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GENERAL STRUCTURAL NOTES

- A1. All work shall conform to the requirements of the 2003 International Building Code and other codes having jurisdiction.
- A2. The structural design of the building is based on the full interaction of all connected parts, including all reinforced concrete. No provisions have been made for any temporary conditions that may arise during construction prior to the completion of the structure. The contractor shall be responsible for adequate design and construction of all forms, shoring and temporary bracing during the progress of the project.
- A3. The information shown on the structural drawings is intended for this project only and shall not be used for any other purpose. Changes to structural documents (including notes, details, plans and specifications) shall not be made without written approval from Pierce Structural Engineers, Inc. (PSE).
- A4. Contractor(s) shall provide experienced public supervision to ensure that components are installed in accordance with the structural drawings and standards of quality workmanship.
- A5. Principal openings through structural components are shown on these drawings. The Contractor shall examine the project drawings for the required openings, as he shall provide for all openings whether or not shown on the structural drawings and shall verify size and location of all openings with other project requirements. Any deviation from the openings shown on the structural drawings shall be brought to PSE's attention for approval.
- A6. Alternate connection details may be used if such details are submitted to PSE for review and written acceptance is granted. However, PSE shall be the sole judge of acceptability and the contractor's bid shall anticipate the use of these specific details shown on the drawings. The contractor shall be responsible for the design of any alternate details which he proposes.
- A7. Work not indicated on a part of the drawings but reasonably implied to be similar to that shown at corresponding places, shall be included. Do not scale from drawings.
- A8. The contractor shall be completely responsible for the safety of adjacent structures, property, and the public. The contractor shall comply with all Federal, State, and Local requirements.
- A9. All contractors are required to examine the drawings and specifications carefully, visit the site and fully inform themselves as to all existing conditions and limitations, prior to submitting their bid. Failure to visit the site and familiarize themselves with the existing conditions and limitations will in no way relieve the successful bidder from furnishing any materials or performing any work in accordance with drawings and specifications (with no additional cost to the Owner).
- A10. Except where noted on the structural drawings, see architectural drawings and floor drawings for dimensions and locations of new masonry.
- A11. Where conflicts exist between codes, specifications, or drawings, the more stringent requirements shall govern. Notify PSE immediately when such conflicts are discovered.
- A12. Fire code provisions are not contained on structural drawings. See other project documents for requirements.
- A13. Substitutions for specified manufactured materials shall not be made without written approval from PSE. Manufactured materials shall be installed in accordance with manufacturer's requirements and recommendations.
- A14. Submittals containing variations from the structural documents shall have such variations boldly labeled so that they may be specifically reviewed by PSE. Variations not decided in the manner shall not be considered approved, regardless of the status indicated by the shop drawing submittal stamp.
- A15. Stored materials shall be stacked on pallets in a manner that prevents distortion or damage, above the ground, covered and kept in a dry condition. New materials shall be installed plumb, level and square, unless noted otherwise.
- A16. PSE has performed the structural design of the foundation components only for this project. Foundation documents do not contain design details for the foundation components. The contractor shall coordinate with the architect and engineer of record for all details, finishes, ventilation, waterproofing, waterproofing, or any other sitework, architectural, mechanical, electrical or environmental features.
- A17. At areas where existing structural components are uncovered and found to be inadequate, the contractor shall either properly reinforce the components or contact the Engineer (PSE) for the structural design of the modifications.

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FOUNDATIONS

- B1. The foundation design is based on recommendations contained in the Report of Geotechnical Engineering Investigation for the New England Sports Center, prepared by R.V. Gillespie & Associates, Inc. in Sept. 1986 under Award 29, 2004. Copies of this report will be made available to contractors. Contractor shall conform with recommendations in the report.
- B2. All footing excavations are to be finished by hand. All finished foundation excavations shall be inspected by the project foreman. Reinforcement shall be inspected by Gillespie and Associates before any concrete is placed.
- B3. Structural fill below slabs, adjacent to foundation walls and fill below footings shall conform to:

SCREEN OR SEVE SIZE	PERCENT FINER BY WEIGHT
No. 4	90 % - 100%
No. 10	35 % - 70%
No. 200	0 % - 5%

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- B4. Structural fill shall be compacted in 6" (max) lifts to 95 % of its maximum dry density in accordance with ASTM D1557. Hand tamping equipment shall be used to compact backfill adjacent to basement.
- B5. Crushed stone shall consist of clean angular fragments of quarried rock, with uniform quality and conform to MDOT T03.22 Type C. Maximum stone size shall be 1".
- B6. Unless otherwise noted, all foundation units shall be centered under supported members.
- B7. Where foundation elements are to have fill on both sides, each side shall be filled and compacted simultaneously maintaining a common elevation such that compacted fill on one side of the foundation does not exceed more than 12" above the compacted fill on the other side.

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- B8. Contractor shall provide continuous drainage by mechanical methods to control surface and underground water as required during construction, so that all excavations are dry. Water level shall be maintained at 12 inches below bottom of excavations at all times.
- B9. Perforated underdrain shall be placed at exterior walls at wall footings. Underdrains shall be sloped continuously at 1/16" per foot and discharge to daylight or manhole (see site drawings). Underdrains shall be schedule 35 PVC. Provide (2) 4" diameter outlets at locations approved by the geotechnical engineering firm and the civil engineering firm retained for this project.
- B10. All holes in foundation walls shall have plastic sheers. Coordinate size and locations of sheers prior to placing concrete. Sheers larger than 10" diameter shall have additional (2) #4 x 6" rebar on 4 sides of sheers.
- B11. Shoring, bracing or sheeting used to provide lateral support of excavations shall remain in place until all permanent structural systems at and below ground level are complete.
- B12. Drain pipes shall not pass under or through wall footings. Lower footing by stepping to avoid interference. (See typical stepped footing detail).
- B13. Contractor shall take necessary precautions to avoid disturbing soil beneath footings. As a minimum, a smooth edge bucket shall be used for excavation of foundation walls.
- B14. When excavating for new footings, contractor shall take the necessary precautions to avoid disturbing existing utilities which may exist below grade.

CONCRETE

- C1. All concrete work shall conform to the latest edition of the ACI Building Code (ACI 318). Specifications for Structural Concrete for Buildings (ACI 307) and to the 2003 International Building Code. In case of conflict, the more stringent requirements shall govern.
- C2. For locations listed below, concrete shall have 3/4" aggregate, 4 %-% air entrainment, 2" x 4" slump, Type I or II ASTM C-150 Portland Cement and designated compressive strength (f'c) in 28 days as follows:

Slabs, Retaining Walls 4000 psi
Piers, Foundation Walls 3500 psi
Footings, Misc. Concrete 3500 psi
- C3. Contractor shall not proceed with concrete placement until concrete mix design submittal has been reviewed and approved by the structural engineer. Water shall not be added to the concrete mix at the jobsite.
- C4. All concrete exposed to the weather shall contain 5 % - 7% air entrainment admixture.
- C5. All footings shall be placed monolithically. See typical details for construction joint requirements.
- C6. Pipes or conduits placed in slabs on grade shall not be placed closer than 3 diameters on center and shall have an outside diameter less than 1/3 of the slab thickness.
- C7. All keys shall be 2" x 4" (nominal) unless otherwise shown on the drawings.
- C8. No concrete shall be cast until review and written approval of the reinforcing and embedded items have been obtained from the owner's representative.
- C9. All exposed edges of concrete members shall be chamfered 3/4" unless shown otherwise on drawings.
- C10. See architectural drawings for door and window openings, doors, windows, egress, washes, toilet, concrete finishes, masonry anchors, and for miscellaneous embedded plates, bolts, anchors, angles, etc. Refer to mechanical, electrical and site drawings for other embedment requirements.
- C11. See Architectural Drawings for top of slab elevations.
- C12. Aluminum or copper components shall not be placed in concrete. No conduits shall be placed in slabs on metal deck.
- C13. All embedment in concrete, including anchor bolts, shall be firmly secured by the wire to prevent movement during concrete placement. Welding of embedments is not permitted.
- C14. All concrete materials, reinforcement and forms shall be free from oil or debris.
- C15. Concrete shall be maintained above 50 degrees F and in moist condition for at least the first seven days after placement. Contractor shall provide blankets, tenting and heat as necessary to ensure the condition exists. Contractor shall keep two operable concrete thermometers on site throughout concrete construction when temperatures are predicted to be less than 40 degrees F.
- C16. Consolidate all concrete with a vibrator or other means recommended by ACI 301. Honeycombed surfaces will not be permitted.
- C17. See architectural drawings for locations of floor drains. Slope slabs uniformly to drains (LOU).
- C18. Control joints in slabs on grade are mandatory. See typical details. Control joints in foundation walls, basement walls, and retaining walls are mandatory. See typical details.
- C19. Coordinate concrete finish on floor slabs with owner's requirements and specifications.
- C20. Concrete slabs, including those on steel deck, shall be placed so that slab thickness equals or exceeds thickness specified on drawings. This will require that slabs may not be dead level where supported by beams or trusses with camber.
- C21. Curing compound for slabs shall be compatible with floor finishes.
- C22. Maximum finish of wet concrete during placement shall not exceed 5'-0".
- C23. Slabs on grade shall contain ASTM C1116, Type III, 1/2" - 1 1/2" long polypropylene fibers at a rate of 15 pounds (min) per cubic yard unless steel reinforcement is specified.
- C24. All cast-in-place concrete shall be tested by an independent and certified testing agency. Tests shall be performed on each day's concrete placement exceeding 5 cubic yards plus one set for each additional 50 cubic yards or fraction thereof. Concrete shall be tested for 7- and 28-day compression strength, concrete temperature, slump, and air entrainment in accordance with ASTM standard procedures.

REINFORCING FOR CONCRETE

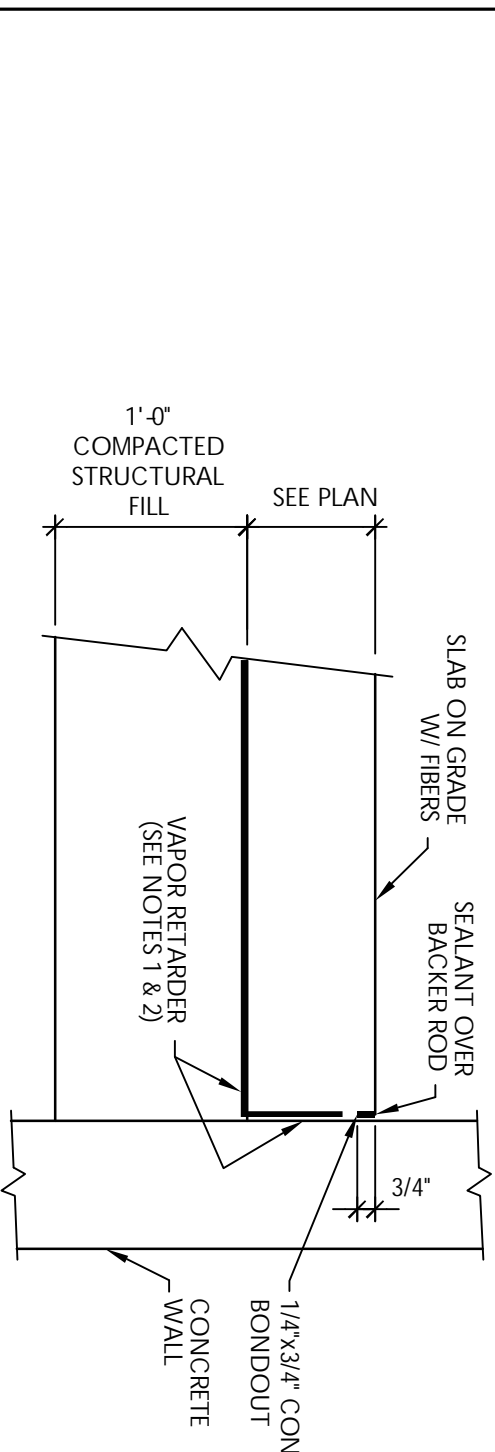
- D1. All concrete reinforcing bars shall conform to ASTM A615, Grade 60 except where noted. All reinforcing bars to be welded shall conform to ASTM A706.
- D2. All welded wire fabric (WVF) shall conform to ASTM A-185. WVF shall be provided in flat sheets.
- D3. Detailing of concrete reinforcement and accessories shall be in accordance with ACI 315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures, latest edition.
- D4. Provide and schedule with the shop drawings, all necessary accessories to hold reinforcing securely in position. Reinforcement supports shall be spaced not more than 4'-0" on center and shall consist of either pre-manufactured chairs or dense concrete block units.
- D5. All lugs in WVF shall be 1 1/2 mesh spaces or 6" x 6", whichever is larger, and shall be wired together.
- D6. Reinforcing bars may not be welded except where designated by PSE.
- D7. Concrete protection for reinforcement shall be provided as follows (LOU):
 - a. Surfaces cast against and permanently exposed to earth..... 3 inches (3x3)
 - b. Formed surfaces exposed to earth or weather

#6 through #18 bars 2 inches
#5 bars and smaller 1 1/2 inches
 - c. Formed surfaces not exposed to earth or weather

Slabs, walls, piers 3/4 inch
Beams, columns (including stirrups and lugs) 1 1/2 inches
- D8. All hooks shown on drawings shall be standard hooks unless noted otherwise.
- D9. Where continuous bars are called for, they shall run continuously around corners and lapped at necessary spaces, or hooked at discontinuous ends. Lap lengths shall be as given in the splice and development table. Lap beam top bars at mid-span and beam bottom bars at supports, unless noted otherwise.
- D10. Show foundation wall control joints on rebar shop drawings.
- D11. Notify owner's representative in a timely manner so that installed reinforcement can be inspected. Installation of reinforcement shall be completed 24 hours before scheduled concrete placement.
- D12. For slabs on grade with wire mesh support, wire mesh with dense concrete block at 4'-0" o.c. each way.

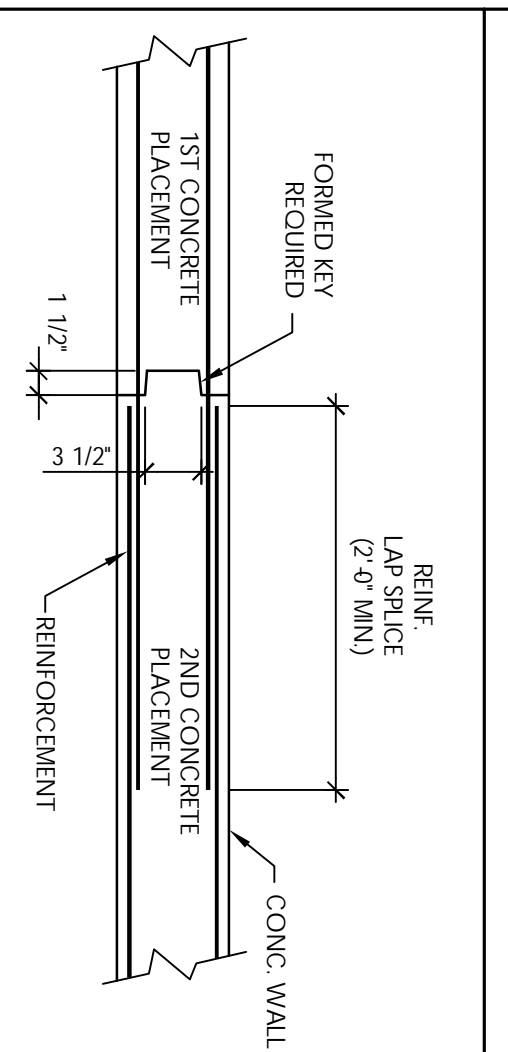
LIST OF ABBREVIATIONS

ADDL	Additional
ALT	Alternate
ALUM	Aluminum
ANCH	Anchor Bolt
ARCH	Arch
BCX	Bottom Chord Extension
BO	Bottom
BOB	Bottom of Footing
BOE	Bottom of Exterior
BS	Bottom of Slab
BRT	Beam
BRS	Bearing Rile
BSN	Bottom Sides
CA	Cast in Place concrete
CD	Center Line
CLR	Clear
CL	Column
COINC	Coincide
CIU	Control Joint
COON	Concrete Masonry Unit
CONST	Construction
CON	Concrete
DBT	Dimensioned Bar Anchor Detail
DET	Detail
DIA	Diameter
DWG	Drawing
EM	Embedment
EQ	Equal
EVG	Existing
EXG	Existing
FD	Foot Drains
FE	Foot End
FF	Final Grade
FG	Finished Floor
FN	Finish
FT	Foot
GA	General
GALV	Galvanized
GC	General Contractor
GCR	General Contractor
HOR	Horizontal
HP	High Point
HT	Head
IF	Inside Face
J	Joint
JS	Joint Substitute
JT	Joint
L	Level
LH	Long Leg Horizontal
LIV	Living
LOCS	Locations
LP	Low Point
MAX	Maximum
MECH	Mechanical
MFR	Manufacturer
MISC	Miscellaneous
MNC	Masonry
NW	North & Weather
NF	Neat Face
NCS	Not in Contact
NKS	Non-Kinematic
OC	On-Center
OD	Outside Diameter
OF	Outside Face
OH	Opposite Hand
OHG	Opposite Hand
OP	Opposite
PAE	Power Attached Fastener
PCF	Pounds per Cubic Foot
PE	Preformed Joint
PF	Preformed
PI	Plywood
PKY	Plywood
PP	Pounds per Square Foot
PS	Pounds per Square Inch
PVC	Polyvinyl Chloride
RED	Reduce
RNF	Reinforcement
REQD	Required
SCHED	Schedule
SECT	Section
SH	Shaper Foot
SH4	Shaper Foot
SOG	Slab on Grade
SP	Spacers
SPEC	Specification
SQ	Square
SS	Standard Steel
STD	Standard
STL	Steel
T&B	Top and Bottom
TCS	Top Chord Extension
TDR	Treated
THD	Through
TI	The Joint
TOC	Top of Concrete
TOG	Top of Ground
TOG	Top of Ground
TOW	Top of Wall
TS	Structural Steel Tube (Rectangular)
TYP	Typical
UN	Unbraced
VERT	Vertical
VF	Very in Field
VP	With
WP	Welding Point
WV	Welded Wire Fabric
WVWF	Welded Wire Fabric
ZNC	Zinc-Rich Coating



- NOTES**
1. Ties all joints, install pipe boots, and seal all vapor retarder penetrations per manufacturer's recommendations. Verify that permeance of vapor retarder conforms to the limitations and requirements set by the manufacturer furnishing floor finish materials.
 2. Vapor retarder shall be Sigo-Wrap (10 mil thickness) by Siga Industries, LLC. (847-669-4646) polypropylene geomembrane or Scotchdriid 90-15 (688-292/6202) polyolefin geomembrane or approved equal.
 3. Water shall not be added to concrete for slab at project site. Remove bleedwater prior to troweling. Avoid over-troweling during finishing.
 4. Construct used barrier finished greater than 10 mph are expected either during concrete placement or within 24 hours after placement.
 5. Continuous moist curing of slab surface shall begin as soon as possible after placement (within 12 hours) and continue for 7 days. Discharging curing compound may be used only if it is verified to be compatible with floor finish materials prior to slab installation.

(C) TYPICAL SLAB ON GRADE (SOG) DETAIL

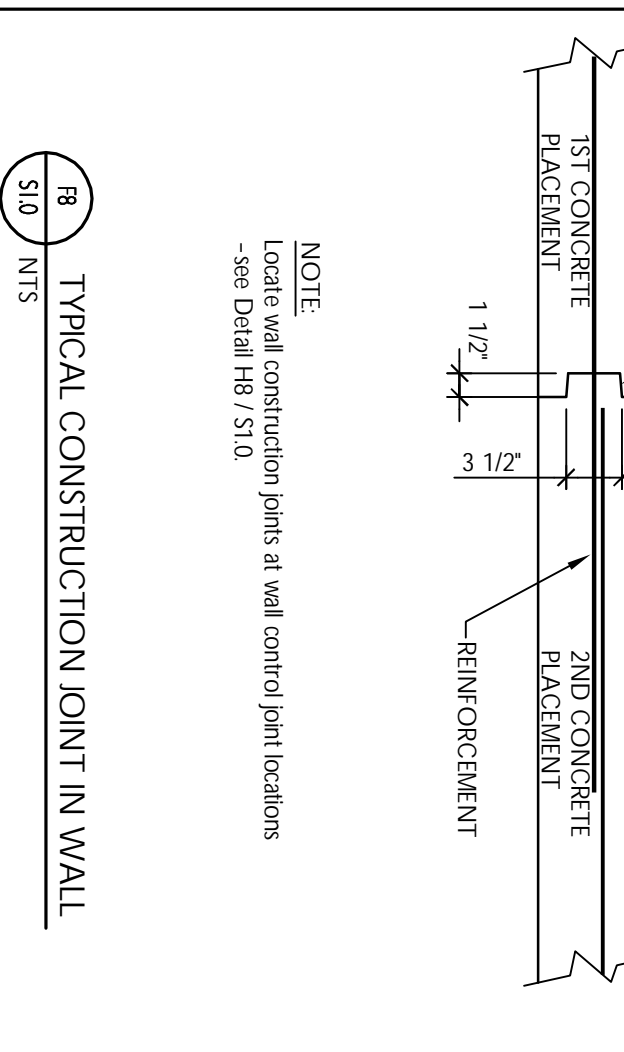


ISSUED FOR PERMIT ONLY

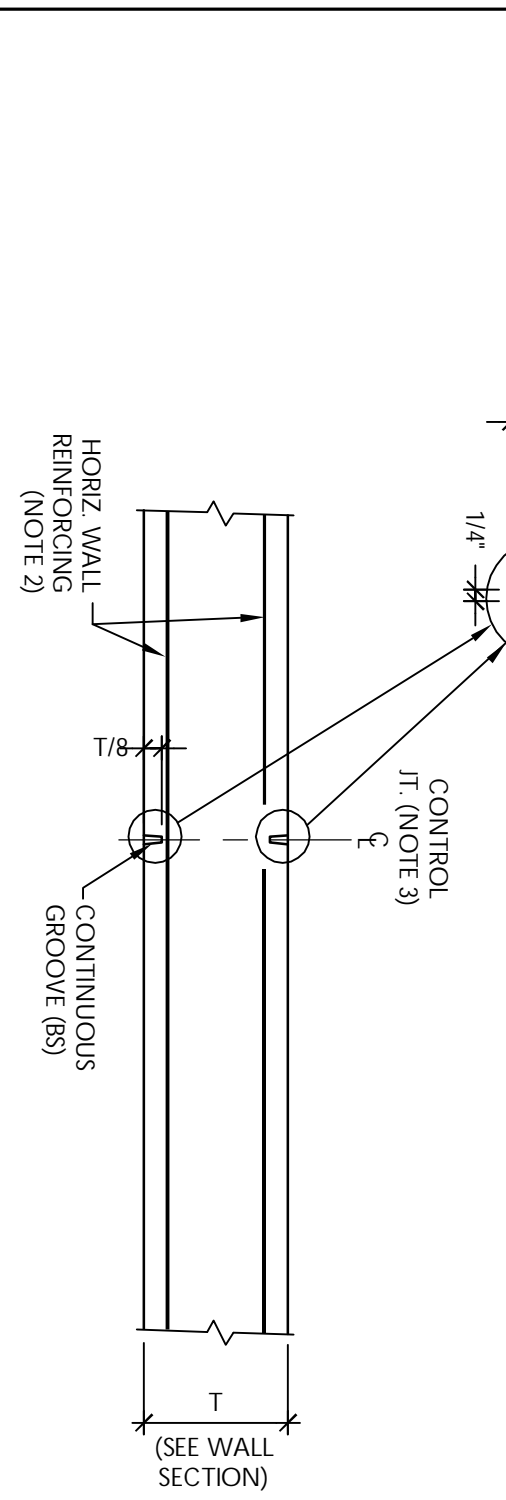
PRELIMINARY

NOT FOR CONSTRUCTION

UNDER NO CIRCUMSTANCES SHALL THIS DRAWING BE USED TO DEVELOP SHOP DRAWINGS OR FABRICATE NEW MATERIALS. SHOP DRAWINGS PREPARED USING THIS DRAWING WILL BE REJECTED WITHOUT REVIEW.



(B) TYPICAL CONSTRUCTION JOINT IN WALL



- NOTES**
1. Wall control joints shall be located as follows:
 - a. 10'-0" from building corners.
 - b. 30'-0" o.c. maximum spacing.
 - c. At foundation wall notches adjacent to doors (where possible).
 2. Cut and stop every other bar extending through control joint.
 3. Locations of wall control joints shall be clearly dimensioned on rebar shop drawings.
 4. Backer rod and sealant required at basement and retaining walls only. Sealant shall be Sominchem NP-2 or approved equal.

(A) TYPICAL FOUNDATION WALL CONTROL JOINT (C)

CWS Architects

Architects
Space Planning
Value Design

134 Cumberland Avenue
Portland, ME 04101
Phone: (207) 774-4441
Fax: (207) 774-4016
www.CWSarch.com

PROZIN INCORPORATED

ISSUED FOR PERMIT
OCTOBER 22, 2004

Project: FROZEN ROPES SPORTS CENTER

Wilton Avenue
Portland, Maine

Contractor: DESTEFANO AND ASSOCIATES, INC.

2461 Lafayette Road
Portsmouth, NH 03801
(603) 430-0339

Drawing Title: **STRUCTURAL FOUNDATION NOTES AND TYPICAL DETAILS**

Scale: As Noted

Date: 10/5/04

PSE Project No.: 038-04

Revisions:

ST10

Drawing Number: