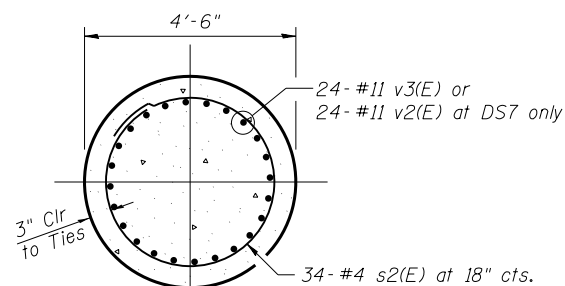
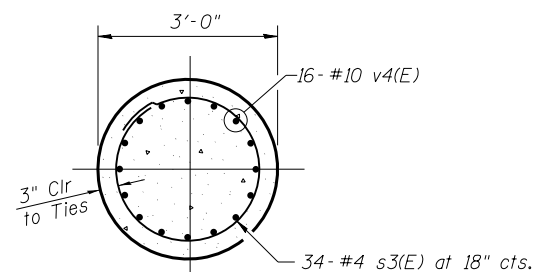


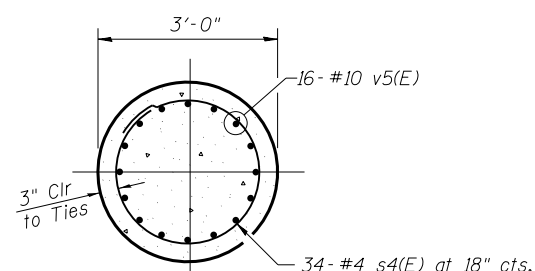
SECTION F



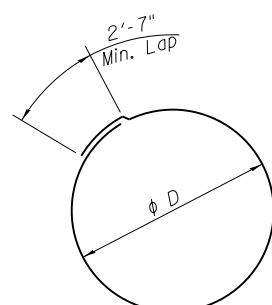
SECTION G



SECTION H

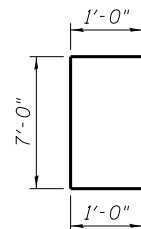


SECTION I

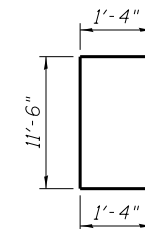


BAR	phi D
s1(E)	4'-6"
s2(E)	4'-0"
s3(E)	2'-6"
s4(E)	2'-6"

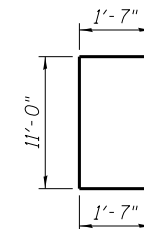
TIES



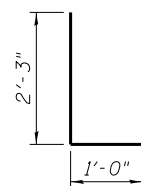
BAR v(E)



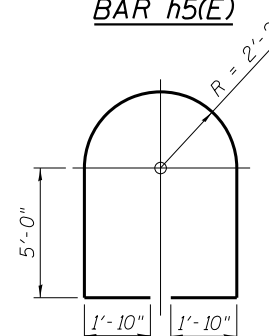
BAR h5(E)



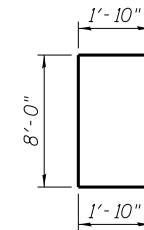
BAR h10(E), h13(E), h25(E)



BAR v1(E)



BAR h19(E)



BAR h21(E)

NOTES:

- For water main general notes, location plans, profiles, details and thrust restraint locations and types see Sheet Nos. 140 through 146. For existing water main reference drawings, see Sheet Nos. 150 through 153.
- Exact locations of existing water mains, existing concrete thrust blocks and existing below grade structures and utilities shall be determined in the field prior to excavation for water mains and drilling shafts for new reinforced concrete thrust restraints and pipe supports. Any conflicts with existing structures and utilities due to field conditions encountered that will impact construction shall be brought to the attention of the Engineer, so as not to delay construction, along with detailed locations of conflicting structures and utilities and suggested solutions to resolve the conflict for Engineer review and approval. Any changes required as a result of field conditions encountered shall be considered incidental to the cost of the respective pay item.
- Contractor shall protect existing buried and above ground structures and utilities that are to remain during construction of the water main and thrust restraints. The cost of such protection shall be incidental to the cost of the 54-inch water main relocation pay item.
- New permanent concrete thrust restraints shall have been in place for a minimum of 28 days and shall have achieved a minimum 28 day compressive strength of 4000 psi prior to pressure testing pipe with water.
- Maximum test pressure for water mains = 100 psi.
- Fitting bends shall not be encased in concrete unless otherwise noted on the drawings. Minor adjustments to concrete dimensions and reinforcing bars shown may be required in the field and shall be considered incidental to the cost of the respective pay item.
- Trench excavation and backfill for thrust restraint is incidental to the cost of the 54-inch water main relocation pay item.
- Mechanical reinforcing bar splices, where shown or required, and stainless steel reinforcing bars shall be considered incidental to Reinforcement Bars, Epoxy Coated pay item.
- Soft clays occur in the soil profile for the borings in this area. Contractor shall review Geotechnical Report and boring logs in his selection of methods to support the excavation in the various stages of shaft drilling, cleaning and concrete placement dependent on the boring logs and site conditions encountered. Surface water shall not be permitted to enter the hole. The Contractor shall comply with the requirements of the Illinois Department of Transportation (IDOT) and the various infrastructure departments of the City of Chicago, including, but not limited to, the Chicago Department of Transportation (CDOT), the Office of Underground Coordination (OUC) and the Department of Water Management (DWM).
- Shafts must be drilled into stiff to very stiff clay layer with a minimum net allowable soil bearing capacity of 6000 PSF, however, the drilled shaft shall not be less than 50 feet in length.
- Concrete Cover:
 - Concrete placed against earth - 3"
 - Concrete in contact with earth - 2"
- All work to conform to IDOT Standard Specifications for Road and Bridge Construction, latest edition.
- Work this sheet with Sheet Nos. 147, 148 and 148A.

**THRUST RESTRAINTS
BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
h1(E)	36	#6	2'-6"	U
h1(E)	24	#6	11'-6"	U
h2(E)	20	#6	5'-6"	U
h3(E)	16	#9	14'-6"	U
h4(E)	20	#6	5'-6"	U
h5(E)	5	#8	14'-2"	U
h6(E)	24	#6	5'-6"	U
h7(E)	12	#6	11'-0"	U
h8(E)	7	#6	8'-6"	U
h9(E)	9	#6	6'-6"	U
h10(E)	4	#9	14'-2"	U
h11(E)	24	#6	4'-6"	U
h12(E)	10	#6	11'-0"	U
h13(E)	4	#9	14'-2"	U
h14(E)	10	#6	4'-0"	U
h15(E)	10	#6	4'-6"	U
h16(E)	6	#5	2'-6"	U
h17(E)	6	#5	3'-0"	U
h18(E)	14	#6	6'-6"	U
h19(E)	2	#10	20'-6"	U
h20(E)	10	#6	4'-0"	U
h21(E)	10	#10	13'-8"	U
h22(E)	10	#6	4'-0"	U
h23(E)	10	#6	11'-0"	U
h24(E)	8	#6	3'-0"	U
h25(E)	10	#9	14'-2"	U
v(E)	12	#6	9'-0"	L
v1(E)	6	#6	3'-3"	L
v2(E)	112	#11	57'-0"	U
v3(E)	192	#11	52'-6"	U
v4(E)	48	#10	51'-0"	U
v5(E)	16	#10	57'-0"	U
s1(E)	68	#4	16'-9"	O
s2(E)	340	#4	15'-2"	O
s3(E)	102	#4	10'-6"	O
s4(E)	34	#4	10'-6"	O
Item	Unit	Quantity		
Concrete Structures	Cu. Yd.	97		
Reinforcement Bars, Epoxy Coated	Pound	112,300		
Drilled Shaft In Soil	Cu. Yd.	421		

SCHEDULE FOR DRILLED SHAFTS IN SOIL

MARK	TOTAL QUANTITY	ELEV. @ WATERMAIN (FEET)	ELEV. TOP OF DRILLED SHAFT (FEET)	ELEV. BOTTOM OF DRILLED SHAFT (FEET)	MINIMUM DRILLED SHAFT LENGTH (FEET)	MINIMUM DRILLED SHAFT DIAMETER (FEET)	VERTICAL REINFORCEMENT BARS	CIRCULAR TIES	SECTION
DS1	2	571.43	567.68	517.68	50	5'-0"	32- #11	34- #4 at 18"	F
DS2	2	569.07	567.57	517.57	50	4'-6"	24- #11	34- #4 at 18"	G
DS3	3	569.07	567.57	517.57	50	4'-6"	24- #11	34- #4 at 18"	G
DS4	3	587.45	585.95	535.95	50	4'-6"	24- #11	34- #4 at 18"	G
DS5	3	588.45	587.70	537.70	50	3'-0"	16- #10	34- #4 at 18"	H
DS6	1	571.43	567.68	517.68	50	3'-0"	16- #10	34- #4 at 18"	I
DS7	2	587.45	583.70	533.70	50	4'-6"	24- #11	34- #4 at 18"	G

LEGEND
DS - Drilled Shaft



USER NAME = cleerd	DESIGNED - AAG	REVISED
	CHECKED - DHR	REVISED
PLOT SCALE = N.T.S.	DRAWN - DLC	REVISED
PLOT DATE = 9/15/2013	CHECKED - AAG	REVISED

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

**WATER MAIN THRUST RESTRAINTS
SECTIONS, SCHEDULES AND NOTES**

SHEET NO. 4 OF 4 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
90/94/290	2013-008R	COOK	559	149
CONTRACT NO. 60W26			ILLINOIS FED. AID PROJECT	

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