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ABBREVIATIONS

A.B. - - - - - - - - Anchor Bolt
A.F.F. - - - - - - Above Finished Floor
ARCH. - - - - - - - Architectural
BP - - - - - - - - Base Plate, Bearing Plate
BLDG - - - - - - - Building
BLK - - - - - - - - Block
BM. - - - - - - - - Beam
BOT. - - - - - - - -Bottom
B/STL. - - - - - - -Bottom of Steel
BRDG. - - - - - - - Bridging
BRG. - - - - - - - -Bearing
BTJ - - - - - - - - Bolted Tie Joist
CANT'L - - - - - Cantilever
C.I.P. - - - - - - - Cast in Place
C.J. - - - - - - - - Control Joint
CL - - - - - - - - Centerline
CLR - - - - - - - - Clear
CMU - - - - - - - - Concrete Masonry Unit
COL. - - - - - - - -Column
CONC. - - - - - - - Concrete
CONNX. - - - - - - Connection
CONSTR. - - - - - -Construction
CONT. - - - - - - - Continuous
CTSK - - - - - - - Countersink
C.Y. - - - - - - - - Cubic Yard
DET. - - - - - - - - Detail
DIAG. - - - - - - - Diagonal
DIA. - - - - - - - - Diameter
DJ - - - - - - - - - Double Joist
DK. - - - - - - - - -Deck
D.L. - - - - - - - - Dead Load
DWG. - - - - - - - Drawing
DWLS - - - - - - - Dowels
EA. - - - - - - - - -Each
E.F. - - - - - - - - Each Face
E.J. - - - - - - - - -Expansion Joint
ELEV. - - - - - - - Elevation or Elevator
E.S. - - - - - - - - Each Side
EQ. - - - - - - - - Equal
EQUIP. - - - - - - -Equipment
E.W. - - - - - - - - Each Way
EXP. - - - - - - - - Expansion
(E) or EXIST. - - -Existing
EXT. - - - - - - - - Exterior
F/BLDG. - - - - - -Face of Building
F/CONC. - - - - - -Face of Concrete
F.D. - - - - - - - - Floor Drain
FIN. - - - - - - - - Finish
FLG. - - - - - - - - Flange
FLR. - - - - - - - - Floor
F.S. - - - - - - - - Far Side or Footing Step
FT. - - - - - - - - -Feet
FTG. - - - - - - - - Footing
FV - - - - - - - - -Field Verify
GA. - - - - - - - - Gauge
G.B. - - - - - - - - Grade Beam
GALV. - - - - - - - Galvanized
HD'D. - - - - - - - -Headed
HORIZ. - - - - - - -Horizontal
I.F. - - - - - - - - -Inside Face
INT. - - - - - - - - Interior
J/B - - - - - - - - Joist Bearing
JST. - - - - - - - - Joist
JT. - - - - - - - - -Joint
k - - - - - - - - - -Kip (1000 lbs.)
L.L. - - - - - - - - -Live Load
LLH - - - - - - - - Long Leg Horizontal
LLV - - - - - - - - Long Leg Vertical
LW - - - - - - - - -Long Way
MAS. - - - - - - - -Masonry
MC - - - - - - - - -Moment Connection
MECH. - - - - - - - Mechanical
MFR. - - - - - - - - Manufacturer
MTL - - - - - - - - Metal
(N) - - - - - - - - - New
(NIC) - - - - - - - - Not in Contract
N.S. - - - - - - - - Near Side
NTS - - - - - - - - Not to Scale
O.C. - - - - - - - - On Center
O.F. - - - - - - - - Outside Face
O/O - - - - - - - - Out to Out
OPNG - - - - - - - Opening
OPP. - - - - - - - - Opposite
P.A.F. - - - - - - - Powder Actuated Fastener
PC - - - - - - - - - Precast Concrete
PL - - - - - - - - - Plate
PLCS. - - - - - - - Places
PPT - - - - - - - - Pressure Preservative Treated
PSF - - - - - - - - Pounds/Square Foot
PSI - - - - - - - - -Pounds/Square Inch.
PVMT. - - - - - - - Pavement
RAD. - - - - - - - -Radius
R.D. - - - - - - - - Roof Drain
REINF. - - - - - - -Reinforcing
REQ'D. - - - - - - -Required
RET. - - - - - - - - Retaining
SECT. - - - - - - - Section
SIM. - - - - - - - - Similar to
S.O.G. - - - - - - - Slab on Grade
SPCS. - - - - - - - Spaces
SQ. - - - - - - - - Square
S.S. - - - - - - - - Stainless Steel
STIFF. - - - - - - - Stiffener
STL. - - - - - - - - Steel
STRUCT. - - - - - -Structural
SW- - - - - - - - - Short Way
SYM. - - - - - - - -Symmetrical
T/ - - - - - - - - - Top of
T&B - - - - - - - - Top and Bottom
TYP. - - - - - - - - Typical
UNO - - - - - - - - Unless Noted Otherwise
VERT. - - - - - - - Vertical
W.P. - - - - - - - - Work Point
W.W.F. - - - - - - -Welded Wire Fabric
W/ - - - - - - - - -With

STRUCTURAL GENERAL NOTES

Governing Code: 2015 IBC with Local Amendments

Building Occupancy (IBC Table 1604.5) Risk Category II

LIVE LOADS

Roof	20 psf	
Public Areas	100 psf	Stores, Retail, First Floor

SNOW DESIGN DATA

Drifting, Sliding and Unbalanced Snow Loads per ASCE 7

Is	1.0	
Ct	1.0	
Ce	1.0	
Pg	10 psf	Ground Snow Load
Rain on Snow Surcharge	N/A	

WIND DESIGN DATA

Vult	115 mph	Ultimate Design Wind Speed
Vasd	90 mph	Nominal Design Wind Speed
Exposure	C	
GCpi	±0.18 psf	Internal Pressure Coefficient

Components and Cladding Pressures (psf)

Effective Wind Area (sq. ft.)	ZONE									
	ROOF						WALL			
	1		2		3		4		5	
10	+16.0	-23.8	+16.0	-39.9	+16.0	-60.1	+23.8	-25.8	+23.8	-31.9
20	+16.0	-23.2	+16.0	-35.7	+16.0	-49.8	+22.7	-24.7	+22.7	-29.7
50	+16.0	-22.4	+16.0	-30.1	+16.0	-36.1	+21.3	-23.3	+21.3	-26.9
100	+16.0	-21.8	+16.0	-25.8	+16.0	-25.8	+20.2	-22.2	+20.2	-24.7
500							+17.7	-19.8	+17.7	-19.8

SEISMIC DESIGN DATA

Ie	1.0	
Ss	0.2028g	Mapped MCE, 5% damped, 0.2 second acceleration factor
S1	0.10g	Mapped MCE, 5% damped, 1.0 second acceleration factor
Site Class	D	Assumed per ASCE 7, Section 11.4.2
Sds	0.243g	Design, 5% damped, 0.2 second acceleration factor
Sd1	0.159g	Design, 5% damped, 1.0 second acceleration factor
Seismic Design Category	C	ASCE 7, Section 11.6
Basic Seismic Force Resisting System(s)		Existing Masonry Shear Walls
V	0.19W	Existing Unfactored Seismic Base Shear
Cs	0.1216	Seismic Response Coefficient
R	2	Response Modification Factor
Analysis Procedure	N/A	Increase in W less than 5%

GENERAL:

1. The structure is designed to be self-supporting and stable after the building is completed and materials have attained their design strengths. It is the sole responsibility of the contractor to determine erection procedure and sequence to insure the safety of construction personnel, property, and component parts during all phases of construction. This responsibility includes the use of whatever shoring, temporary bracing, etc. that may be necessary. Fall protection support from perimeter columns shall be provided in accordance with OSHA requirements.
2. The contractor shall perform all construction for the project in a manner and sequence that are based on accepted industry standards that recognize the interaction of the components that comprise the structure, without causing distress, unanticipated movements or irregular load paths as a result of the construction means and methods employed.
3. Details labeled "typical details" on drawings apply to situations occurring on the project that are the same or similar to those specifically detailed. Such details apply whether or not details are referenced at each location. Notify engineer of conflicts regarding applicability of "typical details".
4. Work these drawings with architectural, mechanical, plumbing and electrical drawings.
5. Do not scale drawings.
6. Contractors shall familiarize themselves with all proprietary products shown on the drawings. Such products shall be installed per the manufacturer's printed instructions unless shown otherwise in the details.
7. Prior to start of construction, contractor shall verify all existing construction, elevations and conditions. Any conditions discovered to be in variance with design documents shall be brought to the attention of the Architect immediately.
8. Contractor is responsible for protecting all existing construction to remain. Any damage caused by the Contractor shall be repaired or replaced to the satisfaction of the Owner and Architect at no cost to the Owner.
9. All structural building code requirements, standards, and specifications referenced are for the year referenced in the governing building code noted.
10. Shop drawings and other submittals:
    a. Submittals shall be checked and coordinated with other materials and trades by the general contractor and shall bear the contractor's review stamp with the checker's initials and date prior to being submitted to the architect for approval.
    b. General contractor's schedule shall allow for a minimum of 10 work days for architect's review and return of all submittals unless noted otherwise.
    c. Where dimensions or elevations of existing construction could affect the new construction, it is the contractor's responsibility to make field measurements for incorporation in the shop drawings.

CAST-IN-PLACE CONCRETE:

1. All concrete work is to be in accordance with Specifications for Structural Concrete for Building ACI 301 and ACI 302, 305 and 306 for the referenced year in the building code noted, unless noted otherwise.
2. All detailing, fabrication and placing of reinforcing bars shall conform to ACI 318, "Building Code Requirements for Structural Concrete", ACI 117, and the latest ACI detailing manual, unless noted otherwise.
3. Admixtures:
    a. Use high range water reducer (HRWR) for all slabs on grade and slabs on metal form.
    b. Use an approved air entraining agent for all concrete exposed to weather or vehicular traffic. Use 6% entrained air, plus 1% minus 1.5%.
    c. The use of calcium chloride or admixtures containing chlorides is prohibited.
    d. Use an approved water reducing agent or high range water reducer for all concrete except footings.
    e. Fly ash: A maximum of 15% by weight of the total cementitious material may consist of Type F flyash conforming to ASTM C618. This amount shall be used in calculating the water-cement ratio. Contractor's schedule shall account for longer curing times required.
4. Reinforcing Steel:
    a. Deformed bars per ASTM A615, Grade 60.
    b. Bars for welding to structural steel per ASTM A706.
    c. Epoxy - coated reinforcing bars per ASTM A934 for use in frost slabs.
    d. Lap reinforcement 40 diameters unless otherwise noted.

Bar	Minimum Lap (inches)
#3	15
#4	20
#5	25
#6	30

    e. Provide all accessories necessary to support reinforcement per CRSI recommendations.
    f. Welded wire fabric per ASTM A1064. Use mats only.
    g. Welded wire fabric in slab on grade shall be supported by "Mesh-Ups" as manufactured by Lotel, Inc. or approved equal. Use one 2 inch mesh up per 3 square feet.
    h. Minimum clearance for placement for reinforcing steel.
       1. Cast against and permanently exposed to earth - - - - - - - - - - - - - - 3"
       2. Exposed to earth or weather:
          #5 and smaller - 1 1/2"
          #6 and larger - 2"
       3. Not exposed to weather or in contact with the ground:
          Slabs and walls, #11 and smaller - - - - - - - - - - - - - - - - - - - 3/4"
          Beams, girders, columns, principle reinforcement, ties and stirrups - - 1 1/2"
          Slabs on grade - 1 1/2"
5. Concrete Type Schedule:

LOCATION	STRENGTH	MAX SLUMP	COMMENTS
Slabs on grade, interior	4000	3"/7"	with HRWR, WWF
Slabs on grade, exterior	4000	3"/7"	with HRWR, Air
Grout for Masonry cores	3000	9"	3/8" max. aggregate

6. Cure all slabs using a moisture retaining cover or wet cure procedures.
7. Concrete mixes shall be proportioned in accordance with ACI 301. Interior slabs shall contain a minimum cement content of 520 lbs/cu.yd. and the maximum size aggregate blend permitted by ACI 301 Section 4.2.2.3.
8. Plastic contraction joint former shall be SureJoint by SureVoid Products. They shall be used in slabs receiving floor coverings.
9. Submittals:
    a. Submit ASTM C39 compressive strength test results for a minimum of four (4) samples of each proposed mix indicating 7 and 28 day compressive strength (psi).
    b. Submit data for proprietary material and items including admixtures, curing compound, inserts etc.
    c. Submit shop drawing of reinforcement, show bar schedules and diagrams together with placement drawings. Comply with ACI 315.
    d. Submit proposed concrete mix design including data on aggregates and cement. Submittals that omit intended Location of proposed concrete mix will be rejected without review. Submittals shall include field strength test record data for specified mixes per ACI 318, Chapter 5 and ACI 301, Section 4.2.3.4.

STRUCTURAL STEEL:

1. Detailing, fabrication and erection shall be in accordance with the latest specifications of the American Institute of Steel Construction.
2. General Contractor shall verify all mechanical unit weights and locations and coordinate opening sizes and dimensions with mechanical contractor and vendor's drawings for actual mechanical unit purchased.
3. Bolts shall be per ASTM F3125, Gr. A325, 3/4" diameter - (bearing) type connections unless otherwise noted.
4. Anchor bolts into concrete or masonry shall be per ASTM A36 or ASTM F1554, Grade 36.
5. All welding to be performed in accordance with latest AWS specifications. Electrodes to be E70XX coated type, low hydrogen classification..
6. All Structural tubing shall be per ASTM A847 weathering steel.
7. All other structural and miscellaneous steel including but not limited to angles, channels, bearing plates, base plates, cap plates, etc., per ASTM A36.
8. Lintel beams built into exterior masonry walls shall be hot dip galvanized per ASTM A123.
    a. Oversized lintels to be painted with zinc rich primer and high build epoxy finish.
11. Exterior steel below grade shall be coated with coal tar epoxy 16 mil minimum DFT.
12. Submittals: Shop and Erection drawings shall be submitted for approval prior to fabrication according to Section 4 of the AISC Code of Standard Practice.

COLD FORMED METAL FRAMING:

1. Cold formed, light gage metal framing including studs, joists, rafters, and tracks shall be per ASTM A653, with a G60 coating.
2. Minimum yield stress (Fy) for 16ga members & heavier = 50 ksi.
   Minimum yield stress (Fy) for members lighter than 16ga = 33 ksi.
3. Minimum sizes shown on drawings are as identified by The Steel Stud Manufacturers Association (SSMA).

SSMA STUD DESIGNATION

600 S 162 - 54

- MEMBER DEPTH: 6" = 600 x 0.01"
- STYLE: S = STUD OR JOIST, T = TRACK
- FLANGE WIDTH: 1 5/8" = 1.625" = 162 x 0.01"
- MATERIAL THICKNESS

THICKNESS CONVERSION	
33 mil	20 ga
43 mil	18 ga
54 mil	16 ga
68 mil	14 ga
97 mil	12 ga
118 mil	10 ga

4. Partitions and curtain walls shall have deflection tracks with a minimum of 1" deflection unless otherwise noted.
5. Minimum sections for construction.
    a. Exterior non-load bearing walls: 600S162-54.
    b. Interior non-load bearing walls: 400S162-33.
6. Unpunched members shall be used for all joists, headers, and accessories. Punchouts in studs shall be a minimum of 10" from the end of the stud.
7. No splices in studs, joists or headers may be made.
8. Light gauge connections (Unless noted otherwise):
    a. To light gauge: #10-16 TEK screw x 5/8" long.
    b. To structural steel: #12-24 TEK screw x 1 1/4" long. Penetration of screws shall not be less than 3 exposed threads. Or Hilti powder actuated fasteners, X-U with 0.157" dia. shank and 1 3/8" dia. washer. Full penetration in steel, 1 1/2" minimum edge distance and spacing.
    c. To concrete: Hilti powder actuated fasteners, X-U with 0.157" dia. shank and 1 3/8" dia. washer. 1 1/4" minimum penetration, 3" minimum edge distance and 4" minimum spacing.
9. Proprietary accessories called for in the typical details are manufactured by The Steel Network (TSN); Substitutes of equal or greater value may be made with prior approval of engineer.
10. Submittals:
    a. Submit shop drawings showing layout, spacing, sizes, and types of framing, fastening, and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, strapping, bracing, bridging accessories and connection details.

SPECIAL INSPECTIONS:

1. The owner shall obtain, in addition to the regular inspections conducted by the department of building safety, special inspection and testing services and provided by an approved independent testing laboratory per ASTM E329. Reports shall be sent directly to the Owner, Architect, Structural Engineer and Contractor. Concrete test reports shall also be sent to ready mix supplier. These services shall include the following:

   Concrete:
   During the taking of test specimens and placing of reinforced concrete (except slabs on grade).

   Reinforcing steel:
   For conformance with the approved plans prior to the closing of forms or the delivery of concrete to the job site.

   Structural Welding:
   Verify the materials, qualifications of welding procedures and welders prior to the start of work and provide periodic inspections of work in progress and a visual inspection of all welds (including welding of metal roof deck, if any) prior to completion of work. Inspection is not required for welding performed in an approved fabricator's shop.

2. The special inspector shall be a qualified person who shall demonstrate his/her competence to the satisfaction of the building official for inspection of the particular type of construction or operation requiring special inspection.

3. Duties and responsibilities of the special inspector:

   Observe the work assigned for conformance to the approved contract documents. The inspector may not alter, modify, enlarge or waive any of the requirements of the contract documents.

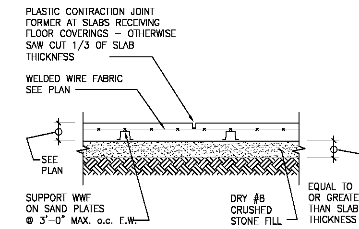
   Furnish inspection reports to the owner, the building official, and the design professional of record. All discrepancies shall be brought to the immediate attention of the contractor for correction, then, if uncorrected, submit a complete list of all outstanding discrepancies on a weekly basis to the owner, the building official, and the design professional of record until all corrections have been completed.

   Submit a final signed report stating whether the work requiring special inspections was, to the best of the special inspector's knowledge, in conformance with the approved contract documents and the applicable workmanship provisions of the building code.

4. Structural Observation (as defined in chapter 17 of the building code) is not required.

5. Where special inspection requirements duplicate the requirements of other specified testing, duplicate inspections shall not be required.

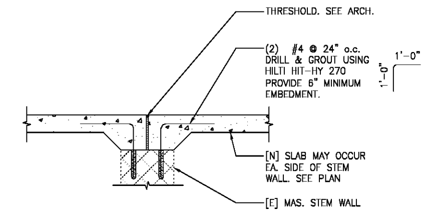
VERIFICATION AND INSPECTION TASKS PER IBC 2015	CONTINUOUS INSPECTION	PERIODIC INSPECTION	REFERENCED STANDARD
STRUCTURAL STEEL SPECIAL INSPECTIONS PER REQUIREMENTS OF AISC 360 (IBC SECTION 1705.2.1)			
CONCRETE CONSTRUCTION (SECTION 1705.3 AND TABLE 1705.3)			
1. INSPECTION OF REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT		X	ACI 318: CH. 20, 25.2, 25.3, 26.6
2. REINFORCING BAR WELDING:			
A. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706		X	AWS D1.4 ACI 318: 26.6.4
B. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16"		X	
C. INSPECT ALL OTHER WELDS	X		
3. INSPECTION OF ANCHORS CAST N CONCRETE		X	ACI 318: 17.8.2
4. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS			
A. ADHESIVE ANCHORS INSTALLED HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS	X		ACI 318: 17.8.2.4
B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4A		X	ACI 318: 17.8.2
5. VERIFYING USE OF REQUIRED DESIGN MIX		X	ACI 318: CH. 19, 26.4
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X		ASTM C 172 ASTM C 31 ACI 318: 26.4, 26.12
7. INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	X		
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES		X	ACI 318: 26.5
9. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED		X	ACI 318: 26.11.1.2
SOIL CONDITIONS (SECTION 1705.6 AND TABLE 1705.6)			
1. VERIFY MATERIALS BELOW SHALLOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.		X	
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.		X	
3. PERFORM CLASSIFICATION AND TESTING OF SELECT FILL MATERIALS.		X	
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X		
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X	



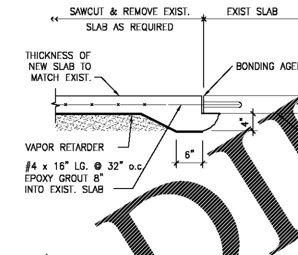
MAX. SPACING OF JOINTS TO BE 16'–0" MAX. ENCLOSED AREA TO BE 256 SQ. FT. PANELS SHALL BE NEAR SQUARE UNLESS NOTED.

"SOFF–CUT" CONCRETE SAW SHALL BE USED WHERE REQUIRED. CUT WITHIN 4 HRS. OF FINISHING.

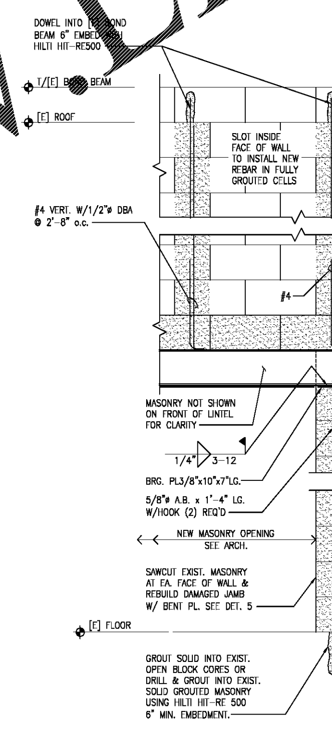
1 | DETAIL
TYPICAL SLAB ON GRADE CONTRACTION JOINT



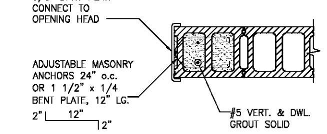
2 | DETAIL
TYPICAL NEW SLAB TO EXISTING STEM WALL



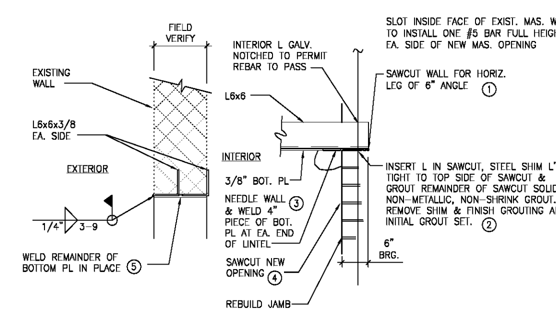
3 | DETAIL
TYPICAL NEW TO EXISTING SLAB INFILL



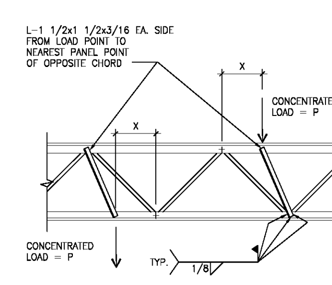
4 | DETAIL
TYPICAL BEAM LINTEL IN [E] MAS. WALL



5 | DETAIL
TYPICAL OVERHEAD DOOR JAMB



6 | DETAIL
TYPICAL LINTEL - NEW OPENING IN EXISTING WALL



NOTE:
REQUIRED WHEN P GREATER THAN 100 LBS. AND X GREATER THAN 4 INCHES

7 | DETAIL
TYPICAL JOIST LOAD STRUT

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Design and construction documents as instruments of service are given in confidence and remain the property of Terry Francis, Engineer. The use of this design and these construction documents for purposes other than the specific project named herein is strictly prohibited without expressed written consent of Terry Francis, Engineer.

NORTHERN TOOL + EQUIPMENT
9401 STATESVILLE ROAD
CHARLOTTE, NC 28269

Project No.:	17483
Drawn By:	WMM
Date	Issue
03-08-20	For Construction Only

S0.1

GENERAL NOTES AND DETAILS