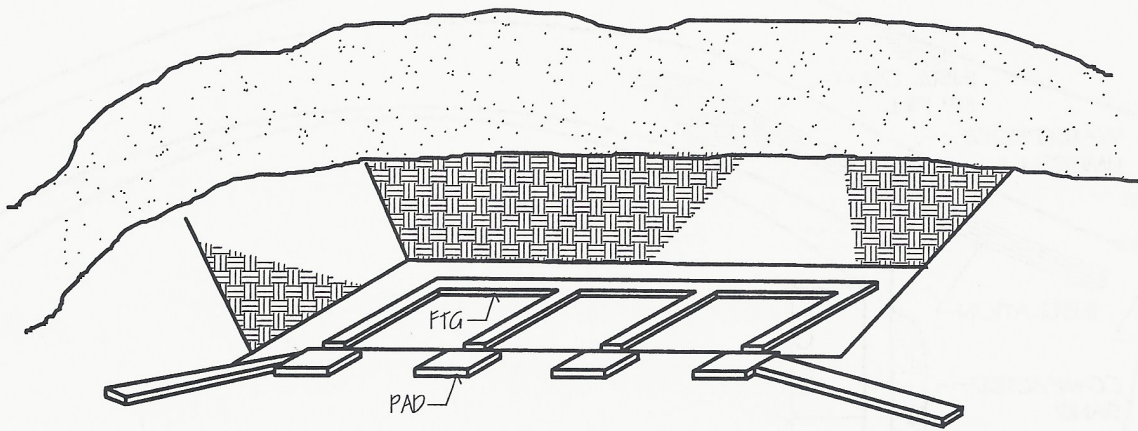


## Excavation

Excavation of all material from the front and sides of the house to the back of the house, far enough back to compensate for slides. Clear all trees, roots and rocks. Get the front and side yards bladed to the finish elevations grade. Build the road for permanent use, place a rock surface thick enough to support heavy concrete trucks, semi-trucks, and other traffic. Backhoe will be needed to excavate all footings, and pads. The average depth of the footings will be 12" deeper than the finished grade on perimeter walls, and major pads.

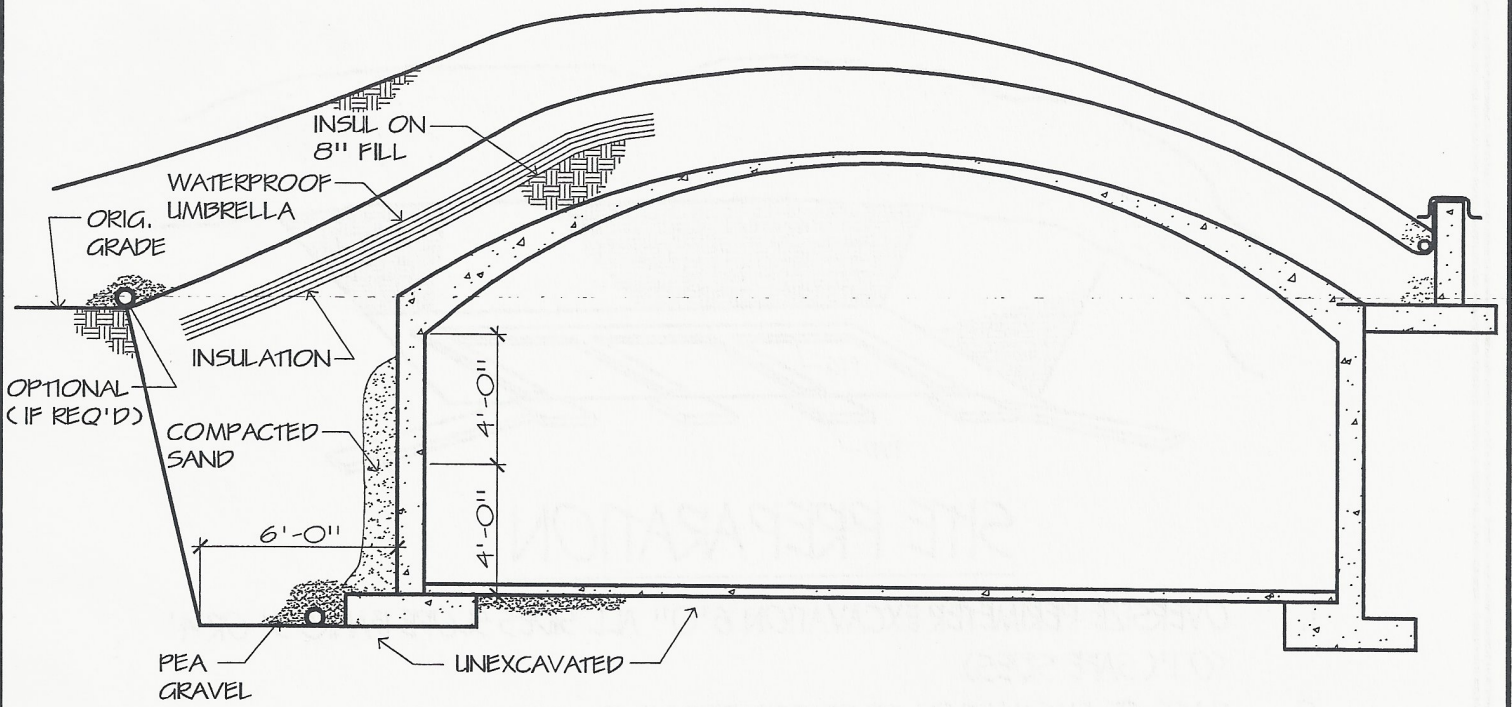
After concrete footings and walls are poured, they will be waterproofed. The top of the house should cure for one month before attempting to fill and finish the roof. At the time of covering the roof the equipment used should be 10,000# or less, a skid-steer loader is best, as not to crush the insulation, due to tire ground pressure.



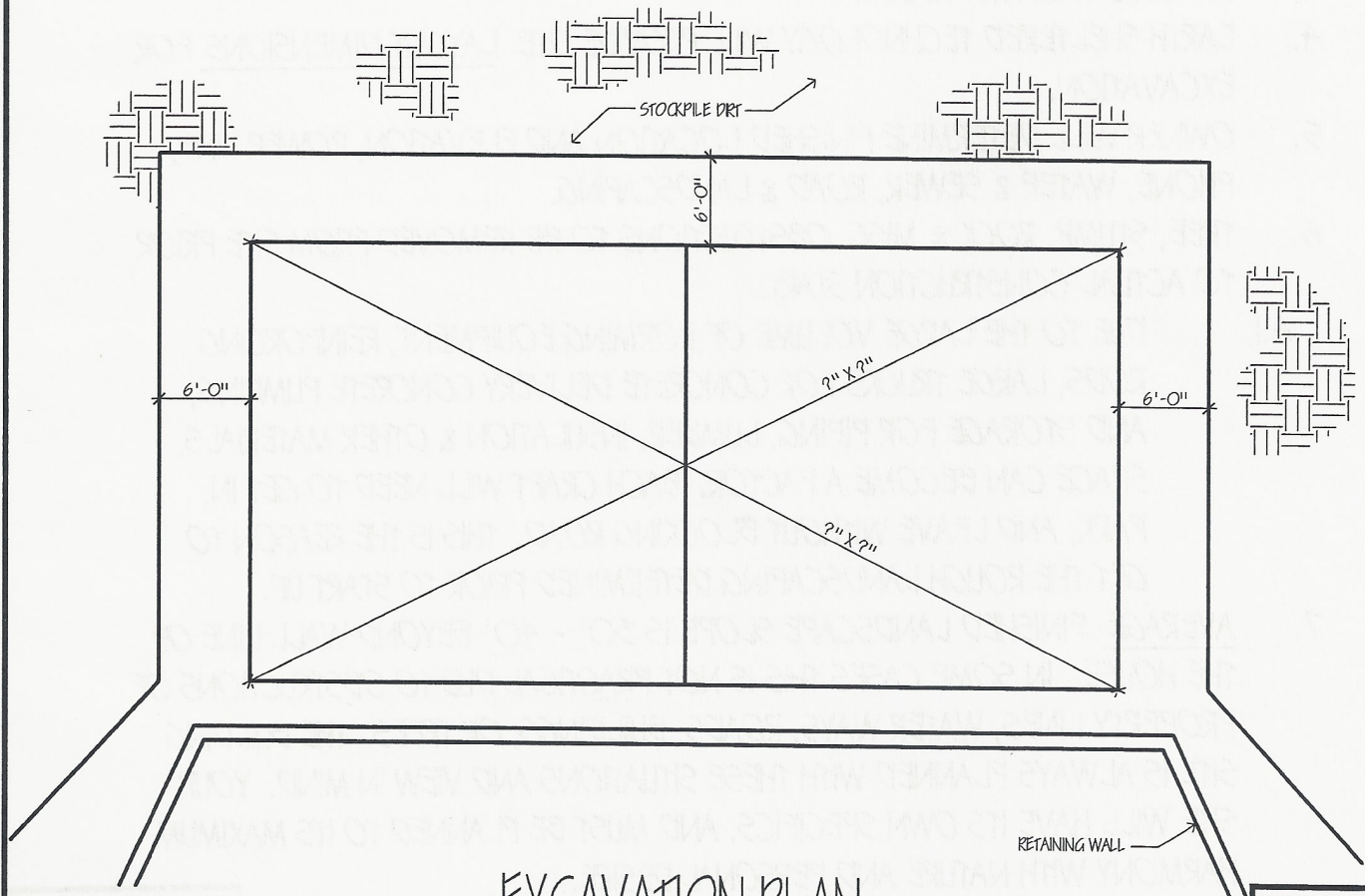
## SITE PREPARATION

1. OVERSIZE PERIMETER EXCAVATION 6'0" ALL SIDES SLOPE BANKS 3' OR 4' TO 1' (SAFE SIDES)
2. BASE OF EXCAVATION TO BE SCRAPED LEVEL (1"±) (NO FILL ADDED, UNLESS COMPACTED TO 97% PROCTOR) AT FOOTING LOCATION.
3. BACKHOE WILL BE NEEDED TO EXCAVATE FOOTING PADS ON EXPOSED (FRONT) WALLS.
4. EARTH SHELTERED TECHNOLOGY WILL PROVIDE SITE LAYOUT DIMENSIONS FOR EXCAVATION.
5. OWNER WILL DETERMINE FINISHED LOCATION AND ELEVATION, POWER LINE, PHONE, WATER & SEWER, ROAD & LANDSCAPING.
6. TREE, STUMP, ROCK & MISC. OBSTRUCTIONS TO BE REMOVED FROM SITE PRIOR TO ACTUAL CONSTRUCTION START.
  - 6.1. DUE TO THE LARGE VOLUME OF FORMING EQUIPMENT, REINFORCING RODS, LARGE TRUCKS FOR CONCRETE DELIVERY CONCRETE PUMPING, AND STORAGE FOR PIPING, LUMBER, INSULATION & OTHER MATERIALS, SPACE CAN BECOME A FACTOR. EACH CRAFT WILL NEED TO GET IN, PARK, AND LEAVE WITHOUT BLOCKING ROAD. THIS IS THE REASON TO GET THE ROUGH LANDSCAPING DETERMINED PRIOR TO START UP.
7. AVERAGE FINISHED LANDSCAPE SLOPE IS 30' - 40' BEYOND WALL LINE OF THE HOUSE. IN SOME CASES THIS IS NOT PRACTICAL DUE TO OBSTRUCTIONS OF PROPERTY LINES, WATER WAYS, ROADS, BUILDINGS, OR TREES. THE BUILDING SITE IS ALWAYS PLANNED WITH THESE SITUATIONS AND VIEW IN MIND. YOUR SITE WILL HAVE ITS OWN SPECIFICS, AND MUST BE PLANNED TO ITS MAXIMUM HARMONY WITH NATURE AND PERSONAL DESIRE.

EX-1

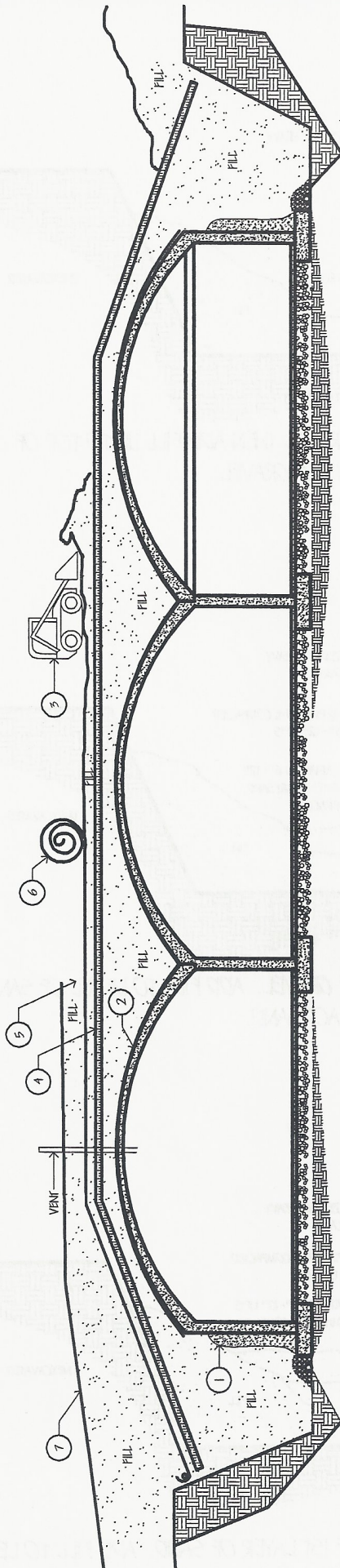


1 EXCAVATION CROSS SECTION  
SCALE: NONE



2 EXCAVATION PLAN  
SCALE: NONE

EX-2



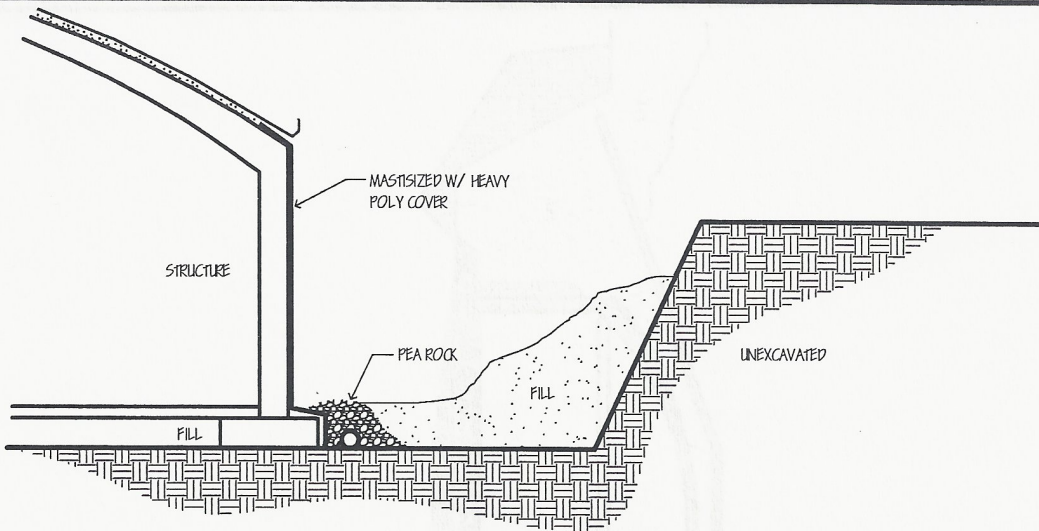
- ① COMPACTED SAND
- ② TOP OF DOME
- ③ TRACKED SKID STEER
- ④ INSULATION
- ⑤ 1' TO 3' OF FILL OVER RUBBER LINER
- ⑥ RUBBER LINER
- ⑦ FINISH GRADE

# EXCAVATION

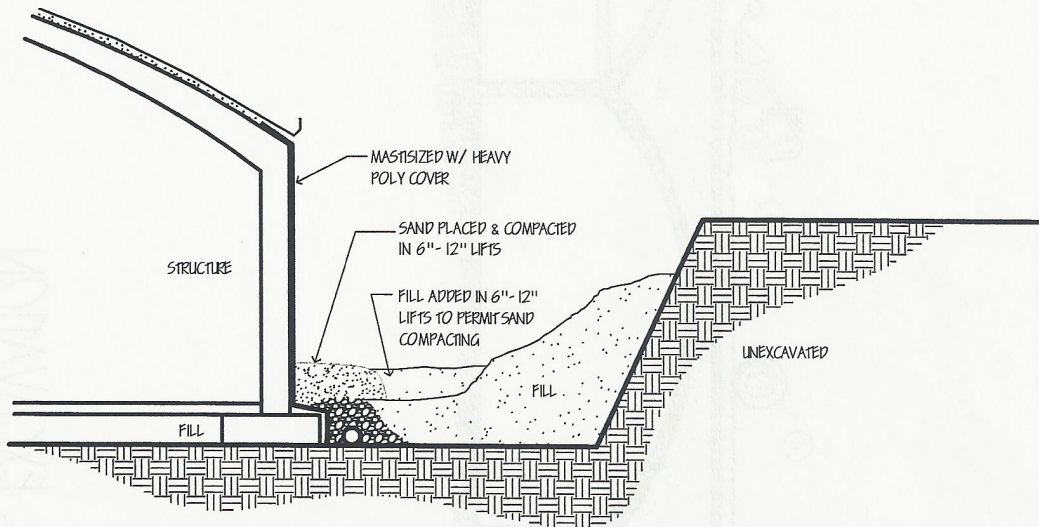
SCALE: NONE

①

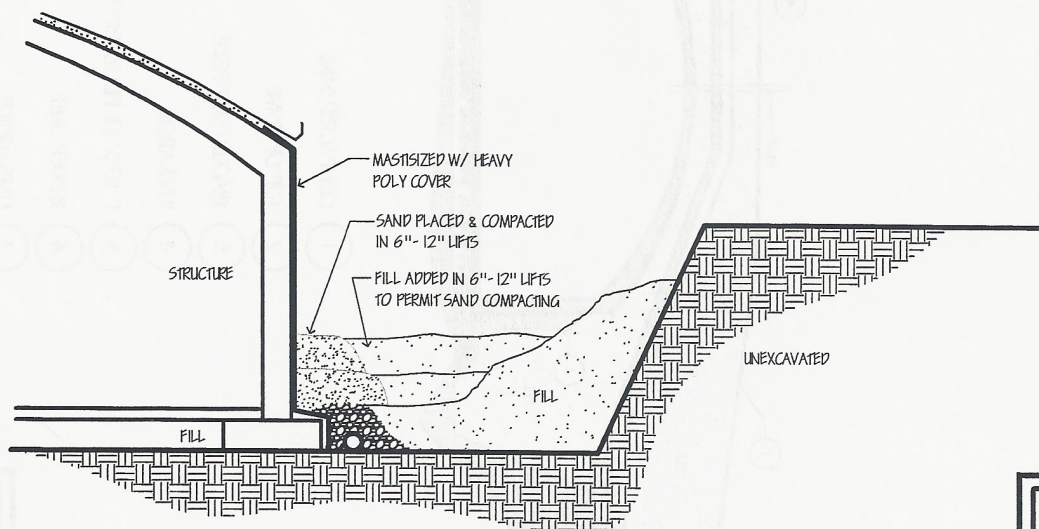
EX-3



FILL AROUND DRAIN TILE WITH PEA GRAVEL THEN ADD FILL UP TO TOP OF GRAVEL.  
COMPACT GRAVEL.



PLACE 6" TO 12" SAND ON TOP OF GRAVEL. ADD FILL TO LEVEL OF SAND.  
COMPACT SAND.



PLACE 6" TO 12" SAND ON TOP OF 1ST LAYER OF SAND. ADD FILL TO LEVEL OF SAND.  
COMPACT SAND. REPEAT THIS STEP TO WITHIN ONE FOOT OF ROOF LINE.

EX-4

## **Footings & Concrete**

**Electrician, heating and plumbing contractors may have pipe or pipe sleeves needed to go through or into the house footings**

### **Items to consider:**

**Vents for hot air near perimeter of walls, main trunk-line, cold air return, fireplace hot air return back to air handler for distribution of hot air throughout the house. Kitchen intake air exhaust for hood fan or other type of stove vent. Bath exhaust, and other roof vents. Electrical sleeve for power line, telephone, television cable, outside lighting, well power, out buildings or signal switch.**

### **Plumbing vents and block-outs for:**

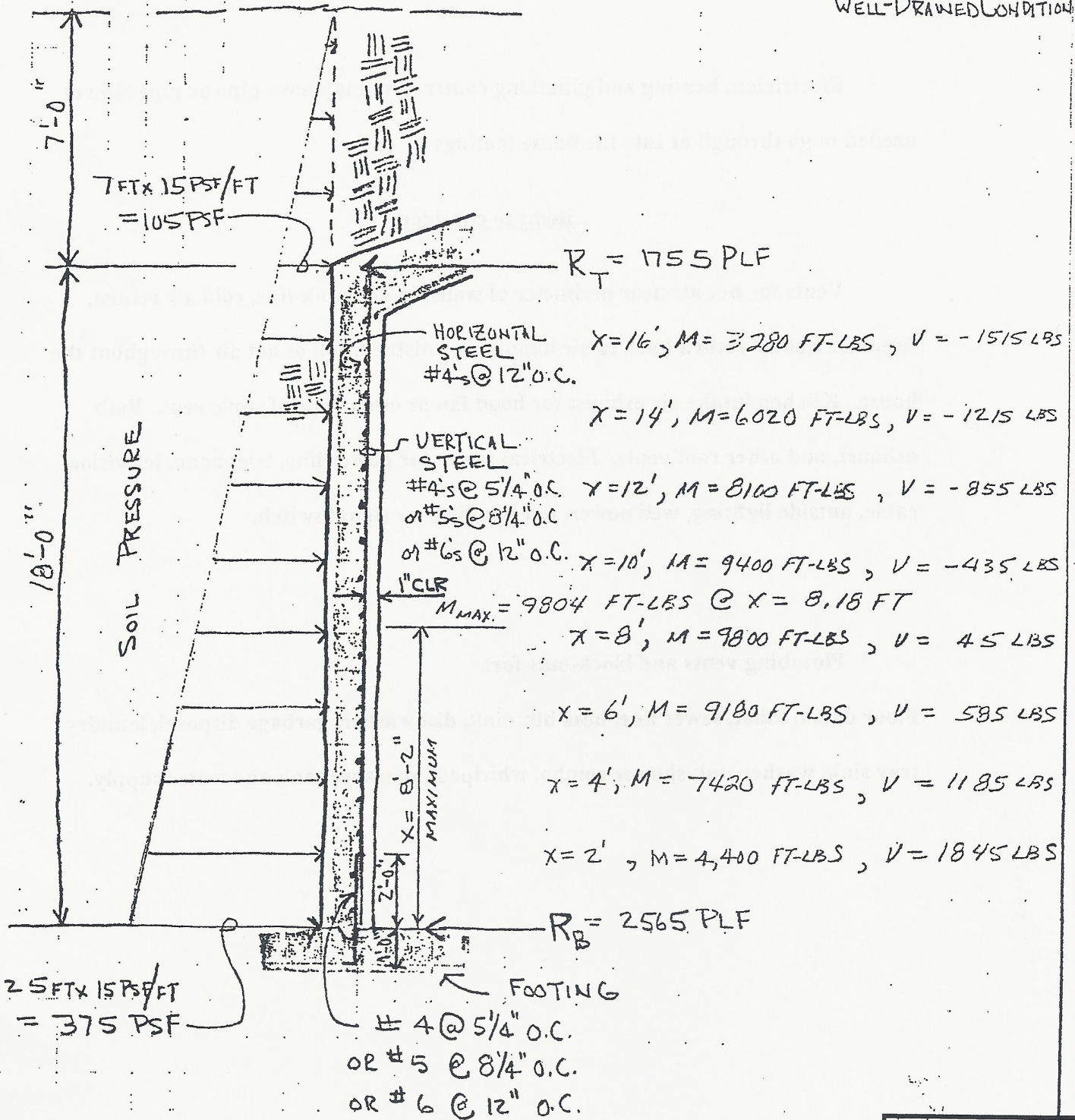
**Floor drain, toilet, sewer line, hose bib, sink, dishwasher, garbage disposal, laundry tray sink, washer, tub shower combo, whirlpool, pressure tank and water supply.**

I & S ENGINEERS, INCORPORATED  
 329 North Broad Street P. O. Box 1026  
 MANKATO, MINNESOTA 56001  
 (507) 387-6651

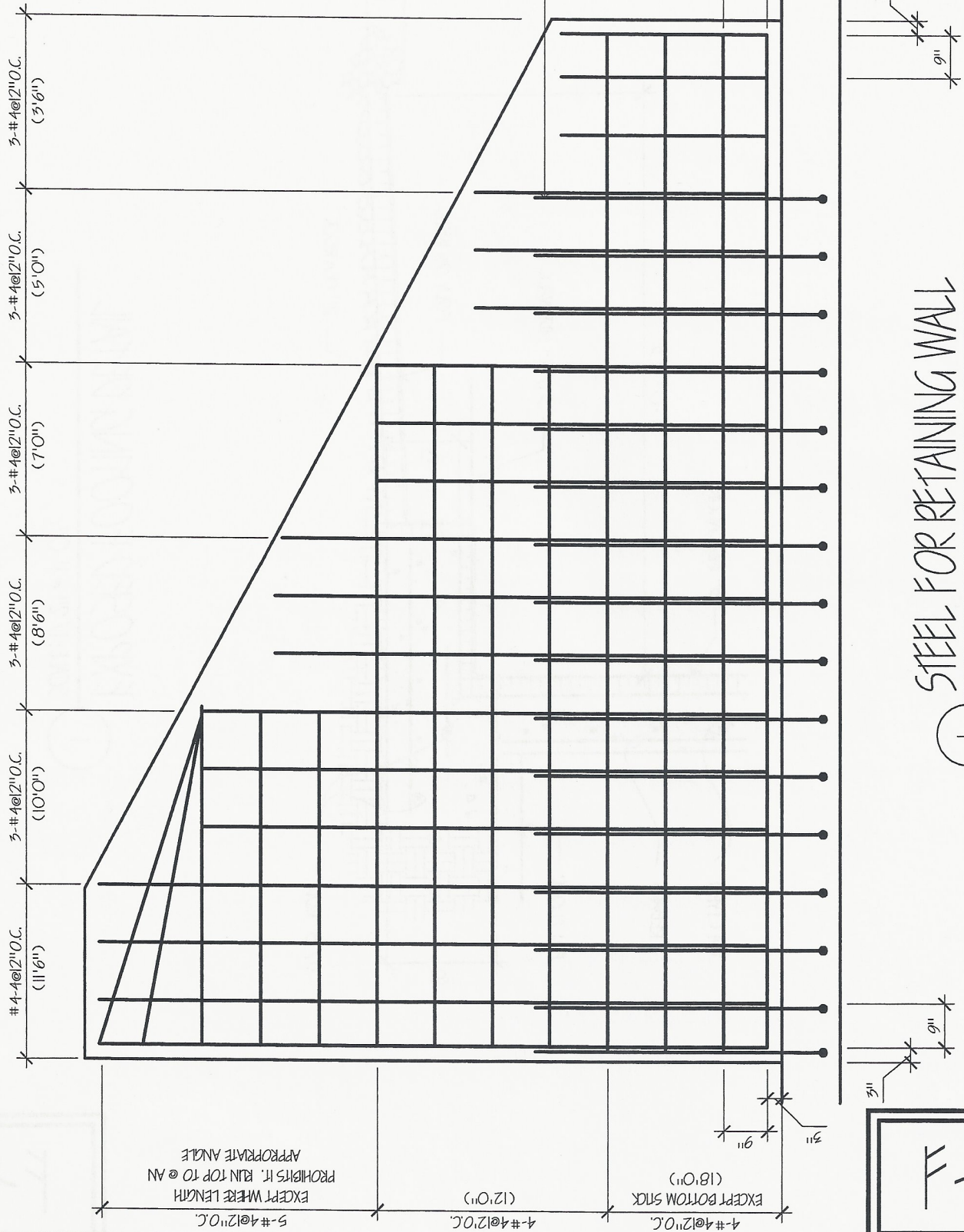
SHEET NO. ONE OF \_\_\_\_\_  
 CALCULATED BY K. SURPRENANT DATE 4-13-83  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 SCALE 1/4" = 1'-0"

STRUCTURAL CALCULATIONS FOR WALLS

LATERAL SOIL LOAD: 15 PSF/FT FOR WELL-DRAWN CONDITIONS



F-1



#4 STEEL @ 12" O.C.;  
 5'-0" BY 2'-0" W/ 90 DEG BEND,  
 3" COVER OFF BOTTOM  
 FACE OF FIG @ 2" FROM EARTH SIDE OF  
 RETAINING WALL

STEEL FOR RETAINING WALL

SCALE: NONE

1

F-2

EXCEPT WHERE LENGTH  
 PROHIBITS IT, RUN TOP TO @ AN  
 APPROPRIATE ANGLE

4#4@2"O.C.  
 EXCEPT BOTTOM 5ft  
 (18'0")

4#4@2"O.C.  
 (12'0")

5#4@2"O.C.

#4-4@2"O.C.  
 (11'6")

3#4@2"O.C.  
 (10'0")

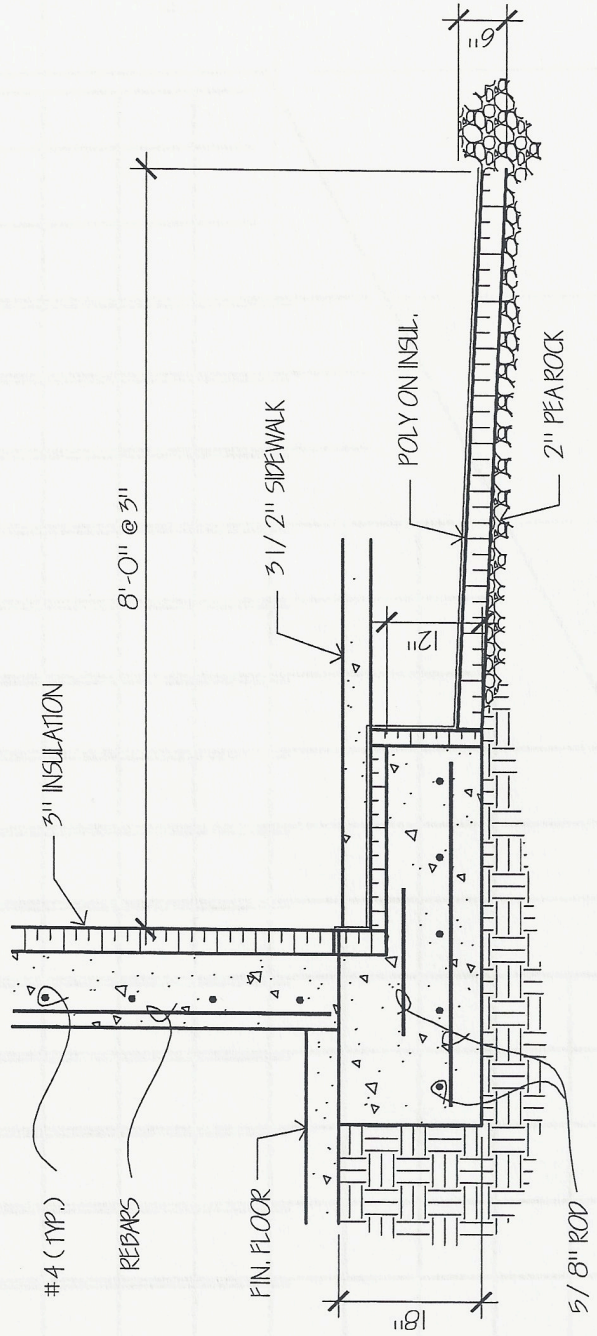
3#4@2"O.C.  
 (8'6")

3#4@2"O.C.  
 (7'0")

3#4@2"O.C.  
 (5'0")

3#4@2"O.C.  
 (3'6")





EXPOSED FOOTING DETAIL

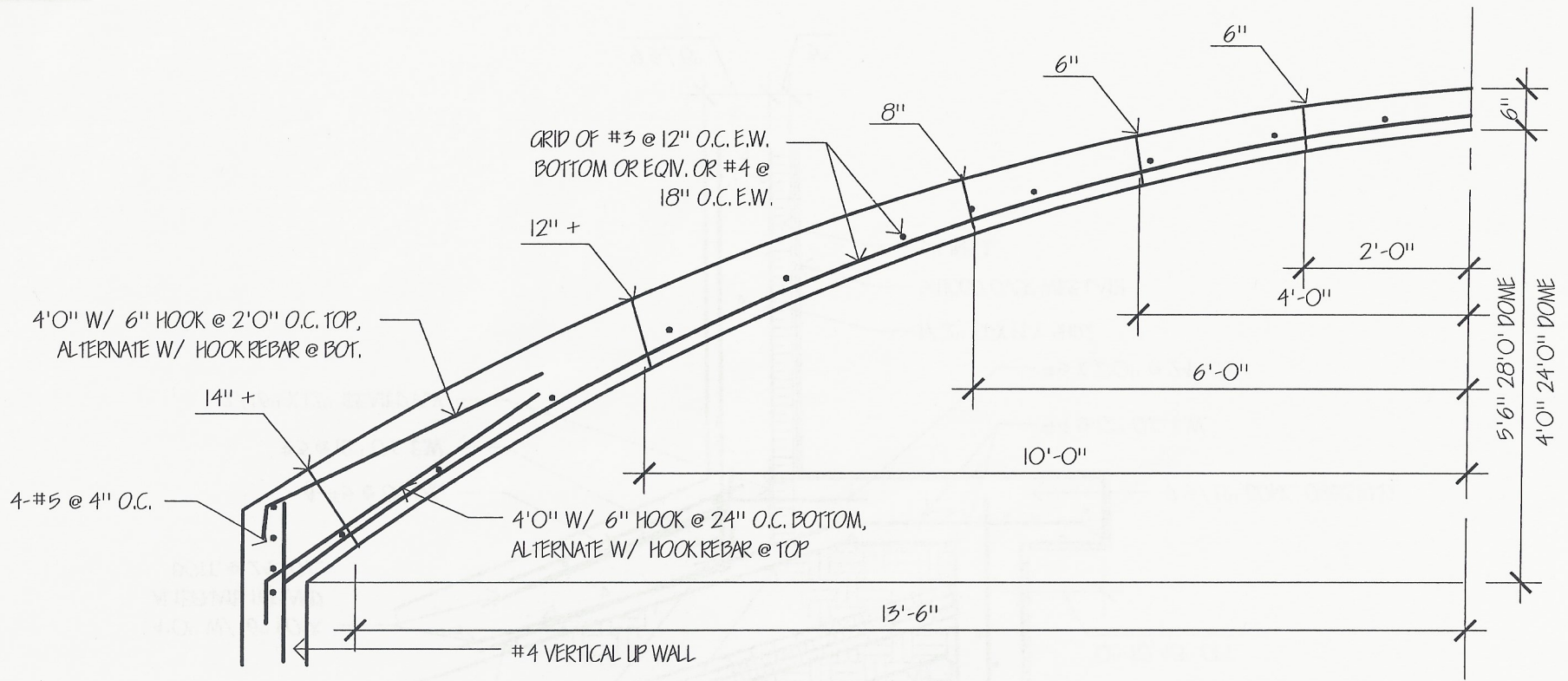
SCALE: 1/2" = 1'-0"

1

F-3

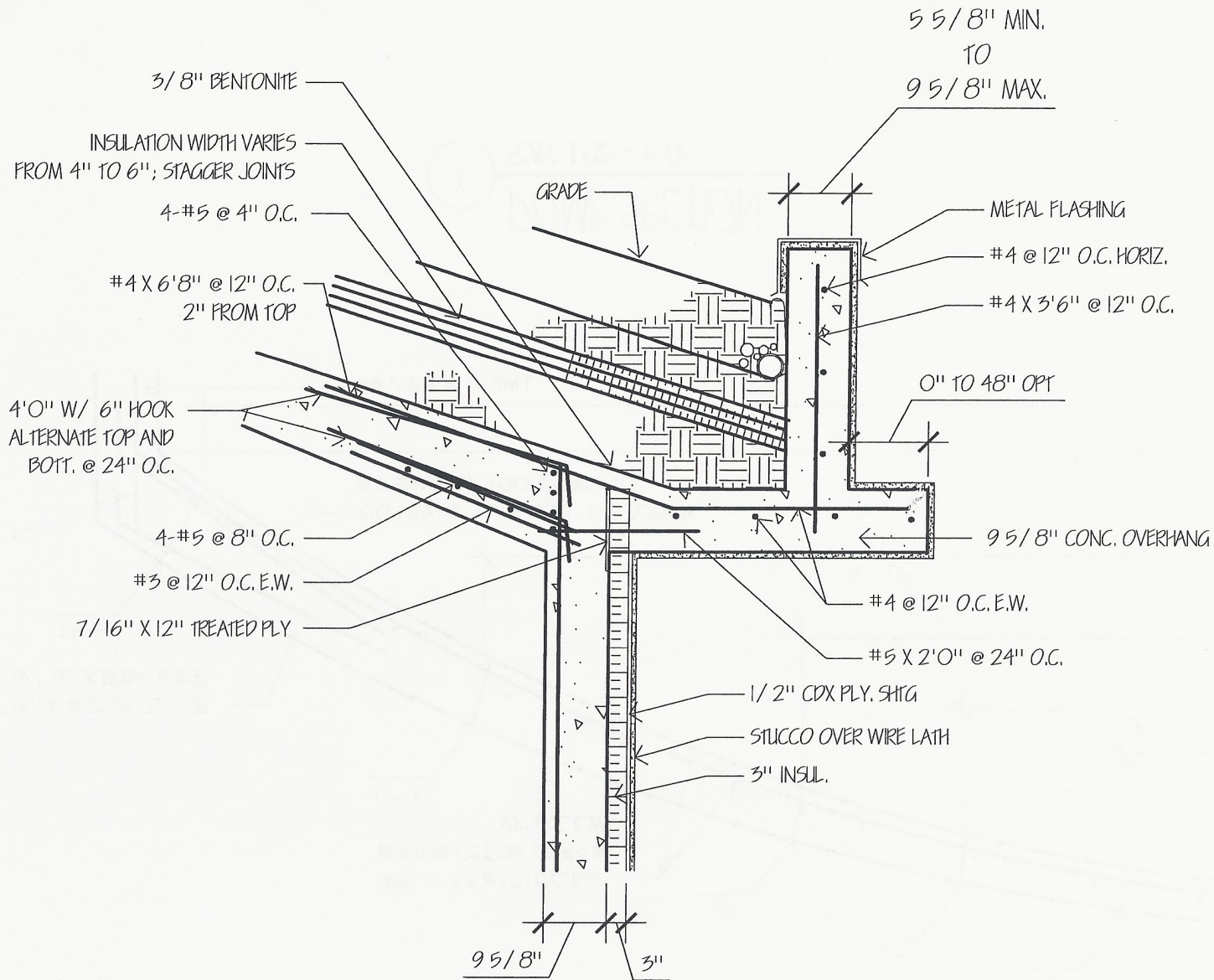
2  
1  
11

EXPOSED REINFORCING SECTION



1 DOME SECTION  
SCALE: 1/2" = 1'-0"

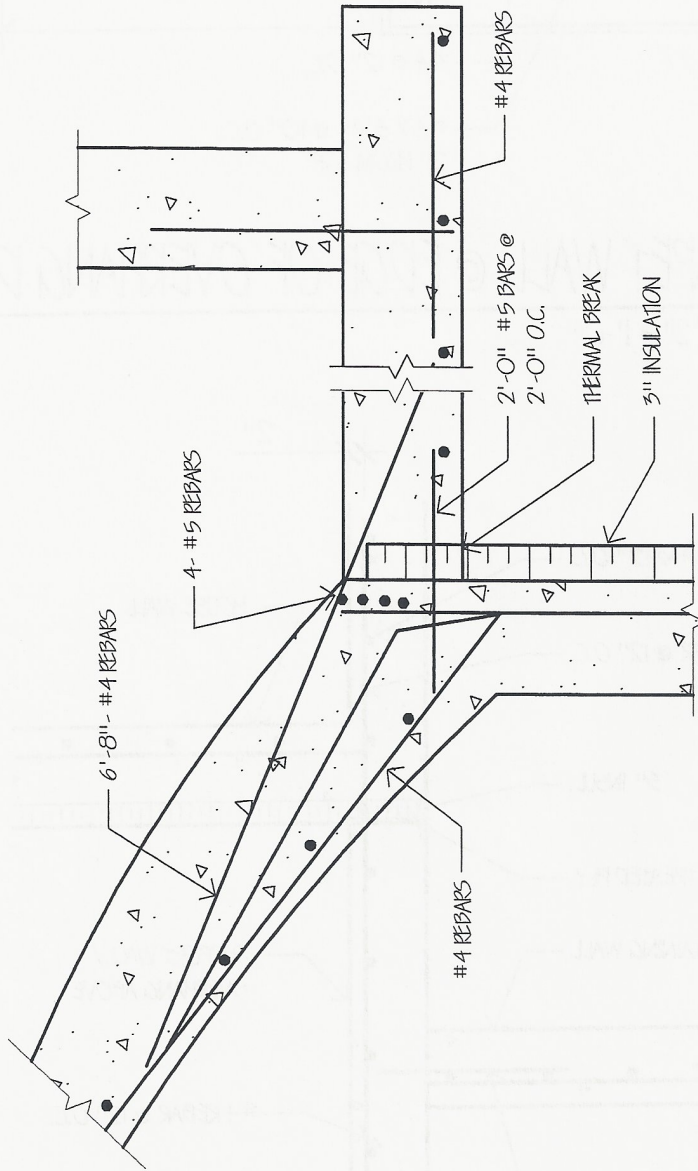
F-4



EXPOSED WALL OVERHANG SECTION

SCALE: 1/2" = 1'-0"

F-5

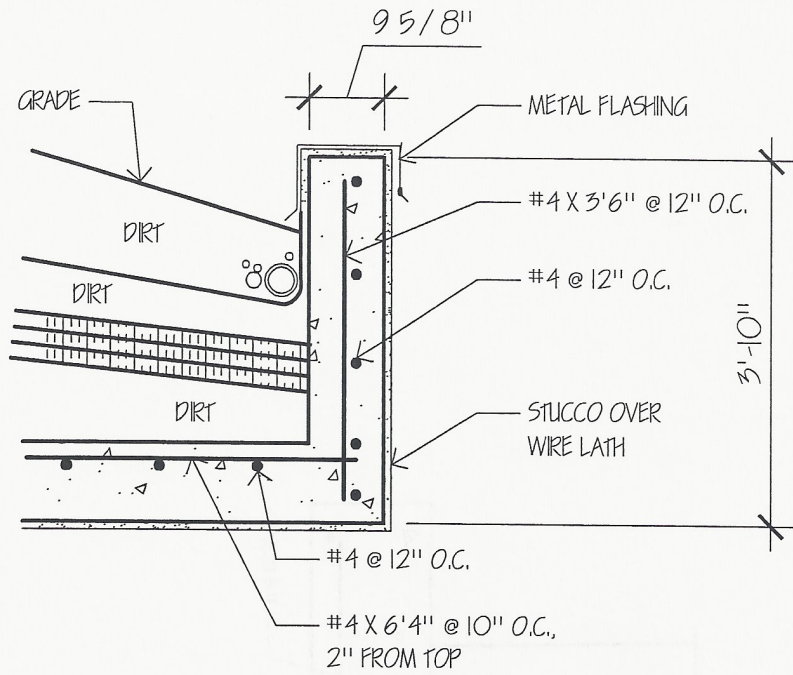


OVERHANG DETAIL

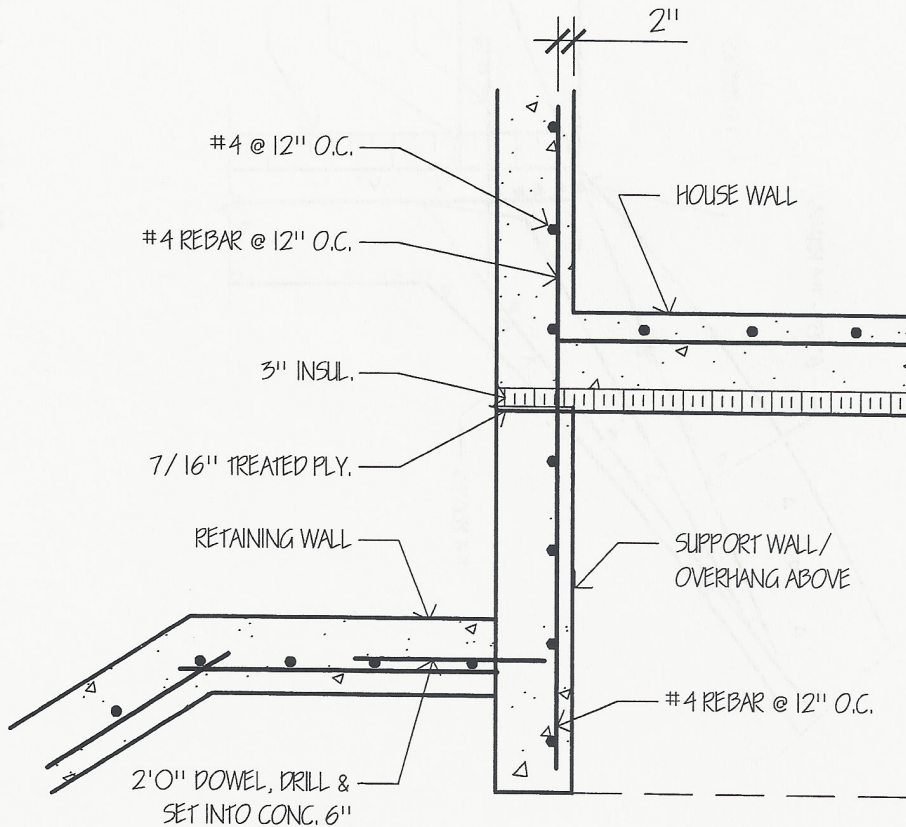
SCALE: 3/4" = 1'-0"

1

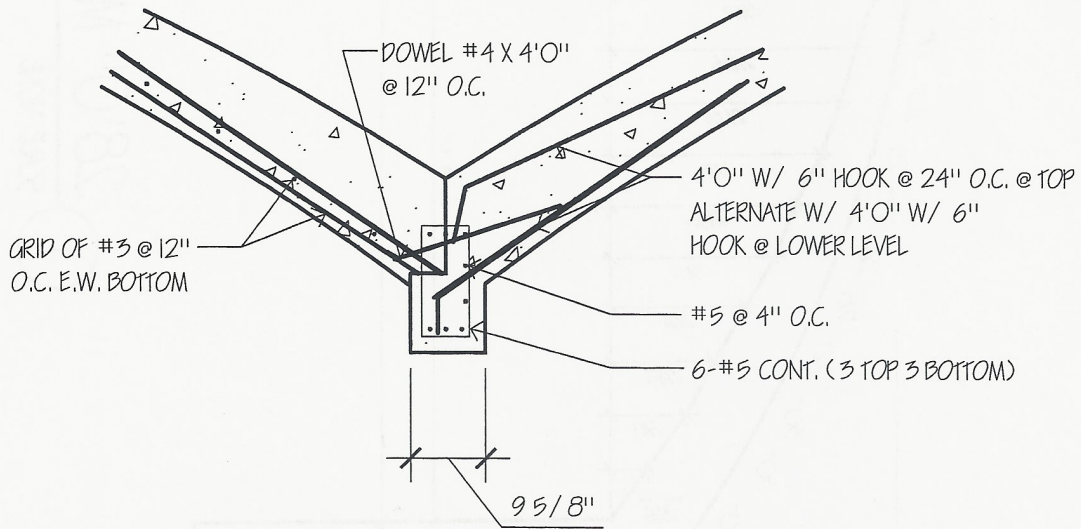
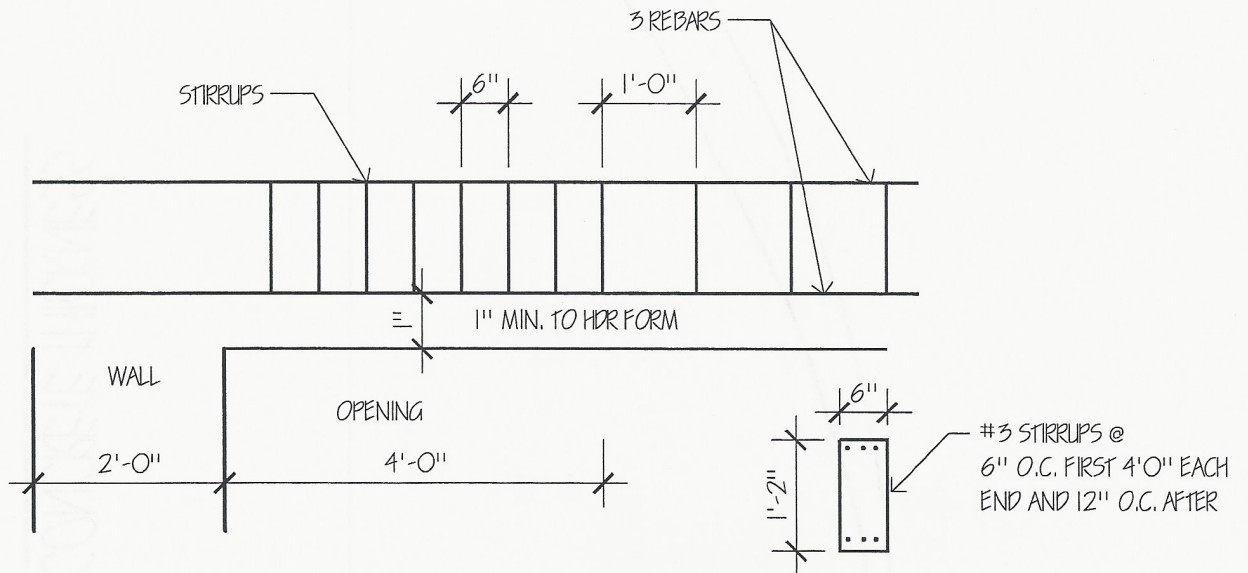
F-6



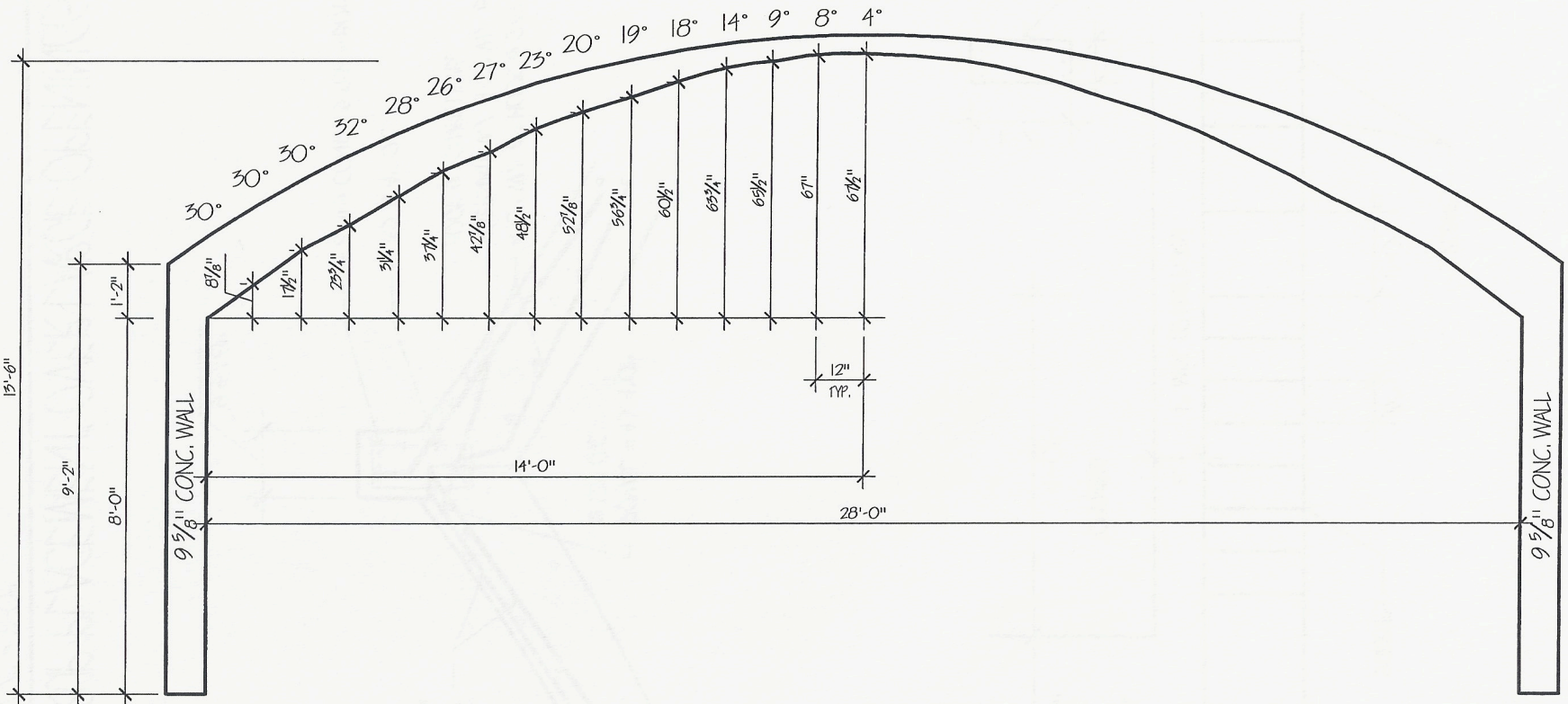
1 PARAPET WALL @ EDGE OF OVERHANG DETAIL  
SCALE: 1/2" = 1'-0"



2 THERMO BREAK DETAIL @ SUPPORT WALL @ HSE WALL  
SCALE: 1/2" = 1'-0"

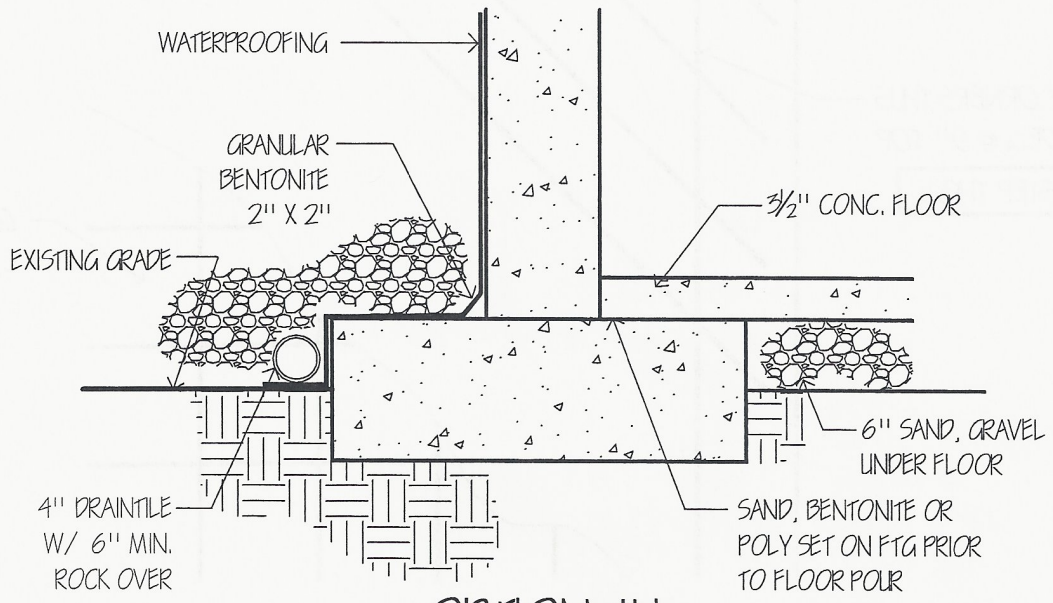


1 STIRRUP PLACEMENT OVER LARGE OPENINGS  
SCALE: 1/2" = 1'-0"

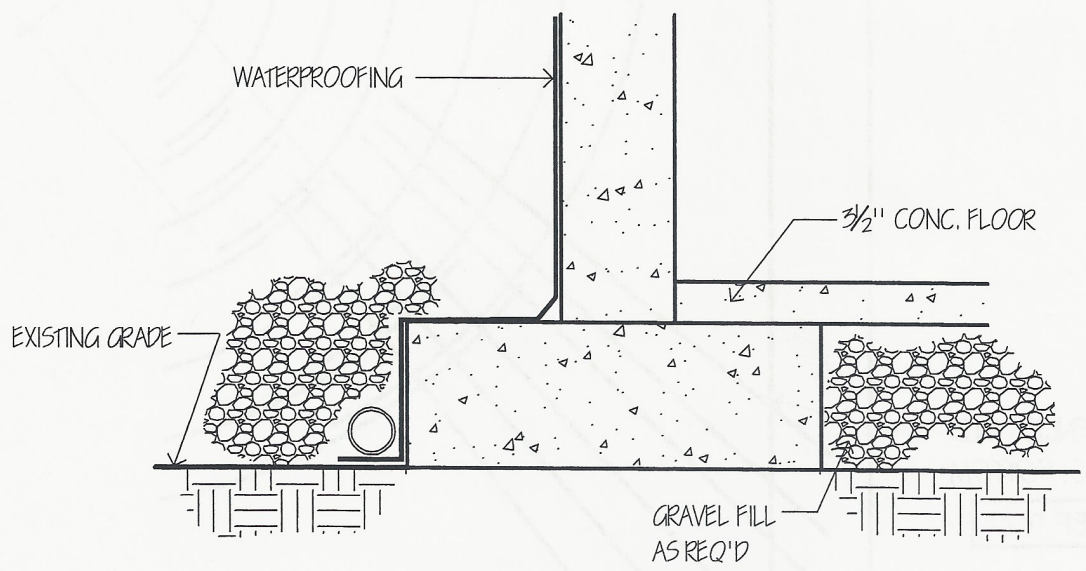


1
 28'0" MODULE - DOME CONCRETE THICKNESS  
 SCALE: NONE

6-9



OPTION #1



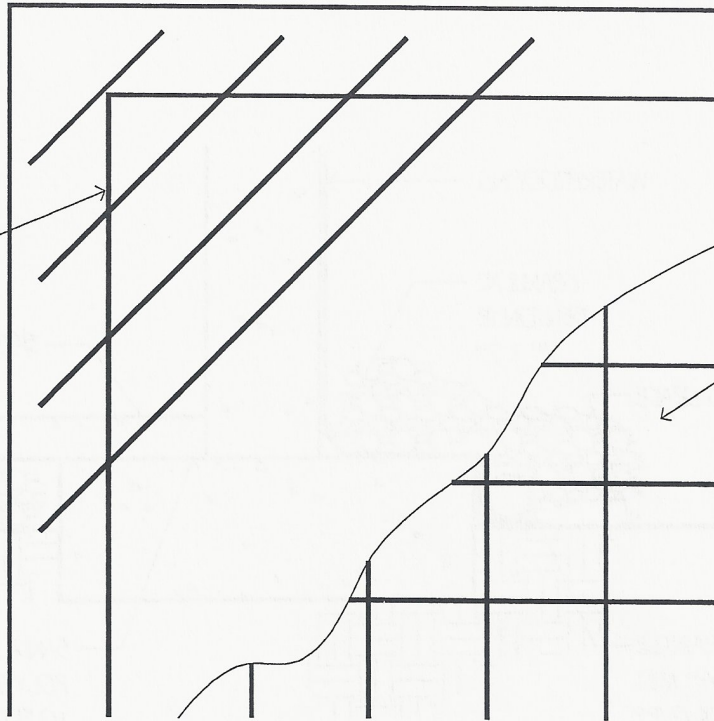
NOTE: SPRINKLE SAND ON TOP OF FOOTING TO PREVENT POURED FLOOR FROM ADHERING TO FOOTINGS

OPTION #2



4 CORNERS THIS  
4-#4 45 DEG @ 9" TOP

STEP THREE

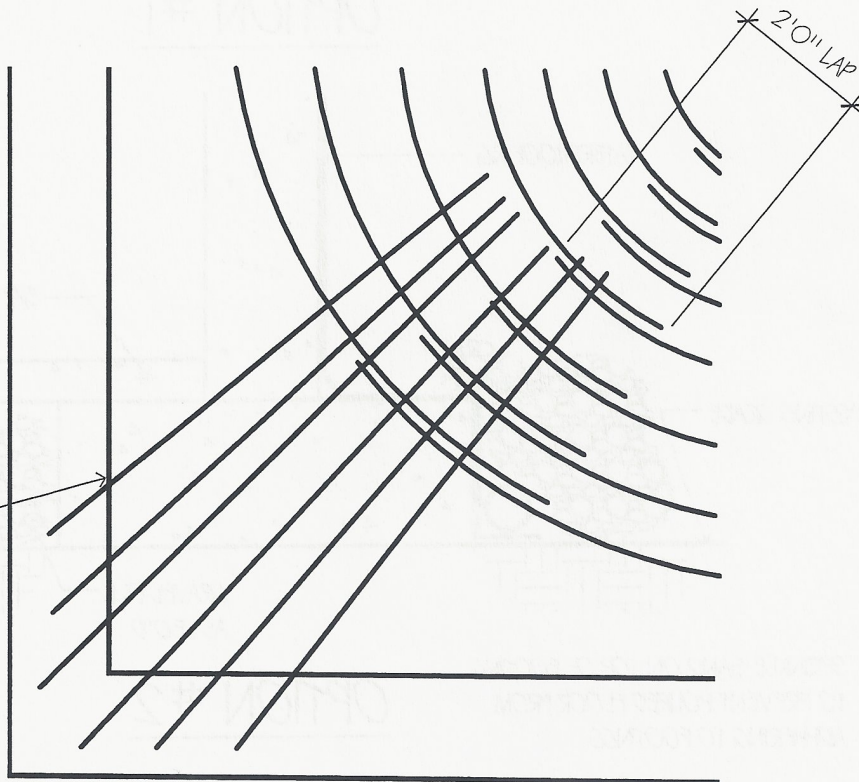


GRID OF #3 @ 12" O.C.  
E.W. BOT. OR EQUIV

STEP ONE

4 CORNERS THIS  
6-#4 @ 9" O.C. BOTTOM

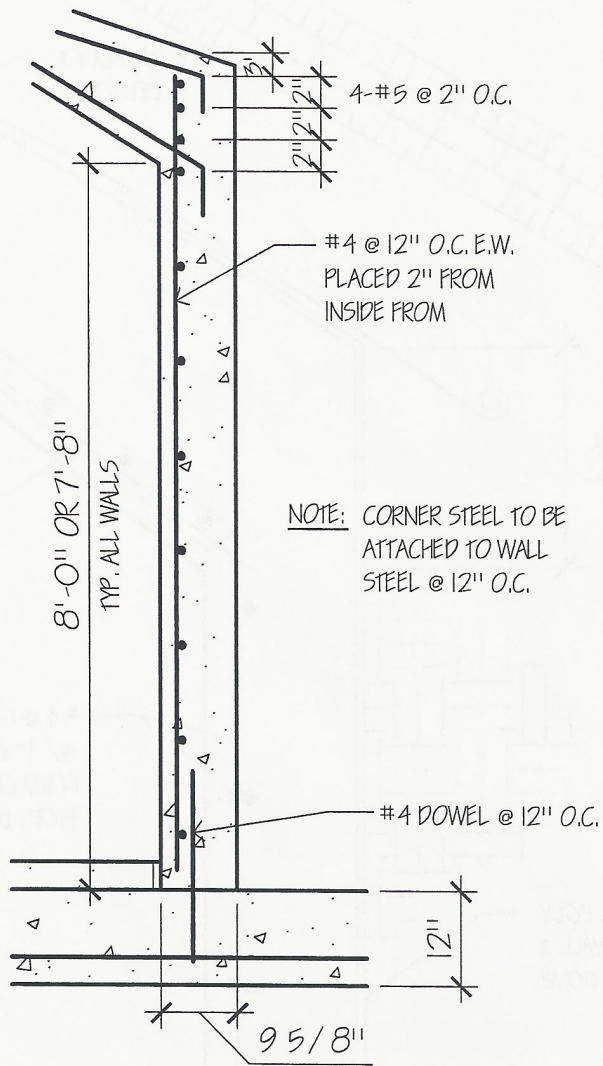
STEP TWO



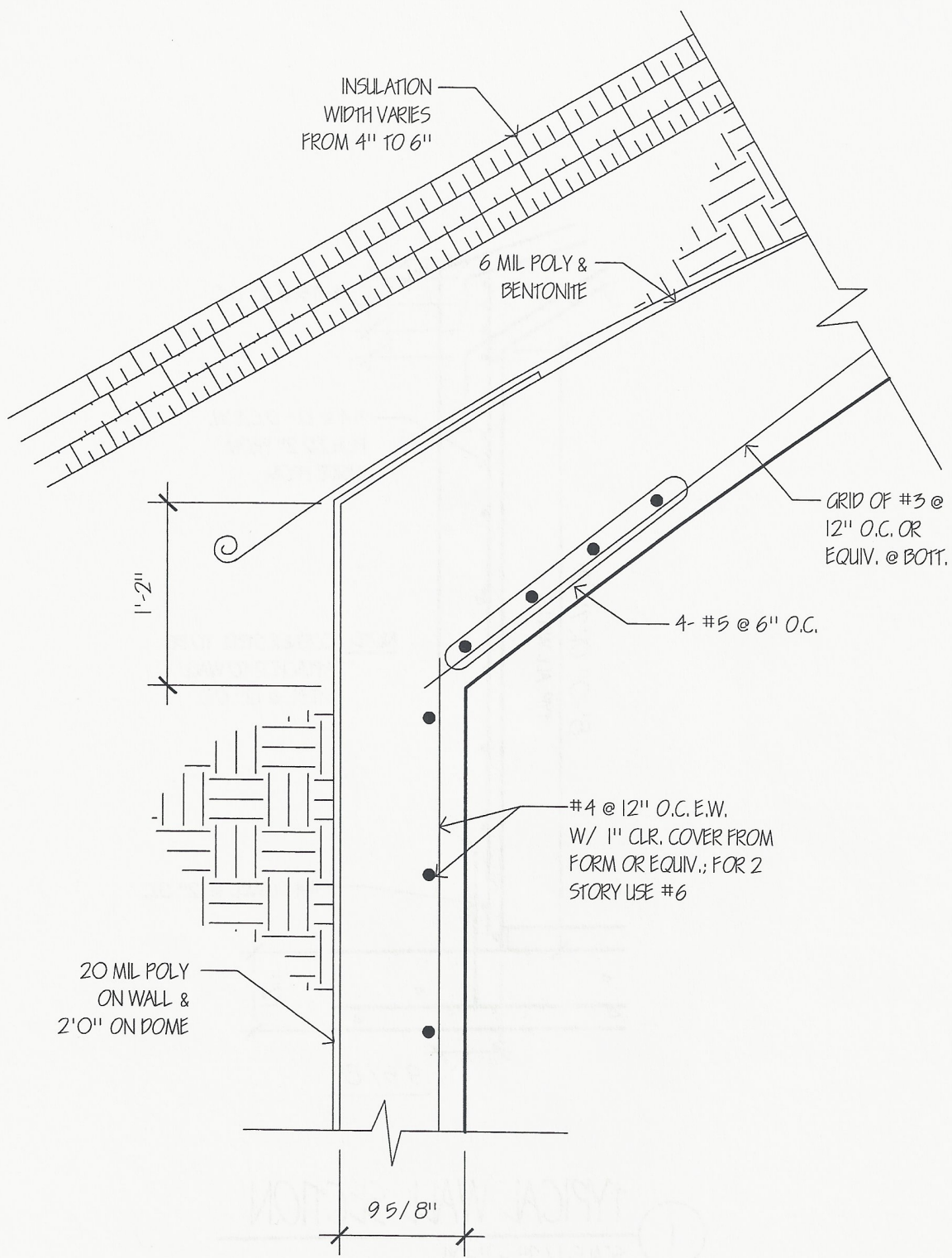
2'-0" LAP

1 TOP VIEW-DOME CORNER STEEL  
SCALE: NONE

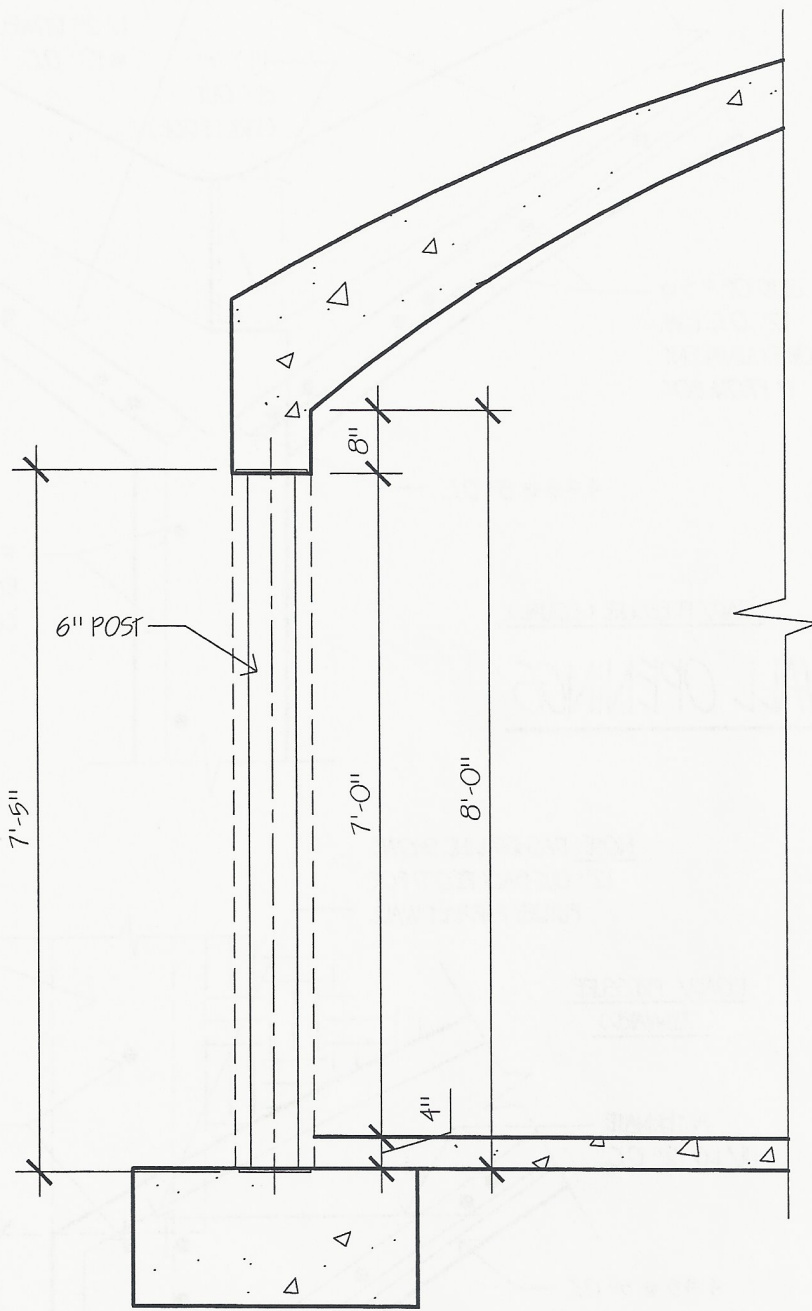
F-11



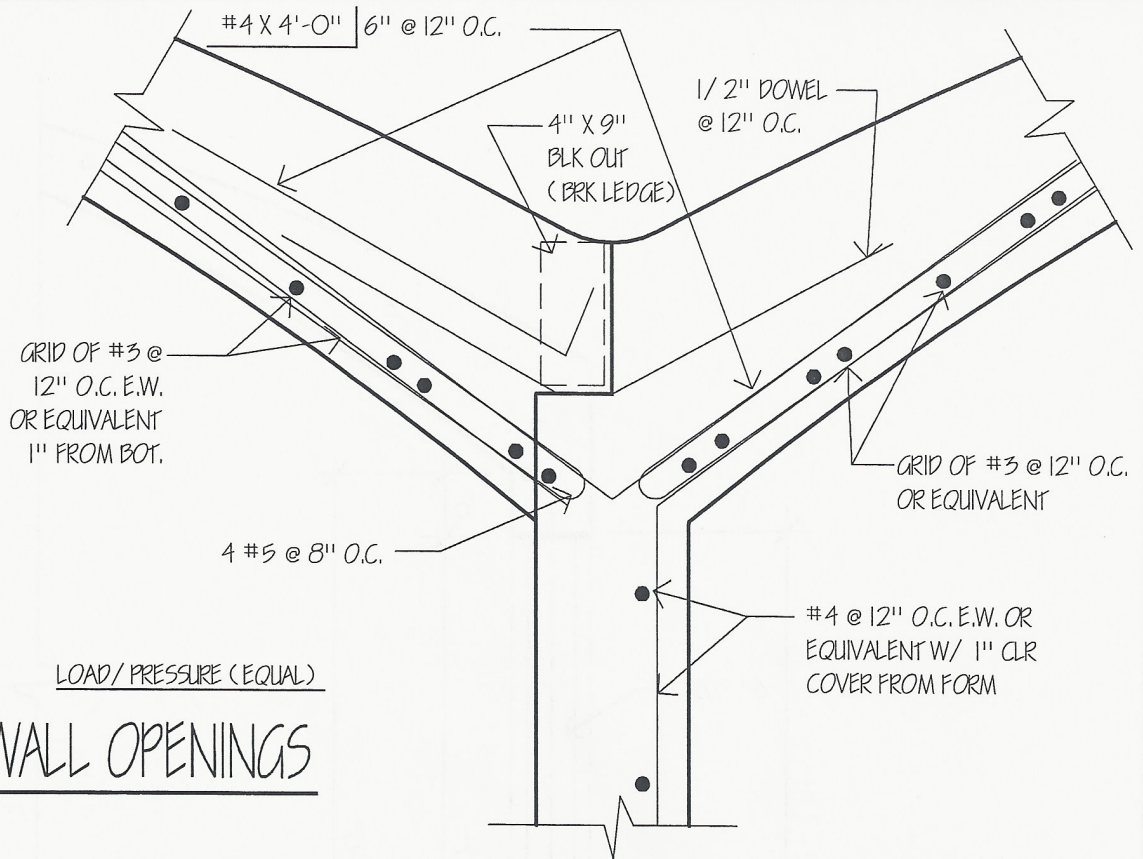
① TYPICAL WALL SECTION  
 SCALE: 1/2" = 1'-0"



① EARTH COVERED WALL / DOME DETAIL  
SCALE: 1" = 1'-0"



① 6" POST DETAIL  
 SCALE: 1/2" = 1'-0"



1

# STANDARD WALL OPENINGS

SCALE: 1" = 1'-0"

NOTE: DASHED LINE SHOWS 12" CUT BACK REQ'D FOR FUTURE PARAPET WALL

LOAD/ PRESSURE (OUTWARD)

ALTERNATE HI/ LO 12" O.C.

4 #5 @ 3" O.C. ON WALL AGAINST BACKFILL IS NEEDED

GRID OF #3 @ 12" O.C. E.W. BOT. OR EQUIV.

#4 @ 12" O.C. E.W. W/ 1" CLR. COVER FROM FORM

PARAPET WALL 3'-0" MAX. HEIGHT EARTH FACE

#4 CONT. @ 12" O.C.

BACK FILL SIDE-DOME WANTS TO PUSH OUTWARD

EXTEND #4 @ 12" O.C. TO TOP OF PARAPET WALL

1'-2"

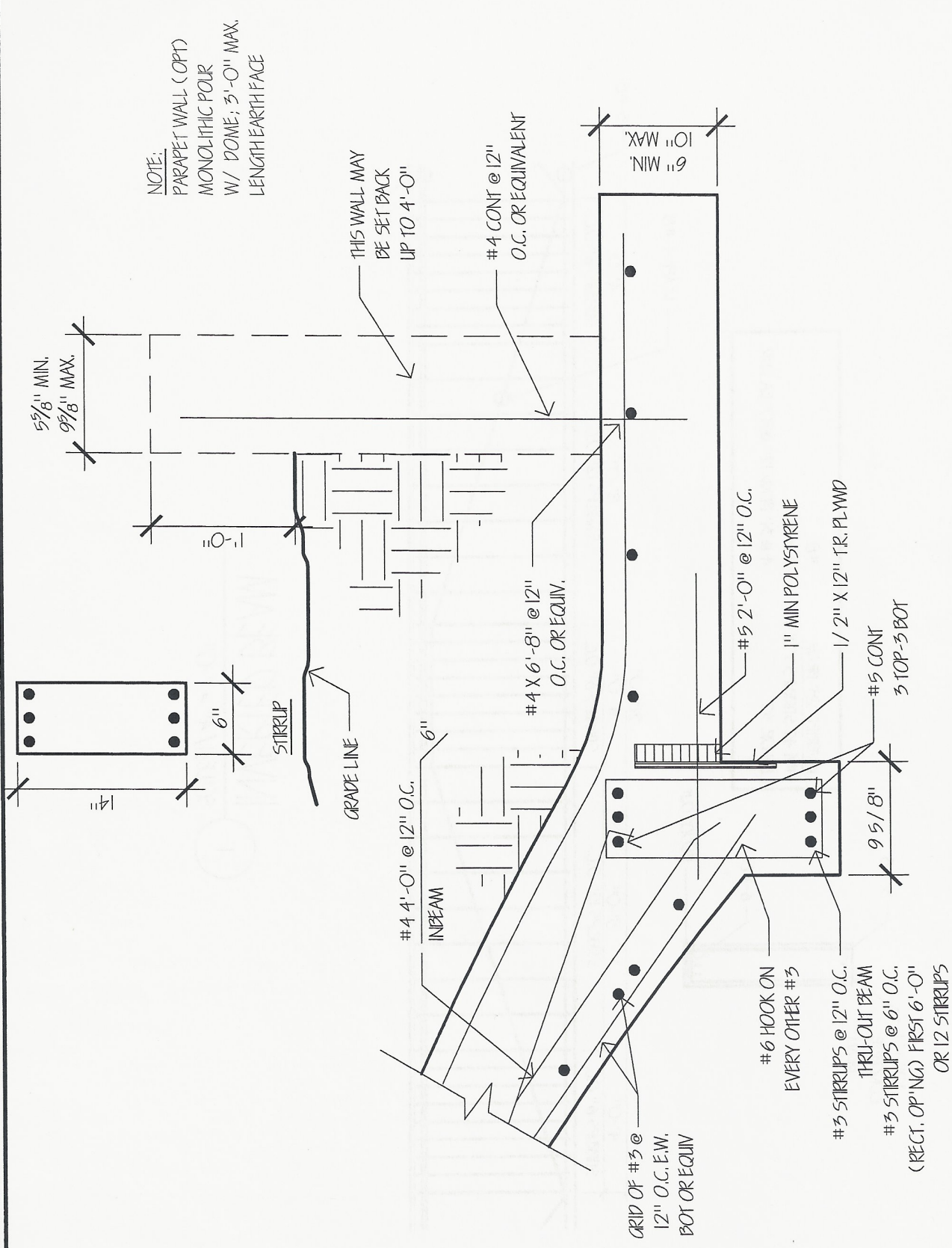
9 5/8"

2

# MONOLITHIC PARAPET WALL ON SIDE WALL

SCALE: 1" = 1'-0"

F-15

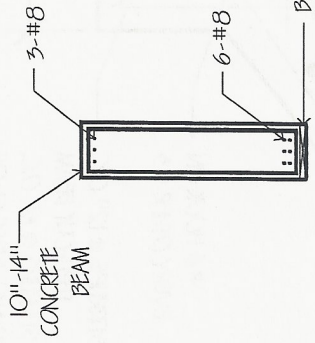


NOTE:  
 PARAPET WALL (OPT)  
 MONOLITHIC POUR  
 W/ DOME; 3'-0" MAX.  
 LENGTH EARTH FACE

# STANDARD OVERHANG AND BLOCK-OUT (REBAR INS. DETAIL)

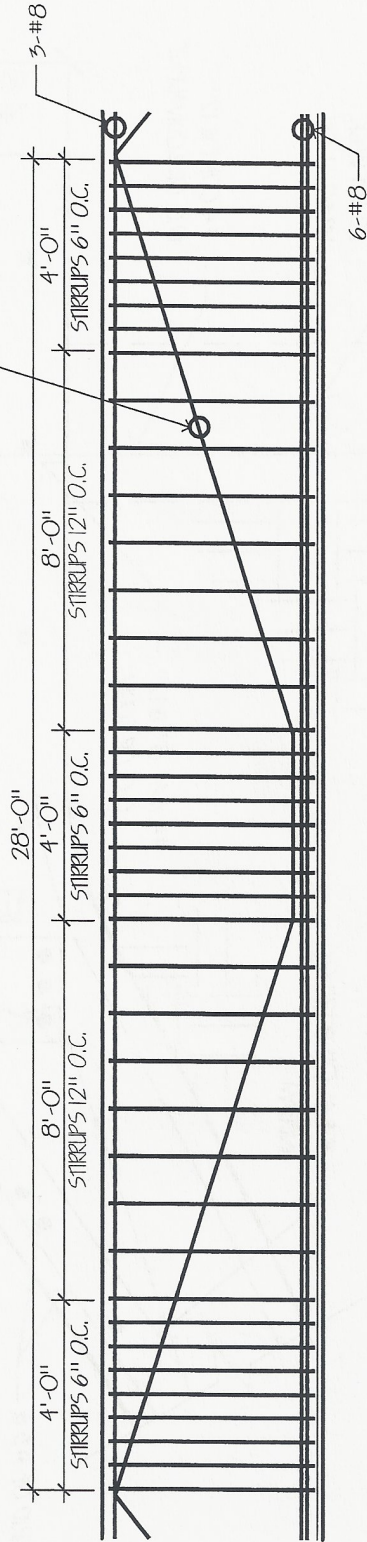
SCALE: 1" = 1'-0"

FOR RECTANGULAR OPENINGS REINF. SIMILAR EXCEPT USE  
 4-#5 TOP & CONT. & 4-#5 6'-0" @ ENDS



INVERTED 28' BEAM  
 #4 42 STIRRUPS 7" X 4"  
 8-HOR. 52'

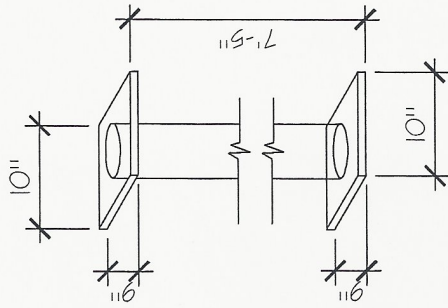
#8  
 9 @ 30'  
 4 @ 31' BEND 12" @ 90° EA. END



INVERTED BEAM

1

SCALE: 1/4" = 1'-0"



NOTE:  
 OWNER TO SUPPLY 7'5" X 6"  
 SCHEDULE 80 HEAVY DUTY  
 BLACK IRON PIPE W/ 1/2" PLATE  
 TOP & BOTTOM.  
 10" X 9" PLATE WELDED SAME  
 DIRECTION EA. END.

STEEL POST DETAIL

1

SCALE: 1/2" = 1'-0"



## Plumbing

### Plumbing and heating:

The venting in this type of construction is somewhat different than frame built. Where this is most noticed, the vent pipes and sleeves must be placed into the forms during the setup. Also, roof vents and sleeves are placed during the setup. The poured walls are 9 5/8" thick, the dome is 14" thick at the base and tapers to 6" thick at the apex.

### Most common vents are:

- Furnace vents and fuel supply sleeves
- Bath fan
- Fireplace chimney and air supply
- Toilet, shower, sink and tub
- Kitchen hood fan, with fresh air supply
- Air conditioner sleeve for copper lines
- Water heater chimney
- Central vacuum exhaust sleeve

Some of the vents require intake air as well as exhaust. On all vents where moisture may condense inside of the pipe, water damage may occur. In order to prevent this from happening, these precautions will help. Where vent pipes extend through the roof, a 90 degree street elbow is glued to riser, with a tee glued in a

vertical position onto the elbow. Then a pipe extension is glued upward into the tee, this should extend 7 feet above the concrete dome. The bottom of the tee should have a 12" pipe glued into it. This is best done to all vents except waste line vents.

**Plumbing rough-in measurements (unless plan specs otherwise)**

1. Toilet drain from center line of drain to finished wall -12".
2. Toilet water supply 6" high from finished floor.
3. Toilet water supply 6" to left of center line of toilet as you face the drain.
4. Water supply 2" out from finished wall.

**Wash Basin:**

1. Basin drain line from finished floor – 18".
2. Basin water supply from finished floor – 22".
3. Basin water supply 4" from center line left & 4" right.
4. Basin trap size 1 ¼" = 1 ½" x 1 ¼" reducing slip nut and washer to convert to 1 ½" drain.
5. Basin line size 1 ½".
6. Basin water supply 2" out from finished wall.
7. If basin is wall hunt – put hangers 33" up from finished floor.

**Kitchen Sink:**

1. Kitchen sink drain with garbage disposal 16" high from finished floor.
2. Kitchen sink drain line size 2".
3. Sink trap size 1 ½".
4. Kitchen sink without garbage disposal 21" from finished floor.

**Bathtubs:**

1. Tub trap size 1 ½" P trap.
2. Tub drain line size 1 ½".
3. Tub drain in floor 3" below finished floor level.
4. Tub spout 5" above edge of tub.
5. Rub faucets 10" above top edge of tub.

**Showers:**

1. Trap size 2".
2. Drain size 2".
3. Drain line 2".
4. Shower head from finished floor 78".
5. Shower head from faucets to head 48".

**Toilets, washbasins, shower and floor drains under concrete floor:**

1. All drain lines should be pitched  $\frac{1}{4}$ " per foot (1" in 4')
2. Drain lines should be installed with wye fittings where you connect drain lines together
3. Toilet drain lines should not be over 7 feet from main sewer line, if it is over 7 feet it has to be vented.
4. Washbasins and showers should also be vented in basement.

**O.K. before another re-vent is needed:**

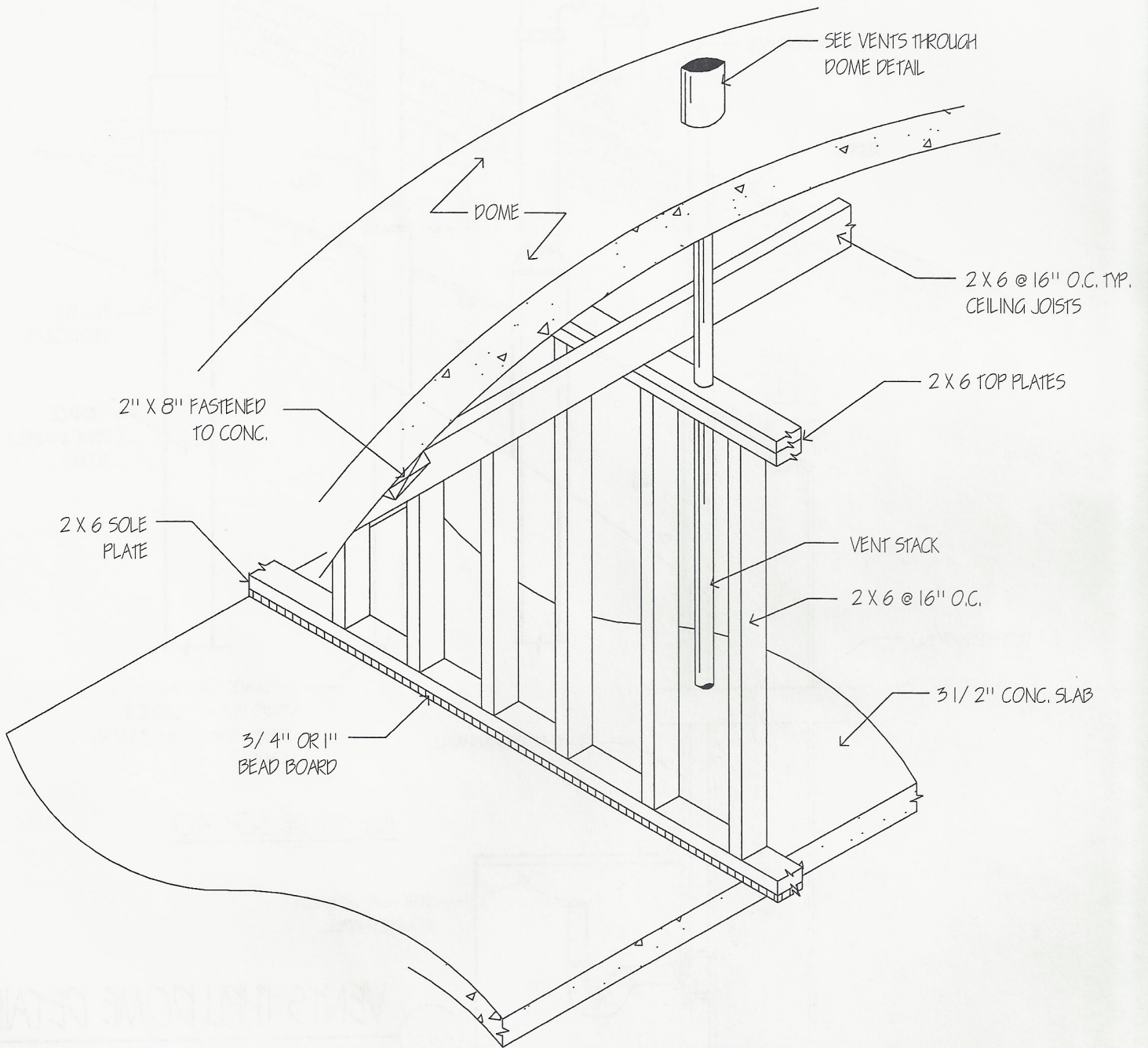
1 $\frac{1}{2}$ " – 3'6"	3' – 7'
2" – 5'0"	4' – 7'

**\*A 2" floor drain maybe 15' away from stack without re-venting.**

**Use TYPE "K" copper (green stripe) BELOW FLOOR IN INSULATION OR SLEEVE ( no fittings or coupling under floor surface).**

**Use TYPE "L" copper (blue stripe) below and above ground.**

**Use TYPE "M" copper (red stripe) in areas above ground.**



1
**PLUMBING WALL DETAIL**  
 SCALE: 1/2" = 1'-0"

VENTS W/ CONDENSATION:  
CLOTHES DRYER, BATH FAN, KIT  
HOOD FAN, FRESH AIR VENTS

ROCK FOR DRAINAGE

RUBBER

FERNCO  
COUPLING

S.S.  
RING

FILL W/  
VERMICULITE

FURNACE  
VENT & SUPPLY  
SLEEVE

WATERPROOFING

2" X 4" FURRING WALL

3" STACK FOR WASTE  
VENTS W/ 4" SLEEVE &  
RUBBER FERNCO 4 X 3 W/ S.S.  
CLAMPS

ALL TO BE SCH. 40

SINK AGAINST EARTH  
COVERED WALL

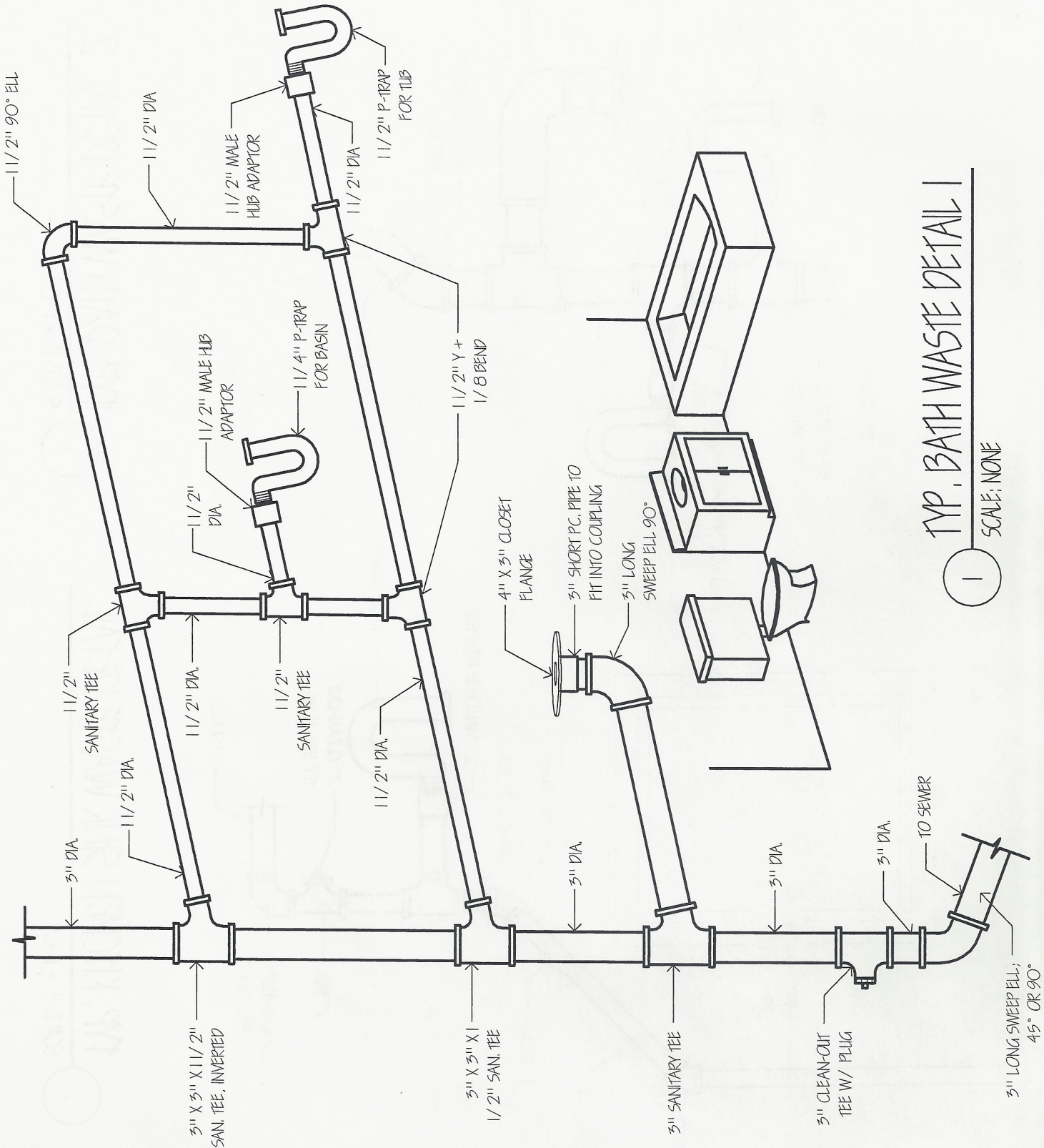
1 VENTS THRU DOME DETAIL

SCALE: 3/4" = 1'-0"

90° LONG SWEEP  
ELBOW REQ'D OR  
45° L.S.

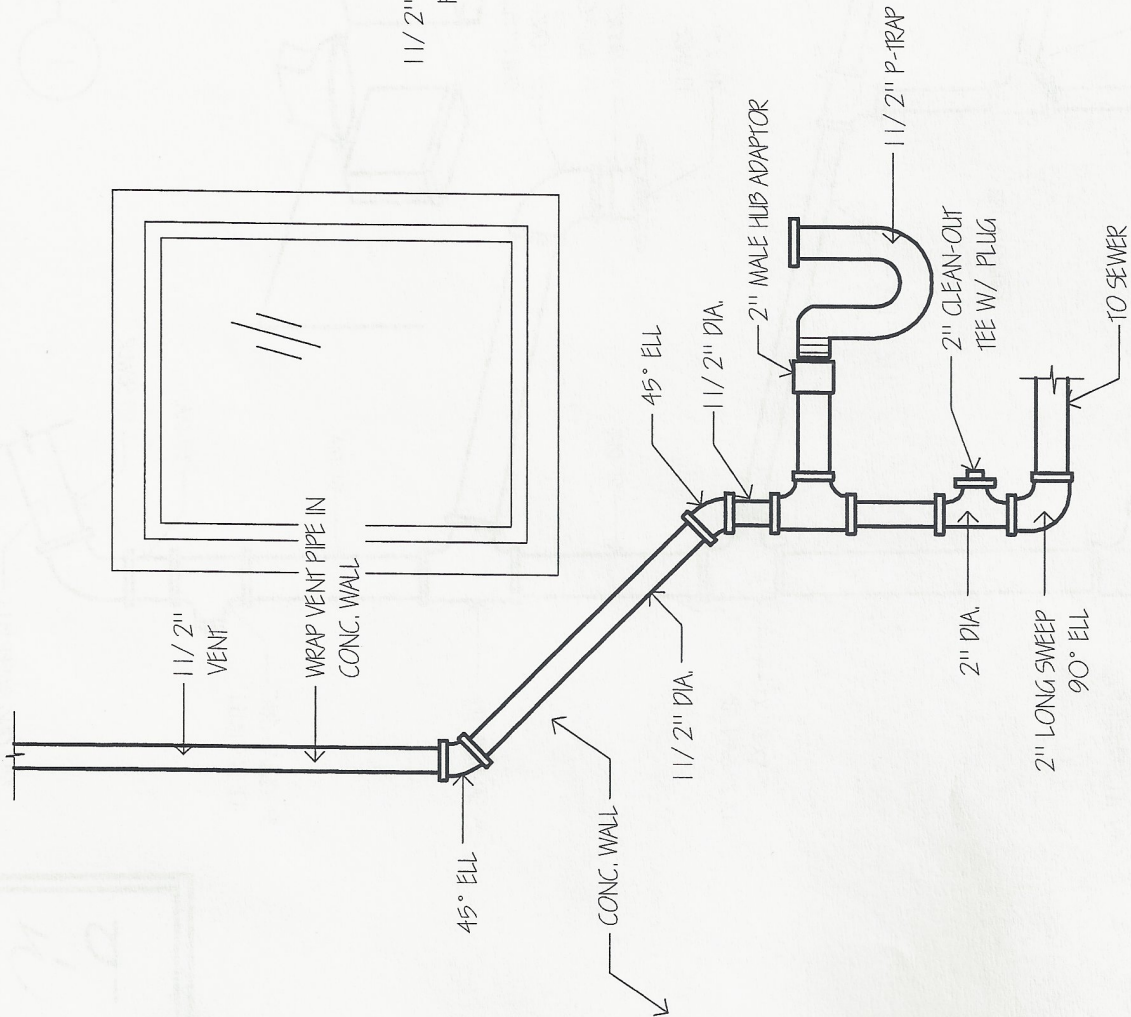
DRAIN TILE  
SLOPES TOWARD  
HSE FRONT

P-2



TYP. BATH WASTE DETAIL I  
SCALE: NONE

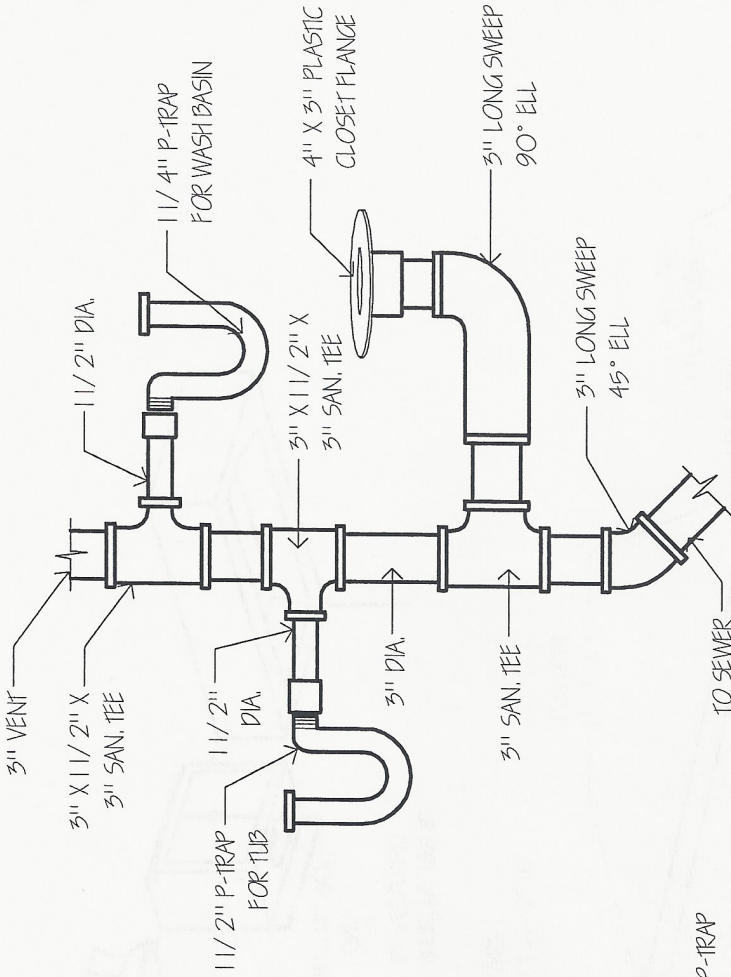
P-3



1 TYP. KITCHEN SINK WASTE DETAIL

SCALE: 1" = 1'-0"

1

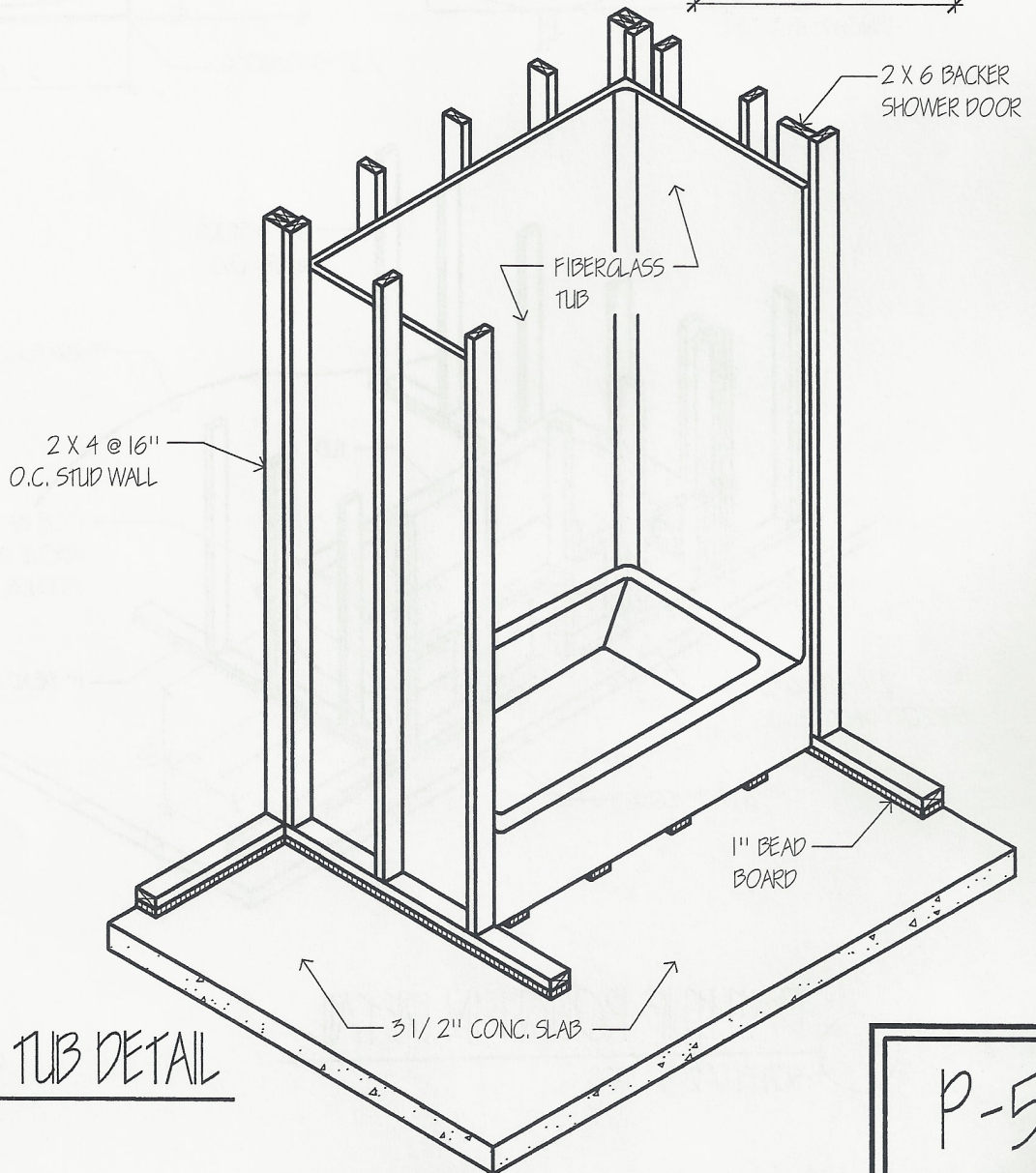
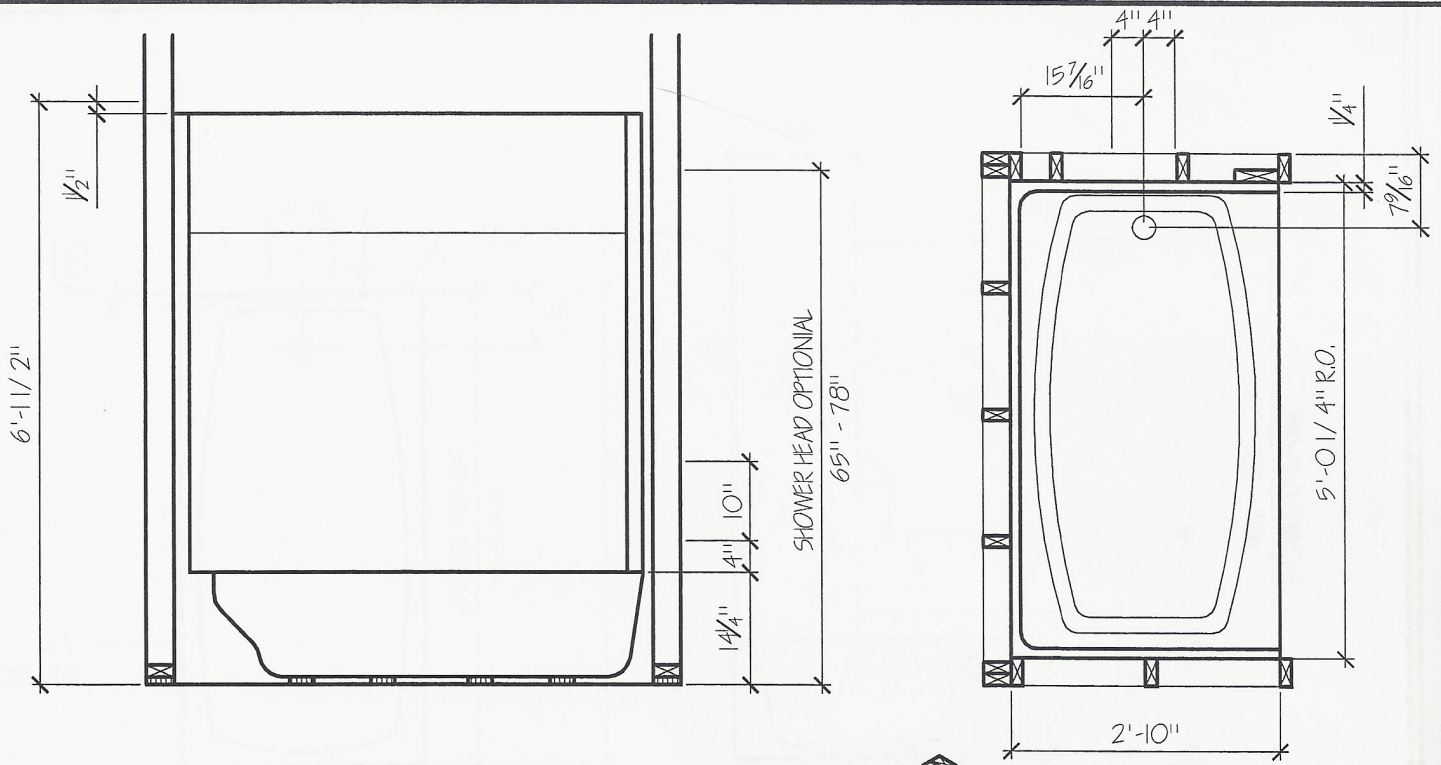


2 TYP. BATH WASTE DETAIL

SCALE: 1" = 1'-0"

2





1

FIBERGLASS TUB DETAIL

SCALE: 1/2" = 1'-0"

P-5