REGIONAL DISTRICT
of Fraser-Fort George

Main Office: 155 George Street, Prince George, BC V2L 1P8
Telephone: 250-960-4400 / Fax: 250-562-8676
Toll Free: 1-800-667-1959 / http://www.rdffg.bc.ca

Addendum No. 2

Invitation to Tender ES-21-01
Construction Services for
Cummings Road Regional Transfer Station Redevelopment

The addendum is being issued prior to the closing of the Invitation to Tender to provide further information, make changes to, or to clarify the original Contract Documents and is to be read, interpreted and coordinated with all other parts of the Contract Documents. This addendum includes new documents related to the project. In the case of a conflict with the balance of the documents, this Addendum shall govern. **Tenderers shall attach a signed copy of this addendum to their tender.** This addendum shall form part of the Contract Documents.

Delete and Replace the following pages with the pages attached:

Page 17 and 18, Schedule of Prices

APPENDIX A: SPECIFICATIONS

Refer to the attached Specifications for revisions to the following sections:

- 01 20 00 Measurement & Payment
- 01 45 00 Quality Control
- 32 32 23 MSE and Gravity Retaining Walls
- 32 92 20 Seeding

APPENDIX B: DRAWINGS

Refer to the attached Drawings “Issued for Addendum 2” showing modifications to the chain link fence and 2-block high gravity wall. Cleanouts for the retaining wall drain pipes have also been included.

CLARIFICATIONS

Question Drawing C07 calls for both galvanizing and priming/painting of the guard rails. I’ve noticed that in most RDFFG site the guard rails have been painted. Is that the case here?
Also can you provide detail on how these rails are to be connected to each other at the 90 deg angles (if required)

Answer All metal (guard rails, kick plate, base plate, bolts) is to be galvanized for protection and painted for visibility (safety yellow). Use paint product approved for application on top of galvanized metal.
Regarding guardrail detail at corners, Section 2 indicates continuous, but Section 1 indicates guard rails in panels. Section 1 is correct, installation in panels is acceptable.

Question If we are strictly hydroseeding, does Section 3.2 apply?

Answer No, 3.2 does not apply, the Contract only calls for hydroseeding.

Question Application of 300 kg/ha prior to hydroseeding, followed by another 170kg/ha during hydroseeding is very excessive. Not to mention further post-application fertilizing. This is too excessive. Is pre-application needed (does section 3.1 apply)?

Answer No, 3.1 does not apply, the Contract only calls for hydroseeding.

Question Seeding rate (300 kg/ha) is very excessive and not at all necessary. Maximum with agronomic seed mixes would be 150 kg/ha.

Answer The Contract only calls for hydroseeding, use rate specified in Sec 3.3 of 170kg/ha.

Question Has a seed mix been prescribed? The specification do not say one way or the other.

Answer Refer to revised Section 32 92 20, attached.

Date: February 12, 2021

Addendum 2 Received.

_____ _____

Signature of Tenderer Name of Tenderer

Inquiries relating to this ITT may be directed to:

Laura Zapotichny, Manager of Waste Diversion Programs
Regional District of Fraser-Fort George
155 George Street, Prince George, BC V2L 1P8
Phone: 250-960-4400 / Fax: 250-562-8676
Email: lzapotichny@rdffg.bc.ca

SCHEDULE OF PRICES

DIVISION	SECTION	ITEM	TITLE	UNIT	QTY	UNIT PRICE	TOTAL
DIV 01	**GENERAL REQUIREMENTS**						
		1.1	Mobilization/Demobilization	LS	1		
		1.2	General Requirements	LS	1		
	01 34 43	1.3	Environmental Protection	LS	1		
DIV 02	**REMOVALS**						
	02 41 23	2.1	Sitework Demolition	LS	1		
DIV 03	**CONCRETE AND RETAINING WALLS**						
	32 32 23	3.1	Supply and install of 3 block high lock block retaining wall	LS	1		
	32 32 23	3.2	Installation of reused lock blocks for 2 block high wall	Ea	85		
	03 48 00	**3.3**	**Supply and Install new lock blocks for 2 block high wall**	**Ea**	**12**		
	32 32 23	3.4	Supply and Install drainage pipe for 2 block high wall	LS	1		
	05 50 13	3.5	Supply and Install of Guard rails	LS	1		
	03 05 10	3.6	Supply and install of 7 concrete bin slabs	LS	1		
	03 05 10	3.7	Supply and install of 7 concrete top of wall slabs	LS	1		
DIV 26	**ELECTRICAL**						
	26 05 10	4.1	Supply and install power lines to the attendant booth, swipe card gate and kiosk c/w new power poles and bases, site lighting, enclosure & meter re-connection.	LS	1		
DIV 31	**EARTHWORKS**						
	31 11 00	5.1	Clearing and Grubbing	m^2	3,100		
	31 14 13	5.2	Stripping, stockpiling and placement of onsite topsoil	m^2	3,100		
	31 24 13	5.3	General Site excavation	m^3	2,750		
	31 24 13	5.4	Excavation Below concrete slabs & retaining wall	m^3	1,750		
	31 24 13	5.5	Reused Onsite Soils Site fill and Subgrade Preparation	m^3	3,400		
	31 24 13	5.6	Imported Site Fill, Subgrade Preparation and Backfill Below Retaining Wall	m^3	2,933		
	31 24 13	5.7	Offsite disposal of MSW (Loading and Haul Costs)	m^3	1,210		
	32 91 21	5.8	Haul Owner Supplied compost (NorGrow)	m^3	50		
	31 91 21	5.9	Blend and Place Prepared Topsoil	m^3	300		
	32 92 20	5.10	Supply and place hydro-seeding	m^2	2,100		
	32 93 00	5.11	Supply and installation of planting mulch, shrubs and trees	LS	1		
	32 92 20	**5.12**	**Supply and installation of coco-matting**	**m^2**	**120**		

DIVISION	SECTION	ITEM	TITLE	UNIT	QTY	UNIT PRICE	TOTAL
DIV 32	**SITE IMPROVEMENTS**						
	32 11 13	6.1	Select Granular Subbase	tonnes	5,355		
	32 11 13	6.2	Well Graded Base	tonnes	2,604		
	32 11 13	6.3	High Fines Surfacing Aggregate	tonnes	1,638		
	03 48 00	6.4	Traffic barriers	Ea.	21		
	32 31 13	6.5	Chain link and electrical fencing	LM	325		
	32 31 13	6.6	Chain link and electric fence double gate	Ea.	2		
	32 31 13	6.7	Chain link and electric fence single gate	Ea.	1		
	32 31 13	6.8	Supply and Install of Mangate	Ea.	1		
DIV 33	**UTILITIES**						
	32 32 23	7.1	Storm ditching (incl. excavation, rip rap)	LM	120		
	33 41 10	7.2	Supply Install French Drain	LM	90		
DIV 36	**MISCELLANEOUS**						
		8.1	Relocate attendant booth	LS	1		
				Total			

NOT FOR CONSTRUCTION
ISSUED FOR TENDER ONLY

ISSUED FOR ADDENDUM 2

2021 / 02 / 12

Regional District Of Fraser-Fort George

Cummings Road Regional Transfer Station Redevelopment

201945000

DRAWING LIST

Sheet Number	Sheet Title
C00	Cover
C01	Existing Site Conditions
C02	Removals
C04	Site Layout & Grading Plan
C04	Gravel & Landscaping Plan
C05	Site Entrance & Exit And Landscaping
C06	Cross Sections
C07	Details
C08	Details
C09	Retaining Wall Details
E01	Electrical Cover Page
E02	Electrical Details
E03	Electrical Work Plan

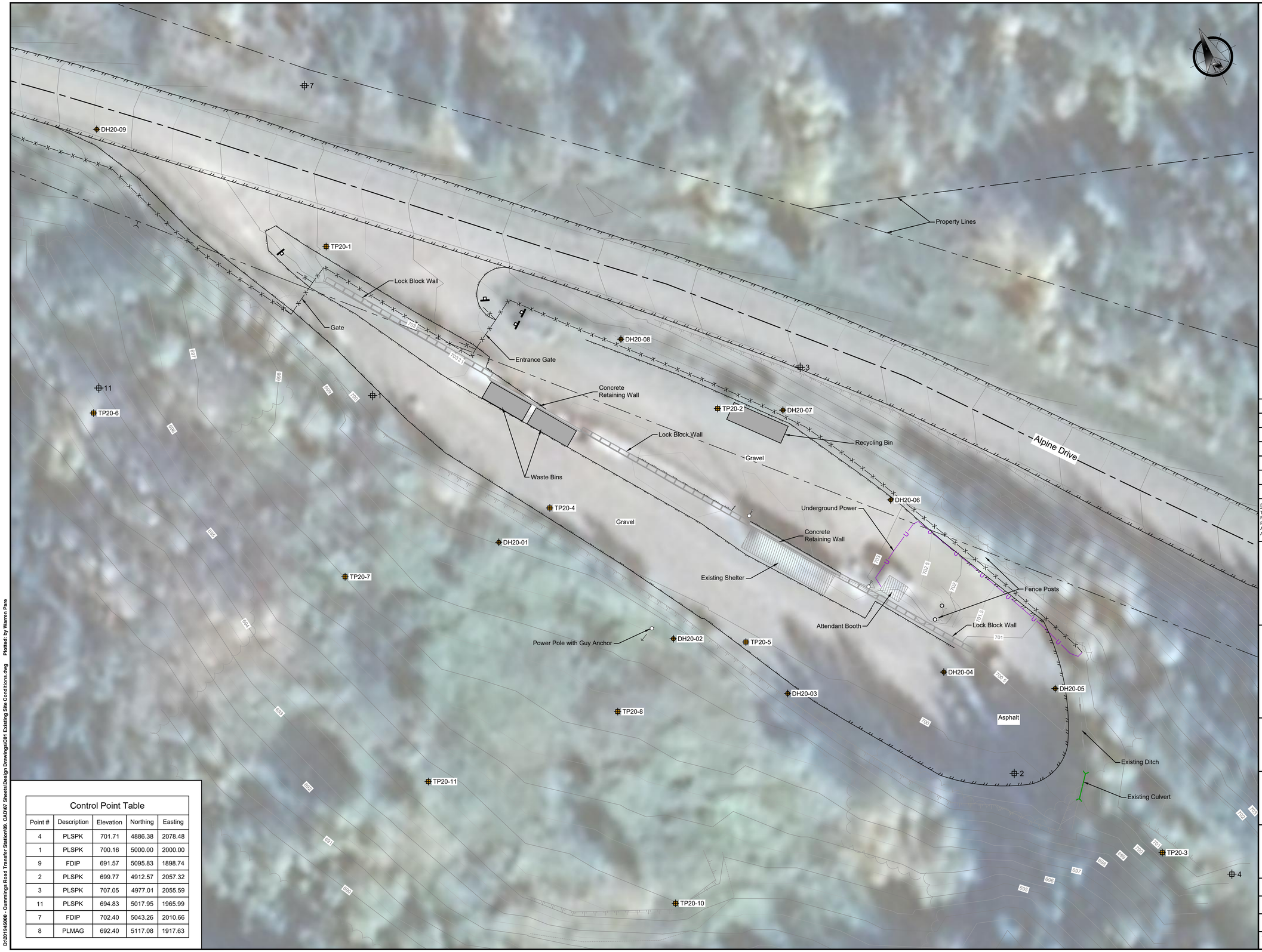
LOCATION PLAN

NTS

MORRISON HERSHFIELD

Unit 310, 4321 Still Creek Drive Burnaby, BC V5C 6S7 Tel: 604 454 0402

D:\201945000 - Cummings Road Transfer Station\09. CAD\07 Sheets\Design Drawings\C00 Cover.dwg Plotted: by Warren Pare



Control Point Table

Point #	Description	Elevation	Northing	Easting
4	PLSPK	701.71	4886.38	2078.48
1	PLSPK	700.16	5000.00	2000.00
9	FDIP	691.57	5095.83	1898.74
2	PLSPK	699.77	4912.57	2057.32
3	PLSPK	707.05	4977.01	2055.59
11	PLSPK	694.83	5017.95	1965.99
7	FDIP	702.40	5043.26	2010.66
8	PLMAG	692.40	5117.08	1917.63

Notes:

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2. Any Deviation Or Inconsistencies From This Plan Shall Be Reported To The Engineer Immediately.
3. The Dimensions Shown On This Plan Take Precedence Over Scaled Dimensions.
4. All Dimensions Are In Meters, And Decimals Thereof Unless Otherwise Noted.

Legend:

- Control Point
- Property Line
- Top Of Slope
- Toe Of Slope
- Edge Of Gravel
- Drainage Ditch
- Edge Of Tree Line
- Chainlink & Electric Fence
- Edge Of Asphalt
- Underground Power Line
- Culvert
- Power Pole
- Drill Hole Location
- Test Pit Location
- Existing Major Contour
- Existing Minor Contour

4	2021-02-12	ISSUED FOR ADDENDUM 2
3	2021-01-21	ISSUED FOR TENDER
2	2020-12-11	ISSUED FOR TENDER REVIEW
1	2020-11-06	ISSUED FOR CLIENT REVIEW
	YYYY-MM-DD	SUBMISSION INFORMATION

STAMP

PERMIT TO PRACTICE

MORRISON HERSHFIELD
Unit 310, 4321 Still Creek Drive
Burnaby, British Columbia V5C 6S7
Tel: 604-454-0402 Fax: 604-454-0403

PROJECT

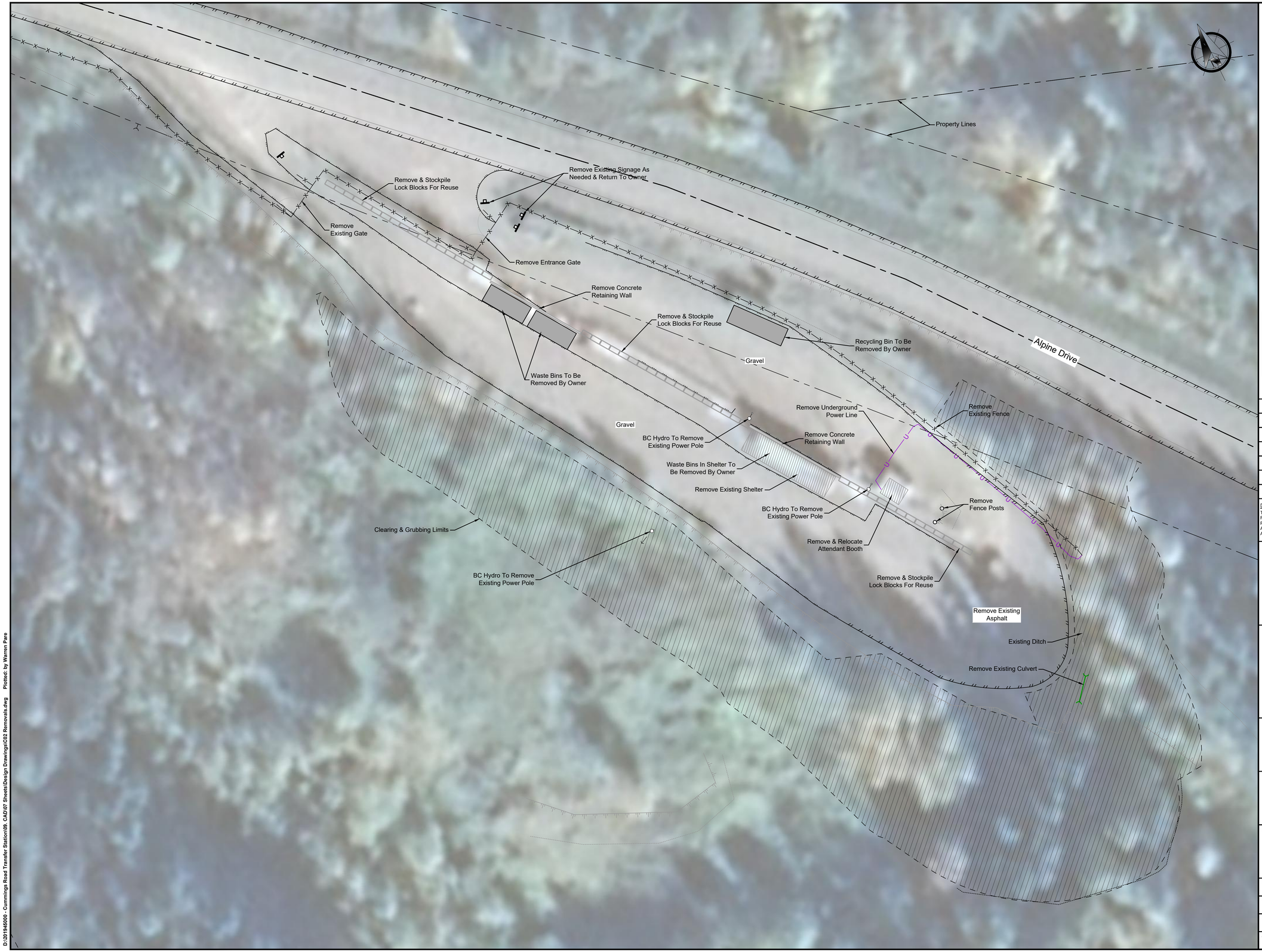
Cummings Rd. Regional Transfer Station Redevelopment

DRAWING

Existing Site Conditions

DESIGN: PM	DATE: Feb. 11, 21	SCALE: 1:250
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C01	VERSION: 4
APPROVED:		

D:\201945000 - Cummings Road Transfer Station\09_CAD\07 Sheets\Design Drawings\C01 Existing Site Conditions.dwg Plotted: by Warren Pare



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- Toe Of Slope
- Edge Of Gravel
- Drainage Ditch
- Edge Of Tree Line
- Chainlink & Electric Fence
- Edge Of Asphalt
- Underground Power Line
- Culvert
- Power Pole

Removals Responsibility Matrix

Item	Responsibility
Waste Bins	Owner
Recycling Bins	Owner
Power Poles	BC Hydro
Removals Coordination	Contractor
All Other Removals	Contractor

4	2021-02-12	ISSUED FOR ADDENDUM 2
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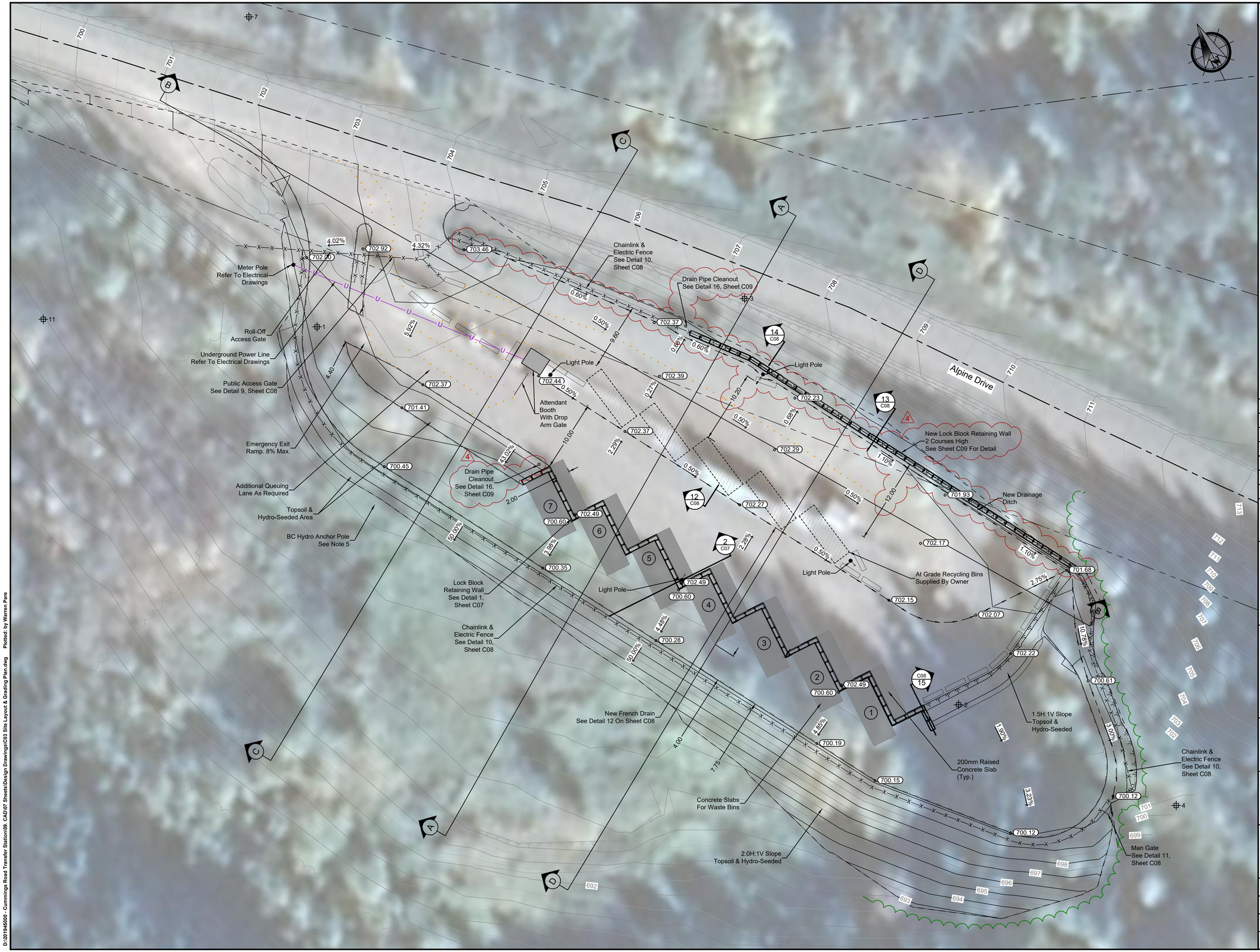
PROJECT

Cummings Rd. Regional Transfer Station Redevelopment

DRAWING

Removals

DESIGN: PM	DATE: Feb. 11, 21	SCALE: As Shown
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C02	VERSION: 4
APPROVED:		



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5. Civil Contractor To Coordinate Location Of New BC Hydro Anchor Pole With BC Hydro On Site At The Beginning Of Construction.

Legend:

- Control Point
- 6.22% — Surface Grade
- 700.73 — Surface Elevation
- Property Line
- Top Of Slope
- Toe Of Slope
- Edge Of Gravel
- Drainage Ditch
- Edge Of Tree Line
- Chainlink & Electric Fence
- Traffic Delineators
- Light Pole
- Meter Pole
- Concrete Jersey Barrier
- Existing Major Contour
- Existing Minor Contour
- Proposed Major Contour
- Proposed Minor Contour

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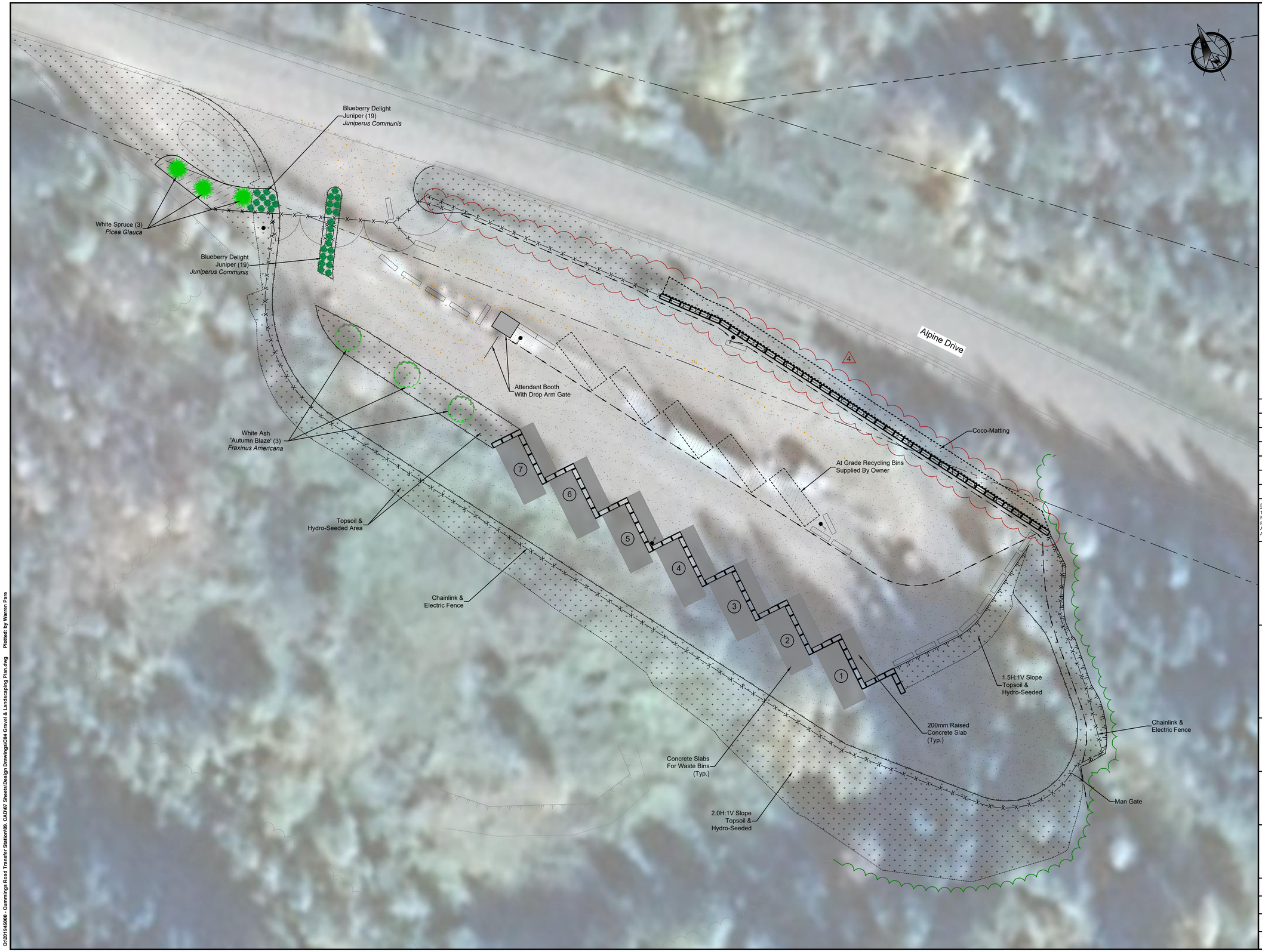
PROJECT
Cummings Rd. Regional Transfer Station Redevelopment

DRAWING
Site Layout & Grading Plan

DESIGN: PM	DATE: Feb. 11, 21	SCALE: As Shown
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C03	VERSION: 4
APPROVED		

D:\201945000 - Cummings Road Transfer Station\09. CAD\07 Sheets\Design Drawings\C03 Site Layout & Grading Plan.dwg Plotted: by Warren Pare



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- Edge Of Gravel
- Drainage Ditch
- Edge Of Tree Line
- Chainlink & Electric Fence
- Traffic Delineators (By Owner)
- Light Pole
- Meter Pole
- Concrete Jersey Barrier
- Topsoil & Seeded Area
- Graveled Area
- Concrete Slabs
- Mulch Planting Bed
- Coco-Matting

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PROJECT

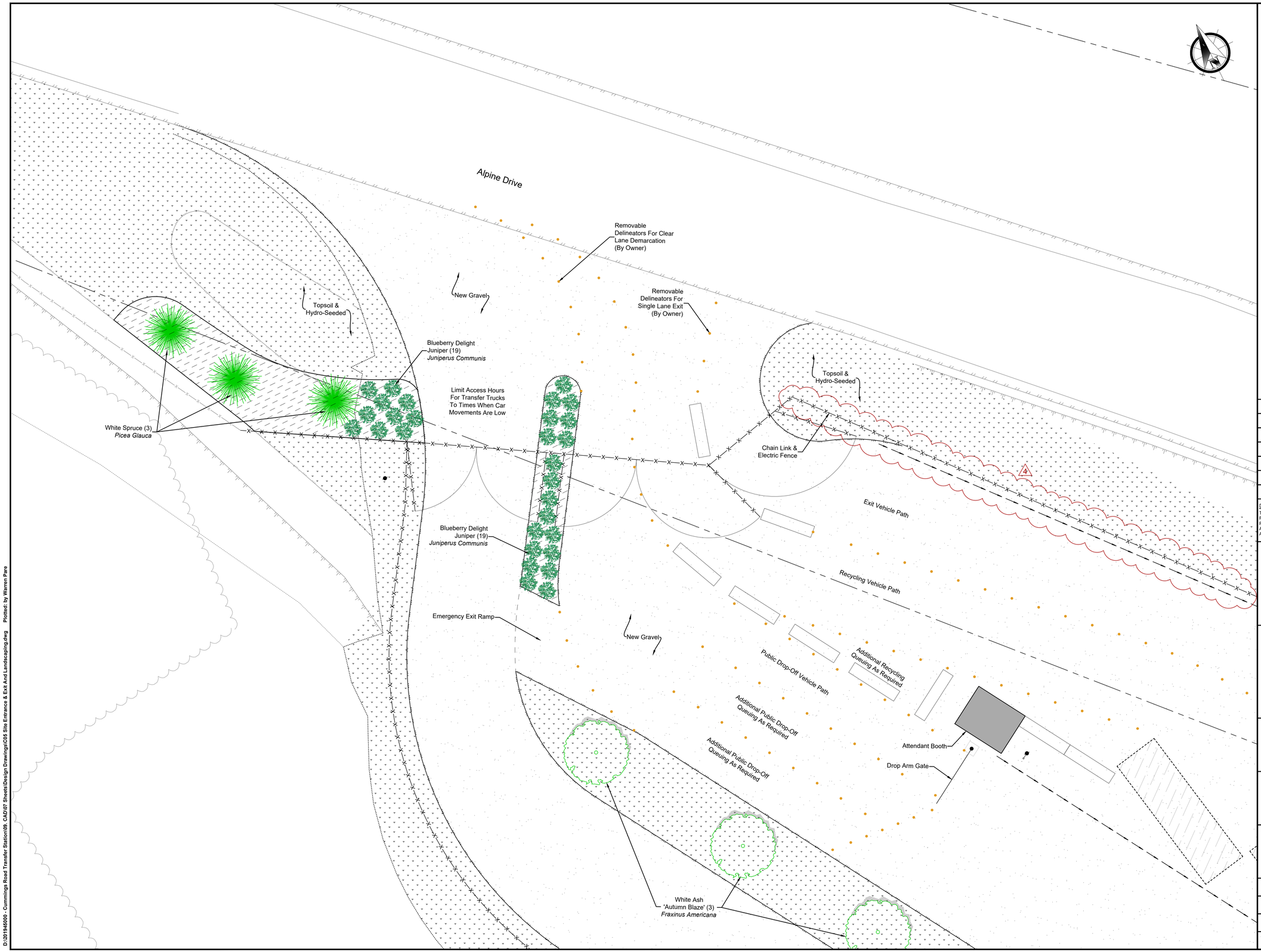
Cummings Rd. Regional Transfer Station Redevelopment

DRAWING

Gravel & Landscaping Plan

DESIGN: PM	DATE: Feb. 11, 21	SCALE: 1:250
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C04	VERSION: 4
APPROVED:		

D:\201945000 - Cummings Road Transfer Station\09. CAD\07 Sheets\Design Drawings\C04 Gravel & Landscaping Plan.dwg Plotted: by Warren Pare



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- Drainage Ditch
- Chainlink & Electric Fence
- Traffic Delineators (By Owner)
- Light Pole
- Meter Pole
- Concrete Jersey Barrier
- Topsoil & Hydro-Seeded Area
- Graveled Area
- Concrete Slabs
- Mulch Planting Bed

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PROJECT

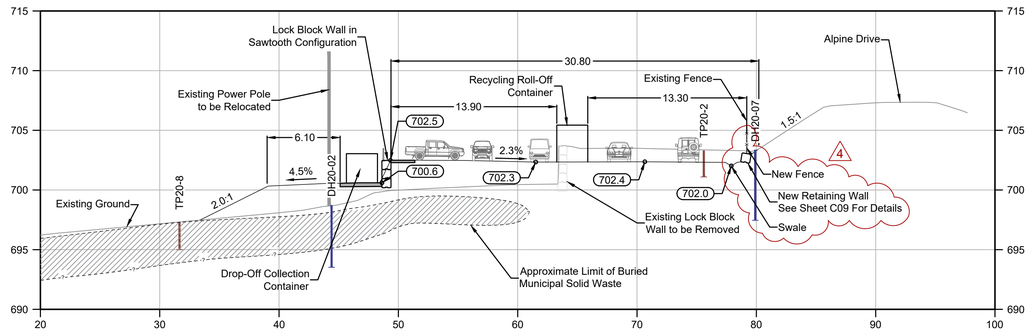
Cummings Rd. Regional Transfer Station Redevelopment

DRAWING

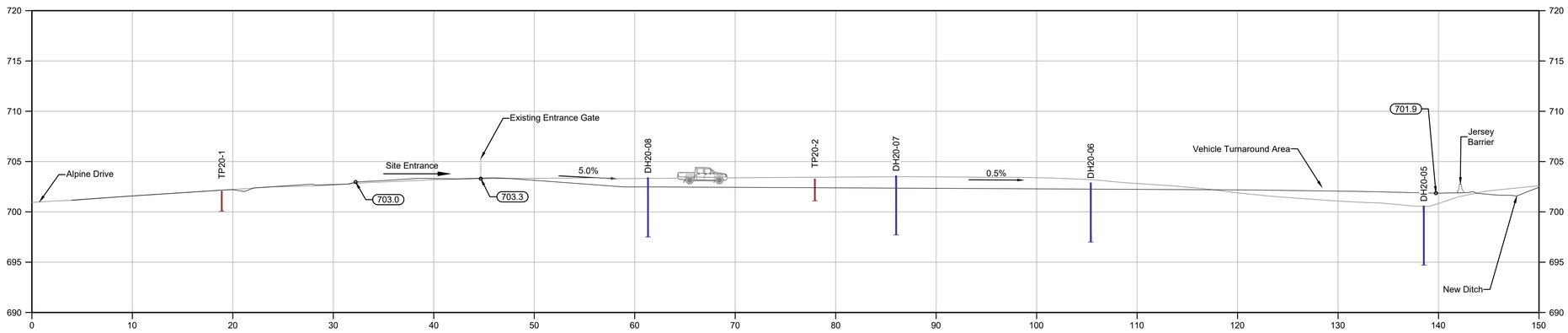
Site Entrance & Exit And Landscaping

DESIGN: PM	DATE: Feb. 11, 21	SCALE: 1:100
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C05	VERSION: 4
APPROVED:		

D:\201945000 - Cummings Road Transfer Station\09. CAD\07 Sheets\Design Drawings\C05 Site Entrance & Exit And Landscaping.dwg Plotted: by Warren Pare



Section A



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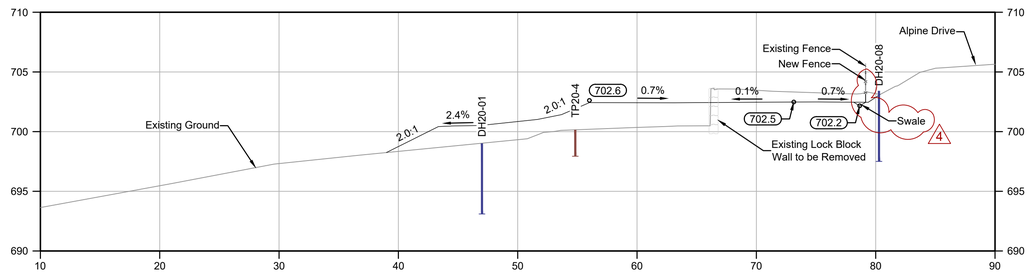

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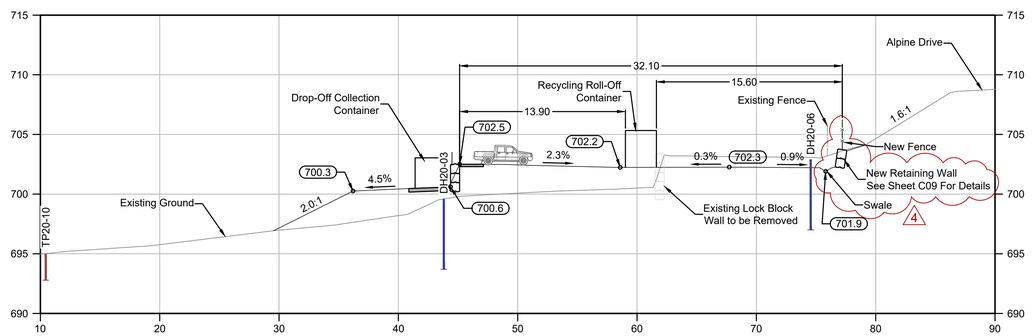

Section D

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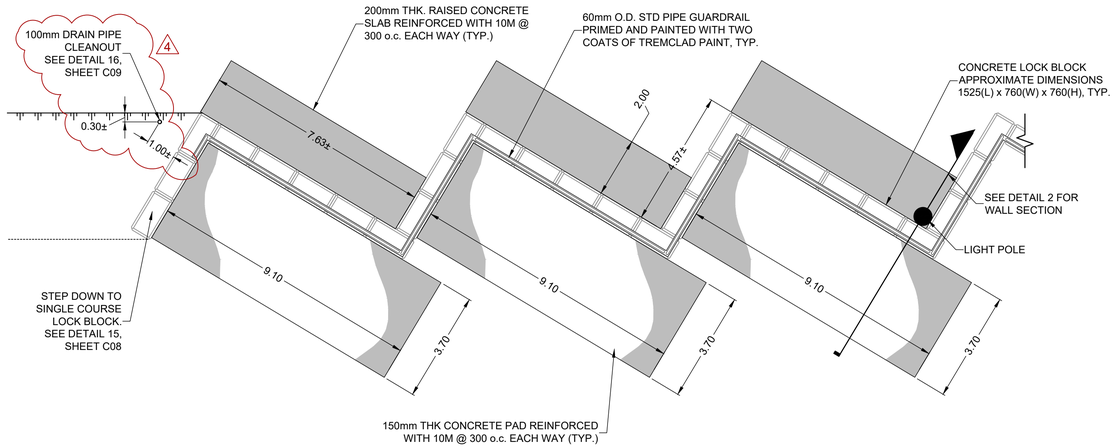
PROJECT

Cummings Rd. Regional Transfer Station Redevelopment

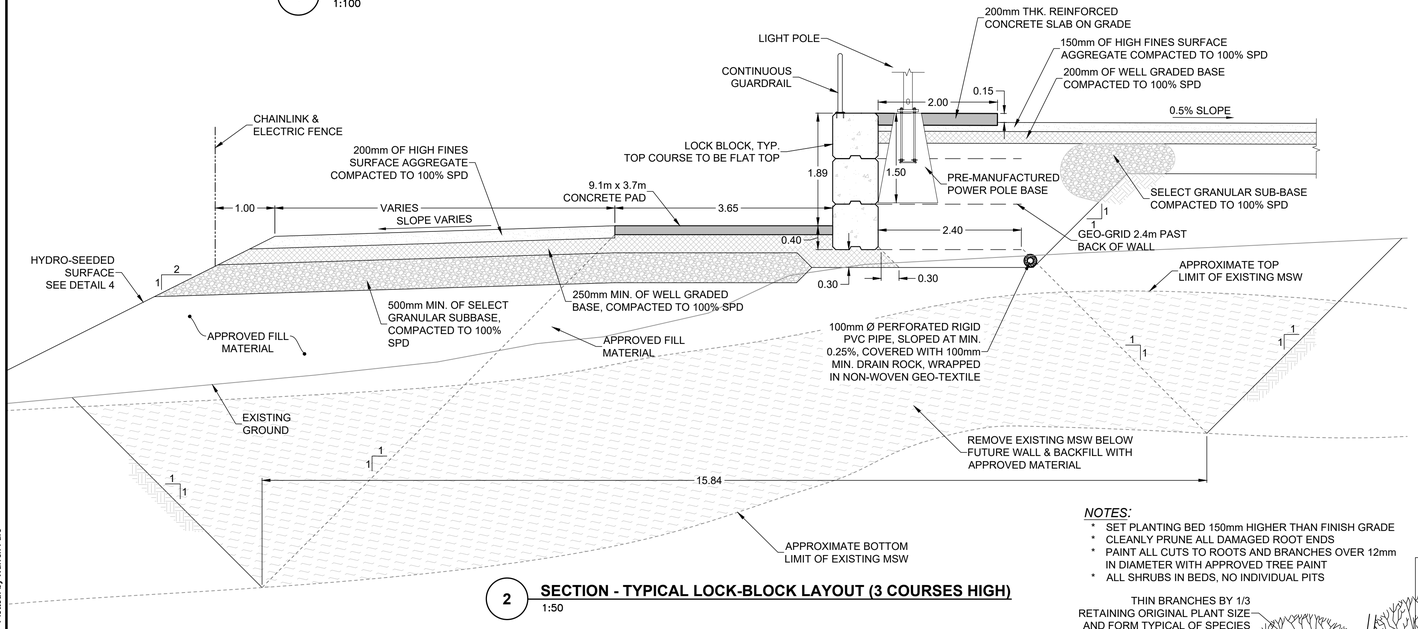
DRAWING

Cross Sections

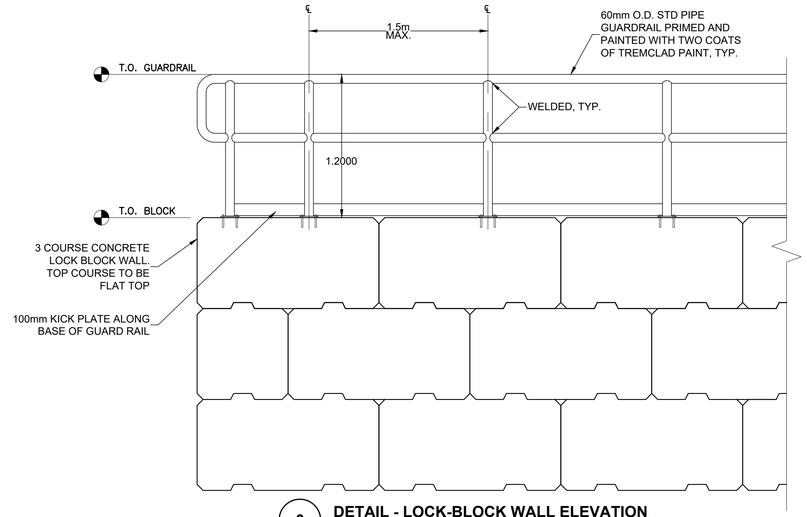
DESIGN: PM	DATE: Feb. 11, 21	SCALE: As Shown
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C06	VERSION: 4
APPROVED:		



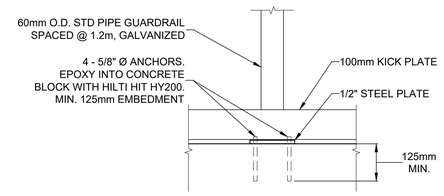
1 PLAN - TYPICAL LOCK-BLOCK LAYOUT (3 COURSES HIGH)
1:100



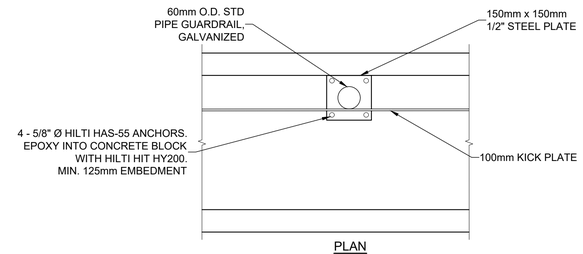
2 SECTION - TYPICAL LOCK-BLOCK LAYOUT (3 COURSES HIGH)
1:50



6 DETAIL - LOCK-BLOCK WALL ELEVATION
1:25

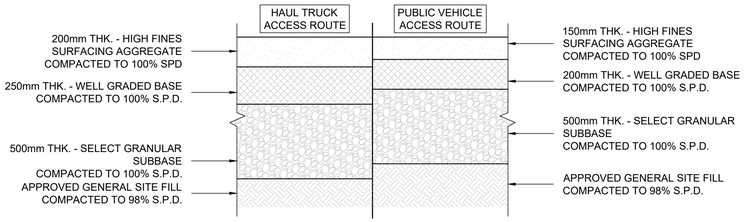


ELEVATION

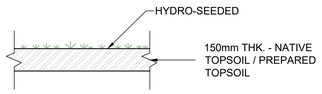


PLAN

7 DETAIL - GUARDRAIL ANCHOR
1:10

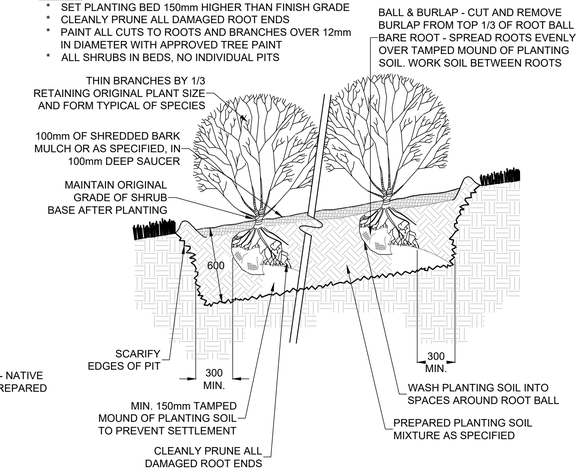


3 DETAIL - GRAVEL SURFACE
N.T.S.

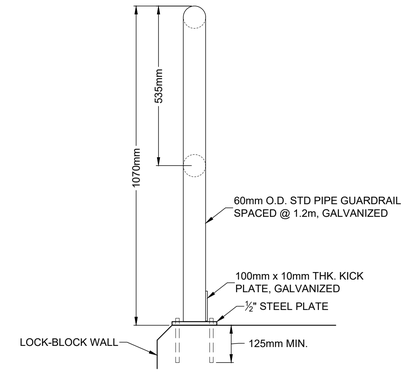


4 DETAIL - TOPSOIL & HYDRO-SEEDED SURFACE
N.T.S.

NOTES:
* SET PLANTING BED 150mm HIGHER THAN FINISH GRADE
* CLEANLY PRUNE ALL DAMAGED ROOT ENDS
* PAINT ALL CUTS TO ROOTS AND BRANCHES OVER 12mm IN DIAMETER WITH APPROVED TREE PAINT
* ALL SHRUBS IN BEDS, NO INDIVIDUAL PITS



5 DETAIL - MULCH PLANTING BED
N.T.S.



8 DETAIL - KICK PLATE
1:10

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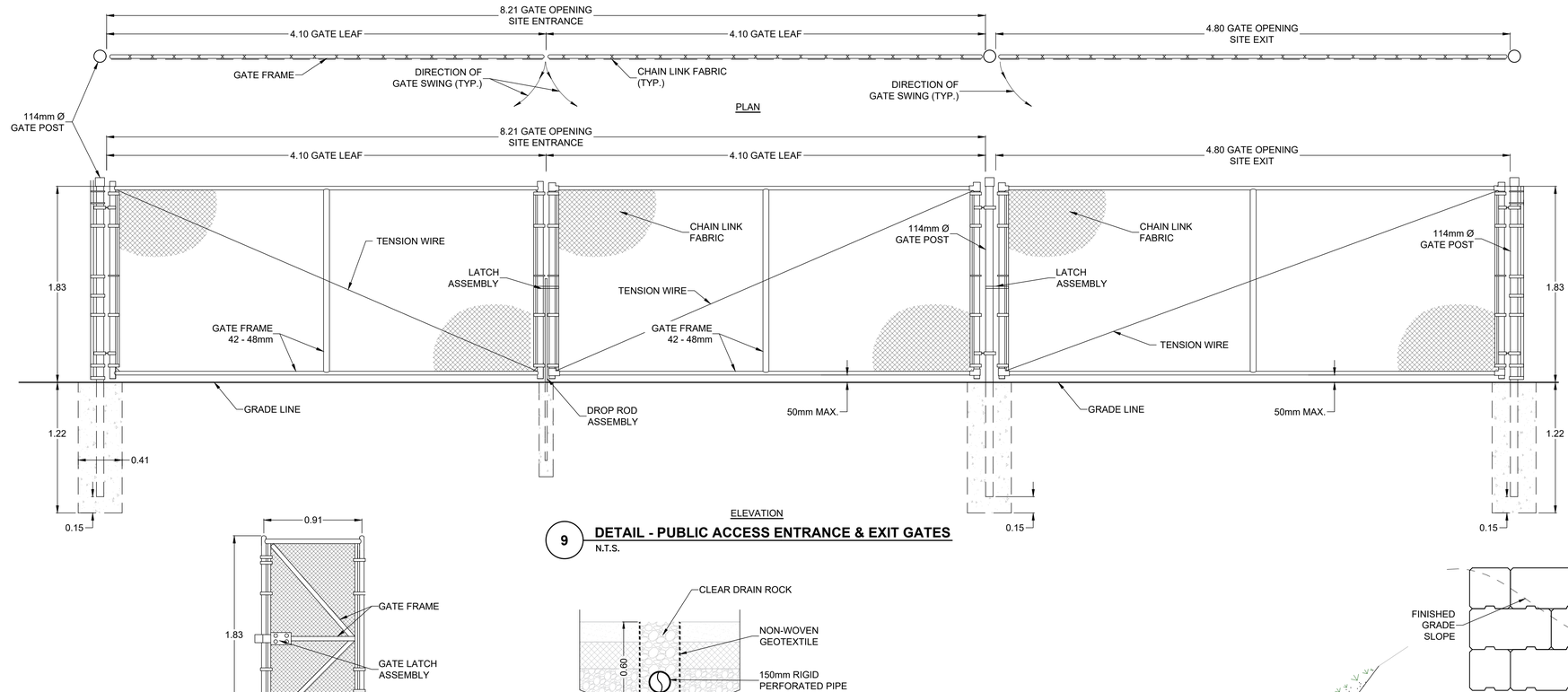
PROJECT
Cummings Rd. Regional Transfer Station Redevelopment

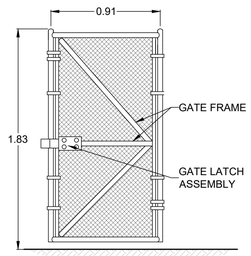
DRAWING
Details

DESIGN	DATE	SCALE
PM	Feb. 11, 21	As Shown
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C07	VERSION: 4
APPROVED		

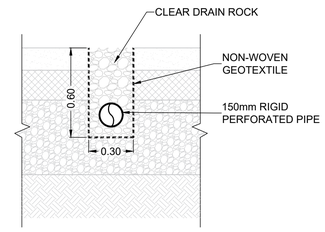
D:\201945000 - Cummings Road Transfer Station\09. CAD\07 Sheets\Design Drawings\C07 Details.dwg Plotted: by Warren Pare



9 DETAIL - PUBLIC ACCESS ENTRANCE & EXIT GATES
N.T.S.

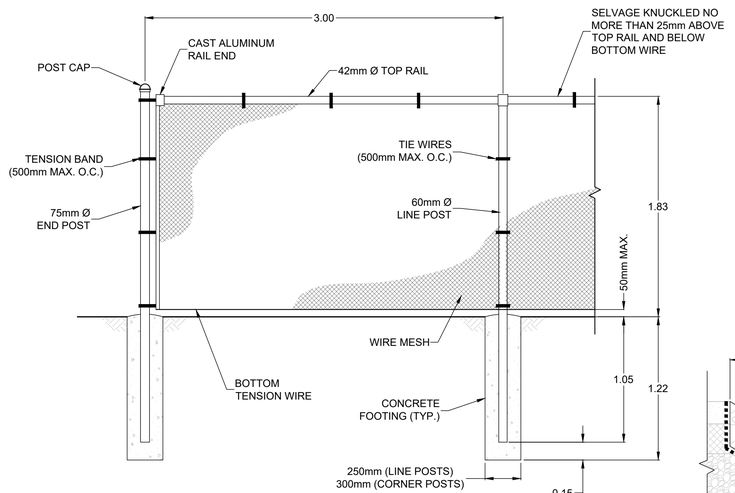


11 DETAIL - MAN GATE
N.T.S.

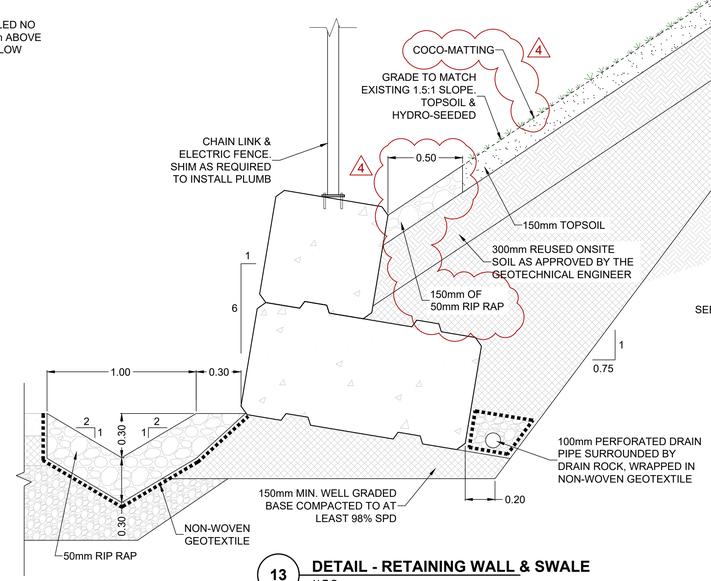


12 DETAIL - FRENCH DRAIN
N.T.S.

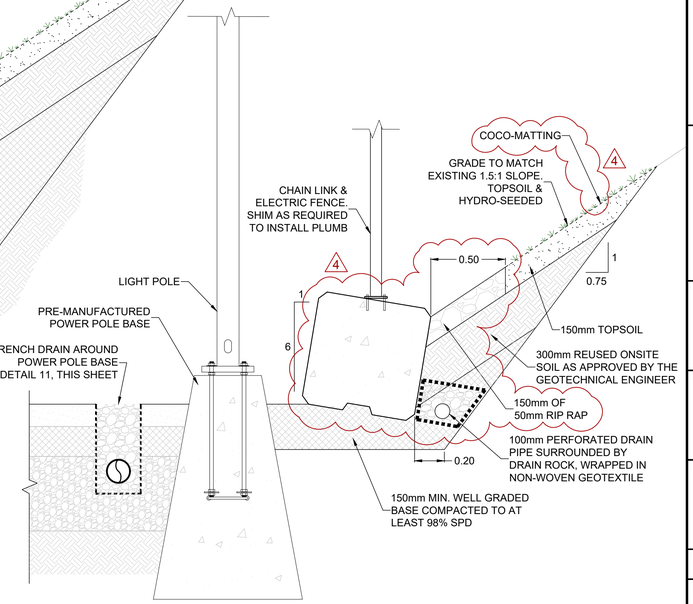
15 DETAIL - LOCK BLOCK STEP DOWN
1:50



10 DETAIL - TYPICAL CHAINLINK FENCE
N.T.S.



13 DETAIL - RETAINING WALL & SWALE
N.T.S.



14 DETAIL - POWER POLE BASE
N.T.S.

Notes:

1. The Contractor Is Responsible For Locating All Existing Above Grade & Underground Structures & Utilities Prior To Construction.
2. Any Deviation Or Inconsistencies From This Plan Shall Be Reported To The Engineer Immediately.
3. The Dimensions Shown On This Plan Take Precedence Over Scaled Dimensions.
4. All Dimensions Are In Meters, & Decimals Thereof Unless Otherwise Noted.

4	2021-02-12	ISSUED FOR ADDENDUM 2
3	2021-01-21	ISSUED FOR TENDER
2	2020-12-11	ISSUED FOR TENDER REVIEW
1	2020-11-06	ISSUED FOR CLIENT REVIEW
	YYYY-MM-DD	SUBMISSION INFORMATION

STAMP | PERMIT TO PRACTICE

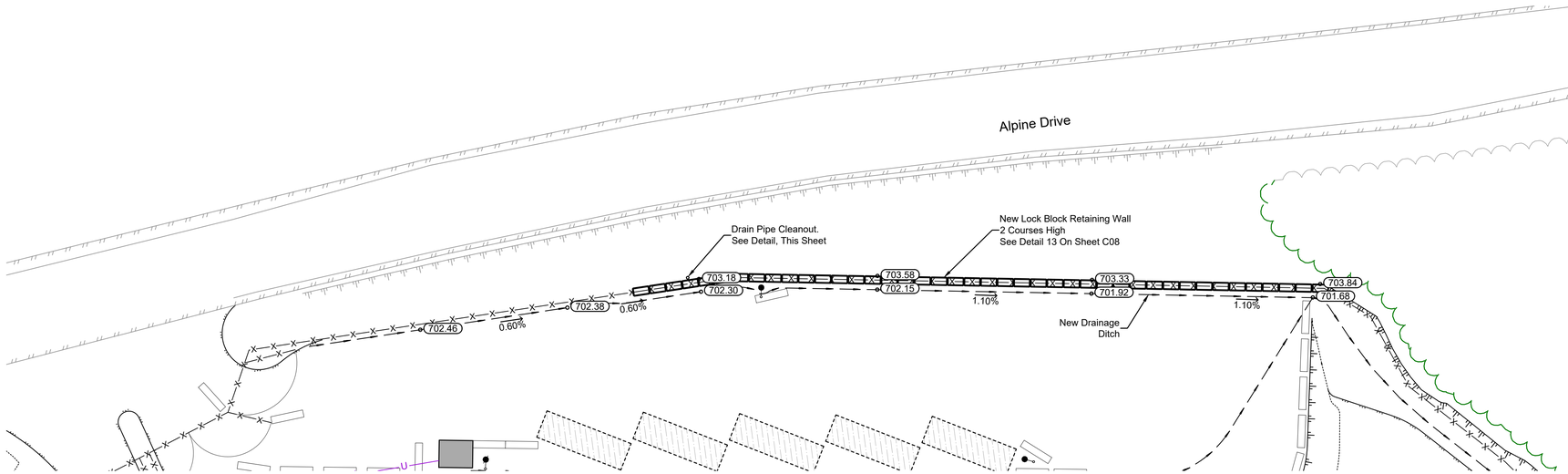
MORRISON HERSHFIELD
Unit 310, 4321 Still Creek Drive
Burnaby, British Columbia V5C 6S7
Tel: 604-454-0402 Fax: 604-454-0403

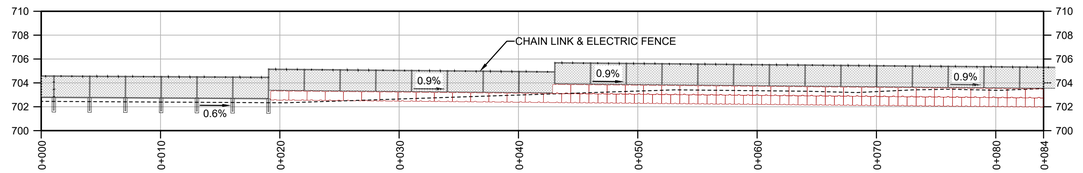
PROJECT
Cummings Rd. Regional Transfer Station Redevelopment

DRAWING
Details

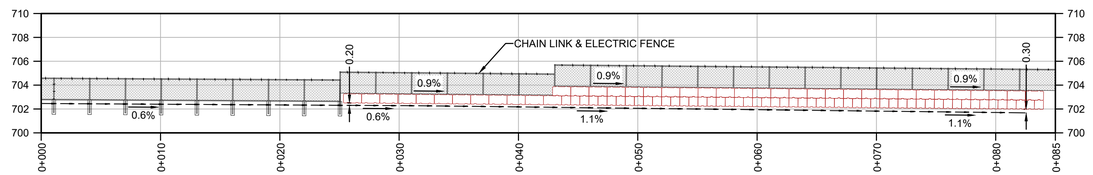
DESIGN: PM	DATE: Feb. 11, 21	SCALE: As Shown
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C08	VERSION: 4
APPROVED:		

4

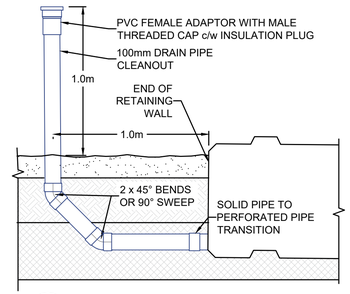




Section Top Of Wall



Section Ditch Profile



16 DETAIL - DRAIN PIPE CLEANOUT
N.T.S.

Legend:

- Control Point
- 6.22% — Surface Grade
- 700.73 — Surface Elevation
- Property Line
- Top Of Slope
- Toe Of Slope
- Edge Of Gravel
- Drainage Ditch
- Edge Of Tree Line
- Chainlink & Electric Fence
- Traffic Delineators
- Light Pole
- Meter Pole
- Concrete Jersey Barrier
- Existing Major Contour
- Existing Minor Contour
- Proposed Major Contour
- Proposed Minor Contour

4	2021-02-12	ISSUED FOR ADDENDUM 2
3	2021-01-21	ISSUED FOR TENDER
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PROJECT
Cummings Rd. Regional Transfer Station Redevelopment

DRAWING
Retaining Wall Details

DESIGN: PM	DATE: Feb. 11, 21	SCALE: As Shown
DRAWN: WP	PROJECT NO.: 201945000	
CHECKED: NM	DRAWING NO: C09	VERSION: -
APPROVED		

PART 1 - GENERAL

1.1 Section Includes

.1 Payments will be made on the basis of the Total Tender Price in the Tender Form Summary and the Unit Prices in the Schedule of Prices.

.2 The Contract Price for supply and installation of materials shall be full compensation of supplying, hauling, constructing, installing, cleaning, testing, commissioning and placing into service together with all other work subsidiary and incidental thereto for which separate payment is not provided elsewhere.

.3 Method of measurement of quantities for payment and basis for payment will be in accordance with the following items of this Section. Quantities shall be measured by the Contractor for payment using generally accepted field survey methods. Contractor shall provide documentation of measurements and corresponding calculations to the Consultant upon request.

.4 Where the Schedule of Prices shows separate items for supply and installation, the Unit Prices or Lump Sum Prices bid for supplying shall include supplying, delivering, loading, unloading, and all allowances for handling, storage, breakage and waste. Payment will be made only for Products and materials actually installed.

.5 Unless otherwise noted, payment encompasses all aspects of performing the Work for each item and includes all tools, labour, Construction Equipment, Products, materials, consumables, and operations necessary or incidental thereto.

.6 Where the Contractor will be hauling materials to and from the Foothills Boulevard Regional Landfill the Contractor is required to track the number of loads and types of materials hauled to and from the Foothills Boulevard Regional Landfill. The Contractor is required to meet all regulations as established by the Regional District of Fraser-Fort George Bylaw No. 3023, Amendment Bylaw No. 3115, 2018. The Contractor is not responsible for the tipping fee associated with materials hauled to the Foothills Boulevard Regional Landfill.

1.2 Measurement and Payment

.1 Division 01 – General Requirements

.1 Item 1.1 - Mobilization and Demobilization

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum item. Payment shall be made on invoice for 50% of the Contractor’s quoted amount on Construction start and the balance 50% on invoice on completion of demobilization and clean-up of the Place of the Work. Cost for this item shall not exceed five percent (5%) of the Total Tender Price.

.3 Work Includes: Initial mobilization and final demobilizing of Construction Equipment and Temporary Work, including site trailer set up, temporary power, etc.

.2 Item 1.2 – General Requirements

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum item. Payment shall be made on a percentage per month basis for duration of the Work.

.3 Work Includes: All direct and indirect costs including but not limited to: temporary facilities and utilities, Performance Labour and Material Bonds, traffic management/control, health and safety, all surveys, quality control testing, expenses and profit associated with the Contract.

.3 Item 1.3 – Environmental Protection

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum item. Payment shall be made on a percentage per month basis for duration of the Work.

.3 Work Includes: Requirements of Section 01 34 43 - Development and implementation of a Construction Environmental Management Plan (CEMP) and all environmental protection elements required for the duration of the Work including but not limited to nesting survey(s), dust control, erosion and sediment control and management of MSW prior to offsite disposal. Management of MSW shall be done in accordance with all governing regulations.

.2 Division 02 – Removals

.1 Item 2.1 – Sitework Demolition

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum item. Payment shall be made when all removals/demolition is complete. Partial payment may be considered based on the Consultant’s estimate of physical percent complete.

.3 Work Includes: Removal and offsite disposal or recycling of all elements identified on the Drawings and Specifications. Including but not limited to existing concrete and lock-block retaining walls, steel structure, guardrails, chainlink fencing and existing site electrical. Includes demolition of the existing lock block walls and stockpiling of the lock blocks in good condition for reuse. Includes coordination with the Owner and BC Hydro as required for removal of items as identified on the Drawings. Revenue generated from recycling will be for the benefit of the Contractor.

.3 Division 03 – Concrete and Retaining Walls

.1 Item 3.1 – Supply and Install of 3-Block High Lock Block Retaining Wall

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum. Payment shall be made when 3-Block High Lock Block Retaining Wall is complete. Partial payment may be considered based on the Consultant's estimate of physical percent complete.

.3 Work Includes: Supply and installation of all elements of the 3-block high lock block retaining wall on the Drawings and Specifications. Including but not limited to new lock blocks, flattop lock blocks, geogrid, drainage pipe and cleanout, geotextile, drain rock. Structural backfill (Select Granular Subbase) will be paid under Item 6.1.

.2 Item 3.2 – Installation of Reused Lock Blocks for 2-Block High Wall

.1 Measurement: Each.

.2 Payment: Paid for as a per Each item. Payment will be made upon completion of placement of each lock block and related items.

.3 Work Includes: All Work associated with preparation and placement of the reused lock blocks for the 2-Block Wall as shown on the Drawings and Specifications. Includes supply and installation of drainage pipe and cleanout, geotextile, drain rock and rip rap. Granular backfill will be paid under Item 6.1.

.3 Item 3.3 – Supply and Installation of New Lock Blocks for 2-Block High Wall

.1 Measurement: Each.

.2 Payment: Paid for as a per Each item. Payment will be made upon completion of placement of each lock block and related items.

.3 Work Includes: All Work associated with supply, preparation and placement of new lock blocks required for the 2-Block Wall as shown on the Drawings and Specifications. Includes supply and installation of drainage pipe and cleanout, geotextile, drain rock and rip rap. Granular backfill will be paid under Item 6.1.

.4 Item 3.4 – Supply and Installation of Drainpipe for 2-Block High Wall

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum item. Payment shall be made when Drainpipe for 2-Block High Wall is complete. Partial payment may be considered based on the Consultant's estimate of physical percent complete.

.3 Work Includes: All Work associated with the supply and installation of drainpipe, drain rock and geotextile as shown on the Drawings and Specifications.

.5 Item 3.5 – Supply and Installation of Guard Rails

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum item. Payment shall be made when Guard Rails are complete. Partial payment may be considered based on the Consultant's estimate of physical percent complete.

.3 Work Includes: All Work associated with the supply and installation of Guard Rails as shown on the Drawings and Specifications.

.6 Item 3.6 – Supply and Install 7 Concrete Bin Slabs

.1 Measurement: Lump Sum

.2 Payment: Paid for as a lump sum item. Payment shall be made when Concrete Slabs are complete. Partial payment may be considered based on the Consultant's estimate of physical percent complete.

.3 Work Includes: Forming, installation of rebar, concrete supply and placement, finishing, curing and provision of control joints of the seven 150 mm thick concrete slabs in accordance with the Drawings and Specifications.

.7 Item 3.7 – Supply and Install 7 Concrete Top-of-Wall Slabs

.1 Measurement: Lump Sum

.2 Payment: Paid for as a lump sum item. Payment shall be made when Concrete Slabs are complete. Partial payment may be considered based on the Consultant's estimate of physical percent complete.

.3 Work Includes: Forming, installation of rebar, concrete supply and placement, finishing, curing and provision of control joints of the seven 200 mm concrete slabs in accordance with the Drawings and Specifications.

.4 Division 26 – Electrical

.1 Item 4.1 – Supply and install underground power cables to the Attendant Booth, lift arm gate assembly, c/w poles, power lines, electrical meter re-connection, site lighting, lockable waterproof enclosures, conduits and connections as required in the Drawings and Specifications.

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum item. Payment shall be made when all Electrical work is complete. Partial payment may be considered based on the Consultant's estimate of physical percent complete.

.3 Work Includes: Supply and install underground power cables to the Attendant Booth, lift arm gate assembly including concrete base, c/w poles, power lines, electrical meter re-connection, site lighting, lockable waterproof enclosures, conduits and connections as required in the Drawings and Specifications including trenching and reuse of excess trench material, import and placement of approved backfill and compaction. Coordination with BC Hydro for permanent power connection and re-connection to meter. All demolition of existing

electrical including removal of existing poles to be included under Item 2.1.

.5 Division 31 – Earthworks

.1 Item 5.1 – Clearing and Grubbing:

.1 Measurement: Square Meters

.2 Payment: Paid for as a Unit Price per square meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: All Work required to completely grub and strip stumps, roots, logs, shrubs, grass, weeds, fallen timber and other surface litter, wherever they occur within the right-of-way and entrance roadway, and within such other areas as directed by the Consultant and shown on the Drawings, including but not limited to cutting, hauling, stockpiling, chipping, cleaning and all other works incidental thereto. All cleared and grubbed materials to be separated and chipped as required for acceptance as compost at the Foothills Boulevard Regional Landfill. Contractor is responsible for hauling cleared and grubbed materials to the Owner's composting facility and tracking the number of trucks hauled. Branches or other wood larger than 75 mm (3 inches) must be chipped for acceptance as compost.

.2 Item 5.2 – Stripping, Stockpiling and Placement of Native Topsoil

.1 Measurement: Square Meters

.2 Payment: Paid for as a Unit Price per square meter of area stripped based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: All Work required to completely strip topsoil, stockpile and placement for reuse onsite.

.3 Item 5.3 - General Site Excavation

.1 Measurement: Cubic Meters

.2 Payment: Paid for at Unit Price per cubic meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: General site grading excavation in accordance with the Drawings, Specifications, Geotechnical Report, and as directed by the Consultant. Work shall include but not be limited to excavating, dewatering, cutting, hauling, stockpiling, dust control, preparing and maintaining access and haul roads and all other works incidental thereto. Excavated materials, where approved, may be used as fill material.

.4 Item 5.4 – Excavation for Concrete Slabs and Retaining Wall

.1 Measurement: Cubic Meters

.2 Payment: Paid for at Unit Price per cubic meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: Excavation and segregation of excavated materials (mineral soils and MSW) underlying the concrete slabs and Lock Block Retaining Wall in accordance with the Drawings, Specifications, Geotechnical Report, and as directed by the Consultant. Work shall include but not be limited to excavating, dewatering, cutting, hauling, stockpiling, dust control, preparation and maintaining access and haul roads and all other works incidental thereto. MSW shall be segregated from mineral soils for offsite disposal. Excavated mineral soils, where approved, will be used as fill material.

.5 Item 5.5 – Site Fill and Subgrade Preparation:

.1 Measurement: Cubic Meters

.2 Payment: Paid for at Unit Price per cubic meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: Haul, placement and compaction of approved onsite reclaimed mineral soils as noted on the Drawings, Specifications and in accordance with the Geotechnical Report, including but not limited to cutting, hauling, stockpiling, placing, dumping, watering, mixing and material conditioning, windrowing, compacting, grading, dust control and all other works incidental thereto.

.6 Item 5.6 – Imported Site Fill, Subgrade Preparation and Backfill Below Lock Block Retaining Wall:

.1 Measurement: Cubic Meters

.2 Payment: Paid for at Unit Price per cubic meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: Supply, haul, placement and compaction of Consultant approved imported soils and compaction as noted on the Drawings, Specifications and in accordance with the Geotechnical Report, including but not limited to cutting, hauling, stockpiling, placing, dumping, watering, mixing and material conditioning, windrowing, compacting, grading, dust control and all other works incidental thereto.

.7 Item 5.7 – Stockpiling and Offsite Disposal of Municipal Solid Waste (MSW)

.1 Measurement: Cubic Meters

.2 Payment: Paid for at Unit Price per cubic meter based on surveyed stockpile of MSW prior to loading and haul offsite.

.3 Work Includes: Stockpiling, stockpile management, loading and haul of MSW to the Foothills Boulevard Regional Landfill for final disposal.

.8 Item 5.8 – Haul Owner Supplied NorGrow/Compost

.1 Measurement: Cubic Meters

.2 Payment: Paid for at Unit Price per cubic meter based on agreed volume per truck load.

.3 Work Includes: Hauling NorGrow from the composting facility at the Foothills Boulevard Regional Landfill and stockpiling as required prior to blending for use as prepared topsoil as per the Drawings and Specifications.

.9 Item 5.9 – Blend and Place Prepared Topsoil

.1 Measurement: Cubic Meters

.2 Payment: Paid for at Unit Price per cubic meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: Blending Norgrow with mineral soil or other soils deemed suitable by the Consultant to create a Prepared Topsoil as defined in 31 91 21 and 32 93 00. Placement of Prepared Topsoil as per the Drawings and Specifications.

.10 Item 5.10 – Supply and Place Hydro-Seeding

.1 Measurement: Square Meters

.2 Payment: Paid for at Unit Price per square meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: Supply and placement of hydro-seeding as per the Drawings and Specifications.

.11 Item 5.11 – Supply and Installation of Planting Mulch, Shrubs and Trees

.1 Measurement: Lump Sum

.2 Paid for as a lump sum item. Payment shall be made when all plantings are complete.

.3 Work Includes: Supply, placement and installation of planting mulch, shrubs and trees as per the Drawings and Specifications.

.12 Item 5.12 – Supply and Installation of Coco-matting

.1 Measurement: Square Meters

.2 Payment: Paid for at Unit Price per square meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: Supply and placement of coco-matting as per the Drawings and Specifications.

.6 Division 32 – Site Improvements

.1 Item 6.1 – Select Granular Subbase

.1 Measurement: Tonnes

.2 Payment: Paid for at Unit Price per tonnes based on truck weigh scale tickets.

.3 Work Includes: Supply, haul, spread and compaction of Select Granular Subbase on the prepared subgrade surface of the Work as per the Drawings and Specifications and in accordance with the

Geotechnical Report. Includes supply, haul, spread and compaction of Select Granular Subbase as backfill for the Lock Block Retaining Wall.

.2 Item 6.2 – Well Graded Base

.1 Measurement: Tonnes

.2 Payment: Paid for at Unit Price per tonnes based on truck weigh scale tickets.

.3 Work Includes: Supply, haul, spread and compaction of Well Graded Base on the prepared Select Granular Subbase as per the Drawings and Specifications and in accordance with the Geotechnical Report.

.3 Item 6.3 – High Fines Surfacing Aggregate

.1 Measurement: Tonnes

.2 Payment: Paid for at Unit Price per tonnes based on truck weigh scale tickets.

.3 Work Includes: Supply, haul, spread and compaction of High Fines Surfacing Aggregate on the prepared Well Graded Base as per the Drawings and Specifications and in accordance with the Geotechnical Report.

.4 Item 6.4 – Traffic Barriers

.1 Measurement: Each.

.2 Payment: Paid for as per Each item. Payment will be made upon completion of placement of all traffic barriers.

.3 Work Includes: Supply and placement of pre-cast concrete traffic barriers as per the Drawings and Specifications.

.5 Item 6.5 – Chain Link and Electric Fence:

.1 Measurement: Linear Meters

.2 Payment: Paid for at Unit Price per linear meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: Supply and installation of the chain link fence c/w posts in concrete, electric fence and all components, including electrical connection necessary for complete fencing and as shown on the Drawings and Specifications.

.6 Item 6.6 – Chain Link and Electric Fence Double Gates:

.1 Measurement: Each

.2 Payment: Paid for as a per Each item. Payment will be made upon completion of this item.

.3 Work Includes: Supply and installation of chain link fence double gates c/w posts in concrete, electric fence and all components as shown on the Drawings and Specifications.

.7 Item 6.7 – Chain Link and Electric Fence Single Gate:

.1 Measurement: Each

.2 Payment: Paid for as a per Each item. Payment will be made upon completion of this item.

.3 Work Includes: Supply and installation of chain link fence single gates c/w posts in concrete, electric fence and all components as shown on the Drawings and Specifications.

.8 Item 6.8 – Supply and Install of Man Gate

.1 Measurement: Each.

.2 Payment: Paid for as a per Each item. Payment will be made upon completion of this item.

.3 Work Includes: Supply and installation of man gate gates c/w posts in concrete, electric fence and all components as shown on the Drawings and Specifications.

.7 Division 33 – Utilities

.1 Item 7.1 – Storm Ditching

.1 Measurement: Lineal Meters

.2 Payment: Paid for at Unit Price per linear meter based on surveyed quantities (refer to 1.1.3).

.3 Work includes: Supply and installation of approved rip rap and geotextile, excavation to construct and shape the ditches, to the elevation and profile as shown in the Drawings.

.2 Item 7.2 – Supply and Install French Drain

.1 Measurement: Lineal Meters

.2 Payment: Paid for at Unit Price per linear meter based on surveyed quantities (refer to 1.1.3).

.3 Work Includes: Supply and installation of all components of the French Drain including trenching, management of excess trench material onsite, backfilling, drain rock, perforated PVC piping and geotextile.

.8 Division 36 – Miscellaneous

.1 Item 8.1 – Relocate Attendant Booth

.1 Measurement: Lump Sum.

.2 Payment: Paid for as a lump sum item. Payment shall be made when relocation is complete.

.3 Work Includes: Relocation and placement of the existing Attendant Booth as indicated on the Drawings. Refer to 02 41 23 – Sitework Demolition.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Quality of Work.

.2 Access to Work.

.3 Inspection & Testing.

1.2 Quality of Work

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

.4 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.5 Be responsible for coordination and placement of openings, sleeves, and accessories.

1.3 Access to Work

.1 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of the Work, allow access to such Work whenever it is in progress.

.2 Allow inspection and testing agencies access to Work, offsite manufacturing facilities, and fabrication plants.

.3 Cooperate to provide reasonable facilities for such access.

1.4 Inspection & Testing

.1 Coordinate and schedule testing and inspection services for the following Work to be provided by the Consultant:

.1 Geotechnical: perform testing and inspection (compaction, bearing capacity, pile installation, soil preparation etc.) as per requirements of Drawings and the Geotechnical Report.

.2 Concrete:

.1 Concrete testing to be done by responsible authority as indicated in the Contract.

.2 Concrete to be tested in accordance with requirements of CSA A23.1 and A23.2, including requirements for air, slump, and age prior to being used. Maintain records of pour dates, testing performed, class of concrete used, and test results for all items placed. Mix designs to be reviewed and approved by testing agency.

.3 Reinforcing steel for Concrete: perform visual inspection of bar size, grade, spacing, cover, chairs, ties, and coatings (if applicable). Basis of inspection shall be final reviewed Shop Drawings.

.4 Steel: Perform visual inspection of all welds, torque testing of bolted connections, and check on bearing, plumbness, alignment and painting. Basis of inspection shall be final reviewed Shop Drawings. Perform non-destructive testing (NDT) of 10% of field welds.

.2 Contractor will be responsible for costs associated with retesting due to failed samples or rejected Work. Contractor to accelerate the Work as required to eliminate any delays caused by failed samples or rejected Work at Contractor's expense.

.1 Costs for retesting completed by the Consultant's Geotechnical Engineer will be deducted from progress payments to the Contractor.

.3 Give timely notice requesting inspection if Work is designated for special tests, inspections, or approvals by Consultant instructions or by law of Place of the Work.

.4 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.5 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

.6 Reports

.1 Submit copies of inspection and test reports to Consultant as directed.

.2 Provide copies to Subcontractor of work being inspected or tested.

.7 Tests and Mix Designs

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of the Work will be appraised by Consultant and may be authorized as recoverable.

END OF SECTION

PART 1 - GENERAL

1.1 Section Includes

.1 Supply and installation of Mechanically Stabilized Earth (MSE) and gravity retaining walls in accordance with Contract Documents, including:

.1 Excavation and preparation of subgrade.

.2 Placement and compaction of reinforced backfill materials.

.3 Installation of retaining wall assembly, including interlocking precast concrete blocks (lock blocks), geosynthetics, connections and drainage.

1.2 Related Sections

.1 31 24 13 – Excavation, Embankment, Compaction and Grading

.2 32 11 13 – Granular Surfacing, Base and Subbase

.3 32 91 21 – Topsoil Placement and Finish Grading

.4 32 92 20 – Seeding

.5 33 41 10 – Site Drainage

1.3 References

.1 The Canadian Geotechnical Society

.1 Canadian Foundation Engineering Manual, 4th Edition (2006) (CFEM)

.2 Engineers and Geoscientists British Columbia

.1 Professional Practice Guidelines: Civil and Transportation Infrastructure Retaining Wall Design (2019)

.3 Federal Highway Administration (FHWA)

.1 FHWA-NH1-00-043, Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design & Construction Guidelines (2001).

.4 ASTM International

.1 ASTM D4533 / 4533M-15 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

.2 ASTM D4632 / D4632M-15a - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

.3 ASTM D4751-20a - Standard Test Methods for Determining Apparent Opening Size of a Geotextile.

.4 ASTM D6241-14 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.

.5 Canadian Standards Association (CSA)

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete

.2 CSA A23.4, Precast Concrete – Materials and Construction

.3 CSA G30.18, Carbon Steel Bars for Concrete Reinforcement

.4 CAN/CSA G40.21-M92, Structural Quality Steels

.6 CGSB 1-GP-181M, Coating, Zinc-Rich, Organic, Ready Mixed

.7 RSIC, Reinforcing Steel - Manual of Standard Practice

1.4 Submittals

.1 Precast Concrete: Provide manufacturer's concrete mix designs and aggregate test results to Consultant.

.2 Reinforced Backfill: Provide test results to Consultant to verify reinforced backfill meets material, placement, and compaction criteria. Tests on reinforced backfill materials shall include sieve analysis.

1.5 Quality Assurance

.1 Notify Consultant at least 10 Working Days prior to installation of retaining walls. Allow Consultant access to all parts of the Work and supply such information and assistance as is required.

PART 2 - PRODUCTS

2.1 Materials

.1 Soil Reinforcement: Tensar UX1600 MSE geogrid or approved equivalent.

.2 Filter Fabric: nonwoven geotextile as specified in Section 33 41 10.

.3 Interlocking Concrete Blocks for Three Block High Wall: Interlocking precast concrete blocks as manufactured by Lock-Block Ltd., or approved equivalent.

.1 Block Size: 1.5 m x 0.75 m x 0.75 m, chamfered on all sides.

.2 Block Profiles:

.1 Bottom and intermediate courses to have interlocking keys on top and key slots on bottom with 12 mm clearance around the key.

.2 Top course to be flat top with interlocking key slots on bottom.

.3 All blocks to have a steel lifting device.

.3 Finish: Smooth finish.

.4 Concrete used in the production of the interlocking concrete blocks shall conform to CSA A23.1 Exposure Class C-2 and shall have a minimum compressive strength of 32 MPa at 28 days, maximum size of coarse aggregate between 14 and 20 mm, and air content of 5-8%.

.5 In addition to the quality control requirements of CSA A23.1, the Contractor shall extract two standard 100 mm diameter by 200 mm long cores from one concrete block for every 50 blocks prior to delivery to the site. One of the cores will be tested for compressive strength according to CSA A23.2 and one of the cores will be tested for air void analysis in accordance with ASTM C457. If the compressive strength or the air voids content do not meet the required specification the entire 50 blocks will be rejected at the Contractor's cost. The Contractor shall be responsible for ensuring the test results are traceable to each of the 50 block lots tested. The cores shall be taken from the middle of the block on the back face, and the resulting hole patched and sealed with approved patching materials so the blocks may be reused if specifications are met.

.6 The Engineer reserves the right to reject interlocking concrete blocks based on visual and non-destructive tests.

.4 Interlocking Concrete Blocks for One to Two Block High Wall:

.1 Interlocking concrete blocks recovered from the existing on-site retaining wall and found to be in good condition may be reused in the Two Block High Retaining Wall.

.2 The Engineer reserves the right to reject the interlocking concrete blocks recovered from the on-site retaining wall based on visual and non-destructive tests.

.5 Fill Materials:

.1 MSE Walls

.1 Backfill: Free-draining granular soil meeting specifications for Select Granular Subbase (SGSB).

.2 Working Surface Below Wall and Base Course at Top of Wall: Well-Graded Base (WGB).

.3 Surface Course at Top of Wall: High Fines Surface Aggregate (HFSA).

.2 Gravity Walls:

.1 General site fill as approved by Consultant.

.6 Rip Rap: Hard, relative density (formally specific gravity) not less than 2.65, durable quarry stone, free from seams, cracks, or other structural defects, to meet following size distribution for use intended:

.1 Hand-placed rip rap:

.1 D_{50} of 150 mm
.2 Minimum diameter 100 mm
.3 Maximum diameter 300 mm

PART 3 - EXECUTION

3.1 Preparation

.1 Remove organic soil, existing fill and Municipal Solid Waste (MSW) from below footprint of concrete lock block wall facing, wall reinforcing, and concrete slabs, and out laterally to allow for 1H:1V slope down to natural, undisturbed silty clay, sand or clay till.

.2 If seepage encountered in excavation, use pumps and sumps to keep bottom of excavation dry.

.3 Bring excavation to grade using mineral soil, free from organic material and debris, at moisture content suitable for compaction.

.1 Place fill out laterally from edges of wall facing, wall reinforcement and concrete slabs at distance equal to depth of fill required below footing to allow 1H:1V distribution of stress from bottoms of structures.

.2 Place fill in uniform layers no greater than 300 mm per layer.

.3 Compact each layer to minimum 98% SPD.

.4 To provide level working surface below wall and concrete slab, apply layer of WGB at least 300 mm thick compacted to minimum 100% SPD.

.4 Where rip rap is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated. Grade areas to be rip rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.

3.2 MSE Retaining Walls

.1 General

.1 MSE Wall Embedment: Embed base course of MSE wall a minimum of 0.4 m below finished grade for frost protection.

.2 Placement of Geogrid: Place below bottom block and between each row of blocks, extending at least 2.4 m from back of wall.

.1 Maintain uniform reinforcement length throughout entire height of wall. Extend reinforced backfill zone as indicated.

.2 Place geogrid with roll width perpendicular to back of wall, without overlapping adjacent widths. Pull out slack, wrinkles, and creases.

.3 Do not cut geogrid to fit over interlocking keys ("crosses" at top of blocks). Let overlying block fix location of geogrid.

.3 Fill Placement and Compaction:

.1 Place fill in layers no more than 300 mm thick. Start placing from back of lock blocks, spreading toward back of reinforced zone to help maintain tension on geogrid.

.2 Compact fill to 100% Standard Proctor Density. Use walk-behind compactor operated at least 50 mm from back of retaining wall. Operate compaction equipment so direction of travel is parallel to back of wall. Larger equipment may be used where distance to back of wall is more than 1 m.

.2 Installation:

.1 Base Course:

.1 Place base layer of geogrid on prepared subgrade as indicated.

.2 Set first layer of concrete lock blocks on top of geogrid base layer.

.3 Place and compact fill until flush with top of lock blocks.

.2 Intermediate Course(s):

.1 Place layer of geogrid, lapping over interlocking keys.

.2 Place layer of lock blocks, staggering vertical joints in relation to previous course.

.3 Place and compact fill until flush with top of lock blocks.

.3 Top Course:

.1 Place final layer of geogrid, lapping over interlocking keys.

.2 Place final layer of flat-topped lock blocks, staggering vertical joints in relation to previous course.

.3 Place and compact final layer of granular fill.

.4 Place and compact base and surface courses as indicated.

3.3 Gravity Wall and Swale

.1 Excavate and prepare subgrade surface as indicated.

.2 Place layer of geotextile over bottom and sides of exposed subgrade surface. Overlap adjacent sheets by minimum 450 mm or as recommended by geotextile manufacturer.

.3 Finish surface even, free of large openings and neat in appearance.

.4 Install lock blocks with vertical joints staggered between courses.

.5 Ensure swale is protected from silt and fine materials. Repair swale with new rip rap at Consultant's direction if silt or fine particles are present.

.6 Grade and apply topsoil to backfilled area in accordance with Section 32 91 21 to match existing slope.

.7 Seed in accordance with Section 32 92 20.

END OF SECTION

PART 1 - GENERAL

1.1 Product Data

.1 When requested by Consultant, submit product data in accordance with Section 01 33 00 – Submittal Procedures.

.2 Provide product data for:

- .1 Seed
- .2 Mulch
- .3 Tackifier
- .4 Fertilizer
- .5 Coco-Matting (Erosion Control Blanket)

.3 Submit in writing to Consultant 5 Working Days days prior to commencing Work:

- .1 Volume capacity of hydraulic seeder in litres
- .2 Amount of material to be used per tank based on volume
- .3 Number of tankloads required per hectare to apply specified slurry mixture per hectare

1.2 Scheduling

.1 Schedule hydraulic seeding to coincide with preparation of soil surface.

.2 Schedule hydraulic seeding using grass mixtures and mixtures as specified in this section between dates recommended by the Provincial Agricultural Department.

1.3 Delivery and Storage

.1 Fertilizer:

- .1 Deliver and store in original packages showing net mass, analysis and manufacturer
- .2 Store on pallets and protect from the elements

.2 Grass seed: deliver and store in original packages, with label indicating:

- .1 Analysis of seed mixture
- .2 Percentage of pure seed by weight
- .3 Year of production
- .4 Net mass
- .5 Date tagged and location

.3 Mulching material: deliver and store in original packages and protect from the elements.

1.4 Maintenance Period

.1 Maintain seeded areas from time of seeding until acceptance by the Consultant.

.2 Seeded areas will be accepted by the Consultant when:

.1 Satisfactory seed test results have been received from seed testing laboratory
.2 Seeded areas are properly established
.3 Turf is free of bare and dead spots
.4 No surface soul is visible when grass cut to height of 50 mm

.3 Warranty of seeding beyond the acceptance period is not required, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 Fertilizer

.1 Complete commercial fertilizer, minimum of 50% of elements derived from organic sources.

.2 Consultant may adjust specified fertilizer after topsoil test analysis results are received, with no change in Contract Price.

2.2 Grass Seed

.1 Grass seed: Supply the seed mixture unless otherwise indicated:

.1 Seed mixture for hydro-seeding for roadside erosion control and trafficked areas as indicated on Drawings. Premier Pacific Seeds Ltd. Roadside Erosion Mix, or approved equivalent:

% Seed Count	% Weight	
31	25	Creeping Red Fescue
18.5	32	Annual Ryegrass
18.0	27	Perennial Ryegrass
20.0	6	Timothy
9.0	5	Alsike Clover
3.5	5	Single Cut Red Clover

2.3 Water

.1 Obtained from the Owner if available at Place of the Work, otherwise supplied by Contractor.

2.4 Mulching Material

.1 Wood of wood cellulose fibre free of growth or germination inhibiting ingredients.

.2 Mass of fibre mulch shall be net air-dry mass determined in accordance with Canadian Pulp and Paper Section, Standard A2.

2.5 Coco-Matting (Erosion Control Blanket)

.1 Blanket matting: Nilex C32 Erosion Control Blanket, or approved equivalent.

2.6 Staples

.1 25 mm wide by 200 mm deep by 3 mm diameter steel wire.

PART 3 - EXECUTION

3.1 Fertilizing

.1 Apply fertilizer only after final grade has been approved by Consultant.

.2 Apply 12-51-0 fertilizer at 300 kg/ha.

.3 Spread evenly with calibrated mechanical distributor.

.4 Mix thoroughly into upper 50 mm of topsoil.

3.2 Seeding

.1 Obtain Consultant's approval of seedbed finish grades, final tilth, surface flatness and fertilizer application before seeding.

.2 Sow at the rate of 300 kg/ha, during calm weather and when soil moisture content is adequate for germination.

.3 Sow 50% of seed with broadcast spreader.

.4 Sow remaining 50% of seed at right angles to first seeding pattern, using same broadcasting method.

.5 Cover seed.

.6 Apply fibre mulch to seeded areas at rate of 2250 kg/ha. Use hydro-seeder for application to achieve uniform cover.

.7 Roll seeded grass with roller not exceeding 50 kg.

.8 Water entire area with fine spray immediately after each area has been sown.

.9 Apply enough water to ensure penetration of at least 50 mm, avoid washing out seeds.

3.3 Hydro-Seeding

.1 Proceed with hydro-seeding only after final grade has been approved by the Consultant.

.2 Mix grass seed and fertilizer thoroughly to obtain following mixture:

.1 Water – 3400 L/ha
.2 Grass Seed – 170 kg/ha
.3 Fertilizer – 12-51-0 at 170 kg/ha

.3 Apply seed and fertilizer mixture with approved hydraulic seeder.

.4 Immediately following seeding apply 2250 kg/ha of fibre mulch to form uniform blotter like ground cover allowing absorption and percolation of water.

.5 Area seeded shall not exceed area which can be mulched on same day.

3.4 Protection of Seed Areas – General

.1 Immediately after seeding, erect barricades and warning signs to protect seeded areas from traffic until grass is established.

.2 Keep site well drained and landscape excavations dry.

3.5 Seed Protection on Slopes and Ditches

.1 Cover all prepared and seeded slopes 3:1 or steeper with matting.

.2 Unroll matting either horizontally or vertically to the slope without stretching or pulling.

.3 Lay matting smoothly on soil surface. Overlap adjacent sections of matting minimum 100 mm and staple.

.4 Staple matting into seedbed. Space staples 300 mm apart at start and end of each roll and 1.8 m apart on each side of matting roll and one row in centre, alternatively spaced between each side. Use common row of staples on adjoining matting.

.5 Minimize damage to seedbed during installation of matting. Regrade by hand raking as required, to correct any damages.

.6 In ditches, unroll matting in direction of flow. Overlap adjacent sections of matting minimum 100 mm with upstream section on top and stapled.

3.6 Maintenance

.1 Apply water in sufficient quantities to prevent grass and underlying soil from drying out.

.2 Areas with no irrigation system: supply labour, all hoses and attachments necessary to provide adequate watering to prevent grass and underlying soil from drying out.

.3 Where water is not supplied, on site by the Owner, provide water truck to haul and apply water to seeded areas.

.4 Provide weed control in newly seeded areas by mowing when required.

.5 Cut grass first time when it reaches height of 60 mm and maintain to minimum height of 50 mm. Do not cut more than 30% of blade in any single mowing.

.6 Re-seed areas which show root growth failure, deterioration, bare or thin spots, or which have been damaged by any means, including vandalism and replacement operations.

.7 Fertilize seeded areas six weeks after seeding with 27-14-0 fertilizer. Spread evenly at rate of 300 kg/ha, water in well.

.8 Postpone fertilizing until spring if application falls after August 15th.

3.7 Clean-up

.1 Clean up immediately any soil and debris spilled onto pavement or concrete.

.2 Broom clean pavement and sidewalks. Clear soil and rubble from underground surface storm sewer lids.

.3 Leave site in neat and clean condition. Remove excess materials from site.

END OF SECTION