

**SP-120001
(New)**



**SPECIAL PROVISIONS
FOR
DEWATERING**

**Pottawattamie County
IM-080-1(423)2--13-78
STP-U-1642(662)--70-78**

**Effective Date
October 16, 2012**

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

1. SCOPE OF WORK

- 1.1.** The Work of this Section includes site dewatering necessary to lower and control groundwater levels and hydrostatic pressure to permit excavation and construction to be performed properly under dry conditions.
 - 1.1.1.** The groundwater shall be lowered and maintained to an absolute minimum of 3 feet or lower below the lowest excavation made for the trench as required to place pipe bedding and manhole bedding.
- 1.2.** Dewatering operations shall be adequate to assure the integrity of the finished project. The responsibility for conducting the dewatering operation in a manner which will protect adjacent structures and facilities rests solely with the Contractor. The cost of repairing any damage to adjacent structures and restoration of facilities shall be the responsibility of the Contractor.
- 1.3.** The Contractor shall bear the sole responsibility for the design, installation, operation, monitoring, and removal of the dewatering system to comply with the requirements of this section and any applicable regulatory agencies. The Contractor shall be required to install additional dewatering equipment as may be required throughout the duration of the project to maintain groundwater level as described in Paragraph 1.1.1.
- 1.4.** The Contractor shall be responsible for submitting the applications and obtaining the required permits for the well construction including obtaining approval from the Council Bluffs Department of Public Health and the Pottawattamie County Office of Planning and Development. Copies of these guidelines are available from the respective agencies. The Contractor shall also be responsible for filing a Field Office Notification with the Iowa Department of Natural Resources (IDNR) and developing a Well Water Pollution Prevention Plan for the discharge of wastewater from well construction activities per the IDNR NPDES General Permit #6. Copies of these guidelines and blank forms are available from the IDNR.
- 1.5.** The Contracting Authority will notify the Contractor of any demands brought upon the project by the IDNR. The Contractor shall cooperate with the Contracting Authority in its efforts to comply with the site-specific guidelines provided by the IDNR, including the possibility of adjusting the dewatering system if the discharge exceeds limits imposed by the IDNR. The Contracting Authority will be responsible for the costs of sampling and laboratory analysis if required by the IDNR.

2. SCHEDULE AND PLAN

- 2.1.** Prior to commencement of construction, the Contractor shall submit a detailed dewatering plan including: dewatering method, a list of equipment and estimated pumping rates.
- 2.2.** Attached for the Contractor's information as an Appendix to these contract documents is geotechnical information collected for the project. Fluctuations of the groundwater level can occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings were completed. The geotechnical information was prepared for design purposes only and may not be adequate for a Contractor to evaluate construction conditions or design the dewatering system. The Contractor should independently interpret the soil/groundwater conditions taking into consideration their intended means and methods of construction, and the Contractor may perform additional exploration at their own expense as necessary for design of the dewatering system.
 - 2.2.1.** Due to possible variations of soil conditions and groundwater levels between soil bore locations the Contractor shall be responsible for changing or modifying the dewatering system to accommodate such variations.

3. MATERIALS

- 3.1 Foundation rock shall be crushed limestone and meet Iowa DOT Gradation No. 13.

4. CONTROL AND OBSERVATION

- 4.1. Adequate control shall be maintained by the Contractor to ensure that the stability of excavated slopes are not adversely affected by water, that erosion is controlled and that flooding of excavation or damage to structures does not occur. The Contractor is solely responsible for site excavation safety and compliance with OSHA regulations, in particular Standard 29 CFR, part number 1926. The Engineer assumes no responsibility for site safety; the above information is provided for consideration by the Contractor only.
- 4.2. The Contracting Authority reserves the right to install piezometers, at its own expense, to observe the groundwater levels and monitor the performance of the system.
- 4.3. The Contractor will be required to excavate a pothole, disturbing the smallest footprint possible, to the elevation as described in Paragraph 1.1.1 for that reach of piping. Said pothole excavation shall be made at the following frequency:
- At the beginning of any day where any trench has not been completely backfilled.
 - At every 150-lineal feet of trench along the length of the pipe run.
 - At the end of every day. (The pothole made at the end of the day shall be left open and shall be used as the pothole for the beginning of the next day of construction.)
- 4.3.1. When observation of the groundwater level is complete the pothole shall be backfilled with foundation rock, and the Contractor shall be paid for the quantity used based on the contract unit price.
- 4.3.2. When directed by the Engineer, the Contractor will be required to excavate a pothole to determine if the groundwater is at the acceptable absolute minimum level or lower.

5. INSPECTION

- 5.1. During or after any trench excavation. If Contractor observes sufficient soil instability present that may prevent proper installation of pipe bedding, pipelines, backfill and compaction, then Contractor shall call for inspection of conditions by the Engineer. The Engineer shall inspect the conditions and determine if they are unacceptable for pipe installation.
- 5.2. If after dewatering has lowered the groundwater level as specified and unacceptable trench conditions are found by the Engineer, then the Contractor may be directed to increase dewatering pumping rates or install additional wells to lower the groundwater to an acceptable level lower than that defined in Paragraph 1.1.1. If more extensive dewatering is required the Contractor must achieve the revised acceptable groundwater level before construction may continue.

6. EXECUTION

- 6.1. The Contractor shall furnish, install, and operate pumps, pipes, appliances, and equipment of sufficient capability to maintain the absolute minimum or lower groundwater elevation described in Paragraph 1.1.1 within the trench excavation limits until the trench is backfilled, unless otherwise authorized by the Engineer.
- 6.2. The Contractor shall provide any temporary ground surface piping necessary to convey dewatering well water discharge to an acceptable storm sewer intake with the capacity to convey said discharge. Any rerouting of temporary ground surface piping, necessary to complete the project, will be provided by the Contractor. Discharge directly onto the ground surface shall not be allowed unless approved by the Engineer. The Contractor shall supply a clean tapping device at each well location to allow easy discharge water sampling by the Engineer.

- 6.3. An adequate system shall be designed, installed and maintained to lower and control the groundwater elevations as described in Paragraph 1.1.1 to permit excavation, construction of structures, and placement of fill materials to be performed under dry conditions.
- 6.4. The system shall be placed into operation, prior to beginning excavating below the natural groundwater level, to lower the groundwater to the elevation as described in Paragraph 1.1.1 and shall be operated continuously 24 hours a day, 7 days a week until sewers have been constructed and backfill materials have been placed to the top of the trench.
- 6.4.1. If the dewatering system shuts down or if pumping is suspended, the groundwater levels will need to be lowered to the required level, as described in Paragraph 1.1.1, and verified by the Engineer before continuing any construction, including excavation or backfilling. The Engineer will also require any compaction, moisture and/or other soils testing, as determined necessary, of any backfill that is prematurely subjected to groundwater to verify said soils stability prior to placement of additional backfill. If said soils are determined to be unacceptable the Contractor will be required to remove and replace damaged soils at their own expense.
- 6.5. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of subgrade soils at the bottom of the proposed excavation.
- 6.6. Diversion ditches and dikes shall be used, where necessary, to prevent surface water from entering the excavation.

7. MEASUREMENT FOR PAYMENT

- 7.1. The measurement and payment for all work covered under this section except foundation rock will be made at the contract lump sum price for Dewatering which shall constitute full compensation for obtaining any necessary permits and furnishing all equipment, labor, and materials to install, operate, maintain, and remove the dewatering system in accordance with all applicable regulations.
 - 7.1.1. No payment shall be made to the Contractor until copies of the permits are supplied to the Contracting Authority.
 - 7.1.2. The cost of pothole excavations, excluding foundation rock backfill, shall be considered incidental to the lump sum bid item Dewatering. If any additional pothole excavations are requested by the Engineer, as stated in Paragraph 4.3.2, the Contractor will be paid for said excavations on an each basis per bid item Pothole Excavations. If the additional potholes are needed as a direct result of the Contractor's actions or negligence they will be done at the sole expense of the Contractor.
 - 7.1.3. Foundation Rock will be paid at the contract unit price in tons. The quantity will be measured by the Engineer from scale tickets provided by the Contractor.
 - 7.1.4. The Contractor shall be required to submit a schedule of values to the Engineer to explain the breakdown of the lump sum price. This schedule of values will only be used to determine the appropriate amount of the lump sum to be attributed to each progress payment. The following list contains items that should be used, at a minimum, for the schedule of values:
 - Obtaining permits and complying with permit requirements.
 - Drilling the wells.
 - Installing the pumps.
 - Installing power supply.
 - Discharge and/or manifold piping.
 - Removal.

LEGEND OF TERMS

Soil Description Terms

Consistency - Fine Grained Very Soft, Soft, Firm, Hard, Very Hard	Consistency - Coarse Grained Very Loose, Loose, Medium Dense, Dense, Very Dense	Moisture Conditions Dry, Slightly Moist, Moist Very Moist, Wet (Saturated)
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Sample Identification

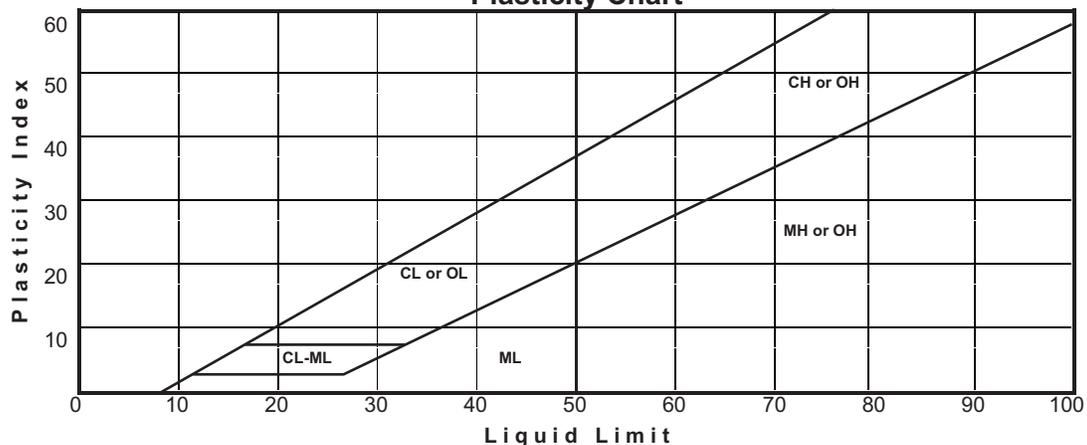
Sample Type U -- Undisturbed (Shelby Tube) S -- Split barrel (disturbed) C -- Continuous sample A -- Auger cuttings (disturbed)	Sample Data No. -- Number SPT -- Standard penetration test bpf -- blows per foot Rec -- Recovery	Laboratory Data MC -- Moisture content γ_d -- Dry unit weight q_u -- Unconfined compression LL/PI -- Liquid limit & plasticity index
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Unified Soil Classification System

Peat	Pt	Highly organic soils	50% or more smaller than No. 200 sieve	
Fat Clay	CH	Clay - Liquid Limit > 50 *		
Elastic Silt	MH	Silt - Liquid Limit > 50 *		
Lean Clay	CL	Clay - Liquid Limit < 50 *		
Silt	ML	Silt - Liquid Limit < 50 *		
Silty Clay	CL-ML	Silty Clay *	More than 50% larger than No. 200 sieve and % sand > % Gravel	
Clayey Sand	SC	Sands with 12 to 50 percent smaller than No. 200 sieve *		
Silty Sand	SM			
Poorly-Graded Sand with Clay	SP-SC	Sands with 5 to 12 percent smaller than No. 200 Sieve *		
Poorly-Graded Sand with Silt	SP-SM			
Well-Graded Sand with Clay **	SW-SC			
Well-Graded Sand with Silt **	SW-SM			
Poorly-Graded Sand	SP	Sands with less than 5 percent smaller than No. 200 sieve *		More than 50% larger than No. 200 sieve and % gravel > % sand
Well-Graded Sand **	SW			
Clayey Gravel	GC	Gravels with 12 to 50 percent smaller than No. 200 Sieve *		
Silty Gravel	GM			
Poorly-Graded Gravel with Clay	GP-GC	Gravels with 5 to 12 percent smaller than No. 200 sieve *		
Poorly-Graded Gravel with Silt	GP-GM			
Well-Graded Gravel with Clay **	GW-GC			
Well-Graded Gravel with Silt **	GW-GM			
Poorly-Graded Gravel	GP	Gravels with less than 5 percent smaller than No. 200 sieve *		
Well-Graded Gravel **	GW			

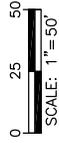
* See Plasticity Chart for definition of silts and clays
 ** See Criteria for Sands and Gravels for definition of well-graded

Plasticity Chart



Criteria for Sands and Gravels

Boulders	Cobbles	Coarse Gravel	Fine Gravel	Coarse Sand	Medium Sand	Fine Sand	FINES (silt or clay)
Sieve size 10"	3"	3/4"	#4	#10	#40	#200	
Well-graded sands (SW) $C_u = D_{60}/D_{10} \geq 6$ and $C_c = (D_{30})^2 / (D_{10} \times D_{60}) \leq 3$ and ≥ 1							
Well-graded gravels (GW) $C_u = D_{60}/D_{10} \geq 4$ and $C_c = (D_{30})^2 / (D_{10} \times D_{60}) \leq 3$ and ≥ 1							



LEGEND
⊕ BORING LOCATION



Thieme Geotech Inc

PROJECT
24TH STREET SEWER RELOCATION
24th STREET AND I-80
COUNCIL BLUFFS, IOWA
JOB # 12117.00 | DATE: 3/24/12

BORING LOCATION PLAN



BORING LOG

WATER LEVEL OBSERVATIONS		PROJECT				DRILLER	LOGGER	JOB NO.	DATE				
During Drilling	9.0'	24th Street Sewer Relocation Project				Gappa	Kalbach	12117.00	3/16/12				
End of Drilling	9.0'	LOCATION				DRILLING METHOD		DRILL RIG	BORING NO.				
		24th Street & I-80, Council Bluffs, IA				6" flight augers		CME 45	B-1				
		LOCATION OF BORING				TYPE OF SURFACE		ELEVATION	DEPTH				
boring backfilled with cuttings		see Boring Location Plan				grass		974	20'				
DEP (ft.)	VISUAL/MANUAL DESCRIPTION						SAMPLE DATA			LABORATORY DATA			DEP (ft.)
	COLOR	MOIST.	CONSIST.	SOIL TYPE	GEOLOGIC ORIGIN	REMARKS	NO. & TYPE	SPT (bpf)	REC (in.)	MC (%)	γ_d (pcf)	q_u (tsf)	
5	grayish brown	slightly moist	soft	silt	fill	much fine grained sand	U-1			13.4	107.8	0.67	
	grayish brown	moist	loose	silty sand	alluvium	fine grained	S-2	8		16.1			
10		wet				fine to medium grained	S-3	4		33.6			P200 14.7% SM
15	dark gray					fine grained							
	olive gray						S-4	8		28.2			
20							S-5	7		23.3			
25						bottom of boring @ 20'							



BORING LOG

WATER LEVEL OBSERVATIONS		PROJECT		DRILLER	LOGGER	JOB NO.	DATE
During Drilling	12.0'	24th Street Sewer Relocation Project		Gappa	Kalbach	12117.00	3/16/12
End of Drilling	10.4'	LOCATION		DRILLING METHOD		DRILL RIG	BORING NO.
		24th Street & I-80, Council Bluffs, IA		6" flight augers		CME 45	B-2
		LOCATION OF BORING		TYPE OF SURFACE		ELEVATION	DEPTH
boring backfilled with cuttings		see Boring Location Plan		grass		977	20'

DEP (ft.)	VISUAL/MANUAL DESCRIPTION						SAMPLE DATA			LABORATORY DATA				DEP (ft.)
	COLOR	MOIST.	CONSIST.	SOIL TYPE	GEOLOGIC ORIGIN	REMARKS	NO. & TYPE	SPT (bpf)	REC (in.)	MC (%)	γ_d (pcf)	q_u (tsf)	LL/PI CLASS	
5	grayish brown	moist	firm	silt	fill	minor fine grained sand								5
				lean clay		trace brick	U-1			20.0	102.3	0.92		
10	light grayish brown	moist	medium dense	poorly graded sand with silt	alluvium	fine grained		13		21.0				10
							S-2							
							S-3	17		22.2				
15	olive gray	wet											15	
							S-4	14		23.8		P200 11.9% SP-SM		
20							S-5	23		24.0			20	
25						bottom of boring @ 20'							25	



SOIL TEST SUMMARY

Project	24th Street Sewer Relocation Project	Job No.	12117.00
Location	24th Street & Interstate 80, Council Bluffs, IA	Date	3/22/2012

BORING NO.	SAMPLE NO.	SAMPLE DEPTH (ft.)	SAMPLE DIA. (in.)	MOISTURE CONTENT (%)	UNIT WEIGHT		VOID RATIO (e)	SAT. (%)	UNCONFINED COMPRESSION		SOIL CLASSIFICATION					REMARKS		
					WET (pcf)	DRY (pcf)			q _u (tsf)	STRAIN (%)	ATTERBERG LIMITS			PASS #200 (%)				
											LL	PL	PI					
B-1	U-1	0.5-2	2.85	13.4	122.3	107.8	0.563	64	0.67	4.7								
	S-2	3.5-5		16.1														
	S-3	8.5-10		33.6													14.7	SM
	S-4	13.5-15		28.2														
	S-5	18.5-20		23.3														
B-2	U-1	0.5-2	2.85	20.0	122.8	102.3	0.647	83	0.92	3.8								
	S-2	3.5-5		21.0														
	S-3	8.5-10		22.2													11.9	SP-SM
	S-4	13.5-15		23.8														
	S-5	18.5-20		24.0														