CITY OF STRATFORD
BUILDING AND PLANNING DEPARTMENT

GUIDELINES FOR RESIDENTIAL ADDITION PERMIT ISSUANCE

1 Small Residential and Change of Use Permit Process Guidelines

5/25/2006 2:24 PM

Scope of Permit Process Guidelines	**Note:** The following information is provided as a guideline to understanding the building permit approval process. **It is not intended to be a complete list of the requirements for securing a building permit. Please see further information that is specific to a permit type process.** Please be advised that requirements are subject to change without notice.
Site Plan / Subdivision Agreements	To establish if there are additional conditions affecting your project we recommend that you contact the developer and obtain the applicable agreement(s) for review. Conditions that may apply could include: • Cash in lieu/parkland dedication • Requirement for noise study report • Occupancy restrictions • Lot grading information • Approval of subdivision services • Access for fire department vehicles • Tree preservation report
General Building Permit Process Information	• The building permit process is administered and coordinated by the Building Division with the assistance of other departments. • We can provide guidance and direction on the requirements for permits, information to be submitted with applications, and advise on the need for approvals and clearances from other Provincial and Municipal departments and agencies. • The building division in some cases will also do pre-permit issuance field reviews to determine permit issuance requirements. • The Building Division uses a one-permit system. The permit includes all work involved i.e. architectural/structural work, plumbing and heating, plumbing site services, ventilating and air-conditioning work. • The Building Division can also utilize a multi-permit system i.e. separate permits can be issued for foundation and site works, shell structure and interior finishing. The multi-permit service is more costly than the single permit system. • Change of use permits are required when an existing buildings use is proposed to be changed to a different use even when no construction is proposed (i.e. office use to a retail use or a single family residence to a B & B operation) a pre-permit issuance field review is undertaken. If compensating construction is required a building permit issuance process will be undertaken. If compensating construction is not required then applicable laws and zoning by-laws are reviewed for compliance. • Site Plan process and building permit application process can run concurrently. • Target turnaround times: ***Small residential building permit*: upon submission of a complete permit application as determined by City of Stratford Building Division and contingent upon no further information being required by the City of Stratford Building Division** 5 business days ***All other building permits*: upon submission of a complete permit application as determined by City of Stratford Building Division and contingent upon no further information being required by the City of Stratford Building Division** 10 business days Note: City of Stratford Building Division will determine which of the above

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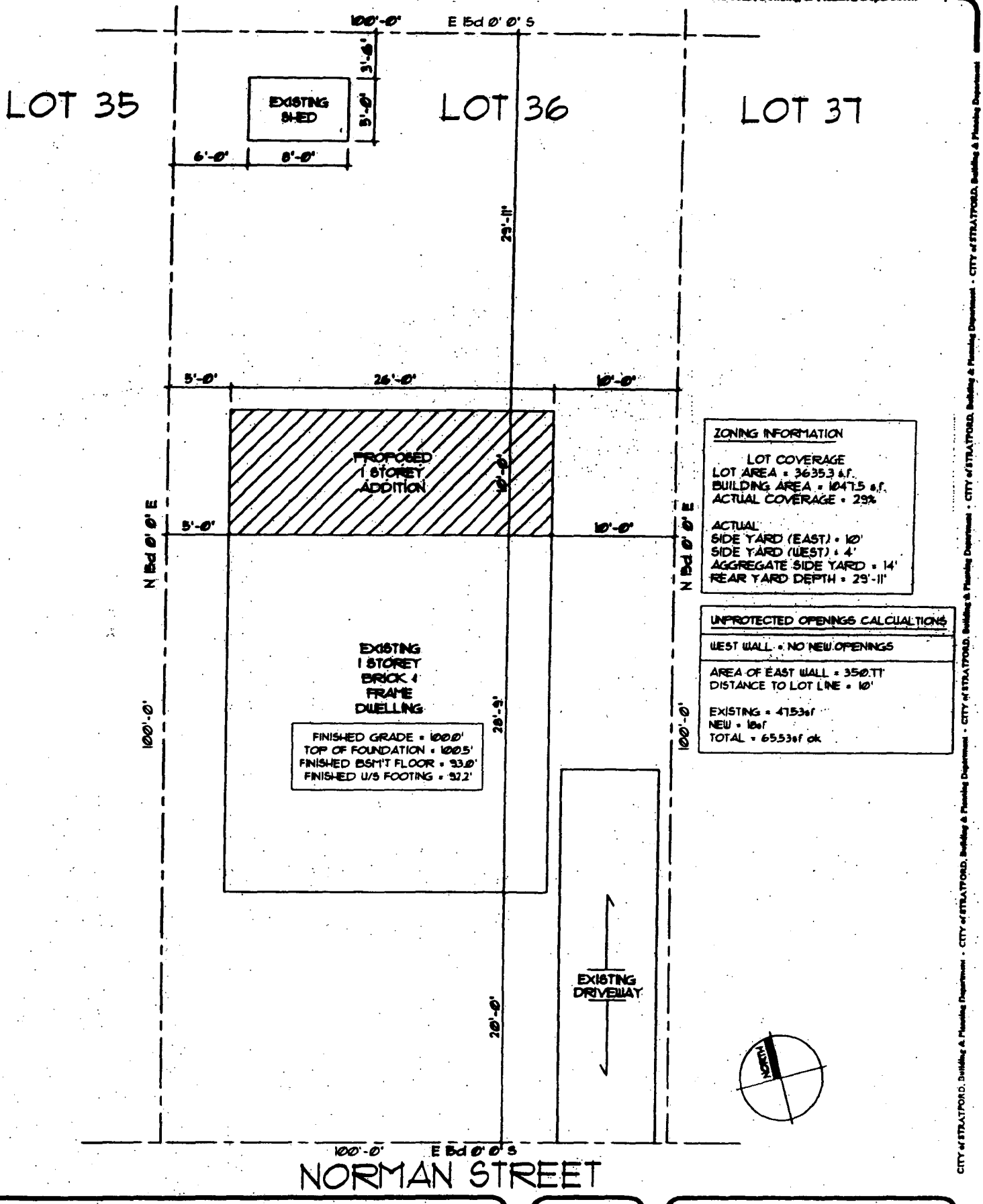
Application for Permit	A permit application typically requires the following submission: • Completed application form • 2 sets of construction drawings(specifications also for more complex projects) • Residential Mechanical Ventilation Design Summary • 2 site plan drawings (includes grading and servicing information) • Applicable commitment forms/confirmation letters • Applicable permit fees
Zoning Plans Examination	• Drawings and required information is reviewed to verify conformance to the Zoning By-law i.e. setbacks, lot coverage and driveway requirements (further information could be required to make these determinations).
External Authorities Approvals	• Approval may be required from the Upper Thames River Conservation Authority (UTRCA) if the property is located in a flood plain or in a designated flood control area. A copy of the approval documents must be submitted to the Building Division prior to the issuance of the permit. • Applicable laws may require other approvals
Ontario Building Code / Grading Plans Examination	• Drawings/specifications are reviewed by the plans examiner to verify compliance with the Ontario Building Code and other referenced standards and legislation (further information could be required to make these determinations). • Plans are also reviewed for compliance with grading requirements and applicable laws (further information could be required to make these determinations). • The plans examiner also co-ordinates most approvals from other departments and external authorities. Note: The City of Stratford is currently offering an incentive program to help residential homeowners disconnect weeping tile and rainwater leaders from sanitary sewers, you may be required to participate in this program if you are renovating or adding an addition to your residence.
Other Approvals / Deposits	The plans examiner will co-ordinate approvals/deposits/fees from building division and other departments or divisions. These approvals may include: • Development charges • Damage deposits for sidewalks, curbs etc. • New service installation deposits • Tree saving plans • Grading/occupancy deposits • Site Plan agreements • Subdivision agreements • Heritage permit (heritage conservation district) • Heritage approval (designated buildings) • Occupancy Permit fee
Permit Issuance	When the plans examiner has determined that submissions conform with the Ontario Building Code, and other applicable laws/by-laws and when all outstanding deposits and fees have been paid a permit may be issued.
Field Review	The building division undertakes field review of projects under construction (this varies depending on the specific project under construction) the following is a list of typical reviews: • Site services (storm, sanitary & water) • Footings (...

	• Foundation (includes weeping tile and rain water leaders) • Plumbing rough-in • Structural framing • Insulation & vapour barrier • Fire separation, life safety systems • HVAC Rough-In inspection (may include a 2nd inspection for finished basements) • Final Plumbing • HVAC Final inspection • Fire Access Route(s) • Occupancy inspection • Lot grading inspection • Final inspection Required inspections for any given project are listed on the building permit and must be completed by the City inspector. It is the responsibility of the owner to ensure that the following requirements are completed a) notification to the inspector of readiness for inspection for each required inspection, and, b) satisfactory completion of each required inspection by the inspector.
Field Review Reports	The building division requires submission of field review reports completed by the appropriate professionals during and at completion of projects under construction (this varies depending on the specific project under construction) the following is a list of typical reports: • Site service reports • Soils reports • Structural reports • Mechanical reports (HVAC and plumbing) • Electrical reports • Wind, water and vapour protection reports. • Fire separation and life safety system reports • Architectural reports • Occupancy reports Required inspection report submissions for any given project are listed on the building permit and must be completed by the appropriate professional. It is the responsibility of the owner to ensure the satisfactory completion of each required inspection report by the appropriate professional
Information Submissions During Construction	The building division requires submission of information at specific times during construction (this varies depending on the specific project under construction) the following is a list of typical information: • Top of foundation certificate • Complete heat loss/gain calculations • Complete duct design calculations • Duct Layout Drawing • Sprinkler shop drawings • Grading certification



ZONING INFORMATION

LOT COVERAGE
LOT AREA = 3635.3 s.f.
BUILDING AREA = 1047.5 s.f.
ACTUAL COVERAGE = 29%

ACTUAL
SIDE YARD (EAST) = 10'
SIDE YARD (WEST) = 4'
AGGREGATE SIDE YARD = 14'
REAR YARD DEPTH = 29'-11"

UNPROTECTED OPENINGS CALCULATIONS

WEST WALL = NO NEW OPENINGS

AREA OF EAST WALL = 350.77
DISTANCE TO LOT LINE = 10'

EXISTING = 47.53sf
NEW = 18sf
TOTAL = 65.53sf ok

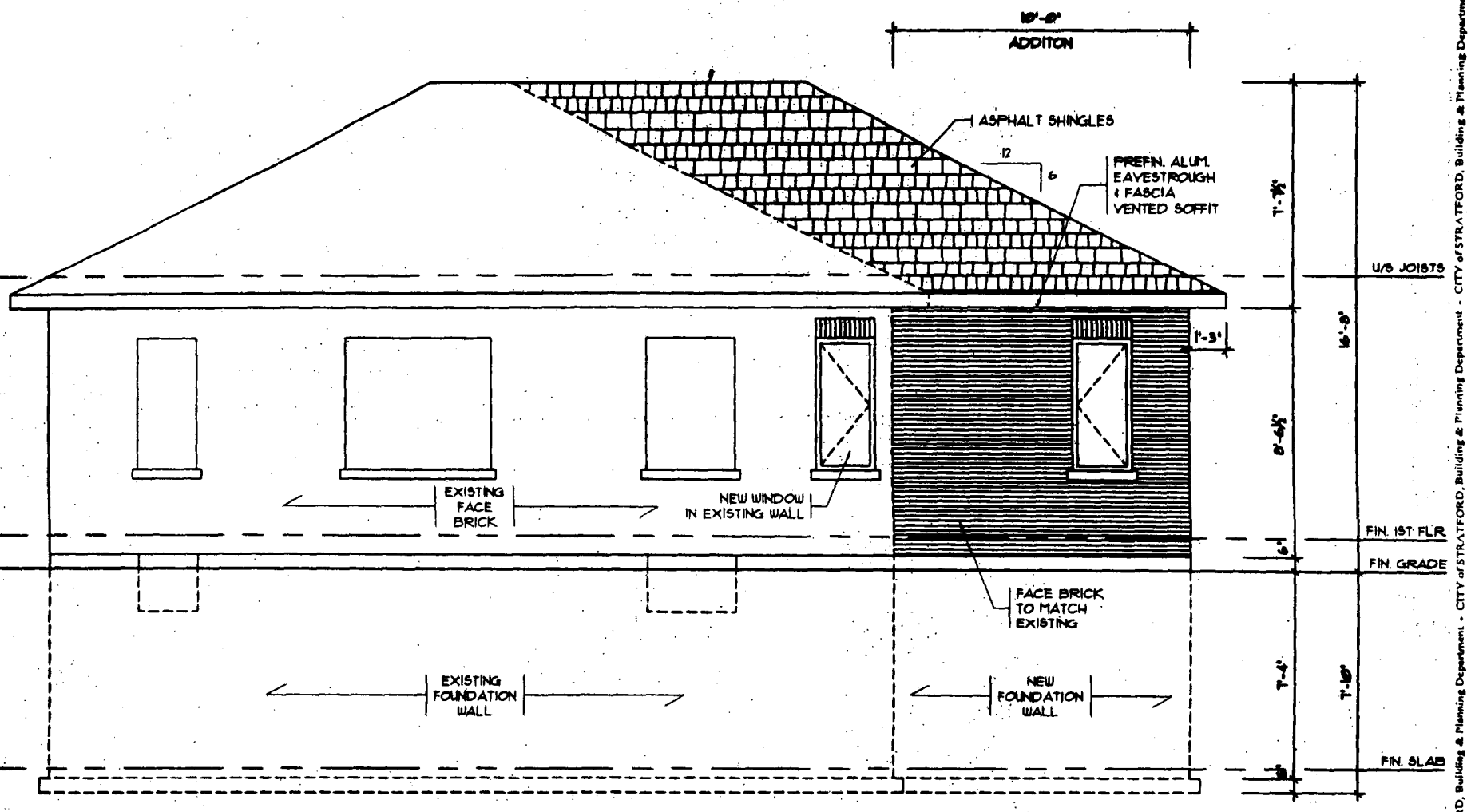
CITY of STRATFORD
Building & Planning Department
CITY HALL ANNEX
82 ERIE STREET, SECOND FLOOR
STRATFORD, ONTARIO. N5A 2M4
519 271 0250
FAX.: 519 271 5966

DWG No.: SP1

PROPERTY PLAN

DRAWN: MLB

DATE: 07/14/04



EAST ELEVATION

3/16"=1'-0"

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DWG No.: EL1

EAST ELEVATION

DRAWN: MLB

DATE: 07/14/04

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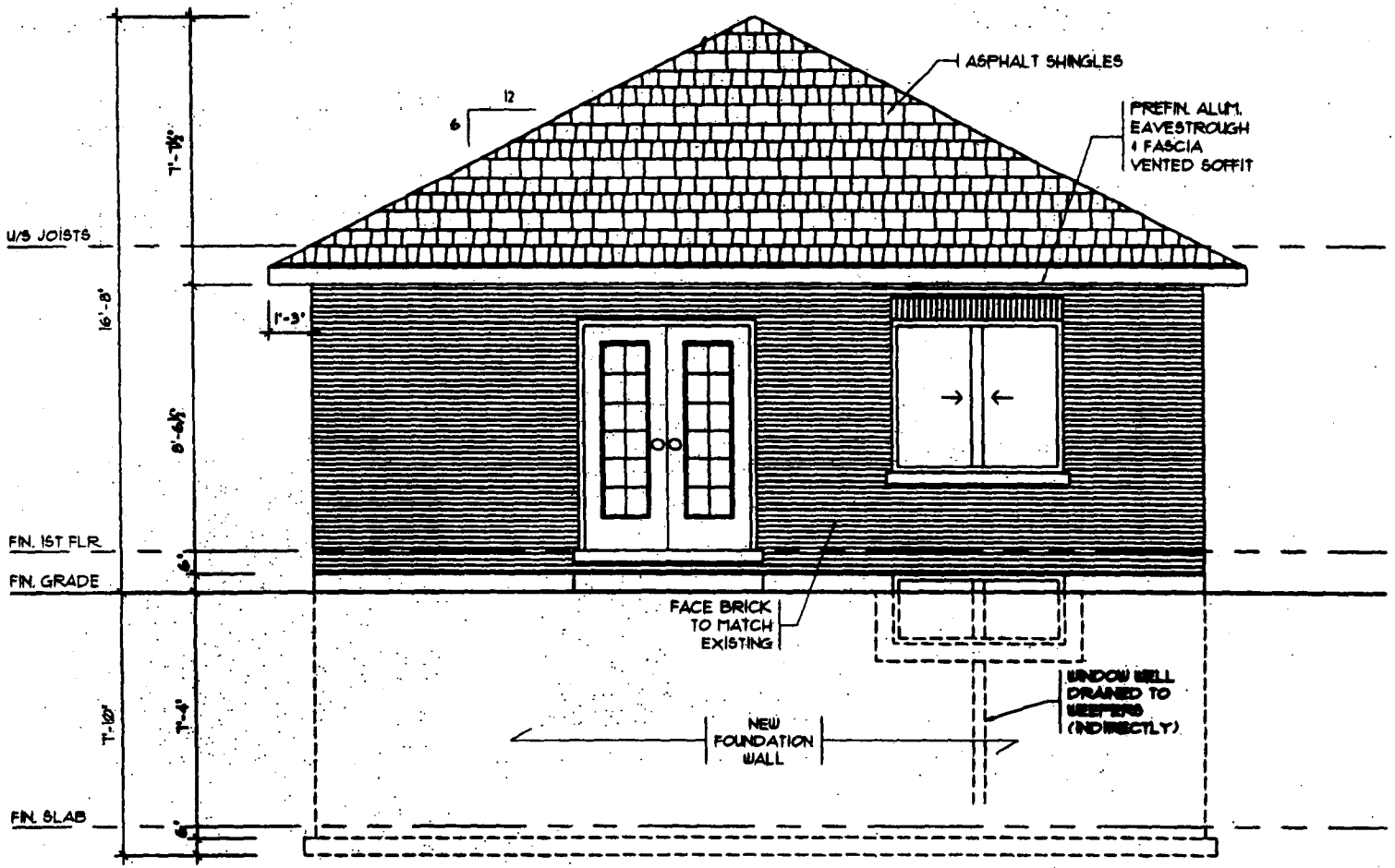

NORTH ELEVATION

3/16"=1'-0"

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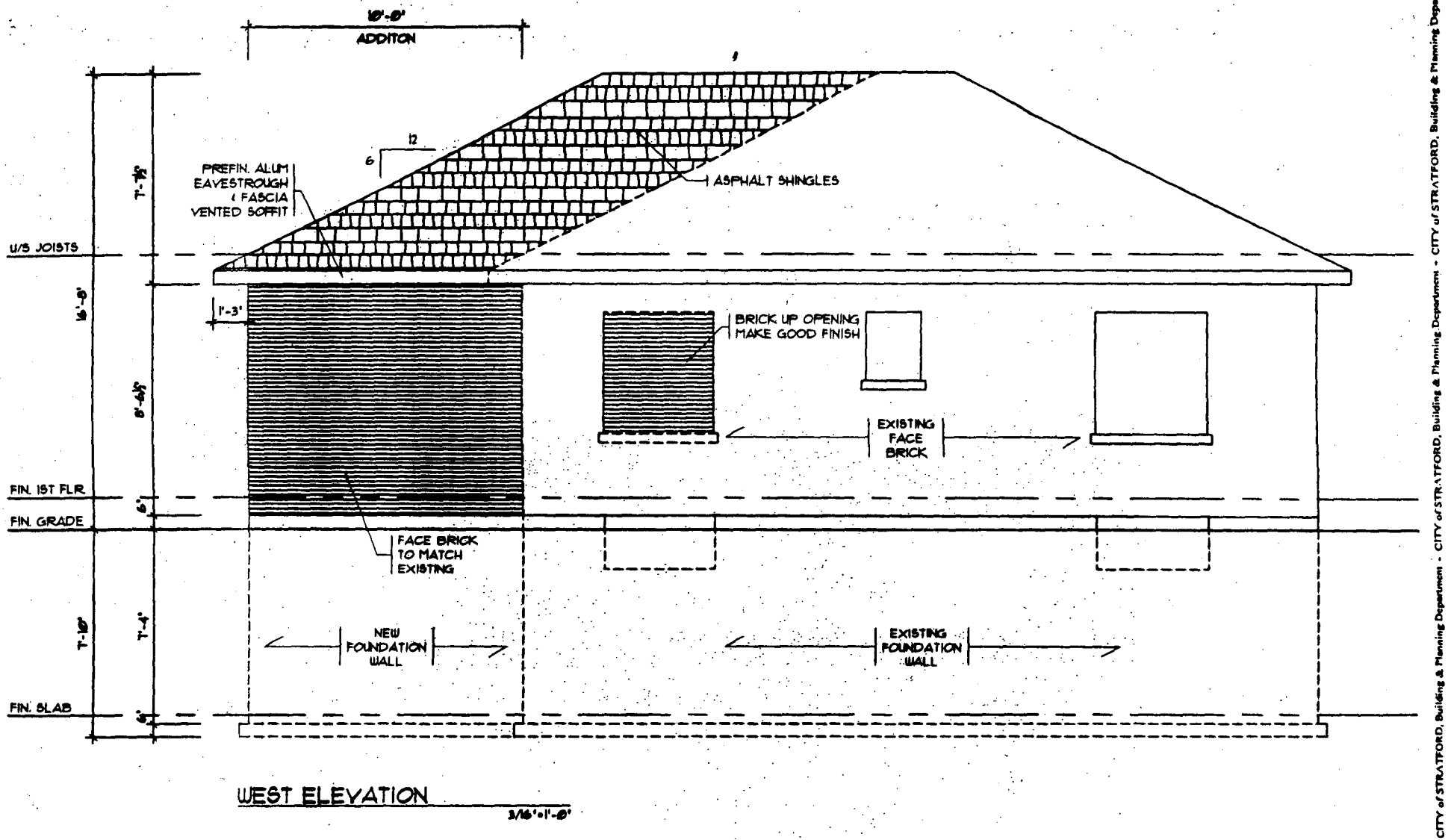
DWG No.: EL2

NORTH ELEVATION

DRAWN: MLB

DATE: 07/14/04



WEST ELEVATION

3/16"=1'-0"

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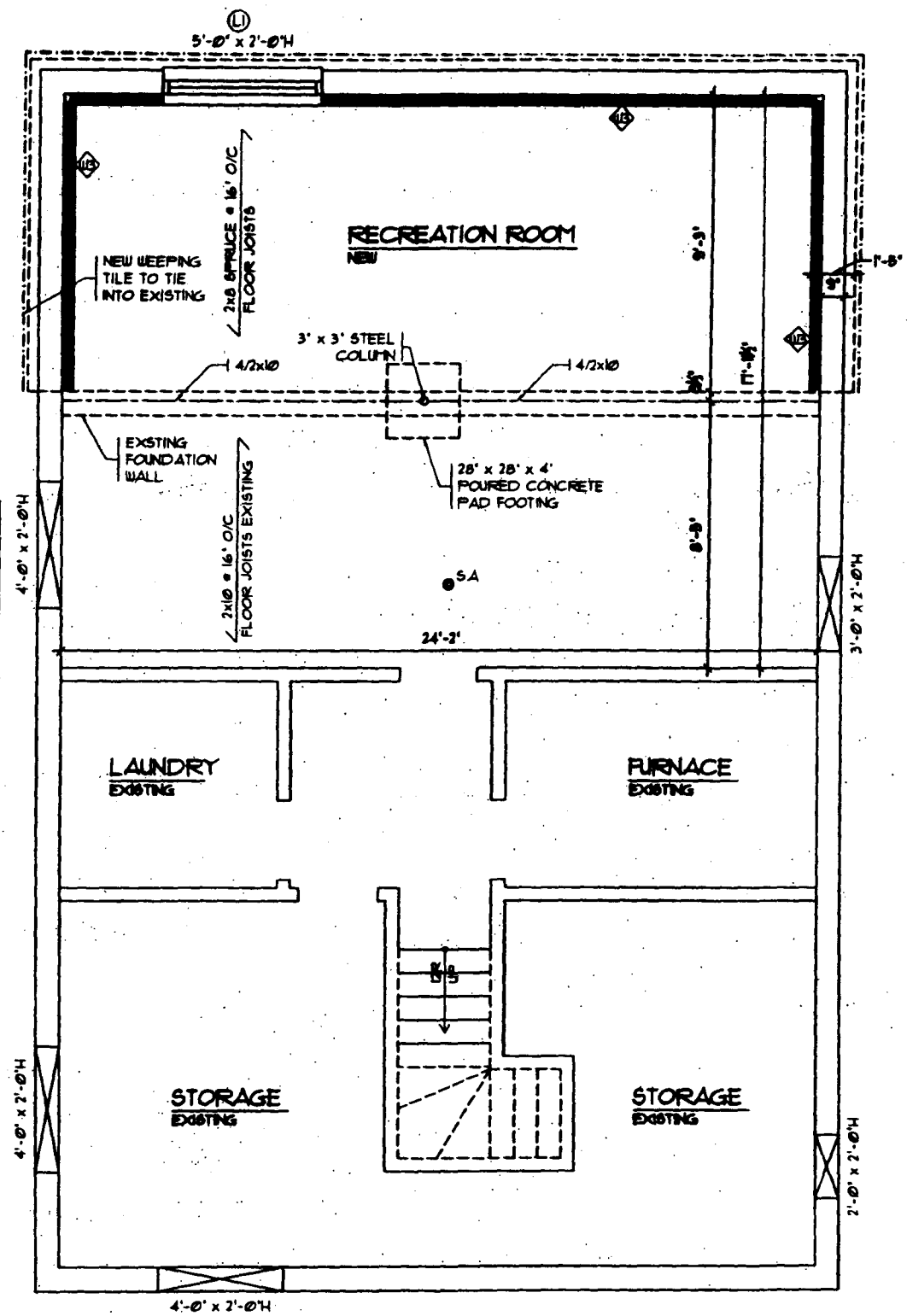
DWG No.: EL3

WEST ELEVATION

DRAWN: MLB

DATE: 07/14/04



LINTELS	
L1	2/2x8 SPF No.1/No.2
L2	3½" x 3½" x ¼" L
L3	2/2x6 SPF No.1/No.2

WALL SCHEDULE	
W1	TYP. FRAME WALL 4" FACE BRICK 1" AIR SPACE AIR BARRIER 1 1/2" R-5 RGID INSUL'N 2x6 STUDS @ 16" O/C W/ R20 BATT INSULATION 6 MIL. VAPOUR BARRIER 1/2" DRYWALL
W2	TYP. INTERIOR WALL 1/2" DRYWALL 2x4 STUDS @ 16" O/C 1/2" DRYWALL
W3	BASEMENT WALL FINISH 1/2" DRYWALL 2x4 STUDS @ 16" O/C W/ R8 BATT INSUL. FULL HEIGHT W/ 6 MIL. POLY VAPOUR BARRIER MOISTURE BARRIER TO GRADE B/W STUD AND FOUNDATION

NORTH

FOUNDATION PLAN

3/16"=1'-0"

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82 ERIE STREET, SECOND FLOOR
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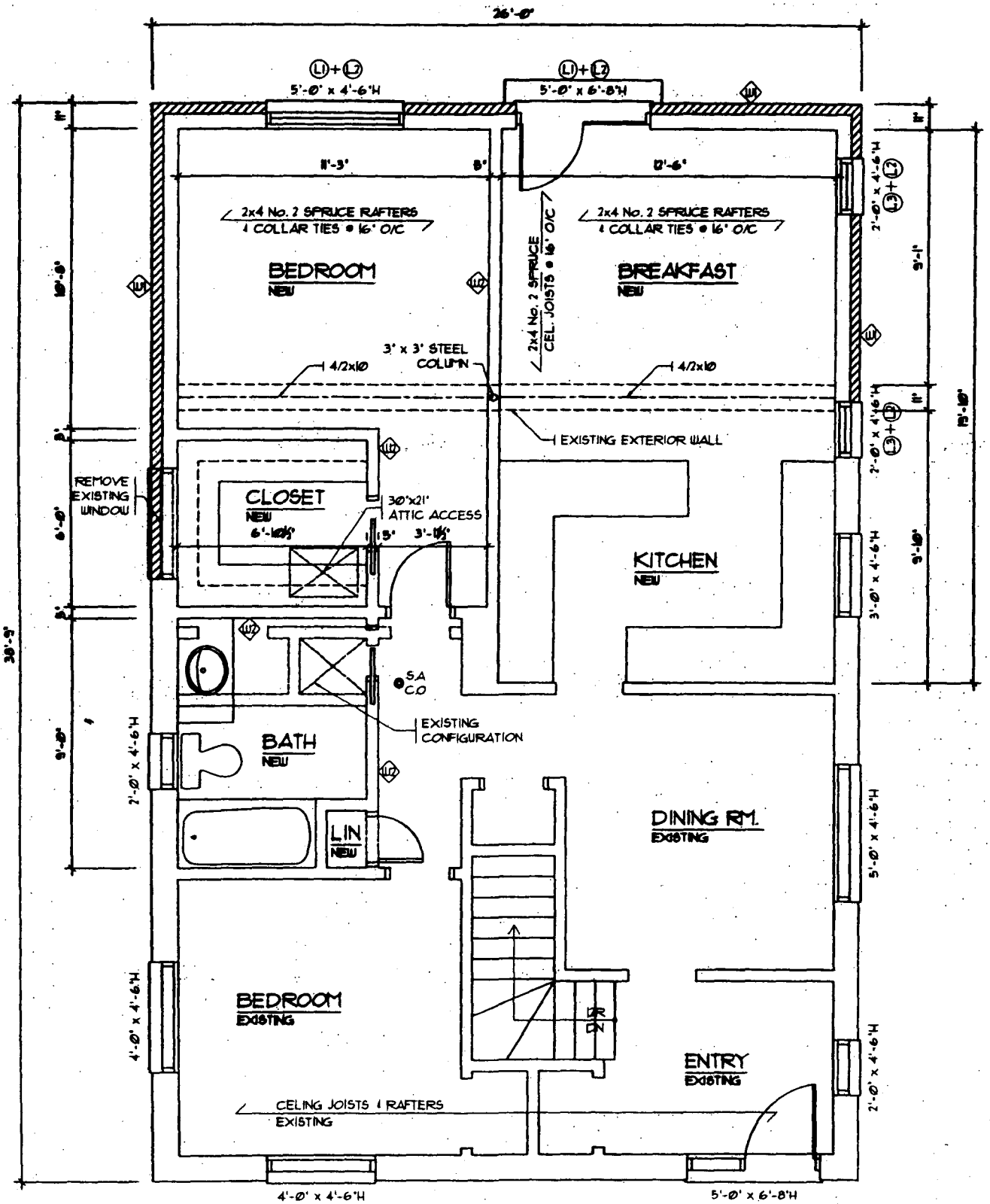
DWG No.: FP1

BASEMENT PLAN

DRAWN: MLB | DATE: 07/14/04



MAIN FLOOR PLAN

3/16"=1'-0"

CITY of STRATFORD *Building & Planning Department*	CITY HALL ANNEX 82 ERIE STREET, SECOND FLOOR STRATFORD, ONTARIO. N5A 2M4 519 271 0250 FAX.: 519 271 5966	DWG No.: FP2	MAIN FLOOR PLAN DRAWN: MLB DATE: 07/14/04

COLUMN FOOTING SCHEDULE

No. OF FLOORS SUPPORTED	DISTANCE BETWEEN COLUMNS (LF)	SIZE OF COLUMN FOOTINGS 6" BEARING PLATE
1	10	25" x 25" x 10"
1	12	29" x 29" x 12"
1	14	32" x 32" x 13"
1	16	34" x 34" x 14"
1	18	36" x 36" x 15"
1	20	38" x 38" x 17"
2	10	34" x 34" x 14"
3	12	36" x 36" x 16"
2	14	40" x 40" x 17"
2	16	42" x 42" x 18"
2	18	43" x 43" x 20"
2	20	46" x 46" x 21"

9.15.4.1. FOUNDATION WALL THICKNESS
(1) WHERE AVERAGE STABLE SOILS ARE ENCOUNTERED, THE THICKNESS OF FOUNDATION WALLS SUBJECT TO LATERAL EARTH PRESSURE SHALL CONFORM TO TABLE 9.15.4.1. FOR WALLS NOT EXCEEDING 2 500 MM (8 FT 2 IN) IN UNSUPPORTED HEIGHT.

TABLE 9.15.4.1.
FORMING PART OF SENTENCE 9.15.4.1(1)

THICKNESS OF FOUNDATION WALLS

TYPE OF FOUNDATION WALL	Minimum Wall THICKNESS, mm (1)	MAXIMUM HEIGHT OF FINISHED GROUND ABOVE BASEMENT FLOOR & CRAWL SPACE GROUND COVER, (ft-in)	
		FOUNDATION WALL LATERALLY UNSUPPORTED AT THE TOP(1)	FOUNDATION WALL LATERALLY SUPPORTED AT THE TOP(1)
SOLID CONCRETE 15 MPa (2200 psi) MIN. STRENGTH	150 (5 7/8)	0.80 (2'-7")	1.50 (4'-11")
	200 (7 7/8)	1.20 (3'-11")	2.15 (6'-11")
	250 (9 7/8)	1.40 (4'-7")	1.90 (7'-7")
	300 (11 3/4)	1.50 (4'-11")	1.90 (7'-7")
SOLID CONCRETE 20 MPa (2900 psi) MIN. STRENGTH	150 (5 7/8)	0.80 (2'-7")	1.80 (5'-11")
	200 (7 7/8)	1.20 (3'-11")	1.90 (7'-7")
	250 (9 7/8)	1.40 (4'-7")	1.90 (7'-7")
	300 (11 3/4)	1.50 (4'-11")	1.90 (7'-7")
UNIT MASONRY	140 (5 1/2)	0.80 (2'-07")	1.80 (2'-7")
	190 (7 1/2)	0.90 (2'-11")	1.20 (3'-11")
	240 (9 1/2)	1.20 (3'-11")	1.80 (5'-11")
	290 (11 5/8)	1.40 (4'-7")	1.20 (7'-3")
COLUMN 1	2	3	4

NOTE TO TABLE 9.15.4.1.
(1) SEE ARTICLE 9.15.4.2.

TABLE 9.20.5.2.B.
FORMING PART OF SENTENCE 9.20.5.2.(5)

MAXIMUM ALLOWABLE SPANS FOR STEEL LINTELS SUPPORTING MASONRY VENEER, m (ft-in)

MAXIMUM ANGLE SIZE, mm (in).			70 mm (2 3/4 in) BRICK	90 mm (3 1/2 in) BRICK	100 mm (4 in) STONE
VERTICAL LEG	HORIZONTAL LEG	THICKNESS LEG			
90 (3 1/2)	75 (3)	6 (1/4)	2.35 (8'-4")	—	—
90 (3 1/2)	90 (3 1/2)	6 (1/4)	2.39 (8'-6")	2.41 (8'-1")	2.30 (7'-7")
100 (4)	90 (3 1/2)	6 (1/4)	2.79 (9'-2")	2.66 (8'-9")	2.48 (8'-2")
125 (4 7/8)	90 (3 1/2)	8 (5/16)	3.48 (11'-5")	3.31 (10'-10")	3.08 (10'-1")
125 (4 7/8)	90 (3 1/2)	10 (3/8)	3.84 (11'-11")	3.48 (11'-5")	3.24 (10'-8")
COLUMN 1	2	3	4	5	6

TABLE A-16 (PARTIAL)
FORMING PART OF SENTENCES 9.23.12.3.(1) AND (3)

MAXIMUM SPANS FOR SPRUCE - PINE - FIR LINTELS NO. 1 OR NO. 2 GRADE - NON-STRUCTURAL SHEATHING

LINTEL SUPPORTING	LINTEL SIZE mm (4)	MAXIMUM SPAN, m (1)(2)(3)	
		EXTERIOR WALLS: SPECIFIED SNOW LOAD OF 2.0 kPa	INTERIOR WALLS
LIMITED ATTIC STORAGE AND CEILING	2 - 38 X 89	—	1.21
	2 - 38 X 140	—	1.99
	2 - 38 X 184	—	2.51
	2 - 38 X 235	—	3.01
	2 - 38 X 286	—	3.51
ROOF AND CEILING ONLY	2 - 38 X 89	1.01	0.98
	2 - 38 X 140	1.46	1.35
	2 - 38 X 184	1.80	1.84
	2 - 38 X 235	2.20	2.01
	2 - 38 X 286	2.56	2.39
ROOF, CEILING AND 1 STOREY	2 - 38 X 89	0.84	0.74
	2 - 38 X 140	1.21	1.02
	2 - 38 X 184	1.55	1.30
	2 - 38 X 235	1.84	1.45
	2 - 38 X 286	2.15	1.66
ROOF, CEILING AND 2 STOREYS (5)	2 - 38 X 89	0.85	0.64
	2 - 38 X 140	1.19	0.86
	2 - 38 X 184	1.44	1.08
	2 - 38 X 235	1.72	1.27
	2 - 38 X 286	1.96	1.48
ROOF, CEILING AND 3 STOREYS (5)	2 - 38 X 89	0.80	0.59
	2 - 38 X 140	1.14	0.81
	2 - 38 X 184	1.35	0.97
	2 - 38 X 235	1.62	1.71
	2 - 38 X 286	1.84	1.35
COLUMN 1	2	3	4

NOTES TO TABLE A-17:
(1) SPANS ARE CALCULATED BASED ON A MAXIMUM SUPPORTED JOIST OR RAFTER LENGTH OF 4.4 M AND A MAXIMUM SUPPORTED TRUSS LENGTH OF 9.8 M. SPANS MAY BE INCREASED BY 5 % FOR SUPPORTED LENGTHS NOT MORE THAN 4.3 m, OR BY 10 % FOR SUPPORTED LENGTHS NOT MORE THAN 3.7 M. SUPPORTED LENGTH MEANS HALF THE SPAN OF THE LONGEST SUPPORTED MEMBER.
(2) IF FLOOR JOISTS SPAN THE FULL WIDTH OF THE BUILDING WITHOUT SUPPORT, LINTELS SPANS SHALL BE REDUCED BY 15 % FOR ROOF, CEILING AND 1 STOREY, BY 20 % FOR ROOF, CEILING AND 2 STOREYS, AND BY 25 % FOR ROOF, CEILING AND 3 STOREYS
(3) FOR ENDS OF LINTELS FULLY SUPPORTED BY WALLS, PROVIDE MINIMUM 50 mm OF BEARING FOR LINTEL SPANS UP TO 3 M, OR MINIMUM 75 mm OF BEARING FOR LINTEL SPANS GREATER THAN 3 M.
(4) A SINGLE PIECE OF 89 mm THICK LUMBER MAY BE USED IN LIEU OF 2 PIECES OF 38 mm THICK LUMBER ON EDGE.
(5) SPANS APPLY ONLY WHERE THE FLOORS SERVE RESIDENTIAL AREAS AS DESCRIBED IN TABLE 4.1.6.3., OR THE UNIFORMLY DISTRIBUTED LOAD ON THE FLOOR DOES NOT EXCEED THAT SPECIFIED FOR RESIDENTIAL AREAS AS DESCRIBED IN TABLE 4.1.6.3.

TABLE A-17 (PARTIAL)
FORMING PART OF SENTENCES 9.23.12.3.(1) AND (3)

MAXIMUM SPANS FOR SPRUCE - PINE - FIR LINTELS NO. 1 OR NO. 2 GRADE - STRUCTURAL SHEATHING (1)

LINTEL SUPPORTING	LINTEL SIZE mm (3)	MAXIMUM SPAN m (1)(2)(3)
		EXTERIOR WALLS: SPECIFIED SNOW LOAD OF 2.0 kPa
ROOF AND CEILING ONLY	2 - 38 X 89	1.11
	2 - 38 X 140	1.79
	2 - 38 X 184	1.10
	2 - 38 X 235	2.31
	2 - 38 X 286	2.99
ROOF, CEILING AND 1 STOREY (6)	2 - 38 X 89	1.01
	2 - 38 X 140	1.46
	2 - 38 X 184	1.01
	2 - 38 X 235	2.31
	2 - 38 X 286	2.56
ROOF, CEILING AND 2 STOREYS (6)	2 - 38 X 89	0.97
	2 - 38 X 140	1.54
	2 - 38 X 184	1.84
	2 - 38 X 235	2.07
	2 - 38 X 286	2.57
ROOF, CEILING AND 3 STOREYS (6)	2 - 38 X 89	0.93
	2 - 38 X 140	1.35
	2 - 38 X 184	1.62
	2 - 38 X 235	1.96
	2 - 38 X 286	2.22
COLUMN 1	2	3

NOTES TO TABLE A-18:
(1) A MINIMUM 9.5 mm THICK STRUCTURAL PANEL CONFORMING TO CSA O121-M, CSA O151-M, CAN/CSA-O325.0 OR CAN/CSA-O437.0 SHALL BE FASTENED WITH AT LEAST 2 ROWS OF FASTENERS CONFORMING TO TABLE 9.23.3.5. TO THE EXTERIOR FACE OF THE LINTEL AND A SINGLE ROW TO THE TOP PLATES AND STUDS.
(2) SPANS ARE CALCULATED BASED ON A MAXIMUM SUPPORTED JOIST OR RAFTER LENGTH OF 4.4 M AND A MAXIMUM SUPPORTED TRUSS LENGTH OF 9.8 M. SPANS MAY BE INCREASED BY 5 % FOR SUPPORTED LENGTHS NOT MORE THAN 4.3 M, OR BY 10 % FOR SUPPORTED LENGTHS NOT MORE THAN 3.7 M. SUPPORTED LENGTH MEANS HALF THE SPAN OF THE LONGEST SUPPORTED MEMBER.
(3) IF ROOF JOISTS SPAN THE FULL WIDTH OF THE BUILDING WITHOUT SUPPORT, LINTELS SPANS SHALL BE REDUCED BY 15 % FOR ROOF, CEILING AND ONE STOREY, BY 20 % FOR ROOF, CEILING AND TWO STOREYS, AND BY 25 % FOR ROOF, CEILING AND THREE STOREYS.
(4) FOR ENDS OF LINTELS FULLY SUPPORTED BY WALLS, PROVIDE MINIMUM 38 MM OF BEARING FOR LINTEL SPANS UP TO 3 M, OR MINIMUM 76 MM OF BEARING FOR LINTEL SPANS GREATER THAN 3 M.
(5) A SINGLE PIECE OF 89 mm THICK LUMBER MAY BE USED IN LIEU OF 2 PIECES OF 38 mm THICK LUMBER ON EDGE.
(6) SPANS APPLY ONLY WHERE THE FLOORS SERVE RESIDENTIAL AREAS AS DESCRIBED IN TABLE 4.1.6.3., OR THE UNIFORMLY DISTRIBUTED LIVE LOAD ON THE FLOOR DOES NOT EXCEED THAT SPECIFIED FOR RESIDENTIAL AREAS AS DESCRIBED IN TABLE 4.1.6.3.

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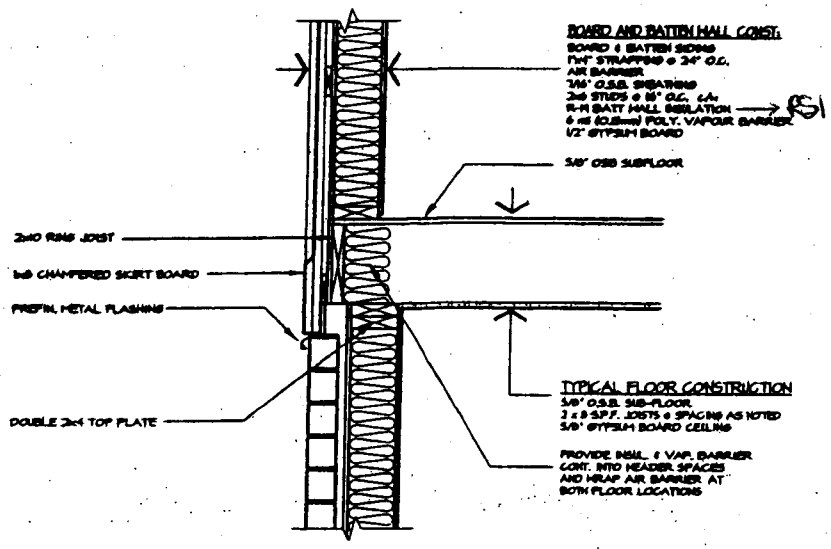
519 271 0250

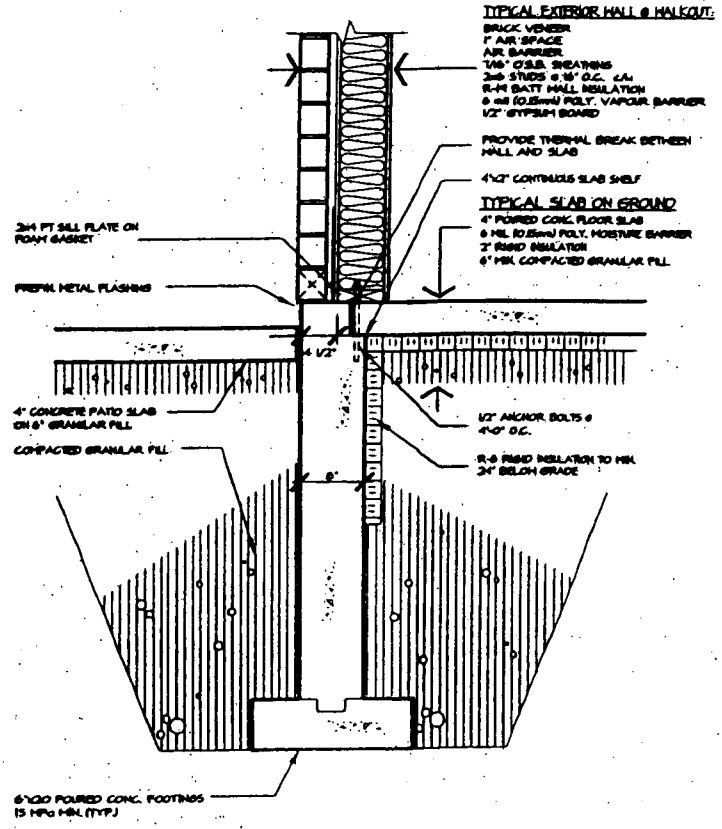
DWG No.: SC1

NOTES AND SCHEDULES



SECTION DETAIL @ FLOOR

SCALE 1/2"=1'-0"



SECTION DETAIL @ WALKOUT

SCALE 1/2"=1'-0"

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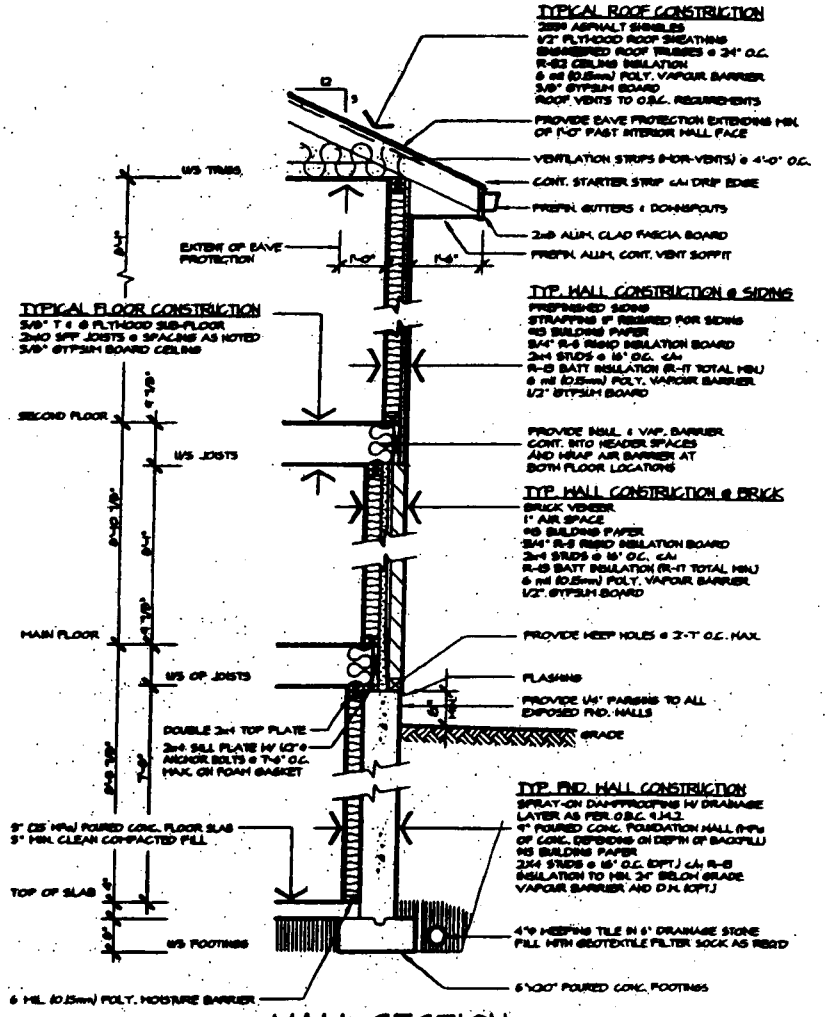
EXAMPLE SECTION DETAILS

DRAWN: DATE:



WALL SECTION

SCALE 1/4"=1'-0"

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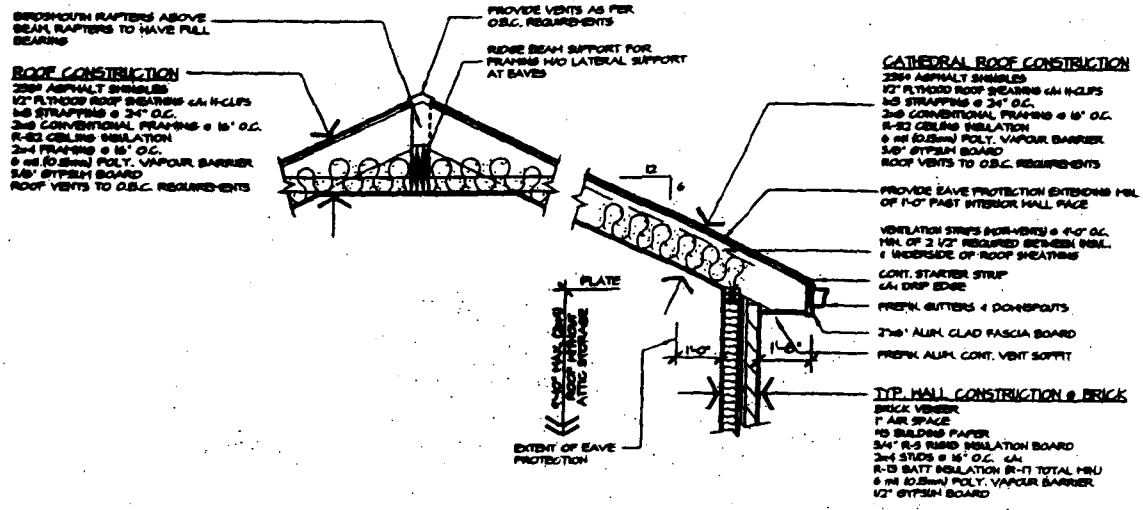
STRATFORD, ONTARIO. N5A 2M4
519 271 0250

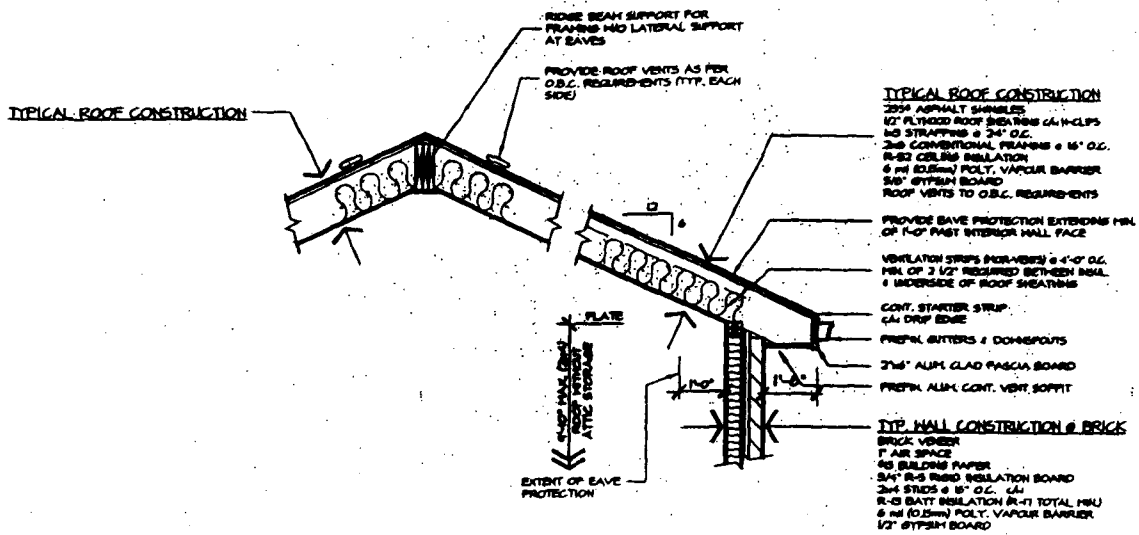
DWG No.: WS1

EXAMPLE WALL SECTION



WALL SECTION @ CATHEDRAL OPTION 1

SCALE 1/4"=1'-0"



WALL SECTION @ CATHEDRAL OPTION 2

SCALE 1/4"=1'-0"

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519 271 0250

DWG No.: WS3

EXAMPLE WALL SECTION

DRAWN: DATE:

Stratford
ONTARIO CANADA
Dramatically Different!

H.V.A.C. Design Requirements- Effective July 1, 2005

Part 9- Residential- Singles, Semis, Duplexes, Triplexes, Quadruplexes, and Townhouses-**New construction**

Required Information Submission

At permit application:

The Residential Mechanical Ventilation Design Summary will be required as part of the building permit submission.

Prior to booking HVAC Rough-In Inspection:

For Singles, Semis, Duplexes, Triplexes, Quadruplexes, and Townhouses, the following will be required prior to the HVAC Rough-In Inspection by City:

- Complete Heat Loss/ Gain Calculations
- Complete Duct Design Calculations
- Duct Layout Drawing

Two copies of the above-noted items are to be sent to Building & Planning Dept. prior to calling in the HVAC Rough-In Inspection request.

Prior to booking HVAC Final Inspection

If an HRV is installed, an HRV Balancing Report is required prior to calling in the HVAC Final Inspection request.

HVAC Inspections

- HVAC Rough-In Inspection- A 2nd HVAC Rough-In Inspection may be required if the basement area is to be finished. For an unfinished basement, this inspection can be part of the HVAC Final Inspection.

- HVAC Final Inspection

Part 9- Residential- Singles, Semis, Duplexes, Triplexes, Quadruplexes, and Townhouses-**Additions & Renovations**

Complete (gut) renovation

- Same requirements as new construction noted above

Renovation which includes bathroom in house constructed prior to 1993

- Fans required in bathrooms with no windows (fan to be H.V.I. listed, duct size and fan size to be labelled on drawing)

Renovation in house constructed from 1993 to present

- Mechanical Ventilation Design Summary required if new fans are to be installed or existing fans are being replaced.

Addition not incl. Bathroom, addition is >25% of floor area of existing house (house constructed prior to 1993)

- Heating review process only

Addition not incl. Bathroom, addition is < or =25% of floor area of existing house (house constructed prior to 1993)

- No heating or ventilation info required

Addition incl. Bathroom, addition is >25% of floor area of existing house

- Heating & ventilation review process -same process as new construction noted above

Other Part 9 Buildings

- HVAC drawings showing layouts within suites and all common areas are required at the time of permit application.
- HVAC Rough-In and HVAC Final Inspection by City req'd
- A certification letter from the designer will be required prior to the occupancy inspection being completed.

Buildings Requiring Design and Review as per 2.3. O.B.C.

- HVAC drawings are required at the time of permit application
- Field review required by building inspector and mechanical engineer

H E A T I N G / C O O L I N G A N A L Y S I S

v5.0

File

Telephone: (res) ( )
(bus) (519)
(fax) (519)

Building:

TOTAL HEATING LOAD	83901 Btu/h 24589 W
TOTAL COOLING LOAD	40495 Btu/h 3.37 tons 11868 W

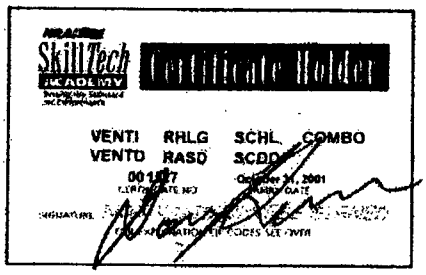
(detail on page 2)

Based on: Dwg + On-Site measure Shaded A/C 2.09 tons
Exist: 2x4/Plaster/stucco/no insul, Exist Ceil: R20
Exist Base: Rubble no Ins. New Walls R20, Ceil R32
New Base R12 full-ht, Dbl Plain Glas, R10 Perim Insul

Local data for:

Area/utility:

From:



Telephone: (bus) (519)
(fax) (519)

E & O E

Estimate by

File 0412-15

ROOM	HEATING Btu/h	HEATING Btu/h.ft2	HEATING W	indr F	b bd	COOLING Btu/h	COOLING Btu/h.ft2	MECH VENT cfm
New Master	6190	22	1814	71.6	2000	3165	11	20
New Ensuite	2547	18	746	71.6	750	1263	9	10
New Master WIC	229	3	67	71.6	300	102	1	0
New Great Room	6803	12	1994	71.6	2000	4202	8	10
New Upper Study	3595	29	1054	71.6	1250	1692	14	10
New Stairwell	2501	37	733	71.6	750	0	0	0
New Kitchen	6337	19	1857	71.6	2000	1007	3	10
Exist Living	9120	45	2673	71.6	2750	2610	13	0
Exist Frnt Entr	1544	22	453	71.6	500	585	8	0
Exist Frnt Bedr	7401	54	2169	71.6	2250	2184	16	0
Exist Main Bath	2265	29	664	71.6	750	336	4	0
New Upper Bedrm	4374	40	1282	71.6	1500	657	6	10
New Bed #1	3490	20	1023	71.6	1250	1108	6	10
New Bed #1 WIC	853	14	250	71.6	300	0	0	0
New Bed #2	3089	16	905	71.6	1000	1126	6	10
New Family Room	5998	18	1758	71.6	2000	3581	11	10
New Base Study	3064	24	898	71.6	1000	1121	9	10
New Mud/Laund	775	3	227	71.6	300	0	0	10
New Base Bath	775	7	227	71.6	300	126	1	10
Exist Base	12951	13	3796	71.6	4000	169	0	0
TOTALS:	83901		24590		26950	25034		130

Total conditioned floor area: at or above grade 304.7 m2 3280 ft2
bsmt/crawl space 104.0 m2 1120 ft2

DESIGN PARAMETERS:
Soil: temperature 48.2 conductivity L Number of occupants 4
Winter temp: out -0.4 ins 71.6 Summer temp: out 84.2 ins 75.2 F
Air leakage: category J 0.42 ac/h
Mechanical ventilation: 0.22 ac/h

HEATING / COOLING ANALYSIS

DETAIL REPORT

Local data for:

	New Master Dimension ft	R	14.0 x 20.0 ft Heating Btu/h	Cooling Btu/h	New Ensuite Dimension ft	R	10.0 x 14.0 ft Heating Btu/h	Cooling Btu/h	New Master WIC Dimension ft	R	6.5 x 11.0 ft Heating Btu/h	Cooling Btu/h
Windows NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Windows WEST	19.5 ft2	2.00	703	989	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Windows SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Windows EAST	6.0 x 4.0	2.00	867	1,207	4.0 x 4.0	2.00	577	805	0.0 x 0.0	0.00	0	0
Walls NORTH	20.0 x 8.0	20.00	577	-31	4.0 x 8.0	20.00	116	-5	0.0 x 0.0	0.00	0	0
Walls WEST	39.2 ft2	20.00	140	18	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Walls SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Walls EAST	48.0 ft2	20.00	174	22	64.0 ft2	20.00	229	29	0.0 x 0.0	0.00	0	0
Ceiling #1	280.0 ft2	32.00	631	352	140.0 ft2	32.00	314	176	71.5 ft2	32.00	160	90
Ceiling #2	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
Doors NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors WEST	6.7 x 2.0	6.67	143	18	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Floor	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Skylight #1	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Skylight #2	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Dormer	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
Other	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Fixed			0	0			0	0			0	0
1 Occupants				0				0				0
Appliances				0				0				0
Air leakage			1,402	338			536	132			69	12
Ventilation			1,553	252			775	126			0	0
TOTALS			6,190	3,165			2,547	1,263			229	102

Local data for:

	New Great Room 22.5 x 24.5 ft				New Upper Study 10.0 x 12.5 ft				New Stairwell 6.5 x 10.5 ft			
	Dimension ft	R	Heating Btu/h	Cooling Btu/h	Dimension ft	R	Heating Btu/h	Cooling Btu/h	Dimension ft	R	Heating Btu/h	Cooling Btu/h
indows NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
indows WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
indows SOUTH	3.0 x 4.0	2.00	433	295	4.0 x 4.0	2.00	577	393	2.0 x 3.0	2.00	215	0
indows EAST	50.0 ft2	2.00	1,802	2,531	4.0 x 4.0	2.00	577	805	0.0 x 0.0	0.00	0	0
alls NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
alls WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	149.1 ft2	20.00	601	0
alls SOUTH	20.0 ft2	20.00	72	0	84.0 ft2	20.00	304	0	84.7 ft2	20.00	345	0
alls EAST	103.3 ft2	20.00	372	47	64.0 ft2	20.00	229	29	0.0 x 0.0	0.00	0	0
eiling #1	551.3 ft2	32.00	1,239	693	125.0 ft2	32.00	280	157	68.3 ft2	32.00	154	0
eiling #2	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
oors NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
oors WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	6.7 x 2.8	6.67	205	0
oors SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	6.7 x 2.0	6.67	143	0
oors EAST	6.7 x 4.0	6.67	287	37	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Floor	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	6.5 x 10.5	10.00	82	0
Skylight #1	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Skylight #2	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
ormer	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
ther	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
ixed			0	0			0	0			0	0
Occupants				0				0				0
Appliances				0				0				0
Air leakage			1,823	473			853	182			756	0
Ventilation			775	126			775	126			0	0
TOTALS			6,803	4,202			3,595	1,692			2,501	0

Local data for:

	New Kitchen Dimension ft		22.5 x 14.5 ft Heating R	Heating Btu/h	Cooling Btu/h	Exist Living Dimension ft		14.5 x 14.0 ft Heating R	Heating Btu/h	Cooling Btu/h	Exist Frnt Entr Dimension ft		14.0 x 5.0 ft Heating R	Heating Btu/h	Cooling Btu/h
dows NORTH	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
dows WEST	0.0 x 0.0		0.00	0	0	6.2 x 5.0		2.00	1,112	1,564	2.0 x 3.0		2.00	215	299
dows SOUTH	6.0 x 1.0		2.00	215	123	4.4 ft2		2.00	160	91	0.0 x 0.0		0.00	0	0
dows EAST	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
ls NORTH	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
ls WEST	0.0 x 0.0		0.00	0	0	85.1 ft2		3.18	1,924	244	20.7 ft2		3.18	467	59
ls SOUTH	110.0 ft2		3.18	2,491	0	107.6 ft2		3.18	2,436	0	0.0 x 0.0		0.00	0	0
ls EAST	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
ling #1	326.3 ft2		20.00	1,174	656	203.0 ft2		20.00	730	408	70.0 ft2		20.00	252	141
ling #2	0.0 ft2		0.00	0	0	0.0 ft2		0.00	0	0	0.0 ft2		0.00	0	0
rs NORTH	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
rs WEST	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	6.7 x 2.0		6.67	143	18
rs SOUTH	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
rs EAST	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
or	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
light #1	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
light #2	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
ner	0.0 ft2		0.00	0	0	0.0 ft2		0.00	0	0	0.0 ft2		0.00	0	0
er	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0	0.0 x 0.0		0.00	0	0
ed				0	0				0	0				0	0
:cupants					0					0					0
liances					0					0					0
leakage				1,682	102				2,758	303				467	68
tilation				775	126				0	0				0	0
TOTALS				6,337	1,007				9,120	2,610				1,544	585

Local data for:

	Exist Frnt Bedr 12.5 x 11.0 ft				Exist Main Bath 6.5 x 12.0 ft				New Upper Bedrm 11.0 x 10.0 ft			
	Dimension ft	R	Heating Btu/h	Cooling Btu/h	Dimension ft	R	Heating Btu/h	Cooling Btu/h	Dimension ft	R	Heating Btu/h	Cooling Btu/h
Windows NORTH	0.0 x 0.0	0.00	0	0	2.3 x 4.0	2.00	334	192	3.7 x 5.5	2.00	727	415
Windows WEST	6.2 x 5.0	2.00	1,112	1,564	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Windows SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Windows EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Walls NORTH	11.0 x 8.0	3.18	1,993	-109	42.7 ft2	3.18	966	-52	67.8 ft2	3.18	1,535	-84
Walls WEST	69.1 ft2	3.18	1,563	198	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Walls SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Walls EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Ceiling #1	137.5 ft2	20.00	495	277	78.0 ft2	20.00	280	157	110.0 ft2	32.00	249	138
Ceiling #2	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
Doors NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Floor	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Skylight #1	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Skylight #2	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Dormer	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
Other	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Fixed			0	0			0	0			0	0
4 Occupants				0				0				0
Appliances				0				0				0
Air leakage			2,238	254			685	39			1,088	62
Ventilation			0	0			0	0			775	126
TOTALS			7,401	2,184			2,265	336			4,374	657

Local data for:

	New Bed #1 Dimension ft	R	12.0 x 14.5 ft Heating Btu/h	Cooling Btu/h	New Bed #1 MIC Dimension ft	R	9.5 x 6.5 ft Heating Btu/h	Cooling Btu/h	New Bed #2 Dimension ft	R	12.5 x 15.0 ft Heating Btu/h	Cooling Btu/h
indows NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
indows WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
indows SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
indows EAST	4.0 x 4.0	2.00	577	830	0.0 x 0.0	0.00	0	0	4.0 x 4.0	2.00	577	830
alls NORTH	14.5 x 8.0	12.00	546	-23	6.5 x 8.0	12.00	212	0	4.0 x 8.0	12.00	222	-10
alls WEST	0.0 x 0.0	0.00	0	0	9.5 x 8.0	12.00	311	0	0.0 x 0.0	0.00	0	0
alls SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
alls EAST	80.0 ft2	12.00	570	61	0.0 x 0.0	0.00	0	0	84.0 ft2	12.00	597	64
eiling #1	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
eiling #2	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
oors NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
oors WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
oors SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
oors EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
oor	12.0 x 14.5	10.00	201	0	9.5 x 6.5	10.00	72	0	12.5 x 15.0	10.00	218	0
kylight #1	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
kylight #2	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
rmer	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
ber	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
xed			0	0			0	0			0	0
Occupants				0				0				0
pliances				0				0				0
r leakage			821	114			258	0			700	116
ntilation			775	126			0	0			775	126
TOTALS			3,490	1,108			853	0			3,089	1,126

HEATING / COOLING ANALYSIS

DETAIL REPORT

Local data for:

	New Family Room 21.0 x 16.0 ft				New Base Study 10.0 x 13.0 ft				New Mud/Laund 25.0 x 10.0 ft			
	Dimension ft	R	Heating Btu/h	Cooling Btu/h	Dimension ft	R	Heating Btu/h	Cooling Btu/h	Dimension ft	R	Heating Btu/h	Cooling Btu/h
Windows NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Windows WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Windows SOUTH	3.0 x 4.0	2.00	433	371	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Windows EAST	50.0 ft2	2.00	1,802	2,593	4.0 x 4.0	2.00	577	830	0.0 x 0.0	0.00	0	0
Walls NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Walls WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Walls SOUTH	20.0 ft2	12.00	150	0	13.0 x 8.0	12.00	409	0	0.0 x 0.0	0.00	0	0
Walls EAST	118.0 ft2	12.00	867	90	64.0 ft2	12.00	461	49	0.0 x 0.0	0.00	0	0
Ceiling #1	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
Ceiling #2	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
Doors NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Doors EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Floor	21.0 x 16.0	10.00	392	0	10.0 x 13.0	10.00	150	0	25.0 x 10.0	10.00	0	0
Skylight #1	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Skylight #2	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Dormer	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
Other	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
Fixed			0	0			0	0			0	0
4 Occupants				0				0				0
Appliances				0				0				0
Air leakage			1,579	401			692	116			0	0
Ventilation			775	126			775	126			775	0
TOTALS			5,998	3,581			3,064	1,121			775	0

HEATING / COOLING ANALYSIS

DETAIL REPORT

Local data for:

	New Base Bath Dimension ft	R	11.0 x 10.0 ft Heating Btu/h	Cooling Btu/h	Exist Base Dimension ft	R	33.0 x 30.0 ft Heating Btu/h	Cooling Btu/h
indows NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
indows WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
indows SOUTH	0.0 x 0.0	0.00	0	0	1.7 x 1.5	2.00	89	78
indows EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
alls NORTH	0.0 x 0.0	0.00	0	0	30.0 x 7.0	2.60	1,454	-45
alls WEST	0.0 x 0.0	0.00	0	0	33.0 x 7.0	2.60	1,600	116
alls SOUTH	0.0 x 0.0	0.00	0	0	207.5 ft2	2.60	4,688	0
alls EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
eiling #1	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
eiling #2	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
oors NORTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
oors WEST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
oors SOUTH	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
oors EAST	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
loor	11.0 x 10.0	10.00	0	0	33.0 x 30.0	10.00	1,204	0
kylight #1	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
cylight #2	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
orner	0.0 ft2	0.00	0	0	0.0 ft2	0.00	0	0
:her	0.0 x 0.0	0.00	0	0	0.0 x 0.0	0.00	0	0
ixed			0	0			0	0
Occupants				0				0
ppliances				0				0
.r leakage			0	0			3,916	20
:ntilation			775	126			0	0
TOTALS			775	126			12,951	169

Job				Date	
Sub					

EQUIPMENT SELECTION DATA

Heat Loss	83,901	Heat Pump Capacity @		0.90	Heat Pump
Furnace	92,000	Additional Heating Capacity Required		0.10	Heat Pump
Design T.R.	67.0	Heating Load		0.28	Heat Pump
Design CFM	1271	Cooling		0.30	Heat Pump
				0.22	Heat Pump
Heat Gain	25025	Heat Pump Capacity @			
A/C	36000	Heat Pump Capacity @		40	Heat Pump
	36000	Heat Pump Capacity @		#DIV/0!	Heat Pump
Additional CFM	1200	Cooling Load			

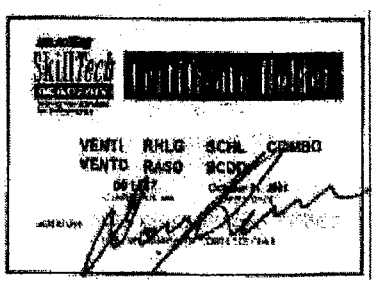
EQUIPMENT

Humidifier	
Air Cleaner	None
Filter	Standard Filter 20 x 25
Ductwork	
Supply Duct	Existing
Return Duct	N/A
Supply Valve	N/A
Return Grille	N/A
Supply Registers	N/A
Duct Insulation	N/A
Insulation Vapour Barrier	N/A

GENERAL

1 Complete installation to conform with all local and provincial codes including but not limited to:
- -Ontario Energy Act
- -Ontario Building Code
- -HRAI Ventilation Manual
- -HRAI Digest
- -HRAI Combo Systems Manual
- -SMACNA Ductwork standards

2 Design for addition to existing forced air system. Airflow and static pressures are based on in-situ measurements of existing system.



EQUIPMENT SELECTION DATA

Heat Loss	83,901														
Furnace	92,000					0.10									
Design A/C	67					0.28					1392	0.8			
Design CFM	1271					0.30					1266	0.9			
											1271				
Heat Gain	25025														
A/C	36,000														
	36,000						1573	CFM							
Design CFM	1200						1271	CFM							

NOTES

Furnace	
A/C Condenser	
A/C Coil	
HRV	None
Filter	Standard Filter 20 x 25
Humidifier	General 1099 Flow-thru or equal if provided

BRANCH SIZING

Outlet No:	Exist		S1	S2	S3	S4	S5	S6	S7	S8	S9	S9A	S10	S11	S11A	S12
Location	Exist		Family	Great	Great	Family	Ensuite	B Bed2	Master	B Bed 1	Base Stud	Up Study	Base WIC	Base Bat	Master	Stairwell
Heat Loss	43992		2999	3402	3402	2999	2776	3089	3095	3490	3064	3595	853	1550	3095	2501
Heat Gain	7539		1791	2101	2101	1791	1365	1126	1583	1108	1121	1692	0	126	1583	0
	3		0	1	1	0	1	0	1	0	0	1	0	0	1	0
Size for Cooling	yes		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Cooling CFM	0												0	0	0	0
Heating CFM	667												23	76	667	38
R.C. width	6		4	4	4	4	4	4	4	4	4	4	4	4	4	4
Reg. Length	10		10	10	10	10	10	10	10	10	10	10	10	10	10	10
Grille ID	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Spread																
Design Pressure	0.30												0.30	0.30	0.30	0.30
Actual Pressure	0.209												0.209	0.059	0.209	0.209
Measured Length	320		68	60	55	40	40	55	45	50	75	65	40	30	35	45
Boots	10		10	10	10	10	10	10	10	10	10	10	10	10	10	10
Flex	40		40	40	40	40	40	40	40	40	40	40	40	40	40	40
Rigid	30		30	30	30	30	50	30	50	30	30	30	30	30	50	50
Elbows	10		30	30	30	30	20	20	20	20	20	20	0	0	20	20
Offset	0		15	0	0	15	0	15	0	15	15	0	15	15	0	0
Effective Length	400												145	135	155	205
Branch Dia.	13.25		6	6	6	6	5	5	5	5	5	6	4	4	5	4
Branch Vel.																
	OK		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Branch CFM	667		23	76	76	76	76	76	76	76	76	76	23	76	667	38
Branch No	Exist		S1	S2	S3	S4	S5	S6	S7	S8	S9	S9A	S10	S11	S11A	S12
Location	Exist		Family	Great	Great	Family	Ensuite	B Bed2	Master	B Bed 1	Base Stud	Up Study	Base WIC	Base Bat	Master	Stairwell
			UPSTREAM		UPSTREAM		TRUNK		SECTIONS				UPSTREAM		TR	
Trunk Flow	1271												1271	1248	907	
Design Loss/100	0.073												0.073	0.439	0.139	
Actual Loss/100	0.059		0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.074	0.059	0.095	
Actual Equiv. Dia	12.25												12.25	12.25	12.5	
No'd o/t Branch	4												4	4	4	
Height	11.5		8	8	8	8	8	8	8	8	8	8	8	8	8	8
Width	12.79		8	8	8	12	12	12	16	16	16	20	20	20	20	20
Trunk Velocity	658												658	646	469	
Status	OK												OK	OK	OK	

Tel:
Fax:

Job:
For:

Heat Loss	83,901	Total S.P.	0.90
Furnace	92,000	Filter Loss	0.10
Design T.R.	67.0	Coil Loss	0.28
Design CFM	1271	Supply SP	0.30
		Return SP	0.22

	25025		
	36000		0
	36000		1272
	1200		

NOTES

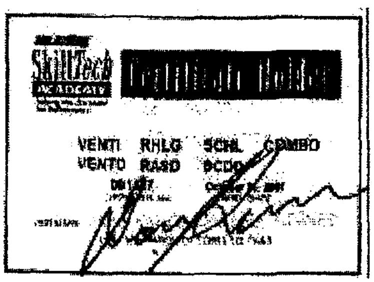
	407
	500
	0
Standard Filter 20 x 25	667

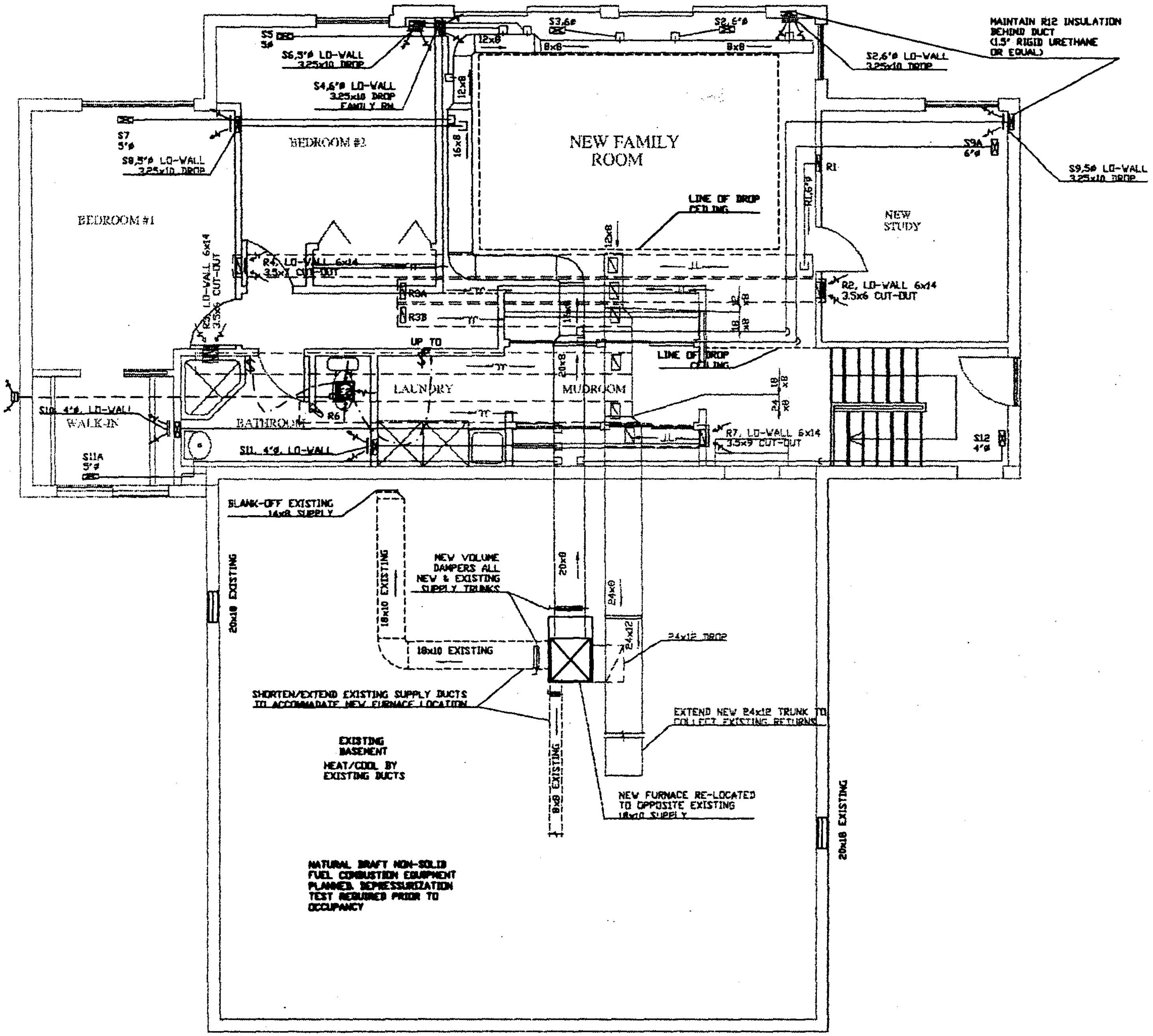
BRANCH SIZING

R1	R4	R2	R3A	R3B	R5	R6	R7	R0
Up Study	B Bed 2	Base Study	Great	Great	B Bed 1	Master	Family	Exist
1	0	0	1	1	0	1	0	3
50	50	50	125	115	50	65	100	667
6	6	6	6	6	6	6	6	50
14	14	14	15	15	14	14	14	50
Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall
40	60	40	55	55	60	50	25	400
85	85	85	85	85	85	85	85	0
40	60	60	60	60	60	60	60	0
40	40	40	40	40	40	40	40	0
20	120	15	0	0	15	0	0	0
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	14.32
6	7	7	11	11	6	7	9	18

DOWNSTREAM TRUNK SECTIONS

8	8	8	8	8	8	8	8	14.32	12
12	12	12	12	18	18	18	24	18	24





NOTES:

ALL REGISTERS 4x10 UNLESS OTHERWISE NOTED

CUTOUTS FOR RETURN AIR TRUNK TO BE 1.5 TO 2 TIMES THE AREA OF THE FLOOR CUTOUT NOTED ON THE DRAWING AT THE STACK LOCATION

SEE PAGE 1 OF THE DUCT DESIGN CALCULATIONS FOR THE EQUIPMENT SPECIFICATIONS

ALL SUPPLY BRANCHES TO BE EQUIPPED WITH A VOLUME DAMPER LOCATED AT BOOT

E2 BROAN DX90 PRINCIPAL EXHAUST FAN, SEE DWG 0412-15C FOR DUCTWORK AND INSTALLATION

SkillTech [redacted]

DRAWING ISSUED FOR THE THE USE OF

AND MAY NOT BE USED BY OTHER PERSONS WITHOUT AUTHORIZATION. DRAWINGS FOR PERMIT AND CONSTRUCTION ARE SIGNED IN RED INK.

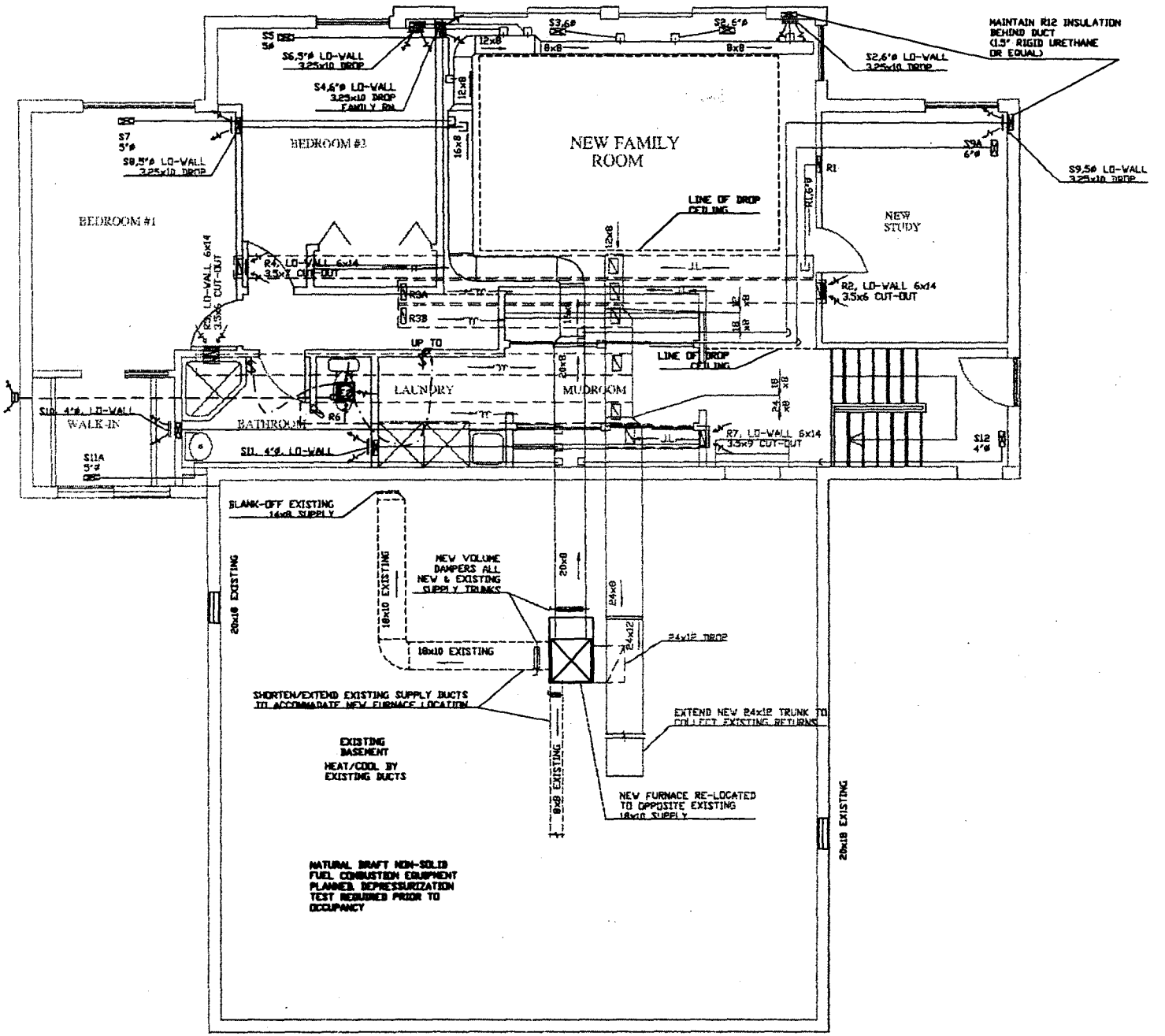
NOTE: DRAWING FOR HVAC SYSTEMS ONLY. ALL DIMENSIONS APPROXIMATE DO NOT SCALE.

DATE:	ISSUED FOR:
APRIL 4/05	PERMIT

PROJECT:

TITLE:
BASEMENT HVAC LAYOUT

SCALE:	DWG. NO:
3/16" = 1'-0"	0412-15A



NOTES:

ALL REGISTERS 4x10 UNLESS OTHERWISE NOTED

CUTOUTS FOR RETURN AIR TRUNK TO BE 1.5 TO 2 TIMES THE AREA OF THE FLOOR CUTOUT NOTED ON THE DRAWING AT THE STACK LOCATION.

SEE PAGE 1 OF THE DUCT DESIGN CALCULATIONS FOR THE EQUIPMENT SPECIFICATIONS

ALL SUPPLY BRANCHES TO BE EQUIPPED WITH A VOLUME DAMPER LOCATED AT BOOT

E2 BROAN DX90 PRINCIPAL EXHAUST FAN, SEE DWG 0412-15C FOR DUCTWORK AND INSTALLATION

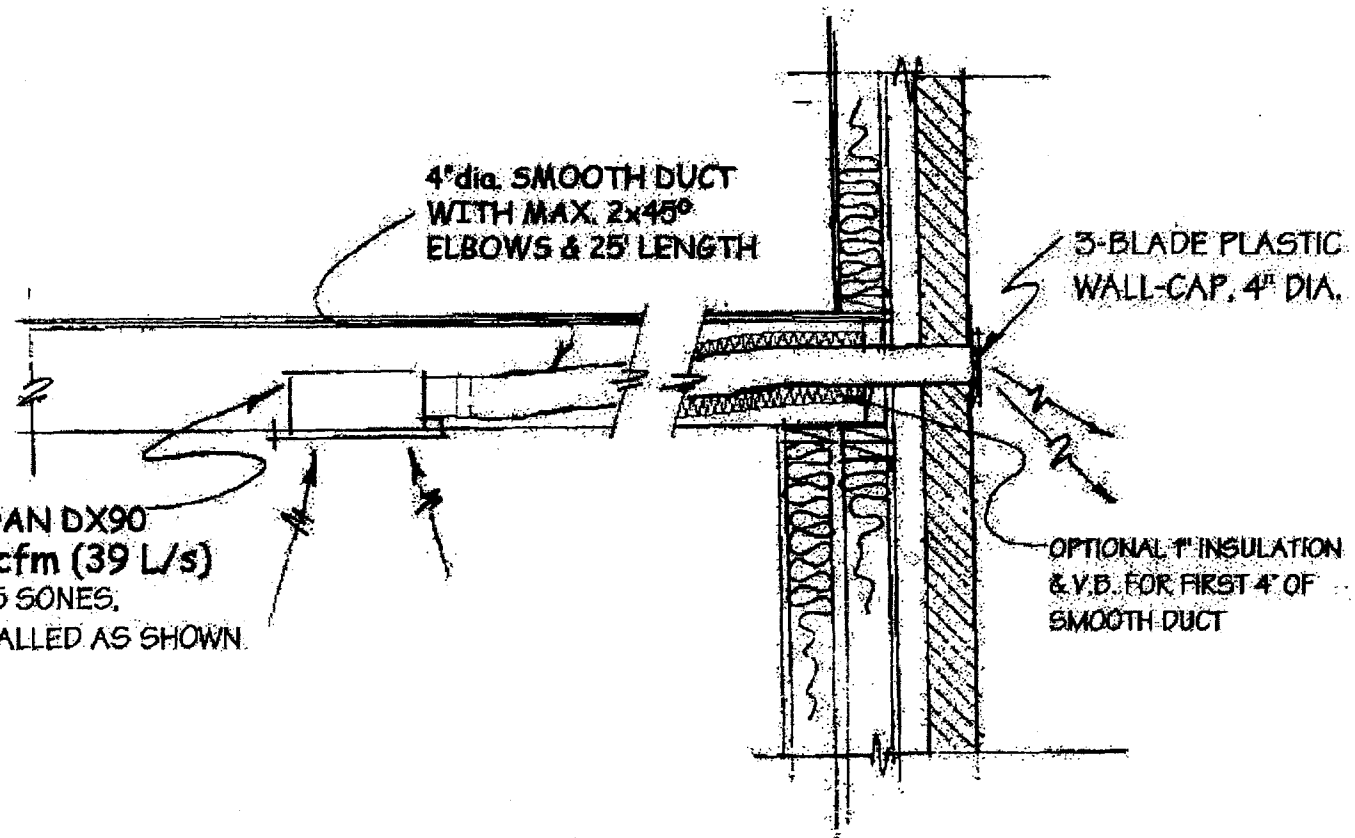
NOTE: DRAWING FOR HVAC SYSTEMS ONLY. ALL DIMENSIONS APPROXIMATE DO NOT SCALE.

DATE:	ISSUED FOR:
APRIL 4/05	PERMIT

PROJECT:

TITLE:
BASEMENT
HVAC LAYOUT

SCALE:	DWG. NO:
3/16" = 1'-0"	0412-15A



4"dia. SMOOTH x 25'.....25'
2x45o ELBOWS.....10'
WALL-CAP.....20'
=====
TOTAL EFFECTIVE LENGTH.....55'

55eq. FT @ 82 cfm = 0.23"w.g.
Broan DX90=82 cfm @0.23"w.g.

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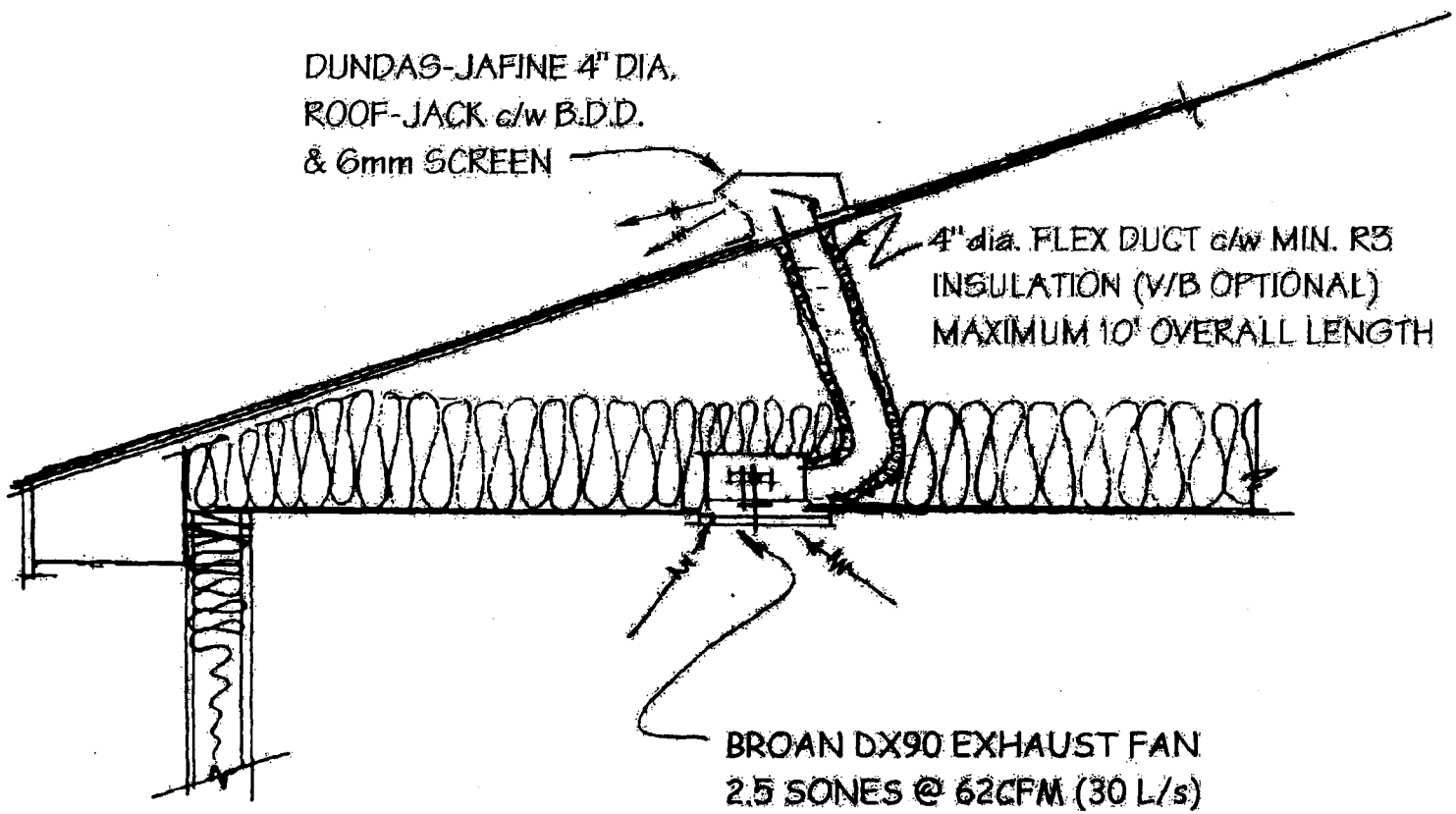
TITLE:	DRAWING NO:	SCALE:	DATE:	PROJECT:
LOWER BATH FAN	0412-15C	N.T.S	APRIL 4/05	



ROOF CAP.....60' e
10' FLEX DUCT.....20' e
90 deg. FLEX ELBOW.....20'
15 deg. FLEX ELBOW.....10' e
=====
TOTAL EFFECTIVE LENGTH.....110' e

62cfm @4"dia. @ 110' = 0.27"w.g
BROAN DX90 @ 62cfm = 0.28"w

SkillTech ACADEMY
Certificate Holder
VENTI RHLG SCHL COMBO
VENTO RASD SCDD
001[illegible]7
October 31, 2001

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TITLE:	DRAWING NO:	SCALE:	DATE:	PROJECT:
UPPER BATH FAN	0412-15D	N.T.S	APRIL 4/05	

HRAI — RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY — 0000

LOCATION OF INSTALLATION

Lot #	Plan #
Township	
Roll #	Permit #
Address	

BUILDER

Name	
Address	
City	
Tel.	Fax

INSTALLING CONTRACTOR

Name	
Address	
City	
Tel.	Fax

COMBUSTION APPLIANCES 9.32.3.1.(1)

- a) ☐ Direct vent (sealed combustion) only
- b) ☐ Positive venting induced draft (except fireplaces)
- c) ☑ Natural draft, B-vent or induced draft fireplace
- d) ☐ Solid Fuel (including fireplaces)
- e) ☐ No Combustion Appliances

HEATING SYSTEM

☑ Forced Air ☐ Non Forced Air

☐ Electric Space Heat *(if more than 10% of heating load)*

HOUSE TYPE 9.32.3.1.(2)

- ☐ I Type a) or b) appliances only, no solid fuel
- ☐ II Type I except with solid fuel (including fireplace)
- ☑ III Any Type c) appliance = Part 6 Design
- ☐ IV Electric space heat *(if more than 10% of heating load)*
- ☐ Other: No forced air = Option 4

SYSTEM DESIGN OPTION

- ☑ 1 Exhaust Only/Forced Air System
- ☐ 2 HRV with Exhaust Ducts/Forced Air System
- ☐ 3 HRV Simplified Connection to Forced Air System
- ☐ 4 HRV - Full Ducting/Not Coupled to Forced Air System
- ☑ Part 6 Design DEPRESSURIZATION TEST REQUIRED

TOTAL VENTILATION CAPACITY 9.32.3.3.(1)

Bsmt & Master Bdrm	1	@ 10L/s	10 L/s
Other Bedrooms	2	@ 5 L/s	10 L/s
Bathrooms & Kitch	3	@ 5 L/s	15 L/s
Other Rooms	6	@ 5L/s	30 L/s
NEW ROOMS ONLY		TOTAL	65 L/s

PRINCIPAL VENTILATION CAPACITY 9.32.3.4.(1)

Master Bedroom	1	@ 15L/s	15 L/s
Other Bedrooms	2	@ 7.5 L/s	15 L/s
		TOTAL	30 L/s

PRINCIPAL EXHAUST FAN CAPACITY

Model: BROAN DX90 Location ENSUITE BATH

39 L/s 2-5 Sones ☑ HVI

HEAT RECOVERY VENTILATOR

Model: N/A

___ L/s High ___ L/s Low

___ % Sensible Efficiency @ 25°C ☐ HVI

SUPPLEMENTAL VENTILATION CAPACITY

Total Ventilation Capacity	65 L/s
Less Principal Ventilation Capacity	39 L/s
required Supplemental Vent. Capacity	26 L/s

SUPPLEMENTAL FANS 9.32.3.5

LOCATION	MODEL	L/S	SONES	HVI
ENSUITE	BROAN DX90	30	2-5	✓
KITCHEN	BROAN 41000	50	7.1	✓

DESIGNER CERTIFICATION

I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.

Name	
Signature	
HRAI#	1527
Date	APRIL 4/05