

ATTACHMENT D RETAINING WALL SECTIONS

1 of 3

1.0 GENERAL NOTES:

- ALL DESIGN HAS BEEN COMPLETED IN ACCORDANCE WITH THE 2018 BC BUILDING CODE. CONSTRUCTION MUST BE IN ACCORDANCE WITH THIS BUILDING CODE AS WELL AS THE LATEST EDITION OF ALL REFERENCED CODES AND ALL LOCAL BY-LAWS.
- THIS SET OF DRAWINGS SHOWS THE COMPLETED PROJECT. THEY DO NOT SHOW COMPONENTS THAT MAY BE NECESSARY FOR CONSTRUCTION SAFETY. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY IN AND AROUND THE JOB SITE DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR THE BRACING OF THE STRUCTURE DURING CONSTRUCTION. ANY BRACING SHOWN ON THESE DRAWINGS IS FOR THE COMPLETED STRUCTURE ONLY.
- ONLY STRUCTURAL COMPONENTS DETAILED ON THESE DRAWINGS HAVE BEEN DESIGNED BY OPUS ENGINEERING LTD. OTHER STRUCTURAL COMPONENTS ARE THE RESPONSIBILITY OF THEIR RESPECTIVE DESIGNERS.
- DESIGN LOADS ARE IN ACCORDANCE WITH THE 2018 BC BUILDING CODE AND THE STRUCTURAL COMMENTARIES TO THE NATIONAL BUILDING CODE OF CANADA 2015.
DESIGN LOADS:
LATERAL EARTH PRESSURE COEFFICIENTS - $K_p=2.66$ $K_a=0.34$ $K_q=0.53$
SOIL FRICTION ANGLE = 27°
RETAINED SOILS UNIT WEIGHT = $21kN/m^3$
SEISMIC LOADS BASED ON $S_s(0.2)=1.0$ $S_s(0.5)=0.69$ $S_s(1.0)=0.35$ $S_s(2.0)=0.15$ PGA=0.50 SITE CLASS=C
 $I_w=1.0$ STRENGTH & 0.75 SERVICEABILITY $I_w=1.0$ STRENGTH & 0.75 SERVICEABILITY $I_w=1.0$
- CHECK ALL DIMENSIONS ON THE STRUCTURAL DRAWINGS AGAINST THE ARCHITECTURAL DRAWINGS. REPORT ANY INCONSISTENCIES BEFORE PROCEEDING WITH THE WORK. DO NOT SCALE THESE DRAWINGS.
- DO NOT BUILD FROM THESE DRAWINGS UNLESS THEY ARE MARKED 'ISSUED FOR CONSTRUCTION'.

2.0 INSPECTIONS:

- THE BUILDING CODE REQUIRES INSPECTIONS TO BE CARRIED OUT TO CONFIRM THAT THE CONSTRUCTION CONFORMS WITH OUR DRAWINGS AND SPECIFICATIONS.
- THE ENGINEER REQUIRES A MINIMUM OF 24 HOURS' ADVANCE NOTICE FOR AN INSPECTION.
- INSPECTIONS ARE REQUIRED AS FOLLOWS:
CONCRETE & REINFORCING STEEL - AFTER PLACING OF REINFORCEMENT & BEFORE POURING CONCRETE.

3.0 FOUNDATIONS:

- REFER TO LEWIS/CHIEF ENGINEERING REPORT #408.01 DATED SEPTEMBER 26, 2018.
FOUNDATIONS HAVE BEEN DESIGNED FOR AN ULTIMATE LIMIT STATE BEARING CAPACITY OF 200 kPa (478 psf) ON STRUCTURAL FILL, OR BEDROCK.
- STRUCTURAL FILL SHALL BE INORGANIC SAND & GRAVEL COMPACTED TO A MINIMUM OF 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY. SUITABLE MATERIAL IS $\frac{3}{4}$ " PLUS CLEAN PIT RUN SAND AND GRAVEL WITH LESS THAN 5% PASSING THE #200 SIEVE.
- PLACE STRUCTURAL FILL IN LIFTS APPROPRIATE FOR THE COMPACTION EQUIPMENT & IN COMPLIANCE WITH THE REQUIREMENTS OF THE GEOTECHNICAL ENGINEER.

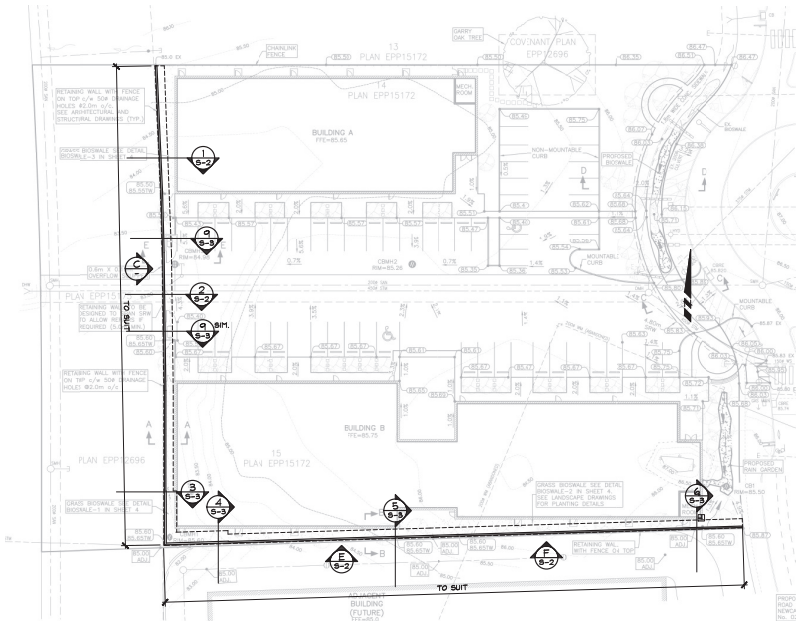
4.0 CONCRETE AND REINFORCING:

- ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF CAN A23.1 & A23.3.
- CONCRETE SHALL BE BATCHED USING TYPE 10 PORTLAND CEMENT TO MEET THE FOLLOWING SPECIFICATIONS:
LOCATION 28-DAY MAX AIR MAX SLUMP
STRENGTH (MPa) 45.0 (65.0) WATER/CEMENT RATIO SLUMP
FOOTINGS, FOUNDATION WALLS 28 20 0.50 4-7% 3'-4"
- COMPACT CONCRETE WITH INTERNAL VIBRATORS TO ENSURE A DENSE FINISHED PRODUCT.
- REINFORCING SHALL BE NEW DEFORMED STEEL CONFORMING TO CSA G30.21-11 WITH A YIELD STRENGTH OF 400 MPa
- EXCEPT WHERE NOTED OTHERWISE, ALL REINFORCING SHALL HAVE CLEAR COVER AS FOLLOWS:
SURFACES CAST AGAINST THE GROUND EXPOSED TO EARTH OR WEATHER NOT EXPOSED
BEAMS, COLUMNS, OR PILES - PRINCIPAL REIN - TIES, STIRRUPS 15" 10" 10" 10"
SLABS OR WALLS 15" 10" 10" 10"
- ALL REINFORCING BARS SHALL BE TIED SECURELY TO PREVENT DISPLACEMENT. COLUMNS, PILASTERS AND BEAM STIRRUPS SHALL HAVE TIES HOOKED 180 DEGREES OR AS DETAILED ON THESE DRAWINGS.
- UNLESS NOTED OTHERWISE, LAP LENGTHS FOR REINFORCING SHALL BE AS FOLLOWS:
BAR SIZE 10M 15M 20M 25M 30M 35M
LAP (in) 16" 24" 28" 32" 48" 51"
- NO SPLICES ARE PERMITTED WITHOUT THE ENGINEER'S APPROVAL WHERE THE LENGTH OF BARS HAVE BEEN GIVEN ON THE DRAWINGS. WELDING OF REINFORCEMENT IS NOT ACCEPTABLE WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
- PROVIDE BAY CUT CONTROL JOINTS IN FLOOR SLABS AS SHOWN ON THE DRAWINGS. BAY CUT TO BE CARRIED PRIOR TO DAY 4. FILL BAY CUT CONTROL JOINTS WITH GRAY POLYBUTYLENE CAULKING UNLESS OTHERWISE SPECIFIED BY ARCHITECT.

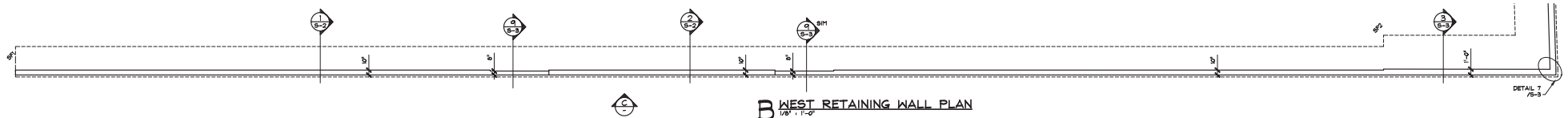
FOOTING SCHEDULE

| MARK | SIZE | REINFORCING |
|------|---------------------|--|
| BH1 | 8'-2" x 1'-0" THICK | 5 - 15M BOTTOM CONTIN. 15M @ 12" o.c. |
| BH2 | 7'-1" x 1'-0" THICK | 7 - 15M BOTTOM CONTIN. 15M @ 6" o.c. |

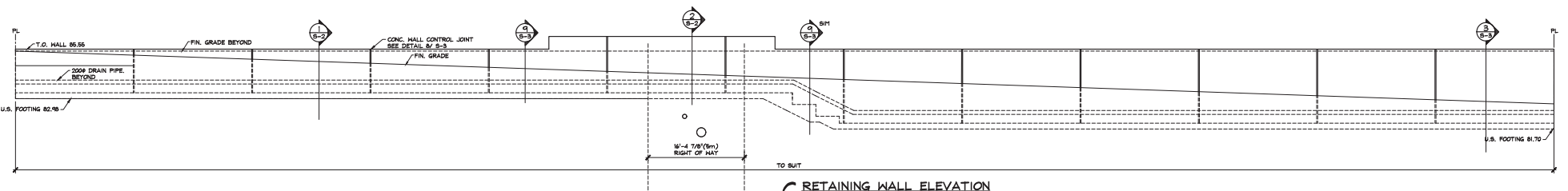
U.S. = 200 MPa (478 psf)



A GARRY OAK PARK SITE PLAN
1/8" = 1'-0"



B WEST RETAINING WALL PLAN
1/8" = 1'-0"



C RETAINING WALL ELEVATION
1/8" = 1'-0"

| REVISION | DATE | No. | REVISION | DATE | No. |
|---------------------------|-----------|-----|----------|------|-----|
| ISSUE FOR BUILDING PERMIT | 26 FEB 18 | 0 | | | |
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SAL

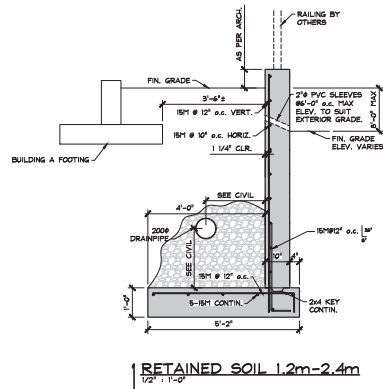
CLIENT
NANAIMO BUSINESS SERVICES
NORTH VANCOUVER, BC

PROJECT
GARRY OAK PARK
1875/1895 BOXWOOD ROAD,
NANAIMO, BC

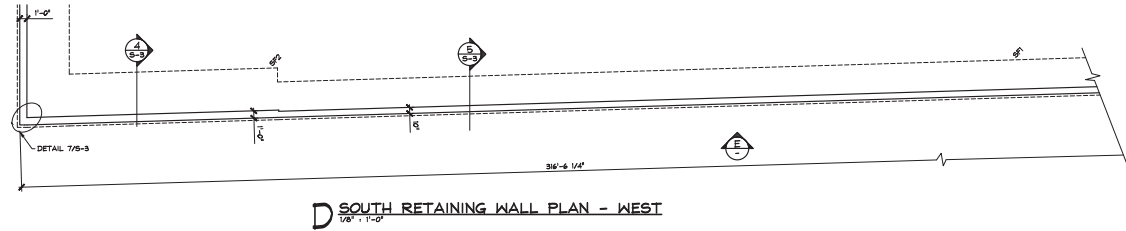
TITLE
RETAINING WALL
GENERAL NOTES, ELEVATION,
SITE PLAN, & WALL PLAN

DRAWN: RC CHECKED: EB
DATE: DEC 2018
SCALE: AS NOTED

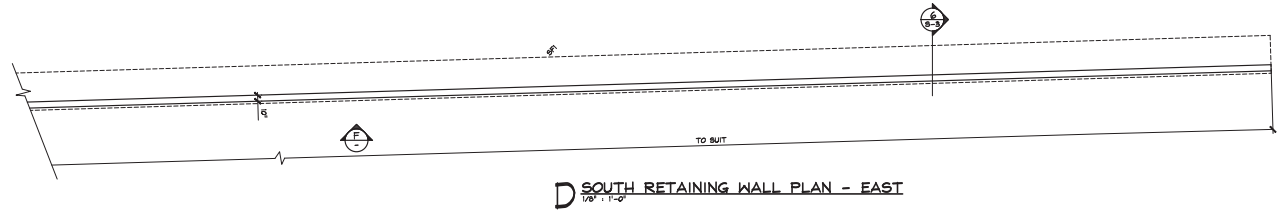
DRAWING
S-1
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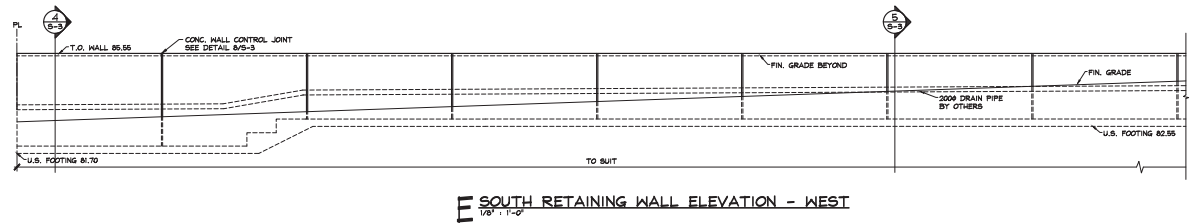
2 SECTION - OVER 5m R.O.W



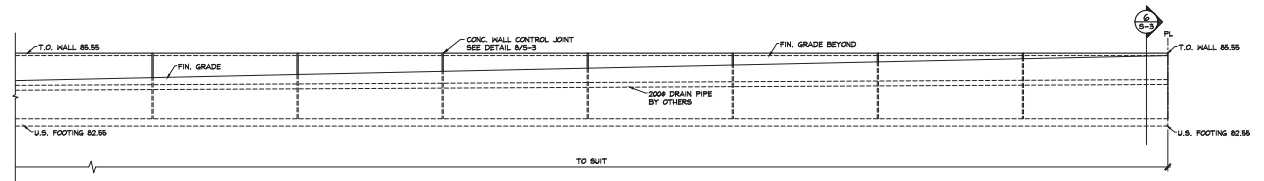
D SOUTH RETAINING WALL PLAN - WEST



D SOUTH RETAINING WALL PLAN - EAST



E SOUTH RETAINING WALL ELEVATION - WEST



F SOUTH RETAINING WALL ELEVATION - EAST

| REVISION | DATE | No. | REVISION | DATE | No. |
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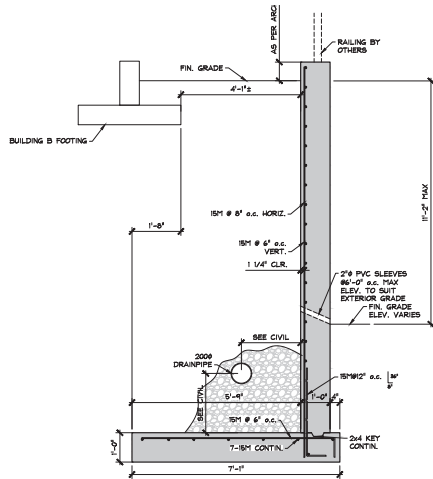
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4548/02/14/07/01/02

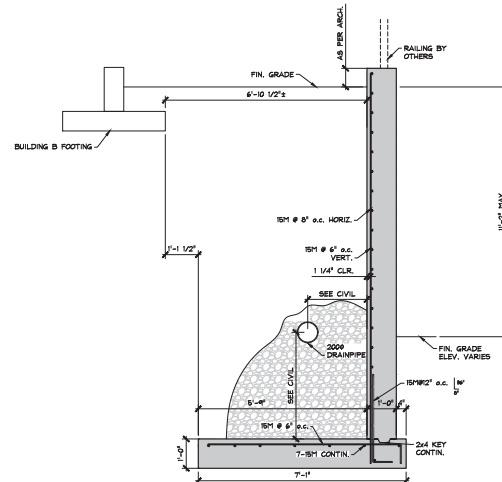
SEAL

CLIENT
NANAIMO BUSINESS SERVICES
NORTH VANCOUVER, BC
PROJECT
GARRY OAK PARK
1875/1895 BOXHOOD ROAD,
NANAIMO, BC

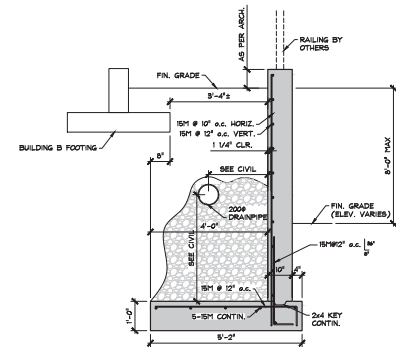
TITLE
RETAINING WALL
WALL PLAN, ELEVATION,
SECTION & DETAILS
DRAWN: RC CHECKED: EB
DATE: DEC 2018
SCALE: AS NOTED
DRAWING
S-2
0



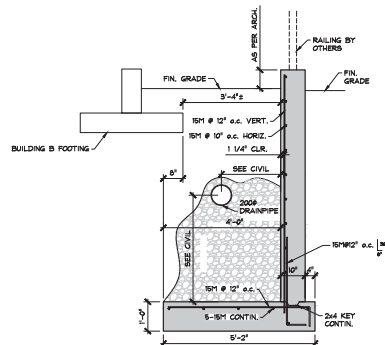
3 RETAINED SOIL 2.4-3.4m
1/2" = 1'-0"



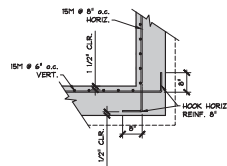
4 RETAINED SOIL 2.4-3.4m
1/2" = 1'-0"



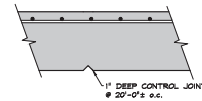
5 RETAINED SOIL 1.2m-2.4m
1/2" = 1'-0"



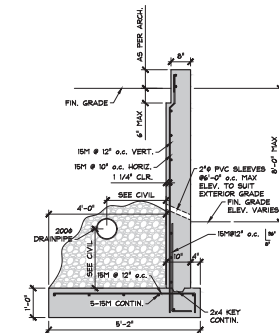
6 RETAINED SOIL 1.2m-2.4m
1/2" = 1'-0"



7 DETAIL
1/2" = 1'-0"



8 CONC. WALL CONTROL JOINT DETAIL
1/2" = 1'-0"



9 SECTION - AT GARBAGE ENCLOSURES
1/2" = 1'-0"

| REVISION | DATE | No. | REVISION | DATE | No. |
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| SEAL |
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| CLIENT |
| NANAIMO BUSINESS SERVICES NORTH VANCOUVER, BC |
| PROJECT |
| GARRY OAK PARK 1875/1895 BOKWOOD ROAD, NANAIMO, BC |

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|--------------------------------------|-----------------|-------------|
| TITLE | | |
| RETAINING WALL SECTIONS & DETAILS | | |
| DRAWING | DRAWN: RC | CHECKED: EB |
| S-3 | DATE: DEC 2018 | |
| | SCALE: AS NOTED | |
| | REV. | 0 |