

1 **(January 2, 2018)**

2 **7-06 Temporary Stream Diversion**

3 **7-06.1 Description**

4 This work shall include designing, installing, operating, maintaining, removing, and disposing  
5 of the temporary stream diversion, environmental compliance and other Work as detailed in  
6 these Specifications.

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8 **7-06.2 Materials**

9 All materials shall be as detailed in the Contractor's Temporary Stream Diversion (TSD)  
10 Plan.

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12 **7-06.3 Construction Requirements**

13 ***7-06.3(1) General***

14 The Work shall include compliance with Washington State Water Quality Standards in  
15 WAC 173-201A, project permits, environmental commitments and these Provisions.

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17 The temporary stream diversion may be either a gravity or a pumped system. Pump  
18 screens must comply with the requirements in Section 7-06.3(4) of these Special  
19 Provisions. Once a pumped diversion begins, the pump must run continuously until it is  
20 no longer necessary to bypass flows. The Contractor shall have back-up pumps on site  
21 and shall provide twenty-four hour monitoring of the pumping operation. Monitoring can  
22 be achieved by providing monitoring personnel on site or through remote sensing and  
23 instrumentation to verify operation of the bypass. If the Contractor elects to monitor by  
24 remote sensing and instrumentation, a Type 2 Working Drawing shall be submitted  
25 outlining how system operation will be monitored, how alerts will be made and how  
26 personnel will respond to a diversion system failure.

27  
28 The temporary stream diversion including water that is retained by the temporary  
29 stream diversion and any dewatering system shall be located within the permitted  
30 impact areas as shown in the Plans. The upstream diversion dam shall be constructed  
31 to a height sufficient to prevent stream flow from entering the work area. Scour  
32 protection shall be provided at the outfall of the temporary stream diversion systems  
33 and dewatering system to prevent flow re-entering the stream channel from mobilizing  
34 streambed and embankment sediments. When a temporary stream diversion is located  
35 in or near an intertidal zone the temporary stream diversion design shall take tidal  
36 influence into consideration.

37  
38 For each temporary stream diversion the Contractor shall arrange a meeting with the  
39 Engineer prior to implementation of the TSD Plan. At this meeting the Contractor shall  
40 explain to the Engineer the Work to be completed for the temporary stream diversion.  
41 The meeting shall be a minimum of 7 calendar days prior to start of the temporary  
42 stream diversion work.

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44 The TSD shall be operational prior to performing any other work below the Ordinary  
45 High Water Line.

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47 ***7-06.3(2) Temporary Stream Diversion Plan***

48 ***7-06.3(2)A General Plan Requirements***

49 The Contractor shall submit a Temporary Stream Diversion Plan in accordance with  
50 the requirements of a Type 2E Working Drawing and these Specifications. A  
51 separate TSD Plan shall be prepared and submitted for each temporary stream

diversion that is required. The TSD Plan shall consist of a narrative and drawings detailing all temporary stream diversion requirements and shall encompass and protect all the areas affected by the Contractor's temporary stream diversion Work.

The Contractor shall fully implement the TSD Plan throughout the duration of the associated Work. The Contractor shall update the TSD Plan throughout project construction to reflect actual site conditions and the Contractor's Work. Changes to plan shall comply with WAC 196-23-020. At the request of the Engineer an updated TSD Plan shall be submitted as a Type 2E Working Drawing. A copy of the TSD Plan shall be on the project site at all times.

The TSD Plan shall describe measures that will be taken to comply with Washington State Water Quality Standards in WAC 173-201A, applicable permits, environmental commitments and these Provisions.

The Contractor shall incorporate the Diversion Schedule and Sequence into their Progress Schedule.

#### **7-06.3(2)B Stream Flows**

##### **Minimum Stream Flows**

At all times of operation the Contractor's temporary stream diversion shall be designed to convey the following minimum flow rate of water in cubic feet per second:

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During all phases of the bypass installation and decommissioning, the Contractor shall maintain flows downstream of the project site.

#### **7-06.3(2)C Plan Requirements**

The TSD Plan shall provide the following information in the following order:

1. Description and Location of the temporary stream diversion
  - a. Identify the name of the water body where the temporary stream diversion will be placed. Provide a description of the temporary stream diversion.
  - b. Provide drawings showing the location of the temporary stream diversion, including proposed access routes and equipment to be used to construct the diversion.
2. Schedule and Sequence
  - a. Provide a sequence of Work, dates, and durations for when the following will occur, in accordance with the in-water work window in the Special Provisions:
    - i. Fish exclusion (performed by the Contracting Agency).
    - ii. TSD Plan Implementation Meeting

- iii. TSD installation.
- iv. Dewatering of the isolated Work area.
- v. Restoration and stabilization of the temporary stream diversion Work area to prevent erosion.
- vi. Any relocations of the temporary stream diversion to accommodate the Work sequence (if needed).
- vii. Channel rewatering.
- viii. Removal of the TSD.
- ix. Fish block removal (performed by Contracting Agency).
- b. Include other Work that needs to be coordinated with the TSD (e.g., temporary erosion control).

### 3. Calculations and Materials

- a. Detail all elements of the temporary stream diversion; including but not limited to pipes, pumps, and other equipment.
- b. Calculations shall demonstrate the diversion system conveys the minimum peak flow specified by the Contracting Agency and include tidal influence where applicable.
- c. Temporary stream diversion shall include a water conveyance system to be used for dewatering and rewatering that is capable of conveying the flow required for the temporary stream diversion.
- d. Methods for anchoring temporary stream diversion pipe and associated hardware; include calculations to demonstrate the devices ability to anchor the pipe and associated hardware.
- e. Specifications for all materials and equipment to be used as part of the diversion including pump or diversion capacities and hose sizes. For example, provide the type, profile, and size of pipe.
- f. Provide the size of fish screens (mesh size and surface area) to be used, in accordance with Section 7-06.3(5) of these Special Provisions.

### 4. Stream Flow Blocking and Dewatering

- a. Provide the method(s), including locations and details (narrative and drawings) for blocking both the upstream and downstream ends of the diversion. Describe how minor leakage from upstream and downstream will be addressed.

- b. Include provisions for scour protection at the temporary stream diversion outfalls.
    - c. Identify the means and methods for dewatering water and disposal of the water.
  5. Inspection and Maintenance
    - a. Provide the schedule and frequency for inspection of the temporary stream diversion; include weekends and holidays.
    - b. Describe how maintenance will be conducted when inspections identify deficiencies in the temporary stream diversion. These include, but are not limited to removal and disposal of trapped sediment or debris and repairing leaks.
    - c. The Contractor shall keep a record of all inspections and maintenance of the temporary stream diversion.
  6. Rewatering the Stream Channel
    - a. Detail how the stream channel will be rewatered to comply with water quality requirements.
    - b. Identify measures that will prevent the stranding of fish during rewatering (i.e. describe methods, rates, and durations of the rewatering process knowing that flows downstream of the fish block must be maintained to protect fish).
  7. Removal of the Temporary Stream Diversion
    - a. Describe the sequence that will be used for removing the temporary stream diversion and methods to prevent water quality impacts.
    - b. Describe how disturbed soil will be permanently stabilized.
    - c. Describe any temporary pipes to remain (requires approval of the Engineer): their type, pipe class, size, location, and plugging procedure.
  8. Other Work required for the Contractor's temporary stream diversion

**7-06.3(3) Fish and Aquatic Species Exclusion and Notifications**

Prior to installing a temporary stream diversion, the Contractor shall allow 7 calendar days after the beginning of the in-water work window defined in the Special Provisions, in their schedule for the Contracting Agency: (1) to install fish block nets upstream and downstream of the in-water Work area; and (2) safely capture and relocate any fish and other aquatic organisms that become trapped between the block nets. No Work within the limits of the Ordinary High Water Line will be allowed prior to installation of fish block nets and completion of fish exclusion activities.

As specified by the Engineer the Contractor shall assist the Contracting Agency with fish and aquatic species exclusion. The Contracting Agency will pay for this Work by the force account item "Fish Exclusion".

#### **7-06.3(4) Dewatering Work Area**

Dewatering the isolated in-water Work area (between the upstream and downstream diversion dams) shall occur at a rate slow enough to allow the Contracting Agency to safely capture and relocate all fish species and other aquatic organisms to avoid stranding, as determined by the Engineer.

All pumps used for dewatering shall have an intake covered with a fish screen, operated, and maintained in accordance with RCW 77.57.010 and RCW 77.57.070. Appropriate fish screens are as follows:

1. Perforated plate: 0.094 inch (maximum opening diameter);
2. Profile bar: 0.069 inch (maximum width opening); or
3. Woven wire: 0.094 inch (maximum opening measured on the diagonal).

The minimum open area for all types of fish screens is twenty-seven percent. The screened intake facility must have enough surface area to ensure that the velocity through the screen is less than 0.4 feet per second. The fish screen must remain in place whenever water is withdrawn until the Contracting Agency Biologists confirm all fish have been removed. At that point, the Contractor may remove the fish screen to finish dewatering the work area.

#### **7-06.3(5) Inspection and Maintenance**

At a minimum, the Contractor shall perform the following activities once per day (including weekends and holidays):

1. Check for and correct leaks;
2. Ensure the fish block nets remain sealed to the channel substrate.

The fish block nets shall be kept clear of debris that could jeopardize the integrity of the nets. The Contractor shall perform the following activities a minimum of three times per day or when requested by the Engineer. On working days, these activities shall be performed at the start, middle, and at the end of the working day. On non-working days, these activities shall be performed between 6:00 am and 8:00 am, between 11:00 am and 1:00 pm, and between 4:00 pm and 6:00 pm:

1. Inspect the upstream and downstream fish block nets and remove debris;
2. Inspect the upstream fish block net and all screens and similar facilities for impinged fish;
  - a. The Contractor shall immediately notify the Contracting Agency when impinged fish are discovered.
  - b. Removal of impinged fish will be performed by the Contracting Agency.

1 The Contractor shall maintain a written record of all inspection and maintenance  
2 activities; record to be available at the request of the Engineer.

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4 **7-06.3(6) Rewatering the Stream Channel**

5 The Contractor shall notify the Engineer a minimum of 7 calendar days in advance of  
6 rewatering the stream channel.

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8 The Contractor shall introduce water to the new stream channel section and trap  
9 sediments until the stream section meets the requirements of these Provisions.  
10 Rewatering shall occur at a rate to avoid loss of surface water downstream while the  
11 new channel section is rewatered.

12  
13 **7-06.3(7) Removal of the Temporary Stream Diversion**

14 The Contractor shall notify the Engineer two business days in advance of beginning the  
15 temporary stream diversion removal sequence.

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17 Once the water in the new stream channel will meet the applicable turbidity standards  
18 the Contractor may begin removal of the temporary stream diversion and the stream  
19 channel opened to flows.

20  
21 The Contractor shall immediately take all corrective actions necessary to prevent the  
22 water from exceeding the turbidity standards should the stream turbidity increase. All  
23 Work within the channel, except for removal of the temporary erosion control items,  
24 shall be completed before the temporary stream diversion is removed. The Contractor  
25 must finish all construction activities within the limits of the Ordinary High Water Line,  
26 including but not limited to culvert installation and creek bed channel restoration, before  
27 the Contracting Agency will remove the fish block nets.

28  
29 All materials used for the diversion shall become the property of the Contractor and  
30 removed from the project limits, with the exception of any materials supplied by the  
31 Contracting Agency, unless otherwise specified by the Engineer.

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33 **7-06.4 Vacant**

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35 **7-06.5 Payment**

36 Payment will be made for the following Bid items when included in the proposal:

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38 "Temporary Stream Diversion", lump sum.

39 The lump sum Contract price for "Temporary Stream Diversion" shall be full payment to  
40 perform the Work as specified. Progress payments for the lump sum item "Temporary  
41 Stream Diversion" will be made as follows:

- 42  
43 1. Twenty-five percent of the bid amount will be paid following completion of the  
44 TSD Plan including resolution of all Contracting Agency review comments.  
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46 2. The remaining seventy-five percent of the bid amount shall be paid in  
47 accordance with Section 1-09.9.

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49 "Fish Exclusion", by force account as provided in Section 1-09.6.

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51 To provide a common Proposal for all Bidders, the Contracting Agency has entered an  
52 amount in the Proposal to become a part of the Contractor's total Bid.