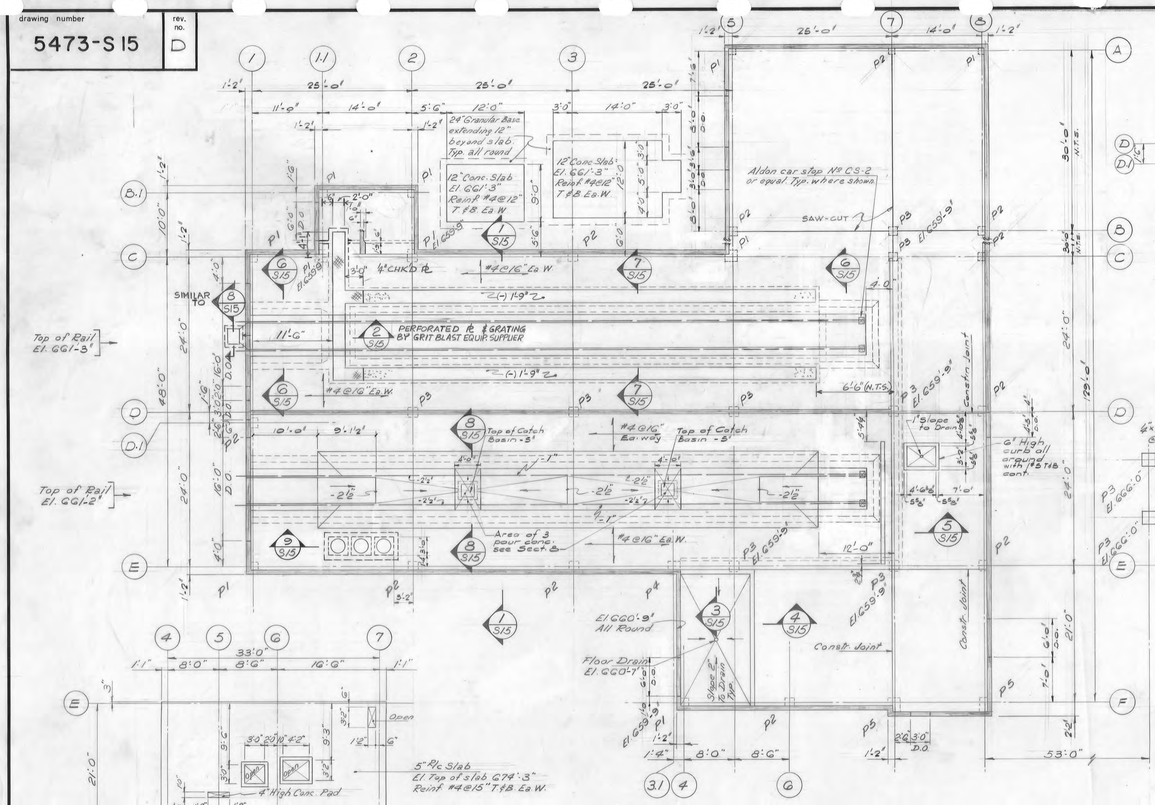
Reference Documents

drawing number 5473-S15 | rev. no. D



FOUNDATION & FLOOR SLAB LAYOUT

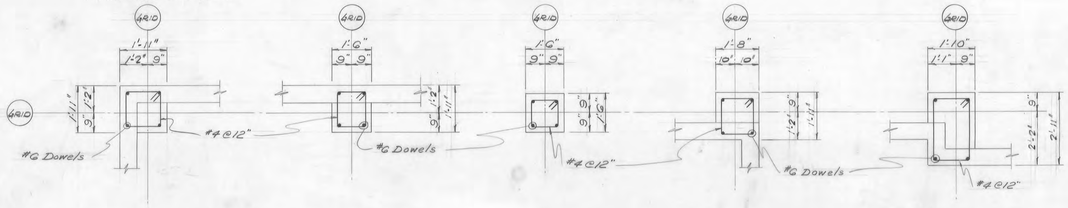
Scale: 1/8"=1'-0"

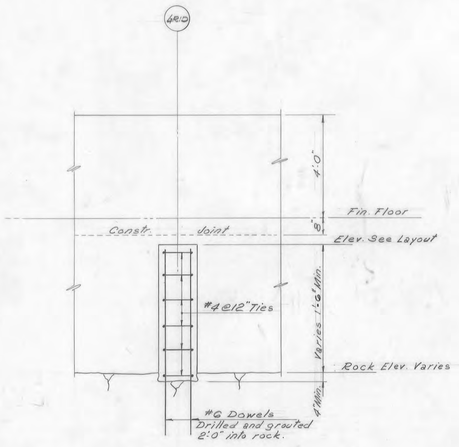
Top of Pier El. GG0'-3" unless noted otherwise.
6" Slab on grade El. GG1'-3" unless noted otherwise.
Slab reinforcement 6"x6" W.W.F. unless noted otherwise.
D.O. denotes door opening.

MECHANICAL FLOOR SLAB

Scale: 1/8"=1'-0"

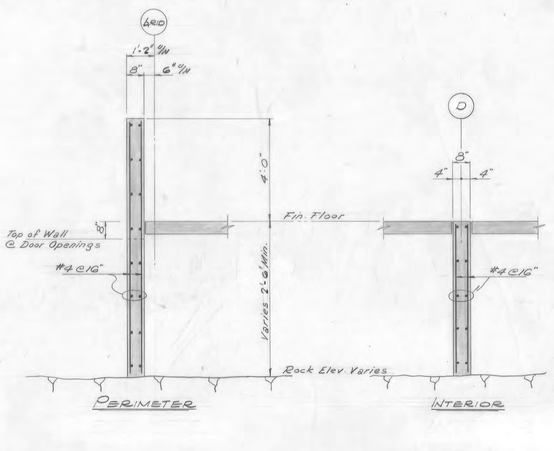
Live Load 100 p.s.f.
Dead Load 68 p.s.f.
Total Load 168 p.s.f.





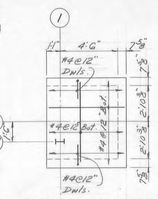
TYPICAL PIER DETAILS

Scale 1/2"=1'-0"



TYPICAL WALL DETAILS

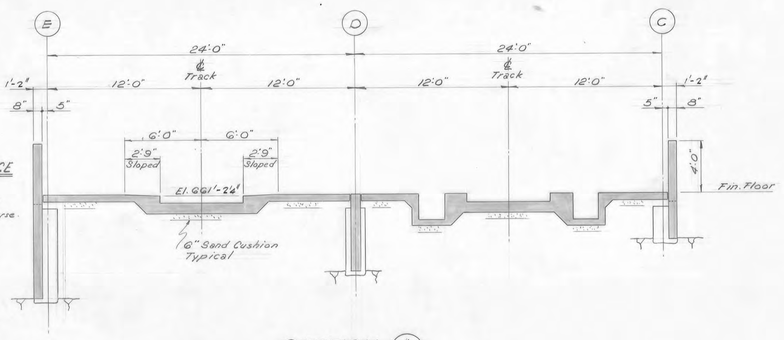
Scale 1/2"=1'-0"

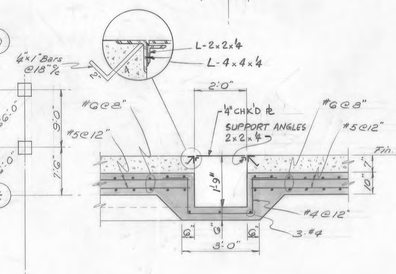


SLAB OVER ENTRANCE

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

8" Slab 7" Slab El. G73'-11"
Grout dwls. into 1st block course.



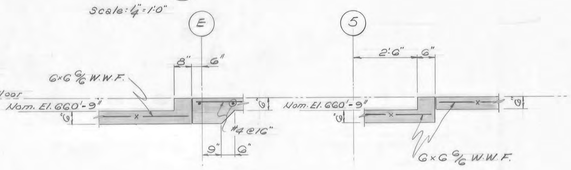


SECTION 2/S15

Scale 1/2"=1'-0"

SECTION 1/S15

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

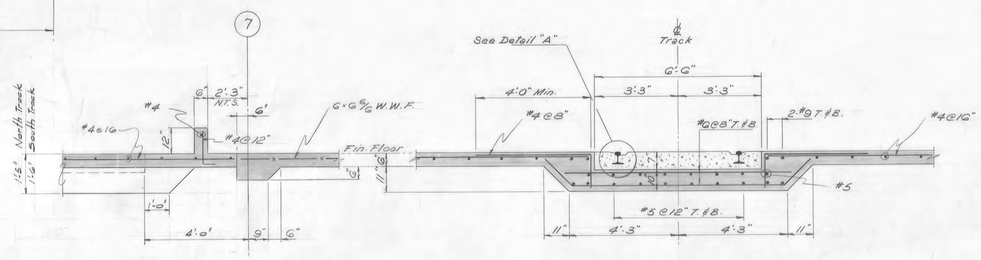


SECTION 3/S15

Scale 1/2"=1'-0"

SECTION 4/S15

Scale 1/2"=1'-0"

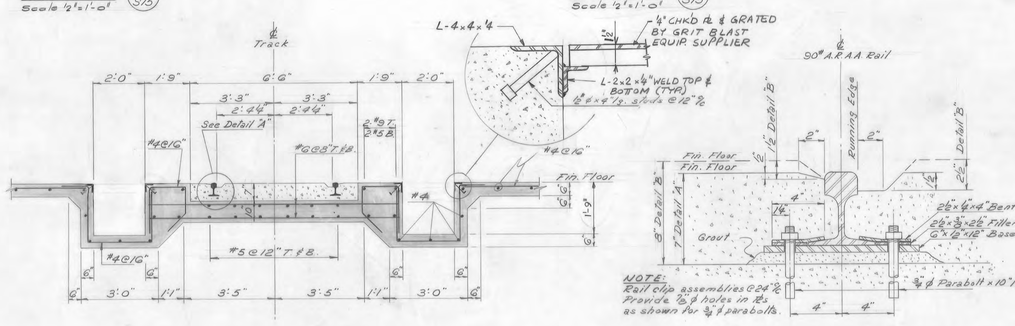


SECTION 5/S15

Scale 1/2"=1'-0"

SECTION 6/S15

Scale 1/2"=1'-0"



NOTE:
Rail clip assemblies @24" c/c
Provide ⅞" ø holes in Pl's as shown for ¾" ø parabolts.

SECTION 7/S15

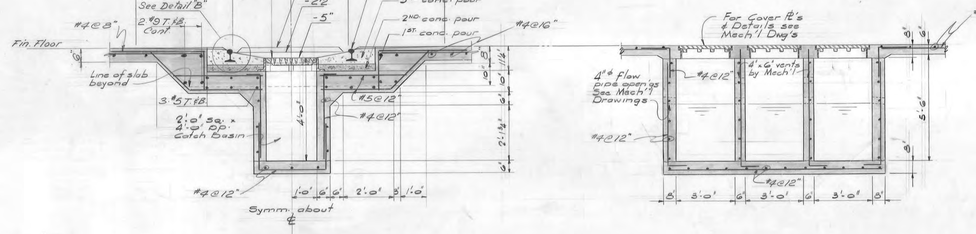
Scale 1/2"=1'-0"

DETAIL "A"

DETAIL "B" SIMILAR EXCEPT AS NOTED

Scale: 3"=1'-0"

Toe section of joint bars at rail splices to be cut back to clear rail clip assemblies as required.



SECTION 8/S15

Scale 1/2"=1'-0"

SECTION 9/S15

Scale 3/8"=1'-0"

north arrow

A detail no.
B location drawing no.
C drawing no.

notes and reference drawings

For Location Plan and Soil Data see dwg. 5473-G1
For General Notes see dwg. 5473-S1
D.O. denotes door openings.
This Contractor to set anchor bolts according to the Anchor Bolt Plan supplied by the Structural Steel Contractor. Structural Steel Contractor to supply the anchor bolts.

no.	date		drawn	checked	approved
D	NOV. 75	AS BUILT	R.E.		
C	SEPT/74	REVISED GRIT BLAST TRENCH DETAILS	R.N.	R.K.	T.J.S.
B	10-5-74	SAW-CUT ADDED LINES 7 & 8. ISSUED FOR CONST'N	A.F.D.	P.N.	T.J.S.
A	Mar. 74	Issued for General Contract Tender			

revisions

seal: REGISTERED PROFESSIONAL ENGINEER T. J. SHERMAN PROVINCE OF ONTARIO

seal: REGISTERED PROFESSIONAL ENGINEER CIVIL C. S. LEPPER PROVINCE OF ONTARIO

COLE, SHERMAN & ASSOC. LIMITED
TORONTO, ONTARIO

ONTARIO NORTHLAND RAILWAY
NORTH BAY YARD
CONSOLIDATION OF REPAIR FACILITIES

PAINT SHOP

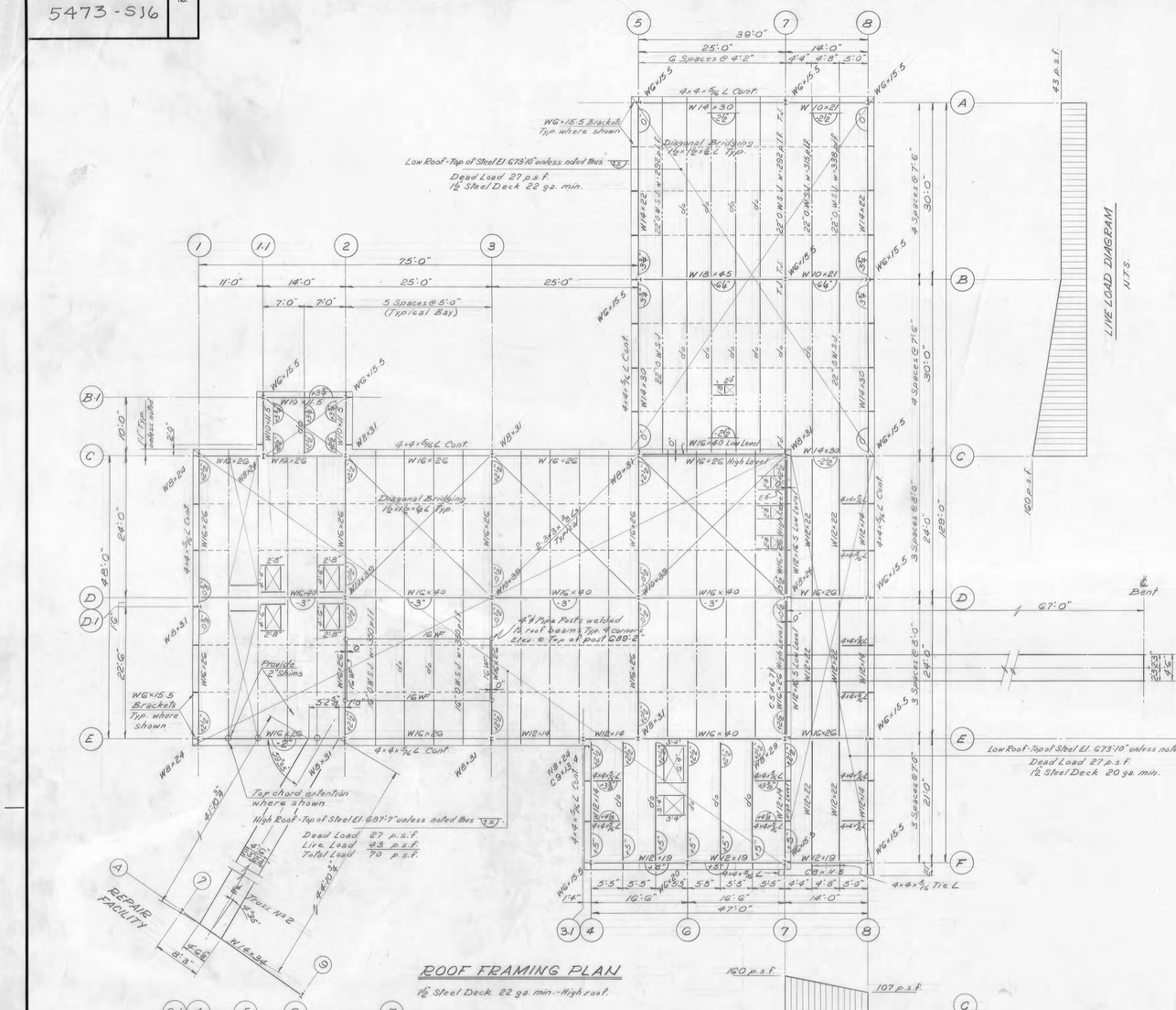
CONCRETE

drawing title
FOUNDATIONS, FLOOR SLAB LAYOUTS AND DETAILS

designed by C.S.L.	checked by C.S.L.	date MARCH, 74	
drawn by F.J.W.	approved by T.J.S.		
scale AS SHOWN	drwg. status	drawing number 5473-S15	rev. no. D
project number 5473			

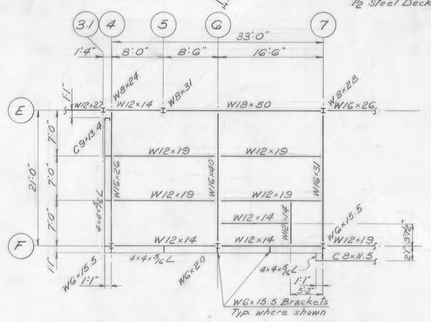
TRANSLAR 100-6-73

drawing number 5473-S16 | rev. no.



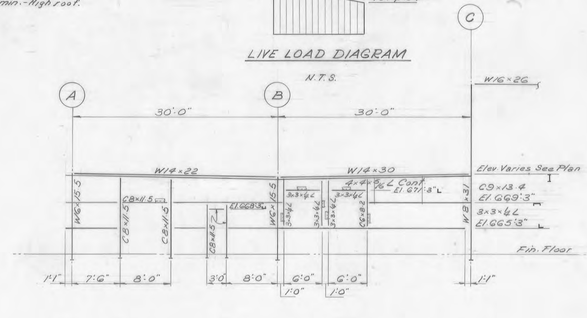
ROOF FRAMING PLAN

1½" Steel Deck 22 ga. min.-High roof.

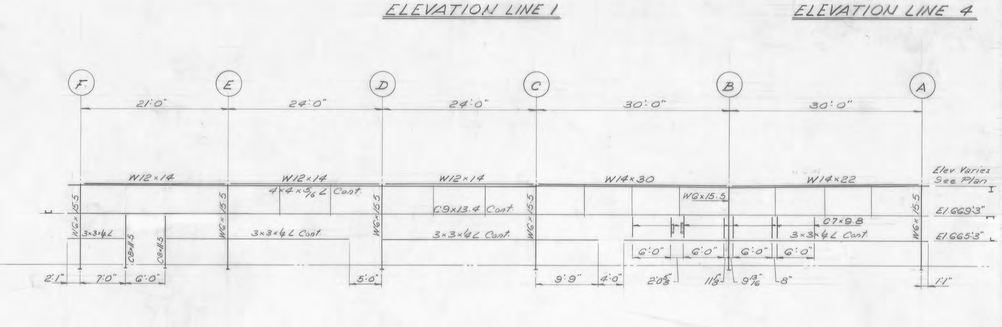


MECHANICAL FLOOR FRAMING PLAN

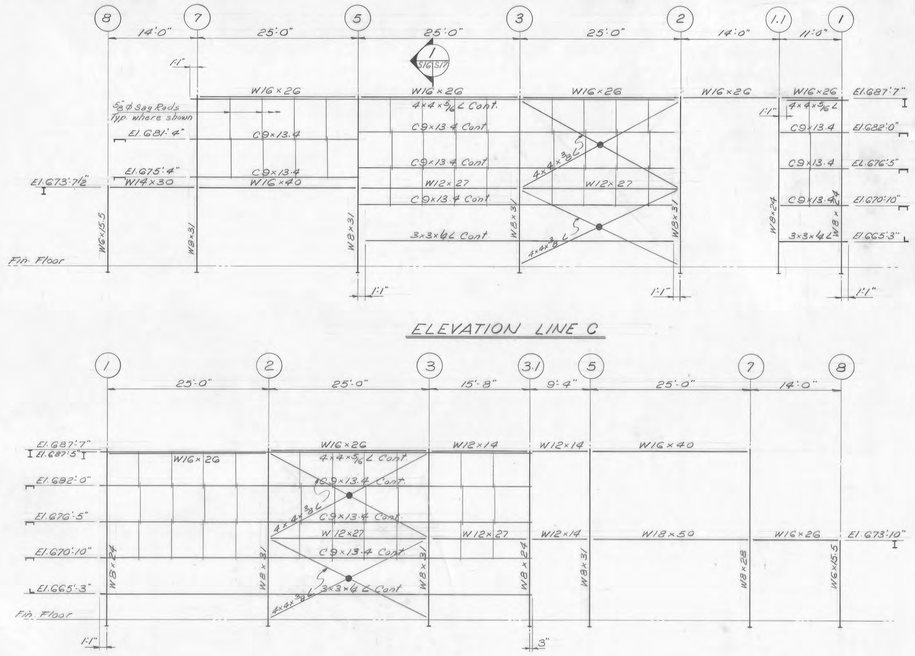
Top of Steel El. 673'10"
Live Load 100 p.s.f.
Dead Load 70 p.s.f.
Total Load 170 p.s.f.



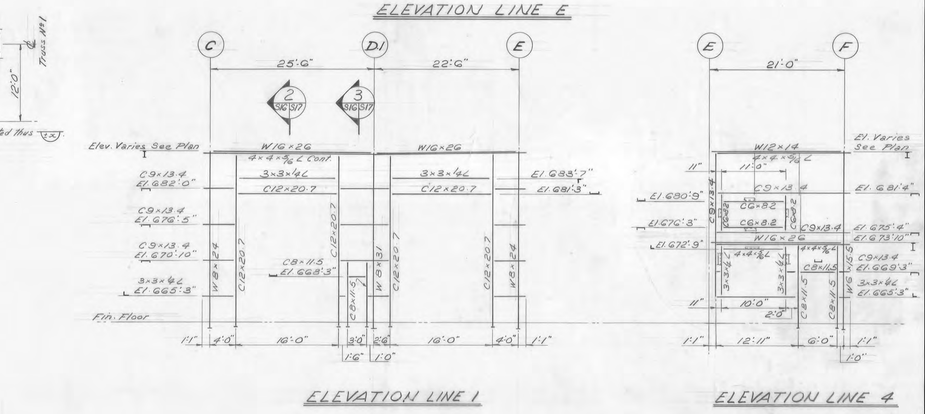
ELEVATION LINE 5



ELEVATION LINE 8



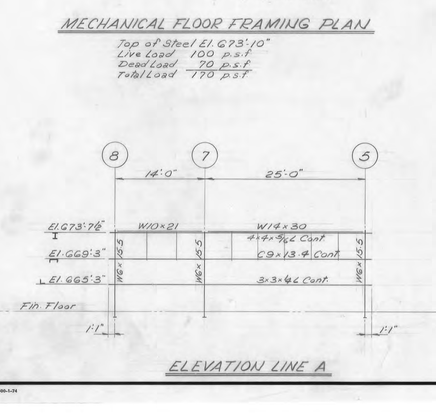
ELEVATION LINE C



ELEVATION LINE E

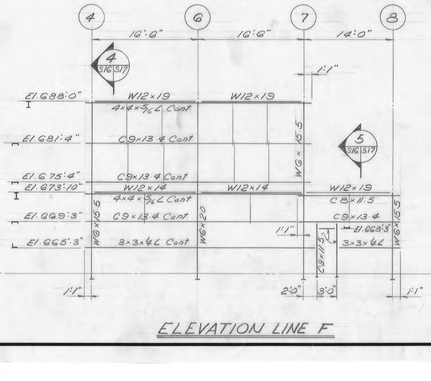
ELEVATION LINE 1

ELEVATION LINE 4

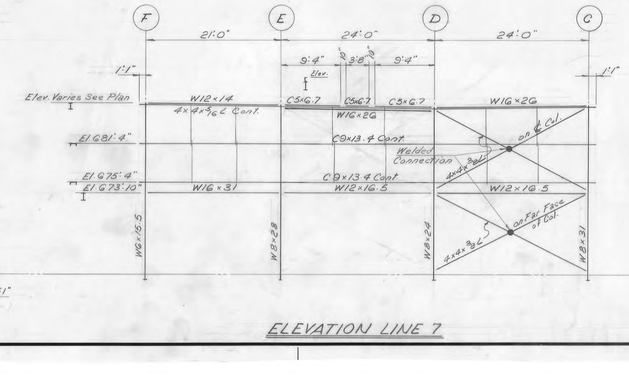


ELEVATION LINE A

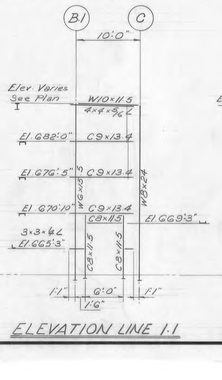
ELEVATION LINE F



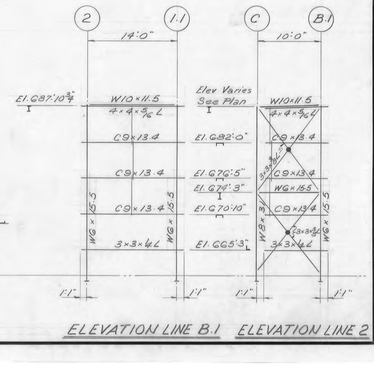
ELEVATION LINE 7



ELEVATION LINE 1.1



ELEVATION LINE B.1



ELEVATION LINE 2

arrow

A detail no.
B location drawing no.
C drawing no.

notes and reference drawings

For General Notes see dwg. 5473-S1.
For details of Trusses N°1 & N°2 see dwg. 5473-S17.
All roof openings framed with 3×3×4 L's.

no.	date	revisions	drawn	checked	approved
F	NOV.75	AS BUILT	R.E.		
E	57.74	Head support L added	F.J.W.	P.N.	T.J.S.
D	10.5.74	ISSUED FOR GEN'L CONTR.	A.P.D.	P.N.	T.J.S.
C	Mar.74	Issued for Reference with General Contract Tender			
B	8.3.74	Col added, bracing added, moved framing for openings added, Trusses added bm size also revised	F.J.W.	C.S.L.	T.J.S.
A	12.2.74	Re-of and - General Revisions	F.J.W.	S.A.	T.J.S.

seal: REGISTERED PROFESSIONAL ENGINEER T. J. SHERMAN PROVINCE OF ONTARIO

seal: REGISTERED PROFESSIONAL ENGINEER CIVIL C. S. LEPPER PROVINCE OF ONTARIO

COLE, SHERMAN & ASSOC. LIMITED
TORONTO, ONTARIO

ONTARIO NORTHLAND RAILWAY
NORTH BAY YARD
CONSOLIDATION OF REPAIR FACILITIES

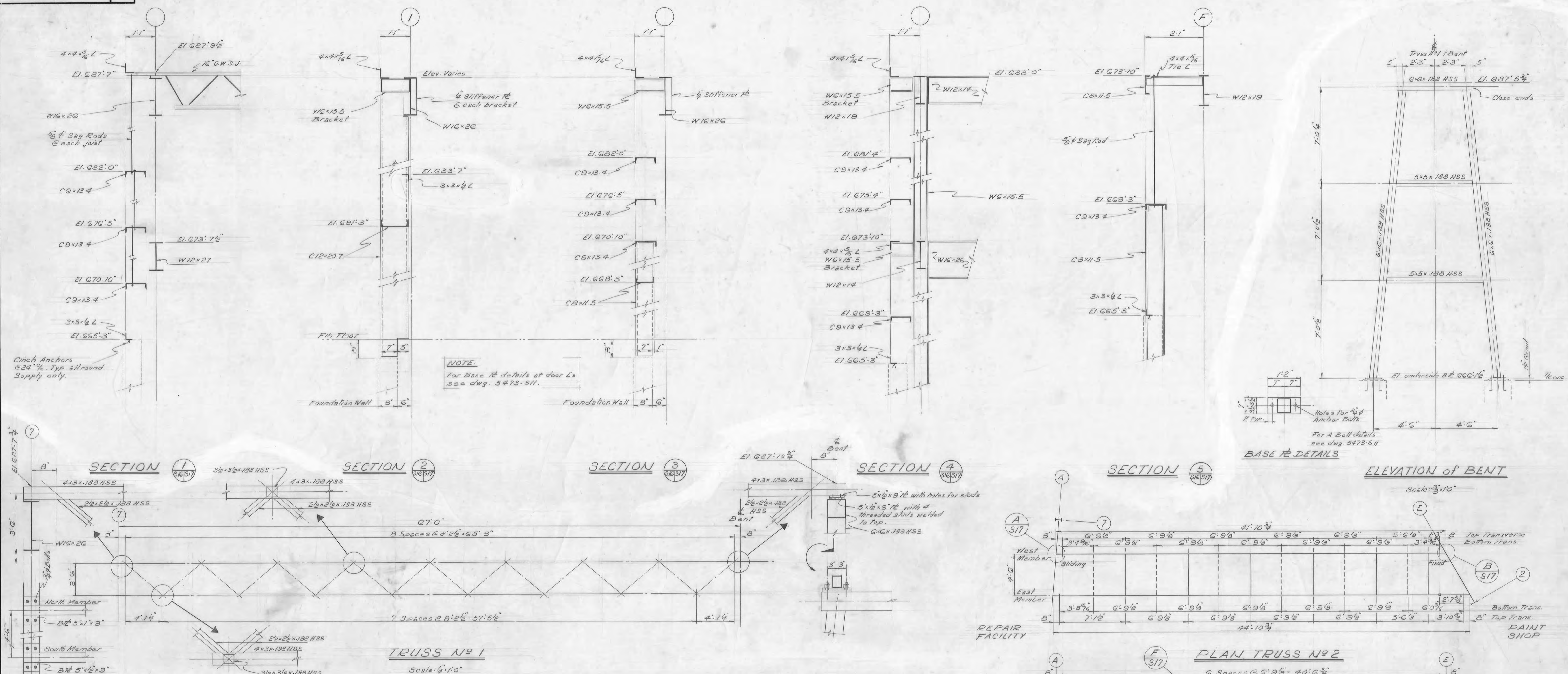
PAINT SHOP

STRUCTURAL STEEL

drawing title
FRAMING PLANS AND ELEVATIONS

designed by S.A. C.S.L.	checked by	date	FEB. 11, 1974
drawn by F.J.W.	approved by T.J.S.		
scale 1/8"=1'-0"	drwg. status	drawing number 5473-S16	rev. no. F
project number 5473			

TRANSLAR 900-3-74



COLUMN SCHEDULE

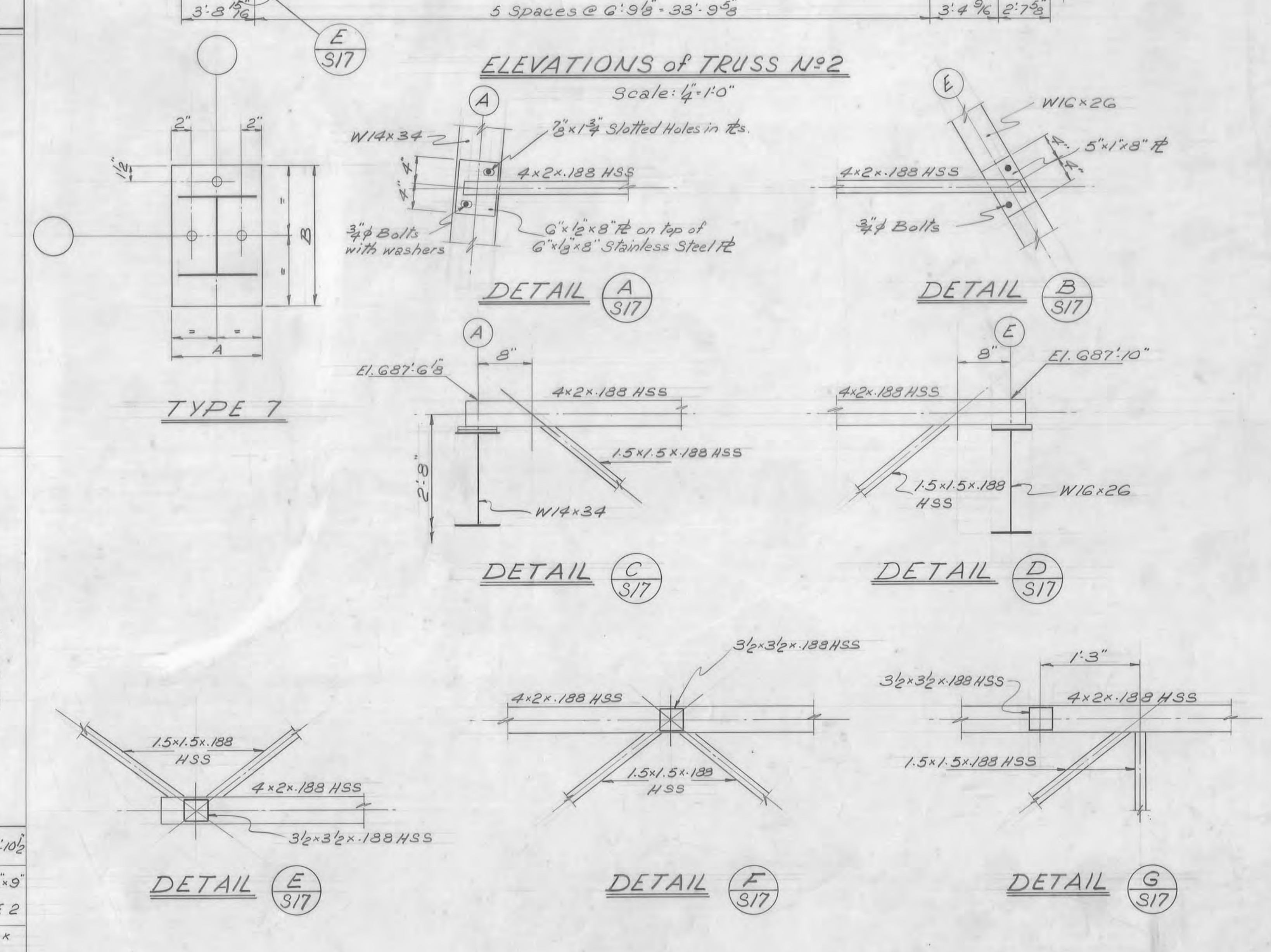
T.O.S. EL. 687'-7"

T.O.S. EL. 673'-10"

FIN. FLOOR EL. 661'-3"

COLUMN LOCATION	A5	A7	A8	B5	B7	B8	B·1 1·1	B·1 2	C1	C2	C3	C5	C7	C8	D2	D3
	W6×15.5	W6×15.5	W6×15.5	W6×15.5	W6×15.5	W6×15.5	W6×15.5	W6×15.5	W8×24	W8×31	W8×31	W8×31	W8×31	W6×15.5	W10×39	W10×39
ELEVATION UNDERSIDE BASE PL	660'-4½"	660'-4½"	660'-4½"	660'-4½"	660'-4½"	660'-4½"	660'-4½"	660'-4½"	660'-4½"	659'-10½"	660'-4½"	660'-4½"	659'-10½"	660'-4½"	660'-4½"	660'-4½"
BASE PL	7"×¾"×7" TYPE 1	7"×¾"×7" TYPE 1	7"×¾"×7" TYPE 1	7"×¾"×7" TYPE 1	7"×¾"×7" TYPE 1	7"×¾"×7" TYPE 1	7"×¾"×7 TYPE 1	7"×¾"×1'-0" TYPE 7	8"×¾"×9" TYPE 2	9"×¾"×1'-2" TYPE 7	9"×¾"×9" TYPE 1	9"×¾"×9" TYPE 1	9"×¾"×9" TYPE 1	7"×¾"×7 TYPE 1	10"×¾"×1'-0" TYPE 2	10"×¾"×1'-0" TYPE 2
LOADS Pv	16K	22K	16K	36K	50K	18K	5K	5K	25K	30K	25K	52K	71K	31K	50K	50K
ANCHOR BOLTS	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	3-1"φ	2-¾"φ	3-1φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ

COLUMN LOCATION	D5	D7	D8	D·1 1	E1	E2	E3	E3·1	E5	E7	E8	F4	F6	F7	F8	C1·1
	W10×39	W8×24	W6×15.5	W8×31	W8×24	W8×31	W8×31	W8×24	W8×31	W8×28	W6×15.5	W6×15.5	W6×20	W6×15.5	W6×15.5	W8×24
ELEVATION UNDERSIDE BASE PL	660'-4½"	659'-10½"	660'-4½"	660'-4½"	660'-4½"	660'-4½"	660'-4½"	660'-4½"	659'-10½"	659'-10½"	660'-4½"	659'-10½"	660'-4½"	660'-4½"	660'-4½"	659'-10½"
BASE PL	10"×¾"×1'-0" TYPE 2	9"×¾"×9" TYPE 1	7"×¾"×7" TYPE 1	9"×¾"×9" TYPE 1	8"×¾"×9" TYPE 2	9"×¾"×9" TYPE 1	9"×¾"×9" TYPE 1	8"×¾"×9" TYPE 2	12"×1"×1'-0" TYPE 1	12"×1¼"×1'-0" TYPE 1	7"×¾"×7" TYPE 1	7"×¾"×7" TYPE 1	9"×¾"×9" TYPE 1	8"×¾"×8" TYPE 1	7"×¾"×7" TYPE 1	8"×¾"×9" TYPE 2
LOADS Pv	50K	55K	30K	30K	15K	25K	25K	35K	75K	100K	30K	30K	55K	40K	15K	15K
ANCHOR BOLTS	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ	2-¾"φ



notes and reference drawings

FOR BASE PL TYPES AND ANCHOR BOLT DETAILS SEE DWG. 5473-S17.

no.	date		drawn	checked	approved
F	NOV.75	AS BUILT	R.E.		
E	5.7.74	Hood support ∠ added	F.J.W.	P.N.	T.J.S.
D	10.5.74	ISSUED FOR GEN'L CONTR.	A.F.D.	P.N.	P.J.S
C	Mar.74	Issued for Reference with General Contract Tender			
B	8.3.74	Col. added, B.PL Elev. Revised Truss & Bent details added	F.J.W.	C.S.L.	T.J.S.
A	12.2.74	Re-drawn General Revisions	F.J.W.	S.A.	T.J.S.

revisions

seal: REGISTERED PROFESSIONAL ENGINEER T. J. SHERMAN PROVINCE OF ONTARIO

seal: REGISTERED PROFESSIONAL ENGINEER CIVIL C. S. LEPPER

COLE, SHERMAN & ASSOC. LIMITED
TORONTO, ONTARIO

ONTARIO NORTHLAND RAILWAY
NORTH BAY YARD
CONSOLIDATION OF REPAIR FACILITIES

PAINT SHOP

STRUCTURAL STEEL

drawing title: SECTIONS AND COLUMN SCHEDULE

designed by S.A. C.S.L. | checked by | date FEB. 11, 1974
drawn by F.J.W. | approved by T.J.S.
scale ¾" = 1'-0" | drwg. status | drawing number 5473-S17 | rev. no. F
project number 5473

TRANSLAR 500-1-74

BUILDING CODE REVIEW:

1.0 general

.1 introduction:

.1 The purpose of this review is to identify the ontario building code requirements and summarize our approach with regard to fire and life safety applicable for the construction of the proposed north bay shop expansion.

.2 This document is based on the requirements of the 1997 ontario building code, ontario regulation 403/97 (obc). [ ] indicates ontario building code, ontario regulation 403/97 article reference.

.2 description:

.1 The scope of this project involves the multi phase construction of new paint shops. The building additions shall be of non-combustible construction and will be sprinklered.

.2 The industrial facility will be organized to accommodate the following programmatic spaces:

.1 paint shops
.2 mechanical / electrical support spaces

.3 Parts 3, 4, 5 and 6 of the o.b.c. will apply to the proposed addition and renovations. part 11, as required, will apply to the design and construction / renovation of portions of the existing building(s). [2.1.1.6.(1)]

.4 Where an existing building system is materially altered or repaired, the performance level of the building after the material alteration or repair shall be at least equal to the performance level prior to the alteration or repair. [11.3.1.1]

.5 Except as provided for in articles 11.3.1.1 and 11.5 the design and construction of portions of a building system or building that are extended shall comply with all other parts of the code. [11.3.1.2, 11.3.2.1]

.6 The performance level of the building after construction will not be less than the performance level of the building prior to construction in conformance with part 11 of the o.b.c. [11.4.1.1]

.7 With the proposed addition the occupant load increases by more than 15%, thus the performance level of the building is reduced [11.4.2.2(1)]

.8 Upgrade early warning systems and evacuation systems as follows [11.4.3.3, table 11.4.3.3];

evaluate access to exits width based on new occupant load as per 3.3.1 (based on the occupant load –(85 x .25" = 21.25"), adequate widths have been provided.)

evaluate exist widths based on occupant load and 3.4.3 (based on the occupant load –(85 x .31.87" = 21.25"), adequate widths have been provided.

install exit signs as per 3.4.5, install lighting in exits and access to exist as per 3.2.7 (provide new exit signage and emergency lighting to suit layout and additional exit doors)

fire alarm system shall meet 3.2.4 (building shall contain a single stage fire alarm system (3.2.4.3) designed to notify the fire department(3.2.4.7) complete with an annunciator panel (3.2.4.8).)

travel distance and number of exits shall conform to all other parts of the code (add additional exits doors to conform with 82' (25m) travel distance requirements. add corridor to provide access to exit at exist. lunchroom. – refer also to other section of this code review)

install door release hardware in accordance with 3.3.1.12 and 3.4.6.15 (every exit door from the f–1 occupancy shall be equipped with panic hardware. (3.4.6.152c).)

2.0 occupancy classification

2.1 existing building (paint shop):

.1 major occupancies:	spray painting operations – high hazard industrial occupancy (group f–1) offices – (group d)
.2 building areas:	9,508 sq. ft. (883.3 m2)
.3 building height:	one (1) storey
.4 gross floor area of buildings:	10,201sq. ft. (947.7 m2)
.5 streets facing:	two (2)
.6 1997 obc classification:	group f, division 1, up to 2 storeys, [3.2.2.65] maximum area is 25,800sq.ft. for 1 storey
.7 construction required:	non combustible, sprinklered
.1 floors:	0hr fire separation
.2 mezzanines	~
.3 roof:	~
.4 sprinklers:	required

.5 All loadbearing walls, columns and arches supporting an assembly required to have a fire–resistance rating shall have a fire–resistance rating of 45min. or be of non combustible construction
.6 Mezzanine is not considered a storey when utilized as a service space. [3.2.1.1(7)]
.7 Facility faces two streets. [3.2.2.10]

2.2 proposed one (1) storey addition and renovations to existing building(s):

.1 major occupancy:	spray painting operations – high hazard industrial occupancy (group f–1) offices – (group d)
.2 building area:	maximum area (1 storey) 38,000sf (proposed area 27,194sf)
.3 building height:	one(1) storeys
.4 gross floor area of building including mezzanines:	27,887sf
.5 streets facing:	two (2)
.6 1997 obc classification:	assembly buildings, group f, division 1, up to 3 storeys, sprinklered [3.2.2.64]

3.0 height and area requirements

3.1 construction required:	non–combustible, sprinklered
.1 floors:	shall be fire separations – 45 minute fire–resistance rating
.2 mezzanines:	~
.3 roof:	~
.4 sprinklers:	required

3.2 All loadbearing walls columns and arches supporting an assembly required to have a fire–resistance rating not less than that required for the supported assembly [3.2.2.64]

4.0 spatial separation

4.1 The existing / proposed development will generally be constructed to within 2'–6" (750 mm) of the property line on the east and within 3'–6" (1050 mm) of the property line on the west side of the building.

Based on the limiting distances, the % of unprotected openings permitted in the exposing building faces are as follows: [table 3.2.3.1D]

exposing building face		area	limiting distance (mm)%	unprotected openings
north elevation		1742sf (161.8m2)	>15000mm	100%
south elevation	F–1	3060sf (284.0m2)	2400mm	21%
east elevation		3060sf (284.0m2)	>15000	21%
west elevation	F–1	2760sf (256.4m2)	>15000mm	100%
west elevation	D	600sf (55m2)	13700mm	100%

4.2 Exposing building face with % unprotected opening of 25% must be constructed of non combustible construction with a 2hr fire resistance rating and have non combustible cladding[3.2.3.7(5)(4)]

4.3 Exposing building face with % unprotected opening of 25% to 100% must be constructed of non combustible construction with a 1hr fir resistance rating and have non combustible cladding. [3.2.3.7(5)(4)]

4.4 Exist doors from adjacent fire compartment within 3m (9.8') with required closures. [3.2.3.12(3)(4)]

5.0 provisions for firefighting

5.1 Facility faces ONE street. [3.2.2.10]

5.2 An access route for fire department vehicles will be provided to the principal entrance of the building. [3.2.5.5]

5.3 A fire alarm system will be provided in the building. [3.2.4.1.(2).(j)] The fire alarm system will have the following characteristics;

* a single stage system [3.2.4.3(1a)]
  * upon the operation of a manual pull station or fire detector and alarm signal shall sound on all signal devices in the system [3.2.4.4(1)]
  * system shall be installed in conformance with CAN/ULC–S524–M – Standard for the Installation of Fire Alarm Systems
  * system shall be tested in conformance with CAN/ULC–S537–M – Standard for the Verification of Fire Alarm Systems
* system shall be designed to send a signal to the fire department [3.2.4.7(1)]
  * an automatic sprinkler system shall be designed to notify the fire department that a waterflow switch has been activated. [3.2.4.7(2)]
* an annunciator panel will be located in the in the main entrance vestibule [3.2.4.8(1)]
* system will comply with all o.b.c., u.l.c., c.s.a., and ontario fire marshal requirements

The existing building does not have a fire alarm system. In accordance with part 11 required upgrades a new fire alarm system will be installed within the existing building.

5.4 Smoke detectors shall be installed in exit stair shafts. [3.2.4.11(e)]

5.5 Automatic sprinkler system shall be equipped with waterflow detecting devices.[3.2.4.16]

5.6 Manual pull station shall be installed near principal entrance, at every required exit. [3.2.4.17]

5.7 a standpipe and hose system is not required to be installed in the building. [table 3.2.9.1]

5.8 Access routes shall be located so that the principal entrance is located not less than 3m and not more than 15m from an access route.[3.2.5.5]

5.9 Adequate water supply for fire fighting shall be provided for every building. [3.2.5.7(1)]

5.10 Hydrants shall be located within 90m (295'–3") from any portion of the building perimeter required to face a street.[3.2.5.7(2)]

5.11 Fire department connection for an automatic sprinkler system shall be located so that the distance from the fire department connection to the fire hydrant is not more than 45m (147'–8" and is unobstructed. [3.2.5.16(2)] A new fire hydrant is required to comply with this requirement.

5.12 Automatic sprinkler system shall conform with NFPA 13 – Standard for the Installation of Sprinkler Systems.

5.13 A standpipe system is not required because the building is sprinklered. [3.2.9.1(1c)]

6.0 requirements for mezzanines and openings through floor assemblies

6.1 Mezzanine is not considered a storey when utilized as a service space. [3.2.1.1(7)]

7.0 safety requirements within floor areas

7.1 The storage, use and handling of hazardous materials shall be in conformance with the Ontario Fire Code and / or the National Fire Code. [3.3.1.2]

7.2 Two (2) egress doorways shall be provided from every room in an F–1 occupancy where the room is greater than 15m2 (161sf). [3.3.1.5(1)]

7.3 The minimum unobstructed width of corridors will be 3 ft. 7 in. (1100 mm.) for every corridor used by the public. [3.3.1.9.(2).(a) & (b)]

7.4 A dead end corridor is permitted in high hazard occupancy where there is a second and separate egress doorway from each room or suite not leading into a dead end corridor. [3.3.1.9.(14)]

7.5 Every door that opens into a corridor or other facility providing access to exit from a room shall swing on a vertical axis and in the direction of travel to the exit where the room is used or intended for an occupant load of more than 60 persons or is in a high hazard occupancy [3.3.1.10.(2).(a)]

7.6 Capacity of access to exits shall be based on the occupant load of the portion of the floor area served. Access to exist width shall be 6.1mm per person (89 x 6.1mm=543mm) for slopes less than 1 in 8 and 9.2mm per person (89x9.1mm=819mm) for slopes more than 1 in 8.

7.7 An exhaust system designed in conformance with part 6 shall be provided in a building in which dust, fumes, gases or vapours have the potential to create a fire or explosion hazard. [3.3.1.19(1)] Explosion relief devices or protective measures shall be provided where explosion hazard is present. [3.3.1.19(2)]

8.0 requirements for exits

8.1 The building has been designed to accommodate approximately 89 persons.

The occupant load for the building has been calculated on the basis of table 3.1.16 for type of occupancy as well as staffing levels requirements defined by the client.

The 'r' suffix at the occupant load indicates that the space will have a restricted occupancy due to operational or other limitations. These limitations are noted in the remarks column. permanent signs indicating the restricted occupant loads will be posted in conspicuous locations.

occupant load calculation

area or room	net floor area (sq.ft.)	area perperson (sq.ft.)	occupantload	remarks
existing building				
paint shops	4,800			10.0
assumed load				
office	360	100		3.6
lunch room	348	11.8		29.0
storage	1100	495		2.0
			subtotal	45.0
building addition				
paint shops	3,000			18.0
			subtotal	18.0
		total occupant load	63.0	

8.3 The proposed building will be served by not less than two (2) exits [3.4.2.1.(1)]. Such exits will be located so that the travel distance to not less than one exit described in article 3.4.2.4 will be not more than 82'–0". (25 m) for high hazard occupancies [3.4.2.5.(1).(a)]

8.4 Exit signage will be provided at every exit door in accordance with 3.4.5.1.(1) and, where necessary, signs will be provided to indicate the direction of egress in corridors serving the public. [3.4.5.1.(5)]

8.5 The required width of an exit will not be less than 3 ft. 7 in. (1100 mm) for corridors and passageways. [3.4.3.1.(2)(a)]

8.6 The required width of an exit will not be less than 2 ft. 7 in. (790 mm) for doorways. [3.4.3.1.(2).(e)]

9.0 fire separation requirements

9.1 Facility contains group F–1 and group D major occupancies. Group F–1 and D major occupancies shall be separated with a fire separation with a 3hr fire resistance rating. [table 3.1.3.1]

9.2 in addition to the requirements to provide a fire separation between major occupancies, the rooms, suites and spaces noted below will be fire separated from the remainder of the building as indicated:

.1 corridor serving the public	45 minutes [3.3.1.4.(2)]
.2 exit stair	45 minutes [3.4.4.1.(1)]
.3 janitor's room	0 hour [3.3.1.20.(3)]
.4 mechanical rooms (service rooms) with fuel–fired appliances	2 hours [3.6.2.1(1a)]
.5 electrical rooms	not required

10.0 openings in fire separation

10.1 Doors installed as closures in required fire separations shall be installed in accordance with the requirements of 3.1.8.5 and table 3.1.8.4.

11.0 fire stopping

11.1 Piping, tubing, ducts, optical fibre cables, electrical wires and cables, electrical outlet boxes and other similar building services that penetrate a membrane forming part of an assembly required to have a fire–resistance rating, or a fire separation shall be:
.1 tightly fitted, or
.2 sealed by a fire stop system that, when subjected to the fire test method in CAN4–S–115–M, "Standard Method ofFire Tests of Firestop Systems", has an F rating not less than the fire protection rating required for the closures in the fire separation. [3.1.9.1]

12.0service spaces

12.1 not applicable.

13.0 health requirements

13.1 The calculated occupant load for the building is in the order of 63 persons. For the purposes of calculating the number of plumbing fixtures required it has been assumed that the male female split is 80 / 9 persons respectively. The building will be provided with plumbing fixtures on the following basis:

.1 men's washrooms	req'd.	provided	
.1 water closets / urinals:	4	5	[3.7.4.9.(1)]
.2 lavatories:	4	exist. wash basin	

.2 Phase 2 addition will provide additional washrooms for women and change room.

14.0 emergency lighting

14.1 emergency lighting shall be provided to an average level of illumination not less than 10 lx at floor level in:
.1 exits
.2 corridors used by the public
.3 floor areas where the public may congregate [3.2.7.3.(1)]

14.2 emergency lighting shall be provided with an emergency power supply designed and installed that upon failure of the regular power it will assume the electrical load automatically for a period of 30 minutes. [3.2.7.4.(1).(b)]

15.0 barrier–free design

15.1 This section is not applicable to F–1 occupancies.

15.2 For group D occupancies (future offices), at least one (1) entrance intended for general use by the public or the occupants complying with the requirements of 3.8.3.3 for barrier–free accessibility shall be provided for the building. [3.8.1.2]

15.3 At least one (1) principle entrance as described in 3.8.1.2 shall be equipped with a power door operator. [3.7.3.3.(5)]

15.4 Water closet stalls or special washrooms, as required, shall conform to 3.8.3.8 and 3.8.3.11.

reference convention:

SYMBOL	Reference	SYMBOL	Reference
(A / A–1.0) SECTION SCALE = 1/4"=1'–0"	TITLE– Sections & Details	(A / A–1.0)	BUBBLE–CROSS–SECTION
ELEVATION SCALE = 1/4"=1'–0"	TITLE– Plan & elevations	(A / A–1.0)	BUBBLE–SECTION
110'–0" U/S roof trusses	BUBBLE–DATUM–TOP	(101 / A–1.0)	BUBBLE–ELEVATION
100'–0" FIN. FLOOR	BUBBLE–DATUM–UNDERSIDE	(A / A–1.0)	BUBBLE–DETAIL
R1	TAG–ROOF	ROOM NAME 101	TAG–ROOM refer to room finish schedule
W1	TAG–WALL	101	TAG–DOOR refer to door schedule
F1	TAG–FLOOR	mw–7	millwork reference
1 HR	FIRE seperation with fire– resistance rating as noted.	sc–1	SCREEN REFERENCE
101	DOOR AND FRAME REFERENCE REFER TO DOOR SCHEDULE		denotes handicap accessible

MATERIALS LEGEND:

BRICK VENEER (plan)	finish wood
concrete block	wood blocking
concrete solid block, filled solid or 75% solid	gypsum board
concrete	crushed stone
earth/BEDROCK	thermal batt ins. to r rating noted in assemblies
poured concrete (SECTION)	semi–rigid insulation
structural steel @ small scale	rigid insulation

MODULAR CO–ORDINATION NOTES:

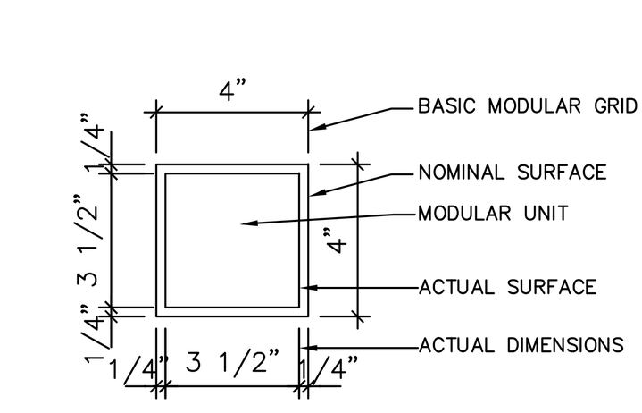
ALL WORKING DRAWING ARE DIMENSIONED BY THE MODULAR COORDINATION METHOD IN CONFORMANCE WITH THE SERIES OF STANDARDS FOR METRIC DIMENSIONAL COORDINATION IN BUILDING CAN3–A31, M–75.

THE POSITION AND SIZE OF BUILDING COMPONENTS IN THIS DRAWING ARE CONTROL BY THE BASIC MODULAR GRID OF 4".

grid lines or points on grid lines are located on the dimension line by an arrowhead

SMALL SCALE ASSEMBLY DRAWING IN PLAN, elevation, or section show diminution to grid lines or to nominal surface of an off–grid component or to center line of construction assembly.

large scale detail drawing show dimensions from grid lines to actual surface of a component.

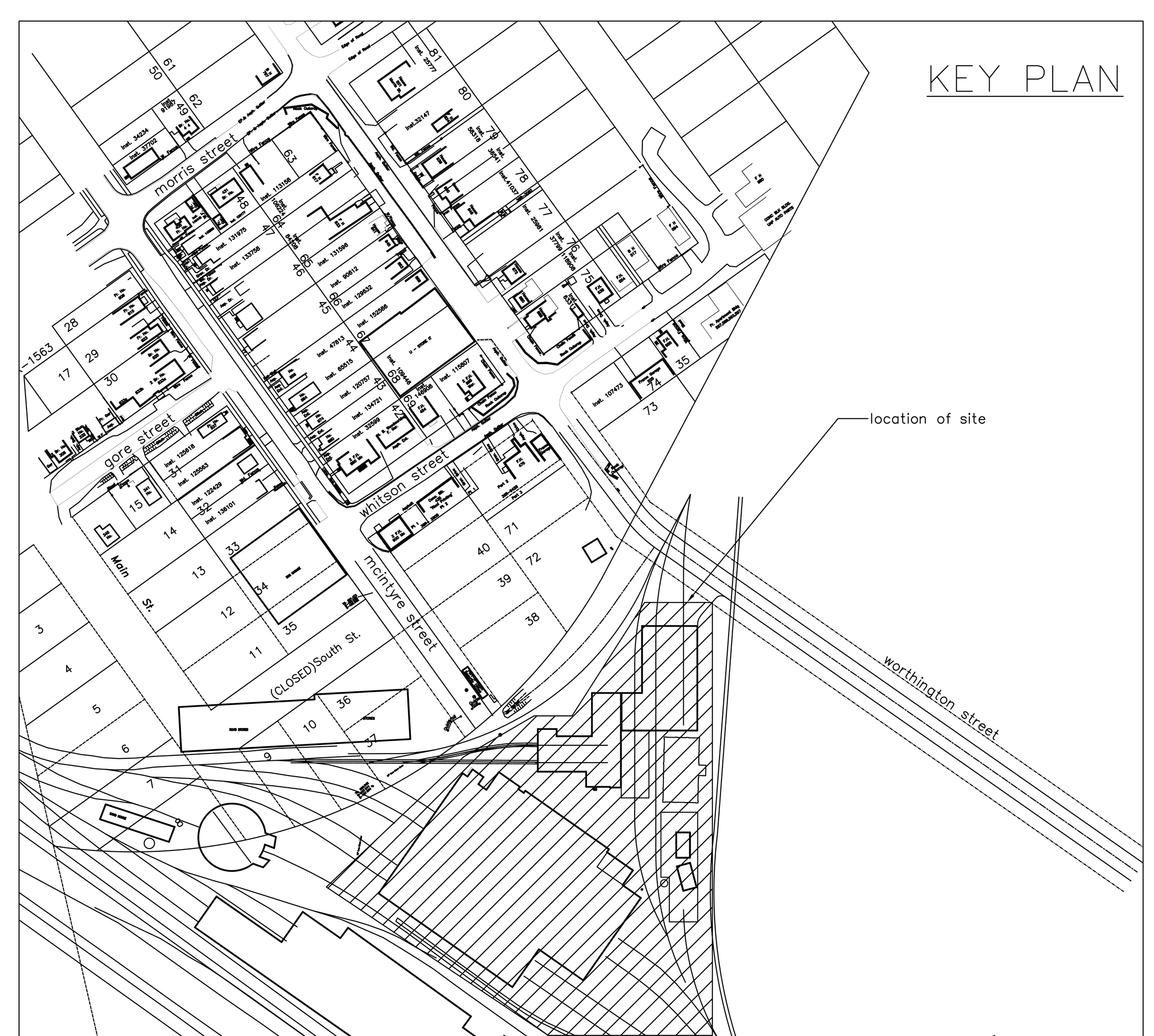


IMPERIAL

GENERAL NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS LISTED.
2. ANY DISCREPANCIES, OMISSIONS OR CONFLICTS SHALL BE REPORTED TO THE ARCHITECT PRIOR TO WORK PROCEEDING.
3. ALL CONTRACTORS SHALL COMPLY WITH PART 3 OF THE ONTARIO BUILDING CODE (1997) ACT, MUNICIPAL BYLAWS. ENVIRONMENTAL LAWS AND ALL OTHER GOVERNING AUTHORITIES HAVING JURISDICTION.
4. Prior to partition layout, site verify all foreseeable interferences and report to architect.
5. Provide adequate blocking in walls and ceilings where apparent loading is present (ie. millwork or other wall/ceiling hung ITEMS)
6. All partition walls unless noted otherwise or detailed shall extend to the underside of structure.

KEY PLAN



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No.:	Revision / Version:	Date:
1	ISSUED FOR REVIEW	MAY 25, 2004
2	PACKAGE A	JUNE 1, 2004
3	PACKAGE B	JUNE 23, 2004

Plotted: June 23, 2004
Plot scale: 1:1
File Name: A-0.1

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ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTH BAY SHOP EXTENSION
INFORMATION PAGE

Drawn by: RC/TJ
Checked by: TJ
Project No.: 0436
Date: June 23, 2004
Scale: AS NOTED
Drawing No.: A-0.1b

ONTARIO NORTHLAND
TRANSPORTATION COMMISSION

NORTH BAY SHOP EXTENSION

SITE PLAN

CASTELLAN JAMES + PARTNERS
ARCHITECTS PLANNERS
269 CEDAR STREET SUDBURY ONTARIO P3B 1M8 TEL 705-674-2300 FAX 705-674-2185

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Drawn by: RC/TS
Checked by: CJ
Project No: 0436

Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.: A-1.0b

No.:	Revision / Version:	Date:
1	ISSUED FOR REVIEW	MAY 25, 2004
2	PACKAGE A	JUNE 1, 2004
3	ADDENDUM No.1	JUNE 11, 2004
4	PACKAGE B	JUNE 23, 2004
5	TRACK & HYDRANT LOCATION REVISED	JULY 16, 2004

Revised: JULY 16, 2004
Plot scale: 1:1
Plot size: A1 - L.D.

LEGEND

TRAIN TRACKS
Denotes property line
NEW SPOT ELEVation
EXISTING SPOT ELEVation
DENOTES APPROXIMATE LEVEL OF BEDROCK (PAT GRADE)
BUILDING ELEVATION
FINISHED FLOOR ELEVATION
Denotes 20'-0" wide unobstructed fire route
DENOTES TRAFFIC FLOW DIRECTION
DENOTES EXISTING MANHOLE
FIRE DEPT. CONNECTION
DENOTES existing fire hydrant to remain
DENOTES new fire hydrant.
DENOTES MAN DOOR ACCESS TO BUILDING
DENOTES OVERHEAD DOOR ACCESS TO BUILDING
DENOTES STORM / SANITARY MANHOLE
DENOTES NEW CATCHBASIN
DENOTES NEW ASPHALT PAVING ASSEMBLY, REFER TO SPECIFICATIONS
DENOTES BUILDING ADDITION
DENOTES EXISTING STRUCTURE
DENOTES "AREA of WORK" REFER TO SPECIFICATIONS
DENOTES BOLLARDS REFER TO DETAIL 6/A-1.0
DENOTES DRAINAGE DIRECTION

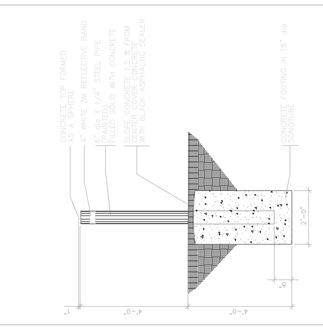
NOTES:

1.0 REFER to MECHANICAL DRAWINGS FOR LOCATION OF SITE SERVICES

2.0 SURVEY INFORMATION TAKEN FROM THE FOLLOWING SOURCES:
- COMPOSITE SKETCHES PREPARED BY NORTHLAND TRANSPORTATION
- BOUNDARY SURVEY
- LOCATED FIELD DATA (GRADES ONLY) COLLECTED BY EGARTER ON INC AND ONTARIO NORTHLAND TRANSPORTATION
- COLE SHERMAN & ASSOC LTD EXISTING DRAWINGS

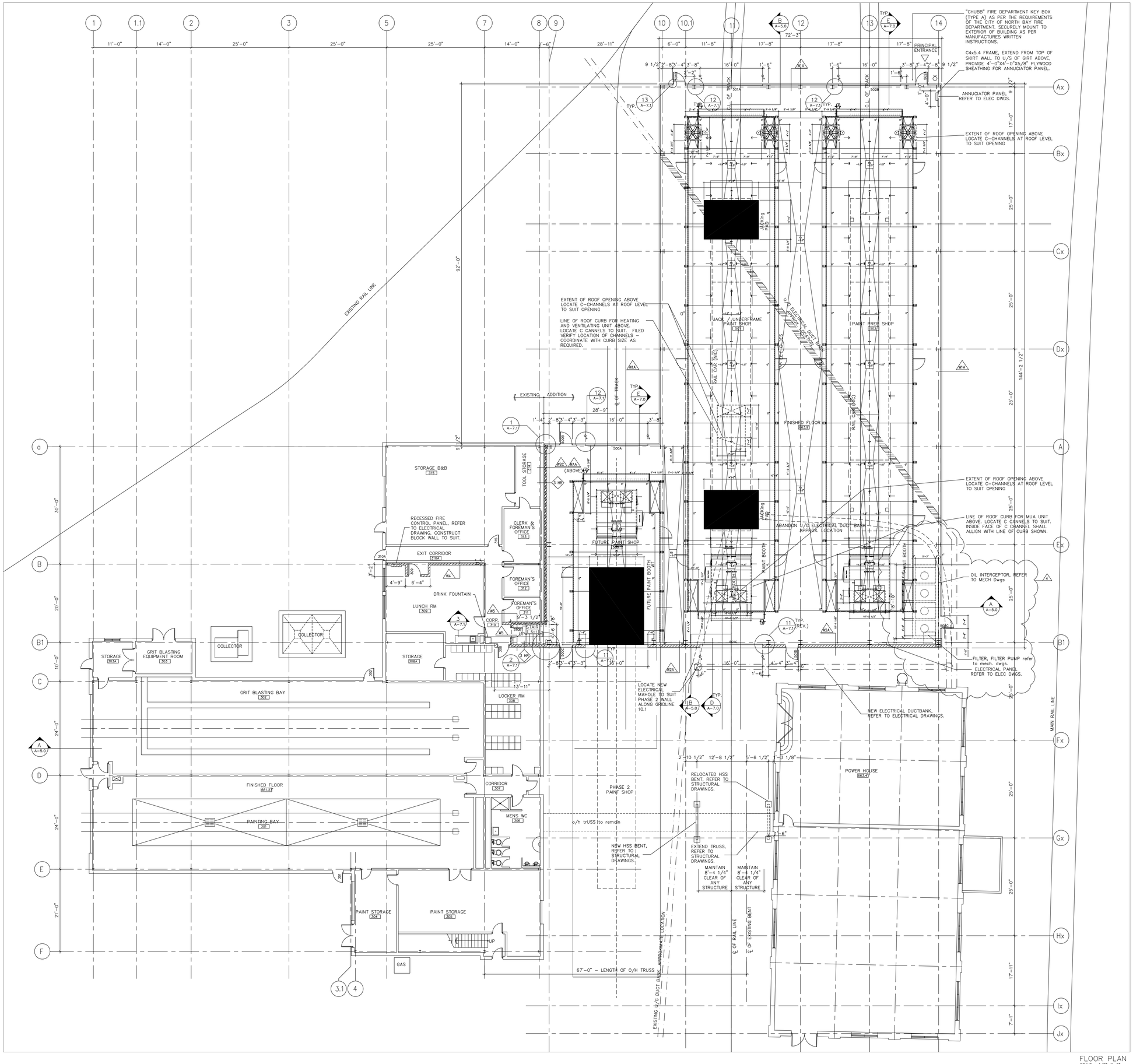
3.0 COORDINATE FINAL GRADE WITH OWNERS TECHNICAL STAFF AS REQUIRED TO SUIT EXISTING CONDITIONS. FINAL TRACK LAYOUT AND GRADING REQUIREMENTS ADJUST GRADES AS REQUIRED TO COMPLETE SMOOTH ROAD GRADES AND ASPHALT PAVING.

4.0 FIELD VERIFY CONDITIONS AND GRADES. REPORT DISCREPANCIES TO ARCHITECT/CONSTRUCTION MANAGER IMMEDIATELY.



1 A-1.0 TYPICAL BOLLARD DETAIL

SITE PLAN
SCALE: 1:250



FLOOR PLAN
SCALE = 1/8"=1'-0"

LEGEND

- NEW GYPSUM BOARD PARTITIONS
- NEW MASONRY PARTITIONS
- EXISTING PARTITIONS TO REMAIN
- 152 NEW DOOR AND FRAME
- EXISTING DOOR AND FRAME TO REMAIN
- DTP DENOTES DUST TIGHT PARTITION.
- FD DENOTES FLOOR DRAIN, REFER TO MECHANICAL DRAWINGS
- DENOTES BOLLARD–REFER TO DETAIL A ON A–1.0.
- DENOTES TRAIN STOP – SUPPLIED AND INSTALLED BY oWNER – REFER TO DETAIL
- DENOTES FIRE DEPARTMENT CONNECTION – REFER TO MECH. DWGS
- –2.5" DENOTES HEIGHT OF FLOOR RELATIVE TO FINISHED FLOOR ELEVATION
- DENOTES EXTENT OF JACKING PAD, REFER TO STRUCTURAL DRAWINGS.
- DENOTES MARKING AT EXISTING DUCT BANK (PAINT USING SAFETY YELLOW)
- EE ES DENOTES EMERGENCY EYE WASH AND EMERGENCY SHOWER LOCATION.

GENERAL NOTES:

1.0 RAIL LINES INSIDE THE BUILDING SHALL BE SUPPLIED BY OWNER AND INSTALLED BY CONTRACTOR. COORDINATE INSTALLATION OF RAILS WITH OWNER AS REQUIRED. NEW RAILS SHALL BE CONTINUOUS ACROSS EDGE OF SLAB ON GRADE AND SHALL EXTEND 20'-0" ONTO EXTERIOR ASPHALT APRON. RAIL LINES OUTSIDE THE BUILDING SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR.

2.0 COORDINATE SIZE AND LOCATION OF PAINT BOOTHS AND RELATED EQUIPMENT AS REQUIRED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.

3.0 REFER ALSO TO STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL PROJECT DETAILS AND REQUIREMENTS.

4.0 CONTRACTOR SHALL COORDINATE BUILDING COMPONENTS WITH PAINT BOOTH SUPPLIER/OWNER AS REQUIRED THROUGHOUT THE CONSTRUCTION OF THE PROJECT.

ASSEMBLIES:

W1A PREFINISHED METAL CLADDING
18GA GALV. ZGIRTS @ 7'-6" O/C
2" SEMI RIGID INSULATION
24 GA. GALV METAL LINER
STEEL GIRTS @7'-6" O/C VERTICALLY (REFER TO STRUCTURAL DWGS.)

W2A PREFINISHED METAL CLADDING
18GA GALV. ZGIRTS @ 7'-6" O/C
2" CAVITY WALL INSULATION MEMBRANE AIR VAPOUR BARRIER
8" – 75% SOLID CONC. BLK

W2C 8" – 75% SOLID CONC. BLK. EXISTING GAL. METAL LINER PROVIDE NEW METAL STUD INFILL AT EXISTING WINDOW OPENINGS AND ⅝"GYP. BD CLADDING OVER METAL STUDS AND EXISTING WALL AS SCHEDULED.

W4 6" CONCRETE BLOCK PARTITION TO EXTEND FROM U/S OF STEEL DECK. 10'-0" +/– AFF.

W5 8" CONCRETE BLOCK, 75% SOLID PARTITION TO EXTEND TO U/S OF STEEL DECK. 10'-0" +/– AFF.

R1 MODIFIED BITUMEN ROOF MEMBRANE
1/2" FIBRE BOARD
4" RIGID INSULATION
AIR VAPOUR BARRIER
1/2" GYPSUM BOARD
3" STRUCTURAL STEEL DECK
OPEN WEB STEEL JOIST

R2 MODIFIED BITUMEN ROOF MEMBRANE
1/2" FIBRE BOARD
4" RIGID INSULATION
1/2" GYPSUM BOARD
EXISTING STEEL DECK

F1 EPOXY COATING
6" CONCRETE REINFORCED SLAB
UNDERSLAB AIR VAPOUR BARRIER
12" GRANULAR 'A' COMPACTED TO 100% SPMMD
12" GRANULAR 'B' COMPACTED TO 100% SPMMD
EXISTING FILL – rigorously compacted in accordance with the geotechnical report
NATIVE BEDROCK

No.:	Revision / Version:	Date:

The Contractor shall verify all dimensions and report discrepancies to the Consultant before proceeding with the Work. Drawings as instruments of service are the property of the Consultant and are protected by copyright. Do not scale drawings.

No.:	Revision / Version:	Date:
1	ISSUED FOR REVIEW	MAY 19, 2004
2	PACKAGE A	JUNE 1, 2004
3	PACKAGE B	JUNE 23, 2004
4	OIL SEP. TANK RELOCATION	JULY 15, 2004
5	PAINT BOOTH LOCATIONS	AUG. 16, 2004
6	FLOOR SLOPE REVISION	SEPT. 6, 2004

Plotted: JUNE 23, 2004
Plot scale: 1:1
File Name: A-2.0

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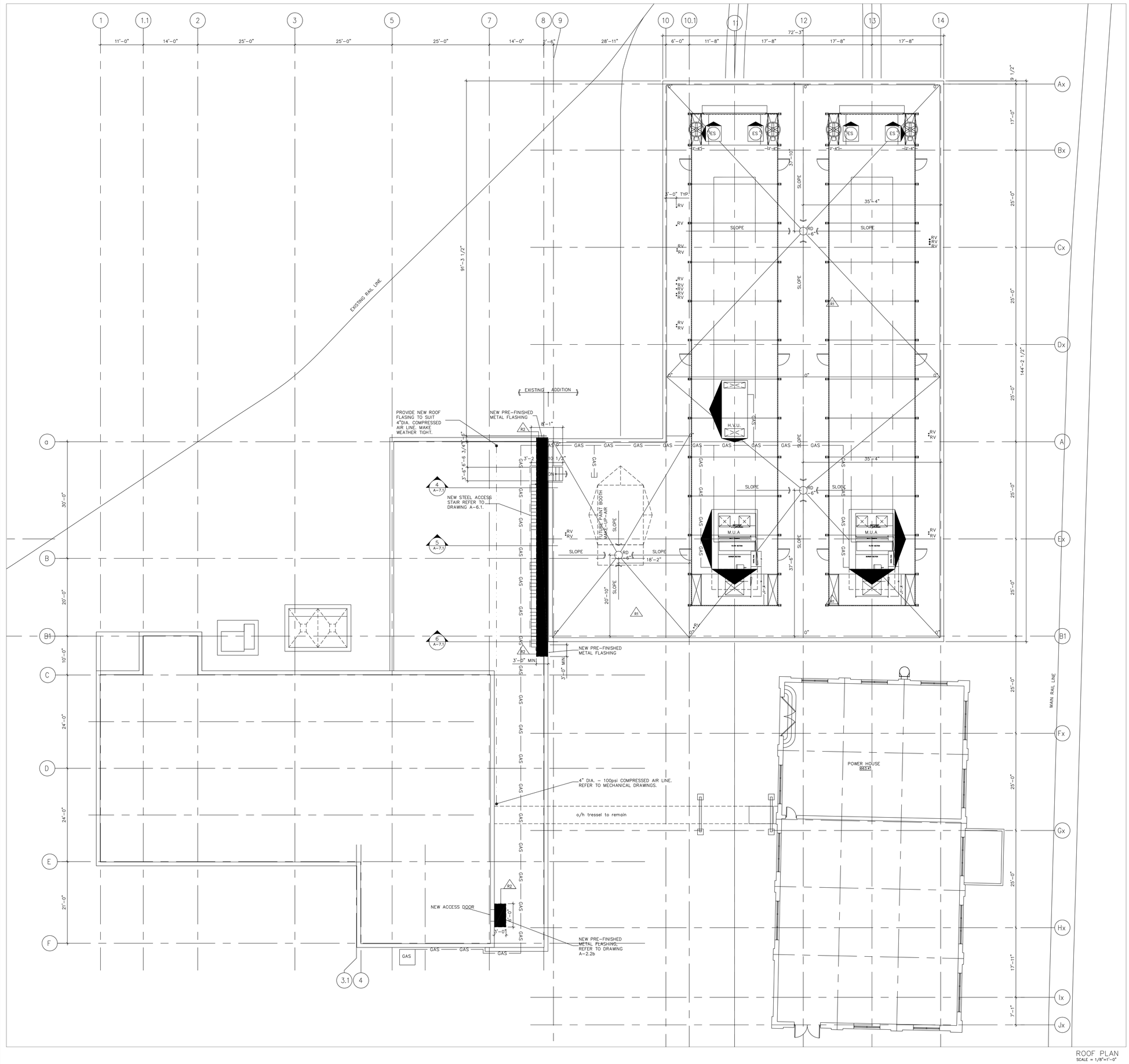
ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTH BAY SHOP EXTENSION

PAINT SHOP - FLOOR PLAN

Drawn by: RC/TJ
Checked by: TJ
Project No.:
0436

Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.:
A-2.1b



ROOF PLAN
SCALE = 1/8"=1'-0"

LEGEND

- RD — DENOTES NEW ROOF DRAIN
- −2.5" — DENOTES FINISHED ROOF RELATIVE TO PARAPET LOCATION. REFER ALSO TO STRUCTURAL DRAWINGS.
- RV — DENOTES ROOF VENT REFER TO MECHANICAL DRAWINGS
- ES — DENOTES EXHAUST STACK (N.I.C)
- M.U.A — DENOTES MAKE UP AIR UNIT (N.I.C.)
- H.V.U. — DENOTES HEATING/VENTILATION UNIT, REFER TO MECHANICAL DRAWINGS.
- DENOTES ROOF OPENING, REFER TO MECHANICAL DRAWINGS.
- DENOTES EXTENT OF ROOF REPLACEMENT FOR TIE IN.
- GAS — DENOTES GAS LINE, REFER TO MECHANICAL DRAWINGS.
- DENOTES CRICKET REFER TO SPECIFICATIONS.

GENERAL NOTES:

1.0 REFER ALSO TO STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL PROJECT DETAILS AND REQUIREMENTS.

2.0 CONTRACTOR TO INSTALL CURBS SUPPLIED BY PAINT BOOTH MANUFACTUER FOR MAKE UP AIR UNITS AND EXHAUST STACKS.

3.0 COORDINATE AND ADJUST THE OPENING SIZES AND LOCATION FOR EXHAUST STACKS (ES) AND MAKE UP AIR UNITS (MUA) WITH PAINT BOOTH PRIOR TO INSTALLATION OF THE OPENINGS.

No.:	Revision / Version:	Date:

No.:	Revision / Version:	Date:
1	PACAKGE B	June 23, 2004

Plotted: JUNE 23, 2004
Plot scale: 1:1
File Name: A-3.0

CASTELLAN JAMES + PARTNERS
ARCHITECTS INC
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ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTH BAY SHOP EXTENSION

PAINT SHOP - ROOF PLAN

Drawn by: RC/TJ
Checked by: TJ
Project No.:
0436

Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.:
A-3.0b

DEMOLITION LEGEND:

- EXISTING TO BE REMOVED
- EXISTING PARTITIONS
- EXISTING DOOR AND FRAME TO REMAIN
- EXISTING DOOR AND FRAME TO BE REMOVED

DEMOLITION NOTES:

D1 REMOVE EXISTING EXTERIOR WALL CLADDING, INSULATION,INTERIOR LINER AND STEEL GIRTS IN AREAS TO PERMIT STRUCTURAL TIE IN'S AS REQUIRED.

D2 REMOVE ALL OF EXISTING STEEL DUST COLLECTOR AND ALL ASSOCIATED STRUCTURAL STEEL, DUCTS AND ELECTRICAL UNITS. SHALL BE BY OWNER.

D3 REMOVE EXISTING METAL SAW DUST CHUTE, PATCH WALL TO MATCH EXISTING.

D4 REMOVE EXISTING STEEL CANOPY c/w ALL STRUCTURAL STEEL, ROOF DECK, ROOFING ASSEMBLY AND PRE-FINISHED METAL CLADDING.

D5 REMOVE EXISTING SPRINKLER SYSTEM, REFER TO MECHANICAL DRAWINGS

D6 REMOVE EXISTING COLUMN AND CONCRETE PIER TO LEVEL OF EXISTING BEDROCK.

D7 REMOVE EXISTING BOLLARDS

D8 SALVAGE EXISTING LIGHT FIXTURES AND TURN OVER TO OWNER.

D9 REMOVE EXISTING FLASHING, CANT STRIP AND ROOFING TO PERMIT TIE IN OF NEW/EXISTING ROOFING, REFER TO ROOF PLAN.

D10 REMOVE ASPHALT AS REQUIRED TO PERMIT INSTALLATION OF NEW CONSTRUCTION. SAW CUT EDGE OF REMOVAL.

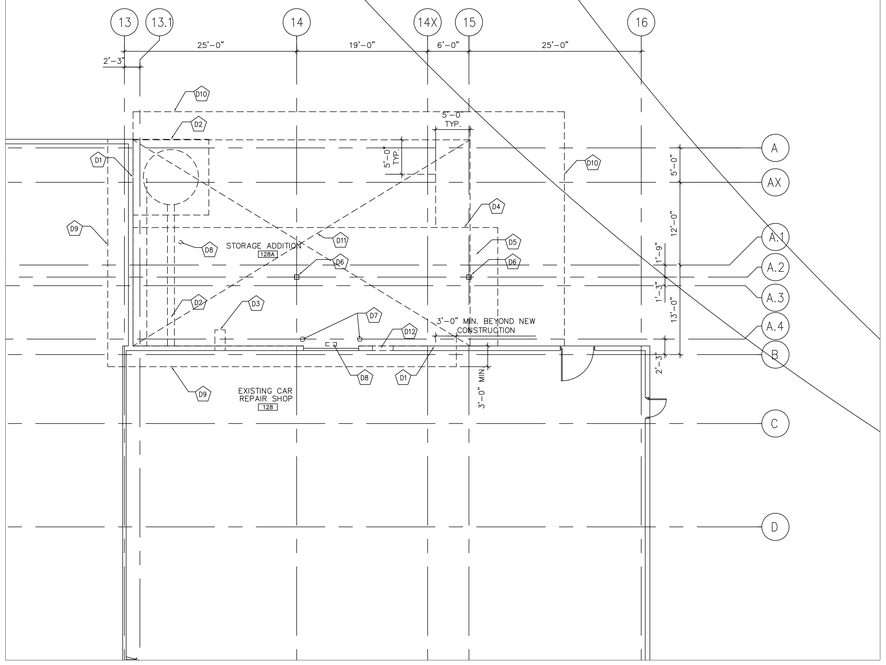
D11 REMOVE AND DISPOSE OF EXISTING FILL FROM FINISHED GRADE TO EXISTING BEDROCK. LIMIT SHALL BE TO 5'-0" OUTSIDE FOOT PRINT OF ADDITION. REFER TO STRUCTURAL DRAWINGS.

D12 REMOVE EXISTING EXTERIOR WALL CLADDING, INSULATION,INTERIOR LINER AND STEEL GIRTS FOR NEW MAN DOOR. SAW CUT AND REMOVE CONCRETE WALL AS REQUIRED FOR NEW OPENING.

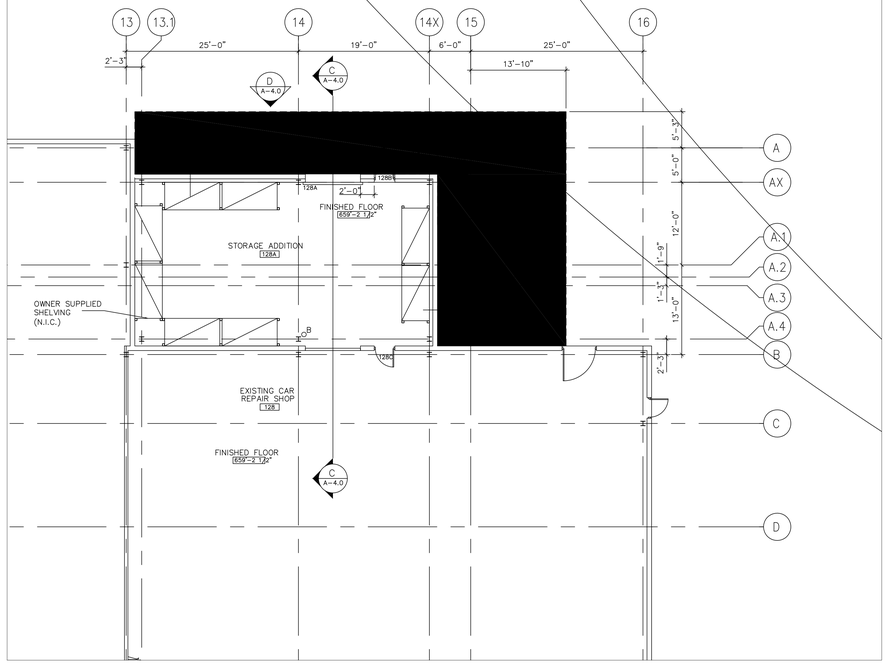
GENERAL DEMOLITION NOTES:

1.0 REFER ALSO TO MECHANICAL, ELECTRICAL DRAWINGS FOR ADDITIONAL NOTES AND DEMOLITION ACTIVITIES.

2.0 OWNER SHALL BE RESPONSIBLE FOR REMOVAL OF EXISTING RACKING AND EQUIPMENT LOCATED AT EXISTING CANOPY PRIOR TO START OF WORK.



CAR REPAIR SHOP–DEMOLITION PLAN
SCALE = 1/8"=1'-0"



CAR REPAIR SHOP–FLOOR PLAN
SCALE = 1/8"=1'-0"

LEGEND

- NEW PARTITIONS
- EXISTING PARTITIONS TO REMAIN
- 152 NEW DOOR AND FRAME
- EXISTING DOOR AND FRAME TO REMAIN
- B DENOTES BOLLARD–REFER TO DETAIL
- DENOTES NEW ASPHALT PAVING REFER TO SPECFICATIONS

ASSEMBLIES:

A3A PREFINISHED METAL WALL CLADDING 24GA.
GALVANIZED METAL LINER
STEEL GIRT (REFER TO STRUCTURAL DRAWINGS)

W3B 8" CONCRETE SKIRT WALL

F2 6" CONCRETE SLAB ON GRADE
6 MIL POLY VAPOUR BARRIER
12" GRANULAR "A" COMPACTED TO 100% SPMPD
GRANULAR 'B' COMPACTED TO 100% SPMPD
NATIVE SOIL/ BEDROCK

R3 MODIFIED BITUMEN ROOF MEMBRANE
1/2" FIBRE BOARD
AIR VAPOUR BARRIER
5/8" GYPSUM BOARD
1 1/2" METAL DECK
O.W.S.J.

CAR REPAIR SHOP–ROOF PLAN
SCALE = 1/8"=1'-0"

1/4.0 SECTION
SCALE = 1"=1'-0"

A/4.0 EAST ELEVATION
SCALE = 1/8"=1'-0"

B/4.0 NORTH ELEVATION
SCALE = 1/8"=1'-0"

C/A-4.0 SECTION
SCALE = 1/8"=1'-0"

No.:	Revision / Version:	Date:

No.:	Revision / Version:	Date:
1	ISSUED FOR REVIEW	MAY 25, 2004
2	PACKAGE A	JUNE 1, 2004

Plotted: JUNE 1, 2004
Plot scale: 1:1
File Name: A-4.0

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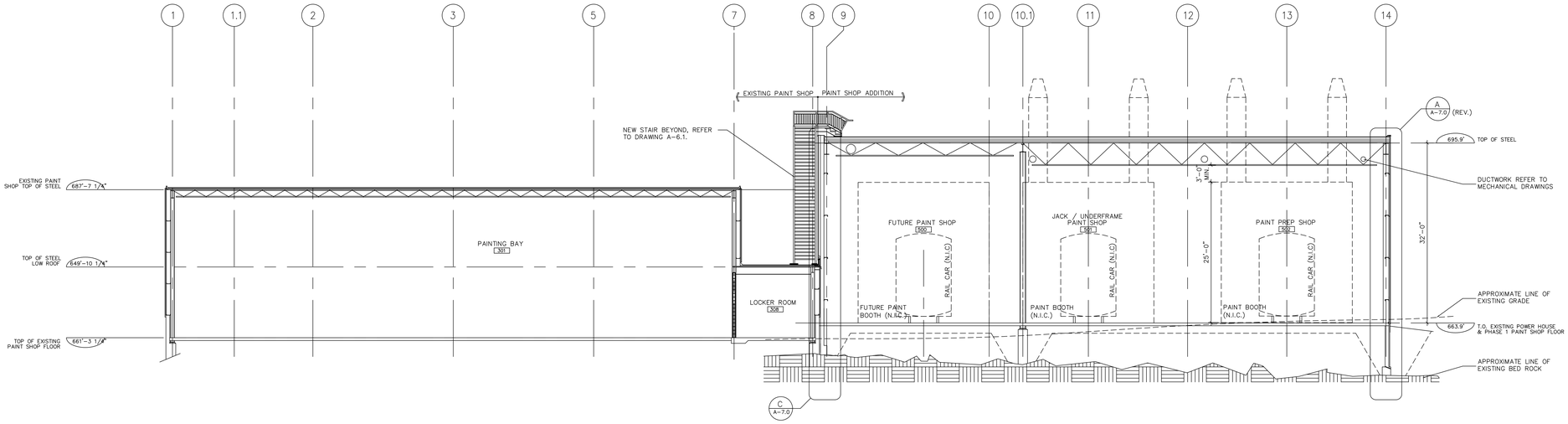
ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTH BAY SHOP EXTENSION

CAR REPAIR SHOP - PLANS, SECTIONS AND ELEVATIONS

Drawn by: RC/TJ
Checked by: TJ
Project No.:
0436

Date: JUNE 1, 2004
Scale: AS NOTED
Drawing No.:
A-4.0a



A A-2.1 SECTION
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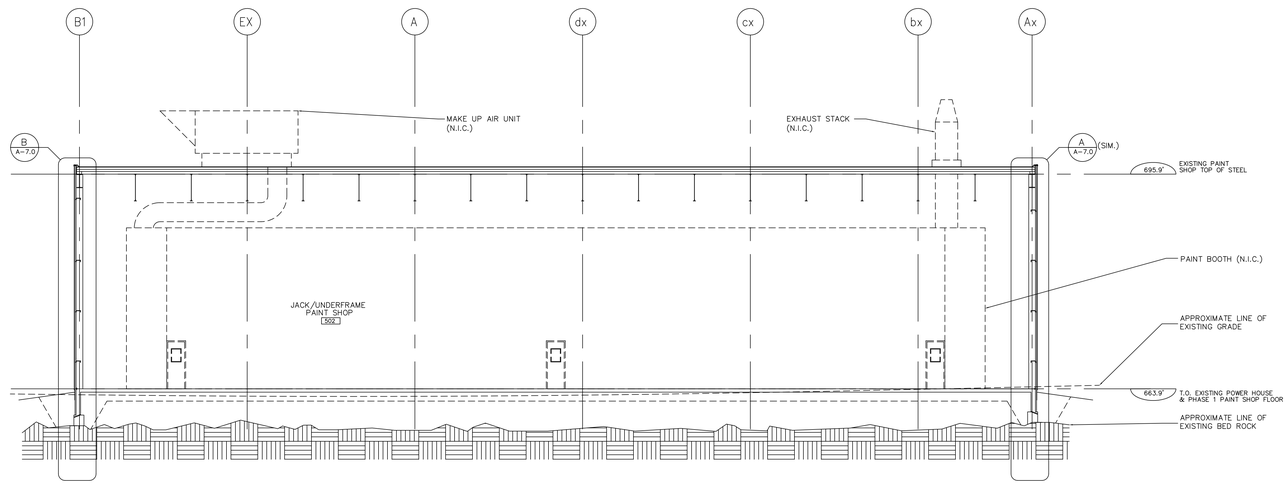

B A-2.1 SECTION
SCALE = 1/8"=1'-0"

No.:	Revision / Version:	Date:

The Contractor shall verify all dimensions and report any discrepancies to the Architect before proceeding with the Work. Drawings as instruments of service are the property of the Architect and are protected by copyright. Do not scale drawings.

No.:	Revision / Version:	Date:
1	ISSUED FOR REVIEW	MAY 25, 2004
2	PACKAGE A	JUNE 1, 2004
3	PACKAGE B	JUNE 23, 2004

Plotted: JUNE 23, 2004
Plot scale: 1:1
File Name: A-5.0

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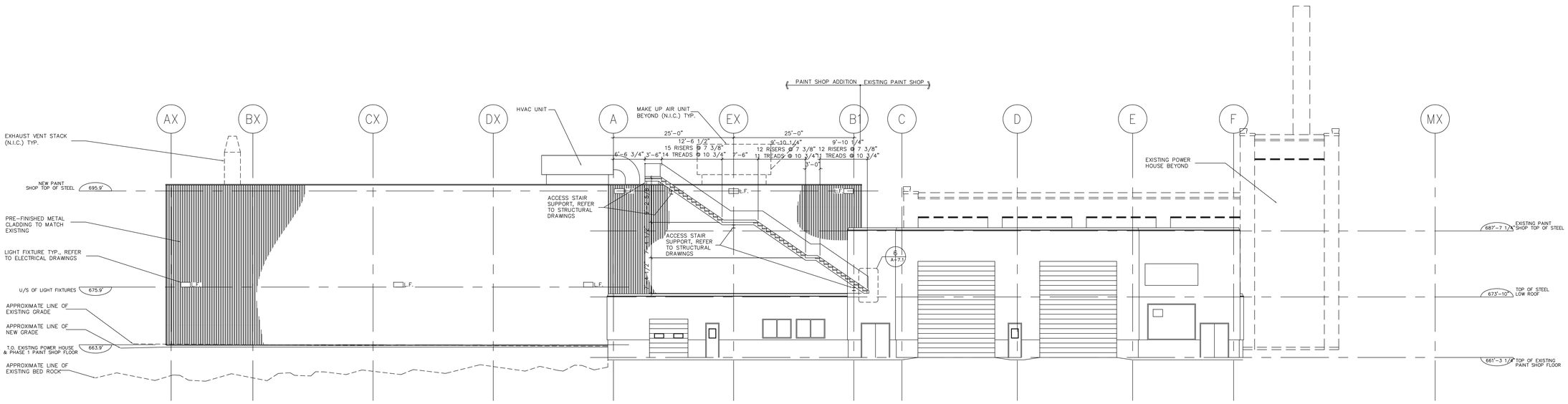
ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTH BAY SHOP EXTENSION

PAINT SHOP - SECTIONS

Drawn by: RC/TJ
Checked by: TJ
Project No.:
0436

Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.:
A-5.0b



C / D-2 WEST ELEVATION
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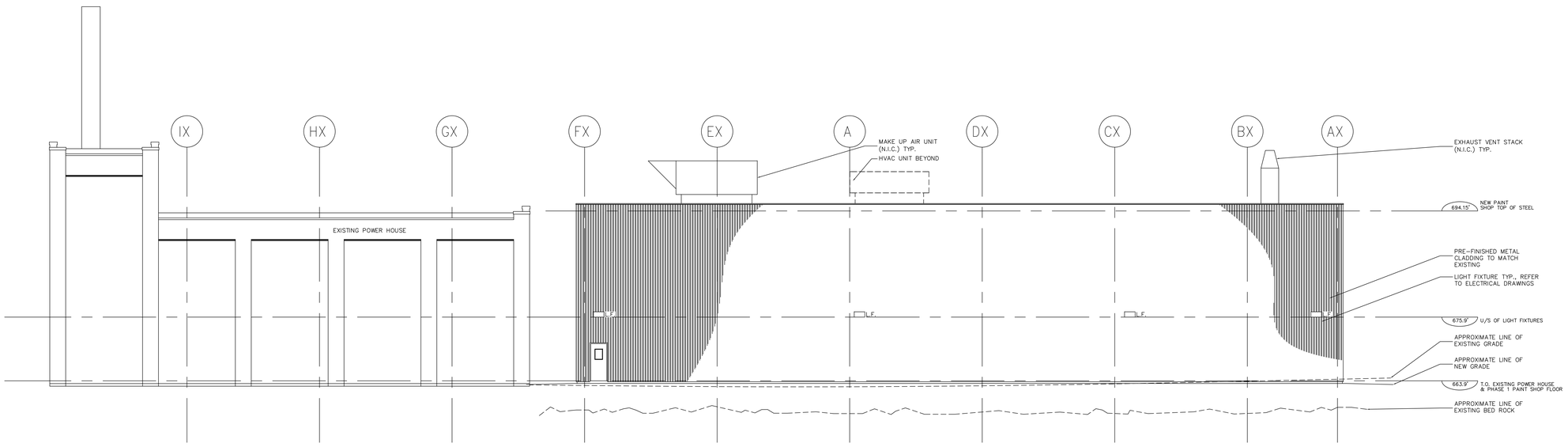

D / D-2 EAST ELEVATION
SCALE = 1/8"=1'-0"

No.:	Revision / Version:	Date:

No.:	Revision / Version:	Date:
1	ISSUED FOR REVIEW	MAY 25, 2004
2	PACKAGE A	JUNE 1, 2004
3	PACKAGE B	JUNE 23, 2004

Plotted: JUNE 23, 2004
Plot scale: 1:1
File Name: A-6.1

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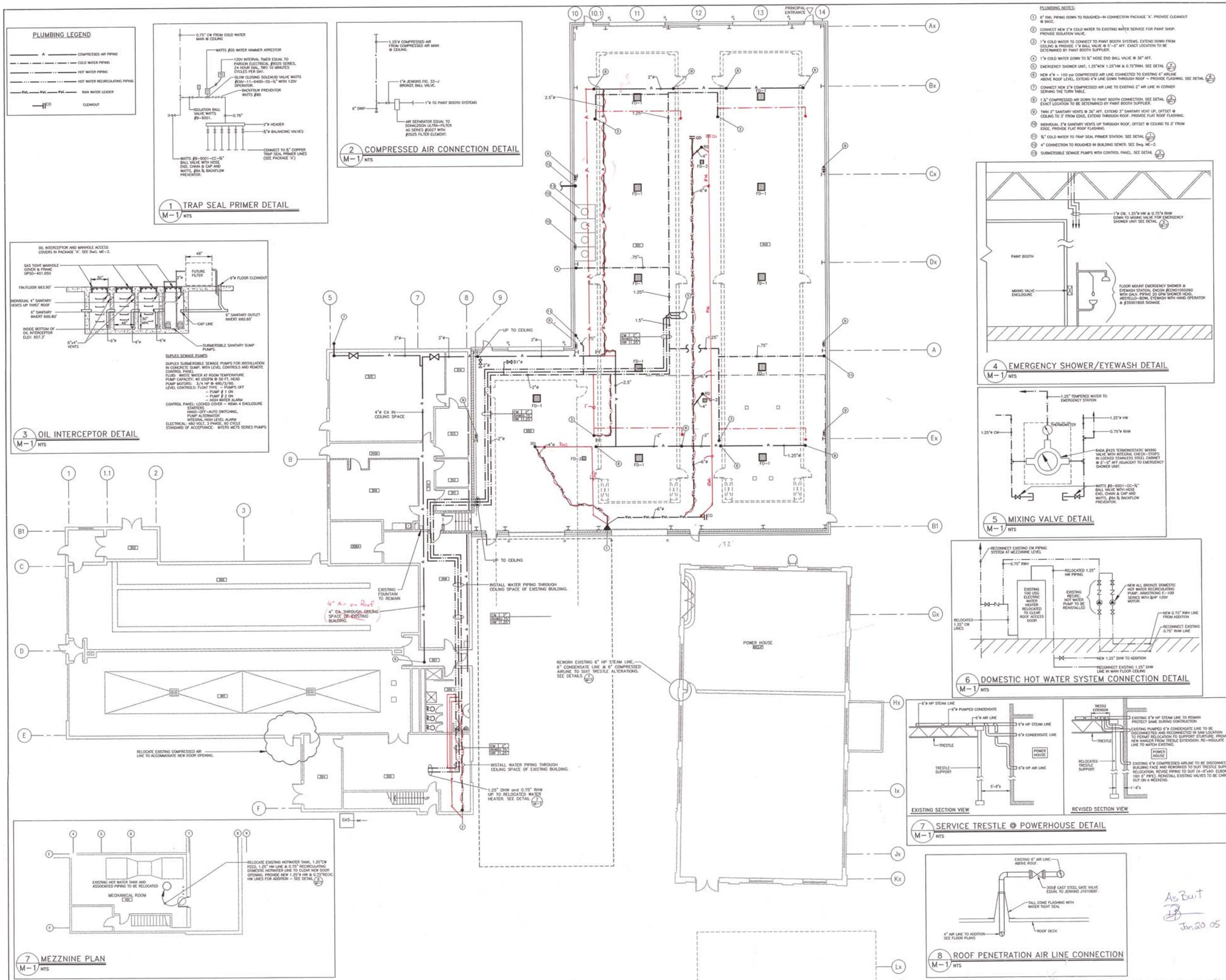
ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTH BAY SHOP EXTENSION

PAINT SHOP - ELEVATIONS

Drawn by: RC/TJ
Checked by: TJ
Project No.:
0436

Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.:
A-6.1b


PLUMBING LEGEND
PLUMBING NOTES:
① 6" RWL PIPING DOWN TO ROUGHED-IN CONNECTION PACKAGE 'A'. PROVIDE CLEANOUT @ BASE.
② CONNECT NEW 2"ø COLD WATER TO EXISTING WATER SERVICE FOR PAINT SHOP. PROVIDE ISOLATION VALVE.
③ 1"ø COLD WATER TO CONNECT TO PAINT BOOTH SYSTEMS. EXTEND DOWN FROM CEILING & PROVIDE 1"ø BALL VALVE @ 5'-0" AFF. EXACT LOCATION TO BE DETERMINED BY PAINT BOOTH SUPPLIER.
④ 1"ø COLD WATER DOWN TO ¾" HOSE END BALL VALVE @ 36" AFF.
⑤ EMERGENCY SHOWER UNIT, 1.25"øCW 1.25"HW & 0.75"RWH. SEE DETAIL 4/M-1
⑥ NEW 4"ø - 100 psi COMPRESSED AIR LINE CONNECTED TO EXISTING 6" AIRLINE ABOVE ROOF LEVEL. EXTEND 4"ø LINE DOWN THROUGH ROOF - PROVIDE FLASHING. SEE DETAIL 8/M-1
⑦ CONNECT NEW 2"ø COMPRESSED AIR LINE TO EXISTING 2" AIR LINE IN CORNER SERVING THE TURN TABLE.
⑧ 1 ¼" COMPRESSED AIR DOWN TO PAINT BOOTH CONNECTION. SEE DETAIL 2/M-1 EXACT LOCATION TO BE DETERMINED BY PAINT BOOTH SUPPLIER.
⑨ TWIN 2" SANITARY VENTS @ 36" AFF. EXTEND 3" SANITARY VENT UP, OFFSET @ CEILING TO 3' FROM EDGE, EXTEND THROUGH ROOF. PROVIDE FLAT ROOF FLASHING.
⑩ INDIVIDUAL 3"ø SANITARY VENTS UP THROUGH ROOF, OFFSET @ CEILING TO 3' FROM EDGE, PROVIDE FLAT ROOF FLASHING.
⑪ ¾" COLD WATER TO TRAP SEAL PRIMER STATION. SEE DETAIL 1/M-1
⑫ 4" CONNECTION TO ROUGHED IN BUILDING SEWER. SEE Dwg. ME-2.
⑬ SUBMERSIBLE SEWAGE PUMPS WITH CONTROL PANEL. SEE DETAIL 3/M-1
1 TRAP SEAL PRIMER DETAIL M-1 NTS
2 COMPRESSED AIR CONNECTION DETAIL M-1 NTS
3 OIL INTERCEPTOR DETAIL M-1 NTS
4 EMERGENCY SHOWER/EYEWASH DETAIL M-1 NTS
5 MIXING VALVE DETAIL M-1 NTS
6 DOMESTIC HOT WATER SYSTEM CONNECTION DETAIL M-1 NTS
7 SERVICE TRESTLE @ POWERHOUSE DETAIL M-1 NTS
7 MEZZNINE PLAN M-1 NTS
8 ROOF PENETRATION AIR LINE CONNECTION M-1 NTS
POWER HOUSE
As Built
Jan 20 05

REFER TO Dwg. #ME-1a FOR SITE SERVICES
REFER TO Dwg. #ME-2a FOR BELOW GRADE PLUMBING SYSTEMS

K.G. LANG 06/23/04

NORTH

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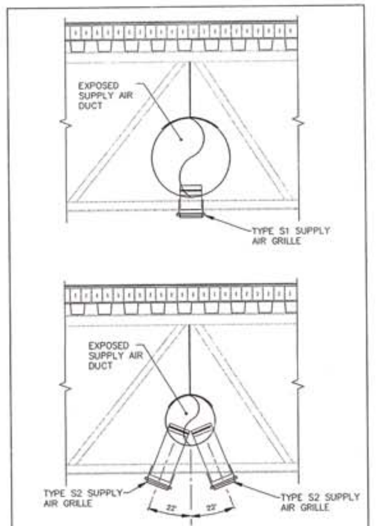
ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTHBAY SHOP EXTENSION
PLUMBING SYSTEMS

Drawn by: KAF
Checked by: KL
Project No.: 2837
Date: JUNE 23, 2004
Scale: ⅛" = 1'-0"
Drawing No.: M-1b



S1- DRUM DIFFUSSER LOURVE WITH EXTRACTOR MOUNTED FOR VERTICAL DOWN AIRFLOW EQUAL TO E.H. PRICE # 18x16/HCD2/F/A/B15 WITH AE-2S EXTRACTOR.

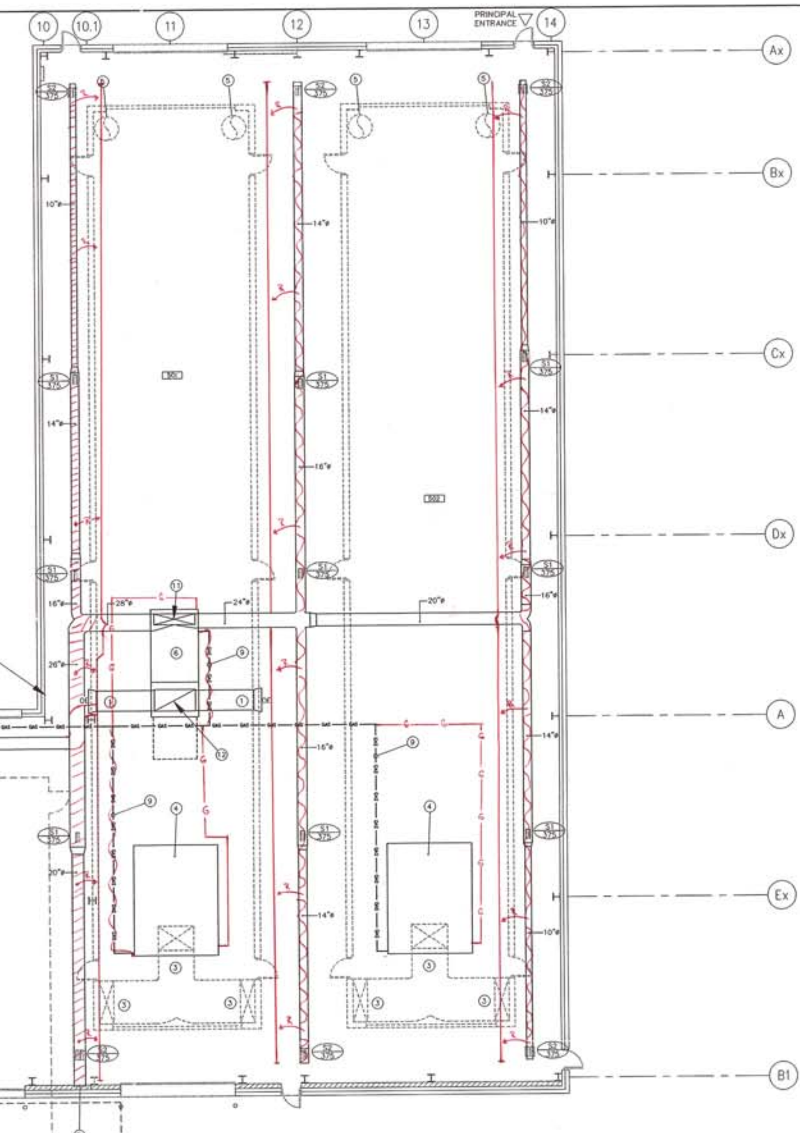
S2- DRUM DIFFUSSER LOURVE WITH EXTRACTOR MOUNTED FOR VERTICAL DOWN AIRFLOW MOUNTED @ 22°EQUAL TO E.H. PRICE # 18x16/HCD2/F/A/B15 WITH AE-2S EXTRACTOR.

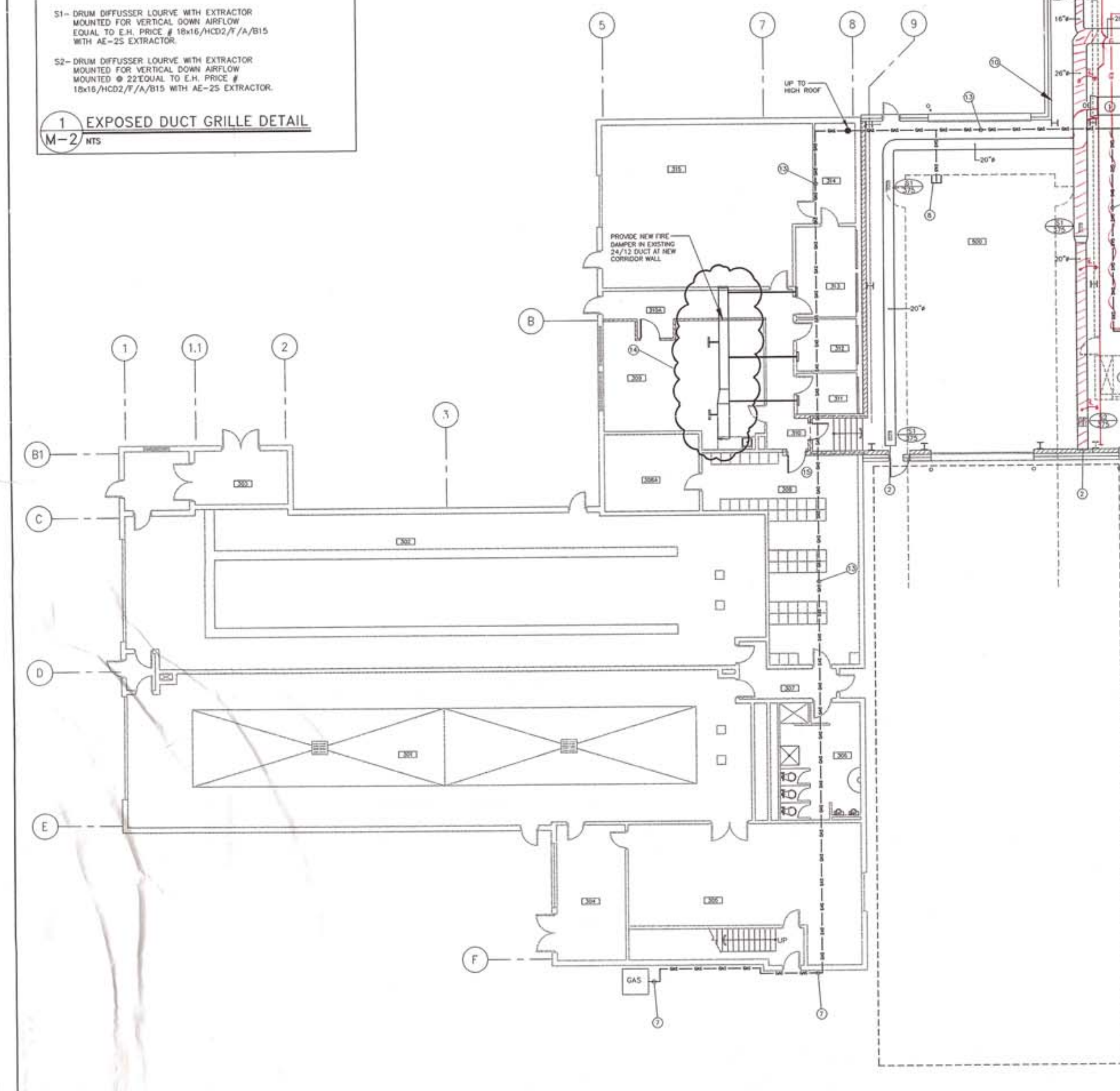
1/M-2 EXPOSED DUCT GRILLE DETAIL
NTS

HEATING & VENTILATION NOTES:

1. 48"w x 26"h OPEN END RETURN AIR DUCT.
2. 20"ø DUCT FOR FUTURE EXTENSION.
3. SUPPLY DUCT FROM MAKE UP AIR UNIT TO PAINT BOOTH BY PAINT BOOTH SUPPLIER.
4. DIRECT FIRED MAKE UP AIR SUPPLY UNIT ON ROOF BY PAINT BOOTH SUPPLIER. COORDINATE INSTALLATION OF ROOF CURB (SENT TO SITE EARLY BY BOOTH SUPPLIER)
5. EXHAUST DUCT TO ROOF MOUNTED EXHAUST FANS BY PAINT BOOTH SUPPLIER. COORDINATE INSTALLATION OF ROOF CURB (SENT TO SITE EARLY BY BOOTH SUPPLIER)
6. ROOF MOUNTED HEATING & VENTILATION UNIT BY DIV. 15 SEE SPECIFICATIONS THIS DRAWING.
7. EXTEND NEW 3"ø – 5psi GAS LINE ALONG EDGE OF BUILDING AND OFFSET UP TO LOW ROOF AREA. SEE DETAIL 2/M-2 FOR METER UPGRADE
8. 2"ø CAPPED 5psi GAS LINE FOR FUTURE.
9. 2"ø GAS LINE TO ROOF MOUNTED EQUIPMENT SEE DETAIL 2/M-2, 6/M-2
10. REMOTE CONTROL PANEL FOR H & V UNIT.
11. 66"x18" SUPPLY AIR DUCT DOWN FROM H & V UNIT ON ROOF.
12. 60"x24" RETURN AIR DUCT UP TO H & V UNIT.
13. NATURAL GAS PIPING ON ROOF WITH SUPPORTS. SEE DETAIL # 3 THIS DRAWING. PAINTING OF PIPING TO GAS CODE REQUIREMENTS BY DIV. 15.
14. EXISTING HVAC SYSTEMS THIS AREA TO REMAIN. REMOVE – REINSTALL AND COORDINATE WITH NEW CEILING SYSTEMS – SEE ARCHITECTURAL DRAWINGS.
15. EXTEND 6"ø EXHAUST DUCT FOR RELOCATED LOCKERS TO EXISTING LOCKER EXHAUST SYSTEM.

NOTE: ALL SUPPLY AIR DUCT WORK TO BE INSTALLED IN OPEN WEB STEEL JOISTS. ALL RETURN AIR DUCT WORK TO BE INSTALLED TIGHT TO U/S OF OWS–J.





ROOF MOUNTED HEATING & VENTILATION UNIT

THE HEATER SHALL BE AN INDUSTRIAL QUALITY ROOF MOUNTED INDIRECT FIRED UNIT, CSA/CGA APPROVED, EQUAL TO QUIET-AIRE MODEL "QAI-1000-4". THE HEATER SHALL BE DESIGNED FOR OUTDOOR HORIZONTAL MOUNTING, ASSEMBLED, WIRED AND FLAME-TESTED BEFORE SHIPMENT, BUILT TO THE FOLLOWING SPECIFICATIONS AND WITH THE FOLLOWING FEATURES:

SPECIFICATIONS:

AIRFLOW RATE 10000 SCFM
EXTERNAL STATIC PRESSURE 1" W.C.
SUPPLY FAN MOTOR SIZE 10 HP
EXHAUST FAN MOTOR SIZE 1/2 HP
HEATING INPUT 1,250,000 BTU/HR
HEATING OUTPUT 1,000,000 BTU/HR
TEMPERATURE RISE (T) 100ø F
POWER SUPPLY 480V/3/60CY
NATURAL GAS SUPPLY 5 psi

FEATURES: THE UNIT(S) SHALL BE FACTORY ASSEMBLED AND SHIPPED IN ONE OR MORE SECTIONS TO FACILITATE SHIPPING AND INSTALLATION REQUIREMENTS.

UNIT CASING:

THE UNIT CASING AND ACCESSORIES SHALL BE HEAVY GAUGE G-90 GALVANIZED STEEL WITH BAKED ENAMEL FINISH. THE UNIT CASING SHALL BE AIRTIGHT AND WEATHERPROOF. ALL STRUCTURAL FRAMING TO BE HOT ROLLED STEEL PRIME PAINTED. FRESH AIR DAMPERS CONSTRUCTED OF 16 GAUGE GALVANIZED STEEL BLADES AND FRAMING WITH NYLON BEARINGS SHALL BE FURNISHED. MOTORIZED DAMPER OPERATION WITH SPRING RETURN ACTION SHALL BE FURNISHED. FILTER RAILS ARRANGED IN A "V" CONFIGURATION FURNISHED WITH 2" REPLACEABLE TYPE FILTER SHALL BE SUPPLIED. A G-90 GALVANIZED STEEL INLET HOOD WITH RAIN SHIELD SHALL BE FURNISHED ON THE FRESH AIR INLET. CASING SHALL BE INSULATED WITH 2" - 3UL NON-WICKING INSULATION, LINED WITH 20 GAUGE GALVANNEAL, TO ELIMINATE AIR BORNE FIBERS FROM ENTERING THE AIR STREAM. INSULATED DOUBLE WALLED HINGED ACCESS DOORS SHALL BE PROVIDED TO PERMIT READY ACCESS TO ALL INTERNAL COMPONENTS.
CASING SHALL BE FURNISHED WITH A REAR TUBE ACCESS PANEL, C/W HANDLES, FOR TUBE MAINTENANCE.

HEAT EXCHANGER

THE HEAT EXCHANGER SHALL BE RATED AT A MINIMUM 80% EFFICIENCY AT RATED OUTPUT. THE FLUE GAS TRAVEL SHALL BE OF FOUR-PASS DESIGN, WITH NO INTERNAL BAFFLES. THE PRIMARY HEAT TRANSFER SURFACE AND HEADERS SHALL BE A MINIMUM OF 16 GA. 409 STAINLESS STEEL UP TO AND INCLUDING INPUTS OF 1250CFH, 14 GA. 409 STAINLESS STEEL FOR THE LARGER INPUTS, THE SECONDARY HEAT TRANSFER SURFACE SHALL BE 16 GA. 409 STAINLESS STEEL. THERE SHALL BE THREE (3) COLLECTOR BOXES FABRICATED FROM16/14 GA. 409 STAINLESS STEEL. THE HEAT EXCHANGER SHALL BE SUPPLIED WITH A REAR TUBE ACCESS PANEL COMPLETE WITH BRASS NUTS FOR EASY REMOVAL TO ALLOW INSPECTION AND SERVICING. THE HEAT EXCHANGER DESIGN SHALL PERMIT UNRESTRICTED LATERAL AND PERIPHERAL EXPANSION DURING THE HEATING AND COOLING CYCLE. THE HEATING SURFACE AREA OF THE PRIMARY AND SECONDARY HEAT TRANSFER SURFACE AREA SHALL BE 60 FT2 AND 58 FT2 RESPECTIVELY.
THE SURFACE TEMPERATURE OF THE HEAT EXCHANGER SHALL NOT EXCEED 75% OF ITS SCALING TEMPERATURE WHEN OPERATING AT RATED CAPACITY.

FAN SECTION

THE UNIT SHALL BE SUPPLIED WITH AMCA RATED, FORWARD CURVED, DOUBLE WIDTH, DOUBLE INLET, STATICALLY AND DYNAMICALLY BALANCED CENTRIFUGAL FANS. THE FAN ASSEMBLY SHALL BE LOCATED UPSTREAM OF THE HEAT EXCHANGER. FANS ARE TO BE MOUNTED ON A HEAVY DUTY, TURNED AND GROUND STEEL SHAFT WITH ITS MAXIMUM OPERATING SPEED NOT EXCEEDING 75% OF ITS FIRST CRITICAL SPEED. THE BEARINGS ARE TO BE OF THE PRE-LUBRICATED, SELF-ALIGNING TYPE WITH LOCKING COLLARS AND EXTENDED GREASE TUBING WITH ALEMITE FITTINGS. THE "V" BELT DRIVE SHALL BE SIZED WITH A CAPACITY 25% GREATER THAN THE MOTOR HORSEPOWER AND HAVE A MINIMUM OF TWO BELTS. UP TO 7.5 HP THE MOTOR SHEAVE SHALL BE OF THE ADJUSTABLE PITCH TYPE. HINGED ACCESS PANELS SHALL BE PROVIDED TO ALLOW INSPECTION AND MAINTENANCE OF THE FAN AND DRIVE ASSEMBLY AND FOR REMOVAL OF THE COMPLETE ASSEMBLY. MOTORS SHALL BE RATED FOR FAN DUTY, TEFC, T-FRAME AND 575 VOLT 60 CYCLE 3 PHASE. THE FAN MOTOR SHALL BE MOUNTED ON AN ADJUSTABLE BASE AND PRE-WIRED IN CONDUIT TO THE CONTROL PANEL.

INDUCED DRAFT FAN

AN INTEGRALLY MOUNTED, HEAVY DUTY, RADIAL BLADE INDUCED DRAFT FAN SHALL BE PROVIDED. THE INDUCED DRAFT FAN SHALL BE EQUIPPED WITH A PROPER MANUAL DAMPER COMPLETE WITH LOCKING QUADRANT TO ENSURE PROPER DRAFT, RATED EFFICIENCY AND EXTENDED HEAT EXCHANGER PERFORMANCE. NO CENTRIFUGAL WHEELS SHALL BE USED. THE INDUCED DRAFT FAN SHALL BE EQUIPPED WITH A PROPERLY SIZED FULL VOLTAGE THREE PHASE MOTOR FOR RELIABLE OPERATION.

GAS FIRED BURNER

GAS BURNER SHALL BE OF THE LOW PRESSURE POWER TYPE, WITH INTEGRAL COMBUSTION AIR BLOWER AND MOTOR, COMBUSTION AIR PROVING DIFFERENTIAL SWITCH AND REMOVABLE PILOT ASSEMBLY. THE COMBUSTION AIR DAMPERS SHALL BE INTERLOCKED WITH A PROPERLY SIZED GAS CONTROL VALVE TO ENSURE "ON RATIO" FIRING. AN ELECTRONIC PROGRAMMING RELAY WITH FLAME ROD SHALL BE USED FOR FLAME SUPERVISION. THE PRE-WIRED AND PRE-PIPED VALVE TRAIN SHALL BE MOUNTED ON THE HEATER AND COME COMPLETE WITH APPLIANCE GAS PRESSURE REGULATOR; AUTOMATIC SHUT-OFF VALVE; FIRING COCK; MANUAL PILOT SHUT-OF COCK; PILOT GAS PRESSURE REGULATOR; AUTOMATIC PILOT VALVE; AND AN ADJUSTABLE ORIFICE/SHUT-OFF COCK. A LUBRICATED PLUG COCK SHALL BE PROVIDED FOR FIELD MOUNTING AT THE UNIT. THE BURNER SHALL FIRE NATURAL GAS AND BE ARRANGED FOR FULL MODULATING, WITH LOW FIRE START.

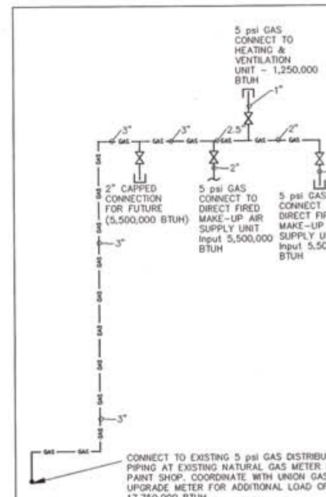
ELECTRICAL CONTROLS

AN NEMA 1 CONTROL PANEL COMPLETE WITH HINGED ACCESS DOOR AND DEADFRONT DISCONNECT SWITCH SHALL BE MOUNTED ON THE UNIT AND WIRED. ALL CONTROL COMPONENTS ARE TO BE LABELED AND INDIVIDUALLY WIRED TO A NUMBERED DIN-RAIL MOUNTED TERMINAL STRIP TO AID IN SERVICING. POINT TO POINT WIRING IS NOT ACCEPTABLE. ALL WIRING SHALL BE COLOUR CODED AND NUMBER TAGGED AT EACH END TO MATCH THE CONTROL DIAGRAM SUPPLIED. ALL CONTROL PANEL WIRING TO RUN IN PLASTIC RACEWAY. WIRING FROM PANEL TO COMPONENTS MUST BE RUN IN FLEXIBLE CONDUIT AND FOR LONGER RUNS IN EMT AND FLEXIBLE CONDUIT. FULL OPERATING AND MAINTENANCE INSTRUCTIONS SHALL ACCOMPANY EACH UNIT.
THE CONTROL SYSTEM SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING COMPONENTS REQUIRED FOR AUTOMATIC OPERATION:

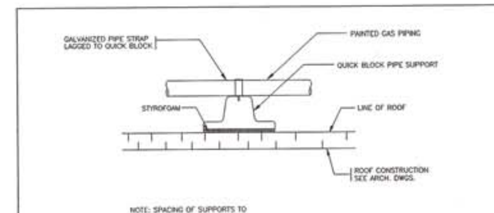
- MAIN DISCONNECT SWITCH
- CONTROL CIRCUIT TRANSFORMER
- FAN MOTOR STARTER C/W OVERLOADS
- SUB CIRCUIT FUSES
- CONTROL CIRCUIT FUSES
- CONTROL RELAYS
- ELECTRONIC FLAME RELAY COMPLETE WITH ALARM CONTACTS
- INDUCED DRAFT FAN AIR PROVING DIFFERENTIAL SWITCH
- HIGH LIMIT SWITCH
- AUTOMATIC/MANUAL FAN SWITCH
- HEAVY DUTY IGNITION TRANSFORMER
- FAN AND BURNER SERVICE SWITCHES
- REMOTE CONTROL PANEL

OPTIONAL ACCESSORIES INCLUDED:

- OUTDOOR/WEATHERPROOF ENCLOSURES
- INLET HOOD(S) WITH BIRD SCREEN
- V-BANK FILTER BOX WITH THROWAWAY 30% PLEATED FILTERS
- 2-POSITION MOTORIZED INLET DAMPER
- FULL MOD BURNER WITH 15:1 TURNDOWN RATIO
- CRI APPROVALS
- EXTENDED GREASE LINES PIPED TO OUTSIDE OF CASING
- NEMA 12 REMOTE CONTROL STATION COMPLETE WITH "FAN ON/OFF" SWITCH, "BURNER ON/OFF" SWITCH, "FAN ON" LIGHT, "BURNER ON" LIGHT AND DISCHARGE TEMPERATURE CONTROLLER.
- NEMA 12 CONTROL PANEL UPGRADE
- A FRONT MOUNTED, SPRING LOADED, PRESSURE RELIEF DOOR COMPLETE WITH AN OBSERVATION WINDOW TO VIEW THE MAIN FLAME
- "C" STACK 4' ABOVE UNIT
- HIGH GAS PRESSURE REGULATORS
- INTERNAL SPRING ISOLATION
- 24" HIGH MOUNTING CURB

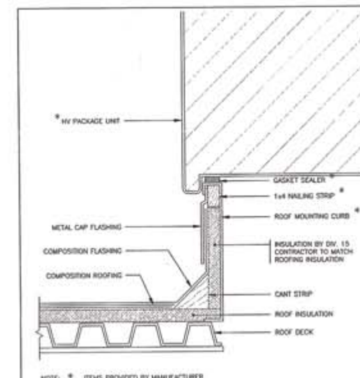


2/M-2 GAS PIPING SCHEMATIC



NOTE: SPACING OF SUPPORTS TO CAN 1-B149.1 & PIPE SIZE

3/M-2 SUPPORT DETAIL FOR NATURAL GAS PIPING ON ROOF
NTS



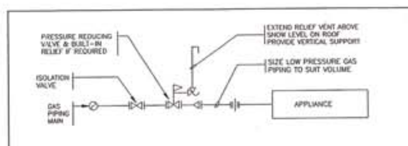
NOTE: * ITEMS PROVIDED BY MANUFACTURER

4/M-2 HV ROOF MOUNTING CURB DETAIL
NTS

NATURAL GAS LOADS

2 MAKEUP AIR UNITS @ 5,500 MBH	11,000 MBH
1 HTG/VENT UNIT @	1,250 MBH
1 FUTURE MAKEUP AIR UNIT @	5,500 MBH
TOTAL CONNECTED LOAD – ADDITION	17,750 MBH

5/M-2 NATURAL GAS LOADS



6/M-2 GAS CONNECTION FOR ROOFTOP EQUIPMENT
NTS

As Built
Jan 20, 05

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ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTHBAY SHOP EXTENSION
HEATING & VENTILATION SYSTEMS

Drawn by:	KAT
Checked by:	KL
Project No.:	2837
Date:	JUNE 23, 2004
Scale:	1/8" = 1'-0"
Drawing No.:	M-2b

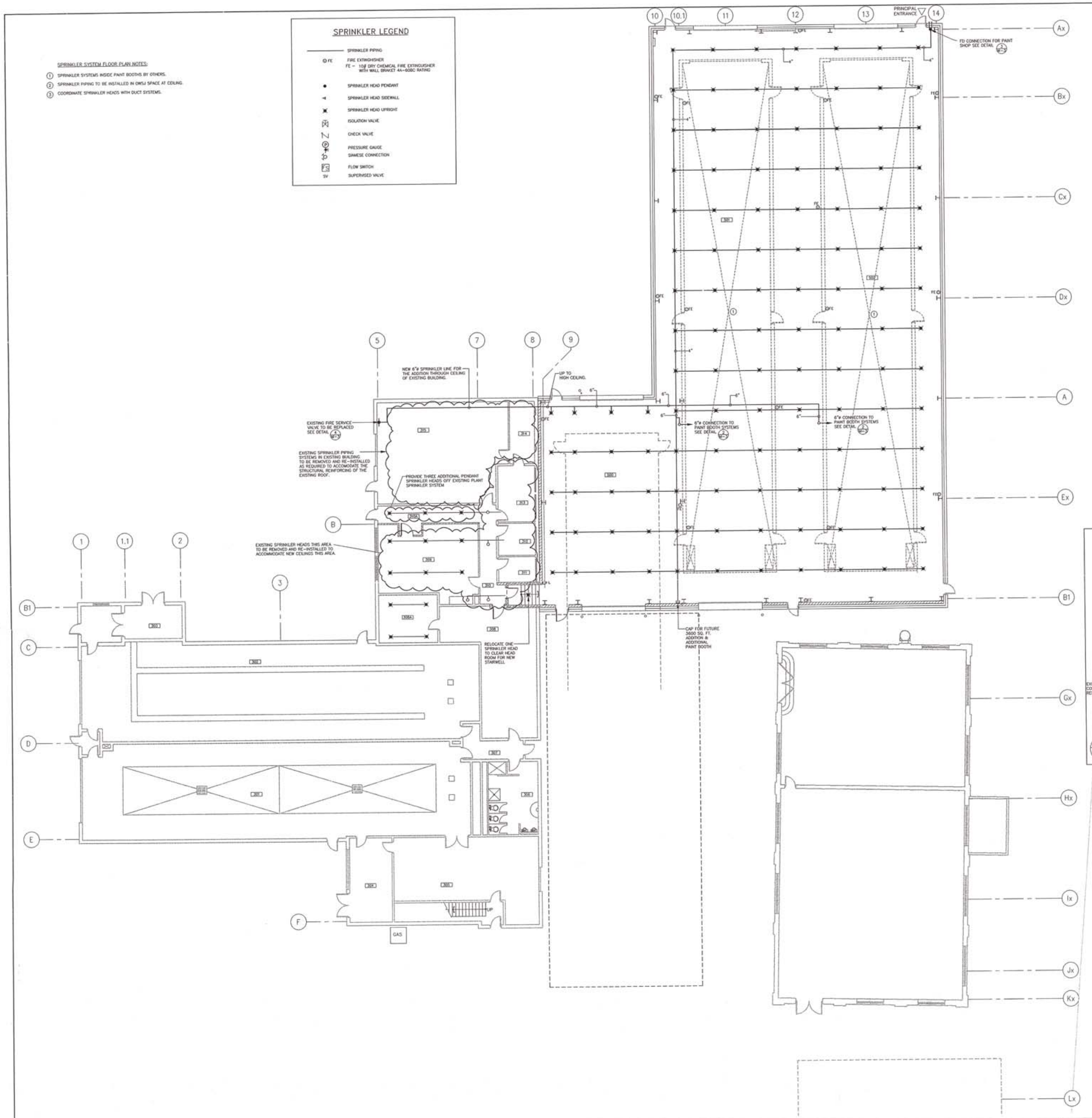
21

SPRINKLER SYSTEM FLOOR PLAN NOTES:

1. SPRINKLER SYSTEMS INSIDE PAINT BOOTHS BY OTHERS.
2. SPRINKLER PIPING TO BE INSTALLED IN OWSJ SPACE AT CEILING.
3. COORDINATE SPRINKLER HEADS WITH DUCT SYSTEMS.

SPRINKLER LEGEND

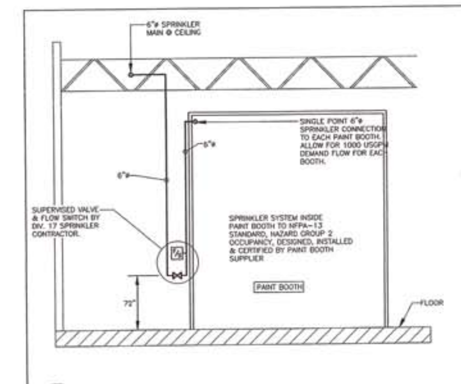
Symbol	Description
———	SPRINKLER PIPING
FE	FIRE EXTINGUISHER FE = 10# DRY CHEMICAL FIRE EXTINGUISHER WITH WALL BRAKET 4A-60BC RATING
●	SPRINKLER HEAD PENDANT
◄	SPRINKLER HEAD SIDEWALL
✖	SPRINKLER HEAD UPRIGHT
	ISOLATION VALVE
	CHECK VALVE
P	PRESSURE GAUGE
	SIAMESE CONNECTION
FS	FLOW SWITCH
SV	SUPERVISED VALVE



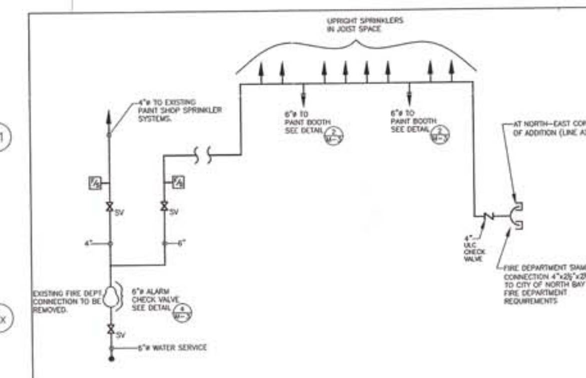
SPRINKLER SYSTEM NOTES

1. REVISIONS TO THE EXISTING SPRINKLER SYSTEMS ARE TO BE DESIGNED AND INSTALLED BY QUALIFIED SPRINKLER SYSTEM CONTRACTORS. THE LAYOUT AND PIPE SIZING INDICATED ON THE DRAWING IS TO BE USED AS A GUIDE ONLY FOR THE QUANTITY AND LOCATION OF HEADS.
2. DESIGN, INSTALL AND TEST ENTIRE SYSTEM IN ACCORDANCE WITH NFPA 13.
3. TESTING TO BE WITNESSED BY AUTHORITY HAVING JURISDICTION.
4. SPRINKLER SYSTEMS FOR THE BUILDING AS FOLLOWS:
   CIRCULATION SPACES – ORDINARY HAZARD
   INSIDE PAINT BOOTHS – EXTRA HAZARD – GROUP 2.
5. THE SPRINKLER SYSTEMS WITHIN THE PAINT BOOTHS WILL BE DESIGNED, INTSALLED AND CERTIFIED BY OTHERS.
   ALLOW FOR A SINGLE POINT 6" ⌀ CONNECTION FOR EACH OF THE TWO PAINT BOOTHS. EXACT DETAIL TO FOLLOW.
6. PROVIDE 6" ⌀ SUPERVISED VALVE AND FLOW SWITCH AT EACH SPRINKLER CONNECTION TO THE PAINT BOOTH.
7. SPRINKLER HEADS – EXPOSED DECK AREAS – UPRIGHT, 57°C RATING.
8. IT IS THE RESPONSIBILITY OF THE SPRINKLER CONTRACTOR TO REMOVE AND REPLACE EXISTING CEILING FINISHES IN THE EXISTING BUILDING AS REQUIRED FOR THE INSTALLATION.
9. WATER SERVICE DATA: AS TESTED BY VIPOND FIRE PROTECTION ON May 24, 2004.
   BUILDING SERVICE LINE: 6" ⌀
   STATIC PRESSURE: 105 psi
   RESIDUAL PRESSURE AT 335 USGPM FLOW RATE: 101 psi
   RESIDUAL PRESSURE AT 815 USGPM FLOW RATE: 96 psi
   RESIDUAL PRESSURE AT 1500 USGPM FLOW RATE: 87 psi
10. A NEW FIRE HYDRANT WILL BE PROVIDED OUTSIDE OF THE PRINCIPAL ENTRANCE FOR FIRE FIGHTING PURPOSES. THIS HYDRANT IS SERVED FROM A SEPARATE WATER LINE. SEE PACKAGE 'A'.
11. IF REQUESTED SUBMIT DESIGN DRAWINGS AND CERTIFICATION TO THE OWNER FOR REVIEW/APPROVAL BY THEIR INSURANCE COMPANY.
    THE INSURANCE COMPANY IS AMERICAN HOME ASSURANCE COMPANY ALL RISKS PROPERTY INSURANCE POLICY # MMAP-1380.

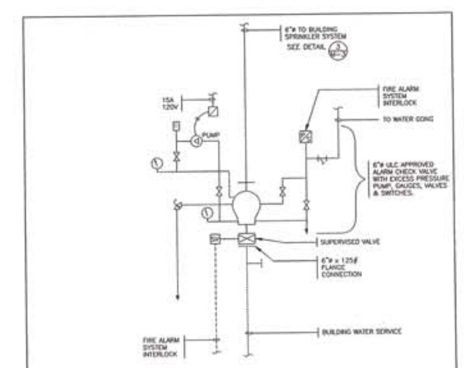
1 / M-3 SPRINKLER SYSTEM NOTES
NTS



2 / M-3 PAINT BOOTH SPRINKLER CONNECTION DETAIL
NTS



3 / M-3 SPRINKLER SYSTEM SCHEMATIC



4 / M-3 SPRINKLER ALARM CHECK VALVE DETAIL

K.O. LANG 06/23/04

NORTH

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202-469 Bouchard Street
Sudbury, Ontario P3E 2K8
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ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTHBAY SHOP EXTENSION

SPRINKLER SYSTEMS

Drawn by:	KAF
Checked by:	KL
Project No.:	2837
Date:	JUNE 23, 2004
Scale:	⅛" = 1'-0"
Drawing No.:	M-3b

LEGEND

- ENT LIGHT FIXTURE
- MOUNTED LIGHT FIXTURE
- W WALL MOUNTED LIGHT FIXTURE
- HT FIXTURE
- ENCY LIGHT FIXTURE – 1 HEAD
- ENCY LIGHT FIXTURE – 2 HEADS

LIGHT FIXTURE SCHEDULE:

TYPE F1 – GASKETED ENCLOSED SUSPENDED INDUSTRIAL FIXTURE WITH 400W METAL HALIDE LAMP, 277 VOLT BALLAST, TWIST LOCK RECEPTACLE, HOOK, BOX AND LOOP-CORD-POWER HOOK PLUG EQUAL TO GE #LWH3400M-277-HC-MAA-11.

MOUNT TOP OF FIXTURE @ UNDERSIDE OF OPEN WEB STEEL JOISTS.

TYPE F2 – EXTERIOR WALL PACK WITH CUT-OFF SHIELD FOR GLARE CONTROL, 175W METAL HALIDE LAMP AND 277 VOLT BALLAST.
EQUAL TO GE WALL LIGHTER #WZSC17M-277-MGSC3

INSTALL FIXTURES @ 18 FEET ABOVE FINISHED FLOOR

TYPE F2a – IDENTICAL TO TYPE F2 FIXTURES MOUNTED @ 12 FEET ABOVE LOW ROOF AREA

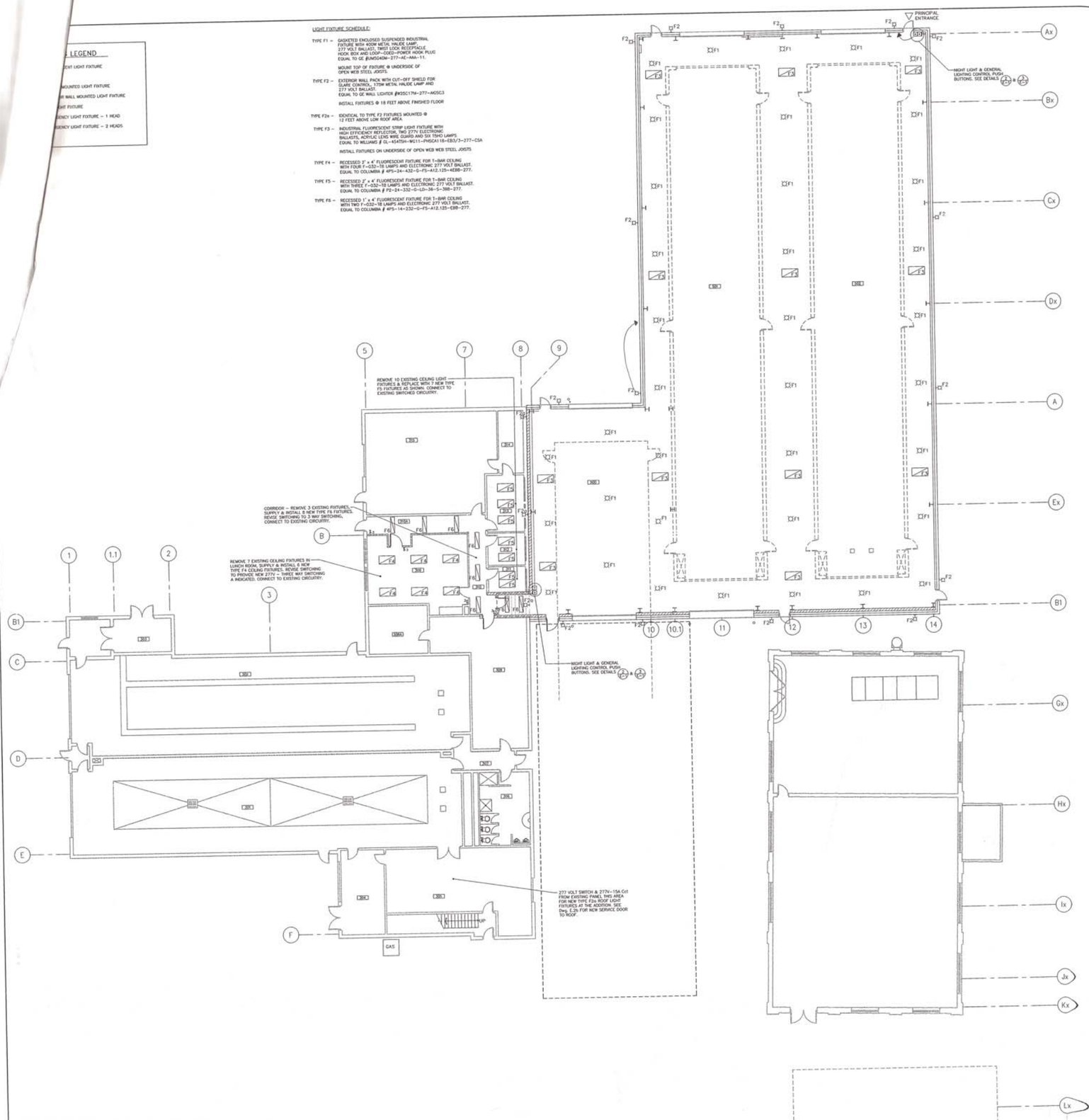
TYPE F3 – INDUSTRIAL FLUORESCENT STRIP LIGHT FIXTURE WITH HIGH EFFICIENCY REFLECTOR, TWO 277V ELECTRONIC BALLASTS, ACRYLIC LENS WIRE GUARD AND SIX T5HO LAMPS. EQUAL TO WILLIAMS # GL-4547SH-WG11-PMSCA1 18-EB3/3-277-CSA

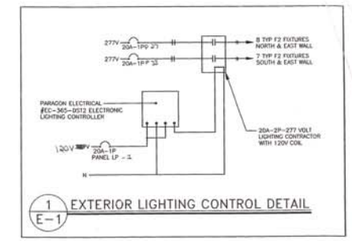
INSTALL FIXTURES ON UNDERSIDE OF OPEN WEB WEB STEEL JOISTS

TYPE F4 – RECESSED 2' x 4' FLUORESCENT FIXTURE FOR T-BAR CEILING WITH FOUR F-032-T8 LAMPS AND ELECTRONIC 277 VOLT BALLAST. EQUAL TO COLUMBIA # XPS-24-432-G-FS-A12.125-4EBB-277.

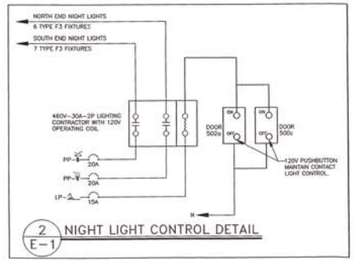
TYPE F5 – RECESSED 2' x 4' FLUORESCENT FIXTURE FOR T-BAR CEILING WITH THREE F-032-T8 LAMPS AND ELECTRONIC 277 VOLT BALLAST. EQUAL TO COLUMBIA # P2-24-332-G-LD-36-S-3BB-277.

TYPE F6 – RECESSED 1' x 4' FLUORESCENT FIXTURE FOR T-BAR CEILING WITH TWO F-032-T8 LAMPS AND ELECTRONIC 277 VOLT BALLAST. EQUAL TO COLUMBIA # XPS-14-232-G-FS-A12.125-EBB-277.

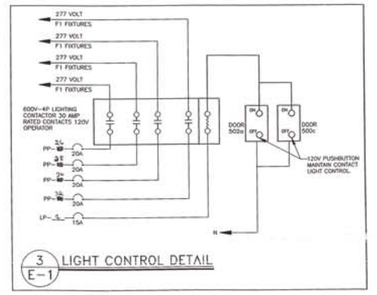




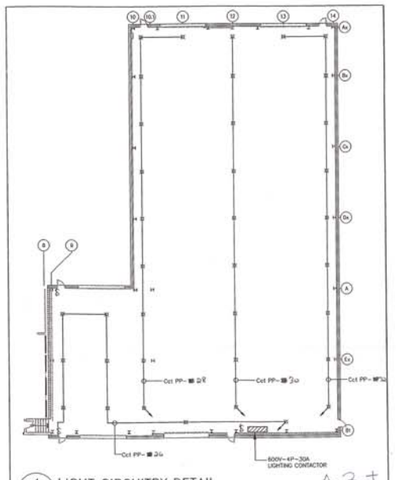
1 E-1 EXTERIOR LIGHTING CONTROL DETAIL



2 E-1 NIGHT LIGHT CONTROL DETAIL

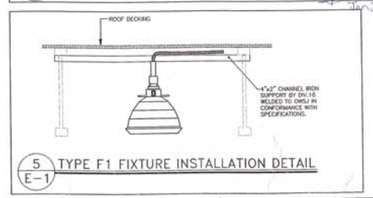


3 E-1 LIGHT CONTROL DETAIL



4 E-1 LIGHT CIRCUITRY DETAIL

As Built



5 E-1 TYPE F1 FIXTURE INSTALLATION DETAIL

No.	Revision / Version	Date
1	PHASE 'B'	JUNE 23, 2004

05/23/04

K.M.C. ENGINEERING
CONSULTING ENGINEERS – MECHANICAL & ELECTRICAL

ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTHWAY SHOP EXTENSION
LIGHTING SYSTEMS

Drawn By: KAF
Checked By: KL
Project No.: 2837
Date: JUNE 23, 2004
Scale: 1/8" = 1'-0"
Drawing No.: E-1b

FIRE ALARM LEGEND

- PULL STATION
- FS — FLOW SWITCH – SPRINKLER SYSTEM
- SV — SUPERVISED VALVE – SPRINKLER SYSTEM
- PS — PRESSURE SWITCH – SPRINKLER SYSTEM
- 10" FIRE ALARM BELL
- XP — 10" FIRE ALARM BELL EXPLOSION PROOF
- FIRE ALARM SYSTEM INTERLOCK

EMERGENCY LIGHTING – EXIT SIGNAGE

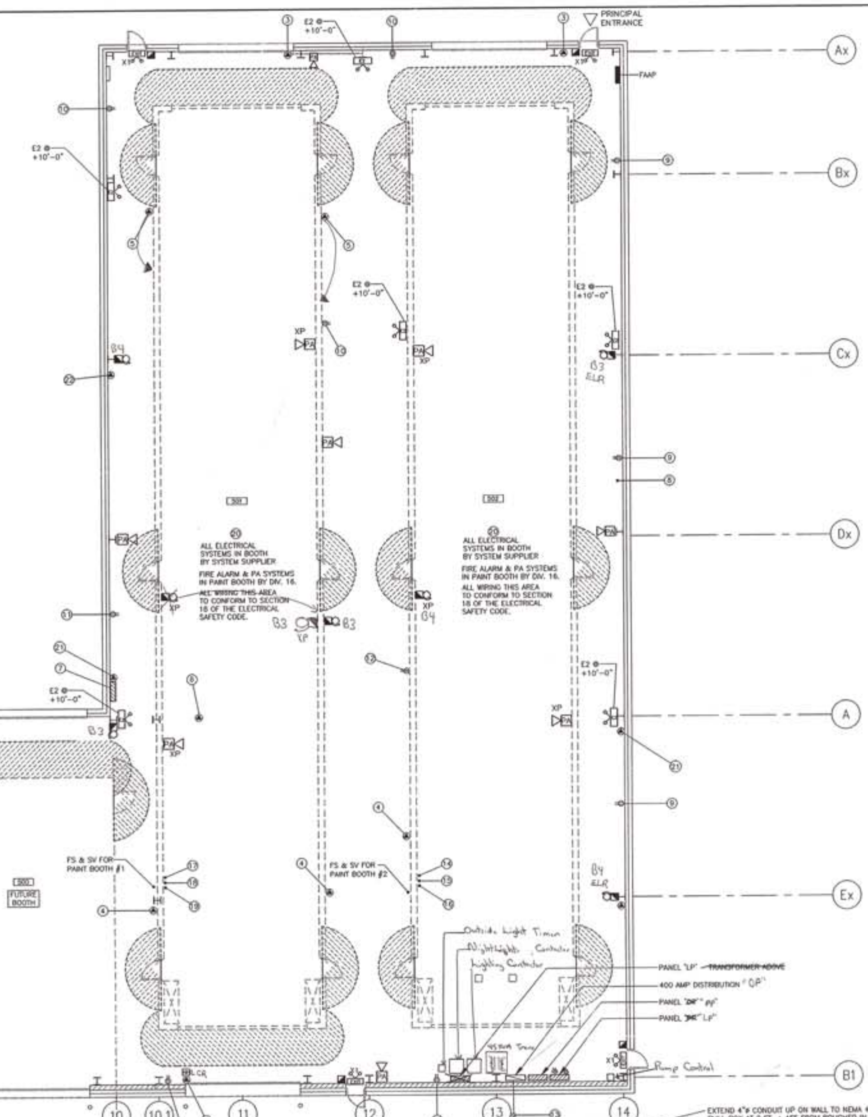
- EXIT X1 – INDUSTRIAL SELF POWERED EXIT & EMERGENCY LIGHT UNIT – WATER, DUST & OIL RESISTANT, EEMAC 4 ENCLOSURE. EQUAL TO LUMACELL #RG36-E01-W4/T2-277V WITH TWO 6V-20W QUARTZ HALOGEN SEALED BEAM LAMPS.
- EXIT X2 – POWER FREE SELF LUMINOUS EXIT SIGN FOR HAZARDOUS AREAS WITH 12 YEAR LIFE EXPECTANCY. AECB APPROVED. EQUAL TO LUMACELL # LTE-1.
- E2 – INDUSTRIAL SELF POWERED EMERGENCY LIGHT UNIT WITH 10 YEAR SEALED BATTERY, EMMAC 12 RATED, WITH TWO – 55W QUARTZ HALOGEN SEALED BEAM LAMPS. EQUAL TO LUMACELL #RG12S1440T/2-WG060-227.

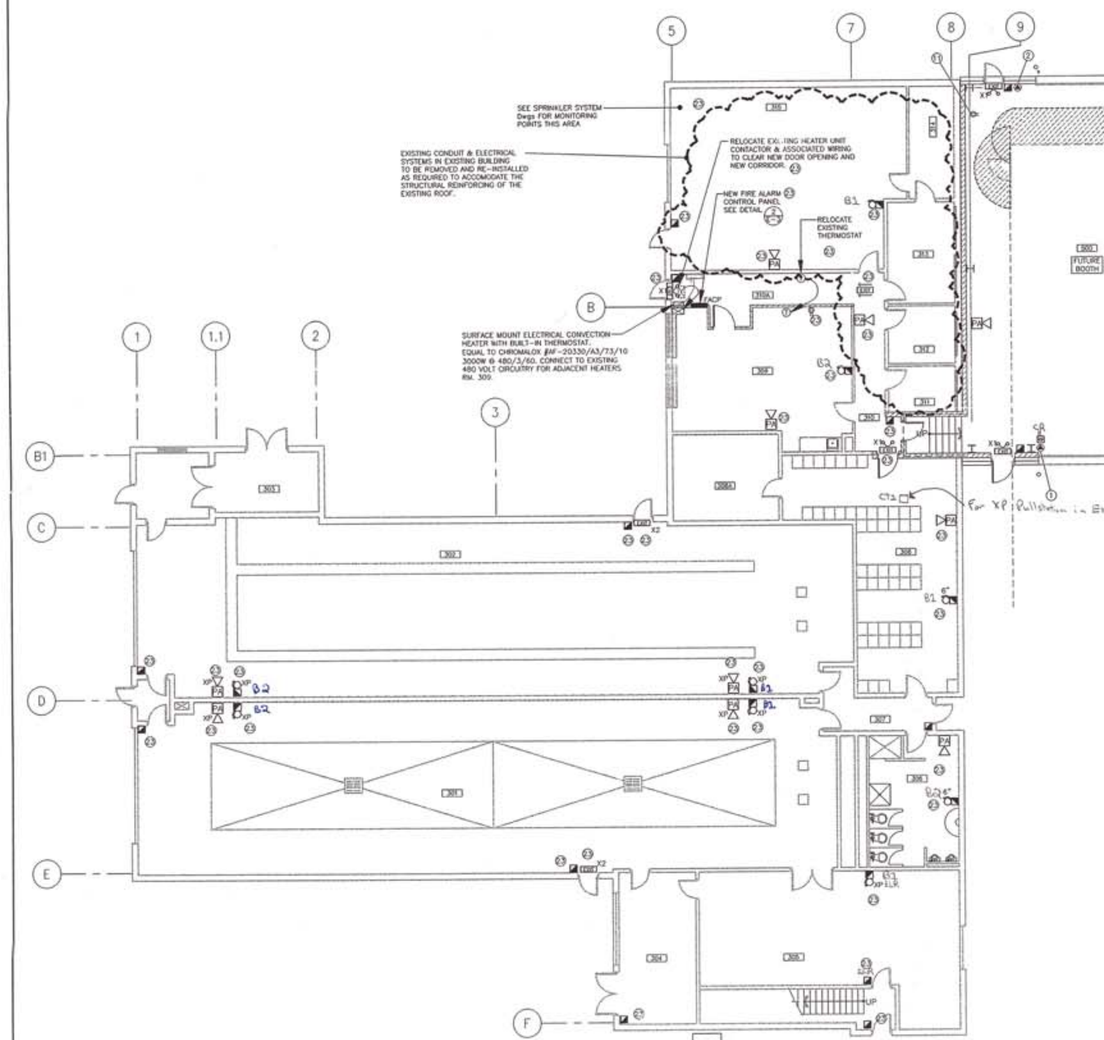
NOTE:

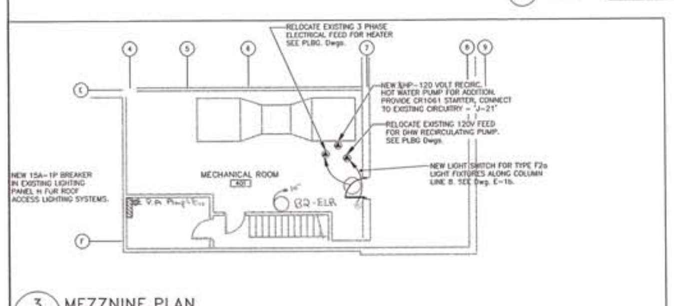
WELDING OUTLETS (BY DIV.16) EQUAL TO CUTLER HAMMER FUSED SAFETY SWITCH WITH CROUSE HINDS ARKTITE RECEPTACLE – TYPE 12 ENCLOSURE 60 AMP 480 VOLT FUSE CLIPS & FUSES FOR CROUSE HINDS # APJ6485 PLUG.

FLOOR PLAN NOTES:

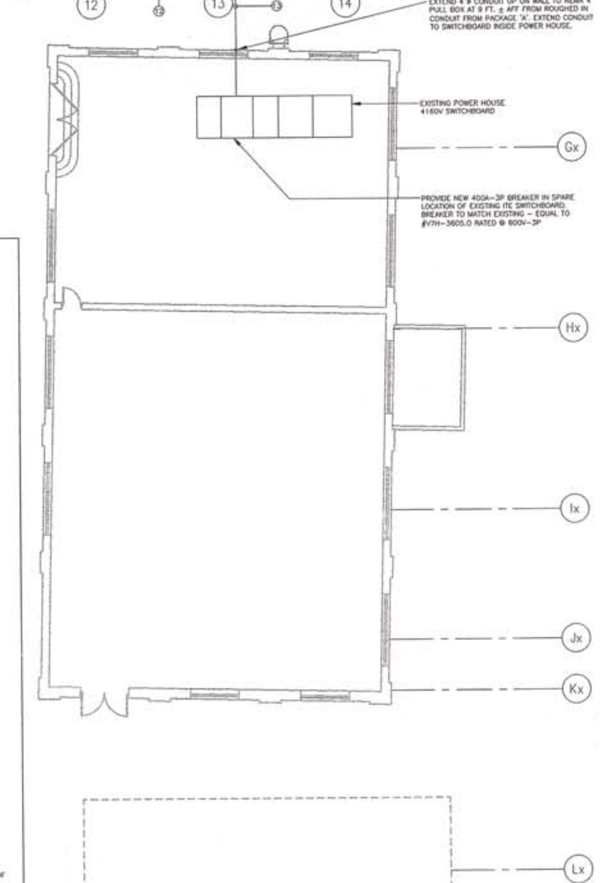
1. 480V POWER FOR 1.5 HP OVER HEAD DOOR MOTORS. EXTEND 480V FROM PANEL PP-1, Cct. 2,4,6. EXTEND POWER TO DOOR OPERATORS ON INSIDE & OUTSIDE OF BUILDING AS REQUIRED.
2. 480V POWER FOR 1.5 HP OVER HEAD DOOR MOTORS. EXTEND 480V FROM PANEL PP-1, Cct. 8,10,12. EXTEND POWER TO DOOR OPERATORS ON INSIDE & OUTSIDE OF BUILDING AS REQUIRED.
3. 480V POWER FOR 1.5 HP OVER HEAD DOOR MOTORS. EXTEND 480V FROM PANEL PP-1. Cct. 14,16,18. EXTEND POWER TO DOOR OPERATORS ON INSIDE & OUTSIDE OF BUILDING AS REQUIRED.
4. WALLMOUNT 480V-60A WELDING OUTLET WITH FUSED SWITCH. SEE SPECIFICATION THIS Dwg Cct. PP-20,22,30.
5. WALLMOUNT 480V-60A WELDING OUTLET WITH FUSED SWITCH. SEE SPECIFICATION THIS Dwg Cct. PP-26,28,30.
6. 30AMP 480V-3PH-4W FEED TO ROOF MOUNTED HEATING & VENTILATION UNIT. PROVIDE W/P DISCONNECT SWITCH @ UNIT. Cct. PP-32,34,36.
7. REMOTE CONTROL PANEL FOR HTG-VENT UNIT. SEE DETAIL 2/E-2
8. REFER TO Dwg E-1 FOR LIGHTING CIRCUITRY.
9. DUPLEX RECEPTACLE @ 36" AFF Cct. LP-4. 2
10. DUPLEX RECEPTACLE @ 36" AFF Cct. LP-6.
11. DUPLEX RECEPTACLE @ 36" AFF Cct. LP-8. 10
12. DUPLEX RECEPTACLE @ 36" AFF Cct. LP-10. 14
13. NEW 480V FEEDER FROM SWITCHBOARD IN POWERHOUSE IN BURIED CONDUIT SUPPLIED IN PKG. 'A' SEE Dwg ME-2a.
14. 200A-480V-3PH POWER SUPPLY FROM DISTRIBUTION PANEL DP-1 TO PAINT BOOTH PANEL. SEE NOTE 20.
15. TWO 20A-277V-1PH POWER SUPPLY FROM PANEL PP TO PAINT BOOTH CONNECTION FOR LIGHTING SYSTEMS. SEE NOTE 20.
16. 3-15A-120V-1PH AND TWO 60A-208V-3PH POWER SUPPLY FROM PANEL LP TO PAINT BOOTH SYSTEMS. SEE NOTE 20.
17. 200A-480V-3PH POWER SUPPLY FROM DISTRIBUTION PANEL DP-1 TO PAINT BOOTH PANEL. SEE NOTE 20.
18. TWO 20A-277V-1PH POWER SUPPLY FROM PANEL PP TO PAINT BOOTH CONNECTION FOR LIGHTING SYSTEMS. SEE NOTE 20.
19. 3-15A-120V-1PH AND TWO 60A-208V-3PH POWER SUPPLY FROM PANEL LP TO PAINT BOOTH SYSTEMS. SEE NOTE 20.
20. ALL ELECTRICAL SYSTEMS INSIDE PAINT BOOTH TO BE CLASS I – ZONE 1 – HAZARDOUS AREA RATING. TO THE REQUIREMENTS OF SECTION 18 OF THE ELECTRICAL SAFETY CODE. SEAL & BOND ALL CONDUITS SERVING PAINT BOOTH SYSTEMS.
21. 120V OUTLET FOR TRAP SEAL PRIMER.
22. 30A-480VOLT FEED TO SEWAGE PUMP CONTROL PANEL.
23. NEW DEVICE IN EXISTING BUILDING TO BE PROVIDED UNDER THIS CONTRACT.







3/M-1 MEZZNINE PLAN NTS



ELECTRICAL LEGEND

- EXIT LIGHT FIXTURE
- E1 EMERGENCY LIGHT FIXTURE – 1 HEAD
- E2 EMERGENCY LIGHT FIXTURE – 2 HEADS
- SINGLE POLE LIGHT SWITCH
- THREE WAY SWITCH
- KEY OPERATED SWITCH
- DUPLEX RECEPTACLE
- ABOVE COUNTER RECEPTACLE
- GFI GROUND FAULT RECEPTACLE
- SPLIT DUPLEX RECEPTACLE
- LOCAL NON-FUSED DISCONNECT SWITCH
- LOCAL DISCONNECT FUSED SWITCH
- COMBINATION MAGNETIC STARTER
- FAN FAN CONNECTION
- SPECIAL RECEPTACLE AS INDICATED
- THERMOSTAT
- DOOR BUZZER
- PUSH BUTTON
- PA WALL MOUNT PA SPEAKER
- ELECTRICAL PANEL
- BP EMERGENCY LIGHT BATTERY PACK
- FIRE ALARM BELL
- MANUAL PULL STATION
- IONIZATION TYPE SMOKE DETECTOR
- DUCT SMOKE DETECTOR
- COMBINATION RATE OF RISE/FIXED TEMPERATURE HEAT DETECTOR
- FIXED TEMPERATURE HEAT DETECTOR
- 200°F FIXED TEMPERATURE HEAT DETECTOR
- FACP FIRE ALARM CONTROL PANEL
- FAAP FIRE ALARM ANNUNCIATOR PANEL
- FIRE ALARM CONTACT
- WP DEVICE TO BE WATERPROOF
- WG DEVICE TO BE COMPLETE WITH WIREGUARD
- XP DEVICE & WIRING SYSTEM TO BE EXPLOSION PROOF

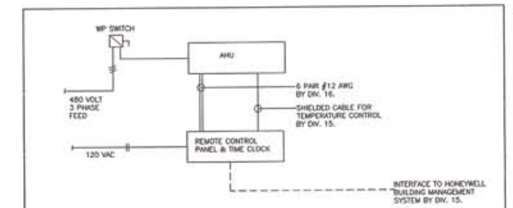
1/E-2 DEMAND LOAD CALCULATION

1. BASE LOAD : 1144 sm @ 25W — 28,600W
2. PAINT BOOTH #501 – (SEE BELOW) — 85,543W
3. PAINT BOOTH #502 – (SEE BELOW) — 85,543W
4. HTG. VENTILATION UNIT – — 10,000W
5. 5 DOOR OPERATOR @ 50% — 3,200W
6. PUMPS — 2,500W
7. TOTAL DEMAND LOAD — 215,386W
8. SERVICE VOLTAGE : 480 VOLT, 3 PHASE, 4 WIRE
9. DEMAND CURRENT : 260 AMPS
10. FEEDER/DISTRIBUTION RATING : 400AMPS @ 408/3/60.

PAINT BOOTH # 501	CONNECTED	MAXIMUM *
1 – 30HP MU AIR FAN	30,227W	30,227W
2 – 10 HP EXH. FAN	20,926W	20,926W
4 – 7.5 HP JACKS	32,219W	
2 – 7.5 HP PRESS. WASH	16,110W	16,110W
2 – 15A – 120V CONNECTIONS	2,880W	2,880W
2 – 1.5 HP DOOR OPERATORS	4,320W	
1 – LIGHTING ALLOWANCE	15,400W	15,400W
	122,082W	85,543W

PAINT BOOTH # 502	CONNECTED	MAXIMUM *
1 – 30HP MU AIR FAN	30,227W	30,227W
2 – 10 HP EXH. FAN	20,926W	20,926W
2 – 7.5 HP PRESS. WASH	16,110W	16,110W
2 – 15A – 120V CONNECTIONS	2,880W	2,880W
2 – 1.5 HP DOOR OPERATORS	4,320W	
1 – LIGHTING ALLOWANCE	15,400W	15,400W
	89,863W	85,543W

* IN USE AT ANY ONE TIME



2/E-2 TYPICAL AIR HANDLING UNIT WIRING DETAIL

3/E-2 HAZARDOUS AREAS

INDICATES EXTENT OF CLASS 1, ZONE 1 HAZARDOUS LOCATION OUTSIDE OF PAINT BOOTHS.

ALL WIRING THIS AREA TO CONFORM TO SECTION 18 OF THE ELECTRICAL SAFETY CODE.

ALL ELECTRICAL EQUIPMENT AND WIRING INSIDE PAINT BOOTHS TO MEET REQUIREMENTS OF ELECTRICAL SAFETY CODE FOR CLASS 1, ZONE 1 HAZARDOUS AREA.

ALL WIRING THIS AREA TO CONFORM TO SECTION 18 OF THE ELECTRICAL SAFETY CODE.

REFER TO Dwg. #ME-1a FOR SITE SERVICES

REFER TO Dwg. # ME-3a FOR BELOW GRADE ELECTRICAL SYSTEMS

K.O. LANG 28370 06/23/04

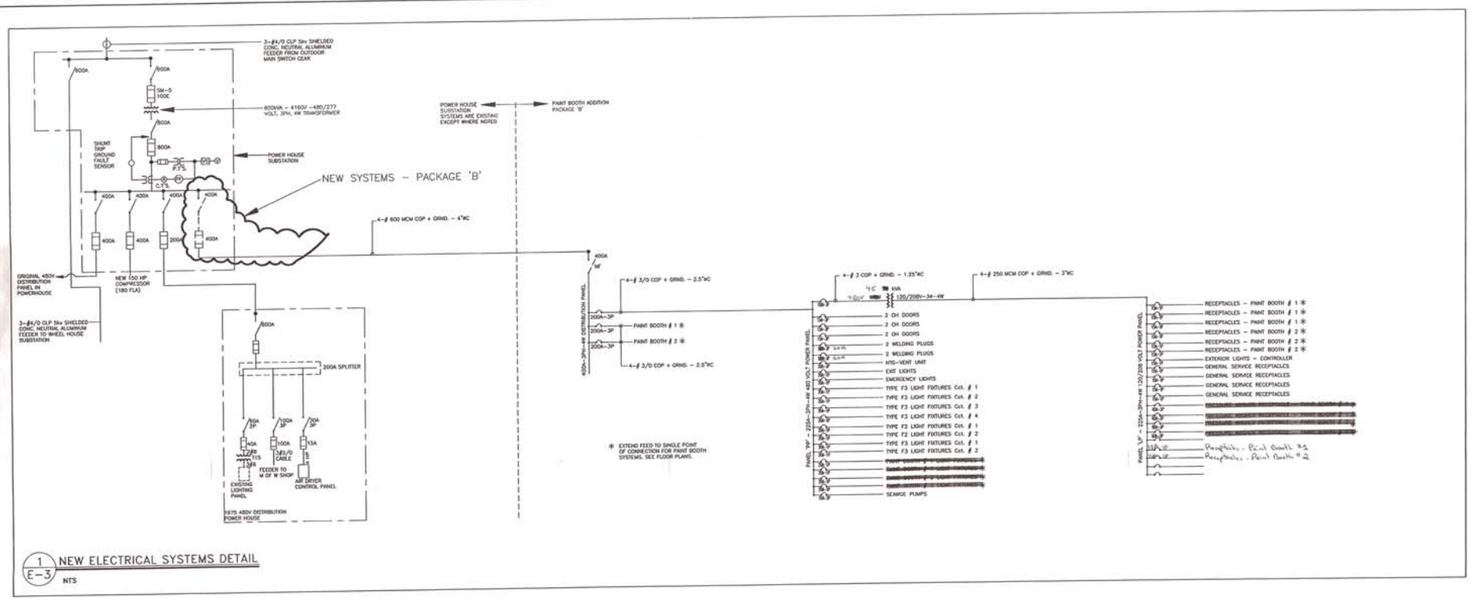
NORTH

K. LANG ENGINEERING LTD.
CONSULTING ENGINEERS – MECHANICAL & ELECTRICAL

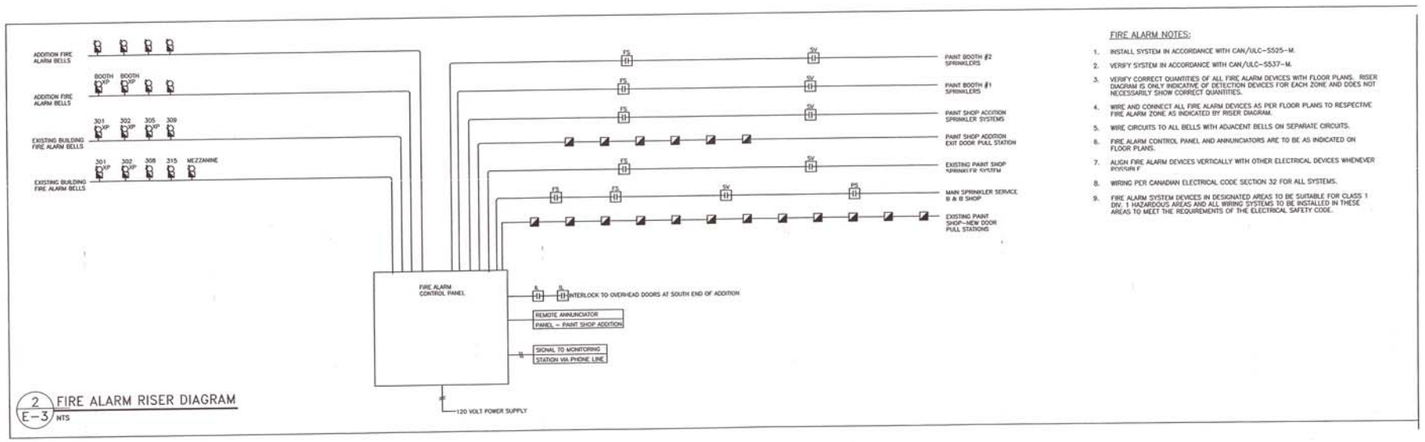
ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTHBAY SHOP EXTENSION
ELECTRICAL SYSTEMS

Drawn by: KAF
Checked by: KL
Project No.: 2837
Date: JUNE 23, 2004
Scale: 1/8" = 1'-0"
Drawing No.: E-2b

As Built Jan 20,05



1 E–3 NEW ELECTRICAL SYSTEMS DETAIL
NTS



2 E–3 FIRE ALARM RISER DIAGRAM
NTS

FIRE ALARM NOTES:

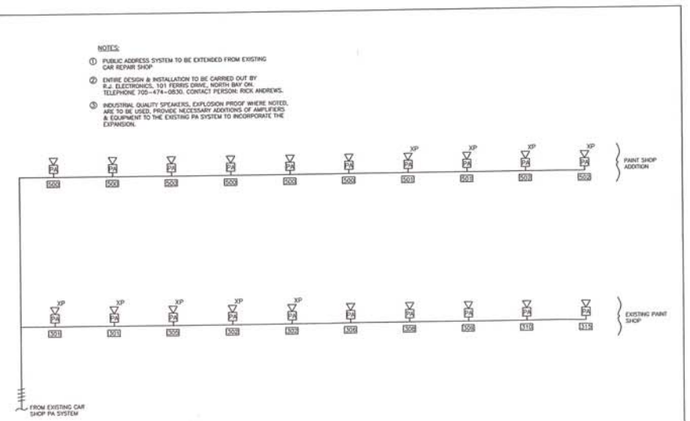
1. INSTALL SYSTEM IN ACCORDANCE WITH CAN/ULC–S525–M.
2. VERIFY SYSTEM IN ACCORDANCE WITH CAN/ULC–S537–M.
3. VERIFY CORRECT QUANTITIES OF ALL FIRE ALARM DEVICES WITH FLOOR PLANS. RISER DIAGRAM IS ONLY INDICATIVE OF DETECTION DEVICES FOR EACH ZONE AND DOES NOT NECESSARILY SHOW CORRECT QUANTITIES.
4. WIRE AND CONNECT ALL FIRE ALARM DEVICES AS PER FLOOR PLANS TO RESPECTIVE FIRE ALARM ZONE AS INDICATED BY RISER DIAGRAM.
5. WIRE CIRCUITS TO ALL BELLS WITH ADJACENT BELLS ON SEPARATE CIRCUITS.
6. FIRE ALARM CONTROL PANEL AND ANNUNCIATORS ARE TO BE AS INDICATED ON FLOOR PLANS.
7. ALIGN FIRE ALARM DEVICES VERTICALLY WITH OTHER ELECTRICAL DEVICES WHENEVER DIVISION F
8. WIRING PER CANADIAN ELECTRICAL CODE SECTION 32 FOR ALL SYSTEMS.
9. FIRE ALARM SYSTEM DEVICES IN DESIGNATED AREAS TO BE SUITABLE FOR CLASS 1 DIV. 1 HAZARDOUS AREAS AND ALL WIRING SYSTEMS TO BE INSTALLED IN THESE AREAS TO MEET THE REQUIREMENTS OF THE ELECTRICAL SAFETY CODE.

NOTES:

① PUBLIC ADDRESS SYSTEM TO BE EXTENDED FROM EXISTING CAR REPAIR SHOP

② ENTIRE DESIGN & INSTALLATION TO BE CARRIED OUT BY R.J. ELECTRONICS, 101 FERRIS DRIVE, NORTH BAY ON. TELEPHONE 705–474–0830. CONTACT PERSON: RICK ANDREWS.

③ INDUSTRIAL QUALITY SPEAKERS, EXPLOSION PROOF WHERE NOTED, ARE TO BE USED. PROVIDE NECESSARY ADDITIONS OF AMPLIFIERS & EQUIPMENT TO THE EXISTING PA SYSTEM TO INCORPORATE THE EXPANSION.



3 E–3 PUBLIC ADDRESS SYSTEM RISER DIAGRAM
NTS

As Built
Jan 20/05

REFER TO Dwg. #ME-1a FOR SITE SERVICES
REFER TO Dwg. # ME-3a FOR BELOW GRADE ELECTRICAL SYSTEMS

No.:
Date: JUNE 23, 2004
Revision / Version:
1 PACKAGE 'B'

K. G. LANG ENGINEERING
CONSULTING ENGINEERS – MECHANICAL & ELECTRICAL

ONTARIO NORTHLAND TRANSPORTATION COMMISSION
NORTHBAY SHOP EXTENSION
ELECTRICAL SYSTEM DETAILS

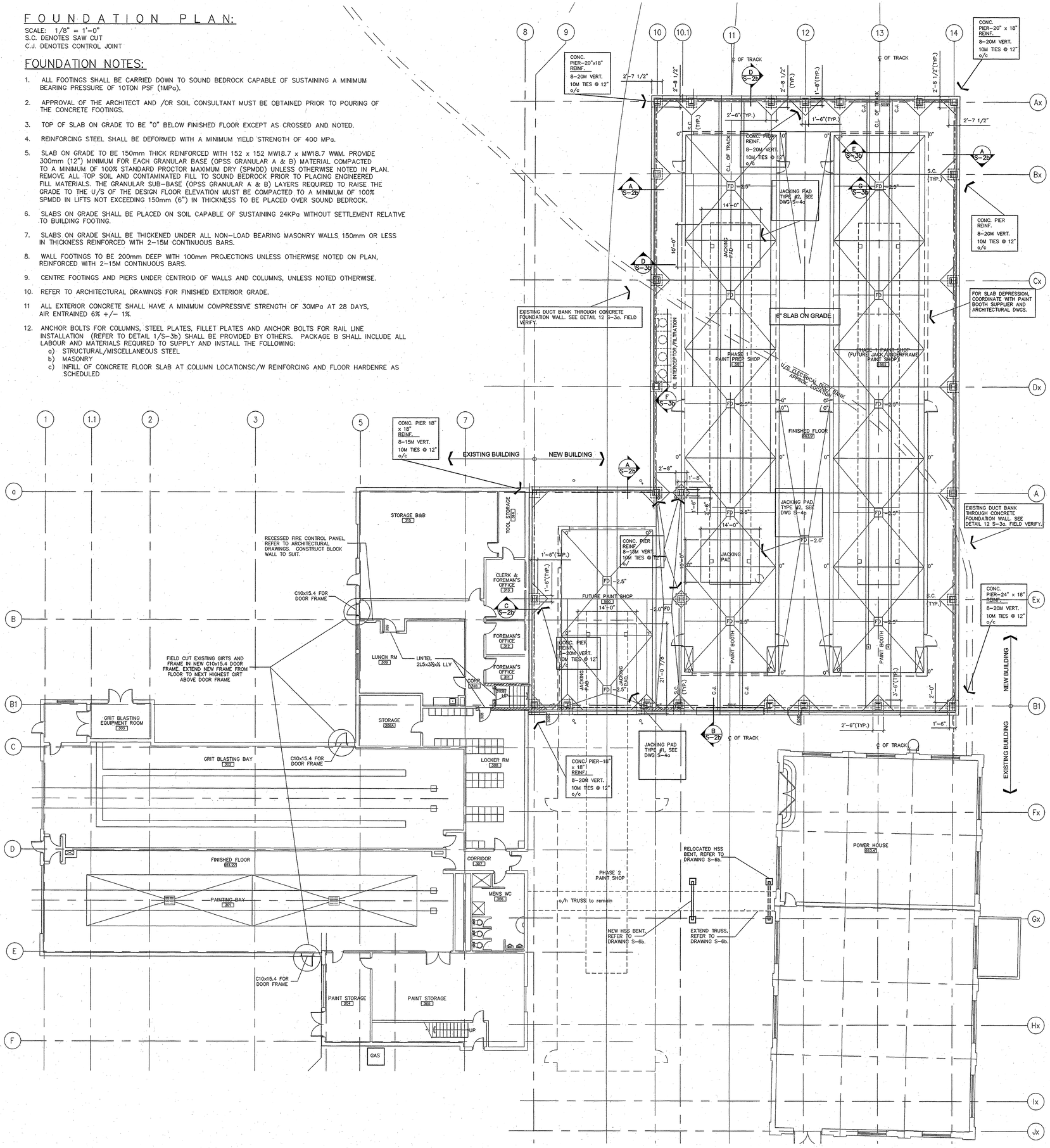
Drawn by: KAF
Checked by: KL
Project No.: 2837
Date: JUNE 23, 2004
Scale: 3/8" = 1'-0"
Drawing No.: E-3b

F O U N D A T I O N P L A N:

SCALE: 1/8" = 1'-0"
S.C. DENOTES SAW CUT
C.J. DENOTES CONTROL JOINT

FOUNDATION NOTES:

1. ALL FOOTINGS SHALL BE CARRIED DOWN TO SOUND BEDROCK CAPABLE OF SUSTAINING A MINIMUM BEARING PRESSURE OF 10TON PSF (1MPa).
2. APPROVAL OF THE ARCHITECT AND /OR SOIL CONSULTANT MUST BE OBTAINED PRIOR TO POURING OF THE CONCRETE FOOTINGS.
3. TOP OF SLAB ON GRADE TO BE "0" BELOW FINISHED FLOOR EXCEPT AS CROSSED AND NOTED.
4. REINFORCING STEEL SHALL BE DEFORMED WITH A MINIMUM YIELD STRENGTH OF 400 MPa.
5. SLAB ON GRADE TO BE 150mm THICK REINFORCED WITH 152 x 152 MW18.7 x MW18.7 WWM. PROVIDE 300mm (12") MINIMUM FOR EACH GRANULAR BASE (OPSS GRANULAR A & B) MATERIAL COMPACTED TO A MINIMUM OF 100% STANDARD PROCTOR MAXIMUM DRY (SPMDD) UNLESS OTHERWISE NOTED IN PLAN. REMOVE ALL TOP SOIL AND CONTAMINATED FILL TO SOUND BEDROCK PRIOR TO PLACING ENGINEERED FILL MATERIALS. THE GRANULAR SUB-BASE (OPSS GRANULAR A & B) LAYERS REQUIRED TO RAISE THE GRADE TO THE U/S OF THE DESIGN FLOOR ELEVATION MUST BE COMPACTED TO A MINIMUM OF 100% SPMDD IN LIFTS NOT EXCEEDING 150mm (6") IN THICKNESS TO BE PLACED OVER SOUND BEDROCK.
6. SLABS ON GRADE SHALL BE PLACED ON SOIL CAPABLE OF SUSTAINING 24KPa WITHOUT SETTLEMENT RELATIVE TO BUILDING FOOTING.
7. SLABS ON GRADE SHALL BE THICKENED UNDER ALL NON-LOAD BEARING MASONRY WALLS 150mm OR LESS IN THICKNESS REINFORCED WITH 2-15M CONTINUOUS BARS.
8. WALL FOOTINGS TO BE 200mm DEEP WITH 100mm PROJECTIONS UNLESS OTHERWISE NOTED ON PLAN, REINFORCED WITH 2-15M CONTINUOUS BARS.
9. CENTRE FOOTINGS AND PIERS UNDER CENTROID OF WALLS AND COLUMNS, UNLESS NOTED OTHERWISE.
10. REFER TO ARCHITECTURAL DRAWINGS FOR FINISHED EXTERIOR GRADE.
11. ALL EXTERIOR CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 30MPa AT 28 DAYS, AIR ENTRAINED 6% +/- 1%.
12. ANCHOR BOLTS FOR COLUMNS, STEEL PLATES, FILLET PLATES AND ANCHOR BOLTS FOR RAIL LINE INSTALLATION (REFER TO DETAIL 1/S-3b) SHALL BE PROVIDED BY OTHERS. PACKAGE B SHALL INCLUDE ALL LABOUR AND MATERIALS REQUIRED TO SUPPLY AND INSTALL THE FOLLOWING:
    a) STRUCTURAL/MISCELLANEOUS STEEL
    b) MASONRY
    c) INFILL OF CONCRETE FLOOR SLAB AT COLUMN LOCATIONSC/W REINFORCING AND FLOOR HARDENRE AS SCHEDULED



GENERAL NOTES:

1. INSTALLING CONTRACTOR SHALL EXAMINE THE SITE AND VERIFY ALL REQUIRED RELEVANT DIMENSIONS AND CONDITIONS WHICH WILL AFFECT HIS WORK PRIOR TO FABRICATION.
2. ALL STRUCTURAL STEEL DESIGN, FABRICATION AND INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE CANADIAN STEEL INSTITUTE OF STEEL CONSTRUCTION APPLICABLE CODES AND SPECIFICATIONS AND THE REQUIREMENTS OF THE NATIONAL AND ONTARIO BUILDING CODE.
3. DRAWINGS HAVE BEEN PREPARED IN ACCORDANCE WITH THE HANDBOOK OF STEEL CONSTRUCTION, LATEST EDITION.
4. ALL ELEVATION SHOWN ON THE DRAWINGS ARE TO THE TOP OF STEEL UNLESS NOTED OTHERWISE.
5. CONTRACTOR TO VERIFY ALL DIMENSIONS AND CONDITIONS WITH ARCHITECTURAL DRAWINGS. REPORT ANY DISCREPANCIES TO STRUCTURAL ENGINEER PRIOR TO PROCEEDING WITH WORK.
6. CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL WORK IS CARRIED OUT IN ACCORDANCE WITH MINISTRY OF LABOUR REQUIREMENTS AS WELL AS THE OCCUPATIONAL HEALTH AND SAFETY ACT
8. IN CASE OF CONFLICTING INFORMATION GIVEN BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS, THE MORE STRINGENT SHALL GOVERN OR CONTRACTOR MUST SEEK CLARIFICATION IN WRITING FROM ENGINEER
9. DESIGN LOADS
    ROOF SNOW LOAD = 55 PSF
    ROOF DEAD LOAD = 20 PSF

B. STRUCTURAL AND MISCELLANEOUS STEEL

1. STRUCTURAL STEEL

STRUCTURAL STEEL SHAPES AND PLATES SHALL BE IN ACCORDANCE WITH CAN/CSA G40.20 / G40.21-M

ALL ROLLED STRUCTURAL WF SHAPES AND PLATES SHALL BE GRADE 350W.
ALL ANGLES AND CHANNEL SHAPES SHALL BE GRADE 300W.
ALL HOLLOW STRUCTURAL SECTIONS SHALL BE GRADE 350W, CLASS C
ALL PIPES SHALL BE GRADE A53 UNLESS NOTED.
STEEL ROOF DECK TO BE TO BE 3," 22 ga. GALVANIZED DECK RD306 BY VIC WEST OR APPROVED EQUAL.
SPOT WELD DECK TO SUPPORTING STEEL FRAMING @ 6" c/c AND CRIMP SIDE LAPS AT 24" c/c.

2. BOLTS

ALL STRUCTURAL BOLTS ARE ¾" DIAMETER ASTM A325 BOLTS WITH 13/16" DIAMETER HOLES UNLESS NOTED OTHERWISE ON THE DESIGN DRAWINGS. MINIMUM 2 (TWO) BOLT CONNECTION.

3. WELDING

ALL WELDING SHALL CONFORM TO THE REQUIREMENTS OF CSA W59.
ELECTRODES SHALL BE TYPE E49XX OF EQUIVALENT CONFORMING TO CSA W48.
ALL WELDING TO BE DONE BY CONTRACTORS CERTIFIED FOR DIVISIONS 1 OR 2 OF CSA W47.1
NOTE: ALL WELDS TO BE ¼" CONTINUOUS FILLETS UNLESS NOTED OTHERWISE ON THE DESIGN DRAWINGS.

C. FABRICATION

1. GENERAL

DESIGN, DETAILING AND FABRICATION SHALL BE IN ACCORDANCE TO CAN/CSA S16.1.

STRUCTURAL STEEL FABRICATOR MUST BE CERTIFIED UNDER CSA W47.1 DIVISIONS 1 OR 2. CONTRACTOR IS TO PROVIDE PROOF THAT THE STEEL FABRICATOR IS CERTIFIED.

2. DRAWING REVIEW

ALL SHOP FABRICATION DRAWINGS WILL REQUIRE REVIEW BY THE DESIGN ENGINEER.
DO NOT COMMENCE FABRICATION UNTIL DRAWINGS HAVE BEEN REVIEWED.

3. CONNECTIONS

1. STEEL FABRICATOR RESPONSIBLE FOR CONNECTION DESIGN. ALL SHOP FABRICATION DRAWINGS SHALL BEAR THE SEAL AND SIGNATURE OF A PROFESSIONAL ENGINEER REGISTERED WITH THE PROVINCE OF ONTARIO.
2. GUSSET PLATES SHALL HAVE A MINIMUM THICKNESS OF ⅜"
3. ALL BOLTED CONNECTIONS TO HAVE A MINIMUM OF TWO (2) BOLTS.

4. CAPPING

ALL OPEN ENDS OF HOLLOW STRUCTURAL SHAPES AND PIPES TO BE CAPPED WITH ⅛" THICK PLATE AND SEAL WELD ALL AROUND UNLESS OTHERWISE NOTED.

D. SURFACE PREPARATION AND PAINTING

1. FINISHED CONCRETE FLOOR TO BE TROWEL FINISH WITH HARDENER.

SURFACE PREPARATION PER SSPC-SP6 - COMMERCIAL BLAST CLEAN
PRIMER - ONE COAT STANDARD PRIME
FINISH COAT - ALKYD ENAMEL
COLOUR - LIGHT GREY

E. TAGGING OF STEELWORK:

1. FABRICATOR IS RESPONSIBLE TO PROPERLY IDENTIFY ALL SHIPPING PIECES.
2. FABRICATOR IS RESPONSIBLE TO MAKE SURE ALL LOOSE PIECES ARE PROPERLY SECURED IN PLACE FOR SHIPPING.

F. TOLERANCES

1. ACCUMULATIVE TOLERANCES NOT TO EXCEED 1/16" ON TOTAL DIMENSION.

G. CONCRETE:

1. CONCRETE AND REINFORCING STEEL FABRICATION/PLACEMENT MUST CONFORM TO CSA A23.1
2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 30 MPa AT 28 DAYS, AIR ENTRAINED 6% +/- 1%
3. NO ADMIXTURES, OTHER THAN AIR ENTRAINING ADMIXTURE CONFORMING TO CAN3-A266.1 MAY BE USED WITHOUT THE WRITTEN APPROVAL FROM THE ENGINEER. THE USE OF CALCIUM CHLORIDE SHALL NOT BE PERMITTED ON THIS PROJECT.
4. CONCRETE SLABS SHALL BE PROTECTED FROM LOSS OF SURFACE MOISTURE FOR NOT LESS THAN 7 DAYS BY USING A CURING COMPOUND CONFORMING TO CAN/CSA A23.1-94 OR KEPT CONTINUOUSLY MOIST AS ENVIRONMENTAL CONDITIONS MAY APPLY. CONTRACTOR TO SUBMIT PROPOSED CURING PROCEDURE TO ENGINEER FOR REVIEW PRIOR TO POURING OF CONCRETE.
5. REINFORCING STEEL TO CONFORM TO CSA G30.18 GRADE 400
6. WELDED WIRE MESH TO BE 152x 152x MW 18.7x MW18.7 CONFORMING TO CSA G30.5 USE FLAT SHEETS ONLY.
7. PROVIDE HEAVY INDUSTRIAL FLOOR HARDENER TO MANUFACTURES RECOMMENDATION
8. CONTRACTOR TO SUBMIT REBAR SHOP DRAWINGS FOR REVIEW OF THE DESIGN ENGINEER. REBAR SHOP DRAWINGS SHALL BEAR THE SEAL AND SIGNATURE OF A PROFESSIONAL ENGINEER REGISTERED WITH THE PROVINCE OF ONTARIO.

H. MASONRY

1. ALL MASONRY CONSTRUCTION SHALL CONFORM TO CAN3-A371 MANSONRY CONSTRUCTION FOR BUILDINGS.
2. WHERE DOWELS, ANCHOR BOLTS, ETC. ARE SHOWN PROJECTING INTO MASONRY, BUILD THESE TIGHTLY INTO MASONRY VOIDS WITH MASONRY GROUT OR TYPE 'M' MORTAR.
3. BENEATH STEEL AND CONCRETE BEAMS, JOISTS AND TRUSSES PROVIDE A MINIMUM DEPTH OF 400mm 100% SOLID MASONRY UNITS PROJECTING A MINIMUM OF 200mm BEYOND THE EDGES OF BEARING PLATES, UNLES OTHERWISE NOTED OR SHOWN.
4. PROVIDE A MINIMUM LENGTH OF 200mm AND A MINIMUM DEPTH OF 200mm OF 100% SOLID MASONRY FOR STEEL CONCRETE OR REINFORCED MASONRY LINTELS.
5. PROVIDE A MINIMUM DEPTH OF 200mm OR 100% SOLID MOSONRY UNITS FOR SLABS OR STEEL DECK BEARING ON MASONRY.
6. BUILD MASONRY TIGHTLY INTO WEBS OF ALL WALL BEARING STEEL BEAMS AT THEIR POINT OF BEARING.
7. BUILD MASONRY TIGHTLY INTO WEBS OF ALL STEEL COLUMNS.
8. REINFORCED MASONRY
    A) CELLS TO BE REINFORCED SHALL BE KEPT CLEAN OF MORTAR.
    B) GROUT FOR REINFORCED CELLS, BOND BEAMS, LINTELS, AND CELLS CONTAINING DOWELS, ANCHOR BOLTS AND INSERTS SHALL CONFORM TO SPECIFICATION UNDER BUILDING MATERIALS.
    C) PROVIDE 2-15M VERTICALS FULL HEIGHT AT ALL WALL ENDS, CORNERS INTERSECTIONS, AND OPENINGS UNLESS OTHERWISE NOTED ON DRAWINGS.
    D) DOWELS FROM FOUNDATIONS TO MATCH VERTICAL REINFORCEMENT IN WALL.
    E) PROVIDE THE FOLLOWING LAPS FOR THE REINFORCEMENT INDICATED:
        WIRE LADDER OR MESH 200mm
        10M BARS 450mm
        15M BARS 600mm
        20M BARS 900mm
    F) PROVIDE CLEANOUTS AT THE BASE OF THE WALL TO VERIFY PROPER PLACEMENT OF GROUT, PLACE GROUT IN MAXIMUM 2400mm LIFTS. IF NO CLEANOUT PROVIDED POUR HIGHT LIMITED TO 12mm.
9. IN EVERY SECOND BED JOINT, PROVIDE 9 GAUGE GALVANIZED LADDER TYPE JOINT REINFORCEMENT WITH SIDE AND CROSS WIRES CONTACT WELDED.

No.:	Revision / Version:	Date:

No.:	Revision / Version:	Date:
1	PACKAGE "A"	JUNE 1, 2004
2	ISSUED PACKAGE "A" ADDENDA NO. 2	JUNE 11, 2004
3	ISSUED PACKAGE "B"	JUNE 23, 2004

Plotted: JUNE, 2004
Plot scale: 1:1
File Name: S-1b

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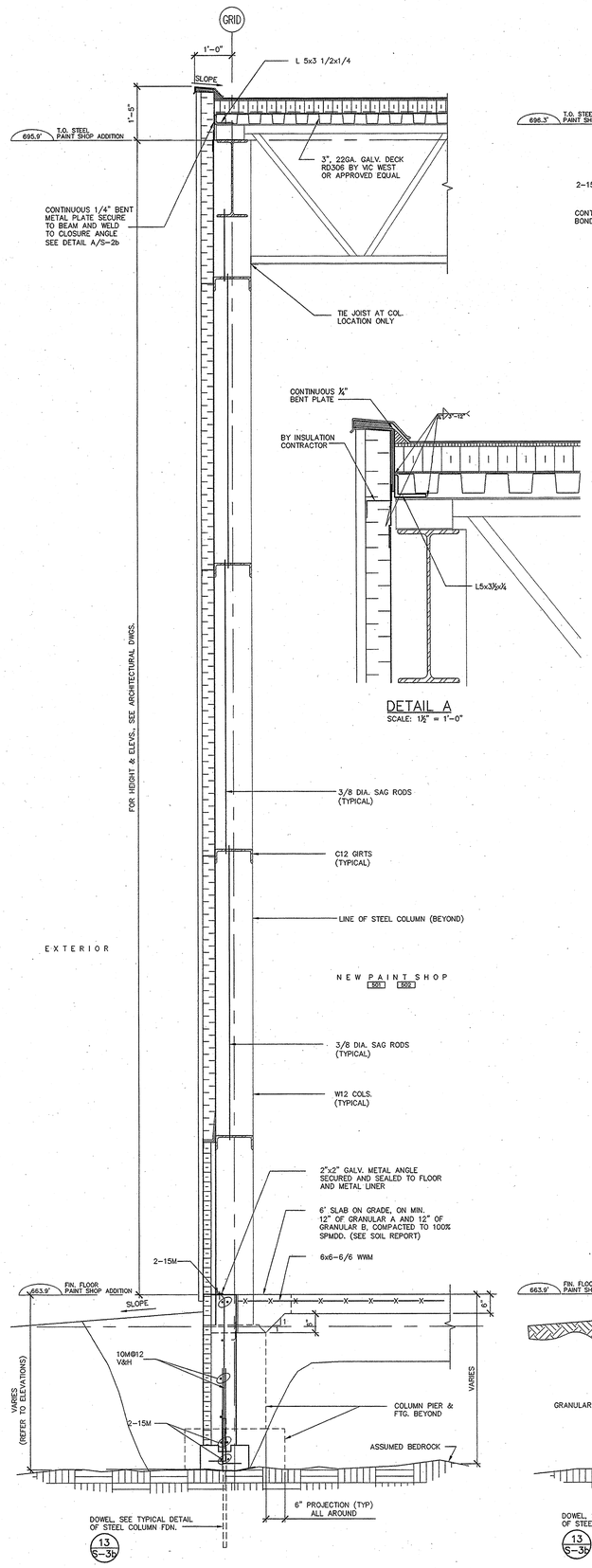
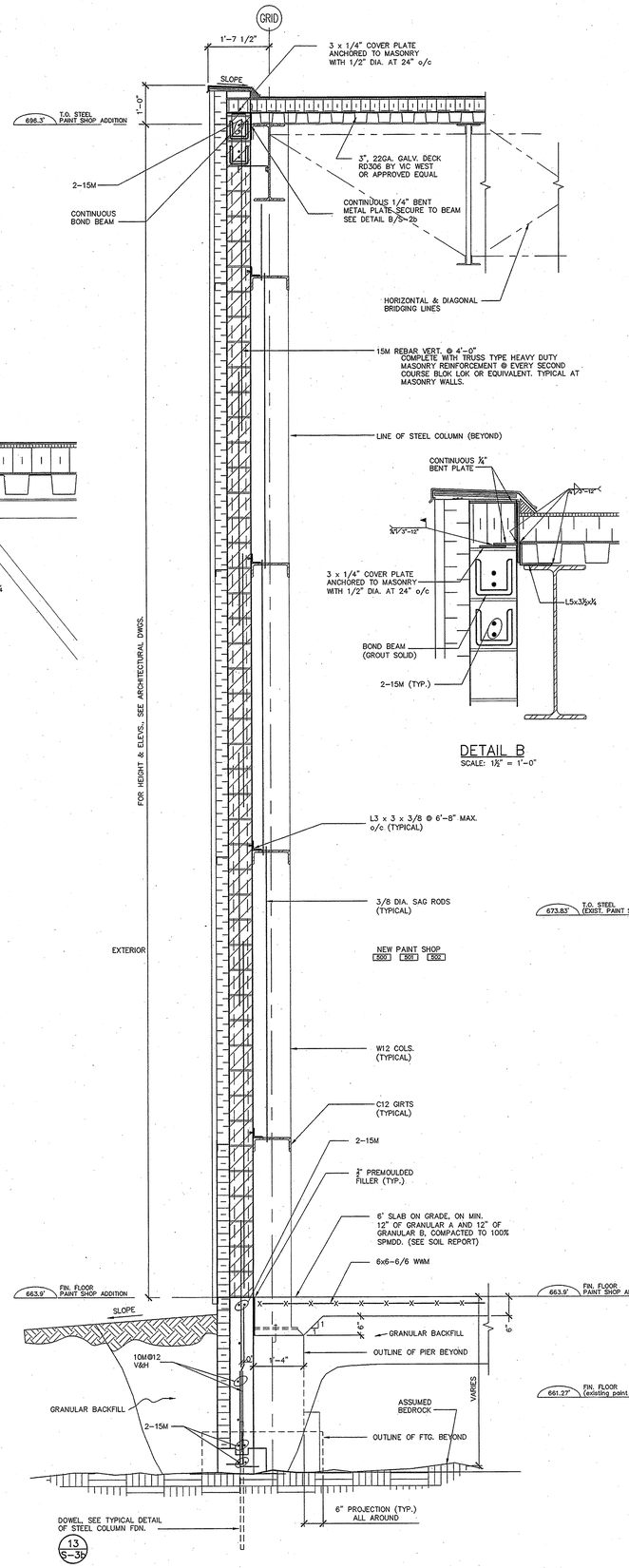
Polestar CM INC

ONTARIO NORTHLAND TRANSPORTATION COMMISION
NORTH BAY SHOP EXTENSION
PAINT SHOP BUILDING ADDITION
FOUNDATION PLAN

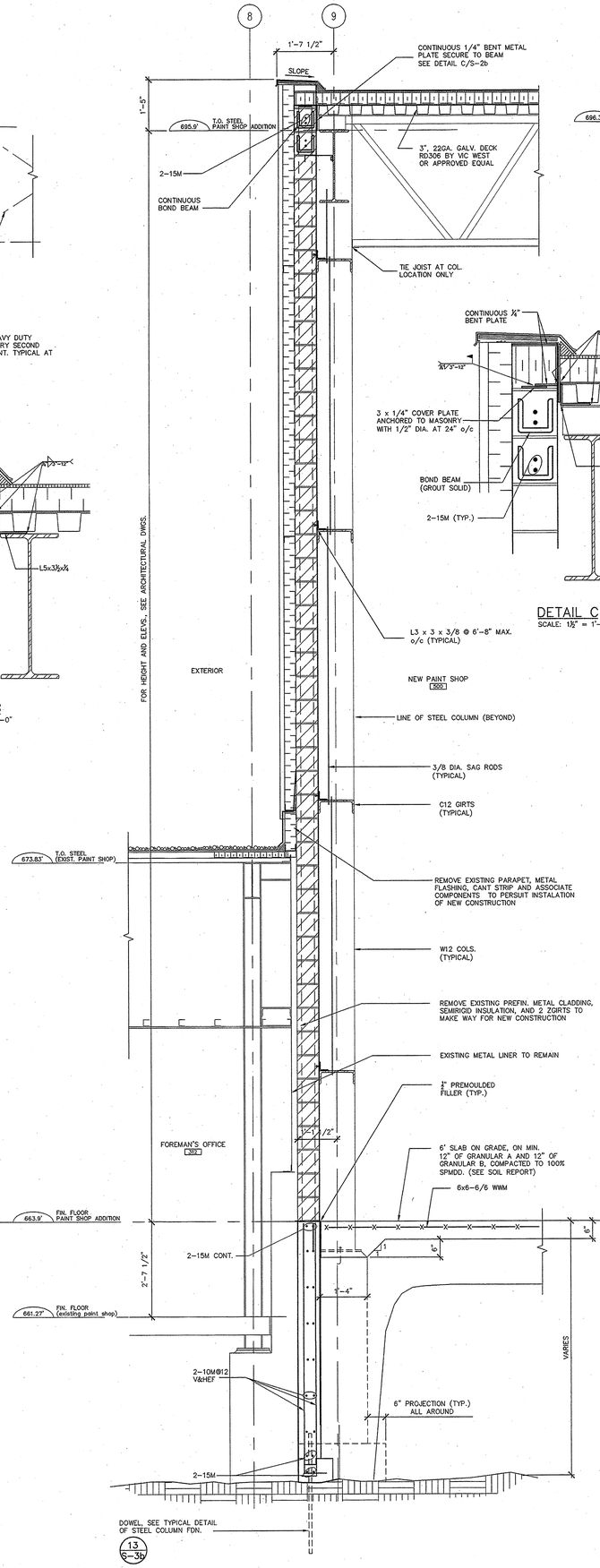
Drawn by: JJN/CWT
Checked by: AA/CL
Project No.: 04092
Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.: S-1b



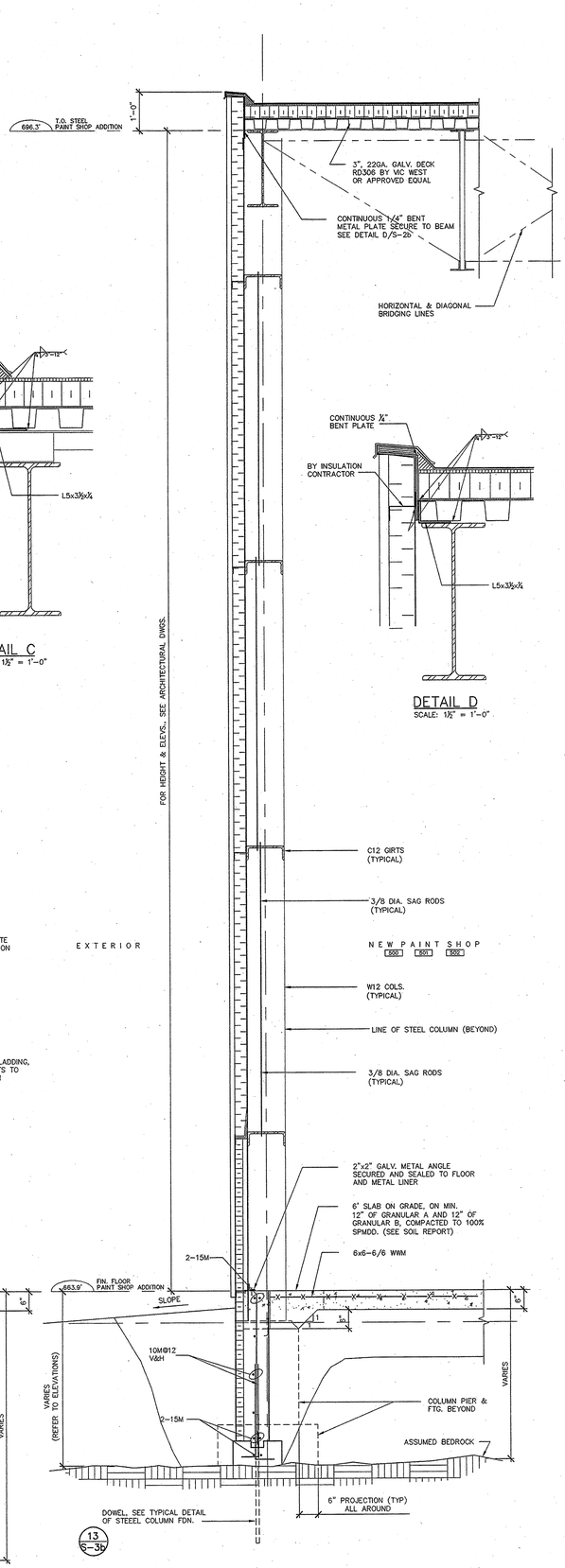
A SECTION
S-2b
SCALE: 3/4" = 1'-0"



B SECTION
S-2b
SCALE: 3/4" = 1'-0"



C SECTION
S-2b
SCALE: 3/4" = 1'-0"



D SECTION
S-2b
SCALE: 3/4" = 1'-0"

DETAIL D
SCALE: 1½" = 1'-0"

DETAIL A
SCALE: 1½" = 1'-0"

DETAIL B
SCALE: 1½" = 1'-0"

DETAIL C
SCALE: 1½" = 1'-0"

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No.:	Revision / Version:	Date:

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No.:	Revision / Version:	Date:
1	PACKAGE 'A'	JUNE 1, 2004
2	ISSUED PACKAGE 'A' ADDENDA NO 2	JUNE 11, 2004
3	ISSUED PACKAGE 'B'	JUNE 23, 2004
4	REVISION #1	JUNE 25, 2004

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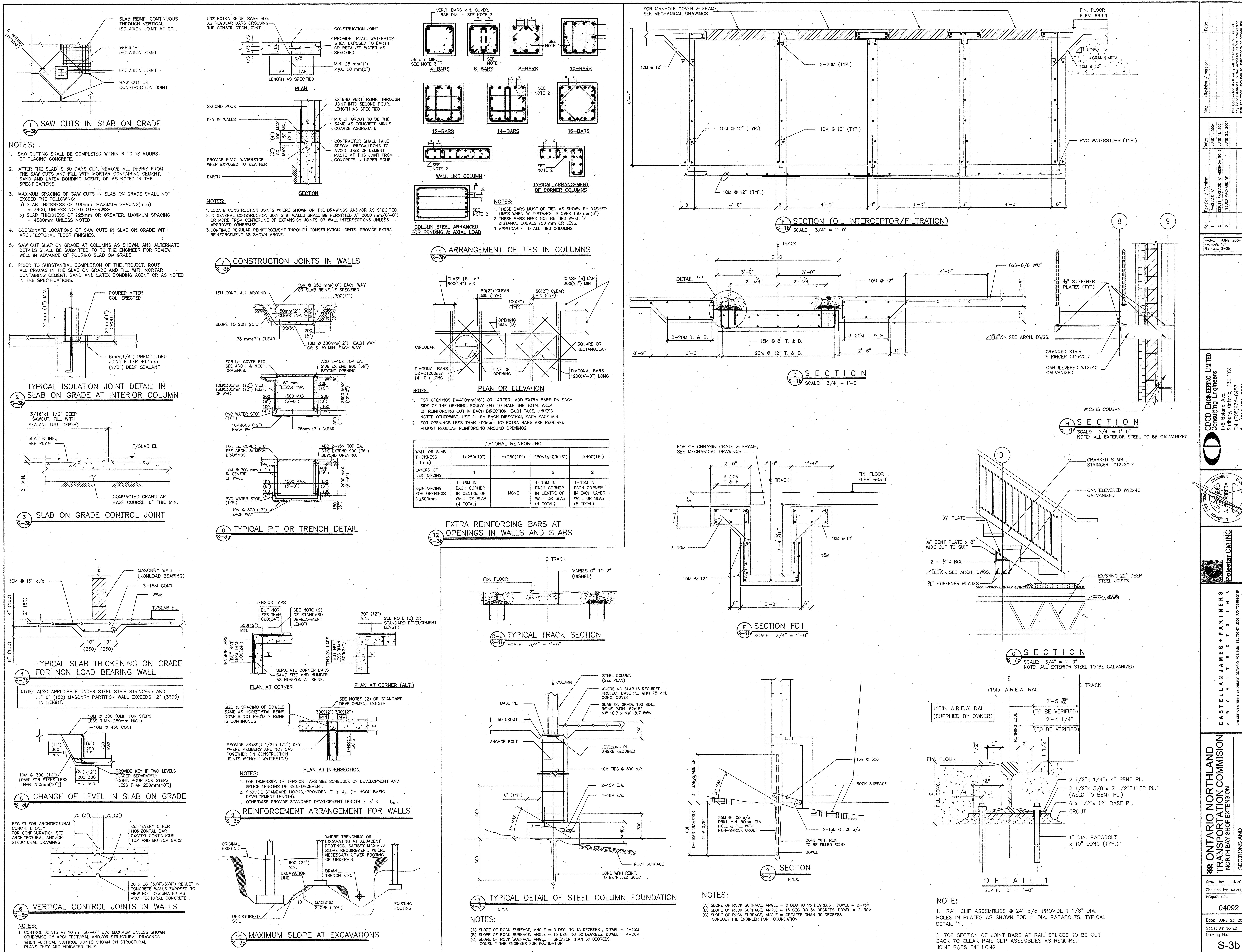
File Name: S-2b

ONTARIO NORTHLAND TRANSPORTATION COMMISION
NORTH BAY SHOP EXTENSION
PAINT SHOP BUILDING ADDITION
WALL SECTIONS

Drawn by: JJN/CWT
Checked by: AA/CL
Project No.:
04092

Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.:
S-2b



1 S-3b SAW CUTS IN SLAB ON GRADE
NOTES:
1. SAW CUTTING SHALL BE COMPLETED WITHIN 6 TO 18 HOURS OF PLACING CONCRETE.
2. AFTER THE SLAB IS 30 DAYS OLD, REMOVE ALL DEBRIS FROM THE SAW CUTS AND FILL WITH MORTAR CONTAINING CEMENT, SAND AND LATEX BONDING AGENT, OR AS NOTED IN THE SPECIFICATIONS.
3. MAXIMUM SPACING OF SAW CUTS IN SLAB ON GRADE SHALL NOT EXCEED THE FOLLOWING:
a) SLAB THICKNESS OF 100mm, MAXIMUM SPACING(mm) = 3600, UNLESS NOTED OTHERWISE.
b) SLAB THICKNESS OF 125mm OR GREATER, MAXIMUM SPACING = 4500mm UNLESS NOTED.
4. COORDINATE LOCATIONS OF SAW CUTS IN SLAB ON GRADE WITH ARCHITECTURAL FLOOR FINISHES.
5. SAW CUT SLAB ON GRADE AT COLUMNS AS SHOWN, AND ALTERNATE DETAILS SHALL BE SUBMITTED TO TO THE ENGINEER FOR REVIEW, WELL IN ADVANCE OF POURING SLAB ON GRADE.
6. PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT, ROUT ALL CRACKS IN THE SLAB ON GRADE AND FILL WITH MORTAR CONTAINING CEMENT, SAND AND LATEX BONDING AGENT OR AS NOTED IN THE SPECIFICATIONS.
2 S-3b TYPICAL ISOLATION JOINT DETAIL IN SLAB ON GRADE AT INTERIOR COLUMN
3 S-3b SLAB ON GRADE CONTROL JOINT
4 S-3b TYPICAL SLAB THICKENING ON GRADE FOR NON LOAD BEARING WALL
NOTE: ALSO APPLICABLE UNDER STEEL STAIR STRINGERS AND IF 6" (150) MASONRY PARTITION WALL EXCEEDS 12' (3600) IN HEIGHT.
5 S-3b CHANGE OF LEVEL IN SLAB ON GRADE
6 S-3b VERTICAL CONTROL JOINTS IN WALLS
NOTES:
1. CONTROL JOINTS AT 10 m (30'-0") o/c MAXIMUM UNLESS SHOWN OTHERWISE ON ARCHITECTURAL AND/OR STRUCTURAL DRAWINGS WHEN VERTICAL CONTROL JOINTS SHOWN ON STRUCTURAL PLANS THEY ARE INDICATED THUS
7 S-3b CONSTRUCTION JOINTS IN WALLS
NOTES:
1. LOCATE CONSTRUCTION JOINTS WHERE SHOWN ON THE DRAWINGS AND/OR AS SPECIFIED.
2. IN GENERAL CONSTRUCTION JOINTS IN WALLS SHALL BE PERMITTED AT 2000 mm (6'-0") OR MORE FROM CENTERLINE OF EXPANSION JOINTS OR WALL INTERSECTIONS UNLESS APPROVED OTHERWISE.
3. CONTINUE REGULAR REINFORCEMENT THROUGH CONSTRUCTION JOINTS. PROVIDE EXTRA REINFORCEMENT AS SHOWN ABOVE.
8 S-3b TYPICAL PIT OR TRENCH DETAIL
9 S-3b REINFORCEMENT ARRANGEMENT FOR WALLS
NOTES:
1. FOR DIMENSION OF TENSION LAPS SEE SCHEDULE OF DEVELOPMENT AND SPLICE LENGTHS OF REINFORCEMENT.
2. PROVIDE STANDARD HOOKS, PROVIDED 'E' ≥ ℓdh (ie. HOOK BASIC DEVELOPMENT LENGTH). OTHERWISE PROVIDE STANDARD DEVELOPMENT LENGTH IF 'E' < ℓdh.
10 S-3b MAXIMUM SLOPE AT EXCAVATIONS
11 S-3b ARRANGEMENT OF TIES IN COLUMNS
NOTES:
1. THESE BARS MUST BE TIED AS SHOWN BY DASHED LINES WHEN 'x' DISTANCE IS OVER 150 mm(6")
2. THESE BARS NEED NOT BE TIED WHEN 'x' DISTANCE EQUALS 150 mm OR LESS.
3. APPLICABLE TO ALL TIED COLUMNS.
12 S-3b EXTRA REINFORCING BARS AT OPENINGS IN WALLS AND SLABS
NOTES:
1. FOR OPENINGS D=400mm(16") OR LARGER: ADD EXTRA BARS ON EACH SIDE OF THE OPENING, EQUIVALENT TO HALF THE TOTAL AREA OF REINFORCING CUT IN EACH DIRECTION, EACH FACE, UNLESS NOTED OTHERWISE. USE 2-15M EACH DIRECTION, EACH FACE MIN.
2. FOR OPENINGS LESS THAN 400mm: NO EXTRA BARS ARE REQUIRED ADJUST REGULAR REINFORCING AROUND OPENINGS.
DIAGONAL REINFORCING
WALL OR SLAB THICKNESS t (mm) | t<250(10") | t<250(10") | 250<t≤400(16") | t>400(16")
LAYERS OF REINFORCING | 1 | 2 | 2 | 2
REINFORCING FOR OPENINGS D≥600mm | 1-15M IN EACH CORNER IN CENTRE OF WALL OR SLAB (4 TOTAL) | NONE | 1-15M IN EACH CORNER IN CENTRE OF WALL OR SLAB (4 TOTAL) | 1-15M IN EACH CORNER IN EACH LAYER WALL OR SLAB (8 TOTAL)
13 S-3b TYPICAL DETAIL OF STEEL COLUMN FOUNDATION N.T.S.
NOTES:
(A) SLOPE OF ROCK SURFACE, ANGLE = 0 DEG. TO 15 DEGREES , DOWEL = 4-15M
(B) SLOPE OF ROCK SURFACE, ANGLE = 15 DEG. TO 30 DEGREES, DOWEL = 4-30M
(C) SLOPE OF ROCK SURFACE, ANGLE = GREATER THAN 30 DEGREES. CONSULT THE ENGINEER FOR FOUNDATION
D-a S-1b TYPICAL TRACK SECTION SCALE: 3/4" = 1'-0"
F S-1b SECTION (OIL INTERCEPTOR/FILTRATION) SCALE: 3/4" = 1'-0"
D S-1b SECTION SCALE: 3/4" = 1'-0"
E S-1b SECTION FD1 SCALE: 3/4" = 1'-0"
2 S-2b SECTION N.T.S.
NOTES:
(A) SLOPE OF ROCK SURFACE, ANGLE = 0 DEG TO 15 DEGREES , DOWEL = 2-15M
(B) SLOPE OF ROCK SURFACE, ANGLE = 15 DEG. TO 30 DEGREES, DOWEL = 2-30M
(C) SLOPE OF ROCK SURFACE, ANGLE = GREATER THAN 30 DEGREES. CONSULT THE ENGINEER FOR FOOUNDATION
H S-7b SECTION SCALE: 3/4" = 1'-0" NOTE: ALL EXTERIOR STEEL TO BE GALVANIZED
G S-7b SECTION SCALE: 3/4" = 1'-0" NOTE: ALL EXTERIOR STEEL TO BE GALVANIZED
DETAIL 1 SCALE: 3" = 1'-0"
NOTE:
1. RAIL CLIP ASSEMBLIES @ 24" c/c. PROVIDE 1 1/8" DIA. HOLES IN PLATES AS SHOWN FOR 1" DIA. PARABOLTS. TYPICAL DETAIL '1'.
2. TOE SECTION OF JOINT BARS AT RAIL SPLICES TO BE CUT BACK TO CLEAR RAIL CLIP ASSEMBLIES AS REQUIRED. JOINT BARS 24" LONG
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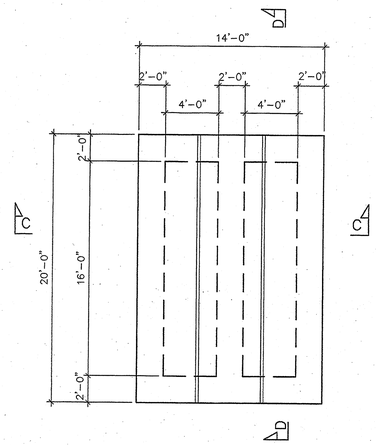
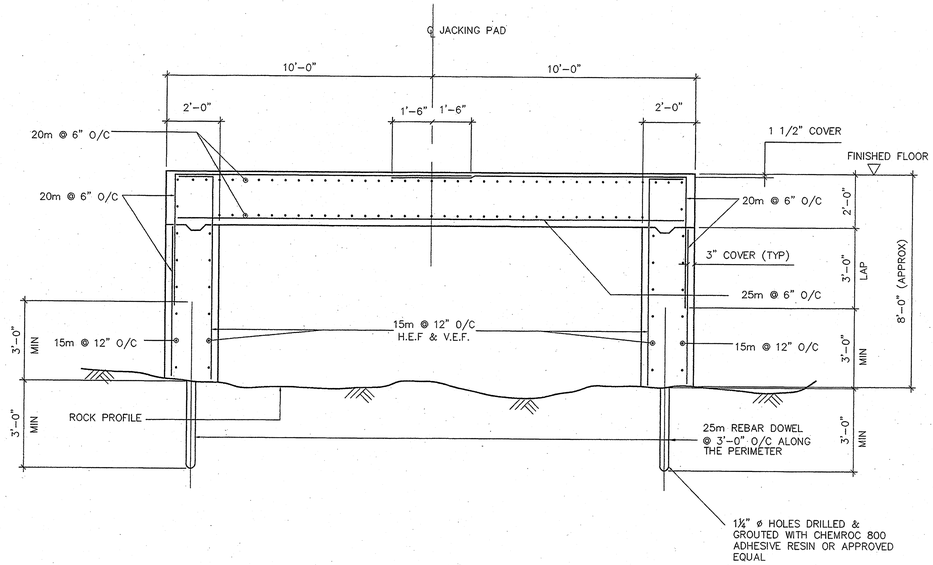
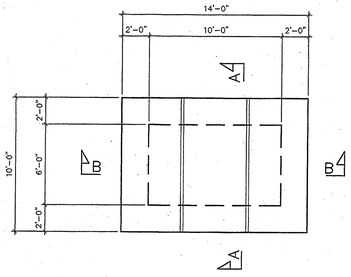
Polestar CM INC
CASTELLAN JAMES + PARTNERS ARCHITECTS INC
ONTARIO NORTHLAND TRANSPORTATION COMMISION NORTH BAY SHOP EXTENSION
SECTIONS AND TYPICAL DETAILS
Revision / Version: 1 PACKAGE 'A' JUNE 1, 2004; 2 ISSUED PACKAGE 'A' ADDENDA NO 2 JUNE 11, 2004; 3 ISSUED PACKAGE 'B' JUNE 23, 2004
Plotted: JUNE, 2004
Drawn by: JJN/CWT
Checked by: AA/CL
Project No.: 04092
Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.: S-3b



TYPE #1 JACKING PAD – PLAN
SCALE ¼" = 1'-0"



SECTION D–D
SCALE ½" = 1'-0"



TYPE #2 JACKING PAD – PLAN
SCALE ¼" = 1'-0"

SECTION A–A
SCALE ½" = 1'-0"

SECTION C–C
SCALE ½" = 1'-0"

SECTION B–B
SCALE ½" = 1'-0"

No.:	Revision / Version:	Date:

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No.:	Revision / Version:	Date:
1	PACKAGE 'A'	JUNE 1, 2004
2	ISSUED PACKAGE 'A' ADDENDA NO 2	JUNE 11, 2004
3	ISSUED PACKAGE 'B'	JUNE 23, 2004

Plotted: JUNE, 2004
Plot scale: 1:1
File Name: S-4b

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ONTARIO NORTHLAND
TRANSPORTATION COMMISION
NORTH BAY SHOP EXTENSION

JACKING PADS
PLAN AND SECTIONS

Drawn by: JJN/CWT
Checked by: AA/CL
Project No.:
04092
Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.:
S-4b

COLUMN AND FOOTING SCHEDULE

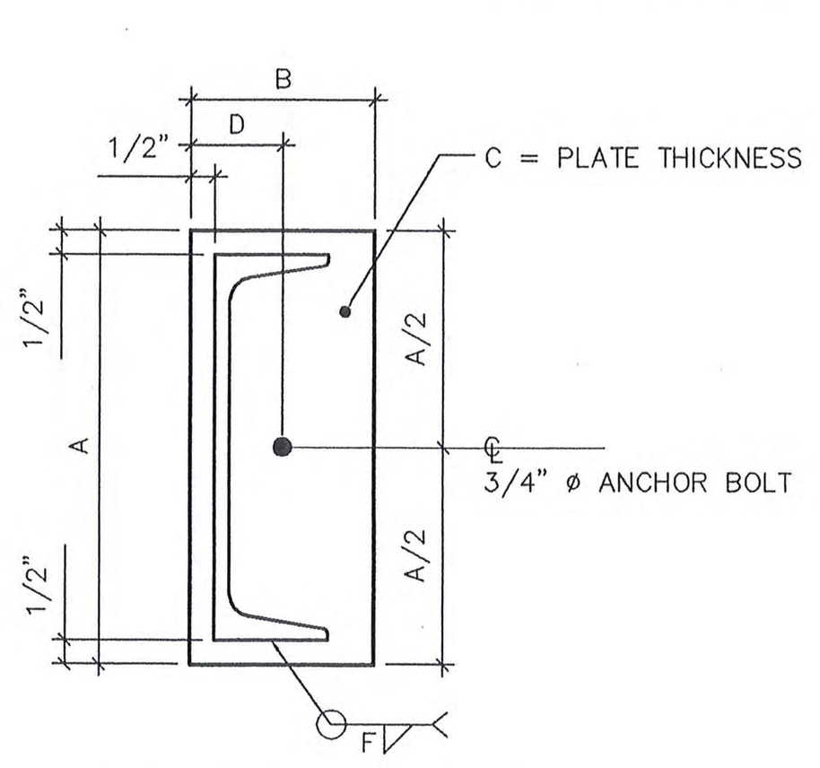
DATA \ COLUMN MARKS		B1-14	EX-14	A-14	DX-14	CX-14	BX-14	AX-14	B1-10.1	EX-10.1	A-10.1	A-10	DX-10	CX-10	BX-10	AX-10	B1-9	EX-9
ROOF																		
GROUND FLOOR		W12X40	W12X45	W12X45	W12X45	W12X45	W12X45	W12X40	W12X45	W12X65 (1)	W12X45	W12X45	W12X45	W12X45	W12X45	W12X40	W12X40	W12X45
UNFACTORED LOADS																		
DL (KIPS)		16	28	29	29	29	24	11	25	26	13	20	29	29	24	11	20	20
LL (KIPS)		45	84	72	56	50	43	20	64	128	64	47	66	50	43	20	30	54
EARTHQUAKE (KIPS)		±60	–	±40	±40	±40	–	±30	±60	–	–	±30	±30	±30	–	±30	–	±30
BASE PLATE (1)		TYPE #B	TYPE #A	TYPE #A	TYPE #A	TYPE #A	TYPE #A	TYPE #A	TYPE #B	TYPE #A	TYPE #A	TYPE #A	TYPE #A	TYPE #A	TYPE #A	TYPE #A	TYPE #A	TYPE #A
ANCHOR BOLTS		TYPE #A 4-1"ø	TYPE #B 2-1"ø	TYPE #A 2-1"ø	TYPE #A 2-1"ø	TYPE #A 2-1"ø	TYPE #B 2-1"ø	TYPE #A 2-1"ø	TYPE #A 4-1"ø	TYPE #B 2-1"ø	TYPE #B 2-1"ø	TYPE #A 2-1"ø	TYPE #A 2-1"ø	TYPE #A 2-1"ø	TYPE #B 2-1"ø	TYPE #A 2-1"ø	TYPE #B 2-1"ø	TYPE #A 2-1"ø
PIER SIZE (NOTE #2)		24"x18"	20"x18"	20"x18"	20"x18"	20"x18"	20"x18"	20"x18"	24"x18"	20"x18"	20"x18"	20"x18"	20"x18"	20"x18"	20"x18"	20"x18"	18"x18"	18"x18"
REINF.		8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT.,10M TIES @12"
DOWELS TO ROCK (NOTE #1)		6-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	6-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG
									(1)			(1)	(1)	(1)				

DATA \ COLUMN MARKS		A-9	B1-13	B1-12	B1-11.1	B1-9.2	B1-9.1	AX-13.1	AX-12.1	AX-12	AX-11.1	AX-10.2
ROOF												
GROUND FLOOR		W12X45	W12X40	W12X40	W12X40	W12X40	W12X40	W12X40	W12X40	W12X40	W12X40	W12X40
UNFACTORED LOADS												
DL (KIPS)		20	8	6	6	6	6	6	6	6	6	6
LL (KIPS)		30	6	4	4	4	4	4	4	4	4	4
EARTHQUAKE (KIPS)		±30	±60	±60	–	±30	–	±30	±60	±30	±60	±30
BASE PLATE (1)		TYPE #A	TYPE #B	TYPE #B	TYPE #A	TYPE #B	TYPE #A	TYPE #A	TYPE #B	TYPE #A	TYPE #B	TYPE #A
ANCHOR BOLTS		TYPE #A 2-1"ø	TYPE #A 4-1"ø	TYPE #A 4-1"ø	TYPE #B 2-1"ø	TYPE #A 4-1"ø	TYPE #B 2-1"ø	TYPE #A 2-1"ø	TYPE #A 4-1"ø	TYPE #A 2-1"ø	TYPE #A 4-1"ø	TYPE #A 2-1"ø
PIER SIZE (NOTE #2)		18"X18"	24"X18"	24"X18"	24"X18"	24"X18"	24"X18"	20"X18"	20"X18"	20"X18"	20"X18"	20"X18"
REINF.		8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"	8-20M VERT., 10M TIES @12"
DOWELS TO ROCK (NOTE #1)		4-25M 6'-0" LONG	6-25M 6'-0" LONG	6-25M 6'-0" LONG	4-25M 6'-0" LONG	6-25M 6'-0" LONG	4-25M 6'-0" LONG	4-25M 6'-0" LONG	6-25M 6'-0" LONG	4-25M 6'-0" LONG	6-25M 6'-0" LONG	4-25M 6'-0" LONG
			(1)			(1)						

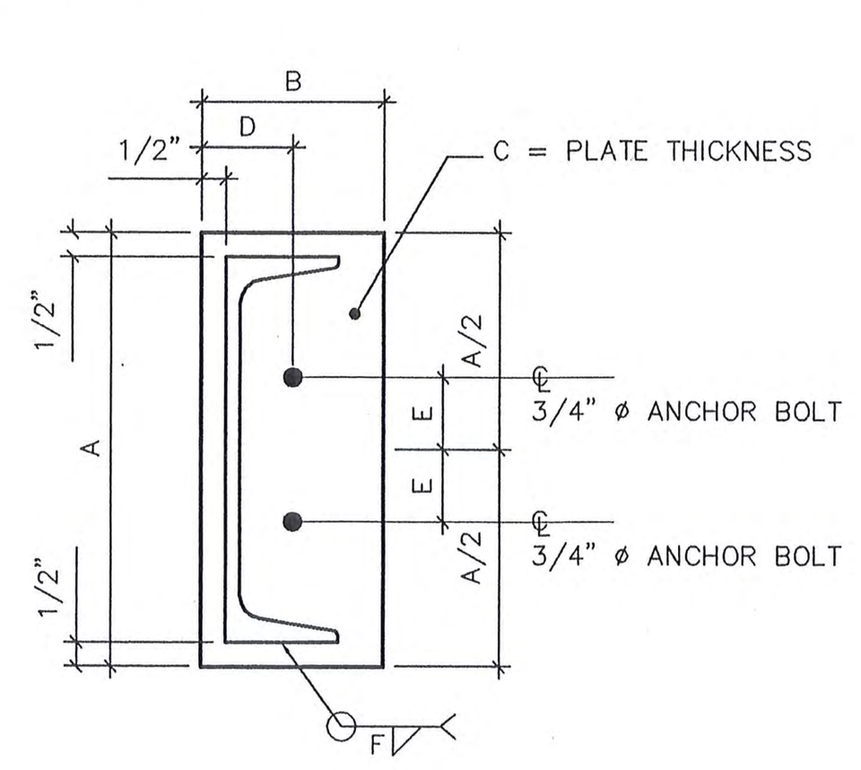
NOTES:

#1 PROVIDE 1 ¼"ø x 3'-0" DEEP HOLES IN SOLID ROCK FOR 3'-0" EMBEDMENT OF 25M REBAR DOWEL AND GROUTED WITH CHEMROCK 800 ADHESIVE RESIN OR APPROVED EQUIVALENT.
#2 PIER REINFORCEMENT IS ADDITIONAL TO WALL REINFORCEMENT. (1)

COLUMN SIZE	DIMENSION IN INCHES					WELD SIZE
	A	B	C	D	E	F
C4	5"	3"	½"	2"	–	3/16"
C5	6"	3"	½"	2"	1"	3/16"
C6	7"	3"	½"	2"	1½"	3/16"
C7	8"	4"	½"	2½"	2"	¼"
C8	9"	4"	½"	2½"	2½"	¼"
C9	10"	4"	½"	2½"	2¾"	¼"
C10	11"	4"	½"	2½"	3"	¼"
C12	1'-1"	5"	¾"	3"	3½"	5/16"
C15	1'-4"	5"	¾"	3"	4½"	5/16"



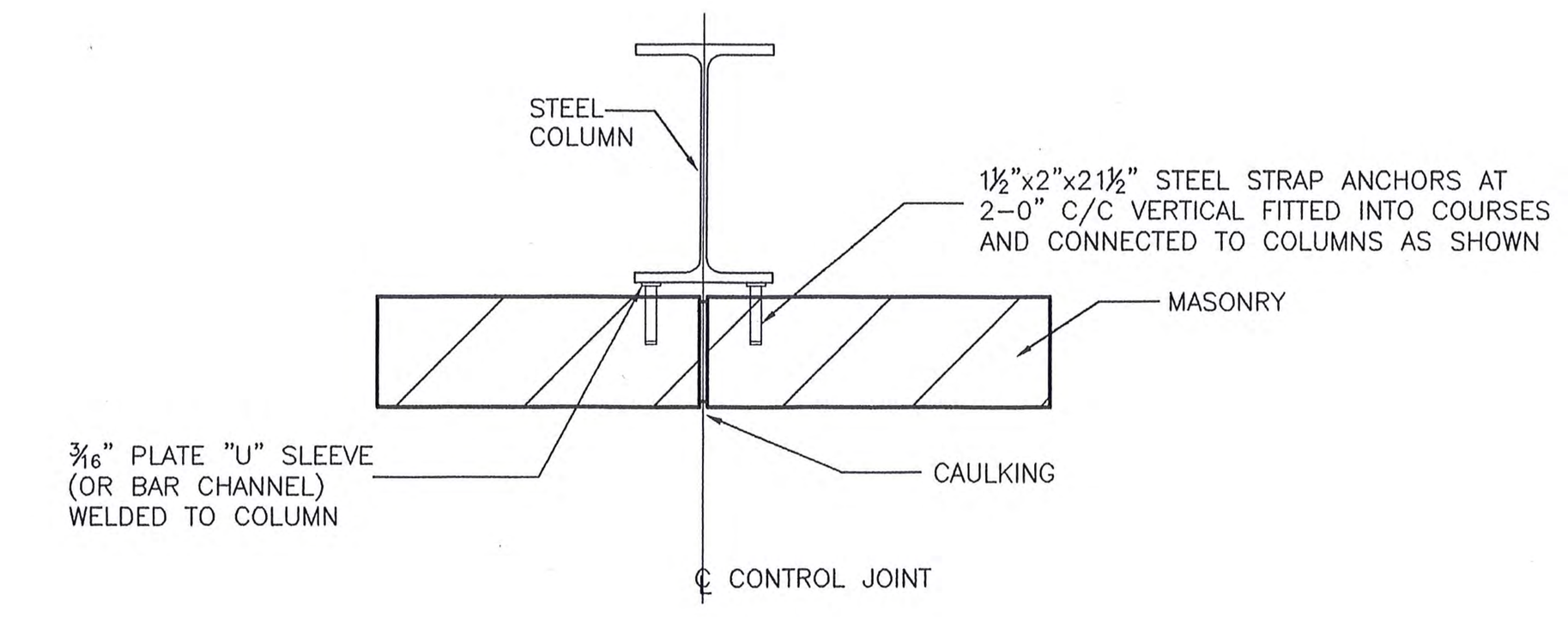
1 BOLT BASE PLATE
N.T.S.
NOTE: FOR C4 COLUMNS ONLY



2 BOLT BASE PLATE
N.T.S.

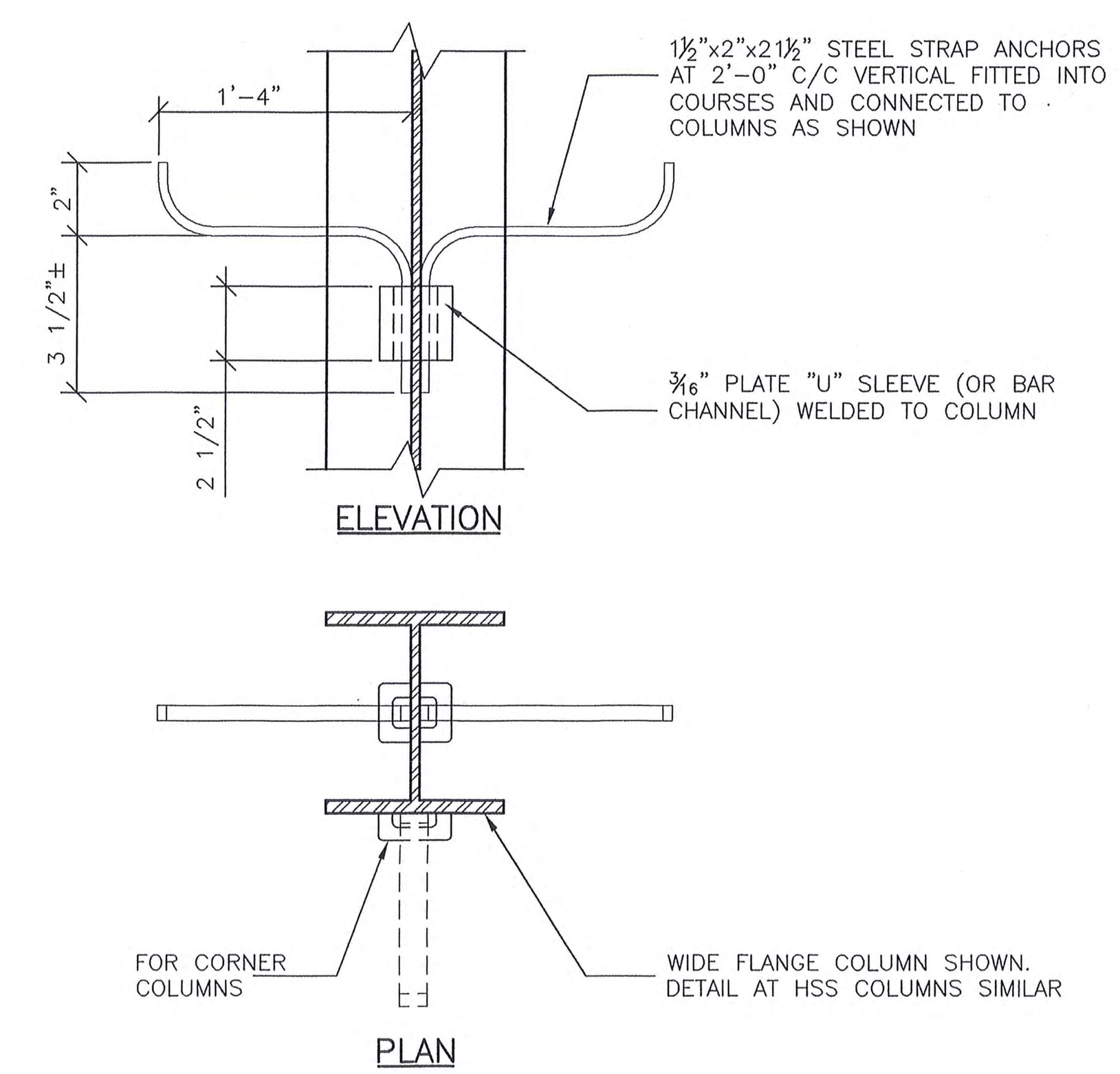
C COLUMNS BASEPLATES

NOTE: ¾"ø ANCHOR BOLTS MAY BE SUBSTITUTED WITH APPROVED EXPANDED ANCHOR BOLT



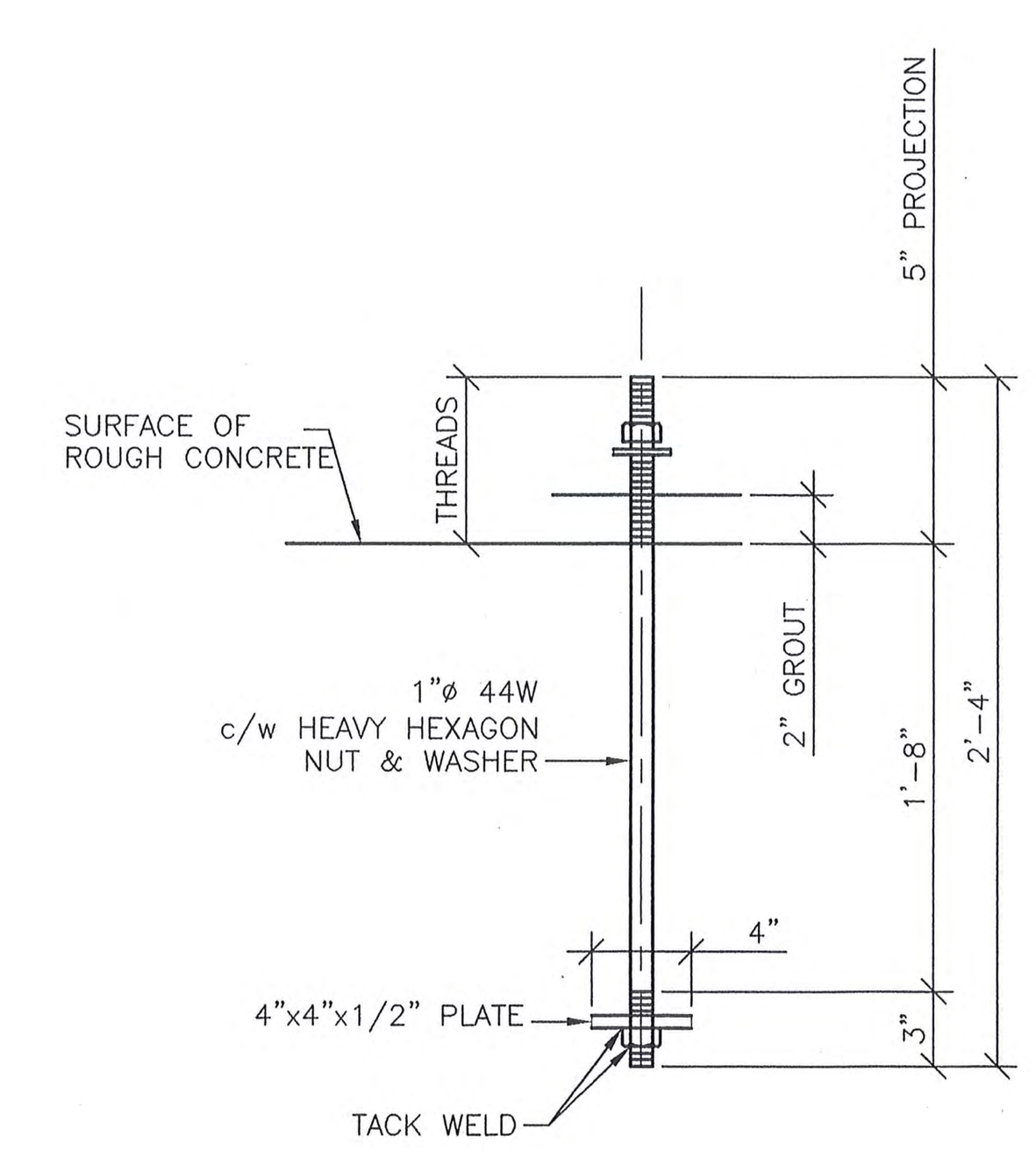
DETAIL OF ANCHORAGE OF STEEL COLUMNS TO MASONRY WALLS WITH CONTROL JOINTS
N.T.S

NOTE: FOR ANCHORAGE OF ALL STEEL CHANNELS TO THE MASONRY WALLS, USE MASONRY DOVETAIL ANCHOR C/W CLIP ANGLE WELDED TO STEEL CHANNEL, FITTED INTO COURSE OF MASONRY.

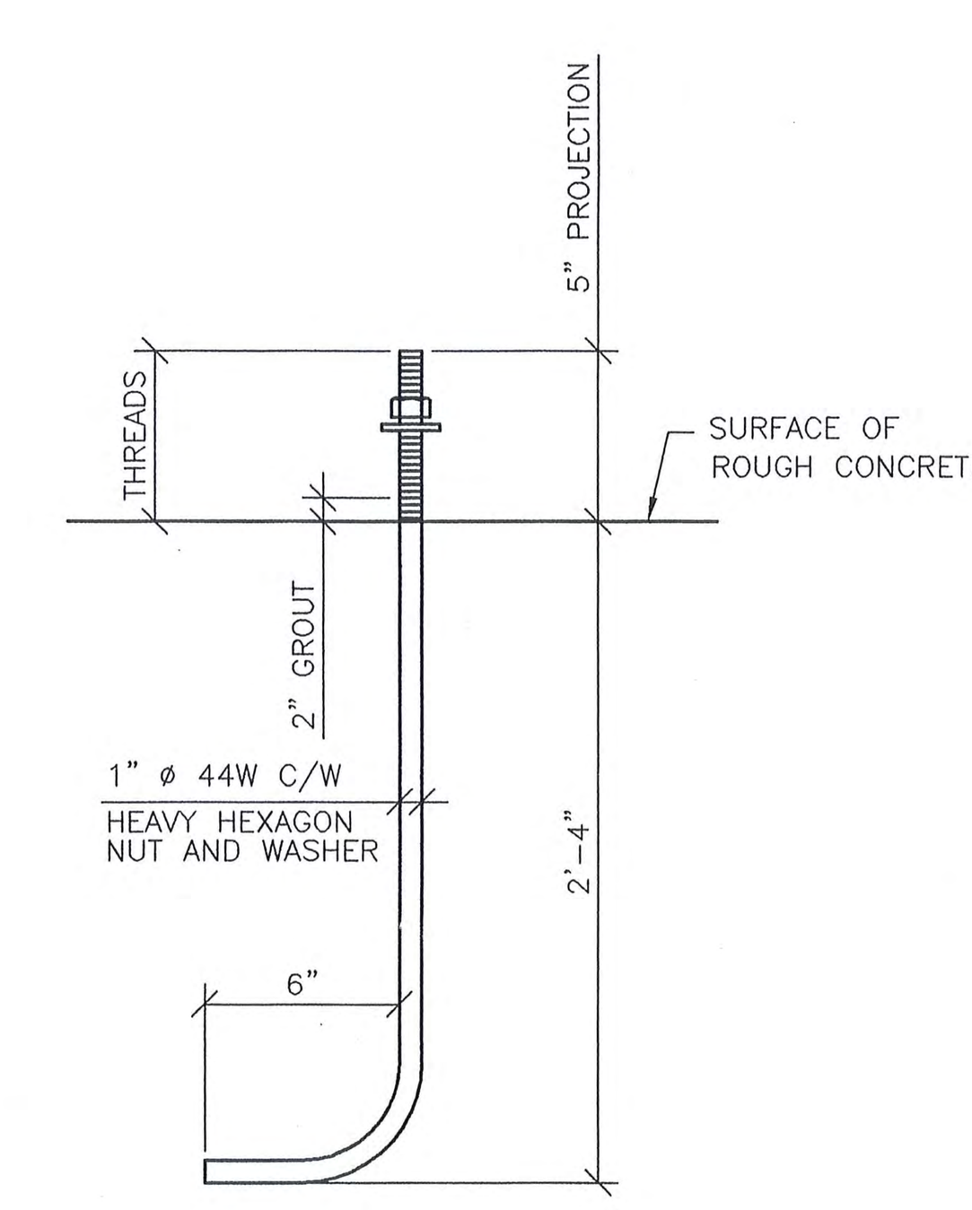


DETAIL OF ANCHORAGE OF STEEL COLUMNS TO MASONRY WALLS
SCALE N.T.S.

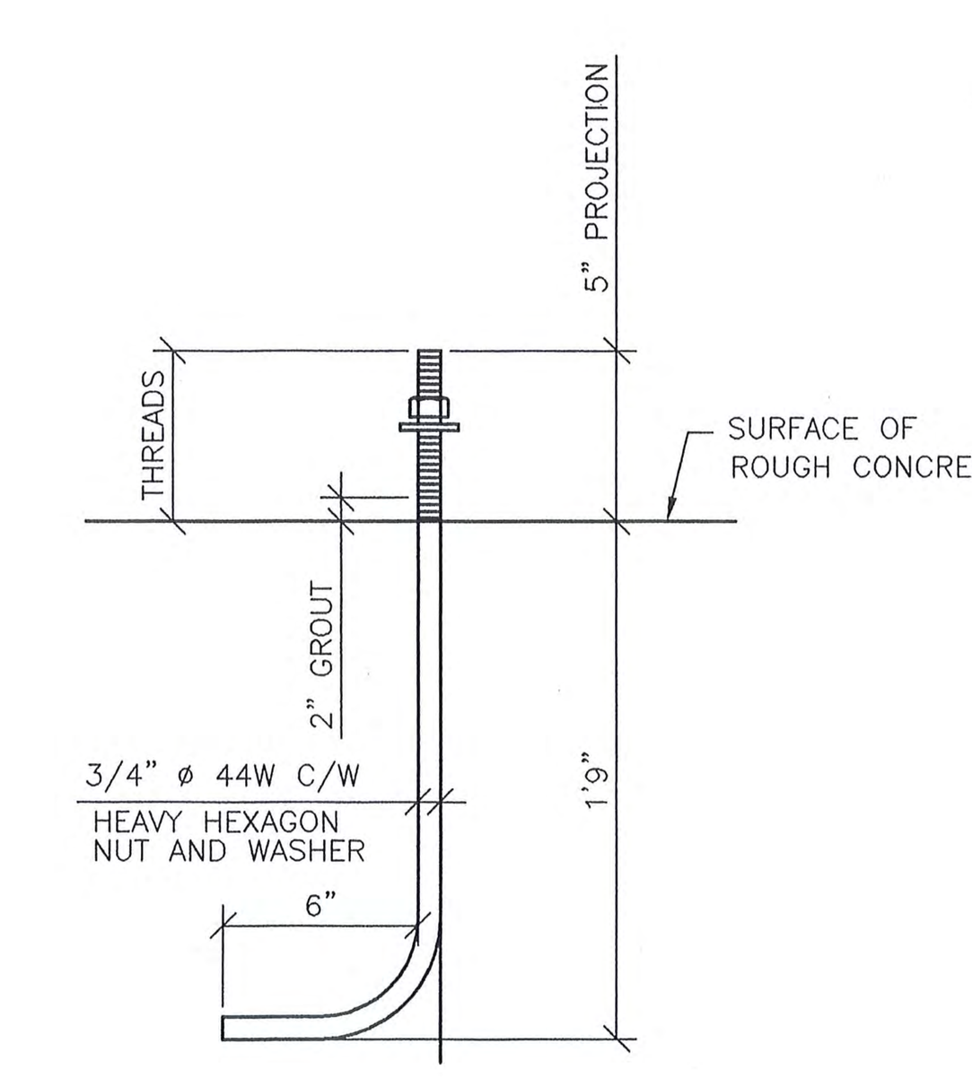
NOTE: WELD TO FLANGE FOR CORNER COLUMNS AND WHERE ORIENTATION OF COLUMNS REVERSED



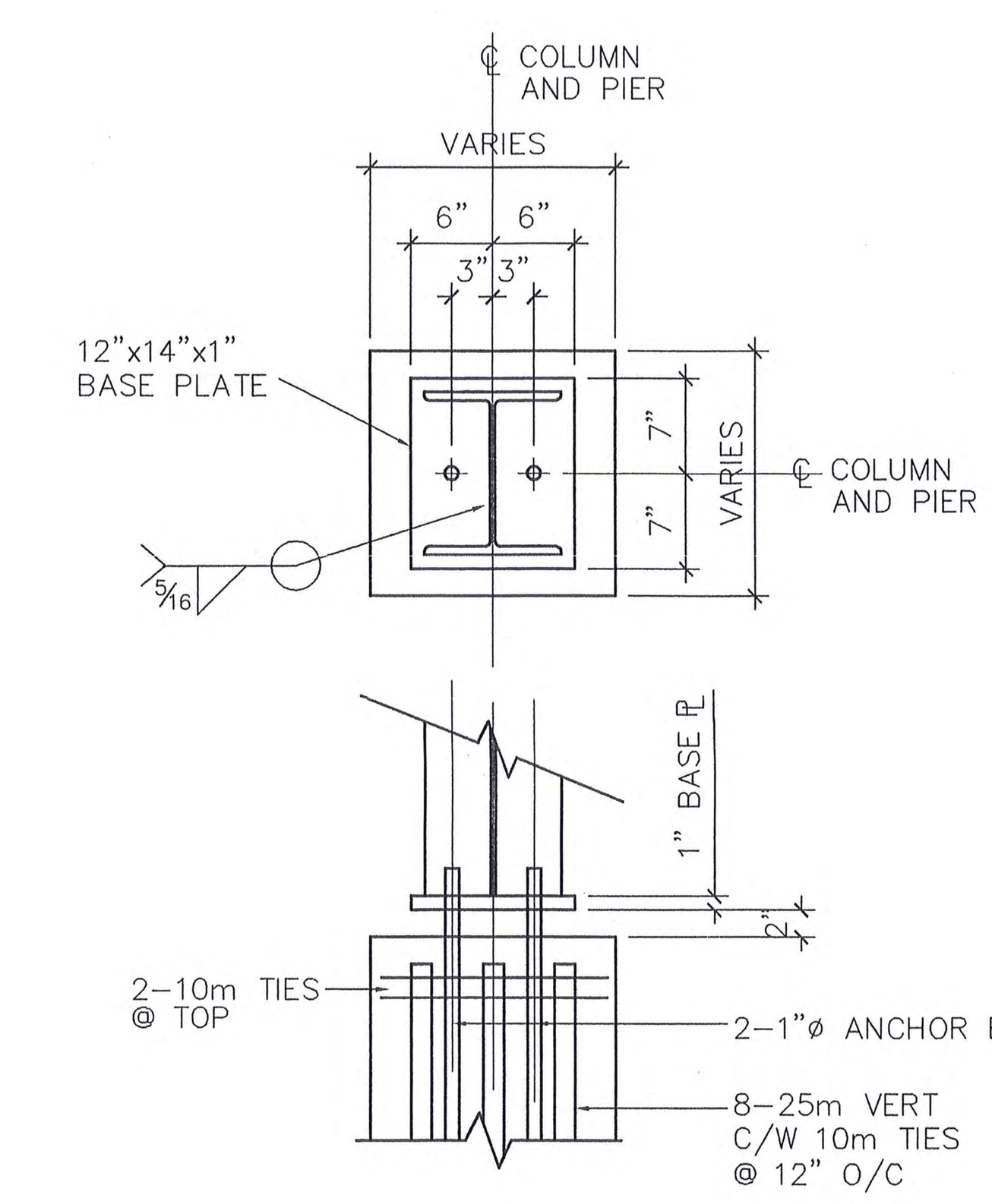
TYPE #A
DETAIL OF 1"ø ANCHOR BOLT
SCALE N.T.S.



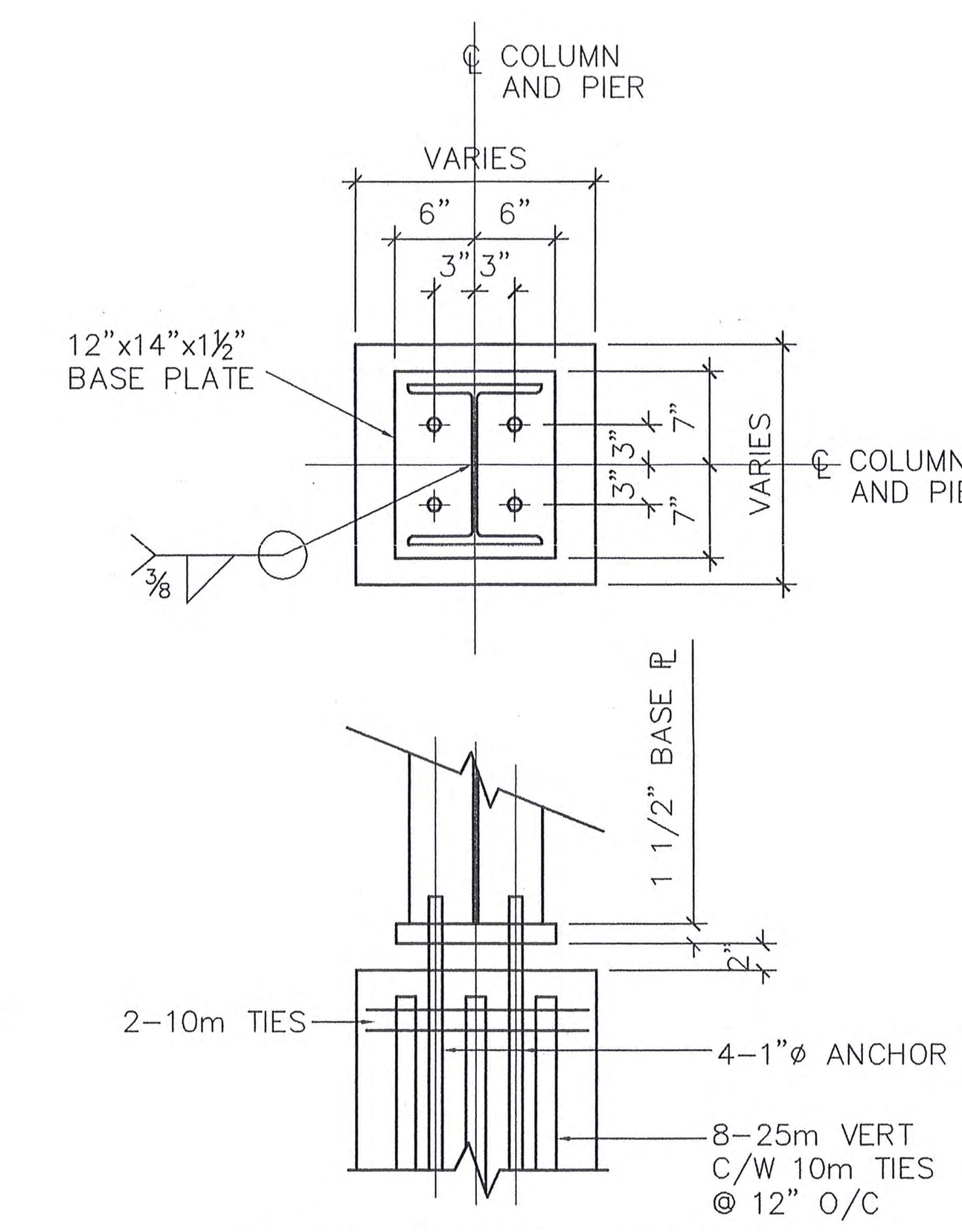
TYPE #B
DETAIL OF 1"ø ANCHOR BOLT
SCALE N.T.S.



TYPE #C
DETAIL OF 3/4"ø ANCHOR BOLT
SCALE N.T.S.



BASE PLATE TYPE #A
SCALE 1"=1'-0"
NOTE: SEE COLUMN SCHEDULE AND WALL SECTIONS



BASE PLATE TYPE #B
SCALE 1"=1'-0"
NOTE: SEE COLUMN SCHEDULE AND WALL SECTIONS

No.:	Revision / Version:	Date:
1	PACKAGE 'A'	JUNE 1, 2004
2	ISSUED PACKAGE 'A' ADDENDA NO 2	JUNE 11, 2004
3	ISSUED PACKAGE 'B'	JUNE 23, 2004
4	REVISION (1)	JULY 15, 2004

Plotted: JUNE, 2004
Plot scale: 1:1
File Name: S-5b

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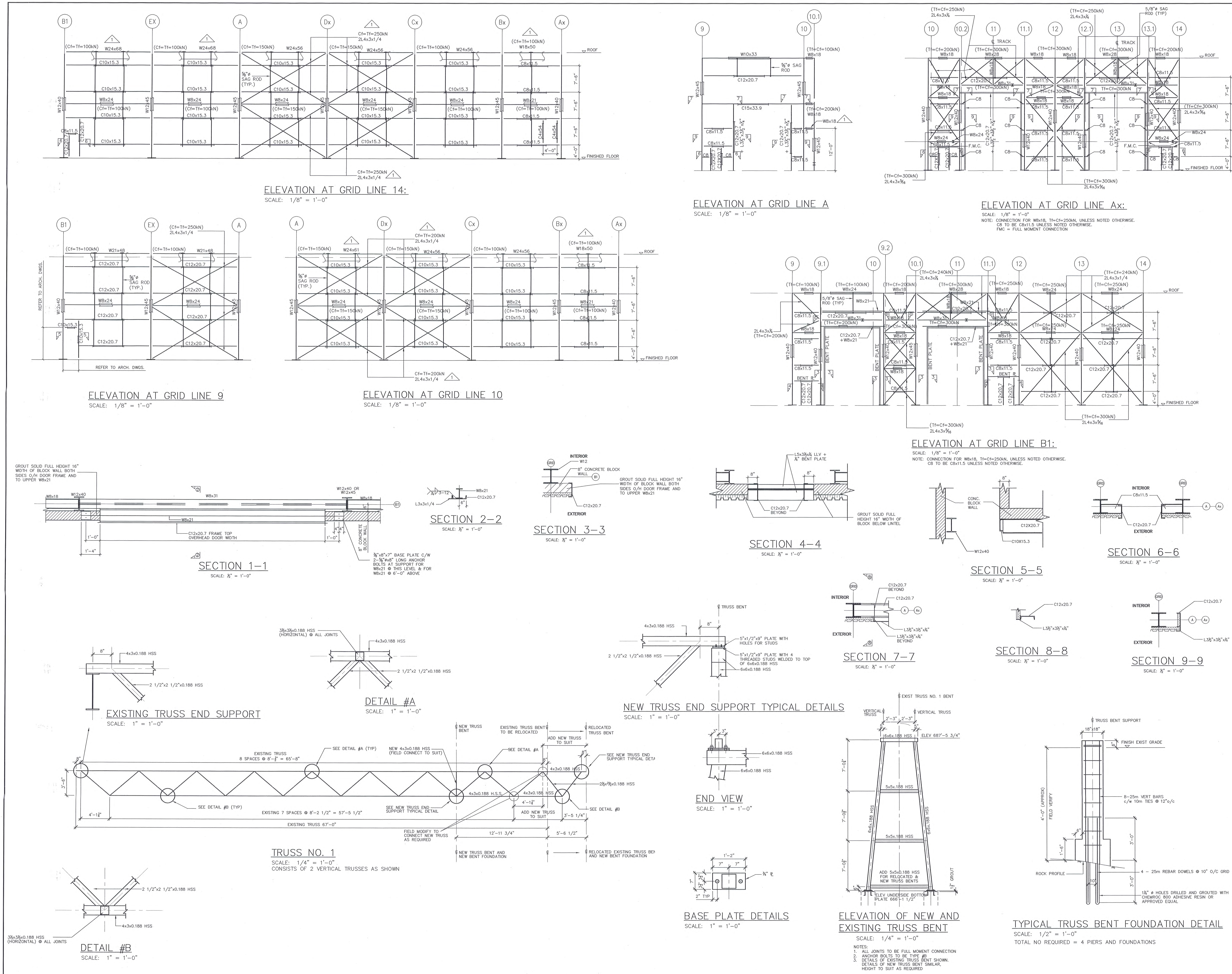
ONTARIO NORTHLAND TRANSPORTATION COMMISION
NORTH BAY SHOP EXTENSION

PAINT SHOP
COLUMN SCHEDULE AND DETAILS

Drawn by: JJN/CWT
Checked by: AA/CL
Project No.: 04092
Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.: S-5b


ELEVATION AT GRID LINE 14:
SCALE: 1/8" = 1'-0"
ELEVATION AT GRID LINE A
SCALE: 1/8" = 1'-0"
ELEVATION AT GRID LINE Ax:
SCALE: 1/8" = 1'-0"
NOTE: CONNECTION FOR W8x18, Tf=Cf=250kN, UNLESS NOTED OTHERWISE. C8 TO BE C8x11.5 UNLESS NOTED OTHERWISE. FMC = FULL MOMENT CONNECTION
ELEVATION AT GRID LINE 9
SCALE: 1/8" = 1'-0"
ELEVATION AT GRID LINE 10
SCALE: 1/8" = 1'-0"
ELEVATION AT GRID LINE B1:
SCALE: 1/8" = 1'-0"
NOTE: CONNECTION FOR W8x18, Tf=Cf=250kN, UNLESS NOTED OTHERWISE. C8 TO BE C8x11.5 UNLESS NOTED OTHERWISE.
SECTION 1-1
SCALE: ½" = 1'-0"
SECTION 2-2
SCALE: ½" = 1'-0"
SECTION 3-3
SCALE: ½" = 1'-0"
SECTION 4-4
SCALE: ½" = 1'-0"
SECTION 5-5
SCALE: ½" = 1'-0"
SECTION 6-6
SCALE: ½" = 1'-0"
SECTION 7-7
SCALE: ½" = 1'-0"
SECTION 8-8
SCALE: ½" = 1'-0"
SECTION 9-9
SCALE: ½" = 1'-0"
EXISTING TRUSS END SUPPORT
SCALE: 1" = 1'-0"
DETAIL #A
SCALE: 1" = 1'-0"
NEW TRUSS END SUPPORT TYPICAL DETAILS
SCALE: 1" = 1'-0"
END VIEW
SCALE: 1" = 1'-0"
TRUSS NO. 1
SCALE: 1/4" = 1'-0"
CONSISTS OF 2 VERTICAL TRUSSES AS SHOWN
DETAIL #B
SCALE: 1" = 1'-0"
BASE PLATE DETAILS
SCALE: 1" = 1'-0"
ELEVATION OF NEW AND EXISTING TRUSS BENT
SCALE: 1/4" = 1'-0"
NOTES:
1. ALL JOINTS TO BE FULL MOMENT CONNECTION
2. ANCHOR BOLTS TO BE TYPE #B
3. DETAILS OF EXISTING TRUSS BENT SHOWN. DETAILS OF NEW TRUSS BENT SIMILAR, HEIGHT TO SUIT AS REQUIRED
TYPICAL TRUSS BENT FOUNDATION DETAIL
SCALE: 1/2" = 1'-0"
TOTAL NO REQUIRED = 4 PIERS AND FOUNDATIONS

The Contractor shall verify all dimensions and report any inconsistencies to the Architect before proceeding with the work. Drawings as instruments of service are the property of the Architect and are protected by copyright. Do not scale drawings.

No.	Revision / Version	Date
1	ISSUED PACKAGE 'B'	JUNE 23, 2004
2	REVISION 1	JULY 16, 2004

Plotted: JUNE, 2004
Plot scale: 1:1
File Name: S-6b

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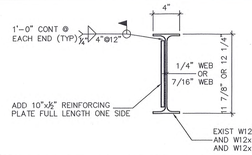
ARCHITECTS INC

ONTARIO NORTHLAND TRANSPORTATION COMMISION
NORTH BAY SHOP EXTENSION

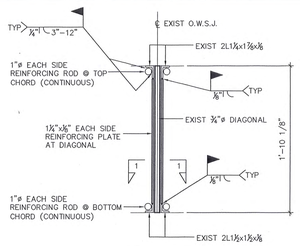
PAINT SHOP - ELEVATIONS
BENT TRUSS DETAILS

Drawn by: JJN/CWT
Checked by: AA/CL
Project No.: 04092
Date: JUNE 23, 2004
Scale: AS NOTED
Drawing No.: S-6b



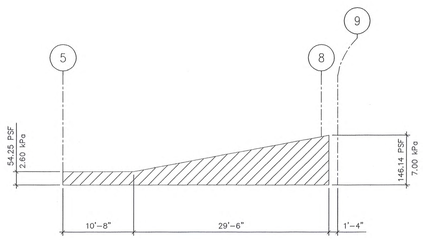
EXISTING BEAMS BETWEEN LINE c/7, c/8, d/7, & d/8 AREA

SCALE: 1½" = 1'–0"



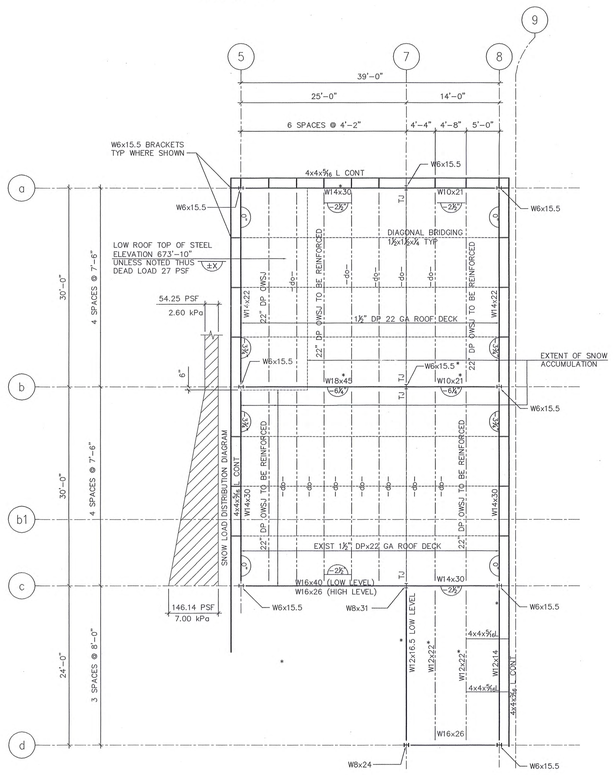
SECTION A–A

SCALE: 1½" = 1'–0"



SNOW LOAD DISTRIBUTION DIAGRAM

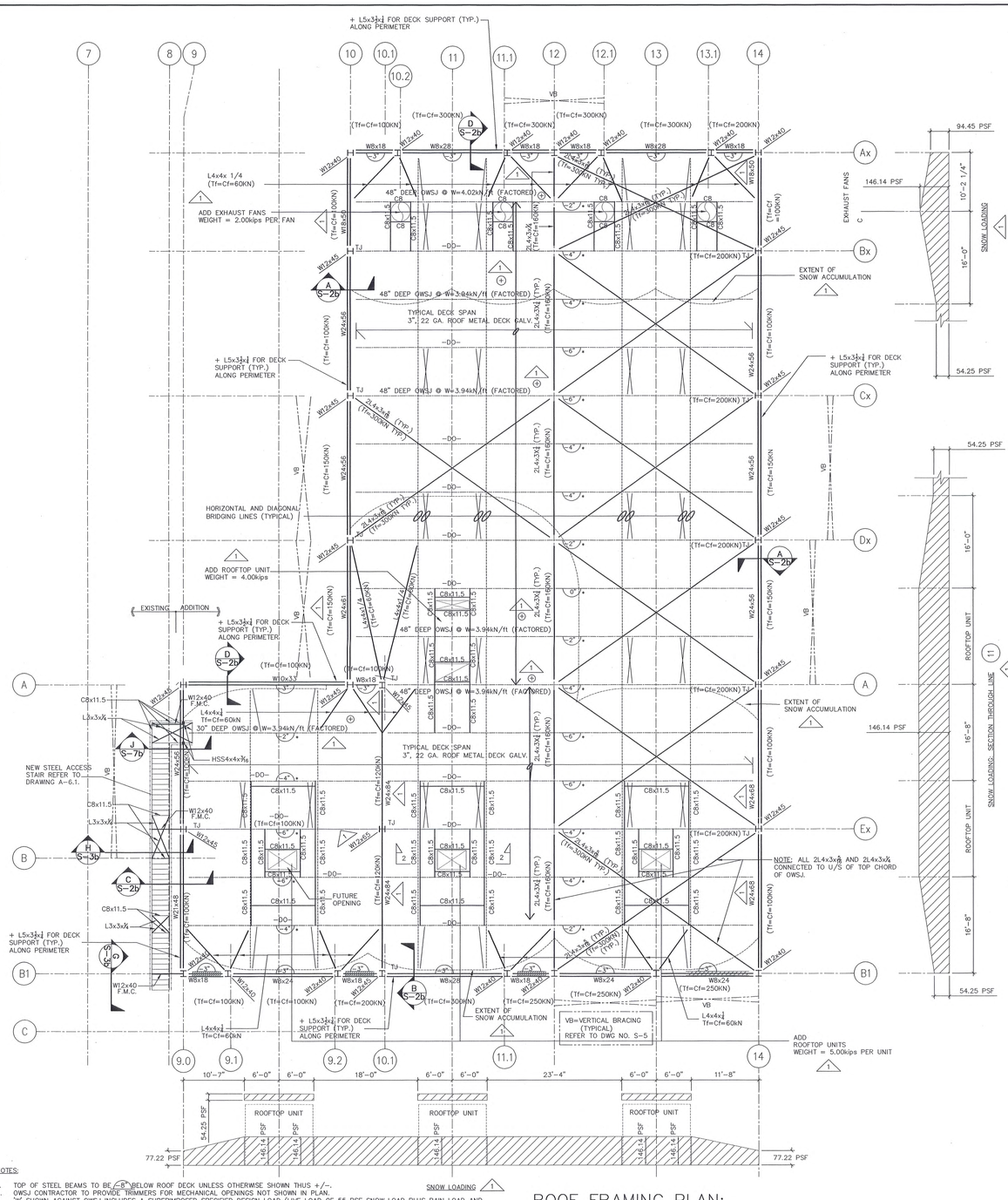
SCALE: ⅛" = 1'–0"



EXISTING LOWER ROOF PLAN

SCALE: ⅛" = 1'–0"

NOTES:
1) ALL STEEL WORK EXISTING UNLESS NOTED OTHERWISE
2) * EXISTING BEAMS AND COLUMNS TO BE REINFORCED



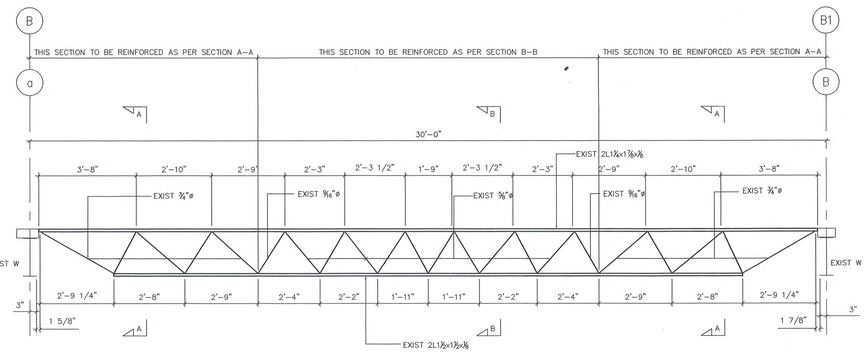
NOTES:

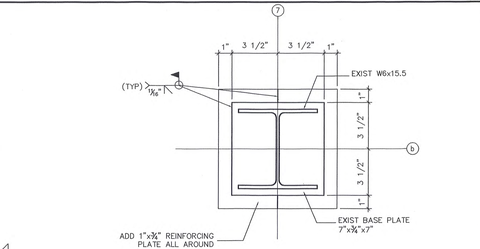
1. TOP OF STEEL BEAMS TO BE –6" BELOW ROOF DECK UNLESS OTHERWISE SHOWN THUS +/–.
2. OWSJ CONTRACTOR TO PROVIDE TRIMMERS FOR MECHANICAL OPENINGS NOT SHOWN IN PLAN.
3. 'W' SHOWN AGAINST OWSJ INCLUDES A SUPERIMPOSED SPECIFIED DESIGN LOAD (LIVE LOAD OF 55 PSF SNOW LOAD PLUS RAIN LOAD AND DEAD LOAD OF 20 PSF EXCLUDING JOIST WEIGHT). O.W.S.J. SUPPLIER TO ADD:
   a) EXHAUST FAN WEIGHT,
   b) ROOFTOP UNIT WEIGHT &
   c) SNOW ACCUMULATION OVER AND ABOVE 54.25 PSF, AS SHOWN ON ROOF PLAN
4. ALL STRUCTURAL STEEL JOINTS SHALL DEVELOP FULL STRENGTH OF MEMBER U/N OTHERWISE.
5. ALL STRUCTURAL STEEL INCLUDING OWSJ SHOP DRAWINGS AND DESIGN TO BEAR THE STAMP OF A PROFESSIONAL ENGINEER REGISTERED IN ONTARIO.
6. MAXIMUM ROOF OWSJ DEFLECTION TO BE SPAN/240.
7. BRIDGING LOCATIONS SHOWN TO BE MINIMUM ONLY AND SHALL CONFORM TO THE REQUIREMENTS OF THE ONTARIO BUILDING CODE
8. SLOPE DENOTES SLOPING MEMBER.
9. 3" STEEL ROOF DECK (WITH 0.036" BASE STEEL THICKNESS), MINIMUM 3 CONTINUOUS SPANS. SUBMIT ROOF DECK TYPE FOR REVIEW.
10. SECURE METAL DECK TO ALL STEEL SUPPORTS WITH ¾" ø PUDDLE WELDS @ 6" O/C AND CRIMP DECK SIDE LAPS @ 12" O/C FOR 6'–0" AROUND PERIMETER OF BUILDING.
11. SECURE METAL DECK TO ALL STEEL SUPPORTS INCLUDING ROOF OPENINGS AND MECHANICAL ROOF TOP SUPPORT STEEL WITH ¾"ø PUDDLE WELDS @ 12" O/C AND CRIMP DECK SIDE LAPS @ 24" O/C
12. CB DENOTES C8x11.5 UNLESS NOTED OTHERWISE
13. SEE A–3.0b FOR ROOF DECK ELEVATIONS
14. FOR ROOFTOP UNIT LOADS REFER TO MECHANICAL DRAWINGS
15. COORDINATE LOCATION AND SIZE OF ROOF OPENINGS WITH MAKE–UP AIR UNIT SUPPLIER AND HVAC SUPPLIER PRIOR TO FABRICATION
16. 'x' * REFERS TO CAMBER ON OWSJ. CAMBER TO BE AT CENTRELINE OF OWSJ.

SNOW LOADING

ROOF FRAMING PLAN:

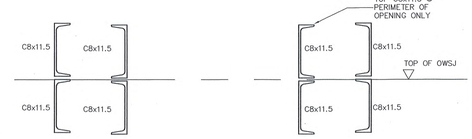
SCALE: 1/8" = 1'–0"





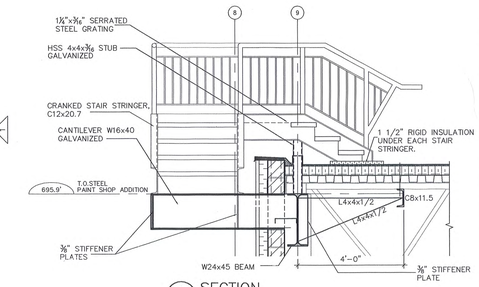
EXISTING COLUMN BASE PLATE REINFORCING DETAILS @ LINE 7/b

SCALE: 3" = 1'–0"



SECTION 2–2 (TYPICAL STEEL SUPPORT AT ROOF HVAC OPENING) AND MUA UNIT

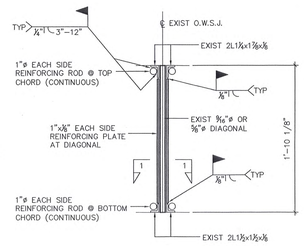
SCALE: 1½" = 1'–0"



J S–7b SECTION

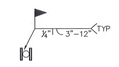
SCALE: 1" = 1'–0"

NOTE: ALL EXTERIOR STEEL TO BE GALVANIZED



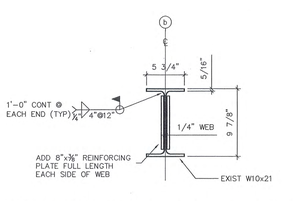
SECTION B–B

SCALE: 1½" = 1'–0"



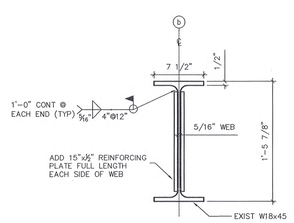
SECTION 1–1

SCALE: 1½" = 1'–0"



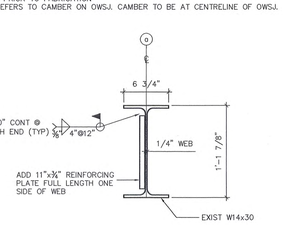
EXISTING BEAM @ LINE b/7–8: REINFORCING DETAIL

SCALE: 1½" = 1'–0"



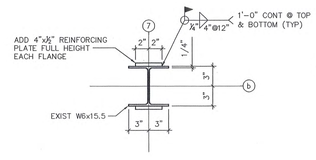
EXISTING BEAM @ LINE b/5–7 REINFORCING DETAIL

SCALE: 1½" = 1'–0"



EXISTING BEAM @ LINE a/5–7: REINFORCING DETAIL

SCALE: 1½" = 1'–0"



EXISTING COLUMN @ b–7: REINFORCING DETAIL

SCALE: 1½" = 1'–0"

ELEVATION OF EXIST 22" DEEP O.W.S.J. TO BE REINFORCED

SCALE ½" = 1'–0"

NOTE: EXISTING OPEN WEB STEEL JOIST BRIDGING SYSTEMS TO BE FIELD ADJUSTED TO SUIT THE REINFORCING DETAILS

No.:	Revision / Version:	Date:

No.:	Revision / Version:	Date:
1	ISSUED PACKAGE 'B'	JUNE 23, 2004
2	REVISION	JULY 16, 2004

Plotted: JUNE, 2004
Plot scale: 1:1
File Name: S–7b

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Polestar CM INC

ONTARIO NORTHLAND TRANSPORTATION COMMISION
NORTH BAY SHOP EXTENSION
PAINT SHOP BUILDING ADDITION
ROOF JOIST REINFORCEMENT

Drawn by: JJN/CWT
Checked by: AA/CL
Project No.: 04092
Date: JUNE 23, 2004
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Issued – October 2018
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DESIGNATED SUBSTANCES SURVEY REPORT

ONTARIO NORTHLAND REMANUFACTURING AND REPAIR CENTRE

916 MCINTYRE STREET EAST
NORTH BAY, ONTARIO

Prepared and Revised by:

THOMAS CONTRACTING

Project No. TC-201434

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ENVIRONMENTAL MANAGEMENT EXPERTS

Reference: TC - 201434 October 31, 2018

ONTARIO NORTHLAND
555 Oak Street East
North Bay, ON
P1B 8L3

ATTENTION: Ed Rowley – Manager Facilities and Shop Equipment

Dear Sirs:

DESIGNATED SUBSTANCES SURVEY
Ontario Northland Remanufacturing and Repair Centre
916 McIntyre Street East
North Bay, Ontario

1.0 INTRODUCTION

Thomas Contracting was commissioned by the Ontario Northland Transportation Commission (ONTC) to complete a designated substances survey (DSS) of their Remanufacturing and Repair Centre located at 916 McIntyre Street East, North Bay, Ontario. The objective of this study was to determine whether any designated substances, as defined under the Ontario Occupational Health and Safety Act, were present within the Centre noted above prior to possible up-coming renovation work. This survey does not include and was not intended to cover any investigation of subsurface hazardous materials / designated substances.

Eleven substances have been "designated" in Ontario - acrylonitrile, arsenic, asbestos, benzene, coke oven emissions, ethylene oxide, isocyanates, lead, mercury, silica and vinyl chloride. Mould and PCB containing materials are also harmful to the environment if handled improperly and therefore are included in our study.

The Ontario Occupational Health and Safety Act requires that a list of all designated substances at a project site be provided to all bidders at the tendering stage. A Designated Substance Survey (DSS) identifies the designated substances present, their locations and concentrations. This information allows contractors involved in demolition or renovation activities to take appropriate steps to control exposure of workers and the general public to the designated substances that are present.

This survey satisfies requirements of the Occupational Health and Safety Act with regards to the presence / absence of designated substances identified within this report.

The study area, methodology and findings are outlined in the sections, which follow.

2.0 STUDY AREA

The study area under this assessment consisted of five (5) separate buildings (see photos 1 to 5 in Appendix 'A') located on the subject property as follows.

1. Power House
2. Grit and Paint Shop
3. Diesel Shop
4. Car Shop
5. Wheel Shop

3.0 STUDY METHODOLOGY

During October 2018, Thomas Contracting personnel conducted the fieldwork portion of the DSS assessment of the buildings noted above, focusing primarily on asbestos-containing materials, lead painted surfaces and mercury containing materials (thermostatic controls and fluorescent light tubes).

Access to suspected designated substances was made following industry-standard, testing protocols. All collected samples were subsequently labeled and the retrieval location(s) identified. All collected samples of suspected asbestos-containing material and lead-containing paint were forwarded to our laboratory subconsultant for positive identification of asbestos fibres and lead content levels.

4.0 ASBESTOS-CONTAINING MATERIALS (ACM's)

The DSS resulted in the retrieval of one hundred and fifty-three (153) representative samples of potential asbestos-containing material (90 of which required testing under Ont. Reg. 278/05). The potential ACM sampled consisted of pipewrap insulation, elbow/fitting insulation, jacket insulation, vinyl flooring, plaster, drywall mud (compound), ceiling tile, caulking and sprayed applied insulation. All samples were submitted to our laboratory sub-consultant (Lex Scientific Inc., Ontario) for PLM bulk analysis with photos of each sample material and laboratory transcripts of the findings presented in Appendix 'A'.

A summary of sample locations and type of building material is presented in Table 1 (below) with the raw laboratory results and photos given in Appendix 'A'. Locations (including floor plans) containing ACM's representative of the obtained bulk samples are shown in the "Building / Room DSS" table in Appendix 'D'.

Table 1
Summary of Asbestos Bulk Sample Results

Sample No.	***Photo No.*** *(Appendix 'A')*	***Location***	***Material***	***Asbestos Content***
ONR – 1	***6***	***Power House***	***Elbow / Fitting Insulation on Cold Water Supply lines***	***80 % Chrysotile***
ONR – 2	***7***	***Power House***	***Pipe Insulation on Condensate lines***	***80 % Amosite***
ONR – 3	***8***	***Power House***	***Exhaust / Breeching Insulation on Boilers***	***50 % Chrysotile***
ONR – 6	***9***	***Power House Mezzanine***	***Jacket Insulation on Deaerator Tank***	***80 % Chrysotile***
ONR – 7	***10***	***Wheel Shop Electrical Room***	***Pipe Insulation (anti-sweat) on Cold Water Lines***	***1 % Chrysotile***
ONR – 8	***11***	***Wheel Shop Electrical Room***	***Pipe Insulation on High Pressure Steam lines***	***90 % Chrysotile***
ONR – 9	***-***	***Wheel Shop Electrical Room***	***Pipe Insulation on Heating lines***	***80 % Chrysotile***
ONR – 12	*12*	*Wheel Shop Room 2*	*2' x 4' Drop Ceiling Tiles*	*None Detected*
ONR – 12a	*-*	*Wheel Shop Room 2*	*2' x 4' Drop Ceiling Tiles*	*None Detected*
ONR – 12b	*-*	*Wheel Shop Room 2*	*2' x 4' Drop Ceiling Tiles*	*None Detected*
ONR – 13	***13***	***Wheel Shop Room 3***	***Elbow / Clean-out Insulation on Rain Leader lines***	***80 % Chrysotile***
ONR – 14	*-*	*Wheel Shop Room 4*	*Wall Plaster*	*None Detected*
ONR – 14a	*-*	*Wheel Shop Room 4*	*Wall Plaster*	*None Detected*
ONR – 14b	*-*	*Wheel Shop Room 4*	*Wall Plaster*	*None Detected*
ONR – 15	*14*	*Wheel Shop Room 5*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 15a	*-*	*Wheel Shop Room 5*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 15b	*-*	*Wheel Shop Room 5*	*12" x 12" Vinyl Floor Tile*	*None Detected*

Sample No.	***Photo No.*** *(Appendix 'A')*	***Location***	***Material***	***Asbestos Content***
ONR – 16	*15*	*Wheel Shop Room 5*	*2' x 4' Drop Ceiling Tiles*	*None Detected*
ONR – 16a	*-*	*Wheel Shop Room 5*	*2' x 4' Drop Ceiling Tiles*	*None Detected*
ONR – 16b	*-*	*Wheel Shop Room 5*	*2' x 4' Drop Ceiling Tiles*	*None Detected*
ONR – 17	*-*	*Wheel Shop Room 6*	*Pipe Insulation (anti-sweat) on Cold Water lines*	*None Detected*
ONR – 17a	*-*	*Wheel Shop Room 6*	*Pipe Insulation (anti-sweat) on Cold Water lines*	*None Detected*
ONR – 17b	*-*	*Wheel Shop Room 6*	*Pipe Insulation (anti-sweat) on Cold Water lines*	*None Detected*
ONR – 18	***-***	***Wheel Shop Room 7***	***Pipe Insulation on Domestic Hot Water lines***	***70 % Chrysotile***
ONR – 20	***16***	***Wheel Shop***	***Exterior Window / Door Caulking***	***20 % Chrysotile***
ONR – 22	***-***	***"Old" Paint Shop Room 1***	***Elbow / Fitting Insulation on Low Pressure Steam lines***	***80 % Chrysotile***
ONR – 24	*-*	*"Old" Paint Shop Room 4*	*Drywall Joint Compound on walls*	*None Detected*
ONR – 24a	*-*	*"Old" Paint Shop Room 4*	*Drywall Joint Compound on walls*	*None Detected*
ONR – 24b	*-*	*"Old" Paint Shop Room 4*	*Drywall Joint Compound on walls*	*None Detected*
ONR – 25	***17***	***"Old" Paint Shop Room 5***	***12" x 12" Vinyl Floor Tile***	***1 % Chrysotile***
ONR – 27	***18***	***Diesel Shop Tunnel***	***Pipe Insulation on Steam lines (white mag-block)***	***80 % Chrysotile***
ONR – 28	***19***	***Diesel Shop Tunnel***	***Tar Paper Wrap on Steam lines***	***10 % Chrysotile***
ONR – 29	***20***	***Diesel Shop Tunnel***	***Elbow / Fitting Insulation on Cold water lines***	***45 % Chrysotile 45 % Amosite***
ONR – 30	***21***	***Diesel Shop Tunnel***	***Pipe Insulation (anti-sweat) on Cold water lines***	***1 % Chrysotile***
ONR – 31	***22***	***Diesel Shop Tunnel***	***Elbow / Fitting Insulation on Steam lines***	***10 % Chrysotile 80 % Amosite***
ONR – 32	***23***	***Diesel Shop Room # 1***	***Pipe Insulation (anti-sweat) on Heating lines***	***60 % Chrysotile***
ONR – 33	***24***	***Diesel Shop Room # 3***	***Pipe Insulation on Cold water lines (anti-sweat / tar paper)***	***7 % Chrysotile***
ONR – 35	***25***	***Diesel Shop Room # 6***	***Pipe Insulation (air-cell) on Steam lines***	***60 % Chrysotile***

Sample No.	***Photo No.*** *(Appendix 'A')*	***Location***	***Material***	***Asbestos Content***
ONR – 36	*43a*	*Diesel Shop Room # 6*	*Sprayed Insulation on ceiling deck*	*None Detected*
ONR – 36a	*-*	*Diesel Shop Room # 6*	*Sprayed Insulation on ceiling deck*	*None Detected*
ONR – 36b	*-*	*Diesel Shop Room # 6*	*Sprayed Insulation on ceiling deck*	*None Detected*
ONR – 38	***-***	***Diesel Shop Room # 5***	***Pipe Insulation on Heating lines (anti-sweat)***	***80 % Chrysotile***
ONR – 40	***26***	***Diesel Shop Room # 4***	***Elbow / Fitting Insulation on Cold water lines***	***80 % Chrysotile***
ONR – 41	***27***	***Diesel Shop East Side***	***Elbow / Fitting Insulation on Heating lines***	***80 % Chrysotile***
ONR – 42	***27***	***Diesel Shop East Side***	***Pipe Insulation on Heating lines (anti-sweat)***	***80 % Chrysotile***
ONR – 43	***27***	***Diesel Shop East Side***	***Pipe Insulation on Heating lines (anti-sweat)***	***50 % Chrysotile***
ONR – 44	*28*	*Diesel Shop Room # 10*	*Plaster on wall*	*None Detected*
ONR – 44a	*-*	*Diesel Shop Room # 10*	*Plaster on wall*	*None Detected*
ONR – 44b	*-*	*Diesel Shop Room # 10*	*Plaster on wall*	*None Detected*
ONR – 45	*29*	*Diesel Shop Room # 10*	*12" x 12" Vinyl Floor Tile (beige)*	*None Detected*
ONR – 45a	*-*	*Diesel Shop Room # 10*	*12" x 12" Vinyl Floor Tile (beige)*	*None Detected*
ONR – 45b	*-*	*Diesel Shop Room # 10*	*12" x 12" Vinyl Floor Tile (beige)*	*None Detected*
ONR – 46	*30*	*Diesel Shop Room # 10*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 46a	*-*	*Diesel Shop Room # 10*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 46b	*-*	*Diesel Shop Room # 10*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 48	*31*	*Diesel Shop Room # 12*	*Roll Vinyl Flooring*	*None Detected*
ONR – 48a	*-*	*Diesel Shop Room # 12*	*Roll Vinyl Flooring*	*None Detected*
ONR – 48b	*-*	*Diesel Shop Room # 12*	*Roll Vinyl Flooring*	*None Detected*
ONR – 50	***32***	***Diesel Shop Room # 17***	***Pipe Insulation on Heating lines (anti-sweat)***	***70 % Chrysotile***
ONR – 51	***-***	***Diesel Shop Pit Area***	***Pipe Insulation on Steam lines (anti-sweat)***	***80 % Chrysotile***
ONR – 52	***-***	***Diesel Shop Pit Area***	***Pipe Insulation on Cold water lines (anti-sweat / tar paper)***	***15 % Chrysotile***

Sample No.	***Photo No.*** *(Appendix 'A')*	***Location***	***Material***	***Asbestos Content***
ONR – 53	***-***	***Diesel Shop Pit Area***	***Pipe Insulation on Hot water lines (anti-sweat)***	***60 % Chrysotile***
ONR – 54	*-*	*Diesel Shop 2005 Addition*	*Elbow / Fitting Insulation on Piping*	*None Detected*
ONR – 54a	*-*	*Diesel Shop 2005 Addition*	*Elbow / Fitting Insulation on Piping*	*None Detected*
ONR – 54b	*-*	*Diesel Shop 2005 Addition*	*Elbow / Fitting Insulation on Piping*	*None Detected*
ONR – 57	*33*	*Diesel Shop Room # 102*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 57a	*-*	*Diesel Shop Room # 102*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 57b	*-*	*Diesel Shop Room # 102*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 58	*34*	*Diesel Shop Room # 103*	*Pipe Insulation (tar paper) on Rain Leader lines*	*< 0.5% Chrysotile Deem non-asbestos*
ONR – 59	*35*	*Diesel Shop Room # 104*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 59a	*-*	*Diesel Shop Room # 104*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 59b	*-*	*Diesel Shop Room # 104*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 60	*36*	*Diesel Shop Room # 104*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 60a	*-*	*Diesel Shop Room # 104*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 60b	*-*	*Diesel Shop Room # 104*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 61	*37*	*Diesel Shop Room # 201*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 61a	*-*	*Diesel Shop Room # 201*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 61b	*37*	*Diesel Shop Room # 201*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 63	*38*	*Diesel Shop Room # 202*	*Drywall Joint Compound*	*None Detected*
ONR – 63a	*-*	*Diesel Shop Room # 202*	*Drywall Joint Compound*	*None Detected*
ONR – 63b	*-*	*Diesel Shop Room # 202*	*Drywall Joint Compound*	*None Detected*
ONR – 64	*39*	*Diesel Shop Room # 202*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 64a	*-*	*Diesel Shop Room # 202*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 64b	*-*	*Diesel Shop Room # 202*	*2' x 4' Drop Ceiling Tile*	*None Detected*
ONR – 65	***40***	***Car Shop Room # 200***	***Elbow / Fitting Insulation on Piping***	***65 % Chrysotile***

Sample No.	***Photo No.*** *(Appendix 'A')*	***Location***	***Material***	***Asbestos Content***
ONR – 70	*41*	*Car Shop Room D*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 70a	*-*	*Car Shop Room D*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 70b	*-*	*Car Shop Room D*	*12" x 12" Vinyl Floor Tile*	*None Detected*
ONR – 71	***42***	***Car Shop Room G***	***12" x 12" Vinyl Floor Tile***	***25 % Chrysotile***
ONR – 72	***43***	***Diesel Shop***	***Caulking Exterior Window and Door***	***8 % Chrysotile***
-	***43b***	***Car Shop Room 117***	***Asbestos Material(s) Storage Cabinet***	***Asbestos Waste***
-	***43c***	***Diesel Shop Service Pits***	***"Transite" panels on upper part of exhaust hoods for locomotives***	***8 % Chrysotile***

4.1 Asbestos Findings

Based on our site assessment and laboratory results, the following general asbestos findings are presented in table 2 (below) with a further detailed "Building / Room DSS" table of our findings presented in Appendix 'D'.

Table 2
Summary of Asbestos Findings

Building	***Asbestos Findings***
Power House	• *All thermal system insulation (Pipewrap, Elbows/Fittings, Headers, Breeching/Exhaust, Jacket Insulation and possible Refractory Brick) within Rooms 100 & 200 (boiler area & mezzanine) is asbestos-containing.* • *All thermal system insulation (Pipewrap, Elbow/Fitting Insulation) within Room 102 (electrical area) is fibreglass.* • *All Exterior Window and Door Caulking is asbestos-containing.* • *Minor repair work to existing ACM's is recommended.*
Wheel Shop	• *All thermal system insulation (Pipewrap, Elbow/Fitting and Header Insulation) is asbestos-containing.* • *All Exterior Window and Door Caulking is asbestos-containing.* • *Minor repair work to existing ACM's is recommended.* • *Vinyl Floor Tiles, Drop Ceiling Tiles and Wall / Ceiling Plaster is non-asbestos.*
"Old" Paint & Grit Shop	• *All Elbow/Fitting and Jacket Insulation is asbestos-containing.* • *Vinyl Floor Tiles are asbestos-containing.* • *Drywall Joint Compound is non-asbestos.* • *All Pipewrap and Ductwork Insulation is fiberglass.*

"New" Paint Shop 2005	• *Nothing found or suspected.*
Diesel Shop (Original Area)	• *All thermal system insulation (Pipewrap, Elbows/Fittings, Headers and Jacket Insulation) is asbestos-containing.* • *All Sprayed Applied Insulation, Wall & Ceiling Plaster, Vinyl Flooring, Drywall Joint Compound and Ceiling Tiles (including sub-ceiling 12" x 12" tiles) are non-asbestos or fibreglass.* • *"Transite" panels on upper part of exhaust hoods for locomotives are asbestos-containing (see photo # 43c in Appendix A).* • *All Exterior Window and Door Caulking is asbestos-containing.* • *Minor clean-up work to existing ACM's is recommended within Room 4.* • *Minor repair work to existing ACM's is recommended.*
Diesel Shop (Addition Area)	• *Nothing found or suspected.* • *All thermal system insulation (Pipewrap, Elbows/Fittings, Headers and Jacket Insulation) is non-asbestos or fibreglass.*
Car Shop	• *All Elbow/Fitting Insulation is asbestos-containing.* • *All Pipewrap and Ductwork Insulation is fiberglass.* • *Vinyl Flooring, Drop Ceiling Tiles and Drywall Joint Compound is non-asbestos.*
"New" Car Shop Office Area	• *Nothing found or suspected.*

Should future activities (demolition/renovation) occur within the buildings noted above which would disturb the asbestos-containing noted in this report, Thomas Contracting recommends that the affected material(s) be removed prior to these activities. This work must be carried out as outlined in R.R.O 2005, Reg. 278, Regulation respecting Asbestos on Construction Projects and in Building and Repair Operations.

5.0 LEAD-CONTAINING BUILDING MATERIALS

The survey resulted in the retrieval of twenty (20) representative samples of paint observed within the five buildings under this DSS. These paint samples were submitted to our laboratory sub-consultant (Caduceon Environmental Laboratories, Ottawa, Ontario) for follow-up lead analysis. Photo of the sampled paint(s) and the laboratory transcript of the findings are presented in Appendix 'B'.

A summary of sample location, surface paint colour and lead content is presented in Table 3 (below).

Table 3
Summary of Paint Sample Result

Sample No.	***Photo No.*** *(Appendix 'B')*	***Location***	***Sample Description***	***Lead Content (µg/g)***
ONR – 4	*44*	*Power House*	*Wall Paint (surface colour = green)*	*5830*
ONR – 5	*45*		*Ceiling Paint (surface colour = light green)*	*1010*

Sample No.	***Photo No.*** *(Appendix 'B')*	***Location***	***Sample Description***	***Lead Content (µg/g)***
ONR – 10	*46*	*Wheel Shop*	*Wall Paint in Room # 1 (surface colour = off white)*	*13800*
ONR – 11	*47*		*Wall & Ceiling Paint in Electrical Room (surface colour = yellow)*	*14200*
ONR – 19	*48*		*Wall Paint in Room # 7 (surface colour = beige)*	*6380*
ONR – 21	*49*		*Ceiling Paint in Room # 7 (surface colour = beige)*	*72*
ONR – 23	*50*	*Paint & Girt Shop "Old" Section*	*Wall Paint in Stairwell # 1 (surface colour = light beige)*	*214*
ONR – 26	*51*		*Wall Paint in Corridor # 9 (surface colour = white)*	*34*
ONR – 34	*52*	*Diesel Shop "Old" Section*	*Wall & Ceiling Paint in Room # 3 (surface colour = beige)*	*2590*
ONR – 37	*53*		*Wall Paint in Room # 6 (surface colour = green)*	*7990*
ONR – 39	*54*		*Ceiling Paint in Room # 5 (surface colour = dark green)*	*7750*
ONR – 47	*55*		*Structural Steel Paint in Main Shop (surface colour = beige)*	*13000*
ONR – 49	*56*		*Wall Paint in Room # 16 (surface colour = beige)*	*2530*
ONR – 55	*57*	*Diesel Shop Addition*	*Wall Paint throughout Shop (surface colour = beige)*	*110*
ONR – 56	*58*	*Diesel Shop "Old" Section*	*Wall & Ceiling Paint in Room # 100 (surface colour = white)*	*2880*
ONR – 62	*59*		*Wall Paint in Room # 201 (surface colour = green)*	*8010*
ONR – 66	*60*	*Car Shop*	*Ceiling Paint in Room # 200 (surface colour = beige)*	*10700*
ONR – 67	*61*		*Wall Paint in Room # 200 (surface colour = green)*	*5180*
ONR – 68	*-*		*Wall Paint in Mech. Room 'A' (surface colour = beige)*	*3950*
ONR – 69	*62*		*Wall Paint in Mech. Room 'A' (surface colour = light beige)*	*380*

5.1 Lead Paint Definition

In absence of a Canadian regulated definition of what constitutes a lead-based paint, the "Lead Guideline for Construction, Renovation, Maintenance or Repair", issued in October 2014 by the Environmental Abatement Council of Ontario (EACO) was followed.

Term	Definition	Guideline Requirements
Low-level lead paints and surface coatings	*Paint or surface coating containing less than or equal to 0.1% lead by dry weight (1000 µg/g, mg/kg, ppm).*	*If these materials (and the surfaces to which they are applied) are disturbed in a non-aggressive manner, performed using normal dust control procedures and are completed so that the TWA for PNOS is not exceeded, then worker protection from the inhalation of lead is not required. General health and safety precautions must still be implemented, which may include, in part, prohibiting eating, drinking, smoking and chewing in the work area, implementing dust suppression techniques and washing facilities for workers to wash hands and face.*
Lead-containing paints and surface coatings	*Paint or surface coating containing greater than 0.1% lead by dry weight (1000 µg/g, mg/kg, ppm) and less than 0.5% lead by dry weight (5000 µg/g, mg/kg, ppm).*	*Tasks performed that disturb these materials must be completed in accordance with the Classifications of Work Operations (in Section 7) and corresponding procedures (in Section 8). Alternatively, a hygiene or exposure assessment can be performed to determine procedures that are required.*
Lead-based paints and surface coatings	*Paint or surface coating containing equal to or greater than 0.5% lead by dry weight (5000 µg/g, mg/kg, ppm).*	*Tasks must always be completed in accordance with the procedures listed in the Classifications of Work Operations (in Section 7) and corresponding procedures (in Section 8). Alternatively, a hygiene or exposure assessment can be performed to determine procedures that are required.*

5.2 Lead Findings

Based on our site assessment and laboratory results, the following general lead findings are presented in Table 4 (below) with a further detailed "Building / Room DSS" table of our findings presented in Appendix 'D'.

Table 4
Summary of Lead Findings

Building	Lead Findings
Power House	• *Wall, ceiling and structural paint observed within the building is classed as Lead-containing paint.*
Wheel Shop	• *Wall, ceiling and structural paint observed within the building is classed as Lead-based paint.*
"Old" Paint & Grit Shop	• *Wall, ceiling and structural paint observed within the building is classed as Low-level lead paint.*
"New" Paint Shop 2005	• *Wall, ceiling and structural paint observed within the building is classed as Low-level lead paint.*

Diesel Shop (Original Area)	• *Wall, ceiling and structural paint observed within the building is classed as both Lead-containing and Lead-based paint.* • *Exterior window / door flashing and window sill plate caulking (see photos 63 & 64 in Appendix B) are both classed as Lead-based materials.*
Diesel Shop (Addition Area)	• *Wall, ceiling and structural paint observed within the building is classed as Low-level lead paint.* • *Exterior window / door flashing and window sill plate caulking (see photos 63 & 64 in Appendix B) are both classed as Lead-based materials.*
Car Shop	• *Wall, ceiling and structural paint observed within the building is classed as Low-level lead paint.* • *Lead-acid batteries storage in Room 117 (see photo 64a in Appendix B).*
"New" Car Shop Office Area	• *Wall, ceiling and structural paint observed within the building is classed as Low-level lead paint.*

Should future activities (demolition/renovation) occur within the buildings noted above which would disturb the lead materials noted in this report, Thomas Contracting recommends that the affected material(s) be removed prior to these activities. This work should be carried out as outlined in "Lead Guideline for Construction, Renovation, Maintenance or Repair", issued in October 2014 by the Environmental Abatement Council of Ontario (EACO).

5.3 Lead Pipes / Solder

Although not sampled due to inflicting damage / leaks to the existing plumbing within all five buildings, it is Thomas Contracting opinion based on visual inspection that lead may also be present as a component in pipes and in solder used in pipe fittings.

5.4 Lead Precautions

Prior to any renovations or demolition activities that may disturb materials identified to contain lead of any concentration, precautions must be taken as described in Ontario Regulation 213/91 as amended, Regulations for Construction Projects - made under the Occupational Health and Safety Act. This may include conducting an assessment of the potential exposure of airborne lead by a qualified person.

Exposure to lead-containing materials is regulated under the Revised Regulation of Ontario 843/90 as amended, Regulation respecting Lead - made under the Occupational Health and Safety Act including disposal of such material Ontario Regulation 347/90 Schedule 4 – Leachate Quality Criteria (Acceptable Lead Concentrations of < 5.0 mg/l). Care must be taken to prevent lead-containing particles from becoming airborne during the disturbance of lead-containing surfaces (i.e., during renovation or demolition projects). All lead abatement work must follow procedures outlined in both the "Guideline for Lead on Construction Projects", issued in September 2004 by the Occupational Health and Safety branch of the Ministry of Labour and the "Lead Guideline for Construction, Renovation, Maintenance or Repair", issued in October 2014 by the Environmental Abatement Council of Ontario (EACO).

6.0 MERCURY

Mercury is a naturally occurring metal. At room temperature it is a shiny, silver coloured odourless liquid. When heated it becomes a colourless, odourless gas. Mercury can be found in fluorescent light tubes, electrical switches, thermostats, thermometers, dental fillings, certain batteries and in some manufacturing processes.

The nervous system is very sensitive to all forms of mercury; however, vapour is especially harmful as it directly reaches the brain. Exposure to high levels of mercury may permanently damage the brain, kidneys and a developing fetus. Short-term exposure may cause lung damage, nausea, vomiting, skin rashes, and eye irritation.

6.1 Fluorescent Light Tubes Findings

Based on our site assessment the following general mercury findings are given in table 5 (below) with a further detailed "Building / Room DSS" table of our findings presented in Appendix 'D'.

Table 5
Summary of Fluorescent Light Tubes Findings

Building	***Mercury Findings***
Power House	• *Fluorescent Tubes*
Wheel Shop	• *Fluorescent Tubes*
"Old" Paint & Grit Shop	• *Fluorescent Tubes* • *Wall Thermostat*
"New" Paint Shop	• *Fluorescent Tubes*
Diesel Shop (Original Area)	• *Fluorescent Tubes* • *Wall Thermostat*
Diesel Shop (Addition Area)	• *Fluorescent Tubes* • *Wall Thermostat*
Car Shop	• *Fluorescent Tubes* • *Wall Thermostat*
"New" Car Shop Office Area	• *Fluorescent Tubes*

6.2 Thermostatic Control Switch Findings

Wall mounted thermostatic control switches, which contains small amounts of liquid mercury, were observed within all five buildings. Observed locations are detailed in our "Building / Room DSS" table of our findings presented in Appendix 'D'.

6.3 General Notes

Prior to any renovations or demolition activities that may disturb materials identified or suspected to contain mercury of any concentration, precautions must be taken to prevent mercury vapours from becoming airborne or liquid mercury contaminating the surrounding environment. Exposure to airborne mercury is regulated under the Revised Regulation of Ontario 844/90 as amended, Regulation respecting Mercury - made under the Occupational Health and Safety Act.

Mercury waste must be handled and disposed of according to the Revised Regulation of Ontario 347/90 as amended - made under the Environmental Protection Act, and may be subject to Leachate Criteria (Schedule 4) of this regulation. Therefore, it is our recommendation that prior to any demolition / renovation activity or if the fluorescent tubes/switches will not be utilized in the future, the fluorescent tubes and thermostatic control switches shall be disposed of properly or recycled by a licensed contractor.

7.0 SILICA

Although not sampled under this study, it is are opinion that free crystalline silica (common construction sand) may be present a component of concrete, mortar, brick, masonry, ceramics, granite, slate, stone, asphalt, etc., used in the construction of the building.

Precautions must be taken to prevent silica-containing particles from becoming airborne during the disturbance of silica-containing surfaces, such as during renovation or demolition projects. Exposure to airborne silica is regulated under the Revised Regulation of Ontario. 845/90 as amended, Regulation respecting Silica - made under the Occupational Health and Safety Act. All work being carried with silica containing materials should be conducted following the Guide Silica on Construction Projects issued September 2004 by the Occupational Health and Safety branch of the Ministry of Labour. Silica waste must be handled and disposed of according to the Revised Regulation of Ontario 347/90 as amended - made under the Environmental Protection Act.

8.0 OTHER DESIGNATED SUBSTANCES

8.1 Acrylonitrile

No source was identified. Acrylonitrile or CAN (also known as vinyl cyanide) is an explosive, flammable liquid used in the manufacture of acrylic fibres, robber-like materials and pesticide fumigants.

8.2 Arsenic

No source was identified. Arsenic is used in metallurgy for hardening copper, lead and alloys, in pigment production, in the manufacture of certain types of glass, in insecticides, fungicides and rodenticides, as a by-product in the smelting of copper ores, and as a dopant material in semiconductor manufacturing.

8.3 Benzene

No source was identified. Benzene or benzol is a colourless liquid. It is used as an intermediate in the production of styrene, phenol, cyclohexane, and other organic chemicals, and in the manufacture of detergents, pesticides, solvents, and paint removers. It is also found in gasoline.

8.4 Coke Oven Emissions

Not applicable for the surveyed site.

8.5 Ethylene Oxide

No source was identified. Ethylene oxide is a colourless gas liquefying below 12°C. It is used generally as a fumigant and sterilizing agent for medical equipment.

8.6 Isocyanates

No source was identified. Isocyanates (HDI, MDI and TDI) are used in the production of polyurethane and as an elastomer in casting compounds, mastics, and textile coatings (IPDI).

8.7 Vinyl Chloride

No source was identified. Vinyl chloride, also known as chloroethylene, is a colourless gas but is usually handled as a liquid under pressure. It is used in the production of PVC resins and in organic synthesis.

9.0 SUMMARY

A designated substances survey of the ONTC Remanufacturing and Repair Centre located at 916 McIntyre Street East, North Bay, Ontario, confirmed the presence of the following:

- *Asbestos-containing building material (ACM's).*
- *Lead paint.*
- *Lead materials "suspected" to be present as components in pipe and in solder used in pipe fittings.*
- *Liquid mercury in thermostatic control switch.*
- *Possible silica in concrete, mortar, brick, masonry, ceramics, granite, slate, asphalt, etc.*

10.0 RECOMMENDATIONS

10.1 Asbestos-containing Material (ACM's)

Based on our field observations, the majority of the identified ACM's do not pose a health hazard in their present state, however minor repair work is recommended to all slightly damaged ACM's including clean-up of fall-out elbow insulation noted on the floor within Room 4 of the Diesel Shop.

Should repair, removal or disposal of any asbestos-containing materials noted in this report be undertaken, all work must be performed in accordance with Ont. Reg. 278, "Regulation respecting Asbestos on Construction Projects and in Building and Repair Operations" and all applicable Federal and Provincial statutes as noted in our report.

10.2 Lead-containing Materials & Paints

Based on our observations, the identified lead paints, window flashing & caulking and possible lead containing pipes do not pose a health hazard in their present state. However, should removal and disposal of any lead-containing paint and possible lead containing pipes be undertaken, work should be performed in accordance with applicable Federal and Provincial statutes as noted in our report.

10.3 Mercury-containing Materials

Based on our observations, the identified mercury-containing equipment / products do not pose a health hazard in their present condition. All maintenance, removal and disposal of any mercury-containing materials must be performed in accordance with applicable Federal and Provincial statutes as noted in our report.

10.4 Silica-containing Materials

Based on our observations, the identified Silica - containing materials do not pose a health hazard in their present condition. All maintenance, removal and disposal of any Silica-containing materials must be performed in accordance with applicable Federal and Provincial statutes as noted in our report.

11.0 LIMITATIONS AND WARRANTY

- *This report is for the exclusive use of the client, their agents, and is neither an endorsement nor condemnation of the subject property.*
- *Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such parties. Thomas Contracting accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. In particular, any contractors bidding on site demolition or renovation work should not rely solely upon the present report for volume or quantity estimates, and should satisfy themselves of the exact quantities and conditions encountered on-site before bidding or initiating any project work, and adapt the appropriate work practices needed to comply with the applicable Federal / Provincial codes and regulations. Proper, detailed, tender packages should be prepared and supplied to contractors prior to the initiation of any renovation or demolition activities.*
- *The findings and conclusions documented in this report have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by qualified professionals currently practicing in this area of environmental assessment. No other warranty, expressed or implied, is made.*
- *The findings contained in this report are based upon conditions as they were observed at the time of investigation. No assurance is made regarding changes in conditions subsequent to the time of the investigation.*
- *Please note that the above survey was limited to the extent of the visual observation and discrete samples collected. Inaccessible areas could not be investigated, and should renovation / demolition work encounter conditions not reported in this document, Thomas Contracting should be retained to provide comments and guidelines on how to proceed.*
- *Some findings contained in this report may be based upon information provided by occupants or employees. No guarantee is made regarding the accuracy of this information. All attempts have been made to independently verify the accuracy of such information unless specifically noted in our report.*
- *If new information is developed in future work, Thomas Contracting should be contacted to re-evaluate the conclusions of this report and to provide amendments as required.*

12.0 CLOSURE

We trust this report meets your current requirements. Should you have any questions in this regard or require further clarification, please do not hesitate to contact the undersigned at this office.

Yours truly,
Thomas Contracting

Grant Johnson
Manager Environmental Services

APPENDIX 'A'

Asbestos Lab Transcripts
&
Sample Photos

LEX SCIENTIFIC INC.

SOLUTIONS
FOR A WORKING WORLD

CERTIFICATE OF ANALYSIS

Company:	Thomas Contracting	**Report Date:**	29-Oct-18
Contact:	Mr. Grant Johnson	**Analysis Date:**	26-Oct-18
Client Address:	72 Ninovan Road, CALLANDER, ON	**Received Date:**	18-Oct-18
Client Reference:	ONR - DSS	**LEX Project Number:**	08181792
Sampling Date:	18-Oct-18	**Number of Analyses:**	18

Analysis Requested **Bulk Asbestos by PLM**

Analysis was performed in accordance with the method EPA/600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials adopted in Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act Ontario Regulation 278/05. LEX Scientific Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP 101949) by the National Institute of Standards and Technology for analysis of bulk materials for asbestos.

German Leal, B.Sc.
Laboratory Manager

			Fibrous Asbestos Content %		Other Materials Content %
Client Sample:	ONR-1	**Asbestos Detected?**	**Yes**		
LEX Sample:	01	**Chrysotile:**	80	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Elbow/ Fitting Insulation on Cold Water Suppy lines in Power House	**Other Amphiboles:**	None Detected	**Non Fibrous:**	20
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

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Company: Thomas Contracting **LEX Project #** 08181792 **Page 2 of 5**

		Fibrous Asbestos Content %	Other Materials Content %
Client Sample: ONR-2		**Asbestos Detected?**	**Yes**
LEX Sample: 02		**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** 80	**MMVF:** None Detected
Colour: Grey		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Pipe Insulation on Condensate lines in Power House		**Other Amphiboles:** None Detected	**Non Fibrous:** 20
		Comments: N/A	
Client Sample: ONR-3		**Asbestos Detected?**	**Yes**
LEX Sample: 03		**Chrysotile:** 50	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Light Brown		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Exhaust/ Breeching Insulation on Boilers in Power House		**Other Amphiboles:** None Detected	**Non Fibrous:** 50
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR-6		**Asbestos Detected?**	**Yes**
LEX Sample: 04		**Chrysotile:** 80	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: White		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Jacket Insulation on Deaerator Tank in Power House		**Other Amphiboles:** None Detected	**Non Fibrous:** 20
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR-7		**Asbestos Detected?**	**Yes**
LEX Sample: 05		**Chrysotile:** 1	**Cellulose:** 99
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Brown/Black		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Pip Insulation on Cold Water lines in Wheel Shop		**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR-8		**Asbestos Detected?**	**Yes**
LEX Sample: 06		**Chrysotile:** 90	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: White		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Pipe insulation on High Pressure Stream Lines in Wheel Shop		**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181792 **Page 3 of 5**

		Fibrous Asbestos Content %	Other Materials Content %
Client Sample: ONR-9		**Asbestos Detected?**	**Yes**
LEX Sample: 07		**Chrysotile:** 80	**Cellulose:** 10
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour:	Grey/White	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description:	Pipe Insulation on Heating Lines in Wheel shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR-12		**Asbestos Detected?**	**No**
LEX Sample: 08		**Chrysotile:** None Detected	**Cellulose:** 45
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** 45
Colour:	White/Grey	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description:	2x4 Drop Ceiling tiles in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: N/A	
Client Sample: ONR-13		**Asbestos Detected?**	**Yes**
LEX Sample: 09		**Chrysotile:** 80	**Cellulose:** None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour:	Grey	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description:	Elbow/ Clean-out Insulation on Rain leader Lines in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 20
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR-14		**Asbestos Detected?**	**No**
LEX Sample: 10		**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour:	White/Cream	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description:	Wall Plaster in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
		Comments: N/A	
Client Sample: ONR-15		**Asbestos Detected?**	**No**
LEX Sample: 11		**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour:	Brown/Black	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description:	12x12 Vinyl Floor Tile in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
		Comments: N/A	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181792 **Page 4 of 5**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR-16	**Asbestos Detected?**		**No**	
LEX Sample:	12	**Chrysotile:**	None Detected	**Cellulose:**	50
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	50
Colour:	Cream/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2x4 Drop Ceiling tiles in Wheel Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	None Detected
		Comments:	N/A		
Client Sample:	ONR-17	**Asbestos Detected?**		**No**	
LEX Sample:	13	**Chrysotile:**	None Detected	**Cellulose:**	90
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Brown/Black	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pip Insulation on Cold Water lines in Wheel Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		
Client Sample:	ONR-18	**Asbestos Detected?**		**Yes**	
LEX Sample:	14	**Chrysotile:**	70	**Cellulose:**	20
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation on Hot water Lines in Wheel shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		
Client Sample:	ONR-20	**Asbestos Detected?**		**Yes**	
LEX Sample:	15	**Chrysotile:**	20	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Grey	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Window/ Door Caulking on Exterior of Wheel Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	80
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		
Client Sample:	ONR-22	**Asbestos Detected?**		**Yes**	
LEX Sample:	16	**Chrysotile:**	80	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Elbow/ Fitting Insulation onLow Pressure Steam Lines in Paint Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	20
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181792 **Page 5 of 5**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR-24	**Asbestos Detected?**		**No**	
LEX Sample:	17	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Drywall Joint Compound in Paint	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR-25	**Asbestos Detected?**		**Yes**	
LEX Sample:	18	**Chrysotile:**	1	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12x12 Vinyl Floor Tile in Paint Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	99
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

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CERTIFICATE OF ANALYSIS

Company:	Thomas Contracting	**Report Date:**	29-Oct-18
Contact:	Mr. Grant Johnson	**Analysis Date:**	26-Oct-18
Client Address:	72 Ninovan Road, CALLANDER, ON	**Received Date:**	23-Oct-18
Client Reference:	ONR - DSS	**LEX Project Number:**	08181814
Sampling Date:	23-Oct-18	**Number of Analyses:**	24

Analysis Requested **Bulk Asbestos by PLM**

Analysis was performed in accordance with the method EPA/600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials adopted in Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act Ontario Regulation 278/05. LEX Scientific Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP 101949) by the National Institute of Standards and Technology for analysis of bulk materials for asbestos.

German Leal, B.Sc.
Laboratory Manager

			Fibrous Asbestos Content %		Other Materials Content %
Client Sample:	ONR - 27	**Asbestos Detected?**	**Yes**		
LEX Sample:	01	**Chrysotile:**	80	**Cellulose:**	10
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation (white mag-block) on Steam lines in Diesel Shop - Tunnel	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

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Company: Thomas Contracting **LEX Project #** 08181814 **Page 2 of 6**

		Fibrous Asbestos Content %	Other Materials Content %
Client Sample: ONR - 28		**Asbestos Detected?**	**Yes**
LEX Sample: 02		**Chrysotile:** 10	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Black		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Tar Paper Wrap on Steam lines in Diesel Shop - Tunnel		**Other Amphiboles:** None Detected	**Non Fibrous:** 90
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR - 29		**Asbestos Detected?**	**Yes**
LEX Sample: 03		**Chrysotile:** 45	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** 45	**MMVF:** None Detected
Colour: Grey		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Elbow/Fitting Insulation on Cold Water lines in Diesel Shop - Tunnel		**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR - 30		**Asbestos Detected?**	**Yes**
LEX Sample: 04		**Chrysotile:** 1	**Cellulose:** 99
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Brown		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Pipe Insulation (anti-sweat) on Cold Water lines in Diesel Shop - Tunnel		**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR - 31		**Asbestos Detected?**	**Yes**
LEX Sample: 05		**Chrysotile:** 10	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** 80	**MMVF:** None Detected
Colour: Grey		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Elbow/Fitting Insulation on on Steam lines in Diesel Shop - Tunnel		**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181814 **Page 3 of 6**

		Fibrous Asbestos Content %	Other Materials Content %
Client Sample:	ONR - 32	**Asbestos Detected?**	**Yes**
LEX Sample:	06	**Chrysotile:** 60	**Cellulose:** 20
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour:	Grey/Beige	**Crocidolite:** None Detected	**Other Fibres:** 10
Description:	Pipe Insulation (anti-sweat) on Heating lines in Diesel Shop - Room #1	**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample:	ONR - 33	**Asbestos Detected?**	**Yes**
LEX Sample:	07	**Chrysotile:** 7	**Cellulose:** 93
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour:	Beige/Black	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description:	Pipe Insulation (anti-sweat/Tar paper) on Cold Water lines in Diesel Shop - Room #3	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample:	ONR - 35	**Asbestos Detected?**	**Yes**
LEX Sample:	08	**Chrysotile:** 60	**Cellulose:** None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour:	Beige/Yellow	**Crocidolite:** None Detected	**Other Fibres:** 30
Description:	Pipe Insulation (air-cell) on Steam lines in Diesel Shop - Room #6	**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample:	ONR - 36	**Asbestos Detected?**	**No**
LEX Sample:	09	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** 100
Colour:	White	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description:	Sprayed Insulation on Ceiling Deck in Diesel Sop - Room #6	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
		Comments: N/A	
Client Sample:	ONR - 38	**Asbestos Detected?**	**Yes**
LEX Sample:	10	**Chrysotile:** 80	**Cellulose:** 10
Layers Analyzed:	Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour:	Beige	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description:	Pipe Insulation (anti-sweat) on Heating lines in Diesel Shop - Room #5	**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181814 **Page 4 of 6**

		Fibrous Asbestos Content %	Other Materials Content %
Client Sample: ONR - 40		**Asbestos Detected?**	**Yes**
LEX Sample: 11		**Chrysotile:** 80	**Cellulose:** 10
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Beige		**Crocidolite:** None Detected	**Other Fibres:** 10
Description: Elbow/Fitting Insulation on Cold Water lines in Diesel Shop - Room #4		**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR - 41		**Asbestos Detected?**	**Yes**
LEX Sample: 12		**Chrysotile:** 80	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Brown/Grey		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Elbow/Fitting Insulation on Heating lines in Diesel Shop -East-side		**Other Amphiboles:** None Detected	**Non Fibrous:** 20
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR - 42		**Asbestos Detected?**	**Yes**
LEX Sample: 13		**Chrysotile:** 80	**Cellulose:** 10
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Yellow		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Pipe Insulation (anti-sweat) on Heating lines in Diesel Shop - East-side		**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR - 43		**Asbestos Detected?**	**Yes**
LEX Sample: 14		**Chrysotile:** 50	**Cellulose:** 40
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Beige		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Pipe Insulation (anti-sweat) on Heating lines in Diesel Shop - East-side		**Other Amphiboles:** None Detected	**Non Fibrous:** 10
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR - 44		**Asbestos Detected?**	**No**
LEX Sample: 15		**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: White/Yellow		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Plaster on Wall in Diesel Shop - Room #10		**Other Amphiboles:** None Detected	**Non Fibrous:** 100
		Comments: N/A	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181814 **Page 5 of 6**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR - 45	**Asbestos Detected?**		**No**	
LEX Sample:	16	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Tile	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige/Brown	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12"x12" Vinyl Floor Tile (beige) in Diesel Shop - Room #10	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 46	**Asbestos Detected?**		**No**	
LEX Sample:	17	**Chrysotile:**	None Detected	**Cellulose:**	40
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	60
Colour:	White/Grey	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2'x4' Drop Ceiling Tile in Diesel Shop - Room #10	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		
Client Sample:	ONR - 48	**Asbestos Detected?**		**No**	
LEX Sample:	18	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Dark Green	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Roll Vinyl Flooring in Diesel Shop - Room #12	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 50	**Asbestos Detected?**		**Yes**	
LEX Sample:	19	**Chrysotile:**	70	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige/Yellow	**Crocidolite:**	None Detected	**Other Fibres:**	20
Description:	Pipe Insulation (anti-sweat) on Heating lines in Diesel Shop - Room #17	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		
Client Sample:	ONR - 51	**Asbestos Detected?**		**Yes**	
LEX Sample:	20	**Chrysotile:**	80	**Cellulose:**	10
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Grey/Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation (anti-sweat) on Stream lines in Diesel Shop - Pit Area	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181814 **Page 6 of 6**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR - 52	**Asbestos Detected?**	**Yes**		
LEX Sample:	21	**Chrysotile:**	15	**Cellulose:**	75
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige/Black	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation (anti-sweat/Tar paper) on Cold Water lines in Diesel Shop - Pit Area	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		
Client Sample:	ONR - 53	**Asbestos Detected?**	**Yes**		
LEX Sample:	22	**Chrysotile:**	60	**Cellulose:**	30
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Yellow/Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation (anti-sweat) on Hot Water lines in Diesel Shop - Pit Area	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.		
Client Sample:	ONR - 54	**Asbestos Detected?**	**No**		
LEX Sample:	23	**Chrysotile:**	None Detected	**Cellulose:**	20
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	40
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Elbow/Fitting Insulation on piping in Diesel Shop - Addition	**Other Amphiboles:**	None Detected	**Non Fibrous:**	40
		Comments:	N/A		
Client Sample:	ONR - 57	**Asbestos Detected?**	**No**		
LEX Sample:	24	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Tile	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White/Black	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12"x12" Vinyl Floor Tile (beige) in Diesel Shop - Room #102	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

LEX SCIENTIFIC INC

SOLUTIONS
FOR A WORKING WORLD

CERTIFICATE OF ANALYSIS

Company:	Thomas Contracting	**Report Date:**	30-Oct-18
Contact:	Mr. Grant Johnson	**Analysis Date:**	30-Oct-18
Client Address:	72 Ninovan Road, CALLANDER, ON	**Received Date:**	29-Oct-18
Client Reference:	ONR-DSS	**LEX Project Number:**	08181850
Sampling Date:	29-Oct-18	**Number of Analyses:**	10

Analysis Requested **Bulk Asbestos by PLM**

Analysis was performed in accordance with the method EPA/600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials adopted in Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act Ontario Regulation 278/05. LEX Scientific Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP 101949) by the National Institute of Standards and Technology for analysis of bulk materials for asbestos.

German Leal, B.Sc.
Laboratory Manager

			Fibrous Asbestos Content %	Other Materials Content %	
Client Sample:	ONR-58	**Asbestos Detected?**	**Yes**		
LEX Sample:	01	**Chrysotile:**	< 0.5	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Black	**Crocidolite:**	None Detected	**Other Fibres:**	10
Description:	Pipe Insulation (tar paper) on Rain Leader lines in Diesel Shop - Room #103	**Other Amphiboles:**	None Detected	**Non Fibrous:**	90
		Comments:	Not asbestos containing material under Ontario Regulation 278/05.		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

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Company: Thomas Contracting **LEX Project #** 08181850 **Page 2 of 3**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR-59	**Asbestos Detected?**		**No**	
LEX Sample:	02	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12"x12" Vinyl Floor Tile in Diesel Shop - Room # 104	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR-60	**Asbestos Detected?**		**No**	
LEX Sample:	03	**Chrysotile:**	None Detected	**Cellulose:**	40
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	60
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2'x4' Drop Ceiling Tile in Diesel Shop - Room # 104	**Other Amphiboles:**	None Detected	**Non Fibrous:**	None Detected
		Comments:	N/A		
Client Sample:	ONR-61	**Asbestos Detected?**		**No**	
LEX Sample:	04	**Chrysotile:**	None Detected	**Cellulose:**	40
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	60
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2'x4' Drop Ceiling Tile in Diesel Shop - Room # 201	**Other Amphiboles:**	None Detected	**Non Fibrous:**	None Detected
		Comments:	N/A		
Client Sample:	ONR-63	**Asbestos Detected?**		**No**	
LEX Sample:	05	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Drywall Joint Compound on wall in Diesel Shop - Room # 202	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR-64	**Asbestos Detected?**		**No**	
LEX Sample:	06	**Chrysotile:**	None Detected	**Cellulose:**	50
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	50
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2'x4' Drop Ceiling Tile in Diesel Shop - Room # 202	**Other Amphiboles:**	None Detected	**Non Fibrous:**	None Detected
		Comments:	N/A		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181850 **Page 3 of 3**

		Fibrous Asbestos Content %	Other Materials Content %
Client Sample: ONR-65		**Asbestos Detected?**	**Yes**
LEX Sample: 07		**Chrysotile:** 60	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Grey		**Crocidolite:** None Detected	**Other Fibres:** 5
Description: Elbow/Fitting Insulation on pipes in Car Shop - Room #200		**Other Amphiboles:** None Detected	**Non Fibrous:** 35
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR-70		**Asbestos Detected?**	**No**
LEX Sample: 08		**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Beige		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 12"x12" Vinyl Floor Tile in Car Shop - Room # D		**Other Amphiboles:** None Detected	**Non Fibrous:** 100
		Comments: N/A	
Client Sample: ONR-71		**Asbestos Detected?**	**Yes**
LEX Sample: 09		**Chrysotile:** 25	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Beige		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 12"x12" Vinyl Floor Tile in Car Shop - Room # G		**Other Amphiboles:** None Detected	**Non Fibrous:** 75
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	
Client Sample: ONR-72		**Asbestos Detected?**	**Yes**
LEX Sample: 10		**Chrysotile:** 8	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized		**Amosite:** None Detected	**MMVF:** None Detected
Colour: Grey		**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Caulking on exterior windows of Diesel Shop		**Other Amphiboles:** None Detected	**Non Fibrous:** 92
		Comments: This sample meets the definition of "asbestos containing material" according to Ontario Regulation 278/05.	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

SOLUTIONS
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CERTIFICATE OF ANALYSIS

Company:	Thomas Contracting	**Report Date:**	31-Oct-18
Contact:	Mr. Grant Johnson	**Analysis Date:**	31-Oct-18
Client Address:	72 Ninovan Road, CALLANDER, ON	**Received Date:**	30-Oct-18
Client Reference:	ONR-DSS	**LEX Project Number:**	08181859
Sampling Date:	30-Oct-18	**Number of Analyses:**	26

Analysis Requested **Bulk Asbestos by PLM**

Analysis was performed in accordance with the method EPA/600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials adopted in Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act Ontario Regulation 278/05. LEX Scientific Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP 101949) by the National Institute of Standards and Technology for analysis of bulk materials for asbestos.

German Leal, B.Sc.
Laboratory Manager

Analysis Notes: Samples ONR-45, ONR-45b, ONR-57a and ONR-57b are floor tiles instead of what is described in CoC

	Fibrous Asbestos Content %	**Other Materials Content %**
Client Sample: ONR - 12a	**Asbestos Detected?** No	
LEX Sample: 01	**Chrysotile:** None Detected	**Cellulose:** 50
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** 50
Colour: Grey	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 2' x 4' Drop Ceiling Tiles in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
	Comments: N/A	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

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Company: Thomas Contracting **LEX Project #** 08181859 **Page 2 of 6**

	Fibrous Asbestos Content %	Other Materials Content %
Client Sample: ONR - 12b	**Asbestos Detected?**	**No**
LEX Sample: 02	**Chrysotile:** None Detected	**Cellulose:** 50
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** 50
Colour: Grey	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 2' x 4' Drop Ceiling Tiles in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
	Comments: N/A	
Client Sample: ONR - 14a	**Asbestos Detected?**	**No**
LEX Sample: 03	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: White/Beige	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Wall Plaster in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	
Client Sample: ONR - 14b	**Asbestos Detected?**	**No**
LEX Sample: 04	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: White/Beige	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Wall Plaster in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	
Client Sample: ONR - 15a	**Asbestos Detected?**	**No**
LEX Sample: 05	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: Beige	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 12" x 12" Vinyl Floor Tile in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	
Client Sample: ONR - 15b	**Asbestos Detected?**	**No**
LEX Sample: 06	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: Beige	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 12" x 12" Vinyl Floor Tile in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	
Client Sample: ONR - 16a	**Asbestos Detected?**	**No**
LEX Sample: 07	**Chrysotile:** None Detected	**Cellulose:** 50
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** 50
Colour: Light Brown	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 2' x 4' Drop Ceiling Tiles in Wheel Shop	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
	Comments: N/A	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181859 **Page 3 of 6**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR - 16b	**Asbestos Detected?**		**No**	
LEX Sample:	08	**Chrysotile:**	None Detected	**Cellulose:**	50
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	50
Colour:	Light Brown	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2' x 4' Drop Ceiling Tiles in Wheel Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	None Detected
		Comments:	N/A		
Client Sample:	ONR - 17a	**Asbestos Detected?**		**No**	
LEX Sample:	09	**Chrysotile:**	None Detected	**Cellulose:**	90
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Brown	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation (anti-sweat) on Cold Water lines in Wheel Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		
Client Sample:	ONR - 17b	**Asbestos Detected?**		**No**	
LEX Sample:	10	**Chrysotile:**	None Detected	**Cellulose:**	90
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Brown	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation (anti-sweat) on Cold Water lines in Wheel Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		
Client Sample:	ONR - 24a	**Asbestos Detected?**		**No**	
LEX Sample:	11	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Drywall Joint Compound on walls in Paint Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 24b	**Asbestos Detected?**		**No**	
LEX Sample:	12	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Drywall Joint Compound on walls in Paint Shop	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181859 **Page 4 of 6**

	Fibrous Asbestos Content %	Other Materials Content %
Client Sample: ONR - 36a	**Asbestos Detected?**	**No**
LEX Sample: 13	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** 100
Colour: White	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Sprayed Insulation on Ceiling Deck in Diesel Shop - Room #6	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
	Comments: N/A	
Client Sample: ONR - 36b	**Asbestos Detected?**	**No**
LEX Sample: 14	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** 100
Colour: White	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Sprayed Insulation on Ceiling Deck in Diesel Shop - Room #6	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
	Comments: N/A	
Client Sample: ONR - 44a	**Asbestos Detected?**	**No**
LEX Sample: 15	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: White	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Plaster on wall in Diesel Shop - Room #10	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	
Client Sample: ONR - 44b	**Asbestos Detected?**	**No**
LEX Sample: 16	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: White	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Plaster on wall in Diesel Shop - Room #10	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	
Client Sample: ONR - 45a	**Asbestos Detected?**	**No**
LEX Sample: 17	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: Light Grey/ Dark Grey	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 12"x12" Vinyl Floor Tile (beige) in Diesel n Shop - Room #10	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181859 **Page 5 of 6**

	Fibrous Asbestos Content %	Other Materials Content %
Client Sample: ONR - 45b	**Asbestos Detected?**	**No**
LEX Sample: 18	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: Light Grey/ Dark Grey	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 12"x12" Vinyl Floor Tile (beige) in Diesel n Shop - Room #10	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	
Client Sample: ONR - 46a	**Asbestos Detected?**	**No**
LEX Sample: 19	**Chrysotile:** None Detected	**Cellulose:** 60
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** 40
Colour: Light Grey	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 2' x 4' Drop Ceiling Tiles in Diesel Shop - Room #10	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
	Comments: N/A	
Client Sample: ONR - 46b	**Asbestos Detected?**	**No**
LEX Sample: 20	**Chrysotile:** None Detected	**Cellulose:** 60
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** 40
Colour: Light Grey	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: 2' x 4' Drop Ceiling Tiles in Diesel Shop - Room #10	**Other Amphiboles:** None Detected	**Non Fibrous:** None Detected
	Comments: N/A	
Client Sample: ONR - 48a	**Asbestos Detected?**	**No**
LEX Sample: 21	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: Green/Brown	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Roll Vinyl Flooring in Diesel Shop - Room #12	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	
Client Sample: ONR - 48b	**Asbestos Detected?**	**No**
LEX Sample: 22	**Chrysotile:** None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample Homogenized	**Amosite:** None Detected	**MMVF:** None Detected
Colour: Green/Brown	**Crocidolite:** None Detected	**Other Fibres:** None Detected
Description: Roll Vinyl Flooring in Diesel Shop - Room #12	**Other Amphiboles:** None Detected	**Non Fibrous:** 100
	Comments: N/A	

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181859 **Page 6 of 6**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR - 54a	**Asbestos Detected?**		**No**	
LEX Sample:	23	**Chrysotile:**	None Detected	**Cellulose:**	10
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	50
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Elbow/Fitting Insulation on Piping in Diesel Shop - Addition	**Other Amphiboles:**	None Detected	**Non Fibrous:**	40
		Comments:	N/A		
Client Sample:	ONR - 54b	**Asbestos Detected?**		**No**	
LEX Sample:	24	**Chrysotile:**	None Detected	**Cellulose:**	10
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	50
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Elbow/Fitting Insulation on Piping in Diesel Shop - Addition	**Other Amphiboles:**	None Detected	**Non Fibrous:**	40
		Comments:	N/A		
Client Sample:	ONR - 57a	**Asbestos Detected?**		**No**	
LEX Sample:	25	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12"x12" Vinyl Floor Tile (beige) in Diesel Shop - Room #102	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 57b	**Asbestos Detected?**		**No**	
LEX Sample:	26	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12"x12" Vinyl Floor Tile (beige) in Diesel Shop - Room #102	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

SOLUTIONS
FOR A WORKING WORLD

CERTIFICATE OF ANALYSIS

Company:	Thomas Contracting	**Report Date:**	01-Nov-18
Contact:	Mr. Grant Johnson	**Analysis Date:**	01-Nov-18
Client Address:	72 Ninovan Road, CALLANDER, ON	**Received Date:**	31-Oct-18
Client Reference:	ONR - DSS	**LEX Project Number:**	08181864
Sampling Date:	30-Nov-18	**Number of Analyses:**	14

Analysis Requested **Bulk Asbestos by PLM**

Analysis was performed in accordance with the method EPA/600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials adopted in Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act Ontario Regulation 278/05. LEX Scientific Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP 101949) by the National Institute of Standards and Technology for analysis of bulk materials for asbestos.

German Leal, B.Sc.
Laboratory Manager

			Fibrous Asbestos Content %		Other Materials Content %
Client Sample:	ONR - 61a	**Asbestos Detected?**		**No**	
LEX Sample:	01	**Chrysotile:**	None Detected	**Cellulose:**	30
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	60
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2' x 4' Drop Ceiling Tiles in Diesel Shop - Room #201	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

291 Woodlawn Road West, Unit B-12 Guelph, Ontario N1H 7L6
1.800.824.7082
e-mail: admin@lexscientific.com Website: www.lexscientific.com

Company: Thomas Contracting **LEX Project #** 08181864 **Page 2 of 4**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR - 61b	**Asbestos Detected?**		**No**	
LEX Sample:	02	**Chrysotile:**	None Detected	**Cellulose:**	30
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	60
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2' x 4' Drop Ceiling Tiles in Diesel Shop - Room #201	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		
Client Sample:	ONR - 63a	**Asbestos Detected?**		**No**	
LEX Sample:	03	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Drywall Joint Compound on walls in Diesel shop-Room #202	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 63b	**Asbestos Detected?**		**No**	
LEX Sample:	04	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Drywall Joint Compound on walls in Diesel shop-Room #202	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 64a	**Asbestos Detected?**		**No**	
LEX Sample:	05	**Chrysotile:**	None Detected	**Cellulose:**	45
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	45
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2' x 4' Drop Ceiling Tiles in Diesel Shop - Room #202	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		
Client Sample:	ONR - 64b	**Asbestos Detected?**		**No**	
LEX Sample:	06	**Chrysotile:**	None Detected	**Cellulose:**	45
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	45
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2' x 4' Drop Ceiling Tiles in Diesel Shop - Room #202	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181864 **Page 3 of 4**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR - 58a	**Asbestos Detected?**		**No**	
LEX Sample:	07	**Chrysotile:**	None Detected	**Cellulose:**	50
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Black	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation (Tar Paper) on Rain leader linesin Diesel Shop-Room #103	**Other Amphiboles:**	None Detected	**Non Fibrous:**	50
		Comments:	N/A		
Client Sample:	ONR - 58b	**Asbestos Detected?**		**No**	
LEX Sample:	08	**Chrysotile:**	None Detected	**Cellulose:**	50
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Black	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	Pipe Insulation (Tar Paper) on Rain leader linesin Diesel Shop-Room #103	**Other Amphiboles:**	None Detected	**Non Fibrous:**	50
		Comments:	N/A		
Client Sample:	ONR - 59a	**Asbestos Detected?**		**No**	
LEX Sample:	09	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12" x 12" Vinyl Floor Tile in Diesel Shop - Room # 104	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 59b	**Asbestos Detected?**		**No**	
LEX Sample:	10	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12" x 12" Vinyl Floor Tile in Diesel Shop - Room # 104	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 60a	**Asbestos Detected?**		**No**	
LEX Sample:	11	**Chrysotile:**	None Detected	**Cellulose:**	45
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	45
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2' x 4' Drop Ceiling Tiles in Diesel Shop - Room # 104	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

Company: Thomas Contracting **LEX Project #** 08181864 **Page 4 of 4**

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample:	ONR - 60b	**Asbestos Detected?**		**No**	
LEX Sample:	12	**Chrysotile:**	None Detected	**Cellulose:**	45
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	45
Colour:	Grey/White	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	2' x 4' Drop Ceiling Tiles in Diesel Shop - Room # 104	**Other Amphiboles:**	None Detected	**Non Fibrous:**	10
		Comments:	N/A		
Client Sample:	ONR - 71a	**Asbestos Detected?**		**No**	
LEX Sample:	13	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige/Black	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12" x 12" Vinyl Floor Tile in Car Shop - Room # G	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		
Client Sample:	ONR - 71b	**Asbestos Detected?**		**No**	
LEX Sample:	14	**Chrysotile:**	None Detected	**Cellulose:**	None Detected
Layers Analyzed:	Sample Homogenized	**Amosite:**	None Detected	**MMVF:**	None Detected
Colour:	Beige/Black	**Crocidolite:**	None Detected	**Other Fibres:**	None Detected
Description:	12" x 12" Vinyl Floor Tile in Car Shop - Room # G	**Other Amphiboles:**	None Detected	**Non Fibrous:**	100
		Comments:	N/A		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibres: Fibreglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

PHOTO # 1
POWER HOUSE

PHOTO # 2
WHEEL SHOP

PHOTO # 3
PAINT & GRIT SHOP

PHOTO # 4
DIESEL SHOP

PHOTO # 5
CAR SHOP

PHOTO # 6
Sample # ONR 1 : Asbestos-containing Elbow / Fitting Insulation
on Cold Water Supply lines in Power House. (80% chrysotile asbestos)

PHOTO # 7
Sample # ONR – 2 : Asbestos-containing Pipe Insulation
on Condensate lines in Power House. (80% amosite asbestos)

PHOTO # 8
Sample # ONR 3 : Asbestos-containing Exhaust / Breeching Insulation
on Boilers in Power House. (50% chrysotile asbestos)

PHOTO # 9
Sample # ONR – 6 : Asbestos-containing Jacket Insulation
on Deaerator Tank in Power House - Mezzanine. (80% chrysotile asbestos)

PHOTO # 10
Sample # ONR – 7 : Asbestos-containing Pipe Insulation (anti-sweat)
on Cold Water Lines in Wheel Shop – Electrical Room. (1% chrysotile asbestos)

.

PHOTO # 11
Sample # ONR – 8 : Asbestos-containing Pipe Insulation on High Pressure Steam lines in Wheel Shop – Electrical Room. (90% chrysotile asbestos)

.

PHOTO # 12
Sample # ONR – 12 : Non-asbestos 2' x 4' Drop Ceiling Tiles in Wheel Shop – Room # 2.

PHOTO # 13
Sample # ONR – 13 : Asbestos-containing Elbow / Clean-out Insulation on Rain Leader lines in Wheel Shop – Room # 3. (80% chrysotile asbestos)

.

PHOTO # 14
Sample # ONR – 15 : Non-asbestos 12” x 12” vinyl floor tile in Wheel Shop – Room # 5.

.

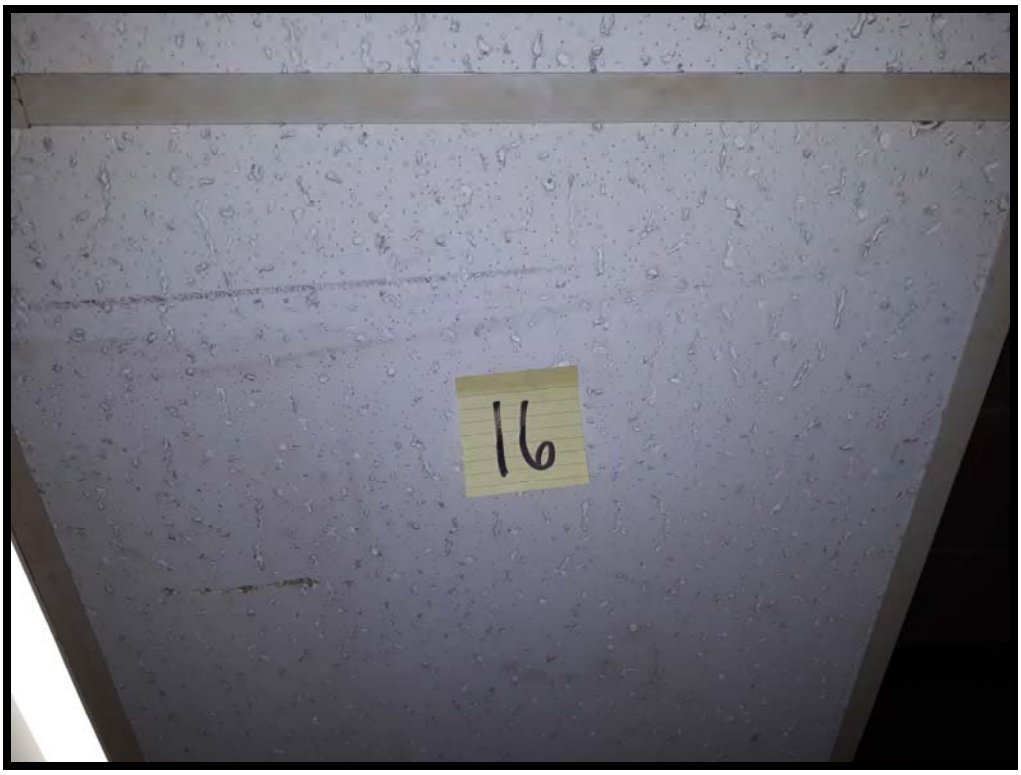

PHOTO # 15
Sample # ONR – 16 : Non-asbestos 2' x 4' Drop Ceiling Tiles in Wheel Shop – Room # 5..

PHOTO # 16
Sample # ONR – 20 : Asbestos-containing Window / Door Caulking on Exterior of Wheel Shop. (20 % Chrysotile asbestos)

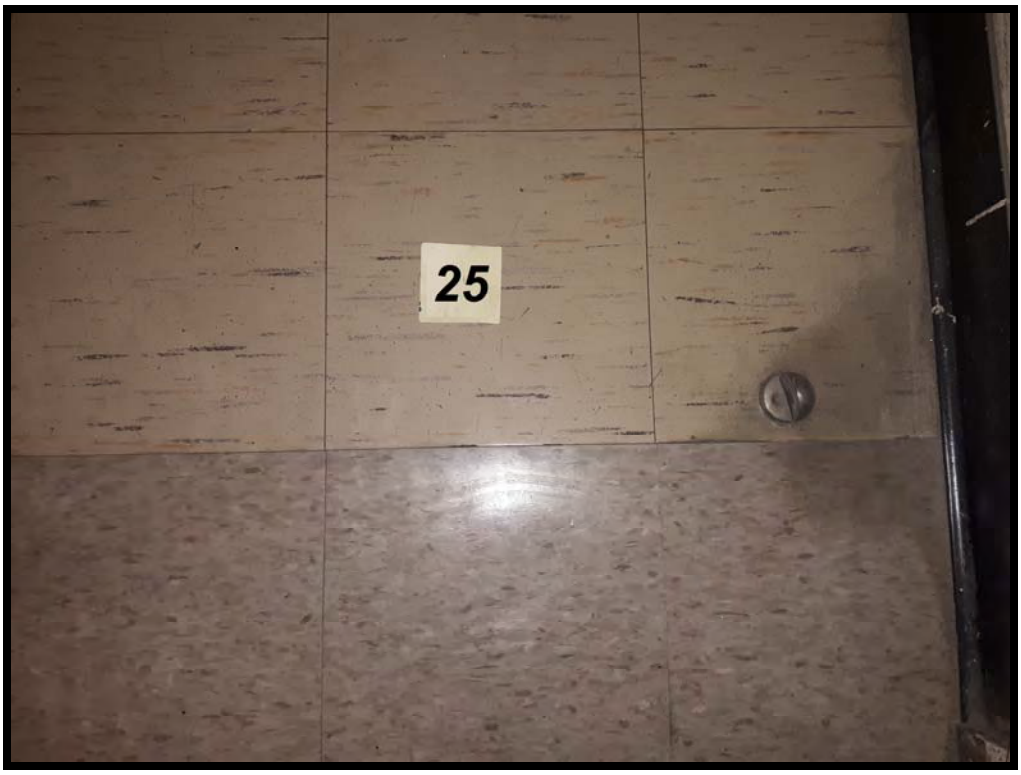

PHOTO # 17
Sample # ONR – 25 : Asbestos-containing 12" x 12" Vinyl Floor Tile in Paint Shop – Room # 5. (1% chrysotile asbestos)

PHOTO # 18
Sample # ONR – 27 : Asbestos-containing Pipe Insulation (white mag-block) on Steam lines in Diesel Shop - Tunnel. (80% chrysotile asbestos)

PHOTO # 19
Sample # ONR – 28 : Asbestos-containing Tar Paper Wrap
on Steam lines in Diesel Shop - Tunnel. (10% chrysotile asbestos)

PHOTO # 20
Sample # ONR – 29 : Asbestos-containing Elbow / Fitting Insulation
on Cold water lines in Diesel Shop - Tunnel. (45% chrysotile and 45% amosite asbestos)

PHOTO # 21
Sample # ONR – 30 : Asbestos-containing Pipe Insulation (anti-sweat) on Cold water lines in Diesel Shop - Tunnel. (1% chrysotile asbestos)

PHOTO # 22
Sample # ONR – 31 : Asbestos-containing Elbow / Fitting Insulation on Steam lines in Diesel Shop – Tunnel (10% chrysotile and 80% amosite asbestos).

PHOTO # 23
Sample # ONR – 32 : Asbestos-containing Pipe Insulation (anti-sweat) on Heating lines in Diesel Shop - Room # 1. (60% chrysotile asbestos)

PHOTO # 24
Sample # ONR – 33 : Asbestos-containing Pipe Insulation (anti-sweat / tar paper) on Cold water lines in Diesel Shop - Room # 3. (7% chrysotile asbestos).

PHOTO # 25
Sample # ONR – 35 : Asbestos-containing Pipe Insulation (air-cell)
on Steam lines in Diesel Shop - Room # 6. (60% chrysotile asbestos)

PHOTO # 26
Sample # ONR – 40 : Asbestos-containing Elbow / Fitting Insulation
on Cold water lines in Diesel Shop - Room # 4. (80% chrysotile asbestos)

PHOTO # 27
Sample # ONR – 41, 42 and 43 : Asbestos-containing Elbow / Fitting and Pipewrap Insulation on Heating lines in Diesel Shop - East-side. (80% chrysotile asbestos)

PHOTO # 28
Sample # ONR – 44 : Non-asbestos Plaster on wall in Diesel Shop - Room # 10.

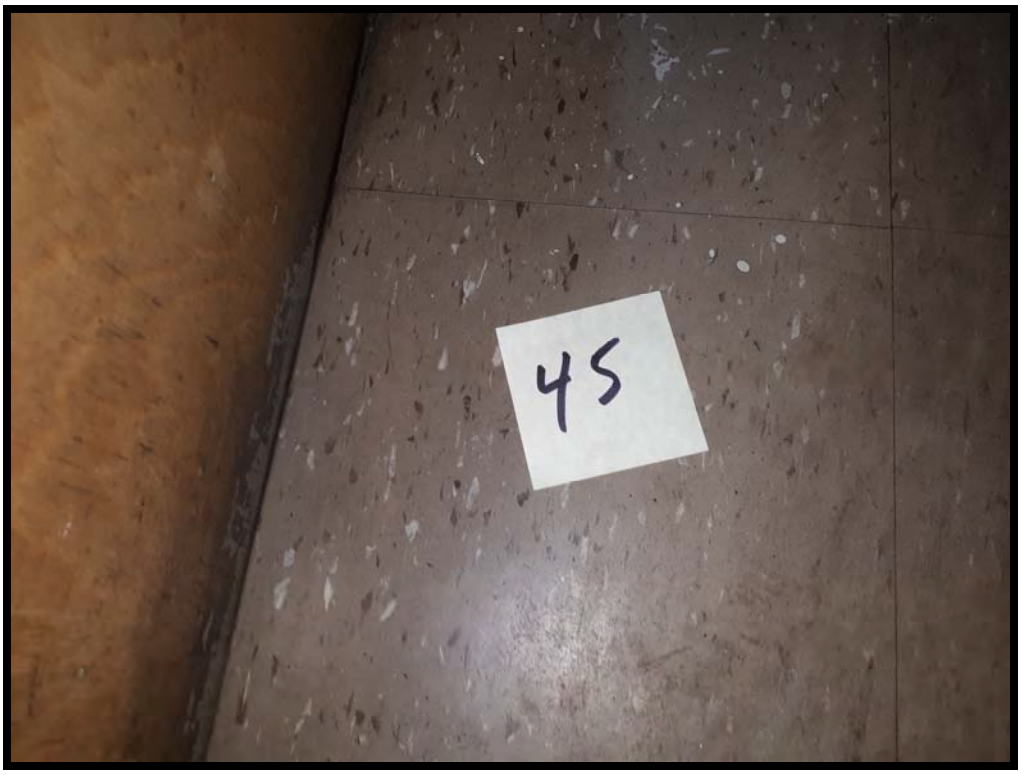

PHOTO # 29
Sample # ONR – 45 : Non-asbestos 12" x 12" Vinyl Floor Tile (beige)
in Diesel Shop - Room # 10.

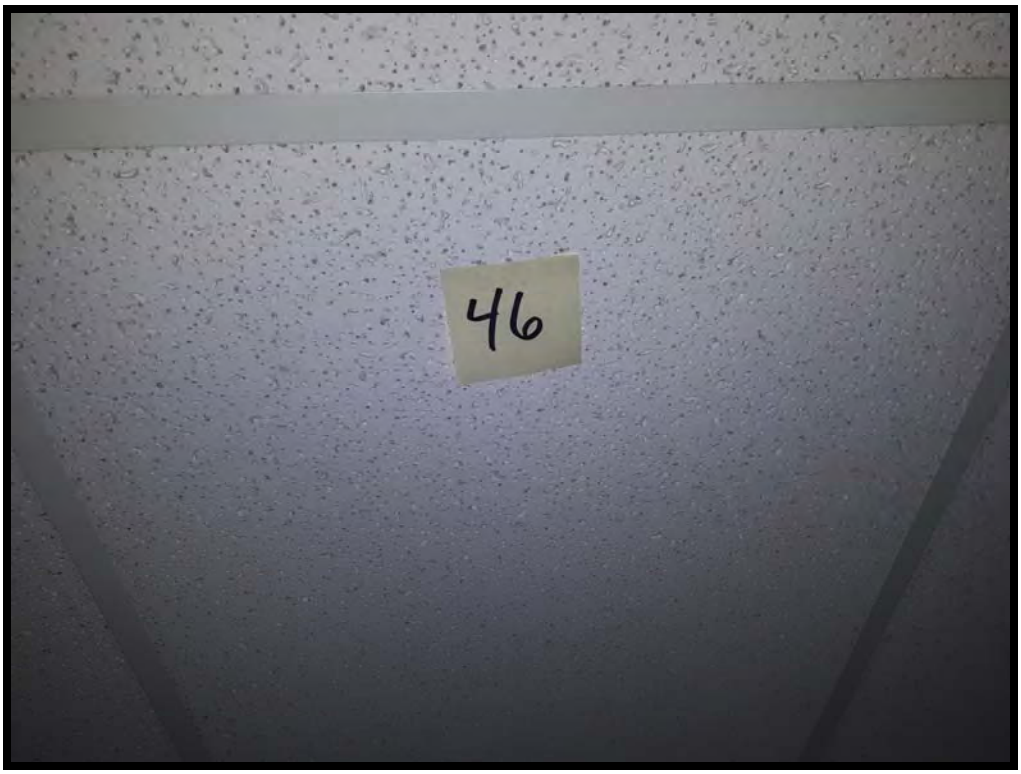

PHOTO # 30
Sample # ONR – 46 : Non-asbestos 2' x 4' Drop Ceiling Tile
in Diesel Shop - Room # 10.

PHOTO # 31
Sample # ONR – 48 : Non-asbestos Roll Vinyl Flooring
in Diesel Shop - Room # 12.

PHOTO # 32
Sample # ONR – 50 : Asbestos-containing Pipe Insulation (anti-sweat)
on Heating lines in Diesel Shop - Room # 17. (70% chrysotile asbestos)

PHOTO # 33
Sample # ONR – 57 : Non-asbestos 12" x 12" Vinyl Floor Tile in Diesel Shop - Room # 102.

PHOTO # 34
Sample # ONR – 58 : Pipe Insulation (tar paper)
on Rain Leader lines in Diesel Shop - Room # 103.
.

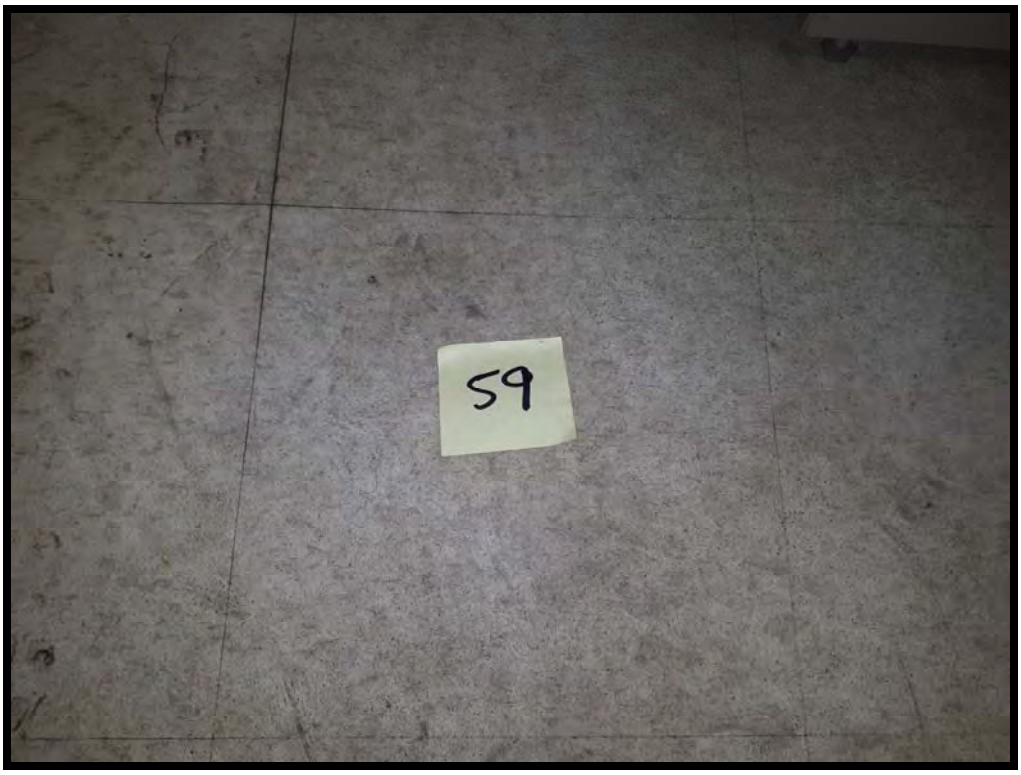

PHOTO # 35
Sample # ONR – 59 : Non-asbestos 12" x 12" Vinyl Floor Tile
in Diesel Shop - Room # 104.

PHOTO # 36
Sample # ONR – 60 : Non-asbestos 2' x 4' Drop Ceiling Tile
in Diesel Shop - Room # 104.

PHOTO # 37
Sample # ONR – 61 :Non-asbestos 2' x 4' Drop Ceiling Tile in Diesel Shop - Room # 201.

PHOTO # 38
Sample # ONR – 63 : Non-asbestos Drywall Joint Compound on wall in Diesel Shop - Room # 202.

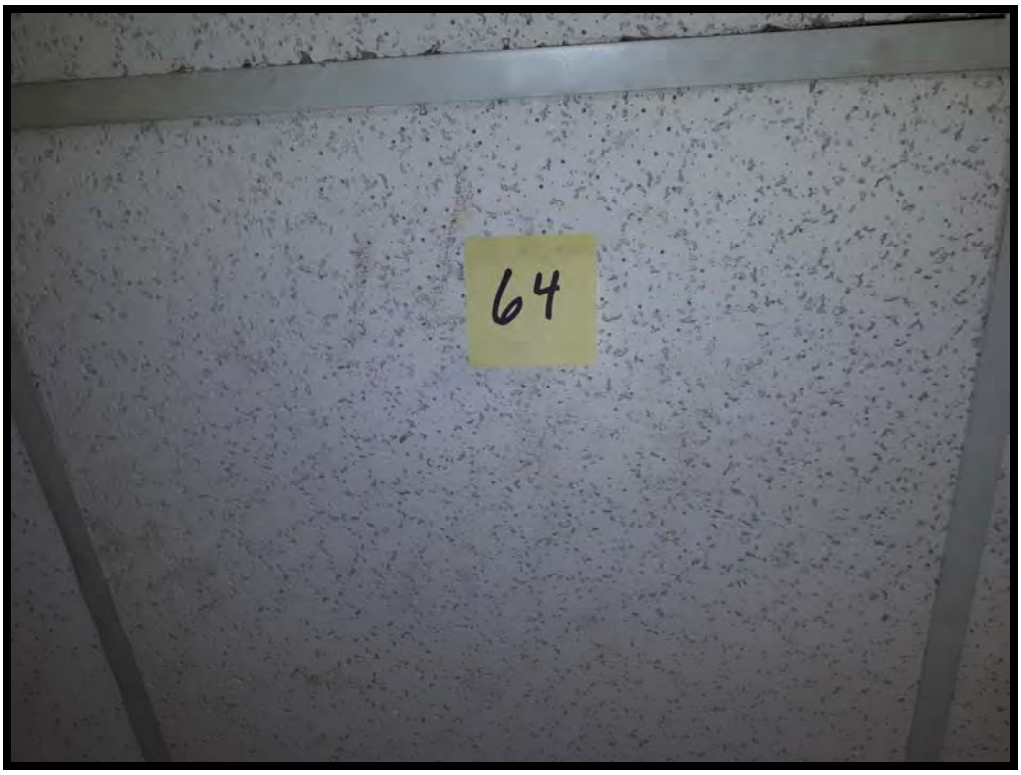

PHOTO # 39
Sample # ONR – 64 : Non-asbestos 2' x 4' Drop Ceiling Tile in Diesel Shop - Room # 202.

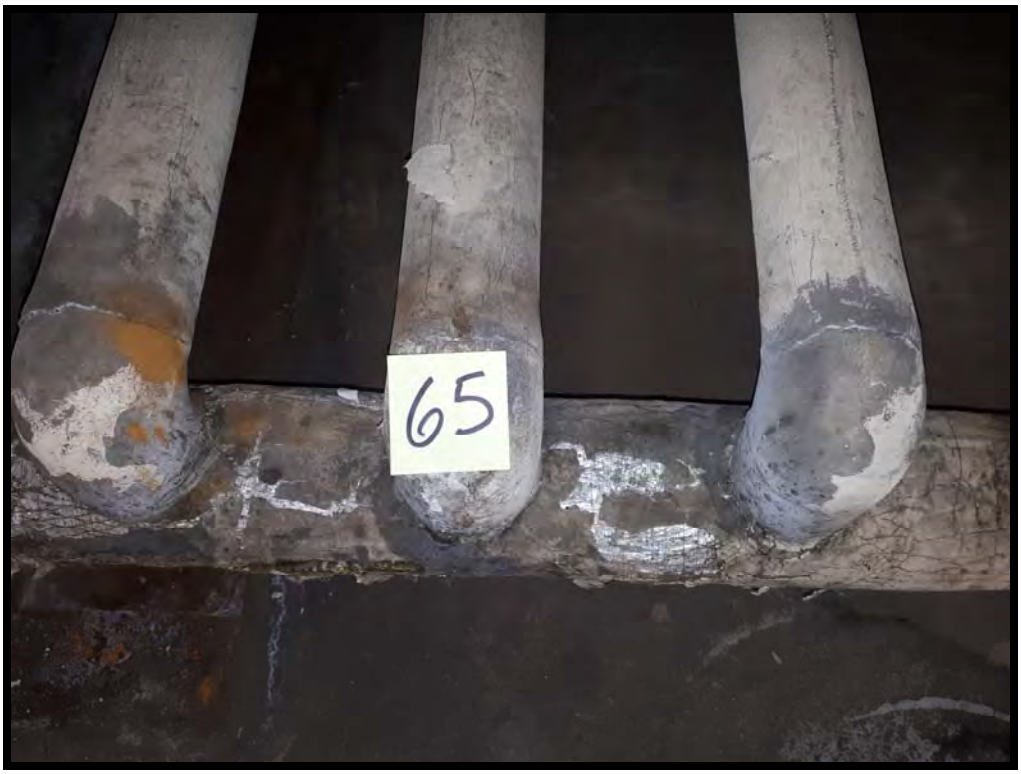

PHOTO # 40
Sample # ONR – 65 : Asbestos-containing Elbow / Fitting Insulation on pipes in Car Shop - Room # 200. (60% chrysotile asbestos).

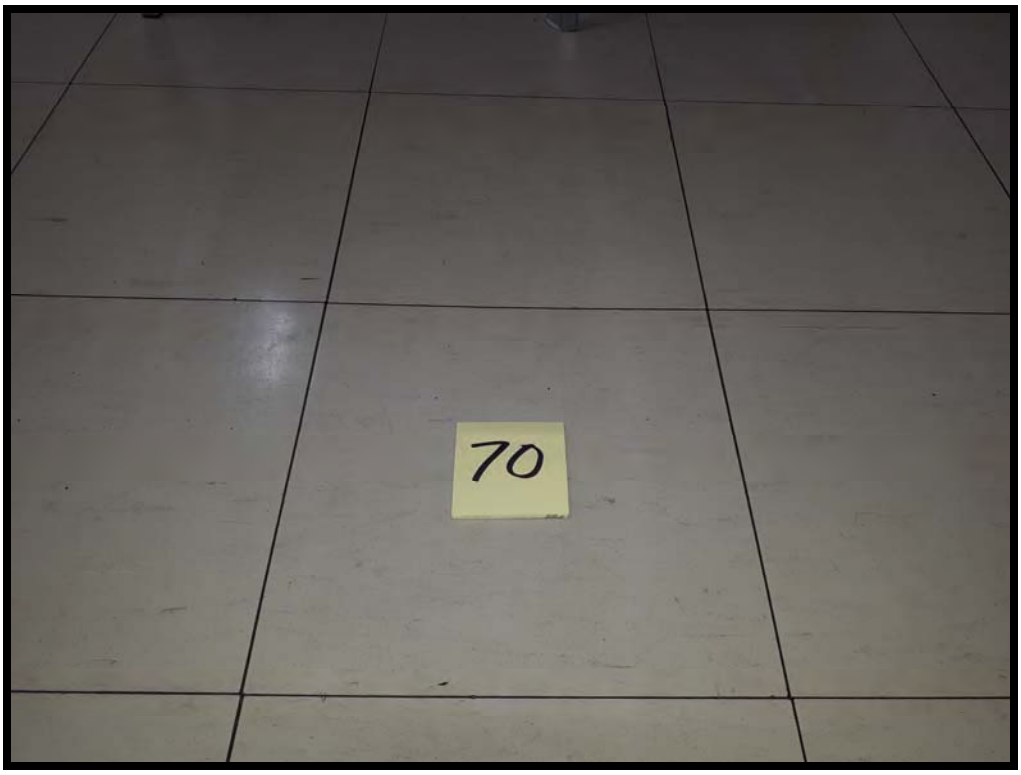

PHOTO # 41
Sample # ONR – 70 : Non-asbestos 12" x 12" Vinyl Floor Tile
in Car Shop - Room # D.

PHOTO # 42
Sample # ONR – 71 : Asbestos-containing 12" x 12" Vinyl Floor Tile
in Car Shop - Room # G (25% chrysotile asbestos)

PHOTO # 43
Sample # ONR – 72 : Asbestos-containing Caulking
on exterior widows of Diesel Shop. (8% chrysotile asbestos)

PHOTO # 43a
Sample # ONR – 36 : Non-asbestos Sprayed Applied Insulation
on ceiling in Diesel Shop – Room 6.

PHOTO # 43b
Asbestos-containing materials within storage cabinet
in Car Shop – Room 117

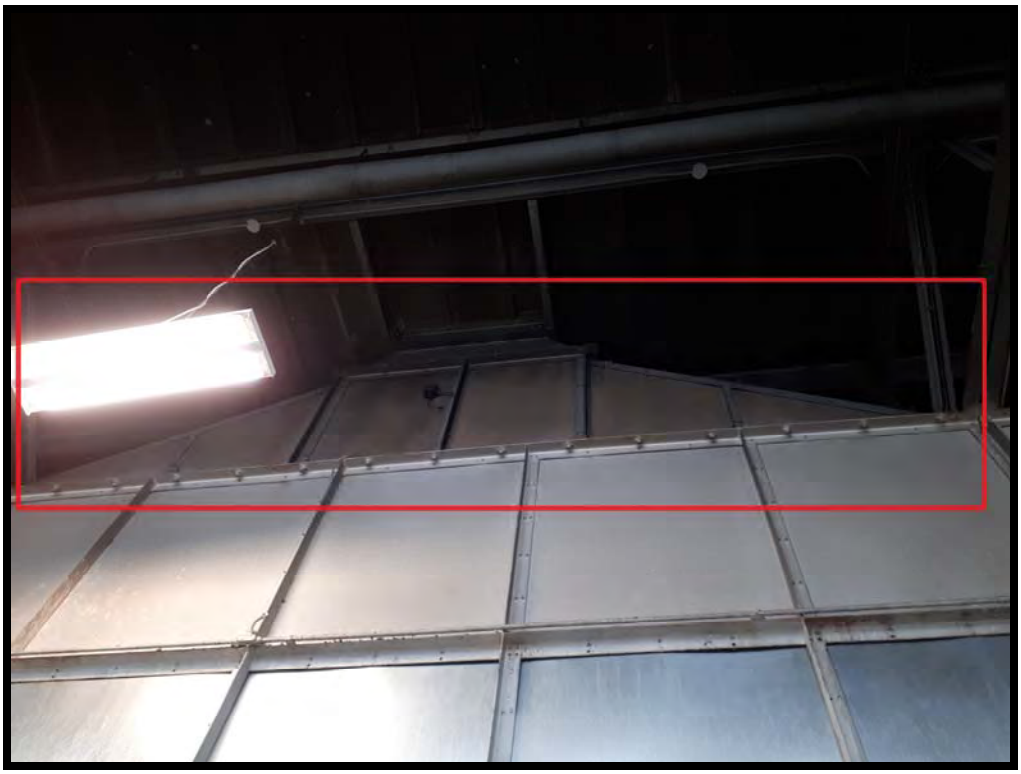

PHOTO # 43c
Asbestos-containing "Transite" panels on upper part of
exhaust hoods for locomotives in Diesel Shop – above Service Pits

APPENDIX 'B'

Lead Lab Transcripts
&
Sample Photos

CADUCEON ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: --- **REPORT No. B18-32158**

Report To:

Thomas Contracting
72 Ninovan Road,
Callander ON P0H 1H0 Canada
Attention: Grant Johnson

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 17-Oct-18
DATE REPORTED: 30-Oct-18
SAMPLE MATRIX: Paint Chips

JOB/PROJECT NO.: ONR-DSS
P.O. NUMBER: TC-201434
WATERWORKS NO.

	Parameter		Lead	Lead			
	Units		µg/g	µg/g			
	R.L.		5	5			
	Reference Method		EPA 6010	EPA 6010			
	Date Analyzed/Site		29-Oct-18/O	30-Oct-18/O			
Client I.D.	**Sample I.D.**	**Date Collected**					
ONR-4	B18-32158-1	15-Oct-18		5830			
ONR-5	B18-32158-2	15-Oct-18	1010				
ONR-10	B18-32158-3	15-Oct-18		13800			
ONR-11	B18-32158-4	15-Oct-18		14200			
ONR-19	B18-32158-5	15-Oct-18		6380			
ONR-21	B18-32158-6	15-Oct-18	72				
ONR-23	B18-32158-7	15-Oct-18	214				
ONR-26	B18-32158-8	15-Oct-18	34				

Greg Clarkin , BSc., C. Chem
Lab Manager - Ottawa District

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Page 1 of 1.

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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: ---

REPORT No. B18-32692

Report To:

Thomas Contracting
72 Ninovan Road,
Callander ON P0H 1H0 Canada
Attention: Grant Johnson

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 23-Oct-18
DATE REPORTED: 26-Oct-18
SAMPLE MATRIX: Paint Chips

JOB/PROJECT NO.: ONR-DSS
P.O. NUMBER: TC-201434
WATERWORKS NO.

	Parameter		Lead	Lead			
	Units		µg/g	µg/g			
	R.L.		5	5			
	Reference Method		EPA 6010	EPA 6010			
	Date Analyzed/Site		25-Oct-18/O	26-Oct-18/O			
Client I.D.	**Sample I.D.**	**Date Collected**					
ONR-34	B18-32692-1	18-Oct-18	2590				
ONR-37	B18-32692-2	18-Oct-18		7990			
ONR-39	B18-32692-3	18-Oct-18		7750			
ONR-47	B18-32692-4	18-Oct-18		13000			
ONR-49	B18-32692-5	18-Oct-18	2530				
ONR-55	B18-32692-6	18-Oct-18	110				
ONR-56	B18-32692-7	18-Oct-18	2880				

Greg Clarkin , BSc., C. Chem
Lab Manager - Ottawa District

R.L. = Reporting Limit
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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Page 1 of 1.

CADUCEON™ ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: --- **REPORT No. B18-33320**

Report To:
Thomas Contracting
72 Ninovan Road,
Callander ON P0H 1H0 Canada
Attention: Grant Johnson

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 29-Oct-18
DATE REPORTED: 01-Nov-18
SAMPLE MATRIX: Paint Chips

JOB/PROJECT NO.: ONR-DSS
P.O. NUMBER: TC-201434
WATERWORKS NO.

	Parameter		Lead	Lead			
	Units		µg/g	µg/g			
	R.L.		5	5			
	Reference Method		EPA 6010	EPA 6010			
	Date Analyzed/Site		31-Oct-18/O	01-Nov-18/O			
Client I.D.	Sample I.D.	Date Collected					
ONR-62	B18-33320-1	24-Oct-18		8010			
ONR-66	B18-33320-2	24-Oct-18		10700			
ONR-67	B18-33320-3	24-Oct-18		5180			
ONR-68	B18-33320-4	24-Oct-18	3950				
ONR-69	B18-33320-5	24-Oct-18	380				

Greg Clarkin , BSc., C. Chem
Lab Manager - Ottawa District

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Page 1 of 1.

Photo # 44
Sample # ONR – 4 : Wall paint located within the Power House - Room 100.
Deem to be Lead-based paint. (surface colour = green)

Photo # 45
Sample # ONR – 5 : Ceiling paint located within the Power House – Room 100.
Deem to be Lead-containing paint. (surface colour = off white)

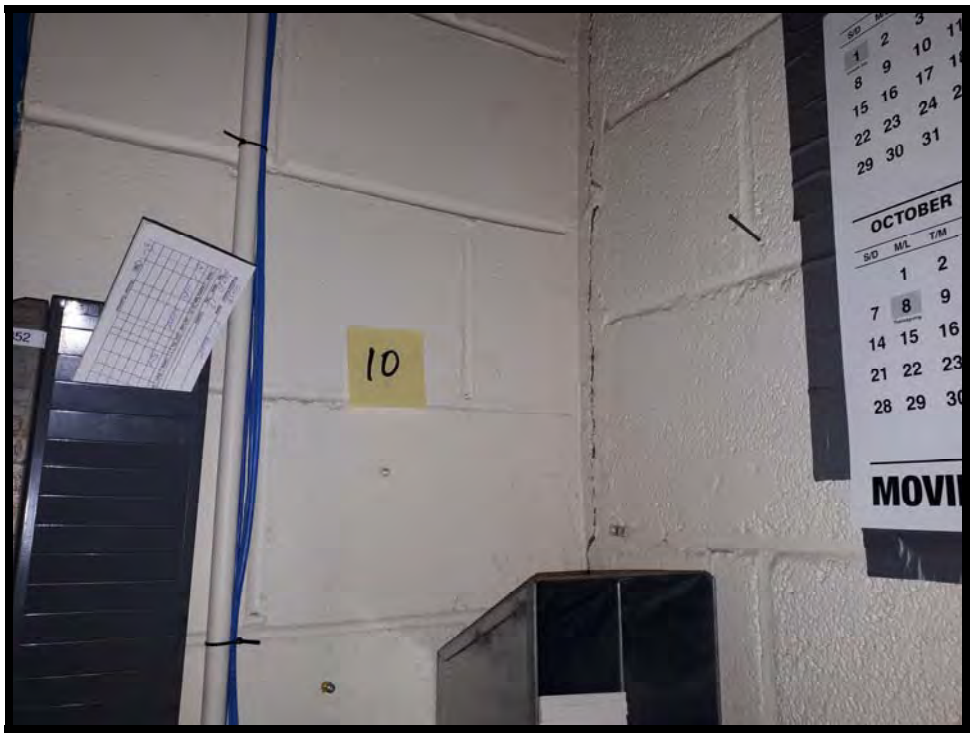

Photo # 46
Sample # ONR – 10 : Wall & Ceiling paint located within the Wheel Shop - Room 1.
Deem to be Lead-based paint. (surface colour = off white)

Photo # 47
Sample # ONR – 11 : Wall & Ceiling paint located within the Wheel Shop – Electrical Room.
Deem to be Lead-containing paint. (surface colour = yellow)

Photo # 48
Sample # ONR – 19 : Wall paint located within the Wheel Shop - Room 7.
Deem to be Lead-based paint. (surface colour = beige)

Photo # 49
Sample # ONR – 21 : Ceiling paint located within the Wheel Shop – Room 7.
Deem to be Low-level lead paint. (surface colour = off white)

Photo # 50
Sample # ONR – 23 : Wall paint located within the "Old" Paint & Grit Shop – Stairs 1. Deem to be Low-level lead paint. (surface colour = light beige)

Photo # 51
Sample # ONR – 26 : Wall paint located within the "Old" Paint & Grit Shop – Room 9. Deem to be Low-level lead paint. (surface colour = light beige)

Photo # 52
Sample # ONR – 34 : Wall & Ceiling paint located within the Diesel Shop – Room 3.
Deem to be Lead-containing paint. (surface colour = beige)

Photo # 53
Sample # ONR – 37 : Wall paint located within the Diesel Shop – Room 6.
Deem to be Lead-based paint. (surface colour = green)

Photo # 54
Sample # ONR – 39 : Ceiling paint located within the Diesel Shop – Room 5.
Deem to be Lead based paint. (surface colour = dark green)

Photo # 55
Sample # ONR – 47 : Structural Steel paint located within the Diesel Shop – East Area. Deem to be Lead-based paint. (surface colour = beige)

Photo # 56
Sample # ONR – 49 : Wall & Ceiling paint located within the Diesel Shop – Room 16.
Deem to be Lead-containing paint. (surface colour = light beige)

Photo # 57
Sample # ONR – 55 : Wall paint located within the Diesel Shop – Addition Area.
Deem to be Low-level lead paint. (surface colour = green)

Photo # 58
Sample # ONR – 56 : Wall & Ceiling paint located within the Diesel Shop – Room 100.
Deem to be Lead-containing paint. (surface colour = light beige)

Photo # 59
Sample # ONR – 62 : Wall paint located within the Diesel Shop – Room 201.
Deem to be Lead-based paint. (surface colour = green)

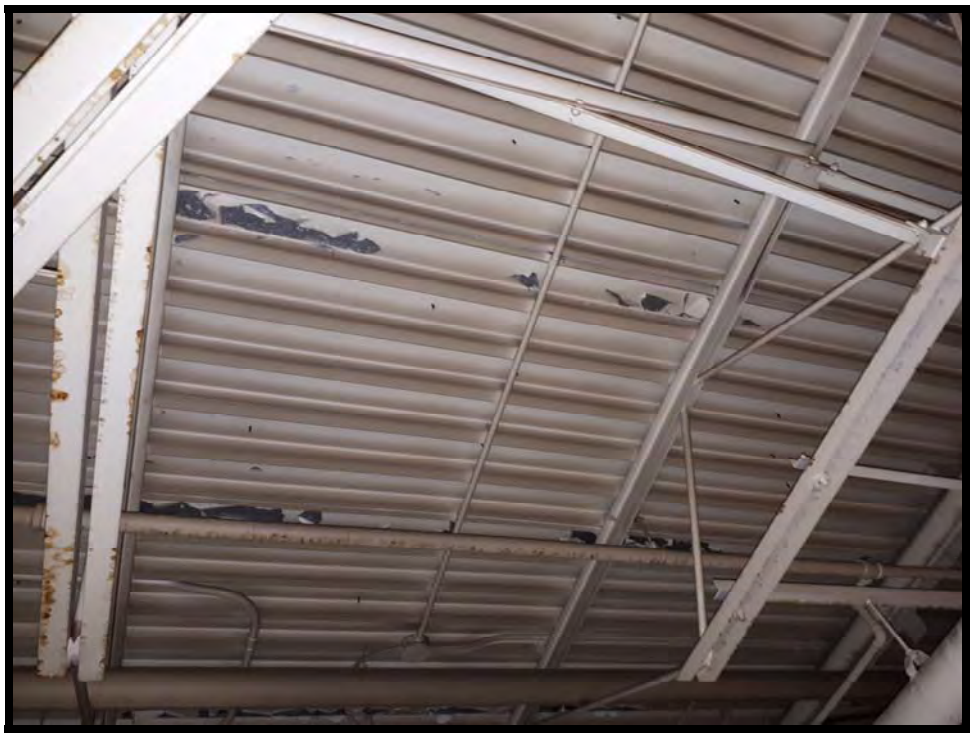

Photo # 60
Sample # ONR – 66 : Ceiling paint located within the Car Shop – Room 200.
Deem to be Lead-based paint. (surface colour = beige)

Photo # 61
Sample # ONR – 67 : Wall paint located within the Car Shop – Room 200.
Deem to be Lead-based paint. (surface colour = green)

Photo # 62
Sample # ONR – 69 : Wall paint located within the Car Shop – Room B.
Deem to be Low-level lead paint. (surface colour = light beige)

Photo # 63
Lead-based metal flashing used on exterior windows and doors on Wheel Shop.
Also used on exterior windows and doors on Wheel Shop.

Photo # 64
Lead-based caulking used on exterior windows sill's on Wheel Shop.
Also used on exterior windows and doors on Wheel Shop.

Photo # 64a
Lead-based caulking used on exterior windows sill's on Wheel Shop.
Also used on exterior windows and doors on Wheel Shop.

APPENDIX 'C'

Thermostatic Control Switch Photo (Mercury)

Photo # 65
Wall mounted "Honeywell" Thermostatic Control Switch – Mercury Containing.
Located within the "Old" Paint & Grit Shop – Room 10.
Typical of other Thermostats' found throughout all buildings

Photo # 66
Wall mounted "Honeywell" Thermostatic Control Switch – Mercury Containing.
Located within the Diesel Shop – Room D.
Typical of other Thermostats' found throughout all buildings.

Photo # 67
Wall mounted "Honeywell" Thermostatic Control Switch – Mercury Containing.
Located within the Car Shop – Room 200.
Typical of other Thermostats' found throughout all buildings.

APPENDIX 'D'

Building / Room DSS Assessment

BUILDING / ROOM DSS ASSESSMENT

POWER HOUSE

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Exterior	• *Window Caulking – ONR 20 – 50 ft^2*	• *No suspected LCM's*	• *No suspected MCM's*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
100 (Boiler Area)	• *Cold Water – Elbow/Fitting Insulation – ONR 1 – 22* • *HPS – Pipewrap Insulation – SAS 2 – 200 ft* • *HPS – Header Insulation – SAS 2 – 20 ft* • *HPS – Elbow/Fitting Insulation – SAS 1 – 10* • *Condensate Line – Pipewrap Insulation – ONR 2 – 200 ft* • *Condensate Line – Elbow/Fitting Insulation – SAS 1 – 23* • *Boiler Feed & Make-up Line – Pipewrap Insulation – SAS 2 – 130 ft* • *Boiler Feed & Make-up Line – Elbow/Fitting Insulation – SAS 1 – 10* • *Boiler Breeching/Exhaust – Pipewrap Insulation – ONR 3 – 160 ft* • *Boiler Units – Possible jacket insulation and refractory brick*	• *Green Wall Paint – ONR 4* • *White Ceiling Paint – ONR 5*	• *Fluorescent Tubes (50)*	• *Ceramic Floor Tile* • *Block Walls* • *Concrete Slabs* • *Concrete Foundations* • *Refractory Brick*
101 (Office)	• *No suspected ACM's*	• *No suspected LCM's (modern blue latex paint)*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
102 (Electrical Area)	• *No suspected ACM's*	• *Green Wall Paint – ONR 4* • *White Ceiling Paint – ONR 5*	• *No suspected MCM's*	
200 (Mezzanine)	• *Jacket Insulation on Deaerator Tank – ONR 6 – 250 ft^2* • *HPS – Pipewrap Insulation – SAS 2 – 22 ft* • *HPS – Elbow/Fitting Insulation – SAS 1 – 10*	• *Green Wall Paint – ONR 4* • *White Ceiling Paint – ONR 5*	• *No suspected MCM's*	

Notes:
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b) Samples : "ONR" designation are primary samples obtained and "SAS" designation are representative materials based on the primary sample.
c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

WHEEL SHOP

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Exterior	• *Window Caulking – ONR 20 – 50 ft^2*	• *Bar flashing around windows* • *Caulking on window sill plates*	• *No suspected MCM's*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Electrical Room	• *HPS – Pipewrap Insulation – ONR 8 – 15 ft* • *Cold Water – Pipewrap Insulation – ONR 7 – 20 ft* • *Heating Line – Pipewrap Insulation – ONR 9 – 35 ft* • *Heating Line – Elbow/Fitting Insulation – SAS 13 – 2*	• *Yellow Wall Paint – ONR 11* • *Yellow Ceiling Paint – SAS 11*	• *Fluorescent Tubes (6)* • *Possible PCB's in light fixture ballast*	• *Ceramic Floor Tile* • *Block Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 1	• *No suspected ACM's*	• *White Wall Paint – ONR 10* • *White Ceiling Paint – SAS 10*	• *Fluorescent Tubes (2)*	• *Ceramic Floor Tile* • *Block Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 2	• *Heating Line – Pipewrap Insulation – SAS 9 – 16 ft*	• *White Wall Paint – SAS 10* • *White Ceiling Paint – SAS 10*	• *Fluorescent Tubes (4)*	
Room 3	• *Heating Line – Pipewrap Insulation – SAS 9 – 18 ft* • *Rain Leader – Elbow/Fitting Insulation – ONR 13 – 5*	• *White Wall Paint – SAS 10* • *White Ceiling Paint – SAS 10*	• *Fluorescent Tubes (12)* • *Possible PCB's in light fixture ballast*	
Room 4	• *Heating Line – Pipewrap Insulation – SAS 9 – 120 ft* • *Rain Leader – Elbow/Fitting Insulation – SAS 13 – 16* • *Wall Plaster – ONR 14*	• *Yellow Wall Paint – SAS 19* • *Yellow Ceiling Paint – SAS 19*	• *Fluorescent Tubes (40)* • *Possible PCB's in light fixture ballast*	
Room 5	• *Rain Leader – Elbow/Fitting Insulation – SAS 13 – 2*	• *Yellow Wall Paint – SAS 19* • *Yellow Ceiling Paint – SAS 19*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
Room 6	• *Heating Line – Pipewrap Insulation – SAS 9 – 50 ft* • *Heating Line – Elbow/Fitting Insulation – SAS 13 – 6* • *Cold Water Line – Elbow/Fitting Insulation – SAS 13 – 4* • *HPS – Pipewrap Insulation – SAS 8 – 21 ft* • *HPS – Elbow/Fitting Insulation – SAS 13 – 2*	• *Yellow Wall Paint – SAS 19* • *Yellow Ceiling Paint – SAS 19*	• *Fluorescent Tubes (6)* • *Possible PCB's in light fixture ballast*	• *Ceramic Floor Tile* • *Block Walls* • *Concrete Slabs* • *Concrete Foundations*

Notes:
a) This table is to be read in conjunction with Thomas Contracting Report TC - 201434, and requires interpretation assistance before use by others.
b) Samples : "ONR" designation are primary samples obtained and "SAS" designation are representative materials based on the primary sample.
c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

WHEEL SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Room 6A	• *Heating Line – Pipewrap Insulation – SAS 9 – 40 ft*	• *No suspected LCM's (modern dark beige latex paint)*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	• *Ceramic Floor Tile* • *Block Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 7	• *HPS – Pipewrap Insulation – SAS 8 – 150 ft* • *HPS – Elbow/Fitting Insulation – SAS 13 – 8* • *Heating Line – Pipewrap Insulation – SAS 9 – 150 ft* • *Heating Line – Elbow/Fitting Insulation – SAS 13 – 25* • *Cold Water Line – Elbow/Fitting Insulation – SAS 13 – 30* • *Domestic Hot Water Line – Pipewrap Insulation – ONR 18 – 310ft* • *Domestic Hot Water Line – Elbow/Fitting Insulation – SAS 13 – 4* • *Rain Leader – Elbow/Fitting Insulation – SAS 13 – 16*	• *Yellow Wall Paint – ONR 19* • *Beige Ceiling Paint – ONR 21*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Attic Space (above offices)	• *No suspected ACM's*	• *No suspected LCM's*	• *No suspected MCM's*	• *No suspected Silica*

Notes:
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b) Samples : "ONR" designation are primary samples obtained and "SAS" designation are representative materials based on the primary sample.
c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

"OLD" PAINT & GRIT SHOP

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Exterior	• *No suspected ACM's*	• *No suspected LCM's*	• *No suspected MCM's*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Stairs 1	• *Heating Line – Elbow/Fitting Insulation – SAS 22 – 10*	• *Light Blue Paint – ONR 23*	• *Fluorescent Tubes (6)* • *Possible PCB's in light fixture ballast*	
Room 1 (Upper Mech. Rm.)	• *Piping – Elbow/Fitting Insulation – ONR 22 – 40* • *Tank Insulation – SAS 22 – 12 ft*	• *Light Blue Paint – SAS 23*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	• *Block Walls* • *Concrete Slabs*
Room 2 (Upper Elect. Rm.)	• *No suspected ACM's*	• *No suspected LCM's*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 3	• *Heating Line – Elbow/Fitting Insulation – SAS 22 – 10* • *Cold Water Line – Elbow/Fitting Insulation – SAS 22 – 4*	• *Light Blue Paint – SAS 23*	• *Fluorescent Tubes (10)* • *Possible PCB's in light fixture ballast*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 4	• *No suspected ACM's*	• *Light Beige Paint – SAS 26*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
Room 5	• *12" x 12" Vinyl Floor Tile – ONR 25 – 22 ft^2*	• *Light Beige Paint – SAS 26*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 6	• *12" x 12" Vinyl Floor Tile – ONR 25 – 830 ft^2* • *Heating Line – Elbow/Fitting Insulation – SAS 22 – 15*	• *Light Beige Paint – SAS 26*	• *Fluorescent Tubes (16)* • *Possible PCB's in light fixture ballast*	
Room 7	• *No suspected ACM's*	• *No suspected LCM's (modern beige latex paint)*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 8	• *Rain Leader Line – Elbow & Hopper Insulation – SAS 22 – 2*	• *Light Beige Paint – SAS 26*	• *Fluorescent Tubes (44)*	

Notes:
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c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

"OLD" PAINT & GRIT SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Rooms 10 to 12	• *No suspected ACM's*	• *Light Beige Paint – SAS 26*	• *Fluorescent Tubes (24)* • *Wall Thermostat*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 13	• *No suspected ACM's*	• *No suspected LCM's*	• *Fluorescent Tubes (4)*	
Room 14	• *Heating Line – Elbow/Fitting Insulation – SAS 22 – 9*	• *No suspected LCM's*	• *Fluorescent Tubes (18)* • *Possible PCB's in light fixture ballast*	
Room 15	• *No suspected ACM's*	• *Possible lead paint debris from sandblasting work*	• *No suspected MCM's*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations* • *Sandblasting medium*
Room 16	• *No suspected ACM's*	• *Light Beige Paint – SAS 26*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
Room 17	• *HPS Line – Elbow/Fitting Insulation – SAS 22 – 8*	• *Light Beige Paint – SAS 26*	• *No suspected MCM's*	
Room 18	• *No suspected ACM's*	• *Light Beige Paint – SAS 26* • *Possible lead paint in stored cans*	• *No suspected MCM's*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*

"NEW" PAINT SHOP

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Entire Shop	• *No suspected ACM's*	• *Wall, ceiling and structural paint observed within the building is classed as Low-level lead paint.*	• *Fluorescent Tubes*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*

Notes:
a) This table is to be read in conjunction with Thomas Contracting Report TC - 201434, and requires interpretation assistance before use by others.
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c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

DIESEL SHOP

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Exterior	• *Window Caulking – ONR 72*	• *Bar flashing around windows* • *Caulking on window sill plates*	• *No suspected MCM's*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Tunnel	• *HPS Line – Elbow/Fitting Insulation – ONR 31 – 15* • *HPS Line – Pipewrap Insulation – ONR 27 – 400 ft* • *HPS Line – Tar Paper Insulation – ONR 28 – 400 ft* • *Cold Water Line – Elbow/Fitting Insulation – ONR 29 – 15* • *Cold Water Line – Pipewrap Insulation – ONR 30 – 50 ft*	• *No suspected LCM's*	• *No suspected MCM's*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 1	• *Heating Line – Pipewrap Insulation – ONR 32 – 80 ft* • *Heating Line – Elbow/Fitting Insulation – SAS 31 – 2*	• *Light Beige Paint – SAS 34*	• *Fluorescent Tubes (24)* • *Possible PCB's in light fixture ballast*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 2	• *Heating Line – Pipewrap Insulation – SAS 32 – 16 ft* • *Heating Line – Elbow/Fitting Insulation – SAS 31 – 2*	• *Light Beige Paint – SAS 34*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 3	• *No suspected ACM's*	• *Light Beige Paint – SAS 34*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
Room 4	• *Heating Line – Pipewrap Insulation – SAS 32 – 130 ft* • *Heating Line – Elbow/Fitting Insulation – SAS 31 – 4*	• *Light Beige Paint – SAS 26*	• *No suspected MCM's*	
Room 5	• *No suspected ACM's*	• *Dark Green Paint – ONR 39*	• *No suspected MCM's*	

Notes:
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c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

DIESEL SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Room 6	• *No suspected ACM's*	• *Green Paint – ONR 37*	• *Fluorescent Tubes (6)*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 7	• *Cold Water Line – Pipewrap Insulation – SAS 33 – 125 ft* • *Cold Water Line – Elbow/Fitting Insulation – SAS 29 – 13* • *Steam Line – Pipewrap Insulation – ONR 35 – 100 ft* • *Steam Line – Elbow/Fitting Insulation – SAS 31 – 5*	• *Green Paint – ONR 37*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 8	• *Heating Line – Pipewrap Insulation – SAS 50 – 75 ft* • *Heating Line – Elbow/Fitting Insulation – SAS 31 – 2* • *Rain Leader Line – Elbow/Fitting Insulation – SAS 29 – 2*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (14)* • *Possible PCB's in light fixture ballast*	
Room 9	• *Heating Line – Pipewrap Insulation – SAS 50 – 100 ft*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (32)* • *Possible PCB's in light fixture ballast*	
Room 10	• *Heating Line – Pipewrap Insulation – SAS 50 – 20 ft*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 11	• *Heating Line – Pipewrap Insulation – SAS 50 – 20 ft*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 12	• *Heating Line – Pipewrap Insulation – SAS 50 – 40 ft*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (12)* • *Possible PCB's in light fixture ballast*	

Notes:
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c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

DIESEL SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Room 13	• *Heating Line – Pipewrap Insulation – SAS 50 – 20 ft*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (6)* • *Possible PCB's in light fixture ballast*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 14	• *Heating Line – Pipewrap Insulation – SAS 50 – 40 ft*	• *No suspected LCM's (New white latex paint)*	• *Fluorescent Tubes (18)* • *Possible PCB's in light fixture ballast*	
Room 15	• *Heating Line – Pipewrap Insulation – SAS 50 – 10 ft*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (2)*	
Room 16	• *Heating Line – Pipewrap Insulation – SAS 50 – 70 ft*	• *Light Beige Paint – ONR 49*	• *Fluorescent Tubes (36)*	
Room 17	• *Heating Line – Pipewrap Insulation – ONR 50 – 20 ft*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
Room 18	• *Heating Line – Pipewrap Insulation – SAS 50 – 20 ft*	• *Light Beige Paint – SAS 49*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
East Area	• *Heating Line – Elbow/Fitting Insulation – ONR 41 – 44* • *Heating Line – Pipewrap Insulation – ONR 42 – 175 ft* • *Heating Line – Pipewrap Insulation – ONR 43 – 175 ft* • *Rain Leader Line – Elbow/Fitting Insulation – ONR 41 – 6* • *HPS Line – Elbow/Fitting Insulation – SAS 41 – 10*	• *Beige Structural Steel Paint – ONR 47*	• *Fluorescent Tubes (40)*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Centre Area	• *Heating Line – Elbow/Fitting Insulation – SAS 41 – 12* • *Heating Line – Pipewrap Insulation – SAS 43 – 170 ft* • *Rain Leader Line – Elbow/Fitting Insulation – SAS 41 – 4* • *HPS Line – Elbow/Fitting Insulation – SAS 41 – 14*	• *Beige Structural Steel Paint – SAS 47*	• *Fluorescent Tubes (40)*	

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b) Samples : "ONR" designation are primary samples obtained and "SAS" designation are representative materials based on the primary sample.
c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

DIESEL SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
West Area	• *Cold Water Line – Pipewrap Insulation – SAS 52 – 80 ft* • *Hot Water Line – Pipewrap Insulation – SAS 53 – 80 ft* • *Heating Line – Pipewrap Insulation – SAS 43 – 300 ft* • *Rain Leader Line – Elbow/Fitting Insulation – SAS 41 – 15*	• *Beige Structural Steel Paint – SAS 47*	• *Fluorescent Tubes (40)*	
Service Pits	• *Cold Water Line – Pipewrap Insulation – ONR 52 – 720 ft* • *Hot Water Line – Pipewrap Insulation – ONR 53 – 720 ft* • *Steam Line – Pipewrap Insulation – ONR 51 – 720 ft* • *All Pipe – Elbow/Fitting Insulation – SAS 41 – 80* • *"Transite" Panels – Top of Train Exhaust Hoods – 1200 ft^2*	• *Beige Structural Steel Paint – SAS 47*	• *Fluorescent Tubes (200)*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 100	• *Domestic Water Line – Pipewrap Insulation – SAS 52 – 36 ft* • *Domestic Water Line – Elbow/Fitting Insulation – SAS 40 - 8*	• *Light Beige Wall Paint – ONR 56* • *Light Beige Ceiling Paint – SAS 56*	• *Fluorescent Tubes (36)* • *Possible PCB's in light fixture ballast*	
Room 101	• *No suspected ACM's*	• *Light Beige Paint – SAS 56*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 102	• *No suspected ACM's*	• *Light Beige Paint – SAS 56*	• *Fluorescent Tubes (8)*	
Room 103	• *Rain Leader Line – Elbow/Fitting Insulation – SAS 41 – 5*	• *Beige Structural Steel Paint – SAS 47* • *Light Beige Paint – SAS 56*	• *Fluorescent Tubes (60)* • *Possible PCB's in light fixture ballast*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 104	• *No suspected ACM's*	• *Light Beige Paint – SAS 56*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
Stairs 1	• *No suspected ACM's*	• *Light Beige Paint – SAS 56*	• *Fluorescent Tubes (10)* • *Possible PCB's in light fixture ballast*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*

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b) Samples : "ONR" designation are primary samples obtained and "SAS" designation are representative materials based on the primary sample.
c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

DIESEL SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Room 201	• *No suspected ACM's*	• *Green Wall Paint – ONR 62*	• *Fluorescent Tubes (60)* • *Possible PCB's in light fixture ballast*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs*
Room 202	• *No suspected ACM's*	• *Light Beige Paint – SAS 56*	• *Fluorescent Tubes (60)* • *Possible PCB's in light fixture ballast*	
Room 203	• *No suspected ACM's*	• *No suspected LCM's*	• *Fluorescent Tubes (40)*	
Diesel Shop Addition	• *No suspected ACM's*	• *Beige Structural Steel and Wall Paint – ONR 55*	• *Fluorescent Tubes (175)*	• *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*

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BUILDING / ROOM DSS ASSESSMENT

CAR SHOP

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Mech. Room 200 (above Rm. 112)	• *All Pipe – Elbow/Fitting Insulation – ONR 65 – 160*	• *Beige Ceiling Paint – ONR 66* • *Green Wall Paint – ONR 67*	• *Fluorescent Tubes (14)* • *Possible PCB's in light fixture ballast*	• *Block / Brick Walls* • *Concrete Slabs*
Elect. Room 201 (above Rm. 112)	• *No suspected ACM's*	• *Beige Ceiling Paint – SAS 66* • *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (14)* • *Possible PCB's in light fixture ballast*	
Mech. Room 202 (above Rm. 110)	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 55*	• *Beige Ceiling Paint – SAS 66* • *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (14)*	
Mech. Room 'A' (above Rm. 103)	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 30*	• *Beige Wall Paint – ONR 68*	• *Fluorescent Tubes (12)* • *Possible PCB's in light fixture ballast*	
Room 'B'	• *Above Ceiling – Elbow/Fitting Insulation – SAS 65 – 1*	• *Light Beige Paint – ONR 69*	• *Fluorescent Tubes (28)* • *Possible PCB's in light fixture ballast*	
Stairs 'C'	• *No suspected ACM's*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
Room 'D'	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 15*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (34)* • *Wall Thermostat*	
Room 'E'	• *Rain Leader Line – Elbow/Hopper Insulation – SAS 65 – 4*	• *Beige Ceiling Paint – SAS 66* • *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (74)* • *Wall Thermostat*	
Room 'F'	• *Above Ceiling – Elbow/Fitting Insulation – SAS 65 – 3*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (20)* • *Possible PCB's in light fixture ballast*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs*
Room 'G'	• *12" x 12" Vinyl Floor Tile – ONR 71 – 300 ft^2* • *Above Ceiling – Elbow/Fitting Insulation – SAS 65 – 6*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (30)* • *Possible PCB's in light fixture ballast*	• *Block / Brick Walls* • *Concrete Slabs*

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c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

CAR SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Stairs 'H'	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 11*	• *Dark Beige Paint – SAS 66*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	• *Block / Brick Walls* • *Concrete Slabs*
Stairs 'J'	• *No suspected ACM's*	• *Dark Beige Paint – SAS 66*	• *Fluorescent Tubes (6)* • *Possible PCB's in light fixture ballast*	
Room 100	• *All Pipe – Elbow/Fitting Insulation – ONR 65 – 30*	• *Gray Paint – SAS 66*	• *Fluorescent Tubes (40)* • *Possible PCB's in light fixture ballast*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 101 & Room 101A	• *No suspected ACM's*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	
Room 101B (2 Offices)	• *No suspected ACM's*	• *No suspected LCM's (New blue latex paint)*	• *No suspected MCM's*	
Room 101C	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 10*	• *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (12)* • *Possible PCB's in light fixture ballast*	
Room 101D	• *Above Ceiling – Elbow/Fitting Insulation – SAS 65 – 2*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (2)* • *Possible PCB's in light fixture ballast*	
Room 102	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 12*	• *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (26)* • *Possible PCB's in light fixture ballast*	
Room 103	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 15*	• *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (38)* • *Possible PCB's in light fixture ballast*	
Room 104	• *No suspected ACM's*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (6)* • *Possible PCB's in light fixture ballast*	

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BUILDING / ROOM DSS ASSESSMENT

CAR SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Room 105	• *Above Ceiling – Elbow/Fitting Insulation – SAS 65 – 1*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (8)* • *Possible PCB's in light fixture ballast*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 106	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 150*	• *Light Beige Paint – SAS 69* • *Dark Beige Paint – SAS 66*	• *Fluorescent Tubes (6)* • *Possible PCB's in light fixture ballast*	
Room 107	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 11*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (16)* • *Possible PCB's in light fixture ballast*	
Room 108	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 17*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 109	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 150*	• *Light Beige Paint – SAS 69* • *Dark Beige Paint – SAS 66*	• *No suspected MCM's*	
Room 110	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 25*	• *Dark Beige Paint – SAS 66* • *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (24)*	
Room 111	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 30*	• *Light Beige Paint – SAS 69* • *Dark Beige Paint – SAS 66*	• *No suspected MCM's*	
Room 112	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 23*	• *Dark Beige Paint – SAS 66* • *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (32)* • *Possible PCB's in light fixture ballast* • *Wall Thermostat*	
Corridor 113	• *Above Ceiling – Elbow/Fitting Insulation – SAS 65 – 7*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (14)* • *Possible PCB's in light fixture ballast* • *Wall Thermostat*	
Room 114	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 2*	• *Light Beige Paint – SAS 69* • *Dark Beige Paint – SAS 66*	• *Fluorescent Tubes (12)* • *Possible PCB's in light fixture ballast*	

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b) Samples : "ONR" designation are primary samples obtained and "SAS" designation are representative materials based on the primary sample.
c) Estimated quantities are for guidance only and are not to be used for tendering purposes.

BUILDING / ROOM DSS ASSESSMENT

CAR SHOP (con't)

Location (Room / Area)	***Asbestos-Containing Materials (Component – Material – Sample # – Est. Qty.)***	***Lead-Containing Materials (Material – Sample #)***	***Mercury-Containing Materials***	***Silica***
Room 114A	• *No suspected ACM's*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	• *Ceramic Tiles* • *Block / Brick Walls* • *Concrete Slabs* • *Concrete Foundations*
Room 115	• *No suspected ACM's*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 116	• *No suspected ACM's*	• *Light Beige Paint – SAS 69*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Room 117	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 15* • *Asbestos Storage Cabinet – contains asbestos materials*	• *Green Wall Paint – SAS 67* • *Lead-acid Batteries Storage*	• *Stored (225) and in use Fluorescent Tubes (10)* • *Possible PCB's in light fixture ballast*	
Room 118	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 4*	• *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (10)* • *Possible PCB's in light fixture ballast*	
Room 119	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 12*	• *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (36)* • *Possible PCB's in light fixture ballast*	
Room 120	• *All Pipe – Elbow/Fitting Insulation – SAS 65 – 23*	• *Green Wall Paint – SAS 67*	• *Wall Thermostat*	
Room 121	• *No suspected ACM's*	• *Green Wall Paint – SAS 67*	• *Fluorescent Tubes (4)* • *Possible PCB's in light fixture ballast*	
Car Shop Office Area (New 2005)	• *No suspected ACM's*	• *No suspected LCM's (New latex paint)*	• *Fluorescent Tubes (46)*	

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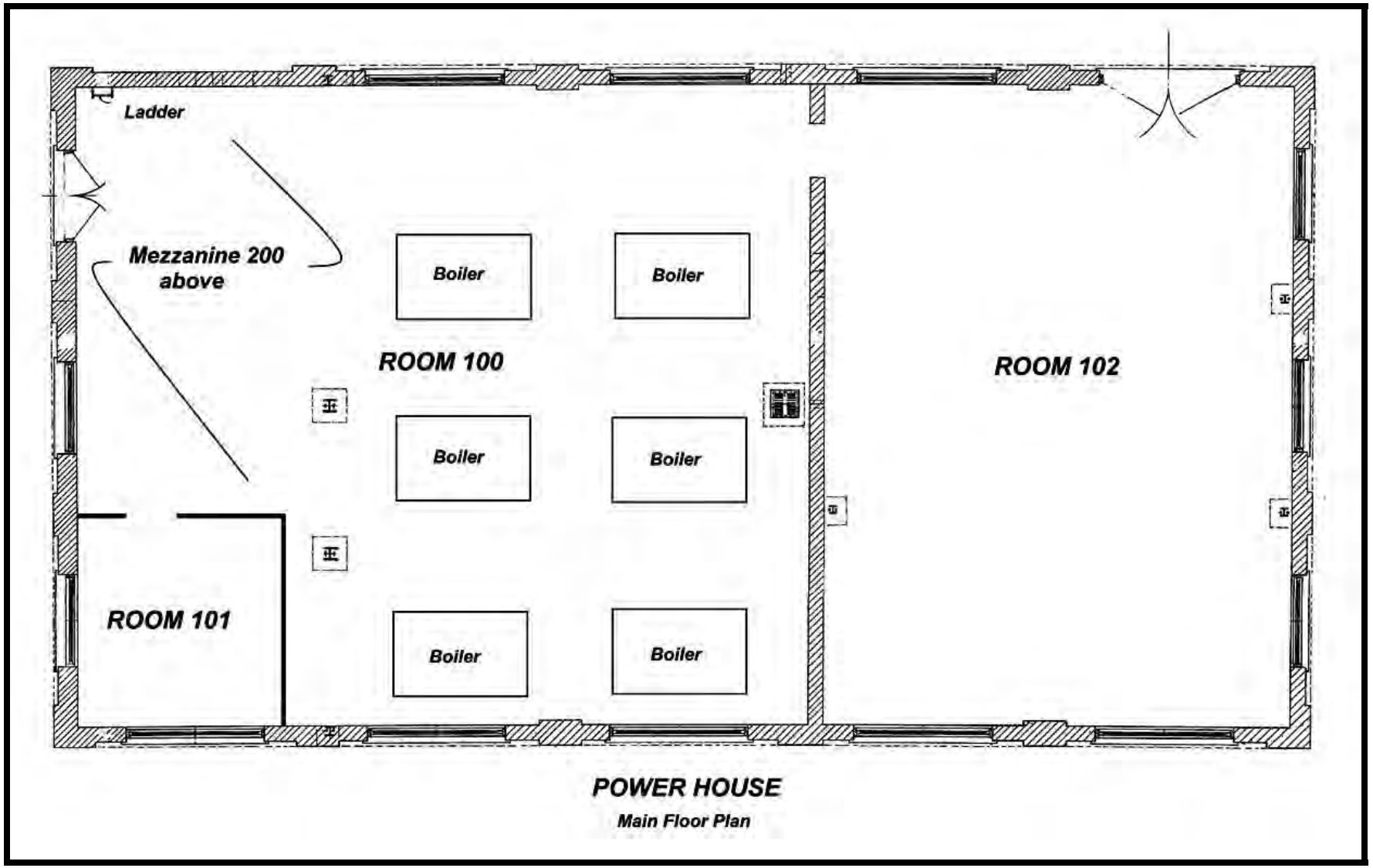
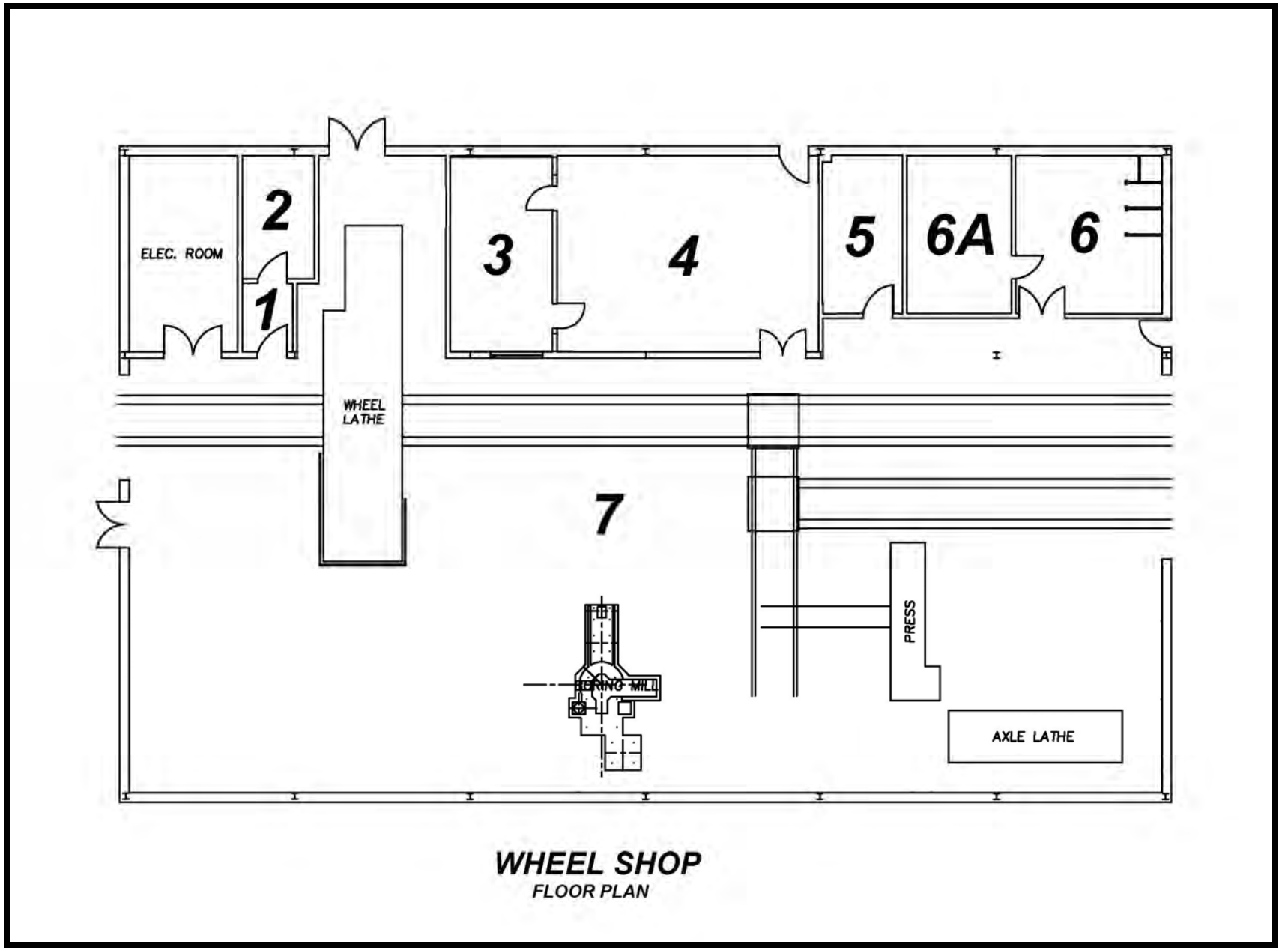
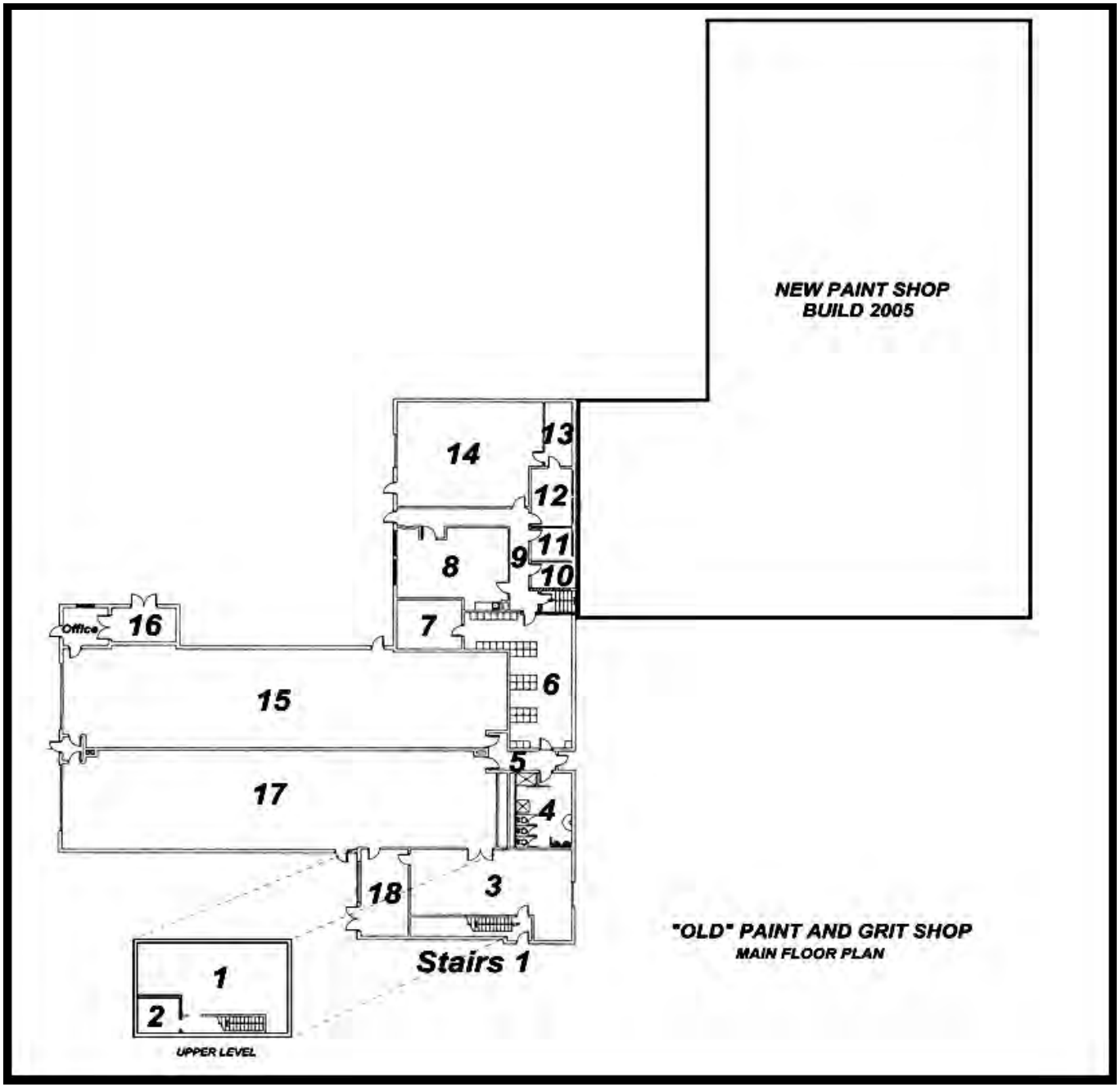
APPENDIX 'E'

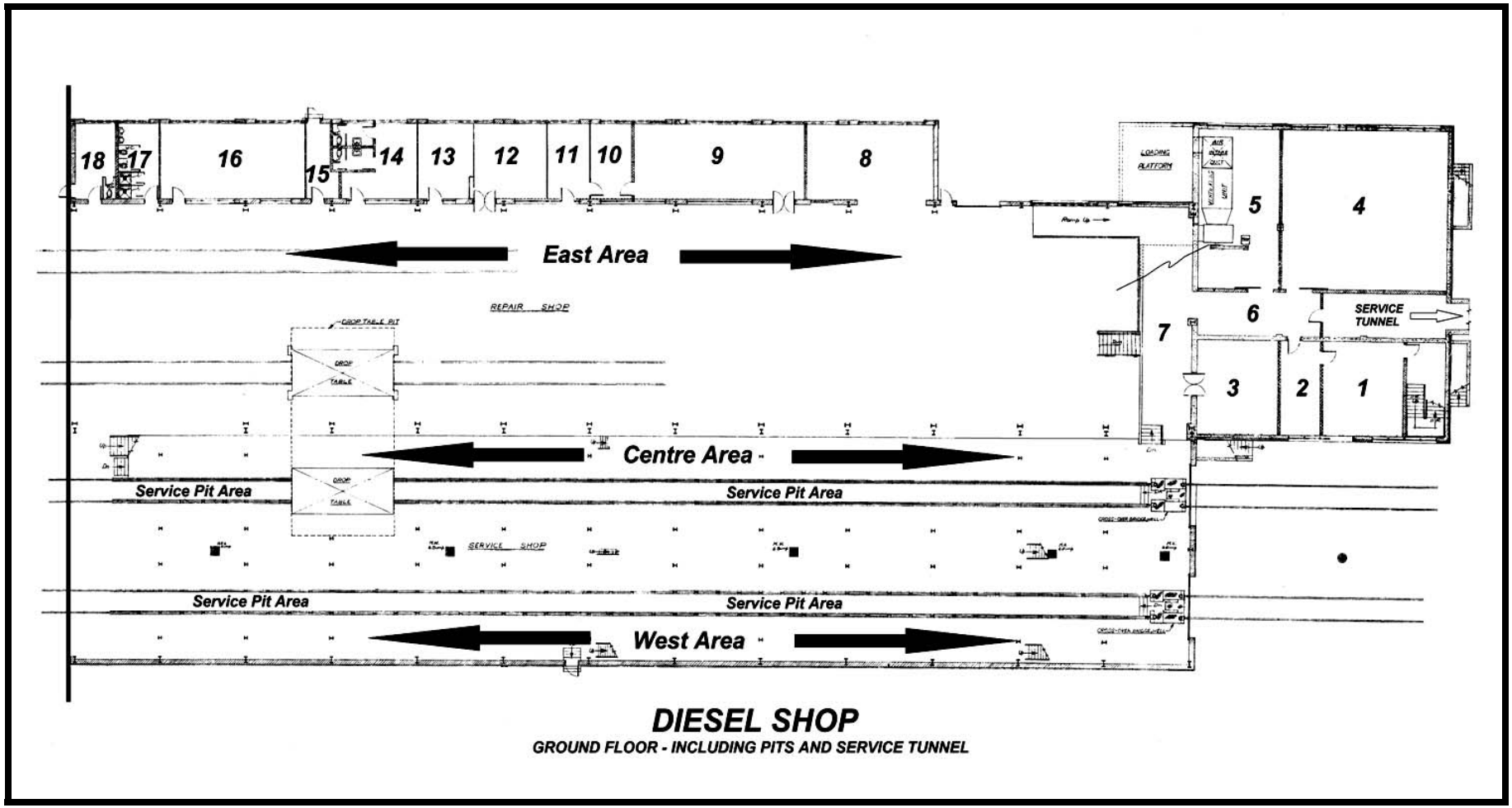
BUILDING FLOOR PLANS


Ladder
Mezzanine 200 above
Boiler
Boiler
ROOM 100
ROOM 102
Boiler
Boiler
ROOM 101
Boiler
Boiler
POWER HOUSE
Main Floor Plan



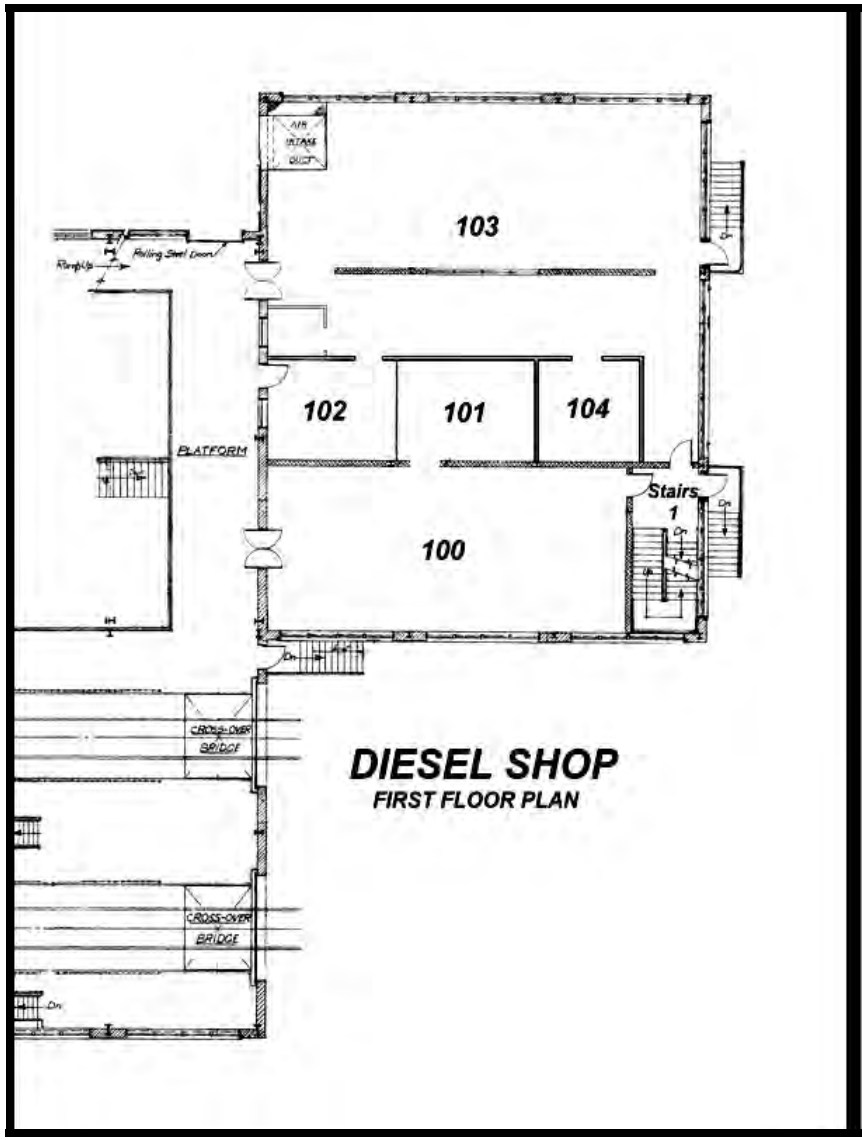
WHEEL SHOP
FLOOR PLAN

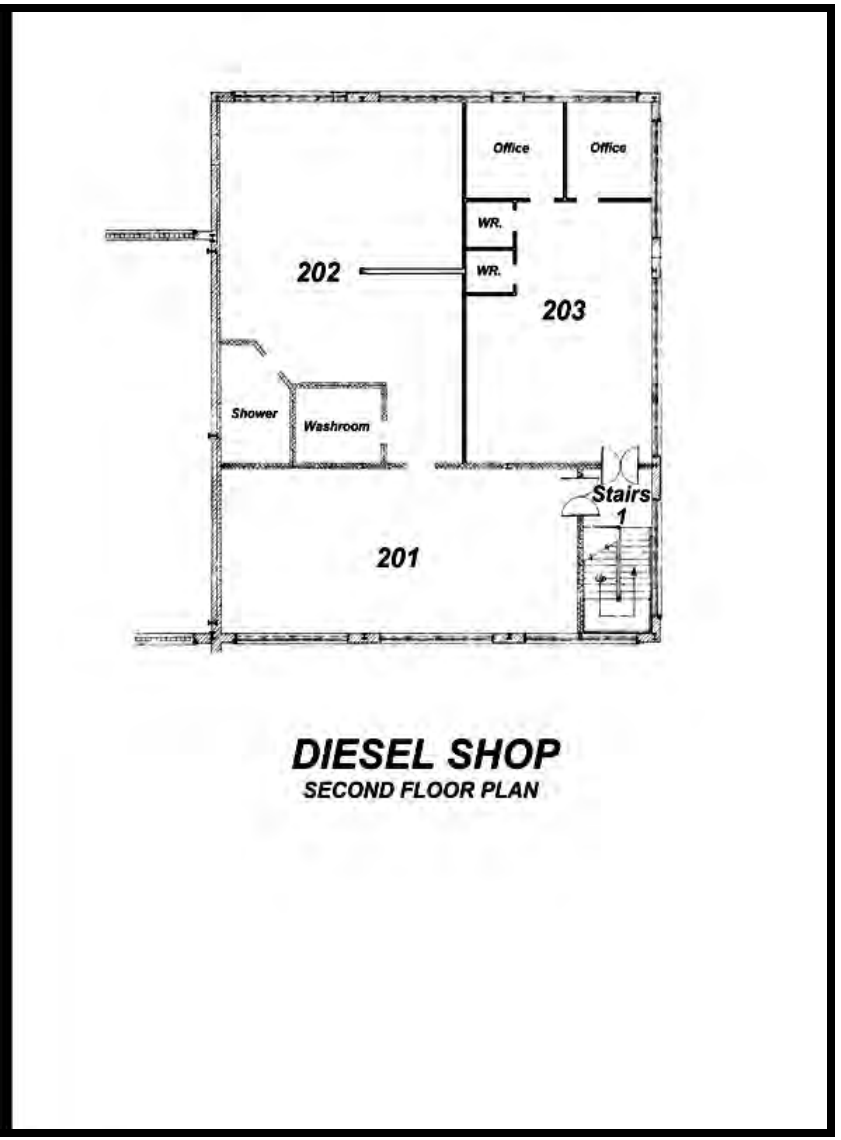

NEW PAINT SHOP
BUILD 2005
14
13
12
11
10
9
8
7
Office
16
15
6
5
17
4
18
3
Stairs 1
1
2
UPPER LEVEL
"OLD" PAINT AND GRIT SHOP
MAIN FLOOR PLAN

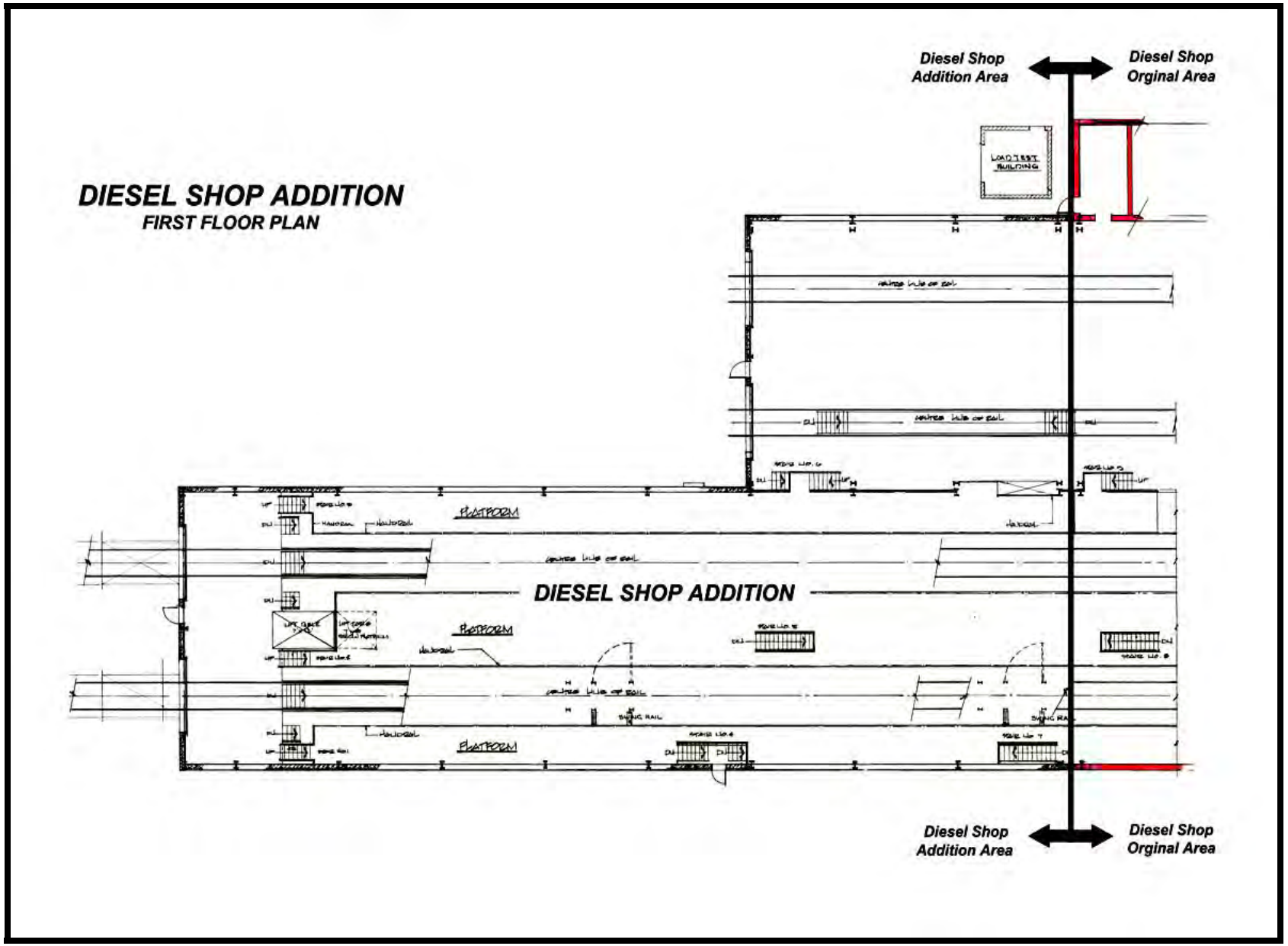


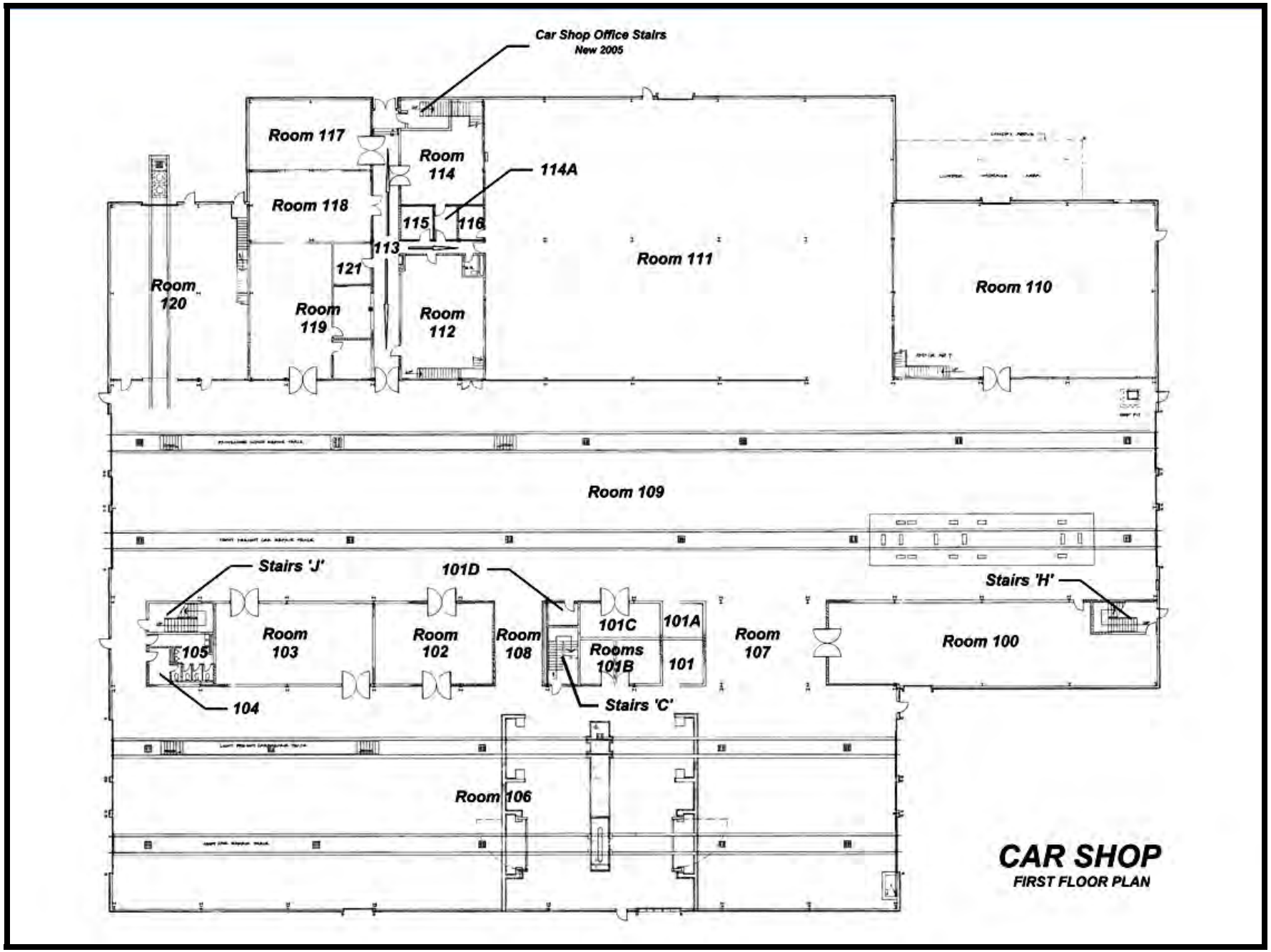
DIESEL SHOP

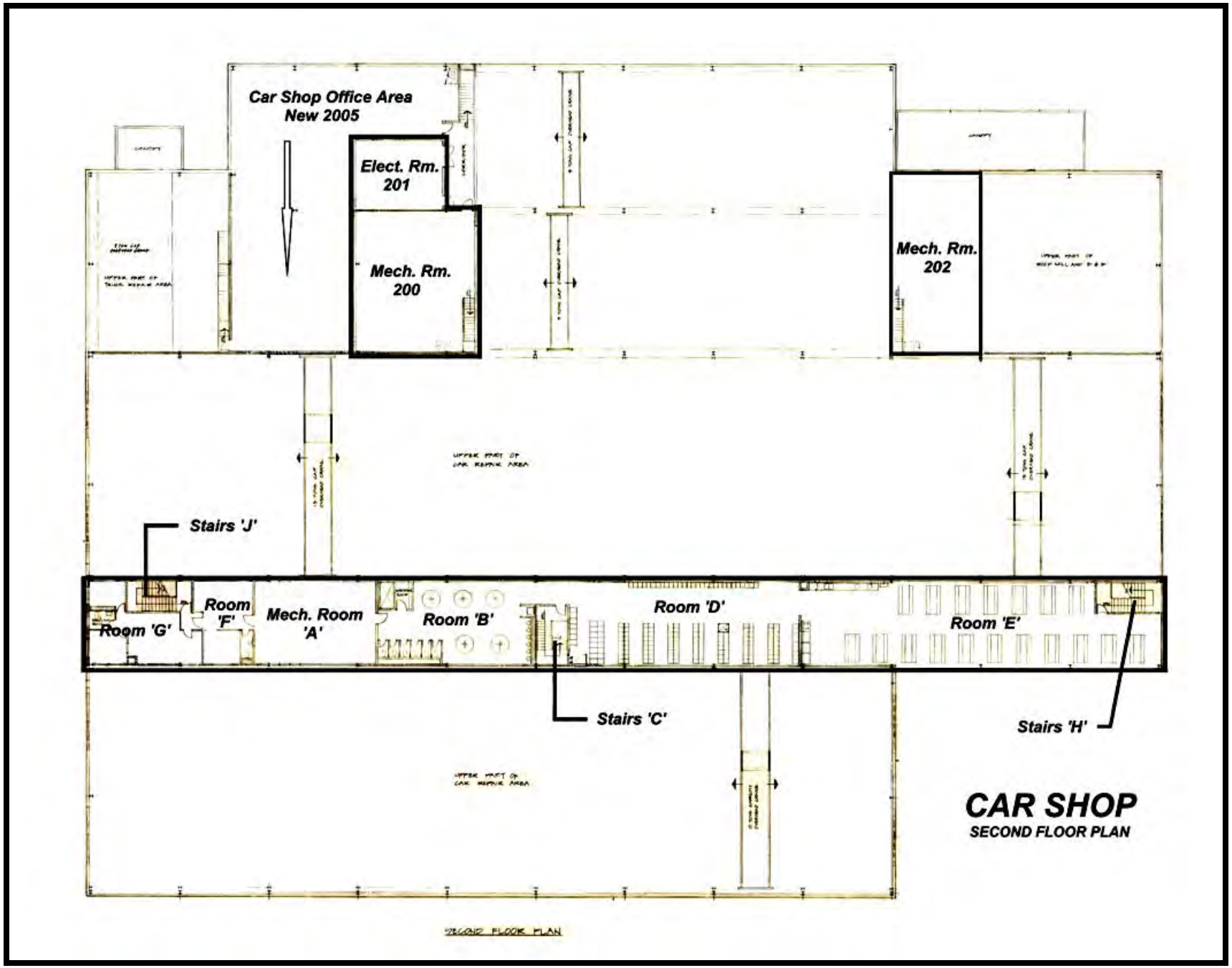
GROUND FLOOR - INCLUDING PITS AND SERVICE TUNNEL


AIR INTAKE DUCT
103
Rolling Steel Doors
Ramp Up
102
101
104
PLATFORM
Stairs 1
100
CROSS-OVER BRIDGE
CROSS-OVER BRIDGE
DIESEL SHOP
FIRST FLOOR PLAN


Office
Office
WR.
WR.
202
203
Shower
Washroom
Stairs 1
201
DIESEL SHOP
SECOND FLOOR PLAN


Diesel Shop
Addition Area
Diesel Shop
Orginal Area
DIESEL SHOP ADDITION
FIRST FLOOR PLAN
LOAD TEST
BUILDING
PLATFORM
DIESEL SHOP ADDITION
PLATFORM
PLATFORM
Diesel Shop
Addition Area
Diesel Shop
Orginal Area


Car Shop Office Stairs
New 2005
Room 117
Room 114
114A
Room 118
115
116
113
121
Room 120
Room 119
Room 112
Room 111
Room 110
Room 109
Stairs 'J'
101D
Stairs 'H'
Room 103
Room 102
Room 108
101C
101A
Rooms 101B
101
Room 107
Room 100
105
104
Stairs 'C'
Room 106
CAR SHOP
FIRST FLOOR PLAN


Car Shop Office Area
New 2005
Elect. Rm.
201
Mech. Rm.
200
Mech. Rm.
202
Stairs 'J'
Room
'F'
Room 'G'
Mech. Room
'A'
Room 'B'
Room 'D'
Room 'E'
Stairs 'C'
Stairs 'H'
CAR SHOP
SECOND FLOOR PLAN

Blue Signals/ Flags Procedure

Procedure No. HSP-007 **Date Issued: February 7, 2014**	**Revision:** **Date:**
Approved By: **H&S Mgmt Co-chair**	**Approved By:** **CMO/ VP**

PURPOSE AND SCOPE

Signals are used to ID equipment undergoing repair or maintenance on live tracks. Blue signals are required when working between, underneath and on top of equipment outside of shops, but can be used anywhere when safety may be in doubt. These blue signals are used by shop employees, contractors and customers.

RESPONSIBILITIES

The Supervisor is responsible for ensuring this procedure is adhered to. Employees are to follow the instructions included in this safe operating procedure as well as any additional instructions given by his or her supervisor.

PROCEDURE

Transport Canada Operating Rules (RAC)

- Recommended Blue Flag Specifications:
  a. Blue flags shall be blue in color and clearly distinguishable from both sides.
  b. The dimension of the blue flag should be a minimum of 14 inches by 10 inches. Blue flag should be at a minimum height of 18 inches from the top of the rail to the bottom of the flag.
  c. The blue flag must be maintained in good condition
- Supervisor may appoint a competent person to set up and remove blue signal protection.
- Blue signal to be placed between the switch and first car ensuring it is far away from the switch as to not interfere with said switch. When blue flagging equipment, where possible place flag a minimum of one car length from equipment and refer to C.R.O.R. Rule 26 on placing equipment in front of a blue signal
- When working in yards or high traffic areas, employees should be in communication with persons responsible for switching and carry a radio to monitor traffic.
- Repair work is any work performed in the red zone between, underneath, and on top.
- Adjoining track may be blue-flagged also if there is a hazard while performing duties and also if the employee will foul said track.

REFERENCES

RAC - Best Practice Circular No. 12- Blue Flag April 1, 2010
Rule 40 - Collective Agreement between ONTC and UNIFOR

REVISION RECORD

Description of Change	*Date*
Original Issue	2/7/14

Lockout Tag out Procedure

Procedure No. HSP-008 **Date Issued: February 9, 2017**		**Revision:** **Date:**
Approved By: **H&S Mgmt Co-chair**	**Approved By:** **H&S Union Co-chair**	**Approved By:** **Director of Operations**

PURPOSE AND SCOPE

To ensure that dangerous machines are properly shut off and not started up again prior to the completion of maintenance or servicing work. This must be followed to avoid the unexpected energization or start up of the machinery or equipment, or the release of stored energy, which could cause injury to employees.

RESPONSIBILITIES

The Supervisor is responsible for ensuring this procedure is adhered to. Employees are to follow the instructions included in this safe operating procedure as well as any additional instructions given by his or her supervisor.

PROCEDURE

The following SIX STEPS are a review of basic steps for safely de-energizing equipment:

1. Notify all "affected employees" that the equipment will be shut down.
2. Shut down the equipment by normal stopping procedures. Open the main disconnect switch or breaker.
   Note: Disconnect switches should never be pulled while they are under load. Shutdown everything you can at the point of operation, then pull the main switch with your LEFT hand while facing away from the switch box.
3. "Isolate" all the equipment's energy sources.
   a. **Electrical-** All Electrical lockouts must be done by designated qualified personnel the only acceptable electrical lock out is to lock the correct disconnect switch in the OFF position. Where possible, it is also advisable to remove the fuses. When an electrical lockout is necessary and the control is a breaker, lockout the breaker where possible or switch off the breaker and lock the panel door,
   b. **Steam/Air/Gas & Hydraulics-** These sources of power can be locked out by chains attached to the valves, by valves with built-in lockout devices or by designing special attachments for the valves. In pneumatic and hydraulic power systems, the pressure between the lock out and the machine must be reduced to zero before any work is begun. The pressure should be reduced slowly through a bleed-off valve. If the system does not incorporate a bleed-off valve, very slowly loosen a line fitting to reduce the pressure.
   c. **Confined Spaces** – Where work is to be done in the confined spaces such as tanks, bins, etc., the supply lines must be blanked off or disconnected. Valves alone must never be depended upon. Pumps or other related power equipment must be locked out and the person in the confined space must keep the key.
4. Lock out and/or tag out the energy isolating devices with assigned, individual locks. Every employee involved must also put their own lockout and tag on each source of power at this time.
5. Release or restrain any stored energy by grounding, blocking, bleeding down, etc.

6. Assure that no personnel are exposed, and then test the equipment to assure that it will not operate. (check the lockout cannot be operated, then try the machine controls to verify a proper disconnect)

Restoring Equipment to Service:

1. Check to Assure that all employees have been safely positioned or removed from the area.
2. Verify that equipment controls are in neutral.
3. Remove lockout devices and/or tags and re-energize the machine or equipment. (each employee involved is responsible for removal of their own lockout and tag)
4. Notify affected employees that servicing is complete and the equipment is ready for use.

REQUIREMENTS

1. Employee should have metal tag with name and number stamped on the tag for each lock out you use. The tag is to be placed on the shank of the lockout each time the lock out is used.
2. Disconnects should be clearly marked to identify the equipment they energize or control.
3. Never depend on a push button as a means of locking out the equipment. The only positive lock out is made at the disconnect or breaker.
4. If you are being reassigned or going off shift and someone else is going to finish the job, your relief must put on their lock out before you remove your lock out
5. Employees will be issued one key with each lock. A duplicate key will be kept in the Supervisor's office. Each lock and key shall be numbered for ease of identification. The duplicate key is to be used in case of emergency.
6. Uno circumstances should lockout be borrowed or loaned.

LOCK OUT REMOVAL PROCEDURE:

1. The area Supervisor shall be informed that a lock out needs to be removed and that the person assigned the lock out cannot be located.
2. The area supervisor will make every effort to contact the lock out owner and documents these attempts
3. If the area supervisor removing the lockout is not the supervisor of the lock out owner, that supervisor will be contacted if possible
4. If the above persons cannot be contacted and the area in question has been inspected and is clear of hazards to everyone, the lock out may be removed (cut-off).

REFERENCES

OSHA Standard: 29 CFR 1910.147
Canada Labour code – Part II

REVISION RECORD

Description of Change	*Date*
Original Issue	2/9/17

General Requirements for Contractors:

1. The Contractor will be required to complete the work in accordance with all applicable federal, provincial, and municipal laws.

2. The Contractor will be required to obtain and pay for all necessary permits, fees, inspections, and ministry notifications required for the project including, but not limited to, the following:
    - Filing notice of project with the Ontario Ministry of Labour.
    - Registering as Constructor with the Ontario Ministry of Labour.
    - Obtaining all necessary building permits and inspections.

3. The Contractor must strictly adhere to the inspection schedule detailed on the supplied drawings and documents.

4. Contractor to provide all locates required to complete work. Locates are required before breaking any ground or floor.

5. The Contractor will be required to secure their work area (create construction islands) for the duration of the project. The Contractor will be responsible for all activities inside this construction island, including health and safety. The Contractor shall coordinate their work with ONTC to ensure that disruption to work being done by ONTC employees in the areas outside of the construction island is not interrupted. Access by the Contractor will be restricted to the work area (construction island) only.

    Note that construction islands established by the Contractor must be blue flagged following the ONTC Blue Signals/Flags Procedure, Procedure No. HSP-007 (included with this RFQ), if the construction islands block live tracks. Also note that obstructions to road and pedestrian traffic must be kept to a minimum and coordinated with ONTC.

6. The Contractor will be required to perform all remediation work for designated substances which is required to complete the work for the Project, including the removal and disposal of any designated substances in accordance with all applicable laws. The cost of this remediation and disposal shall be included in the Contractor's price submission.

7. The Contractor shall remove all demolished material from ONTC property and pay for all disposal fees, with the exception of excavated material. Any excavated material (soil, gravel, sand, etc,) should be assumed to be contaminated and will remain on site.

8. The Contractor will have access to the construction island, 24 hours per day, seven days per week. The Contractor will be required to coordinate their hours of work with ONTC and maintain a record of all persons accessing the site that at a minimum includes the name of the person, time-in, time-out and their site contact with the Contractor.

9. The Contractor shall:
    - Supply their own on-site facilities, including construction trailer, washrooms, and eating area.
    - Plan and organize the work prior to and during construction.
    - Provide all required shop drawing submittals in compliance with the contract documents.
    - If there are no requirements for shop drawing submittals in other documents, Provide shop drawing submittals in compliance with following requirements
        - Submit shop drawings for review to owner's representative or owner for review within two weeks of project award.
        - Submit shop drawings in electronic format unless another delivery method is warranted and authorized by the owner.
        - Clearly identify any submittals that are a priority such as long lead time items or critical path items.
        - Shop drawings shall be reviewed, stamped, and signed by the contractor/s prior to submission to the owner's representative or the owner. Submittals shall include at minimum: All technical specifications, drawings, and characteristics required to determine suitability for purpose, dimensions, clearances, colours and finishes, the details of any required services (such as electricity, water, or natural gas), Coordination with existing site conditions.
        - Submit any additional shop drawings or information as requested by the owner or owner's representative.
        - Shop drawings not reviewed shall be rejected
        - Maintain a record of all submittals and any review comments. A paper copy of submittal shall be kept on site and available for review by owner's representative or owner.
    - Provide a preliminary construction schedule with their bid.
    - Provide a revised construction schedule two weeks after project award.
    - Supply all personal protective equipment (PPE) and consumable supplies as required to meet all applicable legislation, ONTC policies and Contractor Policies. Note: Safety glasses with side shields, safety boots, hard hats, and high visibility clothing must be worn at all times on ONTC property. Any employees not wearing the required PPE will be immediately escorted off ONTC property.
    - Designate a site supervisor who will be responsible for managing the project and be responsible for on-site safety, including all sub-contractors and suppliers. This site supervisor will be the single point of contact for the duration of the project. This site supervisor will be required to communicate with ONTC supervision to ensure the work is completed safely with minimal impact on the operation of the facility.
    - Coordinate required site inspections with independent inspection and testing firms.
    - Purchase and deliver to the site all Contractor supplied materials, equipment, facilities, and manpower necessary to accomplish the work within the schedule.

- Establish a site-use plan acceptable to ONTC providing an organized, safe, and efficient means of personnel transport, material handling, storage/laydown areas, construction trailer locations, access points and methods of access, and limits of construction within the premises.
- Receive, unload, store, protect, secure, and transport within the jobsite all Contractor and ONTC furnished equipment and materials.
- Provide on-site and off-site quality control services as required in specifications, drawings and documents.
- Maintain complete records including daily construction site diary/log book, shop drawings, and pertinent photographs.
- Provide qualified personnel to perform the work.
- Ensure that the project is started and completed on schedule.
- Make every reasonable effort to contain any dust or fumes so that adjacent work areas are not contaminated during the project.
- Clean up and demobilize areas upon completion of the work.
- Supply all necessary tools, machinery, and equipment to perform the work including, but not limited to, forklifts, mobile cranes, hoisting equipment, scaffolding, ladders, man lifts, temporary lighting, heating, welding machines, ventilation, consumables, and any other material or equipment required to complete the work. The Contractor shall provide all necessary vehicles and qualified personnel to transport people and materials.
- Be aware of all high voltage equipment in the building. Be familiar with proper equipment shut down procedures and follow “Lock Out and Tag Out” procedures. Understand the effect on light sources for work involving power outages, and be responsible for temporary light sources required to complete their work safely.