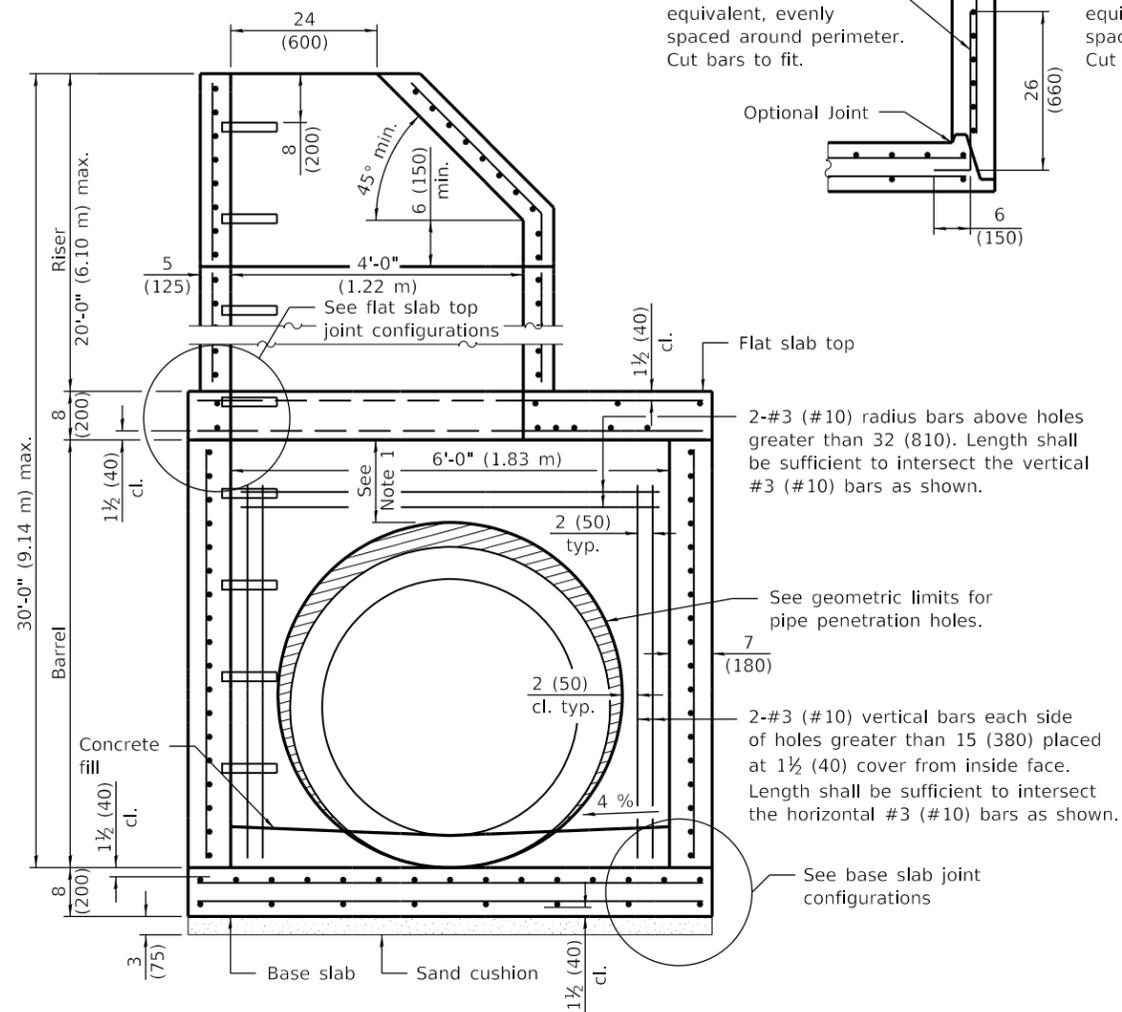


SECTION PARALLEL TO PIPE
(Without conical top riser)

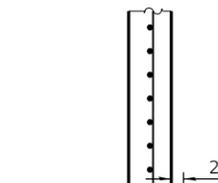
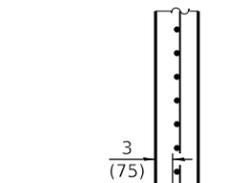
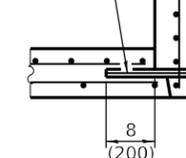
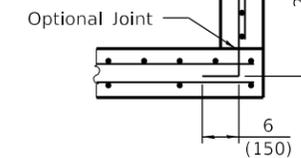
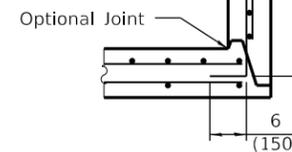


SECTION PERPENDICULAR TO PIPE
(With conical top riser)

11-#4 (#13) bars or equivalent, evenly spaced around perimeter. Cut bars to fit.

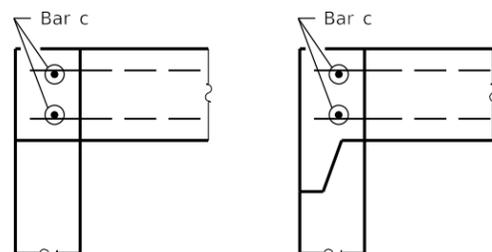
11-#4 (#13) bars or equivalent, evenly spaced around perimeter. Cut bars to fit.

14-#5 (#16) bars evenly spaced drilled and grouted in place at center of slab



Single-element shear key at center of slab

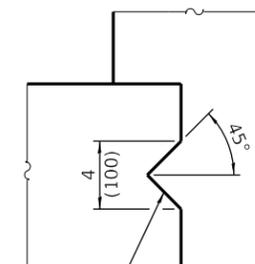
BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

- Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).
- Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
- Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
- Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
- Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
- Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



Single-element shear key at center of slab

SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

GENERAL NOTES

- Pipe holes shall be formed to facilitate proper placement of hole reinforcement.
- The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.
- Lifting holes shall be located in the sections as per the manufacturer's recommendations.
- See Standard 602701 for details of manhole steps.
- All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
1-1-21	Revised Note 1, Note 2 and lifting hole general note.
3-1-19	Moved wall reinforcement from inside face to middle.

PRECAST MANHOLE TYPE A
6' (1.83 m) DIAMETER

(Sheet 1 of 3)

STANDARD 602406-11

Illinois Department of Transportation

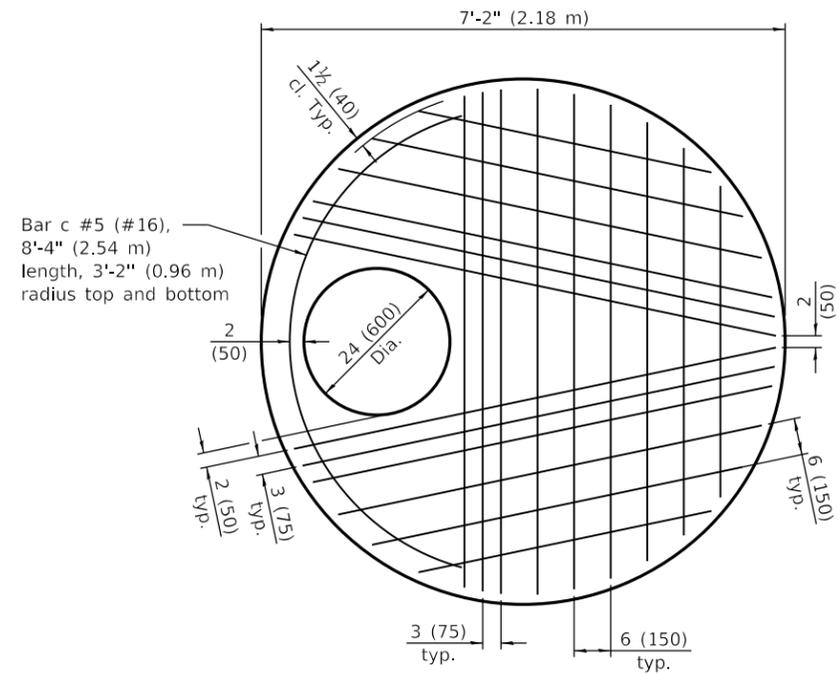
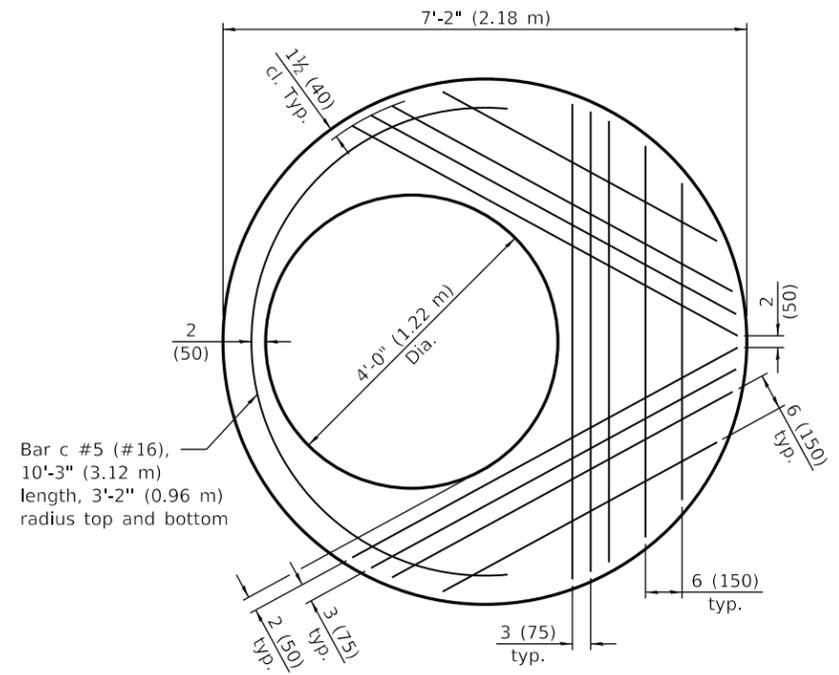
PASSED January 1, 2021

 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2021

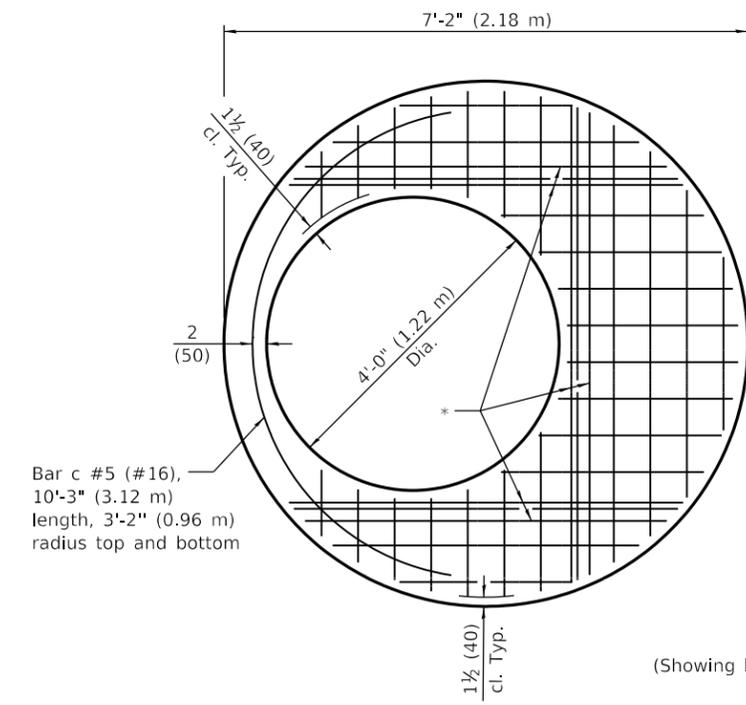
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-21



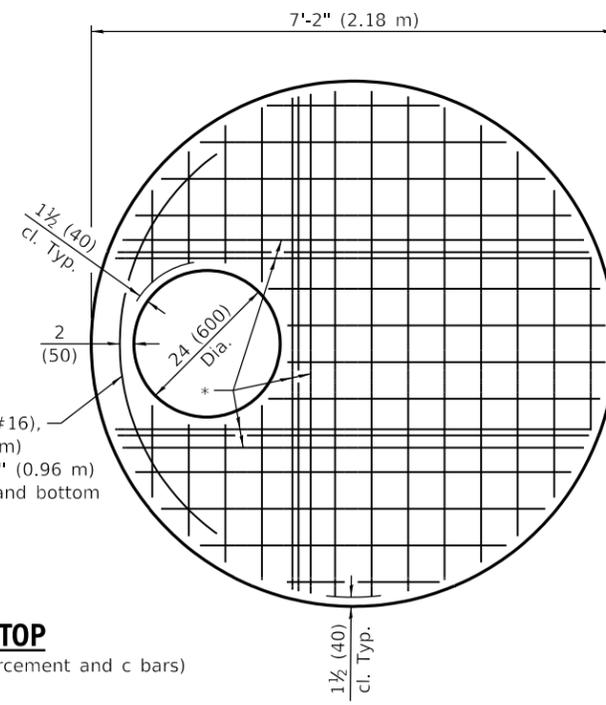
PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)



* #5 (#16) bars for risers ≤ 10 ft. (3.05 m) tall or #6 (#19) bars for risers > 10 ft. (3.05 m) tall bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

Illinois Department of Transportation

PASSED January 1, 2021
Michael Bond
 ENGINEER OF POLICY AND PROCEDURES

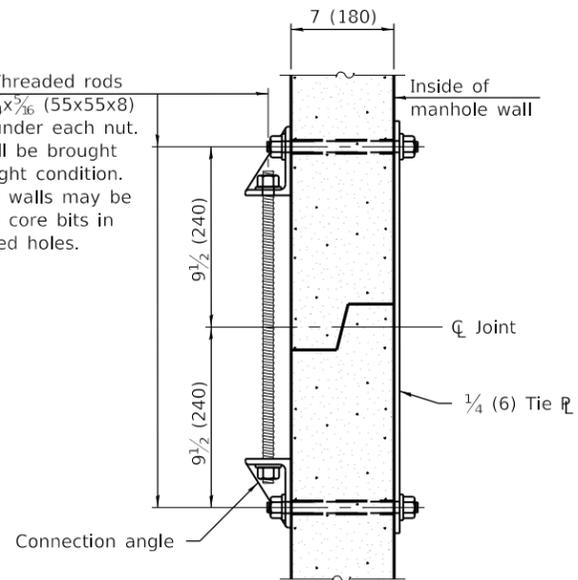
APPROVED January 1, 2021
J. E. ...
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

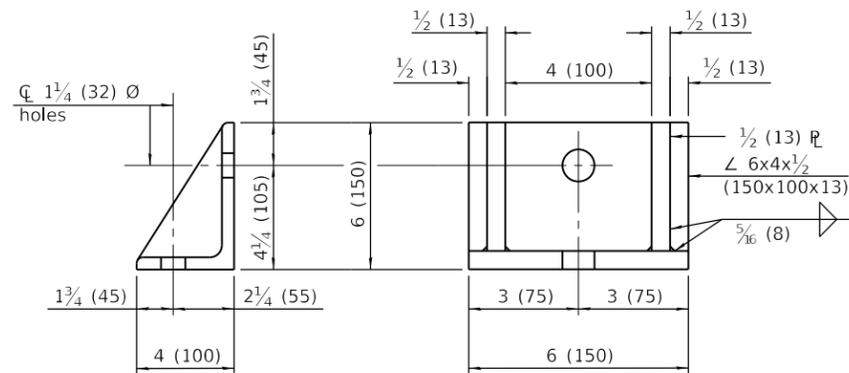
PRECAST MANHOLE TYPE A
6' (1.83 m) DIAMETER
 (Sheet 2 of 3)

STANDARD 602406-11

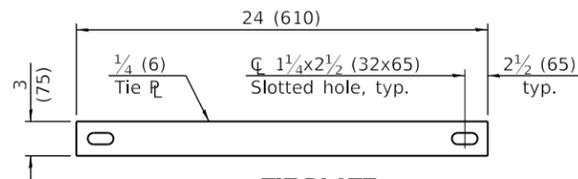
\varnothing 1(25) \varnothing Threaded rods with $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{3}{16}$ (55x55x8) \varnothing washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		A_s (min.)	Spacing (max.)	A_s (min.)	Spacing (max.)	Bar Size
Top Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	RH \leq 10 ft. (3.05 m)	** 0.62 sq. in./ft. (1312 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)
	RH > 10 ft. (3.05 m)	** 0.88 sq. in./ft. (1863 sq. mm/m)	6 (150)			#6 (#19)

** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

Location	Orientation	WWR or Rebar	
		A_s (min.)	Spacing (max.)
4 ft. (1.22 m) \varnothing Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
6 ft. (1.83 m) \varnothing Barrel	Circumferential	0.18 sq. in./ft. (381 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

BASE SLAB REINFORCEMENT

Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)	
		A_s (min.)	Spacing (max.)
Top Mat	RH \leq 10 ft. (3.05 m) & TH \leq 20 ft. (6.10 m)	0.28 sq. in./ft. (593 sq. mm/m)	6 (150)
	RH > 10 ft. (3.05 m) or TH > 20 ft. (6.10 m)	0.40 sq. in./ft. (847 sq. mm/m)	6 (150)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)