

**STRUCTURAL STEEL**

- Detailing, fabrication and erection shall conform to the AISI Specifications and Standard Code of Practice for the year referenced in the building code noted and the project Specifications.
- Steel shall conform to the following grades unless otherwise noted:
  - W Shapes - ASTM A992 Grade 50 (Fy=50 ksi)
  - Plates, Channels, Angles and Bars - ASTM A36 (Fy=36 ksi)
  - Pipes - ASTM A53 (Fy=35 ksi)
  - Bolts - ASTM 325-n
  - Washers - ASTM F436
  - Nuts - ASTM A563
  - Anchor Rods (Bolts) - ASTM F1554 Grade 36 (Fy=36 ksi)
  - Welding Electrodes - E70xx
  - Clevis - ASTM A668
  - Turnbuckle - ASTM F1145
  - Grout for Base Plates - Prepacked, non-metallic, non-gaseous, and non-shrink per CRD C621 and ASTM C1107 at fluid consistency (Flow Cone) of 20-30 seconds. 28 day compressive strength = 7000 psi.
- All column base plates shall have a minimum of four (4) anchor rods.
- Steel fabrication and erection shall follow OSHA requirements.
- All welding shall be in accordance with the "Structural Welding Code", AWS D1.1, Latest Edition.
- General contractor shall verify all structural beam locations, mechanical units weights and opening sizes and locations with mechanical contractor and vendor's drawings for actual mechanical unit purchased.
- Cuts, holes, coping, etc. required for work of other trades shall be shown on the shop drawings and made in the shop. Cuts or burning of holes in the structural steel members in the field will not be permitted, unless specifically approved in each case by the engineer.
- Splicing of structural members where not detailed on the drawings is prohibited without prior approval of the structural engineer.
- Hot dip galvanize per ASTM A123 after fabricating the following steel members:
  - All Structural Steel Shapes
  - All Handrails, Posts and Plates
  - All Ladders and Brackets
  - All Lintels, Door Heads and Door Jambs
  - All Bollards inside building
  - Diamond Tread Plate
  - Fall Protection Tie-offs
  - Brackets
- Mechanical Galvanizing per ASTM B695 after fabricating the following steel members:
  - Bolts
  - Nuts
  - Washers
  - Anchor Rods
  - Threaded Rods
- Repair galvanized surfaces according to ASTM A 780.
- Stainless Steel Shall meet:
  - ASTM A276 for structural shapes
  - ASTM F593 and F594 for Bolts, Nuts, Anchors and Rods
- Stainless Steel shall be Type 304L Stainless Steel, unless noted otherwise.
- Hot Rolled Steel Diamond Tread Plate shall meet ASTM A786 Specifications.
  - Minimum yield strength = 36 ksi
  - Hot Dip Galvanized

**METAL DECKING**

- Fabricated roof decks, without top-flange stiffening grooves, shall comply with "Steel Deck Institute (SDI) Specifications and Commentary for Steel Roof Decks", in SDI Publication No. 30.
- Fabricated Noncomposite Steel Floor Deck shall comply with "Steel Deck Institute (SDI) Specifications and Commentary for Noncomposite Steel Form Deck", in SDI Publication No. 30.
- Deck shall be galvanized steel sheets that comply with ASTM A653, Structural Steel, Grade 33, G60 Galvanized Coating.
- Lap deck 4" minimum at splices center on support.
- Deck manufacturer shall coordinate size and location of roof openings with architectural and mechanical drawings and suppliers.
- No light gage framing, mechanical, electrical or other equipment shall be suspended from or attached to any metal roof deck.
- See drawings for deck attachment patterns.

**MASONRY**

- All masonry shall conform to "Building Code Requirements for Masonry Structures" (ACI 530/ASCE 5/TMS 402) and "Specifications for Masonry Structures" (ACI 530.1/ASCE 6/TMS 602) for the year referenced in the building code noted.
- All brick and concrete masonry and construction shall comply with the recommendations of Brick Industry of Association (BIA) and the National Concrete Masonry Association (NCMA) and minimum requirement established by noted building codes.
- Grout to fill cores shall be ASTM C476, coarse grout (3/8" maximum aggregate) with a minimum compressive strength of 3000 psi in 28 days.
- Concrete masonry units shall be units conforming to ASTM C90, Grade N, Type I, Light Weight (density of unit = 105 pcf), min. block compressive strength = 2400 psi, specified design strength of masonry, fm=1500.
- ASTM C270 Type "S" mortar with a minimum compressive strength of 1800 psi shall be used for all masonry.
- Reinforcing bars shall conform to AASHTO A706, Grade 60.
- All cores with reinforcement shall be filled solid with grout. Place reinforcing bars before grouting. Place grout in lifts not exceeding 5 feet. Consolidate each lift by mechanical vibration. The next lift of the pour may be after initial water loss and reconsolidation of the prior lift, while it is still plastic.
- Add an additional vertical reinforcement in center of fully grout cells at each side of openings in CMU wall and on each side of control joint, as shown on drawings.
- Properly secure reinforcing bars to maintain the position indicated on the drawings. Bars are to be located in center of cells unless otherwise noted.
- Mortar protrusions extending into cells or cavities to be reinforced and filled, shall be removed.
- Lay masonry units with full mortar coverage on horizontal and vertical face shell. Bed webs in mortar in starting course of footing and in all courses of columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with grout.
- All masonry walls shall have vertical control joints, as shown on drawings. Coordinate with locations indicated on architectural drawings. Control joints shall extend through entire wall thickness, except at continuous bond beams at the roof line the masonry shall be scored only.
- All CMU shall be temporarily braced during construction per the governing building code for lateral loads until permanent restraints have been installed. Temporary bracing is the sole responsibility of the contractor. The contractor is responsible for all cost associated with repairs resulting from improper or insufficient bracing.
- All lintels on the shall be hot dipped galvanized.
- Anchor brick to concrete block with seismic masonry-veneer anchors per Section 042000 of Specifications.
- Preformed Control-Joint Gaskets shall be made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain material stability in masonry wall.

**SPECIAL INSPECTIONS AND TESTING**

- The owner shall employ an independent special inspector and test agency to perform the required special inspections and tests per Specifications.
- Special inspection and testing reports shall be furnished to owner, structural engineer, and contractor.
- The special inspector shall submit a final report stating that the structural work was, to the best of the special inspector's knowledge, performed in accordance with the construction documents.
- Special inspections shall conform to Chapter 17 of the International Building Code, IBC, 2012. Special inspections include:
  - Steel Construction - Section 1705.2 of IBC 2012
  - Concrete Construction - Section 1705.3 of IBC 2012
  - Masonry Construction - Section 1705.4 of IBC 2012
  - Soils - Section 1705.6 of IBC 2012

**SAFETY GATE:**

- Safety gates shall meet OSHA Requirements
- The gates shall be able to be installed with no cutting, welding or drilling. The gates shall fit the handrail.
- The gates shall have stainless steel springs that automatically close the gate after each passage.
- The gates shall have a positive stop mechanism that provides a positive stop without handrail or handrail post contact.
- The gates shall be A36 Carbon Steel Galvanized.

**SUGGESTED SEQUENCE OF CONSTRUCTION - EXISTING PUMP STATION BUILDING:**

- Completely remove existing Flexicore Roof, 8-inch monorail, and existing CMU wall, as shown on demo drawings.
- Sawcut 42"x30" Opening in slab at elevation 418.64, as shown on demo sheets.
- Disconnect and remove existing Pump No. 1 (SW-P01).
- Frame and pour 12" full height wall between Pump No. 1 (SW-P01) and Pump No. 2 (SW-P02) at elevation 412.64 (Stage 1 Construction Line). Use rapid hardening concrete.
- Patch manhole and existing Pump 1 openings at elevation 418.64 with new concrete (do not patch areas where new openings will be added).
- Patch existing Pump 1 openings at elevation 412.64 and 393.64 with new concrete (do not patch areas where new openings will be added).
- Frame and pour (3) 12"x10" Reinforced Concrete Beams around Pump No. 1 (SW-P01) opening below elevation 418.64.
- Frame and pour 28"x12" Reinforced Concrete Beam between Pump No. 1 (SW-P01) and Pump No. 2 (SW-P02) at elevation 393.64 (Stage 1 Construction Line).
- Frame and pour Reinforced Concrete Beams around Pump No. 1 (SW-P01) opening at elevation 393.64.
- Core openings, for New Pump No. 1, into slabs at elevation 418.64, 412.64, and 393.64 and into existing concrete wall. See demo sheets for opening sizes.
- Seal 2'-0" square opening in new 12" full height concrete wall with steel plate.
- Install new pump 1 (SW-P01) and all attachments and bring pump into service.
- Repeat Steps 3 and 4 for Pump No. 2 (SW-P02).
- Remove and salvage steel plate from new concrete wall and move plate to new wall.
- Repeat Steps 5-12 for Pump No.2 (SW-P02).
- Remove steel plate from new concrete wall.
- Frame and pour 12" full height wall between Pump No. 3 (SW-P03) and Pump No. 4 (SW-P04) at elevation 412.64.
- Disconnect and remove existing Pump No. 3 (SW-P03).
- Patch existing Pump 3 openings at elevation 418.64, 412.64 and 393.64 with new concrete (do not patch areas where new openings will be added).
- Frame and pour (2) 12"x10" Reinforced Concrete Beams around Pump No. 1 (SW-P01) opening below elevation 418.64.
- Remove existing slab at elevation 393.64 and existing 12" thick concrete wall at elevation 412.64, as shown on demo plans.
- Frame and pour Reinforced Concrete Slab (Stage 3 Construction Line) at elevation 393.64.
- Frame and pour Reinforced Concrete beams around Pump No.3 (SW-P03) opening at elevation 393.64.
- Core openings, for New Pump No. 3, into slabs at elevation 418.64, 412.64, and 393.64. See demo sheets for opening sizes.
- Core openings, for New Pump No. 4, into slabs at elevation 412.64, and 393.64. See demo sheets for opening sizes.
- Install new pumps 3 (SW-P03) and 4 (SW-P04), stilling well, and all attachments and bring pumps into service.
- Complete remaining Stage 3 demo.
- Complete all CMU work, handrail and grating installation, steel construction and new roof construction, as shown on plans

SUMMARY OF QUANTITIES					
CODE NO.	ITEM	UNIT	EXISTING PUMP STATION BUILDING QUANTITY	WELL HOUSE BUILDING QUANTITY	TOTAL QUANTITY
50102400	CONCRETE REMOVAL	CU YD	6.9	-	6.9
50200100	STRUCTURE EXCAVATION	CU YD	-	1825	1825
50300225	CONCRETE STRUCTURES	CU YD	11.3	378.3	1825
50800105	REINFORCEMENT BARS	POUND	2360	63600	65960
50800515	BAR SPLICERS	EACH	-	57	57
51202100	FURNISHING STEEL PILES HP14X117	FOOT	-	960	960
51202305	DRIVING PILES	FOOT	-	960	960
51204100	TEST PILE STEEL HP14X117	EACH	-	1	1
X2090210	POROUS GRANULAR BACKFILL, SPECIAL	CU YD	-	3000	3000
Z0012754	STRUCTURAL REPAIR OF CONCRETE (DEPTH EQUAL TO OR LESS THAN 5 INCHES)	SQ FT	7	-	7
* Weight of Grade 50 Steel = 14360 lbs, Grade 36 Steel = 14330 lbs and Grade A53 Steel = 1530 lbs					

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USER NAME = seb	DESIGNED - RJP	REVISED - AMS - 9/25/14
PLOT SCALE = 40.0000' / 1"	CHECKED - ADL	REVISED -
PLOT DATE = 9/25/2014	DATE -	REVISED -

**STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION**

<b>STRUCTURAL NOTES</b>	
<b>MISSOURI AVENUE DEEP WELL FACILITY</b>	
SCALE: AS NOTED	SHEET 2 OF 2 SHEETS
STA. TO STA.	

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
64	82-4T-1	ST. CLAIR	185	76
CONTRACT NO. 76C99				
ILLINOIS FED. AID PROJECT				

**S002**