

## Hydraulic Report Checklist

**Project Title and Number:**

**Hydraulic Designer:**

**PEO:**

**Date:**

**Region:**

### Checklist Acronyms

ADT	Daily Traffic Count
APE	Area of Potential Effect
BMP	Best Management Practice
COE	Army Corps of Engineers
EEF	Engineerin and Economic Feasibility
ESA	Endangered Species Act
HM	Hydraulics Manual
HRM	Highway Runoff Manual
HRO	Hydrualics Report Outline
MR	Minimum Requirement
MRI	Mean Recurrance Interval
PEO	Project Engineers Office
PMP	Project Management Plan
TMDL	Total Maximum Daily Load
WDFW	Washington Department of Fish and Wildlife

*Each milestone is considered completed when the checklist, along with deliverables is submitted to the Region Hydraulic Engineer. See Figure 1-5.*

0%

## Define Project

<u>Completed</u>			<u>Task</u>	<u>Deliverable</u>	<u>HRO</u>
<u>Yes</u>	<u>No</u>	<u>N/A</u>			
0.1			Designer has received and reviewed the Project Summary.		1.3
0.11			Provide the HRM Training Certificate Number and clearly state if the designer has had the training or if the designer is working directly under someone who has had the training.	A copy of the HRM Training Certificate and a brief description of the project role of the person certified.	Title Page
0.12			Project Team has been established.	List of team members including roles or a copy of the PMP	
0.13			Region Hydraulic Engineer has been contacted and initial meeting date is set.	none	
0.14			Internal environmental staff involved in permitting should be identified and set initial meeting date.	List of team members including roles.	6
0.15			Outside agencies involved in the project should be identified.	List of agencies and roles.	3.4
0.16			Resource agencies involved in permitting for the project should be identified.	List of agencies and roles.	6
0.17			Permits that may apply to the project should be obtained and reviewed.	List of permits required for the project.	6.2
<b>0.2 Specialty Design Needs Identified</b>					
0.21			Identify need for HQ Hydraulics expertise. See HM section 1-2.	Contact HQ Hydraulics (through the Region Hydraulic Engineer) regarding specialty items and include meeting minutes and/or emails	1.4
0.22			Contact Bridge and Structure if Bridge work will be part of the project.		6.4

10%

## Approve Project Schedule

<u>Completed</u>			<u>Task</u>	<u>Deliverable</u> <sup>1</sup>	<u>HRO</u>
<u>Yes</u>	<u>No</u>	<u>N/A</u>			
<b>10.1 Meet with participants as established at 0%.</b>					
10.11			<u>PEO Kick off meeting</u> - With PEO team members, Region Hydraulics and internal contacts. Review project scope, schedule, budget, key issues, constraint, and risk. Also approve review schedule.	Meeting minutes and approved schedule milestones and dates (may also be included in the PMP).	
10.12			<u>Hydraulic Engineer meeting</u> - To go over project scope, preliminary ideas, and any additional guidance.		
10.13			<u>Environmental Staff meeting</u> - Identify potential environmental impacts (ie ESA, COE, WDFW, etc.) and determine how they could impact the project and if they will cause a deviation from the HRM and/or HM.	Brief summary	6
10.14			<u>Outside Agency meeting(s)</u>	Meeting minutes	3.4
10.15			<u>Maintenance Meeting</u> - Identify existing drainage deficiencies and discuss proposed drainage and maintenance review.	Meeting minutes	7
10.16			<u>Geotechnical Meeting</u> - Preliminary discussion of geotechnical support	Meeting minutes	2.4
10.17			<u>ROW Meeting</u> - Identify any additional ROW needs or easements for drainage features	Brief summary and meeting minutes with realstate services	6.3

1. Many of the deliverables can be found in the PMP.

<b>10.2 Collect Data</b>					
10.21			<u>Geotechnical</u> - Locate historical data and research records		2.4
10.22			<u>Traffic Analysis Data (where applicable) and Average Daily Traffic counts (ADTs)</u> - Should be obtained.	Brief summary and copy of ADT analysis (if not available use estimated ADT).	6.4
10.23			<u>Existing Plan Sheets</u> - Compile all relevant As-built plans, ROW, and aerial maps.	Brief summary of items collected	2.3

10.24			<u>Environmental exhibit map of project site</u> - using ArcGIS (or similar software), create an exhibit map and show all stormwater-related layers to include Rivers and Streams, Lakes, Wetlands, Flood Zones, Groundwater features, Geology and Soils features, fish Barriers, Stormwater Outfalls, Hazardous Waste Sites, and any other layers relevant to project.	Environmental exhibit map	6
10.25			<u>Existing Stormwater Outfalls</u> - Complete the Outfall Stormwater Spreadsheet.	Include on Environmental exhibit map with outfall locations and the spreadsheet.	2.5
<b>10.3 Design Tools</b>					
10.31			<u>Select Hydraulic Report Outline</u> - use the Hydraulics Outline in the Hydraulics Manual unless the region has customized an outline	Brief summary of which outline will be used	
10.32			<u>Training</u> - Identify any training needs that might be needed. See the HQ Hydraulics web page for more information. <a href="http://www.wsdot.wa.gov/Design/Hydraulics/Training.htm">http://www.wsdot.wa.gov/Design/Hydraulics/Training.htm</a>	Brief summary	
10.33			<u>Software</u> - Identify Software that will be used during the design process. If different than shown in Section 1-5, designer shall submit request to use a different software, along with an explanation for the request.	Brief summary either accepting currently approved software or request and for approval of different software	3.8
<b>10.5 Endorse Project Schedule</b>					
10.51			<u>Endorse a project schedule</u> - Using the milestone template in section 1-5 of the Hydraulics Manual, develop a working schedule including dates. The schedule should be approved by the PEO, Region, HQ Hydraulics, and other support groups as needed.	Approved hydraulic schedule.	

25%

## Design Planning Checklist

<u>Completed</u>			<u>Task</u>	<u>Deliverable</u>	<u>HRO</u>
<u>Yes</u>	<u>No</u>	<u>N/A</u>			
<b>25.1</b>			<b>Meetings</b>		
			Meet with Region Hydraulics for review of 25% checklist and deliverables.	Meeting Minutes	
25.11					
			<u>Geotechnical Meeting</u> - Meet with geotech/region materials office and go over list of BMP options to determine if soil conditions at site are compatible, identify testing requirements, and schedule testing.	(Verify with chapter 4 of HRM). Verify timeline for testing and project schedule.	2.4
25.12					
<b>25.2</b>			<b>Design</b>		
			Existing TDA Delineations	Plan sheets with TDA delineation per HM Outline section 2.3	2.3
25.21					
			Basin Delineation and Calculations	Plan sheets basins delineated and calculations per section 4.1 of HR outline	4.1
25.22					
			Determine Minimum Requirements for project.	Complete Design Documentation Spreadsheet, see section 3.2 of HR outline	3.2
25.23					
			<u>Identify potential BMPs</u> - go through BMP selection flow charts and based on Design Documentation Spreadsheet and site conditions develop a list of BMPs that could meet the minimum requirements.	List of BMPs noting which MR they would meet.	5.1
25.24					
			<u>Design Frequency</u> - Note the appropriate design frequency and design storms that will be used to size hydraulic features on the project (where applicable).	Table with MRI for each hydraulic feature/BMP and associated precipitation.	3.1
25.25					
<b>25.3</b>			<b>Deviations or Other Requirements/Agreements</b>		
			<u>Other Requirements</u> - Note any additional requirements in that differ or are in addition to those found in the HRM or HM.	Brief summary	3.4
25.31					

25.32			<u>TMDL and Local Critical Area Ordinances</u> - Review and document approved basin plan (TMDL) and local Critical Area Ordinance requirements.	Brief Summary	3.4
25.33			<u>Other Agreements/Requirements</u> - Approach and concept should be feasible based on information available and MOA/MOUs and other agreements made with local agencies, utilities, tribes, cities, for operations, outfalls, easements, etc.	Brief summary	3.4
25.34			<u>HRM deviations</u> - Assess need for demonstrative team involvement	Brief summary and EEF if ready	3.6
25.35			<u>Hydraulic Manual Deviations</u> - request approval for any deviation from the HM	Written request and explanation for deviations.	3.5
25.4	<b>Site Visit</b>				
25.41			<u>HRM section 2-3.2.1</u> - Identify existing natural and manmade drainage features to include streams and other water bodies, floodplain limits, culverts, outfalls, stormsewers, BMPs, etc.		
25.42			<u>Locate and map</u> : existing drainage features, existing utilities, and outfalls.	Basemap	1.3

40%

## Conceptual Design Checklist

<u>Completed</u>			<u>Task</u>	<u>Deliverable</u>	<u>HRO</u>
<u>Yes</u>	<u>No</u>	<u>N/A</u>			
40.1			<b>Meetings</b>		
40.11			Meet with Region Hydraulics for review of 40% checklist and deliverables.		
40.12			<u>Geotechnical Meeting</u> - Meet w/ geotech to review preliminary results and identify further testing needs.	(Verify with chapter 4 of HRM). Verify timeline for testing and project schedule.	2.4
40.13			<u>Meeting with Maintenance</u> - review BMPs and hydraulics features to verify they can be maintained. And that there concerns from 25% have been conceptually addressed.	Written documentaiton that maintenance agrees with conceptual design. Email is acceptable.	2.4, 2.6, 7.0
40.14			<u>ROW Meeting</u> - identify any additional ROW needs or easements for drainage features	Brief summary and meeting minutes	6.3
40.15			<u>Environmental Staff meeting</u> - identify potential environmental impacts (ie ESA, COE, WDFW, etc.) and determine how they could impact the project and if they will cause a deviation from the HRM and/or HM.	Brief summary	6.2
40.16			Outside Agency meeting(s)	Meeting minutes	
40.2			<b>Design</b>		
40.21			Identify any changes since the 25% submittal	Brief summary	
40.22			<u>Drainage Features</u> - Identify drainage features including: the type, size, and locations. Identify any impacts.	Conceptual level calculations and plan sheets with drainage features/BMPs sketched in approximate locations. A short paragraph noting the HM or HRM design criteria for each.	5.1
40.23			<u>HRM and HM standards</u> - Identify existing design standards and guidelines to be used in the designs.	summary of all the design standards and guidelines to be used	3.5, 3.6

40.25			<u>Feasibility/Constructibility Issues</u> - Preliminary assessment of (risk based)	Brief summary	7
40.3	<b>Deviations</b>				
40.31			<u>HRM deviations</u> - Assess need for demonstrative team involvement. Contact Region Hydraulics and Demonstrative Approach Team.	Brief summary if applicable	3.6
40.32			<u>Hydraulic Manual Deviations</u> - Request approval for any deviation from the HM	Written request and explanation for deviations.	3.5
40.4	<b>Site Visit</b>				
40.41			<u>Field Review</u> - Conduct onsite assessment with Region Hydraulic engineer and maintenance. Depending on the scope of the project, the team may need to expand to include: landscaping, permits, biologist, DAT, etc.	Meeting Minutes	
40.42			<u>Existing Utilties</u> - any conflicts with existing utilties and proposed hydraulics should be noted.	Meeting Minutes	2.6



70%

Design Complete

<u>Completed</u>			<u>Task</u>	<u>Deliverable</u>	<u>HRO</u>
<u>Yes</u>	<u>No</u>	<u>N/A</u>			
70.1			<b>Meetings</b>		
70.11			<u>Team meeting with Hydraulics - and/or submittal review of 70% items.</u>		
70.12			<u>Maintenance - Meeting with maintenance to discuss design and determine if maintenance has any concerns</u>	Written documentaiton that maintenance agrees to maintain hydraulic features as per 70% design. Email is acceptable	7
70.13			<u>Additional Meetings - Any other meeting held with team participants should be summarized</u>	List of meeting and meeting minutes	
70.2			<b>Design</b>		
70.21			<u>Any changes from the 40% should be highlighted.</u>	Written description of change along with delieverable specified at 40%.	
70.22			<u>Analysis of all Drainage Features and BMPs including MGSFlood, StormShed, HY8, inlet analysis, sag analysis, etc.</u>	Provide a brief summary of all analysis performed. Submit all calculations, and program output for review.	5.1 and A3
70.23			<u>Hydraulic Report Outline</u>	Use the hydraulic report outline selected to create an outline report of project.	
70.24			<u>Draft plan sheets - review all drainage plan sheets including all BMPs</u>	all plan sheets listed on Hydraulic Outline	A-3
70.25			<u>Retrofit - Identify and document Retrofit requirements</u>	Design Documentation Spreadsheet	3.3
70.26			<u>Downstream Impacts</u>	brief summary	3.6
70.3			<b>Deviations</b>		

70.31			<u>HRM Deviations - EEF</u> should be completed and submitted to DAT	EEF and meeting minutes with DAT	3.5
70.32			<u>Hydraulic Manual Deviations</u> - Should be submitted to State Hydraulic Engineers	Items submitted to HQ Hydraulics.	3.6
70.4	<b>Permits</b>				
70.41			<u>Complete evaluation of section 106 (establish APE) and hazardous waste sites.</u>		6
70.42			Any other Permit issues that should be addressed?		6

90%

Hydraulic Report Completed - Region Review

<u>Completed</u>			<u>Task</u>	<u>Deliverable</u>	<u>HRO</u>
<u>Yes</u>	<u>No</u>	<u>N/A</u>			
90.1			<b>Meetings</b>		
90.11			Team meeting <u>Hydraulics</u> - And/or submittal review of 90% items.		
90.12			<u>Additional Meetings</u> - Any other meeting held with team participants should be summarized	List of meeting and meeting minutes	
			<b>Design</b>		
90.21			<u>Any changes</u> from the 70% should be highlighted.	Written description of change along with deliverables data as specified at 70%	
90.22			<u>Draft Hydraulic Report</u> - Complete the narrative for the Hydraulic Report outline. Submit the report and all appendix items noted on the outline for review.	Draft report, along with a memo from the person stamping the report stating they have reviewed the Hydraulic Report and it is ready for final review and approval.	
90.23			<u>Completed Plan Sheets</u> - review for compliance with manuals and constructibility	All plan sheets listed on Hydraulic Outline	
90.24			Completed Draft BMP and UIC registration forms and Outfall Inventory Spreadsheets	Spreadsheets and forms	A-12
90.3			<b>Deviations</b>		
9.31			<u>HRM deviations</u> approved by DAT.	Approval letter and any correspondence needed for the deviation	3.6
90.32			<u>HM deviations</u> approved by State hydraulic engineer	Approval letter and any correspondence needed for the deviation	3.5

100%

Hydraulic Report Approved

<u>Completed</u>			<u>Task</u>	<u>Deliverable</u>	<u>HRO</u>
<u>Yes</u>	<u>No</u>	<u>N/A</u>			
100.1			<u>Meetings</u>		
100.11			<u>Team meeting with Hydraulics</u> - And/or submittal review of 100% items if needed.		
100.12			<u>HQ Hydraulics Approval</u> - If applicable, HQ Hydraulics Review is completed.	Approval letter	
100.13			<u>Suppliments and Revisions</u> - Any suppliments and revisions have been submitted for review and approved. See section 1-3 of Hydraulics Manual for additional guidance	Apprval Letter	
100.14			<u>Hydraulic Report Archived</u>	Follow HM section 1-3 requirements for archiving report.	A-13
100.15			<u>Lesson Learned</u>	Memo describing issues and resolution. To be posted on lessons learned data page	