toronto zoo

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2020-01-16

REQUEST FOR TENDER
ORANGUTAN OUTDOOR EXHIBIT CONSTRUCTION
RFT#: TZC T 57-2019-12
ADDENDUM # 2

This addendum shall be incorporated into, and form part of TZC T 57-2019-12 and take precedence over all requirements of the previously issued bid documents including plans. This addendum must be signed by the bidder (signing officer) in the appropriate space and must be attached to the Form for submission by the bidder. This Addendum consists of one (1) page and the documents listed below.

1. **Addendum #2:**
   Please see the attached addendum #A002 from Zeidler Architects dated January 15, 2020. Addendum #2 addresses RFIs, unit pricing, cash allowance, gaur drawings, DSS, etc.

Receipt of the Addendum shall be acknowledged as part of your submission.

The Board of Management of the Toronto Zoo reserves the right to reject any or all Quotations or to accept any quotation, should it deem such action to be in its interests.

If you have any queries regarding this matter, please contact Mr. Peter Vasilopoulos, Supervisor, Purchasing & Supply, at 416-392-5916.

Yours truly,

Peter Vasilopoulos
Supervisor, Purchasing & Supply

I/we hereby acknowledge receipt of this addendum and make allowance in my bid.

_____
Signed (Must be Signing Officer of Firm)

_____
Name of Firm

_____
Date:

zeidler

Date Issued:	2020 January 15
Project Name:	**Toronto Zoo Orangutan Outdoor Exhibits**
To:	Ben Knoop Toronto Zoo 361A Old Finch Avenue Toronto, ON M1B 5K7
Project Number:	18-1-086
RFT Reference No.:	TZC T–57-2019-12 (issued 2019-12-17)

Addendum ADD #A002

Note: *This addendum is issued prior to closing of tender to provide for certain revisions to or clarifications in the work. The revisions covered by this addendum shall be carried out in accordance with the requirements of the specifications. The following addendum items are included and shall become part of the contract.*

1. **General**
   - **1.1 ADD Access to Site diagram:**
     - 1.1.1 See attached
   - **1.2 Questions & Answers:**
     - 1.2.1 See attached Answers to Bidders' RFIs
     - 1.2.2 See attached existing building "Guar 2 & Trailer DSS report"
     - 1.2.3 See attached existing building Guar 1 As built drawings
   - 1.3 **Revised Forms (this will supersede Addendum 1 Part 5- Pricing Forms):**
     - 1.3.1 See attached Part 5 Appendix I Schedule of Values with Cash Allowance included.
     - 1.3.2 See revised Part 5 Appendix II Unit Prices with items added for Generator scope.

2. **Architectural – prepared by Zeidler**
   - **2.1 Specifications issued for #A002 dated January 14, 2020:**
     - 2.1.1 Refer to enclosed Architectural drawing revision List
     - 2.1.2 See attached architectural specs, all revisions are **in *Bold & Italic*.**
   - **2.2 Drawings issued for #A002 dated January 8, 2020**
     - 2.2.1 Refer to enclosed Architectural drawing revision List
     - 2.2.2 See attached architectural drawings

zeidler

3. **Structural – prepared by RJC**
   3.1 Drawings issued for Structural Addendum No. #2 dated January 10, 2020 - see attached

4. **Mechanical & Electrical – prepared by Quasar**
   4.1 Drawings issued for Mechanical & Electrical Addendum No.2 dated January 10, 2020 – see attached

5. **Civil – prepared by MGM**
   5.1 Drawings issued for Civil Addendum #2 dated January 10, 2020 – see attached.

6. **Landscape – prepared by NAK**
   6.1 Specification & Drawings issued for Landscape Addendum #L2 dated January 10, 2020 – see attached.

END OF ADD #A002

Sincerely,
ZEIDLER ARCHITECTURE INC.

Lena Chow, Associates
cc: Zeidler Architecture Inc.

ZC T–57-2019-12
ADDENDUM - A002.1.1
Toronto Zoo Orangutan Exhibits
ACCESS TO SITE

BRIDGE
- 140,500 LB
CAPACITY

BRIDGE
- 10'6" CLEARANCE BELOW
- 24,000 LB MAX AXLE
LOAD ABOVE

BOARDWALK
- 2200 LB
CAPACITY

P8

P7

HABITAT #2

HABITAT #1

Old Finch Ave
Reesor Rd
Hillside Cemetery
Meadowvale Rd
Zoo Rd
Flamingo Exhibit
Polar Bear Exhibit
Beavertails
Booster Juice
Splash Island
Zootique Gift Shop
Twiga Duka
Africa
Indian Rhinoceros Pavilion
Lion Exhibit
Malayan Woods Pavilion
Baboon House
African Rainforest Pavilion
Zebras
Toronto Zoo
Twiga Market
Simba Safari Lodge
Rouge River

Toronto Zoo Orangutan Exhibits
Bidder's RFI Log

(G)=General, (A)=Arch, (S)= Struct,
(M)=Mech, (E)=Elec, (Se)= Security,
(C)=Civil, (LA)=Landscape

Date Discipline	**Description**	**Answers**	**Additional information**
01.07.A	**A**		
1 (G)	Can Testing & Inspections be included in a cash allowance?	**Yes, see specs 01 21 00 Allowance sec. 2.4.**	
2 (A)	Can you please provide existing drawings for the building that has to be demolished.	**Following will be provided as part of Addendum 2:** **- Gaur 1 As built dwgs** **- Pre-Demolition Designated Substance (DDS) & Hazardous Materials Assessment for Gaur 2 Building - see attached.** **DDS of Gaur 1 Building will be available to successful bidders**	
3 (A)	Can you please provide a list of Glazing companies that have worked for the Toronto Zoo before?	**Stadia Glass & Door - Dylan Gosine - dgosine@stadia.ca;** **Abtek Door Services - Scott Malcolm - scott@abtekdoor.com**	
01.07.B	**B**		
1 (A)	Are we to duplicate the cables used in both the Indianapolis and Guadalajara projects?	**Yes, The Toronto Zoo would like the same cables used in the Indianapolis Zoo, i.e. use Tway lifting products (as per specs) or approved equivalent**	
2 (S)	Please provide termination lengths from pole to pole at all locations.	**Detail 1/S-800 has a note for the cable designer to determine cable length based on anticipated self weight sag (catenary). We may expand on this in the tender addendum #2 as the catenary of habitat 2 cable is a bit different than habitat 1 since it is longer, and poles are taller and more flexible.**	
3 (S)	In both of the previous installations we had a separation between the upper and lower cables of 5’3” and a sag of 24” at the mid-point of the span regardless of the span length. Is this to remain the same?	**We have two upper cables and one lower cable, the distance between upper and lower cable was set through design sessions with the Toronto Zoo.** **Structural note mentioned in item above doesn’t necessarily cover the maximum total sag, because it only deals with the catenary under self weight and therefore doesn’t include the weight of Orangutans.**	

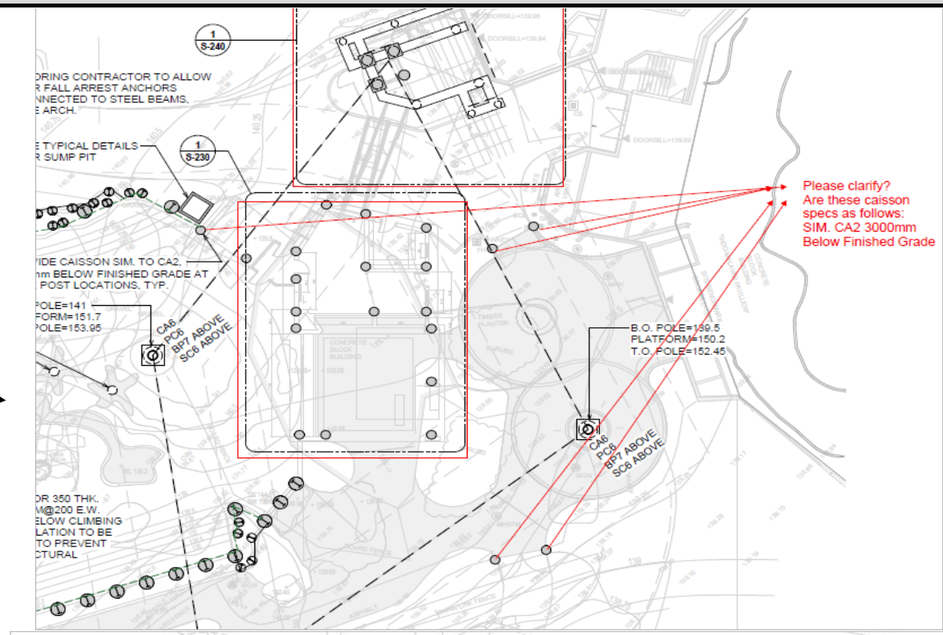
Date Discipline	**Description**	**Answers**	**Additional information**
4 (S)	Please provide details of a design to provide instruction on termination and attachment Construction.	**Typical connection detail shown on 1/S800.**	
01.07.C	**C**		
1 (LA)	No spec provided for concrete paving / sidewalks. Please provide.	**See landscape specs sections:** **32 12 16 Asphaltic Paving;** **32 14 13.19 Permeable Pavers &** **03 33 01 CIP conc - Landscape**	
2 (S)	No spec provided for caisson lagging and retaining wall. Please provide	**The caisson and lagging wall is intended to be designed by the shoring contractor. We have shown a typical concept that can be used for pricing, and we have also included specs for the individual components of the system (concrete caissons, steel beams, shotcrete etc.) however the final design should be detailed by the shoring contractor. We have this noted on all of the S700 details for clarity.**	
3 (LA)	No spec provided for concrete curbs. Please provide	**Refer to specs section 3 33 01 Cast In Place concrete - Landscape**	
01.07.D	**D**		
1 (S)	The Column for Habitat 2 Pole structure P7 is about 9 Metric ton about 200’ away. Even a big crane cannot install this column. Please send alternate using column in section and splice at location.	**Structural specs state that if a splice is needed for erection, then the splice is to be designed for full strength and stiffness of the member. Splices should be dealt with at shop drawing stage.**	
2 (S)	Steel Column SC6 is shown 610 Diax59.5mm thick. Looks to me some mistake in thickness.	**The column wall thickness shown is correct. This is not a typical grade 350W HSS column, it would have to be a pipe section, likely A53-gradeB or similar. See answer above.**	

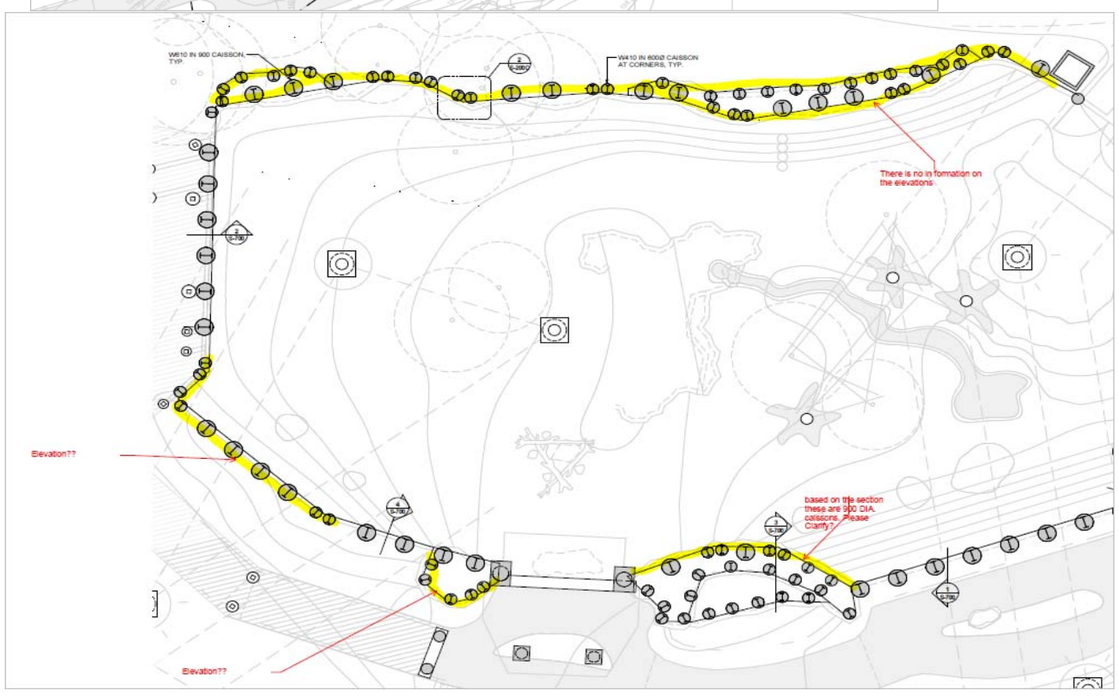
Date Discipline	Description	Answers	Additional information
3 (LA)	How much thickness of planting soil has to be required except at trees and Shrubs. This will help us in pricing excavation at planting areas	**Refer to drawing LA3. The depths are shown in detail 2 and 3 on this page**	
01.08.A	**A**		
1 (E)	Drawing EP102 has a note “provide new fiber connection from existing pavilion basement to new wall mounted rack”. Can you please provide information as to the location of the existing pavilion basement in relation to the new wall mounted rack location. Is this within the same building/pavilion location? If not in same building can you please provide an approximate distance to the existing building pavilion so we can provide correct lengths of fiber cable required.	**Location of Comm room is in the basement of the Indo-Malaya Pavilion, see EP-101- issued as part of Adddendum 2.** **.** **Normally we would not specify the feeder distance as the contractor would make a take-off from the drawings.**	
2 (E)	Also can you please provide detail on fiber optic cable type required? Multimode OM3/0M4 or Single mode, quantity of strands?	**The existing fiber is OM3 Multimode 6 Fiber**	
01.08.B	**B**		
1 (E)	Can we have more information on the existing panels at the zoo (manufacturer, model etc.)?	**Panel LP-VS1 is Westinghouse NQB. Panel LP-M10 is FPE NBLP 42-4L.**	
2 (E)	For the Orangutan Exhibit, DWG EX-101, Switchgear Elevation, are we to provide new 400A service for the exhibit? Can we acquire details on the switchgear?	**The new power panel is rated for 225A, 3P, 4W, 120/208V. The new service is to match the new panel rating (225A service). Existing Switchgear DP-MA DP-MB is FPE LL-15226 , 600A, 120/208V.**	
3 (E)	For the Orangutan Exhibit, DWG EX-101, Luminaire Schedule, a few of the lighting types do not have a manufacturer listed, just an incomplete Cat No.; please advise.	**Light Fixture LD1 Manufacturer is Newstar.** **Light Fixture LD2 Manufacturer is PEERLESS.** **Light Fixture LD3 Manufacturer is Prescolite.** **Information is included in Addendum 2**	
4 (E)	For the Orangutan Exhibit, DWG EX-102, Heat Pad Detail; please provide more information on heat pad and advise if Div. 16 is to supply & install.	**The heatpad utilizes snow-melt cabling. Basis of design is "Raychem Electromelt EM2-XR". Approximate area coverage of each heatpad is 8m2. Division 16 to supply and install.**	

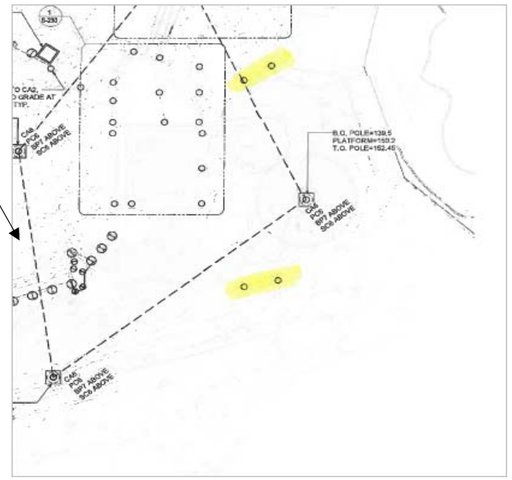
Date Discipline	Description	Answers	Additional information
5 (G)	Please advise working hours at the zoo, and if possible a shutdown schedule for feeder replacements and setup of Temporary Power	**Working hours outside the pavilion are 24/7. Working hours inside the pavilion are from 7:30am to Zoo close (the Zoo closes at 4:30pm during the winter and 7pm during the summer, Monday-Sunday). Shutdown schedule for feeder replacements cannot be determined at this time, but will occur during the daytime on a weekday.**	
6 (E)	Is communications to be done by zoo approved contractor?	**Communications contractor does not need to be approved by the Zoo, but they do need to be approved/certified to work on the brands of equipment specified**	
7 (G)	Will the Staging area, parking, and utilities be available for free for the GCs?	**Parking and staging area will be free. Contractor shall supply their own utilities (water, power, gas) or pay to use Zoo utilities. Contractor to also supply their own construction office, toilets etc. Refer to Arch specs Div. 1 issued as part of Addendum 2**	
01.08.C	**C**		
1 (S)	Are there shoring drawings to bid with? Or is the structural foundation plan paired with the civil plan elevations what is to be used for tender purposes	**S-200C and S-700 are sheets related to the shoring. The details and concepts on these sheets were provided for pricing and intended to be used as a concept only. Final shoring design should be completed by the shoring contractor. These drawings should be used in conjunction with the civil drawings to determine the finished grade elevations.**	
01.09.A	**A**		
1 (E)	Drawing EP-101 indicated electrical connection for HOT WIRE, please identify Hot wire	**Electrical contractor to provide power connection to hotwire device. Location of hotwire device is per the power connection on electrical drawings.** **Also refer to AR-104 detail 9 for details of hotwire at pole platforms.** **Devices for Hotwire (or hot vines) and electric fence above Habitat walls will be added to specs and issued as part of a future Addendum.**	

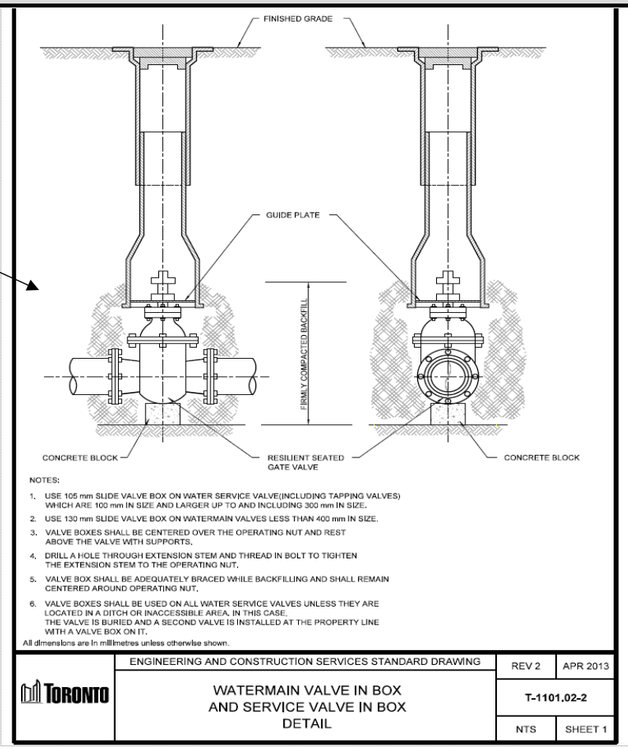
Date Discipline	Description	Answers	Additional information
2 (Se)	Are the Thirteen (13) Cameras going to tie into an existing Video Recorder?	**The Zoo will be utilizing existing video recording infrastructure for video recording/storage.**	
3 (Se)	Cat 6 Cabling or Fiber will be supplied and installed by the security contractor or will you carry it yourselves?	**The security contractor should supply and install.**	
01.09.B	**B**		
1 (A)	AR-111 & AR-210 - The details for the overhead transfer chutes call out two different mesh types (50 x 100 x 6 steel mesh and flexible mesh, bronze or black color) at the outer perimeter. I assume they just want the flexible cable mesh on the outside of the chute and the rigid mesh only at the floor as indicated, correct?	**- The transfer chutes outer perimeter mesh called as flexible mesh should be Stainless Steel Cable Mesh, 60x60 x 2.4 mm dia. (7x19) with black oxide finish.** **- We do not require the inner 50x100x6 mesh layer; it will be deleted from the dwgs.** **-The chutes floor rigid mesh should be Steel WWM, 50x50x7 (6 ga.)** **-Above is issued as part of Addendum 2**	
2 (A)	AR-120 – The mesh added to the exposed structural rafters is called out as 16ga. where orangutans cannot access and 10ga. where they can access the mesh. Specification section 05 59 64 callout those mesh sizes to be 10ga. and 6ga. respectively. Please clarify which is to be used.	**Where Orangutans can access the mesh, use 6 ga. rigid wwm mesh, where Orangutans cannot access the mesh, use 10 ga. wwm mesh.** **This is issued as part of Addendum 2**	
3 (A)	AR-122 & AR-123 – The vestibule is shown as mesh and 2500mm tall on AR-123 but solid plate and 4500mm tall on AR-122. Please clarify.	**The 2 East façades directly facing the Orangutan Habitat is 4.5 m tall solid plate; the other 2 (west & south) facades are to remain lower @ 2.5m mesh + roof.** **All surfaces within the Habitat should be non-climbable surface with height at 4.5m mininum.**	
4 (A)	AR-106 – Are there any additional details or specifications for the “puzzle feeders”? Is this something that the zoo already has in use? If so, can we get some photos of them to better understand how they are made?	**The Zoo is currently using similar puzzle feeders and can provide additional information and photographs for preparation of shop drawings. The information shown on sheet AR-106 shows frame dimensions, depth and design intent.** **See photo to the right.**	
01.09.C	**C**		
1 (A)	Can you please provide the specifications metal Roofing and Metal Shingles.	**Refer to spec sections 07 31 16 Metal Shingles; 07 61 00 Metal Roofing (Alternate Price).**	

Date Discipline	**Description**	**Answers**	**Additional information**
2 (A)	Also drawing with same symbol on Roof shows one with Metal Roofing other drawing shows Metal Shingle Roofing.	**They should all say Metal shingle roofing for all structures, i.e. a) Research station/Glass Viewing, b) Trellis Glass Viewing and c) Treehouse- issued as part of Addendum A002.**	
01.10.A	**A**		
1 (S)	Fencing scope - what the infill for the "access to exhibit" gates, doesn't seem to specify on the detail.	**I'm not sure what this is referring to. We have a note referring to typical caissons at gate post locations on S-200A.**	
2 (S)	Foundation Clarification – See attached S-200A	**Assumption on the sketch appears correct. Typical caissons at gate posts are similar to CA2 except that they are to be founded 3000mm below finished grade, rather than what is shown on the caissons schedule for CA2**	
3 (S)	Shoring Clarification – See attached S-200C	**Section cut marker could have been moved slightly left on the page to avoid this confusion….however the shoring plans and sections are intended to be used for concept and pricing only, the final shoring design shall be determined by the shoring contractor**	
4 (S)	It seems there are 4 caissons without any information on the attached drawing S200A.	**The highlighted caissons are at gate post locations, shall be similar to CA2, except founded 3000mm below finished grade instead of what is called out on the caisson schedule. Typical gate post caisson spec is called out on S-200A, near the sump pit.**	
5 (S)	Is shoring for a long term purpose (i.e., permanent shoring)?	**Yes, shoring is permanent forming new exhibit.**	
6 (S)	Is habitat 2 included in the project? Based on drawing # S-250, it seems there are 4 micropiles. I couldn't find micropile detail from drawings. Can you please send me a related section? If we are to design the micropile, where can I find the boreholes to do so? The expected borehole (BH2) is not present. Would using BH3 be a viable substitute?	**Typical micropile detail is shown on S-850. Please contact geotechnical engineer for any questions related to boreholes.**	
7 (S)	There are several caisson piles in both habitats with details shown in caisson schedule on drawing# S-300. Can you please clarify existing grade elevation and finish grade elevation? Depth below finish grade has been only reflected in caisson schedule.	**We have not noted this on the structural drawings, finished grade elevations should be read from final grading plan.**	





Date Discipline	**Description**	**Answers**	**Additional information**
8 (C)	Regarding to shoring part in habitat 1 (drawing# S-700), can you please specify top of wall, existing grade, bottom of wall and bottom of caisson's elevation for each section. Related elevations cannot be figured out from architectural drawings.	**See Civil grading plan**	
9 (C)	Regarding to shoring part in habitat 1 (drawing# S-700), there is 1.2 m gap between bottom of wall and bottom of excavation in all sections except section 2. Would this 1.2 m be backfilled after a shoring?	**Yes, these are to be backfilled. Bottom of wall shown on drawings.** **.** **Structurally, the 1.2m is shown to locate the bottom of the shotcrete wall below the frost line.**	
10 (A)	10. Is there any 3D perspective from completed project to have a better vision on that?	**No**	
11 (C)	The note on the CV-003 Grading drawing says. With in the Exhibit to be per contour lines. The grading drawing shows both contour and existing elevations and both do not match each other. Please clarify which Grading elevations consider as existing elevations.	**Contours shown are proposed elevations. Light gray spot elevations are existing.**	
12 (C)	Please clarify the details of Area drains as per drawing CV-002 site servicing.	**Zurn - Z645 (CANADIAN MARKET) - 12" X 12"HEAVY-DUTY DRAIN WITH INTERNAL TRAP. https://www.zurn.com/products/building-drainage/floor-drains/area-drains/z645-(canadian-market)**	

Date Discipline	**Description**	**Answers**	**Additional information**
13 (C)	Please clarify the details for Sanitary drain valve and sanitary drain connecting to the Ex San MH as per drawing CV-002 site servicing.	**The sanitary drain connection services the bottom of the water feature. It is normally closed. A gate valve will allow the Zoo to open the drain to empty the water feature for maintenance purposes. Per the Zoo's requirements the water feature is to be drained out daily.** **We were originally thinking that it would be setup similar to the detail (to the right), and zoo staff can use a valve key to open and close the drain. Alternatively we can consider using something that has an accessible valve handle above grade.** **The handle will need to be lockable (chain and padlock) to avoid visitors tampering with it.** **.** **(zoo) The drain valve can be a normal "curb stop" style operated with a key.**	
14 (C)	As per drawing CV-002 site servicing, DICB3 T/G 139.30, INV 139.19 the difference is 0.11 m, and also the OBV of existing 450 mm CSP culvert is 139.69 higher that T/G of new DICB 3 and the swale INV is 139.30 which is shown as the T/G. please clarify.	**Revise DICB3 T/G elevation to 139.50, with a grate slope of 2:1. Grate elevation referenced is the lower elevation of the grate. At 2:1 grate slope, the top elevation of the grate will be 139.80. The existing 450mm culvert with invert of 139.19, and obvert of 139.64, can fit within the taller side of the DICB. Swale slope will be revised from 3.5% to 2.5%.**	
01.10.B	**B**		
1 (Se)	For the CCTV, there is nothing in the Spec drawing about them	**Questions is not clear. CCTV specification 28 20 00 was provided. Camera locations are located on electrical plans.**	
2 (Se)	Are there access control doors for this project?	**There is no electrical access control.**	
3 (Se)	Is there intrusion for this project?	**There is no intrusion protection for this project.**	
4 (Se)	Division 28 has no mention of security devices, was this a mistake that was missed?	**There are no electronic security devices.**	

REPORT

September 7, 2017

PRE-DEMOLITION DESIGNATED SUBSTANCE AND HAZARDOUS MATERIALS ASSESSMENT

Guar 2 Building and Wildlifecare Supervisor Trailor, Toronto Zoo 361A Old Finch Avenue, Toronto, Ontario

Submitted to:
Ms. Leona Mitchell
Director, Facilities and Services
Toronto Zoo
361A Old Finch Avenue
Toronto Ontario
M1B 5K7

Report Number: 1785748

Distribution:

1 e-copy - Toronto Zoo
1 e-copy - Golder Associates Ltd.

Golder Associates

Table of Contents

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by The Toronto Zoo (Zoo) to conduct an intrusive pre-demolition designated substance and hazardous materials survey (DSS) of the Guar 2 Building and Wildlife Care Supervisor Office located at the Toronto Zoo, 361A Old Finch Avenue, Toronto, Ontario (the Site). The survey was conducted on August 21st, 2017. The DSS was required prior to Site demolition.

The pre-demolition DSS was performed with the objective of identifying designated substances, as required under the Ontario *Occupational Health and Safety Act* (the *Act*) and to provide recommendations to remove these materials prior to demolition. The designated substances surveyed include asbestos-containing materials (ACM), lead, mercury and silica. The remaining designated substances (acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates and vinyl chloride) were not anticipated to be present. The presence of select hazardous materials including ozone depleting substances (ODSs), polychlorinated biphenyls (PCBs) and mould-contamination were also noted, where observed.

1.1 Site Description

The areas assessed include the Guar 2 Building and the Wildlife Care Supervisor Office.

The Guar 2 Building is a single-storey, approximately 815 square foot building built in 1980. The interior walls consisted of wood board and planks of wood, with no insulation or fibreglass insulation. The flooring was poured concrete. The ceiling was wood board and was noted to be uninsulated. The exterior walls consisted of wood planks with the bottom two feet of the wood exterior covered in a thick black plastic. The roofing system appeared to be constructed of metal sheeting and non-asbestos black mat and gravel that facilitated plant growth on the roof. Mechanical pipes were noted to be uninsulated or insulated with fibre glass and plastic foam. On the east side of the Guar 2 Building is an enclosed pen comprised of painted wood, chain-link and chicken wire fencing. The south exterior side of the Guar 2 Building was not assessed as it was part of the Guar enclosure, but was visually assessed to be of the same materials as the rest of the Guar 2 Building exterior.

The Wildlife Care Supervisor Office is a single-storey approximately 150 square foot building with wood foundation on concrete blocks, located directly east of the Guar 2 Building. The interior walls consisted of drywall and were insulated with fibre glass insulation. The ceilings were composed of ceiling tile and insulated with fibreglass insulation. The floors were carpet over plywood. The exterior walls consisted of plywood under aluminium sheeting. The roofing system was composed of aluminum sheeting.

2.0 SCOPE OF WORK

The Scope of Work involved conducting a pre-demolition building materials survey to:

- identify designated substances and selected hazardous materials present;
- supplement visual observations by conducting representative bulk sampling of materials suspected of containing asbestos, and paints suspected of containing lead and/or PCBs;
- complete analysis of bulk samples for asbestos type/percentage; and lead and PCBs content, where required; and,

- provide a report detailing the findings and any recommendations with respect to management of any identified designated substances, ODSs, PCBs and mould-contamination present.

3.0 REGULATIONS, GUIDELINES, STANDARDS AND SAMPLING METHODOLOGY

The regulations, guidelines, and standards referenced throughout this report are listed and defined in Appendix D. Similarly, the Investigation and Sampling Methodologies are provided in Appendix E.

4.0 RESULTS AND DISCUSSION

4.1 Asbestos

A total of 24 samples representing eight distinct homogeneous building materials were collected. Due to the layering of materials (i.e. rubber mat and underlying mastics etc.) a total of 25 analyses were conducted. Based on the laboratory Certificates of Analysis, the following material was found to contain asbestos:

- White window caulking on exterior door windows and skylight (Samples 4A-C) in the Guar 2 Building was found to contain 2% Chrysotile. Approximately 30 linear feet of the non-friable caulking was observed in good condition.

Materials sampled and determined to be non-asbestos include the following:

- White 2'x4' ceiling tile (Samples 1A-C) in the Wildlife Care Supervisor Office;
- White caulking on the exterior door (Samples 2A-C) in the Wildlife Care Supervisor Office;
- Silver caulking on the roof sheeting (Samples 3A-C) in the Wildlife Care Supervisor Office;
- Black caulking between wood walls and black plastic base (Sample 5A-C) on the Guar 2 Building;
- White caulking on eaves trough (Sample 6A-C) on the Guar 2 Building;
- Black rubber mat and asphalt mastic lining the eaves trough (Samples 7A-C) on the Guar 2 Building; and,
- Black roof mat (Samples 8A-C) on the Guar 2 Building.

Throughout the areas surveyed 'bell and spigot' pipe connections and/or Transite™ (asbestos-cement) pipes were not observed.

Throughout the assessment multiple locations were intrusively investigated for the presence of hazardous materials. Intrusive methods included pulling up flooring to investigate for multiple layers (i.e. carpet, vinyl floor tiles, etc.), creating access ports into solid surfaces, and assessing ceiling spaces. Although the investigation was thorough it may still fail to detect all materials. Any materials found in these spaces that have not been identified should be considered asbestos-containing until proven otherwise.

Please refer to Appendix A - *Spreadsheet of Findings – Hazardous Materials* for representative photographs and laboratory results, including those found to be non-asbestos. The laboratory Certificate of Analysis is presented in Appendix B.

4.2 Lead

Two bulk lead samples were collected and submitted for analysis. The light green paint (Sample LP-1) on the Wildlife Care Supervisor Office and the olive green paint (Sample LP-2) on the Guar 2 Building. Based on the laboratory Certificate of Analysis, the samples were found to be below the laboratory detection limit and are considered lead-free.

Lead is also suspected in the solder within the copper domestic water pipes in the Guar 2 Building. Please refer to Appendix A for representative photographs and laboratory results. The laboratory Certificate of Analysis is presented in Appendix C.

4.3 Mercury

Mercury vapour is suspected in the six fluorescent light tubes in the Wildlife Care Supervisor Office and approximately 20 florescent light tubes in the Guar 2 Building.

4.4 Silica

Silica is suspected in the ceiling tile, concrete and mortars used to construct the Site buildings.

4.5 Ozone Depleting Substances

ODSs are suspected within the Air conditioning unit in the Wildlife Care Supervisor Office. The compact chest freezer in the Guar 2 Building was noted to contain R600a a non-ODS refrigerant.

4.6 Polychlorinated Biphenyls

Based on the suspected age of the Sites, the fluorescent light ballasts may contain PCBs.

4.7 Mould

Water staining was noted on the ceiling tiles within the Wildlife Care Supervisor Office. No Mould was observed in the areas assessed.

4.8 Waste Materials

At the time of the assessment, office materials, files, animal crates and enclosures were observed on the Sites.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Asbestos

Through Site investigation and laboratory analytical testing, asbestos was identified in white window caulking on exterior door windows and skylight in the Guar 2 Building. The following recommendations are made in accordance with the requirements of the Regulation Respecting Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05):

- Prior to future demolition, the asbestos-containing window caulking should be removed following Type 1 procedures.
- The quantities of ACM as reported are estimates only and may not accurately reflect the exact quantities at the Site. Contractors retained to complete asbestos abatement activities should independently confirm the reported quantities.
- Due to the limitations in the scope of work, it is possible that undiscovered ACM are present within inaccessible locations such as behind solid surfaces not investigated. Furthermore, although not observed multiple layers of flooring may present beneath existing flooring. Although not expected, concealed materials (i.e. underground asbestos-cement products, sheeting, sanitary drain, pipe, etc.) not identified or known may become apparent during demolition activities. Because of this uncertainty, an abatement "per unit" rate sheet be developed and added to the abatement specification. The contractor retained to work on this project should be notified of this limitation and written procedures be established in the event additional ACM are identified. The overall objective is to minimize exposure, project delay and cost during demolition
- If suspected ACM not identified in this report are encountered during demolition the material(s) should be tested to determine asbestos content. This would be executed in order to provide recommendations on the applicable work procedures.

5.2 Lead

Based on the analytical results, lead was not detected in the light green exterior paint on the Wildlife Care Supervisor Office or the olive green paint on the exterior of the Guar 2 Building.

Lead is also suspected in the solder within the copper domestic water pipes in the Guar 2 Building. Although not expected, during demolition activities, inaccessible lead-containing materials may be uncovered (e.g. lead sheeting). All bulk lead-containing materials should be extracted and sent to a recycling facility. If recycling of the lead is not practicable then it must be disposed of in an approved landfill as lead waste.

Ontario Regulation 490/09 - Designated Substances, as amended (O. Reg. 490/09) prescribes an occupational exposure limit (OEL) for elemental lead of 0.05 mg/m3 calculated as an 8 hour/daily and a 40 hour/weekly time-weighted average (TWA) limit. If workers are required to perform operations where significant levels of airborne lead-containing dust may be generated, then measures must be taken to ensure the OEL for lead is not exceeded and that all reasonable regulatory and health and safety precautions are taken.

The potential for worker exposure is dependent on how the materials are to be disturbed. The Ministry of Labour (MOL) Guideline - Lead on Construction Projects (April 2011), provides a classification system to assist with determining the required control measures necessary, based on the proposed work activity. The MOL Guideline should be reviewed prior to completing a specific task with the objective of evaluating the need for health and safety precautions such as engineering controls, safe work and hygiene practices, personal protective equipment and training.

5.3 Mercury

Mercury vapour is suspected in the fluorescent light tubes in the Wildlife Care Supervisor Office and the Guar 2 Building. If the mercury is to be disposed of, it should be removed and recycled. If it cannot be recycled, the suspected mercury-containing tubes/switches should be disposed of as mercury-containing waste.

5.4 Silica

Silica is likely to be present in the ceiling tile, concrete and mortars used to construct the Site building. During demolition, it is recommended that materials suspected to contain silica are routinely misted with water to control airborne dust levels, thereby preventing worker and public exposure to silica. Any work involving silica should be completed in accordance with the MOL Guideline - Silica on Construction Projects (April 2011). Workers in the immediate vicinity or having the potential to become exposed to airborne silica should be provided with the appropriate respiratory protection.

5.5 Ozone Depleting Substances

Prior to disposal, the ODS-based refrigerants suspected within the air-conditioning unit in the Wildlife Care Supervisor Office should be drained by a licensed technician before the equipment is decommissioned and up-to-date records should be kept detailing the transfer quantities by refrigerant types and given to the owner for their records. Maintenance, transfer and disposal of refrigerants must be conducted in accordance with the Regulation Respecting Ozone Depleting Substances and other Halocarbons (O. Reg. 463/10).

5.6 Polychlorinated Biphenyls

Given the suspected age of the Site, the light ballast present are suspected to contain PCBs. For confirmation purposes prior to disposal, all light ballasts must be checked and compared to the Environment Canada's Report EPS 2/CC/2 (revised) August 1991, Identification of Lamp Ballasts Containing PCBs. Ballasts clearly identified as "Non-PCB" or "PCB-Free" can be recycled or disposed of as regular construction waste. All other ballasts must be identified by the markings, date code, model and serial number to confirm the presence of PCBs. However, given the number of ballast present and the limited quantity of PCBs suspected in each ballast, the ballasts can likely be disposed of as solid, non-hazardous waste under the Ontario small quantity exemption since the total quantity of PCBs is expected to be less than 1 kilogram (refer to Ontario Regulation 347/90, as amended, and Ontario Regulation 362/90).

5.1 Waste Materials

During demolition activities, the debris and garbage (i.e. office materials, files, animal crates and enclosures etc.) should be removed and/ or disposed of off-Site by a Ministry of the Environment and Climate Change licensed waste contractor in accordance with Ontario Regulation 347/90, as amended.

6.0 LIMITATIONS

This report was prepared for the use of the Toronto Zoo. This report is based on data and information collected during the Site visit conducted by Golder and is based solely on Site conditions encountered at the time of the survey. The conclusions and recommendations contained in this report are based upon professional opinions with regard to the subject matter. These opinions are in accordance with applicable and currently accepted occupational health and safety or environmental assessment standards and practices applicable to these locations and are subject to the following inherent limitations:

- The data and findings presented in this report are valid as of the date of the investigation. The passage of time, manifestation of latent conditions or occurrence of future events may warrant further exploration at the properties, analysis of the data, and re-evaluation of the findings, observations, and conclusions expressed in this report;

- Additional hazardous building materials not identified in this report may become evident during demolition. Should additional information become available, Golder requests that this information be brought to our attention so that we may re-assess the conclusions presented herein;

- Golder's report presents professional opinions and findings of a scientific and technical nature. While attempts were made to relate the data and findings to applicable environmental and occupational health and safety laws and regulations, the report shall not be construed to offer legal opinion or representations as to the requirements of, nor compliance with, environmental and occupational health and safety laws, rules, regulations or policies of federal, provincial, or local governmental agencies. Any use of this assessment report constitutes acceptance of the limits of Golder's liability. Golder's liability extends only to its client and not to other parties who may obtain this assessment report. Issues raised by the report should be reviewed by appropriate legal counsel;

- In evaluating the Site conditions, Golder has relied in good faith on information provided by others. We accept no responsibility for any deficiency, misstatements or inaccuracies contained in this report as a result of omissions, misinterpretations or fraudulent acts of the persons involved;

- The quantities of identified designated and hazardous substances noted herein are estimated quantities for reporting purposes, and this report is limited in that regard. It is solely the responsibility of the contractor to confirm the exact quantities of designated substances to be removed, prior to their removal;

- Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance in the management of identified materials. Contractors bidding on, or undertaking any work should rely on their own investigations, as well as their own interpretations of the factual data presented in this report, as to how concealed conditions may affect their work, including but not limited to proposed techniques, schedule, safety and equipment capabilities; and,

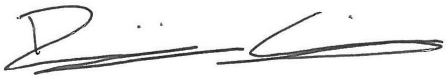
- Special risks occur whenever engineering or related disciplines are applied to identify Site conditions and even a comprehensive investigation, sampling and testing program may fail to detect all or certain Site conditions. The conditions that Golder interprets to exist between and beyond investigation and sampling points may differ from those that actually exist.

7.0 CLOSURE

If you have any questions regarding the information presented in this report, or require assistance with environmental health and safety issues related to this, or any other Site, please feel free to contact the undersigned at (905) 723-2727. Thank you for the opportunity to be of service. We look forward to working with you again.

Report Signature Page

GOLDER ASSOCIATES LTD.



Bronte Wright (B.Sc., Dipl (Env. Tech))
EH&S Technician

Jason McGonigle, CRSP, CHSC, B.Tech., Dipl.
Principal, Senior EHS Practice Leader

BW/AHD/JM:kc

c:\users\kclark\desktop\temp sharepoint\1785748 dss report - guar 2 & trailer 7sep17.docx

APPENDIX A

Spreadsheet of Findings – Designated Substances / Hazardous Materials

SPREADSHEET OF FINDINGS - HAZARDOUS MATERIALS
Guar 2 Building and Wildlife Care Supervisor Trailor, Tronto Zoo, Toronto, Ontario

Haz Mat.	Location	Material & Description	Est. Qty*	Units	Condition	Friable Yes/No	Accessibility	Sample #	% and Type	Photographs	Recommended Actions
ASBESTOS											
Asbestos	Wildlife Care Supervisors Office	White 2'x4' ceiling tile	NA	Square feet	Good	No	High	01A-C	None detected		No Action Required
Asbestos	Wildlife Care Supervisors Office	White caulking on the exterior door	NA	Linear Feet	Good	No	High	02A-C	None detected		No Action Required

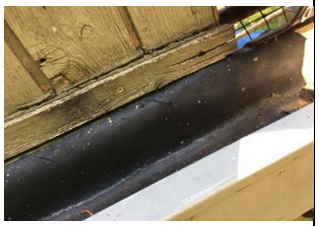
Accessibility:
High: Accessible to All
Mod: Accessible to Maintenance Staff Only
Low: Enclosed in Building Materials

SPREADSHEET OF FINDINGS - HAZARDOUS MATERIALS
Guar 2 Building and Wildlife Care Supervisor Trailor, Tronto Zoo, Toronto, Ontario

Haz Mat.	Location	Material & Description	Est. Qty*	Units	Condition	Friable Yes/No	Accessibility	Sample #	% and Type	Photographs	Recommended Actions
Asbestos	Wildlife Care Supervisors Office	Silver caulking on the roof sheeting	NA	Linear Feet	Good	No	Low	03A-C	None detected		No Action Required
Asbestos	**Guar 2 Building**	**White window caulking on exterior door window**	**NA**	**Linear Feet**	**Good**	**No**	**High**	**04A-C**	**2% Chrysotile**		**Prior to disturbance remove following Type 1 procedures**

Accessibility:
High: Accessible to All
Mod: Accessible to Maintenance Staff Only
Low: Enclosed in Building Materials

SPREADSHEET OF FINDINGS - HAZARDOUS MATERIALS
Guar 2 Building and Wildlife Care Supervisor Trailor, Tronto Zoo, Toronto, Ontario

Haz Mat.	Location	Material & Description	Est. Qty*	Units	Condition	Friable Yes/No	Accessibility	Sample #	% and Type	Photographs	Recommended Actions
Asbestos	Guar 2 Building	Black caulking between wood walls and black plastic base	NA	Linear Feet	Good	No	High	05A-C	None detected		No action required
Asbestos	Guar 2 Building	White caulking on eaves trough	NA	Linear Feet	Good	No	Low	06A-C	None detected		No action required

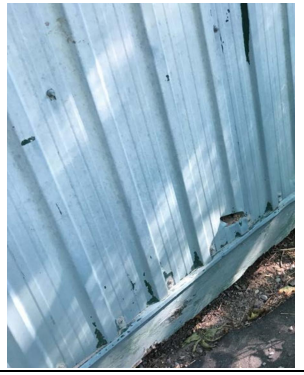
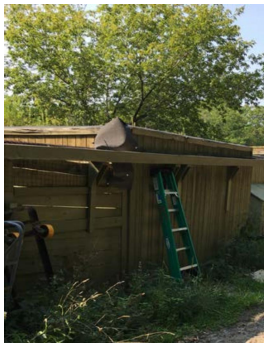
Accessibility:
High: Accessible to All
Mod: Accessible to Maintenance Staff Only
Low: Enclosed in Building Materials

SPREADSHEET OF FINDINGS - HAZARDOUS MATERIALS
Guar 2 Building and Wildlife Care Supervisor Trailor, Tronto Zoo, Toronto, Ontario

Haz Mat.	Location	Material & Description	Est. Qty*	Units	Condition	Friable Yes/No	Accessibility	Sample #	% and Type	Photographs	Recommended Actions
Asbestos	Guar 2 Building	Black mat and asphalt mastic lining the eaves trough	NA	Linear Feet	Good	No	Low	07A-C	None detected		No action required
Asbestos	Guar 2 Building	Black roof mat	NA	Square feet	Good	No	Low	08A-C	None detected		No action required

Accessibility:
High: Accessible to All
Mod: Accessible to Maintenance Staff Only
Low: Enclosed in Building Materials

SPREADSHEET OF FINDINGS - HAZARDOUS MATERIALS
Guar 2 Building and Wildlife Care Supervisor Trailor, Tronto Zoo, Toronto, Ontario

Haz Mat.	Location	Material & Description	Est. Qty*	Units	Condition	Friable Yes/No	Accessibility	Sample #	% and Type	Photographs	Recommended Actions
LEAD											
Lead	Exterior Wildlife Care Supervisor Office	Light green paint	NA	Square feet	Good	NA	High	LP-1	None detected		No Action Required
Lead	Exterior Guar 2 Building	Olive green paint	NA	Square feet	Good	NA	High	LP-2	None detected		No Action Required

Accessibility:
High: Accessible to All
Mod: Accessible to Maintenance Staff Only
Low: Enclosed in Building Materials

APPENDIX B

Laboratory Certificate of Analysis - Asbestos

EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: 289-997-4602 / (289) 997-4607
http://www.EMSL.com / torontolab@emsl.com

EMSL Canada Order 551709299
Customer ID: 55GOLA62
Customer PO: 1785748
Project ID:

Attn: Bronte Wright
Golder Associates, Ltd.
100 Scotia Court
Whitby, ON L1N 8Y6

Phone: (905) 723-2727
Fax: (905) 723-2182
Collected: 8/21/2017
Received: 8/22/2017
Analyzed: 8/29/2017

Proj: 1785748

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 01A **Lab Sample ID:** 551709299-0001
Sample Description: Ceiling Tile, Wildlife Trailer

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Brown	80%	20%	None Detected	

Client Sample ID: 01B **Lab Sample ID:** 551709299-0002
Sample Description: Ceiling Tile, Wildlife Trailer

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Brown	80%	20%	None Detected	

Client Sample ID: 01C **Lab Sample ID:** 551709299-0003
Sample Description: Ceiling Tile, Wildlife Trailer

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Gray	80%	20%	None Detected	

Client Sample ID: 02A **Lab Sample ID:** 551709299-0004
Sample Description: White Door Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	White	0%	100%	None Detected	

Client Sample ID: 02B **Lab Sample ID:** 551709299-0005
Sample Description: White Door Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	White	0%	100%	None Detected	

Client Sample ID: 02C **Lab Sample ID:** 551709299-0006
Sample Description: White Door Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	White	0%	100%	None Detected	

Client Sample ID: 03A **Lab Sample ID:** 551709299-0007
Sample Description: Silver Roof Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Silver	0%	100%	None Detected	

EMSL Canada Inc.

2756 Slough Street Mississauga, ON L4T 1G3
Phone/Fax: 289-997-4602 / (289) 997-4607
http://www.EMSL.com / torontolab@emsl.com

EMSL Canada Order 551709299
Customer ID: 55GOLA62
Customer PO: 1785748
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 03B **Lab Sample ID:** **551709299-0008**
Sample Description: Silver Roof Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Silver	0%	100%	None Detected	

Client Sample ID: 03C **Lab Sample ID:** **551709299-0009**
Sample Description: Silver Roof Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Silver	0%	100%	None Detected	

Client Sample ID: 04A **Lab Sample ID:** **551709299-0010**
Sample Description: Window Flashing, Door, Guar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Brown	0%	98%	**2% Chrysotile**	

Client Sample ID: 04B **Lab Sample ID:** **551709299-0011**
Sample Description: Window Flashing, Door, Guar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017			Positive Stop (Not Analyzed)		

Client Sample ID: 04C **Lab Sample ID:** **551709299-0012**
Sample Description: Window Flashing, Door, Guar

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017			Positive Stop (Not Analyzed)		

Client Sample ID: 05A **Lab Sample ID:** **551709299-0013**
Sample Description: Black Caulking B/W Wood, and Plastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	0%	100%	None Detected	

Client Sample ID: 05B **Lab Sample ID:** **551709299-0014**
Sample Description: Black Caulking B/W Wood, and Plastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	0%	100%	None Detected	

Client Sample ID: 05C **Lab Sample ID:** **551709299-0015**
Sample Description: Black Caulking B/W Wood, and Plastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	0%	100%	None Detected	

EMSL Canada Inc.

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http://www.EMSL.com / torontolab@emsl.com

EMSL Canada Order 551709299
Customer ID: 55GOLA62
Customer PO: 1785748
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 06A **Lab Sample ID:** 551709299-0016
Sample Description: White Eves Trough Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Brown	0%	100%	None Detected	

Client Sample ID: 06B **Lab Sample ID:** 551709299-0017
Sample Description: White Eves Trough Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Brown	0%	100%	None Detected	

Client Sample ID: 06C **Lab Sample ID:** 551709299-0018
Sample Description: White Eves Trough Caulking

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Brown	0%	100%	None Detected	

Client Sample ID: 07A-Rubber **Lab Sample ID:** 551709299-0019
Sample Description: Black Rubber Mat and Asphalt Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	0%	100%	None Detected	

Client Sample ID: 07A-Asphalt Mastic **Lab Sample ID:** 551709299-0019A
Sample Description: Black Rubber Mat and Asphalt Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	5%	95%	None Detected	

Client Sample ID: 07B-Rubber **Lab Sample ID:** 551709299-0020
Sample Description: Black Rubber Mat and Asphalt Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	0%	100%	None Detected	

Client Sample ID: 07B-Asphalt Mastic **Lab Sample ID:** 551709299-0020A
Sample Description: Black Rubber Mat and Asphalt Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	4%	96%	None Detected	

Client Sample ID: 07C-Rubber **Lab Sample ID:** 551709299-0021
Sample Description: Black Rubber Mat and Asphalt Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	0%	100%	None Detected	

EMSL Canada Inc.

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Phone/Fax: 289-997-4602 / (289) 997-4607
http://www.EMSL.com / torontolab@emsl.com

EMSL Canada Order 551709299
Customer ID: 55GOLA62
Customer PO: 1785748
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: 07C-Asphalt Mastic ***Lab Sample ID:*** **551709299-0021A**

Sample Description: Black Rubber Mat and Asphalt Mastic

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	0%	100%	None Detected	

Client Sample ID: 08A ***Lab Sample ID:*** **551709299-0022**

Sample Description: Black Roof Mat

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	70%	30%	None Detected	

Client Sample ID: 08B ***Lab Sample ID:*** **551709299-0023**

Sample Description: Black Roof Mat

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	70%	30%	None Detected	

Client Sample ID: 08C ***Lab Sample ID:*** **551709299-0024**

Sample Description: Black Roof Mat

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	8/29/2017	Black	70%	30%	None Detected	

Analyst(s):

Anne Balayboa PLM (17)
John Biesiadecki PLM (8)

Reviewed and approved by:

Matthew Davis
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 08/29/201719:47:04

APPENDIX C

Laboratory Certificate of Analysis - Lead

EMSL Canada Inc.
2756 Slough Street, Mississauga, ON L4T 1G3
Phone/Fax: 289-997-4602 / (289) 997-4607
http://www.EMSL.com torontolab@emsl.com

EMSL Canada Or	551709335
CustomerID:	55GOLA62
CustomerPO:	1771956
ProjectID:	

Attn: **Bronte Wright**
Golder Associates, Ltd.
100 Scotia Court
Whitby, ON L1N 8Y6

Phone:	(905) 723-2727
Fax:	(905) 723-2182
Received:	08/22/17 10:09 AM
Collected:	8/21/2017

Project: **1771956**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
LP-1	*551709335-0001*	8/21/2017	8/24/2017	<0.017 % wt
	Site: Light Green Paint- Trailor Insufficient sample to reach reporting limit.			
LP-2	*551709335-0002*	8/21/2017	8/24/2017	<0.0090 % wt
	Site: Olive Green Paint - Guar 2 Building			

Rowena Fanto, Lead Supervisor
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Environmental Testing Cert #2845.08

Initial report from 08/29/2017 08:47:23

APPENDIX D

Regulations, Guidelines and Standards

REGULATIONS, GUIDELINES AND STANDARDS

Occupational Health and Safety Act

The Ontario Health and Safety Act (the Act) defines and regulates designated substances that may be present within buildings. Section 30 of the *Act* requires that, prior to beginning a construction project (including building renovation or demolition) a document summarizing the presence of these materials must be available to contractors and subcontractors requesting tenders.

Asbestos-Containing Materials

Ontario Regulation 278/05 - Asbestos on Construction Projects and in Buildings and Repair Operations, as amended (O. Reg. 278/05), made under the *Act,* prescribes specific procedures for the identification of asbestos-containing materials (ACM) and protocols for their removal. Under this regulation, if ACM are suspected to be present or ought reasonably to be suspected, locations of the materials must be documented and available to contractors and subcontractors requesting tenders.

Ontario Regulation 347/90 - General Waste Management, as amended (O. Reg. 347/90), made under the *Environmental Protection Act*, prescribes requirements for general waste management including ACM. The regulation defines "asbestos waste" as “solid or liquid waste that results from the removal of asbestos-containing construction or insulation materials or the manufacture of asbestos-containing products and contains asbestos in more than a trivial amount or proportion”. Asbestos waste must be disposed of in a licensed waste facility which has been properly notified of the presence of asbestos waste.

Lead

Lead was used as a pigment and drying agent in alkyd oil-based paint. Ontario Regulation 490/09 - Designated Substances, as amended (O. Reg. 490/09) made under the *Act*, prescribes requirements relating to the control of potential exposure to lead-containing materials in the workplace, where lead is present, produced, used, handled or stored and at which the worker is likely to be exposed to lead.

If operations that will likely produce airborne lead dust or fumes (e.g. during welding, torch cutting, sanding and sand blasting) are to occur during building demolition, it is recommended that the disturbance of lead paint be carried out in accordance with procedures outlined in the Ontario Ministry of Labour (MOL) Guideline - Lead on Construction Projects dated September 2004 (updated April 2011).

The MOL currently does not include criteria for classification of lead paint, and allows for no minimum concentration of lead in paint to be acceptable as non-lead containing. Therefore in these circumstances, Golder considers all paints with any detectable presence of lead as lead-containing paint (LCP). The accepted laboratory testing methods for determination of lead in paint is either flame atomic absorption spectroscopy (FAAS) or inductively coupled plasma-atomic emission spectroscopy (ICP-AES).

Mercury

Mercury is regulated under O. Reg. 490/09. This regulation prescribes occupational exposure limits (OELs) and requirements for engineering controls, work practices and hygiene practices and facilities to protect workers who may be potentially exposed to mercury.

Silica

Silica is a naturally occurring mineral and may be found in common aggregates in concrete mortar, brick and ceiling tiles, and is likely present in the concrete and mortar used to construct the Site. The health risks associated with exposure to silica is due primarily to the inhalation of respirable crystalline silica, particularly in the form of dust associated with the abrading or cutting of silica containing materials.

Silica is regulated under O. Reg. 490/09. This regulation prescribes OELs and requirements surrounding engineering controls, work practices, and hygiene practices and facilities to protect workers who may be potentially exposed to crystalline silica (cristobalite, quartz and tripoli). As prescribed under O. Reg. 490/09, an employer shall take all reasonable precautions to prevent worker exposure to crystalline silica. Procedures for workers involved in construction activities occurring on a Site where silica is disturbed are outlined in the MOL Guideline - Silica on Construction Projects dated September 2004 (updated April 2011).

Ozone-Depleting Substances

In 1998, the federal government enacted the Ozone Depleting Substances Regulations (SOR/99-7), to amend controls on production and consumption of chlorofluorocarbons (CFC), halons, tetrachloride and methyl-chloroform. The Federal Halocarbon Regulations (SOR/2003-289), was enacted to ensure uniformity with respect to the release, recovery and recycling of ozone depleting substances (ODSs) and their halocarbon alternatives in refrigeration and air conditioning. The regulation also requires that permits be obtained to import or export used, recovered, recycled and reclaimed ODSs.

Equipment containing ODSs should be removed by a licensed contractor and handled in accordance with the Code of Practice for the Reduction of CFC Emissions from Refrigeration and Air Conditioning Systems, updated in 2008 and Ontario Regulation 463/10 - Ozone Depleting Substances and other Halocarbons (O. Reg. 463/10). ODSs are often present in refrigerators and freezers, vending machines (refrigerated) and in water fountains/water coolers and air conditioning systems.

Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) were used as a dielectric fluid in electrical equipment such as transformers, light ballasts and capacitors. The use of PCBs in fluorescent lamp ballast capacitors was common up to 1980. The Polychlorinated Biphenyls Regulation (SOR/2008-273) prohibits and restricts the use of PCBs pertaining to the manufacture, export, import, sale, and or processing of PCBs and PCB-containing products.

SOR/2008-273 prescribes requirements pertaining to the handling, storage and disposal of PCBs and PCB-containing equipment. Revisions to the federal regulation have provided end-of-use deadlines for liquids containing PCBs, as well as PCBs in specified equipment. The first such deadline was December 31, 2009, by which time all equipment containing PCBs at concentrations greater than 500 mg/kg, and equipment within 100 metres of specified sensitive locations and containing PCBs at concentrations greater than 50 mg/kg, must have been phased out of use. These deadlines exclude PCB-containing light ballasts, and pole-mounted transformers.

The presence of PCB in paints was determined by collecting bulk samples and submitting for laboratory analysis. Samples found to contain PCB in concentrations of 50 ug/g or greater are considered PCB-containing.

Mould

There is no specific regulation in Ontario addressing mould contamination. However, according to Health Canada and the Environmental Abatement Council of Ontario (EACO) guidelines on assessment and remediation of fungi in indoor environments, building materials supporting mould growth should be remediated as rapidly as possible in order to ensure a healthy environment. Remediation of mould growth is based on an approximation of the extent of visible mould growth including the estimated extent of any hidden mould growth. The EACO guideline describes three levels of work practice; Small- Level 1, Medium- Level 2 and Large- Level 3. The thresholds between Small and Medium (1 m^2 or 10 sq. ft.) and between Medium and Large project areas (10 m^2 or 100 sq. ft.) are guidelines only and are subject to professional judgment. Repair of the defects that led to water accumulation should be conducted in conjunction with or prior to the remediation.

The basic principles of proper water damage restoration practice and mould remediation procedures to be followed, and the precautions to be observed, are described in the Standards for Professional Water Damage Restoration S500-2006 and Reference Guide for Professional Mould Remediation Restoration S520-2008, issued by Institute of Inspection, Cleaning and Restoration Certification (IICRC).

Other Hazardous Materials

Other hazardous materials include acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride. None of these substances were expected to be present as significant constituents of the building materials and architectural finishes and, as such, no specific observations or sampling of materials potentially containing these substances was included as part of this survey and will not be discussed further in this document.

APPENDIX E

Methodology

METHODOLOGY

The Site was assessed for suspected asbestos-containing materials (ACM), lead-containing paint (LCP), mercury in thermostats and pressure sensing devices, ozone depleting substances (ODSs) in items or systems such as refrigerators and air conditioning units, polychlorinated biphenyl's (PCBs) in fluorescent light ballasts and painted surfaces, and mould contaminated building materials. Silica will be present in common aggregates, concrete, mortar and brick, as outlined below.

Asbestos-Containing Materials

Readily available information was gathered regarding the building including age, type of structure, presence of renovated areas or additions, and any details regarding the building mechanical systems. The building systems reviewed as part of this investigation included mechanical systems, structural components, and architectural finishes and materials.

The areas surveyed were visually assessed on an area-by-area basis in order to identify the locations of confirmed and potential ACM. Bulk samples were collected of materials suspected of containing asbestos for confirmation purposes.

Homogeneous materials sampling was utilized during the course of the investigation. The bulk material sampling was completed on homogeneous materials that are uniform in colour, texture, and installation or construction date. As per "Table 1" of Ontario Regulation 278/05 - Asbestos on Construction Projects and in Buildings and Repair Operations, as amended (O. Reg. 278/05), a minimum of three samples per homogeneous material were collected and submitted for analysis.

Representative samples of suspected ACM were submitted to EMSL Canada Inc. (EMSL) of Mississauga, Ontario for analysis to determine asbestos type and percentage content, in accordance with U.S. Environmental Protection Agency (USEPA) Method EPA/600/R-93/116, as prescribed under O. Reg. 278/05.

Lead

Systematic sampling and visual identification of suspected lead-containing paint (LCP) were completed as part of the survey. Samples of suspected LCP were collected and submitted to EMSL for analysis in accordance with the American Society for Testing and Materials (ASTM) Method D3335-85A. This method is derived from the USEPA SW 846 Method 3050B where each sample is digested, diluted and analyzed by flame atomic absorption spectroscopy (FAAS).

An inventory was made of the other known or suspected lead-containing materials (i.e. batteries for emergency lights) based on visual observations, where observed.

Mercury

A review of potential mercury-containing equipment installed at the Site was completed as part of the survey, such that any mercury-containing switches, thermostats (switch bulbs) and pressure-sensing devices were noted, if observed. Elemental mercury may be present in thermostats and trace amounts of mercury vapour may be present in metal halide light bulbs and fluorescent light tubes.

Silica

Silica is a naturally-occurring mineral and may be found in common aggregates, concrete, mortar and brick. The health risk associated from exposure to silica is primarily due to the inhalation of respirable crystalline silica, particularly in the form of dust associated with the abrading or cutting of silica-containing materials. No silica sampling was conducted during the Site visit.

Ozone-depleting Substances

A review of thermostats, refrigeration and air conditioning units was completed to verify the presence of ODSs such as refrigerants R-11, R-12 and R-22. The presence of refrigerants was determined by gathering an inventory of all observed air conditioner and refrigerator units.

Polychlorinated Biphenyls

The Site was visually assessed for the presence of PCBs in fluorescent light ballasts only. Representative samples of suspected PCBs were submitted to Maxxam Analytics (Maxxam) of Mississauga, Ontario for analysis to determine PCB content in accordance with U.S. Environmental Protection Agency (EPA) Method EPA 8082.

Mould

The visual assessment included a review of readily accessible areas at the Site, which included floors, walls, and ceilings for evidence for obvious or suspect mould growth on building materials.

As a global, employee-owned organisation with over 50 years of experience, Golder Associates is driven by our purpose to engineer earth's development while preserving earth's integrity. We deliver solutions that help our clients achieve their sustainable development goals by providing a wide range of independent consulting, design and construction services in our specialist areas of earth, environment and energy.

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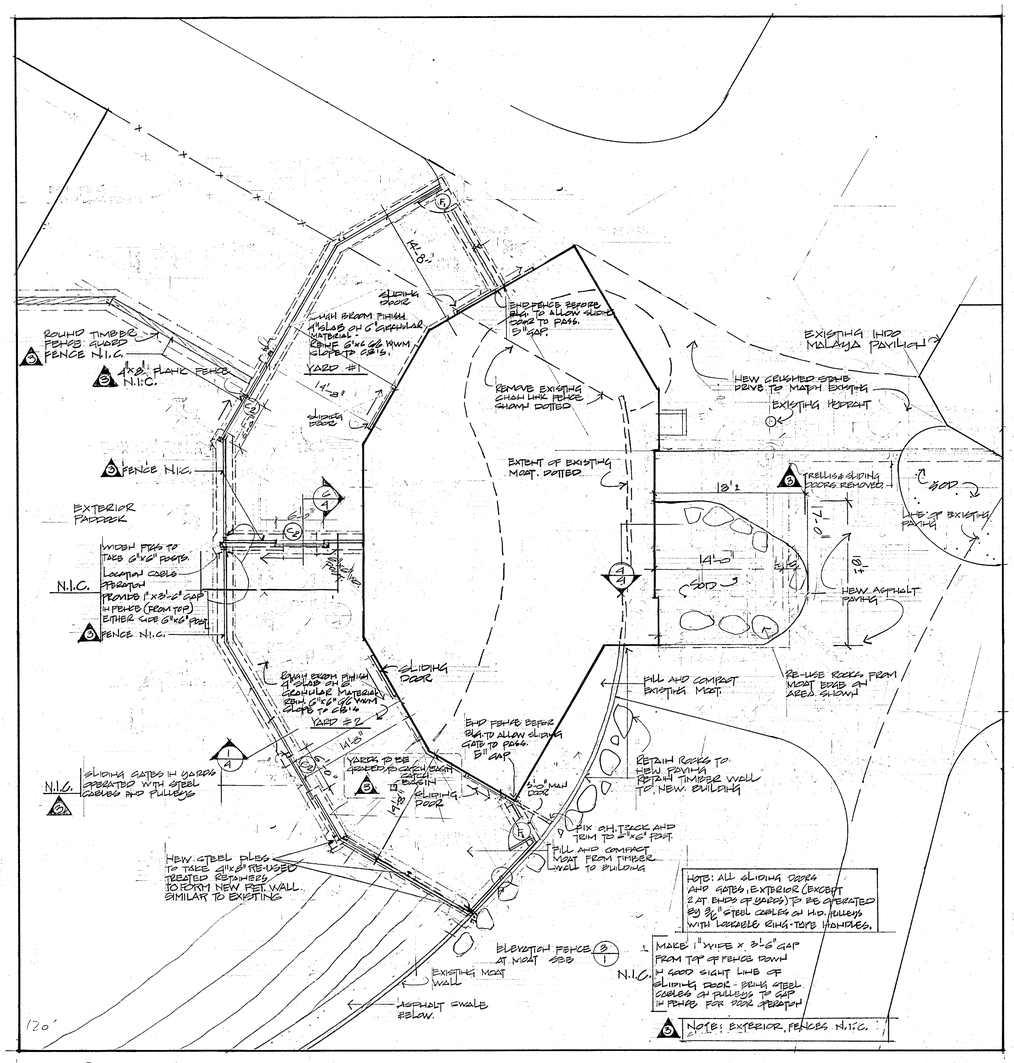
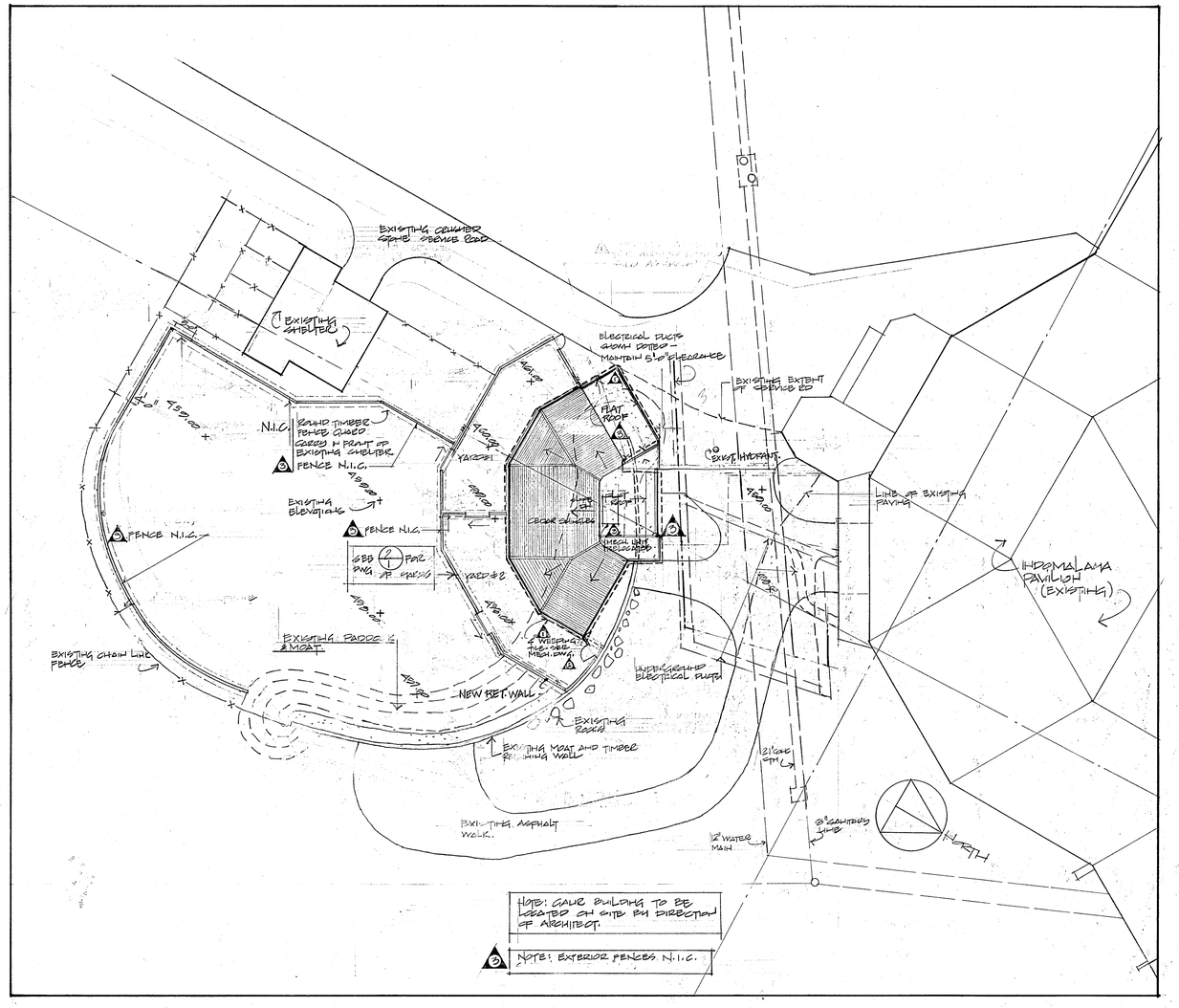
Golder Associates

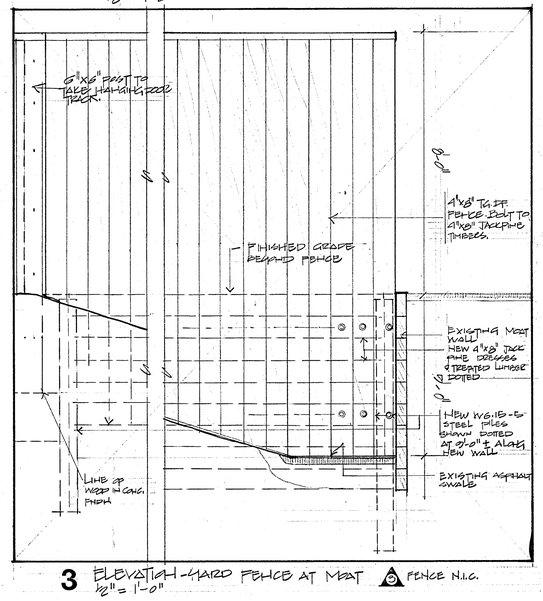
17'-4"



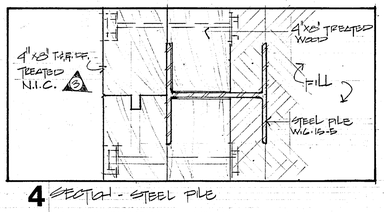
2 EXTERIOR WORK PLAN
3/8"=1'-0"



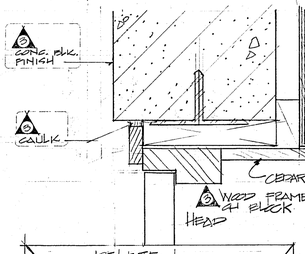
1 SITE PLAN 1/16"=1'-0"

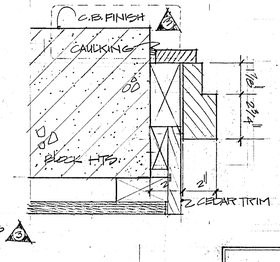


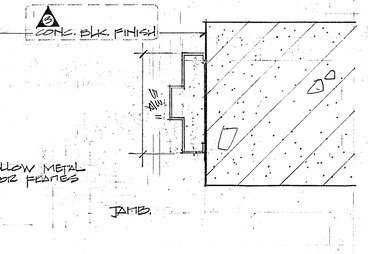
3 ELEVATION - YARD FENCE AT MOAT FENCE N.I.C.
1/2"=1'-0"

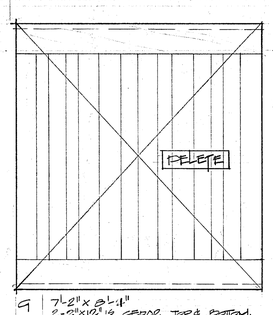


4 SECTION - STEEL PILE

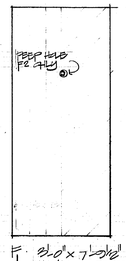




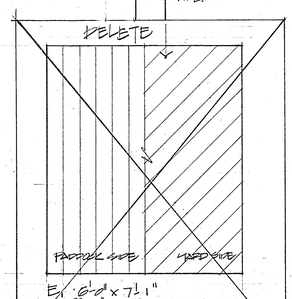




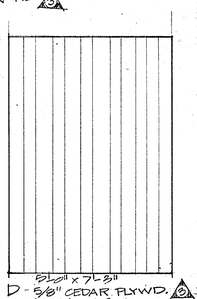
G 7'-2" x 8'-1"
2-2"x10" 1/4 CEDAR TOP & BOTTOM. 1" RANDOM VERT. CEDAR SIDING SLIDING GATES REMOVED



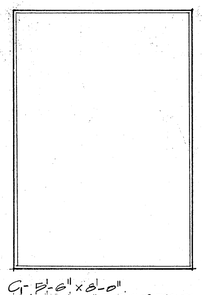
F 3'-0" x 7'-0 1/2"
MAN GATE 2 LAYERS 3/8" EXTERIOR GRADE PLYWOOD 16GA. SHEET METAL COVER - STEEL CHANNEL FRAME
F2 3'-0" x 6'-6" WITH PEEP HOLE - APARTMENT DOOR TYPE



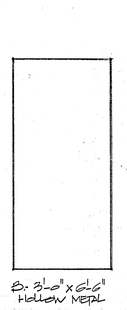
E 6'-0" x 7'-1"
2"x6" T&G PP PADDOCK SIDE
2"x6" T&G PP FINISHED YARD SIDE



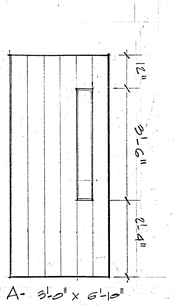
D 5'-3" x 7'-3"
5/8" CEDAR PLYWD. SIDING ON 3/4" PLY CEDAR BATH BANDS.



G 3'-6" x 8'-0"
2-LAYERS 3/4" EXTERIOR GRADE PLYWOOD. 16GA. SHEET METAL COVER. STEEL CHANNEL FRAME
C2 6'-0" x 7'-1"
C3 5'-8" x 8'-0"



B 3'-0" x 6'-6"
HOLLOW METAL



A 3'-0" x 6'-6"

HOTES:
- THE CONTRACTOR SHALL VERIFY ALL JOB AND DRAWING DIMENSIONS
- DO HOT SCALE DRAWINGS
- (12) INDICATES DETAIL HO.
  (2) INDICATES DRAWING HO.

REVISIONS
MAY 7 78
1. ADDENDUM #1
- EXTENT MECHANICAL SCREEN - 4" WEEPING TILE NOTED ON SITE PLAN
2. YARD REVISED TO MATCH 3/8" SCALE PLAN.

REVISIONS
MAR 7H 22, 79
3. - REMOVAL OF TRELLIS & SLIDING GATES.
- MECH. UNIT RELOCATED
- PADDOCK FENCES NOTED N.I.C.
- CAULKING & DOOR FRAMES
- CONC. BLK. FINISH @ WALLS AT ROOMS
- YARDS TO BE GRADED TO CATCH BASIN
- 5/8" FIRMO. INT. FINISH WHERE NOTED.

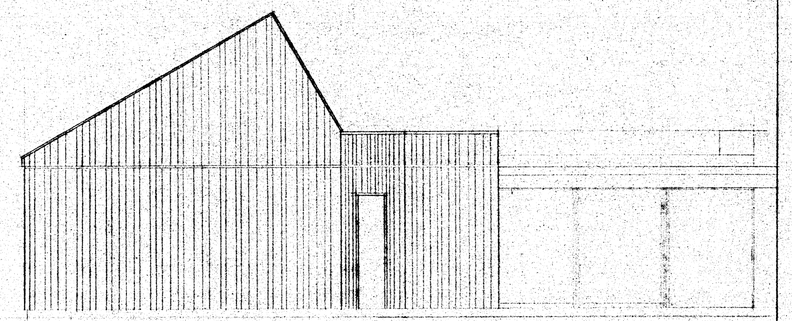
clifford lawrie bolton ritchie architects
153 st. clair avenue west, toronto

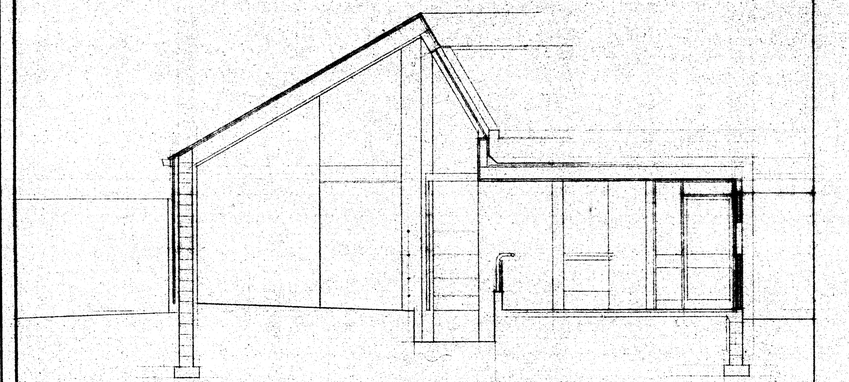
CLAIR EXHIBIT & SHELTER - SITE PLAN & DETAILS

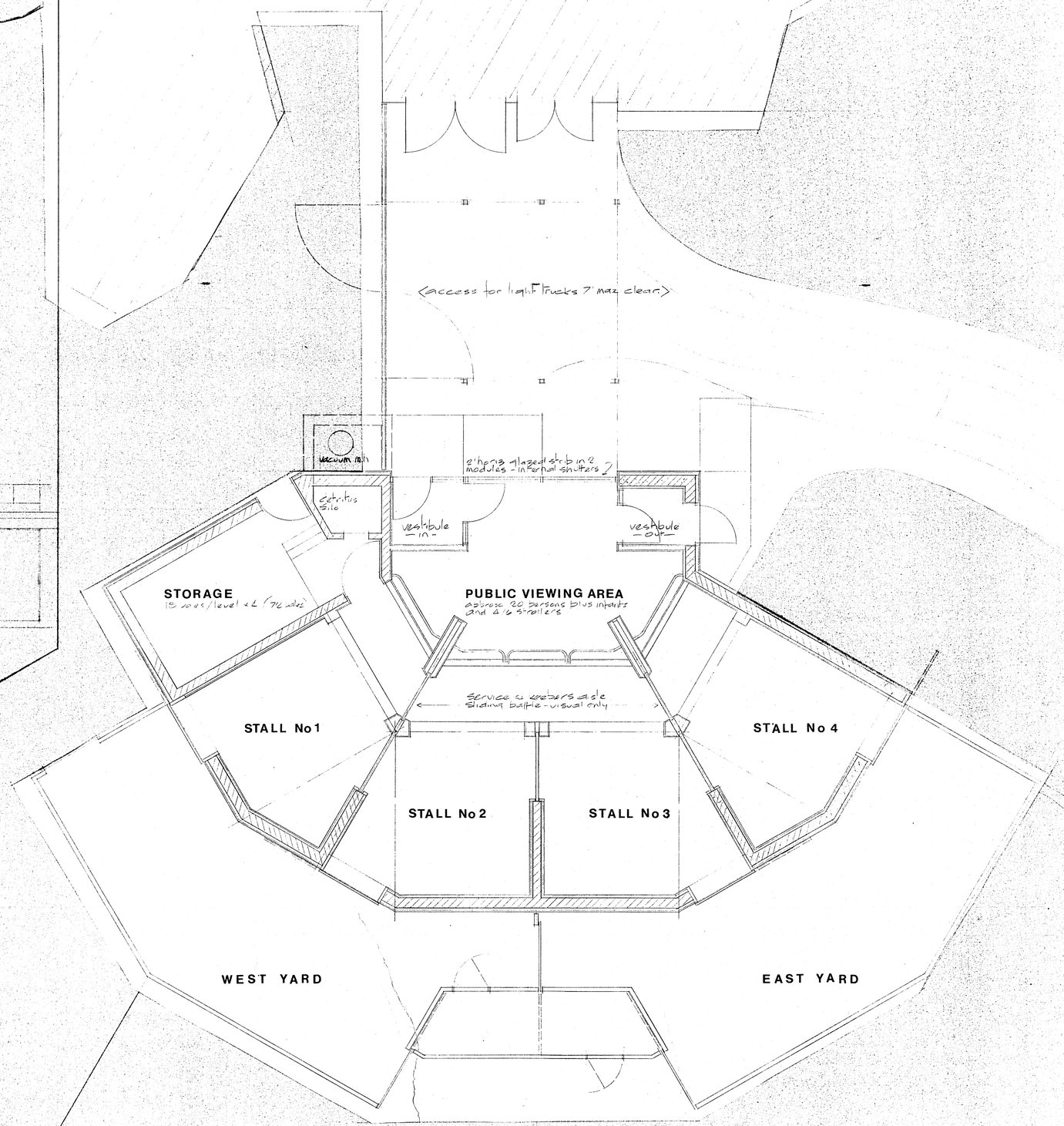
scale	drawn
AS SHOWN	H.
date	checked
OCT. 1978	

project no.

drawing no. 1







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clifford lawrie
craig & boake

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lawrie
bolton
ritchie
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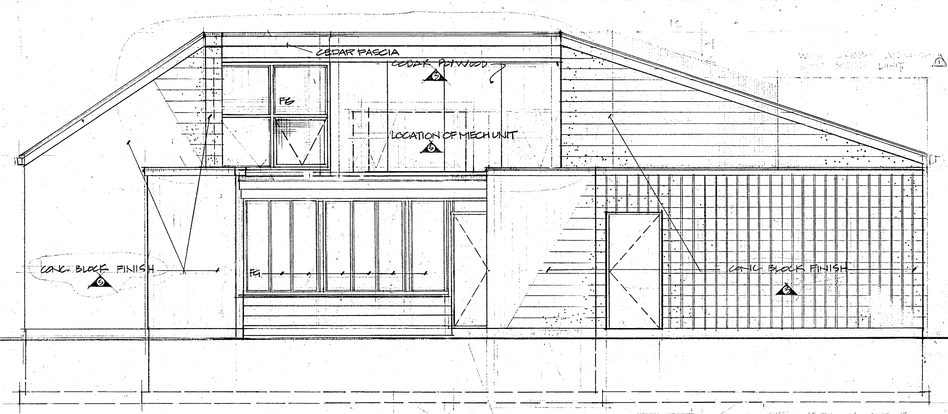
TORONTO
ZOO

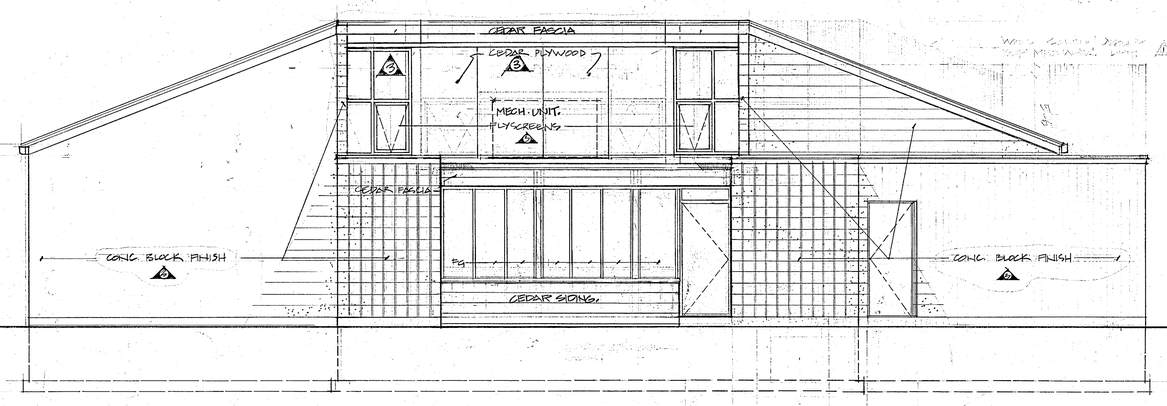
gaur exhibit
& shelter

scale 1/4" = 1'0" drawn WM
date September 1978 checked -

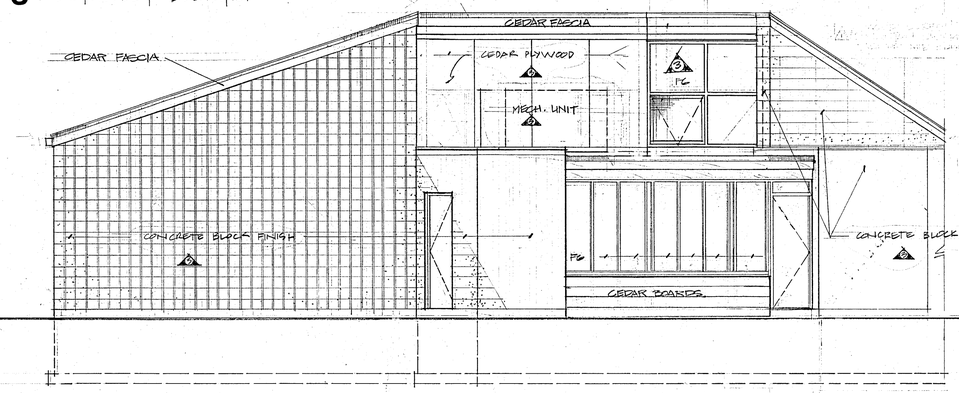
project no.
drawing no. A1 p



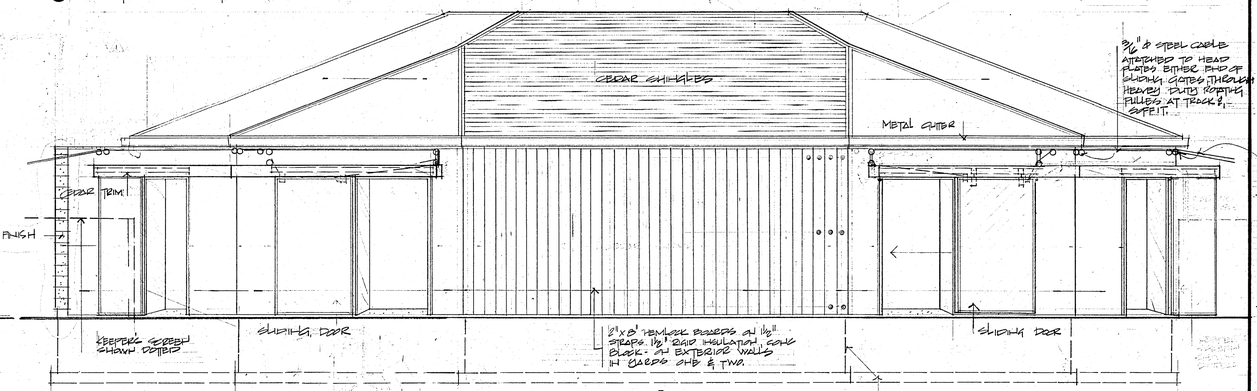
5 NORTHWEST ELEVATION



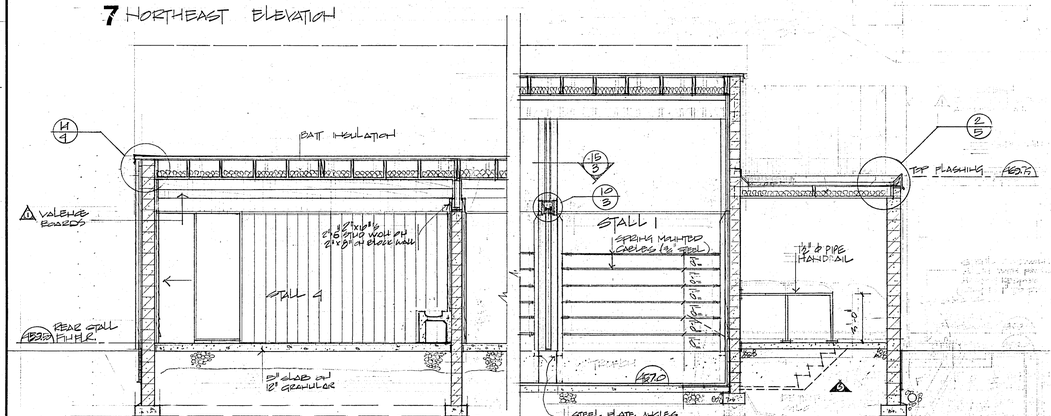
6 NORTH ELEVATION



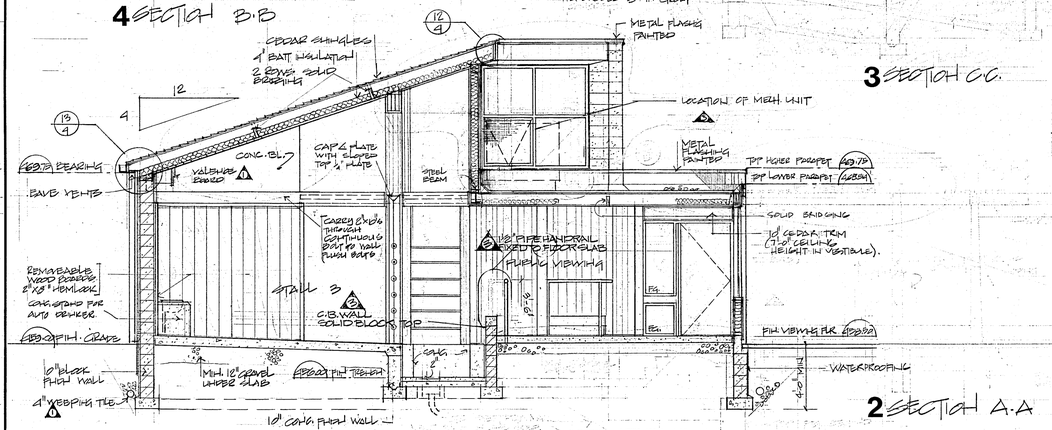
7 NORTHEAST ELEVATION



8 SOUTH ELEVATION

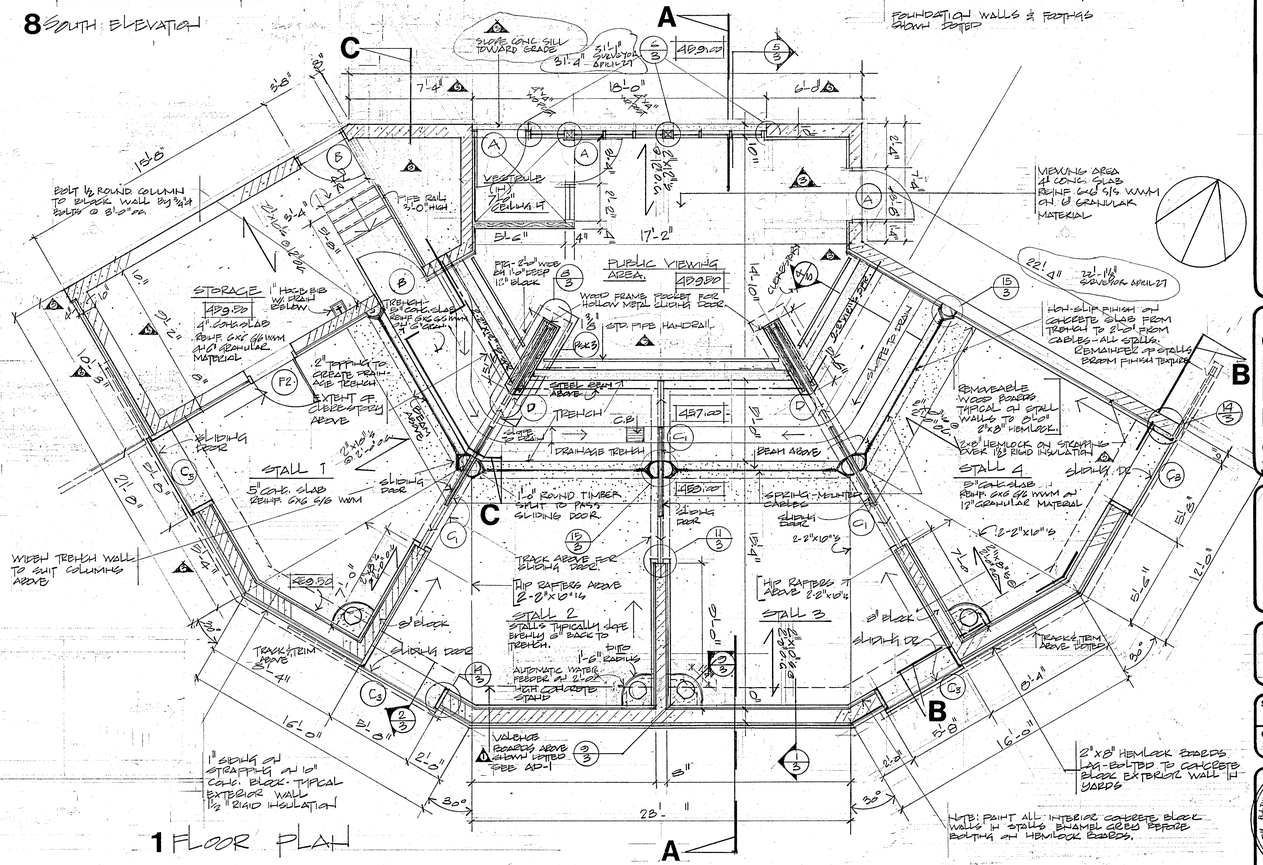


4 SECTION B-B



3 SECTION C-C

2 SECTION A-A



1 FLOOR PLAN

REVISIONS

1 REV. 7-78
ADDENDUM #1
- EXTENT WOOD SCREEN REVISED
- 4" WEEPING TILES SHOWN ON SECTION
- VALANCE BOARDS SHOWN AS PER AD-1.

2 MARCH 23 | 79
- CONC. BLOCK FINISH SHOWN ON ELEVATIONS - EXTERIOR
- LOCATION OF MECH. UNIT CHANGED ON ELEVATIONS & SECTIONS
- CLERESTORY WINDOWS REDUCED
- DETRITUS SILO REMOVED
- CEDAR PLYWOOD FINISH AS SHOWN ON ELEVATIONS
- BLOCK DIMENSIONS ALTERED ON PLAN
- EXTERIOR TRELLIS DELETED
- BULKHEAD OVER CLERESTORY DELETED
- HANDRAIL & SPANDREL WALL IN PUBLIC AREA SIMPLIFIED
- INTERIOR PAVING DELETED
- VESTIBULE DELETED
- EXPOSED CONC. BLOCK ABOVE 5'-0" IN ANIMAL AREAS

¾" ø STEEL CABLE ATTACHED TO HEAD PLATE EITHER END OF SLIDING GATES THROUGH HEAVY DUTY ROLLER PULLEYS AT TRACK & SUPPLY.

SHS SET PULLEYS TO OPEN
SHS SET TO CLOSE
- STAGGER POSITION OF PULLEYS AND CLOSED PULLEYS TO AVOID FAILING.

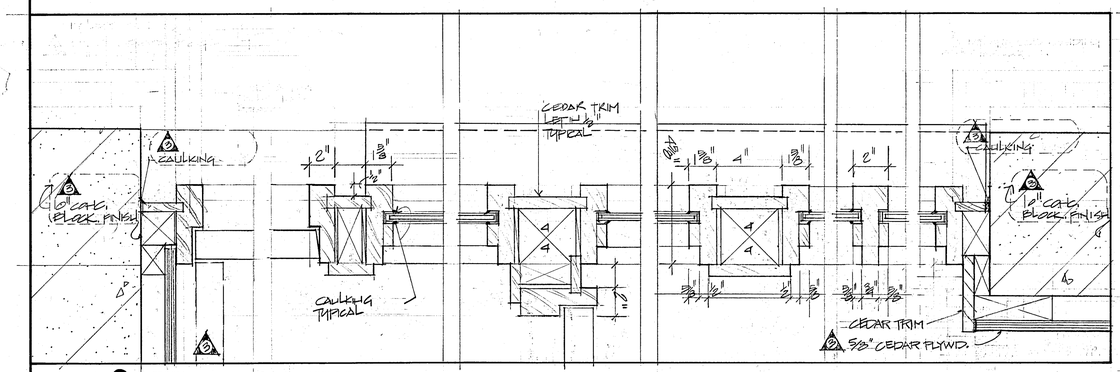
NOTE: MOUNT SLIDING DOOR TRACK 3" HIGHER AT OPEN POSITION END - MOUNT DOOR ON WHEELS SO THAT DOOR HANGS FORWARD TO GROUND, NOT TRACK.

clifford lawrie bolton ritchie architects
153 st. clair avenue west, toronto

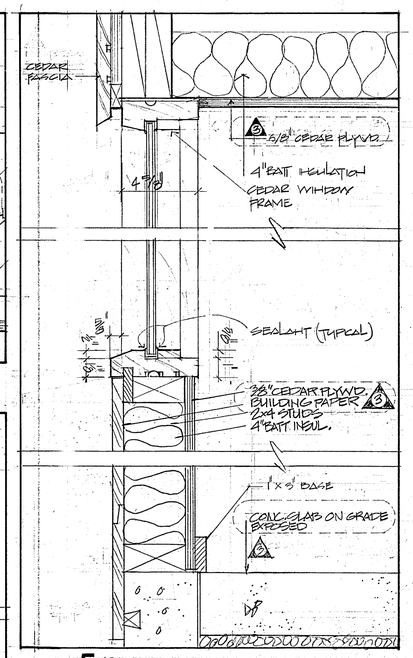
GAUR EXHIBIT & SHELTER - PLAN SECTIONS - ELEVATIONS

scale 1/4" = 1'-0" | drawn H WM.
date OCT. 1978 | checked

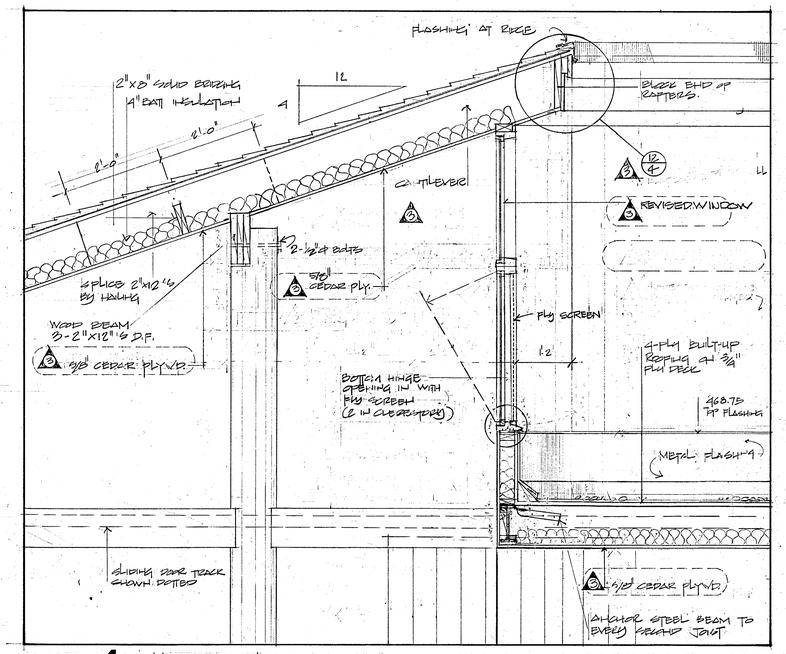
project no.
drawing no. 2



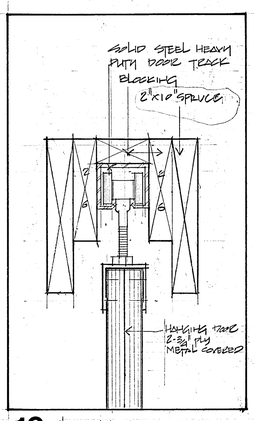
6 WINDOW & DOOR FRAMES
3"=1'-0"



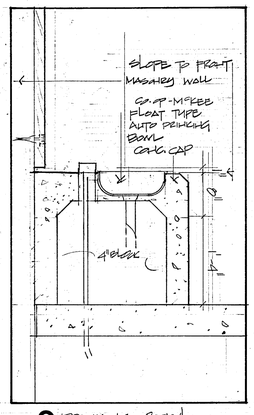
5 PUBLIC AREA WINDOW
3"=1'-0"



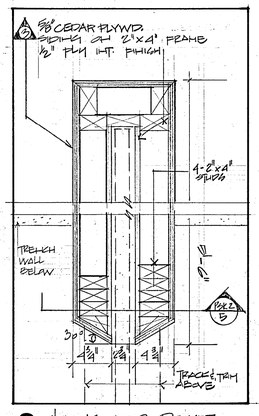
4 WALL SECTION @ CLERESTORY
3/4"=1'-0"



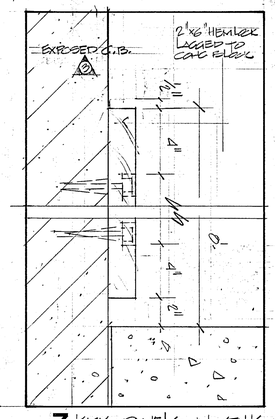
10 SLIDING DOOR TRACK (HEAVY DUTY)
3"=1'-0"



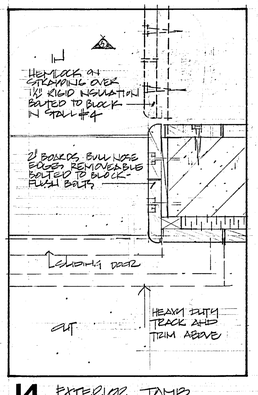
9 DRINKING BOWL
1"=1'-0"



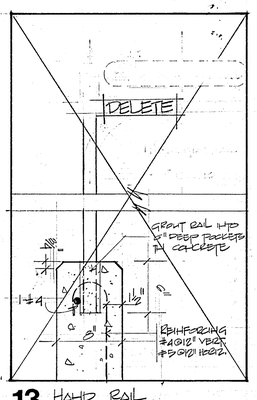
8 SLIDING DOOR POCKET FOR LIGHT DOOR
1/2"=1'-0"



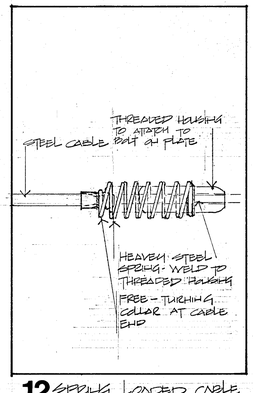
7 KICK PANELS IN STALLS
3/4"=1'-0"



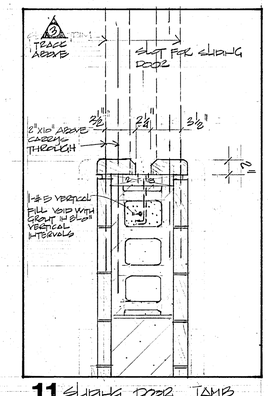
14 EXTERIOR JAMB
1 1/2"=1'-0"



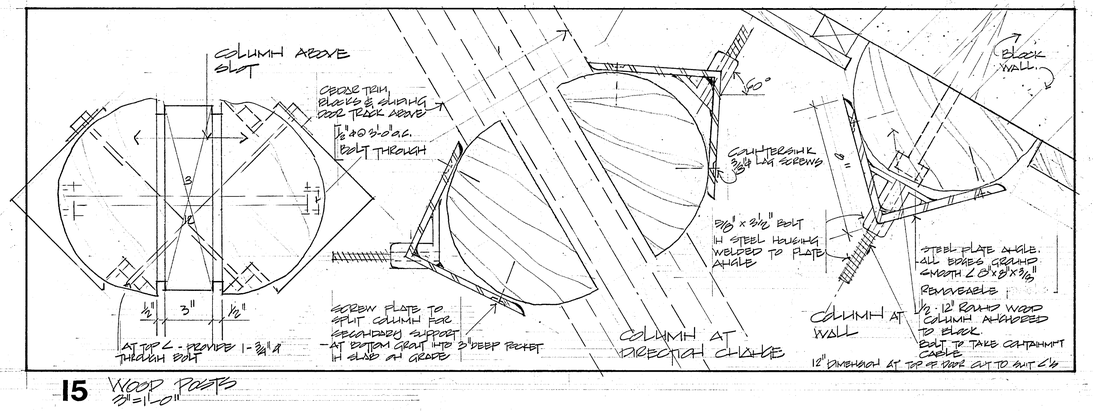
13 HAND RAIL
1 1/2"=1'-0"



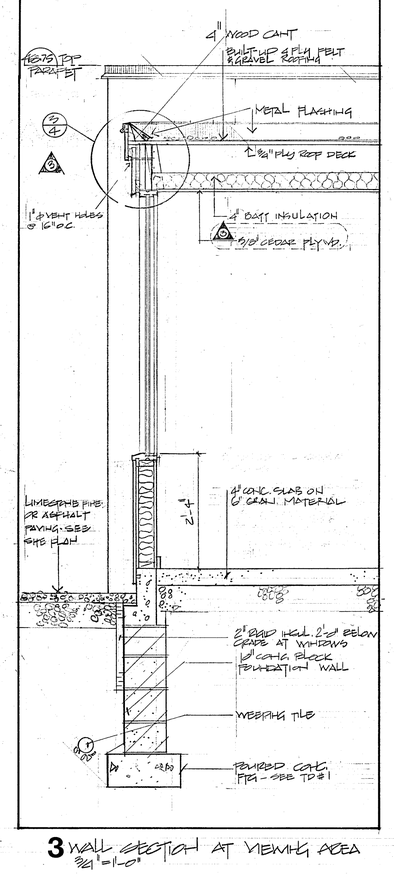
12 SPRING LOADED CABLE
3"=1'-0"



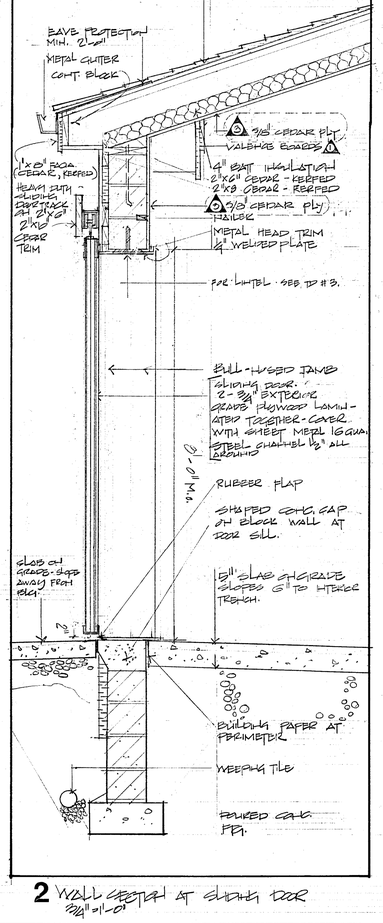
11 SLIDING DOOR JAMB
1 1/2"=1'-0"



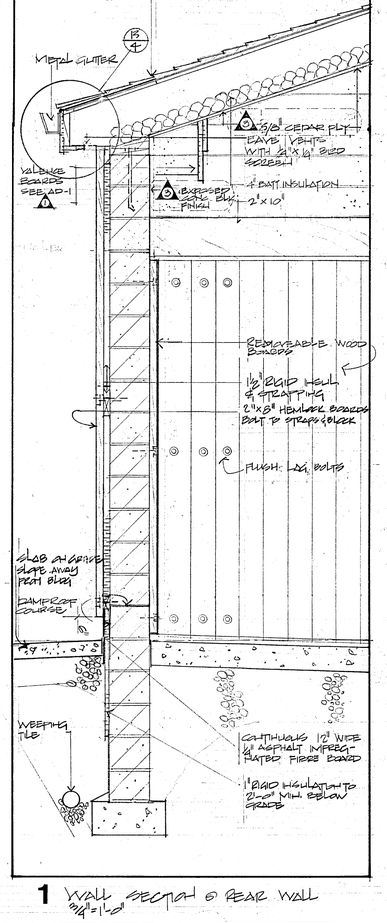
15 WOOD POSTS
3"=1'-0"



3 WALL SECTION AT VIEWING AREA
3/4"=1'-0"



2 WALL SECTION AT SLIDING DOOR
3/4"=1'-0"



1 WALL SECTION @ REAR WALL
3/4"=1'-0"

Revisions

Nov. 7. 73
1. ADDED ELEM #1
- VALENCE BOARDS SHOWN SEE AD-1
- AWNING WINDOW TOP HINGE.
MARCH 22. 74
2. - REVISED CLERESTORY WINDOW
- 5/8 CEDAR PLY @ CEILING
- 5/8 CEDAR PLY @ CLEERSTORY WALL
- EXPOSED CONC. BLK. FINISH ABOVE 2'x 10' @ ANIMAL ENCLOSURE.
- CONC. BLK FINISH @ EXTERIOR WALLS.
- 5/8 CEDAR PLY INTERIOR FINISH
- REVISED FASCIA
- STANDARD TYPE HANDRAIL AT VIEWING AREA
- ELIM. BULKHEAD OVER WINDOWS
- ELIM. EXTERIOR TRELLIS
- DELETE INTERIOR PAVING
- DELETE ONE VESTIBULE
- 2-1/2 CEDAR TERM CHANGED TO 2'-10" SPRUCE

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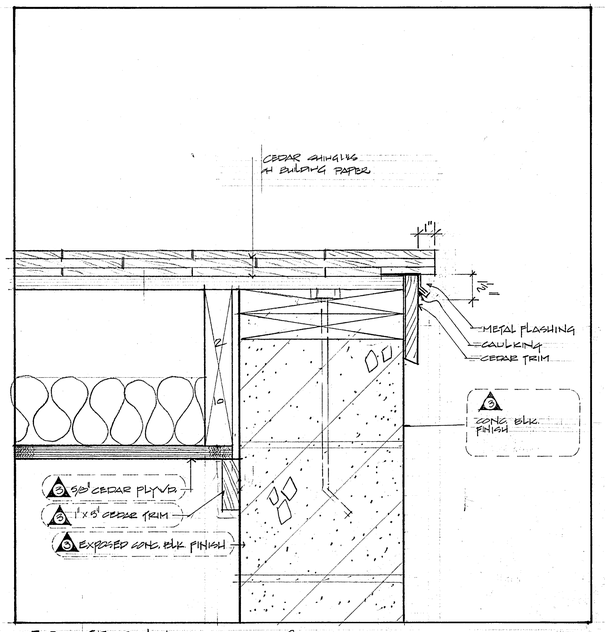
153 st. clair avenue west, toronto

GAUR EXHIBIT AND SHELTER DETAILS

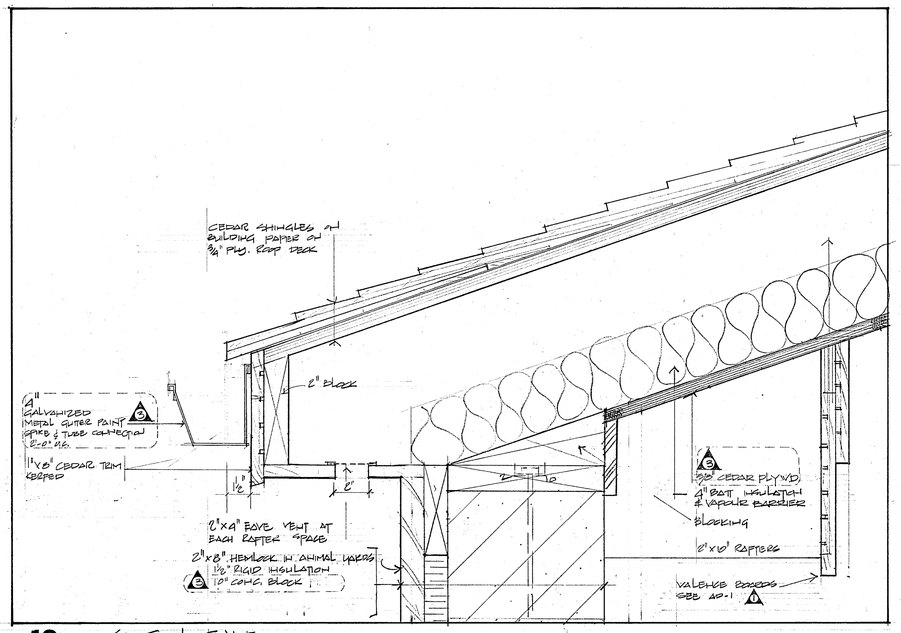
scale	drawn
AS SHOWN	I.T.
date	checked
OCT. 73	

project no.

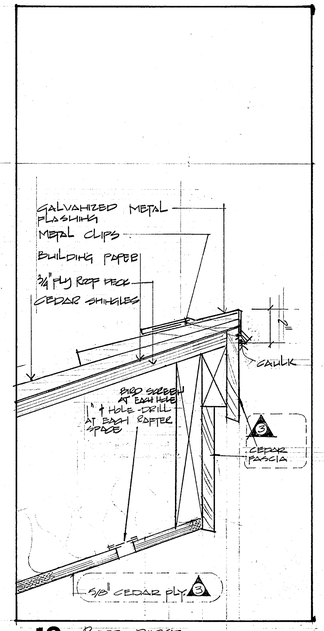
drawing no. 3



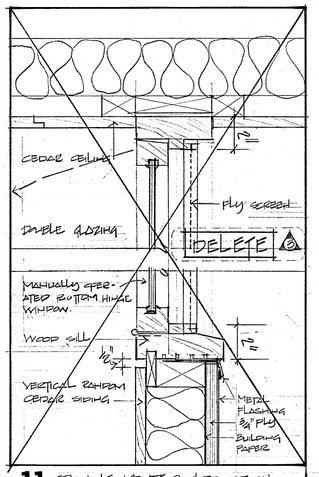
14 SECTION - EAVE PITCHED ROOF
3" = 1'-0"



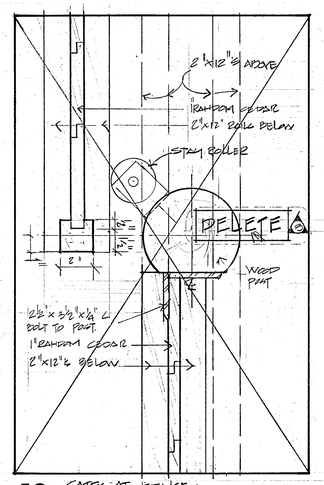
13 SECTION - EAVE
3" = 1'-0"



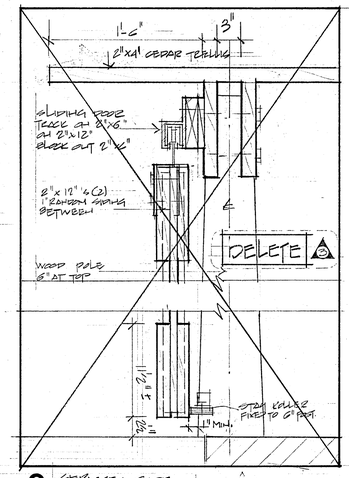
12 ROOF RIDGE
3" = 1'-0"



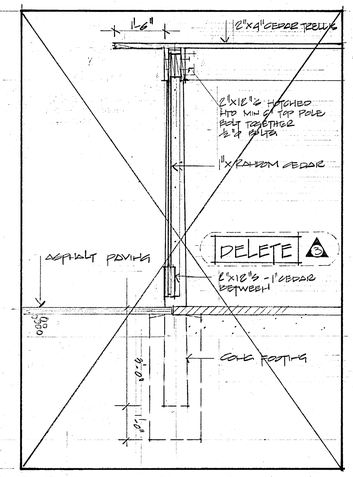
11 OPENING VENTS @ CLERESTORY.
3" = 1'-0"



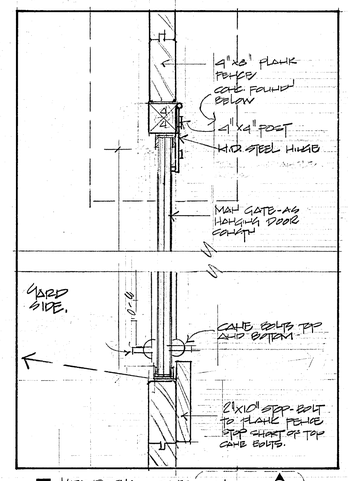
10 GATE AT FENCE
3" = 1'-0"



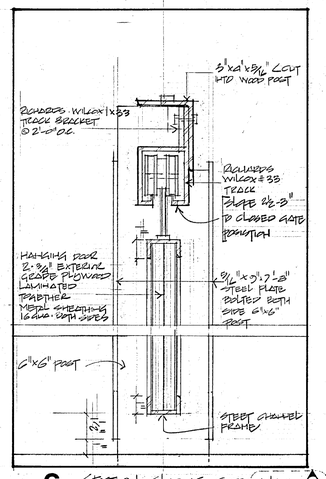
9 SERVICE GATE
1/2" = 1'-0"



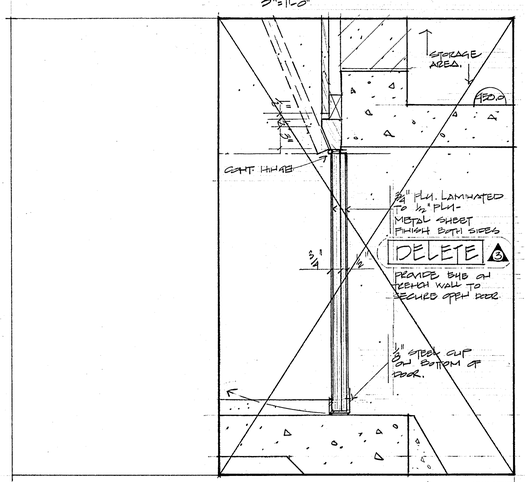
8 FENCE AT SERVICE AREA
1/2" = 1'-0"



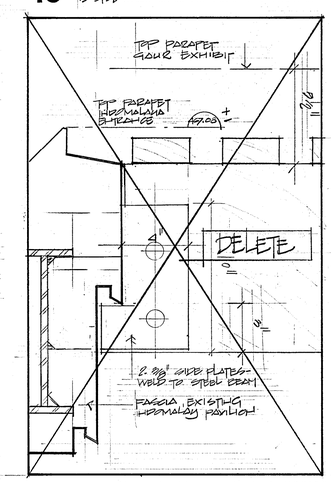
7 KEEPER'S GATE N.I.C.
1/2" = 1'-0"



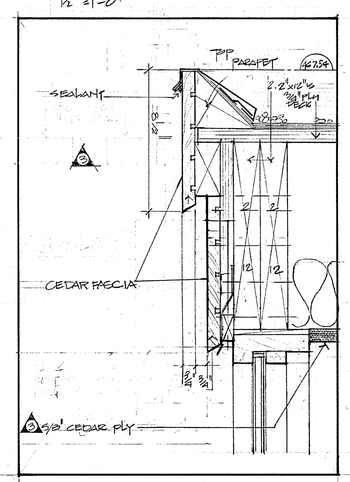
6 SECTION SLIDING GATE N.I.C.
3" = 1'-0"



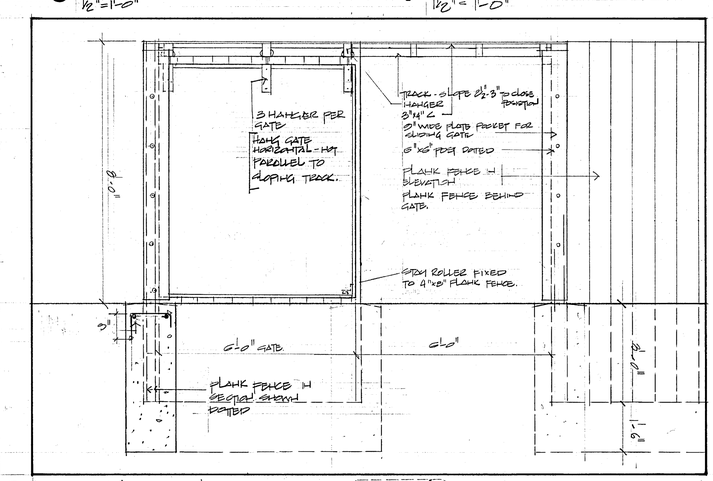
5 TRENCH DOOR TO SILO
1/2" = 1'-0"



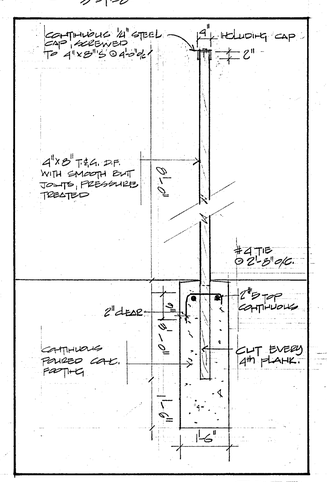
4 TRELLIS AT HEMMALAYA PAVILION
3" = 1'-0"



3 SECTION AT FASCIA
3" = 1'-0"



2 ELEVATION - SLIDING GATE N.I.C.
1/2" = 1'-0"



1 TIMBER FENCE N.I.C.
1/2" = 1'-0"

REVISIONS

1 MAY 7, 1979
ADDENDUM NO. 1.
- VALANCE BOARDS SHOWN SEE A9-1.

MARCH 21/79
2 5/8" CEDAR PLYWD @ CEILING.
- EXPOSED CONC. BLK. FINISH ABOVE 8'-0" @ INTERIOR STALL WALLS
- 4" GALV. METAL GUTTER PAINTED
- EXTERIOR FENCES & GATES N.I.C.
- REVISE FASCIA AT CLERESTORY (BULKHEAD ELIMINATED)
- EXTERIOR SIDING DELETED, C.B FINISH
- INTERIOR FINISH & CEILING TO 5/8" PLYWD. WHERE SHOWN
- EXTERIOR TRELLIS DELETED

clifford lawrie bolton ritchie architects
153 st. clair avenue west, toronto

for Union
Clifford Lawrie
Bolton Ritchie
Architects for the
Metropolitan Toronto Zo

GALT EXHIBIT & SHELTER DETAILS

scale	drawn
AS SHOWN	LT.
date	checked
SEPT. 1978	

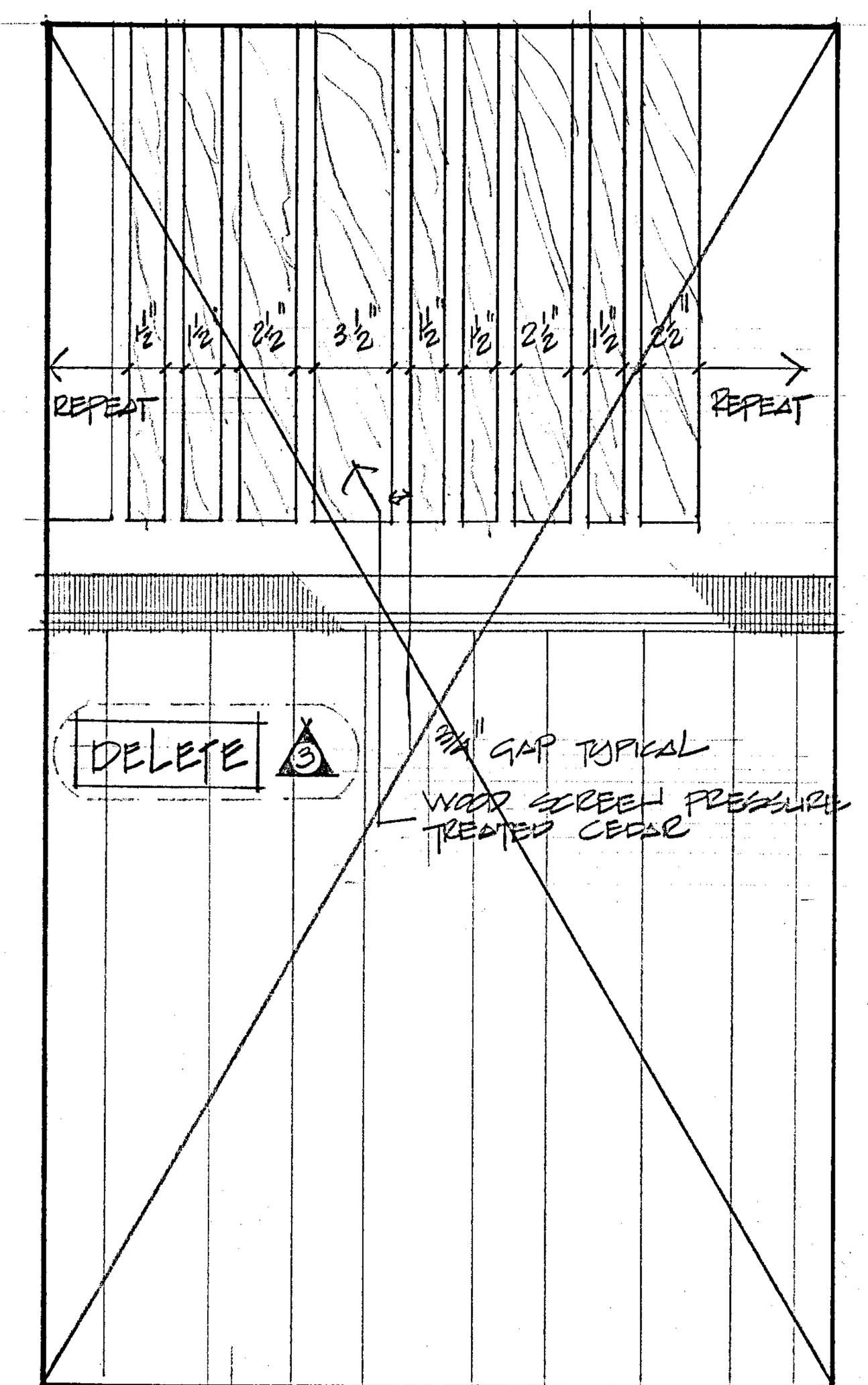
project no.

drawing no. 4

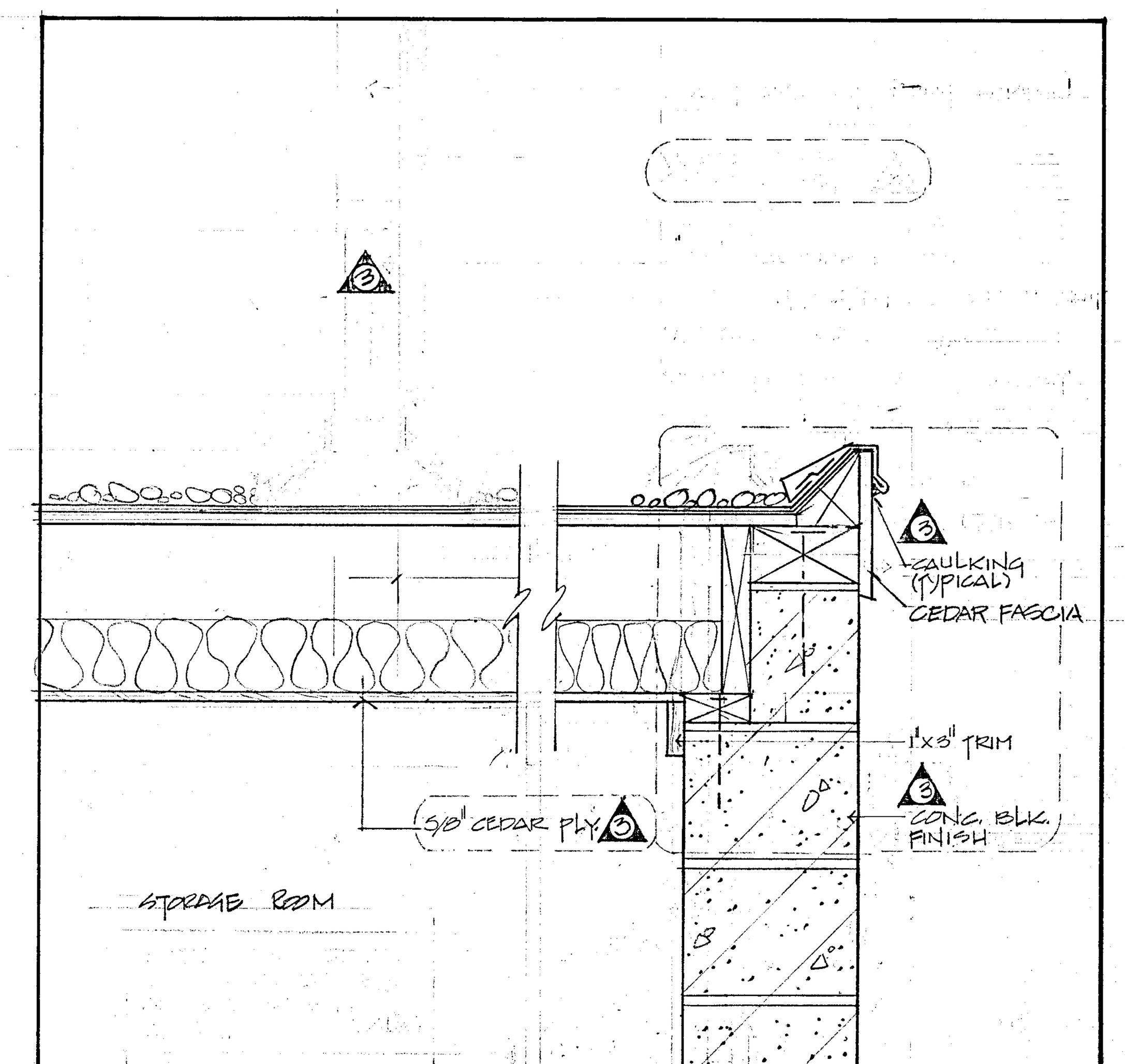
REVISIONS

NOV. 7.78
(1) ADDENDUM # 1

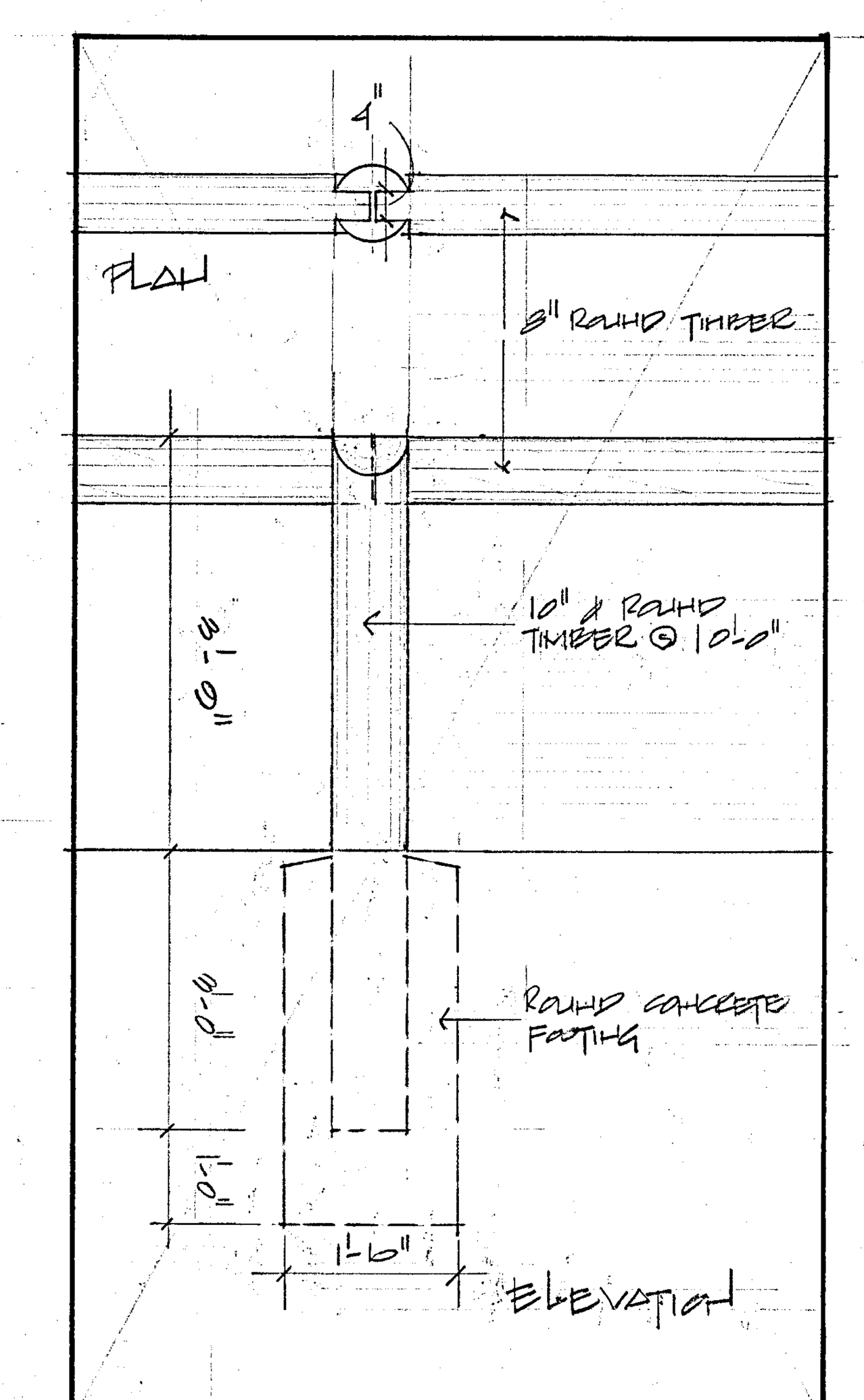
MARCH 21/79
(3) – EXTERIOR FENCE N.I.C.
– DELETE WD. SCREEN ON ROOF
– CONC. BLK. FINISH @ EXTERIOR WALL
– 5/8" CEDAR PLY @ CEILING



3 ELEVATION - ROOF SCREEN.
1/2" = 1'-0"



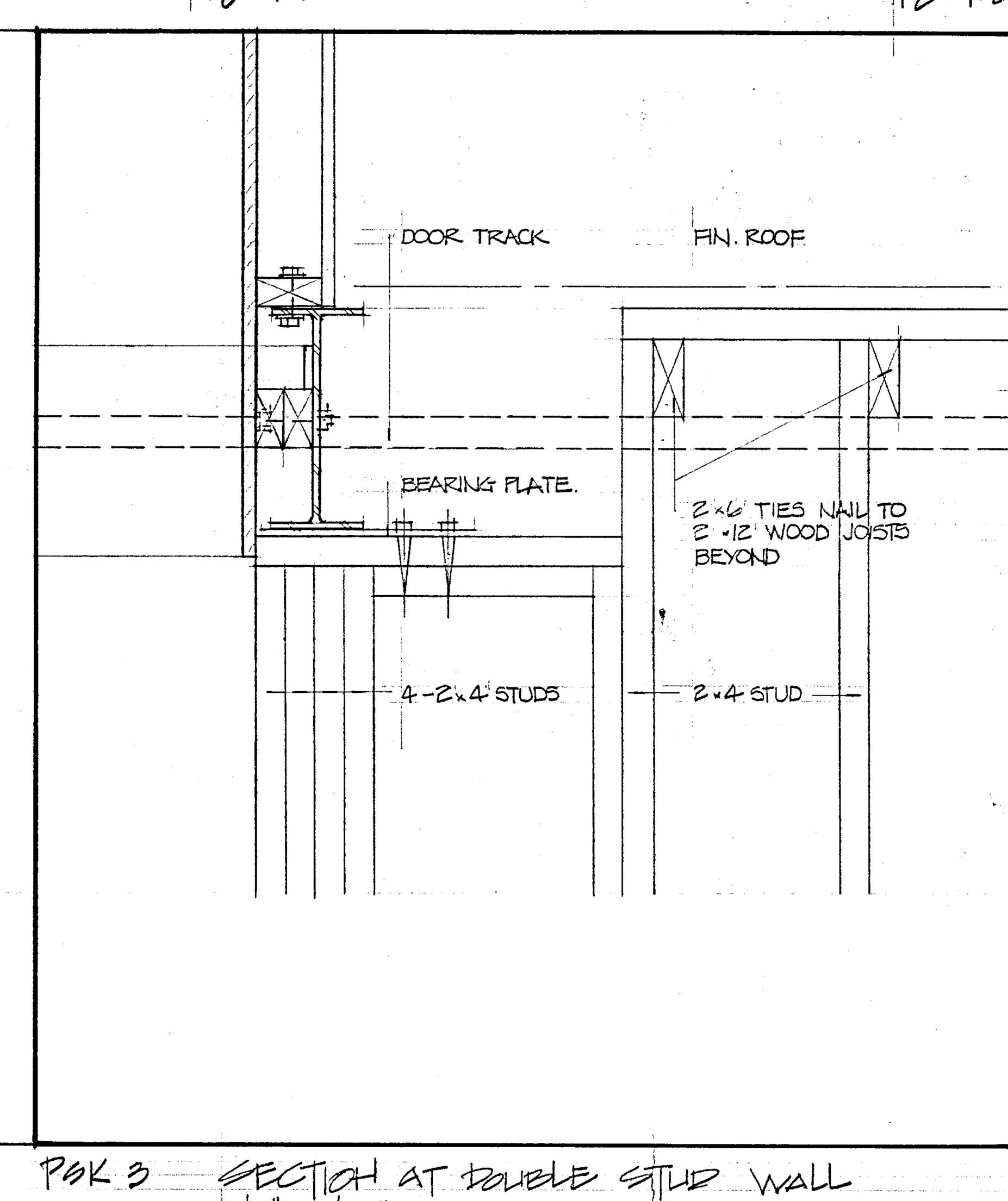
2 SECTION - FLAT ROOF OVER STORAGE RM. (3)
1/2" = 1'-0"



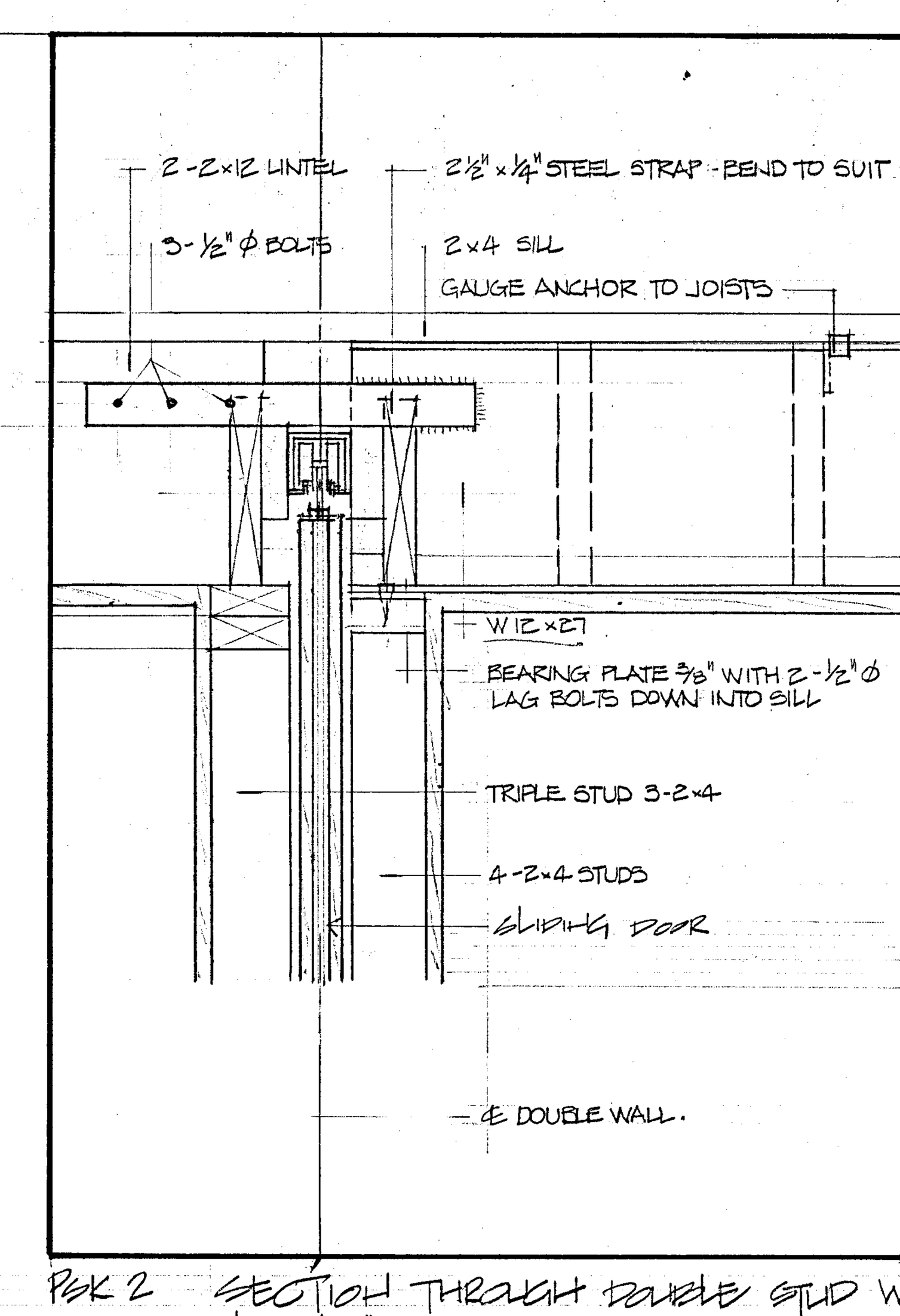
1 FENCE CLOSED N.I.C. (3)
1/2" = 1'-0"

STRUCTURAL NOTES

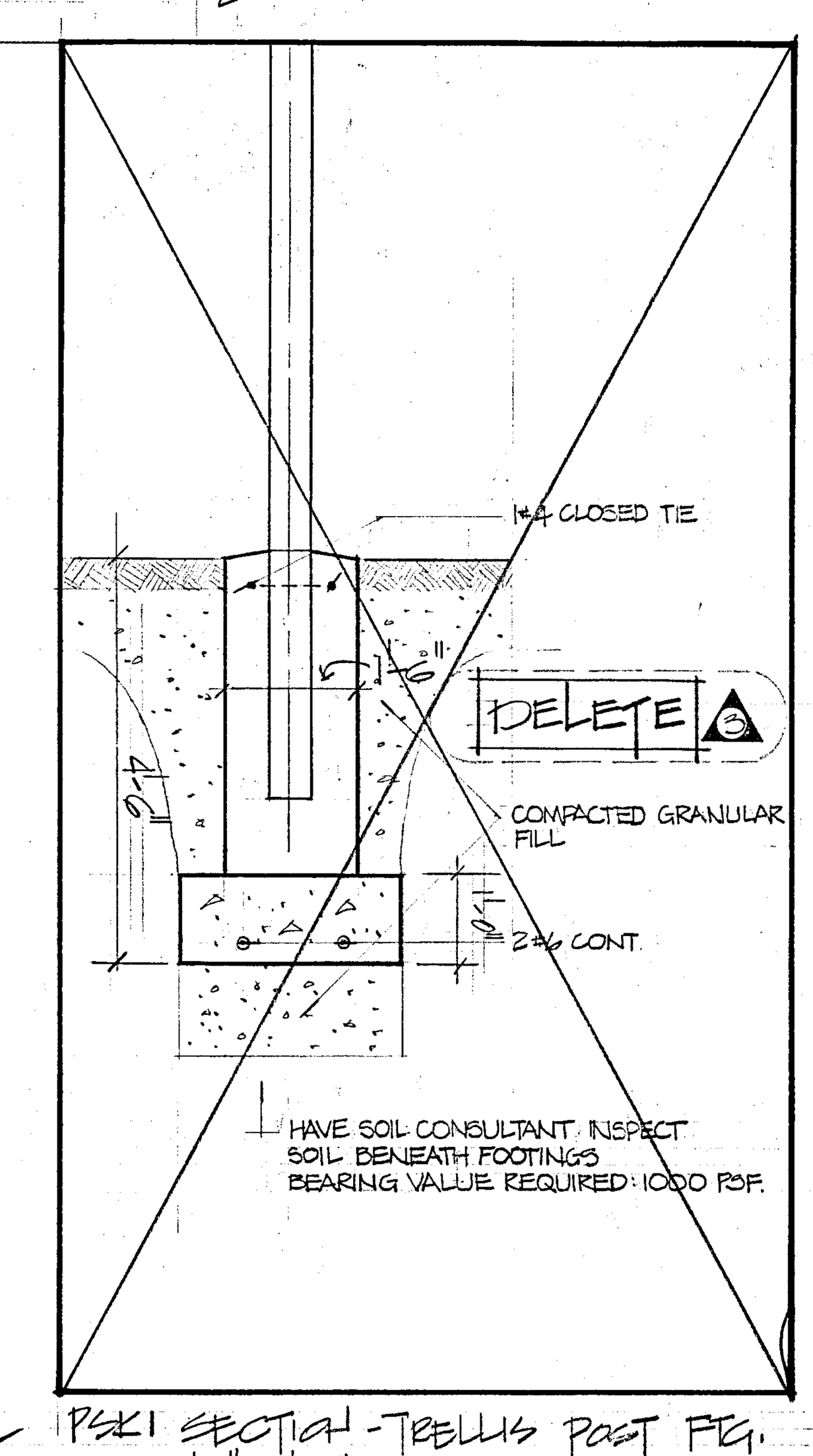
1. MATERIALS AND WORKMANSHIP TO CONFORM TO THE ONTARIO BUILDING CODE, LATEST ISSUE.
2. MATERIALS:
   a) CONCRETE: 3000 PSI, 3" SLUMP, FOR CONCRETE OTHER THAN FOOTINGS PROVIDE 5%±1% ENTRAINED AIR.
   b) REINFORCING STEEL :- CSA G30
   c) STRUCTURAL STEEL : CSA G40.21 - 44 W.
   d) TIMBER : ROOF FRAMING, POSTS AND STUD WALLS: SPRUCE #1, EXCEPT AS OTHERWISE NOTED.
3. PROVIDE HORIZONTAL BLOCK WALL REINFORCING IN EVERY SECOND COURSE.
4. TIMBER CONNECTIONS:
   a) CONFORM TO CSA 086.
   b) INTER CONNECT MEMBERS BY NAILING OR BOLTING TO TRANSFER FORCES SHOWN OR IMPLIED.
5. FOUNDATIONS:
   a) FOUND FOOTINGS ON UNDISTURBED SOIL CAPABLE OF SAFELY SUPPORTING 2000 lbs. PER SQ. FT., BUT FOR PERIMETER FOOTINGS AT LEAST 4'-0" BENEATH THE FINISHED GRADE.
   b) FOR FOOTINGS ABOVE EXISTING MAIN SEWER LINE SEE DETAILS ON DRAWINGS.
6. COMPLY WITH TYPICAL DETAIL SHEETS NOS. TD1-3 UNLESS MORE STRINGENT REQUIREMENTS ARE NOTED ON THE DRAWINGS.
7. DESIGN LOADS ON ROOFS:
   a) GENERAL - 32 PSF
   b) OVER LOW ROOF - 100 PSF AVERAGE DUE TO SNOW PILE UP.



PSK 3 SECTION AT DOUBLE STUD WALL
1/2" = 1'-0"



PSK 2 SECTION THROUGH DOUBLE STUD WALL
1/2" = 1'-0"



PSK1 SECTION - TRELLIS POST FTG.
1/2" = 1'-0"

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lawrie
bolton
ritchie
architects
153 st.clair avenue west, toronto

R.J. Thom
Clifford & Lawrie
Crang & Boake

Architects for the Metropolitan Toronto Zoo

GAUR EXHIBIT & SHELTER - DETAILS, STRUCTURAL DTLS. & NOTES

scale	drawn
AS SHOWN	I.F. ML
date	checked
OCT 1978	

ONTARIO ASSOCIATION OF ARCHITECTS – MEMBERS – R.J. THOM · CLIFFORD & LAWRIE · CRANG & BOAKE ASSOCIATED ARCHITECTS – ARCHITECTS FOR THE METROPOLITAN TORONTO ZOO

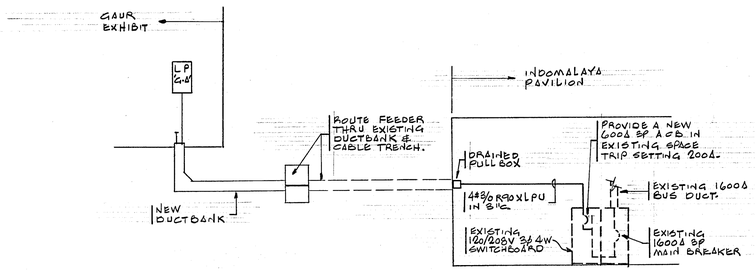
project no.

drawing no.

5

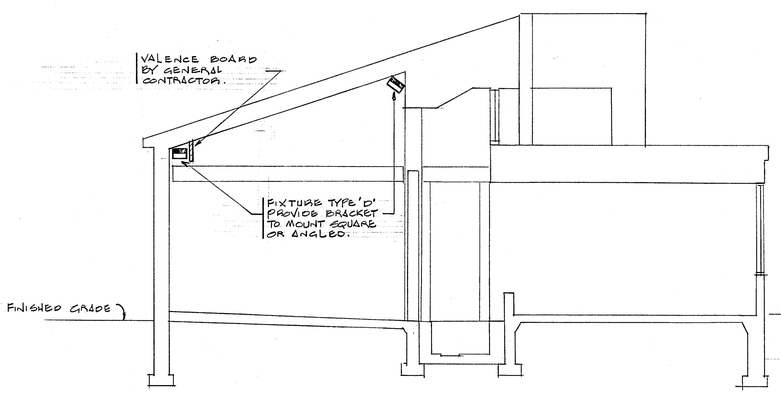
ELECTRICAL LEGEND :

- — 4'-0" FLUORESCENT FIXTURE.
- — 4'-0" FLUORESCENT STRIPLIGHT.
- — CEILING MOUNTED INCANDESCENT FIXTURE.
- — WALL MOUNTED INCANDESCENT FIXTURE.
- — SINGLE POLE SWITCH.
- — TIME SWITCH.
- — 15A 120V 1Φ GROUNDED DUPLEX RECEPTACLE.
- — 208V 1Φ OUTLET AS NOTED.
- — 208V 3Φ OUTLET AS NOTED.
- — COMBINATION STARTER OR DISC. SW. BY OTHERS.
- — DISCONNECT SWITCH BY THIS CONTRACTOR.
- — LIGHTING PANEL.



DISTRIBUTION

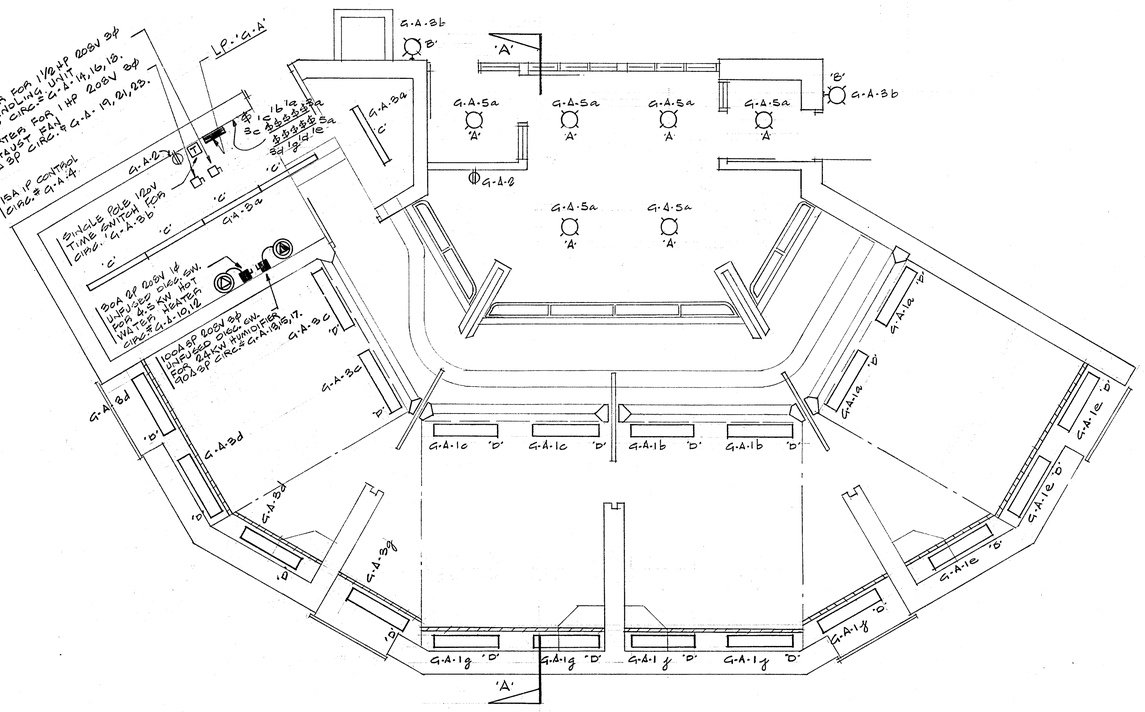
N.T.S.



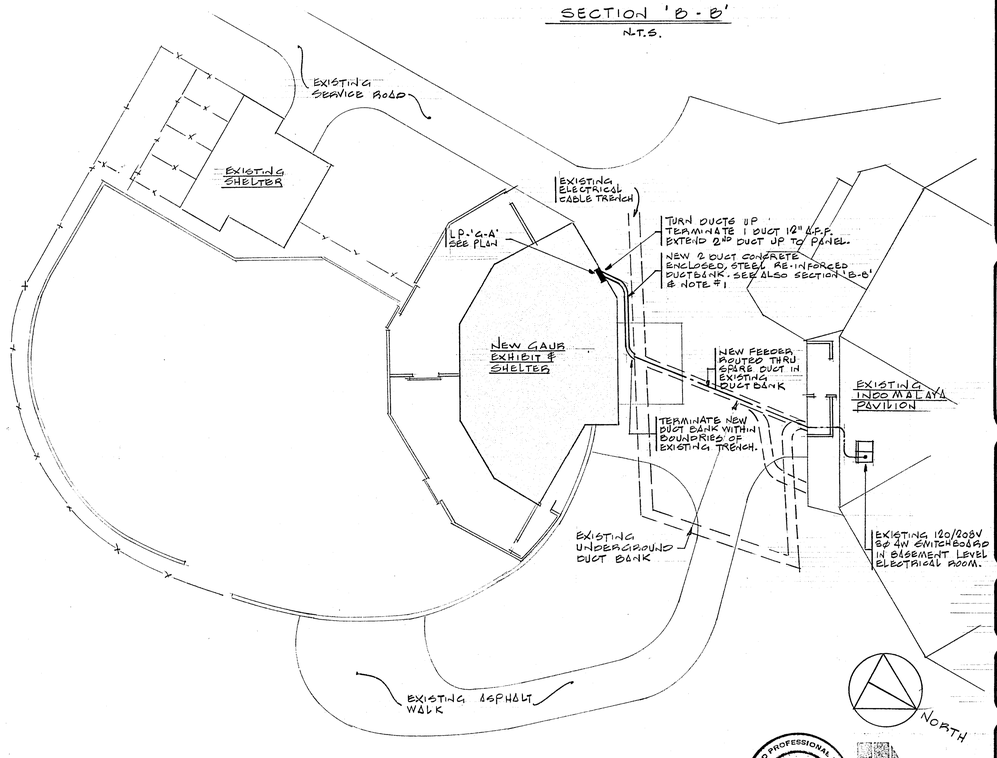
SECTION 'A-A' Scale : 1/4" = 1'-0"

GENERAL NOTES :

1. EXCAVATION FOR NEW DUCTBANK ANYWHERE IN THE VICINITY OF THE EXISTING CABLE TRENCH SHALL BE HAND SHOVELLED. EXACT ROUTING OF EXISTING AND NEW DUCTBANKS SHALL BE DETERMINED ON SITE.
2. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL EXCAVATIONS BY OTHER TRADES FOR SUCH WORK AS BUILDING FOOTINGS, MECHANICAL PIPING ETC. ANYWHERE IN THE VICINITY OF EXISTING CABLE TRENCHES OR DUCTBANKS IS HAND SHOVELLED.
3. CO-ORDINATE COMPLETE ELECTRICAL INSTALLATION WITH ALL TRADES.
4. LP-'G-A' SHALL BE SURFACE MOUNTED 30 CIRCUIT 120/208V 3Φ 4W 2000AMP COPPER MAINS C/W 200A 3P MAIN BREAKER, 10-15A 1P, 3-20A 1P, 1-30A 2P, 2-15A 3P, 1-90A 3P BRANCH BREAKERS.

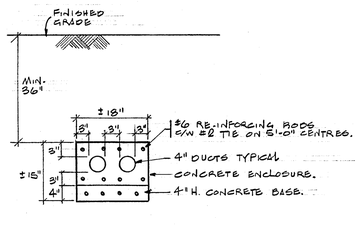


FLOOR PLAN SCALE : 1/4" = 1'-0"



SITE PLAN

SCALE : 1/16" = 1'-0"



SECTION 'B-B'

N.T.S.

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153 st. clair avenue west, toronto

GAUR EXHIBIT ELECTRICAL

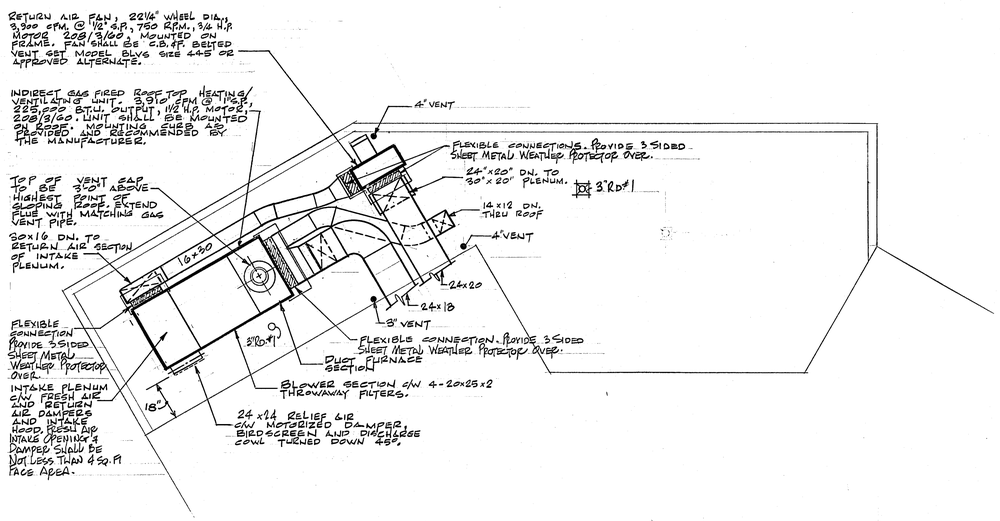
scale AS NOTED	drawn L.G-F.
date OCT. /78.	checked E.B.S.

project no.

drawing no. E-1

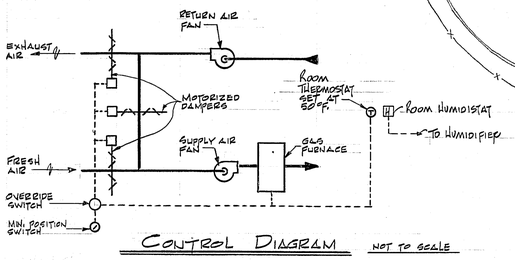
REGISTERED PROFESSIONAL ENGINEER — ELECTRICAL — DAVID ETHERINGTON — 3412 — PROVINCE OF ONTARIO

H.H. Angus & Associates Limited Consulting Engineers



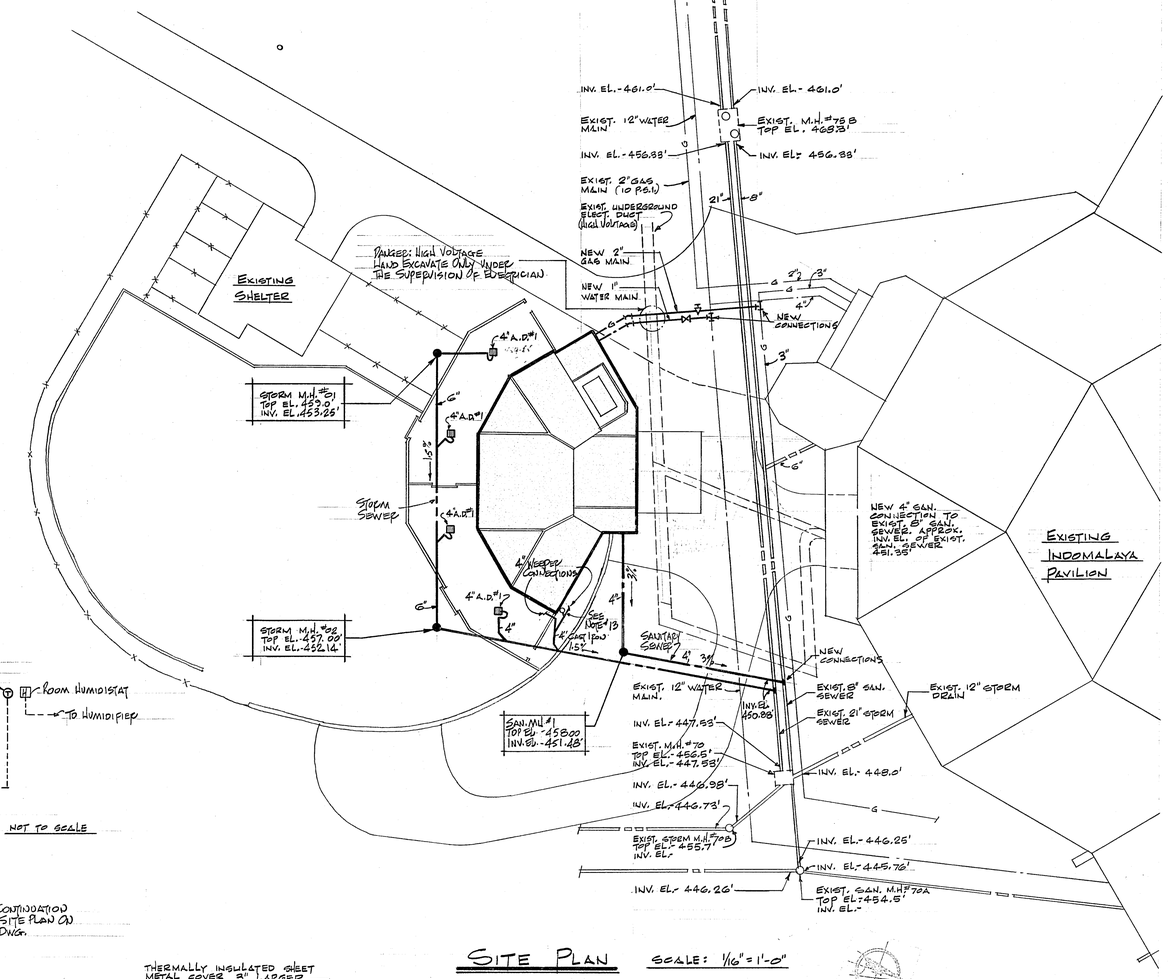
PART ROOF PLAN

SCALE: 1/4"=1'-0"



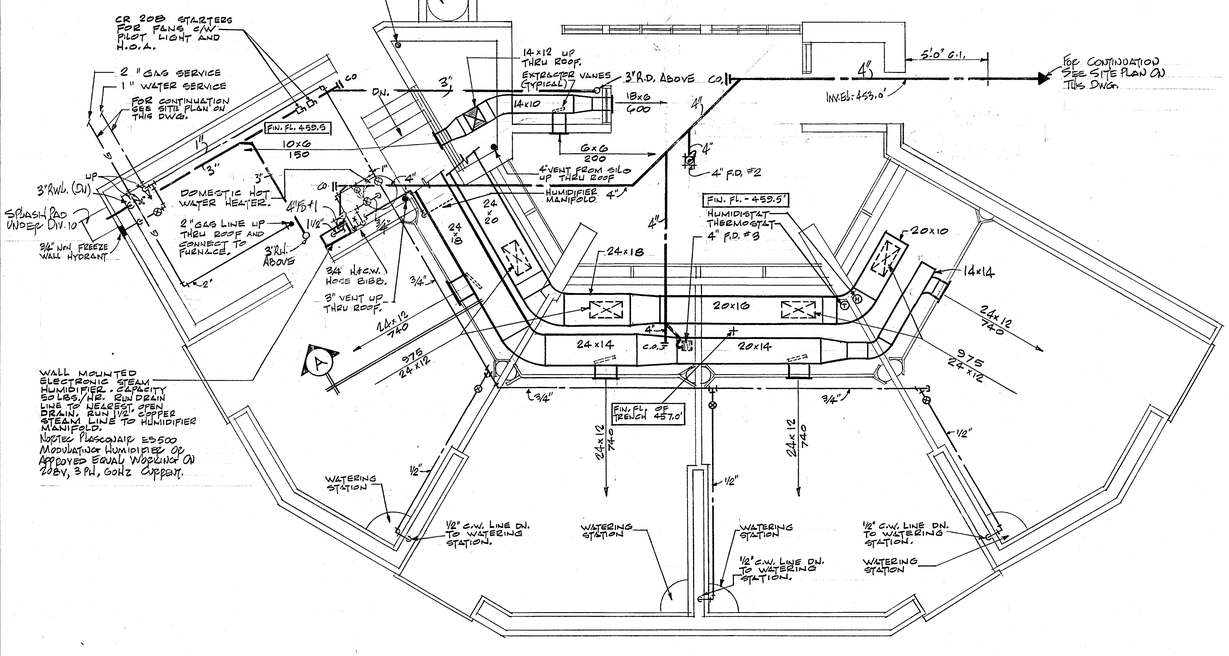
CONTROL DIAGRAM

NOT TO SCALE



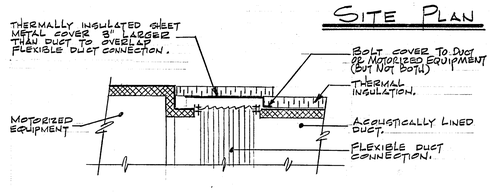
SITE PLAN

SCALE: 1/16" = 1'-0"



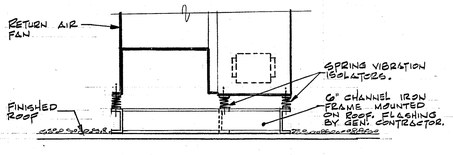
FLOOR PLAN

SCALE: 1/4"=1'-0"



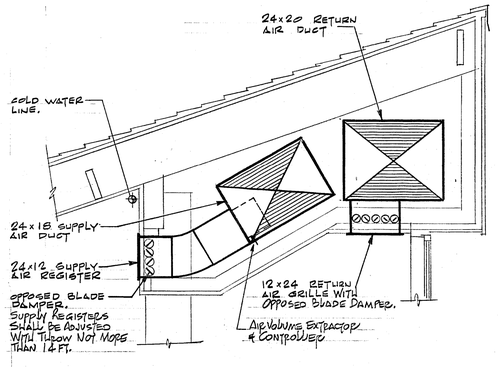
TYPICAL DETAIL OF COVERING OVER FLEXIBLE DUCT CONNECTIONS

NOT TO SCALE



DETAIL OF RETURN AIR FAN BASE

NOT TO SCALE



SECTION 'A'

SCALE: 3/4"= 1'-0"

GENERAL NOTES:

1. THE LAYOUT OF ALL EXISTING OUTSIDE SERVICES ARE APPROX. ONLY AND SHALL BE ACCURATELY CHECKED ON THE SITE AND ANY DISCREPANCY REPORTED BEFORE NEW WORK IS COMMENCED.
2. FIRE EXTINGUISHERS SHALL BE PROVIDED BY THE OWNERS TO SUIT THE REQUIREMENTS OF SCARBOROUGH FIRE DEPT. AND BUILDING DEPARTMENT.
3. F.D.#1 SHALL BE ENPOCO - E-1400 WITH GALVANIZED DUCTILE IRON GRATE AND SEDIMENT BUCKET
4. F.D.#2 SHALL BE ENPOCO E-1000 EHR WITH 6½" DIA. STRAINER, WITH POLISHED BRONZE FINISH, SEDIMENT BUCKET AND VANDAL PROOF SCREWS.
5. F.D.#3 SHALL BE ENPOCO E-1800 BVP WITH GALVANIZED DUCTILE IRON GRADE WITH SEDIMENT BUCKET AND VANDAL PROOF SCREWS.
6. R.D.#1 SHALL BE ENPOCO E-2400 DEP WITH ALUMINUM DOME.
7. WATERING STATION SHALL BE THE 60-09 McKEE MODEL SINGLE AUTOMATIC WATER BOWL C/W FLEXIBLE INSTALLATION KIT SUPPLIED BY THE UNITED CO-OPERATIVES OF ONTARIO, 151 CITY CENTRE DRIVE, MISSISSAUGA PHONE 670-3560.
8. A.D.#1 SHALL BE ENPOCO E-1800 B WITH GALVANIZED DUCTILE IRON GRADE WITH SEDIMENT BUCKET.
9. ALL DUCTWORK AND PLENUMS INSTALLED INSIDE AND OUTDOORS SHALL HAVE 1" ACOUSTIC INSULATION.
10. ALL DUCTWORK INSTALLED OUTDOORS SHALL HAVE AN ADDITIONAL 1" THERMAL INSULATION (SEE SPEC.)
11. SUPPLY DIFFUSERS SHALL BE TITUS MODEL C.S. 272 SBGGS OR APPROVED ALTERNATE.
12. RETURN AIR GRILLES SHALL BE TITUS MODEL C 500 BC GS.
13. PROVIDE A 4" NUB - 12" ABOVE GRADE TO RECEIVE DOWNSPOUT FROM GUTTER DRAIN.
14. LOCATE THERMOSTAT AND HUMIDISTAT AS LATER DIRECTED.
15. EXCAVATION AT AND AROUND EXISTING UNDERGROUND ELECTRIC DUCTBANK CARRYING HIGH VOLTAGE (27,000 VOLTS) SHALL BE DONE ONLY WITH THE SUPERVISION OF ELECTRICAL CONTRACTOR.

clifford lawrie bolton ritchie architects
153 st. clair avenue west, toronto

GAUR EXHIBIT

MECHANICAL

scale: AS NOTED	drawn: R.B.S.
date: Nov. 1, 1978	checked: G.G.

project no.

drawing no. M-1

REGISTERED PROFESSIONAL ENGINEER — G. GROZA — 3412 — PROVINCE OF ONTARIO

H.H. Angus & Associates Limited
Consulting Engineers

Tender Pricing Form Submission – Rev 1 for Addendum #2

Complete and return this section Part 4–*Form of Tender* including Appendices I to V

Project/Contract: Orangutan Outdoor Exhibit Construction

Project/Contract No.: **TZC T 57-2019-12**

OWNER: TORONTO ZOO

I/We, the undersigned have received, allowed for and included as part of our submission all issued Addendum numbered _____.

This form must be completed, properly signed and received on or before the date and time specified or your submission will not be considered. Quoted prices shall remain in effect for a period of ninety (90) days from the Bid validity period.

The Board of Management of the Toronto Zoo reserves the right to reject any or all Quotations or to accept any Quotation, should it deem such action to be in its interests.

By signing and submitting this FORM, you are agreeing to the release of your quotation information, as deemed necessary by the Board, in order to conduct business associated with this quotation or project.

I/We, the undersigned, **having the authority to bind the Company**, certify, that I/we have examined the Instruction to Bidders, Construction Agreement and General Conditions, Specifications, Scope of Work, Drawings and Form of Tender, do hereby offer and agree to enter into an agreement with The Toronto Zoo, to construct a new Outdoor Orangutan Exhibit near the Indo-Malayan Pavilion at the Toronto Zoo as described herein for a Total Tender Price, including HST in Canadian funds, equal to the total of the amounts in the following clauses (A) to (B).

THIS TENDER is submitted by

_____
Name of Firm

_____
Address Postal Code

_____
Telephone Number Fax Number

_____
Name of Authorized Signing Officer for Firm

Title of Authorized Signing Officer for Firm

Name and Title of Project Contact Person

Email and fax # of Project Contact person

FORM OF TOTAL TENDER PRICE (Note, this is the base bid price with a date of substantial performance of 2021-02-26)

(A) PRICE of ***TENDER, which excludes HST is:***

_____
In lawful money of Canada. (State in writing)

$_____
(State in numbers)

(B) PRICE of HST of (13 %) payable by the Owner to the Contractor
DOLLARS

_____
In lawful money of Canada. (State in writing)

$_____
(State in numbers)

TOTAL TENDER PRICE, which includes the Tender (A) and HST (B) price is:
DOLLARS

_____
In lawful money of Canada. (State in writing)

$_____
(State in numbers)

DISCOUNT	**Discount and/or Other**	**Days**
Discount allowed for prompt payment and period within which invoice must be paid to qualify.	%	
Charity Status: The Toronto Zoo is a registered charitable organization (registration #BN 119216398RR0001) and accordingly may be eligible for preferred pricing which should be reflected in the Quotation as submitted.		

The following appendix(s) must be completed and returned with the tender submission.

Appendix I	**Schedule of Values**
Appendix II	**Unit Prices**
Appendix III	**Additional Prices – Not Applicable**
Appendix IV	**Alternative Prices**
Appendix V	**Unsolicted Prices**

APPENDIX I- SCHEDULE OF VALUES (Due 24 hours after stipulated closing date)
(**included** in Total Tender Price)

All prices are to include the supply and installation of all labour, material, taxes (excluding Harmonized Sales Tax), charges, payroll, burden, and profit, and would be deducted from the Total Tender Price should the specified work be excluded from the contract work.

ITEM	DESCRIPTION	PRICE (BASE BID – SUBSTANTIAL PERF 2021-02-26)	PRICE (ALTERNATIVE PRICE – SUBSTANTIAL PERF 2020-10-16)
1.	Mobilization	$	$
2.	Div 02: Demolition & Removals	$	$
3.	Div 03: Concrete	$	$
4.	Div 04: Masonry	$	$
5.	Div 05: Metals	$	$
6.	Div 06: Wood, Plastics, and Composites	$	$
7.	Div 07: Thermal & Moisture Protection	$	$
8.	Div 08: Openings	$	$
9.	Div 09: Finishes	$	$
10.	Div 10: Specialties	$	$
11.	Div 11: Equipment	$	$
12.	Div 20: Mechanical, General	$	$
13.	Div 22: Plumbing	$	$
14.	Div 23: Heating, Ventilating and Air Conditioning	$	$
15.	Div 25: Integrated Automation	$	$
16.	Div 26: Electrical	$	$
17.	Div 27: Communications	$	$
18.	Div 28: Electronic Safety and Security	$	$
19.	Div 31: Earthwork	$	$
20.	Div 32: Exterior Improvements	$	$
21.	Div 33: Utilities	$	$
22.	Demobilization	$	$
23.	Cash Allowance for Inspection & Testing	$ 35,000	$ 35,000
	Total Tender Price*	$	
	Total Alternative Tender Price**		$

*The sum of the amounts shown in the table above **should** equal the Total Tender Price stipulated in the space provided in the Form of Total Tender Price
The sum of the amounts shown in the table above **should equal the Alternative Price indicated in Appendix IV of the Pricing Forms

APPENDIX II - UNIT PRICES (Due 24 hours after stipulated closing date)

All prices are to include the supply and installation of all labour, material, charges, taxes (excluding Harmonized Sales Tax), payroll, burden and profit.

ITEM	**UNIT**	**ADD**	**DEDUCT**
Climbing Pole 1 including but not limited to associated excavation, foundation, platform & supports, hot vines, pipe vines, climbing ropes, video feed/camera, drinker, feeder.	Each	$	$
Climbing Pole 2 including but not limited to associated excavation, foundation, platform & supports, hot vines, pipe vines, climbing ropes, video feed/camera, drinker, feeder.	Each	$	$
Climbing Pole 3 including but not limited to associated excavation, foundation, platform & supports, hot vines, pipe vines, climbing ropes, video feed/camera, drinker, feeder.	Each	$	$
Climbing Pole 4 including but not limited to associated excavation, foundation, platform & supports, hot vines, pipe vines, climbing ropes, video feed/camera, drinker, feeder.	Each	$	$
Climbing Pole 5 including but not limited to associated excavation, foundation, platform & supports, hot vines, pipe vines, climbing ropes, video feed/camera, drinker, feeder.	Each	$	$
Climbing Pole 6 including but not limited to associated excavation, foundation, platform & supports, hot vines, pipe vines, climbing ropes, video feed/camera, drinker, feeder.	Each	$	$
“O line” cables	lm	$	$
Kick Rail (Det 2/AR=180)	lm	$	$
Guardrail (Det 1/AR-180)	lm	$	$

Barrier Fence (Det 3/AR-111)	lm	$	$
150mm diameter subdrain. Installation wrapped in geotextile and clear stone backfill	lm	$	$
300mm PVC storm sewer. Installation at approximately 3.5m depth	lm	$	$
Remove and dispose of existing manhole	Each	$	$
New U/G Feeders: 4-4C 600MCM RWU90 + #2 BND in new U/G rigid PVC duct	lm	$	$
3-#1 RWU90 + #6 bond (PP-1) 4-250MCM RWU90 + #4 bond (ATS-1) in 103mm underground rigid PVC duct	lm	$	$
14-#14 RWU90 + #14BND, 53mm rigid PVC duct	lm	$	$

THIS SECTION IS NOT APPLICABLE

APPENDIX III - ADDITIONAL PRICES (Due 24 hours after stipulated closing date)

(**not included** in Total Tender Price)

All prices are to include the supply and installation of all labour, material, taxes (excluding Harmonized Sales Tax), charges, payroll, burden and profit.

ITEM	DESCRIPTION	PRICE
		$_____ **Increase / Reduction**

* For each item, insert amount in the appropriate column to indicate whether the price change will result in an increase in, or a reduction of, the Total Tender Price.

APPENDIX IV- ALTERNATIVE PRICES (Due 24 hours after stipulated closing date)

(**not included** in Total Tender Price)

All prices are to include the supply and installation of all labour, material, taxes (excluding Harmonized Sales Tax), charges, payroll, burden and profit.

Item	Description	Increase or Reduction From Total Tender Price
1.	Cost to complete project as per date for substantial performance of 2020-10-16 & total performance of 2020-11-13. Liquidated damages will apply to these dates.	

* For each item, insert amount in the appropriate column to indicate whether the price change will result in an increase in, or a reduction of, the Total Tender Price.

APPENDIX V - *UNSOLICITED ALTERNATIVES (Due 24 hours after stipulated closing date IF APPLICABLE)
(prices not used for Total Tender Price)

All alternatives must conform to the requirements of Section 01 25 00 – Product Substitution Procedures.

All prices are to include the supply and installation of all labour, material, taxes (including Harmonized Sales Tax), charges, payroll, burden and profit.

Number of Item	Description of Item	Change in Total Tender Price Substituted in Work	
		Increase	**Reduction**

zeidler

DRAWING LIST WITH REVISION DESCRIPTION

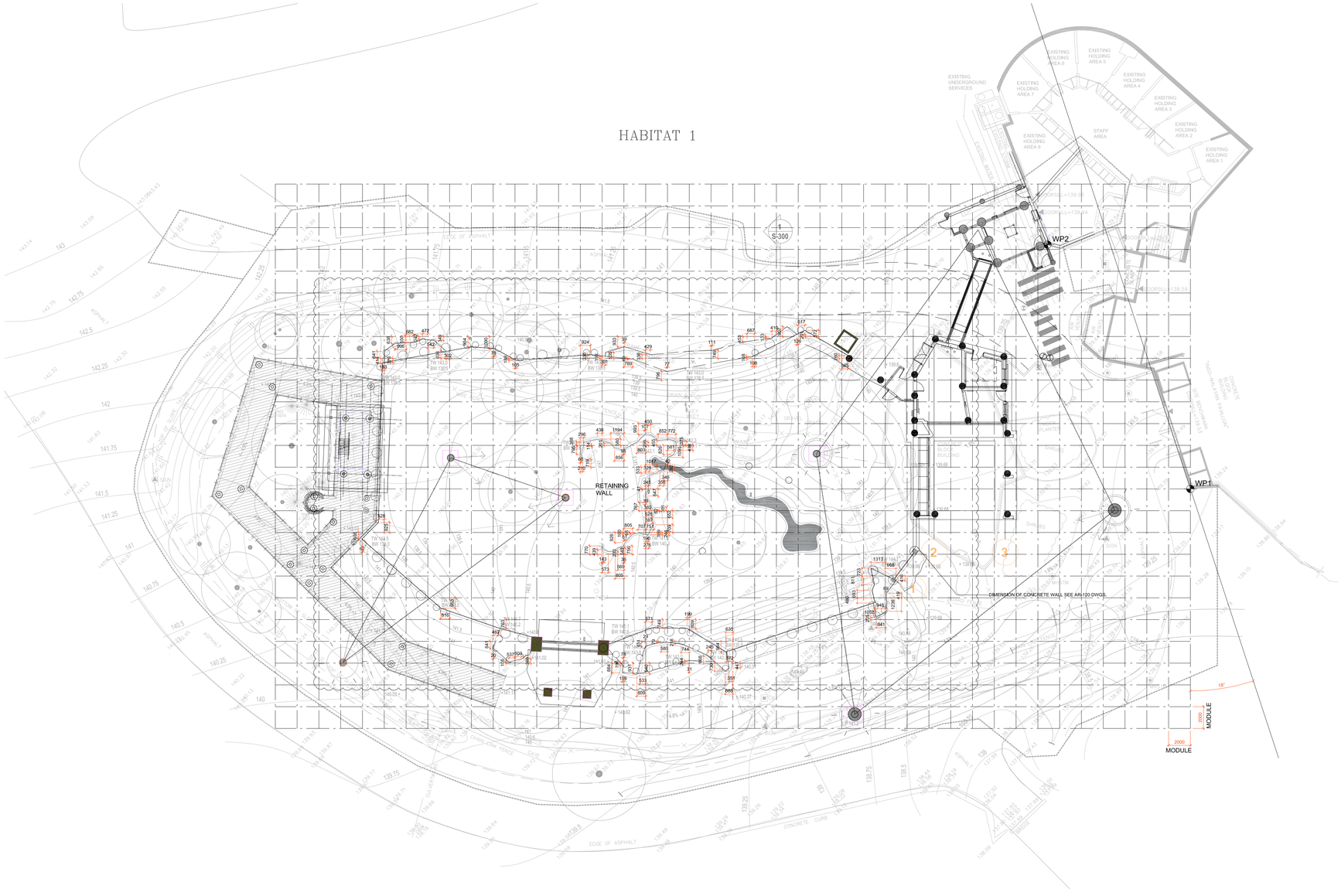
Toronto Zoo Orangutan Exhibits

JOB # 18-1-086

DATE UPDATED: JANUARY 15, 2019

Drawing Series	Drawing No.	Drawing Title	Revision Description	04 Issued for Addendum #A002 01/08/2020
ARCHITECTURAL GENERAL				
	AR-007	SETTING OUT PLAN FOR CASSION LAGGING & RETAINING WALLS	Added dimensions & angles for lagging and retaining walls	4
HABITAT 1	AR-100	DEMOLITION PLAN	Added Note "Turnover all doors & frames to zoo" for concrete building to be demolished	4
	AR-101	LAYOUT AND MATERIAL PLAN	Extends New Generator (prepared by McGregor Allsop) area scope	4
	AR-104	CLIMBING POLE DETAILS	Revised distance of pole to edge of platform from 750mm to 900mm	4
	AR-110	DAYROOM PLAN & EXISTING PLANS	1.Extends edge of platform to be 1150mm from cental of post ; 2.revised note:climbing bar anchor to eisting Building	4
	AR-111	DAYROOM SECTIONS	1.Extends edge of platform to be 1150mm from cental of post ;2.Added wall section of ex. holding bldg; 3. Change from flexble mesh to S.S. cable mesh; 4. Change from steel mesh to rigid mesh steel WWM; 5.Remove note"50 X 100 X 6 steel mesh"	4
	AR-112	DAYROOM ELEVATIONS	Extends platform to be 900mm from edge of post	4
	AR-120	VIEWING/RESEARCH STATION - CONSTRUCTION & RCP PLANS	1.Change gauge at ceiling ;2.Added dimension on east end concrete retaining wall;	4
	AR-121	VIEWING/RESEARCH STATION - PLANS	Clarified the metal roof is metal shingle roof;	4
	AR-122	VIEWING/RESEARCH STATION - SECTIONS	Change gauge at ceiling	4
	AR-123	VIEWING/RESEARCH STATIONS - ELEVATIONS	Clarified the metal roof is metal shingle roof;	4
	AR-130	GLASS VIEWING TRELLIS PLAN	Clarified the metal roof is metal shingle roof;	4
	AR-140	TREE HOUSE - PLANS	1.Clarified the metal roof is metal shingle roof; 2. Added 6/AR140 for guardrail corner condition	4
	AR-141	TREE HOUSE - SECTIONS & ELEVATIONS	Clarify the metal roof is metal shingle roof;	4
HABITAT 2				
	AR-210	CHUTES DETAILS	1. Change flexble mesh to s.s.cable mesh; 2. Change steel mesh to rigid mesh steel WWM; 3. remove note"50 X 100 X 6 steel mesh"	4

Drawing Series	Drawing No.	Drawing Title	Revision Description	04 Issued for Addendum #A002 01/08/2020
SPECIFICATIONS DIVISION	SECTION	**Owner (O)** **Architect (A)** **Civil Consultant (C)** **Electrical Consultant (E)** **Landscape Consultant (L)** **Mechanical Consultant (M)** **Structural Consultant (S)**	**Specification updated 2020.01.14**	
Div. 1 - General Requirements				
A	01 11 00	Summary of Work	Clause regarding working hours and shutdown Schedule have been added to Section.	Y
A	01 50 00	Temporary Controls and Facilities	Clarification has been provided regarding utilities and facilities (i.e. power, water, gas, staging, parking, construction office and toilets).	Y
Div.5 - Metals				
A	05 16 00	Steel Cabling	Further information regarding coating, cable sizing and accessories have been added to the Section	Y
A	05 50 00	Miscellaneous and Metal Fabrications	Galvanized steel woven wire mesh materials have been added for floors of chute assemblies and it has been clarified that black stainless steel mesh is used as outer perimeter mesh of chute assemblies.	Y
A	05 59 64	Wire Mesh Panels and Doors	Puzzle feeder reference Clause has been added to the Section.	Y
A	same as above	Reference Photographs	Puzzle feeder reference image has been added to the Section.	Y



1 AR-007 HABITAT 1: SETTING OUT PLAN FOR LAGGING & RETAINING WALL

SCALE - 1: 200

GENERAL NOTES:

1.FOR GRADING, SEE CIVIL DWGS.

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
4		ADDENDUM # A-002	2020-01-08

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JONES JONES

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t 416.596.8300 f 416.5596-1408

CLIENT: **TORONTO ZOO**

toronto zoo

361A Old Finch Ave, Toronto, ON M1B 5K7 · 416-392-5929

PROJECT:
ORANGUTAN EXHIBITS

DRAWING NAME :

HABITAT 1
SETTING OUT PLAN FOR CAISSON LAGGING & RETAINING WALL

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	LL	LC

DRAWING NUMBER:

SCALE:
AS NOTED
DECEMBER 11,2019

AR-007

HABITAT 1

rough opening for Orang door in existing Pavilion wall; provide lintel for new opening

preserve existing utils outside habitat, typ

tree to remain, typ (protect)

demolish building

fire hydrant to remain

demolish building & turnover all doors&frames to zoo

remove rocks & turnover to zoo

tree to be removed, typ see Arborist Report

demolish or relocate utilities in habitat, typ

remove asphalt paving and prepare area for planting

remove and re-use rock for new walls

existing door to remain

new door opening

"INDO-MALAYAN PAVILLION"

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
4		ADDENDUM #A-002	2020-01-08

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CLIENT: **TORONTO ZOO**

toronto zoo

361A Old Finch Ave, Toronto, ON M1B 5K7 · 416-392-5929

PROJECT:
ORANGUTAN EXHIBITS

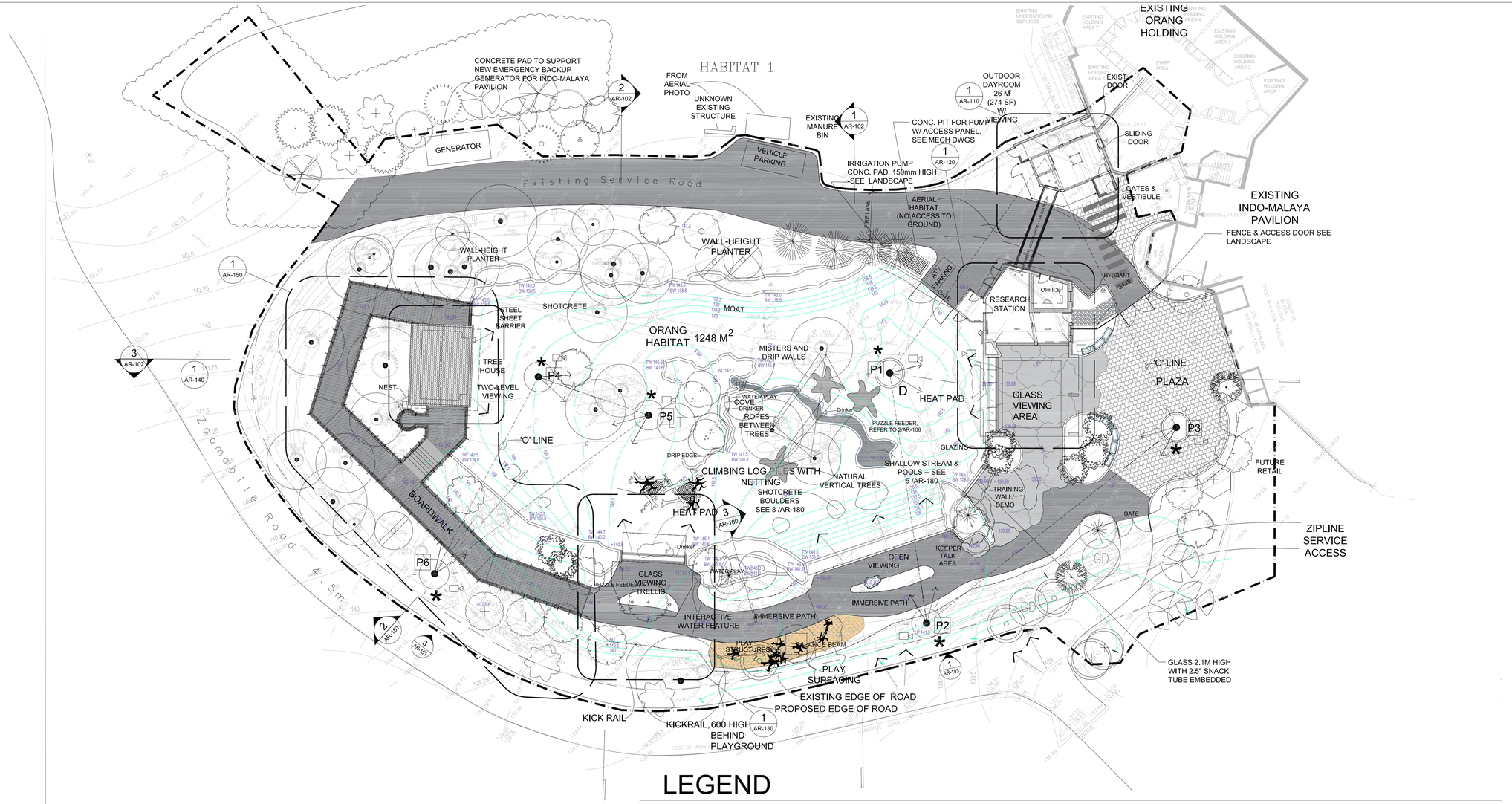
DRAWING NAME :

HABITAT 1
DEMOLITION PLAN

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	LL	LC

SCALE:
AS NOTED
DECEMBER 11,2019

DRAWING NUMBER:
AR-100



1 AR-101 HABITAT 1: LAYOUT & MATERIAL PLAN

SCALE - 1: 200

LEGEND

- 'O' LINE (AERIAL HABITAT)
- ROPE (AERIAL HABITAT)
- CLIMBING POLE, upper platform with hotwire
- POLE W/ HOTWIRE
- CLIMBING POLE
- FEEDER (AT TOP OF POLE) *
- DRINKER AT TOP OF POLE D
- POLE # (SEE AR-104 & AR-105) P1
- VIDEO FEE (TOP OF POLE) OR SECURITY CAMERA
- VIDEO FEED CAMERA ANGLE
- VIEWING GUARDRAIL SEE 6 /AR-180
- GUARDRAIL / KICK RAIL SEE 1 & 2/ AR-180
- BARRIER FENCE SEE 3 /AR-111
- LIMIT OF WORK
- CONCRETE PAVING W/ COLOR & TEXTURE, see landscape
- ASHPALTIC PAVING, see landscape
- CONCRETE PAVERS, see landscape
- BENCH W/ BACKREST
- HEAT PAD-MINIMUM 2M X 4M

GENERAL NOTES:

1.FOR GRADING, SEE CIVIL DWGS.

2.FOR PAVING MATERIAL SEE LANDSCAPE

3.DRINKERS & HOSE BIBS LOCATION, SEE MECH . PLUMBING DWGS.

4. SECURITY CAMERA LOCATION, SEE ELEC. DWGS

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
4		ADDENDUM # A-002	2020-01-08

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PROJECT:
ORANGUTAN EXHIBITS

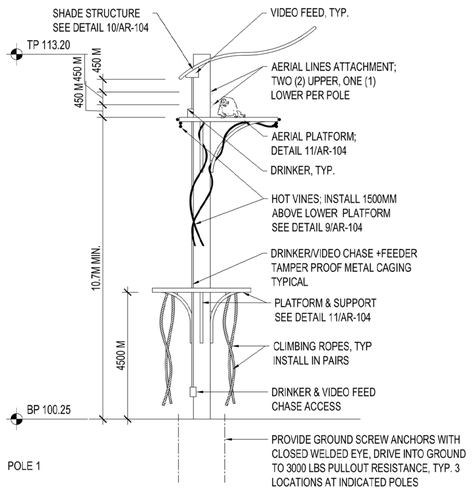
DRAWING NAME :

HABITAT 1
LAYOUT & MATERIAL PLAN

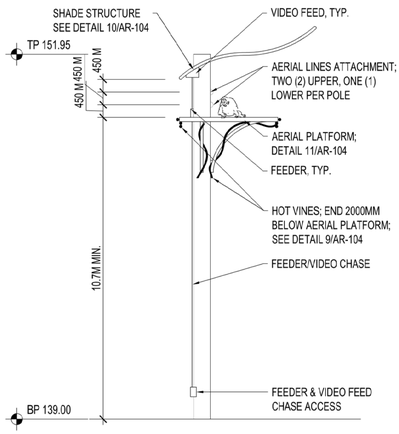
PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	LL	LC

SCALE:
AS NOTED
DECEMBER 11,2019

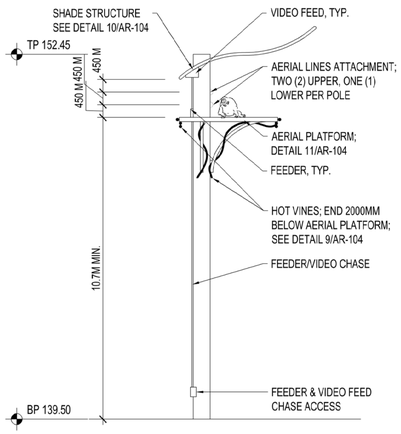
DRAWING NUMBER:
AR-101



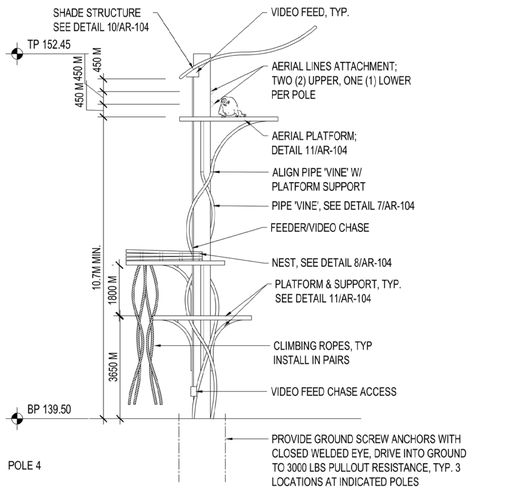
1 POLE 1
SCALE:1:100



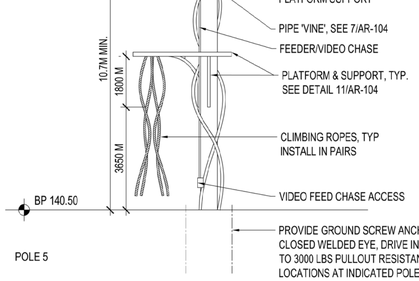
2 POLE 2
SCALE:1:100



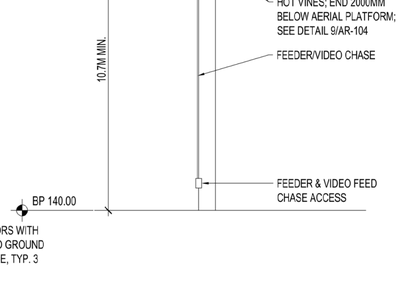
3 POLE 3
SCALE:1:100



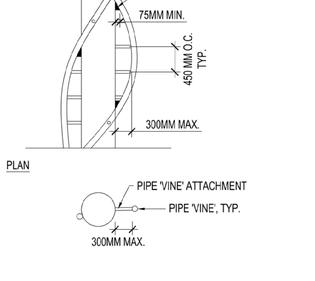
4 POLE 4
SCALE:1:100



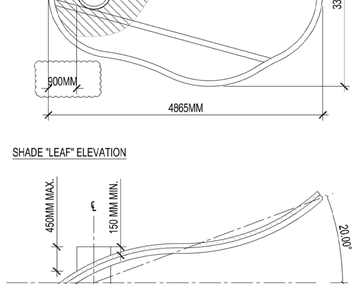
5 POLE 5
SCALE:1:100



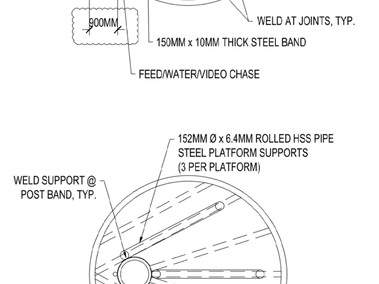
6 POLE 6
SCALE:1:100



7 PIPE 'VINE' ATTACHMENT
SCALE:1:50

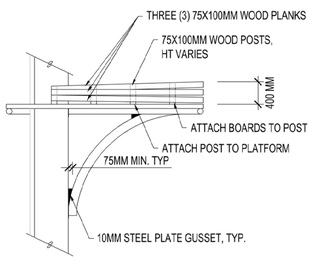


10 SHADE "LEAF" PLAN & SECTION
SCALE:1:50

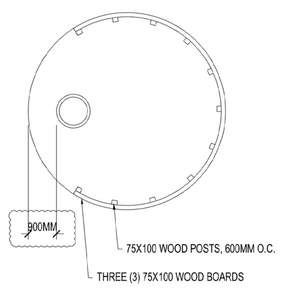


11 PLATFORM PLANS & SECTION
SCALE:1:50

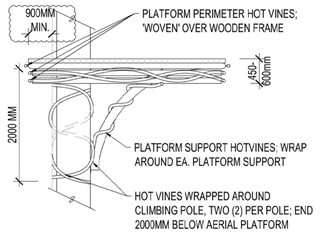
NEST ELEVATION



NEST PLAN



8 NEST
SCALE:1:50



9 HOTVINES
SCALE:1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
4		ADDENDUM # A-002	2020-01-28

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toronto zoo
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PROJECT:
ORANGUTAN EXHIBITS

DRAWING NAME :

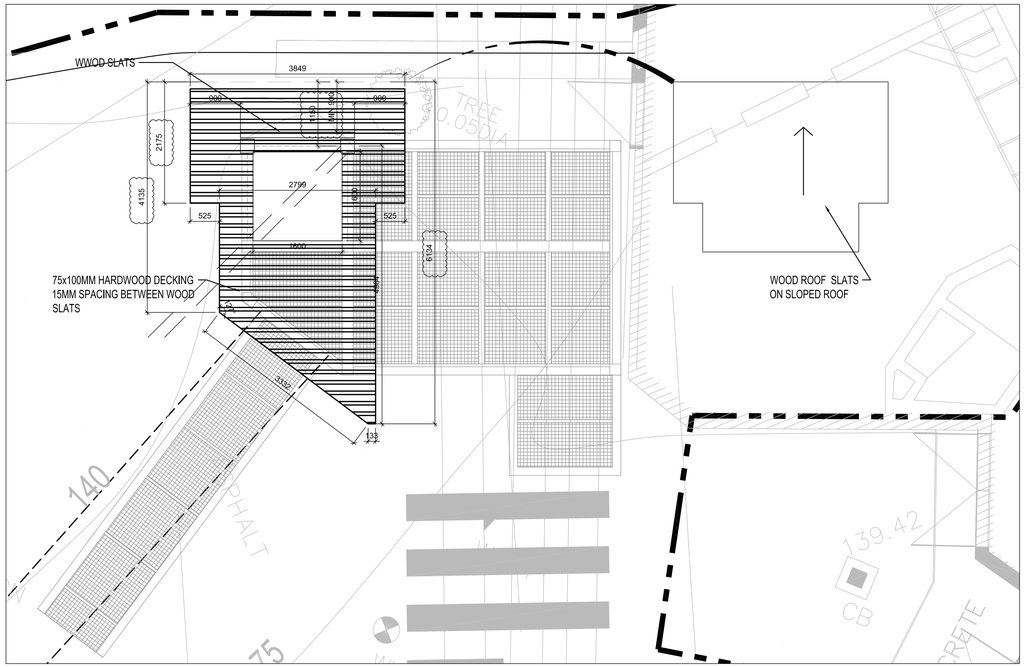
HABITAT 1
CLIMBING POLES DETAILS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	LL	LC

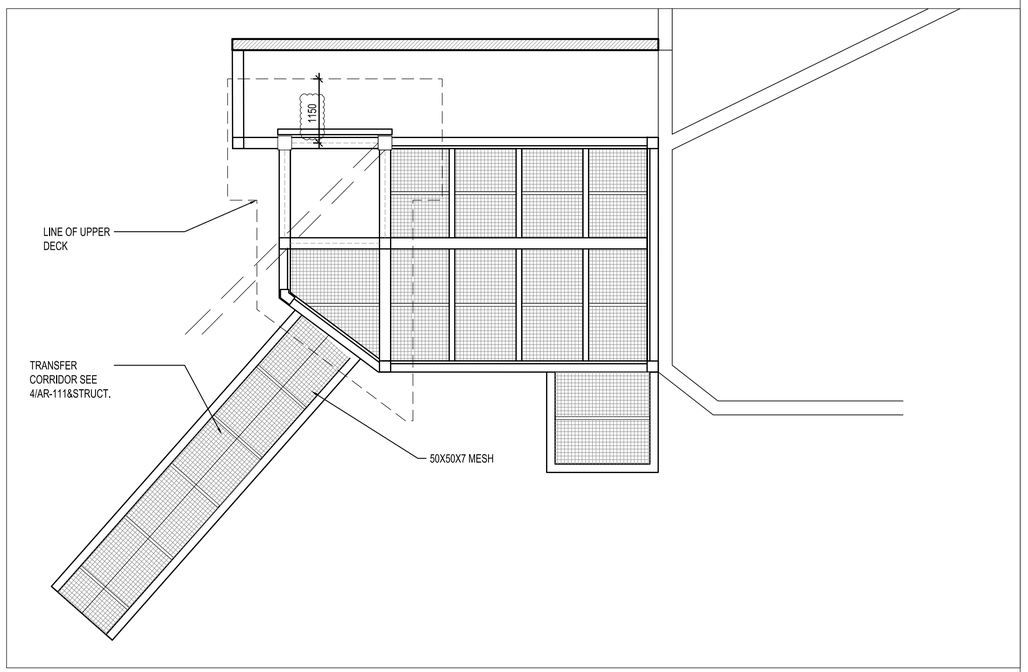
DRAWING NUMBER:

SCALE:
AS NOTED
DECEMBER 11,2019

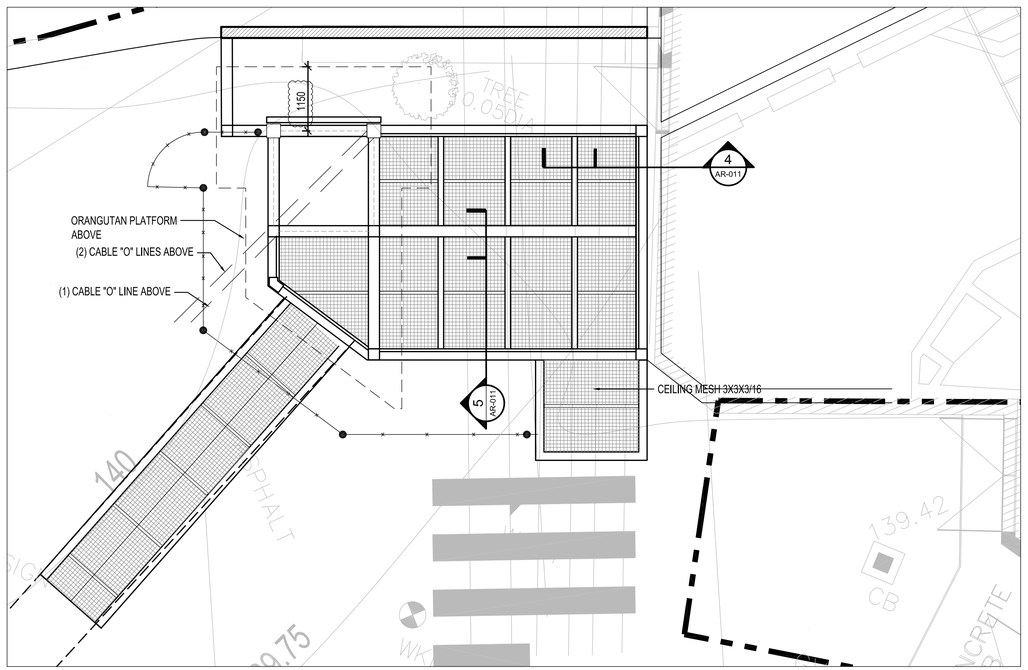
AR-104



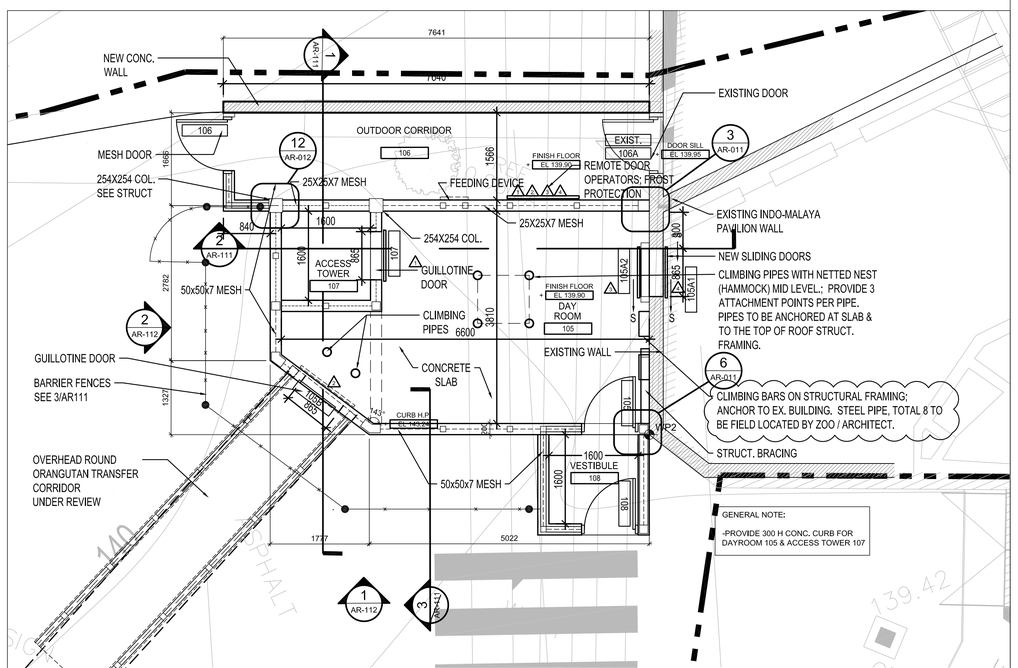
4 AR-110 UPPER DECK PLATFORM PLAN
SCALE - 1:50



2 AR-110 REFELCTED CEILING PLAN
SCALE - 1:50



3 AR-110 LOWER ROOF PLAN
SCALE - 1:50



1 AR-110 CONSTRUCTION PLAN
SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
4		ADDENDUM # A.002	2020-01-28

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PROJECT:
ORANGUTAN EXHIBITS

DRAWING NAME :

HABITAT 1
DAYROOM AND EXISTING PLANS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
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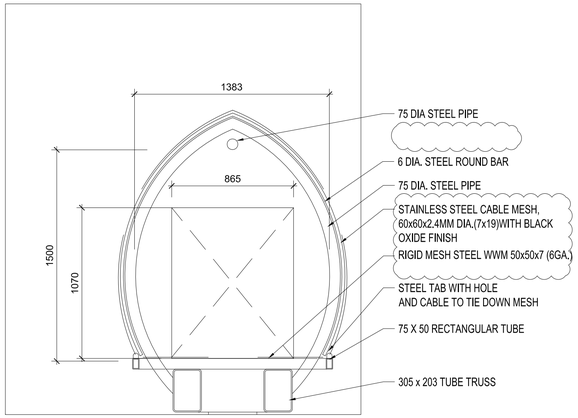
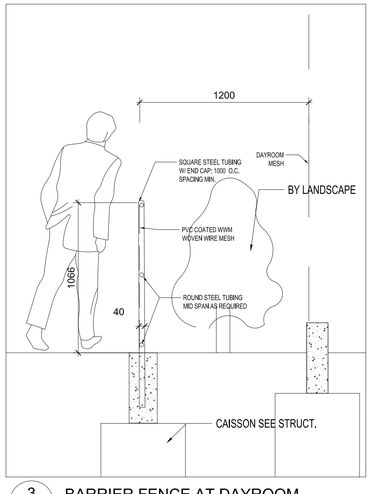
SCALE:
AS NOTED
DECEMBER 11,2019

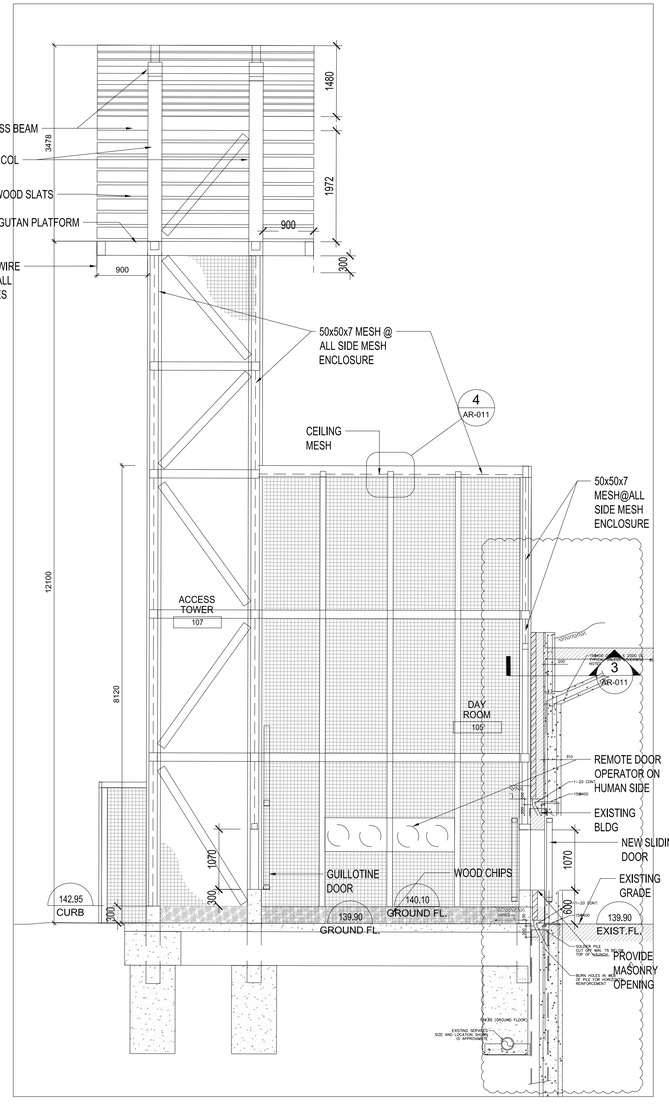
DRAWING NUMBER:
AR-110



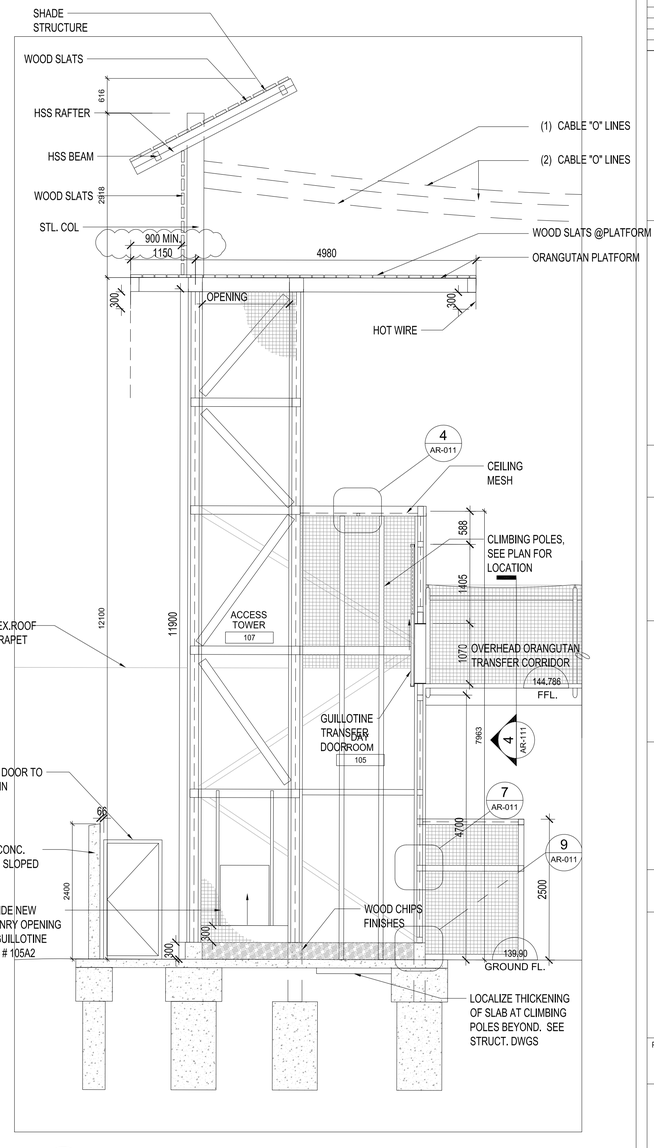
4 AR-111 SECTION AT CHUTE
SCALE - 1:20



3 AR-111 BARRIER FENCE AT DAYROOM
SCALE - 1:20



2 AR-111 SECTION
SCALE - 1:50



1 AR-111 SECTION
SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
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4		ADDENDUM # A-002	2020-01-08

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PROJECT:
ORANGUTAN EXHIBITS

DRAWING NAME :

HABITAT 1
DAYROOM SECTIONS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
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DRAWING NUMBER:

SCALE:
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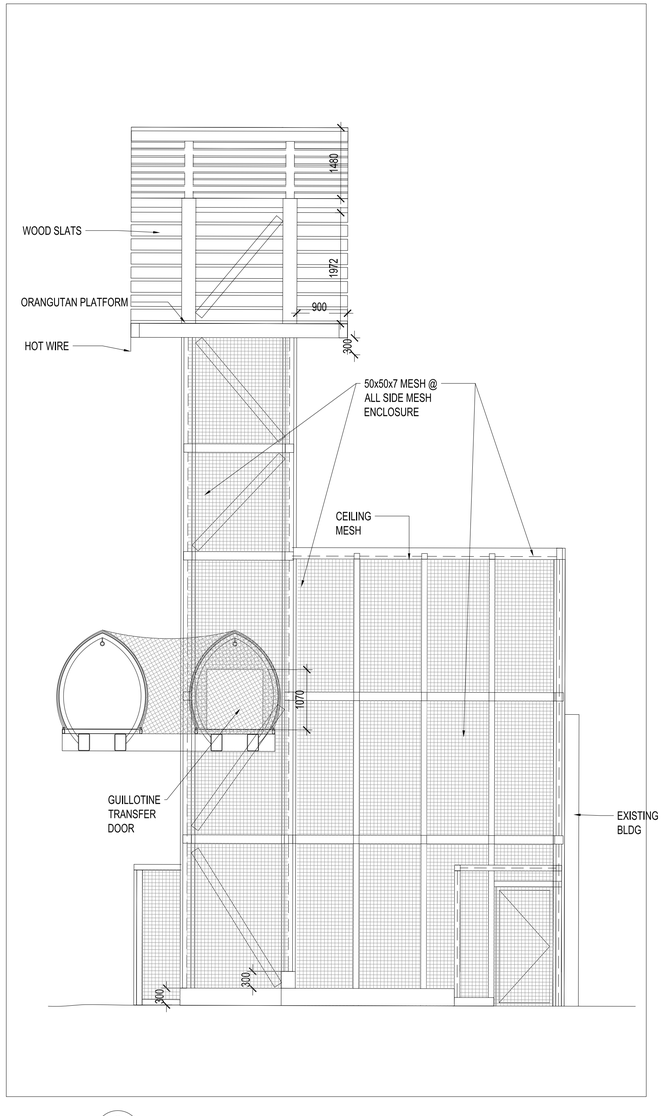
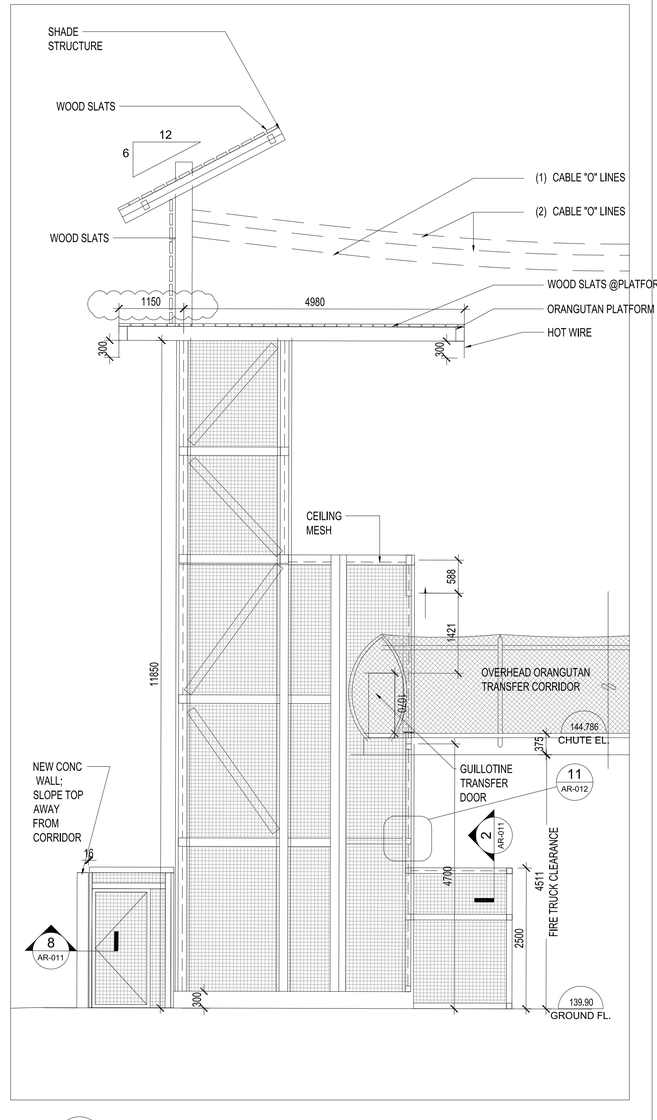
DECEMBER 11,2019

AR-111



2 AR-112 ELEVATION
SCALE - 1:50



1 AR-112 ELEVATION
SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
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HABITAT 1
DAY ROOM ELEVATIONS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	LL	LC

DRAWING NUMBER:

SCALE:
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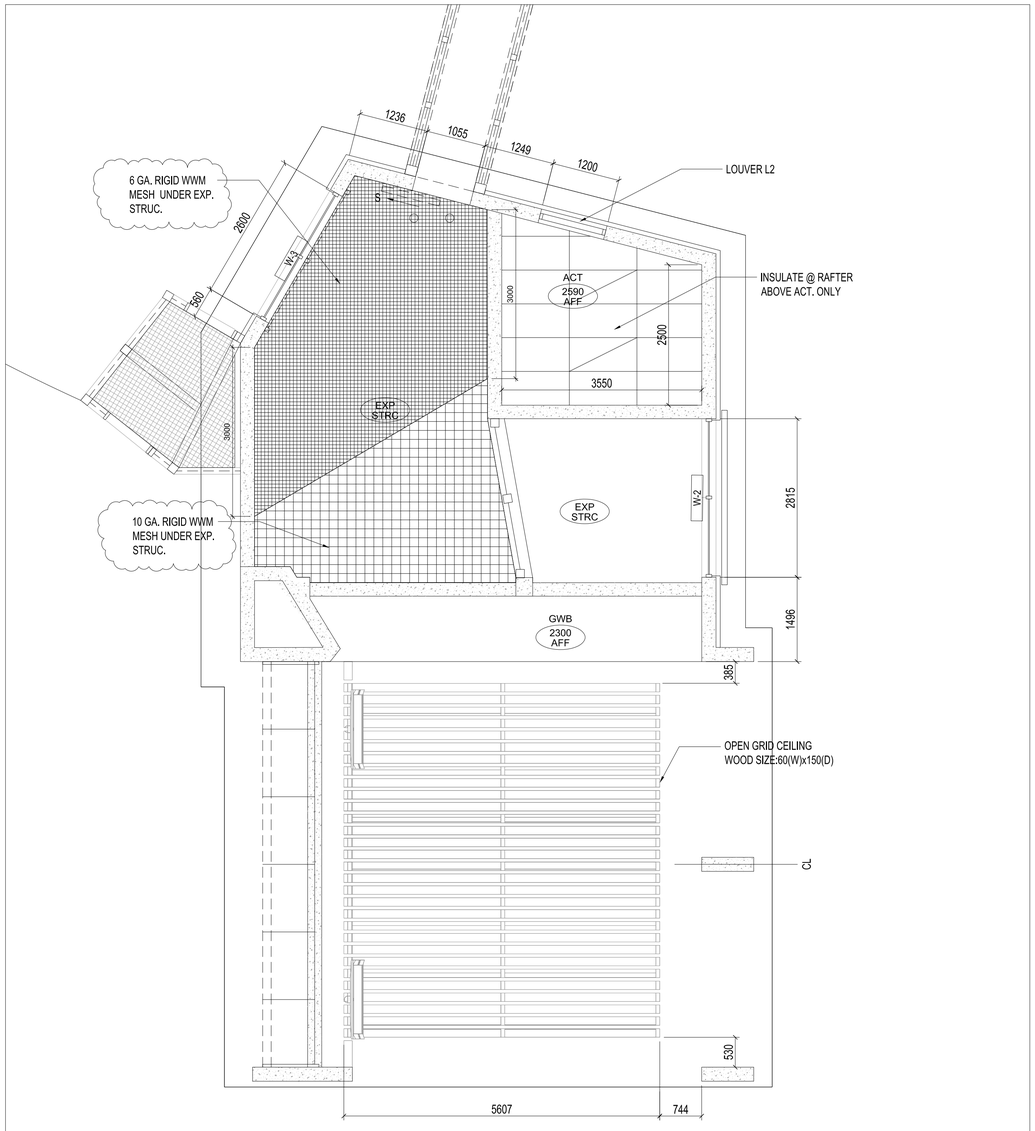
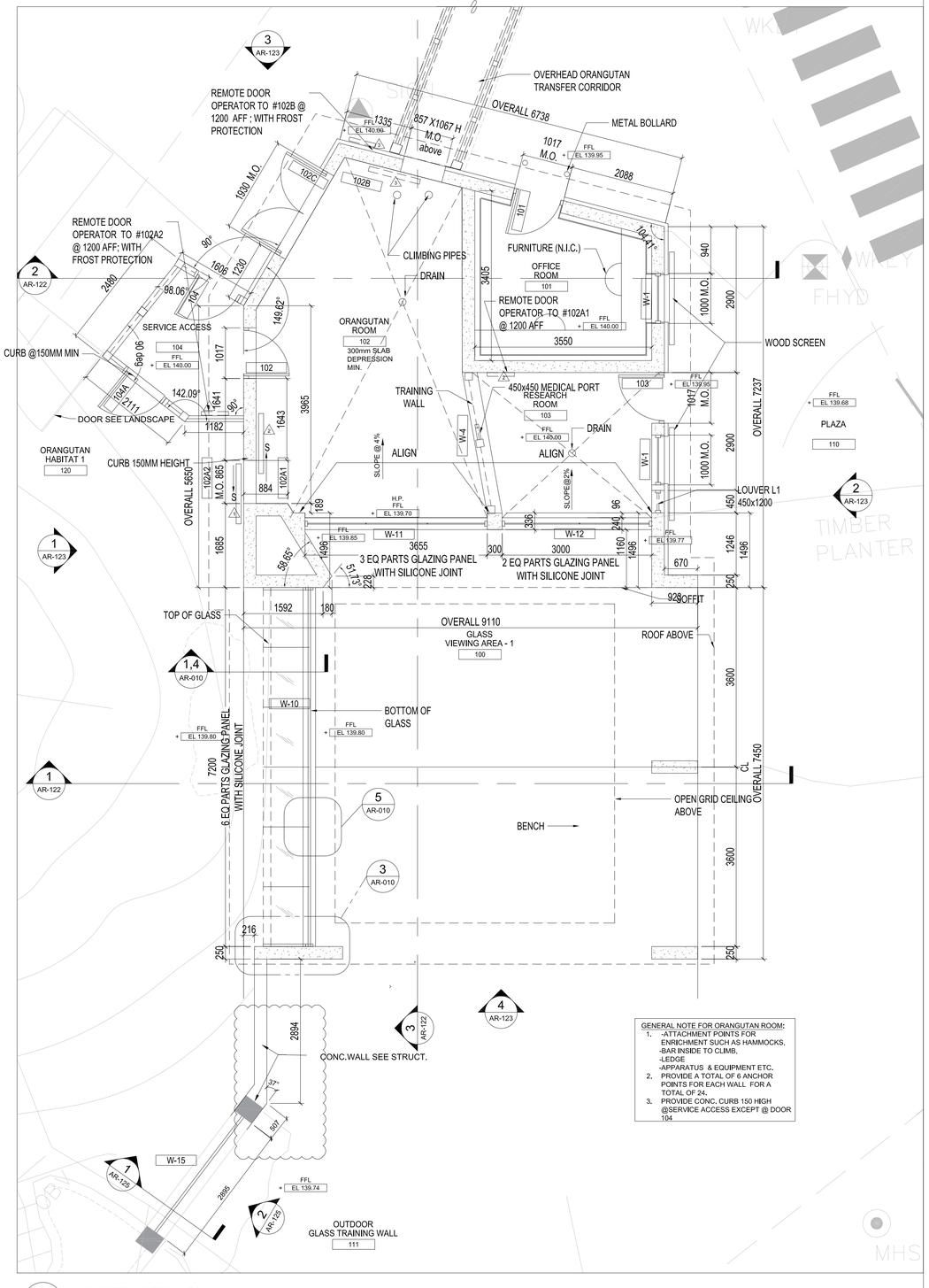
DECEMBER 11,2019

AR-112



2 AR-120 REFELCTED CEILING PLAN

SCALE - 1:50



1 AR-120 CONSTRUCTION PLAN

SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
4		ADDENDUM # A-002	2020-01-08

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PROJECT:

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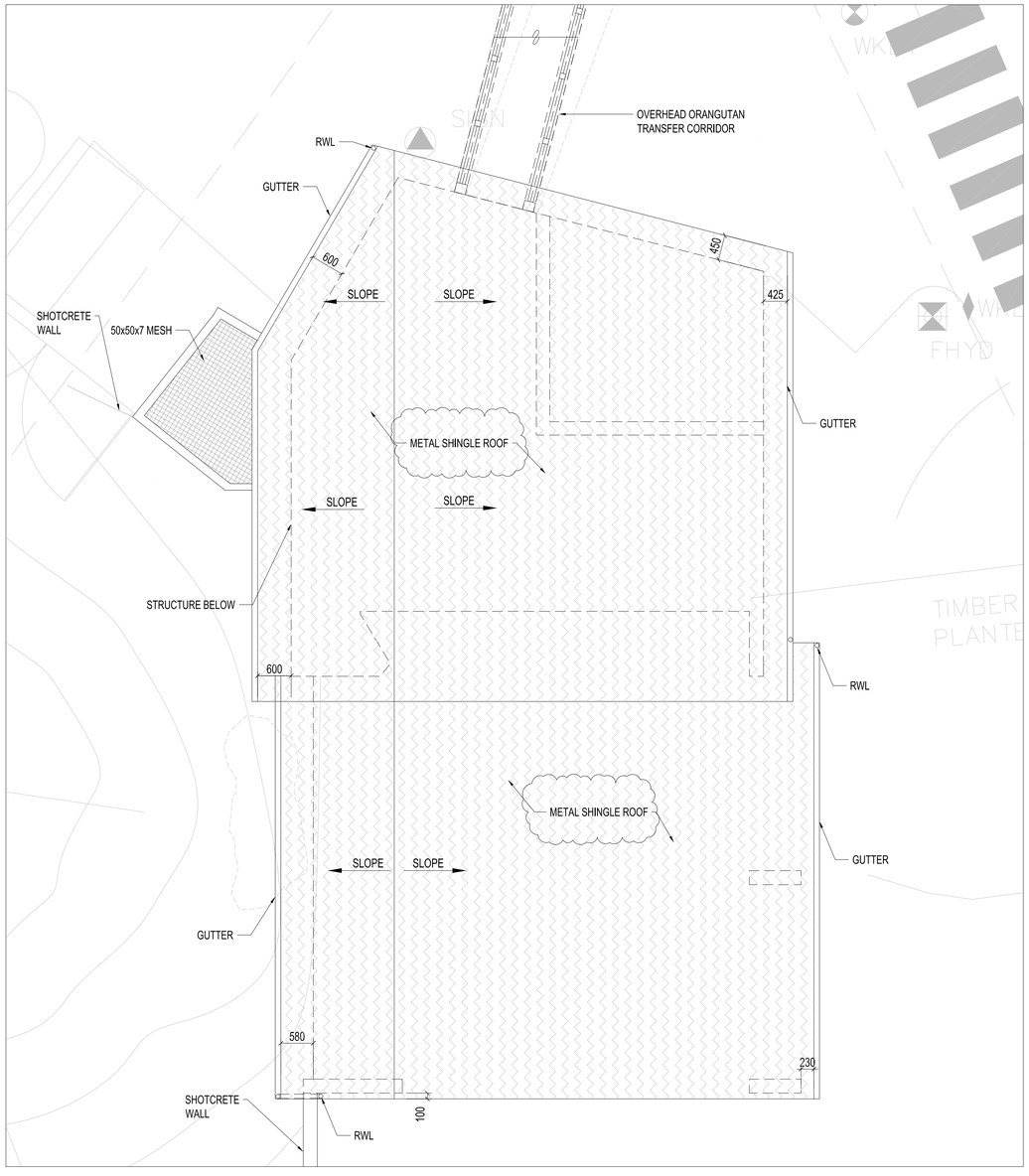
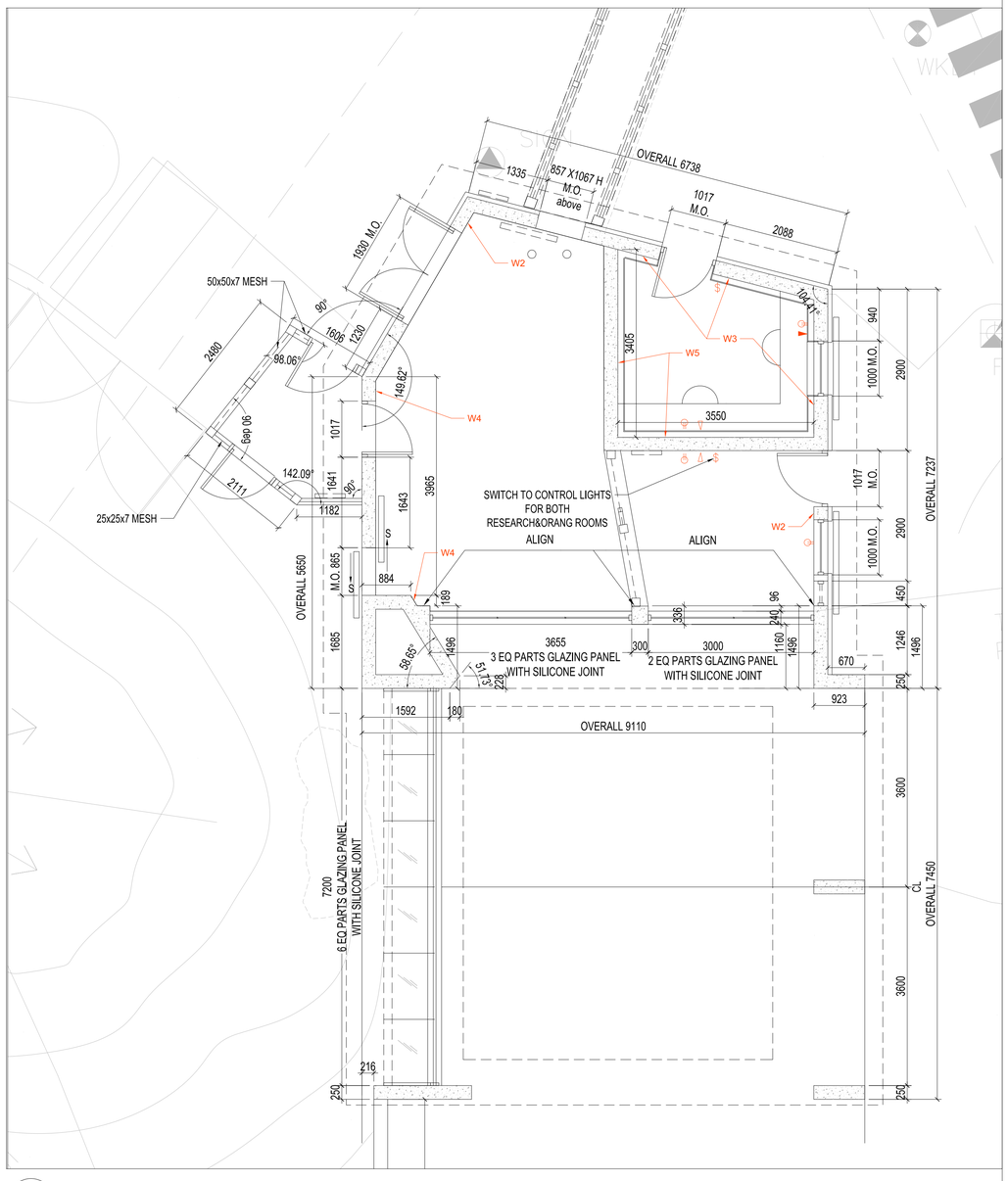


2 AR-121 ROOF PLAN
SCALE - 1:50



1 AR-121 POWER & COMMUNICATIONS & FINISHES PLAN
SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
4		ADDENDUM # A-002	2020-01-08

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DRAWING NUMBER:

SCALE:
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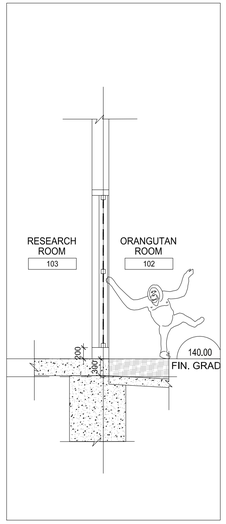
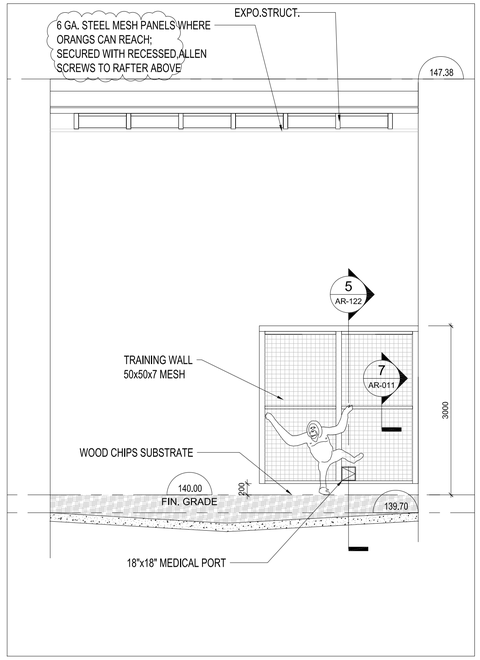
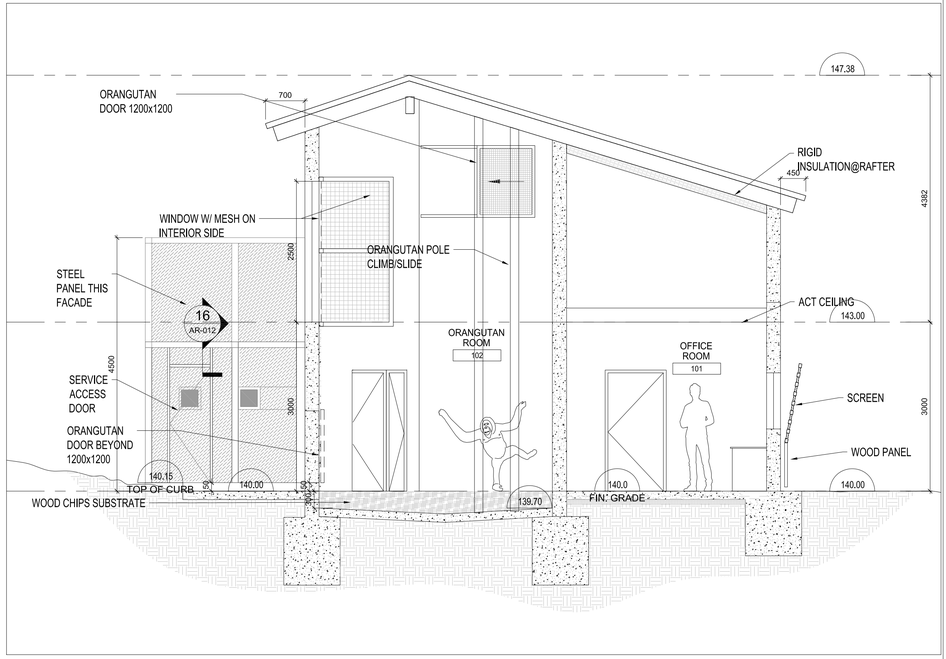


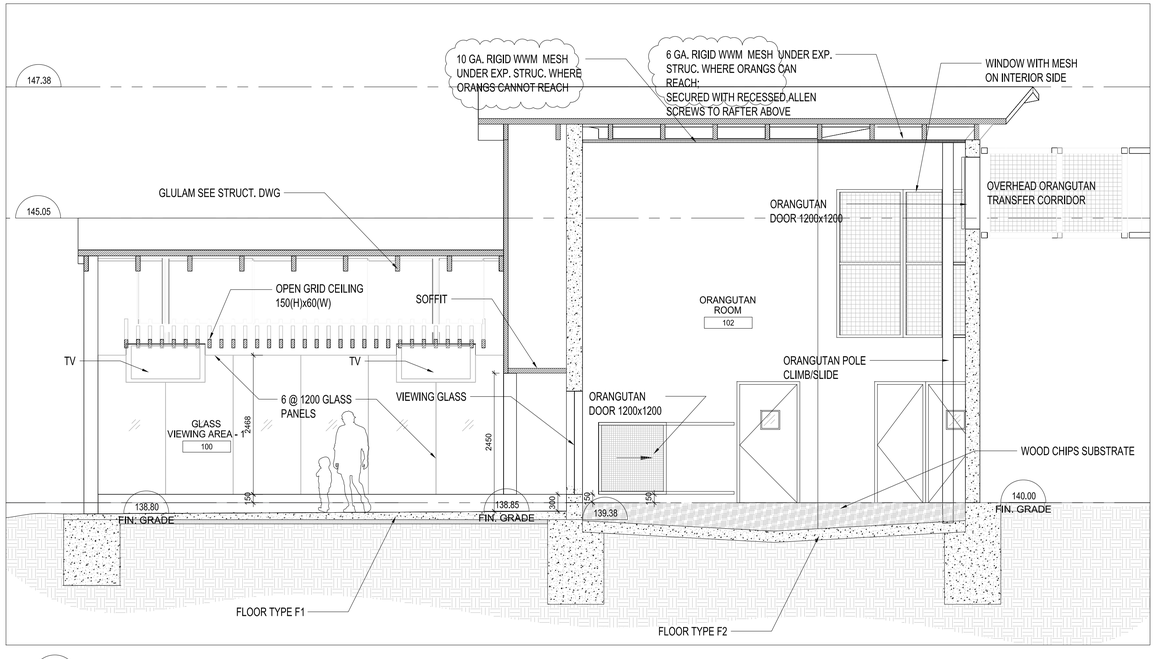
5 AR-122 SECTION @ TRAINING WALL
SCALE - 1:50



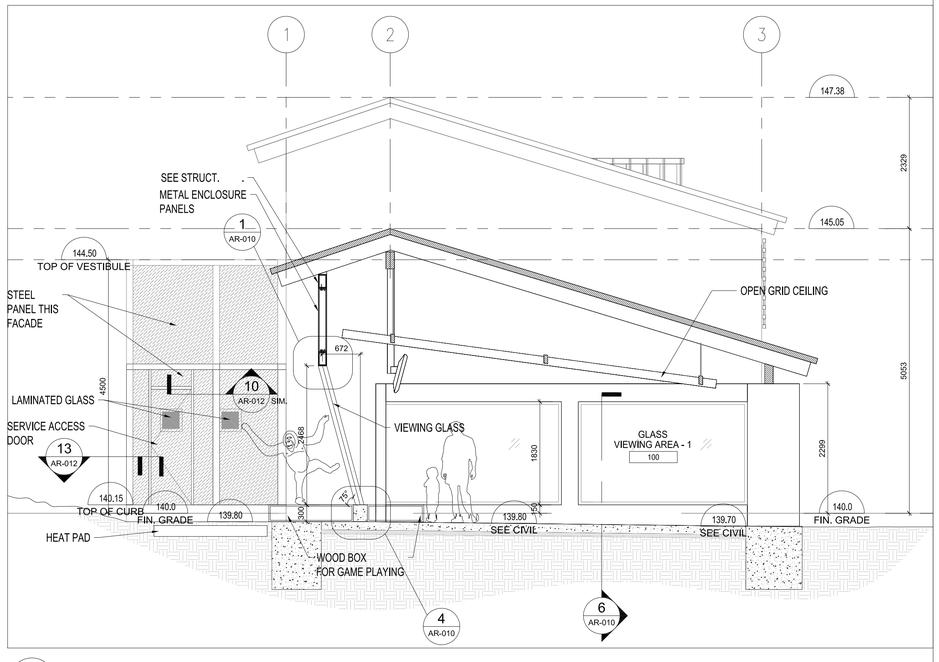
4 AR-122 INTERIOR ELEVATION
SCALE - 1:50



2 AR-122 SECTION
SCALE - 1:50



3 AR-122 SECTION
SCALE - 1:50



1 AR-122 SECTION
SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
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PROJECT:
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PROJECT NO.:	DRAWN BY :	CHECKED BY:
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DRAWING NUMBER:

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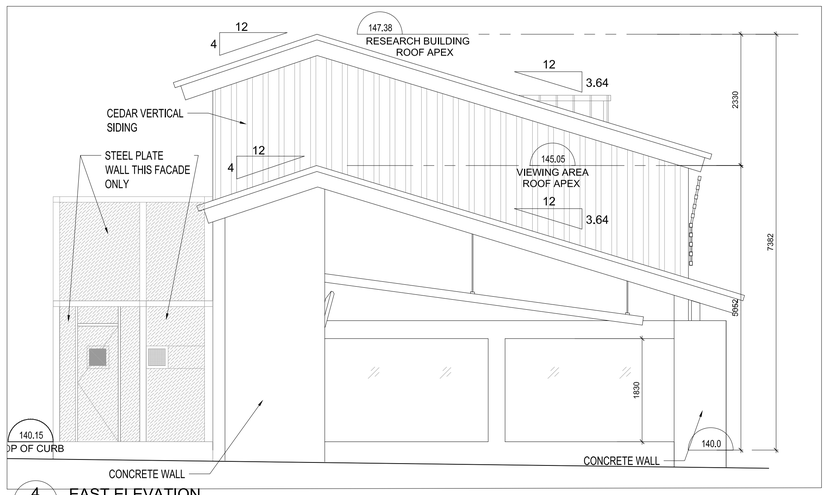
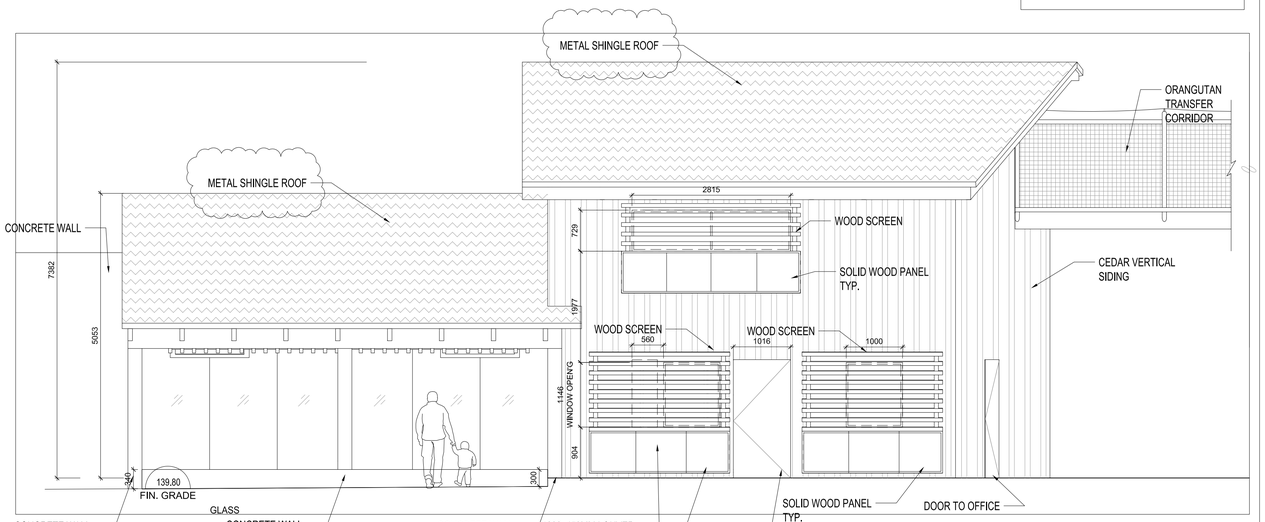
AS NOTED
DECEMBER 11,2019

AR-122

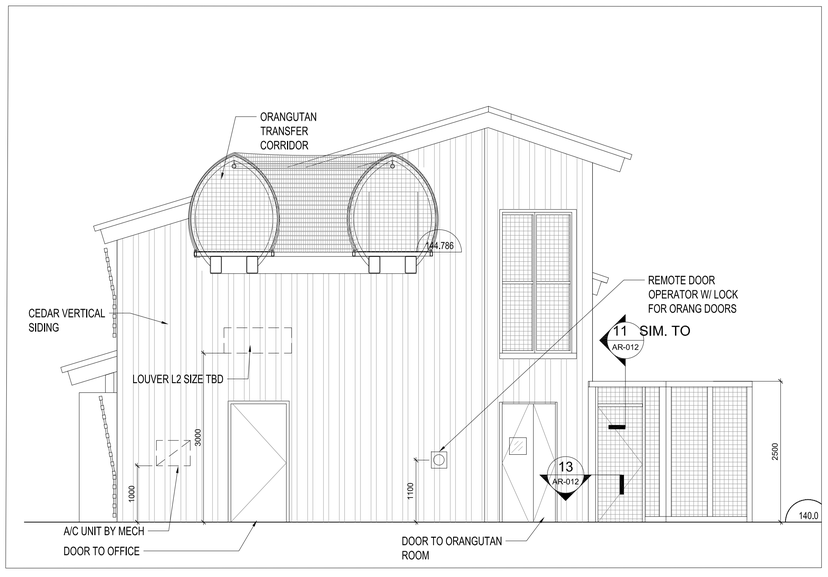
GENERAL NOTES:
1, ALL EXPOSED CONCRETE IN RESEARCH BUILDING & GLASS VIEWING AREA TO BE INTEGRAL PIGMENTED CONCRETE BY INTERSTAR
COLOUR: CHPAPS BN2520R ; TO MATCH PLAZA CONC. PAVING COLOUR.
2. .ALL WINDOW OR GLAZING FRAME TO BE DARK BROWN (COLOUR TBD).



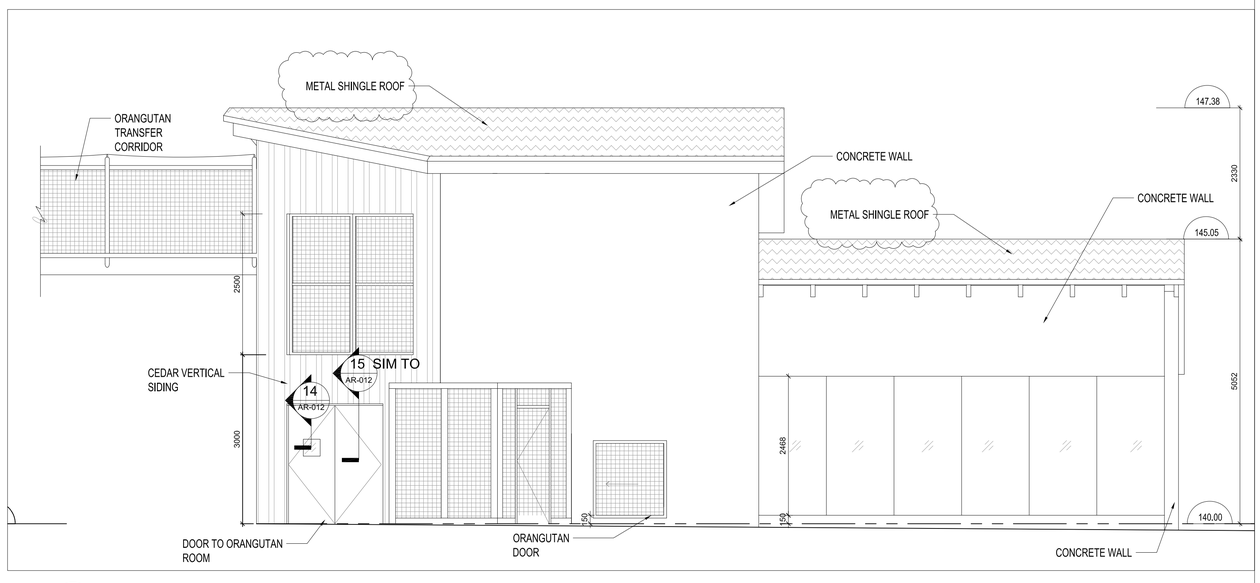
4 EAST ELEVATION
AR-123 SCALE - 1:50



2 NORTH ELEVATION
AR-123 SCALE - 1:50



3 WEST ELEVATION
AR-123 SCALE - 1:50



1 SOUTH ELEVATION
AR-123 SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
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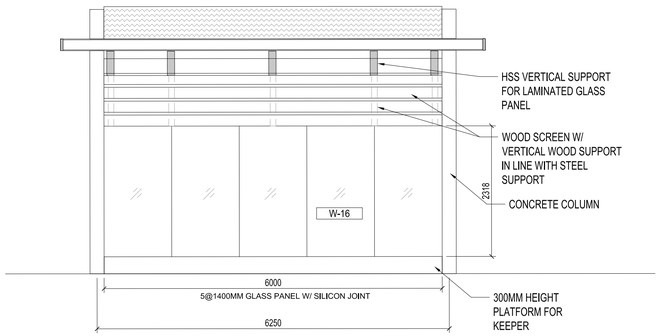
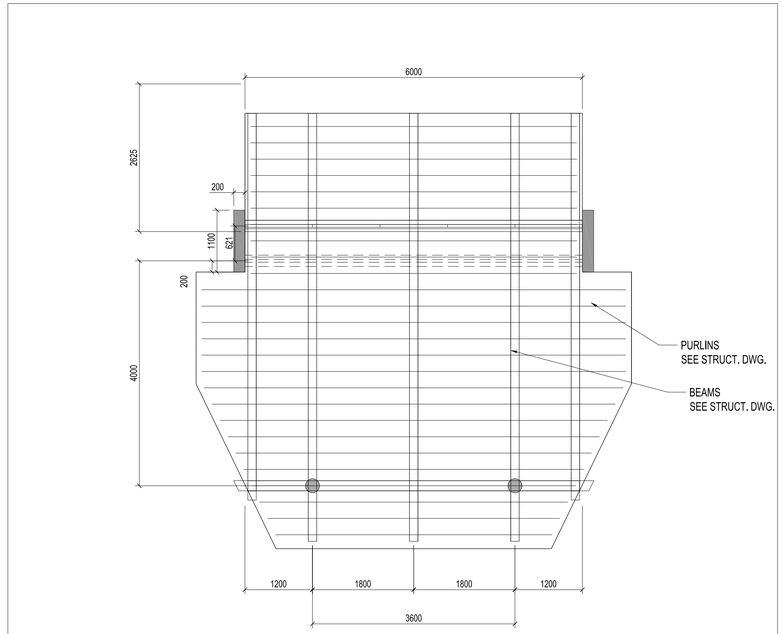
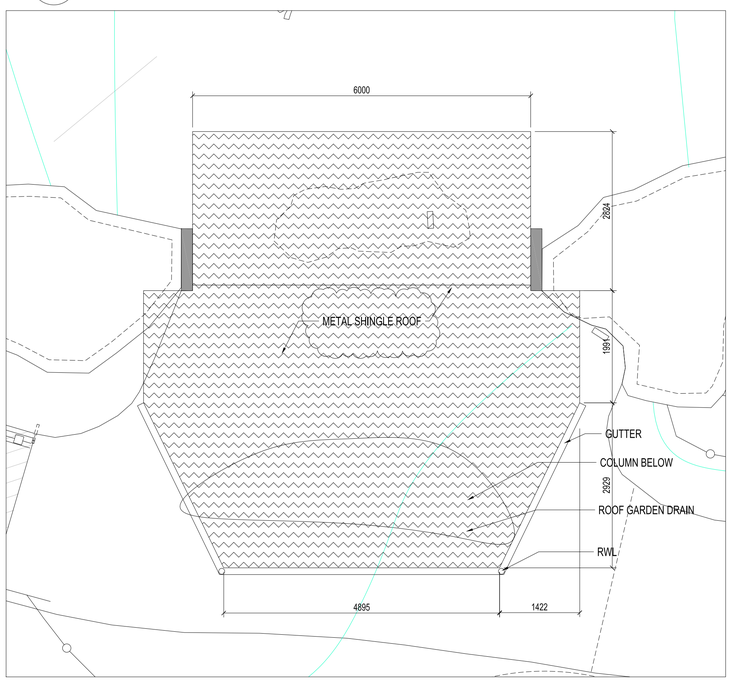


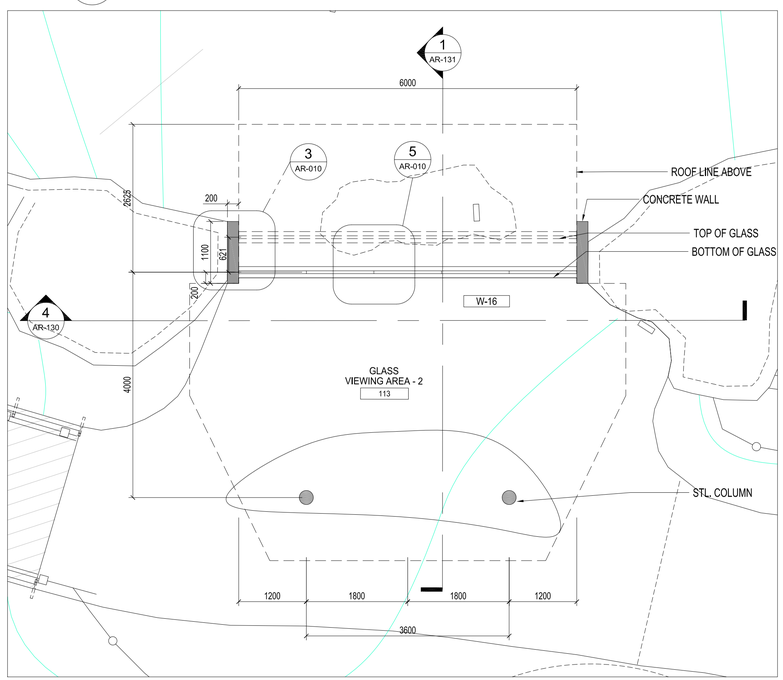
4 AR-130 SECTION
SCALE - 1:50



2 AR-130 REFELCTED CEILING PLAN
SCALE - 1:50



3 AR-130 ROOF PLAN
SCALE - 1:50



1 AR-130 CONSTRUCTION PLAN
SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
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4		ADDENDUM # A-002	2020-01-08

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PROJECT:
ORANGUTAN EXHIBITS

DRAWING NAME :

HABITAT 1
GLASS VIEWING TRELLIS PLANS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
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SCALE:
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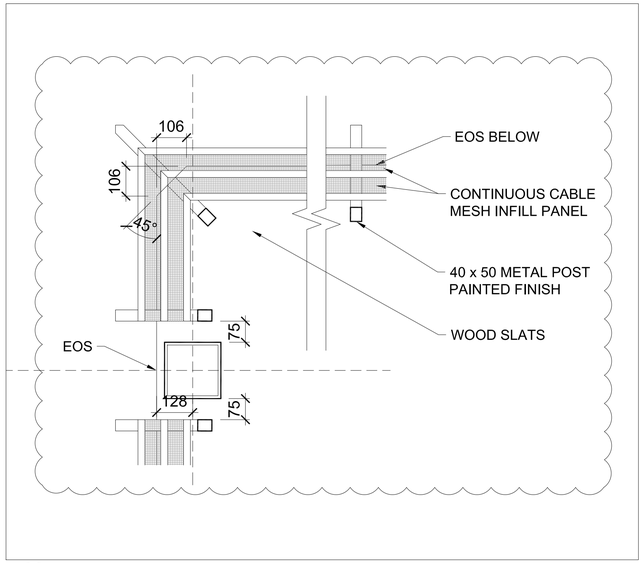
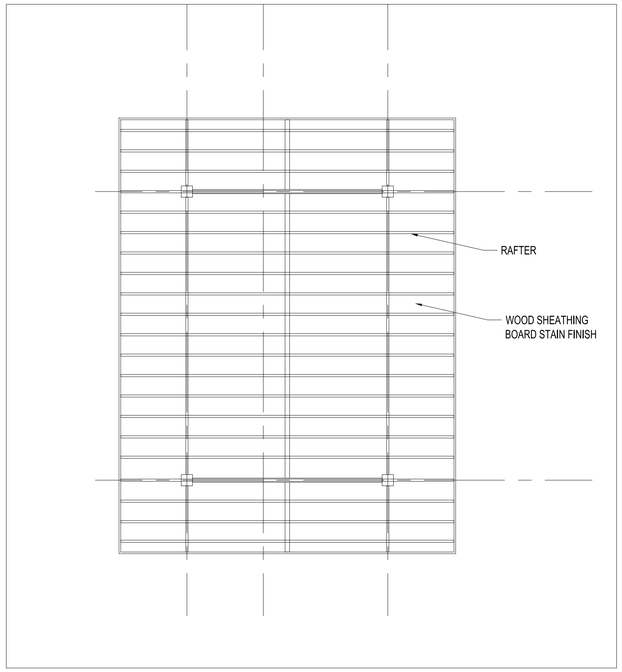
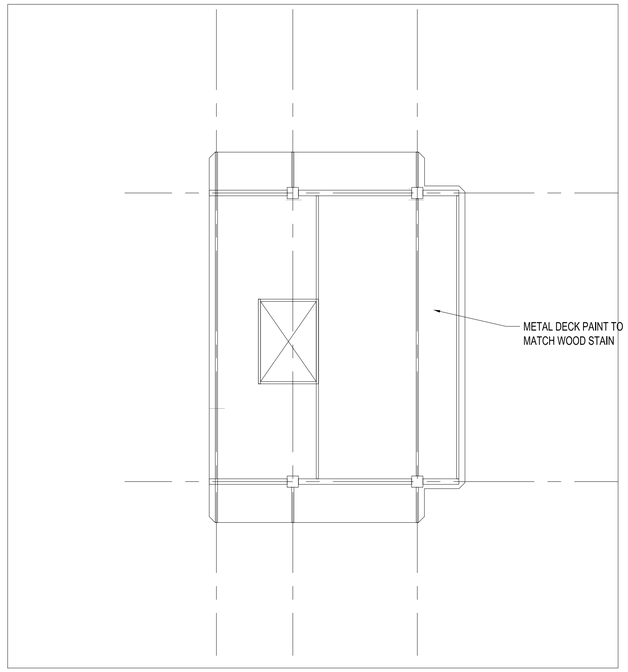


6 AR-140 GUARDRAIL CONER DETAIL
SCALE - 1:10



4 AR-140 REFELCTED CEILING PLAN - UPPER LEVEL
SCALE - 1:50



2 AR-140 REFELCTED CEILING PLAN - LOWER LEVEL
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NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
4		ADDENDUM # A-002	2020-01-08

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CLIENT: **TORONTO ZOO**

toronto zoo
361A Old Finch Ave, Toronto, ON M1B 5K7 · 416-392-5929

PROJECT:
ORANGUTAN EXHIBITS

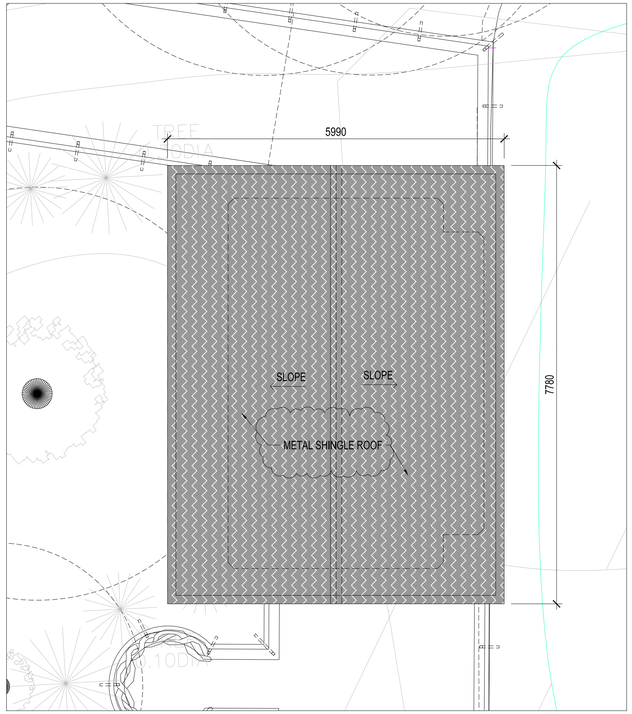
DRAWING NAME :

HABITAT 1
TREE HOUSE PLANS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	LL	LC

SCALE:
AS NOTED
DECEMBER 11,2019

DRAWING NUMBER:
AR-140



5 AR-140 METAL SHINGLE ROOF PLAN
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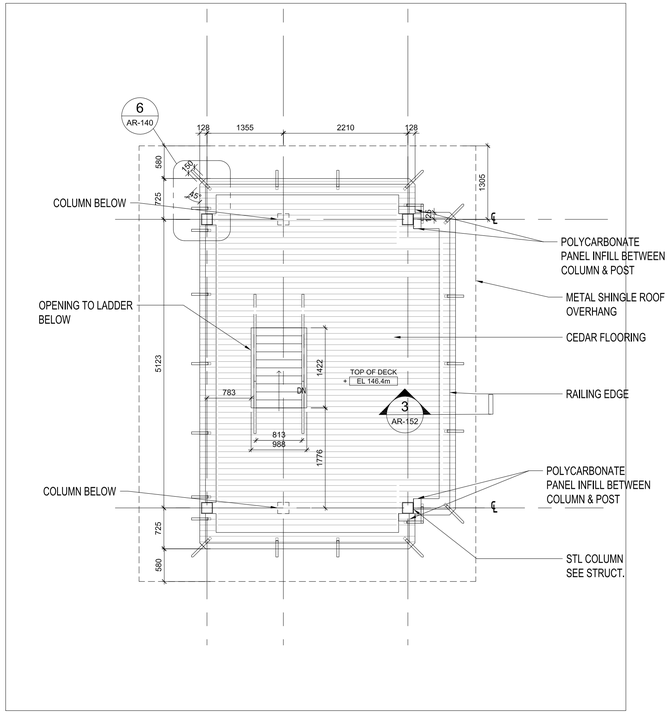
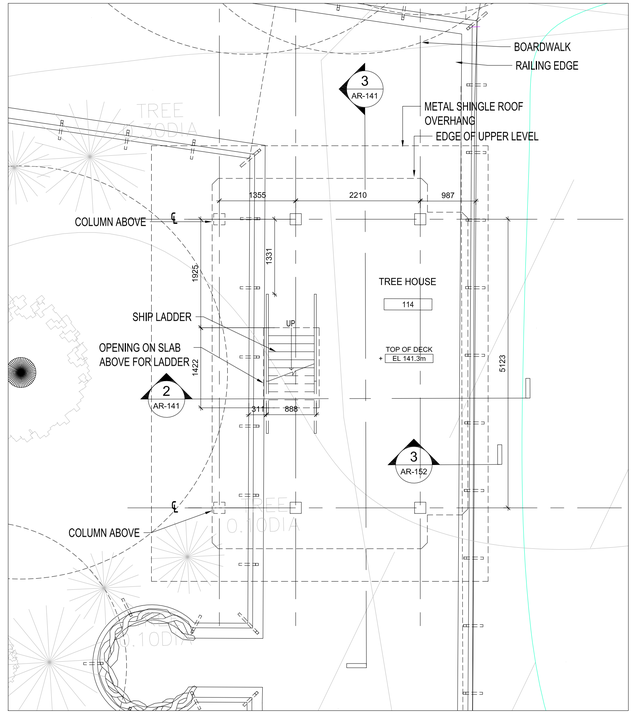
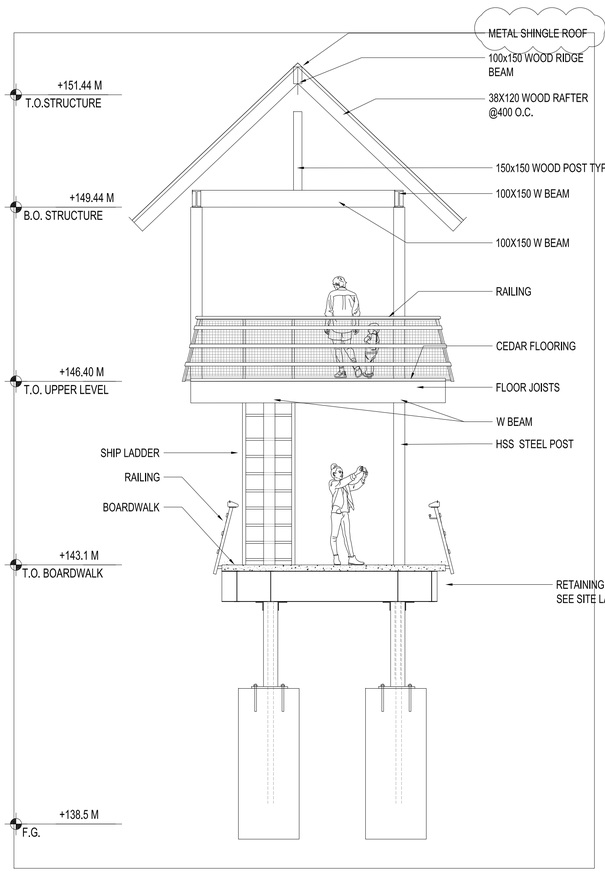


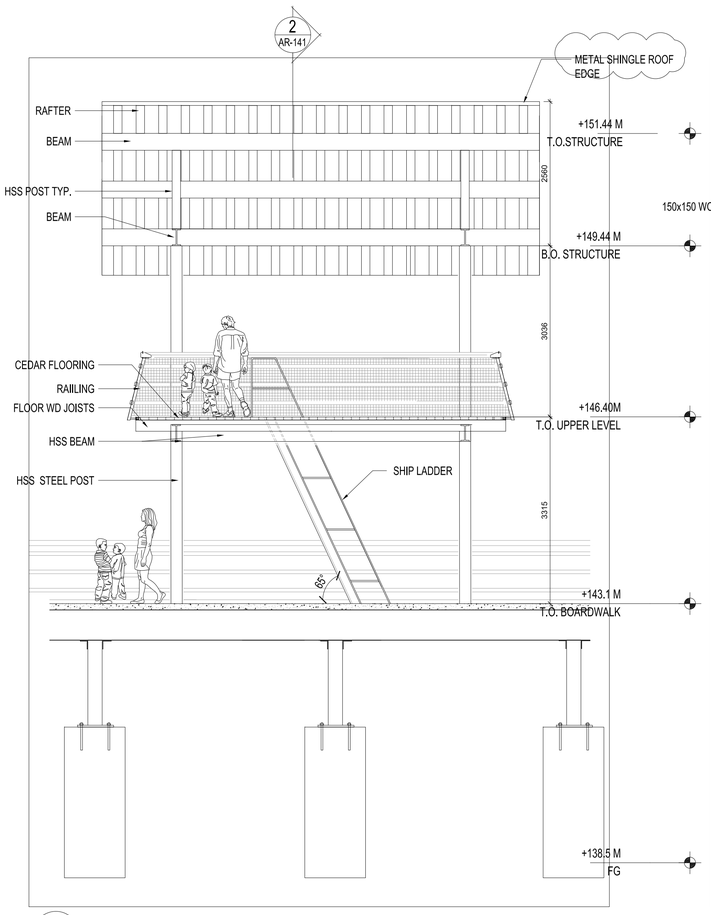
3 AR-140 CONSTRUCTION PLAN - UPPER LEVEL
SCALE - 1:50



1 AR-140 CONSTRUCTION PLAN - LOWER LEVEL
SCALE - 1:50



4 AR-141 ELEVATION
SCALE - 1:50



3 AR-141 SECTION
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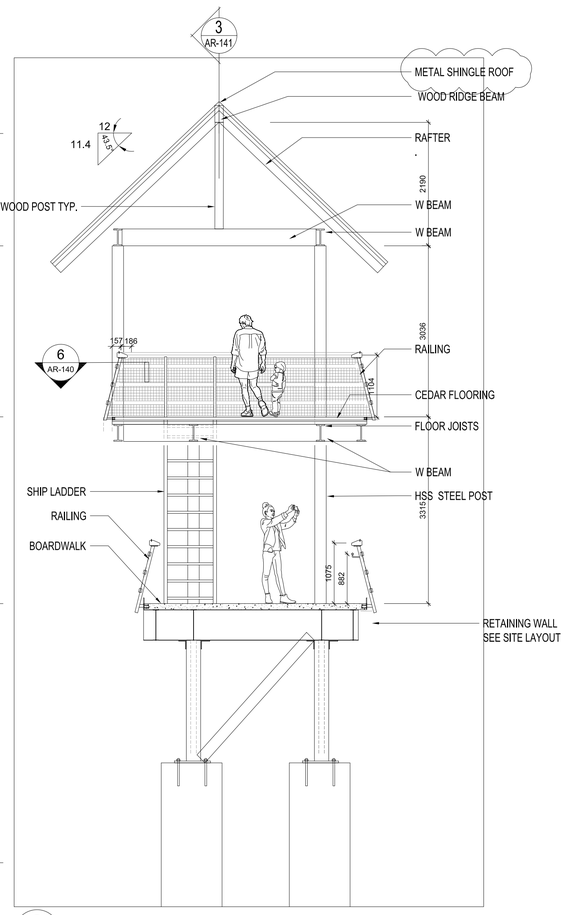

2 AR-141 SECTION
SCALE - 1:50

NO.	REV.	ISSUED FOR	DATE
1		PERMIT	2019-11-14
2		TENDER REVIEW	2019-12-06
3		TENDER	2019-12-11
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CLIENT: **TORONTO ZOO**

toronto zoo
361A Old Finch Ave, Toronto, ON M1B 5K7 · 416-392-5929

PROJECT:
ORANGUTAN EXHIBITS

DRAWING NAME :

HABITAT 1

TREE HOUSE SECTIONS AND ELEVATIONS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	LL	LC

SCALE:
AS NOTED
DECEMBER 11,2019

DRAWING NUMBER:
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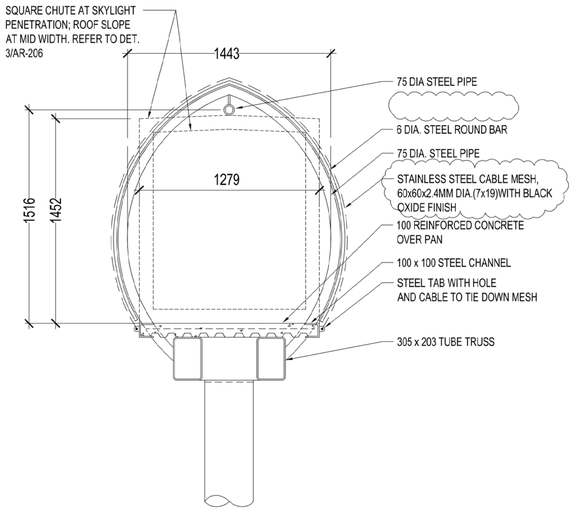
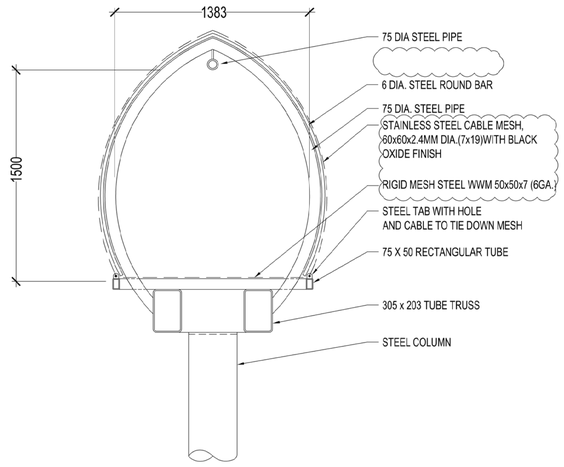


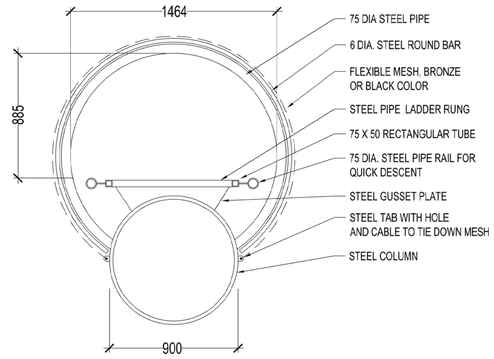
1 CHUTE W/ CONC WALKWAY (OUTDOOR)

scale: 1:20



2 CHUTE W/ MESH WALKWAY (INDOOR)

scale: 1:20



3 VERTICAL CHUTE AT LARGE POLE

scale: 1:20

GENERAL NOTES:

1. ALL EXTERIOR METAL TO BE EITHER GALVANIZED OR STAINLESS STEEL TYPE 304

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PROJECT:
ORANGUTAN EXHIBITS

DRAWING NAME :

HABITAT 2
CHUTES DETAILS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	LL	LC

SCALE:
AS NOTED
DECEMBER 11,2019

DRAWING NUMBER:

AR-210

1 GENERAL

1.1 The requirements of the Articles of Agreement, Conditions of the Contract, Division 1 apply to and form all Sections of the Contract Documents and the Work.

1.2 Work in this Specification is divided into descriptive sections which are not intended to identify absolute contractual limits between Subcontractors, nor between the Contractor and their Subcontractors. The Contractor is responsible for organizing division of labour and supply of materials essential to complete the Contract. The Consultant assumes no liability to act as an arbiter to establish subcontract limits between Sections or Divisions of Work.

1.3 It is intended that Work supplied under these Contract Documents shall be complete and fully operational in every detail for the purpose required. Provide all items, articles, materials, services and incidentals, whether or not expressly specified or shown on Drawings, to make finished Work complete and fully operational, consistent with the intent of the Contract Documents.

1.4 Work designated as “N.I.C.” is not included in this Contract.

1.5 Specifications, Schedules and Drawings are complementary and items mentioned or indicated on one may not be mentioned or indicated on the others.

1.6 Contractors finding discrepancies or ambiguities in, or omissions from the Drawings, Specifications or other Contract Documents, or having doubt as to the meaning and intent of any part thereof shall contact the Consultant for clarification.

1.7 Mention in the specifications or indication on the drawings of materials, Products, operations, or methods, requires that the Contractor provide each item mentioned or indicated of the quality or subject to the qualifications noted; perform according to the conditions stated in each operation prescribed; and provide labour, materials, Products, equipment and services to complete the Work.

1.8 Where the singular or masculine is used in the Contract Documents, it shall be read and construed as if the plural, feminine or neuter had been used when the context or the statement so requires and as required to complete the Work, and the rest of the sentence, clause, paragraph, or Article shall be construed as if all changes in grammar, gender or terminology thereby rendered necessary had been made.

1.9 The terms “approved”, “review”, “reviewed”, “accepted”, “acceptance”, “acceptable”, “satisfactory”, “selected”, “directed”, “instructed”, “required”, “submit”, “permitted”, “approved alternative”, “approved equal”, or similar words or phases are used in standards or elsewhere in Contract Documents, it shall be understood, that words “by (to) the Consultant” follow, unless context provides otherwise.

1.10 The term ‘or approved alternative’ following a list of Products, systems, or manufacturers used in the Contract Documents shall be construed to mean approved by Consultant. Specified products to be Base Bid. Contractor to follow ‘Substitution’ procedures specified in Section 01 60 00 for submitting proposed Products, systems, and manufacturers and obtain Consultant’s approval of the same prior to proceeding with ordering proposed Products and systems or engaging manufacturers. Contractors who purchase Products and systems or engage manufacturers prior to Consultant’s review and acceptance do so at their own risk.

1.11 Where the words 'submit', 'acceptable' and 'satisfactory' are used in the Contract Documents, they shall be considered to be followed by the words 'to the Consultant' unless the context provides otherwise.

1.12 The terms “exposed” or “exposed to view” refers to surfaces that are within the line of vision of persons from any accessible viewpoint, both within and without the building. Where any part of a surface is exposed to view, all other portions of that surface shall also be considered as exposed to view.

2 EXISTING SITE CONDITIONS

2.1 Make a careful examination of the site, and investigate and be satisfied as to all matters relating to the nature of the Work to be undertaken, as to the means of access and egress thereto and therefrom, as to the obstacles to be met with, as to the extent of the Work to be performed, any limitations under which the work has to be executed, and any and all matters which are referred to in the Contract Documents. Claims for additional costs will not be entertained with respect to conditions which could reasonably have been ascertained by an inspection prior to Tender closing.

2.2 Report any inconsistencies, ambiguities, discrepancies, omissions, and errors between Site conditions and Contract Documents to the Consultant prior to the commencement of Work. If inconsistencies, ambiguities, discrepancies, omissions, and errors are not reported and clarified, the most stringent requirement shall govern, as determined by the Consultant. Ensure that each Subcontractor performing work related to the site conditions has examined it so that all are fully informed on all particulars which affect the Work thereon in order that construction proceeds competently and expeditiously.

2.3 Before commencing the Work of any Section or trade, carefully examine the Work of other Sections and trades upon which it may depend, examine substrate surfaces, and report in writing to the Consultant, defects which might affect new Work. Commencement of Work shall constitute acceptance of conditions and Work of other sections, trades, and Other Contractors upon which the new Work depends. If repair of surfaces is required after commencement of specific work it shall be included in the work of the trade providing the specific system or finish.

3 USE OF SITE

3.1 Accept full responsibility for assigned work and storage areas from the time of Contract award until Substantial Performance of the Work.

3.2 Check means of access and egress, rights and interests which may be interfered with. Do not block lanes, roadways, entrances of exits. Direct construction traffic and locate access to site as directed by municipality.

3.3 Where encroachment beyond property limits is necessary make arrangements with respective property owners.

3.4 Before vehicles or equipment enter the Site, obtain permission from the Owner/Consultant for storage and appropriate access route. Appropriately barricade, stake off, or snow fence access route and storage area and around construction area in order to minimize damage to buildings, grounds, planting, turf, and surrounding facilities at the Site, and to restrict unauthorized persons from entering the construction area. Be responsible for making good any/all damages caused by operations at the Site. Restoration of such damages shall be to original condition and to the satisfaction of the Owner.

3.5 Cost of providing temporary protection, roads and services, including removal of same at completion of the Work and restoration of the involved areas to original state, shall be included in the Bid Price.

3.6 Maintain the exterior of the affected existing building during performance of the work. provide proper housekeeping measures to maintain a neat and orderly site to eliminate any complaints from surrounding neighbours.

4 ACCESS/PROPERTY CONSTRAINTS

4.1 Working hours:

.1 Working hours outside the pavilion are on a 24/7 basis.

.2 Working hours inside the pavilion are from 7:30 am to Zoo close. Zoo close is at 4:30 pm during winter and 7:00 pm during summer, Monday-Sunday).

.3 Shutdown schedule for feeder replacements is to be determined. Noted shutdown will occur during the daytime on a weekday.

4.2 Provide and maintain access facilities as may be required for access to the Work.

4.3 Minimize disruption, noise and dust to the functions of existing operational areas of existing buildings affected by Work of this Project. Times of entry, routes of access and time required to complete the Work shall be arranged and scheduled in cooperation with the Owner.

4.4 Confine Work and operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the premises with products.

4.5 Organize delivery of materials/equipment to and removal of debris and equipment from place of Work to permit continual progress of work and suitable for restricted site conditions.

4.6 Determine and make arrangement as required for loading and unloading of equipment and Products at times that will not affect public traffic flow and that will be permitted by the City of Toronto. Conform to City by-laws with regard to parking restrictions and other conditions.

4.7 Make provisions and arrangements and provide allowances if times for loading and unloading allowed by the City of Toronto are other than regular working hours.

4.8 All Products, materials and equipment required on Site shall be portable and/or size suitable for access and movement on Site and without causing damage to buildings.

4.9 The Work shall be confined to the area defined on the drawings and by the property lines except that services connections and certain portions of landscaping, hard paving and curb work shall be executed on Municipal property under regulation of authorities.

4.10 Provide locked doors in barriers, permit access by Owner and Consultant to Work areas and to areas Contractor is responsible for.

4.11 Workers shall not enter existing building requiring remedial work beyond construction areas except where required for connection or modification to existing services or other such work. Arrange such requirements with Owner prior to entering existing occupied areas.

4.12 Personnel access and material deliveries to the Site shall be only by routes designated by the Owner. Deliver Products between the hours as agreed upon by the Owner. Owner's equipment such as trucks, bins, dollies, and other such equipment/facilities shall not be used by Contractors. Arrangements for handling items weighty or bulky enough to require special treatment must be made and reviewed with the Owner.

4.13 Advise the Owner 48 hours in advance of large or cumbersome item deliveries. Give particulars of item size and weight, protection to existing surfaces to be provided and safety precautions during movement.

5 **SECURITY**

5.1 Be responsible for security of all areas affected by Work of this Contract until taken over by Owner. Take steps to prevent entry to the Work by unauthorized persons and guard against theft, fire and damage by any cause.

5.2 Provide suitable surveillance equipment and /or employ guard services, as required to adequately protect the work.

5.3 Make provisions to permit Owner's security personnel to view areas where all Work is being performed.

5.4 Use of facilities such as building entrances, washrooms, and access routes and paths through the Site as directed by Owner's security personnel and as specified.

5.5 Take acceptable precautions to guard Work site, premises, materials and the public during and after working hours due to the Work of this Contract.

5.6 A regular full time watchman is generally not required on Site, however, if in the opinion of the Consultant the Work is not adequately protected, the Owner may request that a watchman be employed by the Contractor at no extra cost to the Contract.

5.7 Any security service provided by the Owner is for the protection of the Owner's interest in the Work on the Site and shall not relieve the Contractor of the responsibility to protect the construction site and the Work of the Contract.

6 WEATHER

6.1 Incorporate into the Contract Schedule allowances for the number of working days lost due to inclement weather, which can be anticipated, on the basis of analysis of information available from Environment Canada, for weather conditions on and near the Site, over the last ten (10) years. The Contractor may be entitled to a schedule extension for those activities on the critical path which are delayed on account of inclement weather, assessed on a quarterly basis, by the number of days in excess of the anticipated number of working days for the quarter in question by more than 20%. No additional payment will be made on account of any such schedule extension.

6.2 For the purpose of this clause the quarters are defined as January 1 to March 31, April 1 to June 30, July 1 to September 30, and October 1 to December 31.

7 WASTE AUDIT/PLANS FOR WASTE REDUCTION

7.1 Comply with requirements of authorities having jurisdiction.

7.2 Prepare and submit waste audit and waste reduction plan in accordance with Ontario Regulation 102/94 Waste Audits and Waste Reduction Workplans.

7.3 Prepare and submit source separation plan in accordance with Ontario Regulation 103/94 Industrial, Commercial and Institutional Source Separation Programs.

7.4 Deliver to nearest appropriate depot all materials accepted for recycling by the region or municipality having jurisdiction over the Place of Work, including but not limited to cardboard, paper, plastic, aluminum, steel, and glass. Deliver to nearest appropriate depot all scrap and excess gypsum wallboard for recycling of this material. Pay all costs for this work.

END OF SECTION

1 TEMPORARY CONTROLS

1.1 Hoarding, fencing and barriers:

.1 Before commencing operations, supply, erect and maintain hoarding around entire perimeter of construction area as required. Paint outside of hoarding in a colour selected by the Consultant and mark with "POST NO BILLS" signs.

.2 Before commencing operations, supply, erect and maintain chain link fence 1800 mm high around entire perimeter of Site to protect public and private property from injury or damage.

.3 Provide temporary enclosures as required to protect the existing building where remedial work is occurring in its entirety or in its parts, against the elements, to maintain environmental conditions required for work within the enclosure, and to prevent damage to materials stored within and to protect the overall construction site.

.4 Provide lockable gates through hoarding, fencing, and barriers for access to Site by workers and vehicles.

1.2 Prevent unauthorized entry to the Site. Barricade, guard or lock access points to the satisfaction of the Consultant and post "NO TRESPASSING" signs.

1.3 Provide hoarding, barriers and covered walkways required by governing authorities for public safety, public rights-of-way and for access to the existing building.

1.4 Provide temporary exterior and/or interior barrier free ramps/guardrails/handrails as required to permit public access to existing complex functions.

1.5 Install signs for movement of people around Work Site as required and directed by the Consultant.

1.6 Provide secure, rigid guide rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs as required for protection of Work, workers, and the public.

1.7 Remove hoarding, fencing, barriers, existing building enclosures, guide rails and barricades upon Total Performance of the Work unless otherwise noted on the Contract Drawings or as directed by the Consultant.

2 SERVICE AND UTILITY SYSTEMS

2.1 Consult with utility companies and other authorities having jurisdiction to ascertain the locations of existing services on or adjacent to site.

2.2 Information as to the location of existing services, if shown on the Drawings, does not relieve the Contractor of his responsibility to determine the exact number and location of existing services.

2.3 Give proper notices for new services as may be required. Make arrangements with authorities and utilities for service connections required.

2.4 Pay any charges levied by utilities or authorities for work carried out by them in connection with this Contract, unless specified otherwise.

2.5 Operate and maintain all utility systems affected by work of this Contract, until the existing building or specific portions thereof have been accepted by the Owner.

2.6 Report existing unknown services encountered during excavation to Consultant for instructions; cut back and cap or plug unused services. Be responsible for the protection of all active services encountered and for repair of such services if damaged.

3 SCAFFOLDING, HOISTS AND CRANES

3.1 Select, operate, and maintain scaffolding, hoisting equipment and cranes as may be required.

3.2 Do not erect or operate equipment that will endanger existing structures, local municipalities hydro installations, or traffic signals.

3.3 Design and construct scaffolding in accordance with CAN/CSA S269.2-M.

4 TEMPORARY WORKS

4.1 Installation and Removal: Provide temporary utilities, facilities and controls in order to execute the Work expeditiously. Remove from Site all such Work after use.

4.2 Arrange for connections with ***appropriate utility company for temporary utilities or pay to use*** Owner***'s*** utilities ***(such as water, power and gas).*** ~~and~~ ***P***ay all costs for installation, maintenance and removal.

4.3 ~~Be responsible for the careful and reasonable use of Owner supplied water and power.~~ ***Pay all costs for temporary works consumed prior to Contract Completion.***

4.4 Temporary Power and Lighting Systems:

.1 Supply, install and maintain electrical power and necessary electrical equipment including overhead and underground feeders, transformers, motors, starters, panels, protective devices and equipment. Connections will be made available to any part of the Work within distance of a 30 m extension.

.2 Provide temporary lighting inside and outside structure of adequate intensity to illuminate construction activities. Provide temporary pedestrian lighting for sidewalk areas affected by the Work.

.3 Supply and install the type and quantity of minimum lighting equipment in each location to ensure adequate, continual illumination 24 hours per day, 7 days per week for the following:

.1 Emergency evacuation, safety and security throughout the Project at intensity levels required by jurisdictional authorities.

.2 General lighting for performance of the Work throughout the Project, evenly distributed, and at intensities to ensure that proper installations and applications are achieved.

.3 Performance of finishing trades in area as required evenly distributed, and of an intensity of at least 50 Lux.

.4 In locations approved by the Consultant. install and support the electrical plant, distribution and temporary lighting systems including service equipment and local hydro authority meter energized by the local hydro circuits. Installations shall be approved by the Consultant and shall be carried out in a neat manner to avoid interference with the application of finish material and to facilitate removal when the installed permanent lighting system is in operation.

.5 Make all necessary arrangements for and pay all costs for a temporary electrical service of sufficient capacity to supply temporary lighting, operation of power tools, cranes and equipment for all construction, implementation, and inspection and testing purposes. Supply and install necessary temporary cables and other electrical equipment and make all temporary connections as required.

.6 Temporary power distribution wiring shall comply with Ontario Hydro Electrical Safety Code. Obtain inspection certificates for temporary electrical work.

.7 Maintain the lighting systems in operation during the life of the Contract. Replace burned or missing lamps immediately.

.8 Upon Total Performance of the Work, remove electrical plant and temporary lighting from the Site.

4.5 Water supply:

.1 Provide and pay for a continuous supply of potable water for construction use. Provide as a minimum one water connection on each floor level.

.2 Provide and maintain all temporary lines, extensions and hoses as required. Remove all temporary connections and lines on completion of the Work and make good any damage.

4.6 Temporary Heating:

.1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.

.2 Construction heaters used inside buildings must be vented to the outside or be flame less type. Solid fuel salamanders are not permitted.

.3 Maintain temperatures of minimum 10°C in areas where construction is in progress unless otherwise indicated in the Contract Documents. Protect exposed and adjacent services from freezing. Repair at no cost to the Owner any such services, buildings or other utilities disrupted by freezing.

.4 Ventilate heated areas and keep structures free from exhaust combustion gases.

.5 The permanent heating system of the building or portions thereof may be used when available only upon written permission by Consultant. If permission to use heating system is obtained:

.1 Before using air handling systems, ensure that dust/debris is removed from the premises and install temporary filters to prevent construction dust/debris from entering via return air or intake openings. keep unused ducts sealed to prevent entry of dust/debris. Replace filters frequently during construction.

.2 On competition of work remove temporary filters and install new filters in accordance with Division 23. After temporary use of air handling system is complete and before turning over system to Owner, vacuum internally to ensure all dust/debris is removed.

4.7 Temporary telephone and facsimile: Provide and pay for separate telephones and facsimile services, for local call only, as required for own use and use of the Consultant and Owner. Long distance call shall be paid by party making call.

4.8 Sanitary facilities: Provide sanitary facilities in accordance with occupational health and safety requirements in the place of the Work. Use of Owner's existing sanitary facilities on site is ***not*** allowed.

5 PROTECTION

5.1 Protect surrounding property from damage during performance of the Work.

5.2 Take all necessary precautions to prevent damage to work affected by temperature, water, weather and other environmental conditions.

5.3 Protection of building finishes and equipment:

.1 Provide protection for existing structure, finished and partially finished building finishes, waterproofing systems, and equipment during performance of the Work.

.2 Cover Owner's equipment and plant within the Site with 6 mil PVC sheet, or equal, taped to make it dust-tight. Equipment and existing work moved or altered to facilitate construction, movement of Products or equipment shall be stored, protected with dust-tight covers and subsequently returned to its original location.

.3 Obtain approval from the Consultant prior to the installation of temporary supporting devices into existing roof, ceiling, or wall members for the erecting of equipment or machinery. Repair roof, ceiling, and wall members used for this purpose to the satisfaction of the Consultant.

.4 Provide necessary screens, covers and hoarding as required.

.5 Provide temporary weather tight, dust tight, and lockable partitions within the building where work is performed. Provide weather tight closures to unfinished door and window openings, and other openings in roofs.

.6 Any Products or equipment damaged while carrying out the Work shall be restored with new Products or equipment matching the original equipment. Damage shall include harm resulting from all construction work, such as falling objects, wheel and foot traffic, failure to remove debris, operation of machinery and equipment, and scaffolding and hoisting operations.

.7 Protect finished surfaces of new work from damage by restriction of access or by use of physical means suitable to the material and surface location. Where construction operations must be performed or traffic routed over finished floors, lay 6 mm plywood coverings tightly fitted and secured over surface in such areas.

5.4 Fire Protection:

.1 Take precautions to prevent fires. Provide and maintain temporary fire protection equipment of a type appropriate to the hazard anticipated in accordance with authorities having jurisdiction, governing codes, regulations, by-laws and to the satisfaction of the Consultant and insurance authorities.

.2 Excessive storage of flammable liquids and other hazardous materials is not allowed on Site. Flammable liquids must be handled in approved containers. Remove combustible wastes frequently.

.3 Inspect temporary wiring, drop cords, extension cables for defective insulation or connections frequently.

.4 Open burning of rubbish is not permitted on the Site.

.5 Handle, transport, store, use and dispose of gasoline, benzine or other flammable materials with good and safe practice as required by authorities having jurisdiction.

.6 Provide fire extinguishers of the non-freezing chemical type in each temporary building, enclosure and trailer. Use only fire-proofed tarpaulins.

.7 A fire watch shall be required for each of the following activities regardless of the number, duration or size of the activity in operation:
- .1 any open flame activities(e.g., soldering and welding);
- .2 shutdown of fire detection system;
- .3 shutdown of sprinkler system.

5.5 Maintain adequate cover over services as required by Utility Authorities.

5.6 Report any discharge of a contaminant to the Authorities having jurisdiction.

6 **PEST CONTROL**

6.1 Be responsible to provide control measures, restraining procedures, and treatments to prevent infestation and spread of insects, rodents and other pests deemed to be present at Site and/or noticed during course of the Work. Carry out fumigation, pest control procedure, and posting of warning signs, notices including contents of such notices in accordance with requirements of Pesticides Act and any other authorities having jurisdictions. Pesticides used shall be in accordance with Canada Pest Control Products Act, and provincial and municipal regulations.

7 **FIRST-AID FACILITIES**

7.1 Provide site equipment and medical facilities necessary to supply first-aid service to injured personnel in accordance with regulations of the Workmen's Compensation Act. Maintain facilities for duration of Contract.

8 **USE OF NEW PERMANENT SERVICE & EQUIPMENT**

8.1 Do not use any new permanent service or equipment without Owner's written approval.

8.2 Where permission is granted to use permanent services and equipment provide competent persons to operate services and equipment; inspect frequently and maintain facilities in proper operating condition at all times.

8.3 Permanent services and equipment shall be turned over to Owner in "as new" and perfect operating condition.

8.4 Use of permanent systems and equipment as temporary facilities shall not affect the warranty conditions and warranty period for such systems and equipment. Make due allowance to ensure that Owner will receive full benefits of equipment manufacturers warranty after project takeover.

9 **PROJECT IDENTIFICATION**

9.1 If required, obtain approvals from jurisdictional authorities for temporary signs.

9.2 Do not display signs without the Consultant's and Owners written consent.

9.3 Maintain signs in good condition for the duration of Contract.

10 **SITE MAINTENANCE**

10.1 Maintain the Site and adjacent premises in a clean and orderly condition, free from debris and other objectionable matter. Immediately remove rubbish and surplus Products, equipment and structures from the Site. If the Site is not cleaned (within 48 hours after the Contractor has been instructed to do so), the Consultant may clean the Site and retain the cost from monies due, or to become due, to the Contractor.

10.2 When the Work is substantially performed, remove surplus Products, tools, construction machinery and equipment not required for the performance of the remaining Work.

11 SITE STORAGE AND OVER LOADING

11.1 Confine the Work and operations of employees to limits indicated by the Contract Documents. Do not unreasonably encumber the Site with Products.

11.2 Products shall be stored only in areas designated or approved by the Consultant, and shall not be left lying on streets, sidewalks, boulevards or elsewhere within public view. Products which the Consultant may permit to be stored elsewhere than in the Contractor's storage areas shall be neatly stacked or otherwise disposed and shall be so maintained.

11.3 Fabrication shops shall not be set up within the structure except as directed by or with the permission of the Consultant.

11.4 Do not load or permit to be loaded any part of the Work with a weight or force that it is not calculated to bear safely. Be solely responsible and liable for damages resulting from violation of this requirement. Provide temporary supports as strong as permanent support.

11.5 Do not cut, drill or sleeve load bearing members unless shown on drawings or otherwise approved by the Consultant in writing for each location.

11.6 Site storage and loading requirements to be in accordance with the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

12 PUBLIC CONVENIENCE AND SAFETY

12.1 Promptly remove ice and snow from walkways surround the construction area.

12.2 Keep haul routes free at all times from Products spilled on street surfaces and clean streets of deposits due to performance of the Work to the satisfaction of the Consultant and street authorities. Clean streets within 24 hours of Consultant's instruction.

12.3 The Consultant may inspect haul routes, the Site and adjacent premises daily and may halt operations, withhold payment or carry out such additional operations as necessary, deducting the cost from monies due, or to become due, to the Contractor.

13 ACCESS AND EGRESS TO SITE

13.1 Where construction requirements demand, construct access roads capable of withstanding construction equipment and haul traffic. Maintain access roads in good condition at all times. Remove access roads prior to completion of the Work unless otherwise noted and restore area as shown on the Contract Drawings.

14 **PUBLIC TRAFFIC FLOW**

14.1 Provide and maintain flag persons, Police Officers, traffic signals, barricades and illumination as required by Authorities having jurisdiction and/or as necessary to perform the Work and protect the public.

15 **PUBLIC UTILITIES AND SERVICES**

15.1 Verify limitations imposed on project work by presence of utilities and services, and ensure no damage occurs to them.

15.2 Notify service authorities concerned so that they protect, remove, relocate, or discontinue them, as they may require.

15.3 Make arrangements and pay for connection charges for services required for project work.

15.4 Locate poles, pipes, conduit, wires, fill pipes, vents, regulators, meters, and sanitary services work in inconspicuous locations. If not shown on Drawings, verify location of service work with Consultant before commencing installation.

16 **ROADS, CURBS, GUTTERS, AND WALKS**

16.1 Include all curb cuts and making good of existing curbs, walks and paving on Municipal property to provide fully paved and finished approaches to requirements of authorities having jurisdiction.

17 **CONSTRUCTION PARKING *AND STAGING AREA***

17.1 ***Free p***arking ***and staging area*** will be permitted on Site in location as permitted by the Owner~~. and provided it does~~ ***Parking and staging area are*** not ***to*** disrupt the performance of Work, Site safety or the movement of vehicular or pedestrian traffic and ~~is~~ ***are to be*** acceptable to the Consultant.

18 **SITE VISITORS**

18.1 During the progress of the Work, afford access to visitors duly authorized by the Consultant and facilitate inspections or tests they may desire to make. Record site visitors in log book maintained on site.

18.2 Ensure construction site visitors wear appropriate safety apparel.

19 **EROSION AND SEDIMENTATION CONTROL**

19.1 Refer to Section 31 25 00 for erosion and sedimentation control requirements for Work of this Project.

19.2 Conform to sedimentation and erosion control requirements of the local Conservation Authority and authorities having jurisdiction.

19.3 Prevent tracking of mud and dirt from site onto paved roads. Provide stabilized vehicle access/egress points, constructed of coarse granular material. Place additional granular material as required to maintain access/egress points in proper working order. Clean mud and dirt from paved roads at end of each day by shoveling or sweeping and subsequent washing. Dispose of mud dirt in a controlled disposal area.

20 TEMPORARY DRAINAGE AND DEWATERING

20.1 Drainage lines and gutters shall be kept open at all times. No flow of water shall be directed across or over pavements except through pipes or properly constructed troughs. Keep all portions of Work properly and efficiently drained during construction and until completion. Be responsible for all disturbances, dirt and damage which may be caused by or result from water backing up or flowing over, through, from or along any part of Work, or due to operations which may cause water to flow elsewhere.

20.2 Keep trenches and other excavations free of water at all times. Employ adequate means to remove water in a manner that will prevent loss of soil, and maintain the stability of excavation.

20.3 Dispose of such water in a manner that will not be dangerous to public health, private property or to any portion of Work completed or under construction, nor which causes an impediment to the use of streets by the public.

20.4 Drainage of trenches or other excavation through newly laid storm drainage pipe will be allowed only with the express permission of the authority having jurisdiction.

20.5 When drainage is directed to existing catch basins, regularly inspect and clean such catch basins of debris and sediment.

21 SNOW REMOVAL

21.1 Allow no accumulation of ice and snow on Site, and on roof deck when roofing operations are scheduled to take place.

21.2 Remove snow from access road, Site circulation paths and elsewhere as required to permit access to Work, parking and uninterrupted construction progress.

22 POLLUTION (DUST, DEBRIS, AND NOISE) CONTROL

22.1 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

22.2 Keep premises free of waste material.

22.3 Arrange and pay for removal of all waste generated by the work in manner acceptable to authorities having jurisdiction.

22.4 Limit noise levels in accordance with requirements of authorities having jurisdiction.

22.5 Maintain temporary erosion and pollution control features installed under this contract.

22.6 Control emissions from equipment and plant to local authorities emission requirements.

22.7 Prevent abrasive-blasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

23 **TREE PROTECTION**

23.1 Within Contractor's assigned work and storage areas and adjacent to designated access routes, protect existing trees and other plants scheduled to remain. Provide minimum 1.8 m high chain link fencing outside of dripline of trees or groups of trees and other plants.

23.2 Leave fenced areas undisturbed; do not use areas for storage, stockpiling or any other purpose. Do not dump or flush any contaminants in areas of tree feeder roots.

23.3 Do not attach rigging cables to trees.

23.4 Where limbs or portions of plants are required to be removed to accommodate new work, they shall be removed in accordance with accepted arboricultural practice.

23.5 Where root systems of protected trees adjacent to construction are exposed or damaged, they shall be neatly trimmed and the area backfilled with suitable material to prevent desiccation.

23.6 Where necessary give plants an overall pruning to restore the balance between roots and top growth and/or to restore appearance.

23.7 Except at locations where specific procedures are included in Contract Documents do not alter grades around existing trees/plants without first obtaining Consultant's consent and directions.

24 SITE OFFICE/TRAILER

24.1 Contractor to make their own provisions for a temporary site office/trailer to be used during the course of the Work.

24.2 Office/trailer location to be approved by the Consultant.

24.3 Keep temporary office and surrounding area clean and tidy.

24.4 ***Remove temporary site office/trailer upon Contract Completion. Restore surrounding area to match the existing surrounding area.***

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for the ***coated*** steel cabling system work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 CAN/CSA S16.1-M, Limit States Design of Steel Structures.

.2 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.

.3 NAAMM, The National Association of Architectural Metal Manufacturers.

1.3 **DESIGN REQUIREMENTS**

.1 Design ***coated steel*** cabling system, anchors and connections in accordance with CSA S16.1, S136.1, and to withstand live, dead, lateral, wind, seismic, handling, transportation, erection loads and Project loading requirements for usage by orangutans.

1.4 **SUBMITTALS**

.1 Shop drawings:
.1 Submit shop drawings for fabrication and erection of cabling in accordance with Section 01 33 00 indicating:
.1 Materials, core thicknesses, class of finish (AMP 555), connections, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.2 Samples:
.1 Submit samples in accordance with Section 01 33 00 of the following:
.1 Two 300 mm sample of ***coated*** steel cabling demonstrating material, size and ***vinyl coating*** finish ***and colour***.

1.5 **QUALITY ASSURANCE**

.1 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in work of comparable complexity and scope, to perform the following services as part of the work of this Section:
.1 Design ***coated*** steel cabling system and associated components.
.2 Review, stamp, date and sign shop drawings.

.2 Workmanship: Fabricate work of this Section to meet the required class of workmanship indicated below in accordance with NAAMM's AMP 555, Section 8.
- .1 Class 1: for use on direct exposed to view fabricated items:
  - .1 Exposed surfaces are finished smooth with pitts, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off.
  - .2 Distortions should not be visible to the eye.

.3 Mock-up:
- .1 Construct one full size mock-up of orangutan ***coated steel*** cabling system in location acceptable to Consultant, demonstrating workmanship and installation procedures and connections.
- .2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with work.
- .3 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.
- .4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

.4 Pre-installation meetings: Arrange meeting on Site to be attended by Consultant, Contractor, and cabling Subcontractor to inspect substrates, and to review installation procedures 48 hours in advance of installation.

2 Products

2.1 ACCEPTABLE MANUFACTURERS

.1 Tway Lifting Products.

.2 Or approved alternative.

2.2 MATERIALS

.1 General:
- .1 All materials under work of this Section, including but not limited to, primers and paints are to have low VOC content limits.
- .2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
- .3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of work of this Section.

.2 ***Coated s***teel cables and accessories:

.1 Vinyl coated structural steel cables ***with an outside diameter of 31 mm, consisting of 25 mm diameter steel cable and 3 mm thick vinyl coating,*** complete with anti-tamper connectors, cable 'O' lines***, end fittings and additional accessories as required for complete installation,*** ~~size and diameter as required to suit Project requirements~~.

.2 Coating material:

.1 UV stabilized vinyl ***coating*** material ***with a smooth gripping surface for orangutans, extruded under pressure into centre of cable to prevent peeling.***

.2 Colour: ~~in~~ ***C***olour as selected by the Consultant.

.3 Cable lengths:

.1 Average cable length of 20 m (65 ft).

.2 Approximate total length of 610 m (2000 ft).

.4 Fasteners: Corrosion resistant stainless steel fasteners as recommended by cabling manufacturer for securement of cabling.

.5 End terminations: Stainless steel swaged clevis end fittings suitable for application.

.6 Drilled inserts and anchoring system: Heavy-duty anchors, complete with all components required for a complete installation and to suit Project.

2.3 FABRICATION

.1 Fabricate ***coated*** steel cabling and associated components in accordance with reviewed shop drawings and manufacturer's written instructions.

.2 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.

.3 Carefully make and fit details. Take special care with exposed finished work to produce a neat and correct appearance to the Consultant's acceptance.

3 Execution

3.1 EXAMINATION

.1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 INSTALLATION

.1 Install ***coated*** steel cabling system in accordance with reviewed shop drawings, manufacturer's written instructions and to meet Owner's Project requirements.

.2 Make work in true planes with adequate fastenings.

.3 Install ***coated*** steel cabling system plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.

.4 Securely attach cabling and adjust for proper appearance.

.5 Ensure cabling system is installed taut and secure and meets the satisfaction of the Consultant.

3.3 CLEANING

.1 Cleaning cabling system and associated components in accordance with manufacturer's written instructions.

3.4 PROTECTION

.1 Do not permit subsequent construction activities to cause damage to appearance or operation of installed cabling system and accessories.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for the miscellaneous and metal fabrication work in accordance with the Contract Documents.

1.2 **REFERENCES**

.1 AAMA 2605, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.2 ANSI, H35.1M Alloy and Temper Designation Systems for Aluminum (Metric).

.3 ASTM A53, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.4 ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished

.5 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.

.6 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.7 ASTM A276, Specification for Stainless and Heat-Resisting Steel Bars and Shapes.

.8 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

.9 ASTM A392, Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.

.10 ASTM A480/A480M, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.

.11 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.

.12 ASTM B209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.13 ASTM B211, Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.

.14 ASTM B633,Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.

.15 ASTM C1107/C1107M, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

.16 ASTM E488/E488M, Standard Test Methods for Strength of Anchors in Concrete Elements.

.17 ASTM F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

.18 ASTM F1941/F1941M, Standard Specification for Electrodeposited Coatings on Mechanical Fasteners, Inch and Metric.

.19 ***ASTM F3125/F3125M, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.***

.20 CAN/CGSB 138.1-M, Fence, Chain Link, Fabric.

.21 CAN/CGSB 138.2-M, Fence, Chain Link, Framework, Zinc-Coated, Steel.

.22 CISC/CPMA 1.73a, A Quick-Drying One-Coat Paint for Use on Structural Steel.

.23 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.

.24 CAN/CSA S16.1-M, Limit States Design of Steel Structures.

.25 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.

.26 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.27 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.

.28 CSA W59-M, Welded Steel Construction (Metal Arc Welding).

.29 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.

.30 NAAMM, The National Association of Architectural Metal Manufacturers.

.31 Steel Structures Painting Council (SSPC), Steel Structures Painting Manual, Vol. 2.

1.3 **DESIGN REQUIREMENTS**

.1 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.

.2 Ensure no sharp edges occur in metal fabrications that will be exposed to orangutans.

1.4 **SUBMITTALS**

.1 Shop drawings:
- .1 Submit shop drawings for fabrication and erection of miscellaneous and metal items in accordance with Section 01 33 00 indicating:
  - .1 Materials, core thicknesses, class of finish (AMP 555), connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
  - .2 Ensure shop drawings are of one uniform size and based on field measurements.
  - .3 Adjacent construction, elevations and details, dimensions, gauges, finishes and relationship to adjacent construction.
  - .4 Show methods of fastenings, accessory items required, and design computations, and other pertinent data and information.

.2 Samples:
- .1 Submit samples in accordance with Section 01 33 00 of the following:
  - .1 Two 300 x 300 mm samples of guard cable mesh infill panel demonstrating material, pattern, powder coat finish and colour for the Consultant's approval.
  - .2 One 500 mm sample of grating tread with checker plate nosing at ship ladder.
  - .3 Two 300 x 300 mm samples of black coloured stainless steel rope mesh for use at chute assemblies, demonstrating material, mesh pattern, finish and colour for the Consultant's approval.
  - ***.4 Two 300 x 300 mm of galvanized woven wire mesh panel demonstrating material, opening and finish.***
  - ***.5*** Two 300 mm square wire fabric mesh with vinyl coating.
  - ***.6*** Each hardware item for pole feeder as specified. Tag samples identifying applicable Specification article number, brand name and number, finish, building location, date and catalogue number.

.3 Certification: Submit compliance certificate from Engineer of record certifying that guards, stairs and ladders meet design criteria and performance requirements of this Section.

1.5 **QUALITY ASSURANCE**

.1 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in work of comparable complexity and scope, to perform the following services as part of the work of this Section:
- .1 Design exhibit viewing window metal components, climbing pole metal components, steel stairs, handrails and railings, ladders, ***chute assemblies*** and metal fabrication items that are required to resist live, dead, lateral, wind, or seismic loads.
- .2 Review, stamp, date and sign shop drawings.

.2 Workmanship: Fabricate work of this Section to meet the required class of workmanship indicated below in accordance with NAAMM's AMP 555, Section 8.
.1 Class 1: for use on direct exposed to view fabricated items:
.1 Exposed surfaces are finished smooth with pitts, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished.
.2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.
.3 Distortions should not be visible to the eye.
.4 Exposed joints are fitted to a hairline finish.

.3 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

.4 Perform stainless steel work in accordance with NAAMM, Code of Standard Practice for the Metal Industry, Workmanship, Class 1.

1.6 SITE CONDITIONS

.1 Prior to submission of shop drawings, the metal fabrications Subcontractor shall verify that all field measurements are as indicated on Drawings, and notify the Consultant in writing of any major discrepancies. No fabrication shall proceed until all inconsistencies are corrected.

.2 Established dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions. Chute work not fitting the conditions as detailed and specified shall be rejected and replaced at no cost to the Owner.

2 Products

2.1 **MATERIALS**

.1 General:
.1 All materials under work of this Section, including but not limited to, primers and paints are to have low VOC content limits.
.2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
.3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of work of this Section.

.4 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharp defined profiles.

.2 Structural shapes, plates, and similar items: CAN/CSA-G40.20/G40.21-M, Grade 350W. Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.

.3 Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating, size and shape as shown.

.4 Stainless steel materials:
- .1 Stainless steel tubing: ASTM A269, Type 316, finish to X-L Blend S. Size as shown.
- .2 Stainless steel sheet and plate: ASTM A480/A480M, Type 316, finish to X-L Blend S. Size as shown.
- .3 Stainless steel shapes: ASTM A276, Type 316, finish to X-L Blend S. Sizes and shapes as shown.

.5 Aluminum materials:
- .1 Aluminum extrusions and channels: ASTM B211 and ANSI H35.1 AA6063 alloy, T6 temper.
- .2 Aluminum sheet: ASTM B209 and ANSI H35.1 AA1100 aluminum alloy, H14 temper.
- .3 Powder coat finish (retractable/lockable ladder): Manufacturer's standard powder coat finish in colour as selected by the Consultant.

.6 Pipe: ASTM A53/A53-M, Schedule 40 standard weight steel pipe, for ship ladder and bollard applications. Sizes as shown.

.7 Black stainless steel rope mesh:
- .1 2.4 mm wire rope diameter with mesh size of x 60 x 60 mm, Type 316 stainless steel rope mesh with black oxide finish, manufactured by Huamei Metal Mesh Factory or approved alternative.
- .2 Provide all components and accessories as required for complete and secure installation of mesh material at chute assemblies.
- ***.3 Flexible black stainless steel mesh to be used at outer perimeter mesh of transfer chute assemblies.***

.8 Galvanized woven wire mesh panels:
- ***.1 Woven wire crimped mesh with galvanized after weld finish.***
- ***.2 5 mm (6 ga.) mesh to be sized at 50 x 50 mm.***
- ***.3 Mesh to be complete with galvanized steel HSS framing, supports and fasteners as required for installation of mesh floor panels at chutes.***
- ***.4 Joints are to be continuously welded on animal side and ground smooth and with no ends typical.***

.5 ***Galvanized finish: Weight of metallic (zinc) Coating conforming to ASTM A 392, Type II, Class 2, 610 g/sq. m. with zinc coating applied before weaving.***

.6 ***Rigid galvanized steel woven wire mesh to be used at mesh floors of transfer chute assemblies where indicated.***

.7 ***Manufactured by A Thru Z Consulting and Distributing, Inc., Thermeq Company or LGL Animal Care Products, Inc.***

.9 Cable wire mesh infill panel (guards):

.1 4.1 mm diameter, drawn galvanized steel wire, electrically welded nominal 50 x 50 mm mesh, galvanized with powder coat finish as specified herein.

.2 Mesh, together with frame, shall be electrostatically finished in fabricator's shop with specified powder coat finish in colour as selected by the Consultant.

.10 Wire rope cabling and associated components (kick rails):

.1 Cabling: 5 mm diameter Type 316 stainless steel stranded wire rope to suit intended kick rail application. Manufactured by Unirope Ltd., Wire Rope Industries Ltd., or approved alternative.

.2 Accessories: Provide all components and accessories as required for complete and secure installation including but not limited to turnbuckles, fittings, hooks, clips, clamps, and eye bolts as required. Accessories shall be manufactured by Spae-Naur or approved alternative.

.11 Metal grating stair treads: Galvanized grating treads with checkered plate nosing. 'Welded Steel Treads' by Fisher & Ludlow Ltd.; Safety Steps' by IKG Borden; or 'Stair Treads' by Amico-ISG.

.12 Fence materials (barrier fence)

.1 Powder coated fence fabric: CAN/CGSB 138.1, powder coated No. 9 gauge steel wire woven in a 50 mm mesh, with knuckled finish top and bottom selvage edges.

.2 Posts, braces and rails: CAN/CGSB 138.2; Schedule 40 pipe, size, thickness, diameter and length to meet standard. Minimum galvanizing weight: 610 g/m^2 of uncoated base metal surface with powder coating.

.3 Bottom tension wire and tie wire fasteners: CAN/CGSB 138.1; Zinc-coated steel wire and zinc coating, same diameter as specified for chain link fence fabric.

.4 Tension bar: 19 x 4.88 mm galvanized steel.

.5 Tension bar bands: 33 x 19 mm minimum galvanized steel.

.6 Fittings and hardware: Galvanized steel with minimum galvanizing weight of 610g/m^2 of uncoated base metal.

.1 Post caps: Waterproof fit, to fasten securely over posts and, to carry top rail.

.2 Turnbuckles: Drop forged.

.7 Finish coating: Powder coating as specified herein in colour as selected by the Consultant.

.13 Welding materials: CSA W48 and CSA W59-M.

.14 Fasteners:

.1 Unless otherwise indicated, provide Type 316 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls ***and typical applications***. Select fasteners for type, grade, and class required.

.2 Steel bolts and nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A653/A653M; and, where indicated, flat washers.

.3 Anchor bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A653/A653M; and, where indicated, flat washers. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

.4 Exposed mechanical fastenings (chute work): Flush countersunk torx or hex socket machine screws and bolts; stainless steel finish; unobtrusively located; consistent with design of component, except where specifically noted otherwise. Fasteners, bolts, nuts, and washers: ASTM F3125/F3125M; all bolts, machine screws and fasteners shall be Type 316 stainless steel.

.5 Supply bolts of lengths required to suit thickness of material being joined, but not projecting more than 6 mm beyond nut, without the use of washers.

.15 Powder coat finish:

.1 Epoxy polyester coating conforming to AAMA 2605 with finish and colours as selected by the Consultant. 'Interpon D3000' by Interpon Powder Coatings (Akzo Nobel) or approved alternative. Provide manufacturers recommended primer.

.2 For use at cable mesh infill panels at guardrails and barrier fence fabric.

.16 Primer paint:

.1 Interior metal fabrications: CPMA 1.73a and in accordance with Section 09 91 00.

.2 Exterior metal fabrications: In accordance with Section 09 97 13 for exterior steel coating system.

.17 Galvanized primer paint: Inorganic zinc rich primer. For use on galvanized fabrications where touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.

.18 End sleeves: Galvanized steel sleeves for installation within concrete.

.19 Cast-in safety treads (metal pan stairs): Nosing base to be type 6063-T5 extruded aluminum; epoxy/abrasive filler to have minimum 60% aluminum oxide content; 'Spectra Type WP3SP' by Wooster Products Inc. or approved alternative. Colour to be selected by the Consultant.

.20 Anchors:

.1 Anchors, general: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M.

.2 Drilled inserts: “HSL-3" by Hilti Inc. or “Dynabolt Sleeve Anchors” by ITW Construction Products, heavy-duty anchors, sizes as shown.

.3 Adhesive anchor system: ‘HIT HY 200 Injectable Mortar with Hilti HAS Stainless Steel Anchor Rod System’ by Hilti Ltd. or approved alternative by ITW Construction Products, complete with all components required for a complete installation.

.21 Non-shrink, nonmetallic grout: Factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

.22 Pole feeder hardware:

.1 Heavy duty winch driven cable assembly complete with all hardware as required for complete and secure installation.

.2 Hardware to be corrosion resistant and suitable for pole feeder unit.

.23 Concrete: In accordance with Division 3 - Concrete.

2.2 FABRICATION

.1 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.

.2 Fit and assemble work in shop where possible. Execute work in accordance with details and reviewed shop drawings.

.3 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal work unless otherwise found acceptable by the Consultant.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications against corrosion in accordance with CAN/CSA S16.1-M.

.5 Execute shop welding to requirements specified.

.6 Carefully make and fit details. Take special care with exposed finished work to produce a neat and correct appearance to the Consultant's acceptance.

.7 Assemble members without twists or open joints.

.8 Correctly size holes for connecting work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.

.9 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.

2.3 **FABRICATED ITEMS**

.1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.

.2 Where work is required to be built into work of other Sections supply such members to respective Sections.

.3 Provide miscellaneous and metal fabrications indicated on the drawings, listed below, and not indicated to be supplied under other Sections. Provide miscellaneous and metal fabrications including but not limited to the following:

.4 Metal components for exhibit viewing windows:

.1 Provide galvanized steel bent plates and for fastening of viewing glass to structural steel members, and galvanized steel plates and angles as required for casting into concrete at sills, jambs and headers as shown on Contract Drawings.

.2 Coordinate with Section 08 80 01 as required for sizing and installation of laminated glass at intended viewing areas and Division 3 - Concrete for casting steel angles as required.

.3 Install exhibit viewing window members in accordance with reviewed shop drawings, plumb, true, and level.

.4 Finish and colour: Exterior steel coating for metal components in accordance with Section 09 97 13, in colour as selected by the Consultant.

.5 Metal pan stairs:

.1 Fabricate exterior galvanized bent steel pan stairs in accordance with reviewed shop drawings.

.2 Fabricate galvanized steel channel stringer of size, construction and attachment to structure as shown.

.3 Furnish treads, risers and landing permanent metal forms of steel sheet formed as shown; treads to be concrete filled in accordance with Division 3. Fabricate landings for concrete fill of same material as stair treads, unless ribbed metal deck form is shown.

.4 Support treads, risers and landings as detailed on reviewed shop drawings.

.5 Finish and colour: Exterior steel coating for galvanized steel components in accordance with Section 09 97 13, in colour as selected by the Consultant.

.6 Metal components for guardrails:
- .1 Provide galvanized steel components for guardrail consisting of a wood handrail, cable mesh infill panels, metal posts, stainless steel pipe handrail as end sleeves and additional components as indicated on Contract Drawings.
- .2 Coordinate with Section 06 20 00 as required for sizing and installation of wood handrail and wood slats at guardrails.
- .3 Design guard system to withstand minimum horizontal and vertical loads as required to meet requirements of authorities having jurisdiction. In no instance shall load design of railings be less than 3.0 kN/m horizontally and 1.5 kN/m vertically.
- .4 Ensure cable mesh infill panels are installed straight, smooth, plumb and free of wrinkles, buckles and defects in appearance.
- .5 Finishes and colours:
  - .1 Metal components, typical: Exterior steel coating for galvanized steel components in accordance with Section 09 97 13, in colour as selected by the Consultant.
  - .2 Cable mesh infill panels: Powder coat finish as specified, in colour as selected by the Consultant.

.7 Metal components for climbing poles:
- .1 Provide galvanized steel components for climbing poles such as but not limited to shade leaf, platforms and pipe vines. Sizes as shown.
- .2 Coordinate with Sections 05 12 00 and 06 20 00 as required for sizing and installation for structural steel posts and base plate connections and wood components.
- .3 Shade leaf:
  - .1 Shade leaf to consist of galvanized steel HSS pipe steel frame and beams and steel band as shown on Contract Drawings.
  - .2 Shade structure to be complete with wood planks provided under Section 06 20 00.
- .4 Platforms:
  - .1 Aerial platforms:
    - .1 Aerial platforms to consist of galvanized steel HSS pipe steel frame and beams, steel band, feeder tube and inserts as shown on Contract Drawings.
    - .2 Platforms to be complete with black locust decking provided under Section 06 20 00.
  - .2 Nesting platforms:
    - .1 Nesting platforms to consist of galvanized steel plate gussets as shown on Contract Drawings.
    - .2 Platforms to be complete with wood planks, posts and boards provided under Section 06 20 00.
- .5 Pipe vines: Provide galvanized steel pipe vines, pine vine attachments and plate gussets to sizes and shapes as shown on Contract Drawings.
- .6 Ensure metal components are installed plumb, true, rigid, secure, level and free from distortion or defects detrimental to appearance or performance.
- .7 Finish and colour: Exterior steel coating for metal components in accordance with Section 09 97 13, in colour as selected by the Consultant.

8. Ships ladder and railings:
   - .1 Design ladders to support a minimum live load of 6 kPa, in addition to dead load. Ladders shall be securely anchored to building structure.
   - .2 Design railings to withstand minimum horizontal and vertical loads as required to meet requirements of authorities having jurisdiction with a minimum of 3.8 kPa horizontally and 4.8 kPa vertically.
   - .3 Fabricate treads of 6 mm thick galvanized steel checkered plate with leading edge turned down to form nosing. Reinforce back edge of treads using a continuous steel angle on underside.
   - .4 Ladder shall be complete with 38 mm diameter, Schedule 40 pipe balustrades at maximum 1200 mm on centre. Cap exposed ends of all rails.
   - .5 Finish and colour: Exterior steel coating in accordance with Section 09 97 13, in colour as selected by the Consultant.

.9 Vertical lockable ladder:
   - .1 Fabricate ladder as shown on Contract Drawings complete with lockable panel and safety cage and in compliance with authorities having jurisdiction.
   - .2 Fabricate aluminum ladders complete with stiffeners, rungs, angle rails, bent plate straps or angle brackets, lockable panel and safety cage.
   - .3 Provide safety cage around ladder to meet Ministry of Labour requirements.
   - .4 Lockable panel on ladder to prevent accessibility to unauthorized parties. Panel lock to be keyed to meet Owner's requirements.
   - .5 Ensure panel is installed straight, smooth, plumb and free of wrinkles, buckles and defects in appearance.
   - .6 Adjust ladder panel to provide smooth and efficient operation.
   - .7 Finish and colour: Manufacturer's standard powder coat system, in colour as selected by the Consultant.
   - .8 Retractable and lockable ladder as manufactured by Acklands Grainger or approved alternative.

10. Ladder rungs:
   - .1 Provide galvanized steel ladder rungs in at concrete wall application as shown on Contract Drawings.
   - .2 Fabricate ladder rungs from 19 mm diameter, intermediate grade, plain Hi-bond bars.
   - .3 Rungs shall be 400 mm wide, spaced at 300 mm centres, projecting 150 mm clear from face of wall.
   - .4 Finish and colour: Exterior steel coating in accordance with Section 09 97 13, in colour as selected by the Consultant.

11. Kick rail:
   - .1 Provide galvanized steel components for kick rail consisting of steel square tubing, end caps and stainless steel cabling as indicated on Contract Drawings.
   - .2 Ensure cabling is installed taut, rigid and secure.
   - .3 Finish and colour: Exterior steel coating for galvanized steel components in accordance with Section 09 97 13, in colour as selected by the Consultant.

12. Barrier fence:
    .1 Lay out lines and establish elevations required for correct location and setting of fence posts, framing and fabric to suit Site contours.
    .2 Erect fence along lines as indicated on Contract Drawings and in accordance with CAN/CGSB-138.3 and reviewed shop drawings.
    .3 Auger post holes to depths and dimensions in accordance with CAN/CGSB-138.3. Form top 250 mm with concrete forms.
    .4 Space line posts maximum 3000 mm apart, measured parallel to ground surface.
    .5 Space straining posts at equal intervals 50 m maximum between end or corner posts on straight continuous lengths of fence and over smooth grade.
    .6 Install additional straining posts at changes in grade.
    .7 Install corner post where change in alignment exceeds 10^0.
    .8 Install end posts at end of fence and at structures and walls.
    .9 Embed posts into concrete and extend concrete 50 mm above ground level and slope to drain away from posts.
    .10 Brace posts in plumb position and true to alignment and elevation until concrete has set.
    .11 Do not install fence fabric until concrete has cured a minimum of 7 days.
    .12 Install brace between end posts and nearest line post, at inclination as indicated on Contract Drawings. Install braces on both sides of corner and straining post in similar manner.
    .13 Install post caps.
    .14 Install top rail between posts and fasten securely to posts and secure waterproof caps.
    .15 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands. Place 150 mm from bottom of fabric.
    .16 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals. Knuckled selvage at bottom. Twisted selvage at top. Make closures by splicing fabric to form a continuous mesh.
    .17 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals. Give tie wires minimum two twists.
    .18 Powder coat finish and colour: Powder coat finish as specified, in colour as selected by the Consultant.

.13 Lintels: Fabricated from CAN/CSA-G40.20/G40.21-M, Grade 350W, size and location as shown, width to be not less than 25 mm less than width of wall and extend 200 mm beyond opening at each end. Unless otherwise shown, fabricate lintels in block walls of steel sections.

14. Masonry lateral support angles:
    .1 Supply only, to Section 04 20 00 for installation, all horizontal lateral support anchors at top of non-load-bearing masonry walls.
    .2 Refer to Structural Drawings for size and spacing of required support anchors. Provide drilled holes as required for anchorage.
    .3 Galvanized finish.

.15 Tubular steel door frames:
- .1 Structural tubular steel door frame sections as shown on Contract Drawings, with joints welded and ground smooth. Supply anchors for anchorage to wall as required.
- .2 Coordinate with Section 08 11 13 as required for sizing and installation with extra heavy duty hollow metal door.
- .3 Finish and colour: Exterior steel coating in accordance with Section 09 97 13, in colour as selected by the Consultant.

.16 Steel plate cladding, channels and supports:
- .1 Provide minimum 6 mm thick galvanized steel plate cladding ~~for Habitat 2 access tower location~~ as shown on Contract Drawings, complete with HSS channels and supports as required.
- .2 Fabricate and install plate cladding and supports in accordance with reviewed shop drawings.
- .3 Fabricate plate cladding flat, true, free of marks, without visible distortion and with edges straight and true. Make all planes true, and corners square and bend of minimum radius.
- .4 Install plates plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.
- .5 Finish and colour: Exterior steel coating in accordance with Section 09 97 13, in colour as selected by the Consultant.

.17 Vertical and horizontal chutes (Habitat 2):
- .1 Provide chute assemblies as shown on Contract Drawings, complete with ***flexible*** black coloured stainless steel rope mesh ***for outer perimeter***, ***rigid galvanized steel woven wire mesh for chute floors,*** cabling, steel pipes, tubing, bars, channels, pipe rails, tabs and additional components as indicated. Coordinate with Section 05 12 00 as required for sizing and installation with structural steel columns, tube trusses and additional components.
- .2 Install chute assemblies in accordance with reviewed shop drawings. Chute assemblies are to be installed plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.
- .3 Ensure ~~rope~~ mesh ***materials*** ~~is~~ ***are*** installed taut, rigid and secure.
- .4 Finish and colour: Exterior steel coating for galvanized steel components in accordance with Section 09 97 13, in colour as selected by the Consultant.

.18 Bollards (protection posts):
- .1 Provide galvanized steel bollards as indicated on drawings. Posts to be 250 mm diameter with a wall thickness of 8 mm. Place posts into a 1500 mm foundation, fill with 20 Mpa concrete and round top. Project pipes 1500 mm above finished grade.
- .2 Finish and colour: Exterior steel coating in accordance with Section 09 97 13, in colour as selected by the Consultant.

.19 Orangutan pole feeders:
- .1 Provide heavy duty winch driven cable and pulley galvanized steel pipe feeders, casings and shafts as shown on Contract Drawings and to meet Project requirements.
- .2 Provide all galvanized metal components and corrosion resistant hardware as required for pole feeder assembly. Sizes as shown.
- .3 Fabricate and install pole feeders in accordance with reviewed shop drawings and to the satisfaction of the Owner.
- .4 Adjust hardware for smooth and efficient operation of pole feeder unit.
- .5 Finish and colour: Exterior steel coating in accordance with Section 09 97 13, in colour as selected by the Consultant.

.20 Miscellaneous steel brackets, supports and angles
- .1 Supply and install or supply for installation by trades responsible, all loose steel brackets, supports and angles where indicated, except where such brackets, supports and angles are specified under work of other Sections. Drill for countersunk screws, expansion anchors and anchor bolts.
- .2 Unless otherwise specified, galvanized finish.

2.4 STAINLESS STEEL WORK

.1 Take all necessary precautions to safeguard against latent surface discolouration due to disturbance of the natural protective oxide coating of the material or to contamination from other sources.

.2 Workmanship shall be the best standard practice for this type of work. Execute stainless steel work in accordance with the applicable instructions set forth in Atlas Stainless Steels' "Technical Data" handbook on stainless steel.

.3 Do all stainless steel fabrication in clean shops, located away from areas where carbon steel is burnt, ground, or cut with abrasive wheels to ensure that carbon steel dust will not be embedded into the stainless steel, and as follows:
- .1 In fabrication of stainless steel do not use tools and dies which have been used on carbon steels.
- .2 Ensure tools and dies use for forming and cutting stainless steel are free of nicks and other damage.
- .3 Do not use carbon grits and grinding wheels which will imbed foreign particles into stainless steel surfaces. Use only stainless steel wool when wool polishing is required.
- .4 Stainless steel items, on which rust stains appear, shall be replaced with new fabricated material.

2.5 ANCHORS AND FASTENING

.1 Use weld studs of size not larger than 10 mm for attaching miscellaneous materials and equipment to building steel. If weight of item requires larger fasteners use clips or brackets and secure by welding or through bolting.

.2 Use self drilling expansion type concrete anchors for attaching to masonry and concrete

.3 Do not secure items to decks.

.4 Use steel beam clamps of two bolt design to transmit load to beam web. Do not use C and I clamps.

2.6 **WELDING**

.1 Perform welding by electric arc process.

.2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:
- .1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.
- .2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.
- .3 CAN/CSA W117.2-M - for safety.

.3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds which will be exposed to view and finish paint.

.4 Test welds for conformance and remove work not meeting specified standards and replace to Consultant's acceptance.

2.7 **SHOP PAINTING**

.1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter.

.2 Shop prime steel with one coat of primer paint to dry film thickness of 0.07 mm. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 deg C. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature, and humidity conditions.

.3 Clean but do not paint surfaces being welded in field.

.4 Do not paint surfaces embedded in concrete, but clean as if they were to be primed.

.5 Do not prime steel to be fireproofed or to receive intumescent paint coating.

.6 Do not prime machine finished surfaces, but apply an effective anti-rust compound.

.7 Take precautions to avoid damage to adjacent surfaces.

2.8 **POWDER COAT FINISH**

.1 Shop apply electrostatic coating in strict accordance with manufacturer's written instructions.

.2 Provide primer where required and one finish coat.

.3 Ensure application of each coat into all corners, pinholes and other difficult areas and ensure full coverage to all surfaces.

.4 Ensure a smooth finish, free of laps, sags, runs, pin holes, crawls and skips. Back lap all edges to achieve full coverage.

2.9 **HOT DIP GALVANIZING**

.1 After fabrication, hot dip galvanize specific miscellaneous steel items as indicated. After galvanizing, plug relief vents air tight with appropriate aluminum plugs as suitable and required for intended metal fabricated item. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with zinc rich primer in accordance with manufacturer's printed directions.

.2 Hot-dip galvanize members in accordance with requirements of the following ASTM, with minimum coating weights or thicknesses as follows:

.1 Rolled, pressed and forged steel shapes, plates, bars and strips: ASTM A123; average weight of zinc coating per square/metre of actual surface, for 4.8 mm and less thickness members 600 g/m^2 for 6 mm and heavier members 640 g/m^2.

.2 Iron and steel hardware: ASTM A153; minimum weight of zinc coating, in ounces per square foot of surface, in accordance with ASTM A153,Table 1 for the various classes of materials used in the Work.

3 Execution

3.1 **EXAMINATION**

.1 Examine previously installed Work, upon which this Section depends, verify dimensions and condition of existing Work, and coordinate repairs, alterations, and rectification if necessary. Commencement of work of this Section is deemed to signify acceptance of existing, prior conditions.

.2 Obtain Consultant's written approval prior to field cutting or altering of structural members.

3.2 **ERECTION**

.1 Install metal fabrications in accordance with reviewed shop drawings and manufacturer's written instructions.

.2 Fit joints and intersecting members accurately. Make work in true planes with adequate fastenings. Build and erect work plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.

.3 Perform drilling of concrete and steel as required to fasten work of this Section.

.4 Erect rails in true vertical and horizontal planes, rigid, and free from whip.

.5 Continuously weld connections for railings, and anchor directly to steel stringers.

3.3 **TOUCH UPS**

.1 Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up shop primer damaged during transit and installation, with primer to match shop primer.

END OF SECTION

1 General

1.1 **SECTION INCLUDES**

.1 Design, labour, Products, equipment and services necessary for the wire mesh panel and door work in accordance with the Contract Documents.

.2 Work of this Section shall include the following:
.1 Mesh enclosures including ceiling, wall and vestibule enclosure panels.
.2 Mesh swing, sliding and guillotine doors.
.3 Associated framing and supports for panels and doors.
.4 Orangutan puzzle feeders.

1.2 **REFERENCES**

.1 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.

.2 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.3 ASTM A392, Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric.

.4 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.

.5 ASTM F3125/F3125M, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.

.6 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.

.7 CAN/CSA S16.1-M, Limit States Design of Steel Structures.

.8 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.

.9 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.

.10 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.

.11 CSA W59-M, Welded Steel Construction (Metal Arc Welding).

.12 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.

.13 NAAMM, The National Association of Architectural Metal Manufacturers.

1.3 **DESIGN REQUIREMENTS**

.1 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.

1.4 **SUBMITTALS**

.1 Product data: Submit manufacturer's Product data in accordance with Section 01 33 00 indicating compliance with reference standards, transportation, storage, handling and installation requirements.

.2 Shop drawings:
- .1 Submit shop drawings for fabrication and erection of wire mesh panels and doors in accordance with Section 01 33 00 indicating:
  - .1 Materials, core thicknesses, class of finish (AMP 555), connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
  - .2 Ensure shop drawings are of one uniform size and based on field measurements.
  - .3 Detailed drawings for sliding and guillotine doors, hardware and locking mechanisms.
  - .4 Door locations, sizes, hardware quantities required, and mounting heights of each type of hardware.

.3 Samples:
- .1 Submit samples in accordance with Section 01 33 00 of the following:
  - .1 One 600 x 600 mm of each wire mesh type demonstrating material, opening, finish, showing typical termination conditions, typical welded connections, and other pertinent construction components.
  - .2 Each hardware item for each type of door. Tag samples identifying applicable Specification article number, brand name and number, finish, building location, date and catalogue number.
  - .3 Do not order hardware until samples have been accepted. Submit new samples to replace rejected samples. Supply hardware and finishes identical to each accepted sample.

.4 Certificates: Submit fabricator and installer qualification data for the Consultant’s review.

.5 Closeout submittals:
- .1 Submit the following in accordance with Section 01 78 23 for each Product for incorporation into Operation and Maintenance Manual:
  - .1 Maintenance data.
  - .2 Operating instructions and safety precautions.
  - .3 Parts list with name and address of supplier.
  - .4 Lubrication schedule and type of lubricant recommended.
  - .5 Keys, tools and special devices.
  - .6 Inspection procedures related to preventive maintenance.

1.5 QUALITY ASSURANCE

.1 Reference photographs:

.1 Sliding and guillotine mesh door hardware to be similar to types and layout as shown in reference photographs appended to this Section.

.2 ***Puzzle feeders to be similar to type as shown in reference photograph appended to this Section. The information shown in Contract Drawings demonstrates frame dimensions, depth and design intent.***

.2 Fabricator's and installer's qualifications: Qualifications for companies not listed in this Section are as follows:

.1 Perform work of this Section by a company having a minimum of ten years experience in metal work of this type, plus a minimum of three similar projects involving containment of animals.

.2 Companies requesting consideration shall submit written and photographic proof of previously performed projects.

.3 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in work of comparable complexity and scope, to perform the following services as part of the work of this Section:

.1 Design wire mesh panel enclosures and door assemblies.

.2 Review, stamp, date and sign shop drawings.

.4 Workmanship: Fabricate work of this Section to meet the required class of workmanship indicated below in accordance with NAAMM's AMP 555, Section 8.

.1 Class 1: for use on direct exposed to view fabricated items:

.1 Exposed surfaces are finished smooth with pitts, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished.

.2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.

.3 Distortions should not be visible to the eye.

.4 Exposed joints are fitted to a hairline finish.

.5 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver hardware to Site packaged, labelled and its scheduled installation location.

.2 Accept Products of this Section on Site and ensure that each item is undamaged.

.3 Catalogue and store hardware in secure area.

1.7 **SITE CONDITIONS**

.1 Prior to submission of shop drawings, the mesh work Subcontractor shall verify that all field measurements are as indicated on Drawings, and notify the Consultant in writing of any major discrepancies. No fabrication shall proceed until all inconsistencies are corrected.

.2 Established dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions. Caging not fitting the conditions as detailed and specified shall be rejected and replaced at no cost to the Owner.

1.8 **COORDINATION**

.1 Contractor shall coordinate with the finish hardware requirements to provide for smooth operation with minimal efforts as approved by the Owner and Consultant. Any conditions detrimental to door operation as specified shall be brought to the attention of the Consultant prior to fabrication.

.2 Coordinate with concrete and masonry trades for installation details required.

.3 Secondary containment areas: Contractor shall be responsible to maintain the joints, attachments, and clearances to equal the detailed dimensions and connections required for the primary enclosure unless otherwise noted.

2 Products

2.1 **ACCEPTABLE FABRICATORS**

.1 Mesh work:
- .1 A Thru Z Consulting and Distributing, Inc.
- .2 Thermeq Company.
- .3 LGL Animal Care Products, Inc.

2.2 **MATERIALS**

.1 General:
- .1 All materials under work of this Section, including but not limited to, primers and paints are to have low VOC content limits.
- .2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
- .3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of work of this Section.

.4 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharp defined profiles.

.2 Galvanized structural shapes, plates, and similar items: CAN/CSA-G40.20/G40.21-M, Grade 350W. Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.

.3 Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating, size and shape as shown.

.4 Galvanized wire mesh panel and door assemblies:
- .1 Woven wire crimped mesh with galvanized after weld finish.
- .2 Size of wire mesh to be 50 x 50 mm, unless otherwise indicated.
- .3 Mesh to be complete with framing, supports and fasteners as specified herein.
- .4 Mesh gauges as follows:
  - .1 Vertical wall panels: 5 mm (6 ga.).
  - .2 Doors: 5 mm (6 ga.).
  - .3 Ceilings (accessible to orangutans): 5 mm (6 ga.).
  - .4 Ceilings (inaccessible to orangutans): 3.4 mm (10 ga.).
  - .5 Vestibule enclosure (inaccessible to orangutans): 3.4 mm (10 ga.).
- .5 Joints are to be continuously welded on animal side and ground smooth and with no ends typical.
- .6 Galvanized finish: Weight of metallic (zinc) Coating conforming to ASTM A 392, Type II, Class 2, 610 g/sq. m. with zinc coating applied before weaving.

.5 Steel cover plate: 3.4 mm (10 ga.) thick galvanized steel sheet. Pre-drill for fasteners.

.6 Cords and wires: Heavy duty, galvanized steel, sized to suit intended application.

.7 Welding materials: CSA W48 and CSA W59-M.

.8 Exposed mechanical fastenings:
- .1 Typical: Flush countersunk torx or hex socket machine screws and bolts; stainless steel finish; unobtrusively located; consistent with design of component, except where specifically noted otherwise. Fasteners, bolts, nuts, and washers: ASTM F3125/F3125M; all bolts, machine screws and fasteners shall be Type 316 stainless steel.
- .2 Ceilings: Ceiling mesh to be secured with recessed allen screws to rafter above; unobtrusively located; consistent with design of component, stainless steel finish and conforming to ASTM F3125/F3125M.

.9 Galvanized primer paint: Inorganic zinc rich primer. For use on galvanized fabrications where touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.

.10 Door hardware and locking mechanisms for swing, sliding and guillotine mesh doors:
- .1 Metal finishes: Free from defects, clean, unstained and of a uniform colour for each type of finish required.
- .2 Sliding and guillotine door hardware and locking mechanisms to be heavy duty type, cable drive operator with spring loaded pin and to match reference photographs appended to this Section.
- .3 Hardware to include tracks, pulleys and cables in animal spaces with steel casing covers.
- .4 Hardware to include exterior tracks and operators with steel covers for weather and snow protection.
- .5 Hardware to be complete with all components and accessories as required for complete, secure and safe installation and to meet Owner's Project requirements.
- .6 Ensure that hardware selected will function correctly, meets Contract requirements and Ontario Building Code and authorities having jurisdiction.
- .7 Mortise lock/latch and strike boxes: 3 mm thick galvanized steel sheet, galvanized with door/gate frame, pre-drilled for latch/strike installation. Box shall fully enclose mortise lock mechanisms with removable mortise face by mortise manufacturer.
- .8 Keying: Coordinate all keying with the Owner's Representative and the requirements of Section 08 70 00.

.11 Polycarbonate panels: In accordance with Section 08 45 13.

.12 Medical port: Fabricate 450 x 450 mm lockable painted and galvanized steel medical port for blood sleeve to match Owner's standard, complete with cover and padlock. Colour of painted port as selected by the Consultant.

.13 Anchor bolt system: Countersunk flathead hex socket, stainless steel finish, for installation in monolithic concrete, sizes as shown, complete with all components required for a complete installation; 'Kwik-Bolts' by Hilti Ltd. or approved alternative by ITW Construction Products.

.14 Puzzle feeders: Fabricate two (2) 300 x 600 mm galvanized steel mesh and steel plate puzzle feeders as shown on Contract Drawings and to match ~~Owner standards~~ ***reference image appended to this Section***.

2.3 FABRICATION

.1 Fabricate wire mesh panels and doors in accordance with reviewed shop drawings, manufacturer's written instructions and to meet Owner's Project requirements.

.2 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.

.3 Fabricate work free from defects impairing function, appearance, strength and durability.

.4 Carefully make and fit details. Take special care with exposed finished work to produce a neat and correct appearance to the Consultant's acceptance.

.5 Fabricate items with joints tightly fitted and secured. Make exposed joints butt tight, flush, and hairline.

.6 All oversized holes required for fabrication shall be welded and plugged. No holes, cavities or other voids, will be acceptable, unless specifically designed into the caging system.

.7 Continuously seal joined members by continuous welds.

.8 Fit and shop assemble in largest practical sections, for delivery to site.

.9 Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius of 3 mm. Radius all comers to 6 mm.

.10 Provide weep holes in closed HSS sections, 10 mm diameter.

.11 Galvanized wire mesh panel and door assemblies: Refer to drawings for panel assembly and door components fabricated as follows:

- .1 Wall and ceiling panels:
  - .1 Woven wire crimped mesh with galvanized after weld finish.
  - .2 Wall panel mesh to be secured with continuous 5 mm x 25 mm compression bar and 6 mm diameter Tek Hex headed screws at 150 mm o.c. to each frame member on the animal side of frames.
  - .3 Ceiling panel mesh to be secured with recessed allen screws to rafters as specified herein.
  - .4 Frame walls and ceiling panels are composed of HSS steel as indicated on the drawings, with joints welded continuously on animal side and ground smooth, and with no open ends typical.
  - .5 Anchor HSS frame to slab with shim space and with minimum of two (2) anchor bolts adjacent to each HSS post connected to slab through the frame base angle detailed.
  - .6 At angle frames, connect the sill member to slab with shim space and anchor bolts spaced at 600 mm on center minimum.
  - .7 Provide continuous mesh with joints only if unavoidable and if supported continuously by metal frame members.
  - .8 Provide 10 mm weeps in lower horizontal member HSS at 600 mm on center in the bottom of enclosed HSS sections.
- .2 Steel mesh doors:
  - .1 Provide all mesh door types required for Work of this Project including swing, guillotine and sliding doors as scheduled.
  - .2 Frame: 38 x 38 x 3 mm HSS steel, mitred and welded continuously.
  - .3 Wire mesh panels continuously welded to frame, G90 galvanized after fabrication.
  - .4 Provide mechanically attached polypropylene door guides in guide tracks to prevent metal to metal contact. Door tracks shall be as detailed.

.3 Coordinate with Section 08 45 13 as required for sizing and installation of polycarbonate glazing panels used in conjunction with mesh work.

.12 Medical port: Fabricate medical port in wire mesh training wall as shown on Contract Drawings, complete with galvanized steel framing.

.13 Feeders: Fabricate puzzle feeders as specified herein, as shown ***on Contract Drawings*** and to match ~~Owner's standards~~ ***reference image***.

2.4 **WELDING**

.1 Perform welding by electric arc process.

.2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:
.1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.
.2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.
.3 CAN/CSA W117.2-M - for safety.

.3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds which will be exposed to view.

.4 Test welds for conformance and remove work not meeting specified standards and replace to Consultant's acceptance.

2.5 **HOT DIP GALVANIZING**

.1 After fabrication, hot dip galvanize specific miscellaneous steel items as indicated. After galvanizing, plug relief vents air tight with appropriate aluminum plugs as suitable and required for intended metal fabricated item. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with zinc rich primer in accordance with manufacturer's printed directions.

.2 Hot-dip galvanize members in accordance with requirements of the following ASTM, with minimum coating weights or thicknesses as follows:
.1 Rolled, pressed and forged steel shapes, plates, bars and strips: ASTM A123; average weight of zinc coating per square/metre of actual surface, for 4.8 mm and less thickness members 600 g/m^2 for 6 mm and heavier members 640 g/m^2.
.2 Iron and steel hardware: ASTM A153; minimum weight of zinc coating, in ounces per square foot of surface, in accordance with ASTM A153,Table 1 for the various classes of materials used in the Work.

3 Execution

3.1 **EXAMINATION**

.1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **INSTALLATION**

.1 Install wire mesh panels, doors and hardware in accordance with reviewed shop drawings, manufacturer's written instructions and to meet Owner’s Project requirements.

.2 Perform field welding in accordance with CSA A59.

.3 Fit joints and intersecting members accurately.

.4 Make work in true planes with adequate fastenings.

.5 Perform drilling of concrete and steel as required to fasten work of this Section.

.6 Install mesh work plumb, true, square, straight, level and accurate to sizes detailed, at correct elevation and free of wrinkles, buckles, distortion or defects detrimental to appearance or performance.

.7 Erect mesh enclosures plumb, level, straight, rigidly supported, and securely fastened to abutting surfaces, free from superimposed loads.

.8 Mesh doors and door hardware:
- .1 Install doors and hardware and adjust as required for proper closing, locking, smooth and balanced operation.
- .2 Lubricate hardware if required by manufacturer's instructions.

.9 Ports and feeders: Install ports and feeders in accordance with reviewed shop drawings and to the satisfaction of the Owner.

.10 Remove all sharp edges, burrs, corners and slivers which, in the opinion of the Consultant or Owner, could injure animals or caregivers.

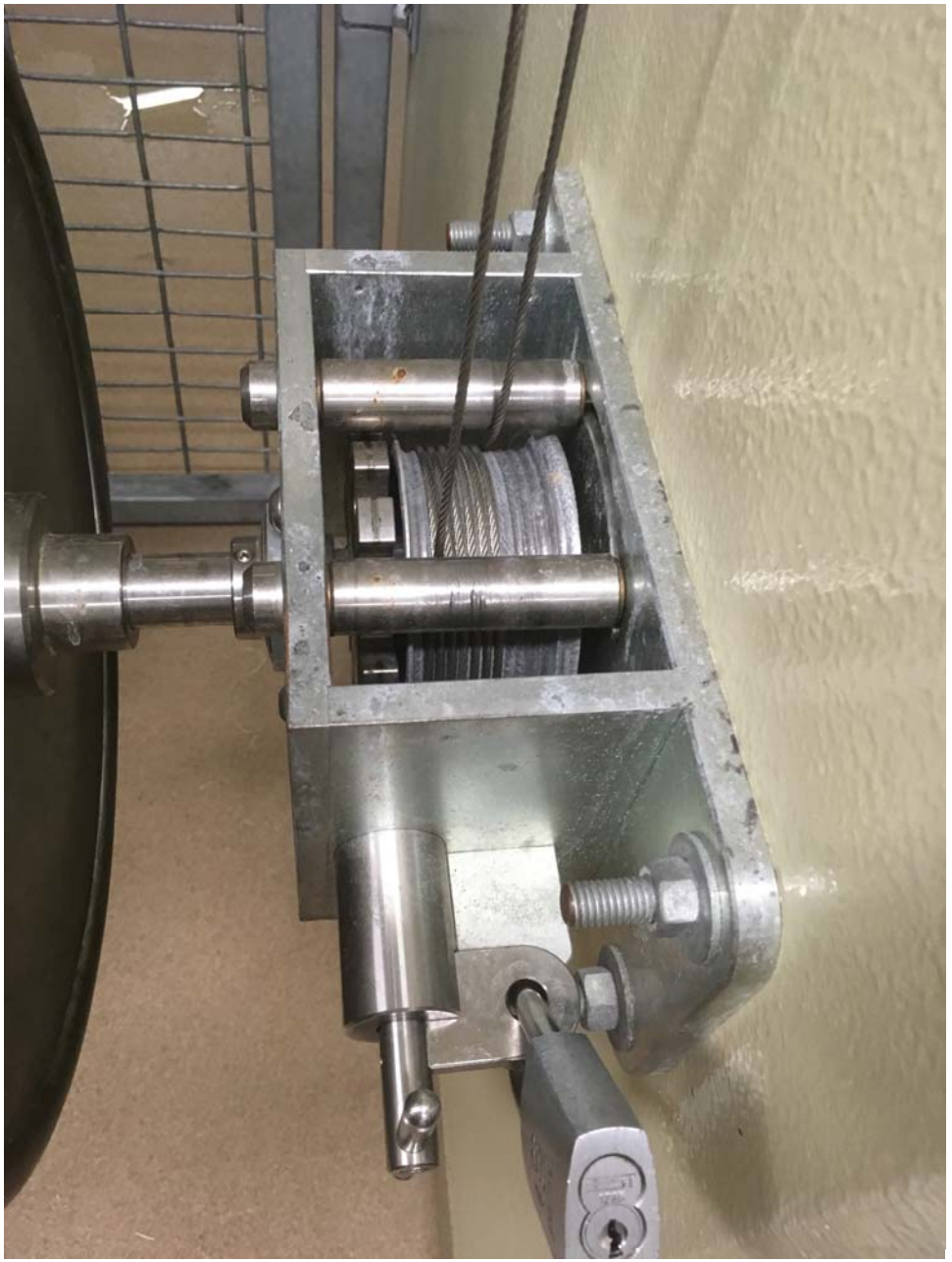
3.3 **CLEANING**

.1 Remove wrappings at completion of the Project and clean hardware in accordance with manufacturer's instructions.

.2 Clean mesh panels and doors.

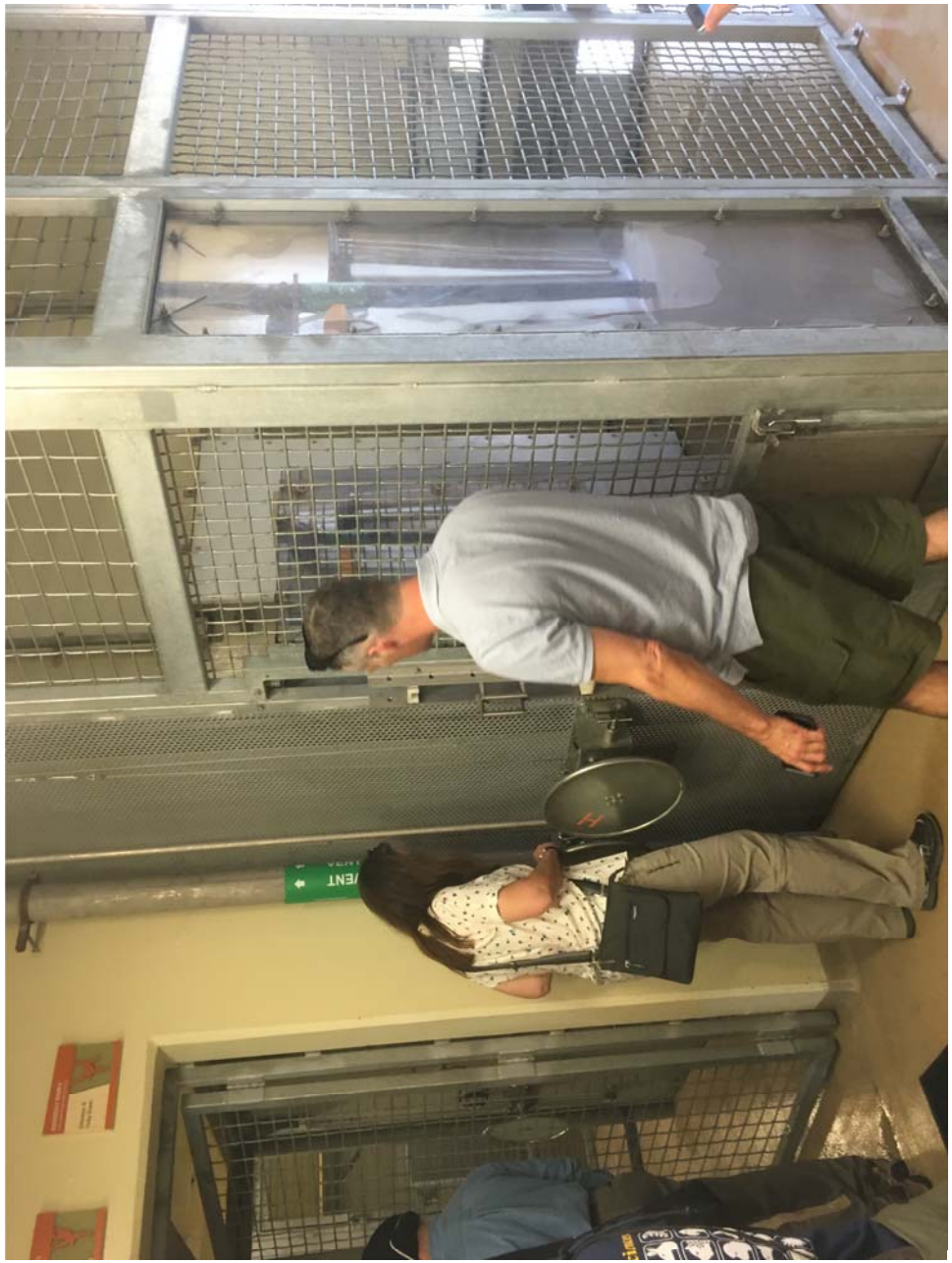
END OF SECTION

Sliding and Guillotine Mesh Door Hardware Reference Image



Sliding and Guillotine Mesh Door Hardware Reference Image

Sliding and Guillotine Mesh Door Hardware Reference Image



Sliding and Guillotine Mesh Door Hardware Reference Image

Puzzle Feeder Reference Image

ADDENDUM NO. 2

Project:	Toronto Zoo Orangutan Outdoor Exhibit Toronto	Project No.:	TOR.113946.0011
Client:	Zeidler Partnership Archtects	Date:	January 10, 2019
Contact:	Lena Chow, OAA, M.Sc., B.Arch., LEED AP	Page:	1 of 3 + 23 drawings
		Issued By:	Nathan Bissell, P.Eng.

This addendum forms part of the contract documents and amends the original drawings, specifications, schedules, and details Issued for Tender, December 12, 2019

1.0 DRAWINGS ISSUED

1.1. S-100 General Notes and Typical Details
1.2. S-101 General Notes and Typical Details
1.3. S-102 General Notes and Typical Details
1.4. S-103 General Notes and Typical Details
1.5. S-200 Overall Foundation Plan
1.6. S-200A Foundation Plan – Habitat 1
1.7. S-200B Foundation Plan – Habitat 2
1.8. S-200C Foundation Plan – Shoring
1.9. S-210 Boardwalk and Treehouse Framing Plans
1.10. S-230 Research Centre Framing Plans – Habitat 1
1.11. S-240 Dayroom Framing Plans
1.12. S-250 Partial Floor Framing Plan – Habitat 2
1.13. S-260 Training Wall Plan, Section and Detail
1.14. S-300 Schedules
1.15. S-700 Foundation Shoring Section and Details
1.16. S-800 Section and Details
1.17. S-810 Boardwalk and Treehouse Sections and Details – Habitat 1
1.18. S-830 Research Centre Sections and Details – Habitat 1
1.19. S-831 Research Centre Sections and Details – Habitat 1
1.20. S-832 Research Centre Sections and Details – Habitat 1
1.21. S-840 Dayroom Sections and Details
1.22. S-841 Dayroom Sections and Details
1.23. S-850 Section and Details – Habitat 2

Copy to:

- [x] Edward Chan - Zeidler
- [x] John Kooymans - RJC
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2.0 SPECIFICATIONS ISSUED

2.1. none

3.0 SKETCHES ISSUED

3.1. none

4.0 DESCRIPTION OF ADDITIONAL REVISIONS

4.1. S-100

a. Lateral earth pressure coefficient modified

4.2. S-101

a. Updated geotechnical report referenced, with updated soil bearing capacities

4.3. S-102

a. Updated geotechnical report referenced

4.4. S-103

a. Retaining wall detail modified for 2m max. retaining wall

4.5. S-200

a. Revised foundations shown at outdoor training wall

4.6. S-200A

a. Revised foundation shown at training wall
b. Retaining wall height inside exhibit changed to 2m. max
c. Expected self weight sag for cables noted on plan

4.7. S-200B

a. Expected self weight sag for cable noted on plan

4.8. S-200C

a. Passive lateral earth pressure coefficient updated per latest geotechnical report
b. Bulk unit weight of backfill updated per latest geotechnical report

4.9. S-210

a. Pile caps added to caissons at boardwalk
b. Treehouse upper level slab edges chamfered, note added to modify deck closure angle
c. Ridge beam and posts changed to steel instead of wood
d. Steel beam sizes changed at boardwalk perimeter

4.10. S-230

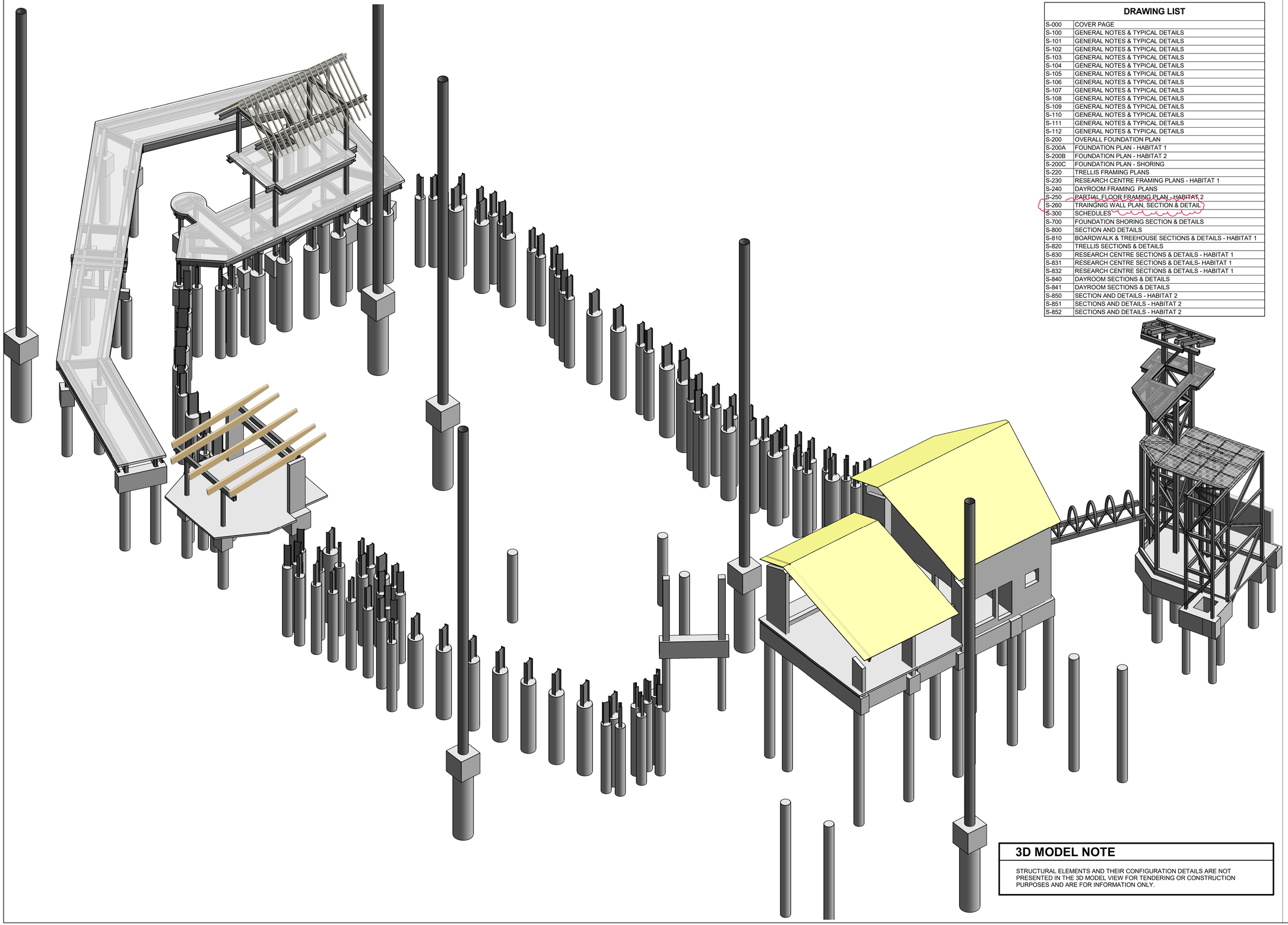
a. Longitudinally slotted connection added to transfer corridor beam
b. Extent of grade beam corrected foundation plan

4.11. S-240

a. Orangutan platform floor and roof framing plans modified to suit latest architectural extents of both areas
b. Slab thickening required at dayroom for climbing poles, which are designed by misc. metals
c. Framing added in dayroom roof to support top of climbing poles

4.12. S-250
   a. Beam removed from chute roof framing plan to facilitate installation of guillotine doors
   b. Connection note add to plan detail 2
4.13. S-260
   a. New Sheet added to set for training wall
4.14. S-300
   a. PC6 and PC7 modified
   b. PC10, PC11, and PC12 added
   c. BP1 modified
4.15. S-700
   a. Note added to section 1 referencing shoring foundation plan
4.16. S-800
   a. Anchor bolt detail for climbing poles modified
   b. Note added about climbing pole column splice
4.17. S-810
   a. Section 1 updated showing pile caps at boardwalk
   b. Additional notes added for wood rafter connections
4.18. S-830
   a. Slab edge detail clarified
4.19. S-831
   a. Tension strap added at research centre roof ridge
4.20. S-832
   a. Detail 5 modified
4.21. S-840
   a. Braced frame connection forces modified
4.22. S-841
   a. Slab thickened detail added for climbing pipes
4.23. S-850
   a. Chute connection forces added to detail 1
   b. Diagonal brace wall thickness increased.

END OF ADDENDUM NO. 2



DRAWING LIST

3D MODEL NOTE

STRUCTURAL ELEMENTS AND THEIR CONFIGURATION DETAILS ARE NOT PRESENTED IN THE 3D MODEL VIEW FOR TENDERING OR CONSTRUCTION PURPOSES AND ARE FOR INFORMATION ONLY.

NO.	REV.	ISSUED FOR	DATE
1	1	100% DD	2019-10-02
2	2	PROGRESS	2019-10-17
3	3	60% CD	2019-10-25
4	4	100% CD	2019-11-12
5	5	ISSUED FOR PERMIT	2019-11-14
6	6	ISSUED FOR TENDER REVIEW	2019-12-06
7	7	ISSUED FOR TENDER	2019-12-11
8	8	ISSUED FOR ADDENDUM #2	2020-01-10

N

STAMP

CONTRACTOR SHALL CHECK ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL AUTHORIZED IN WRITING BY CONSULTANT.

rjc Engineers

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PROJECT:

DRAWING NAME:

COVER PAGE

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: 1 : 1

DRAWING NUMBER:

S-000

NON-STRUCTURAL ELEMENTS

1. "NON-STRUCTURAL" OR "SECONDARY STRUCTURAL" ELEMENTS ARE NOT PART OF THE STRUCTURAL DESIGN SHOWN ON THESE DRAWINGS. SUCH ELEMENTS ARE DESIGNED, DETAILED AND REVIEWED IN THE FIELD BY OTHERS. THEY APPEAR ON DRAWINGS OTHER THAN THESE DRAWINGS OF READ JONES CHRISTOFFERSEN LTD., WHERE STRUCTURAL ENGINEERING RESPONSIBILITY IS REQUIRED FOR THESE ELEMENTS, THIS SHALL BE PROVIDED BY SPECIALTY STRUCTURAL ENGINEERS, WHO SHALL ALSO PROVIDE ANY LETTERS REQUIRED BY BUILDING PERMIT AUTHORITIES.

2. EXAMPLES OF NON-STRUCTURAL ELEMENTS INCLUDE, BUT ARE NOT LIMITED TO:

   A. ARCHITECTURAL COMPONENTS SUCH AS GUARDRAILS, HANDRAILS, FLAG POSTS, CANOPIES, CEILINGS, MILLWORK, ETC.
   B. LANDSCAPE ELEMENTS SUCH AS BENCHES, LIGHT POSTS, PLANTERS, ETC.
   C. CLADDING, GLAZING, WINDOW MULLIONS, INTERIOR STUD WALLS AND EXTERIOR STUD WALLS.
   D. ARCHITECTURAL PRECAST, PRECAST CLADDING.
   E. SKYLIGHTS.
   F. MECHANICAL AND ELECTRICAL EQUIPMENT, COMPONENTS, AND THEIR ATTACHMENT DETAILS.
   G. WINDOW WASHING EQUIPMENT AND ITS ATTACHMENTS.
   H. ESCALATORS, ELEVATORS, AND CONVEYING SYSTEMS.
   I. GLASS BLOCK AND ITS ATTACHMENTS.
   J. BRICK OR BLOCK VENEERS AND THEIR ATTACHMENTS.
   K. NON-LOAD BEARING MASONRY.
   L. NON-STRUCTURAL CONCRETE TOPPINGS.

3. SHOP DRAWINGS FOR NON-STRUCTURAL ELEMENTS WHICH MAY AFFECT THE PRIMARY STRUCTURAL SYSTEM SHALL BE SUBMITTED TO READ JONES CHRISTOFFERSEN LTD. THESE DRAWINGS WILL BE REVIEWED ONLY FOR THE EFFECT OF THE ELEMENT ON THE PRIMARY STRUCTURAL SYSTEM.

CALCULATED STRUCTURAL MOVEMENTS

THIS STRUCTURE WILL UNDERGO NORMAL TYPES OF MOVEMENT AND DEFLECTION, AND THE FOLLOWING ARE ESTIMATES FOR THIS STRUCTURE. NON-STRUCTURAL COMPONENTS MUST BE DETAILED TO ACCOMM0DATE THIS. DESIGN, DETAILING, AND FIELD REVIEW OF THESE NON-STRUCTURAL ELEMENTS IS BY OTHERS, AND NOT READ JONES CHRISTOFFERSEN LTD.

1. DIFFERENTIAL VERTICAL MOVEMENTS BETWEEN ADJACENT COLUMNS AND BETWEEN ADJACENT COLUMNS AND WALLS = APPROXIMATELY 25 mm IN ACCORDANCE WITH GEOTECHNICAL REPORT

2. VERTICAL DEFLECTION OF COLUMNS AND WALLS DUE TO SHRINKAGE AND CREEP = APPROXIMATELY 3.5 mm PER 3600 mm OF HEIGHT.

3. VERTICAL FLOOR/ ROOF DEFLECTIONS HAVE BEEN DESIGNED TO MEET THE FOLLOWING CRITERIA, BUT NOT TO EXCEED MAXIMUM DEFLECTION OF 25mm.

TYPE OF MEMBER	DEFLECTION TO BE CONSIDERED	CALCULATED DEFLECTION LIMITATIONS
REINFORCED CONCRETE MEMBERS		
ROOF OR FLOOR CONSTRUCTION SUPPORTING NONSTRUCTURAL ELEMENTS **NOT** LIKELY TO BE DAMAGED BY LARGE DEFLECTIONS	SUM OF THE LONG-TERM DEFLECTIONS DUE TO ALL SUSTAINED LOADS AND THE IMMEDIATE DEFLECTION DUE TO ANY DDITIONAL LIVE LOAD	L/240
ROOF OR FLOOR CONSTRUCTION SUPPORTING NONSTRUCTURAL ELEMENTS **NOT** LIKELY TO BE DAMAGED BY LARGE DEFLECTIONS	IMMEDIATE DEFLECTION DUE TO SPECIFIED LIVE LOAD	L/360
ROOF OR FLOOR CONSTRUCTION SUPPORTING NONSTRUCTURAL ELEMENTS LIKELY TO BE DAMAGED BY LARGE DEFLECTIONS	THAT PART OF THE TOTAL DEFLECTION OCCURRING AFTER ATTACHMENT OF NONSTRUCTURAL ELEMENTS	L/480
STRUCTURAL STEEL MEMBERS		
SIMPLE SPAN MEMBERS OF FLOORS AND ROOFS SUPPORTING CONSTRUCTION AND FINISHES NOT SUSCEPTIBLE TO CRACKING	LIVE LOAD	L/300
SIMPLE SPAN MEMBERS OF FLOORS AND ROOFS SUPPORTING CONSTRUCTION AND FINISHES SUSCEPTIBLE TO CRACKING	LIVE LOAD	L/360

4. THE STRUCTURE HAS BEEN DESIGNED ASSUMING THAT THE INSTALLATION OF NONSTRUCTURAL ELEMENTS SUCH AS CLADDING, MECHANICAL AND ELECTRICAL SERVICES AND THE LIKE, WILL NOT COMMENCE UNTIL AT LEAST ONE MONTH AFTER THE REINFORCED CONCRETE SLAB SUPPORTING THE NONSTRUCTURAL ELEMENTS HAS BEEN POURED AND THE RESHORING REMOVED.

5. THE STRUCTURE HAS BEEN DESIGNED TO LIMIT THE MAXIMUM INTERSTOREY DRIFT UNDER SERVICEABILITY LIMIT STATE (SLS) AVERAGE HOURLY WIND PRESSURE TO H/400 WHERE H IS THE FLOOR TO FLOOR HEIGHT BETWEEN TO ADJACENT FLOORS, UNDER SEISMIC LOADS, THE INTERSTOREY DRIFT HAS BEEN LIMITED TO 0.025 Hs, WHERE Hs IS THE HEIGHT OF THE STOREY.

6. DIFFERENTIAL DEFLECTIONS OF EDGE BEAMS AND EDGES OF SLABS ARE APPROXIMATELY:
   - TYPICAL FLOOR: 12mm
   - 2ND FLOOR (FLOOR ABOVE RIGID FLOOR): 20mm.

7. NONSTRUCTURAL ELEMENTS SUCH AS CLADDING, MECHANICAL AND ELECTRICAL SERVICES AND SUPPORTS AND THE LIKE, MUST BE DESIGNED AND DETAILED TO ACCOMMODATE THE ANTICIPATED MOVEMENTS NOTED ABOVE.

8. MOVEMENT AT EXPANSION JOINTS - SEE DETAIL AND PLANS

9. HORIZONTAL SHRINKAGE MOVEMENTS OF POST-TENSIONED SLABS = APPROXIMATELY 10 mm PER 30000 mm OF LENGTH.

ALL STRUCTURES ARE ALSO SUBJECT TO CONSTRUCTION TOLERANCES. THIS SHOULD BE ALLOWED FOR IN DETAILING NON-STRUCTURAL COMPONENTS IN ADDITION TO THE ABOVE MOVEMENTS.

DESIGN LOADS

1. FLOOR PLAN LOADING IS SHOWN ON PLANS.

2. CLADDING LOADS:

   A. CURTAIN AND WINDOW WALL - 1.0 kPa VERTICAL SURFACE

3. SPECIFIED CONCENTRATED LOADS ARE AS FOLLOWS U.N.O. ON PLAN:
   A. ROOFS ----------1.3 kN

4. SEISMIC AND WIND DESIGN:

   THE LATERAL SYSTEM FOR THIS PROJECT CONSISTS OF MOMENT FRAMES AND BRACED FRAMES WHEN STEEL CONSTRUCTION IS USED AND SHEAR WALLS WHEN CONSCRETE CONSTRUCTION IS USED. THE LATERAL SYSTEMS ARE DESIGNED FOR THE FOLLOWING EARTHQUAKE FACTORS:

4a. EARTHQUAKE DESIGN PARAMETERS

Sa (0.2) = 0.19	SITE CLASSIFICATION: SITE CLASS D	
Sa (0.5) = 0.110	Ie = 1.0	Fa = 1.3
Sa (1.0) = 0.068	Rd = 1.5	Fv = 1.4
Sa (2.0) = 0.022	Ro = 1.3	Ta = PER PLAN
Sa (0.2)Fale = 0.247		

4b. WIND DESIGN PARAMETERS:

Ce, Cg, and Cp ARE BASED ON OBC CL. 4.1.7.
q50 = 0.47 kPa, Iw = 1.0 ULS, 0.75 SLS

WIND UPLIFT LOADS ON STEEL OR WOOD ROOFS SHALL BE 1 kPa NET UNLESS NOTED OTHERWISE ON PLAN.

4c. FACTORED BASE FORCES.

MAXIMUM BASE SHEARS AND OVERTURNING MOMENT FOR THE STRUCTURE THROUGH STATIC ANALYSIS ARE NOTED ON PLAN.

WIND - NORTH/SOUTH DIRECTION -
- EAST/WEST DIRECTION -

SEISMIC - NORTH/SOUTH DIRECTION -
- EAST/WEST DIRECTION -

5. LATERAL LOADS ON FOUNDATION WALLS.

A. FOUNDATION WALLS RETAINING EARTH ARE DESIGNED TO RESIST A HORIZONTAL PRESSURE AT ANY DEPTH PER THE GEOTECHNICAL REPORT BASED ON FOLLOWING:

EARTHQUAKE SOIL PRESSURE----------: PE = N/A
SOIL PRESSURE COEFFICIENT----------: K = 0.4
DEPTH BELOW GROUND WATER LEVEL------: Hw = 0 (Free draining)
DRY UNIT WEIGHT OF SOIL----------: q = 21.5 kPa
SURFACE SURCHARGE----------: q = 4.8 kPa

B. THE SUBSTRUCTURE HAS BEEN DESIGNED TO RESIST UNBALANCED SOIL PRESSURE ACTING ON FOUNDATION WALLS AND RESISTED BY THE SHEAR WALLS AND FOUNDATION WALLS. THE UNBALANCED SOIL PRESSURE HAS BEEN CALCULATED BASED ON THE SOILS REPORT, AND IT IS A CONSEQUENCE OF:

- FINISHED GRADE ELEVATION

C. DO NOT BACKFILL WALLS UNTIL LATERALLY SUPPORTED BY COMPLETED FLOOR AND/ OR ROOF STRUCTURE.

6. WATER TABLE: THIS BUILDING IS NOT DESIGNED AS A TANKED STRUCTURE.

7. LOADS TO EXISTING STRUCTURES:

A. SNOW DRIFTING AS NOTED ON PLAN

TEMPORARY WORKS

1. THE CONTRACTOR SHALL DESIGN, PROVIDE, ERECT, MAINTAIN, REMOVE AND ASSUME FULL AND SOLE RESPONSIBILITY FOR ALL TEMPORARY WORKS REQUIRED FOR THE SAFE AND COMPLETE EXECUTION OF THE WORKS.

2. IN THE EXECUTION OF THE TEMPORARY WORKS AND FOR THE DURATION OF THE CONTRACT, THE CONTRACTOR SHALL MAKE ADEQUATE PROVISION FOR ALL LIKELY CONSTRUCTION LOADING AND PROVIDE SUFFICIENT BRACING AND PROPS TO KEEP THE WORKS IN PLUMB AND ALIGNMENT AND FREE FROM EXCESSIVE DEFLECTION.

3. ACCESS OF HEAVY CONSTRUCTION EQUIPMENT AND ACCUMULATION OF CONSTRUCTION MATERIALS ON THE FLOORS ARE NOT PERMITTED, UNLESS SUCH HAVE BEEN CATERED FOR IN THE CONTRACTOR'S TEMPORARY WORK DESIGN TO THE SATISFACTION OF THE ARCHITECT & ENGINEER.

4. COSTS OF ALL TEMPORARY WORKS ARE DEEMED TO HAVE BEEN INCLUDED IN THE CONTRACT PRICE.

5. SUBMIT SHOP DRAWINGS FOR ALL TEMPORARY WORKS FOR REVIEW BEFORE FABRICATION COMMENCES. SHOP DRAWINGS SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED AND LICENSED TO PRACTICE BY THE PROFESSIONAL ENGINEERING ASSOCIATION HAVING JURISDICTION IN THE AREA WHERE THE STRUCTURE IS TO BE BUILT.

6. ANY CONSTRUCTION SEQUENCES SHOWN ON THE DRAWINGS SHALL BE PART OF TEMPORARY WORKS AND ARE FOR THE CONTRACTOR'S CONSIDERATION ONLY. THE CONTRACTOR IS AT LIBERTY TO USE ANY OTHER SEQUENCE AS HE DEEMS APPROPRIATE, BUT AT NO TIME SHALL THE SAFETY AND INTEGRITY OF THE WORKS AND THE STRUCTURE BE COMPROMISED. IF THE CONTRACTOR ADAPTS THE SUGGESTED SEQUENCE, SUCH SEQUENCE SHALL BE DEEMED AS THE CONTRACTOR'S OWN SELECTION OF METHOD, AND THE CONTRACTOR SHALL ASSUME FULL AND SOLE RESPONSIBILITY FOR IT, AS STATED IN (1) ABOVE. THE CONTRACTOR SHALL INFORM THE ARCHITECT IF HE WISHES TO DEVIATE FROM ANY SUGGESTED SEQUENCE.

7. SEE ALSO CONCRETE FORMWORK STRIPPING AND SHORING NOTES.

GENERAL CONTINUED...

GALV. ----- GALVANIZED
G.L. ---------- GRID LINE
H.1.E.------- HOOK ONE END
H.2.E. ------ HOOK 2 ENDS
H & V ------- HORIZONTAL AND VERTICAL
H, HOR. --- HORIZONTAL
HSC --------- HORIZONTALLY SLOTTED CONNECTION
Hf ---------- FACTORED HORIZONTAL SHEAR FORCE
HORZ. ----- HORIZONTAL
HORIZ ---- HORIZONTAL
HP -------- HIGH POINT
INT. ------- INTERIOR
JT. ---------- JOINT
LG. --------- LONG
L.L. --------- LIVE LOAD
T.J. --------- TIE JOIST
T.O. -------- TOP OF
T.O.C. ------ TOP OF CONCRETE
T.O.S.S.---- TOP OF STRUCT. STEEL
T.O.S. ------ TOP OF SLAB
T.U.L. ------ TOP UPPER LAYER
TYP -------- TYPICAL
U.N.O. ------ UNLESS NOTED OTHERWISE
ULS --------- ULTIMATE LIMIT STATE
SLS --------- SERVICEABILITY LIMIT STATE
U/S --------- UNDERSIDE
V., VERT. -- VERTICAL
Vf ---------- FACTORED SHEAR FORCE
VXB--------- VERTICAL BRACING, VERTICAL CROSS BRACING
W.P. -------- WORK POINT

12. DEFINITIONS:

A. RJC: READ JONES CHRISTOFFERSEN OR ITS REPRESENTATIVE.

B. SPECIALTY STRUCTURAL ENGINEER: A STRUCTURAL ENGINEER REGISTERED AND LICENSED TO PRACTICE BY THE PROFESSIONAL ENGINEERING ASSOCIATION HAVING JURISDICTION IN THE AREA WHERE THE STRUCTURE IS TO BE BUILT AND WHO IS RESPONSIBLE FOR THE DESIGN AND FIELD REVIEW OF:

- STRUCTURAL ELEMENTS DESIGNED BY THE CONTRACTOR OR SUBCONTRACTORS, SUCH AS OPEN WEB STEEL JOISTS, PRECAST DOUBLE TEES, PRECAST PLANKS, STRUCTURAL STEEL CONNECTIONS, LIGHT WOOD FRAME ROOF TRUSSES, ETC.
- SECONDARY STRUCTURAL ELEMENTS AND NON-STRUCTURAL ELEMENTS. SEE ALSO "NON-STRUCTURAL ELEMENTS" GENERAL NOTES.

C. CONTINUOUS: FULL TENSION SPLICE AND TENSION DEVELOPMENT LENGTH.

D. EMBEDMENT: UNLESS NOTED OTHERWISE COMPRESSION EMBEDMENT MEANS A COMPRESSION DEVELOPMENT LENGTH AND TENSION EMBEDMENT MEANS A TENSION DEVELOPMENT LENGTH AS PER CAN/CSA-A23.3 AND AS SHOWN ON THESE GENERAL NOTES DRAWINGS.

E. GENERAL CONTRACTOR: FOR THE PURPOSES OF THESE DRAWINGS, THE USE OF THE TERM "CONTRACTOR" OR "GENERAL CONTRACTOR" SHALL REFER TO THE PRIME PERSON OR COMPANY RESPONSIBLE FOR CONSTRUCTION OF THE PROJECT AND THE COORDINATION OF TRADES AND SUBCONTRACTORS. THIS MAY BE THE GENERAL CONTRACTOR, OR A CONSTRUCTION MANAGER.

DESIGN CODE

1. THE COMPLETED BASE BUILDING STRUCTURE SHOWN ON THE STRUCTURAL DRAWINGS HAS BEEN DESIGNED IN SUBSTANTIAL ACCORDANCE WITH THE ONTARIO BUILDING CODE 2012 WHICH IS BASED ON THE NATIONAL BUILDING CODE OF CANADA 2010.

FIELD REVIEW BY READ JONES CHRISTOFFERSEN (RJC)

1. READ JONES CHRISTOFFERSEN PROVIDES FIELD REVIEW ONLY FOR THE WORK SHOWN ON THESE STRUCTURAL DRAWINGS. THIS REVIEW IS NOT A "FULL TIME" REVIEW BUT IS CONDUCTED WITH SUCH FREQUENCY AS RJC DEEMS APPROPRIATE TO OBSERVE VARIOUS STAGES OF THE WORK AND TO ASCERTAIN THAT THE WORK IS IN GENERAL CONFORMANCE WITH THE PLANS AND SUPPORTING DOCUMENTS PREPARED BY READ JONES CHRISTOFFERSEN. FIELD REVIEW BY READ JONES CHRISTOFFERSEN IS NOT CARRIED OUT FOR THE CONTRACTOR'S BENEFIT, NOR DOES IT MAKE READ JONES CHRISTOFFERSEN GUARANTORS OF THE CONTRACTOR'S WORK. IT REMAINS THE CONTRACTOR'S RESPONSIBILITY TO BUILD THE WORK IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. RJC SHALL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUB-CONTRACTOR, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

   RJC WILL REVIEW SHOP DRAWINGS PERTAINING TO WORK SHOWN ON RJC'S DRAWINGS. THE EXTENT OF THIS REVIEW IS AT THE SOLE DISCRETION OF RJC'S ENGINEER AND IS FOR THE SOLE PURPOSE OF ASCERTAINING GENERAL CONFORMANCE WITH THE STRUCTURAL DESIGN CONCEPT. THE REVIEW IS NOT AN APPROVAL OF THE DESIGN, DETAILS, AND DIMENSIONS INHERENT IN THE SHOP DRAWINGS, RESPONSIBILITY FOR WHICH SHALL REMAIN WITH THE CONTRACTOR OR SUBCONTRACTOR SUBMITTING THEM. SUCH REVIEW SHALL NOT RELIEVE THE CONTRACTOR OR SUBCONTRACTOR OF HIS OR HER RESPONSIBILITY FOR ERRORS AND OMISSIONS IN THE SHOP DRAWINGS OR FOR MEETING ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS.

2. PROVIDE 24 HOURS ADVANCE NOTICE OF EACH REQUIRED FIELD REVIEW. FIELD REVIEWS SHALL BE SCHEDULED TO BE CARRIED OUT DURING NORMAL BUSINESS HOURS UNLESS SPECIAL ARRANGEMENTS ARE MADE WITH RJC.

3. THE WORK TO BE REVIEWED SHALL BE GENERALLY COMPLETE.

DRAWINGS

1. THE USE OF THESE DRAWINGS IS LIMITED TO THAT IDENTIFIED IN THE REVISIONS COLUMN. DO NOT CONSTRUCT FROM THESE DRAWINGS UNLESS MARKED "ISSUED FOR CONSTRUCTION" IN THE REVISIONS COLUMN, BY READ JONES CHRISTOFFERSEN LTD. THE DRAWINGS SHALL NOT BE USED FOR PRICING, COSTING, OR TENDER UNLESS SO INDICATED IN THE REVISION COLUMN. PRICING OR COSTING DRAWINGS ARE NOT COMPLETE AND ANY PRICES BASED ON PRICING OR COSTING DRAWINGS MUST INCLUDE ALLOWANCES FOR THIS.

2. THE INFORMATION ON THESE DRAWINGS SHALL NOT BE USED FOR ANY OTHER PROJECT OR WORKS. THE INFORMATION ON THESE DRAWINGS APPLIES SOLELY TO THIS PROJECT.

3. THE DRAWINGS DO NOT SHOW COMPONENTS THAT MAY BE NECESSARY FOR CONSTRUCTION SAFETY. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR SAFETY IN AND ABOUT THE JOB SITE DURING CONSTRUCTION, AND THE DESIGN AND ERECTION OF ALL TEMPORARY STRUCTURES, FORMWORK, FALSE WORK, SHORING, ETC. REQUIRED TO COMPLETE THE WORK.

GENERAL

1. SECTION MARK SHOWN THUS 4 / S301 MEANS SECTION #4 ON DRAWING S301.

2. SEE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR SLEEVES, NAILERS, INSERTS, ETC., TO BE ENCASED IN CONCRETE.

3. SEE ARCHITECTURAL DRAWINGS FOR FLOOR AND ROOF ELEVATIONS, RECESSES, DRAINAGE SLOPES, ETC.

4. THE GENERAL CONTRACTOR SHALL REVIEW ALL THE DRAWINGS AND CHECK DIMENSIONS BEFORE CONSTRUCTION. REPORT DISCREPANCIES BETWEEN STRUCTURAL AND OTHER DISCIPLINES DRAWINGS FOR CLARIFICATION.

5. DESIGN FORCES INDICATED ON DRAWINGS FOR STRUCTURAL STEEL WORK ARE FACTORED FORCES UNLESS NOTED OTHERWISE. FORCES ARE VERTICAL SHEAR FORCES U.N.O.

   A. FORCES ---------- kN
   B. MOMENTS ---------- kN-m
   C. LINE LOADS ---------- kN/m
   D. DISTRIBUTED LOADS ---------- kPa

   SEE "GENERAL NOTES - LOADS" FOR DEFINITIONS AND VALUES OF LIVE LOAD, DEAD LOAD AND SUPERIMPOSED DEAD LOAD. SEE ALSO PLANS FOR OTHER LOAD/FORCE REQUIREMENTS.

6. CONCRETE WORK
   SHALL CONFORM TO CAN/CSA-A23.1, CAN/CSA-A23.2, CAN/CSA-A23.3 AND REFERENCED DOCUMENTS.

7. STRUCTURAL STEEL WORK
   SHALL CONFORM TO CAN/CSA-S16 AND REFERENCED DOCUMENTS

8. FIRE RESISTANCE RATINGS
   SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR PRECISE LOCATION OF REQUIRED FIRE RESISTANCE RATINGS.

9. DO NOT CUT OR DRILL ANY OPENINGS IN STRUCTURAL MEMBERS WITHOUT WRITTEN PERMISSION OF RJC.

10. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND LANDSCAPE DRAWINGS FOR LOCATIONS, CONFIGURATIONS, EXTENT, AND SIZES OF ALL CURBS, UPSTANDS, DOWNTURNS; AND FOR OPENINGS THROUGH FLOORS AND WALLS FOR DUCTS, CONDUIT AND PIPING. PROVIDE FOR SAME.

11. ABBREVIATIONS:

75 ---------- MOMENT CONNECTION PASS THROUGH FORCE [kN]
A.B. -------- ANCHOR BOLT
A.E.S.S.----- ARCHITECTURALLY EXPOSED STRUCTURAL STEEL
ALT. -------- ALTERNATE
ARCH. ------ ARCHITECTURAL
B.C.E. ------ BOTTOM CHORD EXTENSION
BEW ------- BOTTOM EACH WAY
B.L.L. ------ BOTTOM LOWER LAYER
BLW ------- BOTTOM LONG WAY
BSW ------- BOTTOM SHORT WAY
B, BOT. ---- BOTTOM
B.U.L. ------ BOTTOM UPPER LAYER
CA ---------- COLUMN ABOVE
CANT. ------ CANTILEVER
CB ---------- COLUMN BELOW
CBM -------- COUPLING BEAM
Cf ---------- FACTORED AXIAL FORCE COMPRESSION
C.I.P. ------- CAST IN PLACE
C.J. --------- CONTROL JOINT
CL. ---------- CENTER LINE
CLR. -------- CLEAR
CONC. ------ CONCRETE
CONT. ------ CONTINUOUS
C.P. --------- COMPLETE PENETRATION
CTRS. ------ CENTRES
C/W --------- COMPLETE WITH
DBM -------- DIVIDER BEAM
DET. -------- DETAIL
D.L. --------- DEAD LOAD
D.O. --------- DO OVER - (DITTO)
DP. ---------- DEEP (I.E. DEPTH OF BEAM)
D.T.S. ------ DEPTH TO SUIT
DWG. ------ DRAWING
DWLS. ----- DOWELS
E.E. --------- EACH END
E.F. --------- EACH FACE
EL. ---------- ELEVATION
ELEV. ------ ELEVATION
ELEC. ------ ELECTRICAL
E.S. --------- EACH SIDE
E.WAY ----- EACH WAY
E.W. -------- EACH WAY
EXIST. ------ EXISTING
EXT. -------- EXTERIOR
EXP. JT. --- EXPANSION JOINT
F.D. --------- FLOOR DRAIN
F.S. --------- FAR SIDE
L.L.B.B. ---- LONG LEGS BACK TO BACK
L.L.H. ------ LONG LEG HORIZONTAL
L.L.V. ------ LONG LEG VERTICAL
LS.H. ------ LONG SIDE HORIZONTAL
L.S.V. ------ LONG SIDE VERTICAL
L.W. --------- LONG WAY
LP ---------- LOW POINT
MAX. -------- MAXIMUM
MECH. ------ MECHANICAL
Mf ---------- FACTORED BENDING MOMENT
Mfx ---------- STRONG AXIS BENDING MOMENT
Mfy ---------- WEAK AXIS BENDING MOMENT
MIN. --------- MINIMUM
Mtf ---------- FACTORED TORSION
N.I.C. ------ NOT IN CONTRACT
N.S. --------- NEAR SIDE
N.T.S. ------ NOT TO SCALE
O.C. --------- ON CENTRE
O/C --------- ON CENTRE
OPP. -------- OPPOSITE
O.W.S.J. --- OPEN WEB STEEL JOIST
P.P. --------- PARTIAL PENETRATION
P/T ---------- POST-TENSIONING
R.D. --------- ROOF DRAIN
RTN. -------- RETURN
R/W --------- REINFORCED WITH
S.D.L. ------ SUPERIMPOSED DEAD LOAD
S.D.F. ------ STEP DOWN FOOTING
SIM. --------- SIMILAR
S.L. ---------- SNOW LOAD
S.L.B.B. ---- SHORT LEGS BACK TO BACK
S.O.G. ------ SLAB ON GRADE
SPEC. ------ SPECIFICATIONS
SR ---------- STUD RAIL
ST. --------- STAGGER
STIR. ------- STIRRUP
S.W. --------- SHORT WAY
SYM. ------- SYMMETRICAL
TEW -------- TOP EACH WAY
Tf ---------- FACTORED AXIAL TENSION FORCE
THK. -------- THICK
THRU ------ THROUGH
T.L.L. ------- TOP LOWER LAYER
T & B ------- TOP AND BOTTOM
T & C ------- TENSION AND COMPRESSION
T & G ------- TONGUE AND GROOVE

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
4	7	ISSUED FOR TENDER	2019-12-11
5	8	ISSUED FOR ADDENDUM #2	2020-01-10

N

STAMP

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CLIENT: TORONTO ZOO
toronto zoo
361A Old Finch Ave, Toronto ON M1B 5K7 · 416-392-5929

PROJECT:

DRAWING NAME:
GENERAL NOTES & TYPICAL DETAILS

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: As indicated

DRAWING NUMBER:
S-100

EXCAVATIONS

1. DESIGN AND FIELD REVIEW OF EXCAVATION, SHORING, AND BACKFILL IS NOT DONE BY READ JONES CHRISTOFFERSEN.

FOUNDATIONS

1. FOOTINGS HAVE BEEN DESIGNED FOR THE FOLLOWING BEARING RESISTANCES IN ACCORDANCE WITH THE SOILS REPORT.
   PREPARED BY: SOIL ENGINEERS LTD.
   DATED: NOVEMBER 13, 2019

   A. STRIP FOOTINGS: ULS: 250 kPa, SLS: 150 kPa
   B. SPREAD FOOTINGS: ULS: 250kPa, SLS: 150 kPa

2. BEARING SURFACES MUST BE APPROVED BY THE SOILS ENGINEER IMMEDIATELY BEFORE FOOTING CONCRETE IS PLACED. RJC IS NOT RESPONSIBLE FOR CONFIRMING BEARING CAPACITIES OF SOILS.

3. REFER TO SOILS REPORT FOR OTHER SPECIFIC DESIGN REQUIREMENTS FOR FOOTINGS, SOIL SLOPES, FROST PROTECTION, MINIMUM COVER, ETC.

4. UNLESS OTHERWISE SHOWN, CENTER FOOTINGS UNDER COLUMNS AND WALLS.

5. DOWELS SHALL BE PLACED BEFORE CONCRETE IS PLACED. TEMPLATES SHALL BE USED TO ENSURE CORRECT PLACEMENT OF DOWELS.

6. PROVIDE 50 mm GROUND SEAL/ SKIM COAT, MUD SLAB UNDER FOOTINGS AS REQUIRED BY SOIL CONDITIONS.

7. FOR GROUND ELEVATIONS AND DRAINAGE SLOPES, SEE ARCHITECT'S DRAWINGS.

8. VARY FOOTING ELEVATIONS WHERE REQUIRED IN ACCORDANCE WITH DETAIL FOR "TYPICAL STEPPED FOOTING"(S.D.F.), SHOWN ON STRUCTURAL DRAWINGS.

9. FOOTINGS MAY HAVE TO BE LOWERED TO ACCOMMODATE MECHANICAL OR ELECTRICAL SERVICES. SEE MECHANICAL AND ELECTRICAL DRAWINGS FOR ELEVATIONS OF SAME. FOOTINGS ARE NOT TO BE UNDERMINED BY EXCAVATIONS FOR SERVICES, PITS, ETC.

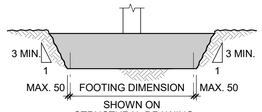
10. FOOTING ELEVATIONS, IF SHOWN, ARE FOR PRICE ESTIMATING PURPOSES ONLY, ARE NOT FINAL, AND MAY VARY ACCORDING TO SITE CONDITIONS OR AS REQUIRED BY SERVICES. ALL FOOTINGS MUST BE TAKEN TO A BEARING LAYER APPROVED BY THE SOILS ENGINEER.

11. BEARING SURFACES MUST BE PROTECTED FROM FREEZING BEFORE AND AFTER FOOTINGS ARE POURED.

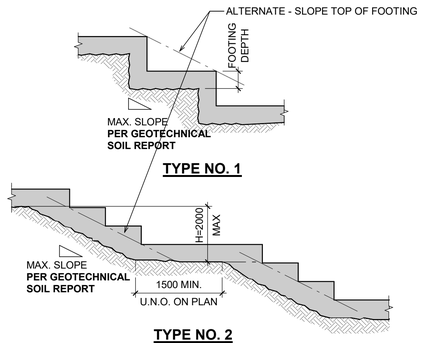
12. SUB-BASE DESIGN OF SOIL UNDER THE SLAB ON GRADE SHALL BE IN ACCORDANCE WITH THE SOIL REPORT.

13. CONCRETE PLACED UNDER WATER SHALL CONFORM TO CAN/CSA-A23.1.

14. FOOTINGS CAST DIRECTLY INTO EXCAVATIONS (WITHOUT SIDE FORMS) SHALL NOT BE LARGER THAN SHOWN BELOW:



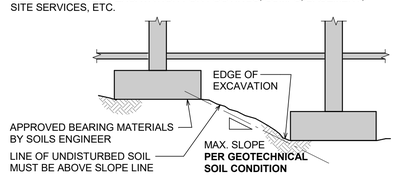
TYPICAL STEPPED FOOTINGS *ON SOIL* (WALLS)



NOTE: IF TOTAL STEPPING 'H' EXCEEDED PROVIDE INTERMEDIATE FLAT HORIZONTAL SECTION BETWEEN SLOPED FOOTINGS U.N.O. ON PLAN

TYPICAL FOOTING ADJACENT TO EXCAVATION

EDGE OF ADJACENT EXCAVATION FOR FOOTINGS, SUMPS, BASEMENT, SITE SERVICES, ETC.



CONCRETE ANCHORS

1. EXCEPT WHERE INDICATED ON THE DRAWINGS, ANCHORS SHALL CONSIST OF THE FOLLOWING ANCHOR TYPES AS PROVIDED BY HILTI (CANADA) LTD. CONTACT HILTI AT (800) 363-4458 FOR PRODUCT RELATED QUESTIONS.

   - "EPOXY OR ADHESIVE ANCHOR" MEANS A:
     - HIT-HY 200 SAFE SET SYSTEM OR HIT-HY 200 FOR FAST CURE APPLICATIONS.
     - HIT-RE 500 OR HIT-RE 500 SD ADHESIVE ANCHOR FOR SLOW . CURE APPLICATIONS.
   - "SCREENED EPOXY ANCHOR" MEANS A "HIT-HY 70 ADHESIVE ANCHOR".
   - "KWIK BOLT" MEANS A "KWIK BOLT TZ OR KWIK BOLT 3 EXPANSION ANCHOR", TO BE SELECTED BASED ON APPLICATION REQUIREMENTS.
   - "HSL" MEANS AN "HSL-3 HEAVY-DUTY EXPANSION ANCHOR".

2. ANCHOR CAPACITY USED IN DESIGN IS BASED ON GUIDELINES PUBLISHED BY HILTI. ALTERNATE FASTENING SYSTEMS PROPOSED BY THE CONTRACTOR SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL. ALTERNATE ADHESIVE ANCHORS MUST BE EQUAL CONSIDERING LOAD RESISTANCE, IN SERVICE AND INSTALLATION TEMPERATURE, AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS, CREEP TESTING, SEISMIC TESTING, AND APPROPRIATE ON SITE TRAINING.

3. INSTALL AS PER THE MANUFACTURER'S INSTRUCTIONS AS INCLUDED IN THE ANCHOR PACKAGING. WEDGE ANCHORS TO HAVE HOLES CLEANED WITH HIGH PRESSURE AIR BLAST. ADHESIVE (EPOXY) ANCHORS TO HAVE HOLES WELL CLEANED PER MANUFACTURER'S INSTRUCTIONS WHICH INCLUDES HIGH PRESSURE AIR BLAST FOLLOWED BY BRUSHING THEN HIGH PRESSURE AIR BLAST SEQUENCE. USE STEEL WIRE BRUSH ON CONCRETE AND MASONRY.

4. OVERHEAD ADHESIVE ANCHORS MUST BE INSTALLED USING THE HILTI PROFI SYSTEM.

5. <u>ON-SITE TRAINING AND REVIEW BY HILTI:</u>

   THE CONTRACTOR SHALL RETAIN A HILTI REPRESENTATIVE TO PROVIDE ON-SITE ANCHOR INSTALLATION TRAINING FOR ALL OF THE HILTI PRODUCTS SPECIFIED. THE CONTRACTORS PERSONNEL MUST BE TRAINED PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS. LETTERS OF TRAINING FOR INSTALLERS TO BE SUBMITTED TO RJC.

   THE CONTRACTOR MAY RETAIN AN INDEPENDANT TESTING AGENCY TO PROVIDE AN ON-GOING SERVICE OF ON-SITE QUALITY CONTROL REVIEWS TO ENSURE THAT ANCHORS ARE BEING INSTALLED IN ACCORDANCE TO HILTI (CANADA) LIMITED'S SPECIFICATIONS. QUALITY ASSURANCE REPORTS FROM THE INDEPENDANT INSPECTION AGENCY ARE TO BE SUBMITTED TO RJC AFTER EACH SITE VISIT.

6. A REPRESENTATIVE SAMPLE OF ANCHORS ARE TO BE TESTED FOR EACH TYPE OF ANCHOR SPECIFIED BY AN INDEPENDANT PROJECT MATERIALS CONSULTANT/ TESTING AGENCY. ANCHORS WHICH FAIL THE LOAD TEST SHALL BE REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S COST.

7. <u>TESTING OF EPOXY ANCHORS:</u>

   PROVIDE TESTING OF EPOXY ANCHORS BY THE PROJECT MATERIALS CONSULTANT / TESTING AGENCY AS FOLLOWS:

   - PROOF LOAD TEST 10% OF EPOXY ANCHORS TO MANUFACTURER'S SPECIFIED CAPACITY.
   - RANDOMLY SELECT 2% OF EPOXY ANCHORS (3 MINIMUM) FOR TESTING TO FAILURE. CONTRACTOR TO REPLACE ANCHORS AT CONTRACTOR'S COST.

   THE ABOVE TESTING IS PAID FOR BY THE OWNER. THE FOLLOWING TESTING IS PAID FOR BY THE CONTRACTOR:

   - IF ANY PROOF LOAD TEST FAILS, TEST 100% OF ANCHORS.
   - IF ANY ANCHORS ARE FOUND TO BE INSTALLED WITHOUT COMPLETE EPOXY OR ARE EMBEDDED LESS THAN 90% OF THE DEPTH SHOWN ON THE DRAWINGS, THEN PROOF LOAD TEST 100% OF THE ANCHORS.
   - PROVIDE FULL TIME FIELD REVIEW OF ALL REPAIRS BY MATERIALS CONSULTANT / TESTING AGENCY.

   THE TESTING AGENCY IS TO PROVIDE A TESTING AND REPAIR REPORT SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OR TERRITORY WHERE THE WORK IS DONE.

8. ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.

9. DO NOT CUT REINFORCING BARS TO INSTALL ANCHORS UNLESS THE STRUCTURAL DRAWINGS SPECIFICALLY NOTE FOR A PARTICULAR DETAIL THAT THE REINFORCING BARS IN THE CONCRETE CAN BE CUT.

10. EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. UNLESS NOTED ON THE DRAWINGS THAT THE BARS CAN BE CUT, THE CONTRACTOR SHALL REVIEW THE EXISTING STRUCTURAL DRAWINGS AND SHALL UNDERTAKE TO LOCATE THE POSITION OF THE REINFORCING BARS AT THE LOCATIONS OF CONCRETE ANCHORS, BY HILTI FERROSCAN, HILTI PS 1000, GPR, X-RAY, CHIPPING OR OTHER MEANS, BEFORE ANY HOLES ARE DRILLED.

11. WHEN ANCHORS ARE USED TO ATTACH STRUCTURAL STEEL, THE CONTRACTOR SHALL USE A TEMPLATE TO LOCATE THE ANCHOR HOLES. IF THIS IS NOT DONE, THEN UPON COMPLETION OF ANCHOR INSTALLATION, THE CONTRACTOR SHALL PREPARE TEMPLATES OF THE AS-BUILT ANCHOR POSITIONS. THE CONTRACTOR SHALL REFER TO THESE TEMPLATES FOR THE FABRICATION OF THE STEEL STRUCTURE.

    AT LOCATIONS OF INTERFERENCE BETWEEN CONCRETE ANCHORS AND EXISTING REINFORCEMENT, ADJUST PROPOSED LOCATIONS OF ANCHORS AS REQUIRED TO AVOID CUTTING REINFORCEMENT. SUBMIT A PROPOSED ANCHOR LAYOUT TO RJC FOR REVIEW AND APPROVAL BEFORE INSTALLING ANCHORS.

12. DO NOT OVERSIZE HOLES IN STEEL MATERIAL TO FIT ANCHOR LOCATIONS EXCEPT FOR COLUMN BASE PLATE HOLES WHICH ARE FABRICATED SLIGHTLY OVERSIZED AS PER STANDARD PRACTICE.

SHOP DRAWING REVIEW RESPONSIBILITIES

1. AS PART OF FIELD SERVICES, RJC WILL REVIEW SHOP DRAWINGS PERTAINING TO WORK SHOWN ON RJC'S DRAWINGS BY MEANS OF APPROPRIATE RATIONAL SAMPLING PROCEDURES AND COMMENT ON THE ACCURACY WITH WHICH THE CONTRACTOR PREPARED THE DRAWINGS. REVIEW OF SHOP DRAWINGS IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPT AND IS NOT AN APPROVAL OF THE DETAIL DESIGN INHERENT IN THE SHOP DRAWINGS. RESPONSIBILITY FOR WHICH SHALL REMAIN WITH THE CONTRACTOR SUBMITTING THEM. SUCH REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR ERRORS AND OMISSIONS IN THE SHOP DRAWINGS OR FOR MEETING ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INFORMATION PERTAINING TO THE FABRICATION PROCESS TECHNIQUES OF CONSTRUCTION AND INSTALLATION AND FOR CO-ORDINATION OF THE WORK OF ALL SUB-TRADES.

2. ALL CONNECTIONS TO BE DESIGNED BY FABRICATOR UNLESS NOTED OTHERWISE. ALL BEAM CONNECTIONS TO BE STANDARD FRAME BEAM CONNECTIONS OR EQUIVALENT, UNLESS NOTED OTHERWISE. THE FABRICATOR SHALL SUBMIT SUMMARY DESIGN DRAWINGS FOR REVIEW SHOWING IN DETAIL THE "STANDARD" CONNECTIONS AND THEIR CAPACITIES THAT IS INTENDED FOR USE ON THE PROJECT. THESE DRAWINGS ARE IN ADDITION TO THE REGULAR SHOP DRAWINGS, AND SHALL PRECEDE THEM.

   A. SHOP DRAWINGS SHALL BE PREPARED UNDER THE DIRECTION OF A SPECIALTY STRUCTURAL ENGINEER. FOR THOSE CONNECTIONS AND COMPONENTS DESIGNED BY THE FABRICATOR. THIS ENGINEER OR THEIR REPRESENTATIVE SHALL VISIT THE SITE TO REVIEW IN PLACE THE CONNECTIONS AND COMPONENTS DESIGNED BY THIS ENGINEER TO SATISFY THEMSELVES THAT THESE CONNECTIONS AND COMPONENTS COMPLY WITH THEIR DESIGN ON THE SHOP DRAWINGS. THIS ENGINEER SHALL PROVIDE A LETTER TO RJC TO THIS EFFECT. THIS ENGINEER SHALL ALSO PROVIDE SEALED SKETCHES FOR ALL FIELD MODIFICATIONS MADE TO THEIR DESIGN.

   B. BEFORE THE SUBMISSION OF SHOP DRAWINGS NOTIFY RJC AS TO WHO THE ENGINEER WILL BE THAT WILL BE DESIGNING AND PROVIDING FIELD REVIEW FOR THE CONNECTIONS AND COMPONENTS DESIGNED BY THE CONTRACTOR.

   C. PRIOR TO SUBMITTING SHOP DRAWINGS THE CONTRACTOR SHALL NOTIFY RJC IN WRITING THAT THE FABRICATOR IS CERTIFIED TO A MINIMUM OF DIVISION 2 OF CSA W47.1.

   D. DRAWINGS OF COMPONENTS AND CONNECTIONS DESIGNED BY THE FABRICATOR'S SPECIALTY STRUCTURAL ENGINEER SHALL BE SIGNED AND SEALED BY THIS ENGINEER OR A LETTER SHALL BE SUBMITTED AT THE END OF SHOP DRAWING PRODUCTION SIGNED AND SEALED BY THIS ENGINEER, IDENTIFYING WHAT WAS DESIGNED AND LISTING THE FINAL DRAWINGS WITH DATES AND REVISION NUMBERS.

   E. REQUEST BY THE FABRICATOR MUST BE ACCEPTABLE TO RJC AND DETAILED ON THE SHOP DRAWINGS. TESTING OF THESE CONNECTIONS SHALL BE AT THE DISCRETION OF RJC AND TO THE CONTRACTORS ACCOUNT.

   F. SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO START OF STEEL FABRICATION.

   G. FABRICATION, ERECTION, STRUCTURAL DESIGN, AND DETAILING OF ALL STEEL SHALL BE IN ACCORDANCE WITH CAN/CSA-S16.

RENOVATIONS

1. THE CONTRACT DOCUMENTS ARE BASED ON ASSUMED AS-BUILT DIMENSIONS FOR THE EXISTING BUILDING STRUCTURE AND ASSUMPTIONS ACCORDANCE WITH DETAILING AND PLACING PRACTICE. THESE ASSUMPTIONS MAY VARY FROM THE ACTUAL ON-SITE CONDITIONS. THE CONTRACTOR SHALL IMMEDIATELY INFORM THE CONSULTANT OF ANY ACTUAL VARIATIONS FROM THE ASSUMED CONDITIONS.

2. MINOR MODIFICATIONS TO SUIT TOLERANCES OF +/- 50mm WILL BE REQUIRED TO THE WORK INDICATED ON THESE DRAWINGS TO REFLECT ACTUAL SITE CONDITIONS. THE CONTRACTOR WILL COOPERATE WITH THE CONSULTANT AND RJC IN THIS REGARD. MINOR MODIFICATIONS WILL BECOME THE RESPONSIBILITY OF THE CONTRACTOR AND WILL NOT RESULT IN A CHANGE IN THE CONTRACT PRICE.

3. ENSURE THAT ALL NECESSARY JOB DIMENSIONS ARE TAKEN AND ALL TRADES ARE COORDINATED FOR THE PROPER EXECUTION OF THE WORK. THE CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR THE ACCURACY AND COMPLETENESS OF SUCH DIMENSIONS, AND FOR COORDINATION.

4. PRIOR TO FABRICATION OF ANY STRUCTURAL MEMBERS, THE CONTRACTOR SHALL COMPLETE THIS SITE REVIEW OF CRITICAL "TIE-IN" DIMENSIONS AND CONFIRM ALL DIMENSIONS TO ENSURE PROPER FIT OF NEW WORK TO EXISTING. REPORT ANY DISCREPANCIES TO RJC PRIOR TO STARTING WORK.

5. COMMENCEMENT OF CONSTRUCTION OR ANY PART THEREOF CONSTITUTES ACCEPTANCE OF EXISTING CONDITIONS AND MEANS DIMENSIONS AND ELEVATIONS HAVE BEEN CONSIDERED, VERIFIED AND ARE ACCEPTABLE.

6. ANY OPENINGS THAT ARE NOT SHOWN OR INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE REPORTED TO RJC FOR REVIEW. THESE OPENINGS MAY NOT BE ALLOWED, MAY HAVE TO BE MOVED, OR MAY REQUIRE ADDITIONAL STRUCTURAL WORK AND DETAILING. DO NOT PROCEED WITH THESE OPENINGS WITHOUT WRITTEN PERMISSION FROM RJC.

7. UNLESS NOTED OTHERWISE ON THE STRUCTURAL DRAWINGS, THE CORING OR CUTTING OF OPENINGS AND HOLES SHOWN ON THE STRUCTURAL DRAWINGS THROUGH THE EXISTING STRUCTURE SHALL NOT CUT ANY REINFORCING BARS. THE CONTRACTOR SHALL LOCATE THE LOCATION, SIZE, LENGTH, ORIENTATION AND POSITION OF EXISTING REINFORCING AND PROVIDE RJC WITH HARD COPIES OF SUCH FOR OUR REVIEW IN THE VICINITY OF THE HOLES AND SLEEVES TO BE CUT OR CORED, AND THE HOLES AND SLEEVES SHALL BE LOCATED TO AVOID CUTTING OF REINFORCING BARS. WHERE THIS IS NOT POSSIBLE, IT SHALL BE REPORTED TO RJC FOR REVIEW.

8. NEW OPENINGS TO BE CUT THROUGH EXISTING FLOOR SLAB OR WALLS SHALL BE CLEARLY MARKED OUT BY THE CONTRACTOR. THE CONTRACTOR SHALL NOTIFY RJC ONCE THE MARKING OUT HAS BEEN COMPLETED SO THAT RJC CAN REVIEW THE PROPOSED LOCATIONS OF ALL NEW OPENINGS. DO NOT PROCEED WITH CUTTING OF NEW OPENINGS WITHOUT THE APPROVAL OF RJC.

9. UNLESS NOTED OTHERWISE ON THE DRAWINGS NEW STRAIGHT SIDED OPENINGS THROUGH EXISTING SLABS AND WALLS SHALL BE SAWCUT WITH NO OVERCUTS. USE CORED HOLES AT THE CORNERS. JACKHAMMERING SHALL NOT BE PERMITTED. REFER TO THE DETAILS AND PROCEDURES INDICATED ON THE STRUCTURAL DRAWINGS FOR THE NEW OPENINGS. ALTERNATES TO THE ABOVE PROCEDURES MUST BE REVIEWED BY RJC PRIOR TO THE START OF DEMOLITION OR CONSTRUCTION.

10. UNLESS NOTED OTHERWISE AT ALL LOCATIONS WHERE NEW CONCRETE WILL BE IN CONTACT WITH EXISTING CONCRETE SURFACES, THE EXISTING CONCRETE SURFACE IS TO BE COMPLETELY CLEANED AND ROUGHENED BY HYDRODEMOLITION, BUSH HAMMERING, (OR APPROVED EQUAL) TO AN AMPLITUDE OF 6 mm (1/4").

11. CONNECTIONS FOR NEW STRUCTURAL STEEL FRAMING TO EXISTING STRUCTURAL STEEL SHALL BE ACHIEVED THROUGH WELDED CONNECTIONS UNLESS OTHERWISE NOTED. WELDING OF NEW STEEL TO "OLD" STEEL (STEEL PRODUCED IN EARLY 20TH CENTURY) MAY REQUIRE MODIFICATIONS TO THE STANDARD WELDING PROCEDURES. PROCEDURES OF WELDING NEW STEEL TO "OLD" STEEL SHALL BE PREPARED BY THE CONTRACTOR'S SPECIALTY STRUCTURAL ENGINEER AND REVIEWED AND APPROVED BY RJC. CONTRACTOR TO ALSO PROVIDE A REPORT FROM MATERIALS TESTING COMPANY COMMENTING ON CHEMICAL COMPOSITION AND WELDABILITY OF OLD STEEL.

12. CONTRACTOR TO ENSURE THAT UNDERGROUND OR IN-SLAB SERVICES ARE NOT DAMAGED THROUGH DEMOLITION, SAWCUTTING, HOLE AUGURING, OR OTHER CONSTRUCTION ACTIVITIES. SEE SPECIFICATION FOR TESTING/LOCATING REQUIREMENTS.

13. FASTENING TO EXISTING MATERIALS:

    UNLESS NOTED OTHERWISE, THE FOLLOWING REQUIREMENTS APPLY TO ALL CONNECTIONS BETWEEN EXISTING AND NEW MATERIALS:

    A. USE ONLY PRODUCTS AS SPECIFIED UNLESS ALTERNATES HAVE BEEN PRE-APPROVED BY RJC IN WRITING.

    B. ON SITE TRAINING - THE CONTRACTOR SHALL RETAIN A MANUFACTURER'S REPRESENTATIVE TO PROVIDE ON-SITE ANCHOR INSTALLATION TRAINING FOR ALL PROPRIETARY PRODUCTS SPECIFIED. THE CONTRACTOR'S PERSONNEL MUST BE TRAINED PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.

    C. THE CONTRACTOR IS TO RETAIN A THIRD PARTY MATERIALS TESTING AGENCY EXPERIENCED WITH THE INSTALLATION OF ANCHORS TO PROVIDE AN ON-GOING SERVICE OF ON-SITE QUALITY CONTROL REVIEWS TO ENSURE THAT ANCHORS ARE BEING INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED SPECIFICATIONS AND INSTALLATION PROCEDURES. QUALITY ASSURANCE REPORTS FROM THE TESTING AGENCY ARE TO BE SUBMITTED TO RJC AFTER EACH SITE VISIT. AT THE END OF THE PROJECT, THE TESTING AGENCY IS TO PROVIDE A LETTER SIGNED BY A REGISTERED ENGINEER STATING THAT THE GENERAL INSTALLATION OF ANCHORS FOR THE PROJECT IS IN ACCORDANCE WITH THE RECOMMENDED INSTALLATION PRACTICE AS SPECIFIED BY THE MANUFACTURER.

    D. A REPRESENTATIVE SAMPLE OF ANCHORS IS TO BE TESTED FOR EACH TYPE OF ANCHOR SPECIFIED. TESTING SHALL BE CARRIED OUT BY A TESTING AGENCY APPOINTED AND PAID FOR BY THE OWNER. ANCHORS WHICH FAIL THE LOAD TEST SHALL BE REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S COST. IF THE FAILURE RATE EXCEEDS 1 IN 10 FOR A TYPE OF ANCHORS, ALL ANCHORS ARE TO BE TESTED.

    E. SEE ALSO CONCRETE ANCHORS NOTE.

14. DRILL AND SITE MEASURE BOLT HOLES IN EXISTING STRUCTURE PRIOR TO FABRICATING STEEL CONNECTION PLATES. BOLT HOLES MAY HAVE TO BE MOVED FROM WHAT IS SHOWN ON THE DRAWINGS TO AVOID CUTTING EXISTING REINFORCING OR TO AVOID OTHER SITE CONDITIONS. SITE MODIFICATION OF STEEL CONNECTION PLATES WILL NOT BE ACCEPTED WITHOUT THE PRIOR APPROVAL OF RJC.

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
4	7	ISSUED FOR TENDER	2019-12-11
5	8	ISSUED FOR ADDENDUM #2	2020-01-10

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PROJECT:

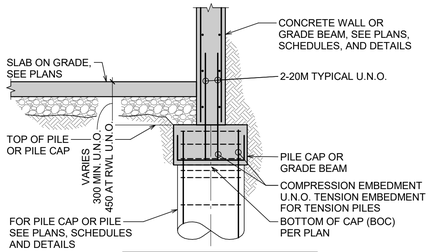
DRAWING NAME:
GENERAL NOTES & TYPICAL DETAILS

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: As indicated

DRAWING NUMBER:
S-101

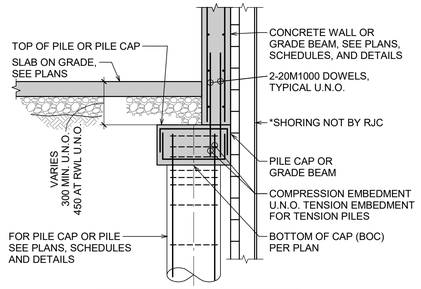
TYPICAL INTERIOR WALL ON PILE OR PILE CAP - U.N.O.



WALL PLACED BEFORE SLAB POURED

NOTE: PROVIDE MINIMUM FROST COVER AT FROST SUSCEPTIBLE LOCATIONS PER GEOTECHNICAL RECOMMENDATIONS.

TYPICAL EXTERIOR WALL ON PILE OR PILE CAP WITH SHORING- U.N.O.



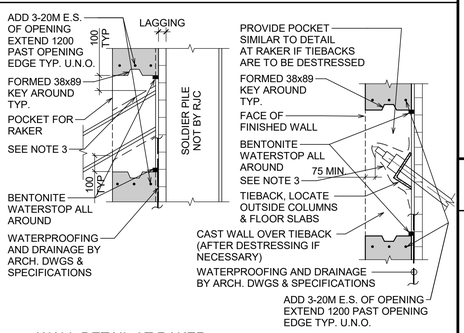
WALL PLACED BEFORE SLAB POURED

NOTE: PROVIDE MINIMUM FROST COVER AT FROST SUSCEPTIBLE LOCATIONS PER GEOTECHNICAL RECOMMENDATIONS.

PLACING OF CONCRETE IN STEEL PILES

1. CONCRETE MAY BE PLACED IN STEEL PILES AND CAISSONS BY DROPPING FROM TOP.
2. PILE DRIVING OPERATIONS MUST NOT DISTURB ADJACENT CONCRETE PLACED IN PILES, PILE CAPS, GRADE BEAMS, SLABS, ETC. BETWEEN THE TIME THE CONCRETE STARTS ITS INITIAL SET AND UNTIL IT REACHES 10 MPa STRENGTH.

EXCAVATION SUPPORT SYSTEMS & FOUNDATION WALLS



WALL DETAIL AT RAKER

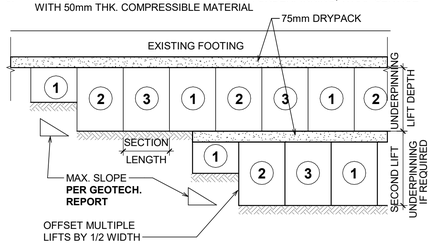
DETAIL @ TIEBACKS (NO WALER)

NOTES:

1. PROVE VERTICAL CONTROL JOINT IN LINE WITH TIE BACK AND RAKER LOCATIONS.
2. DESIGN OF SHORING SYSTEM IS BY THE SHORING CONSULTANT.
3. PAINT/ MASKING/ COATING PER ARCH DWGS & SPECIFICATIONS.

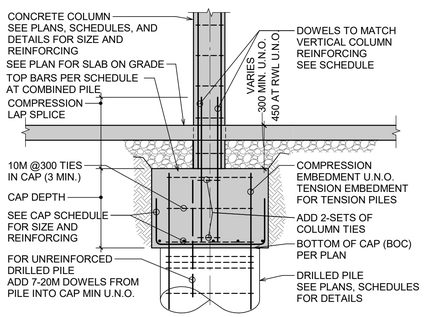
UNDERPINNING NOTES

1. CONCRETE SHALL HAVE 28 DAY STRENGTH OF 25 MPa AND A MAX. SLUMP OF 75mm (3"). DRYPACK GROUT TO BE NON-SHRINK MIN. F'c=35 MPa.
2. UNDERPINNING SHALL BE DONE IN 1200mm (4'-0") LONG SECTIONS MAX. U.N.O.
3. NUMBERS OF PANELS INDICATE STAGES IN WHICH UNDERPINNING SHALL PROCEED, I.E. ALL SECTIONS MARKED #1 FOLLOWED BY ALL SECTIONS #2 ETC. POUR CONCRETE IN PLACE AND LEAVE FOR 24 HRS. BEFORE CLEANING UNDERSIDE EXISTING FOOTING, DRYPACKING AND PROCEEDING WITH NEXT STAGE.
4. PROVIDE ALL NECESSARY SHORING/ BRACING TO EXISTING STRUCTURE REQUIRED TO CARRY OUT THIS WORK. CONTRACTOR TO ENSURE EXISTING WALL ABOVE IS STABLE PRIOR TO PROCEEDING WITH WORK.
5. FOOTING AND UNDERPINNING EXCAVATIONS SHALL BE INSPECTED BY A GEOTECHNICAL ENGINEER PRIOR TO POURING CONCRETE TO CONFIRM ADEQUACY OF SUB-GRADE.
6. MAX. HEIGHT OF UNDERPINNING SHALL NOT EXCEED 1200mm (4'-0") TYPICAL IN ONE LIFT. IF UNDERPINNING DEPTH IS LARGER, MULTIPLE LIFTS ARE REQUIRED. EACH LIFT TO BE COMPLETED AND FULLY CURED PRIOR TO SUBSEQUENT LIFT PROCEEDING. UNDERPINNING WIDTH TO MATCH EXISTING FOUNDATION WIDTH U.N.O.
7. CLEAN UNDERSIDE OF EXISTING FOOTING/WALL.
8. DO NOT LEAVE OPEN EXCAVATION OVERNIGHT.
9. WHERE EXISTING SERVICES RUN THROUGH UNDERPINNING, WRAP SERVICE WITH 50mm THK. COMPRESSIBLE MATERIAL



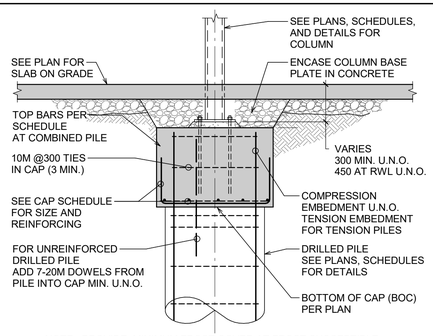
ELEVATION

TYPICAL SINGLE INTERIOR CONCRETE COLUMN ON PILE OR PILE CAP - U.N.O.



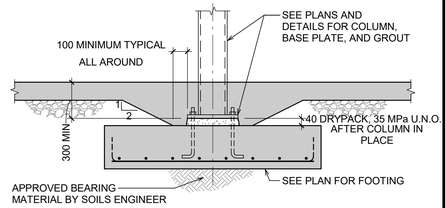
NOTES:
1. COLUMN PLACED BEFORE SLAB POURED. IF SLAB ON GRADE IS POURED WITH INTEGRAL PEDESTAL TO TOP OF PILE CAP, REVISE COMPRESSION LAP TO MEASURE FROM TOP OF SLAB ON GRADE. PROVIDE MINIMUM FROST COVER AT FROST SUSCEPTIBLE LOCATIONS PER GEOTECHNICAL RECOMMENDATIONS.

TYPICAL SINGLE STEEL COLUMN ON INTERIOR PILE OR PILE CAP - U.N.O.

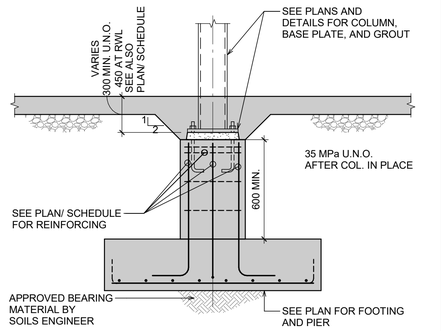


NOTE: PROVIDE MINIMUM FROST COVER AT FROST SUSCEPTIBLE LOCATIONS PER GEOTECHNICAL RECOMMENDATIONS

TYPICAL INTERIOR STEEL COLUMN ON FOOTING DETAILS - U.N.O.



STEEL COLUMN BEARING DIRECTLY ON FOOTING

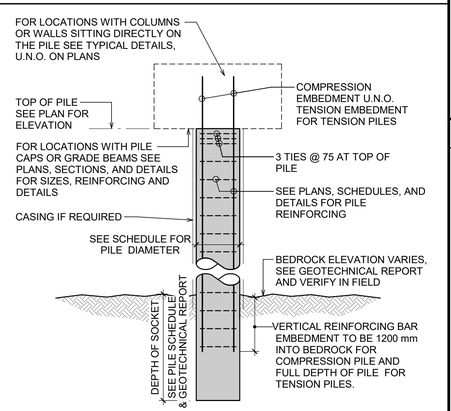


NOTES:

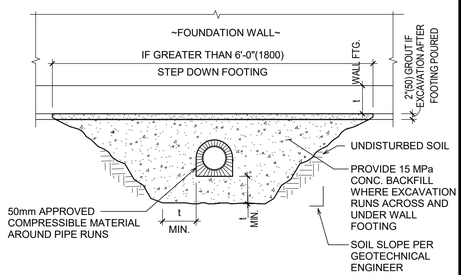
1. 15M VERTS WITH C15M DOWELS (LAP SPLICE 600) MAY BE USED. DO NOT WET SET DOWELS OR C15M VERTS.
2. DRYPACK - PREMIXED OR NON-PREMIXED COMPOSITION OF NON-METALLIC AGGREGATE, CEMENT AND SUFFICIENT WATER FOR THE MIXTURE TO RETAIN ITS SHAPE WHEN MADE INTO A BALL BY HAND AND CAPABLE OF DEVELOPING COMPRESSIVE STRENGTH OF 35 MPa AT 28 DAYS.
3. PROVIDE MINIMUM FROST COVER AT FROST SUSCEPTABLE LOCATIONS PER GEOTECHNICAL RECOMMENDATIONS.

STEEL COLUMN ON PEDESTAL ON FOOTING

TYPICAL ROCK SOCKETED DRILLED PILE

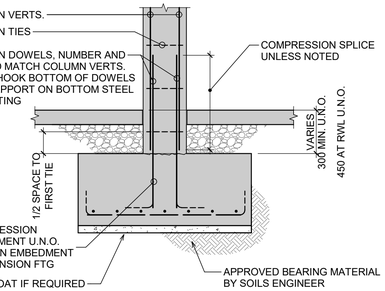


TYPICAL PIPE UNDER WALL FOOTING DETAIL



TYPICAL INTERIOR COLUMN FOOTING

EXCEPT AS NOTED:
- FOR SPLICE LENGTHS, SEE TABLES ON STRUCTURAL DRAWINGS.
- FOOTING SHALL BE CENTERED UNDER COLUMN U.N.O.

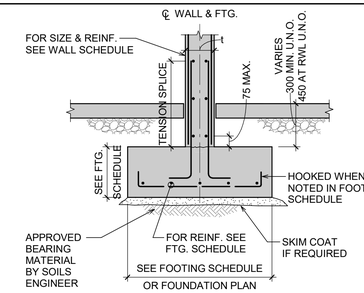


WITHOUT PEDESTAL

NOTES:

1. PROVIDE MINIMUM 8-20M DOWELS UNLESS NOTED OTHERWISE IN SCHEDULE.
2. EXTEND DOWELS INTO FOOTING BELOW WHEN HEIGHT OF PEDESTAL IS LESS THAN THE COMPRESSION DEVELOPMENT LENGTH OF THE DOWELS BEING DEVELOPED.
3. PROVIDE MINIMUM FROST COVER AT FROST SUSCEPTABLE LOCATIONS PER GEOTECHNICAL RECOMMENDATIONS.

TYPICAL INTERIOR SHEAR WALL FOOTINGS



DOWELS TO MATCH VERTICAL WALL REINFORCING U.N.O.

SHEAR WALL FOOTING WITHOUT PEDESTAL

DRILLED PILE FOUNDATIONS

1. FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL REPORT ..... PREPARED BY: SOIL ENGINEERS LTD. DATED: NOVEMBER 13, 2019) REFER TO THE REPORT FOR ANY PARTICULARS AS TO SOILS CONDITIONS AND FOUNDATIONS RECOMMENDATIONS.
2. ENSURE THAT THE REQUIREMENTS OUTLINED IN THIS REPORT ARE READ AND UNDERSTOOD PRIOR TO COMMENCING WITH FOUNDATION WORK.
3. CONCRETE CAST-IN-PLACE DRILLED PILES HAVE BEEN DESIGNED ON THE BASIS OF THE FOLLOWING FACTORED SKIN FRICTION RESISTANCE VALUES, AND FACTORED END BEARING RESISTANCE VALUES:

DEPTH BELOW GRADE	SKIN FRICTION (SLS)	FACTORED END BEARING
0 m TO 1.2 m	0 kPa	N/A
BELOW 1.2 m	60 kPa	N/A

4. PRIOR TO PLACING CONCRETE FOR PILE FOUNDATIONS, BEARING STRATA FOR PILES SHALL BE INSPECTED BY A GEOTECHNICAL CONSULTANT TO CONFIRM THE BEARING CAPACITY OF THE SOIL. READ JONES CHRISTOFFERSEN LTD. IS NOT RESPONSIBLE FOR CONFIRMING FOUNDATION CAPACITIES OF SOILS.
5. UNLESS OTHERWISE SHOWN, CENTER PILES UNDER COLUMNS AND WALLS.
6. ALL DOWELS AND ANCHOR RODS SHALL BE PLACED BEFORE CONCRETE IS POURED. TEMPLATES SHALL BE USED TO ENSURE CORRECT PLACEMENT OF DOWELS AND ANCHOR RODS.
7. UNLESS OTHERWISE INDICATED, PROVIDE A MINIMUM OF 4-20M DOWELS INTO GRADE BEAM ABOVE.
8. PROVIDE DOWELS TO MATCH VERTICAL REINFORCEMENT IN SUPERSTRUCTURE ABOVE.
9. DRILLED PILES SHALL BE PLACED WITH THE FOLLOWING TOLERANCES:
   A. NOT MORE THAN 2% OF ITS LENGTH OUT OF PLUMB FOR VERTICAL PILES.
   B. NOT MORE THAN 75 mm OFF CENTER AT THE TOP.
10. SUB-BASE DESIGN OF SOIL UNDER THE SLAB ON GRADE SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.
11. FOR GROUND ELEVATIONS AND DRAINAGE SLOPES, SEE ARCHITECTURAL DRAWINGS.

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1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
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5	8	ISSUED FOR ADDENDUM #2	2020-01-10

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S-102

DEMOLITION OF STRUCTURAL ELEMENTS CONTINUED.....

H. PROVIDE SHORING TO SUPPORT THE SLAB WHEN REMOVALS REDUCE ITS LOAD-CARRYING CAPACITY, AS DIRECTED BY THE ENGINEER. NO PAYMENT WILL BE MADE FOR SUCH SHORING AS IT IS TO BE INCLUDED IN THE COST OF REPAIR AS OUTLINED IN THESE DOCUMENTS.

I. DEMOLITION PROCEDURES AND EQUIPMENT SHALL MEET ALL APPLICABLE NOISE-CONTROL BY-LAWS AND REGULATIONS OF THE LOCATION OF THE WORK.

J. REFER TO TEMPORARY WORKS AND RENOVATION NOTES FOR ADDITIONAL DRAWINGS TO BE PREPARED UNDER THE DIRECTION OF A SPECIALTY STRUCTURAL ENGINEER. FOR THOSE CONNECTIONS AND COMPONENTS DESIGNED BY THE FABRICATOR, THIS ENGINEER OR THEIR REPRESENTATIVE SHALL VISIT THE SITE TO REVIEW IN PLACE THE CONNECTIONS AND COMPONENTS DESIGNED BY THIS ENGINEER TO SATISFY THEMSELVES THAT THESE CONNECTIONS AND COMPONENTS COMPLY WITH THEIR DESIGN ON THE SHOP DRAWINGS. THIS ENGINEER SHALL PROVIDE A LETTER TO RJC TO THIS EFFECT. THIS ENGINEER SHALL ALSO PROVIDE SEALED SKETCHES FOR ALL FIELD MODIFICATIONS MADE TO THEIR DESIGN.

DEMOLITION OF STRUCTURAL ELEMENTS

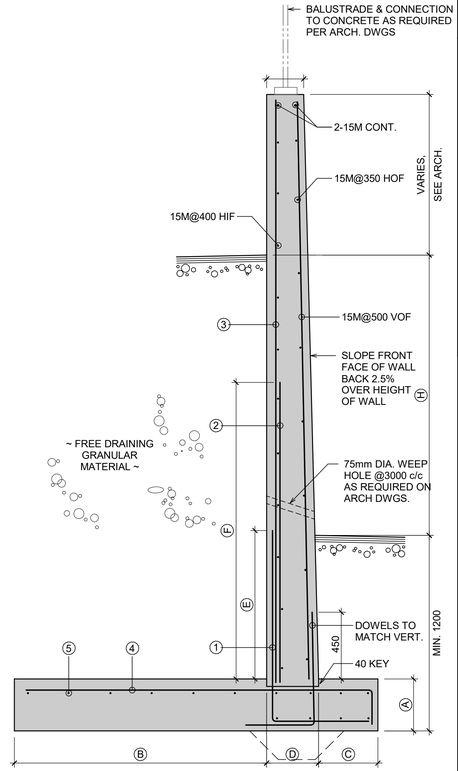
1. SEE TEMPORARY WORKS NOTES.
2. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS AND SPECIFICATIONS FORMING THE TENDER PACKAGE.
3. THE DRAWINGS ILLUSTRATE SCHEMATIC APPROACH TO THE TEMPORARY BRACING OF THE EXISTING STRUCTURE AND IS PREPARED FOR CONTRACTOR CONSIDERATION ONLY. THE CONTRACTOR MAY ADOPT THE ILLUSTRATED APPROACH AT HIS SOLE DISCRETION OR PROPOSE ANY OTHER METHOD HE DEEMS APPROPRIATE TO PROVIDE TEMPORARY BRACING, BUT IN NO TIME SHALL THE SAFETY AND INTEGRITY OF THE EXISTING STRUCTURE BE COMPROMISED.
4. THE CONTRACTOR SHALL DESIGN, PROVIDE, CONSTRUCT AND MAINTAIN, REMOVE AND ASSUME FULL AND SOLE RESPONSIBILITY FOR THE TEMPORARY WORKS.
5. SUBMIT SHOP DRAWINGS, DIAGRAMS AND DETAILS SHOWING SEQUENCE OF DEMOLITION WORK AND SUPPORTING STRUCTURES AND UNDERPINNING. SUBMIT CALCULATIONS TO THE CONSULTANT. DRAWINGS AND CALCULATIONS SUBMITTED SHALL BEAR SIGNATURE AND STAMP OF QUALIFIED PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF ONTARIO.
6. THE PROFESSIONAL ENGINEER EMPLOYED TO DESIGN THE TEMPORARY SHORING, BRACING, NEEDLING AND THE SAME ENGINEER SHALL ALSO BE EMPLOYED TO FULLY SUPERVISE THEIR INSTALLATION AND REMOVAL AND SHALL SUBMIT WEEKLY REPORTS TO THE CONSULTANT, AND OWNER REGARDING THIS WORK.
7. GENERAL CONTRACTOR MUST EXAMINE DRAWINGS OF ALL DISCIPLINES AND COORDINATE THE STRUCTURAL DEMOLITION WORK TO ASSURE THAT THE ADOPTED SEQUENCE OF DEMOLITION WORK PROVIDES FOR SUBSEQUENT CONSTRUCTION OF ALL ELEMENTS OF THE PROJECT WITHOUT INTERFERENCE.
8. IT IS GENERAL CONTRACTOR RESPONSIBILITY TO COORDINATE THE STRUCTURAL DEMOLITION WORK WITH OTHER DEMOLITION REQUIRED BY ARCHITECTURAL AND MECHANICAL DISCIPLINES AND ASSIGN COORDINATED SCOPE OF WORK TO THE SUBTRADES.
9. THE EXISTING STRUCTURE SHOWN ON THE DRAWINGS IS BASED ON THE ORIGINAL DRAWINGS AND LIMITED INFORMATION AVAILABLE AT THE TIME OF DESIGN. THE DEMOLITION SCOPE OF WORK SHALL INCLUDE REMOVAL OF ALL STRUCTURAL AND NON-STRUCTURAL ELEMENTS IN THE AREAS MARKED ON DRAWINGS AND AS INDICATED BY THE ARCHITECT.
10. PROTECTION:
    - A. PREVENT MOVEMENT, SETTLEMENT OR DAMAGE OF ELEMENTS OF EXISTING BUILDING TO REMAIN. PROVIDE BRACING, SHORING AS REQUIRED. PROTECT ALL EXISTING SURFACES NOT TO BE RESTORED FROM DAMAGE DURING REMOVAL PROCEDURE. REMOVE OR PROTECT IN PLACE ALL SURFACE- MOUNTED OR PERMANENT ELECTRICAL FIXTURES AND ALL CONDUIT, FIXTURES, EQUIPMENT, ETC. NOT TO BE DEMOLISHED. UPON COMPLETION OF THE REPAIR WORK, REINSTALL ALL EXISTING EQUIPMENT AND FIXTURES DESIGNATED TO REMAIN. MAKE GOOD DAMAGE CAUSED BY DEMOLITION.
    - B. TAKE PRECAUTIONS TO SUPPORT AND, IF SAFETY OF ELEMENTS NOT SLATED FOR DEMOLITION APPEARS TO BE ENDANGERED, CEASE OPERATIONS AND NOTIFY ENGINEER IMMEDIATELY.
    - C. PREVENT DEBRIS FROM BLOCKING SURFACE DRAINAGE SYSTEM, MECHANICAL, AND ELECTRICAL SYSTEMS WHICH MUST REMAIN IN OPERATION.
11. INSPECTION:
    - A. VISIT AND EXAMINE THE SITE AND NOTE ALL CHARACTERISTICS AND FEATURES AFFECTING THE WORK OF THIS SECTION.
    - B. ENSURE ALL SERVICES, WHETHER BURIED, BUILT-IN OR EXPOSED ARE PROPERLY IDENTIFIED AS TO POSITION, TYPE OF SERVICE, SIZE, DIRECTION OF FLOW. SLABS MUST BE SCANNED OR X-RAYED FOR EMBEDDED SERVICES AT REPAIR LOCATIONS PRIOR TO UNDERTAKING THE REPAIR WORK SUCH THAT THESE SERVICES CAN BE RELOCATED. CONTRACTOR WILL BE RESPONSIBLE FOR DAMAGES TO ALL EMBEDDED SERVICES.
    - C. INSPECT MATERIALS, EQUIPMENT, COMPONENTS TO BE RE-USED OR TURNED OVER TO THE OWNER. NOTE THEIR CONDITION AND ADVISE ARCHITECT IN WRITING OF ANY DEFECTS OR CONDITIONS WHICH WOULD AFFECT THEIR REMOVAL AND RE-USE.
12. PREPARATION:
    - A. DO NOT DISRUPT ACTIVE OR ENERGIZED UTILITIES DESIGNATED TO REMAIN UNDISTURBED.
    - B. RELOCATE EXISTING SERVICES PRIOR TO START OF WORK AS REQUIRED, BUT DO NOT AFFECT THE SERVICES OF AREAS NOT UNDER CONSTRUCTION OR ESSENTIAL TO THE ONGOING OPERATION OF THE BUILDING.
    - C. PROTECT ALL SURFACE-MOUNTED FIXTURES FROM DAMAGE.
    - D. IN ALL CASES, EXERCISE ALL REASONABLE CARE DURING REMOVAL OPERATIONS TO AVOID DAMAGING ITEMS TO BE SALVAGED, RE-USED, OR ITEMS THAT ARE NOT PART OF THE SCOPE OF WORK.
13. DEMOLITION, SALVAGE AND DISPOSAL:
    - A. DEMOLISH PARTS OF STRUCTURE TO PERMIT REMEDIAL WORK AS INDICATED.
    - B. REMOVE EXISTING EQUIPMENT, SERVICES, AND OBSTACLES WHERE REQUIRED FOR REFINISHING OR MAKING GOOD OF EXISTING SURFACES, AND REPLACE AS WORK PROGRESSES.
    - C. AT END OF EACH DAY'S WORK, LEAVE WORK IN SAFE CONDITION SO THAT NO PART IS IN DANGER OF CAUSING INJURY OR DAMAGE.
    - D. DEMOLISH TO MINIMIZE DUSTING. KEEP DUSTY MATERIALS WETTED, WHERE POSSIBLE.
    - E. DEMOLISH CONCRETE IN SMALL SECTIONS. CAREFULLY REMOVE AND LOWER HEAVY OR LARGE OBJECTS.
    - F. THE CONTRACTOR IS TO TAKE CARE NOT TO DAMAGE THE SURFACE OF SOUND CONCRETE WHICH IS TO REMAIN THROUGH THE REMOVAL OPERATION. WHERE ANY SUCH DAMAGE IS DONE TO SOUND MATERIAL, IT IS TO BE REPAIRED BY THE CONTRACTOR AT THEIR OWN EXPENSE TO THE APPROVAL OF THE ENGINEER.
    - G. WHERE NEW CONCRETE IS TO BE APPLIED TO EXISTING CONCRETE, THE SURFACE IS TO BE LEFT CLEAN AND SOUND.

FREESTANDING RETAINING WALL NOTES & DETAILS

1. RETAINING WALLS ARE DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SOILS REPORT NOTED UNDER FOUNDATION GENERAL NOTES PLUS A 2.4 kPa LATERAL LOAD ALLOWANCE FOR A VERTICAL SURCHARGE OF 4.8 kPa. SEE ALSO DESIGN LOADS IN GENERAL NOTES.
2. RETAINING WALLS ARE DESIGNED FOR A FREE DRAINING AND WELL DRAINED BACKFILL. SEE ARCHITECTURAL AND PLUMBING SPECIFICATIONS AND DRAWINGS FOR DRAINAGE REQUIREMENTS.
3. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR DAMPROOFING OR WATERPROOFING REQUIREMENTS.
4. SEE ALSO ARCHITECTURAL AND CIVIL/ LANDSCAPING DWGS FOR EXTENT OF FOR RETAINING STRUCTURES.
5. BACKFILL MATERIALS AND METHODS TO BE REVIEWED BY SOILS CONSULTANT TO BE ENSURE COMPLIANCE TO THE RECOMMENDATIONS AS NOTED IN THE GEOTECHNICAL REPORT.
6. DESIGN AND FIELD REVIEW OF BACKFILL IS BY SOILS CONSULTANT AND NOT BY READ JONES CHRISTOFFERSEN.
7. UNLESS NOTED OTHERWISE, ALL RETAINING WALLS BELOW GRADE AND ALL EXTERIOR WALLS EXPOSED TO THE WEATHER ABOVE GRADE SHALL HAVE CONTROL JOINTS. SEE CONTROL JOINT DETAIL. CONSTRUCTION JOINT MAY REPLACE CONTROL JOINT WHERE REQUIRED. THE LOCATION OF CONTROL JOINTS IN EXPOSED CONCRETE WALLS SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW.
8. VERTICAL CONTROL JOINTS AND CONSTRUCTION JOINTS PER WALL TYPICAL DETAILS.

RETAINING WALL DETAIL

Ⓗ	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	Ⓕ	①	②	③	④	⑤
2000 MAX	350	1500	400	350	800	2000	20M@200	20M@200	20M@200	20M@200	15M@280

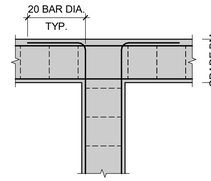


GRADE BEAM REINFORCEMENT

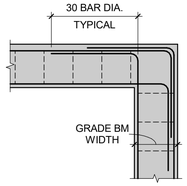
1. UNLESS OTHERWISE NOTED ALL GRADE BEAM REINFORCEMENT SHALL CONSIST OF THE FOLLOWING:

   2-20M TOP AND BOTTOM
   10M @ 300 STIRRUPS
   15M @ 200 HORIZ. EACH FACE MIN. U.N.O.

2. HOOK HORIZONTAL BEAM REINFORCING OR PROVIDE CORNER BARS AT ALL BEAM INTERSECTIONS AND CORNERS.
3. UNLESS NOTED OTHERWISE BEAM REINFORCEMENT SHALL BE CONTINUOUS:
   - A. TOP REINFORCEMENT SHALL BE SPLICED AT MIDSPAN AND SHALL HAVE LAPS OF 600 mm. HOOK TOP REINFORCEMENT AT END SUPPORTS AND PROVIDE ADDITIONAL TOP BARS WHERE REINFORCEMENT IS INTERUPTED BY RECESSED COLUMN OR BASEPLATE DETAILS.
   - B. BOTTOM REINFORCEMENT SHALL BE SPLICED AT PILE LOCATIONS AND SHALL HAVE LAPS 450 mm.
   - C. ALL REINFORCEMENT TO BE CONTINUOUS THROUGH PILE CAPS OR INTERSECTING GRADE BEAMS.
4. UNLESS OTHERWISE NOTED MAXIMUM LENGTH OF POUR SHALL NOT EXCEED 30 m. LOCATIONS AND DETAILS OF CONSTRUCTION JOINTS SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW PRIOR TO CONSTRUCTION.
5. REFER TO STRUCTURAL DRAWINGS FOR DETAILS OF GRADE BEAM CONSTRUCTION JOINTS AND CONTROL JOINTS.



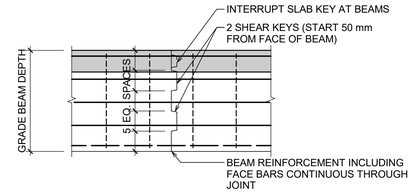
TEE INTERSECTION (PLAN VIEW)



CORNER (PLAN VIEW)

CONSTRUCTION JOINT THROUGH GRADE BEAMS

NOTE: LOCATIONS OF CONSTRUCTION JOINTS TO BE PRE-APPROVED BY THE STRUCTURAL ENGINEER.



BEAM ELEVATION

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
4	7	ISSUED FOR TENDER	2019-12-11
5	8	ISSUED FOR ADDENDUM #2	2020-01-10

N

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CONTRACTOR SHALL CHECK ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL AUTHORIZED IN WRITING BY CONSULTANT.

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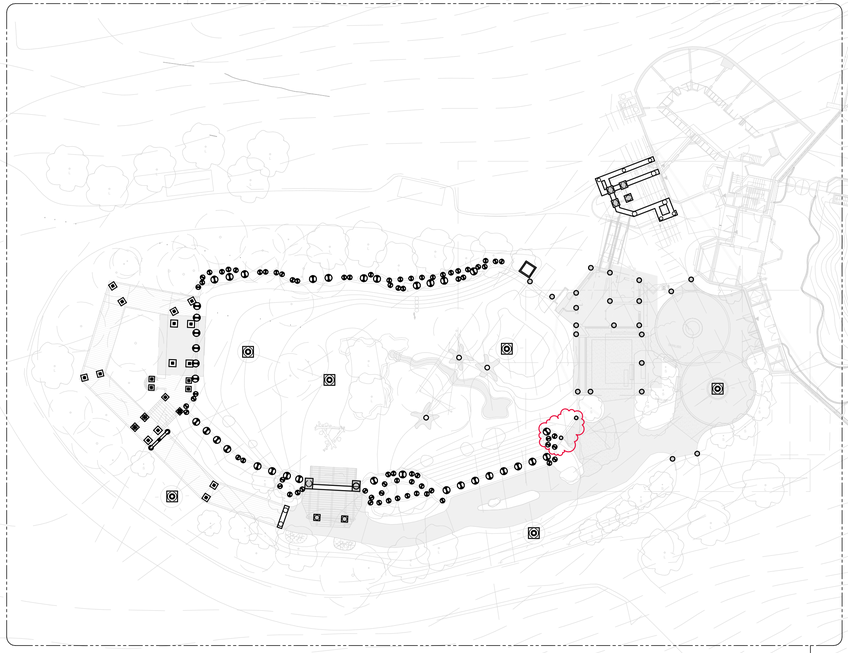
PROJECT:

DRAWING NAME:
GENERAL NOTES & TYPICAL DETAILS

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: As indicated

DRAWING NUMBER:
S-103



HABITAT 1

1
S-200A

HABITAT 2

1
S-200B

OVERALL FOUNDATION PLAN
1 : 375

NO.	REV.	ISSUED FOR	DATE
1	1	100% DD	2019-10-02
2	2	PROGRESS	2019-10-17
3	3	60% CD	2019-10-25
4	4	100% CD	2019-11-12
5	5	ISSUED FOR PERMIT	2019-11-14
6	6	ISSUED FOR TENDER REVIEW	2019-12-06
7	7	ISSUED FOR TENDER	2019-12-11
8	8	ISSUED FOR ADDENDUM #2	2020-01-10

N

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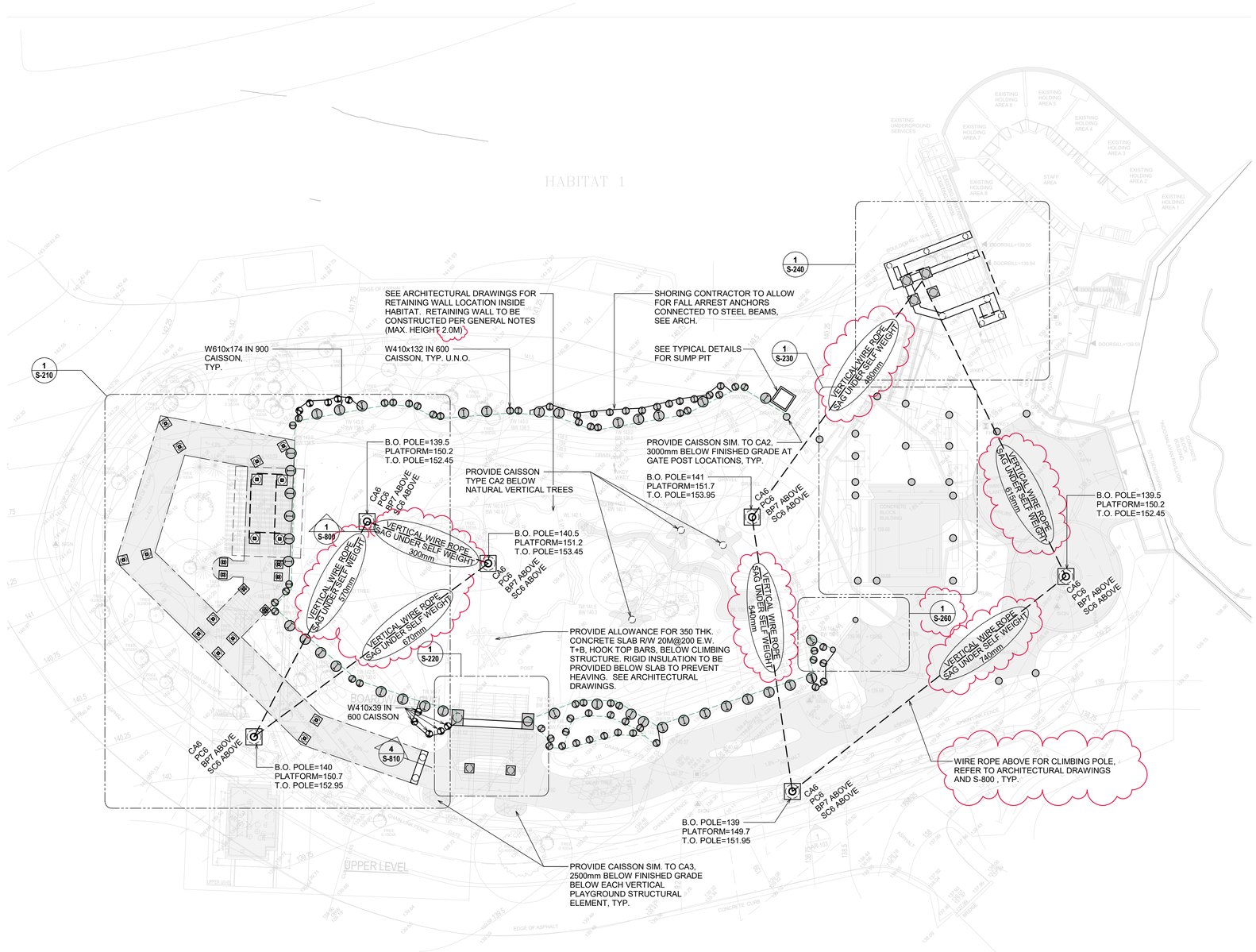
PROJECT:

DRAWING NAME:
OVERALL FOUNDATION PLAN

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: 1 : 375

DRAWING NUMBER:
S-200



FOUNDATION PLAN - HABITAT 1

1 : 200

Notes:

1. CAISSON EMBEDMENT DEPTHS BELOW FINISHED GRADE ARE SHOWN ON SCHEDULE, SEE S-300 SERIES
2. CAISSON HAVE BEEN DESIGNED ASSUMING SKIN FRICTION CAPACITY OF 60KPA (SLS), NEGLECTING THE TOP 1.2M OF SHAFT DEPTH BELOW FINISHED GRADE. WHERE A PILE CAP IS USED ATOP THE CAISSON, THE 1.2M OF NEGLECTED SHAFT DEPTH INCLUDES THE DEPTH OF THE CAP AND IS NOT IN ADDITION TO IT.
3. CAISSON EMBEDMENT DEPTHS TO BE VERIFIED BY GEOTECHNICAL ENGINEER ON SITE AND MAY HAVE TO BE ADJUSTED TO SUIT DESIGN REQUIREMENTS.
4. CENTER ALL CAPS, PIERS, CAISSONS AND FOOTINGS UNDER COLUMNS EXCEPT WHERE NOTED OTHERWISE ON PLAN.
5. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. SCHEDULES – S-300 SERIES
   c. FOUNDATION PLAN – SHORING – S200C

NO.	REV.	ISSUED FOR	DATE
1	1	100% DD	2019-10-02
2	2	PROGRESS	2019-10-17
3	3	60% CD	2019-10-25
4	4	100% CD	2019-11-12
5	5	ISSUED FOR PERMIT	2019-11-14
6	6	ISSUED FOR TENDER REVIEW	2019-12-06
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8	8	ISSUED FOR ADDENDUM #2	2020-01-10

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PROJECT:

DRAWING NAME:

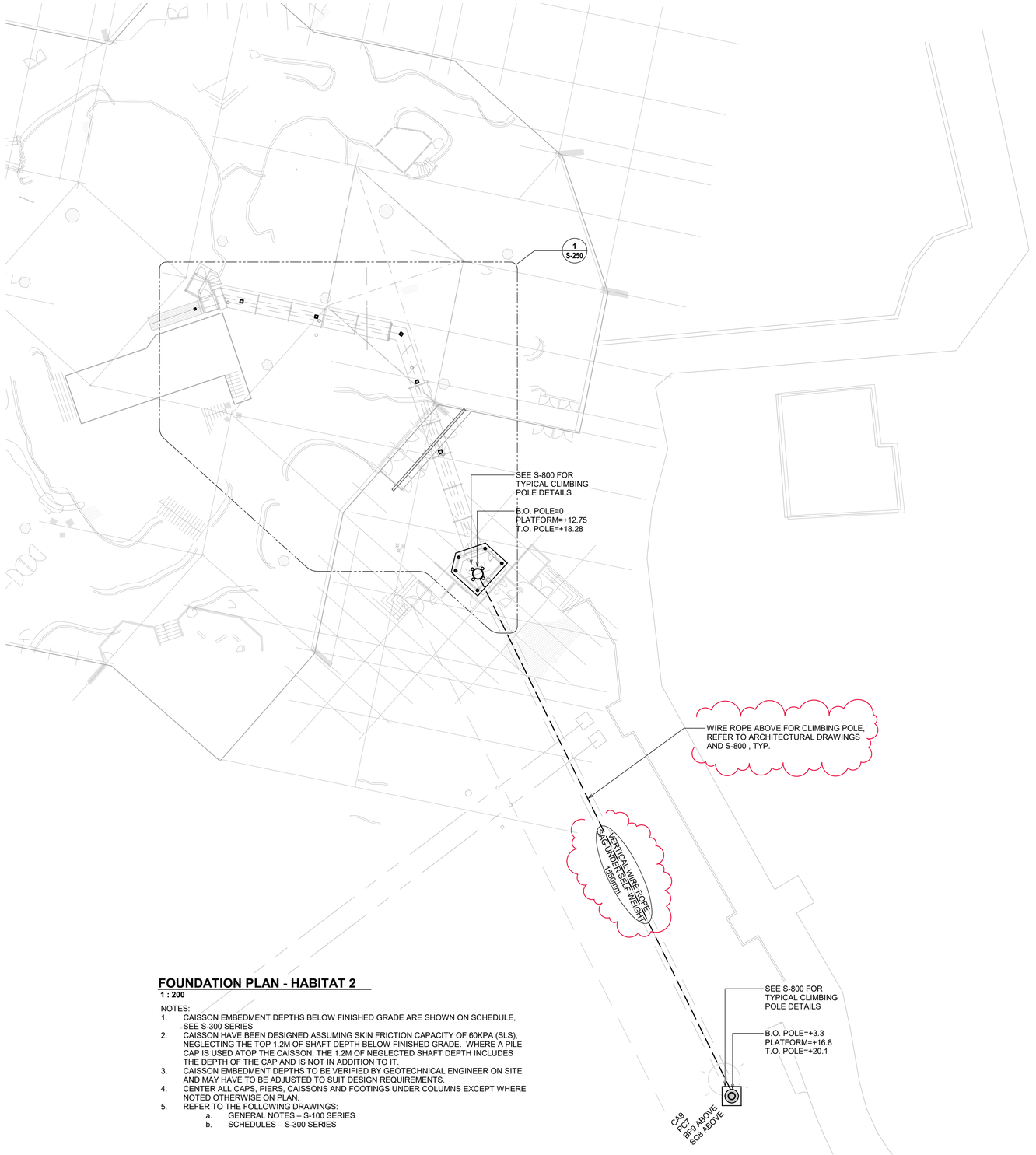
FOUNDATION PLAN - HABITAT 1

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: 1 : 200

DRAWING NUMBER:

S-200A



FOUNDATION PLAN - HABITAT 2

1 : 200

NOTES:

1. CAISSON EMBEDMENT DEPTHS BELOW FINISHED GRADE ARE SHOWN ON SCHEDULE, SEE S-300 SERIES
2. CAISSON HAVE BEEN DESIGNED ASSUMING SKIN FRICTION CAPACITY OF 60KPA (SLS), NEGLECTING THE TOP 1.2M OF SHAFT DEPTH BELOW FINISHED GRADE. WHERE A PILE CAP IS USED ATOP THE CAISSON, THE 1.2M OF NEGLECTED SHAFT DEPTH INCLUDES THE DEPTH OF THE CAP AND IS NOT IN ADDITION TO IT.
3. CAISSON EMBEDMENT DEPTHS TO BE VERIFIED BY GEOTECHNICAL ENGINEER ON SITE AND MAY HAVE TO BE ADJUSTED TO SUIT DESIGN REQUIREMENTS.
4. CENTER ALL CAPS, PIERS, CAISSONS AND FOOTINGS UNDER COLUMNS EXCEPT WHERE NOTED OTHERWISE ON PLAN.
5. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. SCHEDULES – S-300 SERIES

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8	8	ISSUED FOR ADDENDUM #2	2020-01-10

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PROJECT:

DRAWING NAME:

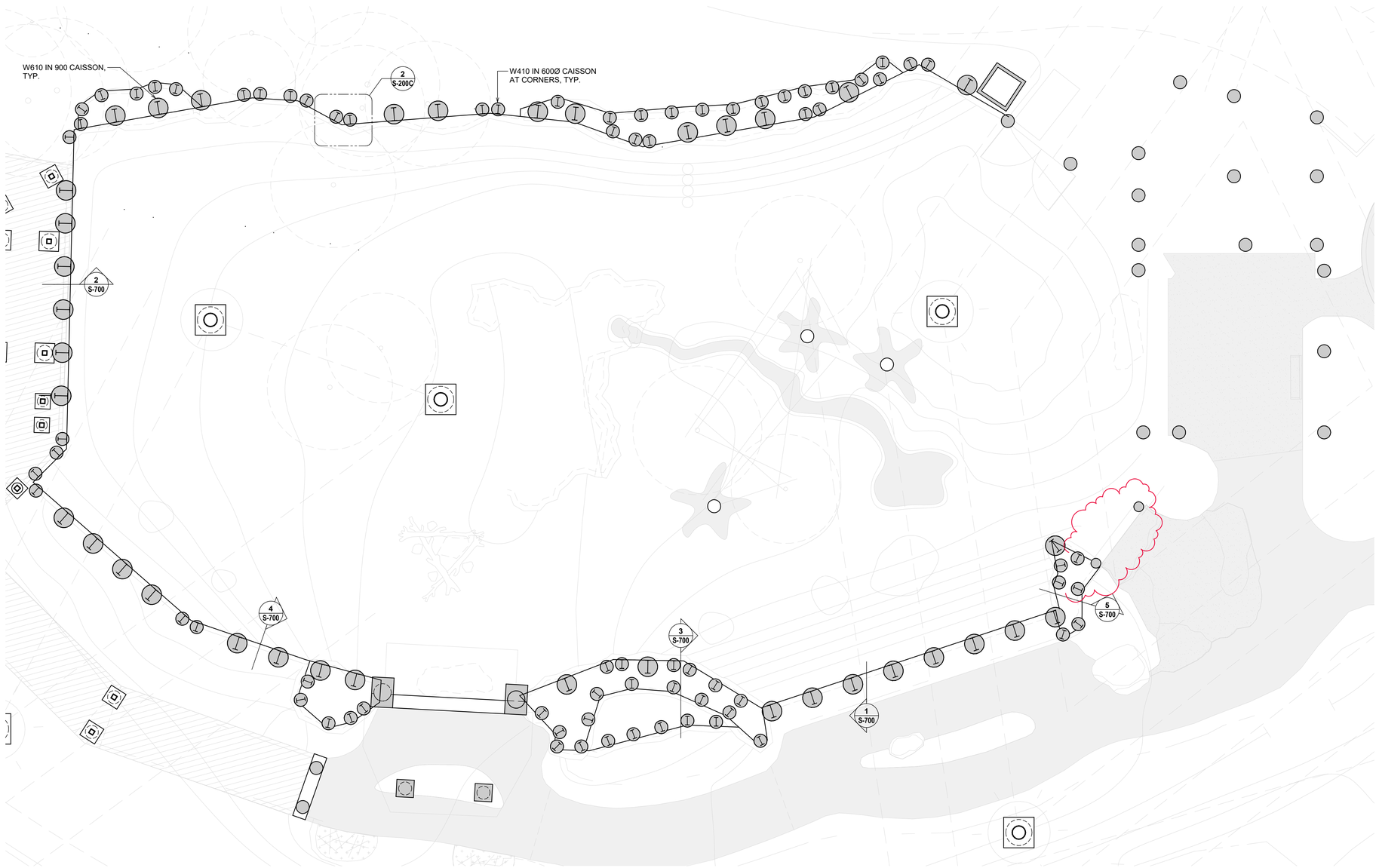
FOUNDATION PLAN - HABITAT 2

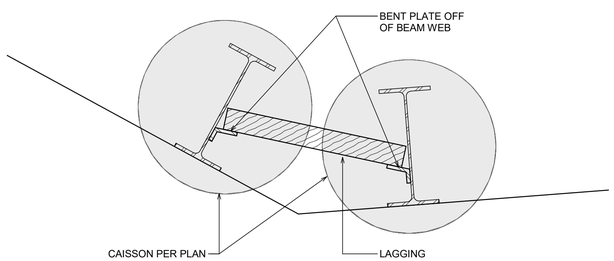
PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: 1 : 200

DRAWING NUMBER:

S-200B





2 S-200C 1 : 10

FOUNDATION PLAN - SHORING

1 : 100

NOTES:

1. SOLDIER PILE SHORING SCHEME IS SHOWN FOR CONCEPT AND INTENDED TO BE USED FOR COSTING PURPOSES ONLY.
2. FINAL SHORING DESIGN IS TO BE COMPLETED BY THE SHORING CONTRACTOR.
3. DESIGN ASSUMPTIONS ARE AS FOLLOWS:
   a. ACTIVE LATERAL EARTH PRESSURE COEFFICIENT, KA=0.4
   b. AT REST LATERAL EARTH PRESSURE COEFFICIENT, KO=0.5
   c. PASSIVE LATERAL EARTH PRESSURE COEFFICIENT, KP=2.5 MIN. (VARIES WITH SOIL TYPE, SEE GEOTEHNICAL REPORT NOTED IN GENERAL NOTES)
   d. BULK UNIT WEIGHT OF BACKFILL, γ=22 KN/M^3

1. REFER TO GEOTECHNICAL REPORT, NOTED IN GENERAL NOTES, FOR ADDITIONAL INFORMATION REQUIRED FOR DESIGN.
2. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. FOUNDATION SHORING SECTIONS AND DETAILS – S700 SERIES

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
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PROJECT:

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FOUNDATION PLAN - SHORING

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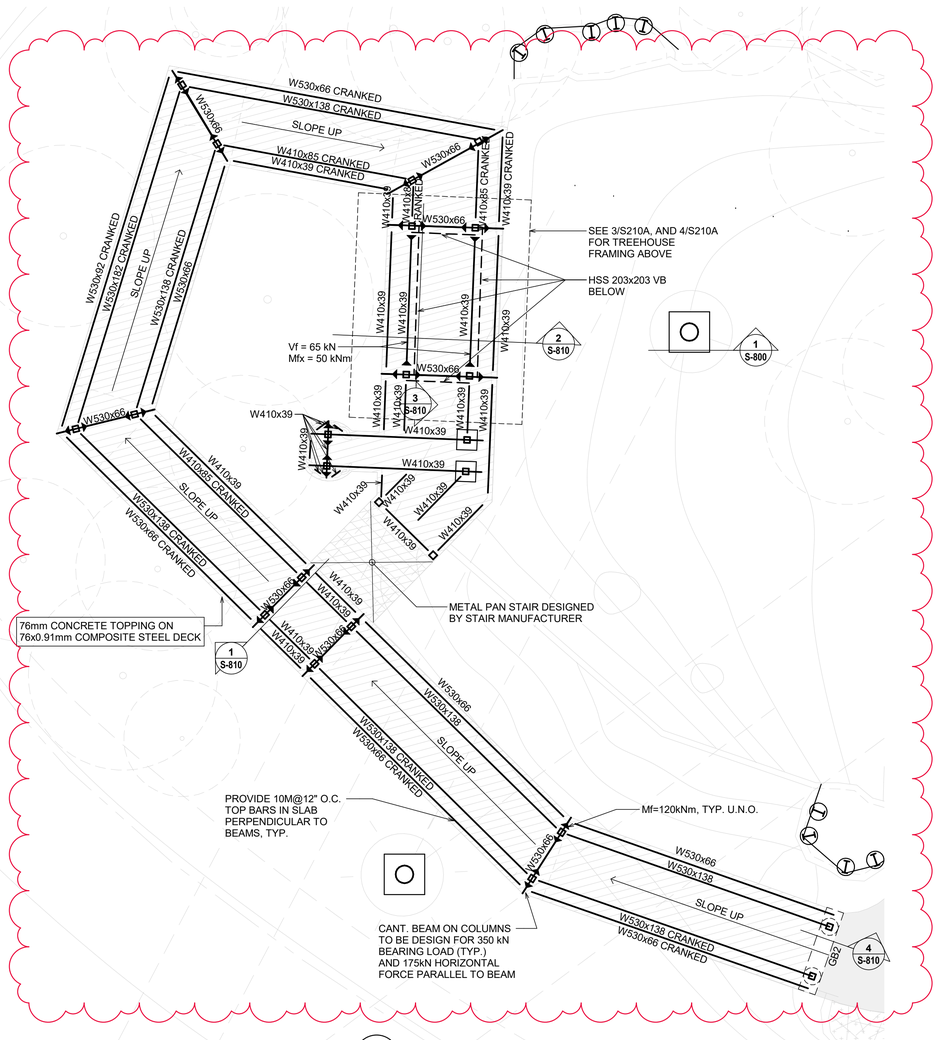
S-200C

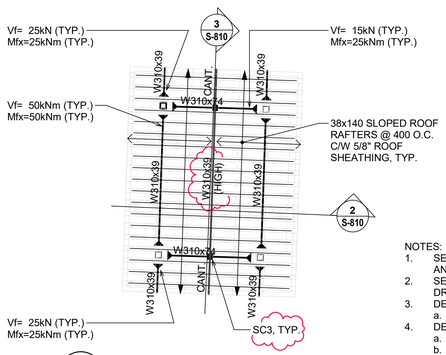


2 S-210 BOARDWALK FRAMING PLAN

1 : 100

NOTES:

1. SEE ARCHITECTURAL DRAWINGS FOR TOP OF SLAB ELEVATIONS, SLOPES, DIMENSIONS, CURBS, AND SLAB EDGES.
2. TOP OF STRUCTURAL STEEL IS 152MM BELOW TOP OF SLAB U.N.O.
3. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. LIVE LOAD 4.8KPA
4. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. FLOOR FINISHES 0.8KPA
   b. SOFFIT/SERVICES 0.6KPA
5. ALL STEEL DECK WITH CONCRETE TOPPING TO BE COMPOSITE UNLESS NOTED OTHERWISE. REFER TO GENERAL NOTES FOR REINFORCEMENT OF CONCRETE TOPPING SLABS.
6. DESIGN STEEL BEAM CONNECTIONS FOR FORCES SHOWN ON PLAN. WHERE NO FORCE IS INDICATED, DESIGN CONNECTIONS FOR VF =150KN.
7. ALL STRUCTURAL STEEL OUTSIDE OF THE BUILDING ENVELOPE TO BE HOT DIPPED GALVANIZED UNLESS NOTED OTHERWISE.
8. GENERAL CONTRACTOR TO VERIFY SITE CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
9. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. SCHEDULES – S-300 SERIES
   c. BOARDWALK AND TREEHOUSE SECTIONS AND DETAILS – S-810 SERIES

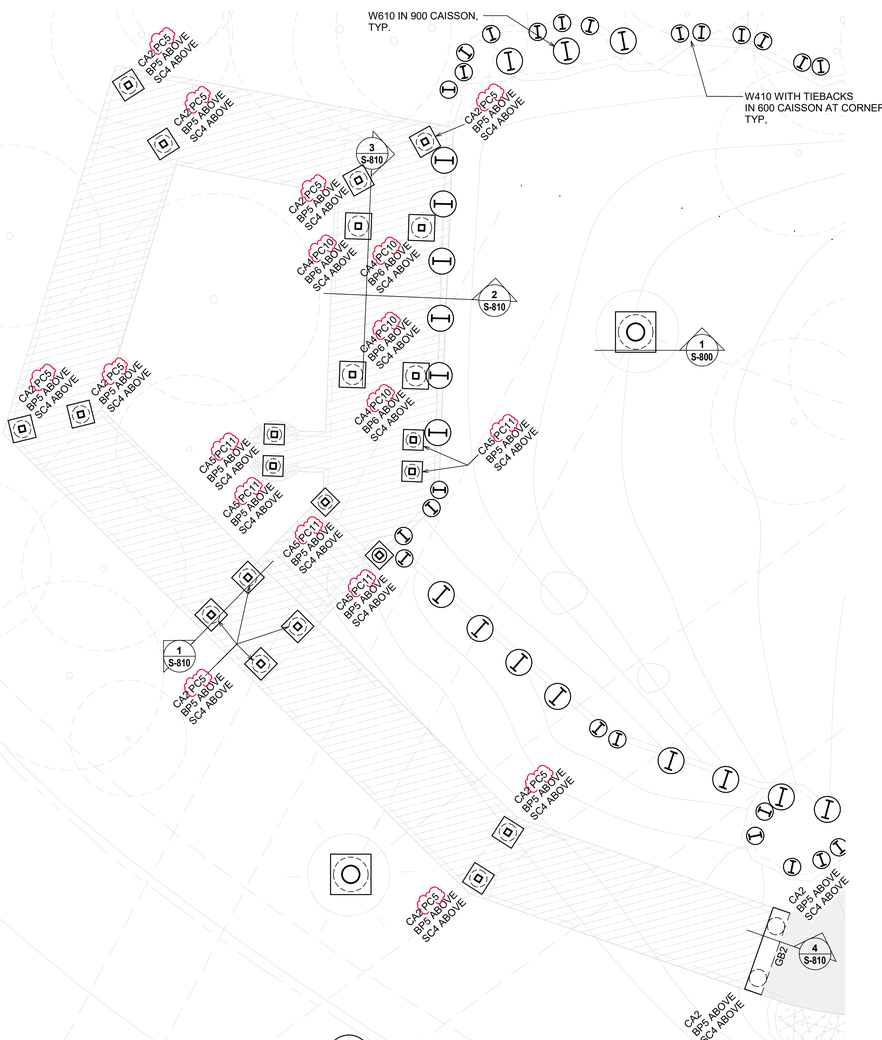


4 S-210 TREEHOUSE ROOF FRAMING PLAN

1 : 100

NOTES:

1. SEE ARCHITECTURAL DRAWINGS FOR TOP OF ROOF ELEVATIONS, SLOPES, DIMENSIONS, CURBS, AND SLAB EDGES.
2. SEE S810 SERIES FOR SECTIONS TO BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS TO DETERMINE TOP OF STRUCTURAL FRAMING ELEVATIONS.
3. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. SNOW LOAD 1.3KPA
4. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. ROOF FINISHES 0.5KPA
   b. CEILING/SERVICES 0.6KPA
5. SEE GENERAL NOTES FOR WOOD FRAMING INFORMATION.
6. REFER TO PLAN NOTES ON 2/S-210 FOR ADDITIONAL INFORMATION NOT RELATED TO LOADING.

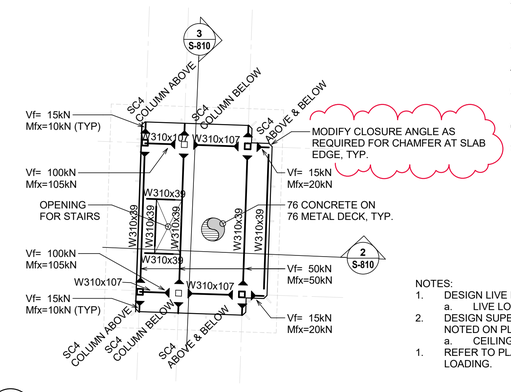


1 S-210 BOARDWALK FOUNDATION PLAN

1 : 100

NOTES:

1. CAISSON EMBEDMENT DEPTHS BELOW FINISHED GRADE ARE SHOWN ON SCHEDULE, SEE S-300 SERIES
2. CAISSON HAVE BEEN DESIGNED ASSUMING SKIN FRICTION CAPACITY OF 60KPA (SLS), NEGLECTING THE TOP 1.2M OF SHAFT DEPTH BELOW FINISHED GRADE. WHERE A PILE CAP IS USED ATOP THE CAISSON, THE 1.2M OF NEGLECTED SHAFT DEPTH INCLUDES THE DEPTH OF THE CAP AND IS NOT IN ADDITION TO IT.
3. CAISSON EMBEDMENT DEPTHS TO BE VERIFIED BY GEOTECHNICAL ENGINEER ON SITE AND MAY HAVE TO BE ADJUSTED TO SUIT DESIGN REQUIREMENTS.
4. CENTER ALL CAPS, PIERS, CAISSONS AND FOOTINGS UNDER COLUMNS EXCEPT WHERE NOTED OTHERWISE ON PLAN.
5. UNDERSIDE OF BASE PLATE TO BE FOUNDED 300MM ABOVE FINISHED GRADE. UNDERSIDE OF BASE PLATE ELEVATIONS VARY DEPENDING ON FINISHED GRADE ELEVATION. REFER TO GRADING PLAN.
6. GENERAL CONTRACTOR TO VERIFY SITE CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
7. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. SCHEDULES – S-300 SERIES
   c. BOARDWALK AND TREEHOUSE SECTIONS AND DETAILS – S-810 SERIES



3 S-210 TREEHOUSE UPPER LEVEL FRAMING PLAN

1 : 100

NOTES:

1. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. LIVE LOAD 4.8KPA
2. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. CEILING/SERVICES 0.6KPA
1. REFER TO PLAN NOTES ON 2/S-210 FOR ADDITIONAL INFORMATION NOT RELATED TO LOADING.

NO.	REV.	ISSUED FOR	DATE
1	1	100% DD	2019-10-02
2	2	PROGRESS	2019-10-17
3	3	60% CD	2019-10-25
4	4	100% CD	2019-11-12
5	5	ISSUED FOR PERMIT	2019-11-14
6	6	ISSUED FOR TENDER REVIEW	2019-12-06
7	7	ISSUED FOR TENDER	2019-12-11
8	8	ISSUED FOR ADDENDUM #2	2020-01-10

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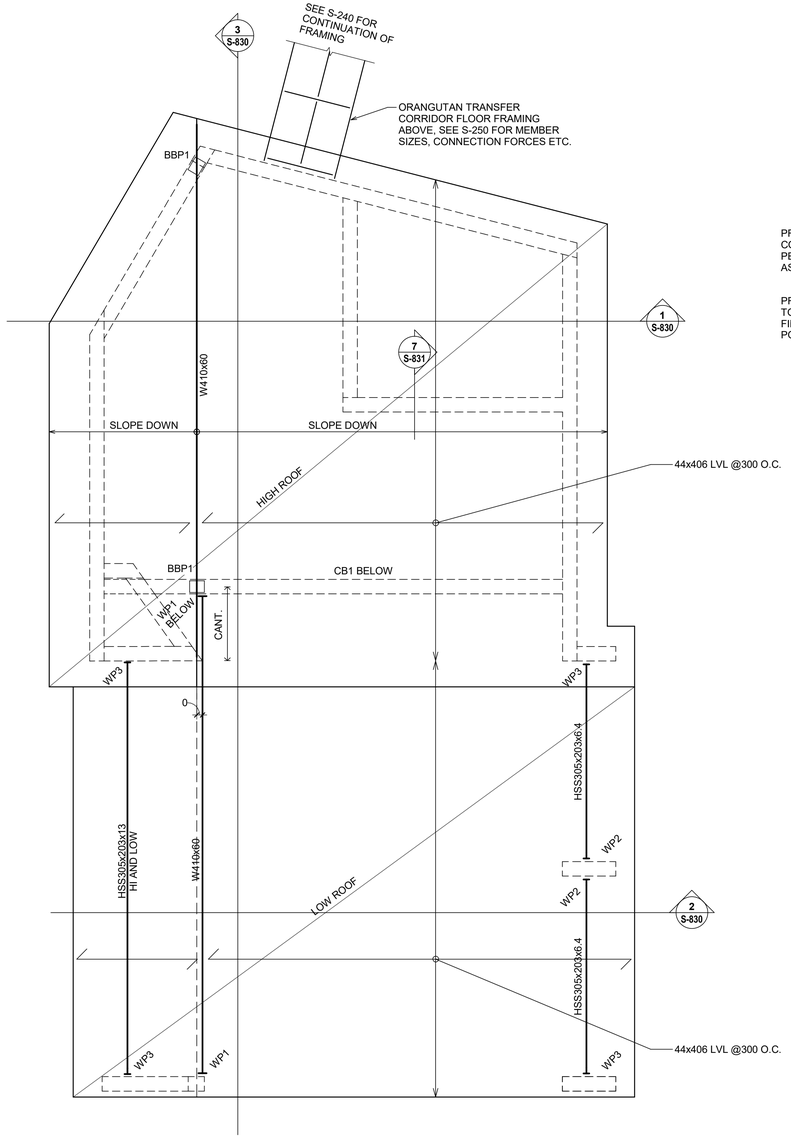
PROJECT:

DRAWING NAME:
BOARDWALK & TREEHOUSE FRAMING PLANS - HABITAT 1

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: 1 : 100

DRAWING NUMBER:
S-210

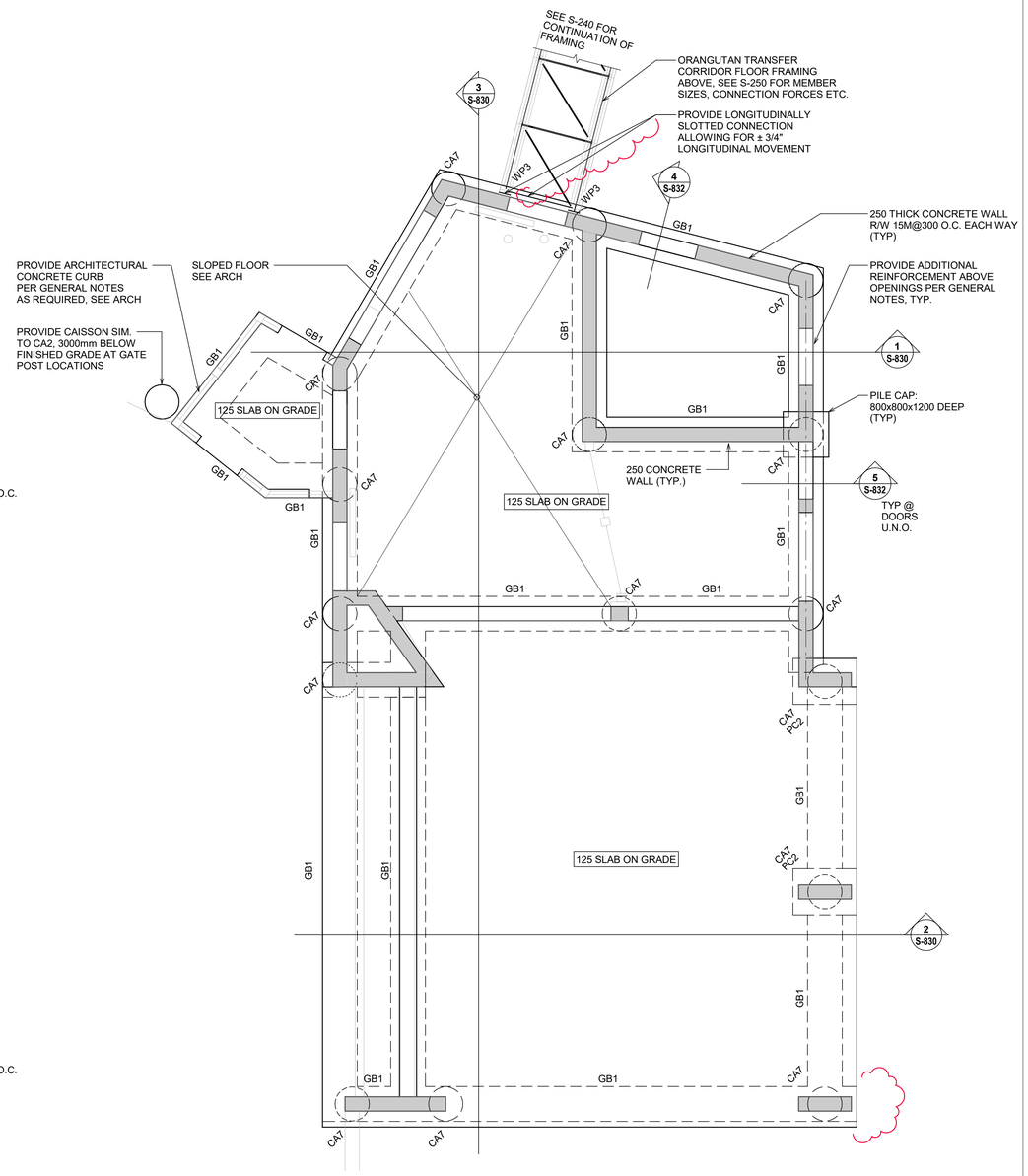


2 S-230 RESEARCH CENTRE FOUNDATION AND TRANSFER CORRIDOR ROOF FRAMING PLAN

1 : 50

NOTES:

1. SEE ARCHITECTURAL DRAWINGS FOR TOP OF ROOF ELEVATIONS, SLOPES, DIMENSIONS, CURBS, AND SLAB EDGES.
2. SEE S830 SERIES FOR SECTIONS TO BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS TO DETERMINE TOP OF STRUCTURAL FRAMING ELEVATIONS.
3. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. SNOW LOAD 1.3KPA
4. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   RESEARCH CENTRE
   a. ROOF FINISHES 0.5KPA
   b. CEILING/SERVICES 0.6KPA
   TRANSFER CORRIDOR
   a. FINISHES 0.3KPA
5. SEE GENERAL NOTES FOR WOOD FRAMING INFORMATION.
6. GENERAL CONTRACTOR TO VERIFY SITE CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
7. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. SCHEDULES – S-300 SERIES
   c. RESEARCH CENTRE SECTIONS AND DETAILS – S-830 SERIES



1 S-230 RESEARCH CENTRE FOUNDATION AND TRANSFER CORRIDOR FLOOR FRAMING PLAN

1 : 50

NOTES:

1. SEE ARCHITECTURAL DRAWINGS FOR TOP OF SLAB ELEVATIONS, SLOPES, DIMENSIONS, CURBS, AND SLAB EDGES
2. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   RESEARCH CENTRE
   a. LIVE LOAD 4.8KPA
   TRANSFER CORRIDOR
   a. LIVE LOAD 1.0KPA
3. DESIGN SUPERIMPOSED DEAD LOADS AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   TRANSFER CORRIDOR
   a. FINISHES 0.3KPA
4. SLAB ON GRADE TO BE REINFORCED IN ACCORDANCE WITH GENERAL NOTES.
5. CAISSON EMBEDMENT DEPTHS BELOW FINISHED GRADE ARE SHOWN ON SCHEDULE, SEE S-300 SERIES
6. CAISSON HAVE BEEN DESIGNED ASSUMING SKIN FRICTION CAPACITY OF 60KPA (SLS), NEGLECTING THE TOP 1.2M OF SHAFT DEPTH BELOW FINISHED GRADE. WHERE A PILE CAP IS USED ATOP THE CAISSON, THE 1.2M OF NEGLECTED SHAFT DEPTH INCLUDES THE DEPTH OF THE CAP AND IS NOT IN ADDITION TO IT.
7. CAISSON EMBEDMENT DEPTHS TO BE VERIFIED BY GEOTECHNICAL ENGINEER ON SITE AND MAY HAVE TO BE ADJUSTED TO SUIT DESIGN REQUIREMENTS.
8. CENTER ALL CAPS, PIERS, CAISSONS AND FOOTINGS UNDER COLUMNS EXCEPT WHERE NOTED OTHERWISE ON PLAN.
9. GENERAL CONTRACTOR TO VERIFY SITE CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
10. REFER TO THE FOLLOWING DRAWINGS:
    a. GENERAL NOTES – S-100 SERIES
    b. SCHEDULES – S-300 SERIES
    c. RESEARCH CENTRE SECTIONS AND DETAILS – S-830 SERIES

NO.	REV.	ISSUED FOR	DATE
1	2	PROGRESS	2019-10-17
2	3	60% CD	2019-10-25
3	4	100% CD	2019-11-12
4	5	ISSUED FOR PERMIT	2019-11-14
5	6	ISSUED FOR TENDER REVIEW	2019-12-06
6	7	ISSUED FOR TENDER	2019-12-11
7	8	ISSUED FOR ADDENDUM #2	2020-01-10

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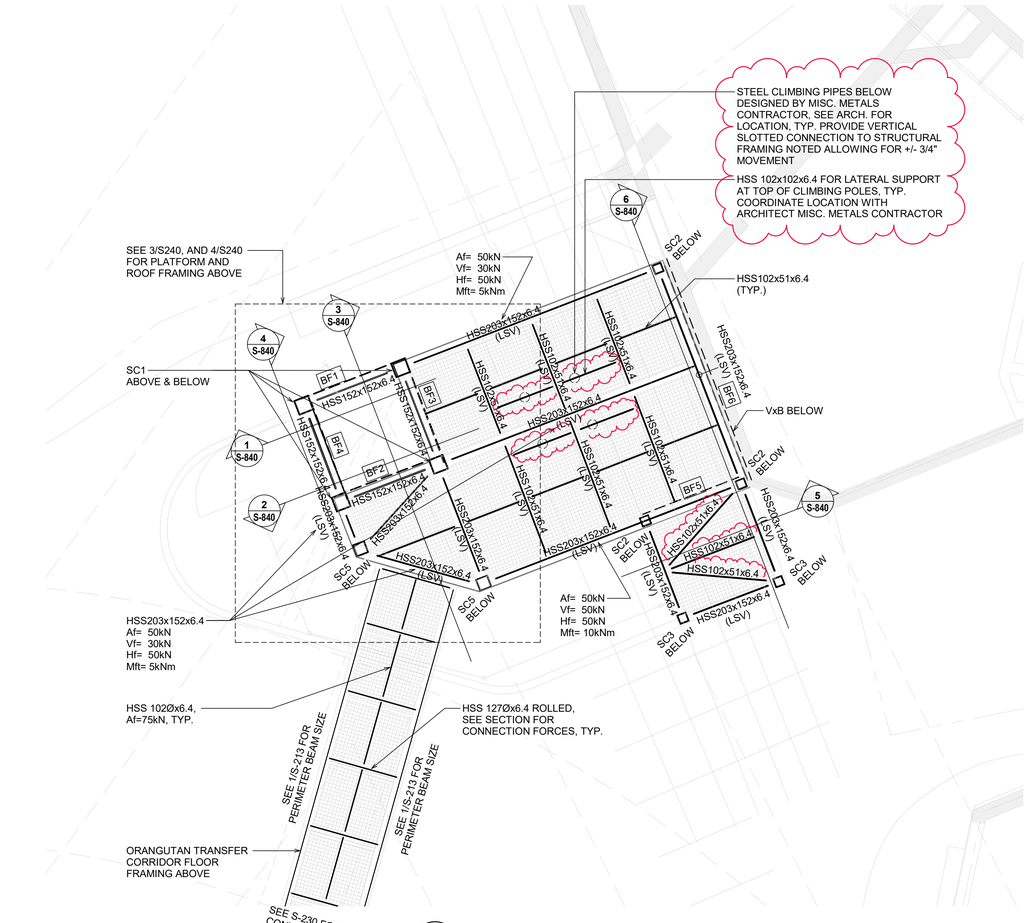
PROJECT:

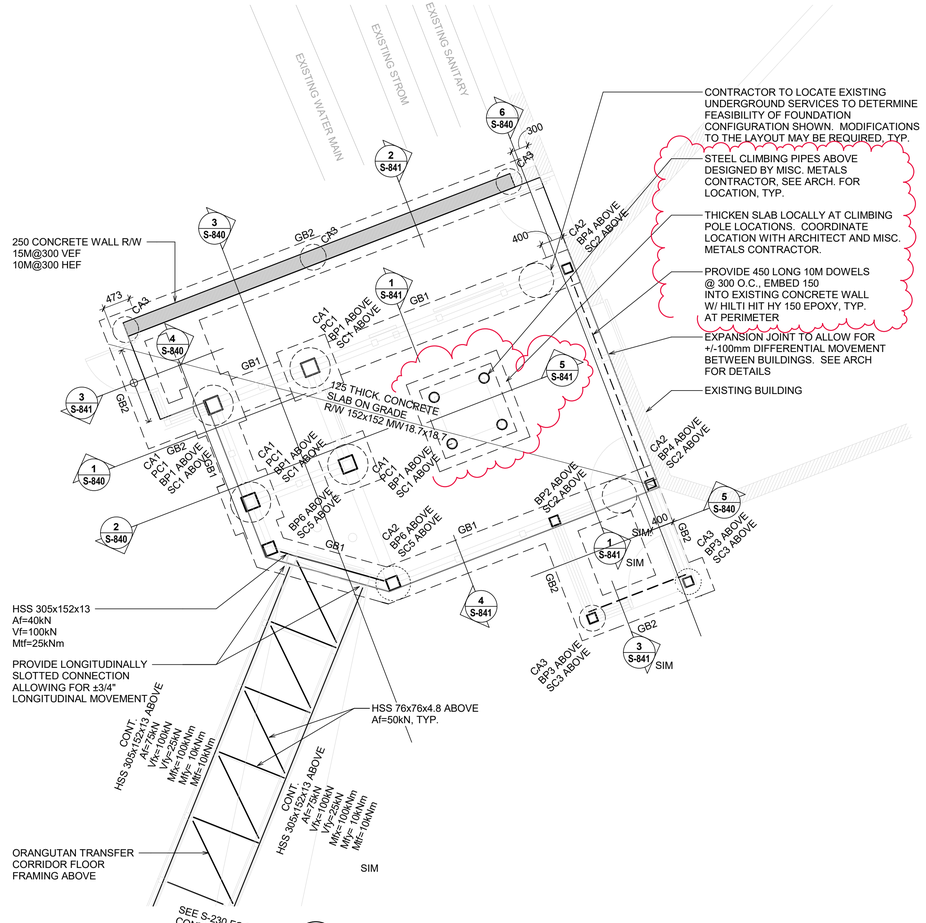
DRAWING NAME:
RESEARCH CENTRE FRAMING PLANS - HABITAT 1

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: 1 : 50

DRAWING NUMBER:
S-230





2 S-240 DAYROOM AND TRANSFER CORRIDOR ROOF FRAMING PLAN

1 : 50

NOTES:
1. ALL FRAMING CONNECTIONS TO BE DESIGNED FOR Af=25kN, Vf=50kN, Hf=25kN, Mtf=10kNm IN ADDITION TO Mfx AND Mfy SHOWN ON THE DRAWINGS U.N.O.

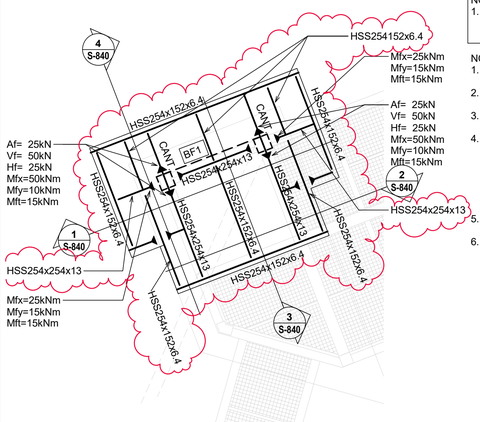
NOTES:
1. SEE ARCHITECTURAL DRAWINGS FOR TOP OF ROOF ELEVATIONS, SLOPES, DIMENSIONS, CURBS, AND SLAB EDGES.
2. SEE S840 SERIES FOR SECTIONS TO BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS TO DETERMINE TOP OF STRUCTURAL FRAMING ELEVATIONS.
3. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. SNOW LOAD 1.3KPA
4. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   RESEARCH CENTRE
   a. ROOF FINISHES 0.5KPA
   b. CEILING/SERVICES 0.6KPA
   TRANSFER CORRIDOR
   a. FINISHES 0.3KPA
5. GENERAL CONTRACTOR TO VERIFY SITE CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
6. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. SCHEDULES – S-300 SERIES
   c. RESEARCH CENTRE SECTIONS AND DETAILS – S-840 SERIES

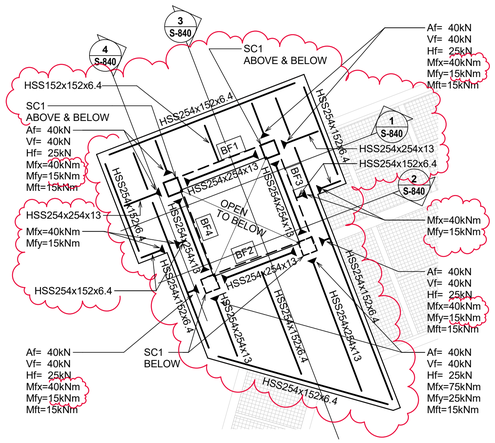
1 S-240 DAYROOM FOUNDATION AND TRANSFER CORRIDOR FLOOR PLAN

1 : 50

NOTES:
1. SEE ARCHITECTURAL DRAWINGS FOR TOP OF SLAB ELEVATIONS, SLOPES, DIMENSIONS, CURBS, AND SLAB EDGES
2. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   DAYROOM
   a. LIVE LOAD 4.8KPA
   TRANSFER CORRIDOR
   a. LIVE LOAD 1.0KPA
3. DESIGN SUPERIMPOSED DEAD LOADS AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:

   TRANSFER CORRIDOR
   a. FINISHES 0.3KPA
4. SLAB ON GRADE TO BE REINFORCED IN ACCORDANCE WITH GENERAL NOTES.
5. CAISSON EMBEDMENT DEPTHS BELOW FINISHED GRADE ARE SHOWN ON SCHEDULE, SEE S-300 SERIES
6. CAISSON HAVE BEEN DESIGNED ASSUMING SKIN FRICTION CAPACITY OF 60KPA (SLS). NEGLECTING THE TOP 1.2M OF SHAFT DEPTH BELOW FINISHED GRADE. WHERE A PILE CAP IS USED ATOP THE CAISSON, THE 1.2M OF NEGLECTED SHAFT DEPTH INCLUDES THE DEPTH OF THE CAP AND IS NOT IN ADDITION TO IT.
7. CAISSON EMBEDMENT DEPTHS TO BE VERIFIED BY GEOTECHNICAL ENGINEER ON SITE AND MAY HAVE TO BE ADJUSTED TO SUIT DESIGN REQUIREMENTS.
8. CENTER ALL CAPS, PIERS, CAISSONS AND FOOTINGS UNDER COLUMNS EXCEPT WHERE NOTED OTHERWISE ON PLAN.
9. GENERAL CONTRACTOR TO VERIFY SITE CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
10. REFER TO THE FOLLOWING DRAWINGS:
    a. GENERAL NOTES – S-100 SERIES
    b. SCHEDULES – S-300 SERIES
    c. DAYROOM SECTIONS AND DETAILS – S-840 SERIES





4 S-240 ORANGUTAN PLATFORM ROOF FRAMING PLAN

1 : 50

NOTES:
1. ALL FRAMING CONNECTIONS TO BE DESIGNED FOR Af=25kN, Vf=50kN, Hf=25kN, Mtf=10kNm IN ADDITION TO Mfx AND Mfy SHOWN ON THE DRAWINGS U.N.O.

NOTES:
1. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. SNOW LOAD 1.3KPA
   b. SERVICES 0.2KPA
2. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. FINISHES 0.5KPA
   b. SERVICES 0.2KPA
3. REFER TO PLAN NOTES ON 2/S-240 FOR ADDITIONAL INFORMATION NOT RELATED TO LOADING.

3 S-240 ORANGUTAN PLATFORM FLOOR FRAMING PLAN

1 : 50

NOTES:
1. ALL FRAMING CONNECTIONS TO BE DESIGNED FOR Af=40kN, Vf=50kN, Hf=25kN, Mtf=10kNm IN ADDITION TO Mfx AND Mfy SHOWN ON THE DRAWINGS U.N.O.

NOTES:
1. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. LIVE LOAD 1.0KPA
2. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. FINISHES 0.5KPA
   b. SERVICES 0.2KPA
3. REFER TO PLAN NOTES ON 2/S-240 FOR ADDITIONAL INFORMATION NOT RELATED TO LOADING

NO.	REV.	ISSUED FOR	DATE
1	1	100% DD	2019-10-02
2	2	PROGRESS	2019-10-17
3	3	60% CD	2019-10-25
4	4	100% CD	2019-11-12
5	5	ISSUED FOR PERMIT	2019-11-14
6	6	ISSUED FOR TENDER REVIEW	2019-12-06
7	7	ISSUED FOR TENDER	2019-12-11
8	8	ISSUED FOR ADDENDUM #2	2020-01-10

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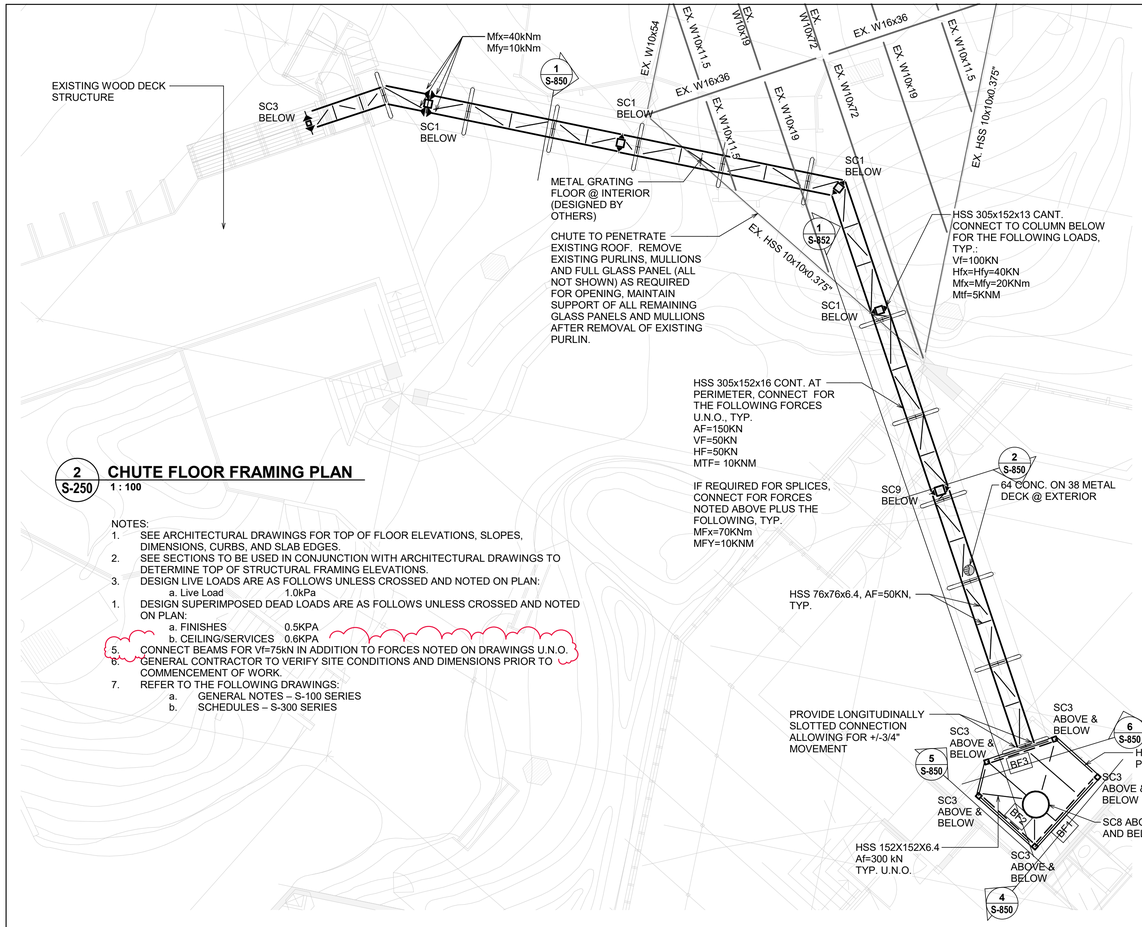
PROJECT:

DRAWING NAME:
DAYROOM FRAMING PLANS

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: 1 : 50

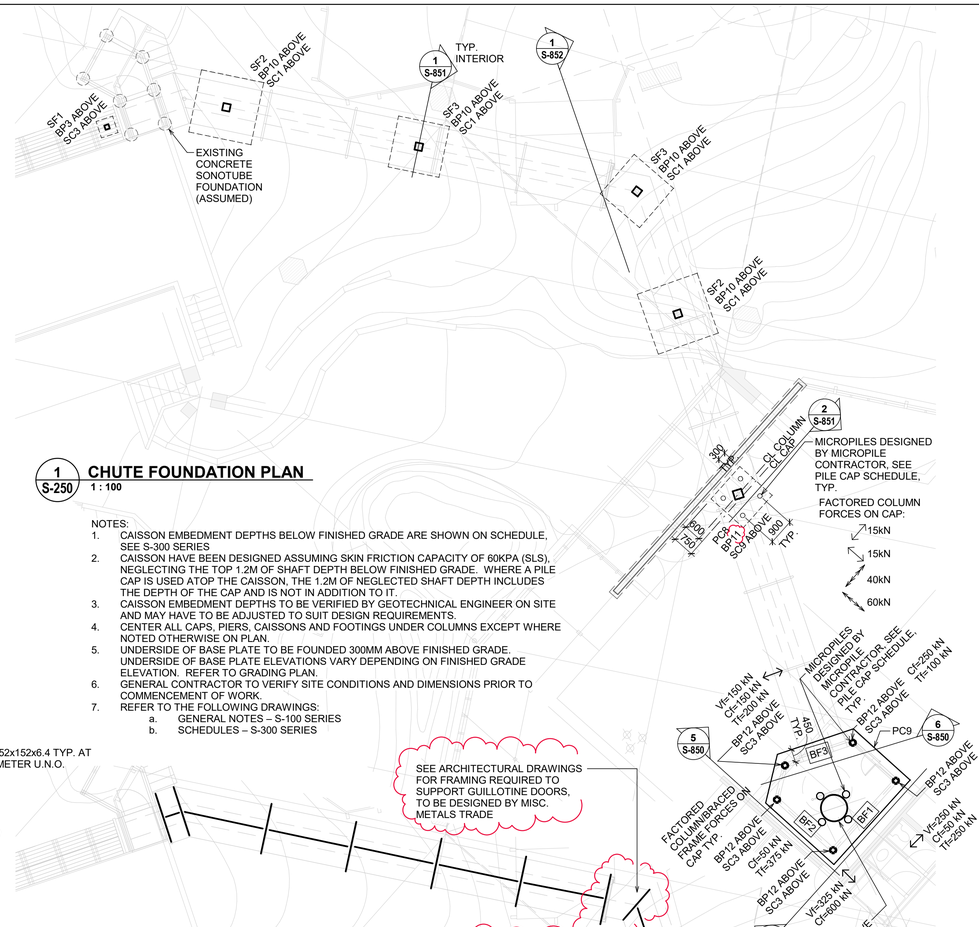
DRAWING NUMBER:
S-240



2/S-250 CHUTE FLOOR FRAMING PLAN

1 : 100

NOTES:
1. SEE ARCHITECTURAL DRAWINGS FOR TOP OF FLOOR ELEVATIONS, SLOPES, DIMENSIONS, CURBS, AND SLAB EDGES.
2. SEE SECTIONS TO BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS TO DETERMINE TOP OF STRUCTURAL FRAMING ELEVATIONS.
3. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. Live Load 1.0kPa
1. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. FINISHES 0.5KPA
   b. CEILING/SERVICES 0.6KPA
5. CONNECT BEAMS FOR Vf=75kN IN ADDITION TO FORCES NOTED ON DRAWINGS U.N.O.
6. GENERAL CONTRACTOR TO VERIFY SITE CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
7. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. SCHEDULES – S-300 SERIES



1/S-250 CHUTE FOUNDATION PLAN

1 : 100

NOTES:
1. CAISSON EMBEDMENT DEPTHS BELOW FINISHED GRADE ARE SHOWN ON SCHEDULE, SEE S-300 SERIES
2. CAISSON HAVE BEEN DESIGNED ASSUMING SKIN FRICTION CAPACITY OF 60KPA (SLS), NEGLECTING THE TOP 1.2M OF SHAFT DEPTH BELOW FINISHED GRADE. WHERE A PILE CAP IS USED ATOP THE CAISSON, THE 1.2M OF NEGLECTED SHAFT DEPTH INCLUDES THE DEPTH OF THE CAP AND IS NOT IN ADDITION TO IT.
3. CAISSON EMBEDMENT DEPTHS TO BE VERIFIED BY GEOTECHNICAL ENGINEER ON SITE AND MAY HAVE TO BE ADJUSTED TO SUIT DESIGN REQUIREMENTS.
4. CENTER ALL CAPS, PIERS, CAISSONS AND FOOTINGS UNDER COLUMNS EXCEPT WHERE NOTED OTHERWISE ON PLAN.
5. UNDERSIDE OF BASE PLATE TO BE FOUNDED 300MM ABOVE FINISHED GRADE. UNDERSIDE OF BASE PLATE ELEVATIONS VARY DEPENDING ON FINISHED GRADE ELEVATION. REFER TO GRADING PLAN.
6. GENERAL CONTRACTOR TO VERIFY SITE CONDITIONS AND DIMENSIONS PRIOR TO COMMENCEMENT OF WORK.
7. REFER TO THE FOLLOWING DRAWINGS:
   a. GENERAL NOTES – S-100 SERIES
   b. SCHEDULES – S-300 SERIES

3/S-250 CHUTE ROOF FRAMING PLAN

1 : 100

NOTES:
1. DESIGN LIVE LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. LIVE LOAD 1.0KPA
2. DESIGN SUPERIMPOSED DEAD LOADS ARE AS FOLLOWS UNLESS CROSSED AND NOTED ON PLAN:
   a. FINISHES 0.5KPA
3. REFER TO PLAN NOTES ON 2/S-250 FOR ADDITIONAL INFORMATION NOT RELATED TO LOADING
4. CONNECT BEAMS FOR VF=75kN U.N.O.

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
4	7	ISSUED FOR TENDER	2019-12-11
5	8	ISSUED FOR ADDENDUM #2	2020-01-10

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CONTRACTOR SHALL CHECK ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL AUTHORIZED IN WRITING BY CONSULTANT.

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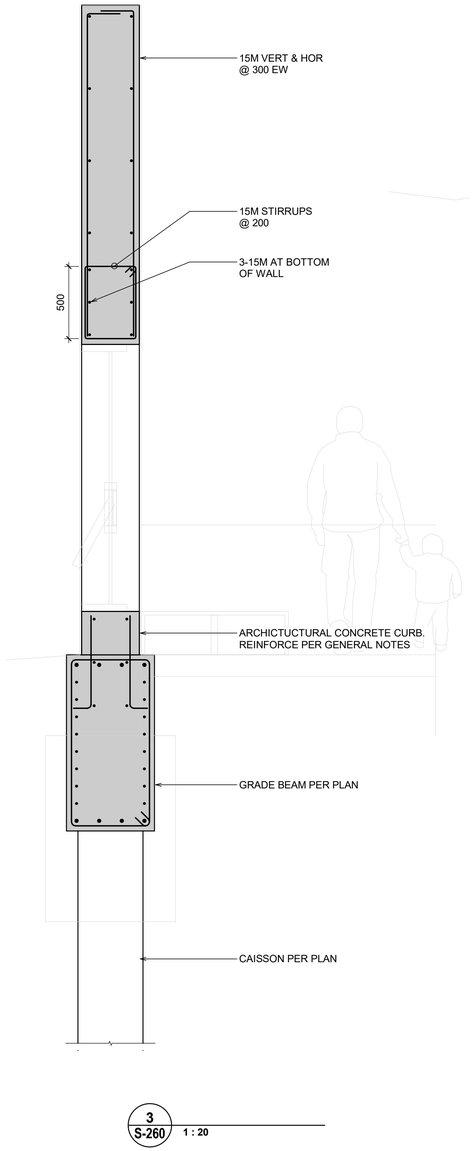
PROJECT:

DRAWING NAME:
PARTIAL FLOOR FRAMING PLAN - HABITAT 2

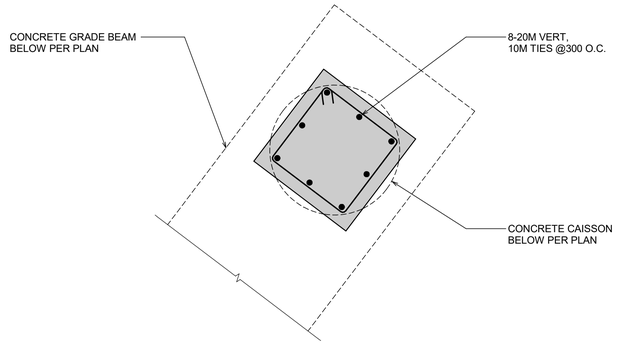
PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: 1 : 100 DRAWING NUMBER:

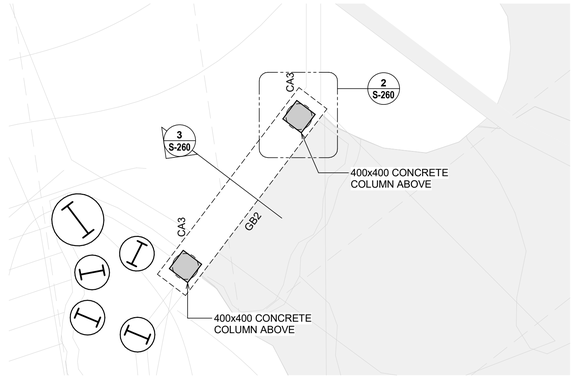
S-250



3 S-260 1 : 20



2 S-260 1 : 10



1 S-260 **TRAINING WALL** 1 : 50

NO.	REV.	ISSUED FOR	DATE
1	8	ISSUED FOR ADDENDUM #2	2020-01-10

N

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PROJECT:

DRAWING NAME:

TRAINGNIG WALL PLAN,
SECTION & DETAIL

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: As indicated

DRAWING NUMBER:

S-260

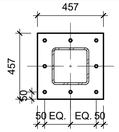
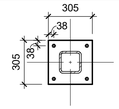
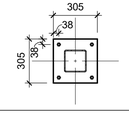
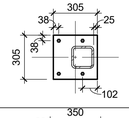
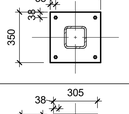
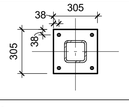
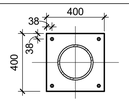
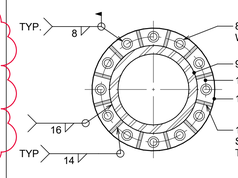
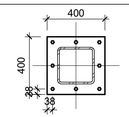
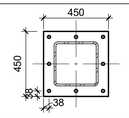
STEEL COLUMN SCHEDULE

MARK	SIZE (mm)	REMARKS
SC1	HSS 254x254x13	
SC2	HSS 152x152x13	
SC3	HSS 152x152x6.4	
SC4	HSS 203x203x6.4	
SC5	HSS 203x203x13	
SC6	HSS 610Øx59.5	ASTM A53 GRADE B
SC7	HSS 245Øx13	
SC8	HSS 915Øx25	ASTM A53 GRADE B
SC9	HSS 305x305x13	

SPREAD FOOTING SCHEDULE

MARK	SIZE (mm)	REINFORCING
SF1	600x600x300	4-15M B.E.W. H2E
SF2	2200x2200x1200	12-25M T+B.E.W. H2E
SF3	1800x1800x900	8-25M T+B.E.W. H2E

BASE PLATE SCHEDULE

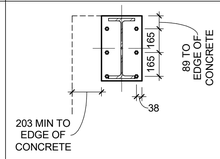
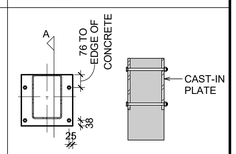
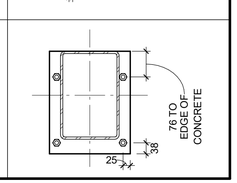
MARK	SIZE (mm)	ANCHORS	DETAIL
BP1	457x457x28 THICK	(8) 25mmØ ASTM F1554 GR. 55 915mm EMBEDMENT C/W DOUBLE NUT AND WASHER	
BP2	305x305x19 THICK	(4) 19mmØ ASTM F1554 GR. 55 915mm EMBEDMENT C/W DOUBLE NUT AND WASHER	
BP3	305x305x19 THICK	(4) 19mmØ ASTM F1554 GR. 55 406mm EMBEDMENT C/W DOUBLE NUT AND WASHER	
BP4	305x305x22 THICK	(4) 19mmØ ASTM F1554 GR. 55 915mm EMBEDMENT C/W DOUBLE NUT AND WASHER	
BP5	350x350x19 THICK	(4) 19mmØ ASTM F1554 GR. 55 915mm EMBEDMENT C/W DOUBLE NUT AND WASHER	
BP6	350x350x19 THICK	(4) 19mmØ ASTM F1554 GR. 55 915mm EMBEDMENT C/W DOUBLE NUT AND WASHER	
BP7	850Øx51 THICK (350 MPa)	(12) 38mmØ ASTM F1554 GR. 105, 1200mm EMBEDMENT C/W 89mmØ x19mm THICK WELDED WASHERS AND DOUBLE NUT AT TOP, DOUBLE NUT AND 100mmØ x19mm THICK WASHER PLATE, Fy=350 MPa AT BASE SEE S-800 FOR SECTION	
BP8	400x400x19 THICK	(4) 19mmØ ASTM F1554 GR. 55 915mm EMBEDMENT C/W DOUBLE NUT AND WASHER	
BP9	1170Øx51 THICK (350 MPa)	(12) 38mmØ ASTM F1554 GR. 105, 1200mm EMBEDMENT C/W 89mmØ x19mm THICK WELDED WASHERS AND DOUBLE NUT AT TOP, DOUBLE NUT AND 100mmØ x19mm THICK WASHER PLATE, Fy=350 MPa AT BASE SEE S-800 FOR SECTION	
BP10	400x400x25 THICK	(8) 19mmØ ASTM F1554 GR. 55 600mm EMBEDMENT C/W DOUBLE NUT AND WASHER	
BP11	450x450x25 THICK	(8) 19mmØ ASTM F1554 GR. 55 600mm EMBEDMENT C/W DOUBLE NUT AND WASHER	

NOTES:
1. PLACE STEEL COLUMN / BASEPLATES ON 1" DRYPACK GROUT U.N.O.
2. NO REINFORCING STEEL WITHIN EXISTING STRUCTURE IS TO BE CUT OR DAMAGED.
3. ALL EXISTING CONCRETE ANCHORING SURFACES MUST BE SCANNED BY CONTRACTOR TO LOCATE EXISTING REINFORCING STEEL.
4. LOCATE BASE PLATE BOLT HOLES TO AVOID EMBEDDED REINFORCING STEEL PRIOR TO FABRICATION OF BASE PLATES.
5. BASE PLATE BOLT HOLES MAY BE RELOCATED MAX 15mm FROM POSITION SHOWN ON BASE PLATE DETAILS TO ACCOMMODATE SITE CONDITIONS.
6. WHERE BASEPLATE IS LOCATED ON CONCRETE WALL, ANCHORS SHALL BE LOCATED AT THE CENTERLINE OF THE WALL

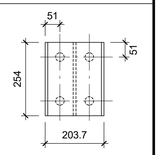
CAISSON SCHEDULE

MARK	SIZE (mm)	REINFORCING	DEPTH BELOW FINISH GRADE
CA1	700	12-25M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 150 AT TOP	9000
CA2	600	12-25M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 150 AT TOP	4600
CA3	450	8-20M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 150 AT TOP	4600
CA4	700	12-25M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 150 AT TOP	4600
CA5	500	10-20M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 150 AT TOP	3200
CA6	1200	28-30M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 100 AT TOP	9000
CA7	600	12-25M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 100 AT TOP	6200
CA8	800	12-25M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 100 AT TOP	4600
CA9	1500	30-30M VERT 10M TIES @ 300 (3) ADDITIONAL 10M TIES @ 100 AT TOP	7000

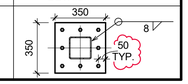
WALL PLATE SCHEDULE

MARK	SIZE (mm)	ANCHORS	DETAIL
WP1	450x280	19mm CAST-IN PLACE PLATE W/ (6) D1.1 GRADE B 19mm HEADED STUD WITH 150mm EMBEDMENT	
WP2	355x355	(2) 19mm CAST-IN PLACE PLATE WITH (4) 19mm THREADED RODS C/W NUTS AND WASHERS	
WP3	355x280	19mm CAST-IN PLACE PLATE WITH (4) D1.1 GRADE B 19mm HEADED STUD WITH 150mm EMBEDMENT	

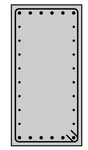
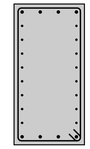
BEAM BEARING PLATE SCHEDULE

MARK	SIZE (mm)	ANCHORS	DETAIL
BBP1	254x203	19mm CAST-IN PLACE PLATE W/ (4) 19mmØ ASTM F1554 GR55 W/ 400mm EMBEDMENT AND 75 HOOK	

BASE PLATE SCHEDULE

MARK	SIZE (mm)	ANCHORS	DETAIL
BP12	350x350x25	(8) 25.4mmØ ASTM F1554 GR. 55 915mm EMBEDMENT C/W DOUBLE NUT AND WASHER	

GRADE BEAM SCHEDULE

MARK	SIZE (mm)	REINFORCING	DETAIL
GB1	610x1220	6-25M T+B 15M@300 CLOSED STIRRUPS 15M@150 FACE STEEL	
GB2	610x1220	4-25M T+B 15M@300 CLOSED STIRRUPS 15M@150 FACE STEEL	

PILE CAP SCHEDULE

MARK	SIZE (mm)	REINFORCING	REMARKS
PC1	900x900x1200	8-25M H2E. EW. T+B	WHERE PILE CAP IS ADJACENT TO A GRADE BEAM, CONTINUE LONGITUDINAL PILE CAP REINFORCEMENT INTO GRADE BEAM. PILE CAP LONGITUDINAL REINFORCEMENT NEED NOT BE HOOKED AT ENDS WHERE IT WILL CONTINUE INTO GRADE BEAM.
PC2	810x1120x1200	8-25M H2E T+B	WHERE PILE CAP IS ADJACENT TO A GRADE BEAM, CONTINUE LONGITUDINAL PILE CAP REINFORCEMENT INTO GRADE BEAM. PILE CAP LONGITUDINAL REINFORCEMENT NEED NOT BE HOOKED AT ENDS WHERE IT WILL CONTINUE INTO GRADE BEAM.
PC3	810x1975x1200	8-25M H2E T+B	WHERE PILE CAP IS ADJACENT TO A GRADE BEAM, CONTINUE LONGITUDINAL PILE CAP REINFORCEMENT INTO GRADE BEAM. PILE CAP LONGITUDINAL REINFORCEMENT NEED NOT BE HOOKED AT ENDS WHERE IT WILL CONTINUE INTO GRADE BEAM.
PC4	1370x1000x1200	8-25M H2E, EW, T+B LONG DIRECTION 6-25M H2E. EW, T+B SHORT DIRECTION	WHERE PILE CAP IS ADJACENT TO A GRADE BEAM, CONTINUE LONGITUDINAL PILE CAP REINFORCEMENT INTO GRADE BEAM. PILE CAP LONGITUDINAL REINFORCEMENT NEED NOT BE HOOKED AT ENDS WHERE IT WILL CONTINUE INTO GRADE BEAM.
PC5	800x800x1200	8-20M H2E, EW, T+B	
PC6	1400x1400x1500	12-20M CLOSED EW	
PC7	1700x1700x1500	14-20M CLOSED EW	
PC8	1500x1500	REINFORCING TO BE DESIGNED BY MICROPILE CONTRACTOR	MICROPILE CONTRACTOR TO DESIGN PILE CAP FOR FORCES NOTED ON PLAN. COORDINATE ANCHOR REINFORCEMENT WITH RJC
PC9	DIMENSION PER PLAN	REINFORCING TO BE DESIGNED BY MICROPILE CONTRACTOR	MICROPILE CONTRACTOR TO DESIGN PILE CAP FOR FORCES NOTED ON PLAN. COORDINATE ANCHOR REINFORCEMENT WITH RJC
PC10	900x900x1200	8-20M H2E, EW, T+B	
PC11	700x700x1200	6-20M H2E, EW, T+B	

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
4	7	ISSUED FOR TENDER	2019-12-11
5	8	ISSUED FOR ADDENDUM #2	2020-01-10

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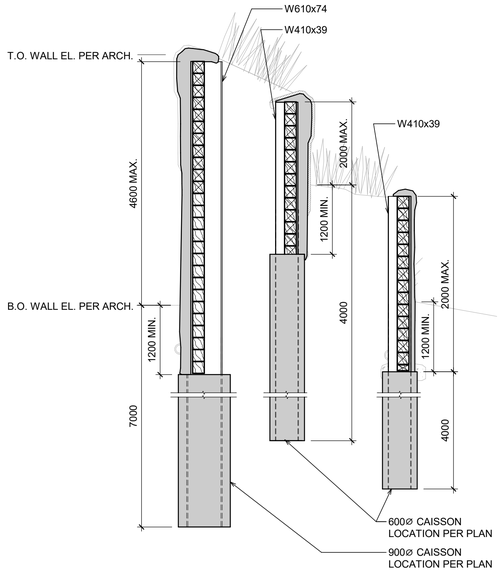
PROJECT:

DRAWING NAME:
SCHEDULES

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: As indicated

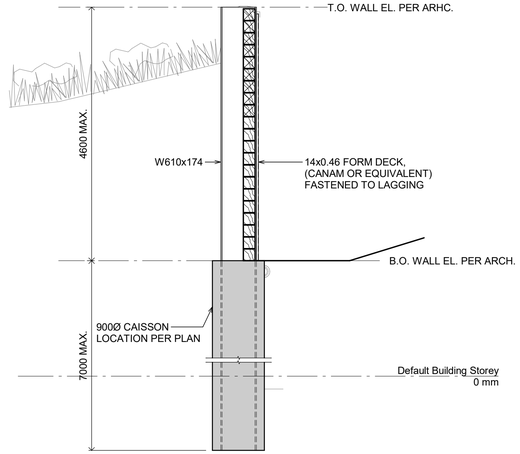
DRAWING NUMBER:
S-300



3 S-700 THREE LEVEL RETAINING WALL

1 : 50

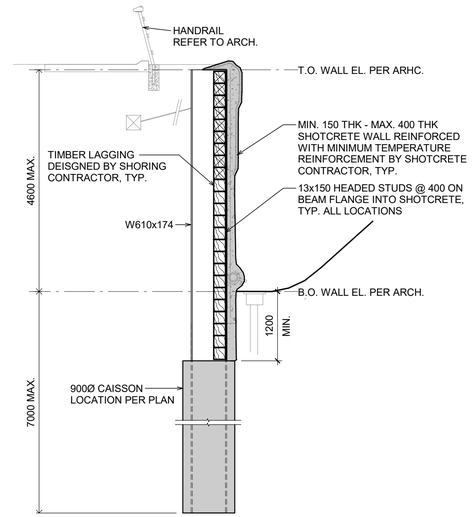
NOTES:
1. SEE 1/S700 FOR MISSING INFORMATION.
1. DETAILS SHOWN FOR CONCEPT AND PRICING ONLY. SHORING AND SHOTCRETE TO BE DESIGNED BY SHORING CONTRACTOR.



2 S-700 SHEET METAL WALL

1 : 50

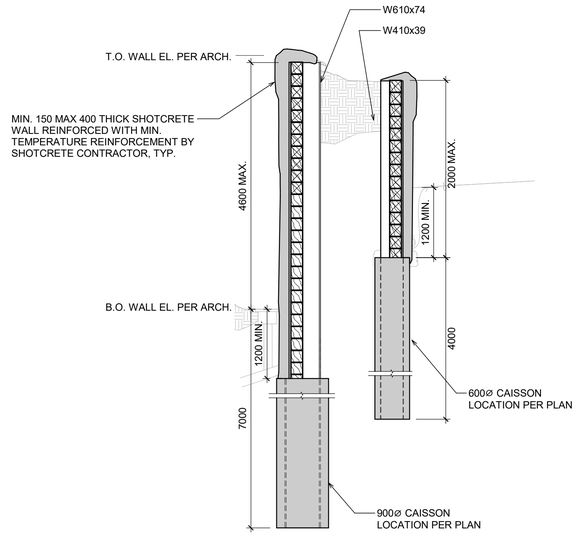
NOTES:
1. SEE 1/S700 FOR MISSING INFORMATION
2. DETAILS SHOWN FOR CONCEPT AND PRICING ONLY. SHORING AND SHOTCRETE TO BE DESIGNED BY SHORING CONTRACTOR



1 S-700 FULL MOAT WALL

1 : 50

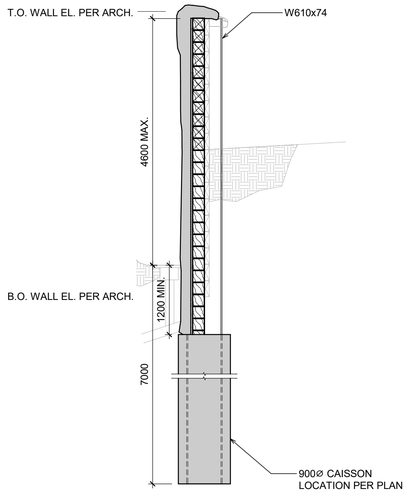
NOTES:
1. DETAILS SHOWN FOR CONCEPT AND PRICING ONLY. SHORING AND SHOTCRETE TO BE DESIGNED BY SHORING CONTRACTOR
2. REFER TO NOTES ON S-200C IN CONJUNCTION WITH GEOTECHNICAL REPORT NOTED ON S-102 FOR GEOTECHNICAL DESIGN INFORMATION.



5 S-700 HALF MOAT WALL WITH PLANTER

1 : 50

NOTES:
1. SEE 1/S700 FOR MISSING INFORMATION.
2. DETAILS SHOWN FOR CONCEPT AND PRICING ONLY. SHORING AND SHOTCRETE TO BE DESIGNED BY SHORING CONTRACTOR.



4 S-700 HALF MOAT WALL WITH PLANTER

1 : 50

NOTES:
1. SEE 1/S700 FOR MISSING INFORMATION.
2. DETAILS SHOWN FOR CONCEPT AND PRICING ONLY. SHORING AND SHOTCRETE TO BE DESIGNED BY SHORING CONTRACTOR.

NO.	REV.	ISSUED FOR	DATE
1	1	100% DD	2019-10-02
2	2	PROGRESS	2019-10-17
3	3	60% CD	2019-10-25
4	4	100% CD	2019-11-12
5	5	ISSUED FOR PERMIT	2019-11-14
6	6	ISSUED FOR TENDER REVIEW	2019-12-06
7	7	ISSUED FOR TENDER	2019-12-11
8	8	ISSUED FOR ADDENDUM #2	2020-01-10

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PROJECT:

DRAWING NAME:
FOUNDATION SHORING
SECTION & DETAILS

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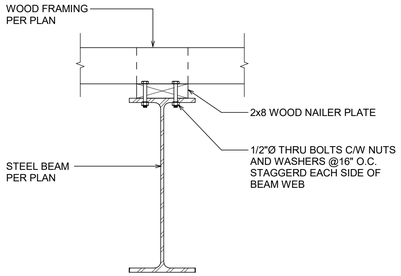
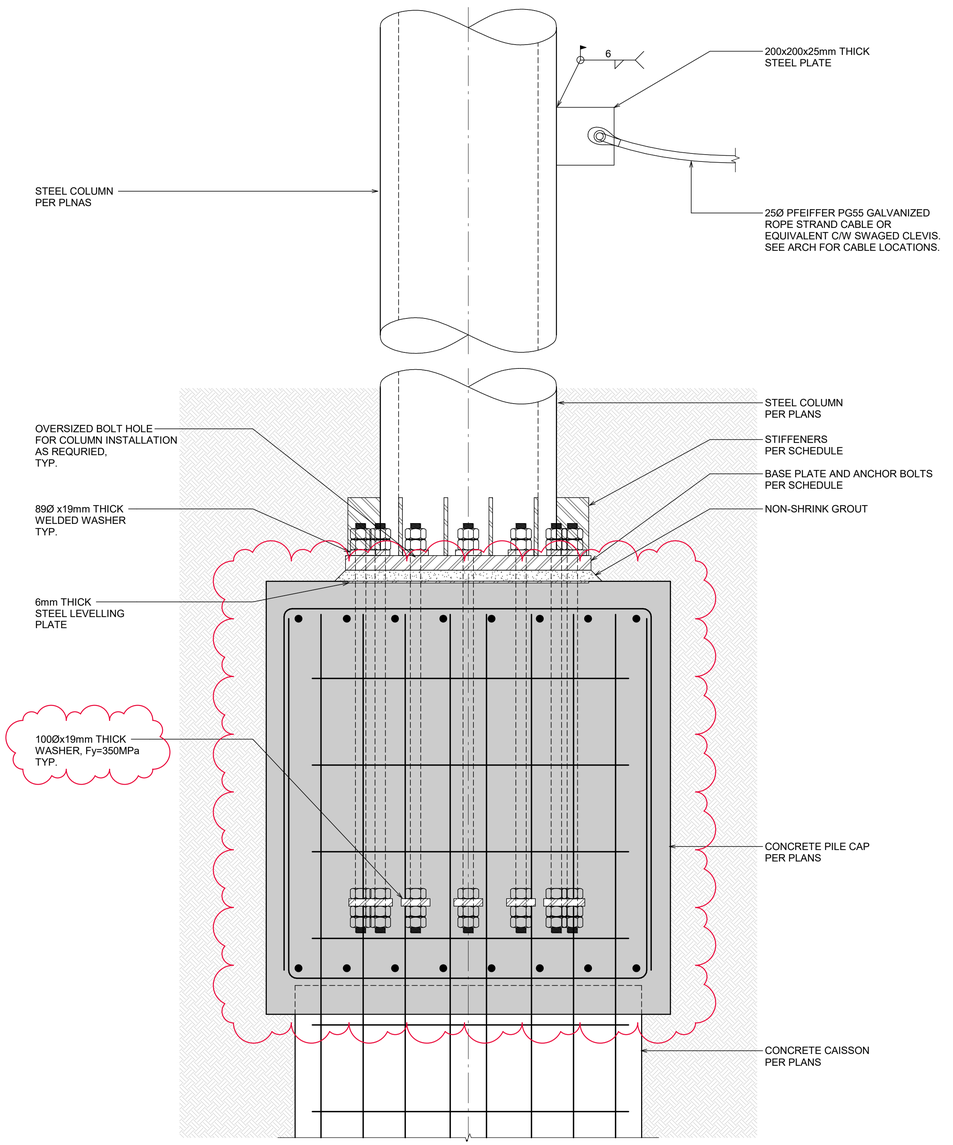
Scale: 1 : 50

DRAWING NUMBER:
S-700



2 / S-800 **TYPICAL STEEL BEAM SUPPORTING WOOD FRAMING**
1 : 10



1 / S-800 **TYPICAL CLIMBING POLE FOUNDATION & CABLE CONNECTION DETAIL**
1 : 10

NOTES:

1. FOR PRICING, CONTRACTOR TO ACCOUNT FOR SPLICING COLUMN AS REQUIRED FOR ERECTION FOR FULL STRENGTH AND STIFFNESS, PER STRUCTURAL SPECIFICATIONS.

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
4	7	ISSUED FOR TENDER	2019-12-11
5	8	ISSUED FOR ADDENDUM #2	2020-01-10

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PROJECT:

DRAWING NAME:
SECTION AND DETAILS

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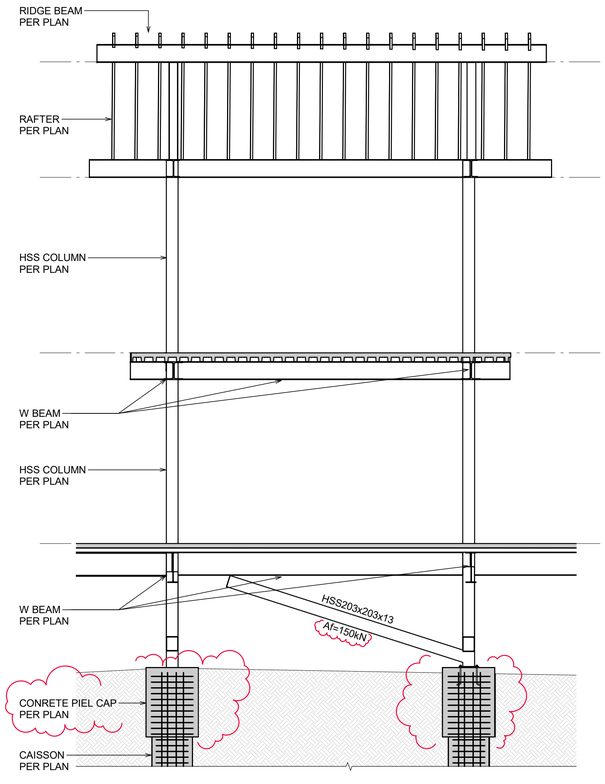
TOR.113946.0011	JP	NB

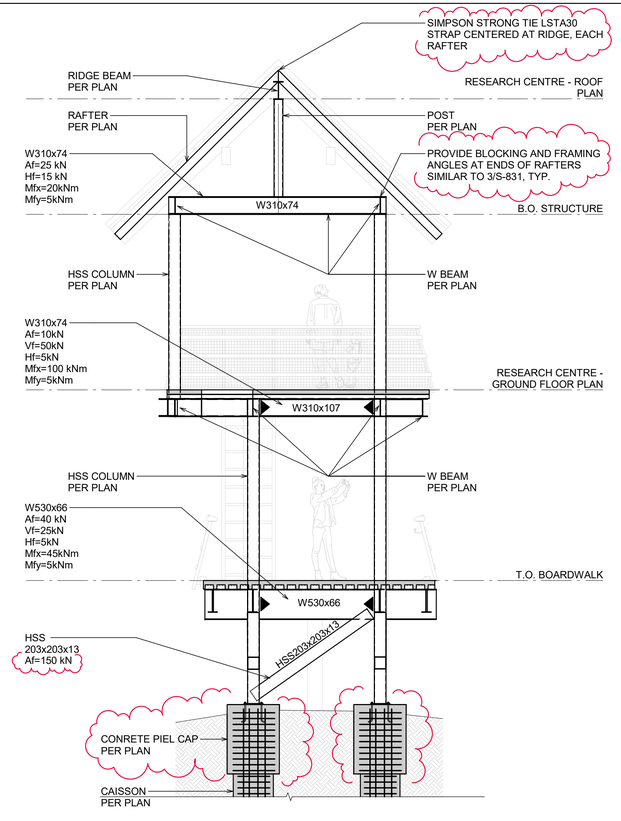
Scale: 1 : 10 DRAWING NUMBER:

S-800



3 S-810 TREEHOUSE SECTION

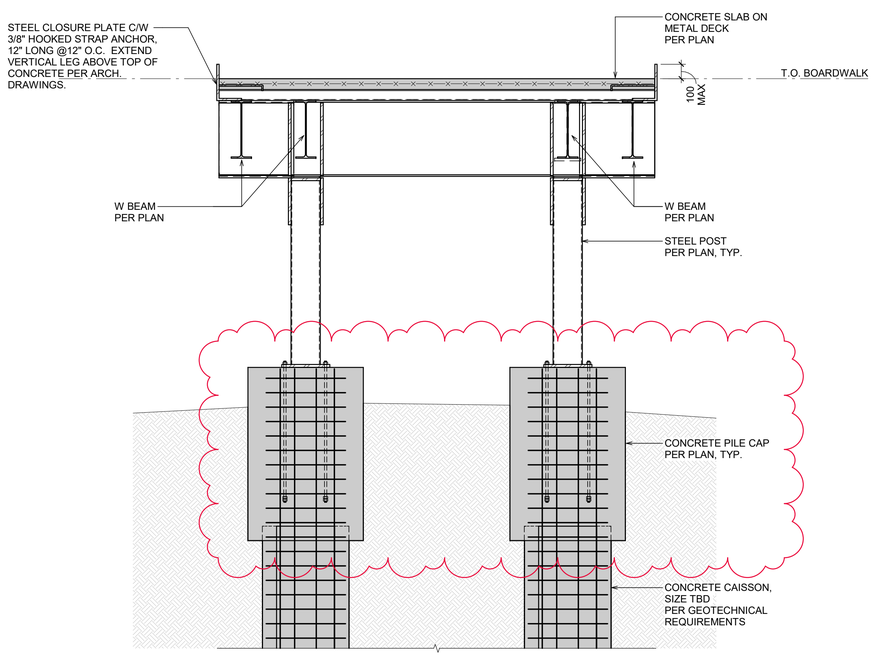
1 : 50



2 S-810 TREEHOUSE SECTION

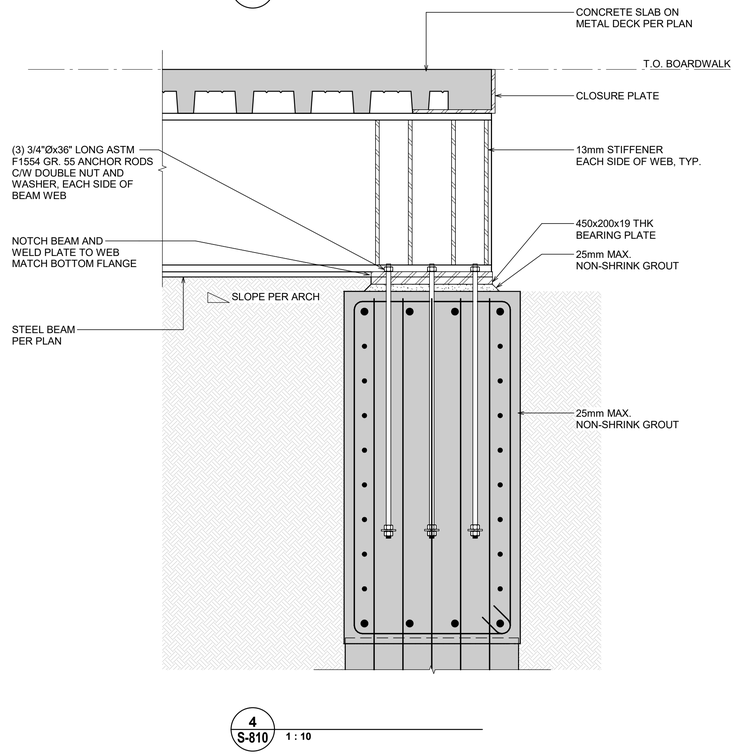
1 : 50

1. SEE S-800 SERIES FOR TYPICAL STEEL BEAM SUPPORTING WOOD FRMAING
2. PROVIDE SIMPSON STRONG TIE H3 HURRICANE TIES FOR RAFTERS AT RIDGE AND EAVES



1 S-810 BOARDWALK SECTION

1 : 20



4 S-810

1 : 10

NO.	REV.	ISSUED FOR	DATE
1	1	100% DD	2019-10-02
2	2	PROGRESS	2019-10-17
3	3	60% CD	2019-10-25
4	4	100% CD	2019-11-12
5	5	ISSUED FOR PERMIT	2019-11-14
6	6	ISSUED FOR TENDER REVIEW	2019-12-06
7	7	ISSUED FOR TENDER	2019-12-11
8	8	ISSUED FOR ADDENDUM #2	2020-01-10

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PROJECT:

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BOARDWALK & TREEHOUSE SECTIONS & DETAILS - HABITAT 1

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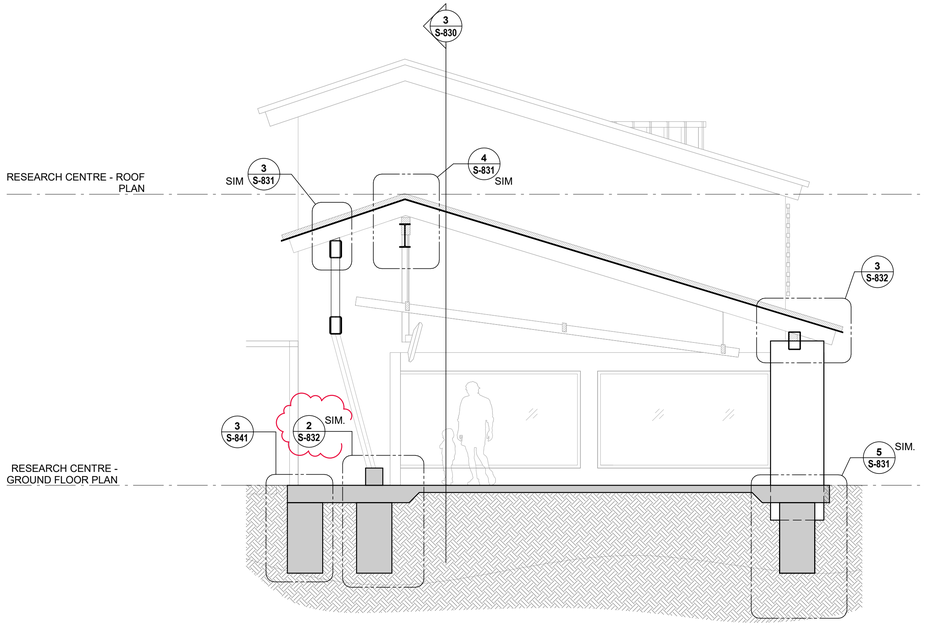
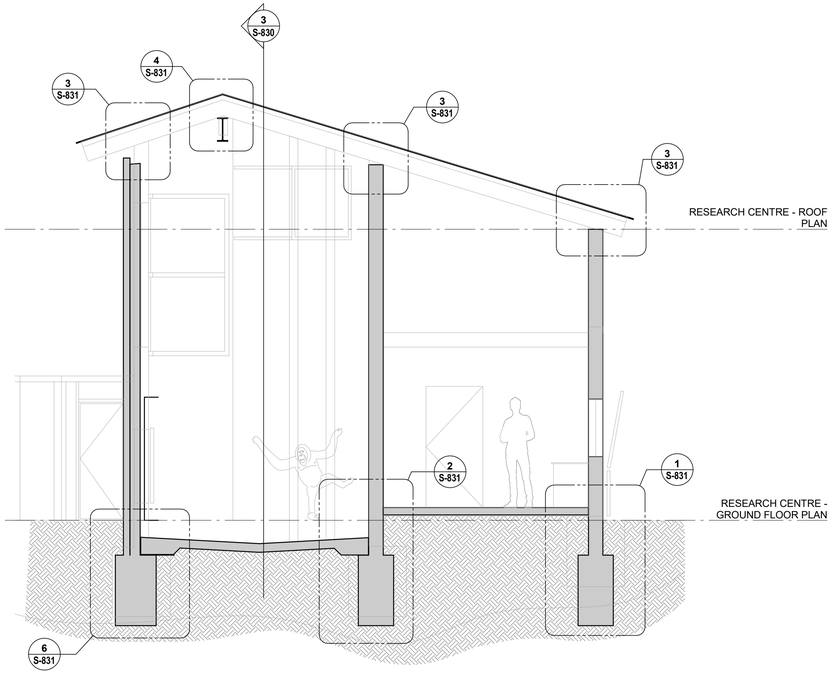
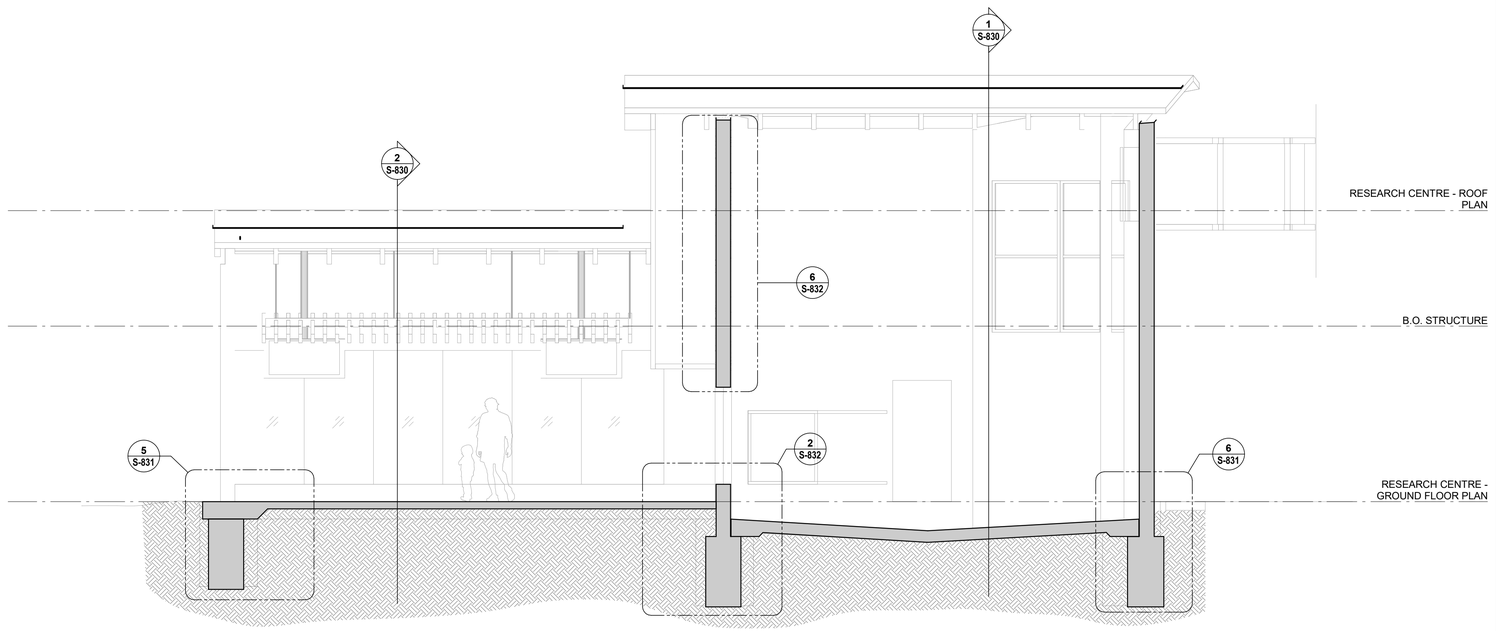


2 S-830 **SECTION**
1 : 50



1 S-830 **SECTION**
1 : 50



3 S-830 **SECTION**
1 : 50

NO.	REV.	ISSUED FOR	DATE
1	2	PROGRESS	2019-10-17
2	3	60% CD	2019-10-25
3	4	100% CD	2019-11-12
4	5	ISSUED FOR PERMIT	2019-11-14
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PROJECT:

DRAWING NAME:
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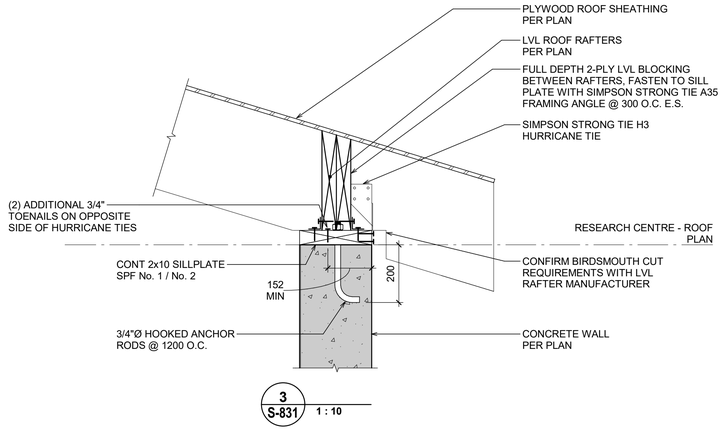
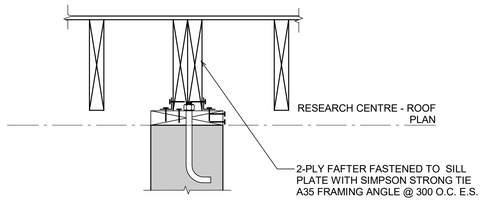
S-830

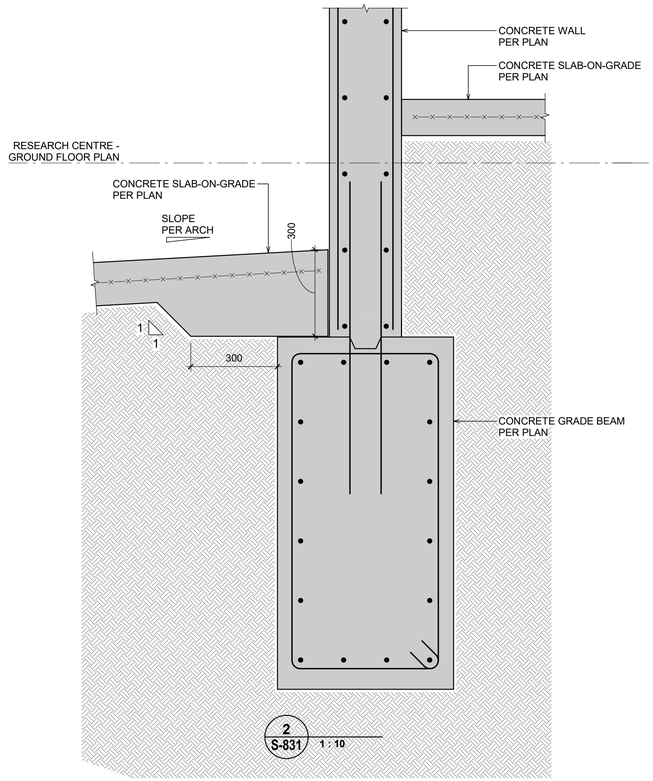


3 S-831 1 : 10

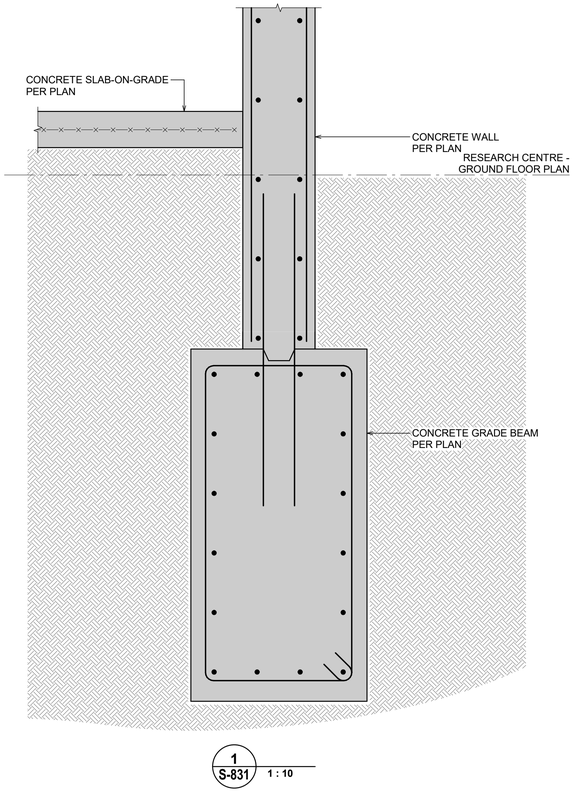


7 S-831 1 : 10

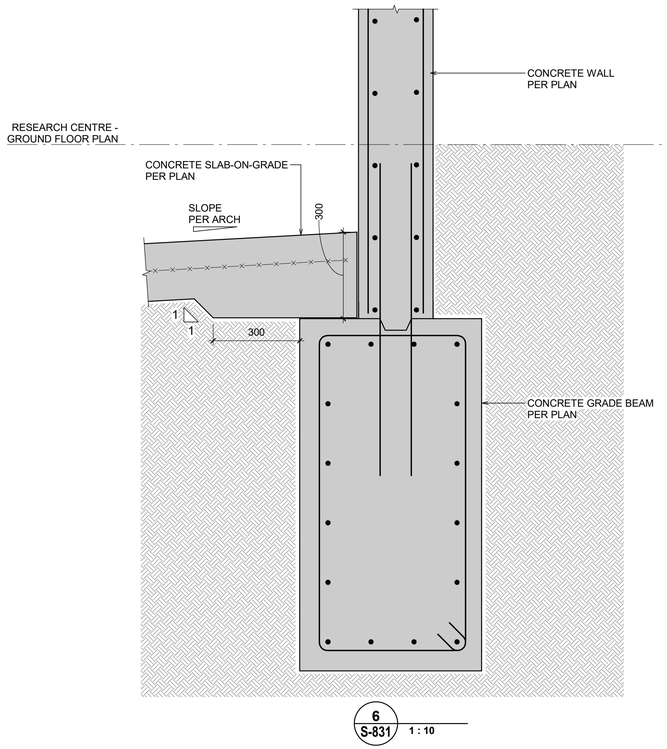
NOTE:
1. SEE 3/S831 FOR MISSING INFORMATION



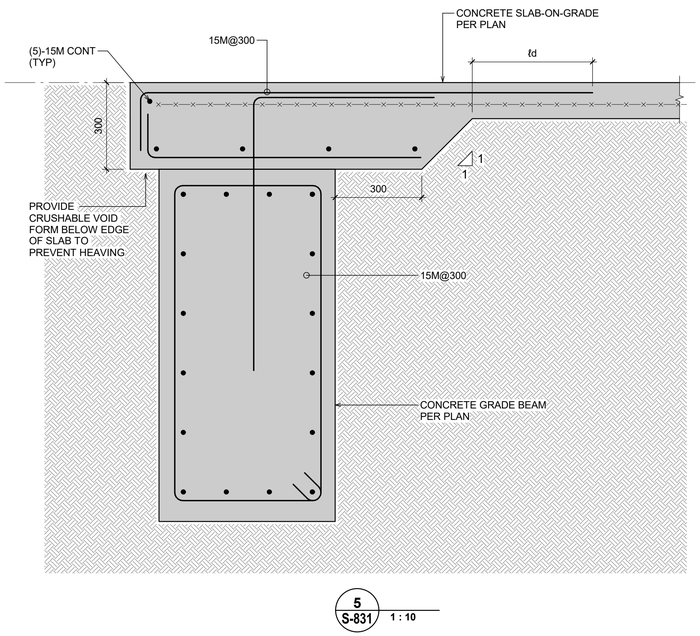
2 S-831 1 : 10



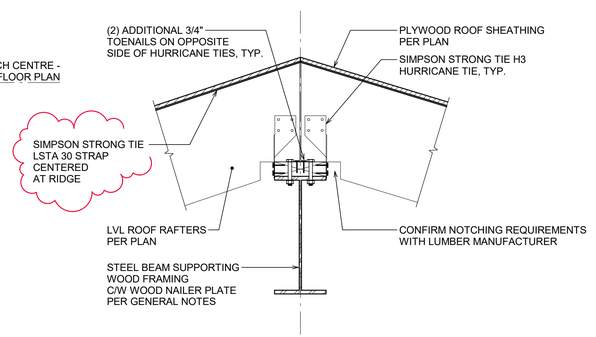
1 S-831 1 : 10



6 S-831 1 : 10



5 S-831 1 : 10



4 S-831 1 : 10

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
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5	8	ISSUED FOR ADDENDUM #2	2020-01-10

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PROJECT:

DRAWING NAME:
RESEARCH CENTRE SECTIONS
& DETAILS- HABITAT 1

PROJECT NO:	DRAWN BY:	CHECKED BY:
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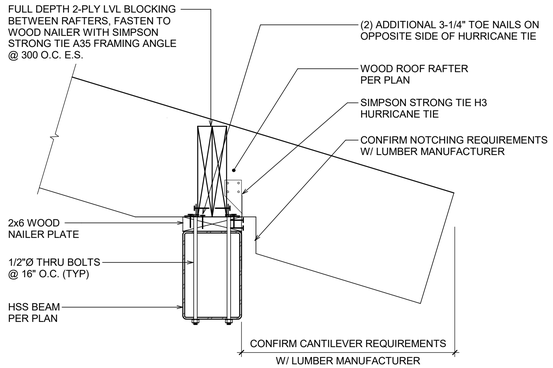
Scale: 1 : 10

DRAWING NUMBER:
S-831



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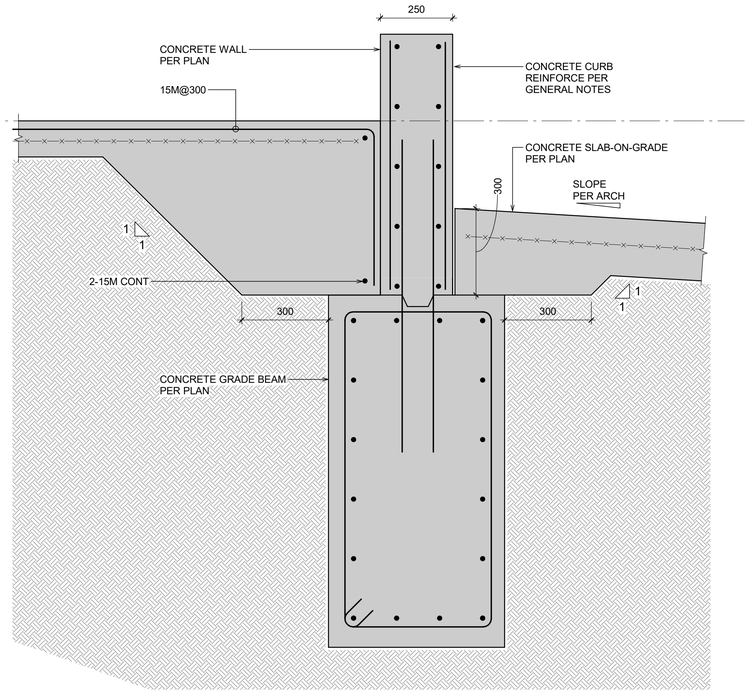
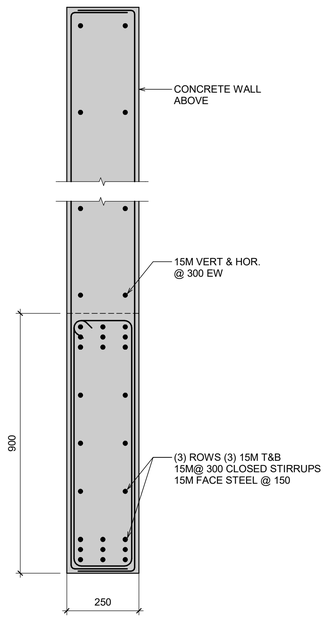


2 S-832 1 : 10



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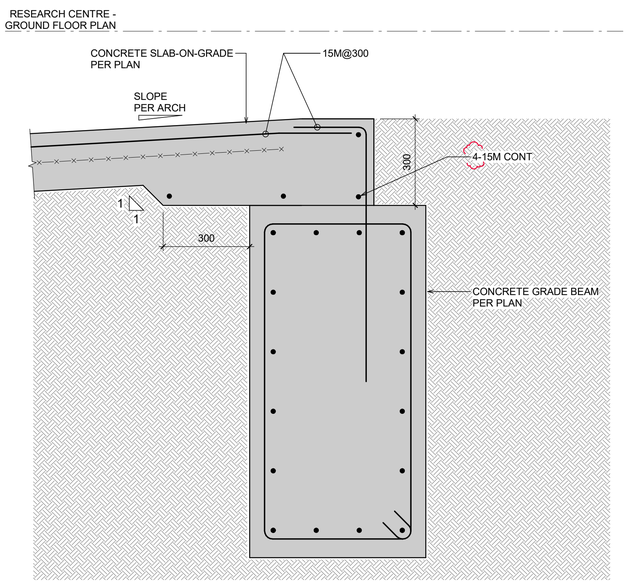

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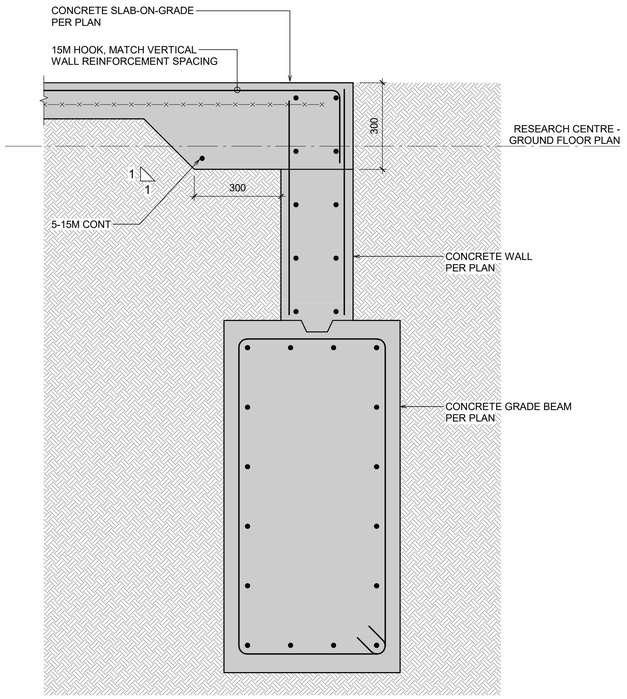

4 S-832 1 : 10

NO.	REV.	ISSUED FOR	DATE
1	4	100% CD	2019-11-12
2	5	ISSUED FOR PERMIT	2019-11-14
3	6	ISSUED FOR TENDER REVIEW	2019-12-06
4	7	ISSUED FOR TENDER	2019-12-11
5	8	ISSUED FOR ADDENDUM #2	2020-01-10

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PROJECT:

DRAWING NAME:

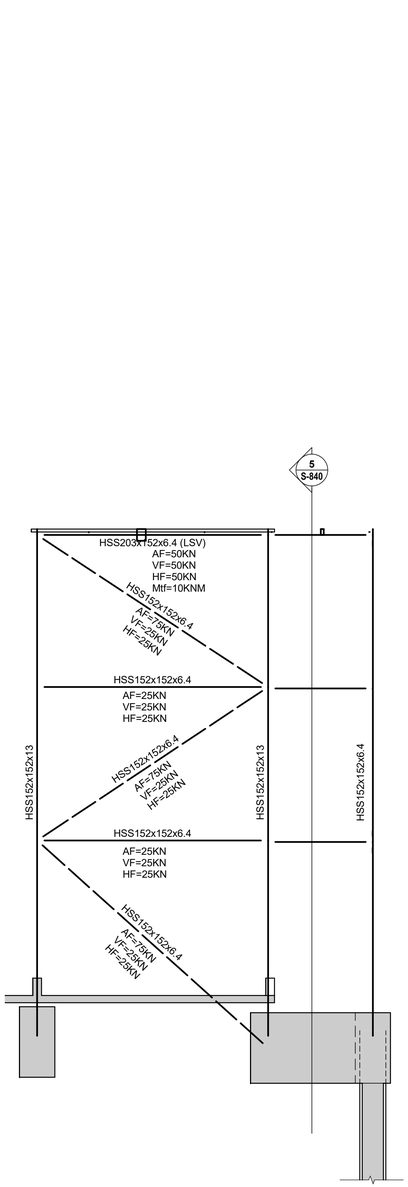
RESEARCH CENTRE SECTIONS & DETAILS - HABITAT 1

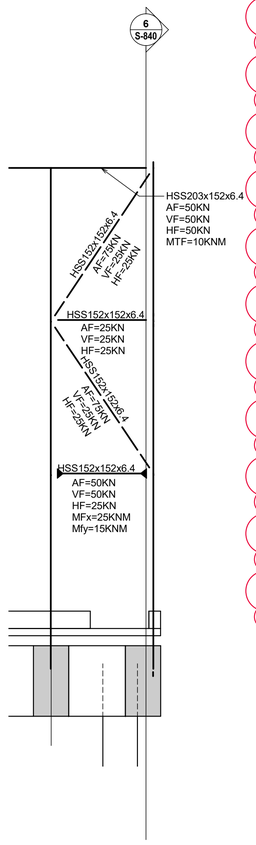
PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

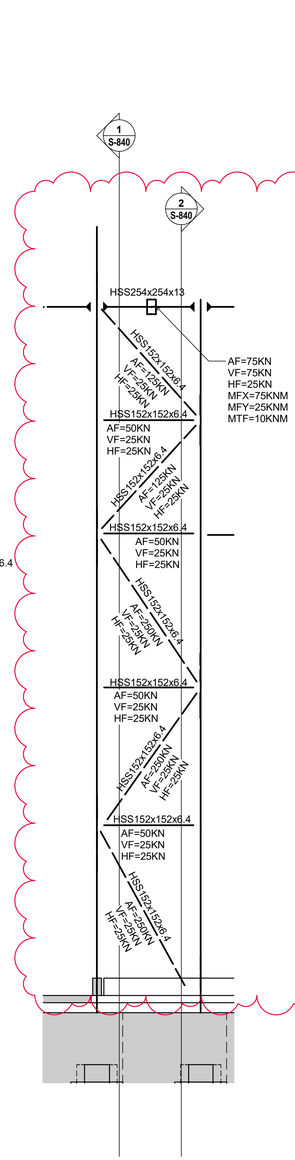
Scale: 1 : 10

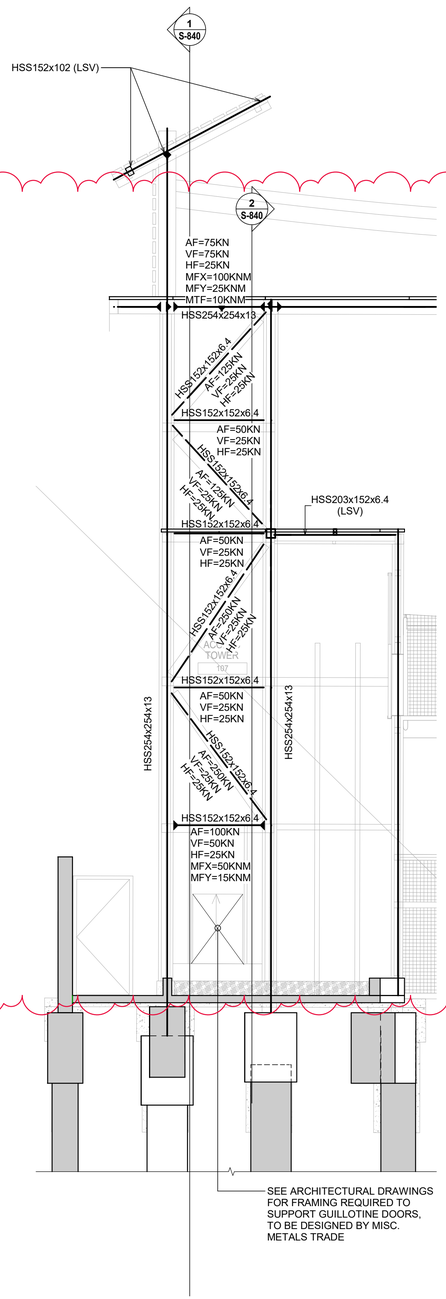
DRAWING NUMBER:

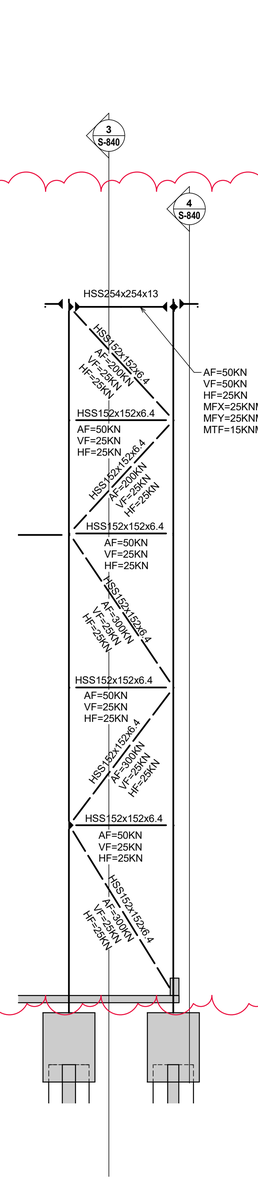
S-832

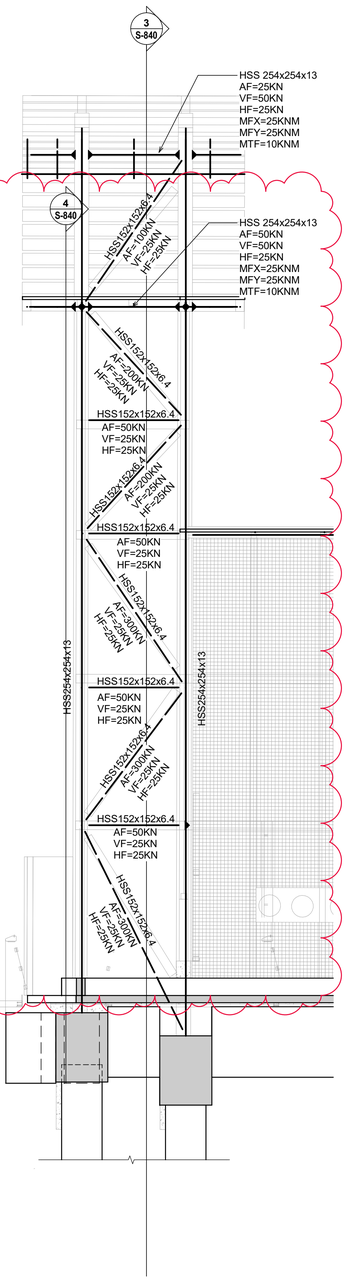












6 S-840 BF6 FRAMING ELEVATION
1 : 50

5 S-840 BF5 FRAMING ELEVATION
1 : 50

4 S-840 BF4 FRAMING ELEVATION
1 : 50

3 S-840 BF3 FRAMING ELEVATION
1 : 50

2 S-840 BF2 FRAMING ELEVATION
1 : 50

1 S-840 BF1 FRAMING ELEVATION
1 : 50

NO.	REV.	ISSUED FOR	DATE
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2	2	PROGRESS	2019-10-17
3	3	60% CD	2019-10-25
4	4	100% CD	2019-11-12
5	5	ISSUED FOR PERMIT	2019-11-14
6	6	ISSUED FOR TENDER REVIEW	2019-12-06
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PROJECT:

DRAWING NAME:
DAYROOM SECTIONS & DETAILS

PROJECT NO:	DRAWN BY:	CHECKED BY:
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DRAWING NUMBER:
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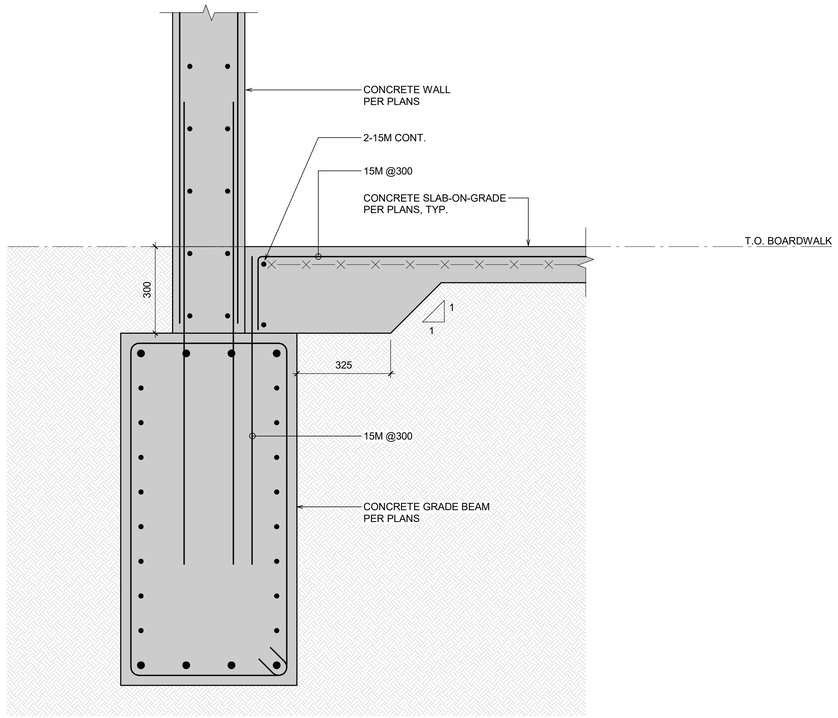

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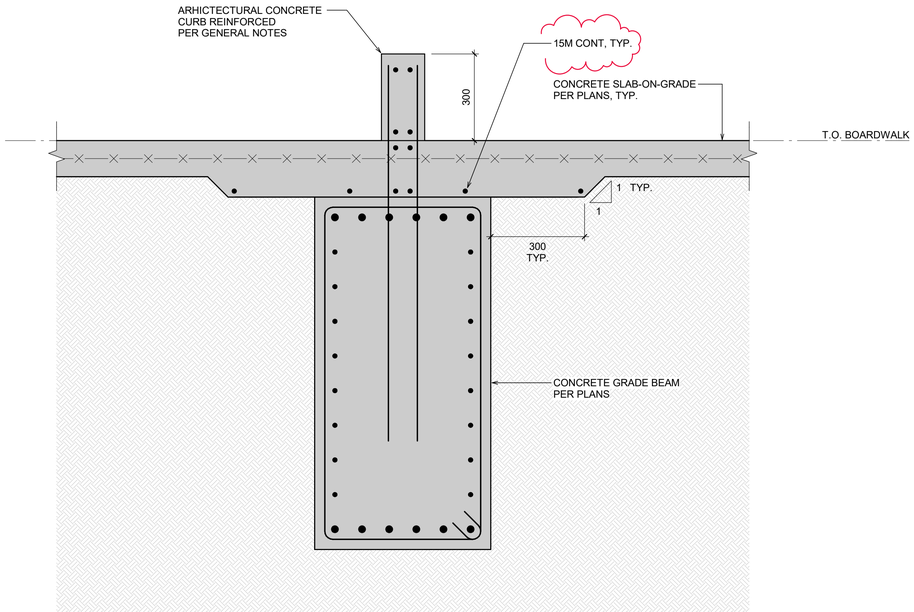

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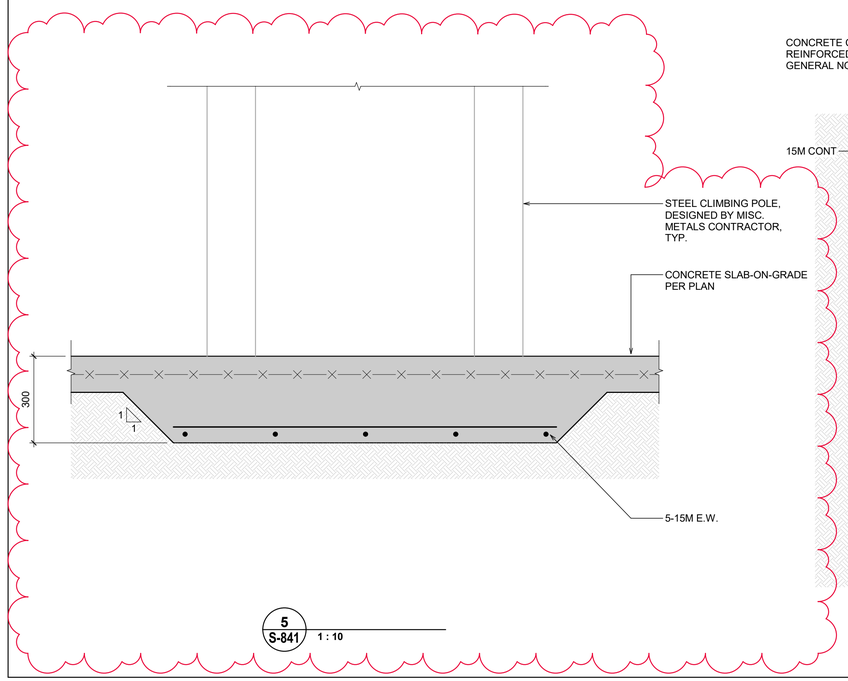

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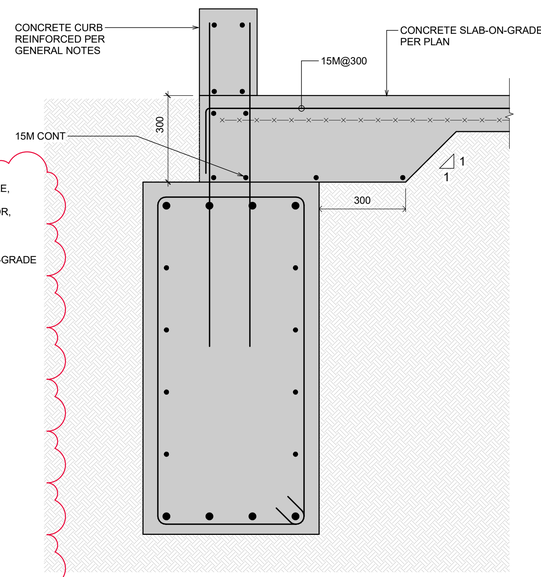

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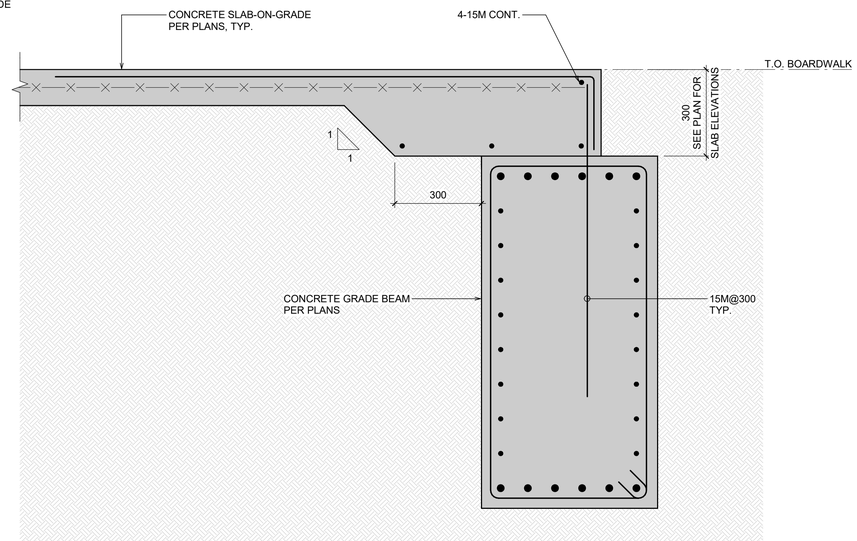

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PROJECT:

DRAWING NAME:

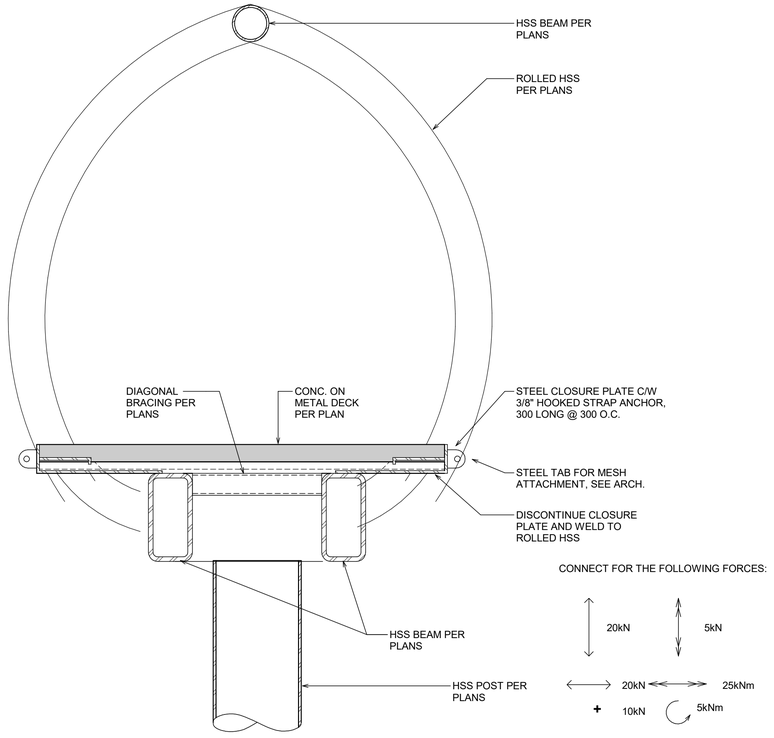
DAYROOM SECTIONS & DETAILS

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

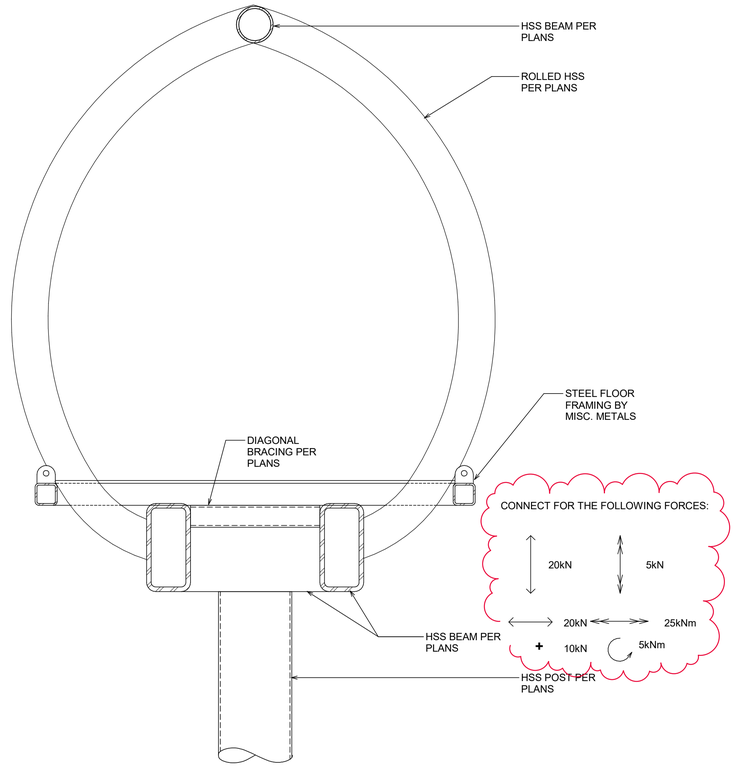
Scale: 1 : 10

DRAWING NUMBER:

S-841



2 S-850 **TYPICAL CHUTE OUTDOOR SECTION**
1 : 10



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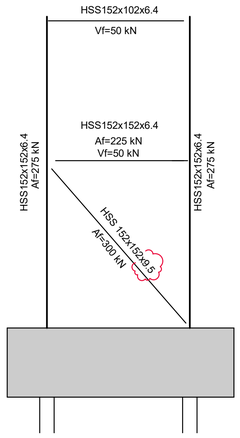
1 : 10



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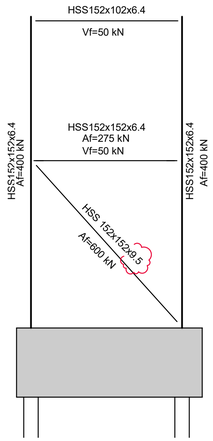

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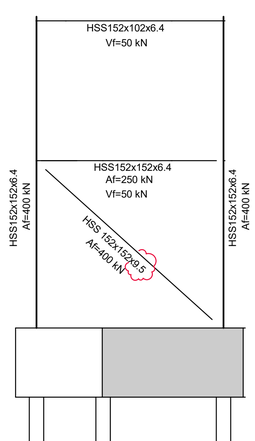

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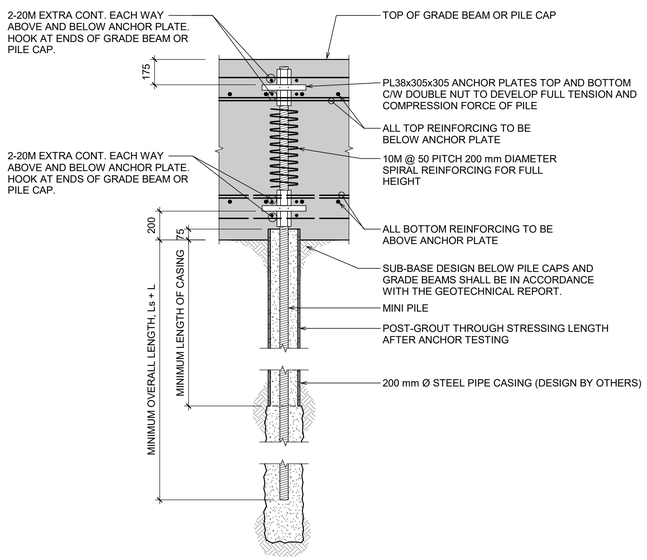

3 S-850 **TYPICAL TENSION / COMPRESSION MINI PILE DETAIL**
1 : 20

NO.	REV.	ISSUED FOR	DATE
1	6	ISSUED FOR TENDER REVIEW	2019-12-06
2	7	ISSUED FOR TENDER	2019-12-11
3	8	ISSUED FOR ADDENDUM #2	2020-01-10

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CONTRACTOR SHALL CHECK ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL AUTHORIZED IN WRITING BY CONSULTANT.

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PROJECT:

DRAWING NAME:

SECTION AND DETAILS - HABITAT 2

PROJECT NO:	DRAWN BY:	CHECKED BY:
TOR.113946.0011	JP	NB

Scale: As indicated

DRAWING NUMBER:

S-850

Project Name:	Orangutan Exhibit	**Date Issued:**	January 10, 2020
Quasar Project #:	MC-13-391		
Client Project #:	-		

Distribution

Zeidler Architecture	Lena Chow	lchow@zeidler.com

Addendum #:	2
Revision #:	-

This Addendum forms part of the Contract Specifications and Drawings, and modifies the Bidding Documents, with Amendments and Additions noted below. This Addendum shall be added to the front of the specifications as issued. Bidders shall acknowledge receipt of this Addendum in the space provided in the Bid Form and include in bid amount.

This addendum includes modifications to the drawings as summarized below. Unless otherwise noted, all drawings listed below are attached herewith.

Changes to Drawings:

1. Mechanical:
    a. Additional drawings have been provided adding a drinker at the top of Pole 8, and hose bib at the base of Pole 7.
    b. Additional information provided regarding the mist nozzles to be utilized in the Habitat 1 area.
2. Electrical:
    a. EX-101
        i. Added existing electrical panel information and existing switchgear information.
        ii. Added light fixture manufacturers.
    b. EP-101
        i. Identified location of new fibre cable run.

Quasar Consulting Group

Daniel Boragina	Roman Trochanowski
Team Lead – Mechanical	Team Lead - Electrical

CONTROLS

SYMBOL	DESCRIPTION
SF	SUPPLY FAN
RF	RETURN EXHAUST FAN
EF	EXHAUST FAN
H/C	HEATING COIL
C/C	COOLING COIL
P/C	PRE-HEAT COIL
	FILTERS
	HUMIDIFIER
	THERMOMETER
SA	SUPPLY AIR
EA	EXHAUST AIR
OA	OUTDOOR AIR
RA	RETURN AIR
MD	MOTORIZED DAMPER
MSP	MOTOR STARTER PANEL
MCC	MOTOR CONTROL CENTER
VFD	VARIABLE FREQUENCY DRIVE
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
EP	ELECTRO-PNEUMATIC SWITCH
PE	PRESSURE ELECTRIC SWITCH
H	HUMIDITY SENSOR
T	TEMPERATURE SENSOR
BAS	BUILDING AUTOMATED SYSTEM
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
GP	BAS GRAPHICS POINT
CO	CARBON MONOXIDE SENSOR
NO2	NOX SENSOR
O	OXYGEN SENSOR
OS	OCCUPANCY SENSOR
GDP	GAS DETECTION SYSTEM CONTROL PANEL

PLUMBING

SYMBOL	DESCRIPTION
SAN	SANITARY DRAINAGE - ABOVE GROUND
SAN	SANITARY DRAINAGE - UNDERGROUND
SAN(AR)	SANITARY DRAINAGE (ACID RESISTANT) - ABOVE GROUND
SAN(AR)	SANITARY DRAINAGE (ACID RESISTANT) - UNDERGROUND
STM	STORM DRAINAGE - ABOVE GROUND
STM	STORM DRAINAGE - UNDERGROUND
PD	PUMPED DISCHARGE
	DOMESTIC COLD WATER SUPPLY
	DOMESTIC HOT WATER SUPPLY
	DOMESTIC HOT WATER RECIRC.
TW	TEMPERED WATER
AWV	ACID RESISTANT VENT
V	VENT
G	GAS
RO	REVERSE OSMOSIS PIPING
ISO	RADIO ISOTOPE DRAIN
CA	COMPRESSED AIR
	HEAT TRACING
	RUNNING TRAP
	P-TRAP
BFP	BACKFLOW PREVENTER
	BACK WATER VALVE
"WC-1"	DENOTES FIXTURE TYPE PER SPECIFICATION
ES	EMERGENCY SHOWER
EW	EYE WASH
CO	CLEANOUT IN FLOOR
CO	CLEANOUT IN CEILING
HB	HOSE BIBB
NFHB	NON FREEZE HOSE BIBB
G	SINGLE GAS OUTLET
G	DOUBLE GAS OUTLET
RD	ROOF DRAIN
CFRD	CONTROL FLOW ROOF DRAIN
VTR	VENT THROUGH ROOF
RWL	RAIN WATER LEADER
TSP	DENOTES FIXTURE TYPE PER SPECIFICATION
	SCUPPER DRAIN
MH	MANHOLE
CB	CATCH BASIN
TD	TRENCH GRATE & FRAME
AD	AREA DRAIN
FFD	FUNNEL FLOOR DRAIN
FD	FLOOR DRAIN
HD	HUB DRAIN
FS	FLOOR SINK
TDD	TERRACE DECK DRAIN
FRD	FLOOR DRAIN - FLUSHING RIM
M	WATER METER ASSEMBLY
	GAS METER
CA	COMPRESSED AIR OUTLET

VENTILATION

SYMBOL	DESCRIPTION
FD	FUSIBLE LINK FIRE DAMPER (DOUBLE LINE)
FD	FUSIBLE LINK FIRE DAMPER (SINGLE LINE)
BDD	BACK DRAFT DAMPER (DOUBLE LINE)
BDD	BACK DRAFT DAMPER (SINGLE LINE)
SD	SMOKE DAMPER (DOUBLE LINE)
SD	SMOKE DAMPER (SINGLE LINE)
BD	BALANCING DAMPER (DOUBLE LINE)
BD	BALANCING DAMPER (SINGLE LINE)
600x300	RECTANGULAR DUCTWORK - DIMENSION AS SHOWN
600Ø	ROUND DUCTWORK - DIMENSION AS SHOWN
600x300	DUCTWORK (SINGLE LINE) - DIMENSION AS SHOWN
SFD	COMBINATION SMOKE/FIRE DAMPER (DOUBLE LINE)
SFD	COMBINATION SMOKE/FIRE DAMPER (SINGLE LINE)
	SUPPLY RISER UP
	EXHAUST/RETURN RISER UP
	SUPPLY RISER DOWN
	EXHAUST/RETURN RISER DOWN
	MITRED ELBOW WITH AIR TURNING VANES
	DUCT RISE (DOUBLE LINE)
	DUCT RISE (SINGLE LINE)
MD	MOTORIZED DAMPER
	SUPPLY GRILLE
	EXHAUST/RETURN GRILLE
	CEILING SUPPLY AIR DIFFUSER
	SUPPLY AIR LINEAR SLOT DIFFUSER
	CEILING EXHAUST/RETURN GRILLE
	BRANCH TAKE-OFF WITH ADJUSTABLE SPLITTER DAMPER IN SUPPLY DUCT (DOUBLE LINE)
	BRANCH TAKE-OFF WITH ADJUSTABLE SPLITTER DAMPER IN SUPPLY DUCT (SINGLE LINE)
O.E.D.	OPEN ENDED DUCT WITH BALANCING DAMPER AND BELLMOUTH. DIRECTION AS SHOWN (DOUBLE LINE)
O.E.D.	OPEN ENDED DUCT WITH BALANCING DAMPER AND BELLMOUTH. DIRECTION AS SHOWN (SINGLE LINE)
	FLEXIBLE DUCT CONNECTION
TYPE, NECK SIZE (mm), A-2000-100, AIRFLOW IN L/s	DIFFUSER TAG
TYPE, A-100, AIRFLOW IN L/s	GRILLE TAG
	ACOUSTICALLY LINED DUCTWORK (DOUBLE LINE)
	ACOUSTICALLY LINED DUCTWORK (SINGLE LINE)
SL	SILENCER (ATTENUATOR)
	FLEXIBLE DUCT (DOUBLE LINE)
	FLEXIBLE DUCT (SINGLE LINE)
R.A.O.	RETURN AIR OPENING IN WALL ABOVE FINISHED CEILING
	FLEXIBLE DUCT CONNECTION WITH BALANCING DAMPER ON TAKE-OFF
	DUCT MOUNTED HEATING COIL (DOUBLE LINE)
	DUCT MOUNTED HEATING COIL (SINGLE LINE)
VAV 111	VARIABLE AIR VOLUME BOX C/W REHEAT COIL. 8 DENOTES SIZE, 111 DENOTES AIR QUANTITY IN LITRES/SEC.
	DUCT TRANSITION FROM RECTANGULAR TO ROUND
	RECTANGULAR DUCT BREAK
	ROUND DUCT BREAK
	SINGLE LINE DUCT BREAK

HEATING & COOLING

SYMBOL	DESCRIPTION
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HGR	HEATING GLYCOL RETURN
HGS	HEATING GLYCOL SUPPLY
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CHGR	CHILLED GLYCOL RETURN
CHGS	CHILLED GLYCOL SUPPLY
CNDR	CONDENSATE DRAIN
REFR	REFRIGERANT GAS
REFS	REFRIGERANT LIQUID
LPS	LOW PRESSURE STEAM
LPC	LOW PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HPC	HIGH PRESSURE CONDENSATE
V	VENT
ST-V	STEAM VENT
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
FOV	FUEL OIL VENT
BB - XXX	ELECTRIC BASEBOARD HEATER OUTPUT AS SHOWN (KW)
ECH	ELECTRIC CABINET HEATER
CUH	CABINET HEATER
UH	UNIT HEATER
CV, 1200-5.6	CONVECTOR - LENGTH - HEAT OUTPUT (KW)
WF, 1200-5.6	WALL FIN - LENGTH - HEAT OUTPUT (KW)
	UNION
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
	EXPANSION COMPENSATOR
	EXPANSION SWING
	PIPE ANCHOR
	PIPE GUIDE
	PIPE SLEEVE
	FLOAT & THERMOSTATIC TRAP
	INVERTED BUCKET TRAP
	ELECTRIC TRACING
8C-600-1100 = 2.1	RADIANT PANEL - 8 DENOTES DEPTH, 600mm DENOTES HEIGHT, 1100mm DENOTES LENGTH & 2.1 HEAT OUTPUT (KW)

GENERAL

SYMBOL	DESCRIPTION
	EXISTING TO REMAIN
	EXISTING TO BE DEMOLISHED
R	EXISTING TO BE REMOVED FOR RELOCATION
R	EXISTING RELOCATED IN NEW WORK
	NEW WORK
CTE	CONNECT TO EXISTING
DN	PIPE TURNING DOWN
	PIPE TURNING UP
	PRESSURE REDUCING VALVE
T	ROOM THERMOSTAT
H	ROOM HUMIDISTAT
	PUMP
	AUTOMATIC CONTROL VALVE - TWO WAY
	AUTOMATIC CONTROL VALVE - THREE WAY
	ISOLATION VALVE
	BALANCING VALVE
	CHECK VALVE
	STRAINER - OVER 50MM WITH VALVED FLUSHING DRAIN
	PIPE BRANCH OFF TOP
	PIPE BRANCH OFF BOTTOM
	RELIEF VALVE (PIPE TO DRAIN)
	PRESSURE GUAGE
	THERMOMETER
CAP	CAP

Drawing List

Sheet Number	Sheet Title
MA-100	MECHANICAL SYMBOLS AND DRAWING LIST - HABITAT 2
MP-101	PLUMBING - HABITAT 2 - NEW WORK PLAN
MP-102	PLUMBING - ENGLARGED NEW WORK PLAN
MX-100	MECHANICAL DETAILS - HABITAT 2

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1	0	ISSUED FOR PROGRESS REVIEW	2019-12-04
2	0	ISSUED FOR ADDENDUM 2	2020-01-10

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PROJECT:
ORANGUTAN EXHIBIT

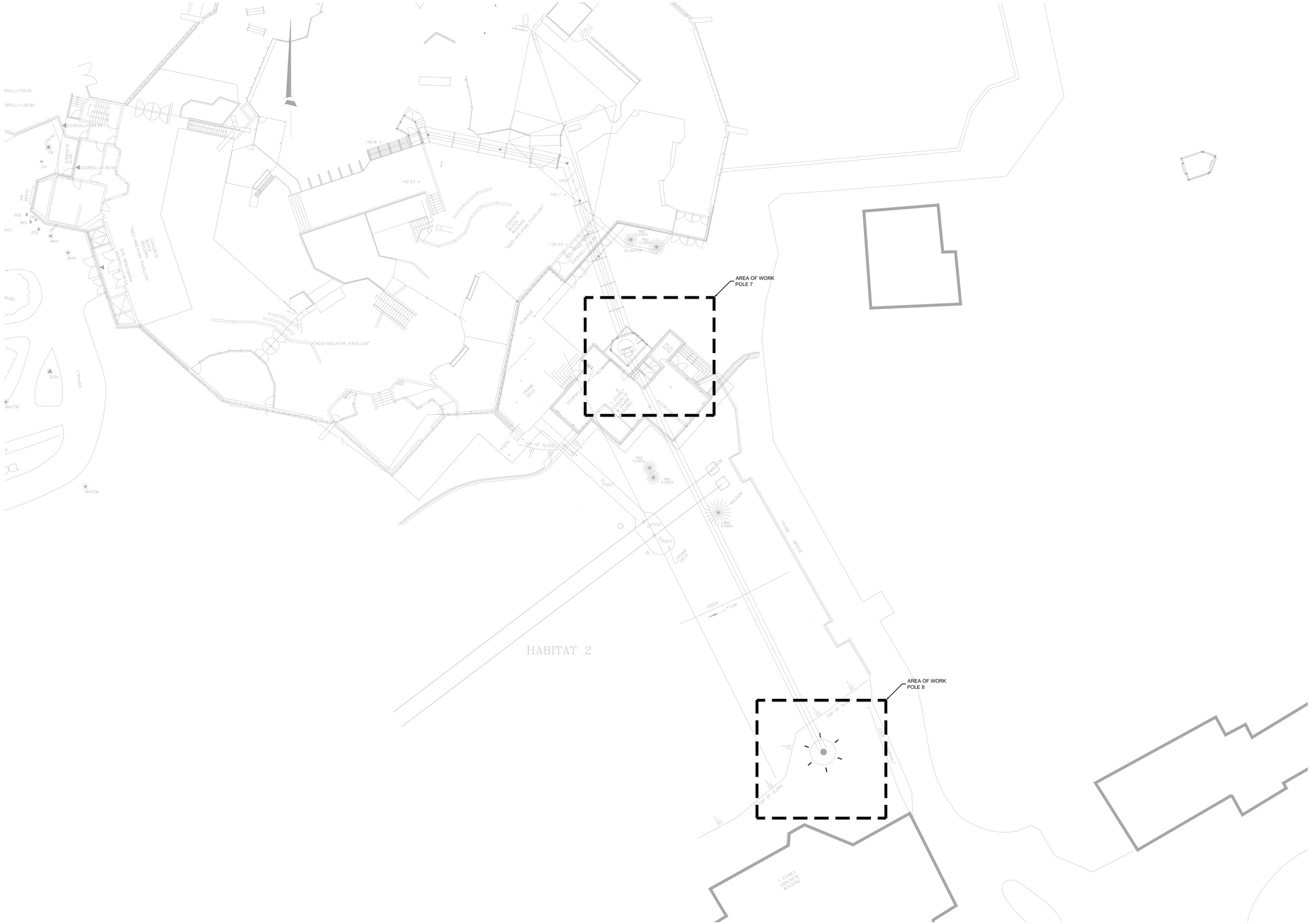
DRAWING NAME :

MECHANICAL SYMBOLS AND DRAWING LIST - HABITAT 2

PROJECT NO.:	DRAWN BY :	CHECKED BY:
CM-18-391	DB	DB

SCALE:
AS SHOWN
08.2019

DRAWING NUMBER:
MA-100



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PROJECT:
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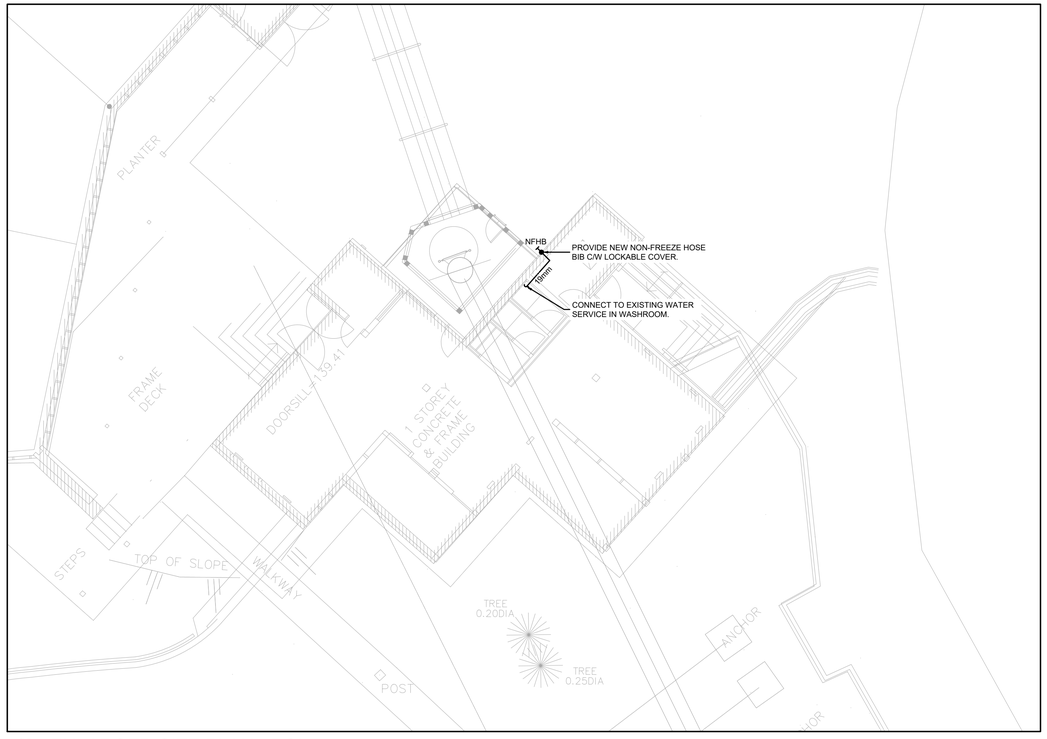
PLUMBING - HABITAT 2 - NEW WORK PLAN

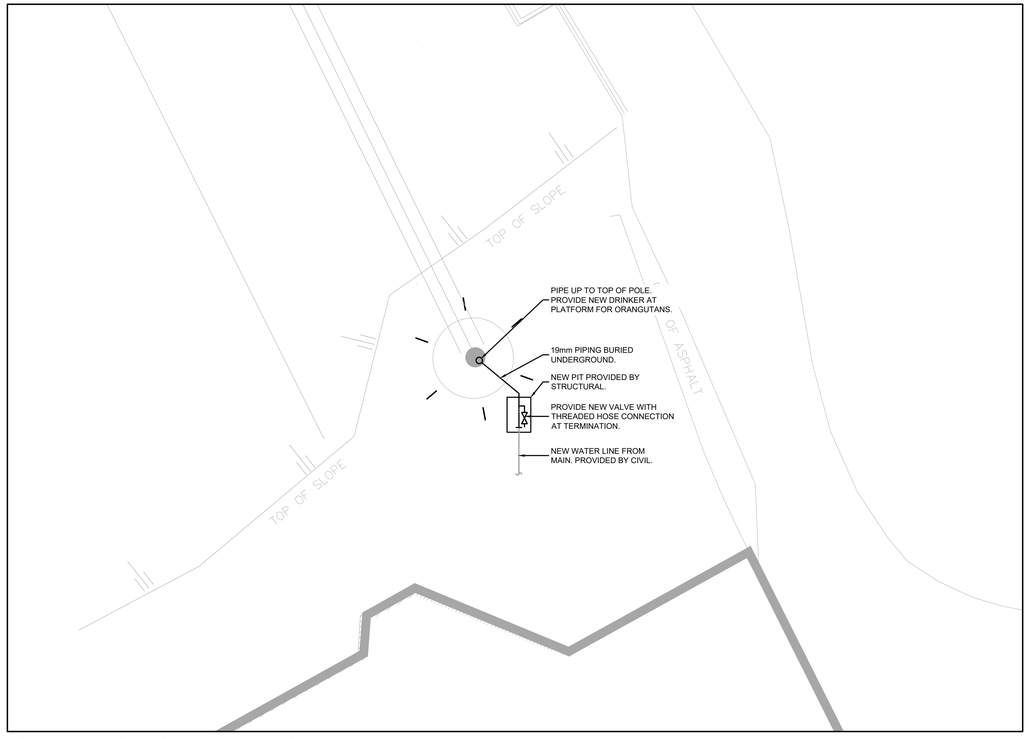
PROJECT NO.:	DRAWN BY :	CHECKED BY:
CM-18-391	DB	DB

SCALE:
AS SHOWN
08.2019

DRAWING NUMBER:
MP-101



1 ENLARGED SITE PLAN - POLE 7
SCALE: 1:100



2 ENLARGED SITE PLAN - POLE 8
SCALE: 1:100

PLUMBING FIXTURE TAGS			
TAG	DESCRIPTION	SERVICE TYPE	SERVICE SIZE
DR-1	PROVIDE DRINKING SPOUT COMPLETE WITH PUSH BUTTON ACTUATION MOUNTED IN SHOTCRETE WALL. ACTUATION SHALL BE ENGAGED FOR AS LONG AS THE BUTTON IS PRESSED. ALL COMPONENTS TO BE WITHIN LOCKABLE, VANDAL PROOF COVER WITHIN SHOTCRETE.	NON-POTABLE WATER	19mm

GENERAL NOTES	
1.	ALL PIPING TO BE SLOPED BACK TO MAIN PIT FOR DRAINAGE DURING OFF SEASON.

NO.	REV.	ISSUED FOR	DATE
1	0	ISSUED FOR PROGRESS REVIEW	2019-12-04
2	0	ISSUED FOR ADDENDUM 2	2020-01-10

N

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zeidler
Zeidler Architecture Inc.
315 Queen St. West, Suite 200
Toronto, Ontario, Canada M5V 2X2
t 416.596.8300 f 416.5596-1408

CLIENT: TORONTO ZOO

toronto zoo
361A Old Finch Ave, Toronto ON M1B 5K7 · 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

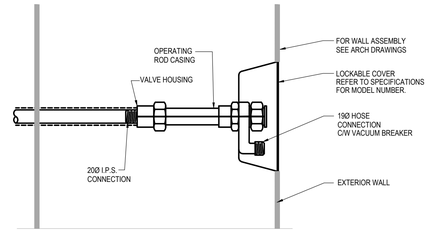
DRAWING NAME :

PLUMBING - ENGLARGED NEW WORK PLAN

PROJECT NO.:	DRAWN BY :	CHECKED BY:
CM-18-391	DB	DB

SCALE:
AS SHOWN
08.2019

DRAWING NUMBER:
MP-102



1 NON-FREEZE HOSE BIBB PIPING
SCALE: 1:100

NO.	REV.	ISSUED FOR	DATE
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361A Old Finch Ave, Toronto ON M1B 5K7 · 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

MECHANICAL DETAILS - HABITAT 2

PROJECT NO.:	DRAWN BY :	CHECKED BY:
CM-18-391	DB	DB

SCALE:
AS SHOWN
08.2019

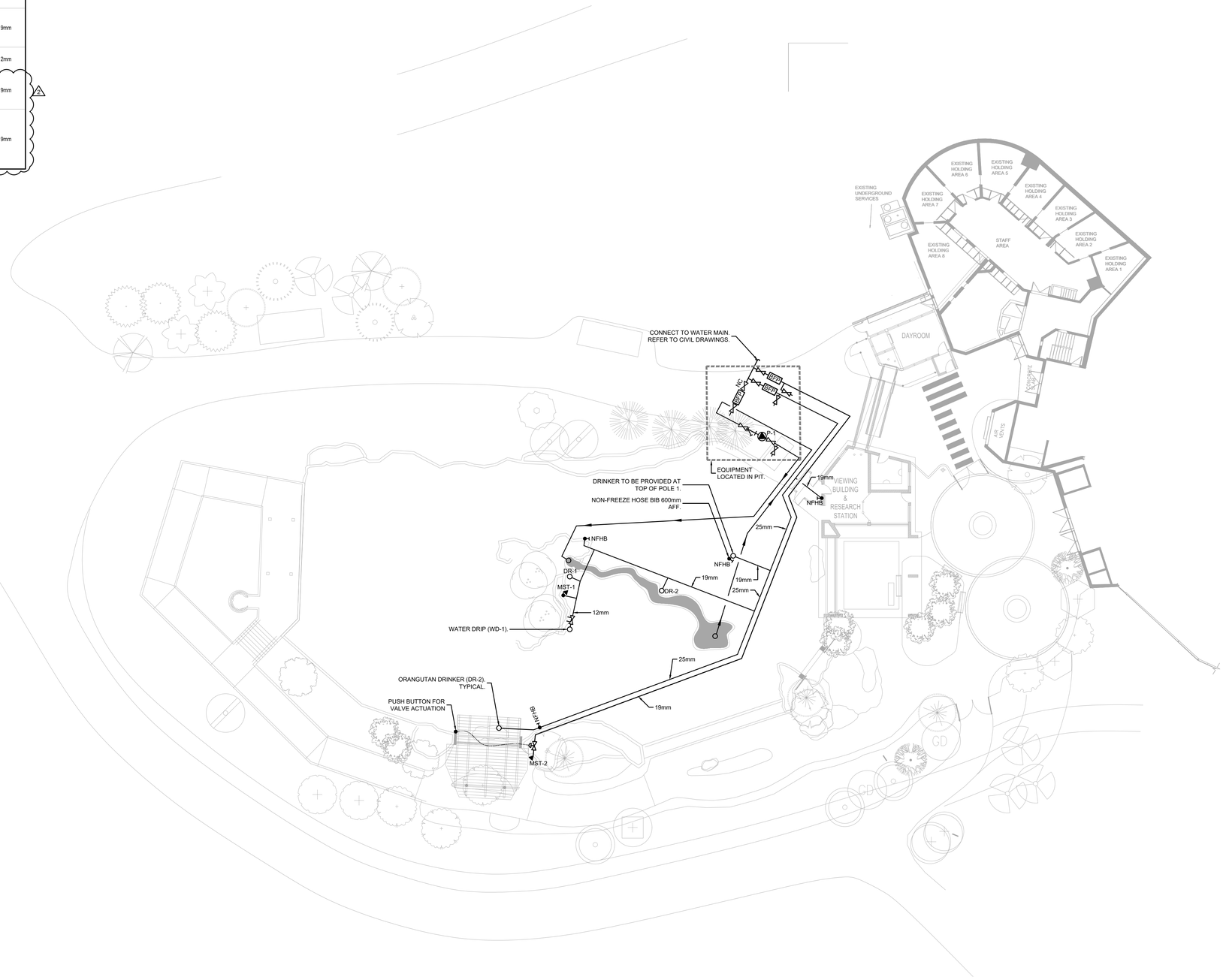
DRAWING NUMBER:
MX-100

PLUMBING FIXTURE TAGS

TAG	DESCRIPTION	SERVICE TYPE	SERVICE SIZE
DR-1	PROVIDE DRINKING SPOUT COMPLETE WITH PUSH BUTTON ACTUATION MOUNTED IN SHOTCRETE WALL. ACTUATION SHALL BE ENGAGED FOR AS LONG AS THE BUTTON IS PRESSED. ALL COMPONENTS TO BE WITHIN LOCKABLE, VANDAL PROOF COVER WITHIN SHOTCRETE.	NON-POTABLE WATER	19mm
DR-2	PROVIDE WATER CONNECTION FROM BELOW, PIPE INTO SHOTCRETE BOWL, COMPLETE WITH STRAINER AND PUSH BUTTON ACTUATION. ACTUATION SHALL BE ENGAGED FOR AS LONG AS THE BUTTON IS PRESSED. ALL COMPONENTS TO BE WITHIN LOCKABLE, VANDAL PROOF COVER WITHIN SHOTCRETE.	NON-POTABLE WATER	19mm
WD-1	WATER DRIP FEATURE IN SHOTCRETE. PROVIDE BALANCING VALVE WITHIN SHOTCRETE ROCK. LOCKABLE VANDAL PROOF COVER. PUSH BUTTON TIMED ACTUATION.	NON-POTABLE WATER	12mm
MST-1	WATER MISTER VIA PUSH BUTTON 5 SECOND TIMED ACTUATION. MISTER TO BE MEE-FOG SYSTEM DESIGNED FOR ZOO APPLICATIONS OR APPROVED EQUAL. ALL COMPONENTS INSTALLED WITHIN SHOTCRETE ROCK. LOCKABLE VANDAL PROOF COVER.	NON-POTABLE WATER	19mm
MST-2	WATER MISTER VIA PUSH BUTTON 5 SECOND TIMED ACTUATION. PUSH BUTTON LOCATED WITHIN ORANGUTAN EXHIBIT AND BE FULLY STAINLESS STEEL. MISTER LOCATED WITHIN VIEWING AREA. TIMER SHALL BE ADJUSTABLE AND INSTALLED WITHIN SHOTCRETE WALL FOR FUTURE ADJUSTMENT. ALL COMPONENTS INSTALLED WITHIN SHOTCRETE. LOCKABLE VANDAL PROOF COVER. MISTER TO BE MEE-FOG SYSTEM DESIGNED FOR ZOO APPLICATIONS OR APPROVED EQUAL.	DOMESTIC COLD WATER	19mm

GENERAL NOTES

1.	ALL PIPING TO BE SLOPED BACK TO MAIN PIT FOR DRAINAGE DURING OFF SEASON.
2.	ALL NON-POTABLE WATER LINES SHOULD HAVE IDENTIFICATION TAGS IN PUBLIC AREAS. PROVIDE SIGN WHEN ENTERING EXHIBIT THROUGH VESTIBULE INDICATING ALL HOSE BIBS ARE NON-POTABLE.



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1	0	ISSUED FOR PROGRESS REVIEW	2019-08-23
2	0	ISSUED FOR PROGRESS REVIEW	2019-10-18
3	0	ISSUED FOR 100% CD	2019-11-11
4	0	ISSUED FOR PERMIT	2019-11-14
5	0	ISSUED FOR TENDER REVIEW	2019-12-06
6	0	ISSUED FOR TENDER	2019-12-11
7	0	ISSUED FOR ADDENDUM 2	2020-01-10

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CLIENT: TORONTO ZOO

toronto zoo
361A Old Finch Ave, Toronto ON M1B 5K7 · 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

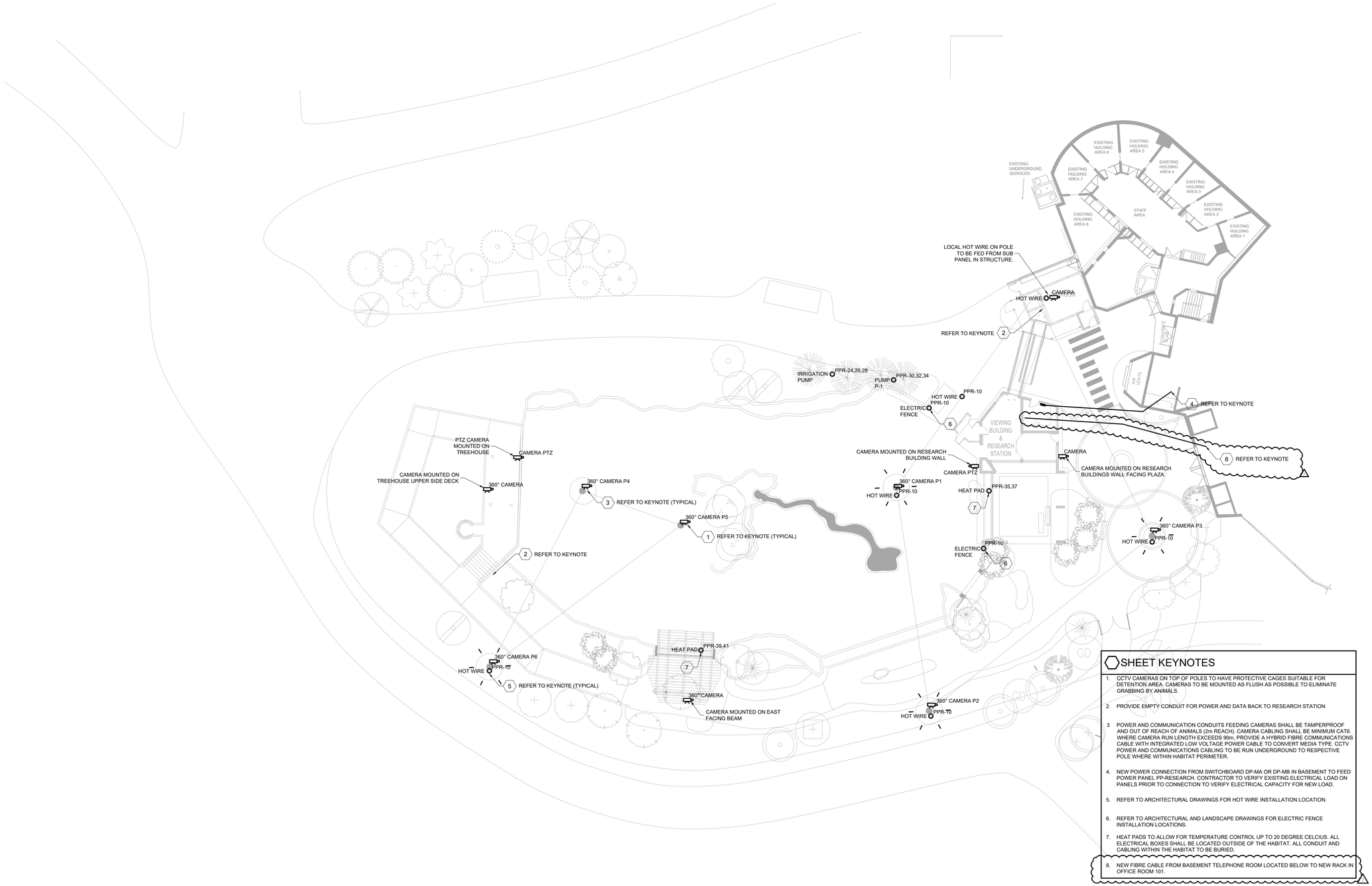
DRAWING NAME :

PLUMBING
HABITAT 1
NEW WORK PLAN

PROJECT NO.:	DRAWN BY :	CHECKED BY:
CM-18-391	DB	DB

SCALE:
1:200
08.2019

DRAWING NUMBER:
MP-101



SHEET KEYNOTES

1. CCTV CAMERAS ON TOP OF POLES TO HAVE PROTECTIVE CAGES SUITABLE FOR DETENTION AREA. CAMERAS TO BE MOUNTED AS FLUSH AS POSSIBLE TO ELIMINATE GRABBING BY ANIMALS.
2. PROVIDE EMPTY CONDUIT FOR POWER AND DATA BACK TO RESEARCH STATION
3. POWER AND COMMUNICATION CONDUITS FEEDING CAMERAS SHALL BE TAMPERPROOF AND OUT OF REACH OF ANIMALS (2m REACH). CAMERA CABLING SHALL BE MINIMUM CAT6. WHERE CAMERA RUN LENGTH EXCEEDS 90m, PROVIDE A HYBRID FIBRE COMMUNICATIONS CABLE WITH INTEGRATED LOW VOLTAGE POWER CABLE TO CONVERT MEDIA TYPE. CCTV POWER AND COMMUNICATIONS CABLING TO BE RUN UNDERGROUND TO RESPECTIVE POLE WHERE WITHIN HABITAT PERIMETER.
4. NEW POWER CONNECTION FROM SWITCHBOARD DP-MA OR DP-MB IN BASEMENT TO FEED POWER PANEL PP-RESEARCH. CONTRACTOR TO VERIFY EXISTING ELECTRICAL LOAD ON PANELS PRIOR TO CONNECTION TO VERIFY ELECTRICAL CAPACITY FOR NEW LOAD.
5. REFER TO ARCHITECTURAL DRAWINGS FOR HOT WIRE INSTALLATION LOCATION.
6. REFER TO ARCHITECTURAL AND LANDSCAPE DRAWINGS FOR ELECTRIC FENCE INSTALLATION LOCATIONS.
7. HEAT PADS TO ALLOW FOR TEMPERATURE CONTROL UP TO 20 DEGREE CELCIUS. ALL ELECTRICAL BOXES SHALL BE LOCATED OUTSIDE OF THE HABITAT. ALL CONDUIT AND CABLING WITHIN THE HABITAT TO BE BURIED.
8. NEW FIBRE CABLE FROM BASEMENT TELEPHONE ROOM LOCATED BELOW TO NEW RACK IN OFFICE ROOM 101.

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3	0	ISSUED FOR 100% CD	2019-11-11
4	0	ISSUED FOR PERMIT	2019-11-14
5	0	ISSUED FOR TENDER REVIEW	2019-12-06
6	0	ISSUED FOR TENDER	2019-12-11
7	0	ISSUED ELECTRICAL ADDENDUM E01	2020-01-10

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PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

POWER AND SYSTEMS
HABITAT 1
NEW WORK

PROJECT NO.:	DRAWN BY :	CHECKED BY:
CM-18-391	MI	MI

SCALE:
1:200
08.2019

DRAWING NUMBER:
EP-101

EXISTING ELECTRICAL PANELBOARD SCHEDULE

PANEL ID: LP-VS1	VOLTS: 120/208V	LOCATION:
MAIN BUS: 225A	PHASE: 3	FED FROM: DP-MB
MAIN BREAKER:	WIRE: 4	FEEDER ENTRY AT: BOTTOM
TYPE:	MOUNTING: SURFACE	FEEDER:
INTERRUPTING CAPACITY -	ENCLOSURE RATING:	REMARKS: WESTINGHOUSE NQB

CIR NO.	DESCRIPTION	PHASE VA ØA	PHASE VA ØB	PHASE VA ØC	BRKR	Ø	BRKR	PHASE VA ØA	PHASE VA ØB	PHASE VA ØC	DESCRIPTION	CIR NO.
1	BOILER ROOM LIGHTS	-	-	-	15A	A	15A	-	-	-	BOILER ROOM HEATER	2
3	FISH LIGHTS	-	-	-	15A	B	15A	-	-	-	WATERFALL PUMPS	4
5	MAIN ENTRANCE LIGHTS	-	-	-	15A	C	15A	-	-	-	SUMP PIT PUMP	6
7	SKYLIGHT MOTOR	-	-	-	15A	A	15A	-	-	-	NORTH HOLDING ROOM	8
9	"SPARE"	-	-	-	15A	B	15A	-	-	-	LEOPARD EXHIBIT (PLUG)	10
11	WIREMOLD PLUGS	-	-	-	15A	C	15A	-	-	-	LEOPARD EXHIBIT (LIGHTS)	12
13		-	-	-	15A	A	15A	-	-	-	HOLDING ROOM LIGHTS	14
15	DOOR	-	-	-	15A	B	15A	-	-	-	PLUGS. S. HOLDING PEN	16
17	SPARE	-	-	-	15A	C	15A	-	-	-	HOLDING ROOM FANS	18
19	BOILER ROOM PLUG	-	-	-	15A	A	15A	-	-	-	SNAKE HEATING CABLE	20
21	BOILER ROOM PLUG	-	-	-	15A	B	15A	-	-	-	EXIT	22
23	BATTERY UNIT BOILER ROOM	-	-	-	15A	C	15A	-	-	-	SNAKE EX. FAN	24
25	PLUGS	-	-	-	15A	A	15A	-	-	-	ENTR HEATER	26
27	HALLWAY HALOGENS	-	-	-	15A	B	30A	-	-	-	ORANGE HEATER	28
29	BACKLIT SIGN	-	-	-	15A	C		-	-	-		30
31	MAIN DOOR	-	-	-	15A	A	30A	-	-	-	STAR HEATER	32
33	TYPE A FIXTURE	-	-	-	15A	B		-	-	-		34
35	SNAKE LIGHTS	-	-	-	15A	C	20A	-	-	-	LEOPARD	36
37	HOTWIRE	1200	-	-	15A	A		-	-	-		38
39	SPACE	-	-	-	-	B	15A	-	-	-	FISH LIGHTS	40
41	SPACE	-	-	-	-	C	-	-	-	-	SPACE	42

TOTAL ØA: - VA , TOTAL ØB: - VA , TOTAL ØC: - VA

NOTES:

* - PROVIDE LOCKABLE BREAKER
** - PROVIDE GFI TYPE BREAKER
*** - COORDINATE EXACT BREAKER SIZE WITH EQUIPMENT SHOP DRAWINGS
R - RECEPTACLE
L - LIGHTING

CIRCUIT NUMBERS ARE GIVEN FOR GROUPING ONLY. SITE VERIFY AVAILABLE CIRCUIT BREAKER SPACES IN PANELS DURING TENDER WALKTHROUGH.

EXISTING ELECTRICAL PANELBOARD SCHEDULE

PANEL ID: LP-M10	VOLTS: 120/208V	LOCATION:
MAIN BUS: 225A	PHASE: 3	FED FROM: DP-MB
MAIN BREAKER:	WIRE: 4	FEEDER ENTRY AT: -
TYPE:	MOUNTING: SURFACE	FEEDER:
INTERRUPTING CAPACITY -	ENCLOSURE RATING:	REMARKS: FEDERAL PACIFIC FPE NBLP 42-4L

CIR NO.	DESCRIPTION	PHASE VA ØA	PHASE VA ØB	PHASE VA ØC	BRKR	Ø	BRKR	PHASE VA ØA	PHASE VA ØB	PHASE VA ØC	DESCRIPTION	CIR NO.
1	ORCH RECEPT (IN OFF POSITION)	-	-	-	15A	A	15A	-	-	-	TIMES RECEPT	2
3	ORCH RECEPT	-	-	-	15A	B	15A	-	-	-	RECEPTS S. WALL	4
5		-	-	-		C	15A	-	-	-	LIGHT - RECEPT	6
7	ENTRANCE FLOODLIGHT OUTSIDE (IN OFF POSITION)	-	-	-	15A	A	15A	-	-	-	RECEPT MAIN RM E.	8
9	A/C UNIT	-	-	-	40A	B	15A	-	-	-	WALL OUTLETS	10
11		-	-	-		C	40A	-	-	-	IN -USE	12
13		-	-	-		A		-	-	-		14
15	HEATER OUTLETS PYTHON	-	-	-	20A	B	15A	-	-	-	EXIT LIGHTS	16
17		-	-	-		C	20A	-	-	-	BRIDGE OUTLETS	18
19	IN -USE	-	-	-	15A	A	20A	-	-	-	BRIDGE OUTLETS	20
21	EXHAUST FAN	-	-	-	15A	B	20A	-	-	-	BRIDGE OUTLETS	22
23	HEATER OUTLET	-	-	-	20A	C	20A	-	-	-	NEW TRACK	24
25		-	-	-		A		-	-	-		26
27	IN -USE	-	-	-	15A	B	15A	-	-	-	CEILING RECEPT, MAIN ROOM	28
29	HOTWIRE	-	-	1200	15A	C	-	-	-	-	SPACE	30
31	BAIL CANADA	-	-	-	15A	A	15A	-	-	-	TRACK LIGHTS	32
33	FLOOR RECEPTACLE AT DESK	-	-	-	15A	B	15A	-	-	-	TRACK LIGHTS	34
35	FLOOR RECEPTACLE AT DESK	-	-	-	15A	C	15A	-	-	-	PROJECTION ROOM	36
37	MICROWAVE + FRIDGE (IN OFF POSITION)	-	-	-	20A	A	15A	-	-	-	WALL OUTLETS	38
39	BASEBOARD HEATER	-	-	-	15A	B	-	-	-	-	SPACE	40
41		-	-	-		C	-	-	-	-	SPACE	42

TOTAL ØA: - VA , TOTAL ØB: - VA , TOTAL ØC: - VA

NOTES:

* - PROVIDE LOCKABLE BREAKER
** - PROVIDE GFI TYPE BREAKER
*** - COORDINATE EXACT BREAKER SIZE WITH EQUIPMENT SHOP DRAWINGS
R - RECEPTACLE
L - LIGHTING

CIRCUIT NUMBERS ARE GIVEN FOR GROUPING ONLY. SITE VERIFY AVAILABLE CIRCUIT BREAKER SPACES IN PANELS DURING TENDER WALKTHROUGH.

ELECTRICAL PANELBOARD SCHEDULE

PANEL ID: PP-RESEARCH (PPR)	VOLTS: 120/208V	LOCATION: RESEARCH BUILDING
MAIN BUS: 225A	PHASE: 3	FED FROM: DP-MA/MB
MAIN BREAKER: 225A	WIRE: 4	FEEDER ENTRY AT: BOTTOM
TYPE:	MOUNTING: SURFACE	FEEDER: 2 PARALLEL RUNS OF (4#2/0 +G) IN 63mmC
INTERRUPTING CAPACITY 14kAIC	ENCLOSURE RATING:	REMARKS:

CIR NO.	DESCRIPTION	PHASE VA ØA	PHASE VA ØB	PHASE VA ØC	BRKR	Ø	BRKR	PHASE VA ØA	PHASE VA ØB	PHASE VA ØC	DESCRIPTION	CIR NO.
1	A/C-1	1300	-	-	20A	A	20A	889	-	-	LIGHTING	2
3		-	1300	-		B	15A	-	0	-	SPARE	4
5	DAMPER (ORANG ROOM)	-	-	200	15A	C	20A	-	-	1500	CFH-1	6
7	OAH-1	1500	-	-	20A	A		1500	-	-		8
9	FFH-1	-	1000	-	15A	B	15A	-	1200	-	HOTWIRE	10
11		-	-	1000		C	15A	-	-	264	EF-1	12
13	PP-HABITAT1	0	-	-	100A	A	100A	0	-	-	PP-DAYROOM	14
15		-	0	-		B		-	0	-		16
17		-	-	0		C		-	-	0		18
19	COMMUNICATIONS RACK	207	-	-	30A	A	15A	1333	-	-	OFFICE RECEPTACLE 3X	20
21		-	207	-		B	15A	-	2	-	IRRIGATION CONTROLLER	22
23		-	-	207		C		-	-	2006	IRRIGATION PUMP	24
25	TV RECEPTACLES	889	-	-	15A	A	40A	2006	-	-		26
27	BOARDWALK RECEPTACLES	-	1200	-	15A	B		-	2006	-		28
29	BOARDWALK RECEPTACLES	-	-	1200	15A	C		-	-	2126		30
31	TREEHOUSE CAMERAS	222	-	-	15A	A	40A	2126	-	-	P-1 GRINDER PUMP	32
33	SPARE	-	0	-	15A	B		-	2126	-		34
35	HEATING PAD 1	-	-	1810	40A	C	15A	-	-	1200	RECEPTACLE (ORANG ROOM)	36
37		1810	-	-		A	15A	1200	-	-	HOTWIRE	38
39	HEATING PAD 2	-	1810	-	40A	B	15A	-	1200	-	HOTWIRE	40
41		-	-	1810		C	15A	-	-	1200	HOTWIRE	42
43	HOTWIRE	1200	-	-	15A	A	15A	1200	-	-	ELECTRIC FENCE	44
45	HOTWIRE	-	1200	-	15A	B	15A	-	1200	-	ELECTRIC FENCE	46
47	HOTWIRE	-	-	1200	15A	C		-	-	0		48
49		0	-	-		A		0	-	-		50
51		-	0	-		B		-	0	-		52
53		-	-	0		C		-	-	0		54
55		0	-	-		A		0	-	-		56
57		-	0	-		B		-	0	-		58
59		-	-	0		C		-	-	0		60

TOTAL ØA: 17,516 VA , TOTAL ØB: 14,718VA , TOTAL ØC: 15,857VA

NOTES:

* - PROVIDE LOCKABLE BREAKER
** - PROVIDE GFI TYPE BREAKER
*** - COORDINATE EXACT BREAKER SIZE WITH EQUIPMENT SHOP DRAWINGS
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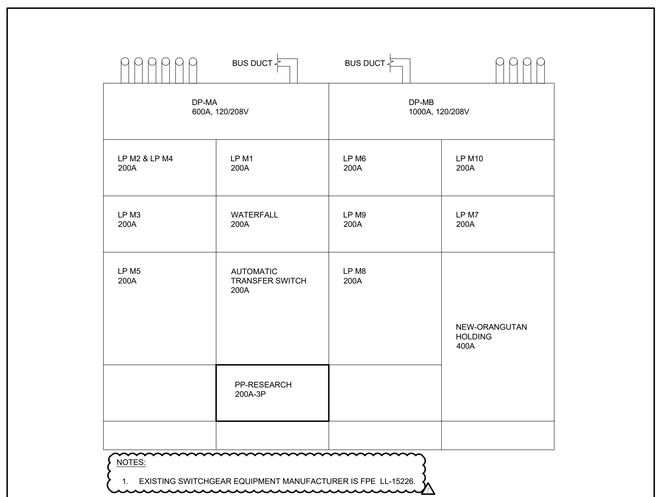

NOTES:

1. EXISTING SWITCHGEAR EQUIPMENT MANUFACTURER IS FPE LL-15226.

1 EXISTING SWITCHBOARD ELEVATION
SCALE: N.T.S.

LIGHTING FIXTURE SCHEDULE

SYMBOL	TYPE	DESCRIPTION	BASIS OF DESIGN MANUFACTURER AND CAT NO. SEE NOTE 1	VOLTAGE/ INPUT WATTS	LUMEN PACKAGE (3500 K CCT UNLESS NOTED OTHERWISE) MINIMUM 80 CRI	MOUNTING	REFERENCE	REMARKS
	LD1	VANDAL-PROOF 1'X4' LED LUMINAIRE. CRS BACKBOX. POLYCARBONATE LENS. TAMPERPROOF.	NEWSTAR S3L14-B-L2-40-1-2-A	120 V 50 WATTS	5750 LUMEN	SURFACE MOUNTED		
	LD2	1'X4' LED TROFFER, 4000K	PEERLESS LACH3-14G-30-40K-12	120V 25 WATTS	3041 LUMEN	T-BAR CEILING		
	LD3	6" ADJUSTABLE LED. 4000K, DAMP RATED	PRESCOLITE LFA6SL-6LFASL-15L-40K-8-WFL45	120V 15.7 WATTS	1214 LUMEN	RECESSED		
	EM1	EMERGENCY LED BATTERY PACK WITH BATTERY UNIT AND REMOTE HEADS	COOPER XR6C-LED	120V	300 LUMEN PER HEAD	WALL MOUNT		
	EM2	EMERGENCY REMOTE HEADS WITH WEATHERPROOF VANDAL RESISTANT POLYCARBONATE COVER	COOPER XR6C-LED COOPER VS2WP VANADL WEATHERPROOF COVER	120V	300 LUMEN PER HEAD	WALL MOUNT		

LIGHTING FIXTURE SCHEDULE NOTES:
1. ACCEPTED ALTERNATE MANUFACTURES AND SUPPLIERS: ACUITY BRANDS (LITHONIA), CREE CANADA, JUNO LIGHTING BY SCHNEIDER ELECTRIC, LSI INDUSTRIES, PHILIPS LIGHTING, VISCOR/VISIONEERING.
2. WHERE AN INCOMPLETE MODEL/CAT NO. IS LISTED, MANUFACTURERS/SUPPLIERS MUST CONFIRM THE PROPOSED FIXTURE WITH THE CONSULTANT A MINIMUM OF ONE WEEK PRIOR TO TENDER CLOSE.
3. SUBMIT SHOP DRAWINGS FOR CONSULTANT'S REVIEW PRIOR TO PLACING ANY ORDER.

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3	0	ISSUED FOR 100% CD	2019-11-11
4	0	ISSUED FOR PERMIT	2019-11-14
5	0	ISSUED FOR TENDER REVIEW	2019-12-06
6	0	ISSUED FOR TENDER	2019-12-11
7	0	ISSUED ELECTRICAL ADDENDUM E01	2020-01-10

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CLIENT: TORONTO ZOO
toronto zoo
361A Old Finch Ave, Toronto ON M1B 5K7 · 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :
ELECTRICAL
SCHEDULE AND DETAILS

PROJECT NO.: CM-18-391
DRAWN BY :
CHECKED BY:

SCALE: N.T.S.
08.2019

DRAWING NUMBER:
EX-101

DRAWING LIST WITH REVISION DESCRIPTION

Toronto Zoo Orangutan Exhibits

JOB # 18-1-086
DATE UPDATED: JANUARY 13, 2020

					PERMIT SCOPE 2019-11-14								ISSUED FOR		
Drawing Series	**Phase 1**	**Phase 2**	**Drawing No.**	**Drawing Title**	1. Research Station	2. Glass Viewing Trellis	3. Treehouse & Boardwalk	4. Outdoor Dayroom	5. Habitat 2 - indoor	6. Habitat 2 - Outdoor	**Revision Description**	**Issued for Constrution Y/**	ISSUED FOR PERMIT 11/14/2019	03 Issued for Tender 12/11/2019	04 Issued for Addendum #002 01/10/2020
CIVIL	**Phase 1**	**Phase 2**													
Habitat 1			CV-001	EROSION AND SEDIMENT CONTROL PLAN									1	1	
Habitat 1			CV-002	SERVICING PLAN							Revised servicing information for DICB3. Revised water feature pump chamber overflow connection. Connection to be made to sanitary system through the research station sanitary drain.		1	1	1
Habitat 2			CV-003	SERVICING AND EROSION AND SEDIMENT CONTROL PLAN							New Drawing: Added civil work for connecting a new 19mm water service from existing watermain, to the pump pit for the pole drinker.				1
Habitat 1			CV-004	GRADING PLAN							Revised DICB3 top of grate and associated slopes. Revised drawing number from CV-003, to CV-004.		1	1	1
			CV-005	DETAIL AND NOTES PLAN							Added area drain specification on notes. Revised drawing number from CV-004, to CV-005.		1	1	1

NO.	REV.	ISSUED FOR	DATE
1.		ISSUED FOR PERMIT	2019.11.14
2.		ISSUED FOR TENDER REVIEW	2019.12.06
3.		ISSUED FOR TENDER	2019.12.11
4.		ISSUED WITH ADDENDUM NO.2	2020.01.13

N

ENGINEER'S STAMP

CONTRACTOR SHALL CHECK ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL AUTHORIZED IN WRITING BY CONSULTANT.

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PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

SERVICING PLAN

Habitat 1

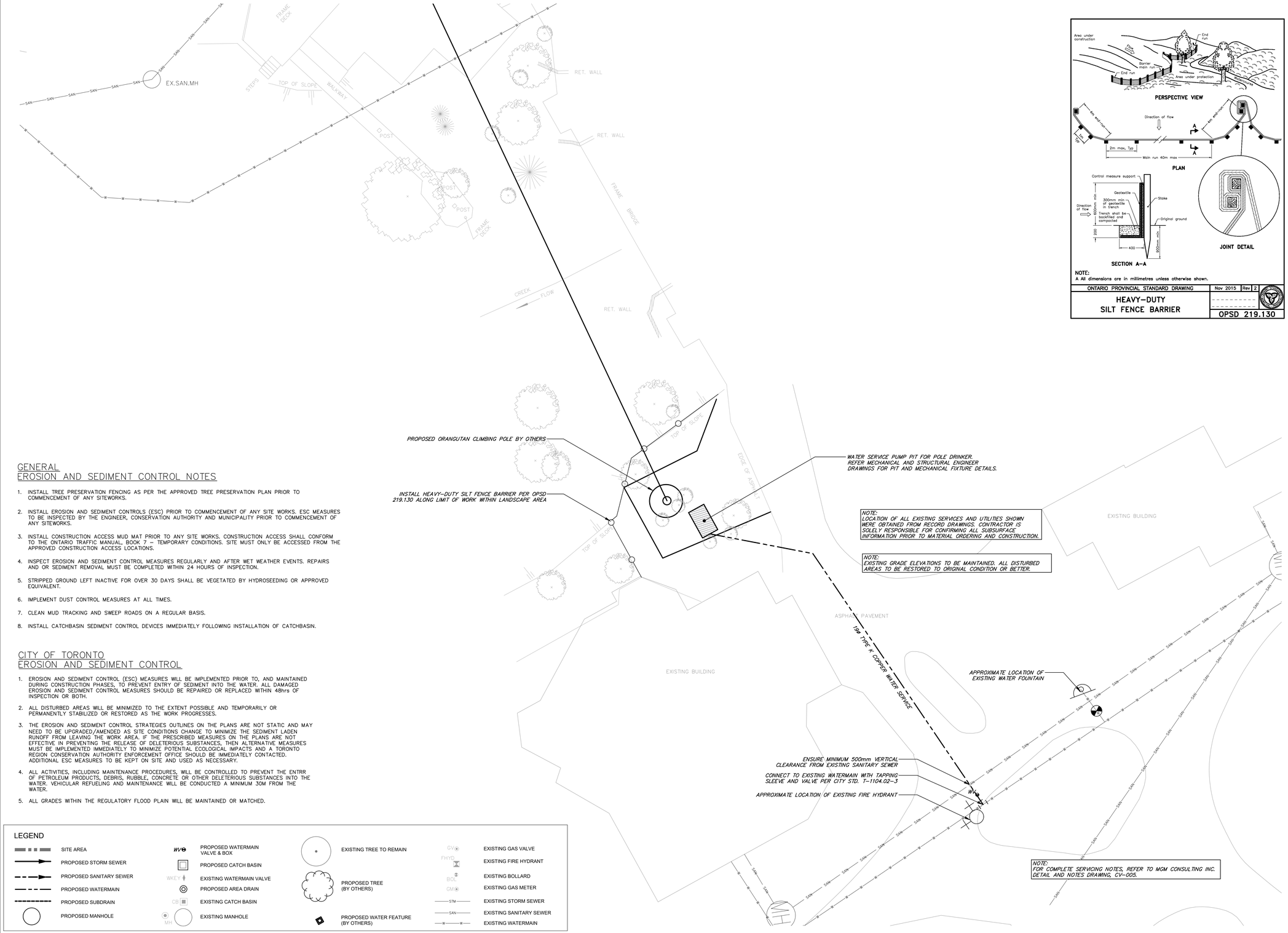
PROJECT NO.:	DRAWN BY :	CHECKED BY:
2019 - 001	AP	MLS

SCALE:
1:150
JAN. 13, 2020

DRAWING NUMBER:
CV-002

LEGEND

- SITE AREA
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- PROPOSED SUBDRAIN
- PROPOSED MANHOLE
- PROPOSED WATERMAIN VALVE & BOX
- PROPOSED CATCH BASIN
- EXISTING WATERMAIN VALVE
- PROPOSED AREA DRAIN
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING TREE TO REMAIN
- PROPOSED TREE (BY OTHERS)
- PROPOSED WATER FEATURE (BY OTHERS)
- EXISTING GAS VALVE
- EXISTING FIRE HYDRANT
- EXISTING BOLLARD
- EXISTING GAS METER
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN



GENERAL
EROSION AND SEDIMENT CONTROL NOTES

1. INSTALL TREE PRESERVATION FENCING AS PER THE APPROVED TREE PRESERVATION PLAN PRIOR TO COMMENCEMENT OF ANY SITEWORKS.
2. INSTALL EROSION AND SEDIMENT CONTROLS (ESC) PRIOR TO COMMENCEMENT OF ANY SITE WORKS. ESC MEASURES TO BE INSPECTED BY THE ENGINEER, CONSERVATION AUTHORITY AND MUNICIPALITY PRIOR TO COMMENCEMENT OF ANY SITEWORKS.
3. INSTALL CONSTRUCTION ACCESS MUD MAT PRIOR TO ANY SITE WORKS. CONSTRUCTION ACCESS SHALL CONFORM TO THE ONTARIO TRAFFIC MANUAL, BOOK 7 – TEMPORARY CONDITIONS. SITE MUST ONLY BE ACCESSED FROM THE APPROVED CONSTRUCTION ACCESS LOCATIONS.
4. INSPECT EROSION AND SEDIMENT CONTROL MEASURES REGULARLY AND AFTER WET WEATHER EVENTS. REPAIRS AND OR SEDIMENT REMOVAL MUST BE COMPLETED WITHIN 24 HOURS OF INSPECTION.
5. STRIPPED GROUND LEFT INACTIVE FOR OVER 30 DAYS SHALL BE VEGETATED BY HYDROSEEDING OR APPROVED EQUIVALENT.
6. IMPLEMENT DUST CONTROL MEASURES AT ALL TIMES.
7. CLEAN MUD TRACKING AND SWEEP ROADS ON A REGULAR BASIS.
8. INSTALL CATCHBASIN SEDIMENT CONTROL DEVICES IMMEDIATELY FOLLOWING INSTALLATION OF CATCHBASIN.

CITY OF TORONTO
EROSION AND SEDIMENT CONTROL

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED OR REPLACED WITHIN 48hrs OF INSPECTION OR BOTH.
2. ALL DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
3. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINES ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE THE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREA. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF DELETERIOUS SUBSTANCES, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS AND A TORONTO REGION CONSERVATION AUTHORITY ENFORCEMENT OFFICE SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.
4. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRR OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE WILL BE CONDUCTED A MINIMUM 30M FROM THE WATER.
5. ALL GRADES WITHIN THE REGULATORY FLOOD PLAIN WILL BE MAINTAINED OR MATCHED.

LEGEND

- SITE AREA
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- PROPOSED SUBDRAIN
- PROPOSED MANHOLE
- PROPOSED WATERMAIN VALVE & BOX
- PROPOSED CATCH BASIN
- EXISTING WATERMAIN VALVE
- PROPOSED AREA DRAIN
- EXISTING CATCH BASIN
- EXISTING MANHOLE
- EXISTING TREE TO REMAIN
- PROPOSED TREE (BY OTHERS)
- PROPOSED WATER FEATURE (BY OTHERS)
- EXISTING GAS VALVE
- EXISTING FIRE HYDRANT
- EXISTING BOLLARD
- EXISTING GAS METER
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING WATERMAIN

NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015 Rev 2
HEAVY–DUTY SILT FENCE BARRIER	OPSD 219.130

NO.	REV.	ISSUED FOR	DATE
1.		ISSUED WITH ADDENDUM NO.2	2020.01.13

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PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

SERVICING AND EROSION AND SEDIMENT CONTROL PLAN

Habitat 2

PROJECT NO.:	DRAWN BY :	CHECKED BY:
2019 - 001	AP	MLS

SCALE:
1:150
JAN. 13, 2020

DRAWING NUMBER:
CV-003

NOTE:
GRADING WITHIN EXHIBIT TO BE PER CONTOUR LINES SHOWN (BY JONES AND JONES) UNLESS NOTED OTHERWISE ON THIS GRADING PLAN. CONTRACTOR TO COORDINATE WITH JONES AND JONES, AND MGM CONSULTING INC. REGARDING GRADING DISCREPANCIES PRIOR TO CONSTRUCTION.

NOTE:
ALL GRADE ELEVATIONS BEYOND THE LIMIT OF WORK TO BE MAINTAINED

MAINTAIN EXISTING GRADE ELEVATIONS ALONG EXISTING ASPHALT SERVICE ROAD

BOARDWALK SHOWN IS LOCATED ABOVE GRADE, REFER TO ARCHITECTURAL DRAWINGS FOR BOARDWALK DETAIL

MAINTAIN GRADE ELEVATIONS AROUND EXISTING TREE THAT ARE TO REMAIN (TYP.)

RESEARCH STATION FFE.140.00

PAD TO BE AT CONSISTENT ELEVATION OF 139.80

AREA DRAIN-1 T/G 138.00

REFER TO ARCHITECTURAL DRAWINGS FOR WALL HEIGHT AND DETAILS (TYP.)

AREA DRAIN-2 T/G 135.85

AREA DRAIN-3 T/G 139.36

4.0m WIDE FLUSH CURB

MAINTAIN TOP OF SLOPE GRADES

MATCH EXISTING GRADE ELEVATIONS ALONG EXISTING ASPHALT SERVICE ROAD

15.2m SWALE @ 2.0%

20.0m SWALE @ 2.5%

DICB3 T/G 139.58

CB4 T/G 139.90

CB5 T/G 139.47

EX.STM.MH

EX.SAN.MH

EX.STM.MH

EX.SAN.MH

EDGE OF ASPHALT

CONCRETE CURB

ASPHALT

BOULDER RET. WALL

CONCRETE BUILDING BUILDING "KNOX-MAYLAN PAVILION"

SITE BENCHMARK DOORSILL=139.53

DOORSILL=139.95

DOORSILL=139.94

DOORSILL=139.55

DOORSILL=139.59

N

LEGEND

- SITE AREA
- 89.20 PROPOSED GRADE ELEVATION
- 2.0% PROPOSED GRADE SLOPE
- EX.139.67 EXISTING GRADE ELEVATION
- PROPOSED EMERGENCY OVERLAND FLOW ROUTE
- EXISTING OVERLAND FLOW ROUTE
- WV PROPOSED WATERMAIN VALVE & BOX
- WKEY EXISTING WATERMAIN VALVE
- PROPOSED AREA DRAIN
- PROPOSED CATCH BASIN
- CB EXISTING CATCH BASIN
- PROPOSED MANHOLE
- MH EXISTING MANHOLE
- PROPOSED WATER FEATURE (BY OTHERS)
- EXISTING TREE TO REMAIN
- PROPOSED TREE (BY OTHERS)
- BOL EXISTING BOLLARD
- GM EXISTING GAS METER
- GV EXISTING GAS VALVE
- FHYD EXISTING FIRE HYDRANT

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CLIENT: **TORONTO ZOO**

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PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

GRADING PLAN

Habitat 1

PROJECT NO.:	DRAWN BY :	CHECKED BY:
2019 - 001	AP	MLS

SCALE:
1:150
JAN. 13, 2020

DRAWING NUMBER:
CV-004

CITY OF TORONTO NOTES:

LEGISLATION, REGULATION AND CODES

1. ALL WORK WITHIN THE CITY RIGHT-OF-WAY SHALL BE CONSTRUCTED ACCORDING TO THE LATEST CITY OF TORONTO STANDARD DRAWINGS AND SPECIFICATION. ONTARIO PROVINCIAL STANDARD DRAWINGS AND SPECIFICATIONS MAY, SUBJECT TO THE APPROVAL OF THE CITY OF TORONTO, BE USED WHERE NO CITY STANDARD OR SPECIFICATION IS AVAILABLE.
2. ALL WORK SHALL BE COMPLETED ACCORDING TO THE CURRENT OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS. THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
3. ALL TEMPORARY TRAFFIC CONTROL AND SIGNAGE DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT ONTARIO TRAFFIC MANUAL BOOK 7: TEMPORARY CONDITIONS FIELD EDITION.

CONSTRUCTION NOTES

1. ALL MATERIAL FOR SEWER, FORCEMAIN, WATERMAIN, HYDRANTS AND APPURTENANCES, SHALL BE ACCORDING TO CITY OF TORONTO MATERIAL/MANUFACTURER SPECIFICATIONS AS REQUIRED BY CHAPTER 6, MATERIAL SPECIFICATIONS FROM DESIGN CRITERIA FOR SEWERS AND WATERMAINS MANUAL.
2. UTILITY SEPARATION SHALL BE ACCORDING TO APPENDIX 'D' OF THE CITY OF TORONTO DESIGN CRITERIA FOR SEWERS AND WATERMAINS MANUAL.
3. ALL AREAS DISTURBED DURING CONSTRUCTION WITHIN SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION AND TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR. GRASS AREAS SHALL BE TREATED WITH 100mm OF TOPSOIL AND SHALL BE SODDED ACCORDING TO TS 5.00 AND TS 5.10, UNLESS OTHERWISE SPECIFIED BY THE LANDSCAPE ARCHITECT.
4. ALL EXISTING UTILITIES SHOWN ON DRAWINGS ARE FOR REFERENCE PURPOSES ONLY. THE CONTRACTOR SHALL SATISFY THEMSELVES AS TO THE ACTUAL LOCATION AND DEPTH OF ANY UTILITY AND SHALL BE LIABLE FOR ALL OR ANY DAMAGE.
5. ANY DISCREPANCIES BETWEEN SITE CONDITIONS AND CONSTRUCTION DRAWINGS MUST BE REPORTED TO MGM CONSULTING INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION AND APPROPRIATE ACTION TAKEN TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
6. ALL SURVEY STAKE LAYOUT POINTS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE LAYOUT SHALL BE IMMEDIATELY REPORTED TO THE CITY.
7. ATTENTION IS DIRECTED TO THE POSSIBILITY OF EXISTING PRIVATE SPRINKLERS AND LIGHTING SYSTEMS WITHIN THE RIGHT-OF-WAY, WHICH ARE NOT SHOWN ON THE PLANS. LOCATING, WORKING AROUND AND PROTECTING THESE SYSTEMS SHALL BE COMPLETED AT NO EXTRA COST TO THE CITY.
8. AT ALL LOCATIONS WHERE THE PROPOSED WATERMAIN CROSSES UNDER OR ABOVE THE EXISTING SEWERS, OR UTILITIES, GRANULAR A BEDDING MATERIAL IS TO THE EXTEND FROM THE LOWER PIPE TO THE TOP OF THE UPPER PIPE. GRANULAR A TO BE COMPACTED TO MINIMUM 98% OF MAXIMUM DRY DENSITY.
9. CONTRACTOR TO PROVIDE ADEQUATE SUPPORT DURING CONSTRUCTION BETWEEN NEW WATERMAIN AND EXISTING GAS MAINS. MAINTAIN 300mm MINIMUM VERTICAL CLEARANCES BETWEEN THE NEW WATERMAIN AND EXISTING GAS MAINS LESS THAN 300mm IN DIAMETER. MAINTAIN 600mm MINIMUM VERTICAL CLEARANCE BETWEEN THE NEW WATERMAIN AND EXISTING GAS MAINS EQUAL TO OR GREATER THAN 300mm IN DIAMETER.
10. ALL EXISTING WATERMAINS AND SEWER PIPES LARGER THAN 300mm DIAMETER SHALL BE SUPPORTED ACCORDING TO DRAWING T-1007.01-4.
11. ALL DIMENSIONS ARE EXPRESSED IN METRES (m) AND PIPE SIZES ARE EXPRESSED IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.

ROAD RECONSTRUCTION

1. LIMITS OF SIDEWALK/CURB RECONSTRUCTION ARE APPROXIMATE, ACTUAL LIMITS ARE TO BE CONFIRMED IN THE FIELD BY THE CONTRACT ADMINISTRATOR.
2. ADJUST ALL STRUCTURES (MAINTENANCE HOLES, CATCH BASINS, ETC.) TO SUIT NEW DESIGN ELEVATIONS INCLUDING BREAKING DOWN AND REMOVAL OF PORTION OF TOP OF STRUCTURES TO ALLOW FOR MINIMUM 150mm ADJUSTMENT UNITS.
3. ALL CURBS SHALL BE CONSTRUCTED WITH A LEDGE AT THE BACK OF THE CURB TO FACILITATE FUTURE SIDEWALK CONSTRUCTION.
4. FULL DEPTH SAW-CUTS ARE REQUIRED AT CONSTRUCTION LIMITS OF EXISTING CURB, SIDEWALK AND PAVEMENT UNLESS OTHERWISE SHOWN.
5. SAW CUT EXISTING PAVEMENT, SIDEWALK, CURB, GUTTER, DRIVEWAYS, WALKWAYS, ETC. AT CONSTRUCTION LIMITS TO PROVIDE A CLEAN JOINT FOR THE PROPOSED WORK.
6. ADJUSTMENT OF APPROACHES, WALKWAYS AND STEPS MAY BE REQUIRED. LIMITS ARE TO BE DETERMINED IN THE FIELD BY THE CONTRACT ADMINISTRATOR.
7. EXISTING ASPHALT THICKNESS MAY VARY, TAPER TO MATCH EXISTING AT CONSTRUCTION LIMITS (MINIMUM 2.0m).
8. FILTER FABRIC TO BE PLACED UNDER GRATES ON ALL CATCH BASINS TO TRAP SEDIMENT. SILT TRAPS ARE TO BE CLEANED REGULARLY AND ARE NOT TO BE REMOVED UNTIL SUCH TIME AS THE CURBS ARE CONSTRUCTED AND THE BOULEVARDS ARE SODDED OR BACKYARDS GRADED AND SODDED. FILTER FABRIC FOR SILT CONTROL TO BE TERRA FIX 270R OR APPROVED EQUIVALENT.

WATERMAINS

1. PVC WATERMAINS SHALL BE MINIMUM DR 18 CLASS 235 (AWWA) C900-07.
2. EMBEDMENT MATERIAL FOR FLEXIBLE PIPE SHALL BE ACCORDING TO OPSD 802.010 AND USING GRANULAR A ACCORDING TO TS 1010 AND COMPACTED TO MINIMUM 98% OF MAXIMUM DRY DENSITY.
3. MINIMUM COVER ON WATERMAINS SHALL BE 1.8m.
4. ALL HYDRANTS SHALL BE CONSTRUCTED ACCORDING TO T-1105.01.
5. HYDRANT LEADS SHALL BE MINIMUM DR 18 CLASS 235 (AWWA) C900-07.
6. ALL SERVICES CONNECTIONS SHALL BE CONSTRUCTED ACCORDING TO T-1104.01, T-1104.02-1, T-1104.02-3, T-1105.02-1 AND T-1105.02-2.
7. SINGLE WATER SERVICE CONNECTIONS SHALL BE MINIMUM OF 19mm DIA. TYPE "K" SOFT COPPER ACCORDING TO T-1104.01. WHEN SERVICE LENGTH EXCEEDS 30m, THE DIAMETER SHALL BE 25mm DIA.
8. ALL CURB AND VALVE BOXES TO BE LOCATED AT STREET LINE.
9. MECHANICAL THRUST RESTRAINTS SHALL BE INSTALLED AT ALL FITTINGS, BENDS, TEES, CROSSES, REDUCERS AND VALVES FOR ALL WATERMAIN SIZES. MECHANICAL RESTRAINTS AT JOINTS SHALL BE INSTALLED AT EVERY PIPE JOINT 6.1m OF EITHER SIDE OF THE VALVE FOR WATERMAINS 100mm DIAMETER OR LARGER.
10. ALL TEES, PLUGS, HORIZONTAL, VERTICAL BENDS, REDUCERS AND HYDRANTS TO HAVE CONCRETE THRUST BLOCKS ACCORDING TO T-1103.01 AND T-1103.02.
11. WATERMAINS MUST FOLLOW THE ONTARIO MINISTRY OF THE ENVIRONMENT PROCEDURE F-6-1 THAT GOVERN THE SEPARATION OF SEWERS AND WATERMAINS. A MINIMUM VERTICAL CLEARANCE OF 0.30m WHEN CROSSING UNDER SEWERS AND ALL OTHER UTILITIES IS REQUIRED. MUST ALSO MAINTAIN 2.5m HORIZONTAL SEPARATION WITH SEWERS.
12. ALL VALVES LESS THAN 400mm WILL BE IN A VALVE AND BOX ACCORDING TO T-1101.02-2. ALL VALVES 400mm AND LARGER SHALL BE IN A CHAMBER.
13. SACRIFICIAL ANODES SHALL BE INSTALLED ON ALL METALLIC PIPES AND APPURTENANCES, WATER SERVICES AND FITTINGS ACCORDING TO T-1106.04, T-1106.05, T-1106.06 AND TS 7.22.
14. TRACER WIRE INSTALLATION SHALL BE ACCORDING TO TS 7.40.
15. HYDROSTATIC PRESSURE TEST AND LEAKAGE TESTING OF THE WATERMAIN SHALL BE ACCORDING TO TS 441.
16. THE NEW WATERMAIN SHALL BE ISOLATED ACCORDING TO T-1104.03-3 OR T-1104.03-4 UNTIL BACTERIOLOGICAL TESTS ARE SATISFACTORILY COMPLETED.
17. PROVISION FOR FLUSHING THE WATERMAIN PRIOR TO TESTING AND SO FORTH MUST BE PROVIDED WITH AT LEAST A 50mm OUTLET ON 100mm AND LARGER LINES ACCORDING TO T-1104.03-1. COPPER WATER SERVICES SHALL HAVE FLUSHING POINTS AT THE END, THE SAME SIZE AS THE LINE. ON FIRE LINES, FLUSHING OUTLET TO BE 50mm DIAMETER MINIMUM OR A HYDRANT.
18. DISINFECTION OF THE WATERMAIN SHALL BE ACCORDING TO TS 7.30 AND SHALL INCLUDE ALL NEW WATER SERVICES 100mm DIA. AND LARGER.
19. TORONTO WATER REQUIRES THAT THE NEW DISTRIBUTION SYSTEM REMAIN ISOLATED UNTIL SATISFACTORY BACTERIOLOGICAL SAMPLE RESULTS ARE RECEIVED. ECS CONTRACT ADMINISTRATOR SHALL NOTIFY TORONTO WATER WHEN SAMPLE RESULTS HAVE PASSED IN ORDER TO PROCEED WITH REMOVAL OF THE BLOW-OFF AND BACK FILLING OF THE ACCESS PIT.
20. AFTER SATISFACTORY DISINFECTION OF THE NEW WATERMAIN IS ACHIEVED, PERMANENT CONNECTIONS TO THE EXISTING WATERMAIN(S) WITH A FILLER PIECE SHALL BE MADE ACCORDING TO TS 7.70.
21. CITY IN-SERVICE WATER VALVES, CURB STOPS, FIRE HYDRANTS CAN ONLY BE OPERATED BY TORONTO WATER STAFF.
22. ALL NEW WATERMAINS SHALL BE INSULATED WHERE THE COVER IS LESS THAN 1.65m ACCORDING TO T-708.01-4.
23. THE CONTRACTOR SHALL CONNECT OR RECONNECT ALL STRAY CURRENT DRAINAGE CABLES CONNECTED TO THE TTC ELECTRIFIED RAIL SYSTEM ENCOUNTERED DURING WATERMAIN CONSTRUCTION.

SANITARY AND STORM SEWERS

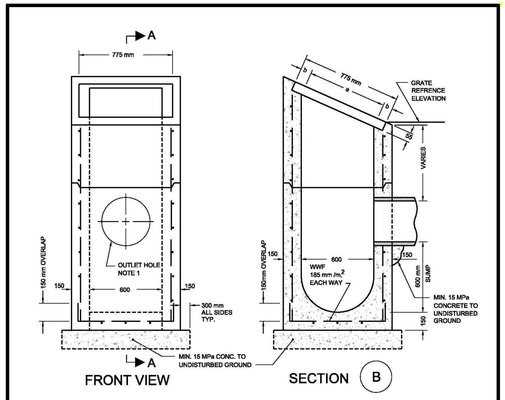
1. MAIN LINE PVC PIPE SHALL BE DR 35.
2. EMBEDMENT MATERIAL FOR FLEXIBLE PIPE SHALL BE ACCORDING TO OPSD 802.010 AND USING GRANULAR A ACCORDING TO TS 1010 AND COMPACTED TO MINIMUM 98% OF MAXIMUM DRY DENSITY.
3. BEDDING FOR RIGID PIPE SHALL BE CLASS B BEDDING MATERIAL ACCORDING TO OPSD 802.031 AND USING GRANULAR A BEDDING MATERIAL ACCORDING TO TS 1010 AND COMPACTED TO MINIMUM 98% OF MAXIMUM DRY DENSITY.
4. ULTRA-RIB PIPE IS NOT PERMITTED WITHIN THE MUNICIPAL RIGHT-OF-WAY.
5. MAINTENANCE HOLES SHALL BE ACCORDING TO T-701.010 (1200mm), T-701.011 (1500mm), T-701.012 (1800mm), OR T-701.013 (2400mm). FRAME AND COVER SHALL BE ACCORDING TO OPSD 401.010 TYPE A CLOSED (SANITARY AND STORM).
6. MAINTENANCE HOLE CHAMBER OPENINGS MUST BE LOCATED ON THE UPSTREAM SIDE OF THE MAINTENANCE HOLE.
7. BENCHING DETAILS SHALL BE ACCORDING TO T-701.021 OR AS SHOWN ON THE DRAWING.
8. DROP STRUCTURE SHALL BE ACCORDING TO T-1003.01 (EXTERNAL) AND T-1003.01-2 (INTERNAL).
9. SANITARY MAINTENANCE HOLES SHALL HAVE WATERTIGHT FRAMES AND COVERS IN PONDING AREAS ACCORDING TO OPSD 401.030.
10. REINFORCED CONCRETE PIPE SHALL BE MINIMUM 65-D. HEIGHT OF FILL TO BE VERIFIED USING OPSD TABLES 807.010 AND 807.030.
11. NON-REINFORCED CONCRETE PIPE 150mm TO 250mm SHALL BE CLASS 3. HEIGHT OF FILL TO BE VERIFIED USING OPSD TABLE 807.040.
12. SINGLE CATCH BASINS SHALL BE ACCORDING TO T-705.010 COMPLETE WITH GOSS TRAP, WHERE SPECIFIED. FRAME AND COVER SHALL BE ACCORDING TO OPSD 400.070.
13. DOUBLE CATCHBASINS SHALL BE ACCORDING TO T-705.020 COMPLETE WITH GOSS TRAP, WHERE SPECIFIED.
14. CATCHBASIN LEADS TO BE 250mm PVC DR 35 FOR SINGLE CATCHBASINS AND 300mm PVC DR35 FOR DOUBLE CATCHBASINS.
15. CONNECTION DETAIL FOR SEWER PIPE AT CATCHBASINS AND MAINTENANCE HOLES SHALL BE ACCORDING TO T-708.020.
16. AREA DRAINS TO BE ZURN DRAIN Z645 12"x12" HEAVY-DUTY DRAIN WITH INTERNAL TRAP, OR APPROVED EQUIVALENT.

GENERAL

1. PRIOR TO STARTING ANY WORKS, THE CONTRACTOR MUST ENSURE THAT ALL NECESSARY APPROVALS ARE IN PLACE FROM THE MUNICIPALITY, REGION, AND OTHER APPROVAL AGENCIES, AS REQUIRED.
2. WORK SHALL BE CARRIED OUT IN COMPLIANCE WITH THE APPLICABLE HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS. THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTORS AS DEFINED IN THE ACT.
3. WORKS AND MATERIALS SHALL CONFORM TO CURRENT MINISTRY OF THE ENVIRONMENT, CONSERVATION & PARKS, MUNICIPAL, REGIONAL AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS. FOR WORK WITHIN PRIVATE PROPERTY, WORKS AND MATERIALS SHALL CONFORM TO THE ONTARIO BUILDING CODE OR THE ABOVE-NOTED STANDARDS, WHICHEVER IS MORE STRINGENT.
4. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ANY EXISTING UTILITIES AND SERVICES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND SERVICES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION AND/OR REPAIR, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION, FOR ANY UTILITIES DISTURBED DURING CONSTRUCTION. DISCREPANCIES BETWEEN THE DRAWINGS AND FIELD CONDITIONS TO BE IMMEDIATELY REPORTED TO THE ENGINEER.
5. ALL TEMPORARY TRAFFIC CONTROL AND SIGNAGE DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT ONTARIO TRAFFIC MANUAL BOOK 7: TEMPORARY CONDITIONS FIELD EDITION.
6. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR, TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF PROJECT ENGINEER, ARCHITECT AND LANDOWNER. GRASSED AREAS SHALL BE RESTORED BY PLACING 150 mm TOPSOIL AND ACTIVELY GROWING NUMBER 1 NURSERY SOD.
7. REFER TO THE ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND LAYOUT INFORMATION.

GRADING

1. PRIOR TO COMMENCEMENT OF EARTHWORKS, SITE ALTERATION PLANS MUST BE APPROVED AND ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND OPERATIONAL. THE CONTRACTOR SHALL MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL CONSTRUCTION IS COMPLETED TO THE SATISFACTION OF THE ENGINEER.
2. ENGINEERED FILL SHALL CONFORM TO THE SPECIFICATIONS PROVIDED IN THE GEOTECHNICAL REPORT, OR LATEST AMENDMENT THEREOF.
3. ENGINEERED FILL SHALL BE INSPECTED AND TESTED BY THE GEOTECHNICAL CONSULTANT. PROOF ROLLING OF SUBGRADE WILL BE REQUIRED PRIOR TO PLACEMENT OF GRANULAR MATERIALS. COORDINATE INSPECTIONS WITH GEOTECHNICAL CONSULTANT.
4. GRANULAR COMPACTION TO BE PER GEOTECHNICAL REPORT.
5. ASPHALT COMPACTION TO BE PER GEOTECHNICAL REPORT.
6. BARRIER CURB WITHIN THE SITE TO BE CONSTRUCTED AS PER OPSD 600.110. MOUNTABLE CURB SHALL BE AS PER OPSD 600.100. SEMI-MOUNTABLE CURB SHALL BE AS PER OPSD 600.090.
7. CONCRETE SIDEWALK: AS PER OPSD 310.020. WHERE SIDEWALK CROSSES RESIDENTIAL DRIVEWAY: 150 mm DEEP, GRANULAR BASE UNDER SIDEWALK TO BE 75 mm GRANULAR 'A' AND SHALL BE INCREASED TO 150 mm UNDER DRIVEWAYS.
8. EXISTING BOUNDARY ELEVATIONS ALONG THE PERIMETER OF THE SITE SHALL REMAIN UNDISTURBED. DRAINAGE RECEIVED FROM ADJACENT PROPERTIES SHALL BE ACCOMMODATED AND DRAINAGE FROM THE SUBJECT LANDS SHALL BE SELF-CONTAINED UNLESS NOTED OTHERWISE.
9. PERFORATED SUB-DRAINS SHALL BE CONNECTED TO ALL CATCHBASINS AS PER DETAIL ON ARCHITECTURAL DRAWINGS.
10. INSTALL SIGNAGE AS PER THE ARCHITECTURAL SITE PLAN.
11. ALL EXCESS EXCAVATED MATERIAL SHALL BE REMOVED OFFSITE TO THE CONTRACTOR'S APPROVED DISPOSAL SITE.
12. EMBANKMENTS SHALL BE SLOPED AT A MAXIMUM OF 3H:1V, UNLESS OTHERWISE SPECIFIED.
13. DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER. THE RELOCATION OR REMOVAL OF TREES AND SHRUBS SHALL BE SUBJECT TO APPROVAL BY THE LANDSCAPE ARCHITECT OR ARBORIST.
14. REFER TO LANDSCAPE DRAWINGS FOR LOCATION AND TYPE OF ALL HARD LANDSCAPE SURFACES, INCLUDING CONCRETE SIDEWALKS, PAVING STONES, COLOURED CONCRETE, ETC.
15. CONTRACTOR TO ENSURE A 150mm ELEVATION DROP FROM FINISHED FLOOR TO PERIMETER GRADES AT BUILDING ENVELOPE. CONTRACTOR TO CONFIRM GRADING REQUIREMENTS AT LEVEL ACCESS LOCATIONS PRIOR TO CONSTRUCTION.



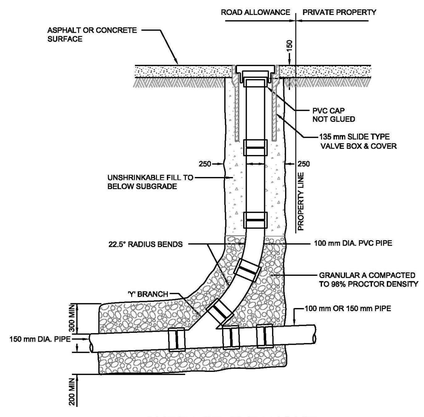
OPENING DIMENSIONS (mm)			
GRATE TYPE	SLOPE	a	b
A	2:1	670	52
	3:1	632	72
	4:1	618	79
	6:1	606	83
	8:1	605	85
	10:1	603	86
	HOR	600	87

NOTES:

1. OUTLET HOLE SIZE 625 mm MAXIMUM DIAMETER, LOCATION AS REQUIRED.
2. WHERE INLET IS PLACED ACROSS DITCH AND IS ACCESSIBLE TO VEHICULAR TRAFFIC, GRATING SLOPE IS TO BE 6:1 OR FLATTER.
3. ALL REINFORCING STEEL SHALL HAVE 25 mm MINIMUM COVER.
4. GRATING ACCORDING TO OPSD-403.010.
5. PIPE SUPPORT ACCORDING TO T-708.020.
6. ALL DIMENSIONS ARE NOMINAL.

All dimensions are in millimetres unless otherwise shown.

TORONTO	ENGINEERING AND CONSTRUCTION SERVICES STANDARD DRAWING	REV 1	APR 2013
	PRECAST CONCRETE CATCHBASIN DITCH INLET 600 mm x 600 mm x DEPTH 4.0 m MAX	T-705.040-1	
		NTS	SHEET 1



SURFACE CLEANOUT

NOTES:

1. INSTALL 135 mm SLIDE TYPE VALVE BOX AND COVER (MARKED SEWER) OVER PVC CAP, NOT GLUED.
2. USE EAST JORDAN IRON WORKS PRODUCT No. 85557126 WITH 06800006 SERIES DROP LID OR APPROVED EQUAL.
3. FOR USE IN PAVED AREAS.
4. THIS CONFIGURATION FOR HOUSE CONNECTIONS ONLY.

All dimensions are in millimetres unless otherwise shown.

TORONTO	ENGINEERING & CONSTRUCTION SERVICES STANDARD DRAWING	REV 1	NOV 2016
	SANITARY SEWER CLEANOUT OPTION "A" 100 mm SURFACE CLEANOUT	T-708.01-5	
		NTS	SHEET 1

NO.	REV.	ISSUED FOR	DATE
1.		ISSUED FOR PERMIT	2019.11.14
2.		ISSUED FOR TENDER REVIEW	2019.12.06
3.		ISSUED FOR TENDER	2019.12.11
4.		ISSUED WITH ADDENDUM NO.2	2020.01.13

N

ENGINEER'S STAMP

CONTRACTOR SHALL CHECK ALL DIMENSIONS ON THE WORK AND REPORT ANY DISCREPANCY TO THE CONSULTANT BEFORE PROCEEDING. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNTIL AUTHORIZED IN WRITING BY CONSULTANT.

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CLIENT: **TORONTO ZOO**

toronto zoo
361A Old Finch Ave, Toronto ON M1B 5K7 - 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

DETAIL AND NOTES PLAN

Habitat 1

PROJECT NO.:	DRAWN BY :	CHECKED BY:
2019 - 001	AP	MLS

SCALE:
AS NOTED
JAN. 13, 2020

DRAWING NUMBER:
CV-005

NAK
design strategies

Toronto Zoo- Orangutan Outdoor Exhibit

January 10, 2020
Job No. 19-017

ADDENDUM NO: L2

1.0 GENERAL

1.1 The following additions, deletions and amendments are hereby made a part of the drawings and specifications.

1.2 This addendum shall be drawn to the attention of all sub-contractors and shall form part of the specifications.

1.3 All costs involved in items listed are hereby amended as follows and included in the tender.

2.0 SPECIFICATIONS or DRAWINGS

2.1 Specification 32 18 16- Rubber Surfacing as been added. Note that woodchips have been substituted with rubber surfacing.

2.2 Drawing LA1- Note legend has been changed to note the location of the “RUBBER SAFETY SURFACE”, plan has been updated to remove the Woodchips, and the Woodchip detail key has been changed to “RUBBER SAFETY SURFACE”.

2.3 Drawing LA1.2- Tree quantity has been updated.

2.4 Drawing LA1.3- Shrub quantity has been updated.

2.5 Drawing LA1.4- quantities have been updated.

2.6 Drawing LA1.6- pump specification has been updated.

2.7 Detail 5/LA3- The detail has been changed to “RUBBER SAFETY SURFACE” in leu of the Woodchips

2.8 Detail 1/LA5- Note has been changed to “RUBBER SAFETY SURFACE”. Minor design changes have been made to the play structure

2.9 Detail 3/LA5- Minor design changes have been made to the natural vertical trees

NOTE: Contractor is responsible for obtaining all safety certifications for the “Rubber Safety Surface”.

END OF ADDENDUM L2

SECTION 321816
RUBBER SURFACING

PART 1 GENERAL

1.1 SUMMARY

A. Work in this section includes furnishing all labour, materials, equipment, and services required to install Rubaroc Safetydeck (a porous, impact attenuating, poured-in-place granular EPDM or SBR rubber surface over concrete, asphalt or compact crushed stone) for residential and commercial playgrounds. It will be completed to architects drawing details and specifications.

1.2 RELATED DOCUMENTS AND REFERENCES

A. 03 10 00 - Concrete Forming and Accessories-Landscape

B. 03 33 01 - Cast-In-Place Concrete-Landscape

C. 32 12 16 - Asphalt Paving-Landscape

1.3 SUBMITTAL

A. Submit full range of Rubaroc Safetydeck sample colours and finishes available, sales literature, playground warranty information, liability insurance certificates, material safety data sheets & previous Rubaroc Safetydeck playground installation fall height compliance tests

1.4 DELIVERY AND STORAGE:

A. Deliver materials in manufacturer's clearly labeled, unopened containers. Store and handle in a manner, which will prevent intrusion of foreign matter and will assure protection from weather. All resins and solvents should be stored at a temperature of not less than 0 degrees C (32 degrees F). Bags of topcoat rubber should be protected from moisture.

1.5 SCHEDULING

A. Co-ordinate the delivery of the materials with the scheduled time of installation to insure minimum storage time at the project site.

1.6 WARRANTY

A. All Rubaroc supplied materials under this section shall be installed by a Rubaroc Dealer authorized by the manufacturer and shall be guaranteed by the manufacturer against defects only as described in the manufacturer's warranty to the authorized Rubaroc Dealer. The labour and installation warranty period for all residential and commercial playgrounds or play areas shall be ONE to FIVE (1 – 5) YEARS as specified and provided by the authorized Rubaroc Dealer.

1.7 CONTRACTOR

A. The authorized Rubaroc Dealer must have installed at least 25 applications of a similar size and have a minimum of 5 years' experience in the poured-in-place rubber safety surfacing industry.

1.8 JOB CONDITIONS

A. The air & ground temperature is recommended to be above 5 degrees Celsius (41 degrees Fahrenheit) day and night. Any temperatures below this may affect the speed and quality of the installation. The relative humidity is recommended to be between 40%-80%. The substrate must be dry for 24 hours before and 24 hours after the installation.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Recycled granular or virgin EPDM or SBR rubber granules and accessory materials such as polyurethane resin binders and solvents shall be produced and/or supplied by Rubaroc International Incorporated.

2.2 MATERIALS

A. Rubber Granules - Pure vulcanized EPDM rubber granules ranging in size from 0.5-1.5mm minimum dimension (Rubaroc Premium) to 1-4mm maximum dimension (Rubaro Classic). EPDM rubber shall be UV stable.

B. Polyurethane Resin Binder- Resin (Chemical Family: Aromatic (Rubaroc Standard Resins) or Aliphatic (Rubaroc UV Resins) Isocyanate as specified by client). Binder shall be 100% polyurethane and contain no TDI. Accelerators may be used with certain aliphatic binders when job site temperature requires it.

(Aliphatic binders should be considered on indoor applications where there is UV exposure or where light coloured rubber granules are used.)

C. Primer – Aromatic or Aliphatic resin as above thinned with solvent.

D. Solvent – Dibasic Ester.

E. Finished Product: - Shall meet or exceed current ASTM F1292 and CAN/CSA Z-614 for GMAX and HIC. Note: A lower number than the standard does not necessarily equate toa superior product.

F. Granular Base: Granular ‘A’

G. Finish Colour: Dark Brown or as selected by consultant from standard colours

2.3 TESTING

A. The system should be tested to the following standard.

1. Hardness: ASTM D-2444 94% recovery
2. Water Absorption: ASTM D-530 +6.5%
3. Ultraviolet Resistance: ASTM D-3137
4. Fungal Resistance: trace to no growth ASTM G-21
5. ASTM-F1292 and CAN/CSA-Z614 (HIC less than 1000, GMAX less than 200)
6. Spread of Flame Resistance: ANSI/UL 790 (ULC-S107) Class A
7. Accelerated: weathering no change after 2000 hours
8. Freeze /Thaw: no change after 30 days at minus 50 in 24-hour period

PART 3 EXECUTION

3.1 PREPARATION: GRANULAR “A” Base

A. When using “A” gravel as a base, it is recommended to be a minimum of 25mm thick to 100mm thick once compact. Depth of granular is dependent on the fall height meeting the CSA certifications.

B. The base shall be compacted to 95% Proctor Density.

3.2 INSTALLATION: RECYCLED SBR RUBBER BASE

A. Base mat thickness will vary depending on the fall height compliance required. The surfacing must meet CSA certification.

B. Certain fall zones may require a loose crumb SBR rubber base in varying thickness depending on the applicable fall height without the use of resin.

C. A crumb rubber and resin base shall be applied, including over any loose crumb rubber layer. The crumb rubber/resin base layer shall be mixed in a mechanical mixer with an aromatic polyurethane resin binder at a ratio of approximately 90/10. Base may range in thickness from 6mm up to 50mm depending on required fall height compliance.

D. Material needs to be mixed for a length of time to allow proper coating of all rubber granules with the Aromatic resin.

E. On installations where there is no retaining border such as concrete curbs or pressure treated timbers, rolled edges or bevels shall be implemented.

F. Let base cure for fully for approximately 24 hours.

3.3 INSTALLATION: EPDM TOP COAT

A. Using a short nap roller, roll onto base coat surface one coat of primer at approximately 40-50 square feet per liter.

B. The selected EPDM coloured granules for topcoat should be coated with resin in a mechanical mixer at a rubber to resin ratio of approximately 80/20. Topcoat should be trowelled out to approximately 6-12mm in thickness. It is recommended that the mixing of the topcoat be carried out with an electric vertical shaft mortar mixer to ensure consistency and assuring complete coverage of each granule.

C. It should be noted that EPDM makes an excellent topcoat as the rubber is coloured throughout the entire granule. It is not a black recycled SBR rubber granule mixed with a coloured urethane coating which will quickly show wear patterns and fading back to its original black colour

D. Black recycled granule with coloured urethane coating topcoat can be provided if requested by client.

3.4 HEALTH & SAFETY

A. When using either polyurethane resin or solvent products, whether during mixing or application, the wearing of personal protective equipment is essential. This will protect contact of the skin directly with the materials. Gloves will be required to be changed regularly throughout the installation and sufficient quantities of same should be allowed for.

B. Should any polyurethane resin or solvent come into contact with the skin, this must be immediately washed off using suitable detergents and water.

C. When troweling the product, it is recommended that rubber kneepads with Velcro straps or knee boards be used.

D. Read all Material Safety Data Sheets (MSDS) prior to installation. All relevant MSDS sheets should be on site during installation.

E. Local laws and regulations in regards to health and safety should be observed at all times.

3.5 SITE PROTECTION

A. Erect barricades or caution tape as required preventing inadvertent pedestrian traffic on the finished floor surface for a period of 24-48 hours

B. On large projects where access to the public is possible, barricades and signs

must be implemented around the working area, again to avoid any inadvertent traffic. This is more relevant on projects taking more than one day to complete.

3.6 CLEAN UP

A. On large projects where access to the public is possible, barricades and signs must be implemented around the working area, again to avoid any inadvertent traffic. This is more relevant on projects taking more than one day to complete.

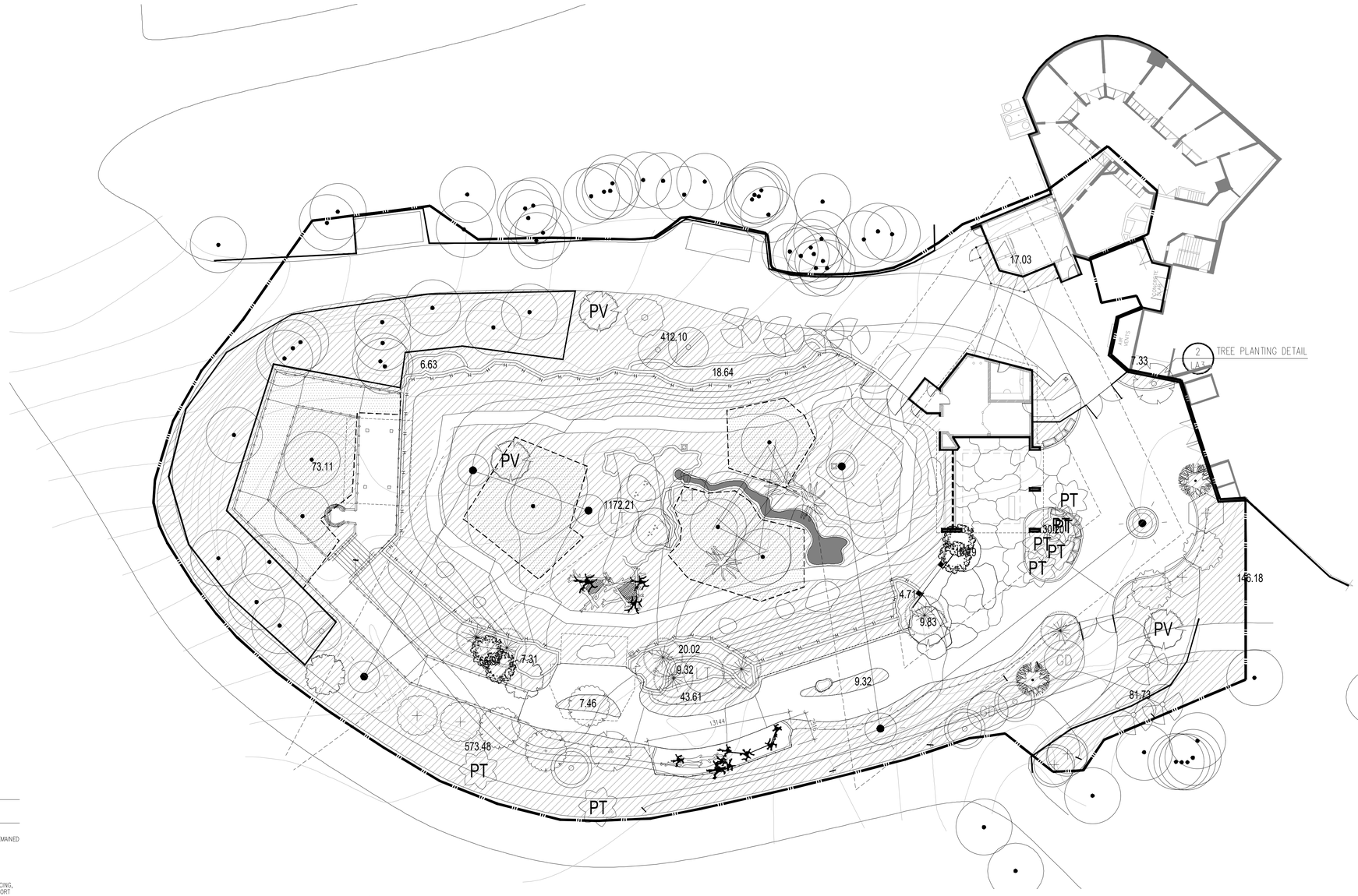
Please Note:
After the completion of the surface, the EPDM granules may appear to take on a yellowish colour which we refer to as “ambering”. This is a result of using an MDI (Aromatic) urethane (if selected by the customer) which gives long-term flexibility to the surface, but also a short-term ambered colour. This will “burn off” with normal activity and sunlight in a short period of time. Rubaroc also offers Aromatic based urethanes that will not show any ambering.

IMPORTANT NOTE:
The “Fall Zone” and “Non – Fall Zone” shown in the contract drawings is not necessarily considered as the same fall-zone and non - fall-zone as specified by EN, CSA, ASTM or other similar written playground standards.

The actual on-site fall-height of the applicable play equipment will factor into deciding what areas of a playground rubber surface should be considered as fall-zone or non – fall-zones as shown in the detail.

An on-site meeting with a playground standards qualified Rubaroc dealer/installer or a third-party representative qualified in applicable playground standards prior to starting any rubber installation is recommended to establish the correct fall-zone and non - fallzone and fall heights and the applicable rubber material thickness that will be required to achieve standards compliance.

END OF SECTION 32 18 16



LEGEND

LIMIT OF WORK

PLANTING

EXISTING TREE TO BE REMAINED

PLANTING AREA

TREE PRESERVATION FENCING, REFER TO ARBORIST REPORT

HORIZONTAL HOARDING, REFER TO ARBORIST REPORT

NOTE:
1. ALL TREE PRESERVATION FENCING LOCATIONS AND REQUIREMENTS REFER TO ARBORIST REPORT AND TREE INVENTORY AND PRESERVATION PLAN BY KUNTZ FORESTRY CONSULTING.
2. ENSURE TREES ARE 1m CLEAR OF EXISTING/PROPOSED UTILITIES;
3. REFER TO SHEET LA1.4 FOR PLANTING LIST.

Perennials, Grasses, Vines, Ferns, Bulbs, and Seeded Area

2747.36 m2

Tree Symbol	Botanic Name	Quantity
	Alnus incana	3
	Carpinus caroliniana	3
	Carya ovata	2
	Catalpa speciosa	7
	Celtis occidentalis	2
	Cercis canadensis	1
	Cornus alternifolia	2
	Fagus grandifolia	2
GD	Gymnocladus dioicus	2

Tree Symbol	Botanic Name	Quantity
	Juniperus virginiana	1
LT	Liriodendron tulipfera	3
	Ostrya virginiana	1
	Populus balsamifera	2
	Populus tremuloides	4
PV	Prunus virginiana	3
PT	Ptelea trifoliata	8
	Quercus alba	3
	Quercus rubra	2

Tree Symbol	Botanic Name	Quantity
	Sassafras albidum	4
	Thuja occidentalis	7
	Zanthoxylum americanum	2

NOTE: EACH SYMBOL REPRESENTS 1 TREE
NUMBERS SHOWN REFLECT THE HATCHED AREAS

NO.	REV.	ISSUED FOR	DATE
1		ISSUED FOR TENDER	Dec. 11/19
2		ISSUED FOR ADDENDUM 2	Jan. 10/20

N

ARCHITECT'S STAMP

ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO
ROBERT NG
OALA
MEMBER

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NAK design strategies

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CLIENT: **TORONTO ZOO**

toronto zoo

361A Old Finch Ave, Toronto ON M1B 5K7. 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

PLANTING PLAN
Habitat 1–Trees&Groundcovers

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	RH	LC

SCALE:
1:200
AUGUST 13, 2019

DRAWING NUMBER:
LA1.2

LEGEND

LIMIT OF WORK

PLANTING

EXISTING TREE TO BE REMAINED

PLANTING AREA

TREE PRESERVATION FENCING, REFER TO ARBORIST REPORT

HORIZONTAL HOARDING, REFER TO ARBORIST REPORT

NOTE:
1. ALL TREE PRESERVATION FENCING LOCATIONS AND REQUIREMENTS REFER TO ARBORIST REPORT AND TREE INVENTORY AND PRESERVATION PLAN BY KUNTZ FORESTRY CONSULTING.
2. REFER TO SHEET LA1.4 FOR PLANTING LIST.

Perennials, Grasses, Vines, Ferns, Bulbs, and Seeded Area

2747.36 m2

NOTE: EACH SYMBOL REPRESENTS 1 SHRUBS NUMBERS SHOWN REFLECT THE HATCHED AREAS

Shrub Symbol	Botanic Name	Quantity
Ac	Amelanchier canadensis	10
At	Asimina triloba	13
Bc	Berberis canadensis	25
Ca	Ceanothus americana	12
Ch	Ceanothus herbacea	4
Cr	Cornus racemosa	26
Cs	Cornus sericea	39
Co	Corylus americana	61
Cp	Crataegus spp.	12
Gp	Gaultheria procumbens	25
Hv	Hamamelis virginiana	14
Hk	Hypericum kalmianum	13
Pm	Paxistima canbyi	27
Po	Physocarpus opuifolius	6
Ra	Rhus aromatica	60
Rr	Rosa rugosa	26
Ro	Rubus ordoratus	19
Sx	Salix lucida	45
Ss	Sobaria sorbifolia	9
Sf	Staphylea trifolia	7
St	Stepanandra incisa 'Crispa'	17
Vn	Viburnum acerifolium	9

NO.	REV.	ISSUED FOR	DATE
1		ISSUED FOR TENDER	Dec. 11/19
2		ISSUED FOR ADDENDUM 2	Jan. 10/20

N

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ROBERT NG
MEMBER

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CLIENT: **TORONTO ZOO**

toronto zoo

361A Old Finch Ave, Toronto ON M1B 5K7. 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

PLANTING PLAN
Habitat 1–Shrubs

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	RH	LC

DRAWING NUMBER:

SCALE:
1:200
AUGUST 13, 2019

LA1.3

Plant Schedule

Trees

Symbol	Botanic name	Common Name	Toronto Native	Source	Size	Quantity	Notes	max height
	Alnus incana ssp. rugosa	Speckled Alder	Y	DM	70mm	3		6m
	Carpinus caroliniana	American Hornbeam	Y	DM	60mm	3	to be coppiced	7m
	Carya ovata	Shagbark Hickory	Y	GW		2	to be coppiced	15m
	Catalpa speciosa	Northern Catalpa		DM	100mm	7	listed as Zone 5A per NRC	15m
	Celtis occidentalis	Northern Hackberry	Y	DM	80mm	2	zones 2-7	15m
	Cercis canadensis	Redbud	Y	DM	70mm	1		8m
	Cornus alternifolia	Pagoda Dogwood	Y	DM	60mm	2	coppice	10m
	Fagus grandifolia	American Beech	Y	DM	50mm	2		18m
GD	Gymnocladus dioicus	Kentucky Coffee Tree	Y	DM	60mm	2		8m
	Juniperus virginiana	Eastern Red Cedar	Y	DM	300cm	1		10m
LT	Liriodendron tulipifera	Tulip Tree	Y	DM	70mm	3		8m
	Ostrya virginiana	Ironwood	Y	DM	70mm	1		10m
	Populus balsamifera	Balsam Poplar	Y	DM	70mm	2		30m
	Populus tremuloides	Quaking Aspen	Y	DM	50mm	4		30m
PV	Prunus virginiana 'Schubert'	Choke Cherry	Y	DM	80mm	3		8m
PT	Ptelea trifoliata	Hop Tree	Y	GW		8	verify with veterinarian	6m
	Quercus alba	White Oak	Y	DM	100mm	3	tannic acids in new buds causes diarrhea in giraffes	35m
	Quercus rubra	Red Oak	Y	DM	80mm	2		25m
	Sassafras albidum	Sassafras	Y			4	verify with veterinarian, used in public areas	20m
	Thuja occidentalis	Eastern White Cedar	Y	DM	245cm	7	field grown	15m
	Zanthoxylum americanum	Prickly Ash	Y	PN		2	verify with veterinarian	5m
						64	**TOTAL**	

Shrubs

Symbol	Botanic name	Common Name	Toronto Native	Source	Size	Quantity	Notes
Ac	Amelanchier canadensis	Serviceberry	Y	DM	200cm WB	10	
Al	Asimina triloba	Paw Paw				13	smallish tree
Bc	Berberis canadensis	American barberry				25	
Ca	Ceanothus americanus	New Jersey Tea	Y	DM - GW	60cm	33	
Ch	Ceanothus herbacea	Prairie Redroot	Y	GW	1 gal	12	
Cs	Cornus racemosa	Gray Dogwood	Y	DM	80cm	26	
Co	Cornus sericea	Red-osier Dogwood	Y	DM	100cm	39	
Cr	Corylus americana	American Hazel	Y	DM	80cm	61	
Cp	Crataegus x mordenensis 'Snowbird'	Snowbird Hawthorn		DM	30cm	12	
Gp	Gaultheria procumbens	Wintergreen	Y	PARA	1 gal	25	
Hv	Hamamelis virginiana	Witchhazel	Y	DM	125cm WB	14	
Hk	Hypericum kalmianum	Kalm's t. John's Wort	Y	DM	30cm	13	
Pm	Paxistima canbyi	Canby Paxistima		DM	1 gal	27	
Po	Physocarpus opuifolius 'Golden'	Golden Ninebark	Y	DM	100cm	6	
Ra	Rhus aromatica	Fragrant Sumac	Y	NSH	1 gal	60	
Rr	Rosa rugosa	Rugosa Rose	Y	DM	80cm	26	
Ro	Rubus ordoratus	Flowering Raspberry	Y	DM	60cm	19	
	Salix lucida	Shining Willow	Y	DM	60cm	45	
Ss	Sobaria sorbifolia 'Sem'	Sem False Spirea		PARA	80cm	9	
St	Staphylea trifolia	Bladdernut	Y	NSH	1 gal	7	
St	Stephanandra incisa 'Crispa'	Cutleaf Stephanandra		DM	50cm	17	
Vn	Viburnum acerifolium	Mapleleaf Viburnum	Y			9	
						508	**TOTAL**

Perennials, Grasses, Vines, Ferns, Bulbs, Seed

Symbol	Botanic name	Common Name		Toronto Native		size	quantity	notes
	Acanthus hungaricus	Bear's Breeches	perennial	No	LH	1 gal	100	
	Acanthus spinosus	Bear's Breeches	perennial	No	LH	1 gal	100	zone 5
	Achillea millefolia	Yarrow	perennial	Y	DM	1 gal	100	
	Allium canadense	Wild Garlic	bulb	Y	GW	bulb	100	
	Allium schoenoprasum v. sibiricum	Wild Chives	bulb	Y	GW	bulb	100	
	Anaphalis margaritacea	Pearly Everlasting	perennial	Y	GW	1 gal	100	
	Andropogon gerardii	Big Bluestem	grass	Y	DM	2 gal	500	
	Anemone canadensis	Canada Anemone	perennial	Y	DM	1 gal	100	
	Antennaria plataginfolia	Plaintain-leaved Pussytoes	perennial	Y	GW	1 gal	100	
	Aquilegia canadensis	Wild Columbine	perennial	Y	DM	1 gal	100	
	Aralia continentalis	Manchurian Spikenard	perennial	No	LH	1 gal	100	
	Aralia recemosa		perennial	No	LH	1 gal	100	
	Arisaema triphyllum	Jack-in-the-Pulpit	perennial	Y	GW	1 gal	100	verify with veterinarian
	Aruncus diocus	Giant Goat's Beard	perennial	No	DM	1 gal	100	
	Asarum canadense	Wild Ginger	perennial	Y	DM	1 gal	100	
	Aster cordifolius	Heart-leaved Aster	perennial	Y	GW	1 gal	100	
	Astilboides tabularis	Shieldleaf Rodgersia	perennial	No	PARA	1 gal	100	prefers moist soils
	Boehmeria platanifolia	Sycamore-leaf False Nettle	perennial	No			100	
	Brunnera macrophylla 'Jack Frost'	Brunnera	perennial	No	DM	1 gal	100	
	Carex muskingumensis	Palm Sedge	grass	Y	DM	1gal	500	
	Carex pennsylvanica	Oak Sedge	grass	Y	DM	1gal	500	
	Carex plantaginea	Plantain-leaved Sedge	grass	Y	GW	1 gal	500	
	Carex platyphylla	Broad-leaved Sedge	grass	Y	GW	1 gal	500	
	Carex tenera	Quill Sedge	grass	Y	GW	1 gal	500	
	Chamerion angustifolium	Fireweed	seed	Y	GW	seed	100	broadcast seed, treat an an annual
	Chasmanthium latifolium	Spangle Grass	grass	Y	DM	2 gal	500	
	Cimicifuga racemosa	Black Snakeroot	perennial	No	DM	1 gal	100	verify with veterinarian
	Clematis virginiana	Virgin's Bower	vine	Y	PARA	1 gal	100	
	Darmera peltata	Umbrella Plant / Indian Rhubarb	perennial	No	PARA	1 gal	100	verify with veterinarian, mulch for winter protection, needs boggy conditions
	Desmodium canadense	Showy Tick-trefoil	perennial	Y	DM	1 gal	100	
	Elymus canadensis	Canada Wild Rye	seed	Y	DM	1 gal	seed	
	Elymus riparius	Riverbank Wild Ryegrass	grass	Y	GW	1 gal	500	
	Geranium maculatum	Wild Geranium	perennial	Y	DM	1 gal	100	
	Heliopsis helianthoides	Sweet Ox-eye	perennial	Y	DM	1 gal	100	
	Hosta 'Empress Wu'	Empress Wu Hosta	perennial	No	DM	1 gal	100	
	Kirengeshoma palmata 'Margarita'	Yellow Wax Bells	perennial	No	PARA	1 gal	100	mulch for winter protection
	Ligularia 'Little Rocket''	Little Rocket Ligularia	perennial	No	DM	1 gal	100	verify with veterinarian
	Matteuccia struthiopteris	Ostrich Fern	fern	Y	DM	1 gal	100	
	Monarda fistula	Wild Bee Balm	perennial	Y	DM	1 gal	100	
	Mukdenia rossii 'Karasuba'	Karasuba Mukdenia	perennial	No	LH	1 gal	100	
	Osmunda cinnamonea	Cinnamon Fern	fern	Y	DM	1 gal	100	
	Panicum virgatum	Switchgrass	grass	Y	DM	2 gal	500	
	Panicum virgatum 'Cloud Nine'	Cloud Nine Switchgrass	grass	No	DM	2 gal	500	
	Penstemon hirsutus	Hairy Beardtongue	perennial	Y	GW	1 gal	100	
	Petasites japonicus	Giant Butterbur	perennial	No	FN	1 gal	100	use on visitor side only
	Rheum palmatum	Chinese Rhubarb	perennial	No	PARA	1 gal	100	use on visitor side only
	Rodgersia aesculifolia	Fingerleaf Rodgersia	perennial	No	PARA	1 gal	100	mulch for winter protection
	Rodgersia pinnata	Rodgersia	perennial	No	DM	1 gal	100	mulch for winter protection
	Schizachyrium scoparium	Little Bluestem	grass	Y	DM	1 gal	500	
	Smilax hispida	Bristly Greenbriar	vine	Y	GW	1 gal	100	
	Solidago flexicaulis	Zig-zag Goldenrod	perennial	Y	GW	1 gal	100	limited to roots, verify with veterinarian
	Sorghastrum nutans 'Sioux Blue'	Indian Grass 'Sioux Blue'	grass	No	DM	1gal	500	
	Thalictrum pubescens	Tall Meadow Rue	perennial	Y	GW	1 gal	100	
	Verbena bonariensis	Tall Verbena	annual	No		seed	seed	broadcast seed, treat an an annual
	Verbena hastata	Blue Vervain	perennial	Y	GW	1 gal	100	
	Verbena strictus	Hoary Vervain	perennial	Y	GW	1 gal	100	
							10200	**TOTAL**

DM	Dutchmaster Nurseries, Brougham, Ontario
GW	Grow Wild Native Plant Nursery, Omemee, Ontario
PN	Puslinch Naturally Native Trees, Puslinch, Ontario
NSH	Not So Hollow Farm, Mulmur, Ontario
FN	Fiddlehead Nursery, Kimberley, Ontario
LH	Lost Horizons Nursery, Acton, Ontario
PARA	Paramount Nursery, Ottawa, Ontario

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ARCHITECT'S STAMP

ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO ROBERT NG MEMBER OALA

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CLIENT: **TORONTO ZOO**

toronto zoo

361A Old Finch Ave, Toronto ON M1B 5K7. 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

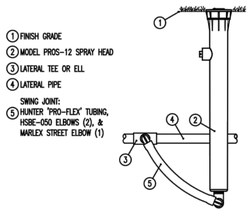
PLANTING LIST
Habitat 1

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	RH	LC

DRAWING NUMBER:

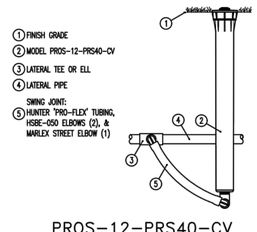
SCALE:
1:200
AUGUST 13, 2019

LA1.4



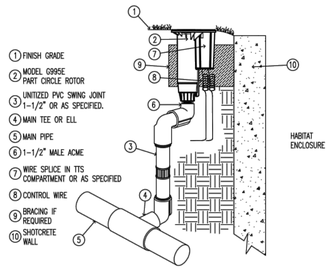
01 PROS-12 SPRAY HEAD

Hunter IRRIGATION DETAIL



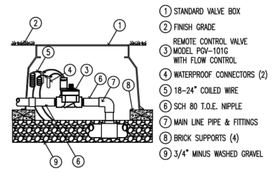
02 PROS-12-PRS40-CV MP ROTATOR SPRINKLER

Hunter IRRIGATION DETAIL



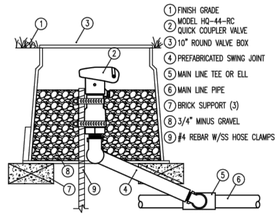
03 G995E GEARED ROTOR

IRRIGATION DETAIL



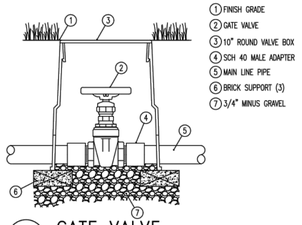
04 PGV GLOBE VALVE

Hunter IRRIGATION DETAIL



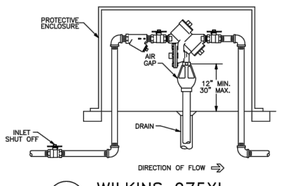
05 QUICK COUPLER VALVE

Hunter IRRIGATION DETAIL



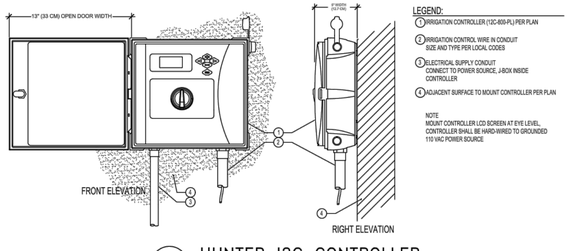
06 GATE VALVE

IRRIGATION DETAIL



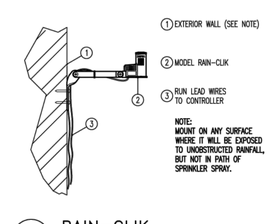
07 WILKINS 975XL

IRRIGATION DETAIL



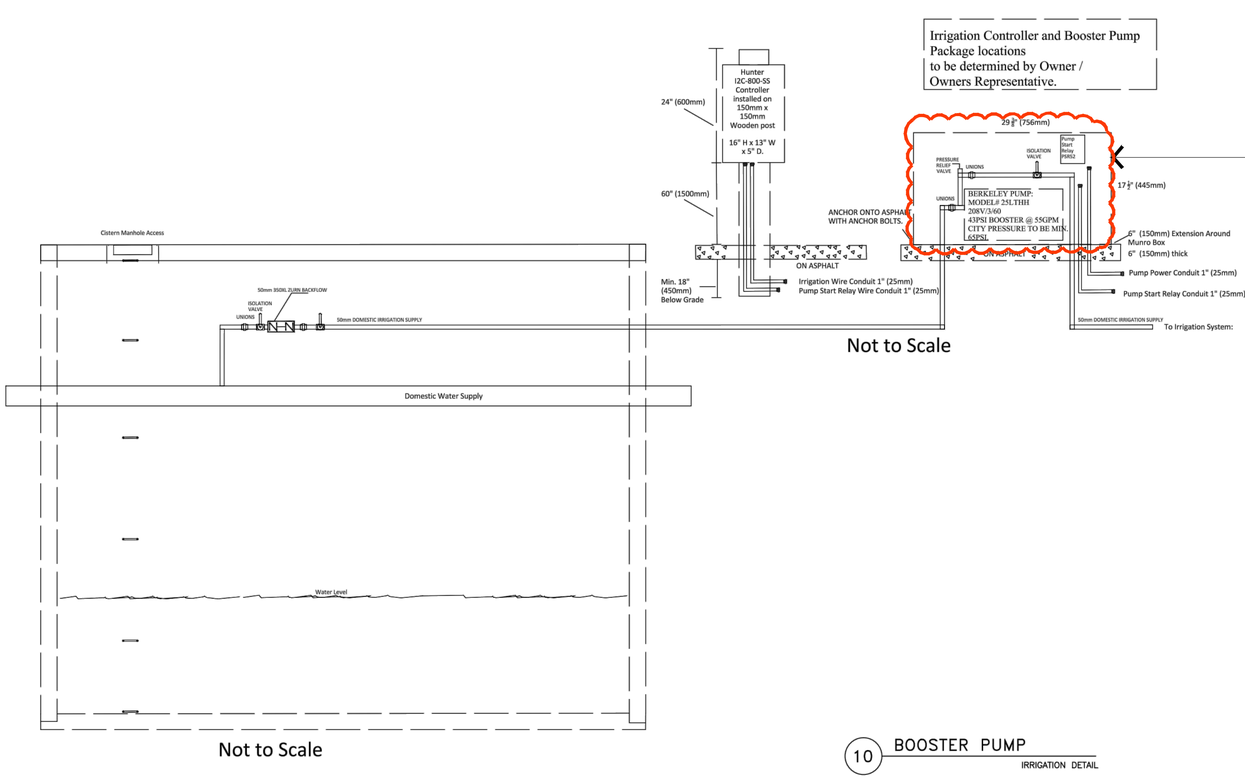
08 HUNTER I2C CONTROLLER

Hunter IRRIGATION DETAIL



09 RAIN-CLIK

Hunter IRRIGATION DETAIL



10 BOOSTER PUMP

IRRIGATION DETAIL

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1		ISSUED FOR TENDER	Dec. 11/19
2		ISSUED FOR ADDENDUM 2	Jan. 10/20

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ARCHITECT'S STAMP

ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO ROBERT NG MEMBER OALA

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CLIENT: TORONTO ZOO
toronto zoo
361A Old Finch Ave, Toronto ON M1B 5K7. 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

IRRIGATION DETAILS
Habitat 1

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	RH	LC

DRAWING NUMBER:

SCALE:
1:200
AUGUST 13. 2019

LA1.6

LEGEND

- LIMIT OF WORK
- KICK RAIL BY OTHERS
- VIEWING GUARDRAIL BY OTHERS
- BARRIER FENCE BY OTHERS
- HOT WIRE
- 3m TALL TREE SETBACK LINE

PLANTING

- EXISTING TREE TO BE REMAINED
- PLANTING AREA
- TREE PRESERVATION FENCING, REFER TO ARBORIST REPORT
- HORIZONTAL HOARDING, REFER TO ARBORIST REPORT

HARDSCAPE

- PERMEABLE UNIT PAVER THORNBURY PAVER BY UNILOCK PATTERN A
- STAMPED INTEGRAL CONCRETE BY INTERSTAR COLOUR: CHAPS (8N2520R)
- INTEGRAL CONCRETE BY INTERSTAR W/ WOOD PANEL TEXTURE COLOUR: PLUM (8N1616R) COLOUR: DESERT (JO7961R)
- ASPHALT
- GRANULAR
- RUBBER SAFETY SURFACE

furnishing

- ARMOUR STONE SEATING
- POLE, BY OTHERS

NOTE:
1. ALL TREE PRESERVATION FENCING LOCATIONS AND REQUIREMENTS REFER TO ARBORIST REPORT AND TREE INVENTORY AND PRESERVATION PLAN BY KUNTZ FORESTRY CONSULTING;
2. EXISTING PAVEMENT THAT IS IMPACTED AND DAMAGED DUE TO CONSTRUCTION, NEEDS TO BE REPAIRED AS PER EXISTING CONDITION.

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ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO
ROBERT NG
MEMBER

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CLIENT: **TORONTO ZOO**

toronto zoo
361A Old Finch Ave, Toronto ON M1B 5K7. 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

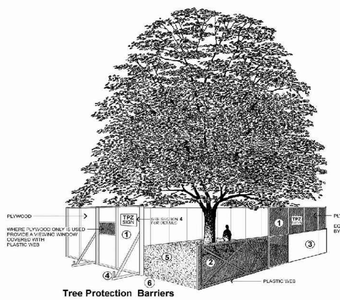
DRAWING NAME :

LAYOUTS & MATERIALS PLAN
Habitat 1

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	RH	LC

SCALE:
1:200
AUGUST 13. 2019

DRAWING NUMBER:
LA1

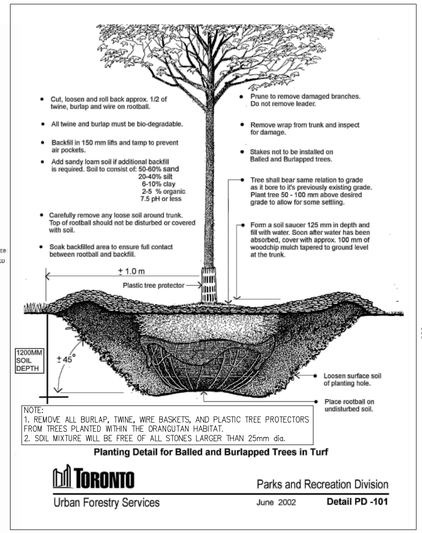


Tree Protection Barriers

1. Tree protection barriers must be a plywood or plastic web hoarding or equivalent as approved by Urban Forestry.
2. Tree protection barriers for trees situated on the City road allowance where visibility must be maintained can be 1.2m (4ft.) high and consist of orange plastic web snow fencing on a wood frame made of 2"x 4"s .
3. Where some excavate or fill has to be temporarily located near a tree protection barrier, plywood must be used to ensure no material enters the Tree Protection Zone.
4. All supports and bracing should be outside the Tree Protection Zone. All such supports should misimize damaging roots outside the Tree Protection Barrier.
5. No construction activity, grade changes, surface treatment or excavations of any kind is permitted within the Tree Protection Zone.
6. Sediment control fencing shall be installed in locations indicated in as Urban Forestry approved Tree Protection Plan. The sediment control fencing must be installed to Ontario Provicial Standards (OPSD-219.110) and to the satisfaction of Urban Forestry.

TORONTO — Parks, Forestry and Recreation
Urban Forestry — Sept 2008 — **Detail TP-1**

1 TREE PROTECTION BARRIERS
DETAIL TP-1

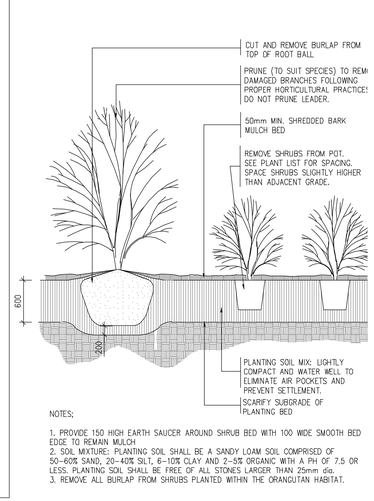


NOTE:
1. REMOVE ALL BURLAP, TWINE, WIRE BASKETS, AND PLASTIC TREE PROTECTORS FROM TREES PLANTED WITHIN THE ORANGUTAN HABITAT.
2. SOIL MIXTURE WILL BE FREE OF ALL STONES LARGER THAN 25mm dia.

Planting Detail for Balled and Burlapped Trees in Turf

TORONTO — Parks and Recreation Division
Urban Forestry Services — June 2002 — **Detail PD -101**

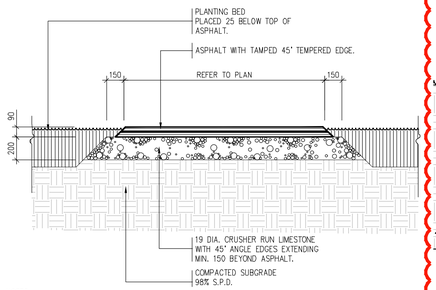
2 PLANTING DETAIL FOR BALLED AND BURLAPPED TREES IN TURF
DETAIL PD-101



NOTES;

1. PROVIDE 150 HIGH EARTH SAUCER AROUND SHRUB BED WITH 100 WIDE SMOOTH BED EDGE TO REMAIN MULCH
2. SOIL MIXTURE: PLANTING SOIL SHALL BE A SANDY LOAM SOIL COMPRISED OF 50-60% SAND, 20-40% SILT, 6-10% CLAY AND 2-5% ORGANIC WITH A PH OF 7.5 OR LESS. PLANTING SOIL SHALL BE FREE OF ALL STONES LARGER THAN 25mm dia.
3. REMOVE ALL BURLAP FROM SHRUBS PLANTED WITHIN THE ORANGUTAN HABITAT.

3 SHRUB PLANTING AT GRADE
1:30



NOTES:

EXCAVATION: EXCAVATE TO 275mm MINIMUM DEPTH OR DEEPER AS REQUIRED. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF ANY UNSUITABLE SUBGRADE MATERIAL SUCH AS TOPSOIL, ALL SOFT SPOTS AND/OR ORGANIC MATTER AND REPLACEMENT WITH CLEAN SUBSOIL FILL. SUBGRADE SHALL BE CONSOLIDATED TO A 98% S.P.D. REMOVE EXCAVATED MATERIAL OFF SITE UNLESS OTHERWISE DIRECTED.

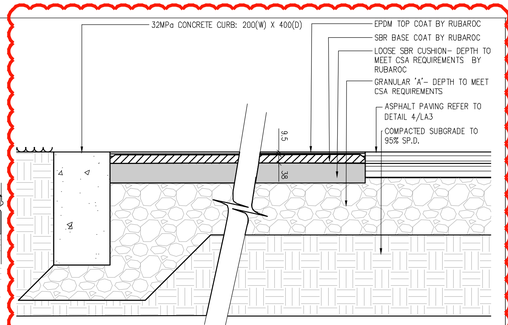
GRANULAR BASE: 200mm LAYER OF 19ø CRUSHER RUN COMPACTED TO 98% STANDARD PROCTOR DENSITY MIN.

ASPHALT: 40mm TOP LAYER (AFTER COMPACTION) OF HOT MIX HL3A, AND 50mm BOTTOM LAYER (AFTER COMPACTION) OF HOT MIX HL8 IN ACCORDANCE WITH O.P.S.S. STANDARDS.

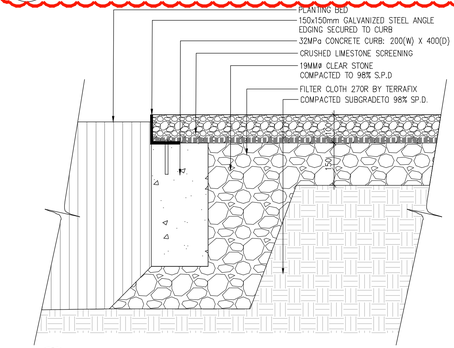
EDGE TREATMENT: ASPHALT EDGE TO BE 45° WELL TAMPED TO FORM UNIFORMLY, SMOOTH, CLEAN EDGES WITHOUT LATERAL DEMATIONS. SOD TO FEATHER IN WITH EXISTING SOD AND GRADES AT A MAXIMUM SLOPE OF 4:1 ALL SEEDED OR SODDED AREAS SHALL BE 25 BELOW THE ASPHALT SURFACE. REPLACE ALL TOPSOIL AND SOD AS DIRECTED IN CUT AND FILL SITUATIONS.

DRAINAGE: SLOPE TO BE A MINIMUM OF 2% ON CROWNED OR CROSS SLOPED PATHS AS DIRECTED ON SITE OR AS SHOWN IN DRAWINGS.

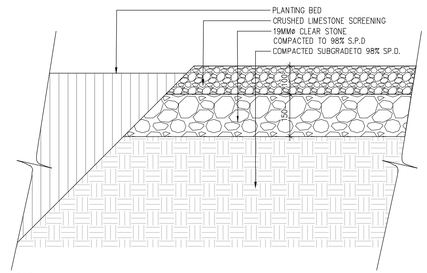
4 ASPHALT DETAIL
1:25



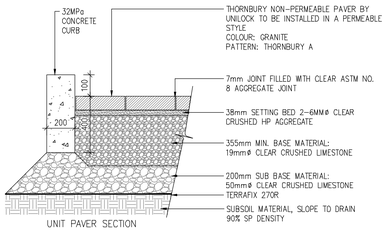
5 RUBBER SAFETY SURFACE
1:10



6 LIMESTONE SCREENING SURFACE
1:10



9 LIMESTONE SCREENING SURFACE @ MOW PATH
1:10



UNIT PAVER SECTION

7 PERMEABLE PRECAST PAVER DETAIL
1:20

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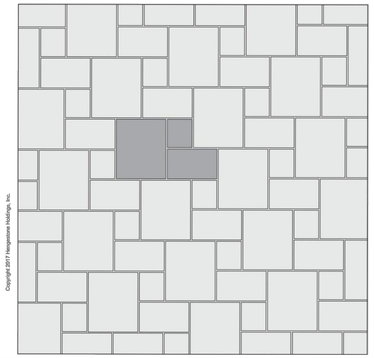
Notes:
AutoCAD® hatch pattern files can be downloaded from www.unilock.com for use in architectural drawings.

Some patterns may not necessarily reflect the percentages of stone sizes within a particular bundle configuration. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

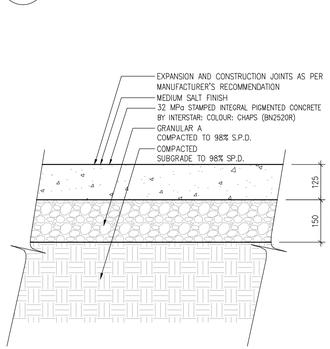
Thornbury™ — Pattern A

- 14% 6"/8" x 8"/4"
- 29% 13"/4" x 8"/4"
- 57% 13"/4" x 16"/2"



8 INTEGRAL PIGMENTED CONCRETE @ BOARDWALK
1:15

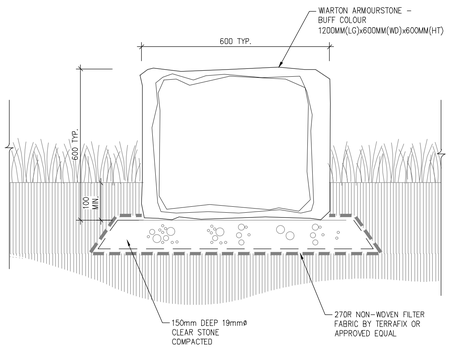
NOTE: REFER TO STRUCTURAL/ARCHITECTS FOR BOARDWALK DETAILING. LANDSCAPE DETAIL SHOWS JUST PAVING FINISH. REFER TO PLAN FOR COLOUR/LOCATION.



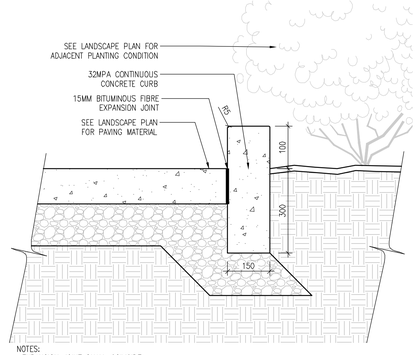
SECTION 1:10

DECORATIVE PATTERN

10 INTEGRAL PIGMENTED STAMPED CONCRETE
AS SHOWN

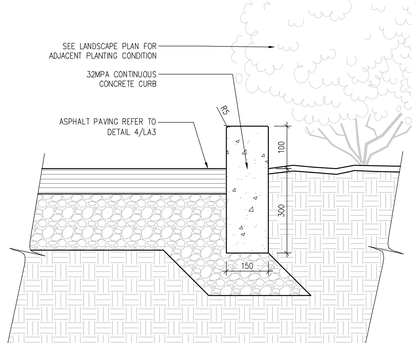


11 ARMOURSTONE
1:10



NOTES:
-EXPANSION JOINT SHALL COINCIDE WITH JOINTS IN ADJACENT PAVING

@ CONCRETE PAVING



@ ASPHALT PAVING

12 LANDSCAPE CURB @ CONCRETE PAVING / ASPHALT PAVING
1:10

NO.	REV.	ISSUED FOR	DATE
1		ISSUED FOR TENDER	Dec. 11/19
2		ISSUED FOR ADDENDUM 2	Jan. 10/20

N

ARCHITECT'S STAMP

ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO — ROBERT NG — MEMBER

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CLIENT: **TORONTO ZOO**
toronto zoo
361A Old Finch Ave, Toronto ON M1B 5K7. 416-392-5929

PROJECT:
ORANGUTAN EXHIBIT

DRAWING NAME :

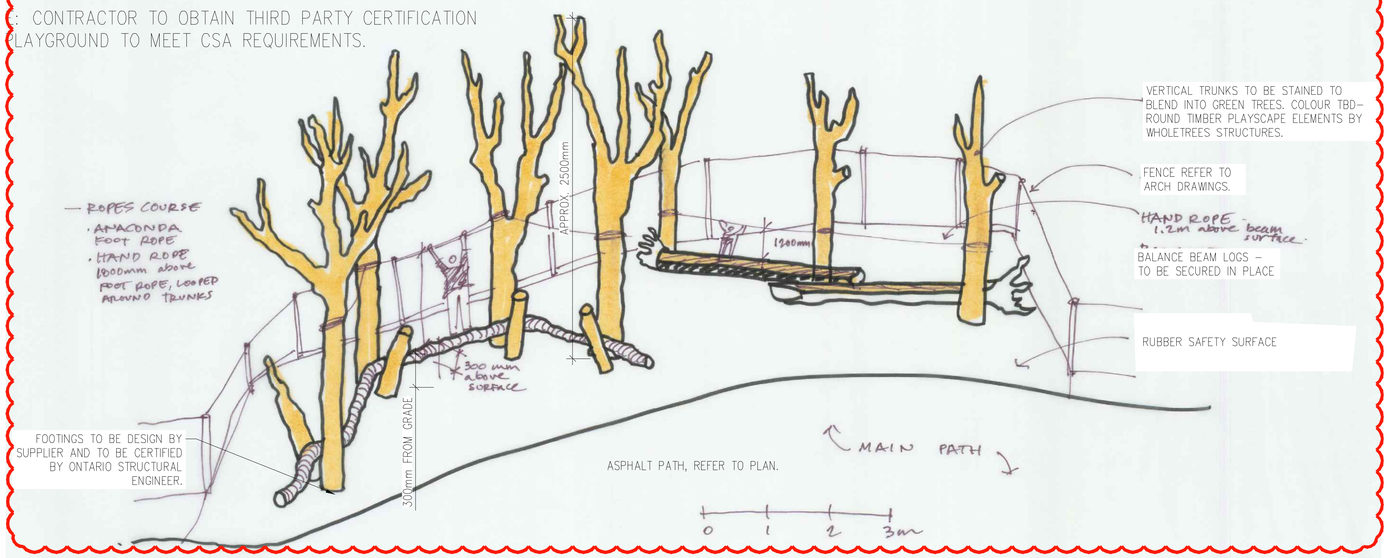
LANDSCAPE DETAILS

PROJECT NO.:	DRAWN BY :	CHECKED BY:
18-1-086	RH	LC

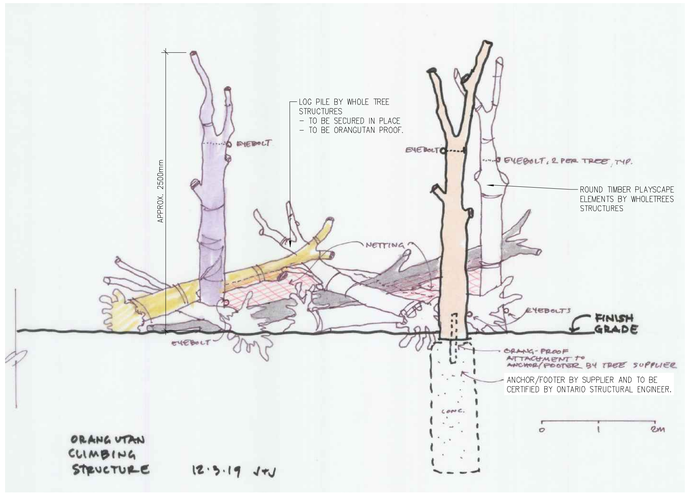
SCALE:
AS SHOWN
AUGUST 13. 2019

DRAWING NUMBER:
LA3

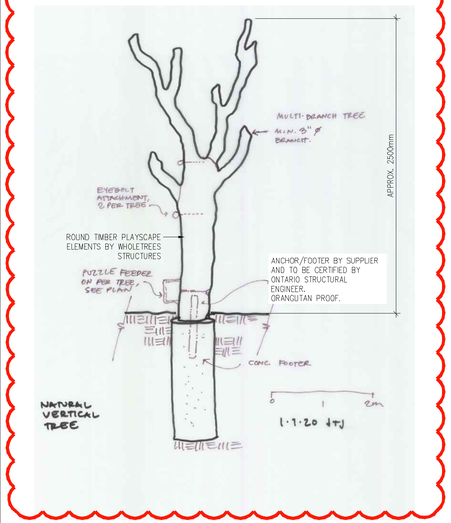
: CONTRACTOR TO OBTAIN THIRD PARTY CERTIFICATION
PLAYGROUND TO MEET CSA REQUIREMENTS.



1 PLAY STRUCTURE
1:50



2 ORANGUTAN CLIMBING STRUCTURE
1:50



3 NATURAL VERTICAL TREES
1:50

NO.	REV.	ISSUED FOR	DATE
1		ISSUED FOR TENDER	Dec. 11/19
2		ISSUED FOR ADDENDUM 2	Jan. 10/20

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ROBERT NG
MEMBER

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LA5