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Chair

Councillor Paul Ainslie

Chief Executive Officer

Chief Operating Officer
Robin D. Hale

REQUEST FOR PROPOSAL CONSULTING SERVICES FOR ORANGUTAN OUTDOOR EXHIBIT RFP # 58 (2018-10)

You are invited to submit a written proposal to provide consulting services for the Orangutan Outdoor Exhibit Project at the Toronto Zoo. Services to be provided include: the analysis of all site constraints and opportunities, review of existing facilities, services and drawings, the conceptual design of a new Orangutan Outdoor Exhibit and transfer from/to the existing indoor holding and/or exhibit and design of any associated landscape work. Consultant's scope of work also includes detailed design, completion of specifications and drawings, review and recommendation of tender submissions and contract administration throughout the construction phases of the Project.

<u>Project Briefing:</u> A project briefing for consultants will be held **Friday, 2018-10-26, at 0900 hours** (9:00 a.m.). Meet at the Administrative Support Centre, enter at Gate A, 361A Old Finch Avenue, west of Meadowvale Road, Toronto, Ontario, M1B 5K7.

Proposal:

Provide **four (4)** copies of your proposal, **one (1)** unbound signed and clearly marked as ORIGINAL and **three (3)** copies of the original proposal clearly marked as COPY and **one (1)** electronic copy (Microsoft Word or PDF) on a CD or flash drive in a sealed package or envelope. The original and all copies should be identical (excluding any obvious differences in labeling as noted above). Proposal to be delivered to the office of Purchasing & Supply, Toronto Zoo, Administrative Support Centre, 361A Old Finch Ave., Toronto, Ontario, M1B 5K7 by:

Due Date: Wednesday, 2018-11-14 by 1200 hours (noon), local time

Proposals shall remain in effect for a period of ninety (90) days from the Proposal due date.

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

If you have any queries regarding this request for proposal, please contact Mr. Peter Vasilopoulos, Supervisor of Purchasing & Supply at 416 392-5916 or pvasilopoulos@torontozoo.ca. If you require further technical details, please contact Ben Knoop, Project Manager at 416-392-6002 or bknoop@torontozoo.ca.

Yours truly,

Robin D. Hale Chief Operating Officer

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1.0 GENERAL TERMS

- 1.1 The following definitions will apply to this Request for Proposal and to any subsequent Contract:
 - 1.1.1 "**Board**" means the Board of Management of the Toronto Zoo;
 - 1.1.2 **"COO"** means the Chief Operating Officer of the Toronto Zoo;
 - 1.1.3 "Consultant" means the person, partnership or corporation contracting with the Board to provide the required Services;
 - 1.1.4 "Contract" means acceptance by the Toronto Zoo (by way of written acknowledgement, Agreement, Contract or Purchase Order) to furnish Services for money or other considerations;
 - 1.1.5 "Contract Price" means the price payable under the contract to the Consultant, being the Proposal Price eventually accepted by the Board of Management of the Toronto Zoo subject to any changes pursuant to the Contract Requirements;
 - 1.1.6 **"Proponent"** means an individual or company that submits or intends to submit, a proposal in response to this Request for Proposal;
 - 1.1.7 "**Proposal Price**", "Contract" and "Contract Documents" have the meanings set out therefore in clauses contained in these documents;

- 1.1.8 **Request for Proposal (RFP)**" means the RFP document in its entirety, inclusive of any addenda that may be issued by the Toronto Zoo;
- 1.1.9 "Services" or "Work" means everything that is necessary to be performed, furnished delivered by the Consultant to meet the Consultant's obligation under this Contract;

2.0 BACKGROUND AND PROJECT SCOPE

The Toronto Zoo opened August 15, 1974. Home to more than 5,000 animals and 300 exhibits representing the world's biomes, the Zoo is situated on 710 acres of land in the picturesque Rouge Valley. The Zoo attracts an average of 1.3 million visitors annually.

Since the Toronto Zoo opened there has never been an outdoor exhibit for the orangutans. Capital funding is available in 2018 - 2019 for design and construction of an outdoor habitat to greatly enhance and enrich the orangutan area. The new outdoor exhibit will be located south of the Indo-Malaya Pavilion at the location of the former Gaur holding and outdoor exhibit. This exhibit is viewable along the main Zoomobile route and could provide great immersive and interactive experiences for the orangutans and the visiting public.

Orangutans are a very intelligent great ape and we must exceed recommended standards that will allow for the needs of this species well into the future. It is imperative to design the habitat to allow species appropriate behaviours that meet the physical, psychological and social wellbeing for the orangutans. This must include allowing the animals to "make a choice" in how they use their environment. In addition you must design the exhibit to be fully accessible and aesthetically pleasing to the public while meeting all of the requirements of the animals. An outdoor habitat for the orangutans will greatly enhance the animals overall wellbeing and allow them to live a more arboreal lifestyle. This new habitat would include interactive features to engage visitors and connect them with the plight of this endangered red ape and empower people to help save them in the wild.

The Toronto Zoo previously hired a consultant to work on this project, but needed to cancel the contract part-way through design due an unforeseen circumstance with the consultant. The Toronto Zoo is now seeking a qualified and experienced consultant team to complete the design and develop a state-of-the-art outdoor orangutan exhibit. Review of the existing drawings, discussions with appropriate Toronto Zoo staff and a complete review of the site, facilities, exhibits, equipment and infrastructure is required to confirm the design concept and develop the required design documents. As well, the direction of the Zoo and its mission and vision, goals and objectives as set out in the 2015-2020 Strategic Plan and the 2016 Master Plan have to be considered in preparing your proposed design with respect to animal care, existing structures, site conditions, financial sustainability, conservation, education and visitor experiences.

The new exhibit must meet the requirements of this species as identified by Toronto Zoo staff and the Orangutan Care Manual. At the same time meeting the viewing expectations of the visiting public through enhanced viewing opportunities, immersive environments, educational graphics and interactives. The new outdoor habitat may include, but not be limited to, the following (overview):

- Access from the new habitat to the existing holding area or existing indoor exhibit.
- Maximize usable vertical space for this arboreal species.
- Incorporate enrichment devices for the animals.
- Several training stations.
- Numerous animal platforms within the habitat. Several that extend out of the habitat for the orangutans to climb to and rest. This would be an amazing immersive experience for the visitors.

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- Glass viewing panels at prime public viewing areas.
- Animal/public interactive experiences.
- Multiple climbing features to allow animals to brachiate throughout the habitats.
- High resting stations for the animals.
- Sheltered and shaded areas for the animals.
- Multiple visual barriers so orangutans can retreat from conspecifics.
- Connectivity for camera monitoring equipment.
- Graphics and interpretives with interactive features for the public to enjoy.
- A play area for children to mimic orangutan behaviours.

The terms of this engagement are outlined in a deliverable of set objectives over a one and a half year period, to commence immediately upon award and issuance of a purchase order.

3.0 DESCRIPTION AND SCOPE OF PROJECT

- 3.1 The Orangutan Outdoor Exhibit will provide a modern facility that provides outdoor access to natural sunlight that has never been available before. Conceptual and detailed design drawings are to be completed in early 2019 with construction anticipated for completion in early 2020. The Consultants responsibilities include:
 - a) Completion of detailed design including all products leading to Final Plans and Specifications for tender;
 - b) Tender;
 - c) Contract Administration for the construction phase;
 - d) Commissioning.

The Consultant will assess the current drawings from the previous consultant. Electronic copies of latest drawings completed to date are included with this RFP. Upon award of this project an AutoCAD drawing of the Site Survey will be available to the successful proponent. AutoCAD drawings of the architectural, structural, mechanical and electrical drawings are not available. No specifications have been prepared to date. They will also review the proposed area and surrounding site to evaluate and design refurbishments and changes to accommodate a new Orangutan outdoor exhibit. Demolition of the existing Gaur house II will be included with the design, all necessary permits will be required. The existing Gaur I facility is to be renovated. There is an underground spring in the proposed area of the holding building that will have to be considered during design and construction.

3.2 The consultant will be required to complete all design work and products, including all site review and final commissioning and close-out services as follows and as further defined in Section 3.

3.2.1 <u>Detailed Design</u>

Finalization of detailed design for a new Orangutan outdoor exhibit complete with modifications of the existing pavilion for the transfer. Detailed design services will include working to specialized Animal Exhibit and Holding design criteria, review of similar projects, associated design work, incorporating animal holding needs, and landscaping. Preparation of all Tender Documents, including certification of drawings by Architect/Engineer is required.

3.2.2 Tender

Preparation of tender documents, including drawings and specifications, review of recommended contractor references, review of the tender submissions and recommendation to the Zoo of a successful contractor.

3.2.3 <u>Construction Contract Administration</u>

The Consultant will perform construction administration and provide inspection and reporting services during the course of construction of the Orangutan Outdoor Exhibit Project. Services during course of construction to include field review, as required for conformance to all plans and specifications and as required by the Building Permit Process, cost control, invoice certification, reporting, preparation of all documentation required for changes, other documentation, deficiency identification, follow-up inspection, and project close-out and commissioning.

3.2.4 Commissioning

Commissioning of services to ensure all systems operate as designed. Review of operation and maintenance of all equipment with Toronto Zoo staff and the project contractor.

- 3.3 The Project detailed design and construction implementation must benefit from specialists in modern zoo and facility design and construction techniques. The Consultant Team proposals must demonstrate this expertise and experience through the successful completion of similar projects. Details regarding special materials, equipment, facility design, energy design strategies and other related project design are the responsibility of the Consultant. Final detailed design products, drawings, specifications, renderings, photographic and other design products following Consultant and Zoo approval must be reviewed and approved by all authorities having jurisdiction.
- 3.4 The Project must be integrated into the existing Zoo site consistent with the current and future public and staff service circulation, physical site features, and site and facility plans.
- 3.5 Existing site drawings at the Toronto Zoo are for review and site familiarization only. Conceptual drawings and background information, provided by the Zoo, are for general layout and reference and not to be treated as final design products. Partially complete drawings from the previous consultant can be used as a starting point, but all dimensions and details must be verified for accuracy. If available, specifications for some typical details from similar projects, as prepared by the Zoo with previous Consultants, are to be reviewed, and/or modified where necessary and used by Consultant to formulate drawings and specifications for all related work (architectural, landscaping, structural, interior animal holding, servicing, electrical, mechanical work, etc.) required for design and implementation of the Project.
- 3.6 The total budget for this project is a maximum of \$4,733,000 including consultants fees, construction, construction contingency allowance, and excluding taxes. Consultant to liaise with Zoo staff throughout the Project to confirm final design details.
- 3.7 Upon successful selection of consultant, the Detailed Design phase is expected to be undertaken immediately and proceed as fast as possible and to be completed by January 2019, for a February 2019 tender with construction starting in April 2019. See Section 8.0 for the detailed schedule requirements. The project is a priority for the Zoo and will be our major new opening in early 2020.

3.8 The Consultant shall keep proper record of accounts including supporting documents for the services rendered as a result of this Agreement and these records of account shall be open for inspection and/or audit by the Zoo upon reasonable request during normal business hours at the Zoo. Such records shall be retained for two (2) years following the completion of the services.

4.0 CONSULTANT SERVICES TO BE PROVIDED

- 4.1 Upon award of the contract, the selected firm will enter into an agreement for Architectural and Engineering Services with the Zoo, incorporating the terms and conditions of the Request for Proposal and the proponent proposal.
- 4.2 Design work is expected to be undertaken consistent with the Toronto Zoo Capital Works Program implementation.
- 4.3 Direct assistance and liaison of consultant with Zoo Facilities & Services staff regarding planning, design, construction, organization and scheduling.
- 4.4 Consultant to co-ordinate and liaise with all sub-consultants and others as necessary making sure all relevant issues have been raised and concluded.
- 4.5 Consideration must be given to the use of reused and recycled products, consideration for waste management concerns and energy efficiency within the design. Consideration should also be given to the use of long lasting maintenance free products where possible and appropriate. Consultant to assess and prepare a report detailing energy use change resulting from the project.
- 4.6 Regular meetings with Zoo staff will be required to finalize program requirements, design, development, concept drawings, specifications, implementation schedule and accurate Project costing products. Consultant to attend and take minutes at all design meetings.
- 4.7 Consultant to ensure notification of sub-consultants, names and phone numbers etc. for site access security purposes during design. Consultant and sub-consultants to attend a project start up meeting with appropriate Zoo staff for site access security purposes.
- 4.8 Consultant to prepare detailed design drawings and specifications from Zoo site drawings, typical specifications & specifications (where available) supplied by the Zoo and all animal holdings and staff/animal facilities components design from Project team meetings and workshop developments. The following authorities, guidelines and directives, among others, must be considered and developed into designs, as appropriate:
 - Ontario Ministry of Agriculture Animals for Research Act
 - Ontario Ministry of Labour Health & Safety Act
 - Ontario Hydro Energy Conservation Design Guidelines
 - Canadian Council on Animal Care Research Facilities
 - AZA Guidelines for Zoo Animal Facilities and Aquarium exhibits
 - Orangutan (Pongo) Care Manual
 - City of Toronto Energy Efficiency Guidelines
 - Toronto Green Standard

- Ontario Building Code
- Climate Change Risk Management
- Orangutan Care Manual
- 4.9 Consultant to seek the building permit where applicable, and all other approvals from authorities having jurisdiction on behalf of the Zoo, and such work to be considered part of the Scope of Work of the Consultant in the Fee Proposal. Consultant to submit all necessary Project reports including final Project review report to authorities having jurisdiction on behalf of the Zoo.
- 4.10 Any Building Permit Application fees, and other fees that may be required, will be paid by the Zoo and should not be included in your fee proposal.
- 4.11 Preparation of final Plans and Specifications including all drawings (Architectural, Structural, Mechanical, Electrical, etc.), specifications, renderings, models and photograph reference as necessary for tendering and construction.
- 4.12 Retention of all specialized Sub-consultants (e.g. architectural, engineering, landscape, quantity surveyor, etc.) necessary to complete detailed design of the Project.
- 4.13 The Consultant to arrange soil, survey, or other investigations, and analysis if required, as part of their work for the Project.
- 4.14 Design, preparation, review and submission of detailed design drawings, renderings, and specifications and related design products for approval, for all aspects of the work as necessary for the Project. Extent of mechanical, electrical drawings, investigations, and other needs for the Project to be determined as part of the classification of the buildings, based on the Ontario Building Code and Zoo requirements.
- 4.15 Design of graphics & interpretives/interactives.
- 4.16 Design of a play area with elements for children to play and mimic orangutan behaviour.
- 4.17 Preparation of final comprehensive construction tender documents for the Project.
- 4.18 Consultant to attend site briefing of contractors during tendering of project.
- 4.19 Consultant to review tender documents for the Project against requirements and Project budget and make recommendations.
- 4.20 Review tender submissions against requirements and project budget, confirm references and recommend a successful contractor to the Zoo for award of the work.
- 4.21 Consultant to attend pre-construction start-up and Health & Safety meeting with contractor(s), Zoo Facilities & Services staff and Safety & Security staff.
- 4.22 Consultant to attend and take minutes at all design, facility & program reviews, and special meetings as required throughout the duration of the project. Consultant to attend bi-weekly site meetings during construction of the project.

- 4.23 Consultant to ensure arrangement of construction work to be undertaken through liaison with Zoo staff to allow animal moves etc., for the best interest of the Zoo animal collection.
- 4.24 Inspection and general supervision of contractors and subcontractors to include all work (design and fabrication, architectural, structural, mechanical and electrical special materials and items, etc.) required to finish the project. The contractor must be notified of incorrect or unacceptable work immediately for prompt correction.
- 4.25 Consultant to be cognizant of the planned Project construction budgets in the Zoo Capital Works Program, design within budget, and undertake more detailed cost analysis where warranted during the detailed design of the Project.
- 4.26 Consultant to design within specified project budget limitations and be responsible for all work necessary to ensure conformance to budget, which includes the cost of construction, consultant fees, permits, disbursements, etc. Consultant to prepare a working budget for evaluation and analysis of tender results including unit prices as applicable.
- 4.27 Consultant will be responsible for re-design as necessary without additional cost if the Consultant costings are demonstrated to be in excess of budget amounts as determined by the Chief Operating Officer, Toronto Zoo. Any need to adjust Project costing must be communicated during detailed design and co-ordinated with Zoo staff if adjustments are deemed necessary.
- 4.28 Consultant to ensure notification prior to construction to the Zoo of list of contractors and sub-contractors, names and phone numbers etc. for site access security purposes.
- 4.29 Construction Contract Administration throughout the construction phases of the Project to final completion. Resident site inspection will be provided if requested by the Zoo, at a specified daily rate.
- 4.30 Consultant to review, prepare, recommend and issue site instructions (SI), requests for information (RFI), contemplated change orders (CCO) and change orders (CO), including for correction of site conditions, unknowns, and owner requested changes that are within the contingency allowance, as required to the contractor performing the **Project**, at no additional fee.
- 4.31 Consultant to review and approve shop drawings for all aspects of the work as necessary during construction.
- 4.32 Review of contractor invoices and preparation and review of certificates of payment are the responsibility of the Consultant.
- 4.33 Consultant to co-ordinate and liaise with all Sub-consultants and others as necessary making sure all relevant issues have been raised and concluded.
- 4.34 Preparation of bi-weekly progress report, verifying Project in place and schedule of completion.
- 4.35 Direct assistance and liaison of Consultant with Zoo Project Management staff regarding planning, design, final detailed design and construction implementation reporting.

- 4.36 Consultant to perform commissioning services for all systems to confirm they are operating as designed. Consultant to attend commissioning and review of equipment with contractor and Toronto Zoo staff.
- 4.37 Consultant to ensure that all close-out documentation is provided including as-built drawings, maintenance manuals, operating manuals, warranty information etc. as per the contract documents.
- 4.38 Consultant to re-inspect the project, to liaise with contractors and other consultants, making sure all deficiencies have been corrected prior to the expiry date of warranties.

5.0 INSURANCE, INDEMNIFICATION AND POLICIES

- 5.1 Professional liability insurance in the amount of \$1,000,000 (per claim) and \$2,000,000 general liability insurance in respect of injury or death to a single person or for property damage in a manner satisfactory to the General Manager must be maintained through the Project and included in the Fee Proposal.
- 5.2 The Consultant hereby agrees that the Consultant will keep harmless and fully indemnify the Board, the City of Toronto, the Toronto and Region Conservation Authority, their employees, officers and agents against all actions and claims against all loss, liability, judgments, costs, demands or expenses which they or any of them may sustain as a result of the negligent or intentional acts or omissions of the Consultant, its agents, servants, employees or subconsultants or any of them, in the performance of the Services, save and except and only to the extent that any such loss, liability, judgments, costs, demands or expenses are caused by the Board or those for whom at law it is responsible.
- 5.3 All insurance policies shall be endorsed to provide a minimum advance written notice of not less than thirty (30) days, in the event of cancellation, termination or reduction in coverage or limits, such notice to be made to the Chief Operating Officer.
- 5.4 The Consultant shall, as applicable, conform to and enforce strict compliance with the Occupational Health and Safety Act and for purposes of the Act be designated as the "constructor" for the Service.
- 5.5 The Consultant must adhere to all relevant Zoo policies, including, but not limited to, the Contractor Safety Policy, Working in the Vicinity of Animal Containments Policy and the Vehicles on Site Policy, copies of which the COO shall supply to the Consultant.

6.0 PROPONENT SUBMISSION REQUIREMENTS

- 6.1 Title page showing request for Proposal Proponent's name
- 6.2 Duly executed proposal form
- 6.3 Indicate the individual or incorporated name of the Proponent (i.e. the prime Consultant); address(es); telephone and fax number(s); and name of key contact person(s).
- 6.4 The Proponent must provide names and company information for all Sub-consultants required by Consultant.
- 6.5 State the scope and limits of responsibility of the Consultant and Sub-consultants named in the team.

- 6.6 Provide a schedule or chart of the proposed tasks, hours and the hourly rates for each person associated with this project.
- 6.7 The Proponent must confirm compliance with the Insurance and Indemnification provisions identified in Section 4.0.
- 6.8 Clearly articulate key personnel to be involved with the Project and their responsibilities. Indicate the qualifications and experience (beyond a general resume), that each member will bring to the team and include a breakdown on the number of hours each will devote to the Project and their hourly billing rate. Indicate the total extent of availability of all team members throughout entire Project period.
- 6.9 Provide the name, location, client reference and brief description of not more than five (5) similar studies under the direct responsibility of the persons or team named above.
- 6.10 Clearly indicate how Project design and construction will be managed to conform to assigned projects budgets, construction timing, etc.
- 6.11 Guarantee Project start immediately following successful confirmation of award of the Project, and work to implementation and completion schedule.

7.0 PROPONENT FEE PROPOSAL

7.1 On the Fee Proposal Form (Appendix I), provide an upset fee limit for the Project inclusive of disbursements, plus HST, broken out for each Project phase, as follows:

Phase I

- Detailed Design including all services and products leading to the Final Plans and Specifications for construction;
- Tender including site briefings for contactors, preparing addenda, review and recommendation of tenders.

Phase II

- Construction Contract Administration including inspection, reporting, meetings, and cost control tracking;
- Commissioning including review and confirmation all systems meet design requirements.
- Disbursements separated out by each phase of design and construction administration.
- Daily rate for resident site inspection (if requested).

All Consultant and Sub-consultants costs and drawings, models, renderings and similar costs to be the responsibility of the Consultant, identified and included as part of the fees in the Fee Proposal.

- 7.2 Provide hourly rates for other services which may be requested during completion of the Project.
- 7.3 An upset limit for disbursements is required, including, but not limited to, reproduction, postage, courier, fax machine, long-distance telephone calls; printing of drawings and

specifications, photographic production, approved Consultant travel, as required. Photocopies of receipts must be provided for disbursements.

- 7.4 Soil and topographical surveys, environmental testing, permits and application fees are <u>not</u> to be included in the Fee Proposal and will be reimbursed separately if required.
- 7.5 A 10% holdback will apply to all fees, not including disbursements, to be released after 30 days following acceptance of final construction of the Project.
- 7.6 Proposal prices shall remain in effect for a period of ninety (90) days from the proposal due date of 2018-11-14
- 7.7 The Proponent shall bear all costs and expenses with respect to the preparation and submission of its Proposal and the bidder participation in the proposal process (the "Proposal Costs"), including but not limited to: site visits and inspections, all information gathering processes, interviews, preparing responses to questions or requests for clarification from the Board, preparation of questions for the Board, and contract discussions and negotiations.
- 7.8 The Zoo shall not be responsible for or liable to pay any Proposal Costs of any bidder regardless of the conduct or outcome of the Proposal Request, Purchase Order, or Contract process.

8.0 PROPOSAL EVALUATION AND SELECTION

- 8.1 The Proponent is urged to ensure that its Proposal is submitted in the most favourable terms in order to reflect the best possible potential, since less than best potential could result in exclusion of the Proposal from further consideration.
- 8.2 The Agreement will not be awarded to the Proposal with the lowest cost, but rather, award shall be based on a combination of related expertise, prior project experience and price. Additionally, the Zoo may accept or reject any part of the Proponent's bid.
- 8.3 An Evaluation Team comprised of representatives designated by the Zoo will evaluate responses to the RFP.
- 8.4 There are three steps to the pre-defined evaluation process:
 - Step 1 Initial Review of Responses
 - Step 2 Evaluation of Submitted Proposals
 - Step 3 Evaluation of Presentations
- 8.5 Step 1 Initial Review of Responses

The Zoo will open only those Proposals received by the Proposal Deadline and time specified within this RFP. Immediately upon opening, the Zoo will review each Proposal for compliance with the instructions and conditions applicable to this RFP. The Zoo, at its option, may seek Proponent retraction and clarification of any discrepancy/contradiction found during its review of Proposals.

- 8.6 Step 2 Evaluation of Submitted Proposals
 - 8.6.1 The Evaluation Team will evaluate each submitted Proposal, that has passed through Step 1, on criteria that will include, but not necessarily be limited to, the following:

Evaluation Criteria	Points
Depth and breadth of the Project team's relevant qualifications	25
and experience with similar scale and type of Projects	
Depth and breadth of the Project team Lead's relevant	20
qualifications and experience	
Commitment to complete work according to schedule of events	10
in section 8.11 within the RFP	
Availability of team members during entire Project	10
Understanding of Project scope of work	10
Details on the general approach and methodology that	10
proponent would take in performing the services outlined	
within the RFP	
Fee Proposal	15

- 8.6.2 The Zoo may, at its discretion, eliminate a Proposal from further consideration if it deems the overall cost to be prohibitive.
- 8.6.3 A short-list of suitable Proponents may be established who may be invited to Step 3 to provide presentations related to their Proposal.
- 8.7 Step 3 Evaluation of Presentations (If Required)
 - 8.7.1 Invited Proponent(s) shall provide presentations in support of their Proposals or to demonstrate or otherwise expand on the information contained therein.
 - 8.7.2 The Proponent(s) shall ensure that the presentation is made by well versed staff with the authority to make decisions and commitments on behalf of the Proponent.
 - 8.7.3 Any and all costs incurred by the Proponent in order to prepare for and attend the presentation and/or demonstration including transportation, food, lodging, etc. shall be borne entirely by the Proponent.
- 8.8 The final score is then calculated as illustrated in the following table:

Evaluation	Score
Step 1 – Initial Review of Submitted Proposals	Prerequisite
Step 2 – Evaluation of Submitted Proposals	Maximum 100
Step 3 – Evaluation of Presentations (If Required)	(Maximum 50 If Required)
Total maximum score excluding Presentation	100
Total maximum score including Presentation	150

- 8.9 By responding to this Proposal, the Proponent agrees to accept the recommendation of the Evaluation Team as final.
- 8.10 All Proposals shall be submitted by the Proponent on the understanding that the Proposals shall become the property of the Zoo.

8.11 **SCHEDULE OF EVENTS:**

The following is a tentative schedule for the Orangutan Outdoor Exhibit process.

The Zoo expects detailed design work to begin immediately upon selection of the successful consultant, and be completed such that all construction/refurbishment work is completed as follows:

The final schedule will be developed jointly with the successful proponent in the first week of project execution:

Pre-Award	
Site visit	2018-10-26
Proponents' Question Deadline	2018-10-31
Submission Due	2018-11-14
Interviews, if necessary	Week of 2018-11-19
Notification of Award By the Toronto Zoo	Week of 2018-11-26
Post-Award	
Kick Off Meeting	Week of 2018-11-26
Final Design Due	2019-01
Tender	2019-02
Construction Start Date	2019-04
Construction Completion Date	2020-04

The RFP process and project will be governed according to the above schedule or other schedule provided by the Consultant and approved by the COO. Although every attempt will be made to meet all dates listed, the Toronto Zoo reserves the right to modify any or all dates at its sole discretion. Appropriate notice of change will be provided, in writing, as soon as is feasible so that each Proponent will be given the same non-preferential treatment.

9.0 PROPOSAL TERMS AND PROVISIONS

The successful Proponent shall be retained through a contractual agreement and/or a purchase order, which includes the terms and conditions of this Request for Proposal.

9.1 Consultant's Liability and Indemnity

The Consultant will from time to time at all times hereafter well and truly save, defend and keep harmless and fully indemnify the Board, the City of Toronto, and the Toronto and Region Conservation Authority and each of their officers, employees and agents (hereinafter called the "Toronto Indemnities") of, from and against all manner of action, suits, claims, executions and demands which may be brought against or made upon the Toronto Indemnities or any of them and of, from and against all loss, costs, charges, damages, liens and expenses which may be sustained, incurred or paid by the Toronto Indemnities, their officers, employees and agents or any of them by reason of or on account of or in consequence of the execution of this agreement or provision of the business or any other work or matter to be carried out or performed by the Proponent with respect to the Request for Proposal or any agreement that may result from the request for proposal process, and/or the non-execution or imperfect or improper execution thereof and will pay to the Toronto Indemnities on demand any loss, costs, damages and expenses which may be sustained, incurred or paid by the Toronto Indemnities or any of them in consequence of any such action, suit, claim, lien, execution or demand and any monies paid or payable by the Toronto Indemnities or any of them in settlement or discharge on account thereof.

The Consultant shall be responsible for any and all damages, or claims for damages for injuries or accidents done or caused by his or her employees, or resulting from the prosecution of the

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Work, or any of their operations, or caused by reason of the existence of location or condition of the works, or of any materials, plant or machinery used thereon or therein, or which may happen by reason thereof, or arising from any failure, neglect or omission on their part, or on the part of any of their employees to do or perform any or all of the several acts or things required to be done by him or them under and by these General Conditions, and covenants and agrees to hold the Board, the Toronto and Region Conservation Authority and the City of Toronto, their officers, agents, employees, Consultants and invitees harmless and indemnified for all such damages and claims for damage; and in case of the Consultant's failure, neglect or omission to observe and perform faithfully and strictly, all the provisions of the Work, the COO may, either with or without notice (except where in these Contract Requirements, notice is specially provided for, and then upon giving the notice therein provided for), take such steps, procure such material, plant trucks and men, and do such work or things as he/she may deem advisable toward carrying out and enforcing the same and any such action by the COO as he is herein empowered to take, shall not in any way relieve the Consultant or his/her surety from any liability under the Contract.

9.2 Incurred costs

toronto

The Proponent shall bear all costs and expenses with respect to the preparation and submission of its Proposal and the Proponent's participation in the proposal process (the "Proposal Costs"), including but not limited to: all information gathering processes, interviews, preparing responses to questions or requests for clarification from the Board and contract discussions and negotiations.

The Toronto Zoo shall not be responsible for or liable to pay any Proposal Costs of any Proponent regardless of the conduct or outcome of the Proposal Request, Purchase Order process, or Contract process.

9.3 The RFP does not constitute an offer or tender by the Toronto Zoo. Receipt of Proposals by the Toronto Zoo pursuant to this RFP or selection or notification confers no rights under any Proposal nor obligates the Toronto Zoo in any manner whatsoever.

9.4 Liability of Errors

While the Toronto Zoo has used considerable efforts to ensure an accurate representation of information in this Request for Proposal, the information contained in this Request for Proposal is supplied solely as a guideline for Proponents. The information is not guaranteed or warranted to be accurate by the Toronto Zoo, nor is it necessarily comprehensive or exhaustive. Nothing in this Request for Proposal is intended to relieve Proponents from forming their own opinions and conclusions with respect to the matters addressed in this Request for Proposal.

9.5 Toronto Zoo Rights and Options Reserved:

The Toronto Zoo reserves the right to award the contract to any proponent who will best serve the interest of the Toronto Zoo. The Toronto Zoo reserves the right, in its sole discretion, to exercise the following rights and options with respect to the proposal submission, evaluation and selection process under this RFP:

- (a) To reject any or all proposals.
- (b) To re-issue this RFP at any time prior to award of work.
- (c) To cancel this RFP with or without issuing another RFP.
- (d) To supplement, amend, substitute or otherwise modify this RFP at any time prior to the selection of one or more proponents for negotiation.

- (e) To accept or reject any or all of the items in any proposal and award the work in whole or in part.
- (f) To waive any informality, defect, non-responsiveness and/or deviation from this RFP and its requirements.
- (g) To permit or reject at the Toronto Zoo's sole discretion, amendments (including information inadvertently omitted), modifications, alterations and/or corrections of proposals by some or all of the proponents following proposal submission.
- (h) To request that some or all of the proponents modify proposals based upon the Toronto Zoo's review and evaluation.
- (i) To request additional or clarifying information or more detailed information from any Proponent at any time, before or after proposal submission, including information inadvertently omitted by the proponent.

9.6 Cancellation

Nothing herein shall be construed as giving the Proponent the right to perform the services contemplated under this agreement beyond the time when such services become unsatisfactory to the Toronto Zoo; and in the event that the Proponent shall be discharged before all the services contemplated hereunder have been completed or the services are for any reason terminated, stopped or discontinued because of the inability of the Proponent to serve under this agreement, the Proponent shall be paid only for the portion of the work which shall have been satisfactorily completed at the time of termination.

9.7 Ownership and Confidentiality of Board-Provided Data

All correspondence, documentation and information provided by the Toronto Zoo staff to any bidder or prospective Bidder in connection with, or arising out of this RFP, the services or acceptance of the RFP:

- 9.7.1 is and shall remain the property of the Board;
- 9.7.2 must be treated by Proponents and Prospective Proponents as confidential;
- 9.7.3 must not be used for any purpose other than for replying to this RFP, and for fulfillment of any related subsequent agreement.

9.8 Copyright:

The final product and related materials from the work is to be for the exclusive use of the Toronto Zoo. The Toronto Zoo shall be the only and sole owner of the product and related materials for the sole and unfettered use by the Toronto Zoo. Upon payment of the said product and related materials by the Toronto Zoo, the successful bidder shall have no hold, proprietary claim, ownership, use of any kind, intellectual or otherwise nor shall there be any restrictions placed on the final product and related products by the successful bidder. By submitting a Proposal in this response to this RFP, the Bidder shall thereby acknowledges and agrees that the Toronto Zoo has exclusive ownership and sole and unfettered use of this final product and related products.

9.9 Ownership and Disclosure of Proposal Documentation

The documentation composing any Proposal submitted in response to this RFP, along with all correspondence, documentation and information provided to the Toronto Zoo by any Bidder in connection with, or arising of this RFP, once received by the Toronto Zoo:

9.9.1	Shall become property of the Toronto Zoo and may be appended to purchase
	order issued to the successful Bidder;

9.9.2 Shall be come subject to the Municipal Freedom of Information and Protection of Privacy Act ("MFIPPA") and may be released pursuant to that Act

Because of *MFIPPA*, prospective Bidders are advised to identify in their Proposal material any scientific, technical, commercial, proprietary or similar confidential information, the disclosure of which could cause them injury.

Each Bidder's name shall be made public. Proposals will be made available to member of the Board on a confidential basis and may be released to members of the public pursuant to *MFIPPA*.

9.10 Conflict of Interest Statement

In its Proposal, the Proponent must disclose to the Toronto Zoo any potential conflict of interest that might comprise the performance of the Work. If such a conflict of interest does exist, the Toronto Zoo may, at its discretion, refuse to consider the Proposal.

The Proponent must also disclose whether it is aware of any Toronto Zoo employee, member of board, agency or commission or employee thereof having a financial interest in the Proponent and the nature of that interest. If such an interest exists or arises during the evaluation process or the negotiation of the Agreement, the Toronto Zoo may, at its discretion, refuse to consider the Proposal or withhold the awarding of any agreement to the Proponent until the matter is resolved to the Toronto Zoo's sole satisfaction.

Proponents are cautioned that the acceptance of their Proposal may preclude them from participating as a Proponent in subsequent projects where a conflict of interest may arise. The Consultant(s) for this project may participate in subsequent/other Toronto Zoo projects provided the Consultant(s) has (have) satisfied pre-qualification requirement of the Toronto Zoo, if any and in the opinion of the Toronto Zoo, no conflict of interest would adversely affect the performance and successful completion of an Agreement by the Consultant(s).

If, during the Proposal evaluation process or the negotiation of the Agreement, the Proponent is retained by another client giving rise to potential conflict of interest, then the Proponent will so inform the Toronto Zoo. If the Toronto Zoo requests, then the Proponent will refuse the new assignment or will take steps as are necessary to remove the conflict of interest concerned.

9.11 No Collusion

A proponent shall not discuss or communicate, directly or indirectly, with any other Proponent or their agent or representative about the preparation of the Proposals, Each proponent shall attest by virtue of signing the Proposal Submission Form that its participation in the RFP process is conducted without any collusion or fraud. If the Toronto Zoo discovers there has been a breach of this requirement at any time, the Toronto Zoo reserves the right to disqualify the Proposal or terminate any ensuing Agreement.

9.12 Governing Law

This RFP and any quotation submitted in response to it and the process contemplated by this RFP including any ensuing Agreement shall be governed by the laws of the Province of Ontario. Any dispute arising out of this RFP or this RFP process will be determined by a court of competent jurisdiction in the Province of Ontario

2018-10-25 Page 17 of 19

10.0 PROPOSAL FORM

The undersigned Proponent having reviewed and fully understood the RFP and all terms and requirements of the RFP and all terms and conditions of the RFP and information provided, hereby submits the attached Proposal and supporting materials ("the Proposal") in accordance.

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

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

By submitting a Proposal the Proponent agrees to all of the terms and conditions of this Request for Proposal.

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

COMPANY INFORMATION	
Company Name:	
Name of authorized	
Signing Officer	Title:
Signature:	Date:
Contact Name:	Title:
Address:	·
	1
Telephone #:	Fax #:
Email:	Web Site:
HST #:	

DISCOUNT		Discount	Days
Discount allowed for prompt payment must be paid to qualify.	and period within which invoice	%	

NOTICE OF NO BID

INSTRUCTIONS:

It is important to the Toronto Zoo to receive a reply from all invited bidders. If you are unable, or do not wish to submit a bid, please complete the following portions of this form. State your reason for not bidding by checking the applicable box(es) or by explaining briefly in the space provided. It is not necessary to return any other Request for Proposal/Quotation/Tender documents or forms. Please just return this completed form by fax or by mail prior to the official closing date. Purchasing and Supply Fax Number: (416) 392-6711.

Project/quantity too large.	Project/quantity too small.
We do not offer services or commodities to these requirements	Cannot meet delivery or completion requirement
We do not offer this service or commodity.	Agreements with other company do not permit us to sell directly.
Cannot handle due to present commitments.	Licensing restrictions
Unable to bid competitively.	We do not wish to bid on this service or commodity in the future.
Insufficient information to prepare quote/proposal/tender	Specifications are not sufficiently defined
We are unable to meet bonding or insurance requirements.	
ner reasons or additional comments (plea	1 1

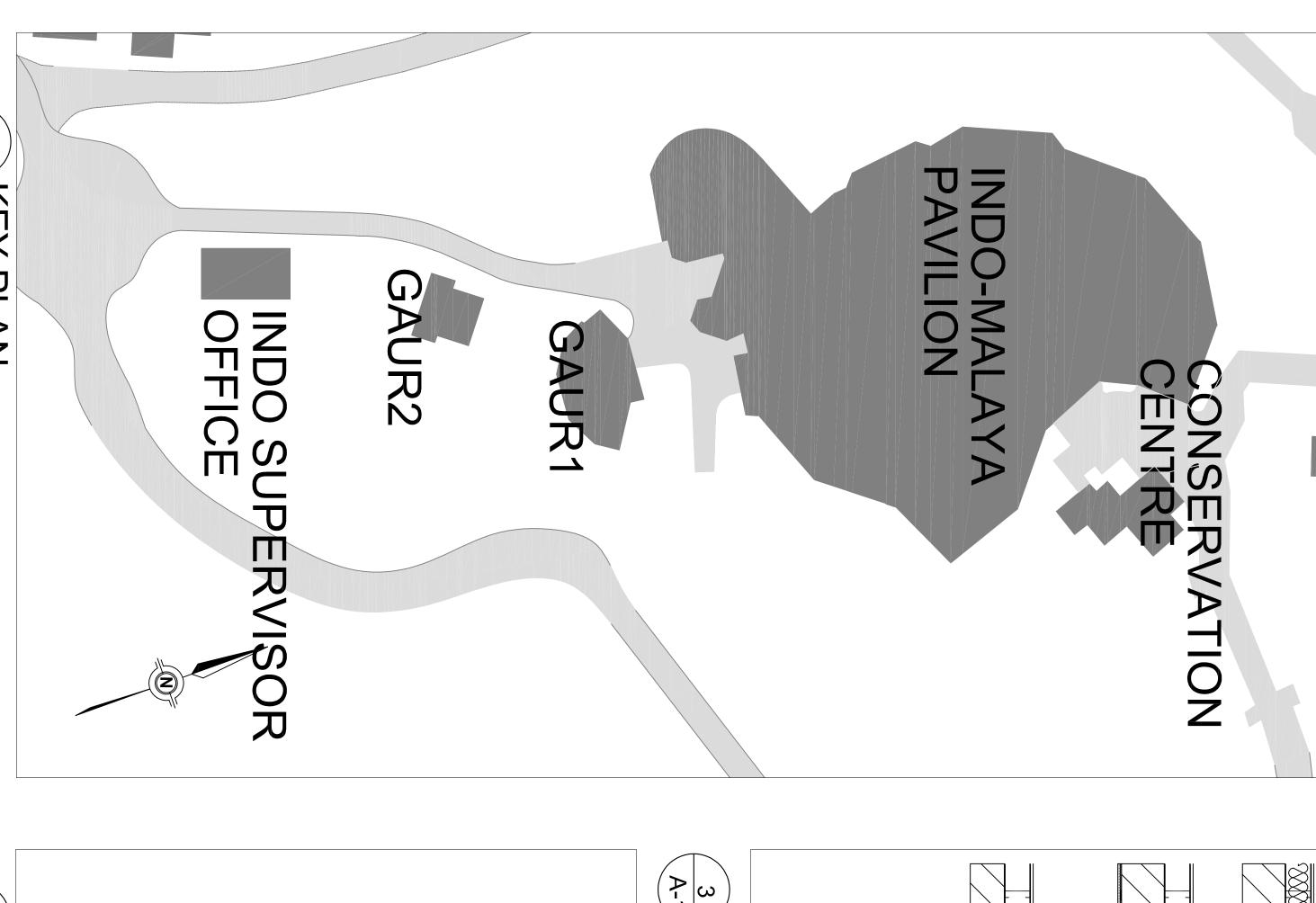
Company Name:	
Address	
Contact Person:	
Signature of	
Company	
Representative:	
Date:	
Phone Number:	
Email address	
Fax Number:	

APPENDIX I

FEE PROPOSAL FORM

Proponent Name				
	FEES	DISBURSEMENTS	HST	TOTAL
Detailed Design and Tender				
Construction Administration and Commissioning				
Daily Rate For Resident Site Inspection (if requested)				
TOTAL COSTS				





W1						A-1 N.T.S	CONST				
WALL TYPE SYMBOL (SEE CONSTRUCTION TYPES)	NEW PARTITION WALLS	EXISTING WALLS			NEW DOOR		RICTION TYPE		NEW EXTERIOR WALL WALL TYPE W3 16MM GYPSUM WALL BOARD 6MM POLY VAPOUR BARRIER ON 152.4MM METAL STUDS @ 406.4MM O.C WITH 15 LBS BUILDING PAPER ON 203.2mm CONCRETE BLOCK ON	WALL TYPE W2 16MM GYPSUM WALL BOARD 6MM POLY VAPOUR BARRIER ON 152.4MM METAL STUDS @ 406.4MM O.C WITH 15 LBS BUILDING PAPER ON 254mm CONCRETE BLOCK ON 50.8mm STEEL CHANELS 406.4mm O.C 16mm S.S PERFORATED METAL PANELS	EXISTING EXTERIOR WALL WALL TYPE W1 16mm GYPSUM WALL BOARD 6mm POLY VAPOUR BARRIER ON 152.4mm METAL STUDS @ 406.4mm O.C WITH R-12 BATT INSULATION BETWEEN STUDS 15 LBS BUILDING PAPER ON 254mm CONCRETE BLOCKS
BT1)——E		(101) F	R1	F2			ָרֻ ולי				
BARRIER TYPE SEE A-5	WINDOW NUMBER SEE ROOM AND WINDOW SCHEDULE		NEW ROOF TYPE SYMBOL, SEE CONSTRUCTION TYPES	NEW FLOOR TYPE SYMBOL, SEE CONSTRUCTION TYPES				ROOF TYPE R2 25.4mm GRAVEL COVERING 6mm WATERPROOF MEMBRANE ON 101.4 INSULATION WTIH 1% SLOPE ON 19mm PLYWOOD ON 38mm STEEL DECKING W200 STEEL ROOF JOIST	NEW ROOF TYPES ROOF TYPE R1 24ga. PREFINISHED METAL FLASHING 1 PLY 250gm/m2 MOD. BIT. CAP SHEET FLASHING 1 PLY 180gm/m2 MOD. BIT. BASE SHEET FLASHING ENVELOPE INSULATION 13mm PLYWOOD 203.2mm ROOF JOIST	NEW FLOOR TYPES FLOOR TYPE F1 101.4mm POURED CONCRETE SLAB C/W 152.4mm W.W.M 6mm POLY ON 50.8mm SAND BASE 152.4mm GRANULAR FILL	NEW INTERIOR PARTITIONS NON LOAD BEARING INT. PARTITION TYPE P1 16mm GYPSUM WALL BOARD 6mm POLY VAPOUR BARRIER ON 152.4mm METAL STUDS @ 406.4mm O.C WITH R-12 BATT INSULATION BETWEEN STUDS 6mm POLY VAPOUR BARRIER 16mm GYPSUM WALL BOARD

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OFESSIONAL

SEALS

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371 WINNETT AVE.
Toronto, Ontario
M6C 3M2
t: 416.658.6001
e: dbalind@balindarch.com

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VINDOW S	WINDOW SCHEDULE - TORONTO ZOO ORANGUTAN OUTSIDE EXHIBIT	JTAN O	UTSIDE EXHI	ВІТ										
MINDOW								FRAME						
Window #	Type	Qty.	Width	Height	Thickness F	Ply	Notes	Material	Rough Opening	Thickness	Head	Jam	Sill	Notes
×1	Fixed. Non Operable	_	1505 mm	1524 mm	6.35mm	_	Window at Research Station	Aluminum	1556 x 1575 mm	25.4 mm				
W2	Fixed, Non Operable	1	1529 mm	1200 mm	6.35mm	_	Window at Office	Aluminum	1529 x 1242 mm	25.4 mm				
W3	Fixed, Lam. & Temp. ; Non Operable	1	1124 mm	2133.6 mm	12.7 mm	2	Window at Retreat Space #1	Aluminum						
W4	Fixed, Lam. & Temp. ; Non Operable	1	748 mm	2133.6 mm	12.7 mm	2	Window at Retreat Space #1	Aluminum	748 x 2100	25.4 mm				
W5	Fixed, Lam. & Temp. ; Non Operable	1	748 mm	2133.6 mm	12.7 mm	2	Window at Retreat Space #1	Aluminum	748 x 2100	25.4 mm				
W6	Fixed, Lam. & Temp. ; Non Operable	1	748 mm	2133.6 mm	12.7 mm	2	Window at Retreat Space #1	Aluminum	748 x 2100	25.4 mm				
W7	Fixed, Lam. & Temp. ; Non Operable	1	748 mm	2133.6 mm	12.7 mm	2	Window at Retreat Space #1	Aluminum	748 x 2100	25.4 mm				
W8	Fixed, Lam. & Temp. ; Non Operable	2	1758 mm	2133.6 mm	12.7 mm	2	Window Viewable to Exhibit Space	Aluminum	3591 x 2197	25.4 mm				
W9	Fixed, Lam. & Temp.; Non Operable	1	2133.6 mm	2133.6 mm	12.7 mm	2	Window Viewable to Exhibit Space	Aluminum	2184 x 2184	25.4 mm				
W10	Fixed, Lam. & Temp.; Non Operable	1	2133.6 mm	2133.6 mm	12.7 mm	2	Window Viewable to Exhibit Space	Aluminum	2184 x 2184	25.4 mm				
W11	Fixed, Lam. & Temp.; Non Operable	1	1300 mm	2133.6 mm	12.7 mm	2	Window at Retreat Space #2	Aluminum	1338 x 2184	25.4 mm				
W12	Fixed, Lam. & Temp.; Non Operable	_	1300 mm	2133.6 mm	12.7 mm	2	Window at Retreat Space #2	Aluminum	1360 x 2184	25.4 mm				
Vindow Scl	Nindow Schedule Legend													
_am.	Laminated													
Гетр.	Tempered													
														_

고/

NEW WALL/PARTITION (SEE CONSTRUCTION TYPES)

REVISIONS MADE
PER ZOO'S REQUEST
2017-06-29
REVISIONS MADE
PER ZOO'S REQUEST
2017-08-16

D A T E

LEGEND

WINDOW SCHEDULE

DOOR SCHEDULE - TORONTO ZOO ORANGUTANS EXHIBIT

Height

Material Glazing Rating

Frame Thickness

50.8 mm 50.8 mm 75mm DIA. 50.8 mm

Staff entrance from the existing basement
Mesh door into Orangutan Entrance Space
New Orangutang Entrance (from Holding Area)
New Chain link Gate in front of Holding Area
New Orangutan Entrance (End of Elevated Walkwanstring Entrance from Pavillion
Existing Entrance from Pavillion
Covered Pedestrian Walkway
Research Station
New Research Station - Operable Training Wall

nless Steel ated Metal Door orated Metal Pan

DOOR N.T.S

AND

HARDWARE

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ROO	ROOM FINISH SCHEDULE - TORONTO ZOO ORANGUTAN OUTSIDE EXHIBI	ZOO ORAN	NGUTAN (OUTSIDE	EXHIBIT					Room Finsh Sche
RM. #	Area Name	Floor	옥		Walls		Ceiling	Height	Notes	
		Base	Finish	Base	Finish	Base	Finish			
B100	Existing Holding Area	Existing	Existing	Conc.	Paint.	Exist.	Existing	1		Gyp. bu Gypsuii
100	Existing Entrance from Pavillion	Conc.	1	ı	•	ı		ı		
101	New Orangutang Entrance	Conc.	Mulch	Perf. Pan.	Paint	Conc.	-	7.5 m		Ply Wa. Plywood
102	New Elevated Walkway for Orangutans.	H.S.S	Paint	W.M	Paint		-	1.5 m		Sht. Flr. Sheet F
103	Kiosk	Conc.	-	-	-	-	-	-	Toronito Zoo to supply & install the Gift Shop	V.Base Vinyl Ba
104	Research Station	Conc.	V. Base	BK	Paint	Gyp. Bd.	Paint	To Exist.		Wd, Wood
105	Staff Office	Conc.	Tile	BK	Gyp. Board Paint	Gyp. Bd.	Paint	To Exist.		W.M Wire Mest
106	Retreat Space #1	Conc.	Mulch	Glass	Glass	Existing	Existing	To Exist.		WD STDS. Wood Stu
107	Covered Visitor Viewing #1	Conc.	V. Base	WD STDS	Gyp. Board Paint	Gyp. Bd.	Paint	To Exist		C.P Cedar Pla
108	Covered Visitor Viewing #2	Conc.	V. Base	WD STDS	Gyp. Board Paint	Gyp. Bd.	Paint	To Exist.		WP.M Waterproc
109	Covered Pedestrian Walkway	Sand	Flag Stone	Bamboo	-	Stl. Std.	Wood Planks	3.1 m		H.S.S
110	Retreat Space #2	Conc	Mulch	Glass	Glass		-	To Exist		Pert. Pan. Perforated
111	Covered Interactive Area	Existing	Existing	Existing	Paint	Metal	Paint	3.1 m		
112	Site Orientation Map	Conc.	-	-	-	-	-	-		
113	Boardwalk	Wood Joists	C.P	·			•	-		
114	Orangutan Exhibit	Grass	-	Conc.	•		•	-		
115	Wetland	Conc.	WP.M	-	-	-	-	-		
110	+									

A-1	7
/ N.T.S	ROOM FINISH SCHEDULE

			DRAW	DRAWING LIST
			A-1	NOTES AND DETAILS
			A-2	SITE DEMOLITION PLAN
			> A-3	GAUR DEMOLITION PLAN
chedule Legend			A-5	SITE PLAN
	Z	NOTES AND LEGEND	A-5.01	TREE HOUSE AT THE END OF
crete Block	СВ	DENOTES CATCH BASIN		BOARDWALK
	~	DENOTES WATER VALVE	A-6	BARRIER TYPES AND
sum Board	FHYD	DENOTES FIRE HYDRANT		SECTIONS AT BOARDWALK
≓	WKEY	DENOTES WATER KEY	A-6.01	METAL BARRIER IN EXHIBIT
wood	LS		A-6.02	PLANTING BARRIERS
et Flooring	Z		·	AROUND BOARDWALK
/l Base	MII	DENOTES MANHOLE (HYDRO)		ELEVATIONS
<u>od</u>	MHSTM	DENOTES MANHOLE (STORM)	A-7.01	GAUR FLOOR PLANS AND
Mesh	Q Q		•)	SECTIONS
Stude	<u> </u>		A-8	SILE PLAN WITH SWAY POLE
r Blanks	Φ.C.		• •	LOCATIONS
rnroof Membrane	E N		A-8.01	AND CLIMB STORDER BOLES
w Stainless Steel				LOCATIONS
rated Metal Panels			A-8.02	SITE PLAN WITH SHORT POLE
				LOCATIONS
			A-9	COVERED PEDESTRIAN
			A-10	SERVICE ENTRANCE DOORS
			A-11	ELEVATED ORANGUTAN
				WALKWAY
			A-12	WATER LINES
			A-13	SITE DETAILS
			A-13.01	CLIMBING POLES FOR
				ORANGUTANS

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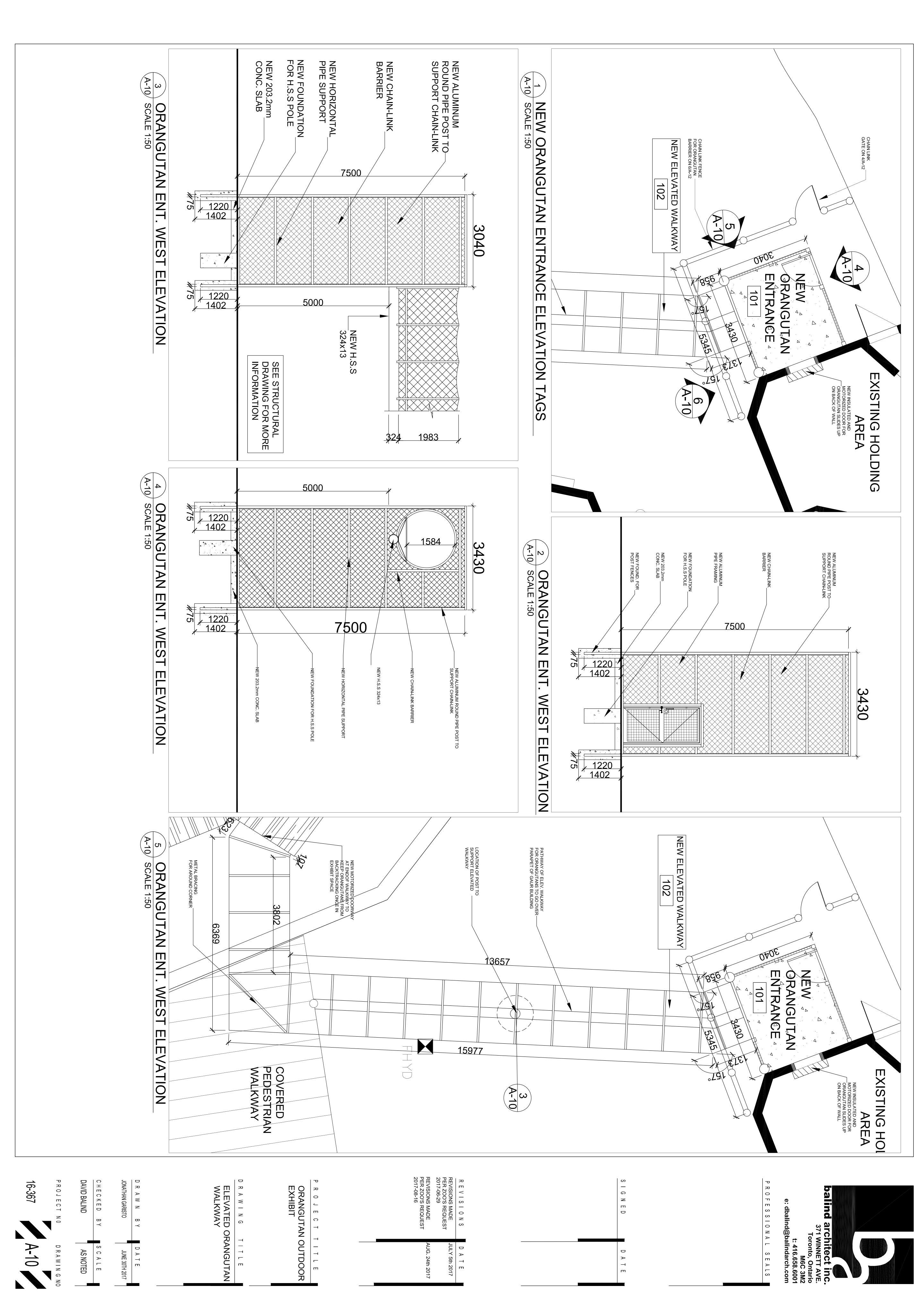
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LOCATION PLAN, KEY PLAN, CONSTRUCTION TYPES, DOOR, WINDOV SCHEDULE AND ROOM FINISH SCHEDULE	
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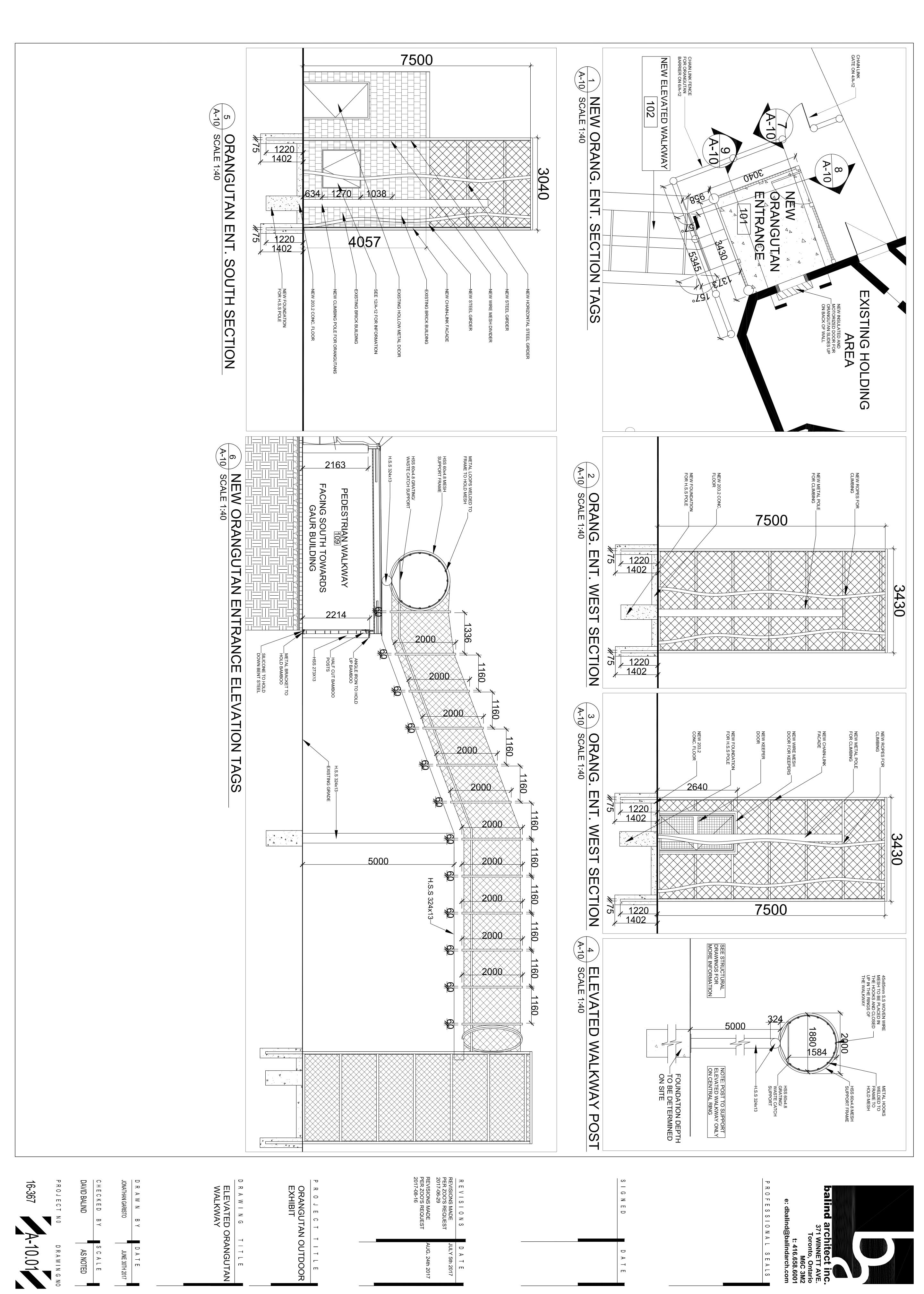
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AS NOTED	SCALE	JUNE 30TH 2017	DATE

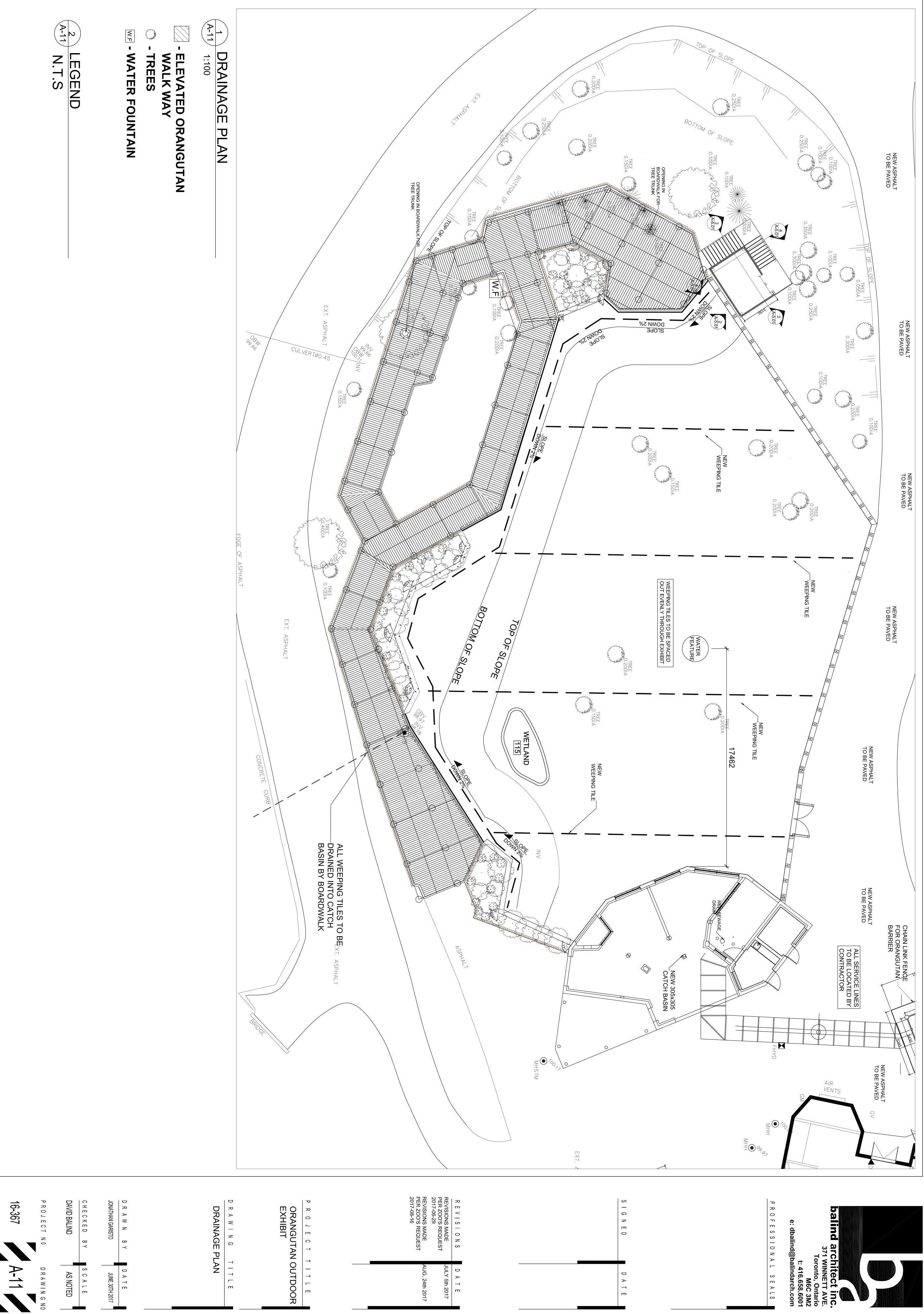
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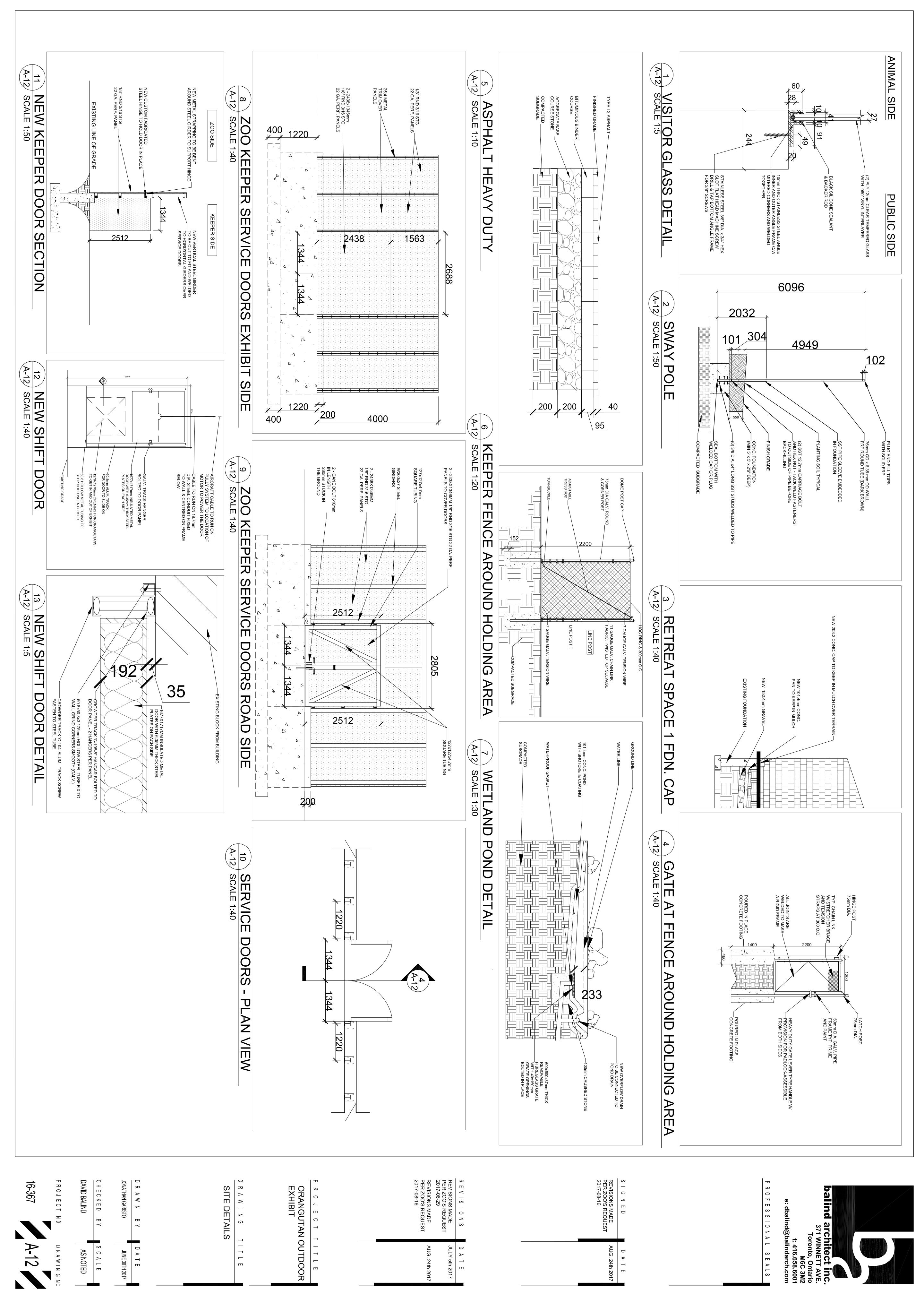


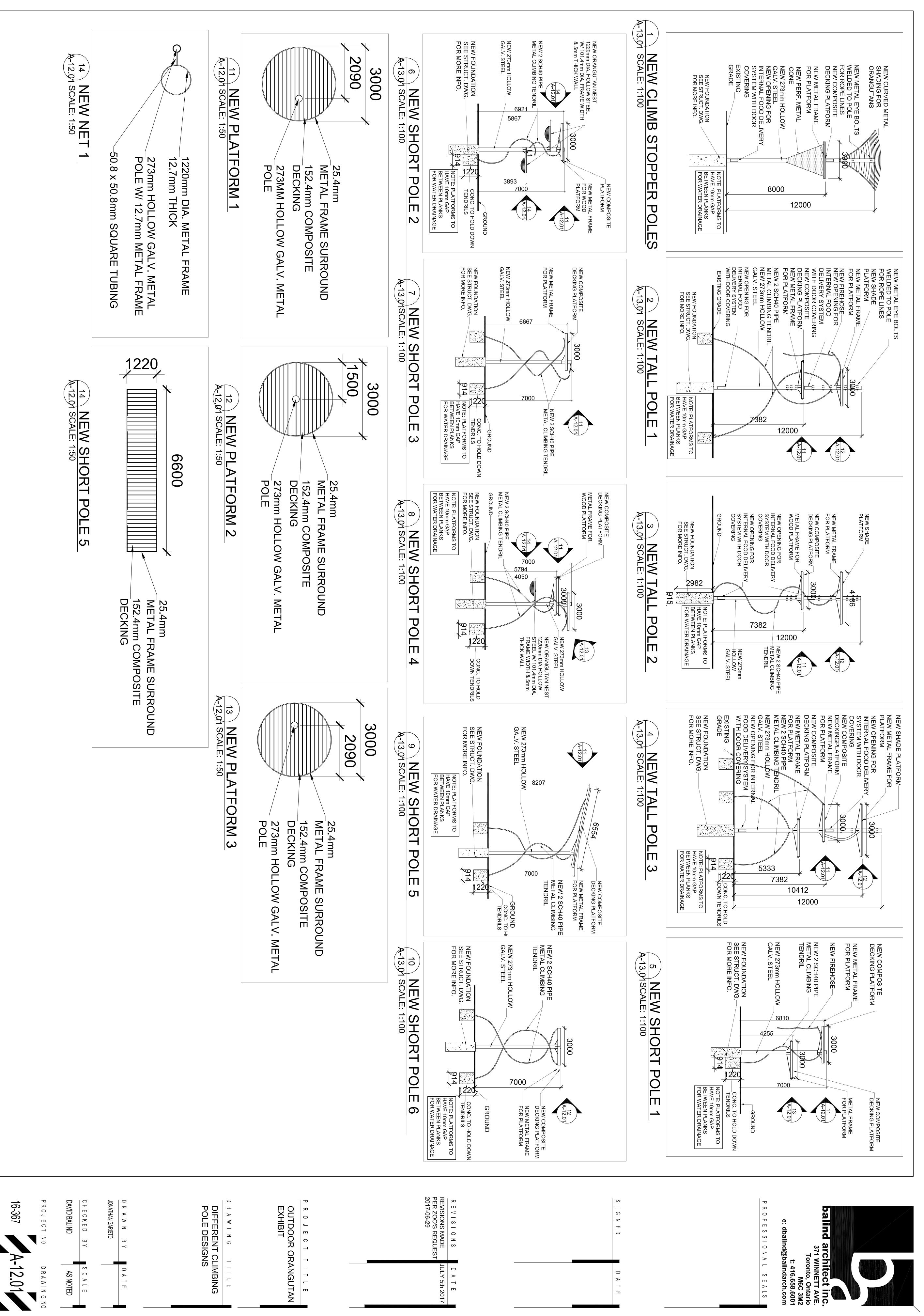


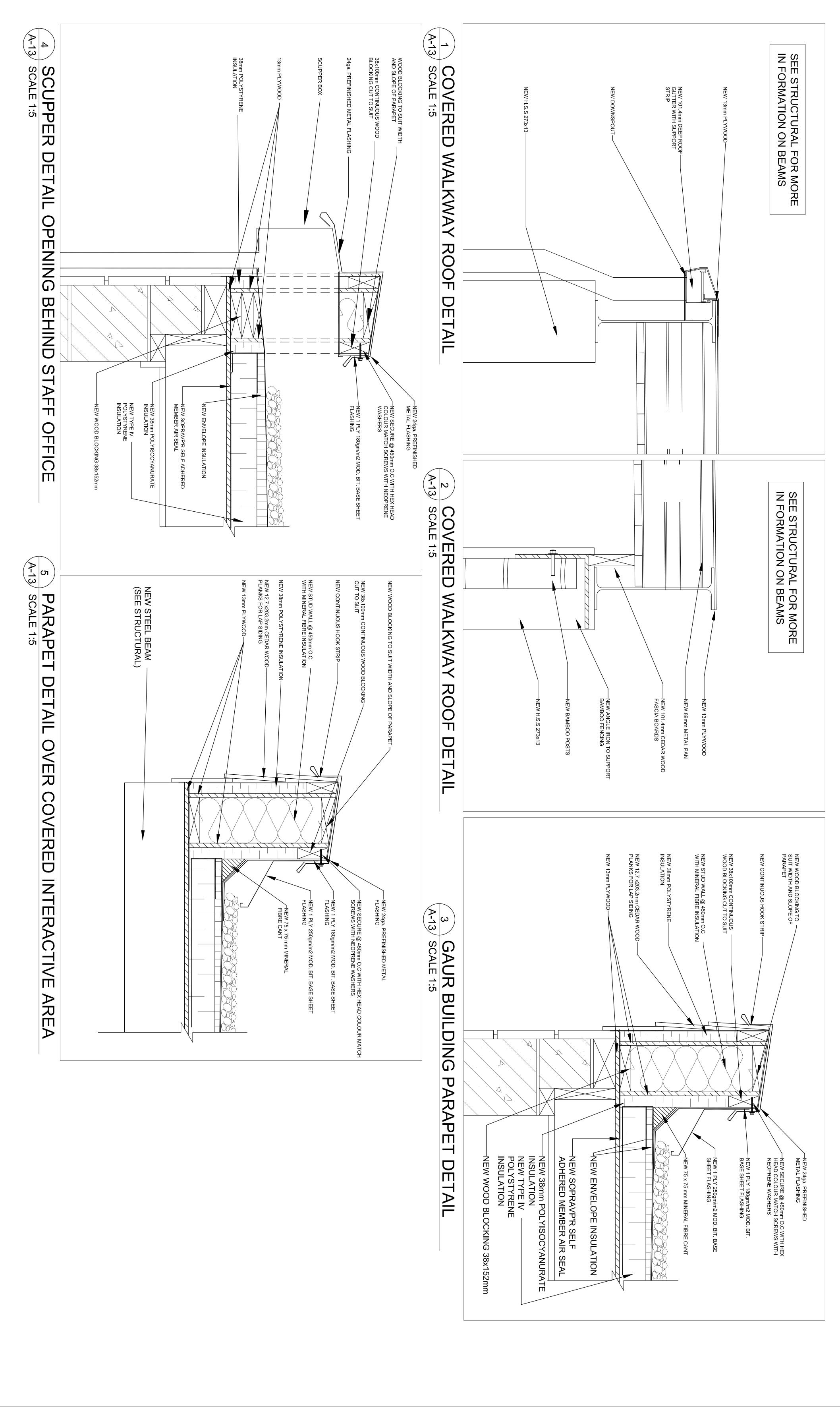
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Balind architect inc.
371 WINNETT AVE.
Toronto, Ontario
371 WINNETT AVE.
Toronto, Ontario
Winc May
1: 416.858 6001
e: dbalind@balindarch.com
PROFESSIONAL SEALS
REVISIONS MADE
FER ZOONS REQUEST
2017-08-16

REVISIONS MADE
FER ZOONS MADE
FER ZOONS REQUEST
2017-08-16

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JONATHAN GARISTO

DATE

JUNE 30TH 2017

PROJECT NO

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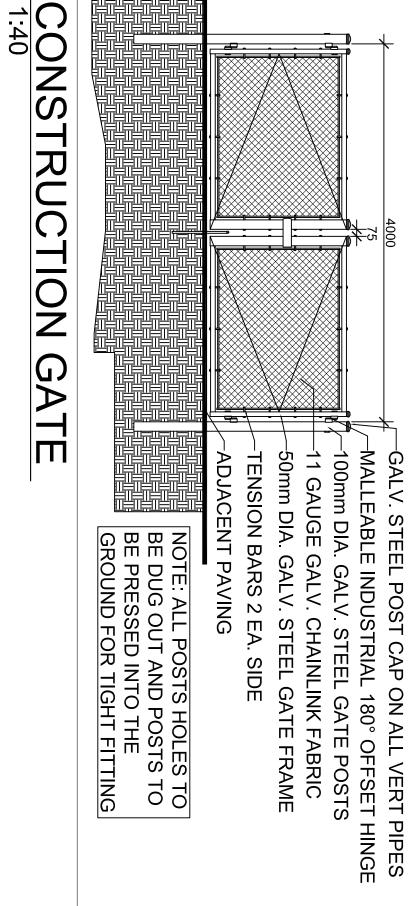
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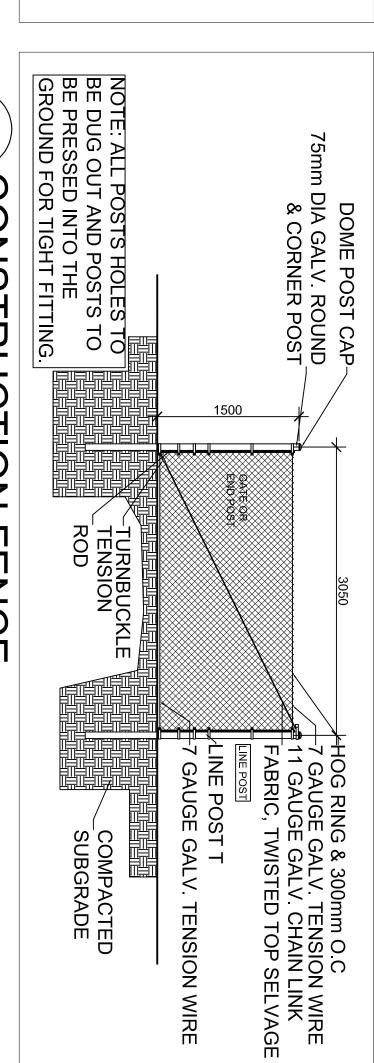
EXISTING N.T.S

SITE DEMOLITION NOTES

- CHAIN-LINK AND WIRE FENCING DISPOSED. TO BE REMOVED AND
- 2)ROCKS ROCKS SURROUNDING (TREES TO REMAIN) **TREES** TO BE TURNED OVER TO
- 3) POST TO BE REMOVED AND DISPOSED.
- 4) SHED WALLS AND ROOF SHED WALLS AND ROOF TO BE AND BASE COURSE MATERIALS TAKEN DOWN. ASPHALT TO BE DISPOSED.
- 6 METAL GATE 5 GRAVEL WOOD GATES TO BE TO BE TO BE TAKEN OUT AND DISPOSED. TAKEN OUT TAKEN OUT AND DISPOSED. AND DISPOSED.
- 8)BOARD DISPOSED. ANTING **FENCING** AND FLOWER BED WALLS TO BE TAKEN OUT AND DISPOSED TO BE TAKEN OUT AND
- (10) ASPHAL TO BE TAKEN OUT AND DISPOSED.



NOTE: WHERE POSSIBLE ALL DEMOLISHED MATERIALS TO BE DISPOSED OF AT AN APPROPRIATE RECYCLING FACILITY. A MANIFEST FOR DISPOSAL MUST BE PROVIDED FOR EACH ITEM. CONTRACTOR TO PROVIDE TORONTO ZOO WITH VOLUME/WEIGHT/ETC. OF DISPOSED MATERIALS.



$\langle \dot{b} | \omega \rangle$ 1:40 CONSTRUCTION FENCE

LEGEND CONSTRUCTION CONSTRUCTION GATE FENCE

DEMOLITION PLANS	DRAWING TITLE

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AS NOTED	CHECKED BY DAVID BALIND
	JONATHAN GARISTO

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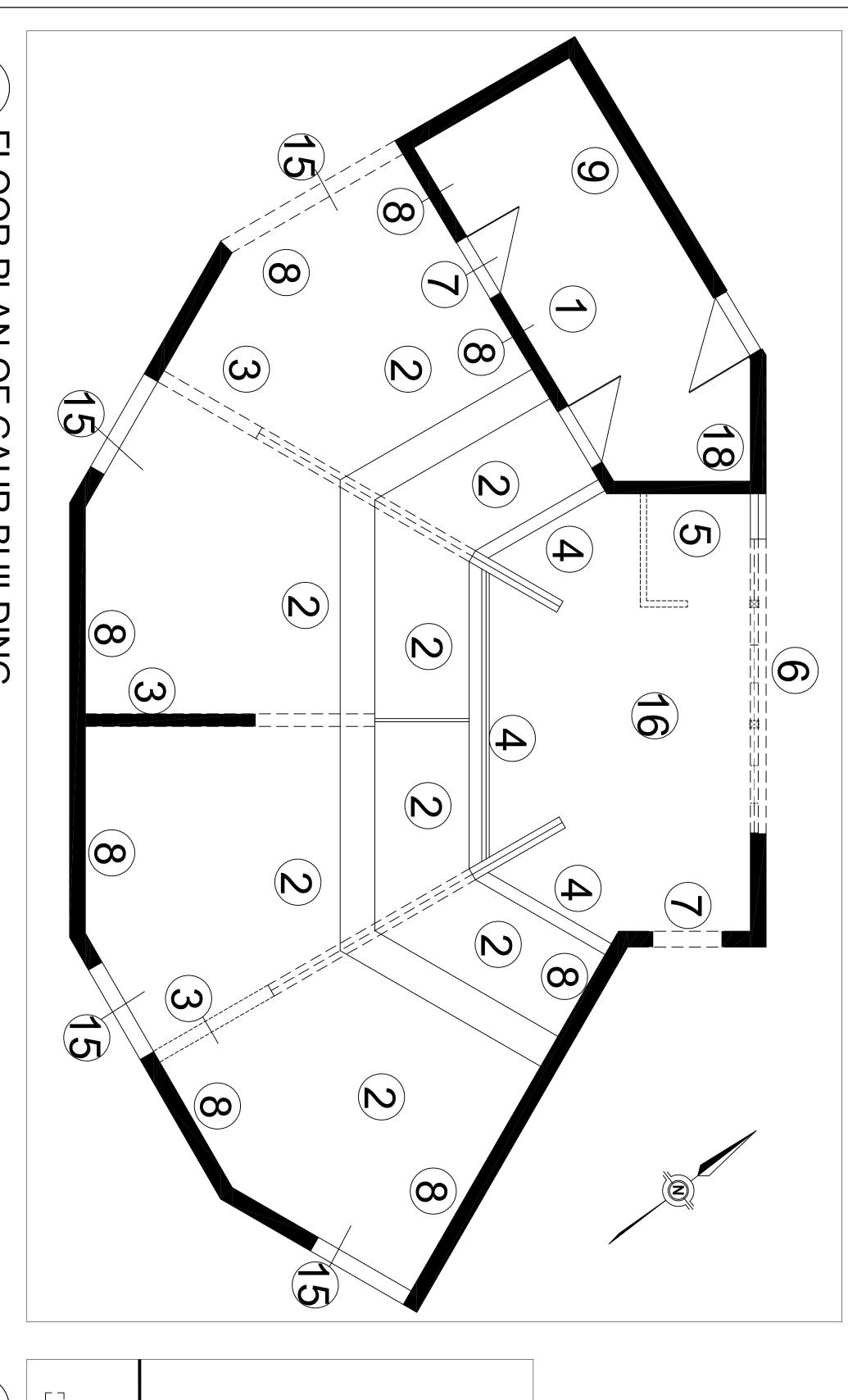
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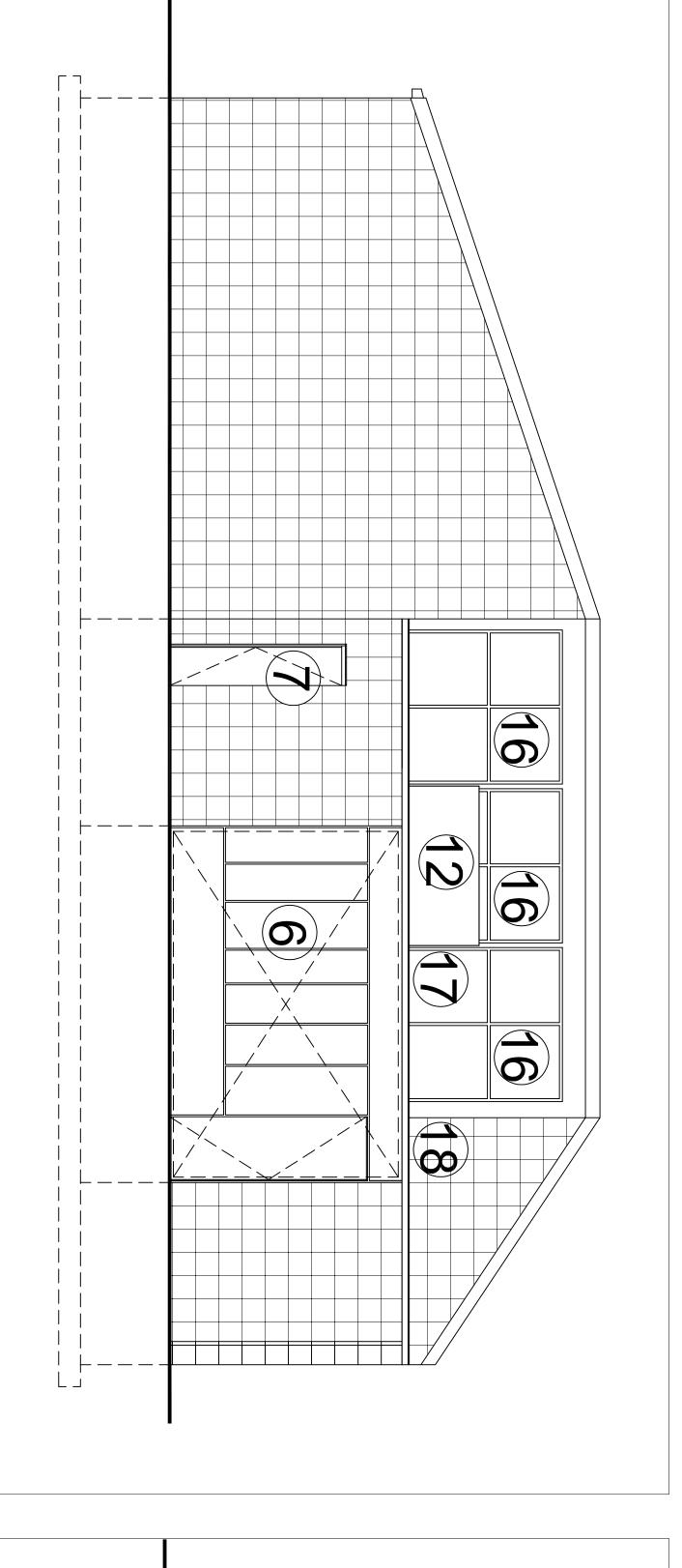
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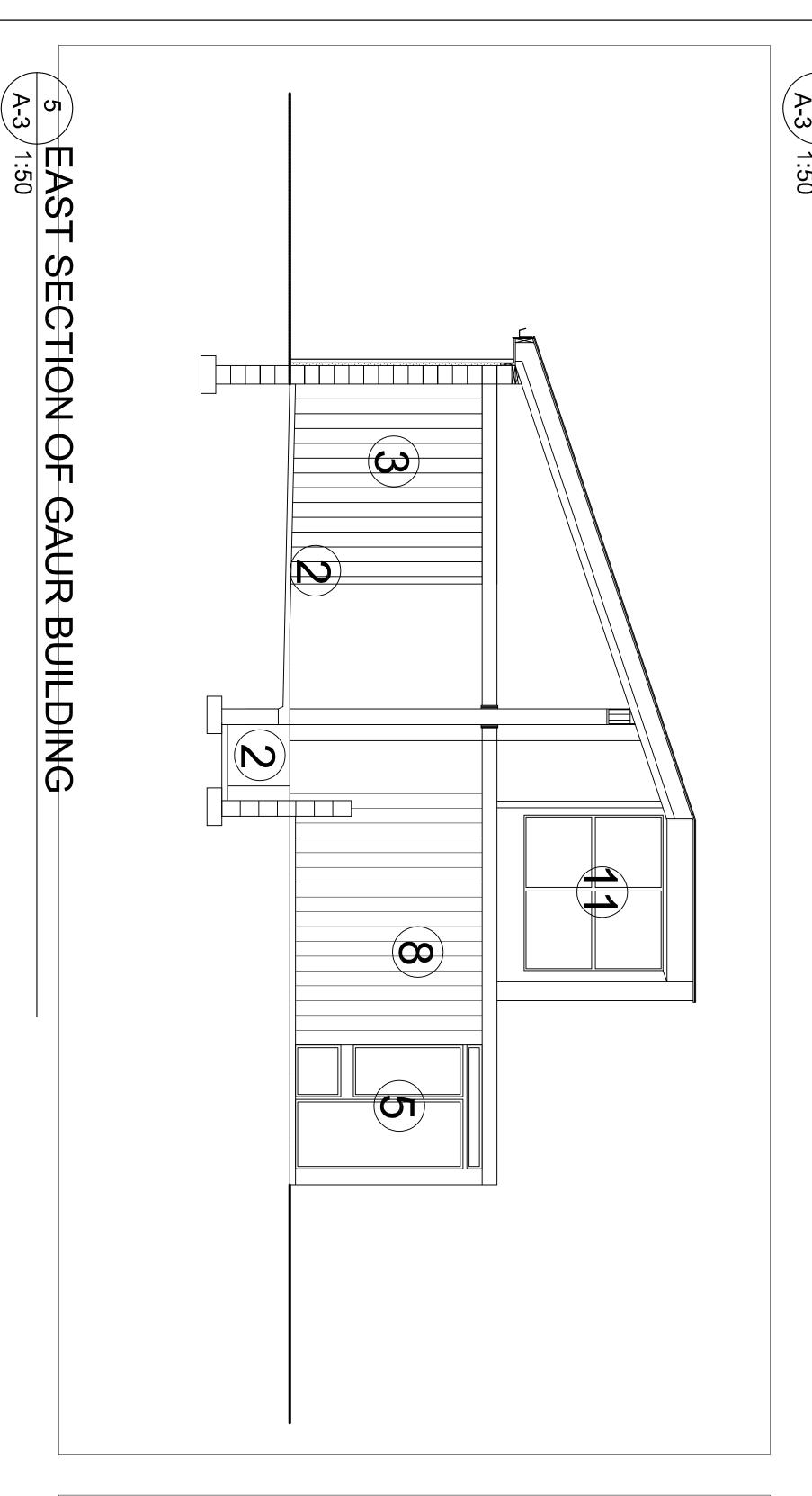
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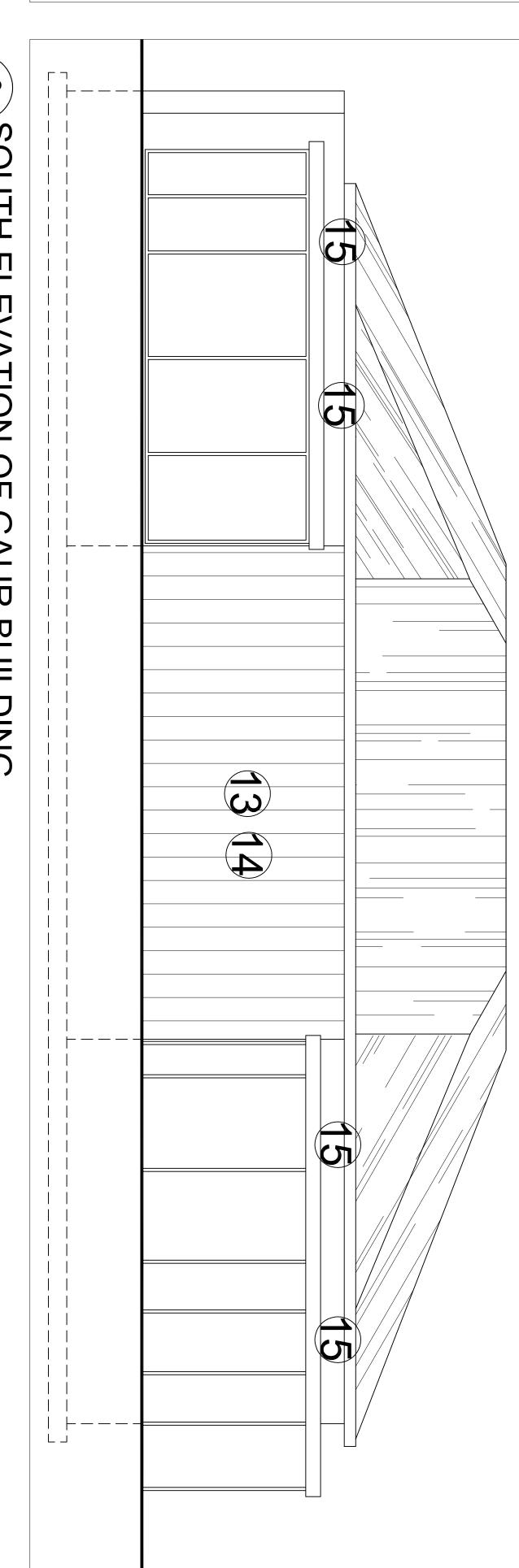


FLOOR PLAN OF GAUR BUILDING



NORTH 1:50 EAS: **ELEVATION OF GAUR** BUILDING





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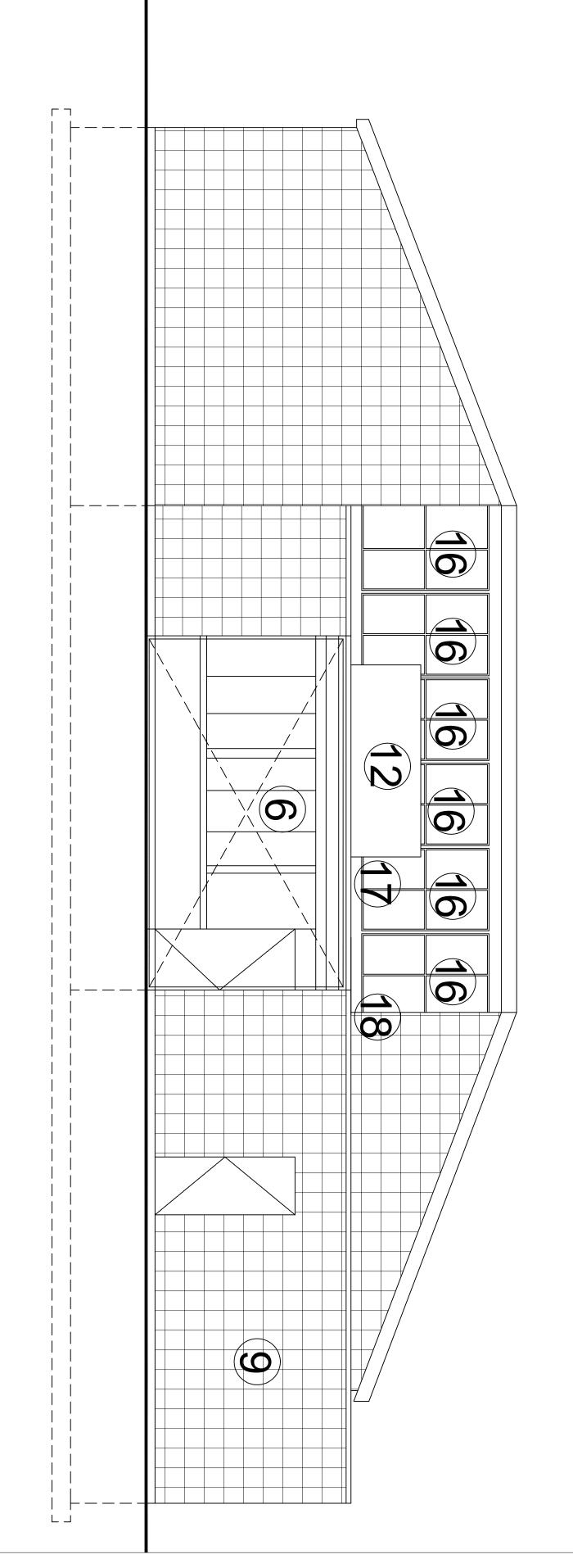
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OFESSIONAL

SEALS

SOUTH ELEVATION OF GAUR BUILDING



R E V I S I O N S
REVISIONS MADE
PER ZOO'S REQUEST
2017-06-29

D A I

E 2017

REVISIONS MADE PER ZOO'S REQUEST 2017-08-16

NORTH ELEVATION OF 1:50 **GAUR** BUILDING

GAUR DEMOLITION NOTES

ORANGUTAN OUTDOOR EXHIBIT

- WOOD CEILING TO BE TAKEN OUT AND DISPOSED.
 REMOVE CONCRETE FLOORING AND BLOCK TRENCH WALL AND UNDERNEATH COURSE MATERIALS AND DISPOSE OF CONTENTS
 WALL PARTITION FACADE AND ALL CONTENTS TO BE REMOVED AND TO BE DISPOSED OF. BEAMS ARE TO REMAIN.
 RAILING TO BE TAKEN OUT AND DISPOSED OF.
- **5** VESTIBULE WALLS DISPOSED OF TO BE REMOVED AND
- (6) GLASS WALL TO BE REMOVED AND CONTENTS TO BE DISPOSED OF.
- (7) DOOR AND JAM OF DOOR TO REMOVED AND CONTENTS TO BE DISPOSED OF.

- WOOD BOARDS TO BE TAKEN OFF THE WALLS AND DISPOSED OF.

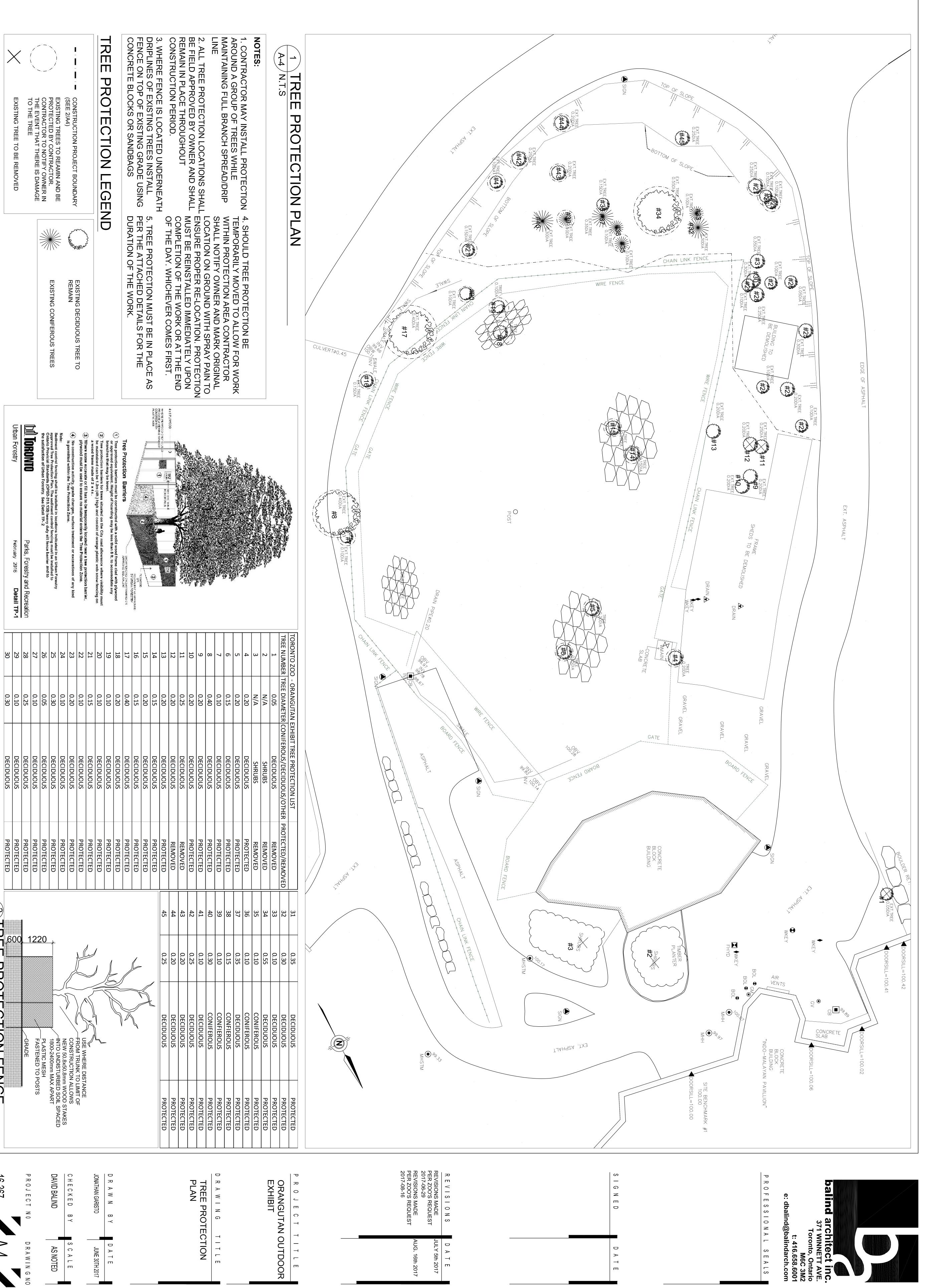
 © CREATE NEW DOOR OPENING. BLOCKS TO BE REMOVED FROM SITE AND DISPOSED OF.

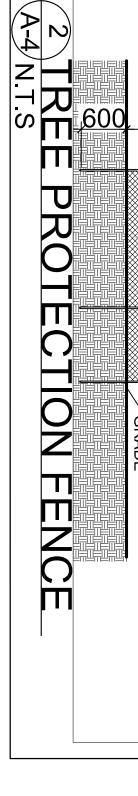
 OLD WINDOWS ARE TO BE TAKEN OFF SITE AND OLD WINDOWS ARE TO BE TAKEN OFF SITE AND OLD WINDOWS / DISPOSED OF.
- (1) WINDOW TO BE REMOVED TO MAKE SPACE FOR ORANGUTAN OPENING FROM ELEVATED WALKWAY (12) MECHANICAL UNIT TO BE DISCONNECTED AND TAKEN OUT AND DISPOSED OF.

 (13) EXTERIOR WOOD PANELS ARE TO BE REMOVED AND DISPOSED OF.

 (14) CREATE NEW OPENING IN EXISTING WALL. OLD BLOCKS TO BE TAKEN OFF SITE AND DISPOSED (6) CLERESTORY WINDOWS TO BE REMOVED AND REPLACED WITH NEW WINDOWS. OLD WINDOWS TO BE DISPOSED OF. (5) DOOR RAILS TO BE REMOVED AND DISPOSED OF. 9
- (7) FLAT ROOF TO BE REMOVED AND CONTENTS TO BE DISPOSED OF. NEW FLAT ROOF TO BE REBUILT IN ITS PLACE. (8) REMOVE GAS AND WATER LINES LINES FOR HVAC FROM ROOF TOP AND INTERIOR WALLS FROM BUILDING AND DISPOSED OF. GAUR DEMOLITION PLANS R A W I N G

16-367	PROJECT NO	DAVID BALIND	CHECKED BY	DRAWN BY JONATHAN GARISTO	
A-3	DRAWIN G NO	AS NOTED	SCALE	D A T E JUNE 30TH 2017	





<u>, 1220</u>

USE WHERE DISTANCE
—FROM TRUNK TO LIMIT OF
CONSTRUCTION ALLOWS
NEW 50.8x50.8mm WOOD ST
INTO UNDISTURBED SOIL S
1800-2400mm MAX APART

CHECKED

16-367 PROJECT A-4

DRAWIN G NO

DAVID BALIND AS NOTED

JONATHAN GARISTO D A T E JUNE 30TH 2017 C A L

TITLE

D A T E

SEALS

— Е

\UG. 16th 2017

D R A W N

PROTECTION L

EGEND

EXISTING TREES TO REAMIN AND BE PROTECTED BY CONTRACTOR.
CONTRACTOR TO NOTIFY OWNER IN THE EVENT THAT THERE IS DAMAGE TO THE TREE

CONSTRUCTION PROJECT BOUNDARY (SEE 2/A4)

EXISTING DECIDUOUS REMAIN

TO

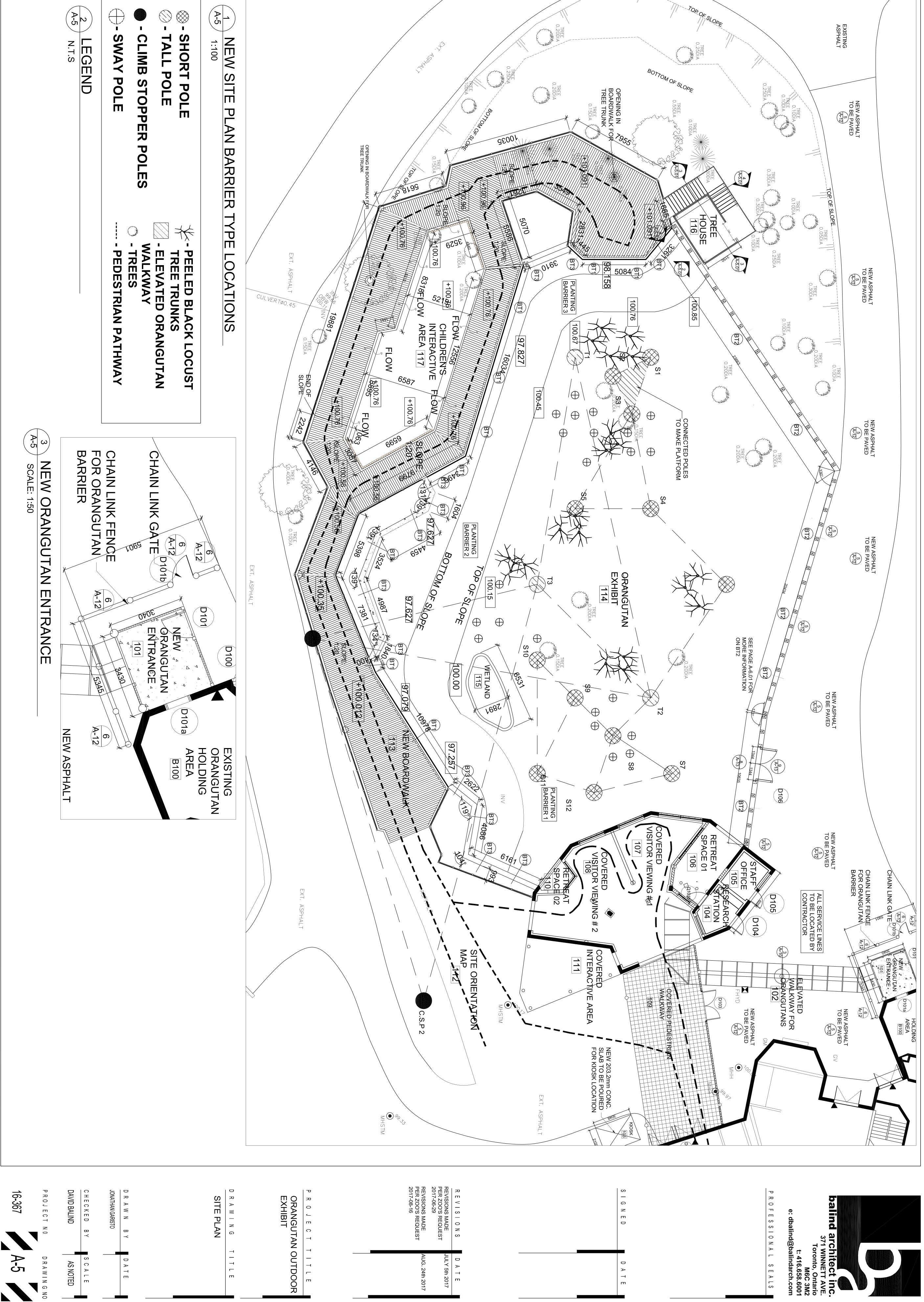
EXISTING CONIFEROUS

TREES

IORONTO

Parks, Forestry and Recreation
February 2016 Detail TP-1

EXISTING TREE TO BE REMOVED



A --Y 5th

E 2017

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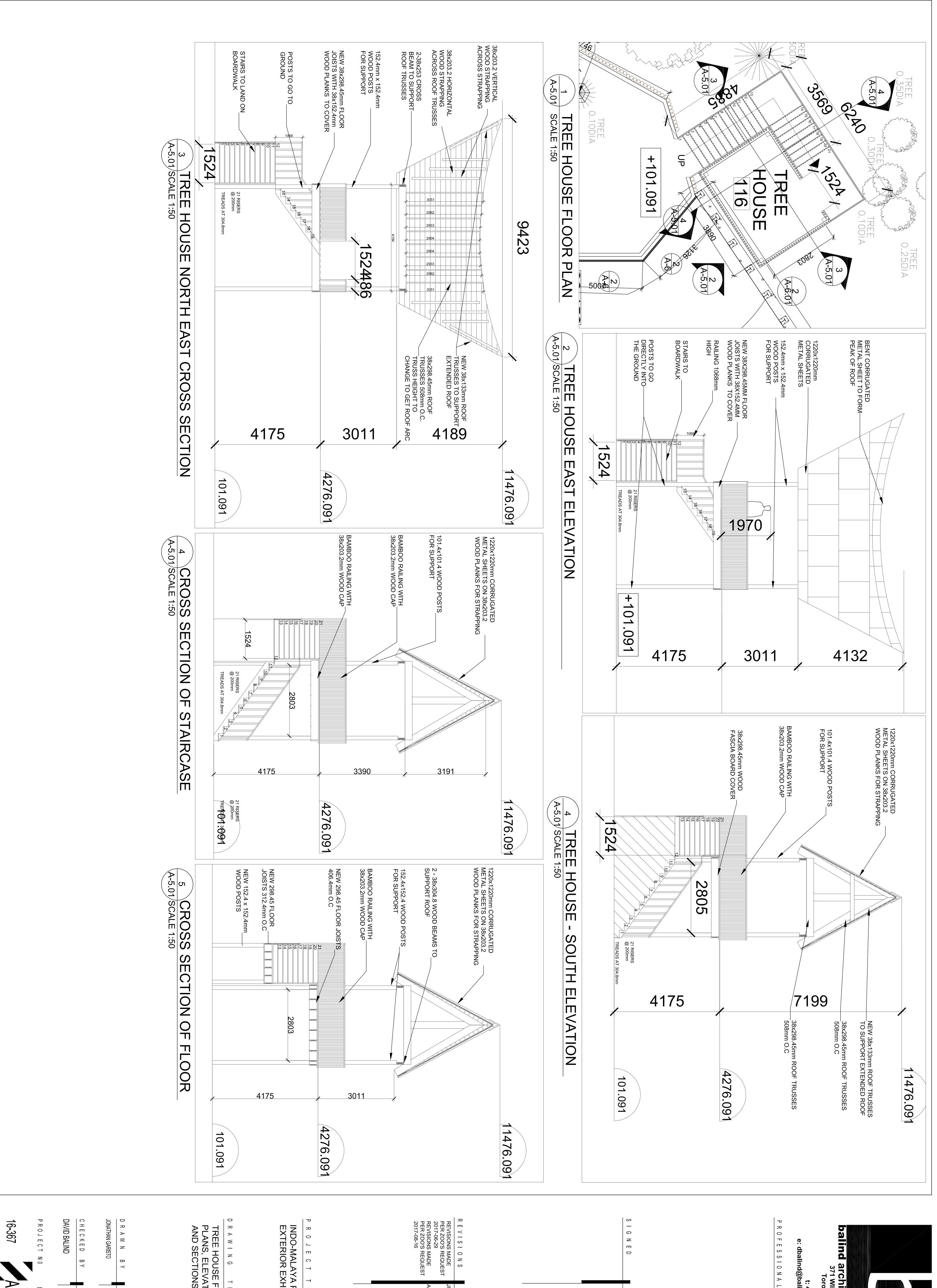


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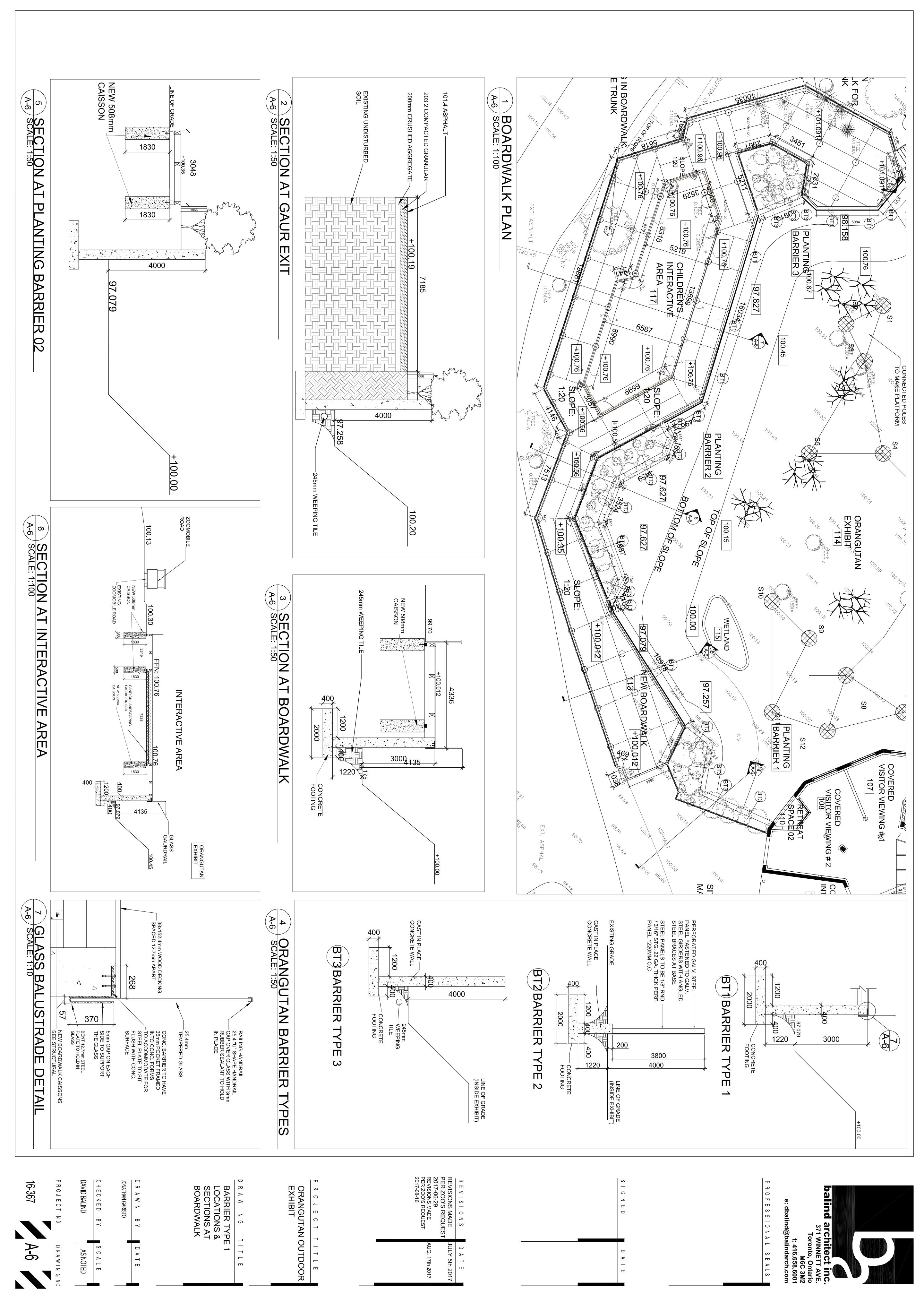
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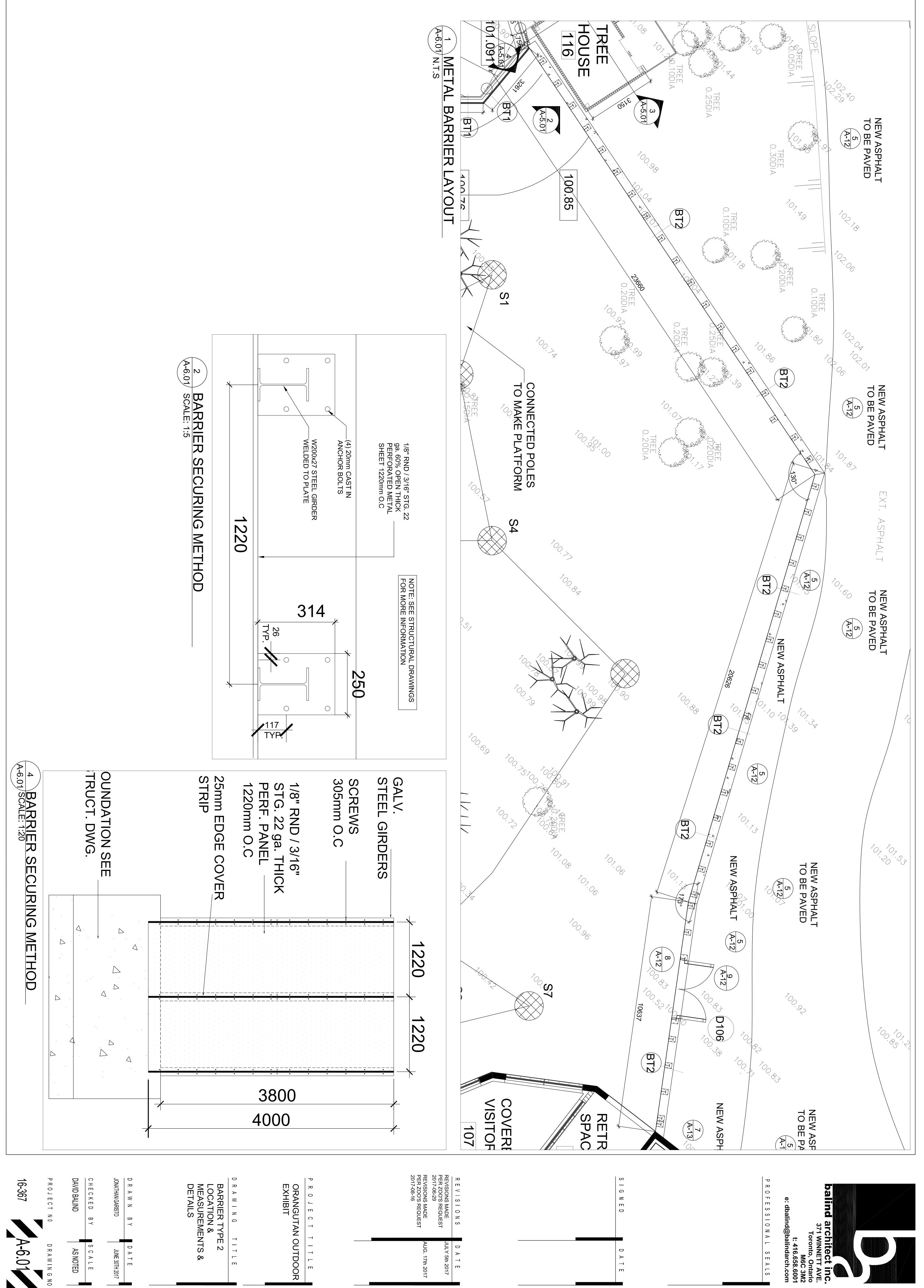


REVISIONS MADE
PER ZOO'S REQUEST
2017-06-29
REVISIONS MADE
PER ZOO'S REQUEST
2017-08-16 TREE HOUSE FLOOR PLANS, ELEVATIONS AND SECTIONS INDO-MALAYA PAVILION EXTERIOR EXHIBIT A-5.01 D A T E AS NOTED JUNE 30TH 2017 ш

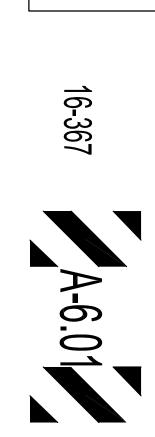
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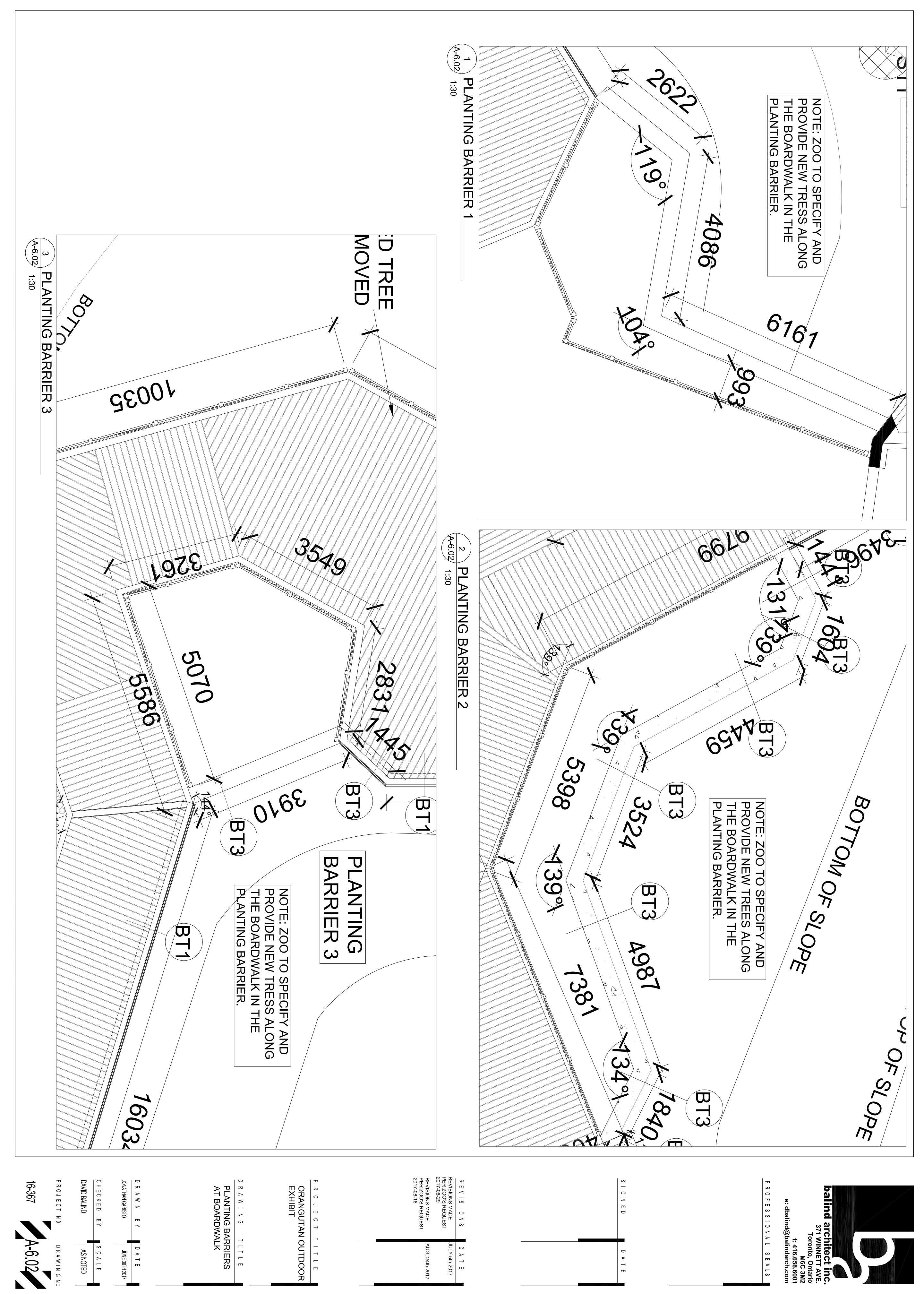


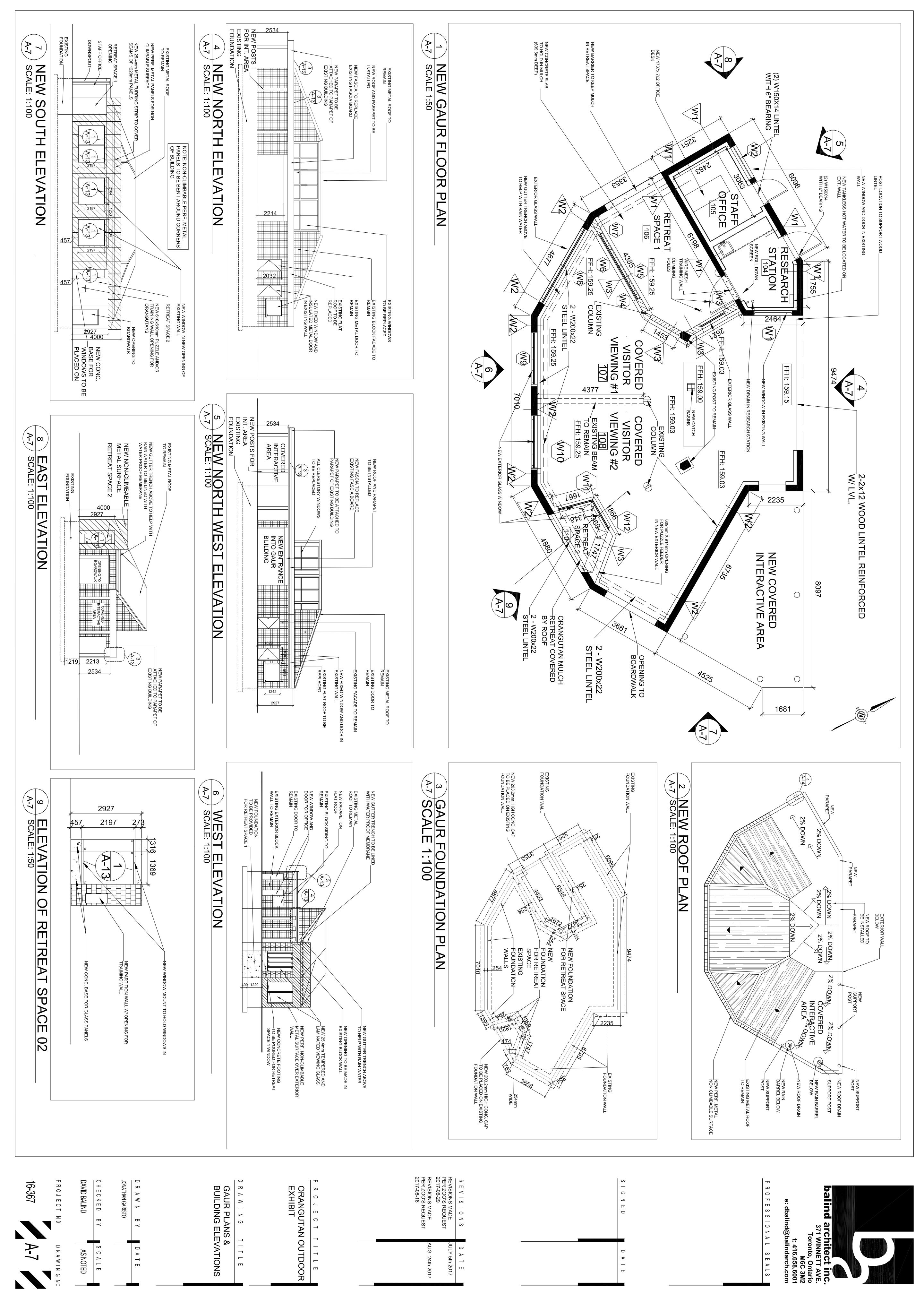


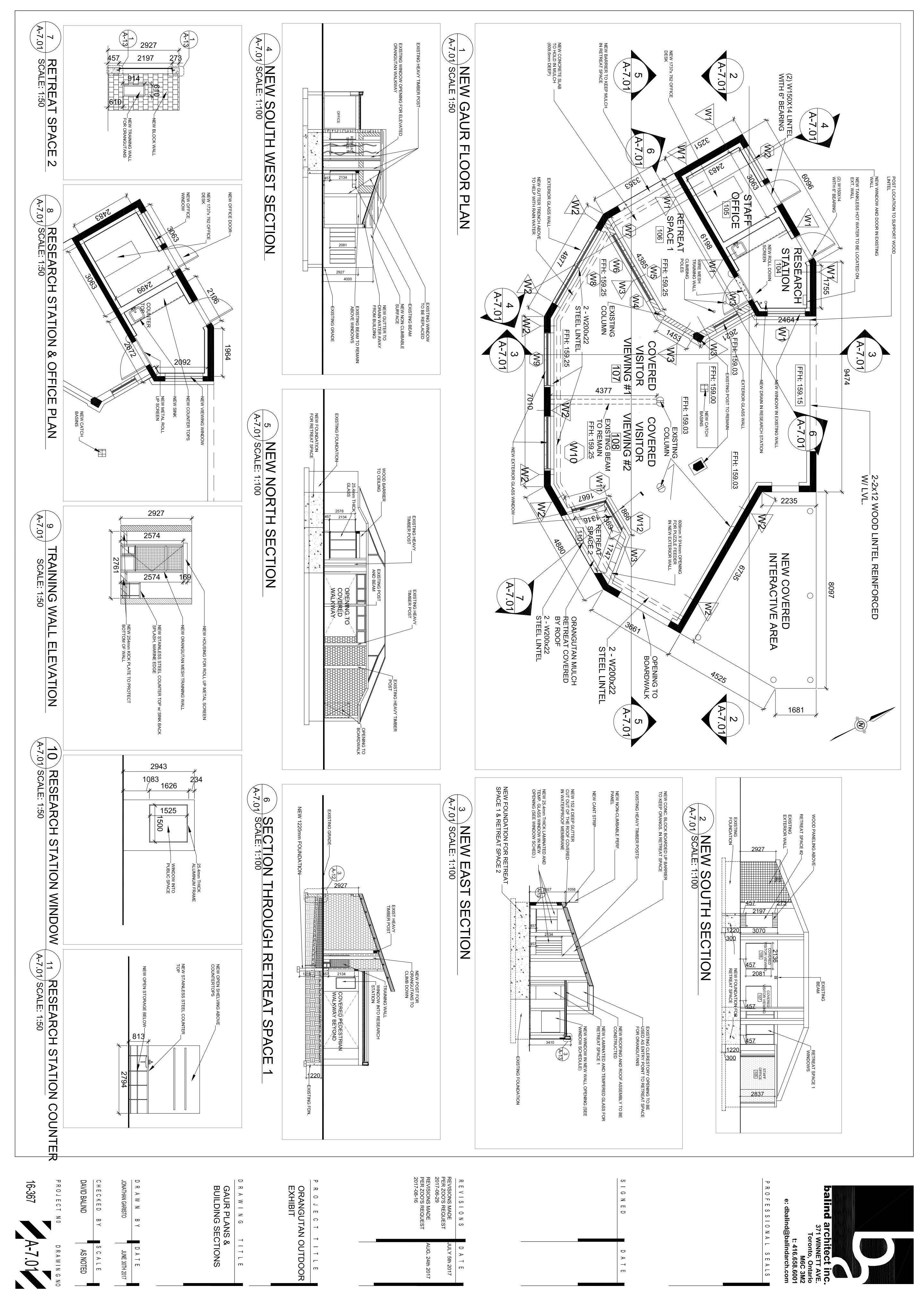
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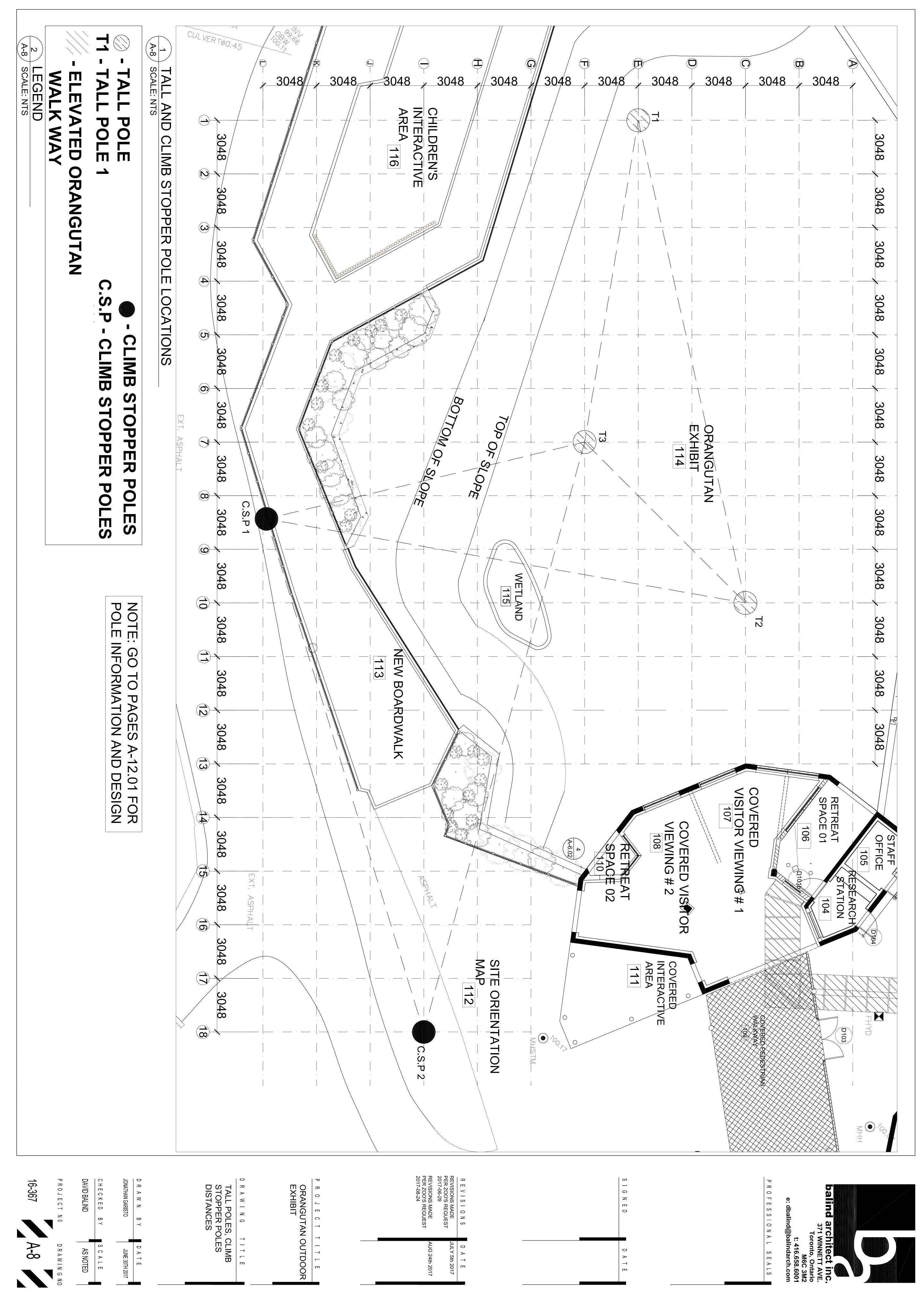


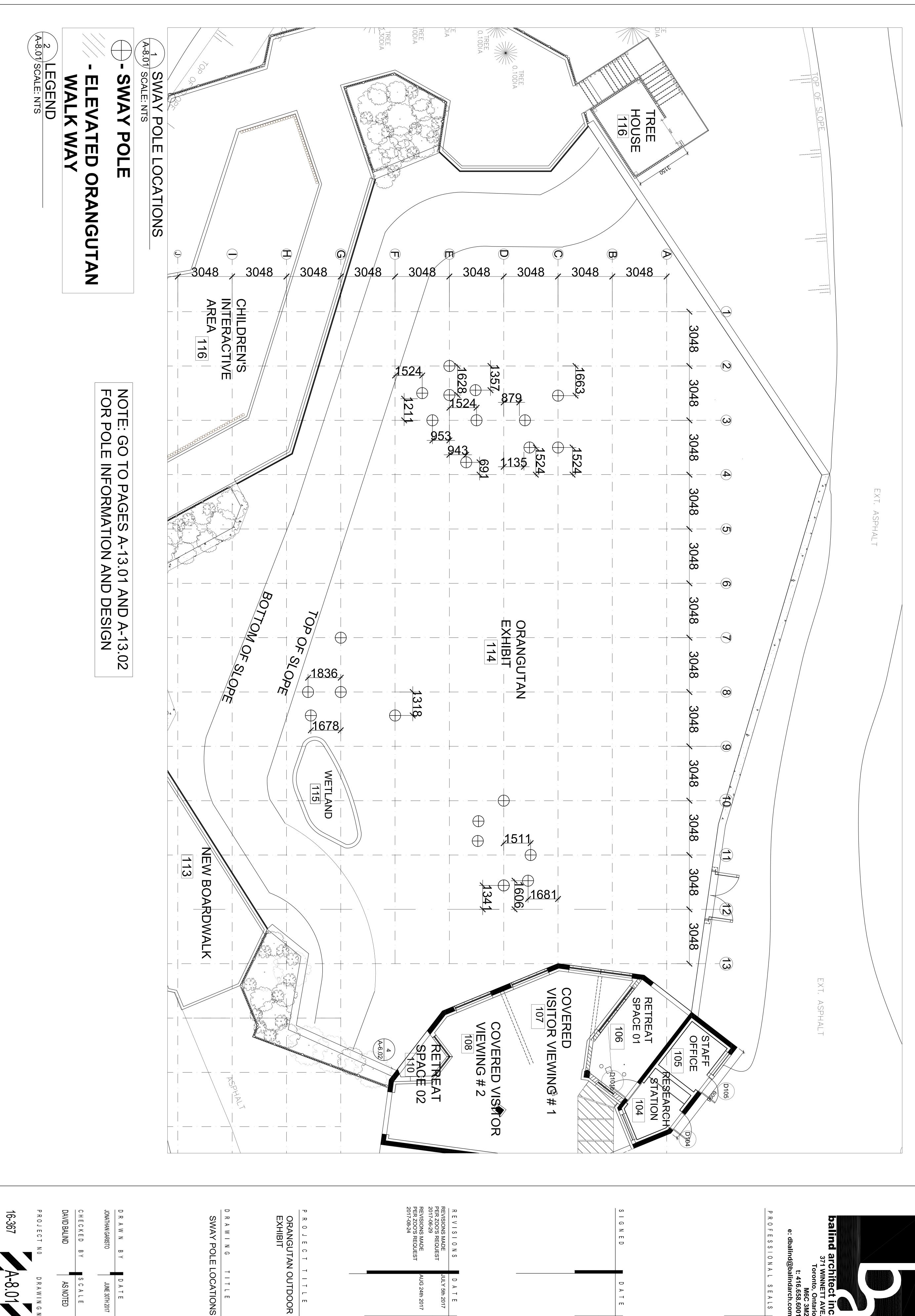
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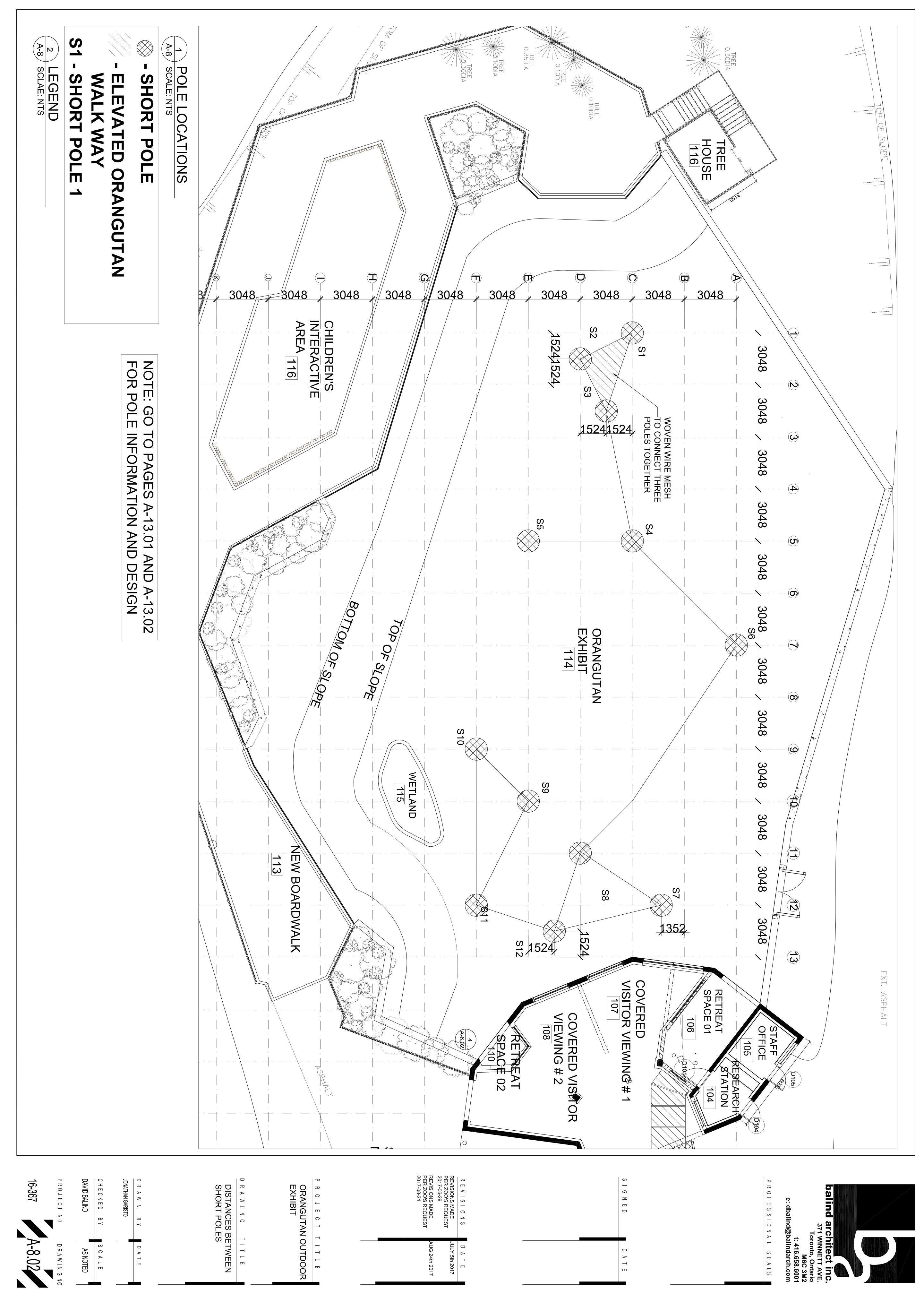
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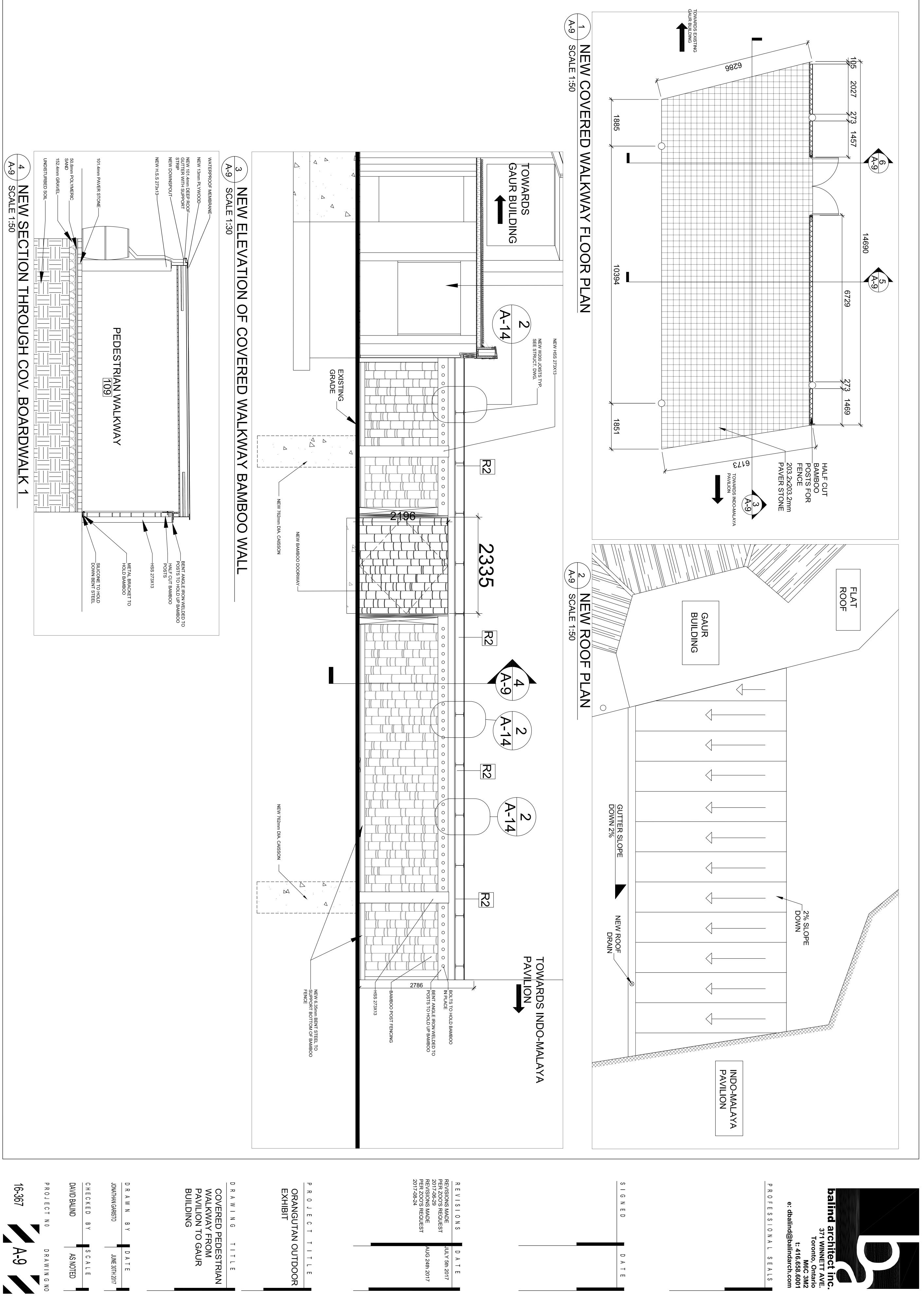
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DATE

JUNE 30TH 2017

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SEALS

INDO-MALAYA PAVILION EXTERIOR EXHIBIT GAUR BUILDING

General Electrical Specifications

1.0 GENERAL

- .1 THE ELECTRICAL CONTRACTOR SHALL COMPLETE ALL ELECTRICAL WORK IN ACCORDANCE WITH THE RELEVANT SECTIONS FOR ITEMS OF THE EXISTING BASE BUILDING SPECIFICATIONS AND DRAWINGS TO THE SATISFACTION OF THE BUILDING OWNER. THE BASE BUILDING DOCUMENTS WILL BE MADE AVAILABLE FOR REVIEW BY THE BUILDING OWNER IF SO REQUIRED.
- .2 THE DRAWINGS FOR THE WORK OF THIS DIVISION ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK, GENERAL ARRANGEMENT AND LOCATION OF THE EQUIPMENT, APPROXIMATE SIZES AND LOCATIONS OF THE EQUIPMENT AND OUTLETS. FOLLOW THESE DRAWINGS IN EXECUTION OF THE WORK. CONSULT GENERAL CONSTRUCTION DRAWINGS TO BECOME FAMILIAR WITH ALL CONDITIONS RELATING TO THE INSTALLATION AND TO VERIFY SPACES IN WHICH THE WORK WILL BE INSTALLED REPORT ANY DISCREPANCIES BETWEEN THE INTERIOR DESIGNER DRAWINGS AND THE ENGINEER'S DRAWINGS AND THE ENGINEER'S DRAWING TO THE ENGINEER AND ARCHITECT PRIOR TO INSTALLATION.
- WHENEVER DIFFERENCES OCCUR BETWEEN PLANS AND DIAGRAMS OR SCHEMATICS, AND BETWEEN THE SPECIFICATIONS AND DRAWINGS, THE MAXIMUM CONDITION SHALL GOVERN, AND THE TENDER SHALL BE BASED ON WHICHEVER IS THE GREATER AMOUNT.
- .4 KEEP A RECORD SET OF DRAWINGS ON THE SITE ON WHICH SHALL BE CLEARLY INDICATED, THE EXACT LOCATION OF ALL OUTLETS, LUMINAIRES, FEEDER RUNS, PANELS, JUNCTION BOXES, PULL BOXES, etc. TWO COPIES OF THE RECORD DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT OR THE INTERIOR DESIGNER UPON COMPLETION OF THE PROJECT.
- .5 THE CONTRACTOR SHALL VISIT THE SITE AND EXAMINE ALL DRAWINGS CAREFULLY TO DETERMINE THE EXTENT OF RENOVATIONS IN THE EXISTING BUILDING. EXAMINE THE SITE AND TOGETHER WITH DRAWINGS DETERMINE AND INCLUDE IN THE TOTAL PRICE OF THE TOTAL COST OF LABOUR AND MATERIAL TO DISCONNECT. REMOVE. RELOCATE. BLANK OFF, RE-ROUTE, OR MAKE SAFE ALL EXISTING CONDUITS AND WIRE, JUNCTION BOXES, LUMINAIRES, AND EQUIPMENT REQUIRED.
- .6 NO ALLOWANCE WILL BE MADE FOR OBVIOUS CONSIDERATIONS WHICH MAY HAVE BEEN OVERLOOKED.
- .7 EXAMINE THE STRUCTURAL, MECHANICAL, AND ARCHITECTURAL DRAWINGS TO ENSURE THAT THE WORK OF THIS DIVISION CAN BE SUCCESSFULLY COMPLETED WITH NO INTERFERENCES OR DISCREPANCIES.
- .8 EXAMINE THE WORK OF THE OTHER TRADES. AS THEY AFFECT THIS DIVISION, AND REPORT IMMEDIATELY TO THE ARCHITECT OR INTERIOR DESIGNER ANY DEFECT OR INTERFERENCE THAT MAY AFFECT THE WORK OF THIS DIVISION. OR THE GUARANTEE OF THIS WORK.
- .9 THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL NECESSARY PERMITS AND INSPECTIONS AS REQUIRED OR REQUESTED BY THE AUTHORITIES HAVING JURISDICTION. ONCE THE ELECTRICAL WORK HAS BEEN COMPLETED AND ACCEPTED BY THE OWNER. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE OWNER WITH CERTIFICATES VERIFYING THAT THE WORK HAS BEEN COMPLETED IN ACCORDANCE WITH ALL APPLICABLE CODES. BUILDING STANDARDS. AND ALL AUTHORITIES HAVING JURISDICTION.
- .10 THE ELECTRICAL WORK SHALL BE CARRIED OUT AND PERFORMED WITH QUALITY WORKMANSHIP. TO THE SATISFACTION OF THE CONSULTANT, OWNER, AND ARCHITECT OR INTERIOR DESIGNER, ANY UNSATISFACTORY WORK SHALL BE RE-DONE OR REPLACED BY THIS DIVISION WITHOUT EXTRA COST TO THE OWNER.
- .11 THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE OWNER WITH A ONE YEAR WRITTEN WARRANTY, COMMENCING ON THE DATE OF ACCEPTANCE. THE WARRANTY SHALL COVER THE COMPLETE ELECTRICAL INSTALLATION. THE ELECTRICAL CONTRACTOR SHALL REPAIR AND/OR REPLACE ANY DEFECTS IN THE MATERIALS OR WORKMANSHIP THAT OCCUR DURING THE WARRANTY PERIOD AT A TIME CONVENIENT TO, AND AT NO EXTRA COST TO, THE OWNER.
- 12 PROVIDE THE OWNER AND ENGINEER WITH ONE SET OF 'AS-BUILT' PRINT RECORD DRAWINGS PREPAREI ON AUTOCAD 2015 (OR COMPATIBLE FORMAT), INCLUDING A COPY OF THE DRAWINGS ON DISKETTE. PROVIDE THE ENGINEER WITH ONE SET OF BLACK LINE PRINTS OF THE 'AS-BUILT' RECORD DRAWINGS THESE DRAWINGS SHALL ONLY BE DELIVERED TO THE ENGINEER AND "OWNER" AFTER COMPLETION OF THE WORK AND AFTER ALL DEFICIENCIES HAVE BEEN CORRECTED.
- .13 THE ARCHITECT OR INTERIOR DESIGNER SHALL HAVE THE RIGHT, AT ANY TIME, TO CHANGE THE LOCATION OF ANY OUTLET OR FLOORBOX UP TO TEN FEET WITHOUT EXTRA COST TO THE OWNER. PROVIDED THAT NOTIFICATION OF SUCH CHANGES OCCUR PRIOR TO INSTALLATION.
- .14 IN CASE EXTRA WORK OF ANY KIND IS REQUIRED, OBTAIN WRITTEN INSTRUCTIONS FROM THE ARCHITECT OR INTERIOR DESIGNER, AND THE ENGINEER BEFORE PROCEEDING. PAYMENT WILL BE MADE AT A FAIR AND REASONABLE RATE ONLY FOR AUTHORIZED EXTRAS. IN THE CASE OF OMISSIONS, THE SAME PROCEDURE SHALL APPLY, AND A DECREASE MADE.
- .15 THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR DISCONNECTING AND REMOVING ALL ELECTRICAL EQUIPMENT FROM AREAS BEING ALTERED OR DEMOLISHED. WIRING, CONDUIT, AND ALL OTHER EQUIPMENT REQUIRED TO MAINTAIN SERVICE IN OTHER PARTS OF THE BUILDING SHALL BE TEMPORARILY SUPPORTED, RE-ROUTED, SERVICED, OR RELOCATED AS REQUIRED. OBSOLETE OR REDUNDANT CONDUITS AND CABLES SHALL BE DISCONNECTED FROM THEIR SOURCE OF SUPPLY AND REMOVED FROM THE SITE, EXCEPT THEY SHALL BE CUT-FLUSH WHERE IMBEDDED IN STRUCTURE AND THE FINISH SHALL BE PATCHED TO MATCH THE EXISTING CONDITIONS. ALL EXISTING WIRING THAT CANNOT BE REMOVED SHALL BE DISCONNECTED FROM ITS SUPPLY, BLANKED-OFF, AND OTHERWISE
- .16 SUBMIT SHOP DRAWINGS OF LUMINAIRES, PANELBOARDS, AND OTHER MAJOR ELECTRICAL EQUIPMENT, AS THEY APPLY TO THIS PROJECT, OR AS REQUESTED BY ENGINEER. EACH SHOP DRAWING SHALL BE CHECKED AND STAMPED AS BEING CORRECT BY THE ELECTRICAL AND GENERAL CONTRACTOR PRIOR TO SUBMISSION TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS NOT STAMPED AS SUCH WILL NOT BE REVIEWED AND WILL BE RETURNED AND DESIGNATED AS "REVISE AND RESUBMIT"
- .17 THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DISRUPTION TO THE EXISTING SERVICES. ALL THE EXISTING BUILDING SERVICES MUST BE KEPT IN OPERATION AT ALL TIMES. ARRANGE WORK IN SUCH A MANNER THAT INTERRUPTIONS IN SERVICES OCCUR ONLY AT SCHEDULED TIMES, AND WITH WRITTEN PERMISSION BY THE OWNER. UNAVOIDABLE INTERRUPTIONS SHALL BE SCHEDULED WITH THE ARCHITECT OR INTERIOR DESIGNER AT LEAST 48 HOURS IN ADVANCE. OVERTIME WORK THAT MAY BE REQUIRED TO TIE-IN SERVICES AT NIGHT OR ON WEEKENDS SHALL BE INCLUDED IN THE TENDER AMOUNT.

- .18 ALL NEW SERVICES WHICH PENETRATE THE FLOOR SLAB OR FIRE—RATED WALLS AND CEILINGS SHALL BE INSTALLED IN RIGID STEEL CONDUIT AND SHALL BE SEALED WITH AN APPROVED, NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT.
- .19 ALL WORK SHALL BE SCHEDULED AND COORDINATED TO AVOID INTERFERENCES WITH OTHER TRADES DURING AND AFTER CONSTRUCTION.
- .20 PROVIDE TEMPORARY ELECTRICAL POWER FOR THE WORK OF THIS DIVISION AND OTHER TRADES AS REQUIRED BY THE GENERAL CONTRACTOR OR OWNER.

2.0 WORK IN EXISTING BUILDING

- .1 THE WORK AS SPECIFIED OR INDICATED INCLUDES REVISIONS TO THE EXISTING BUILDING AND ITS RELATED SYSTEMS. WHERE INTERFACING COMPONENTS AND EQUIPMENT ARE REQUIRED TO COMPLETE THE WORK, INCLUDE THESE IN THE TENDER AMOUNT REGARDLESS OF WHETHER THEY ARE INDICATED ON .14 FUSES SHALL BE GOULD-SHAWMUT, DUAL-ELEMENT TYPE, SIZED AS NOTE ON THE DRAWINGS. THE PLANS. ENSURE THAT ALL SUCH COMPONENTS ARE FULLY COMPATIBLE WITH THE EXISTING BASE-BUILDING SYSTEMS.
- OBTAIN WRITTEN APPROVAL FROM BUILDING OWNER TO PENETRATE ANY STRUCTURAL SURFACES OR FLOOR SLABS. AND CARRY OUT THE PENETRATIONS IN ACCORDANCE WITH TENANT REQUESTS. THE CONTRACTOR SHALL REPLACE OR REPAIR ANY ITEMS WHICH ARE DAMAGED DUE TO THIS WORK, AT NO EXTRA COST TO THE BUILDING OWNER.
- 3 CAREFULLY EXAMINE THE SITE AND CONDITIONS OF THE PROPOSED WORK TOGETHER WITH THE WORK OF ALL OTHER TRADES AND INCLUDE IN THE TENDER AMOUNT ALL ASSOCIATED COSTS SUCH AS; CUTTING, PATCHING, RE-ROUTING AND REPOSITIONING OF ELECTRICAL EQUIPMENT AND WIRING THAT ARE NECESSARY TO ACCOMMODATE THE ARCHITECTURAL RENOVATIONS AND ELECTRICAL SYSTEMS INDICATED. NO EXTRAS WILL BE ALLOWED FOR THE RELOCATING OR REPOSITIONING OF EXISTING ELECTRICAL SERVICES THAT WERE EXPOSED, OR KNOWN TO EXIST, AT THE TIME OF TENDER.
- .4 NEW CONDUITS AND OTHER NEW SERVICES SHALL BE CAREFULLY ROUTED SO THAT THEY DO NOT INTERFERE WITH ANY EXISTING INSTALLATIONS. ANY EXISTING CONDUITS, CABLE TRAYS, BUS DUCTS, OR OTHER SERVICES THAT INTERFERE WITH THE NEW INSTALLATION SHALL BE RELOCATED UNDER THIS
- .5 REMOVE AND/OR RELOCATE EXISTING LUMINAIRES, CONDUIT AND WIRING, WIRING DEVICES, AND OTHER EQUIPMENT AS NECESSARY TO ACCOMMODATE THE NEW CONSTRUCTION INCLUDING NEW CEILING AND PARTITION LAYOUTS. EXISTING CONDUIT, WIRING AND ELECTRICAL OUTLETS THAT ARE NOT BEING REUSED SHALL BE CUT BACK IN AN APPROVED MANNER SO THAT THE FINISHED WORK IS CLEAN AND NEAT IN APPEARANCE. PATCH SURFACE TO MATCH EXISTING.
- .6 ALL BASE-BUILDING LUMINAIRES, TRANSFORMERS, PANELBOARDS, AND DISCONNECT SWITCHES WHICH ARE REMOVED SHALL BE HANDED OVER TO THE BUILDING OWNER. SUCH EQUIPMENT SHALL BE DELIVERED TO THE BUILDING OWNER'S SITE STORAGE AREAS AS DIRECTED BY TENANT AT NO EXTRA COST. DELIVERY TO OFF-SITE BUILDING OWNER'S STORAGE AREAS SHALL BE EXTRA TO THE CONTRACT AND SHALL BE ARRANGED BETWEEN THE CONTRACTOR AND THE BUILDING OWNER.
- .7 REMAINING REMOVED EQUIPMENT AND MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UPON COMPLETION OF THE WORK, UNLESS NOTED OTHERWISE.

3.0 NEW CONSTRUCTION

FREE ACCESSIBILITY.

- THE CONSTRUCTION SITE SHALL BE KEPT CLEAN AND ANY DEBRIS OR CONSTRUCTION MATERIAL SHALL BE REMOVED FROM THE SITE THROUGHOUT THE CONSTRUCTION PERIOD AND ON COMPLETION OF THE WORK AS DIRECTED BY THE OWNER'S AND TENANT'S RESPECTIVE REPRESENTATIVE.
- 2 BRANCH CIRCUIT WIRING SHALL BE AS FOLLOWS:
- A. 1200 WATTS MAXIMUM ON 15A-1P CIRCUIT BREAKER (AT 120 VOLT) B. USE #12AWG FOR RUNS UP TO 70ft (21m)
- B. USE #10AWG FOR RUNS FROM 71ft (21m) UP TO 120ft (36m)
- ALL CONDUCTORS SHALL BE STRANDED OR SOLID COPPER SIZED AS SHOWN WITH TYPE R90, X-LINK INSULATION AND A MINIMUM WIRE SIZE OF #12AWG (20 AMP RATED).

.3 ALL WIRING IN CEILINGS AND PARTITIONS SHALL BE IN EMT CONDUIT. ALL WIRING IN SLAB SHALL BE

- IN RIGID STEEL CONDUIT. ARMOURED CABLE MAY BE PERMITTED FOR DOWNDROPS FROM JUNCTION BOXES TO LUMINAIRES AND IN PARTITIONS, UNLESS PROHIBITED BY CODE OR BUILDING STANDARDS. ARMOURED CABLE SHALL NOT BE USED IN ANY EXPOSED AREAS, UNLESS SPECIFICALLY NOTED. .4 ACCESS PANELS MAY BE PROVIDED IN CEILINGS WHERE JUNCTION BOXES CANNOT BE LOCATED IN
- ACCESSIBLE LOCATIONS PROVIDED THAT APPROVAL HAS BEEN OBTAINED FROM THE ARCHITECT OR INTERIOR DESIGNER.

.5 ALL ELECTRICAL EQUIPMENT SHALL BE CSA OR CULC LISTED AND SHALL BEAR THE CSA OR CULC

- STAMP AND BE OF COMMERCIAL GRADE. .6 ALL ELECTRICAL EQUIPMENT SHALL OPERATE WITHOUT OBJECTIONABLE NOISE OR VIBRATION AND SHALL
- BE RECTIFIED TO THE OWNER'S SATISFACTION.

.7 EXPOSED COVERPLATES SHALL BE INSTALLED AFTER FINAL PAINTING, FLUSH WITH THE WALL.

.8 LOCAL SWITCHES SHALL BE 20 AMP-RATED, SPECIFICATION GRADE, VOLTAGE AS INDICATED. EXACT LOCATION AND MOUNTING HEIGHT TO BE COORDINATED WITH ARCHITECT OR INTERIOR DESIGNER PRIOR

TO ROUGHING-IN. MOUNTING HEIGHT MUST CONFIRM TO BUILDING CODE REQUIREMENTS FOR BARRIER-

.9 DUPLEX RECEPTACLES SHALL BE 120VOLT, 15 AMP-RATED, SPECIFICATION GRADE, UNLESS OTHERWISE NOTED. VERIFY EXACT LOCATION, MOUNTING HEIGHT, AND COLOUR WITH ARCHITECT OR INTERIOR DESIGNER PRIOR TO INSTALLATION.

- .10 ALL GROUNDING SHALL CONFORM TO THE CANADIAN ELECTRICAL CODE AND LOCAL AUTHORITY
- .11 EXISTING PANELBOARD DIRECTORIES SHALL BE REPLACED WITH NEW TYPE-WRITTEN DIRECTORIES WHICH REFLECT THE LATEST REVISIONS. EXISTING PANELBOARDS WITHOUT DIRECTORIES AND NEW PANELBOARDS SHALL BE PROVIDED WITH TYPE-WRITTEN DIRECTORIES, WITH LABELING BASED ON ROOM NUMBERS AND/OR LOCATION.
- .12 NEW PANELBOARDS SHALL MATCH BASE-BUILDING STANDARDS WITH CIRCUITS AS INDICATED ON THE PLANS. CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE ONLY. ALL NEW PANELBOARDS SHALL HAVE LOAD-BALANCED FEEDERS AND BRANCH CIRCUITS.
- .13 DISCONNECT SWITCHES SHALL BE OF "QUICK-MAKE/QUICK-BREAK" TYPE, AND OF SAME MANUFACTURE AS BASE-BUILDING EXISTING UNITS.
- .15 ALL LUMINAIRES SHALL COME COMPLETE WITH LAMPS OF THE LISTED TYPE AND RATINGS. LAMPS SHALL BE AS MANUFACTURED BY PHILIPS, SYLVANIA/OSRAM, OR CGE. FLUORESCENT LAMPS SHALL BE HIGH-VISION PHOSPHOR (3500K), UNLESS OTHERWISE NOTED, AND SHALL BE GUARANTEED FOR A PERIOD OF TWELVE (12) MONTHS FROM DATE OF ACCEPTANCE OF SPACE OR BUILDING. INCANDESCENT LAMPS SHALL BE 130VOLT-RATED, FROSTED, OF EXTENDED-SERVICE TYPE, AND SHALL BE GUARANTEED FOR A PERIOD OF THREE (3) MONTHS FROM DATE OF ACCEPTANCE OF SPACE OR BUILDING. ALL FLUORESCENT BALLASTS TO BE CERTIFIED HIGH POWER FACTOR WITH THERMAL CUTOUTS. ALL T8 SYSTEMS SHALL COME COMPLETE WITH ELECTRONIC HPF BALLASTS
- .16 PROVIDE ENGRAVED LAMICOID NAMEPLATES ON ALL MAJOR ELECTRICAL EQUIPMENT IDENTIFYING: EQUIPMENT NAME, VOLTAGE, PHASE, CURRENT RATING, DESTINATION, AND USE, LETTERING SHALL BE WHITE, MINIMUM 1/4" HIGH ON A BLACK BACKGROUND

4.0 TELEPHONE CONDUIT SYSTEM

- .1 THE TELEPHONE SYSTEM SHALL CONSIST OF A COMPLETE CONDUIT SYSTEM, PULL BOXES, AND OUTLETS FOR ENCLOSURE OF WIRING BY COMMUNICATION CONTRACTOR.
- .2 PROVIDE A 3/4" DIAMETER CONDUIT FROM EACH TELEPHONE OUTLET IN PARTITION WALL AND TERMINATE IN A JUNCTIÓN BOX IN CEILING SPACE.
- .3 INSTALL A 1/8" PULL-CORD IN ALL EMPTY CONDUITS THROUGH TO OUTLETS.
- WALL MOUNTED TELEPHONE OUTLETS SHALL CONSIST OF A SINGLE-GANG BOX, COMPLETE WITH COVERPLATE, INSERT PLATES, AND CONNECTORS BY COMMUNICATION CONTRACTOR.

5.0 DATA CONDUIT SYSTEM

- THE DATA SYSTEM SHALL CONSIST OF A COMPLETE CONDUIT SYSTEM, PULL BOXES, AND OUTLETS FOR ENCLOSURE OF WIRING BY A CERTIFIED SYSTEM VENDOR.
- .2 PROVIDE A 3/4" DIAMETER CONDUIT FROM EACH DATA OUTLET IN PARTITION WALL AND TERMINATE IN A JUNCTION BOX IN CEILING SPACE.
- .3 INSTALL A 1/8" PULL-CORD IN ALL EMPTY CONDUITS THROUGH TO OUTLETS.
- INSERT PLATES, AND CONNECTORS BY COMMUNICATION CONTRACTOR

.4 WALL MOUNTED DATA OUTLETS SHALL CONSIST OF A SINGLE-GANG BOX, COMPLETE WITH COVERPLATE,

Legend	of Symbols
A A	FLUORESCENT LUMINAIRE; LETTER DENOTES TYPE. HATCHING DENOTES CONNECTION TO NIGHT LIGHT CIRCUIT. SEE LIGHTING FIXTURE SCHEDULE.
	WALL OR CEILING MOUNTED LED EXIT SIGN, ARROW DENOTES DIRECTION, SINGLE OR DOUBLE FACE AS INDICATED CONNECTED TO EMERGENCY CIRCUIT AS NOTED. SIGN SHALL BE GREEN PICTOGRAM 'RUNNING MAN'
9 92	REMOTE EMERGENCY LIGHT HEAD, SINGLE OR DUAL AS INDICATED, WALL MOUNTED AND CONNECTED TO BATTERY UNIT AS SHOWN WITH LED MR16 LAMPING AS NOTED ON PLANS
	REMOTE SURFACE CEILING MOUNTED EMERGENCY LIGHT HEAD, CONNECTED TO BATTERY UNIT AS SHOWN WITH LED MR16 LAMPING AS NOTED ON PLANS.
BU1 550watts	EMERGENCY LIGHTING BATTERY UNIT BU1, HEADS AS SHOWN 12voit DC OUTPUT AND CONNECTED TO REMOTE HEADS NOTED. 120voit AS REQ'D.
\$	20A, 120v SINGLE POLE TOGGLE SWITCH MOUNTED AT 43" AFF OR AS NOTED. PROVIDE IVORY COLOUR DECORATOR STYLE EXCEPT IN SERVICE AREAS.
b b	15A, 120v U-GROUND OR GFCI DUPLEX RECEPTACLE MOUNTED 18"AFF, IVORY, UNLESS OTHERWISE NOTED. 15A, 120v U-GROUND DUPLEX RECEPTACLE, IVORY,
	MOUNTED 48" ABOVE FINISHED FLOOR OR ABOVE COUNTER. 15A, 120v ISOLATED-GROUND DUPLEX RECEPTACLE, IVORY,
•	MOUNTED 18"AFF, WITH ORANGE FACE AND PLATE.
 2 2	WALL MOUNTED 18"AFF, IVORY, DUPLEX OR SINGLE OTHER THAN 15A. '2' DENOTES 20 AMP, '3' DENOTES 30 AMP, '5' DENOTES 50 AMP, etc
\rightarrow	20A, 120v U-GROUND QUADPLEX RECEPTACLE, IVORY, MOUNTED AT 18"AFF, UNLESS OTHERWISE NOTED.
	120v DIRECT CONNECTION TO EQUIPMENT (INCLUDE OUTLET BOX AS REQUIRED)
	208v,1ø DIRECT CONNECTION TO EQUIPMENT (INCLUDE OUTLET BOX AS REQUIRED)
	208v,3ø DIRECT CONNECTION TO EQUIPMENT (INCLUDE OUTLET BOX AS REQUIRED)
	120v,1p CONNECTION TO MECHANICAL EQUIPMENT COMPLETE WITH ISOLATION DISCONNECT SWITCH
	208v,1p CONNECTION TO MECHANICAL EQUIPMENT COMPLETE WITH ISOLATION DISCONNECT SWITCH
	208v,3p CONNECTION TO MECHANICAL EQUIPMENT COMPLETE WITH ISOLATION DISCONNECT SWITCH
$\overset{\mathbb{B}}{\sqcap} \odot$	DOORBELL CHIME C/W TRANSFORMER, DECORATIVE PUSHBUTTON MOUNTED AT 48"aff. CHIME AT 84"aff.
_ _ CR	PROXIMITY-TYPE CARD/FOB READER TO CONTROL ELECTRIC STRIKE AND DOOR OPENER AS REQUIRED
DR	DOOR RELEASE PUSHBUTTON WITH CONDUIT AND WIRING TO RELEASE ELECTRIC DOOR STRIKE
ES	ELECTRIC DOOR STRIKE PROVIDED WITH GLASS PANEL WALL SYSTEM. CONDUIT AND WIRING BY DIVISION 16.
JB	4" x 4" OUTLET BOX AND COVER WITH HOLE FOR SYSTEMS FURNITURE WHIP (BY OTHERS)
OS	DUAL-TECHNOLOGY OCCUPANCY SENSOR CONNECTED TO CONTROL LIGHTING AS INDICATED AND NOTED
РВ	10" x 10" PULL BOX WITH PADLOCKED COVER TO BE INSTALLED AT ALL BENDS IN TELECOM CONDUIT
Т	LINE VOLTAGE THERMOSTAT TO BE INSTALLED AND CONNECTED BY ELECTRICAL CONTRACTOR
•	TELEPHONE OUTLET MOUNTED AT SAME ELEVATION AS THE ADJACENT RECEPTACLE OR 18"AFF IF ALONE PROVIDE 2"x4" BOX, CONDUIT, TELECOM CABLING
∇	DATA OUTLET MOUNTED AT THE SAME ELEVATION AS THE ADJACENT RECEPTACLE OR 18"AFF IF ALONE PROVIDE 2"x4" BOX, CONDUIT, TELECOM CABLING.
T	SINGLE TELECOM OUTLET MOUNTED AT SAME ELEVATION AS ADJACENT RECEPTACLE OR 18"AFF IF ALONE. PROVIDE 2"x4" BOX, CONDUIT, CABLES.
	INDICATES ELECTRICAL CONNECTION FOR 'WI—FI' EQUIPMENT (BY OTHERS) LOCATED IN CEILING SPACE. PROVIDE DUPLEX RECEPTACLE IN BOX ABOVE CLG.
	FIRE ALARM SMOKE DETECTOR (PE) MOUNTED AT CLG AND CONNECTED TO FLOOR ZONE AS REQUIRED.
	FIRE ALARM MANUAL PULL STATION MOUNTED AT 47"aff TO CENTRE,CONNECTED TO INITIATING CIRCUIT
	FIRE ALARM HORN MOUNTED HIGH ON WALL AND CONNECTED TO EXISTING FIRE ALARM SIGNAL CIRCUIT
AFF	DENOTES "ABOVE FINISHED FLOOR"
CLG RELC'D	DENOTES DEVICE MOUNTED IN OR AT "CEILING" DENOTES DEVICE MOUNTED IN "RELOCATED" POSITION
TYP	DENOTES "TYPICAL"
(P1)	DENOTES "REFER TO INSTALLATION NOTE P1"

REVISIONS DATE

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14 AUG 2017

16 MAY 2017

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ISSUES

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PROJECT TITLE

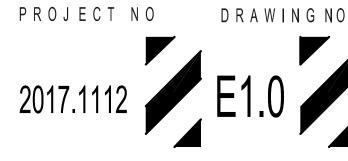
INDO-MALAYA PAVILION EXTERIOR EXHIBIT

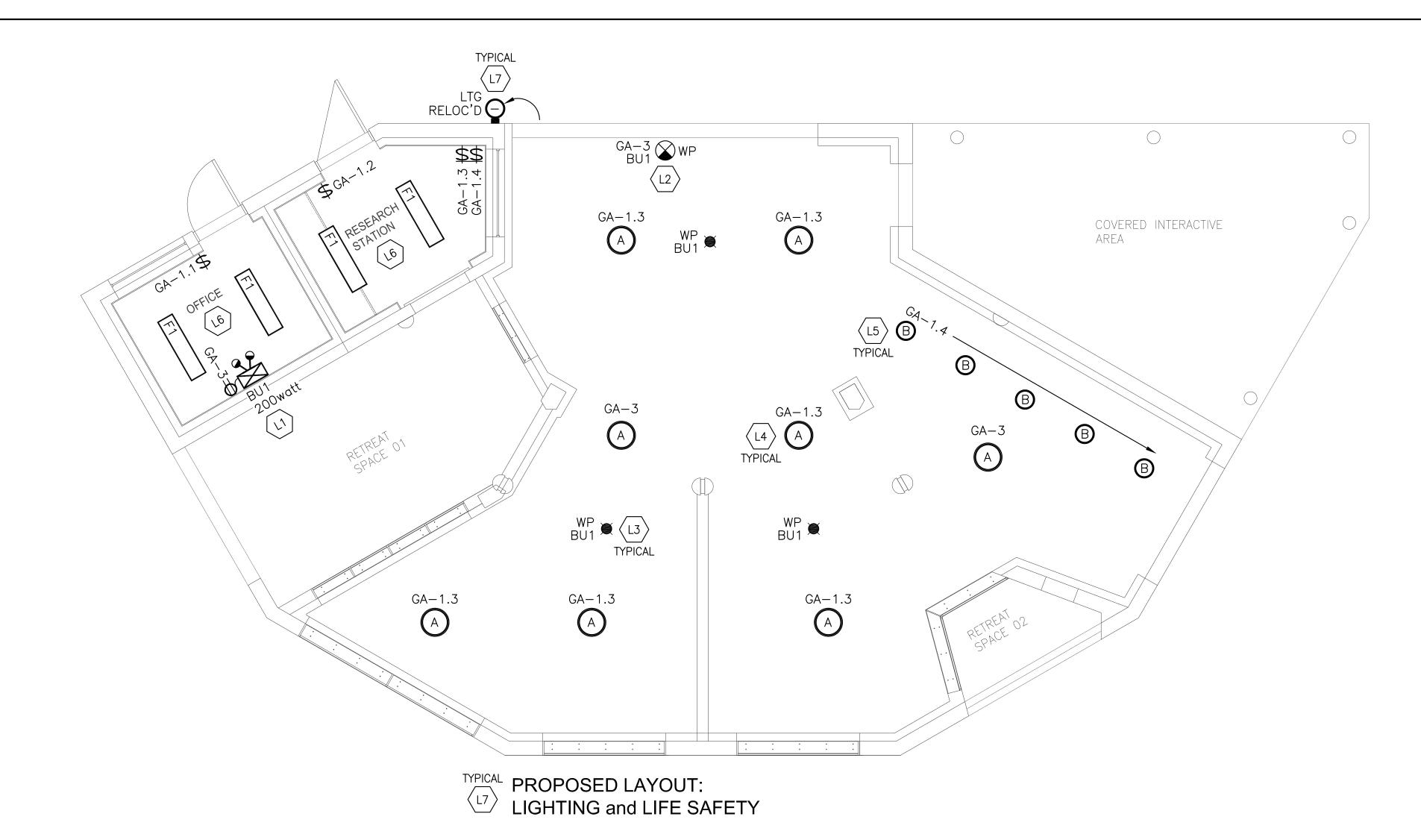
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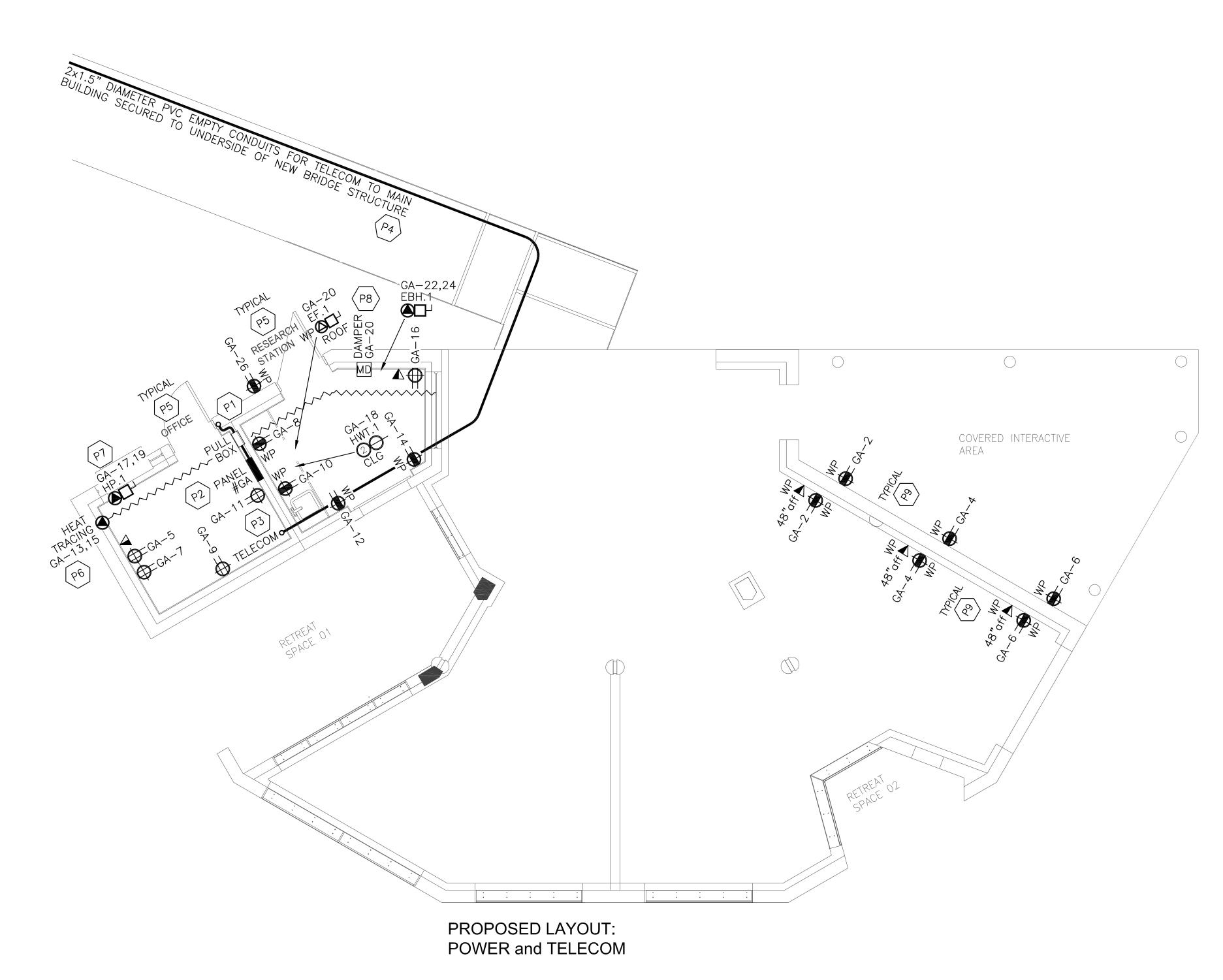
GAUR BUILDING: **ELECTRICAL DEMOLITION** and PROPOSED POWER PLANS

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Lighting Installation Notes

- INDICATES LOCATION OF NEW BATTERY UNIT WITH DUAL INTEGRAL HEADS LOCATED IN OFFICE AREA. BATTERY UNIT SHALL BE SIMILAR TO "BEGHELLI" LIGHTING #AQ-U-12-200-2SEA-LEDSB (6watt)-AT-LD SERIES WITH 200watt CAPACITY, DUAL LED MR16 LAMPS, AUTO-TEST FUNCTION, AND LAMP-DISCONNECT FEATURE.
- INDICATES LOCATION OF PICTOGRAM TYPE (RUNNING MAN) GREEN WATERPROOF LED EXIT SIGN SIMILAR TO "BEGHELLI" LIGHTING #AQ-RM-L1-0-C-WG SERIES FOR CEILING-MOUNTED APPLICATION WITH WIRE GUARD. WIRING TO BE CONCEALED IN CEILING CAVITY.
- INDICATES LOCATION OF WEATHERPROOF EMERGENCY REMOTE LED DUAL LIGHT HEAD, SURFACE-MOUNTED ON CEILING AT LOCATIONS INDICATED AND CONNECTED TO EMERGENCY BATTERY UNIT. REMOTE HEAD SHALL BE SIMILAR TO "BEGHELLI" #WR-2-12V5W-TP SERIES WITH 12voltDC OPERATION, DUAL 5watt LED MR16 LAMPING, TAMPERPROOF HARDWARE, AND FULLY ENCLOSED LAMP HEADS TO PREVENT TAMPERING OR RE-POSITIONING OF HEADS. WIRING TO BE CONCEALED IN CEILING CAVITY. AIM HEADS ON SITE DURING EVENING CONDITIONS TO OPTIMIZE ILLUMINATION ON FLOOR ALONG PATHS OF
- CONTRACTOR SHALL INSTALL NEW TYPE 'A' SURFACE-MOUNTED LED-SOURCE LUMINAIRES ALIGNED TO ARCHITECT'S SATISFACTION AT LOCATIONS INDICATED. FIXTURES SHALL BE AS MANUFACTURED BY "McGRAW-EDISON" TOPTIER MODEL #TT-B1-LED-E1(120v)-WQ-GM-8030-SG-TP-X-MSP/DIML12-TT/WG SERIES 18.5" DIAMETER x 4.5" DEEP x 16 LBS,WET-LOCATION AND 3G VIBRATION-RATED LUMINAIRE WITH 3000 LUMEN OUTPUT, 80CRI/3000K COLOUR TEMPERATURE, 120volt OPERATION, INTEGRAL 10kV TRANSIENT SURGE PROTECTION, WIDE BEAM DISTRIBUTION, DIMMING OCCUPANCY SENSOR FOR <9' MOUNTING HEIGHTS, TAMPER-RESISTANT HARDWARE, SOLITE GLASS LENS, WIRE GUARD, AND GRAPHITE METALLIC FINISH (TO BE CONFIRMED BY ARCHITECT PRIOR TO ORDERING). UNIT SHALL BE RATED 90% LUMEN MAINTENANCE AT MINIMUM 60,000 HRS OPERATION BASED ON LM-80 AND TM-21 TEST DATA. WIRING TO BE CONCEALED IN CEILING CAVITY.
- CONTRACTOR SHALL INSTALL NEW TYPE 'B' SURFACE-MOUNTED LED-SOURCE ADJUSTABLE LUMINAIRE AT LOCATIONS INDICATED. FIXTURES SHALL BE AS MANUFACTURED BY "LUMIERE (EATON)" MODEL #203-FL-10LED-30-21-12-BK SERIES 2.25" DIAMETER x 3.75" DEEP SUITABLE FOR WET-LOCATIONS, WITH FLUSH LENS AND SIDE SWIVEL STEM (1.5" NPS), BLACK FINISH, AND MOUNTED ON A RECESSED BOX WITH BLACK THREADED COVERPLATE. WIRING TO BE CONCEALED IN
- CONTRACTOR SHALL INSTALL NEW TYPE 'F1' SURFACE/PENDANT LED-SOURCE SIMILAR TO GE LIGHTING: # ALR101H4714SNNSTKNW (38watt) - 7"x51" SURFACE-MOUNTED LED LUMINAIRE HIGH OUTPUT (MINIMUM 5350 INITIAL LUMENS @"70CRI OR BETTER), 4000K COLOUR TEMPERATURE, 120° OPTICS, SUITABLE FOR WET AND LOW TEMPERATURE APPLICATIONS, FINISHED IN WHITE, NON-METALLIC ENCLOSURE. FOR 120VOLT OPERATION.
- INDICATES PROPOSED FINAL POSITION OF RELOCATED EXISTING EXTERIOR WALL-MOUNTED LIGHTING CYLINDER. CONTRACTOR SHALL RECONNECT ALL EXISTING EXTERIOR LIGHTING TO NEW DISTRIBUTION PANELBOARD AS REQUIRED VIA NEW 24HOUR / 365DAY 2-CHANNEL ASTRONOMICAL TIMER WITH INTEGRAL MANUAL BYPASS, 30amp-RATED MULTIPOLE CONTACTOR AND EXTERIOR PHOTOCELL ON NORTH SIDE OF BUILDING WITH NEW CONTROL WIRING IN CONDUIT AS REQUIRED FOR A COMPLETE OPERATING SYSTEM.

FED FROM EXISTING DP/NTS IN MAIN RUILDING (TO REMAIN AND RE REWORED)

ا	MAIN BRKR:	200A-3P	- 1	PAN	NEL	.G/	4		
1	MOUNTING:	RECESSED	TYPE:	120/	208v,	3p,4v	/		
1	CIRCUIT QTY:	42 (SINGLE TUB)	MAINS:	225	amp			EQUIP WITH LOCKING HINGED	DOOR
	LOAD (w):	14,656							
	LOAD (w)	DESCRIPTION	BRKR	CII	RCUI	Т	BRKR	DESCRIPTION	LOAD (w)
		LTG: 2F1,5A,5B (CHAN 1)	20A	1	Α	2	15A	RECEPT: INTERACTIVE AFEA	750
*	500	BU1 / EXIT SIGNS	15A	3	В	4	15A	RECEPT: INTERACTIVE AFEA	750
	400	RECEPT: OFFICE	15A	5	С	6	15A	RECEPT: INTERACTIVE AFEA	750
	400	RECEPT: OFFICE	15A	7	Α	8	15A	RECEPT: FESEARCH STATION	400
	400	RECEPT: OFFICE	15A	9	В	10	15A	RECEPT: FESEARCH STATION	400
	400	RECEPT: OFFICE	15A	11	С	12	15A	RECEPT: FESEARCH STATION	400
*	1000	HEAT TRACING	(20A)	13	Α	14	15A	RECEPT: FESEARCH STATION	400
		(2#12-3/4"C)	L 2P	15	В	16	15A	RECEPT: FESEARCH STATION	400
	4056	HP.1 (OFFICE)	(20A)	17	С	18	20A	HWT.1 (RESEARCH STATION)	150)
		(3#10-3/4"C)	L 2P	19	Α	20	15A	EF.1 (RESEARCH STATION)	250
*	500	EXTERIOR LIGHTING (CHAN 2)	20A	21	В	22	(20A)	EBH.1 (RESEARCH STATION)	500
		SPARE	15A	23	С	24	₹2P J	(2#12-3/4"C)	
		SPARE	15A	25	Α	26	15A	RECEPT: EXTERIOR GFI	500
		SPARE	15A	27	В	28	20A	SPARE	
		SPACE		29	С	30		SPACE	
		SPACE		31	Α	32		SPACE	
		SPACE		33	В	34		SPACE	
		SPACE		35	С	36		SPACE	
		SPACE		37	Α	38		SPACE	
		SPACE		39	В	40		SPACE	
		SPACE		41	С	42		SPACE	

- * DENOTES BREAKER LOCK-ON DEVICE ON THIS CIRCUIT
- ** DENOTES GROUND FAULT CIRCUIT INTERRUPTER BREAKER
- *** DENOTES CIRCUIT CONNECTED PHOTOCELL/TIMESWITCH TS DENOTES CIRCUIT CONNECTED TO TIMESWITCH CHANNEL

Power Installation Notes

- INDICATES APPROXIMATE LOCATION OF INCOMING 200amp;120/208volt,3phase,4wire ELECTRICAL SERVICE FROM MAIN BUILDING. CONTRACTOR TO ELECTRICALLY ISOLATE SERVICE FOR THE FOLLOWING WORK AND THEN RE—ENERGIZE WHEN APPLICABLE. CONTRACTOR SHALL PULL BACK EXISTING CONDUCTORS AND REROUTE IN CONDUIT THROUGH WALL TO TERMINATE AT A JUNCTION BOX WITH ACCESSIBLE BLANK COVERPLATE. EXTEND 4#3/0-2.5"C FEEDER FROM JUNCTION BOX (WITH APPROVED WIRE JOINTS) TO NEW PANELBOARD LOCATION AS INDICATED. CONTRACTOR SHALL CONFIRM WIRE SIZE TO ENGINEER IN WRITING IMMEDIATELY UPON MOBILIZING TO SITE.
- CONTRACTOR SHALL INSTALL A RECESSED PANELBOARD AT INDICATED LOCATION TO BE 42circuit 225amp;120/208volt,3phase,4wire WITH MAIN 200A-3P ISOLATION BREAKER, LOCKING HINGED DOOR, BRANCH BREAKERS AS INDICATED IN PANEL SCHEDULE, AND WIRING TO LOADS AS INDICATED WITH TYPE-WRITTEN DIRECTORY TO REFLECT AS-BUILT CONDITIONS. COORDINATE EXACT LOCATION OF PANEL WITH ARCHITECT AND OTHER DEVICES AND SERVICES PRIOR TO
- INDICATES PROPOSED LOCATION OF STUB-DOWN FOR TWO (2) 1.5" DIAMETER PVC EMPTY CONDUITS AND PROPOSED ROUTING FROM "GAUR BUILDING" OFFICE TO MAIN BUILDING FOR TELECOM COMPLETE WITH TWO (2) NYLON PULL-ROPES IN EACH FOR FUTURE CABLING BY OTHERS.
- CONTRACTOR SHALL ROUTE THE CONDUITS CONCEALED WITHIN THE "GAUR BUILDING" AND THEN TRANSITION TO EXTERIOR RUNNING TIGHT TO UNDERSIDE OF NEW PROPOSED BRIDGE AND MOUNTED TO BE AS CONCEALED AS POSSIBLE TO ARCHITECT AND OWNER SATISFACTION ON SITE - COORDINATE PRIOR TO INSTALLATION AND OBTAIN WRITTEN APPROVAL FOR MOUNTING DETAILS AND METHODS. TERMINATE CONDUITS IN CEILING SPACE OF MAIN BUILDING IN A PULL-BOX. MAIN BUILDING TERMINATION POINT IS LOCATED APPROXIMATELY 100 LINEAR FEET AWAY FROM "GAUR BUILDING" AND CONTRACTOR SHALL CONFIRM EXACT CONDUIT RUN LENGTHS ON SITE PRIOR TO SUBMITTING TENDER.
- ALL DEVICES AND EQUIPMENT IN THIS AREA SHALL BE COORDINATED WITH THE LATEST ARCHITECTURAL AND MECHANICAL DRAWINGS AND IN CONJUNCTION WITH EXISTING STRUCTURE TO ELIMINATE INTERFERENCES WITH STRUCTURAL ELEMENTS, SERVICES, EQUIPMENT, AND DEVICES.
- CONTRACTOR SHALL MAKE 208volt,1phase CONNECTION TO ELECTRIC HEAT TRACE FOR PIPING (PROVIDED AND INSTALLED BY OTHERS) COMPLETE WITH GFI BREAKER PROTECTION. COORDINATE EXACT CONNECTION LOCATION(S) WITH MECHANICAL CONTRACTOR ON SITE AND ENSURE ACCESS POINT(S) IS IDENTIFIED AND MAINTAINED TO SERVICE JUNCTION BOX FOR FUTURE MAINTENANCE AND/OR REPLACEMENT REQUIREMENTS.
- INDICATES PROPOSED LOCATION FOR NEW THROUGH—WALL HVAC UNIT BY MECHANICAL CONTRACTOR. THIS CONTRACTOR SHALL COORDINATE FOR EXACT LOCATION AND TERMINATION METHOD FOR ELECTRICAL SERVICE WHICH SHALL BE CONCEALED.
- INDICATES PROPOSED LOCATION FOR NEW MOTORIZED DAMPER TO BE INTERCONNECTED WITH EXHAUST FAN EF.1. PROVIDE ALL REQUIRED WIRING AND INTERCONNECTIONS NECESSARY FOR A COMPLETE INSTALLATION IN CONJUNCTION WITH LATEST MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR.
- CONTRACTOR SHALL INSTALL WEATHERPROOF ELECTRICAL RECEPTACLES AND/OR TELECOM OUTLETS ON WALLS AS INDICATED AT APPROXIMATELY 48"aff TO ARCHITECT'S DIRECTION ON SITE PRIOR TO ROUGHING-IN SERVICES. PROVIDE WHILE-IN-USE CLEAR COVERS FOR ALL RECEPTACLES AND DATA OUTLET LOCATIONS. RECEPTACLES ARE TO BE FED VIA GFI-TYPE CIRCUIT BREAKERS — LOCAL GFI DEVICES WILL NOT BE ACCEPTED.



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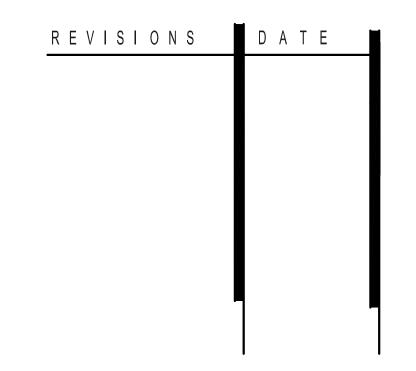
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ISSUES ISSUED FOR REVIEW 16 MAY 2017 14 AUG 2017 ISSUED FOR PERMIT



P R O J E C T T I T L E

INDO-MALAYA PAVILION **EXTERIOR EXHIBIT**

DRAWING TITLE

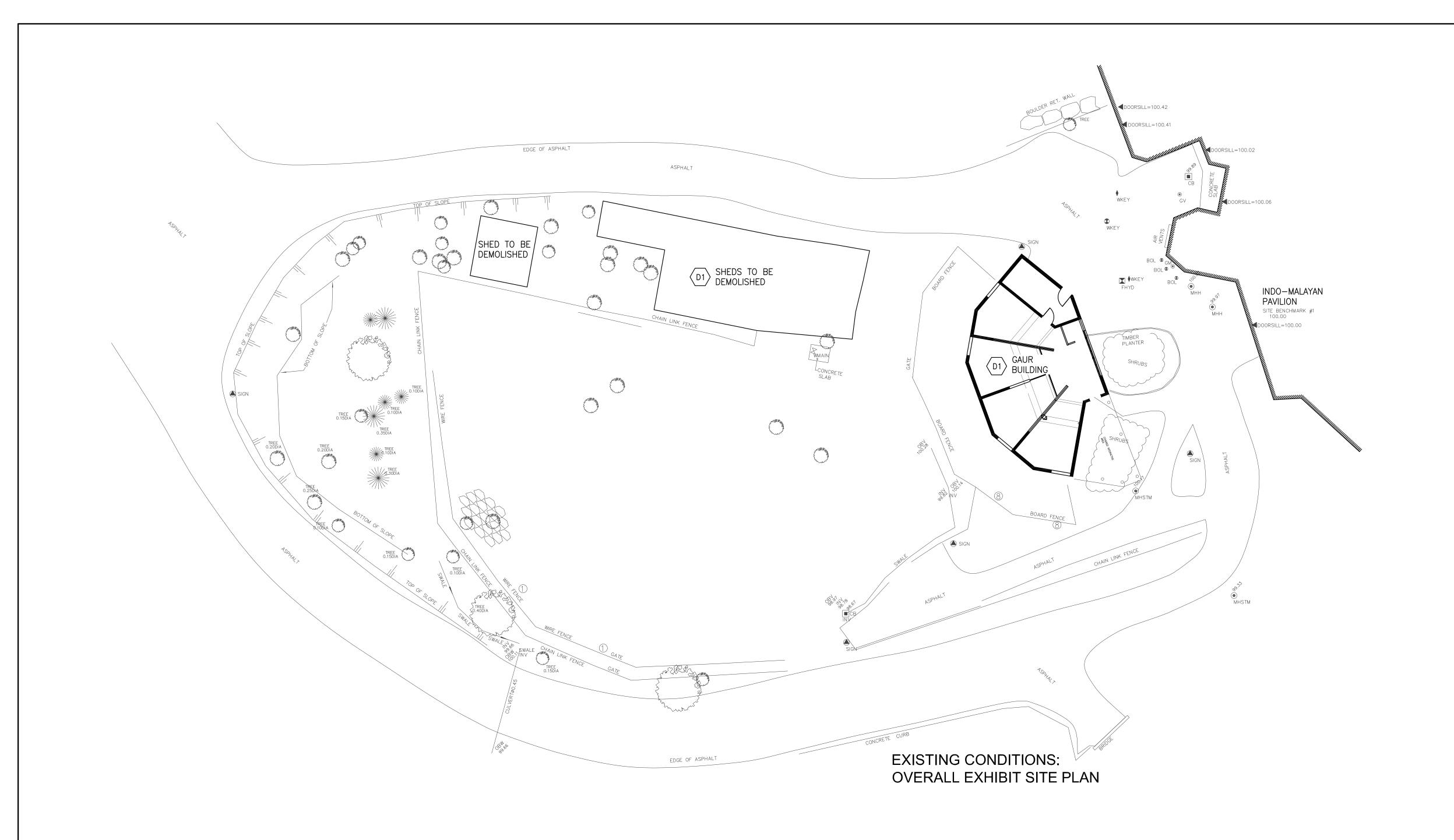
GAUR BUILDING: **ELECTRICAL PROPOSED** LIGHTING, POWER, and TELECOM PLANS

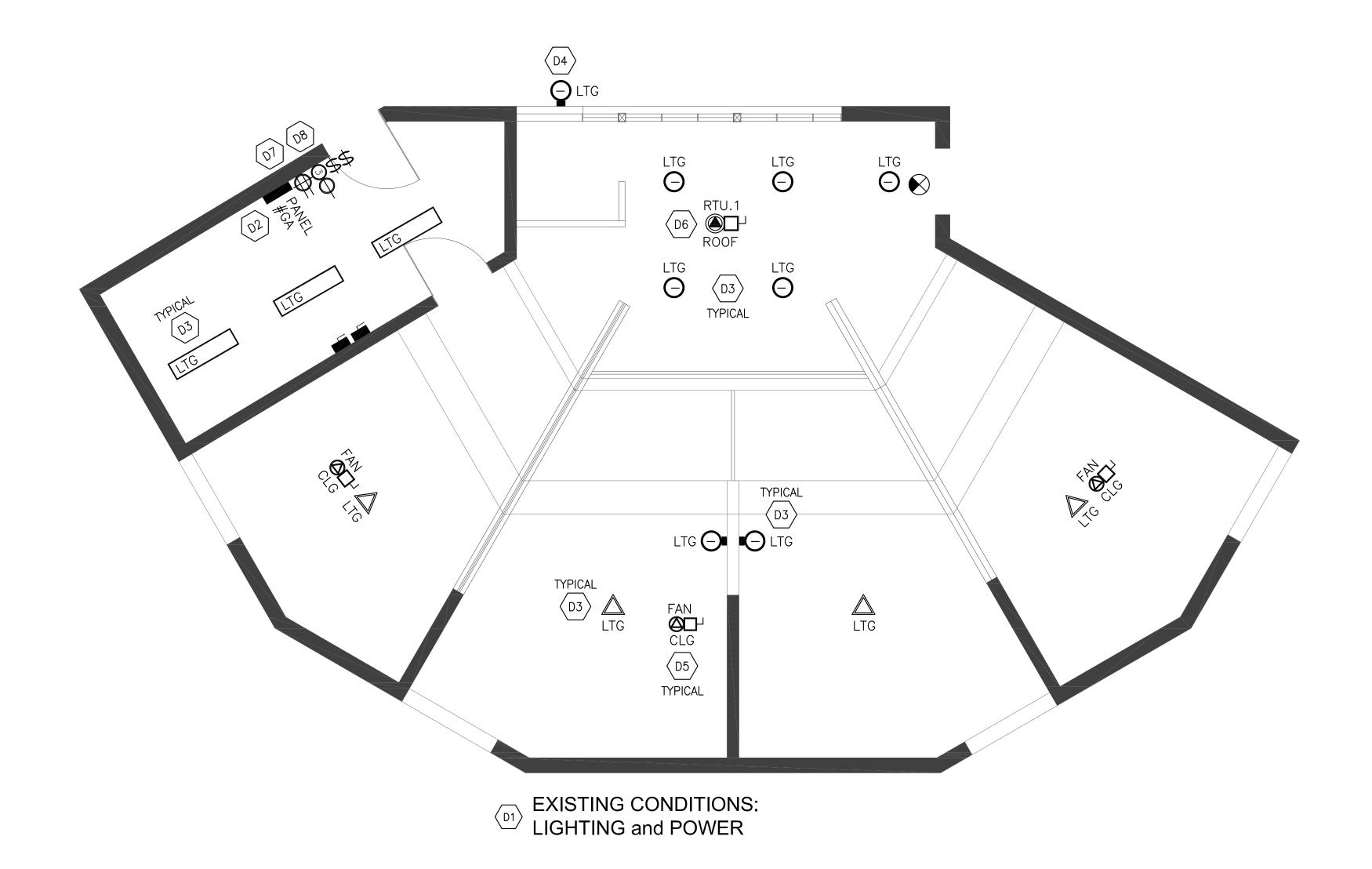
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Electrical Demolition Notes

- CONTRACTOR SHALL DISCONNECT, REMOVE, AND OTHERWISE MAKE SAFE ALL EXISTING ELECTRICAL LIGHTING, DEVICES, AND EQUIPMENT CONNECTIONS LOCATED IN SHEDS TO BE DEMOLISHED BACK TO SOURCE PANEL(S) IN MAIN BUILDING AS REQUIRED. COORDINATE AND CONFIRM REQUIREMENTS FOR DEMOLITION PRIOR TO TENDER CLOSING.
- CONTRACTOR SHALL DE-ENERGIZE EXISTING 200amp;120/208volt,3phase,4wire SERVICE TO "GAUR BUILDING" AND DISCONNECT AND REMOVE EXISTING PANEL, COILING EXISTING FEEDER FOR RE-USE IN NEW BUILDING SCOPE OF WORK. COORDINATE WITH PROPOSED PLANS AND TAKE CARE IN PROTECTING FEEDERS.
- CONTRACTOR SHALL DISCONNECT AND REMOVE ALL EXISTING INTERIOR LIGHTING AND ASSOCIATED WIRING AND CONDUIT BACK TO SOURCE EXCEPT CUT FLUSH AND PATCH WHERE EMBEDDED IN STRUCTURE.
- CONTRACTOR RELOCATE EXISTING EXTERIOR LIGHTING FIXTURE AT THIS APPROXIMATE LOCATION TO FINAL POSITION AS INDICATED, EXTENDING CIRCUIT AS REQUIRED. FOR ALL OTHER REMAINING EXTERIOR LIGHTING, CONTRACTOR SHALL REFEED FROM NEW PANEL AS REQUIRED.
- CONTRACTOR SHALL DISCONNECT AND REMOVE ALL CEILING FANS, CONTROLS, AND ASSOCIATED WIRING AND CONDUIT BACK TO SOURCE EXCEPT CUT FLUSH AND PATCH WHERE EMBEDDED IN STRUCTURE.
- CONTRACTOR SHALL DISCONNECT AND REMOVE ROOFTOP UNIT AT THIS APPROXIMATE LOCATION INCLUDING CONTROLS, AND ASSOCIATED WIRING AND CONDUIT BACK TO SOURCE EXCEPT CUT FLUSH AND PATCH WHERE EMBEDDED IN STRUCTURE.
- CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING TIMESWITCHES AT THIS APPROXIMATE LOCATION INCLUDING ALL ASSOCIATED WIRING AND CONDUIT BACK TO SOURCE EXCEPT CUT FLUSH AND PATCH WHERE EMBEDDED IN STRUCTURE.
- CONTRACTOR SHALL DISCONNECT AND TURN OVER TO OWNER ELECTRIC FENCE CONTROLLER AT THIS APPROXIMATE LOCATION AND REMOVE ALL ASSOCIATED WIRING AND CONDUIT BACK TO SOURCE EXCEPT CUT FLUSH AND PATCH WHERE EMBEDDED IN STRUCTURE.

NOTE:

LOCATIONS INDICATED FOR EXISTING DEVICES AND EQUIPMENT ARE PROVIDED ONLY TO ASSIST IN PRICING THE DEMOLITION SCOPE OF WORK AND BASED ON VISUAL OBSERVATION.

CONCEALED OR OTHERWISE HIDDEN-FROM-VIEW DEVICES AND EQUIPMENT WILL NOT BE SHOWN.

CONTRACTOR SHALL CONFIRM THE EXISTING CONDITIONS ON SITE AND SHALL ACCOMMODATE THE REQUIREMENTS AS NECESSARY TO COMPLETE THE PROJECT TO THE INTENT INDICATED ON THE ELECTRICAL DRAWING SET ISSUED.



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PROJECT TITLE

INDO-MALAYA PAVILION EXTERIOR EXHIBIT

DRAWING TITLE

GAUR BUILDING: ELECTRICAL EXISTING CONDITION LIGHTING, POWER, and TELECOM PLANS

DRAWN BY DATE

CADD MAY 2017

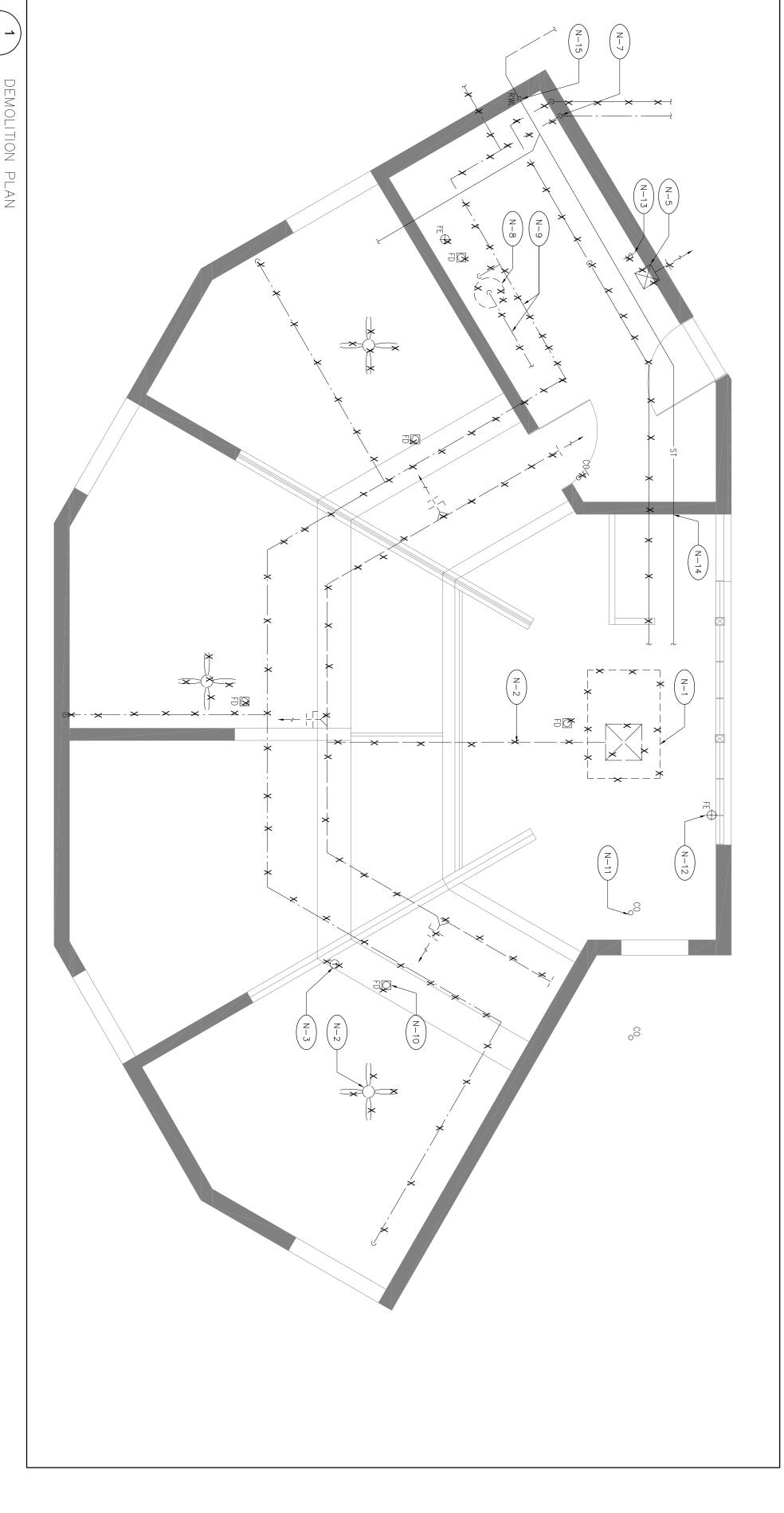
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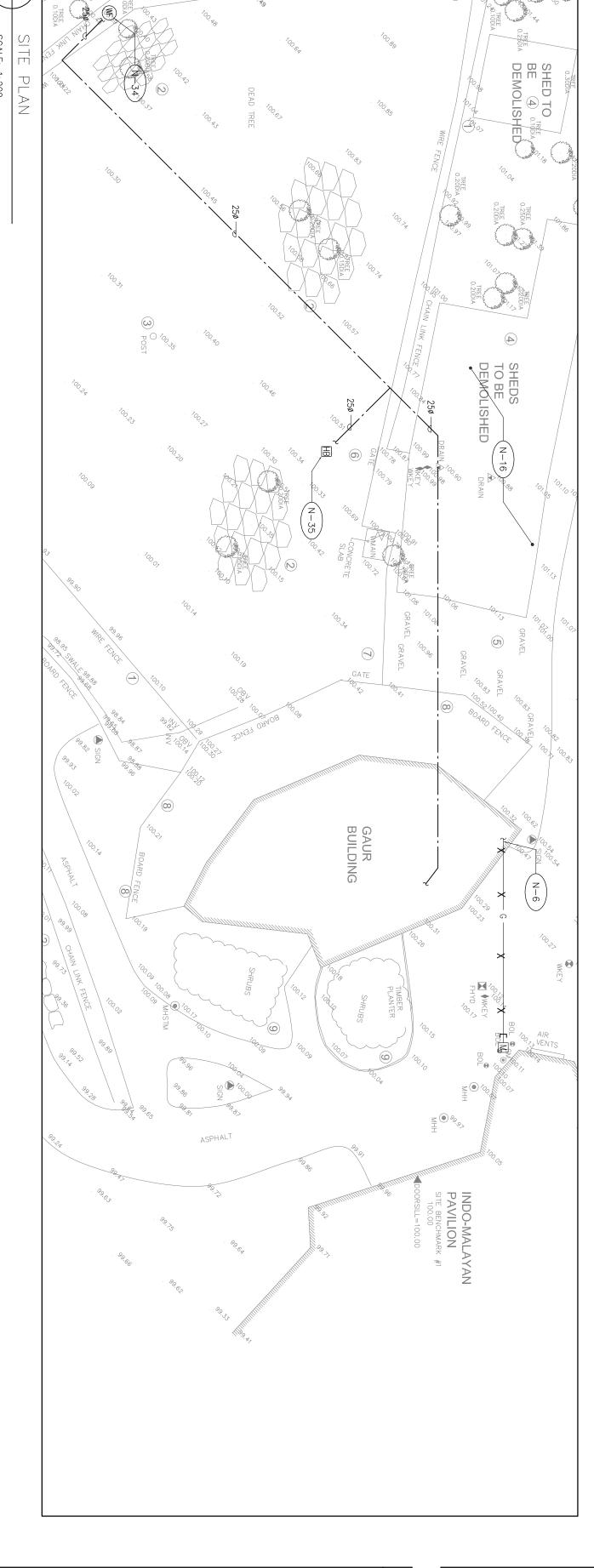
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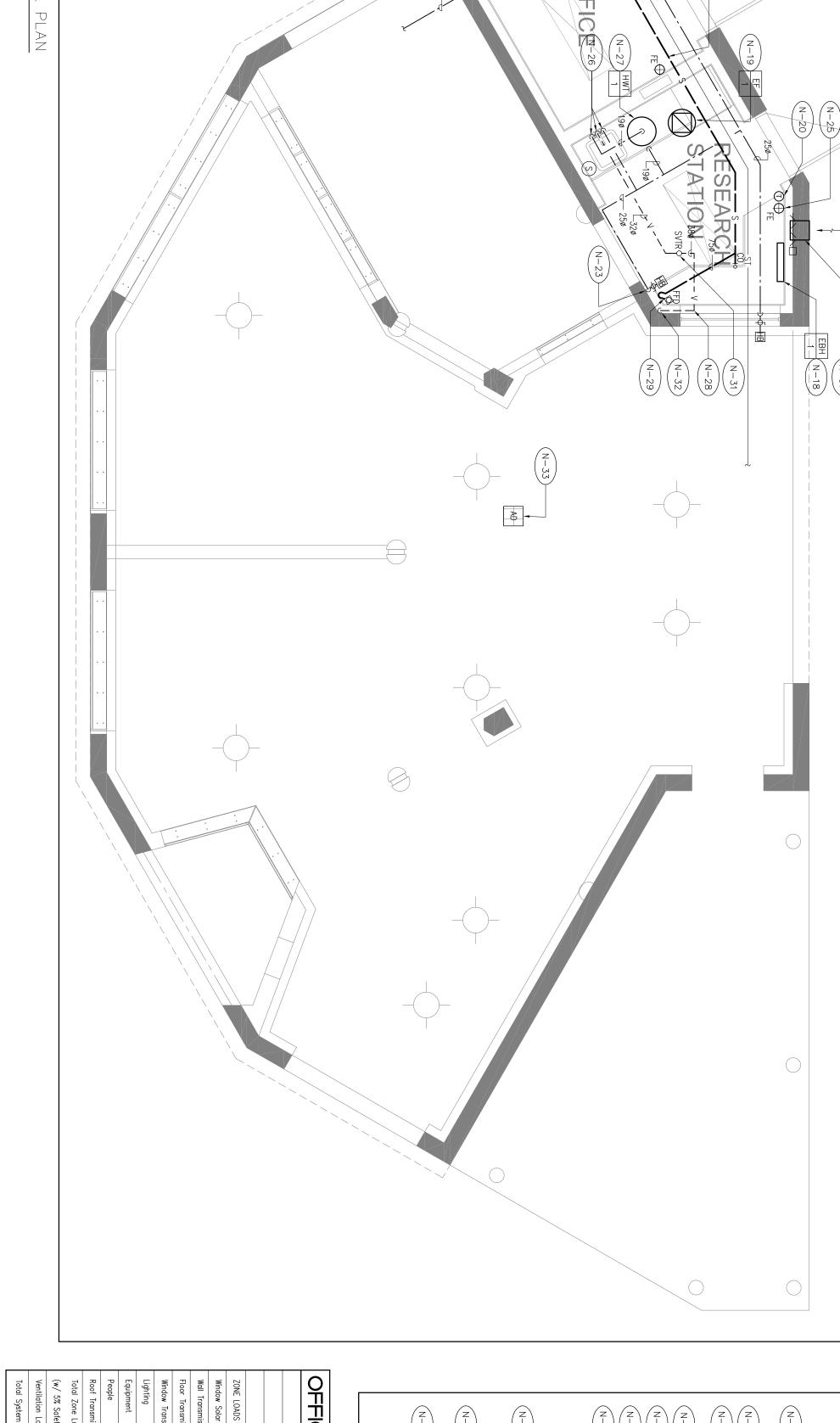
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RACTOR TO ALLOW FOR ALL REQUIRED EXCAVATION, EXCAVATION SAFETY JRES, BACK FILL ETC. AS REQUIRED FOR THE REMOVAL OF EXISTING D SERVICES. IT OFF VALVE WHERE SHOWN AND AT EACH CONNECTION TO ALL MAIN SHUT OFF/ISOLATION VALVES TO BE LABELLED. ALL REQUIRED CONCRETE CUTTING, SCANNING, PATCHING ETC. D RE-INSTALLATION OF EXISTING FLOOR COVERINGS BY OTHERS. TO PROVIDE 3/4" PLYWOOD OR METAL PLATE SECURELY LAID (CAVATIONS WHEN NOT BEING WORKED ON AND PROVIDE CAUTIORFOL. DEMOLITION NOTES ARRANGE FOR ALL REQUIRED SYSTEM SHUT DOWNS MIN NCE. DURING SHUT—DOWN OF PRESSURIZED PLUMBING ALL REQUIRED ISOLATION VALVES WITHIN THE SAME OD SO AS TO AVOID MULTIPLE SHUT—DOWNS OF SAME UNUSED PIPE SLAB IN SPACE. SEALANT TO MATCH FIRE RATING OF VALL CAVITY / SH

- AND ALL ASSOCIATED DUCTWORK, C. TO BE REMOVED. DIV. 16 TO S. REMOVED IN ITS ENTIRETY.
- RE TO BE REMOVED. DIV. 16 TO ED BY OTHERS.
- REMOVE ALSO BURIED NATURAL ID CAP. ALLOW FOR ALL
- TION TO BE REMOVED IN ITS
- ESTIC HOT AND COLD WATER,
 Y VENTING) LOCATED IN BUILDING
 S FIXTURES, HOT WATER HEATERS
 JUT BACK AND REMOVED TO
 TO REVIEW EXISTING SERVICES
 ASSOCIATED REMOVAL AS NO EXTRA
 UIRED EXCAVATION AND BACK FILL

ATION NOTES

- NEW ROOF MOUNTED EXHAUST FAN AS SPECIFIED. NSTALL, DIV. 16 TO POWER. ROOF OPENING BY O DIV. 15 TO SUPPLY AND)THERS.
- $\begin{pmatrix} N-22 \end{pmatrix}$ VIDE NEW CLEAN—OUT ON EXISTING RWL AT 12" A.F.F. WALL FURR OUT JND RISER TO BE BY OTHERS. DIV. 15 TO SUPPLY A 16"x16" METAL AKABLE ACCESS DOOR AND TURN OVER TO GC FOR INSTALLATION. ATER LINE TO EXISTING CAPPED CONNECTION NEW WALL CAVITY TO HIGH LEVEL. RUNLING AS INDICATED. DIV. 16 TO PROVIDE VIGTH OF PIPE.
- BE RUN AT U/S OF TE WITH ANY INTERFERENCES.
- LD WATER LINE TO NEW PEDESTAL MOUNT HOSE VE TO BE RUN BELOW FROST LEVEL AND BE LIVE AND HOSE CONNECTION (ENCLOSED IN COUND UTILITY BOX AS SPECIFIED) TO ALLOW FOR CO-ORDINATE EXACT ROUTING AND TIE-INS ON WATER LINE DOWN TO BELOW FROST LEVEL AND R DRINKING FOUNTAIN IN OUTDOOR EXHIBIT AREA.

 WASSEMBLY FOR LINE. CO-ORDINATE ROUTING

AND RESEARCH LOAD SUMMARY

COOLING OA DB / WB 90.0F / 75.0F HEATING OA DB / WB -10.0 F			L													
Sensible Latent Sensible Sensible	Total System Loads	Ventilation Load	(w/ 5% Safety Factor)	Total Zone Loads	Roof Transmission	People	Equipment	Lighting	Window Transmission	Floor Transmission	Wall Transmission	Window Solar Loads	ZONE LOADS			
90.0F / 75.0F		41 CFM			440 ft ²	3	400 W	660 W	50 ft²	440 ft²	1410 ft ²	50 ft²	Details		COOLING	DESIG
DESIGN FIEATING HEATING OA DB / WB S Details 50 ft² 440 ft² 440 ft² 440 ft² 440 ft²	19661	603		19058	3061	735	1365	2252	329	0	7624	2784	(BTU/hr)	Sensible	OA DB / WB	N COOLING
	1388	742		646		615							(BTU/hr)	Latent	90.0°F / 75.0°F	
		41 CFM			440 ft²				50 ft²	440 ft²	1410 ft ²	50 ft²	Details		HEATING OA DB	DESIGN HE,
	39241	3432		35809	4244				2352	2081	25427	0	(BTU/hr)	Sensible		AIING

- BE REMOVED TO 6" ABOVE ECTION.
- . DIV. 16 TO DISCONNECT

- DNNECTING 750 BURIED SANITARY /E DRAIN TRAP. DICATED. CO-ORDINATE EXACT D BURIED DRAIN OF SUITABLE SIZE.
- JØ DOMESTIC COLD WATER LINE NIT. DOMESTIC COLD WATER WIDED WITH A BLOW OUT VALVE O UTILITY BOX AS SPECIFIED) TO E 390 SANITARY DRAIN FROM SEWER. CO-ORDINATE EXACT
- _ AT HIGH LEVEL. STUB DUCT 00mm AF.F. INSULATE WITH 1" TERMINATE DUCT TO EXTERIOR 10TORIZED DAMPER WITH LINE IN OF EF-1. DIV. 16 TO

	DESIG	DESIGN COOLING		DESIGN HEATING	ING
	COOLING	COOLING OA DB / WB	90.0°F / 75.0°F	HEATING OA DB / WB	WB -10.0 °F
		Sensible	Latent		Sensible
SOME LOADS	Details	(BTU/hr)	(BTU/hr)	Details	(BTU/hr)
Window Solar Loads	50 ft²	2784		50 ft²	0
Wall Transmission	1410 ft²	7624		1410 ft ²	25427
Floor Transmission	440 ft²	0		440 ft ²	2081
Window Transmission	50 ft²	329		50 ft²	2352
Lighting	660 W	2252			
Equipment	400 W	1365			
People	3	735	615		
Roof Transmission	440 ft²	3061		440 ft²	4244
Total Zone Loads		19058	646		35809
(w/ 5% Safety Factor)					

SPECIFICATIONS

GENERAL NOTES

Division One, General Requirements, is part of this specification and shall apply Visit the site prior to tender to determine suitability of design for existing site from Toronto Zoo standards, and/or good practice prior to Tender closing.

Determine exact dimensions, locations of existing capped Toronto Zoo services existing services and equipment in Tender Price. No extra claim will be approve

rvices and other restrictive conditions on site, not from Drawings. Allow for approved for extra labour or material necessary due to any site conditions.

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1.4 The word "Provide" shall mean "supply, install and connect".

1.5 Apply, obtain and pay for all required permits, licenses and inspections. Conform to requirements of the governing authorities, codes and local

1.6 All work shall be done in accordance with the approved construction schedule and all specified interim schedules.

1.7 All work must comply with the Toronto Zoo's guidelines where applicable. Clean up and remove from site, all debris created by this Division.

1.8 Coordinate all work with all other Divisions. Inform other Divisions of the locations of openings, sleeves, chases, supports, services, connections, the location of all new equipment and routing of all new services to be coordinated and agreed to by all other Divisions prior to installation.

1.9 On completion of work, submit to Toronto Zoo and Tenant a final unconditional certificate of approval by authorities having jurisdiction.

1.10 Upon completion of work, submit a written warranty for all labour, material and equipment in this contract for a period of one (1) year comme representative, deems the work acceptable.

A set of record drawings shall be kept on site at all times. As work progress, mark drawings to accurately indicate installed work. At completion of the work, transfer all information onto "as-built" drawings. As-built drawings shall be produced using AutoCAD V. 2000 or higher. Identify each drawing in lower right hand corner in letters at least 1/2" high as follows: — "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED". Sign and date each drawing. Submit three (3) sets of as-built drawings and one (1) set the drawing files on disk.

1.13 1.14 1.15 On completion of the work, submit three (3) project manuals each containing data sheet, brochures, valve charts, equipment operating and maintaparts lists. Include a "reviewed" set of shop drawings and bind in hard cover. Submit one (1) preliminary copy for review by Engineer. Make all Provide all specified equipment. Substitution of any equipment will only be considered when the Tendered equipment becomes unavailable and writ. The quality and performance of the substitute equipment shall be equal to the specified equipment. Acceptance of the substitution shall be at the shop drawing as submitted by the Contractor. Assume responsibility and pay for any additional costs incurred by all Divisions resulting from the Drawings, incorporating all related changes. Indered equipment becomes unavailable and written proof from equipment supplier is submitted.

Acceptance of the substitution shall be at the discretion of the Engineer upon review of the substitution. Make revision to the Record

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Consult with Toronto Zoo for all requirements regarding shut down, draining and re-filling of any portion of the existing Toronto Zoo systems, Comply with all of the Toronto Zoo's instruction and requirements. Include all related costs in Tender price (including overtime costs).

1.17 Return all existing equipment and materials not to be re-used to the Toronto Zoo unless otherwise noted.

1.18 Provide all cutting, patching and flashing for mechanical services as required.

1.19 Flash and counter flash all pipes and ducts passing through floors. Ensure waterproof installation.

1.20 Provide sleeves for all new piping passing through floor slabs, beams, concrete walls, slab to slab partitions, etc.

1.21 Seal air tight all around piping penetrations through partitions.

1.22 Install all piping in the best workmanlike manner and in accordance with the best practices of the trade. Provide piping and ductwork identification will in which installed. Doors shall be provided wherever access is required to any new and existing Toronto Zoo and/or tenant equipments, valves, cleanouts, etc.). Coordinate exact location with other Division and Architect.

1.24 Identify each pipe run complete with directional arrows. Match Toronto Zoo identification system where applicable. Locate identification no main and accordance with the directional arrows. Match Toronto Zoo identification system where applicable. Locate identification no main accordance with a complete with directional arrows. encil letterin the trade. Provide piping and ductwork identifications to Toronto Zoo standards.

shall be equal to the fire rating, and are compatible with the type and finish, of the ceiling and existing Toronto Zoo and/or tenant equipment, fixtures, and system devices (dampers, t.

SIGNED

ISSUED FOR PERMIT

ISSUED FOR REVIEW

MAY 12, 2017

AUG. 4, 2017

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25 Provide valve tag and equipment nameplate to mature to black background, mechanical attached.

26 Provide vibration isolation for all fans, A/C units, etc., to Toronto Zoo standards.

27 All power wiring for mechanical equipment and associated devices (starters, etc.) including connection and a complete cost breakdown of all materials, equipment and labour costs associated with eac Request final inspection of the work when the completed installation has been checked, all deficience fixtures cleaned, and Toronto Zoo's staff instructed in all phases of the system operation.

This contractor and all sub-trades are responsible to repair and/or replace any existing services due.

This contractor and all sub-trades are responsible to repair and/or replace any existing services damaged while performing Prior to submission of Tender, review operation of all existing equipment and controls noted to be reused on site with build and refurbishing of any of the equipment and controls.

Heating Ventilating and Air Conditioning (HYAC)

All ductwork construction, support and installation shall be in accordance with the latest SMACNA and ASHRAE standards.

Seal all transverse joints in all supply, return and exhaust ductwork with Duro Dyne EDS-RS Smooth duct Sealer rated for does not apply to turne hood and general exhaust systems.

Provide flexible connectors between all fans and adjacent ductwork consisting of a ULC listed and labelled, pre-assembled to Dyne "Durolon". Maintain a minimum 3" gap between fan and ductwork. Connector must not be under tension.

All sanitary drains and vents 50 mm copper drainage tube (DWV). ping shall be type "L" copper with cast by

Provide isolation valves on main and/or branch lines and for all equipment/fixtures served. All valves shall be suitable for the operating pressure of the system in which Makes and models shall be per Toronto Zoo standards and specifications, unless noted otherwise. Install all valves in accessible locations for ease of future maintenance

Provide new plumbing fixtures as specified. Install all fixtures and components in architect prior to installation. Clean all fixtures prior to taken over by Owner.

V I S I O N S

rovide natural gas piping in accordance with all applicable Gas Codes and CSA regulations. Obtain approval from low th all Code requirements and regulations. All gas and vent piping shall be Schedule 40, ASTM—A53 standard black Dange working pressure. Screw joints for pipe sizes up to 50 mm, butt weld for all other sizes. Weld all concealed cal Gas Utility's authority prior to installation. Vent all system in accordance teel pipe with standard black malleable iron fittings rated for 1380 kPa gas pipes and vent lines. Provide approved type plug cocks with quarter

ılate all domestic hot and cold water piping with 25 mm thick our barrier with self—adhesive longitudinal joint.

Apply PVC recovery jacket to all pipir Make good all existing piping insulation Duct thermal insulation where indicate nsulate all conde arrier with self over all duct insulation in exposed areas (areas without ceiling) in process areas (areas without ceiling). sate/HWT relief piping with 1" dhesive longitudinal joint.

ovide all controls, wiring, conduit, ther ork shall be performed by the Toronto ontrol valves, dampers, I contractor. Include o s, control transformer, cone all costs in the Tender p Toronto Zoo standards. ntrol air piping and all other price (including overtime cos

INDO-MALAYA PAVILION EXTERIOR EXHIBIT

R O J E C

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HP—1: LG Packaged Terminal Air Conditioner Model#LP093HD3B, heat pump model, 9.3 MBH cooling capacity, 8 MBH heating capacity, 12.7 EER, 3.6 COP, 270 CFM supply airflow, up to 75 CFM outdoor ventilation airflow, 3.1 kW Electric heater, 208V/1Ph, MOP = 20 A, MCA = 19.5 A, weight = 109 Lbs. Unit to be c/w 42" wall sleeve #AYSVB01A, 42" stamped aluminium grille #AYAGALB01A (dark bronze), Hardwire kit #AYHW101, leveling legs #AYLL101A, condensate drain kit #AYDR101A, Digital Wirelss Wall thermostat #PYRCUCC1HB and Sub Base #AYSB1101A.

Electric Baseboard Hewall mount cabinet. Exhaust Fan (EF—1): Green acting line voltage thermo s, 120V/1Ph, 1/6 HP. Pr

Water Fountain (WF): Stern Williams #ADF-3700-FP pedestal mounted drinking fountain, bi-level, precast terrazzo with stainless steel receptor, push button operated stainless steel valve with flow adjustment, chrome plated solid brass bubbler, vandal-resistant access plate, no mounting frame. Frost proof. Suitable concrete base for mounting base plate is required. Provide minimum 5 cubic feet (0.14 cubic m) of porous gravel.McGuire #LFHST11LK drinking fountain supplies, chrome plated finish polished brass, straight stops, 10 mm (3/8") I.P.S. Inlet, V.P. Loose keys, low lead. McGuire #8872C P-Trap, heavy cast brass adjustable body, with slip nut, 32 mm (1-1/4") size, shallow wall flange and seamless tubular wall bend. Hose Bib (HB): Watts #HY—725—K Hydrant non—freeze hydrant, all bronze head, seat casting and internal working parts, wall mount hydrant, concealed, bronze wall integral vacuum breaker, nickel bronze box and door, loose key, cylinder lock, 3/4"Ø (19 mm) hose connection, 3/4"Ø (19 mm) female x 1"Ø (25 mm) male pipe c

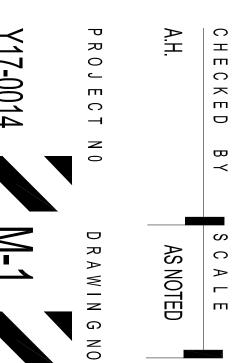
Floor Drain (FD): J.R. Smith #2005Y—03—05 unit to be c/w trap primer connection, bronze body, nickel bronze strainer. Floor drain to be provided with a J.R. Smith #2699 automatic trap primer installed as per manufacturer's recommendations on existing/new domestic cold water line upstream of fixtures serving space and piped to FFD. Unit to be c/w oval funnel.

Mall Louvre (Type 'A'): Nailor Model 1606D, c/w fla extended sill. Refer to drawings for grille sizes.

Backflow Prevetor (BFP): Watts 957-957-AG-NRS LEAD FREE — Reduced Pressure Zone Assembly — two indepersone end connection sleeve accessible housing, stainless steel springs, replaceable elastomer discs, differential shut—off valves non—rising stem gate valves, bronze body, nickel plated test cocks, 957-AG air gap. 304 stainless steel, schedule 40 pipe with ow the check modules, two drip tight

> RAWING MECHANICAL PLANS TITLE

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STRUCTURAL STEEL

1.0 GENERAL

- 1.1 STRUCTURAL STEEL DESIGN DETAILS & CONNECTIONS SHALL CONFORM TO CAN/CSA-S16 & SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER EXPERIENCED IN THIS TYPE OF WORK.
- 1.2 REFER ALSO TO GENERAL NOTES, NOTES UNDER PLANS & TO THE SPECIFICATION.
- 1.3 WELDING SHALL CONFORM TO CSA STANDARD W59 OR W59-M AND BE PERFORMED BY A FABRICATOR CERTIFIED TO CSA W47.1.
- 1.4 BEAM CONNECTIONS SHALL BE DESIGNED FOR A MINIMUM OF 50% OF THE BEAM SHEAR CAPACITY UNLESS OTHERWISE NOTED, & IN NO CASE BE LESS THAN THE LOADS SHOWN ON OR IMPLIED BY THE DRAWINGS.
- 1.5 ALL STEEL HANGERS TO BE WELDED ALL AROUND WITH 6MM FILLET U/N
- 2.1 STRUCTURAL STEEL SECTIONS SHALL CONFORM TO CSA-G40.20/G40.21 1. WW SHAPES, S SHAPES, CHANNELS, ANGLES, PLATES & RODS: - GRADE 300W 2. HSS SECTIONS: - GRADE 350W (CLASS C U/N)
- 3. W SHAPES: GRADE 350W
- 2.2 BOLTS, NUTS & WASHERS FOR CONNECTIONS TO CONFORM TO ASTM A325 UNLESS NOTED.
- 2.3 ANCHOR BOLTS, NUTS & WASHERS FOR BASE PLATES, BEARING PLATES & WELD PLATES TO CONFORM TO ASTM A307 UNLESS NOTED.
- 2.4 SHEAR STUDS WHERE REQUIRED TO CONFORM TO ASTM A108, WELDING TO CONFORM TO CSA W59 OR W59-M
- 2.5 WELDING MATERIALS TO CONFORM TO CSA W48-M (SERIES).
- 2.6 PRIMER PAINT TO CONFORM TO CAN/CGSB-1.40 OR CISC/CPMA 1 OR CISC/CPMA 2.
- 2.7 ALL EXPOSED STEEL TO BE HOT DIPPED GALVANIZED UNLESS NOTED
- 2.8 HOT DIP GALVANIZING TO CONFORM TO CAN/CSA-G164 WITH A MIMIMUM ZINC COATING OF 600g/sq.m. UNLESS OTHERWISE SPECIFIED.
- 3.0 EXECUTION
- 3.1 FABRICATION, HANDLING & ERECTION TO CONFORM TO CAN/CSA-S16
- 3.2 PROVIDE ADJUSTABLE ANCHORS TO ALL STEEL TO BE BUILT INTO, ABUTTED BY, OR FACED WITH MASONRY (REFER ALSO TO DETAILS IF SHOWN). SPACING OF ANCHORS TO BE .1 FOR VERTICAL SPACING ..
 - . 600 (24") MAX. CENTRES .2 FOR HORIZONTAL SPACING 10 TIMES WALL THICKNESS* (MAX. 2000 (6'-8") CENTRES) (* NOTE, USE BACK-UP WYTHE THICKENING ONLY FOR CAVITY WALLS.)
 - .3 WHERE STEEL PROVIDES LATERAL BRACING ONLY TO MASONRY (I.E. DOES NOT SUPPORT MASONRY)
- ANCHORS SHALL PERMIT DIFFERENTIAL VERTICAL MOVEMENT BETWEEN STRUCTURAL MEMBER & MASONRY. 3.3 CLEAN, PREPARE SURFACES AND SHOP PRIME STRUCTURAL STEEL & JOISTS WITH ONE COAT OF SPECIFIED PRIMER PAINT IN ACCORDANCE WITH CAN/CSA-S16, EXCEPT WHERE MEMBERS ARE TO BE ENCASED
- IN CONCRETE. FIELD "TOUCH-UP" BOLTS, WELDS, BURNED OR SCRAPED SURFACES AFTER ERECTION. 3.4 PROVIDE ALL NECESSARY TEMPORARY BRACING TO KEEP STRUCTURE SAFE AND PLUMB. BRACING SHOWN
- ON STRUCTURAL DRAWINGS IS PERMANENT FOR FINISHED BUILDING ONLY. 3.5 CO-ORDINATE WITH MECHANICAL & ELECTRICAL CONSULTANTS & SUB-TRADES WHOSE WORK MAY EFFECT
- DETAILING, FABRICATION & ERECTION OF THE STEEL STRUCTURE. 3.6 TOLERANCES: VARIATION FROM PLUMB & LEVEL EXTERIOR COLUMNS, COLUMNS AT ELEVATOR SHAFTS, &
- SPANDREL BEAMS INCLUDING ANGLES 1:1000 MAX. 25 mm (1/8" IN 10'-0" MAX. 1") ... 1:500 (1/4" IN 10'-0") OTHER PIECES . 3.7 NO HOLES OTHER THAN THOSE SHOWN ON REVIEWED SHOP DRAWINGS SHALL BE MADE IN ANY STEEL
- MEMBER WITHOUT WRITTEN PERMISSION OF THE STRUCTURAL CONSULTANT.
- 4.0 QUALITY CONTROL
- 4.1 SEE GENERAL NOTES, NOTES UNDER PLANS, &/OR SPECIFICATION FOR INSPECTION & TESTING REQUIREMENTS.

CAST-IN-PLACE CONCRETE NOTES

1.0 GENERAL

- 1.1 PROVIDE ALL LABOUR, MATERIALS, TOOLS AND EQUIPMENT REQUIRED TO CARRY OUT THE WORK. 1.2 REFER ALSO TO GENERAL NOTES, NOTES UNDER PLANS AND SCHEDULES, TYPICAL DETAILS AND SPECIFI-
- CATION. 2.0 PRODUCTS
- 2.1 PORTLAND CEMENT, WATER AND AGGREGATES SHALL CONFORM TO CSA STANDARD A23.1.
- 2.2 PROVIDE AN APPROVED WATER REDUCING ADDITIVE IN ALL CONCRETE. PROVIDE AN APPROVED AIR ENTRAINING ADDITIVE IN ALL CONCRETE WHICH WILL BE EXPOSED TO A FREEZE/THAW CYCLE AND/OR THE ACTION OF DE-ICING SALT. ADMIXTURES SHALL CONFORM TO CSA STANDARD A23.5. 2.3 PROVIDE STANDARD ADJUSTABLE MASONRY ANCHOR SLOTS FOR ALL MASONRY FACING OR ABUTTING
- CONCRETE FACES. 2.4 PROVIDE AND/OR INSTALL STANDARD ADJUSTABLE INSERTS & ALL OTHER CAST—IN INSERTS AS REQUIRED
- BY THE ARCHITECTURAL, STRUCTURAL, MECHANICAL & ELECTRICAL DRAWINGS & SPECIFICATION. 2.5 REINFORCING STEEL UNLESS SPECIFICALLY NOTED, SHALL BE DEFORMED BARS CONFORMING TO
- CAN/CSA-G30.18-M GRADE 400 (58000 PSI). 2.6 REINFORCING SHALL BE DETAILED, BENT, PLACED AND SUPPORTED TO CONFORM TO ACI STANDARD 315 AND THE MANUAL OF STANDARD PRACTICE PUBLISHED BY THE REINFORCING STEEL INSTITUTE OF
- 2.7 DRY-PACK GROUT TO BE 1 PART PORTLAND CEMENT TO 1 PART SAND TO 2 PARTS OF 8 mm PEA GRAVEL WITH ONLY SUFFICIENT WATER TO DAMPEN MIXTURE. COMPRESSIVE STRENGTH 25MPa AT 28 DAYS.
- 2.8 NON-SHRINK GROUT TO BE AN APPROVED PRE-MIXED PROPRIETARY PRODUCT. 2.9 CURING AND SEALING COMPOUNDS WHERE APPROVED FOR USE TO CONFORM TO ASTM STANDARD C309. GENERALLY, ALL CONCRETE SURFACES ARE TO BE SEALED UNLESS NOTED OTHERWISE. COMPOUNDS ARE TO BE COMPATIBLE WITH APPLIED FINISHES.

AND POINT LOADS.

- 3.1 MINIMUM COMPRESSIVE STRENGTH FOR CONCRETE @ 28 DAYS SHALL BE AS NOTED ON THE DRAWINGS
- 3.2 SLUMP AT THE POINT OF DISCHARGE SHALL BE CONSISTENT AT 80 mm ±30mm (3" ±1w") UNLESS NOTED OTHERWISE. GREATER SLUMPS ARE NOT ACCEPTABLE.
- 3.3 CONCRETE MIXING, TRANSPORTATION, HANDLING AND PLACING SHALL CONFORM TO CSA STANDARD A23.1. 3.4 CONSTRUCTION JOINTS FOR WALLS, SLABS, AND BEAMS NOT SHOWN ON THE DRAWINGS SHALL BE APPROVED BY THE STRUCTURAL CONSULTANT BEFORE CONSTRUCTION. GENERALLY JOINTS IN SLABS SHALL BE AT RIGHT ANGLES TO THE SPANS, AT MID-SPAN IF POSSIBLE AND BE CLEAR OF SUPPORTS
- 3.5 INSERTS, FRAME-OUTS, SLEEVES, BRACKETS, CONDUITS AND FASTENING DEVICES, SHALL BE INSTALLED AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS IN A MANNER THAT SHALL NOT IMPAIR THE STRUCTURAL STRENGTH OF THE SYSTEM, BE SO INSTALLED THAT THEY SHALL NOT REQUIRE THE CUTTING, BENDING, OR DISPLACEMENT OF THE REINFORCING OTHER THAN AS SHOWN ON THE TYPICAL
- 3.6 ELECTRICAL CONDUIT SHALL NOT PASS THROUGH A COLUMN, SHALL NOT BE LARGER IN OUTSIDE DIA-METER THAN 1/3 SLAB THICKNESS OR WALL OR BEAM IN WHICH IT IS EMBEDDED, SHALL NOT BE SPACED CLOSER THAN 3 DIAMETERS ON CENTRE UNLESS APPROVED AND HAVE A MINIMUM CONCRETE COVER OF 25 mm (1") AND UNLESS SPECIFICALLY PERMITTED OTHERWISE, SHALL NOT RUN HORIZONTALLY IN
- A CONCRETE WALL. 3.7 OPENINGS AND DRIVEN FASTENERS REQUIRED IN THE CONCRETE AFTER THE CONCRETE IS PLACED SHALL BE APPROVED BY THE STRUCTURAL CONSULTANT BEFORE PROCEEDING
- 3.8 FINISHING, REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR REQUIRED FINISH TO EXPOSED CONCRETE. ALL HONEYCOMBING SHALL BE CUT OUT AND FILLED. FLOOR FINISHES SHALL BE AS REQUIRED BY THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS AND SHALL CONFORM TO CSA STANDARD A23.1 (CLASS A CONVENTIONAL SMOOTH CLASSIFICATION).
- 3.9 TOLERANCES FOR PLACING STRUCTURAL CONCRETE, REINFORCING STEEL, CAST-IN HARDWARE AND FOR FLOOR & ROOF FINISHES SHALL BE AS SPECIFIED IN CSA STANDARD A23.1.
- 4.0 QUALITY CONTROL
- 4.1 FOR INSPECTION AND TESTING, SEE GENERAL NOTES.

GENERAL NOTES

- 1.0 GENERAL
- 1.1 DESIGN AND CONSTRUCTION IS TO CONFORM TO THE REQUIREMENTS OF THE ONTARIO BUILDING CODE REFER ALSO TO TYPICAL DETAILS, NOTES UNDER PLANS & SCHEDULES ON THE STRUCTURAL DRAWINGS, AND TO THE SPECIFICATION. ALL CODES, MANUALS, STANDARDS AND SPECIFICATIONS REFERRED TO SHALL BE THE LATEST EDITIONS INCLUDING ALL REVISIONS AND ADDENDA. ALL DIMENSIONS, OTHER THAN PURELY STRUCTURAL DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS MUST BE CHECKED AGAINST THE ARCHITECTURAL DRAWINGS AND ANY INCONSISTENCIES REPORTED TO THE ARCHITECT
- BEFORE PROCEEDING WITH THE WORK. STRUCTURAL DRAWINGS MUST NOT BE SCALED. 1.2 REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR LOCATIONS AND SIZES OF OPENINGS, TRENCHES, PITS, SUMPS, EQUIPMENT, SLEEVES, DEPRESSIONS, GROOVES AND CHAMFERS NOT INDICATED ON THE STRUCTURAL DRAWINGS. UNLESS SPECIFICALLY NOTED OTHERWISE, THE ABOVE ITEMS WHERE SHOWN ON THE STRUCTURAL DRAWINGS ARE INDICATED ONLY APPROXIMATELY AS TO SIZE AND LOCATION.
- 1.3 UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS, NO PROVISION HAS BEEN MADE IN THE DESIGN FOR CONDITIONS OCCURRING DURING CONSTRUCTION. THE CONTRACTOR IS TO PROVIDE ALL NECESSARY BRACINGS AND SHORING REQUIRED FOR STRESSES AND INSTABILITY OCCURRING FROM ANY CAUSE DURING CONSTRUCTION. THE CONTRACTOR SHALL ACCEPT FULL RESPONSIBILITY FOR ALL SUCH MEASURES. IT SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL NECESSARY BRACINGS, SHORINGS OR OTHER TEMPORARY SUPPORTS TO SAFEGUARD ALL EXISTING OR ADJACENT STRUCTURES AFFECTED BY THIS WORK.
- 2.0 SHOP DRAWINGS, PLACING DRAWINGS & BAR LISTS: -
- 2.1 FOR ALL STRUCTURAL COMPONENTS SHOWN ON THE STRUCTURAL DRAWINGS, SUBMIT COPIES OF SHOP DRAWINGS AS DIRECTED, FOR REVIEW BY THE STRUCTURAL CONSULTANT. SHOP DRAWINGS TO SHOW COMPLETE INFORMATION FOR THE FABRICATION AND ERECTION OF THE STRUCTURAL COMPONENTS.
- 2.2 REVIEW OF SHOP DRAWINGS BY THE STRUCTURAL CONSULTANT IS ONLY TO ASSESS THAT THE SUBMITTED SHOP DRAWINGS REFLECT THE INTENT OF THE STRUCTURAL DESIGN.
- 2.3 REVIEW BY THE STRUCTURAL CONSULTANT SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR SEEING THAT THE WORK IS COMPLETE, ACCURATE AND IN CONFORMITY WITH THE STRUCTURAL DRAWINGS AND SPECIFICATIONS. 3.0 INSPECTION AND TESTING: -
- 3.1 A SOILS CONSULTANT AND AN INDEPENDENT INSPECTION AND TESTING COMPANY ARE TO BE ENGAGED TO CARRY OUT THE FOLLOWING SERVICES: -
- .3 CAST-IN-PLACE & PRECAST CONCRETE ROUTINE INSPECTION OF MATERIALS, INCLUDING SLUMP, CYLINDER AND AIR ENTRAINMENT TESTS & REINFORCING ROD TESTS WHEN REQUIRED OR DIRECTED IN ACCORDANCE WITH CSA STANDARD A23.2
- .4 THE PROJECT SUPERINTENDENT IS TO ADVISE THE STRUCTURAL CONSULTANT A MINIMUM OF 48 HOURS IN ADVANCE OF A CONCRETE POUR FOR A REVIEW OF PREPARATIONS.
- .5 STRUCTURAL STEEL ROUTINE SHOP AND FIELD INSPECTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF CSA S16
- .6 CORE SLAB SEE CORE SLAB NOTES. .7 MASONRY - WHEN REQUIRED OR DIRECTED, CONCRETE BLOCKS SHALL BE TESTED IN ACCORDANCE WITH CAN/CSA-A369.1M BRICKS IN ACCORDANCE WITH CAN/CSA A82.2M; AND MORTAR AND/OR GROUT IN ACCORDANCE WITH CSA A179.
- 3.2 ALL INSPECTION AND TESTING SERVICES ARE TO BE PERFORMED BY COMPANIES CERTIFIED BY THE CANADIAN STANDARDS ASSOCIATION AND FOR WELDING, INSPECTORS ARE TO BE CERTIFIED BY THE CANADIAN WELDING BUREAU.
- 4.0 FOUNDATIONS
- 4.1 REFER TO NOTES UNDER FOUNDATION PLANS. ALL EXTERIOR FOUNDATIONS EXPOSED TO FREEZING SHALL BE FOUNDED AT A MINIMUM OF 1200mm (4'-0") BELOW FINISHED GRADE UNLESS OTHERWWISE NOTED FOOTINGS EXPOSED TO FROST ACTION DURING CONSTRUCTION SHALL BE PROTECTED BY A MIN. 1200mm (4'-0") OF EARTH OR EQUIVALENT SUFFICIENT TO PREVENT FREEZING.
- 4.2 THE LINE OF SLOPE BETWEEN ADJACENT EXCAVATIONS FOR FOOTINGS OR ALONG STEPPED FOOTINGS SHALL NOTE EXCEED A RISE OF 7 IN A RUN OF 10, MAX. STEP APPROX 600 mm (2'-0").
- 4.3 WALL DEPTHS AND FOOTING FLEVATIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE BASED ON UPON INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THE STRUCTURAL DRAWINGS.
- 4.4 IF ACTUAL JOB SITE OR SOIL CONDITIONS VARY FROM THOSE ASSUMED, THEN WRITTEN DIRECTIONS MUST BE OBTAINED FROM THE STRUCTURAL CONSULTANT BEFORE PROCEEDING WITH THE WORK.
- 4.5 KEEP EXCAVATIONS CONTINUOUSLY DRY BEFORE CONCRETE IS PLACED. IF THE SOIL IS SOFTENED BY WATER THE EXCAVATION SHALL BE EXTENDED BELOW THE SOFTENED MATERIAL AND THE BOTTOM OF THE FOOTINGS LOWERED TO SUIT.
- 4.6 FOUNDATION DESIGN PARAMETERS: ALL FOUNDATION ELEMENTS DESIGNED TO THE VALUES LISTED IN THE GEOTECHNICAL INVESTIGATION BY SOIL ENGINEERS LTD. REF. NO: 1610-S137 DATED DEC. 7TH 2016
- MAX. SOIL BEARING SLS: 250kPa MAX. SOIL BEARING ULS: 400kPa DESIGN SOIL DENSITY: 22kN/m^3 DESIGN ACTIVE LAT. FARTH COFF.: 0.40
- DESIGN PASSIVE LAT. EARTH COEF. : 2.50 DESIGN AT REST LAT. EARTH COEF. : 0.50 5.0 BACKFILLING AND COMPACTION
- 5.1 SLABS-ON-GRADE AND ALL STRUCTURAL ELEMENTS FRAMING INTO WALLS WHICH RETAIN EARTH MUST BE IN PLACE BEFORE BACKFILLING.
- 5.2 AT FOUNDATION WALLS WITH GRADE BOTH SIDES, UNLESS ADEQUATELY SHORED, BACKFILL & COMPACT EACH SIDE OF WALL SIMULTANEOUSLY.
- 5.3 BACKFILL UNDER SLAB-ON-GRADE, IN FOOTING EXCAVATIONS AND IN TRENCHES ONLY WITH APPROVED MATERIAL. UNLESS SPECIFICALLY NOTED OTHERWISE, BACKFILLING SHALL BE CARRIED OUT IN MAXIMUM OF 200mm (8") THICK LIFTS OF LOOSE FILL EACH COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.

WOOD NOTES

1.0 GENERAL

- 1.1 STRUCTURAL WOOD MEMBERS DESIGN DETAILS AND CONNECTIONS SHALL CONFORM TO CAN/CSA-086 & SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER
- 1.2 REFER ALSO TO GENERAL NOTES, NOTES UNDER PLANS & TO THE SPECIFICATION.
- 1.3 WOOD MEMBER BEAM CONNECTIONS SHALL BE DESIGNED FOR THE SHEAR CAPACITY OF THE BEAM SHEAR CAPACITYUNLESS OTHERWISE NOTED, & IN NO CASE BE LESS THAN THE LOADS SHOWN ON OR IMPLIED BY THE DRAWINGS.

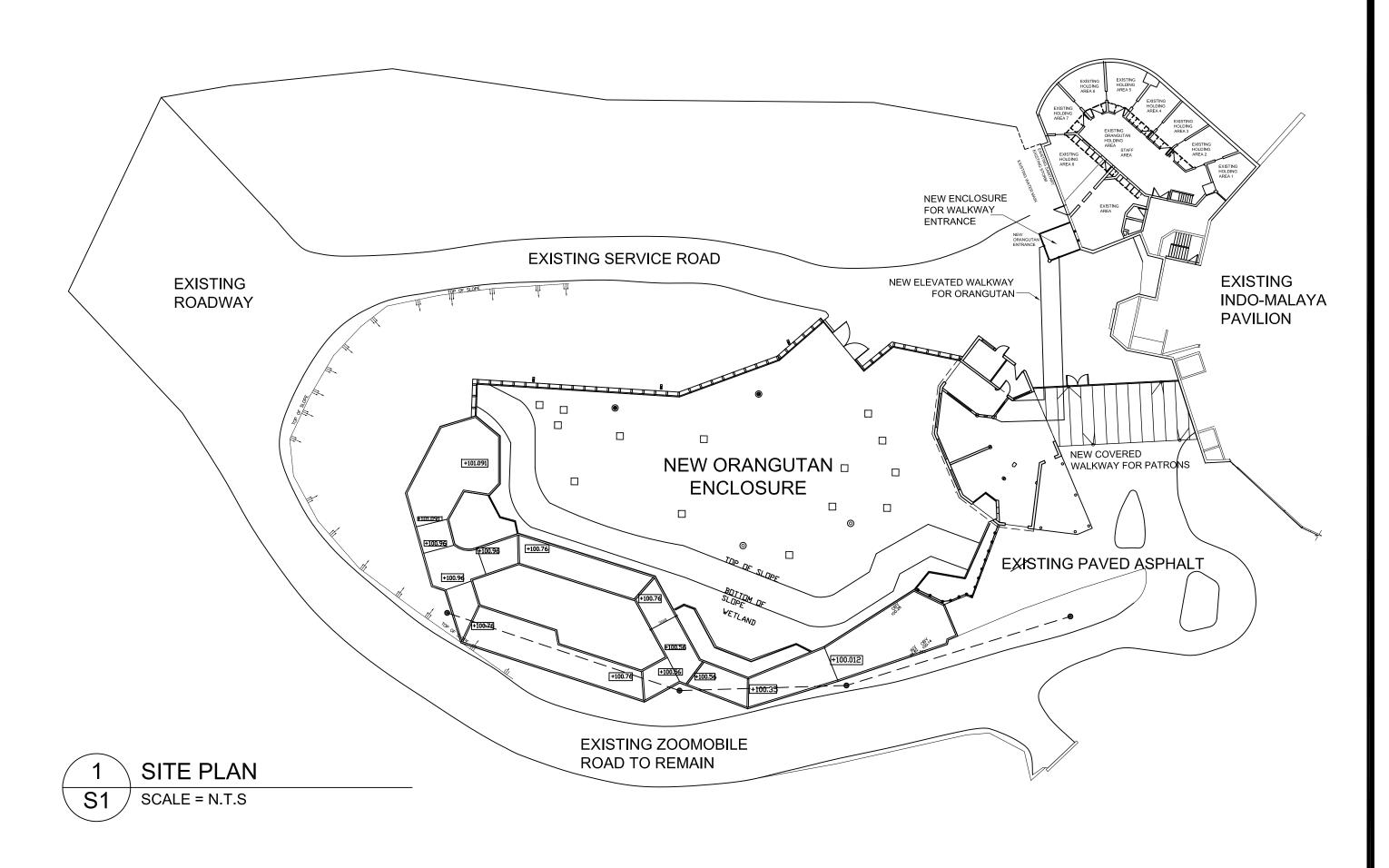
- 2.1 ALL REFERENCED WOOD POLES TO BE MANUFACTURED BY "GUELPH UTILITY POLE" UNLESS OTHERWISE NOTED 2.2 ALL REFERENCED WOOD HORIZONTALS TO BE SPF No1 UNLESS OTHERWISE NOTED
- 2.3. DESIGN OF WOOD MEMBERS IN ACCORDANCE WITH CSA 086 2.4 DESIGN OF COLD FORMED WOOD CONNECTORS IN ACCORDANCE WITH CSA 136
- 2.5 ALL SPECIFIED WOOD CONNECTORS TO BE GALVANIZED 2.6 ALL SPECIFED WOOD CONNECTIONS TO BE MANUFACTURED BY SIMPSON STRONG—TIE UNLESS OTHERWISE

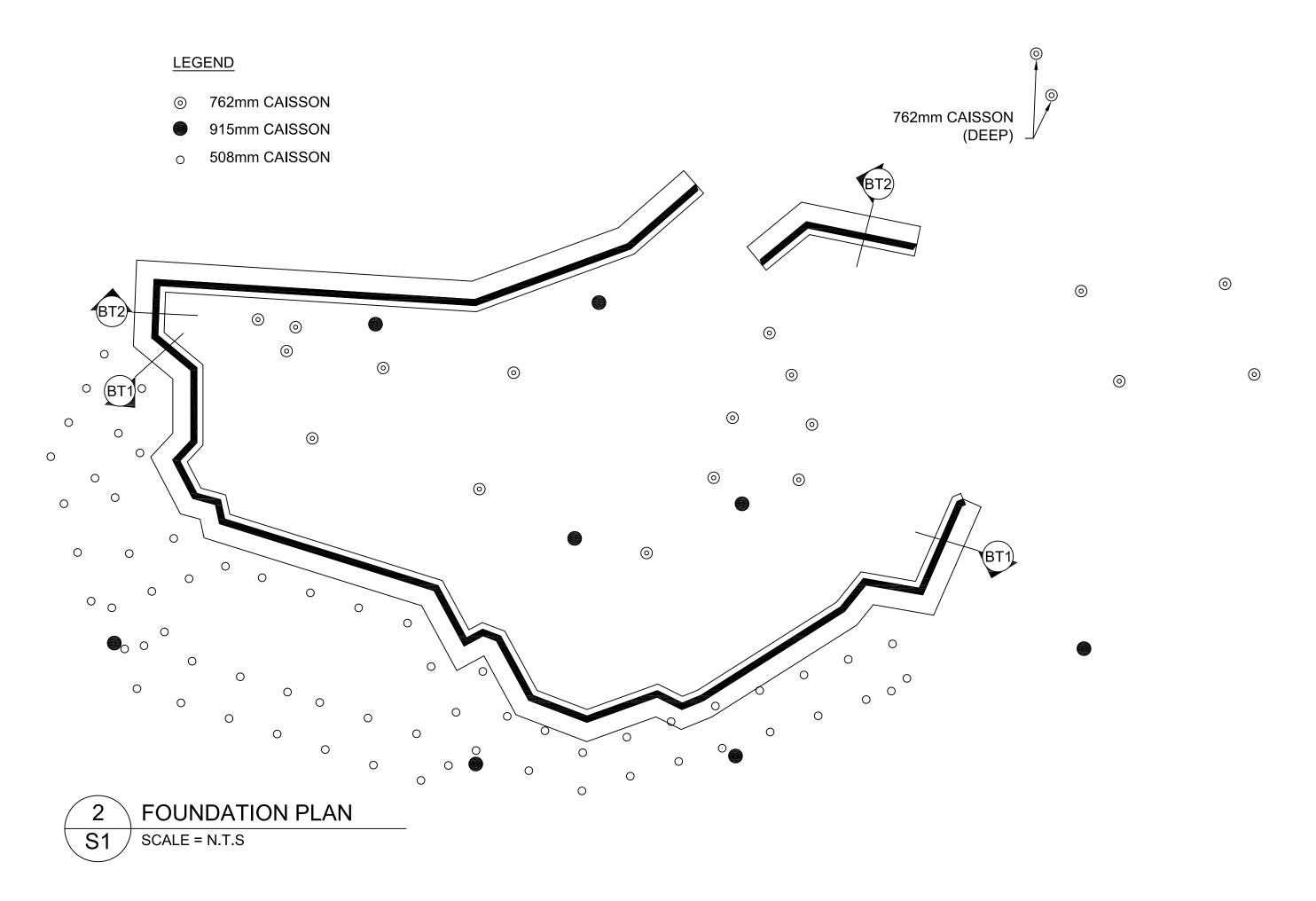
3.0 EXECUTION

- 3.1 FABRICATION, HANDLING & ERECTION TO CONFORM TO CAN/CSA-086
- 3.2 EMBEDED PORTION OF POLES TO BE TREATED WITH CREOSOTE OR APPROVED EQUIVALENT 3.3 PROVIDE ALL NECESSARY TEMPORARY BRACING TO KEEP STRUCTURE SAFE AND PLUMB. BRACING SHOWN ON STRUCTURAL DRAWINGS IS PERMANENT FOR FINISHED STRUCTURE ONLY.
- 3.4 NO HOLES OTHER THAN THOSE SHOWN ON REVIEWED SHOP DRAWINGS SHALL BE MADE IN ANY WOOD MEMBER WITHOUT WRITTEN PERMISSION OF THE STRUCTURAL CONSULTANT.

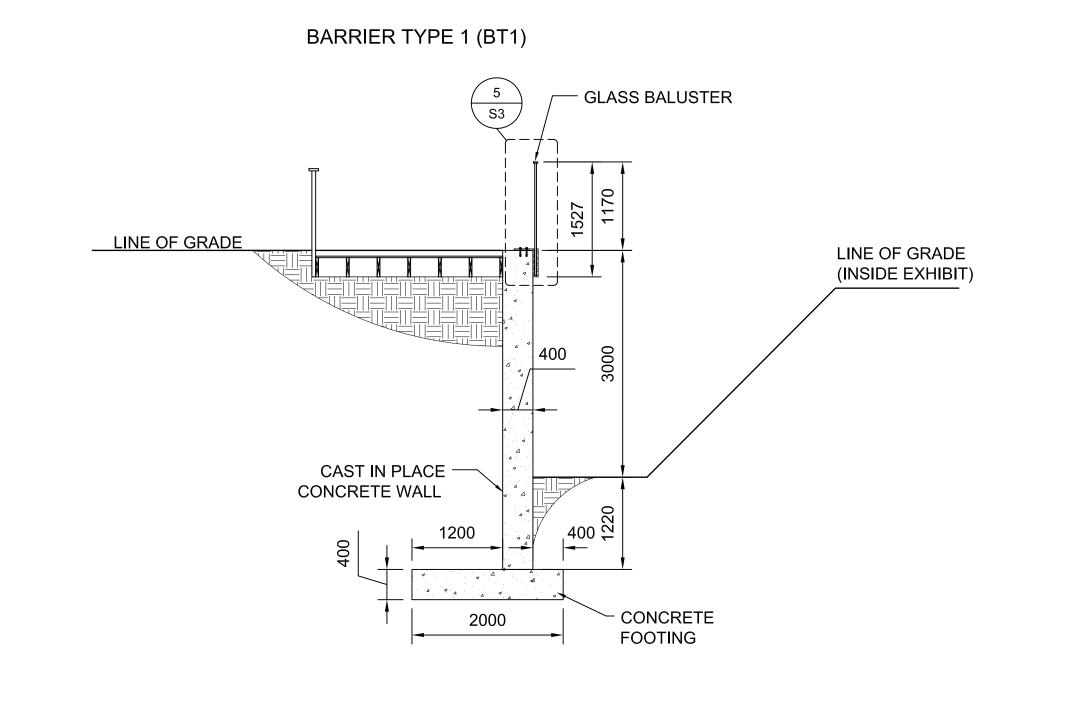
4.0 QUALITY CONTROL

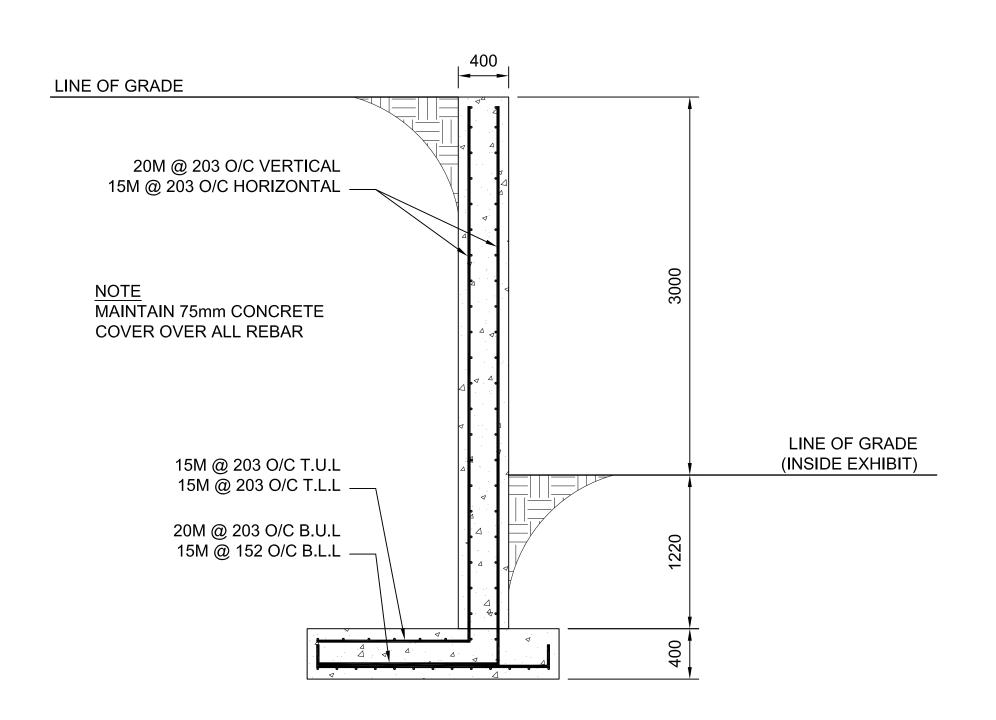
4.1 SEE GENERAL NOTES, NOTES UNDER PLANS, FOR SPECIFICATION FOR INSPECTION & TESTING REQUIREMENTS.





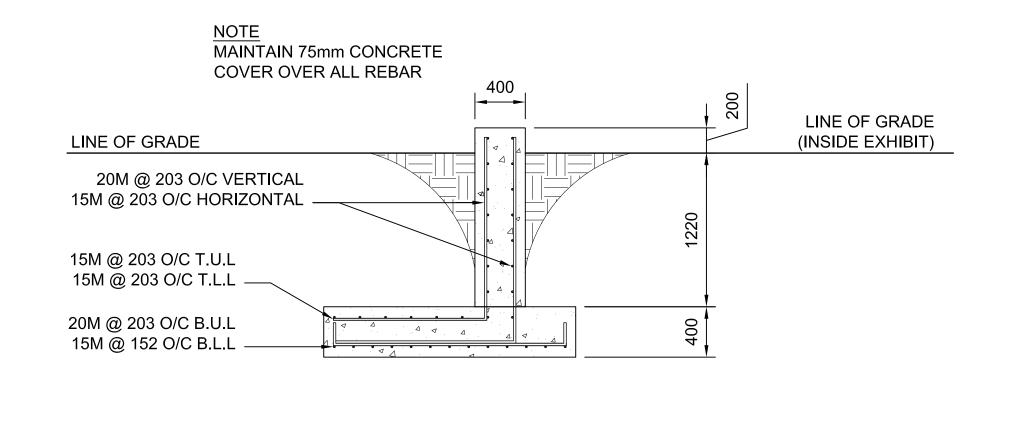
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JEROL)-	JEROL TECHNOLOGIES INC.					NOTES, SITE FLAN & FOUNDATION FLAN	SCALE:	AS NOTED	C1
	95 ALLAURA BLVD. AURORA, ONT., L4G 3N2 905-726-3817					PROJECT NAME: ORANGUTAN ENCLOSURE	DATE:	APR. 13, 2017	51
	303 720 3017						DRAWN	D.A.B	





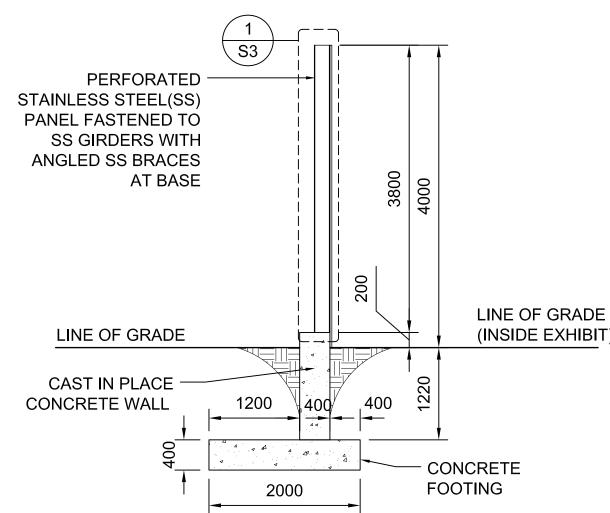
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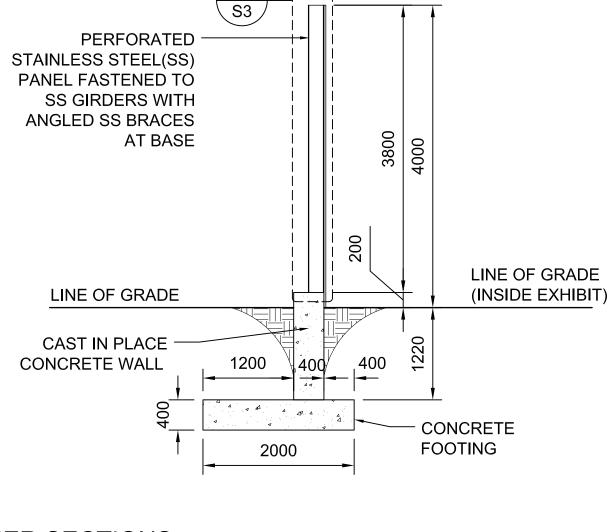
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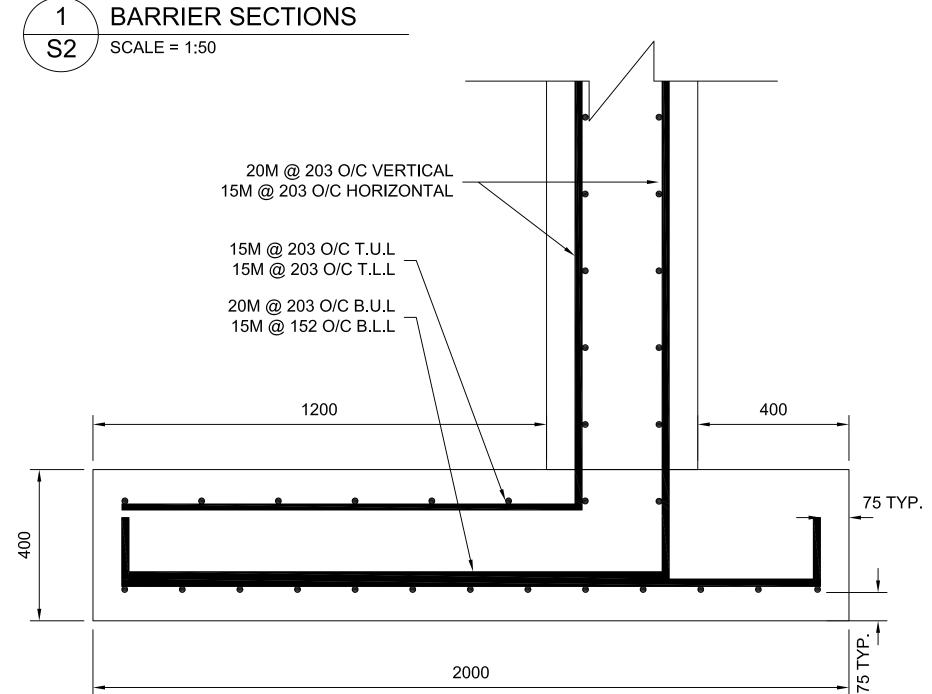








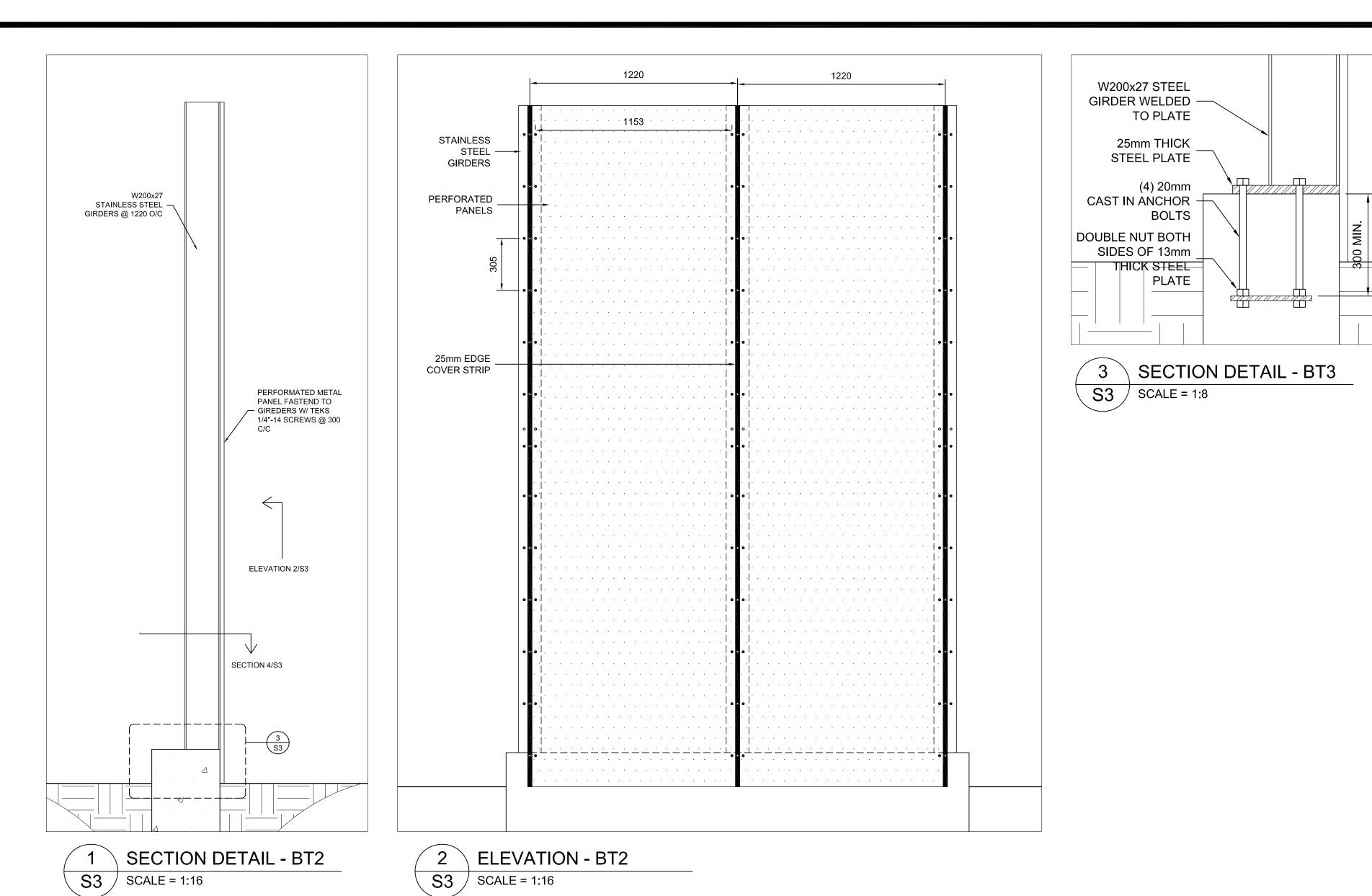


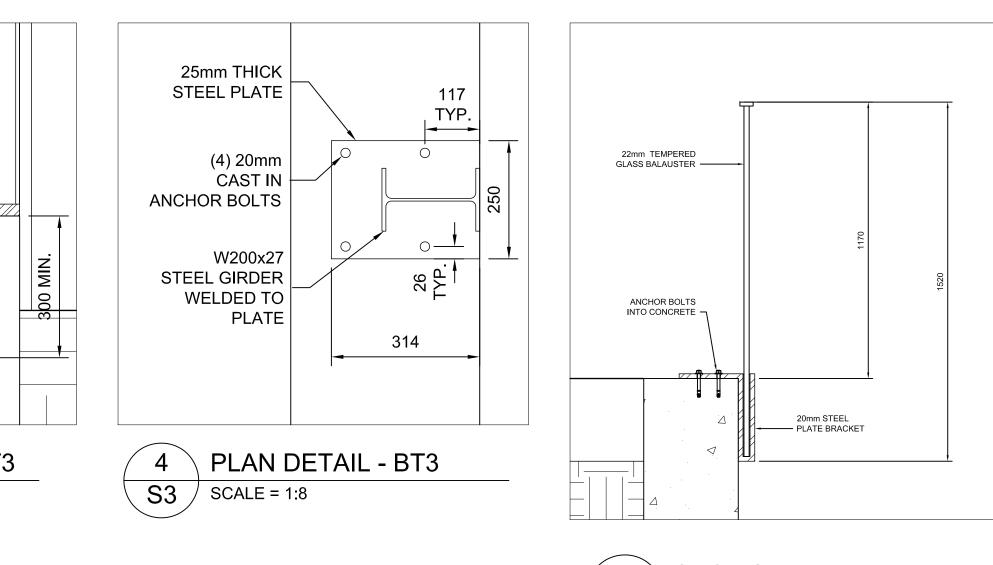


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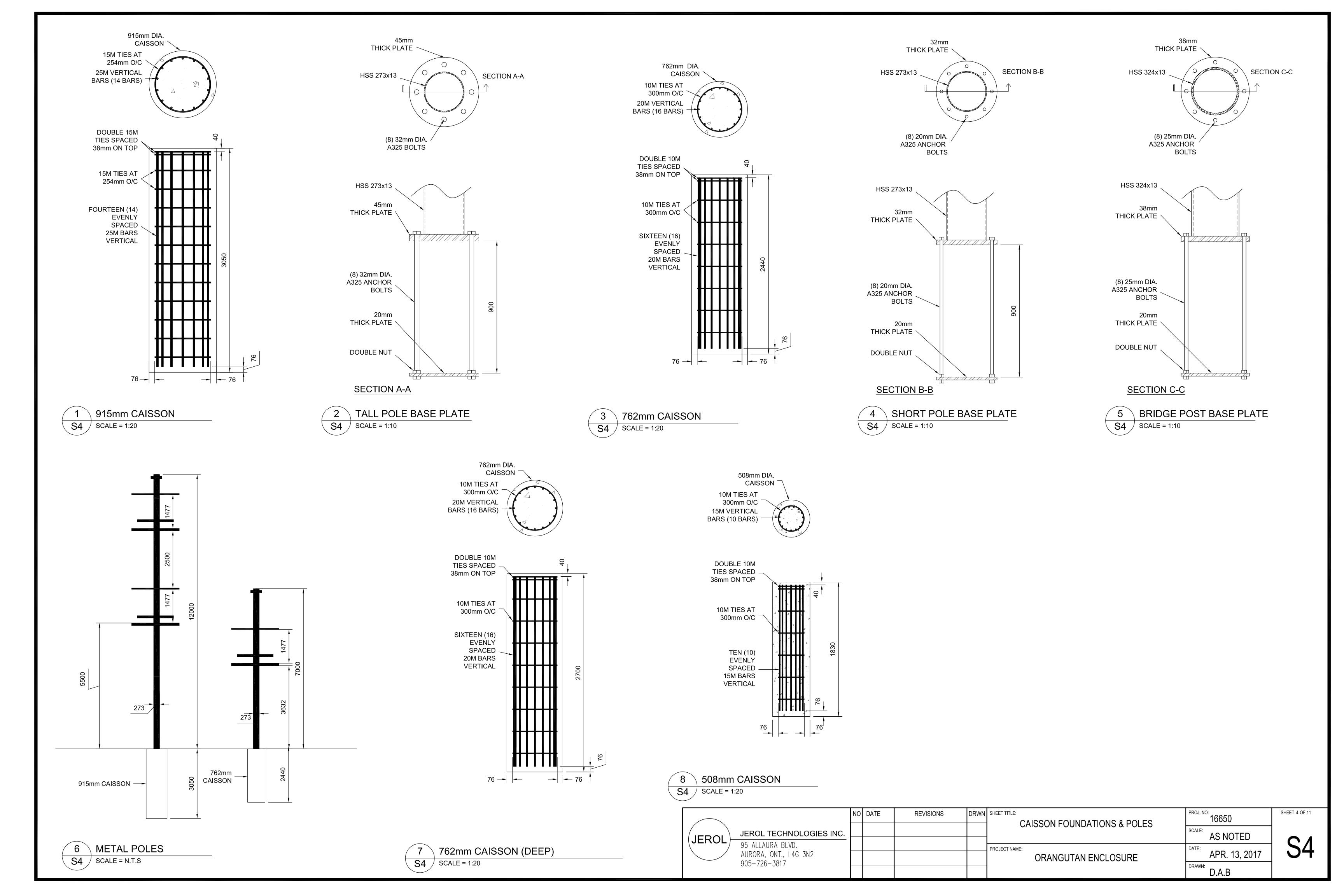
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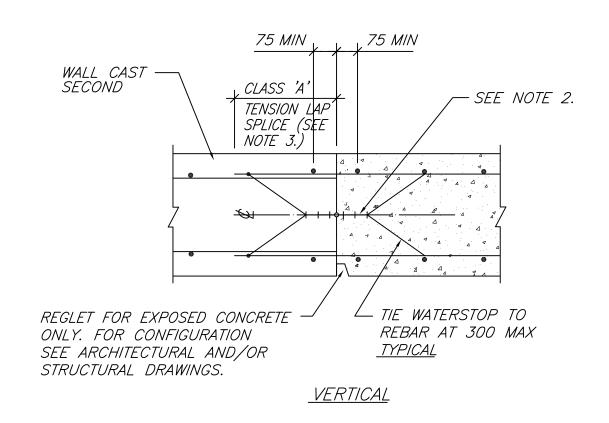
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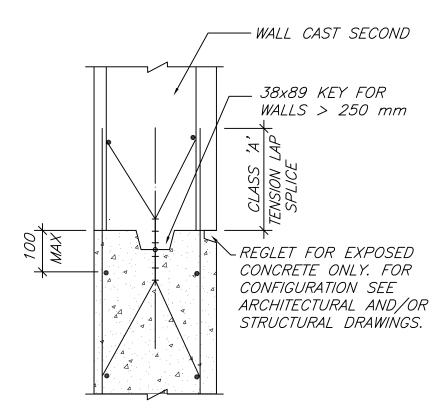




5 SECTION DETAIL - BT1
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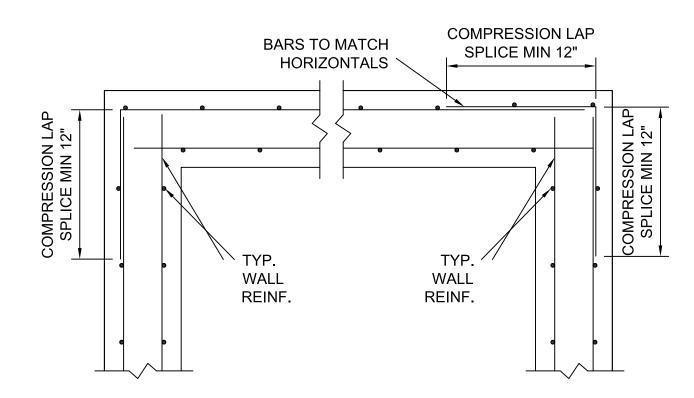


<u>HORIZONTAL</u>

NOTES

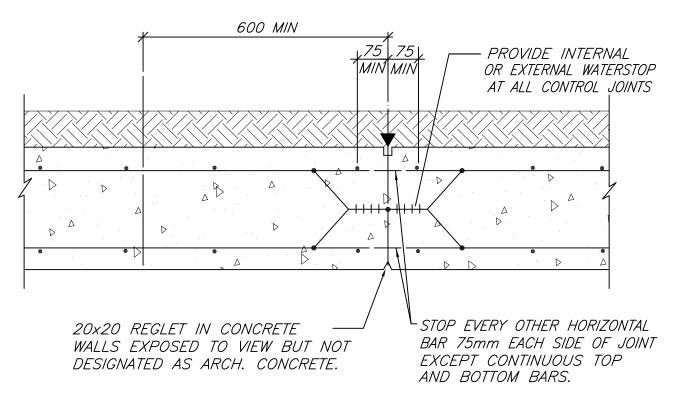
- 2. FOR WALLS ABOVE GRADE EXPOSED TO WEATHER PROVIDE INTERNAL TYPE CONT. WATERSTOP.
- 3. PROVIDE CLASS 'C' TENSION LAP SPLICE ('FOR TOP BARS") WHERE WALL SPANS HORIZONTALLY.



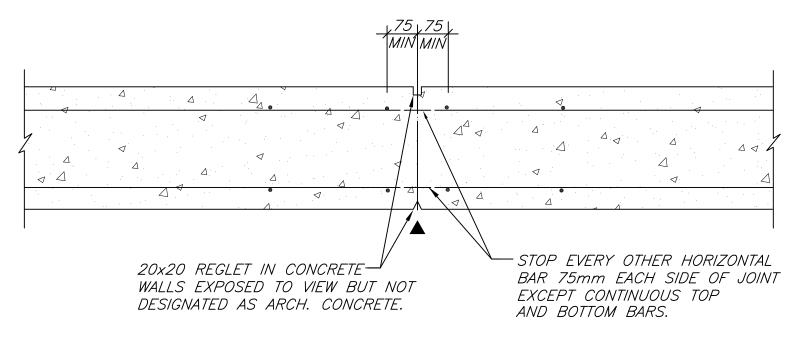


TYP. ALTERNATIVE PLANS AT CORNERS





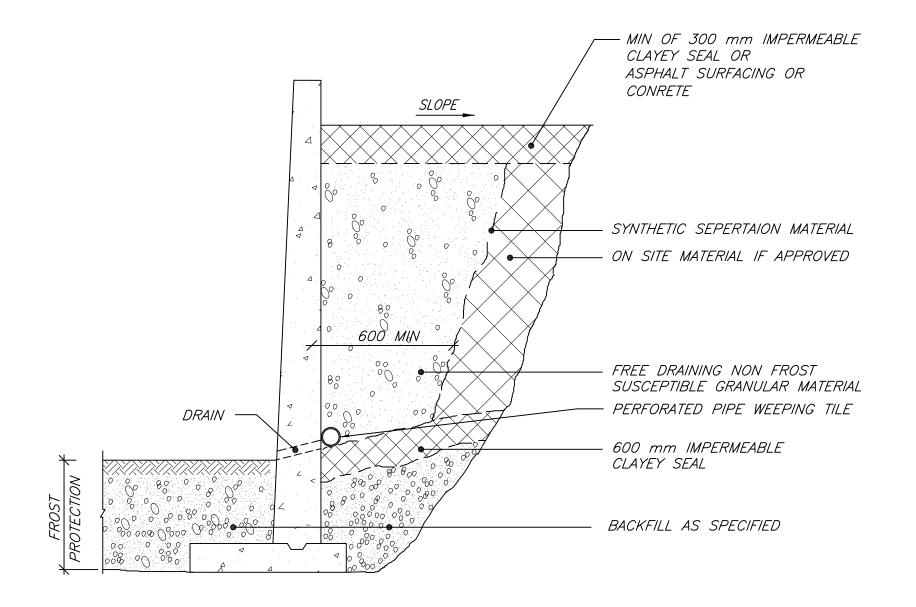
FOUNDATION WALLS



WALLS NOT RETAINING SOIL

- 1. PROVIDE CONTROL JOINTS IN ALL WALLS AT LOCATIONS SHOWN ON PLANS THUS lacktriangle .
- 2. MAXIMUM SPACING OF CONTROL JOINTS SHALL BE 6000 mm UNLESS NOTED OTHERWISE.
- 2. FOR WALLS DESIGNATED AS ARCHITECTURAL CONCRETE REGLET SHALL BE AS PER ARCH. DWGS.





NOTES:

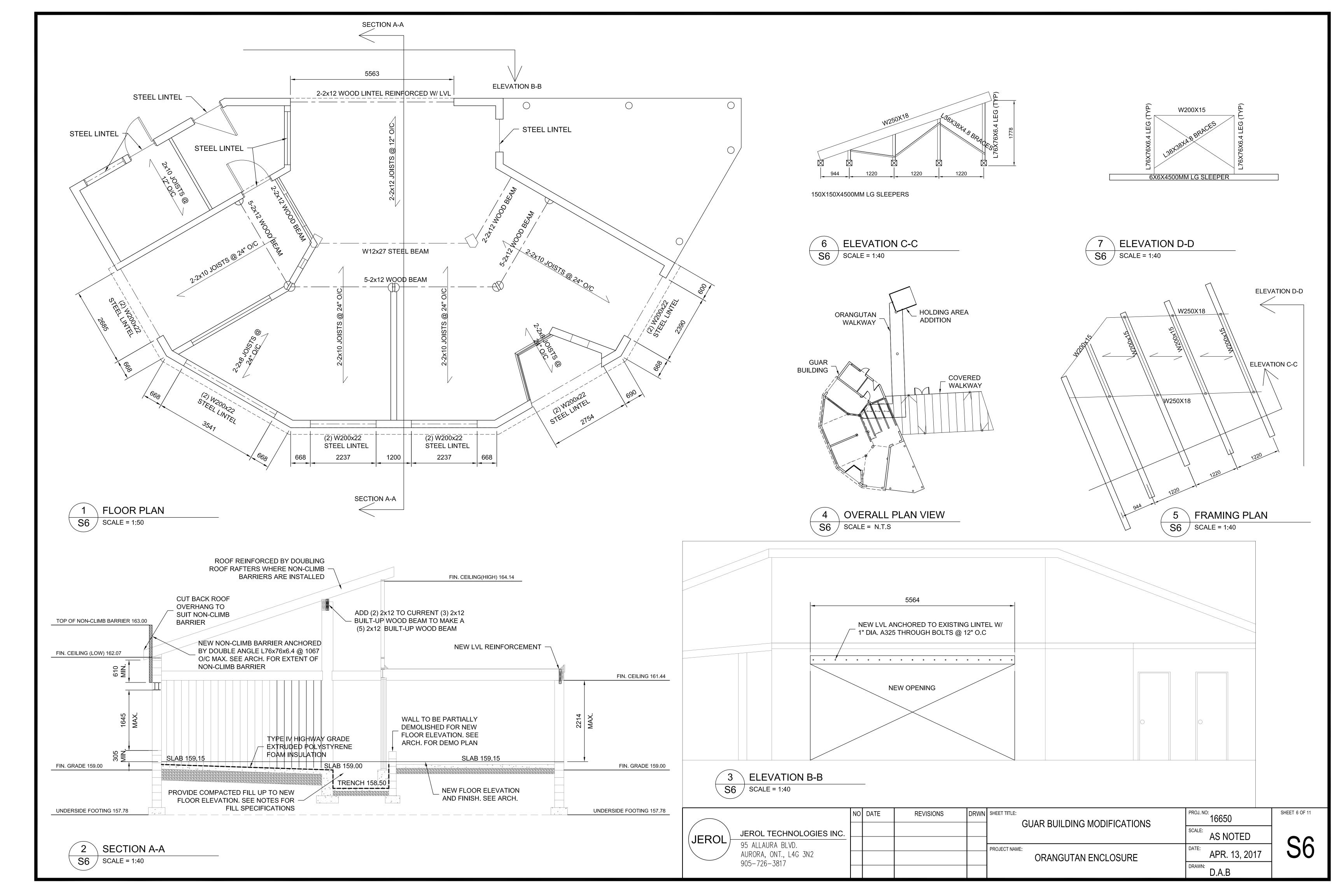
- 1. ALL FILL TO BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY, UNLESS OTHERWISE NOTED OR SHOWN.
- 2. PROVIDE 50 mm Ø DRAIN HOLES AT 1200 mm MAX c/c.
- 3. DO NOT COMPACT CLOSER THAN 1800 mm FROM WALL WITH HEAVY EQUIPMENT. USE HAND CONTROLLED LIGHT EQUIPMENT WITHIN 1800 mm FROM WALL.
- 4. REFER TO SOIL REPORT FOR ADDITIONAL INFORMATION.
- 5. PROVIDE CONTROL JOINTS IN WALL AS PER TYPICAL DETAIL 2/S4.

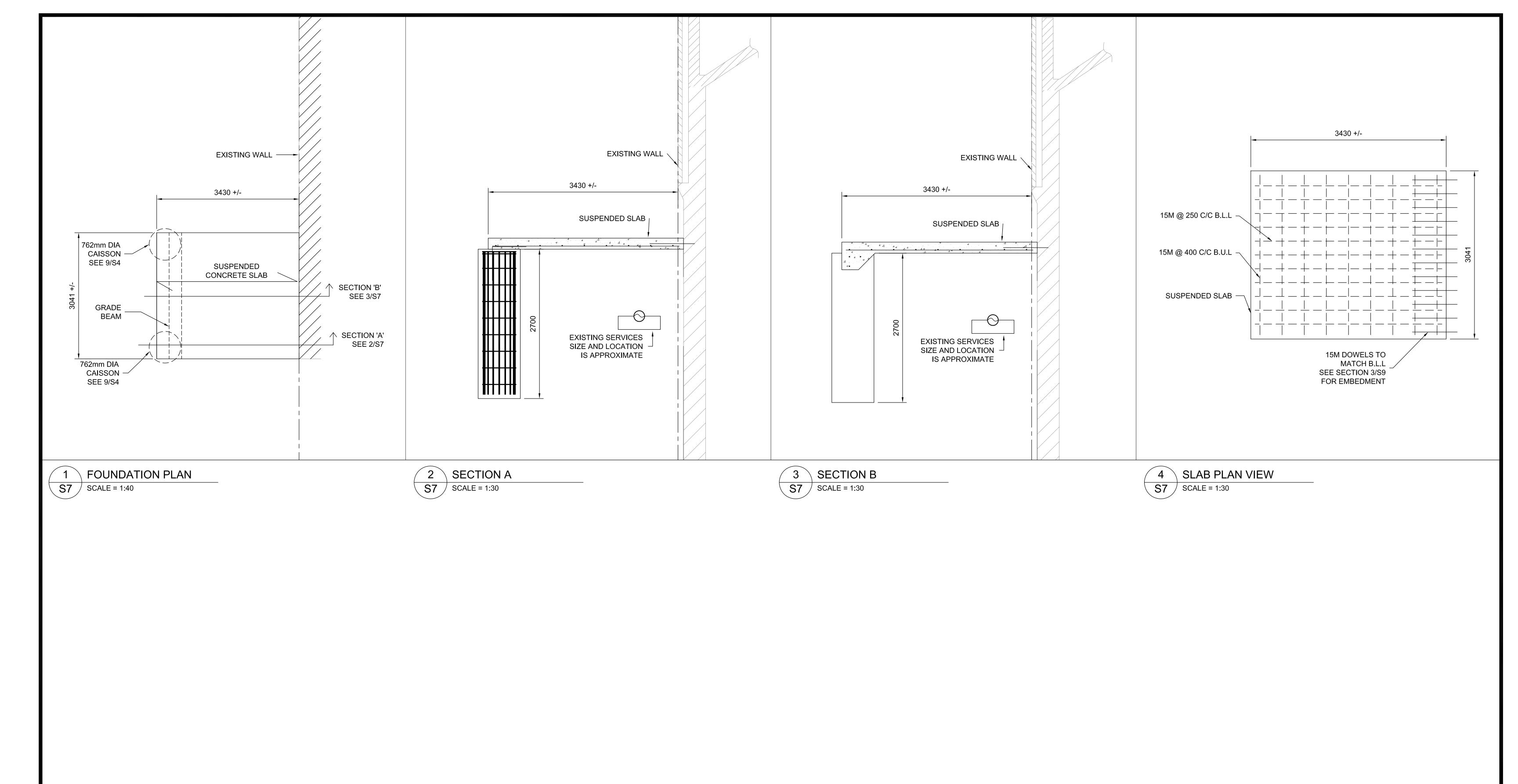
 MAXIMUM SPACING OF JOINTS IS TO BE 2400 mm

 UNLESS NOTED OTHERWISE.

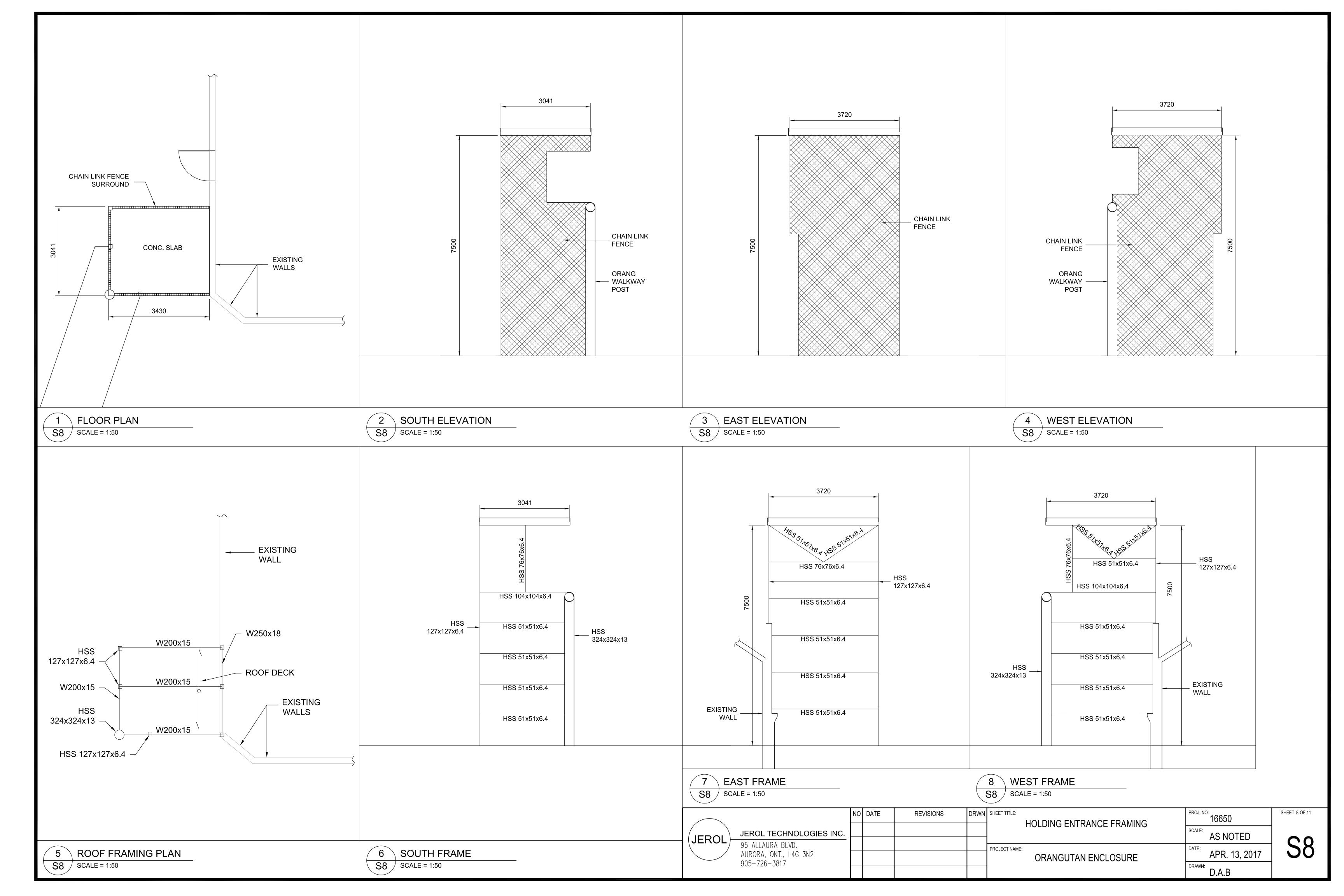


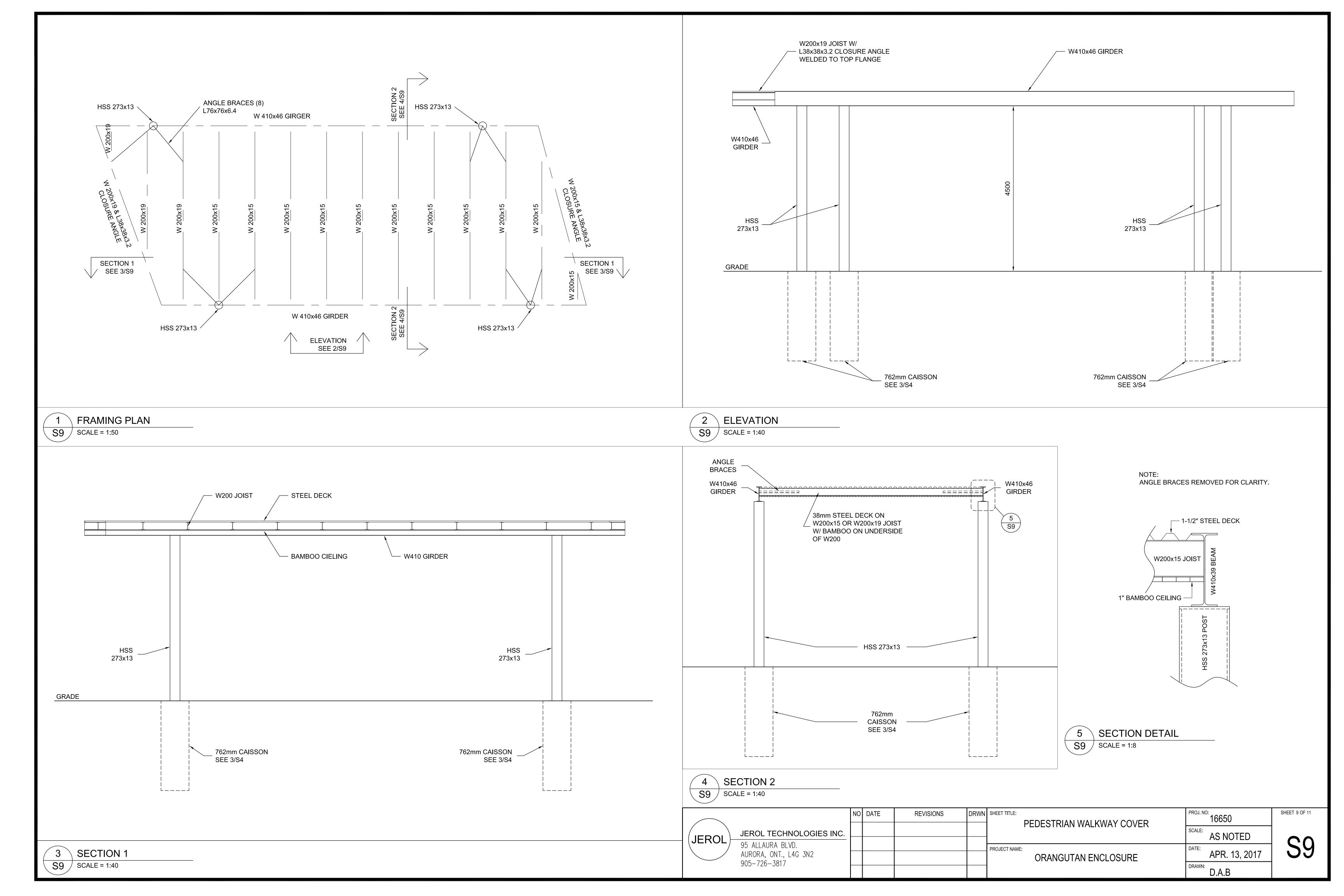
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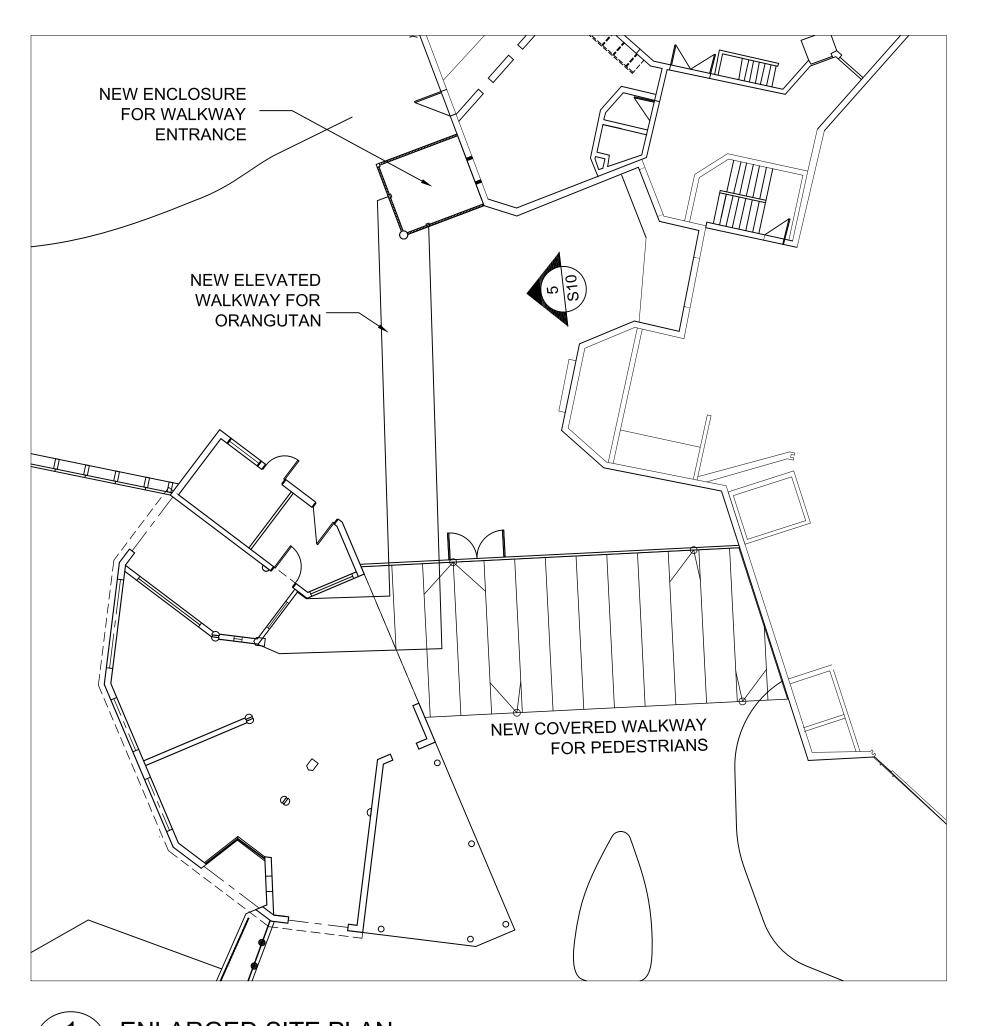




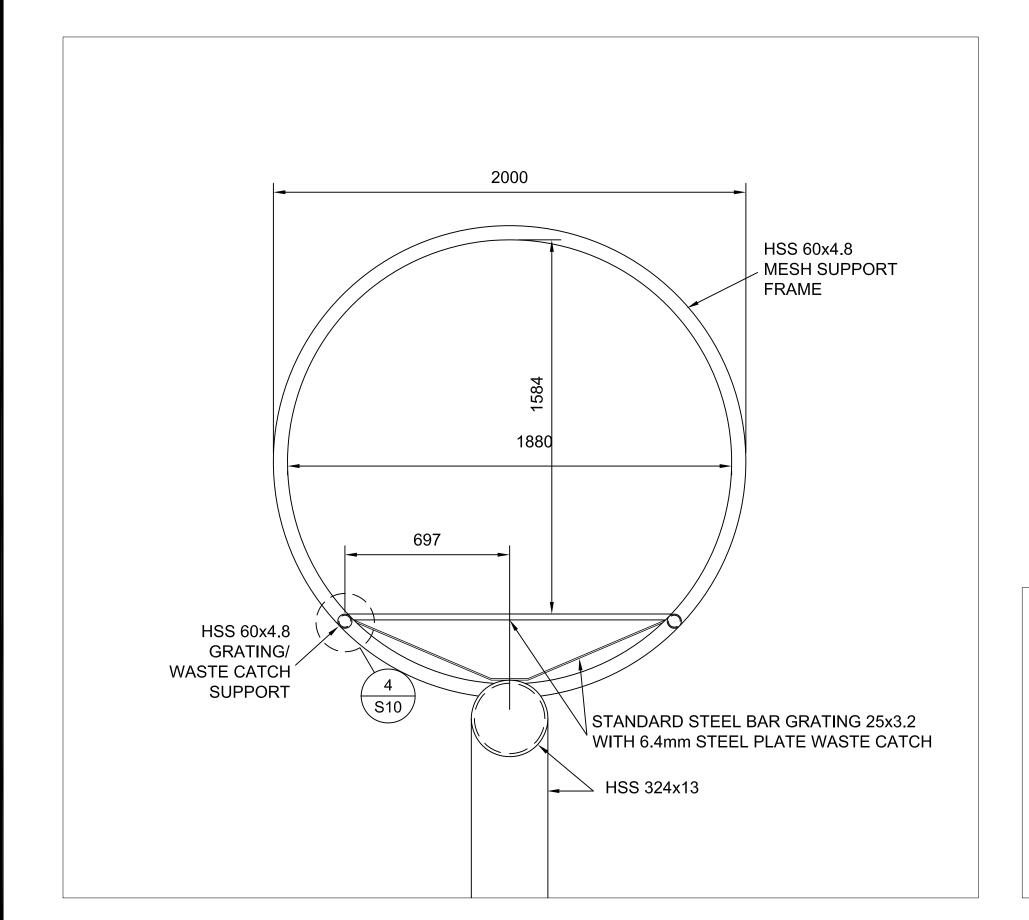
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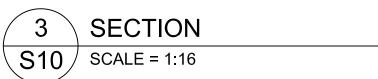


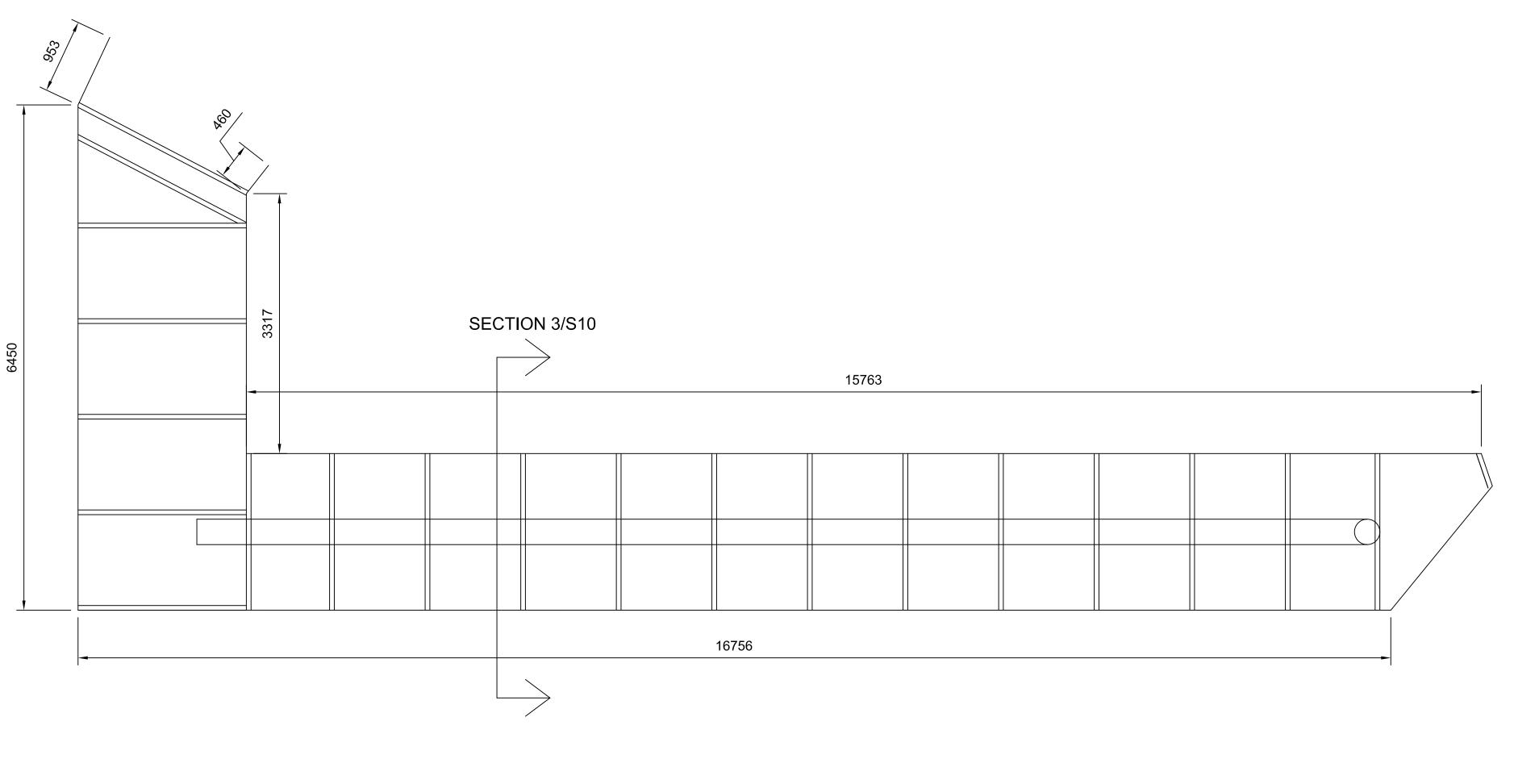




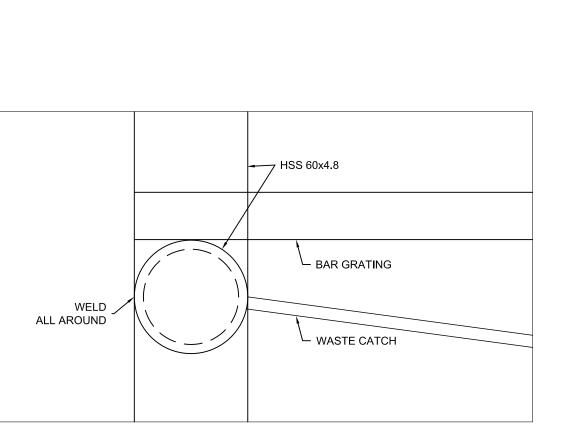












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	AURORA, ONT., L4G 3N2 905–726–3817

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			ORANGUTAN ENCLOSURE	DRAWN:	APR. 13, 20
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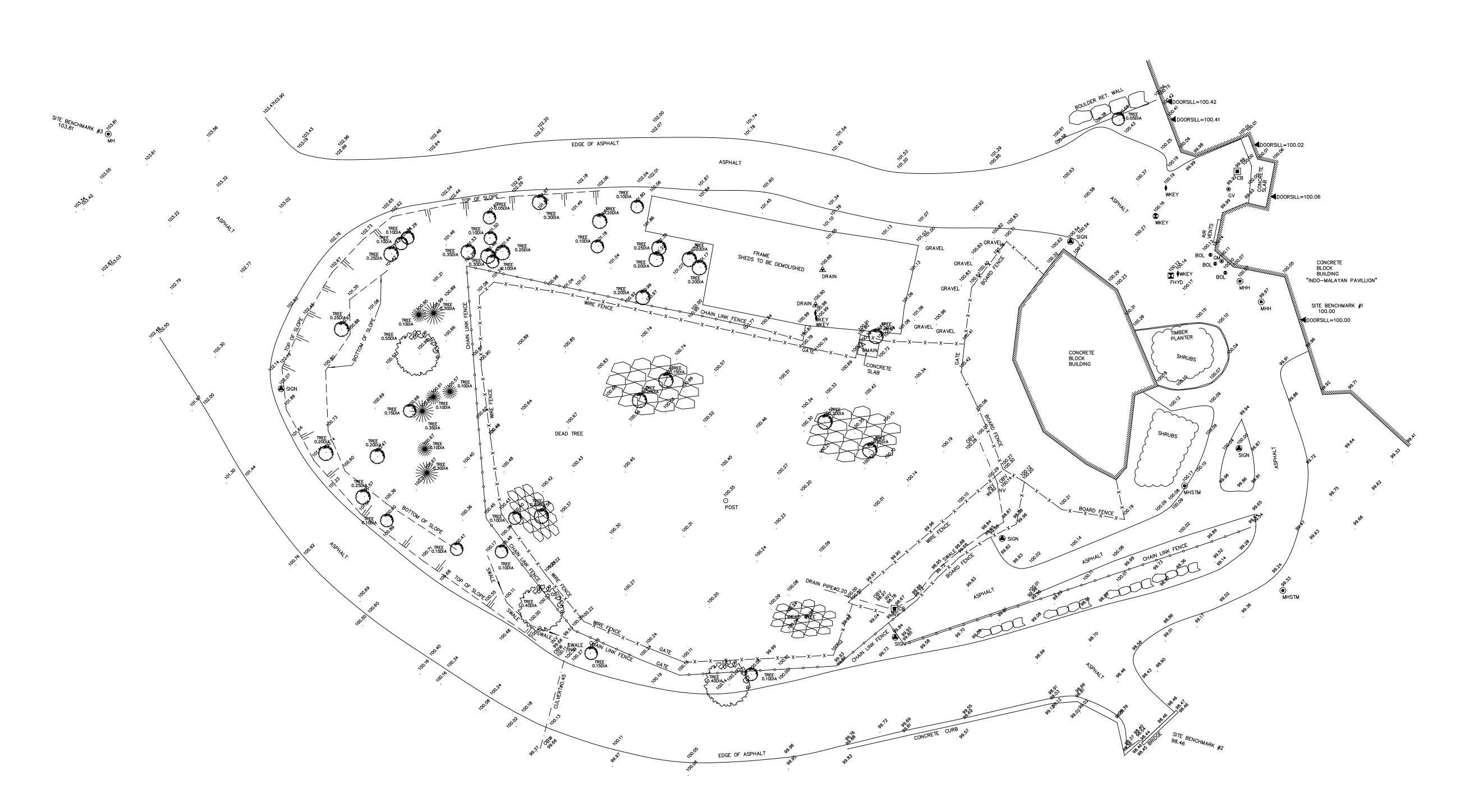
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	AURORA, ONT., L4G 3N2 905-726-3817				PROJECT NAME: ORANGUTAN ENCLOSURE	APR. 13, 2017 DRAWN: D.A.B	311



PLAN SHOWING TOPOGRAPHIC DETAIL OF PART OF TORONTO ZOO

SCALE 1:200

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DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES AND LEGEND

CB DENOTES CATCH BASIN
WV DENOTES WATER VALVE
FHYD DENOTES FIRE HYDRANT
WKEY DENOTES WATER KEY
LS DENOTES LAMP STANDARD
MH DENOTES MANHOLE
DIA DENOTES DIAMETER
MHH DENOTES MANHOLE (HYDRO)
MHSTM DENOTES MANHOLE (STORM)
GV DENOTES GAS VALVE
GM DENOTES GAS MAIN
BOL DENOTES BOLLARD
INV DENOTES INVERT
OBV DENOTES OBVERT

ALL CURB ELEVATIONS ARE TAKEN TO THE BACK OF CURB

ELEVATION NOTE ELEVATIONS ARE REFERRED TO A LOCAL BENCHMARK No.1 HAVING AN ASUUMED ELEVATION OF 100.00 METRES.

SURVEYOR'S CERTIFICATE

I CERTIFIY THAT: THE FIELDWORK WAS COMPLETED ON THE 19th DAY OF OCT., 2016


DATE: OCTOBER 27, 2016

T. A. SENKUS ONTARIO LAND SURVEYOR

TOM A. SENKUS ONTARIO LAND SURVEYOR 40 BURROWS AVENUE TORONTO (ISLINGTON), ONTARIO M9B 4W7

PHONE: (416) 237-1893 E-MAIL: tomsenkus@rogers.com mapcad@rogers.com

FILE: 16-44 CAD FILE: ZOO-TOPO





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A REPORT TO TORONTO ZOO

A SOIL INVESTIGATION FOR PROPOSED ORANGUTAN EXHIBIT

361A OLD FINCH AVENUE

CITY OF TORONTO

REFERENCE NO. 1610-S137

JANUARY 2017

DISTRIBUTION

3 Copies - Toronto Zoo

1 Copy - Soil Engineers Ltd. (Toronto)

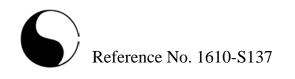
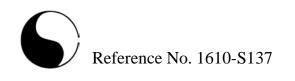


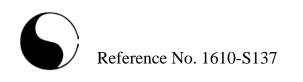
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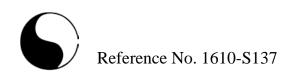


1.0 **INTRODUCTION**

In accordance with Purchase Order No. 0064367 issued on October 27, 2016, by Mr. Ben Knoop of the Toronto Zoo, a soil investigation was carried out for a proposed Orangutan Exhibit at the Toronto Zoo, located at 361A Old Finch Avenue, in the City of Toronto.

The purpose of the investigation was to reveal the subsurface conditions and determine the engineering properties of the disclosed soils for the design and construction of the proposed project.

The geotechnical findings and resulting recommendations are presented in this Report.

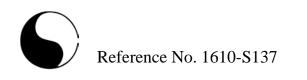


2.0 SITE AND PROJECT DESCRIPTION

The City of Toronto is located on Markham till plain where glacial drift predominates the soil stratigraphy. In places, the drift has been modified by the depositing of lacustrine clay, silt, sand and water-laid till derived from water action of Peel Ponding (glacial lake).

The subject site of investigation is located within the Toronto Zoo, situated southwest of Old Finch Avenue and Meadowvale Road, in the City of Toronto (Scarborough). The site area is an open space with some trees. The ground surface is relatively flat and level.

The proposed project consists of the construction of an Orangutan Exhibit with slab-on-grade structures.



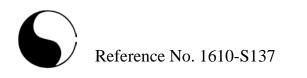
3.0 **FIELD WORK**

The field work, consisting of 4 boreholes to depths of 5.2 m and 6.2 m, was performed on November 18, 2016, at the locations shown on the Borehole Location Plan, Drawing No. 1. Refusal to augering was encountered at a depth of 5.2 m at Borehole 1.

The holes were advanced at intervals to the sampling depths by a track-mounted, continuous-flight power-auger machine equipped for soil sampling. Standard Penetration Tests, using the procedures described on the enclosed "List of Abbreviations and Terms", were performed at the sampling depths. The test results are recorded as the Standard Penetration Resistance (or 'N' values) of the subsoil. The relative density of the granular strata and the consistency of the cohesive strata are inferred from the 'N' values. Split-spoon samples were recovered for soil classification and laboratory testing.

The field work was supervised and the findings were recorded by a Geotechnical Technician.

The sampling depths and the depths of the soil strata changes were referred to the prevailing ground surface at each of the borehole locations.



4.0 **SUBSURFACE CONDITIONS**

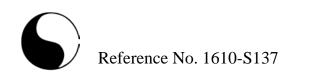
Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs, comprising Figures 1 to 4, inclusive. The revealed stratigraphy is plotted on the Subsurface Profile, Drawing No. 2, and the engineering properties of the disclosed soils are discussed herein.

This investigation has disclosed that beneath a veneer of topsoil at Borehole 3, and a layer of earth fill at Boreholes 1, 2 and 4, the site is underlain by strata of sandy silt till and silty sand till.

4.1 **Topsoil** (Borehole 3)

The revealed topsoil is 18 cm thick. It is dark brown in colour, indicating that it contains appreciable amounts of roots and humus. These materials are unstable and compressible under loads; therefore, the topsoil is considered to be void of engineering value. Due to its humus content, it may produce volatile gases and generate an offensive odour under anaerobic conditions. Therefore, the topsoil must not be buried below any structures or deeper than 1.2 m below the finished grade, so that it will not have an adverse impact on the environmental well-being of the developed areas.

Since the topsoil is considered void of engineering value, it can only be used for general landscaping and landscape contouring purposes. A fertility analysis can be carried out to determine the suitability of the topsoil as a planting material.



4.2 **Earth Fill** (Boreholes 1, 2 and 4)

The earth fill was found extending to depths of 0.3 to 0.7 m below the prevailing ground surface. The fill consists of silty clay and silty sand materials.

The obtained 'N' values are 2, 5 and 11 blows per 30 cm of penetration, indicating that the fill is loosely placed. Its relative density is non-uniform and loose, and, therefore, it is unsuitable to support structures sensitive to settlement.

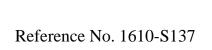
The natural water content values are 12%, 14% and 25%, indicating that the fill is in a moist to wet condition, which corresponds with our sample examinations.

Due to its unknown history, and non-uniform and loose density, the earth fill is considered to be unsuitable for supporting structures. For structural use, the fill must be subexcavated, inspected, sorted free of any deleterious material, if detected, and properly compacted.

One must be aware that the samples retrieved from boreholes 10 cm in diameter may not be truly representative of the geotechnical and environmental quality of the fill, and do not indicate whether the topsoil beneath the earth fill was completely stripped. This should be further assessed by laboratory testing and/or test pits.

4.3 **Sandy Silt Till** (All Boreholes)

The sandy silt till was encountered immediately below the earth fill or topsoil at Boreholes 1, 2 and 3, and beneath a layer of silty sand till in Borehole 4; it extends to the maximum investigated depth at all boreholes. It consists of a



random mixture of soil particle sizes ranging from clay to gravel, with the silt being the predominant fraction. Its structure is heterogeneous, indicating it is a glacial deposit.

Hard resistance to augering was encountered in places, indicating the presence of cobbles and boulders. Occasional wet sand and silt seams and layers were also found in the till mantle.

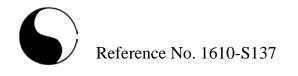
The obtained 'N' values range from 7 blows per 30 cm to 50 blows per 5 cm, with a median of 50 blows per 15 cm, showing that the relative density of the till is loose to very dense, being generally very dense. The surficial layer of the till is generally weathered to a depth of $0.6\pm$ m below grade.

The natural water content was determined, and the results are plotted on the Borehole Logs; the values range from 5% to 11%, with a median of 7%, showing the sandy silt till is in a damp to moist condition.

Grain size analyses were performed on 2 representative samples and the results are plotted on Figure 5.

The deduced engineering properties pertaining to the project are given below:

- Moderately high frost susceptibility and moderately low water erodibility.
- Low permeability, with an estimated coefficient of permeability of 10^{-6} cm/sec, an estimated percolation rate of 65 min/cm, and runoff coefficients of:



Slope					
0% - 2%	0.15				
2% - 6%	0.20				
6% +	0.28				

- A frictional-cohesive soil, its shear strength is density dependent and is augmented by cementation and cohesion.
- It will slough slowly if submerged in an unconfined state, or from an openface cut under seepage conditions, particularly in the zone where wet sand and silt layers are prevalent.
- A fair pavement-supportive material, with an estimated California Bearing Ratio (CBR) value of 8% to 10%.
- Moderately low corrosivity to buried metal, with an estimated electrical resistivity of 5000 ohm·cm.

4.4 Silty Sand Till (Borehole 4)

The silty sand till consists of a random mixture of soil particle sizes ranging from clay to gravel, with the sand being the dominant fraction. It is heterogeneous in structure, showing that it is a glacial deposit.

Hard resistance to augering was encountered, showing that cobbles and boulders are embedded in the sand till.

The natural water content was determined, and the results are plotted on the Borehole Logs; the values, 4%, 5% and 8%, indicate the sand till is in a damp to moist condition.

The obtained 'N' values are 10, 36 and 46 blows per 30 cm of penetration, showing that the relative density of the silty sand till is compact to dense. The surficial layer of the till is generally weathered to a depth of 0.8 m below grade.

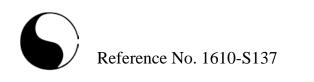
A grain size analysis was performed on 1 sample and the result is plotted on Figure 6.

The deduced engineering properties pertaining to the project are given below:

- High frost susceptibility and moderate water erodibility.
- Relatively pervious, depending on the clay content, with an estimated coefficient of permeability of 10⁻⁴ cm/sec, an estimated percolation rate of about 20 min/cm, and runoff coefficients of:

Slope

- A frictional soil, its shear strength is primarily derived from internal friction and is augmented by cementation. Therefore, its strength is density dependent.
- It will be stable in steep cuts; however, under prolonged exposure, immediate sloughing and sheet collapse will likely occur, particularly where seepage occurs.
- A fair pavement-supportive material, with an estimated CBR value of 10%.
- Moderately low corrosivity to buried metal, with an estimated electrical resistivity of 5000 ohm·cm.



4.5 Interpretation of Refusal to Augering

Refusal to augering was encountered at Borehole 1 at a depth of 5.2 m below the prevailing ground surface. It is inferred that boulders were encountered at this level.

4.6 <u>Compaction Characteristics of the Revealed Soils</u>

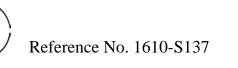
The obtainable degree of compaction is primarily dependent on the soil moisture and, to a lesser extent, on the type of compactor used and the effort applied.

As a general guide, the typical water content values of the revealed soils for Standard Proctor compaction are presented in Table 1.

Table 1 - Estimated Water Content for Compaction

	Determined Natural	Water Content (%) for Standard Proctor Compaction			
Soil Type		100% (optimum)	Range for 95% or +		
Earth Fill	12, 14 and 25	10 to 16	6 to 21		
Sandy Silt Till	5 to 11 (median 7)	11	7 to 16		
Silty Sand Till	4, 5 and 8	10	6 to 15		

Based on the above findings, the sandy silt till and portions of the earth fill and silty sand till are generally suitable for a 95% or + Standard Proctor compaction. A portion of the earth fill is too wet and will require aeration, whereas a portion of the silty sand till is too dry and will require the addition of water or mixing with wetter soils prior to structural compaction. The existing earth fill must be sorted free of any deleterious materials prior to use as structural fill.

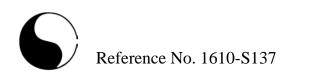


The silty clay fill, sandy silt till and silty sand till should be compacted using a heavy-weight, kneading-type roller. The silty sand fill can be compacted by a smooth roller with or without vibration, depending on the water content of the soil being compacted. The lifts for compaction should be limited to 20 cm, or to a suitable thickness as assessed by test strips performed by the equipment which will be used at the time of construction.

When compacting the tills on the dry side of the optimum, the compactive energy will frequently bridge over the chunks in the soils and be transmitted laterally in the soil mantle. Therefore, the lifts of this soil must be limited to 20 cm or less (before compaction). It is difficult to monitor the lifts of backfill placed in deep trenches; therefore, it is preferable that the compaction of backfill at depths over 1.0 m below the pavement subgrade be carried out on the wet side of the optimum. This would allow a wider latitude of lift thickness.

If the compaction of the soils is carried out with the water content within the range for 95% Standard Proctor dry density but on the wet side of the optimum, the surface of the compacted soil mantle will roll under the dynamic compactive load. This is unsuitable for pavement construction since each component of the pavement structure is to be placed under dynamic conditions which will induce the rolling action of the subgrade surface and cause structural failure of the new pavement. The foundation or bedding of the sewer and slab-on-grade will be placed on a subgrade which will not be subjected to impact loads. Therefore, the structurally compacted soil mantle with the water content on the wet side or dry side of the optimum will provide an adequate subgrade for the construction.

The presence of boulders in the till will prevent transmission of the compactive energy into the underlying material to be compacted. If an appreciable amount of boulders over 15 cm in size is mixed with the material, it must either be sorted or must not be used for structural backfill.



5.0 **GROUNDWATER CONDITIONS**

Groundwater seepage encountered during augering was recorded on the field logs. The level of groundwater was measured upon completion of the boreholes; the data are plotted on the Borehole Logs and listed in Table 2.

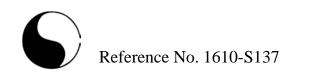
Table 2 - Groundwater Levels

BH No.	Borehole Depth (m)	Soil Colour Changes Brown to Grey Depth (m)	Seepage Encountered During Augering Depth (m) Amount		Measured Groundwater/ Cave-In* Level On Completion Depth (m)	
1	5.2	2.3	-	-	Dry	
2	6.2	2.3	-	-	3.0/3.0*	
3	6.2	2.3	-	-	Dry	
4	6.2	3.0	-	-	Dry	

^{*} Cave-in level (In wet sand and silt layers, the level generally represents the groundwater regime at the borehole location.)

As shown above, groundwater was detected at a depth of 3.0 m below the prevailing ground surface at Borehole 2, and the borehole caved at the same depth; all other boreholes remained dry upon completion of the field work. The groundwater level will fluctuate with the seasons.

The yield of groundwater from the sandy silt till and silty sand till, due to their relatively low permeability, is expected to be small and limited.



6.0 <u>DISCUSSION AND RECOMMENDATIONS</u>

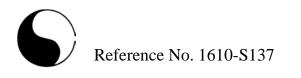
The investigation has disclosed that beneath a veneer of topsoil at Borehole 3, and a layer of earth fill at Boreholes 1, 2 and 4, the site is underlain by strata of compact to very dense, generally very dense sandy silt till and compact to dense silty sand till. The surficial soil layer is generally weathered to depths of 0.3 to 0.8 m below the prevailing ground surface.

Groundwater was detected at a depth of 3.0 m below the prevailing ground surface at Borehole 2, and the borehole caved at the same depth; all other boreholes remained dry upon completion of the field work. The groundwater level will fluctuate with the seasons.

The yield of groundwater from the sandy silt till and silty sand till, due to their relatively low permeability, is expected to be small and limited.

The geotechnical findings which warrant special consideration are presented below:

- 1. The topsoil must be removed for the project construction. This material is unsuitable for engineering applications; therefore, it should be placed in the landscaped areas only and should not be buried within the building envelope, or deeper than 1.2 m below the exterior finished grade of the project.
- 2. The existing earth fill is loose and is unsuitable for supporting foundations. For structural use, it must be subexcavated, assessed, sorted free of any deleterious materials, aerated and properly compacted. If it is impractical to sort the fill, then it must be wasted.
- 3. The sound natural soils below the topsoil, earth fill and weathered zone are suitable for normal spread and strip footing construction. The footing subgrade must be inspected by either a geotechnical engineer, or a



- geotechnical technician under the supervision of a geotechnical engineer, to ensure that its condition is compatible with the design of the foundation.
- 4. For slab-on-grade construction, any weathered, soft or loose soils should be subexcavated, aerated and properly compacted prior to the placement of the slab. Any new material for raising the grade should consist of organic-free soil compacted to at least 98% of its maximum Standard Proctor dry density.
- 5. A Modulus of Subgrade Reaction of 25 MPa/m is recommended for the design of the floor slab.
- 6. A Class 'B bedding, consisting of compacted 20-mm Crusher-Run Limestone, is recommended for the construction of the underground services. The sewer joints should be leak-proof, or wrapped with an appropriate waterproof membrane, to prevent subgrade migration. If subgrade stabilization is required, the stone immersion technique may be applied. In areas where more extensive dewatering is required for sewer construction, a Class 'A' bedding should be considered.
- 7. The tills contain cobbles and boulders. Boulders over 15 cm in size must not be used for structural backfill. Excavation into the tills containing boulders will require extra effort and the use of a heavy-duty backhoe.

The recommendations appropriate for the project described in Section 2.0 are presented herein. One must be aware that the subsurface conditions may vary between boreholes. Should this become apparent during construction, a geotechnical engineer must be consulted to determine whether the following recommendations require revision.

6.1 **Foundations**

Based on the findings, the footings should be placed below the topsoil, earth fill and weathered soil onto the sound natural soils. The recommended soil pressures for

use in the design of the normal spread and strip footings, together with the corresponding suitable founding levels, are presented in Table 3.

Table 3 - Founding Levels

	Factored Ultimate So	ole Soil Pressure (SLS)/ il Bearing Pressure (ULS) ling Founding Level
	250 kPa (SLS) 400 kPa (ULS)	300 kPa (SLS) 480 kPa (ULS)
Borehole No.	Depth (m)	Depth (m)
1	1.0 or +	1.6 or +
2	1.0 or +	1.6 or +
3	1.0 or +	1.6 or +
4	-	1.0 or +

The recommended soil pressures (SLS) incorporate a safety factor of 3. The total settlement of the new footings is estimated to be 15 mm.

Due to the presence of topsoil, earth fill and weathered soils, the footing subgrade must be inspected by either a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer, to ensure that the subgrade conditions are compatible with the foundation design requirements.

The footings exposed to weathering must have at least 1.2 m of earth cover for frost protection.

The footings should meet the requirements specified in the latest Ontario Building Code, and the building must be designed to resist a minimum earthquake force using Site Classification 'C' (very dense soil).

The in situ soils are highly frost susceptible; if these soils are to be used for the foundation backfill, the foundation walls should be shielded by a polyethylene slip-membrane for protection against soil adfreezing. The recommended measures are schematically illustrated in Diagram 1.

Slab-On-Grade

Grading

Granular Base

Folded Heavy Polyethylene
Slip-Membrane (Closed End Up)

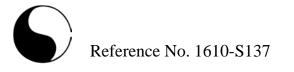
Diagram 1 - Frost Protection Measures (Foundations)

The necessity to implement the above measures should be further assessed by a geotechnical engineer at the time of construction.

The exterior grading must be such that runoff is directed away from the building to prevent ponding adjacent to the structure.

6.2 Slab-On-Grade

In preparation of the subgrade, the weathered and loose or soft soils must be completely removed. Properly compacted inorganic earth fill and sound natural soils are suitable for the slab-on-grade construction. The surface of the subgrade must be inspected, and proper proof-rolling must be carried out. Any loose soil



detected must be subexcavated and replaced with inorganic fill compacted to at least 98% of its maximum Standard Proctor dry density.

The slab should be constructed on a granular base, 20 cm thick, consisting of 20-mm Crusher-Run Limestone, or equivalent, compacted to its maximum Standard Proctor dry density.

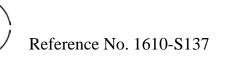
A Modulus of Subgrade Reaction of 25 MPa/m is recommended for the design of the floor slab on sound natural soils.

The ground around the buildings must be graded to direct water away from the structure to minimize the frost heave phenomenon generally associated with the disclosed soils.

6.3 <u>Underground Services</u>

The subgrade for the underground services should consist of natural soils or compacted organic-free earth fill. Where weathered, loose or soft soils are encountered, these materials must be subexcavated and replaced with properly compacted bedding material.

A Class 'B' bedding, consisting of compacted 20-mm Crusher-Run Limestone, is recommended for the construction of the underground services. The sewer joints should be leak-proof, or wrapped with an appropriate waterproof membrane, to prevent subgrade migration. If subgrade stabilization is required, the stone immersion technique may be applied. In areas where more extensive dewatering is required for sewer construction, a Class 'A' bedding should be considered.



In order to prevent pipe floatation when the sewer trench is deluged with water, a soil cover with a thickness equal to the diameter of the pipe should be in place at all times after completion of the pipe installation.

The pipe joints should be leak-proof or they should be provided with a waterproof membrane. This is to prevent migration of fines due to leaks from faulty joints.

Openings to subdrains and catch basins should be shielded with a fabric filter to prevent blockage by silting.

6.4 **Backfilling In Trenches and Excavated Areas**

The backfill in trenches and excavated areas should be compacted to at least 95% of its maximum Standard Proctor dry density, and increased to 98% below any floor slabs. In the zone within 1.0 m below the subgrade, the material should be compacted with the water content 2% to 3% drier than the optimum, and the compaction should be increased to at least 98% of the respective maximum Standard Proctor dry density. In the lower zone, the compaction should be carried out on the wet side of the optimum; this allows a wider latitude of lift thickness. Wetting of the tills may be necessary to achieve this requirement.

In normal construction practice, the problem areas of ground settlement largely occur adjacent to footings, and strip, spread and narrow trench foundations, where access is difficult for a heavy compactor. Sand backfill should be used with thin lifts and should be compacted using a small, vibratory plate compactor.

The narrow trenches should be cut at 1 vertical:2 or + horizontal so that the backfill can be effectively compacted. Otherwise, soil arching will prevent the achievement

of proper compaction. The lift of each backfill layer should either be limited to a thickness of 20 cm, or the thickness should be determined by test strips.

6.5 **Soil Parameters**

The recommended soil parameters for the project design are given in Table 4.

Table 4 - Soil Parameters

Unit Weight and Bulk Factor	Unit Weight <u>(kN/m³)</u>		mated <u>Factor</u>
	Bulk	Loose	Compacted
Earth Fill and Weathered Soil	21.0	1.20	1.00
Sound Tills	22.0	1.33	1.05
Lateral Earth Pressure Coefficients			
	Active K _a	At Rest K _o	Passive K _p
Earth Fill and Weathered Soil	0.40	0.50	2.50
Sound Tills	0.30	0.40	3.33

6.6 Excavation

Excavation should be carried out in accordance with Ontario Regulation 213/91.

Excavations in excess of 1.2 m should be sloped at 1 vertical:1 horizontal for stability.

The tills contain occasional boulders. Extra effort and a properly equipped backhoe will be required for excavation. Boulders larger than 15 cm in size are not suitable for structural backfill.

For excavation purposes, the types of soils are classified in Table 5.

Table 5 - Classification of Soils for Excavation

Material	Туре
Sound Tills	2
Earth Fill and weathered Soil	3

The groundwater yield from the sandy silt till and silty sand till, due to their relatively low permeability, will be small and can be controlled by pumping from sumps.

Prospective contractors must assess the in situ subsurface conditions prior to excavation by performing test cuts to at least 0.5 m below the intended bottom of excavation. These test pits should be allowed to remain open for a period of at least 4 hours to assess the trenching and groundwater conditions.

7.0 LIMITATIONS OF REPORT

This report was prepared by Soil Engineers Ltd. for the account of Toronto Zoo, and for review by its designated agents, financial institutions, and government agencies. Use of the report is subject to the conditions and limitations of the contractual agreement. The material in the report reflects the judgment of Frank Lee, P.Eng., and Bernard Lee, P.Eng., in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, and/or any reliance on decisions to be made based on it are the responsibility of such Third Parties. Soil Engineers Ltd. Accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

SOIL ENGINEERS LTD.

Frank Lee, P.Eng.

Bernard Lee, P.Eng. FL/BL:dd



LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

SAMPLE TYPES

SOIL DESCRIPTION Cohesionless Soils:

AS	Auger sample
	Chunk sample
DO	Drive open (split spoon)
DS	Denison type sample
FS	*
RC	Rock core (with size and percentage
	recovery)
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

'N' (blow	/s/ft)	Relative Density
0 to	4	very loose
4 to	10	loose
10 to	30	compact
30 to	50	dense
over	50	very dense

Cohesive Soils:

PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter, 90° point cone driven by a 140-pound hammer falling 30 inches.

Plotted as '---'

Undra	ine	d S	Shear
			_

Streng	th (k	<u>sf)</u>	<u>'N' (</u>	blov	vs/ft)	<u>Consistency</u>
less t	han	0.25	0	to	2	very soft
0.25	to	0.50	2	to	4	soft
0.50	to	1.0	4	to	8	firm
1.0	to	2.0	8	to	16	stiff
2.0	to	4.0	16	to	32	very stiff
O	ver	4.0	0	ver	32	hard

Standard Penetration Resistance or 'N' Value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil.

Plotted as 'O'

WH Sampler advanced by static weight Sampler advanced by hydraulic pressure PH Sampler advanced by manual pressure PM No penetration NP

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

 \triangle Laboratory vane test

Compression test in laboratory

> For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength

METRIC CONVERSION FACTORS

1 ft = 0.3048 metres1 inch = 25.4 mm11b = 0.454 kg1 ksf = 47.88 kPa



Job Number: 1610-S137 LOG OF BOREHOLE NO.: 1 Figure No.: 1

Project Description: Proposed Orangutan Exhibit

Job Location: 361A Old Finch Avenue, City of Toronto (Scarborough) Method of Boring: Flight-Auger

Drilling Date: November 18, 2016

									Drillin	ıg ı	Date	: N	oven	nber 1	8, 20	16
<u> </u>	SOIL		SAMP	PLES	(m)		Dynamic 20	: Cone (blov 40 60	ws/30cm) 80 			terbe ⊃L	rg Lir L	mits LL		
Elevation (m)	DESCRIPTION	Number	Туре	N-Value	Depth Scale (m)		50 Pene	r Strength (F	200 stance			> .ioturo				Water Level
0.0	Ground Surface	_		_		10	30 I I	(blows/30cn 50	n) 70 90 III		10 3	30 5 1 1	50 7	70 90 1 I I		>
0.0 -0.7 0.7	Brown SILTY CLAY and SILTY SAND, Fill	1	DO	11	0 =	¢	,				14					
0.7	Compact to very dense	2	DO	28	1 -						9					
		3	DO	48	2 -						8					
	SANDY SILT, Till grey occ. wet sand and		DO	50/15	- - - - -					¢:						Dry on completion
	silt seams and layers, cobbles and boulders	5	DO	50/13	3 -					Ø.	6					Dry on c
					4 =						6					
-5.2 5.2	END OF BOREHOLE	6	DO	50/10	5 -											
0.2	Refusal to augering Inferred boulders				6 -											
					7 -											
					' =											
					8 -											
					9 -											
					10											



SOIL ENGINEERS LTD.

Job Number: 1610-S137 LOG OF BOREHOLE NO.: 2 Figure No.: 2

Project Description: Proposed Orangutan Exhibit

Job Location: 361A Old Finch Avenue, City of Toronto (Scarborough) Method of Boring: Flight-Auger

Drilling Date: November 18, 2016

									<i>D</i>	riiii	ng	Dα	te:	No ——	ven	nber	18,	2016	}
<u> </u>	SOII		SAMP	LES	(m)	[Oynamio 20	Cone (40	blows/3	80cm) 80		ı	Attei PL	rberg		nits .L			
Elevation (m)	SOIL DESCRIPTION	Number	Туре	N-Value	Depth Scale (m)		50 	r Streng 100 tration F	150 	200 			>			1 (0)			Water Level
0.0	Ground Surface			2		10	30	(blows/3 50	0cm) 70) 	90 	10 	Moist 30 	ture C 50 I I	onte 7	nt (%) '0) 90 		>
0.0 -0.3 0.3	Brown SILTY CLAY and SILTY SAND, Fill	1A	DO	-	0 :							10	2 5						
0.5	Loose to very dense weathered silty sand layer	1B	DO	7	-	9						+							
		2	DO	24	1 -		0					9			+				
		3	DO	48	2 -							8			+				c
	brown grey SANDY SILT, Till fine sand layer	4A 4B	DO DO	82	<u>-</u>					þ		•6 1	1						W.L. and Cave-in @ 3.0 m on completion
	occ. wet sand and silt seams and layers, cobbles and boulders	5	DO	50/15	3 -							8						₩	3.0 m on
					4 -										+				ave-in @
		6	DO	50/15	=							7							L. and Ca
					5 -														8
			- 00	50/0	6 -							8							
-6.2 6.2	END OF BOREHOLE	7	DO	50/8	=														
					7 -										\perp				
					-														
					8 -										+				
					9 -									\Box	$^{\perp}$				
					-														
					10										<u> </u>				



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Job Number: 1610-S137 LOG OF BOREHOLE NO.: 3 Figure No.: 3

Project Description: Proposed Orangutan Exhibit

Job Location: 361A Old Finch Avenue, City of Toronto (Scarborough) Method of Boring: Flight-Auger

Drilling Date: November 18, 2016

										y Date.	INOVE	iibei io	, 2010
(1	COII		SAMP	LES	Depth Scale (m)	1	Dynamio 20	c Cone (b	olows/30cm) 60 80	Atte	rberg Lir	nits _L	
Elevation (m)	SOIL DESCRIPTION				ale	×	Shea	r Strength	h (kN/m ²)	\rceil		◁	Water Level
ıtior	5200mm.	er		<u>e</u>	Sc	1			150 200		·	7	r Le
eva		Number	Туре	N-Value	ept		\ Dana	stration D	esistance	1			/ate
	Craying Curfoss	Z	←	Ż		10	30 Yene	(blows/30	ocm) 70 90		ture Conte	nt (%) 70 90	>
0.0	Ground Surface 18 cm TOPSOIL	1A	DO		0 -	ļŤ	$+\tilde{1}$	$+$ $\ddot{\parallel}$	 	1111	+	HĤ	
0.0	Compact to very dense	1B	DO	20			\downarrow			8			
				20	-	╀	Υ	+		17			
			D0	25	1 -					8			
		2	DO	25	'	\vdash	10	+		17			
					-					7			
	SANDY SILT, TIII	3	DO	34	_ =		+ 4	+		7			
	occ. wet sand and <u>browr</u>				2 -								
	silt seams and layers, grey	4	DO	50/15	<u>-</u>	╁				6	+++		uo
	copples and boulders	Ė		007.0									pleti
		_		50/45	3 -	╀				16	+++		Dry on completion
		5	DO	50/15	=					6			no /
					=	\vdash		+		+++	+++		ρ
					4 -								
						H	++	++		+++	+++		
		6	DO	50/13	-					6			
					_ =								
					5 -								
					=	H	+						
					=								
-6.2		7	DO	50/8	6 -	\vdash				₽			
6.2	END OF BOREHOLE] =								
					-								
					7 -	$oxed{oxed}$							
					=								
					_								
					8 -								
									+++	+++	+++		
					-								
					9 -		$\dagger \dagger$						
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					40								
					10 -	1							
1			_	1110		_	_	_	\				



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Job Number: 1610-S137 LOG OF BOREHOLE NO.: 4 Figure No.: 4

Project Description: Proposed Orangutan Exhibit

Job Location: 361A Old Finch Avenue, City of Toronto (Scarborough) Method of Boring: Flight-Auger

Drilling Date: November 18, 2016

							Drilling	g Date:	November 18,	2016
(1	0011		SAMP	LES	(m)	Dynamic Cone (20 40	(blows/30cm) 60 80	Atter PL	rberg Limits	
Elevation (m)	SOIL DESCRIPTION	Number	Туре	N-Value	Depth Scale (m)	Shear Streng 50 100	150 200	► Moist	dure Content (%)	Water Level
0.0	Ground Surface					10 30 50	70 90	10 30	50 70 90	
0.0 -0.4	Brown SILTY SAND, Fill	1A	DO		0 =			5 12		
0.4	Brown, compact to dense weathered	1B	DO	10	<u>-</u>	Ф				
	SILTY SAND, Till	2	DO	36	1 -			4		
0.4	occ. wet sand and silt seams and layers, cobbles and boulders	3	DO	46	2			8		
-2.1 2.1	Very dense	4	DO	50/15	2 -			•7		_
	SANDY SILT, Till occ. wet sand and silt seams and layers, cobbles and boulders	5	DO	50/10	4			6		Dry on completion
-6.2 6.2	END OF BOREHOLE	7	DO	50/5	8 -			7		



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Page: 1 of 1



GRAIN SIZE DISTRIBUTION

Reference No: 1610-S137

ILS BUREAU OF SOILS CLASSIFICATION

	U.S. BUREAU OF SOILS CLASSII	FICATION								
		GRAVEL				S	AND		SILT	CLAY
		COARSE		FINE	COARSE	MEDIUM	FINE	V. FINE	S.E.	22.11
	UNIFIED SOIL CLASSIFICATION	1								
	GRAVE	EL			SAND				CH TO CHAV	
	COARSE	FINE	COARSE	ME	EDIUM		FINE		SILT & CLAY	
	3" 2-1/2" 2" 1-1/2" 1" 3/	/4" 1/2" 3/8"	8 10	16	20 30	40 50 60	100 1-	40 200 2	0 325	
00							— BH.1	/Sa.2		
)									BH.2/Sa.6	
0 -									BH.2/5a.0	
) +										
$\begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$										
0 -										
0										
10	OGrain Size in millin	meters 10		1			(0.1	0.01	0.

Project:	Propose	d Orangutan Exhibit	BH./Sa.	1/2	2/6
Location:	361A O	ld Finch Avenue, City of Toronto	Liquid Limit (%) =	-	-
			Plastic Limit (%) =	-	-
Borehole No:	1	2	Plasticity Index (%) =	-	-
Sample No:	2	6	Moisture Content (%) =	9	7

Depth (m): 4.6 **Estimated Permeability** 1.1 $(cm./sec.) = 10^{-6}$ Elevation (m):

Classification of Sample [& Group Symbol]: SANDY SILT, Till

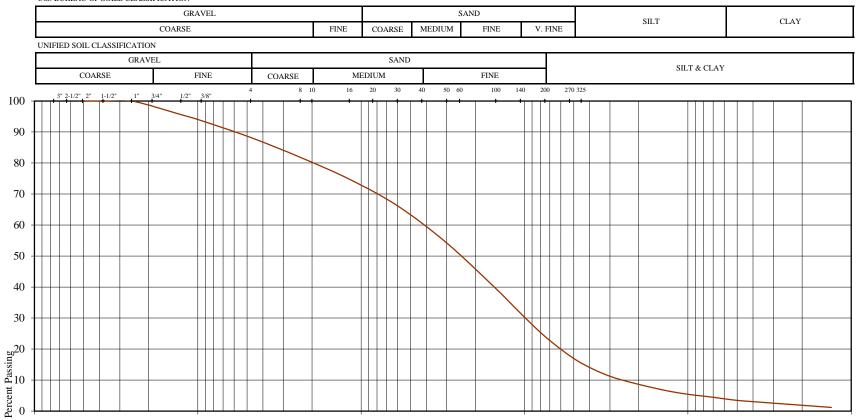
a tr. to some clay, a tr. of gravel



GRAIN SIZE DISTRIBUTION

Reference No: 1610-S137

U.S. BUREAU OF SOILS CLASSIFICATION



Project: Proposed Orangutan Exhibit

100

Grain Size in millimeters 10

Location: 361A Old Finch Avenue, City of Toronto

1

Plastic Limit (%) =

Liquid Limit (%) =

0.01

Plasticity Index (%) = Borehole No: 4

0.1

Sample No: Moisture Content (%) = 4 2

Estimated Permeability Depth (m): 1.1

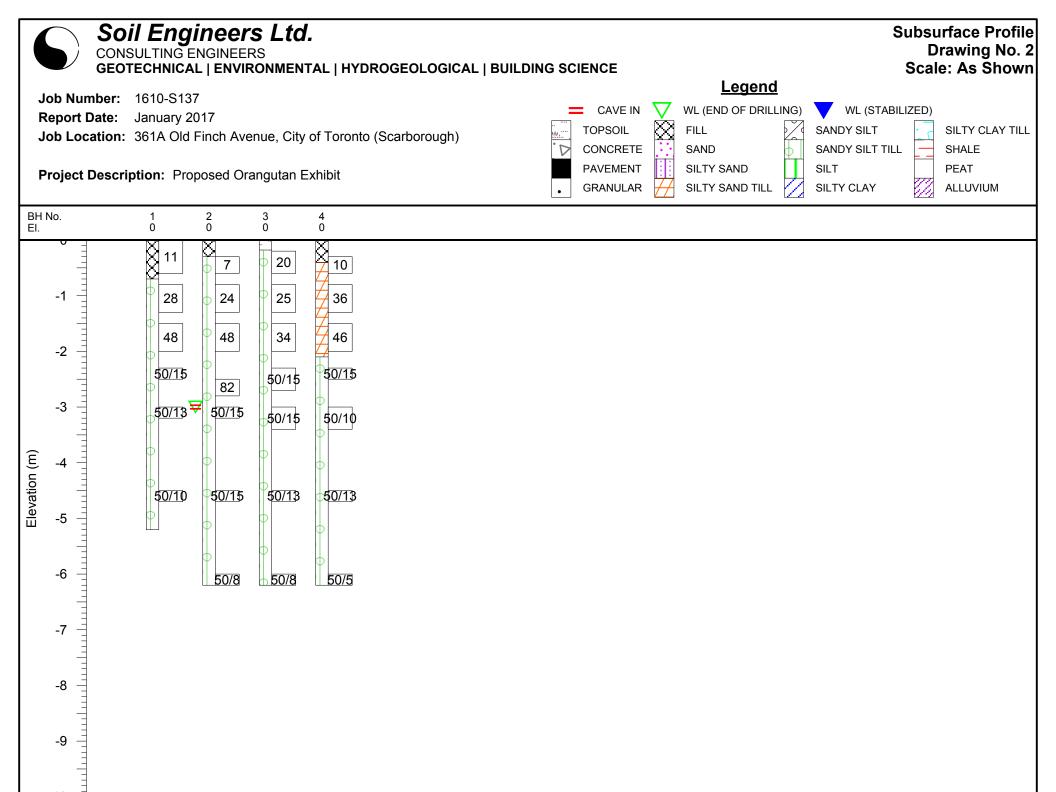
 $(cm./sec.) = 10^{-4}$ Elevation (m):

Classification of Sample [& Group Symbol]: SILTY SAND, Till

some gravel, a tr. of clay

0.001





REPORT

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.



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APPENDIX B

Laboratory Certificate of Analysis - Asbestos





APPENDIX C

Laboratory Certificate of Analysis - Lead

APPENDIX D

Regulations, Guidelines and Standards

APPENDIX E

Methodology





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) <u>Guideline - Lead on Construction Projects</u> (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 <u>Guideline - Silica on Construction Projects</u> (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 upto-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

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



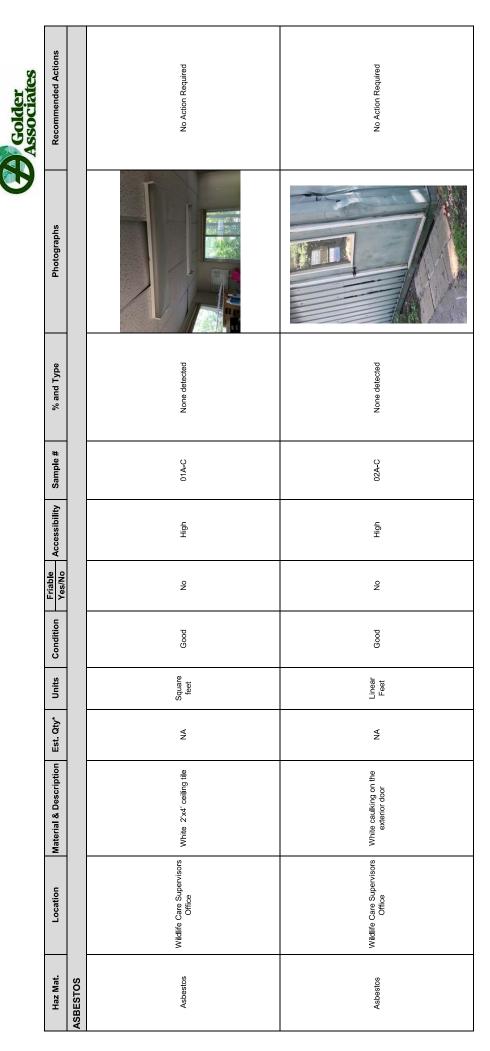


APPENDIX A

Spreadsheet of Findings – Designated Substances / Hazardous Materials



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



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



Recommended Actions	No Action Required	Prior to disturbance remove following Type 1 procedures		
Photographs				
% and Type	None detected	2% Chrysotile		
Sample #	03A-C	04A-C		
Accessibility	Low	High		
Friable Yes/No	<u>0</u>	ž		
Condition	Poog	рооб		
Units	Linear Feet	Linear Feet		
Est. Qty*	ž	A A		
Material & Description	Wildlife Care Supervisors Silver caulking on the roof Office sheeting	White window caulking on exterior door window		
Location	Wildlife Care Supervisors Office	Guar 2 Building		
Haz Mat.	Asbestos	Asbestos		

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



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

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





Recommended Actions	No action required	No action required
Photographs		
% and Type	None detected	None detected
Sample #	07A-C	08A-C
Accessibility	Low	Low
Friable Yes/No	o Z	Š
Condition	Good	Poog G
Units	Linear Feet	Square
Est. Qty*	٧ ٧	₹ 2
Material & Description	Black mat and asphalt mastic lining the eaves trough	Black roof mat
Location	Guar 2 Building	Guar 2 Building
Haz Mat.	Asbestos	Asbestos

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

Golder Associates

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

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

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 55GOLA62 Customer ID:

Lab Sample ID:

551709299-0003

1785748

Customer PO: Project ID:

(905) 723-2727

(905) 723-2182

8/21/2017

8/22/2017

8/29/2017

Attn: **Bronte Wright**

> Golder Associates, Ltd. 100 Scotia Court

Collected: Received: Whitby, ON L1N 8Y6 Analyzed:

Proj: 1785748

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

Phone:

Fax:

551709299-0001 Lab Sample ID: Client Sample ID:

Sample Description: Ceiling Tile, Wildlife Trailer

		Analyzed		Non	-Asbestos			
TEST		Date	Color	Fibrous	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

Analyzed			Non-Asbestos			
TEST	Date	Color	Fibrous No	n-Fibrous	Asbestos	Comment
PLM	8/29/2017	Brown	80%	20%	None Detected	

Client Sample ID:

01C Sample Description: Ceiling Tile, Wildlife Trailer

		Analyzed		Non	-Asbestos				
TEST		Date	Color	Fibrous	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

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

02B Lab Sample ID: 551709299-0005 Client Sample ID:

Sample Description: White Door Caulking

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

Lab Sample ID: 551709299-0006 Client Sample ID: 02C

Sample Description: White Door Caulking

Analyzed		Non-Asbestos			
TEST	Date	Color	Fibrous 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

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



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EMSL Canada Order 551709299 Customer ID: 55GOLA62

1785748

Customer PO:

Project ID:

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

03B Lab Sample ID: 551709299-0008 Client Sample ID: Sample Description: Silver Roof Caulking Analyzed Non-Asbestos Color Fibrous Non-Fibrous **TEST** Date **Asbestos** Comment PLM 8/29/2017 Silver 0% 100% None Detected 03C Lab Sample ID: 551709299-0009 Client Sample ID: Sample Description: Silver Roof Caulking Analyzed Non-Asbestos Non-Fibrous **TEST Fibrous** Asbestos Comment Date Color PLM 8/29/2017 Silver 0% 100% None Detected 551709299-0010 04A Lab Sample ID: Client Sample ID: Sample Description: Window Flashing, Door, Guar Analyzed Non-Asbestos **TEST** Fibrous Non-Fibrous Comment Date Color Ashestos PLM 8/29/2017 Brown 0% 98% 2% Chrysotile 04B Lab Sample ID: 551709299-0011 Client Sample ID: Sample Description: Window Flashing, Door, Guar Analyzed Non-Asbestos **TEST** Date Color Fibrous Non-Fibrous Asbestos Comment PLM 8/29/2017 Positive Stop (Not Analyzed) 04C Lab Sample ID: 551709299-0012 Client Sample ID: Sample Description: Window Flashing, Door, Guar Analyzed Non-Asbestos **TEST** Date Color Fibrous Non-Fibrous Comment Asbestos PLM 8/29/2017 Positive Stop (Not Analyzed) Lab Sample ID: 551709299-0013 Client Sample ID: 05A Sample Description: Black Caulking B/W Wood, and Plastic Analyzed Non-Asbestos **TEST** Date Color **Fibrous** Non-Fibrous **Asbestos** Comment PLM 8/29/2017 Black 0% 100% None Detected Lab Sample ID: 551709299-0014 Client Sample ID: 05B Sample Description: Black Caulking B/W Wood, and Plastic Analyzed Non-Asbestos Non-Fibrous Comment **TEST** Date Color **Fibrous Asbestos** PLM 8/29/2017 Black 0% 100% None Detected Lab Sample ID: 551709299-0015 05C Client Sample ID: Sample Description: Black Caulking B/W Wood, and Plastic Analyzed Non-Asbestos Non-Fibrous Comment **TEST** Date Color Fibrous **Asbestos** PLM 8/29/2017 Black 0% 100% None Detected



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

Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via

			EPA600/R	-93/116 Met	hod		
Client Sample ID:	06A					Lab Sample ID:	551709299-0016
Sample Description:	White Eves Trough Caulking						
	Analyzed		Non	-Asbestos			
TEST	Date	Color		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						
	Analyzed			-Asbestos		_	
TEST	Date	Color		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		-Asbestos Non-Fibrous	Asbestos	Comment	
PLM	8/29/2017	Brown	0%		None Detected	Comment	
		BIOWII		10070	None Detected		55450000 0040
Client Sample ID:	07A-Rubber					Lab Sample ID:	551709299-0019
Sample Description:	Black Rubber Mat and Asphalt	Mastic					
	Analyzad		Non	-Asbestos			
TEST	Analyzed Date	Color		-Asbestos Non-Fibrous	Asbestos	Comment	
PLM	8/29/2017	Black	0%		None Detected		
Client Semple ID:	07A Asphalt Mastic					Lab Sample ID:	551709299-0019A
Client Sample ID: Sample Description:	07A-Asphalt Mastic	N44:-				Lab Sample ID.	331103293-0019A
Sample Description.	Black Rubber Mat and Asphalt	Mastic					
	Analyzed		Non	-Asbestos			
TEST	Date	Color		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				•	
	Analyzed		Non	-Asbestos			
TEST	Date	Color	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					
	·						
	Analyzed			-Asbestos			
TEST	Date	Color		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					
	Analyzed			-Asbestos			
TEST	Date	Color		Non-Fibrous	Asbestos	Comment	
PLM	8/29/2017	Black	0%	100%	None Detected		



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

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

Analyzed Non-Asbestos Fibrous Non-Fibrous **TEST** Date Color **Asbestos** Comment PLM 8/29/2017 Black 0% 100% None Detected Lab Sample ID: 551709299-0022

Client Sample ID: 08A

Sample Description: Black Roof Mat

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

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

Sample Description: Black Roof Mat

Analyzed Non-Asbestos **TEST** Fibrous Non-Fibrous Comment Date Color Ashestos PLM 8/29/2017 Black 70% 30% None Detected 08C Lab Sample ID: 551709299-0024 Client Sample ID:

Sample Description: Black Roof Mat

Analyzed Non-Asbestos **TEST** Date Color 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

2 aucht

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



APPENDIX C

Laboratory Certificate of Analysis - Lead





Attn: Bronte Wright

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

torontolab@emsl.com

(905) 723-2727 (905) 723-2182

08/22/17 10:09 AM

EMSL Canada Or

CustomerID:

CustomerPO:

ProjectID:

551709335

55GOLA62

1771956

Collected: 8/21/2017

Phone:

Received:

Fax:

100 Scotia Court Whitby, ON L1N 8Y6

Golder Associates, Ltd.

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 - Gua	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 - <u>General Waste Management</u>, 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 - <u>Designated Substances</u>, 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) <u>Guideline - Lead on Construction Projects</u> 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 m² or 10 sq. ft.) and between Medium and Large project areas (10 m² 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 - <u>Asbestos on Construction Projects and in Buildings and Repair Operations</u>, 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.



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