

PART 00200 - TEMPORARY FEATURES AND APPURTENANCES**Section 00210 - Mobilization****Description**

00210.00 Scope - This work consists of operations and preparatory work necessary to become ready to perform the work or an item of work.

Construction

00210.40 Mobilization - Mobilization includes, but is not limited to, the following:

- Move personnel, equipment, supplies, and incidentals to the Project site.
- Establish offices, buildings, and other facilities necessary to work on the Project.
- Perform other work and operations or incur costs as necessary before beginning work on the Project.

Measurement

00210.80 Measurement - No measurement of quantities will be made for work performed under this Section.

Payment

00210.90 Payment - Payment for mobilization will be made at the Contract lump sum amount for the item "Mobilization".

The amounts paid for mobilization in the Contract progress payment will be based on the percent of the original Contract amount that is earned from other Contract items, not including advances on materials, and as follows:

- When 5% is earned, either 50% of the amount of mobilization or 5% of the original Contract amount, whichever is the least.
- When 10% is earned, either 100% of mobilization or 10% of the original Contract amount, whichever is the least.
- When all work is completed, amount of mobilization exceeding 10% of the original Contract amount.

This schedule of mobilization progress payments will not limit or prelude progress payments otherwise provided by the Contract.

When the Contract Schedule of Items does not indicate payment for mobilization, no separate or additional payment will be made for mobilization. Payment will be included in payment made for the appropriate items under which this work is required.

Section 00220 - Accommodations for Public Traffic**Description**

00220.00 Scope - This work consists of maintaining facilities to accommodate public traffic through and within the Project for the life of the Contract. Public traffic includes motor vehicles, bicycles, and pedestrians.

00220.01 Beginning of Contractor's Responsibility - The Contractor's responsibilities for accommodating public traffic begin on the day any on-site work begins within the Project limits.

00220.02 Public Safety and Convenience - Provide for the safety and convenience of the public and:

- Be responsible for damages according to 00170.80.
- Conduct work at all times so that there is the least possible interference with or hazard to the traveling public and the affected community.
- Locate stockpile materials and park construction equipment and vehicles that are not in active use a minimum of 30 feet from the traveled way. If this is not possible, protect the stockpile materials, the equipment, and vehicles, with barriers or as directed.
- Provide and maintain safe temporary access to business and residence driveways, business and residence entrances during business operating hours, basement vaults as needed, temporary intersections, and temporary connections with roads, streets, and bicycle and pedestrian facilities.
- Provide approved protection and delineation between each work area and public traffic.
- Allow emergency vehicles, incident response units and transit vehicles immediate passage at all times.
- Use portable changeable message signs to provide appropriate work zone information to the public when included in the Contract Schedule of Items.
- For all sidewalk or sidewalk ramp closures, install signs as shown and adhere to the requirements of 00220.40(e).
- Do not impede the flow of traffic or close any lanes of traffic except as listed in 00220.40(h).
- Do not stop or hold vehicles on the traveled way, at intersections, or other connecting roadways with the Project limits for more than 5 minutes.
- Do not block driveways for more than 5 minutes or with open excavation for more than 2 hours unless otherwise authorized in writing.
- Do not close any traffic or bike lane, or street until the area is signed according to the plans or the requirements of this Section and Section 00225.

- Do not perform work which would restrict or interrupt traffic movement on opposite sides of the traveled way at the same time.
- Do not use temporary steel plating within the roadway or shoulder having a preconstruction posted speed zone greater than 35 mph.
- Do not place work zone signs or supports where they will block existing walkways or bikeways.
- Delineate with a tubular or conical marker any silt bags that occupy existing walkways or bikeways.

00220.03 Work Zone Notifications - Provide the following work zone notifications:

(a) Over-Dimensional Vehicle Restrictions - When a project restricts the width, length, height, or weight of vehicles through a work zone or detours trucks around a work zone, notify the Motor Carrier Transportation Division (MCTD) by using the web based electronic version of the "Highway Restriction Notice-Size and/or Weight" form (Form No. 734-2357) and notify the Engineer in writing at least 28 calendar days before the restriction or detour taken effect.

(b) Closures and Modifications - Submit to the Engineer, in writing, for approval, all proposed closure schedules, as follows:

- **Lanes** - A minimum of 7 calendar days before lane closures begin.
- **Roads** - A minimum of 14 calendar days before closure. Also notify in writing, all affected emergency services, school districts, and US Postal Service a minimum of 14 days before any closure.
- **Bicycle and Pedestrian Facilities** - A minimum of 14 calendar days before a bike lane, sidewalk, or multi-use path closure.
- **Signals and Traffic Control Devices** - Provide a minimum of 7 working days notice in advance for any adjustments to existing traffic signals, signs or other traffic control devices. Notify the District Signal Engineer at least 5 working days in advance of traffic signal interruption or modification.
- **Parking** - A minimum of 14 calendar days prior to closure. Contractors must purchase the required permits 14 days in advance from the Permit Center, 503-823-7365. After receiving written approval, provide 48 hour public notification before the closure.
- **Transit Stops** - A minimum of 7 calendar days prior to closure. After receiving written approval, notify TriMet at least 48 hours in advance of any transit stop closures.
- **Transit Detours** - A minimum of 7 calendar days prior to closure. Identify bus routes in the project area and coordinate with TriMet to determine an alternative route, removal of parking requested by TriMet on the alternate route, and advance notification. Submit any traffic control associated with the alternate transit routing.

Construction

00220.40 General Requirements - Provide the following for public traffic in all construction areas:

(a) Traffic Nuisance Abatement - If loose rock or dust exists on roadway surfaces and shoulders, the Engineer may direct one or more of the following:

- Use flaggers or pilot cars and flaggers.
- Apply a fine spray of water to the surface as directed.
- Sweep paved surfaces with power brooms.

(b) Detours and Stage Construction - Construct and remove, if required, detours, stage construction roadways, shoulders, and temporary bridges, including accessory features shown or ordered.

(c) Driveways - Provide reasonable access as follows:

- Replace and maintain business accesses, driveways, approaches, crossings and intersections as needed
- Use reasonably well-graded aggregate material
- Before placing the permanent base, do one of the following:
 - Uniformly spread the temporary aggregate material over the subgrade.
 - Remove and place the temporary aggregate material in the shoulder slope area if it meets quality requirements.
 - Dispose of the temporary aggregate material in a manner satisfactory to the Engineer.
- When construction requires the closure of a driveway, contact the property's point of contact 14 days in advance of construction. Coordinate all driveway closures with the property representative to minimize disruption and inconvenience during construction. Parking and delivery access shall be accommodated during construction either on site or on an adjacent street block.

(d) Adjacent to Excavations - Where paved shoulders adjacent to excavations are less than 4 feet wide, protect the traffic as follows:

- At the end of each working day, backfill pavement edge excavations to the elevation of the existing pavement with permanent base material or with a temporary wedge of aggregate as shown on ODOT standard drawings.
- Do not excavate along both edges of the pavement adjacent to traffic at the same time. Before excavating at the edge of the pavement on the opposite side of the roadway, complete the construction to existing pavement elevation on the side which was excavated first.

- Remove the temporary wedge of aggregate material, if used, before placing permanent base material, and place it in the shoulder slope area or spread it uniformly over the subgrade.

(e) Sidewalk Closure - When construction requires the closure of a sidewalk or sidewalk ramp:

- Place Type "W1" "SIDEWALK CLOSED" signs (MUTCD R9-9, 10, 11, 11a) as needed to direct pedestrian traffic. Mount each sign between the panels of a Type II barricade placed across the sidewalk, facing pedestrians approaching the work area.
- Close the sidewalk at a point where there is an alternate way to proceed or provide an alternate pedestrian route. To the maximum extent feasible, the alternate circulation path shall be provided on the same side of the street as the disrupted route. Pave the alternate pedestrian route surface or provide an approved, non-slip 36 inch minimum width surface meeting the requirements of the Americans with Disabilities Act (ADA). If appropriate, delineate this route and protect pedestrians by placing work zone delineation fencing.
- Barricades, channelizing devices and fencing are to remain in place, except as required for actual work, until the sidewalk is reopened to pedestrian traffic. Reopen the sidewalk during non-work hours or continue to provide an alternate route for pedestrians. Reopen the sidewalk when no work is being performed or if no work is scheduled for 2 weeks or more, and if required, place ramps, barrels, and other protective measures to delineate the route.
- Provide alternate pedestrian routes that match existing facilities and provide additional traffic control measures to meet the accessibility requirements in Part VI of the MUTCD.

(f) Doorways - All open doorways in and around the work site shall be clearly marked using cones and caution tape, construction fencing or other measures approved by the engineer. Accessible 48 inch wide walkways of wood or other hard, non-skid surface shall be provided through, over or around work areas to doorways adjacent to construction activities.

(g) Trenches - At the end of each working day, backfill trenches to the elevation of the existing pavement, cover trenches with temporary steel plates, or surround trenches with temporary fencing.

(h) Lane Restrictions - Do not close any traffic lanes and remove all barricades and objects from the roadway during the periods listed below unless approved.

(1) Weekdays:

- Between 7:00 a.m. and 9:00 a.m. and between 4:00 p.m. and 6:00 p.m. Monday through Friday.

(2) Holidays - Between 4:00 p.m. on the day preceding a legal holiday or holiday weekend and midnight on a legal holiday or the last day or holiday weekend, except for Thanksgiving, when no lanes may be closed between noon on Wednesday and midnight on the following Sunday.

For the purposes of this Section, legal holidays are as follows:

- New Year's Day on January 1
- Memorial Day on the last Monday in May
- Independence Day on July 4
- Labor Day on the first Monday in September
- Thanksgiving Day on the fourth Thursday in November
- Christmas Day on December 25

When a holiday falls on Sunday, the following Monday shall be recognized as a legal holiday. When a holiday falls on Saturday, the preceding Friday shall be recognized as legal holiday.

(3) Special Events - Between 4:00 p.m. on the day preceding and midnight on the final day of the special event.

Maintenance

00220.60 Surface Maintenance Responsibilities - Provide adequately maintained accommodations at all times for public traffic through and within the Project according to this Section and Section 00225.

(a) During Construction - The responsibility for maintaining all surfaces during construction is as follows:

(1) Contractor Responsibility - Do the following at Contractor's expense:

- Keep roads, streets, bikeways, sidewalks, multi-use paths, and shoulders used by public traffic, free of debris, aggregate, dirt, mud, and other materials that impede traffic.
- Repair damage to surfaces caused by the Contractor's operations.
- Maintain all detour or stage construction surfacings not constructed as specified or directed.

Before winter shutdown begins, do the following:

- Provide paved traffic lanes for each direction of traffic.
- Do not leave abrupt edges.
- Remove or cover temporary construction signs unless otherwise directed.
- Clean, install, and reinstall all necessary channelization and pavement markings, as directed.



If this winter shutdown work is not completed and in place, the City may do the work according to 00220.60(d)

(2) City Responsibility - The City will be responsible to do the following at City expense:

- Maintain existing surfacings and shoulders that are being used by public traffic at the start of the Project which have not been damaged by Contractor operations.
- Maintain surfaces of detours and intermediate stage construction during the time they are being used by public traffic, but only if constructed according to the plans or as directed.
- Maintain existing surfaces and shoulders of detours located outside the Project limits during the time they are being used by public traffic.
- Sand icy pavements and remove the sand residue.
- Remove snow from traveled ways as required to accommodate public traffic.

The City may authorize the Contractor to perform this work according to Section 00196.

(b) During Suspensions - Maintain surfacings for which the Contractor is responsible according to 00220.60(a)(1), the work according to 00170.80, and work zone traffic control according to Section 00225 during suspensions of the work as follows:

(1) Suspensions Due to Contractor Fault or Neglect - If the suspension is due to any cause within the control or responsibility of the Contractor, including failure to do the following:

- Perform any provisions of the Contract,
- Correct conditions unsafe for the general public, workers or City employees, or
- Carry out orders given by the Engineer

Then assume sole responsibility for making provisions for traffic acceptable to the Engineer, and be solely responsible for the costs of maintaining surfaces under traffic, the work, and work zone traffic control during the suspension.

(2) Suspensions Due To Other Causes - If the suspension is due to unforeseen circumstances, or causes not included in 00220.60(b)(1), and if the suspension occurs within the Contract time or adjusted Contract time:

- Place uncompleted traveled ways, shoulders, driveways, approaches, connections, and detours necessary for traffic in a maintainable, acceptable condition. Be responsible for the work.
- Be responsible for work zone traffic control.

The City will then assume responsibility for maintenance of the roadway surfaces during the suspension.

(c) Resuming Contract Work after Suspension - After any suspension do not resume Contract work until approved.

(d) Right of City To Perform Work At Contractor Expense - If the Contractor fails to provide adequate accommodations for traffic and to maintain the traveled ways and connections as provided in the Contract, the Engineer may proceed immediately to provide adequate accommodations and maintenance. The cost of this work will be deducted from monies due, or that become due, the Contractor.

00220.65 Existing Traffic Control Device Maintenance Responsibility:

(a) General - Maintain existing regulatory and warning traffic control signs, such as STOP, YIELD, KEEP RIGHT, and ONE-WAY signs, for the duration of the construction in accordance with (b) and (c) below, unless otherwise directed. If the Contractor fails to comply with the provisions below, the City may perform the work at the Contractor's expense.

(b) Sign Relocation - If a permanent sign must be temporarily relocated, the sign shall be adequately mounted, placed as near as possible to the original locations, and remain clearly visible to approaching traffic without creating a traffic hazard as approved by the Engineer.

(c) Damaged/Missing Signs - Damaged, missing or improperly located STOP, YIELD, or ONE-WAY signs shall be replaced or relocated immediately. Provide manual traffic control from the time at which the problem is noted until the time at which it is corrected.

00220.70 Opening Sections to Traffic - When it is in the public interest the Engineer may order any portion of the work opened to traffic. If the portion opened to traffic has been finished in an acceptable manner, it will be designated as "accepted for traffic", and the Contractor will be relieved of maintaining it for legal, public traffic. If the portion of the work to be opened to traffic has not been finished in an acceptable manner, it shall be maintained under traffic by the Contractor in a condition serviceable and adequate for traffic until it is finished in an acceptable manner, except as provided in 00220.60(b).

Maintain portions of the work designated "accepted for traffic" as Extra Work if so ordered. Maintain portions of the work opened to traffic but not "accepted for traffic" at no additional compensation, except watering ordered to protect the work or to alleviate dust will be paid for as provided in Section 00340.

The "accepted for traffic" portion(s) of the work will:

- Be accepted only to the extent the Contractor is relieved of maintaining these portions for legal, public traffic after acceptance.
- Not entitle the Contractor to reduction of Retainage.
- Not relieve the Contractor's responsibility for defective materials or work.
- Not relieve the Contractor's responsibility for damages to the work from causes other than legal, public traffic except as provided in 00170.80.
- Not constitute a waiver of any provision of the Contract.

If the Contractor delays the completion of shoulders, drainage structures, or other feature of the work, the Engineer may order all or any portion of the work to be opened to traffic. In this case, the Contractor shall be responsible for maintenance as described in 00220.60(a)(1), during the period the work is opened to traffic until final acceptance. Conduct the remaining operations to cause the least obstruction to traffic, and pay all additional costs caused by the presence of traffic.

Measurement

00220.80 Measurement - No measurement of quantities will be made for work performed under this Section.

Payment

00220.90 Payment - No separate or additional payment will be made for work performed under this Section, unless otherwise provided or pay items are provided under other Sections.

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In addition, no payment will be made for costs incurred by the Contractor because of:

- Inconvenience, additional length of travel to conform to established traffic patterns and planned access features; or
- Compliance with laws governing traffic regulations and load limitations.

Costs anticipated because traffic will be using portions of the work will be included in the Contract prices for the various items of work involved.

Section 00225 - Work Zone Traffic Control**Description**

00225.00 Scope - This work consists of providing temporary traffic control measures (TCM) and furnishing, installing, moving, operating, maintaining, inspecting, and removing traffic control devices (TCD) throughout the Project Area according to the standard drawings, the traffic control plan (TCP) for the Project, these Specifications, or as directed.

00225.01 Abbreviations, Definitions, and Standards:**(a) Abbreviations:**

ADT	-	Average Daily Traffic
TCD	-	Traffic Control Devices
TCM	-	Traffic Control Measures
TCP	-	Traffic Control Plan
TCS	-	Traffic Control Supervisor
TSS	-	Temporary Sign Support
PCMS	-	Portable Changeable Message Sign
PROM	-	Programmable Read Only Module

(b) Definitions:

Traffic Control Devices (TCD) - Signs, signals, markings, and other devices placed on, over or adjacent to a road to regulate, warn, or guide public traffic by authority of a public body or official having jurisdiction.

Traffic Control Measures (TCM) - Elements of the TCP including, but not limited to, TCD, personnel, materials and equipment used to control public traffic through a work zone.

Traffic Control Plan (TCP) - A written and drawn plan for providing the safe and efficient movement of public traffic through or around a work zone while protecting workers, incident responders, and equipment.

Work Zone - An area within highway construction, maintenance, or utility work activities which extends from the first warning sign to the last TCD.

(c) Standards - When designing, applying, installing, maintaining, inspecting, and removing traffic control devices, use and follow the most current versions in effect of the following:

- Oregon Department of Transportation's "Sign Policy and Guidelines for the State Highway System"
- The "Manual on Uniform Control Devices (MUTCD)"

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- FHWA "Standard Highway Sign" manual
- ODOT "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less" when directed by the Engineer only for mobile pavement marking operations or surveying work

00225.02 General Requirements:

(a) General - Be responsible to provide and maintain all TCM. The Engineer may verbally or in writing require immediate changes to the TCM being used on the Project. Immediately make these changes, as directed. Submit all proposed TCM revisions to the Engineer for approval.

Appoint a trained person on site during normal working hours and on call at all other times who:

- Meets the requirements of 00225.31.
- Is responsible to maintain all TCD in proper position and condition.
- Is equipped with a two-way radio conforming to 00225.28 or cell phone.
- Has the authority to assign and control flagging operations.
- Files his/her name and phone number with the Engineer and local police.

Do not start work on any stage of construction until the TCP has been reviewed and accepted and all TCM are in place and the TCP is operating satisfactorily. During construction, determine if additional TCM are required to those in place and immediately notify the Engineer. Immediately make changes as approved or directed, but do not place or remove devices without prior approval.

Work may be suspended as specified in 00180.70 or the TCM may be performed by the City if the Contractor fails to correct an unsafe condition. Costs for work performed by the City will be deducted from monies due the Contractor.

(b) Horizontal Clearance - When the horizontal clearance for the roadway is less than 19 feet, install "ROAD NARROWS" signs (MUTCD W5-2) signs, identifying the narrowest width of the roadway. Locate these horizontal clearance signs as shown or as directed.

(c) Vertical Clearance - When the vertical clearance is less than 15 feet 3 inches, install low clearance (MUTCD W12-2) signs. The clearance shown on the signs shall be 3 inches less than the shortest height of the opening. Locate these low clearance signs as shown or as directed.

(d) Intersecting Streets - When a through road intersects the work zone, place a 36 inch "ROAD WORK AHEAD" sign in advance of the intersection at sign spacing "A" from the "TCD Spacing Table" shown on the standard drawings. These signs do not require sign flag boards, unless otherwise directed.

(e) Paving Operations - When paving operations create an abrupt edge, protect traffic by installing signing according to the "2-Lane, 2-Way Roadway Overlay Area" detail shown on the standard drawings.

When a cold planed pavement surface is used by traffic, install a 36 inch "BUMP" sign at the transverse paving edge. Install a 36 inch "GROOVED PAVEMENT" sign in advance of the bump sign at sign spacing "A" from the "TCD Spacing Table" shown on the standard drawings. Face both signs toward oncoming traffic and install them before opening the cold planed surface area to active traffic.

(f) Extended Traffic Queues - During flagging operations, monitor the length of traffic queues and when extended traffic queues develop, protect traffic by providing advance flagger(s) and signing according to the "Extended Traffic Queues for Advance Flagging" detail shown on the standard drawings.

00225.03 Traffic Control Outside Project Site - Provide TCM outside the Project Site when required.

00225.04 Regulations and Codes - All electrical equipment, materials, and work shall conform to NEC requirements and all other laws that apply.

00225.05 Contractor Traffic Control Plan - The Contractor will be allowed to use the City's TCP, modify the City's TCP, or use a different TCP. Submit the following, for approval, 5 calendar days before the preconstruction conference:

(a) City's or Contractor TCP - If the City's TCP is used without modification, a written notification indicating that the City's TCP will be used without modification with the proposed order and duration of the TCM and a designated haul route if required.

If the Contractor will be using a modified City TCP, or if the Contractor will not be using the City TCP, include the following:

- Proposed TCP showing all TCM and quantities of all TCD
- Proposed order and duration of the TCM
- A detailed temporary striping plan
- A designated haul route if required

(b) Tourist-Oriented Directional (TOD) and Business Logo Signs - Two copies of a sketch map of the Project showing all existing TOD and business logo signs and a written narrative describing how these signs will be kept in service and protected throughout all the construction stages.

If there are no TOD signs on the project, a written notification that no TOD signs exist within the project limits.

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00225.06 Routing Traffic Over Surfacing - Control traffic being routed over surfaces as follows:

(a) **Aggregates** - When directed, control traffic over aggregate with flaggers or flaggers and pilot car(s).

(b) **Asphalt Treated Permeable Base (ATPB)** - When directed, control traffic over ATPB with flaggers or flaggers and pilot car(s).

(c) **Asphalt Concrete** - Control traffic over asphalt concrete as follows:

(1) **Paving** - When the longitudinal joint is greater than 1 inch in height, install additional TCD according to 00225.02. Complete the placing of HMAC and construction of paving joints according to 00744.61 and 00744.62.

(2) **Cold Plane Pavement Removal** - Complete the pavement removal according to 00620.40. When the area cannot be paved back during the same shift and the depth of pavement removal is greater than 1 inch, install additional TCD according to 00225.02.

(d) **Oil Mats or Chip Seals** - Control traffic over asphalt oil mats or chip seals with flaggers and pilot car(s), unless otherwise directed, until the entire surface has been broomed or bladed after the aggregate was placed as tabulated below:

ADT	Minimum Pilot-Cars
Over 1500	2
1500 and less	1

(e) **Sand Seals** - Control traffic with flaggers and pilot car(s) during application of asphalt and until it is covered with aggregate, unless otherwise directed.

(f) **Steel Plates** - When steel plates are installed in travel and bike lanes, appropriate warning signs shall be placed in advance of the plates as shown on the approved TCP.

Materials

00225.10 General - Evaluate the condition of TCD using the criteria shown in the most current version in effect of the American Traffic Safety Services Association (ATSSA) publication titled "Quality Guidelines for Work Zone Traffic Control Devices". Use new or acceptable TCD for all installations unless otherwise specified. Provide test results, quality compliance certificates, equipment lists and drawings when specified. Acceptance will be by the CPL, test results, quality compliance certificates, equipment lists, drawings and testing as necessary to assure compliance with the Specifications. After TCD have been installed and accepted on the Project, inspect and maintain the condition of the devices.

All work zone TCD shall comply with the crashworthy requirements of National Cooperative Highway Research Program (NCHRP) Report 350.

00225.11 Temporary Signing - Furnish new or acceptable temporary signs and accessories meeting the following requirements:

(a) Signs - Use materials and fabricate signs conforming to Sections 00940 and 02910 and the following:

(1) Size and Shape - Use standard size and shape signs meeting the requirements of 00225.01(c) unless otherwise specified or ordered. Double-face signs will not be allowed except for flagger "STOP/SLOW" sign paddles.

(2) Type - Use Type "O3," "O4" or "O5" signs, unless otherwise indicated in this Section or in the TCP. Fabricate these signs on one of the following materials:

- New sheet aluminum sign blanks.
- New extruded aluminum panels.
- Use sheet aluminum sign blanks that are without bends, tears, holes, or dents and that have been cleaned to bare metal.
- 3/4 inch high-density overlay plywood.
- 3/4 inch medium-density overlay plywood.
- Light-weight sign substrates from the CPL.

(3) Folding or Turning Signs - Temporary signs on posts may be the folding or turning type as long as they can be locked when not in use so the sign message is not visible to any traffic.

(4) Roll-up Signs - Use roll-up signs with fluorescent orange roll-up sheeting from the CPL.

(b) Sign Supports:

(1) Wood Sign Posts - Use wood sign posts in the sizes and quantities as shown on the ODOT standard drawings and according to 02110.40, except posts may be untreated.

(2) Portable Sign Supports - Use portable sign supports from the CPL and conforming to the following:

- Free standing.
- Capable of supporting signs in vehicle-caused turbulence and in winds common to the area where they are used. If additional ballast is required to maintain the signs in an upright position, use sandbags to anchor the sign support legs. Place a sandbag filled with loose sand (approximately 25 pounds) across the bottom of each leg as needed.

(3) Concrete Barrier Sign Supports - Use concrete barrier sign supports that meet the following:

- Conform to the ODOT standard drawings.
- Attach securely to the top of the concrete barrier.

(4) Temporary Sign Supports - Fabricate and use TSS as shown on the ODOT standard drawings and according to 02110.40 except posts may be untreated.

(5) Perforated Steel Square Tube Sign Supports - Use perforated steel square tube sign supports from the CPL and as shown on the ODOT standard drawings.

(c) Sign Covers:

(1) Temporary Signs - Sign covers for temporary signs shall be:

- One-piece plywood.
- Other sign cover from the CPL.
- Large enough to completely cover the sign.
- Easy to attach to and remove from the sign without damaging the sign face.
- Black, non-reflective and opaque.

(2) Permanent Signs - Sign covers for permanent signs shall conform to Section 00941

(d) Sign Flags - Sign flags shall be:

- Fluorescent red-orange.
- 16 inch square or larger.
- Made from an acceptable tightly woven fabric or plastic sheeting.

(e) Amber Flashers - Amber flashers shall:

- Be industry standard 8 inch traffic signal head with visors.
- Be visible the full width of the traveled way and shoulders 1,200 feet from the flashers.
- 110/120 volt or 12 volt rechargeable, battery-operated.
- Provide a constant flash rate of one flash per second $\pm 10\%$.
- Provide an illuminated period of each flash of 30% $\pm 10\%$ of each flash cycle.

(f) Sign Flag Boards - Use sign flag boards as shown on the ODOT standard drawings.

(g) **Flashing Stop/Slow Paddles** - Use flashing "STOP/SLOW" paddles from the CPL.

00225.12 Temporary Barricades, Guardrail, Barrier, Attenuators, and Pedestrian Fencing - Furnish temporary barricades, guardrail, barrier, attenuators, pedestrian fencing, and accessories shall conform to the following:

(a) **Barricades** - Use barricades from the CPL and as shown on the ODOT standard drawings.

(b) **Guardrail** - Use guardrail meeting the requirements of Section 00810 except posts may be untreated. Use guardrail terminals from the CPL and as shown on the ODOT standard drawings.

Reuse salvaged guardrail materials that comply with the requirements of 00810.15.

(c) **Concrete Barrier** - Use concrete barrier meeting the requirements of Section 00820 and have the same cross section, height, and loop configuration within individual runs and the following:

- Pin-and-loop concrete barrier as shown on the ODOT standard drawings (three ASTM A 36 loops, 32 inch height).
- Tall concrete barrier as shown on the ODOT standard drawings (two ASTM A 36 perforated C-shapes, 42 inch height).

Provide concrete barrier for temporary applications that are in acceptable condition, without cracks, chips, spalls, corroded loops or C-shape connectors.

The concrete barrier shall have functioning scuppers, unless otherwise approved.

(d) **Impact Attenuators** - Furnish impact attenuators from the CPL and as shown on the ODOT standard drawings.

(e) **Glare Shields** - Use glare shields from the CPL that are a minimum 24 inches in height.

(f) **Pedestrian Fencing** - Use pedestrian work zone delineation fencing from the CPL.

(g) **Reflective Barrier Panels** - Use reflective barrier panels from the CPL.

00225.13 Temporary Traffic Delineation - Furnish temporary traffic delineation items and accessories meeting the following requirements:

(a) **Tubular Markers** - Use tubular markers from the CPL.

(b) **Conical Markers** - Use conical markers from the CPL.

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(c) **Surface Mounted Tubular Markers** - Use surface mounted tubular markers from the CPL.

(d) **Plastic Drums** - Use plastic drums from the CPL. Use retroreflective drum sheeting meeting the requirements of ASTM D 4956 Type III or Type IV.

(e) **Delineators** - Use new delineators from the CPL or salvaged reflectorized delineators (W-1) or (Y-1), as appropriate, and conforming to the requirements of Section 00840 and the following:

(1) **Guardrail** - At guardrail locations, use Type 4 delineators.

(2) **Concrete Barrier** - At concrete barrier locations, use Type 5 delineators.

(f) **Pavement Markers:**

(1) **Reflective Pavement Markers** - Use new Type 1 reflective pavement markers from the CPL.

(2) **Flexible Oiling Pavement Markers** - Use new flexible oiling pavement markers from the CPL.

(3) **Flexible Overlay Pavement Markers** - Use new flexible overlay pavement markers from the CPL.

(g) **Temporary Tape** - Use temporary non-removable, temporary removable, and temporary non-reflective tape, from the CPL.

(h) **Striping:**

(1) **Paint** - Use striping paint from the CPL.

(2) **Beads** - Use glass beads from the CPL.

00225.14 Temporary Illumination - Furnish materials for temporary illumination meeting the requirements of Sections 00960, 00970, 02920, 02926 and the temporary illumination plans.

00225.15 Traffic Signals - Furnish cable, guy wires, hardware, wood poles, wood pole foundations, and guy anchors that are able to support the dead load of the equipment shown and withstand 100 mph, 3-second gust wind speed with an importance factor (Ir) equal to 0.71 according to the 4th Edition AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

(a) **Temporary Traffic Signal** - Use materials for temporary traffic signals that conform to Sections 00960, 00990, 02120, 02920, 02925 and the following:

(1) **General** - Used materials are allowed if restored to new condition or have very minor wear that is undetectable without close inspection. Do not use permanent signal equipment as part of the temporary signal installation.

(2) **Cable and Wire** - Use all new cable and wire.

(3) **Wood Poles** - Use poles that are of acceptable condition without visible signs of deterioration or significant longitudinal splits. Poles shall have no more than 8 drilled holes for messenger and tether cable eyebolt attachments. Holes shall not be closer than 6 inches.

(4) **Concrete** - Use commercial grade concrete according to Section 00440.

(5) **Traffic Signal Control Devices** - The controller program, PROM and monitor programming will be furnished by the City. When the temporary signal is removed, return the PROM to the City.

(b) **Portable Traffic Signals** - Use new or like-new portable traffic signals from the CPL

00225.16 Temporary Electrical Signs - Furnish electrical signs meeting the following requirements:

(a) **Sequential Arrow Signs** - Use trailer mounted Type "C" sequential arrow signs from the CPL.

(b) **Portable Changeable Message Signs** - Use trailer mounted PCMS units from the CPL.

00225.17 Flagger Station Lighting - Furnish flagger station lighting from the CPL and meeting the following requirements:

- Illuminates the flagger so that the flagger is visible, and is discernable as a flagger, from a distance of 1,000 feet.
- Illuminates the flagger from above at a height of 18 feet \pm 3 feet.
- The light is shielded from approaching traffic.

00225.18 Temporary Pedestrian Walkways - Materials for temporary walks shall be constructed using Douglas Fir-Larch No. 2 or better. The walk shall be a minimum of 7 feet wide with 42 inch high hand railing on both sides of the walk. The lumber used shall be a minimum of 2 inches x 8 inches except for the hand railing which shall be a minimum of 2 inches x 4 inches with 4 inches x 4 inches posts. Apply a non-skid material, with a minimum static coefficient of friction of 0.6 (0.8 on slopes greater than 4%) as determined by ASTM C1028, to the walking surfaces.

Submit a design for the proposed walks for review before construction begins.

Equipment

00225.20 General - Equipment will be accepted based on compliance with the Specifications and the Engineer.

00225.27 Flaggers - Provide flaggers with the following:

(a) Flagger Equipment - Equip flaggers with the following:

- Clothing to cover the complete body except head, neck, and arms below the point of the shoulders.
- An ANSI Class II orange, yellow, strong yellow green or fluorescent versions of these colors, retroreflective vest, shirt, or jacket. The vest, shirt, or jacket shall be designed to identify the wearer as a person and be visible through the full range of body motions.
- A fluorescent yellow-green, orange, yellow, or bright white hardhat. Wear hardhats during flagging operations.
- A minimum 18 inch x 18 inch "STOP/SLOW" paddle made of rigid substrate and fabricated using Type "R1"/"O4" sheeting, or a flashing "STOP/SLOW" paddle from the CPL. A 24 inch x 24 inch "STOP/SLOW" paddle is recommended for higher speed situations or where more conspicuity is desired.
- Portable, self contained two-way radio and repeaters, as required, with a range suitable for communications throughout the Project limits.

(b) Flagger Station Lighting - Use flagger station lighting from the CPL and conforming to the following:

- Provide flagger illumination sufficient to ensure the safety of the flagger, motorists, and workers during flagging operations.
- Provide shielding to prevent light beams from being directed toward traffic.

00225.28 Traffic Control Supervisor - Equip the Traffic Control Supervisor (TCS) as follows:

- Clothing, vest, and hard hat or cap equivalent to that of flaggers.
- Portable, self-contained two-way radio with a range suitable for the Project.
- Cellular telephone active 24 hours a day.
- A vehicle that is equipped with a roof or post mounted rotating amber light or strobe light that is visible for 360°.

00225.29 Pilot Cars - Provide pilot cars with the following features:

- No smaller than a compact pickup truck.
- Four wheels.

- A "PILOT CAR FOLLOW ME" (G20-4-18) sign mounted in a conspicuous location on the rear of the vehicle.
- A roof or post mounted rotating amber light or strobe light that is visible for 360°.
- A two-way radio with a range suitable for the Project.

Labor

00225.30 General - Observe all laws concerning safety, health, and sanitation standards according to 00170.60. Provide flaggers, TCS, signal operators, and pilot car operators, to stop, direct and maintain traffic control through the work zone.

00225.31 Qualifications - Use flaggers, TCS, signal operators, and pilot car operators that meet the following requirements:

- Have a valid driver's license.
- Are at least 18 years old.
- Have the mental and physical ability to provide timely, clear, and positive guidance to the traveling public.
- Have a sense of responsibility for public and work crew safety.
- Have a professional appearance.
- Have a courteous but firm manner.
- Have completed an approved work zone traffic control flagging course within the past 3 years and have in their possession a current, official state Flagger Certification card from either Oregon, Washington, Idaho or Montana.

00225.32 Traffic Control Supervisor - The TCS shall possess a current ODOT "Oregon Certified Traffic Control Supervisor" card. A TCS with a current card from another State Department of Transportation or from American Traffic Safety Services Association may obtain an Oregon Certified TCS card upon successful completion of ODOT's one-day Recertification Class.

The TCS duties include the following:

- Meets the requirements of 00225.31.
- Files his/her name and phone number with the Engineer and local police.
- Notify the Engineer of any corrections being made to the TCP when it is not functioning as required.
- Inspect TCD during each construction work shift for proper function, location, installation, message, cleanliness, and effect on the traveling public.

- Check post-mounted signs once a week. Inspect traffic control devices to be left in place for more than 24 hours during non-working hours immediately following initial placement of TCD. Conduct additional TCD inspections for extended periods, as requested. Check for effectiveness in both daylight and darkness.
 - Review and inspect nighttime lighting and its effect on the traveling public.
 - Make temporary revisions to the TCP in the event of an emergency. Immediately follow-up with and report any changes to the Engineer.
 - Oversee all requirements of the Contract to ensure the convenience, safety and orderly movement of vehicular, bicycle, and pedestrian traffic.
-
- Have the documents listed in 00225.01 and applicable standards and specifications available on the Project at all times.
 - Discussing proposed TCM and coordinating implementation of the TCP with the Engineer.
 - Coordinating all TCM, including those of subcontractors, suppliers, and any adjacent construction or maintenance operation.
 - Coordinating the Project's activities (such as ramp closures, road closures, and lane closures) with appropriate police, fire control agencies, city or county engineering, medical emergency agencies, school districts, Postmaster and transit companies.
 - Prepare and sign a daily Traffic Control inspection report or at another frequency as approved. Submit the report to the Engineer no later than the end of the next working day. As a minimum, include the following items in the report:
 - When sign and TCD are installed and removed.
 - Locations of signs and TCD.
 - Revisions to the TCP (include copy of signed approval by the Engineer).
 - Lighting utilized at night.
 - Observations of traffic conditions.
 - When TCD are damaged or replaced.
 - How TCD were damaged and by whom.
 - Accidents or incidents occurring within the work zone.
 - The TCS may make minor revisions to the TCP to accommodate site conditions as long as the original intent of the TCP is maintained and the revision has been approved by the Engineer.
 - Attending Project meetings specifically scheduled to discuss the TCP and TCM.
 - Providing supervision over all TCM on a 24 hour per day basis.

| Do not designate the Project superintendent as the TCS unless approved.

Maintain a 24-hour telephone number at which the TCS can be contacted. Make arrangements so that the TCS will be available on every working day, on call at all times, and available upon the Engineer's request at other than normal working hours. During non-work periods, the TCS, or authorized representative, shall report to the Project site within 45 minutes after notification in the event of a work zone incident. The TCS shall have appropriate manpower, equipment, and material available at all times to expeditiously correct any deficiency in the TCM for the Project.

Notify the Engineer of an alternate TCS who can assume the duties of the assigned TCS in the event of that person's inability to perform. Alternate TCS shall be adequately trained and certified to the same degree as the assigned TCS. Notify the Engineer within 24 hours of designating the TCS for the following 24-hour period. Make succeeding notifications within 24 hours every time a subsequent TCS is appointed to the Project.

The on-duty TCS shall not act as a flagger except in an emergency.

Construction

00225.40 General - Install, inspect, move, operate, maintain, and remove temporary TCD according to the plans, these Specifications, and the following:

- Install, maintain, and move all TCD by working with the direction of traffic.
- Provide additional TCM, according to 00225.02, when necessary or directed.
- Turn, cover, or remove the existing TCD as directed when they are not necessary or conflict with temporary devices. Remove and obliterate, without damaging the wearing surface, all evidence of all temporary TCD when the Contract is complete.
- Remove TCD in the reverse sequence of the installation.

Temporary TCD are to remain the property of the Contractor.

Existing TCD shall remain in operation throughout the Contract or until replaced by new permanent TCD as appropriate.

00225.41 Temporary Signage - Once temporary signs have been accepted and paid for on the Project, do not remove them from the Project, until directed.

Install all temporary signing according to the plans, Section 00940, the MUTCD, the "Sign Policy and Guidelines for the State Highway System," FHWA "Standard Highway Sign" manual and the following:

(a) **Speed Signs** - Use speed signs as follows:

(1) **Advisory Speed Signs** - Install the advisory Type "O4" speed signs as directed.

When advisory Type "O4" speed signs are used, cover the appropriate Type "W1" speed zone signs with sign covers according to Section 00941. Uncover them when the advisory Type "O4" speed signs are removed or covered. At the trailing end of the Project, install a Type "W1" speed zone sign with the original designated speed. If existing Type "W1" speed signs are 500 feet or less beyond the Project, additional signs are not required.

When there is no work on the Project or when directed, cover or remove the advisory Type "O4" speed signs and restore the original Type "W1" speed zone signs.

(2) **Regulatory Speed Signs** - Install and maintain the regulatory signs as directed and according to the "Temporary Speed Zone Order" signed by the State Traffic Engineer.

When regulatory Type "W1" speed signs are used, cover the appropriate Type "W1" speed zone signs with sign covers according to Section 00941. When there is no work on the Project or when directed, cover or remove the regulatory Type "W1" speed signs and restore the original speed zone signs.

(b) **Sign Supports:**

(1) **Wood Sign Posts** - Except as provided in the following (2) through (5), mount all temporary signs on wood sign posts as shown and as shown on the ODOT standard drawings.

When sign posts are installed in rock, a shorter post may be used provided the post is installed in a buried concrete footing at least 12 inches in diameter and 2 feet deep.

(2) **Portable Sign Supports** - Use portable sign supports as follows:

- When signs are needed at a single location for no more than 48 consecutive hours.
- Position the support so the lowest point of the sign is at least 1 foot above the roadway surface.
- Install flags if required on signs according to 00225.41(c).
- Remove from road at end of each work shift when the condition is no longer in effect.
- Use with roll-up signs.
- Use ballast to prevent blow down.

(3) Concrete Barrier Sign Supports - Mount signs on concrete barrier so the:

- Lowest point of the sign is at least 7 feet above the roadway surface.
- Sign and post are held securely with a device that prevents blowdown.
- Sign can be turned and locked parallel to the flow of traffic when not in use.

(4) Temporary Sign Supports - Use TSS as follows:

- When signs are needed at a single location for more than 48 consecutive hours.
- When not practical to post mount due to location or when utility conflict exists.
- Do not tip TSS.
- Position the TSS's behind a Type III barricade if it is placed in the roadway.
- When not in use, locate TSS outside the clear zone and turn away from traffic, or cover sign and retain the Type III barricade for delineation.

(5) Perforated Steel Square Tube Sign Supports - Perforated steel square tube sign supports may be used as a substitute for wood sign posts. Install perforated steel square tube sign supports as shown on the ODOT standard drawings.

(c) Sign Flag Boards and Sign Flags - Use 2 sign flag boards and flags as follows:

(1) Sign Flag Boards - Install 2 sign flag boards, as shown on the standard drawings, the plans, and 00225.02.

(2) Sign Flags - Install at least 2 sign flags above all signs mounted on portable sign supports. Mount flags so the entire sign is visible.

(d) Amber Flashers - Use either 110/120 volt flashers or 12 volt rechargeable flashers.

(e) Roll-up Signs - Roll-up signs may be used at a single location for no more than 48 consecutive hours.

(f) Inconsistent Temporary Signs - Ensure that all temporary signs are properly used and consistent with the work zone. When signage is no longer required for staging or shift work, do the following:

00225.42

- Remove from the road all temporary signs, supports, and ballast.
- Turn or cover the signs so that the message is not visible to any traffic.
- Remove or cover the sign flag boards.
- Remove or cover flags with an opaque, black, reflective sheath.
- Remove or turn off amber flashers.

When it is determined only minor work remains on the Project and the work area does not encroach on the roadway shoulder, do the following:

- Remove all temporary signs, supports, and ballast including the advance construction signs and sign flag boards.
- Provide signs for minor work on portable sign supports.

(g) Permanent Signing - Install the appropriate permanent signing as required before changing traffic control staging.

00225.42 Temporary Barricades, Guardrail, Barrier, Attenuators, and Pedestrian Fencing - Install temporary barricades, guardrail, barrier, attenuators, pedestrian fencing, and accessories as follows:

(a) Barricades - Use and place barricades as shown or as directed.

(b) Guardrail - Construct temporary guardrail as shown and according to Section 00810.

(c) Concrete Barrier - When placing barrier adjacent to a road, maintain a minimum of 24 inches from face of barrier to edge of traffic lane. Flare the leading end as shown in the table below and treat ends as shown on the plans.

Speed (mph)	Flare Rate
65	19:1
55	16:1
50	14:1
45	13:1
40	11:1

Pin or restrain temporary concrete barrier when the distance behind the barrier is limited to less than 3 feet. When pinning or restraining barrier, maintain a minimum of 1 foot between the back face of barrier and a drop-off or obstruction. Use the appropriate pinning or restraint detail shown on the ODOT standard drawings.

(d) Impact Attenuators - Assemble and install impact attenuators according to the manufacturer's recommendations and as follows:

- May be placed on pallets, which are no more than 4 inches high, as approved.
- Place and fill the modules with the weight of dry sand as shown on the ODOT standard drawings.
- Mix salt with the sand to the proportions recommended by the manufacturer or at least 5% by volume when no manufacturer recommendations are given.
- Attach an object marker to the lead module as shown on the ODOT standard drawings.
- Use attenuators designed for the original preconstruction posted speed.
- For narrow site systems, pin or restrain the first two barrier sections as shown on the ODOT standard drawings.

(e) Glare Shields - Install glare shields as shown or as directed and according to the following:

- Install at spacing recommended by the manufacturer.
- Install all glare shield blades vertical and true to line.
- Firmly attach the base plate anchor bolts to the concrete barrier to withstand a 1,000 pound vertical pull and to prevent horizontal and rotational displacement. Maximum spacing between anchor bolts or modular units shall be 30 inches.
- Repair any damage to the concrete barrier caused by the Contractor's operations at no additional cost to the City.
- Modular or single element glare shields that are installed in a continuous run shall be of the same manufacture and of like appearance throughout the entire installation.

(f) Temporary Pedestrian Fencing - Install temporary pedestrian work zone delineation fencing as shown or directed.

(g) Reflective Barrier Panels - Install reflective barrier panels on temporary concrete barrier as shown or directed and as follows:

- Install 2 panels on each barrier section.
- Maintain a 4 foot gap between panels on each barrier section.
- Alternate silver-white and fluorescent orange color panels.
- Attach the panels to the face of the concrete barrier with a minimum of 4 anchors.
- Install the bottom edge of panels 20 inches above the bottom of the concrete barrier.

00225.43 Temporary Traffic Delineation - Install and remove temporary traffic delineation items and accessories as follows:

(a) Tubular and Conical Markers - Install tubular or conical markers as shown or directed.

Place tubular or conical markers no more than 10 feet apart along both sides of driveways, streets, and road connections within work areas.

Within individual runs of tubular or conical markers, use one shape for the entire run. Conical markers may substitute for tubular markers.

(b) Surface Mounted Tubular Marker - Install surface mounted tubular markers as shown or directed.

(1) Surface Mounted Tubular Marker Removal - Remove surface mounted tubular marker bases in a manner that leaves any remaining adhesive material with a textured surface condition similar to the texture of the surrounding top lift wearing course pavement surface. Make the surface dull and non-reflective. Remove adhesive from the pavement surface using a method that will not damage the pavement surface.

(c) Plastic Drums - Install plastic drums as shown or as directed.

(d) Delineators - Install traffic delineators as shown on the ODOT standard drawings or as directed. Install delineators on temporary concrete barrier and temporary guardrail as follows:

- Space on 50 foot centers. Closer spacing may be required as directed.
- Use yellow when installed on the left side of traffic.
- Use white when installed on the right side of traffic.
- Use bi-directional markers for median applications.
- Position to face oncoming traffic.

(e) Pavement Markers - Unless shown on the plans, install pavement markers as follows:

- Three single markers spaced 4.5 feet apart to simulate a 9 foot skip line with a gap of 15 feet to the next skip line.
- Single markers spaced 5 feet apart for solid, no passing lines.
- Double markers spaced 5 feet apart for double solid, no passing lines.

Use yellow markers for highway centerline. Use white markers for lines between adjacent lanes in the same direction of traffic.

Flexible pavement markers shall remain in place until the permanent striping is complete. Replace missing markers at no additional cost to the City. Remove the markers from the top lift of pavement within 5 days after the Contractor is notified of the placement of permanent markings through the work area. Remove the flexible paving markers without damaging the roadway surface, or cut the markers off within 1/8 inch of the roadway surface.

(1) Reflective Pavement Markers - Use reflective pavement markers when shown according to Section 00855. Establish alignment with control points at 50 foot intervals on tangents and at 25 foot intervals on curves.

(2) Flexible Oiling Pavement Markers - Use flexible oiling pavement markers just before applying asphalt for chip seals, sand seals, and oil mats. Remove marker covers before re-opening the roadway to traffic.

If a segment of roadway is not completed when the roadway is re-opened to traffic, install another set of markers just before the next application of asphalt.

(3) Flexible Overlay Pavement Markers - Use flexible overlay pavement markers as follows:

- On surfaces that do not require chip seals, sand seals, and oil mats.
- On underlying surfaces that temporarily carry traffic.
- When temporary striping is determined as not practical.

Install markers before opening the roadway to traffic. Remove the markers on underlying surfaces before placing the next surface layer.

(4) Existing Pavement Marker Removal - Remove and dispose of existing raised or recessed pavement markers as needed for Stage Construction or as directed. Remove the markers from permanent wearing course surfaces so the roadway surface is not damaged and a surface texture similar to that of the surrounding area remains. Make the surface dull and non-reflective. Remove adhesive from the pavement surface using a method that will not damage the pavement surface.

(f) Temporary Tape - Install temporary tape as shown and the following:

(1) Temporary Removable Tape - Install removable tape on existing surfaces or wearing course as shown or as directed. When staging across new bridge deck use temporary removable tape.

(2) Temporary Non-Removable Tape - Install non-removable tape on base courses as shown or as directed.

(3) Temporary Non-Reflective Tape - Install non-reflective tape over durable pavement markings to be retained as shown or directed.

(g) Temporary Striping - Before opening roadways to traffic, unless otherwise allowed, apply temporary painted stripes on pavement base courses and pavement markers on the wearing surface at locations designated. Immediately remove all unacceptable striping and replace with acceptable striping at no additional cost to the City.

(1) Base Courses - On pavement base courses apply bead binder at a thickness of 15 mils wet, equivalent to 17 gallons/mile for a 4 inch wide solid line. Apply glass beads at a rate of 5 pounds/gallon of paint. Apply 4 inch wide by 9 foot long stripes with 15 foot gaps for skip striping. Apply 4 inch wide, continuous stripe for edge line striping.

(2) Wearing Course - On pavement wearing courses use pavement markers or temporary removable tape to simulate lane lines. When a travel lane is adjacent to temporary concrete barrier, replace the edge line with temporary removable tape, as directed. When striping the edge line, use a continuous strip of temporary removable tape.

(3) Durable Permanent Pavement Markings - On pavement wearing courses apply temporary striping for lane line delineation until durable permanent pavement markings can be applied, unless otherwise directed. Reduce the application rate to a thickness of 10 mils wet, equivalent to 12 gallons per mile for a 4 inch wide solid stripe. Apply reflective elements at a rate of 5 pounds per gallon of paint. Only one application is required.

Place temporary striping directly adjacent to the final location of the durable permanent pavement markings. Place so that the durable permanent pavement markings can be aligned with the existing striping on the adjacent project. Removal of this striping is not required, if aligned as above.

When scheduled installation of durable permanent pavement markings will exceed, or will likely exceed, four weeks after placement of wearing surface, furnish and place temporary striping at the standard rate stated in 00225.43(g)(1). Removal of this striping is not required, if aligned as above.

(h) Pavement Edge Delineation - Place tubular or conical markers to delineate the edge of pavement when construction work obscures the painted shoulder stripe (fog line) or when paving creates an abrupt or sloped edge drop-off 1 inch or more in height along the shoulder. Locate and maintain the markers as follows:

- Between existing delineators.
- Space markers as shown for traffic delineators on the ODOT standard drawings, except do not exceed 50 feet on tangent or 25 feet on curves.
- Patrol daily and restore them to their proper position at least once in the early morning and once in the late afternoon until the tubular or conical markers are no longer required.

- Remove after a new edge stripe has been painted and new delineators are in place.
- Between traffic and the abrupt edge.
- Place delineation immediately.

(i) Stripe and Legend Removal - When removing striping and legends for stage construction, remove them by sandblasting, hydro-blasting, steel shot blasting, or grinding so the pavement surface is not damaged below a depth of 1/8 inch. Remove durable markings and durable legends by steel shot blasting or grinding the pavement surface to a depth no greater than 1/8 inch, or other approved method so the pavement surface is not damaged. Do not use paint or asphalt to cover existing stripes. Repair any damaged surfaces to the Engineer's satisfaction at no additional compensation.

Use vacuum shrouded equipment or other equally effective containment procedures.

Contain and collect all removed paint, durable markings, and spent abrasive and dispose of according to 00290.20.

Remove striping on pavement base courses when a change in striping is necessary and when the pavement will not be covered with an additional base course. Remove striping and pavement markers on the wearing course so that the permanent markings can be applied. Remove all remaining striping and pavement markers from the wearing course after the permanent markings have been applied, as directed.

Coordinate all removal work with the construction activity. Remove striping, legends, and pavement markers during the same day(s) the traffic shift is accomplished unless otherwise approved.

00225.44 Temporary Illumination - Construct and remove temporary illumination according to the plans, and Sections 00950, 00960, 00970, 02920, and 02925.

00225.45 Traffic Signals - Provide traffic signals according to the following:

(a) Temporary Traffic Signals - Construct and remove temporary traffic signals as shown according to the plans, Sections 00950, 00960, 00990, 02920 and 02925 and the following:

(1) Removal - Remove the temporary traffic signal when directed. Remove all wood poles and guy anchors in their entirety. Abandon vehicle detector loops in place. Contractor furnished equipment remains the property of the Contractor.

(2) Power Service - Be responsible for utility coordination, hook-up, and power consumption.

(3) Wood Poles - Backguy wood poles so that they are vertical with all dead loads applied.

(4) Suspension of Heads - Adapt signal mounting hardware as needed for mounting on wood poles.

(5) Testing and Turn-on - Certify that all traffic signal controllers and related control equipment for temporary signals have passed the Oregon Department of Transportation laboratory tests. Successfully tested controllers and related control equipment will be assigned permanent certification tags and will not require further environmental testing. Deliver controllers to the Traffic Signal Services Unit for functional testing.

(b) Portable Traffic Signals - Unless otherwise indicated in the TCP, provide and install portable temporary traffic signals as shown on the standard drawings and the following:

(1) Location and Setup - Locate and set up portable temporary traffic signals according to the following:

- Locate the portable temporary traffic signal so that one vehicle signal head is directly over the traveled way with minimum vertical clearances of 17 feet.
- Provide conflict monitoring of green and yellow field indications.
- If there are indications in conflict or if there is operational failure, set the default to red flash.
- Hardwire interconnect the two units for timing and conflict monitoring.
- Provide cellular or other immediate methods of failure notification.

Do not install portable temporary traffic signals if driveways or road approaches are between the portable temporary traffic signals.

(2) Vehicle Detection - Provide vehicle detection at the stop line for each direction of traffic.

(3) Testing and Turn-on - Notify the Engineer 14 calendar days before turning on the portable temporary traffic signal. The Engineer will do the following:

- Inspect the installation and confirm the date and time the portable traffic signal is to be turned on.
- Notify the Contractor, in writing, with a list of deficiencies that need correction.
- Provide timing parameters to the Contractor for input into the portable temporary traffic signal.

Correct all deficiencies identified by the Engineer before turning on the portable temporary traffic signal. Do not change the timing parameters without the approval of the Engineer. Use flaggers to control traffic during initial turn on of the signal. The flaggers shall remain on standby for 2 hours after the signal is turned on and operating properly.

Correct deficiencies at no additional cost to the City.

(c) Existing Traffic Signals - Adjust existing traffic signals according to the plans and Sections 00950, 00960, 00990, 02920, and 02925.

00225.46 Temporary Electrical Items - Provide and install electrical resources as follows:

(a) Sequential Arrow Signs - Use the sequential arrow signs as follows:

- Mount at a height of 7 feet from bottom of sign to ground.
- Do not use on 2-Lane, 2-Way roadway.
- For shoulder work use caution mode only.
- Provide a solar/battery power source.

(b) Portable Changeable Message Signs (PCMS) - Use PCMS as follows:

- Mount at a height of 7 feet from bottom of sign to ground.
- Entire message is displayed within 7.5 seconds.
- Use a maximum of 2 panels to display an entire message.
- Separate 2 PCMS used in sequence by 1,000 feet minimum.
- Messages shall not scroll horizontally or vertically across the face of the sign.
- When the PCMS is not displaying appropriate messages, as directed, remove the PCMS from the roadway and locate the device outside the clear zone.
- Provide a solar/battery power source.
- Use clear, concise messages, approved by the Engineer, that convey applicable work zone information to the motorist.
- Protect PCMS according to the ODOT standard drawings.

(c) Temporary Power Source - Arrange for, provide, and pay for all electrical power.

00225.47 Flaggers and Flagger Station Lighting - Use flaggers and flagger station lighting as follows:

(a) Flaggers - Locate flaggers far enough in advance of the work area to permit adequate time for the motorist to respond to the flagger's instructions. All flaggers, including advance flaggers, shall use a STOP/SLOW paddle. Do not use the roll-up STOP/SLOW paddle for non-emergency flagging operations.

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During advance flagging operations, only display the SLOW face of the paddle by covering the STOP face of the paddle with black, opaque, nonreflective material.

Position flaggers, as directed, at locations where traffic can enter the highway within the limits of the work zone. Flaggers shall direct vehicles entering the highway to follow the pilot car line.

Flagging stations shall be staffed continuously or until the Engineer determines flagging is no longer required.

(b) Flagger Station Lighting - Provide continuous flagger station lighting for nighttime flagging as follows:

- Locate the light equipment on the same side of the roadway as the flagger between 5 to 10 feet from the edge of the travel lane, on or beyond the roadway shoulder, or as directed.
- Place the flagger station lighting to direct the lighting away from the approaching traffic in the near lane at approximately a 15° horizontal angle $\pm 10^\circ$ perpendicular to the centerline of the roadway.
- Aim all of the luminaires directly at the flagger.
- Increase the output wattage or number of luminaires as the luminance from, and number of, surrounding and background lights increases. Do not provide a total output more than 2,500 watts, unless otherwise directed.

00225.48 Traffic Control Supervisor - Supervise the safe operation of traffic control within the construction work zone.

00225.49 Pilot Cars - Operate pilot cars at a safe and prudent speed.

00225.50 Temporary Pedestrian Walkways - Construct temporary pedestrian access shown on the traffic control plans where the crosswalks and sidewalks have been excavated in the Project. Transitions from the temporary walk to the sidewalks shall comply with the Americans with Disabilities (ADA) regulations.

Maintenance

00225.60 Temporary TCD - Evaluate the condition of TCD and maintain them using the criteria shown in the current American Traffic Safety Services Association (ATSSA) publication titled "Quality Guidelines for Work Zone Traffic Control Devices". Except for electrical devices, replace all TCD that are in marginal or unacceptable condition with equal devices, in new or acceptable condition, within a time period agreed upon by the Engineer.

Electrical devices that are in marginal or unacceptable condition may be repaired instead of being replaced, as long as the repairs are satisfactorily completed within a time period agreed upon by the Engineer.

The replacement or repair of TCD, found to be in marginal or unacceptable condition, shall be made at no additional cost to the City except as in 00225.90(a)(1).

Evaluate, maintain, repair or replace TCD, and perform other duties including the following:

- Keep the devices in proper position, clean, and legible at all times.
- Keep lights, reflectors, and flashers clean, visible, and operable during both daylight and darkness.
- Trim or remove vegetative growth or other materials so the devices can be seen.
- Verify by inspection, the effectiveness of the installations at frequent intervals, both in daylight and darkness, at actual travel speeds.
- Repair, replace, or restore damaged or destroyed devices to maintain continuity and effectiveness.
- Maintain temporary TCD during suspensions of work the same as if work were in progress.

00225.61 Signs and Other Existing TCD - Maintain existing guide signs, warning signs, regulatory signs, specific service signs (business logos), TODS, and other existing TCD, in the same manner as temporary signs and devices associated with the Project.

00225.62 Temporary Concrete Barrier, Guardrail and Attenuators - Maintain or replace materials and equipment as follows:

(a) Temporary Concrete Barrier and Guardrail - Immediately repair any concrete barrier segment or guardrail element that is damaged by the Contractor during or after placement. Repair it to the Engineer's satisfaction or replace it with an undamaged section at no additional cost to the City.

(b) Temporary Impact Attenuators - Complete repair of damaged temporary impact attenuators, except for narrow site systems, within 24 hours of being notified of the damage. Complete repair of damaged narrow site systems within 4 hours of discovery of or of being notified of the damage.

When impact attenuator, truck mounted attenuator, or narrow site attenuator systems are used, have enough modules, cartridges, components, and replacement parts on site to replace one complete installation. Re-stock replacement parts within 24 hours of use. All modules, cartridges, components, and replacement parts not used, remain the property of the Contractor.

00225.64

Replace damaged modules, cartridges, components, and replacement parts with modules, cartridges, components, and replacement parts of the same manufacturer and type, and with attenuation capabilities equal to the original, installed system.

00225.64 Illumination and Sign Illumination - Maintain existing illumination and sign illumination after adjusting or working on them until accepted.

Routine maintenance of existing illumination and sign illumination will be performed by the Agency at the Agency's expense before the Contractor works on them and after work on them is completed and accepted.

00225.65 Traffic Signals - Maintain or replace materials and equipment as follows:

(a) Temporary Traffic Signals - After successful turn-on, assume all maintenance of the temporary traffic signal installation until it is removed. After notification by the City, if the Contractor is not able to respond to a maintenance request, City electricians will make repairs at the Contractor's expense.

(b) Portable Traffic Signals - After successful turn-on, perform all required maintenance during operation of the portable traffic signal. Maintain a log for each portable traffic signal that contains at least the following information:

- Dates and times when service and maintenance is performed.
- A description of equipment that was serviced and a brief description of why the service was performed.
- All operational and equipment failures of the unit.
- Repairs made to the unit.
- Past operational history of the unit.
- All timing parameters input into the controller.

The log shall remain with the corresponding portable traffic signal at all times.

The City will not replace or repair any part of portable traffic signals.

If the portable traffic signal fails during operation for any reason, immediately provide flaggers to control traffic until the portable traffic signal is operational. If the portable traffic signal fails a second time within 30 calendar days of the first failure, remove it from the Project and control traffic with flaggers until a replacement portable traffic signal is installed, activated, and working properly. No additional payment will be made for flagging as a result of a portable traffic signal failure.

(c) Existing Traffic Signals - Maintain existing signals after adjusting or working on them until accepted.

Routine maintenance of existing signals will be performed by the City at the City's expense before the Contractor works on them and after work on them is completed and accepted.

00225.66 Portable Electrical Signs - Maintain and use the required portable changeable message signs and sequential arrow signs according to the manufacturer's recommendations, traffic control plans, and as required. Do not display or alter any sign message before it is approved.

While portable changeable message signs and sequential arrow signs are in use, have repair equipment and parts on the Project site as recommended by the manufacturer.

When directed, repair or replace sequential arrow signs and portable changeable message signs that are damaged or destroyed before continuing work that requires use of the signs.

00225.67 Flagger Station Lighting - Maintain and use the required flagger station lighting according to the manufacturer's recommendation and as required.

When flagger station lighting is in use, have on the Project site, the following:

- Repair equipment and electronic components recommended by the manufacturer.
- At the beginning of each shift, have approved backup flagger station lighting available for immediate use in event of failure.
- Sufficient fuel to maintain continuous operation of the diesel generator.

00225.68 Temporary Pedestrian Walkways - Keep walking surfaces clean of debris at all times. Inspect non-skid surfaces weekly for signs of wear and correct as needed. Check slope of transition from walkway to sidewalk for compliance with ADA regulations each time walkway is adjusted or relocated.

Measurement

00225.80 Measurement - Work covered under this Section will be measured by one of the following methods:

- **Method "A" - Unit Basis** - Under this method, work zone traffic control measures will be measured according to 00225.80(a) through 00225.89.
- **Method "B" - Lump Sum basis** - Under this method, no measurement of quantities will be made.
- **Method "C" - Incidental Basis** - Under this method, no measurement of quantities will be made.

00225.81

(a) Quantity Limitations - The quantities for work zone traffic control measures (TCM) will be limited to the following, unless otherwise specified:

- The initial installation of quantities necessary to complete the Project based on the Contract Schedule of Items.
- The initial installation of additional TCD and TCM that the Engineer and Contractor agree are necessary to ensure a safe work zone.
- The replacement of TCD and TCM, except temporary signing, temporary electrical signs, and portable temporary traffic signals, damaged by public traffic and replaced by the Contractor.

Temporary signing, temporary electrical signs, and portable temporary traffic signals damaged by public traffic and replaced or repaired by the Contractor will not be measured.

(b) Temporary Protection and Direction of Traffic - No measurement of quantities will be made for this work.

00225.81 Temporary Signing - Quantities for temporary signing and flashers will be determined as follows:

(a) Signs - Temporary signs will be measured on the area basis upon delivery to the Project. The quantities will be limited to those in the approved TCP including speed zone signage. The sign area will be the nominal area determined by multiplying the width times the length. No deductions will be made for corners or irregular shapes.

Route markers and other signs fastened to the face of larger signs will be measured as separate signs.

(b) Amber Flashers - Amber flashers will be measured on a unit basis.

00225.82 Temporary Barricades, Guardrail, Barrier, Attenuators, and Pedestrian Fencing - The quantities of barricades, attenuators, guardrail, concrete barrier, and pedestrian fencing will be determined as follows:

(a) Barricades and Attenuators - Barricades, temporary impact attenuators, and moving temporary impact attenuators will be measured on a unit basis.

(b) Guardrail, Concrete Barrier, and Pedestrian Fencing:

- (1) Guardrail** - Temporary guardrail will be measured on the length basis of each type complete and in place, determined by one of the following methods:

a. Count Method - The number of standard sections will be counted and multiplied by 12 1/2 feet. For purposes of this subsection, a "standard section" is defined as 12 1/2 feet of complete guardrail, without regard to the number of posts or rail elements used. Non-standard sections will be measured from center of post to center of post and added to the total calculated length of the standard sections of each run.

b. Length Method - Measurement will be from center to center of end posts, along the line and grade of each run of each type.

(2) Guardrail Terminals, Transitions, and Bridge Connections - Temporary guardrail terminals, temporary guardrail transitions, and temporary bridge connections will be measured on a unit basis.

(3) Concrete Barrier - Quantities of temporary concrete barrier and moving temporary concrete barrier will be measured on the length basis determined by one of the following methods:

a. Count Method - The laying length of a standard section, as shown on the applicable ODOT standard drawing, multiplied by the number of standard sections installed in each separate run. Non-standard sections, terminal sections, and transition sections will be measured and added to the total length of standard sections.

b. Length Method - Measurement will be from end to end of the barrier along the line and grade of each run.

(4) Pedestrian Fencing - When pedestrian fencing is shown, the work will be measured according to Section 00270.

(c) Glare Shields - Glare shields and moving glare shields will be measured on the length basis from center to center of the glare shield blades, as installed on concrete barrier for each run.

(d) Reflective Barrier Panels - Reflective barrier panels will be measured on the unit basis.

00225.83 Temporary Traffic Delineation - Quantities for temporary traffic delineation will be determined as follows:

(a) Surface Mounted Tubular Markers, Plastic Drums, Delineators, and Pavement Markers - Surface mounted tubular markers, replacing surface mounted tubular markers, plastic drums, temporary delineators, reflective pavement markers, and flexible pavement markers will be measured on a unit basis.

Flexible pavement markers includes flexible oiling markers and flexible overlay markers.

(b) Temporary Tape - Temporary tape will be measured on the length basis, to the nearest foot, as follows:

(1) Removable - Removable tape will be determined by measuring the actual length of the 4 inch wide tape complete and in place.

(2) Non-Removable Tape - Non-Removable tape will be determined by measuring the actual length of the 4 inch wide tape complete and in place.

(3) Non Reflective Tape - Temporary non-reflective tape will be determined by measuring the actual length of the 6 inch wide tape complete and in place.

(c) Striping - Painted temporary striping on pavement base courses will be measured on the length basis, to the nearest foot, determined by measuring the actual length of 4 inch wide stripe complete and in place.

Temporary striping required for durable permanent pavement marking installation will be included in the measurement.

Skip intervals will not be included in the measurement.

Temporary striping will be measured on the length basis of lines based on a nominal width of 4 inches. If the plans call for, or the Engineer requires, stripes other than nominal 4 inch width, the measurement will be adjusted by converting to equivalent length of nominal 4 inch width.

(d) Stripe Removal and Legend Removal - Stripe removal and legend removal will be measured as follows:

(1) Stripe Removal - Stripe removal for stage construction will be measured on the length basis, to the nearest foot, determined by measuring the overall length of 4 inch line removed. The quantity of stripe removal will be the computed length of lines removed based on a nominal width of 4 inches. For computation purposes, the following apply:

- The width of a line is the normal standard line width applied during original placement of solid no-passing lines, broken (skip) lines, edge lines, and any other lines normally 4 inches wide.
- The length of continuous lines is length of the line.
- The length of broken (skip) stripes is the standard length of a skip line normally painted during original placement of the lines 9 feet of paint per 24 feet of roadway length.

The length of standard 8 inch or 12 inch wide stripes will be adjusted by converting to equivalent length of 4 inch width line. No conversion or adjustment will be allowed for lines that are wider or longer due to improper placement or retracing deviations.

(2) Legend Removal - Pavement legend removal for stage construction will be measured on the area basis, of each legend removed and will be the nominal area determined by multiplying the width times the length of the legend. No deductions will be made for corners or irregular shapes.

(e) Striping and Stripe Removal Mobilization - Striping and Stripe removal mobilization will be measured on a unit basis for mobilization to perform striping, stripe removal, or durable stripe removal or for mobilization to place or remove temporary flexible pavement markers.

00225.84 Temporary Illumination - No measurement of quantities will be made for temporary illumination.

00225.85 Traffic Signals - The quantities of traffic signals will be measured as follows:

(a) Temporary Traffic Signals - No measurement of quantities will be made for temporary traffic signals.

(b) Portable Traffic Signals - Portable traffic signals will be measured on the unit basis, for each complete system. A complete system consists of 2 portable temporary traffic signals and hardwire interconnect between them.

00225.86 Temporary Electrical Signs - The quantities for temporary electrical signs will be measured as follows:

(a) Sequential Arrow Signs - Sequential arrow signs will be measured on the unit basis, where the devices are initially installed on the Project.

(b) Portable Changeable Message Signs - Portable changeable message signs will be measured on the unit basis, where the devices are initially installed on the Project.

00225.87 Flaggers and Flagger Station Lighting - The quantities of flaggers and flagger station lighting will be measured as follows:

(a) Flaggers - Flaggers will be measured on the time basis, of the actual number of hours flagging stations are staffed.

Flagging performed by a TCS will not be measured.

(b) Flagger Station Lighting - Flagger station lighting will be measured on the unit basis, where the devices are initially installed on the Project or on the time basis, of the actual number of hours the flagger stations are staffed and flagger station lighting is required.

No measurement will be made for the backup unit in event it is used or not.

00225.88 Traffic Control Supervisor (TCS) - The quantities of the TCS will be measured on the time basis, of the actual number of hours the TCS is working on the Project.

00225.89

For the purpose of determining TCS time, TCS hours will be any work shift or portion of a work shift where any of the following operations occur:

- Full lane closures or lane shifts implemented on a daily basis on a City street with an ADT greater than 10,000.
- When TCS is called to respond to a traffic-related issue during non-work hours.
- Other construction operations as requested by the Engineer.

A maximum quantity of 2 TCS construction work shifts will be allowed for each 24 hour period. One TCS will be allowed for a construction work shift unless otherwise approved.

Quantities will be limited to time authorized and documented by a daily Traffic Control Report submitted by the end of the next working day.

00225.89 Pilot Cars and Temporary Pedestrian Walkways - Quantities for pilot cars and temporary pedestrian walkways will be determined as follows:

(a) Pilot Cars - The quantity for pilot cars will be measured on the time basis, of the actual number of hours pilot cars are operated.

(b) Temporary Pedestrian Walkways - Quantities of temporary pedestrian walkways will be measured from end to end of the walkway along the line and grade of each run including the wooden transitions on each end of the walkway.

Payment

00225.90 Payment - Work covered under this Section will be paid by one of the following methods:

(a) Method "A" - Unit Basis:

(1) Pay Quantities - The accepted quantities, measured according to 00225.80(a) through 00225.89, will be paid for at the Contract lump sum amount or Contract unit price per unit of measurement for each of the pay quantities listed in the Contract Schedule of Items and in approved change orders.

Payment will be payment in full for furnishing, installing, moving, operating, maintaining, inspecting, and removing the materials and TCD, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified, except as covered in 00225.90(a)(2).

All TCD damaged by public traffic and replaced by the Contractor, except temporary signing, temporary electrical signs and portable temporary traffic signals will be paid for at the Contract price for the pay items listed in the Contract Schedule of Items or in approved Contract change orders, unless otherwise specified. Replacement temporary impact attenuator component(s) will be paid for according to Section 00196. Payment for replacing damaged TCD will only be made when:

- The Engineer orders it.
- The replacement devices are used on the Project.
- The damaged devices are disposed of to the Engineer's satisfaction.

No separate or additional payment will be made for:

- Moving and reinstalling signs, barricades, plastic drums, delineators, sequential arrow signs, and portable changeable message signs required by stage construction.
- Providing TCM, including flaggers, used at material sources and disposal sites that are outside the Contract limits unless specifically called for on the plans or in the Special Provisions.
- Providing portable signs when only minor work is required as indicated in 00225.41(f).
- TCD damaged or destroyed by Contractor's equipment or operations.

(2) Temporary Protection and Direction of Traffic - Temporary protection and direction of traffic will be paid for at the Contract lump sum amount for the item "Temporary Protection and Direction of Traffic" and will be for:

- Positioning all traffic control devices in proper locations at all times.
- Providing and furnishing electrical power.
- Cleaning up and removing devices destroyed or damaged by public traffic.
- Furnishing, placing, maintaining and removing temporary sign covers.
- Moving temporary concrete barrier to and from Contractor's stockpile areas.
- Moving temporary impact attenuators of any type to and from Contractor's stockpile areas.
- Furnishing, placing, replacing, maintaining, moving and removing tubular and conical markers.
- Removing existing raised and recessed pavement markers.
- Furnishing, placing, replacing, maintaining, moving and removing tubular and conical markers used to delineate the pavement edge because of edge line obliteration.

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- Moving and removing existing signs, specific services signs (business logos) and TODS from their existing locations and reinstalling them on any type of support at new locations required by stage construction, as shown or directed.
- Moving, reinstalling, and removing existing post-mounted signs required by stage construction.
- Furnishing, installing, maintaining, moving, and removing pedestrian work zone delineation fencing.
- Providing, surfacing, maintaining, removing, and restoring the alternate pedestrian route.
- Providing, moving, reinstalling, and removing guardrail end pieces and guardrail anchors as required by stage construction.
- Performing routine inspections of the TCD by the TCS.

(b) Method "B" - Lump Sum Basis - Work zone traffic control will be paid for at the Contract lump sum amount for the item "Temporary Work Zone Traffic Control, Complete".

Payment will be payment in full for furnishing, installing, moving, operating, maintaining, inspecting, and removing materials and TCD, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

(c) Method "C" - Incidental Basis - When the Contract Schedule of Items does not indicate payment for work zone traffic control, all work zone traffic control will be considered Incidental and no separate payment will be made.

00225.91 Temporary Signing - The accepted quantities of temporary signing and appurtenances will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
(a) Temporary Signs.....	Square Foot
(b) Amber Flashers.....	Each

Item (a) includes all signs, regardless of type.

No separate or additional payment will be made for flags, sign flag boards, or posts and other supports.

00225.92 Temporary Barricades, Guardrail, Barrier, Attenuators, and Pedestrian Walkways - The accepted quantities of temporary barricades, guardrail, barrier, attenuators, and appurtenances will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
(a) Temporary Barricades, Type_____.....	Each
(b) Temporary Guardrail, Type_____ ReflectORIZED ...	Foot
(c) Temporary Guardrail Terminals, _____.....	Each

- (d) Temporary Guardrail Transition Each
- (e) Temporary Bridge Connections Each
- (f) Temporary Concrete Barrier, Reflectorized..... Foot
- (g) Temporary Concrete Barrier, Tall, Reflectorized..... Foot
- (h) Moving Temporary Concrete Barrier..... Foot
- (i) Temporary Impact Attenuator, _____ Each
- (j) Moving Temporary Impact Attenuators, _____ Each
- (k) Temporary Glare Shields Foot
- (l) Moving Temporary Glare Shields..... Foot
- (m) Reflective Barrier Panels Each
- (n) Temporary Pedestrian Walkways Foot

In item (a), the type of barricade will be inserted in the blank.

In items (b) and (c), the type of guardrail or terminal will be inserted in the blank.

Items (d) and (e) includes each device, regardless of size or type.

Items (f) and (g) includes Type 5 delineators. No separate or additional payment will be made for pinning or restraining barrier.

Item (h) includes moving temporary concrete barriers, regardless of size or type, from one location of actual use to another, and for removing and replacing Type 5 delineators on the barriers, as necessary.

In items (i) and (j), the type of attenuator, if applicable, will be inserted in the blank.

Item (j) includes each move of the device from one location of actual use to another.

Item (l) includes moving the devices from one location on the concrete barrier to another.

Item (m) includes panels installed on the concrete barrier and replacing damaged panels.

Item (n) includes the transitions. No separate payment will be made for adjusting walkways as needed during construction.

No separate payment will be made for temporary impact attenuator replacements, replacement modules, cartridges, components, or replacement parts.

When temporary pedestrian fencing is installed, the work will be paid for according to Section 00270.

00225.93 Temporary Traffic Delineation - The accepted quantities of temporary traffic delineation will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item **Unit of Measurement**

- (a) Surface Mounted Tubular Markers..... Each
- (b) Replace Surface Mounted Tubular Markers..... Each
- (c) Temporary Plastic Drums..... Each
- (d) Temporary Delineators Each
- (e) Temporary Reflective Pavement Markers..... Each
- (f) Temporary Flexible Pavement Markers Each
- (g) Temporary Removable Tape Foot
- (h) Temporary Non-Removable Tape..... Foot
- (i) Temporary Non-Reflective Tape..... Foot
- (j) Temporary Striping Foot
- (k) Stripe Removal Foot
- (l) Legend Removal..... Square Foot
- (m) Striping and Stripe Removal Mobilization Each

Item (a) includes furnishing and installing the complete assembly of each device in its initial location and for removing the device from the surface.

Item (b) includes furnishing new or refurbished devices to replace damaged or missing devices.

Item (e) includes temporary pavement markers having either one or two reflective faces.

Item (f) includes removing flexible pavement marker covers.

Item (k) includes removal of painted and durable stripes required for stage construction.

Item (l) includes removal of durable and non-durable legends required for stage construction.

Payment for items (g), (h), (i), and (j) performed beyond the quantity shown in the Contract Schedule of Items will be made at the Contract unit price if the Engineer determines that the Contract unit price does not exceed the value of the work as determined on the basis of rates given in Section 00197. If the Engineer determines that the Contract unit price exceeds the value of the work, payment for the additional work will be made according to Section 00196.

Item (m) is for each time the Contractor mobilizes as required for striping or stripe removal.

No separate or additional payment will be made for mobilization to perform legend removal, or for mobilization to place or remove temporary flexible pavement markers.

00225.94 Temporary Illumination - The accepted quantities of temporary illumination will be paid for at the Contract lump sum amount for the item "Temporary Illumination".

00225.95 Traffic Signals - The accepted quantities of traffic signals will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
(a) Temporary Traffic Signal	Lump Sum
(b) Portable Traffic Signal	Each

Item (a) includes all required materials called for by the plans and Specifications.

Item (b) includes furnishing, operating, moving, and removing the signals and all required earthwork, bases, surfacings, and hardwire interconnects.

No separate or additional payment will be made for removing and replacing damaged portable traffic signals.

Flagging for initial turn-on and 2 hour standby time will be paid for under the flagger pay item.

00225.96 Temporary Electrical Signs - The accepted quantities of temporary electrical signs will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
(a) Sequential Arrow Signs.....	Each
(b) Portable Changeable Message Signs.....	Each

Items (a) and (b) includes furnishing, operating, moving, and removing the signs and supports.

No separate or additional payment will be made for removing and replacing damaged signs.

00225.97 Flaggers and Flagger Station Lighting - The accepted quantities of flaggers and flagger station lighting will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
(a) Flaggers.....	Hour
(b) Flagger Station Lighting.....	Each or Hour

Item (a) includes all necessary equipment, special apparel, flagging equipment, and two-way radios.

Workers performing flagging duties who are not properly equipped or attired will not be considered to be flaggers and will not be eligible for payment under this item.

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Flaggers performing work other than flagging will not be considered flaggers and will not be eligible for payment under this item.

Payment for item (a) performed beyond the quantity shown in the Contract Schedule of Items will be made at the Contract unit price if the Engineer determines that the Contract unit price does not exceed the value of the work as determined on the basis of rates given in Section 00197. If the Engineer determines that the Contract unit price exceeds the value of the work, payment for the additional work will be made according to Section 00196.

Item (b) includes furnishing, operating, moving, and removing the flagger station lighting.

No separate or additional payment will be made for back-up unit in event it is used or not.

00225.98 Traffic Control Supervisor - The accepted quantities of traffic control supervisor will be paid for at the contract unit price, per each for the item of "Traffic Control Supervisor".

Payment includes vehicle and equipment.

Payment for item "Traffic Control Supervisor" performed beyond the quantity shown in the Contract Schedule of Items will be made at the Contract unit price if the Engineer determines that the Contract unit price does not exceed the value of the work as determined on the basis of rates given in Section 00197. If the Engineer determines that the Contract unit price exceeds the value of the work, payment for the additional work will be made according to Section 00196.

When the Contract Schedule of Items does not indicate payment for Traffic Control Supervision work performed under this Section, no separate or additional payment will be made. Payment will be included in payment made for the appropriate items under which this work is required.

00225.99 Pilot Cars - The accepted quantities of pilot cars will be paid for at the Contract unit price, per hour for the item "Pilot Cars".

Payment will be payment in full for fully operated pilot cars, two-way radios, the "PILOT CAR FOLLOW ME" sign, and the rotating amber light mounted on the pilot car.

Payment for item "Pilot Cars" performed beyond the quantity shown in the Contract Schedule of Items will be made at the Contract unit price if the Engineer determines that the Contract unit price does not exceed the value of the work as determined on the basis of rates given in Section 00197. If the Engineer determines that the Contract unit price exceeds the value of the work, payment for the additional work will be made according to Section 00196.

Section 00240 - Temporary Drainage Facilities

Description

00240.00 Scope - This work consists of furnishing, installing, and removing temporary drainage facilities.

Construction

00240.40 General - Furnish and install temporary drainage facilities of sufficient capacity and strength to carry traffic over the facility, and water flow in or under the facility. Determine the actual size, strength and type of facility needed. The sizes of facilities shown on the plans are the minimum only. Submit this determination and its basis to the Engineer for review. Do not install until approved.

Remove temporary drainage facilities when they are no longer needed. The facilities remain the property of the Contractor.

Measurement

00240.80 Measurement - No measurement of quantities will be made for work performed under this Section.

Payment

00240.90 Payment - The accepted quantities of work performed under this Section will be paid for at the Contract lump sum amount for the item "Temporary Drainage Facilities".

Payment will be payment in full for furnishing, placing, maintaining, and removing temporary drainage facilities, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

Section 00270 - Temporary Fences

Description

00270.00 Scope - This work consists of constructing, maintaining, and removing temporary fences, gates, and gateways as shown or directed.

00270.01 Definitions:

Exclusion Zone - An area established by the City, an outside agency, or a private party having jurisdiction or ownership rights to prohibit work related activities from occurring in the specified area. An exclusion zone may include private property, an environmental conservation or protection zone, a waterway, a drainage reserve or a mitigation site.

Materials

00270.10 Material - Furnish materials meeting the following requirements:

- Barbed Wire 03010.10
- Chain Link Fabric..... 03010.30
- Commercial Grade Concrete..... 00440
- Concrete Barrier 00225.12(c)
- Fence Gates 03010.60
- Fence Posts, Braces,
and Appurtenances 02110.30, 03010.50
- Gabion Wire Mesh Fabric..... 03010.70(i)
- Pickets..... 03010.31
- Wood Fence Posts and Braces 02110.30
- Woven Wire Fabric..... 03010.20

00270.11 Plastic Mesh - Use high-visibility orange colored extruded plastic mesh manufactured from polypropylene with a minimum weight of 4 ounces per square yard.

00270.12 Pedestrian Metal Barricade - Use galvanized metal interlocking vertical bar (bike rack style) barricades with V-foot or similar bases from the CPL. Install orange wooden kickboards on either side of the V-foot base along the length of each barricade to provide a caneable surface for sight impaired pedestrians and to reduce the tripping hazard.

Construction

00270.40 General - Construct temporary fences, gates, and gateways according to the applicable parts of Section 01050.

00270.41 Rock Protection Fence - Construct concrete barrier according to Section 00820. Attach fence to barrier as shown.

00270.42 Restrictions for Exclusion Zones - If the plans depict an exclusion zone adjacent to the project work limits, work is prohibited within this area.

00270.43 Exclusion Zone - Construct the temporary fencing to establish a visible barrier between the exclusion zone and the work limits. Extend the fencing beyond the limits of the exclusion zone where encroachment could occur as shown on the plans.

00270.44 Pedestrian Metal Barricade - Use pedestrian metal barricades outside the clear zone unless the barricade has a certificate of crashworthiness for work zone devices or is approved.

Maintenance

00270.60 General - Maintain temporary fences and appurtenances in good condition. Keep the fences in place until they are no longer needed.

00270.61 Exclusion Zones - Inspect the condition of the exclusion zone fence daily. Maintain the fence for the project duration or until all work activity in the area closest to the encroachment zone is complete.

Finishing and Cleaning Up

00270.70 General - When temporary fences and appurtenances are no longer needed remove and dispose of them according to the applicable parts of Section 00310 except fence fabric, fence wire, posts, and braces may be used in permanent fence installations if the following conditions are met:

- The material was new when installed for temporary purposes.
- The material has not been used on previous projects.
- The material meets the requirements of 01050.10.
- The material is undamaged.
- The material is acceptable to the Engineer.

Measurement

00270.80 Fence and Gateways - The quantities of temporary fence will be measured on the length basis of each type of temporary fence. Gateways will be considered as fence of the type which adjoins them and will be measured as a continuing part of that type of fence. Measurement will be from center to center of posts, measured along the line and grade of each separate continuous run of fence as constructed exclusive of gates.

00270.81 Gates - The quantities of temporary gates will be measured on a unit basis per each by actual count regardless of size or type.

00270.82 Rock Protection Fence - The quantities of barrier mounted rock protection fence will be measured on the length basis. Measurement will be from center to center of posts, measured along the line and grade of each separate continuous run.

Payment

00270.90 General - The accepted quantities of work performed under this Section will be paid for at the Contract price, per unit of measurement, for the following items:

	Pay Item	Unit of Measurement
(a)	Temporary Type ____ Fence.....	Foot
(b)	Temporary ____ Chain Link Fence.....	Foot
(c)	Temporary Type Orange Plastic Mesh Fence.....	Foot
(d)	Temporary Gates	Each
(e)	Temporary Rock Protection Fence, Barrier Mounted....	Foot
(f)	Temporary Pedestrian Metal Barricade Fence.....	Foot

In items (a) and (b) the type of fence will be inserted in the blank.

No separate payment will be made for moving and reinstalling fence required by stage construction.

Payment will be payment in full for furnishing, placing, moving, maintaining, and removing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

Section 00275 - Trench Protection

Description

00275.00 Scope - This work consists of furnishing, installing, maintaining, and removing temporary plating or fencing for utility trenches and similar work as shown or directed.

Materials

00275.10 Plating - Furnish material meeting the requirements of 02530.20 in grade A-36 or better.

00275.11 Plating Coating - Furnish a plating coating from the CPL.

00275.12 Fencing - Furnish chain link fencing material meeting the requirements of Section 03010.

Construction

00275.40 General - Provide temporary backfill and pavement when excavation are over 12 inches in depth and will be left unattended overnight. If approved, use temporary fencing or steel plating in lieu of temporary backfill and pavement. The use of steel plating shall not exceed one week in any one location.

Install temporary plating such that the roadway or sidewalk is available for access during non-working hours.

Do not use temporary plates if the forecast temperature is to be less than 35 °F or on grades greater than 8% slope unless otherwise directed.

00275.41 Signage - Provide advance warning signage for all motorists, cyclists, and pedestrians warning them that a temporary plate is in use.

00275.42 Plate Thickness and Span - The following table list the minimum plate thickness and maximum trench span for an AASHTO HS20-44 load configuration.

Plate Thickness Minimum	Trench Span Maximum
3/4 inch	2 ft - 6 in
7/8 inch	3 ft - 4 in
1 inch	4 ft - 5 in
1 1/4 inch	7 ft - 0 in
1 1/2 inch	10 ft - 0 in

If the span is greater than 10 feet, submit a stamped, engineered temporary plating plan for review. Multiple stacked plates are not allowed.

00275.43

00275.43 Plate Placement - Install plates in the following manner:

- Pin temporary plates to prevent movement under traffic.
- Ramp edges of temporary plates with asphalt concrete pavement to provide a smooth transition.
- On uneven or crowned streets, shim the temporary plate.
- Plates shall be in full contact with undisturbed ground/surface for a minimum of 2 feet on either side of the trench.

00275.44 Anti-skid Coating Application - Apply a coating to temporary plates as an anti-skid surface treatment when plates are subject to cyclist or pedestrian traffic.

Maintenance

00275.60 General - Maintain temporary plating or fencing in good condition. Re-align any plates that have been moved by traffic. Re-apply any missing anti-skid coating.

Measurement

00275.80 Measurement - No measurement of quantities will be made for temporary plating or fencing.

Payment

00275.90 Payment - No separate or additional payment will be made for temporary plating or fencing. Payment will be included in payment made for the appropriate items under which this work is required

Advance warning signs will be paid for according to Section 00225.

Section 00280 - Erosion and Sediment Control

Description

00280.00 Scope - This work consists of implementing structural and non-structural Best Management Practices (BMP) for the purpose of controlling soil erosion by wind or water and keeping eroded sediments and other construction-generated pollutants from moving off project sites.

Requirements described in these Specifications and shown on the plans are part of the project Erosion and Sediment Control Plan (ESCP) and are the minimum for all project construction sites and conditions. These Specifications cover all project activities performed under the authority and jurisdiction of the City, including material sources, disposal sites, staging areas, and off-site mitigation areas unless specific project activities are excluded elsewhere in these Specifications or in the City approved documents controlling the work.

00280.01 National Pollutant Discharge Elimination System - Comply with Federal, State, and local laws, rules and regulations, and the National Pollutant Discharge Elimination System (NPDES) 1200 Permit or Permits applicable to the Project. A copy of the City's General Construction 1200 CA, if applicable to the Project, is available from the City.

00280.02 Erosion and Sediment Control Plan on City Control Lands - For work on City-controlled lands, submit signed copies of the following for review and approval 10 days before the preconstruction conference:

- A Contractor-developed "construction" ESCP that incorporates the City's ESCP and all proposed modifications to it that fully complies with NPDES 1200 Permits applicable to the project.
- A narrative as described in the NPDES 1200 Permit and the City Erosion Control Manual.
- Implementation schedules for the ESCP based on each phase of the contractor's construction schedule.

The ESCP and the implementation schedules shall be prepared by an individual who is knowledgeable in erosion and sediment control.

Keep a copy of the approved ESCP on site during all construction activities. During inactive periods longer than 7 calendar days, the ESCP shall be on site.

Do not begin work until the ESCP and the implementation schedules are approved.

Update the ESCP and schedules as needed for unexpected storm events or for other reasons to ensure that sediment-laden water does not leave the construction site. Add approved changes to the ESCP and schedules as soon as possible after changes have been implemented, but no later than 24-hours after implementation.

A City-developed ESCP is typically furnished as part of a conventional contract plan set, which helps fulfill part of the ESCP requirement of the Permit. This initial ESCP, when adopted by the Contractor, may be used as the basis of the construction ESCP. Additional or revised erosion and sediment control features, not shown on the initial ESCP, may be required depending on the Contractor's methods of operation and schedule. To assist in the preparation or modification of the ESCP, refer to the current version of the City's Erosion and Sediment Control Manual along with Title 10 of the City Code.

For each phase of the scheduled work, indicate on the ESCP all the BMP proposed and installed for erosion and sediment control to minimize clearing, stabilize exposed soil, divert or temporarily store flows, limit runoff from exposed areas, and filter transported sediment. Include all temporary slopes, constructed for staging or other reasons, which may not have been identified in the original contract plans. For assistance in preparing or modifying the ESCP, refer to the current City Erosion Control Manual.

Some ESCP required elements typically required by NPDES 1200 Permits:

(a) Narrative Site Description:

- Nature of the construction activity planned for the site
- Estimates of total site area and the areas of the site expected to be disturbed
- Soil types found on the site and their erosion potential
- The types of fill materials to be used
- Timetable for sequence of major construction events
- Off-site dewatering

(b) Site Map:

- All areas of development
- Drainage patterns
- Areas of soil disturbance, including pre-development and post-development elevation contours
- Areas used for storage of soils or wastes
- Areas where vegetative practices are to be implemented
- Location of all erosion and sediment control BMP or structures
- Location of all impervious structures and surfaces after project is completed
- Springs, wetlands, other surface waters, and environmental zoning located on site
- Boundaries of the 100 year floodplain, if determined
- Ordinary High Water line, if determined
- Location of storm drainage outfalls to receiving waters, if applicable
- Details of sediment and erosion controls

- Details of detention ponds, storm drain piping, inflow and outflow details
- Topography of areas greater than 10% slope

(c) Required BMP and Procedures for Erosion Prevention, Runoff Control, and Sediment Control:

- Construction entrances and parking areas
- Unpaved site roads such as haul roads
- Hauling saturated soils from the site
- Water washed from concrete trucks
- Correct installation of erosion and sediment control BMP (contract documents and City references such as these Specifications may be cited as installation standards if applicable)
- Prompt maintenance and repair of BMP
- Clearing and grading practices to minimize area of exposed soil throughout the life of the project
- Schedule of phased clearing operations to limit soils to what can be stabilized
- Vegetative practices including preservation of existing vegetation, seeding, mulching, and buffer strips
- Preventing erosion of exposed areas
- Diverting flows from exposed slopes
- Limiting runoff from exposed areas
- Limiting sediment transport within work sites and keeping it from moving off of project areas
- Perimeter controls for all clearing and grubbing, both planned and installed
- Additional controls for wet season work and temporary work suspensions
- Sensitive areas such as wetlands
- Off site material source and waste areas
- Dust
- Emergency materials stockpiled on site
- Storing flows, and filtering sediment
- Stockpiles
- Dewatering

Ensure that the Contractor's construction ESCP and implementation schedules are prepared by an individual who meets qualifications of 00280.30. Furnish a signed copy of the ESCP with individual's name, title, state certifications, and employing firm if different than Contractor's firm.

00280.03

Do not begin any site activities that have potential to cause erosion or sediment movement until the ESCP and implementation schedules are approved by the Engineer.

Keep a copy of the approved ESCP with updated changes on site during all construction activities.

During inactive periods longer than 7 calendar days, keep the ESCP on site or provide a copy to the Engineer to retain.

Continually update the ESCP and schedules as needed for unexpected storm or other events to ensure that sediment-laden water does not leave the construction site. If there are approved changes, add them to the ESCP no later than 24 hours after implementation.

00280.03 Non-City Controlled Lands ESCP - For work on non-City controlled lands, in addition to the requirements of 00280.02, submit the following for review 10 days before the preconstruction conference:

- A Contractor-developed ESCP for each unique site covered under project NPDES 1200 Permits.
- A description of how the ESCP will be implemented and monitored on these sites.
- A complete list of other applicable permits controlling work on these lands, whether the City is one of the permittees or not, and copies the applicable permits.
- Proof that permits are not required from all pertinent federal, State, county, city, and local agencies.
- Signed letter from the property owner that allows the Contractor access to the property. Include a statement in the letter that holds the City harmless for all consequences related to the Contractor's use of the property.
- Signed agreement with the property owner detailing the Contractor's operation, use of the property, and stating that Contractor will abide by permits, if any.

If the Contractor's operations require work on non-City controlled lands not presented at the preconstruction conference, or if changes to the Contractor's submitted ESCP are necessary, submit a new or revised ESCP to the City for approval before beginning work.

00280.04 Erosion and Sediment Control Manager - Designate and provide a representative, as the Erosion and Sediment Control Manager (ESCM) who meets the qualifications of 00280.30.

00280.05 Project Signing - Install number of erosion signs indicated, along with project information and contact number as shown in the Special Provisions. Place and mount the signs according to ODOT Standard Drawing TM670. Orientate the signs so they are visible to traffic, bicyclists, and pedestrians. Install these signs before performing clearing, grading, or other land alteration activities.

Materials

00280.14 Erosion Prevention Materials:

(a) Plastic Sheeting - Furnish plastic sheeting slope protection, anchoring system, flow control, and toe protection meeting the following requirements:

- **Plastic Sheeting** - Minimum 6 mil thick polyethylene plastic sheeting.
- **Anchoring System** - Minimum 65 pounds, non-puncture type anchor weights with cords or ropes of adequate strength to support the weights on the slope or new or used chain link fence conforming to 03010.30.
- **Stakes** - Commercial grade metal posts with a weight of at least 135 pounds per foot.
- **Rock** - Class 50 riprap conforming to Section 00390.
- **Runoff** - Control of flow off of plastic sheeting.

(b) Chemical Soil Binder - Furnish a liquid stabilizing emulsion meeting the requirements of 00280.14(c).

(c) Chemical Dust Control - Furnish non-toxic materials with no adverse effect on soil structure or establishment and growth of vegetation. Furnish one of the following materials and apply as directed by the manufacturer's instructions:

(1) Liquid Stabilizer Emulsion - A tackifier of liquid and polyvinyl acetate polymers with emulsion resins containing not less than 55% total solids by weight. Do not use tackifiers containing polyacrylates or polyvinyl acrylics.

(2) Dry Powder Tackifier - A tackifier consisting of one or more active hydrocolloids from natural plant sources which hydrates in water and blends with other slurry materials, and upon application and drying tacks the slurry particles to the soil surface, and exhibits no growth or germination inhibiting factors Provide stabilizing emulsion in a dry powder form that may be re-emulsifiable and consists of a processed organic adhesive derivative of one of the following:

- Gumbinder derived from guar (*Cyamopsis tetragonoloba*)
- Gumbinder derived from plantain (*Plantago insularis*)

(d) Temporary Mulching - Furnish temporary and permanent seeding, fertilizing, and mulching meeting the requirements of Section 01030.

(e) **Slope and Channel Liner Matting** - Matting is organized according to categories from the Texas DOT/TTI Hydraulics and Erosion Control Laboratory. Furnish matting from the CPL that meets the following performance criteria categories:

- **Type A** - Slope protection mat for clay soil slopes 1V:3H or flatter.
- **Type B** - Slope protection mat for sandy soil slopes 1V:3H or flatter.
- **Type C** - Slope protection mat for clay soil slopes steeper than 1V:3H.
- **Type D** - Slope protection mat for sandy soil slopes steeper than 1V:3H.
- **Type E** - Flexible channel liner for shear stress from 0 to 2 pounds per square foot.
- **Type F** - Flexible channel liner for shear stress from 0 to 4 pounds per square foot.
- **Type G** - Flexible channel liner for shear stress from 0 to 6 pounds per square foot.
- **Type H** - Flexible channel liner for shear stress from 0 to 8 pounds per square foot.

(1) **Check Slot:**

- **Channel Application** - Compacted Class 50 riprap meeting the requirements of Section 00390.
- **Slope Application** - Compacted suitable native embankment material

(2) **Fasteners** - U-shaped wire staples or heavy duty pins as follows:

- **Staples** - 14 gauge steel wire staples 1 inch "U" width with a length of 6 inches minimum for cohesive soils and 8 inches minimum for non-cohesive soils.
- **Pins** - 3/16 inch diameter steel pin with a 2 inch diameter steel washer secured at the head of the pin with a length of 18 inches minimum for cohesive soils and 24 inches minimum for non-cohesive soils.

00280.15 Runoff Control Materials:

(a) **Check Dams** - Furnish check dam material meeting the following requirements:

- **Type 1: Aggregate** - Aggregate with maximum size between 3 inches and 6 inches meeting the requirements of 00330.16.
- **Type 2: Straw Bales** - Standard rectangular straw bales meeting the requirements of 01030.15.

- **Type 3: Biofilter Bags** - Minimum size 18 inch x 6 inch x 30 inch plastic mesh bags with 1/2 inch openings filled with approximately 45 pounds of clean, non-toxic 100% recycled wood product waste containing no fine materials or sediments, or as shown on ODOT standard drawings for this device.
- **Type 4: Sand Bags** - Durable, weather-resistant bags woven tightly enough to prevent leakage of filler material. Fill bags with at least 75 pounds of firmly-packed fine PCC 3/8" - 0 aggregate, or round 3/8" - 3/16" pea gravel.
- **Type 5: Prefabricated System** - Prefabricated check dam system conforming to the manufacturer's recommendations and on the CPL.
- **Check Dam Stakes** - Stakes meeting the requirements of 00280.14(a).

(b) Diversion Dikes and Swales - Furnish diversion dike and swale materials meeting the following requirements:

- **Aggregate** - Aggregate with maximum size between 4 inches and 1 inch meeting the requirements of 00330.16.
- **Seeding, Fertilizing and Mulching** - Permanent or temporary seeding, fertilizing and mulching meeting the requirements of Section 01030.

(c) Temporary Drainage Curbs - Furnish temporary drainage curb material meeting the following requirements:

- **Type 1 Curb** - Concrete drainage curb meeting the requirements of 00480.10.
- **Type 2 Curb** - Asphalt concrete drainage curb meeting the requirements of 00480.10.
- **Type 3 Curb** - Sand bags meeting the requirements of 00280.15(a).

(d) Temporary Slope Drains - Furnish either plastic pipe meeting the requirements of Section 02410 or metal pipe meeting the requirements of Section 02420. If the runoff contributing area is not established, use 12 inch diameter.

(e) Flow Spreader - Furnish aggregate for flow spreaders with a maximum size between 5 inches and 2 inches meeting the requirements of 00330.16.

00280.16 Sediment Control Materials:

(a) Construction Entrances - Furnish materials meeting the following requirements:

- **Aggregate** - Aggregate with a maximum size between 3 inches and 6 inches meeting the requirements of 00330.16.
- **Geotextile** - Subgrade geotextile meeting the requirements of Section 02320 Provide "Level B" documentation according to 02320.10(c).

(b) **Tire Wash Facility** - Provide the following materials for tire wash facilities:

- **Aggregate** - 1 1/2" - 0, 1" - 0, or 3/4" - 0 aggregate base material meeting the requirements of Section 00640.
- **Reinforcing Steel** - Reinforcing steel meeting the requirements of 02510.10.
- **Geotextile** - Subgrade geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).
- **Concrete** - Commercial grade concrete meeting the requirements of Section 00440.

(c) **Sediment Fence** - Provide the following materials for sediment fences:

- **Geotextile** - Sediment fence geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).
- **Posts** - Posts meeting the following requirements:
 - **Sediment Fence, Supported** - Commercial grade metal posts with a weight of at least 1.35 pounds/ per foot.
 - **Sediment Fence, Unsupported** - 1 1/2 inch x 1 1/2 inch x 48 inch untreated wood posts (wood stain is acceptable).
- **Wire Mesh** - For supported sediment fence, furnish galvanized wire mesh with 2 x 2 opening, horizontally and vertically self-supporting prior to fastening to posts, a minimum tensile strength of 70 ksi, and meeting the requirements of ASTM A 82.

(d) **Inlet Protection** - Furnish inlet protection materials meeting the following requirements:

- **Wire Mesh** - Wire mesh materials as follows:
 - **Type 1 Inlet Protection** - Wire mesh meeting the requirements of 00280.16(c).
 - **Type 2 Inlet Protection** - 19 gauge steel-mesh with 3/8 inch x 3/8 inch openings.
- **Geotextile** - Type 1 sediment fence geotextile meeting the requirements of Section 02320 Provide "Level B" documentation according to 02320.10(c).
- **Aggregate** - Aggregate with maximum size between 1 inches and 4 inch meeting the requirements of 00330.16.

- **Stakes** - Stakes meeting the following requirements:
 - **Type 1 Inlet Protection** - Commercial grade metal posts with a weight of at least 135 pounds per foot.
 - **Type 4 Inlet Protection** - Minimum 1 inch x 2 inch x 18 inch wooden posts.
- **Biofilter Bags** - Biofilter bags meeting the requirements of 00280.15(a).
- **Prefabricated Filter Inserts** - Prefabricated filter inserts manufactured specifically for collecting sediment in drainage inlets and listed on the CPL Include handles and fasteners sufficient to keep the insert from falling into the inlet during maintenance and removal of the insert from the inlet.
- **Concrete Masonry Units** - Nominal 8 inch x 8 inch x 16 inch, 29 pound concrete masonry units (CMU).
- **Sod** - Grass sod meeting the requirements of 01040.19(h).
- **Reinforcing Steel** - No. 4 rebar commercial grade reinforcing steel.

(e) **Sediment Barriers** - Furnish sediment barriers and sediment barrier stakes meeting the following requirements:

- **Type 1: Straw Bales** - Standard 45 to 65 pound rectangular straw bales that are wire-bound or string-tied meeting the requirements of 01030.15(b).
- **Type 2: Biofilter Bags** - Biofilter bags meeting the requirements of 00280.15(a).
- **Type 3: Fiber Rolls Wattles** - Fiber rolls made of straw meeting the requirements of 01030.15(b) except use only rice or coconut straw material. Wrap the straw, to a minimum density of 2.75 pounds per cubic foot, in tubular plastic netting meeting the following requirements:
 - 8 inch to 10 inch diameter size
 - Minimum strand thickness of 0.003 inch
 - Knot thickness of 1/16 inch
 - Weight of 0.35 ounces per foot $\pm 10\%$
 - Made from 85% high density polyethylene, 14% ethyl vinyl acetate, and 1% color for UV inhibition
- **Type 4: Sand Bags** - Sand bags meeting the requirements of 00280.15(a).
- **Type 5: Brush Barrier** - Maximum 6 inch diameter woody debris brush or topsoil strippings for brush barriers. Provide Type 1 sediment fence geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).

00280.30

- **Type 6: Filter Berm** - Aggregate with maximum size between 4 inches and 1 inch meeting the requirements of 00330.16. Provide subgrade geotextile meeting the requirements of Section 02320. Provide "Level B" geotextile documentation according to 02320.10(c).
- **Type 7: Prefabricated Barrier System** - Prefabricated barriers manufactured specifically for temporarily obstructing the flow of sediment-laden water and listed on the CPL.
- **Stakes** - Sediment barrier stakes as follows:
 - **Biofilter Bags** - Use minimum 1 inch x 2 inch x 18 inch wood stakes
 - **Brush Barrier** - Use minimum 1 inch x 2 inch x 18 inch wood stakes
 - **Straw Bales** - Use minimum 1 1/2 inch x 1 1/2 inch x 36 inch wood stakes
 - **Fiber Rolls** - Use minimum 1 inch x 1 inch x 24 inch wood stakes

(f) **Sediment Mat** - Furnish sediment mats from the CPL.

(g) **Temporary Scour Basin** - Furnish class 100 riprap for temporary scour basins meeting the requirements of Section 00390.

(h) **Temporary Sediment Trap** - Furnish sediment trap materials meeting the following requirements:

- **Geotextile** - Type 2 drainage geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).
- **Aggregate Base** - 1 1/2" - 0, 1" - 0, or 3/4" - 0 aggregate for aggregate base meeting the requirements of Section 00640.
- **Aggregate** - Aggregate with maximum size between 6" and 3" meeting the requirements of 00330.16.

Labor

00280.30 Erosion and Sediment Control Manager - Designate and provide an ESCM with the following minimum qualifications:

- Experience in all major disciplines of public infrastructure construction.
- Knowledgeable in principles of and practice of erosion and sediment controls.
- Skilled in assessing site conditions and effectiveness of erosion control BMP used.
- Successful completion of erosion control formal training sponsored by the City or acceptable to the Engineer.

- Responsible participation in construction of at least 1 City project with erosion control.
- Authority to immediately mobilize necessary personnel to correct and modify erosion control BMP as required.

Duties typically required of ESCM include:

- Manage and ensure proper implementation of the ESCP.
- Accompany the Engineer during field review of the ESCP prior to construction activities.
- Monitor rainfall on and in the vicinity of the Project site.
- Monitor water quality in receiving streams in the vicinity of the Project site.
- Inspect erosion and sediment control on active construction sites weekly.
- Inspect erosion and sediment control on inactive sites every 2 weeks.
- Inspect erosion control BMP on all active and inactive sites at least daily during rainy periods when 5/8 inch or more of rain has fallen within a 24-hour period.
- Mobilize crews to make immediate repairs to BMP or install additional BMP during working and non-working hours.
- Record actions taken to clean up significant amounts of sediment.
- Report potential permit violations to the City in a timely manner.
- Regularly update the approved Erosion Control Monitoring form.
- Update the ESCP monthly and within 24 hours after changes or major BMP modifications are implemented.
- Prepare a contingency plan in preparation for emergencies and the rainy season
- Accompany the Engineer on inspections and, if required, on inspections by representatives of regulating agencies.

Provide the ESCM name, description of experience and training, qualifying certifications, and contact phone number 10 days before the preconstruction conference. If changes in the appointment of the ESCM occur during the term of the Contract, provide written notice to the Engineer within 5 calendar days.

Construction

00280.40 Installation - Install erosion and sediment control BMP as shown and according to the most current City's Erosion and Sediment Control Manual. Install erosion and sediment control devices before performing clearing, grading, or other land alteration activities. Ensure no visible and measurable sediment or pollutants leave the Project boundaries, enter drainage systems or waterways, or violate applicable water standards.

00280.41

For purposes of this requirement, "visible and measurable" is defined as:

- Deposits or tracking of mud, dirt, sediment or similar material exceeding 1/2 cubic foot in volume on any private or public street or adjacent property, or into any storm or surface water drainage system, either by direct deposit, dropping or discharge, or as a result of erosion; or
- Evidence of concentrated flows of water over bare soils; turbid or sediment-laden flows; or evidence of on-site erosion, such as rivulets on bare slopes where the flow of water is not filtered or captured on the site; or
- Earth slides, mudflows, earth sloughing, or other earth movement off the Project site.

Included in this work are both non-structural BMP, such as limiting clearing of vegetation, and structural BMP such as various kinds of physical devices or materials like sediment fences. BMP may be temporary or they may be permanent when required to continue functioning after the Contract ends. Coordinate temporary erosion control BMP with permanent BMP and all related project work.

Provide continuous erosion prevention and sediment control throughout the period the Contractor is responsible for project sites under the Contract as determined by the Engineer. Take all reasonable steps to minimize or prevent any erosion and transport of sediment. Install and maintain all erosion and sediment control BMP to function as required. If planned or installed BMP are not effective, modify or change them so they are effective. Effective functioning is defined as preventing erosion, controlling runoff, or controlling sediment in each location where a measure is needed so all erosion-related impacts of site construction are fully mitigated as required.

00280.41 Work Restrictions - The following work restrictions apply:

(a) Disturbance Limits - Flag all construction site clearing limits. Do not disturb areas outside the flagging limits. Maintain the flagging during Project construction.

(b) Perimeter Controls - Perimeter controls include sediment fences, ditches, filters, berms in flatter areas, and other methods for channeling flows. Install all appropriate perimeter controls before beginning.

Install all erosion and sediment control features for soil disturbing activities that are within 300 feet horizontal distance of the 2 year flood elevation before beginning work.

(c) Wet Season Work and Temporary Work Suspension - Wet season work is defined as work between October 1 and April 30. Update the ESCP and schedule for work proposed during the wet season to ensure that all appropriate controls, including work suspension controls, are implemented and maintained. Submit the updated ESCP and schedule to the City and receive approval before beginning any work during the wet season. The City may not approve work on critical sites with high erosion potential if controls are not properly installed or have a likelihood of failure.

During the wet season work, stabilize soil stockpiles at the end of each workday by diverting flows, placing covers, or installing sediment barriers at the stockpiles. Also, limit excavation and bare ground activities to only that which is required for immediate operations.

(d) Disturbance Restrictions - If soil erosion and sediment resulting from construction activities is not effectively controlled, the City will limit the amount of disturbed areas to that which can be effectively controlled. Incorporate erosion and sediment control measures into the Project at the earliest practicable time. Install all erosion and sediment control devices according to the approved implementation schedule and these Specifications. If the Contractor fails to control erosion, the City will stop all construction work according to 00180.70.

00280.42 Stabilization - Protect exposed soils from erosion by water, wind, or vehicles when required by permits or directed by the Engineer. At a minimum, stabilize soil areas as follows:

(a) Soil Exposure Limitations - Stabilize all soils which are exposed and disturbed during construction related activities according to the following:

- **October 1 through April 30** - Stabilize all areas immediately, but no later than within 24 hours of exposure.
- **May 1 through September 30** - Stabilize all areas as soon as practical, but no later than within 7 days of exposure.

(b) Temporary Stabilization - Temporarily stabilize exposed soils:

- Every 14 days or more frequently if needed or directed.
- Upon approval, active work areas scheduled for re-disturbance may be left unstabilized for 14 day periods if erosion by wind, water, or vehicles is not occurring or imminent.
- A minimum of one day before expected rain events.
- During wet periods and when not actively raining, at the end of each day.
- As an emergency measure when rain is falling on unprotected areas.
- When wind or vehicle traffic is visibly causing more than minor dust.
- Soil surfaces at finish grade when working outside the permanent seeding dates.

00280.43

Temporary stabilization includes, but is not limited to, chemical soil binders, mulching and tacking, erosion control matting, plastic sheeting, and temporary seeding or other BMP required to achieve the necessary stabilization.

Document all implemented BMP on the ESCP. Ensure that permanent slope stabilization is achieved before removing temporary BMP.

(c) Permanent Stabilization - Permanently stabilize exposed soil surfaces at finished grade. Permanent stabilization methods include, but are not limited to, seeding, mulching, structural surface coverings such as riprap, and vegetative stabilization. Permanent stabilization includes stabilization of temporary structures such as detours and staged earthwork. Immediately perform permanent stabilization at each completed excavation and embankment area except for areas that are scheduled to be redisturbed.

If areas are not sufficiently stabilized by an established stand of vegetation according to 01030.60, or if the soil surface is not sufficiently protected with temporary stabilization BMP by November 1 of each year, do the following:

- Use BMP's necessary to redirect water away from the disturbed areas.
- Re-grade disturbed areas to finished grade.
- Apply permanent seeding at the original specified rate.
- Apply temporary mulching or matting.

If areas for temporary stabilization are too steep or lack access for effective straw mulch application, apply, upon approval, another effective measures such as chemical soil binder.

Incorporate permanent erosion control features into the Project at the earliest practicable time. Use temporary erosion control features for the following situations:

- To correct conditions that occur during construction activities that were not foreseen during the design stage of the Project.
- That are needed prior to installing permanent erosion control features.
- To temporarily control erosion that develops during normal construction activities.

Where potential for erosion exists and if construction permits, construct permanent erosion control features immediately after clearing and grubbing and grading operations are complete. If permanent erosion control BMP are not practicable to construct, furnish and install temporary erosion control BMP.

00280.43 Area Preparation - Prepare areas according to 01040.48(d) and track all fill slopes at finished grade steeper than 1V:3H and flatter than 1V:1.5H so that track impressions run parallel to slope contours. Maintain at least 1 3/8 inch tall track grousers.

00280.44 Erosion Prevention BMP - Install erosion and sediment control devices as shown and according to the following:

(a) Plastic Sheeting - Place plastic sheeting on disturbed, temporary slopes or stockpiles where immediate protection is required and mulching or other methods of soil stabilization are not feasible. Temporary slopes include vertical excavations for retaining walls and other temporary soil excavations and embankments related to structural work.

Cover exposed soil with plastic sheeting and secure tightly using an anchoring system of sand bags, chain link fence, or other approved methods. Do not allow the anchoring system to puncture the plastic sheeting. Trench plastic sheeting at the top of slope and secure adequately to keep in place during any conditions that can be reasonably expected in the area. Direct runoff away from areas above plastic sheeting to prevent undermining. Control runoff from plastic sheeting so water discharges into protected drainage.

(b) Chemical Soil Binder - Hydraulically apply a liquid stabilization emulsion at the following rates unless the manufacturer recommends a greater rate of application:

- **Long Term Control of Exposed Soil Surfaces** - Apply 35 gallons per acre of emulsion. Dilute with water at the rate of one part emulsion to 20 parts water.
- **Steep Slopes with Raveling Small Rock** - Apply 45 gallons per acre of emulsion. Dilute with water at the rate of one part emulsion to 10 parts water.

(c) Chemical Dust Control - Apply appropriate dust control for wind or equipment-caused erosion according to the following:

- **Water** - Apply water according to Section 00340.
- **Liquid Stabilizer Emulsions** - Dilute the emulsion with water at a rate of one part emulsion to 30 parts water. Apply the diluted mixture at the rate of 865 gallons per acre unless the manufacturer recommends a greater rate of application.
- **Dry Powder Tackifier** - Apply at a rate of 140 pounds per acre unless the manufacturer recommends a greater rate of application. Watering for dust control may also be covered under Section 00340.

(d) Temporary Mulching - Evenly apply dry mulch and tackifier material to form a cohesive surface cover that is resistant to displacement by wind and water. In areas not accessible to heavy equipment, mulch by hand or by other approved methods. Areas not prepared according to 01040.48(d) will require greater rates of application at no additional cost to the City.

(1) **Dry Mulch** - Apply straw mulch on slopes 1V:15H or flatter. Spread straw mulch by hand or blower. Place approximately 2 inch deep, in loose condition, at a rate between 2 to 3 tons per acre of dry mulch. Place straw mulch so that it is loose enough for sunlight to penetrate and air to circulate, but dense enough to shade the ground, reduce water evaporation, and materially reduce soil erosion. Anchor using hydraulically applied tackifier, crimping disc, or sheep's-foot roller approved by the City or methods specified in the Special Provisions.

Provide blower equipment that uses air pressure with an adjustable spout that uniformly applies dry mulch at constantly measured rates. Apply the materials using a sweeping, horizontal motion of the nozzle.

(2) **Tacking** - Straw mulch may be tackified using hydraulically applied tacking agents or mechanical methods at the following rates of application:

a. **Hydraulically Applied Tacking Agents:**

- **Liquid Stabilizer Emulsions** - Dilute the emulsion with water at a rate of one part emulsion to 30 parts water. Apply the diluted mixture at the rate of 865 gallons per acre unless the manufacturer recommends a greater rate of application.
- **Dry Powder Tackifier** - Apply at 80 pounds per acre with 2,000 pounds of hydromulch fiber unless the manufacturer recommends a greater rate of application.

b. **Mechanical Methods** - Straw mulch may be mechanically tackified using a crimping disc or sheep's-foot roller.

- **Crimping Disc** - A heavy disk with flat, scalloped discs approximately 1/4 inch thick, having dull edges and spaced no more than 9 inches apart.
- **Sheep's-Foot Roller** - Modified sheep's-foot roller equipped with straight studs, made of approximately 3/4 inch steel plate, placed approximately 8 inches apart and staggered. Ensure that the studs are not less than 6 inches long or more than 6 inches wide, and rounded to prevent withdrawing the straw from the soil. Use a roller with enough weight to incorporate the straw sufficiently into the soil providing a uniform surface cover.

(e) **Slope and Channel Liner Matting** - Ensure that the matting is installed according to the plans, these Specifications, or the manufacturer's recommendations, whichever is more stringent. Within 25 feet of water resources or as indicated, install only matting that is fully biodegradable (photodegradable is not acceptable).

(1) **Area Preparation** - Remove all materials (vegetation, rocks, wood, etc) larger than 2 inches in size. Smooth the surface and remove undulations sufficient to allow the matting to be placed in complete contact with the soil.

(2) **Seeding** - Apply seeding to all disturbed areas, including the area where matting is required, according to one of the following:

a. **Seeding Prior to Matting Installation** - Apply according to Section 01030 This method is preferred.

b. **Seeding After Matting Installation** - This method is allowed only when specified or approved. Apply according to Section 01030 at double the application rate for seed.

c. **Single Application - Matting and Seed:**

- **Hydraulically Applied Matting** - Apply seed at double the rate specified in Section 01030. Thoroughly mix seed, fertilizer, and matting material.
- **Manually Applied (Pre-seeded) Matting** - Pre-seed the matting at double the rate specified with the seed mix specified in Section 01030.

(3) **Matting Placement** - Apply matting loosely so it is in complete contact with the soil to prevent erosion occurring beneath it. Apply mat and fasteners as shown Construct check slots on all channel applications and on slope applications when shown or specified.

00280.45 Runoff Control BMP - Install runoff control BMP as shown and according to the following:

(a) **Check Dams** - Construct check dams as shown or directed.

- **Type 1: Aggregate** - Place aggregate in the ditch section with the center low point below the outside edge.
- **Type 2: Straw Bales** - Straw bales are not acceptable for use as check dams except in emergency situations and when approved at each location. If straw bales are used as check dams, replace with another acceptable check dam as soon as practicable but no longer than 7 calendar days.
- **Type 3: Biofilter Bags** - Place aggregate in ditch section and extend check dam with biofilter bags sufficient to direct flow over aggregate weir. Aggregate weir may be replaced with additional biofilter bags if approved.
- **Type 4: Sand Bags** - Place aggregate in ditch section and extend check dam with sand bags sufficient to direct flow over aggregate weir. Aggregate weir may be replaced with additional sand bags if approved.

- **Type 5: Prefabricated System** - Install prefabricated systems according to the plans, Special Provisions, and the manufacturer's recommendations. Field fabricated systems are not acceptable.

(b) Diversion Dikes and Swales - Construct diversion dikes and swales above the cut slope to divert runoff from undisturbed areas away from disturbed slope areas. Convey runoff to an undisturbed area and discharge in a non-erosive manner.

Construct diversion dikes and swales at the toe of fill slopes to divert and convey sediment laden water to a sediment control facility. Compact dike material according to the Agency Manual of Field Test Procedures.

Immediately after construction of diversion dikes and swales, place temporary seed and mulch according to Section 01030, or place erosion matting and seed as directed.

(c) Temporary Drainage Curbs - Construct temporary drainage curbs as shown or directed.

(d) Temporary Slope Drains - Construct watertight slope drains and extend as the embankment height increases. Construct temporary slope berms at the top of embankment slopes to direct water into the drains until permanent drainage structures are completed.

(e) Flow Spreader - A flow spreader is a device that receives channeled runoff and uniformly disperses it along the length of the spreader. It may be constructed of clean aggregate in a berm or trench or lumber or similar materials. Place the flow spreader to discharge water into a stabilized area at non-erosive velocities. See the plans for details and locations of this device.

00280.46 Sediment Control BMP - Install sediment control BMP as shown and according to the following:

(a) Construction Entrances - Install construction entrances at every point of access onto paved surfaces.

When construction entrances are in use and mud and dirt tracking is still evident, take additional steps to eliminate tracking by hosing off tires before vehicles leave the site, or by modifying construction techniques or work operation. Perform tire washing on gravel pads. Use silt-trapping structures to collect and drain wash water before it leaves the construction site.

(b) Tire Wash Facility - Excavate the area for installation of the tire wash facility. Install subgrade geotextile, aggregate base coarse, reinforced concrete, and water as shown.

(c) Sediment Fence - Construct supported (mesh and metal posts) and unsupported (no mesh) as follows:

- When installing geotextile and mesh, or geotextile alone, use a continuous roll of geotextile cut to the length of the barrier to avoid joints.
- Manufacturer's factory seams are acceptable. Field sewn seams are not acceptable.
- Drive posts into undisturbed soil as shown.
- Securely fasten the geotextile (and mesh) to the upslope side of the posts. Securely fasten each end of the geotextile (and mesh) to the end posts.
- Use stitched loops over posts for unsupported sediment fence.
- Excavate a trench on the upslope side of the fence and place geotextile to the bottom of the trench. Backfill the trench with native material and compact.
- Attach the supported sediment geotextile to the wire mesh.
- Install the manufactured sediment fence system according to the plans, Special Provisions, and manufacturer's recommendations. Connect end of rolls as shown.

(d) Inlet Protection - Construct inlet protection that directs flows through the control and into the inlet.

- **Type 1: Sediment Fence** - Install supported sediment fence around the perimeter of the inlet according to 00280.46(c).
- **Type 2: Geotextile/Wire Mesh/Aggregate** - Place wire mesh over the inlet grate. Place sediment fence geotextile over the wire mesh and perimeter area near the inlet. Install aggregate over the geotextile fabric.
- **Type 3: Prefabricated Filter Inserts** - Install prefabricated filter inserts according to the plans, Special Provisions, and manufacturer's recommendations. Prefabricated inserts with provisions for overflow are allowed only when accompanied by additional BMP to prevent the potential of sediments entering project storm systems. Field fabricated inserts are not allowed.
- **Type 4: Biofilter Bags** - Install biofilter bags according to the plans.
- **Type 5: Masonry** - Install concrete masonry units around the perimeter of the inlet. Place sediment fence geotextile around the outside perimeter, up the outside face, and on the top of masonry units. Place aggregate over the geotextile fabric and flush with the top of masonry units.
- **Type 6: Sod** - Install sod around the perimeter of inlets within 36 hours of harvest of the sod.

(e) **Sediment Barriers:**

- **Type 1: Straw Bales** - Straw bales are only acceptable for use as short-term emergency containment. Receive approval before each use of straw bales and remove within 30 calendar days of installation unless directed to replace with new bales.
- **Type 2: Biofilter Bags** - Place and arrange biofilter bags as shown or directed.
- **Type 3: Wattles** - Place and arrange wattles as shown or directed.
- **Type 4: Sand Bags** - Place and arrange sand bags as shown or directed.
- **Type 5: Brush Barrier** - Place brush barrier as shown or directed. Place woody debris in a linear pile.
- **Type 6: Filter Berm** - Place and arrange filter berms as shown or directed. Place rock in an evenly spread, trapezoidal berm.
- **Type 7: Prefabricated Barrier System** - Install prefabricated barrier systems according to the plans, Special Provisions, and manufacturer's recommendations. Field fabricated systems are not allowed.

(f) **Sediment Mat** - Place sediment mats a minimum of 20 feet downstream of work areas. Install mats individually or in groups on the stream bottom. Remove the mats not later than 48 hours after stream activities are complete. Remove them from the Project site, or if approved, place them on the stream bank and cover with permanent seeding.

(g) **Temporary Scour Basin** - Construct temporary scour basins at the outfall ends of temporary slope drains or as shown.

(h) **Temporary Sediment Trap** - The trap may be formed by constructing a berm or by partial or complete excavation. Direct the discharge flow to a stabilized conveyance outlet or level spreader.

00280.47 Work Quality - Protect areas according to 01030.49.

00280.48 Emergency Materials - Provide, stockpile, and protect emergency materials on site for unknown weather or erosion conditions. A list of emergency materials will be listed in the Special Provisions. Replenish emergency materials as they are used.

The emergency materials are in addition to the other erosion control materials required to implement and maintain the ESCP.

Remove all unused emergency materials from the Project site at the completion of the Project.

Maintenance

00280.60 General - Maintain installed erosion and sediment control devices in good working order at all times. Keep the devices in place until the City issues notification of acceptance of stabilization. All maintenance and repairs are at no additional cost to the City.

00280.61 Ineffective Controls - If a control feature does not function effectively, immediately repair, replace, or provide additional devices. Devices repaired, replaced, or added due to improper installation, insufficient maintenance, or damage from Contractor operations will be at no additional cost to the City.

00280.62 Inspection and Monitoring - Ensure that regular site inspection and monitoring is performed according to the schedule and record keeping requirements of the NPDS permit.

(a) Inspection - Perform general site inspection, complete all applicable parts of the ODOT Erosion Control Monitoring Form, and submit the Form to the City as follows:

- Weekly for active sites
- Every 2 weeks for inactive sites
- When directed by the Engineer

(b) Rainfall - Furnish and install a rain gauge at the Project site. Notify the City if 5/8 inch or more of rainfall occurs within a 24-hour period. As soon as practicable, but not later than 24 hours, after 5/8 inch or more of rainfall occurs, including weekends and holidays, inspect the entire Project to determine the condition of all erosion and pollution control devices.

(c) Monitoring Receiving Stream - Observe and record color and turbidity or clarity within 30 feet upstream and downstream of locations where surface waters from the construction site enter the receiving stream. Note whether sheen and floating matter are present or absent. Describe any apparent color and the clarity of the discharge, and any observable difference in comparison with the receiving stream.

00280.64 Sediment Removal - Remove sediment and upgrade or repair the devices as needed as soon as practicable, but not later than 2 days after the surrounding exposed ground has dried sufficiently to prevent further damage from equipment needed for repair operations. If rainfall continues over a 24-hour period, or other circumstances that preclude equipment operation in the area, hand carry and install additional sediment control devices with best management practices and approved by the City.

(a) Catch Basins - Maintain catch basin inserts and other forms of inlet protection by removing trapped sediment when storage capacity has been reduced by 33%. Do not flush sediment into the inserts or other forms of inlet protection for the drainage system.

00280.65

(b) Sediment Controls - Remove sediment from sediment fences, sediment barriers, check dams, and sediment traps once it has reached one third of the exposed height of the device or storage depth. Replace aggregate and rock filter material with new aggregate material when the sediment reduces the filtering capacity of the device by one half. Replace biofilter bags with clean, washed bags when removing sediment from them. Wash bags in an approved sediment control area.

(c) Paved Areas - Keep all paved areas clean for the duration of the Project. Use cleaning methods that do not transport sediment-laden water to receiving streams and storm or sanitary facilities.

(d) Construction Entrances - Add and remove aggregate or other specified material as needed to maintain the proper function of the construction entrances.

(e) Permanent Stabilization - Re-stabilize within 2 calendar days of disturbance all areas disturbed by the Contractor's operations or other causes including wind, water, and vandalism.

(f) Straw Bales - Replace straw bales when they become non-functional or, at a minimum, on an annual basis or at the beginning of each construction season as appropriate.

00280.65 Sweeping - Sweeping shall be done using a regenerative air or vacuum pickup sweeper together with proper dust control methods to assure sediments and pollutants do not leave the Project. Mechanical sweepers may be used only for debris pickup after cold plane pavement removal. Clean and sweep the Project to remove sediment, particulate matter and erosion accumulation. Adjust the frequency of sweeping to ensure compliance with the ESCP.

Finishing and Clean Up

00280.70 Removal - Within 30 days of the notification of acceptance of permanent stabilization, remove temporary erosion and sediment control devices, materials, and erosion control signing from the area. Remove accumulated sediment before removing the devices and materials. Immediately shape and permanently stabilize areas affected by the removal process. All temporary erosion and sediment control features that are not incorporated into the permanent work remain the property of the Contractor. Do not remove temporary erosion and sediment control devices before permanent stabilization is accepted.

00280.71 Sediment Disposal - Re-grade removed sediment into slopes or remove and dispose of off-site according to 00290.20. Do not flush sediment-laden water into waterways or drainage systems.

Measurement

00280.80 Measurement - Quantities of work performed under this Section will be measured according to the following:

(a) **Lump Sum Basis** - No measurement of quantities will be made for lump sum items.

(b) **Unit Basis** - Unit basis items will be measured on the unit basis of each device or location where the device is constructed or placed.

(c) **Length Basis** - Length basis items will be measured on the length basis along the line and grade of the item or device constructed or placed.

- Flow spreaders and diversion dike/swale will be measured along the long axis.
- Sediment barrier, when measured on the length basis, will be measured along the long axis of the barrier regardless of type.
- Temporary slope drains will be measured from the beginning of the metal end pieces to the end of the drain. Measurement will be made when each installation is at its maximum length.

(d) **Area Basis** - Area basis items will be measured on the area basis along the ground surface, and computed to the square foot or acre as applicable.

(e) **Limitations** - The quantities of emergency materials listed in 00280.48 of the Special Provisions are included in the items listed in the Contract Schedule of Items.

Payment

00280.90 Payment - The accepted quantities of work performed under this Section will be paid for at the Contract unit price, per unit of measurement, for the following items:

Pay Item	Unit of Measurement
(a) Erosion Control	Lump Sum
Erosion Prevention	
(b) Plastic Sheeting	Square Foot
(c) Chemical Soil Binder.....	Acre
(d) Chemical Dust Control	Acre
(e) Temporary Mulching	Acre
(f) Matting	Square Yard
Runoff Control	
(g) Check Dams	Each
(h) Temporary Diversion Dike/Swale.....	Foot
(i) Temporary Slope Drains	Each or Foot
(j) Flow Spreader.....	Foot

Sediment Control

(k) Construction Entrances.....	Each
(l) Tire Wash Facility	Each
(m) Sediment Fence, _____.....	Foot
(n) Inlet Protection	Each
(o) Sediment Barrier	Each
(p) Sediment Mat.....	Square Yard
(q) Temporary Scour Holes	Each
(r) Temporary Sediment Traps	Each

Item (a) includes:

- providing the Erosion and Sediment Control Manager
- developing, revising, and documenting the ESCP
- mobilization
- monitoring activities
- furnishing, stockpiling, protecting, restocking, and removing emergency materials
- preparing Project for winter shut-down
- inspecting, maintaining, and removing erosion control devices
- restoring, mulching, tacking, and seeding all disturbed ground, work, and storage areas not otherwise covered
- erosion control signs

When only Item (a) is listed in the Contract Schedule of Items, no separate or additional payment will be made for modifications or additions to the BMP that become necessary for permit compliance during construction.

Partial payments for item (a) will be made as follows:

- When the initial Contractor developed ESCP, narrative, and schedule are complete and accepted, and the initial erosion control devices are installed25%
- When 50 % of the Contract is complete, excluding advances on materials25%
- When 75% of the Contract is complete, excluding advances on materials25%
- At completion of the Contract and all erosion control devices are either removed from the Project site or are fully functioning as permanent BMP.....25%

Item (b) includes protecting exposed slopes with plastic sheets, anchoring devices, and toe protection maintenance.

Item (f) includes preparing the slope surface and stabilizing exposed soil with erosion matting material.

Items (g), (n), and (o) includes the biofilter bags, sand bags, and sediment fence as applicable.

Emergency materials that are incorporated into the Project will be paid for under the appropriate items listed in the Contract Schedule of items.

Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

No separate or additional payment will be made for:

- removing and disposing of sediment build up behind sediment fences and sediment barriers
- removing and reinstalling required appurtenances to modify temporary slope drains as the embankment slopes are changed
- constructing and removing temporary slope berms
- applying dust control
- erosion control for work outside the construction limits including but not limited to borrow pits, haul roads, disposal sites, and equipment storage sites

Section 00290 - Environmental Protection

Description

00290.00 Scope - This Section describes the Contractor's duties and obligations with respect to protection of the land, waters, air, wildlife and other environmental resources of the State.

Comply with all applicable federal, State and local environmental, health, safety and other laws, acts, statutes, regulations, administrative rules, ordinances, orders and permits, as they may be amended from time to time (referred to in this Section as "Laws"). Comply with all applicable Laws, whether or not specifically referenced in this Section or elsewhere in the Contract.

Federal, State and local agencies known to have enacted ordinances and regulations relating to environmental pollution and the preservation of natural resources that may affect the performance of the Contract are listed in 00170.01.

If any provision of these Specifications appears to conflict with one or more Laws, the more stringent requirement shall apply, unless the Engineer directs otherwise in situations where these Specifications are more stringent.

Comply with all additional requirements or Laws imposed by any agency or governmental unit having authority to enforce the Endangered Species Act (ESA) and other Laws.

All penalties assessed against the City because of the Contractor's violation of Laws referenced above, or permits applicable to the Project, will be withheld from the progress or final payments according to 00195.50(e).

No Condition of the Contract releases the Contractor from any responsibility or requirement under any environmental or other Law.

00290.10 Staging and Disposal Sites - Locate staging areas and disposal sites in previously improved or disturbed sites including existing roadways, pullouts, turnouts, parking lots, and storage yards that have been compacted, graveled and paved, unless otherwise approved, in writing, by the Engineer.

00290.11 Water Conservation - Minimize use of water by maintaining equipment, immediately fixing water line and container leaks, ensuring water valves are turned off promptly, and using recycled water when feasible.

00290.20 Waste, Hazardous Waste and Hazardous Substances - Comply with all applicable federal, State and local laws and regulations as they pertain to the storage, handling, management, transportation, disposal and documentation of waste, hazardous waste, and hazardous substances.

(a) Hazard Communication - Ensure the following documents are readily available on site to employees, subcontractors and inspectors:

- Material Safety Data Sheets (MSDS) for all hazardous substances stored or used on site.
- Written hazard communication program, including employee training documentation.
- The Oregon Occupational Safety and Health Division (OR-OSHA) provides guidance to meet these requirements in their publication "Hazard Communication: A Safe-Work-Practice Guide".

(b) Fuel Storage - Store fuel according to the current edition of the International Fire Code applicable federal, State, and local laws.

If total fuel and petroleum storage, in containers 55 gallons or larger, exceeds 1,320 gallons, comply with the applicable spill prevention control and countermeasures (SPCC) requirements of 40 CFR 112. If applicable, submit the professional engineer stamped SPCC plan, 10 days before the preconstruction conference. Comply with the plan and keep a copy on site and readily available. The SPCC plan may be combined with the Pollution Control Plan required under 00290.30(b).

(c) Waste Management:

(1) General - Prepare a hazardous waste determination for all waste generated on site to determine whether the waste is classified as hazardous waste, universal waste excluded. The City may provide initial analytical results for some wastes such as lead-based paint and asbestos containing material. Conduct additional testing necessary for waste characterization and disposal using an Oregon Environmental Laboratory Accreditation Program (ORELAP) accredited laboratory, under chain of custody procedures.

Segregate all demolition debris according to its intended end use (reuse, recycle, or dispose). If required, store in designated areas in a manner that prevents contamination to soil and water and prevents fugitive dust emissions. Remove all waste materials recovered from the site unless otherwise approved, in writing. Retain disposal and recycling facility receipts for wastes generated on site for at least 1 year after completion of the Project. Provide copies of the receipts to the Engineer within 7 calendar days of the disposal or recycling.

Dispose of noxious weeds and Specified Weeds according to Section 01030.

Do not reuse demolition material, coated or treated materials, or concrete and masonry materials in waters of the State or US.

(2) Clean Fill - Clean fill, defined by OAR 340-093-0030(13), becomes the property of the Contractor at the place of origin.

(3) Reuse, Recycle, and Dispose of Materials - Waste materials become the property of the Contractor at the place of origin. Unless prohibited by Law, treat waste materials according to the following priority:

- Reuse demolition debris on site.
- Recycle demolition debris.
- If it is not feasible to reuse or recycle, ("feasible" is defined as a facility that is capable of handling the material, will take the material and the cost of transportation plus the cost to reuse or recycle the material is equal to or less than the costs of disposal) dispose of waste material according to the following:

a. Burnable Materials - Dispose of burnable material, that cannot be reused or recycled, according to 00290.30(c)(3).

b. Woody Matter - Woody matter may be burned according to 00290.30(c)(3) or may be chipped to a size of no more than 3 inches in any direction then uniformly spread over selected landscape areas, as directed, in loose layers not more than 3 inches thick Burying wood, stumps, or other woody material is not allowed.

c. Preserved and Coated Wood - Dispose of chemically preserved wood, pressure treated wood, and wood coated with latex paint that does not contain lead according to the following:

- Reused whole.
- Provided to others to reuse.
- Burned as fuel at an energy recovery facility with a DEQ stationary source permit.
- Delivered to a DEQ permitted municipal solid waste landfill or a DEQ permitted construction and demolition landfill.

Dispose of wood coated with lead-containing paint at a DEQ permitted municipal solid waste landfill or a DEQ permitted construction and demolition landfill.

Test wood as required by the receiving facility.

d. Concrete and Masonry - Concrete and masonry, when not recycled, may be reused to fill basements or be buried in embankments on site, provided that the materials are broken into pieces not exceeding 15 inches in any dimension, and placed so that:

- No part of any piece is within 2 feet of the top, side or end surface of the basement, embankment, or other structures.
- The fill or embankment is constructed and compacted according to 00330.42 and 00330.43.

If the Engineer provides written approval, concrete may be reused as aggregate if it meets the requirements of Section 02610 through Section 02690.

e. Disposal on City-Owned Lands - Do not dispose of waste materials on City-owned or City-controlled lands, except when shown, specified, or allowed in writing to be used as fill. If allowed, place waste materials only at specified locations, as directed.

f. Off-Site Disposal - Dispose of waste at an energy recovery facility with a DEQ or LRAPA Stationary Source Permit, at a permitted landfill, or at other waste disposal facilities as required depending on that type of waste.

Subject to local zoning codes and the requirements of 00280.03, materials that meet the definition of clean fill may be placed on other properties in a manner consistent with environmental requirements, and with written permission of the property owner. Furnish the Engineer a copy of the signed agreement with the owner before placement of the clean fill material. Do not place the clean fill material at locations that are visible from a public highway, road, or street unless the site is zoned and licensed for landfill.

(d) Hazardous Waste Management - Determine the generator category for the Project, based on the amount and type of hazardous waste generated. Use the following definitions. If they differ from current Laws, use the current Laws. For all waste streams classified as hazardous waste under 00290.20(d), use an EPA ID number obtained by the Owner for waste characterization and disposal. Conduct all additional testing necessary to characterize the waste for disposal purposes.

- **Conditionally Exempt Generator** - A conditionally exempt generator (CEG) generates 220 pounds or less of hazardous waste per month or 22 pounds or less of acutely hazardous waste per month and accumulates up to 2,200 pounds hazardous waste or 22 pounds acutely hazardous waste on site.
- **Small Quantity Generator** - A small quantity generator (SQG) generates 220 pounds to 2,200 pounds hazardous waste per month, can accumulate up to 13,200 pounds hazardous waste on site (or more with a permit), and ship hazardous waste off-site within 180 days of generation.

- **Large Quantity Generator** - A large quantity generator (LQG) generates more than 2,200 pounds hazardous waste per month or more than 22 pounds acutely hazardous waste per month, has no accumulation limit, but ship all hazardous waste off-site within 90 days of generation.

In addition to current Laws, comply with the following:

- If the Project generator category is SQG or LQG, or if it requires a hazardous waste identification number, obtain a Resource Conservation and Recovery Act (RCRA) site identification number from the DEQ. Pay all fees and complete the RCRA application form as follows:
 - List the Contractor as the Site Contact, the Site Operator, the Hazardous Waste Form Contact, and the Hazardous Waste Fee Contact.
 - List the City as the Site Location, the Land Owner, and the Legal Owner.
 - Fill in the Comments section with the following statement:
 "[Contractor name] is responsible for the following: All hazardous waste management on site for the duration of this construction project, for delivery of the waste to a permitted recycling or disposal facility, and for all forms and fees associated with the hazardous waste management including cancellation of the RCRA site identification number at the end of the Project. The City is the owner of the waste and maintains long term responsibility for the waste as required by RCRA, excluding all wastes generated solely from materials brought to the site by the Contractor, which remain the property of the Contractor".
 - The Contractor may sign hazardous waste manifests for the off-site shipment of hazardous wastes as the "offeror" rather than as the "generator".
- Maintain all required waste management records, including monthly hazardous waste generation records, manifests, recycling and disposal receipts, test results, and annual DEQ reports. Submit monthly records to the Engineer by the fifteenth day of the following month and submit DEQ reports to the Engineer concurrently with DEQ. Keep copies for at least 3 years following completion of the Project and resolution of any regulatory violations or citations.
- If the quantity of hazardous waste projected to be generated meets the requirements for a CEG, store hazardous wastes on site for no more than 180 days.
- If the quantity of hazardous waste projected to be generated meets the requirements for a SQG or for a LQG, prepare a Hazardous Waste Contingency Plan according to 40 CFR 26551. Maintain a copy of the Contingency Plan on site at all times during construction activities, readily available to employees and inspectors.

- If the project is SQG or LQG, retain a Certified Hazardous Materials Manager (CHMM) in good standing and with experience managing the hazardous wastes associated with the Project to oversee waste management at the site.
- All employees involved in the handling and management of CEG hazardous waste shall comply with the federal and State Laws for hazardous waste management. All employees involved in the handling of SQG and LQG hazardous waste shall be trained according to federal and State Laws For LQC hazardous waste projects, keep employee training records on site and readily available.
- If the quantity of hazardous waste generated in a month changes the generator category, immediately implement the requirements for the new category and comply with them for the remainder of the year. Complete the new documentation and training requirements within 30 calendar days of the change.
- Ensure hazardous waste containers are clearly and visibly labeled with the contents and accumulation start date, compatible with the contents and in good condition. Store them in a designated weather-protected area that is secured from public access, has secondary containment adequate to contain a release, and has sufficient aisle space to safely maneuver containers and respond to spills (minimum 30 inches).
- If hazardous waste will be treated on site, obtain approval from DEQ and the Engineer for each specific treatment or recycling process, treat wastes within accumulation tanks or closed containers that meet RCRA requirements, conduct treatment within the storage time for the applicable generator category, maintain current copies of all required notifications and waste analysis plans readily available on site and request DEQ technical assistance prior to starting any on site recycling or treatment.

(e) Hazardous Substance Transportation - Comply with the following requirements for transportation of hazardous substances and hazardous waste:

- Train all employees involved in transportation and shipping as required by US DOT.
- Use drivers who have a commercial driver's license with a hazardous materials endorsement when required.
- Ship hazardous wastes from SQG and LQG projects using a DEQ registered hazardous waste transporter under a hazardous waste manifest.
- Ensure shipments are appropriately packaged and labeled, and vehicles are appropriately placarded.
- Submit copies of the completed manifests and documentation to the Engineer and retain copies for at least 1 year.

(f) Unexpected Contamination - If, during construction, unanticipated hazardous substances are discovered that threaten the health and safety of workers, the public, or the environment, do the following:

- Immediately remove all affected employees and secure the area to prevent access.
- Notify the Engineer immediately and provide written notification within 24 hours, setting forth description of the hazardous substances encountered.

The Engineer will attempt to resolve the unanticipated situation expeditiously according to 00140.40. Delays to work due to the discovery of unexpected contamination shall be considered for exclusion from Contract time according to 00180.80(d)(1).

(g) Spills and Releases - Obtain a response agreement with a professional on-call spill response team. The professional on-call spill response team, identified in the PCP, agrees to be available and respond to spills that cannot be cleaned up with on-site resources. A professional spill response team is a company or section of a company specifically dedicated to hazardous materials emergency spill response, insured, and bonded for hazardous materials cleanup, and employing experienced personnel certified according to 29 CFR 1920120.

In the event of a spill or release of hazardous substance or hazardous waste, do the following:

- Immediately commence response actions to protect human health and the environment. Follow the PCP, SPCC and Contingency Plan, as appropriate. If any of the provisions in these plans conflict, implement the actions providing the greatest protection of public health and safety and the environment.
- If the spill can not be safely contained and cleaned up with on-site resources, activate the professional on-call spill response team.
- Immediately notify the Engineer.
- If the quantity released exceeds the State or Federal reportable quantity, or if the release impacts or threatens to impact any surface water body, immediately notify DEQ by the Oregon Emergency Response System (OERS) at 1-800-452-0311 and the EPA and the USCG through the National Response Center at 1-800-424-8802 (Federal reportable quantities or spills impacting or potentially impacting water only). If the quantity released is unknown, proceed with OERS and NRC notifications. Reportable quantities are listed at 40 CFR 302.4 and OAR 340-142-0040 to OAR 340-142-0050.
- Conduct cleanup of the released material according to all applicable Laws and DEQ requirements. Cleanup to background levels unless otherwise agreed to by the City in writing.

- Provide a written report to the Engineer, using the DEQ Spill/Release Report form, within 10 calendar days of completing spill response, but no more than 30 calendar days after the initial event. If the spill was reported to DE, submit the report to DEQ concurrently. Include a description of how future releases will be prevented.

00290.29 Health and Safety - Comply with all applicable health and safety Laws as they pertain to the hazardous substances and wastes used, stored and generated on site. If any of these requirements are in conflict, the more stringent requirements apply.

00290.30 Pollution Control - Prevent, control and abate pollution of the environment. Comply with new or amended environmental pollution Laws, not contemplated at the time of bid preparation according to 00140.50 and ORS 279C.525.

(a) Pollution Control Measures - Comply with the following requirements:

(1) General:

- Allow no pollutant of any kind (e.g., petroleum products or fresh "green" concrete) to come in contact with an active flowing stream or waters of the State and U.S.
- Comply with the erosion prevention and sediment control requirements of Section 00280 and all applicable DEQ NPDES 1200 Permit requirements.
- Do not cause turbidity to waters of the State and U.S. outside of regulated levels.
- Protect potable water system from contamination.

(2) Materials and Waste Management:

- Store construction equipment, materials and debris in a manner that prevents contamination of water and soil and prevents fugitive dust.
- Store hazardous substances in the original containers or labeled compatible containers according to State Fire Marshal's regulations, International Fire Code and product MSDS.
- Locate areas for storing fuels and other potentially hazardous materials at least 150 feet away from any waters of the State and US or storm inlet, unless otherwise approved by the Engineer.
- Dispose of material waste according to 00290.20.
- Do not use treated timbers within any waters of the State and US.

(3) Equipment Fueling, Repair and Maintenance:

- Promptly correct or repair operational procedures, leaks, or equipment problems that may cause pollution at the Project Site. If soils or other media become contaminated as a result of operational procedures or equipment problems, remove and dispose of them according to applicable Laws and 00290.20(g).
- Locate areas for parking, refueling and servicing mobile equipment and vehicles at least 150 feet away from any waters of the State and US or storm inlet, unless otherwise approved by the Engineer.
- For large equipment that is not easily moved, prevent fuel and operating fluids from reaching any waters of the State and US or storm inlet by, at a minimum, using spill containment systems designed to completely contain potential spills during all refueling and equipment repair operations.

(4) Equipment Cleaning and Washouts:

- Inspect and clean all equipment prior to operating it within 150 feet of any waters of the State and US or storm inlet. Check for fluid leaks and remove all external oil, grease, weed seed, and dirt.
- Do not discharge untreated wash and rinse water into the any waters of the State and US or storm inlet.
- Establish wash areas that contain all fluids and debris, at least 150 feet from any waters of the State and US or storm inlet, such that untreated waste water does not impact those systems.
- Clean concrete equipment in washout areas that contain all fluids and debris. Recycle washout materials into fresh mixes or dispose of according to applicable permits.

(5) Off Site Tracking:

- Limit water leakage from trucks carrying saturated soils to less than 1 gallon per hour before allowing them to leave the Project Site.
- Remove all loose dirt and debris from trucks prior to leaving the Project Site.

(6) Other Spill Prevention and Response Measures:

- Inspect heavy equipment, storage containers, staging areas and other potential sources of hazardous substances daily to identify and prevent potential releases.
- If flooding of the Project site is expected to occur within 24 hours, evacuate areas used for staging, access roads, or storage and remove materials, equipment, and fuel.

- Immediately contain and repair leaking equipment or containers and cleanup any releases according to 00290.20(g).
- Maintain hazardous material containment kits and spill containment kits on site to facilitate the cleanup of hazardous material spills on dry land and waters of the State and US.

(b) Pollution Control Plan (PCP) - Develop and submit a PCP to prevent pollution related to Contractor operations for approval 10 days before the preconstruction conference. Maintain a copy of the PCP on site at all times during construction activities, readily available to employees and inspectors. Ensure that all employees comply with the provisions of the PCP.

Include the following information in the PCP:

- Identify a professional on-call spill response team.
- Identify all contractor activities, hazardous substances used and wastes generated.
- Describe how hazardous substances and wastes will be stored, used, contained, monitored, disposed of and documented Include pollution prevention, spill response, waste reduction, dust prevention, off site tracking prevention, washout facility design, vehicle and equipment fueling and maintenance procedures, employee training and emergency contact information.
- Include the waste determination results from 00290.20(c)(1). Provide reuse, recycle, and disposal options, the reason for selecting that alternative, and estimated quantities for each reuse, recycle, and disposal option.
- Include or refer to the SPCC plan and the hazardous waste contingency plan, if required.
- Include scaled site plans showing locations for hazardous substance storage, spill response equipment, communications equipment and fire suppression equipment.

A "Pollution Control Plan Contractor Packet" is available from the City.

(c) Air Pollution Control Measures - Comply with ORS 468, 468A, OAR 340-014, 340-200 through OAR 340-268, and all other applicable Laws.

(1) Vehicle and Equipment Idling - Establish truck staging areas for diesel-powered vehicles located where the truck emissions have a minimum impact on sensitive populations, such as residences, schools, hospitals and nursing homes.

Limited idling of trucks and other diesel powered equipment to 5 minutes, when the equipment is not in use or in motion, except as follows:

- When traffic conditions or mechanical difficulties, over which the operator has no control, force the equipment to remain motionless.



- When operating the equipment's heating, cooling or auxiliary systems is necessary to accomplish the equipment's intended use.
- To bring the equipment to the manufacturer's recommended operating temperature.
- When the outdoor temperature is below 20 °F.
- When needed to repair equipment.
- Under other circumstances specifically authorized by the Engineer.

(2) Dust Control and Permitting - Prevent airborne dust and fugitive dust emissions from construction activities including rock, concrete, and asphalt crushing operations and obtain permits according to 00160.70. Do not use oil, waste, waste water, or other illegal materials as dust suppressants.

(3) Burn Restrictions - Burn wastes only if open burning is allowed by State, LRAPA, and local burning Laws. Obtain and comply with all required permits including DEQ permits required by OAR 340-264-0010 through OAR 340-264-0020, LRAPA permits, and local fire district permits. Provide copies of all permits to the Engineer prior to burning. Do not conduct burning within riparian areas. Conduct burning at locations where existing structures will not be damaged and where smoke will not impact traffic. Do not burn the following materials on site:

- Rubber products
- Tires
- Plastic
- Wet garbage
- Petroleum and petroleum treated materials
- Asphalt or industrial waste
- Any material that creates dense or noxious odors
- Painted materials
- Asbestos, mercury or PCB containing materials or equipment
- Hazardous wastes
- Scrap wiring or electrical equipment
- Painted or treated wood

Buildings intended for demolition may be burned by the local fire department for training purposes. Contact the local fire department for applicable restrictions.

00290.32 Noise Control - Comply with ORS 467, OAR 340-035, City Code 18.10.060, all other applicable Laws, and the following construction noise abatement measures:

- Perform construction and pile driving with equipment that complies with City Code 18.10.060.
- Use equipment with sound control devices no less effective than those provided on the original equipment. Equipment with un-muffled exhausts is prohibited.
- Use equipment complying with pertinent equipment noise standards of the EPA.
- Perform blasting operations in compliance with Fire and Water Bureau requirements.
- Mitigate the noise from rock crushing or screening operations performed within 3,000 feet of all occupied dwellings by placing material stockpiles between the operation and the affected dwellings, or by other means approved by the Engineer.

If a specific noise impact complaint occurs during the construction of the Project, one or more of the following noise mitigation measures may be required, at no additional cost to the City, as directed by the Engineer:

- Locate stationary construction equipment as far from nearby noise sensitive properties as feasible.
- Shut off idling equipment.
- Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.
- Notify nearby residents whenever extremely noisy work will be occurring.
- Install temporary or portable acoustic barriers around stationary construction noise sources.
- Operate electric-powered equipment using line voltage power or solar power.

00290.34 Protection of Fish and Fish Habitat - Comply with the Laws of the Oregon Department of Fish and Wildlife, National Marine Fisheries Service, and US Fish and Wildlife Service, and the rules and practices developed through the Oregon Plan for Salmon and Watersheds. Conduct operations to avoid any hazards to the safety and propagation of fish and shellfish in waters of the State and US.

(a) Regulated Work Areas - Perform work within regulated work areas only within the regulated in-water work periods. Do not allow equipment to enter any waters of the State or US or the regulated work area except as allowed in permits issued for the Project.

The regulated work area, if any, will be identified in the Special Provisions.

(b) Prohibited Operations - Except where allowed by the Contract or by permit, do not:

00290.36

- Blast underwater.
- Use water jetting.
- Release petroleum products or chemicals in the water.
- Disturb spawning beds.
- Obstruct stream channels.
- Cause silting or sedimentation of waters of the State and US.
- Use treated timbers within the regulated work area.
- Impede adult and juvenile fish passage, including intermittent streams.

00290.36 Protection of Wildlife and Wildlife Habitat - Comply with the Laws of the Oregon Department of Fish and Wildlife and US Fish and Wildlife Service. Conduct operations to avoid any hazards to the safety and propagation of wildlife.

(a) Migratory Birds - Comply with the Migratory Bird Treaty Act (16 USC 703-712) which protects most species of birds in Oregon and prohibits the removal of nests containing eggs and dependent young Migratory birds include most birds in Oregon, except pigeons, house sparrows, and starlings. Except where allowed by the Contract and by permit, do not disturb a migratory bird nest containing eggs or dependent young, or the surface the nest is built on.

If migratory bird nests are encountered that contain eggs or dependent young, stop all actions that may disrupt the nest and contact the Engineer. Do not resume work, which may disrupt nesting, until approved by the Engineer.

(b) Bats - Avoid destruction of bat colonies as shown.

00290.38 Protection of Plants - Plant habitats to be protected will be shown with the plant habitat boundaries flagged by the Engineer. Avoid destruction of plant habitats by ensuring construction personnel, equipment, and associated pollutants, including sediment, chemical contaminants, discharge water, non-native grass and weed seed, do not enter the habitat.

00290.40 Protection of Forests - Obtain necessary permits according to ORS 477.625 and ORS 527.670, and comply with the Laws of any authority having jurisdiction for protection of forests.

00290.41 Protection of Wetlands - Comply with and require that all the Contractor's employees, agents, and subcontractors on the Project Site comply with the following:

- Clean Water Act Section 404 (33 USC 1344); Federal Rivers and Harbors Act of 1899, Section 10 (33 USC 403 et seq).
- ORS 196800 to ORS 196990 (Oregon Removal-Fill law).
- ORS 390805 to ORS 390925 (Oregon Removal and Filling in Scenic Waterways law).
- All other applicable Laws governing preservation of wetland resources.

For the purposes of this Section, "wetland" or "wetlands" shall be understood to include wetlands as defined in 0011020, as well as other jurisdictional waters of the State and U.S.

Willful violation of permit conditions and applicable laws exposes the offending Contractor and other violators to criminal and civil sanctions. Civil sanctions include, but are not limited to, the offender's sole liability for all costs associated with site restoration, maintenance and additional mitigation work required by federal or State authorities.

(a) Identifying Wetlands - Wetlands known to be on the Project Site will be shown and identified either as "permanently filled or excavated" or as "temporarily impacted" Wetlands to be protected will be shown as "no work zones".

(b) Disturbing Wetlands - If wetlands are shown, meet with the City Wetland Specialist, the Engineer, and inspector on site prior to moving equipment onto the site or beginning any work, to ensure that all parties understand the locations of wetlands and the measures that shall be taken to protect them.

Ensure protection of no work zones as follows:

- Fence off no work zones using pedestrian safety fence or approved equivalent.
- Except as authorized by the Engineer for the purpose of installing or maintaining approved wetland protective measures, keep all persons, equipment and materials off no work zones.
- The Engineer has the authority to bar from the Project any person entering a protected site other than for the purpose of installing or maintaining protective measures.

Install all site protection for wetlands required by the Plans and Special Provisions prior to staging equipment or starting work near the site(s).

The Engineer may suspend work until the Contractor, Engineer, City Wetland Specialist, and other required federal and State personnel, if any, meet to determine damage to the site and the nature and scope of necessary site restoration and maintenance. The Engineer may require the Contractor to submit a written plan for protection of other sites for the duration of the Project before work resumes.

00290.50 Protection of Cultural Resources - Comply with all Laws governing preservation of cultural resources. Cultural resources may include, but are not limited to, dwellings, bridges, trails, fossils, and artifacts.

If cultural resources are encountered on the Project area or in material sources, and their disposition is not addressed in the Special Provisions:

00290.51

- Immediately discontinue operations or move to another area of the Project Site or material source.
- Protect the cultural resource from disturbance or damage.
- Notify the Engineer.

The Engineer will:

- Contact the City's Archaeologist, to arrange immediate investigation.
- Arrange for disposition of the cultural resources. The Engineer may direct the Contractor to perform salvage operations as Extra Work.
- Notify the Contractor when to begin or resume construction operations in the affected area.

00290.51 Protection of Sensitive Cultural Sites - Comply with and require that all the Contractor's employees, agents, and subcontractors on the Project Site comply with all Laws applicable to the preservation and protection of sensitive cultural sites. The existence of any sensitive cultural sites affecting the Project, and the mandatory preservation and protection measures applicable to the sites, are determined in accordance with the Laws including, but not limited to the following:

- National Historic Preservation Act (NHPA) of 1966, Section 106, codified in 36 CFR Part 800 (Protection of Historic Properties).
- ORS 97.740 to 97.760 and 97.990(5) and (6) (Indian Graves and Protected Objects).
- ORS 358.905 to 358.955 (Archaeological Objects and Sites).
- ORS 390.235 to 390.240 (Archaeological Sites and Historical Material).

Ensure protection for sensitive cultural sites according to the following:

- Except as authorized by the Engineer for the purpose of installing or maintaining approved sensitive cultural site protective measures, keep all persons, equipment, and materials off known sensitive cultural sites.
- Install all sensitive cultural site protection required by the plans and Special Provisions prior to staging equipment or starting work near the site(s).
- Instruct all Contractor and subcontractor personnel to regard the locations of these sites and their contents as confidential.

The Engineer has the authority to bar from the Project any person entering a protected site other than for the purpose of installing or maintaining protective measures.

If sensitive cultural sites are known to be on the Project, further information will be provided in the Special Provisions.

(a) Disturbing Known Sensitive Cultural Sites - Willful violation of Laws exposes the offending Contractor and other violators to criminal and civil sanctions Civil sanctions include, but are not limited to the offender's sole liability for all costs associated with monitoring, recovery, site restoration or other archaeological work required by Tribal, federal, and State authorities Costs can exceed \$100,000.

The Engineer may suspend work until the Contractor and the Engineer meet to determine damage to the site and the nature and scope of necessary site restoration and maintenance. The Engineer may require the Contractor to submit a written plan for protection of other sites for the duration of the Project before work resumes.

(b) Disturbing Unknown Sensitive Cultural Sites - If the Contractor finds a previously undiscovered sensitive cultural site, immediately cease all activities at that site, follow procedures listed in 00290.50, and notify the Engineer. If the Contractor inadvertently disturbs unknown sensitive cultural sites, but immediately ceases all activities and follows the procedures listed in 00290.50, the City, to the extent permitted by Article XI, section 7 of the Oregon Constitution and by the Oregon Tort Claims Act, will indemnify, within the limits of the Tort Claims Act, the Contractor for costs associated with monitoring, recovery, site restoration or other required archaeological work, provided neither the City nor the State shall be required to indemnify the Contractor for such costs resulting from, arising out of or relating to the willful misconduct, negligence or other wrongful acts attributable to the Contractor or other persons on the Project site.

Delays to work due to new cultural resource finds will be considered for exclusion from contract time according to 00180.50(e).

Work required for monitoring and site restoration for newly discovered sensitive cultural sites encountered by the Contractor will be paid according to Section 00197.

Measurement

00290.80 Measurement - There will be no separate measurement of work performed under this Section.

Payment

00290.90 Payment - The accepted quantities for work performed this Section will be paid for at the Contract lump sum amount for the pay item "Pollution Control Plan".

Partial Payments will be made as follow:

- When the initial PCP is approved20%
- When 30% of the Contract is complete, excluding advances on materials20%
- When 60% of the Contract is complete, excluding advances on materials20%
- When 90% of the Contract is complete, excluding advances on materials20%
- At completion of the Contract and all waste is removed from the Project site and all reports, receipts, and documents have been submitted20%

Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

Payment includes, but is not limited to, the following:

- Contractor's Pollution Control plan (PCP)
- Spill Prevention Control and Countermeasures (SPCC) plan
- Hazardous Waste Contingency plan
- Hazardous waste determination
- Determination of generator category
- The Certified Hazardous Materials Manager
- The Professional on-call Spill Response Team

Section 00291 – Contaminated Media

Description

00291.00 Scope - This work consists of the preparation of specific work plans and the excavation, handling, and disposal of Contaminated Media. Work shall include, but is not limited to the following:

- Developing the Health and Safety Plan.
- Development of the Contaminated Media Disposal Plan.
- Record Keeping.
- Site Excavation Monitoring.
- Material Excavation, Handling and Disposal.

00291.02 Environmental Site Assessment Report - When an environmental site assessment report has been performed that evaluated the area for on-site environmental contamination, the environmental sampling and data interpretation reports will be available for review upon request for the Contractor. The City makes no representation or guarantees concerning any reports, assessments or investigations concerning site conditions, or any information contained therein.

00291.03 Abbreviations and Definitions:

(a) Abbreviations:

- CERCLA** - Comprehensive Environmental Response, Compensation, and Liability Act
- CMDP** - Contaminated Media Disposal Plan
- CMMZ** - Contaminated Media Management Zone
- CPR** - Cardiopulmonary Resuscitation
- HASP** - Health and Safety Plan
- PCB** - Polychlorinated biphenyl
- RCRA** - Resource, Conservation, and Recovery Act
- UST** - Underground Storage Tanks

(b) Definitions:

Contaminated Media - Soil, water, sludge, free product, UST, buried abandoned utility lines containing residual or free product, solid waste, treated wood waste, chemical containers, asbestos containing material, lead based paint, PCB containing, materials, or other solid, liquid or gas substances with hazardous substance levels above background levels. Note: The background concentration of organic hazardous substances is zero. The background concentrations of inorganic substances (i.e., metals) are site specific.

Contaminated Media Management Zone - The CMMZ is a restricted area within the project site where Contaminated Media is managed. The CMMZ includes the following zones: CM-Loading, and other related zone(s). The CMDP defines the activities allowed in each of these zones.

Environmental Laws - Any applicable statute, law, ordinance, order, consent decree, judgment, permit, license, code, covenant, deed, common law, treaty, convention, or other requirement pertaining to the protection of the environment, health or safety, natural resource, conservation, wildlife, waste management or disposal, contaminated media, hazardous substances or pollution including, but not limited to, regulation of releases to air, land, water, and groundwater.

Hazardous Substances - Those substances or materials as defined in the Environmental Protection Agency Region 9 Preliminary Remediation Goals and in the Oregon Revised Statutes 340-122, as amended. Hazardous Substances are defined by the Oregon Department of Environmental Quality (DEQ) Rules (OAR Chapter 340, Division 122) as:

- Substances defined as hazardous substances in Section 101 (14) of the Federal CERCLA.
- Oil, including gasoline, fuel oil, diesel, lubricating oil, petroleum hydrocarbons or other petroleum products.

Identified Contaminated Area - Any project areas shown or described in the Special Provisions where Contaminated Media has been identified.

Oregon State-Only Hazardous Waste - As defined in OAR 340-101-033.

RCRA Hazardous Waste - All waste material, including excavation spoils, which requires management, handling, transport, treatment, storage or disposal according to the requirements of the Federal RCRA and associated regulations (42 U.S.C. § 6901 et seq. and 40 CFR Parts 260 and 261 et seq.).

Release - Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment including the abandonment or discarding of barrels, containers and other closed receptacles containing any hazardous substance, or threat thereof.

Solid Waste Disposal or Treatment Facility - Defined as a solid waste landfill or other facilities permitted by federal, state, and local agencies to receive and dispose or treat contaminated media.

00291.04 Disposal Facilities - Only transport contaminated media to facilities, listed in the Special Provisions or approved equal, for disposal of contaminated media after receiving confirmation from the facility operator that will accept the media.

Only permitted disposal facilities, Subtitle-D- Landfill for contaminated media or Subtitle-C-Landfill for hazardous waste or approved equal shall be used for offsite disposal. Unless otherwise stated the Contractor will contact the approved disposal facility, arrange for the disposal permits and all associated permitting, including any required manifesting.

00291.05 Submittals - Provide one complete submittal package prior to commencing work within the Contaminated Media areas that includes the following:

- The proposed HASP for the project meeting the terms and conditions of this Section within 30 days of the Notice of Award.
- All modifications to the HASP and any task-specific HASP's developed for this project.
- The proposed CMDP for the project meeting the terms and conditions of this Section within 30 days of the Notice of Award.
- Name and qualifications of the competent person that prepared the HASP, and Contractor's Health and Safety Representative.
- Updated Traffic Control Plan to include contaminated media management activities.
- Worker training certifications and related records.
- Security and training logs and worker compliance agreements.
- Safety inspection logs, daily health and safety reports, and a closeout safety report.
- Closeout CMDP.
- Emergency and accident reports.

00291.06 Environmental Laws and Hazardous Substances Encountered During Construction - Comply with all Environmental Laws and all federal, state, and local laws regarding Hazardous Substances. In the event of a conflict between the Contract Documents and those laws, the more stringent shall apply. In the event the Contractor, during the course of construction or during any other activities authorized under this Contract, should encounter Hazardous Substances or any other materials suspected of posing a threat to employees, the public, or the environment, do the following:

- Immediately cease all work activities in and around any area of the Project where Hazardous Substances have been encountered or discovered, and take appropriate measures in compliance with all applicable Environmental Laws to stop or minimize the immediate spread or release of any Hazardous Substances.
- Remove the affected employees and secure access to the area.
- Immediately contact the Engineer and deliver an oral assessment of the site conditions. Within 48 hours of the incident, deliver to the Engineer a written assessment of the occurrence, current site conditions and all actions taken.

- In order to prevent rain or stormwater runoff from contacting the suspected Hazardous Substances, immediately place appropriate control measures or devices on or adjacent to the affected area in such a manner that does not disturb the site or the suspected Hazardous Substance.

Subcontracting of work does not relieve the Contractor of any of its obligations, including the Contractor's obligation to comply with all Environmental Laws as defined herein. The Contract Documents do not authorize the Contractor to remove, remediate, handle, transport, treat, or dispose of Hazardous Substances unless such activities are specifically required by the Contract.

Properly handle, store, use and dispose of any Hazardous Substances brought onto the work site in accordance with all applicable Environmental Laws as defined herein. In the event of a spill or release of any Hazardous Substances brought on to the work site by the Contractor, the Contractor shall follow the procedures set forth above.

Comply with Oregon law and Oregon DEQ requirements regarding PCB's, radioactive waste, UST, and actions to abate health hazards.

Comply with Oregon law, DEQ requirements and federal, state and local laws regarding air pollution, noise control, water pollution, oil spillage and used-oil disposal and asbestos abatement.

Prevent, control and abate pollution of federal, state, county and municipal waters as required by the Contract Plans and Specifications and local, state and federal regulations and requirements. No condition of this Contract releases the Contractor from any responsibilities or requirements under any environmental statutes, regulations or Permits. In the event of conflict between the Contract requirements and pollution control laws, rules or regulations, the more restrictive laws apply.

Comply with federal, state and local laws and regulations regarding Environmental Laws, including, but not limited to, those regarding employee health and safety and endangered and threatened species.

Complete a City BES Chain of Custody Form whenever a soil sample is collected for the purpose of laboratory chemical analysis. Completed forms shall be provided to the Engineer with all samples. Samples shall be stored in closed, waterproof plastic bags.

Work Plans

00291.07 Health and Safety Plan - Prepare a project HASP to protect workers, the public and the environment while constructing the project in areas with known or discovered Contaminated Media. The HASP shall be developed and implemented in association with the Contractor's normal construction safety program.

Submit to the Engineer within 30 days of the Notice of Award. Submission to the City does not relieve the Contractor of its safety responsibilities nor does it impose responsibility or legal liability upon the City for safety.

The HASP shall be distributed to all on-site workers and employees. Workers and employees are required to read the HASP, sign a compliance agreement, and abide by all of its provisions. The HASP shall be displayed or made available at the site at all times.

Revise the HASP as needed whenever new information about Contaminated Media or other potential site hazards is obtained. The Contractor's Health and Safety Representative, as appropriate shall certify any changes, deletions, or additions to the HASP. All proposed changes, deletions or additions to the HASP shall be submitted to the City prior to implementation.

The HASP shall conform to the requirements of 29 CFR 1926.65 and all applicable federal, state, and local statutes, rules, regulations and ordinances. The HASP may be more stringent than, but shall be in accordance with the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.

The HASP shall include, but is not limited to, the following:

(a) Key Personnel - Identification of key personnel authorized to be responsible for site safety and delegation of responsibilities for ensuring compliance with the HASP. Provide the name and qualifications of:

- Contractor's Health and Safety Representative(s)

(b) Site Description and Location - Site address or location description.

(c) Site Control Measures - Site control measures will be defined and identified on a site map.

(d) Pre-Entry Briefings - Descriptions of pre-entry briefings to be held prior to initiation of work in areas with known contamination at the construction site, and at such other times as necessary to ensure that workers are apprised of HASP provisions and that such plan is adequate and being followed.

(e) Chemical Hazard Analysis - Identify and establish appropriate procedures for addressing suspected conditions or activities that may pose routine occupational hazards or immediate danger to life or health of site personnel. The HASP must describe the risks associated with each task and the actions to be taken to mitigate existing hazards and to make the work environment less hazardous.

(f) Contaminated Media Management Zones - Designate work zone(s) including Contaminated Media Management, contamination reduction, and support zone(s) to reduce the potential for contaminant migration and minimize personnel exposure to Contaminated Media. Describe the procedures for informing all persons at the site about CMMZ requirements. The plan must set forth the specific criteria and thresholds for designation of work zones.

(g) Personal Protective Equipment - Address levels of personal protection to be employed during work, setting forth specific criteria and thresholds for choices of protective clothing, equipment, and respirators based upon the types and concentrations of contaminants and exposure pathways that may be encountered by site workers during various site operations.

(h) Environmental Monitoring - Set forth a program for the determination of personal exposure monitoring requirements including air monitoring in the work area(s) as needed. List and describe equipment to be used.

(i) Decontamination Procedures - Set forth procedures for decontamination of personnel, materials, and equipment as needed.

(j) Spill Prevention and Cleanup - Describe the equipment and procedures to prevent releases of hazardous substances to the soil and water from the construction equipment and materials. The plan shall also describe the equipment and procedures to be used to immediately cleanup any such releases, if they occur.

(k) Storage and Handling - With information from 00291.42, develop and coordinate procedures for storage, handling and disposal of any Contaminated Media or contaminated debris to promote safe working conditions in accordance with the HASP and all applicable federal, state, and local statutes, rules, regulations and ordinances.

(l) Emergency Response - Develop an Emergency Response Plan for safe and effective response to emergencies which establishes emergency procedures including, but not limited to escape routes, signals for evacuation workers, emergency communications, procedures for communication with personnel, and response to fire and explosions. Describe emergency equipment that will be available on site, such as portable extinguishers, first aid kit, etc.

(m) Training Requirements - Define appropriate levels of training and training procedures to promote a safe working environment in accordance with the HASP.

(n) Medical Monitoring - If the employees meet the requirements of 29 CFR 1926(f)(2)(l)-(iv), include a medical surveillance program consistent with 29 CFR 1926.65(f).

00291.08 Contaminated Media Disposal Plan - The CMDP shall contain the following:

- Site Map
- Name of Contaminated Media Disposal Facility
- Contaminated Media Management Zone
- Contaminated media handling (container, bagged, dump truck, etc.)

- On-site hauling routes, entrance and exit locations, standby areas, etc.
- Decontamination and best house keeping practices

Refer to any Environmental Reports or Contaminated Media stations listed in the special provisions and on the construction plans.

As new information is discovered and as otherwise required, update and maintain the CMDP to reflect the most current Contaminated Media information throughout the duration of the contract.

List the haul routes that will be used to transport the contaminated media to the approved disposal site.

Describe in the Plan, the facilities and location where any contaminated groundwater will be treated. If contaminated groundwater goes to the sanitary system include the City Industrial Batch Discharge Permit, and documentation of off-site disposal facility acceptance for sludge or solids created by on-site treatment processes (e.g. settling tanks).

On-site excavation work shall not begin until the CMDP has been approved.

Materials

00291.10 Materials - Furnish materials meeting the following requirements:

- Plastic Sheeting00280.10(k)
- Straw Bales.....00280.10(n)

00291.11 Truck Liners - Furnish plastic, 6 mil minimum, truck liners that are watertight and designed to transport contaminated media.

Labor

00291.30 General - Submit certificates demonstrating individual personnel have been properly trained to handle the excavation and disposal of contaminated media. Training shall include the 40 hour Hazardous Waste Operations and Emergency Response Training Program, and associated 8 hour annual refresher in accordance with 29 CFR 1910.120 and 1910.134. Appropriate training is required for all personnel who come in contact with, or operate equipment that handles contaminated media.

00291.32 Safety Representative - Submit certificates demonstrating the Safety Representative(s) meets the requirements stated below for all work relating to hazardous substances or Contaminated Media.

00291.33 Contractor Safety Representative Authorization - All contractor personnel, subcontractors, services vendors, sales personnel, or anyone else entering the construction site must be authorized by the Contractor's Health and Safety Representative.

(a) Qualifications of Safety Representative(s):

- **Training** - Have completed all required OSHA Training in accordance with 29 CFR 1910.120, including completion of 40 hour + 8 hour supervisory training updated annually and completion of 3 days on-site training by a qualified instructor.
- **Experience** - Have a minimum of 3 years experience in hazardous substance or hazardous waste site remediation or related work.
- **Certification** - Are currently certified in first aid and CPR.
- **Knowledge** - Have demonstrated knowledge of federal, state, and local occupational health and safety regulations.
- **Pollution Control Requirements** - Be familiar with and follow all pollution control requirements during implementation of the HASP.

(b) Responsibilities:

- **On-Site** - Be on site and present during work in contaminated media zones identified in the HASP, in areas where Contaminated Media is encountered, and during the handling, transportation, or disposal of Contaminated Media and all work related to the presence or potential for unknown hazardous substances.
- **HASP Requirements** - Develop, implement, enforce, modify and monitor the HASP requirements.
- **Training** - Conduct the preconstruction training and other periodic training of all on site personnel with regard to contents of the HASP(s) and other safety Requirements to be observed during construction.
- **Monitoring** - Perform all air monitoring if required by the HASP(s).
- **Compaction Testing** - All personnel testing for compaction entering the excavation shall meet the HASP requirements.

(c) Authority:

- **Work Suspension** - Suspend field activities if health and safety of Contractor personnel, Project personnel, or the public are endangered.
- **Individual Suspension** - Suspend individual(s) from field activities due to infractions of the HASP(s).

Construction

00291.40 Record Keeping - Maintain the following records on an on-going basis. Provide copies to the Engineer upon request or as identified herein.

(a) Daily Reports - Prepare reports on the same day in which any Contaminated Media management activity occurs and submit to the Engineer the next business day by 9:00 a.m. These reports shall document all monitoring

and management of Contaminated Media. The report(s) shall include, as applicable, the following:

- Location and depth where Contaminated Media was excavated, pumped or removed.
- Estimated volumes of Contaminated Media excavated, pumped or removed.
- The locations of any temporary contaminated media stockpiles or storage and the volume of contaminated media placed in, or removed from, the stockpiles, and how it is stored.
- The location, depth, and nature of any potential unanticipated Contaminated Media encountered or observed and the response taken by the Contractor.

(b) Contaminated Media Bills of Lading and Weigh Slips - Use a bill of lading for each offsite shipment of Contaminated Media. The bill of lading shall include the date and time of shipment, the name of the hauling company, the name of the truck driver, the disposal site, the Owner's project number, the removal location, and a brief description of the Contaminated Media. A copy of the bill of lading and the associated weigh slip showing the weight/volume of the Contaminated Media shall be provided to the Engineer within 24 hours of shipment of the Contaminated Media.

(c) Hazardous Waste Manifests - If RCRA, Oregon State-Only and other Hazardous Waste is encountered, follow the procedures described below:

Prepare waste manifest forms (EPA Form 8700-22) for each shipment of hazardous waste from the site. The manifest shall describe the contents of each truck carrying materials to the hazardous waste facility, including as applicable the appropriate unit of measure of the waste materials.

The Contractor's hauler shall sign and date the manifest indicating that the load has been accepted as the load described in the manifest on that particular day. The Contractor's hauler shall carry a hazardous waste manifest with each truckload. Prior to truck departure, the Engineer will sign and keep appropriate copies of the manifest and give the remaining copies to the Contractor's hauler. Provide the Engineer with the Generator's copy.

The Engineer will provide a hazardous waste generator identification number for use on the manifest while the Contractor shall provide a hazardous waste transporter's identification number and telephone number.

Within 2 days of receiving a completed waste manifest, provide a copy to the Engineer confirming the receipt of the shipment at a permitted disposal facility.

00291.41

Should any waste manifest not be returned within 35 days of shipment, initiate follow-up efforts to determine what happened to the shipment, document its effort in writing with an Exception Report as required by 40 CFR 262.42 and provide a copy to the Engineer. A copy of the completed waste manifest shall be provided to the Engineer indicating each waste shipment has been received at the Solid Waste Disposal or Treatment Facility within 2 days of their return to the Contractor.

00291.41 Site Excavation Monitoring - Monitor all excavations required by the contract, including those outside areas of known contamination, for the possible presence of contaminated media using the procedures described in this Section. At all times observe for visual, olfactory, or texture indications of contamination during all excavation activities. These indications may include, but are not limited to: petroleum, oil, fuel, or gasoline odor, other unusual odors, mottled or gray appearance, unusual color, sheen, staining, debris, or other non-native material. Observations are to be recorded in reports submitted daily to the Engineer.

Notify Engineer when groundwater is encountered within excavated areas.

Immediately notify the Engineer if observations indicate the presence of contaminated media outside the areas of known contamination, and follow the procedures described in the following subsections:

00291.42 Known or Anticipated Contaminated Media - Any known or anticipated contaminated media will be shown and listed in the Special Provisions.

00291.43 Contaminated Media Management Zones and Decontamination - Before beginning excavation of contaminated media, establish a CMMZ around the excavation area where contaminated media is located. Entrance/exit locations to the CMMZ shall be established by the Contractor and described in the CMDP and HASP.

Equipment may move freely within the CMMZ. Decontamination between specific excavation areas shall consist of brooming off loose soil and removal of significant quantities of adhered soil with hand tools. Washing of equipment is not required for movement of equipment within the CMMZ.

If practicable, truck-loading areas shall be located at the boundary of the CMMZ so that trucks will not enter the CMMZ and will not require decontamination.


Trucks shall be broom cleaned before leaving the loading area.

Personnel exiting the CMMZ shall decontaminate according to the decontamination procedures to be specified in HASP.

After beginning excavation, the Engineer will take media samples at increasing distances from the area where contamination was identified and test the sampled media for contamination. If contaminated media is found, continue to follow the protocol for managing and contaminated media. If through this additional sampling and testing it is determined that media is not contaminated, then follow the direction of the Engineer regarding use or disposal of this material.

00291.44 Excavation and Handling - All known contaminated media excavated or removed shall be excavated and loaded using the following requirements and procedures described in the CMDP:

- Notify the Engineer no less than 24 hours prior to beginning excavation of contaminated media.
- Control surface water runoff, to minimize entry or collection of water in excavations and storm drains.
- Initiate applicable provisions of the HASP to restrict and protect workers, and the public from exposure to contaminated media. Modify the HASP as necessary, to address new contaminants, hazards, and other contaminated media concerns discovered during construction. All modifications to the HASP shall be submitted to the Engineer no sooner than 24 hours prior to working in the area affected by the modifications. Meet all requirements necessary to provide adequate security, staging, characterization, removal, cleanup, handling, and disposal of unknown and unanticipated contaminated media.
- Excavate media in a manner that prevents commingling of contaminated and uncontaminated media. Minimize movement of excavation equipment over or through contaminated media to prevent movement of contaminated media into areas where no contaminated media exists.
- Maintain excavation equipment in good working order. Prevent spillage of oil, fuel, or hazardous substances from equipment. Promptly repair oil leaks from equipment and clean up any contaminated media.
- Select a location for contaminated media stockpile. Supply drop box or sheeting and hay bales. Stockpile soil or other contaminated media in covered drop box or on 10-mil plastic sheeting bermed by hay bales. Cover contaminated media stockpile with plastic sheeting and maintain, as necessary, until removed.
- Loading areas for contaminated media will be located in the CMMZ.
- Load contaminated soil into trucks or approved containers in a manner that prevents spilling or tracking of contaminated media into areas of the site with uncontaminated soil. Soil will not be accepted in drums.
- Remove loose material falling onto truck during loading before truck leaves loading area. Broom trucks clean before leaving the loading area. Any contaminated material collected in loading area shall either be placed into truck or back onto soil stockpile.

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- If loading area is unpaved, notify Engineer when loading activities are complete so Engineer can determine if collecting surface soil samples from area is required to confirm that contaminated media is not present. If loading area is paved, clean any loose soil from pavement by sweeping at conclusion of each day's loading activities.
 - Cover all trucks before they leave the loading area.
 - All vehicles leaving a CMMZ and entering right-of-way shall be cleaned of any suspected contaminated media on wheels, frames, or other non covered areas.
 - If free liquid is present in excavated contaminated media, provide liquid tight liners for the trucks hauling the material to the disposal/treatment facility.
 - Establish specific truck haul routes before beginning offsite contaminated media transport to reduce risk of releases of contaminated media and impact on local traffic. Establish onsite truck routes to minimize or prevent movement of trucks over contaminated media.
 - Ensure that loaded truck weights are within acceptable limits.
 - Personnel exiting a CMMZ shall decontaminate according to the decontamination procedures specified in the HASP.
 - Comply with all applicable federal, state, and local laws, codes, and ordinances that govern or regulate contaminated media or hazardous waste/material transportation.
 - Ensure that all drivers of vehicles transporting contaminated media or hazardous waste/material have in their possession during transport all applicable Oregon State and local vehicle insurance requirements, valid drivers' license, and vehicle registration and license. Responsible for informing all drivers of transport vehicles about:
 - Nature of material transported in the form of a written manifest or disposal permit.
 - Required routes to and from the offsite disposal facility.
 - Applicable City street regulations and requirements, and State of Oregon Department of Transportation codes, regulations and requirements.
 - Contaminated Media shall not be spilled or tracked offsite at any time during project.
 - Trucks shall be substance compatible, licensed, insured, and permitted pursuant to federal, state, and local statutes, rules, regulations and ordinances for transportation of Contaminated Media or hazardous substances offsite.
 - Copies of approved disposal/acceptance permit and disposal manifests shall be provided by Engineer (disposal/treatment facility requires driver to have copies of permit or disposal manifests).

00291.45 Discovery of Unanticipated Contaminated Media - Follow procedures described in 00291.06 and comply with the following in response to unanticipated and unknown Contaminated Media. Upon notification, the Engineer will make a determination whether unanticipated and unknown Contaminated Media has been encountered. While making this determination:

- Immediately cease all work activity in and around any area where suspected Contaminated Media is encountered.
- Remove employees from the immediate area and secure the site.
- Immediately contact the Engineer and deliver an oral assessment of the site conditions.
- Do not move, haul or dispose any unknown media until the determination is made.
- Take appropriate measures in compliances with all applicable Environmental Laws to stop or minimize the immediate spread or release of any contamination.
- Immediately place appropriate control measures or devices on or adjacent to the affected area in such a manner that does not disturb the site or the suspected media. Prevent rain or stormwater runoff from contacting media and becoming contaminated.
- Upon notification, the Engineer will collect and analyze test samples for laboratory analysis and make a determination whether unanticipated and unknown and Contaminated Media has been encountered.
- During analysis, cease excavation and dewatering activities at the sample location(s). Do not move, haul or dispose of any suspected media. Maintain and secure the construction site until the final determination is made.
- The Engineer will provide analysis results to the Contractor within 72 hours after a sample is taken.
- Update the CMDP to address this new information. All document modifications shall be reviewed by the Engineer.
- Until a determination is made, any excavated media which is suspected of contamination shall be temporarily stored in a pre-approved secure, covered, water tight location shown in the CMDP that limits possible cross contamination with other non contaminated media. Temporary storage locations shall be placed within the public rights of way and adjacent to the excavation pit. Incorporate storage locations into traffic control plans.
- Within 48 hours of discovery of unanticipated Contaminated Media deliver to the Engineer a written assessment of the occurrence, current site conditions and all actions taken.

- Update the HASP, the CMDP, and Spill Prevention and Cleanup Plan as necessary, to address new contaminations, hazards, and other Contaminated Media concerns associated with the unanticipated and unknown contamination. The Engineer will provide the Contractor unanticipated and unknown Contaminated Media sampling and analysis results to assist the Contractor in updating the CMDP and other document modifications. All document modifications shall be reviewed by the Engineer.

00291.46 Discovery of Active or Abandoned Leaking Underground Utilities or Tanks - Report discovery of leaking abandoned buried pipelines, utility conduits, or tanks to the Engineer immediately. Manage and properly dispose of associated Contaminated Media per these specifications. If encountered, Engineer may collect sample of abandoned utility (tank) discharge. If sampled, Engineer will provide Contractor results of sample characterization, and guidance on disposal options within 96 hours of sampling.

00291.47 Management of Contaminated Media - Unless approved, contaminated media excavated from the contaminated areas described in any Environmental Report, construction plans, Special Provisions and CMDP shall not be temporarily stockpiled or stored on site at any time. Contaminated media excavated from sections illustrated in the CMDP shall be directly loaded and hauled off site to the approved facility, or if approved by the Engineer, immediately used as fill material. The CMDP will be shown in the Special Provisions.

00291.48 Treatment of Contaminated Media - Unless approved, contaminated media shall not be treated on site.

Contaminated construction dewatering effluent may be treated on site so long as effluent meets the City Batch Discharge standards. Contaminated construction dewatering effluent may be pretreated within a suspended solid settling tank, such as a baker tank or other approved treatment method. Contaminated construction dewatering effluent determined to contain soluble forms of hazardous materials shall not be discharged directly into the City's sewer system unless approved. Contaminated construction dewatering effluent treatment guidelines include, but are not limited to, the following:

- If sampling is necessary to determine disposal options, the Engineer will collect a sample of containerized water, wait 24 hours for excavation to recharge, and re-sample water from the excavation.
- Propose a location for storage of pumped groundwater. The Engineer will approve final location.
- Supply the pump, hosing, and the holding tank or other appropriate containers.
- Evacuate water from excavation, containerize, and treat at the direction of the Engineer. Treatment options will be determined based on the type and amount of contamination.

The Engineer will submit water samples to the City BES Water Pollution Laboratory for analysis. The Laboratory requires a minimum of 96 hours for processing sample and returning data.

- The Engineer will select a disposal method.
- Discharge of contaminated excavation de-watering effluent to the City sewer line requires Permit from the City BES Water Pollution Lab-Source Control Division. This permit shall be obtained by the Contractor before commencement of dewatering activities.
- If batch discharge to the City's sewer system is permissible, provide all labor, equipment and materials necessary to complete the work.
- Concentration of effluent from the settling tank shall meet City discharge
- Transport contaminated sludge from the pretreatment to an approved disposal or treatment facility.
- Provide the Engineer with the contaminated sludge disposal receipt or a copy.

00291.49 Environmental Construction Oversight - Environmental construction oversight includes the specific environmental construction oversight tasks that will be used during the construction of this project.

The Contractor's Safety Officer's responsibilities as part of the oversight team are as follows:

- Monitor excavated media for evidence of unanticipated and unknown conditions. Notify the Engineer if potential unanticipated and unknown Contaminated Media conditions are observed.
- Remove, manage, and dispose of the known Contaminated Media in accordance with these specifications.
- Collect and analyze water discharge sample to monitor compliance with the wastewater batch discharge permit.

Measurement

00291.80 Measurement - The quantities of work performed under this Section will be measured according to the following:

- **Lump Sum Basis** - Under this method, no measurement of quantities will be made.
- **Separate Item Basis** - Under this method, the quantities of work performed on a separate item basis will be measured as follows:
 - **Volume Earthwork** - Computed by the average end area method from cross section measurements, or other methods of equivalent accuracy.
 - **Volume Water** - In tanks or tank trucks of predetermined capacity or approved meters.
 - **Weight** - Quantities will be measured in the hauling vehicle.
 - **Each** - Items will be measured on a unit basis.

Payment

00291.90 Payment - The accepted quantities of work performed under this Section will be paid for at the Contract lump sum or separate item basis for the following items:

Pay Item	Unit of Measurement
(a) Contaminated Media Disposal	Ton or Cubic Yard
(b) Stockpile Berm	Lump Sum
(c) Decontamination of Equipment	Lump Sum
(d) Truck Liners	Each
(e) HASP/CMDP WorkPlans	Lump Sum
(f) Contaminated Groundwater Disposal	M-Gallon
(g) Contaminated Water Storage Tank.....	Each
(h) Drop Boxes	Each

Item (a) will be payment in full for stockpiling in a berm for testing, reloading, and disposal of the material. Payment for excavation of Contaminated Media will be paid under the appropriate pay items in Sections 00330 and 00405.

Item (b) will be payment in full for constructing an impervious barrier and berm to contain contaminated material for testing and material to cover stockpile to prevent rainfall from coming into contact with contaminated material.

Item (c) will be to properly clean all equipment used to handle contaminated material. No payment will be made until a written report is submitted detailing the decontamination performed on the equipment.

Item (d) will be payment in full for the liner regardless of how many times the liner is reused.

Item (f) is for contaminated groundwater disposal and includes settling tanks, permit fees, and all work, equipment and materials required to estimate, handle, store, process, and dispose of contaminated groundwater

Item (g) are storage tanks similar to Baker Tanks.

Item (h) includes a cover over the drop box.

Loading and disposal of material shown by testing to be non-contaminated media will be considered incidental with no additional payment.

Unanticipated Contaminated Media, as outlined in 00291.45 and 00291.46 will be paid according to Section 00196.

Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.