



Whipple Consulting Engineers, Inc.

October 13, 2016

City of Spokane Valley
Attn: Henry Allen, Development Engineer
11707 E. Sprague Ave, Ste. 106
Spokane Valley, WA 99206

**Re: PAINTED HILLS FLOODPLAIN REVIEW – Comment Review Meeting Document
City Project No.: SUB-2015-0001
DETAILED Review Comments for Submittal #1**

Dear Mr. Allen:

Enclosed are our responses to City of Spokane Valley comments provided January 6, 2016 with regards to the Painted Hills PRD Floodplain/CLOMR first submittal. Our response is shown in **bold** following your comment.

Note: SS = Spokane Valley Street Standards, SRSM = Spokane Regional Stormwater Manual, ROW = right of way,

General

1. These comments are to be applied in conjunction with comments from Spokane County. If any conflict should occur between the two reviews please bring it to our attention for resolution.

See attached letter for responses to Spokane County comments. Although there is one CLOMR application, the construction work has been divided into two plan sets representing the work in each jurisdiction.

2. Please apply for a Floodplain Development permit and a Land Disturbance permit for both Spokane Valley and Spokane County. Include permit numbers on the plans.

Permit applications are included with this submittal. Numbers will be added to the plans when available.

3. Contact Ecology regarding the need for a NPDES Construction Stormwater Permit.

An NOI will be filed prior to construction in accordance with the Construction Stormwater General Permit

4. If there is any concern with the acceptance of the design by FEMA, we recommend first having a preliminary discussion with Lynn Schmidt/Ecology prior to submittal to FEMA.

Noted.

5. Prior to construction permit release, the following needs to be accomplished:
 - a. Copy of CLOMR from FEMA

Noted and will be met as a part of this process.

- b. Plan approval from Spokane Valley and Spokane County

Noted and will be met as a part of the process.

6. Prior to construction acceptance, the following needs to be accomplished:
 - a. Copies of the Department of Ecology (DOE) drywell registrations for all new drywells (submitted with construction certification)
 - b. Record drawings showing as-built condition
 - c. Revisions to HEC-RAS model and reassessment of the freeboard if construction has altered the channels from that depicted in the model
 - d. Formation of HOA with CC&R's if it will be responsible for the project components
 - e. Letter from design engineers certifying project constructed according to approved plans and specifications
 - f. Levee certifications (44 CFR 65.10 (e))
 - g. Construction Certification Package

Above items are noted for construction acceptance. These will be finalized after approved preliminary plat.

FEMA Forms and Submittal

7. MT-2 Form Instructions
 - a. Form 2,
 - i. D. Common Reg. Requirements – include proof of property owner notifications and evidence of regulatory floodway revision notification

Individual property owner notifications are required if the proposed project results in adverse impacts such as increases in BFEs and SFHAs. Notification

is also required for any changes to the floodway whether adverse or beneficial (largely beneficial for this CLOMR). Individual notification for adverse impacts to BFEs and SFHAs generally is on community letterhead. We will provide text and ask that the City/County add the text to their letterhead which we would then send to property owners. We will need a GIS layer of properties with contact information so that we can identify affected properties for notification. The Floodway notification can be done via public notice in the paper but must come from the community (City/County), (per email communication with FEMA CLOMR review team). We can provide the text to the City and County for this notice.

At this time, the notifications have not been sent and based on past project experience, we recommend the notifications be issued after we have City and County approval of the CLOMR package that will be submitted to FEMA and have determined there will be no further modifications to the project (at least prior to FEMA review). This ensures that there is no confusion to properties owners as we work through the review process with the communities. As is typical for CLOMR projects, we will mail the individual notifications just prior to or at the same time we submit the CLOMR to FEMA for review and would request the community post the public notice at that time.

- b. Form 3,
 - i. C. Bridge/Culvert, 3. – finish filling out this section

The form has been completed based on information provided by Inland Pacific

- ii. E. Levee/Floodwall – please use Geotech reports and revised plans to fill out this section. If additional information is needed please bring it to our attention.

The form has been completed based on information provided by Inland Pacific

- c. Hydraulic calcs – include digital files for calcs supporting the Flood Control improvement design

A CD has been provided with the revised CLOMR submittal

Civil Plans

8. Prior to Civil Plans approval the following must be accomplished:

- a. Recording numbers of the easements for the stormwater facilities (including the park area) and maintenance access roads outside right-of-way and border easements on the plans

Per our discussion, we have included draft easements with the submittal and will furnish recorded easements once the CLOMR is complete.

- b. Provide a single, complete Financial Plan and an Operations and Maintenance (O&M) Manual for the funding, operation, maintenance, repair, and replacement of the project components, including the stormwater systems, levees, impact mitigations, etc. as described on the Civil plans and in the reports (such as the Geotech reports and the Biological Evaluation by BSW). Include specific tasks, frequencies and costs. See SRSM chapter 11 for details. Include the person/entity responsible for the financing, operation and maintenance so that the project will be in compliance with SRSM chapter 11; 44 CFR §60.3(b) (7), §65.6(a) (12), and §65.10(d). For the levees, provide a brief description of what some of the repairs may involve. All discussions need to be in terms a non-technical person can understand. If a Financial Plan and an O&M Manual is created for the onsite development then these two manuals need to be under a single cover prior to final acceptance of the onsite construction.

Draft plan included with submittal.

- c. O&M manual – 44 CFR 65.10 (d) states for levees “At a minimum, maintenance plans shall specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance. “ Please make sure these items are covered including the frequency and name of responsible party. Prior to construction acceptance the O&M items mentioned in SRSM chapter 11 (e.g. financial plan, etc.) need to also be included.

Draft plan included with submittal.

9. General

- a. The drainage plans shall provide enough detail for a third party to construct the proposed facilities per the engineer’s design (SRSM3.5.2)

Complete construction plans are included with this submittal.

- b. Confirm that the plans contain the applicable minimum plan elements per SRSM 3.5.2

Confirmed.

- c. Identify/specify and locate all structures (pipes, manholes, drywells, grates, ponds, levees, berms, fences, access roads, etc.), including their alignments, in space and their boundaries (as applicable). Provide lengths and dimensions as needed. For all structures reference applicable standard plans; make sure references are for correct jurisdiction.

Complete construction plans are included with this submittal.

- d. Provide maintenance access to all stormwater and levee facilities (SRSM 11.1.6), provide approaches where accesses connect to a road

Maintenance access is shown to facilities with driveway approaches at road connections.

- e. Stormwater facilities (including the park area) and maintenance access roads outside right-of-way and border easements must be in a tract or easement (SRSM 11.1.6, 11.2). Show easements/tracts on the plans. Easements must be recorded at the County with a copy of what was recorded (with the recording number on it) returned to Development Engineering or Spokane County, as applicable. Recording numbers must be placed on these flood mitigation plans, the onsite civil plans (as applicable) and plat (as applicable) prior to final approvals. For drainage easements receiving water from Spokane Valley public facilities, please use the City's form.

Easements are shown on the plans and will be recorded in accordance with comment 8 above.

- f. At points along all project levees call out proposed top of levee elevation, BFE and max required freeboard (44 CFR 65.10 (b) (1) (i)). For levees that will also be used for access provide surfacing details.

- g. Please include our plans acceptance stamp on each sheet. Plans to be reviewed for acceptance once FEMA comments addressed.

Plans acceptance stamp has been added to each sheet.

- h. Include details for the proposed improvements to the existing levee between Thorpe and Dishman-Mica roads. Include, at least, existing and proposed elevations and slopes, elevations of the pedestrian bridges at the levee, cross-section showing existing and proposed geometry with surfacing, other items as mentioned above, items called out in sections 4.8.2, 5.2, 5.5, 6.6 of the Biological Evaluation by BSW and in section 3.4 of the Geotech report for this levee, etc. Evaluate the need for erosion protection at outlet of Thorpe culvert where the model shows velocities around 7 ft/s. Show how the ground will transition from the existing pedestrian bridge elevation to the raised levee elevation.

Details have been added to include elevations, cross-sections with slopes and surfacing. The existing pedestrian bridge elevations are at or above the raised levee elevation. Contouring of the levee is now shown. Based on the Biological Evaluation there are no wetlands to show. Stream buffers are called out. The mitigations are not applicable to flood control except that there are no plantings within 15 feet of the toe of the levee. This restriction has been added to cross sections. Landscape plans will be prepared for mitigations for the PRD project.

- i. Provide design details mentioned in the Biological Evaluation by BSW showing elk travel corridor improvements (sections 4.7, 5.6, 5.10, 6.1-6.7) and impact mitigations (sections 5.0, 5.2, 5.6, 5.8, 5.10, 6.1-6.7) that are pertinent to the improvements shown on these civil plans.

The mitigations are not applicable to flood control except that there are no plantings within 15 feet of the toe of the levee. This restriction has been added to cross sections. Landscape plans will be prepared for mitigations for the PRD project.

- j. Show riparian buffer limits

Limits were shown on the plans and are now labeled.

- 10. For the final submittal, the cover sheet shall be signed and dated by project proponent or agent

Space has been added for the developer's signature.

- 11. Sheet FC0.0 Cover sheet, include (SS 4.4.2) –

- a. Provide the following information:
 - i. Spokane Valley
 - 1. SUB-2015-0001
 - 2. FPD-2015-???? (Floodplain Development permit number)

3. EGR-????-???? (Land Disturbance permit number)
- ii. Spokane County
 1. Floodplain Development permit number
 2. Grading permit number
 - 3.

Information has been added to the sheet and will be completed when additional information is received.

- b. Include the following drywell construction note on the cover sheet: Construction of every drywell, including fabric and drain rock, shall be observed by the on-site inspector to confirm that it meets the design details and specifications. Drywells not observed shall have their performance verified by a full-scale drywell test.

This note has been added.

- c. Easement recording numbers

Easement recording numbers will be added once the easements have been recorded per response to comment 8 above

12. Sheet FC0.1 General Notes

- a. General Grading Note 6 – add that these elevations shall also be used for finished grade

Note revised.

13. Sheet FC4.0 South Grading and Drainage Plan

- a. Show existing culverts and alignment of Detail 1 FC4.3

Existing culverts are shown and are called out for removal.

- b. For the ponds, per SRSM, detail the maintenance access roads (11.1.6) and fencing (7.8.7). For the south pond show how water will get past the fencing and into the pond.

Access roads and fencing have been added to plans. South pond has been eliminated.

- c. Show pavement cuts with dimensions

Pavement cut dimensions have been added to the plans.

- d. Show how the north edge of the park area will transition back to existing ground and call out slopes

With revised flood control concept, this no longer applies.

- e. A note in the HEC-RAS PCM model says that Thorpe is raised at the culverts. If this is true provide design including elements per SS 4.6, especially SS 4.6.3.

With the current proposal the profile of Thorpe Rd matches existing.

- f. Identify the dashed lines in Thorpe and Madison Roads

Dashed lines are identified by the legend or additional labels.

- g. Through the hydrograph, are the maximum velocities for flows down the slopes into the south pond and the distribution pond high enough to warrant erosion control measures on the slopes?

With revised flood control concept, this no longer applies.

- h. Construction notes –

- i. Recommend calling out all pertinent detail sheets for the facilities

Standard plans and detail sheets are referenced in construction notes.

- ii. Note 4 – compaction – reference the specific Geotech report

Reference added where applicable.

- iii. Note 5 – include that pipe is to be rubber gasketed

Note revised.

- iv. Note 9 - compaction – reference the specific Geotech report

Reference added where applicable.

- i. Why does the gravel gallery extend all the way to Madison Road?

These galleries have been eliminated.

- j. Legend – show property lines, proposed concrete and limits of proposed stormwater ponds

Legend replaced with construction notes and labels.

- k. Title block – check road name

The road name in the third line of the title refers to the project location. When a sheet is for a specific road, that road is in the second line of the sheet title.

14. Sheet FC4.1 West Grading and Drainage Plan

- a. Show proposed accesses from the site to Dishman-Mica Road that cross the levee. How will these accesses be constructed so as to not compromise the levee's function?

Accesses have been located and graded such that elevations will maintain the levee when surface improvements are constructed.

- b. Dishman-Mica Road Section –
 - i. Check road cross-slopes

Road slopes with widening spreadsheet are included in the plans.

- ii. Call out centerline

Centerline is identified on plan sheets with construction note 1.

- iii. Future development should include a 6 foot sidewalk

The proposal is for an 8 foot path along Dishman-Mica on top of the levee in lieu of a 6 foot sidewalk.

- iv. Levee top should be shown higher than the road, provide range of distances between edge of future development and top of levee

Section on C0.2 shows levee above roadway.

- v. Provide path surfacing details

Path surfacing callouts added to construction notes or levee sections.

15. Sheet FC4.2 Triangle Pond

Gustin Ditch and the Triangle Pond are now a separate plan set.

a. Plan view –

- i. provide lines to show alignment of levee and adjacent channel

Control line has been added.

- ii. Show existing crossings to be removed as mentioned in the Geotech levee report section 3.1

Construction note added to remove existing crossings.

- iii. Show culvert at start of channel

Existing culvert is now shown.

b. Construction Note 2 – provide pond access road details.

Additional notes and details have been added for the access road

c. For the pond and levee, per SRSM, detail the maintenance access road (11.1.6) and fencing (7.8.7)

There is existing fencing around the pond. A gate has been added for the new maintenance road off of 40th Ave.

d. Levee Detail –

- i. Note – compaction – reference the specific Geotech report

Compaction requirements and reference to Geotech report have been added.

- ii. show location of alignment line

Control line has been added.

- iii. specify width of slope between levee and channel and/or depth of channel

Levee elevations are called out on the plan. Width of the slope varies with the levee elevation and the flowline of the ditch based on the distance needed to achieve a 3:1 slope.

- iv. specify some details for slope at right bank of channel

Slopes on both sides of the channel are identified.

- e. Title block – provide correct location

Location has been revised. The road name in the third line of the title refers to the project location.

16. Sheet FC4.3 Grading and Drainage Details

- a. Provide design calcs and details for the drywell rock

Drywell rock has been called out to be per WSDOT Std Spec 9-03.12(5).

- b. Forebay Ponds Section

- i. Sidewalk is 5'
- ii. Confirm that drywell rock at culvert outlet will not erode
- iii. Show and callout drywell in the overflow/park area to identify rim elevation
- iv. Show right-of-way and border easement

Forebay has been deleted.

- c. Gravel Gallery –

- i. Provide pipe details. Is pipe perforated?

Pipe is not perforated. Pipe details have been added.

- ii. Specify geotextile

Geotextile has been called out to be nonwoven per WSDOT Std Spec 9-33.

- d. Title block – provide correct location

The road name in the third line of the title refers to the project location. When a sheet is for a specific road, that road is in the second line of the sheet title.

17. Sheet FC5.0 Madison Drainage Plan

- a. Show road alignment with stationing, confirm future road widening width.

Road alignment with stationing is shown. Widening width is per standards.

- b. Construction Notes –
 - i. Note 1 – have arrows point to portion of pipe to be removed

Under new proposal, entire culvert is being replaced.

- ii. Note 2 – include that minimum pavement section is 4/6

Pavement section is shown on street section, sheet C0.3.

- iii. Note 5 – confirm pipe type on WSDOT pipe cover tables

Meets WSDOT 2 foot minimum cover.

- c. Title block – provide correct location

The road name in the third line of the title refers to the project location. When a sheet is for a specific road, that road is in the second line of the sheet title.

18. Sheet FC5.1 Pond Details

- a. Confirm that –
 - i. The maintenance access roads (including alignment, cross-section, width, surfacing, slope, etc.) and fencing are detailed. Maintenance road must go within 15 feet of structures.

Details have been added. Access is within 15 feet of structures.

- ii. All side slopes are called out

Side slopes identified.

- b. Forebay – show and dimension the drywell rock

Forebay deleted.

- c. Collection pond – provide erosion protection on side slopes as needed

Pond deleted.

- d. Triangle Pond – confirm that maintenance road provides access to all structures

Access is to all structures.

- e. Construction Notes –
 - i. Note 3 – what is a CMD pipe?

No longer applicable, was CMP.

- ii. Notes 6 & 7 – provide cross-sections and rock details. Need geotextile?

Cross section added and rock detail added to construction note.

- f. Title block – provide correct location

The road name in the third line of the title refers to the project location. When a sheet is for a specific road, that road is in the second line of the sheet title.

19. Sheet FC9.0 – FC9.3 – Erosion Control

- a. General notes –
 - i. include reference to Spokane Valley

Reference added

- ii. Please add a note to the ESC standard notes that “A site log shall be completed with the project per SS 5.4”

Note added

- b. Show silt fence and stockpile locations

Locations shown. General Note 5 modified to instruct contractor to add silt fence as needed.

- c. Check numbering on Appendix 9A notes

Numbering checked.

- d. Title blocks – provide correct location

The road name in the third line of the title refers to the project location. When a sheet is for a specific road, that road is in the second line of the sheet title.

Flood Control Development Narrative (dated July 23, 2015)

20. SRSM 3.4 – provide

- a. short discussion about floodplain background (e.g. see Biological Evaluation by BSW, sections 4.8.1, 4.8.2), Painted Hills and how this project fits in,

Discussion has been added concerning floodplain background.

- b. include discussion of Geotech Phase II study,

Reference to Phase II study has been added.

- c. maps showing locations of -

- i. all components discussed in report
- ii. all Geotech evaluation sites (Phase I and II) with the proposed flood mitigation components
- iii. contributing drainage basins
- iv. off-site easements

Site Element Plans, overall and geotech evaluation locations has been added as attachment. Madison Rd culvert flow map has been added as attachment. Easements have been added to the construction plans and shown on Site Element Plan.

- d. calculations for all applicable structures such as –maximum velocities for flows down slopes into the south pond and the distribution pond, maximum velocities out of the 36-inch culverts, riprap sizing at culvert outlets, capacity ratings for beehive grates and gravel gallery pipe entrances, design calcs for v-ditch into triangle pond and riprap pad, etc.

Calculations have been added in the attachments.

21. Report Narrative

- a. Page 1, Concept Design and Process – since the stormwater is being directly injected into the ground, how will this water be treated?

These are flood flows from the existing Chester Creek stream channel and fields east of Madison Road, not runoff from developed areas. There is a bio-infiltration channel in the system just prior to the flood flows entering the gravel galleries that will filter the flows.

- b. Page 2 –

- i. Both Ponds in Tandem –

1. Confirm that pipe inverts are 1.55 feet above pond bottom

2. How will the separation in elevation remove anything other than large suspended solids? Is the residence time long enough to enable fine sands and smaller particles to settle out? (note the forebay discussion mentions silt deposits)
 3. Silt is mentioned as accumulating in the forebay. O&M manual needs to discuss maintenance details to ensure that the silt is removed
- ii. Broad Crested Weir –
1. What is the 2.22 foot depth measured from?
 2. Provide information supporting that the floating filter will have 10 times the surface area

The tandem ponds and broad-crested weir are no longer part of the proposal.

c. Page 3 –

- i. Infiltration Rate – the gravel galleries are closer to P-5 (TP28) and the soils are more similar at P-5 (SM) than those at P-3. Use infiltration rate from P-5 for the gravel galleries.

With the move of the gravel galleries, three additional boring were performed in the area of the proposed galleries as well as a full scale drywell test. We have used the infiltration rate from that test.

ii. Hydraulic Analysis –

1. Hydraflow is not on FEMA’s list of approved software programs. We recommend that before submitting the study you check with FEMA to see if they will accept this software.

Hydroflow calculations are no longer included as part of the proposal.

2. Discuss how the storm volumes compare between the HSPF model and the Hydraflow model

Hydroflow calculations are no longer included as part of the proposal.

d. Page 4 –

- i. Hydraulic Analysis, continued – Table 2 – for 100-year storm how can the water level in the upstream collection pond be lower than at the downstream weir? How does this compare with the PCM HEC-RAS output elevations?

Collection pond and weir are no longer part of the system.

- e. Page 5, Table 4 – is heading “Elevation of inlet” supposed to be “Water Elevation at Inlet”?

Table 4 is no longer applicable and has been deleted.

- f. Page 6, Secondary Flow Across Madison Road – at STA 20+44 and 24+41 the drywell outflow rates provided in the table appear to be derived from TP-19 where the soils are SP but the test pits closest to these drywells, TP-20, TP-24 and TP-25, show the soils to be either clay or clayey sand. Please use drywell outflow rates that would be expected from these latter soils.

Culverts are now connected to the trunk storm drain line for disposal in the gravel gallery field at the north end of the site.

- g. Copies of referenced emails from West Consultants

Emails are no longer referenced.

- h. Please include some discussion about what happens to stormwater generated between the Triangle pond and Madison Road

Discussion has been added.

22. Report Calcs

- a. Include printouts of the input and of the culvert calcs for the 100-year run

Calculations are included for the piping system.

- b. 2-year storm run, Haase Pond –
- Is this the South Collection Pond?
 - The orifice coefficient used for the culvert (pipe projecting) is 1.00. Please provide supporting documentation for this value.

Haase Pond has been eliminated.

- c. 2-year storm run, Overflow Pond –
- Is this the Forebay Pond?
 - Why does the contour area decrease as the stage increases?
 - Confirm crest length
 - Provide supporting documentation for the exfiltration rate

Overflow Pond has been eliminated.

- d. 2-year storm run, Discharge Pond –
- i. Is this the Distribution Pond?
 - ii. The outflow consists of 4 36-inch pipes at elevation 2001.44. What pipes are these? The gravel gallery consists of 18-inch pipes at elevation 1994.56 +/- . These pipes are shown with a 0.5% slope but the plans show the slope as flat, please explain.
 - iii. The outflow is also modeled using a 78' weir at elevation 2007.44. Please explain where this is.

Discharge Pond has been eliminated.

- e. Gravel Gallery Calc Sheet – provide an exhibit that relates the run (A, B, C, D, E) to the pipe on the plans.

Galleries are identified on the plan and profile sheet, C5.5.

23. Will the gravel gallery pipes, which have no slope, have the capacity to convey the peak flow without backing up the water too much?

The redesign of the gravel galleries has the pipes sloped at 1.0%. The galleries are set up such that water will flow into them via drywells and once the depth in the drywell reaches 10 feet the water will enter the pipes. This size pipe at 1.0% will carry 30 cfs times 4 equals 120 cfs, therefore, we don't anticipate the water backing up.

24. West half of the gravel gallery system is represented by Geotechnical Evaluation Phase II (IPEC 2015) boring B-9. This boring shows that groundwater is very shallow, 11 feet below the ground surface, which puts the groundwater level near the top of the perforated drywell barrel sections and gravel galleries. These readings were taken in July 2015 in the summer of a declared statewide drought. {Per www.ncdc.noaa.gov, the monthly precipitation totals at Spokane Airport for 6 of the 7 months prior to July (March excluded) were near average to far below average with April and May at about 50% of normal, June at 6% of normal and July at 30% of normal.} We are concerned that if the groundwater is this high during a drought year then during a year that is wet enough to produce a 100-year storm the groundwater level will be significantly higher, high enough to make the drywell and gravel gallery infiltration ineffective. This concern is also applicable to the east portion of the infiltration system where the groundwater in July 2015 was 27 feet below existing ground (boring B-10). In a typical year this Chester Creek branch is flowing meaning that prior to the 100-year storm these flows could saturate the ground also resulting in very high groundwater levels. Please address.

The gravel galleries have been moved to the north end of the site. The boring, B-2, conducted in April, 2016, located groundwater 71 feet below the ground surface. The bottom of the galleries are proposed to be 20-25 feet below the ground surface.

25. Compare the 100-year water surface elevations between the HEC-RAS PCM run and the Hydraflow run.

Hydraflow calculations are no longer included in the design.

CLOMR Application Report (dated Sept 10, 2015)

26. Page 3 title block – please check the project location figure at the bottom

The red watershed boundary on the figure legend refers to the boundary depicted on the main figure, not the figure inset (due to scale). Based on subsequent email communication with Henry Allen we believe the figure is OK as-is.

27. Unnamed Tributary flow - Page 5 says that the total flow for the Unnamed Tributary is 20 cfs but page 10 says it is 16 cfs. Please check.

The 20 cfs statement on page 5 was in error and has been revised to read 16 cfs. 20 cfs is the 0.2% annual chance flood flow and 16 cfs is the 1% annual chance flood flow.

28. Infiltration facilities –

a. Page 9 says that the WCE report is 2014 but it should be 2015

This has been revised

b. Page 10 near the top says that the pond is 215 ft. wide by 215 ft. long. Confirm that these dimensions are correct.

The revised design by WCE no longer includes this pond.

29. Interior Drainage – Page 13 last paragraph mentions 103 drywells, please confirm this number

103 is the current estimate from WCE, though this may be refined when the stormwater design is finalized.

HEC-RAS Model

30. Confirm that the cross-section spacing and the profile downstream of Thorpe matches the Civil plan

The Civil plans have been updated to match the most recent RAS model cross-section locations.

Preliminary Geotechnical Evaluation, Phase 1

31. Correct all incidences where P-5 is incorrectly called out as P-2

Report revised.

Preliminary Geotechnical Evaluation, Phase 2

32. Include this report in the FEMA submittal

Report included in submittal.

Geotechnical Evaluation, Levee Evaluation and Certification (Existing Levee between Thorpe and Dishman-Mica roads)

33. Section 2.1 Logs – section mentions previous Geotechnical reports. Please include a description of them in Section 1.4.

The reports were already described in Section 1.4.

34. Section 3.4 – discuss the needed erosion protection for the high velocities (7 ft/s) just downstream of Thorpe Road as shown in the table

Recommendation has been added.

35. O&M Manual

a. Section 3.10 Operation – for the financial plan, how much money should be put aside to prepare for fixing flood damage?

See O&M plan.

b. Section 3.20 Maintenance, for the financial plan -

i. Estimate how many mowing per year and their annual cost. Can 2.3H:1V slopes be mowed?

The O&M plan shows 4 mowings. Slopes unable to be mowed may be maintained with gas powered grass trimmers.

ii. Estimate the frequency and annual cost for tree and objectionable material removal from the levee and creek channel.

The O&M plan shows frequency and cost for debris removal.

Geotechnical Evaluation, Proposed Levee (Levee along east side of Dishman-Mica road)

36. Section 3.4 Closures – note that the proposed access appears to penetrate the levee

Plan has been revised to show levee configuration at access onto Dishman-Mica.

37. Section 3.9 and 3.10 –please include the operation and maintenance plan

Separate O & M plan is included with the submittal.

Geotechnical Evaluation, Gustin Levee Evaluation (Levee near 40th Avenue)

38. Section 2.2 Site Conditions – mentions fairways, please check

Reference has been removed.

39. Section 3.5 Embankment Protection – FEMA FIS Station appears to differ from the HEC-RAS cross-section station, please include the HEC-RAS stations.

Stations have been added.

40. Section 3.9 and 3.10 – please include the operation and maintenance plan

Separate O & M plan is included with the submittal

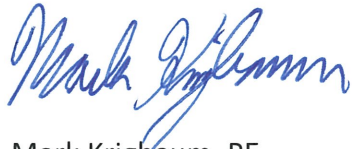
Biological Evaluation by BSW

41. Section 5.4 mentions restoring the temporary trench area to its original contours but the civil plans show this area being regraded. Please check.

Report revised to eliminate reference.

If you have any questions, please don't hesitate to contact our office at 893-2617. We are also available to meet with either CSV and/or SCE staff to discuss these responses further.

Sincerely,
WHIPPLE CONSULTING ENGINEERS, INC.



Mark Krigbaum, PE

Cc: Bryan Walker, NAI Black
Marianne Barrentine, Spokane County

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