SOUTH FLORIDA WATER MANAGEMENT DISTRICT

CALOOSAHATCHEE RIVER (C-43)
WEST BASIN STORAGE RESERVOIR

HENDRY COUNTY, FLORIDA

VOLUME IV- PERIMETER CANAL
CONTROL STRUCTURES

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APPROVED BY:

JEFFREY R. KIVETT, P.E.
EVERGLADES RESTORATION ENGINEERING DEPARTMENT

NOTES:

PRIOR TO SOLICITATION FOR THE C-43 WEST BASIN STORAGE RESERVOIR CONSTRUCTION CONTACT DOCUMENTS SHOULD BE UPDATED INCLUDING:

- THE C-43 PUMP PROCUREMENT PACKAGE MUST BE UPDATED. THE CONTRACTOR MUST BE SELECTED AND THE SHOP DRAWINGS RELATED TO THE PUMP PROCUREMENT MUST BE RECEIVED BY THE DISTRICT.

- VOLUMES I-V (AND ANY ASSOCIATED SPECIFICATIONS) WILL REQUIRE UPDATING INCLUDING CHANGES REQUIRED BY THE PUMP PROCUREMENT SHOP DRAWINGS. REFER TO DRAWING G3002 FOR A LIST OF UPDATED ISSUES THAT SHOULD BE ADDRESSED.

LOCATION MAP

PROJECT I.D. NO. P504-8303

CONFIDENTIAL INFORMATION ENCLOSED

The confidential, proprietary, and other pertinent information associated with this project shall consist with Stanley Consultants Inc. The owner and/or ultimate owner of the information may take appropriate steps for the protection of said information. Information may be shared with a manufacturer's representative or outside/third party not performing work on behalf of the project in question.
FIXED WEIR (KNEEWALL) UPSTREAM ELEVATION

SCALE: 1/8" = 1'-0"

NOTE: EXTENDED, PERIODICALLY REINFORCING IS BAR SIDE OF PIER EjEN WALLS AND TERMINATES IN STANDARD HOOK.

SECTION

SCALE: 1/8" = 1'-0"

NOTE: CONCRETE, PLACEMENT OF REINFORCING BONDED WITH LOCATION OF WIR GATE FRAME ANCHOR BOLTS.

SCALE: 1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
### Structural Design Criteria

3. **Concrete Design Code:** Building code requirements for structural concrete, ACI 318-19, as published by American Concrete Institute.
4. **Steel Design Code:** Specification for Structural Steel Buildings, AISC 360, as published by the American Institute of Steel Construction.
5. **Bridge Code:** AASHTO LRFD, AASHTO Bridge Specifications, Third Edition.
6. **Concrete Compression Strength:** 4000 psi at 28 days, full concrete 2800 psi at 28 days.
7. **Structural Steel:** H-section, 60 ksi.
8. **Reinforcing Steel:** A617-275, D6500.
9. **Required Safe Net Area:** 0.30 in²/sq ft, 1.25 in²/sq in.
10. **Seismic Group:** B, 0.25 g, 0.30 g.

### Structural Design

**Concrete:**
- **Concrete Cover:**
  - Minimum 2 inches (0.05 m) for all columns, girders, and slabs.
  - Minimum 1 inch (0.025 m) for all beams.

**Reinforcing Steel:**
- Minimum 2 inches (0.05 m) for all columns, girders, and slabs.
- Minimum 1 inch (0.025 m) for all beams.

### Reinforcing Bar Minimum Lap Lengths

<table>
<thead>
<tr>
<th>Size (in)</th>
<th>Top Bars</th>
<th>Other Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>20</td>
<td>16</td>
</tr>
</tbody>
</table>

### Reinforcing Bar Minimum Splice Lengths

<table>
<thead>
<tr>
<th>Size (in)</th>
<th>Top Bars</th>
<th>Other Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>8</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

### Steel Notes

1. **Steel fabrication:** All steel members that are not noted otherwise, should be designed in accordance with ASME Section VIII, Division 1, of the American Society of Mechanical Engineers, as published by ASME.
2. **Steel bars:** Steel bars shall be welded or fastened to concrete members in accordance with the American Concrete Institute, as published by ACI.
3. **Steel connections:** Steel connections shall be designed in accordance with the American Institute of Steel Construction, as published by AISC.

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**Table:**

- **Concrete:**
  - Minimum 2 inches (0.05 m) for all columns, girders, and slabs.
  - Minimum 1 inch (0.025 m) for all beams.

- **Reinforcing steel:**
  - Minimum 2 inches (0.05 m) for all columns, girders, and slabs.
  - Minimum 1 inch (0.025 m) for all beams.

- **Reinforcing bar minimum lap lengths:**
  - Top bars: 15 inches (0.38 m)
  - Other bars: 13 inches (0.33 m)

- **Reinforcing bar minimum splice lengths:**
  - Top bars: 12 inches (0.30 m)
  - Other bars: 12 inches (0.30 m)
SILL BEAM PERSPECTIVE

NOTE: NUMBER AND LOCATION OF ALIGNMENT STUDS AND WELDING PADS TO BE DETERMINED BY ENGINEER.

FIELD WELDED ALIGNMENT STUDS

TYPE A

TYPE B
**SCHEDULE: DIMENSIONS:**

<table>
<thead>
<tr>
<th>MARK</th>
<th>DIMENSION</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10&quot; x 12&quot;</td>
<td>GALV PLATE</td>
<td>W/ NUT &amp; WASHERS</td>
</tr>
<tr>
<td>B</td>
<td>8&quot; x 12&quot;</td>
<td>GALV PLATE</td>
<td>W/ NUT &amp; WASHERS</td>
</tr>
<tr>
<td>C</td>
<td>6&quot; x 12&quot;</td>
<td>GALV PLATE</td>
<td>W/ NUT &amp; WASHERS</td>
</tr>
<tr>
<td>D</td>
<td>4&quot; x 12&quot;</td>
<td>GALV PLATE</td>
<td>W/ NUT &amp; WASHERS</td>
</tr>
</tbody>
</table>

**GENERAL NOTES:**

1. SINGLE BOLT CONNECTION TYPICAL AT EACH END OF WALE.
2. FINISHED BEVELED SPACER PLATES BETWEEN 1/8" PLATES AND SHEET PILE, AND BETWEEN SHEET PILE AND WALES WHERE NECESSARY TO ACCOMMODATE MISMATCHED ANCHOR ROG DIMENSIONS. DIMENSIONS OF SPACER SHALL MATCH THOSE OF 1/8" PLATE ON SAME SIDE OF SHEET PILE AS SPACER.
ELEVATION LOOKING AT COLUMN

ELEVATION LOOKING DOWNSTREAM

NOTE:
1. DE-BURR ALL EDGES.

DETAIL

NOTE:
1. LUMBER SHALL BE SOUTHERN PINE WITH STRENGTH VALUES NOT LESS THAN THOSE INDICATED IN TABLE 1 OF ASTM D2555.
2. ALL LUMBER SHALL BE TREATED TO CONFORM TO FEDERAL SPECIFICATION NO. TT-W-371.

GATE POSITION INDICATOR:
A. GAUGE BOARD SHALL BE SURFACED ON ALL FOUR SIDES.
B. BOARD TO HAVE (2) COATS OF GRAY LATEX ENAMEL.
C. GUAGE STRIPS AND NUMERALS TO BE PORCELAIN, ENAMEL, IRON OR FIBERGLASS.
MOUNT ON GAUGE BOARD WITH NONCORROSIVE SYSTEMS.
1. DETAILS AND NOTATION PRESENTED ON THESE SHEETS ARE INTENDED TO PROVIDE EXAMPLES OF SELECTED MAJOR ITEMS AND COMPONENTS. THE LISTING OF ELECTRICAL ITEMS USED ON THIS SHEET IS FOR REFERENCE ONLY. EACH ITEM MUST BE VERIFIED, DESIGNED AND SIZED FOR THE SPECIFIC PROJECT.

2. DIMENSIONS SHOWN ARE FOR INSTALLATIONS USING 3/8 INCH CABLE AND 3/8 INCH DRUMS.

3. COMMERCIAL ELECTRIFICATION SYSTEMS.
CONTRACTOR / FABRICATOR SUBMITTAL REQUIREMENTS (CONTRACTOR TO VERIFY)

HOSTING EQUIPMENT DESIGN DATA:

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT OF MEASURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TACKLE BLOCK</td>
<td>3</td>
<td>UNIT PARTS / METH. ADVANTAGE</td>
</tr>
<tr>
<td>LINE PULL</td>
<td>3,444</td>
<td>2,628 LBS</td>
</tr>
<tr>
<td>WIRE ROPE DESIGN LOAD (SAFETY FACTOR = 6.5)</td>
<td>17,019</td>
<td>13,140 LBS</td>
</tr>
<tr>
<td>S.S. WIRE ROPE DIAMETER (MIN. 0.5/32&quot;) - MINIMUM</td>
<td>0.5</td>
<td>0.5 INCHES</td>
</tr>
<tr>
<td>UPPER BLOCK WORKING LOAD</td>
<td>4</td>
<td>4 TONS</td>
</tr>
<tr>
<td>LOWER BLOCK WORKING LOAD</td>
<td>8</td>
<td>8 TONS</td>
</tr>
<tr>
<td>REQUIRED OUTPUT TORQUE</td>
<td>41,320</td>
<td>31,535 INCH - POUNDS</td>
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</tbody>
</table>

DRIVE GEAR DESIGN DATA (SEE NOTE 1):

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT OF MEASURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEAR RATIO</td>
<td>3,600:1</td>
<td>3,600:1 R.P.M.</td>
</tr>
<tr>
<td>LOAD CURVE MEDIUM SHOCK</td>
<td>0.468</td>
<td>0.468 R.P.M.</td>
</tr>
<tr>
<td>OUTPUT SPEED</td>
<td>41,320</td>
<td>31,535 INCH + POUNDS</td>
</tr>
<tr>
<td>REQUIRED OUTPUT POWER</td>
<td>0.01</td>
<td>0.01 HP</td>
</tr>
<tr>
<td>REQUIRED INPUT MECHANICAL POWER</td>
<td>0.15</td>
<td>0.15 HP</td>
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MOTOR DESIGN DATA (SEE NOTE 2):

<table>
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<tr>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>UNIT OF MEASURE</th>
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<tbody>
<tr>
<td>SPEED</td>
<td>1,750</td>
<td>1,750 R.P.M.</td>
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<tr>
<td>POWER</td>
<td>2</td>
<td>2 HP</td>
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<tr>
<td>VOLTAGE</td>
<td>208</td>
<td>208 VOLTS</td>
</tr>
<tr>
<td>PHASE</td>
<td>3</td>
<td>3</td>
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</table>
GENERAL NOTES:
1. ALL DIMENSIONS SHOWN ARE FOR INSTALLATIONS USING STANDARD 7/8" INCH CABLE. MODIFY AS REQUIRED FOR LARGER DIAMETER CABLE.
2. ALL Dimensions SHOWN ARE FOR INSTALLATIONS USING STANDARD 7/8" DIAMETER GATE, ONE (1) LEFT HAND AND ONE (1) RIGHT HAND.
3. CORE HOLE SIZES UNLESS NOTED OTHERWISE.
4. MANUFACTURER MAY USE STANDARD LENGTH DRUM - MINIMUM LENGTH 14'-8".
5. MINIMUM KEYWAY SIZE: 5/8" WIDE X 5/8" HIGH X 2 5/8" EACH HUB.
7. Dimensions of the grooves were assumed for 7/8" in diameter wire rope and may be modified by the manufacturer to suit standard fabrications.
8. All dimension notes depend on final design details.
### DISTRIBUTION PANELBOARD SCHEDULE

<table>
<thead>
<tr>
<th>PANEL NAME</th>
<th>UNIT NO.</th>
<th>SOURCE NAME</th>
<th>SOURCE LOCATION</th>
<th>SERVICE AMPS</th>
<th>MVA</th>
<th>VOLTAGE</th>
<th>NUMBER</th>
<th>O/W</th>
<th>BUR</th>
<th>R/C</th>
<th>( \bar{O} )</th>
<th>TIME</th>
<th>CHARGE</th>
<th>( \bar{O} )</th>
<th>( \bar{O} )</th>
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</table>

### CIRCUIT SCHEDULE FOR ONE AND TWO GATE STRUCTURES

<table>
<thead>
<tr>
<th>CIRCUIT NO.</th>
<th>DESCRIPTION</th>
<th>CIRCUIT</th>
<th>UNIT NO.</th>
<th>SOURCE NAME</th>
<th>SOURCE LOCATION</th>
<th>SERVICE AMPS</th>
<th>MVA</th>
<th>VOLTAGE</th>
<th>NUMBER</th>
<th>O/W</th>
<th>BUR</th>
<th>R/C</th>
<th>( \bar{O} )</th>
<th>TIME</th>
<th>CHARGE</th>
<th>( \bar{O} )</th>
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**CONDUCTOR SIZES BASED ON NPS WATER. CONDUCTOR SIZES SHALL BE ADJUSTED TO MATCH ACTUAL WATER SUPPLIES.**

**COMBINE CIRCUITS 5TH AND 6TH IN DMN. 7TH CIRCUIT.**

**FOR CIRCUIT LENGTHS LESS THAN 500 FEET USE SELECTION TYPE 134-125 CABLE. FOR CIRCUIT LENGTHS GREATER THAN 500 FEET USE SELECTION TYPE 125-125 CABLE.**

**NOTE: FOR MORE REQUIREMENTS SEE SPECIFICATION.**
### General Notes:

1. **Switches:** Provide all single-pole, 3-way and 4-way switches as indicated. Mount 4 feet above floor, wall, or finished grade. Install close to trim on look sides when located near doors.

2. **Receptacle Outlets:** Outlets shall be surface-mounted, rated 15A at 120V AC. Outlets are resistant back and side wired and 3-way code wiring type. New residence 5-20R, provide 302 stainless steel. Walls, plates and matching counterpoint devices. Provide gray receptacles with 302 stainless steel.

   **Specification:** Grade Type S120 (30), S120-WC31104 (Grade Wall Plate). Provide 15A and 15A single or multiple gang boxes. Mount receptacles, outlets 2'-0" above floor, wall, or finished grade in all remaining rooms.

### Electrical Layout

<table>
<thead>
<tr>
<th>Room</th>
<th>Group</th>
<th>Category</th>
<th>Type</th>
<th>Description</th>
<th>Location</th>
<th>Quantity</th>
</tr>
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</tbody>
</table>

### Service Pole Installation

- 1-phase transformer
- Service by utility
- Conduit and riser by utility
- Handhole by electrical utility
- To meter socket at control building
- Pole, 6 ft. of WC for splicing by utility

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**Final Submission**
RTU DRAWING PACKAGE
FULL MOSCAD WITH DIGITAL UHF RADIO
I/O FOR TWO ELECTRIC MOTOR DRIVEN ROLLER GATES AND
TWO ELECTRIC MOTOR DRIVEN SINGLE STEM WEIR GATES,
AUTOMATIC WATER SAMPLER AND LOW HEAD STILLING WELLS
RTU DRAWING PACKAGE
FULL MOSCAD WITH DIGITAL UHF RADIO
I / O FOR ONE ELECTRIC MOTOR DRIVEN ROLLER GATE AND
TWO ELECTRIC MOTOR DRIVEN SINGLE STEM WEIR GATES,
GENSET AND LOW HEAD STILLING WELLS
RTU DRAWING PACKAGE
FULL MOSCAD WITH DIGITAL UHF RADIO
I/O FOR ONE ELECTRIC MOTOR DRIVEN SINGLE STEM SLIDE GATE AND ONE ELECTRIC
MOTOR DRIVEN SINGLE STEM WEIR GATE, GENSET, AUTOMATIC WATER SAMPLER AND
LOW HEAD STILLING WELLS
### RTU System Components

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply</td>
<td>24V DC Power Supply</td>
</tr>
</tbody>
</table>
| Controller | RTU Controller (Model X)
| Surge Protection | Surge Protection Module |
| Antenna | Microwave Antenna Kit |
| Data Modem | Wireless Data Modem |

### Electrical Layout

####典型控制建筑设备布局 (Elevation View)

#### RTU enclosure front view

1. All work shall be performed in accordance with the latest edition of the National Electrical Code (NEC) and applicable local codes and ordinances.
2. All equipment is to be manufactured to manufacturer's specifications. Any parts not listed on the RTU system components table are allowed without written request and are subject to approval.
3. Conductor identification and panel control, and instrument conductors for the RTU panel wiring shall be as follows:
   - All conductors in the panel shall be permanently identified with markings provided by the manufacturer and shall be marked at termination points. Every circuit shall be identified with its corresponding panel partition. Partitions are labeled "A" to "Z", inclusive.
   - Conductors shall be sized in accordance with the NEC regarding wiring diameter and voltage drop considerations. Minimum conductor sizes are:
     - 14 AWG: 1000 V
     - 12 AWG: 600 V
     - 10 AWG: 250 V
     - 8 AWG: 150 V
4. Each panel and fuse block section shall be identified by its terminal block ID and individual terminal block number.
5. Identify each relay and relay block with its relay ID, provides a spare relay of each voltage, relay type, and relay number shall be placed listed in the bottom of the RTU panel.
6. All RTU panel equipment and components shall be identified with markings of size 1/8" minimum.
7. All equipment shall be identified with black letters.
8. Minimum foot ground shall be a 4/0
c9. Omit the small ground key in the panel, and each of its main components including:
   - Power panel name and description (reference RTU enclosure front view)
   - Transformer name and description
   - Circuit breaker name and description
   - Equipment identification number
   - Each control relay (5" or 6"
9. All wiring and equipment shall be clearly identified.
10. All wiring and equipment shall be clearly identified.
11. All wiring shall be a 1/8" minimum size.
12. Conductors shall be 1/8" field wiring to RTU panel.

#### Battery Box + Breaker

(Typical for Non-Solar Panel Sites) (Section View)
RTU DRAWING PACKAGE
MOSCAD-L WITH DIGITAL UHF RADIO
I/O FOR ONE ELECTRIC MOTOR DRIVEN SINGLE STEM SLIDE GATE, GENSET,
AUTOMATIC WATER SAMPLER AND LOW HEAD STILLING WELLS
RTU DRAWING PACKAGE
MOSCAD-L WITH DIGITAL UHF RADIO

I/O FOR ONE ELECTRIC MOTOR DRIVEN SINGLE STEM SLIDE GATE AND ONE ELECTRIC MOTOR DRIVEN SINGLE STEM WEIR GATE, AUTOMATIC WATER SAMPLER AND LOW HEAD STILLING WELLS
**RTU DRAWING PACKAGE**

MOSCAD-L WITH DIGITAL UHF RADIO

1 / 0 FOR ONE ELECTRIC MOTOR DRIVEN SINGLE STEM WEIR GATE
AND LOW HEAD STILLING WELLS

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>MOSCAD RTU</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-417</td>
<td>S477RM</td>
</tr>
</tbody>
</table>