

## 1 GENERAL

- .1 This section includes:
  - .1 Hoarding and Overhead Protection.
  - .2 Temporary Barriers and Enclosures.
  - .3 Scaffolding and Structural Steel Framing.
  - .4 Metal Fabrications.
  - .5 Floor Protection
  - .6 Protective netting.
  - .7 Rough Carpentry.
  - .8 Fabric Enclosure.
- .2 Provide construction facilities in order to execute work expeditiously.
- .3 Remove from site all such work after use.
- .4 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to work. Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights or lanterns as required to perform work and protect the public.
- .5 Maintain access to property including overhead clearances for use by emergency response vehicles.
- .6 Scaffolding, fabric enclosure, netting and hoarding shall remain on site until the work above is completed.
- .7 All items, materials, products and equipment provided for this project shall be new; purpose made for intended use, specifically designed, constructed to suit requirements of this project.
- .8 All structural members to be non-combustible.
- .9 Damage to the structure, claddings, roofing, floor, wall and ceiling finishes, and other building elements is not acceptable.
- .10 Provide protection for building finishes, interior and exterior elements and equipment during performance of work. Protect surrounding private and public property from damage during performance of work.
- .11 Be responsible for damage incurred due to lack of or improper protection.
- .12 Submit for review shop drawings for scaffold, structural steel framing, metal fabrications, protective netting, and fabric enclosure signed and sealed by Professional engineer, retained by contractor, licensed in the province of Ontario. The same Professional engineer, in writing, must approve additions or modifications to scaffolding.

## 2 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel.
  - .2 CAN/CSA-S16-14, Design of Steel Structures.
  - .3 CSA-W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
  - .4 CSA W59-13, Welded Steel Construction (Metal Arc Welding) (Metric Version).
  - .5 CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .6 CSA S136-16, North American specification for the design of Cold Formed Steel Structural Members.
  - .7 CSA S269.2-16 Access Scaffolding for Construction Purposes.
  - .8 CSA B111-1974 (R2003), Wire Nails, Spikes, and Staples.
  - .9 CSA B35.3-1962, Tapping and Drive Screws (Slotted and Recessed Head, Thread Forming and Thread Cutting Screws, and Metallic Drive Screws).
  - .10 CSA O121-08 (R2013), Douglas Fir Plywood.
  - .11 CSA O141-05 (R2014), Softwood Lumber.
  - .12 CSA O325-16, Construction Sheathing.
- .2 American Society for Testing and Materials (ASTM)
  - .1 ASTM A653/A653M-15e1, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM A53/A53M-12, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .3 ASTM A269/A269M-15a, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - .4 ASTM A307-14, Specification for Carbon Steel Bolts, Studs and Threaded Rod, 60,000 PSI Tensile Strength.
  - .5 ASTM D1761-12, Standard Test Methods for Mechanical Fasteners in wood.
- .3 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2000.
- .4 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-11, Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
- .5 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
  - .2 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
- .6 American National Standards Institute (ANSI)

- .1 ANSI A10.11-2010(R2016) Safety Requirements for Personnel Nets.
- .7 Ontario Ministry of Labour – Occupational Health and Safety Act are regulations for construction projects, R.S.O. as amended 213/91.
- .8 Canada Labour Code, Canada Occupational Safety and Health regulations.

### 3 DESIGN

- .1 Design all work in accordance with the requirements of the National Building Code of Canada latest edition, errata and revisions as well as the requirements of local authorities having jurisdiction. All Construction to be designed to the wind and earthquake requirements of the National Building Code. Submit final drawings for review. Drawings submitted to bear the stamp and signature of qualified professional engineer licensed to practice in the province Ontario.
- .2 General:
  - .1 Scaffold/Overhead Protection General Requirements:
    - .1 Select scaffold structural framing system to provide necessary load capacity and stiffness for support of dead, live and impact loads for intended use.
    - .2 Scaffold to be designed by qualified Professional Engineer licensed in the province of Ontario.
    - .3 Provide scaffolding as required for protective enclosures and work access as outlined on the drawings
    - .4 Scaffold design and erection shall be in accordance with the “Occupational Health and Safety Act” and “Regulations for Construction Projects”, and relevant municipal, provincial and federal regulations.
    - .5 The Contractor shall be responsible for design of support of scaffold to existing structure. No attachment allowed to or through floor, wall, or ceiling cladding elements. Refer to drawings for acceptable scaffold bearing locations on existing structure.
    - .6 Provide steel guardrails, including toe boards, intermediate rails, and handrails, at perimeter and around openings of all work platforms, to meet Health and Safety regulations.
  - .2 Design parameters:
    - 1. Scaffold:
      - 1. Design scaffold for dead loads plus minimum live load of 2.4 kN/m<sup>2</sup> for workers, tools, and stockpiled materials. Maximum two platforms to be loaded in any vertical scaffold module.
      - 2. Design scaffold for fall arrest loading where guardrails cannot be provided.
      - 3. Design scaffold to be to maintain structural integrity when disassembled in sections to allow progression of work.

2. Overhead protection:
  1. CAP Structures: Design for dead loads, live load of 2.4 kN/m<sup>2</sup> and impact loads from material weights indicated drawings.
  2. Floor protection: Provide continuous resilient floor covering in work areas to prevent damage to granite finish.
  3. Protective netting: Design for self weight, live load of 1.0 kN/m<sup>2</sup> and capable arresting the fall of a 225 kg glass panel. Netting material, design and testing to be in accordance with ANSI/ASSE A10.11-2010(R2016) personnel and debris nets.
  4. Design netting and connections to not apply forces to building structure greater than indicated on drawings. Provide shock absorbing fittings as required.
- .3 Structural Steel framing
  - .1 Design steel structure, details and connections in accordance with requirements of CAN/CSA-S16 and CAN/CSA-S136 to resist all forces, moments and shears.
  - .2 Design steel joists and bridging in accordance with CAN/CSA S16 and CSA S136.

#### **4 MATERIALS**

- .1 Tubular Scaffold:
  - .1 Tubular scaffold, scaffold bridge, stair, side brackets, work platforms, guardrails, barricades, and other accessories shall be an engineered type tube and clamp (system-type and frame type) scaffold system unless design requires otherwise. All components galvanized steel.
- .2 Structural Steel framing:
  - .1 Columns & Bracing Supporting Floors:
    - .1 Structural steel: to CAN/CSA-G40.21 Grade 350W and CAN3-S136 with CSA S136.1.
    - .2 Anchor bolts: to ATSM A307.
    - .3 Bolts, nuts and washers: to ASTM A325M and/or ASTM A490M.
    - .4 Welding materials: to CSA W48 Series and/or CSA W59 and certified by Canadian Welding Bureau.
  - .2 Floor Joists and Beams:
    - .1 Open web steel joists and structural steel to CAN/CSA-G40.21 Grade 350W and CAN3-S136 with CSA S136.1.
    - .2 Welding materials: to CSA W59.
    - .3 Shear studs: to CSA-W59, Appendix H.
- .3 Steel fabrication, details and connections in accordance with requirements of CAN/CSA-

S16 and CAN/CSA-S136.

- .4 Steel fabrication to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel joists and/or CSA W55.3 for resistance welding.
  - .5 Zinc-iron Alloy (ZF) coated steel sheet: to ASTM A653M, structural quality, Grade: A, with ZF275 coating, for interior surfaces not exposed to weather, unpainted (unless required in Room Data Schedules) finish, 0.91mm minimum base steel thickness. All exterior exposed steel to be galvanized.
  - .6 Cover plates, cell closures and fastenings: steel sheet with minimum base steel thickness of 0.91 mm. Metallic coating same as deck material.
- .3 Metal Fabrications:
- .1 Steel sections and plates: to CAN/CSA/G40.20/G40.21, Grade 350W.
  - .2 Steel pipe: to ASTM A 53/A53M extra strong, galvanized finish.
  - .3 Welding materials: to CSA W59.
  - .4 Welding electrodes: to CSA W48 Series.
  - .5 Bolts and anchor bolts: to ASTM A 307
  - .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.
4. Rough Carpentry:
- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
    - .1 CAN/CSA-O141.
    - .2 NLGA Standard Grading Rules for Canadian Lumber.
  - .2 Framing and board lumber: in accordance with NBC, except as noted.
  - .3 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
    - .1 S2S is acceptable.
    - .2 Board sizes: "Standard" or better grade.
    - .3 Dimension sizes: "Standard" light framing or better grade.
    - .4 Post and timbers sizes: "Standard" or better grade.
  - .4 Panel materials:
    - .1 Douglas fir plywood (DFP): to CSA O121 and CAN/CSA O325, exterior grade, standard construction with maximum moisture content of 8% at time of manufacture, G1S (good one side).
- .5 Floor Protection:

- .1 Continuous resilient floor covering to be provided in open work area suitable to resist impact from objects of a size capable of passing through protective netting.
- .6 Protective Netting:
- .1 Netting shall be supplied by approved manufacturer with a minimum of 5 years experienced in similar applications. Submit technical information on proposed components with tender.
  - .2 Materials used for personnel and debris nets may be of natural synthetic fiber of sufficient size, strength, and number to absorb the drop-test loads specified in ANSI A10.11 without significant distortion of the net pattern.
  - .3 Provide all installation hardware and accessories as required.
  - .4 Net hardware shall be drop-forged, pressed, or formed steel, or material of equal or better quality. Surfaces shall be smooth and free of sharp edges.
  - .5 Each net shall be permanently labeled with the following information:
    1. Name of manufacturer
    2. Identification of net material
    3. Date of manufacture
    4. Date of prototype test
    5. Name of testing agency Serial number
- .7 Fabric Enclosure:
- .1 Fabric: specifically designed for scaffolding applications; fabric to use a scrim design, woven from high density polyolefin slit tapes, containing flame retardant and ultra-violet stabilizers. Fabric to be free from plasticizers and chlorine.
  - .2 Fabric to include an engineered coating to provide resistance to tears and punctures, ultra-violet light. Fabric to be inert to most chemicals and liquids.
  - .3 Fabric to have the following minimum properties:
    - .1 Weave count: 63 x 63 yarns/10 cm
    - .2 Scrim weight: 224 g/sq.m.
    - .3 Coating thickness: 102 microns per side
    - .4 Total thickness: 0.59m
    - .5 Grab tensile: 1624 x 1491 N to ASTM D5034-09(2013)
    - .6 Strip tensile: 2280 x 2104 N to ASTM D5035-11(2015)
    - .7 Tongue tear: 534-534-N to ASTM D2261-13
    - .8 Trapezoidal tear: 401x 378 N to ASTM D4533/D4533M-15
    - .9 Mullen burst: 4692 kPa to ASTM D3786/D3786M-13
    - .10 Max. operating temperatures: -50 to +70 deg. C.
    - .11 UV resistance: >90% to ASTM G53-96/G154-16

- .12 Flame resistance to CAN/ULC-S109-14, Flame tests of flame-resistant fabrics and films.
- .4 Colour and texture to be as indicated on drawings.
- .5 Coordinate design of fabric enclosure with NGC Design Services and Tim Davis Design.

## 5 INSTALLATION

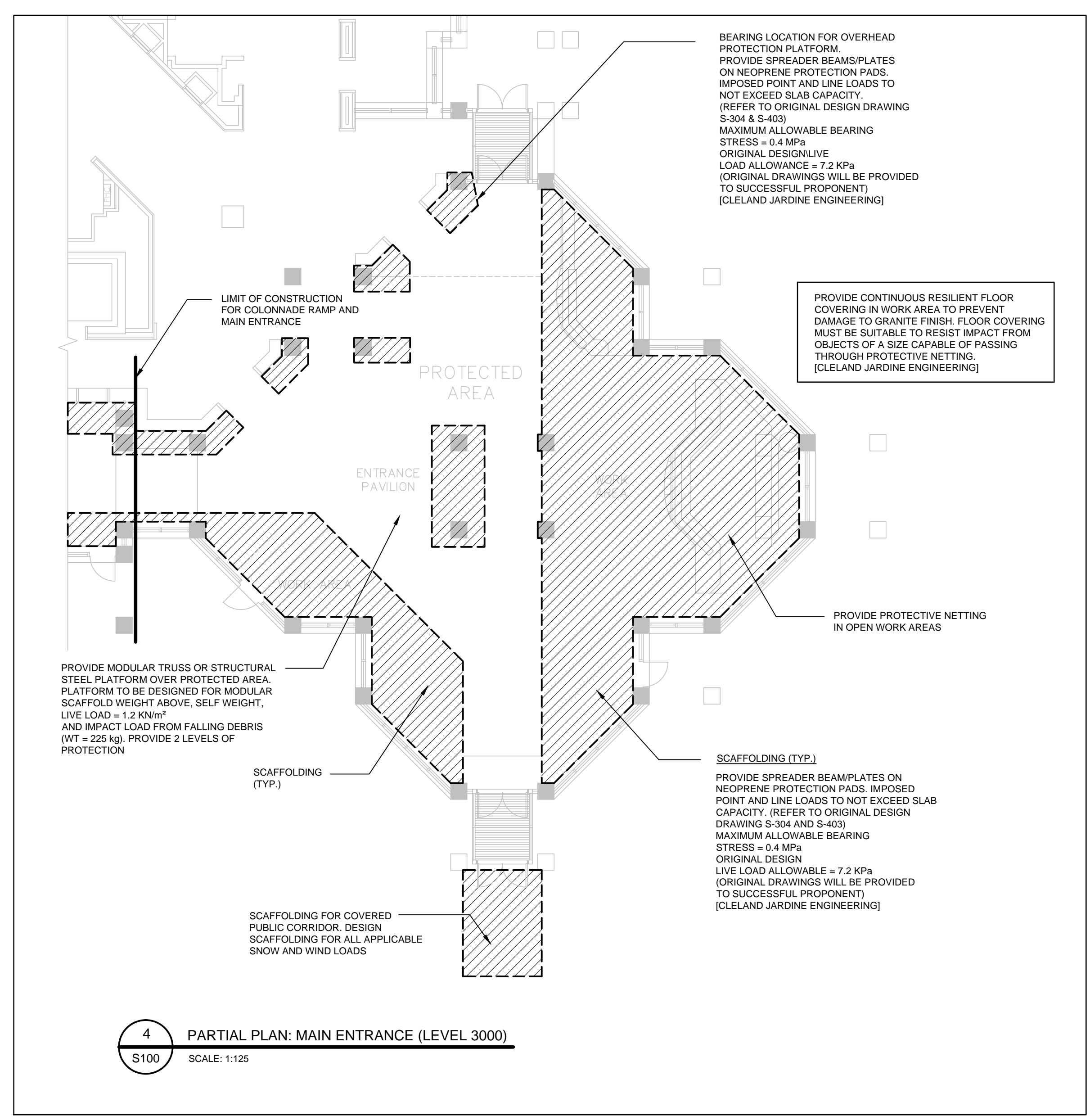
- .1 Scaffold:
  - .1 Install engineered scaffold, hoarding and overhead protection in accordance with approved submittals.
  - .2 A competent worker shall supervise the erection of scaffold.
  - .3 A Professional engineer shall inspect the scaffold before it is used to ensure that it is erected in accordance with design drawings.
- .2 Structural Steel framing:
  - .1 Install steel structure, details and connections in accordance with requirements of CAN/CSA-S16 and CAN/CSA-S136 with CSA S136.1 to resist all forces, moments and shears.
  - .2 Fabricate and erect steel joists and bridging in accordance with CAN/CSA-S16 and CSA S136.
  - .3 Welds or bolted connections to be neat and compact. Bridging to be straight with neat, compact connections.
  - .4 Clean, prepare surfaces and shop prime structural steel, steel joist and bridging in accordance with CAN/CSA-S16, CSA-S136 and CSA S136.1.
- .3 Rough Carpentry:
  - .1 Comply with requirements of NBC 2012 Part 9 supplemented by following paragraphs.
  - .2 Install members true to line, levels, and elevations, square and plumb.
  - .3 Construct continuous members from pieces of longest practical length.
  - .4 Installing spanning members with "crown-edge" up.
  - .5 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
  - .6 Install plywood flooring panel end-joints located on solid bearing, staggered at least 800mm. Secure flooring to steel deck using self-tapping screws, space 400mm cc.
  - .7 Install hoarding as shown. Use the good side of the plywood on the exterior of the hoarding. Install bases and moulding as show. Mitre corners. Splice individual pieces with angled joints.
  - .8 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

- .4 Protective netting:
  - .1 Fasten netting securely in accordance with ANSI A10.11 personnel and debris nets.
  
- .5 Enclosure fabric:
  - .1 Install and fasten enclosure fabric in accordance with supplier's recommendations.  
Make good any damage to enclosure during this contract.

**END OF SECTION**

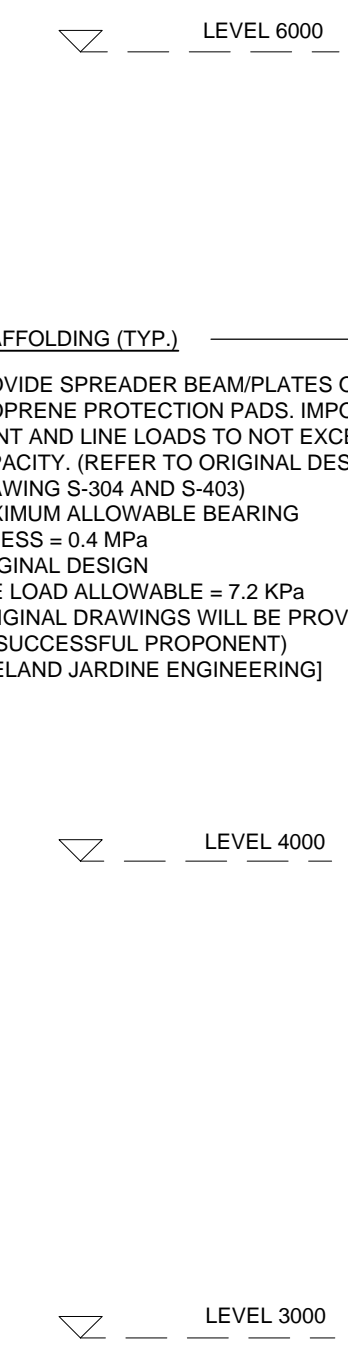


The Contractor shall check and verify all dimensions on site. This drawing is not to be used for construction unless stamped and signed by the Engineer. Do not scale drawings. Copyright reserved. This drawing is the exclusive property of Cleland Jardine Engineering Ltd.

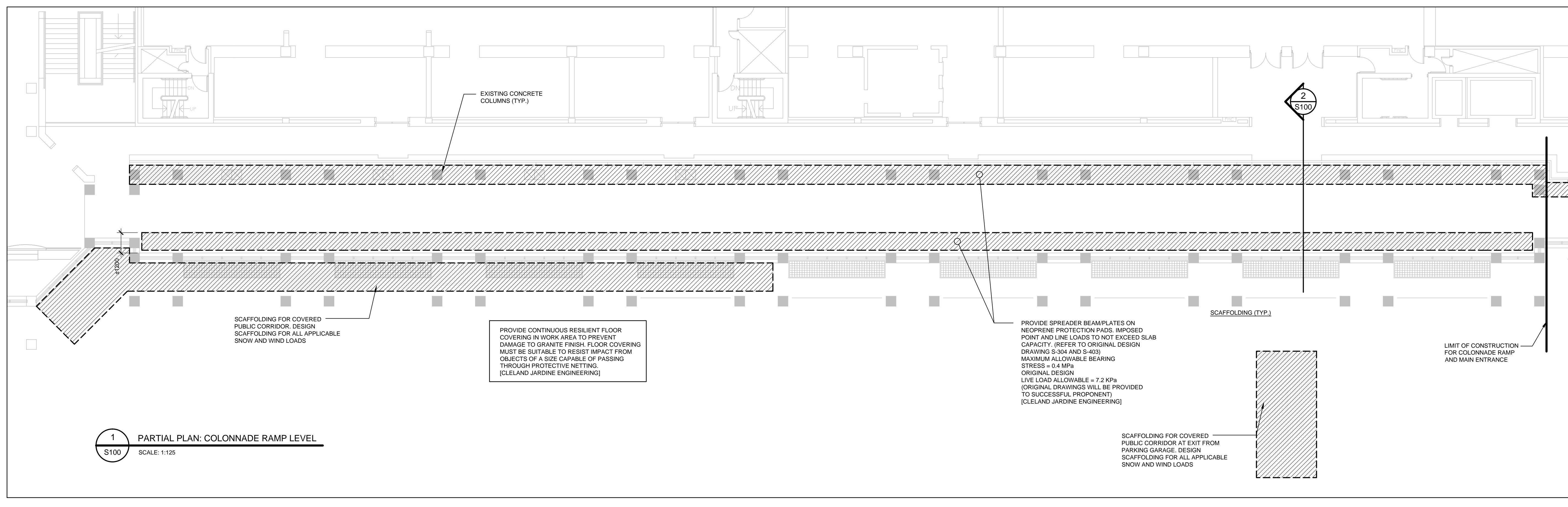


4 PARTIAL PLAN: MAIN ENTRANCE (LEVEL 3000)  
S100 SCALE: 1:125

- SCAFFOLDING NOTES:**
- GENERAL INFORMATION:**
- CONTRACTOR TO DESIGN & ENGINEER TEMPORARY SCAFFOLDING SYSTEM
  - DRAWING TO BEAR SEAL OF PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO
  - WORK PLATFORMS TO BE DESIGNED FOR LIVE LOAD OF 2.4 KPa, SELF WEIGHT FOR BEAMS AND SHEATHING, AND SUPERIMPOSED DEAD LOAD OF 0.25 KPa FOR THE SUSPENDED CEILING AND ELECTRICAL.
  - LIMIT LOADS ON EXISTING STRUCTURE TO LOADS INDICATED ON PLANS.
  - ALL EXPOSED SUPPORTS MUST BE UNIFORM FINISH AND COLOUR AS SPECIFIED IN THE TIM DAVIS DESIGN INC. WRITTEN DOCUMENT.



2 SECTION: COLONNADE  
S100 SCALE: 1:75



1 PARTIAL PLAN: COLONNADE RAMP LEVEL  
S100 SCALE: 1:125

No.	DATE	REVISIONS	BY
5	AUG 14/17	RE-ISSUED FOR TENDER	JP
4	AUG 03/17	ISSUED FOR REVIEW	JP
3	MAR 03/17	ISSUED FOR TENDER	JP
2	FEB 14/17	RE-ISSUED FOR REVIEW	ME
1	FEB 03/17	ISSUED FOR REVIEW	ME

PROJECT NORTH

STAMP

**CLELAND JARDINE**  
ENGINEERING LTD.

200-880 TERRY AVE. DR.  
SCARBOROUGH, ONT. M1T 4P7  
(416) 291-1533

PROJECT  
**380 SUSSEX DRIVE,  
COLONNADE & MAIN  
ENTRANCE GLAZING  
REPLACEMENT**

DRAWING  
**GENERAL NOTES,  
PARTIAL PLAN AND  
DETAILS**

DRAWN:	M. EPPICH	DRAWING No.	<b>S100</b>
DESIGNED:	C.F./S.P.		
DATE:	JAN 31/17		
SCALE:	AS SHOWN		
PROJECT No.:	16-2156		