October 2020
Black Horse at Whiskey Creek Residential Development

ANCHOR QEA

Compensatory On-Site Mitigation Plan (NWS-2008-76)

Prepared for D.R. Horton

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Prepared for
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Project Number: 200775-01.01
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ABBREVIATIONS

Ecology	Washington State Department of Ecology
sf	square foot
USACE	U.S. Army Corps of Engineers

1 Introduction to Proposed Project

This mitigation plan has been prepared to address permanent impacts to approximately 7,000 square feet (sf) of freshwater Category 4 wetland habitat associated with the construction of a residential housing unit development located within the Urban Growth Area of the City of Ellensburg, in Kittitas County, Washington. This mitigation plan addresses the requirements for U.S. Army Corps of Engineers (USACE) application #NWS-2008-76.

The development site, known as Black Horse at Whiskey Creek, is located on approximately 75 acres at the intersection of Reecer Creek Road and West Bender Road (Figure 1). It is bordered by Whiskey Creek and agricultural land to the east and Bowers Road to the north. The purpose of the project is to meet projected housing demand within the Urban Growth Area of the City of Ellensburg in accordance with municipal zoning standards. The proposed development includes single-family lots along with associated infrastructure and stormwater management facilities (Figure 2). In order to meet design and zoning standards, the proposed residential development requires frontage improvements along the surrounding county roads. These improvements include widening the road at the Whiskey Creek and the Ellensburg Town Ditch crossings and culvert improvements to meet fish passage requirements that were completed in 2020.

2 Existing Conditions in Proposed Project Area

The site is located at 1406 West Bender Road, Ellensburg, Washington, 98926, in Section 27, T18N, R18E, W.M. in Kittitas County. The parcel number is 18-18-27010-0002. The site is situated in Water Resource Inventory Area 39 (Upper Yakima) on a rectangular-shaped agricultural parcel of approximately 75 acres.

The landscape setting of the site is within the Columbia Plateau Ecoregion, which was historically characterized by large expanses of sagebrush shrub-steppe and grasslands. Significant water resources exist around this site and in the greater Ellensburg area, and the floodplain and streams have been highly modified to increase agricultural productivity.

Development in the Columbia Plateau Ecoregion is predominantly rural with only a few major urban areas; however, development associated with farming and the establishment of towns and other residential areas has diminished the amount and connectivity of remaining shrub-steppe and grassland habitats.

The site comprises fields that were previously in agricultural production, most consistently used for hay (primarily timothy [*Phleum pretense*]). Currently, the site has been graded for future development but is not in use. The agricultural fields were irrigated with water from the Cascade Irrigation District. Past irrigation practices and the overall manipulation of the floodplain in the region likely influenced hydrology at the site. The Category 4 wetland in the southeastern corner of the site was preliminarily identified as an agricultural wetland without clear hydrology aside from ongoing irrigation; it was determined to be impaired, providing only marginal ecological function, such as a minor amount of flood storage and filtration, as a result of agricultural impacts and grazing (Sewall 2006). The areal extent of the Category 4 wetland at the time of the delineation was accepted by Washington State Department of Ecology (Ecology) to be 39,375 sf (Sewall 2013). Upon receipt of site development approval by the County, and prior to definitive jurisdictional information about this wetland, 21,000 sf of the wetland was filled in 2007 as part of preliminary site grading activities. The development design was revised in 2019 to decrease the impact around the wetland to 7,000 sf. The remaining wetland area will be protected from encroachment and access as part of the proposed residential development design.

The 2020 site conditions reflect grading that occurred on the site between 2007 and 2009. Water is currently ponded in several stormwater ponds intended for use in stormwater management as well as the wetland restoration area, allowing natural colonization of hydrophitic vegetation to occur in these areas. Little vegetation has colonized within the footprint of the wetland restoration area since it was recently graded. See Photographs 1 through 3 for existing conditions of the wetland restoration area.

Photograph 1
View of Wetland Restoration Area Facing East Toward Whiskey Creek and Bender Road

Photograph 2
View of Wetland Restoration Area Facing Northwest from Bender Road

Photograph 3
View of Wetland Restoration Area Adjacent to Whiskey Creek Riparian Buffer Facing North

Other jurisdictional waters at the site include Whiskey Creek, which flows south along the southeast side of the site, and the Town Ditch that crosses the southwest corner of the site. Both of these waters were identified as being jurisdictional in previous project documentation completed by Sewall Wetland Consulting, Inc. (Sewall 2013). Work in these waterways has included culvert replacement, which will improve habitat functions within Whiskey Creek; the Town Ditch is a manufactured irrigation canal and the replacement of the culvert will not impact its functions.

3 Compensatory Mitigation

The project currently has an impact area of 7,000 sf of Category 4 wetland habitat due to the previous fill and permanent placement of site features. This impact area reflects project design features and construction methods intended to minimize impacts. The wetland was filled with structural fill, and silt fencing was in place during grading activities to prevent erosion or soil disturbance and avoid additional impacts to the remaining portion of the Category 4 wetland.

The Project proposes to create a wetland with a 50-foot buffer within the wetland restoration area shown on Figure 2. The 10,500-sf compensatory wetland mitigation site is located within the wetland restoration area to compensate for the 7,000 sf of impacts to Category 4 wetland habitat. The compensatory wetland mitigation site will be planted with native trees including grey alder (*Alnus incana*), black cottonwood (*Populus trichocarpa*), and Pacific willow (*Salix lasiandra*). Native shrubs to be planted within the wetland area, including the compensatory mitigation area, include red-osier dogwood (*Cornus sericea*), swamp rose (*Rosa pisocarpa*), coyote willow (*Salix exigua*), and dusky willow (*Salix melanopsis*). A similar species mix is proposed for the remaining wetland restoration area. The wetland buffer will be planted with a mix of trees and shrubs including grey alder, black cottonwood, serviceberry (*Amelanchier alnifolia*), red-osier dogwood, black hawthorne (*Crataegus douglasii*), golden currant (*Ribes aureum*), wood rose (*Rosa woodsia*), and Scouler's willow (*Salix scouleriana*). A native seed mix will also be planted within the wetland and wetland buffer areas.

Upon completion of the mitigation action, a deed restriction, Declaration of Restrictive Covenant, or similar site protection instrument will be filed will be filed the local registrar of deeds to protect the mitigation site.

3.1 Compensatory Mitigation Goals and Objectives

The on-site wetland creation described in this report will address unavoidable impacts to wetland habitat associated with the residential development project consistent with the requirements established by the Kittitas County Critical Areas Ordinance and Ecology requirements for wetland mitigation. The Category 4 wetland area was impaired in its ability to provide ecological functions due to decades of agricultural activity. The ecological functions provided by the remaining portion of this wetland will improve over time through protection from encroachment.

The proposed on-site mitigation action will result in improved and additional ecological functions within the site, including protection of water quality, flood storage, hydrologic function, provision of food sources and habitat for birds and other native wildlife. The development of the wetland mitigation site will also support the functions of the aquatic habitat within Whiskey Creek and its

riparian buffer through promotion of habitat connectivity and protection and enhancement of vegetation along the riparian corridor.

To meet the goals of increased ecological function, the following objectives have been used to develop the mitigation plan to compensate for loss and damage to the wetland habitat:

- Provide demonstrable and qualitative replacement of functional elements of the natural system
- Establish native wetland enhancement plant communities by planting native species and removing anthropogenic species (such as timothy and Himalayan blackberry)
- Use native and naturalized plant species commonly found in the semi-arid region of Kittitas County
- With the plantings, simulate wetland native plant communities in terms of composition, cover, and structure

3.2 Description of Proposed Compensatory Mitigation

To mitigate permanent impacts to 7,000 sf of Category 4 wetland habitat associated with the proposed residential development project, on-site compensatory mitigation is proposed at a greater than 1.5:1 ratio, exceeding the requirements of the current Kittitas County Critical Areas Ordinance. The proposed compensatory wetland mitigation site will provide enhanced ecological function that did not exist at the site during agricultural use, including flood storage, erosion protection, and habitat for birds and small mammals. The compensatory wetland mitigation will install wetland vegetation within a 10,500-sf Category 3 wetland within a 25,300-sf wetland restoration area. The wetland will be planted with native vegetation that will enhance the upland habitat conditions, as well as riparian habitat along the reach of Whiskey Creek adjacent to the site. The wetland restoration area and Whiskey Creek will be protected by appropriately sized vegetated buffers (75 feet for Whiskey Creek and 50 feet for the wetland restoration area). The groundwater table in this area is low and it is anticipated that the wetland hydrology that has already resulted in ponded water at the proposed wetland restoration area will remain intact after final construction. Trees and native species within the restored wetland area and associated buffers will support the native insect and invertebrate ecosystem, which in turn provides prey and food resources for fish that may occur in Whiskey Creek.

The compensatory wetland mitigation site was previously graded to previously permitted elevations to support wetland habitat and consists of mostly bare ground. The new wetland may retain some standing water and a hydrological connection to Whiskey Creek from the grading. However, the elevations were re-configured along the berm between the wetland area and Whiskey Creek to reduce the potential for fish stranding in the wetland area during any high flow events. Planted along

the eastern border of the site (along the Whiskey Creek channel) are a number of native trees and shrubs, which were protected during re-grading for the mitigation project.

For the wetland restoration action, the native vegetation will be planted and protected along the buffer and limits of the restoration area through the use of temporary fencing. Plant protection fencing is proposed to remain for up to 5 years during the monitoring period. The wetland vegetation planting will include a combination of native trees and shrubs, with appropriate ground covers within the wetland and wetland buffer. Table 1 identifies the type and number of native species to be included in the compensatory mitigation site of the wetland restoration area.

Table 1
Proposed Mix of Species to be Planted in the Compensatory Wetland Mitigation Site

Vegetation Type	Common Name	Scientific Name	Type	Species Count
Native Trees	Grey Alder	*Alnus incana*	Evergreen	9
	Black Cottonwood	*Populus trichocarpa*	Deciduous	8
	Pacific Willow	*Salix lasiandra*	Deciduous	30
Native Shrubs/ Small Trees	Red-osier Dogwood	*Cornus sericea*	Deciduous	167
	Swamp Rose	*Rosa pisocarpa*	Deciduous	138
	Coyote Willow	*Salix exigua*	Deciduous	908
	Dusky Willow	*Salix melanopsis*	Deciduous	908
Wetland Seeding	Water Foxtail	*Alopecurus geniculatus*	Seed	Equal quantities of each species
	Western Mannagrass	*Glyceria occidentalis*	Seed	
Buffer Seeding	Idaho Fescue	*Festuca idahoensis*	Seed	Equal quantities of each species
	Bluebunch Wheatgrass	*Agropyron spicatum*	Seed	

As necessary to support the wetland vegetation community, soil amendments (topsoil and mulch) will be included in the project design. Up to 195 cubic yards of topsoil will be placed around planting pits supporting installed plants; the topsoil will improve the native soil's nutrient and water holding capacity. In addition, 2.5 inches of mulch will be placed above the topsoil area to protect against water loss from the soil and inhibit weed growth. If plants are installed and seeded within the dormant season (November 1 through March 1), an irrigation system will not be required. If plantings are installed outside of the dormant season, a temporary irrigation system will be required. This system may be removed after the first or second year, provided plants are established and acclimated to on-site conditions. Irrigation will only be used for establishment of vegetation and is not intended to supplement or create wetland hydrology within the mitigation area.

Figures 3 through 6 provide a plan view, detailed plan of the wetland creation, planting schedule and details. Figures 7 through 10 provide planting guidelines.

3.3 Monitoring Plan

To ensure success of the compensatory wetland mitigation site, a 5-year monitoring and management program will be implemented. The objective of this plan is to ensure the achievement of the prescribed standards of success.

Wetland hydrology will be monitored at two sample locations within the compensatory wetland mitigation site. Based on the USACE Wetland Delineation Manual/Arid West Final Regional Supplement (USACE 2008), successful wetland hydrology exhibits either inundation for 14 or more consecutive days or soil saturation within 12 inches of the surface during the growing season (April 15 to October 31). Samples of surface water level or groundwater saturation depths will be collected at the two sample locations to determine if wetland hydrology has been successfully attained.

Installed vegetation communities will be monitored annually to assess the performance of the compensatory wetland mitigation site. Prior to the first monitoring visit, an as-built (or Year 0) plan will be prepared to document the implementation of the wetland design. Any minor changes to the approved designs that are required by site conditions encountered during construction must be documented on the as-built plans. The monitoring period will begin once the as-built plans have been approved. Due to the relatively small size of the compensatory wetland mitigation site, sample plots will not likely be established, and monitoring will include the entire area. Based on as-built plans or record drawings, monitoring will take place near the end of the growing season (summer or early fall) prior to leaf drop. Monitoring activities will focus on the collection of vegetation to evaluate, describe, and quantify (to the extent possible) wetland functions and compliance with performance measures. Monitoring will also include photographic documentation of site features and development of habitat on the site. Monitoring methods entail the following:

- Samples of surface water level or groundwater saturation depths will be collected the two sample locations
- Survival of planted trees and shrubs will be assessed
- Percentage of aerial cover for native trees and shrubs, both planted and colonizing, will be estimated
- Aerial cover for state-listed noxious weeds will be estimated, and weeds will be removed
- Photographic documentation from photo points will be identified on the as-built plans
- Intrusions, vandalism, or other actions that impair the intended functions of the mitigation area will be reported
- Recommendations will be made for maintenance or repair of the wetland mitigation area

Following each year's monitoring visit, a report will be prepared detailing the findings of the visit. A total of three reports (Years 1, 3, and 5) will be prepared as part of ongoing monitoring reporting.

3.4 Performance Measures, Standards of Success, and Contingency Plans

Performance measures and success standards describe specific on-site characteristics that indicate a function is being provided. Performance measures are used to guide management of the compensatory wetland mitigation site. Success standards are thresholds to be measured during the monitoring period that demonstrate that the mitigation has complied with regulatory requirements and is providing intended functions. The proposed enhancement will be monitored for 5 years to demonstrate that intended wetland enhancement functions have been achieved. Specific performance measures and success standards are as follows:

- Trees and shrubs:
  - Year 1 – 100% survival of all installed plants
  - Year 3 – 80% survival of all installed plants and 20% survival of areal cover
  - Year 5 – At least 30% survival of areal cover
- Nonnative vegetation presence:
  - Years 1 through 5 – Less than 15% cover

Contingency plans describe what actions can be taken to correct site deficiencies. If there is a significant problem with the enhancement area meeting its performance standards, a contingency plan will be developed. Contingency plans may include the following:

- Replacing all plants lost to vandalism, drought, or disease, as necessary
- Replacing any plant species with a 20% or greater mortality rate through plant substitutions of type, species, quantity, or location
- Irrigating the wetland area as necessary during dry weather if plants appear to be too dry, with a minimal quantity of water
- Reseeding wetland and buffer areas with an approved grass mixture as necessary if erosion or sedimentation occurs
- Removing all litter and weeding invasive species from the wetland and buffer areas

Contingency plans will be developed for review and approval by Ecology and USACE, as appropriate. In addition, implemented contingency plans will be described in the monitoring report following each year's visit. Success of the wetland creation will be based on the mitigation goals, performance standards, and contingency measures.

4 References

Sewall (Sewall Consulting), 2006. *D.R. Horton/Axtman Wetland Delineation*. May.

Sewall, E., 2013. *Biological Assessment for Black Horse at Whiskey Creek*. Prepared for ESM Civil Engineers on behalf of DR Horton.

USACE (U.S. Army Corps of Engineers), 2008. Wetlands Regulatory Assistance Program. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). September 2008

Figures

FIGURE LIST	
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2	PROPOSED SITE LAYOUT
3	MITIGATION DESIGN PLAN
4	PLANTING PLAN
5	PLANTING SCHEDULE
6	PLANTING DETAILS
7	PLANTING GUIDELINES
8	PLANTING GUIDELINES
9	PLANTING GUIDELINES
10	PLANTING GUIDELINES

SOURCE: Aerial from ESRI World Topo
HORIZONTAL DATUM: Washington State Plane South Zone, North American Datum of 1983 (NAD83), U.S. Survey Feet

VICINITY MAP

REFERENCE #: NWS-2008-76

APPLICANT: D.R. HORTON

LOCATION: 1406 WEST BENDER ROAD
ELLENSBURG, WASHINGTON 98926

ADJACENT PROPERTY OWNERS:
1 - BIVENS, OLIVER L & DONNA J
2 - CARMEN, JULIE D, & WILEY, MARC R
3 - SEE ATTACHMENT C FOR ADJACENT PROPERTY OWNERS

NAME: BLACK HORSE AT WHISKEY CREEK DEVELOPMENT WETLAND MITIGATION

PROPOSED: WETLAND MITIGATION DESIGN

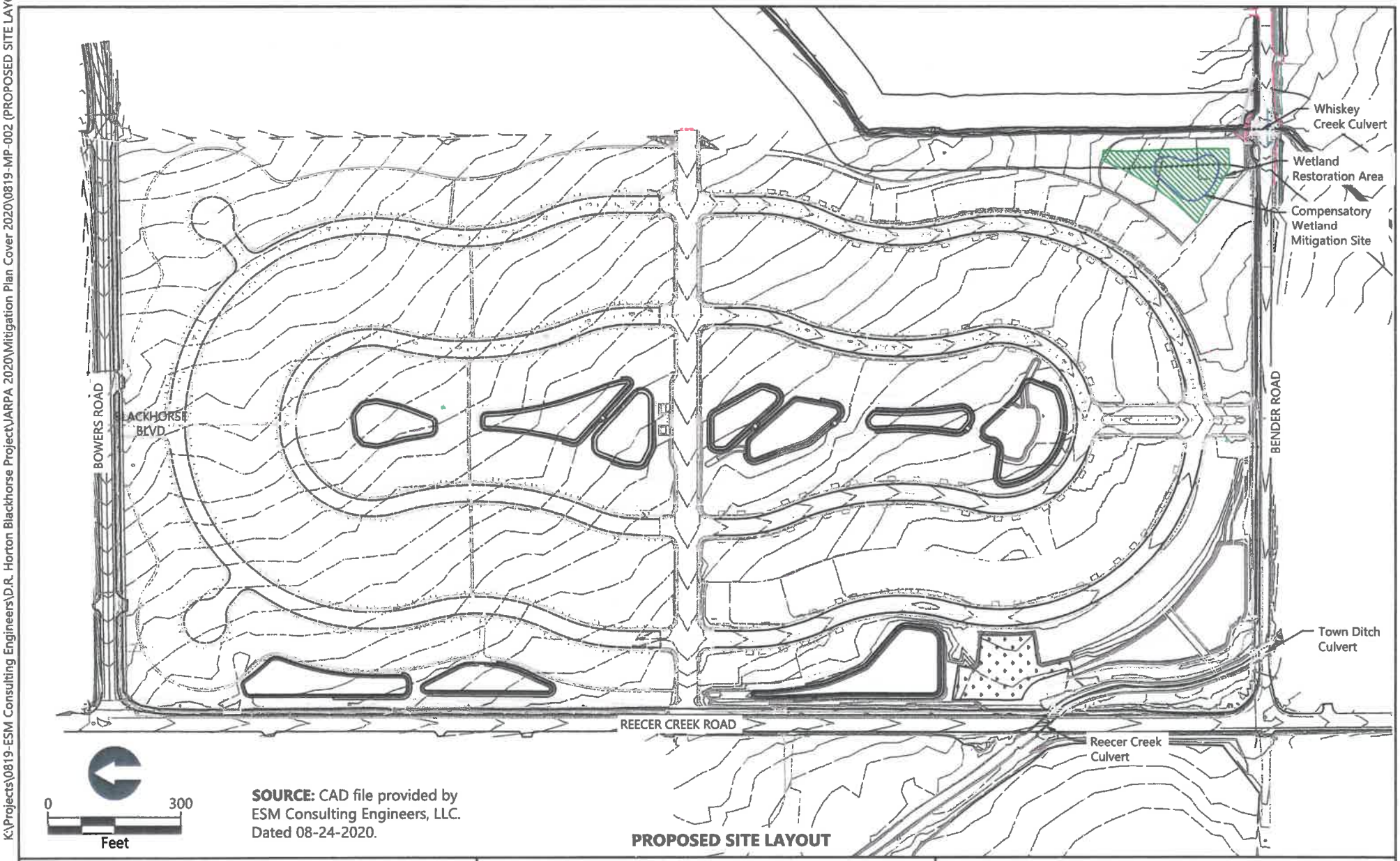
PURPOSE: WETLAND MITIGATION FOR DEVELOPMENT IMPACTS

DATUM: NAVD88
LATITUDE: 47.024781
LONGITUDE: -122.89142
S-T-R: 27-18N-18E

IN: ELLENSBURG
NEAR/AT: WHISKEY CREEK AND THE TOWN DITCH
COUNTY: KITTITAS
STATE: WASHINGTON

DATE: OCTOBER 2020

ANCHOR QEA
1201 3rd Ave, Suite 2600
Seattle, WA 98101
206-287-9130



SOURCE: CAD file provided by ESM Consulting Engineers, LLC. Dated 08-24-2020.

PROPOSED SITE LAYOUT

REFERENCE #: NWS-2008-76

APPLICANT: D.R. HORTON

LOCATION: 1406 WEST BENDER ROAD
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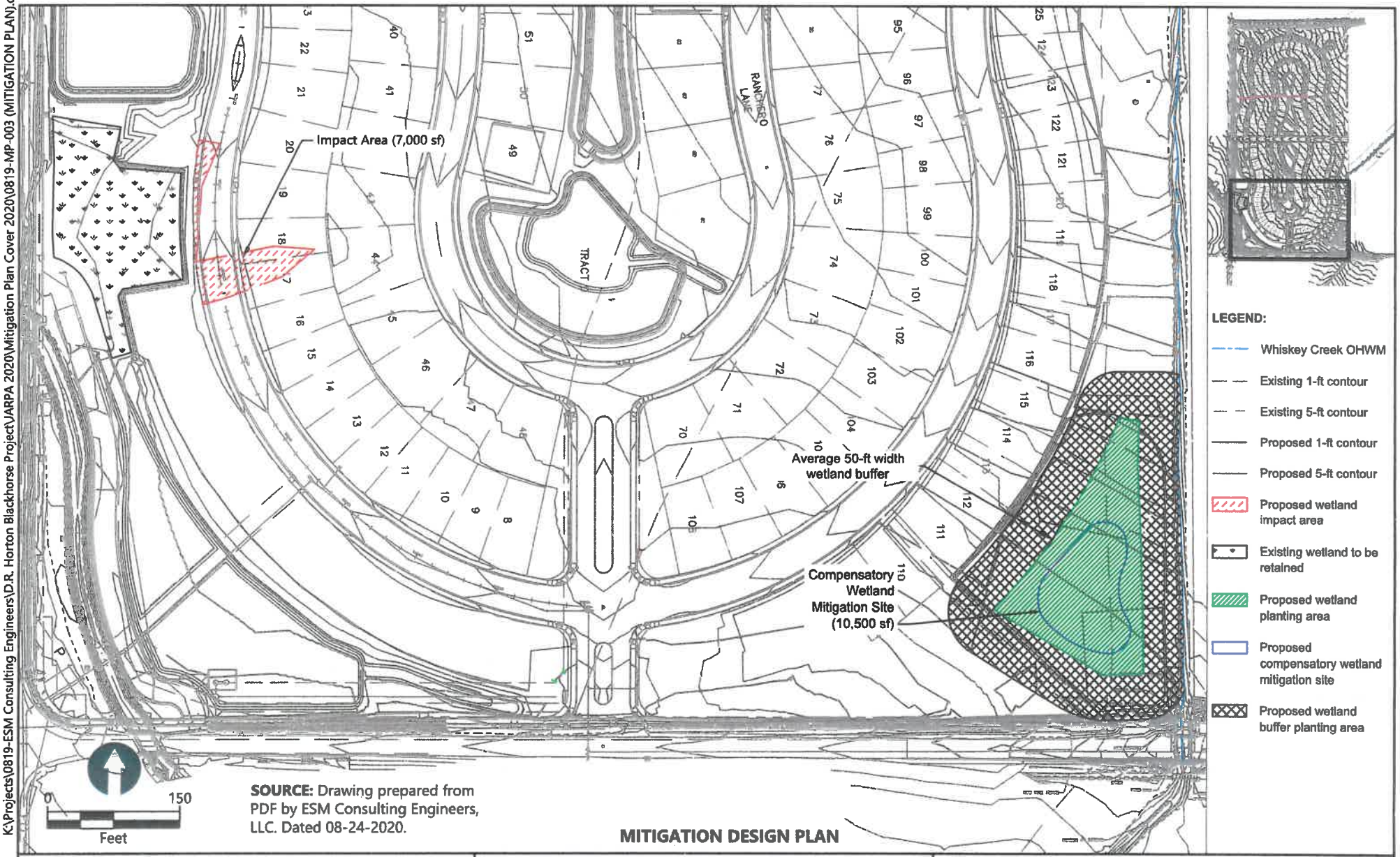

SOURCE: Drawing prepared from PDF by ESM Consulting Engineers, LLC. Dated 08-24-2020.

MITIGATION DESIGN PLAN

REFERENCE #: NWS-2008-76

APPLICANT: D.R. HORTON

LOCATION: 1406 WEST BENDER ROAD
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NAME: BLACK HORSE AT WHISKEY CREEK DEVELOPMENT
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PROPOSED: WETLAND MITIGATION DESIGN

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1201 3rd Ave, Suite 2600
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SOURCE: Drawing prepared from survey and design base files provided by ESM Consulting Engineers, LLC
VERTICAL DATUM: NAVD88

PLANTING PLAN

REFERENCE #: NWS-2008-76

APPLICANT: D.R. HORTON

LOCATION: 1406 WEST BENDER ROAD
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Wetland Plant Schedule					
Symbol	Scientific Name	Common Name	Indicator Status	Size	Spacing
Trees					
⊘	*Alnus incana*	Grey alder	FAC-	2 gal.	12' O.C.
⊛	*Populus trichocarpa*	Black cottonwood	FAC	2 gal.	10' O.C.
⊙	*Salix lasiandra*	Pacific willow	FACW+	Livestake	2' O.C.
Shrubs					
COSE	*Cornus sericea*	Red-osier dogwood	FACW	1 gal.	6' O.C.
ROPI	*Rosa pisocarpa*	Swamp rose	FAC	1 gal.	6' O.C.
SAEX	*Salix exigua*	Coyote willow	OBL	Livestake	6' O.C.
SAME	*Salix melanopsis*	Dusky willow	OBL	Livestake	6' O.C.

Buffer Plant Schedule					
Symbol	Scientific Name	Common Name	Indicator Status	Size	Spacing
Trees					
⊘	*Alnus incana*	Grey alder	FAC-	2 gal.	As shown
⊛	*Populus trichocarpa*	Black cottonwood	FAC	2 gal.	As shown
Shrubs					
AMAL	*Amelanchier alnifolia*	Serviceberry	FACU	1 gal.	6'O.C.
COSE	*Cornus sericea*	Red-osier dogwood	FACW	1 gal.	6' O.C.
CRDO	*Crataegus douglasii*	Black hawthorne	FAC	1 gal.	6' O.C.
RIAU	*Ribes aureum*	Golden currant	FAC	1 gal.	6' O.C.
ROWO	*Rosa woodsii*	Wood rose	FACU	1 gal.	6' O.C.
SASC	*Salix scouleriana*	Scouler's willow	FAC	Livestake	6' O.C.

Mitigation Area Plant Schedule						
Symbol	Scientific Name	Common Name	Indicator Status	Size	Spacing	Notes
Trees						
⊘	*Alnus incana*	Grey alder	FAC-	2 gal.	As shown	
⊛	*Populus trichocarpa*	Black cottonwood	FAC	2 gal.	As shown	
⊙	*Salix lasiandra*	Pacific willow	FACW+	Livestake	As shown	Each symbol represents 3 livestakes together spaced 2' O.C.
Shrubs						
COSE	*Cornus sericea*	Red-osier dogwood	FACW	1 gal.	4' O.C.	
ROPI	*Rosa pisocarpa*	Swamp rose	FAC	1 gal.	4' O.C.	
SAEX	*Salix exigua*	Coyote willow	OBL	Livestake	2' O.C.	
SAME	*Salix melanopsis*	Dusky willow	OBL	Livestake	2' O.C.	

Wetland Seed Mix		
Scientific Name	Common Name	Percent
Alopercurus geniculatus	Water foxtail	40
Glyceria occidentalis	Western mannagrass	60
Buffer Seed Mix		
Bromus carinatus	California brome	30
Elymus glaucus	Blue wildrye	40
Agropyron spicatum	Bluebunch wheatgrass	30

NOTES: Place 6" buffer topsoil in all buffer creation planting areas. Place 6" wetland topsoil in all wetland creation planting areas. Place 3" mulch in all planting areas. Refer to Figure 7 through 10 for planting guidelines.

PLANTING SCHEDULE

REFERENCE #: NWS-2008-76

APPLICANT: D.R. HORTON

LOCATION: 1406 WEST BENDER ROAD
ELLENSBURG, WASHINGTON 98926

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WETLAND MITIGATION

PROPOSED: WETLAND MITIGATION DESIGN

PURPOSE: WETLAND MITIGATION FOR DEVELOPMENT IMPACTS

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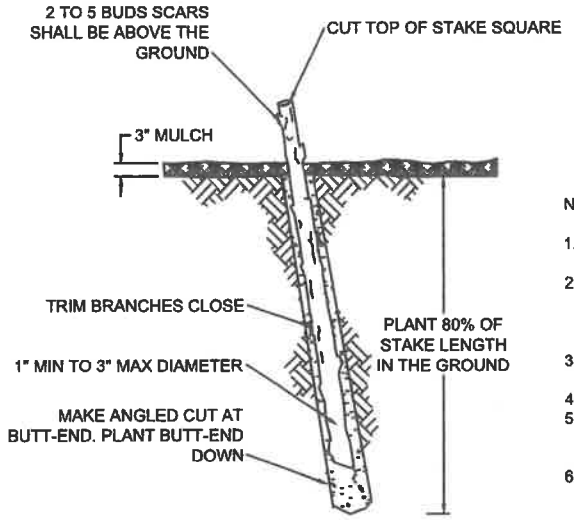
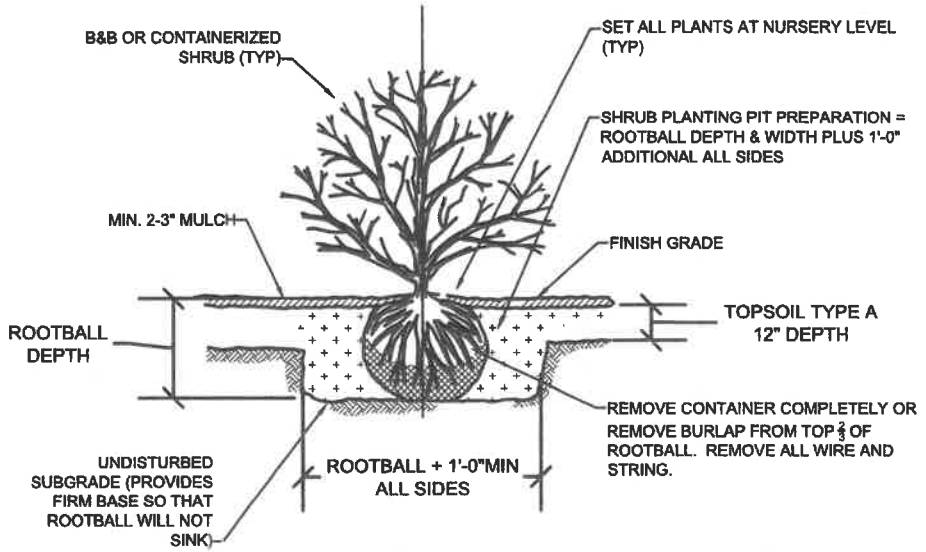


NOTES:

1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION, USE A PILOT BAR IN FIRM SOILS.
3. SOAK CUTTINGS CONTINUOUSLY PRIOR TO INSTALLATION.
4. TAMP THE SOIL AROUND THE STAKE.
5. ONLY NURSERY GROWN STOCK SHALL BE USED. HARVESTING OF WILD PLANTS IS NOT ACCEPTABLE.
6. USE EQUAL NUMBER AND EVEN DISTRIBUTION OF EACH WILLOW SPECIES.

1 - LIVE STAKE PLANTING
SCALE:NTS



2 - TREE AND SHRUB PLANTING
SCALE:NTS

PLANTING DETAILS

REFERENCE #: NWS-2008-76

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ADJACENT PROPERTY OWNERS:
1 - BIVENS, OLIVER L & DONNA J
2 - CARMEN, JULIE D, & WILEY, MARC R
3 - SEE ATTACHMENT C FOR ADJACENT PROPERTY OWNERS

NAME: BLACK HORSE AT WHISKEY CREEK DEVELOPMENT
WETLAND MITIGATION

PROPOSED: WETLAND MITIGATION DESIGN

PURPOSE: WETLAND MITIGATION FOR DEVELOPMENT IMPACTS

DATUM: NAVD88
LATITUDE: 47.024781
LONGITUDE: -122.89142
S-T-R: 27-18N-18E

IN: ELLENSBURG
NEAR/AT: WHISKEY CREEK AND THE TOWN DITCH
COUNTY: KITTITAS
STATE: WASHINGTON

DATE: OCTOBER 2020

ANCHOR QEA
1201 3rd Ave, Suite 2600
Seattle, WA 98101
206-287-9130

SITE CLEARING

- Mark clearing units for approval by the Owner prior to commencing clearing.
- Preserve and provide protection for:
  - Adjacent facilities: Exercise extreme care to prevent damage to adjacent facilities that are to remain.
  - Monuments: Carefully maintain benchmarks, monuments, and other reference points. If disturbed or destroyed, replace as directed. Note the position of all monuments on the As-Built Drawings. Maintain at least two benchmarks on the site that are at least 500-feet apart from one another and that are established by a professional land surveyor, licensed in the state of Washington.
  - Flag Existing Vegetation to Remain: The Contractor will notify the Engineer one week prior to beginning clearing or grading activities. The Engineer will flag existing trees/vegetation to remain within the clearing limits. Prior to grading, the Contractor shall install 4-foot-tall orange construction fencing around flagged existing trees/vegetation to remain (at the limits of clearing/grading). Fencing shall remain in place until the completion of earthwork, and removal shall be approved by the Engineer. Any living woody plant that is damaged during construction shall be treated within 24 hours of occurrence. The Engineer shall be notified immediately of any damage incident. The Contractor shall perform wound shaping treatment, which includes, but is not limited to, evenly cutting broken branches, exposed roots, and damaged tree bark immediately after damage occurs. Injured plants shall be thoroughly watered and additional measures shall be taken, as appropriate, to aid in plant survivability. Protect trees and shrubs in accordance with Paragraph 3.07 and Section 329310 – Tree and Shrub Protection.
  - Manually Remove Invasive Species, Protect Native Species: The Contractor will limit work to the use of hand tools, such as weed wrenches and mattdux picks, to clear and grub invasive vegetation without damaging the above ground or below ground native vegetation. Use of mechanical equipment in these areas shall not occur without prior approval of the Engineer.
  - Remove vegetation only as required. Do not do an initial general clearing and grubbing of site that leaves areas exposed that will not have immediate follow-up construction.
  - All temporary and erosion control measures must be in place prior to clearing and grubbing.
  - Contractor shall adhere to City of Ellensburg seasonal restrictions for land clearing.

GRUBBING

- In areas indicated for removal of invasive material and topsoil on the Drawings, the Contractor shall grub deep enough to remove all roots and other vegetative material or to the depth shown on the plans whichever is greater.
- Any grubbed material containing non-native and invasive seed or plant material, such as reed canary grass or Himalayan blackberry shall be removed immediately from the site for disposal at an approved off-site location. This material shall not be stockpiled in areas outside the identified buffer area. Care shall be taken to prevent the spread of weed seed and other vegetative material
- The Engineer will flag, and the Contractor shall protect, existing native vegetation in this area to remain. This selective clearing will require hand work.
- Perform clearing and grubbing in advance of trenching, excavation, and grading work.

DISPOSAL OF CLEARED MATERIAL AND NATIVE TOPSOIL

- Remove and legally dispose of all cleared material from the mitigation area to an approved off-site location. The Contractor, in a manner consistent with all government regulations, shall dispose of the refuse resulting from clearing and grubbing. In no case shall refuse material be left on the project site, or be buried in embankments or trenches on the project site unless directed otherwise by the Owner.

BUFFER TOPSOIL

Buffer topsoil shall conform of WSDOT specification 9-14.1(2) Topsoil Type B or meet the following specification:

The Topsoil Mix shall consist of 60 percent Sand Component and 40 percent Composted Organic Amendment by volume and shall meet or exceed the following specifications.

The Sand Component shall meet the following specifications within reasonable variations:

Screen Size	Percent Passing
1/43/8"	100
#46	99
#10	65
#20 #18	35
#40 #20 + #35	<30
#40 + #60	<15
#100	2-10
#200	1-5

The Composted Organic Soil Amendment Component shall meet the following specifications within reasonable variations:

The Composted Organic Amendment shall consist of 100 percent decomposed organic mulch material, and shall consist of yard waste debris or other organic waste materials that have been sorted, ground up, aerated, and aged, and shall be fully composted, stable, and mature (non-aerobic). The composting process shall be for at least 6 months' time and the organic amendment shall have a uniform dark, soil-like appearance and consist of 100 percent recycled content. In addition, the organic amendment shall have the following physical characteristics:

- Shall be certified by the U.S. Composting Council STA program.
- Shall be fully mature and stable before usage.
- Shall be screened using a sieve no finer than 1/4-inch and no greater than 1/2-inch. Based on dry weight of total organic amendment sample, it must comply with the following percent by weight passing:

Sieve Size	Percent Passing
2"	100
1"	99
5/8"	90-100
¼"	70-100

- Meets "composted materials" definition in Washington Administrative Code (WAC) 173-350 Section 220, available at: http://www.ecy.wa.gov/programs/swfa/compost/
- Has Organic Matter Content 40 to 60 percent, by weight, and Carbon to Nitrogen ratio of 20:1 to 30:1.
- Shall have heavy metal concentrations below the Washington State Department of Agriculture (WSDA) per year load limits as follows:

Metal	WSDA – Maximum pounds per acre per year
Arsenic	0.297
Cadmium	0.079
Cobalt	0.594
Lead	1.981
Mercury	0.019
Molybdenum	0.079
Nickel	0.713
Selenium	0.055
Zinc	7.329

PLANTING GUIDELINES

REFERENCE #: NWS-2008-76

APPLICANT: D.R. HORTON

LOCATION: 1406 WEST BENDER ROAD
ELLENSBURG, WASHINGTON 98926

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- Shall be certified by PITRP guidelines for composting as established by EPA.

The Topsoil Mix shall also have the following characteristics:

- The pH range shall be from 5.5 to 7.5.
- The Sodium Adsorption Ratio shall be less than 6.0.
- The Saturation Extract Concentration of Boron shall be less than 1.0 part per million (ppm).
- The Water Percolation/Infiltration Rate of the disturbed soil sample shall be a minimum of 0.4 inches per hour.
- The Soil Structure shall be loose, friable, and not subject to consolidation or compaction.
- The soil mix shall contain less than 100 plant parasitic nematodes per 100 cubic centimeters (cc) of soil.
- The soil mix shall be relatively free of soil-borne plant pathogens.
- Minimal weed seed shall be present, based on germination testing of a representative sample.
- Non-soil components shall be less than 1 percent by volume (i.e., plastic, sticks, glass, etc.).

The Final Topsoil Mix shall contain sufficient quantities of available nitrogen, phosphorus, potassium, calcium, magnesium, sulfate, copper, zinc, manganese, iron, and boron to support normal plant growth. In the event of nutrient inadequacies, provisions shall be made to add required materials prior to planting.

The Contractor shall submit soil analysis results from soils testing laboratory to the Owner. Indicate source and obtain the Owner's approval before hauling to site (an analysis test of a 5 pound bag sample is required).

For available sources, refer to the current edition of the "Directory of Recycled Content Building and Construction Products" as published by the Clean Washington Center, Department of Trade and Economic Development, 2001 Sixth Avenue, Suite 2700, Seattle, WA 98121, Phone: 206-464-7040

WETLAND TOPSOIL

Wetland topsoil shall meet the following specification:

The Topsoil Mix shall consist of 60 percent Silt or Silty Loam Component and 40 percent Composted Organic Amendment by volume and shall meet or exceed the following specifications.

The Silt or Silty Loam Component shall meet the following specifications within reasonable variations:

Screen Size	Percent Passing
¾"	100
½"	98
¼"	85
#10	70
#18	50
#30	40
#60	30
#100	25
#200	<30
#270	<25
2 um	<20

The Composted Organic Amendment shall be consistent with the requirements described for the Buffer Topsoil.

PLACING TOPSOIL

1. Scarify or till subgrade to 4 inches depth. Entire surface should be disturbed by scarification. Do not scarify within drip line of existing trees to be retained. Amend soil to meet required organic content.
2. Rototill topsoil into prepared sub-grade in planting area. Rake out all rocks, roots, sticks and other debris larger than 1 inch diameter or sticks longer than 3 inches. Leave surface even and readily able to accommodate planting installation.

MULCH

Mulch should conform to WSDOT specification 9-14.4(3) Bark or Wood Chips which states: Bark or wood chip mulch shall be derived from Douglas fir, pine, or hemlock species. It shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or wood shavings shall not be used as mulch.

PLACING MULCH

Mulch shrub and groundcovers planting pits, shrub beds, and groundcover beds with required mulching material immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.

PLANT MATERIAL

Quality Assurance

- Provide and plant shrubs and groundcovers as shown on the Planting Plan. Comply with sizing and grading standards of the 2000 edition of "American Standard for Nursery Stock." Nomenclature shall conform to Hortus Third compiled by the L. H. Bailey Arboretum, Cornell University, 1976.
- All plants shall be nursery grown or collected materials that has been held in a nursery for at least one year. Nursery climatic conditions must be similar to those in the locality of the project. All plants shall be weed free at the time of planting. All plants shall be of normal habitat of growth, and shall be healthy, vigorous, and free o disease, insect eggs, and larvae.
- Stock furnished shall be at least the minimum size indicated in the Planting Schedule Larger stock is acceptable at no additional cost, and providing that the larger plants will not be cut back to size indicated. Provide plants indicated by two measurements so that only a maximum of 25 percent are of the minimum size indicated and 75 percent are of the maximum size indicated.
- Shrubs and groundcovers of a size reduced from those specified will not be permitted unless approved by project wetland biologist.

Delivering, Storage, and Handling

- Deliver fertilizer materials in original, unopened, and undamaged containers showing weight, analysis, and name of manufacturer. Store in such a manner as to prevent wetting and deterioration of the fertilizer.
- Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock. On arrival, the certificate shall be filed with the Owner. Protect all plants from desiccation. Wilt-proof or another antidesicant shall be applied only with approval of the Owner. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Owner. Water heeled-in plantings daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.
- Cover plants transported on open vehicles with a protective covering to prevent wind-burn.
- Provide dry, loose soils for planting. Frozen or muddy soil is not acceptable.
- Stock shall be handled by root ball only, not the trunks, stems, or tops.

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Project Conditions

- Work notification: notify the Owner at least 5 working days prior to the installation of plant material.
- Protect existing utilities, paving, and other facilities from damage caused by planting operations.
- Do not install plant material when ambient temperatures may drop below 35 degrees F or above 80 degrees.
- Do not install plants when wind velocity exceeds 30 miles per hour.
- Confine work to designated areas. Do not disturb existing vegetation outside project limits and protect all trees, shrubs and ground covers within project limits not designated to be removed. Do not permit vehicular traffic or materials storage under or around new or existing trees.
- Once accepted on-site, all plants shall be protected at all times from animal damage, vandalism, drought damage, frost damage, and wind damage.

Sequencing and Scheduling

- Planting vegetation shall be performed during the period between October 1 and April 30. Planting at other times shall only be done by written permission by the Project Biologist.
- Plants that cannot be planted within one (1) day after arrival at mitigation site shall be "heeled-in" or otherwise stored temporarily in accordance with accepted horticultural practice in a manner that does not compromise the health of the plant material.

PLANT QUALITY

- General: Plants shall have all leaders and buds intact. Plants shall not have sunscalds, disfiguring knots, fresh cuts of limbs, damaged leader, or deformed trunk.
- Container Stock: Provide container stock grown in container long enough to provide a root system that reaches the edges of the container in which it has grown. Shrubs shall be well rooted and shall have sufficient root mass to hold together the soil, in which it is growing, when removed from the pot.
- Bare Root Stock: All bare root stock shall have heavy fibrous root systems. Unless otherwise approved by project wetland biologist and/or landscape architect, all bare root plants must be dormant at the time of planting.

PLANT INSTALLATION

1. Only personnel experienced in the installation of native plant materials shall perform planting and all planting shall occur under the direct supervision of a qualified supervisor. Adjust plant locations as necessary to best meet post-grading conditions. Planting locations will be checked by the project biologist prior to and/or during planting. A biologist from the design team shall be on-site for the planting.
2. Plants brought to the planting site shall be bare root, balled, and burlapped, or in containers, depending on how specified in the planting schedule in the Contract for the particular type of planting Material.
3. Plants shall not be planted during freezing weather or when the ground is frozen. Plants shall not be planted during excessively wet conditions. Plants shall not be placed on any day in which temperatures are forecast to exceed 80° unless the Owner approves otherwise. Plants shall not be placed in areas that are below finished grade.
4. Plants shall be removed from containers in a manner that prevents damage to the root system.
5. Containers may require vertical cuts down the full depth of the container to accommodate removal. All circling roots shall be loosened to ensure natural directional growth after planting.
6. Excavate circular plant pits with scarified vertical sides, except for plants specifically indicated to be planted in beds. Provide planting pits at least twice the diameter of the root system or container. Depth of pit shall accommodate the entire root system. Scarify the bottom and sides of the pit to a depth of 4 inches. If groundwater is encountered upon excavation of planting holes, the Contractor shall promptly notify the Owner.
7. Place specified planting soil for use around the balls and roots of the plants.
8. Install fertilizer packets around plant root balls based on plant size and manufacturer recommendations.
9. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. Set crown of plant material at the finish grade. No filling will be permitted around trunks or stems or above grafts on grafted plants. Backfill the planting pit with specified soil or amendment. Do not use frozen or muddy mixtures for backfilling. Form a ring of soil around the edge of each planting pit to retain water.
10. Space shrubs using triangular spacing in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants. Plant to within 18 inches of the trunks of shrubs within planting bed and to within 12 inches of edge of bed.
11. Spread and arrange roots of bare-rooted plants in their natural position. Work in specified planting soil. Do not mat roots together. Cut all broken and frayed roots before backfilling with remaining specified planting soil.
12. Pruning: Prune all plants only to remove broken or damaged branches, or for aesthetic purposes as directed by the Owner. Branches will be pruned at the branch collar. Neither stubs nor flush cuts will be acceptable.
13. All plants are to be watered within 24 hours of planting.

WARRANTY

- Warrant plant material to remain alive and be in healthy, vigorous condition for a period of one year after the date of Physical Completion. Inspection of plants will be made by the Engineer at the completion of planting.
- Replace, in accordance with the drawings and specifications, all plants that are dead or, as determined by the Engineer, are in an unhealthy or unsightly condition, and have lost their natural shape due to dead branches, or other causes due to the Contractor's negligence. The cost of such replacement(s) is at the Contractor's expense. Warrant all replacement plants for one year after Physical Completion, unless otherwise specified.
- Warranty shall not include damage or loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightning storms, or winds over 75 MPH, winter kill caused by extreme cold and severe winter conditions not typical of planting area; acts of vandalism or negligence on the part of the Owner.
- Remove and immediately replace all plants, as determined by the Engineer, to be unsatisfactory during the initial planting installation.
- This warranty also applies to existing trees, shrubs, and ground covers that are to be removed and heeled-in for later replanting on site.

PHYSICAL COMPLETION

1. Upon completion of plantings, the Contractor shall request an inspection by the Owner. The Owner will then make an inspection and either accept the plantings or make a list noting remaining items to be corrected or completed to conform to the Contract Documents. The Contractor shall then complete or correct all items and request another inspection. Upon written acceptance by the Owner, the plant establishment period will begin.
2. During this period, the Contractor shall maintain a healthy growing condition for all plant materials through irrigation, weeding, plant replacement, and other necessary maintenance operations. Plants shall be inspected by the Contractor at least once per week during the growing season and maintenance performed promptly. Planting beds shall be kept free of all weeds, grass, and other undesirable vegetation growth. Invasive, non-native weeds and plants including, but not limited to, reed canary grass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus armeniacus*) shall be removed and disposed of offsite. Removal of all weeds and invasive vegetation within the planting area shall be completed a minimum of three times during the growing

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season; once each in April, June, and September. Dead or impaired plants shall be replaced promptly during specified planting seasons. Maintenance period plant substitution as approved by the Owner will be allowed at the time of placement. If determined necessary by the Owner, plant protection from herbivores will be required.

MAINTENANCE

1. The Contractor shall maintain all plant materials covered under this contract for a period of 1 year from acceptance of proper plantings installation.
2. Maintenance shall include irrigation, cultivating, weeding, and plant replacement as necessary.
   a. Reset settled plants to proper grade and position. Restore planting saucer and adjacent material and remove dead material.
   b. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit.
3. Plants shall be inspected by the Contractor at least once per week during the growing season and maintenance performed promptly. Planting beds shall be kept free of all weeds, grass, and other undesirable vegetation growth. Invasive, non-native weeds and plants including, but not limited to, reed canary grass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus armeniacus*) shall be removed and disposed of offsite.
4. Removal of all weeds and invasive vegetation within the planting area shall be completed a minimum of three times during the growing season; once each in April, June, and September. Dead or impaired plants shall be replaced promptly during specified planting seasons. Maintenance period plant substitution as approved by the Owner will be allowed at the time of placement. If determined necessary by the Owner, plant protection from herbivores will be required.

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