
LOW WATER CUTOFF
- M**
- MAGNETIC MOTOR STARTER  
MILLIAMPERE  
MAIN CIRCUIT BREAKER  
MOTOR CONTROL CENTER  
MOTOR CONTROL LINEUP  
MOISTURE DETECTOR, MOTION DETECTOR  
MAGNETIC DOOR LOCK  
MANUFACTURER  
MANHOLE, MOUNTING HEIGHT  
MOTOR OPERATED VALVE  
MOTOR PROTECTION RELAY  
MANUAL MOTOR STARTER  
MOTOR SPACE HEATER  
MANUAL TRANSFER SWITCH  
MILLIVOLT, MEDIUM VOLTAGE  
MEGAVOLT AMPERE
- N**
- NEUTRAL  
NEUTRAL GROUNDING RESISTOR  
NEUTRAL GROUNDING TRANSFORMER  
NORMALLY CLOSED  
NORMALLY OPEN, NUMBER
- O**
- OPEN  
OVERLOAD  
ON-OFF-AUTO  
ON-OFF-REMOTE  
OCCUPANCY SENSOR  
OVER/UNDER
- P**
- PRIMARY, POWER, POLE  
PLANT CONTROL SYSTEM  
PUSH BUTTON, PULL BOX  
PHOTOELECTRIC SENSOR, PHOTOCCELL  
POWER FACTOR  
POWER FACTOR CORRECTION CAPACITOR  
PHASE  
PILOT LIGHT  
PROGRAMMABLE LOGIC CONTROLLER  
POWER PANEL  
PAIR  
PROXIMITY SWITCH  
PRESSURE SWITCH  
POTENTIAL TRANSFORMER, PROGRAM TIMER
- Q**
- NOT USED
- R**
- RED, RAISE, RELAY, REVERSE  
RECEPTACLE  
RESISTOR  
REMOTE HANDSET  
REPEATING TIMER  
RESISTANCE TEMPERATURE DETECTOR  
REMOTE TERMINAL UNIT  
REDUCED VOLTAGE SOLID STATE STARTER
- S**
- SHORT-TIME, SHIELDED, STARTER  
SURGE ARRESTER, SPEAKER AMPLIFIER  
SCADA  
SUPERVISORY CONTROL AND  
DATA ACQUISITION  
SULFUR HEXAFLUORIDE  
SPACE HEATER  
SOLID NEUTRAL  
SOLENOID OILER  
SINGLE POLE  
SURGE PROTECTION DEVICE  
SINGLE POLE DOUBLE THROW  
SINGLE POLE SINGLE THROW  
SELECTOR SWITCH, START/STOP, STAINLESS STEEL  
SOLID-STATE METERING  
SOLID STATE STARTER  
SST  
SUPERVISORY CONTROL  
SOLENOID VALVE  
SMB, SMBD SWITCHBOARD  
SMB, SWIR SWITCHGEAR
- T**
- THERMOSTAT, TIMER, TOTALIZER,  
TRANSFORMER  
TACHOMETER  
TERMINAL BLOCK  
TIMER CLUTCH  
TIME DELAY RELAY  
TEMPERATURE  
TIMER MOTOR  
TORQUE  
TIMER RELAY, TRIAD  
TEMPERATURE SWITCH  
TELEPHONE TERMINAL BOARD
- U**
- UNDERGROUND  
UNINTERRUPTIBLE POWER SUPPLY
- V**
- VOLTS, VOLTAGE RESTRAINED  
VOLT AMPERE  
VARIATOR  
VARIABLE FREQUENCY DRIVE  
VACUUM INTERRUPTER  
VALVE LIMIT SWITCH  
VOLTMEETER  
VALVE POSITION INDICATOR  
VOLTMEETER SWITCH
- W**
- WHITE, WATTS  
WATTHOUR METER  
WATT METER  
WEATHERPROOF  
WEATHERPROOF IN-USE  
WALL STATION
- X**
- AUXILIARY RELAY  
TRANSFORMER  
EXPLOSION PROOF
- Y**
- YELLOW
- Z**
- AUXILIARY RELAY, IMPEDANCE  
POSITION SWITCH  
ZERO SPEED SWITCH
- 1-1PR#16S ONE, SINGLE PAIR, TWISTED  
SHIELDED #16 CABLE  
3-71C#14 THREE, SINGLE, SEVEN CONDUCTOR #14  
MULTICONDUCTOR CONTROL CABLES

## ELECTRICAL ABBREVIATIONS

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |                                                                                                                                                                                                                                                                                                                                                                                                 |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A</b>    | ALTERNATING CURRENT<br>AIR CIRCUIT BREAKER<br>ACCESS CARD READER<br>AMPERE FRAME<br>ADJUSTABLE FREQUENCY DRIVE<br>ARC FLASH REDUCTION DEVICE<br>AMMETER<br>ANNUNCIATOR<br>ALARM RELAY<br>AMMETER SWITCH, AMPERE SENSOR<br>AMPERE TRIP<br>AUTOMATIC TRANSFER SWITCH<br>AUXILIARY<br>AMERICAN WIRE GAUGE                                                                                                                                                                                                                                     | <b>I</b> | INPUT/OUTPUT<br>INSTANTANEOUS<br>INTERCOM JUNCTION BOX                                                                                                                                                                                                                                                                                                                                          | <b>S</b>         | SHORT-TIME, SHIELDED, STARTER<br>SURGE ARRESTER, SPEAKER AMPLIFIER<br>SCADA<br>SUPERVISORY CONTROL AND<br>DATA ACQUISITION<br>SULFUR HEXAFLUORIDE<br>SPACE HEATER<br>SOLID NEUTRAL<br>SOLENOID OILER<br>SINGLE POLE<br>SURGE PROTECTION DEVICE<br>SINGLE POLE DOUBLE THROW<br>SINGLE POLE SINGLE THROW<br>SELECTOR SWITCH, START/STOP, STAINLESS STEEL<br>SOLID-STATE METERING<br>SOLID STATE STARTER<br>SST<br>SUPERVISORY CONTROL<br>SOLENOID VALVE<br>SMB, SMBD SWITCHBOARD<br>SMB, SWIR SWITCHGEAR |
| <b>B</b>    | BUS<br>BATTERY CHARGER<br>BREAKER<br>BRAKE<br>BEARING TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>J</b> | JUNCTION BOX                                                                                                                                                                                                                                                                                                                                                                                    | <b>T</b>         | THERMOSTAT, TIMER, TOTALIZER,<br>TRANSFORMER<br>TACHOMETER<br>TERMINAL BLOCK<br>TIMER CLUTCH<br>TIME DELAY RELAY<br>TEMPERATURE<br>TIMER MOTOR<br>TORQUE<br>TIMER RELAY, TRIAD<br>TEMPERATURE SWITCH<br>TELEPHONE TERMINAL BOARD                                                                                                                                                                                                                                                                       |
| <b>C</b>    | CLOSE, COUNTER, CONTACTOR, CONTROL,<br>CCTV CAMERA<br>CAPACITOR<br>CIRCUIT BREAKER<br>CIRCUIT BREAKER AUXILIARY CONTACT<br>(OPEN WHEN BREAKER IS OPEN)<br>CIRCUIT BREAKER AUXILIARY CONTACT<br>(CLOSED WHEN BREAKER IS OPEN)<br>CONTROL DAMPER<br>CELL INTERLOCK<br>CIRCUIT<br>CHLORINE<br>CABLE OPERATED SWITCH<br>CONTROL PANEL<br>CONTROL POWER TRANSFORMER<br>CURRENT OF CONTROL RELAY, CARD READER<br>CONTROL STATION<br>CYCLE TIMER OR CURRENT TRANSFORMER<br>CYCLE TIMER CLUTCH<br>CYCLE TIMER MONITOR<br>2 CONDUCTOR<br>4" CONDUIT | <b>L</b> | LOW, LEVEL, LONG-TIME<br>LIGHTNING ARRESTER<br>LOCAL AREA NETWORK<br>LIGHTING CONTRACTOR<br>LIGHTING CONTACTOR ENCLOSURE<br>LIGHTING CONTROL ENCLOSURE<br>LOCAL CONTROL PANEL<br>LOCAL CONTROL STATION<br>LOCAL-OFF-AUTO<br>LOCAL-ON-REMOTE<br>LOCK OUT STOP<br>LIGHTING PANEL<br>LIMIT OR LEVEL SWITCH<br>LIGHTING<br>LOW WATER CUTOFF                                                         | <b>U</b>         | UNDERGROUND<br>UNINTERRUPTIBLE POWER SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>D</b>    | DIRECT CURRENT, DOOR CONTACT<br>DOOR INTERLOCK<br>DAMPER MOTOR, DEMAND METER,<br>DIMMER SWITCH<br>DOUBLE POLE DOUBLE THROW<br>DOUBLE POLE SINGLE THROW<br>DIFFERENTIAL PRESSURE REGULATOR<br>DIFFERENTIAL PRESSURE SWITCH<br>DISCONNECT SWITCH, DOOR SWITCH,<br>DESKTOP STATION<br>DISCHARGE VALVE LIMIT SWITCH                                                                                                                                                                                                                            | <b>M</b> | MAGNETIC MOTOR STARTER<br>MILLIAMPERE<br>MAIN CIRCUIT BREAKER<br>MOTOR CONTROL CENTER<br>MOTOR CONTROL LINEUP<br>MOISTURE DETECTOR, MOTION DETECTOR<br>MAGNETIC DOOR LOCK<br>MANUFACTURER<br>MANHOLE, MOUNTING HEIGHT<br>MOTOR OPERATED VALVE<br>MOTOR PROTECTION RELAY<br>MANUAL MOTOR STARTER<br>MOTOR SPACE HEATER<br>MANUAL TRANSFER SWITCH<br>MILLIVOLT, MEDIUM VOLTAGE<br>MEGAVOLT AMPERE | <b>V</b>         | VOLTS, VOLTAGE RESTRAINED<br>VOLT AMPERE<br>VARIATOR<br>VARIABLE FREQUENCY DRIVE<br>VACUUM INTERRUPTER<br>VALVE LIMIT SWITCH<br>VOLTMEETER<br>VALVE POSITION INDICATOR<br>VOLTMEETER SWITCH                                                                                                                                                                                                                                                                                                            |
| <b>DVLS</b> | DISCHARGE VALVE LIMIT SWITCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>N</b> | NEUTRAL<br>NEUTRAL GROUNDING RESISTOR<br>NEUTRAL GROUNDING TRANSFORMER<br>NORMALLY CLOSED<br>NORMALLY OPEN, NUMBER                                                                                                                                                                                                                                                                              | <b>W</b>         | WHITE, WATTS<br>WATTHOUR METER<br>WATT METER<br>WEATHERPROOF<br>WEATHERPROOF IN-USE<br>WALL STATION                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>E</b>    | ELECTRIC OPERATOR FOR CONTROL DAMPER<br>OR VALVE<br>EMPTY CONDUIT<br>ELECTRICAL DOOR STRIKE<br>ELEVATION, EMERGENCY LIGHT<br>ELECTRICAL MANHOLE<br>ELECTRODE RELAY<br>END SWITCH, REQUEST TO EXIT SENSOR<br>EMERGENCY STOP<br>ELAPSED TIME METER<br>EXISTING<br>EXPLOSION PROOF                                                                                                                                                                                                                                                            | <b>O</b> | OPEN<br>OVERLOAD<br>ON-OFF-AUTO<br>ON-OFF-REMOTE<br>OCCUPANCY SENSOR<br>OVER/UNDER                                                                                                                                                                                                                                                                                                              | <b>X</b>         | AUXILIARY RELAY<br>TRANSFORMER<br>EXPLOSION PROOF                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>F</b>    | FORWARD, FIELD<br>FIBER OPTIC<br>FEEDER PROTECTION RELAY<br>FLOW SWITCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>P</b> | PRIMARY, POWER, POLE<br>PLANT CONTROL SYSTEM<br>PUSH BUTTON, PULL BOX<br>PHOTOELECTRIC SENSOR, PHOTOCCELL<br>POWER FACTOR<br>POWER FACTOR CORRECTION CAPACITOR<br>PHASE<br>PILOT LIGHT<br>PROGRAMMABLE LOGIC CONTROLLER<br>POWER PANEL<br>PAIR<br>PROXIMITY SWITCH<br>PRESSURE SWITCH<br>POTENTIAL TRANSFORMER, PROGRAM TIMER                                                                   | <b>Y</b>         | YELLOW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>G</b>    | GREEN, GROUND, GENERATOR,<br>GROUND FAULT<br>GROUND DETECTOR<br>GENERATOR<br>GROUND FAULT CURRENT INTERRUPTOR,<br>GROUND FAULT INTERRUPTOR<br>GEARED LIMIT SWITCH<br>GENERATOR PROTECTION RELAY<br>GROUND<br>#8 GROUND WIRE                                                                                                                                                                                                                                                                                                                | <b>Q</b> | NOT USED                                                                                                                                                                                                                                                                                                                                                                                        | <b>Z</b>         | AUXILIARY RELAY, IMPEDANCE<br>POSITION SWITCH<br>ZERO SPEED SWITCH                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>H</b>    | HIGH, HUMIDISTAT<br>HANDHOLE<br>HIGH MOTOR TEMPERATURE<br>HAND-OFF-AUTO<br>HAND-OFF-REMOTE<br>HORSEPOWER<br>HAND STATION<br>HIGH WATER CUTOFF<br>HERTZ (CYCLE)                                                                                                                                                                                                                                                                                                                                                                             | <b>R</b> | RED, RAISE, RELAY, REVERSE<br>RECEPTACLE<br>RESISTOR<br>REMOTE HANDSET<br>REPEATING TIMER<br>RESISTANCE TEMPERATURE DETECTOR<br>REMOTE TERMINAL UNIT<br>REDUCED VOLTAGE SOLID STATE STARTER                                                                                                                                                                                                     | <b>1-1PR#16S</b> | ONE, SINGLE PAIR, TWISTED<br>SHIELDED #16 CABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

DESIGNED: DG  
DATE: FEBRUARY 2021

1" = 12'  
IF THIS BAR DOES NOT  
MEASURE 1" THEN DRAWING IS  
NOT TO FULL SCALE

PROJECT NO.  
199322  
SHEET  
13 OF 27

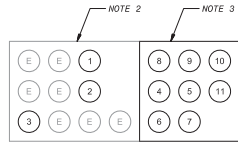
CITY OF KEY WEST  
RICHARD A. VEAATCH ENGINEERING, ARCHITECT AND  
ELECTRICAL SWITCHGEAR REPLACEMENT

ELECTRICAL  
ABBREVIATIONS & NOTES

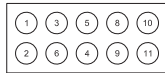
BLACK & VEATCH  
Black & Veatch Corporation  
3111 North University Drive, Suite 700  
Coral Springs, FL 33065  
Professional Engineer  
Richard D. Veaatch  
No. 22315  
Professional Engineer  
Richard D. Veaatch  
No. 22315

REVISIONS AND RECORD OF USE  
NO. 33376  
STATE OF  
FLORIDA  
REVISIONS AND RECORD OF USE  
NO. 33376  
STATE OF  
FLORIDA

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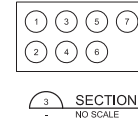
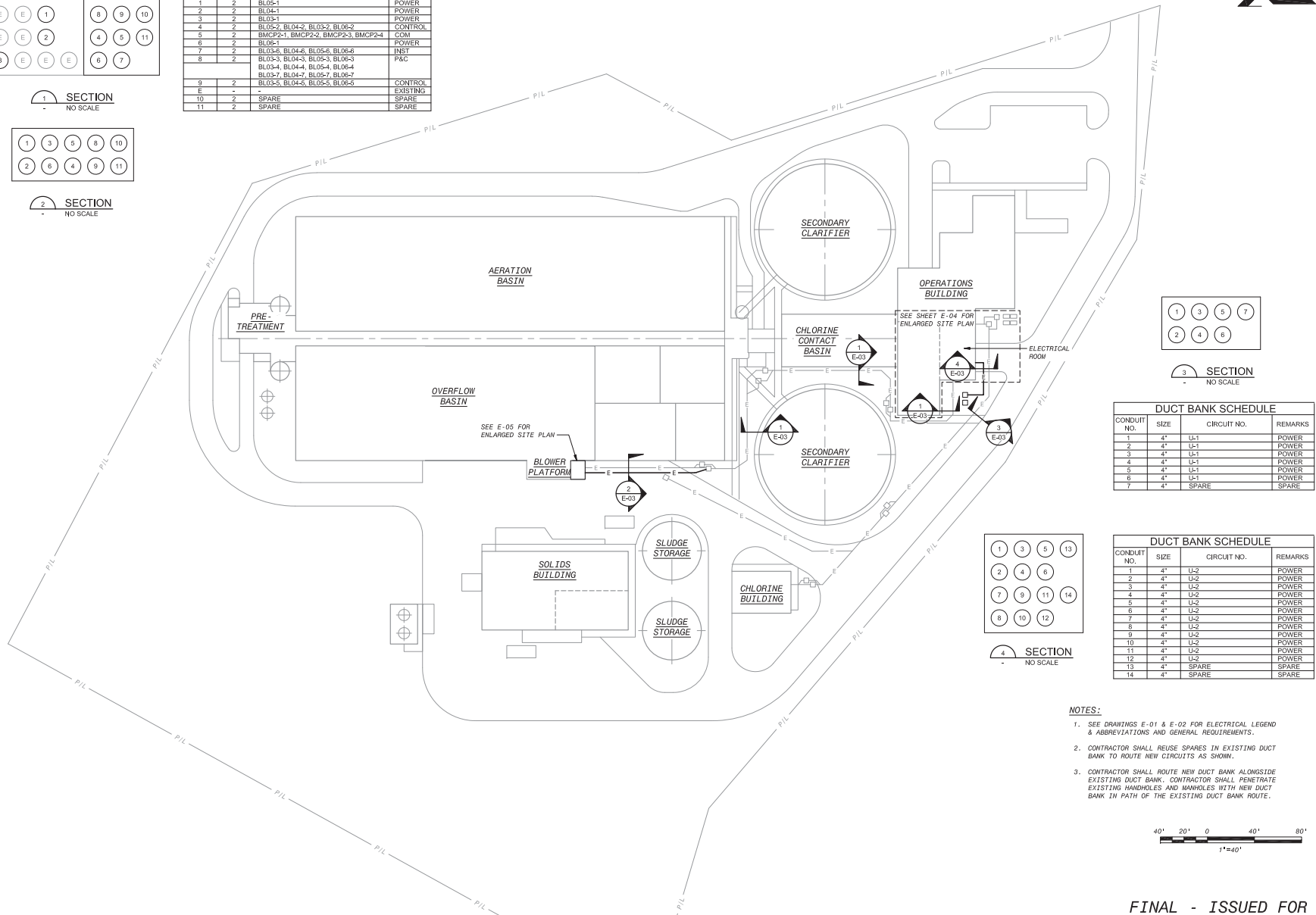


1 SECTION  
NO SCALE



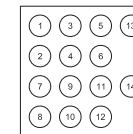
2 SECTION  
NO SCALE

| 480V DUCT BANK SCHEDULE |      |                                    |          |
|-------------------------|------|------------------------------------|----------|
| CONDUIT NO.             | SIZE | CIRCUIT NO.                        | REMARKS  |
| 1                       | 2    | BL05-1                             | POWER    |
| 2                       | 2    | BL04-1                             | POWER    |
| 3                       | 2    | BL03-1                             | POWER    |
| 4                       | 2    | BL05-2, BL04-2, BL03-2, BL06-2     | CONTROL  |
| 5                       | 2    | BMCP2-1, BMCP2-2, BMCP2-3, BMCP2-4 | CDM      |
| 6                       | 2    | BL06-1                             | POWER    |
| 7                       | 2    | BL03-6, BL04-6, BL05-6, BL06-6     | INST     |
| 8                       | 2    | BL03-3, BL04-3, BL05-3, BL06-3     | P&C      |
| 9                       | 2    | BL03-4, BL04-4, BL05-4, BL06-4     | EXISTING |
| 10                      | 2    | BL03-7, BL04-7, BL05-7, BL06-7     | EXISTING |
| 11                      | 2    | BL03-5, BL04-5, BL05-5, BL06-5     | CONTROL  |
| E                       | -    | -                                  | EXISTING |
| 10                      | 2    | SPARE                              | SPARE    |
| 11                      | 2    | SPARE                              | SPARE    |



3 SECTION  
NO SCALE

| DUCT BANK SCHEDULE |      |             |         |
|--------------------|------|-------------|---------|
| CONDUIT NO.        | SIZE | CIRCUIT NO. | REMARKS |
| 1                  | 4"   | U-1         | POWER   |
| 2                  | 4"   | U-1         | POWER   |
| 3                  | 4"   | U-1         | POWER   |
| 4                  | 4"   | U-1         | POWER   |
| 5                  | 4"   | U-1         | POWER   |
| 6                  | 4"   | U-1         | POWER   |
| 7                  | 4"   | SPARE       | SPARE   |

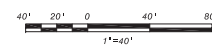


4 SECTION  
NO SCALE

| DUCT BANK SCHEDULE |      |             |         |
|--------------------|------|-------------|---------|
| CONDUIT NO.        | SIZE | CIRCUIT NO. | REMARKS |
| 1                  | 4"   | U-2         | POWER   |
| 2                  | 4"   | U-2         | POWER   |
| 3                  | 4"   | U-2         | POWER   |
| 4                  | 4"   | U-2         | POWER   |
| 5                  | 4"   | U-2         | POWER   |
| 6                  | 4"   | U-2         | POWER   |
| 7                  | 4"   | U-2         | POWER   |
| 8                  | 4"   | U-2         | POWER   |
| 9                  | 4"   | U-2         | POWER   |
| 10                 | 4"   | U-2         | POWER   |
| 11                 | 4"   | U-2         | POWER   |
| 12                 | 4"   | U-2         | POWER   |
| 13                 | 4"   | SPARE       | SPARE   |
| 14                 | 4"   | SPARE       | SPARE   |

# NOTES:

- SEE DRAWINGS E-01 & E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
- CONTRACTOR SHALL REUSE SPARES IN EXISTING DUCT BANK TO ROUTE NEW CIRCUITS AS SHOWN.
- CONTRACTOR SHALL ROUTE NEW DUCT BANK ALONGSIDE EXISTING DUCT BANK. CONTRACTOR SHALL PENETRATE EXISTING HANDHOLES AND MANHOLES WITH NEW DUCT BANK IN PATH OF THE EXISTING DUCT BANK ROUTE.



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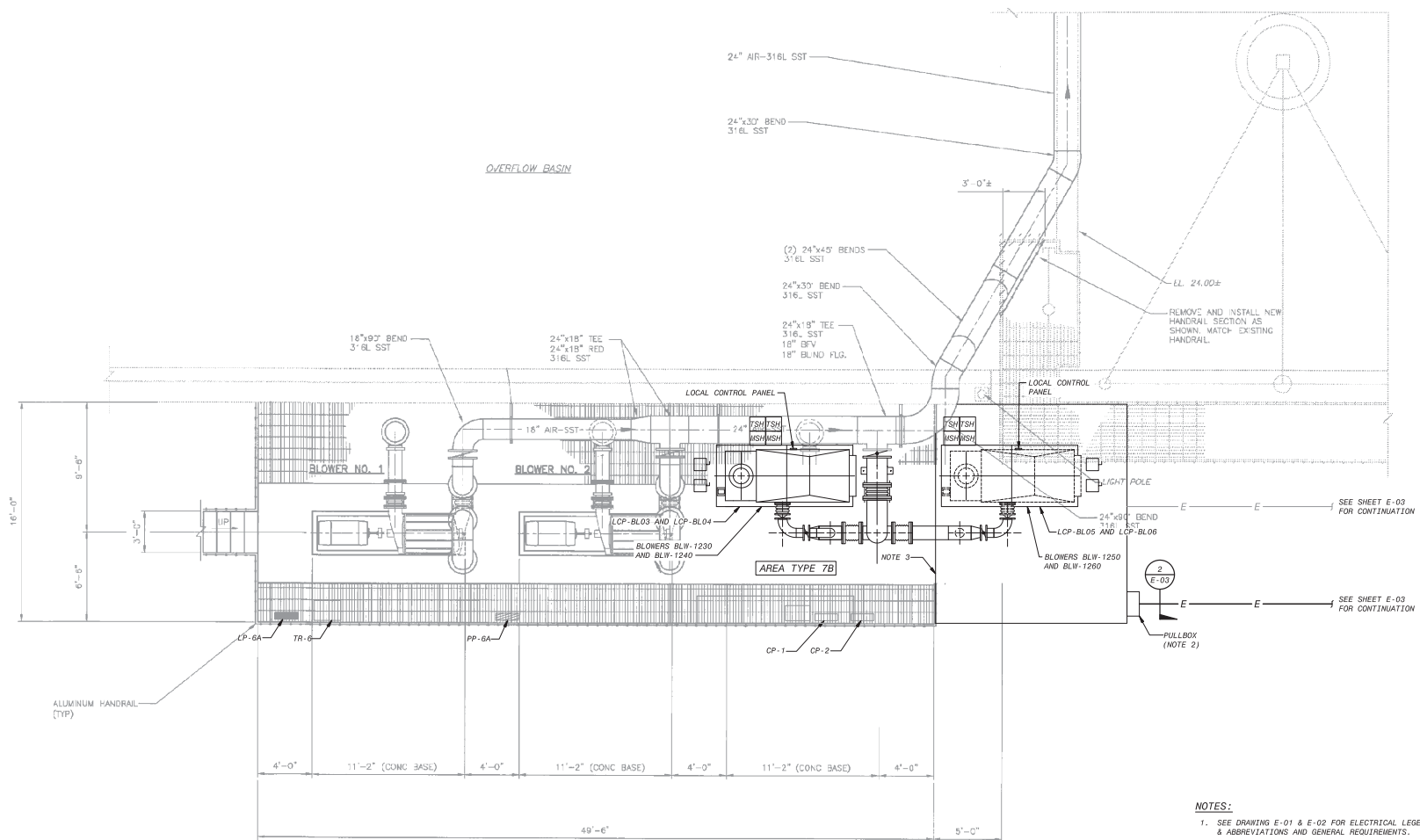
|                                                                                                                                                                                    |                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| DESIGNED: DG                                                                                                                                                                       | DATE: FEBRUARY 2021 |
| DETAILED: TLK                                                                                                                                                                      |                     |
| CHECKED: RBT                                                                                                                                                                       |                     |
| APPROVED:                                                                                                                                                                          |                     |
|                                                                                                                                                                                    |                     |
| <b>BLACK &amp; VEATCH</b><br>Black & Veatch Corporation<br>3111 North University Drive, Suite 700<br>Coral Springs, FL 33065<br>Certificate No. 8132<br>Florida License No. 199322 |                     |
| CITY OF KEY WEST<br>RICHARD A. HEWITT ENVIRONMENTAL PROTECTION<br>PLANT IMPROVEMENT PROJECT AND<br>ELECTRICAL SWITCHGEAR REPLACEMENT<br>ELECTRICAL<br>OVERALL SITE PLAN            |                     |
| PROJECT NO.<br>199322<br><b>E-03</b><br>SHEET<br>14 OF 27                                                                                                                          |                     |



1. SEE DRAWINGS E-01 & E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. KEYS ENERGY SERVICES TO REMOVE EXISTING TRANSFORMERS AND TO INSTALL TWO NEW 150KVA TRANSFORMERS. CONTRACTOR SHALL COORDINATE WITH KEYS ENERGY SERVICES AND PROVIDE TRANSFORMER CONCRETE PAD PER UTILITY STANDARDS. CONTRACTOR SHALL SUPPLY GROUNDING ELECTRODE SYSTEM PER SPECIFICATIONS AND DRAWINGS.
3. 6SMD TO BE REPLACED IN KIND AS INDICATED IN THE SPECIFICATIONS. CABLES TO EXISTING LOADS WILL BE RE-LANDED AS INDICATED ON THE ATTACHED CABLE LAYOUT. SPJ WILL BE NOT ALLOWED UNLESS WITH THE APPROVAL OF THE ENGINEER.

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[illegible]FD-198322  
0100375



1. SEE DRAWING E-01 & E-02 FOR ELECTRICAL LEGEND & ABBREVIATIONS AND GENERAL REQUIREMENTS.
2. DUCT BANK SHALL TURN UP OUT OF THE GROUND INTO PULLBOX. CONDUITS SHALL THEN RUN EXPOSED UNDERNEATH THE BLOWER PLATFORM AND PENETRATE THE SLAB TO TERMINATE AT THE BLOWER DISCONNECTS.
3. ALL CONDUITS PENETRATING SLAB SHALL BE A MINIMUM 12" AWAY FROM NEW AND EXISTING SLAB CONNECTION.

[illegible]
**BLACK & VEATCH**

**Black & Veatch Corporation**  
3111 North University Drive, Suite 700  
Coral Springs, FL 33065  
Certificate No.:

ELECTRICAL  
ENLARGED BLOWER PLATFORM POWER PLAN

DESIGNED: DG  
 DETAILED: TLK  
 CHECKED: WR  
 APPROVED: RDT  
 DATE: FEBRUARY 2021



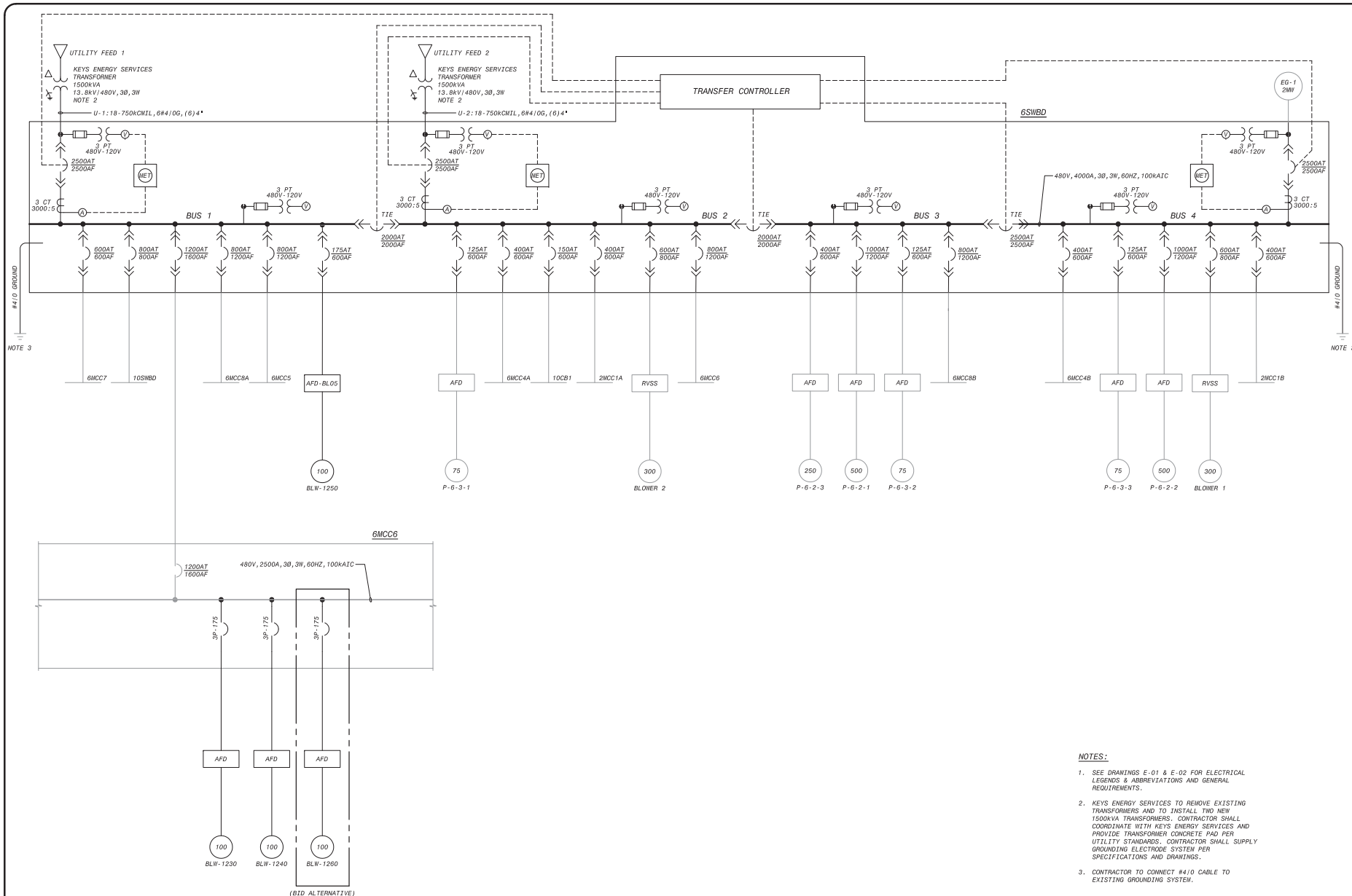
IF THIS BAR DOES NOT  
 MEASURE 1" THEN DRAWING IS  
 NOT TO FULL SCALE

PROJECT NO.  
 199322

**E-05**  
 SHEET  
 16 OF 27







01/09/22  
199322

PARTIAL POWER DISTRIBUTION FUNCTIONAL DIAGRAM

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|               |                     |
|---------------|---------------------|
| DESIGNED: DG  | DATE: FEBRUARY 2021 |
| DETAILED: TLK | PROJECT NO. 199322  |
| CHECKED: RDT  | SHEET 18 OF 27      |
| APPROVED: RDT |                     |

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO. 199322

SHEET 18 OF 27

E-07

CITY OF KEY WEST  
RICHARD A. HEWITT ENVIRONMENTAL AND  
UTILITY DEPARTMENT  
ELECTRICAL SWITCHGEAR REPLACEMENT

BLACK & VEATCH  
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3111 North Unkenhake Drive, Suite 700  
Coral Springs, FL 33065  
Certificate No. 8132

REVISIONS AND RECORD OF USE

NO. 33376

STATE OF FLORIDA

ENGINEER OF RECORD

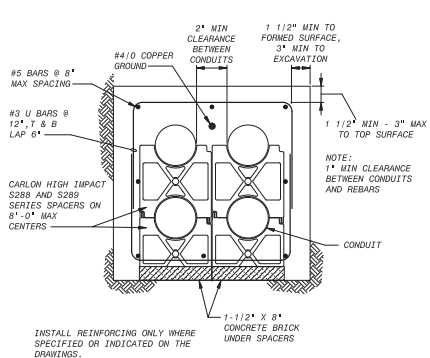
RICHARD D. RAYLOR

Florida License No. 199322

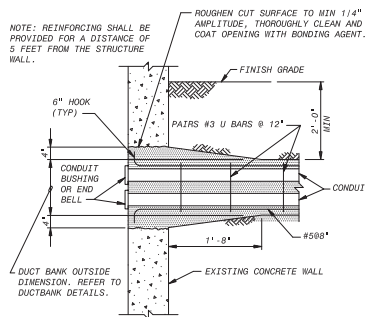




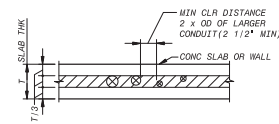




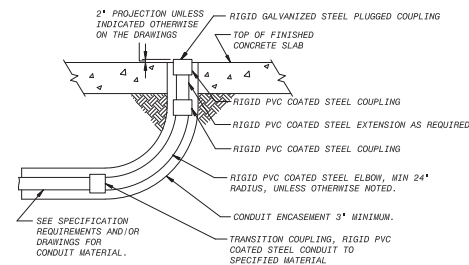
**TYPICAL DUCT BANK  
SECTION**  
NO SCALE



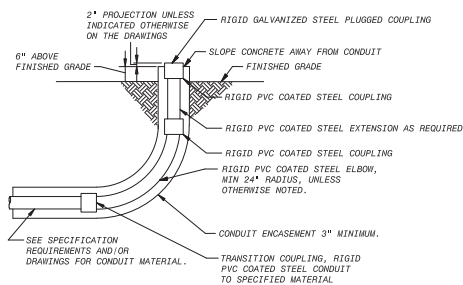
**TYPICAL UNDERGROUND  
DUCT BANK ENTRANCE DETAIL**  
NO SCALE  
NOTE: FOR EXISTING WALL



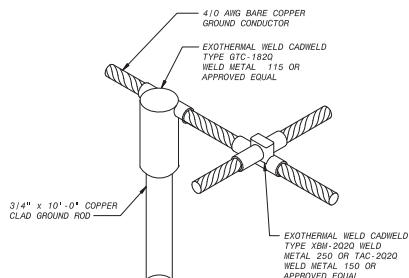
**CONDUIT PLACING DETAIL**  
NO SCALE  
NOTES:  
1. PLACE CONDUIT ONLY IN SHADED AREA  
2. FOR CONDUIT REQUIREMENTS SEE THE ELECTRICAL DRAWINGS AND SPECIFICATIONS.



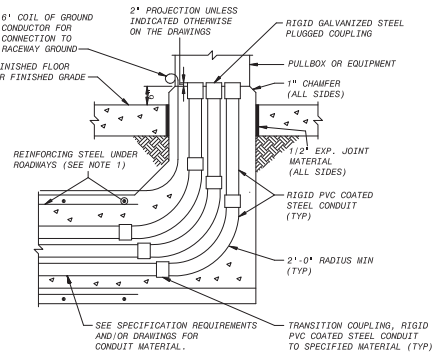
**TYPICAL CONDUIT RISER  
TERMINATING IN CONCRETE SLAB**  
NO SCALE



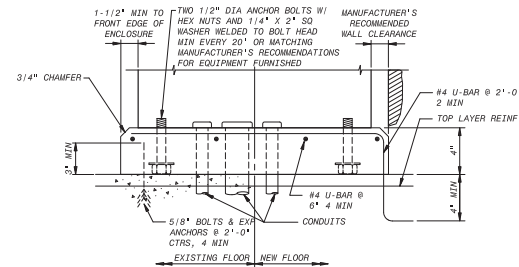
**TYPICAL CONDUIT RISER  
TERMINATING IN SOIL**  
NO SCALE



**TYPICAL EXOTHERMAL WELD  
GROUND ROD AT CROSS OR TEE CONNECTION**  
NO SCALE



**TYPICAL DUCT BANK  
RISER CONSTRUCTION**  
NO SCALE



**ELECTRICAL EQUIPMENT BASE**  
NO SCALE  
NOTE: UNLESS OTHERWISE NOTED, ALL INDOOR FLOOR-MOUNTED ELECTRICAL EQUIPMENT, INCLUDING SWITCHGEAR, SWITCHBOARDS, MOTOR CONTROL CENTERS, ADJUSTABLE FREQUENCY DRIVES, INSTRUMENT CABINETS, ETC., SHALL BE PROVIDED WITH EQUIPMENT BASES.

| REV | DATE | BY | CHK | DESCRIPTION |
|-----|------|----|-----|-------------|
|     |      |    |     |             |
|     |      |    |     |             |
|     |      |    |     |             |
|     |      |    |     |             |

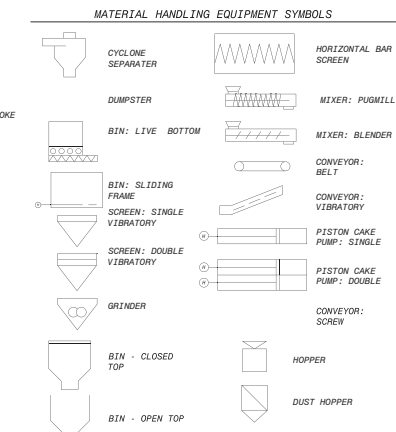
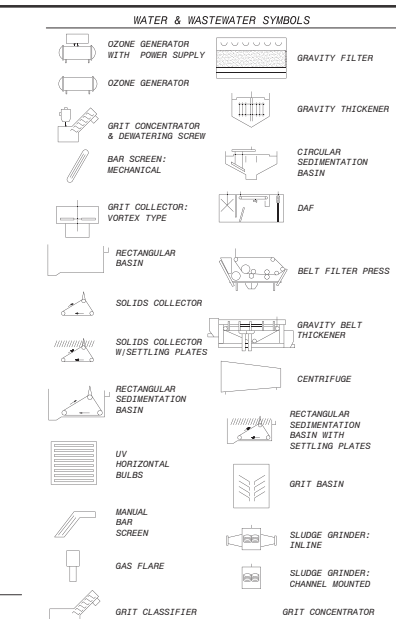
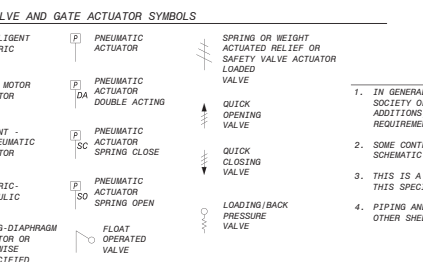
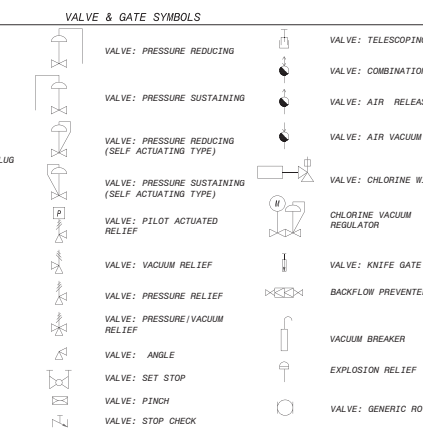
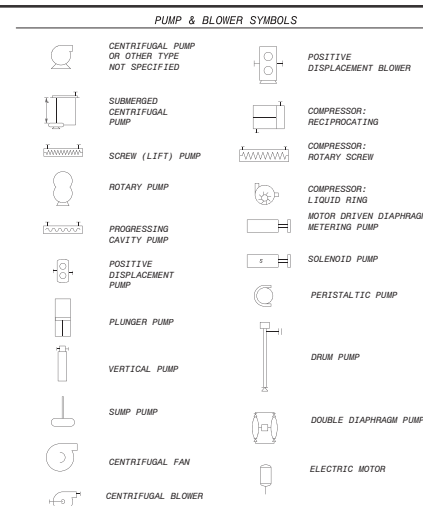
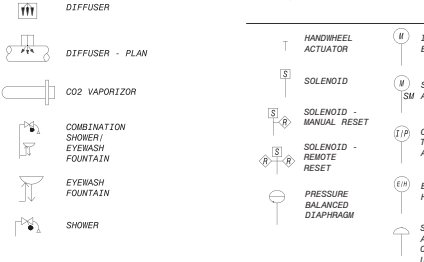
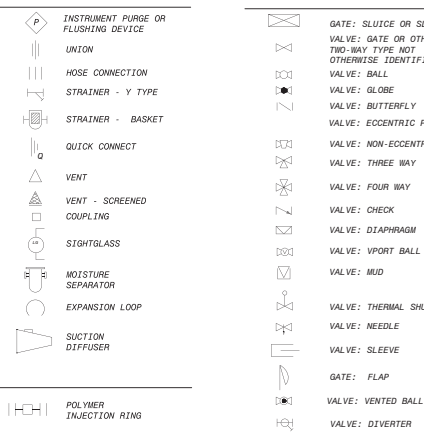
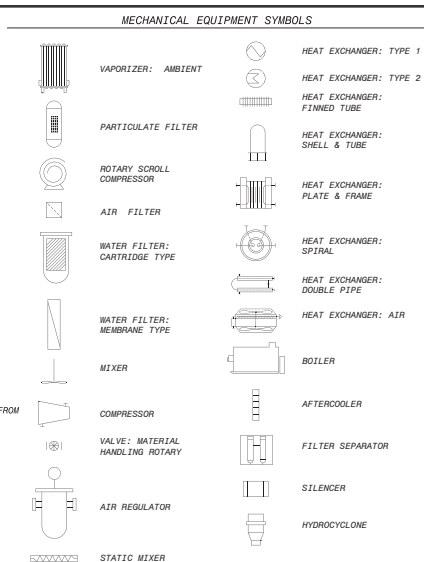
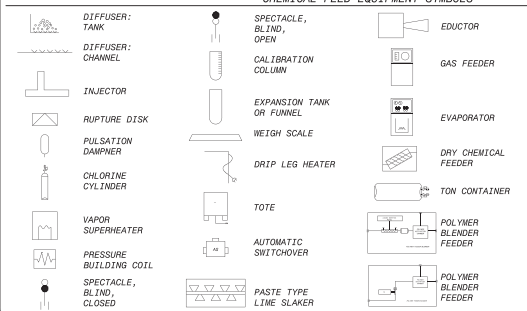
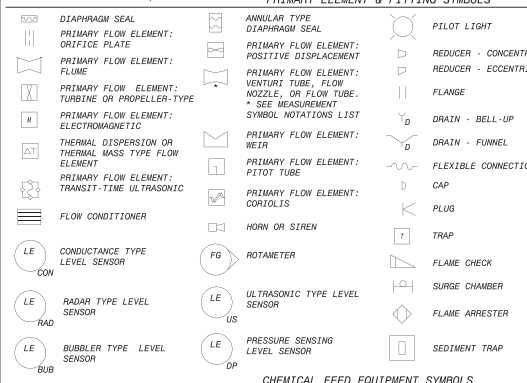
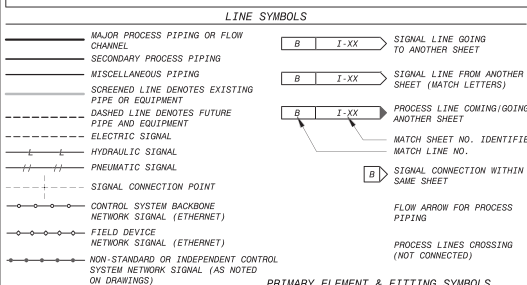
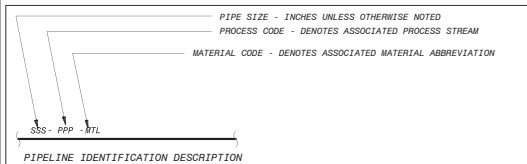


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Black & Veatch Corporation  
3111 North U.S. Highway 1  
Coral Springs, FL 33065  
Certificate No. 8132

**CITY OF KEY WEST  
RICHARD A. WHELAN ENVIRONMENTAL AND  
PLANNING DEPARTMENT  
ELECTRICAL SWITCHGEAR REPLACEMENT**

|                     |
|---------------------|
| DESIGNED: DG        |
| DETAILED: TLK       |
| CHECKED:            |
| APPROVED: RD1       |
| DATE: FEBRUARY 2021 |
| PROJECT NO. 199322  |
| SHEET 21 OF 27      |

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### GENERAL NOTES

1. IN GENERAL, THE P&ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARD PRACTICE ANSI/ISA-5.1 (2009). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE TO ACCOMMODATE THE PROJECT REQUIREMENTS.
2. SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P&ID DRAWINGS.
3. THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
4. PIPING AND EQUIPMENT LEGEND APPLIES TO P&ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.

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### FUNCTION CODE ABBREVIATIONS

X = PROCESS CODE SUFFIX USED TO  
FURTHER SPECIFY A PROCESS STREAM  
(I.E. CL2 G FOR CHLORINE GAS  
OR CL2 L FOR CHLORINE SOLUTION)

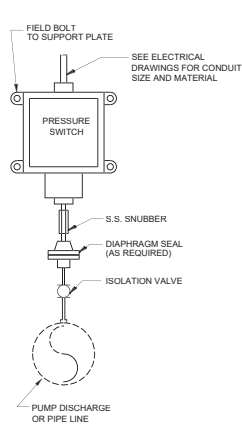
### FUNCTION CODE ABBREVIATIONS

**CITY OF KEY WEST**  
**WARD A. HEYMAN ENVIRONMENTAL PROTECTION**  
**AND**  
**WILLIAM AERATION SYSTEM UPGRADE AND**  
**ELECTRICAL SWITCHGEAR REPLACEMENT**

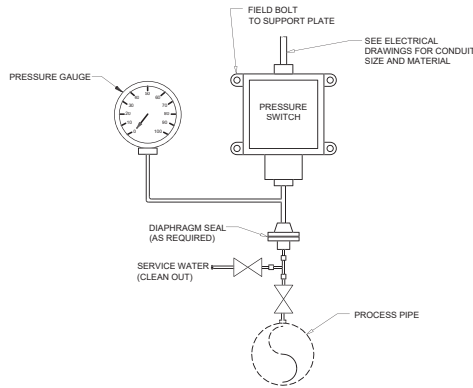




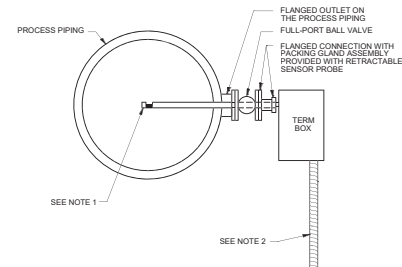




**PRESSURE SWITCH (PIPE-MOUNT)**  
**INSTALLATION DETAIL**  
 NO SCALE  
 DETAIL APPLIES TO PSH-6-3-3

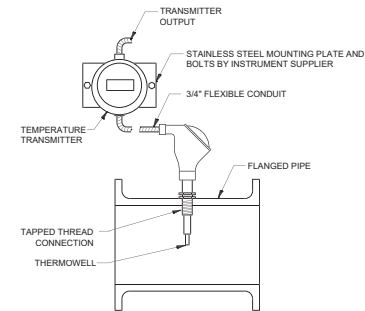


**PRESSURE SWITCH, GAUGE & TRANSMITTER**  
**INSTALLATION DETAIL**  
 NO SCALE  
 DETAIL APPLIES TO PSH-6-2-3/PI-6-2-3



**FLOW METER-THERMAL DISPERSION**  
**(HOT-TAP TYPE SENSOR) INSTALLATION DETAIL**  
 NO SCALE

- NOTES:
1. PROBE LENGTH AND ORIENTATION OF PROBE TO FLOW PROFILE SHALL CONFORM TO MANUFACTURER RECOMMENDATIONS.
  2. LENGTH OF LIQUDTIGHT FLEXIBLE METAL CONDUIT TO INDICATOR/TRANSMITTER AS REQUIRED TO ALLOW EASY REMOVAL OF SENSOR. CABLE BETWEEN PROBE AND INDICATOR/TRANSMITTER SHALL BE MANUFACTURER SUPPLIED.



- NOTES:
1. THERMOWELLS SHALL BE EITHER WELD-TYPE OR THREADED. SITE CONNECTIONS OR APPLICATION SHALL DETERMINE TYPE.
  2. THERMOWELLS AND RTSS TO BE SIZED FOR THE INSERTION DEPTH OF THE PIPE.

**TEMPERATURE TRANSMITTER (REMOTE-MOUNT)**  
**INSTALLATION DETAIL**  
 NO SCALE

| NO. | REVISIONS AND RECORD OF USE | DATE | BY | CHK | APP |
|-----|-----------------------------|------|----|-----|-----|
|     |                             |      |    |     |     |



**BLACK & VEATCH**  
 Black & Veatch Corporation  
 311 North University Drive, Suite 700  
 Coral Springs, FL 33065  
 Certificate No. 8132

**CITY OF KEY WEST**  
**RECHARD A. HEWITT ENGINEERING AND**  
**UTILITY CONSULTANTS, INC.**  
**ELECTRICAL SWITCHGEAR REPLACEMENT**  
**INSTRUMENTATION**  
**DETAILS**

|                     |
|---------------------|
| DESIGNED: LJB       |
| DETAILED: LJB       |
| CHECKED: SAN        |
| APPROVED: LJB       |
| DATE: FEBRUARY 2021 |
| PROJECT NO. 199322  |
| SHEET I-06          |
| 27 OF 27            |

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