1. What is the treatment standard for the water being returned to the EJMT WWTP?  
   • Can the WWTP permit be provided to Contractor’s for reference

   **CDOT RESPONSE:** There should not be water resulting from this project being returned to the WWTP. The Seep drains bypass the WWTP operations.

2. For the flow data provided, can CDOT provide the location where the measurements are being taken along with a schematic showing the relationship between the Seepage Pipe feeds and the WWTP? Its unclear if the flow volumes are from both tunnels, or from individual seepage pipes as shown on Sheet 16.

   **CDOT RESPONSE:** The flow volumes provided on the plans are the maximum “combined tunnel discharge”. This “combined tunnel discharge” included the WWTP effluent and the Seep system from both bores. Measurement is being taken at MH 2.

3. Can an additional bid item be provided for the Class 2 Removals associated with the Portal Beams? This is materially different from the Removal of Portions of Present Structure bid item and further, no quantities are represented in the plans for these specific removals. 202-00453 is traditionally used for Class 2 Removals of similar nature.

   **CDOT RESPONSE:** The location of portal beam repairs and other concrete repairs are shown on Contract Sheet 9 and quantities for these specific removals are shown on Contract Sheet 29. The work included in this item is small compared to the overall project, hence why the different removals were lumped into one pay item.

4. Can CDOT clarify or provide a detail showing how the light described on Sheet 34 can be disconnected and removed should it be necessary to temporarily remove the light in order to complete the repairs?

   **CDOT RESPONSE:** Contract Sheet 34 shows the known details of the light supports based on available as-built information. Refer to Note 2 on this sheet and the Revision of Section 210 project specifications.

5. Milestone No. 1 describes completion of all grouting operations for Segment 13 for the concrete stage within the primaries. Does this mean grouting the concrete stage within the primaries at only Segment 13 or Segments 1-13?
CDOT RESPONSE: Milestone No 1. describes the completion of grouting for only the concrete stage within Segment 13. Due to design and advertisement schedule, Milestone No 1 date does not hold ramifications if not met.

6. Can a new bid item be provided for the work associated with the tertiary drill holes? The tertiary drill holes make up 39% of the grouting scope and it will be unknown if these holes are drilled and grouted. Currently, the plans call for 288 tertiary holes to be drilled and grouted based on the effectiveness of the grouting at the primaries and secondaries.

CDOT RESPONSE: Sheet 25 of the drawings state that all primary, secondary, and tertiary holes shall be drilled and grouted. The LF estimates for the Drilled Hole and 2-inch Drilled hole include footage for tertiary grout holes. A separate bid item will not be created.

7. The specifications and General Notes state "Consolidation grout holes shall not cut or penetrate through permanent tunnel support reinforcement elements."
   • Can CDOT define what it considers to be a tunnel support element? Steel sets, rock anchors, timber blocking, etc?

CDOT RESPONSE: Tunnel support elements are divided into initial and permanent support classes per typical tunnel industry design and construction practices. Permanent tunnel support includes rebar that was used in cast-in-place concrete for the permanent liner and long-term tunnel support. Tunnel initial support elements include steel sets, timber lagging, spiling, etc. That were used to stabilize the excavation until permanent tunnel support could be installed.

   • If while drilling the grout hole it is determined that a "tunnel support" element has been encountered and the hole must be abandoned, will CDOT pay the as drilled length of the hole under the appropriate bid item? Instrumentation for locating rebar and other steel will only be accurate to depths of 2-ft or shallower.

CDOT RESPONSE: It is anticipated that initial tunnel support elements will be encountered in 95% of the consolidation grout holes. It is expected that the Contractor will develop their means and methods to accommodate drilling the holes through concrete, structural steel (steel sets), and timber. If, according to the determination of the Engineer, a grout hole must be abandoned, then the Contractor will be compensated for the drilled length of hole.

8. The specifications note that "Chemical grouts may be required by Engineer to plug leaks through the cast-in-place liner." A chemical grouting plant and the hoses and grouting apparatus are a completely different setup for plant, pumps, and grouting equipment.
   • Can a separate bid item be provided to account for this work?, or if not,
   • How shall the Contractor factor these costs into the proposal?

CDOT RESPONSE: Estimated quantities for chemical grout were not provided in the Contract as there was not a reasonable basis to determine potential quantities. If it is determined by the Engineer that chemical grout is needed, compensation will be provided via a change order per the Contract.

9. Due to the weight constraints, can contractor mount temporary lines and electrical boxes to the liner during the grouting program and then repaired when finished?
CDOT RESPONSE: It is not anticipated that additional load can be affixed to the plenum divider wall. For the purposes of bidding, it is anticipated that solutions can be affixed to the liner. After award, proposed options for additional loading on the tunnel permanent liner may be evaluated allowing CDOT an opportunity to assess weights and proposed anchorages with tunnel and/or structural design engineers. At that time, it may be determined that this is acceptable.

10. Can CDOT release the remaining As-Built drawings and original plans for contractor review? Some of these details will be beneficial for project approach.

CDOT RESPONSE: Due to the size and security nature of the as-builts, additional design details may be provided following award based on need.

11. Historical records and photos of the original tunnel construction show likely obstructions, metal debris, and other misc items in the concrete liner beyond the steel ribs. How will CDOT account for potentially encountering these types of conditions and pay for the lengthened drilling/grouting/re-setup of drills at these locations?

CDOT RESPONSE: The concrete and rock drilling estimated footage, as provided, accounts for the potential variation in concrete stage thicknesses. Specification 2-inch Drilled Hole defines the end of 2-inch drilled hole and the start of Drilled Hole as the rock interface. The rock stages for all primary, secondary, and tertiary grout holes are not estimated to have variation as each stage is 10 ft starting at the edge of the excavated rock interface. Re-drilling of previously grouted stages is addressed in the Basis of Payment Section.

12. Per Project Special Provision 211(d)(n) - it denotes that chemical grouts shall be adjustable from seconds to hours. Our suppliers have indicated that they can only provide seconds to minutes. Please clarify if this is acceptable.

CDOT RESPONSE: This is acceptable.

13. How and when will the Engineer decide whether a chemical grout is needed?

CDOT RESPONSE: The determination of whether a chemical grout is needed will follow standard grouting industry practices. Groundwater infiltration rates, pressures, and grout hole characteristics will determine whether chemical grouts are needed. The Engineer will work with the Contractor to determine the appropriate chemical grout properties.

14. Would the following materials be acceptable for use on the project (product data included):
   • Aquafin-IC Admixture in lieu of Xypex

CDOT RESPONSE: The product submitted is not permitted at this time due to lack of testing results as they relate to the performance and mechanical properties of grout. If test and field performance results can be provided for projects with similar scope of work, they may be submitted for review to the Engineer.

   • InjectProEco Chemical Grout
CDOT RESPONSE: Specific chemical grouts will be considered after the determination has been made that the use of chemical grout is needed.

15. Is it possible to provide the stationing for the grouting locations relative to the provided tunnel as-built in order to identify the anticipated ground conditions and tunnel support characteristics?

CDOT RESPONSE: Tunnel Segments 1 through 167 are approximately 50-feet 3-inches in length. Utilizing the stationing at the cross-passages, contractors can estimate within reason the stationing and corresponding ground conditions.

16. What is the minimum Stainless Steel fastener length required for re-fastening the failed ceiling anchors shown on Plan Sheet 30?

CDOT RESPONSE: The fastener shall provide a minimum 2” nominal embedment into the concrete ceiling panel as shown on Plan Sheet 30. The minimum length required will vary based on the steel ceiling panel depths and neoprene shims used. The maximum fastener length is not anticipated to exceed 4”.

17. What is the length of the stainless steel carriage bolt required for the repair of the lights shown on Plan Sheet 34?

CDOT RESPONSE: The minimum carriage bolt length is anticipated to be 14” on the supply air side of the ceiling and 18” on the exhaust air side of the ceiling. Per Note 2 and the Section 210 Specification, the Contractor shall inspect the condition of the light fixtures and provide a method statement for the proposed work. If the existing carriage bolts are found to be securely anchored and in good condition, they may remain in place if approved by the Engineer. Other hardware shall be replaced and secured as noted in Note 5 and the Section 210 Specification.

18. Regarding Project Special Provision 250 - Environmental Health & Safety Management

- Please confirm that space is available within the Water Treatment Facility and near to the North Tunnel Preliminary Monitoring Location for continuous water monitoring equipment to detect contaminants within the seepage pipe?
  - Would 120 V or 240 V power be available in this location?

CDOT RESPONSE: 120 V power may be made available. Space constraints will vary based on the proposed equipment.

- Please confirm that testing and treatment for heavy metals or other known contaminants typical of the I-70 Mountain Corridor is not required for any of the seepage flows.

CDOT RESPONSE: Testing requirements are identified in the April 27, 2022 -1- Revision to Section 250 Environmental, Health and Safety Management Subsection 250.03

- During the course of the work, can CDOT remove the existing flow monitoring equipment located with Manhole 2b to allow for capture, treatment and discharge of the seepage water?
If this is to become the responsibility of the Contractor, how shall the work be compensated and can CDOT provide information as to how the equipment is currently powered and operating.

CDOT RESPONSE: It is not anticipated that existing monitoring equipment can be removed.

- The specification notes that the "work" is to be conducted for a "period of 1-week following active consolidation grouting activities." Does this imply that the Contractor is required to divert and treat the water even if analysis at the preliminary monitoring location does not necessitate treatment of the subsurface flows?

CDOT RESPONSE: Contractor is responsible for monitoring the seep water quality for a period of 1-week following grouting. If the preliminary monitoring results indicate no need for treatment then the contractor would not be responsible for additional treatment.

- Does CDOT have any analytical water sampling data for the current tunnel seepage water? Can it be provided?

CDOT RESPONSE: Stand-alone testing data for the seep water is not available.

- Is power available in the median area for the associated water treatment system?

CDOT RESPONSE: It is anticipated that the contractor shall provide power for the testing equipment selected within the median.

- Is CDOT aware of any other permit requirements necessary for the treatment of water as described in the plans or shall the Contractor assume that the discharges will be performed under CDOT’s existing permit with the Contractor listed as the facility operator?

CDOT RESPONSE: Contractor shall assume that all discharges will be performed under CDOT’s existing permit CO0026069

19. Due to the highly specialized nature of the work, and the large percentage of specialized scope in relation to the contract value, the opportunity to achieve the DBE, OJT, and minimum self-performed work is a substantial risk to the Contractor.

The project has four major scopes of work: Consolidation Grouting, Traffic Control, Concrete Repairs and Water Treatment, with the most significant amount of work related to the Consolidation Grouting and Water Treatment, both of which do not require substantial traffic control. In addition, through Addendum #1, CDOT removed the Public Information scope of work from the contract requirements, thus eliminating an opportunity to provide additional DBE participation.

In prior project’s CDOT has adjusted the calculation for DBE, OJT, and self-performed work through a "Specialized Work" project special provision. Below is an example from a past project.
REVISION OF SECTION 108
SPECIALTY ITEMS

Section 108 of the Standard Specifications is hereby revised for this project as follows:

Subsection 108.01 shall include the following:

For the purpose of computing the amount of work required to be performed by the Contractor’s own organization, the following work is designated as “Specialty Items” for this project:

<table>
<thead>
<tr>
<th>Specialty Items</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclassified Excavation (CIP) (Special)</td>
<td>Cubic Yard</td>
</tr>
<tr>
<td>Seeding (Riparian)</td>
<td>Acre</td>
</tr>
<tr>
<td>Brush Fill</td>
<td>Cubic Yard</td>
</tr>
<tr>
<td>Perennials (Tubeling)</td>
<td>Each</td>
</tr>
<tr>
<td>Willow Cuttings</td>
<td>Square Foot</td>
</tr>
<tr>
<td>Stone Landscape Wall</td>
<td>Square Foot</td>
</tr>
<tr>
<td>Stone Fascia</td>
<td></td>
</tr>
</tbody>
</table>

Kraemer is considering Items 45, 50, 55, 60, 65 & 70 to be Specialty Work. Kraemer is requesting that a similar specification be incorporated into this project for the purpose of adjusting the OJT, DBE total dollars, and minimum self-performed work determination.

CDOT RESPONSE: At this time this will not be incorporated due to time constraints.

20. Plan Sheet 24 - Note 3 & 4 - Geo-Drain Scope
   - In some locations the geo-drains are being supported by a cinder block bearing on the plenum floor. Does the weight of the water filled geo-drain need to be considered with respect to the concentrated and live load restrictions outlined in the plans?
   - Should it be assumed when the geo-drains are disassembled that they will be stored outside the supply air duct due to their potential to move when the fans are turned on and to reduce live load on the floor?

CDOT RESPONSE: The volume of water and subsequent weight transferred to individual floor panels is considered negligible. It is assumed that the geo-drains, once disassembled will be located outside of the plenums

   - The geo-drain system appears to have a high degree of calcium build up within the pipe and based upon its condition during the field visit, disassembly will likely result in damage to the pipe. It also appeared that a heating element of some type was being utilized to prevent freezing but did not appear to be up to current code.
   - What is the contingency should disassembly of the geo-drain system damage the pipes?

CDOT RESPONSE: Damage to the pipes will be addressed on an as-needed basis. Care should be taken to avoid unnecessary damage.

   - Is the Contractor expected to address the calcium build up that is severely restricting the flow?
CDOT RESPONSE: The contractor is not responsible for addressing the calcium build-up which exists within the existing geo-drain system

- Is it the Contractor's responsibility to bring the electrical / heating components up to current code? Restoring the electrical / heating element to their present condition presents issues with respect to the warranty provisions typical in CDOT contracts.

CDOT RESPONSE: The contractor is not responsible for addressing or upgrading the components which remain in place following completion of this project.

21. Have any previous water sampling been performed on the water from the 4-inch seep drains or the outlet where water treatment mixes with the 4-inch seep drains? Can this testing information be provided to understand the baseline water quality conditions?

CDOT RESPONSE: Test data available is only from the total combined tunnel discharge for compliance verification with the identified discharge permit.

22. Within the plenum, can the existing rood ramps be replaced with a similar that would permit heavier equipment to pass over the obstruction?

CDOT RESPONSE: Wood ramps within the plenums may be replaced. Loading and utility protection should be considered and will need to be reviewed by CDOT prior to implementation.

23. What electrical voltage and amperage is available to the Contractor to use within the building, plenum and outside (in the center of I-70 and nearest the parking lot of the east & west portal)?

CDOT RESPONSE: This information will be provided to the selected contractor as we did not have enough time to track the information down.

24. What are the weight restrictions for the plenum divider wall?

CDOT RESPONSE: It is not anticipated that additional loading will be allowed to be affixed to the plenum divider wall.

25. Along the interior dividing wall, is the Contractor allowed to fasten items such plumbing lines and power and keep it there throughout the duration of the project? Does the weight associated with such items need to be accounted for during the load assessment of the concrete floor panels?

CDOT RESPONSE: It is not anticipated that additional loading be affixed to the plenum divider wall.

26. Grout and water lines will need to be run from the exterior of the building from various staging areas. Are such lines permitted to be run either through the building walls, entry/exit doors, through the roof, or through the air louvers?

CDOT RESPONSE: Lines may be run through fresh air louvers on the north and south side of the ventilation buildings as discussed during the contractor outreach on 3/2/2022. Building doors may be
evaluated by CDOT for security purposes. It is not anticipated that destructive means of creating access will be permitted.

27. Is the Contractor permitted to use a forklift in the portal building between the south bay doors and the plenum access point for moving materials and equipment?

CDOT RESPONSE: Yes, provided CDOT confirms size, loading, and storage locations of equipment.

28. Can the Engineer provide a better understanding of the locations of the Rapid Cure Joint Sealant? Based upon Plan Sheet 35, there seems to be significantly more quantity in the tabulation than is shown on the plan sheet.

CDOT RESPONSE: Sealant is intended to be between each precast façade panel of each ventilation building.

29. Please provide the maximum wind load/pressure within the working areas of the plenum and in what direction it flows when the exhaust system is fully operational.

CDOT RESPONSE: During working hours, one fan is typically run on low providing fresh air. During non-working hours (i.e. no personnel in the plenums), maximum wind speed can be up to ~135mph+ during an emergency. Exhaust flow direction is from the center of the tunnel toward the ventilation buildings.

30. Due to the uncertainty in the quantity of grout that will be injected and the rate of injection, Kraemer recommends utilizing a separate bid item, “Grouting (Special),” measured and paid by the hour once grout pumping has started, in order to account for the pumping time necessary to complete the work. This bid item would allow the Contractor to reduce our risk by eliminating the guesswork in determining the duration of the grouting, allowing our pricing to be more reasonable. Without such a bid item, the Contractor will need to conservatively account for the pumping time associated with grouting. Would CDOT be amenable to adding this bid item to the project?

CDOT RESPONSE: A separate pay item is not anticipated at this time.
31. On drawing sheet 26, the Existing Utilities photograph does not show a geodrain system. Please confirm one does not exist in the western grouting section.

CDOT RESPONSE: Geodrains are not present in the western grouting section and present in the eastern grouting area.

32. Please provide details on the drainage system that covers the tunnel liner in the vicinity of Segment 141.

CDOT RESPONSE: See additional reference sheets provided by CDOT.

33. On project drawing sheet 39, there is a note in the Notes section referencing Drawing C2-13. Please provide this drawing if available.

CDOT RESPONSE: Drawing C2-13 is not available. See additional reference sheets provided by CDOT (drawings C2-13A through C2-13J). Please note the location of the referenced sheet with respect to the grouting locations.

34. On project drawing sheet 39, Drawing C2-39 is referenced with the 4” seep drain collector tag. Please provide this drawing if available.

CDOT RESPONSE: Drawing C2-39 is not available. See additional reference sheets provided by CDOT (drawings C2-39A through C2-39F). Use of additional details is at the bidder’s discretion.

35. On project drawing sheet 39, there is a tag stating “Rock Drain Risers not shown” in relation to the 4” seep drain. Please provide additional information on the risers.

CDOT RESPONSE: See additional reference sheets provided by CDOT. Use of additional details is at the bidder’s discretion.

36. On project drawing sheet 39, please clarify if there are any vertical connections that connect the Seep Mains beneath the roadway to the seep collection system behind the tunnel liner?

CDOT RESPONSE: See additional reference sheets provided by CDOT. Use of additional details is at the bidders discretion. It is possible that vertical drains extend and connect within the plenum.

37. Please clarify if the Seep Mains below the roadway have any lateral connections, or are they just perforated pipe in a gravel ditch?

CDOT RESPONSE: See additional reference sheets provided by CDOT. Use of additional details is at the bidders discretion. It is possible that longitudinal and lateral drains connect vertical drains to the longitudinal drain beneath the roadway.
38. On project drawing sheet 16, the East Portal Area Drainage Schematic shows a drain identified as the North Tunnel 8” Seep Drain. Is there anywhere to monitor the in the drain prior to it entering Manhole 2?

**CDOT RESPONSE:** Monitoring effluent within the seep drain is possible via the preliminary monitoring port identified within the plan set.

39. Can groundwater that is encountered behind the tunnel liner, or in the rock, during the drilling and grouting operation be combined into our process water handling system and potentially be reused in our operation?

- If the groundwater cannot be reused, please clarify how the Department expects the contractor to separate the groundwater from the process water and dispose of it?

**CDOT RESPONSE:** Yes. This water may be reused for drilling as long as it does not affect the drilling operations negatively (i.e. too many solids or fines for the drilling operations). For grouting operations, reused water may or may not be used depending on the water quality. Follow direction from the project and/or the product specifications.

40. Can contractor’s supply lines for the drilling and grouting operations be attached to the unistrut channel that is on the concrete divider wall? The supply lines would consist of air lines, water lines, grout lines, and temporary work lighting.

**CDOT RESPONSE:** It is not anticipated that additional loading be affixed to the plenum divider wall.

41. On drawing sheet 25, Note 11, states that used construction water must meet the requirements of Standard Spec 250 prior to discharge. Please clarify if this statement means that treated process can be discharged into the combined tunnel discharge at manhole 2 without a permit?

**CDOT RESPONSE:** Treated process water may be discharged at Manhole 2 without an additional permit provided all water quality requirements set forth are met and in full compliance.

42. The measurement and payment the 2-inch drilled hole includes drilling through wood and steel. The amount of time and effort required to drill through wood, steel, and other potential obstructions is impossible to determine. Will the Department consider adding a pay item for obstruction drilling that is paid by the hour?

**CDOT RESPONSE:** A separate pay item is not anticipated at this time.

43. Under Standard Spec Section 250, EHS Management, the contractor is responsible for monitoring the combined tunnel discharge at Manhole 2. If the water quality is not in compliance, please clarify the following:

- What is the allowable response time from notification of noncompliance to when the contractor must initiate his contingency plan?
CDOT RESPONSE: Selected process to ensure compliance with CDOT’s discharge permit will vary based on means, methods, and associated procedures.

- Can the water be diverted at MH2, treated, and discharged into 2B?

CDOT RESPONSE: Yes

- What is the pipe size going from MHs 2A to 2 to 2B in the event an inflatable plug is necessary to divert the flow?

CDOT RESPONSE: The pipe size is 36 inches CMP from MH 2A to 2 to 2B.

44. On drawing sheet 16, the Water Quality Treatment Staging Area is not large enough to contain all the of contingency equipment necessary to have the potential maximum flows. The area required to contain the equipment would potentially need to be about 30 ft x 100 ft. Where can this equipment be located?

CDOT RESPONSE: Additional space may be permitted to the east of the proposed area identified in the plans beyond the median cross-over. CDOT must approve the use of the space. Note the width may not meet the 30 ft requirement stated within the question.

45. Drawing sheets 26 thru 28, provide Grout Injection Tables that give the maximum grouting pressures at each stage. The concrete grout stages are less than the rock grout stages. If grout migrates to the tunnel liner during the rock grouting stages, please confirm that the tunnel liner can support the higher rock grouting pressures without compromising the liner.

CDOT RESPONSE: The higher grouting pressures in the rock grouting stages have been considered as one of the loading cases acting on the permanent tunnel lining.

46. If grout does migrate behind the tunnel liner during the rock grouting phases, the contractor has no way of knowing this until the liner cracks or spalls. Please confirm that the liner repair would be a change order in the event this occurs.

CDOT RESPONSE: For the purpose of bidding, assume a change order would be issued for repair work. Please note that all parameters of the grouting process (workplans, injection pressure spikes, etc.) will be reviewed prior to determining basis of additional payment during construction.

47. We cannot find any reference to an allowable concrete strength for the tunnel liner in the project documents. Please provide an allowable concrete strength that contractor can use to size temporary anchor points for attaching platforms and equipment to the tunnel liner above the Plenum.

CDOT RESPONSE: As shown on Sheet 39, please use 4,000-5,000 psi depending on tunnel location.

48. Is there a maximum cross-sectional area for any potential equipment, support items, utilities that may be left in the Plenum during non-working times?
CDOT RESPONSE: The Contract states all protective elements (coverings for drains, fire suppression system, conduit, etc.) must be removed prior to the end of the last working shift at the end of a work week. Items that are left in the plenum must be secured such that they are immovable at 135 mph ventilation air speeds.

49. The project drawings show the tunnel liner rebar mats being embedded 2.5” to 3.5”; however, during the contractor outreach meeting it was stated that the rebar is deeper than shown on the plans. Please clarify the rebar depth and depth of other embedded items the contractor is to assume for bidding purposes.

CDOT RESPONSE: For bidding purposes assume the depths as stated on the project drawings. Tunnel initial support elements such as timber, lagging, and steel sets are not considered embedded in the permanent tunnel liner.

50. For additional laydown areas for item such as bulk water storage tanks, can we use portions of the asphalt areas away from the ventilation buildings and against the concrete barrier rail as long as enough contractor doesn’t impede traffic and maintains access?

CDOT RESPONSE: For bidding purposes, additional laydown area on the loop bypass roads may be allowed. A single lane must be maintained and conveyance of WB-67 vehicles. Additional space requirements will be vetted by CDOT Engineering and Maintenance staff based on tunnel operational needs.

51. On the East Ventilation Building, can the grassy area at the top of the Loop Road behind the ventilation building be used for laydown? Can the concrete barrier rail be moved to the rear of the building?

CDOT RESPONSE: For bidding purposes, additional laydown areas along the loop bypass may be considered. Vehicle passage requirements discussed above will be required.

52. Specification Revision of Section 211 – Pre-Grouting Part (d) states that cement will conform to ASTM C150. This Part goes on to state that cement with Blaine Fineness of at least 900 m2/kg will be used. ASTM C150 is specific to eight types of Portland cement. It is unlikely that a Portland cement source meeting the Blaine Fineness requirement required can be located. To meet the Blaine Fineness requirement, a blended cement (such as a microfine, ultrafine, superfine, etc.) will have to be utilized, however, these cements will not conform to ASTM C150. Please clarify if the contractor is to utilize a Portland cement not meeting the fineness requirements or the intent is to utilize a cement not conforming to ASTM C150, but meeting the fineness requirements of the specification.

CDOT RESPONSE: Please utilize a cement meeting the Blaine Fineness as described in the specifications.

53. We are seeking more information on the steel rib configuration and the tunnel liner reinforcement. On Project Drawing Sheet 39, there are callouts referencing As-Built drawing sheets C2-4 and C2-34. It appears there are multiple C2-4 sheets, and we have a couple of them. Can all the C2-4 sheets and sheet C2-34 be provided?
CDOT RESPONSE: Drawings C2-4 and C2-34 are not available. See additional reference sheets provided by CDOT (drawings C2-4B through C2-4H).

54. Can non-production work, or support work, be performed during the Free Time including Friday, Saturdays, and Sundays as required? The work in question would only be the support activities required to support the production activities and would not impact traffic or the tunnel operations. Examples of the support work would be:

- This would be the initial installation and then any relocation required when moving to different sections of the tunnel.

CDOT RESPONSE: See below.

- Staging and setup of office trailer, grouting equipment, water tanks, filter equipment, pumps, tool containers, etc.

CDOT RESPONSE: Proposed work areas must be reviewed and approved by the Engineer regarding availability and access of work areas outside of the plenums during weekend hours.

- Preparatory work inside the Plenum to install features that would stay in place for the duration of the work
  
  i. Installation of temporary work lighting and communication lines
  
  ii. Installation of main supply piping – air, water, grout, return lines, etc.
  
  iii. Installation of hanging platforms and structural support systems required to distribute the working loads to meet the working load threshold requirements

CDOT RESPONSE: During non-production times (Fridays, Saturdays, and Sundays), the plenums will be fully ventilated with all fans operational for emergency response during peak traffic volumes thus prohibiting any work from occurring in the plenums due to wind speeds and general safety. Work in the ventilation buildings or around the site (cleanup, cleaning of the grouting equipment, cleaning packers, grout lines, etc.) may proceed with approval by the Engineer. Work shall not impact traffic or tunnel operations.

55. Is there any flow data available that separates the seep drain flow rates from the total flow rates in the tunnel combined outfall?

CDOT RESPONSE: This data will not be made available at this time but will be available to the selected contractor.

56. Please clarify if it is the intent of the Department that the contractor maintains a suitable bypass pumping and treatment system on-site in case there is grout intrusion into the tunnel combined flow outfall that exceeds the permitted discharge limits, or just have an approved contingency plan in-place?

CDOT RESPONSE: The intent of the Department is to maintain an approved contingency plan in place.
57. Section 250 of the Project Special Provisions states that the time of transport of the seep water from the drilling and grouting activities shall be determined by a dye trace study. The wording of the paragraph implies that the Department expects that a connection will occur. Please clarify the acceptable parameters of the dye trace study, and how much transport time the contractor should allow for dye tracing at each grout section before starting the grouting operation?

**CDOT RESPONSE:** Fluorescent dye trace is intended to provide the contractor with additional information pertaining to their contingency plan. The department does expect a connection to occur however the timing is not a known quantity and varies throughout the year based on flow rates.

58. For dye tracing or grout intrusion, we believe that the transport time from Section 13 to the outfall could be days given the length of the piping through the tunnel and the time to travel through the rock. Also, depending on the pipe flow at the time of testing, we believe the dye could potentially never make it to the outfall and sit in the seep drain in a low flow condition. Therefore, being able to measure the travel time through the rock to the drains versus the flow time in the pipe is critical. The only monitoring points provided are at the WWTP and at the outfall which would be too late and only give total transport time. Can the Department provide additional monitoring locations closer to the grouting locations to catch the intrusion sooner?

**CDOT RESPONSE:** Additional monitoring locations closer to the tunnel segments being addressed are not available.

59. If additional monitoring points cannot be provided for grout intrusion monitoring, then there is a good possibility that a significant amount of grout could enter the drains before there is ever any indication of the intrusion. Please clarify the following:
   - Would this remediation be considered a change order?

**CDOT RESPONSE:** For the purpose of bidding, assume a change order would be issued for repair work. Please note that all parameters of the grouting process will be reviewed prior to determining basis of additional payment during construction.
   - What remediation methods would the Department expect the Contractor to use to remove the grout from the drains?

**CDOT RESPONSE:** Remediation methods are variable based on the need.

60. Specification Revision of Section 211 states that the use of chemical grouts may be required by the Engineer. There are no quantities provided. How should the Contractor address the use of chemical grout for bidding purposes?

**CDOT RESPONSE:** Estimated quantities for chemical grout were not provided in the Contract as there was not a reasonable basis to determine potential quantities. If it is determined by the Engineer that chemical grout is needed, compensation will be provided via a change order per the Contract.

61. Note 1 under Special Construction Requirements on Drawing Sheet 3 references abiding by the Tunnel Safety Rules. Can a copy of these rules be provided for review?
CDOT RESPONSE: Tunnel rules may be provided following award