

DEWATERING SPECIFICATION AS PER ADDENDUM NOTE

1.0 DESCRIPTION. The Contractor shall be responsible to design, furnish, install, operate and maintain a temporary dewatering system as required to lower and control ground water levels, hydrostatic pressures, and control surface water, and precipitation entering the excavation during construction; disposing of pumped water; constructing, coordinating, maintaining and observing, installing and removing of equipment and instrumentation for the control of the system.

2.0 SUBMITTALS. The Contractor shall submit the following in accordance with the below requirements.

- A. Reference Standards.** This section is not applicable.

- B. Shop Drawings.** The Contractor shall provide a dewatering plan including drawings and written text which illustrates the location and identification of the components of the proposed dewatering system. The plan shall include but is not limited to the following:
 1. Proposed locations and number of wells, well points (where applicable) and sumps.
 2. Proposed casing diameters and depths.
 3. Proposed location and size of the discharge piping.
 4. Proposed estimated total pumping horsepower and standby power generator(s) capacity.
 5. Proposed location and size of sediment pond and any erosion or stormwater pollution prevention measures; explanation/sizing calculation of discharge methodology.
 6. Proposed means of flow monitoring.

- C. Calculations.** The Contractor is responsible for adequacy of the dewatering system design to:
 1. Pre-drain the water-bearing strata above and below the bottom of the structure foundations, drains, sewers and all excavations.
 2. Effectively reduce and maintain the hydrostatic pressure and lower the groundwater levels in the water-bearing strata below the structure foundation, drains, sewers, and all excavations. The ground water level shall be maintained at all times a minimum of **24-inches** vertically below the bottom of the excavation.
 3. Prevent structures, utilities, sidewalks, pavements, and other facilities, at the work location and areas adjacent to the work location which may be affected by the dewatering operations from any settlement, subsidence, lateral movement, undermining, washout, and other hazards created by dewatering operations as may be determined by the Engineer.

4. Determine elevations of existing structures. These shall be surveyed by a registered surveyor at Contractor's expense. Structures to be surveyed for settlement include but are not limited to any on-site manholes.
5. Establish benchmarks on each structure prior to commencing dewatering operations. Elevations shall be checked by the registered surveyor not less than once per month commencing at the start of dewatering and ending one month after removal of dewatering system. The survey records from each check shall be provided to the Owner within 48 hours of the survey.
6. Provide a means to measure total daily pumping from the dewatering system. This information shall be submitted to the Engineer on a weekly basis in the form of a daily report.

D. Certifications. This section is not applicable.

E. Well Log Requirements.

1. All wells installed by the Contractor shall be logged and all logs submitted to the Ohio Department of Natural Resources, (ODNR) Division of Water on the appropriate form in accordance with ODNR requirements. Copies of logs shall be submitted to the Owner.
2. The Contractor shall be required to complete submittals required by ODNR ground water withdrawal (and abandonment when done) facility registration. Submittals shall be made directly to ODNR and copies to the Owner.

3.0 MATERIALS. This section is not applicable.

4.0 EXECUTION. The Contractor shall be responsible for the following work in accordance with the below requirements.

A. Summary of Work.

1. Work includes but is not limited to:
 - a. Lowering the water table.
 - b. Intercepting seepage which would otherwise emerge from the slopes or bottom of the excavation,
 - c. Collecting and pumping water seepage that enters the excavations.
 - d. Increasing the stability of excavated slopes.
 - e. Preventing loss of material from the slopes or bottom of the excavation; improving the excavating and hauling characteristics of on-site soil.
 - f. Preventing rupture or heaving of the bottom of an excavation.
 - g. Properly disposing of pumped water. Discharge in a closed conduit all water from the dewatering system to the designated storm conveyance outlets.
 - h. Provision of adequate protection against erosion of materials at the entrance to and exit from the existing and new storm conveyances.
 - i. Provision of an isolation/shutoff valve and a check valve in each well discharge line when used.

- j. Provision that all pumps and motors used for the dewatering system shall be properly sized, tested, and suitable for their intended use.
- k. All dewatering wells (when used) shall be developed until the total suspended solids is less than three parts per million (discharge shall be maintained at or below this level).
- l. Locate dewatering facilities where they would not interfere with utilities, demolition, and construction work.

B. Required Remedies as Conditions Warrant. The Contractor shall remedy the following situations to the satisfaction of the Owner at no additional expense to the Owner.

1. Prevent quick conditions, seepage, boils, the loss of fines, or the softening of the foundation strata.
2. Maintain the stability of the sides and bottoms of the excavations, always including dryness sufficient for the work being performed.
3. Monitor traffic access needs; provide ramps or road crossings for access to and around the excavation.
4. Provide a system, including standby generator(s) to maintain dewatered conditions during any maintenance or electrical outage that might occur during the dewatering activities.
5. Provide separate circuits to power the dewatering system such that the failure of any one of those circuits does not impede the efficiency of the entire system.
6. Modify dewatering procedures which may threaten to cause damage to existing facilities so as to prevent damage. Such modifications shall be made at no additional expense to the Owner.

C. Regulatory Requirements.

1. Permits, if required by local, state, or federal agencies for the dewatering system to discharge into any drainage channels or waivers, as applicable shall be obtained by the Contractor prior to commencement of dewatering. Submit copies of permits to the Owner.
2. Treatment of Contaminated Groundwater (if required)

D. Ground Water Level Maintenance.

1. At all times, maintain ground water at or below a minimum of 24-inches vertically below the bottom of the excavation.
2. Furnish all labor, materials, equipment, and incidentals to lower the water table, to collect and pump water from excavations, to collect and divert surface drainage from entering the excavation during construction and to dispose of pumped water (subject to water quality requirements above) to the existing or new storm conveyances.
3. The Contractor shall keep the Owner advised of any changes made to accommodate field conditions and, on completion of the dewatering system installation, revise and resubmit information drawings as necessary to show the installed configuration.

4. The Contractor shall organize dewatering operations to lower the ground water level in excavations or remove water from excavations as required for execution of the work and to provide a stable, dry subgrade for the execution of subsequent work. Take all precautions to prevent disturbances of foundations soils.
5. In the event that any part of the dewatering system may become inadequate or fail, the Contractor shall provide complete standby equipment including a power generator(s) installed and available, and additional pump. The standby equipment will be for immediate use as may be required to adequately maintain the dewatered conditions at all times.
6. The dewatering system shall operate twenty-four (24) hours per day, seven (7) days per week during duration of dewatering. Contractor shall provide a monitoring and telemetry system to alert Contractor of dewatering system malfunction. Contractor shall be available to adequately respond to emergencies and any events that arise so that dewatering system operation is maintained.
7. The Contractor shall obtain the Owners written approval before shutting down the dewatering system for any reason or before discontinuing the operation of any part of the dewatering system.
8. Contractor shall investigate for potable water wells within 1,000 feet of dewatering well string. If well(s) exist, Contractor shall either obtain permission to monitor or drill a monitoring well (piezometer) to track depth.
9. Contractor shall monitor well every two days while water table is being lowered to desired level and once a week after water table is at desired level. Any changes requiring lowering water table shall reinstate the two day well monitoring. If the monitored level drops to within five feet of potable water pump set level, Contractor shall immediately contact the Owner for resolution.
10. Abandonment of the dewatering system shall be by the Contractor with no additional cost to the Owner.
 - a. Upon completion of dewatering and contingent upon the approval the Owner, the Contractor shall remove and properly seal all monitoring and dewatering wells installed by the Contractor in accordance with ODNR well abandonment procedures.
 - b. The Contractor shall also submit copies of "Water Well Sealing Report" to ODNR and the Owner for each well that is abandoned.

5.0 ELECTRICAL. Any electrical work to energize dewatering systems shall comply with contract drawings and Item 29.

- A. Provision of Power.** The Contractor shall be responsible for providing all electrical controls and power distribution.
1. All conductors shall be copper and all enclosures shall be minimum NEMA 3R.
 2. Costs for maintenance of electrical components associated with the dewatering system shall be the responsibility of the Contractor.
 3. The Contractor shall meter and pay all costs for power associated with dewatering and installation of the system.

4. In general, the power distribution to the dewatering system shall follow closely the route of the dewatering system piping. These conductors shall be encased in a conduit system that shall be either PVC - Schedule 80 or Aluminum (heavy wall).

6.0 QUALITY ASSURANCE.

A. Testing. This section is not applicable.

B. Observation.

1. City of Canton designated representative will visually observe the dewatering operations. The representative will notify the Owner of any discrepancies with the contract documents in the course of the Contractor performing the work. The progress observations by the City of Canton do not waive any rights or remedies, nor divest the Contractor of any responsibility for contract compliance or liability for damage.

C. Warranty. This section is not applicable.

7.0 MEASUREMENT. This section is not applicable.

8.0 PAYMENT. The cost is incidental to the items of work that need dewatered. Contractor shall bid said item(s) appropriately to include dewatering as needed. Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work:

END OF SECTION