

## **Drawing Package for Consultant RFP**



**Fire Hall #3**

**115 Stone Rd**

**Guelph, ONT**

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# GUELPH FIRE

# SUB-STATION

FOR THE CORPORATION OF THE CITY OF GUELPH

CRAFT LEE LIMITED

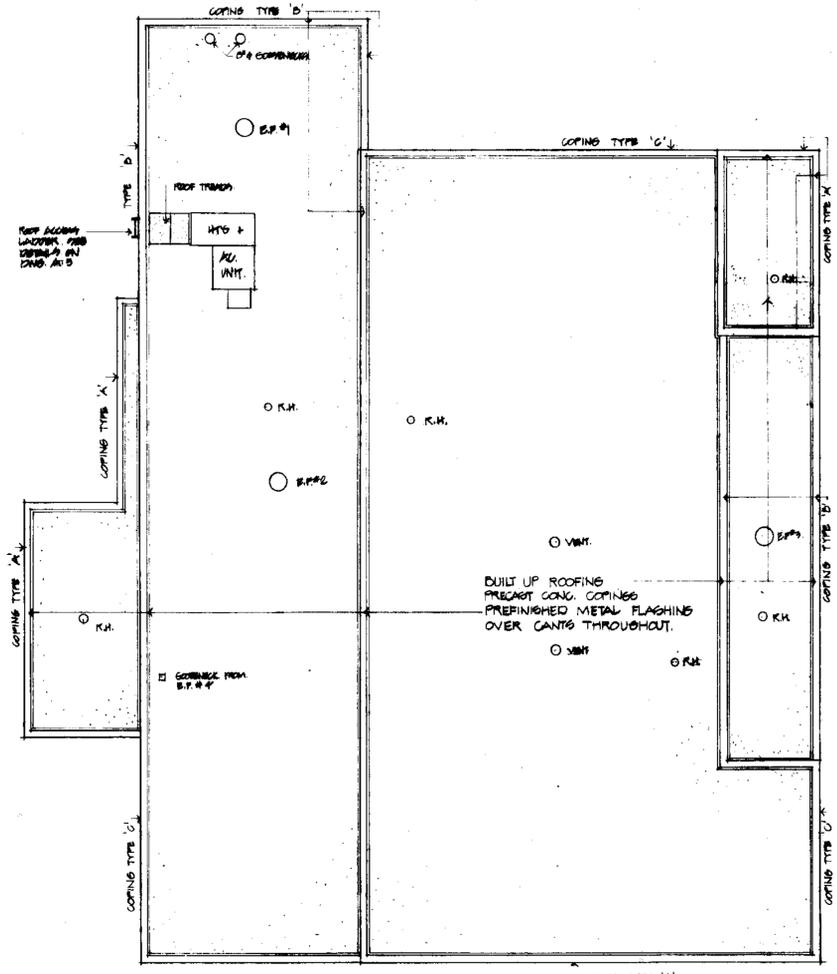
PER *Craft Lee*

BRIESTENSKY ARCHITECT GUELPH AND WALTER FEDY McCARGAR HACHBORN CONSULTING ENGINEERS KITCHENER

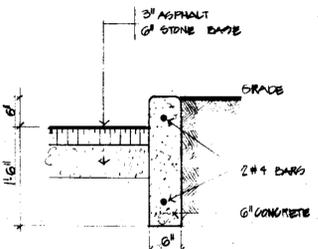
TITLE SHEET

*W. G. Hall*  
W. G. HALL, City Clerk  
GUERPH - ONTARIO

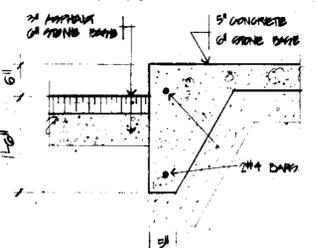
SET NO. 2



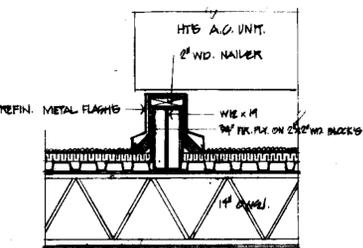
ROOF PLAN  
1/8" = 1'-0"



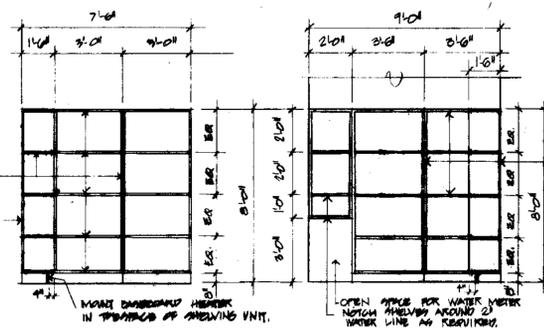
TYPICAL CURB DETAIL  
3/4" = 1'-0"



CONCRETE WALK AT DRIVEWAY  
3/4" = 1'-0"



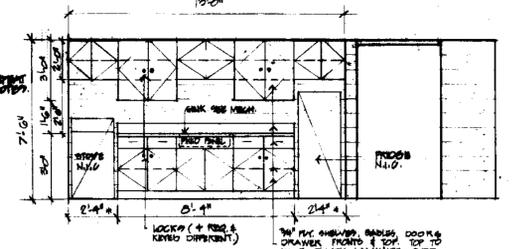
TYPICAL CURB DETAIL  
ROOF MTD. MECH. EQUIP.  
3/4" = 1'-0"



ELEVATION A  
1/4" = 1'-0"

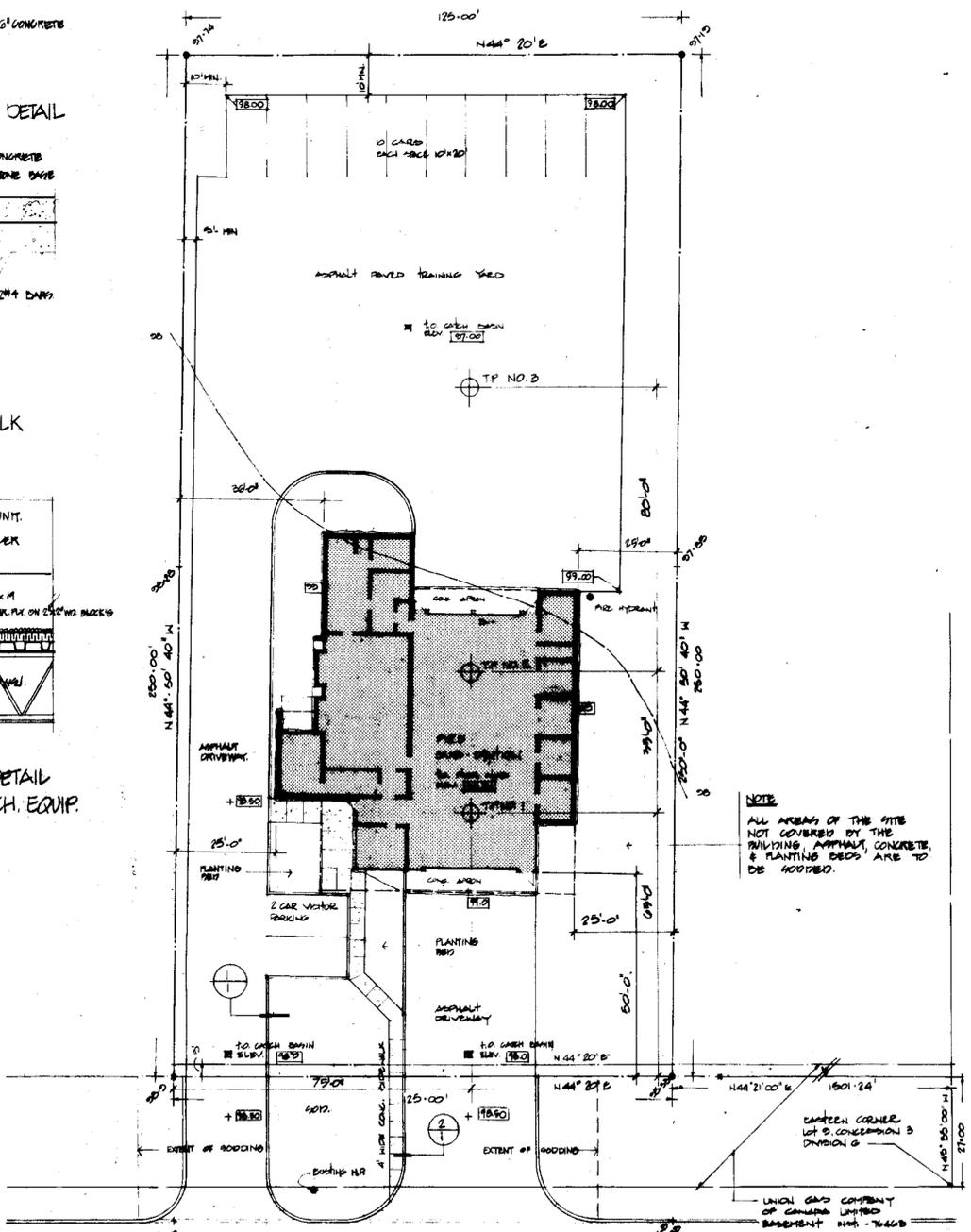
ELEVATION B  
1/4" = 1'-0"

SHELVING DETAILS - STORAGE RM. 115



ELEVATION C  
1/4" = 1'-0"

KITCHEN - 103



NOTE  
ALL AREAS OF THE SITE NOT COVERED BY THE BUILDING, ASPHALT, CONCRETE, & PLANTING BEDS ARE TO BE GRADED.

W.G. HALL, City Clerk  
GUELPH - ONTARIO

SITE PLAN  
1" = 20'-0"

NOTE  
PLAN SHOWING BOUNDARY AND ELEVATIONS ON PART 1 AND PART OF PART 2, LOT 5, CONCESSION 3 DIVISION 6, CITY OF GUELPH

PREPARED BY:  
BLACK, SHEPHERD & BROWN LTD. ALLS. 3501 SHEPPARD AVE. E. GUELPH, ONT. L1G 4P5  
DATED HERE: 1975 PROJECT NO. 75-2500

DIMENSIONS ARE IN FEET AND DECIMALS. ALL HANGING LINES HAVE BEEN VERIFIED. DIMENSIONS ARE APPROXIMATE AND ARE SUBJECT TO DETAILED PLAN WORK-06

LEGEND:  
- 1" = 20' LINES AND DIMENSIONS  
- 1" = 20' DIMENSIONS  
- 1" = 20' DIMENSIONS

CRAFT LEE LIMITED  
PER *[Signature]*

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMITS	1975.10.10
2	ISSUED FOR PERMITS	1975.10.10
3	ISSUED FOR PERMITS	1975.10.10
4	ISSUED FOR PERMITS	1975.10.10
5	ISSUED FOR PERMITS	1975.10.10
6	ISSUED FOR PERMITS	1975.10.10
7	ISSUED FOR PERMITS	1975.10.10
8	ISSUED FOR PERMITS	1975.10.10
9	ISSUED FOR PERMITS	1975.10.10
10	ISSUED FOR PERMITS	1975.10.10

NO. 1000  
DESCRIPTION  
DATE

REVISIONS

BRISTENSKY ARCHITECT ASSOCIATION & MEMBER  
K.D.  
ARCHITECT

DATE: 1975.10.10  
CHECKED: K.D.  
PRINT DATE: 1975.10.10

TRUE NORTH

CONSTRUCTION NORTH

OWNER:  
CORPORATION OF THE CITY OF GUELPH

BRISTENSKY ARCHITECT  
GUELPH ONTARIO

GUELPH FIRE SUB-STATION

SHEET SITE PLAN, ROOF PLAN

SCALE: AS SHOWN  
PROJ. NO. 75-40

SHEET NO. A.1

CRAFT, LEE, LIMITED  
PER [Signature]

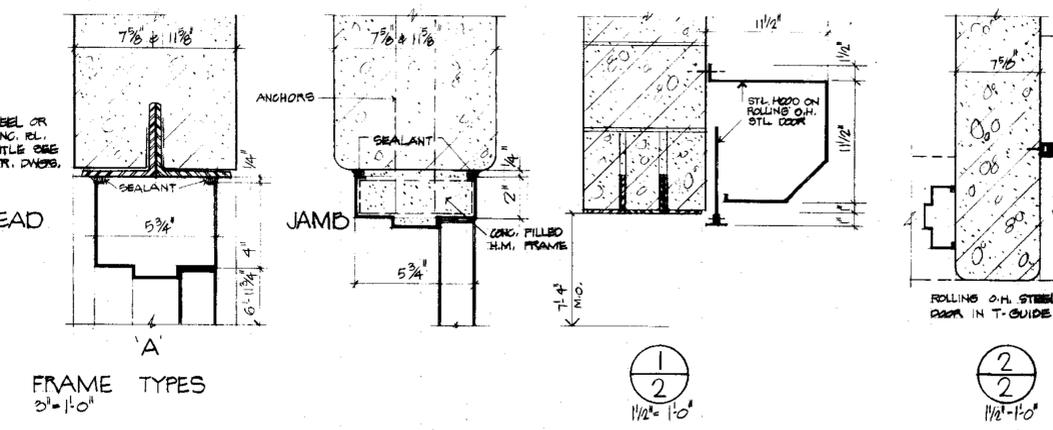
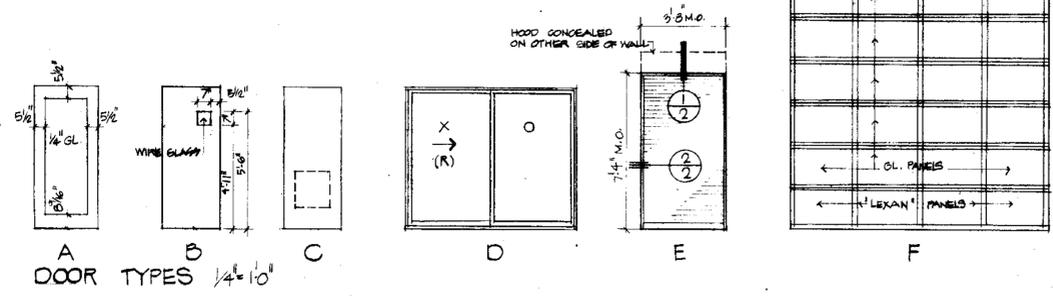
ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS			CEILING			REMARKS
				N.S.E.W.	WALL STRUCTURE	FACING	FINISH	MATERIAL	FINISH	
101	DUTY OFFICER	V.A.T.	RUB.	N.S.E.W.	CONC. BL.	NONE	PAINT	AG. T.	NONE	9'-4"
102	VEHICLE									9'-4"
103	KITCHEN									9'-4"
104	LIBRARY									7'-6"
105	ALL PURPOSE ROOM									9'-4"
106	LOCKER ROOM									9'-4"
107	STORAGE ROOM									12'-0" x 8'
108	SHOWER ROOM									9'-4"
109	WASHROOM									9'-4"
110	APPARATUS FLOOR	COL. CONC.	NONE	N.S.E.W.	CONC. BL.			EXP. STR.		17'-0" x 8' * 1/4" OF STEEL DECK.
111	STAIR									34'-0" x 8'
112	TOWER									34'-0" x 8'
113	DRYING RM.									10'-0" x 8'
114	WORK RM.									
115	STORAGE RM.									
116	ELECTRICAL RM.									

ABBREVIATIONS  
N.S.E.W. - NORTH SOUTH EAST WEST  
V.A.T. - VINYL ASBESTOS TILE  
RUB. - RUBBER  
CONC. BL. - CONCRETE BLOCK  
COL. CONC. - COLOURED CONCRETE  
AG. T. - ACOUSTIC TILE  
EXP. STR. - EXPOSED STRUCTURE  
EP. FT. - EPOXY PAINT

ROOM FINISH AND DOOR SCHEDULES

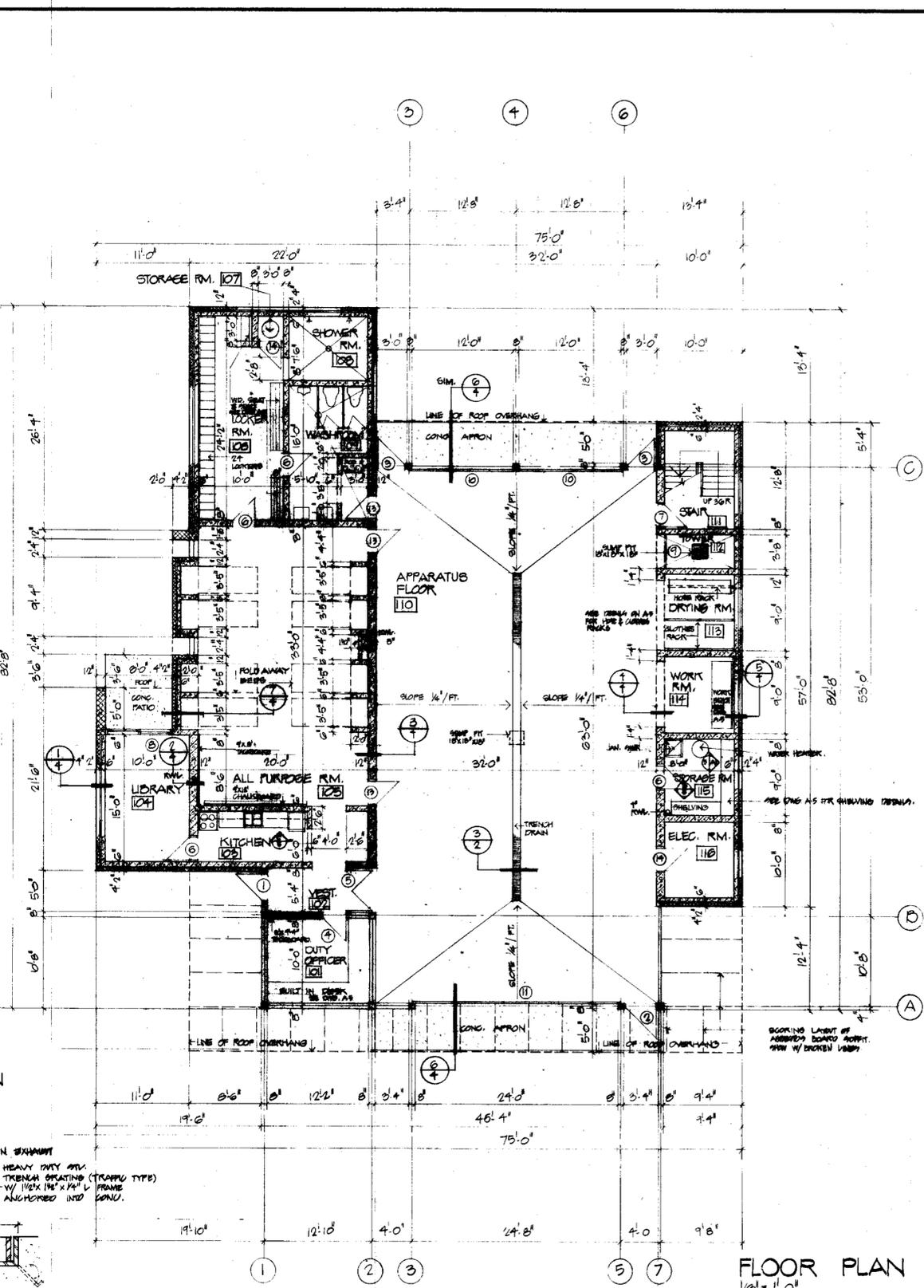
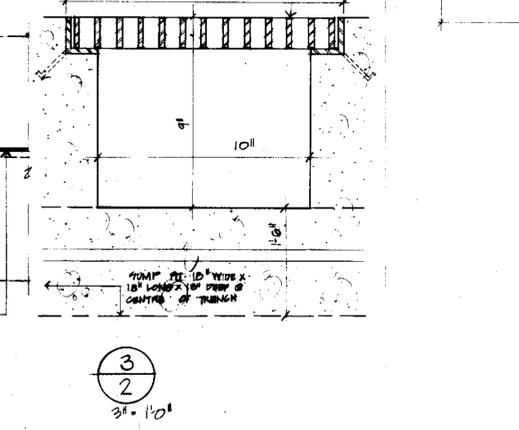
DOOR NO.	SIZE	TYPE	FIELD	FINISH	THRESHOLD	FRAME				TRAN-SOM	GRILLE	REMARKS
						MATERIAL	TYPE	FINISH	PART. THICK.			
1	3'-0" x 7'-0" x 1 3/4"	A	H.M. & GL.	PT.	ALUM.	H.M.	A	PT.	8"	NONE	NONE	
2	3'-0" x 7'-0" x 1 3/4"	A	H.M. & GL.	PT.	ALUM.	H.M.	A	PT.	8"	GL.	NONE	
3	2'-8" x 7'-0" x 1 3/4"	A	H.M. & GL.	PT.	ALUM.	H.M.	A	PT.	8"	GL.	NONE	
4	2'-8" x 7'-0" x 1 3/4"	B	H.M. & GL.	PT.	NONE	H.M.	A	PT.	8"	H.M. PANEL	NONE	FRAME HT. 9'-4"
5	2'-8" x 7'-0" x 1 3/4"	B	H.M. & GL.	PT.	NONE	H.M.	A	PT.	8"	H.M. PANEL	NONE	FRAME HT. 9'-4"
6	2'-8" x 7'-0" x 1 3/4"	C	H.M.	PT.	NONE	H.M.	A	PT.	8"	NONE	SEE SCH.	
7	3'-0" x 7'-0" x 1 3/4"	C	H.M.	PT.	NONE	H.M.	A	PT.	12"	NONE	NONE	
8	3'-0" x 7'-0" x 1 3/4"	D	ALUM. & GL.	DURACRON	NONE	ALUM.		DURACRON		NONE	NONE	
9	3'-0" x 7'-4"	E	STEEL	FACTORY	NONE	STEEL	T-GUIDE	PT.	8"	NONE	NONE	FACE OF WALL HOOD INSTALL WITH BETWEEN WALL T-GUIDES
10	12'-2" x 14'-1" x 1 3/4"	F	ALUM. & GL.	DURACRON	NONE	STEEL	ST. COL.	PT.	8"	NONE	NONE	
11	24'-2" x 14'-1" x 1 3/4"	F	ALUM. & GL.	DURACRON	NONE	STEEL	ST. COL.	PT.	8"	NONE	NONE	
12	1'-10" x 3'-0" x 1 3/4"	C	H.M.	PT.	NONE	H.M.	A	PT.	12"	NONE	NONE	* 2" HEAD - SEE DWG. A-B
13	2'-8" x 7'-0" x 1 3/4"	C	H.M.	PT.	NONE	H.M.	A	PT.	12"	NONE	NONE	1/2 HR. LABELLED DR. & FR.
14	2'-8" x 7'-0" x 1 3/4"	C	H.M.	PT.	NONE	H.M.	A	PT.	8" x 12"	NONE	NONE	1/2 HR. LABELLED DOOR & FRAME

DOOR GRILLE SCHEDULE  
DR. 6 RMS. 105 TO 109 - 10" x 12"  
DR. 6 RMS. 105 TO 106 - 24" x 18"



REFLECTED CEILING PLAN  
1/8" = 1'-0"

- LEGEND:
- 2x4 AC TILES
  - RECESSED LIGHT FIXTURE
  - SUPPLY AIR DIFFUSER
  - RETURN AIR GRILLE 1'-11"
  - KITCHEN EXHAUST
  - HEAVY DUTY 4"x4" TRENCH GRATING (TRAP TYPE) W/ 1/2" x 1/2" x 1/2" L ANCHORED INTO CONG.



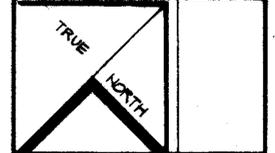
FLOOR PLAN  
1/8" = 1'-0"

NO. DESCRIPTION DATE

REVISIONS

K. BRIESTENSKY  
ARCHITECT ASSOCIATION  
MEMBER  
GUELPH & STRALFORD  
ARCHITECT

DRAWN K. B.  
DATE APR. 79  
CHECKED K.D.  
PRINT DATE APR. 24/79



CONSTRUCTION NORTH

OWNER  
CORPORATION OF THE CITY OF GUELPH

BRIESTENSKY ARCHITECT  
GUELPH ONTARIO

GUELPH FIRE SUB-STATION

SHEET FLOOR PLAN, FINISH & DOOR SCHEDULES, DETAILS

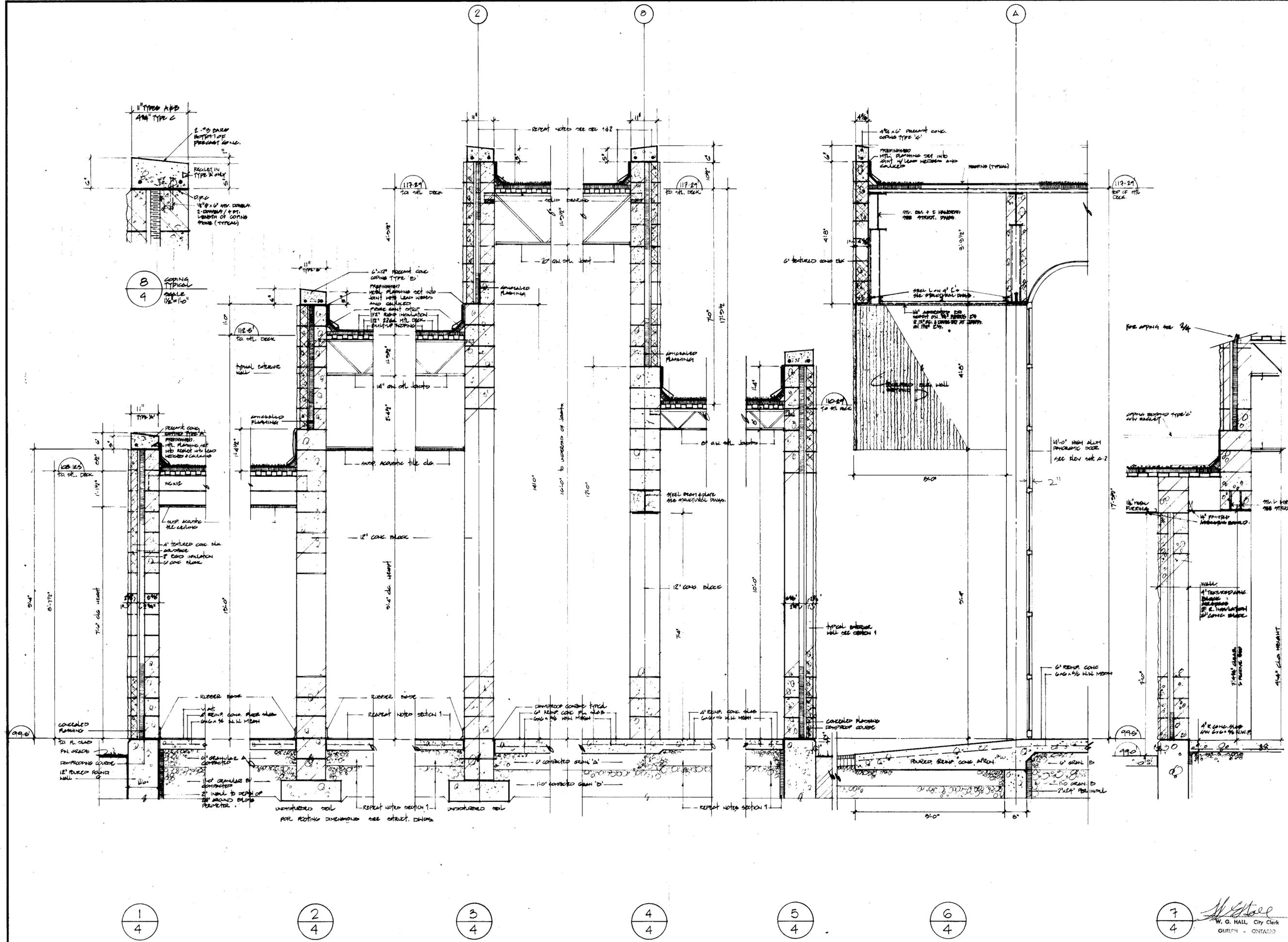
SCALE AS SHOWN

PROJ. NO. 7540

W. G. HALL, City Clerk  
GUELPH, ONTARIO

INSET  
A-2





NO.	DESCRIPTION	DATE
REVISIONS		
1	DRAWN	8
2	DATE	SEPT 1979
3	CHECKED	K.D.
4	PRINT DATE	SEPT. 26 '79

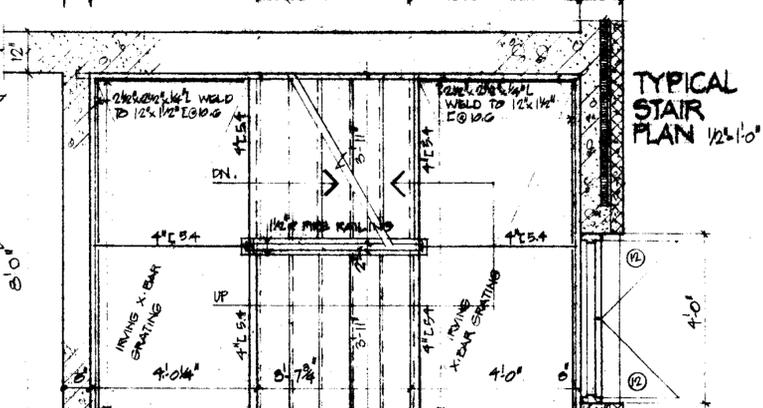
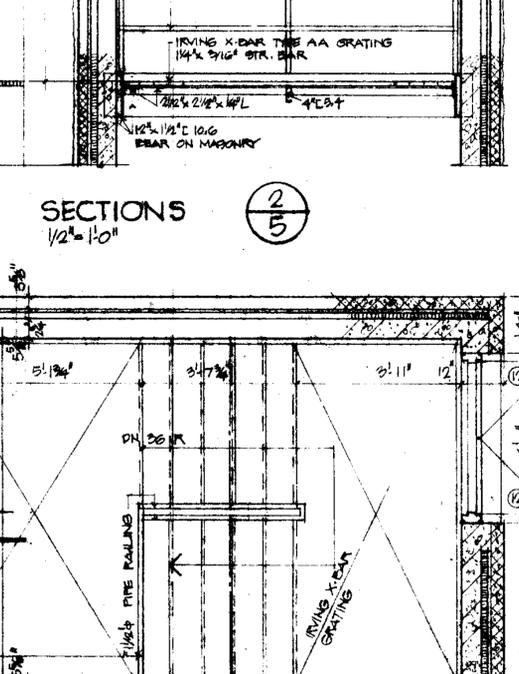
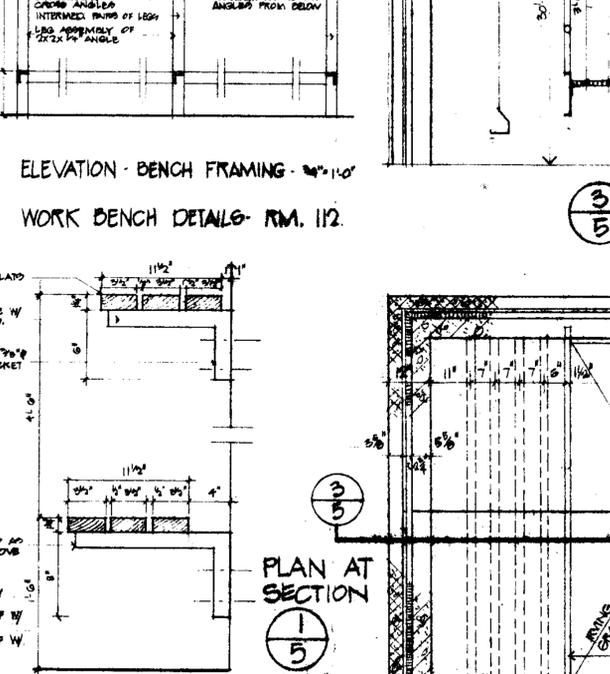
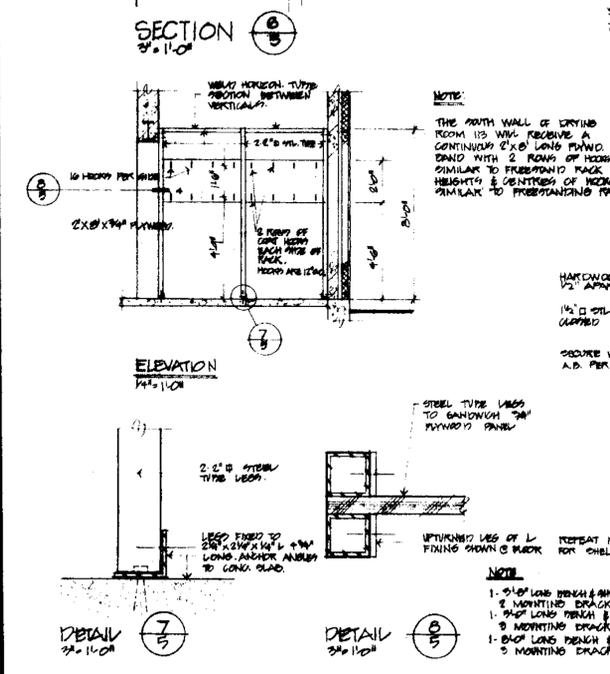
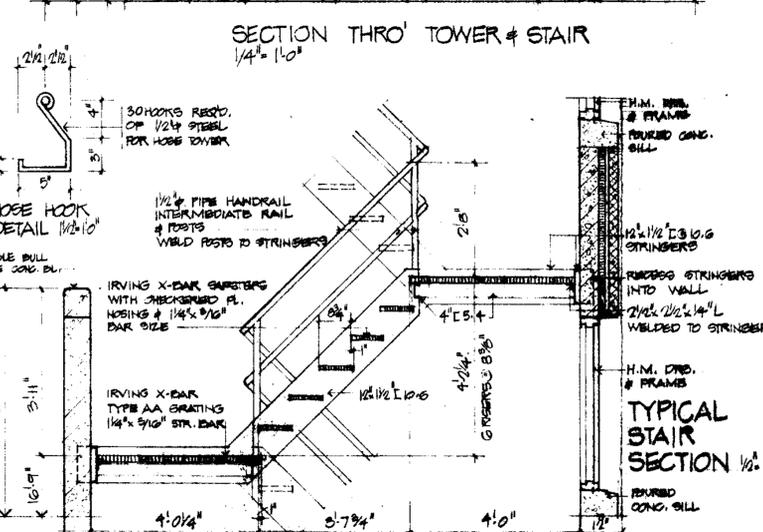
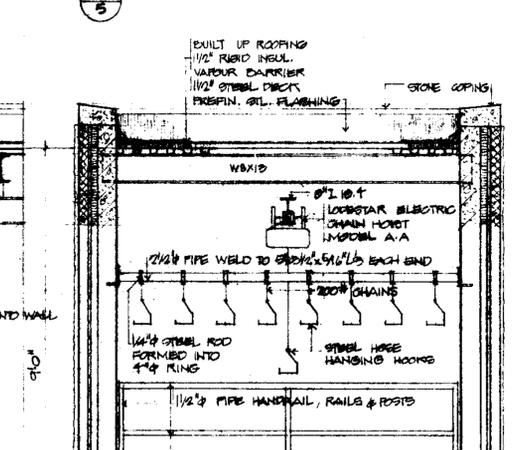
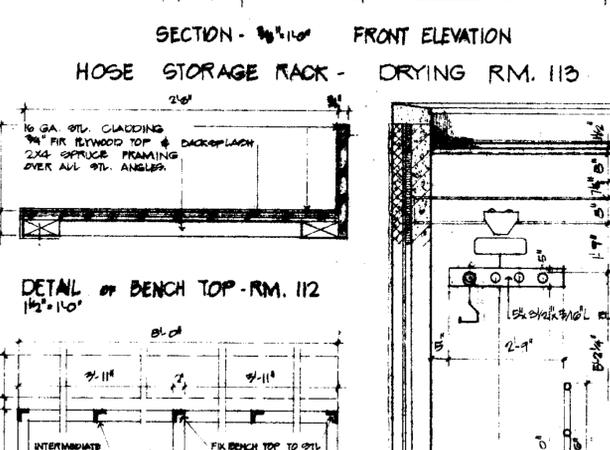
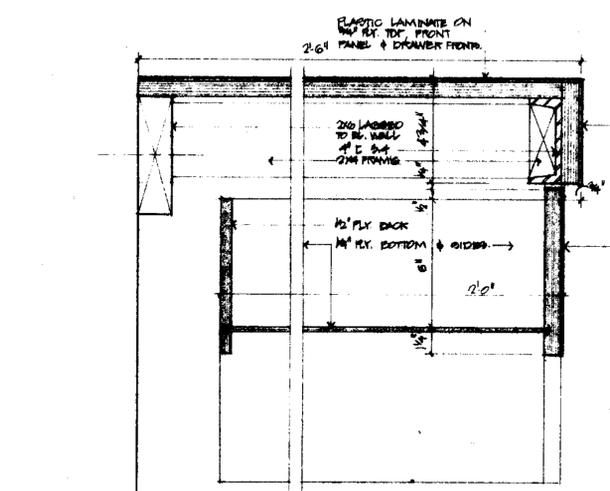
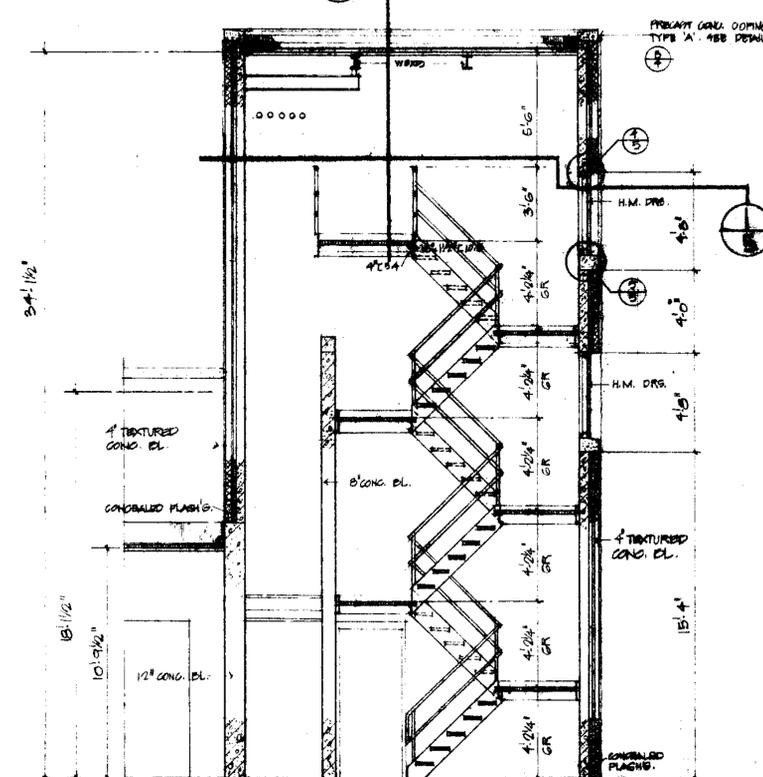
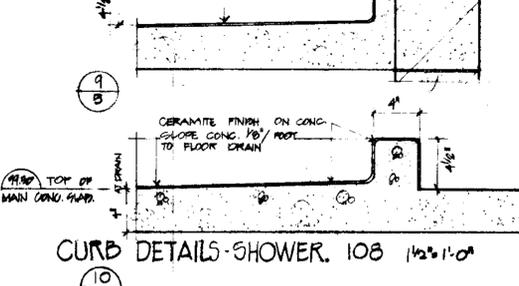
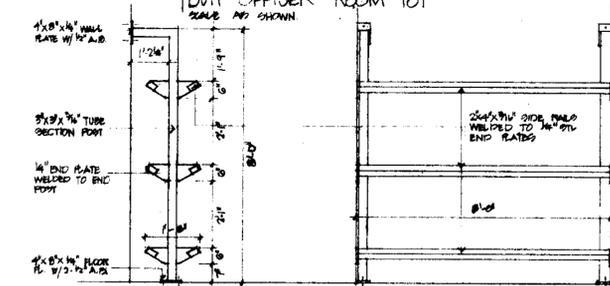
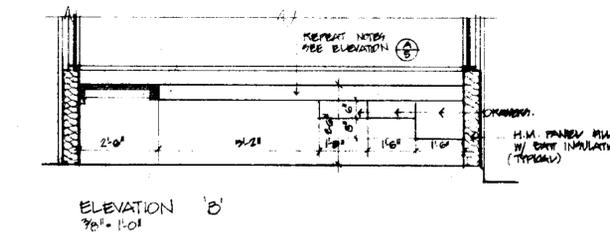
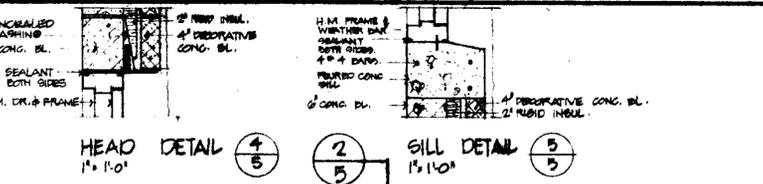
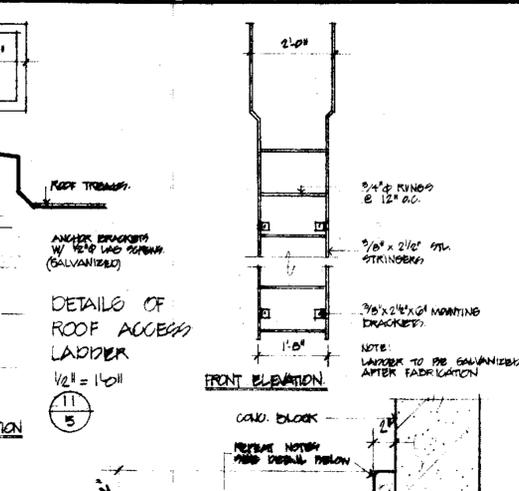
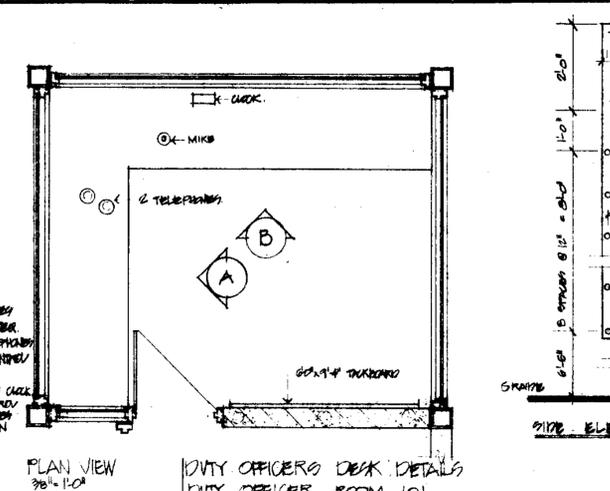
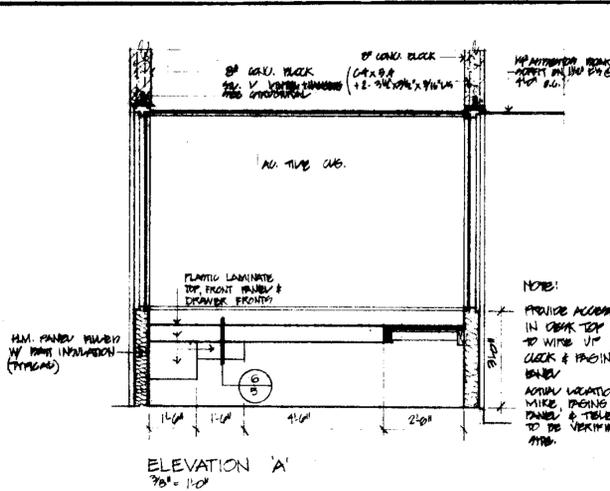
  

OWNER CORPORATION OF THE CITY OF GUELPH	
BRIESTENSKY ARCHITECT	
GUELPH	ONTARIO

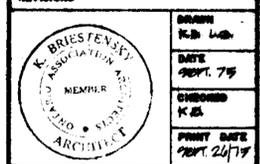
  

GUELPH FIRE SUB-STATION	
SHEET TITLE WALL SECTIONS	
SCALE 3/8" = 1'-0"	SHEET NO. A-4
PROJ. NO. 7540	

*Handwritten Signature*  
W. G. HALL, City Clerk  
GUELPH - ONTARIO



NO.	DESCRIPTION	DATE
REVISIONS		
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OWNER  
CORPORATION  
OF THE CITY OF GUELPH

**BRESTENSKY**  
ARCHITECT  
GUELPH ONTARIO

**GUELPH FIRE SUB-STATION**

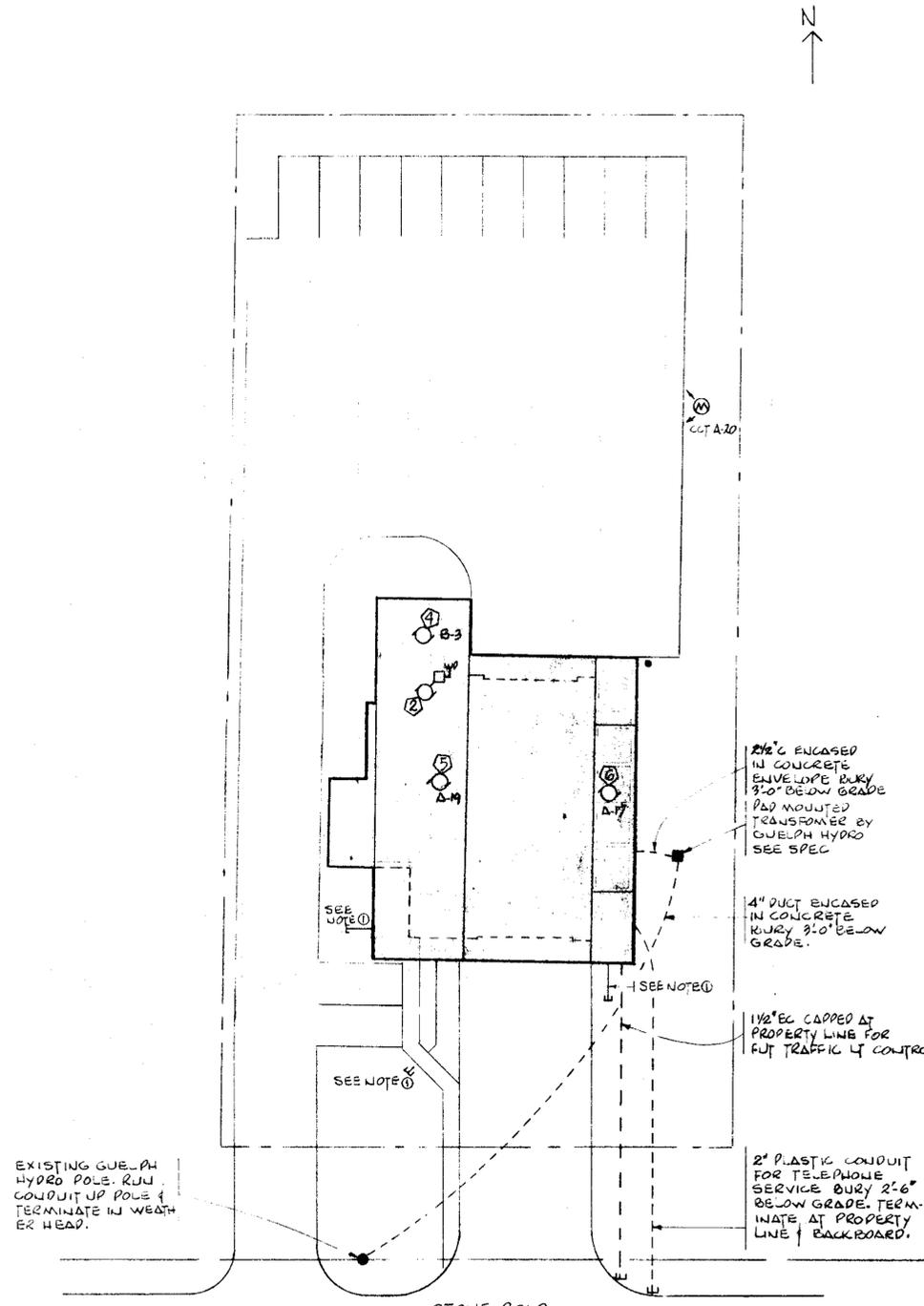
SHEET STAIR, HOSE TOWER  
MISCELLANEOUS DETAILS.

SCALE AS SHOWN. SHEET NO. **A-5**  
PROJ. NO. 7540

# ELECTRICAL LEGEND

GENERAL	
	LIGHT FIXTURE (TYPE AS INDICATED)
	LIGHT FIXTURE (TYPE AS INDICATED)
	LIGHT FIXTURE (BRACKET TYPE)
	CLOCK OUTLET - SINGLE FACE CLOCK (DF = DOUBLE FACE)
	DUPLEX RECEPTACLE (F = FLOOR MOUNTED WP = WEATHERPROOF)
	DUPLEX RECEPTACLE (4" ABOVE COUNTER SPLASHBACK, OR AS SHOWN)
	DUPLEX RECEPTACLE (MTD. IN TOE SPACE OR UNDER HEATING UNIT)
	DUPLEX SAFETY RECEPTACLE
	DUPLEX RECEPTACLE 3 WIRE
	RED FACED RECEPTACLE - EMERGENCY CIRCUIT
	SPECIAL OUTLET
	BELL TELEPHONE OUTLET - WALL MOUNTED (F = FLOOR MOUNTED)
	TOGGLE SWITCH - SINGLE POLE (S, A, S OR 4-WAY, H = KEY OPERATED)
	PILOT LIGHT TOGGLE SWITCH
	REMOTE CONTROL LOW VOLTAGE SWITCH
	MOTOR (H.P. AS SHOWN)
	UNFUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	MANUAL STARTER (P = PILOT LIGHT)
	MAGNETIC START
	LIGHTING PANEL
	POWER PANEL
	TELEPHONE PANEL - TYPE "T"
	ELECTRIC HEATING UNIT
	EQUIPMENT ITEM NUMBER
	THERMOSTAT
	ELECTRIC RELAY
	PUSH BUTTON EDWARDS CAT # 22-2 120V
	PUSH BUTTON STATION (P = PILOT LIGHT)
	T.V. SYSTEM OUTLET
	COMBINED T.V. SYSTEM OUTLET & DUPLEX RECEPTACLE
	HAND DRYER
	HAIR DRYER
	EMPTY CONDUIT STUBBED & CAPPED FOR FUTURE
	INTERCOM SPEAKER
	CHIME EDWARDS CAT # 330 120V

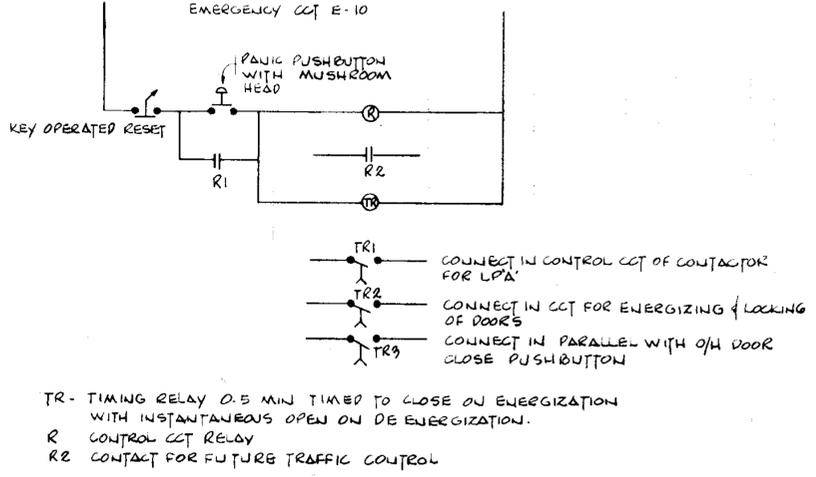
CRAFT-LEE LIMITED  
PER *[Signature]*



**SITE PLAN**  
SCALE 1" = 20'-0"

**NOTES**

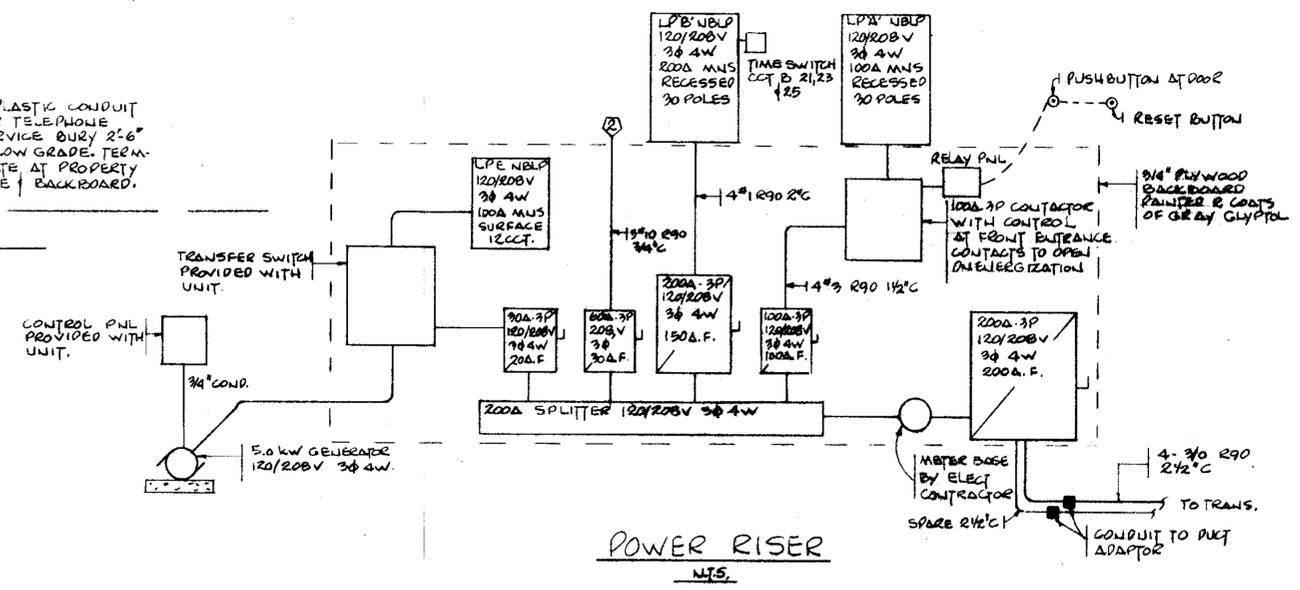
1. CONDUIT STUBS FOR FUTURE FLOOD LIGHTING, TYPICAL OF 3, ONE CIRCUIT FROM THE TIME SWITCH TO SERVE FLOOD LIGHTING COT. B.25. THE CONTRACTOR SHALL CARRY A SEPARATE PRICE OF \$1500. (FIFTEEN HUNDRED DOLLARS) FOR FIXTURES & INSTALLATION



**CONTROL WIRING**

**SCHEDULE OF BREAKERS**

- LP A'
- 11 - 15A-1P
  - 3 - 20A-1P 4, 6, 8
  - 1 - 15A-2P 12, 14
  - 1 - 50A-2P 16, 18
- LP B'
- 6 - 20A-2P
  - 4 - 15A-1P 1, 3, 21, 25
  - 1 - 15A-2P 14, 16
  - 3 - 30A-2P 9, 11, 17, 19, 18, 20
- LP C'
- 5 - 15A-1P
  - 1 - 15A-3P 1, 3, 5
  - 2 - 20A- 7, 9



**POWER RISER**  
N.T.S.

*[Signature]*  
W. G. HALL, Eng. Clerk  
GUELPH - ONTARIO

NO.	DESCRIPTION	DATE
1	REVISION	
<b>OWNER</b> CORPORATION OF THE CITY OF GUELPH		
<b>ARCHITECT</b> BRIESTENSKY ARCHITECT GUELPH ONTARIO		
<b>SUBJECT</b> SITE PLAN, LEGEND & RISER		
SCALE	1" = 20'-0"	DATE
FILE NO.	P540	REV.
		E1

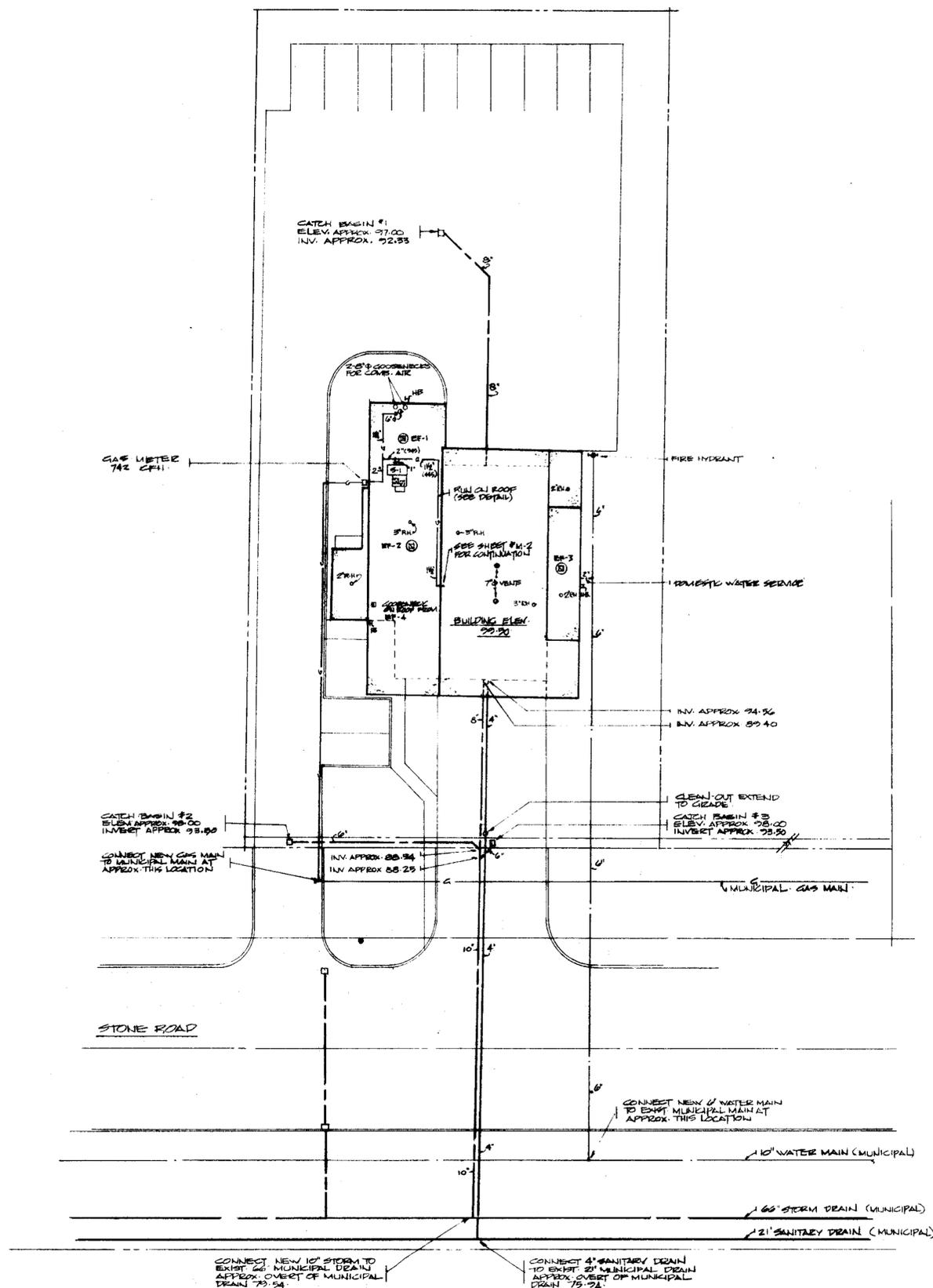




**LEGEND**

---	SANITARY DRAIN (BELOW FLOOR)
---	SANITARY DRAIN (AT CEILING)
---	STORM DRAIN (BELOW FLOOR)
---	STORM DRAIN (AT CEILING)
---	COLD WATER
---	HOT WATER
---	HOT WATER RECIRCULATING LINE
---	COLD SOFT WATER
---	PRIME LINE
---	FIRE LINE
L	LAVATORY
WC	WATER CLOSET
SH	SHOWER
S	SINK
U	URINAL
BDF	DRINKING FOUNTAIN (BLESTEL)
FD	FLOOR DRAIN
FFD	FUNNEL FLOOR DRAIN
HB	HOSE BIBB
RH	ROOF HOPPER
RWL	RAIN WATER LEADER
CO	CLEAN OUT
---	SUPPLY DUCT
---	RETURN OR EXHAUST DUCT
---	FLEXIBLE CONNECTION
---	MOTORIZED DAMPER
FD	FIRE DAMPER
---	MANUAL BALANCING DAMPER
250	CUBIC FEET/MINUTE
20x12	GRILLE SIZE
D6	DOOR GRILLE
⊙	SPLITTER SIZE (INCHES)
---	LOW VELOCITY SOUND INSULATION
---	VECTROL

CRAFT-LEE LIMITED  
PER *[Signature]*



**NOTES:**

ALL INVERTS & ELEVATIONS TO BE VERIFIED ON SITE BEFORE INSTALLATION.  
 CO-ORDINATE DIFFUSERS & GRILLES WITH LIGHTS & CEILING TILE LAYOUTS BEFORE INSTALLATION.  
 RETURN GRILLES IN CEILINGS TO BE CAL/MANUAL BALANCING DAMPERS.

NO.	DESCRIPTION	DATE
REVISIONS		
1	DRAWN	SEP/75
2	CHECKED	SEP/75
3	POST DATE	SEP/75
OWNER CORPORATION OF THE CITY OF GUELPH		
BRISTENSKY ARCHITECT GUELPH ONTARIO		
GUELPH FIRE SUB-STATION		
SHEET TITLE SITE PLAN & LEGEND		
SCALE	1" = 20'-0"	SHEET NO.
PROJ. NO.	7540	M-1







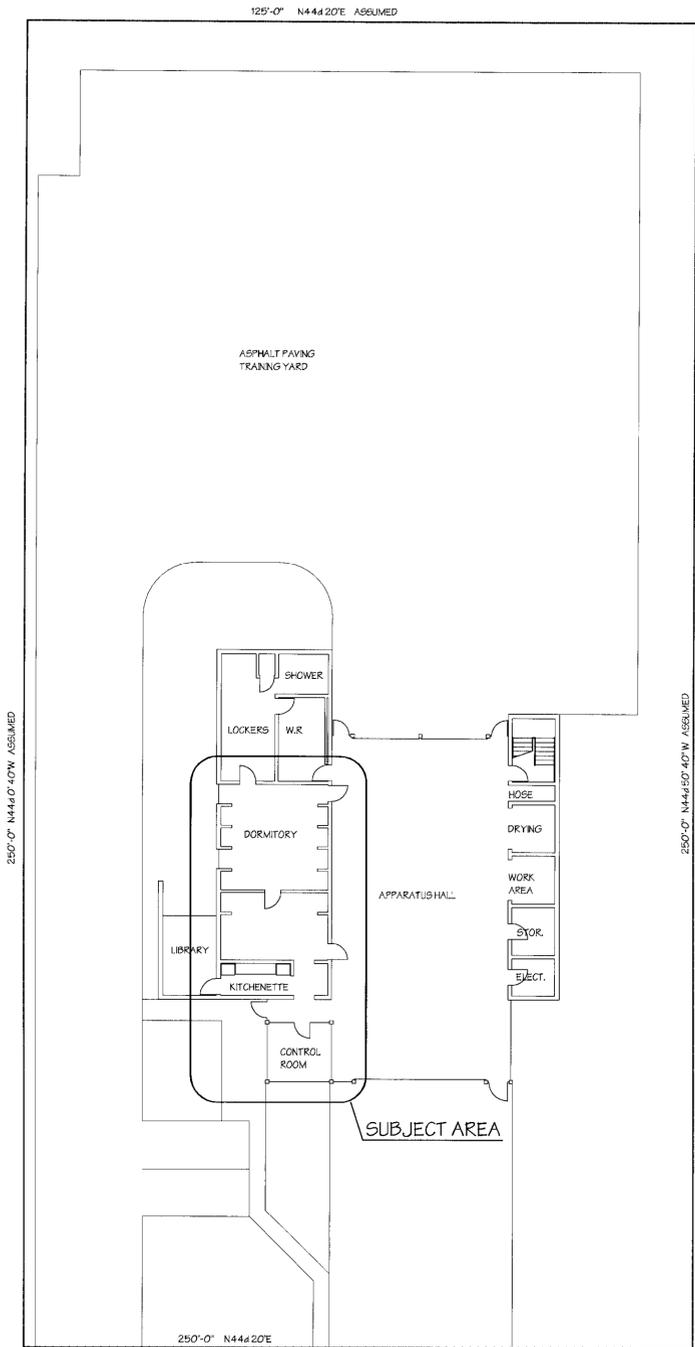
THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

**A** DETAIL No.  
**B** DRAWING No. WHERE DETAILED.

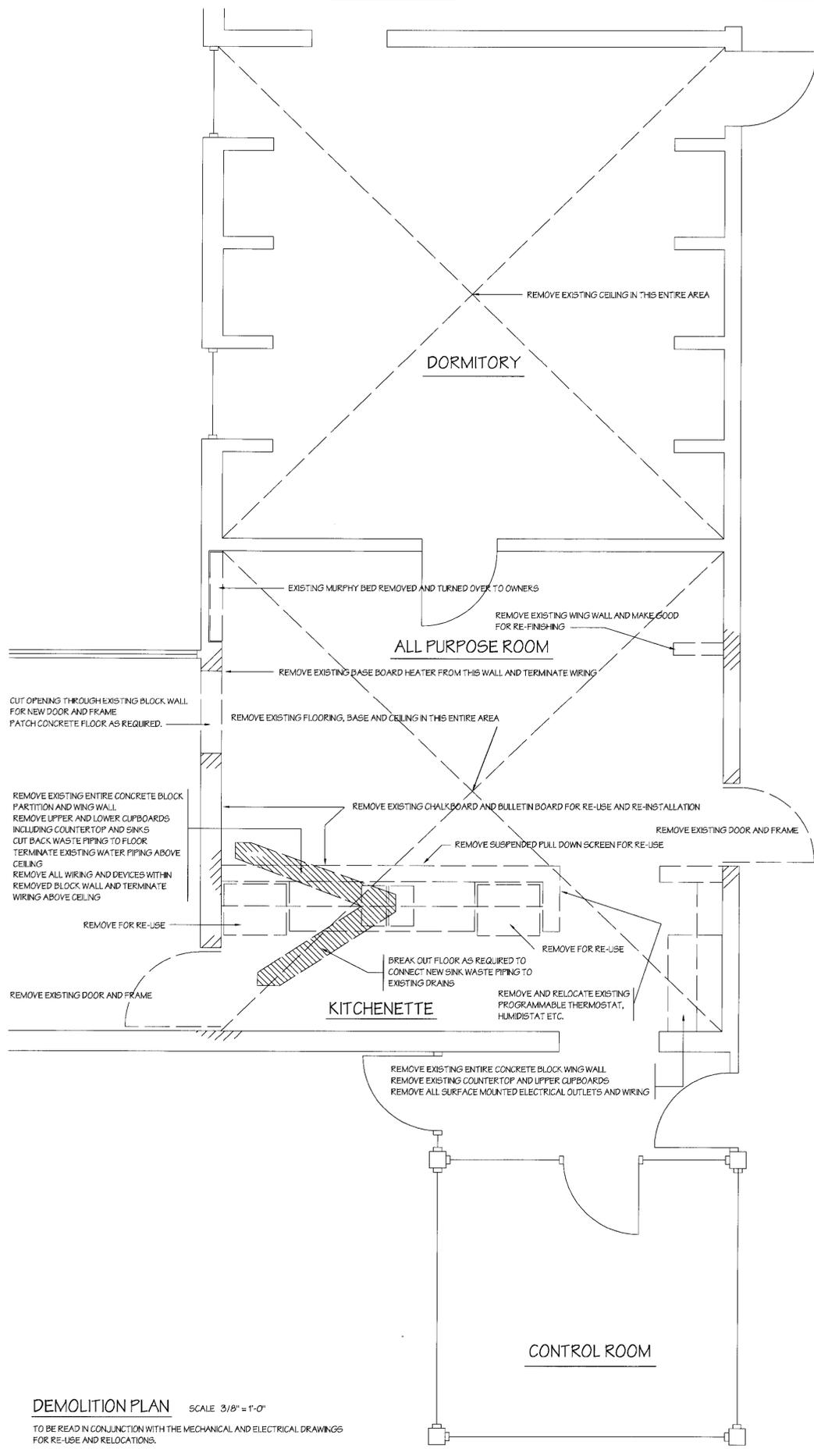
**City of Guelph Firehall #3  
Stone Road, Guelph  
All Purpose Room Renovations.**

**BUILDING DATA**

Description	Renovation to All Purpose Room.
Classification	Group F, Division 2, Not Sprinklered Facing 1 Street
Use	Firehall
Number of Stories	One (1)
Building Area	4548 SF / 423 m <sup>2</sup>
Floor Area	4150 SF / 386 m <sup>2</sup>
Sprinkler System	none
Designed to Code Regulation	Proposed Work: to 3.2.2
Type of Construction	Non-Combustible
Occupant Load	No Change 4 Crews of 6 persons on rotation.
Fire Separations	Existing to be maintained.
Fire Stopping	All new penetrations to be fire stopped, any existing unsealed penetrations exposed in the course of this work to be firestopped. System based on ULC Designs to suit existing separation materials and construction.
Plumbing:	Non-combustible



KEY PLAN / SITE PLAN SCALE 1/16" = 1'-0"



DEMOLITION PLAN SCALE 3/8" = 1'-0"  
TO BE READ IN CONJUNCTION WITH THE MECHANICAL AND ELECTRICAL DRAWINGS FOR RE-USE AND RELOCATIONS.

No	REVISION	DATE

ORIENTATION

STAMP

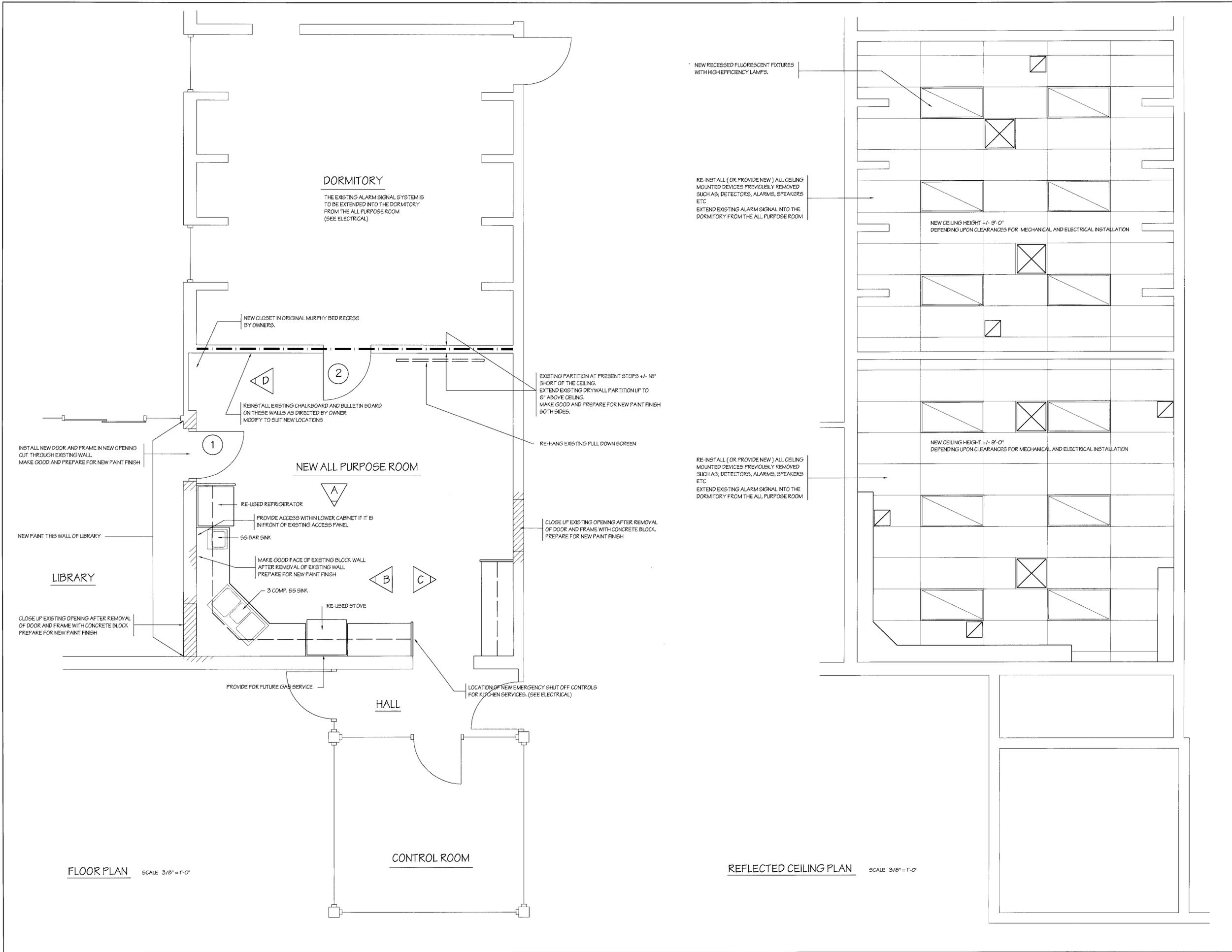
**PATRICK COLES  
ARCHITECT  
LONDON ONTARIO**

PROJECT: FIREHALL #3  
GUELPH ONTARIO

SCALE: AS NOTED APPROVED BY: DRAWN BY: TP  
DATE: 12 OCT. 2005 REVISION:

PROJECT SCOPE:  
ALL PURPOSE ROOM RENOVATIONS

DRAWING DESCRIPTION: SITE PLAN / DEMOLITION PLAN DRAWING No: A-1



THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

**A** DETAIL No.  
**B** DRAWING No. WHERE DETAILED.

No	REVISION	DATE

ORIENTATION  
↑  
REAL NORTH

STAMP  
ONTARIO ASSOCIATION OF ARCHITECTS  
PATRICK M. COLES  
LICENSE 3443  
2005 11 09

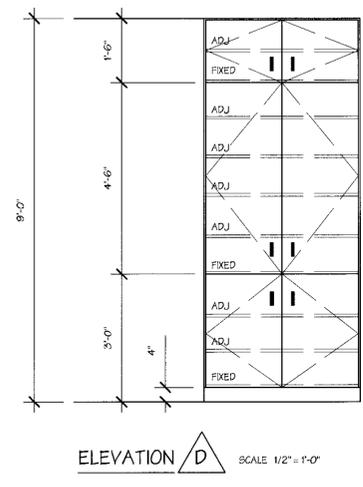
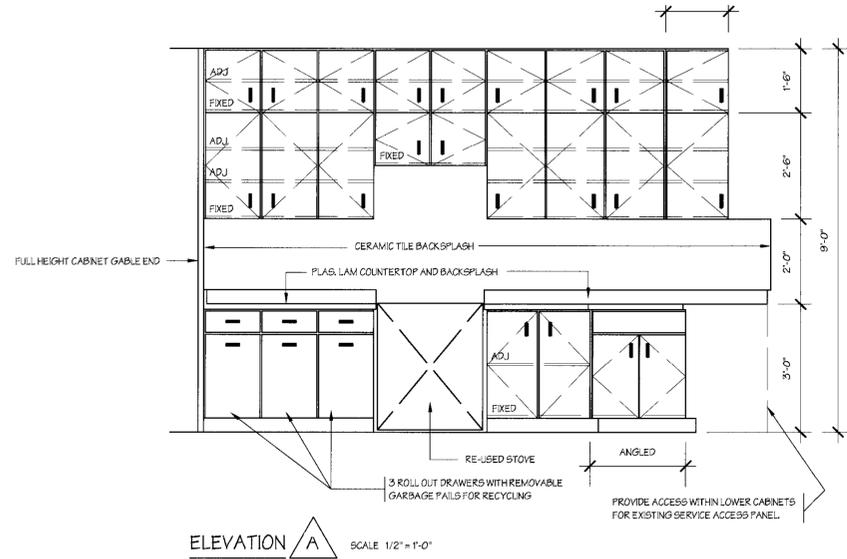
**PATRICK COLES**  
ARCHITECT  
LONDON ONTARIO

PROJECT: FIREHALL #3  
GUELPH ONTARIO

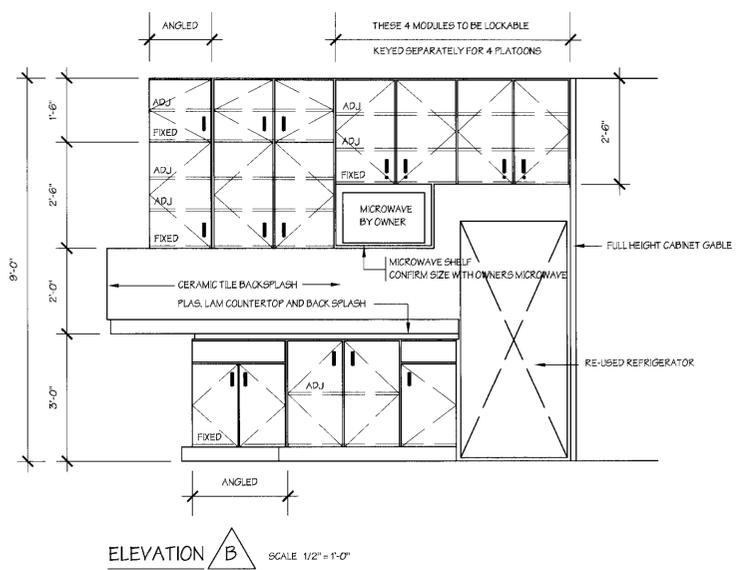
SCALE: AS NOTED	APPROVED BY:	DRAWN BY: TP
DATE: 12 OCT. 2005		REVISED:

PROJECT SCOPE:  
ALL PURPOSE ROOM RENOVATIONS

DRAWING DESCRIPTION: FLOOR PLAN / REF. CLG PLAN	DRAWING No: A-2
--	--------------------



CABINET AND SHELVING IN MURPHY BED RECESS BY OWNERS. IF MANUFACTURED UNIT PROVIDE SHOP DRAWING FOR APPROVAL.



**DOOR #1**  
EXISTING DOOR AND FRAME  
PROVIDE NEW CLOSER AS REQUIRED.

**DOOR #2**  
NEW 3'-0" X 7'-0" X 1 3/4" SOLID CORE WOOD DOOR (PAINTED)  
IN 2" X 5 3/4" PAINTED HOLLOW METAL FRAME w/  
1 1/2" PAIR OF BUTTS  
PUSH PLATE  
PULL  
CLOSER.

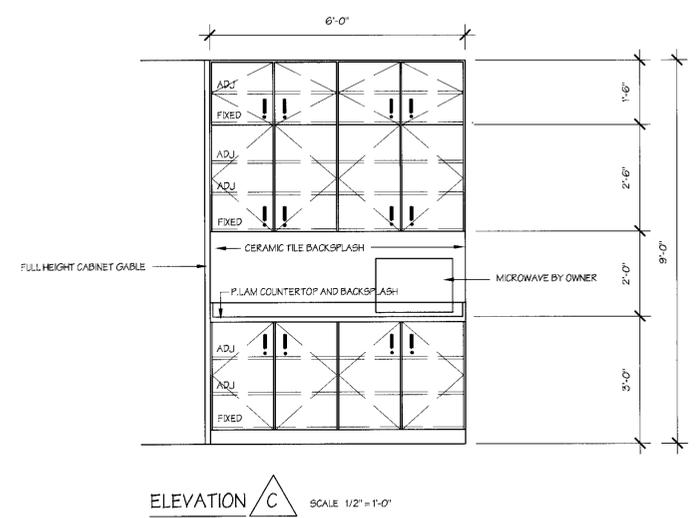
**ROOM FINISHES:**  
**LIBRARY:**  
PAINT EAST WALL ONLY (INCL. DOOR #2 AND FRAME)  
**DORMITORY:**  
NEW FLOORING: CERAMIC TILE  
NEW BASE: CERAMIC TILE  
NEW LAY-IN ACOUSTIC TILE CEILING  
NEW PAINT ON EXISTING BLOCKWORK - NORTH, EAST AND WEST WALLS  
NEW PAINT ON NEW AND EXISTING GYPSUM BOARD - SOUTH WALL.

**NEW ALL PURPOSE ROOM:**  
NEW FLOORING: CERAMIC TILE  
NEW BASE: CERAMIC TILE  
NEW LAY-IN ACOUSTIC TILE CEILING  
NEW PAINT ON EXISTING BLOCKWORK - SOUTH, EAST AND WEST WALLS  
NEW PAINT ON NEW AND EXISTING GYPSUM BOARD - NORTH WALL.

**HALL:**  
NEW FLOORING: CERAMIC TILE  
NEW BASE: CERAMIC TILE  
NEW PAINT ON EXISTING BLOCKWORK - NORTH WALL.

**CONTROL ROOM:**  
NEW FLOORING:  
NEW BASE:

**NOTE:**  
PAINTING ON NEWLY PAINTED WALLS IS TO INCLUDE NEW AND EXISTING DOORS AND FRAMES.



ALL UPPER AND LOWER CABINETS FOR THIS ELEVATION TO BE PANTRY UNITS WITH ADDITIONAL STORAGE SHELVING ON DOOR INTERIORS.  
UPPER AND LOWER CABINETS TO CONSIST OF 4 SEPARATE MODULES EACH LOCKABLE, KEYED SEPARATELY FOR EACH OF 4 PLATOONS.

**CABINETRY:**  
STANDARD CABINET BOXES:  
5/8" MELAMINE GABLES WITH PVC EDGE TAPE.  
3/16" PAINTED HARDBOARD BACKS ON BASE AND WALL CABINETS.  
CONCEALED 110 DEGREE HINGES.  
5/8" MELAMINE ADJUSTABLE SHELVING WITH PVC EDGE TAPE.  
DOOR FRONTS - 3/4" RIGID THERMOFOL WITH 3/4" RADIUS PROFILE (4 SIDES)  
DRAWER FRONTS - 3/4" RIGID THERMOFOL UNROUTED WITH 3/4" RADIUS PROFILE (4 SIDES)  
NATURAL MAPLE MELAMINE INTERIORS.  
CABINET COLOUR - PEARWOOD

**DRAWERS:**  
FULL EXTENSION DRAWER BOXES  
3/4" SOLID ASPEN SIDES, FRONT AND BACK.  
1/4" BOTTOM IN ROUTED GROOVE.  
CONCEALED UNDERMOUNT FULL EXTENSION DRAWER SLIDES WITH SELF CLOSING FEATURE.

**COUNTERTOP:**  
POST-FORMED PLASTIC LAMINATE WITH 4" ATTACHED BACKSPLASH WITH D-WRAP EDGE PROFILE.  
WILSONART - SMOKY TOPAZ - CRYSTAL FINISH 4589-80.

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

**A** DETAIL No.  
**B** DRAWING No. WHERE DETAILED.

No	REVISION	DATE

**ORIENTATION**

**STAMP**

ONTARIO ASSOCIATION OF ARCHITECTS  
PATRICK COLES ARCHITECT  
LONDON ONTARIO  
2005 11 09

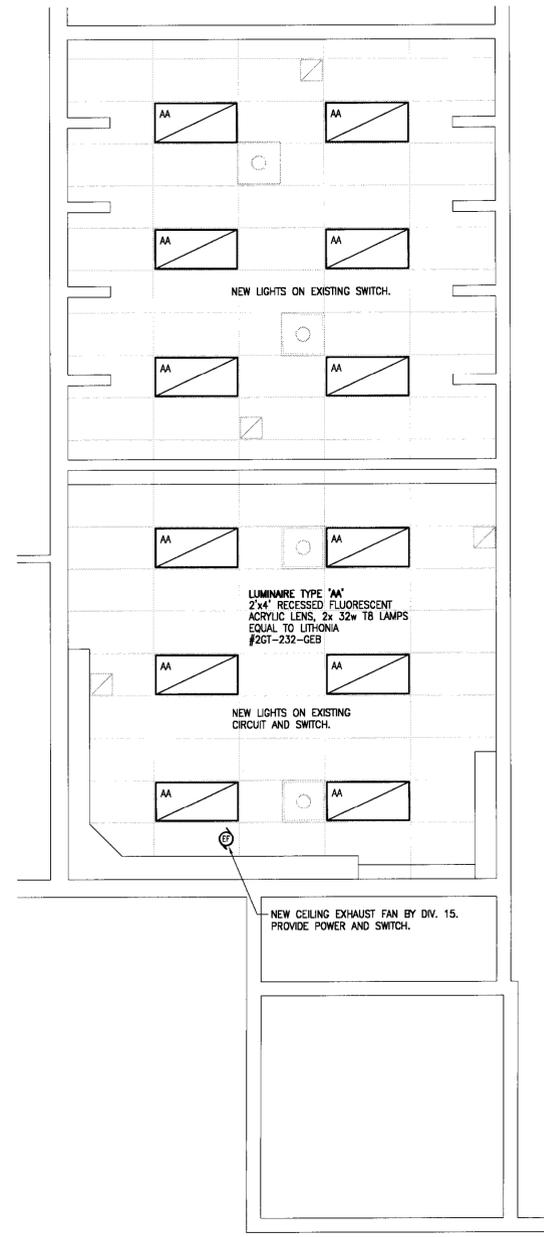
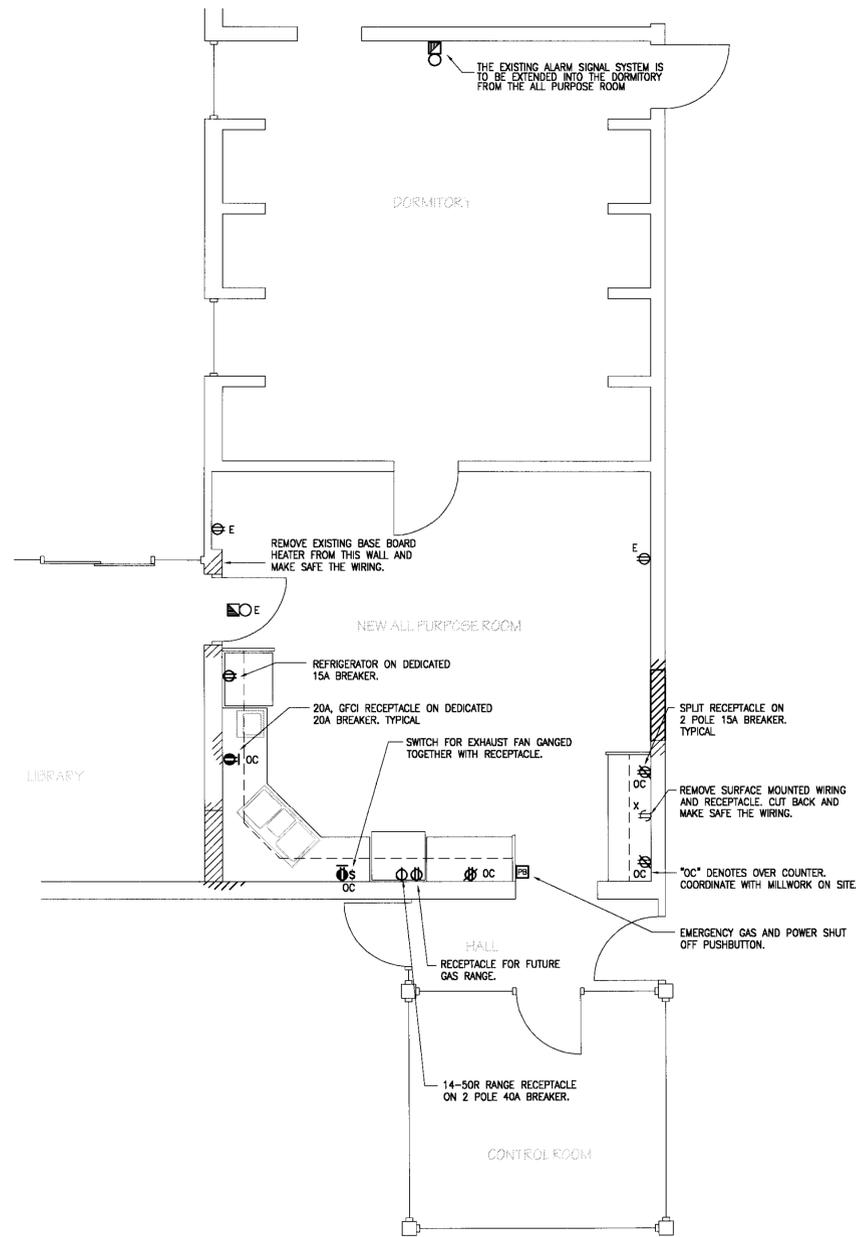
**PATRICK COLES ARCHITECT**  
LONDON ONTARIO

**PROJECT:** FIREHALL #3 GUELPH ONTARIO

**SCALE:** AS NOTED  
**DATE:** 12 OCT. 2005  
**APPROVED BY:**  
**DRAWN BY:** TP  
**REVISION:**

**PROJECT SCOPE:** ALL PURPOSE ROOM RENOVATIONS

**DRAWING DESCRIPTION:** ELEVATIONS / NOTES  
**DRAWING No:** A-3



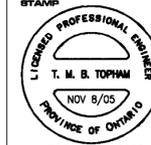
ELECTRICAL SPECIFICATIONS	
<b>GENERAL</b>	
1. PROVIDE ALL MATERIAL AND LABOUR FOR A COMPLETE INSTALLATION OF ALL SYSTEMS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN. THE WORK SHALL BE IN ACCORDANCE WITH THE ONTARIO ELECTRICAL SAFETY CODE AND THE ONTARIO BUILDING CODE.	
2. ARRANGE AND PAY FOR ALL PERMITS AND FEES. UPON COMPLETION OF THE WORK PROVIDE AN UNCONDITIONAL CERTIFICATE OF ACCEPTANCE FROM THE ONTARIO ESA.	
3. PROVIDE ONLY NEW, CSA APPROVED MATERIAL MOUNTED PLUMB AND PARALLEL TO BUILDING LINES. ALL WORKMANSHIP SHALL BE FIRST CLASS IN TERMS OF ACCESSIBILITY, DURABILITY AND NEATNESS, EMPLOY QUALIFIED TRADESPERSONS AND SPECIALIZED SUBTRADES AS REQUIRED.	
4. THE DRAWINGS INDICATE GENERAL DESIGN LAYOUT ONLY. MAKE ALLOWANCES FOR SITE CONDITIONS AND CO-ORDINATION WITH OTHER TRADES. EXAMINE THE SITE AND RELATED DOCUMENTS PRIOR TO TENDER.	
5. MAKE GOOD ALL SURFACES AFFECTED BY THE WORK.	
6. PROVIDE LAMACOID LABELS ON ALL EQUIPMENT. LABELS SHALL INDICATE THE NAME OF EQUIPMENT OR PANEL/EQUIPMENT CONNECTED. COMPLETE ALL PANEL DIRECTORIES.	
7. PROVIDE A ONE YEAR WARRANTY ON THE WORK COMMENCING FROM THE DATE OF ACCEPTANCE BY THE TENANT. FURNISH ONE SET OF DRAWINGS CLEARLY MARKED TO SHOW AS-BUILT CONDITIONS.	
8. EXAMINE THE SITE AND BECOME FAMILIAR WITH ALL SYSTEMS AFFECTED BY THIS PROJECT. NO ALLOWANCE WILL BE MADE FOR EXTRA WORK THAT WOULD HAVE BEEN REVEALED IN THE COURSE OF SUCH AN INVESTIGATION.	
THIS ABBREVIATED SPECIFICATION DESCRIBES A MINIMUM STANDARD OF WORKMANSHIP, EQUIPMENT AND MATERIALS TO BE INCLUDED IN THE WORK. THE STANDARDS TO BE MET ARE FULLY DESCRIBED IN THE MASTER SPECIFICATIONS OF INTEGRATED ENGINEERING AND ARE AVAILABLE FOR REFERENCE AT THEIR OFFICE.	

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

**A** DETAIL No.  
**B** DRAWING No. WHERE DETAILED.

No	REVISION	DATE
0	ISSUED FOR TENDER	05.11.08

ORIENTATION  
↑  
PLAN NORTH

STAMP  
  
 PROJECT # 3098

**INTEGRATED ENGINEERING**  
 Mechanical & Electrical Building Systems  
 291 Boler Road (ph) 519-472-3688  
 London, Ontario (fax) 519-472-4322  
 N6K 2J9 mail@integratedengineering.ca

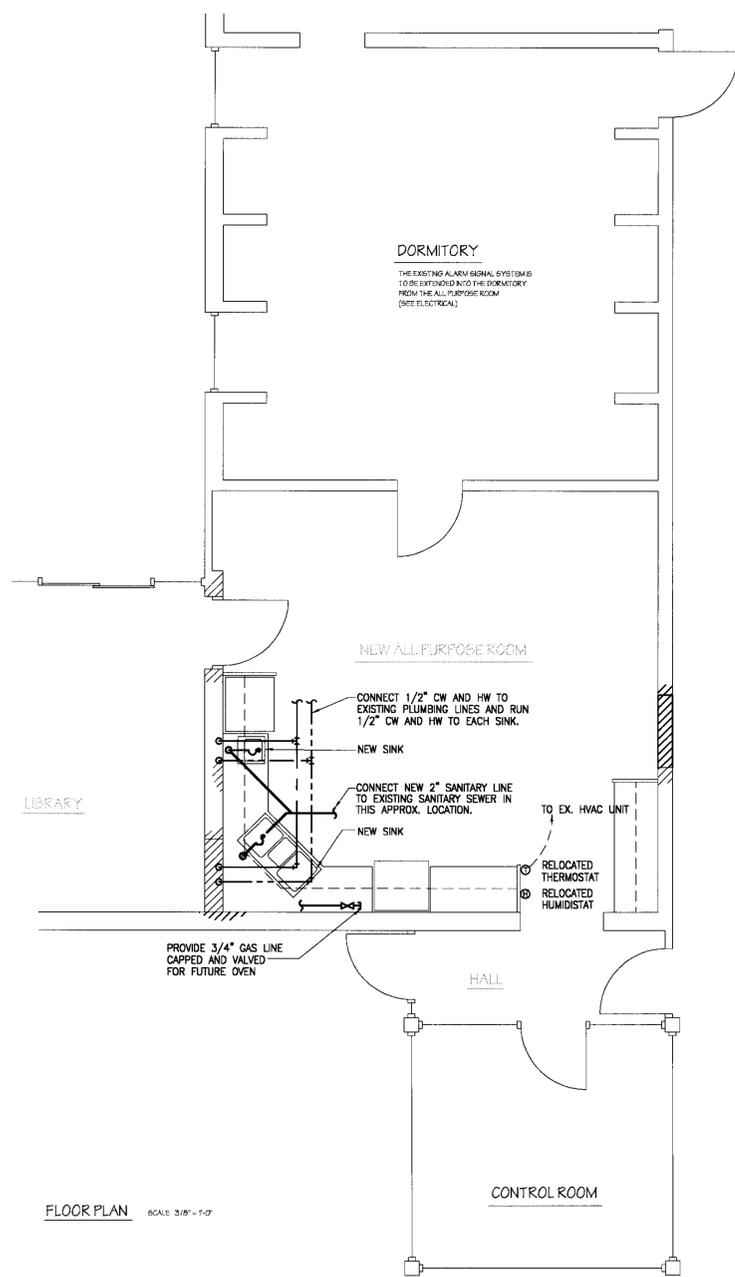
**PATRICK COLES**  
**ARCHITECT**  
 LONDON ONTARIO

PROJECT: FIREHALL #3  
 GUELPH ONTARIO

SCALE: NOTED	APPROVED BY:	DRAWN BY: 11
DATE: OCT. 2005		REVISED:
PROJECT SCOPE: ALL PURPOSE ROOM RENOVATIONS		
DRAWING DESCRIPTION: ELECTRICAL PLAN		DRAWING No: E-1

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

**A** DETAIL No.  
**B** DRAWING No. WHERE DETAILED.

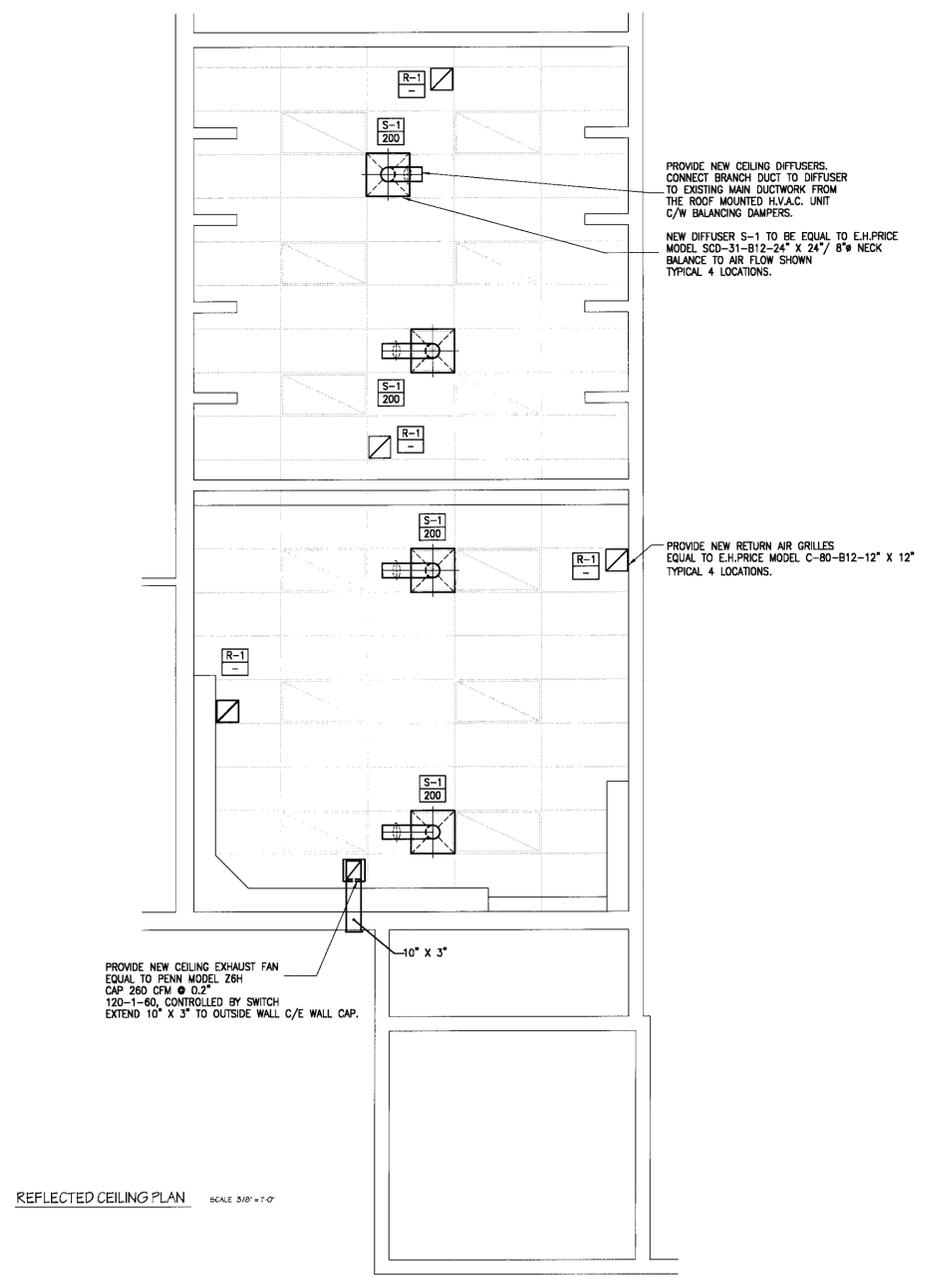


PLUMBING FIXTURE SCHEDULE					
SYMBOL	DESCRIPTION	DRAIN	VENT	HW	CW
C.S.	COUNTER SINK	1 1/2"	1 1/4"	1/2"	1/2"

**NOTE:**  
- ALL SANITARY VENTING TO BE INSTALLED IN ACCORDANCE WITH LATEST EDITION OF THE ONTARIO BUILDING CODE.  
- ALL FLOOR DRAINS TO BE TRAPPED, VENTED AND PRIMED BELOW FLOOR.

- GENERAL**
  - PROVIDE ALL LABOUR AND NEW MATERIALS FOR THE COMPLETE INSTALLATION OF THE SYSTEMS AS SHOWN ON THE DRAWINGS. ENSURE THAT COMPLETE INSTALLATION MEETS WITH THE APPROVAL OF ALL AUTHORITIES HAVING JURISDICTION IN ACCORDANCE WITH ALL CODES ETC.
  - ARRANGE AND PAY FOR ALL PERMITS AND FEES REQUIRED FOR THIS INSTALLATION.
  - PROVIDE ONLY NEW, CSA APPROVED MATERIAL MOUNTED PLUMB TRUE AND PARALLEL TO BUILDING LINES ALL WORKMANSHIP SHALL BE FIRST CLASS IN TERMS OF SAFETY, ACCESSIBILITY, DURABILITY AND NEATNESS EMPLOY QUALIFIED TRADESPERSONS AND SPECIALIZED SUBTRADES AS REQUIRED.
  - THE DRAWINGS INDICATE GENERAL DESIGN LAYOUT ONLY. MAKE ALLOWANCE FOR SITE CONDITIONS AND CO-ORDINATION WITH OTHER TRADES, EXAMINE THE SITE AND ALL OTHER PERTINENT DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT PRIOR TO TENDER.
  - MAKE GOOD ALL SURFACES AFFECTED BY THE WORK.
  - KEEP PREMISES CLEAN AS WORK PROGRESSES, AND AVOID ACCUMULATION OF DEBRIS, ON COMPLETION OF WORK, CLEAN UP AND REMOVE FROM SITE ALL SCRAP MATERIALS RESULTING FROM THE WORK.
  - GUARANTEE ALL WORK, EQUIPMENT AND MATERIALS FOR ONE YEAR FROM SUBSTANTIAL COMPLETION OF THE CONTRACT. ENSURE THAT ALL EQUIPMENT IS PROPERLY GUARANTEED BY THE MANUFACTURER.
  - SUBMIT SHOP DRAWINGS OF ALL FIXTURES AND EQUIPMENT (INCLUDING WIRING DIAGRAMS), TO THE ENGINEER FOR APPROVAL, APPROVAL OF SHOP DRAWINGS IS GRATUITOUS AND DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES.
  - CUTTING AND PATCHING FOR THIS WORK WILL BE PROVIDED BY OTHERS, THIS CONTRACTOR TO LAY PIPING HAND DIG TO OBTAIN REQUIRED SLOPE, BACK FILLING BY OTHERS.
  - WIRING - ALL POWER WIRING BY DIVISION 16, ALL 24 VOLT WIRING BY DIVISION 15.
  - ALLOW FOR DEMONSTRATION TO THE OWNER AND THE OWNERS STAFF.
  - NO DEVIATION WILL BE ALLOWED FROM THE DRAWINGS OR SPECIFICATIONS WITHOUT WRITTEN APPROVAL FROM THE ENGINEER. ASSUME FULL RESPONSIBILITY THAT THE EQUIPMENT OFFERED AS AN ALTERNATE IS SUITABLE AND PAY FOR ANY COSTS INCURRED BY THE USE OF THE ALTERNATE.

- INSULATION**
  - INSULATE ALL DOMESTIC HOT, COLD WATER PIPING WITH 1/2" FIBREGLASS
  - INSULATE ALL EXHAUST DUCTWORK FROM EXTERIOR WALL OR ROOF WITH 1" FLEXIBLE INSULATION FOIL BACKED. FOR 6'-0"
- PIPING**
  - DOMESTIC HOT, COLD AND CONDENSATE PIPING TO BE COPPER TYPE 'L'
  - SANITARY AND VENT PIPING TO BE CAST TYPE M, 2 1/2" AND UNDER TO BE COPPER DW PIPING BELOW GRADE TO BE ABS-DW.
  - GAS PIPING TO BE SCHEDULE 40 BLACK STEEL PIPE. PIPING BELOW GRADE TO BE ABS-DW.



0	ISSUED FOR TENDER	05.11.08
No	REVISION	DATE

ORIENTATION  
PLAN NORTH

STAMP  
LICENSED PROFESSIONAL ENGINEER  
G. L. HRD  
PROVINCE OF ONTARIO  
PROJECT # 3098

**INTEGRATED ENGINEERING**  
Mechanical & Electrical Building Systems  
291 Boler Road (ph) 519-472-3688  
London, Ontario (fax) 519-472-4322  
N6K 2J9 mail@integratedengineering.ca

**PATRICK COLES**  
ARCHITECT  
LONDON ONTARIO

PROJECT: FIREHALL #3  
GUELPH ONTARIO

SCALE(S) NOTED	APPROVED BY: GJH	DRAWN BY: MJS
DATE: OCT. 2005		REVISED: 0

PROJECT SCOPE:  
ALL PURPOSE ROOM RENOVATIONS

DRAWING DESCRIPTION: MECHANICAL PLAN  
DRAWING No: M-1



solar canada inc.

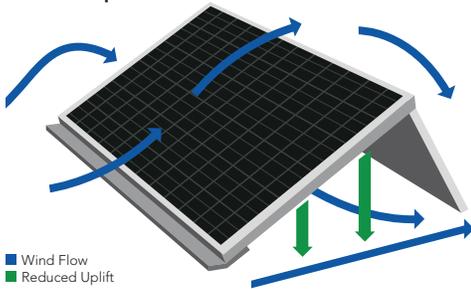
innovation for flat-roof PV

SCIROCCO®



## SCIROCCO® – An innovative, low impact, and low ballast racking system for flat roof pv

Patented design results in pressure equalization and dramatically reduced uplift



Low overall system weight and modular concept

- Non-penetrating light weight ballasted racking, 3-4 psf on average
- Lowest impact on roofing surface, mainly line loads
- Rubber pads separate the array from the roof
- Quick and easy to move when access to roof is required
- Quick decommissioning and fully recyclable

Each PV array is designed individually by hb Solar

- Supplied system "fits like a glove," no surprises on site
- Friction coefficient testing performed on all types of flat roof surfaces
- Supplied in stackable 20ft transport racks, easy to stage, easy to move
- Local climatic data used to determine each customized design (wind, snow, exposure, local wind pressures, building height, etc.)
- Available in inclinations of 5,10,15,20, 27 & 30 degrees

Focus on quality and backed by extensive experience

- Every system comes with a 10-year transferrable warranty
- Ontario installations range in size from 4 kWp to 650 kWp
- In North America, hb Solar's installed base exceeds 15 MWp
- hb Solar draws on over 160 MWp of project experience worldwide!



650 kWp at Main Street, Delhi, ON



188 kWp, 20° installation at CNE, Toronto, ON



59.8 kWp, 20° inclination, Toronto, ON



Effective cable management and cable access through rear wind deflector



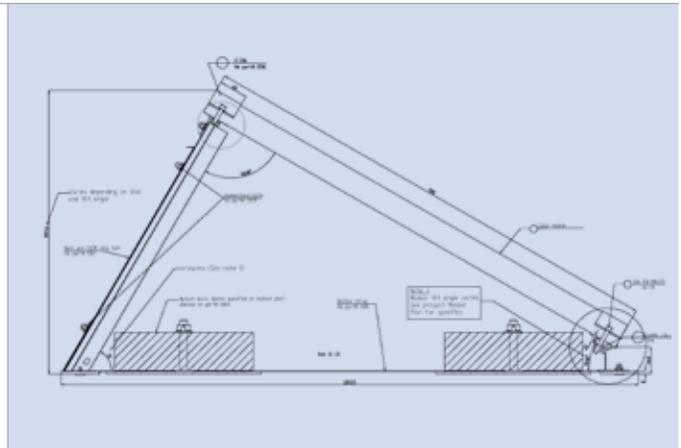
Passed a rigorous audit by LCAB to confirm the domestic content is fully compliant with domestic content regulations. SCIROCCO system is the first system in Ontario to carry this distinction.

### System Features

Detail	
Roof types	BUR, TPO membrane, EPDM, PVC
Connections	Non-penetrating, low ballast mounting system
Customizations	Local climatic data used to determine each customized design (wind, snow, exposure, local wind pressures, building height and other factors)
Module compatibility	SCIROCCO can accommodate all solar module types
Tilt angle	5, 10, 15, 20, 25 & 30 degrees with additional custom designs available
Friction co-efficient	Testing for friction co-efficient has been done for each roof type
Hybrid systems	SCIROCCO ballasted system with anchors for seismic loading, 1:2 or 1:3 anchor/kWp ratio
System ventilation	Vented design results in lower operating temperatures & improved solar yield
Design approach	Manufactured in modular racking units (1,2 or 3 solar modules)
Pre-assembly	Racking units are shop pre-assembled
Training	Installer training and continuous site support provided
Bonding/Grounding	Solar module bonding available using WEEB clips and lugs
Domestic content	Made entirely in Ontario, SCIROCCO complies with FIT & micro-FIT requirements
Warranty	10 year fully transferrable warranty
Materials	Racking components are all aluminum with stainless steel fasteners
Fasteners	Stainless steel fasteners and hardware, pre-kitted
System weight	SCIROCCO system weight (including solar modules) is 3-4 psf on average

### System Configuration Customized for Each Project

20° tilt cross-section

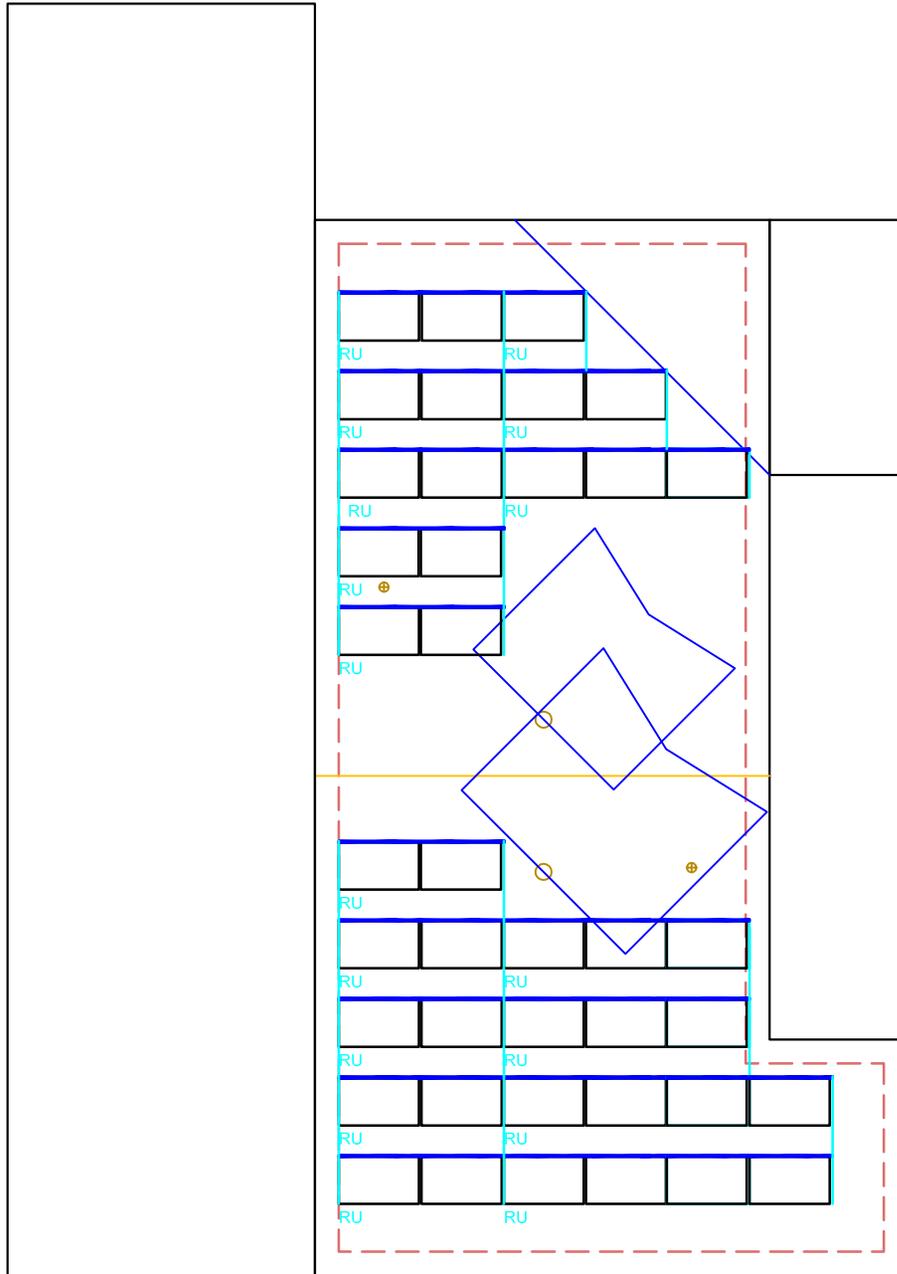


### Engineering Features

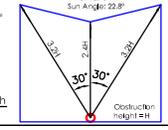
Detail	
Engineering design	SCIROCCO has been wind tunnel tested by RWDI in Guelph, ON
Snow accumulation	Systems are configured to avoid additional snow accumulation based on report from RWDI
Engineering drawings	All projects are designed to meet OBC requirements and are delivered with locally stamped engineering drawings

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HW Day: Dec 21 Time: 10:15 AM Sun Angle: 17.4°  
 NE Day: Dec 21 Time: 12:15 PM Sun Angle: 22.8°  
 NE Day: Dec 21 Time: 2:15 PM Sun Angle: 17.4°

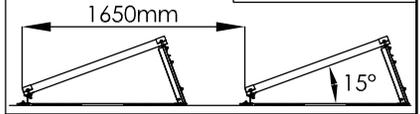


Shading Approach

**ARRAY INFORMATION**

ITEM	VALUE
Module Type	CS6P-250
Module Wattage	250 W
No. of Modules	40
DC Capacity	10.0 kWp
Module Tilt	15 deg
Row Spacing	1.65 m
Min Edge Set-Back	0.5 m
Azimuth of modules	45 deg E of S
Roof Slope	Flat
Module Surface Area	692 Sq. Ft.
Solution Area	1,690 Sq. Ft.

Scirocco Section View



TITLE: Firehall #3, Guelph

CLIENT: Kiwi-Newton

SIZE	DWG. NO.	PROJECT NO.	REV
<b>B</b>	M-001	PP-896	00

SCALE: 1:1 WEIGHT: SHEET 1 of 1

DRAWN: JT DATE: 2013-11-06

CHECKED:

**LEGEND**

- ⊗ Roof Drain
- Vent
- A/C Unit
- Gas Line
- Roof Edge

- = Row Connector Lengths
- = Scirocco mounting system - 15° inclination

6-21 Roysun Road, Woodbridge  
 Phone: (905) 856-8444  
 E-Mail: info@hbsolar.ca

**PROPRIETARY AND CONFIDENTIAL**

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF hb Solar Canada Inc. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF hb Solar Canada Inc. IS PROHIBITED



## Detailed Structural Assessment Report



### **Fire Hall #3**

**115 Stone Road West  
Guelph, ON**

Prepared for  
**City of Guelph**  
Corporate Building Maintenance | Community Services

March 8, 2013

CCI's Project No.: 03000111  
PO No.: 1300957

March 8, 2013

**Project No. 03000111**

City of Guelph  
Corporate Building Maintenance | Community Services  
1 Carden Street  
Guelph, ON N1H 3A1

**Attn.: Ms. Samantha Jansen B.A. Arch, PMP, FMP**  
Project Manager - Facilities

Dear Ms. Jansen,

**Subject: Detailed Structural Assessment of Fire Hall #3**  
**115 Stone Road West, Guelph, ON**

As instructed, the above-captioned site was visited by personnel from Construction Control, Inc. on January 29, 2013. Our visual review was carried out from both the exterior and the interior of the Fire Hall #3. We understand this review is required to assess the general condition of the structural components and to verify any immediate unsafe conditions.

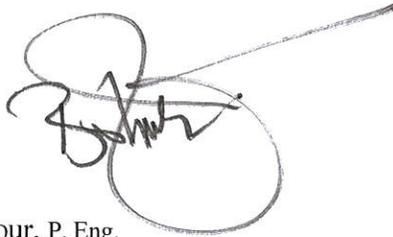
Only accessible areas with no materials obstructing our view were reviewed by this office. Photographs have been included at the end of this report in Appendix "A" to illustrate the on-site conditions.

The specific deficiencies identified during the assessment and their associated recommendations for repairs are described within the main body of this report.

We trust that the report addresses your requirements. Should you require clarification or information regarding this report, please contact the undersigned. Following your review of this submission, we shall be available to address any questions you may have relating to the findings and/or recommendations.

Yours truly,  
**CONSTRUCTION CONTROL INC.**

Prepared by:



Maziyar Bolour, P. Eng.  
Structural Engineer

Reviewed by:



John Kirkpatrick, B.Tech.(Arch.Sc.), M.A.A.T.O., CRP, BCQ  
Director, Corporate Projects

## TABLE OF CONTENTS

1.0	Description of the Facility.....	3
2.0	Historical Data .....	3
3.0	Current Conditions .....	3
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b)	Floor Slab .....	4
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## 1.0 Description of the Facility

The subject property is a single storey fire hall with a gross floor area of approximately 4,300 sq.ft. [400 sq.m.], built in 1976. Any directional references in this report assume the front of the building faces south.

During our site visit, it was noted to us that this building is not designated as a post-disaster building. Post-disaster buildings are buildings that are essential to the provision of services in the event of a disaster. Table 4.1.2.1. “*Importance Categories for Buildings*” forming part of sentence 4.1.2.1(3) of National Building Code of Canada (NBCC) stipulates that “*fire, rescue and police stations, and housing for vehicles, aircrafts or boats used for such purposes*” are considered to be post-disaster buildings “*unless exempted from designation by the authority having jurisdiction*”.

The building is of conventional steel frame construction with load-bearing concrete block walls. Some renovation work was carried out in the multipurpose room and dormitory area in 2006. The renovation work consisted of replacement of the flooring, base board and ceiling finish materials; installation of new kitchen cabinets, fixtures and appliances; cutting through the west exterior block wall to create a new door opening to the library (TV room); removal of a swing door and its frame in the 12-inch block wall separating apparatus floor from the multipurpose room on gridline “2”; removal of a swing door and its frame opening from kitchenette to library; filling in the openings with concrete blocks; adding a demising steel stud wall between dormitory and multipurpose room; and some alterations to the interior walls such as removal of two wing walls on the west side of the block wall at gridline “2”.

There are roof overhangs in the front and rear of the building extending approximately 5’ [1.52m] away from the exterior walls in the north-south direction. The roof overhangs are constructed with cantilevered steel beams, hangers and vertical braces supporting the dropped ceiling of the roof overhangs.

There is a fire hose storage tower at the north east corner of the building with prefabricated steel stairs. The roof height of the tower is approximately 34’ [10.4m] from grade. Stringers and the landings of the stairs are directly supported by the staircase peripheral walls.

## 2.0 Historical Data

No historical significant information has been provided in relation to the structure. Architectural drawings A.1, A.2, A.3, A.4 and A.5 together with structural drawings S.1 and S.2 were provided to us in digital format (Adobe Acrobat PDF).

## 3.0 Current Conditions

### a) Footings

Footing size, depth, thicknesses, size and spacing of the required reinforcing steel are shown in the structural drawings. It is noted on the structural drawing S.1 last dated September 26, 1975 that the footings must be carried down to natural undisturbed soil capable of sustaining a net bearing pressure of 3,000 psf [143.65 kPa]. A minimum 28 day compressive strength of 3,000 psi [20.68 MPa] is specified for all cast-in-place concretes. All steel bars are specified to be deformed bars having minimum yield stress of 50 ksi [344.73 MPa] except for #2 bars that are specified to be plain bars.

The required minimum reinforcing steel has not been provided in the footings and there are footings that are unreinforced; however, there are no above-grade conditions that indicate that the footings are not performing as intended.

**b) Floor Slab**

The floor slab is a concrete slab-on-grade. As per the structural drawing S.1, the minimum thickness of the entire floor slab is 4-inch reinforced concrete with WWF except for the apparatus floor that is specified to be 6-inch [152mm] concrete slab reinforced with #4 bars spaced at 12" on centre each way. Based on our visual review the general condition of the floor slab appears to be fair throughout the facility except for minor cracks in the apparatus floor that could be due to absence of the required expansion joints.

**c) Foundation Walls**

The thicknesses and the depth of the foundation walls as well as the size, spacing and placement of the reinforcing steel are shown in the structural drawing S.1. The peripheral foundation walls supporting the exterior walls are 12-inch thick cast-in-place plain concrete wall doweled to footings using #4 bars spaced at 12" on centre placed at the centre of the wall.

The interior walls are constructed with 8-inch and 12-inch concrete blocks that are carried down to the footing level with the same thickness. No vertical and horizontal reinforcing steel is specified in the structural drawings.

The required minimum reinforcing steel has not been provided in the foundation walls and there are foundation walls that are unreinforced; however, there are no above-grade conditions that indicate that the foundation walls are not performing as intended.

**d) Interior Walls**

The interior walls are mainly constructed with 8-inch and 12-inch concrete blocks extending up to the soffit of the roof deck or to the roof framing. Steel lintels are provided for the window and door openings. There is no indication on the structural drawings as to whether the concrete blocks are to be solid or hollow. No vertical and horizontal reinforcing steel is specified for the load-bearing walls.

As a systematic deficiency, we have noted that some of the interior block walls aren't sealed to the soffit of the roof deck or to the roof framing. There are concrete blocks that are loose in place with no proper supporting structure. Top of the concrete block walls must be laterally braced. All duct penetrations through the block walls must be properly framed and reinforced. The repair work must include the required application of fire stopping and smoke sealant to all pipe penetrations through the fire rated assemblies where breached.

**e) Roof Framing and Roof Overhangs (Canopies)**

The roof structure is comprised of corrugated steel deck supported by either open web steel joists (OWSJs) or W shape steel beams running east-west direction. The OWSJs and the steel beams are supported by load-bearing masonry walls. The high beams and the roof overhangs are partially supported by HSS steel columns and concrete block walls.

The roof design live load of 48 psf [2.3 kPa] (snow and minimum live loads) noted on the permit drawing S.2 last dated September 26, 1975 is based on NBCC applicable at the time of construction. No wind and seismic parameters are notes on the existing drawings.

Plymovent exhaust system, gas-fired radiant heaters and lighting fixtures are attached to the bottom chord of the roof OWSJs. It is recommended that the manufacturer of the products provide a letter certifying that the installation of the products has been carried out as per the manufacturers' technical and installation guide and that the installation has been reviewed by a professional engineer confirming that the additional loads due to operation of the products would not compromise the structural integrity of the supporting structure(s).

At the time of this site visit, there were no signs of structural distress in the forms of deformation, excessive deflection, lateral displacement, torsion and cracks in the supporting elements and connections of the roof structure where visible.

The exterior steel framing and the soffit of the cantilevered portion of the roof overhangs (canopies) are covered with transite boards (asbestos fibre cement boards) that are mechanically fastened to the supporting structure. The fastening screws are corroded. The transite boards are locally cracked and delaminated from the supporting structure at the edges. The sealant material at the edges of the suspended soffit is locally cracked and has failed.

The steel framing and the steel hangers supporting the split-faced architectural blocks are showing sign of significant corrosion. Complete soffit replacement, refurbishment of the steel framing and block repairs are recommended.

#### **f) Ancillary Components/Issues**

##### **i) Roofing**

There is water staining on the surface of the interior block wall above the Sump Pit Room at the north-east corner of the apparatus floor. There is evidence of leakage on the surface of the block wall at the roof and wall interface located at gridline "2". The roofing material, underlayments, corner flashings, cap flashings and sealants should be checked for any damages and or signs of deterioration to prevent water penetration through the roof assembly.

##### **ii) Fire Hose Rack**

The hose rack(s) in the apparatus floor is not properly secured to the floor. There is a gap between the baseplate and the sloped floor that needs to be shimmed. The anchor bolts have to be replaced with stainless steel anchor bolts with appropriate strength and embedment.

### iii) Swing Doors at Hose Storage Tower

The sill blocking and drip flashings are required at the north elevation. There is some minor paint delamination in the vicinity of the doorframes.

## 4.0 Conclusion

Based on our visual review of the facility, the fire hall structure in general is in satisfactory condition and serviceable. The structure is comparable standing, commensurate with its age, to other similarly constructed facilities.

Since the structural elements are generally not subjected to the full combination of design loads (including wind and seismic loads) this type of review is very limited in identifying hidden or latent structural deficiencies.

## 5.0 Opinions of Probable Costs

Following is the summary of our recommendations and the associated cost estimates:

1) Floor slab localized repairs .....	\$5,000
2) Minor masonry work.....	\$16,000
3) Localized repair and replacement of roof and canopy framing .....	\$28,000
4) Minor steel work, mechanical fasteners and anchor bolts .....	\$8,000
5) Replacement of the roofing material and associated components .....	\$25,000
6) Soffit replacement of the front and rear canopies .....	\$18,000
7) Sealants, metal flashings and capping repairs.....	\$12,000
Total .....	\$112,000

## 6.0 Limitations

- 1) Building code assessment is limited to the structural components only.
- 2) This investigation is designed to provide sufficient information for its purpose, while trying to balance the cost of obtaining this information. It is likely that conditions not uncovered by this investigation exist, which may affect the costs or effectiveness of the recommended repairs.
- 3) Our recommendations are based on our experience and on generally accepted practice. The long-term effectiveness of these recommendations cannot be assessed beyond present knowledge and experience.
- 4) Our recommendations are based primarily on technical considerations. We would be pleased to review with you how the final course of action can also take into account your financial and operational requirements.
- 5) The opinions of probable costs presented in this report are based on estimated quantities and our experience with similar projects. They are meant as an order of magnitude budget estimates only and are subject to confirmation by competitive tendering and when the repairs are actually carried out.
- 6) The recommendations made in this report are based on the information available at this time. Should future associated restoration work reveal additional information, the recommendations may have to be revisited.
- 7) This report and its appendices should be read in their entirety.
- 8) A specification should be prepared for any of the work recommended herein to facilitate proper workmanship and material use and to obtain competitive bids from suitably qualified contractors.
- 9) Competent site review should be carried out during the course of the remedial work to facilitate compliance with the specified requirements and as required to review previously unidentified conditions.
- 10) The opinions of probable costs exclude contingencies, applicable taxes, engineering fees, contract and construction administration and site reviews.

## Appendix “A” (Photographs)



Photograph "1"  
Apparatus floor



Photograph "2"  
Roof joist system at apparatus floor  
Duct work, lighting fixtures



Photograph "3"  
W shape steel beam supporting roof deck



Photograph "4"  
Typical steel lintel at doorways



Photograph "5"  
Plymovent system suspended from the bottom chord of the roof joists



Photograph "6"  
Apparatus floor  
Plymovent system suspended from the bottom chord of the roof joists



Photograph “7”  
Apparatus floor  
Alterations to the Multipurpose Room (Door opening sealed with blocks)



Photograph “8”  
Alterations to the Multipurpose Room



Photograph "9"  
Fire hose storage rack

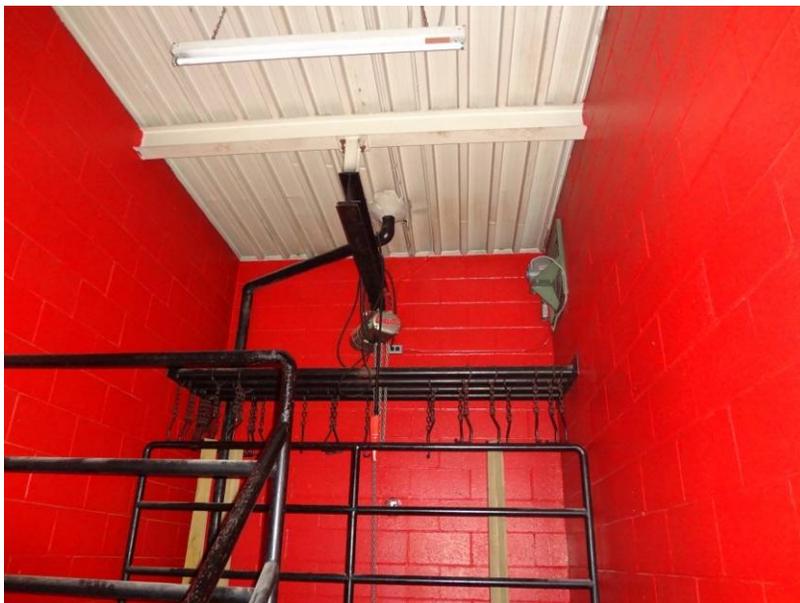


Photograph "10"  
Baseplate of fire hose storage rack



Photograph "11"  
Apparatus floor

Top connection of the fire hose storage rack to concrete block wall



Photograph "12"

Fire Hose Storage Tower (Monorail)



Photograph "13"  
Swing doors at the Fire Hose Storage Tower



Photograph "14"  
Fire Hose Storage Tower  
Paint delamination



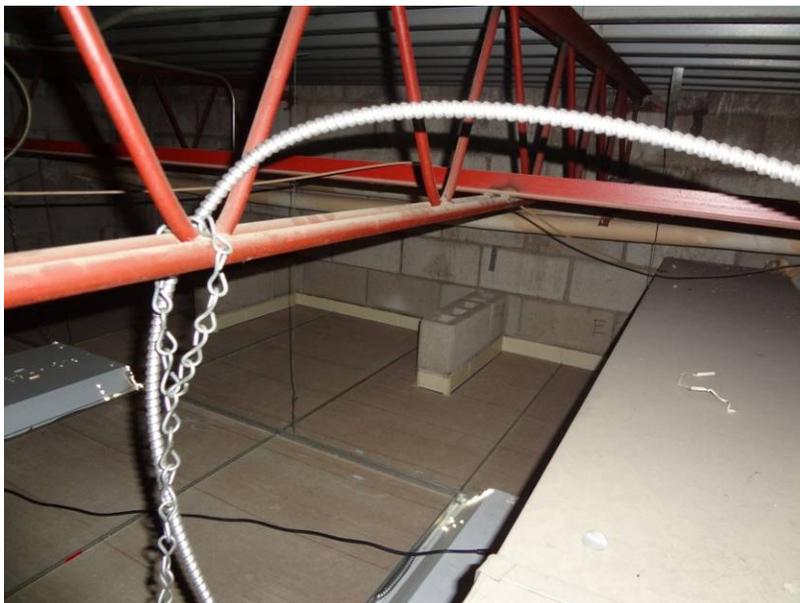
Photograph "15"  
Demising wall at gridline "2"  
Note duct penetration through the block wall with no reinforcement  
Note evidence of leakage



Photograph "16"  
Demising wall at gridline "2"  
Pipe penetrations through the block wall  
Note evidence of leakage



Photograph "17"  
Demising wall at gridline "2"  
Pipe penetrations through the block wall



Photograph "18"  
Dormitory wing walls  
Roof joists



Photograph "19"

Low roof steel framing

Note loose concrete blocks, unreinforced duct penetrations, laterally unsupported block wall



Photograph "20"

Low roof steel framing

Note loose concrete blocks, laterally unsupported block wall



Photograph "21"  
Demising wall separating Dormitory and Multipurpose Room  
Laterally unsupported wall



Photograph "22"  
Demising wall separating Dormitory and Multipurpose Room  
Laterally unsupported wall



Photograph "23"  
Fire Hose Storage Tower North Elevation  
Missing sill blocking and sill flashing



Photograph "24"  
Fire Hose Storage Tower North Elevation  
Deteriorated sill blocking and missing sill flashing



Photograph "25"  
Roof overhang (canopy) at the north Elevation



Photograph "26"  
Roof overhang (canopy) at the south elevation



Photograph "27"

Roof overhang (canopy) at the south elevation

Note cracked and deteriorated sealant, delaminated transite fibre cement board



Photograph "28"

Roof overhang (canopy) at the south elevation (Above main entrance)

Note cracked and deteriorated sealant, cracked & delaminated transite fibre cement board

Note corroded steel framing

**FINAL REPORT**

**Condition Assessment Survey for  
Various Facilities within the City of  
Guelph, Contract No. 07-017**

**Fire Station No. 3**

115 Stone Road West  
Guelph, Ontario

Presented to:

**Corporate Property Division**

**City of Guelph**

c/o, Mr. Murray McCrae, P.Eng.  
Manager  
Guelph City Hall, 59 Carden Street  
Guelph, Ontario  
N1H 3A1

## EXECUTIVE SUMMARY

Morrison Hershfield Limited (MH) was retained to perform a Condition Assessment Survey, subject to certain limitations, of the property known as Fire Station No. 3, located at 115 Stone Road West, Guelph, Ontario. Visual assessments of the subject facility were conducted in April and May 2007.

### General Facility Description

The subject property is located at 115 Stone Road West, Guelph, Ontario. The property contains a one-storey building, with asphalt surface parking area primarily at the north (rear) of the building. There are two driveways at this site, with the south (front) driveway intended for fire truck access and west entrance along the west side of the lot. The parking area also extends along the west side of the building providing access to the office area. There is minimal landscaping around the building with planters around the office entrance at the southwest corner.

The building has a footprint of approximately 600 square metres (6,200 square feet), and was constructed in about 1976. For typical elevations of this facility, refer to Photographs 1 and 2. The building has cast-in-place concrete footings, and is built directly on grade, with no basement level. The building has a steel roof deck supported on open web steel joists and concrete block exterior walls and pilasters. Cladding consists of split-faced concrete block. There are several single-glazed windows around the facility, where an additional glazing lite has been installed in the past.

During our site review, MH met with Mr. Dave Hambly, Maintenance Supervisor for the City of Guelph's Fire Stations, to gain an understanding of current problems and recent repair history of the building. We understand that Mr. Hambly has been involved with maintenance and operation of the facility since 1988.

### Building Profile

Particulars of the facility are summarized in the following table.

Building Address:	115 Stone Road West, Guelph, Ontario
Construction Date:	1976
Total Approximate Gross Floor Area:	600 sq. m. (6,200 sq. ft.)
Floors Above Grade	One (1)
Overall Condition of Facility	Good

Key elements requiring significant remedial costs, or where there is major uncertainty regarding future costs within the next five years, are summarized below.

### **Grounds/Site**

The site features were generally in fair condition. It appears sections of asphalt paving have been replaced, however we have budgeted for replacement of the original asphalt paving within the next five years.

### **Structural Systems**

The structural systems were generally in good condition where reviewed. No evidence of structural distress was noted. The structural systems should last the life of the building.

### **Building Envelope**

The condition of building exterior components ranged from fair to good. The sealants were in generally poor condition and should be replaced within the next year. The original windows are generally in fair condition and would last the life of the building, however we have included replacement of these windows to incorporate sealed double-glazed windows to improve thermal performance.

### **Roofing**

The roofing was generally in fair condition. We understand there have been no major roof repairs or replacements conducted since original construction. The roof systems should be replaced within the term of this study.

### **Building Interior**

The interior finishes are generally in good condition, as major renovations were completed recently. Interior finishes generally appear to be performing well, and should last beyond the term of this study without major repairs.

### **Mechanical Systems, including Related Life Safety Systems**

Heating, cooling and ventilation for the building is provided by a single gas-fired rooftop unit. The unit is nine years old. Replacement of the rooftop units will be required at 15 years of age.

The three exhaust fans are 31 years old and are budgeted for replacement in two years time.

Domestic water supply piping and sanitary and storm drainage piping are original installations and appear to be in fair condition. A thorough inspection should be made periodically to ensure condition is known. We recommend that the sanitary and storm lines be scoped on a periodic basis with closed circuit cameras. For this purpose, capital expenditures have been allocated should repairs be necessary because of the findings of this scoping work.

**Electrical Systems, including Related Life Safety Systems**

The electrical components for this building consist of electrical panels and a utility owned transformer located outside. The system appears to be in fair condition, no replacement recommendations made.

The emergency generator is 31 years old and should be replaced in the next three years.

## Capital Expenditure Summary for Next 5 Years

A summary of Capital Expenditures required within the next five years includes the following:

*Table 1 – 5-Year Summary of Anticipated Capital Expenditures*

Building Element/System and Description	Cost per Year (2007 Dollars)						Priority
	2007	2008	2009	2010	2011	2012	
S 1 – Sidewalks, Curbs & Patios						\$10,000	Priority 3 – Discretionary
S 3 – General Landscaping				\$5,000			Priority 4 – Contingency
S 4 – Driveways and Curbs						\$30,000	Priority 3 - Discretionary
BE 2 – Complete Window Replacement					\$32,000		Priority 3 – Discretionary
BE 3 – Caulking		\$5,000					Priority 2 – Highly Recommended
R 1 – Canopies				\$1,000			Priority 3 – Discretionary
R 2 – Roof Systems					\$65,000		Priority 3 – Discretionary
BI 8 – Doors – Service Area					\$1,000		Priority 4 – Contingency
BI 11 – Egress	\$3,000						Priority 1 – Mandatory / Life Safety
BI 12 – Fire Separations and Containment		\$500					Priority 1 – Mandatory / Life Safety
MS 1 – Heating System					\$5,500		Priority 2 – Highly Recommended

**Condition Assessment Survey**  
**Fire Station No. 3, 115 Stone Road West, Guelph, Ontario**

- v -

<b>Building Element/System and Description</b>	<b>Cost per Year (2007 Dollars)</b>						<b>Priority</b>
	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	
MS 3 – Exhaust System – Centralized			\$6,600				Priority 3 – Discretionary
MS 4 – DWS Shut-off - Main	\$500						Priority 3 – Discretionary
MS 5 – Valves	\$150	\$150	\$150	\$150	\$150	\$150	Priority 3 – Discretionary
MS 6 – DWS H.W. Heaters				\$3,000			Priority 2 – Highly Recommended
MS 10 – Extinguishers	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	Priority 1 – Mandatory / Life Safety
ES 2 – Main Distribution Panel	\$500			\$500			Priority 2 – Highly Recommended
ES 3 – Lighting Fixtures	\$5,600						Priority 2 – Highly Recommended
ES 4 – Exterior Lighting	\$100	\$100	\$100	\$100	\$100	\$100	Priority 3 – Discretionary
ES 5 – Smoke and CO Detectors				\$300	\$300	\$300	Priority 1 – Mandatory / Life Safety
ES 6 – Emergency Generator	\$12,000						Priority 2 – Highly Recommended
ES 7 – Emergency Lighting	\$1,000				\$1,000		Priority 1 – Mandatory / Life Safety
<b>TOTAL</b>	<b>\$23,850</b>	<b>\$6,750</b>	<b>\$7,850</b>	<b>\$11,050</b>	<b>\$106,050</b>	<b>\$41,550</b>	

## **Maintenance Planning**

Predictive and preventive maintenance plan reports have been prepared by our subconsultant, Process Data Management (PDM) Technologies Inc., and are included as an Appendix to this Condition Assessment Survey Report. A tabular schedule for preventive maintenance activities has also been included as part of PDM's reports.

## **Photographs**



Photograph 1. Overview of the Main Office Entrance (South Elevation)



Photograph 2. South (Rear) Elevation

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## **INTRODUCTION**

Morrison Hershfield Limited (MH) was retained by the City of Guelph (the City) to conduct a Condition Assessment Survey (CAS) of the municipal property located at 115 Stone Road West, Guelph, Ontario. Authorization to proceed with the assessment was provided by Purchase Order No. 0705312 from the City of Guelph, dated April 3, 2007.

The following represents our findings with respect to the Condition Assessment Survey and 25-year capital and maintenance plan for the above-noted building.

### **.1 Objectives and Terms of Reference**

This condition assessment survey includes reviews of eight (8) City-owned buildings. The City's main objective for this assignment is to assess the long-term viability of these buildings and to develop predictive maintenance tests and schedules for mechanical equipment within each building.

The Condition Assessment Survey was subject to the limitations of Section 6 and addressed the following scope of services:

1. A review of available pertinent documents and interviews with appropriate building/management staff to establish repair and maintenance history.
2. A detailed non-invasive assessment of the complex including the following building elements:
  - the building site, structure and envelope, including exterior cladding, exterior sealants, parapets, windows, and doors, and existing roof areas;
  - the building's interior finishes, including wall, floor, and ceiling finishes
  - the existing heating, ventilating and air conditioning systems, plumbing and drainage systems, fire suppression equipment, and vehicle exhaust equipment;
  - the existing electrical systems and equipment, including power distribution and lighting systems, generators, and existing parking lot lighting belonging to each facility; and
  - conveying equipment at each applicable facility, which includes one elevator at the Guelph Civic Museum and one elevator at the Guelph Main Public Library.
3. An estimate of the financial capital and maintenance needs over the next 25 years, and development of a 25-year capital and maintenance plan.
4. For mechanical equipment, identification of maintenance deficiencies, provision of comments on overall maintenance and benchmarking. Identification of hazardous conditions and potential hazardous equipment.

Preparation of cost estimates for maintenance and repairs and assessment of required manhours for maintenance and repairs.

5. Predictive maintenance using infrared scans on electrical systems under normal loads, temperature and vibration checks on mechanical equipment under normal loads, and analysis of oil samples.
6. Infrared thermographic scans on built-up roof areas at each applicable building.
7. A final report generally conforming to the following:
  - Summary of observed existing conditions, supported by photographs;
  - Recommendations for all critical conditions observed, including cost estimates;
  - Options for repair or replacement of the critical conditions observed; and
  - Final recommendations for options considered to enhance and prolong the life expectancy of each applicable component or system.

The main components/discipline areas reviewed included the following:

1. Grounds/Site
2. Structural Systems
3. Building Envelope
4. Roofing
5. Building Interior
6. Mechanical Systems
7. Electrical Systems
8. Conveying Equipment (not applicable at this facility).

An infrared roof scan was also conducted at this building, in June 2007.

As detailed in the RFP, the mandatory site meeting, and Addendum No. 2, the following components were not included in our scope of services:

- Transit Garage hydraulic hoists, cranes and testing equipment.
- Main Fire Hall maintenance hydraulic hoists.
- Internal and external light level readings.
- Infrared scans on secondary distribution panels or lighting panels.
- Vibration and temperature checks on mechanical equipment less than 5 hp.
- Life Safety studies.

Based on our review of the RFP's requirements, we also did not include the following services:

- Structural analysis or review of the building components.
- Performance/load testing of the fire and life safety systems.
- Review of appliances, such as fridges, stoves, washers and the dryers, sinks, handbasins, baths and water closets, cabinetry and countertops and any other furniture.
- Any other services not described in this proposal.

## **.2 Project Team**

This CAS has been prepared and/or reviewed by various personnel within MH. The visual review of the building, mechanical and electrical systems, and site was conducted during April and May 2007. The following are the reviewers and the respective disciplines for which each was responsible:

- Mr. Matt Vervoorn, B.E.Sc., of MH addressed the structural, building envelope, building interior, site elements, and roofing elements, and drafted these report sections;
- Mr. George Ferreira, P.Eng., LEED® Accredited Professional, of MH addressed the mechanical, electrical, and life safety systems, and drafted these report sections;
- Mr. Grant Akitt, of PDM Technologies Inc., addressed the predictive and preventive maintenance elements for building equipment and drafted the associated reports; and
- Mr. Jeremy Carkner, P.Eng., LEED® Accredited Professional, of MH reviewed the report for technical content and compiled the information of all team members.

During our review of the building, we met with Mr. Dave Hambly, Maintenance Supervisor for the City of Guelph's Fire Stations, who provided us access to all areas of the facility. We understand Mr. Hambly has been involved with the operation and maintenance of the building since 1988.

## **.3 Report Format**

This report is divided into several sections as follows:

1. Executive Summary for the Property
2. Introduction

3. Individual sections relating to each of the eight (8) major categories listed above. Each section presents the observations, assessments, and recommended remedial work for that element. These sections are included in **Appendix A**.
4. Summary **Tables 1 and 2** in **Appendix B**.
  - **Table 1** identifies life cycle assumptions and long-term capital expenses for each recommended remedial task listed in the order that they appear in the report.
  - **Table 2** identifies the recommended budgets (in future dollars) for major repairs and replacements for each year between 2007 and 2031, and forms part of the 25-year Capital Plan for the building.
5. Photographs are provided within each individual report section to illustrate representative building elevations and to highlight found deficiencies.
6. Infrared Roof Scan Report, in **Appendix C**.
7. Glossary of building terms, in **Appendix D**.
8. Predictive and Preventive Maintenance Plan Reports, including tabular schedule of preventive maintenance activities, in **Appendix E**.

#### **.4 Documents Reviewed**

No building drawings were available for review.

#### **.5 Condition and Priority Rating System**

The condition of the building systems and components was assessed according to the following definitions:

- Good Condition: Reasonable condition, not requiring capital expenditure.
- Fair Condition: Deteriorating condition, likely to become “poor” within a few years if not addressed.
- Poor Condition: Observable deterioration requiring capital repair.

Priority of repair of the building systems and components was assessed according to the following definitions:

Priority 1: **Mandatory** due to legislative requirements (e.g. Building Code violations), liability (e.g. safety hazards), or where immediate attention is required to maintain function of the building for its current use.

- Priority 2: **Highly recommended** to avoid escalating future costs, to limit potential liability, or to enhance or maintain functionality of the building.
- Priority 3: **Discretionary** in that decisions to proceed are subject to operational priorities.
- Priority 4: **Contingency** amount, an estimate of the repair or replacement for elements that are presently performing well, and may continue to provide the same level of service beyond the period of study (assuming continued good maintenance), however the age of the component exceeds the standard capital repair cycle.

## **.6 Limitations and Assumptions**

This Condition Assessment Survey provides an assessment of the current conditions at the reviewed facility based on the specific Scope of Work and to support the specific objectives identified previously.

This report was prepared for the exclusive use of our Client, and may not be reproduced in whole or in part, or used or relied upon by any other party. MH accepts no responsibility for any damages suffered by any third party as a result of decisions made or actions taken based on this report.

Professional judgment was exercised in gathering and analyzing the information obtained and in the formulation of the conclusions. Like all professional persons rendering advice, we do not act as insurers of the conclusions we reach, but we commit ourselves to care and competence in reaching those conclusions. No other warranties, either expressed or implied, are made.

### **.1 Restricted Access**

MH undertook all reasonable measures to review all areas of this facility. However, we were not able to review certain areas of some buildings due to access restrictions by building users. We have identified these specific locations in the appropriate report sections, where applicable.

### **.2 Visual Review**

Conclusions are based on a visual review of a sampling of building elements for the purpose of identifying major deficiencies within the building, building elements and site. Observations were made only of those areas that were readily accessible during our review. The general findings reported may not be extended to portions of the facility that were unavailable for direct observation at the time of the MH visit.

No destructive/cut testing, detailed analysis or design calculations were conducted.

Detailed discussions of the existing elements and required repairs or replacements were beyond the scope of this assessment.

### **.3 Information Used**

The assessment is based, in part, on information provided by others. Unless specifically noted, we have assumed that this information was correct and have relied on it in developing our conclusions.

It is possible that unexpected conditions may be encountered at the building/facility that have not been explored within the scope of this report. Should such an event occur, MH should be notified in order that we may determine whether modifications to our conclusions are necessary.

### **.4 Costing**

Cost estimates are provided only as an indication of possible cost of remedial work. They are based on costs of past repairs at the building as reported by the maintenance staff, recent costing data such as “Means Repair and Remodeling Cost Data - Commercial/Residential” and “Hanscomb’s Yardsticks for Costing,” or our professional judgment.

More precise cost estimates would require more detailed investigation to define the scope of work.

For Table 1, all costs are identified in **2007 Canadian dollars**, and include a separate cost for consulting fees where appropriate, but do not include the GST. Consulting fees have been budgeted at an allowance of up to 7% of the costs identified, where applicable. For Table 2 (25-year Cash-flow Projections), all costs are identified in inflated future dollars based on the present value of each item inflated at **2% annually**, and include consulting fees as well as the GST.

All cost estimates assume that regular annual maintenance and repairs will be performed to all elements at the facility.

## **CLOSURE**

Morrison Hershfield Limited has reviewed this property and conducted a Condition Assessment Survey in accordance with the Scope of Services and the Limitations and Assumptions outlined in Section 6 of this report. If you have any questions regarding the information contained herein, please contact the undersigned.

MORRISON HERSHFIELD

Jeremy Carkner, P.Eng., LEED® AP  
Associate, Project Manager  
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Principal, Manager  
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# 1. SITEWORK

An evaluation of exterior site features and pavements was conducted and consisted of a visual sampling review of the existing surface drainage characteristics and the site, pavement, walkway and curb conditions.

## 1.1 Grounds/Landscaping

The grounds of the facility consist of general landscaping, sidewalks and curbs, driveways.

### 1.1.1 Sidewalks, Curbs & Patios

There are cast-in-place concrete sidewalks and curbs located around the perimeter of asphalt surfaces as well as around the cast-in-place concrete sidewalks. There is a fenced in patio area at the west elevation of the building consisting of gravel.

The curbs, sidewalks, and patio areas around the property were in generally fair condition at the time of the site review. Localized areas of cracked sidewalks and curbs were noted around the building, including at the front entrance.



Photo 1: Typical condition of the concrete sidewalks and curbs at the front entrance

The sidewalks, curbs, patio areas are likely to last their full expected life, but will require replacement in the future.

S1

No current remedial action is required. Budget for repairs and/or replacement to the sidewalks and curbs at the same time as asphalt repairs as per the budget summary chart.

### 1.1.2 Drainage

A general review of the drainage of the site was conducted. It had not rained prior to the site visit, and thus, ponding or other drainage problems may not have been evident at the time of the review.

The site, in general, is designed to drain overland to landscaping catchbasins.

The drainage of the driveways and surface parking was noted to be adequate.



Photo 2: Typical catchbasin located within the garage main entrance

It is unlikely that any substantial repairs to the site drainage characteristics will be required within the study period.

S2

No current remedial action is required. No capital costs anticipated.

### 1.1.3 General Landscaping

We reviewed the extent and condition of the exterior general landscaping associated with the property.

The general landscaping consists of shrubs, trees, planters, and gardens generally located at the front entrance.

The landscaping was in generally fair condition at the time of the site review.



Photo 3: Landscaping around the front entrance

In order to bring the general landscaping up to the standard of the original assumed design, replanting will be required to some of the shrubs and flowerbeds.

S3

No current remedial action is required. We have budgeted for a landscaping upgrade contingency according to the budget summary charts. Landscaping is often client dependent and should be reviewed on a regular basis.

## 1.2 Pavements

The parking facility at 115 Stone Road West consists of surface parking along the east side at the rear of the building.

### 1.2.1 Surface Parking Areas

A general visual review of the surface parking area was conducted.

There are no identified parking areas within the rear asphalt surface, however it appears building occupants use the east perimeter of the asphalt surface for parking. This parking area is minimal and a cost allowance has been incorporated within the "Driveways and Curbs" item below.

### 1.2.2 Driveways and Curbs

We visually reviewed the site driveways as part of this study.

Asphalt driveways and parking areas are located around the building: the main garage entrance driveway is located at the south side of the building, a large area for surface parking is located at the north of the building, including a narrow driveway along the west side of the building providing access to the office entrance.

The asphalt driveways and surface parking areas were in generally fair condition, with areas of settlement, alligator cracking, and minor pot holes. There appeared to have been isolated asphalt patches conducted in the past, however this was not confirmed by site personnel.



Photo 4: Typical alligator cracking with joint of previous asphalt replacement shown

Repairs and/or isolated replacement of the driveways and parking areas should be conducted in order to ensure acceptable operation is maintained.

S4

We recommend that the original asphalt driveways and parking areas be repaired according to the charts provided.

### 1.3 Other Buildings

There is one other exterior building on the site other than the main building, consisting of a small storage shed.

### 1.3.1 Storage Buildings

The storage building consists of a wood-frame constructed building clad with metal siding and placed directly on grade. The roof was sloped with asphalt shingles.

The storage shed near the rear entrance was noted to be in generally fair condition.

S5

No current remedial action is required. Any repairs or replacement should be conducted at a cost below the threshold value associated with this assignment.

## 2. STRUCTURAL SYSTEMS

A general evaluation of the building structure was performed. Our site review consisted of a visual walk-through survey of a sampling of readily accessible structural components in an attempt to identify the symptoms of structural distress (e.g., wide cracks or excessive displacement). Given that our review has been made on a random sampling basis and that structural members were generally not subjected to their full design live loads (including wind and seismic effects) this type of review is very limited in identifying hidden or latent structural defects.

### 2.1 Columns and Parapets

A general review of the exposed columns and pilasters was conducted.

The columns are of concrete block construction.

The exposed portions of the structural columns/pilasters were in generally good condition.

The columns/pilasters are expected to last the life of the building.

**SS1** No current remedial action required. Budget for isolated repointing and isolated repairs within the term of this assignment.

### 2.2 Foundation Walls

The condition of the exposed areas of the foundation walls was reviewed.

The foundation walls are cast-in-place reinforced concrete, and visible above grade immediately below the split-face concrete block cladding.

The foundation walls appeared to be in generally good condition at the time of the site review.



Photo 5: General photo of cast-in-place concrete foundation walls

The condition of the foundation walls indicate that no current capital expenditures appear to be necessary. It is unlikely that significant repairs to the foundation walls above the threshold amount would be required within the study period.

- SS2** We do not anticipate any capital expenditures in the term of this report. Isolated parging should be conducted as part of maintenance.

### **2.3 Floor Slabs**

A general review of the condition of the unfinished areas of the floors was conducted.

Exposed areas of the floors were visible from the garage as well as service rooms. The main floor consists of a cast-in-place concrete slab with the roof structure consisting of steel deck on open web steel joists. Crack control joints were installed around the slab-on-grade within the garage.

The exposed portions of the concrete floor slabs and steel deck were in generally good condition.

The floor slab's condition indicate that no immediate repairs are anticipated. The interior portions of the floor slabs should last the life of the building.

- SS3** No significant current remedial action is required. The cost of minor repairs to the concrete slabs is anticipated to be under the threshold value associated with this assignment.

## 2.4 Exterior Stairs

A general review of exterior stairs was conducted during the site visit.

Aside from the minimal (limited number of) cast-in-place concrete steps at the main office entrance, there is a wall-mounted steel access ladder for the roof areas at the west elevation.

The painted access ladder was in generally good condition, with no signs of damage or distress.



Photo 6: Wall mounted roof access ladder located on the west elevation

### New Discussion

#### SS4

No current capital expenditures are anticipated. The access ladder should be reviewed on a regular basis and repaired when required. Consideration should be given to replacing the existing ladder with one complete with a fall protection cage.

### 3. BUILDING ENVELOPE

A visual review of the building envelope was conducted including a review of the exterior cladding, windows and joint sealants.

#### 3.1 Exterior Cladding

The exterior cladding consists primarily of solid concrete back-up wall construction with split-faced concrete block finish/veneer.

##### 3.1.1 Concrete

A general visual review of the split-faced concrete block was conducted.

The concrete block cladding is located around the entire perimeter of the building. The blocks have a split-faced architectural finish.

The concrete block cladding was in generally good condition with localized area of step-cracking at the southeast corner, on the east elevation.



Photo 7: Isolated location of stepcracking of the split-faced concrete blocks

The condition of the concrete blocks does not appear to warrant significant expenditures at this time, however, future repairs will likely be required within the term of this assignment.

**BE1**

No current remedial action is required. A contingency allowance should be made for periodic repairs to the concrete blocks every 15 years, including any mortar re-pointing and isolated block replacement, if required.

## 3.2 Windows

A general review of the windows was conducted during the site visit. The windows were reviewed from the interior and exterior where accessible. The windows are typically punched.

### 3.2.1 Complete Window Replacement

The majority of windows are all fixed glazing units without operable sections. We noted the office windows at the southwest corner of the building have a reflective coating.

The window frames appear to be in generally fair condition. It appeared the original windows consisted of single-glazed fixed lites and were later modified by installing an additional single-glazed window on the inboard side of the window. Debris was noted within the "cavity" at most locations.



Photo 8: Typical window consisting of original single-glazed window with an additional glazing lite installed following original construction

No information was provided regarding the window retrofits. The additional single-glazing was likely installed to improve thermal performance or minimize air leakage, however this was not confirmed. Installation of current window technologies would provide superior thermal performance by incorporating sealed insulated glass (I.G.) units within thermally broken frames to minimize thermal bridging at glazing areas. We have included replacement of the remaining original overhead door at the rear (north) elevation that is currently not being used.

**BE2** No current remedial action is required. The single-glazed windows could last beyond the study with replacement only required if breakage occurs. However, we recommend replacing the single glazed windows with sealed I.G. units within the term of this study.

### **3.3 Other**

A general visual review of the sealants and doors was conducted as part of the site review.

#### **3.3.1 Caulking**

The exterior walls of this building are face-sealed, that is, they are sealed with one bead of caulking at the face of the exterior walls. There are different types of joints at this building: masonry-masonry joints (e.g., control joints), metal-to-masonry joints (e.g., door and window perimeters). We assume there have been sealant replacements conducted since original construction, however this was not confirmed by site personnel or City of Guelph maintenance staff. We have estimated the age of the sealants accordingly.

The exterior sealants were in generally poor condition at the time of the site review. Cracked, hard, unbonded, and surface alligating sealants were observed around the building perimeter. Sealants located at the various roof levels were in generally good condition and any repairs or replacements required would be covered as part of the roof repair items.



Photo 9: Typical alligator cracking of sealants around perimeter of garage glazing

Deteriorated sealants are likely to lead to water / air infiltration, causing damage to interior wall elements. Therefore, sealants should be maintained, and replaced when they become cracked or unbonded.

**BE3**

Budget for complete replacement of the exterior sealants every 12 years, after which we suggest you implement a three-year inspection cycle making isolated repairs where necessary.

**3.3.2 Doors**

The entrance and exit doors around the building consist of swinging finished metal doors with metal frames.

The doors were in generally fair to poor condition. Scratches, impact damage, missing weatherstripping, and general difficult operation was noted at most of the doors reviewed.

The doors should be maintained for security purposes as well as for appearance and durability. We understand the exit doors are all from original construction and are nearing the end of their expected service life.

**BE4**

Budget for replacement of exterior doors every 40 years. Any minor repairs to these doors should be carried out as part of ongoing regular maintenance.

A general visual review of the condition of the exterior overhead doors was conducted.

There are three overhead doors located within the garage area; two located at the rear (north) elevation and one at the front (south) elevation. Two of the overhead doors have been replaced since original construction, which consist of insulated metal doors with isolated vision glass. The vision glass consisted of sealed insulated glass (I.G.) units with aluminum spacers date-stamped 1999. The original door consists of a metal-framed door with several single-glazed lites.

The two new overhead doors were in generally fair condition, with isolated areas of surface corrosion and impact damage noted, generally located at the base of the doors.



Photo 10: General condition of overhead doors within the garage

The doors should be maintained for security purposes as well as for appearance and durability. We understand, through discussions with Mr. Hambly, the original overhead door is not currently in use. Although the original door is not required for daily operation and could last the life of the building with only minor repairs, we suggest replacing this door as part of the window replacements in order to update with current technologies, and to provide improved thermal performance.

**BE5**

Budget for replacement of the two operable overhead doors every 30 years. Any minor repairs to these doors should be carried out as part of ongoing regular maintenance.

## 4. ROOFING

A general visual review of the roofing was conducted, including the roof systems, flashings, sealants, canopies, and soffits.

### 4.1 Roofs

There are five levels of flat roofs at this facility, including the main garage roof, two lower office (with front entrance overhang) and storage roofs, one lower office roof, and the elevated fire hose storage roof.

#### 4.1.1 Canopies

A general review of the canopies above access doors was reviewed as part of the site visit.

The underside of the canopies appear to be finished with a cement board material, connected to the underlying structure with exposed fasteners. It appeared the cement board was installed since original construction, although this was not confirmed.

Low-severity corrosion was observed on the fasteners at canopy locations. The sealant joint between the split-faced block and the edge of the cement board was typically failed.



Photo 11: Typical finishes of cement board and fasteners at canopy locations

The canopies should be reviewed on a regular basis and any repairs should be conducted as part of maintenance. Sealant replacement, if required, would be covered as part of the "Caulking" item in the "Building Envelope" section above.

**R1** No significant current remedial action is required. The cost of the replacement is under the threshold value associated with this assignment.

#### **4.1.2 Parapets**

12-in. roof parapets are located around the perimeter of the building roofs, complete with metal flashing. We have included our observations and associated costs in the "Roof Flashings" section below.

#### **4.1.3 Roof Systems**

A general review of the roof areas was conducted as part of the site review.

The roof systems are the same throughout the roof and consist of conventional built-up roofs with pea gravel ballast.

The roof areas were generally in good to fair condition. There are isolated areas of blueberries at each of the roof sections, generally concentrated around roof perimeters and roof-mounted mechanical equipment. There were areas of organic debris around the roof areas, indicating possible areas of water leakage or ponding. The roof drains were protected with plastic or metal strainer covers, which were secured and generally clear of debris with some organic debris noted. We noted there was a pitch pocket around a pipe penetration at the lower office roof that was in fair condition.



Photo 12: Typical area of organic debris showing signs of possible ponding

Mr. Hambly reported there are no issues with current water leakage associated with the roof systems. We understand the roof is from original construction, with only isolated repairs and sealant installation completed since that time. Although the roof is currently in fair condition with no water leaks noted, based on current age we recommend budgeting for replacement within the term of this assignment.

**R2**

No current remedial action is required. Budget for complete replacement of the roofing systems every 20 years.

#### **4.1.4 Roof Flashings**

Roof cap flashing and counterflashing are installed around the entire perimeter of the different building roof areas.

There is prefinished cap flashing installed along each of the roof parapet areas, as well as prefinished counterflashing installed along the bottom transition between adjacent roof areas with varying heights. Fasteners required to secure metal flashing to the substrate were typically covered with sealant, including all joints. Some of the roof-mounted mechanical equipment had metal flashing installed at the time.

The roof cap flashing and counterflashing step flashing was in generally fair to good condition at the time of the site review. Isolated scratches were noted around the roof perimeters, with some areas of faded finishes.



Photo 13: Typical layout of roof cap flashing and counterflashing at the various roof levels

**R3**

No current remedial action is required. Budget for complete replacement of the roof flashings every 20 years, to coincide with the replacement of the roof systems.

## 5. BUILDING INTERIOR

The interior finishes of the common areas and service areas were reviewed.

We understand through discussions with Mr. Hambly that the majority of interior finishes have been replaced since 2000. Interior upgrades include the men's washroom around 2000, the sleeping quarters conducted in 2006, and the kitchen also renovated in 2006. Typical finishes include new ceramic tile flooring, painted drywall, and suspended ceilings.

### 5.1 Ceilings

The common area ceiling finishes consist of a suspended ceiling system.

The common area ceiling finishes were in generally good condition at the time of the site review.

Complete replacement of the suspended ceilings is not anticipated over the term of the study, however isolated ceiling tile replacements should be expected. Isolated repairs and replacements should be completed at a cost below the threshold value associated with this assignment.

- BI1** No current remedial action is required. Budget for replacement of the ceiling finishes every 30 years as part of the common area appearance upgrades.

### 5.2 Ceilings - Service Area

The ceiling finishes within the service areas generally consist of exposed structural systems.

The service areas generally includes the garage bay, where the ceiling finishes consist of exposed steel decking and open web steel joists. Other service areas consist of painted drywall finishes.

The minimal ceiling finishes in the service areas were in generally good condition at the time of the site review.

- BI2** We do not anticipate any capital costs associated with this item, as any work would be performed as part of regular ongoing maintenance.

### 5.3 Walls

The common area wall finishes generally consist of painted drywall and painted concrete block.

The common area walls were in generally good condition at the time of the site review.

The only repairs that are anticipated on common wall areas is likely re-painting.

- BI3** No current remedial action is required. Budget for refurbishing of the common area walls every 15 years.

#### **5.4 Walls - Service Area**

The wall finishes of the service areas generally consist of painted concrete block.

There are minimal areas of painted concrete block within the service areas.

The service area walls were in generally good condition at the time of the site review.

- BI4** No significant current remedial action is required. The cost of the replacement is under the threshold value associated with this assignment.

#### **5.5 Floors**

A general review of the floor finishes within the common areas was conducted.

Floor finishes for the common areas consist of ceramic tile, most of which was replaced during the 2006 interior upgrades.

The floor finishes in the corridors and common areas were in generally good condition at the time of the site review.

- BI5** Budget for replacement of the corridor and common area ceramic tile flooring every 30 years. The replacement cycle is subjective and should be reviewed periodically.

#### **5.6 Floors - Service Area**

A general review of the flooring finishes within service areas was conducted.

The floor finishes within the service areas consist of painted concrete, generally located within the garage and adjacent rooms.

The floor finishes within the service areas were in generally fair condition at the time of the site review, with signs of wear and tear.



Photo 14: Typical painted slab within stairwell of fire hose tower located off of the garage

**BI6** We do not anticipate any capital costs associated with this item, as any painting and touch-ups should be performed as part of ongoing maintenance.

## 5.7 Stairway Treads

A general review of the stairwells was conducted, consisting of the prefabricated steel staircase leading up to the top of the fire hose storage tower.

The finishes of the stairway treads consist of exposed metal grates.

The stairway treads were in good condition at the time of the site review.



Photo 15: Prefabricated steel staircase within the fire hose tower

- BI7** No significant current remedial action is required. The cost of any repairs or painting of the steel staircase is under the threshold value associated with this assignment.

## 5.8 Doors - Service Area

A general review of the service area doors was conducted.

The interior service doors are typically hollow metal doors in metal frames.

The interior doors accessing service areas were in generally fair condition at the time of the site review.

It is unlikely all of the service doors would require replacement at one time, and typically are replaced on an as required basis. Isolated door replacements should be covered under maintenance.

- BI8** No significant current remedial action is required. The cost of the replacement is under the threshold value associated with this assignment.

## 5.9 Storage Lockers

There are storage lockers located within the men's washroom as well as other storage areas within the sleeping quarters.

The lockers are metal construction and were reportedly installed during the 2000 renovation.

The storage lockers were in generally good condition at the time of the site review.



Photo 16: Lockers located within the men's washroom

- BI9** No current remedial action is required. Budget for refurbishing of the storage locker areas every 30 years.

### 5.10 Interior Doors

A general review of common area interior doors was conducted.

The interior common area doors are of metal construction.

The interior suite doors and suite entrance doors were in generally good condition at the time of the site review.

Based on the recent interior renovations, it is unlikely the doors would require replacement over the term of the study. Isolated replacements, if required, should be replaced as part of maintenance.

- BI10** No current remedial action is required. The cost of isolated door replacements is under the threshold value associated with this assignment.

### 5.11 Egress

A general review of the existing exit signs was conducted.

There was minimal exit signage located within the building.

A review should be conducted to determine if additional exit signs should be installed.

- BI11** We have allowed for a professional review of the building to determine if the existing exit sign layout is satisfactory and meets code requirements.

## **5.12 Fire Separations and Containment**

A general review of the fire separations was conducted.

There are minimal service rooms requiring fire separations.

No breaches were noted at penetrations through fire separations.

The condition of fire separations should be reviewed periodically to ensure all openings are sealed.

- BI12** We do not anticipate any capital costs associated with this item, as any work would be performed as part of ongoing maintenance at a cost under the threshold value associated with this assignment.

## **5.13 Washroom Finishes**

A general review of the washrooms was conducted.

The washroom finishes generally consist of ceramic tile floors as well as ceramic tile at the lower portion of the walls. The condition of the washroom finishes will depend on wear and tear, age of installed flooring, and quality of installed flooring.

The washroom finishes were in generally good condition at the time of the site review.



Photo 17: General layout of finishes within men's washroom

Based on the current age and condition, we do not anticipate replacement within the term of this assignment.

**BI13**

Ceramic tile in the suite bathrooms is expected to last between 30 and 40 years. Based on our sampling review of the washrooms, we have maintained a 30-year life expectancy for ceramic tile. Budget for renovating the washroom finishes every 30 years.

## 6. MECHANICAL SYSTEMS

An evaluation of the building's mechanical systems was carried out and consisted of a visual review of the building's HVAC, plumbing and drainage, and fire protection systems.

### 6.1 Major Building Systems

The primary mechanical systems in this facility generally consisted of building heating, roof top units, domestic hot water heating, plumbing and drainage systems.

#### 6.1.1 Heating System

Heating systems such as radiators, infrared heaters and roof top units are used to heat general areas.

The heating system in the apparatus bay area consists of gas-fired infrared heaters. Heating in the rest of the fire station is provided by a rooftop unit and electrical radiant heaters. The roof top unit is nine years old and appeared to be in fair condition, the infrared heaters are six years old and in fair condition. The electrical radiant heat equipment is approximately 31 years old and appeared to be in fair condition.

Below are recommendations on the heating system other than roof-top units. Please see section on "Air Makeup System and Ventilation" for recommendations on the roof-top units.



Photo 18: Infrared tube heaters in the apparatus area

**MS1**

Replace two infrared heaters in the apparatus bays at 10 years of age, funded by maintenance budget. Budget to replace the electrical heaters at the same time.

### **6.1.2 Air Makeup System and Ventilation Systems**

Roof top units provide ventilation air to the building. The air is introduced into the facility through a constant flow of fresh and return air into the facility.

The building has one Trane roof top unit (model YCD049C3HABE), located on the roof. It is controlled by a wall-mounted thermostat, non-programmable type. The unit has a 97,200 BTU/Hr heating capacity at 81% efficiency and cooling capability using R-22 refrigerant. The unit is approximately nine years old and in fair condition.



Photo 19: Trane roof top unit, F3-AC-1

**MS2**

Install programmable thermostat for better energy efficiency. Budget for replacement of the unit at 15 years of age.

### **6.1.3 Exhaust System - Centralized**

Exhaust air flow is provided by an exhaust fan located on the building roof and a fan in the apparatus bays.

The fans F3-EF-1 and F3-EF-2 are approximately 30 years old and are in fair condition.



Photo 20: Exhaust fan, roof mounted

The apparatus exhaust fan, F3-EF-3, is interlocked with the carbon monoxide (CO) detection system and only turns on when CO levels created by the fire trucks exceed the set limit. This fan does not run often relative to building general exhaust and therefore has an extended life expectancy. Regular maintenance should continue to be carried out.



Photo 21: Apparatus bays exhaust fan, F3-EF-3

**MS3**

Budget for replacement of the exhaust fans at 20 years of age.

#### **6.1.4 DWS Shut-off - Main**

The main domestic water shutoff valve is located where the city water main enters the building and is used to shut off the flow of domestic water to the building in case of emergency.

The city water is supplied on 1.5- inch copper pipe, the shut-off valve is a ball valve located in the apparatus area. The valve or meter appear to be leaking and should be replaced.



Photo 22: City water shut-off valve and water meter

**MS4** The valve or meter appear to be leaking and should be replaced (less than \$5,000). No capital expenditures above the established threshold are anticipated within the study period.

### 6.1.5 Valves

Valves control the flow of fluids through building heating systems and domestic water distribution systems. It is important that valves be worked periodically to ensure that they do not seize and will operate properly when required. Working the valves is a no-cost maintenance item.

Valve service life varies with type, use, and location.

**MS5** Annual maintenance budgets should include for periodic repair and replacement of valves as required. No capital expenditures above the established threshold are anticipated within the study period.

### 6.1.6 DWS H.W. Heaters

Domestic hot water is generated in a gas-fired hot water heater manufactured by A.O. Smith (model BT197-8805). The heater appeared to be approximately 12 years old and is in fair condition.



Photo 23: Gas-fired hot water heater, F3-WH-1

**MS6** Budget for replacement of the hot water heater at 15 years of age (less than \$5,000). No capital expenditures above the established threshold are anticipated within the study period.

#### **6.1.7 Domestic Water Supply - Copper**

The domestic water supply system provides hot and cold water to the building through a network of risers, branch, and recirculation lines.

The domestic water supply piping is copper and is the age of the building. Individual risers and shutoff valves were not visible to the reviewer.

**MS7** Periodic inspection of the lines under a preventive maintenance program is recommended, if leaks are detected repair as required. No capital expenditures above the established threshold are anticipated within the study period.

#### **6.1.8 Sanitary Drainage**

Sanitary drainage systems consist of drain stacks, branches, and lateral lines that collect sanitary waste from plumbing fixtures in the building and transport it to the municipal sanitary sewer system.

The sanitary drainage lines, where visible, are made of cast iron. With proper maintenance, these lines should last approximately 40 years or more. The lines are approximately 31 years old and based on past performance appeared to be in fair condition.

**MS8**

Budget for periodic scoping and potential repairs. Scoping allows the inspector to view the inside of the pipes through a closed circuit television and assess the condition of the pipes.

### **6.1.9 Storm Water Removal**

Storm water removal systems consist of roof drains, catch basins and floor drains that collect storm water and transport it to the municipal storm sewer system.

The storm drainage lines, where visible, are made of cast iron. With proper maintenance these lines should last approximately 40 years or more. The lines, where visible, appeared to be in fair condition.

**MS9**

Budget for periodic scoping and potential repairs. Scoping allows the inspector to view the inside of the pipes through a closed circuit television and assess the condition of the pipes.

## **6.2 Fire Safety**

Aspects of the overall life safety of the building were generally reviewed, including the fire hydrant and fire extinguishers.

### **6.2.1 Hydrant**

The nature and layout of the facility requires the use of on-site hydrants to meet the requirements of building and fire codes.

No capital expenditures above the established threshold are anticipated within the study period.



Photo 24: Local fire hydrant

### 6.2.2 Extinguishers

The building code requires fire extinguishers to be installed in certain locations in the building and for them to be regularly inspected.

Type A/B/C fire extinguishers are located in corridors or exits.



Photo 25: Fire extinguisher by exit door

**MS10**

Continue the inspection and maintenance of the fire extinguishers under annual operating and maintenance budgets. No capital expenditures above the established threshold are anticipated within the study period.

## 7. ELECTRICAL SYSTEMS

An evaluation of the building's electrical systems was carried out and consisted of a visual review of the main power supply and distribution systems, lighting, and electrical devices.

### 7.1 Major Building Systems

The primary electrical systems in the facility generally consist of building incoming electrical service, power distribution panels, lighting distribution panels, and common area devices.

#### 7.1.1 Transformer

Transformers typically step down voltage from higher incoming voltage supplied by the utility company. Main transformers are either utility-owned or facility-owned, this arrangement is generally reflected in the utility bill and rates charged accordingly. Utility-owned transformers are the responsibility of the utility to maintain, whereas facility-owned transformers are the responsibility of the owner to maintain.

A 15,000-volt transformer, oil-filled type, is located outside and appeared to be in good condition.



Photo 26: Utility owned transformer

#### ES1

The transformer appeared to be 30 years of age and is not likely to contain PCBs, however it is recommended that Guelph Hydro be contacted to confirm the presence or absence of PCBs in the oil. No capital expenditures above the established threshold are anticipated within the study period.

### 7.1.2 Main Distribution Panel

The main distribution panel controls power and provides overload protection to the entire facility.

The panels are manufactured by Federal Pioneer. They are likely to be the age of the facility (31 years old), are properly labeled and appeared to be in fair condition. No power issues reported by maintenance staff or occupants of the facility.

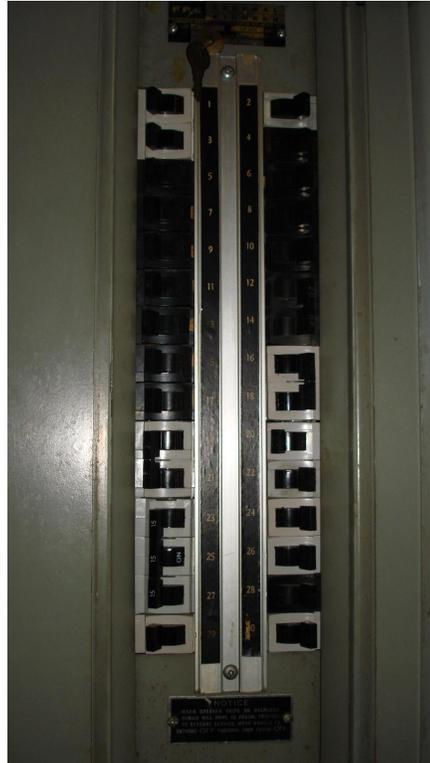


Photo 27: Typical electrical panel

#### ES2

The panel should be cleaned and inspected periodically. We also recommend that a thermographic scan be conducted every three years. This should be paid for out of the maintenance budget. No capital expenditures above the established threshold are anticipated within the study period.

### 7.1.3 Lighting Fixtures

Light fixtures provide general lighting to the apparatus bay area, common space and offices.

Lighting fixtures in the apparatus are T-12 fluorescent bulbs with magnetic ballasts and should be converted to more energy efficient T-8

fluorescent type with electronic ballasts. The fixtures appear to be in fair condition.

Light fixtures in the newly renovated areas such as kitchen already have energy efficient T-8 lighting.



Photo 28: T-12 fluorescent bulbs, apparatus bays

ES3

Budget for replacement of the T-12 lighting fixtures at 20 years of age. This type of project typically has a two to three year payback due to the energy savings generated.

## 7.2 Other Electrical Systems

Other electrical systems include security systems, entrance systems, and exterior lighting.

### 7.2.1 Exterior Lighting

Exterior lighting provides general and security lighting for parking and sidewalk areas around the building.

The facility has outdoor lighting consisting of two WideLite fixtures mounted on the ground and under soffits, providing security and parking lot illumination. The source of lighting is metal halide and halogen, respectively, and are time-switch controlled. The halogen fixtures are in fair condition.



Photo 29: Soffit exterior lighting

The two metal halide light fixtures were refurbished two years ago and are in good condition.



Photo 30: Exterior lighting, mounted on grade

**ES4**

Overall, the exterior lighting appears to be in fair condition with no extreme signs of deterioration. We suggest regular maintenance is all that is required on an ongoing basis. No capital expenditures above the established threshold are anticipated within the study period.

## 7.3 Fire Safety

A general review of the fire code compliance for electrical-related items of the building was conducted as part of the overall life safety review.

### 7.3.1 Smoke and CO Detectors

The building code requires fire alarm systems to have smoke detectors to be connected to the systems and for the equipment to be regularly inspected and tested.

Carbon monoxide (CO) detectors were installed in the apparatus area and appear to be in good condition. When found malfunctioning, smoke or CO detectors should be repaired or replaced immediately as part of the regular operating and maintenance budgets.



Photo 31: CO detector interlocked with F3-EF-3, apparatus exhaust fan

**ES5**

Replace carbon monoxide detectors as required. No capital expenditures above the established threshold are anticipated within the study period.

### 7.3.2 Emergency Generator

Emergency generators provide power to base building and life safety systems in the event of a loss of power from the grid.

The emergency generator is an Onan Electric 5.0CCK-4R/8848R unit of estimated 5-kW capacity. The unit runs on natural gas and is located in the room adjacent to the apparatus area. It appears to be approximately 31 years old and is in fair condition.



Photo 32: Emergency generator F3-G-1, runs on natural gas

ES6

Budget for replacement of the emergency generator at 20 years of age.

### 7.3.3 Emergency Lighting

Emergency lighting equipment is installed to provide illumination in the event of a loss of power from the grid.

The lights use internal batteries and appear to be in good condition. They are tested regularly by the health & safety staff.



Photo 33: Emergency light head, battery pack type

**ES7**

Repairs to emergency lights should be made as part of the regular maintenance budget. Replace batteries every four years or sooner, also as part of the maintenance budget.

## **1 Introduction**

Morrison Hershfield Limited (MH) was retained by the City of Guelph (Guelph), to conduct an infrared (IR) survey at Fire Station #3, located at 115 Stone Road West. The purpose of the investigation was to attempt to detect thermal anomalies on the built-up roof areas of the complex, which would indicate problems with the roof system. Survey work was completed at all built-up roof areas. The IR survey was part of MH's building condition assessment (BCA) services for this building, which have been ongoing since March 2007.

Mr. Matt Vervoorn, B.E.Sc. and Mr. Caleb Teeple, B.Eng., both of MH, conducted the survey on June 6, 2007, between 10:30 pm and 11:15 pm.

## **2 Methodology**

The built-up roof areas were surveyed using a "FLIR E4" infrared camera from the rooftop. Roof thermography is a technique used to detect moisture that has migrated into or through the roof membrane and has been absorbed by the insulation. Areas of possible wet insulation are typically identified on IR roof scans by their distinct geometric shapes at areas of possible membrane failures, and are generally contained within individual insulation boards.

A roof, including all of its structural elements, can heat up to a temperature of +60°C during the course of a summer day. After sunset, the roof begins to dissipate this stored solar energy; however, areas of moisture contamination will retain the heat energy much longer than the dry portions. This differential in the rate of cooling allows areas of moisture contamination to be detected by the heat sensitive thermographic imaging equipment. However, since the roof scan was not conducted during full summer conditions, the temperature differences of the roof systems may not be optimal.

IR images (thermograms) of selected roof areas as well as visible light (regular photographs) images of the same areas have been included with this letter as an Appendix. Note that light areas in the thermograms indicate warmer areas.

The surface temperatures indicated in the scales adjacent to the IR images are not absolute, and should be used as a guide to relative surface temperature. Establishing absolute surface temperatures of the asphalt roofing would require the calibration of the IR camera and the determination of the emissivity (reflective characteristics) of the surfaces. This was beyond our scope of work, and not required for this survey of this type where differential surface temperatures are used to locate suspected deficiencies. The relative temperatures across a surface of the same material will be accurate for material surfaces with consistent surface characteristics (emissivity).

### **3 Observations and Discussion**

Outdoor conditions during the survey were as follows: temperature 9°C, clear sky, and winds were calm to light. The effects of the wind on the building were not established, however these were not expected to be significant based on the observed conditions at the time of our review.

The roof of Fire Station #3, constructed around 1976, has a gross area of approximately 6,200 sq. ft, divided over several roof areas, with the majority of the roof areas consisting of the central Garage Roof, and West Office Roof. The other roof areas consist of lower canopy roofs, as well as the elevated fire hose roof area. The garage roof area is approximately 5-ft higher than the office roof. The majority of the building's mechanical equipment is located on the West Office Roof. We understand the roof is from original construction.

During our survey of this roof area, we noted a few areas of interest. Most of the warmer areas observed from thermal imaging appeared to correspond with areas where "blueberries" were congregated. Blueberries are small beads of excess asphalt membrane bleeding to the surface, typically occurring around roof penetrations and along vertical joints during application. Photographs of a typical blueberries and the associated thermogram have been included as Figure 1, for reference. These areas are not indicative of wet insulation boards or roof leakage.

We noted three locations on the main garage roof that appeared to be possible areas of wet insulation boards. Two of these areas were near exhaust vent stack penetrations and consisted of a rectangular pattern indicative of wet insulation. Photographs and thermograms of these locations have been included as Figures 2 and 3. The regular light photographs suggest that blueberries may have influenced the observed thermal profiles in these areas.

Another possible location of wet insulation at an area where no roof penetrations or blueberries were observed. The thermal image identifies a distinct rectangular pattern indicative of wet insulation. A photograph and thermogram have been included in Figure 4.

The last area of possible leakage was noted on the lower west roof at a roof drain. This area identified a distinct rectangular profile, and no blueberries were noted corresponding to the thermal image. Figure 5 contains a regular lit photograph and thermogram of this area.

### **4 Conclusions and Recommendations**

The IR survey identified a few small areas of possible wet insulation indicative of water leakage in the built-up roof areas. The roof surface appeared to be in good condition, considering its age. We were not informed of any current or previous roof leaks at or around these locations, and hence repairs are likely not warranted at this time. Aside from the roof replacement at the end of its service life indicated in the cost summary tables, no additional repairs are warranted.



(a)



(b)

**Figure 1:** Typical photograph and thermogram identifying the effects of blueberries and the associated thermal images.



(a)

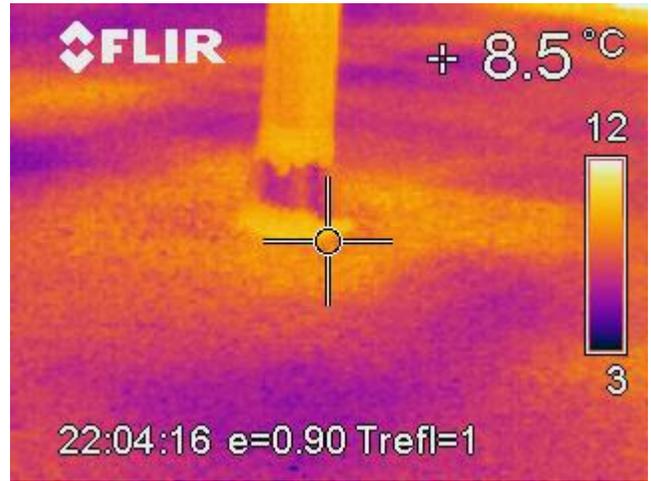


(b)

**Figure 2:** Photograph and thermogram identifying warmer areas, indicative of wet insulation at an exhaust vent penetration.



(a)

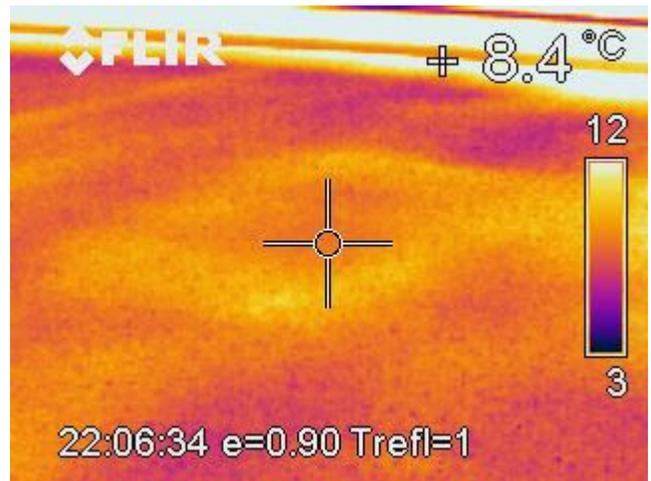


(b)

**Figure 3:** (a) shows the area around a vent pipe where the thermal profile in (b) was observed. (a) suggests that the thermal profile might be influenced by the blueberries in this area.



(a)

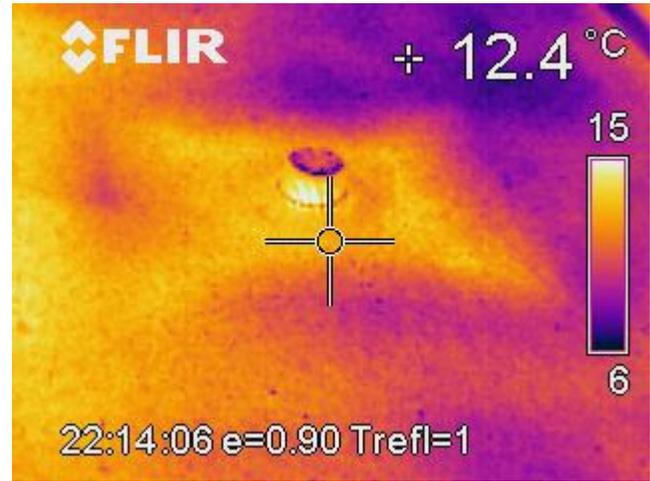


(b)

**Figure 4:** Rectangular pattern of warmer area, indicative of wet insulation noted in the centre of the garage roof.



(a)



(b)

**Figure 5:** Photograph and thermogram of the roof drain on the lower west roof, identifying a distinct rectangular profile, indicative of a wet insulation board.



**LEX Project # 01050118**

*Solutions for a Working World*

**HAZARDOUS MATERIALS ASSESSMENT  
FIRE HALL #3  
115 STONE ROAD WEST  
GUELPH, ONTARIO**

**Prepared for:** The Corporation of the City of Guelph  
59 Carden Street  
Guelph, Ontario  
N1H 3A1

**Attention:** Mr. Murray McCrae  
Manager of Corporate Property

**Date:** March 14, 2006

**Prepared by:**

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*Solutions for a Working World*



**SOLUTIONS**  
*FOR A WORKING WORLD*

**HAZARDOUS MATERIALS ASSESSMENT**  
**FIRE HALL #3**  
**115 STONE ROAD WEST**  
**GUELPH, ONTARIO**  
  
**LEX Project # 01050118**

March 14, 2006

Mr. Murray McCrae  
Manager of Corporate Property  
The Corporation of the City of Guelph  
59 Carden Street  
Guelph, Ontario  
N1H 3A1

Dear Mr. McCrae,

On December 9, 2005, LEX Scientific conducted an assessment to determine the presence of hazardous material(s) including asbestos, peeling lead-based paint, mercury, mould and PCBs in the Fire Hall #3 located at 115 Stone Road West in Guelph, Ontario.

The assessment has been completed and the results are contained in this report. All work was performed according to the Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Regulation 278/05); Designated Substances in the Workplace: A Guide to the Lead Regulation (Ontario Regulation 843) - made under the Occupational Health and Safety Act; Fungal Contamination in Public Buildings: A Guide to Recognition and Management, Health Canada; and Regulation respecting Mercury (Ontario Regulation 844/90) made under the Occupational Health and Safety Act.

On behalf of LEX Scientific, we would like to thank you for the opportunity to serve you. If you have any questions regarding this report, please call us at (519) 824-7082.

Yours sincerely,

---

Dave Wiebenga,  
Occupational Hygiene Technologist

---

Michael Hoffbauer,  
Director, Occupational Hygiene & EHS Services

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## 1.0 INTRODUCTION

LEX Scientific Inc. (LEX) conducted a survey on December 9, 2005, to assess the presence of hazardous material(s) including asbestos, peeling lead-based paint, polychlorinated biphenyls (PCBs), mercury and mould in the Fire Hall #3 located at 115 Stone Road West, in Guelph, Ontario.

The assessment has been completed and the results are contained in this report. All work was performed according to the Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations (Ontario Regulation 278/05); Designated Substances in the Workplace: A Guide to the Lead Regulation (Ontario Regulation 843) - made under the Occupational Health and Safety Act, Fungal Contamination in Public Buildings: A Guide to Recognition and Management, Health Canada, and Regulation respecting Mercury (Ontario Regulation 844/90) made under the Occupational Health and Safety Act.

The results of the hazardous materials assessment presented in this report should be used as part of the hazardous material management program for this building.

## 2.0 SURVEY METHODOLOGY

### 2.1 Buildings Surveyed

**Table 1: Information Regarding Building Inspected for Hazardous Materials**

Building Name	Building Address	Area Inspected	Inaccessible Areas
Fire Hall #3	115 Stone Road West Guelph, Ontario	Interior and Exterior of Building	- Rooftop - Fixed Ceilings

### 2.2 Method

A walk through visual inspection was performed to determine the condition of asbestos containing materials (ACM) and the presence of other hazardous materials such as lead, mould, PCB's and mercury. Materials of interest included, but were not limited to:

- Thermal System Insulation (TSI) including pipe insulation, pipefittings, boiler insulation, and duct insulation.
- Surfacing materials including spray-on fireproofing, trowled-on material and decorative coatings.
- Miscellaneous materials including vibration cloth, transite board or pipes, asbestos cement composite, ceiling tiles, and floor tiles.
- Lead paint on walls, ceilings, pipes etc.
- Mould growth on surfaces such as ceiling tiles, drywall, plaster and other building materials.
- PCB containing Light Ballasts.
- Mercury containing Electrical switches, lights and thermostats.



When an ACM was identified, its current condition was noted as good, fair, or poor. The overall potential for disturbance of the ACM was evaluated based on the friability, potential for disturbance (physical, mechanical), and potential for asbestos fibres to become airborne. Representative bulk samples were collected for suspect materials present in the building.

Materials not sampled or inspected as part of this assessment, which may contain asbestos, include: fire doors, chalk boards, countertops and desk tops and other materials as identified in Section 3.1 (if applicable). Cinderblock walls were not inspected for vermiculite due to the non-invasive nature of this inspection.

Representative paint samples were taken from surfaces with peeling paint in the areas inspected and were analyzed for lead content.

If suspect mould-contaminated building materials were observed, the location and approximate quantity was noted. Surface sampling for mould was not conducted.

An inventory of all the makes and models of light ballasts inspected was compiled. Based on Environment Canada's publication, "Identification of PCB Light Ballasts," a determination was made whether or not the ballast contained PCBs.

## **2.3 Laboratory Analysis**

Each ACM sample was analyzed as per EPA method 600/R-93/116 by LEX and was performed in compliance with the Code for the Determination of Asbestos from Bulk Samples found in the Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act, Ontario Regulation 838/90. Please refer to Appendix A for the laboratory report.

LEX is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) and by the National Institute of Standards and Technology. The National Voluntary Laboratory Accreditation Program is a United States based laboratory accreditation for analyzing bulk materials for asbestos content. Our NVLAP Lab Code number is 101949.

Lead samples were analyzed by Caduceon Environmental Laboratories. Please refer to Appendix B for the laboratory report.

Surface samples of suspected mould contaminated materials were not collected as part of this assessment.

## 2.4 Definition of Hazardous Materials and Guidelines

### 2.4.1 Asbestos Containing Material (ACM)

Ontario Regulation 278/05 Section 3 (4) defines an ACM as being a material that contains 0.5 percent or more asbestos by dry weight.

Ontario Regulation 837 limits asbestos workplace occupational exposures to 0.1 fibres/cc time weighted average exposure value (TWAEV 8-hour).

Ontario Regulation 278/05 requires that final clearance air monitoring be conducted following all Type III Asbestos Removal Operations to ensure the work enclosure is clean and is suitable for worker/tenant re-occupancy. The Type III work enclosure “passes the clearance test only if every air sample collected has a concentration of fibres that does not exceed 0.01 fibres per cubic centimetre of air<sup>1</sup>”.

### 2.4.2 Lead

Lead is used in the manufacture of storage batteries, ammunition, nuclear and X-ray shielding devices, cable coverings in the power and communication industries, lead sheet for roofing, restoration of old buildings and chemically resistant linings, noise control materials, electrical and electronic equipment, motor vehicles and other transportation equipment, and as a bearing metal. It is used in brass and bronze alloys, casting metals, glass making, ceramic glazes, plastic stabilizers and paints, in some solders, pipes, traps and bends, and other extruded products for building construction, fuel and storage tanks, and process vessels.

Acute exposure to lead by inhalation or ingestion may cause headache, fatigue, nausea, abdominal cramps, and joint pain. Other health effects such as a metallic taste in the mouth, vomiting and constipation or bloody diarrhea might also be expected to occur.

Chronic (long term) exposure to lead by inhalation or ingestion can cause reduced hemoglobin production and reduced life span and function of red blood cells and increase in blood pressure particularly in men, electrocardiograph (ECG) abnormalities and disturbances to vision. Central nervous system (CNS) or brain function and peripheral nerve function (nerves of the arms and legs) has been harmed in workers. Lead can cause peripheral neuropathy, affect the gastrointestinal tract and result in irreversible kidney damage. Lead exposure may cause harmful effects on pregnancy and reproduction, is mutagenic and possibly carcinogenic to humans.

Ontario Regulation 843 limits occupational exposure to lead to 0.05 mg/m<sup>3</sup> TWAEV for workers, but excludes construction projects. However, the Draft Guideline: Lead on Construction Projects requires an equivalent level of protection to be implemented. Adopting the exposure limit value for workers on construction projects would be prudent practice.

---

<sup>1</sup> Occupational Health and Safety Act, O.Reg 278/05 Section 18 (6) 5

The Corporation of the City of Guelph considers paint coatings as lead-containing if the total lead concentration is equal to or greater than 0.5%. For the purposes of this report, the Corporation of the City of Guelph's definition for lead-containing paint coatings will be applied.

### **2.4.3 Polychlorinated biphenyls (PCBs)**

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colourless to light yellow. Some PCBs can exist as a vapour in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they do not burn easily and are good insulators. The manufacture of PCBs was stopped in 1978 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1978 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

The disposal of PCBs and other hazardous waste is controlled by Regulation, R.R.O. 1990/347, General –Waste Management Regulation as amended by O.Reg. 558/00, made under the Environmental Protection Act.

Ontario Regulation 833 limits occupational exposures to PCB's to 0.05 mg/m<sup>3</sup> TWAEV (8 hour).

### **2.4.4 Mercury**

Mercury is prescribed as a designated substance according to Regulation, R.R.O. 1990/844. Mercury has adverse effects on the central nervous system, kidneys and reproductive system. The disposal of mercury and other hazardous waste is controlled by Regulation, R.R.O. 1990/347, General –Waste Management Regulation as amended by O.Reg. 558/00, made under the Environmental Protection Act.

Ontario Regulation 844 limits occupational exposures to mercury to 0.025 mg/m<sup>3</sup> TWAEV (8 hour).

## 2.4.5 Mould

Mould is a subset of fungi, which also includes yeasts, mildews, as well as large mushrooms and is classified as neither plant nor animal. Mould is a simple microscopic organism found in every ecological niche, indoors and outdoors. Fungal colonies may appear cottony, velvety, granular and leathery. Their colour may be white, grey, brown, black, yellow and green. Mould grows within the temperature range of 18° C and 24° C, but some can survive below 10° C while others above 50° C. Many fungi require some exposure to light to stimulate spore production.

The industry standard guides in this field are:

- Fungal Contamination in Public Buildings: Health Effects and Investigation Methods, Health Canada 2004,
- Ontario Ministry of Labour: Alert: Mould in Workplace Buildings, December 2000,
- Assessment, Remediation and Post-Remediation Verification of Mold in Buildings, AIHA Guideline 3, 2004,
- Adverse Human Health Effects Associated with Molds in the Indoor Environment: American College of Occupational and Environmental Medicine (ACOEM), October 2002,
- Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health, 2000,
- Report on Microbial Growth Task Force, AIHA May 2001, and
- Bioaerosols: Assessment and Control, ACGIH, 1999.

According to the ACOEM, mould can affect human health through three processes: allergy and other hypersensitivity reactions, infection, and toxicity. Allergic responses are most commonly experienced as allergic asthma or hay fever, and affect approximately 5% of the human population. More severe cases of allergic responses such as hypersensitivity pneumonitis is typically a result from occupational exposure to high levels of fungal proteins, while uncommon allergic syndromes require predisposing factors such as bronchial disease for fungal colonization of the patient's airways to occur.

Superficial infections of the feet, nails, dry body skin and others due to fungal growth are common and are easily treatable. In contrast, a very limited number of fungi can infect normal individuals and cause fatal illness (e.g. *Blastomyces*, *Coccidioides*, *Cryptococcus*, and *Histoplasma*). Immunocompromised subjects (e.g. patients undergoing cancer and AIDS treatment, and uncontrolled diabetics) are also susceptible to fungal infection.

The majority of human poisonings from mould are due to ingestion of mouldy foods. Cases of acute human intoxications have been reported as a result of occupational inhalation exposure to high levels of spoiled grain products containing high concentrations of fungi and bacteria. Concentrations of this magnitude are not typically found in home or office settings.

According to the NYC Department of Health, “building materials supporting fungal growth must be remediated as rapidly as possible in order to ensure a healthy environment.” To avoid mould problems indoors, the relative humidity should be kept below 50%.

Under section 25(2)(h) of the Occupational Health and Safety Act, the Ontario Ministry of Labour requires that employers “take every precaution reasonable in the circumstances for the protection of workers.” This includes protecting workers from mould in the workplace buildings.

#### **2.4.6 Silica**

Silica, or silicon dioxide ( $\text{SiO}_2$ ) is a mineral constituting about 60% of the earth’s crust. The most common form of crystalline silica is quartz, while other forms include cristobalite, tridymite, and tripoli. At very high temperatures, the crystal structure of silica is lost: converting to amorphous silica.

Silica sand and gravel are commonly used in road construction, buildings (concrete), ceramic and refractory materials. Respiratory impairment and disease among workers exposed to mineral dusts have been documented throughout history. Silicosis (or silica-induced pneumoconiosis) is the result of deposition of crystalline silica particles in the lung tissue. Early symptoms of silicosis are usually coughing and shortness of breath upon exertion. Prolonged and continued exposure to silica dust may cause progressive silicosis resulting in respiratory failure.

The Ontario occupational exposure limit for Quartz Silica is  $0.1 \text{ mg/m}^3$  TWAEV (8-hour) and  $0.05 \text{ mg/m}^3$  TWAEV (12-hour).

### **3.0 RESULTS AND DISCUSSION**

All room names/numbers mentioned in this report correspond to the floor plans of the Fire Hall #3 as created by LEX Scientific Inc. Refer to Appendix E for the floor plans.

#### **3.1 Asbestos Containing Materials**

*Please refer to Appendix D for a listing and approximate quantification of all ACM observed in Fire Hall #3.*

##### **3.1.1 Bulk Sampling Results**

Table 2 summarizes the analytical laboratory results for all homogenous materials collected inside the Fire Hall #3. Please refer to Appendix C for a listing and approximate quantification of asbestos observed in the Fire Hall #3.

**Table 2\*: Summary of Homogenous Materials Collected December 9, 2005,  
at the Fire Hall #3, Guelph, Ontario.**

Sample No.	Sample Location	Homogenous Material Description	Friable ?	Figure <sup>\$</sup>	Fibrous Asbestos Content
FH3 A01 <sup>^</sup>	Room 104, 105, 106	Floor Trim Mastic	No		Not Detected
FH3 A02	Room 105	1' x 1' VFT – Cream Coloured with Brown Smudges	No		<b>1.5% Chrysotile</b>
FH3 A02 <sup>^</sup>	Room 105	Mastic for 1' x 1' VFT	No		Not Detected
FH3 A04 <sup>^</sup>	Room 104	2' x 4' Ceiling Tile – Long Fissures and Dots	Yes		Not Detected
FH3 A05	Room 106	6" - 8" Diameter Transite Pipe	No	2	<b>40% Chrysotile 3% Amosite</b>
Sample Not Analyzed	Room 106	2' x 4' Ceiling Tile – Large and Small Dots, Densely Spaced	Yes	1	<b>Contains Amosite</b>
FH3 A07 <sup>^</sup>	Room 108	Ceiling Texture Coat	Yes		Not Detected
FH3 A08 <sup>^</sup>	Room 106	Drywall Joint Filler Compound	Yes		Not Detected
FH3 A09 <sup>^</sup>	Room 110	6" - 8" Rainwater Leader Pipe Fittings	Yes		Not Detected
FH3 A10	Room 112	2" - 6" TSI Parged Pipe Fitting	Yes	3	<b>20% Chrysotile</b>
FH3 A11	Room 111	2" - 4" TSI Parged Pipe Fitting on Breaching Line	Yes		<b>20% Chrysotile</b>
FH3 A12 <sup>^</sup>	Room 111	TSI Pipe Insulation – Breaching Line	Yes		Not Detected

\*Refer to Appendix A for the Analytical Laboratory Report

Definition of Terms: **VFT** – Vinyl Floor Tile

% Sample was analyzed one time as per O.Reg. 278/05

<sup>^</sup> Sample was analyzed three times as per O.Reg. 278/05.<sup>\$</sup> Refer to Appendix D for Photographs**TSI** – Thermal System Insulation

# Sample was analyzed five times as per O.Reg. 278/05.

+ Sample was analyzed seven times as per O.Reg. 278/05.

The roofing material for this building was not sampled due to the non-invasive nature of the assessment. Until the roofing material/membrane can be sampled and analyzed, it is assumed to contain asbestos.

### 3.1.2 Quantity of Asbestos Containing Materials

**Appendix C contains a listing and quantification of all ACM observed in Fire Hall #3.**

Appendix D contains the photographs of locations referred to in Table 2 as well as in Appendix C (if applicable). Appendix E identifies the locations of friable and non-friable asbestos containing materials on the floor plans of Fire Hall #3 - as supplied by LEX Scientific Inc.

LEX has been notified that since the date of inspection, one fitting in poor condition in Room 111 of this building has been removed by an asbestos abatement contractor. While this removal has not been confirmed by LEX, this item has been excluded from Appendix C.



## Key Observations:

- **Parged Pipe Fittings** – Asbestos containing and non-asbestos containing parged pipe fittings on the hot/cold water piping and rainwater leaders were observed. If both types of fittings were observed in the same room, all fittings have been identified as asbestos containing. In Rooms 110, 115 and 116, all fittings observed were not asbestos containing. As per Appendix E, Room 110 has been identified as containing non-friable asbestos only (transite rainwater leader piping).
- **2' x 4' Ceiling Tile** – One ceiling tile known to contain amosite asbestos was observed in Room 106 (a ventilation grill is attached to this ceiling tile). The tile contains a large and small dotted pattern.

## 3.2 Lead Containing Materials

### 3.2.1 Lead Based Paint

Table 3 summarizes the results of the lead sampling conducted at Fire Hall #3. The lead concentrations are expressed in micrograms lead per gram of paint ( $\mu\text{g/g}$ ) as well as in percent lead.

**Table 3\*: Summary of Laboratory Results for the Paint Samples collected December 9, 2005, at Fire Hall #3 in Guelph, Ontario.**

Sample ID	Location	Surface Sampled	Lead ( $\mu\text{g/g}$ )	% Lead
FH3 L01	Room 116	Red Paint on Block Wall	12700	1.27
FH3 L02	Room 110	Blue Pain on Block Wall	25	0.0025

\*Refer to Appendix B for the Analytical Laboratory Report

Based on the results summarized in Table 3 above, some of Fire Hall #3 paint coatings are lead containing (as per the Corporation of the City of Guelph's definition of lead paint - 0.5% or more of lead in paint). All similar paint coatings to that present in Room 116 should be treated as lead-containing.

### 3.2.2 Other Lead-Containing Materials

**Lead Solder** – plumbing contains lead solder between joints and valves.

### 3.3 PCB Containing Fluorescent Light Ballasts

Table 3 contains a summary of the types of fluorescent light ballasts found in the Fire Hall #3. Table 4 is considered representative of the types of light ballasts inside the building as approximately 40% of the light ballasts were inspected.

Please note that most light ballasts have a stamping on the back of the housing, and therefore could not be checked during the site inspection. Stamping should be checked upon removal of the ballast to determine if PCBs are present.

**Table 3: Summary of Fluorescent Light Ballasts Observed  
in the Fire Hall #3 located in Guelph, Ontario**

Manufacturer	Catalogue #	Stamping	PCBs?	Location of Ballast*	Comments
<b>Canadian General Electric</b> (CGE: Includes Val-Miser)	17A128T	On Back of Housing	<b>Possible</b>	Room 108	All Ballasts with a Catalogue Number ending with "A" or "N" contains PCBs; "T" may contain PCBs; while "E" does not contain PCBs (E≡Environmental)  Ballasts with "T" that were made prior to 1979 are PCB Containing (Stamping: 7505 ≡ May 1975)
<b>Phillips</b>	R140-TCP	On Back of Housing	No (Labelled "No PCBs")	Room 107	All Ballasts prior to 1980 Contain PCBs unless Stated "No PCBs" on Label (Stamping: 575 ≡ May 1975)

\*Information partially based on Environment Canada's Publication: "Identification of Lamp Ballasts containing PCBs."

\*Note: this is not a comprehensive list of all ballasts in the building. This table is a representation of the types of ballasts found during the inspection. All ballasts and their corresponding stamping should be examined and compared to Table 5 to determine if PCBs are present.

### 3.4 Mercury Containing Materials

All fluorescent light tubes are assumed to contain Mercury Vapour. Fluorescent lights were observed in various areas of the Fire Hall #3. Mercury containing vapours were not observed in this building.

### **3.5 Mould**

Mould contaminated buildings materials were not observed during the December 9, 2005 site visit.

### **3.6 Silica**

Concrete and/or cinderblock used for the footings and exterior walls inside the building contain silica, a designated substance.

### **3.7 Other Hazardous Materials**

The following designated substances were not observed inside the Fire Hall #3 during the inspection: Acrylonitrile, Arsenic, Benzene, Coke Oven Emissions, Ethylene Oxide, Isocyanates, and Vinyl Chloride.

## **4.0 CONCLUSIONS**

1. Fire Hall #3 contains friable ACM in poor to good condition, which may be damaged in the future by external disturbances (water, wind, vibration, and physical) causing the release of airborne asbestos fibre.
2. Fire Hall #3 contains non-friable ACM in good condition, which may be damaged in the future by external disturbances (water, wind, vibration, and physical). The potential for airborne asbestos fibre release due to this material is low.
3. Fire Hall #3 may contain asbestos within inaccessible areas and/or in the roofing membrane.
4. Fire Hall #3 contains lead-based paint coatings.
5. Fire Hall #3 contains plumbing, which is assumed to contain lead solder between joints and valves.
6. Fire Hall #3 may contain PCB light ballasts.
7. Fire Hall #3 does not contain mould contaminated building materials (at the time of the building inspection).
8. Fire Hall #3 contains fluorescent tube lights in which mercury vapour is present.
9. Fire Hall #3 contains silica as a constituent of concrete and cinderblock.

## 5.0 RECOMMENDATIONS

1. It is recommended that all friable ACM in poor condition be repaired or removed. The repair/removal should occur as soon as possible to ensure that the facility maintenance workers and subcontractors are not exposed to airborne asbestos fibre (as per O.Reg. 837 4(1)).
2. It is recommended that an asbestos re-assessment be conducted in the building at least once in each 12-month period as per O. Reg. 278/05 Section 7 (5) (a)).
3. It is recommended that all ACM (regardless of the condition) that may potentially be disturbed by future renovation/demolition activities be removed (as per O.Reg. 278/05 6(1)).
4. It is recommended that prior to demolition or renovation activities, invasive sampling be conducted for asbestos on building materials not collected during this non-invasive asbestos inspection (e.g. roofing membrane(s), materials inside inaccessible wall/ceiling spaces etc.).
5. It is recommended that if ACM is still present following renovations, an asbestos re-assessment of the building be conducted to determine the presence and condition of all remaining ACM.
6. It is recommended that all PCB ballasts be disposed of as per provincial/federal requirements when no longer functional. Ballasts that cannot be identified as either PCB-Containing or Non-PCB should be disposed of as PCB-Containing Ballast. *ALL* ballasts and their date stamps should be examined and compared with the manufacturer and stamping identified in Table 5 to determine if PCBs are present.
7. It is recommended that when disposing of fluorescent light tubes, they be packaged in rigid containers with packing material to prevent accidental breakage and worker exposure or an environmental release of mercury.
8. It is recommended that the results of the hazardous materials assessment presented in this report be used as part of the hazardous material management program for this building.
9. It is recommended that a copy of this report be provided to the Joint Health and Safety Committee or to the Health and Safety Representative for this building.

## 6.0 DISCLAIMER

This report is prepared exclusively for the purposes, project and site location outlined in the report. The report is based on information provided to, or collected and/or obtained by LEX as indicated in the report, and applies solely to site conditions existing at the time of sampling. LEX's report represents a reasonable analysis and interpretation of available information within an agreed scope of work, schedule and budget.

LEX prepared this report for the sole benefit of the Corporation of the City of Guelph; it reflects LEX's best judgement in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. LEX accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

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LEX Scientific Inc. can be of assistance in providing air monitoring and inspection services during the course of an abatement project. On behalf of LEX Scientific, we would like to thank you for the opportunity to serve you. If you have any questions regarding this report, please call us at (519) 824-7082.

Sincerely,

---

David Wiebenga,  
Occupational Hygiene Technologist

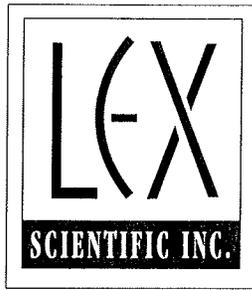
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Michael Hoffbauer,  
Director, Occupational Hygiene & EHS Services



## APPENDICES

## **APPENDIX A: Laboratory Report - Asbestos in Bulk Samples**



Solutions for a Working World

Client: LEX Scientific Inc.

Contact: Mr. Dave Wiebenga

Client Address: 2 Quebec Street, Suite 204, Guelph, ON

Wednesday, January 04, 2006

Project Number: 09051837

Sampling Date: 12/09/2005

Client Reference: 01050118

Total Number of Samples: 25

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

Michael Hoffbauer, B.Sc. Director

Client: LEX Scientific Inc.

Page: 1 of 7

Project Number: 09051837

Table with 4 columns: LEX Sample #, Sample #, Sample Colour, Analyst, Sample Condition, Comments, Fibrous Asbestos Content%, and Other Materials Content %.

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
This test report relates only to the items tested
PLM - method detection limit is 0.1%

Analyst [Signature]

This test report must not be used to claim product endorsement by NVLAP or any agency of the United States government. This test report must not be reproduced except in full without the written consent of the laboratory.

2 Quebec Street, Suite 204 Guelph, Ontario N1H 2T3
Phone: 519.824.7082 Fax: 519.824.5784 Toll Free: 1.800.824.7082
e-mail: admin@lexscientific.com Website: www.lexscientific.com

Project Number: 09051837

		Fibrous Asbestos Content%	Other Materials Content %
LEX Sample #:	01B	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FH3 A01-B	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Yellow	Crocidolite: None Detected	Rockwool: None Detected
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: 5%
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Mastic Floor Trim		Non-Fibrous: 95%
LEX Sample #:	01C	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FH3 A01-C	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Yellow	Crocidolite: None Detected	Rockwool: None Detected
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: 3%
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Mastic Floor Trim		Non-Fibrous: 97%
LEX Sample #:	02.1A	Chrysotile: 1.5%	Fibreglass: None Detected
Sample #:	FH3 A02-A	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Beige	Crocidolite: None Detected	Rockwool: None Detected
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	1x1 VFT with Mastic (cream with brown smudge); VFT layer; Analysis of ash residue only		Non-Fibrous: 98.5%
LEX Sample #:	02.2A	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FH3 A02-A	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Black	Crocidolite: None Detected	Rockwool: None Detected
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	1x1 VFT with Mastic (cream with brown smudge); Mastic		Non-Fibrous: 100%

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified  
 This test report relates only to the items tested  
 PLM - method detection limit is 0.1%

Analyst 

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Project Number: 09051837

		Fibrous Asbestos Content%	Other Materials Content %
LEX Sample #:	02.2B	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
Sample #:	FH3 A02-B	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
Sample Colour:	Black	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
Analyst:	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
Sample Condition	Sealed Bag		<b>Other:</b> None Detected
Comments:	1x1 VFT with Mastic (cream with brown smudge); Mastic		<b>Non-Fibrous:</b> 100%
LEX Sample #:	02.2C	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
Sample #:	FH3 A02-C	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
Sample Colour:	Black	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
Analyst:	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> 5%
Sample Condition	Sealed Bag		<b>Other:</b> None Detected
Comments:	1x1 VFT with Mastic (cream with brown smudge); Mastic		<b>Non-Fibrous:</b> 95%
LEX Sample #:	03A	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
Sample #:	FH3 A04-A	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
Sample Colour:	Grey/White	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> 10%
Analyst:	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> 60%
Sample Condition	Sealed Bag		<b>Other:</b> None Detected
Comments:	Ceiling Tile (long fissures and dots)		<b>Non-Fibrous:</b> 30%
LEX Sample #:	03B	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
Sample #:	FH3 A04-B	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
Sample Colour:	Grey/White	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> 10%
Analyst:	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> 60%
Sample Condition	Sealed Bag		<b>Other:</b> None Detected
Comments:	Ceiling Tile (long fissures and dots)		<b>Non-Fibrous:</b> 30%

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified  
 This test report relates only to the items tested  
 PLM - method detection limit is 0.1%

Analyst 

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Project Number: 09051837

		Fibrous Asbestos Content%	Other Materials Content %
LEX Sample #:	03C	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FHR A04-C	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	White/Grey	Crocidolite: None Detected	Rockwool: 10%
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: 50%
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Ceiling Tile (Long fissures and dots)		Non-Fibrous: 40%
LEX Sample #:	04A	Chrysotile: 40%	Fibreglass: None Detected
Sample #:	FH3 A05-A	Amosite: 3%	Glasswool: None Detected
Sample Colour:	Grey	Crocidolite: None Detected	Rockwool: None Detected
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Transite Pipe above Ceiling Tile 6-8" Diameter		Non-Fibrous: 57%
LEX Sample #:	05A	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FH3 A07-A	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Grey/Cream	Crocidolite: None Detected	Rockwool: None Detected
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Ceiling Texture Coat		Non-Fibrous: 100%
LEX Sample #:	05B	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FH3 A07-B	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Grey/Cream	Crocidolite: None Detected	Rockwool: None Detected
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Ceiling Texture Coat		Non-Fibrous: 100%

Other Amphiboles: ac=actinolite, a=anthophyllite, t=tremolite, u=unidentified  
 This test report relates only to the items tested  
 PLM - method detection limit is 0.1%

Analyst



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Project Number: 09051837

		Fibrous Asbestos Content%	Other Materials Content %
LEX Sample #:	05C	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
Sample #:	FH3 A07-C	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
Sample Colour:	Grey/Cream	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
Analyst:	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
Sample Condition	Sealed Bag		<b>Other:</b> None Detected
Comments:	Ceiling Texture Coat		<b>Non-Fibrous:</b> 100%
LEX Sample #:	06A	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
Sample #:	FH3 A08-A	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
Sample Colour:	Cream	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
Analyst:	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
Sample Condition	Sealed Bag		<b>Other:</b> None Detected
Comments:	Drywall Joint Compound		<b>Non-Fibrous:</b> 100%
LEX Sample #:	06B	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
Sample #:	FH3 A08-B	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
Sample Colour:	Cream	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
Analyst:	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
Sample Condition	Sealed Bag		<b>Other:</b> None Detected
Comments:	Drywall Joint Compound		<b>Non-Fibrous:</b> 100%
LEX Sample #:	06C	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
Sample #:	FH3 A08-C	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
Sample Colour:	Cream	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
Analyst:	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
Sample Condition	Sealed Bag		<b>Other:</b> None Detected
Comments:	Drywall Joint Compound		<b>Non-Fibrous:</b> 100%

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified  
 This test report relates only to the items tested  
 PLM - method detection limit is 0.1%

Analyst



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Project Number: 09051837

		Fibrous Asbestos Content%	Other Materials Content %
LEX Sample #:	07A	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FH3 A09-A	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Grey	Crocidolite: None Detected	Rockwool: 30%
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Rainwater Leader 6-8" Fittings (Room 110)		Non-Fibrous: 70%
LEX Sample #:	07B	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FH3 A09-B	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Grey	Crocidolite: None Detected	Rockwool: 40%
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Rainwater Leader 6-8" Fittings (Room 110)		Non-Fibrous: 60%
LEX Sample #:	07C	Chrysotile: None Detected	Fibreglass: None Detected
Sample #:	FH3 A09-C	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Grey	Crocidolite: None Detected	Rockwool: 30%
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	Rainwater Leader 6-8" Fittings (Room 110)		Non-Fibrous: 70%
LEX Sample #:	08A	Chrysotile: 20%	Fibreglass: None Detected
Sample #:	FH3 A10-A	Amosite: None Detected	Glasswool: None Detected
Sample Colour:	Cream/Grey	Crocidolite: None Detected	Rockwool: None Detected
Analyst:	GL	Other Amphiboles: None Detected	Cellulose: None Detected
Sample Condition	Sealed Bag		Other: None Detected
Comments:	TSI Pipe Fitting 2-6"		Non-Fibrous: 80%

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified  
 This test report relates only to the items tested  
 PLM - method detection limit is 0.1%

Analyst 

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Project Number: 09051837

		Fibrous Asbestos Content%	Other Materials Content %
<b>LEX Sample #:</b>	09A	<b>Chrysotile:</b> 20%	<b>Fibreglass:</b> None Detected
<b>Sample #:</b>	FH3 A11-A	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
<b>Sample Colour:</b>	Cream/Grey	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
<b>Analyst:</b>	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
<b>Sample Condition</b>	Sealed Bag		<b>Other:</b> None Detected
<b>Comments:</b>	TSI Pipe Fitting 2-4" - Breaching Line		<b>Non-Fibrous:</b> 80%
<b>LEX Sample #:</b>	10A	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
<b>Sample #:</b>	FH3 A12-A	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
<b>Sample Colour:</b>	White	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
<b>Analyst:</b>	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
<b>Sample Condition</b>	Sealed Bag		<b>Other:</b> None Detected
<b>Comments:</b>	TSI Pipe Insulation - Breaching Line		<b>Non-Fibrous:</b> 100%
<b>LEX Sample #:</b>	10B	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
<b>Sample #:</b>	FH3 A12-B	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
<b>Sample Colour:</b>	White	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
<b>Analyst:</b>	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
<b>Sample Condition</b>	Sealed Bag		<b>Other:</b> None Detected
<b>Comments:</b>	TSI Pipe Insulation - Breaching Line		<b>Non-Fibrous:</b> 100%
<b>LEX Sample #:</b>	10C	<b>Chrysotile:</b> None Detected	<b>Fibreglass:</b> None Detected
<b>Sample #:</b>	FH3 A12-C	<b>Amosite:</b> None Detected	<b>Glasswool:</b> None Detected
<b>Sample Colour:</b>	White	<b>Crocidolite:</b> None Detected	<b>Rockwool:</b> None Detected
<b>Analyst:</b>	GL	<b>Other Amphiboles:</b> None Detected	<b>Cellulose:</b> None Detected
<b>Sample Condition</b>	Sealed Bag		<b>Other:</b> None Detected
<b>Comments:</b>	TSI Pipe Insulation - Breaching Line		<b>Non-Fibrous:</b> 100%

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified  
 This test report relates only to the items tested  
 PLM - method detection limit is 0.1%

Analyst



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## **APPENDIX B: Laboratory Report - Lead in Paint Chip Samples**

C.O.C.: ---

REPORT No. B06-4060

**Report To:**

**LEX Scientific Inc.**  
2 Quebec St. Suite 204  
Guelph ON N1H 2T3

**Attention:** Dave Wiebenga

**Caduceon Environmental Laboratories**

2378 Holly Lane  
Ottawa Ontario K1V 7P1  
Tel: (613) 526-0123  
Fax (613) 526-1244

DATE RECEIVED: 13-Feb-06

JOB/PROJECT NO.:

DATE REPORTED: 15-Feb-06

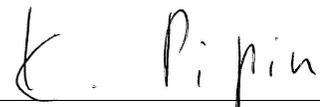
P.O. NUMBER: C201950

SAMPLE MATRIX: Paint Chips

WATERWORKS NO.

<b>Parameter:</b>	Lead				
<b>Units:</b>	µg/g				
<b>M.D.L.:</b>	5				
<b>Reference Method:</b>	EPA 6010				
<b>Date Analyzed:</b>	15-Feb-06				

<b>Client I.D.</b>	<b>Sample I.D.</b>	<b>Date Collected</b>				
FH3 L01	B06-4060-1		12700			
FH3 L02	B06-4060-2		25			



Krystyna Pipin, M. Sc.  
Lab Supervisor

M.D.L. = Method Detection Limit

Accredited by the Standards Council of Canada and CAEAL for specific tests.

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior written consent from Caduceon Environmental Laboratories.

**APPENDIX C: Asbestos Quantification and Management/Abatement Option  
Summary**

**APPENDIX C: Fire Hall #3 – 115 Stone Road West, Guelph, Ontario: ACM Quantification and Management/Abatement Option Summary**

ASSESS NO.	LOCATION	ASBESTOS CONTAINING MATERIAL TYPE	FRIABLE ?	APPROX. QUANTITY	MATERIAL CONDITION	ACCESSIBILITY / DISTURBANCE POTENTIAL <sup>#</sup>	PRIORITY SCORE**	MANAGEMENT / ABATEMENT OPTIONS
1	Room 101	1' x 1' VFT – Cream Coloured with Brown Smudges	No	120 ft <sup>2</sup>	Good	3	4	Manage
2	Room 104	1' x 1' VFT – Cream Coloured with Brown Smudges	No	150 ft <sup>2</sup>	Fair	3	4	Manage
3	Room 105	1' x 1' VFT – Cream Coloured with Brown Smudges	No	240 ft <sup>2</sup>	Fair	3	4	Manage
4	Room 106	1' x 1' VFT – Cream Coloured with Brown Smudges	No	400 ft <sup>2</sup>	Fair	3	4	Manage
5		6" – 8" Transite Rainwater Leader Piping above 2' x 4' Ceiling Tile	No	16 ft	Good	3	4	Manage
6		6" – 8" Transite Rainwater Leader inside Block Wall	No	9 ft	Good	3	4	Manage
7		2' x 4' Ceiling Tile (Large and Small Dots, Densely Spaced)	Yes	8 ft <sup>2</sup>	Good	2	4	Manage
8	Room 110	6" – 8" Transite Rainwater Leader Piping on West Side	No	15 ft	Good	3	4	Manage
9		6" – 8" Transite Rainwater Leader Piping on East Side	No	15 ft	Good	3	4	Manage
10	Room 111	2" – 4" TSI Pipe Fittings on Breaching Line for generator	Yes	3	Good	2	4	Manage

\*Asbestos Containing Material Types  
 TSI - Thermal System Insulation      VFT – Vinyl Floor Tile  
 VFS – Vinyl Floor Sheeting            LFBP – Light Fixture Backing Plate

#Accessibility / Disturbance Potential  
 1 – General Public and/or Office Worker  
 2 – Building Maintenance/Custodial Staff  
 3 - Building Renovation/Demolition

\*\* Priority Score Code:  
 1 - High Priority                              3 - Low Priority  
 2 - Moderate Priority                      4 - O&M measures to prevent damage

**APPENDIX C: Fire Hall #3 – 115 Stone Road West, Guelph, Ontario: ACM Quantification and Management/Abatement Option Summary**

ASSESS NO.	LOCATION	ASBESTOS CONTAINING MATERIAL TYPE	FRIABLE ?	APPROX. QUANTITY	MATERIAL CONDITION	ACCESSIBILITY / DISTURBANCE POTENTIAL <sup>#</sup>	PRIORITY SCORE**	MANAGEMENT / ABATEMENT OPTIONS
11	Room 112	2” – 6” TSI Pipe Fittings	Yes	10	Good	2	4	Manage
12		6” – 8” Rainwater Leader Pipe Fittings	Yes	1	Poor	2	2	Repair/Remove
13		6” – 8” Rainwater Leader Pipe Fittings	Yes	4	Good	2	4	Manage
14		6” – 8” Transite Rainwater Leader Piping	No	10 ft	Good	3	4	Manage
15	Room 117	1” – 2” TSI Pipe Fittings above water tank	Yes	8	Fair	3	4	Manage
16	Exterior	Transite Paneling on Soffits	No	650 ft <sup>2</sup>	Good	3	4	Manage

\*Asbestos Containing Material Types

TSI - Thermal System Insulation      VFT – Vinyl Floor Tile  
 VFS – Vinyl Floor Sheeting          LFBP – Light Fixture Backing Plate

#Accessibility / Disturbance Potential

1 – General Public and/or Office Worker  
 2 – Building Maintenance/Custodial Staff  
 3 - Building Renovation/Demolition

\*\* Priority Score Code:

1 - High Priority                      3 - Low Priority  
 2 - Moderate Priority              4 - O&M measures to prevent damage

## **APPENDIX D: Photographs**

Figure 1: Firehall #3, Guelph, Ontario

Room 106 - Asbestos Containing 2' x 4' Ceiling Tile - only one tile of this type of ceiling tile was observed in this building.

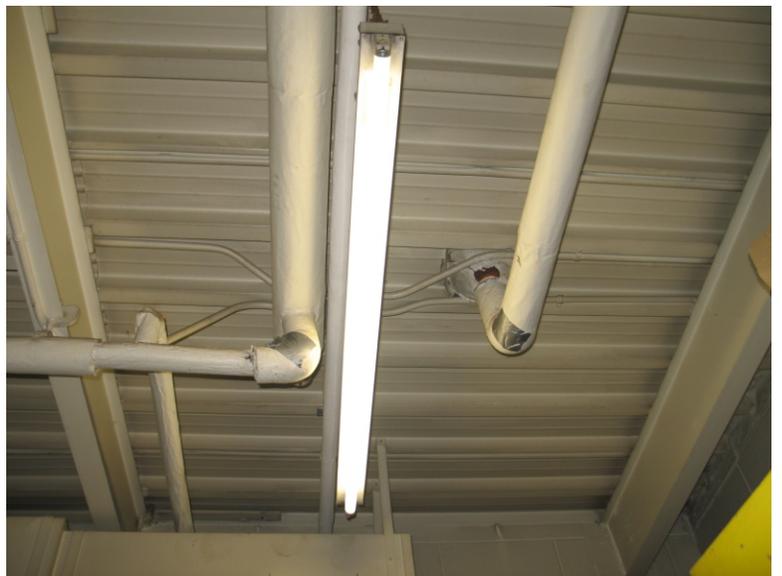


Figure 2: Fire Hall #3, Guelph, Ontario

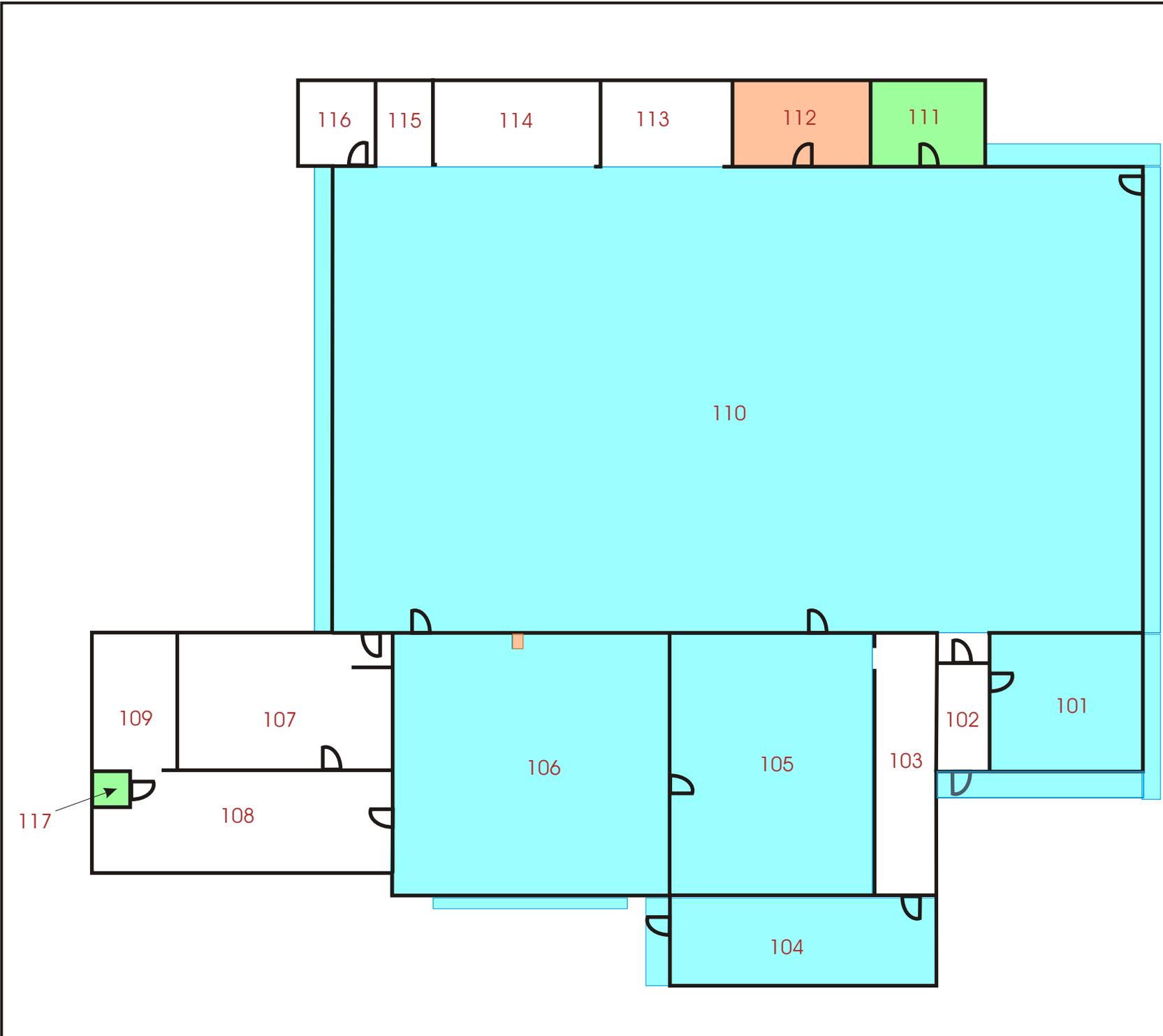
Transite Rainwater Leader Piping in Garage. The Fittings for the piping in this room do not contain asbestos.

Figure 3: Firehall #3, Guelph, Ontario

All Fittings in Room 112 contain asbestos



## **APPENDIX E: Locations of Friable and Non-Friable ACM**



2 Quebec Street Suite 204  
Guelph, Ontario, N1H 2T3

ph: (519) 824-7082  
fx: (519) 824-5784

www.lexscientific.com

Appendix E:  
Locations of Friable  
and Non-Friable ACM

Fire Hall #3  
115 Stone Road West  
Guelph, Ontario

MAIN FLOOR

Legend

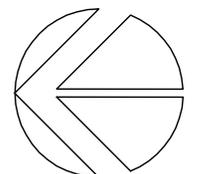
- Friable ACM Present
- Non-Friable ACM Present
- Friable and Non-Friable ACM Present

Not to Scale

Floor Plans Provided by

LEX Scientific Inc.

February 2006



## **Appendix F: Field Survey Update Forms**

APPENDIX F  
FIELD SURVEY UPDATE FORMS

FIELD SURVEY UPDATE FORM  
REASSESSMNT OF ASBESTOS-CONTAINING MATERIALS

Location of asbestos-containing material(s) (address, building, room(s), or general description):

FIRE HALL #3  
115 STONE ROAD WEST  
GUELPH, ONTARIO  
ROOM 112

Type of asbestos-containing material(s):

- ① Sprayed- or trowelled-on ceilings or walls.
- ② Sprayed- or trowelled-on structural members.
- ③ Insulation on pipes, tanks, or boilers.
- ④ Other (describe): \_\_\_\_\_

Abatement Status:

- 1. The material has been encapsulated \_\_\_\_\_ enclosed \_\_\_\_\_, neither X

Assessment:

- 1. Evidence of physical damage: YES
- 2. Evidence of water damage: YES
- 3. Evidence of delamination or other deterioration: YES
- 4. Degree of accessibility of the material: MODERATE
- 5. Degree of activity near the material: MODERATE
- 6. Location in an air plenum, air shaft, or air stream: NO
- 7. Other observations (including the condition of the encapsulant or enclosure, if any): DAMAGED  
ACMS REMOVE. ROOM 112 RAINWATER LEAD, ELBOW, AND OTHER  
PIPE FITTINGS NEED TO BE REMOVED.

Signed: [Signature] Evaluator Date: July 20, 2010

APPENDIX F  
FIELD SURVEY UPDATE FORMS

FIELD SURVEY UPDATE FORM  
REASSESSMENT OF ASBESTOS-CONTAINING MATERIALS

Location of asbestos-containing material(s) (address, building, room(s), or general description):

FIRE HALL #3  
115 STONE ROAD WEST  
GUELPH, ONTARIO  
ROOM 110, 111, 117, EXTERIOR

Type of asbestos-containing material(s):

- 1. Sprayed- or trowelled-on ceilings or walls.
- 2. Sprayed- or trowelled-on structural members.
- 3. Insulation on pipes, tanks, or boilers.
- 4. Other (describe): TRANSITE PIPE, TRANSITE PANELING

Abatement Status:

- 1. The material has been encapsulated \_\_\_\_\_ enclosed \_\_\_\_\_, neither X

Assessment:

- 1. Evidence of physical damage: NO
- 2. Evidence of water damage: NO
- 3. Evidence of delamination or other deterioration: NO
- 4. Degree of accessibility of the material: MODERATE TO LOW
- 5. Degree of activity near the material: MODERATE TO LOW
- 6. Location in an air plenum, air shaft, or air stream: NO
- 7. Other observations (including the condition of the encapsulant or enclosure, if any): GOOD  
CONDITION - CONTINUE MANAGEMENT

Signed: [Signature] Date: July 20, 2010  
Evaluator

APPENDIX F  
FIELD SURVEY UPDATE FORMS

FIELD SURVEY UPDATE FORM  
REASSESSMNT OF ASBESTOS-CONTAINING MATERIALS

Location of asbestos-containing material(s) (address, building, room(s), or general description):

FIRE HALL #3  
115 STONE ROAD WEST  
GUELPH, ONTARIO  
ROOM 101, 104, 105  
ROOM 106 VET & CEILING TILE ONLY REMOVED

Type of asbestos-containing material(s):

1. Sprayed- or trowelled-on ceilings or walls.
2. Sprayed- or trowelled-on structural members.
3. Insulation on pipes, tanks, or boilers.
4. Other (describe): \_\_\_\_\_

Abatement Status:

1. The material has been encapsulated \_\_\_\_\_ enclosed \_\_\_\_\_, neither X ACM HAS

Assessment:

BEEN REMOVED

1. Evidence of physical damage: \_\_\_\_\_
2. Evidence of water damage: \_\_\_\_\_
3. Evidence of delamination or other deterioration: \_\_\_\_\_
4. Degree of accessibility of the material: \_\_\_\_\_
5. Degree of activity near the material: \_\_\_\_\_
6. Location in an air plenum, air shaft, or air stream: \_\_\_\_\_
7. Other observations (including the condition of the encapsulant or enclosure, if any): \_\_\_\_\_

Signed: [Signature] Date: July 20, 2010  
Evaluator