

SECTION 02210

DEWATERING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Section includes specifications for temporary dewatering systems.

1.02 SYSTEM DESCRIPTION

- A. Remove water which accumulates in excavations during the progress of work so that all work can be done in the dry, unless otherwise approved by the Engineer. Keep excavated areas free from water while underground utilities or structures are constructed, while concrete is setting and until backfill or elements of the structure have been placed to a sufficient height to anchor the work against possible leakage or buoyant uplift forces. A height to anchor the work against buoyant uplift forces shall be considered sufficient when the dead load weight of the backfill or elements of the structure exceeds the uplift forces by a minimum factor-of-safety of 1.5.
- B. In addition to the other requirements specified herein, design the dewatering systems to perform as follows:
 - 1. Prevent damage to adjacent properties, buildings, structures, utilities, and other work as a result of settlement or other groundwater-related effects.
 - 2. At all times, maintain groundwater levels over the entire excavation a minimum of 3 feet below the excavation grade.
- C. At all times, have on the work site sufficient pumping equipment for immediate use, including standby pumps for use in case other pumps become inoperable. Dispose of water in accordance with the detailed requirements specified herein and so as to cause no injury to personnel or the public, damage to public or private property, nor menace to the public health.
- D. Design dewatering system to prevent pumping fines from below grade or disturbing materials exposed at the excavation bottom. Wells shall be cased, and filter(s) shall be provided to prevent such pumping of fines.
- E. Provide a sufficient number of monitoring wells to confirm the following:
 - 1. The dewatering system is performing as intended and is achieving the specified reduction in groundwater levels.
 - 2. Construction site groundwater levels inside and outside dewatered excavations to determine the acceptability of removing the dewatering system from operation.
- F. Furnish container for construction dewatering complete with baffles for the purpose of filtering silt prior to discharge of water. Size container or containers

to suit dewatering and storage demands.

- G. If the approved methods include displacing groundwater as concrete or other work is placed in excavations, the dewatering system shall capture groundwater as it is displaced and follow the procedures herein for its containment, analysis, and discharge.
- H. Obtain jurisdictional authority's specific discharge requirements prior to commencement of dewatering.

1.03 SUBMITTALS

- A. Submit dewatering plan including shop drawings and design data including the following elements:
 - 1. The proposed type of dewatering system.
 - 2. Arrangement, location, and depths of system components.
 - 3. Complete description of equipment and instrumentation to be used, with installation, operation and maintenance procedures.
 - 4. Types and sizes of filters.
 - 5. Design calculations demonstrating adequacy of the proposed system and equipment.
 - 6. Methods of disposal of pumped water.
 - 7. Method of water quality monitoring.
 - 8. Type of filtration and chemical treatment of contaminated water, as applicable.
 - 9. Well point system design, if proposed: Submit design complete with calculations and shop drawings.
 - 10. Method for establishing and monitoring construction site groundwater levels.
 - 11. Criteria for determining the acceptability of removing the dewatering system from operation.
- B. Prior to removing the dewatering system from operation, submit documentation and calculations verifying that the approved criteria for determining the acceptability of removing the system from operation have been met.

1.04 DELIVERABLES

- A. Submit copies of permits required for work of this Section.

1.05 QUALITY ASSURANCE

- A. Well point design, if applicable, shall be prepared, signed, and sealed by a geotechnical engineer registered by the State of California and qualified and

experienced to perform such design.

PART 2 – PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.01 DEWATERING

- A. Except as otherwise indicated in the Contract Documents, perform dewatering to accomplish a lowering of measured static ground water level to an elevation which is suitable for the construction of structures below grade.
- B. When pumping is required to reduce groundwater levels, accomplish pumping in a manner that will not disrupt the surrounding environment.
- C. Refer to General Provisions 7.10, Sound and Light Control Requirements, for noise control requirements. The Contractor may, during the daylight hours of 8:30 AM to 4:30 PM, use power plants to operate the dewatering pumps. During all other hours, power to run the pumps shall be electric and obtained from the electric power utility in accordance with Section 01590, Construction Facilities, unless otherwise authorized by the Engineer and jurisdictional authorities.
- D. If any dewatering well pumps fines, terminate pumping and construct new well at a different location with a revised design which eliminates the pumping of fines.
- E. Do not turn off the dewatering system in a manner that the upsurge in water weakens the subgrade for completed excavation and structure foundation work.
- F. Remove storage containers, including those cleaned, and other dewatering facilities from the site at the completion of dewatering operations.

3.02 CONTAINMENT, ANALYSIS, AND DISCHARGE OF GROUNDWATER EXTRACTED

- A. Containment: Upon extraction, store groundwater extracted in the process of construction dewatering in containers prior to discharge or disposal of water, as applicable. Keep containers locked to prevent accidental or purposeful discharge of the water. Contain and store the water on-site and in such a manner that it will not interfere with the Contractor's existing or continued construction operations.
- B. Analysis: Collect and analyze water samples taken directly from each storage container to verify that the extracted groundwater meets applicable discharge requirements. Number of samples taken per container shall be at the sole discretion of the Engineer.
- C. Discharge Requirements: Discharge no water which exceeds regulatory requirements or the jurisdictional authority's discharge requirements.
- D. Discharge: Obtain jurisdictional authority's specific discharge requirements prior to commencement of dewatering. Subject to the discharge restrictions specified herein and upon written authorization from the jurisdictional authority, discharge

effluent from dewatering directly into existing sanitary manholes, where said sewer system is in operating condition. Provide conduits to carry said effluent to nearest sanitary sewer manhole and drainage to the nearest storm drainage. Confirm that manholes to be utilized are in operating condition. Release water in a manner that will not impact the Contractor's operations.

- E. Disposal: In the event that extracted groundwater does not meet the discharge requirements criteria, provide for the disposal of the extracted groundwater in accordance with General Provisions 7.16, Disposal of Material Outside of the Work Site. Clean dewatering containers, piping, pumps, and other dewatering facilities contaminated as a result of the Work.
- F. Use: Extracted groundwater of sufficient quality as shown by test data may be used on site with Engineer's written approval for those purposes approved by the Engineer.

END OF SECTION