

## SECTION 03 41 10 - PRECAST CONCRETE BOOSTER PUMP STATION (BPS) BUILDING

### PART 1 GENERAL

#### 1.1 DESCRIPTION

Contractor shall furnish a precast concrete transportable building to be delivered and placed on a contractor-prepared crushed stone foundation in accordance with manufacturer's recommendations. The building shall be provided by the manufacturer with all necessary openings as specified on the drawings in conformance with manufacturer's structural requirements. Building interior dimensions shall be as shown in the drawings.

#### 1.2 SUBMITTAL PROCEDURES

- A. As required by Section 01 33 00.

#### 1.3 REFERENCES (LATEST EDITIONS WHERE NOT INDICATED)

A. American Concrete Institute:

1. ACI 301 Specifications for Structural Concrete.
2. ACI 318-19 Building Code Requirements for Structural Concrete.

B. ASTM International:

1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. A185/A185M-07 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
4. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
5. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
6. ASTM C33 - Standard Specification for Concrete Aggregates.
7. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
8. ASTM C150 - Standard Specification for Portland Cement.

C. American Welding Society:

1. AWS D1.1 - Structural Welding Code - Steel.
2. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

D. Precast/Prestressed Concrete Institute:

1. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.
2. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete.
3. PCI MNL-122 - Architectural Precast Concrete.
4. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete.

E. Other:

1. ASCE/SEI 7-16 with Supplement 1
2. IBC 2021

1.4 DESIGN REQUIREMENTS

A. Design units to withstand design gravity and lateral (wind and seismic) loads as calculated per the ASCE and IBC codes, including erection forces. Calculate structural properties of units in accordance with ACI 318. The following shall be per the General Structural Notes (G.S.N.) in the plan set:

1. Risk Category
2. Roof Live Load
3. Roof Snow Load
4. Floor Live Load
5. Wind Load
6. Seismic Design Criteria
7. Soil Bearing Design Values

B. Joints shall be watertight per the General Structural Notes (GSN) in the plans set and shall be interlocking to secure proper alignment between sections.

1.5 SUBMITTALS

A. Shop Drawings:

1. Submit for approval complete drawings sealed by a professional engineer in the State of Arizona. Indicate layout, unit locations, configuration, connection details, support items, location of lifting devices, dimensions, openings, and other appurtenances.

B. Design Data:

1. Submit for approval engineering calculations sealed by a professional engineer in the State of Arizona.

1.6 CLOSEOUT SUBMITTALS

A. As required by Section 01 33 00

## 1.7 QUALITY ASSURANCE

- A. The precast concrete building producer shall be a plant-certified member of either the National Precast Concrete Association (NPCA), The Precast/Prestressed Concrete Institute (PCI), or equal.
- B. The precast concrete building producer shall be a plant-certified member of either the National Precast Concrete Association (NPCA), The Precast/Prestressed Concrete Institute (PCI), or equal.
- C. Perform Work in accordance with governing agency requirements.
- D. Structural design shall be under the direct supervision of a Professional Engineer experienced in design of this Work and licensed in the State of Arizona.
- E. Welder: Qualified within the previous 12 months in accordance with AWS D1.1 and AWS D1.4.

## 1.8 PRE-INSTALLATION MEETINGS

- A. Convene a minimum of two weeks prior to commencing installation of work in this section.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Handle precast units to position, consistent with their shape and design. Lift and support only from support points.
- B. Blocking and Lateral Support During Transport and Storage: Clean, non-staining, without causing harm to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.
- C. Protect units to prevent staining, chipping, or spalling of concrete.
- D. Mark units with date of production in location not visible to view when in final position in structure.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers:
  - 1. Four Corners Pre-Cast, Inc., 1790 Bisti Hwy, Farmington, NM 87401 or approved equal.

### 2.2 MATERIALS

- A. Cement: ASTM C150, Type 1 - Normal Portland.
- B. Concrete Materials: ASTM C33; water and sand.
- C. Reinforcement: ASTM A615, Grade 60 deformed steel size and spacing commensurate with precast unit design.

D. Sealant: Per the General Structural Notes (G.S.N.) in the plan set.

## 2.3 ACCESORIES

A. Steel door and frame cast into wall shall comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100) and as herein specified. All door and frame galvanizing shall be in accordance with ASTM A924 and A653, A60 minimum coating thickness.

1. The buildings shall be equipped with double or single (as shown on the plans) 3'-0" x 6'-8" x 1-3/4" thick insulated, 18 gauge, metal doors with 16-gauge frames (to meet wall thickness). Doors to have flush top cap. 12 gauge flat astragals shall be applied to the active leaf to protect against the elements or forced opening. Doors and frames shall be factory bonderized and painted with one coat of rust inhibitive primer and one finish coat of enamel paint; color to be selected by the engineer.
2. Doors and frames shall meet SDI standard Level 2, 1 3/4" heavy duty. Manufacturers: Republic, Steelcraft, Ceco, Black Mountain, Pioneer, Curries, Mesker, MPI, Door components or approved equal.

B. Door hardware to include the following:

1. Pull Handle: Shall meet requirements of ANSI A156.2. Shall be thru bolt attached and constructed of a minimum 3/4" diameter stainless pull handle sized 8" center to center with a stainless backer plate, minimum 0.053" on both sides. Manufacturers: Design Hardware, Don-Jo, or approved equal.
2. Hinges: Shall comply with ANSI A156.1 and be of the ball bearing, non-removable pin type (3 per door minimum). Hinges shall be 4 1/2" x 4 1/2" US26D (652) brushed chrome finish. The manufacturer shall provide a lifetime limited warranty. Manufacturers: Design Hardware or approved equal.
3. Deadbolt: Commercial Grade Deadbolt conforming to ANSI 156.5 furnished with a 2 1/4" face plate and a 1" projecting deadbolt with hardened steel pins. Dead bolts shall be UL and ADA approved. Finish shall be US26D (626) brushed chrome finish. The manufacturer shall provide a lifetime limited warranty. Manufacturers: Design Hardware, Dorma, or approved equal
4. Surface Bolt: 8" Surface bolt UL listed. Finish US26D (626) brushed chrome finish. (2 per inactive leaf).
5. Bumper Seal type threshold with a maximum 1" rise to prevent water intrusion. Thresholds shall be approved for UL 10B suitable for use with fire doors rated up to three hours. Manufacturer: National Guard Products or approved equal.
6. Threshold: Bumper Seal type threshold with a maximum 1" rise to prevent water intrusion. Thresholds shall be approved for UL 10B suitable for use with fire doors rated up to three hours. Manufacturers: National Guard Products or approved equal.
7. Drip Cap: Aluminum drip cap with minimum projection of 2 1/2" shall be furnished. Manufacturers: Design Hardware, National Guard Products, or approved equal.

8. Door Stop: ANSI 156.16 approved wall mounted door stop with keeper constructed of a corrosion resistant cast brass material. Finish US26D (626) brushed chrome finish. Manufacturers: Don-Jo, Rockwood, or approved equal.

C. Interior of building to be insulated and finished with FRP wall panels.

#### 2.4 MIX

A. Concrete: Minimum 4,000 psi, 28-day strength, in accordance with ACI 318.

#### 2.5 FABRICATION

- A. Fabricate in conformance with PCI MNL-117 and ACI 318.
- B. Maintain plant records and quality control program during production of precast units. Make records available upon request.
- C. Maintain consistent quality during manufacture.
- D. Fabricate connecting devices, plates, angles, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.
- E. Weld steel fabrications in accordance with AWS D1.1. Weld reinforcing steel in accordance with AWS D1.4. Do not tack weld reinforcing.
- F. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items for door frames.
- G. Locate hoisting devices to permit removal after erection.
- H. Cure units to develop concrete quality, and to minimize appearance blemishes including non-uniformity, staining, or surface cracking.
- I. Minor patching in plant is acceptable if approved by the engineer, and providing structural adequacy and appearance of units is not impaired.
- J. Roof: Single component monolithic section (except where shown on the plans) and shall slope  $\frac{1}{2}$ " from front to back as shown on the plans. The roof shall extend a minimum of 2  $\frac{1}{2}$ " beyond the wall section on each side and have a turndown design which extends  $\frac{1}{2}$ " below the top edge of the wall sections to prevent water migration into the building along top of wall sections.
- K. Section Connections: All sections shall be securely fastened together with  $\frac{3}{8}$ " thick steel brackets. Steel is to be of structural quality, hot-rolled carbon complying with ASTM A36 and hot dipped galvanized after fabrication. All fasteners to be  $\frac{1}{2}$ " diameter bolts complying with ASTM A325 for carbon steel bolts. Cast-in anchors used for section connections to be Dayton-Superior F-63 coil inserts, or equal. All inserts for corner connections must be secured directly to form before casting sections. No floating-in of connection inserts shall be allowed.

#### 2.6 FINISH – PRECAST UNITS

A. Integrally cast slump block or brick finish.

- B. Prime and finish paint exterior concrete surfaces. Color as selected by the engineer.

## 2.7 FINISH – EXPOSED METAL

- A. Clean surfaces of rust, scale, grease, and foreign matter.
- B. Prime paint in one coat and finish paint in two coats metal doors and frames and all exposed metal surfaces, except surfaces in direct contact with concrete or requiring field welding. Color to be selected by the engineer.
- C. Galvanizing for Structural Steel Members: ASTM A123/A123M; galvanize after fabrication.
- D. Galvanizing for Fasteners, Connectors, and Anchors:
  - 1. Hot-Dipped Galvanizing: ASTM A153/A153M.
  - 2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

## 2.8 FABRICATION TOLERANCES

- A. Maximum Out of Square: 1/8 inch in 10 feet, non-cumulative.
- B. Variation From Dimensions Indicated on Drawings: Plus or minus 1/8 inch.
- C. Maximum Misalignment of Anchors, Inserts, Openings: 1/8 inch.

## 2.9 SOURCE QUALITY CONTROL AND TESTS

- A. Section 01 45 00 - Quality Control: Testing, inspection, and analysis requirements.
- B. Test and analyze concrete in accordance with ACI 318.
- C. The precast contractor to submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

# PART 3 EXECUTION

## 3.1 PREPARATION

- A. Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.

## 3.2 ERECTION

- A. Erect units without damage to shape or finish. Replace or repair damaged sections.
- B. Erect units level and plumb within allowable tolerances.
- C. Align and maintain uniform horizontal and vertical joints as erection progresses.
- D. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Engineer.
- E. Weld units in place. Perform welding in accordance with AWS D1.1.

- F. Touch-up field welds scratched or damaged surfaces.
- G. Weld reinforcing steel in accordance with AWS D1.4. Do not tack weld reinforcing.
- H. Exposed Joint Dimension: 1/2 inch.
- I. Seal perimeter and intermediate joints in accordance with this Section.

### 3.3 ERECTION TOLERANCES

- A. Maximum Variation from Plane of Location: ¼ inch in 10 feet, non-cumulative.
- B. Maximum Offset from Indicated Alignment Between Two Connecting Units: 1/4 inch.
- C. Joint Tolerance: Plus or minus 1/4 inch.

### 3.4 FIELD QUALITY CONTROL

- A. Welding: Inspect welds in accordance with AWS D1.1.

### 3.5 ADJUSTING

- A. Adjust units so joint dimensions are within tolerances.

### 3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Use non-combustible shields during welding operations to protect adjacent Work.

END OF SECTION

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## SECTION 03 41 20 - PRECAST CONCRETE ALTITUDE VAULT

### PART 1 GENERAL

#### 1.1 DESCRIPTION

Contractor shall furnish a precast concrete transportable vault to be delivered and placed and buried on a contractor-prepared crushed stone foundation in accordance with manufacturer's recommendations. The vault shall be provided by the manufacturer with all necessary openings as specified on the drawings in conformance with manufacturer's structural requirements. Vault interior dimensions shall be as shown in the drawings.

#### 1.2 SUBMITTAL PROCEDURES

- A. As required by Section 01 33 00.

#### 1.3 REFERENCES (LATEST EDITIONS WHERE NOT INDICATED)

- A. American Association of State Highway and Transportation Officials (AASHTO).
  - 1. LRFD Bridge Design Specifications.
- B. American Concrete Institute:
  - 1. ACI 301 Specifications for Structural Concrete.
  - 2. ACI 318-19 Building Code Requirements for Structural Concrete.
- C. ASTM International:
  - 1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
  - 2. A185/A185M-07 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
  - 3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
  - 4. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
  - 5. ASTM C857 – Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
  - 6. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - 7. ASTM C33 - Standard Specification for Concrete Aggregates.
  - 8. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
  - 9. ASTM C150 - Standard Specification for Portland Cement.

10. ASTM C890 – Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
  11. ASTM C1577 - Standard Specification for Precast Concrete Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers Designed According to AASHTO LRFD.
- D. American Welding Society:
1. AWS D1.1 - Structural Welding Code - Steel.
  2. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
- E. Precast/Prestressed Concrete Institute:
1. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.
  2. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete.
  3. PCI MNL-122 - Architectural Precast Concrete.
  4. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete.
- F. Other:
1. ASCE/SEI 7-16 with Supplement 1
  2. IBC 2021

#### 1.4 DESIGN REQUIREMENTS

- A. Design units to withstand design loads as calculated per the AASHTO, ASCE and IBC codes, including erection forces. Calculate structural properties of units in accordance with ACI 318. The following shall be per the General Structural Notes (G.S.N.) in the plan set:
1. Risk Category
  2. Live Load
  3. Snow Load
  4. Floor Live Load
  5. Soil Lateral and Bearing Design Values
  6. Adjacent Traffic Load
  7. Buoyancy
- B. Design requirements: Structural analysis, design, and detailing:
1. Analyze and design structures including the effects of 2-way action (“plate action”) and of load transfer around current and future openings.
  2. Where structures include sections designed for future removal (“knockout sections”), design structures for loads and stresses with any combination of any or all such sections in place or removed.
  3. Design structures in accordance with the requirements of ACI 318 and this Section.

4. Provide reinforcement at all areas subject to tensile stress when loaded with the specified loads and combinations thereof.
  5. Provide temperature and shrinkage reinforcement to equal or exceed ACI 318 requirements in all concrete sections.
  6. Provide minimum clear concrete cover over reinforcement at both interior and exterior faces of all members in accordance with the following:
    - a. Diversion structures: 2 inches.
  7. Reinforcement details:
    - a. Walls: For structures with wall thickness of 8 inches or less, locate a single mat of reinforcement at the center of the wall.
    - b. Slabs: For structures with slab thickness of 7 inches or less, locate a single mat of reinforcement at the center of the slab.
    - c. Structures with wall or slab thicknesses exceeding these limits shall have reinforcement at each face of the member.
  8. Joints:
    - a. Seal joints watertight per the General Structural Notes (GSN) in the plan set.
    - b. Joints shall be interlocking to secure proper alignment between sections and prevent migration of soil through the joint.
- C. Design requirements: Materials:
1. Portland cement concrete diversion structures:
    - a. In accordance with ASTM C858, except as modified in this Section.
    - b. Proportion concrete mixes to resist damage from freezing and thawing in a moist environment, and for exposure to deicing chemicals. In accordance with ACI 318 requirements for minimum specified compressive strength and air entrainment.
- D. Diversion structure shall be solid walled construction.
1. Where penetrations of the pre-cast concrete diversion structure are required, such penetrations shall be accommodated through pre-cast openings or core-drilled sections.
  2. Openings for penetrations shall be smooth and free of surface irregularities and without exposed steel reinforcing.
  3. Diversion structures need not be designed to resist thrust from piping passing through the diversion structure.
  4. Coordinate pipe penetration locations with piping arrangement as indicated on the Drawings.

5. Minimum wall, floor, and lid thickness shall be 8-inches.

#### 1.5 SUBMITTALS

##### A. Shop Drawings:

1. Submit for approval complete drawings sealed by a professional engineer in the State of Arizona. Indicate layout, unit locations, configuration, connection details, support items, location of lifting devices, dimensions, openings, and other appurtenances.

##### B. Design Data:

1. Submit for approval engineering calculations sealed by a professional engineer in the State of Arizona.

#### 1.6 CLOSEOUT SUBMITTALS

- ##### A.
- As required by Section 01 33 00.

#### 1.7 QUALITY ASSURANCE

- ##### A.
- The precast concrete building producer shall be a plant-certified member of either the National Precast Concrete Association (NPCA), The Precast/Prestressed Concrete Institute (PCI), or equal.
- ##### B.
- The precast concrete building producer shall be a plant-certified member of either the National Precast Concrete Association (NPCA), The Precast/Prestressed Concrete Institute (PCI), or equal.
- ##### C.
- Perform Work in accordance with governing agency requirements.
- ##### D.
- Structural design shall be under the direct supervision of a Professional Engineer experienced in design of this Work and licensed in the State of Arizona.
- ##### E.
- Welder: Qualified within the previous 12 months in accordance with AWS D1.1 and AWS D1.4.

#### 1.8 PRE-INSTALLATION MEETINGS

- ##### A.
- Convene a minimum of two weeks prior to commencing installation of work in this section.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- ##### A.
- Handle precast units to position, consistent with their shape and design. Lift and support only from support points.
- ##### B.
- Blocking and Lateral Support During Transport and Storage: Clean, non-staining, without causing harm to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.
- ##### C.
- Protect units to prevent staining, chipping, or spalling of concrete.
- ##### D.
- Mark units with date of production in location not visible to view when in final position in structure.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

#### A. Manufacturers:

1. Four Corners Pre-Cast, Inc., 1790 Bisti Hwy, Farmington, NM 87401 or approved equal.

### 2.2 MATERIALS

- A. Cement: ASTM C150, Type 1 - Normal Portland.
- B. Concrete Materials: ASTM C33; water and sand.
- C. Reinforcement: ASTM A615, Grade 60 deformed steel size and spacing commensurate with precast unit design.
- D. Sealant: Per the General Structural Notes (G.S.N.) in the plan set.

### 2.3 ACCESORIES

- A. Aluminum hatch with safety fall protection grate. Manufacturer Halliday Model No. S2S 4848 or approved equal. Install per the manufacturer's recommendations.
- B. Aluminum ladder. Manufacturer Halliday Model No. L1B or approved equal. Install per the manufacturer's recommendations.
- C. Aluminum ladder extension. Manufacturer Halliday Model No. L1E or approved equal. Install per the manufacturer's recommendations.

### 2.4 MIX

- A. Concrete: Minimum 4,000 psi, 28-day strength, in accordance with ACI 318.

### 2.5 FABRICATION

- A. Fabricate in conformance with PCI MNL-117 and ACI 318.
- B. Maintain plant records and quality control program during production of precast units. Make records available upon request.
- C. Maintain consistent quality during manufacture.
- D. Fabricate connecting devices, plates, angles, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.
- E. Weld steel fabrications in accordance with AWS D1.1. Weld reinforcing steel in accordance with AWS D1.4. Do not tack weld reinforcing.
- F. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items for door frames.
- G. Locate hoisting devices to permit removal after erection.

- H. Cure units to develop concrete quality, and to minimize appearance blemishes including non-uniformity, staining, or surface cracking.
- I. Minor patching in plant is acceptable if approved by the engineer, and providing structural adequacy and appearance of units is not impaired.
  - 1. Section Connections: All sections shall be securely fastened together with 3/8" thick steel brackets. Steel is to be of structural quality, hot-rolled carbon complying with ASTM A36 and hot dipped galvanized after fabrication. All fasteners to be 1/2" diameter bolts complying with ASTM A325 for carbon steel bolts. Cast-in anchors used for section connections to be Dayton-Superior F-63 coil inserts, or equal. All inserts for corner connections must be secured directly to form before casting sections. No floating-in of connection inserts shall be allowed.
  - 2. Where penetrations of the pre-cast concrete diversion structure are required, such penetrations shall be accommodated through pre-cast openings or core-drilled sections.
  - 3. Diversion structures need not be designed to resist thrust from piping passing through the diversion structure.
  - 4. Coordinate pipe penetration locations with piping arrangement as indicated on the Drawings.

## 2.6 FABRICATION TOLERANCES

- A. Maximum Out of Square: 1/8 inch in 10 feet, non-cumulative.
- B. Variation From Dimensions Indicated on Drawings: Plus or minus 1/8 inch.
- C. Maximum Misalignment of Anchors, Inserts, Openings: 1/8 inch.

## 2.7 SOURCE QUALITY CONTROL AND TESTS

- A. Section 01 45 00 - Quality Control: Testing, inspection, and analysis requirements.
- B. Test and analyze concrete in accordance with ACI 318.
- C. The precast contractor to submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

# PART 3 EXECUTION

## 3.1 PREPARATION

- A. Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.

### 3.2 ERECTION

- A. Pre-cast concrete sections shall be transported and handled with care in accordance with the manufacturer's written recommendations.
  - 1. Where lifting devices are provided in pre-cast sections, such lifting devices shall be used as intended.
  - 2. Where no lifting devices are provided, the Contractor shall follow the manufacturer's recommendations for lifting procedures to provide proper support during lifting.
- B. Buried pre-cast concrete structures shall be assembled and placed in excavations on properly compacted soil foundations as indicated. Pre-cast concrete diversion structures shall be set to grade and oriented to provide the required dimensions and clearances from pipes and other structures.
- C. Erect units without damage to shape or finish. Replace or repair damaged sections.
- D. Erect units level and plumb within allowable tolerances.
- E. Align and maintain uniform horizontal and vertical joints as erection progresses.
- F. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Engineer.
- G. Weld units in place. Perform welding in accordance with AWS D1.1.
- H. Touch-up field welds scratched or damaged surfaces.
- I. Weld reinforcing steel in accordance with AWS D1.4. Do not tack weld reinforcing.
- J. Exposed Joint Dimension: 1/2 inch.
- K. Where joints are designed in pre-cast concrete diversion structures, such joints shall be interlocking to secure proper alignment between members and prevent migration of soil through the joint. Structural sections at joints shall be sized sufficiently to reinforce the section against localized distress during transportation and handling and against excess contact bearing pressures through the joint.

### 3.3 ERECTION TOLERANCES

- A. Maximum Variation from Plane of Location: ¼ inch in 10 feet, non-cumulative.
- B. Maximum Offset from Indicated Alignment Between Two Connecting Units: 1/4 inch.
- C. Joint Tolerance: Plus or minus 1/4 inch.

### 3.4 FIELD QUALITY CONTROL

- A. Welding: Inspect welds in accordance with AWS D1.1.

### 3.5 ADJUSTING

- A. Adjust units so joint dimensions are within tolerances.

### 3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Use non-combustible shields during welding operations to protect adjacent Work.

END OF SECTION