MEMORANDUM

To: Cordata Business Park Association, Applicant

From: Molly Porter, PWS, Northwest Ecological Services (NES)

Date: July 25, 2023

RE: Critical Areas Summary and Beaver Management Plan for Cordata Parcels 380212 225390 and 380212 155415

BACKGROUND

Northwest Ecological Services, LLC (NES) was retained to assist the Cordata Business Park Association with preparation of a beaver management plan for wetlands within their property in the City limits of Bellingham, Washington (Section 12, Township 38N, Range 02E, W.M.) (Figure 1).

The review areas include two parcels, 380212 225390 and 380212 155415, that are generally located west of Cordata Parkway and north of June/ Stuart Road. The site is located between the Fir Ridge development to the north and the Festival development to the south. The subject parcels are dominated by a large wetland/ beaver pond complex.

The assessment performed by NES included a reconnaissance review for wetlands, streams, and protected fish and wildlife habitats, as observed within the review area. All information contained in this memo is based on available information and site conditions at the time of the site visit(s).

This memo is intended for inclusion with future wetland, stream, and wildlife habitat permit applications to the City of Bellingham, Washington State Department of Ecology (Ecology), Washington State Department of Fish and Wildlife (WDFW), and/or the U.S. Army Corps of Engineers (Corps), as may be required.

NES ecologists performed site visits in March and May of 2023 to document current site conditions. Photographs from the May site visit are attached to this memo.

CRITICAL AREA SUMMARY

Wetlands

Document Review

- **WDFW PHS**
  WDFW Priority Habitat and Species (PHS) mapping indicates wetland in the northern portion of the site in the location of the northern pond, but the south pond/wetland is not mapped by WDFW.
- **City of Bellingham City IQ (Figure 2)**
  The majority of both parcels are mapped as wetland in City IQ. This mapping is based on a delineation performed by Element Solutions in 2017. In reviewing their report, it appears only a small portion of the property on the southeastern edge of the wetland was actually delineated, the remainder was estimated for the purposes of wetland ratings.

Field Observations

A large wetland/ beaver pond complex spans both parcels. Figure 2 is the COB City IQ mapping of this wetland complex. NES did not delineate the wetlands for this assessment, but a site reconnaissance was performed. The wetland boundaries are generally consistent with the 2017 assessment, with minor adjustments shown in Figure 3.

The wetland is a large 14+/- acre depressional wetland. It includes forested, scrub-shrub, and emergent components, and permanently ponded open water. Species observed included red alder (*Alnus rubra*), quaking aspen (*Populus tremuloides*), black cottonwood (*P. balsamifera*), western red cedar (*Thuja plicata*), willow (*Salix sp*., mainly *sitchensis*), hardhack (*Spiraea douglasii*), and black twinberry (*Lonicera involucrata*). Much of the emergent community is dominated by common cattail (*Typha latifolia*) and invasive species, including reed canarygrass (*Phalaris arundinacea*) and yellow flag iris (*Iris pseudacorus*). The buffer is primarily mowed lawn or thickets of invasive Himalayan blackberry (*Rubus armeniacus*). Some areas of native vegetation are also present in the buffer, mainly on a forested hillslope on the north end of the south pond.

Fish and Wildlife Habitat Conservation Areas (HCAs)

Document Review

- **WDFW SalmonScape**
  SalmonScape maps a tributary of Bear Creek flowing though the site and out of the ponds at southwestern extent. This stream is mapped as gradient accessible to a number of salmonids from Cordata Park trail near the western review area boundary to the west.
- **WDFW PHS**
  WDFW PHS mapping indicates a tributary of Bear Creek flowing thought the site, but

flowing out of the ponds at the northwestern extent, not to the south. Fish presence is not indicated.

- **City of Bellingham CityIQ**
  City mapping is consistent with WDFW maps, indicating a tributary to Bear Creek flowing through the site wetlands, and City mapping indicates streams flowing from both the northwest and southwestern ponds.

  The site is not mapped with recommended protection actions by COB in the 2015 Bellingham Habitat Restoration Technical Assessment. The site is also not mapped as an important wildlife habitat area in the 2021 Wildlife Corridor Analysis; however it immediately abuts one to the west.

Field Observations

A tributary of Bear Creek originates from the ponds as mapped. Based on NES observations for this project and past assessments in the area, we believe the primary outlet from the ponds is a man-made outlet (culvert) in the northeastern corner of the site. This culvert outfalls to a ditch to the north, then flows to additional wetlands and a tributary of Bear Creek located just north of the property (Figure 3). A second outlet is also present, where a stream also flows out of the northwestern corner of the ponds to the northwest (Figure 3). No outlets were observed on the southern pond. If one is present, it is a buried culvert that could not be located.

No fish were observed in the wetland/ ponds, but observations were very limited and fish could exist due to downstream presence. The offsite streams were not directly observed by NES.

No state or federal Threatened, Endangered, or Candidate species or habitat or Priority species (other than wetland) were observed within the review area.

North American beaver (*Castor canadensis*) activity was noted throughout the site. Chew was observed on numerous trees throughout the wetland. Beavers Northwest surveyed the ponds in a canoe and located two lodges in the southern pond. At the time of the May site visit, there were two main dams on the ponds, one at the northern extent of each (approximate locations shown in Figure 3). Three smaller secondary dams were also observed on the narrower wetland swale between the two larger ponds, and one additional smaller dam was seen on the outlet to the stream at the northwestern edge of the north pond (Figure 3).

REGULATIONS

The wetland/ pond complex is anticipated to be regulated by the City of Bellingham, Ecology, Corps of Engineers, and WDFW.

City of Bellingham

The COB regulates all wetlands, regardless of size or category. The COB CAO states that no activity may be conducted within a regulated wetland, stream, or buffer without critical areas review and approval. Activities impacting regulated wetlands generally must provide mitigation sufficient to maintain or enhance the wetland functions.

The COB requires a buffer around regulated critical areas to protect functions. The buffer must remain naturally vegetated except where it can be enhanced to improve the functions. Wetland buffers are measured from the wetland edge. Standard wetland buffer widths are determined according to proposed or existing land use intensity, the overall wetland category, and the habitat rating (from the 2014 Ecology Wetland Rating System). Current wetland ratings and buffers for this site have not been determined at this time.

The COB regulates streams as HCAs. COB also requires a buffer around regulated HCAs to protect functions.

The COB requires that buildings and other structures be set back a minimum of 15 feet from the edge of critical area buffers, or from the critical areas where no buffer is required (BMC 16.55.340(G)). Uses allowed within the 15-foot setback include: landscaping; uncovered decks; building overhangs; impervious surfaces such as driveways, roads, parking lots, and patios, provided that they conform to applicable water quality standards and that construction equipment does not enter or damage the buffer or critical area. Clearing and grading and wells are also allowed within the setback.

Washington State Department of Ecology

Ecology has authority over discharge into all wetlands (including isolated wetlands) and streams and can impose buffers and compensatory mitigation for impacts. Ecology reviews all permits received by the Corps for 401 Water Quality Certification. Ecology requires an "individual" review of all wetland disturbances greater than one-half acre. Water Quality Certification is required for all Individual Permit applications.

Washington Department of Fish and Wildlife

WDFW requires issuance of a Hydraulic Project Approval (HPA) prior to any activities that may directly or indirectly affect streams or associated wetlands.

Army Corps of Engineers

The Corps regulates the discharge of dredged or fill material into all waters of the United States (WOTUS), including wetlands, under Section 404 of the clean water act (CWA). The Corps regulates the construction of any structure and/or work in or affecting the course, condition, or capacity of navigable water of the United States under Section 10 of the Rivers and Harbors Act of 1899. The Corps requires pre-construction notification for all disturbances to wetlands, streams, and potentially to other drainages (ditches) prior to commencing any work. It is incumbent upon the landowner to disclose disturbances.

The 1972 amendments to the CWA established federal jurisdiction over "navigable waters", defined as WOTUS (CWA Section 502[7]). The CWA gives authority for defining WOTUS in regulations to the two federal agencies charged with enforcement of the CWA – the Environmental Protection Agency (EPA) and Corps (EPA, 2023). The interpretation of WOTUS and thereby the scope of waters federally regulated under the CWA, has gone through decades of litigation.

In May of 2023, the U.S. Supreme Court issued a decision on more recent litigation, Sackett v. EPA. It appears that the Court has adopted the "relatively permanent" standard from Rapanos vs. United States to define WOTUS and eliminated a significant nexus as a basis for jurisdiction (NAWM, 2023). Under Rapanos, WOTUS ''include [ ] only those relatively permanent, standing or continuously flowing bodies of water 'forming geographic features' that are described in ordinary parlance as 'streams[,] . . . oceans, rivers, [and] lakes,'" and "wetlands with a continuous surface connection" to a "relatively permanent body of water connected to traditional interstate navigable waters." (EPA, 2023). Traditionally Navigable Waters (TNWs) are navigable water protected under Section 10 of the Rivers and Harbors Act of 1899 or other waters currently or historically used or susceptible to use in interstate or foreign commerce. Under Rapanos, Relatively Permanent Water (RPW) is a surface stream or river that exhibits continuous flow of more than three months out of the year and is connected to a TNW.

The Sackett decision holds that WOTUS includes only those "wetlands with a continuous surface connection to bodies that are 'waters of the United States' in their own right," so that they are "as a practical matter indistinguishable from waters of the United States." Therefore, at this time, in order for a wetland to be jurisdictional under the CWA, it must meet two requirements: (1) have a continuous surface connection to a WOTUS and (2) be practically indistinguishable from that ocean, river, stream, or lake (NAWM and SWS, 2023).

Activities in Waters of the United States that require Corps authorization may qualify for authorization under one of the general Nationwide Permits (NWPs) if the activities meet the criteria. In the more commonly used NWPs, discharge (fill) is limited to under 1/2 acre of wetland, 300 linear feet of stream, and 1/3 acre of tidal waters. Discharge exceeding the NWP thresholds requires an Individual Permit from the Corps. Mitigation is required for most activities. The Corps also has discretion to disallow disturbance to high quality wetlands. As part of their permit review, the Corps must verify the project complies with Section 7 of the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, and Section 106 of the National Historic Preservation Act, (including archeological sites).

Only the agencies have the authority to make jurisdictional determinations.

BEAVER MANAGEMENT PLAN

Ongoing beaver activity has continued to expand the wetland/ pond complex on the property over the last year. Due to the pond expansion, the surrounding property is at risk of damage due to the extent of ponding and possible hazard trees.

Expansion of the ponds has resulted in water encroaching very close to existing infrastructure. Two areas that are currently most at risk are the building at 615 West Horton Way on the north end of the site and a sewer line adjacent to the southern pond (Figure 3). In March, water levels had risen to only a few feet from the foundation of the north building. In May, notching of the dam lowered the water to approximately 10 feet away. The second issue is a City sewer manhole in the southern portion of the site (Figure 3). In March, water was inches away from flowing into the sewer line/manhole before the dam in this location was notched to drop the water in the pond, which was two feet away in May.

The Cordata Business Park Association has engaged with the current project team (AVT Consulting, Bennett Engineering, Beavers Northwest, and NES) to draft a beaver management plan that attempts to balance the needs of the surrounding community by protecting nearby homes and utilities, along with retaining habitat and conditions onsite that support the beaver population. This remainder of this document outlines a management plan that is a result of input from all aforementioned parties.

In order to manage water levels within the ponds it is proposed that two pond levelers be installed, one at each of the primary dams. Pond leveler details are shown in Figure 4- attached Bennett Engineering Drawings.

Another consideration is that the onsite wetland receives stormwater runoff and provides stormwater detention for the surrounding area. Existing weirs were installed on the wetland outlets from the ponds between 1995 and 1996, based on the stormwater design by David Evans and Associates. Bennett Engineering was engaged to provide project drawings and review the management plan in order to ensure any modifications maintain the existing stormwater storage capacity of the site.

Careful consideration went into the proposed elevations of the pond levelers in order to ensure they draw down the ponds enough to protect surrounding infrastructure, retain the needed stormwater capacity within the wetlands, and also that the ponds are not lowered so much that they are likely to disturb the beavers. The design includes the water elevation of the northern pond from the surveyed elevation observed in March of 2023 by 1.7 feet, which is back to the historic elevation as documented during installation of the stormwater weirs. No lodges are located in this pond so it was determined this would not negatively affect beave use.

The design lowers the water elevation of the southern pond by no more than 0.9 feet, as any reduction beyond this would drop the water level below the entrance to the main lodge. This is slightly higher than the original water level, but is a compromise that is anticipated to not have a significant impact on either beaver habitat or stormwater capacity.

Both pond levelers will include 12 inches diameter pipes that allow the ponds to drain to the set elevation. Due to concerns with capacity, it was determined that two 12-inch pipes should be installed on each in order to convey the projected 25-year flow. In the event of a larger storm event, water would over top the dams until water recedes to the inlet height.

Additionally, the rim of the sewer manhole on the south pond will be raised as foot above the currently elevation to ensure water does not overtop into the sewer system.

We are presenting this plan as a programmatic plan and assume these management strategies can be implemented without continued permitting from the aforementioned agencies. We assume continued work can include: adjustments to the proposed levelers, potential installation of additional pond levelers between the two proposed, if need, and removal of hazard trees with replacement as stated below.

Direct Wetland Impacts

No direct wetland impacts are anticipated. The wetland/ pond boundary has likely expanded as a result of recent beaver activity. Installation of the pond levelers is not anticipated to result in a reduction in overall wetland function but they may reduce the overall size (or at minimum extent of inundation) back to something closer to the original 2017 mapping.

Vegetation Impacts

Considering the length of time beavers have been living onsite there has been very little change in the extent of woody vegetation around the ponds.

Much of the internal area of the wetland/ ponds is very difficult to access due to extensive ponding and/ or dense Himalayan blackberry thickets on the perimeter. In order to assess changes in vegetation due to beaver activity, NES walked the boundary and noted the number of dead trees and shrubs. Some of the dead trees (snags) appear to have been dead for some time (not due to recent beaver activity) and these were not counted. At least 12 dead trees, mainly red alder and at least one western red cedar, were observed that likely died recently due to recent increases in the water table. Additionally, at least 17 shrubs appear to have died for the same reason. Any number of other shrubs may have been cut and pulled by beavers to the lodges to be used as building material or food.

Aspen stands exist in the eastern and southern boundary of the ponds. A number of additional aspen trees were chewed down in each area, but also many continue to re-sprout. None of these trees appear negatively affected by higher water tables.

The adjacent residential community has expressed concern of hazard trees due to beaver activity. NES did not observe any dead or dying trees that appeared to be a risk of falling on infrastructure with the exception of possibly one aspen located north of the building at 5064 Festival Blvd. However, hazard tree risk may be constantly changing due to continued beaver chew. We recommend an arborist review the site regularly to assess risk; and that if trees need to be removed, they be cut into snags and replacement trees installed onsite as needed (see management recommendation below).

Additionally, the applicant has proposed to clean vegetation out of the ditch connecting the culvert on the north end of the north pond to other wetlands offsite. This ditch is the primary outlet for the wetland to the north and dense mats of cattail are likely impeding flow.

ACTION ITEMS

The beaver management plan includes the following elements:

- <u>Installation of two pond levelers as shown in attachments (Bennett Engineering).</u>
    - These will be installed in summer/ early fall 2023. Installation will be performed by or in consultation with staff from Beaver Northwest to ensure the structures are installed per plan.
    - Vegetation removal is limited to the area shown as “areas of disturbance” in the attached drawings. This includes removal of mainly invasive material including

blackberry, reed canarygrass, and yellow flag iris. No trees will be cut or removed. These areas will be replanted with willow stakes (see below).

- All disturbed soils shall be covered with woodchip mulch or hydroseed.
- All woody material shall be retained onsite and distributed elsewhere within the wetland edge.
- Long term maintenance will be needed to ensure pond levelers continue to function (see below).

- <u>Vegetation Management</u>
  - Clean out the ditch between the north pond and offsite wetlands. This includes digging out a thick cattail mat that is between 12 and 16 inches in depth.

    The ditch should be re-seeded with pasture grass or covered with erosion control fabric/ mats to limit erosion and not result in sediment downstream. It can alternatively be planted on one-foot centers with a native emergent plant such as slough sedge (*Carex obnupta*) or small-fruited bulrush (*Scirpus microcarpus*) to provide cover and prohibit re-establishment of cattail.
  - Install additional plant material in order to replace lost vegetation onsite. This includes:
    - Plant 35 willow at each of the areas disturbed around each pond leveler. Although vegetation removal is anticipated to mainly be blackberry native plantings are recommended to revegetate these areas.
    - Planting also includes installation of 30 native trees/ shrubs to replace those that have did due to inundation. These plants may be installed anywhere around the margins of the pond, but recommended locations are shown in Figure 3.
    - Plantings should be caged (individually or in groups) until they are established. After establishment the willows are likely to be browsed by beaver, but willows are very hearty and are anticipated to resprout.
  - Contract with an arborist to review the site annually or semiannually to determine if any hazard trees are present.
    - If any hazard tree removal is recommended, they shall be cut into snags rather than removed. Snags should be a minimum height of 20 feet. Depending on the number removed, some cut pieces could be retained as large woody debris.
    - For every tree removed, replace with two new seedings elsewhere around the ponds.
      - Recommended replacement species include western red cedar, and Sitka spruce, Douglas fir, or shore pine.

- Trees shall be installed with a ring of woodchip mulch and shall be installed in wire cages to prevent beaver damage. Cages shall be left on until trees are established, then removed (~ three years).
- Plants replacement trees in areas where beaver do not currently have access, such as on the far side blackberry hedges slightly away from the ponds, but still within the buffer (~150 ft) and in proximity that they would provide habitat over time.

PLANT INSTALLATION METHODS AND PROCEDURES

Plant Installation Standards

- Planting shall take place during the dormant season (between October 15th and April 1st). Bare root material may only be used between December 1st and March 15th.
- Contact NES to consult on placement as needed.

Source of Plant Material

- Plant material shall be obtained from native plant nurseries growing stock from the Puget Sound lowlands.
- Container plants are preferred for this project, however **if bare-root stock or stakes are used the plants numbers should be increased by 20% to compensate for increased mortality.**

Planting Guidelines

- Actual planting shall follow the digging of holes as closely as possible to prevent drying excavated soil. Each plant shall be placed in a hole and backfilled with native soil. The backfill shall be tamped firmly to remove voids in soil. Excess soil shall be smoothed and firmed around plants leaving a slight depression to collect water.
- Water all plants immediately after planting unless the soil is heavily wet.
- Plant 35 willows at each new pond leveler throughout the disturbed area. Other plantings shall be placed elsewhere in the buffer, with recommended planting areas shown in Figure 3.
- All plantings shall be installed in wire cages. Cages can be installed around individual or groups of plants. Cages shall be four feet high cand constructed of hardware cloth or other small wire mesh. Wire needs to be fixed to the ground with landscaping staples so beavers cannot crawl under. Add perpendicular stake with spacing at approximately six feet if larger areas of plants are caged.

The actual size of plant material may vary depending on availability. Table 1 details the planting specifications for the restoration planting areas.

Table 1. Wetland/ Buffer Restoration Planting Specifications

Scientific Name	Common Name	Condition	Grade (min.size)	Spacing	# Plants*
Salix sitchensis	Sitka willow	B/C/S	18" minimum/ one gallon	5' OC	70
Physocarpus capitatus	Pacific ninebark	B/C		15' OC	10
Rhamnus purshiana	Cascara	B/C			10
Picea sitchensis	Sitka spruce	B/C			10
Total					**100**

OC=On-center, B=bare-root, C=container, S= Livestake.

Woodchip Mulch

Apply mulch in a three (3)-foot diameter ring around all installed plant material. Mulch shall be applied in a "donut" around each plant with a depth of three (3) inches at the center grading to a depth of six (6) inches at each edge.

- No mulch shall be placed within one (1) inch of the plant stems but shall cover the root balls to the maximum possible extent;
- Mulch shall consist of clean hog fuel, woodchips with greens, woodchips with no greens, or coarse shredded bark (no beauty bark, no stump grindings);
- Woodchip size shall average between 1/4 and 1/2 inches thick and 1 to 3 inches long (thin cut pulp chips are ideal); and
- Mulch must be clean, free of materials detrimental to plant health and free of invasive plant seeds and soil.

As-Built, Monitoring, and Maintenance

As-Built Documentation

After project installation is complete, either staff from NES or Beavers Northwest shall submit as-built documentation to permitting agencies. The as-built shall document where minor site design changes to the plan were necessary, the final planting schedule, and photographs.

Monitoring and Maintenance

No long-term monitoring of the plantings are anticipated to be required, as this is not a compensatory mitigation project. However, long term maintenance of the pond levelers is needed to ensure they continue to function per plan.

As recommended in the Beavers NW memo (attached), maintenance site visits are recommended to occur every three to six months to assess if levelers are functioning as planned and if any new beaver activity has resulted in new impacts. It is anticipated Cordata Business Park Association maintenance staff will provide these site visits during their regular maintenance work onsite.

Maintenance site visits shall include:

- Removing debris from the pipe inlet or cage.
- Adjusting t-posts, securing pipes and fixing any other parts of the structure; as needed.
- Making observation of any new beaver activity, including monitoring for any new or increased activity between the two main dams.
- If significant activity is noted between the applicants may need to remove debris from these dams or install additional pond levelers.

ATTACHMENTS:

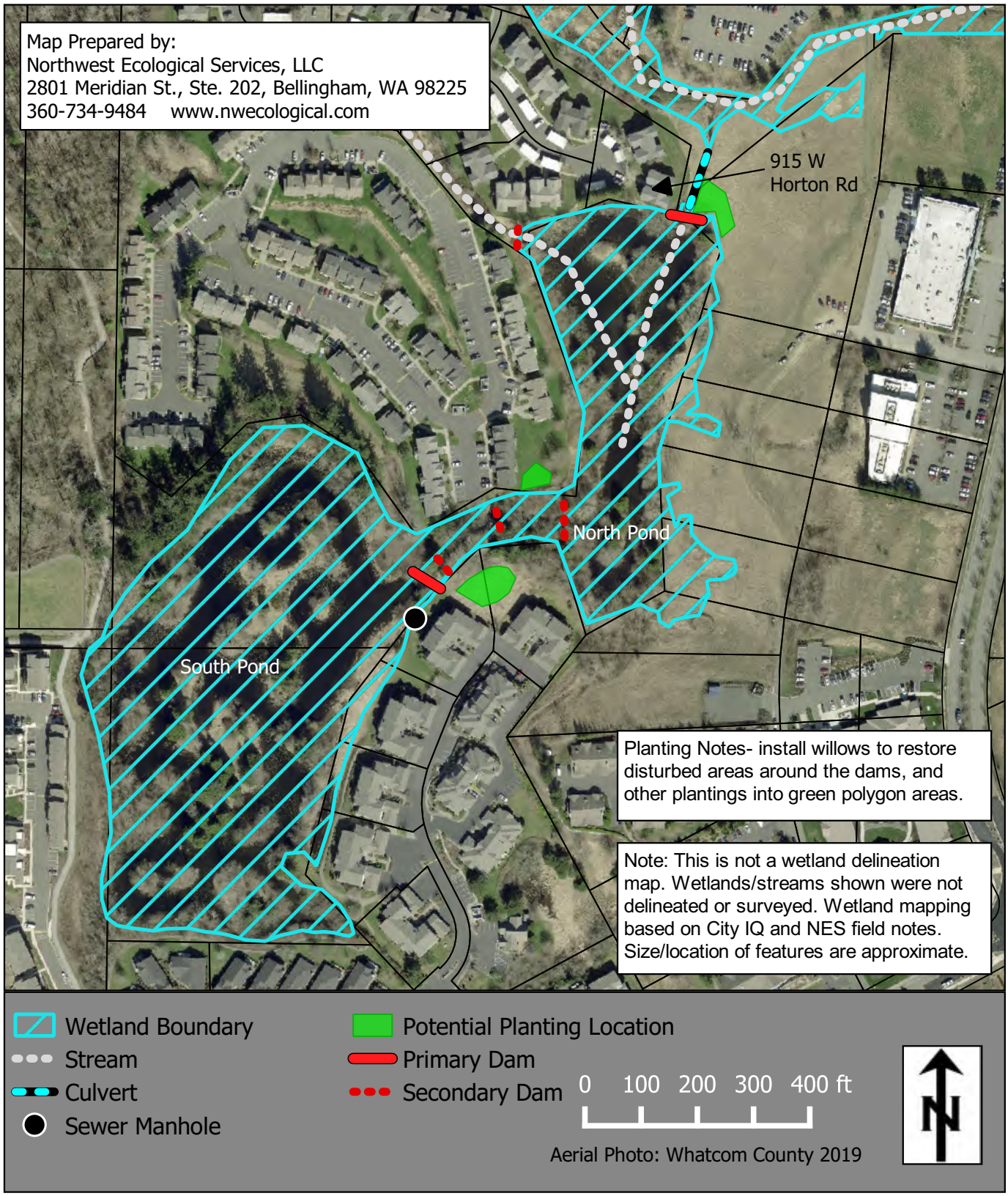
Figures

1. Vicinity Map
2. City IQ Critical Areas Map
3. NES Wetland Map with Project Notes (GIS)
4. Pond Leveler Details- Bennett Engineering

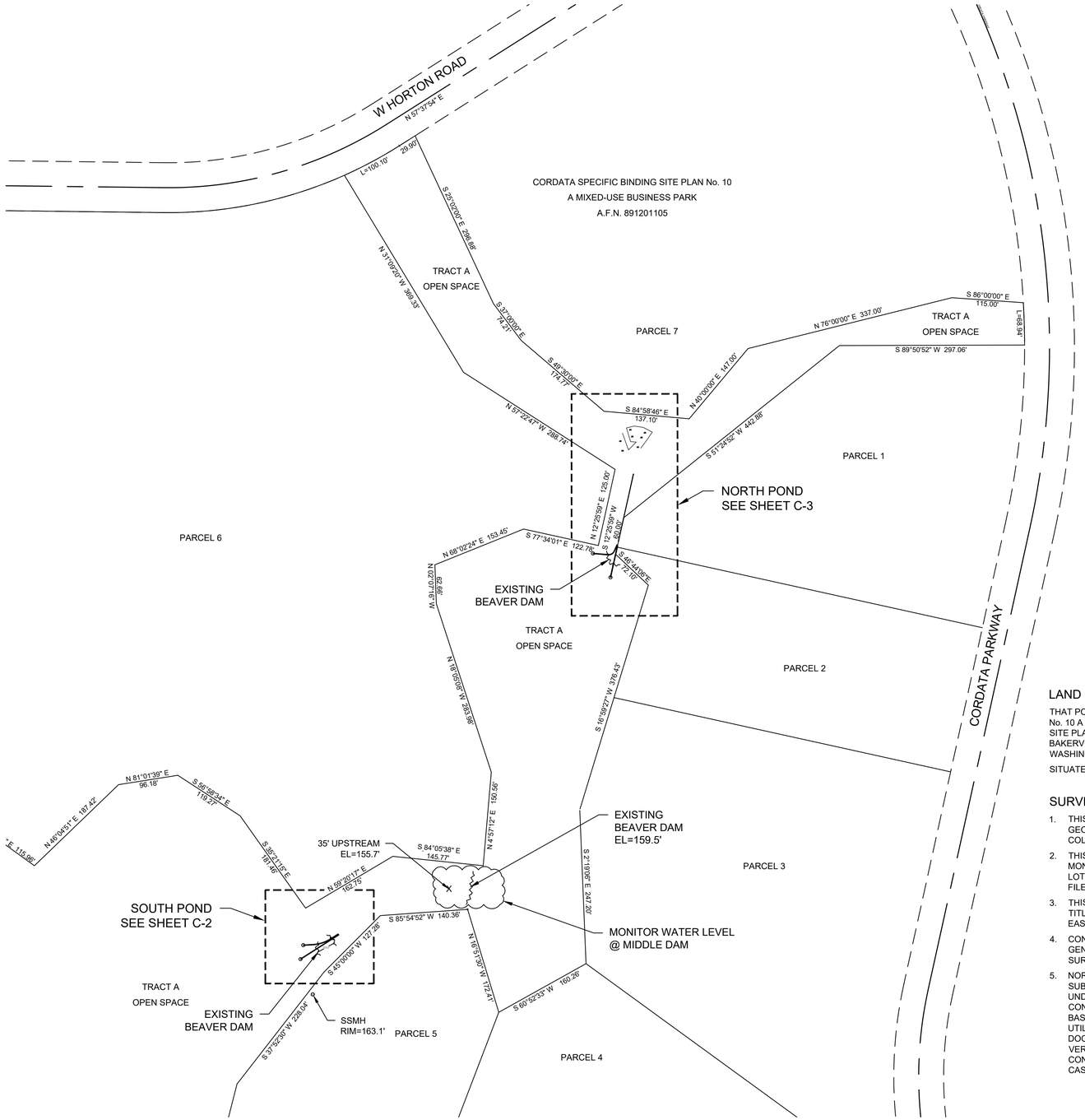
Photo Page
Beavers NW Memo

ECOLOGICAL NORTHWEST	**Vicinity Map** **(City IQ)** **Cordata Business Park** **Beaver Management Plan**	**Figure 1** **July 2023**

ECOLOGICAL NORTHWEST	**City Wetland Map** **(City IQ)** **Cordata Business Park** **Beaver Management Plan**	**Figure 2** **July 2023**



Northwest Ecological	**NES Wetland Map with project notes** **Cordata Business Park Beaver Management Plan**	**Figure 3** **July 2023**



GRAPHIC SCALE

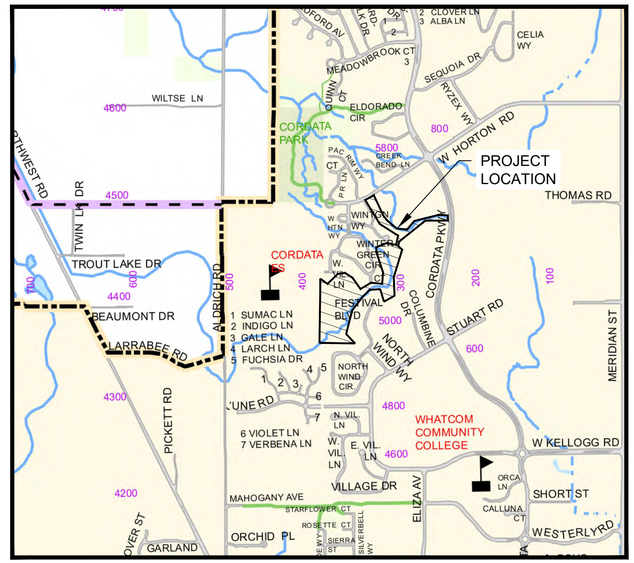
100 0 100 200

1 INCH = 100 FEET

VERTICAL DATUM: NAVD 88.

BASIS OF BEARINGS:

RECORD OF SURVEY FILED UNDER AF No. 891201105



VICINITY MAP
1" = 1000'

SHEET INDEX

LAND DESCRIPTION:

THAT PORTION OF TRACT A OF THE CORDATA SPECIFIC BINDING SITE PLAN No. 10 A MIXED-USE BUSINESS PARK AND RECORDED IN BOOK 1 OF BINDING SITE PLANS, PAGE 55, WHICH LIES WITHIN VACATED BLOCKS 50-71 OF THE BAKERVIEW ADDITION TO BELLINGHAM, RECORDS OF WHATCOM COUNTY, WASHINGTON.

SITUATE IN WHATCOM COUNTY, WASHINGTON.

SURVEYORS NOTES:

1. THIS SURVEY WAS PERFORMED BY STANDARD FIELD TRAVERSE USING A GEOMAX ZOOM90 TOTAL STATION WITH A CARLSON SURVEYOR PLUS COLLECTOR/FIELD COMPUTER IN JANUARY 2023.
2. THIS SURVEY TIED INTO PREVIOUS CONTROL IN THE AREA, STREET MONUMENTATION WITHIN CORDATA PARKWAY AND W. HORTON RD. AND LOT CORNERS AS SHOWN AND RELIED UPON THE RECORD OF SURVEY FILED UNDER AFN 891201105 FOR BASIS OF BEARINGS.
3. THIS SURVEY WAS COMPLETED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT AND DOES NOT PURPORT TO SHOW ANY OR ALL EASEMENTS THAT A CURRENT TITLE REPORT MIGHT REVEAL.
4. CONTOUR INTERVALS ARE 1 FOOT. CONTOURS ARE COMPUTER GENERATED FROM GROUND FIELD TOPOGRAPHY GATHERED FOR THIS SURVEY.
5. NORTHWEST SURVEYING & GPS INC. ASSUMES NO LIABILITY FOR ANY SUBSURFACE CONDITIONS OR UTILITIES NOT SHOWN HEREON. UNDERGROUND UTILITIES ARE KNOWN TO EXIST WITHIN THE AREA OF CONSTRUCTION. THE LOCATION OF EXISTING UTILITIES SHOWN ARE BASED UPON FIELD SURVEY AND VISUAL IDENTIFICATION. ALL EXISTING UTILITIES MAY NOT BE INDICATED WITHIN THE CONSTRUCTION DOCUMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ANY AND ALL UNDERGROUND UTILITY LOCATIONS PRIOR TO CONSTRUCTION AND TO ALERT THE ENGINEER AND OWNER PROMPTLY IN CASE OF CONFLICT.

SURVEYOR
NORTHWEST SURVEYING & GPS, INC.
407 5TH ST
LYNDEN, WA 98264
(360) 354-1950
CONTACT: JEROMY DEMEYTER, PLS

CIVIL ENGINEER
BENNETT ENGINEERING, LLC.
2324 JAMES ST
BELLINGHAM, WA 98227
(360) 671-2600
CONTACT: TOM BENNETT, P.E.

LAND USE CONSULTANT
AVT CONSULTING
1708 F STREET
BELLINGHAM, WA 98225
(360) 527-9445
CONTACT: ALI TAYSI, PRINCIPAL

CRITICAL AREAS BIOLOGIST
NORTHWEST ECOLOGICAL SERVICES
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(360) 734-9484
CONTACT: MOLLY PORTER, PWS

BEAVER HABITAT SPECIALIST
BEAVERS NORTHWEST
15833 11TH AVE NE
SHORELINE, WASHINGTON, 98155
(206) 580-3785
CONTACT: ELYSSA KERR, EXECUTIVE DIRECTOR

NO.	REVISION	BY	DATE
0	SUBMITTED FOR REVIEW	TEB	6/8/23
1	REVISED PER TEAM COMMENTS	TEB	7/20/23
2			
3			
4			

THOMAS E. BENNETT — STATE OF WASHINGTON — 20690 — REGISTERED PROFESSIONAL ENGINEER
7/20/23

BENNETT ENGINEERING, LLC

CIVIL ENVIRONMENTAL
2324 JAMES STREET
BELLINGHAM, WA 98225
Ph: (360) 671-2600
Cell: (360) 739-9844

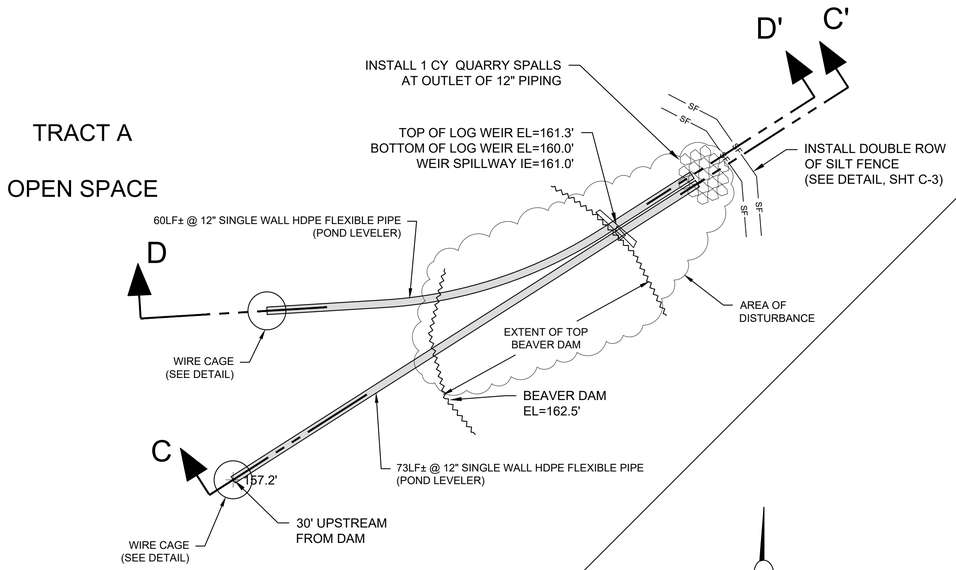
JOB NO.: 22019
DWG. NAME: 22019 Cordata
DESIGNED BY: TEB
DRAWN BY: JSM
CHECKED BY: TEB

CORDATA BUSINESS PARK ASSOC
228 E CHAMPION ST STE 102
BELLINGHAM, WA 98225

COVER SHEET
CORDATA BUSINESS PARK
BELLINGHAM, WA

DATE: JULY 2023
SCALE: H: 1" = 100' V: N/A

DRAWING: C - 1
SHEET: 1 OF 3



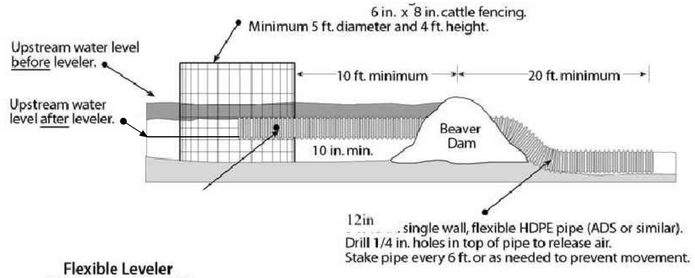
SOUTH POND
SET POND LEVEL @ 161.6'
TOP OF DAM @ 162.5'
2 @ 12" POND LEVELERS

PARCEL 5

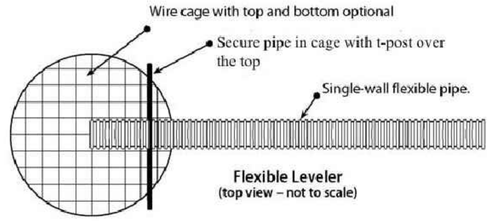
EX SSMH
RAISE RIM 6" TO ELEV 163.6'

SS

GRAPHIC SCALE
10 0 10 20
1 INCH = 10 FEET



Flexible Leveler
(side view – not to scale)



Flexible Leveler
(top view – not to scale)

Construction notes:

1. Construct wire cage using hog rings or similar devices for fasteners. Overlap one section for cage wall.
2. Cut out hole for flexible pipe in cage wall.
3. Remove dam as needed to place flexible pipe. Replace dam after leveler is installed.
4. Stake single-wall HDPE pipe every 6 ft. To prevent it from floating or beavers from moving it, use two T-posts and wire between them and over the top of the pipe to secure the pipe.
5. Secure pipe in cage by placing a t-post through the cage and over the pipe.

GENERAL

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE CURRENT EDITIONS OF THE CITY OF BELLINGHAM DEVELOPMENT GUIDELINES AND IMPROVEMENT STANDARDS (COB STANDARDS), STANDARD PLANS AND SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (WASHINGTON DEPARTMENT OF TRANSPORTATION, WDOT), AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), AND AMENDMENTS TO THESE SPECIFICATIONS AS CONTAINED HEREIN. IN CASE OF A CONFLICT BETWEEN THE STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT SHALL APPLY.
2. PRIOR TO COMMENCING SITE WORK, A PRE-CONSTRUCTION CONFERENCE SHALL BE CONDUCTED BETWEEN THE CONTRACTOR, CBPA REPRESENTATIVES, AND COB STAFF. THE MEETING SHALL BE SCHEDULED A MINIMUM OF THREE WORKING DAYS PRIOR TO THE START OF WORK.
3. EXISTING UNDERGROUND UTILITIES ARE PRESENT WITHIN THE AREA OF CONSTRUCTION. THE LOCATIONS OF EXISTING UTILITIES SHOWN IN THIS PLAN SET ARE APPROXIMATE. THE CONTRACTOR SHALL REQUEST A UTILITY LOCATE A MINIMUM OF 48 HOURS PRIOR TO STARTING EXCAVATION WORK AT 1-800-424-5555. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO IDENTIFY UTILITY LOCATIONS IN THE FIELD AND MAINTAIN THE INTEGRITY OF THE UTILITIES THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER (THOMAS E. BENNETT, P.E., 360-671-2600) PROMPTLY OF ANY CONFLICT WITH EXISTING UTILITIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, BARRIERS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH AND SAFETY OF THE PUBLIC AND PROPERTY IN CONNECTION WITH PERFORMANCE OF THE WORK.
5. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY IN-KIND THAT HAS BEEN DISRUPTED BY THE PROJECT, IMMEDIATELY FOLLOWING COMPLETION OF CONSTRUCTION.
6. THE CONTRACTOR SHALL KEEP A SET OF APPROVED CONSTRUCTION DRAWINGS ON-SITE AT ALL TIMES. THE CONTRACTOR SHALL COLLECT AS-BUILT DATA, INCLUDING THE LOCATION AND ELEVATION OF ALL STRUCTURES AND PIPING. PROPOSED FIELD CHANGES SHALL BE SUBMITTED TO THE PROJECT ENGINEER FOR REVIEW AND APPROVAL.
7. THE CONTRACTOR SHALL PERFORM THE SITE WORK AND CALL FOR INSPECTIONS IN ACCORDANCE WITH ALL APPLICABLE COB, STATE, AND FEDERAL PERMITS.
8. THE CONTRACTOR SHALL INSTALL AND MAINTAIN ADEQUATE EROSION CONTROLS THROUGHOUT THE COURSE OF THE WORK TO PREVENT CONTAMINATION OF SURFACE WATERS DOWNGRADIENT OF THE PROJECT SITE.

SURVEY CONTROL

1. THE CONTRACTOR SHALL LAYOUT AND SET ANY CONSTRUCTION STAKING AND MARKS NEEDED TO ESTABLISH THE LINES, GRADES, SLOPES, AND CROSS-SECTIONS SHOWN ON THESE PLANS.
2. HORIZONTAL CONTROL HAS BEEN ESTABLISHED AT THE SITE IN ACCORDANCE WITH THE WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (NAD83, 1998), PER THE CITY OF BELLINGHAM 2005 HORIZONTAL CONTROL NETWORK. VERTICAL CONTROL (NAVD88) HAS BEEN ESTABLISHED PER THE CITY OF BELLINGHAM ELEVATION DATUM. LOCAL VERTICAL BENCHMARKS HAVE BEEN SET AT THE EXISTING SSMH AT THE SOUTH POND (RIM ELEV = 163.1 FEET, SHEET C-2) AND THE 36-INCH CONCRETE CULVERT (INLET INVERT ELEVATION = 154.3 FEET, SHEET C-3).

EARTHWORK

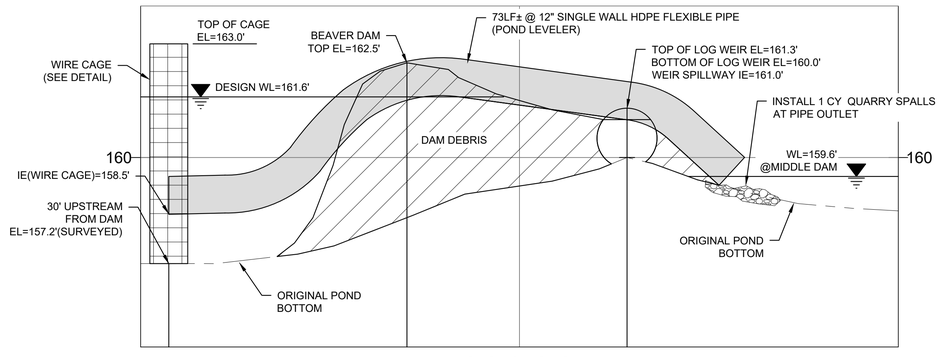
1. PRIOR TO COMMENCING SITE CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL INSTALL ALL TESC MEASURES CALLED OUT ON SHEETS C-2 AND C-3 AND ESTABLISH CONSTRUCTION ACCESS, TEMPORARY SOIL STOCKPILE AREAS, HAUL ROADS, AND PARKING AND LAYDOWN AREAS.
2. THE CONTRACTORS SHALL EXCAVATE AND GRADE TO THE ALIGNMENTS, PROFILES, AND CROSS-SECTIONS SHOWN IN THE PLANS. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL SOIL MATERIALS FROM THE EXISTING DAM SECTIONS, AS REQUIRED TO INSTALL THE 12-INCH PIPING AND ACHIEVE THE FINAL DESIGN GRADES FOR THE DAMS. ALL WOODY MATERIALS REMOVED FROM THE EXISTING DAMS SHALL BE REDISTRIBUTED ON-SITE.

POND LEVELER INSTALLATIONS

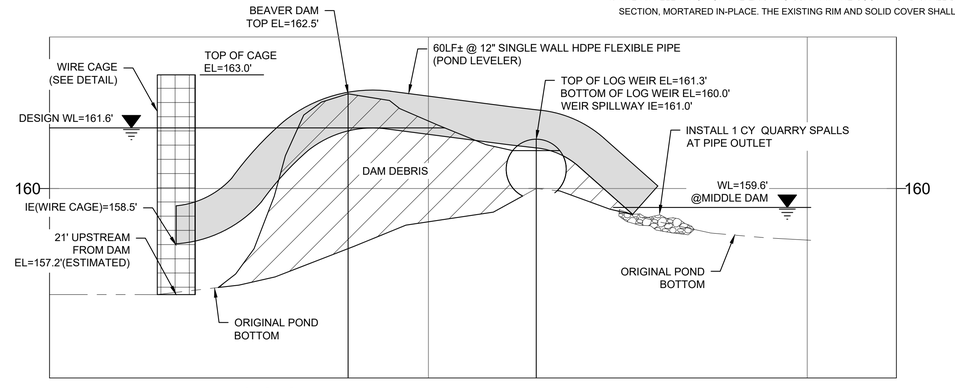
1. A TOTAL OF FOUR POND LEVELERS SHALL BE INSTALLED FOR THE PROJECT, INCLUDING TWO LEVELERS EACH AT THE SOUTH POND AND NORTH POND, RESPECTIVELY.
2. THE POND LEVELER INSTALLATIONS SHALL INCLUDE A WIRE CAGE CONSTRUCTED OF 6" X 8" CATTLE FENCING SECTIONS. THE WIRE CAGES SHALL BE INSTALLED UPSTREAM OF THE EXISTING BEAVER DAMS, AT A DEPTH THAT PROVIDES 10 INCHES OF VERTICAL CLEARANCE BETWEEN THE BOTTOM OF THE POND AND THE INVERT OF 12-INCH PIPING. THE CAGES SHALL BE 5-FOOT MINIMUM DIAMETER AND 4-FOOT MINIMUM HEIGHT, AS SHOWN IN SECTIONS A-A' THROUGH D-D'. THE 12-INCH PIPING SHALL BE SECURED IN THE CAGE BY PLACING A T-POST THROUGH THE CAGE AND OVER THE PIPE. ALTERNATIVELY, THE PIPING MAY BE SECURED USING CINDER BLOCK SADDLES.
3. THE 12-INCH PIPING SHALL BE SINGLE-WALL, CORRUGATED HDPE MEETING ASTM F667 (ADS OR EQUAL). JOINTS SHALL BE MADE WITH SPLIT COUPLINGS. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321 AND THE MANUFACTURER'S RECOMMENDATIONS. THE 12-INCH PIPING SHALL BE STAKED WITH T-POSTS AT 6 FEET O.C. TO PREVENT FLOTATION.
4. THE EXISTING DAM MATERIALS SHALL BE REMOVED, AS NEEDED, TO INSTALL THE 12-INCH PIPING TO THE DEPTHS CALLED OUT IN SECTIONS A-A' THROUGH D-D'. NATIVE SOIL MATERIALS MAY BE USED TO BURY THE PIPE FOLLOWING INSTALLATION.
5. QUARRY SPALL DISPERSION PADS (MINIMUM 1 CUBIC YARD) SHALL BE INSTALLED AT THE PIPE OUTLETS FOR THE SOUTH AND NORTH POND LEVELERS. QUARRY SPALLS SHALL MEET THE GRADATION REQUIREMENTS OF WDOT 9-13.6.

SEWER MANHOLE RIM ADJUSTMENT

1. THE RIM ELEVATION OF THE EXISTING SSMH AT THE SOUTH POND SHALL BE RAISED 6 INCHES USING A PRE-CAST CONCRETE RISER SECTION, MORTARED IN-PLACE. THE EXISTING RIM AND SOLID COVER SHALL BE RE-INSTALLED.



SECTION C - C'
HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 2'



SECTION D - D'
HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 2'

NO.	REVISION	BY	DATE
0	SUBMITTED FOR REVIEW	TEB	6/8/23
1	REVISED PER TEAM COMMENTS	TEB	7/20/23
2			
3			
4			

THOMAS E. BENNETT — STATE OF WASHINGTON — 20690 — REGISTERED PROFESSIONAL ENGINEER
7/20/23

BENNETT ENGINEERING, LLC

CIVIL ENVIRONMENTAL
2324 JAMES STREET
BELLINGHAM, WA 98225
Ph: (360) 671-2600
Cell: (360) 739-9844

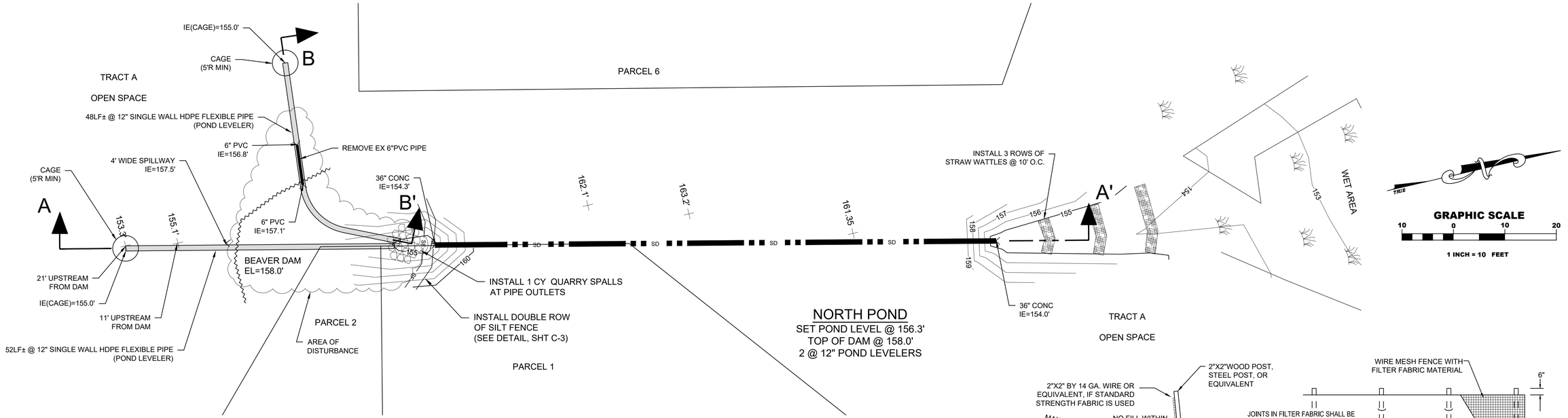
JOB NO.: 22019
DWG. NAME: 22019 Cordata
DESIGNED BY: TEB
DRAWN BY: JSM
CHECKED BY: TEB

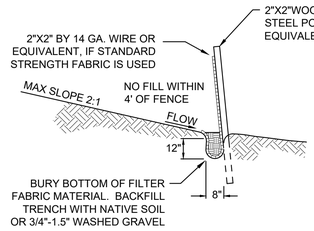
CORDATA BUSINESS PARK ASSOC
228 E CHAMPION ST STE 102
BELLINGHAM, WA 98225

SOUTH POND
WATER LEVEL CONTROL PLAN
CORDATA BUSINESS PARK

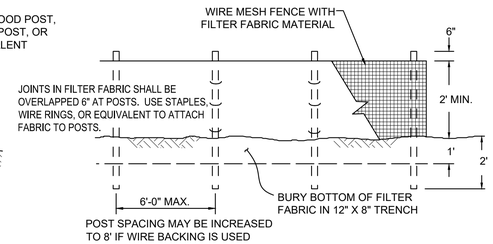
DATE: JULY 2023
SCALE: H: 1" = 10' V: 1" = 2'

DRAWING: C - 2
SHEET: 2 OF 3





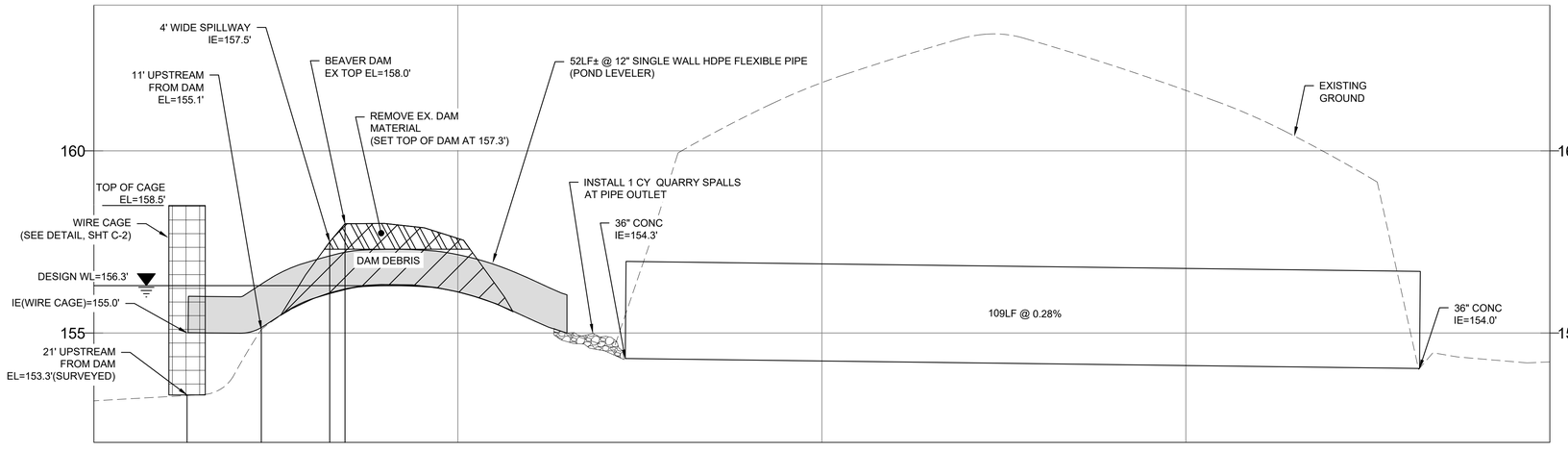
TYPICAL CROSS SECTION



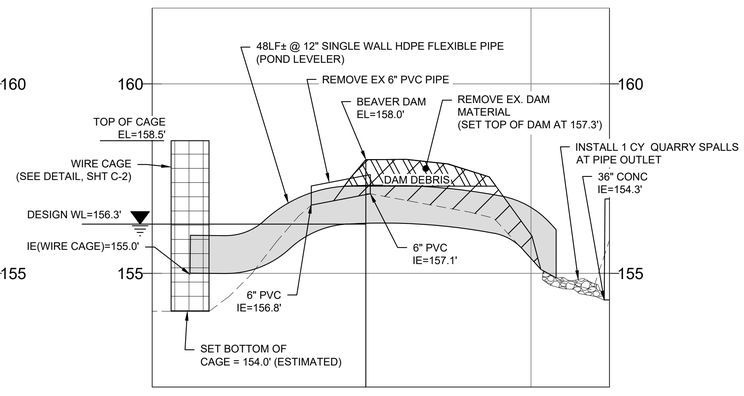
ELEVATION

SILT FENCE DETAIL

NO SCALE



SECTION A - A'
HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 2'



SECTION B - B'
HORIZONTAL SCALE: 1" = 10'
VERTICAL SCALE: 1" = 2'

NO.	REVISION	BY	DATE
0	SUBMITTED FOR REVIEW	TEB	6/8/23
1	REVISED PER TEAM COMMENTS	TEB	7/20/23
2			
3			
4			

THOMAS E. BENNETT — STATE OF WASHINGTON — 20690 — REGISTERED PROFESSIONAL ENGINEER
7/20/23

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JOB NO.:	22019
DWG. NAME:	22019 Cordata
DESIGNED BY:	TEB
DRAWN BY:	JSM
CHECKED BY:	TEB

CORDATA BUSINESS PARK ASSOC
228 E CHAMPION ST STE 102
BELLINGHAM, WA 98225

NORTH POND
WATER CONTROL PLAN
CORDATA BUSINESS PARK

DATE: JULY 2023
SCALE: H: 1" = 10' V: 1" = 2'

DRAWING: C - 3

SHEET: 3 OF 3

Mitigation plantings
on the east side of the north pond

Wetland area sign on north pond, assumed to be
previously on the wetland edge

Chew and conditions on east edge
of the north pond

Dam on the north pond,
looking from the dam south into the wetland

Detail of dam outlet

Proximity of wetland to the building
at 615 West Horton Way

Pond/wetland outlet, needs cattail removal

Overview of north pond, looking south from north end, dead willows in right of photo

Conditions at the NW edge of the north pond

Secondary outlet at the NW edge

Dense vegetation along the western edge of the north pond

Dead tree in north pond

South pond overview,
from the south edge looking north

Wetland proximity to houses south
of the south pond

Trail between homes and the wetland

Dead tree in the south pond

South pond, near the NE edge looking west

Wetland edge,
NES staff standing near sewer manhole

Detail of sewer manhole at wetland edge

South dam, looking SW to the south pond

Detail of south dam

Detail of additional dam between ponds

Additional dam between ponds

Additional dam between ponds

Beavers Northwest
15833 11th Ave NE
Shoreline, WA 98155
info@beaversnw.org

July 10, 2023

Cordata Business Park Beaver Management Memo

Installing pond levelers on the outlets of each of the stormwater ponds at the Cordata Business Park is the preferred action to address flooding, retain ecosystem services, and support wildlife usage of these constructed systems. While removing beavers is an alternative, there is a high likelihood that this site will be recolonized by beavers due to the presence of perennial water, preferred vegetation for beaver browse, and connectivity to other waterways. As such, removal of beavers will always be a temporary action and will require ongoing trapping on as much as an annual cycle. Pond levelers provide an alternative to address beaver conflict concerns while retaining beavers on site.

Pond levelers are a cost-effective practice that have been implemented successfully in many situations throughout North America. These devices function to maintain a compromise between the needs of beavers and the needs of humans and our infrastructure. To maintain this compromise and increase the efficacy of these devices, the Beavers Northwest team surveyed the ponds to find the beaver lodge. Two lodges were found in the south pond one of which appeared active. Lodge entrance depths were approximated using stadia rods to measure water surface elevation to the top of the lodge. Due to the complexity of these lodge structures, all measurements are considered to be approximate. At the time of survey, the shallowest lodge entrance was measured to be at 0.9ft below surface water elevation. Using this measurement, the placement of the pond levelers in the south pond will be set at an elevation to keep this lodge entrance below the surface of the water. This represents the best opportunity for compromise and the best chance of success for these devices.

Devices will be installed using best management practices for pond levelers to ensure minimal ecological disturbance. This includes incrementally notching the beaver dams to prevent erosive flows. Pond levelers will be constructed on land and secured in place at the dam and in the ponds by t-posts and/or cinderblock saddles. Only hand tools will be used in this process.

Beaver modified ecosystems are dynamic and ongoing monitoring and maintenance will be necessary. We recommend maintenance visits every 3-6 months to assess leveler function and beaver activity. Typical maintenance actions include removing debris from the pipe inlet cage, readjusting t-posts or cinderblocks securing pipe, assessing new dams or other beaver activity and determining if follow up action is necessary. In this case, the beavers are building in two quite obvious constriction points at the outlet of each pond. Monitoring for any new or increased activity between the two ponds will be of primary concern.