

DIVISION 31 – EARTHWORK SECTION 31 23 19 – DEWATERING

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes
 - 1. Control of groundwater and surface run-off for construction period.
 - 2. Discharge of drainage water from construction site.
 - 3. Coordinating dewatering work with requirements of other trades and units of work affected by dewatering operations.

1.02 DEFINITIONS

- A. Subgrade: Surface to which excavations are necessarily made for the purpose of construction of the Work. Subgrade as defined does not include additional depths of excavation that may be required or ordered to obtain desired foundation conditions.

1.03 SYSTEM DESCRIPTION

- A. Identify and obtain all required permits for the management of groundwater and surface run-off encountered during the construction period. Develop any required Erosion and Sedimentation Control Plans. Comply with all requirements.
- B. Design and Performance Requirements
 - 1. Design, construct, and maintain a dewatering system.
 - 2. Install and operate dewatering systems, in coordination with the design and construction of excavation shoring systems, excavation and backfilling operations, to meet performance requirements.
 - 3. Prevent surface run-off from entering excavations. Construct ditches, berms, and similar items as required to lead water away from excavation. Do not allow silt laden run-off water to enter water courses. Direct run-off flows to siltation ponds or catchment areas.
 - 4. Dewater and keep excavations free of water to permit placing geotextiles, granular filter blankets, underdrains, granular construction working surface, concrete, and similar items, on firm dry subgrade.
 - 5. Maintain groundwater level a minimum of 12 inches below the subgrade or lower as may be required to fulfill the requirements of the specifications.

6. Prevent destabilization, heaving and shear failure of the bottom of excavation by depressurizing and dewatering groundwater.
 7. Prevent damage to or displacement of structures from groundwater pressures.
 8. Maintain groundwater a minimum of 12 inches below the subgrade until backfilling to final grade has been completed and underdrains and other permanent devices, which protect the structures against buoyancy, are operational. Where designed self weight of structure resists the buoyancy forces, make sure that the structure is completely built before allowing groundwater level to rise.
 9. Obtain the Design Engineer's and the Authority's written consent prior to allowing a rise in groundwater level or prior to shutting down the dewatering operation.
 10. Repair or replace any structure or Works damaged due to dewatering.
- B. Dewatering Discharge Requirements
1. Provide appropriate filter screens so that no soil or foundation material is removed.
 2. Provide a discharge siltation pond, or similar method, of required size to allow sufficient detention time so that the decanted water will meet state regulations. Discharge water from run-off collection and dewatering operations to a siltation pond located on site as directed by the Engineer.
 3. Maintain siltation pond during construction period by removing silt build-up from time to time to keep siltation pond functional.
 4. The Authority may carry out chemical analysis of drainage water to establish conformance with state regulations. If required, treat the drainage water to meet the state regulation before discharging into a watercourse.
 5. Discharge drainage water to existing water courses or storm drainage system. If discharging to water course, prevent erosion of existing banks.

1.04 SUBMITTALS

- A. Shop Drawings
1. Submit a general plan of dewatering scheme which includes:
 - a. Location of generators and other noise producing equipment and anticipated decibel levels.
 - b. Relationship between dewatering equipment, new structures, and the excavation plan.
 - c. Location of dewatering discharge points.

- d. Location and dimensions of siltation pond.
 - e. Details of screens and filter media.
 - 2. These submittals are for record purposes only and will not be reviewed for adequacy.
- B. Dewatering Equipment Approval
 - 1. Apply and obtain dewatering equipment approval from local conservation authority if required.
- C. Dewatering Discharge Approval
 - 1. Apply and obtain dewatering discharge approval from local conservation authority if required.

1.05 QUALITY ASSURANCE

- A. Qualifications
 - 1. Specialist dewatering contractor who has a minimum of 8 years experience in the design and construction of dewatering systems for projects of similar size and complexity.

PART 2 – PRODUCTS

2.01 EQUIPMENT

- A. Dewatering Equipment
 - 1. Pipes, wells, deep wells, well points, pumps, electrical generators, and other equipment.
 - 2. Standby pumps and a generator with effective muffling devices to keep noise levels to a minimum.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
 - 1. Prevent surface water and subsurface or groundwater from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding areas.
 - 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used structures or buildings.
 - 1. Do not close or obstruct streets, walks, or other occupied or adjacent buildings without permission from the Authority and the agencies having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required.

3.02 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material, valves, appurtenances, water disposal, and surface water controls.
- B. Before excavation below ground water level, place system into operation to lower water to specified levels. Operate system continuously until sewers and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.
- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundation, sewer, and other excavations.
 - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, sewers, and other excavations.
 - 1. Maintain piezometric water level sufficiently below surface of excavation.
- E. Dispose of water removed by dewatering in a manner that does not endanger public health, property, and portions of the work under construction or completed. Dispose of water in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow control devices as required.
- F. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of the system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional cost to Authority.
 - 1. Remove dewatering system from site upon completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36" below grade. Restore areas affected by dewatering system to original condition at no additional cost to Authority.
- G. Damages: Promptly repair all damages to adjacent structures, property, and

facilities caused by dewatering operations at no additional cost to the Authority.

3.02 FIELD QUALITY CONTROL

- A. Monitoring Groundwater Level (If necessary)
 - 1. Take readings of groundwater level two times a day for the duration of the dewatering period. Keep a written record of groundwater levels.

END OF SECTION