CORRAL CREEK POND
ARCTIC GRAYLING HABITAT PROJECT
FINAL DESIGN

PREPARED FOR:
MONTANA FISH, WILDLIFE & PARKS
730 N. MONTANA
DILLON, MT 59725

PREPARED BY:
INTERMOUNTAIN AQUATICS, INC.
116 MUSTANG DRIVE, PO BOX 1115
DRIGGS, ID 83422
(208) 354-3690

PARTNERS:
GRAYLING CENTENNIAL LLC
41600 SOUTH VALLEY ROAD
LIMA, MT 59739

MONTANA FISH, WILDLIFE & PARKS
REGION 3 HEADQUARTERS
1400 SOUTH 19TH
BOZEMAN, MT 59718

US FISH & WILDLIFE SERVICE
RED ROCK LAKES NATIONAL
WILDLIFE REFUGE
27650B SOUTH VALLEY RD
LIMA, MT 59739

MONTANA TROUT UNLIMITED
312 N. HIGGINS, SUITE 200
MISSOULA, MT 59802

PROJECT GOAL:
ADD FUNCTIONAL SPAWNING AND OVERWINTER HABITAT TO AN EXISTING POND/WETLAND COMPLEX IN THE CENTENNIAL VALLEY FOR ARTIC GRAYLING CONSERVATION

OBJECTIVES:
1. CONNECT POND/WETLAND COMPLEX TO THE WILD FISHERY
2. CONSTRUCT 1,907 LINEAR FEET OF SPAWNING CHANNELS
3. DEEPEN A PORTION OF THE EXISTING POND TO INCREASE OVERWINTER HABITAT DURING LOW GROUNDWATER OR DROUGHT CONDITIONS

SITE SUMMARY:
NW ¼ NE ¼ & NE ¼ NW ¼ SEC.22, T.14S, R.1E
BEAVERHEAD COUNTY, MONTANA
LAT/LONG - 43.643970°, -111.148788°

SHEET INDEX	
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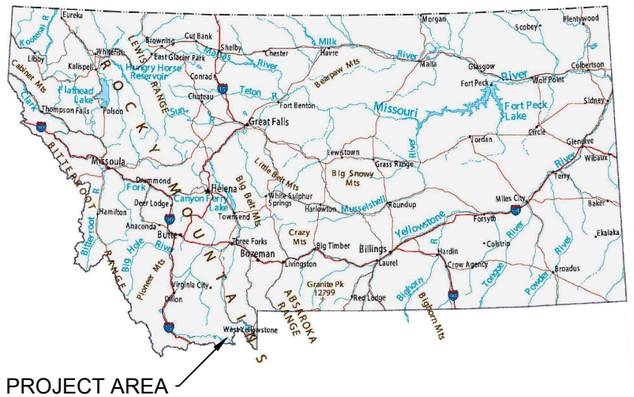
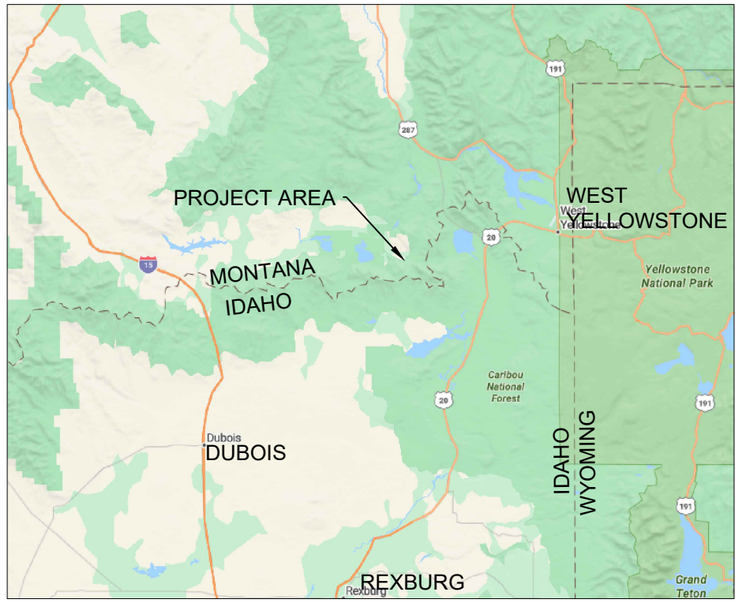
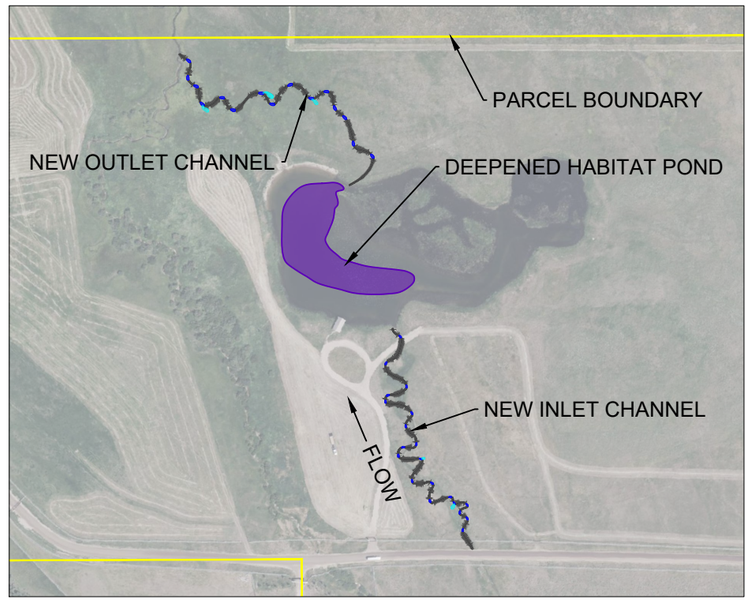
Corral Creek Pond - Arctic Grayling Habitat Project - Final Design Quantities			
Item #	Item	Quantity	Unit
	OUTLET CHANNEL		
1	Excavation - Cut (Includes Overexcavation)	1,270	CY
2	Excavation - Fill & Topdress Side Slopes with Topsoil	130	CY
3	Excavation - Fill to Spoils Area	1,140	CY
4	Organics Stripping and Topdressing (Spoils Areas)	0.35	AC
5	Wetland Sod Transplant (Channel Margins)	0.13	AC
6	Imported Gravel (1/2-7")	100	CY
7	Wetland Seeding	0.60	AC
8	Upland Seeding	0.63	AC
9	Wetland Seed Mix	10	PLS lbs
10	Upland Seed Mix	7	PLS lbs
11	Native Containerized Willows - 5 gal	57	EACH
12	Native Containerized Willows - 15 gal	38	EACH
13	Temporary Wildlife Exclusion Fencing	805	LF
	INLET CHANNEL		
14	Excavation - Cut (Includes Overexcavation)	2,710	CY
15	Excavation - Fill & Topdress Side Slopes with Topsoil	150	CY
16	Excavation - Fill to Spoils Area	2,560	CY
17	Organics Stripping and Topdressing (Spoils Areas)	0.79	AC
18	Wetland Sod Transplant (Channel Margins)	0.14	AC
19	Imported Gravel (1/2-7")	100	CY
20	Wetland Seeding	0.59	AC
21	Upland Seeding	1.17	AC
22	Wetland Seed Mix	10	PLS lbs
23	Upland Seed Mix	13	PLS lbs
24	Native Containerized Willows - 5 gal	82	EACH
25	Native Containerized Willows - 15 gal	55	EACH
26	Temporary Wildlife Exclusion Fencing	980	LF
27	Uninstall/Reinstall Culvert	1	EACH
	POND		
28	Excavation - Cut	5,850	CY
29	Excavation - Fill to Spoils Area	5,850	CY
30	Organics Stripping and Topdressing (Spoils Areas)	1.81	AC
31	Upland Seeding	1.81	AC
32	Upland Seed Mix	20	PLS lbs



MONTANA STATE MAP



VICINITY MAP



PROJECT LOCATION AERIAL (BING)

INTERMOUNTAIN AQUATICS INC.
ENVIRONMENTAL CONSULTING & HABITAT RESTORATION
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Driggs, ID 83422
208.354.3690
www.intermountainaquatics.com

MONTANA LICENSED PROFESSIONAL ENGINEER
ERIC AUGUST
No. 60882PE
Digitally signed by Eric August
Date: 2024.02.28 15:18:10 -07'00'

GRAYLING POND
Final Design
Beaverhead County, MT

N
Scale: VARIES
0
IF PLOTTED ON 11"x17" SIZE: ADJUST ACCORDINGLY BASED ON PAPER SIZE

DATE: February 27, 2024
DRAWN BY: EA / JC / GR
CHECKED BY: KS
JOB NAME: MTFWP-GRAYLING POND
FILE: MTFWP-LAYOUTS.DWG
REVISIONS:

COVER SHEET

GENERAL CONSTRUCTION SPECIFICATIONS

1. GENERAL REQUIREMENTS

DESCRIPTION OF WORK

1. Construction work involves fish habitat enhancement on private property in Beaverhead County, MT. The goal of this project is to add functional spawning and overwinter habitat to an existing pond/wetland complex in the Centennial Valley for Arctic Grayling conservation.
2. The work shall include, but not be limited to, the following activities as shown on the Drawings: preparation of construction access routes and staging area; pond excavation; stream channel construction; excess material hauling and grading; site clean-up and reclamation; seeding; and planting. All work shall be completed in accordance with the contract provisions and these construction specifications and Drawings.

LOCATION

1. All work is on the Grayling Centennial Ranch property - NE 1/4 of Section 22 Township 14 North, Range 1 East, Beaverhead County, Montana.
2. Access to the project site is from South Valley Road, ~13 miles East of Lakeview, MT.

INTENT

1. The intent of this project is to construct habitat that allows a conservation population of Artic Grayling to be stocked, reproduce naturally, and be self-sustaining. This will be done by increasing suitable overwinter depths to an existing pond/wetland complex and adding spawning channels. Flow will be supplied to the spawning channels by existing and future irrigation infrastructure associated with water rights originating from Corral Creek and Hell Roaring Creek. The spawning channels are designed to function for grayling spawning at 3-5cfs. Flow diversion rates and durations will be managed by the project Sponsor to benefit the conservation grayling population viability and promote outmigration to slowly infuse genetic variation to the Red Rock Lake population.

ROLES AND RESPONSIBILITIES

1. The above work is to be performed for The Montana Fish Wildlife and Parks Department, hereafter referred to as the “Sponsor”. Only the Sponsor may approve changes to the contract amount and the contract requirements.
2. The Sponsor will appoint a project staff member, hereafter referred to as "Contracting Officer", who will have the responsibility to issue a contract to construct the above work and will administer the contract and funds for the project. The Contracting Officer will be responsible for coordination with the Property Owner.
3. Intermountain Aquatics, hereafter referred to as “Engineer,” is the Sponsor's representative who has designed the project. The Engineer provides clarification to the Contracting Officer and the Construction "Contractor" regarding the intent of the Drawings and Specifications and whether all the proposed or completed work is in compliance with the Drawings and construction specifications. The Engineer also reviews all proposed changes and makes recommendations to the Contracting Officer prior to the Contracting Officer's approval of the changes.
4. The owner of the property where construction will occur is the Grayling Centennial, LLC, herein referred to as the "Property Owner".
5. Construction observation will be provided by the Contracting Officer and/or Engineer. Construction observers will not direct the Contractor in any way but will monitor construction activities so that technical requirements of the Drawings and Specifications are adhered to, and discrepancies are identified. The construction observers are not responsible for the construction means, methods, techniques, and/or safety of the Contractor.
6. Contractor shall coordinate all work and access to the site with the Contracting Officer.
7. In addition to the work items contained in this plan set, the Contractor is responsible for:

   a. Developing a work plan, de-watering plan, and schedule that maximizes construction efficiencies, minimizes cost, and minimizes ground disturbance.

   b. Drafting, signing and implementing a Storm Water Pollution Prevention Plan (SWPPP) and filing the eNOI for the project, if required (project may qualify for a rainfall exemption).

WORK SCHEDULE

1. All construction activities shall occur during the contract period specified by the Contracting Officer.
2. The proposed construction window for this project is April 15, 2024 - June 15, 2024.
3. The Contractor may not leave the work site or suspend activity for more than five (5) consecutive days after mobilizing to the site and prior to reaching substantial completion unless otherwise approved by the Contracting Officer.

PRODUCT DELIVERY, STORAGE, AND HANDLING

1. The Contractor will provide all materials necessary to complete construction.
2. All materials shall be stored in areas indicated on the Drawings as Equipment and Material Staging Areas or other locations approved by the Contracting Officer.

2. CONSTRUCTION SEQUENCE

Suggested construction sequence, Contractor may alter as long as project specifications are fullfilled.

1. Pre-construction staking (provided by the Engineer)
2. Prepare the site for construction: identify construction staging area(s), disturbance limits; install erosion and sediment control measures (SWPPP); prepare access routes; prepare spoils area by stripping and stockpiling topsoil.
3. Strip wetland vegetation from spawning channel areas and stockpile for later transplanting.
4. Complete channel excavation and grading.
5. Dewater pond.
6. Complete pond excavation.
7. Grade and reclaim spoils area.
8. Reclaim construction access and staging areas.
9. Perform revegetation.

3. CONTRACTOR USE OF PREMISES

GENERAL

1. Contractor is expected to keep a neat and tidy construction site, free of accumulated waste materials and trash.
2. Contractor shall take all measures necessary to maximize the undisturbed area within project boundaries whenever possible to retain existing vegetation.
3. The Contractor shall only remove trees and shrubs that are absolutely necessary for the execution of the work and shall make all efforts to minimize tree removal. In the event that a tree or shrub outside the immediate work areas must be removed or damaged, the Contractor shall obtain prior approval from the Contracting Officer.
4. Prior to performing work, the Contractor shall become thoroughly familiar with the Project Site, existing conditions, and all portions of the Work.
5. Contractor must coordinate all work and access to the site with the Contracting Officer. The Contracting Officer will be responsible for coordination with the Property Owner.
6. The Contractor is responsible for maintaining public safety in and around the Project Site, and will provide any safety precautions such as temporary fencing, signing, or other methods at the Contractor's discretion where deemed necessary.
7. The Contractor is responsible for the security of property at the Project Site and will provide reasonable protection to prevent damage or loss to equipment, materials, and supplies incorporated in the project and to the Property Owner.
8. The Contractor shall only access the Project Site as shown on the Drawings. Alternate access points shall not be used, unless authorized by the Contracting Officer.
9. The Contractor shall cause notice to be given to the State underground utility location service ("811" , "Call Before You Dig") and to any underground utility facilities who are not members of the registered protection service. The Contractor must take all reasonable measures to protect existing utilities and all notices shall be given at least 72 hours prior to the start of construction. All work performed adjacent to utilities shall be in accordance with procedures outlined by the utility company. The contractor shall immediately report any damage to utilities to the Contracting Officer and the utility company.
10. The Contractor shall be responsible for any damage incurred to any utility lines at no cost or obligation to the Contracting Officer or the Property Owner.
11. Movement of construction equipment over pipes, bridges, utilities or infrastructure during construction shall be at the Contractor's risk. The Contractor shall be responsible for any damage incurred to infrastructure at no cost or obligation to the Contracting Officer or the Property Owner.
12. Recycling is encouraged. Unused construction materials and packaging should be recycled. Waste generated by crew members should be recycled.
13. Single-use plastics should be avoided to the greatest extent possible.
14. The Contractor shall remove all temporary equipment and facilities upon completion of work under this contract.

PROHIBITED CONSTRUCTION ACTIVITIES

1. Pumping of sediment-laden water from trenches or other excavations into any surface waters, any stream corridors, any wetlands, or storm sewers.
2. Discharging pollutants - such as chemicals, fuels, lubricants, bituminous materials, raw sewage - and other harmful waste into or alongside any area that may drain back to a waterbody or wetland.
3. Storing construction equipment and vehicles and/or stockpiling construction materials on property, public or private, not specified by the Construction Drawings or Contracting Officer for said purposes.
4. Disposing of excess or unsuitable excavated material in wetlands or floodplains.
5. Burying or burning waste or excess materials without obtaining approval from the Contracting Officer.

4. EQUIPMENT

1. Pressure wash to remove dirt, grease, oil, fuel, vegetation and weed seeds before bringing equipment on site to limit introduction of noxious weeds and pollutants. Contractor must inform the Contracting Officer that this has occurred prior to equipment mobilization.
2. All equipment operated/used in another waterbody within 1 month of being mobilized to the project site shall be cleaned, drained, and dried to prevent the spread of Aquatic Invasive Species. This applies to all equipment including heavy equipment, dewatering equipment (i.e. pumps and coffer dams), and PPE (i.e. waders and boots). Refer to stopaquatichitchhikers.org for more information on effective decontamination procedures. Contractor must inform the Contracting Officer that this has occurred prior to equipment mobilization.
3. All equipment and vehicles shall be stored in the construction staging area nightly.
4. Complete vehicle and equipment staging, cleaning, maintenance, refueling, and fuel storage in the designated construction staging and material storage area away from any natural water body or wetland.
5. Inspect all vehicles and equipment operated within 150 feet of any natural water body or wetland daily for fluid leaks before leaving the construction staging and material storage area. Repair any leaks detected in the construction staging and material storage area before resuming operation. Document inspections in a record that is available for review on request by the Contracting Officer and regulatory agencies.
6. Use of equipment in flowing water is limited by applicable permits. Equipment must be thoroughly cleaned before entering the water. Contractor is responsible for compliance with applicable regulations for in-water equipment use.
7. Hydraulics Fluids - All equipment that are doing work in active stream channels, or permanent water bodies during project construction must use hydraulic oil that meets or exceeds environmentally acceptable lubricants by the U.S. EPA (2011); e.g., mineral oil, polyglycol, vegetable oil, synthetic ester; Mobil® biodegradable hydraulic oils, Total® hydraulic fluid, Terresolve Technologies Ltd.® biobased biodegradable lubricants, Cougar Lubrication® 2XT Bio engine oil, Series 4300 Synthetic Bio-degradable Hydraulic Oil, 8060-2 Synthetic Bio-Degradable Grease No. 2, etc. or meet stringent acute aquatic toxicity (L-50), which is inherently biodegradable. This does not include trucks, dozers, front end loaders, etc., that are operated on the flood plain or involved in the construction of new channels prior to adding water flow or filling abandoned channels after de-watering.

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GENERAL NOTES - 1

All products shall be API certified and the vendor shall furnish documentation of the certification upon request. Products must meet the performance and warranty requirements of the manufacturers listed in the specifications.

8. Absorbent pads to soak up leaks and a fuel spill response kit (including rag pads and booms) of appropriate size for the equipment used shall be on site at all times and readily available throughout the construction period.

5. TEMPORARY UTILITIES

TEMPORARY ELECTRIC

1. Electric power is not available at the site.
2. Contractor shall provide all generators, and other electrical equipment and facilities required for obtaining power and distributing power to the dewatering pumps.
3. All generators shall be accompanied with appropriate spill prevention and containment measures.

TEMPORARY WATER

1. Potable water is not available to the Contractor at the site. The Contractor shall be responsible for supplying potable water for all employees at the site.
2. The Contractor may use ground water pumping for dust control and/or dike compaction purposes.

TEMPORARY SANITATION FACILITIES

1. Contractor shall provide and maintain temporary sanitation facilities (e.g., “port-a-potties”) for use by the construction and observation crews for the duration of the construction and revegetation activities.

TEMPORARY FIRST AID FACILITIES

1. Contractor shall provide first aid equipment and supplies onsite for employees.
2. Contractor shall have an emergency action plan and instruct employees what to do in case of a workplace injury.
3. Contractor shall review the plan with each employee and have the plan available onsite at all times.

TEMPORARY FIRE PROTECTION

1. The Contractor shall conduct operations in a manner that is fire-safe for the work area and adjacent areas. Proper fire extinguishers shall be installed on all equipment and maintained by the Contractor. The premise shall be maintained clear of rubbish, debris, or other material constituting a potential fire hazard.
2. Where significant or continued noncompliance with fire safety is noted, the Contracting Officer reserves the right to stop the work at no extra cost due to extension of time pending remedial action. Furthermore, the Contractor shall be responsible for, and reimburse the Property Owner as appropriate, any fines or penalties as a result of fire.

TEMPORARY FUEL STORAGE

1. All stationary temporary fuel storage shall be located in the Construction Staging Area.
2. Fuel storage vessels shall be inspected prior to site delivery for leaks or damage. Leaky storage tanks will not be permitted on site.
3. Secondary containment will be required for all on site fuel storage vessels. Secondary containment structures will provide storage capacity in the amount of 110% of the volume of the largest primary container stored within.
4. At the conclusion of project construction, any leaked fuel or contaminated rainwater within the secondary containment structure will be properly collected and legally disposed of at an offsite location.

6. TEMPORARY ENVIRONMENTAL CONTROLS

REGULATORY REQUIREMENTS

1. Contractor shall be responsible for compliance with all Federal, State, and local laws and regulations and shall be expected to maintain copies of all required permits on site for inspection and review.
2. Contractor shall conform to most stringent requirement in cases of conflict between specifications and regulatory requirements.
3. Contracting Officer may stop any construction activity in violation of Federal, State, or local laws and additional expenses resulting from work stoppage will be responsibility of Contractor.

AIR POLLUTION CONTROL

1. Utilize reasonably available methods and devices to prevent, control, and otherwise minimize atmospheric emissions or discharges of air contaminants.
2. Do not operate equipment and vehicles that show excessive exhaust gas emissions until corrective repairs or adjustments reduce such emissions to acceptable levels.
3. Equipment idling shall be reduced to the greatest extent possible. When equipment is not in use for an extended period, it shall be shut down. Operations such as equipment warm-up or cool-down are exempt from this requirement. If conditions or individual equipment requirements necessitate idling to avoid damage or excessive wear, then this requirement may be suspended.
4. Heavy equipment equipped with Tier 3, Tier 4 or similar emission reducing technology is preferred.

WATER POLLUTION CONTROL

1. Contractor shall be responsible for developing and implementing a construction strategy that minimizes sediment inputs to Corral Creek.
2. Contractor shall be responsible for drafting and signing a Stormwater Pollution Prevention Plan (SWPP) (if required) and filing the eNOI for the project.
3. Contractor shall be responsible for implementing, adhering to, and maintaining a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the regulations and guidelines set forth and subject to approval by the State of Montana.
4. Perform construction activities by methods that will prevent entrance, or accidental spillage, of solid matter, contaminants, debris, or other pollutants or wastes into streams, flowing or dry watercourses, lakes, wetlands, reservoirs, or underground water sources. Such pollutants and wastes include, but are not restricted to refuse, garbage, cement, sanitary waste, industrial waste, hazardous materials, radioactive substances, oil and other petroleum products, aggregate processing tailings, mineral salts, and thermal pollution.
5. Stream crossings by heavy equipment is unnecessary and is therefore prohibited.

7. SURVEYING

1. Initial construction staking will be provided by the Engineer. Initial construction staking will include: limits of channel excavation grading, stream channel centerlines, construction staging area, and excavation spoils location extents. The Contractor shall take care not to disturb or damage construction stakes. Any construction stakes that are disturbed or damaged by the Contractor and require resetting will be reset by the Engineer at the Contractor's expense for time and materials.
2. The Contractor shall provide all surveying tasks necessary for construction. This includes, but is not limited to, locate survey control and reference points, establish horizontal and vertical control, place grading stakes, identify all major and minor work components, and periodically verify locations and elevations of all construction items. AutoCAD files for the design are available upon request.
3. Contractor is responsible for surveying as it pertains to grading to target elevations. Finished grades shall be in accordance with the lines, grades and cross sections or elevations shown on the drawings. Finish elevations shall be within 0.1 foot of the elevations indicated or as modified in the field by the Engineer.
4. Contractor shall be responsible for reporting any elevation or horizontal discrepancies to the Contracting Officer for clarification. Minor adjustments to suit field conditions are anticipated, and it shall be the responsibility of the Engineer to make decisions regarding these adjustments.
5. Topographic information of existing conditions shown in the Drawings was generated with field survey data collected by the Project Engineer. An electronic version of the topographic information, in AutoCAD format, is available to the Contractor upon request. The Drawings do not include all utilities, surface features, structures, and other items that may be encountered at the Project Site. It is the Contractor's responsibility to check existing conditions prior to bidding or commencing work.
6. Control points identified on the Drawings shall be used for all ties to spatial and elevation data listed in the Drawings.
7. All dimensions on the drawings are in units of feet, unless otherwise specified. <u>All existing and proposed grading contours in the Drawings depict 1.0 ft intervals, unless otherwise noted.</u>

8. FINAL SITE REVIEW

GENERAL

1. Prior to commencing demobilization, the Contractor shall review all construction elements with the Contracting Officer, who will give approval or provide a written list of final items to be corrected.
2. Final site review approval is contingent on the successful completion of: construction of design elements, cleaning of the site, removal of all construction access roads, ruts and staging areas, restoration of areas disturbed by construction activities, and other tasks as outlined in these specifications and on the Drawings.

FINAL CLEANUP

1. Complete the following cleaning operations before requesting inspection for completion for the entire Project or a portion of the Project.
2. Clean the Project Site and grounds in areas disturbed by construction activities of rubbish, waste materials, litter, and foreign substances. Remove all waste from the property, do not burn, bury, or otherwise dispose of trash on the project site.
3. Move construction equipment, tools, machinery, and surplus material to the Construction Staging area. Where extra materials of value remain after completion, coordinate with the Contracting Officer on where to leave them on the project site.
4. Prepare all areas disturbed by construction activities that are above the design water level for seeding specifications outlined in this document.
5. Contracting Officer shall provide final approval of site cleanup prior to demobilization.

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GENERAL NOTES - 2

SURVEY CONTROL				
Control Point #	Elevation (ft)	Northing (ft)	Easting (ft)	Type
1	6810.56	135085.39	1425694.60	rebar/plastic cap **Note:** not shown on this sheet
2	6801.31	135242.60	1425393.28	rebar/plastic cap **Note:** not shown on this sheet
101	6764.92	136484.86	1424689.16	rebar/plastic cap
102	6766.67	136574.21	1425105.65	rebar/plastic cap
COORDINATE SYSTEM: NAD83 - MT STATE PLANES - US FOOT				

EARTHEN DIKE

PARCEL: 18-0037-22-1-01-01-0000
200 AC

CORRAL CREEK FLOW

CP-101

CP-102

FLOW

LEGEND

- EXISTING DITCH
- EXISTING CONTOUR (1' & 5')
- EXISTING POND
- EXISTING WETLAND
- CONTROL POINT
- PARCEL BOUNDARY
- *AERIAL: BING*

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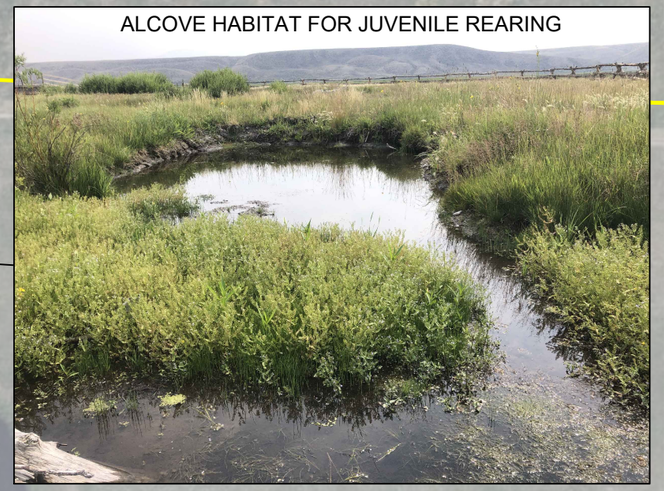
EXISTING CONDITIONS

ALCOVE HABITAT FOR JUVENILE REARING



OUTLET SPAWNING CHANNEL

DEEPENING OF EXISTING POND FOR
OVERWINTER SURVIVAL FOR GRAYLING

REMOVE EXISTING CULVERT
AND REINSTALL AT NEARBY LOCATION

FLOW

INLET SPAWNING CHANNEL

LEGEND

- PROPOSED POND DEEPENING
- PROPOSED POOL
- PROPOSED ALCOVE
- PROPOSED CHANNEL
- PARCEL BOUNDARY
- *AERIAL: BING*

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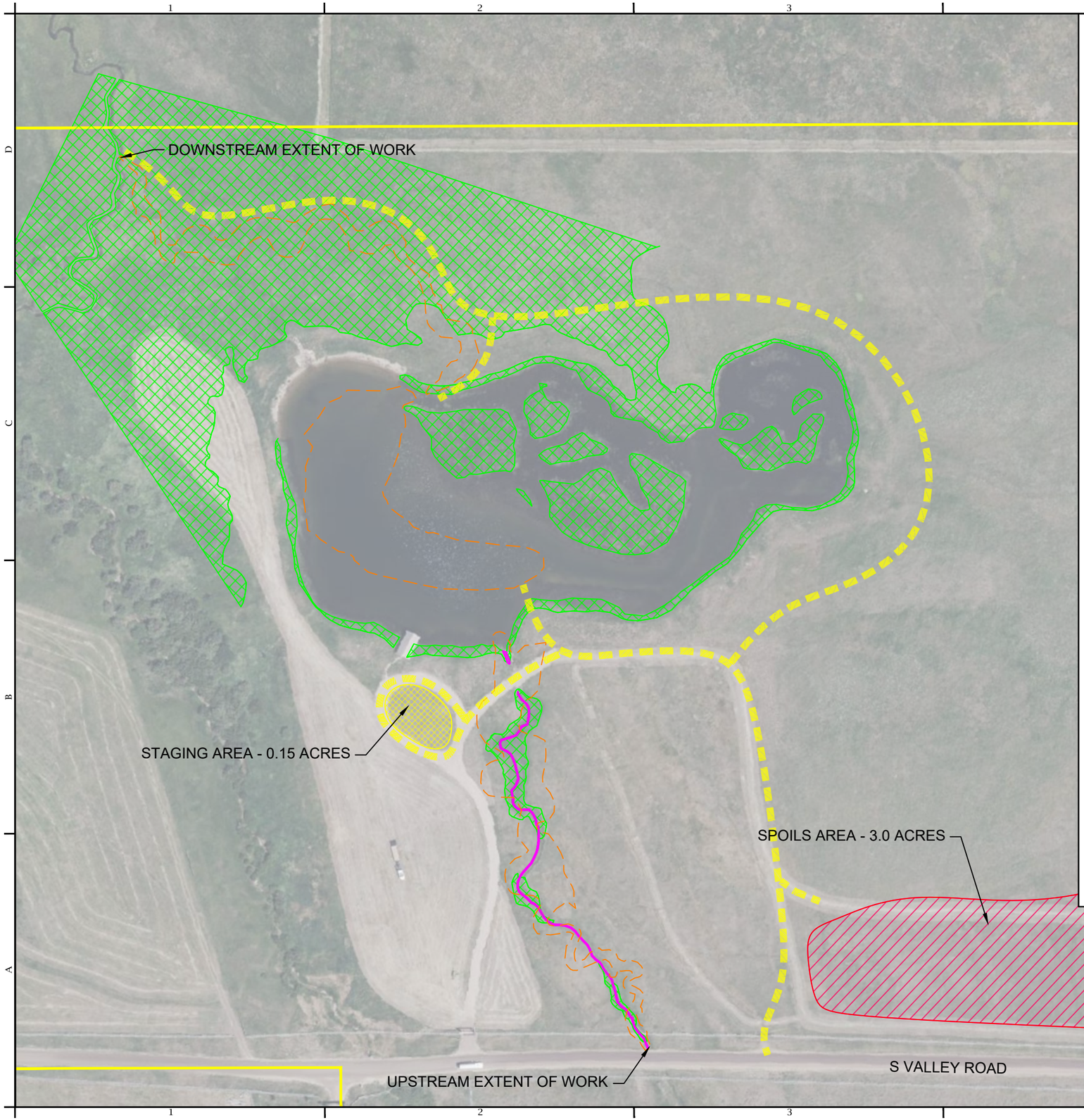

9. ACCESS AND STAGING

REGULATORY REQUIREMENTS

1. The Contractor must comply with applicable local regulations for haul routes over public highways, roads, or bridges. The Contractor must investigate the condition of available public and private roads for clearances, restrictions, bridge-load limits, bond requirements, and other limitations that affect or may affect access and transportation operations to and from the site.
2. Contractor must meet jurisdictional conditions for use of existing roadways and haul routes; including seasonal or other limitations or restrictions, payment of excess size and weight fees, and posting of bonds conditioned upon repair of damage.

SITE CONDITIONS

1. Contractor shall only use equipment access, haul routes, parking and staging areas shown on the Drawings.
2. Unavailability of transportation facilities or limitations thereon shall not become a basis for claims for damages or extension of time for completion of work.

TEMPORARY ACCESS ROADS

1. Access Roads:
   a. The Contractor shall establish temporary access roads as necessary to complete construction in an efficient manner and minimize ground disturbance outside of the project footprint.
   b. Wetlands shall be protected wherever access roads traverse wetland plant communities.
   c. An acceptable method for protecting wetlands is as follows:
      i. Protect wetlands by laying down non-woven geo-textile road fabric and a minimum of 1' of temporary fill or wood mulch. All materials used to protect wetlands shall be removed at project completion and wetland areas returned to pre-existing grades. Temporary fill or wood mulch may be placed in the Spoils Area and all fabric shall be disposed of by the Contractor.
      ii. Alternative methods for protecting wetlands from equipment travel must be pre-approved by the Contracting Offer.
   d. Contractor shall minimize soil disturbance along all access routes and reclaim all ruts caused by construction activities.
2. Maintain roadways, temporary staging, storage areas and temporary access roads in a sound, reasonably serviceable condition until completion and acceptance of all work under this contract.
3. All access routes shall be restored to their original grade and reclaimed as outlined in the revegetation specifications contained in this document.

FENCES & GATES

1. The Contractor is responsible for protecting existing fences and gates in the project area.
2. The Contractor may only remove sections of fencing or gates necessary for completion of the project and that are approved by the Contracting Officer. All sections removed shall be repaired or replaced with equal or better material in their original locations or in a location as directed by the Contracting Officer at no extra cost to the Sponsor.

CONSTRUCTION STAGING AREA

1. Contractor shall park all equipment, vehicles, materials, fuel, portable sanitation facilities, etc. on the sod in the construction staging area, do not strip.
2. All equipment and vehicles shall be stored in the staging area nightly.
3. An additional upland staging area closer to the grading area may be established with pre-approval from the Contracting Officer.
4. Following project completion, the staging area shall be reclaimed as outlined in the revegetation specifications contained in this document.

LEGEND

- CONSTRUCTION ACCESS ROUTE
- EXISTING WETLAND
- EXISTING DITCH
- EXTENT OF GRADING
- PARCEL BOUNDARY
- *AERIAL: BING*

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MONTANA
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LICENSED PROFESSIONAL ENGINEER

GRAYLING POND

Final Design

Beaverhead County, MT

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0 75 150 300

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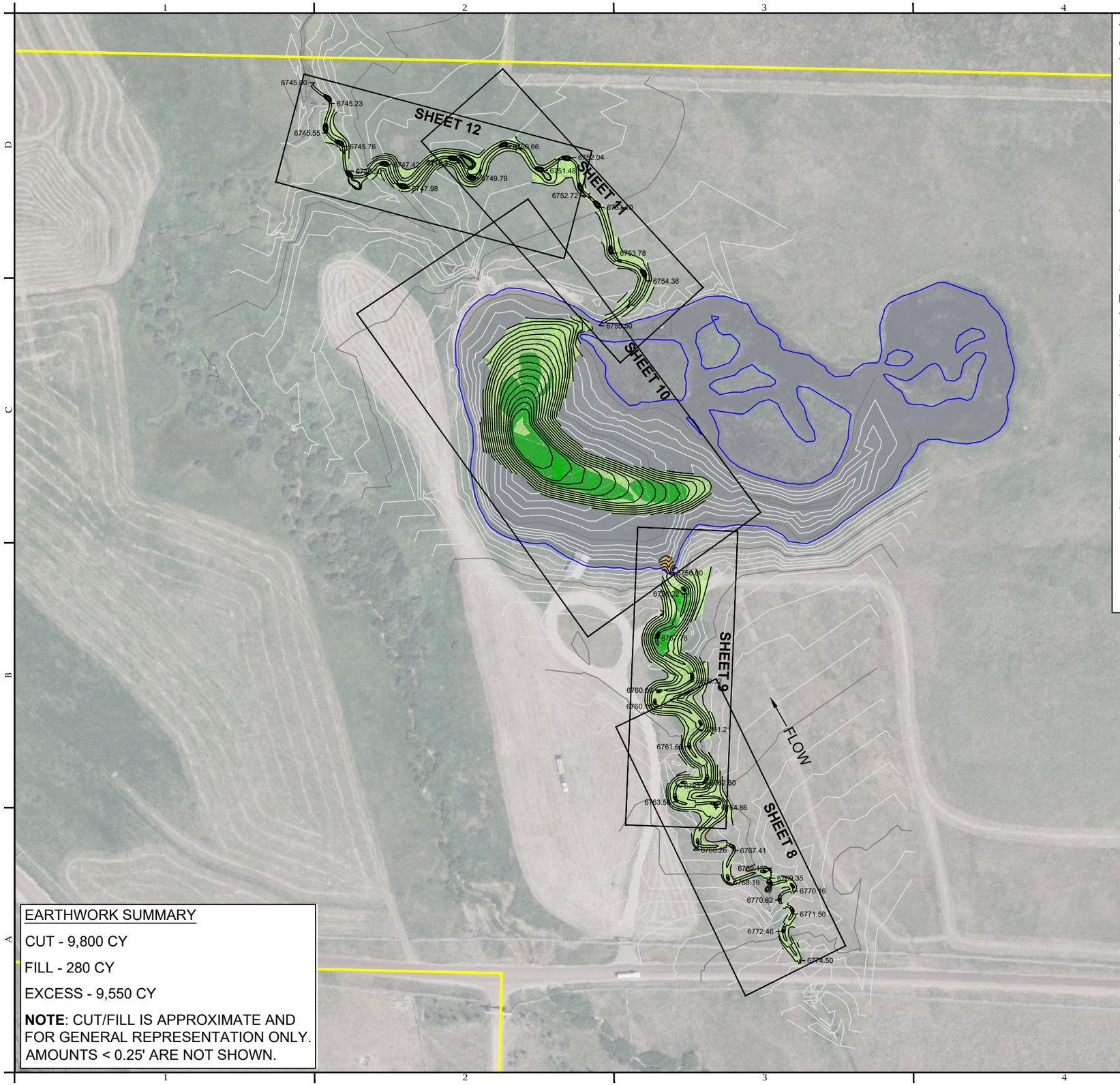
REVISIONS:

ACCESS & STAGING



10. EARTHWORK

GENERAL EXCAVATION AND GRADING

1. Limited soil subsurface data is available for this project. Earthwork quantities are based on site survey data. Additional subsurface investigations may be needed for this project if conditions vary significantly from those estimated based on existing data.
2. Excavate according to the lines and grades shown on the Drawings, or by field clarification by the Contracting Officer or Engineer. No excavation or fill shall be performed outside designated areas on the Drawings.
3. Grade to contours, elevations and dimensions indicated on the drawings. Do not place fill over frozen or excessively wet areas.
4. The combined excavation and placing operations shall produce fill materials that are well mixed and blended sufficiently to provide the most homogeneous section and best practical degree of compaction and stability.
5. A smooth transition shall be graded around all structures and between proposed and existing grades.

EXCAVATION AND EXCESS CUT

1. Total excavation volume is shown in the quantities table.
2. Fill operations consist of placing imported channel gravels and transplanting wetland sod to stream channel margins.
3. Excess cut shall be hauled to the spoil areas as designated on the Drawings.
4. The spoils location shall be stripped of sod prior to placing spoils. Salvaged sod shall be used to topdress the spoils area. Additional revegetation is outlined in the Revegetation specifications.

COMPACTION AND FINISH GRADING

1. Finish grading shall be within ±0.50 feet Horizontal and ±0.10 feet Vertical of the locations and elevations shown on the Drawings and construction stakes.
2. Compaction of finished surface is not required where the finished surface is achieved through excavation only. Mechanical compaction is not required for placement of imported channel gravels. Mechanical compaction is not required for the spoils area. Transplanted wetland sod on the channel margins shall not be compacted, but shall be pressed into the soil to minimize air pockets and maximize soil to root contact.

EARTHWORK SUMMARY

CUT - 9,800 CY

FILL - 280 CY

EXCESS - 9,550 CY

NOTE: CUT/FILL IS APPROXIMATE AND FOR GENERAL REPRESENTATION ONLY. AMOUNTS < 0.25' ARE NOT SHOWN.

LEGEND

- EXISTING POND OHWM
- EXISTING CONTOUR (1' & 5')
- PROPOSED CONTOUR (1')
- PROPOSED CUT (>5')
- PROPOSED CUT (0-5')
- PROPOSED FILL
- PARCEL BOUNDARY
- *AERIAL: BING*

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GRAYLING POND

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N

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0 75 150 300

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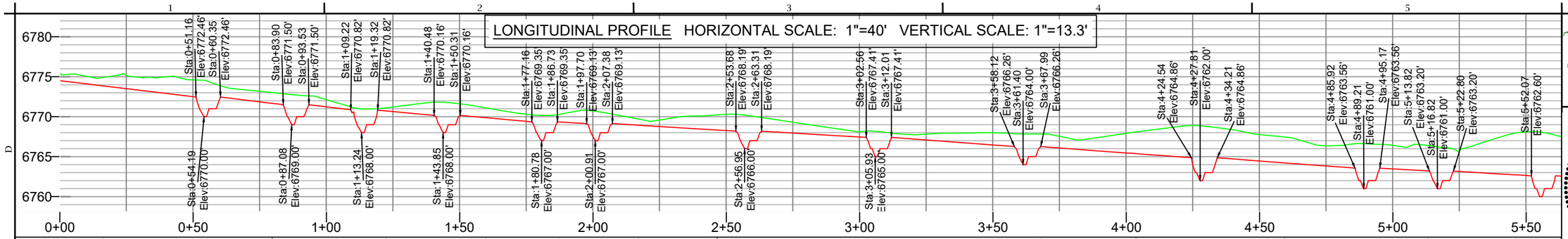
REVISIONS:

GRADING OVERVIEW

LONGITUDINAL PROFILE HORIZONTAL SCALE: 1"=40' VERTICAL SCALE: 1"=13.3'



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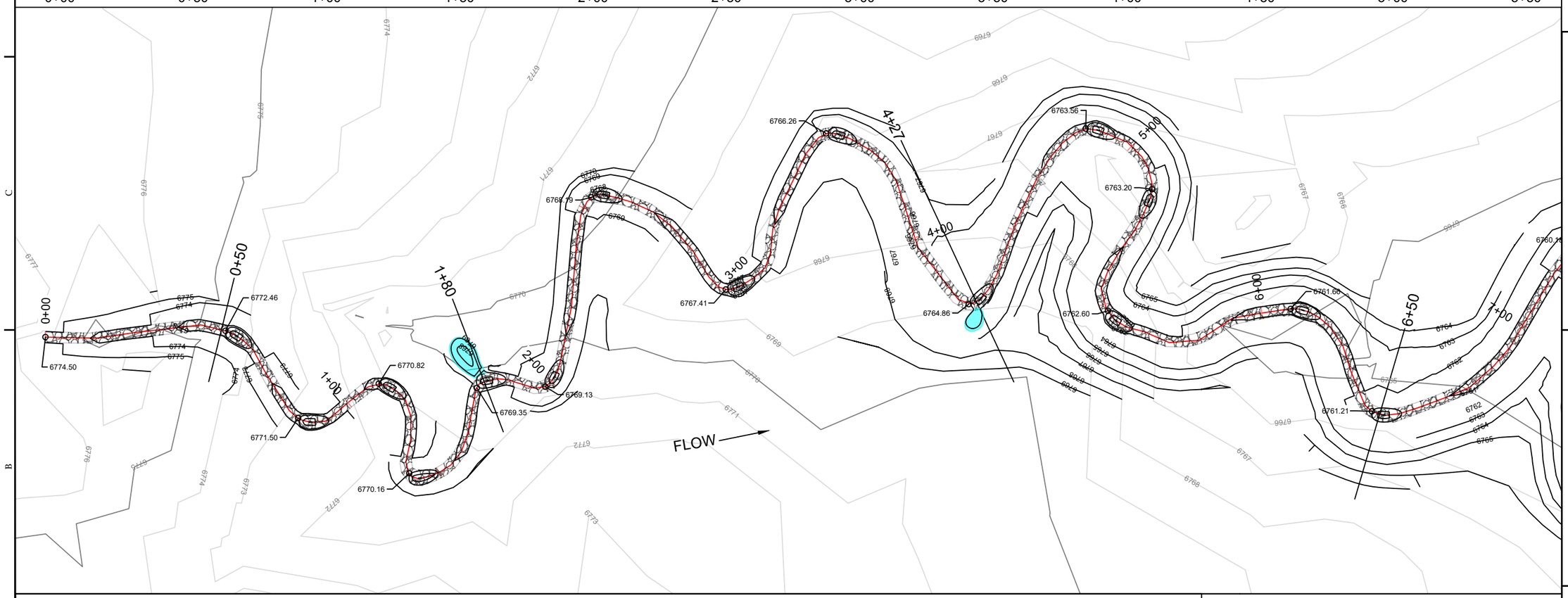

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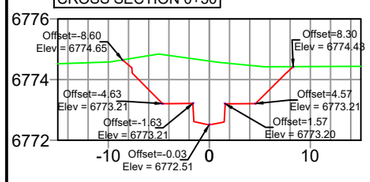
CROSS SECTION 0+50



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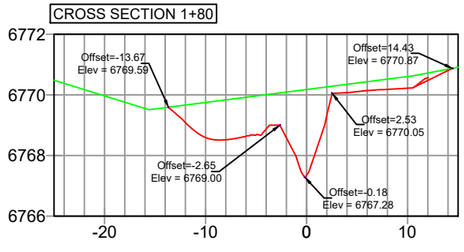

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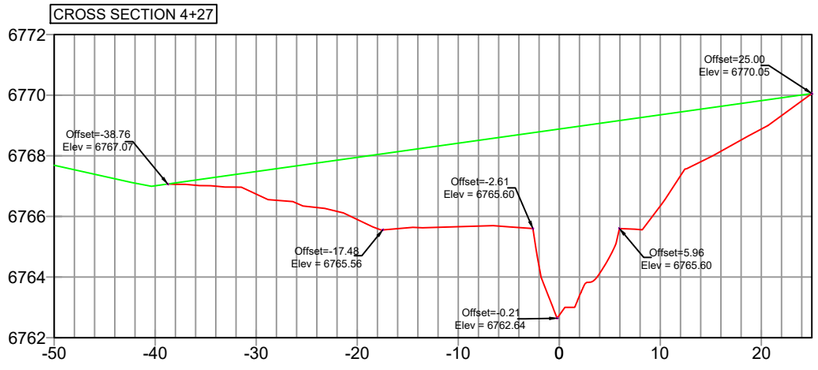

LEGEND

- EXISTING POND OHWM
- EXISTING CONTOUR (1' & 5')
- PROPOSED CONTOUR (1')
- PROPOSED CHANNEL CENTERLINE
- PROPOSED ALCOVE
- OVEREXCAVATION & IMPORTED GRAVEL

LONG PRO & CROSS SECTION LEGEND

- EXISTING GRADE
- PROPOSED GRADE

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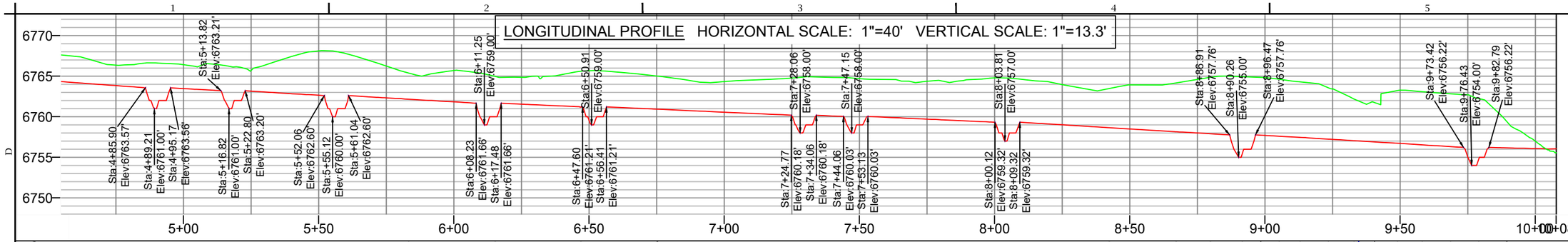
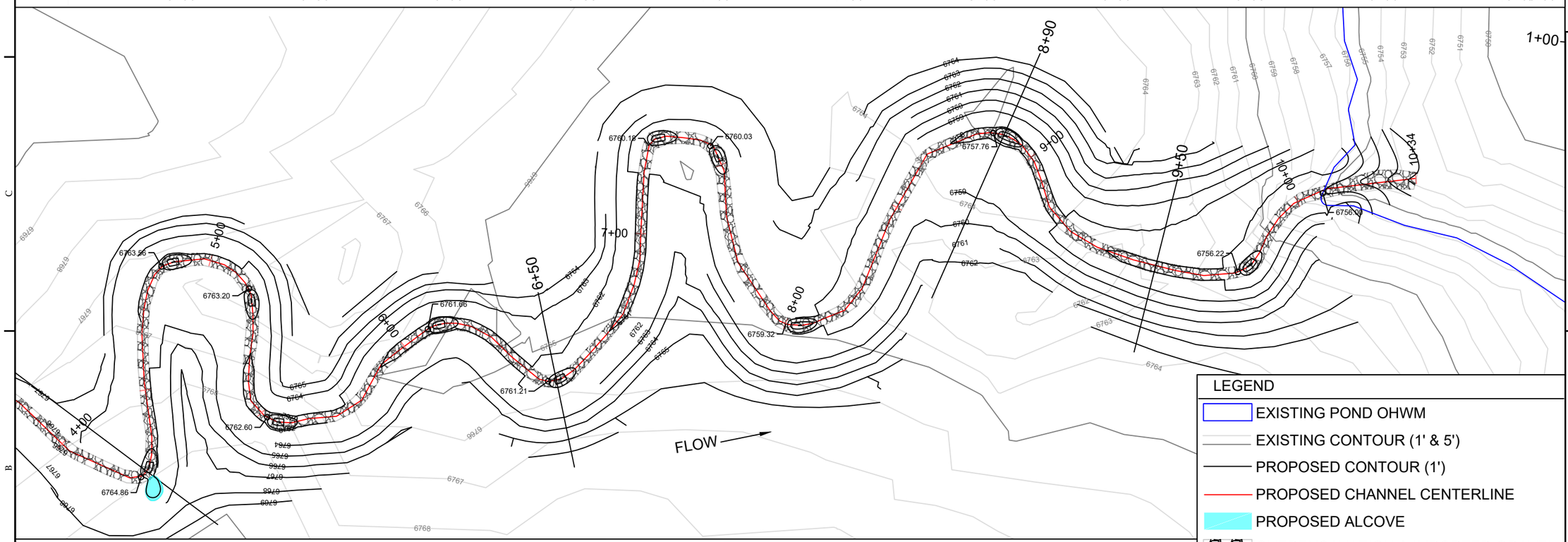
GRADING INLET-1

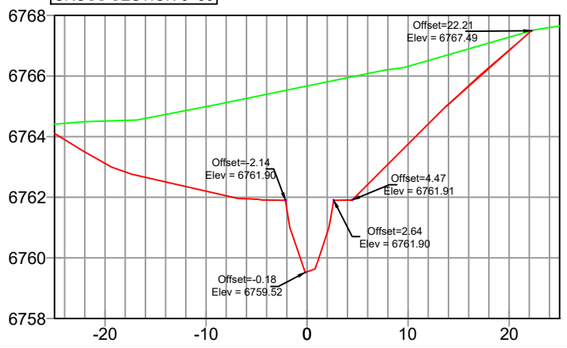
LONGITUDINAL PROFILE HORIZONTAL SCALE: 1"=40' VERTICAL SCALE: 1"=13.3'





CROSS SECTIONS HORIZONTAL SCALE: 1"=15' VERTICAL SCALE: 1"=5'

CROSS SECTION 6+50



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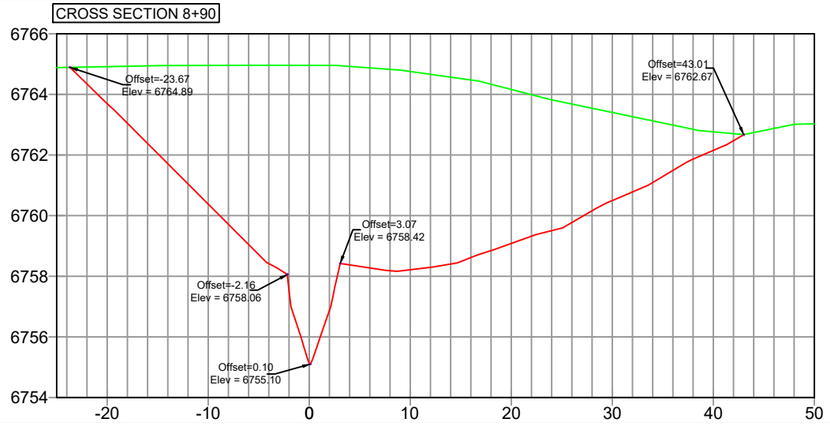

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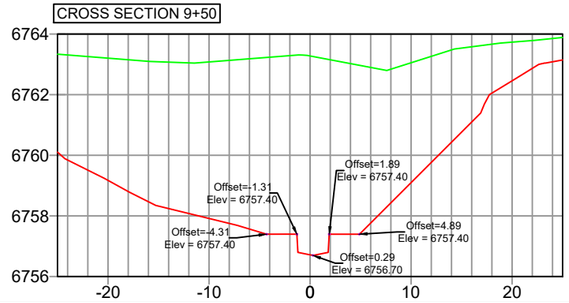

LEGEND

- EXISTING POND OHWM
- EXISTING CONTOUR (1' & 5')
- PROPOSED CONTOUR (1')
- PROPOSED CHANNEL CENTERLINE
- PROPOSED ALCOVE
- OVEREXCAVATION & IMPORTED GRAVEL

LONG PRO & CROSS SECTION LEGEND

- EXISTING GRADE
- PROPOSED GRADE

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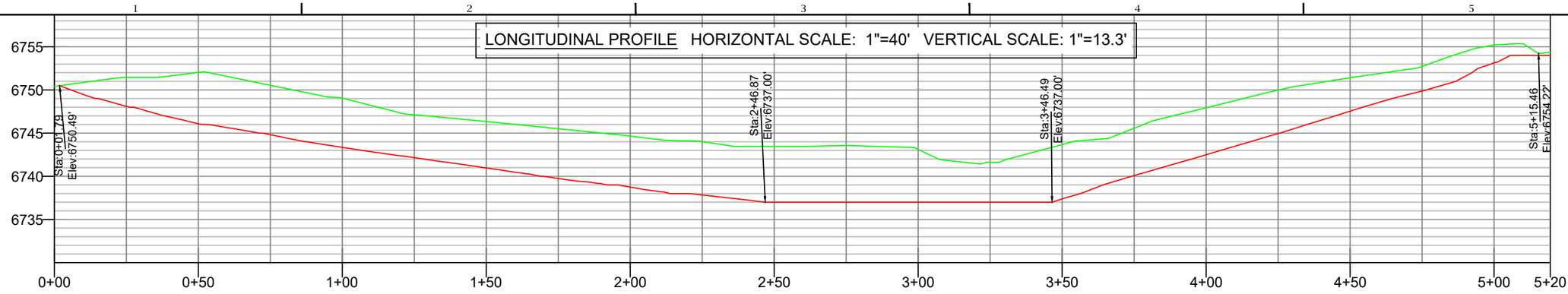
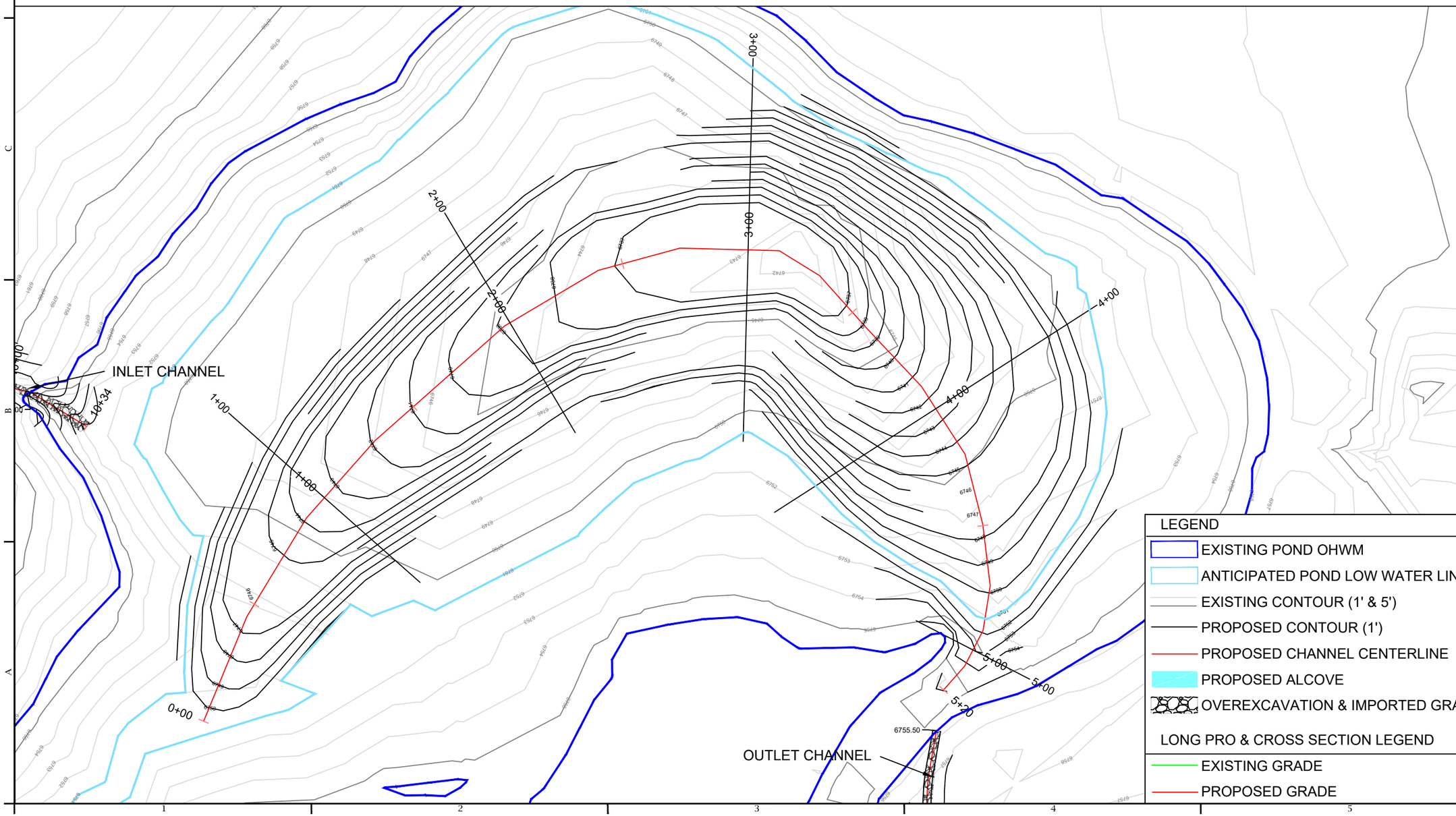
GRADING INLET-2

LONGITUDINAL PROFILE HORIZONTAL SCALE: 1"=40' VERTICAL SCALE: 1"=13.3'





LEGEND

- EXISTING POND OHWM
- ANTICIPATED POND LOW WATER LINE
- EXISTING CONTOUR (1' & 5')
- PROPOSED CONTOUR (1')
- PROPOSED CHANNEL CENTERLINE
- PROPOSED ALCOVE
- OVEREXCAVATION & IMPORTED GRAVEL

LONG PRO & CROSS SECTION LEGEND

- EXISTING GRADE
- PROPOSED GRADE

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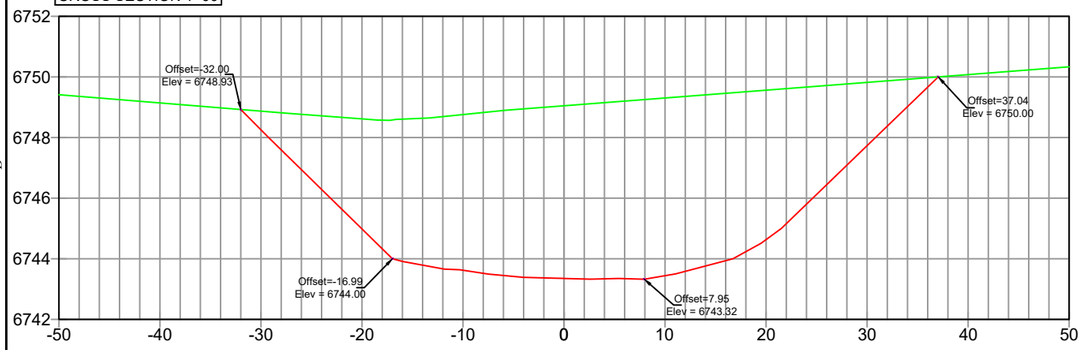
GRADING POND

10 OF 17

CROSS SECTION 1+00



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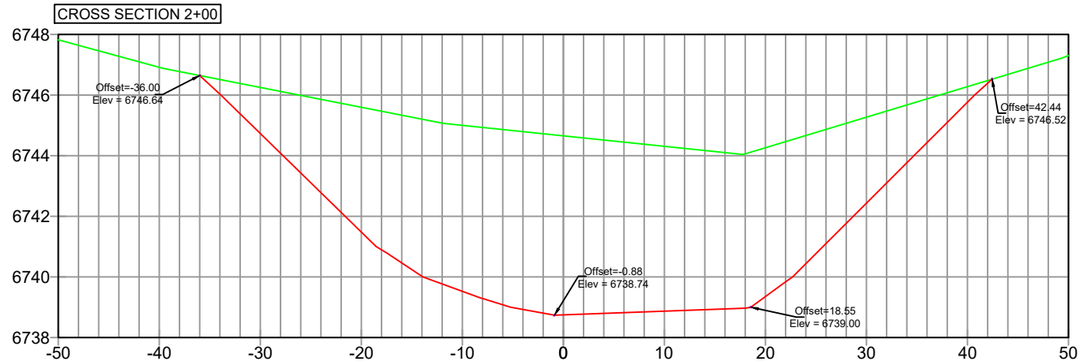

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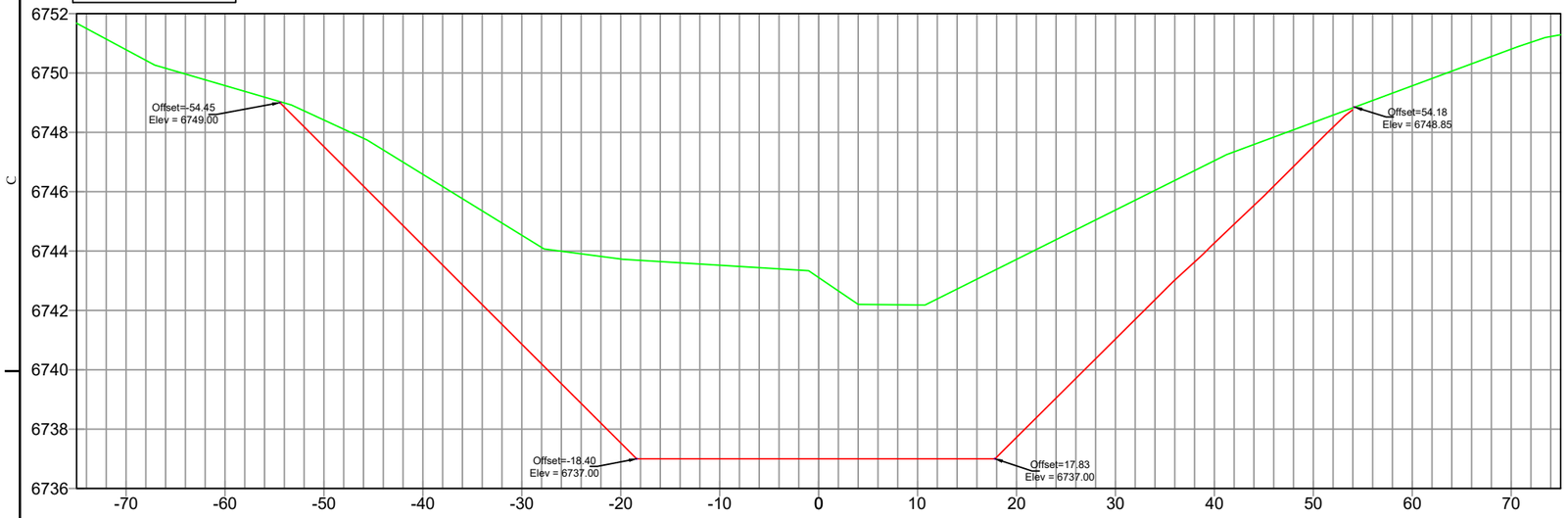

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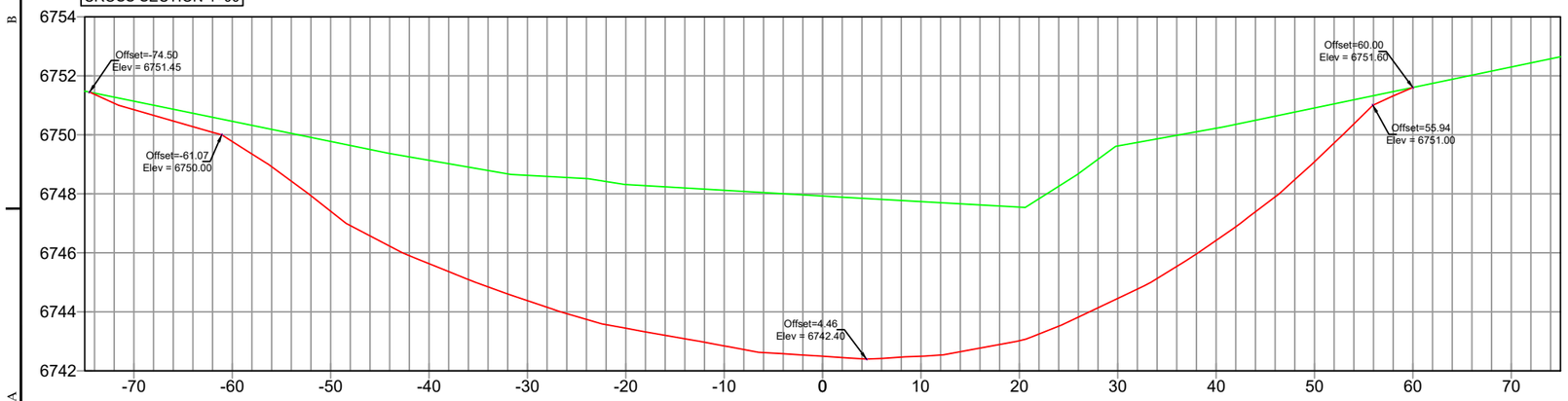

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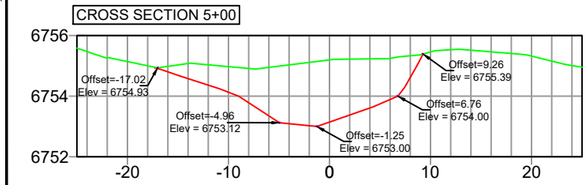

CROSS SECTION LEGEND

EXISTING GRADE

PROPOSED GRADE

HORIZONTAL SCALE: 1"=15'

VERTICAL SCALE: 1"=5'

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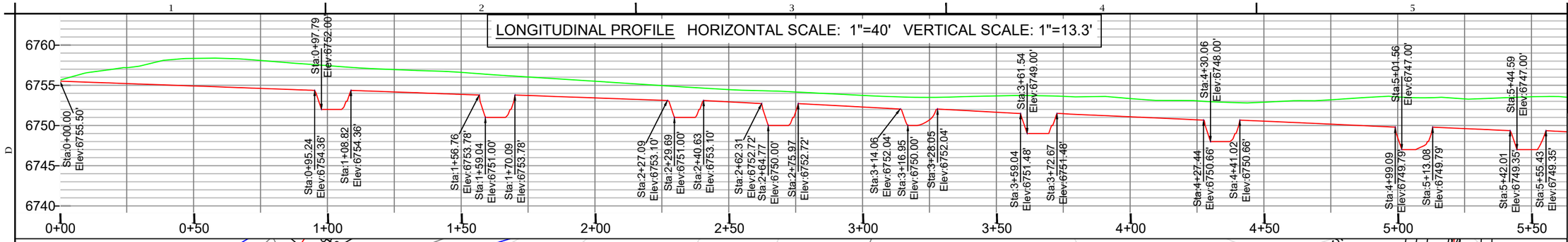
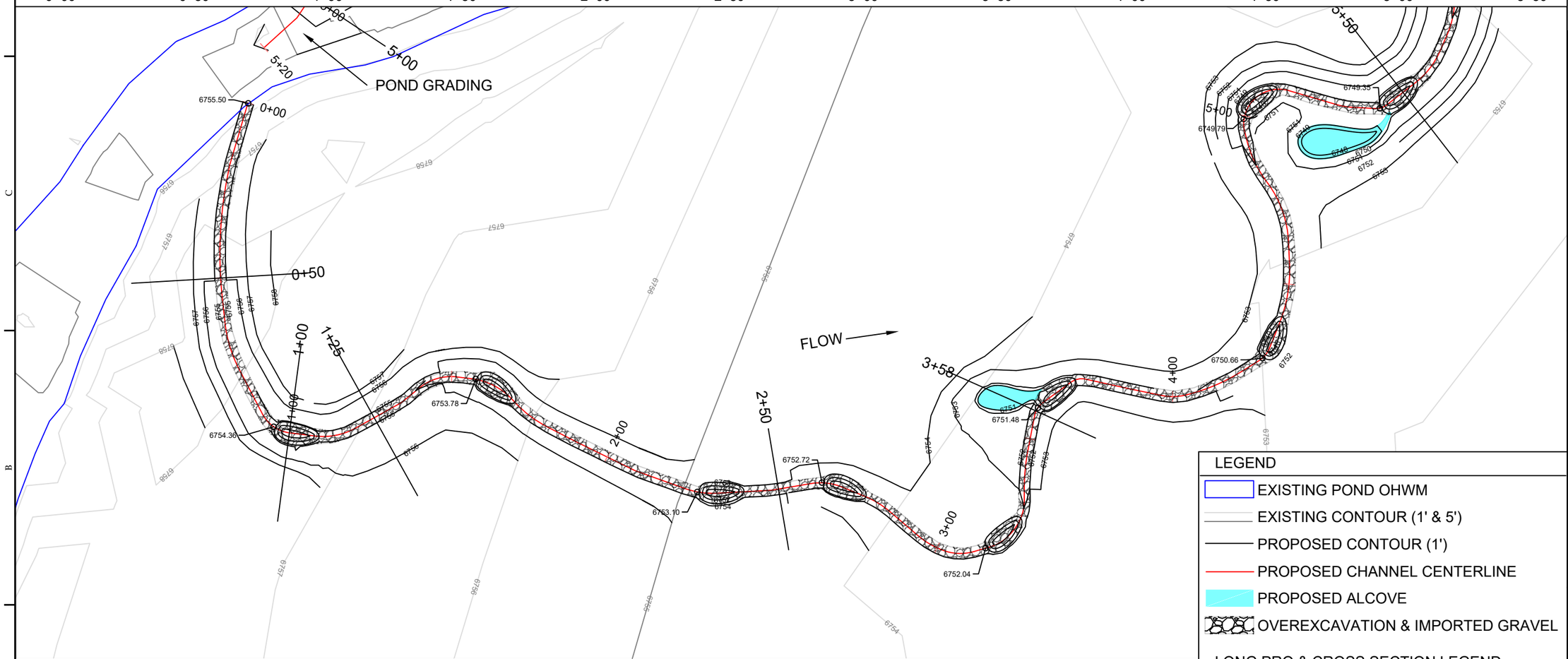
POND XS

LONGITUDINAL PROFILE HORIZONTAL SCALE: 1"=40' VERTICAL SCALE: 1"=13.3'





LEGEND

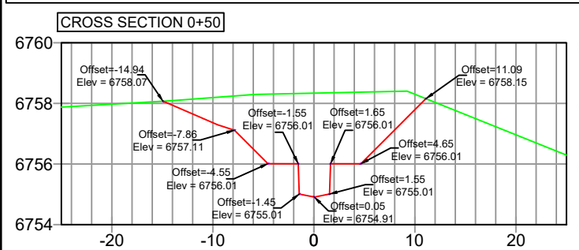
- EXISTING POND OHWM
- EXISTING CONTOUR (1' & 5')
- PROPOSED CONTOUR (1')
- PROPOSED CHANNEL CENTERLINE
- PROPOSED ALCOVE
- OVEREXCAVATION & IMPORTED GRAVEL

LONG PRO & CROSS SECTION LEGEND

- EXISTING GRADE
- PROPOSED GRADE

CROSS SECTIONS HORIZONTAL SCALE: 1"=15' VERTICAL SCALE: 1"=5'

CROSS SECTION 0+50



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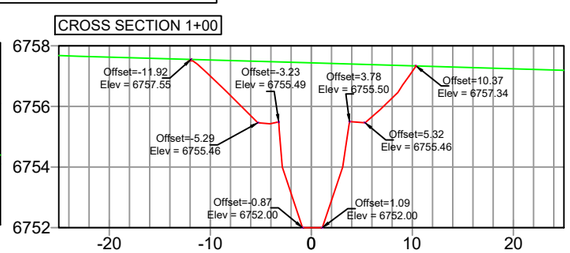

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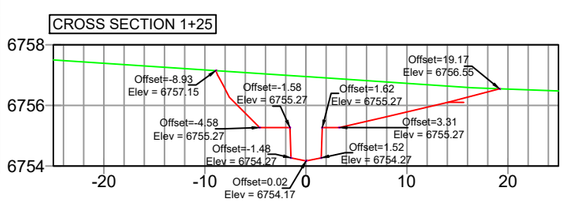

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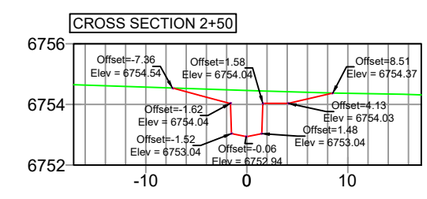

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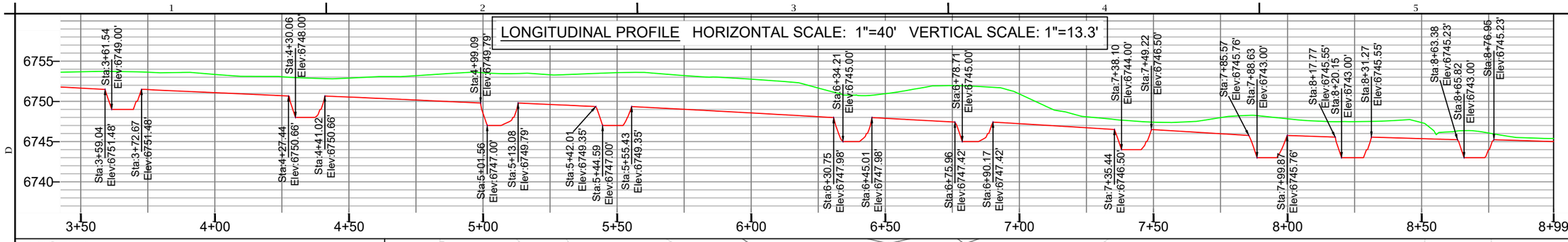
LONGITUDINAL PROFILE HORIZONTAL SCALE: 1"=40' VERTICAL SCALE: 1"=13.3'

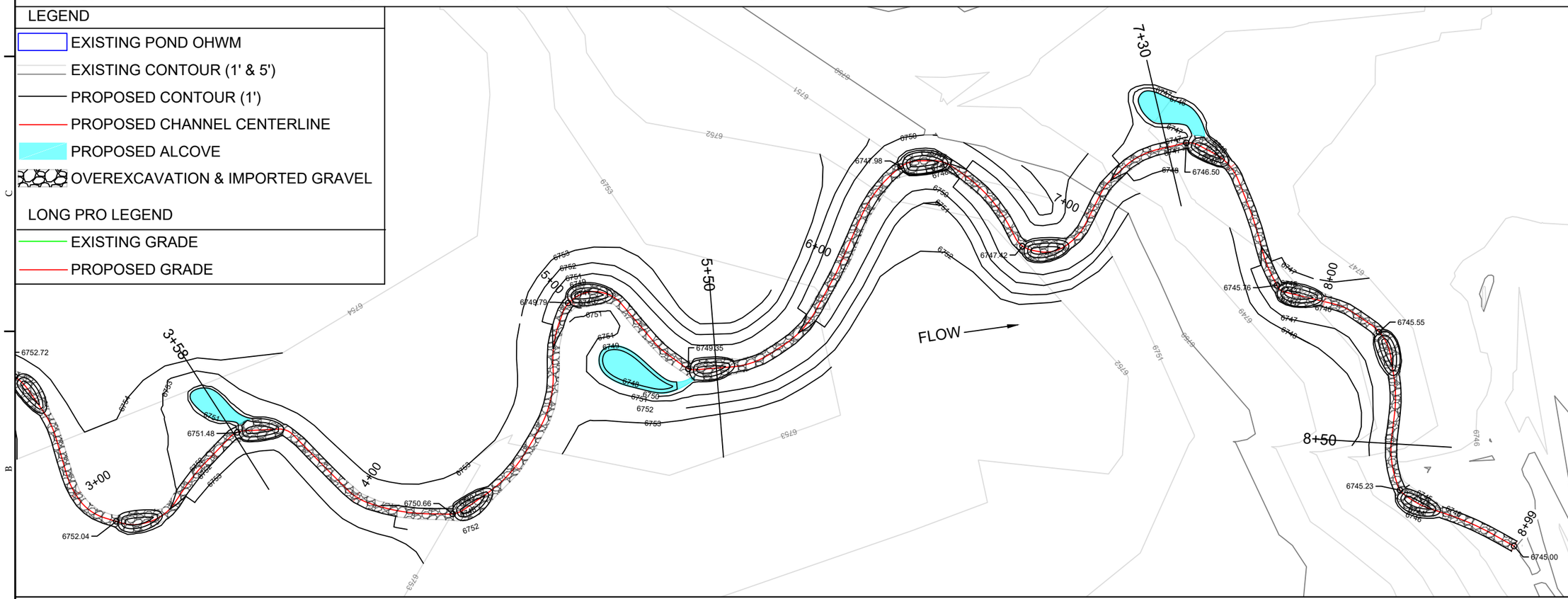


LEGEND

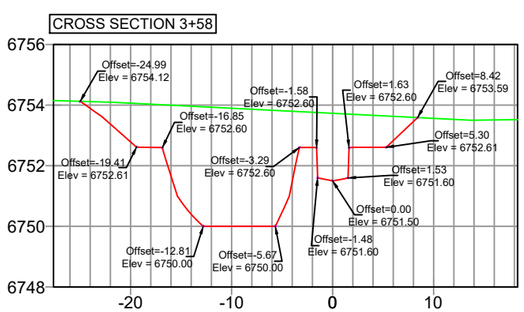
- EXISTING POND OHWM
- EXISTING CONTOUR (1' & 5')
- PROPOSED CONTOUR (1')
- PROPOSED CHANNEL CENTERLINE
- PROPOSED ALCOVE
- OVEREXCAVATION & IMPORTED GRAVEL

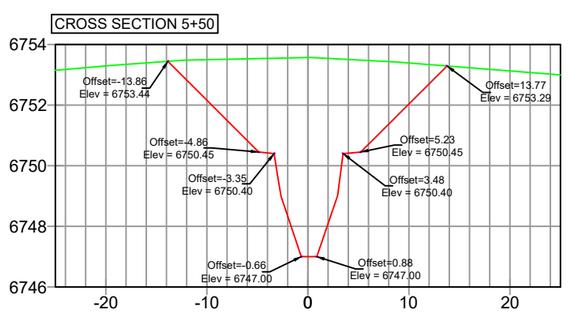
LONG PRO LEGEND

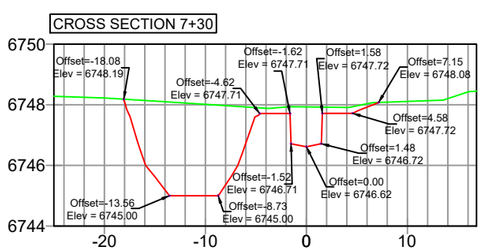
- EXISTING GRADE
- PROPOSED GRADE

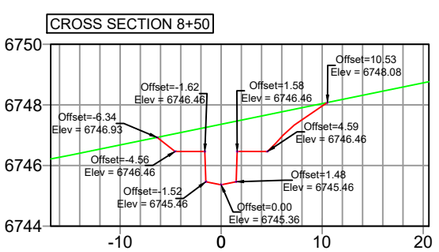


CROSS SECTIONS HORIZONTAL SCALE: 1"=15' VERTICAL SCALE: 1"=5'









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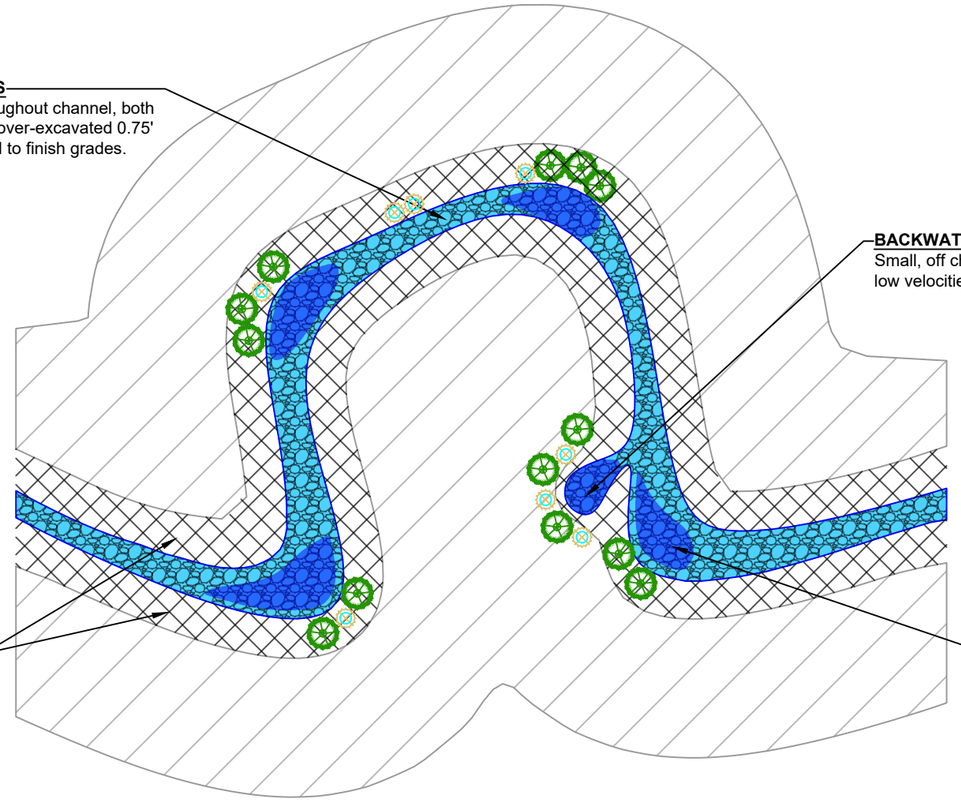
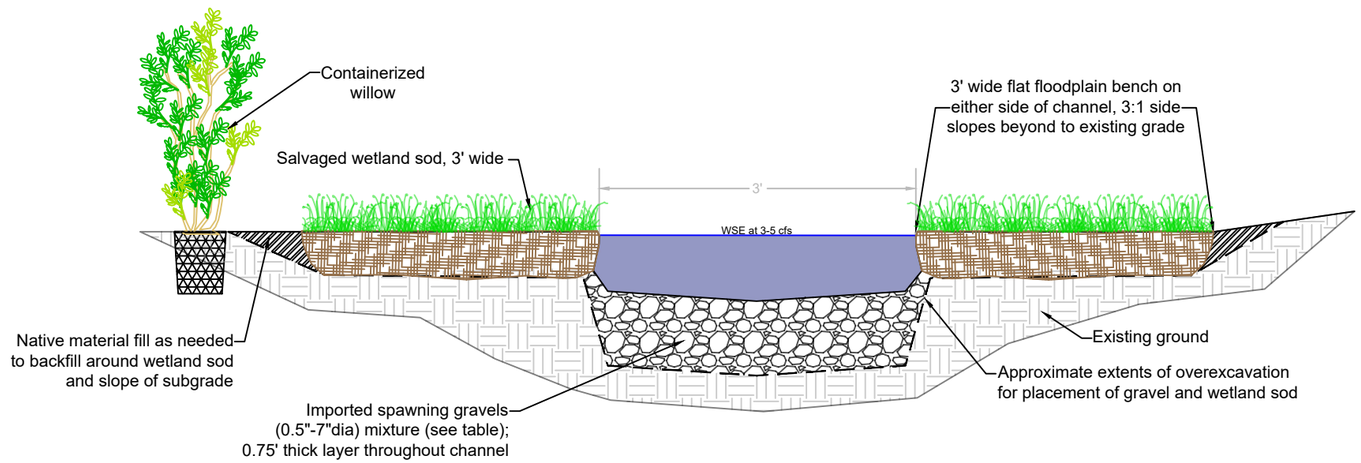
REVISIONS:

GRADING OUTLET-2



CHANNEL CONSTRUCTION DETAILS (NTS)



CHANNEL CONSTRUCTION DETAIL (NTS)

IMPORTED SPAWNING GRAVEL GRADATION	
Intermediate axis diameter (in.)	**Percent passing**
7 in	100
2 in	90
1 in	30
0.5 in	minimum

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208.354.3690
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MONTANA
ERIC AUGUST
No. 60829PE
LICENSED PROFESSIONAL ENGINEER

GRAYLING POND

Final Design

Beaverhead County, MT

Scale: NTS

IF PLOTTED ON 11"x17" SIZE: ADJUST ACCORDINGLY BASED ON PAPER SIZE

DATE: February 27, 2024
DRAWN BY: EA / JC / GR
CHECKED BY: KS
JOB NAME: MTFWP-GRAYLING POND
FILE: MTFWP-LAYOUTS.DWG
REVISIONS:

GRADING DETAILS

LEGEND

- CONTAINER WILLOW (5&15-GAL)
- TEMPORARY EXCLUSION FENCE
- NATIVE SOD TRANSPLANT
- PROPOSED POOL
- PROPOSED ALCOVE
- *AERIAL: BING*

11. REVEGETATION

NURSERY GROWN PLANT MATERIAL

1. All plant materials, shipment and deliveries shall comply with state and federal laws and regulations governing inspection, shipping, selling and handling of plant stock. For any shipment out of state, a certificate of inspection for injurious insects, plant diseases, and other plant pests will accompany each shipment or delivery of plant and seed material.
2. All plants will be mature, healthy, vigorous, well branched and densely foliated when in leaf, and free of disease and insects. Plants will have healthy, well-developed root systems and will be free from physical damage or other conditions that would prevent thriving growth.
3. Immediately upon delivery and until installation, plant material will be shaded and watered to ensure that the plants remain alive and healthy.
4. All plants will be labeled by plant name. labels will be attached securely to all plants and/or containers when delivered. Plant labels will be durable and legible, with information given in weather-resistant ink or embossed process lettering.

CONTAINER WILLOWS

1. Willow species may consist of the following. Other native species may be substituted with approval from the Contracting Officer:
   a. Salix eriocephala (Yellow willow)
   b. Salix boothii (Booth's willow)
   c. Salix geyeriana (Geyer willow)
   d. Salix drummondiana (Drummond willow)
   e. Salix bebbiana (Bebb's willow)
2. Container size shall be #5 (aka 5-gallon) and #15 (aka 15-gallon). Other sizes may be substituted with approval from the Contracting Officer.

NATIVE SOD TRANSPLANTS

1. Sod used for transplanting shall consist of native species and be located within the grading footprints.
2. Harvest locations shall be identified in the field by the Contracting Officer.
3. Place sod mats at areas indicated in the Revegetation plan and at the direction of the Contracting Officer.
4. Stage/stockpile salvaged sod prior to other grading activities.
5. Sod shall be harvested in mats (or sheets) 6-12" in thickness.
6. Minimize the number of time each sod mat is handled to reduce damage and maintain mat size.
7. Place sod mats with vegetation side up and with minimal gaps between mats.
8. Press sod into soil with equipment to smooth and minimize air pockets.

HAUL ROUTE AND STAGING AREA RECLAMATION

1. Contractor is responsible for reclaiming all access roads and staging areas.
2. All haul route and staging areas shall be returned to their original grades. Site conditions will dictate reclamation methods. Work with the Contracting Officer to determine the most effective course of action to achieve this.
   a. If significant compaction has occurred, ripping or disking may be required.
   b. Spreading salvaged sod or topsoil from the Marsh footprint may also be required.
3. Seed all areas disturbed by construction activities according to the Seeding Specifications.

SPOILS AREA RECLAMATION

1. Contractor is responsible for grading and seeding all excess excavation spoil area.
2. Spoil area shall be stripped of existing topsoil/vegetation prior to placing excess excavated material. Windrow stripped topsoil/vegetation adjacent to each location for later use.
3. Grade spoil area according to grade lines in the Drawings or at the direction of the Contracting Officer. Spoils area shall blend with surrounding grades.
4. Top dress spoils area with previously stripped topsoil/vegetation.
5. Seed according to the seeding specifications.

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0 30 60 120

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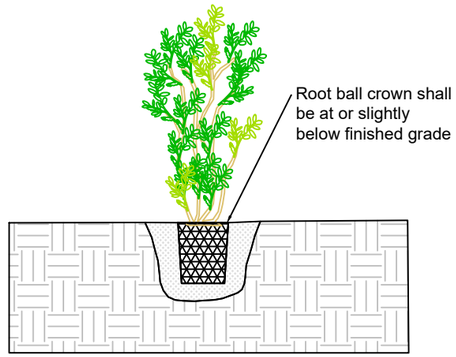
REVEG PLAN

CONTAINERIZED WILLOW PLANTING TYPICAL

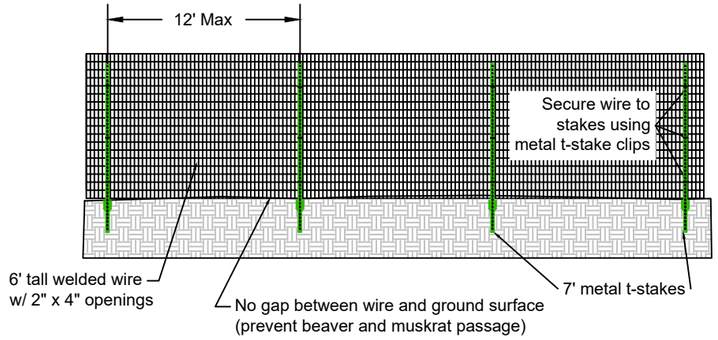
1. Install plants at general locations shown on the plans, with any field clarification from the Contracting Officer or Engineer.
2. Containers shall be separated from the plant immediately before planting to prevent desiccation of the roots.
3. To plant, dig a vertical hole twice the volume as the container, plant vertically and backfill. Backfill uniformly around each plant to maximize root to soil contact and eliminate all air pockets.
4. Backfill shall consist of imported, weed-free topsoil amended with compost. Use material excavated from planting hole to form a continuous berm around each plant to collect precipitation.
5. Care shall be taken to avoid "J-Rooting," do not force plant roots into too small/shallow of a hole and cause the roots to curve back around towards the surface.
6. Remove all plastic plant labels after installation.
7. Thoroughly water immediately after planting all containerized willows. If significant settling is observed after watering, additional soil must be added.
8. Willows may be planted in the fall or spring when dormant. Supplemental irrigation may be necessary to maintain optimal conditions throughout the growing season.




CONTAINERIZED WILLOW PLANTING REFERENCE

TEMPORARY WILDLIFE EXCLUSION FENCING

1. Wildlife exclusion fence shall be constructed around willow plantings. The purpose of this fence is to protect containerized willows during plant establishment from damage by ungulates, muskrats, and beaver.
2. Construct fence with 7-ft metal T-posts on 12-ft (max.) centers. Brace corners. Fence material shall consist of 6-ft tall welded wire mesh with 2" x 4" openings. Affix fencing to the T-posts with metal T-post clips.
3. Ensure that there is no gap between the wire and ground surface.
4. This is a temporary exclusion fence. The Property Owner will remove this fence in 3-5 years depending on plant maturity. All fencing materials will become property of the Property Owner.




TEMPORARY FENCE REFERENCE

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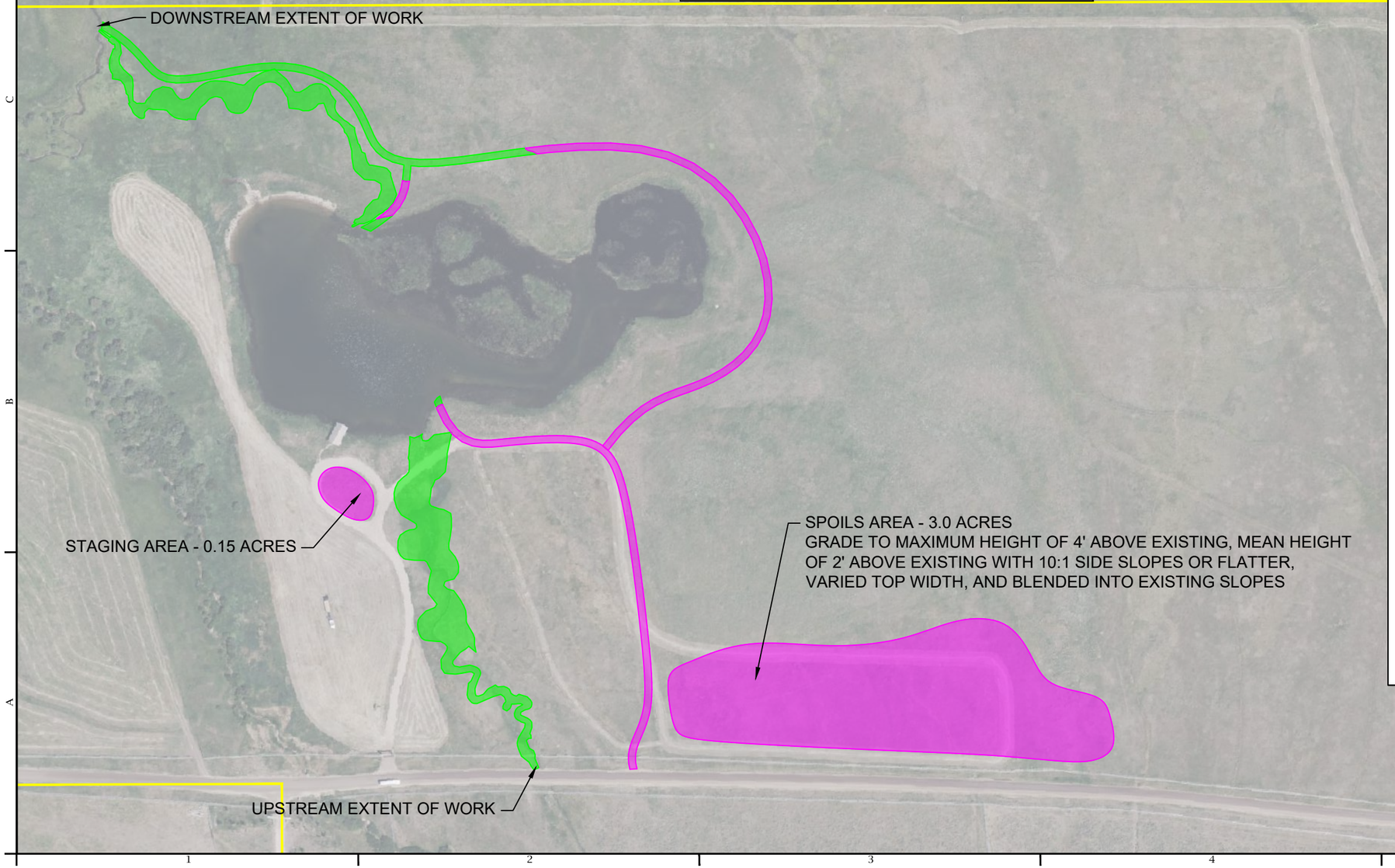
REVEG TYPICALS

Upland Seed Mix		
Common Name	**Species**	**PLS lbs/ac**
Western yarrow	*Achillea millefolium*	0.4
Bottlebrush squirreltail	*Elymus elymoides*	0.9
Thickspike wheatgrass	*Elymus lanceolatus ssp lanceolatus*	2.8
Slender wheatgrass	*Elymus trachycaulus*	1.6
Idaho fescue	*Festuca idahoensis*	0.6
Great Basin wildrye	*Leymus cinereus*	0.7
Lewis blue flax	*Linum perenne*	0.7
Fernleaf biscuitroot	*Lomatium dissectum*	0.5
Rydbergs penstemon	*Penstamon rydbergii*	0.1
Sandburgs bluegrass	*Poa sanbergii*	0.3
Bluebunch wheatgrass	*Pseudoroegneria spicata*	1.9
Scarlet globemallow	*Sphaeralcea coccinea*	0.2
Mtn big sagebrush	*Artemesia tridentata ssp. vaseyana*	0.3
	Total:	**11.0**

Wetland Seed Mix		
Common Name	**Species**	**PLS lbs/ac**
Western mannagrass	*Glyceria occidentalis*	1.11
American sloughgrass	*Beckmannia syzigachne*	0.27
Small-fruited bulrush	*Scirpus microcarpus*	0.06
Meadow barley	*Hordeum brachyanterum*	1.02
Tufted hairgrass	*Deschampsia caespitosa*	0.35
Arctic rush	*Juncus arcticus*	0.04
Canada wildrye	*Elymus canadensis*	3.03
Slender wheatgrass	*Elymus trachycaulus*	2.47
Rough bentgrass	*Agrostis scabra*	0.02
Fowl bluegrass	*Poa palustris*	0.11
Western wheatgrass	*Pascopyrum smithii*	2.77
Blue wildrye	*Elymus glaucus*	1.94
Thickspike wheatgrass	*Elymus lanceolatus*	2.26
Bluebunch wheatgrass	*Pseudoroegneria spicata (or Agropyron spicatum)*	1.56
	Total:	**17.00**



12. SEEDING

SPOILS AREA

1. The anticipated spoils area requiring seeding is approximately 3.0 acres, if all components of the design are included.
2. Spread salvaged sod/topsoil over seeding area.
3. Broadcast the Upland Seed Mix at the specified application rate.
4. Rake or harrow spoils area to incorporate seed into topsoil.
5. Roll areas with a roller, cultipacker, or tracked equipment.
6. Drill seeding the spoils area is an acceptable alternative method. Seed drills shall be capable of ≤ ½-inch planting depth.

EQUIPMENT AND MATERIAL STAGING AREA

1. The Staging Area shall be seeded with the Upland Seed Mix.
2. The Staging Area is approximately 0.15 acre.
3. Broadcast the Upland Seed Mix at the specified application rate.
4. Rake or harrow spoils area to incorporate seed into topsoil.
5. Roll areas with a roller, cultipacker, or tracked equipment.
6. Drill seeding the spoils area is an acceptable alternative method. Seed drills shall be capable of ≤ ½-inch planting depth.

HAUL ROUTES AND ADDITIONAL DISTURBED AREAS

1. Haul routes and disturbed areas not mentioned above shall be seeded with the Wetland Seed Mix or Upland Seed Mix, depending on the location.
2. Broadcast the appropriate Seed Mix at the specified application rate.
3. Roll seeded areas with a roller, cultipacker, or tracked equipment.
3. Areas containing greater than 50% of intact native sod after construction shall be broadcast seeded only.
4. Areas void of vegetation or containing less than 50% intact native sod shall be seeded according to the following specifications
   a. The seed bed shall be prepped by removing all stones and dirt clods greater than 2" and raking a smooth seed bed consisting of loose soil no less than 2" deep.
   b. Broadcast Seed Mix at the specified application rate.
   c. Rake or harrow spoils area to incorporate seed into topsoil.
   d. Roll seeded areas with a roller, cultipacker, or tracked equipment.
5. Work with the Project Engineer to determine the most effective seeding method.

LEGEND

- WETLAND SEEDING
- UPLAND SEEDING
- PARCEL BOUNDARY
- *AERIAL: BING*

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SEEDING PLAN