

<u>Total</u>

<u>Total</u>

<u>Total</u>

Existing New

Total <u>1863</u> <u>127.8</u> <u>1990.8</u>

# TURNBULL LEARNING CENTRE MUSIC ROOM ADDITION

Name of Practice: HOBIN ARCHITECTURE INCORPORATED 63 PAMILLA STREET, OTTAWA, ONTARIO K1S 3K7 TURNBULL LEARNING CENTRE MUSIC ROOM ADDITION Location: HOBIN 1132 FISHER AVE., OTTAWA, ONTARIO ARCHITECTURE Date: 2018-07-09 **Ontario Building Code Data Matrix** Code Part 3 Reference 1 3.00 Building Code Version: Project Type: Addition □ Renovation ☐ Change of use ☐ Addition and renovation 3.02 3.1.2.1.(1) Major Occupancy <u>Occupancy</u> Classification:

	0 Storeys below grade	3.2.1.1.
3.08 High Building	■ No ☐ Yes	3.2.6.
3.09 Number of Streets/ Firefighter access	AS PER EXISTING TO NEW FIRE ROUTE	3.2.2.10. & 3.2.5.
3.10 Building Classification: (Size and Construction Relative to Occupancy)	3.2.2.28 Group/Div GROUP A, DIVISION 2, 1 STOREY	3.2.2.20 83.
3.11 Sprinkler System	☐ Required ■ Not Required  Proposed: ☐ entire building ☐ selected compartments ☐ selected floor areas ☐ basement ☐ in lieu of roof rating ■ none	3.2.1.5. & 3.2.2.17.
3.12 Standpipe System	☐ Not required ■ Required	3.2.9.
3.13 Fire Alarm System	■ Required       □ Not required         Proposed:       ■ Single stage       □ Two stage       □ None	3.2.4.
3.14 Water Service / Supply is Adequate	□ No ■ Yes	
3.15 Construction Type:	Restriction:       ■ Combustible permitted       □ Non-combustible required         Actual:       □ Combustible       ■ Non-combustible       □ Combination         Heavy Timber Construction:       ■ No       □ Yes	3.2.2.20 83. & 3.2.1.4.
3.16 Importance Category:	□ Low       □ Low human occupancy       □ Post-disaster shelter         □ Normal       ■ High       □ Minor storage building       □ Explosive or hazardous substances         □ Post-disaster	4.1.2.1.(3) & T4.1.2.1.B
3.17 Seismic Hazard Index:	$(I_E \text{ Fa Sa } (0.2)) = \underline{0.832}$ Seismic design required for Table 4.1.8.18. items 6 to 21: $((I_E \text{ Fa Sa } (0.2)) \ge 0.35 \text{ or Post-disaster})$ $\square$ No	4.1.2.1.(3) 4.1.8.18.(2)
3.18 Occupant Load  Insert additional lines as needed	Floor Level/Area Occupancy Type Based On Occupant Load (Persons)  LEVEL 1 A2 DESIGN NO ADDITIONAL OCCUANT LOAD TO EXISTING	3.1.17.
3.19 Barrier-free Design:	■ Yes □ No	3.8.

[A] 1.4.1.2. &

CONSTRUCTION ASSEMBLIES

2 x 75mm (STAGGERED) RIGID INSULATION c/w INTEGRAL FACER OR OVERLAY BOARD

AIR VAPOUR BARRIER MEMBRANE 10mm ROOF DECK SHEATHING STEEL DECK, REFER TO STRUCTURAL SLOPED STRUCTURAL STEEL FRAMING/

SEE STRUCTURAL DWGS.

3.20 Hazardous Substances:		□ Yes	3.3.1.2. & 3.3.1.19.
3.21	Required Fire Resistance Ratings	■ No  Horizontal Assembly Rating Supporting Non-combustible Assembly (H) in lieu of rating?	3.2.2.20 83. & 3.2.1.4.
		Floors over basement N/A N/A □ No □ Yes ■ N/A  Floors N/A N/A □ No □ Yes ■ N/A	
		Mezzanine         N/A         N/A         NO         Yes         N/A           Roof         N/A         N/A         NO         Yes         N/A	
3.22	Spatial Separation	Wall       EBF       L.D.       L/H       Required       Construction Type       Cladding Type         Area       (m)       or       FRR (H)       Required       Required         (m²)       H/L	3.2.3.
	Insert additional lines as needed	EAST       30.6       26.7       N/A       N/A       □ Noncombustible       □ Noncombustible         WEST       28.6       6.4       N/A       N/A       □ Noncombustible       □ Noncombustible	
3.23	Plumbing Fixture Requirements  Insert additional lines as needed	Ratio: Male:Female = 50:50 Except as noted otherwise  NO ADDITIONAL OCCUPANT LOAD TO THAT OF EXISTING BUILDING	3.7.4.
3.24	Energy Efficiency:	Compliance Path: N/A  Climatic Zone: N/A	
3.25	Notes:  Insert additional lines as needed	N/A	

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A0.00 SCALE: 1:10

3.03 | Superimposed

3.05

Occupancies:

sert additional lines as needed

sert additional lines as needed

Mezzanine Area

ert additional lines as needed

Gross Area (m²)

Building Area (m²) <u>Description</u>:

Description:

EX. INTERMEDIATE SCHOOL

EX. INTERMEDIATE SCHOOL

October 201

Ontario Building Code Data Matrix, Part 3 October 201 © Ontario Association of Architects

	INTERIOR PARTITIONS:	<b>EXTERIOR WALLS:</b>		PARAPET ASSEMBLY
	iW1 - iW1-92 Stud 16 GYP. BD. TO u/s O 92 METAL STUDS @ FILL W/ BATT INSULA 16 GYP. BD. TO u/s O	600 o.c. MAX. ATION		W1 - W1-275mm FDN WALL 275 CAST-IN-PLACE CONC. FOUNDATION WALL (REFER TO STRUCT) 203 STEEL STUDS @ 400 o.c. SPRAY FOAM MIN. 75mm DEPTH TO BACK
201	iW2 - iW2-92 Stud 2 lz 16 GYP. BD. TO u/s O 16 GYP. BD. TO u/s O 16 GYP. BD. TO u/s O 20 METAL STUDS @ FILL W/ BATT INSULA 16 GYP. BD. TO u/s O 16 GYP. BD. TO u/s O	F DECK  ATION  F DECK  W2  W2	V2	16 GYPSUM BOARD (TAPED, SANDED, PRIMED READY FOR PAINT)  October 2016  W2 - W2-HORZ. WOOD SIDING-SL 16 HORZ. PREFINISHED WOOD SIDING 22 VERT METAL 7-GIRTS @ 400 o.c.  16 HORZ PREFINISHED WOOD SIDING 22 VERT METAL 7-GIRTS @ 400 o.c.
	iW1a iW1a iW1a iW1a iW1a iW1a iW1a iW1a	DECK  0 600 o.c. MAX.  F DECK		90 HORZ. METAL Z-GIRTS @ 600 o.c. c/w 89 SEMI-RIGID INSULATION SELF ADHESIVE AIR/VAPOUR BARRIER MEMBRANE 13 F.GFACED EXTERIOR GRADE GYP. BD. 152 STEEL STUDS @ 400 o.c. 203 STEEL STUDS @ 400 o.c. 16 GYPSUM BOARD U/S DECK (TAPED, SANDED, PRIMED READY FOR PAINT)  22 VERT. METAL Z-GIRTS @ 400 o.c. 90 HORZ. METAL Z-GIRTS @ 600 o.c. c/w 89 SEMI-RIGID INSULATION SELF ADHESIVE AIR/VAPOUR BARRIER MEMBRAN 13 F.GFACED EXTERIOR GRADE GYP. BD. 152 STEEL STUDS @ 400 o.c. 50x50 P.T. WOOD FRAMING FILL VOID w/ RIGID INSULATION
	iW2a - iW2a-152 Stur 16 GYP. BD. TO u/s 0 152 METAL STUDS 0 FILL WI BATT INSUL 16 GYP. BD. TO u/s 0 16 GYP. BD. TO u/s 0	OF DÉCK OF DECK  ② 600 o.c. MAX. ATION OF DECK  W3		W3 - W3-COMPOSITE ALUM SIDING-SL COMPOSITE ALUMINUM PANEL c/w INTEGRAL FRAMING SYSTEM 64 GALV. Z-GIRTS @ 400 o.c. c/w 64 SEMI-RIGID INSULATION SELF ADHESIVE AIR/VAPOUR BARRIER MEMBRANE  16 P.T. PLYWOOD SHEATHING 2-PLY MOD. BIT ROOFING MEMBRANE  P3 P3 - P3-COMP ALUM PANEL PARAPET COMPOSITE ALUMINUM PANEL c/w INTEGRAL FRAMING SYSTEM 64 GALV. Z-GIRTS @ 400 o.c. c/w 64 SEMI-RIGID INSULATION 64 SEMI-RIGID INSULATION
	iW3 iW3 - iW3-22Stud- lay 16 GYP. BD. TO u/s O 22 METAL STUDS @	ers/side IF DECK		SELF ADHESIVE AIR/VAPOUR BARRIER MEMBRANE 13 F. GFACED EXTERIOR GRADE GYP. BD. 203 STEEL STUDS @ 400 o.c. 16 GYPSUM BOARD U/S DECK (TAPED, SANDED, PRIMED READY FOR PAINT)  64 SEMI-RIGID INSULATION SELF ADHESIVE AIR/VAPOUR BARRIER MEMBRANE 13 F. GFACED EXTERIOR GRADE GYP. BD. 152 STEEL STUDS @ 400 o.c. 50x50 P.T. WOOD FRAMING FILL VOID w/ RIGID INSULATION 16 P.T. PLYWOOD SHEATHING 2-PLY MOD. BIT ROOFING MEMBRANE
		EXIST 13 MA		W4 - W4-New Cement Board on Ex. COMPOSITE CEMENT BOARD PANEL c/w INTEGRAL HORZ. & VERT. REVEAL SYSTEM 125 GALV. METAL X-GIRT @ 400 o.c. HORZ. c/w SEMI-RIGID INSUL. S/A AIR BARRIER MEMBRANE 13 F.G. FACED EXT. GRADE GYP. BD. OVER EXISTING 38x89 WD. STUD FRAMING
	ROOF ASSEMBLY:			

ISSUED FOR BUILDING PERMIT

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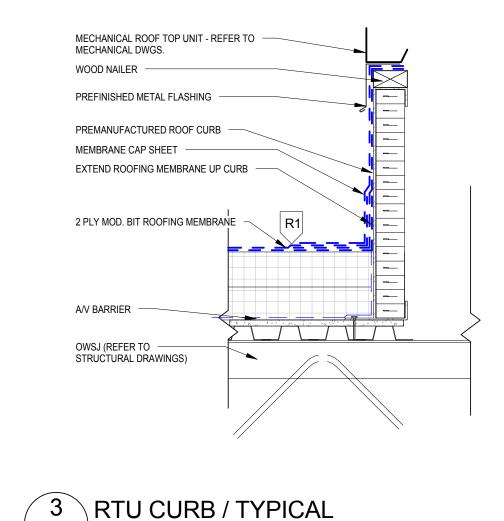
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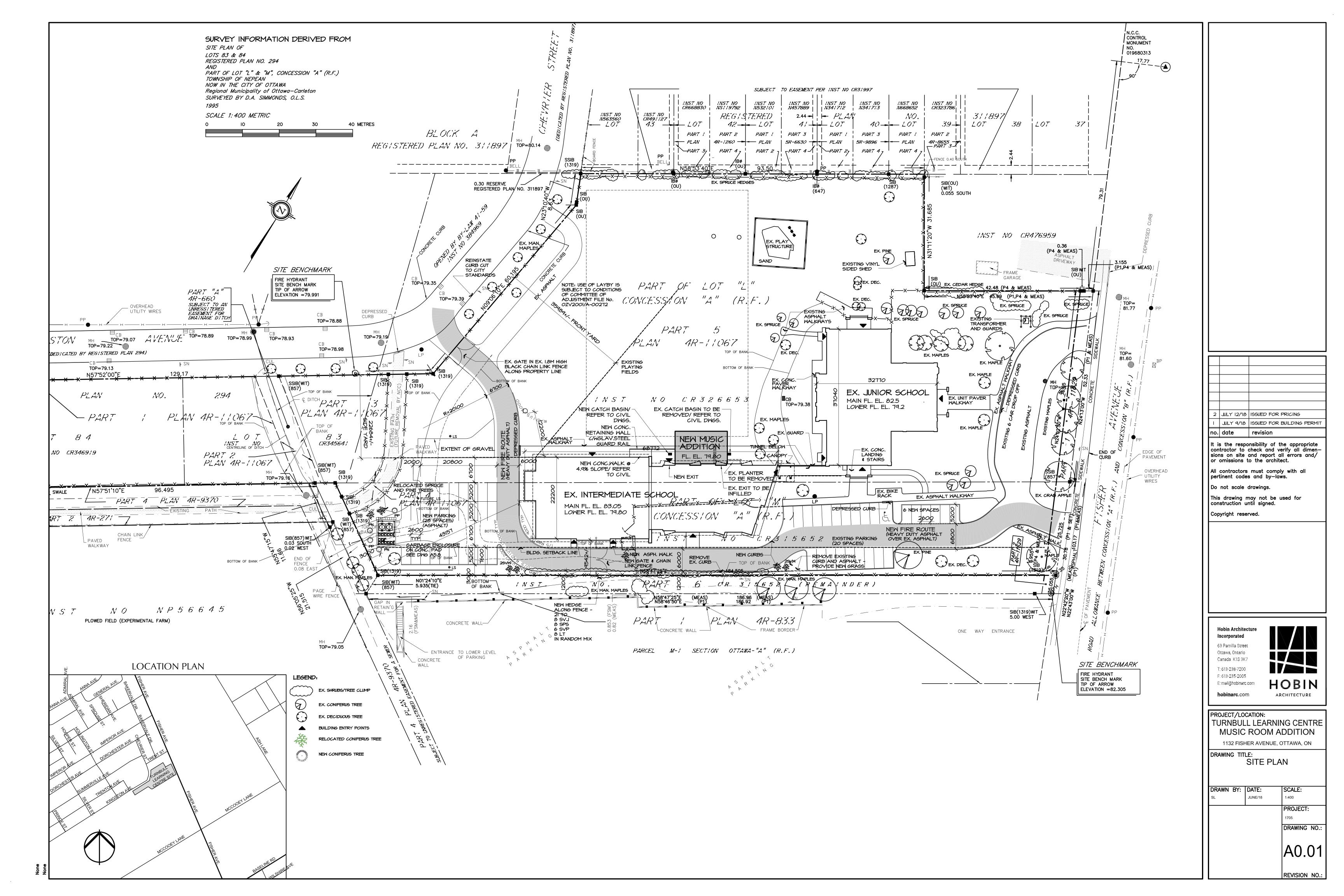
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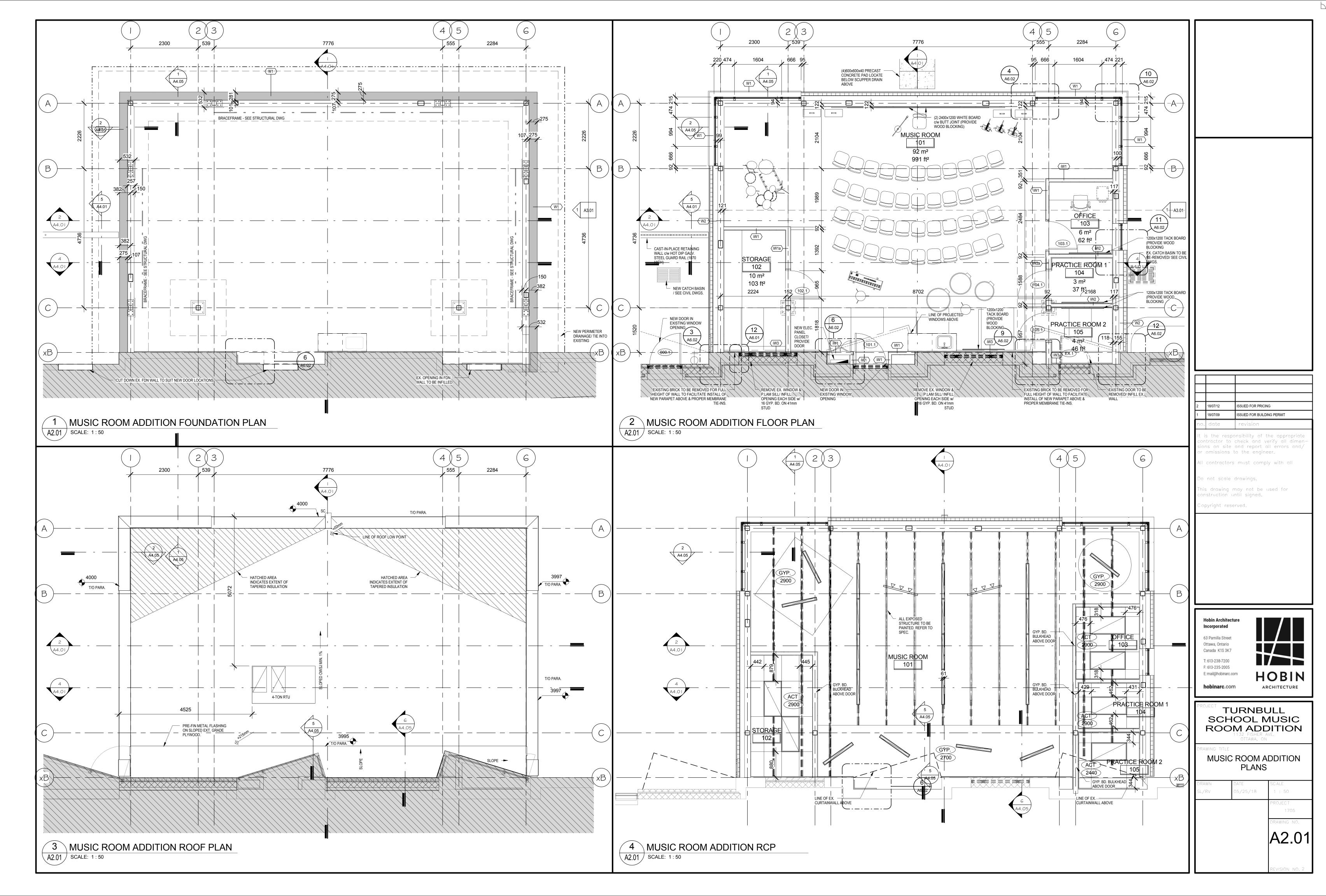
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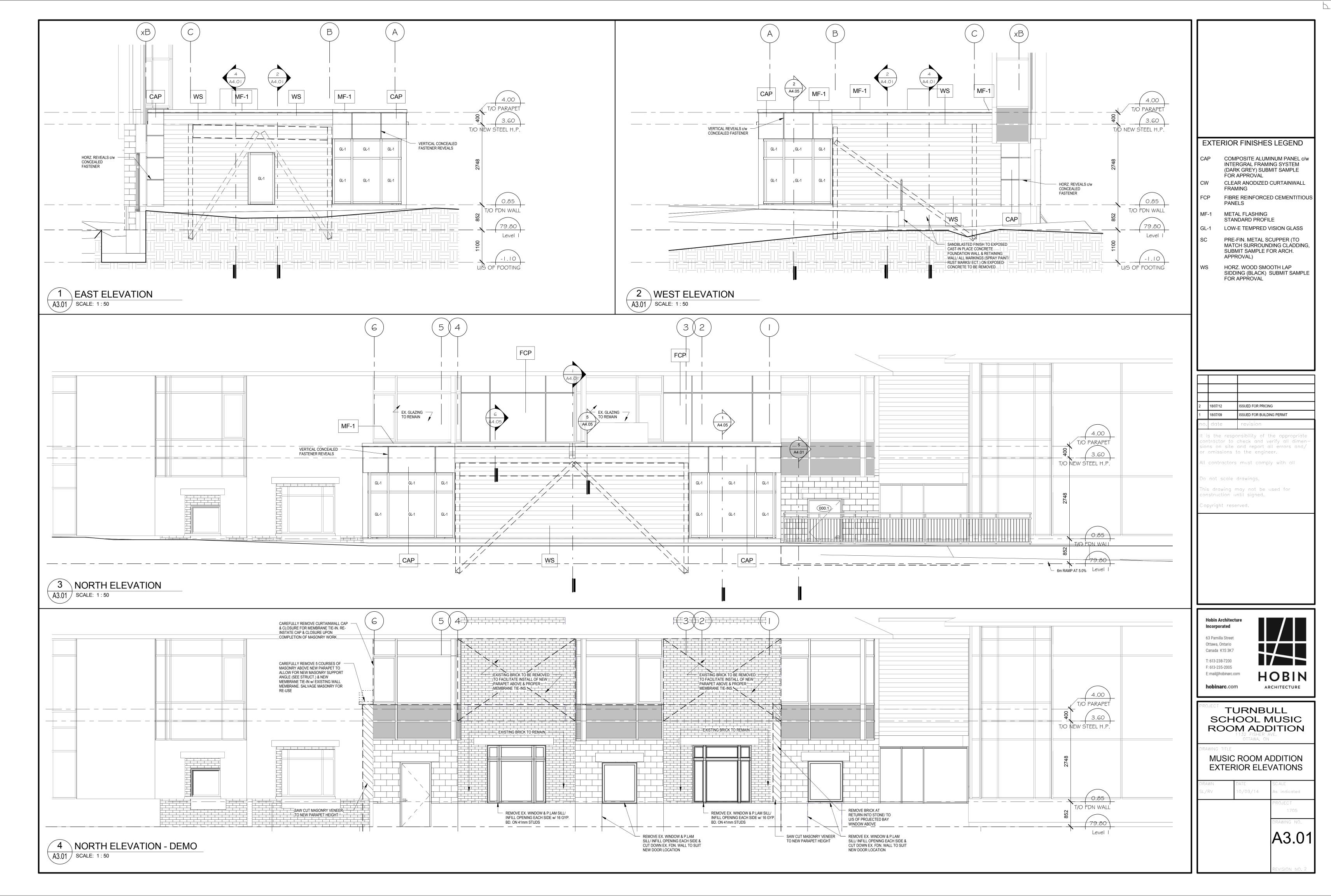
TURNBULL **SCHOOL MUSIC ROOM ADDITION** 

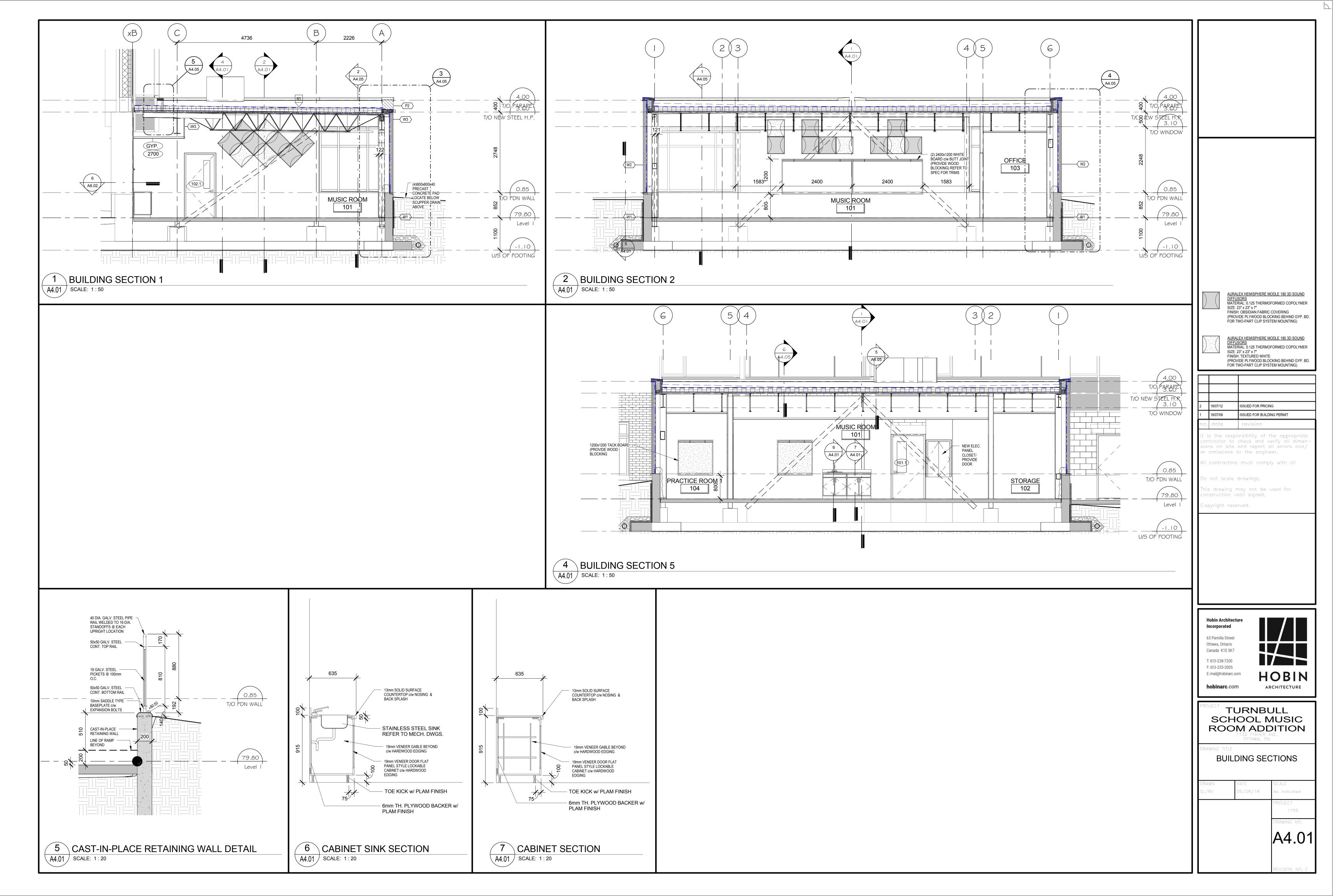
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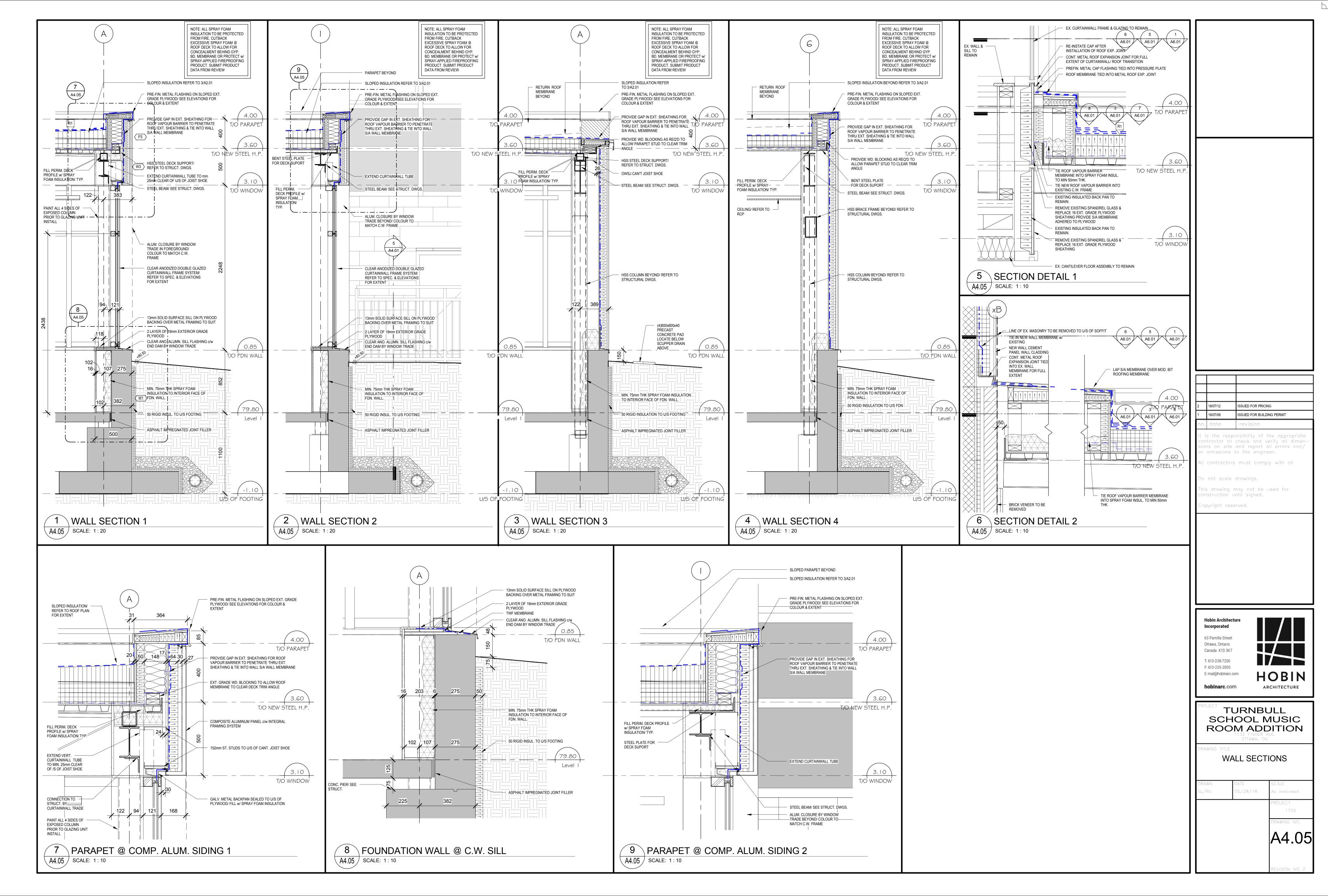


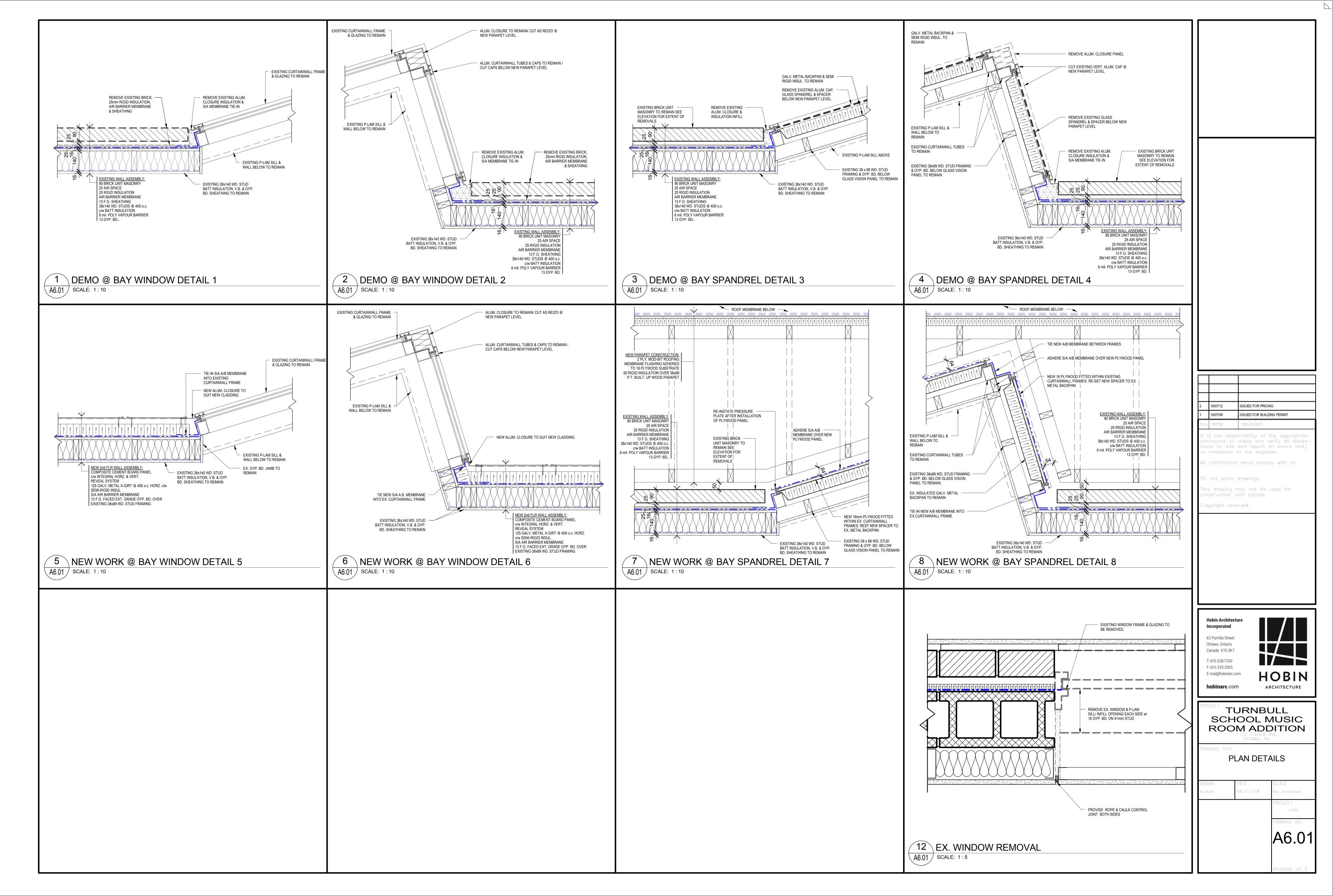


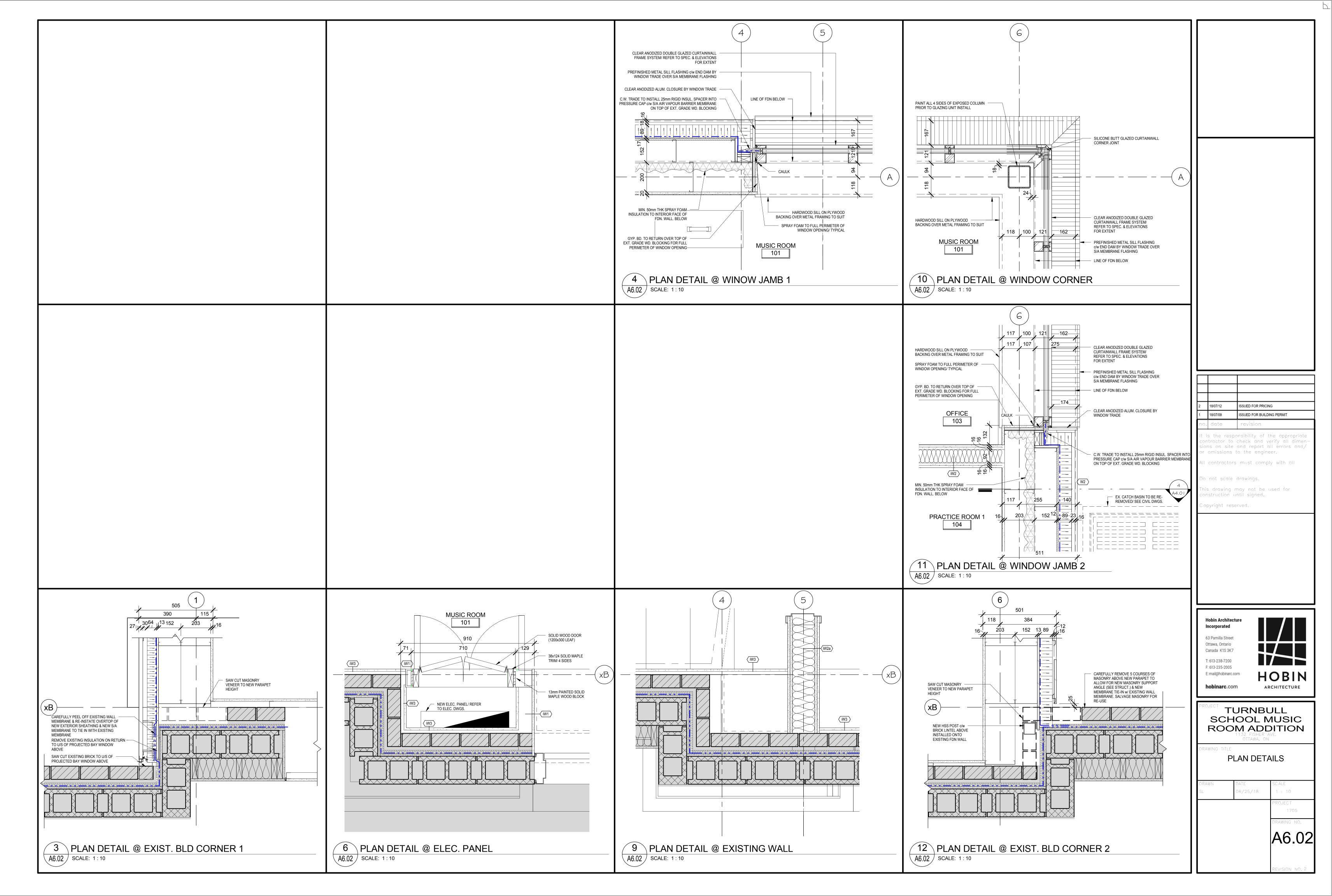


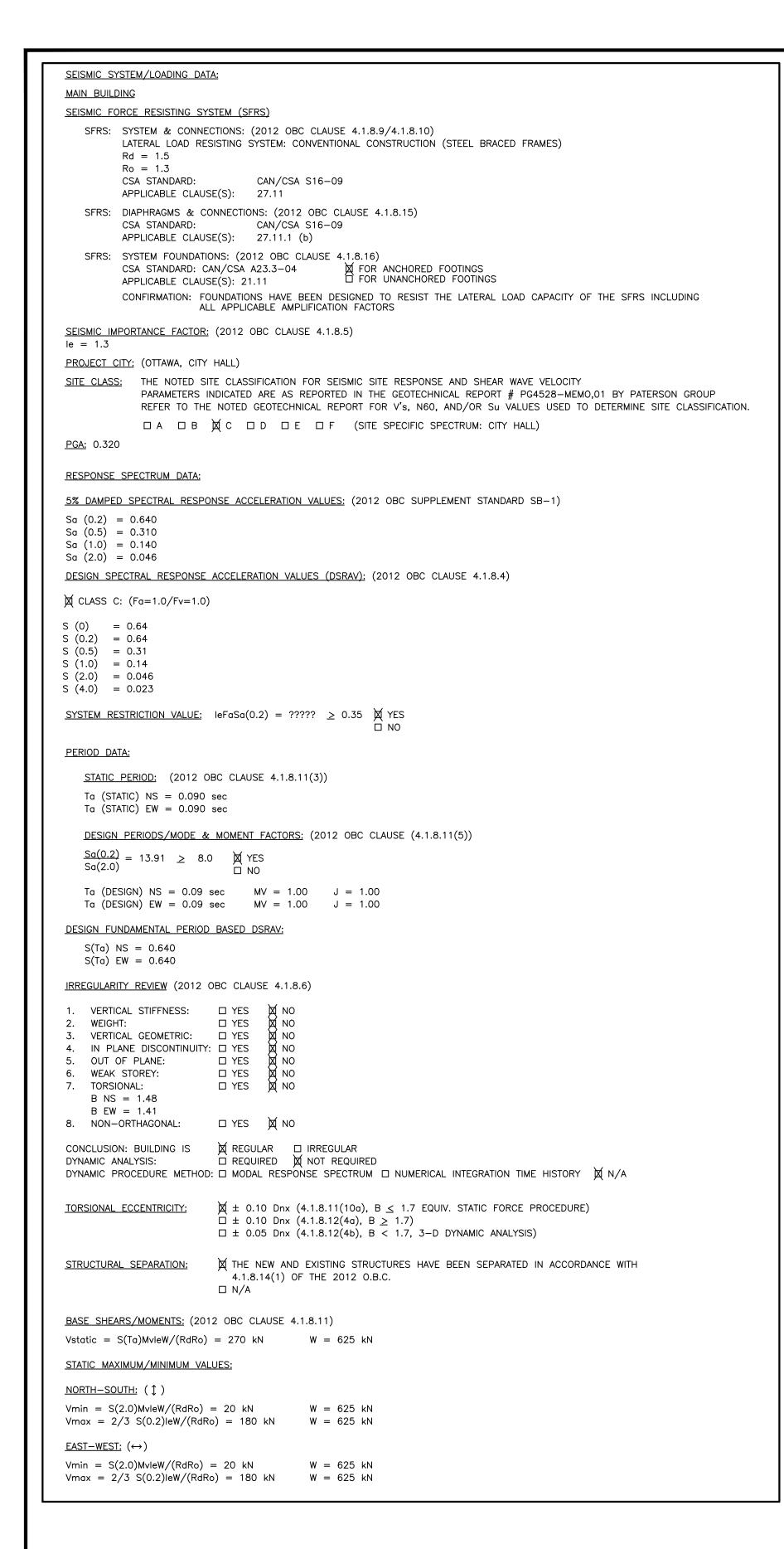












SEISMIC LOADS STATIC LOADS DESIGN LOADS NORTH-SOUTH: (↑) Vdns = 180 kNVstns = 180 kNW = 625 kNMdns = 650 kNmMstns = 650 kNmEAST-WEST:  $(\leftrightarrow)$ Vstew = 180 kNVdew = 180 kNW = 625 kNMdew = 650 kNmMstew = 650 kNmNOTES: 1) <u>DYNAMIC LOAD SCALING FACTOR</u> S.F. =  $g \cdot le = 0.667 g$ 

WIND UPLIFT (REF FIG I-9 NBC 2010 STRUCTURAL COMMENTARY I)

SHEAR AND CORRESPONDING OVERTURNING MOMENT.

PNET = 1.4 (pe-pi) - 0.9 DPe = Iw q Ce Cp Cg Pf = 1.4 Pw NET - 0.9 PdPw NET = Pe - PiPi = lw q Ce Cpi Cqi Pw NET INTERIOR = 1.04 kPa z = 1.5 m

Pw NET PERIMETER = 1.37 kPa DESIGN SNOW LOAD PARAMETERS OTTAWA, ONTARIO, CANADA

DESIGN LOAD SHEAR VALUES ARE BASED ON THE EVALUATION OF Vst AND Vd IN ACCORDANCE

WITH 4.1.8.12 (5),(6),(7),(8), AND (9) OF THE 2012 OBC. LOADS INDICATED SHOW THE DESIGN BASE

Ss = 2.4 kPaSr = 0.4 kPals = 1.15S = 1.15 [2.4(0.8x1.0x1.0x1.0)+0.4]

S = Is [Ss(CbCwCsCa) + Sr]

S= 2.67 kPa

(2012 OBC 4.1.7, 2010 NBC COMMENTARY FIGURE I-7 TO I-9) P= Iw q Ce Cp Cg q = 0.41 kPalw (uls) = 1.15 lw (sls) = 0.75

Ce = 0.9

CpCg = 1.3 OR 1.95 $N.S(\updownarrow)$   $E.W(\leftrightarrow)$  UNITS **VBASE** 18 KN MBASE 65 105 NORTH FOR THE PURPOSES OF THIS DATA IS AT THE TOP SIDE OF ALL PLANS IN THIS SET OF DRAWINGS

REINFORCING BAR LAP LENGTH TABLE								
CONCRETE STRENGTH	REINFO	RCING B	AR LAP L	ENGTH (r	mm)			
(MPa)	10M	15M	20M	25M	30M	35M	45M	55M
20	475	700	850	1325	1575	1875	2300	2975
25	425	600	750	1200	1400	1675	2050	2650
30	400	550	675	1100	1275	1525	1875	2425
35	375	525	625	1000	1200	1425	1750	2250
40	350	475	600	950	1125	1325	1625	2100
45	325	450	550	900	1050	1250	1525	1975
50	300	425	525	850	1000	1200	1450	1875
55	300	425	500	800	950	1150	1400	1800
60	300	400	475	775	925	1100	1325	1725
64	300	375	475	750	875	1050	1300	1650

FOR SPECIAL CONDITIONS MULTIPLY THE VALUES LISTED ABOVE BY THE

FOLLOWING FACTORS:

1. EPOXY COATED REINFORCING (X 1.5) 2. HORIZONTAL REINFORCING WITH >300 mm CONCRETE BELOW (X 1.3) 3. FOR CONDITIONS 1 & 2 OCCURRING SIMULTANEOUSLY (X 1.7)

#### DESIGN & DETAILING CRITERIA FOR SUPPLIERS

STRUCTURAL STEEL CONNECTIONS

STRUCTURAL STEEL CONNECTIONS ARE TO BE DESIGNED AND DETAILED BY STRUCTURAL STEEL SUPPLIER. SHOP DRAWINGS ARE TO BE SUBMITTED TO DESIGN TEAM FOR REVIEW. SHOP DRAWINGS ARE TO BE STAMPED AND SIGNED 'FOR CONNECTIONS ONLY' BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. INSPECTION OF WELDS, CONNECTIONS & INSTALLATION IS TO BE UNDERTAKEN BY A 3RD PARTY, CERTIFIED INSPECTION SERVICE.

COLD FORMED STEEL STUDS & JOISTS STEEL STUDS & JOISTS ARE TO BE DESIGNED AND DETAILED BY STEEL STUDS & JOISTS SUPPLIER. SHOP DRAWINGS ARE TO BE SUBMITTED TO DESIGN TEAM FOR REVIEW. SHOP DRAWINGS ARE TO BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. ALL STEEL STUD & JOIST WORK IS TO BE INSPECTED DURING CONSTRUCTION BY THE STEEL STUD & JOIST DESIGN ENGINEER.

MISCELLANEOUS METALS & STEEL STAIRS MISC METALS & STEEL STAIRS ARE TO BE DESIGNED AND DETAILED BY MISC METALS & STEEL STAIRS SUPPLIER. SHOP DRAWINGS ARE TO BE SUBMITTED TO DESIGN TEAM FOR REVIEW. SHOP DRAWINGS ARE TO BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. ALL MISC METAL & STEEL STAIR WORK IS TO BE INSPECTED DURING CONSTRUCTION BY THE MISC METALS & STEEL STAIRS DESIGN ENGINEER.

**GUARDS & HANDRAILS** GUARDS & HANDRAILS ARE TO BE DESIGNED AND DETAILED BY STEEL SUPPLIER IN ACCORDANCE WITH THE CURRENT BUILDING CODE REQUIREMENTS. SHOP DRAWINGS ARE TO BE SUBMITTED TO DESIGN TEAM FOR REVIEW. SHOP DRAWINGS ARE TO BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. ALL GUARDS & HANDRAIL WORK IS TO BE INSPECTED DURING CONSTRUCTION BY THE GUARD & HANDRAIL DESIGN ENGINEER.

5. <u>SEISMIC RESTRAINT OF MECH'L EQUIPMENT & PIPING</u> SEISMIC RESTRAINT OF MECH'L EQUIPMENT & PIPING TO BE DETAILED BY MECH'L FOUIPMENT & PIPING SUPPLIER OR CONTRACTOR. SHOP DRAWINGS ARE TO BE SUBMITTED TO DESIGN TEAM FOR REVIEW. SHOP DRAWINGS ARE TO BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. ALL SEISMIC RESTRAINT INSTALLATIONS ARE TO BE INSPECTED DURING CONSTRUCTION BY THE DESIGN ENGINEER OF RECORD

6. <u>SEISMIC RESTRAINT OF SUSPENDED CEILINGS</u> SEISMIC RESTRAINT OF SUSPENDED CEILINGS TO BE DETAILED BY CEILING SUPPLIER OR CONTRACTOR. SHOP DRAWINGS ARE TO BE SUBMITTED TO DESIGN TEAM FOR REVIEW. SHOP DRAWINGS ARE TO BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. ALL SEISMIC RESTRAINT INSTALLATIONS ARE TO BE INSPECTED DURING CONSTRUCTION BY THE DESIGN ENGINEER OF RECORD

7. TEMPORARY SHORING (FOR DEMOLITION AND/OR CONSTRUCTION) TEMPORARY SHORING FOR THE PURPOSES OF DEMOLITION AND/OR CONSTRUCTION IS TO BE DESIGNED & DETAILED BY A PROFESSIONAL ENGINEER LICENSED IN ONTARIO. SHOP DRAWINGS ARE TO BE SUBMITTED TO THE DESIGN TEAM FOR REVIEW. SHOP DRAWINGS ARE TO BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO. PERMIT REVIEW OF TEMPORARY SHORING BY CUNLIFFE & ASSOCIATES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND/OR DEMOLITION AND ALSO PRIOR TO REMOVAL OF TEMPORARY SHORING.

INSPECTION REPORTS CREATED AS A RESULT OF THE ABOVE NOTED WORK MUST BE SUBMITTED TO THE CONSTRUCTION MANAGER. CONSTRUCTION MANAGER IS TO PROVIDE COPIES TO THE

#### GENERAL NOTES

ANY DEVIATION FROM THE CONDITIONS SHOWN ON THESE

2. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF PART 4 OF THE O.B.C. (2012 EDITION) ONTARIO REGULATION 332/12 (AS AMENDED)

DRAWINGS MUST BE REPORTED TO THE ENGINEER.

**STANDARDS** -CSA STANDARD A23.3-04 DESIGN OF CONCRETE STRUCTURES -CAN/CSA-S16-09 LIMIT STATES DESIGNS OF STEEL STRUCTURES -CSA STANDARD S304.1-04 DESIGN OF MASONRY STRUCTURES

4. ANY MODIFICATIONS TO EXISTING STRUCTURES ARE TO BE LIMITED TO WORK NOTED ON THESE DRAWINGS. ANY ADDITIONAL OR PROPOSED MODIFICATIONS TO EXISTING STRUCTURES MUST BE APPROVED BY THE ENGINEER

#### 5. <u>FOUNDATIONS</u>

.1 ALL FOOTINGS ARE TO BEAR ON NATURAL UNDISTRIBUTED SOIL OR ENGINEERED FILL. SLS= 125 kPa/ULS=175 kPa

.2 BEARING CAPACITY USED IN THE FOOTING DESIGN IS ASSUMED TO BE

OF 1 HORIZONTAL TO 1 VERTICAL.

.3 BEARING SURFACE IS TO BE INSPECTED BY GEOTECHNICAL ENGINEER PRIOR TO PLACING CONCRETE.

.4 FOR FURTHER INFORMATION SEE GEOTECHNICAL REPORT No. PG4528-MEMO,01 PREPARED BY PATERSON GROUP .5 STEP FOOTINGS WHERE INDICATED ON PLAN AT THE RATE

#### 6. <u>SLABS ON GRADE</u>

.1 SLABS ON GRADE TO BE UNREINFORCED UNLESS NOTED. .2 FOR COMPOSITION & COMPACTION OF FILL SUPPORTING SLABS ON GRADE SEE GEOTECHNICAL REPORT. .3 PROVIDE 12 mm ASPHALT IMPREGNATED FIBREBOARD

BETWEEN SLABS ON GRADE & FOUNDATION WALLS OR COLUMNS. .4 SAWCUT SLAB ON GRADE TO (1/4 x SLAB DEPTH) 8 HOURS

AFTER CONCRETE PLACEMENT. .5 SPACE SAWCUTS ON A 4500 mm x 4500 mm MAXIMUM GRID. AVOID LONG & NARROW SAWCUT PATTERNS. LOCATE SAWCUTS ALONG COLUMN LINES WHERE POSSIBLE. CONTRACTOR IS TO PROVIDE THE ENGINEER WITH DOCUMENTATION SHOWING PROPOSED SAWCUT LOCATIONS FOR APPROVAL UNLESS SAWCUTS LOCATIONS ARE OTHERWISE INDICATED ON THESE DRAWINGS.

#### **MATERIALS**

1 CONCRETE STRENGTH AT 28 DAYS TO BE AS NOTED

ON THESE DRAWINGS AND SPECIFICATIONS. .2 REINFORCING STEEL TO BE DEFORMED GRADE 400R WITH Fv= 400 MPa.

.3 HOLLOW STRUCTURAL STEEL SECTIONS TO BE ASTM A500

GRADE C OR G40.21 350W CLASS C. .4 ALL 'W' & 'WWF' SHAPE STEEL SECTIONS TO BE GRADE

G40.21 350W WITH Fy= 350 MPa. .5 ALL OTHER STRUCTURAL STEEL TO BE GRADE G40.21 300W WITH Fy= 300 MPa UNLESS NOTED OTHERWISE.

.6 ALL STRUCTURAL STEEL TO RECEIVE 1 SHOP APPLIED COAT OF PRIMER UNLESS NOTED.

.7 ALL STRUCTURAL STEEL EXPOSED TO EXTERIOR IS TO BE HOT DIP GALVANIZED UNLESS NOTED.

.8 ANCHOR BOLTS TO BE A307.

.9 ALL OTHER BOLTS TO BE A325. .10 A325 BOLTS EXPOSED TO EXTERIOR ARE TO BE STAINLESS STEEL

.11 A307 BOLTS EXPOSED TO EXTERIOR ARE TO BE GALVANIZED. .12 CONCRETE BLOCK TO BE H/15/A/M

.13 CONCRETE BLOCK MASONRY MORTAR TO BE 8.5 MPa TYPE 'S' U/N. .14 CONCRETE BLOCK MASONRY GROUT TO BE 12 MPa "HIGH SLUMP" (200-250 mm SLUMP)

#### CONCRETE COVER

.1 FOOTINGS 75 mm BOTTOM 50 mm SIDES

.2 WALLS 40 mm UNLESS NOTED OTHERWISE .3 COLUMNS

8. REINFORCING STEEL DESIGNATION

8-20M × 1500 T/B

8 = NUMBER OF BARS 20M = SIZE OF BARS

1500 = LENGTH OF BARS T = BAR LOCATION - TOPB = BAR LOCATION - BOT

LENGTH OF BARS DOES NOT INCLUDE HOOKS OR BENDS <u>DOWELS</u>

DOWELS TO FOOTINGS TO BE OF SAME DIAMETER AS THE LOWEST LIFT OF VERTICAL REINFORCING IN COLUMNS, PIERS OR WALLS.

10. <u>REINFORCING STEEL SPLICES</u> REINFORCING STEEL SPLICES TO BE AS NOTED IN REINFORCING BAR LAP LENGTH TABLE ON SO1 U/N.

#### 11. OPENINGS

.1 AT OPENINGS IN WALLS PROVIDE 2-20M T & B OF OPENING EXTENDING 600 mm MIN. BEYOND CORNERS OF OPENINGS. .2 FOR ADDITIONAL OPENINGS 300 x 300 OR SMALLER SEE ARCHITECTURAL & MECHANICAL DRAWINGS.

HE CONTRACTOR THAT WILL BE INSTALLING ANY HILTI PRODUCT

REPRESENTATIVE ON THE ACCEPTABLE INSTALLATION PROCEDURES

CONTRACTOR IS TO PRESENT PROOF OF THIS TRAINING UPON

.3 REPORT ANY OPENINGS LARGER THAN 300 x 300 NOT SHOWN ON THESE DRAWINGS TO THE ENGINEER.

<u>HILTI PRODUCT INSTALLATION REQUIREMENTS</u>

REQUEST OF DEPARTMENTAL REPRESENTATIVE.

SHALL BE TRAINED & CERTIFIED BY HILTI CANADA'S

FOR THE SPECIFIC HILTI PRODUCT BEING USED. THE

2. <u>LOADS</u> ALL LOADS & FORCES INDICATED ON THESE DRAWINGS ARE UNFACTORED WORKING LOADS UNLESS NOTED.

**DRAWING LIST** 

S02 TYPICAL DETAILS

S300 SECTIONS & DETAILS

S301 SECTIONS & DETAILS

SO1 SEISMIC DATA & GENERAL NOTES

S100 FOUNDATION PLAN & ROOF PLAN

S200 BRACE FRAME ELEVATIONS

#### . CONCRETE BLOCK MASONRY

ALL LOAD BEARING & NON-LOAD BEARING IN EXTERIOR WALLS (U/N) .1 140 mm CONCRETE BLOCK: VERT: 1-15M @ 800 o/c

HORIZ: SL2 @ 200 o/c OR HL2 @ 400 o/c .2 190 mm CONCRETE BLOCK

VERT: 1-15M @ 800 o/c

HORIZ: HL2 @ 200 o/c .3 240 mm CONCRETE BLOCK VERT: 1-20M @ 800 o/c

VERT: 1-20M @ 600 o/c HORIZ: HL2 @ 200 o/c + 1-20M HORIZ. @ 1800 o/c

2 NON-LOAD BEARING INTERIOR WALLS (U/N)

.1 140 mm CONCRETE BLOCK: VERT: 1-15M @ 800 o/c

HORIZ: HL2 @ 200 o/c

.4 290 mm CONCRETE BLOCK

HORIZ: SL2 @ 200 o/c .2 190 mm CONCRETE BLOCK

VERT: 1-15M @ 1200 o/c HORIZ: HL2 @ 400 o/c

.3 240 mm CONCRETE BLOCK VERT: 1-20M @ 1200 o/c HORIZ: HL2 @ 200 o/c

S-STANDARD 9 GAUGE LONGITUDINAL & CROSS WIRES

H-HEAVY 5 mm LONGITUDINAL WIRES 9 GAUGE CROSS WIRES L- LADDER TYPE REINFORCEMENT T- TRUSS TYPE REINFORCEMENT

2-2 LONGITUDINAL WIRES 3 SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR

TYING MASONRY TO BACK UP WALLS. 4 SPECIAL WALLS - SEE NOTES ON PLANS FOR ADDITIONAL REINFORCING AND GROUTING OTHER THAN INDICATED ABOVE

5 REINFORCE CELLS @ END OF WALLS AT INTERSECTING WALLS & BESIDE OPENINGS.

6 GROUT MASONRY SOLID BELOW BEARING BASE PLATES FOR 500mm MIN 7 PROVIDE A CONCRETE BOND BEAM COURSE c/w 1-20M CONT. USING LOW WEB BLOCKS AT THE TOP OF WALLS AND

AT EACH FLOOR LEVEL U/N. GROUT COURSE SOLID. 8 PROVIDE 1-20M CORNER BAR (925 BEND x 925 BEND) AT AT CONCRETE BOND BEAM COURSES @ BLOCK WALL INTERSECTIONS. PROVIDE "CLEAN OUTS" AT BOTTOM OF CELLS TO BE GROUTED TO ENSURE PROPER LAP LENGTH AND THAT CELL IS FILLED

SOLIDLY. MAXIMUM GROUT LIFT IS 3 meters. GROUT TO HAVE 250mm SLUMP O EMBEDMENT OF MASONRY DOWELS IN CONCRETE STRUCTURE BELOW CONCRETE BLOCK WALLS TO BE AS FOLLOWS: 15M DOWELS = 600 mm EMBEDMENT - 1300 Lg. DOWEL 20M DOWELS = 800 mm EMBEDMENT - 1700 Lg. DOWEL

BLOCK CONTROL JOINT SPACED AT 9000 mm MAXIMUM VENEER CONTROL JOINT SPACED AT 12000 mm MAXIMUM COORDINATE LOCATION OF JOINTS WITH ARCHITECT & ENGINEER

#### . <u>LEGEND</u>

B = BOTTOMB1 = BOTTOM LOWER LAYER

B2 = BOTTOM UPPER LAYER BLL = BOTTOM LOWER LAYER

BBP1 = BEAM (OR OWSJ) BEARING PLATE NUMBER BP1 = BASE PLATE NUMBER

BUL = BOTTOM UPPER LAYER

C1 = COLUMN NUMBER CJ = CONCRETE BLOCK WALL CONTROL JOINT

CONT = CONTINUOUS

DP = DEPTHDWL = DOWELS

EE = EACH END EF = EACH FACE

EL = ELEVATION ES = EACH SIDE

EW = EACH WAY

F1 = PAD FOOTING NUMBER

H = HORIZONTAL

(H) = HOOKED BARMP1 = MASONRY PIER NUMBER

O/C = ON CENTER

P1 = PIER NUMBER

T = TOP

T1 = TOP UPPER LAYER T2 = TOP LOWER LAYER TLL = TOP LOWER LAYER

TUL = TOP UPPER LAYER

U/N = UNLESS NOTED OTHERWISEV = VERTICAL WF1 = WALL FOOTING NUMBER

> HOBIN ARCHITECTURE DRAWING

ISSUED FOR PERMIT

REVISION

ANY DISCREPANCY SHALL BE REPORTED TO THE ENGINEER.

4. DO NOT SCALE DRAWINGS.

. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS.

. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL MATERIAL RELEVANT TO

. ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST PROPER

EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT

AS IF THEY WERE INCLUDED WITH THE DRAWINGS IN THE CONTRACT DOCUMENTS.

PROJECT

TURNBULL SCHOOL

ARCHITECT

2018/06/2

DATE

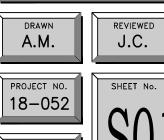
SEISMIC DATA & GENERAL NOTES





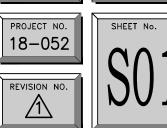
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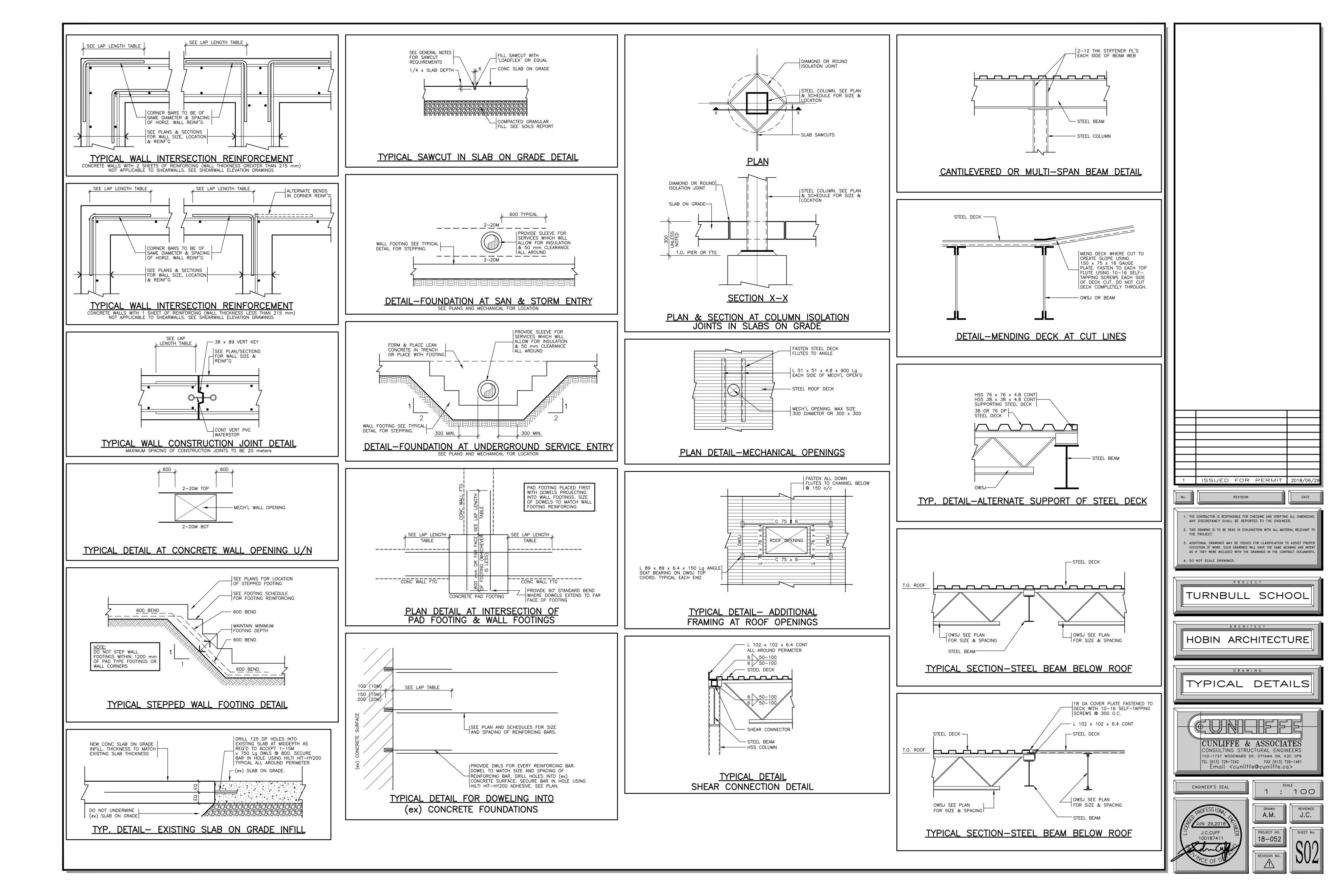


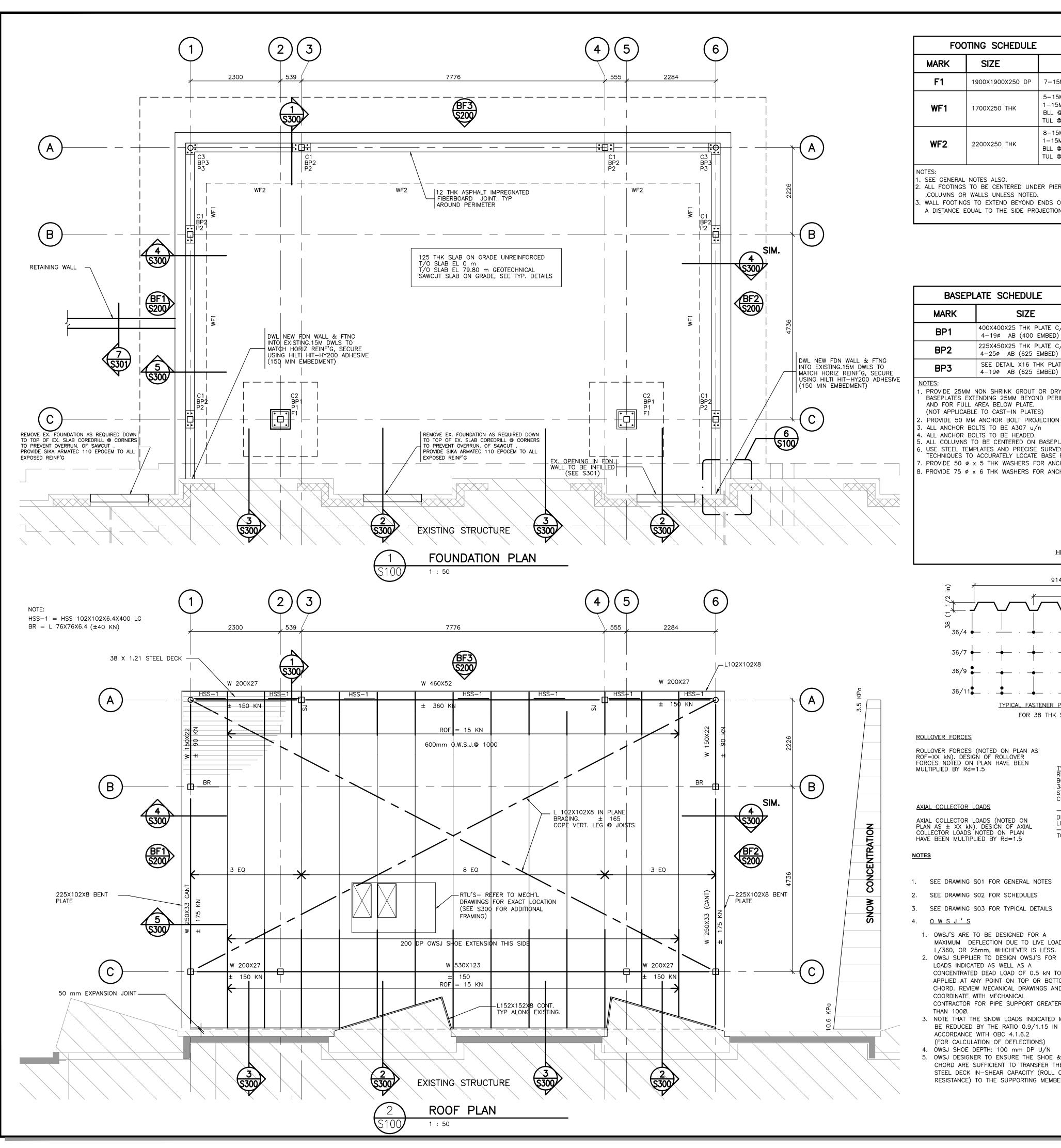


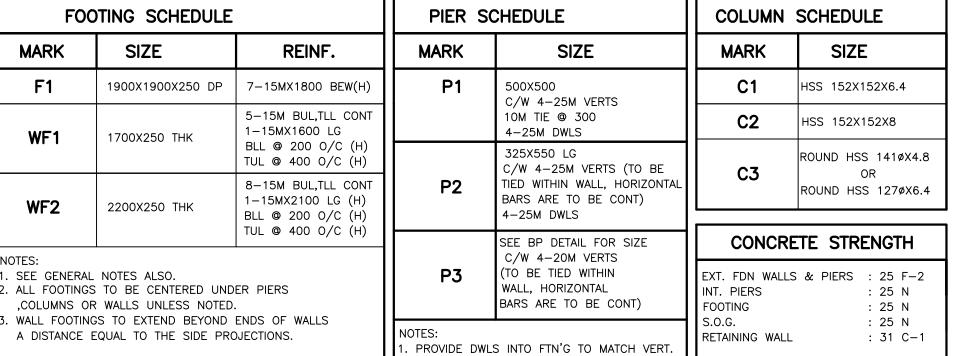




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PIER REINF'G

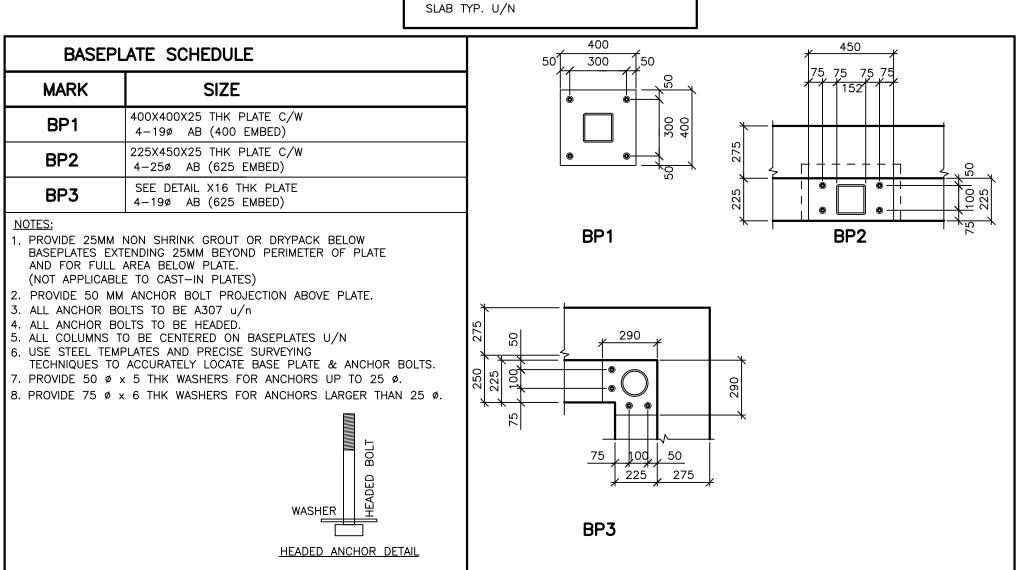
O/C AT TOP OF PIERS.

CONCRETE PIERS.

PROVIDE 3 SETS OF TIES SPACED @ 75

. HORIZ FND WALL REINF'G TO EXTEND THRU

TOP OF PIER TO BE 200 BELOW TOP OF



914 (36 in) STEEL DECK NOTES: TYPICAL ROOF DECK 152 (6 in) 1.  $38 \times 1.21$  INTERLOCKING (CANAM P-3615 OR EQUIVALENT) 3. 36/9 FASTENER PATTERN 4. 19mm PUDDLE WELDS TO SUPPORTING MEMBERS 5. FASTENER SPACING AROUND PERIMETER & OPENINGS TO BE 150 o/c 6. DECK BE 3 SPAN MINIMUM 7. STEEL DECK IS NOT TO BE USED FOR SUPPORT OF ARCH'L, MECH'L OR ELECT'L ITEMS. USE STEEL STRUCTURE FOR SUPPORT. MECHANICAL ROOF TOP UNIT LEGEND: RTU (763 lbs + 300 lbs (CURB) = 1063 lbs) 1749 x 1124 x (921+356 (CURB)) mm TALL

> FABRICATOR TO COORDINATE EXACT DIMENSIONS. SEE DETAILS ON \$300 FOR ADDITIONAL FRAMING

MECHANICAL CONTRACTOR AND STEEL

ROOF LOADS

ROLLOVER FORCES (NOTED ON PLAN AS ROF=XX kN). DESIGN OF ROLLOVER FORCES NOTED ON PLAN HAVE BEEN MULTIPLIED BY Rd=1.5

JED BY Rd=1.5	TYPICAL ROOF RFN'G & INSUL BOARD 38 STEEL DECK STRUCTURE CEILING/MECH/MISC	0.60 kPa 0.10 0.15 0.25 0.35
COLLECTOR LOADS		
COLLECTOR LOADS (NOTED ON S ± XX kN). DESIGN OF AXIAL	DEAD LOAD LIVE LOAD	1.45 kPa 2.67 kPa (OR SNOW)
TOR LOADS NOTED ON PLAN EEN MULTIPLIED BY Rd=1.5	TOTAL LOAD	4.12 kPa (OR DL+SNOW)

TYPICAL FASTENER PATTERNS @ SUPPORT

FOR 38 THK STEEL DECK

ROOF-BELOW RTU'S	
MECH'L/ELECT'L CONC LEVELING 62mm CONC. SLAB ON DECK ROOFING & INSULATION STEEL DECK STRUCTURE CEILING	3.00 kPa 1.20 1.75 0.60 0.10 0.25 0.15
DEAD LOAD LIVE LOAD	7.05 kPa 2.67 kPa (OR SNOW)
TOTAL LOAD	9.72 kPa (OR DL+SNOW)

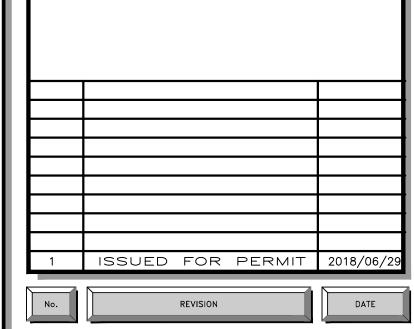
- 1. SEE DRAWING SO1 FOR GENERAL NOTES
- 2. SEE DRAWING SO2 FOR SCHEDULES
- 3. SEE DRAWING SO3 FOR TYPICAL DETAILS
- MAXIMUM DEFLECTION DUE TO LIVE LOADS L/360, OR 25mm, WHICHEVER IS LESS. 2. OWSJ SUPPLIER TO DESIGN OWSJ'S FOR LOADS INDICATED AS WELL AS A CONCENTRATED DEAD LOAD OF 0.5 kN TO BE APPLIED AT ANY POINT ON TOP OR BOTTOM
- CHORD. REVIEW MECANICAL DRAWINGS AND COORDINATE WITH MECHANICAL CONTRACTOR FOR PIPE SUPPORT GREATER THAN 100Ø. 3. NOTE THAT THE SNOW LOADS INDICATED MAY
- (FOR CALCULATION OF DEFLECTIONS) OWSJ SHOE DEPTH: 100 mm DP U/N OWSJ DESIGNER TO ENSURE THE SHOE & TOP CHORD ARE SUFFICIENT TO TRANSFER THE STEEL DECK IN-SHEAR CAPACITY (ROLL OVER RESISTANCE) TO THE SUPPORTING MEMBER.

5. <u>OWSJLEGEND</u>

TIE JOIST = TJ

- PROVIDE 2-12 mm THK STIFFENER PLATES EACH SIDE OF ALL BEAM WEBS WHICH ARE CONTINUOUS OVER SUPPORTS (ie.
- OWSJ TOP & BOTTOM CHORD BRIDGING
- 1. THE BRIDGING LINES INDICATED ON PLAN ARE TO BE CONSIDERED A MINIMUM.
- 2. OWSJ MANUFACTURER TO REVIEW BRIDGING REQUIREMENTS WITH RESPECT TO ERECTION & WIND SUCTION ON THE ROOF AND ADD BRIDGING AS REQUIRED.
- 3. BRIDGING IS TO BE EQUALLY SPACED OVER LENGTH OF OPEN WEB STEEL JOISTS. 4. PROVIDE DIAGONAL BRIDGING AT BEAMS & AT
- END SPACES. 5. OWSJ MANUFACTURER IS TO SPECIFY SIZE OF BRIDGING ANGLES BUT MINIMUM SIZE TO
- BE L35x35x3 6. BRIDGING TO BE NEATLY ERECTED IN ROOMS WITHOUT CEILINGS.

- 8. SEE TYPICAL DETAILS FOR MECH'L UNIT SUPPORT & MECH'L OPENING FRAMING UNLESS NOTED
- ENSURE THAT WELDING PROCEDURES DO NOT DAMAGE OWSJ'S.
- 10. REFER TO ARCHITECTURAL DRAWINGS FOR SUPPLEMENTARY INFORMATION AND ALLOW FOR ARCHITECTURAL REVIEW PRIOR TO FABRICATION.
- MECHANICAL OPENINGS SHOWN ON THIS PLAN ARE 300 x 300 mm IN SIZE OR LARGER. SEE MECH'L, ELECT'L & ARCH'L DWGS FOR SMALLER OPENINGS. CONFIRM SIZE OF OPENINGS WITH MECH'L DWGS. SEE TYPICAL DETAIL ON DWG SO3 FOR ADDITIONAL OPENING FRAMING UNLESS NOTED



- . THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS. ANY DISCREPANCY SHALL BE REPORTED TO THE ENGINEER. 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL MATERIAL RELEVANT TO
- . ADDITIONAL DRAWINGS MAY BE ISSUED FOR CLARIFICATION TO ASSIST PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH THE DRAWINGS IN THE CONTRACT DOCUMENTS. 4. DO NOT SCALE DRAWINGS.
  - PROJECT

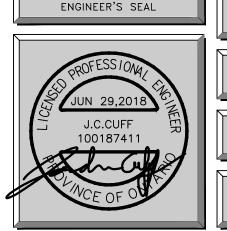
ARCHITECT

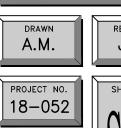
TURNBULL SCHOOL

HOBIN ARCHITECTURE

DRAWING FOUNDATION PLAN & ROOF PLAN

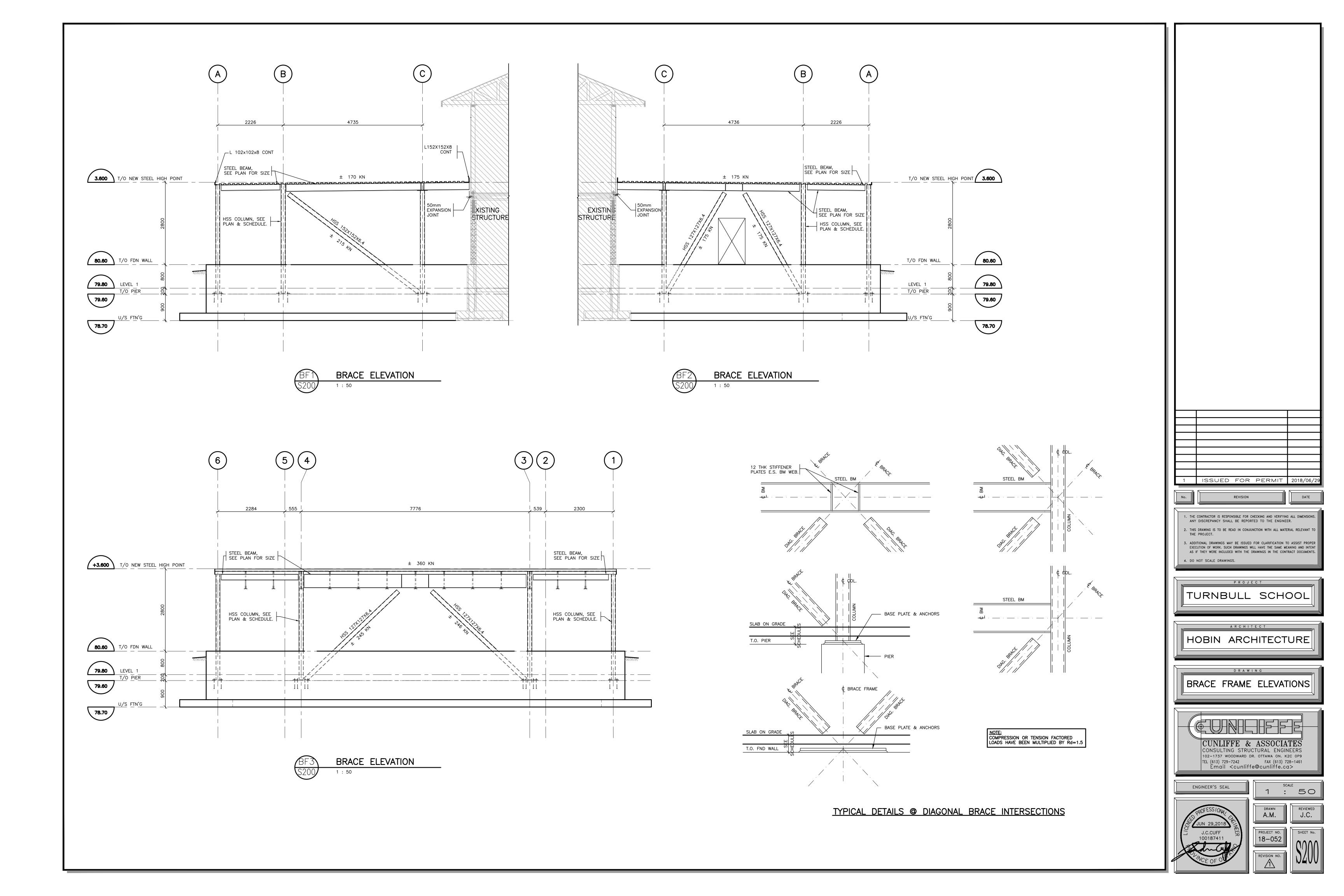


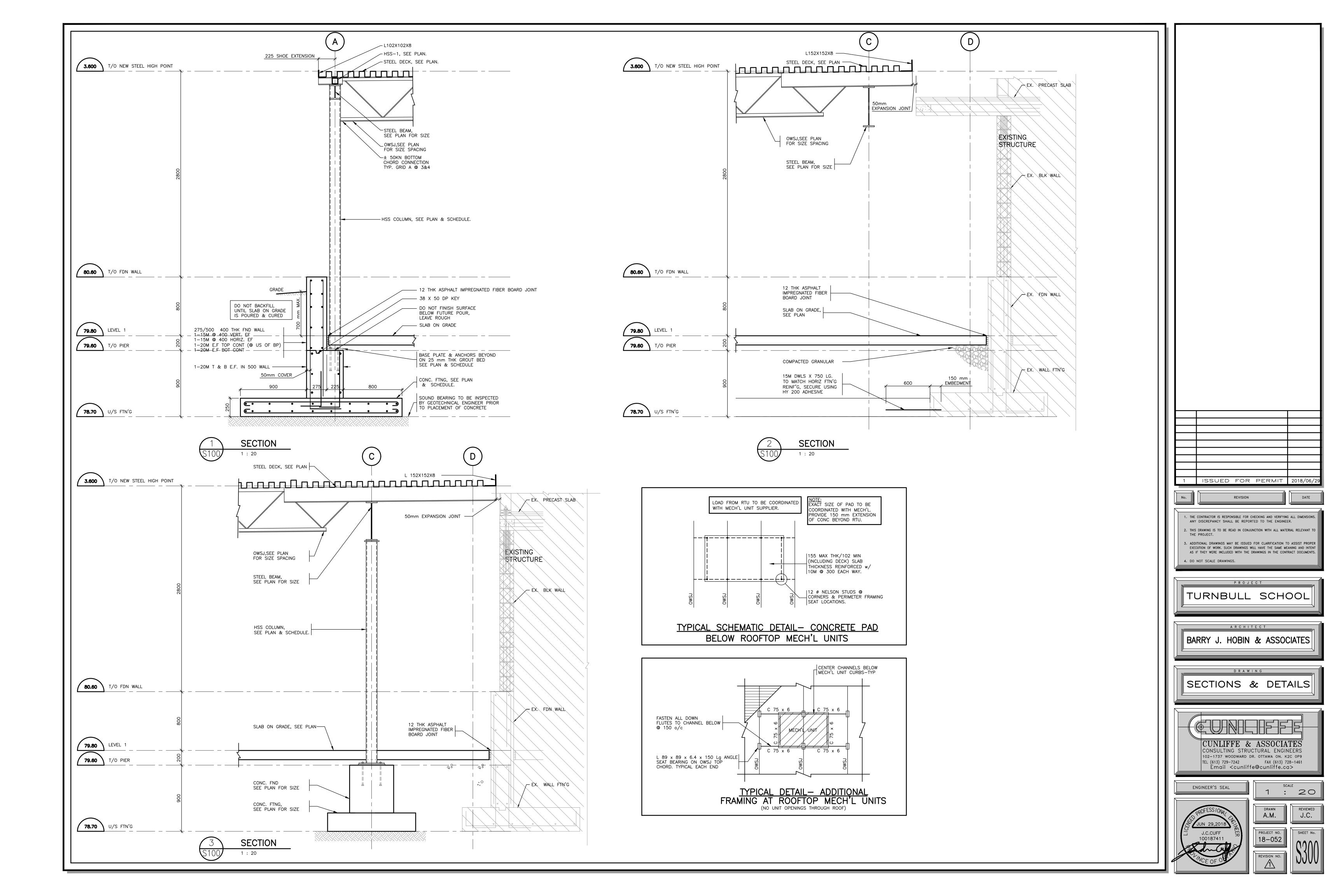


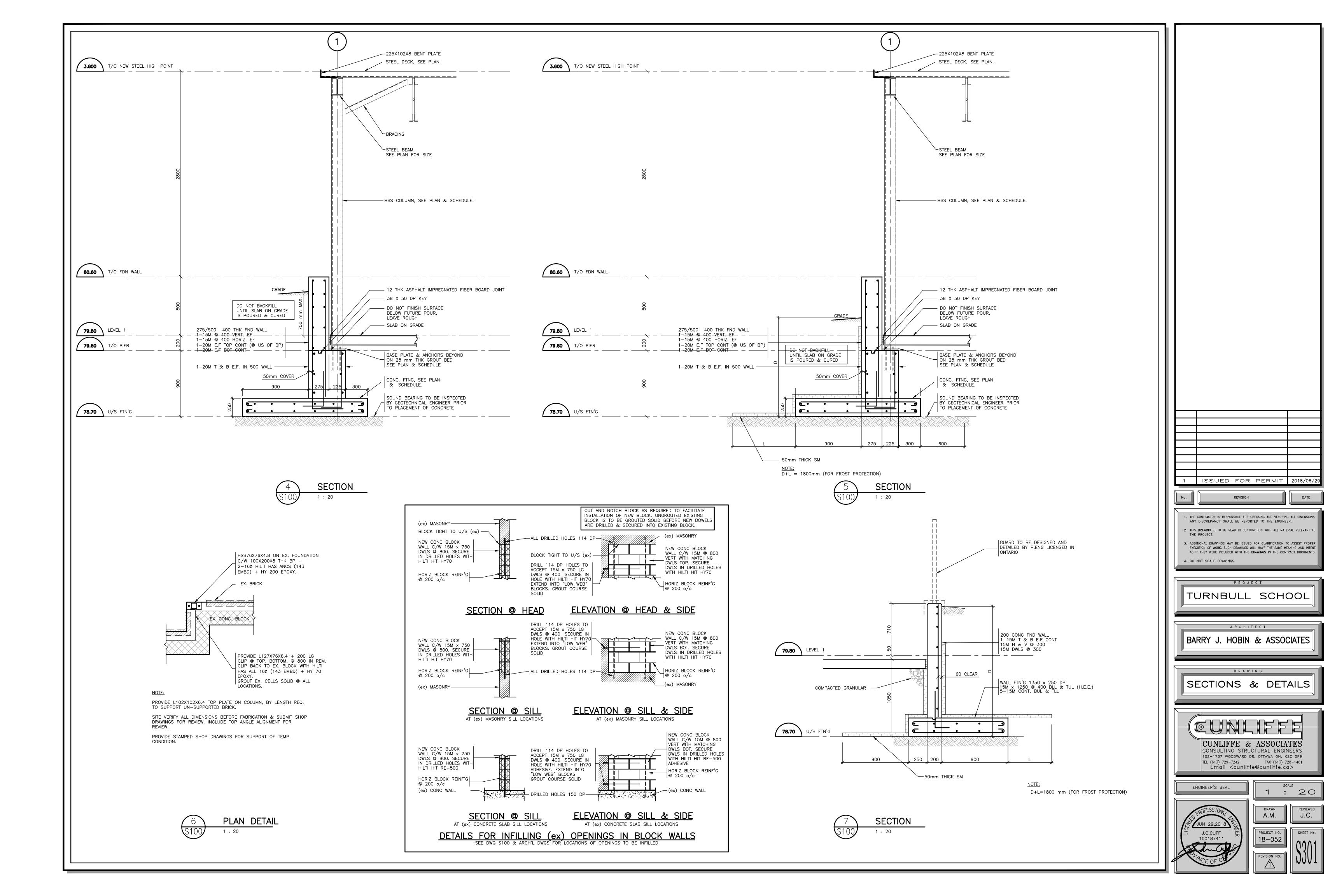


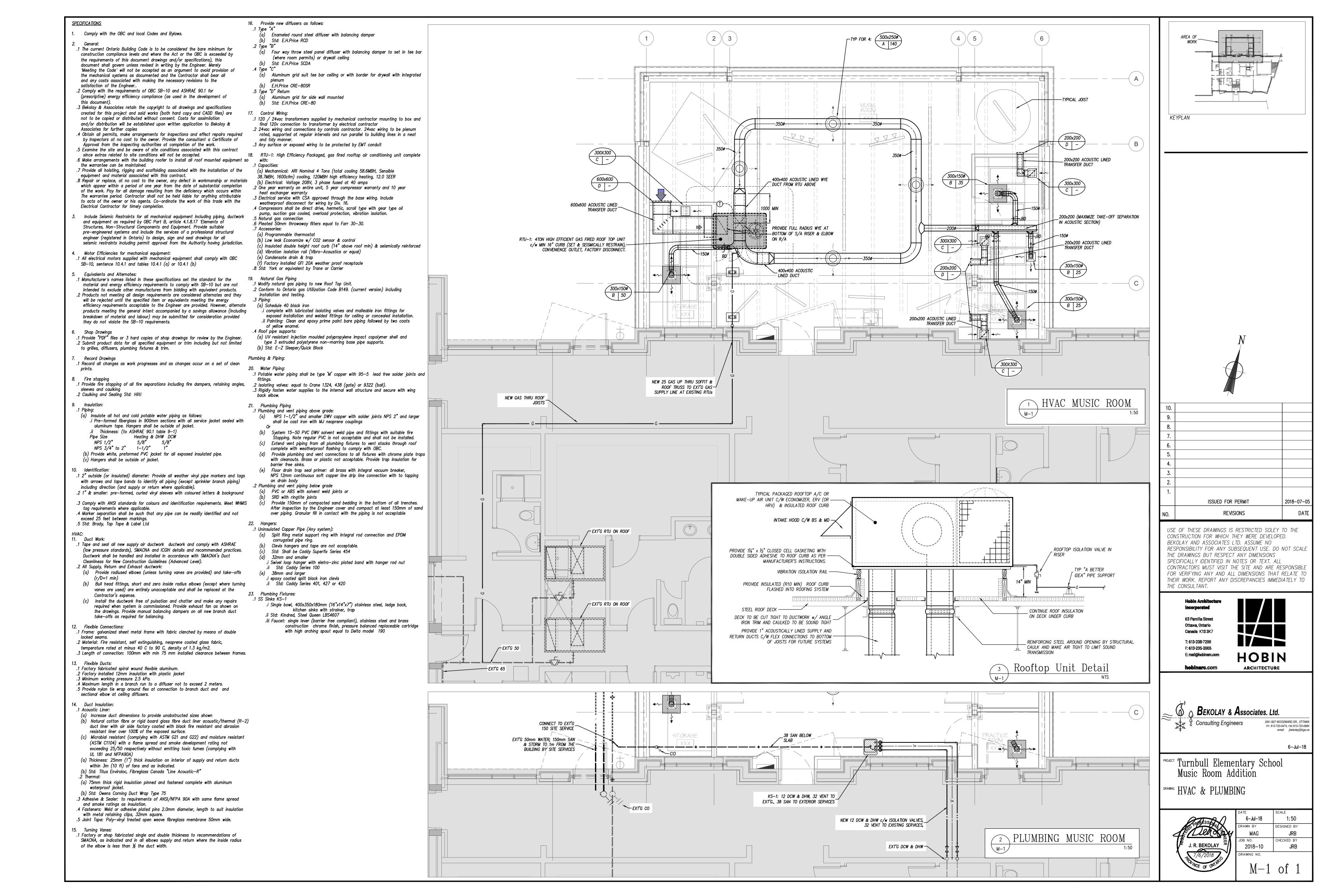
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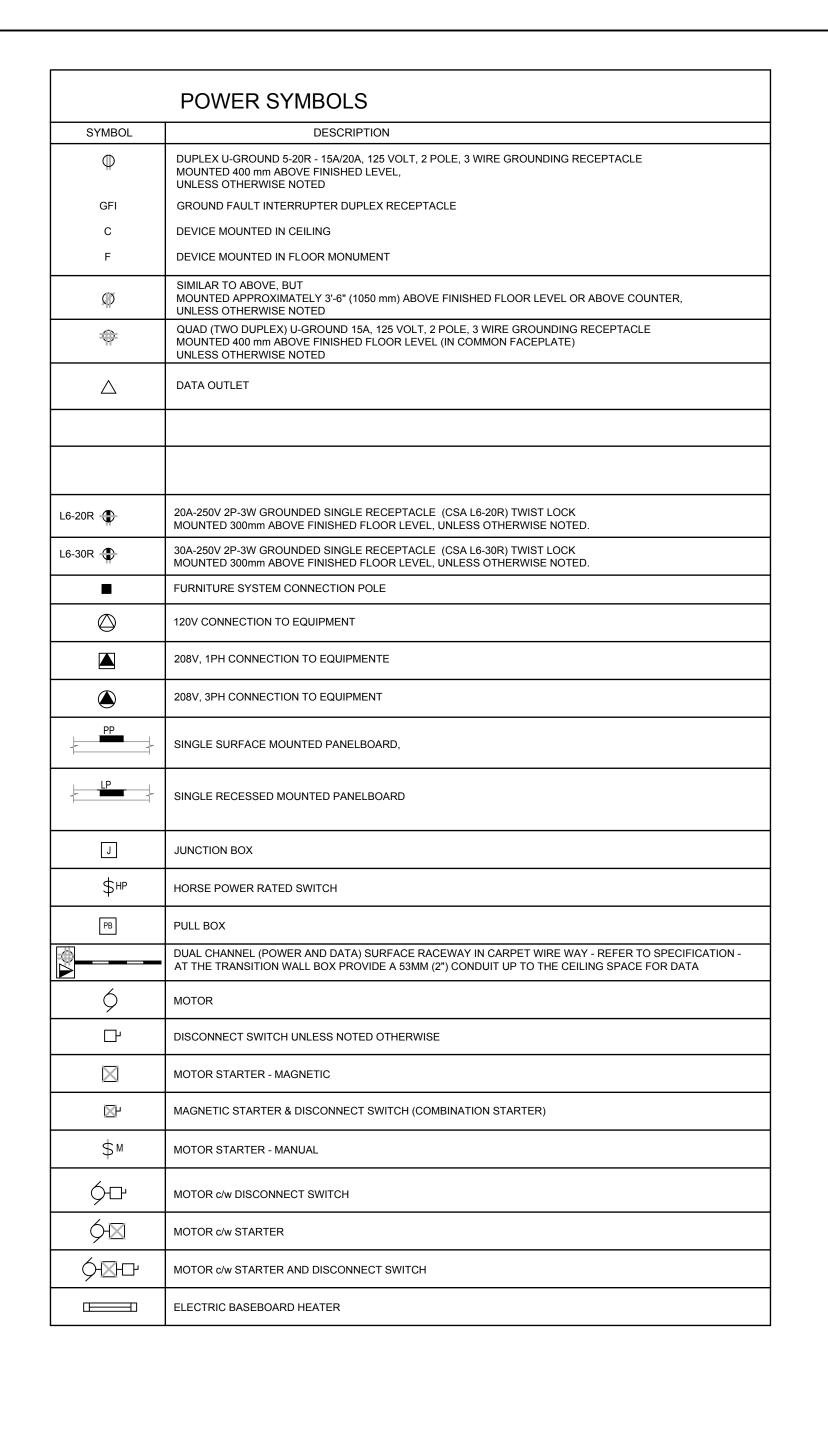












LIGHTING SYMBOLS						
SYMBOL	DESCRIPTION					
A	(1200MM x 600MM) 2'X4' LUMINAIRE, LETTER INDICATES LUMINAIRE TYPE AS PER LUMINAIRE SCHEDULE.					
A	(1200MM x 600MM) 2'X4' LUMINAIRE, SUPPLIED FROM EMERGENCY POWER SOURCE					
A1	(1200MM x 600MM) 2'X4' LUMINAIRE, LETTER INDICATES LUMINAIRE TYPE AS PER LUMINAIRE SCHEDULE. NUMBER INDICATES CONTROLS (DAYLIGHT HARVESTING)					
В	STRIP LUMINAIRE, 1200MM, LETTER INDICATES LUMINAIRE TYPE AS PER LUMINAIRE SCHEDULE.					
BB	STRIP LUMINAIRE, 2400MM, LETTER INDICATES LUMINAIRE TYPE AS PER LUMINAIRE SCHEDULE.					
cО	RECESSED DOWNLIGHT, LETTER INDICATES LUMINAIRE TYPE AS PER LUMINAIRE SCHEDULE.					
\$\$ ##	ONE, TWO, THREE AND FOUR GANG LINE VOLTAGE TOGGLE SWITCH MOUNTED 4'-0" (1200MM) ABOVE FINISHED FLOOR LEVEL, UNLESS OTHERWISE NOTED.					
\$3	3 - WAY SWITCH					
\$ <sup>4</sup>	4 - WAY SWITCH					
\$ <sup>LV</sup>	LOW VOLTAGE SWITCH					
\$ os	OCCUPANCY SENSOR - SWITCH MOUNTED					
\$ vs	VACANCY SENSOR - SWITCH MOUNTED					
OS	OCCUPANCY SENSOR - CEILING MOUNTED					
D	DIMMER SWITCH WITH ON / OFF					
↓⊗H	EXIT SIGN - WALL MOUNTED GREEN PICTOGRAM					
$\stackrel{\Rightarrow}{\bigcirc}$	EXIT SIGN - CEILING MOUNTED GREEN PICTOGRAM					
BAT1	EMERGENCY LIGHTING BATTERY PACK (BAT1) C/W TWO HEADS. RECEPTACLE CONNECTED TO LOCAL LIGHTING CIRCUIT					
BAT1-1	EMERGENCY LIGHTING REMOTE SINGLE HEAD. CONNECTED TO BAT1					
♦ BAT1-2	EMERGENCY LIGHTING REMOTE TWIN HEAD. CONNECTED TO BAT1					

AREA IN CONTRACT

ELEC ROOM

—PANEL 'P' ≯EXISTING

PANEL 'L'

EXISTING

EXISTING MAIN FIRE ALARM PANEL

BELOW

NEW PANEL 'N' ON

**GROUND FLOOR** 

NEW FIRE ALARM

GROUND FLOOR

BOOSTER PANEL ON

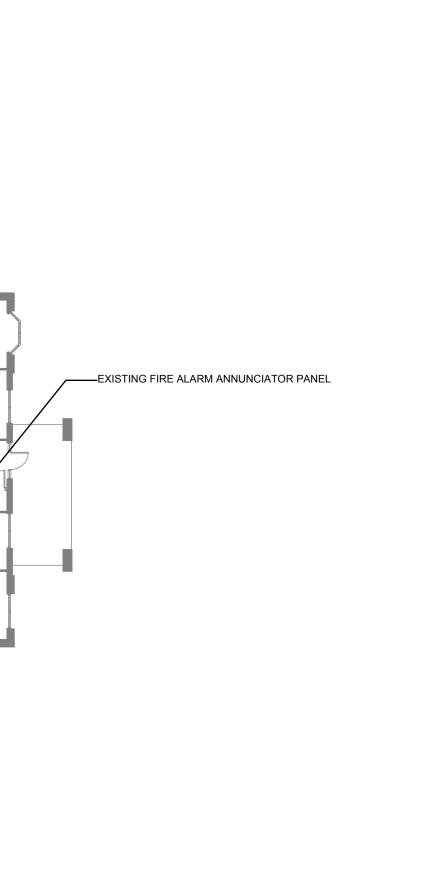
MUSIC ROOM N-14,16,1

→ N-20 GFI

	FIRE ALARM SYMBOLS
SYMBOL	DESCRIPTION
F.A.C.P.	RECESSED OR SURFACE MOUNTED FIRE ALARM CONTROL PANEL.
F.A.A.	RECESSED OR SURFACE MOUNTED FIRE ALARM ANNUNCIATOR PANEL.
	FIRE ALARM PULL STATION MOUNTED 4'-0" (1200) ABOVE FINISHED FLOOR LEVEL UNLESS OTHERWISE NOTED.
CG	SIMILAR TO ABOVE, EXCEPT "CG" WHERE SHOWN, DENOTES DEVICE c/w CLEAR GUARD.
<b>₽</b> c	FIRE ALARM SMOKE DETECTOR.
	FIRE ALARM HORN
	FIRE ALARM STROBE HORN COMBINATION.
ZAM	FIRE ALARM SHUTDOWN RELAY

	1.	THIS IS A CONDRAWINGS
).		

	GENERAL NOTES:			
1.	THIS IS A COMPREHENSIVE LEGEND AND NOT ALL ITEMS APPEAR ON ELECTRICAL DRAWINGS			



	ELECTRICAL DRAWING LIST
SHEET NO.	DRAWING TITLE
E001	ELECTRICAL LEGEND AND, DRAWING LIST
E002	ELECTRICAL SPECIFICATION SHEET 1 0F 2
E003	ELECTRICAL SPECIFICATION SHEET 2 0F 2
E101	ELECTRICAL LIGHTING & POWER SYSTEMS
E201	ELECTRICAL SCHEDULES AND DETAILS

В	2018 07 05	ISSUED FOR PERMIT & TENDER			
Α	2018 06 28	ISSUED FOR CO ORDINATION			
no.	date	revision			
	It is the responsibility of the appropriate contractor to check and verify all dimen—				

sions on site and report all errors and/ or omissions to the architect.

All contractors must comply with all pertinent codes and by—laws.

Do not scale drawings. This drawing may not be used for construction until signed.

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**Hobin Architecture** Incorporated 63 Pamilla Street Ottawa, Ontario Canada K1S3K7

T: 613-238-7200 F: 613-235-2005 HOBIN E: mail@hobinarc.com hobinarc.com

ARCHITECTURE

SCALE:

PROJECT/LOCATION: TURNBULL SCHOOL MUSIC ROOM ADDITION 1132 Fisher Avenue, Ottawa

DRAWING TITLE: ELECTRICAL LEGEND AND DRAWING LIST

DRAWN BY: DATE:

APR. 2018 AS SHOWN PROJECT: 181-04865-00 DRAWING NO .: S.P. SCHWENDEMANN 100042381 REVISION NO .:



- 1.1 COMPLY WITH LATEST REQUIREMENTS OF BUILDING MANAGER'S WORKING REGULATIONS. OBTAIN REGULATIONS AND COMPLY WITH REQUIREMENTS WHEN WORKING ONSITE UNLESS OTHERWISE NOTED, BASE BUILDING STANDARDS AND SPECIFICATIONS TO BE MINIMUM BASIS FOR WORK. OBTAIN COPY OF DOCUMENTS AND REVIEW.
- 1.2 CONFORM TO OWNER'S/LANDLORD'S TENANT DESIGN CRITERIA AND CONSTRUCTION MANUAL AND TENANT LEASE AGREEMENT. WORK SUBJECT TO REVIEW WITH AND/OR APPROVAL OF OWNER/LANDLORD AND BUILDING MANAGER AND REVIEW WITH CONSULTANT.
- 1.3 SUPPLY LABOUR, TOOLS, SERVICES AND EQUIPMENT, AND PROVIDE PRODUCTS AND MATERIALS REQUIRED TO COMPLETE WORK IN ACCORDANCE WITH THIS SPECIFICATION AND DRAWINGS. COMPLY WITH LAWS, REGULATIONS, AND CODES OF AUTHORITIES HAVING JURISDICTION. CONFORM TO REQUIREMENTS OF CONTRACT DOCUMENTS OF DIVISIONS 00 AND 01 AND REQUIREMENTS HEREIN SPECIFIED WHICH ARE SUPPLEMENTARY TO THOSE REQUIREMENTS. PERFORM WORK IN ACCORDANCE WITH LOCAL APPLICABLE GOVERNING CODES AND AUTHORITIES INCLUDING ONTARIO BUILDING CODE (OBC), ONTARIO ELECTRICAL SAFETY CODE (OESC) AND ISSUED BULLETINS AND SUPPLEMENTARY STANDARDS.
- 1.4 WHERE CODES AND/OR REQUIREMENTS CONFLICT, OR THERE IS DISCREPANCY IN DOCUMENTS. INCLUDE FOR MORE STRINGENT AND COSTLY REQUIREMENTS FOR PRICING. ADVISE CONSULTANT AND OBTAIN CLARIFICATION PRIOR TO STARTING WORK.
- 1.5 SUBMIT TO CONSULTANT, CHANGE NOTICE QUOTATIONS FOR EXTRA OR DELETED WORK COMPLETE WITH ITEMIZED COST BREAKDOWN OF LABOUR AND MATERIALS. FAILURE TO PROVIDE WILL RESULT IN REJECTION UNLESS OTHERWISE NOTED IN DIVISION 01 FLECTRICAL CHANGE NOTICES TO BE PRICED IN ACCORDANCE WITH NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION MANUAL OF LABOR UNITS AND "ALLPRISER" LESS 25% DISCOUNT FOR LABOUR AND MATERIAL COST. UNLESS OTHERWISE NOTED, ALLOWABLE MAXIMUM PERCENTAGES FOR OVERHEAD AND PROFIT ARE TO BE 7% AND 5% RESPECTIVELY.
- 1.6 COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION RECOMMENDATIONS AND INSTRUCTIONS UNLESS OTHERWISE NOTED HEREIN OR ON DRAWINGS, OR UNLESS SUCH INSTRUCTIONS AND RECOMMENDATIONS CONTRADICT GOVERNING CODES AND REGULATIONS.
- 1.7 WHERE STANDARDS OF WORK ARE SPECIFIED OR IMPLIED AND WORK DOES NOT COMPLY WITH PERFORMANCE SPECIFIED OR IMPLIED, CORRECT SUCH DEFICIENCY AS DIRECTED BY CONSULTANT OR GOVERNING AUTHORITY ANY SUBSEQUENT TESTING TO VERIEY PERFORMANCE TO BE PROVIDED AT CONTRACTOR'S EXPENSE. ANY CHARGES FOR OWNER'S STAFF, CONSULTANT OR OTHER PERSONNEL RELATED TO SUCH RETESTING, ARE TO BE AT THE CONTRACTOR'S EXPENSE.
- 1.8 FOR COMPLIANCE/SUBSTANTIAL COMPLETION LETTER, SUBMIT FOLLOWING APPLICABLE ELECTRONIC DOCUMENTS (PDFS) AS ONE COMPLETE PACKAGE
- .1 FIRE ALARM VERIFICATION REPORT WITH SOUND PRESSURE READINGS READINGS AT DIFFERENT LOCATIONS WITH DOOR OPEN) AND CERTIFICATE;
- .2 EQUIPMENT DATA SHEETS;
- .3 EQUIPMENT TESTING REPORTS;
- .4 WARRANTIES;
- .5 ESA INSPECTION CERTIFICATE;
- .6 ELECTROMAGNETIC LOCK TEST CERTIFICATE WARRANTY;
- .7 PERMIT NUMBERS;
- .8 AS-BUILT DRAWINGS; .9 CONFIRMATION THAT DEFICIENCIES WERE RECTIFIED.
- 1.9 ELECTRICAL ENCLOSURES IN CLIMATE CONTROLLED AREAS TO BE UNLESS OTHERWISE NOTED, TYPICALLY MINIMUM NEMA 1 TYPE WITH ADDITIONAL SPRINKLER PROTECTION FEATURES OF DRIP SHIELD WHEN SURFACE MOUNTED, GASKETTING AND VENTILATION LOUVRES DESIGNED TO PREVENT EGRESS OF WATER SPRAY ONTO LIVE COMPONENTS
- 1.10 PRIOR TO SUBMITTING BID, CAREFULLY EXAMINE CONDITIONS AT SITE WHICH WILL OR MAY AFFECT WORK, DRAWINGS, AND SPECIFICATIONS, AND BECOME FAMILIAR WITH BUILDING CONSTRUCTION, FINISHES AND OTHER WORK ASSOCIATED WITH WORK IN ORDER THAT BID INCLUDES FOR EVERYTHING NECESSARY FOR COMPLETION OF WORK.
- 1.11 BEFORE ANY EQUIPMENT IS ROUGHED IN, DETERMINE ITS INTENDED LOCATION FROM DRAWINGS AND COORDINATE FINAL LOCATIONS WITH SERVICES AND STRUCTURAL CONDITIONS. IF IT IS NOT SHOWN ON DRAWINGS, VERIFY FINAL LOCATION ON SITE. LOCATIONS OF SERVICES ON DRAWINGS ARE APPROXIMATE ONLY. REVIEW WITH CONSULTANT AND COORDINATE WITH RESPECTIVE TRADES TO ENSURE THAT EQUIPMENT IS FULLY ACCESSIBLE FOR MAINTENANCE. FAILURE TO DO SO WILL NOT BE GROUNDS FOR ADDITIONAL COSTS. PROPERLY PLAN AND COORDINATE EXACT LOCATIONS AND ROUTING OF SERVICES PRIOR TO INSTALLATION TO AVOID OBSTRUCTIONS TO OTHER SERVICES AND EQUIPMENT REQUIRING ACCESS. CONCEAL SERVICES IN WALLS, CEILING SPACE AND FLOOR SPACE UNLESS
- 1.12 MAKE APPLICATION FOR, PAY FOR AND OBTAIN, PERMITS AND INSPECTION CERTIFICATES TO COMPLETE WORK. WHEN WORK IS COMPLETE, SUPPLY AND TURN OVER INSPECTION CERTIFICATES FROM GOVERNING AUTHORITIES, INCLUDING ESA, TO CONSULTANT. PAY FEES AND CHARGES LEVIED BY MUNICIPALITY AND OTHER GOVERNING AUTHORITIES FOR PERMITS. INSPECTIONS, AND CERTIFICATES. RETAIN COPY OF SUCH PERMITS AND CERTIFICATES, ETC. ON JOB SITE. WHERE WORK INVOLVES ELECTROMAGNETIC LOCK WORK, PROVIDE PERMITS AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
- 1.13 COORDINATE WORK WITH WORK OF EACH TRADE TO ENSURE PROPER AND COMPLETE INSTALLATION. NOTIFY TRADES CONCERNED OF REQUIREMENTS FOR OPENINGS. SLEEVES. INSERTS AND OTHER HARDWARE NECESSARY IN COORDINATION OF WORK, AND, WHERE WORK IS INTEGRATED WITH WORK OF OTHER TRADES OR IS INSTALLED IN CLOSE PROXIMITY WITH WORK OF OTHER TRADES, CAREFULLY COORDINATE WORK PRIOR TO AND DURING INSTALLATION.
- 1.14 PROPERLY PLAN. COORDINATE AND ESTABLISH EXACT LOCATIONS AND ROUTING OF SERVICES WITH AFFECTED TRADES PRIOR TO INSTALLATION SUCH THAT THEY CLEAR EACH OTHER AS WELL AS ANY OBSTRUCTIONS, GENERALLY, PIPING REQUIRING UNIFORM PITCH IS GIVEN RIGHT OF WAY, WITH OTHER SERVICES LOCATED AND ARRANGED TO SUIT
- 1.15 SCHEDULE WORK WHICH MAY CAUSE NOISE DISTURBANCES AT TIMES APPROVED BY OWNER AND REVIEWED WITH CONSULTANT. COORDINATE WORK WITH TRADES TO MINIMIZE NOISE
- 1.16 DURING CONSTRUCTION, KEEP SITE REASONABLY CLEAR OF RUBBISH AND WASTE MATERIAL RESULTING FROM WORK ON DAILY BASIS. AFTER COMPLETION OF WORK, REMOVE RUBBISH AND DEBRIS FROM SITE, ARRANGE AND PAY FOR REPAIR OF DAMAGES CAUSED AND LEAVE PREMISES AND WORK IN GOOD ORDER
- 1.17 PROTECT AND STORE EQUIPMENT AND MATERIALS ON SITE FROM DAMAGE. BE RESPONSIBLE FOR SAFE STORAGE OF EQUIPMENT AND GOODS TO BE RELOCATED AND REPAIR OR REPLACE DAMAGED EQUIPMENT AND GOODS AT DISCRETION OF OWNER.
- 1.18 ALLOW CONSULTANT ACCESS TO WORK. NOTIFY CONSULTANT AT AGREED UPON TIMES OF
- 1.19 WHERE STANDARDS OF WORK ARE SPECIFIED OR IMPLIED AND WORK DOES NOT COMPLY WITH PERFORMANCE SPECIFIED OR IMPLIED, CORRECT SUCH DEFICIENCY AS DIRECTED BY CONSULTANT, INCLUDE ANY SUBSEQUENT TESTING TO VERIFY PERFORMANCE, ANY CHARGES FOR OWNER'S STAFF, CONSULTANT, OR OTHER PERSONNEL RELATED TO SUCH RETESTING TO ALSO BE AT EXPENSE OF CONTRACTOR.
- 1.20 PRODUCTS LISTED AND/OR SPECIFIED ON CONTRACT DOCUMENTS ARE SELECTED TO ESTABLISH DESIGN STANDARDS. IN MOST CASES, ACCEPTABLE MANUFACTURERS ARE LISTED. BASE YOUR BID PRICE ON BASE SPECIFIED PRODUCTS OR PRODUCTS SUPPLIED FROM ACCEPTABLE MANUFACTURERS, ENSURE PRODUCTS SUPPLIED FROM MANUFACTURERS OTHER THAN BASE SPECIFIED MANUFACTURERS ARE EQUIVALENT TO SPECIFIED PRODUCTS. CHANGES TO MANUFACTURERS OF PRODUCTS MAY BE PROPOSED TO CONSULTANT FOR ACCEPTANCE PRIOR TO CLOSING OF BIDS, LISTING IN EACH CASE CORRESPONDING CREDIT. CONSULTANT HAS SOLE DISCRETION IN ACCEPTING ANY PROPOSED SUBSTITUTION. INCLUDE IN BID PRICE ANY ADDITIONAL COSTS FOR CHANGES TO ASSOCIATED OR ADJACENT WORK RESULTING FROM PROVISION OF PRODUCTS SUPPLIED BY MANUFACTURER OTHER THAN BASE SPECIFIED MANUFACTURER. ANY PROPOSED CHANGES INITIATED BY CONTRACTOR AFTER AWARD OF CONTRACT MAY BE CONSIDERED BY CONSULTANT AT CONSULTANT'S DISCRETION, WITH COSTS FOR SUCH CHANGES IF ACCEPTED BY OWNER, AND COSTS OF SUCH REVIEW BY CONSULTANT TO BE PAID FOR BY CONTRACTOR.
- 1.21 UNLESS OTHERWISE NOTED IN DIVISION 01, WARRANT WORK TO BE IN STRICT ACCORDANCE WITH CONTRACT DOCUMENTS AND FREE FROM DEFECTS FOR 1 YEAR PERIOD FROM DATE OF WRITTEN ACCEPTANCE BY CONSULTANT, REPAIR AND/OR REPLACE ANY SUCH DEFECTS WHICH APPEAR IN WORK WITHIN WARRANTY PERIOD, ORDINARY WEAR AND TEAR AND WILFUL DAMAGE BY CARELESSNESS OF OWNER'S STAFF OR AGENTS EXCEPTED, WITHOUT ADDITIONAL EXPENSE TO OWNER. WHERE SUCH DEFECTS OCCUR, BE RESPONSIBLE FOR COSTS INCURRED IN MAKING DFFFCTIVF WORK GOOD, INCLUDES REPAIR OR REPLACEMENT OF BUILDING FINISHES, OTHER MATERIALS, OR DAMAGE TO OTHER EQUIPMENT CAUSED BY SUCH DEFECTS, OR BY SUBSEQUENT REPLACEMENT OR REPAIRS.
- 1.22 ENSURE THAT THE INSTALLATION OF EQUIPMENT CONFORMS TO THE APPLICABLE SEISMIC RESTRAINT PROVISIONS INCLUDED IN THE LOCAL GOVERNING BUILDING CODE.

#### 2 INTERRUPTIONS TO AND SHUT DOWNS OF EXISTING SERVICES AND SYSTEMS

- 2.1 COORDINATE AND PERFORM SHUT DOWNS AND INTERRUPTIONS TO EXISTING SYSTEMS AND SERVICES AT TIMES ACCEPTABLE TO OWNER, OBTAIN WRITTEN APPROVAL MINIMUM 5 WORKING DAYS IN ADVANCE OF SHUT DOWN OR INTERRUPTION. INCLUDE FOR PREMIUM TIME TO PERFORM WORK DURING NIGHTS, WEEKENDS OR OTHER TIME OUTSIDE OF NORMAL WORKING HOURS, AS NECESSARY TO MAINTAIN SERVICES IN OPERATION OR WITH MINIMUM INTERRUPTIONS AND TO COMPLY WITH OWNER'S REQUIREMENTS. PERFORM WORK ASSOCIATED WITH SHUT DOWNS AND INTERRUPTIONS AS CONTINUOUS OPERATIONS TO MINIMIZE SHUT DOWN TIME AND TO REINSTATE SYSTEMS AS SOON AS POSSIBLE, AND, PRIOR TO SHUT DOWN, ENSURE MATERIALS AND LABOUR REQUIRED TO COMPLETE WORK FOR WHICH SHUT DOWN IS REQUIRED ARE AVAILABLE AT SITE.
- **CUTTING, PATCHING AND CORE DRILLING** 3.1 PROVIDE CUTTING, PATCHING AND CORE DRILLING OF BUILDING REQUIRED FOR INSTALLATION OF WORK, PERFORM CUTTING IN NEAT AND TRUE FASHION, WITH PROPER TOOLS AND EQUIPMENT TO OWNER'S APPROVAL. PATCH SURFACES TO EXACTLY MATCH EXISTING FINISHES. UTILIZE TRADESMEN SKILLED IN PARTICULAR TRADE OR APPLICATION WORKED ON TO OWNER'S
- 3.2 IN FIRE RATED CONSTRUCTION, PACK AND SEAL VOID BETWEEN OPENING AND CONDUIT FOR LENGTH OF OPENING WITH ASBESTOS FREE ELASTOMERIC AND INTUMESCENT ULC LISTED AND LABELLED MATERIALS. INSTALL FIRESTOP AND SMOKE SEAL MATERIALS IN ACCORDANCE TO ULC CERTIFICATION, OBC AND MANUFACTURER'S REQUIREMENTS TO PROVIDE FIRESTOP RATINGS OF OPENINGS IN ACCORDANCE WITH GOVERNING BUILDING CODE REQUIREMENTS. SUBMIT WITH SHOP DRAWINGS, SPECIFIC ULC DESIGNATED NUMBER FOR EACH APPLICATION AND SDS SHEET. ACCEPTABLE MANUFACTURERS ARE 3M, SPECIFIED TECHNOLOGIES, TREMCO, HILTI, AND TYCO FIRE STOP SYSTEMS.

- 3.3 FOR EXTERIOR AND/OR UNDERGROUND PENETRATIONS, PROVIDE WATERPROOF, WEATHER-TIGHT, FIRE RATED MATERIALS IN COMPLIANCE WITH LOCAL GOVERNING AUTHORITY AND CODE REQUIREMENTS TO SEAL OPENINGS.
- 3.4 COMPLY WITH PRODUCT MANUFACTURER'S RECOMMENDATIONS FOR PRODUCT THAT SUITS EACH SPECIFIC INSTALLATION. TYPICALLY, PRODUCT TO BE CONSISTENT MANUFACTURER THROUGHOUT BUILDING AS COORDINATED WITH GENERAL CONTRACTOR
- 3.5 DO NOT CUT OR DRILL EXISTING WORK WITHOUT PRIOR OWNER'S APPROVAL AND REVIEW WITH CONSULTANT. IN CONSULTATION WITH OWNER AND BY USE OF NON-DESTRUCTIVE RADAR SCANNING. DETERMINE PRESENCE OF EXISTING SERVICES AND REINFORCING RODS CONCEALED BEHIND SURFACE TO BE CUT. ENSURE THAT AREAS OF BOTH SIDES OF SURFACE BEING CUT ARE PROTECTED FROM DEBRIS. BE RESPONSIBLE FOR DAMAGE DONE TO EXISTING BUILDING AND SERVICES CAUSED BY CUTTING OR DRILLING. IF RADAR SCANNING IS NOT PERMITTED BY OWNER, CAREFULLY HAND CHISEL TO EXPOSE RE-BAR AND BURIED SERVICES AND CHISEL OUT REQUIRED OPENINGS. COMPLY WITH OWNER'S FM GLOBAL INSURANCE AS APPLICABLE, OR OTHER REQUIREMENTS CONFIRMED WITH OWNER. CONCRETE WORK
- 4.1 PROVIDE CONCRETE REQUIRED FOR WORK, INCLUDING FORMWORK AND REINFORCING STEEL
- 4.2 PROVIDE CONCRETE WORK IN ACCORDANCE WITH REQUIREMENTS OF DIVISION 03 AND BE OF MINIMUM 3000 PSI READY MIX TYPE.

#### DISCONNECTION, REMOVAL AND RELOCATION WORK

- 5.1 DISCONNECT AND REMOVE ITEMS OF EXISTING OBSOLETE ELECTRICAL WORK. RELOCATE REQUIRED DEVICES AS REQUIRED FOR WORK AND TO ACCOMMODATE WORK OF OTHER DIVISIONS. WHERE LUMINAIRES. SWITCHES. RECEPTACLES. AND OTHER DEVICES AND/OR EQUIPMENT IS REMOVED. DISCONNECT AT POINT OF ELECTRICAL SUPPLY. REMOVE OBSOLETE WIRING AND CONDUIT UP TO SOURCE, UNLESS OTHERWISE NOTED, AND MAKE SYSTEM SAFE TO OWNER'S SATISFACTION. REMOVE OBSOLETE CONDUIT/RACEWAYS IN ACCESSIBLE CEILING SPACES, EXPOSED LOCATIONS, ETC. WHERE EXISTING OBSOLETE CONDUIT AND SIMILAR RACEWAY MATERIAL CANNOT BE REMOVED, SUCH AS EMBEDDED IN CONCRETE, CUT BACK AND CAP OBSOLETE CONDUIT AND RACEWAYS. REFER TO SPECIFIC NOTES ON DRAWINGS.
- WHEN EXISTING CIRCUITS ARE BEING DISCONNECTED, MAINTAIN SUPERVISION OF AREA TO ENSURE THAT SUCH CIRCUITS DO NOT AFFECT ESSENTIAL EXISTING CIRCUITS BEING RETAINED.
- 5.3 REFER TO ARCHITECTURAL DRAWINGS WHICH DEFINE EXTENT OF AREAS BEING DEMOLISHED IN EXISTING BUILDING. REVIEW DRAWINGS AND SITE AND INCLUDE FOR DEMOLITION AND/OR RENOVATION OF SERVICES AS REQUIRED TO ACCOMMODATE ALTERATIONS DETAILED. 5.4 UNLESS OTHERWISE NOTED, TAKE POSSESSION OF OBSOLETE MATERIALS WHICH ARE
- REMOVED AND ARE NOT TO BE RELOCATED OR REUSED AS DIRECTED BY OWNER. REMOVE FROM SITE AND PROPERLY DISPOSE OF, OBTAIN FROM OWNER, LIST OF EXISTING ELECTRICAL ITEMS WHICH ARE TO BE REMOVED AND TURNED OVER TO OWNER. SAID ITEMS ARE TO REMAIN
- 5.5 WHERE EXISTING SERVICES PASS THROUGH OR ARE IN AREA TO SERVE ITEMS WHICH ARE TO REMAIN, MAINTAIN SERVICES. REROUTE EXISTING SERVICES CONCEALED BEHIND EXISTING FINISHES AND WHICH BECOME EXPOSED DURING RENOVATION WORK. SO AS TO BE CONCEALED BEHIND NEW OR EXISTING FINISHES. CONFIRM WITH OWNER SERVICES WHICH ARE TO BE KEPT IN SERVICE AND OPERATIONAL.
- 5.6 REVISE PANELBOARD DIRECTORIES ACCORDINGLY, IF AFFECTED BY ANY RENOVATION, DISCONNECTION OR REMOVAL OF WORK. USE OWNER'S ACTUAL ROOM NAMES/NUMBERS.
- 5.7 PROTECT EXISTING DEVICES BEING RELOCATED OR DELETED TO ENSURE THAT THEY ARE NOT DAMAGED. TEST SUCH DEVICES PRIOR TO DISCONNECTION AND DE-ENERGIZATION. TO ENSURE THAT EACH DEVICE IS IN PROPER WORKING CONDITION. ENSURE THAT MOTORS ARE IN PROPER ROTATION DIRECTION. EXAMINE EACH DEVICE FOR DAMAGE. REPORT DEVICES NOT WORKING OR WITH DAMAGE TO CONSULTANT PRIOR TO INITIATING ANY WORK. IT WILL BE ASSUMED THAT DEVICES ARE IN PROPER WORKING ORDER AND GOOD CONDITION IF NOT REPORTED.
- 5.8 PROVIDE JUNCTION BOXES, OUTLET BOXES, WIRING, PLATES, ETC., AS NECESSARY FOR COMPLETE RELOCATION OF DEVICES. CLEAN RELOCATED OR TEMPORARY REMOVED DEVICES AND EQUIPMENT. AND ENSURE THAT THEY ARE IN GOOD OPERATING CONDITION BEFORE BEING REINSTALLED. WHERE EXISTING LUMINAIRES ARE RELOCATED, CLEAN LUMINAIRES AND INSPECT FOR DAMAGE. RELAMP RELOCATED LUMINAIRES. REPORT DEFECTS OR DAMAGES TO CONSULTANT. DO NOT SPLICE CONDUCTORS WITHOUT CONSENT OF CONSULTANT. UTILIZE JUNCTION BOXES AND TERMINAL DEVICES FOR PROPER EXTENSION OF CIRCUITS WHERE APPROVED. OTHERWISE REPLACE CIRCUITS WITH HOME RUN/CONTINUOUS RUN OF SUITABLE
- 5.9 PROVIDE BLANK COVERPLATES ON EXISTING OBSOLETE BOXES WHICH ARE TO REMAIN IN POSITION.
- 5.10 AFTER INSTALLATION IS COMPLETE. TEST PARTS OF RE-USED OR RELOCATED ELECTRICAL EQUIPMENT AND CORRECT FAULTS AND GROUNDS. INCLUDE FOR FIRE ALARM VERIFICATION COMPANY TO VERIFY ANY RELOCATED DEVICES AND DOWNSTREAM AFFECTED DEVICES. AND VERIFY SYSTEM AS REQUIRED BY LOCAL FIRE AUTHORITY TO SUIT ACTUAL RELOCATION WORK FOR OTHER EXISTING SYSTEMS, ENGAGE MANUFACTURERS AUTHORIZED REPRESENTATIVE OR OWNER'S SYSTEM MAINTENANCE CONTRACTOR TO INSPECT AND VERIFY RELOCATED DEVICES COORDINATE AND CONFIRM EXACT REQUIREMENTS WITH OWNER AND REVIEW WITH CONSULTANT. ANY FIRE ALARM, LIFE SAFETY OR COMMUNICATION SYSTEM DEVICE THAT HAS BEEN WORKED ON OR RELOCATED IS TO BE TESTED, VERIFIED, AND CERTIFIED BY MANUFACTURER'S AUTHORIZED TECHNICIAN AFTER COMPLETION OF WORK. INCLUDE FOR
- 5.11 INTERIOR, EXTERIOR OR UNDERGROUND ELECTRICAL SERVICES (INCLUDING AUXILIARY SERVICES, TELEPHONE, FIRE ALARM, P.A. SYSTEM, ETC.) TO OPERATING PARTS OF BUILDING ARE TO BE MAINTAINED IN OPERATION, AND TO THAT EFFECT, NECESSARY WORK MAY HAVE TO BE CARRIED OUT DURING NON-REGULAR BUSINESS HOURS AT NO ADDITIONAL COST TO THIS PROJECT EXISTING RISERS ARE TO BE MAINTAINED IN SERVICE AS REQUIRED TO FEED OTHER AREAS OF BUILDING. DO NOT INTERRUPT ANY SERVICES WITHOUT PRIOR WRITTEN APPROVAL FROM OWNER AND REVIEW WITH CONSULTANT, SUBMIT FORMAL REQUESTS TO CONSULTAN OUTLINING IN DETAIL REQUIREMENTS OF PROPOSAL AND WAIT FOR INSTRUCTIONS FROM CONSULTANT.
- 5.12 BE PRESENT WHEN ADDITIONAL DOORS OR OPENINGS ARE BEING CUT INTO EXISTING WALLS AND CEILINGS. SHOULD ANY DAMAGE OCCUR TO ELECTRICAL SYSTEM, RESTORE SYSTEM TO A SAFE AND SOUND CONDITION
- 5.13 WHERE REFERENCES ARE MADE ON DRAWINGS THAT EXISTING RECEPTACLES, ETC., BE EXTENDED AND/OR RELOCATED TO SUIT NEW CONSTRUCTION, RECEPTACLES, ETC., ARE TO BE TESTED AND IF FOUND DEFECTIVE. BE REPLACED. CRACKED OR BROKEN COVERPLATES ARE TO BE REPLACED. FINISHES TO MATCH EXISTING SUBJECT TO REVIEW WITH CONSULTANT.
- 5.14 BE RESPONSIBLE FOR DISCONNECTING POWER SUPPLY TO BRANCH CIRCUITS CONTROLLING LIGHTING, RECEPTACLES, PANELS, MECHANICAL EQUIPMENT, ETC., FOR SAFE REMOVAL OF EQUIPMENT, CONDUIT, WIRING, BOXES, ETC., AFFECTED BY DEMOLITION
- 5.15 CLOSE OPENINGS IN BOXES, PANELS, ETC., THAT RESULT FROM REMOVAL OF EQUIPMENT, CONDUIT. WIRING, FIXTURES, ETC. CLOSE OPENINGS IN PROPER MANNER AND PROPERLY TERMINATE AND INSULATE CABLES TO RESTORE SYSTEM TO SAFE OPERATING CONDITION, TO OWNER'S SATISFACTION. 5.16 BE PRESENT AND SUPERVISE REMOVAL OF ELECTRICAL EQUIPMENT AND DEVICES. DURING
- DEMOLITION WORK IS COMPLETED. SERVICES TO TEMPORARILY RELOCATED EQUIPMENT ARE TO BE MAINTAINED AT ALL TIMES. 5.17 DELETE EXISTING SYSTEM DEVICES AS NOTED. INCLUDE FOR: DISCONNECTING AND DECOMMISSIONING OF DELETED DEVICES; REMOVAL OF OBSOLETE BOXES, WIRING AND CONDUIT; PATCHING AND MAKING GOOD SURFACES AS COORDINATED WITH GENERAL TRADES CONTRACTOR: ENGAGING OWNER'S EXISTING RESPECTIVE SYSTEM VENDORS TO DECOMMISSION DEVICES. RE-PROGRAM EXISTING SYSTEM TO SUIT RENOVATIONS WORK. TEST AND VERIFY THAT OPERATION OF EXISTING SYSTEM IS IN PROPER ORDER AFTER SYSTEM

DEMOLITION OF CEILINGS, WALLS, FLOORS, ETC. EXISTING EQUIPMENT WHICH IS NOT TO BE

RELOCATED BUT INTERFERES WITH DEMOLITION IS TO BE TEMPORARILY RELOCATED UNTIL

DISPOSE OF MATERIALS NOT WANTED BY OWNER. 5.18 REMOVE AND RE-INSTALL EXISTING CEILING TILES AS REQUIRED TO PERFORM WORK. PRIOR TO REMOVAL. INSPECT TILES FOR DAMAGE AND REPORT ANY TO OWNER AND CONSULTANT. REMOVE AND REINSTALL ELECTRICAL DEVICES/LUMINAIRES AS REQUIRED FOR INSTALLATION OF WORK. SECURE LOOSE CABLING, DEVICES AND LUMINAIRES TO CEILING SLAB. AFTER WORK HAS BEEN COMPLETED AND SUCCESSFULLY TESTED AND INSPECTED, RE-INSTALL CEILING TILES TO EXISTING STANDARDS. REPLACE TILES AND GRID MEMBERS DAMAGED DURING WORK. PATCH AND MAKE GOOD (INCLUDING PAINTING) SURFACES TO MATCH EXISTING. COMPLY WITH APPLICABLE GOVERNING AUTHORITY REQUIREMENTS WITH REGARDS TO CEILING WORK IN SPECIAL AREAS.

CHANGES; TURN OVER DELETED DEVICES TO OWNER IF REQUESTED BY OWNER; PROPERLY

5.19 CHECK LUMINAIRES TO BE DELETED FOR PCB BALLASTS. DISCONNECT AND REMOVE SUCH BALLASTS. INCLUDE COSTS FOR COMPANY SPECIALIZED IN SUCH HAZARDOUS MATERIALS TO REMOVE AND DISPOSE SUCH MATERIALS OFF-SITE IN COMPLIANCE WITH MINISTRY OF ENVIRONMENT, MINISTRY OF TRANSPORT AND ANY OTHER GOVERNING AUTHORITY REGULATIONS.

#### HAZARDOUS MATERIALS

- 6.1 IF AT ANY TIME DURING COURSE OF WORK HAZARDOUS MATERIALS ARE ENCOUNTERED OR SUSPECTED, CEASE WORK IN AREA IN QUESTION AND IMMEDIATELY REPORT TO CONSULTANT AND COMPLY WITH REGULATIONS OF LOCAL GOVERNING AUTHORITIES. DO NOT RESUME WORK IN AFFECTED AREA WITHOUT APPROVAL FROM OWNER AND REVIEW WITH CONSULTANT.
- 6.2 PROPERLY REMOVE AND DISPOSE OFFSITE MATERIALS CONTAINING HAZARDOUS MATERIALS IN ACCORDANCE WITH LOCAL GOVERNING AUTHORITY REGULATIONS. USE SPECIALTY FIRMS LICENSED BY LOCAL AUTHORITIES AS REQUIRED TO HANDLE SUCH MATERIALS AND TO ENSURE PROPER DISPOSAL TO MINISTRY APPROVED SITES. SUBMIT TO CONSULTANT COPIES OF PERMITS AND/OR APPROVALS. RECORD DRAWINGS (AS-BUILTS)
- 7.1 DRAWINGS FOR THIS PROJECT HAVE BEEN PREPARED ON AUTOCAD RELEASE VERSION OF SOFTWARE CONFIRMED WITH CONSULTANT. COPIES OF DRAWINGS ON DISKS FOR USE IN PREPARING "AS-BUILTS" MAY BE PURCHASED FROM CONSULTANT AT COST OF \$25 CDN. PLUS HST PER DRAWING.
- 7.2 FOR PRODUCTION OF AS-BUILT DOCUMENTS, OBTAIN CONSULTANT'S ACAD DRAWING FILES AND "CTB" FILE (FOR PLOTTING CORRECT LINE THICKNESS). WHEN WORK BEGINS ON SITE, MAINTAIN "AS-BUILT" WHITE PRINTS AT SITE FOR PERIODIC INSPECTION BY CONSULTANT THROUGHOUT DURATION OF WORK. PAY PARTICULAR ATTENTION TO ACCURATELY DIMENSIONING LOCATION OF CONCEALED SERVICES TERMINATED FOR FUTURE, BURIED WORK AND SERVICES, AND CONCEALED WORK. CLEARLY AND ACCURATELY MARK-UP CHANGES AND DEVIATIONS FROM ROUTING OF DUCTS, CONDUITS, RACEWAYS AND SERVICES, AND LOCATIONS OF EQUIPMENT SHOWN ON CONTRACT DRAWINGS. CHANGES AND DEVIATIONS INCLUDE THOSE MADE BY ADDENDA CHANGE ORDERS AND SITE INSTRUCTIONS BEFORE APPLYING FOR A CERTIFICATE OF SUBSTANTIAL COMPLETION, UPDATE AUTOCAD DISK SET IN ACCORDANCE WITH MARKED UP "AS-BUILT" WHITE PRINTS, SUBMIT TO CONSULTANT FOR REVIEW, "AS-BUILT" SITE DRAWING WHITE PRINTS PRODUCED FROM DISK SET AND DRAWING DISK SET USING CONSULTANT "CTB" FILE. MAKE REVISIONS AS REQUESTED BY CONSULTANT. UPON COMPLETION OF WORK, SUBMIT TO CONSULTANT, COMPLETED "AS-BUILT" DRAWINGS (PLOTTED WITH "CTB" FILE) TRANSPARENCIES. AUTOCAD FILES DISKS AND BUILDING INSPECTION DEPARTMENT'S FINAL CERTIFICATE OF APPROVAL. "AS-BUILT" DRAWINGS TO CONTAIN CONTRACTOR'S NAME AND DATE FAILURE TO PLOT DRAWINGS WITH CORRECT LINE THICKNESS WILL RESULT IN REJECTION. CONFIRM QUANTITIES OF SETS OF AS-BUILTS WITH CONSULTANT AT STARTUP.

- 7.3 WHEN WORK BEGINS AT SITE, CLEARLY AND ACCURATELY MARK ON BOUND SET OF WHITE PRINTS OF CONTRACT DRAWINGS. ON DAILY BASIS. CHANGES AND DEVIATIONS FROM ROUTING OF AND LOCATIONS OF EQUIPMENT SHOWN ON CONTRACT DRAWINGS. CHANGES AND DEVIATIONS INCLUDING THOSE MADE BY ADDENDA. CHANGE ORDERS. AND SITE INSTRUCTIONS AND CHANGES AND DEVIATIONS INDICATED ON SUPPLEMENTAL DRAWINGS ISSUED WITH ADDENDA, CHANGE ORDERS, AND SITE INSTRUCTIONS, MAINTAIN "AS-BUILT" WHITE PRINTS AT SITE FOR PERIODIC INSPECTION BY CONSULTANT THROUGHOUT DURATION OF WORK. PAY PARTICULAR ATTENTION TO ACCURATELY DIMENSIONING LOCATION OF CONCEALED SERVICES TERMINATED FOR FUTURE EXTENSION. BURIED WORK AND SERVICES. AND WORK CONCEALED WITHIN BUILDING IN INACCESSIBLE LOCATIONS. LOCATE AND IDENTIFY FIRE ALARM DEVICES
- 7.4 WHEN WORK ENDS AT SITE, UPDATE A COMPUTER FILE COPY OF CONTRACT DOCUMENT DRAWING SET SO THAT IT REFLECTS DEVIATIONS FROM ORIGINAL CONTRACT DOCUMENT DRAWINGS. THUS FORMING A TRUE "AS-BUILT" DRAWING DISK SET, PROVIDE SET OF PRINTS OF CONTRACT DRAWINGS PRODUCED FROM TRUE "AS-BUILT" DRAWING SET. SUBMIT "AS-BUILT DRAWING ELECTRONIC FILES WITH WHITE PRINTS AND CAD PRODUCED "AS-BUILT" PRINTS TO CONSULTANT. SUBMITTED DRAWINGS TO BE OF SAME QUALITY AS ORIGINAL CONTRACT DOCUMENT DRAWINGS.
- 7.5 UPDATE ONSITE DISTRIBUTION RISER DIAGRAMS POSTED IN ELECTRICAL ROOMS.

#### 8 SHOP DRAWINGS AND OPERATING/MAINTENANCE INSTRUCTION MANUALS

- 8.1 SUBMIT SHOP DRAWINGS FOR PRODUCTS. PROPERLY IDENTIFY SHOP DRAWINGS FOR REVIEW AND SHOW IN DETAIL EQUIPMENT AND MATERIALS. ENDORSE EACH DRAWING; INCLUDE COMPANY NAME AND SUBMITTAL DATE
- 8.2 PROVIDE OPERATING AND MAINTENANCE (O&M) INSTRUCTION MANUALS AS INDEXED, IDENTIFIED, HARD COVER 3 RING BINDERS COMPLETE WITH:
  - .1 TITLE SHEET AND LIST OF CONTENTS;
- .2 A COPY OF EACH "REVIEWED" SHOP DRAWING; .3 EXPLANATIONS OF OPERATING PRINCIPLES AND SEQUENCES;
- .4 PART LISTS WITH NUMBERS;
- .5 RECOMMENDED MAINTENANCE PRACTICES AND PRECAUTIONS; .6 COPIES OF INSPECTION CERTIFICATES ISSUED BY GOVERNING AUTHORITIES;
- .7 WIRING AND CONNECTION DIAGRAMS:
- .8 COPIES OF ADDITIONAL AND REVISED PANELBOARD DIRECTORIES.
- 8.3 PROVIDE MINIMUM 2 SETS OF MANUALS UNLESS OTHERWISE DIRECTED IN DIVISION 01. CONFIRM EXACT QUANTITY AND METHOD OF SUBMISSION WITH CONSULTANT REVIEW BY CONSULTANT DOES NOT MEAN APPROVAL OF DETAIL DESIGN INHERENT IN SHOP DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS IN SHOP DRAWINGS
- UNLESS OTHERWISE DIRECTED BY CONSULTANT, SUBMIT SHOP DRAWINGS IN ELECTRONIC FORM. UNLESS OTHERWISE DIRECTED BY CONSULTANT ADDITIONALLY INCLUDE ELECTRONIC PDF COPIES OF MANUALS LOADED ON TO USB FLASH DRIVE.

#### GENERAL CONDUIT AND CONDUCTOR INSTALLATION REQUIREMENTS

- 9.1 INSTALL CONDUIT AND CONDUCTORS CONCEALED TO DEGREE MADE POSSIBLE BY FINISHES AND PROVIDE INSTALLATIONS IN ACCORDANCE WITH OESC AND LOCAL GOVERNING AUTHORITIES. PLAN AND COORDINATE LOCATIONS AND ROUTING OF SERVICES WITH TRADES PRIOR TO INSTALLATION. IN AREAS WHERE MULTIPLICITY OF SERVICES OCCURS. PREPARE DETAILED DRAWINGS AND SUBMIT TO CONSULTANT FOR REVIEW PRIOR TO START OF
- WHERE CONDUIT AND/OR CONDUCTORS ARE EXPOSED. ARRANGE SAME TO AVOID INTERFERENCE WITH OTHER WORK AND INSTALL SERVICES PARALLEL TO BUILDING LINES WHERE HORIZONTAL CONDUITS AND/OR CONDUCTORS ARE EXPOSED, INSTALL AS HIGH AS POSSIBLE. DO NOT INSTALL CONDUIT AND/OR CONDUCTORS WITHIN 150 MM OF "HOT" PIPES OF EQUIPMENT UNLESS CONDUIT AND/OR CONDUCTORS ARE ASSOCIATED WITH EQUIPMENT. INDEPENDENTLY RUN CONDUIT AND CONDUCTORS MUST BE SUPPORTED FROM CEILING/WALL STRUCTURE, NOT FROM CEILING HANGERS, DUCTWORK, PIPING, CABLE TRAYS, ETC.
- 9.3 IDENTIFY CONDUIT RUNS. (I.E.: TAG BOTH ENDS OF CONDUIT RUNS). 9.4 AT NO EXTRA COST, ALLOW FOR FINAL RELOCATIONS OF DEVICES UP TO 3 M TO SUIT FINAL

COORDINATED DEVICE LOCATIONS, PRIOR TO INSTALLATION OF WALL COVERINGS.

- 9.5 GENERALLY, CONDUCTORS AND CONDUIT ARE SIZED ON DRAWINGS, BUT IN ABSENCE OF DIRECTION IN TYPE AND SIZING, TYPE AND SIZE AND PROVIDE REQUIRED QUANTITY IN ACCORDANCE WITH INTENDED APPLICATION. TO APPLICABLE OESC REQUIREMENTS. SIZES WHERE SHOWN, ARE MINIMUM SIZES AND SHALL NOT BE REDUCED UNLESS APPROVED BY OWNER AND REVIEWED WITH CONSULTANT
- 9.6 CONDUCTORS IN PLENUM SPACES AND IN RAISED FLOOR AREAS TO COMPLY WITH OBC AND OESC REQUIREMENTS WITH REGARDS TO FLAME AND SMOKE TEST. 9.7 PROVIDE POLY TYPE PULL STRINGS IN ALL EMPTY CONDUITS.

#### 10 PROVISIONS FOR MISCELLANEOUS SYSTEM ROUGH-INS

- 10.1 PROVIDE COMPLETE SYSTEM OF CONDUITS, OUTLET BOXES, JUNCTION BOXES, FACEPLATES AND SLEEVES (IF REQUIRED) AND FIRE RETARDANT PLYWOOD BACKBOARD TO ACCOMMODATE EXTENSION OF EXISTING SYSTEM BY SYSTEMS INSTALLERS WHO WILL PROVIDE EQUIPMENT AND WIRING, PROVIDE BLANK TYPE FACEPLATES
- 10.2 PROVIDE CONDUIT AS REQUIRED. PROVIDE PULLBOXES IN CONDUIT RUNS LONGER THAN 30 M OR HAVING MORE THAN 2, 90 DEGREE BENDS. PULLBOX SIZES ARE NOT TO BE LESS THAN 8 TIMES ENTERING CONDUIT IN LENGTH. LEAVE CONDUITS FREE AND CLEAR OF OBSTRUCTIONS AND TERMINATE AS REQUIRED. EQUIP TERMINATIONS WITH BUSHINGS AND CLEARLY IDENTIFY EACH RUN PROVIDE FISH WIRES IN EMPTY CONDUIT FOR NETWORK CABLING SYSTEMS BOXES CONDUITS, AND BENDING RADII TO CONFORM TO EIA/TIA 569 STANDARDS FOR INSTALLATION OF CATEGORY RATING OF CABLING. UNLESS OTHERWISE NOTED, CONDUITS TO BE MINIMUM 27 MM DIAMETER AND INCREASED TO SUIT MAXIMUM CABLE FILL REQUIREMENTS. PULL BOXES SHALL BE SECURELY ATTACHED TO THE COMMUNICATIONS PAC-POLE.
- PLASTIC BUSHINGS MUST BE UTILIZED WHEN TRANSITIONING FROM THE PULL BOX TO THE COMMUNICATION PAC-POLE.

- 11.1 PROVIDE CONDUIT FOR CONDUCTORS. INTERIOR CONDUIT TO BE EMT (THINWALL) GALVANIZED. ELECTRICAL METALLIC TUBING TO CSA C22.2 NO. 83. COMPLETE WITH FACTORY MADE BENDS WHERE SITE BENDING IS NOT POSSIBLE. AND JOINTS AND TERMINATIONS MADE WITH SET SCREW TYPE CONNECTORS; FOR SHORT BRANCH CIRCUIT CONNECTORS TO MOTORIZED EQUIPMENT AND TRANSFORMERS (MINIMUM LENGTH 450 MM, MAXIMUM LENGTH 600 MM WITH 180 DEGREE LOOP WHERE POSSIBLE) GALVANIZED STEEL FLEXIBLE FLUID TIGHT METALLIC CONDUIT TO CSA C22.2 NO. 56. COMPLETE WITH IDEAL "STEEL TOUGH" LIQUID TIGHT FLEXIBLE CONDUIT CONNECTORS AT TERMINATIONS FOR EXTERIOR EXPOSED CONDUIT AND FOR INTERIOR CONDUIT GREATER THAN 50 MM DIAMETER AND FOR SURFACE MOUNTED CONDUIT AT HEIGHT LESS THAN 1200 MM, PROVIDE RIGID GALVANIZED STEEL TO CSA C22.2 NO. 45
- COMPLETE WITH FITTINGS, CONNECTORS, AND RIGID COUPLINGS. 11.2 FOR RUNNING UNDERGROUND, OR IN CONCRETE SLABS, PROVIDE CSA APPROVED, RIGID PVC
- CONDUIT COMPLETE WITH COUPLINGS, EXPANSION JOINTS, ELBOWS, ETC., AS REQUIRED. 11.3 SUPPORT AND SECURE CONDUIT AT SPACING IN ACCORDANCE WITH CODE REQUIREMENTS BY MEANS OF GALVANIZED PIPE STRAPS, CONDUIT CLIPS, RING BOLT TYPE HANGERS, OR BY OTHER PROPER MANUFACTURED DEVICES. PROVIDE CONDUIT FITTINGS CONSTRUCTED OF SAME MATERIALS AS CONDUIT AND SUITABLE FOR APPLICATION. SQUARE AND PROPERLY REAM ENDS OF SITE CUT CONDUIT, GENERALLY, CONDUIT IS SIZED ON DRAWINGS, SIZE CONDUIT NOT SIZED ON DRAWINGS IN ACCORDANCE WITH CODE. FOR CONTROLS AND COMMUNICATIONS CONDUCTORS, SIZE CONDUIT AS NOTED, BUT INCREASED TO SUFFICIENTLY ACCOMMODATE HOME RUN CONDUCTORS. BEND CONDUIT AT FULL CONDUIT DIAMETER WITH NO KINKING AND NO FLAKING OR CRACKING OF FINISHES.

#### 12 NOT USED

#### 13 CONDUCTORS

- 13.1 PROVIDE CONDUCTORS CONDUCTORS TO BE COPPER. REFER TO DRAWINGS FOR SIZING OF CONDUCTORS. GENERALLY, CONDUCTOR SIZES ARE INDICATED ON DRAWINGS. SUCH SIZES ARE MINIMUM REQUIREMENTS AND MUST BE INCREASED TO SUIT LENGTH OF RUN AND VOLTAGE DROP IN ACCORDANCE WITH SCHEDULE OBTAINED FROM CONSULTANT, SIZE CONDUCTORS NOT SIZED ON DRAWINGS IN ACCORDANCE WITH OESC. PROVIDE CABLE SUPPORT SYSTEM ACCESSORIES WHICH ARE NOT SPECIFIED HEREIN OR SHOWN ON DRAWINGS. BUT ARE REQUIRED FOR PROPER INSTALLATION.
- 13.2 INTERIOR CONDUCTORS: "T90 NYLON" SINGLE COPPER CONDUCTOR TO CSA C22.2 NO. 75 COLOUR CODED, 90°C RATED, PVC INSULATED AND NYLON COVERED; OR "RW90", SINGLE COPPER CONDUCTOR TO CSA C22.2 NO. 38, 600 VOLTS, MAXIMUM 90°C CONDUCTOR TEMPERATURE, MINUS 40°C MINIMUM INSTALLATION TEMPERATURE, X-LINK POLYETHYLENE INSULATION, COLOUR CODED.
- 13.3 CONDUCTORS IN ACCESSIBLE SUSPENDED CEILING SPACES OR IN STUD WALL CONSTRUCTION TO SUSPENDED CEILING SPACES, MAY BE "BX" TYPE, AC 90 FLEXIBLE ARMOURED CABLE WITH "RW 90" COPPER CONDUCTORS (MAXIMUM 6 M RUN PERMITTED) AND WITH BARE COPPE GROUND CONDUCTOR. "BX" TO COMPLY WITH CSA C22.2 NO. 51 (BULLETIN NO. 994). PROVIDE PROPER SQUEEZE TYPE CONNECTORS AND PLASTIC ANTI SHORT BUSHINGS AT TERMINATIONS. SUPPORT "BX" IN CEILING SPACES AND IN STUD WALL CONSTRUCTION WITH STEEL 2 HOLE CABLE STRAPS TO CODE REQUIREMENTS. RUN BX PERPENDICULAR AND PARALLEL TO BUILDING
- 13.4 CONDUCTORS UP TO AND INCLUDING NO. 10 AWG TO BE SOLID. CONDUCTORS IN SIZES LARGER THAN NO. 10 AWG TO BE STRANDED. PROVIDE CONDUCTORS CONSTRUCTED OF 98% CONDUCTIVE COPPER AND APPROVED FOR 600 V. DO NOT USE CONDUCTORS SMALLER THAN
- 13.5 PROVIDE IDI ELECTRIC "IDEAL" NO. 451, NO. 452 AND NO. 453 "WING NUT" CSA CERTIFIED 600V RATED PRESSURE TYPE CONNECTORS
- 13.6 COLOUR CODE CONDUCTORS IN ACCORDANCE WITH CODE, THROUGHOUT TO IDENTIFY PHASES, NEUTRALS AND GROUND BY MEANS OF SELF-LAMINATING COLOURED TAPE, COLOURED CONDUCTOR INSULATION, OR PROPERLY SECURED COLOURED PLASTIC DISCS. 13.7 WHEN PULLING WIRES INTO CONDUIT, USE IDI ELECTRIC "IDEAL YELLOW 77" LUBRICANT.
- ENSURE WIRES ARE KEPT STRAIGHT AND ARE NOT TWISTED OR ABRAISED. 13.8 PROVIDE A NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT, AND A MINIMUM OF ONE GREEN
- INSULATED GROUND CONDUCTOR PER THREE CIRCUITS. TYPICALLY, FOR EACH 37SQM, PROVIDE A JUNCTION BOX WITH THE BRANCH CIRCUITS, NEUTRALS, AND GROUND CONDUCTORS AS DESCRIBED.

#### 14 OUTLET BOXES, PULLBOXES AND JUNCTION BOXES

- 14.1 PROVIDE CSA APPROVED STAMPED GALVANIZED STEEL ELECTRICAL BOXES FOR EACH LUMINAIRE, DEVICE AND OTHER PRODUCT FOR WIRING TERMINATIONS AS REQUIRED, REFER TO DRAWINGS FOR TYPICAL LOCATIONS OF OUTLETS. CONFIRM EXACT LOCATIONS PRIOR TO ROUGHING IN. BOXES FOR RIGID STEEL CONDUITS TO BE CAST FS/FD TYPES. PROVIDE PVC BOXES FOR PVC CONDUIT SYSTEMS.
- 14.2 PROVIDE PULLBOXES AND JUNCTION BOXES WHEREVER NECESSARY TO FACILITATE CONDUCTOR/CONDUIT INSTALLATIONS. GENERALLY, PROVIDE CONDUIT RUNS EXCEEDING 30 M IN LENGTH, OR WITH MORE THAN 2, 90-DEGREE BENDS WITH PULLBOX INSTALLED AT CONVENIENT AND SUITABLE INTERMEDIATE ACCESSIBLE LOCATION. PROVIDE JUNCTION BOXES AND PULLBOXES SIZED IN ACCORDANCE WITH CODE TO SUIT NUMBER AND SIZE OF CONDUITS AND CONDUCTORS, BOXES TO BE GALVANIZED OR PRIME COATED PLATE STEEL COMPLETE. WITH SCREW ON OR HINGED COVERS AND KNOCKOUTS. BOXES MUST BE ACCESSIBLE AFTER WORK IS COMPLETE.
- 14.3 SIZE, ARRANGEMENT AND TYPE OF BOXES TO BE SUITABLE FOR APPLICATION. PROVIDE BLANK COVERPLATES ON EXISTING OBSOLETE BOXES WHICH ARE TO REMAIN. CLEARLY IDENTIFY MAIN PULL OR JUNCTION BOXES BY PAINTING COVERS IN ACCORDANCE WITH FOLLOWING COLOUR SCHEDULE:
- .1 LIGHTING YELLOW;
- .2 NORMAL POWER BLUE;

15 RECEPTACLES, SWITCHES AND FACEPLATES

### .3 FIRE ALARM - RED.

- 15.1 FOR GENERAL AREAS: PROVIDE CSA APPROVED. EXTRA HEAVY DUTY, INDUSTRIAL GRADE, AC QUIET ACTION NYLON TOGGLE TYPE, 20A, 120 277V SWITCHES AND, TAMPER RESISTANT, EXTRA HEAVY DUTY, SPECIFICATION GRADE PREMIUM QUALITY, NYLON BODY CONSTRUCTION, DUPLEX, 15 OR 20A 125V, 3W GROUNDING RECEPTACLES EQUAL TO HUBBELL 5362WTR. DEVICES TO BE BACK AND SIDE WIRED. PROVIDE STAINLESS STEEL TYPE OR IMPACT RESISTANT THERMOPLASTIC FACEPLATES WITH MATCHING SCREWS, AS PER EXISTING STANDARDS AS REVIEWED WITH CONSULTANT
- 15.2 FOR PUBLIC SPACES OR OTHER AREAS WHERE DESIGNER DEVICES ARE REQUIRED: PROVIDE, CSA APPROVED, SPECIFICATION GRADE, ROCKER TYPE, 20A, 120 277V DECORATIVE TYPE SWITCHES SPECIFICATION GRADE, DUPLEX NYLON CONSTRUCTION, 15A 125V, 3W DECORATIVE RECEPTACLES. DEVICES TO BE BACK AND SIDE WIRED. PROVIDE IMPACT RESISTANT THERMOPLASTIC FACEPLATES WITH MATCHING SCREWS.
- 15.3 WHERE REQUIRED, PROVIDE 15A 125V, ULC LISTED, 2 POLE, 3W, ORANGE COLOURED, SPECIFICATION GRADE ISOLATED GROUND DUPLEX RECEPTACLE COMPLETE WITH STAINLESS STEEL FACEPLATE AND MATCHING SCREWS. 15.4 WHERE REQUIRED, PROVIDE WEATHER RESISTANT SERIES, 15A 125V, ULC LISTED, CLASS A, GROUP ONE, 2 POLE, 3W, IVORY COLOURED, SPECIFICATION GRADE, GROUND FAULT
- MATCHING SCREWS 15.5 IDENTIFY CIRCUIT NUMBERS ON RECEPTACLE DESIGNATED LABELLING SPACES. PROVIDE PERMANENTLY LABELLED, SELF-ADHESIVE, IDENTIFICATION TAPE ON OUTSIDE OF EACH DEVICE OUTLET, IDENTIFYING LOCATION FROM WHERE EACH DEVICE IS FED.

INTERRUPTER DUPLEX RECEPTACLE COMPLETE WITH STAINLESS STEEL FACEPLATES AND

15.6 CONFIRM TYPE, NUMBER OF WAY, NUMBER OF POLES, AND FINISHES OF DEVICES WITH CONSULTANT PRIOR TO ORDERING. SUBMIT SAMPLES AND FINISHES FOR CONSULTANT'S

15.7 ACCEPTABLE MANUFACTURERS INCLUDE HUBBELL, LEGRAND P&S, COOPER ARROW HART AND

### 16 ACCESS DOORS

LEVITON.

- 16.1 PROVIDE MINIMUM NO. 12 GAUGE PRIME COAT PAINTED STEEL FLUSH ACCESS DOORS, EACH COMPLETE WITH A HEAVY FRAME AND ANCHOR, HEAVY DUTY RUST RESISTANT CONCEALED HINGES. POSITIVE LOCKING SCREWDRIVER LOCK. AND MOUNTING AND FINISHING PROVISIONS TO SUIT PARTICULAR CONSTRUCTION IN WHICH IT IS INSTALLED. ACCESS DOORS TYPICALLY STANDARD SIZE AND TO SUIT CONCEALED WORK FOR WHICH THEY ARE SUPPLIED BUT NOT BE LESS THAN 600 MM X 600 MM. ACCESS DOORS IN FIRE RATED CEILINGS, WALLS, PARTITIONS, STRUCTURES, ETC., TO BE ULC LISTED AND LABELLED AND OF A RATING TO MAINTAIN FIRE SEPARATION INTEGRITY.
- 16.2 WHERE ACCESS DOORS ARE LOCATED IN SURFACES WHERE SPECIAL FINISHES ARE REQUIRED. PROVIDE RECESSED DOOR TYPE CAPABLE OF ACCEPTING FINISH IN WHICH THEY ARE TO BE INSTALLED SO AS TO MAINTAIN FINAL BUILDING SURFACE APPEARANCE THROUGHOUT.
- 16.3 SUPPLY ACCESS DOORS TO GIVE ACCESS TO JUNCTION BOXES, PULLBOXES, CONDUCTOR/BUS JOINTS AND OTHER SIMILAR ELECTRICAL WORK WHICH MAY NEED MAINTENANCE OR REPAIR BUT WHICH IS CONCEALED IN INACCESSIBLE CONSTRUCTION. 16.4 BEFORE COMMENCING INSTALLATION OF WORK, PREPARE ON SET OF REFLECTED CEILING PLANS. COMPLETE LAYOUTS OF REQUIRED CEILING ACCESS DOORS. SUBMIT FOR CONSULTANT'S REVIEW, LAYOUTS SHOWING EXACT SIZES AND LOCATIONS. LOCATE AND
- ARRANGE WORK TO SUIT. COORDINATE SUCH THAT MECHANICAL AND ELECTRICAL SERVICES CAN BE ACCESSED AT SAME LOCATION WHERE POSSIBLE. 16.5 ACCESS DOORS TO BE INSTALLED BY TRADE RESPONSIBLE FOR PARTICULAR TYPE OF CONSTRUCTION IN WHICH DOORS ARE REQUIRED. SUPPLY ACCESS DOORS TO TRADE
- INSTALLING SAME AT PROPER TIME. 16.6 CONFIRM EXACT DIMENSIONS PRIOR TO ORDERING. CONFIRM FINISHES WITH CONSULTANT.

### 17 FASTENING AND SECURING HARDWARE

- 17.1 PROVIDE PROPER FASTENERS, HANGERS AND SIMILAR HARDWARE REQUIRED FOR CONDUIT, CONDUCTORS AND EQUIPMENT. DO NOT USE EXPLOSIVE POWDER ACTUATED FASTENERS WITHOUT WRITTEN APPROVAL FROM OWNER AND REVIEW WITH CONSULTANT. UNDER NO CIRCUMSTANCES SHALL CEILING SUSPENSION HANGERS OR GRIDS BE USED FOR SUSPENSION OF CONDUIT AND CONDUCTORS.
- 17.2 PROVIDE METAL "J" HOOKS OR PANDUIT "J-PRO" CABLE SUPPORT SYSTEMS FOR COMMUNICATIONS SYSTEM CABLING IN ACCESSIBLE CEILING SPACES WERE CONDUIT OR CABLE TRAY IS NOT BEING PROVIDED. OBTAIN WRITTEN APPROVAL OF OWNER FOR USE OF J-HOOKS COMPLY WITH J-HOOK MANUFACTURER'S LOADING LIMITATIONS AND SPACING CRITERIA. DO NOT EXCEED 1.2 M SPACING INTERVAL. ADD ADDITIONAL J-HOOKS IF CABLING SAGS, AT DISCRETION OF CONSULTANT. DO NOT INSTALL MORE THAN ONE SYSTEM ON EACH J-HOOK.
- 17.3 PROVIDE VELCRO TIE WRAPS FOR BUNDLING AND SECURING CABLES. DO NOT OVER TIGHTEN. PROVIDE FT6/CMP RATED WRAPS IN PLENUM TYPE SPACES AS PER LOCAL BUILDING CODE

#### 18 IDENTIFICATION NAMEPLATES

18.1 FOR EACH PIECE OF ELECTRICAL DISTRIBUTION EQUIPMENT FROM ELECTRICAL SOURCE OF SUPPLY UP TO AND INCLUDING PANELBOARDS, AND OTHER SYSTEMS CONTROL CABINETS AND ASSOCIATED ENCLOSURES, PROVIDE ENGRAVED LAMACOID IDENTIFICATION NAMEPLATES SECURED TO APPARATUS WITH STAINLESS STEEL SCREWS, WORDING TO INDICATE SOURCE OF ELECTRICAL SUPPLY AND SIZED TO SUIT EQUIPMENT FOR WHICH IT IS PROVIDED. REVIEW EXACT NAMEPLATE WORDING, DESIGNATIONS, AND SIZES WITH CONSULTANT PRIOR TO MANUFACTURE.

#### 19 SYSTEM BACKBOARDS

19.1 FSC (FOREST STEWARDSHIP COUNCIL), G1S CONSTRUCTION GRADE FIR PLYWOOD, FLAME RETARDANT PRIME COAT PAINTED ON EXPOSED SURFACES, MINIMUM 20 MM THICK, AS SIZED ON DRAWINGS AND WITH FLAME SPREAD RATING IN ACCORDANCE WITH OBC REQUIREMENTS.

#### 20 CIRCUIT BREAKERS FOR EXISTING PANELBOARDS

- 20.1 PROVIDE BREAKERS IN EXISTING PANELBOARDS OF TYPE, QUALITY AND STANDARDS TO MATCH EXISTING DEVICES. CONFIRM REQUIREMENTS ON SITE PRIOR TO ORDERING. BREAKERS TO BE FULL HEIGHT MODULES. PROVIDE MODIFICATIONS TO PANELBOARDS TO ACCOMMODATE BREAKERS AND FEEDER INSTALLATIONS, PROVIDE REPLACEMENT BRANCH CIRCUIT DIRECTORY CARDS, NEATLY TYPEWRITTEN TO INCORPORATE ADDITIONAL AND EXISTING CONNECTED LOADS, TO CONSULTANT'S DIRECTIONS. DIRECTORIES TO USE OWNER'S ACTUAL ROOM NAMES/NUMBERS AND NOT CONTRACT DRAWINGS NAMES/NUMBERS. PROVIDE ENGRAVED LAMACOID I.D. NAMEPLATES FOR DISTRIBUTION PANELBOARDS, TO CONSULTANT'S DIRECTIONS.
- 21.1 PROVIDE CUTLER-HAMMER CANADA TYPE "POW-R-LINE 1" FACTORY ASSEMBLED DEAD FRONT PANELBOARDS, 120/208V, 3-PHASE, 4-WIRE, MANUFACTURED TO CSA STANDARD C22.2 NO. 29 AND OESC, AND DESIGNED FOR AN INTERRUPTING CAPACITY OF 10 KA SYMMETRICAL AT 208V, UNLESS OTHEWISE NOTED.

#### 21.2 INSTALL PANELBOARDS WHERE SHOWN COMPLETE WITH:

- EEMAC 2 SPRINKLER-PROOF ENCLOSURE CONSTRUCTED OF CODE GAUGE GALVANIZED STEEL WITH REMOVABLE BOX ENDS, WIRING GUTTER SPACE ON SIDES,
- AND FACTORY PAINTED WITH ASA-61 GREY BAKED, ACRYLIC ENAMEL FINISH: TRIM FOR RECESSED OR SURFACE WALL MOUNTING AS SHOWN, CONSTRUCTED CODE GAUGE STEEL, BONDERIZED, FACTORY FINISHED WITH ASA-61 GREY BAKED ACRYLIC ENAMEL AND COMPLETE WITH CONCEALED FASTENERS. CONCEALED HINGE, CHROME PLATED DOOR LATCH AND KEYED ALIKE LOCK WITH KEY, STEEL FRAME HOLDER AND CIRCUIT DIRECTORY BACK OF DOOR, AND MYLAR CIRCUIT BREAKER IDENTIFICATION STRIPS;
- FACTORY PAINTED DRIP SHIELD FOR SURFACE MOUNTED PANELBOARDS;
- HARD DRAWN ELECTRICAL GRADE COPPER BUS AND GROUND BUS;
- HIGH STRENGTH, SET SCREW TYPE, ANTI-TURNING WIRE CONNECTORS;
- BOLT ON MOULDED CASE CIRCUIT BREAKERS; MAIN BREAKER AND GREEN POWER "ON" INDICATOR LIGHT, WHERE SCHEDULED;
- 200% CAPACITY NEUTRALS FOR PANELBOARDS AS SCHEDULED.

#### 21.3 PROVIDE DOUBLE LUGGING TO EXISTING PANELBOARDS AS SHOWN.

- 21.4 SUPPORT CABINET INDEPENDENT OF CONNECTING CONDUIT. TURN OVER TO CONSULTANT, PRIOR TO APPLICATION FOR SUBSTANTIAL PERFORMANCE OF WORK, QUANTITY OF 2 PANELBOARD CABINET KEYS PER PANELBOARD. IDENTIFY PANELBOARD BREAKERS IN PERMANENT MANNER, AND COMPLETE TYPED CIRCUIT DIRECTORY TO OWNER'S APPROVAL.
- 21.5 ACCEPTABLE MANUFACTURERS INCLUDE SIEMENS ELECTRIC AND SQUARE D.

22.1 PROVIDE COMPLETE SYSTEM OF GROUNDING AND BONDING. WHICH COMPLIES WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION FOR ELECTRICAL WORK, INCLUDING REQUIRED GROUNDING SECTIONS OF OESC. CONNECT GROUNDING CONDUCTORS TO EXISTING BUILDING GROUND SYSTEM. PROVIDE SEPARATE INSULATED GROUND WIRE FOR EACH ISOLATED GROUND CIRCUIT. MAKE BURIED OR IN SLAB GROUND CONNECTIONS WITH ERICO CADWELD TYPE WELDED COPPER CONNECTIONS OR BURNDY HYGROUND COMPRESSION CONNECTORS. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, CONDUCTORS GREATER

THAN 400 A TO BE PROVIDED WITH MINIMUM 3/0 AWG GROUND CONDUCTOR.

22.2 PROVIDE A GROUND CONDUCTOR IN ALL CONDUITS AND EMT.

23 CONNECTIONS FOR MECHANICAL, OWNER'S, ETC., EQUIPMENT

22.3 PROVIDE TELECOMMUNICATIONS GROUNDING BUSBAR (MINIMUM 300MM X 50MM X 9MM) MOUNTED WITH STANDOFF INSULATORS ON WALLS OF LAN CLOSETS. BUSBAR TO INCLUDE MINIMUM 8-DRILLED HOLES. CONNECT TO EQUIPMENT WITH GROUND CONDUCTORS AS

#### 23.1 PROVIDE REQUIRED ELECTRICAL AND COMMUNICATIONS CONNECTIONS TO APPARATUS SUPPLIED BY MECHANICAL DIVISION AND BY OWNER AS PART OF OTHER DIVISIONS. PERFORM ELECTRICAL WORK FOR EQUIPMENT SCHEDULED ON DRAWINGS. MECHANICAL DIVISION CONTRACTOR WILL SUPPLY STARTERS FOR MOTORIZED APPARATUS SUPPLIED BY THEM AND WILL PROVIDE LAMACOID IDENTIFICATION THROUGHOUT

23.2 COORDINATE WITH TRADES OF OTHER DIVISIONS TO ENSURE PROVISION OF PROPER ELECTRICAL AND COMMUNICATIONS REQUIREMENTS. UNLESS OTHERWISE NOTED OR DIRECTED BY CONSULTANT, PROVIDE INTERCONNECTION WIRING BETWEEN REMOTE OPERATOR DEVICES/CONTROLLERS AND EQUIPMENT BEING CONTROLLED BY OPERATOR DEVICES. WHETHER OR NOT SUCH DEVICES ARE SUPPLIED BY ELECTRICAL DIVISION. PROVIDE DISCONNECT SWITCHES, RECEPTACLES AND OTHER REQUIRED WIRING AND CONNECTION ACCESSORIES. COORDINATE WORK WITH SUPPLIERS OF EQUIPMENT TO BE PROVIDED WITH CONNECTIONS AND WITH STRUCTURED CABLING SYSTEM VENDOR

#### 23.3 BE RESPONSIBLE FOR:

- 1 COMPLETE INSTALLATION AND CONNECTION OF STARTERS AND PROVIDE "LINE" AND
- "LOAD" POWER CONNECTIONS AND INTERLOCKING AS REQUIRED; .2 PROVIDE MOTOR STARTER PANELS CONSISTING OF NO. 14 GAUGE STEEL BOLTED PANELS
- SIZED TO ACCOMMODATE STARTERS AS REQUIRED AND SUITABLE SPLITTER; .3 UNLESS OTHERWISE NOTED OR SHOWN ON DRAWINGS. MOUNT 1 PHASE STARTERS ADJACENT TO EQUIPMENT THEY SERVE AND CONNECT COMPLETE:
- .4 COORDINATE FEEDER ENTRIES TO STARTERS AND STARTER ASSEMBLIES WITH MECHANICAL DIVISION: .5 PROVIDE ADDITIONAL DISCONNECT SWITCHES (COMPLETE WITH IDENTIFICATION), AS

COORDINATED WITH MECHANICAL DIVISION CONTRACTOR;

OR IS IN EXCESS OF 9 M (30') FROM ITS STARTER .6 PROVIDE INTERLOCK WIRING AS INDICATED ON DRAWINGS AND AS REQUIRED AND AS

.7 CONNECT REQUIRED CIRCUITS TO MOTOR STARTER PANEL SO AS TO BALANCE ACTUAL

REQUIRED BY CODE, OR FOR APPARATUS WHICH CANNOT BE SEEN FROM ITS STARTER

#### LOADS (WATTAGE).

- 24.1 INCLUDE WITH SHOP DRAWING SUBMISSIONS PHOTOMETRIC DATA LAMP AND DRIVER INFORMATION FOR EACH LUMINAIRE. PHOTOMETRIC DATA TO INCLUDE: TOTAL INPUT WATTS. CANDLEPOWER SUMMARY, CANDELA DISTRIBUTION ZONAL LUMEN SUMMARY, LUMINAIRE EFFICIENCY, CIE TYPE, COEFFICIENT OF UTILIZATION, LAMP TYPE AND LUMEN RATING IN
- ACCORDANCE WITH IESNA TESTING PROCEDURES. 24.2 PROVIDE LUMINAIRES AS NOTED COMPLETE WITH LED LAMPS AND DRIVERS WITH FEATURES AS
  - .1 CSA APPROVED, ULC LISTED AND LABELLED;
  - .2 OPERATING TEMPERATURE RANGE THROUGH -20°C TO 50°C; .3 SPECIFICATION STANDARDS TO MEET REQUIREMENTS OF IES LM-79 AND LM-80;
  - .4 BE 100% COMPATIBLE WITH CONNECTED DIMMER CONTROLS TO PROVIDE DIMMING .5 LEDS TO BE SELECTED FROM SAME COLOUR BIN SIZE FOR CONSISTENCY IN
  - CHROMATICITY AND MEET ANSI C78 377A AS A MINIMUM: .6 GENERALLY, COLOUR TEMPERATURE RANGE TO BE FROM 2700 K TO 6500 K: SPECIFIC TEMPERATURE REQUIREMENTS TO BE IDENTIFIED ON SCHEDULE OF LUMINAIRES;
  - .7 MINIMUM CRI OF 80; .8 RATED LIFE (BASED ON 70% LUMEN DEPRECIATION LEVEL) FROM 50,000 TO 70,000 HOURS.

.9 OPERATE FROM 60 HZ INPUT SOURCE OF 120 VAC WITH SUSTAINED VARIATIONS OF ± 10%

- (VOLTAGE AND FREQUENCY) WITH NO DAMAGE TO DRIVER; .10 OUTPUT REGULATED TO ±5% ACROSS LOAD RANGE;
- .11 POWER FACTOR GREATER THAN 0.90; .12 TOTAL HARMONIC DISTORTION LESS THAN 20%;
- .13 CLASS A SOUND RATING; .14 COMPLY WITH ANSI C62.41 CATEGORY A FOR TRANSIENT PROTECTION;

.15 ACCEPTABLE MANUFACTURERS INCLUDE PHILIPS, LITHONIA, AND COOPER.

24.3 THOROUGHLY REVIEW CEILING TYPES, FINISHES AND CONSTRUCTION DETAILS WITH OWNER BEFORE PLACING LUMINAIRE ORDERS AND ENSURE REQUIRED MOUNTING ASSEMBLIES, RINGS AND SIMILAR FEATURES ARE INCLUDED. INCLUDE FOR ASSEMBLY, MOUNTING AND ADJUSTING OF LUMINAIRES, COMPLETE WITH WIRING, CONNECTIONS, HANGERS, ALIGNERS, BOX COVERS, AND ACCESSORIES FOR COMPLETE, SAFE, FULLY OPERATIONAL ASSEMBLY. CAREFULLY COORDINATE LUMINAIRE INSTALLATION WITH WORK OF OTHER TRADES TO ENSURE NECESSARY RECESSING DEPTHS AND MOUNTING SPACES ARE PROVIDED. INSTALL LUMINAIRES IN ACCORDANCE WITH APPLICABLE ARCHITECTURAL REFLECTED CEILING PLANS AND/OR WALL ELEVATIONS. CONFIRM LUMINAIRE LOCATIONS PRIOR TO ROUGHING IN. REVIEW LAMP COLOUR TEMPERATURES WITH CONSULTANT/OWNER PRIOR TO ORDERING. SUPPORT LUMINAIRES DIRECTLY TO CEILING SLAB STRUCTURE, NOT TO CEILING HANGERS, DUCTWORK, PIPING, CABLE

TRAYS, ETC. ENSURE THAT THE INSTALLATION OF THE LUMINAIRES CONFORMS TO THE

APPLICABLE SEISMIC RESTRAINT PROVISIONS INCLUDED IN THE LOCAL GOVERNING BUILDING

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contractor to check and verify all dimensions on site and report all errors and/ or omissions to the architect.

All contractors must comply with all

It is the responsibility of the appropriate

pertinent codes and by-laws. Do not scale drawings.

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**Hobin Architecture** 

E: mail@hobinarc.com hobinarc.com ARCHITECTURE PROJECT/LOCATION: TURNBULL SCHOOL

> **ELECTRICAL SPECIFICATION** SHEET 1 OF 2

MUSIC ROOM ADDITION

1132 Fisher Avenue, Ottawa



81-04865-00 DRAWING NO.

Incorporated 63 Pamilla Street Ottawa, Ontario Canada K1S3K7 T: 613-238-7200 F: 613-235-2005

N.T.S. PROJECT

- 24.4 CONNECT LUMINAIRES TO CIRCUITS AND NEW OR EXISTING LIGHTING CONTROL EQUIPMENT AS REQUIRED. DO NOT OVERLOAD CIRCUITS BEYOND FIXTURE MANUFACTURER'S RECOMMENDATIONS.
- 24.5 ENSURE THAT PRODUCTS THAT ARE TO BE DIMMED ARE COMPATIBLE WITH EACH OTHER, AND OF ONE MANUFACTURER. ENSURE DIMMING PERFORMANCE LEVELS ARE ACCEPTABLE TO
- CONSULTANT. UNLESS OTHERWISE NOTED, LIGHTING TO BE DIMMED FROM 100% DOWN TO 10%. 24.6 ACCEPTABLE DRIVER MANUFACTURERS ARE ADVANCE, OSRAM SYLVANIA, AND UNIVERSAL.

#### 25 WALL BOX DIMMERS

- 25.1 PROVIDE WALL BOX DIMMERS TO MATCH THE LIGHTING BEING CONTROLLED ( i.e. OF THE SAME MANUFACTURER OR AS RECOMMENDED BY THE LIGHTING MANUFACTURER). DIMMERS TO BE OF TYPE AND CAPACITY TO SUIT INTENDED LOADS, EACH COMPLETE WITH CALIBRATED LINEAR SLIDE CONTROL WITH SILVER CONTACTS AND SILENT POSITIVE ON/OFF, FACEPLATE, EMI AND RFI FILTERING. REVIEW FINISHES WITH CONSULTANT PRIOR TO ORDERING.
- 25.2 INSTALL FLUSH WALL BOX DIMMERS IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. AND CONNECT TO CONTROL LIGHTING. REVIEW EXACT LOCATIONS WITH CONSULTANT PRIOR TO ROUGHING IN. EQUIP EACH DIMMER WITH FACEPLATE. WHEN INSTALLATION IS COMPLETE. CHECK AND TEST OPERATION OF DIMMERS AND ADJUST AS REQUIRED.

#### 26 LOW VOLTAGE RELAYS/CONTACTORS

- 26.1 NOT USED
- 26.2 MAGNETIC, FULL VOLTAGE CONTACTORS, SUITABLE FOR APPLICATIONS; 26.3 ELECTRICAL ENCLOSURES/ BOXES SUITABLE FOR HOUSING COMPONENTS.

#### 27 OCCUPANCY SENSORS

- 27.1 PROVIDE DEVICES TO MATCH THE LIGHTING BEING CONTROLLED. DEVICES TO BE CSA APPROVED AND TO PROVIDE AUTOMATIC CONTROL OF LIGHTING WITH FOLLOWING
- .1 POWER AND SLAVE PACKS; LOW VOLTAGE OR LINE VOLTAGE OPERATION TO SUIT SPECIFIC APPLICATIONS;
- .2 DUAL TECHNOLOGY OCCUPANCY SENSORS;
- .3 OVERRIDE SWITCHES TO BE WALL MOUNTING IN SINGLE GANG RECESSED OUTLET BOXES;
- .4 DAY LIGHT SENSORS TO BE PROVIDED WHERE REQUIRED FOR DIMMING OR CONTROLLING LIGHTS IN AREAS WITH WINDOWS AND ATRIUMS/SKY LIGHTS;
- .5 MOUNTING HARDWARE AND ANCILLARY DEVICES AS REQUIRED;
- .6 WIRING IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S REQUIREMENTS AND APPLICABLE LOCAL GOVERNING CODES AND STANDARDS.
- 27.2 DUAL TECHNOLOGY TYPE SENSORS AS FOLLOWS:
- .1 COMBINATION PASSIVE INFRARED AND ULTRASONIC TECHNOLOGIES;
- .2 WHEN BOTH PIR AND ULTRASONIC TECHNOLOGIES DETECT OCCUPANCY, LIGHTS TURN ON AUTOMATICALLY; ONCE LIGHTS ARE ON, DETECTION BY EITHER TECHNOLOGY HOLDS LIGHTS ON UNTIL OCCUPANCY IS NO LONGER DETECTED AND TIME DELAY ELAPSES; .3 360° LENS AREA COVERAGE, EXTENDING OUT UP TO 6 M AND AREA OF 92.9 M2;
- .4 LOW PROFILE CEILING MOUNTING DESIGN; INTEGRAL LIGHT SENSOR;
- .5 ADJUSTABLE SENSITIVITY AND DIGITAL TIME DELAY; WALK-THROUGH MODE; LED
- INDICATION OF OCCUPANCY DETECTION; .6 ISOLATED RELAY FOR INTERCONNECTION TO AUXILIARY CONTROL SYSTEMS WHERE
- 27.3 FOR APPLICATIONS IN WASHROOMS AND SMALL STORAGE ROOMS: WALL MOUNTED DUAL TECHNOLOGY SENSORS AS FOLLOWS:
  - .1 WALL SWITCH SENSOR TURNS LIGHTS OFF AND ON BASED ON OCCUPANCY;
- .2 FACTORY DEFAULT OPERATION IS FOR MANUAL-ON MODE, SO THAT USERS TURN LIGHT
- ON ONLY WHEN NEEDED; .3 VARIETY OF CONTROL OPTIONS INCLUDING AUTO-ON OPERATION, WALK-THROUGH AND TEST MODE; ADDITIONAL SETTINGS ALLOW CHOICE OF WHICH SENSING TECHNOLOGIES
- HOLD ON OR RETRIGGER LIGHTING;
- .4 COLOUR MATCHED LENS AND LOW PROFILE DESIGN; .5 WIDE DISPERSION LENS AREA COVERAGE, EXTENDING OUT UP TO 10 M AND AREA OF 37
- .6 INFRARED AND ULTRASONIC TECHNOLOGIES;
- .7 ADJUSTABLE TIME DELAYS AND SENSITIVITY; MANUAL PUSHBUTTON OPERATION (OVERRIDE).
- 27.4 EXACT TYPE OF OCCUPANCY SENSORS AND TYPE OF LENSES TO BE VERIFIED BY MANUFACTURER/SUPPLIER TO ENSURE PROPER COVERAGE IN SENSED AREAS ONLY AND
- COMPATIBILITY TO INTERCONNECTED SYSTEMS. CONFIRM WITH RESPECTIVE MANUFACTURERS. 27.5 PROVIDE, LOCATE, AND AIM APPROPRIATE SENSORS IN CORRECT LOCATION REQUIRED FOR COMPLETE AND PROPER VOLUMETRIC COVERAGE WITHIN RANGE OF COVERAGE OF CONTROLLED AREAS PER MANUFACTURER'S RECOMMENDATIONS. ADJUST SENSITIVITY AND
- TIME DELAYS TO SUIT. 27.6 ACCEPTABLE MANUFACTURERS INCLUDE HUBBELL, PHILIPS, SENSOR SWITCH; LEVITON, WATTSTOPPER AND GE

#### 28 EMERGENCY LIGHTING BATTERY UNITS

- 28.1 PROVIDE EMERGI-LITE 12V DC, "ESL" SERIES LONG LIFE (10 YEAR) SEALED LEAD, BATTERY UNITS. UNITS SHALL BE COMPLETE WITH AUTO-DIAGNOSTIC CONTROLLER, SOLID STATE CHARGER, AC LINE CORD AND PLUG SET, NO. 18 GAUGE STEEL CABINET AND INEGRAL 12V/6W LED ADJUSTABLE LAMP HEADS. UNLESS OTHERWISE NOTED, REMOTE SURFACE LAMP HEADS TO BE DISTINCTION DESIGNER SERIES TYPE EF150. 12V/6W MR16 LED SURFACE MOUNTED SINGLE/DUAL LAMP HEADS AND RECESSED UNITS TO MATCH BATTERY PACK, 12V/5W MR16 LED SURFACE, WITH ADJUSTABLE AIM. CONNECT COMPLETE, BACK TO BATTERY UNIT, CHARGER TO RESTORE BATTERIES TO FULL CHARGE WITHIN 12 HOURS. SYSTEM TO HAVE OBC REQUIRED DURATION OF OUTPUT CAPACITY FOR LOAD OF SYSTEM (BUT MINIMUM 30 MINUTES).
- 28.2 MOUNT UNIT IN AREA AS REQUIRED AND PLUG UNIT INTO ADJACENT RECEPTACLE. PROVIDE REMOTE LAMP HEADS WHERE REQUIRED AND PROVIDE WIRING IN CONDUIT TO BATTERY UNIT. CONFIRM EXACT LOCATIONS. SIZE CIRCUIT WIRING IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS FOR VOLTAGE DROP PROTECTION. TEST, CHECK, AND ADJUST AS REQUIRED.
- 28.3 INCLUDE FOR MANUFACTURER TO PROVIDE TESTING OF SYSTEM AND MEASUREMENT OF LIGHT LEVELS TO OBTAIN LOCAL INSPECTION APPROVALS AND PERMITS. MANUFACTURER'S AUTHORIZED TECHNICIAN TO PREPARE AND PROVIDE SIGNED TEST REPORT VERIFYING THAT SYSTEM IS PROPERLY WORKING AND THAT LIGHT LEVELS MEET LOCAL CODE REQUIREMENTS. INCLUDE REQUIRED TEST MEASUREMENTS IN REPORT AND SUBMIT TO CONSULTANT.
- 28.4 ACCEPTABLE MANUFACTURERS INCLUDE LUMACELL, AIMLITE, BEGHELLI AND EMERGI-LITE.
- 29 LOW VOLTAGE LIGHTING CONTROL COMPONENTS
- 29.1 NOT USED

#### 30 EXISTING FIRE ALARM SYSTEM WORK

#### SIEMENS CONTACT: STEVE.WOZNY@SIEMENS.COM Existing system: Edwards EST-6616 and Siemens TXL-1000

- 30.1 ENGAGE EXISTING FIRE ALARM SYSTEM VENDOR AS APPROVED BY OWNER, TO PROVIDE SYSTEM WORK. DISCONNECT, RELOCATE, AND RECONNECT REQUIRED DEVICES. WORK TO BE AN EXTENSION OF EXISTING SYSTEM. PROVIDE ADDITIONAL DEVICES, CONDUCTORS IN CONDUIT
- AND END OF LINE RESISTORS, PROVIDE ULC LISTED DEVICES TO MATCH EXISTING DEVICES AND BE COMPLETELY COMPATIBLE WITH EXISTING SYSTEM. PERFORM WORK IN ACCORDANCE WITH LATEST EDITION OF CAN/ULC S524. SEQUENCE OF OPERATION OF NEW WORK TO FUNCTION AS PER EXISTING SYSTEM. UNLESS OTHERWISE NOTED, CONNECT ADDITIONAL DEVICES TO EXISTING ZONES SERVING AREA, AS PER SYSTEM MANUFACTURER'S INSTRUCTIONS, TO EXISTING STANDARDS AND AS APPROVED BY LOCAL FIRE AUTHORITY. PROVIDE WIRING OF MINIMUM NO. 16 AWG IN CONDUIT AND AS PER OESC REQUIREMENTS. RUN ALARM INITIATING CIRCUITS IN SEPARATE CONDUITS FROM ALARM SIGNALLING CIRCUITS. 30.2 PROVIDE ADDITIONAL DEVICES OF TYPE TO SUIT APPLICATIONS AS RECOMMENDED BY SYSTEM

SUPPLIER. INCLUDE REQUIRED ACCESSORIES FOR PROPER OPERATION AND INSTALLATION.

RE-PROGRAM SYSTEM TO ACCOMMODATE ADDITIONS AND MODIFICATIONS. RE-BURN SOFTWARE AS REQUIRED BY LOCAL FIRE AUTHORITY. MODIFY ANNUNCIATOR PANELS AS

REQUIRED TO INCORPORATE REVISIONS AND ADDITIONS. PROVIDE AUDIBLE DEVICES AND ADJUST TO SOUND AT LEVELS AS PER LOCAL FIRE AUTHORITY REQUIREMENTS. PROVIDE

- ADDITIONAL DEVICES AS REQUIRED TO ACHIEVE SOUND LEVEL STANDARDS. 30.3 DURING WORK TO EXISTING FIRE ALARM SYSTEM, TIME AND DURATION OF INTERRUPTION TO BE APPROVED BY OWNER AND ONLY ONE ZONE SHALL BE INTERRUPTED AT ANY ONE TIME. IN AREAS WHERE RENOVATION WORK REQUIRES SHUTDOWN OF ANY PART OF FIRE ALARM PROTECTION SYSTEM, PROVIDE MANUAL FIRE ALARM PROTECTION (FIRE WARDEN) BY MEANS OF SUPERVISING AREA AS APPROVED BY GOVERNING AUTHORITIES. AT NO TIME SHALL FIRE ALARM SYSTEM OR ANY ONE ZONE BE LEFT INOPERATIVE OVERNIGHT. PROVIDE REQUIRED BYPASS WIRING AND TEMPORARY WIRING AS MAY BE REQUIRED TO MAINTAIN ENTIRE FIRE ALARM SYSTEM OPERATIVE DURING CONSTRUCTION AND ALTERATIONS.
- 30.4 COVER EXISTING DETECTORS TO PROTECT FROM DEMOLITION/CONSTRUCTION DUST. REMOVE COVERS WHEN ALTERNATIVE FIRE ALARM PROTECTION IN AREA IS NOT AVAILABLE OVERNIGHT.

- 30.5 COORDINATE WORK WITH MECHANICAL DIVISION WITH REGARDS TO INTERCONNECTIONS TO AIR HANDLING SYSTEMS, FIRE SUPPRESSION SYSTEMS, SUPERVISORY VALVES AND FLOW SWITCHES, BUILDING AUTOMATION SYSTEM, ETC. PERFORM SUCH INTERCONNECTIONS TO STANDARDS OF EXISTING SYSTEMS AND DOCUMENT IN SHOP DRAWINGS.
- 30.6 WHEN FIRE ALARM SYSTEM WORK IS COMPLETE AND READY FOR ACCEPTANCE, EXISTING SYSTEM MANUFACTURER/VENDOR TO INSPECT, TEST, VERIFY AND CERTIFY WORK AND EQUIPMENT, INCLUDING INITIATING DEVICES, SIGNALLING DEVICES, CONTROL DEVICES AND
- 30.7 TEST AND VERIFY THAT AUDIBLE SIGNALS ARE AT LEVELS ACCEPTABLE TO LOCAL FIRE AUTHORITY AND THAT BATTERIES ARE OF SUFFICIENT CAPACITY AS PER OBC. PROVIDE CERTIFICATE OF LIABILITY INSURANCE REGISTERED FOR THIS PROJECT TO SHOW SATISFACTORY PROOF OF MANUFACTURER'S LIABILITY COVERAGE FOR BOTH HIS PRODUCT AND PERSONNEL. CONDUCT WORK IN ACCORDANCE WITH LATEST EDITIONS OF CAN/ULC S536 AND \$537. TESTS TO BE CONDUCTED IN PRESENCE OF OWNER AND/OR CONSULTANT, PROVIDE TO CONSULTANT MINIMUM ONE HARD COPY AND ELECTRONIC COPY OF TEST REPORT WITH DETAILED SCHEDULES OF TESTED DEVICES. REPORTS SHALL BE SIGNED BY AUTHORIZED CERTIFIED TESTING TECHNICIAN. DIGITAL COPY OF REPORT TO BE PROVIDED IN COMPATIBLE FORMAT CONFIRMED WITH CONSULTANT.
- 30.8 OBTAIN FROM LOCAL FIRE AUTHORITY, APPROVAL CERTIFICATE AND SUBMIT TO CONSULTANT
- 30.9 EMPLOY TECHNICIANS CERTIFIED BY CANADIAN FIRE ALARM ASSOCIATION AND/OR ONTARIO FIRE MARSHALL AS APPLICABLE AND TO REQUIREMENTS OF ONTARIO FIRE CODE.

#### 31 GENERAL ELECTRICAL WORK TESTING

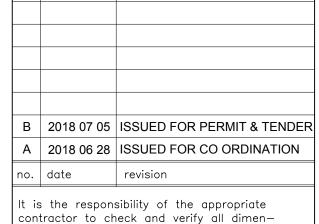
- 31.1 IN ADDITION TO TESTS REQUIRED BY GOVERNING AUTHORITIES AND REGULATIONS, TEST WORK TO ENSURE THERE ARE NO GROUNDS OR CROSSES. ENSURE DEVICES ARE COMMISSIONED AND OPERABLE. CONNECT CIRCUITS TO PANELBOARDS SO AS TO BALANCE ACTUAL LOADS (WATTAGE) WITHIN 5%. IF REQUIRED, TRANSPOSE CIRCUITS WHEN WORK IS COMPLETE TO MEET THIS REQUIREMENT.
- 31.2 IN ADDITION, PERFORM FOLLOWING:
- .1 CHECK COMPONENT CONNECTIONS AND OVERALL INSTALLATION;
- .2 ENSURE THAT DEVICES ARE COMMISSIONED AND OPERABLE;
- .3 TEST AND ADJUST SYSTEM AND ASCERTAIN THAT COMPONENTS ARE AS SPECIFIED AND ENSURE THAT PRODUCTS OPERATE AS DESIGNED;
- .4 PREPARE, DOCUMENT AND EVALUATE TEST RESULTS; .5 AUTHENTICATE TEST RESULTS WITH SIGNATURE OF AUTHORIZED TESTING
- ENGINEER/TECHNICIAN.

#### 31.3 SUBMIT SIGNED REPORTS TO CONSULTANT.

#### 32 SYSTEM TESTING, CO-ORDINATION AND VERIFICATION

- 32.1 PROVIDE ON-SITE ENGINEERING INSPECTION, TESTING AND VERIFICATION OF DISTRIBUTION EQUIPMENT AND OTHER SYSTEMS. REVIEW AND SURVEY EXISTING DISTRIBUTION SYSTEM PROTECTIVE DEVICES AS REQUIRED TO PROPERLY CO-ORDINATE ADDITIONAL SYSTEM DEVICES. FOR MAJOR DISTRIBUTION EQUIPMENT, PROVIDE PRELIMINARY COORDINATION STUDY AND AVAILABLE FAULT CURRENT CALCULATIONS AND SUPPLY TO CONSULTANT DURING SHOP
- 32.2 ENGINEERING INSPECTION AND TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT TESTING COMPANY AND INCLUDE WHERE APPLICABLE:
- .1 TESTING, CLEANING WHEN NECESSARY, AND CALIBRATING RELAYS AND CIRCUIT BREAKER TRIP DEVICES (CALIBRATION OF PROTECTIVE DEVICES SHALL CONFORM TO
- REQUIREMENTS OF APPROVED COORDINATION CURVES);
- .2 FUNCTION TEST OF ASSOCIATED CONTROL DEVICES;
- .3 PROVIDE A COORDINATION STUDY PREPARED TO REVIEW REVISED DISTRIBUTION SYSTEM DEVICES INCLUDING EXISTING MAIN OVER CURRENT PROTECTION DEVICES FEEDING RESPECTIVE MCCS OR PANELS WHERE ADDITIONAL LOADS HAVE BEEN ADDED; REVIEW COORDINATION OF DEVICES AND RESET/ADJUST WHERE POSSIBLE AND AS REQUIRED;
- .4 REPLACEMENT OF FUSES DESTROYED DURING TESTING;
- .5 AN ACCEPTANCE TEST IN PRESENCE OF AND AT SATISFACTION OF CONSULTANT;
- .6 PRESENCE, FOR LENGTH OF TIME REQUIRED, OF QUALIFIED AND COMPETENT EQUIPMENT
- MANUFACTURER'S SERVICE REPRESENTATIVE DURING START UP; .7 ADJUSTMENTS, START-UP PROCEDURES AND VERIFICATION OF EQUIPMENT;
- .8 TESTING OF INSTALLED ELECTRICAL DEVICES, WHETHER OR NOT SUPPLIED BY
- 32.3 PROVIDE VISUAL AND MECHANICAL INSPECTION OF GROUND SYSTEM AND VERIFY THAT IT IS IN COMPLIANCE WITH ISSUED DOCUMENTS AND OESC REQUIREMENTS.
- 32.4 TESTING SHALL BE DOCUMENTED IN A REPORT SIGNED BY PROFESSIONAL ENGINEERS OF ONTARIO LICENSED TESTING ENGINEER AUTHORIZED BY TESTING COMPANY. INCLUDE FOR MINIMUM 2 HARD COPIES AND ELECTRONIC VERSION OF REPORT SUBMITTED TO CONSULTANT FOR REVIEW. REPORT TO INCLUDE TEST RESULTS WITH PROPERLY PLOTTED CURVES, IDENTIFIED TROUBLE AREAS OF COORDINATION, EXTENSIVE COMMENTS REGARDING TEST RESULTS AND RECOMMENDATIONS ON BEST REMEDIAL COURSE OF ACTION.
- 32.5 PRODUCT MANUFACTURER TO EXAMINE PLANS AND SPECIFICATIONS TO ENSURE THAT RELAYS AND PROTECTIVE DEVICES BEING INSTALLED IN DISTRIBUTION SYSTEM WILL PROVIDE SATISFACTORY COORDINATION.
- 32.6 ACCEPTABLE TESTING COMPANIES TO BE INDEPENDENT OF EQUIPMENT MANUFACTURERS/SUPPLIERS AND ARE G.T. WOODS LTD., AC TESLA, PELIKAN, EATON ELECTRIC AND SCHNEIDER ELECTRIC.

END



contractor to check and verify all dimensions on site and report all errors and/ or omissions to the architect.

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Do not scale drawings.

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**Hobin Architecture** Incorporated 63 Pamilla Street Ottawa, Ontario Canada K1S3K7 T: 613-238-7200

F: 613-235-2005 E: mail@hobinarc.com hobinarc.com ARCHITECTURE

PROJECT/LOCATION: TURNBULL SCHOOL MUSIC ROOM ADDITION 1132 Fisher Avenue, Ottawa

**ELECTRICAL** 

**SPECIFICATION** 

DRAWING TITLE

SHEET 2 OF 2 DRAWN BY: DATE:

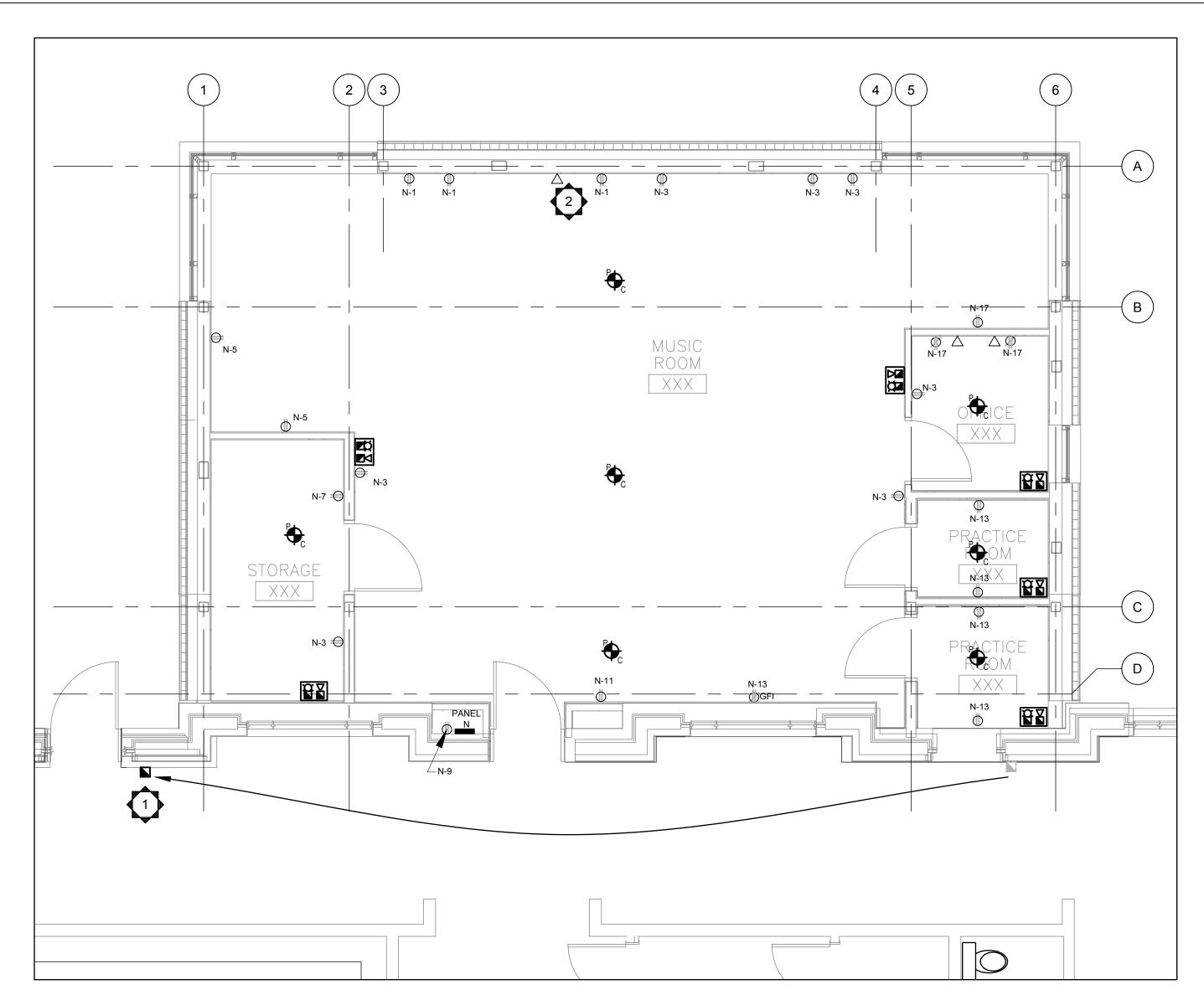


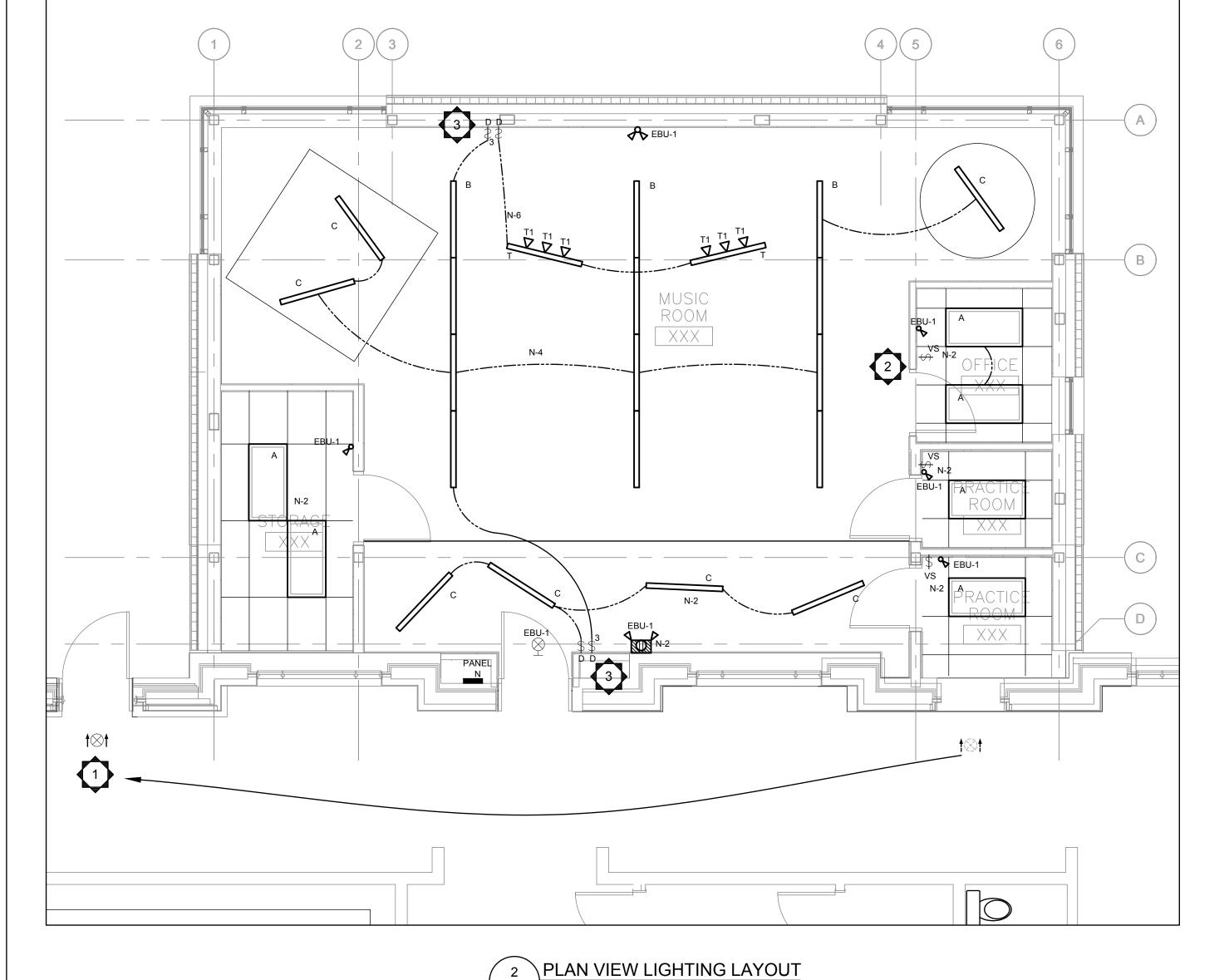
DRAWING NO.:

81-04865-00

SCALE:

REVISION NO.:





\ E101 /

## 1 PLAN VIEW POWER & SYSTEMS LAYOUT

# POWER AND SYSTEMS NOTES:

1. RELOCATE FIRE ALARM PULL STATION TO NEW DOOR OPENING.

FOR DATA OUTLETS PROVIDE DEVICE BOX AND EMPTY CONDUIT TO CEILING. TERMINATE IN A BOX. GENERAL NOTES:

1. CO ORDINATE DEVICE LOCATIONS AND HEIGHTS AFF WITH THE ARCHITECTURAL DRAWINGS AND DETAILS

### # LIGHTING NOTES:

- 1. RELOCATE EXIT SIGN TO NEW DOOR OPENING.
- 2. LIGHTING CONTROL AS FOLLOWS:
  CLASSROOMS OCCUPANCY CONTROL AND DIMMING
  STORAGE ROOM OCCUPANCY
  PRACTICE ROOMS VACANCY CONTROL.
  OFFICE, DIMMING AND VACANCY CONTROL
- 3. WIRELESS LIGHT SWITCHES THE FUNCTION OF THE SWITCH IS INDICATED ON THE DRAWING:
  D DIMMER, OCCUPANCY, DAYLIGHT HARVESTING
  VS DIMMER, VACANCY, DAYLIGHT HARVESTING

### GENERAL NOTES:

 CO ORDINATE DEVICE LOCATIONS AND HEIGHTS AFF WITH THE ARCHITECTURAL DRAWINGS AND DETAILS B 2018 07 05 ISSUED FOR PERMIT & TENDER
A 2018 06 28 ISSUED FOR CO ORDINATION
no. date revision

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TURNBULL SCHOOL
MUSIC ROOM ADDITION

1132 Fisher Avenue, Ottawa

DRAWING TITLE:

ELECTRICAL

LIGHTING

POWER AND SYSTEMS

AS SHOWN

PROJECT: 181-04865-00

DRAWING NO.:

REVISION NO .:

DRAWN BY: DATE:

Hobin Architecture Incorporated
63 Pamilla Street
Ottawa, Ontario
Canada K1S 3K7
T: 613-238-7200
F: 613-235-2005
E: mail@hobinarc.com
hobinarc.com

PROJECT/LOCATION:
TURNBULL SCHOOL



one

		SCHEDULE	WATTS COLOUR TEMPERATURE  DIMM DIA 120V  LED MODULE 4276 LUMENS 36.2 WATTS 3500K  LED MODULE 4576 LUMENS 40.9 WATTS 3500K  LED MODULE 4576 LUMENS 40.9 WATTS 3500K  LED MODULE 4576 LUMENS 40.9 WATTS 3500K  RECESSED IN CEILING GRID  DAYLIGHT SENSING CW DIMMING AND SELECTABLE OCCUPANCY (SPACEWISE)  RECESSED IN DRYWALL FEATURE  OCCUPANCY (SPACEWISE)  RECESSED IN ELECTRICAL WALL BOX OR SURFACE MOUNTING  CONTROLLED BY DIMMER TRANSMICE CONTROLLED BY DIMMER			
TYPE	DESIGN BASED ON SPECIFIED MANUFACTURER AND CATALOG NUMBER	PRODUCT DESCRIPTION	VOLTS	LUMENS WATTS COLOUR	MOUNTING	NOTES
A	PHILIPS DAYBRIGHT CFI FluxGrid 2FG G 42B 835 4D 120 DIM DAY OCC	610mm X 1220mm RECESSED SOFT OPAL DIFFUSER OL	120V	4276 LUMENS 36.2 WATTS		C/W DIMMING AND SELECTABLE OCCUPANCY
В	PHILIPS LEADALITE TRUGROOVE 2901LBGQN0471EW DIM DAY OCC	1200mm X 100mm SUSPENDED LINEAR	120V	4576 LUMENS 40.9 WATTS	SUSPENDED	C/W DIMMING AND SELECTABLE OCCUPANCY
С	PHILIPS LEADALITE TRUGROOVE 3901LBGQS40471EW DIM SWZDT	1200mm X 100mm RECESSED LINEAR	120V	4114 LUMENS 41.8 WATTS	DRYWALL	C/W DIMMING AND SELECTABLE OCCUPANCY
\$	PHILIPS WIRELESS SWITCH UID8451/10	SINGLE GANG SWITCH PROVIDES SELECTABLE FUNCTIONS DIMMER, VACANCY AND OCCUPANCY	1	N/A	ELECTRICAL WALL BOX OR SURFACE	WIRELESS
Т	PHILIPS LIGHTOLIER LYTESPAN 6001NWH	1200mm LONG BASIC ONE CIRCUIT TRACK	120V	N/A	SUSPENDED (TBD)	CONTROLLED BY DIMMER TRAILING EDGE (ELV) DIMMING COMPATIBILITY PHILIPS CONTROLS SR400RPC120
T1	PHILIPS LIGHTOLIER CorePro LT- 08 RWF 830 WH VA	MICRO CYLINDER 57mm Dia X 114mm H COLOUR WHITE MOUNTED ON PIVOTING ARM	120V	LED MODULE 963 LUMENS 9 WATTS 3000K	MOUNTED ON TRACK	DIMMABLE TRACK LIGHTS



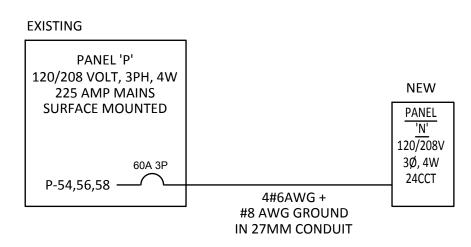
#### LIGHTING FIXTURE SCHEDULE

- 1. DESIGN IS BASED ON THE LUMINAIRES SPECIFIED. IN ALL CASES, ALTERNATIVE LUMINAIRES SHALL BE COMPARABLE TO THE SPECIFIED LUMINAIRE IN QUALITY, PERFORMANCE, AND VISUAL CHARACTERISTICS. ACCEPTABILITY WITH RESPECT TO VISUAL CHARACTERISTICS SHALL BE AT THE SOLE DISCRETION OF THE CONSULTANT. IF A PROPOSED ALTERNATIVE LUMINAIRE IS DEEMED TO BE NOT VISUALLY COMPARABLE, THE SPECIFIED LUMINAIRE SHALL BE PROVIDED.
- 2. SUBJECT TO NOTE 1, ALTERNATIVES TO NOTED LUMINAIRES MANUFACTURED BY PHILIPS (AND AFFILIATES) OR BY LITHONIA ARE ACCEPTABLE, AND MAY BE SUPPLIED WITHOUT CREDIT TO CONTRACT AMOUNT. LUMINAIRES NOT SO NOTED SHALL BE PROVIDED AS SPECIFIED; PROPOSED ALTERNATIVES MAY BE ACCEPTED BY THE CONSULTANT, AND, IF THEY ARE, SHALL RESULT IN A CREDIT TO THE CONTRACT AMOUNT.
- 3. SUBJECT TO NOTE 1, ALTERNATIVES TO NOTED LUMINAIRES MANUFACTURED BY EMERGI-LITE, COOPER (AND AFFILIATES), CANLYTE (AND AFFILIATES) OR BY LITHONIA ARE ACCEPTABLE, AND MAY BE SUPPLIED WITHOUT CREDIT TO CONTRACT AMOUNT. LUMINAIRES NOT SO NOTED SHALL BE PROVIDED AS SPECIFIED; PROPOSED ALTERNATIVES MAY BE ACCEPTED BY THE CONSULTANT, AND, IF THEY ARE, SHALL RESULT IN A CREDIT TO THE CONTRACT AMOUNT.
- 4. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT MOUNTING HEIGHT OF LUMINAIRES.

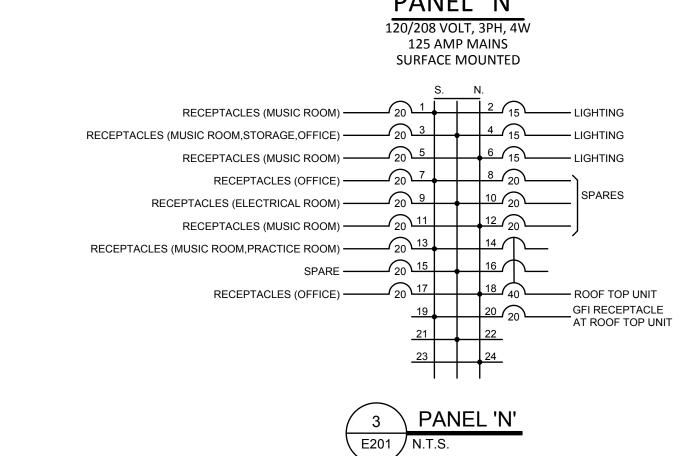
			BATTER	Y PACK	SCHED	ULE	
TAG	DC VOLTS	TWIN HEAD ON BATTERY PACK	# OF TWIN REMOTE HEADS	# OF SINGLE REMOTE HEADS	# OF EXIT LIGHTS	EBU WATTAGE	DESCRIPTION
EBU-1	12VDC	1 OF 2 x 5W	1 OF 2 x 5W	4 OF 5W	1 SIGN 2W	72	EQUAL TO THOMAS & BETTS, EMERGI-LITE 12ESL72 U/2 LI WHITE FINISH

EMERGENCY BATTERY UNIT TO HAVE MINIMUM OF 60 MINUTES BACK UP POWER.
 CONNECT EMERGENCY LIGHTING BATTERY PACKS TO LOCAL (UNSWITCHED) LIGHTING CIRCUIT.

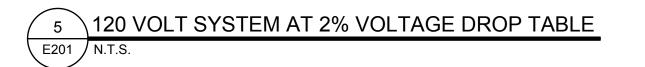


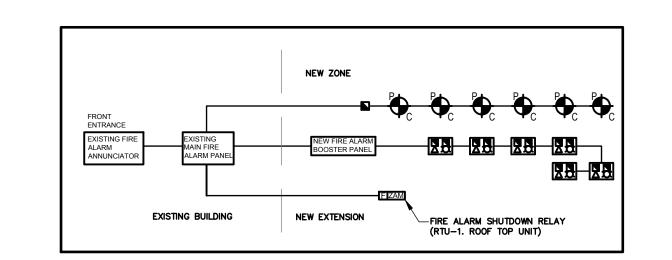




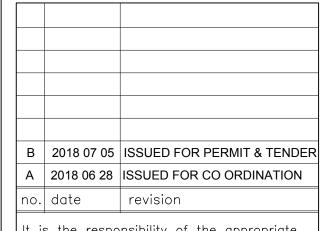


	AXIMUM E DLTAGE D		H WIRI	NG DIS	STANCE	FOR 1	20 VOL	Γ SYSTI	EM AT	2%
WIRE SIZE	BREAKER SIZE (AMPERES)	15	20	30	40	50	60	70	80	100
	MAX. LOAD AT 80% (AMPERES)	12	16	24	32	40	48	56	68	80
NO.12		16.8	12.2							
NO.10		25.9	19.0	12.9						
NO.8		39.6	30.4	20.5	15.2					
NO.6		62.4	47.2	32.0	23.6	19.0	16.0			
NO.4		99.0	73.1	50.2	38.1	30.4	24.3	21.3	19.0	
NO. 2			114.3	77.2	57.9	47.2	38.8	33.5	28.9	22.8
NO.1				96.0	73.1	57.9	47.2	42.6	36.5	27.4
NO.1/0					85.3	68.5	56.3	48.7	41.9	33.5
NO2/0					102.8	80.7	67.0	57.9	50.2	40.3
NO3/0						95.2	79.2	68.5	59.4	47.2
NO4/0							92.9	79.2	70.1	56.3
250 MCM							102.8	86.8	76.2	60.9
300 MCM								100.5	88.3	70.1









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Hobin Architecture
Incorporated
63 Pamilla Street
Ottawa, Ontario
Canada K1S 3K7
T: 613-238-7200

F: 613-235-2005

E: mail@hobinarc.com

hobinarc.com

HOBIN ARCHITECTURE

PROJECT/LOCATION:
TURNBULL SCHOOL
MUSIC ROOM ADDITION

1132 Fisher Avenue, Ottawa

RAWING TITLE:

ELECTRICAL

LIGHTING SCHEDULES & DETAILS

DRAWN BY: DATE: SCALE:



PROJECT:
181-04865-00

DRAWING NO.:

E201

AS SHOWN

REVISION NO.: