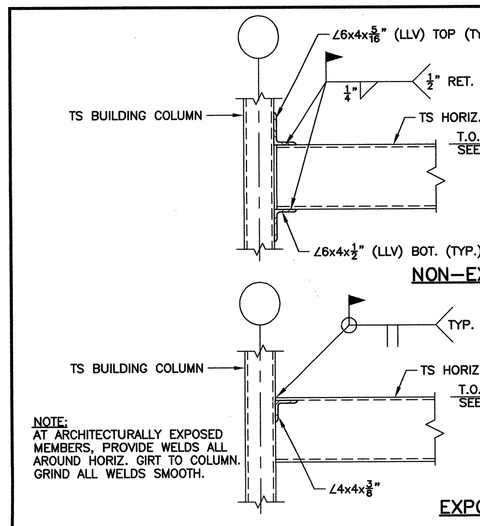
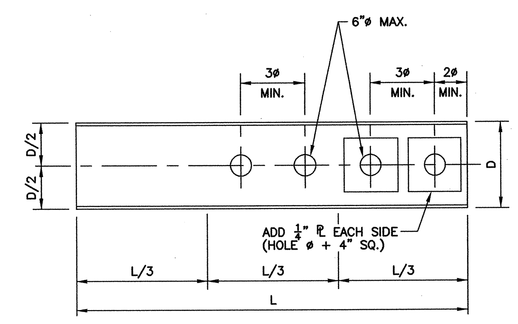


NOTE:
AT ARCHITECTURALLY EXPOSED MEMBERS, PROVIDE WELDS ALL AROUND HORIZ. GIRT TO COLUMN. GRIND ALL WELDS SMOOTH.

TYPICAL HORIZONTAL GIRT CONNECTION DETAIL

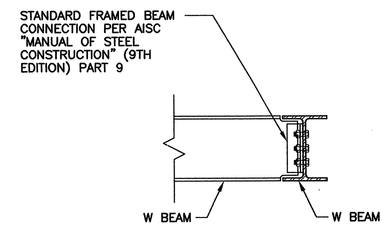
N.T.S. (1)



TYPICAL PIPE HOLE THRU BEAM DETAIL

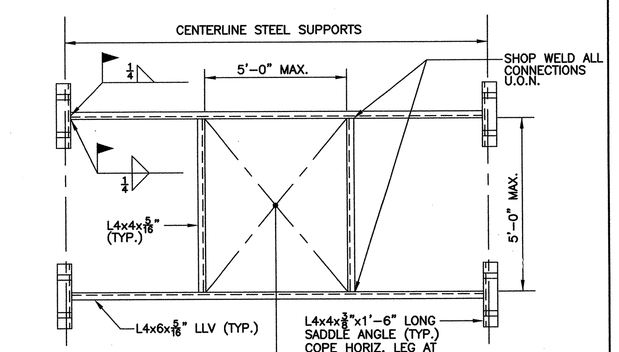
¾"=1'-0" (HOLES TO BE CUT IN FIELD BY MECHANICAL CONTRACTOR)

N.T.S. (2)



TYPICAL BEAM TO BEAM CONNECTION

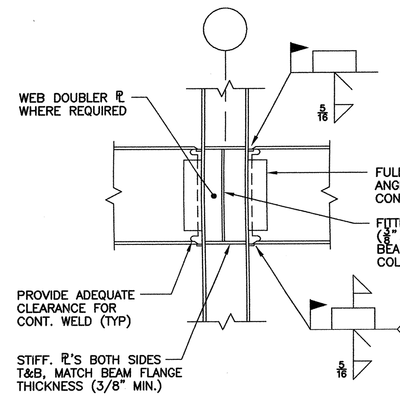
N.T.S. (3)



SEQUENCE OF CONSTRUCTION
1. CUT AND PLACE SADDLE ANGLES, DO NOT WELD IN PLACE.
2. INSTALL ANGLE FRAME AND WELD TO SADDLE ANGLES.
3. TACK WELD SADDLE ANGLES TO EXISTING STRUCTURE.

REINFORCED OPENING AND MECHANICAL EQUIPMENT SUPPORT FRAME AT EXISTING ROOF DECK

N.T.S. (4)

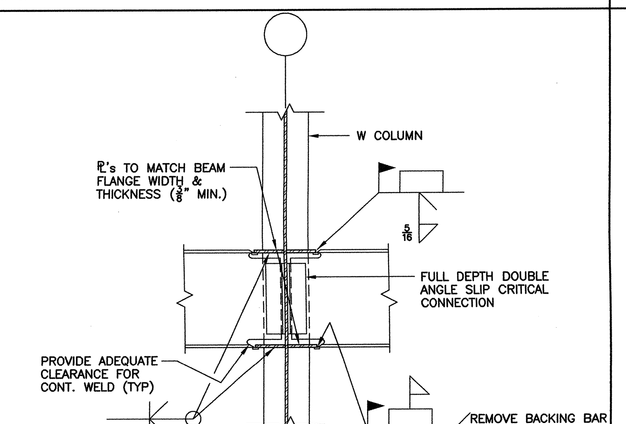


NOTE:
MOMENT CONNECTION WELD METAL TO HAVE A MINIMUM CHARPY V-NOTCH VALUE OF 20 FT-LBS AT 40 DEG. F. SEE 780 CMR 2203.2.1 (MASS CODE)

TYPICAL MOMENT CONNECTION AT FLOOR

(BEAM TO COLUMN FLANGE)

N.T.S. (6)

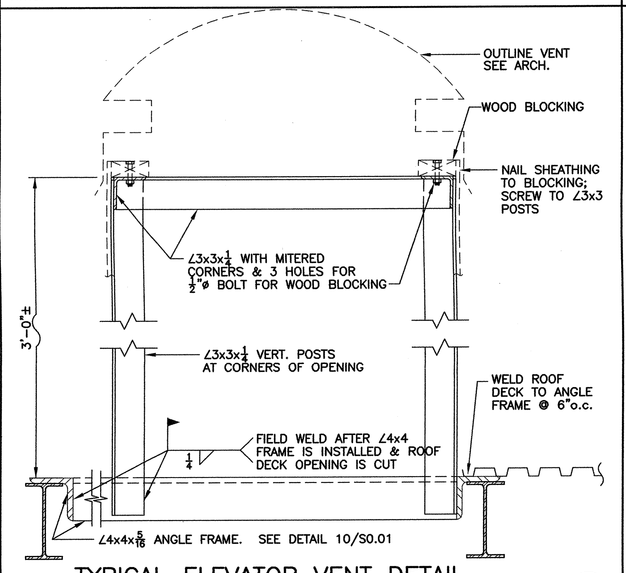


NOTE:
MOMENT CONNECTION WELD METAL TO HAVE A MINIMUM CHARPY V-NOTCH VALUE OF 20 FT-LBS AT 40 DEG. F. SEE 780 CMR 2203.2.1 (MASS CODE)

TYPICAL MOMENT CONNECTION AT FLOOR

(BEAM TO COLUMN WEB)

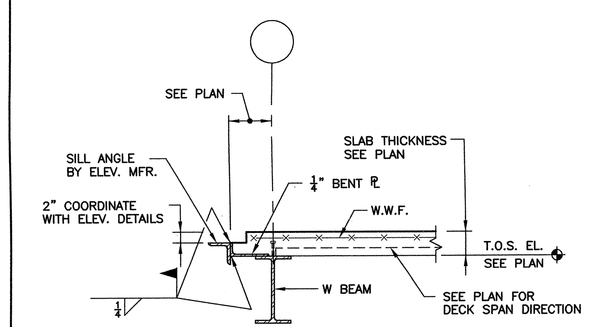
N.T.S. (7)



TYPICAL ELEVATOR VENT DETAIL

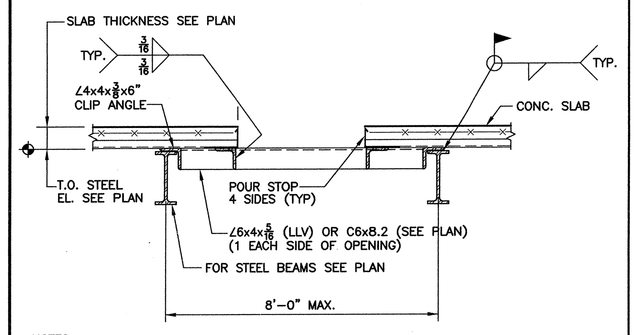
(COORD. SIZE AND LOCATION WITH ARCH. DWG'S)

N.T.S. (8)



NOTE: PROVIDE ½" BENT PLATE WITH 5" VERT. LEG ALL AROUND ELEV SHAFT. SEE PLAN FOR E.O.S. DIMENSION (TYP.)

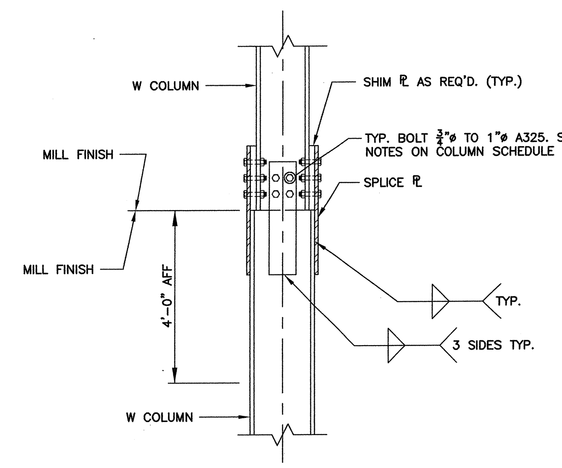
N.T.S. (9)



NOTES:
1. FLOOR FRAMES MUST BE IN PLACE BEFORE INSTALLING DECK.
2. LARGER OPENINGS TO BE FRAMED WITH BEAMS.
3. CIRCULAR OPENINGS UP TO 14" DIA. MAY BE CORED.

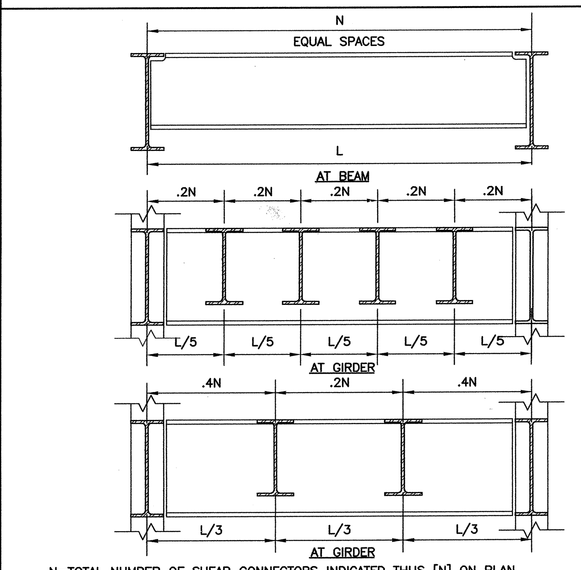
TYPICAL OPENING THROUGH CONCRETE FLOOR

N.T.S. (11)



TYPICAL COLUMN SPLICE

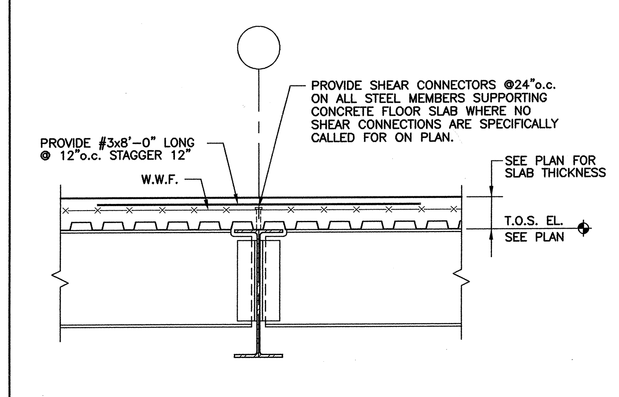
N.T.S. (12)



N=TOTAL NUMBER OF SHEAR CONNECTORS INDICATED THUS [N] ON PLAN
L=SPAN OF MEMBER ℄ TO ℄ OF SUPPORT

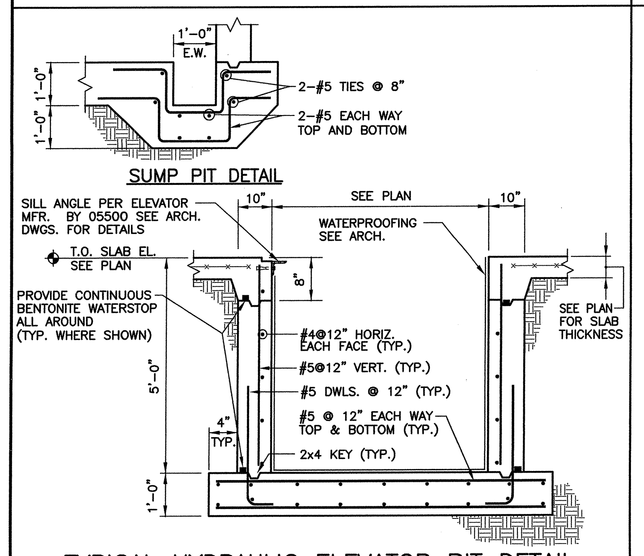
TYPICAL SHEAR CONNECTOR DISTRIBUTION DETAILS

N.T.S. (13)



TYPICAL REINFORCING AT COMPOSITE DECK PARALLEL TO BEAM SPAN

N.T.S. (14)

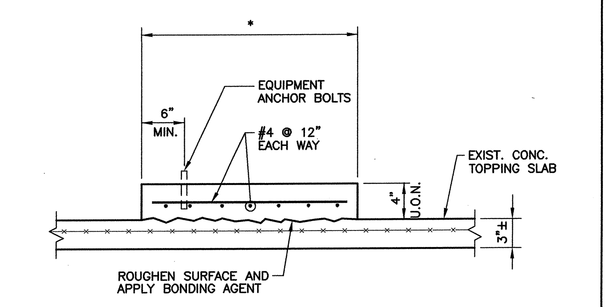


SUMP PIT DETAIL

TYPICAL HYDRAULIC ELEVATOR PIT DETAIL

(EXISTING)

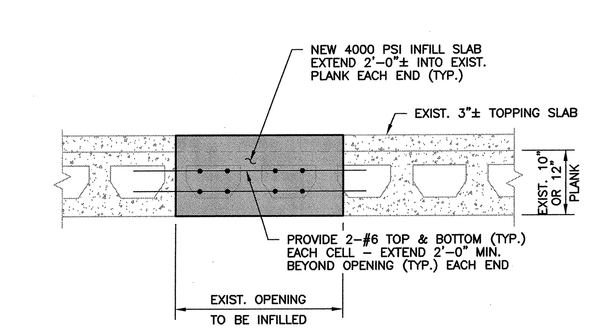
N.T.S. (16)



NOTE:
* SEE MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DRAWINGS FOR EQUIPMENT REQUIRING HOUSEKEEPING PADS. COORDINATE SIZE OF PADS WITH THE SPECIFING AGENT AND THE EQUIPMENT VENDOR.

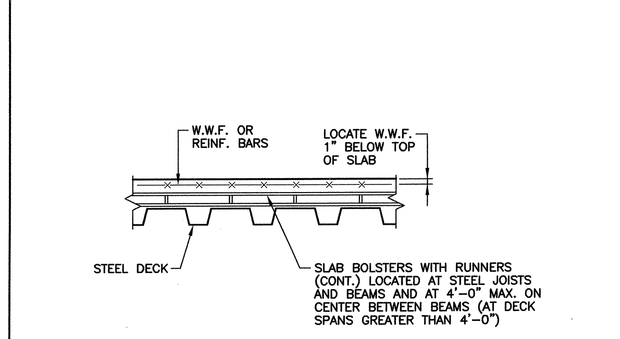
TYPICAL HOUSEKEEPING PAD DETAIL

N.T.S. (17)



TYPICAL PRECAST PLANK INFILL DETAIL

N.T.S. (18)



TYPICAL SLAB ON STEEL DECK

N.T.S. (19)

GENERAL NOTES

Structural drawings shall be used in conjunction with the architectural, mechanical, electrical, plumbing and shop drawings, and specifications.

All dimensions and conditions must be verified in the field, and any discrepancies shall be brought to the attention of the architect before proceeding with the affected portion of the work.

Shop drawings for reinforcing steel (including accessories), structural steel, precast plank, and pre-engineered wood trusses, shall be submitted to the architect, and a stamped approval received before fabrication can proceed. Erection shall be executed from approved shop drawings only.

A complete concrete placement schedule shall be submitted to the architect and a stamped acceptance received before any concrete placement can be made.

Unless otherwise noted, details shown on any drawings are to be considered typical for all similar conditions.

CODE

BOCA 1999 NATIONAL BUILDING CODE

DESIGN LOADS

SNOW: Pf = CeIPg; Pg = 70 PSF, Ce = .70, I = 1.0 (Pf = 49 PSF)

LIVE LOADS:

Public Rooms:	100 PSF
Stairs:	100 PSF
Storage/ Equipment Rooms:	100 PSF
Corridors:	80 PSF
Classrooms:	100 PSF

Wind: Basic Wind Speed: 90 MPH, I = 1.0, Exposure B
Main Building Design Pressures:

0-15'	20 PSF
20'	21 PSF
25'	22 PSF
30'	23 PSF
40'	25 PSF
50'	25 PSF
60'	26 PSF
70'	27 PSF
80'	28 PSF

Design Pressures for Cladding: Per Specifications.

SEISMIC:

V = CsW: W includes 20% of the snow load, plus 10 PSF partition allowance

Cs= $\frac{1.2AvS}{RT^{2/3}}$; Aa=Av=0.10; S=1.0; R=5.0; T=.53;

Seismic Hazard Exposure Group I; Exposure Category B;

CONCRETE

Concrete shall be a mix designed for ultimate strength concrete in accordance with ACI 211.1 to achieve the following 28-day compressive strengths:

Concrete slab on metal deck	3500 PSI, Normal Weight
Housekeeping pads	4000 PSI, Normal Weight.

No pipe shall pass through concrete without permission of the architect. Steel pipe sleeves shall be provided and spaced a minimum of three diameters apart.

Keys shall be 2" x 4", with beveled sides, unless otherwise noted.

Horizontal construction joints shall be as indicated on the drawings. Vertical construction joints in foundation walls shall be at approximately 50' o.c. and shall be approved by the architect. Construction joints shall be formed with a key, and reinforcing shall be lapped to develop the full tension capacity of the (smaller) bar.

Openings in concrete walls shall be located, sized and reinforced (with the exception of small openings and/or sleeves of a size that will not displace or interrupt the continuity of the reinforcing) as shown on respective details. Any alterations require approval of the structural engineer.

REINFORCING STEEL

Reinforcing steel shall be deformed bars, free from loose rust and scale, and conforming to ASTM A615, Grade 60.

Welded-wire fabric shall be deformed wire conforming to ASTM-A497. Lap two squares at joints and tie at 3'-0" o.c. Furnish WWF in flat sheets.

Welded wire fabric shall be supported on precast plank with continuous bolsters at 36" o.c.

Clear concrete cover over bars shall be as follows (see ACI 318 for conditions not noted):

Topping slabs (over precast plank)	1 inch (top)
Framed Slabs	3/4 inches (top & bottom)

Accessories shall have upturned legs and be plastic-dipped after fabrication. Accessories for reinforcing shall be in accordance with ACI current edition.

Lap reinforcing to develop the full tension capacity of the (smaller) bar.

No bars shall be cut or omitted in the field because of sleeves, duct openings or recesses. Bars may be moved aside without change in level with the prior approval of the architect.

STRUCTURAL STEEL

Fabricate and erect structural steel in accordance with the "Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design," and the "Code of Standard Practice" of the AISC. Welding shall conform to the requirements of the "Structural Welding Code" of the American Welding Society.

Structural steel wide flange shapes shall conform to ASTM, A572 or A992, Grade 50 except as noted, steel tubing shall conform to ASTM A500, Grade B.

Bolted connections shall be made with three-quarters inch diameter high strength, ASTM A325-N bolts, unless otherwise noted. Bolted connections at moment connections, all beam-to-column connections, column splices and hangers shall be made with three-quarters inch diameter A325-SC (Slip critical) bolts, unless otherwise noted.

Shop connections may be welded or bolted. Unless otherwise noted, beam connections shall provide shear capacity to support a reaction R equal to half the total uniform load capacity of beam for given shape, span and steel specification (AISC) with effect of concentrated loads accounted for.

Anchor bolts shall be ASTM A307 headed bolts of the diameters and dimensions detailed, unless otherwise noted on the drawings. Anchor bolts shall be set by template. High strength (HS) anchor bolts shall be ASTM A449 headed bolts.

Welding electrodes shall conform to AWS A5.1 E70XX series with proper rod to produce optimum weld (low hydrogen).

Unless otherwise noted, bolted connections with slotted holes shall be field-welded with one-quarter inch fillet welds after final field adjustment.

Provide 3/8" minimum stiffener plates each side at beams framing over columns and at beams supporting columns above.

Provide 1/4" thick leveling plate under all column base plates unless otherwise noted. Leveling plates shall be set and grouted prior to erecting columns.

Provide all angles, plates, anchors, bolts, etc., shown on architectural drawings.

Lintels for exterior masonry and structural steel exposed to weather shall be hot-dip galvanized according to ASTM A123.

Provide ∠4x4x3/8 slab support angle as required at columns where structural members do not frame in at all four sides.

The following load factors shall be applied to the composite beam end reactions determined from the uniform load capacity noted above multiplied by the appropriate load factor (F) identified below.

F=1.2	F=1.3	F=1.0
W14x22	W18x35	W10x12
W14x26	W18x40	W12x16
W16x45	W18x46	W12x26
W18x36	W21x44	
W16x31	W21x50	
W16x40		

METAL DECK

Galvanized metal deck shall be formed of steel sheets conforming to ASTM A653. Galvanized coating shall conform to ASTM Specification A 653-G60.

Composite floor deck shall be 2" deep, 20 gage galvanized steel deck with the following minimum properties per foot:

I = .409in.^{4}
Sp = .353 in.^{3}
Sn = .383 in.^{3}

Floor form deck shall be 9/16 inch deep, 26 gage (minimum), painted steel units with the following minimum section properties per foot:

I = .015 in.^{4}
Sp = .046 in.^{3}
Sn = .047 in.^{3}

Metal roof deck shall be 1½" deep, 36" wide, 20 gage, galvanized Type B metal deck with the following minimum properties per foot:

Ip	= .22 in.^{4}
In	= .24 in.^{4}
Sp	= .25 in.^{3}
Sn	= .26 in.^{3}

Weld composite floor deck 12 inches on center to all structural supports with 5/8 inch or larger puddle welds. Weld deck around openings at 6 inches on center. Screw side lap joints at 24 inches maximum on center.

Unless otherwise noted, weld roof deck sheets 12 inches on center to all structural supports with 5/8 inch or larger puddle welds unless otherwise noted on drawings. weld deck around openings, along braced frame column lines, and around the building perimeter at 6 inches on center including the sides of the deck. Provide sidelap screws at 1/3 joints of the deck span (2 screws per span).

See specifications for additional attachment criteria.

SHEAR STUD PLACEMENT

A. At beams (deck is perpendicular to beam) where there are more studs than ribs, place a double (or triple, if required) row of studs starting at each end of the beam and working toward the center. There should be at least one stud per rib before a double row is required and two studs per rib before a triple row is required.
B. At beams where there are fewer studs than ribs, place one stud at every third rib and then fill in empty ribs starting at each end of the beam, and working towards the center.
C. In general, if studs can not be placed with a uniform spacing along the beam, the greatest number of studs should occur at the ends of the beam, with an equal number of studs on each side of the centerline of the beam.
D. At girders (deck is parallel to beam), place the first stud approximately 12" from the column centerline and work toward the center with uniform spaces between studs. Where stud patterns are noted on the drawings, place the number of studs indicated with a uniform spacing between the beams framing to the girder.
E. If a double (or triple) row of studs is required, place the studs in a staggered pattern rather than side by side.
F. Where no studs are specifically noted on plan, provide studs at 24"o.c. on all steel beams supporting composite floor slabs.

STRUCTURAL DRAWING LIST

S0.02 GENERAL NOTES AND TYPICAL DETAILS
S1.01 EXISTING BASEMENT FLOOR PLAN
S1.11 EXISTING FIRST FLOOR FRAMING PLAN
S1.21 EXISTING SECOND FLOOR FRAMING PLAN
S1.31 EXISTING ROOF/ NEW THIRD FLOOR FRAMING PLAN
S1.41 NEW FOURTH FLOOR FRAMING PLAN
S1.51 NEW FIFTH FLOOR FRAMING PLAN
S1.61 NEW ROOF FRAMING PLAN
S2.01A COLUMN SCHEDULE AND DETAILS
S2.03 BRACING ELEVATIONS AND DETAILS
S4.01 SECTIONS AND DETAILS
S4.02 SECTIONS AND DETAILS

SMMA
SYMMES MAINI & MCKEE ASSOCIATES
1000 Massachusetts Avenue
Cambridge, Massachusetts 02138
617.547.5400 Fax 617.354.5758

OWNER REVIEW

NAME	DATE

NO.	DATE	DESCRIPTION
0	2-20-04	CONTRACT DOCUMENTS

ISSUE LOG
△ = CLOUDED CHANGE

UNIVERSITY OF SOUTHERN MAINE
SCIENCE BUILDING RESEARCH WING EXPANSION
70 Falmouth Street
Portland, Maine

GENERAL NOTES AND TYPICAL DETAILS

SCALE	AS NOTED
DRAWN BY	TMM
CHECKED BY	
PROJ. ARCH. / ENGR.	PPL
PROJ. MGR.	RCH
JOB NO.	03049.00

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S0.02