Figurr Architects Collective
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Montreal, Quebec
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190 Somerset St W #206
Ottawa, ON
K2P 0J4
613-695-6122

The following information supplements and/or supersedes the bid documents issued on **17/02/2022.**
This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof. Acknowledge receipt of this Addendum by inserting its number and date on the Tender Form. Failure to do so may subject the Bidder to disqualification.

Addendum no 01 includes the following documents, attached to the present document :

A. Civil addendum no XX
N/A

B. Landscape addendum no
N/A

C. Structural addendum no XX
Refer to 'Change log – Structural'
Revised sheets : S-000, S-300, S-400 and S-401

D. Electrical addendum no XX
N/A

E. Architectural addendum no AR01
Refer to Architectural 'Addendum no AR01'

1. QUESTIONS FROM BIDDERS:

A. General requirements

1. Validity Period

Question:

Specifications- section 00 21 13 item 4.8 Validity Period is noted at 90 days. Due to the volatile market place we request that be reduced to 15 days, with the market some trades only price with a validity period of 7 to 15 days (specifically the steel industries). This is very challenging for the General contractors, also as it will help in trade participation and getting the most competitive pricing possible.

Response:

Please indicate clearly in the bidding document what prices cannot be guaranteed for 90 days and how long the guarantee would be for these items

2. Submittal of appendices

Question:

Specifications-We would like to request that Appendix B Thru F be submitted 2 hours after bid closing of main bid. Closing a tender as well as submitting each additional item is difficult with pricing arriving up to minutes of the closing time and would be greatly appreciated.

Response:

Appendices B through F can be submitted the day following the bid closing by 9:00 am.

3. washroom facilities

Question:

Will we have access to existing washroom facilities or will the GC need to provide their own?

Response:

Yes, access to one toilet and room

4. Parking for workers

Question:

Will there be parking available for GC and trades? How many spots?

Response:

Approximately 15 spaces

5. Water and power on site

Question:

Will water and power be available for the GC and trades from the existing building?

Response:

Water could be available, if the reason is judged valid. Access to electricity will depend on the available power.

6. Certificate of Publication

Question:
Will a Certificate of Publication be required at end of project?
Response:
Yes

B. Civil

C. Landscape

1. Scale on L1 Landscape plan

Question:
Landscaping-Drawing L1 scale is identified as 1:400 but bar scale shows as 1:300. Please clarify witch is the correct scale.
Response:
The Bar Scale Is Correct at 1:300. The Title Block has been updated to reflect this

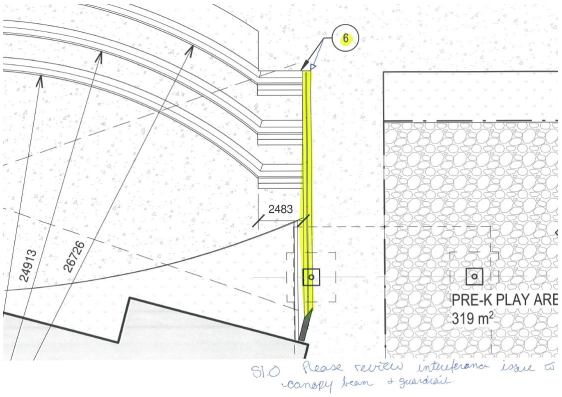
2. Existing trees

Question:
Are all trees on dwg. A-111a and b to be demolished/removed?
Response:
Tree Removals are noted on L1 - Refer To The Landscape Plan / Legend. Also TCR Attached that clarifies tree number/types/sizes etc

D. Structure

1. Conflict of pad footing with existing entrance stairs

Questions:
_Structural/Architectural- one of the pad footings type F1 on grid line 5.3/5 will be in conflict with an existing exterior concrete stairs on south side at Canopy 1. Please clarify if stair will need to be removed or how to proceed.
__please review interference issue to canopy beam & guardrail



Response:
See Structure addenda #1, the columns along gridline 5 have been moved.

E. Electricity

1. Barrier gate and arms

Question:
Specifications/Architectural/Electrical-Appendix F identifies for pricing of 2 barrier gate and arms. Please provide specifications and requirements for these barrier gates as we cannot provide pricing with them.

Response:
The installation of the barrier gates will be a design-build element. Please provide a total price, including admin & profit, etc. However, the conduit from the electric room to the barrier gate locations is to be included in the base contract

2. Electrical charging stations

Question:
Specifications/Architectural/Electrical-Appendix F identifies for pricing of 10 Electrical charging stations. Please provide specifications and requirements for these as we cannot provide pricing with them.

Response:
The installation of the electric charging stations will be a design-build element. Please provide a total price, including admin & profit, etc. However, the conduit from the electric room to the charging station locations is to be included in the base contract.

F. Architecture

1. Masonry scope of work

Questions:

_Masonry- Drawing A202. Please clarify if note 1 to re-point masonry is for a localized area or thru out full brick wall area. We suggest going with a unit rate per ft2 for repointing pricing, Please clarify.
_Is repointing of bricks on A-202 only on the East and North Elevations? Clarify
_ Masonry specification has blank lines that require notes to be filled in.

Responses:
_ASK-2 shows 'extent of repointing work' : all East elevation as well as the first portion of North & South elevations, where the brick is lower.
_The blanks have been filled in, see Architectural Addendum AR01

2. Metal siding scope of work

Questions:
_Metal siding patch and repair- Please clarify what is expected in the scope of work for patch and repair? Please clarify existing siding profile, manufacturer, colour and gage as this will impact any associated cost.
_On dwg. A-202, what is the extent of siding repairs? How can we determine it? I suggest an Allowance be allocated for this.?
Response:
There will be no patch and repair of the existing siding, see addendum AR01 - AR01, point III.4, ASK-1 and ASK-2.

3. Flashing on existing gym wall

Questions:
_On A-202, is item #4"New flashing" on the entire length of brick area on the East elevation ONLY or on other elevations?
_ Is new flashing on North elevation as well?
_ Is item # 4 and item # 7 on A-202 the same material and detail?
Responses:
_the scope of work for the flashing is the same as the brick repointing, see answer to question 1.
_yes, item 4 is the new flashing and item 7 is the existing flashing to demolish

4. Gutters & downspouts

Questions:
_Gutters & downspouts. Drawing A121C notes 4& 4 as aluminum on drawing A202 notes as Steel. Please clarify if information provided is correct or if all gutters and downspouts are to be in metal. If aluminum please provide specifications.
_ On A-202 is the new downspout on right side of East elevation ONLY?
_ On A-202, is the new downspout on the far left side of North Elevation ONLY? Clarify
_ On 4/A-202, demolition item # 6, says exist. Downspout to demo and replace but on 2/A-202 it only shows one downspout at each end.Clarify?
Responses:
_The gutters and downspouts are aluminum, see new specification section 07 71 23 as well as revised notes on drawings in addenda AR01.

_ see elevations on A-202 for downspouts to demolish : 4 on end wall and 1 on North elevation.
_Elevation 1/A-202 says that there is a new downspout on North & South elevation.
_also see plan A-130 for additional downspout along canopies

5. Roofing

Question:

Please clarify roofing system specification and details. Structural drawings S-100 specifies a insulated metal roof system but no details on either structural or architectural.

Response:

_The roof will be a metal roof, see ASK-10 and new specification section 07 61 00.

6. Expansion joints

Questions:

_Clarification details required for expansion joint where canopy roof abut to existing building structure along gride line 5.3 and 15 (drawing A130)
_Clarification detail required for expansion joint type 2 at canopy roofs along gride line E, J, 1, 4, 5.3, 9

Response:

_See ASK-4, ASK-5 and new specification section 07 95 13.

7. Paint

Questions:

_Please provide painting schedule and specifications that clarifies which components are to be painted, type of paint , colour and sheen.

Response:

_See new specification section 09 91 13.

END OF ADDENDUM NO 01

McINTOSH PERRY

CHANGE LOG – STRUCTURAL: ADDENDA #1

TO: Stéphanie Desautels (Figurr)

DATE: March 17th, 2022

PROJECT: Lycée Claudel

SUBJECT: Change Log of Structural Drawings
Project – CCO-221100-00

The purpose of this log is to record changes made to the structural drawings between ***Revision 3 – ISSUED FOR TENDER 17 FEBRUARY 2022 dated 2022-02-17*** and ***Revision 4 – ISSUED FOR ADDENDUM #1 dated 2022-03-17***:

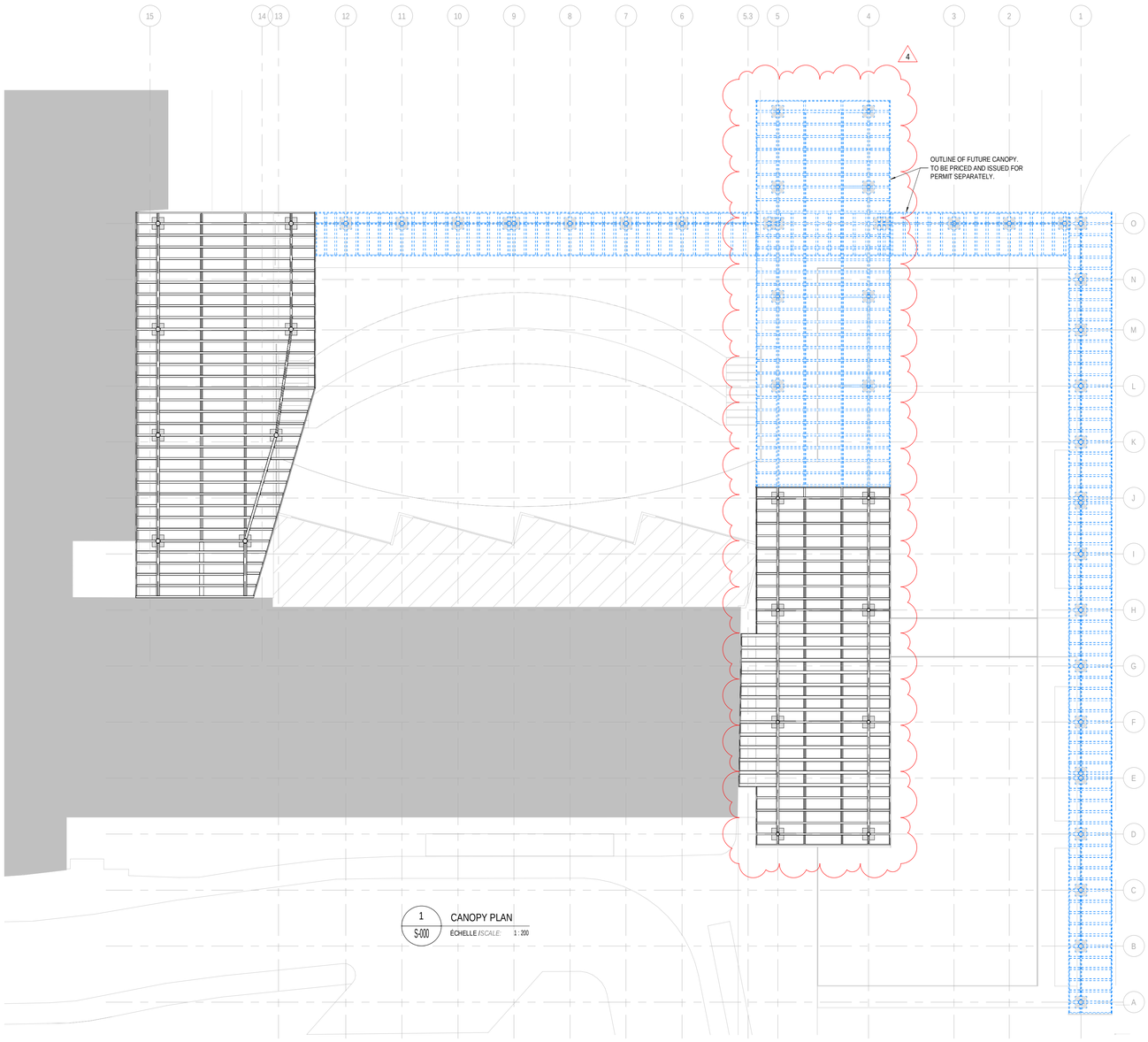
Item Number	Description of Change	Reference
1.	Grid 5 shifted by approx. 850 mm page East in order to avoid clashing with existing staircase that was not caught in the original survery. Grid 4 was also shifted by approx. 850 mm page West in order to maintain symmetry for the canopy as requested by Figurr. This resulted in some beam members to be upsized to accommodate larger cantilever lengths.	S-000 S-300 S-400 S-401

The changes mentioned in this log have also been clouded on Revision 4 of the structural drawings as an alternative means of recording and maintaining a log of changes. This list highlights all the major changes from one revision to another. Please advise should any item have been omitted. It is the contractor's responsibility to identify all changes.

I trust this change log satisfied your present purposes, should you have any questions, please do not hesitate to contact the undersigned.

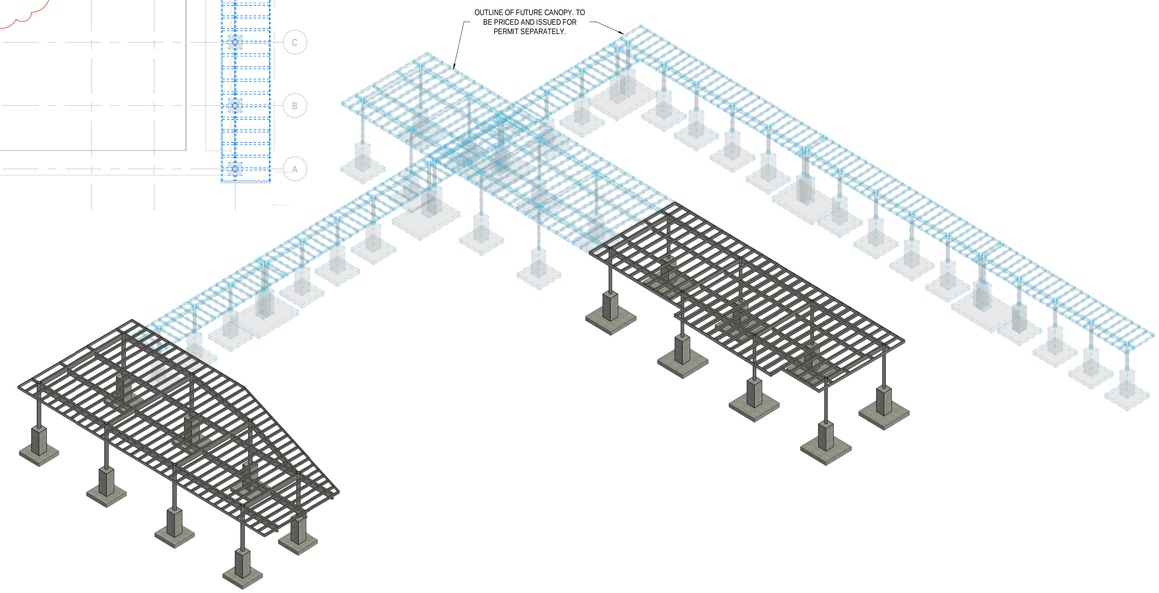
End of Change Log

Abdul Kader Jaber, M.Eng., P.Eng., ing.
McIntosh Perry Consulting Engineers Ltd.



1 / S-000 CANOPY PLAN

ÉCHELLE / *SCALE:* 1 : 200



STRUCTURAL DRAWING LIST

SHEET No.	SHEET NAME	REVISION
S-000	OVERALL CANOPY PLAN	4
S-100	GENERAL NOTES	2
S-101	GENERAL NOTES & DESIGN DATA	2
S-300	FOUNDATION PLAN	4
S-400	ROOF PLANS	4
S-401	ROOF PLANS	4
S-500	SECTIONS	2

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4	17 MAR 2022	STRUCTURAL ADDENDUM #1

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2022-03-17
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100548229
PROVINCE OF ONTARIO

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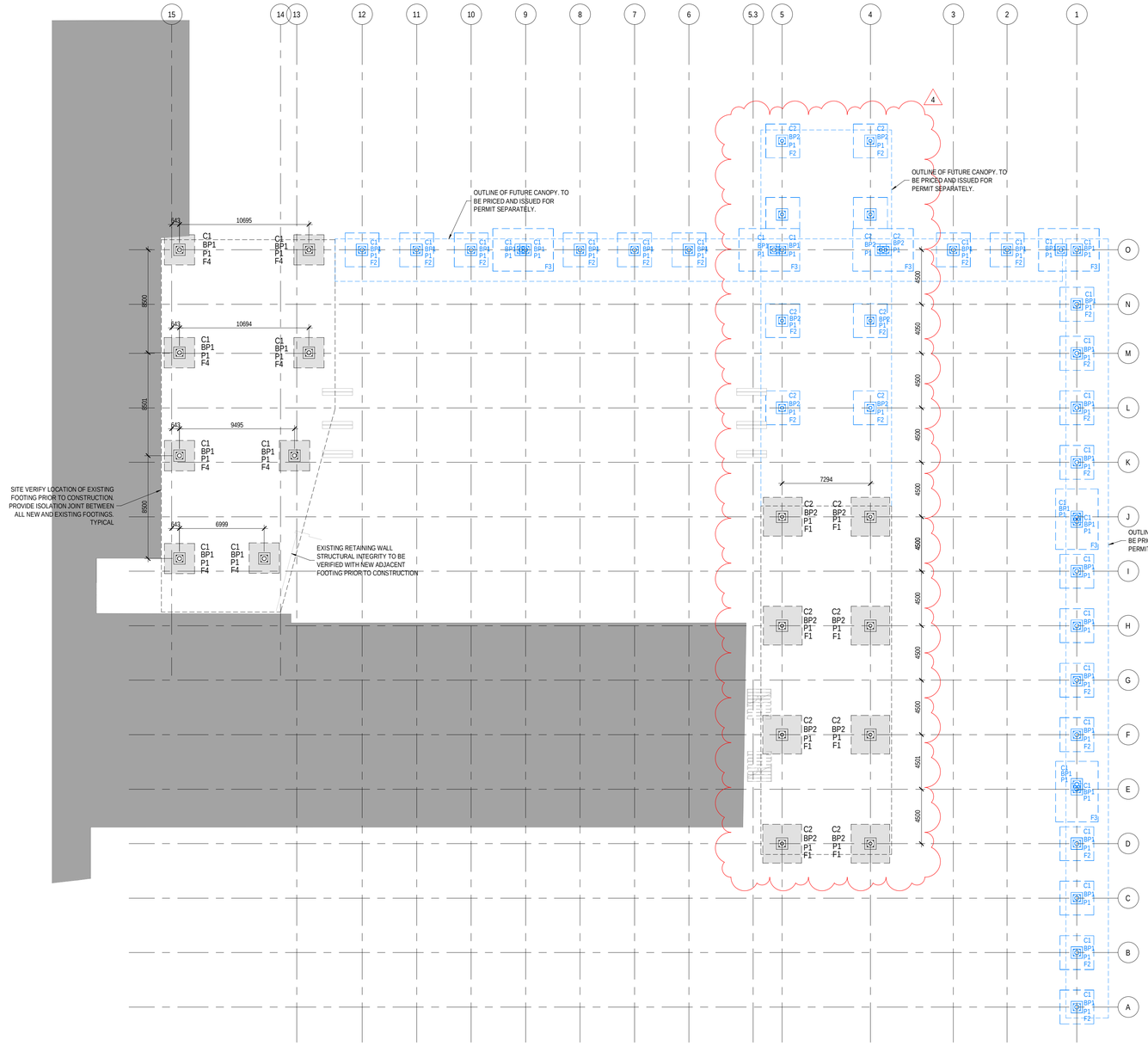
Projet / Project

PROJECT: LYCEE CLAUDEL

Titre / Title

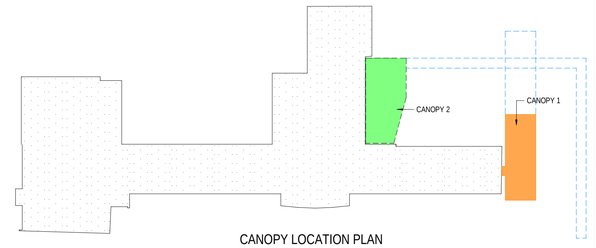
OVERALL CANOPY PLAN

Dessiné par / Drawn by	*No. projet / Project number*
dmw	CCO-22-1100
Vérifié par / Verified by	*No. dessin / Drawing number*
AJ	
Échelle / Scale	*Révision / Revision*
1 : 200	4
Date de création du dessin / Drawing creation date	
01/06/22	S-000



1 / S-300 FOUNDATION PLAN (CANOPIES 1&2)

ÉCHELLE / *SCALE:* 1 : 200

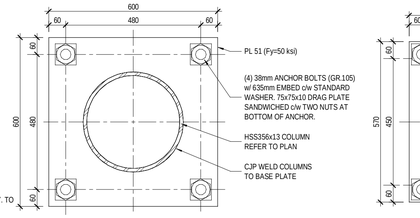


CANOPY LOCATION PLAN

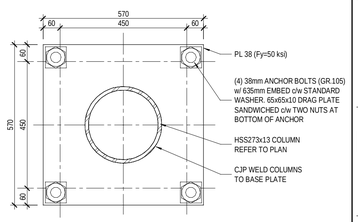
FOOTING SCHEDULE				
MARK	LENGTH	WIDTH	THICKNESS	REINFORCING
F1	3200	3200	400	20M @300 BOTTOM EACH WAY HOOKED EACH END
F2	2800	2800	400	20M @300 BOTTOM EACH WAY HOOKED EACH END
F3	5000	3500	500	25M @300 BOTTOM EACH WAY HOOKED EACH END
F4	2500	2500	400	20M @300 BOTTOM EACH WAY HOOKED EACH END

PIER SCHEDULE		
MARK	SIZE	COMMENTS
P1	950 x 950	SEE DETAIL FOR REINFORCING

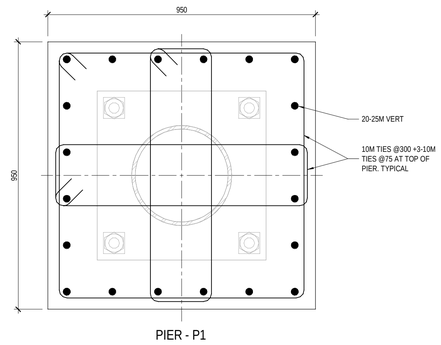
STEEL COLUMN SCHEDULE		
MARK	SIZE	COMMENTS
C1	HSS356x13	
C2	HSS273x13	



BASE PLATE - BP1



BASE PLATE - BP2



PIER - P1

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4	17 MAR 2022	STRUCTURAL ADDENDUM #1

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Ingénieur / Engineer (Structure / Structure)

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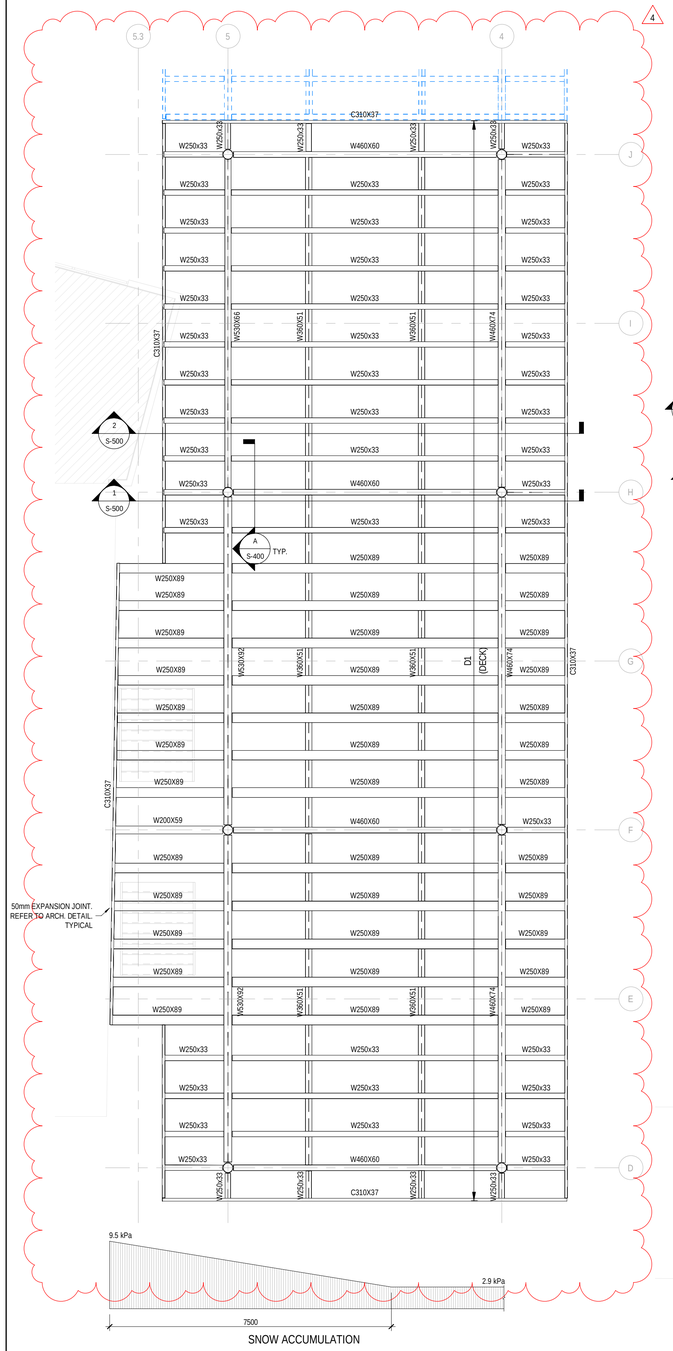
Projet / Project

PROJECT: LYCEE CLAUDEL

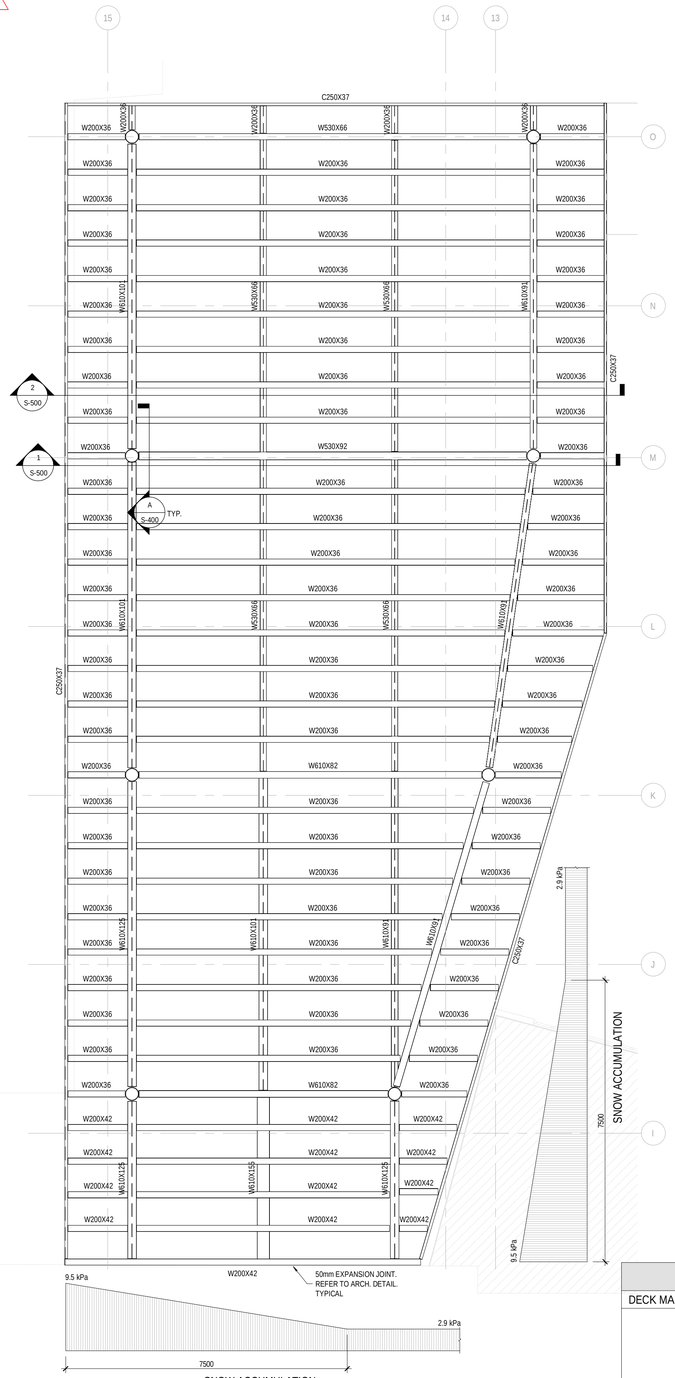
Titre / Title

FOUNDATION PLAN

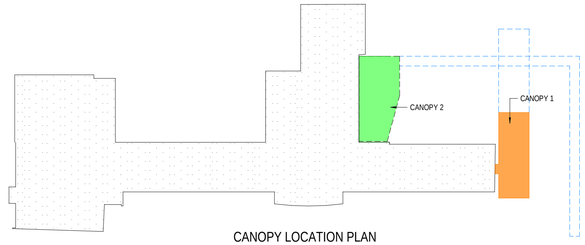
Dessiné par / *Drawn by*	No. projet / *Project number*	
dmw	CCO-22-1100	
Vérifié par / *Verified by*	No. dessin / *Drawing number*	Révision / *Revision*
AJ		4
Échelle / *Scale*		
As indicated		
Date de création du dessin / *Drawing creation date*		
01/06/22	S-300	



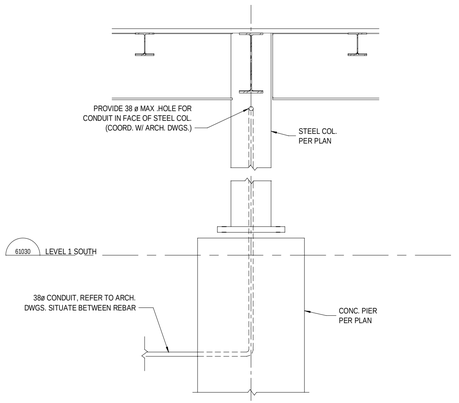
1 CANOPY 1 PLAN
S-400 Scale: 1 : 75



2 CANOPY 2 PLAN
S-400 Scale: 1 : 75



CANOPY LOCATION PLAN



A S-400 CONDUIT DETAIL
ÉCHELLE / SCALE: 1 : 25

4

MEMBER CONNECTION FORCE TABLE	
MEMBER	AXIAL FORCE
W460x74	+/- 375kN
W460x60	+/- 250kN
W530x92	+/-300kN
W610x125	+/- 300kN
W610x155	+/- 300kN
W610x101	+/- 300kN
W610x91	+/- 300kN
W610x82	+/- 300kN
W530x66	+/- 100kN
W360x51	+/- 50kN
W200x36 & W200x46 & W250x33 & W250x89	+/- 25kN
W460x68	+/- 400kN
W460x82	+/- 250kN
W310x45	+/- 50 kN-m
W360x33	+/- 50kN
W200x36 (CANT. CANOPIES)	+/- 25kN
W460x74	+/- 100kN

NOTES:
1. ALL BEAMS TO BE CONNECTED FOR 110% OF MOMENT CAPACITY.

METAL DECK SCHEDULE

DECK MARK	SIZE / PROPERTIES	PROFILE / ATTACHMENT	FASTENERS
D1	TYPE: 38mm WIDE RIB ROOF DECK 3 CONTINUOUS SPANS, MIN GA: 20 GA Fy (MIN): 275 MPa FINISH: SEE SPEC.	CONNECTORS AT SUPPORT: DECK FLUTE PERPERNDICULAR TO PERIMETER BEAM SUPPORT FASTENERS BETWEEN SHEET LAPS AT SUPPORTING STRUCTURE 36/14 PATTERN 75 CONNECTORS AT SUPPORT: DECK FLUTE PARALLEL TO BEAM/JOIST	D1 SIDE LAP: HILTI S-SLC 02 M HWH @ 75mm c/c SUPPORT FASTENERS: HILTI X-HSN 24

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Projet / Project

PROJECT: LYCEE CLAUDEL

Titre / Title

ROOF PLANS

Dessiné par / Drawn by: dmw	No. projet / Project number: CCO-22-1100
Vérifié par / Verified by: AJ	No. dessin / Drawing number: S-400
Échelle / Scale: As indicated	Révision / Revision: 4
Date de création du dessin / Drawing creation date: 01/06/22	

No.	Date	Émis pour / Object
0	07 JAN 2022	ISSUED FOR BUILDING PERMIT
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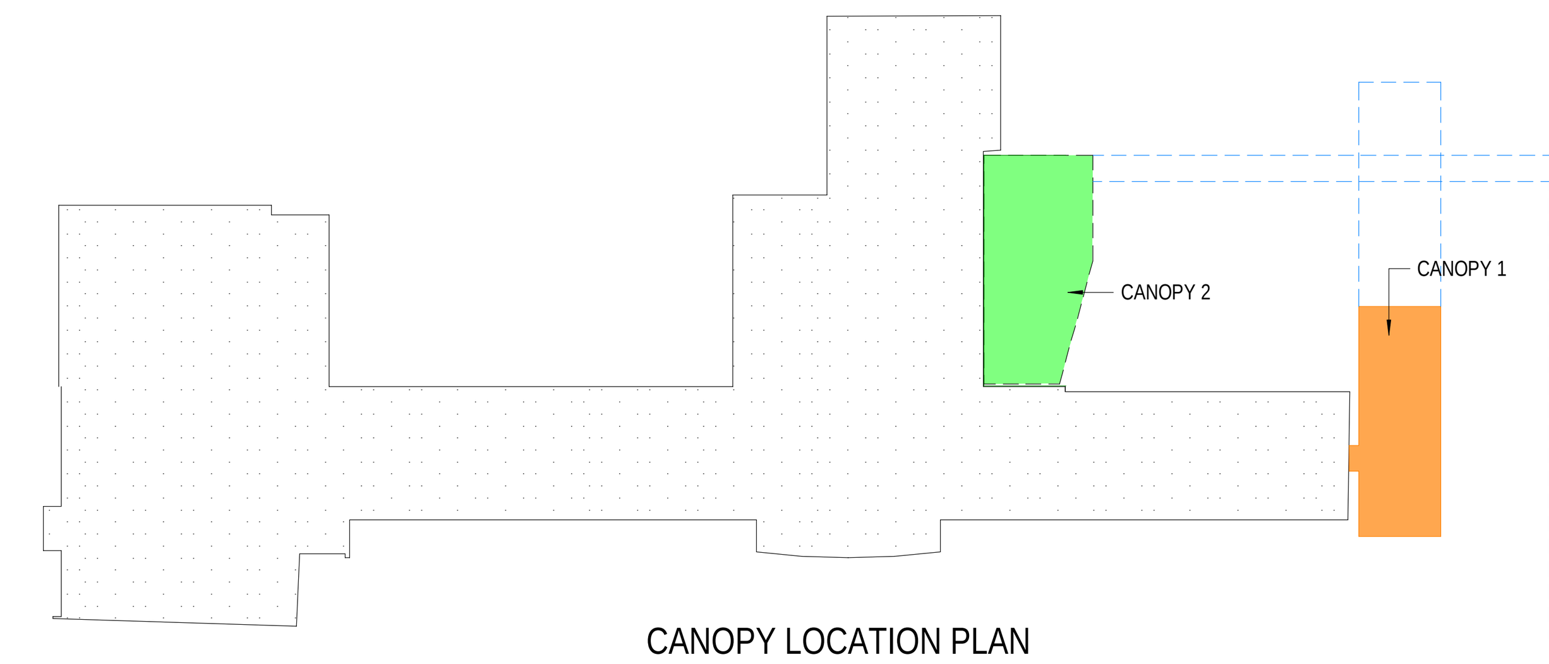
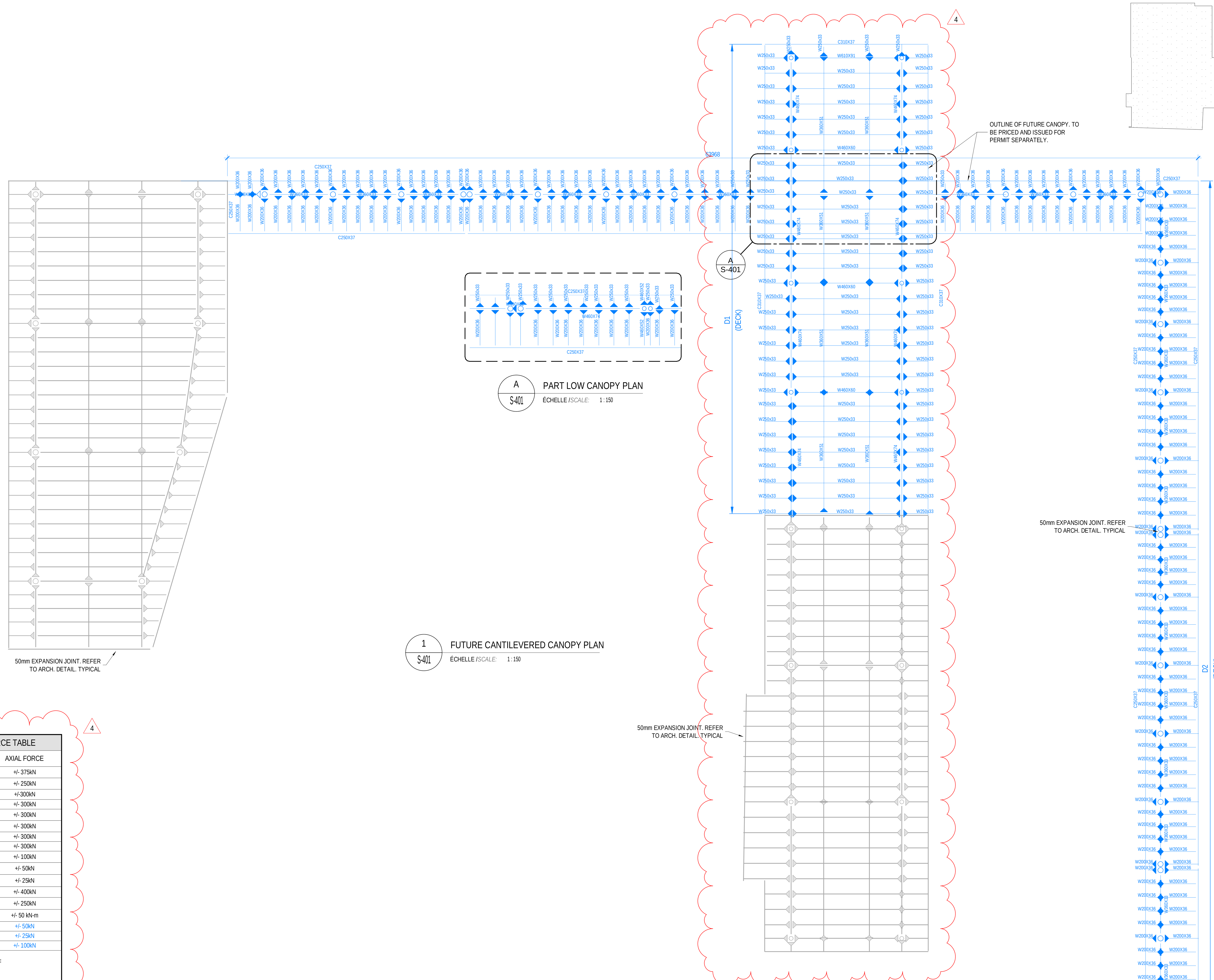


CANOPY LOCATION PLAN



A / S-401 PART LOW CANOPY PLAN

ÉCHELLE / *SCALE:* 1 : 150

1 / S-401 FUTURE CANTILEVERED CANOPY PLAN

ÉCHELLE / *SCALE:* 1 : 150

MEMBER CONNECTION FORCE TABLE

MEMBER	AXIAL FORCE
W460x74	+/- 375kN
W460x60	+/- 250kN
W530x92	+/-300kN
W610x125	+/- 300kN
W610x155	+/- 300kN
W610x101	+/- 300kN
W610x91	+/- 300kN
W610x82	+/- 300kN
W530x66	+/- 100kN
W360x51	+/- 50kN
W200x36 & W200x46 & W250x33 & W250x89	+/- 25kN
W460x68	+/- 400kN
W460x82	+/- 250kN
W310x45	+/- 50 kN-m
W360x33	+/- 50kN
W200x36 (CANT. CANOPIES)	+/- 25kN
W460x74	+/- 100kN

NOTES:
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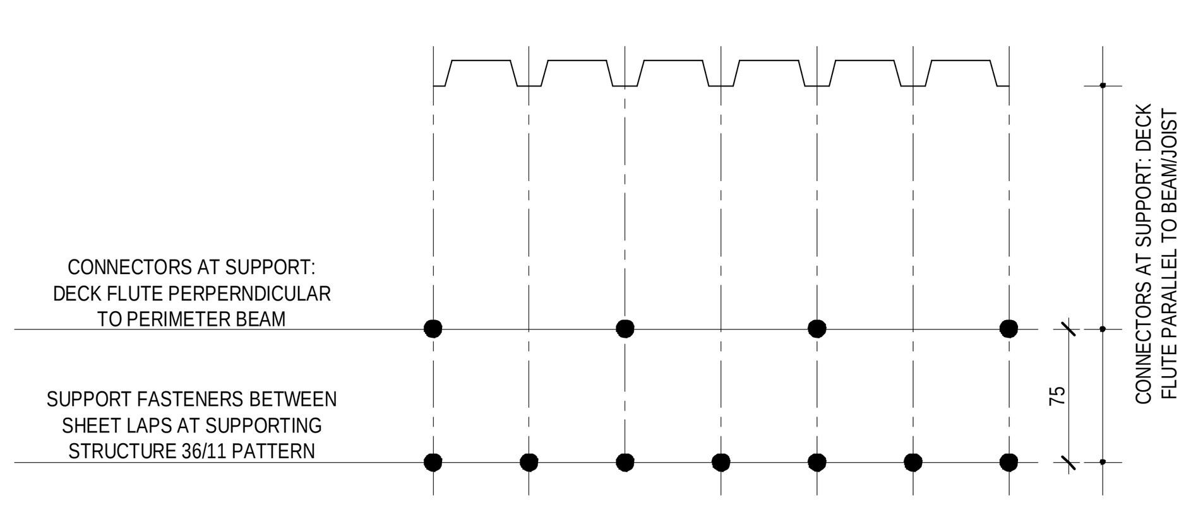
METAL DECK SCHEDULE

DECK MARK	SIZE / PROPERTIES	PROFILE / ATTACHMENT	FASTENERS
D2	TYPE: 38mm WIDE RIB ROOF DECK 3 CONTINUOUS SPANS, MIN GA: 20 GA Fy (MIN): 275 MPa FINISH: SEE SPEC.		D2 SIDE LAP: HILTI S-SLC 02 M HWH @ 75mm c/c SUPPORT FASTENERS: HILTI X-HSN 24

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(Mécanique & Électricité / *Mechanical & Electrical*)

Ingénieur / *Engineer*
(Structure / *Structure*)

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PROJECT: LYCEE CLAUDEL

Titre / *Title*

ROOF PLANS

Dessiné par / *Drawn by*: dmw

No. projet / *Project number*: CCO-22-1100

Vérifié par / *Verified by*: AJ

No. dessin / *Drawing number*: S-401

Révision / Revision: 4

Échelle / Scale: As indicated

Date de création du dessin / *Drawing creation date*: 01/06/22

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The following information supplements and/or supersedes the bid documents issued on **17/02/2022.**
This Addendum forms part of the contract documents and is to be read, interpreted, and coordinated with all other parts. The cost of all contained herein is to be included in the contract sum. The following revisions supersede the information contained in the original drawings and specifications issued for the above-named project to the extent referenced and shall become part thereof. Acknowledge receipt of this Addendum by inserting its number and date on the Tender Form. Failure to do so may subject the Bidder to disqualification.

ARCHITECTURE:

Modifications to the General Requirements and to the Architectural Technical Specifications:
The modifications to the General Requirements and to the Architectural Technical specifications, as identified in the text and sections herein, are an integral part of this addendum.

I. GENERAL REQUIREMENTS

N / A

II. ARCHITECTURAL TECHNICAL SPECIFICATIONS

1. Section 00 01 10 - Table of contents has been updated and is included as part of this addendum

2. Section 04 03 07 - HISTORIC – MASONRY REPOINTING
   - Replace paragraph 2.1.3.1 – Mortar / Property Specification / Exterior walls – above grade – non-bearing, by :
     1. Bedding mortar: Type N
        Mortar compressive strength at 7 days: minimum 3MPa (435 psi)
        Mortar compressive strength at 28 days: minimum 5MPa (725 psi)
        Air entrainment: 8-12%.
        Flexural bond strength: minimum 0.2 MPa.
        Reference product : King 1-1-6 or approved equivalent
     2. Finish pointing mortar: Type O
        ~~Mortar compressive strength at 7 days: minimum~~
        Mortar compressive strength at 28 days: minimum 2,4 MPa (350psi)
        Air entrainment: 8-12%.
        Flexural bond strength: minimum 0.2 MPa.
        Reference product : MasonCare 300 or approved equivalent

   - Replace paragraph 2.2.3 – Replacement brick, by :
     Joints directly exposed to severe weather must be raked when mortar has sufficiently hardened to keep the print of a finger.
   - Add paragraph 3.4.6.3 :
     Replacement brick : Size, colour & percentage of ingredients shall be identical to existing.
   - Add paragraph 3.4.6.4 :
     Profile of joints : Unless noted otherwise, the joints shall be raked in a CONCAVE profile.

3. Section 05 50 00 – Metal fabrications
   This section is issued and included as part of this addendum

4. Section 07 61 00 – Sheet metal roofing
   This section is issued and included as part of this addendum

5. Section 07 62 00 – Flashing and sheet metal
   This section is issued and included as part of this addendum

6. Section 07 71 23 – Manufactured gutters and downspouts
   This section is issued and included as part of this addendum

7. Section 07 92 00 – Joints sealing
   This section is issued and included as part of this addendum

8. Section 07 95 13 – Expansion joint cover assemblies
   This section is issued and included as part of this addendum

9. Section 09 91 13 – Exterior painting
   This section is issued and included as part of this addendum

10. Section 11 68 13 – Playground equipment
    This section is issued and included as part of this addendum

III. Modifications to the drawings – Text description :

The modifications to the drawings as described are an integral part of this addendum.

1. Sheet A111B

New specific note #20 : 'EXISTING STORAGE WALL UNDER THE ENTRANCE STAIRS TO BE DEMOLISHED'

2. Sheet A121B

New specific note #19 : 'NEW STORAGE WALL AND DOOR UNDER THE ENTRANCE STAIRS, SIMILAR TO EXISTING, SEE DETAIL #4/A-350'

3. Sheet A121C

- General note #6
  Replace : 'FOR OUTDOOR SIGNAGE AND PAVEMENT MARKING : REFER TO SPECIFICATION BOOK'
  By : 'FOR PAVEMENT MARKING : REFER TO SPECIFICATION BOOK'

4. Sheet A200

- Elevations #2 & 4
  Replace text : 'PATCH & REPAIR EXISTING METAL SIDING'
  By : 'EXISTING METAL SIDING TO REMAIN'

- Specific note #1
  Replace text : 'REPOINT EXISTING BRICKS'
  By : 'REPOINT 100% OF EXISTING BRICKS WITHIN LIMITS SHOWN ON ELEVATIONS. ASSUME 7,5M2 OF THE BRICKS WILL HAVE TO BE REPLACED, IDENTICAL TO EXISTING BRICKS.'

5. Sheet A202

- Specific note #2
  Replace : 'NEW DOWN SPOUT : 102MM X 102MM, MODEL DS-4 AND DSC-4 BY VICWEST, COLOR WHITE (TO MATCH EXISTING METAL SIDING'
  By : 'NEW DOWN SPOUT : 102MM X 102MM, COLOR TO MATCH EXISTING METAL SIDING'

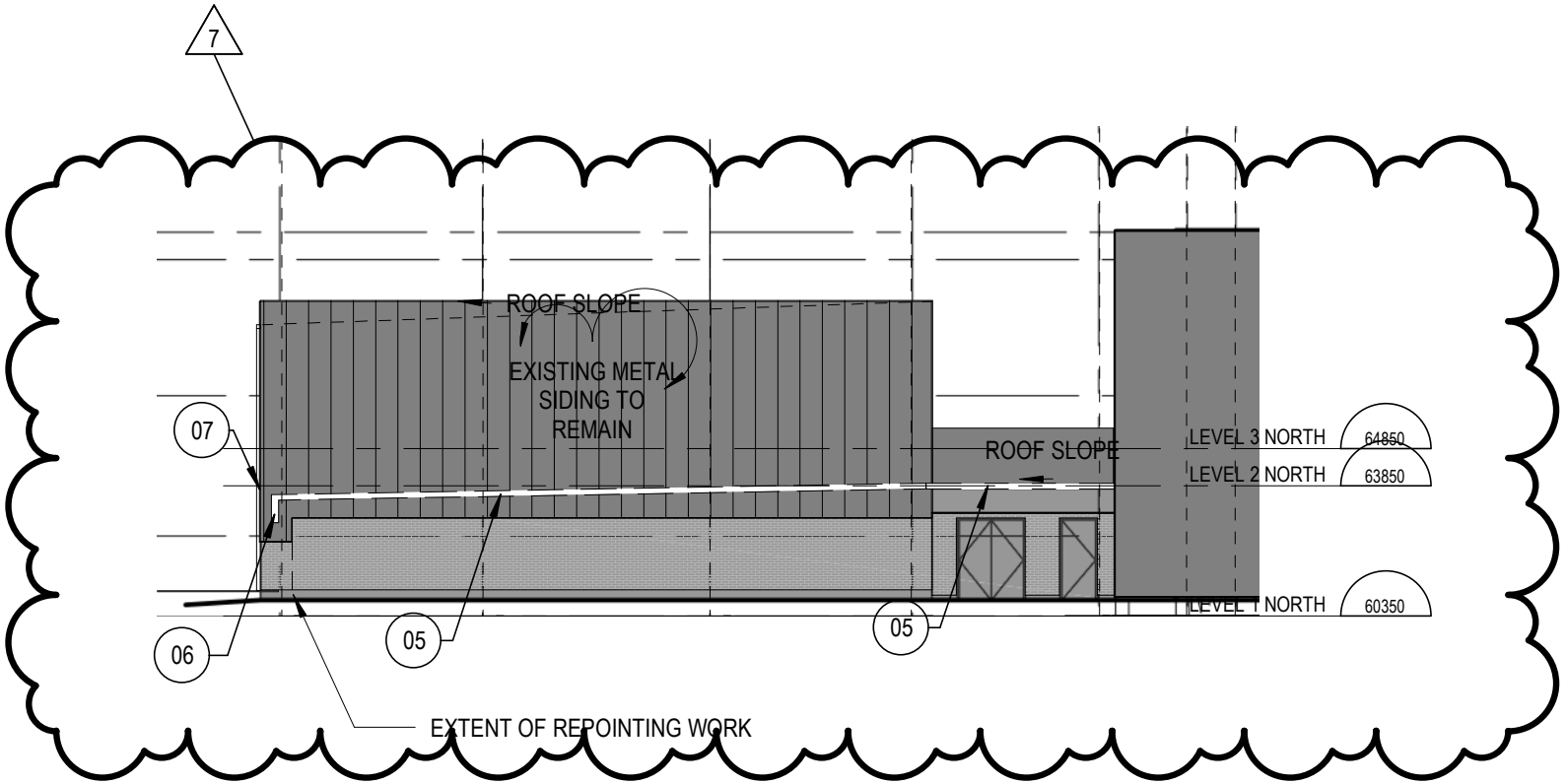
- Specific note #3
  Replace : 'NEW GUTTER :102MM X 102MM, #79535 BY VICWEST, COLOR WHITE'
  By : 'NEW GUTTER :102MM X 102MM, COLOR TO MATCH EXISTING METAL SIDING'

IV. <u>Modifications to the drawings – Annexed drawings :</u>

The modifications to the drawings as annexed drawings are an integral part of this addendum.

1. ASK-1 : Modifies elevation 3/A-200 : North elevation - Demolition
2. ASK-2 : Modifies elevation 2/A-200 : North elevation - Construction
3. ASK-3 : New detail 7/A-350 : Typical detail – Top and perimeter of canopy
4. ASK-4 : New detail 5/A-350 : Typical detail – Expansion joint Roof to Roof
5. ASK-5 : New detail 6/A-350 : Typical detail – Expansion joint Roof to Wall
6. ASK-6 : New detail 4/A-350 : Section through under stair storage wall
7. ASK-7 : Modifies plan 1/A-111B : reference to specific note added
8. ASK-8 : Modifies plan 1/A-121B : reference to specific note added
9. ASK-9 : Modifies plan 1/A-201 : new note added
10. ASK-10 : Modifies plan 1/A-130 : new note added

END OF ADDENDUM NO AR01



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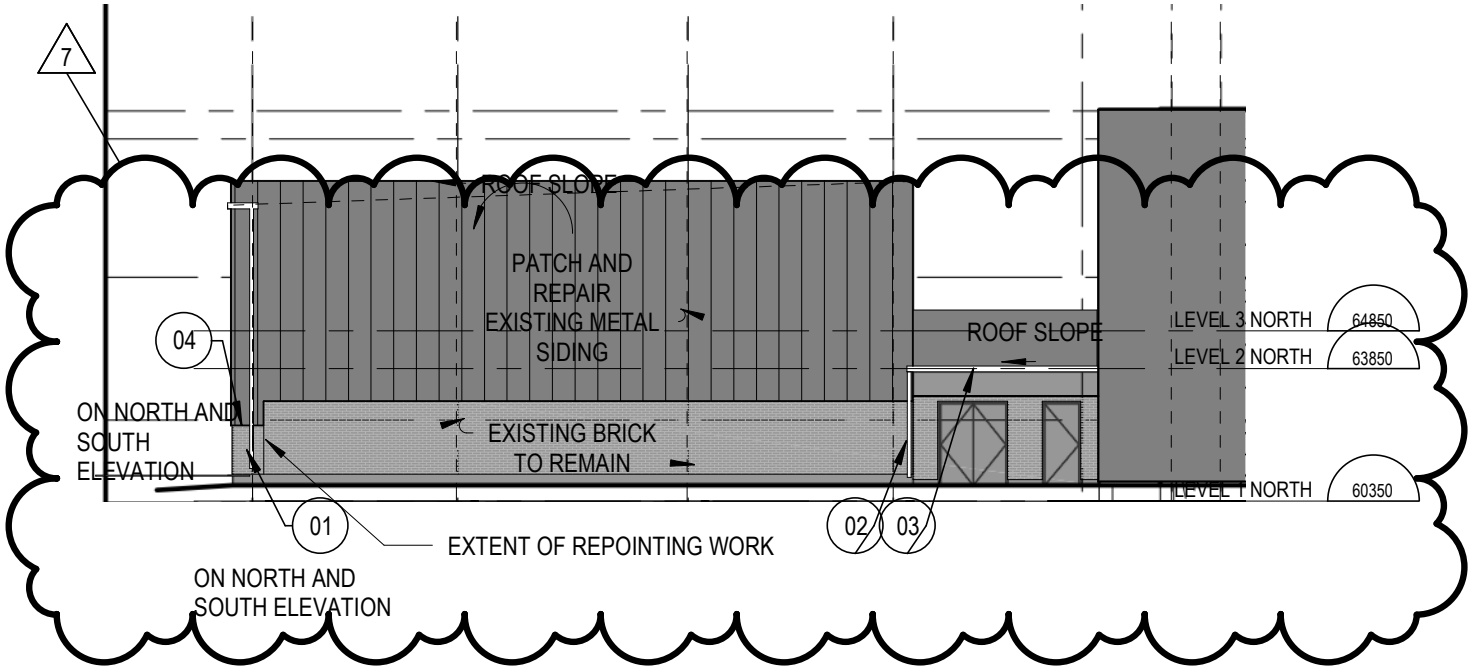
06/05/18

Échelle/Scale: 1 : 200

LYCÉE CLAUDEL - REFURBISHMENT OF OUTDOOR SPACES

3/A200 NORTH ELEVATION - DEMOLITION : REVISION

ASK-1



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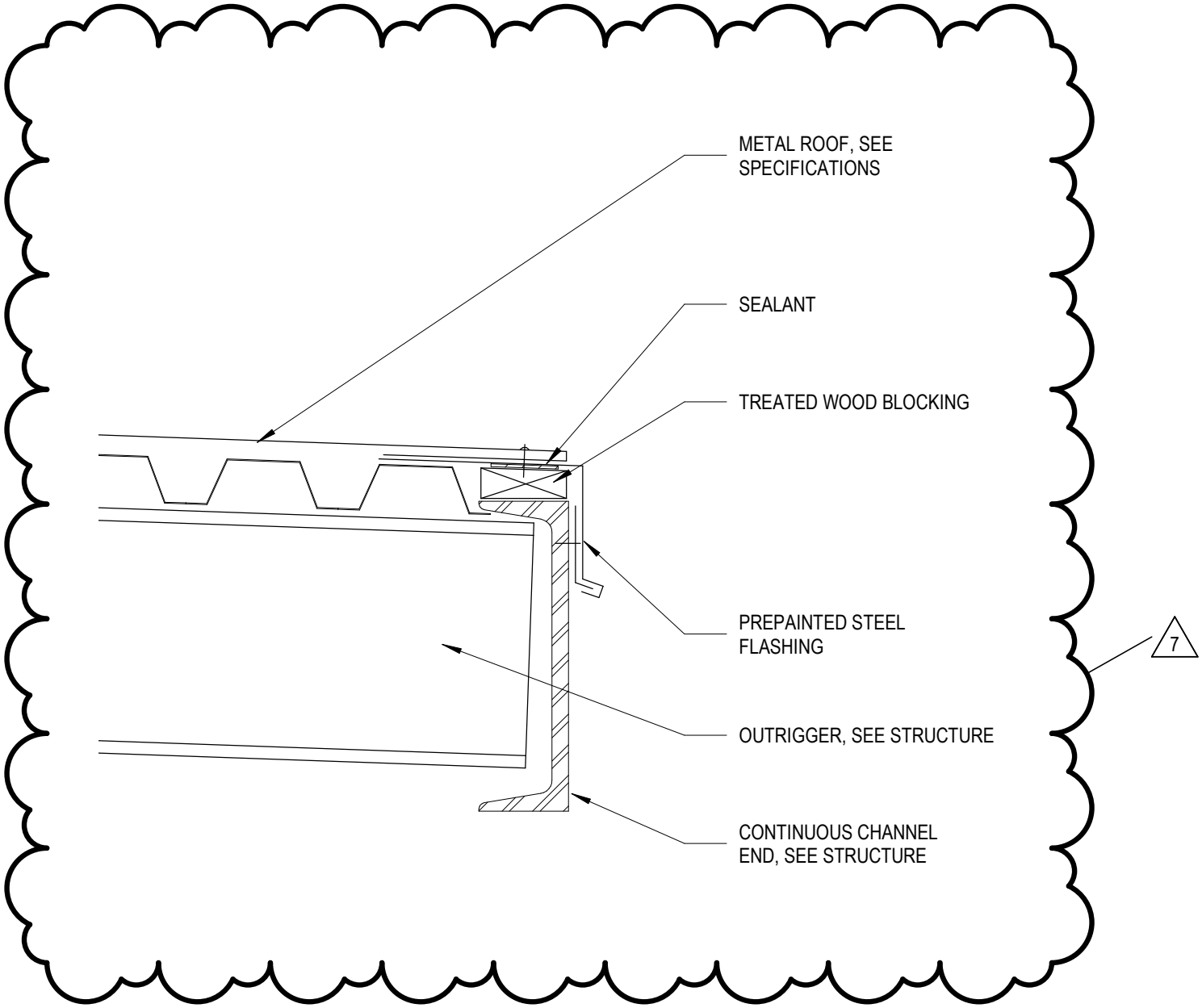
LYCÉE CLAUDEL - REFURBISHMENT OF
OUTDOOR SPACES

2/A200 NORTH ELEVATION - CONSTRUCTION : REVISION

ASK-2



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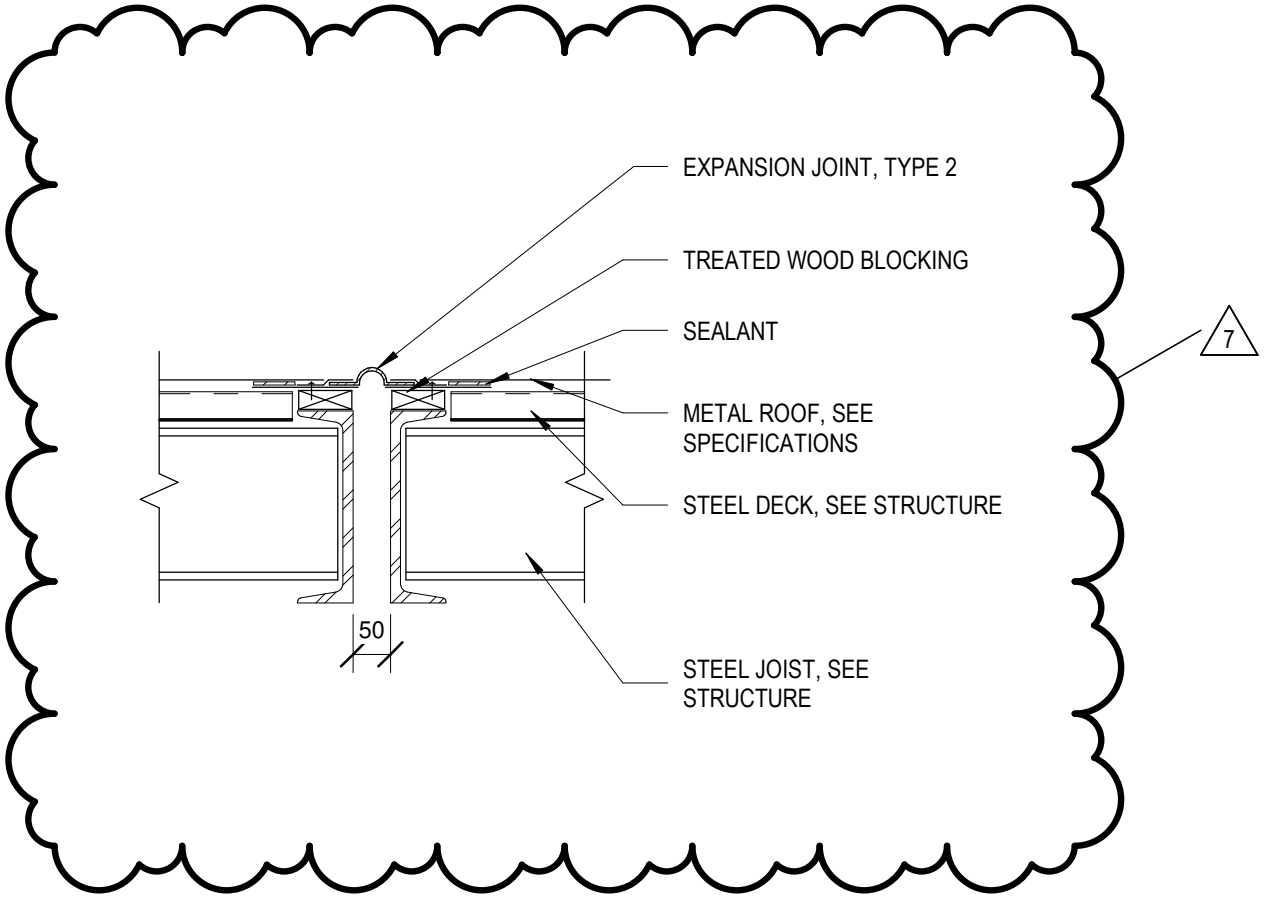
LYCÉE CLAUDEL - REFURBISHMENT OF OUTDOOR SPACES

7/A350 TYPICAL DETAIL

TOP & PERIMETER OF CANOPY : NEW DETAIL

ASK-3



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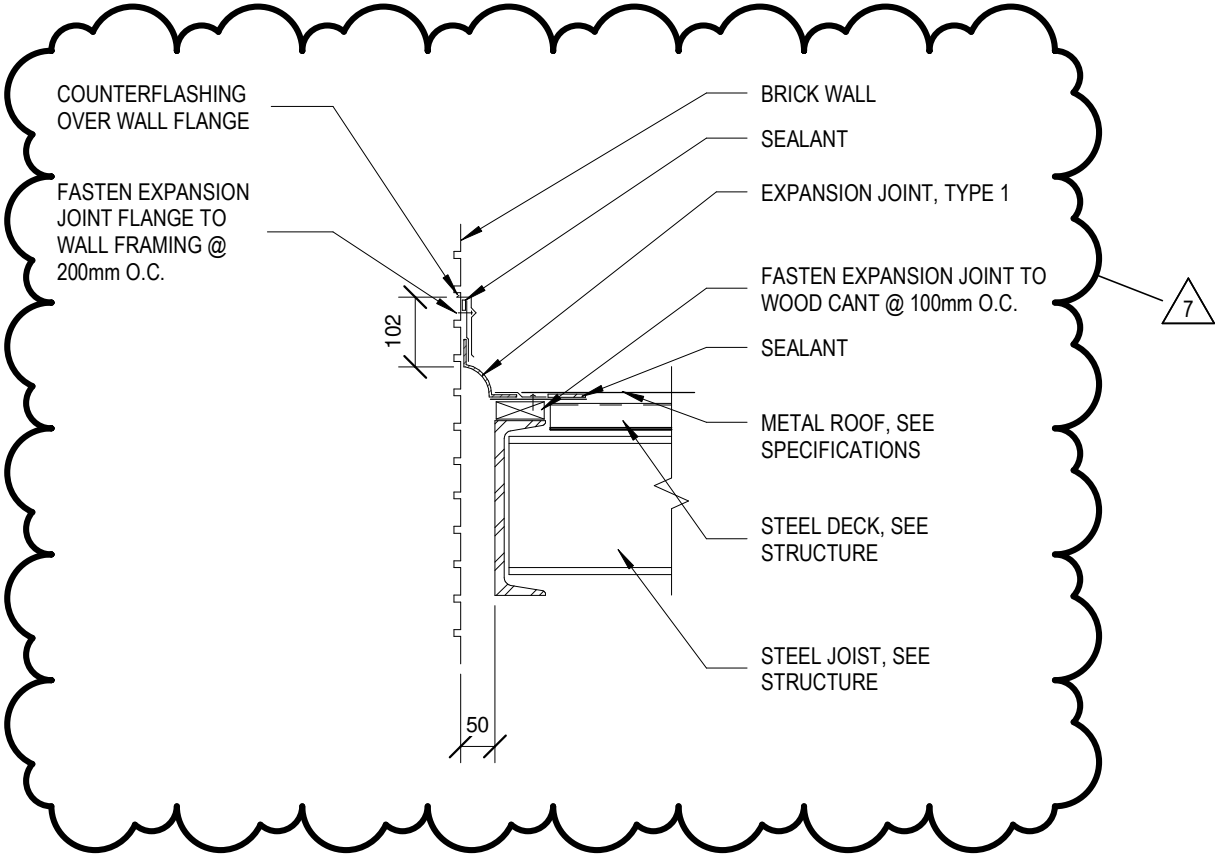
LYCÉE CLAUDEL - REFURBISHMENT OF

5/A350 TYPICAL DETAIL

EXPANSION JOINT - ROOF TO ROOF : NEW DETAIL

ASK-4



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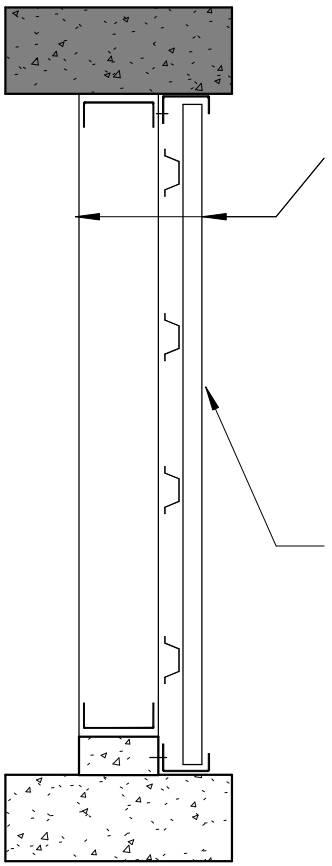
LYCÉE CLAUDEL - REFURBISHMENT OF OUTDOOR SPACES

6/A350 TYPICAL DETAIL

EXPANSION JOINT - ROOF TO WALL : NEW DETAIL

ASK-5



7

WALL
-89mm GALVANIZED STEEL STUD, WITH TOP PLATE FOLLOWING UNDERSIDE OF SLAB
-22mm GALVANIZED STEEL FURRING
-VERTICAL METAL SIDING WITH PERIMETER TRIMS: VICWEST AD300R,
COLOUR: GREY (CHOSEN AMONG STANDARD MANUFACTURED COLOURS)

DOOR
-DIMENSIONS
800mm WIDE DOOR x FULL HEIGHT (FROM TOP OF CURB TO UNDERSIDE OF CONCRETE LANDING
-FRAME
BUILT OF GALVANIZED STEEL ANGLES, WELDED AT CORNERS
-DOOR FINISH
VERTICAL METAL SIDING WITH PERIMETER TRIMS, SAME AS ADJACENT WALL, IN SAME PLANE TO ENSURE CONTINUITY OF FINSH
-HARDWARE
HINGES AND LOCK: SAME AS EXISTING

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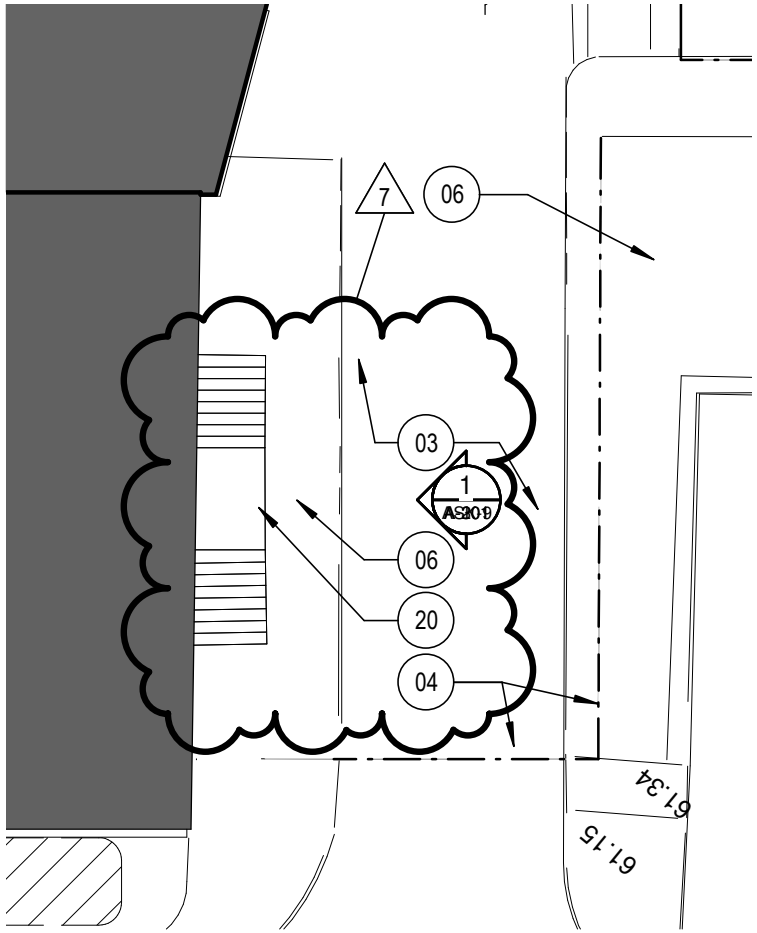
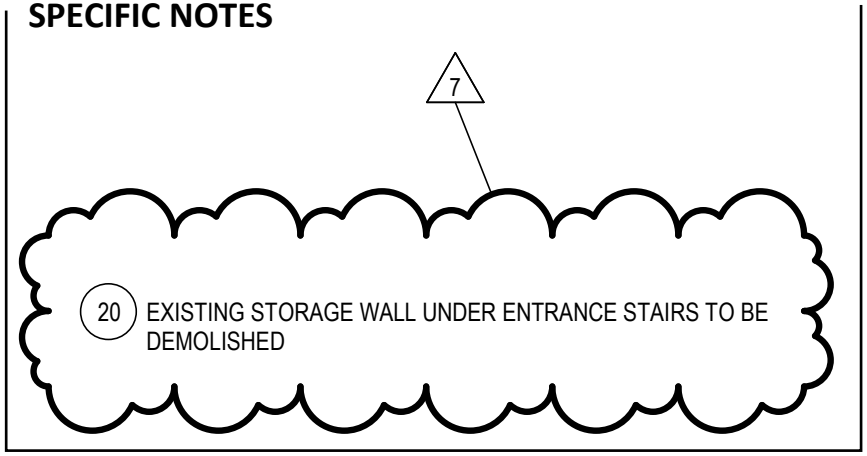
LYCÉE CLAUDEL - REFURBISHMENT OF OUTDOOR SPACES

4/A350 SECTION THROUGH UNDER STAIR STORAGE WALL : NEW DETAIL

ASK-6



SPECIFIC NOTES



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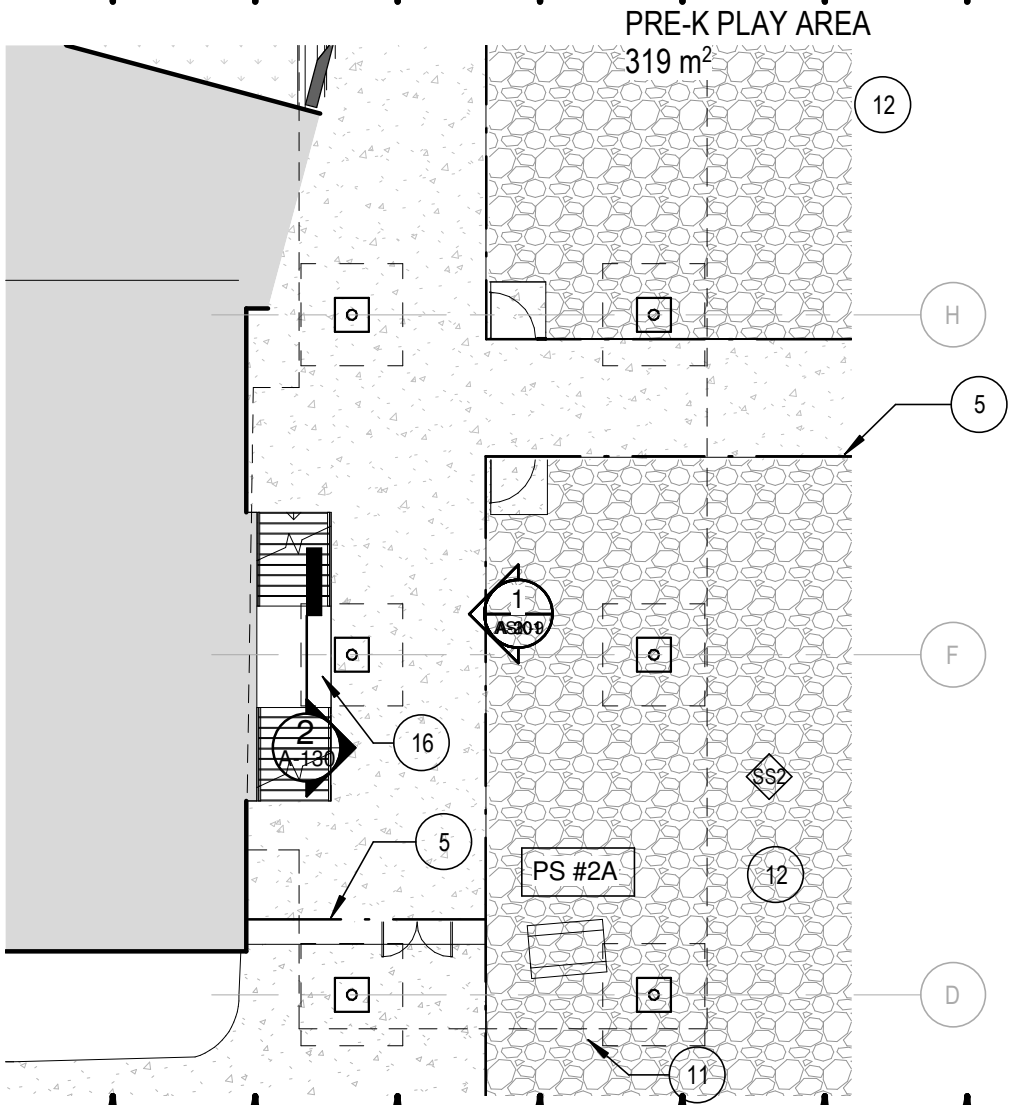
LYCÉE CLAUDEL - REFURBISHMENT OF OUTDOOR SPACES

1/A-111B DEMOLITION PLAN SECTOR 'B': REVISION

ASK-7



SPECIFIC NOTES

16. NEW STORAGE WALL AND DOOR, SIMILAR TO EXISTING, SEE DETAIL 4/A350

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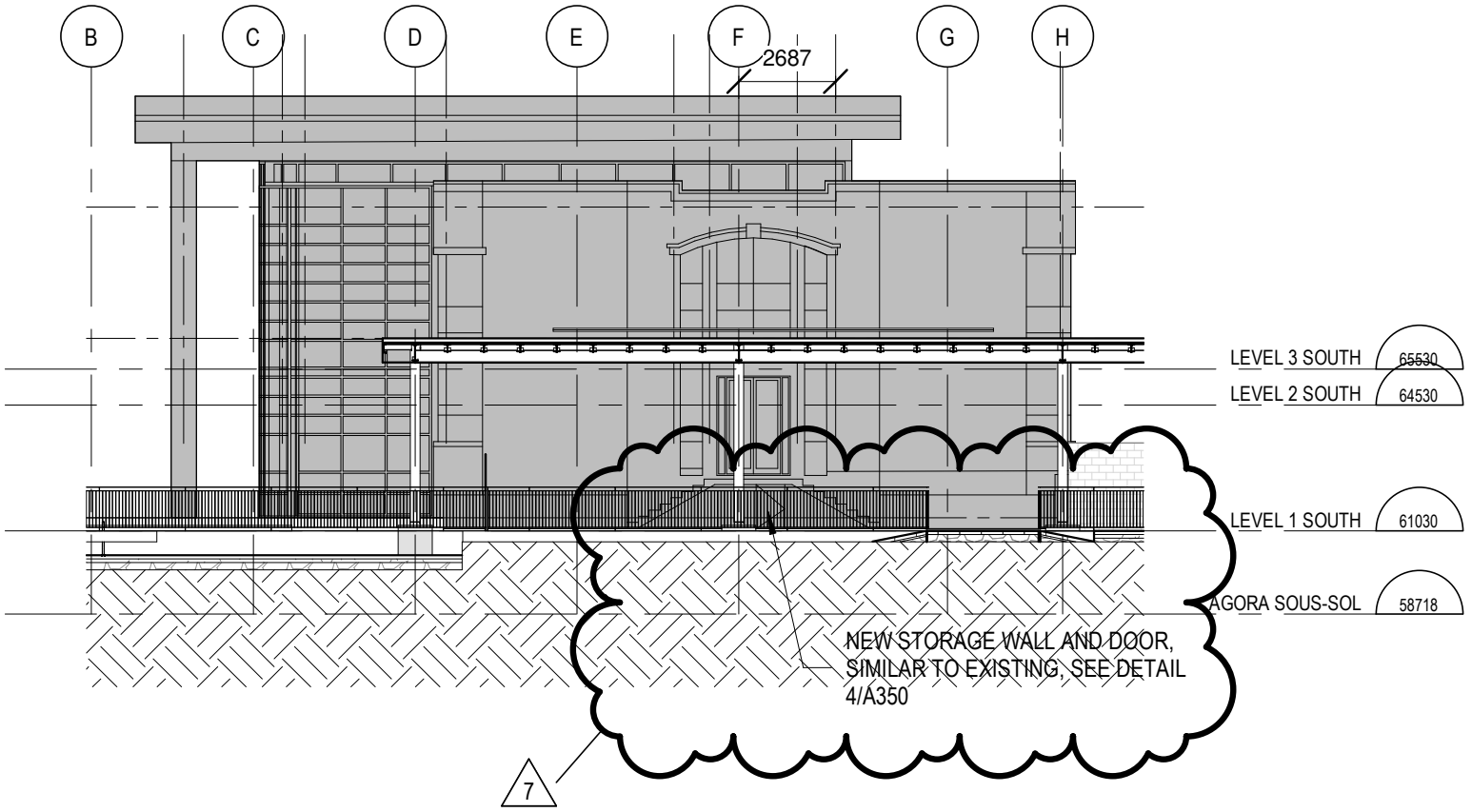
LYCÉE CLAUDEL - REFURBISHMENT OF OUTDOOR SPACES

1/A-121B CONSTRUCTION PLAN SECTOR 'B': REVISION

ASK-8



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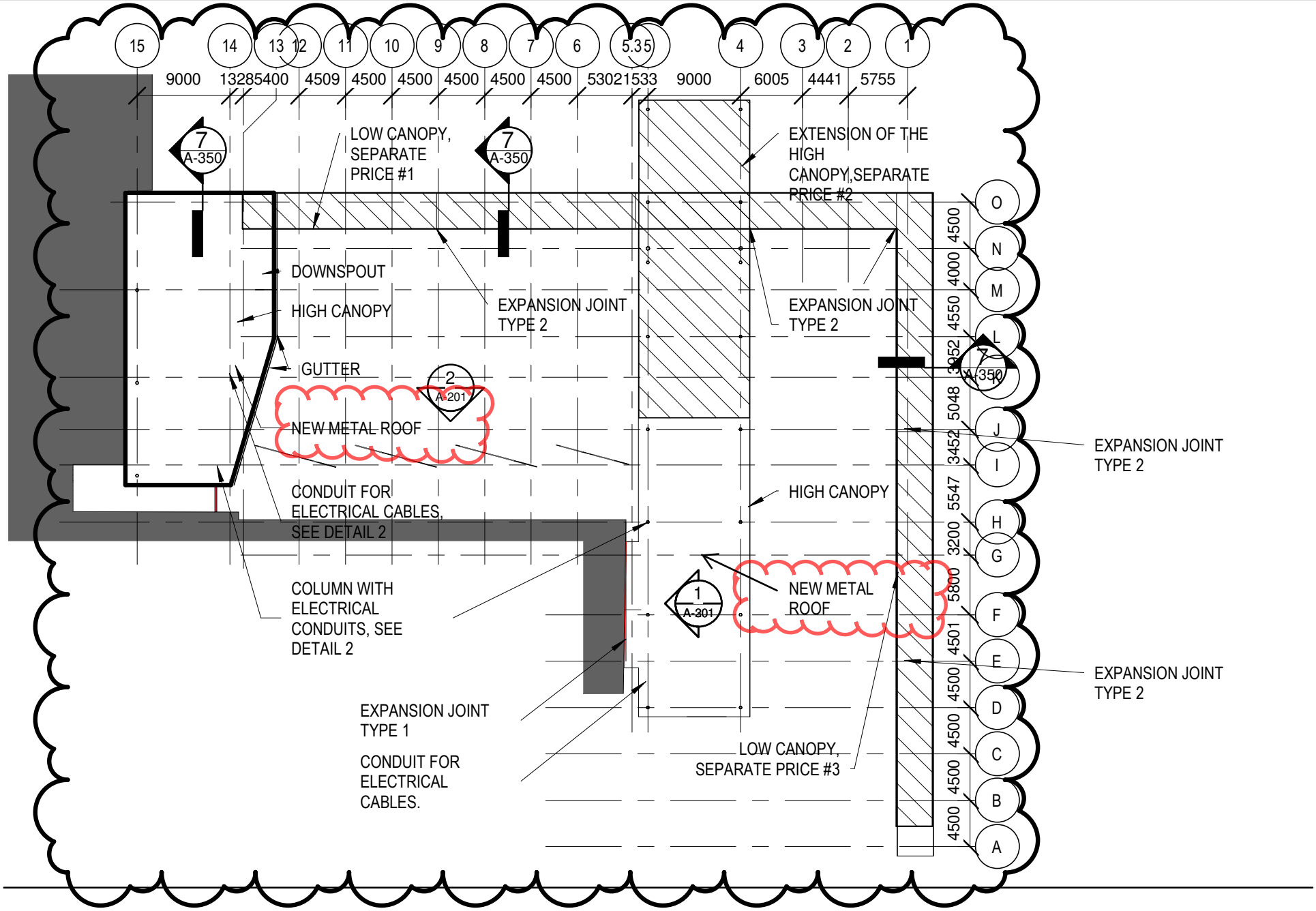
LYCÉE CLAUDEL - REFURBISHMENT OF OUTDOOR SPACES

1/A-201 ELEVATION 2 : REVISION

ASK-9



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LYCÉE CLAUDEL - REFURBISHMENT OF OUTDOOR SPACES

1/A-130 CONSTRUCTION PLANS - OVERALL CANOPY : REVISION

ASK-10

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 95 13 - Expansion joints cover assemblies

.2 Section 09 91 13 – Exterior Painting

1.2 REFERENCE STANDARDS

.1 ASTM A36, Standard Specification for Carbon Structural Steel.

.2 ASTM A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

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

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

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

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

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

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

.9 CSA S16-14, Design of Steel Structures.

.10 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau)

1.3 DESIGN REQUIREMENTS

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe tubing, bolts and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario, Canada.

- For guardrails

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.5 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

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

.1 Design steel stairs, glazed guard, wire rope balustrade system, and metal fabrication items that are required to resist live, dead, lateral, wind, or seismic loads.
.2 Review, stamp, and sign shop drawings.

.4 Subcontractors Qualifications: Provide miscellaneous metals by a fabricator who has adequate plant, equipment, and skilled tradesmen to perform installations expeditiously, and is known to have been responsible for satisfactory installations similar to that specified during a period of at least the immediate past five years.

.5 Welder Qualifications:
.1 Weld structural components: in steel, in accordance with CSA W59.
.2 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

.6 Requirements of Regulatory Agencies:
.1 Conform to requirements of jurisdictional authorities for installations specified in this Section which resist structural forces imposed by dead and live loads.
.2 Submit shop drawings required by authorities to them.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground, indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Surfaces must not be cleared of protecting coating until final cleaning of building. Provide necessary instructions for removal of these protections.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Unless detailed or specified otherwise, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.

.2 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of miscellaneous metals.

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

.4 Steel sections and plates: to CSA G40.20/G40.21.

.5 Welding materials: to CSA W59.

.6 Welding electrodes: to CSA W48 Series.

.7 Bolts and anchor bolts: to ASTM A325, Type 1 medium carbon steel bolts, galvanized finish; ASTM A194/194M, Grade 2H nuts, galvanized finish; ASTM F436M, Type 1 washers; ASTM A307.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof round headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Weld all connections where possible; bolt where not possible and cut off bolts flush with nuts. Countersink bolt heads and provide method to prevent loosening of nuts. Ream holes drilled for fastenings.

.5 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

.6 Finish Work:

.1 Incorporate holes and connections for items installed by other Sections of the Specifications.

.2 Cleanly and smoothly finish exposed edges of materials including holes.

.3 Cap open ends of sections exposed to view, such as handrails and stringers.

.7 Prime Painting of Steel: Clean all loose mill scale, rust, dirt, weld flux and spatter from surfaces after fabrication. Grind smooth sharp projections. Unless otherwise specified, apply to steel surfaces a shop prime coat of paint. Force paint into corners and cover open areas smoothly with a uniform coating. Deliver fabrications to site with primer undamaged. Paint all surfaces except those to be welded in field, encased in concrete, or that are machined or galvanized. Give surfaces that are inaccessible to finish field painting two coats of primer.

2.3 FINISHES

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m^2 to CAN/CSA-G164.

2.4 ISOLATION COATING

.1 Isolate aluminum from following components, by means of bituminous paint:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.5 GUARDRAILS

.1 All guardrails will be made up of upper rail, intermediate rail, bottom rail, vertical bars, posts and anchors.

.2 All components will be made of galvanized steel and are to be painted.

.3 All components will be welded using full length continuous welds.

.4 All open ends to be closed off with galvanized steel and welded.

.5 Finish : painted.

.6 Refer to detail 3/A-350 for component description and assembly.

2.6 FRAME FOR DOOR TO STORAGE (under existing stairs)

.1 Galvanized steel angles to form a rectangle, with mitered joints at corners

.2 Weld all segments together with continuous welds.

.3 Finish : Leave unpainted.

Part 3 Execution

3.1 ERECTION

.1 Take site measurements to ensure that fabrications fit surrounding construction, around obstructions and projections in place, or as shown on Drawings, and to suit service locations.

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

.3 Do welding work in accordance with CSA W59 unless specified otherwise.

.4 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.5 Erect stairs and handrails in true vertical and horizontal planes and rigid.

.6 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.7 Exposed fastening devices to match finish and be compatible with material through which they pass.

.8 Insulate between dissimilar metals; or between metal, and masonry or concrete with bituminous paint to prevent electrolysis.

.9 Supply components for work by other trades in accordance with shop drawings and schedule.

.10 Weld field connection. Make field connections with bolts to CSA S16.

.11 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

.12 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

.1 Primer: maximum VOC limit 250 g/L [to GS-11].

3.2 CLEANING

.1 After erection, touch up primed surface that are burned, scratched or otherwise damaged with prime paint to match shop coat.

.2 Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.

.3 Clean off dirt on surfaces resulting from installation.

.4 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.3 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Division 1.

.2 Section 07 62 00 – Flashing and sheet metal.

.3 Section 07 92 00 – Joint sealants.

.4 Section 07 95 13 – Expansion joints cover assemblies

1.2 REFERENCES

.1 Aluminum Association (AA).

- .1 AA DAF-45, Designation System for Aluminum Finishes.
- .2 AA ASM-35, Specifications for Aluminum Sheet Metal Work in Building Construction, Section 5.

.2 American Society for Testing and Materials International, (ASTM).

- .1 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM A792/A792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process.
- .3 ASTM D822, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.3 Canadian General Standards Board (CGSB).

- .1 CAN/CGSB-37.5, Cutback Asphalt Plastic Cement.
- .2 CAN/CGSB-93.1, Sheet Aluminum Alloy, Prefinished, Residential.

.4 Canadian Standards Association (CSA)

- .1 CSA A123.3, Asphalt Saturated Organic Roofing Felt.

.5 National Research Council Canada (NRC)/ Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC).

- .1 CCMC, Registry of Product Evaluations.

1.3 SUBMITTALS

.1 Submit product data sheets for metal roofing, bitumen, roofing, felts, insulation, include:

- .1 Product characteristics
- .2 Performance criteria
- .3 Limitations

.2 Shop drawings to indicate arrangements of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural frame.

.3 Submit 300 x 300 mm samples of each sheet metal material.

.4 Provide manufacturer's instructions to indicate special handling criteria, installation sequence and cleaning procedures.

1.4 WARRANTY

.1 Provide a written guarantee, signed and issued in the name of the Consultant, stating that the metal roofing systems will stay in place and remain watertight for a period of ten (10) years from the date of Substantial Completion of the work. The warranty will be a ten (10) years covering the total costs of repairing any defective materials and workmanship and associated damages.

1.5 DESIGN REQUIREMENTS

.1 Design, fabricate and install metal roof system to the following requirements:

.1 Resist a minimum positive and negative wind pressure of 2 kPa.

.2 Maximum deflection 1/240 of clean span under live loads of wind, snow and ice.

.3 Calculate snow and ice loads for building area in accordance with National Building Code of Canada.

.4 Resist water penetration

.5 Allow for thermal movement

.6 Resist corrosion

.7 Resist loads imposed by the snow retention system.

PART 2 PRODUCTS

2.1 SHEET METAL MATERIALS _N/A

.1 Aluminum-zinc alloy coated steel sheet: to ASTM A792/A792M, commercial quality, with AZ 150 coating, prefinished as specified in 2.2, 0.85 mm base metal thickness.

2.2 PREFINISHED STEEL SHEET

.1 VOC content for surface coatings and touch up coatings for prefinished metal sheet maximum 250g/L

.2 Surface coatings and touch up coatings manufactured or formulated without aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadimium, hexavelant chromium and their compounds will be acceptable for use on this project.

.3 Prefinished steel with factory applied polyvinylidene fluoride.

.1 Finish coating: silicone modified polyester (SMP) topcoat system.

.2 Colour selected by Consultant from manufacturer's standard range.

.3 Specular gloss: 30 units +/-5 to ASTM D523.

.4 Coating thickness: not less than 22 micrometres.

.5 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20% to ASTM D822 as follows:

.1 Outdoor exposure period 2500 hours.

.2 Humidity resistance exposure period 5000 hours.

.6 Profile as indicated on drawings

2.3 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to CAN/CGSB-37.5.

.3 Underlay: dry sheathing to CAN/CGSB-51.32.

.4 Slip sheet: reinforced sisal paper or a heavy felt kraft paper.

.5 Sealant: as per Section 07 92 00 – Joint Sealants.

.6 Rubber-asphalt sealing compound: to CAN/CGSB-37.29.

.7 Cleats: of same material, and temper as sheet metal, minimum 50mm wide. Thickness same as sheet metal being secured.

.8 Fasteners: concealed.

.9 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.10 Touch-up paint: as recommended by sheet metal roofing manufacturer.

2.4 FABRICATION

.1 Fabricate aluminium sheet metal in accordance with AA ASM-35.

.2 Form individual pieces in 2400 mm maximum lengths. Make allowances for expansion at joints.

.3 Hem exposed edges on underside 12 mm, mitre and seal.

.4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.5 Apply minimum 0.2 mm dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.

.6 Protect metals against oxidization by backpainting with isolation coating where indicated.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Use concealed fastenings except where approved by Consultant before installation.

.2 Provide underlay under sheet metal roofing. Secure in place and lap joints 100 mm minimum.

.3 Apply slip sheet over asphalt felt underlay to prevent bonding between sheet metal and felt. Secure with minimum anchorage and lap joints 50 mm minimum in direction of waterflow.

.4 Install sheet metal roof panels using cleats spaced at 610mm oc.

.5 Secure cleats with two fasteners each and cover with cleat tabs.

.6 Align transverse seams in adjacent panels.

.7 Flash roof penetrations with material matching roof panels, and make watertight.

.8 Form seams in direction of water-flow and make watertight.

3.2 FLAT SEAM ROOFING

.1 Use 450 x 600 mm rectangular sheets to make flat seam roofing. Notch corners and turn up edges 20 mm.

.2 Lay sheets with long dimension parallel to eaves.

.3 Lock cleats into seams and flatten smooth in direction of flow.

.4 At eaves and gable ends, terminate roofing by hooking over previously installed edge strip.

3.3 STANDING SEAM ROOFING _N/A

.1 Use 0.76 mm thick, 400 mm wide to make roofing with standing seams without straight run of standing seam exceeding 10 m.

.2 Fold lower end of each pan under 20 mm. Slit fold 25 mm away from corner to form tab where pan turns up to make standing seam. Fold upper end of each pan over 50 mm. Hook 20 mm fold on lower end of upper pan into 50 mm fold on upper end of underlying pan.

.3 Apply sheet metal roofing beginning at eaves. Loose lock pans to valley flashing and edge strips at eaves and gable rakes.

.4 Finish standing seams 25 mm high on flat surfaces. Bend up one side edge 40 mm and other 45 mm. Make first fold 6 mm wide single fold and second fold 12 mm wide, providing locked portion of standing seam with 5 plies in thickness. Fold lower ends of seams at eaves over at 45˚angle. Terminate standing seams at ridge and hips by turning down in tapered fold.

.5 Form valleys of sheets not exceeding 3 m in length. Lap joints 150 mm in direction of flow. Extend valley sheet minimum 150 mm under roofing sheets. At valley line, double fold valley and roofing sheets and secure with cleats spaced 450 mm oc.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Division 01

.2 Section 05 50 00 – Metal Fabrications

.3 Section 07 61 00 – Sheet Metal Roofing

.4 Section 07 92 00 – Joint Sealants

1.2 REFERENCE STANDARDS

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

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

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

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

.5 ASTM C920, Specification for Elastomeric Joint Sealants.

.6 CSA B111, Wire Nails, Spikes and Staples

.7 CRCA Roofing Manual, Canadian Roofing Contractors Association

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for brick masonry and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings

.1 Submit shop drawings in accordance with Section 01 33 00 indicating:

.1 Details of gutter, scuppers, copings, and miscellaneous flashings.

.2 Proposed method of shaping, forming, and jointing.

.3 Fastening and application of flashing and sheet metal Work.

.2 Samples

.1 Submit samples of pre-coated finish and sheet metal joints if requested.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Storage and Handling Requirements:

.1 Store materials in dry location, off ground in clean, dry, well-ventilated area.

.2 Store and protect flashing and sheet metal from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Steel sheet: to ASTM A653/A653M; Classification LFQ, Grade A, Z275 zinc coating designation, 0.60 mm minimum base steel thickness.

.2 Precoated Finish for Sheet Steel (used over out of sight surfaces such as roof curbs):

.1 Use sheet metal with pre-coated finish where metal is exposed to view.

.2 Organic coating applied to galvanized sheet steel in shop by continuous coating line, by Stelco, Dofasco approved alternate.

.3 Apply 8000 Series coating to dry film thickness of 1 mil on surface exposed to view.

.4 Apply manufacturers standard back coating to back face of sheet metal.

.5 Flashings not exposed to view shall be VICWEST, prepainted, HMP Colorite VW 6071 Stone Grey; all other colours and gloss of finishes shall be selected by the Consultant.

.6 Supply of precoated metal to be installed in conjunction with preformed metal siding is included in specification for these systems. Form and install this sheet metal work under Work of this Section.

.3 Aluminum flashings (used over viewable surfaces such as coping/flashing): Aluminum sheet: ASTM B209 and ANSI H35.1 AA1100 aluminum alloy, H14 temper, minimum 3.0 mm thick. Finish: VW 4-SMX-30 Silver Metallic.

.4 Isolation coating: Alkali resistant bituminous paint; 410-02 by Bakor Inc. or approved alternative.

.5 Peel and Stick Membrane Vapour Retarder: In accordance with Section 07 26 00, Vapour Retarders.

.6 Plastic cement: CAN/CGSB 37.5-M.

.7 Sealant: ASTM C920, Type S, Grade NS, Class 25; High-performance, medium-modulus, one-part, neutral-cure silicone sealant. ‘CWS’ by Dow Corning or approved alternative.

.8 Sealant: ASTM C920, Type S, Grade NS, Class 25; High-performance, medium-modulus, one-part, neutral-cure silicone sealant. ‘CWS’ by Dow Corning or approved alternative.

.9 Fasteners: CSA B111, use only nails, bolts, screws, and other fasteners of the same metal and with the same finish as the metal being fastened. Use fasteners of a size suitable for the particular fastening condition and service. Use only approved nails, bolts, screws, and other fasteners.

.10 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.11 Touch-up paint: Same colour and material as pre-painted sheet steel or aluminum to match adjacent finish, as recommended by prefinished coating manufacturer.

2.2 FABRICATION

.1 Fabricate copings, flashings, curb counter flashings, starter strips, and miscellaneous flashings in accordance with CRCA and to details shown.

.2 Fabricate all possible sheet metal in shop by brake forming, and bench cutting, drilling and shaping.

.3 Form bends with straight sharp lines, angles and arises; and sheets into true planes free from twists, buckles, dents and other visual distortions.

.4 Supply accessories required for installation of sheet metal specified in this Section. Fabricate accessories of same material as sheet metal with which they will be incorporated.

.5 Hem exposed edges 13 mm minimum on underside for appearance and stiffness. Mitre and seal corners with sealant

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for brick masonry installation in accordance with manufacturer's written instructions.

.1 Inform Consultant of unacceptable conditions immediately upon discovery.

.2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 INSTALLATION

.1 Install coping flashings, curb counter flashings, starter strips, and miscellaneous flashings to details shown on the Contract Drawings and in accordance with CRCA.

.2 Apply isolation coating to metal surfaces in contact with concrete or mortar.

.3 Install sheet metal exposed to view in straight lines, with junctions aligned and on same plan.

.4 Install sheet metal wherever possible in minimum lengths of equal 3000 mm on typical runs, except where conditions for securing dictates that shorter lengths are preferable.

.5 Install aluminum wherever possible in minimum lengths of equal 3650 mm on typical runs, except where conditions for securing dictates that shorter and equal lengths are preferable.

.6 Install sheet metal to prevent entry of water under service and weather conditions.

.7 Install sheet metal with concealed fastenings. Exposed fastenings will be permitted only as approved when concealed fastenings are impossible. Fasten sheet metal, clips and other components in an approved manner, with fasteners weathertight and evenly and neatly located. Do not use pop rivets.

.8 Join sheet metal by slip lock seams to permit thermal movement. Space joints evenly where exposed. Lock seam and solder internal corners. Form mitres with standing seams in precoated metal.

.9 Caulk joints with sealant as required to form weathertight seal between flashing and adjoining surfaces and between flashing and other Work. Sealing Work consists of bedding between members where possible. Tool sealant to concave profile where exposed.

.10 At exposed sheet metal install expansion joints with 200 mm wide hooked covers, bedded in caulking compound, fastened at one side only, and at intervals of approximately 7315 mm; or as otherwise shown on Drawings or approved.

.11 Install 50 x 75 mm cleats where required to fasten sheet metal. Secure each cleat to backing with 2 nails, space cleats at 3650 mm O.C. generally.

.12 Install edge strips in lengths of approximately 2430 mm, continuously, and with 6 mm between each length. Fasten at 300 mm O.C.

.13 Do not form open joints or pockets that fail to drain water.

.14 Caulk all reglets and open sheet metal joints that do not mechanically provide weathertight construction, in accordance with Section 07 92 00.

.15 Secure sheet metal by nailing at 150 mm O.C. where concealed, unless otherwise specified or indicated on Drawings.

.16 Roof Edge Trim: Install prefinished sheet metal trim secured by nailing and edge strip.

.17 Gutters, Scuppers: Install prefinished sheet metal as indicated on Drawings.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Remove flux residue completely from surfaces and crevices, remove other deposits, stains or protections and wash metals left unpainted and exposed to view as recommended by the manufacturer of the metal.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

.1 The Aluminum Association Inc. (AA)

.1 Aluminum Sheet Metal Work in Building Construction.

.2 AA DAF45, Designation System for Aluminum Finishes.

.2 American Society for Testing and Materials (ASTM International)

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

.2 ASTM A792/A792M, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.3 ASTM D523, Standard Test Method for Specular Gloss.

.4 ASTM D822, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.3 Canadian General Standards Board (CGBS)

.1 CAN/CGSB-37.5, Cutback Asphalt Plastic Cement.

.4 Canadian Standards Association (CSA International)

.1 CSA B111, Wire Nails, Spikes and Staples.

1.3 SUBMITTALS

.1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, colour and finish.

.2 Clearly indicate bending, folding, jointing, fastening installation details.

1.4 DELIVERY AND STORAGE

.1 Store products off ground and under cover in a dry, well ventilated enclosure.

.2 Stack pre-formed material in manner to prevent twisting, bending and rubbing.

.3 Provide protection for galvanized and pre-coated surfaces.

.4 Prevent contact of dissimilar metals during storage. Protect from acids, flux, and other corrosive materials and elements.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Sheet aluminum 0.64 mm thick. Color as selected by Consultant.

.2 Trough size: 125 mm wide.

.3 Trough Supports: continuous aluminum with a perforated aluminum cover that covers the complete trough to prevent debris from getting stuck in the trough and downpipe.

.4 Downpipes: 0.64 mm thick aluminum.

.5 Downpipe straps: 0.72 mm thick aluminum.

~~.6~~ Sealant :

.1 Urethane two part, self-levelling: to CAN/CGSB-19.24, Type 1, Class B, colour to match aluminum.

.2 Reference product : Dymeric 240 de Tremco or approved equivalent.

.7 Elbows and tees: aluminum same as trough.

2.2 FABRICATION

.1 Fabricate sheet aluminum work in accordance with Aluminum Association Aluminum Sheet Metal Work in Building Construction.

.2 Fabricate eavestrough in continuous length up to a maximum length of 12 metres.

.3 Form eavestrough to an Ogee profile, 125 mm wide and a 305 mm girth.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Install trough supports/debris catchers to provide a continuous slope to drain all water from the trough.

.2 Cut opening in the trough to receive the downpipes.

.3 Install the trough and snap into the supports (no exposed screws or nails permitted). Install elbows and tees as required. Provide for expansion joints to prevent warping where required.

.4 Install aluminum downpipes to a distance of 1,5 metres from the grade. Install aluminum straps 1200 mm o.c designed to match the pipe profile and fasten to building with aluminum or stainless steel screws.

.5 Install sewer type downpiping from the aluminum downpiping to a point 300 mm above the grade. Install aluminum straps designed to suit the pipe profile and fasten to the wall with aluminum or stainless steel screws.

.6 Install sealant as required to ensure all joints are watertight.

.7 When work is completed, provide a water test to ensure there are no leaks and that all the water runs from the trough.

3.2 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Leave works areas clean, free from grease, finger marks and stains.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Division 01

.2 Section 04 03 07 – Historic – Masonry repointing

.3 Section 05 50 00 – Metal fabrications

.4 Section 07 71 23 – Manufactured gutters and downspouts

.5 Section 07 95 13 – Expansion joints cover assemblies

1.2 REFERENCES

.1 ASTM International

.1 ASTM C920-18, Standard Specification for Elastomeric Joint Sealants.

.2 ASTM C1248-08 (2012), Standard Test Method for Staining of Porous Substrate by Joint Sealants.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13-M87 Sealing Compound, One-component, Elastomeric, Chemical Curing.

.2 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.1 Product data: Submit copies of Product data in accordance with Section 01 33 00 describing type, composition and recommendations or directions for surface preparation, material preparation and material installation.

.2 Submit sample of sealant material specified, mount on material similar to that of location where sealant is to be used. Sample size to be no smaller than 100mm x 100 mm. Identify with project name and number, date, sealant type and manufacturer's name.

.3 Approved samples shall be used as minimum standard for all work under this Section and installed work must match samples in every respect.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements:

.1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

1.5 SITE CONDITIONS

.1 Ambient Conditions:

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 5 degrees C.

.2 Joint substrates are dry.

.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 Joint-Width Conditions:

.1 Proceed with installation of joint sealants only where joint widths are within those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.6 WARRANTY

.1 Contractor warrants that work of this section shall remain free from leaks and from defects in materials and workmanship in accordance with General Conditions, but for a period of 2 years, and agrees to promptly make good any defects which become apparent within warranty period. Defects shall include, but shall not be limited to, sag and failure in adhesion or cohesion.

Part 2 Products

2.1 SEALANT MATERIALS

.1 All sealant products to be certified low-VOC (ie. Below 250g/l). GC to submit proof of low-VOC compliance prior to application on site.

.2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.3 Validation: sealants are to have the validation of Sealants and Weatherproofing Restoration Institute (SWRI).

.4 Where sealants are qualified with primers use only these primers.

.5 Provide joint sealants that are compatible with backing material, accessories, substrates and adjacent sealants for the intended uses based on the testing, recommendations, experience and written instructions of the sealant manufacturer.

.6 Colours for Exposed Joint Sealants Caulking: provide joint sealant colours as selected by the Consultant from the manufacturer’s full range of colours.

.7 Properly formulate each sealant type for anti-sag characteristics when material is used in vertical and overhead locations.

.8 Sealants applied in exterior conditions for piping or conduit penetrations to be UV resistant.

2.2 SEALANTS – DESCRIPTION

.1 Preformed backing materials, compressible and non-compressible, as recommended by manufacturer.

.1 Polyethylene, urethane, neoprene or vinyl foam units.

.1 Extruded cellular foam filling rods.

.2 Units oversized by 30% to 50%.

.2 Neoprene units.

.1 Round and full rods, Shore A hardness of 70.

.3 High-density foam units.

.1 Extruded cellular PVC foam units of extruded cellular polyethylene foam, Shore A hardness of 20, tensile strength of 140 to 200 kPa; or of extruded polyolefin foam, density of 32 kg/m³; or of neoprene, in dimensions recommended by manufacturer.

.2 Non-bonding tape.

.1 Polyethylene tape not adhering to sealant.

.3 Sealant Type 'A': One component polyurethane base, moisture curing conforming to ASTM C920. Type S, Grade NS, Class 25.

.1 Tremco "Dymonic”

.2 BASF “MasterSeal NP1”

.3 Dow Corning “CWS or CCS”

.4 Bondaflex “PUR 25” (polyurethane) or Bondaflex “SIL 199” (silicone)

.5 Or approved equivalent

OR

Sealant Type “AA”: Multi-component polyurethane base, chemical curing conforming to ASTM C920, Type M, Grade NS, Class 25. Colour: To match brick and/or architectural block.

1. W.R. Meadows "Pourthane NS/SL”
2. BASF “MasterSeal NP2”
3. Tremco "Dymeric”
4. Sika “Sikaflex 2C NS/SL”
5. Or approved alternate.

.4 Sealant Type 'B': One component silicone base sealant, chemical curing, anti-fungus composition, conforming to ASTM C920, Type S, Grade NS.

.1 Dow Corning "786 Mildew Resistant Silicone Sealant" or “Tub Tile and Ceramic”

.2 GE Silicones "Sanitary 1700”

.3 Sonneborn "Sonolastic Omniplus”

.4 Bondaflex “SIL 100 WF”

.5 Or approved equivalent

.5 Sealant Type 'C': Multi-component silicone, semi self-levelling type, conforming to ASTM C920, Type M, Grade P, Class 25.

.6 Sealant Type ‘D’: One component, moisture cured polyurethane based elastomeric sealant conforming to ASTM C920, Type S, Grade NS, Class 25.

.1 Sikaflex 1a by Sika Canada.

.2 Or approved alternative by Tremco Ltd.

.7 Primer: Compatible type recommended and furnished by same manufacturer as sealant.

.8 Bond breaker: Type recommended by material manufacturers to prevent bonding of sealant to back of recess.

.9 Cleaning agents: As recommended by material manufacturer, harmless to substrates and adjacent finished surfaces.

2.3 CAULKING AND SEALING SCHEDULE

.1 Sealant Type 'A' & ‘AA’.

.1 Apply at following locations;

.1 Perimeter of new window, door and wall frames; Colour to match masonry, or surrounding surfaces. If not installed in brick veneer, then colour of sealant shall match adjacent wall finish.

.2 Junction of wall panels and abutting materials; Colour to match masonry mortar. If not installed in brick veneer, then colour of sealant shall match adjacent wall finish.

.3 Locations not filled with mortar or covered by trim; Colour to match masonry mortar.

.4 At any location indicated on drawings but not covered by foregoing. Confirm colour with Architect.

.5 Or approved equivalent.

.2 Sealant Type ‘B’

.1 Apply at the following locations;

.1 At joint between washroom plumbing fixtures and walls/ floors.

.2 At junction of walls and vanity surfaces.

.3 At junction of equipment having horizontal work surfaces and walls.

.4 At junction of backsplash and walls.

.5 Or approved equivalent.

.3 Sealant Type ‘C’

.1 Apply at any joints shown on drawings or required by work which are subject to foot traffic.

.4 Sealant Type ‘D’

.1 Apply at the following resilient flooring locations:

.1 Areas where water may be tracked in from outdoors (i.e. vestibule areas).

.2 Where maintenance may create water that sits between floor finish transitional areas.

.3 Around all other penetrations (i.e. floor outlets, drains, etc.) in order to prevent adhesive failure.

2.4 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.

.2 Primer: in accordance with sealant manufacturer's written recommendations.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Construction Manager.

.2 Inform Construction Manager of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil, grease, and other matter which may impair Work. Only use chemical cleaners acceptable to sealant manufacturer.

.1 Clean ferrous metals of all rust, mill scale and foreign materials by wire brushing, grinding or sanding.

.2 Wipe metal surfaces to be caulked, except precoated metals, with cellulose sponges or clean rags soaked with ethyl alcohol, a ketone solvent, xylol or toluol and wipe solutions or compounds which will not injure finish and which are compatible with primer and sealant.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

.6 Where surfaces of materials adjacent to joints are likely to become coated with sealant during caulking operations, mask these surfaces with masking tape prior to priming and caulking.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

.3 Prime surfaces of joints with primer to which adhesion is required, unless otherwise instructed by manufacturer

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

.1 Where joints are 12 mm or deeper, insert backing material in continuous 30% compression with set-back from finished face of adjoining materials equal to required depth of caulking (width/depth ratio) as recommended by manufacturer of sealant, but not less than a distance which leaves minimum 6 mm thickness of sealant.

.2 On horizontal traffic surfaces, support joint filler against vertical movement which might result from loads, including foot traffic.

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

.1 Sealant:

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Where surfaces to be caulked are prime painted in shop before caulking, check to make sure prime paint is compatible with primer and sealant. When incompatible, inform Consultant and change primer and sealant to compatible type approved by Consultant.

.4 Apply sealant in continuous beads.

.5 Apply sealant using gun with proper size nozzle.

.6 Use sufficient pressure to fill voids and joints solid.

.7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.8 Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.

.9 Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

.10 Remove masking tape and excess compound promptly as work progresses and upon completion.

.11 Do not thin or adulterate sealants.

.12 Surface of caulking compound shall be worked smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities. Keep surface of caulking flush with faces of adjacent surfaces, unless otherwise indicated on drawings.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.7 CLEANING

.1 Clean surfaces adjacent to joints, remove sealant smears or other soiling resulting from application of sealants. At metal surfaces, remove masking and other residue. Do not to mar or damage finishes on materials adjacent to joints. Repair or replace marred or damaged materials

.2 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Clean adjacent surfaces immediately, removing excess sealant from surfaces while still uncured.

.3 Remove excess and droppings, using recommended cleaners as work progresses.

.4 Remove masking tape immediately after tooling joint without disturbing seal.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.8 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 05 50 00 – Metal fabrications

.2 Section 07 92 00 – Joint sealants

1.2 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

.2 ASTM International

.1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM D412-06ae2, Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.

.3 ASTM D2240-05(2010), Standard Test Method for Rubber Property - Durometer Hardness.

.4 ASTM D2628-91(2011), Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.

.3 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition.

.1 MPI #79 Primer, Alkyd, Anti-Corrosive for Metal.

.2 MPI #80 Primer, Vinyl Wash.

.3 MPI #95 Primer, Quick Dry, for Aluminum.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for expansion joint cover assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.

.2 Indicate on drawings:

.1 Lengths, fasteners, accessories, anchors, seals, [butt joints and locations] finishes and profiles required for each condition.

1.4 QUALITY ASSURANCE

.1 Certificates:

.1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.2 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.3 Manufacturers Field Services:

.1 Submit manufacturers field reports.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors, in dry location and off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect expansion joint cover assemblies from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 DESIGN REQUIREMENTS

.1 Joint movement: design to permit unrestricted lateral movement of up to +/-50% of joint width.

.2 Service Temperature: design exterior expansion joint cover assemblies to accommodate joint movements within service temperature range of -35 degrees C to 65 degrees C.

2.2 MATERIALS

.1 Aluminum extrusions: alloy and temper to suit project requirements.

.2 Stainless steel brake formed or roll formed sections: to ASTM A167, type 304

.3 Bronze extrusions: architectural bronze or Muntz metal.

.4 Vinyl-acrylic extrusions: high impact vinyl acrylic from manufacturer's standard range

.5 Flexible inserts:

.1 Factory-bonded, reinforced, elastomer

.2 Extruded filler strips: flexible neoprene to ASTM D2628 or vinyl to manufacturer's standard. Colour selected by Consultant.

.6 Primer: to MPI #80, 79 or 95.

.7 Primer: VOC limit 250 g/L maximum to GS-11.

.8 Paints and Coatings: VOC limit 50 g/L maximum to GS-11.

.9 Accessories:

.1 Substrate seal: continuous, flexible vinyl seals to provide watertight juncture along base of joint covers.

.2 Butt joint seal: to provide watertight seal between lengths of joint covers.

.3 Spring clips: stainless steel.

.4 Waterstop: continuous flexible vinyl.

.5 Concealed fasteners and anchors: stainless steel.

.6 Extruded filler strip, adhesives and water stops.

.7 Chemical fasteners and anchors: provide chemical anchoring as per manufacturers specifications to avoid joint face spalling.

.8 Epoxy levelling bed: minimum 6 mm epoxy levelling bed under metal rails.

.9 Elastomeric concrete: shop poured filler to allow multidirectional movement and maintain cohesion and adhesion.

2.3 ALUMINUM FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.1 Clear anodic finish

2.4 FABRICATION

.1 Fabricate expansion joint covers, square, true, straight and accurate to required sizes and profiles.

.2 Fabricate in maximum practical lengths to minimize joints.

.3 Shop assemble covers ready for installation where practicable.

.4 Fabricate joint cover assemblies with anchors, levelling nuts, filler inserts shop applied protection as required for a complete installation to suit installation and project requirements.

.5 Fabricate acceptable means of anchorage, such as anchor clips, expansion bolts and shields, welded studs or toggles.

.6 Factory fabricate terminations and transitions.

2.5 EXPANSION JOINT COVERS

.1 Cover made of black EPDM and galvanized steel flanges

.2 For anticipated horizontal expansion of 50mm;

.3 Acceptable products :

.1 Type 1 (from roof to wall)

Expand-O-Flash, Style EJ cant-to-wall by Johns Manville or approved equivalent.

.2 Type 2 (from roof to roof)

Expand-O-Flash, Style EJ cant-to-cant by Johns Manville or approved equivalent.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for expansion joint cover assemblies installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.2 MANUFACTURER'S RECOMMENDATIONS

.1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation recommendations, product carton installation recommendations and data sheets.

3.3 INSTALLATION

.1 Set work plumb, square, level, free from distortion.

.2 Secure work accurately to structure in manner not restricting joint movement.

.3 Maintain continuity of water barrier.

.4 Seal butt joints in accordance with manufacturer's written recommendations to provide watertight joints using sealant.

.5 Protect cover plates during construction. Remove shop protection prior to final inspection.

.6 Ensure sound and clean substrates before installation.

3.4 FIELD QUALITY CONTROL

.1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance of Work with Contract.

.2 Manufacturer's field services: provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits to review Work at stages listed:

.1 Upon completion of Work, after cleaning is carried out.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Remove traces of primer, caulking, epoxy and filler materials; clean expansion joint covers.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by control and expansion joint cover assembly installation.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Painting of canopies including base plates, columns, beams, underside of metal deck and all other visible steel components;

.2 Painting of guardrails ;

.3 Parking line marking ;

.4 All other work described or required in plans.

1.2 RELATED REQUIREMENTS

.1 Division 01

.2 Section 05 50 00 – Metal Fabrications

1.3 REFERENCE STANDARDS

.1 Environmental Protection Agency (EPA)

.1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.

.2 SW-846, Test Method for Evaluating Solid Waste, Physical/Chemical Methods.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - [current edition].

.2 Standard GPS-1-12, MPI Green Performance Standard.

.3 Standard GPS-2-12, MPI Green Performance Standard.

.4 National Research Council Canada (NRC)

.1 National Fire Code of Canada 2015 (NFC).

.5 Society for Protective Coatings (SSPC)

.1 Systems and Specifications, SSPC Painting Manual.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling

.1 Obtain written authorization from Consultant for changes in work schedule.

.2 Schedule new additions to existing building coordinate painting operations with other trades.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for [paint and paint products] and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit an electronic copy of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.

.3 Confirm products to be used are in MPI's approved product list.

.4 Upon completion, provide records of products used. List products in relation to finish system and include the following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour numbers.

.4 Manufacturer's Material Safety Data Sheets (MSDS).

.3 Samples:

.1 Provide 200 x 300 mm duplicate sample panels of each paint, stain and clear coating with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on appropriate substrate materials.

.2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

.3 Provide full range of available colours where colour availability is restricted.

.4 Sustainable Design Submittals:

.1 Low-Emitting Materials:

.1 Provide listing of paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.6 CLOSEOUT SUBMITTALS

.1 Provide in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Provide operation and maintenance data for [painting materials] for incorporation into manual.

.3 Include :

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour numbers.

1.7 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials:

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit 1 four-litre can of each type and colour of stain, primer and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.8 QUALITY ASSURANCE

.1 Qualifications:

.1 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work

.3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.4 Conform to latest MPI requirements for exterior painting work including preparation and priming.

.5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.

.6 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.

.7 Standard of Acceptance:

.1 Walls: no defects visible from 1000mm at 90 degrees to surface.

.2 Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

.2 Mock-Ups:

.1 When requested by Consultant, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and quality of work to MPI Painting Specification Manual standards for review and approval.

.2 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.1 Mock-up will be used:

.1 To judge quality of work, substrate preparation, operation of equipment and material application and skill to MPI Architectural Painting Specification Manual standards.

.2 Locate where directed.

.3 Allow 24 hours for inspection of mock-up before proceeding with Work.

.4 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions and per Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.1 Labels: to indicate:

.1 Type of paint or coating.

.2 Compliance with applicable standard.

.3 Colour number in accordance with established colour schedule.

.3 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Observe manufacturer's recommendations for storage and handling.

.3 Store materials and supplies away from heat generating devices.

.4 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.

.5 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.

.6 Remove paint materials from storage only in quantities required for same day use.

.7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.8 Fire Safety Requirements:

.1 Provide one 9kg Type ABC fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).

.9 Replace defective or damaged materials with new.

.4 Develop Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 35 50 Waste Management and Disposal.

.5 Packaging Waste Management: remove for reuse and return of pallets, packaging materials and crates, as specified in Waste Reduction Workplan in accordance with Section 01 35 50 Waste Management and Disposal.

1.10 SITE CONDITIONS

.1 Ambient Conditions:

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces in accordance with Section 01 51 00 Temporary Utilities.

.2 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.

.3 Where required, provide continuous ventilation for seven days after completion of application of paint.

.4 Co-ordinate use of existing ventilation system with Owner and ensure its operation during and after application of paint as required.

.5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.6 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:

.1 Ambient air and substrate temperatures are below 10 degrees C.

.2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 Relative humidity is above 85% or when dew point is less than 3 degrees C variance between air/surface temperature.

.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

.2 Perform no painting work when maximum moisture content of substrate exceeds:

.1 12% for concrete and masonry (clay and concrete brick/block).

.1 Allow new concrete and masonry to cure minimum of 28 days.

.2 15% for hard wood.

.3 17% for soft wood.

.4 12% for plaster and gypsum board.

.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Application Requirements:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.3 Apply paint when previous coat of paint is dry or adequately cured.

.4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.

.5 Do not apply paint when:

.1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.

.2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.

.3 Surface to be painted is wet, damp or frosted.

.6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

.7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

.8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

.9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of Owner such that painted surfaces will have dried and cured sufficiently before occupants are affected.

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

.1 Environmental Performance Requirements:

.1 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.

2.2 MATERIALS

.1 Only paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project.

.2 Paint materials for paint systems: to be products of single manufacturer.

.3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.

.4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, to be as follows:

.1 Be water-soluble.

.2 Be non-flammable and biodegradable.

.3 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.

.4 Be manufactured without compounds which contribute to smog in the lower atmosphere.

.5 Do not contain chlorinated hydrocarbons, toxic metal pigments, methylene chloride.

.5 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising there from, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

.7 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.

.8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

.1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.9 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

.10 Recycled water-borne surface coatings must contain 50% post-consumer material by volume.

.11 Recycled water-borne surface coatings must not contain:

.1 Lead in excess of 600.0ppm weight/weight total solids.

.2 Mercury in excess of 50.0ppm weight/weight total product.

.3 Cadmium in excess of 1.0ppm weight/weight total product.

.4 Hexavelant chromium in excess of 3.0ppm weight/weight total product.

.5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of [1.0] ppm weight/weight total product.

.12 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.

.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.3 COLOURS

.1 Refer to Finish Plans for number and location of different colours.

.2 Selection of colours will be from manufacturers' full range of colours.

.3 Where specific products are available in restricted range of colours, selection will be based on limited range.

.4 Second coat in three coat system to be tinted slightly lighter colour than topcoat to show visible difference between coats if requested by Consultant.

.5 For deep and ultra deep colours 4 coats may be required.

2.4 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is not allowed.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.

.4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

.6 Deep and ultra deep colors; 4 coats may be required.

2.5 GLOSS/SHEEN RATINGS

.1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category/	Units @ 60 Degrees/	Units @ 85 Degrees/
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35

G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	85	

.2 Gloss level ratings of painted surfaces [as noted on Finish Schedule] [as specified].

2.6 EXTERIOR PAINTING SYSTEMS

.1 Asphalt Surfaces: one/traffic marking for drive and parking areas, etc.

.1 EXT 2.1A - Latex zone/traffic marking finish.
.2 EXT 2.1B - Alkyd zone/traffic marking finish.

.2 Concrete Vertical Surfaces: (including horizontal soffits)

.1 EXT 3.1A - Latex G4 over alkali-resistant primer finish.
.2 EXT 3.1B - Latex G4 over latex aggregate latex finish.
.3 EXT 3.1C - W.B. light industrial G4 over alkali-resistant primer coating.
.4 EXT 3.1D – Epoxy.
.5 EXT 3.1F – Elastomeric flat coating.
.6 EXT 3.1G - Water repellent non-paintable finish.
.7 EXT 3.1H - Water repellent paintable finish.
.8 EXT 3.1J - Concrete stain finish.
.9 EXT 3.1K - Latex G4 finish over latex.
.10 EXT 3.1L - High-build latex G4 finish.
.11 EXT 3.1M - Polyurethane, Pigmented finish over epoxy.
.12 EXT 3.1N - Latex flat G4 aggregate finish.

.3 Concrete Horizontal Surfaces: decks

.1 EXT 3.2A - Latex floor paint gloss finish.
.2 EXT 3.2B - Latex deck coating.
.3 EXT 3.2C - Epoxy deck coating, slip resistant.
.4 EXT 3.2D - Alkyd floor enamel gloss finish.
.5 EXT 3.2E - Latex zone/traffic marking finish for parking lines, etc.
.6 EXT 3.2F - Alkyd zone/traffic marking finish [for parking lines, etc.
.7 EXT 3.2G - Sealer, Clear, solvent based (S.B.)
.8 EXT 3.2H - Sealer, Clear, W.B.
.9 EXT 3.2J - Concrete stain finish.

.4 Cementitious Composition Board Surfaces: (vertical surfaces, horizontal soffits)

.1 EXT 3.3A - Latex G4 finish.
.2 EXT 3.3B - Alkyd G4 over latex primer finish.
.3 EXT 3.3C - W.B. light industrial G5 over W.B.. alkali-resistant primer coating.
.4 EXT 3.3D - Epoxy-Modified Latex semi-gloss finish.
.5 EXT 3.3E – Epoxy semi-gloss finish.
.6 EXT 3.3F - Polyurethane, Pigmented finish over epoxy.
.7 EXT 3.3G - Latex flat G4 aggregate finish.
.8 EXT 3.3H - High-build latex finish.
.9 EXT 3.3J - Latex G4 finish over W.B. alkali resistant primer.

.5 Clay Masonry Units: (pressed and extruded brick)

.1 EXT 4.1A - Latex G2 over alkali-resistant primer finish.
.2 EXT 4.1B - Latex flat G4 aggregate finish.
.3 EXT 4.1C - W.B. light industrial G5 over alkali-resistant primer coating.
.4 EXT 4.1D - Epoxy finish for smooth brick semi-gloss.
.5 EXT 4.1F - Water repellent non-paintable finish.
.6 EXT 4.1G - Water repellent paintable finish.
.7 EXT 4.1H - High-build latex finish.
.8 EXT 4.1J - Polyurethane, Pigmented finish over epoxy.

.6 Concrete Masonry Units: smooth and split face block and brick

.1 EXT 4.2A - Latex G4 over latex block filler finish.
.2 EXT 4.2B - Latex G4 flat aggregate finish.
.3 EXT 4.2C - W.B. light industrial G5 over latex block filler coating.
.4 EXT 4.2D - Elastomeric finish.
.5 EXT 4.2E – Epoxy semi-gloss over epoxy block filler finish.
.6 EXT 4.2G -Polyurethane, Pigmented finish over epoxy block filler and h.b. epoxy.
.7 EXT 4.2H - Water repellent (non-paintable) finish not for use on lightweight concrete block.
.8 EXT 4.2J - Water repellent (paintable) finish (not for use on lightweight concrete block).
.9 EXT 4.2K - High-build latex finish.
.10 EXT 4.2L - Latex G5 finish over alkali resistant primer.

.7 Structural Steel and Metal Fabrications:

.1 EXT 5.1A - Quick dry enamel semi-gloss over q.d. primer finish.
.2 EXT 5.1B - W.B. light industrial G5 coating over inorganic zinc.
.3 EXT 5.1C - W.B. light industrial G5 coating over alkyd metal primer.
.4 EXT 5.1D - Alkyd G5 over alkyd metal primer finish.
.5 EXT 5.1F – Epoxy semi-gloss over epoxy primer and h.b. epoxy finish.
.6 EXT 5.1M - W.B. light industrial G5 coating over w.b. epoxy primer.
.7 EXT 5.1N - W.B. light industrial G5 coating over s.b. epoxy primer.
.8 EXT 5.1P - Polyurethane, Pigmented finish over epoxy zinc rich primer.
.9 EXT 5.1Q – Alkyd G5 over surface tolerant primer finish.
.10 EXT 5.1R – W.B. Light Industrial G5 coating over epoxy primer and h.b epoxy.

.8 Steel - High Heat: heat exchangers, breeching, pipes, flues, stacks, etc., with temperature range as noted.

.1 EXT 5.2A - Heat resistant enamel finish, maximum 400 degrees F 205 degrees C.
.2 EXT 5.2B - Heat resistant aluminum enamel finish, maximum 800 degrees F 427 degrees C.
.3 EXT 5.2C - Inorganic zinc rich coating, maximum 750 degrees F 400 degrees C.
.4 EXT 5.2D - High heat resistant coating, maximum 1100 degrees F 593 degrees C.

.9 Galvanized Steel – Canopies and Guardrails

All canopy structure to be painted as follow :

1. Surface preparation :

   Per SSPC-SP15 - Commercial Grade Power-tool cleaning, until profile of 1 mils. (25 microns) is obtained. Remove dust.

2. Base Coat :

   One coat of two-component, high solids epoxy coating mastic.

   Acceptable product : MF Rust Oleum 9100 to thickness of 2 à 3 mils. (50 to 75 microns) when dry OR approved equivalent.

3. Finish Coats :

   2 coats of two component, high solids, high build, direct to metal, aliphatic acrylic polyurethane mastic.

   Acceptable product : MF Rust Oleum 9800 to thickness of 2 à 3 mils. (50 to 75 microns) per coat when dry OR approved equivalent

The galvanized roofing sheets above canopies will remain unpainted.

.10 Aluminum: sash, sills and frames, flashing, posts and railings, downpipes, etc.

- .1 EXT 5.4A - Alkyd G2 finish over vinyl wash primer and Q.D primer.
- .2 EXT 5.4D - Bituminous finish.
- .3 EXT 5.4E - Epoxy semi-gloss finish over vinyl wash primer.
- .4 EXT 5.4F - Alkyd G2 finish over Q.D. metal primer.
- .5 EXT 5.4G - Waterborne light industrial G2 coating.
- .6 EXT 5.4H - Latex G2 finish over Q.D. metal primer.

.11 Stainless Steel: unpolished

- .1 EXT 5.6A - Alkyd [insert gloss level] finish (over vinyl wash primer.
- .2 EXT 5.6F - Latex G5 finish over bonding primer.
- .3 EXT 5.6G - Waterborne light industrial G5 coating over Q.D. metal primer.

.12 Dimension Lumber: columns, beams, exposed joists, underside of decking, siding, fencing, etc.

- .1 EXT 6.2A - Latex G4 finish over alkyd/oil primer.
- .2 EXT 6.2C - Alkyd G4 finish over alkyd/oil primer.
- .3 EXT 6.2E - Varnish semi-gloss finish over S.B. stain.
- .4 EXT 6.2F - Pigmented fire-retardant G4 coating.
- .5 EXT 6.2G - Clear fire-retardant penetrating wood preservative coating.
- .6 EXT 6.2M - Latex G4 finish over latex primer.

.13 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.

- .1 EXT 6.3A - Latex G3 finish.
- .2 EXT 6.3J - Waterborne light industrial G3 coating, use semi-gloss finish on doors and frames only.
- .3 EXT 6.3K - Waterborne solid colour stain finish over alkyd/oil primer.
- .4 EXT 6.3L - Latex G3 finish over latex primer [do not use flat finish on doors].

.14 Canvas and Cotton Coverings: pipes, ductwork, etc.

- .1 EXT 10.1A - Latex G2 finish.

.2 EXT 10.1B - Waterborne light industrial G2 coating.

.3 EXT 10.1C – Alkyd G2 finish over latex.

.4 EXT 10.1D - Aluminum paint finish over latex.

.15 Bituminous Coated Surfaces: cast iron pipe, concrete, etc.

.1 EXT 10.2A - Latex G2 finish over W.B. rust-inhibitive primer.

.2 EXT 10.2B - Latex G2 aggregate finish.

.3 EXT 10.2C - Alkyd G2 finish over W.B. rust-inhibitive primer.

.4 EXT 10.2D - Aluminum paint finish over W.B. rust-inhibitive primer.

2.7 SPECIAL FINISHES

.1 Reserved

2.8 SOURCE QUALITY CONTROL

.1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.

.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer’s written instructions:

.1 Visually inspect substrate.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed.

.2 Exterior surfaces requiring repainting: inspected by painting contractor who will notify Consultant in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.

.3 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.

.4 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Owner.

3.4 PREPARATION

.1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

.3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.

.2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.

.5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water-based paints.

.6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

.4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminates from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.

.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.

.6 Do not apply paint until prepared surfaces have been accepted by Consultant.

.7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

3.5 EXISTING CONDITIONS

.1 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Consultant. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.2 Maximum moisture content as follows:

.1 Stucco: 12%.

.2 Concrete: 12%.

.3 Clay and Concrete Block/Brick: 12%.

.4 Hard Wood: 15%.

.5 Soft Wood: 17%

3.6 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Consultant.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect passing pedestrians, building occupants and general public in and about building.

.5 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Store items and re-install after painting is completed.

.6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas.

3.7 APPLICATION

.1 Method of application to be as approved by Consultant. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces to be free of roller tracking and heavy stipple unless approved by Consultant.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray Application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately runs and sags.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.6 Wood, stucco, concrete, cement masonry units CMU's and brick; if sprayed, must be back rolled.

.4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Consultant.

.5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.8 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.2 Do not paint over nameplates.

.3 Paint fire protection piping red.

.4 Paint natural gas piping yellow.

.5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.9 FIELD QUALITY CONTROL

.1 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Owner.

.2 Standard of Acceptance:

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Ceilings: no defects visible from floor at 45 degrees degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

.3 Field inspection of painting operations to be carried out by Consultant.

.4 Advise Consultant when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.5 Cooperate with inspection firm and provide access to areas of work.

.6 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.

3.10 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning:

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.

3.11 RESTORATION

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittals

.2 Section 01 61 00 - Common Product Requirements

.3 Section 01 74 11 - Cleaning

1.2 REFERENCE STANDARDS

.1 CSA Group

.1 CSA Z614:20, including annex H – Children's playspaces and equipment

.2 CSA B651:18 - Conception accessible pour l'environnement bâti

.3 CSA Z809-08 - (R2013) Sustainable Forest Management

.2 AODA – Accessibility for Ontarians with Disabilities Act

.3 ASTM International

.1 ASTM A123/A123M - (2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

.2 ASTM A135/A135M - (2021) Standard Specification for Electric-Resistance-Welded Steel Pipe

.3 ASTM A153/A153M - (2016a) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

.4 ASTM A500/A500M - (2021) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

.5 ASTM A513/A513M - (2020a) Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing

.6 ASTM B26/B26M - (2018; E 2018) Standard Specification for Aluminum-Alloy Sand Castings

.7 ASTM B108/B108M - (2019) Standard Specification for Aluminum-Alloy Permanent Mold Castings

.8 ASTM B117 - (2019) Standard Practice for Operating Salt Spray (Fog) Apparatus

.9 ASTM B179 - (2017) Standard Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes

.10 ASTM B221 - (2020) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

.11 ASTM B221M - (2013) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)

.12 ASTM D173/D173M - (2003; R 2011; E 2012) Bitumen-Saturated Cotton Fabrics Used in Roofing and Waterproofing

.13 ASTM D822 - (2013; R 2018) Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings

.14 ASTM D1248 - (2016) Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

.15 ASTM D2454 - (2014) Determining the Effect of Overbaking on Organic Coatings

.16 ASTM D2794 - (1993; R 2019) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

.17 ASTM D3359 - (2017) Standard Test Methods for Rating Adhesion by Tape Test

.18 ASTM D3363 - (2005; E 2011; R 2011; E 2012) Film Hardness by Pencil Test

.19 ASTM D6112 - (2013) Compressive and Flexural Creep and Creep-Rupture of Plastic Lumber and Shapes

.20 ASTM F1487 - (2021) Standard Consumer Safety Performance Specification for Playground Equipment for Public Use

1.3 DEFINITIONS

.1 Age-Appropriate : A term that describes equipment scale to include platform height, fall height and maximum equipment height, that allows safe and successful use by children of a specific chronological age; mental and physical ability; and anthropometric measurement. Maximum equipment height and complexity will not exceed a child's ability in that age group.

.2 Composite Structure : Also "Composite Play Structure; Linked Structure". Two or more play events attached, directly adjacent or functionally linked, to create one integral unit that provides more than one play activity.

.3 Designated Play Surface : Any elevated surface for standing, walking, sitting, or climbing; or a flat surface a minimum 50 mm wide having up to a maximum 30 degree angle from horizontal. In some play events the platform surface will be the same as the designated play surface.

.4 Guardrail : A device around an elevated surface that prevents inadvertent falls from the elevated surface.

.5 Maximum Equipment Height : The highest point on the equipment (i.e., roof ridge, top of support pole).

.6 Play Event : A piece of manufactured playground equipment that supports one or more play activities. The term ‘play event’ is a synonym of ‘Play Equipment’ and ‘Play Experience Type’ as used in CSA Z614:20, including annex H.

.7 Protective Barrier : An enclosing device around an elevated surface that prevents both inadvertent and deliberate attempts to pass through the device.

.8 Protective Surfacing : Material to be used within the use zone that meets the fall attenuation requirements.

.9 Suspended Hazard : Cable, wire, rope or similar devices suspended up to a maximum 2100 mm high between play events; or installed up to a maximum 45 degree angle from the ground to the play event.

.10 Tot : A child under 4 years of age in the pre-toddler and toddler age group.

.11 Use Zone : The area beneath and immediately adjacent to a play structure or equipment that is designated for unrestricted circulation around equipment, and on whose surface it is predicted that a user would land when falling from or exiting the equipment.

1.4 SYSTEM DESCRIPTION

.1 Child Safety

General Contractor to provide play events that meet the child safety performance requirements described in CSA Z614:20, including annex H. The requirements include the following: Head and neck entrapment; sharp points, edges, and protrusions; entanglement; pinch, crush, and shear points; suspended hazards; play event access and egress points; protective surfacing zones.

.2 Equipment Identification

Identify playground equipment with attached and durable label stating the age-group that the equipment is designed to accommodate. Provide permanent User aged labels and manufacturer's identification labels, per CSA Z614:20, including annex H.

1.5 SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop drawings : **N/A**

.1 Submit shop drawings including play structure configuration, materials, description of joints, level of ground, fall height as well as underground foundation or support. The drawings must be stamped and signed by a structural engineer having right of practice in the province of Ontario.

.2 When the use zone perimeter and play event configuration conflict with the requirements and paragraph CHILD SAFETY AND ACCESSIBILITY STANDARDS (what is the Canadian equivalent?), submit scale drawings defining the revised use zone perimeters and play event layout and corrective measures to include the following:

- Adjustment to the play event with the use zone perimeter;
- use zone perimeter overlaps;
- hard surface area and pathway widths;
- structures;
- exterior plant material and planters;
- walls and fences;
- and bare or painted metal platform and slide bed orientation to the direct sun

.3 Samples: showing materials and colours : **N/A**

.4 Closeout Submittals : **N/A**

Submit two bound copies of the manufacturer's operation and maintenance manuals containing the Maintenance Instructions and describing the recommended preventive maintenance, inspection frequency and techniques, periodic adjustments, lubricants, and cleaning requirements.

1.6 QUALITY ASSURANCE

.1 Manufacturer Qualification : **N/A**

Play events and equipment similar to those furnished must have been installed in a minimum 10 sites and been in successful service for a minimum 5 year calendar period. Submit name of the owner or user; service or preventive maintenance provider; date of the installation; point of contact and telephone number; and address for 10 sites.

.2 Installer Qualification

The installer must be approved by the manufacturer for training and experience installing the play events and equipment. Submit the installer's company name and address, and training and experience.

.3 3rd party inspection required

A 3rd party inspector must supervise the installation and adjustment of the play events and equipment in order to verify the installation meets the requirements of the manufacturer, this specification as well as CSA Z614:20 including annex H. Submit the individual's name, company name and address, and playground safety training certificate.

.4 Inspections

The following inspections are recommended :

- 1 stringer/footing inspection;
- 1 pre-use inspection;
- 1 surface impact test for each surface with final report.

1.7 CERTIFICATION

.1 The General Contractor is responsible for the relocation of all existing playground equipment and the compliance of the revised installation to current government standards. General Contractor is required to provide a play equipment compliance Inspection report attesting compliance to CSA Z614:20, including annex H.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

1.9 WARRANTY

.1 The installation of relocated play events and equipment as well as the addition of any new fixture must have a minimum 1 year calendar period warranty.

Part 2 Products

2.1 MATERIALS _N/A

Provide materials which are the standard products of a manufacturer regularly engaged in the manufacture of play event products. Submit results of assembled play event structural integrity tests; vertical load tests; and the maximum number of users that can be on the play event. Prior to the delivery of materials, submit certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates must include composition and tests to which the material has been subjected.

.1 Metal

Metal components must have factory-drilled holes and be corrosion resistant. The components must be free of excess weld and spatter. Components with extra holes not filled by hardware or covered by components must be rejected.

.1 Steel
Steel components must comply with ASTM A135/A135M, ASTM A500/A500M, or ASTM A513/A513M. Minimum tensile strength must be 310 Mpa 45,000 psi. Minimum yield point must be 225 Mpa 33,000 psi.

.2 Aluminum
Extruded aluminum components must be type 6061-T6, 6062-T6, or 6063-T6, and must conform to ASTM B221M ASTM B221. Minimum tensile strength of extruded aluminum components must be 270 Mpa 39,000 psi, and the minimum

yield must be 250 Mpa 36,500 psi. Cast aluminum alloy must conform to ASTM B179, ASTM B26/B26M, and ASTM B108/B108M.

.3 Chain
Chain must be a minimum size 4/0 and must be corrosion resistant zinc plated.

.4 Rope cable
Rope cable must be composed of strands of steel cable with a polypropylene or Dacron synthetic covering that is UV stabilized. Cable ends must be capped to prevent fraying.

.5 Hardware
Hardware must be corrosion resistant and consist of the following: aluminum, stainless steel, brass, zinc plated steel, zinc-chromate plated steel, or galvanized steel, ASTM A153/A153M. When secured, the hardware must require a tool to prevent unauthorized loosening and removal

.6 Rails, Loops, and Hand bars
Rails, loops, and hand bars must consist of corrosion resistant aluminum, powder-coated steel or galvanized steel.

.7 Anchors
Anchors must be in accordance with manufacturer's recommendations

.2 Wood

Wood components must be exterior premium grade and free of knots. Wood components must have factory-drilled holes. Components with extra holes not filled by hardware or covered by other components will be rejected.

.1 Wood Treatment
Treat wood components that are not naturally rot and insect resistant, by using standard treatment procedures. Any wood placed up to a maximum 150 mm above, or any portion below the top elevation of the protective surfacing, must be treated after fabrication. Creosote, pentachlorophenol, and tributyl tin oxide are prohibited according to ASTM F1487. Submit wood treatment chemical content, toxicity level, and life-cycle durability. Submit certifications of wood treatment materials and processes.

.3 Plastic components

.1 Panels
Plastic panels must be molded of ultraviolet (UV) and color stabilized polyethylene or nylon with a minimum 5 mm thickness, ASTM F1487. Edges must be a minimum 5 mm radius.

.2 Windows
Plastic windows must be flat or molded into a bubble shape, consisting of clear polycarbonate plastic a minimum 5 mm thick before forming in accordance with ASTM D1248. Material must be shatterproof and resistant to crazing, cracking, or fogging.

.4 Plastic

Construct or manufacture material with a maximum 6 mm deflection or creep in any member, ASTM D6112. Submit results of individual component and assembled unit structural integrity test; creep tolerance; deflection tolerance; and vertical load test results

.1 High Density Polyethylene
Mold components of ultraviolet (UV) and color stabilized polyethylene consisting of a minimum 75 percent plastic profile of high-density polyethylene, low-density polyethylene, and polypropylene raw material. The material must be non-toxic, have no discernible contaminates such as paper, foil, or wood, and contain a maximum 3 percent air voids. The material must be free of splinters, chips, peels,

buckling, and cracks and be resistant to deformation from solar heat gain. Material must have factory-drilled holes. Components with extra holes not filled by hardware or covered by other components will be rejected. The material must not be painted.

.2 Panel
Panels must be a minimum 6 mm thick; exposed edges must be smoothed, rounded, and free of burrs and points; and the material must be shatterproof and resistant to fading, cracking, or fogging.

.3 Structural Component
Recycled plastic materials will not be used as load bearing structural members: framing, beams, columns or posts.

.4 Recycled Plastic Molded As Deck Material
For deck or platform construction, the span of the structural support members must be a maximum 300 mm on center and recycled plastic decking must connect to a minimum three joists. Material used for decking must have a non-slip texture surface. The assembly must deflect a maximum 1/360 of the span of the frame when exposed to a uniform live load of 585 N/m 40 lbs/ft. The product must meet the structural integrity test requirements, ASTM F1487 and ASTM D6112. Recycled plastic deck material must contain a minimum 95 percent of recycled content. Provide data identifying percentage of recycled content for plastic molded as deck material.

.5 Recycled Plastic Molded as Rails
Recycled plastic rails must contain a minimum 95 percent of recycled content. Provide data identifying percentage of recycled content for plastic molded as rails.

.6 Recycled Plastic Molded as Roof Planks or Pickets
Recycled plastic must contain a minimum 95 percent of recycled content. Provide data identifying percentage of recycled content for plastic molded as roof planks or pickets

.5 Coatings

.1 Galvanized
Metal components must be hot-dipped in zinc after fabrication according to ASTM A123/A123M. Remove tailings and sharp protrusions formed as a result of the hot-dip process; edges must be burnished.

.2 Polyester Powder
Powder-coated surfaces must receive electrostatic zinc coating prior to painting. Powder coating must be electrostatically applied and must be oven cured. Polyester powder must be in accordance with the following: ASTM D3359 for adhesion; ASTM D173/D173M for flexibility; ASTM D3363 for hardness; ASTM D2794 for impact; ASTM D2454 for overbake resistance; ASTM B117 for salt spray resistance; and ASTM D822 for weatherability.

.3 Polyvinyl Chloride (PVC)
Prime PVC coating with a clear acrylic thermosetting solution. The primed parts must be preheated prior to dipping. The liquid polyvinyl chloride must be UV stabilized and mold-resistant. The coated parts must be cured. The coating must be a minimum 2 mm thick within a plus or minus 0.5 mm tolerance. The coating must have an 85 durometer hardness, ASTM D3363. The finish must be slip-resistant.

.6 Wood Sealants

Exposed wood surfaces must have factory applied prime coat with a minimum 2 spray coats of two-component polyurethane or approved preservative.

.1 Paint
Paint must be factory applied to a minimum of 2 coats. Paint must be weather resistant, and resist cracking, peeling and fading.

.2 Sealants
Seal all applied surfaces from air; sealants containing pesticide are prohibited.

.7 Colours

Color must be provided as indicated. Submit 2 colour charts displaying the colors and finishes.

2.2 MATERIALS

.1 Engineered Wood Fibre

.1 Must conform to the CAN-CSA Z614:20 standard, including annex H

.2 Must be IPEMA certified

.3 must conform to ASTM F1292-18 Impact Attenuation

.4 must conform to ASTM F2075-15 Hazardous Metals, Soluble Heavy Metals and Sieve Analysis

.5 must conform to ASTM F1951-14 Wheelchair Accessibility

2.3 EQUIPMENT

Submit manufacturer's descriptive data; catalog cuts; references; and the latest edition of ASTM F1487 and ASTM F2373. Manufacturer's specifications, handling and storage requirements, installation procedures, and safety data sheets to include the following: bare or painted metal platform and slide bed orientation from the direct sun; warnings; and child safety performance standards.

.1 Configuration

Provide play event configuration, platform height, fall height, and maximum equipment height. When the configuration varies from the play event shown, submit scale drawings defining the revised configuration to include the following: equipment layout with the use zone perimeter; designated play surface spot elevations; maximum equipment height spot elevations; platform spot elevations; protective barriers; guardrails; bare or painted metal platform and slide bed orientation; and play events in relationship to the playground layout

.2 Substitution

Substitutions will not be allowed and play events will not be selected without written approval from the technical representative. Evaluate manufacturer substitutions which increase the play event platform height or maximum equipment height. The increased height requires additional protective surfacing in accordance with CSA Z614:20, including annex H. Submit 3rd party written approval.

.3 For following paragraphs 2.2.4 to 2.2.7, it is assumed that the existing equipment already complies to CSA Z614:20, including annex H.

.4 Protective Barrier and Guardrail **N/A**

Provide protective barriers and guardrails in accordance with CSA Z614:20, including annex H. This specification establishes the protective barrier and guardrail requirements for the infant and pre-toddler age group.

.1 Protective Barrier
The protective barrier for pre-toddler, toddler, and pre-school age groups must be provided on elevated surfaces a minimum 760 mm above the protective

surfacing. The protective barrier for school-age and pre-teen age groups must be provided on elevated surfaces a minimum 1200 mm above the protective surfacing. The protective barrier must completely surround the elevated surface except for the access or egress route. As infants are not to be placed on an elevated surface, the protective barrier for the infant age group must be the same as the crawl wall defined CSA Z614:20, including annex H.

.2 Guardrail

The guardrail for pre-toddler, toddler, and pre-school age groups must be provided on elevated surfaces a minimum 510 mm above the protective surfacing. The guardrail for school-age and pre-teen age groups must be provided on elevated surfaces a minimum 760 mm above the protective surfacing. The guardrail must completely surround the elevated surface except for the access or egress route. As infants are not to be placed on an elevated surface, the guardrail for the infant age group must be the same as the crawl wall defined in CSA Z614:20, including annex H.

.5 Roofs

Roofs must contain no designated play surface.

.6 Sliding Poles

Sliding poles must be a maximum 48 mm diameter and a continuous surface with no protruding welds or joints along the sliding area.

.7 Plastic Slide

The slide must be molded of UV stabilized polyethylene or nylon with minimum of 5 mm wall thickness. The edge must be a minimum 5 mm radius, ASTM D1248, Type II, Class A, Grade G4.

Part 3 Execution

3.1 SITE PREPARATION

.1 Finished Grade and Underground Utilities

Submit finished grade, underground utilities, storm-drainage system and irrigation system status; and location of underground utilities and facilities. The location of underground utilities and facilities in the area of the operation must be verified. Damage to underground utilities and facilities must be repaired at the Contractor's expense.

.2 Layout.

.1 General

The layout of the entire outdoor play area must be staked before excavation begins to include the following: all play event configuration access and egress points; use zone perimeters; hard surface areas and pathway widths; exterior plant material and planters; walls and fences; and structures. Provide sufficient space between all adjacent play events and individual play events for play activities and circulation. Moving and rotating play events must be located away from circulation to prevent collisions.

.2 Use Zone

The use zone is associated with the following terms; "Clear Area," and "Fall Zone". The layout must meet the requirements of CSA Z614:20, including annex H.

.3 Orientation

Bare or painted metal platforms and slide beds must be oriented from the direct sun; or shaded to reduce contact burn risk. Play events that require orientation to adjacent play events or to meet visibility requirements must be properly oriented.

.4 Obstructions Below Ground

When obstructions below ground affect the work, submit shop drawings showing proposed adjustments for approval.

3.2 INSTALLATION

Play events must be installed according to to CSA Z614:20, including annex H.

.1 Play Event Modification

Site modifications of play events affect the coverage provided in paragraph WARRANTY; therefore, play events and equipment must not be modified without the written approval of the manufacturer. Submit manufacturer's written approval.

.2 Wood Finishes

Field applied or touch up of wood finishes must meet the same specifications as finishes applied at the factory. Submit wood finish chemical content and toxicity level.

.3 Plastic Play Events

Plastic and recycled plastic components must be connected by stainless steel hardware. The hardware must be countersunk. Recycled plastic molded as lumber or wood-polymer lumber must be installed in accordance with the manufacturer's recommendations.

.4 Footings

The top elevation of play event footings will be installed at the subbase of the protective surfacing.

.5 Slide

The required exit region clear area must be provided in accordance with ASTM F1487.

.6 Chain or Rope Ladder, Climber or Net Climber

A chain or rope ladder; climber; net climber; and similar components must be installed in the vertical position. Angled or arch positions are not accepted.

.7 Composite Structure

The composite structure use zone perimeter must be composed of the use zone perimeters of the play events that, when joined together, comprise the composite structure.

.8 Signage

Durable permanent signage must be provided to identify the age group the equipment is designed to accommodate. Signage must be in accordance with to CSA Z614:20, including annex H.

3.3 RESTORATION AND CLEAN UP

When the operation has been completed, clean up and protect the site. Existing areas that have been damaged from the operation must be restored to original condition at the Contractor's expense.

.1 Clean Up

The site and play events must be cleaned of all materials associated with the operation. Play events and surfaces must be cleaned of dirt, stains, filings, and other blemishes occurring from shipment and installation. Cleaning methods and agents must be as recommended by the manufacturer. Required labeling must be undamaged and visible in accordance with CSA Z614:20, including annex H.

.2 Protection

The area must be protected as required or directed by providing barricades and signage. Signage must be in accordance with CSA Z614:20, including annex H.

.3 Disposal of Materials:

Excess and waste material must be removed and disposed off property.

3.4 CHILD SAFETY AND ACCESSIBILITY EVALUATION

.1 When the protective surfacing is installed the play events and protective surfacing must be thoroughly inspected and measured to verify the playground meets CSA Z614:20, including annex H.

.2 The play events must be age appropriate for the age group using them in accordance with CSA Z614:20, including annex H. Determine 1) secure anchoring; 2) all hardware and connectors are tight; 3) all hardware and connectors require tools to loosen; 4) all hooks are closed; 5) head and neck entrapment; 6) sharp points, edges, and protrusions; 7) entanglement; 8) pinch, crush, and shear points; 9) suspended hazards; 10) all component holes are filled; and 11) recycled plastic components used as load bearing structural members.

.3 Use zone distances must be measured to determine the area is free of hard surfaces, objects or obstacles. Determine exceptions to use zone overlaps occur in accordance with CSA Z614:20, including annex H. Play event fall height must be measured and compared to critical height value for thickness of installed protective surfacing. The slide exit region must have the required clear zone. Play events and surfaces must be properly oriented. Chain, rope, net climbers or similar components must be installed in a vertical position. Warning labels and manufacturer identification labels must be visible in accordance with CSA Z614:20, including annex H.

.4 Play events that do not comply must be reinstalled. Fasteners, anchors, hardware and labels that do not comply must be replaced. Ensure positive drainage for the area and the lowest elevation of protective surfacing subgrade has been provided. A written report describing the results of the evaluation must be provided.

.5 Submit records of measurements and findings by the certified playground safety inspector. Submit verification stating that the installed play events and equipment meet CSA Z614:20, including annex H.

3.5 RE-INSTALLATION

When re-installation is required, accomplish the following:
_Re-install the product as specified.
_Provide new replacement materials supplied by the manufacturer. Material acquisition of replacement parts is the responsibility of the Contractor. Damage caused by the failed installation must be repaired at the Contractor's expense,
_as specified and to the requirements of CSA Z614:20, including annex H as well as AODA.

END OF SECTION