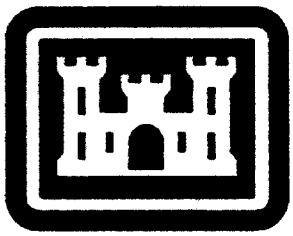


# STANDARD DETAILS FOR UTILITIES, FOUNDATIONS, PAVING AND RAILROADS

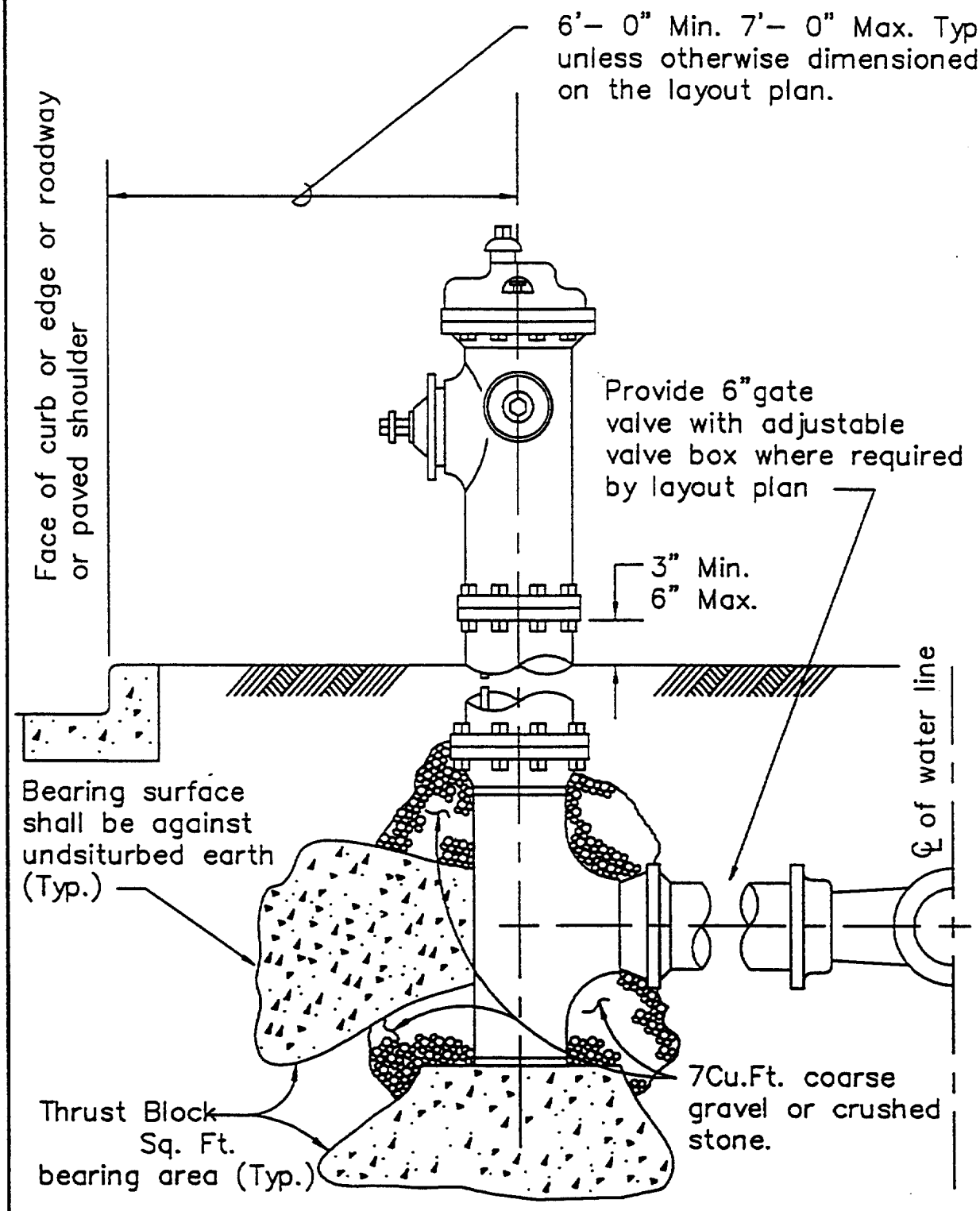
AUGUST 1992


DEPARTMENT OF THE ARMY

SACRAMENTO DISTRICT, CORPS OF ENGINEERS

SACRAMENTO, CALIFORNIA

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



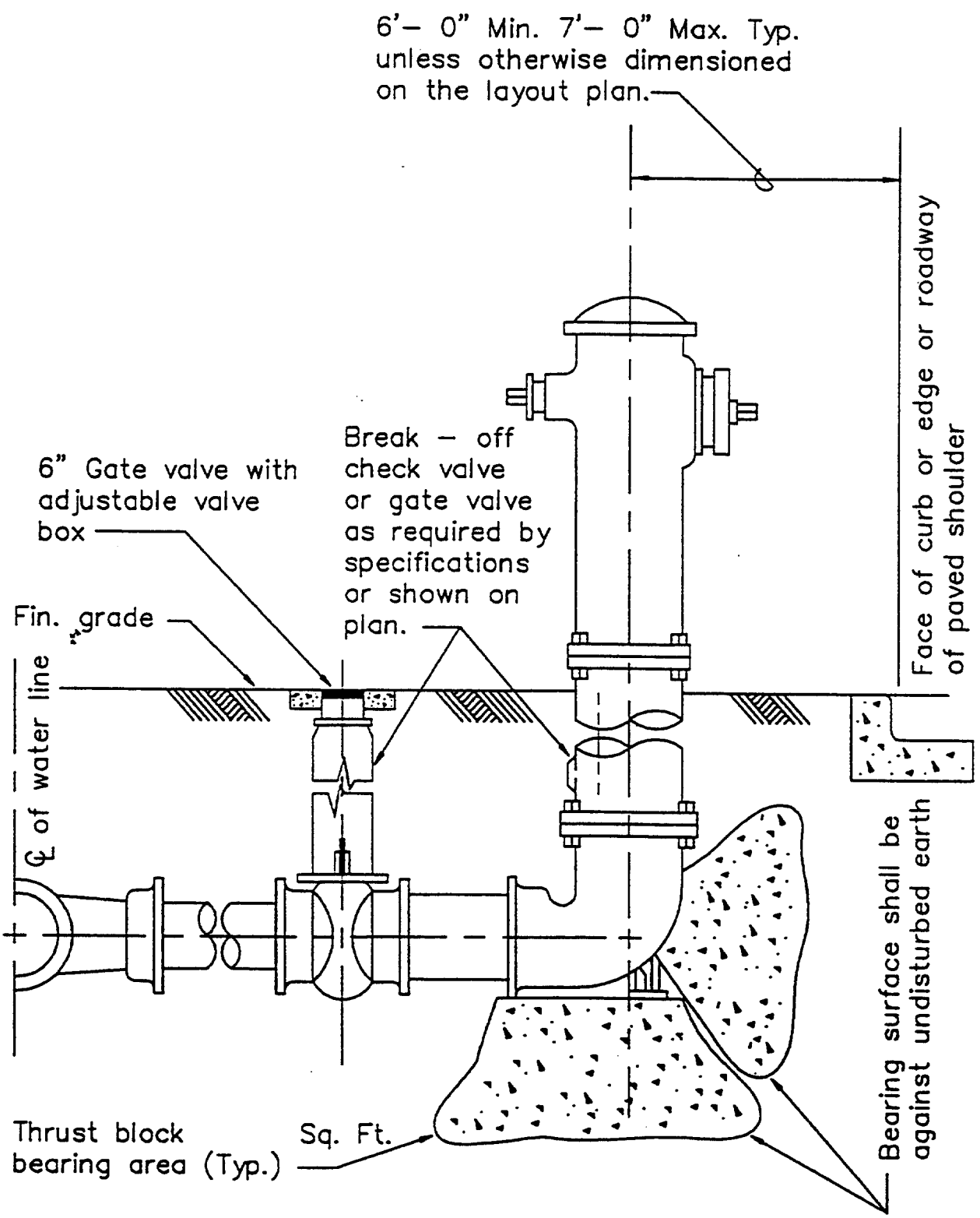

# DRY BARREL FIRE HYDRANT DETAIL
# TYPICAL FIRE HYDRANT SETTING

NO SCALE

FOR USE IN FREEZE AREAS ONLY

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>WATER SYSTEM DETAILS | DATE: JUN. 92 |
| U–1 | |
| 1 | |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



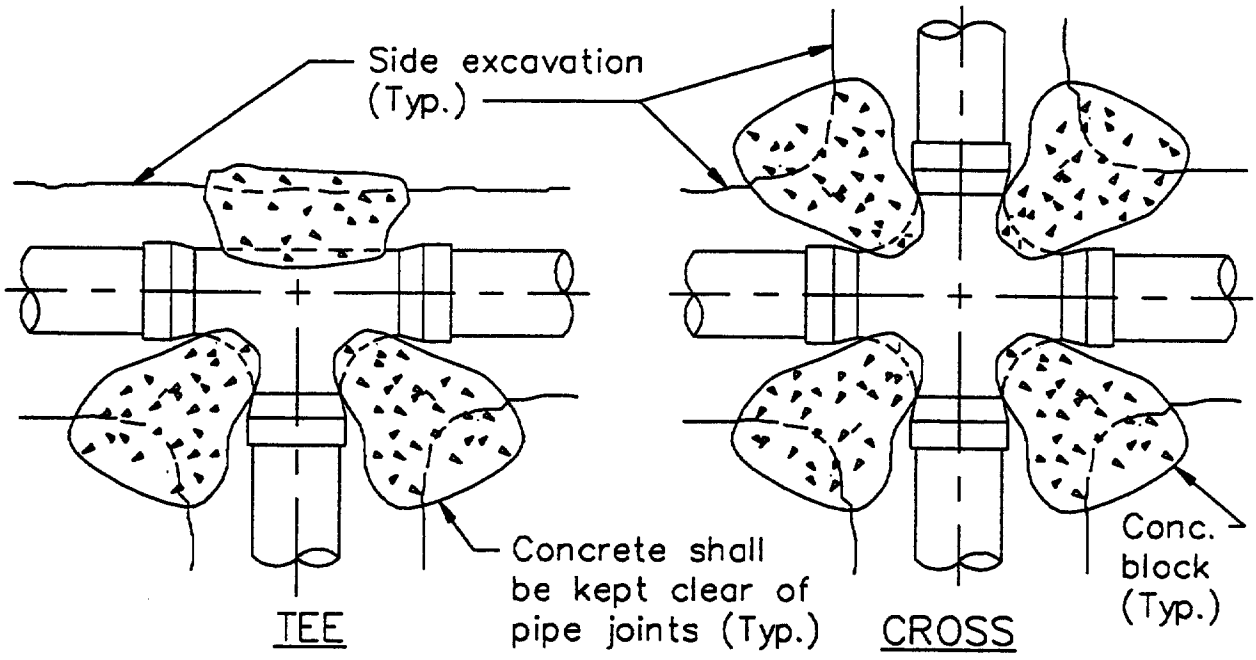

# WET BARREL FIRE HYDRANT DETAIL
# TYPICAL FIRE HYDRANT SETTING

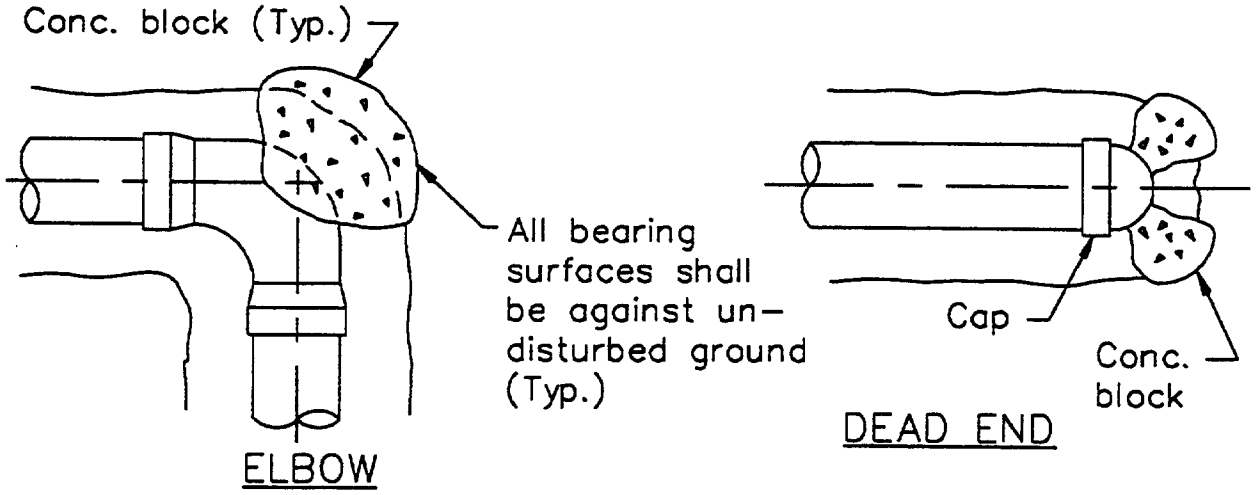
NO SCALE

FOR USE IN NON FREEZE–PRONE AREAS ONLY

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUN. 92<br>WATER SYSTEM DETAILS | U–2<br>2 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




| BEARING AREA EACH DIRECTION OF THRUST IN SQUARE FEET | | | | | |
|---|---|---|---|---|---|
| PIPE SIZE | TEES AND CROSSES | 90° ELBOWS | 45° ELBOWS | 22 1/2° ELBOWS | DEAD ENDS |
| " | | | | | |
| " | | | | | |
| " | | | | | |
| " | | | | | |
| " | | | | | |
| " | | | | | |

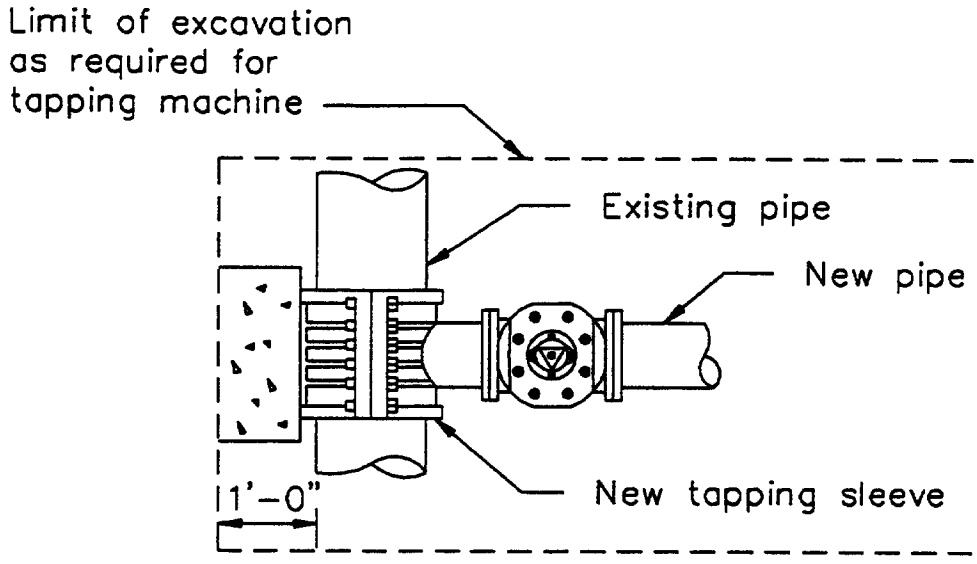
NOTE: Bearing areas shall be as shown in calculations in analysis of design. (The above note shall not be included in drawing detail)

# TYPICAL THRUST BLOCK INSTALLATION

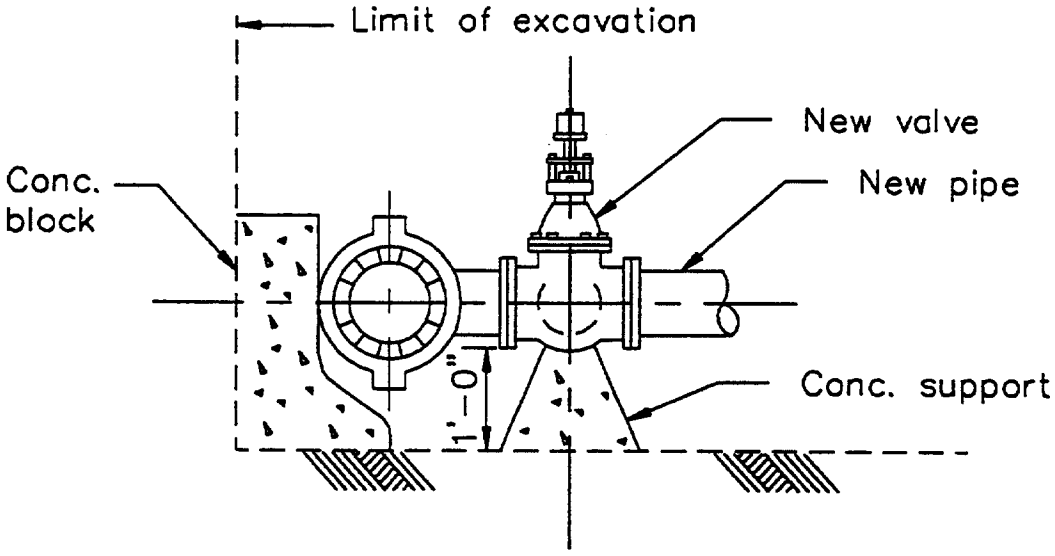
NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>WATER SYSTEM DETAILS<br>DATE: JAN. 91 | U-3<br>3 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT




PLAN



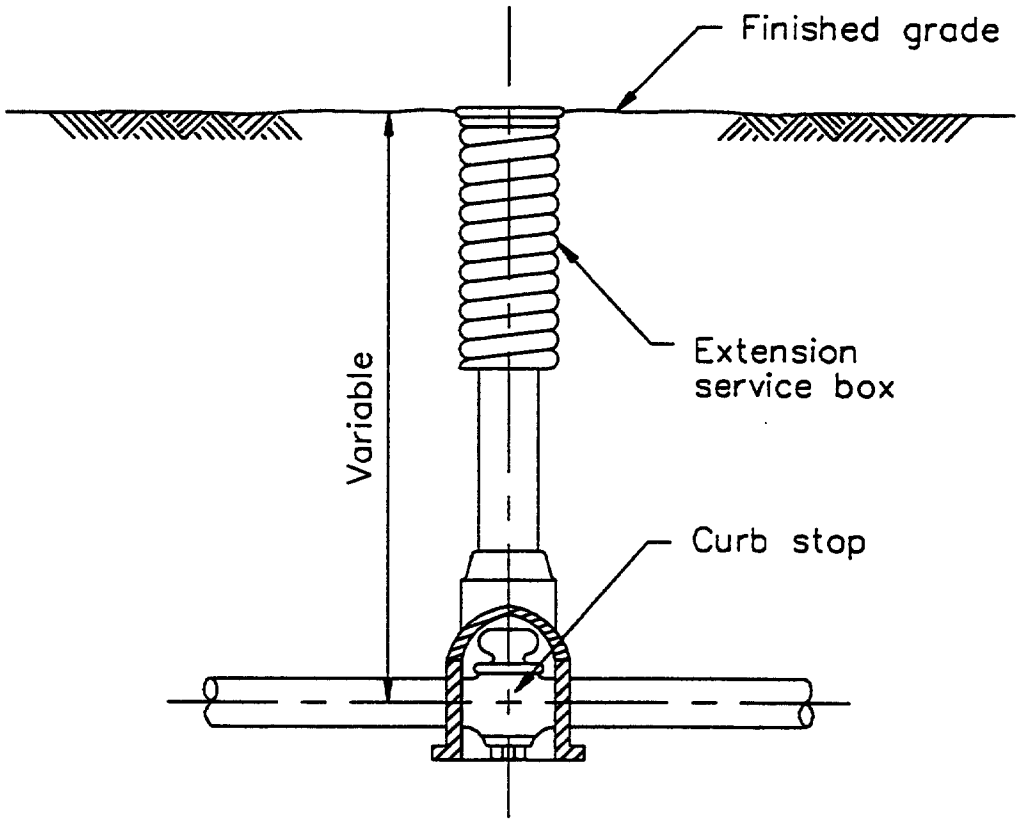

ELEVATION

# TAPPING SLEEVE & VALVE INSTALLATION DETAIL

NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 87<br>WATER SYSTEM DETAILS | U-4<br>4 |

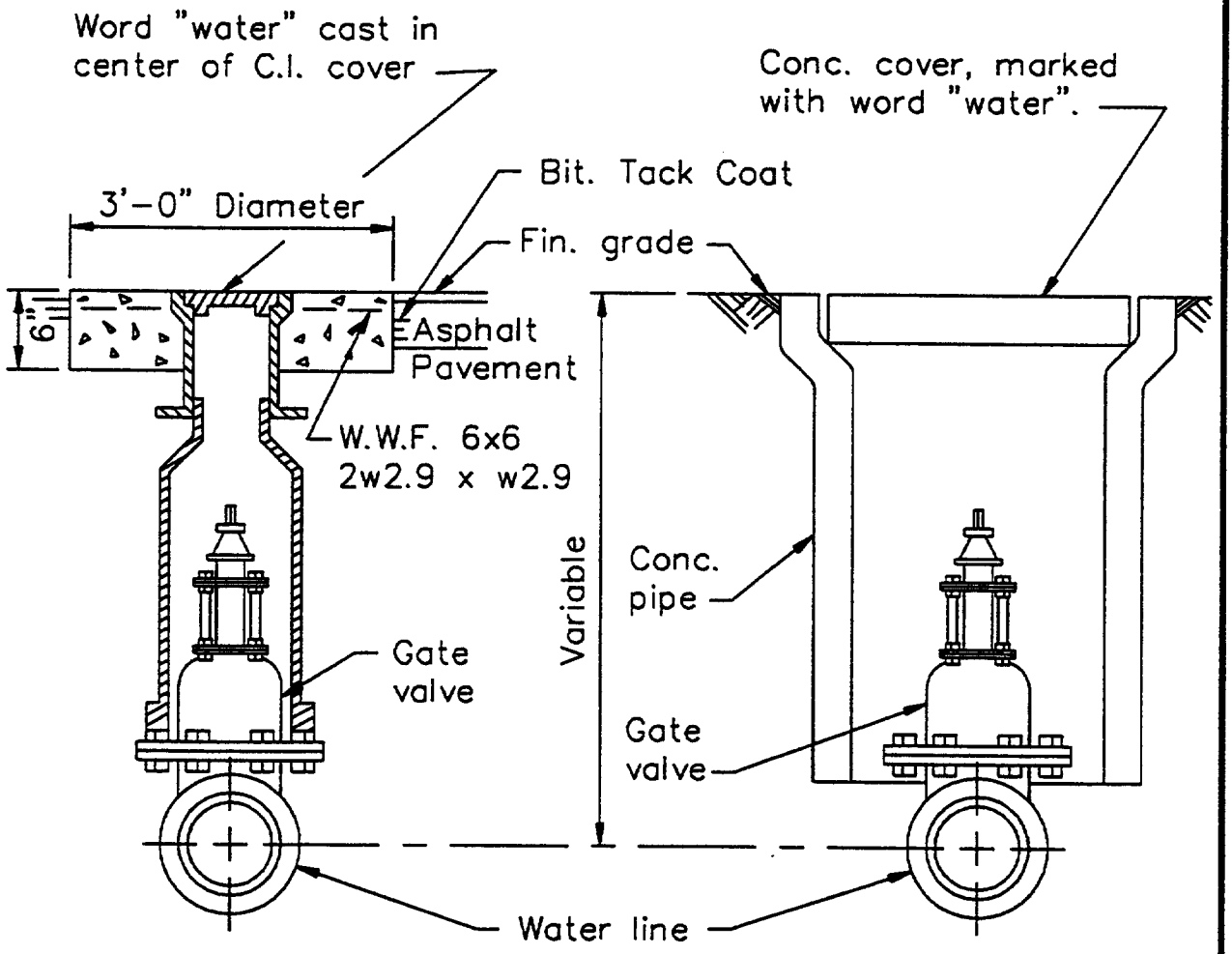
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




## TYPICAL SERVICE BOX SETTING

NO SCALE

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




PAVED AREAS

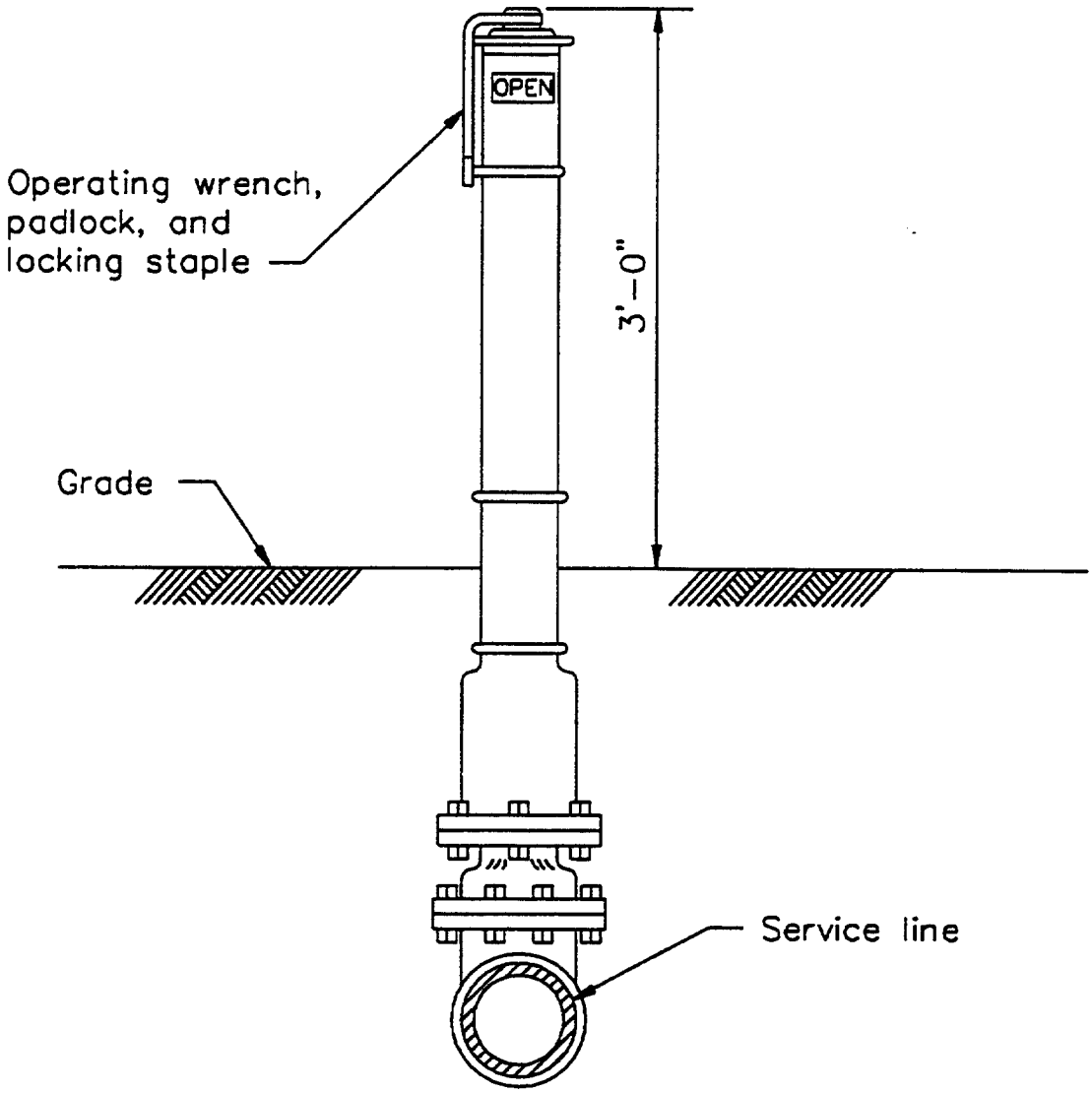
UNPAVED AREAS
(USE IN NON-TRAFFIC AREAS ONLY)

# TYPICAL VALVE BOX DETAILS

NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 89<br>WATER SYSTEM DETAILS | U-6<br>6 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

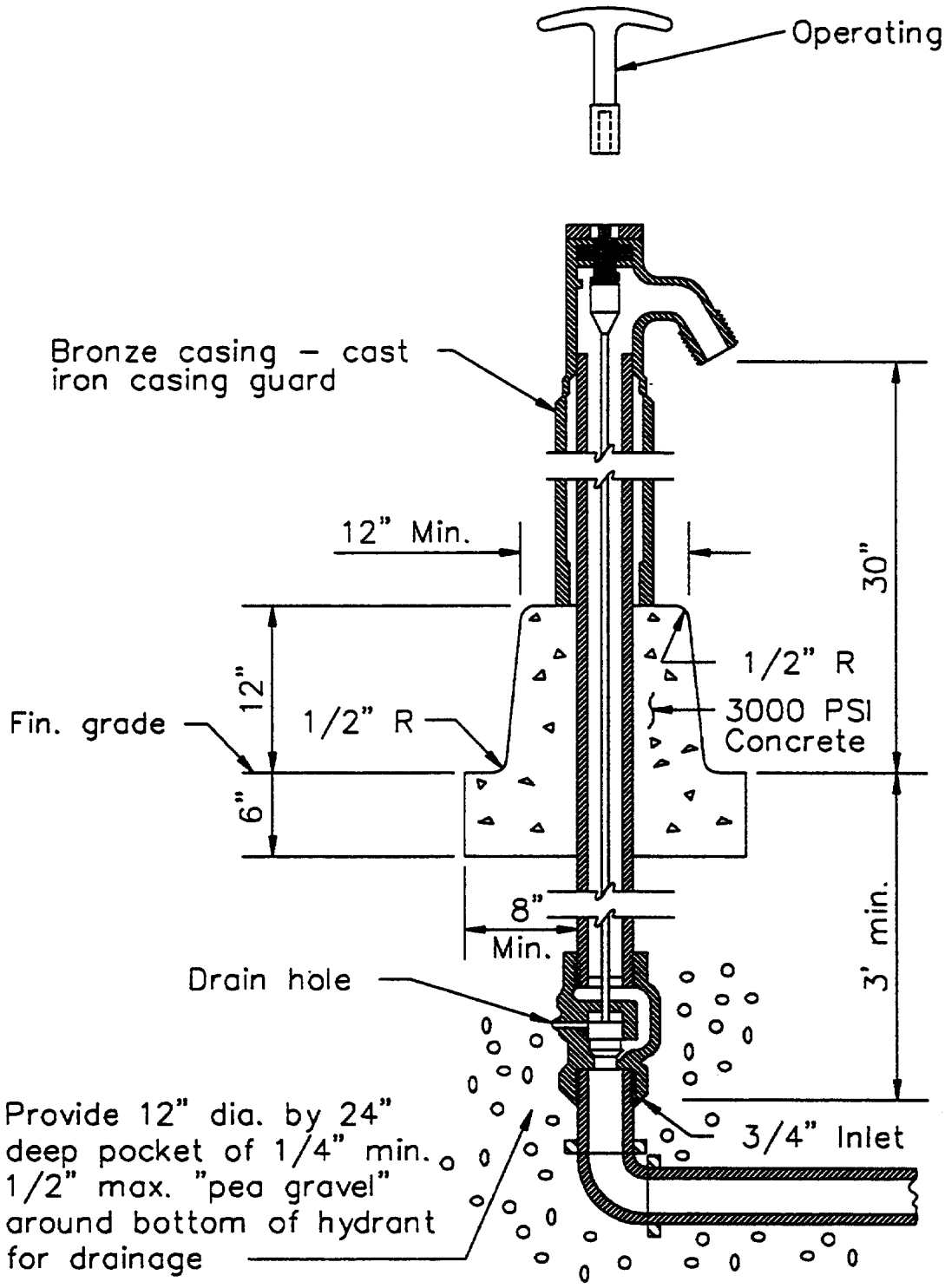



# GATE VALVE WITH INDICATOR POST

NO SCALE

| | | |
|---|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT | | U-7 |
| STANDARD DETAILS | DATE: JULY 1987 | |
| WATER SYSTEM DETAILS | REV. MAR. 88 | 7 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

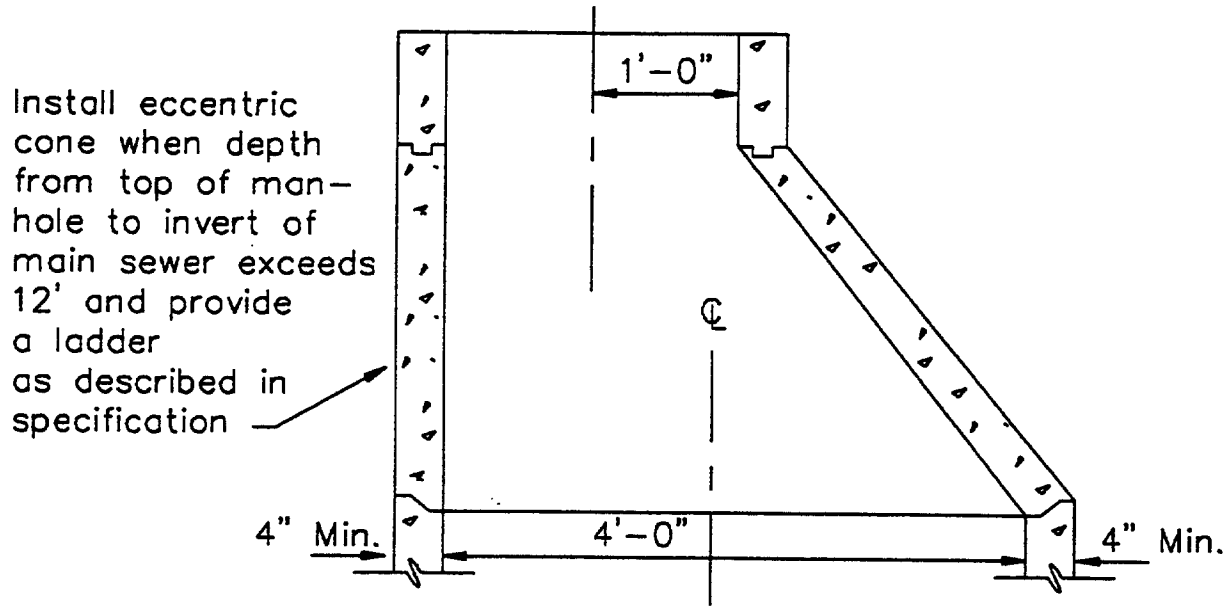



## NON–FREEZE HOSE BIBB

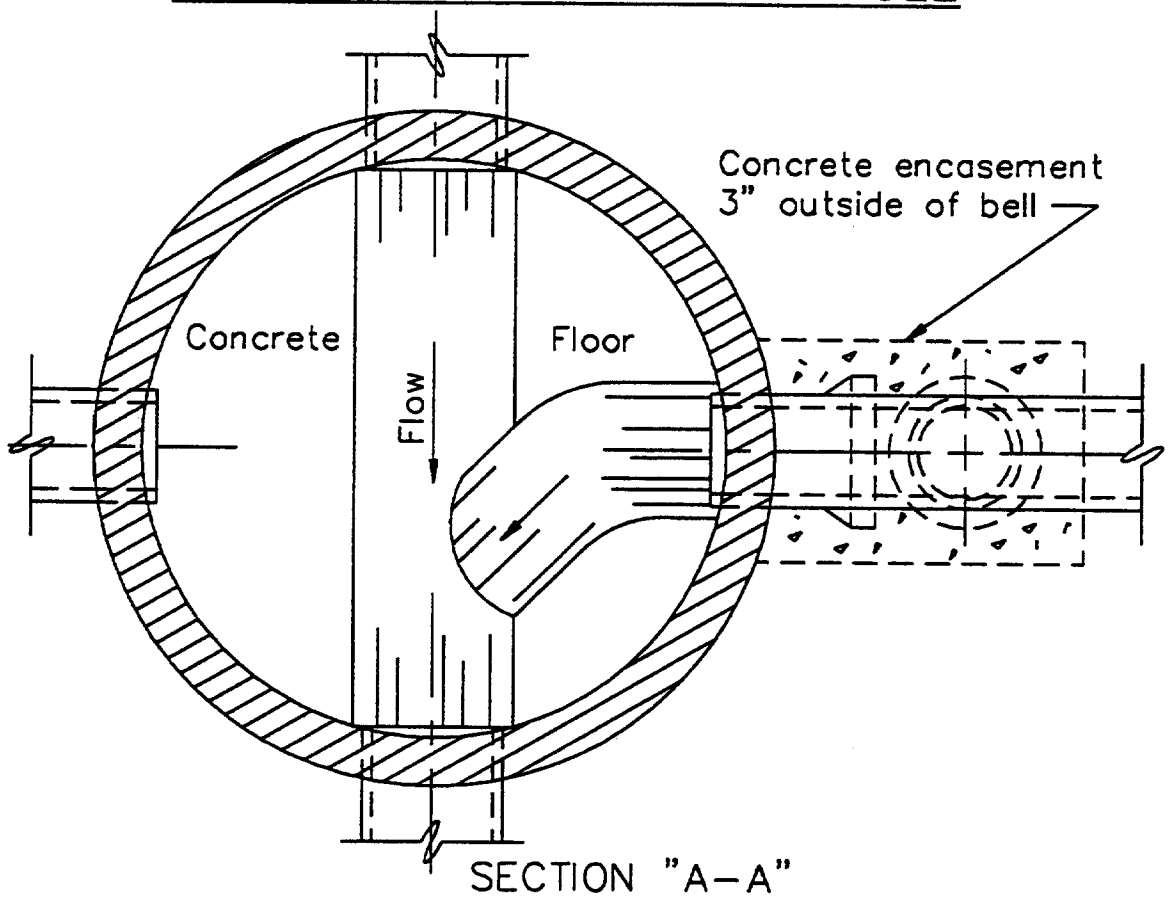
NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUNE 90<br>WATER SYSTEM DETAILS | U–8<br>8 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




SECTION ECCENTRIC MANHOLE




SECTION "A-A"

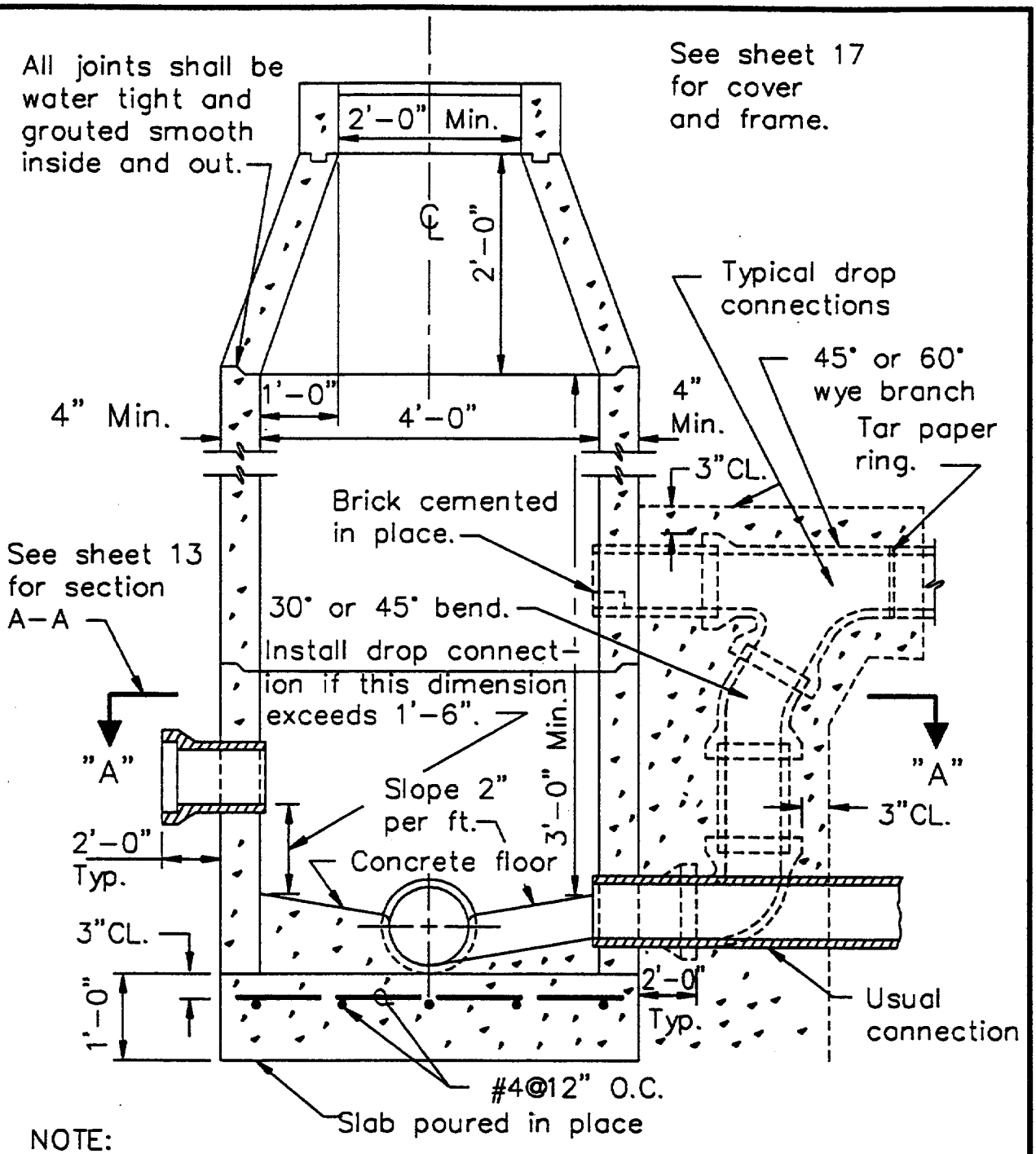
# STANDARD SEWER MANHOLE

## (PRECAST REINFORCED CONCRETE)

SCALE 3/4" = 1'-0"

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 89<br>SANITARY SEWER DETAILS | U-13<br>13 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




NOTE:

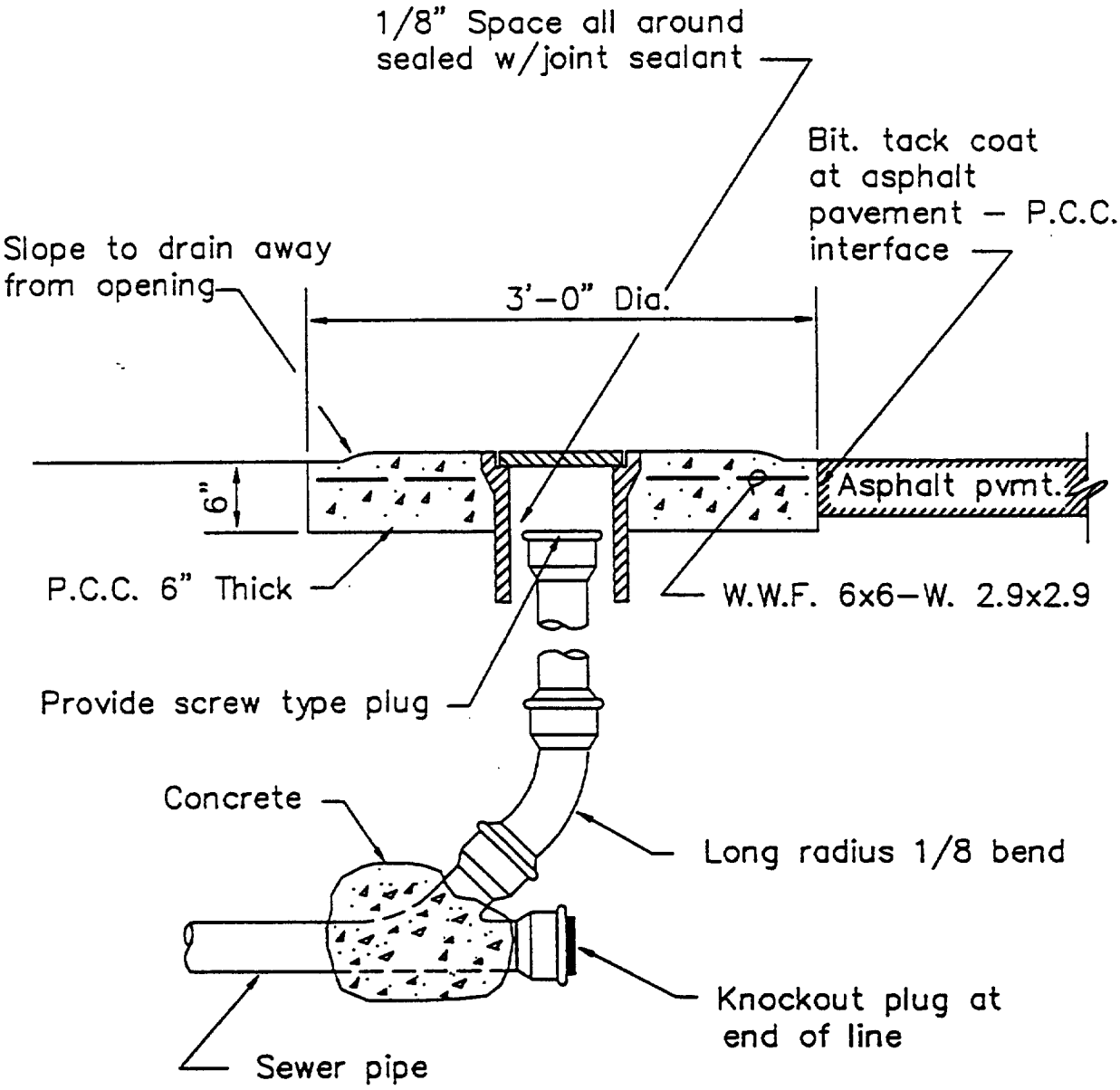
1. Cast in place Concrete Manholes shall have a minimum wall thickness of 8", reinforced with #4 Bars @ 12" O.C. bothways at center of wall. Foundation and floor details will be the same as shown for Precast Manholes.

2. Provide joint within 2' of manhole wall at each pipe.

## SECTION – TAPERED MANHOLE

NO SCALE

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

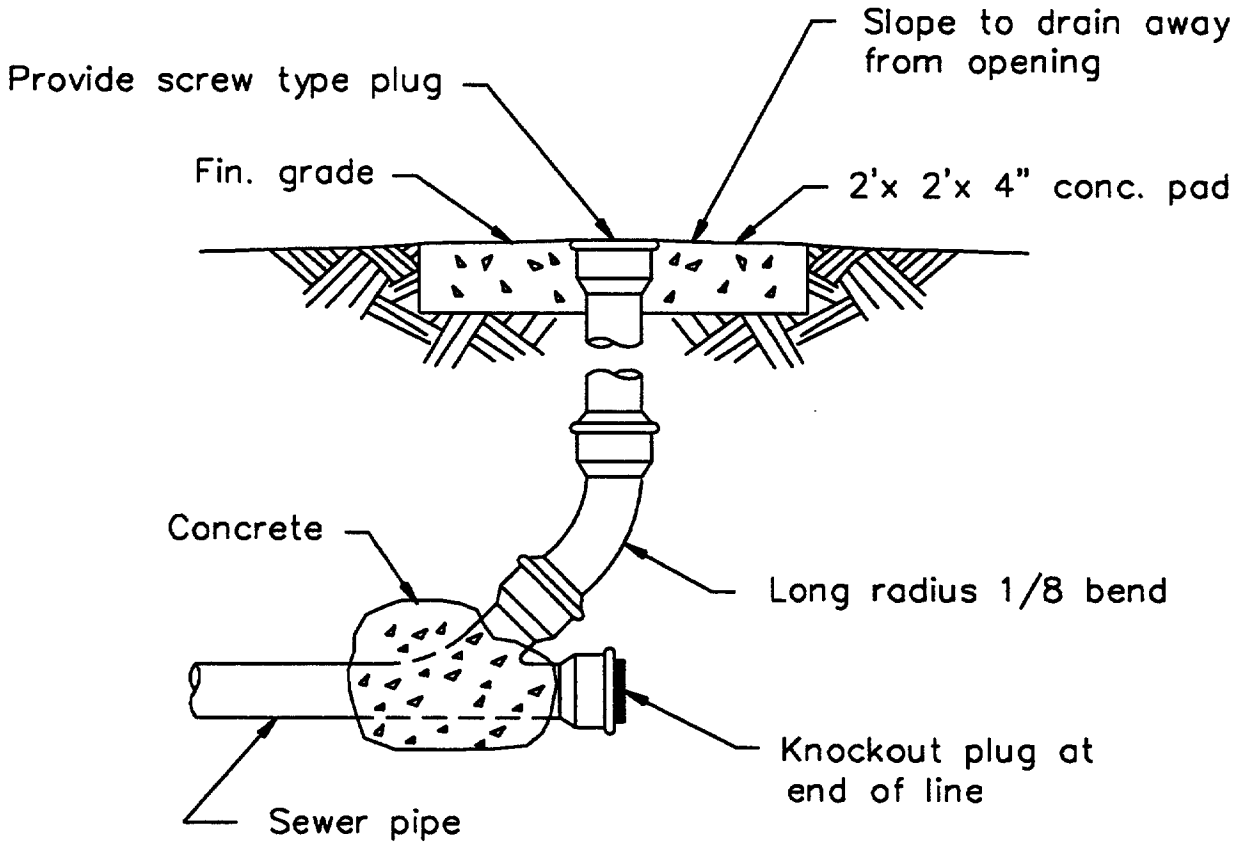



## TYPICAL LOAD BEARING SURFACE CLEANOUT FOR PAVED AREAS

NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SANITARY SEWER DETAILS | DATE: JUN. 92 |
| U–15 | |
| 15 | |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

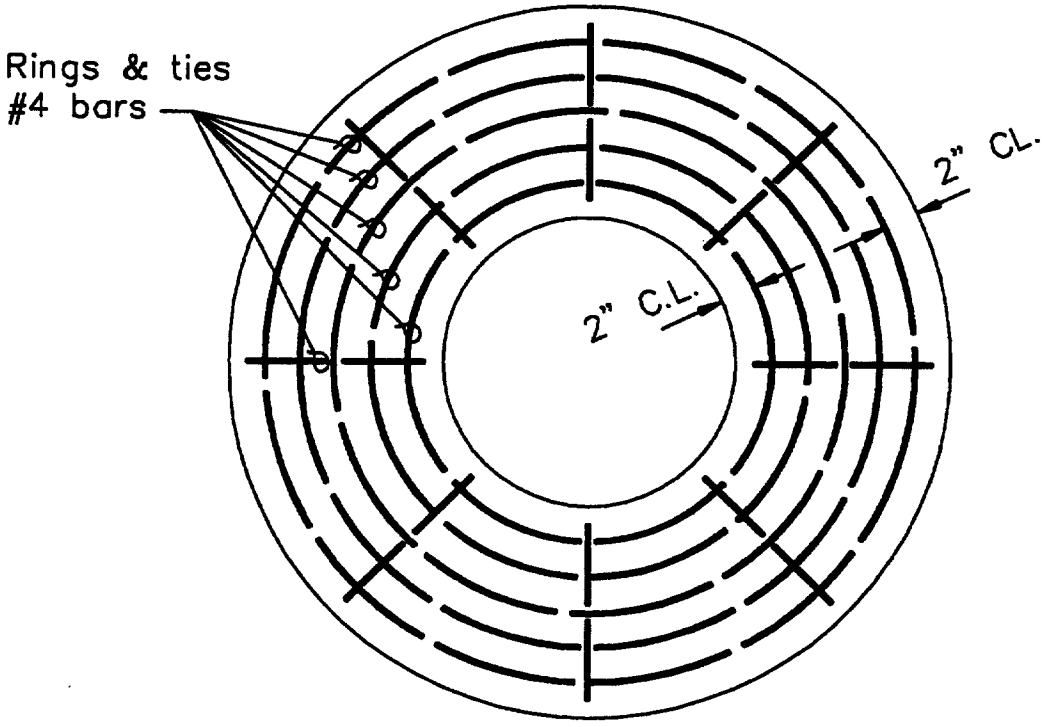



# TYPICAL SURFACE CLEANOUT FOR NON-PAVED AREAS

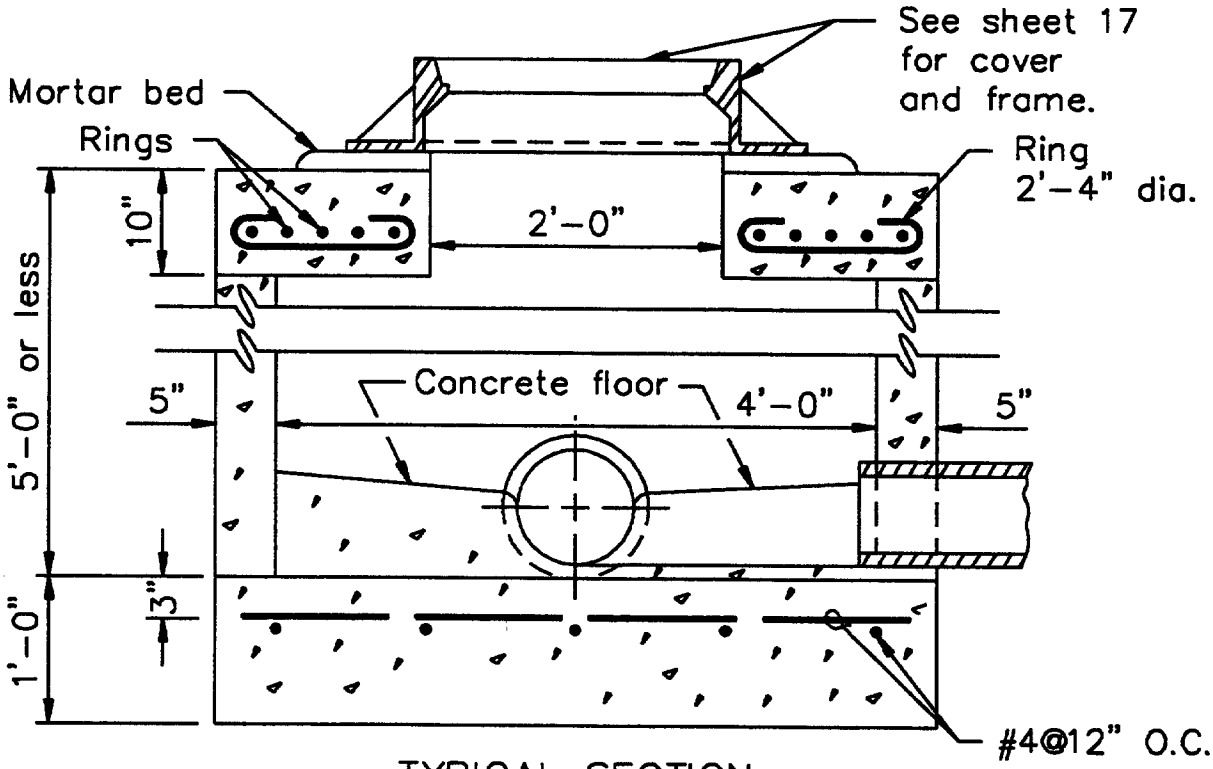
NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SANITARY SEWER DETAILS | DATE: OCT. 89<br>REV. |
| U-15A | |
| 15A | |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




PLAN–RING REINFORCING




TYPICAL SECTION

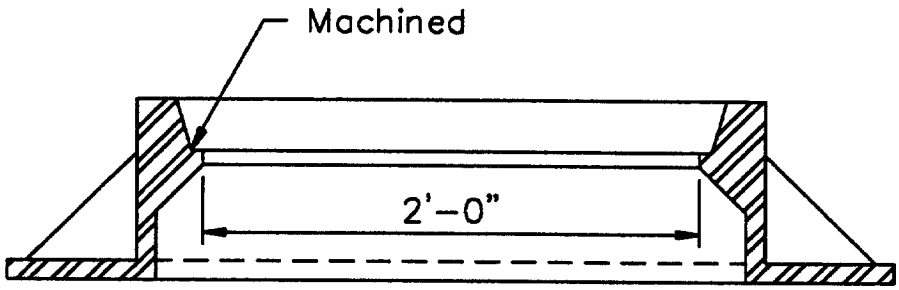
# SHALLOW MANHOLE

(PRECAST REINFORCED CONCRETE)

SCALE: 3/4" = 1'–0"

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SANITARY SEWER DETAILS | DATE: NOV. 89 |
| U–16 | |
| 16 | |

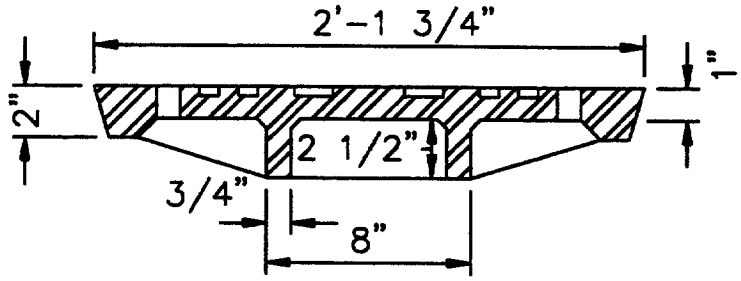
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




FRAME

NOTE:

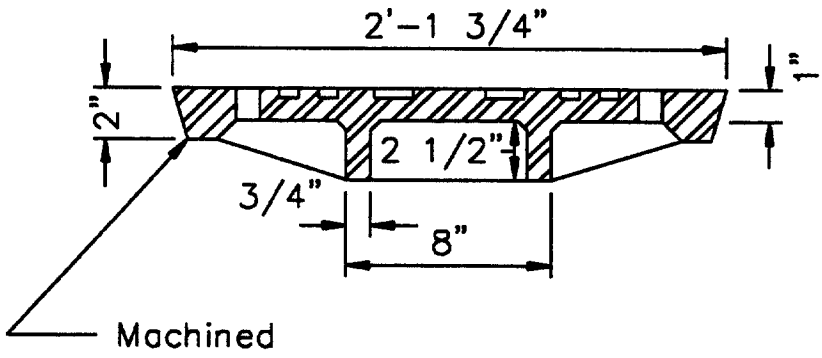
Cover frames shall be securely installed in a bed of cement mortar.



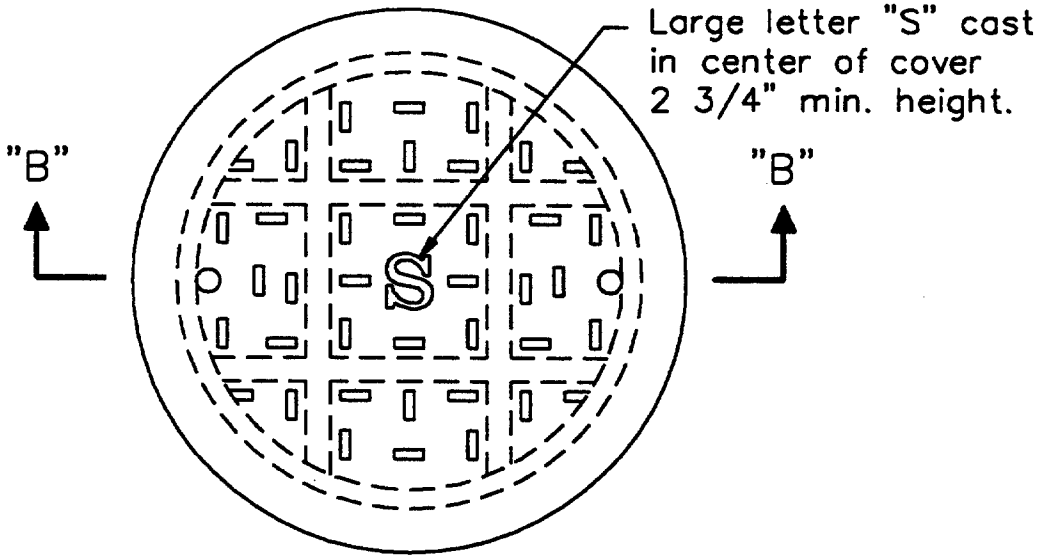

COVER

# SECTION – MANHOLE COVER AND FRAME

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




SECTION "B-B"



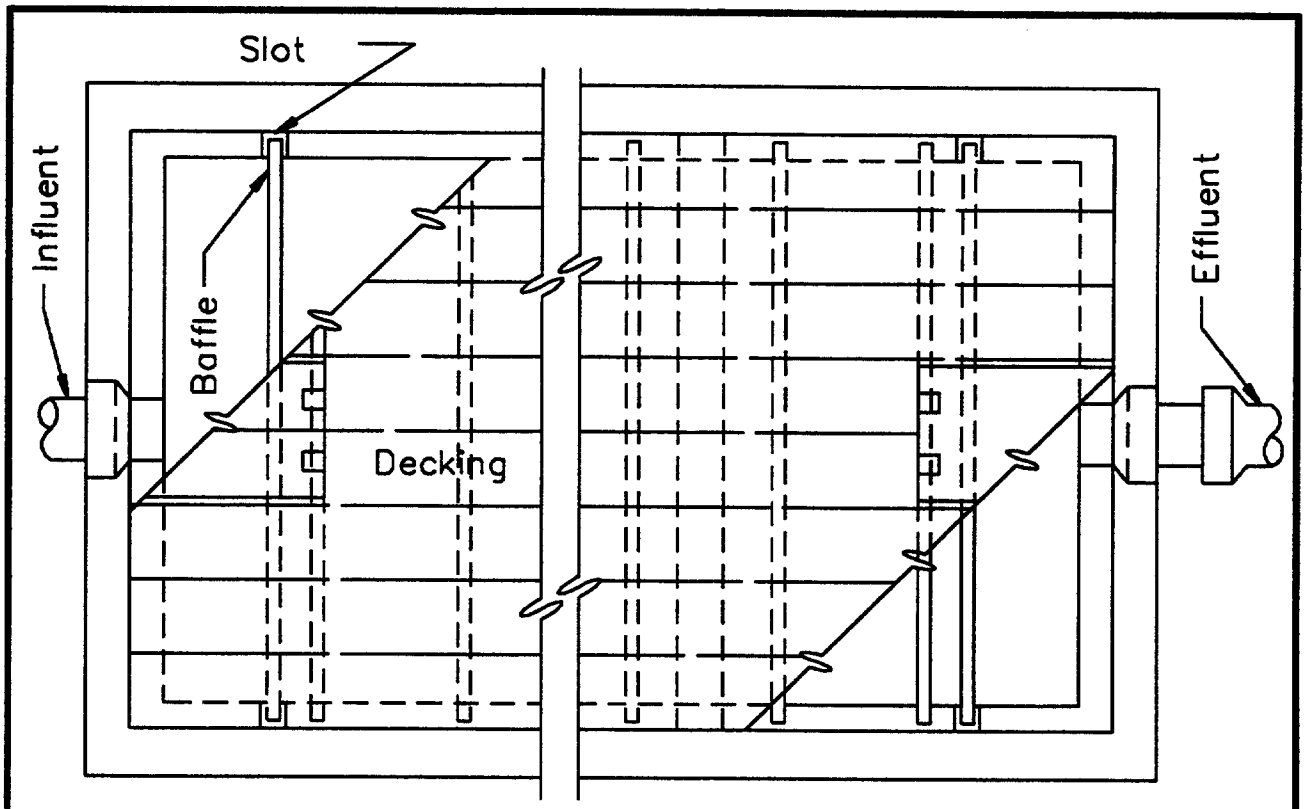

PLAN OF COVER

NOTE:

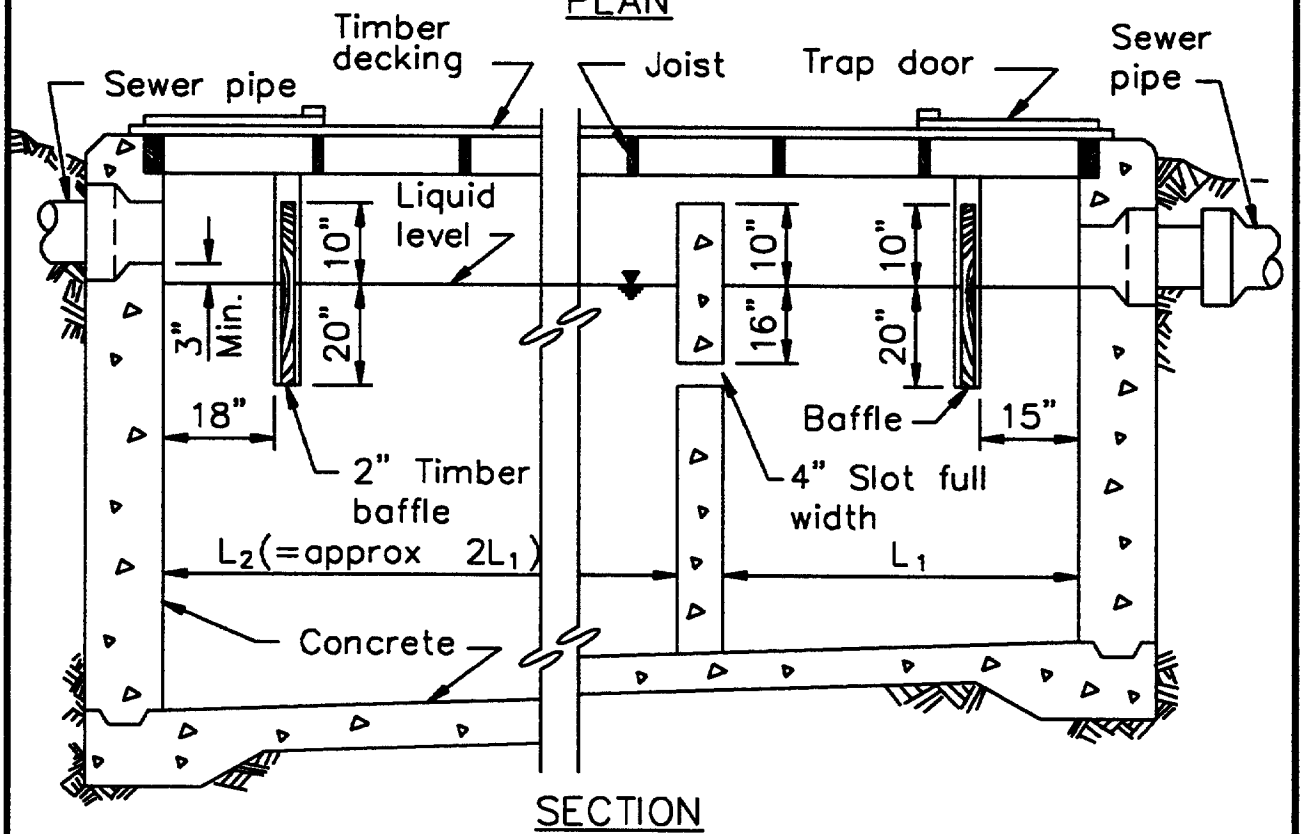
When Manholes are located in non-traffic areas the covers may be cast iron without the ribs, unless otherwise indicated.

# PLAN - MANHOLE COVER

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




PLAN

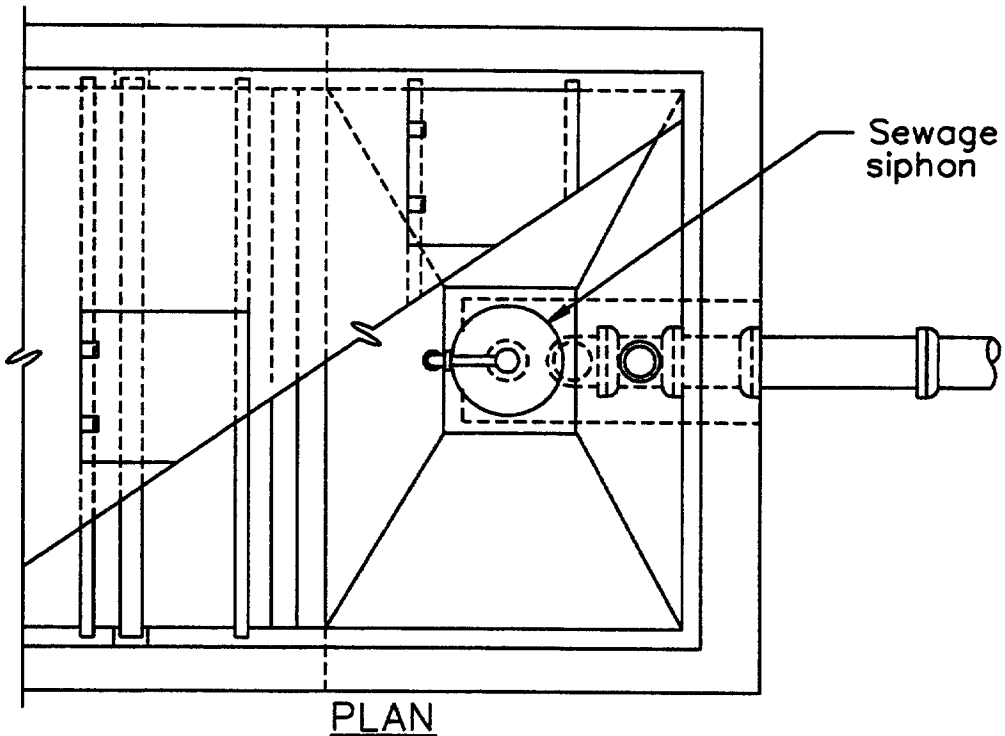



SECTION

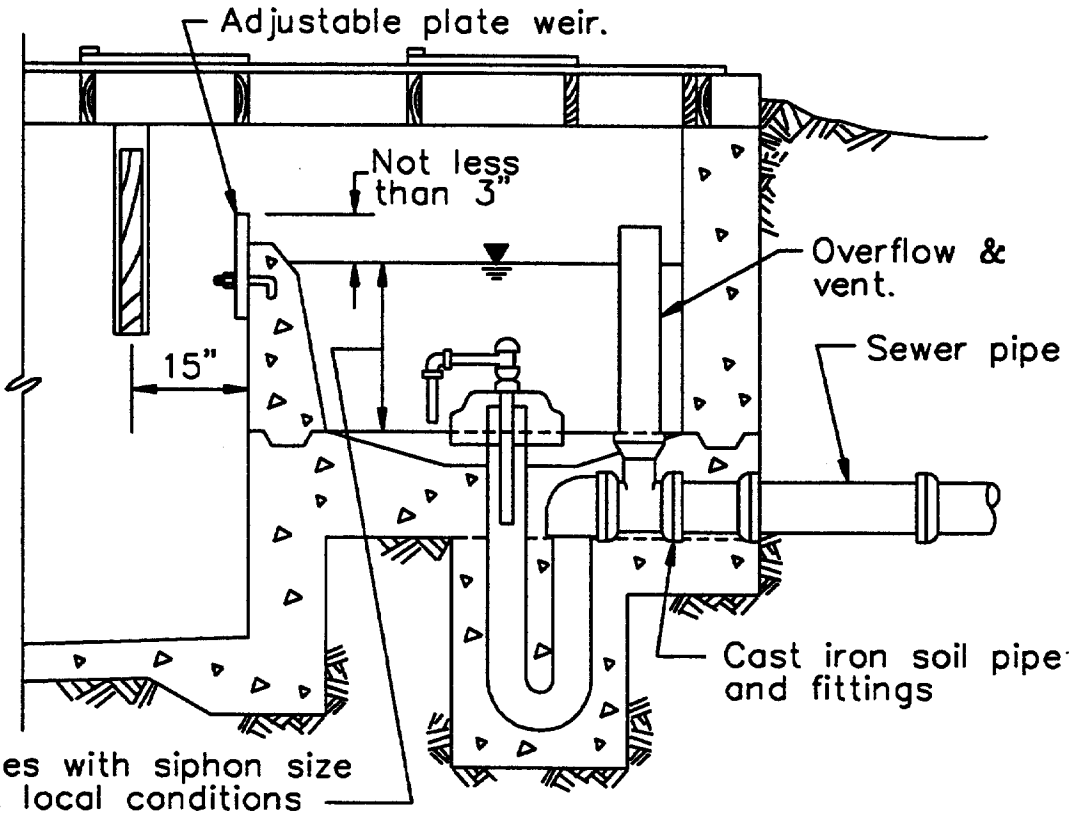
# SEPTIC TANK WITHOUT DOSING SIPHON

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN 91<br>SEPTIC TANKS & SUBSURFACE DISPOSAL. | U-19<br>19 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




PLAN



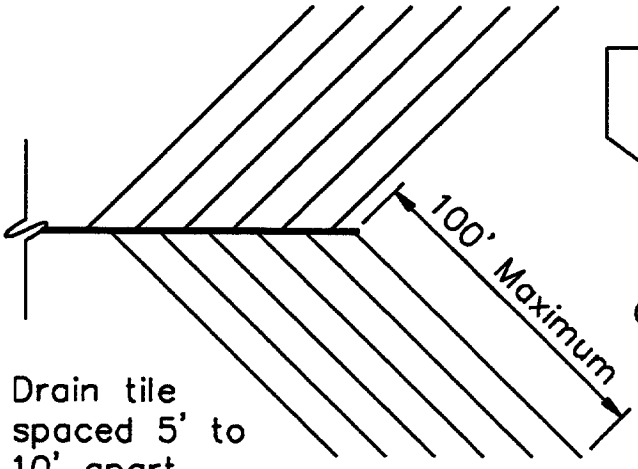

SECTION

# SEPTIC TANK WITH DOSING SIPHON

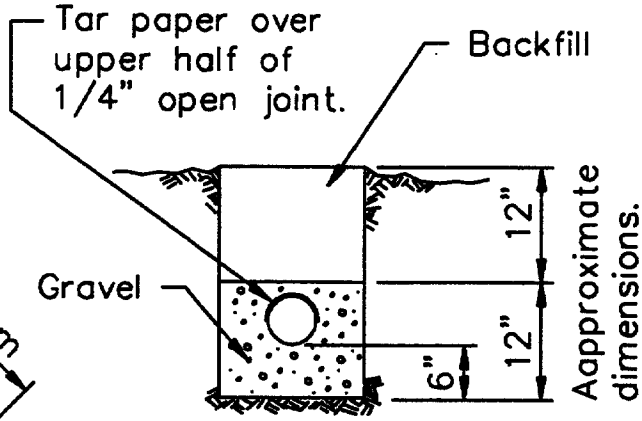
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: DEC. 89<br>SEPTIC TANKS & SUBSURFACE DISPOSAL | U-20<br>20 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

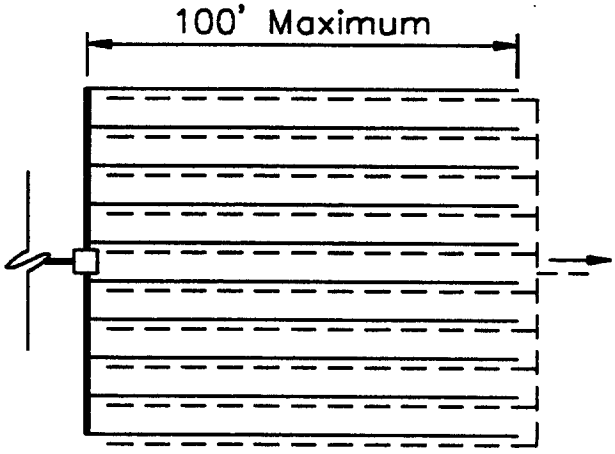
Lay tile on 0.5% Min. grade when dosing siphon is omitted and on 0.3% Min. when used.



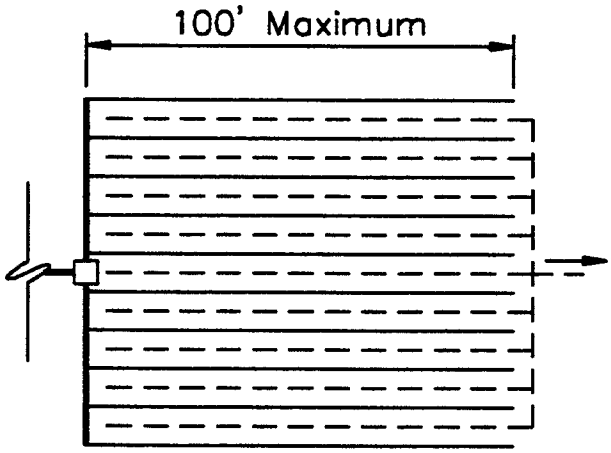

PLAN




PLAN




PLAN
TRENCH TYPE



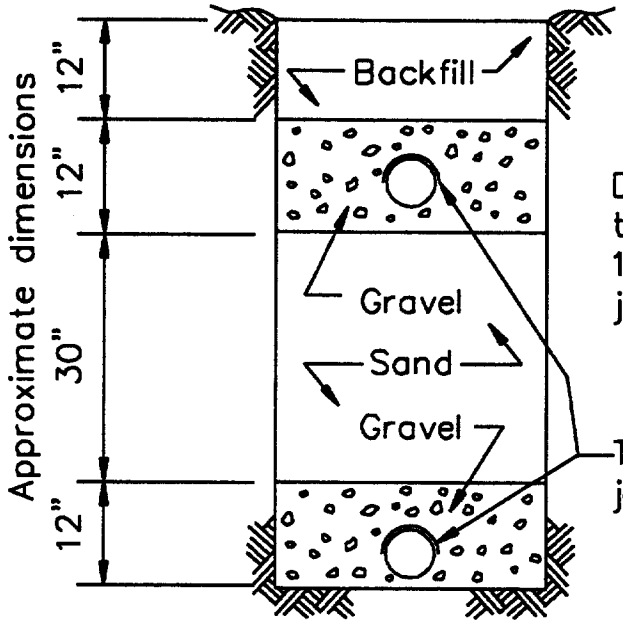

PLAN
BED TYPE

# SUBSURFACE SAND FILTER

NOT TO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: NOV. 89<br>SEPTIC TANKS & SUBSURFACE DISPOSAL. | U-21<br>21 |

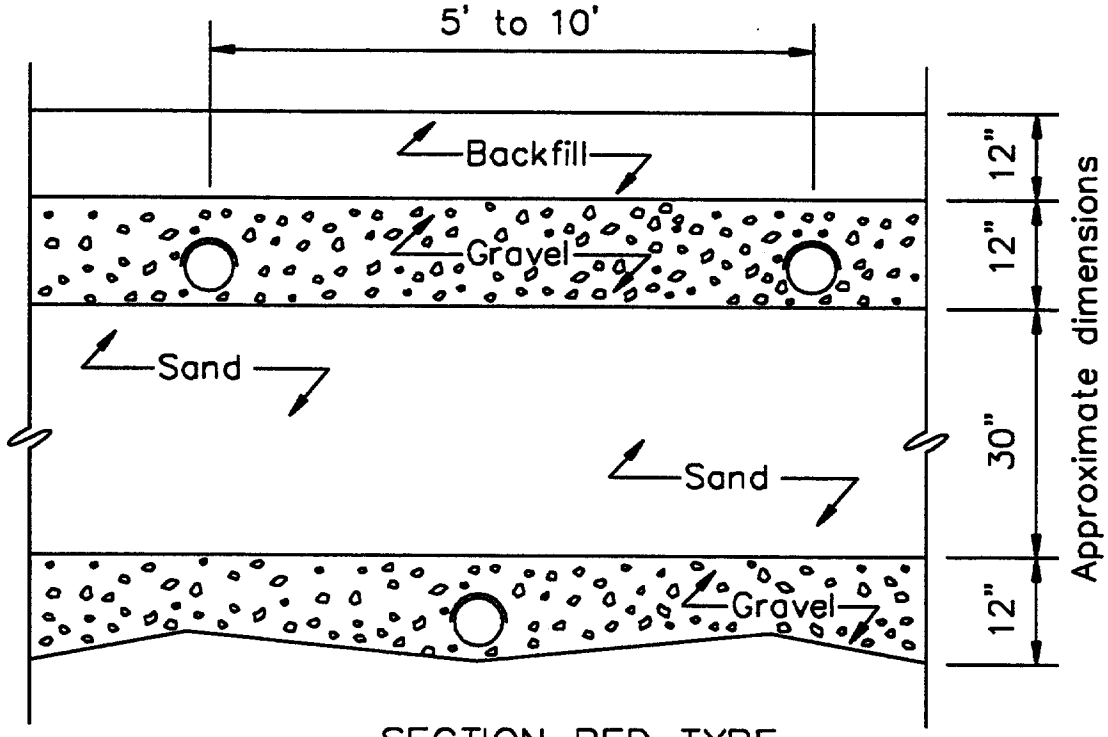
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




Distribution tile and drain tile to be laid with joints open 1/4" and with upper half of joints covered with tar paper.

Tar paper over upper half of joints (typ.)

SECTION TRENCH TYPE




SECTION BED TYPE

# SUBSURFACE SAND FILTER

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAR. 1989<br>SEPTIC TANKS & SUBSURFACE DISPOSAL | U-22<br>22 |

# NOTES

1. For use as a design guide.

2. For septic tanks of capacities ranging from 500 gallons to 2000 gallons.

3. Design of septic Tanks: Tank capacity should provide approximately a 24-hour detention period at average rate of flow if tile fields are used and an 18-hour detention period if subsurface sand filters are used. Add 15% to 25% to volume for sludge space, using the larger percentage for the smaller tanks. Length should not be less than two nor more than three times the width. Provide depth of at least 4 feet in the smaller tanks and 4 1/2 to 6 feet in the larger tanks. Tanks of less than 500-gallon capacity should not be used. In general, septic tanks are not recommended for populations exceeding 500.

4. The tank top, when at or above grade, may be timber construction or concrete, either fixed or as removable slabs. If below grade, the top should be a fixed concrete slab and access manholes should be provided instead of the trap doors and extended to the ground surface.

5. Baffles may be concrete instead of timber. In small tanks pipe fittings may be used instead of baffles.

6. Dosing Tanks: In general, dosing tanks should be provided for septic tanks serving populations exceeding 20 if the effluent is discharged into tile fields or subsurface sand filters. Dosing tank discharge capacity should equal approximately 80 percent of the volumetric capacity of the drain tile. Where this would result in an excessively large dosing tank two alternating siphons may be used, each discharging to one-half of the filter or tile field. Dosing tanks are not required when effluent is discharged into leaching wells.

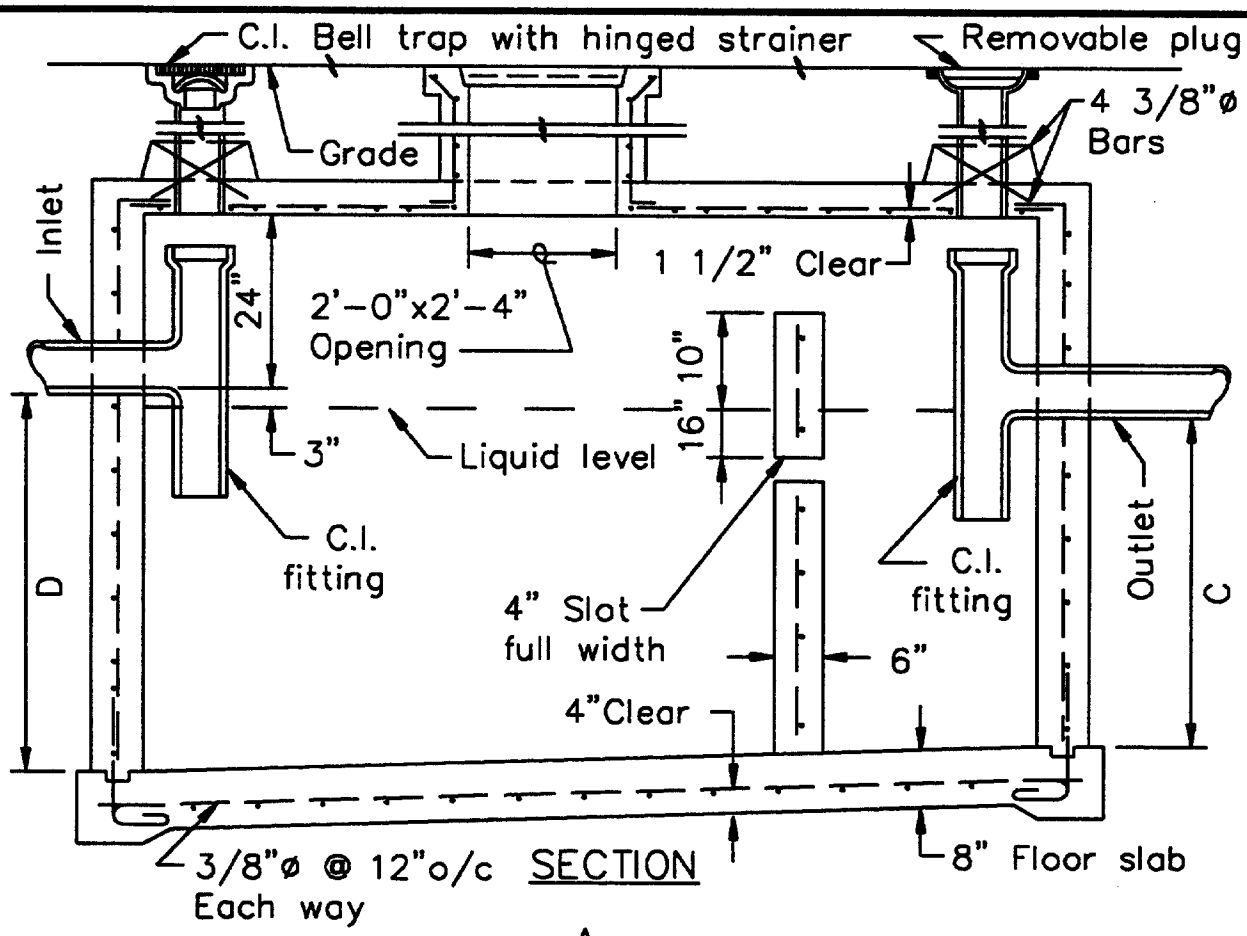
7. Subsurface Sand Filters: Provide one square foot of filter area per gallon of sewage per day. Provide for rodding and flushing distribution lines. Provide vents on sub-drains and distribution lines.

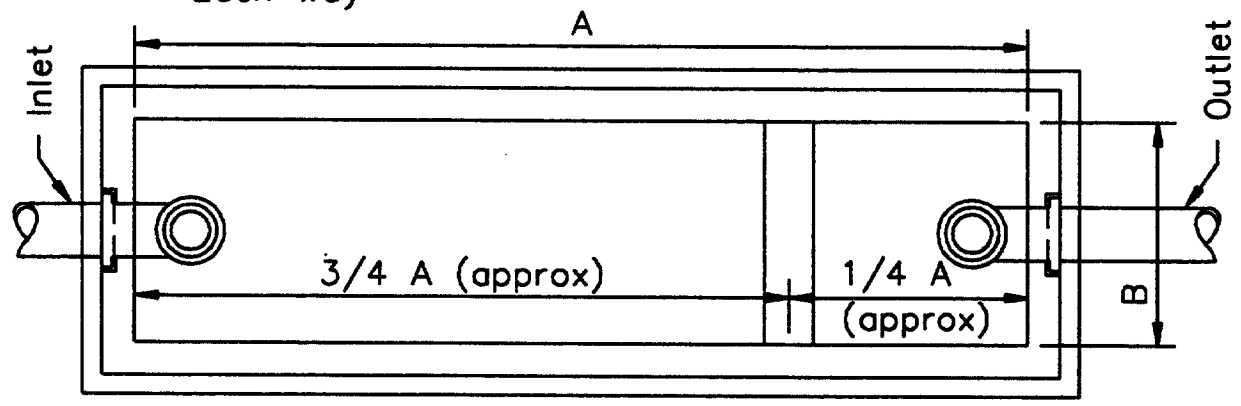
8. Soil Absorptivity Test: To determine the absorption capacity of the ground for sewage disposal, dig test holes one foot square to proposed depth of tile trench or to various depths below the water surface of leaching wells. Fill each hole with water to a depth of one foot. After this has seeped away and while the soil is still wet, refill with water to a depth of 6 inches and note average time for surface to drop one inch. Compute the required trench bottom area for tile field or bottom and side area for leaching wells from the following table:

| Time in Minutes for Water Level to Drop One Inch | Absorption in Gallons per Day | |
|---|---|---|
| | Per Sq. Ft. of Trench Bottom in Tile Fields | Per Sq. Ft. of Percolation Area in Leaching Wells |
| 1 | 4.0 | 5.3 |
| 2 | 3.2 | 4.3 |
| 5 | 2.4 | 3.2 |
| 10 | 1.7 | 2.3 |
| 30 | 0.8 | 1.1 |
| 60 | 0.6 | 0.8 |

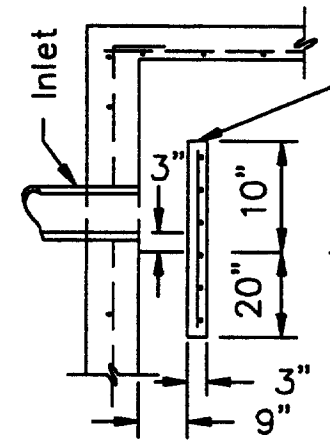
9. Tile Fields: The proposed site of a tile field should be investigated to determine whether seasonal ground water level would obstruct disposal. The subsurface should be explored to determine whether an impervious stratum exists so close to the tile as to prevent continued percolation and cause eventual saturation of the soil. The site should not be in an area that would be subjected to the movement of equipment or where planning for site development requires pavement or deep filling in the future. Posts or other markers should define the tile field boundaries. To promote aeration and evaporation the cover over a tile field should be of as loose soil as economically available and as shallow as feasible. A depth of 15 to 18 inches is usually sufficient to prevent freezing and the entrance of roots of grass or weeds into the tile. Specifications for materials and methods of construction should be such that the full intent of the design will be reflected in the completed facility. Overloading during periods of construction should not be permitted as this could result in clogging the tile field and necessitate costly repairs.

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




PLAN




Concrete or wood baffle across tank at inlet & outlet

Water El.

ALTERNATE

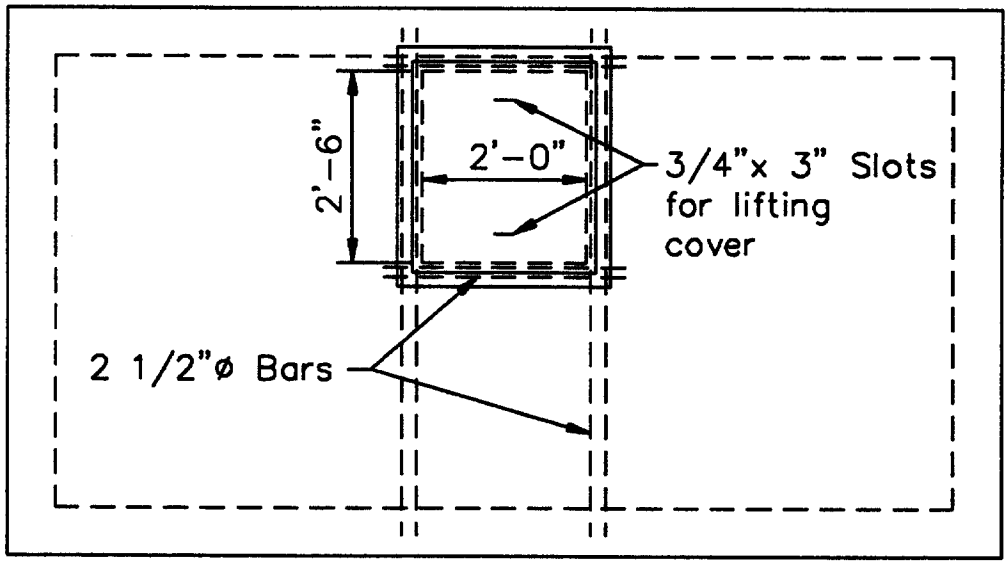
WITH BAFFLE AT INLET AND OUTLET

NOTE:

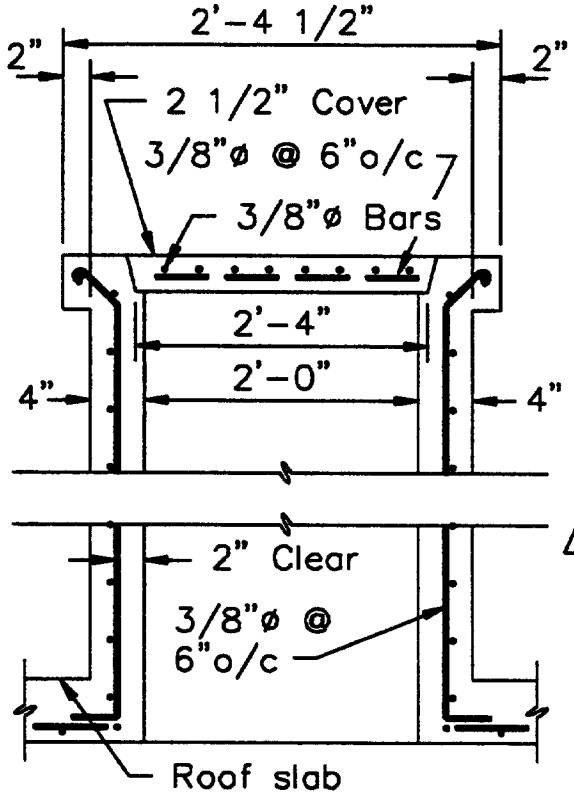
For wall & roof slab reinforcement see table, sheet No. 26

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SEPTIC TANKS 500 TO 2000 GAL. CAPACITIES<br>DATE: OCT. 87<br>REV. MAR. 88 | U-25<br>25 |

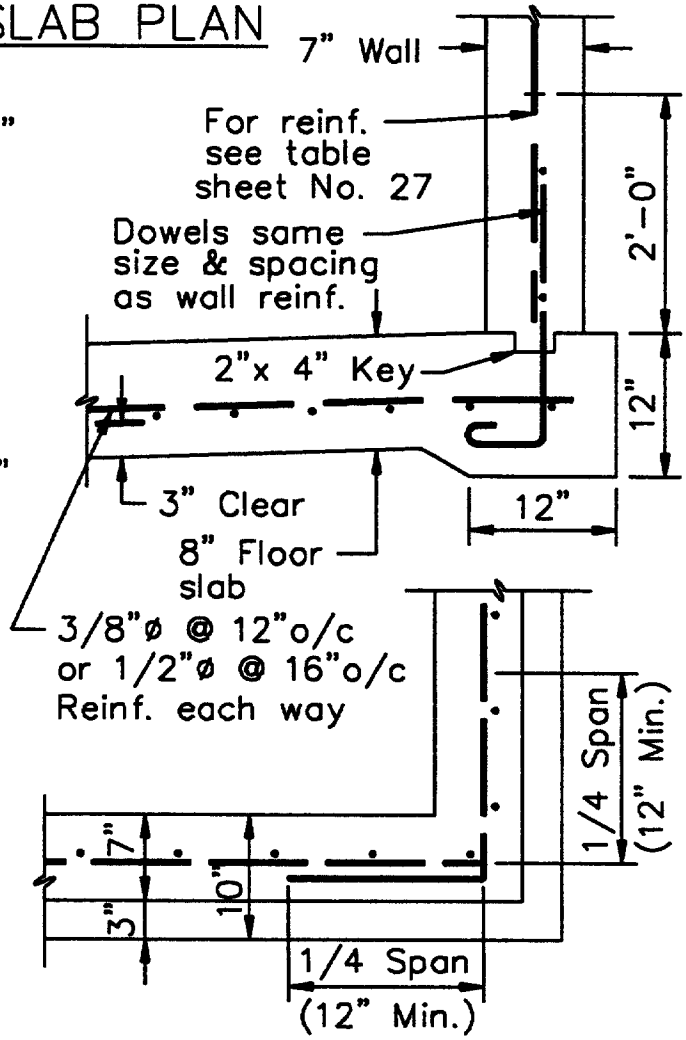
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




ROOF SLAB PLAN




MANHOLE




TYPICAL CORNER REINF.

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SEPTIC TANKS 500 TO 2000 GAL. CAPACITIES | DATE: OCT. 87<br>REV. MAR. 88 |
| U-26 | |
| 26 | |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

## SEPTIC TANK DIMENSIONS AND REINFORCEMENT

| CAPACITY GALL'S | CU. FT. | +25% | A | B | C | D | WALL THICKNESS | WALL REINFORCEMENT FOR 1/2ø HORIZ | WALL REINFORCEMENT FOR 1/2ø VERT | WALL REINFORCEMENT FOR 3/8"ø HORIZ | WALL REINFORCEMENT FOR 3/8"ø VERTICAL | ROOF SLAB SLAB THICKNESS | ROOF SLAB REINF. TRANSVERSE | ROOF SLAB REINF. LONGITUDINAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 500 | 67 | 83 | 6'-8" | 3'-0" | 4'-3" | 4'-9" | 7" WALL THICKNESS | 1/2"ø @ 12" o/c ALL WALLS | 1/2"ø @ 12" o/c ALL WALLS | 3/8"ø @ 8" o/c | MIDDLE HALF OF WALL 3/8"ø @ 6"o/c<br>END QUARTERS OF WALL 3/8"ø @ 12"o/c | 3 1/2" | 1/2"ø @ 6"o/c | 3/8"ø @ 12" o/c ALL SLABS |
| 750 | 100 | 125 | 8'-2" | 3'-8" | 4'-3" | 4'-9" | | | | | | 3 1/2" | 3/8"ø @ 3 1/2"o/c | |
| 1000 | 133 | 166 | 8'-8" | 4'-1" | 4'-9" | 5'-3" | | | | 3/8ø @ 6" o/c | | 3 1/2" | 3/8"ø @ 4" o/c | |
| 1250 | 167 | 208 | 9'-9" | 4'-6" | 4'-9" | 5'-3" | | | | | | 4" | | |
| 1500 | 200 | 250 | 10'-6" | 4'-9" | 5'-0" | 5'-6" | | | | | | 4" | | |
| 1750 | 233 | 292 | 11'-6" | 5'-0" | 5'-0" | 5'-6" | | | | | | 4 1/2" | | |
| 2000 | 266 | 332 | 12'-6" | 5'-3" | 5'-0" | 5'-6" | | | | | | 4 1/2" | | |

CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS DATE: OCT. 87 REV. MAR. 88
SEPTIC TANKS 500 TO 2000 GAL. CAPACITIES

U-27

27

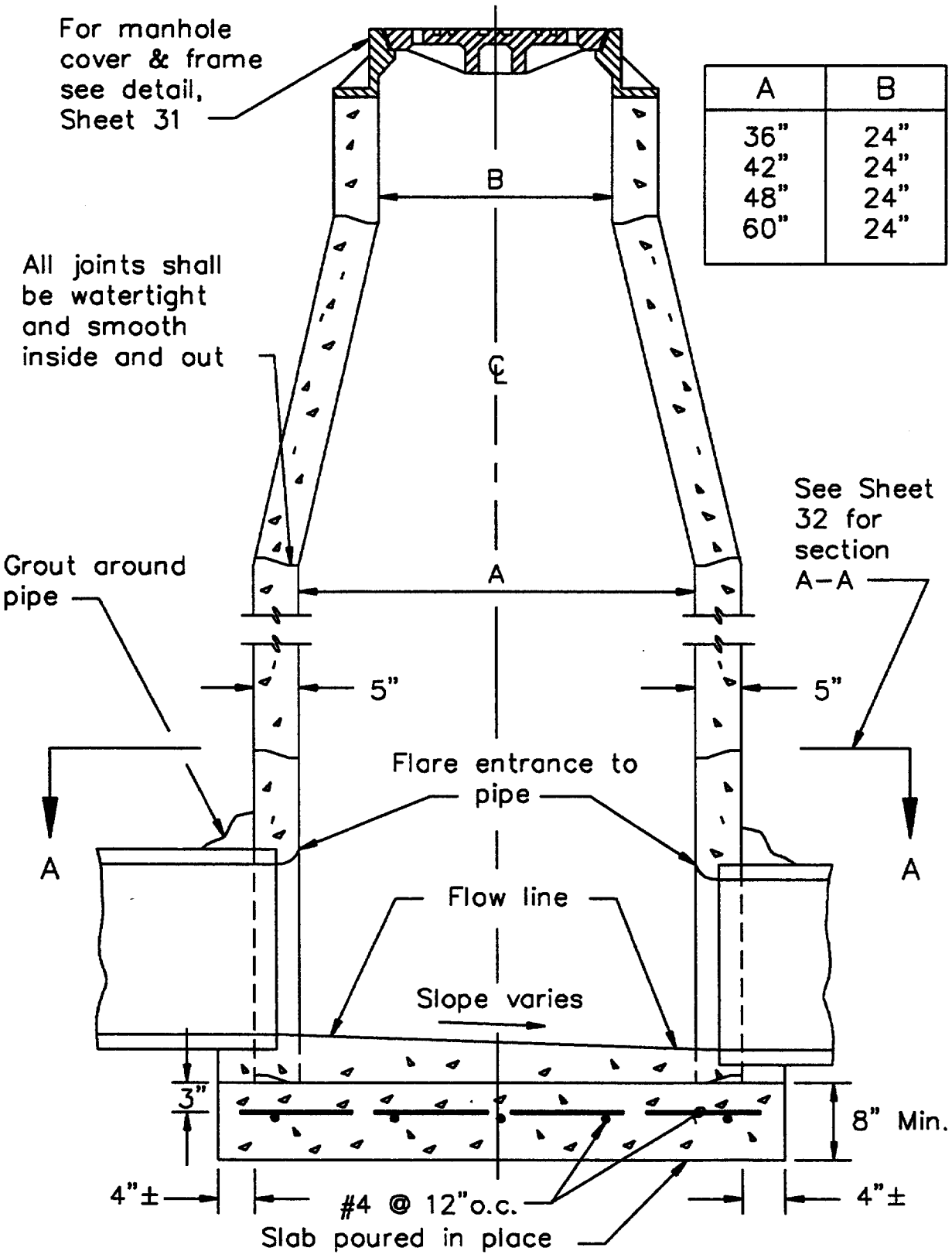
## NOTES

1. Other designs may be used to suit local conditions.
2. The capacities indicated are exclusive of 25% allowance for sludge accumulation.
3. Top of tank may be at grade if conditions permit.

## BASIS OF STRUCTURAL DESIGN

1. Roof slab is designed for an earth load of 300 lbs. per square foot plus a live load of 100 lbs. per square foot.
2. Walls are designed for the internal liquid pressure or for an external earth pressure equivalent to a fluid pressure of 33 lbs. per foot of depth, whichever load causes the max. stress.
3. Concrete to have a minimum strength of 3,000 lbs. per sq. inch in 28 days, with $n = 10$; $f_s = 20{,}000$ lbs. and $f_e = 1350$ lbs. per sq. inch.

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

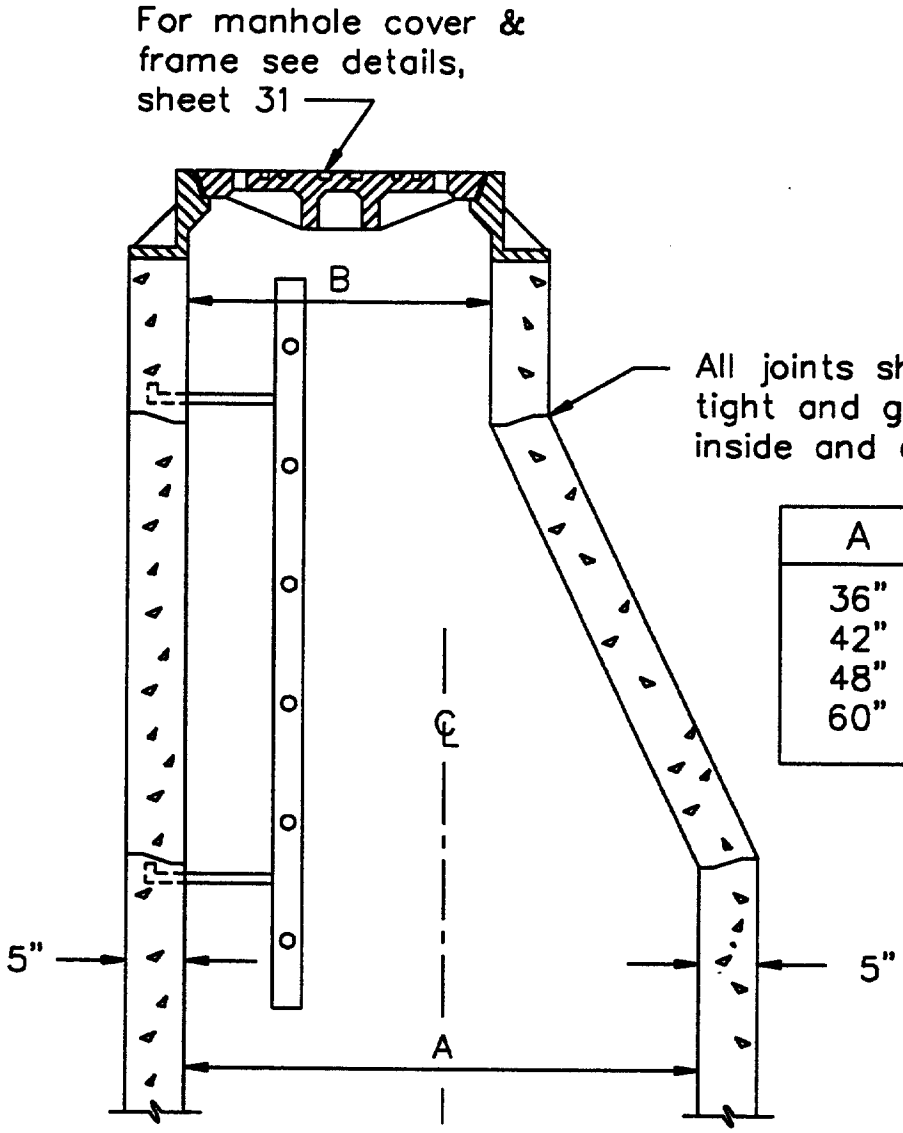



| A | B |
|---|---|
| 36" | 24" |
| 42" | 24" |
| 48" | 24" |
| 60" | 24" |

## SECTION – TAPERED MANHOLE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 87<br>MANHOLE AND INLETS FOR STORM DRAINS REV. MAR. 88 | U–29<br>29 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




| A | B |
|---|---|
| 36" | 24" |
| 42" | 24" |
| 48" | 24" |
| 60" | 24" |

NOTES:

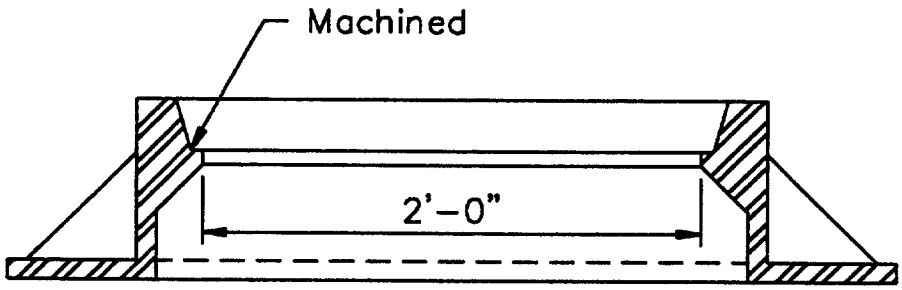
1. Install precast eccentric cone when depth from top of cover to invert of outlet pipe exceeds 12' and provide with ladder described in Note #2.

2. permanently installed galvanized steel side-rail ladder, securely anchored, will conform to the following: projection from wall to center of rungs 7" (min,), length of rungs 16" (min.), vertical spacing of rungs 12" o.c. (max.), diameter of rungs 7/8". Top of ladder shall be located a max. of 6" below bottom of manhole frame. Rails shall be not less than 2 inches by 1/2-inch in section.

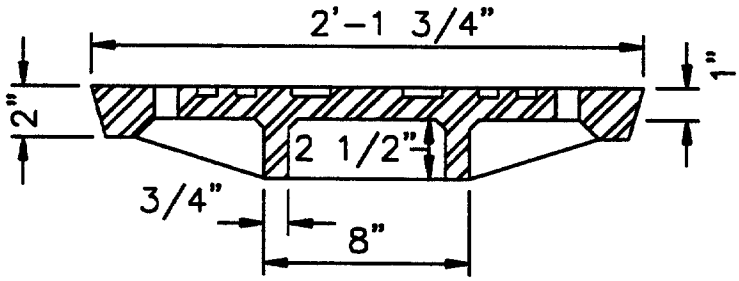
## SECTION – ECCENTRIC MANHOLE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 87<br>MANHOLE AND INLETS FOR STORM DRAINS REV. MAR. 88 | U-30<br>30 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




FRAME



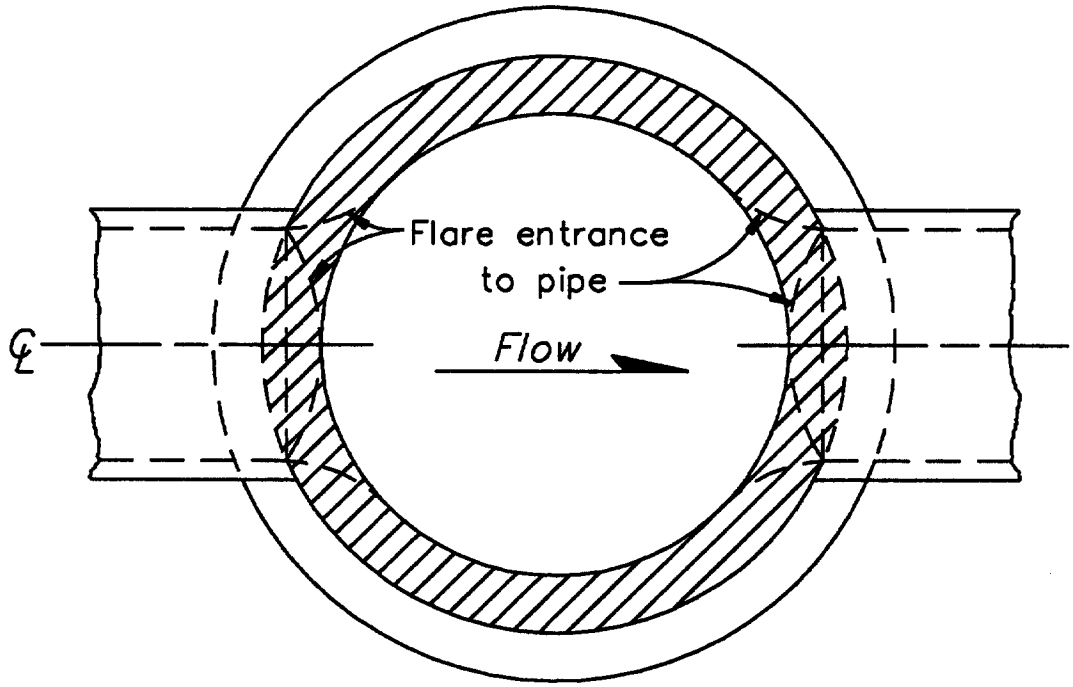

COVER

NOTE:

Minimum combined weight of frame and cover shall be not less than 400 lbs.

# SECTION – MANHOLE COVER AND FRAME

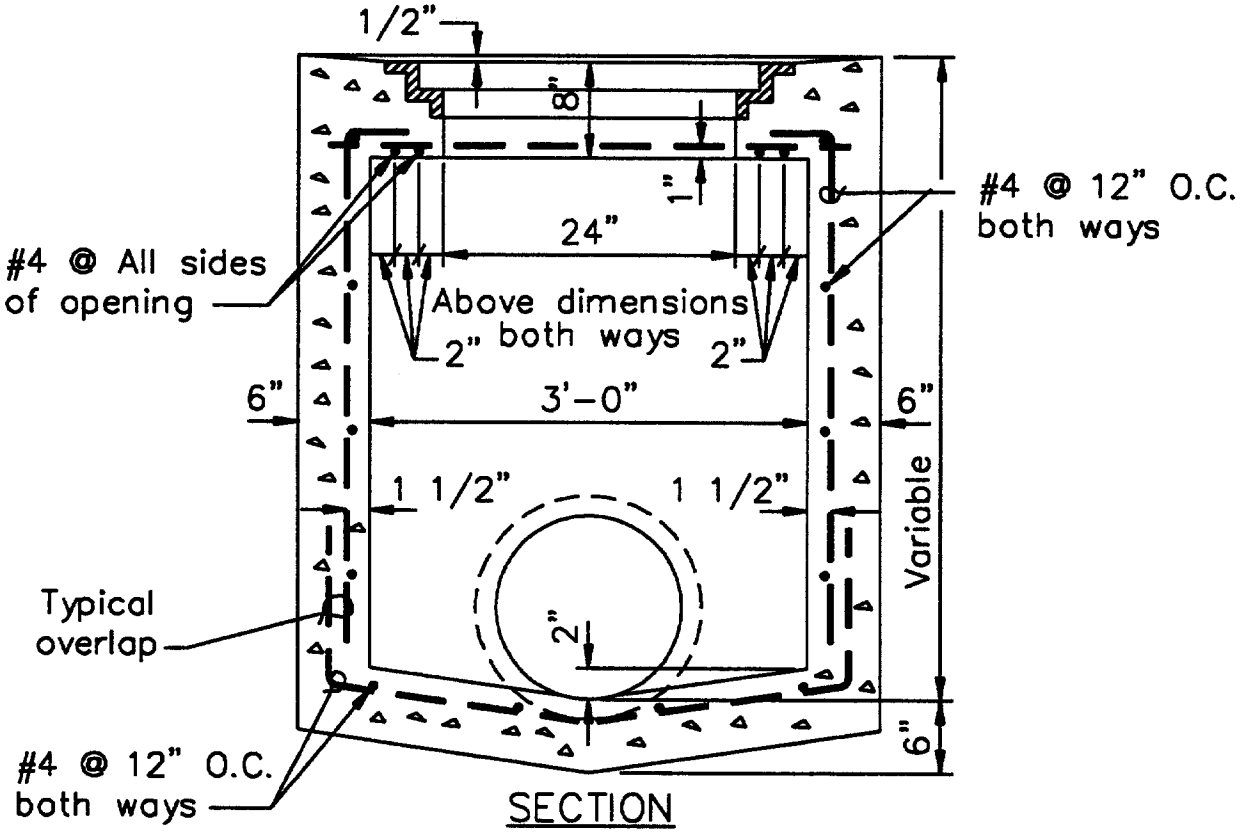
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



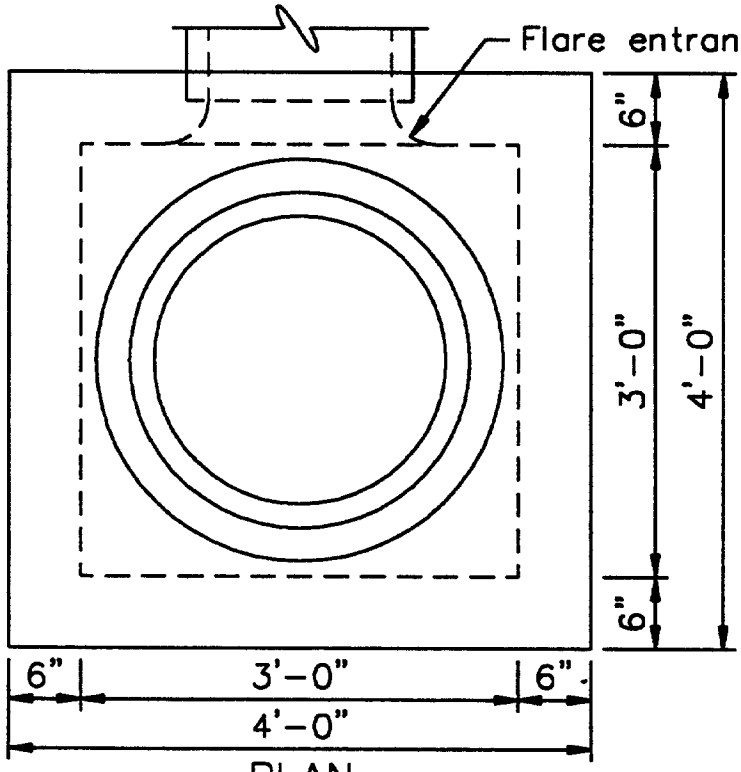

See Sheet 29 for location of Section A–A

## SECTION A–A

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




SECTION




PLAN

NOTE:

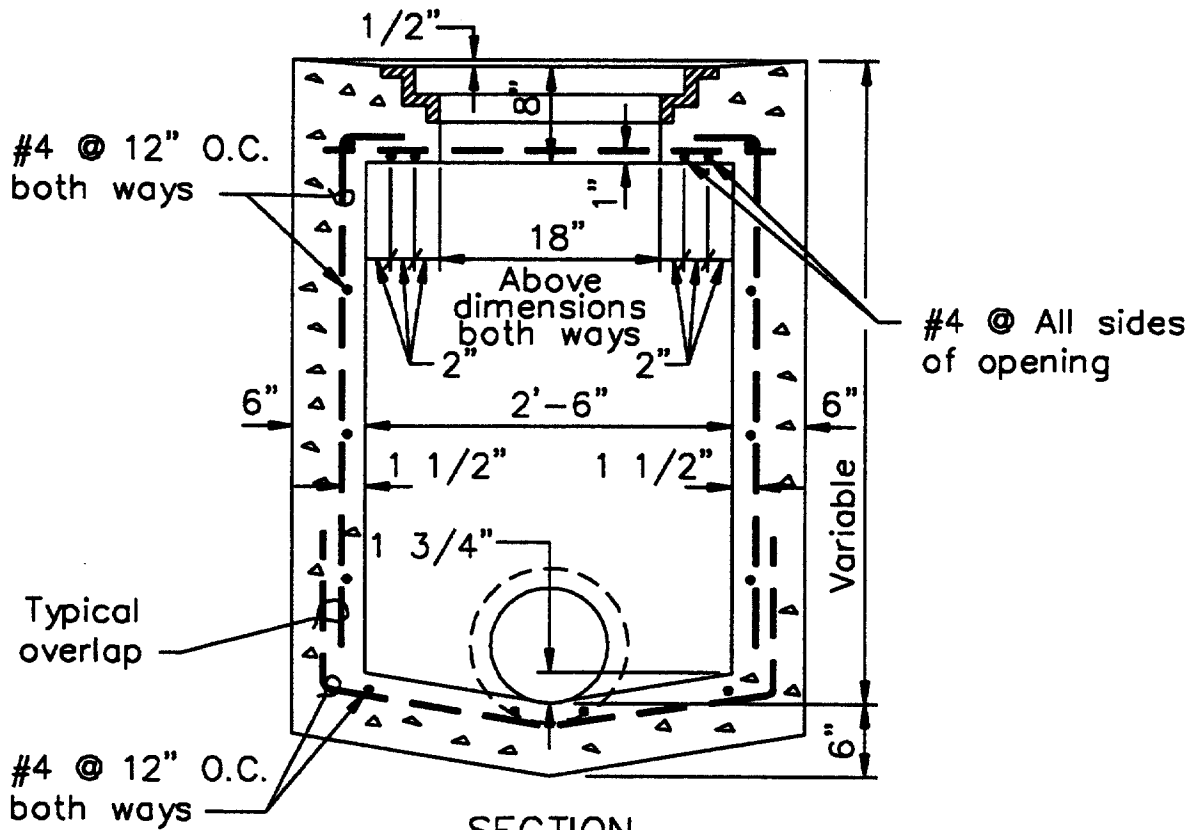
For cover see sht. No. 39

# TYPE "A" INLET

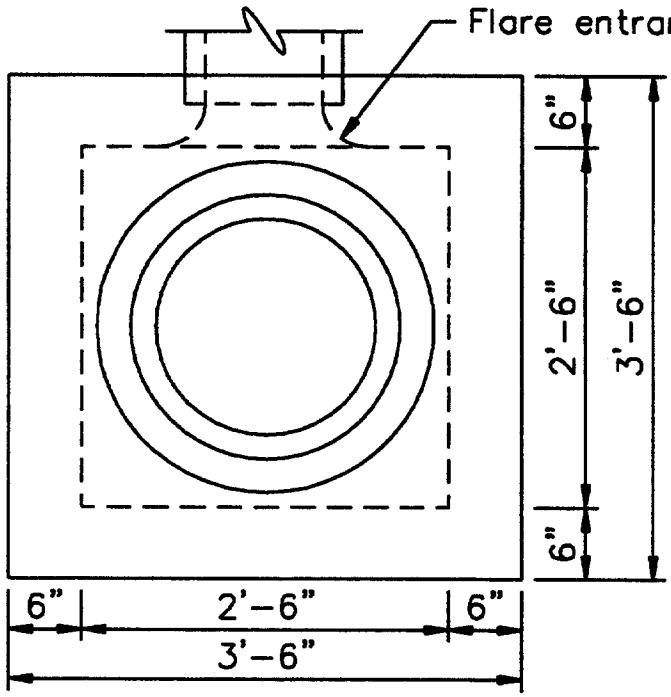
SCALE: 1/2" = 1'-0"

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 89<br>MANHOLE AND INLETS FOR STORM DRAINS | U-33<br>33 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




SECTION




NOTE:

For cover
see sht.
No. 40

PLAN

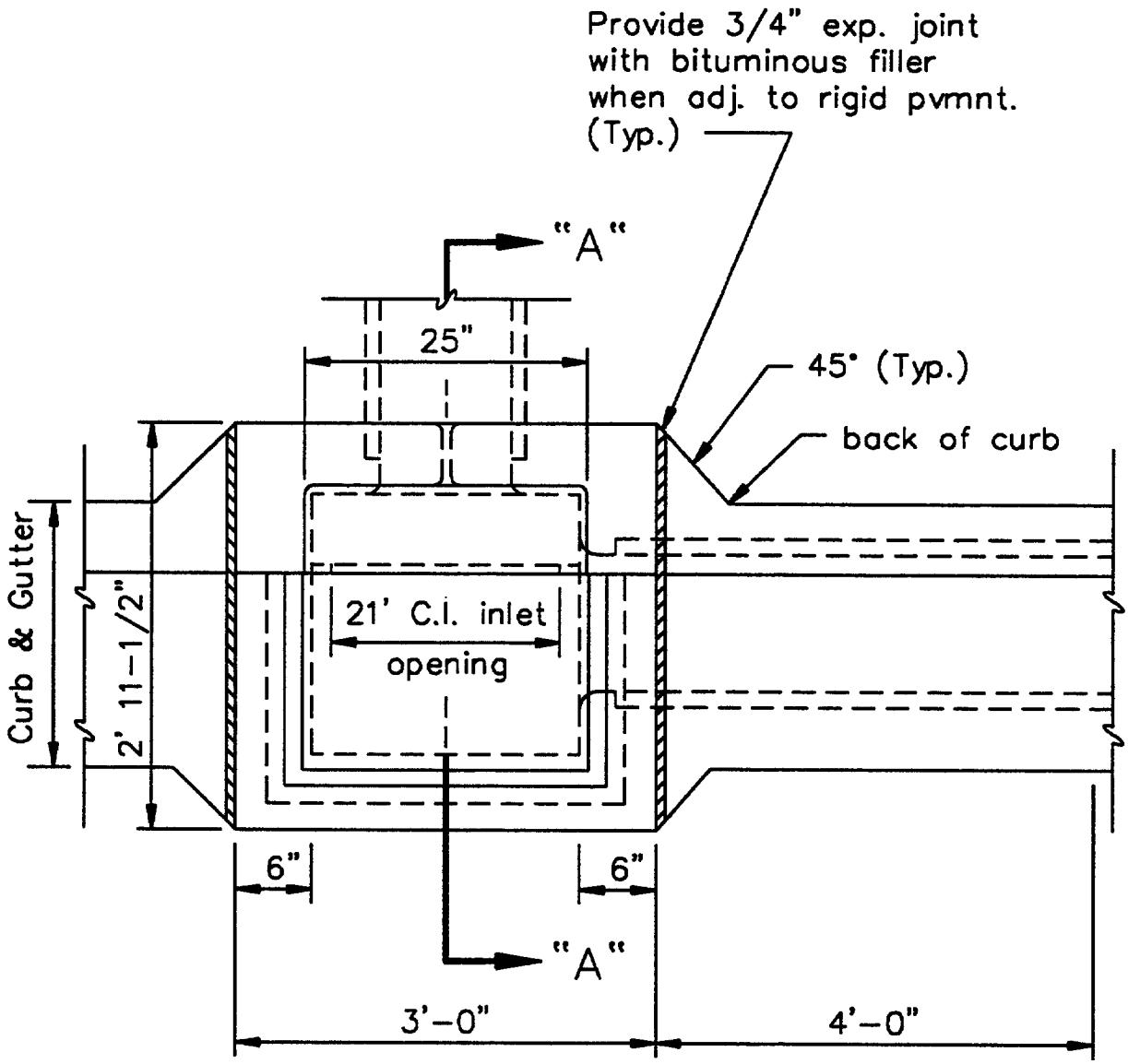
# TYPE "B" INLET

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

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 91<br>MANHOLE AND INLETS FOR STORM DRAINS | U-34<br>34 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

NOTE: For section A–A, see Sheet No. 36




PLAN

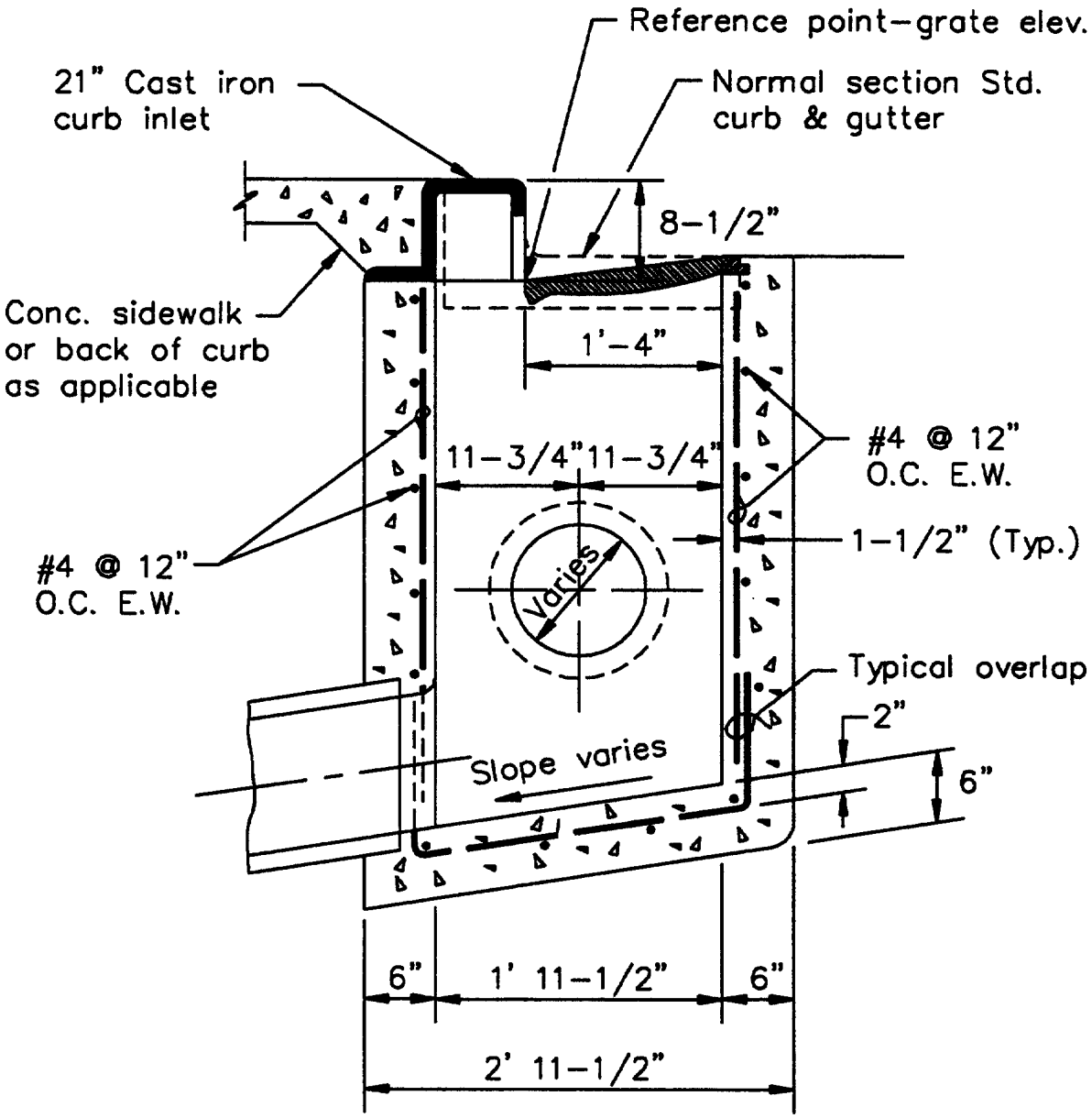
# TYPE "C" INLET

NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 87<br>MANHOLE AND INLETS FOR STORM DRAINS REV. MAR. 88 | U-35<br>35 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

NOTE: For plan, see sheet No. 35




SECTION A–A

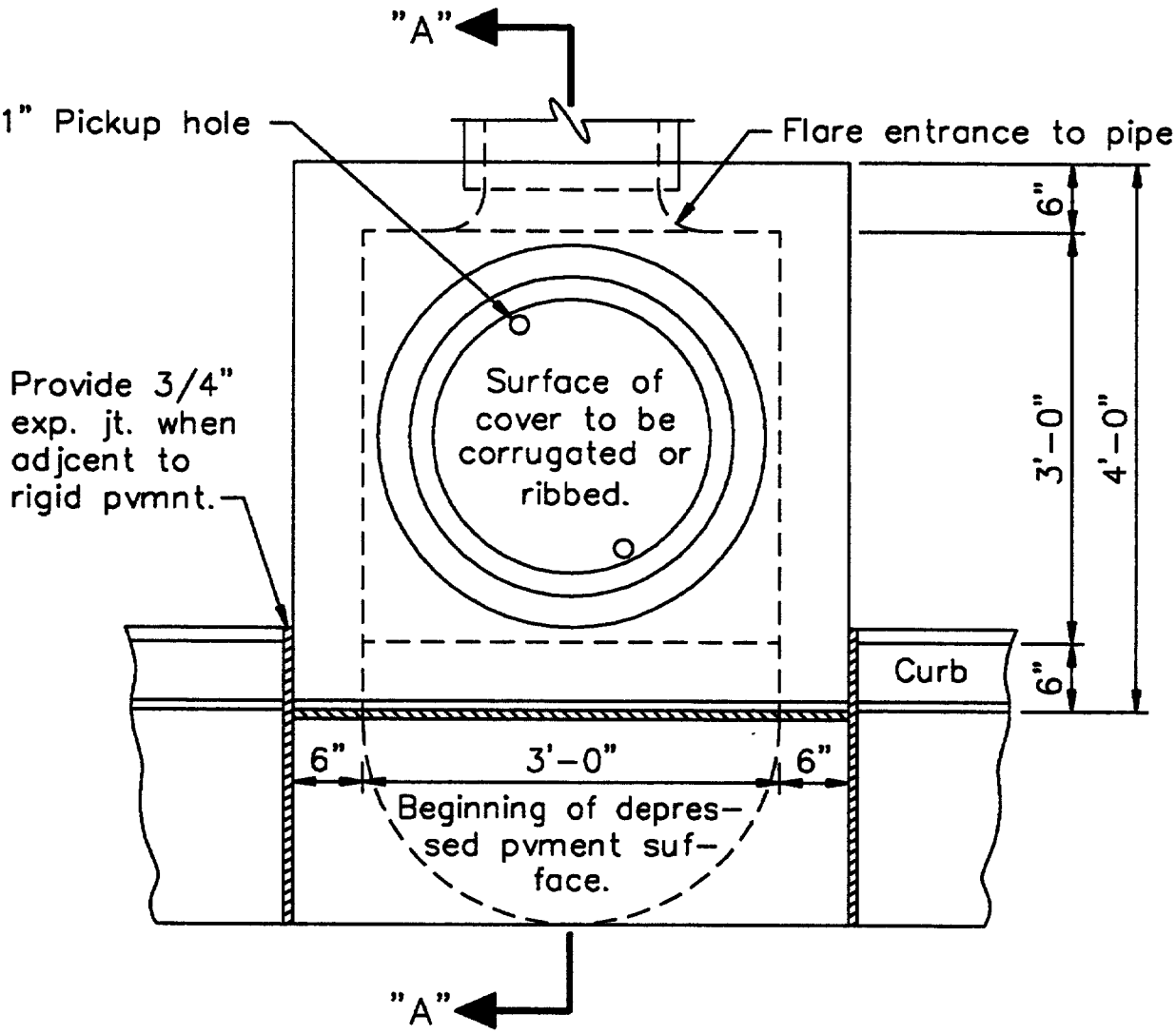
# TYPE "C" INLET

NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 87<br>MANHOLE AND INLETS FOR STORM DRAINS REV. MAR. 88 | U–36<br>36 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

NOTE: For section A–A, see sheet No. 38




PLAN

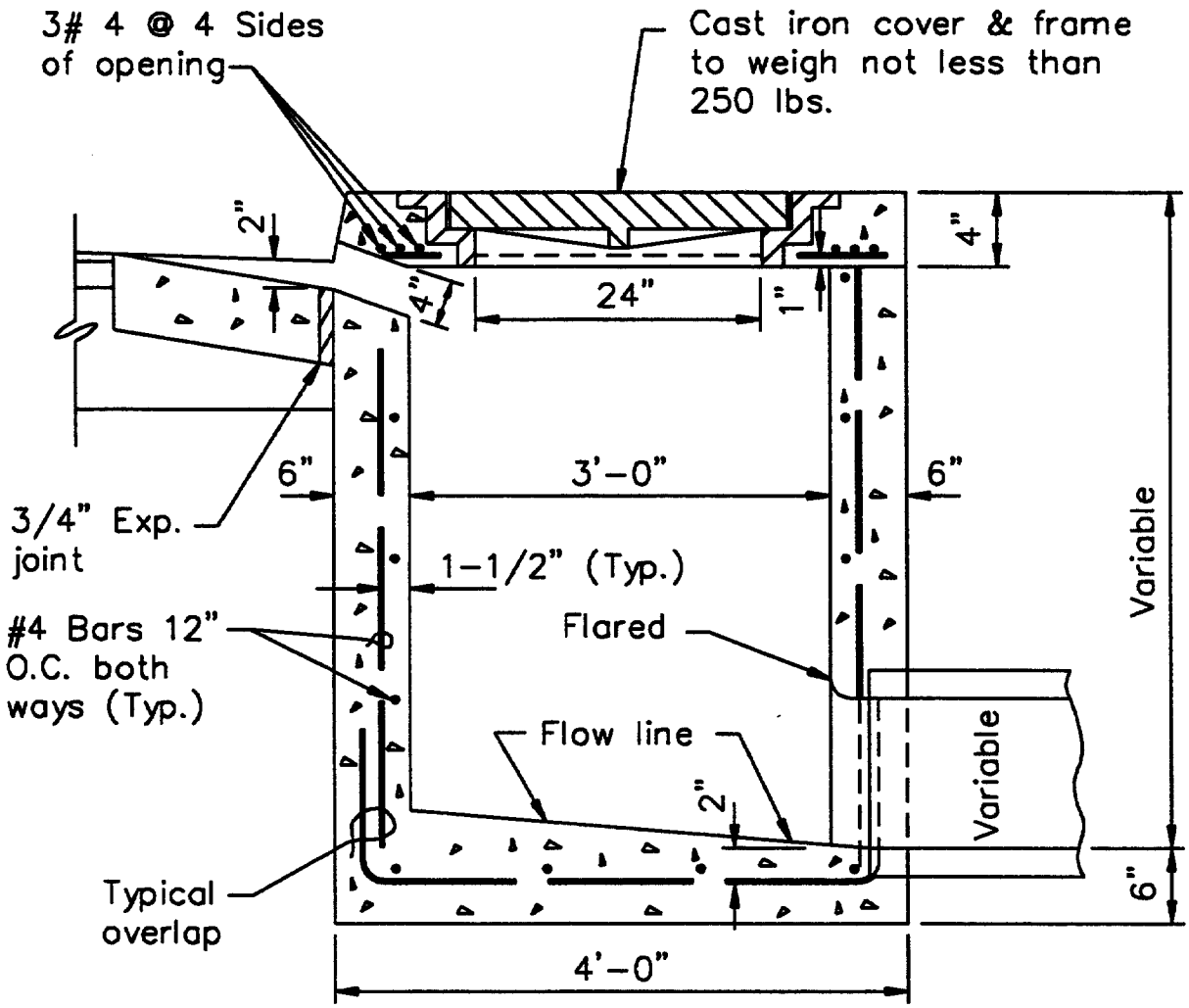
## TYPE "D" INLET

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

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 89<br>MANHOLE AND INLETS FOR STORM DRAINS | U–37<br>37 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

NOTE: For plan, see sheet No. 37



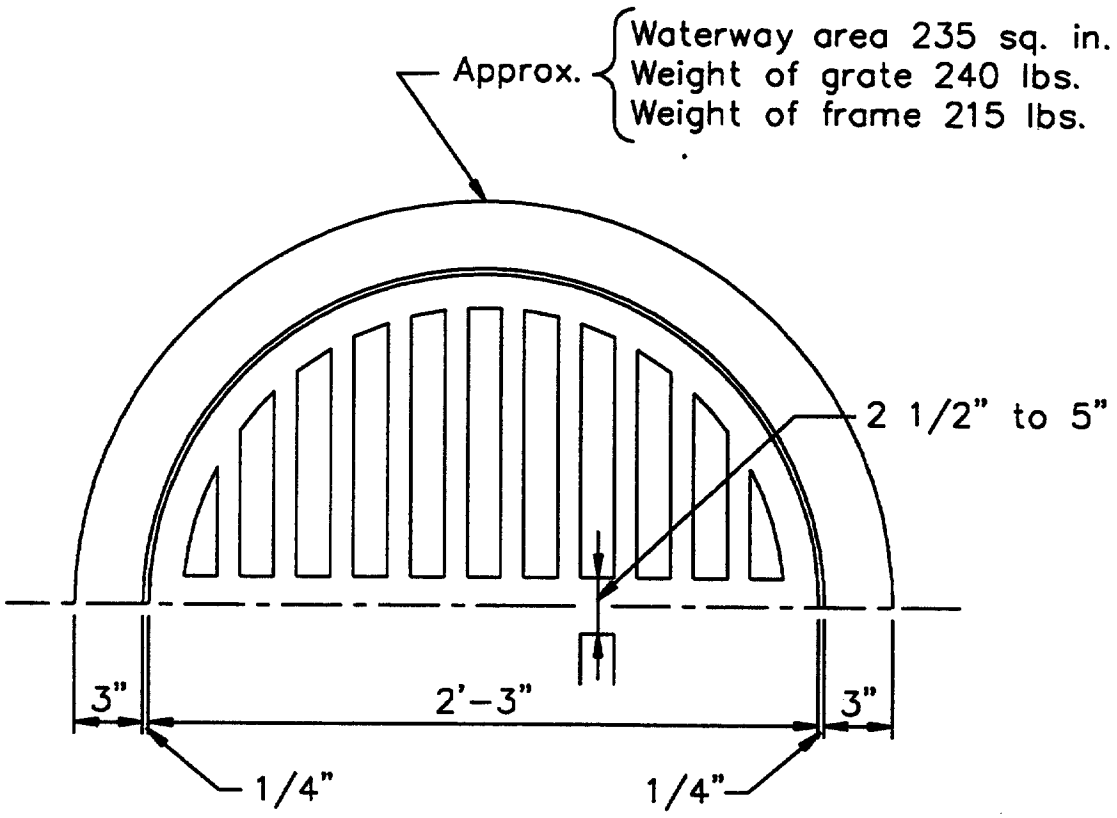

SECTION "A-A"

# TYPE "D" INLET

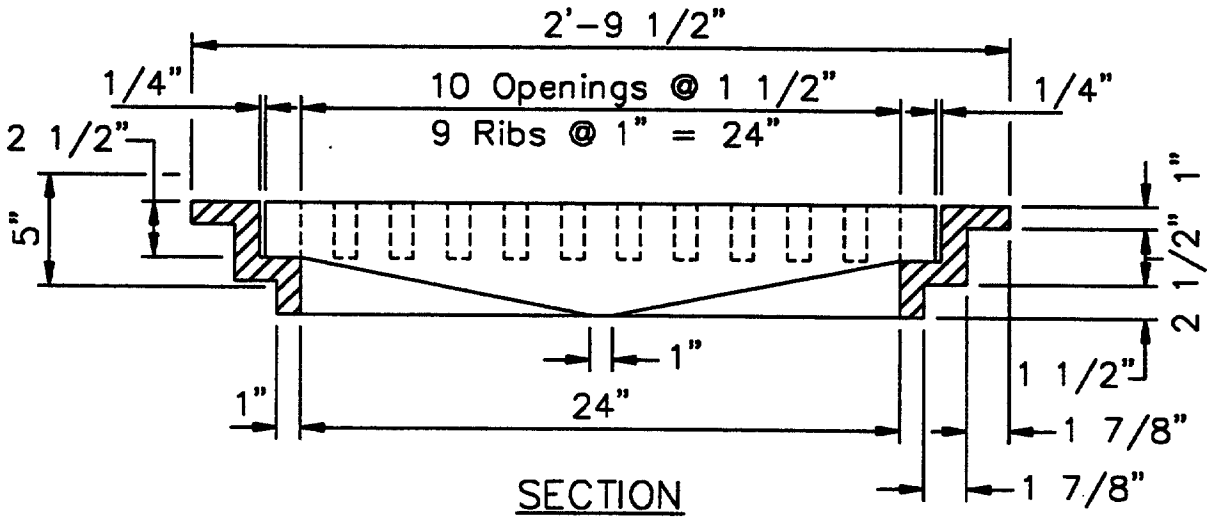
SCALE: 3/4" = 1'-0"

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: DEC. 89<br>MANHOLE AND INLET FOR STORM DRAINS | U-38<br>38 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




HALF PLAN



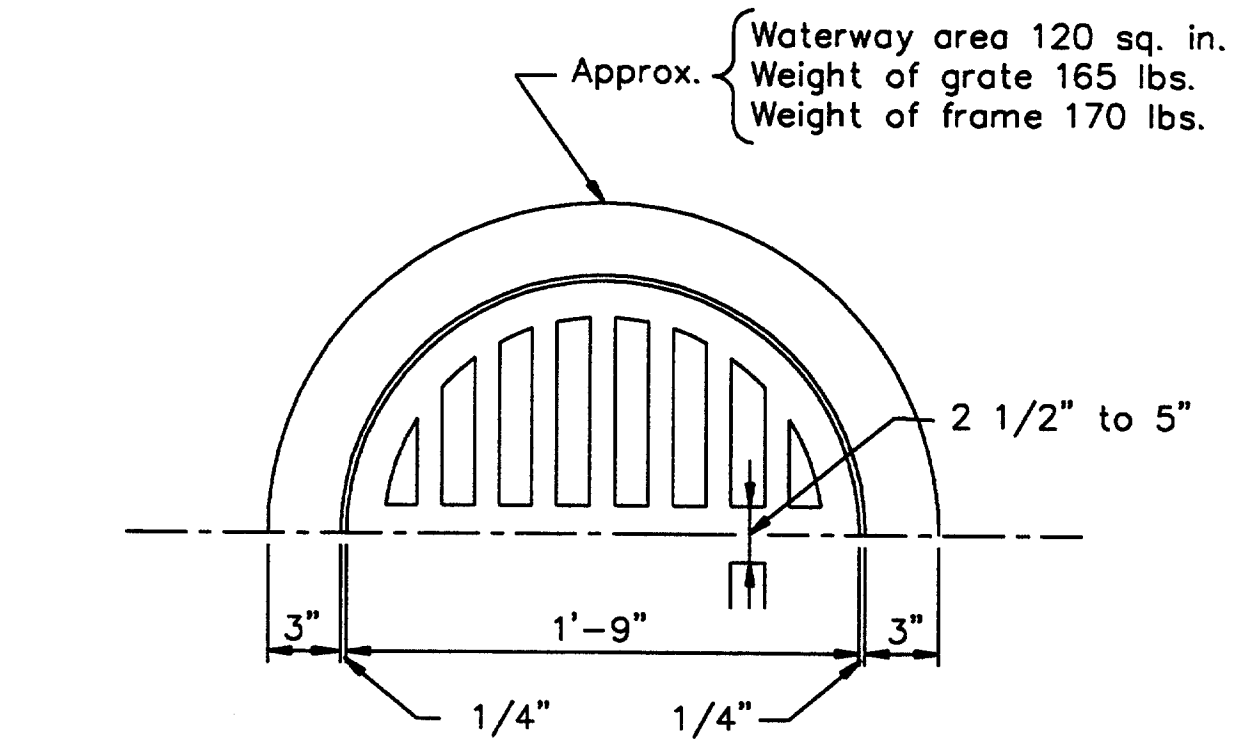

SECTION

# TYPE "A" INLET GRATE & FRAME

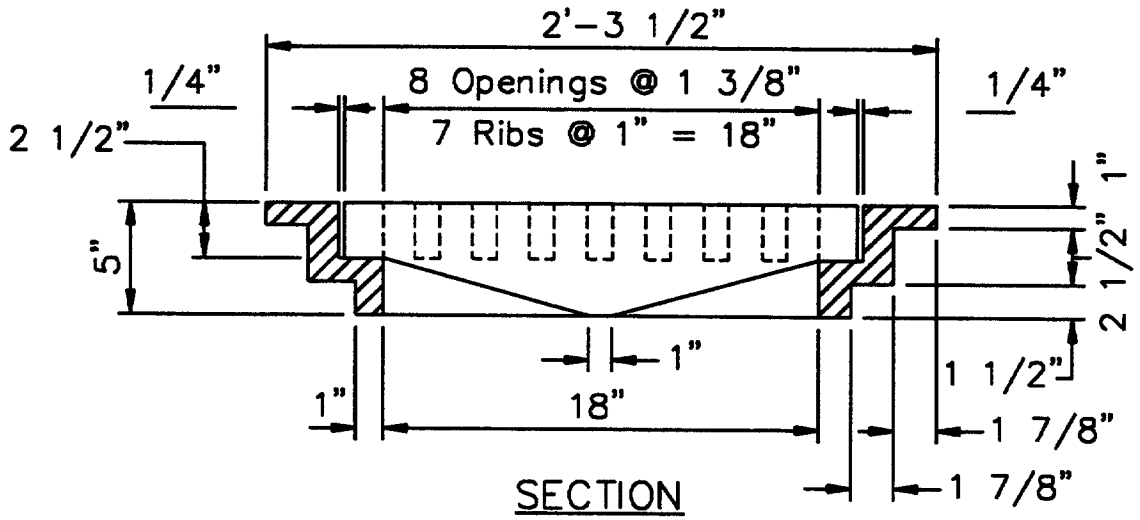
SCALE 1 1/2" = 1'-0"

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: DEC. 91<br>MANHOLE AND INLETS FOR STORM DRAINS | U-39<br>39 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




HALF PLAN



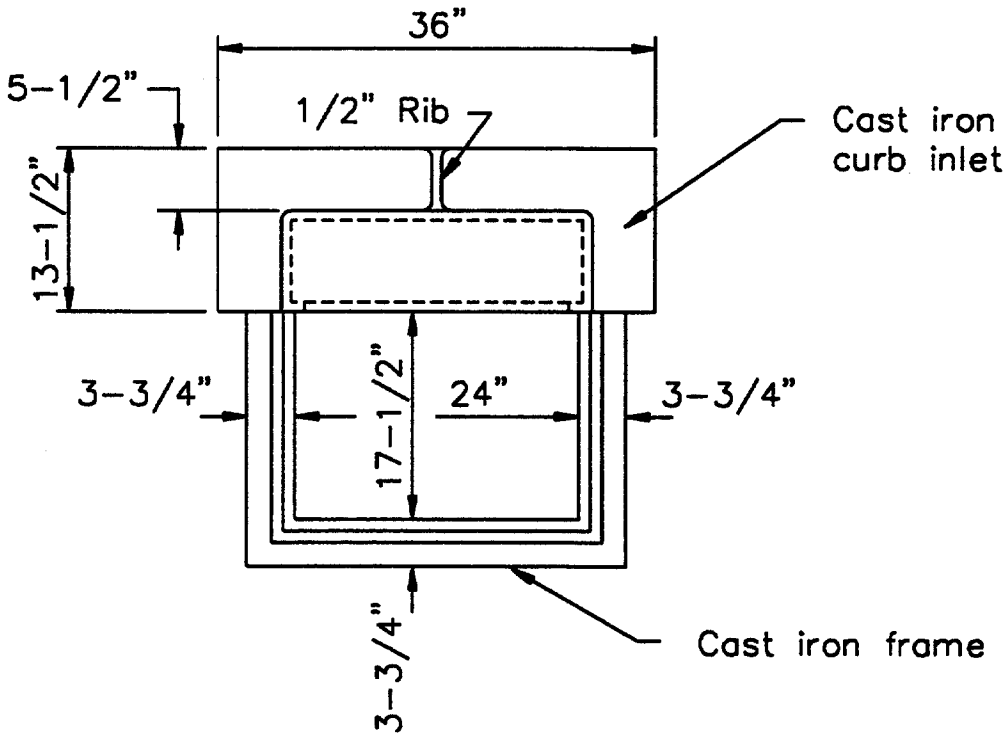

SECTION

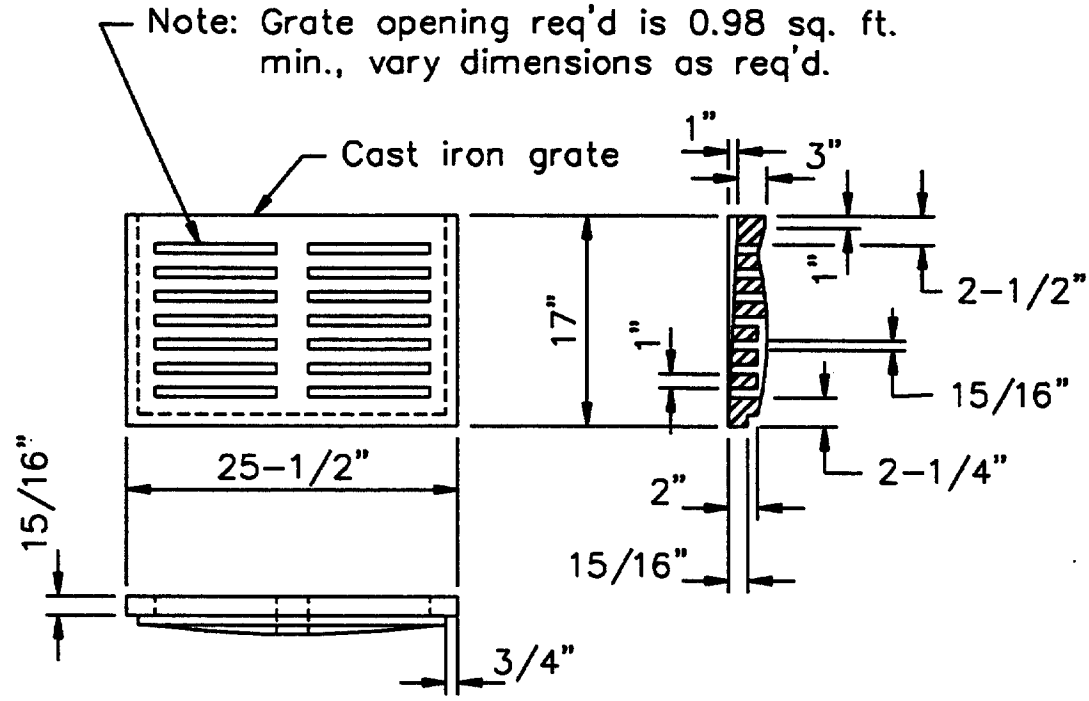
# TYPE "B" INLET GRATE & FRAME

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

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: DEC. 91<br>MANHOLE AND INLETS FOR STORM DRAINS | U-40<br>40 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



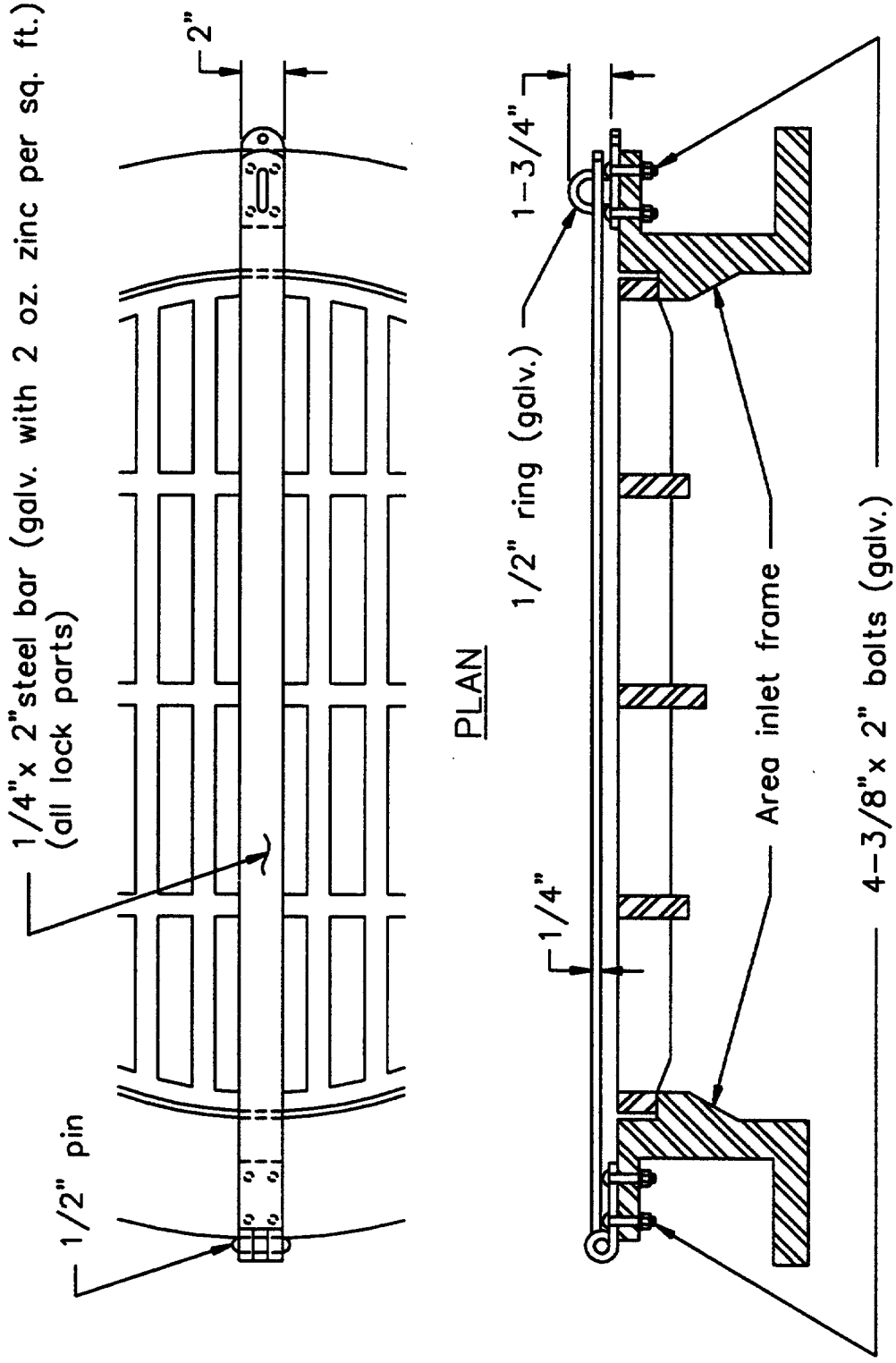




## TYPE "C" INLET GRATE & FRAME

NO SCALE

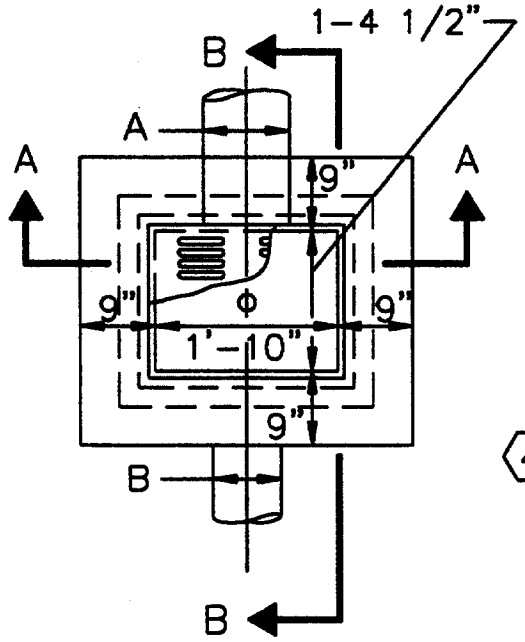
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: DEC. 89<br>MANHOLE AND INLETS FOR STORM DRAINS | U-41<br>41 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



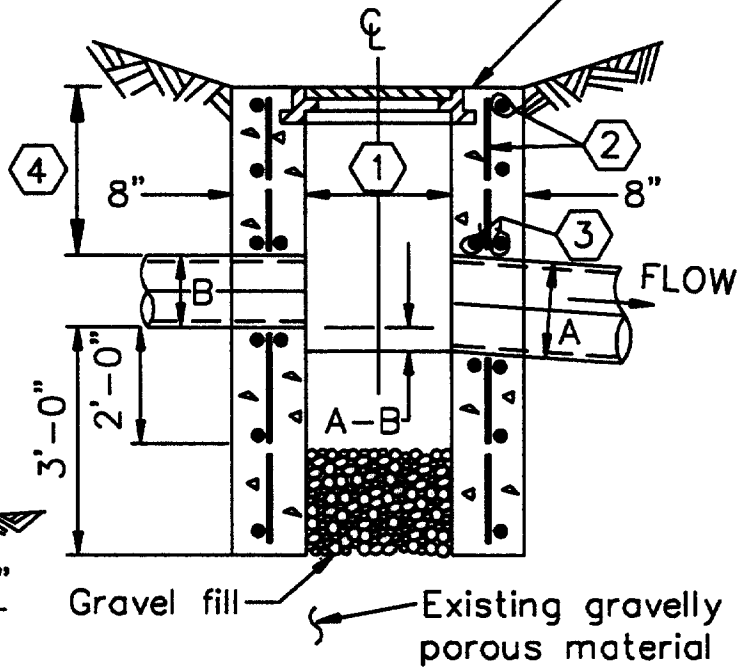

# STEEL STRAP LOCK FOR AREA INLET

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

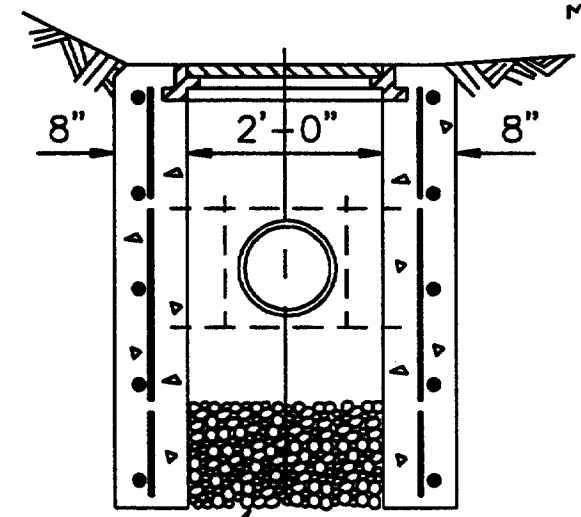



PLAN

Reversible type drain inlet--25"x31" frame, 16-1/2"x22" opening & 4" depth with matching cover. Cover to have slots 7/8" wide. Min. wt.280 lbs. Area waterway - 110 in.$^2$




SECTION B-B




SECTION A-A

1. 1'-6 1/2"
2. #4@12" O.C. Ea. Way
3. 2 #5x2'-0" All Around Pipe
4. 2'-6" Min. Cover

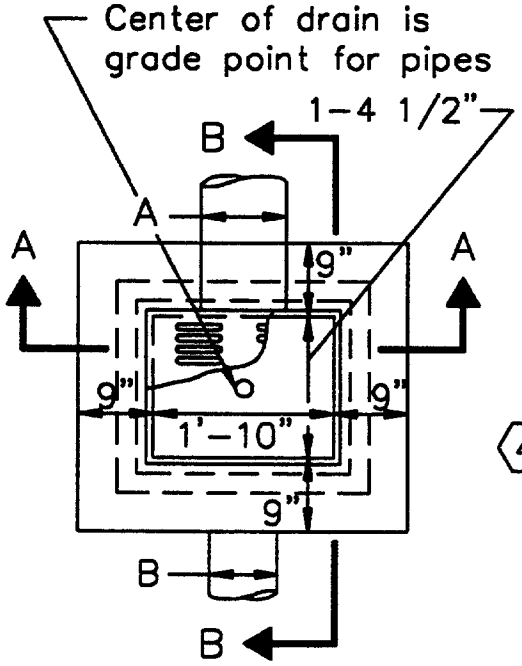
NOTE:

Dimensions of drain inlet may be altered to fit manufacturer's standard frames and covers with same area of waterway and minimum weight, subject to approval of contracting officer.

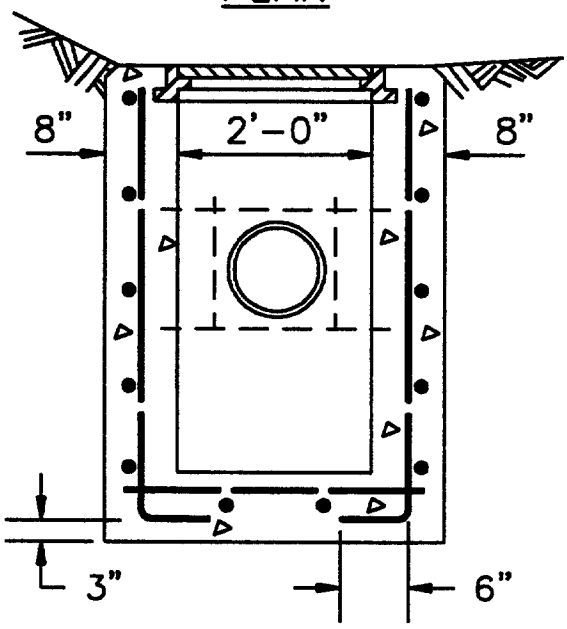
# STORM DRAIN INLET

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 91<br>MANHOLE AND INLETS FOR STORM DRAINS | U-43<br>43 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

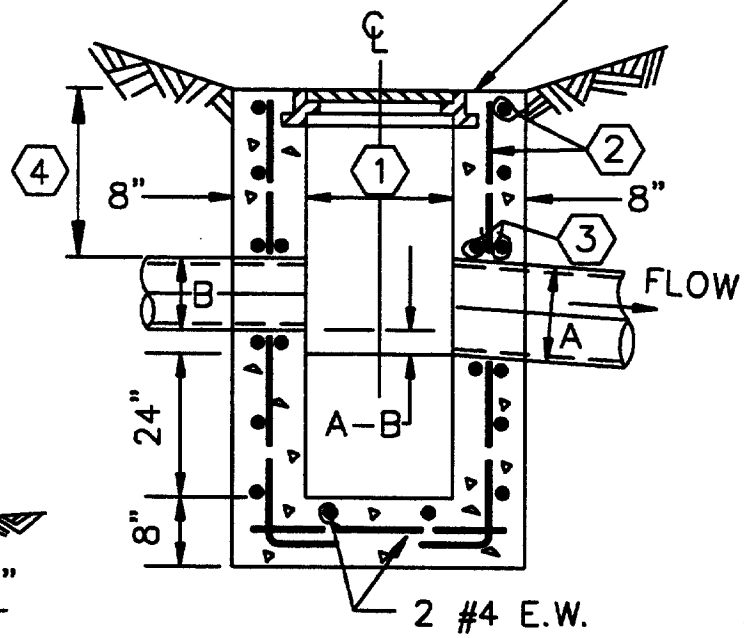



PLAN




SECTION A-A

Reversible type drain inlet- 25"x31" frame, 16-1/2"x22" opening & 4" depth with matching cover. Cover to have slots 7/8" wide. Min. wt. 280 lbs. Area waterway - 110 in.$^2$




SECTION B-B

1. 1'-6 1/2"
2. #4@12" O.C. Ea. Way
3. 2 #5x2'-0" All Around Pipe
4. 30" Min. Cover

NOTE:
Dimensions of drain inlet may be altered to fit manufacturer's standard frames and covers with same area of waterway and minimum weight, subject to approval of contracting officer.

# STORM DRAIN INLET

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: DEC. 89<br>MANHOLE AND INLETS FOR STORM DRAINS | U-44<br>44 |

# RAINFALL INTENSITY AT AIR FORCE INSTALLATIONS

## (60 MIN. DURATION)

(In./hr.)

| AIR FORCE INSTALLATIONS | DESIGN STORM | | | |
|---|---|---|---|---|
| SACRAMENTO DISTRICT | 2 YEAR | 5 YEAR | 10 YEAR | 25 YEAR |
| BEALE, CA. | 0.5 | 0.7 | 0.9 | 1.1 |
| DAVIS-MONTHAN, AZ. | 1.2 | 1.5 | 1.9 | 2.2 |
| EDWARDS, CA. | 0.4 | 0.6 | 0.7 | 0.8 |
| GEORGE, CA. | 0.5 | 0.6 | 0.9 | 1.0 |
| HILL, UT. | 0.5 | 0.6 | 0.8 | 1.0 |
| LUKE, AZ. | 0.9 | 1.3 | 1.5 | 1.8 |
| MARCH, CA. | 0.6 | 1.0 | 1.1 | 1.4 |
| MATHER, CA. | 0.5 | 0.8 | 1.0 | 1.2 |
| McCLELLAN, CA. | 0.6 | 0.8 | 1.0 | 1.1 |
| NELLIS, CA. | 0.6 | 0.8 | 1.0 | 1.2 |
| NORTON, CA. | 0.6 | 1.0 | 1.1 | 1.4 |
| VANDENBERG, CA. | 0.6 | 0.8 | 1.0 | 1.2 |
| WILLIAMS, AZ. | 0.9 | 1.3 | 1.6 | 1.9 |
| HILL AIR FORCE RANGE, UT. | 0.5 | 0.6 | 0.7 | 0.9 |

RAINFALL INTENSITIES ARE BASED ON NOAA ATLAS 2

# RAINFALL INTENSITY AT ARMY INSTALLATIONS

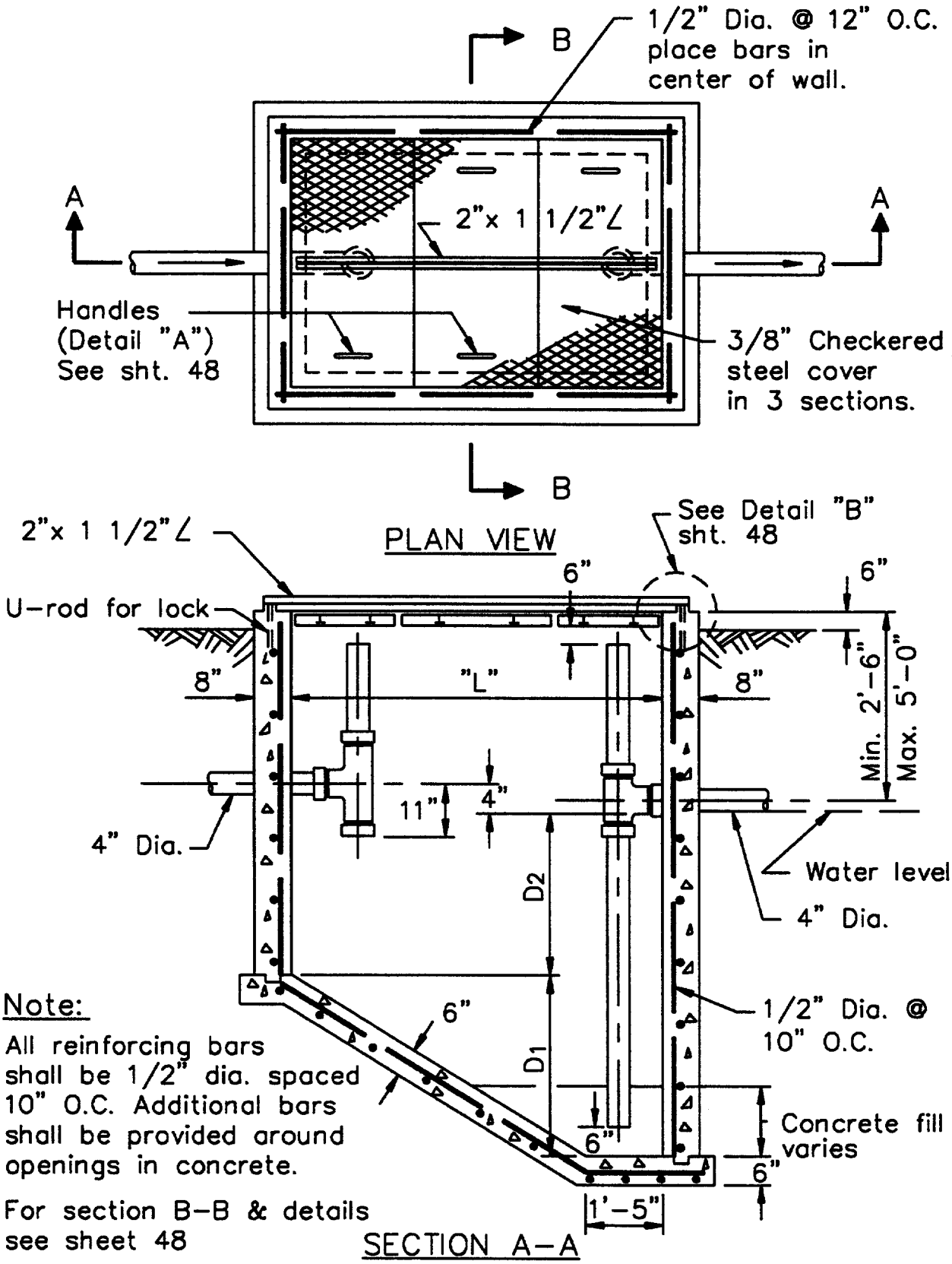
## (60 MIN. DURATION)

(In./hr.)

| ARMY INSTALLATIONS | DESIGN STORM | | | |
|---|---|---|---|---|
| SACRAMENTO DISTRICT | 2 YEAR | 5 YEAR | 10 YEAR | 25 YEAR |
| CAMP ROBERTS, CA. | 0.6 | 0.8 | 1.0 | 1.2 |
| DEFENSE DEPOT, OGDEN, UT. | 0.5 | 0.6 | 0.8 | 1.0 |
| DEFENSE DEPOT, TRACY, CA. | 0.6 | 0.8 | 1.0 | 1.2 |
| DUGWAY PROVING GROUND, UT. | 0.5 | 0.6 | 0.7 | 0.8 |
| FORT BAKER, CA. | 0.7 | 0.9 | 1.1 | 1.2 |
| FORT BARRY, CA. | 0.7 | 0.9 | 1.1 | 1.2 |
| FORT CRONKHITE, CA. | 0.7 | 0.9 | 1.1 | 1.2 |
| FORT DOUGLAS, UT. | 0.4 | 0.6 | 0.7 | 0.9 |
| FORT HUACHUCA, AZ. | 1.2 | 1.6 | 1.9 | 2.3 |
| FORT IRWIN, CA. | 0.3 | 0.4 | 0.5 | 0.6 |
| FORT MacARTHUR, CA. | 0.7 | 0.9 | 1.2 | 1.4 |
| FORT MASON, CA. | 0.7 | 0.9 | 1.1 | 1.2 |
| FORT ORD, CA. | 0.6 | 0.8 | 1.0 | 1.2 |
| FORT HUNTER LIGGETT, CA. | 0.6 | 0.8 | 1.0 | 1.2 |
| OAKLAND ARMY BASE, CA. | 0.5 | 0.8 | 1.0 | 1.1 |
| PRESIDIO OF MONTEREY, CA. | 0.6 | 0.8 | 1.0 | 1.2 |
| PRESIDIO OF SAN FRANCISCO, CA. | 0.6 | 0.8 | 1.0 | 1.1 |
| RIVERBANK ARMY AMMO PLANT, CA. | 0.4 | 0.6 | 0.9 | 1.1 |
| SACRAMENTO ARMY DEPOT, CA. | 0.5 | 0.7 | 0.9 | 1.2 |
| SHARPE ARMY DEPOT, CA. | 0.4 | 0.6 | 0.8 | 1.0 |
| SIERRA ARMY DEPOT, CA. | 0.4 | 0.6 | 0.8 | 0.8 |
| TOOELE ARMY DEPOT, UT. | 0.4 | 0.6 | 0.7 | 0.9 |
| WHITE SANDS MISSILE RANGE, UT. | 0.5 | 0.8 | 1.0 | 1.2 |
| YUMA PROVING GROUND, AZ. | 0.6 | 1.0 | 1.5 | 2.0 |

RAINFALL INTENSITIES ARE BASED ON NOAA ATLAS 2

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




Note:

All reinforcing bars shall be 1/2" dia. spaced 10" O.C. Additional bars shall be provided around openings in concrete.

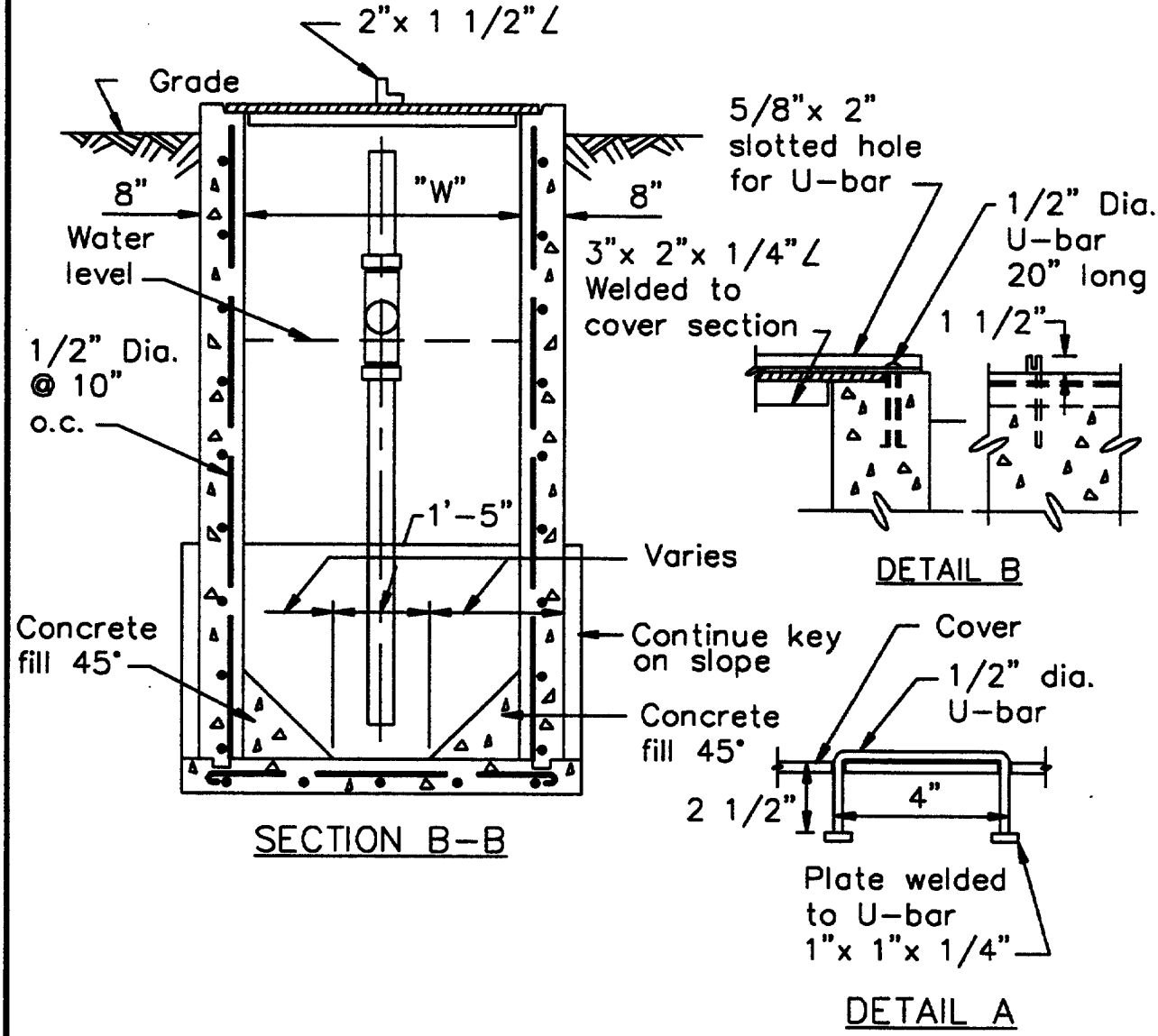
For section B-B & details see sheet 48

# TRAP-GREASE INTERCEPTING

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: DEC. 89<br>TRAP - GREASE INTERCEPTING | U-47<br>47 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

| CAPACITY PERSONS | LENGTH L | WIDTH W | $D_1$ | $D_2$ |
|---|---|---|---|---|
| 1 TO 150 | 4'-3" | 2'-9" | 2'-4" | 1'-2" |
| 151 TO 250 | 4'-3" | 2'-9" | 2'-4" | 2'-0" |
| 251 TO 500 | 4'-6" | 3'-3" | 2'-8" | 2'-8" |
| 500 TO 1000 | 6'-0" | 4'-0" | 3'-2" | 3'-0" |
| 1000 TO 1500 | 8'-0" | 4'-6" | 3'-6" | 3'-0" |




SECTION B-B

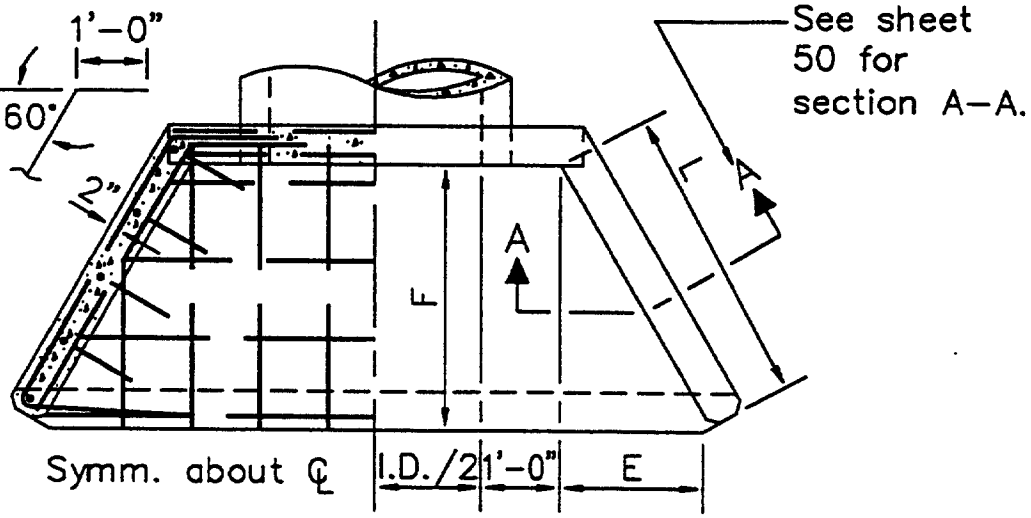
DETAIL B

DETAIL A

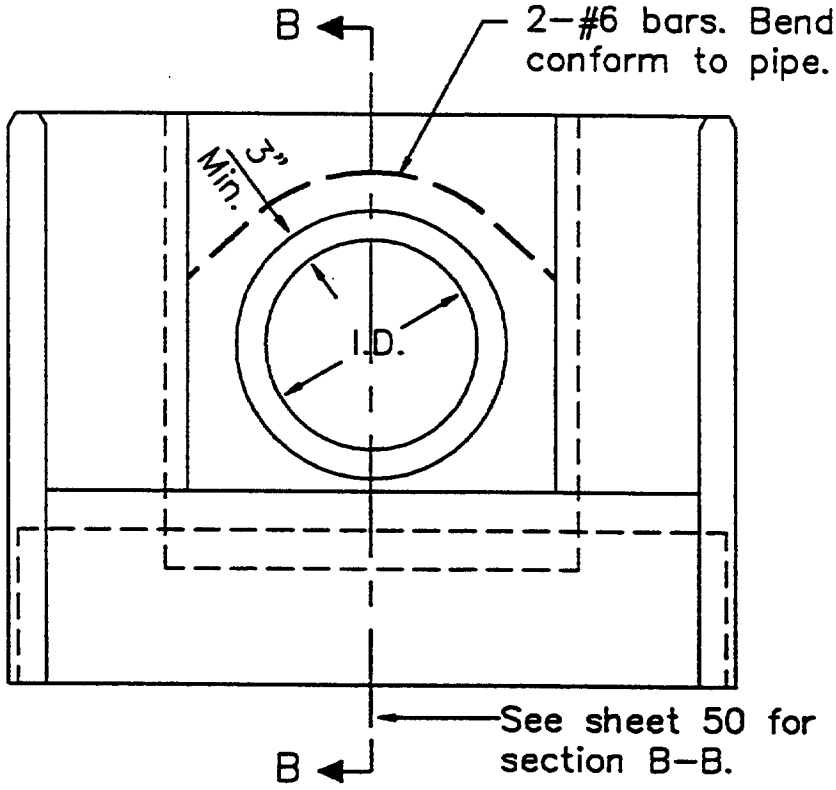
# TRAP-GREASE INTERCEPTING

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 91<br>TRAP - GREASE INTERCEPTING | U-48<br>48 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




PLAN

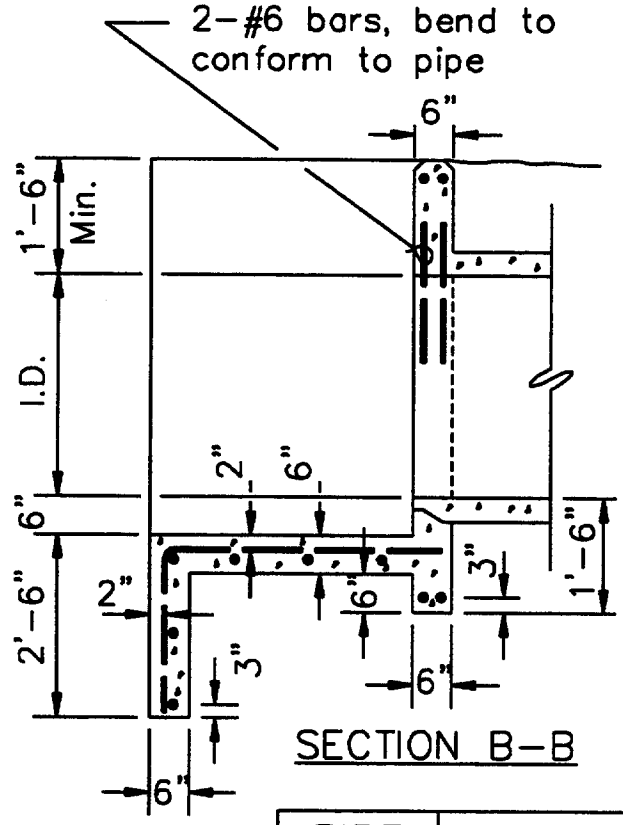



ELEVATION

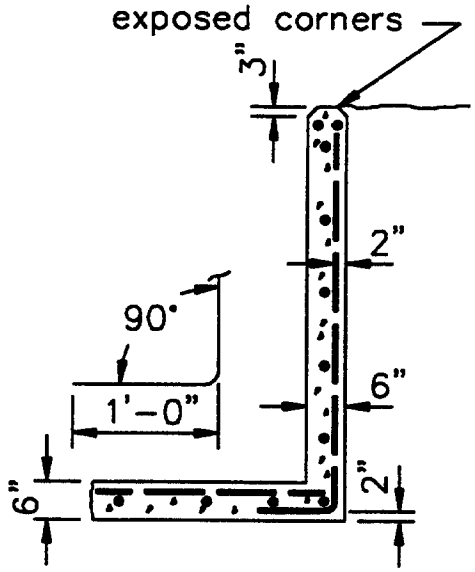
# CONCRETE HEADWALL WITH APRON AND WINGWALLS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUN. 92<br>CULVERT HEADWALL DATA | U-49<br>49 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




SECTION B-B




SECTION A-A

| PIPE | DIMENSIONS | | |
|---|---|---|---|
| I.D. | L | E | F (approx.) |
| 12" | 2'-0" | 1'-0" | 1'-9" |
| 18" | 2'-0" | 1'-0" | 1'-9" |
| 24" | 2'-0" | 1'-0" | 1'-9" |
| 30" | 3'-0" | 1'-6" | 2'-7" |
| 36" | 4'-0" | 2'-0" | 3'-6" |
| 42" | 5'-0" | 2'-6" | 4'-4" |
| 48" | 6'-0" | 3'-0" | 5'-2" |
| 54" | 7'-0" | 3'-6" | 6'-1" |
| 60" | 8'-0" | 4'-0" | 6'-11" |

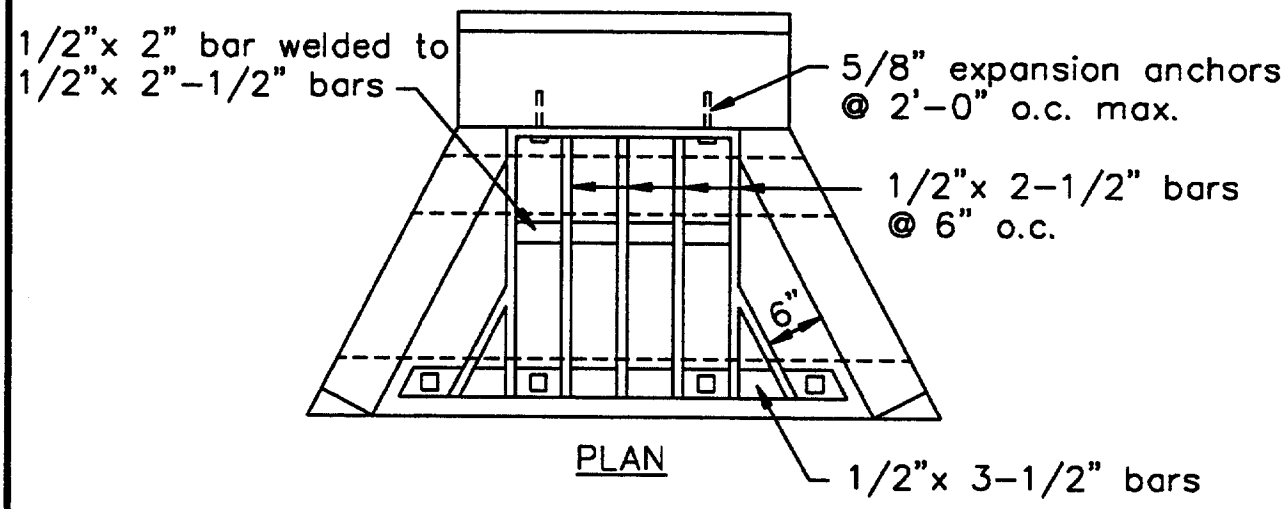
GENERAL NOTES:

1. All concrete shall be Class A.
2. All reinforcing bars shall be #4 except two #6 bars over pipe. Bar spacing approximately 1'-0" o.c. unless otherwise noted.

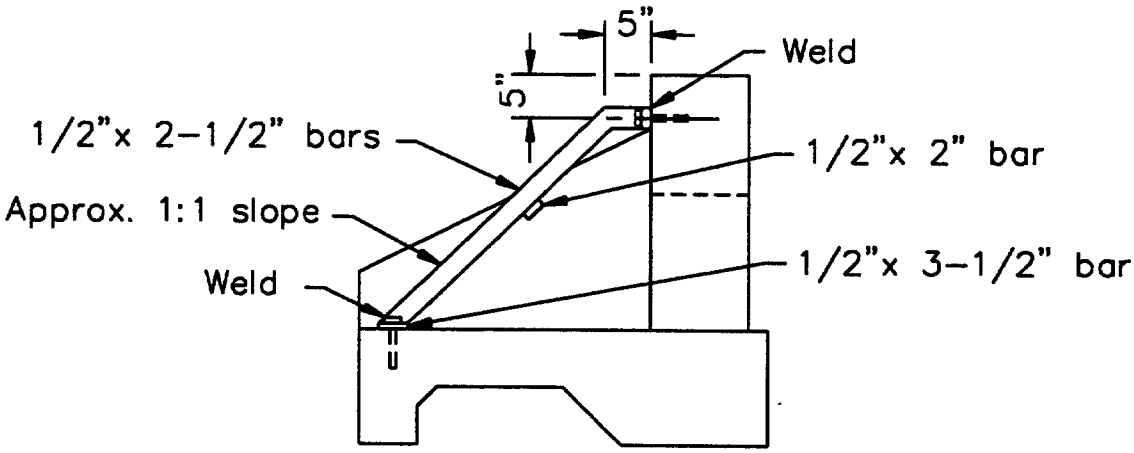
# CONCRETE HEADWALLS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 90<br>CULVERT HEADWALL DATA | U-50<br>50 |

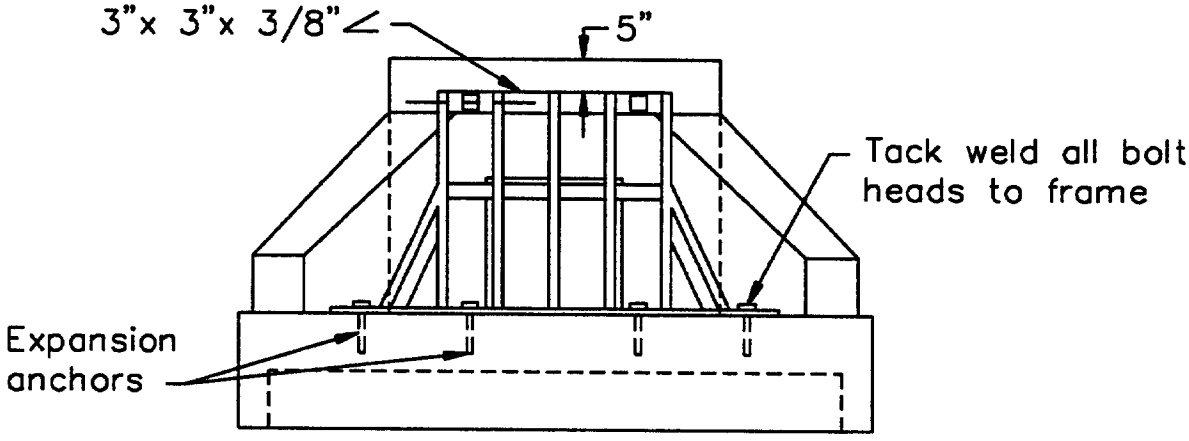
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




PLAN




SECTION ON ℄ PIPE

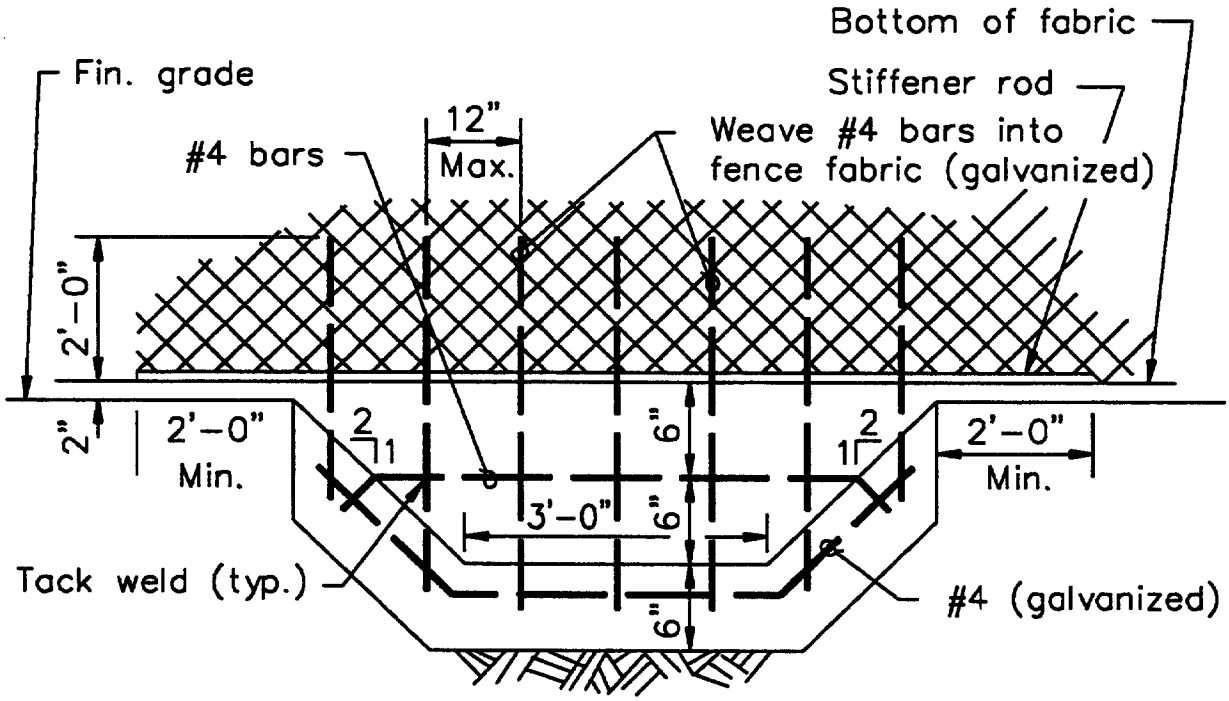



ELEVATION

# HEADWALL PROTECTION BARRIER

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 91<br>CULVERT HEADWALL DATA | U-51<br>51 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



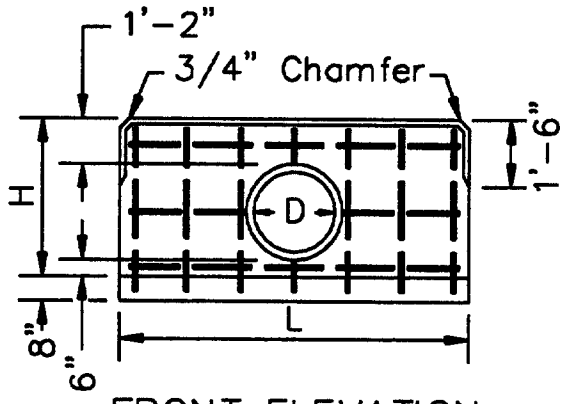

# SECURITY FENCE DITCH CROSSING

## TYPE I

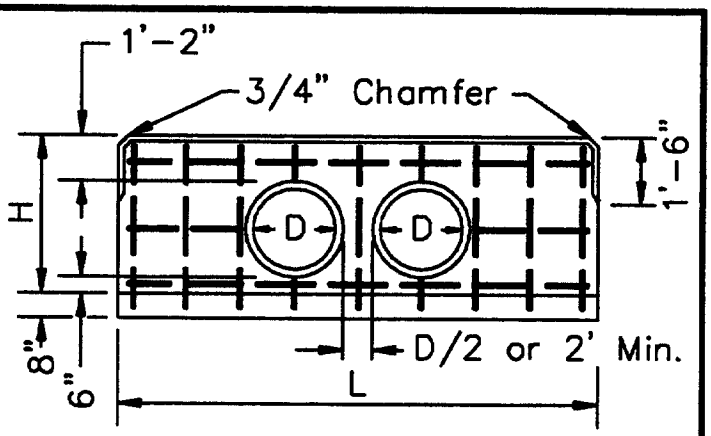
NO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 90<br>CULVERT HEADWALL DATA | U-52<br>52 |

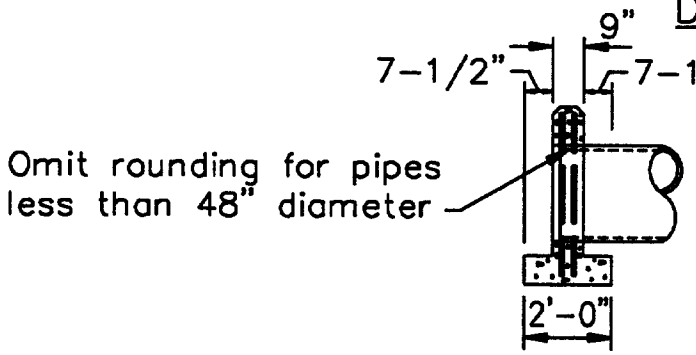
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




FRONT ELEVATION
SINGLE HEADWALL




FRONT ELEVATION
DOUBLE HEADWALL




SECTION, SINGLE &
DOUBLE HEADWALLS

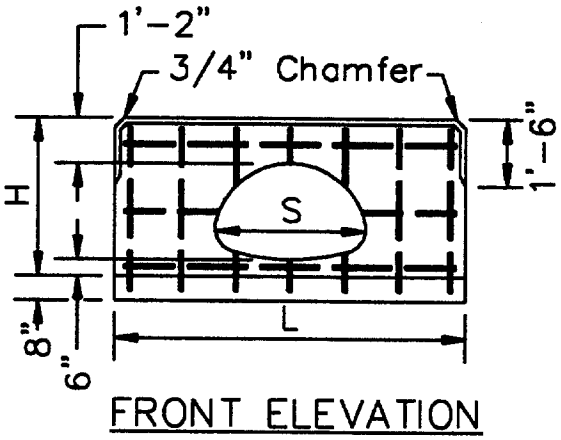
| D | H | SINGLE | DOUBLE |
|---|---|---|---|
| | | L | L |
| 12" | 2'-8" | 5'-0" | 8'-0" |
| 15" | 2'-11" | 6'-0" | 9'-6" |
| 18" | 3'-2" | 7'-0" | 10'-6" |
| 21" | 3'-5" | 7'-6" | 11'-6" |
| 24" | 3'-8" | 8'-6" | 12'-6" |
| 27" | 3'-11" | 9'-6" | 14'-0" |
| 30" | 4'-2" | 10'-0" | 15'-0" |
| 33" | 4'-5" | 11'-0" | 16'-0" |
| 36" | 4'-8" | 12'-0" | 17'-0" |
| 39" | 4'-11" | 12'-6" | 18'-0" |
| 42" | 5'-2" | 13'-6" | 19'-0" |
| 45" | 5'-5" | 14'-6" | 20'-0" |
| 48" | 5'-8" | 15'-0" | 21'-0" |
| 51" | 5'-11" | 16'-0" | 22'-6" |
| 54" | 6'-2" | 17'-0" | 23'-6" |

GENERAL NOTES:

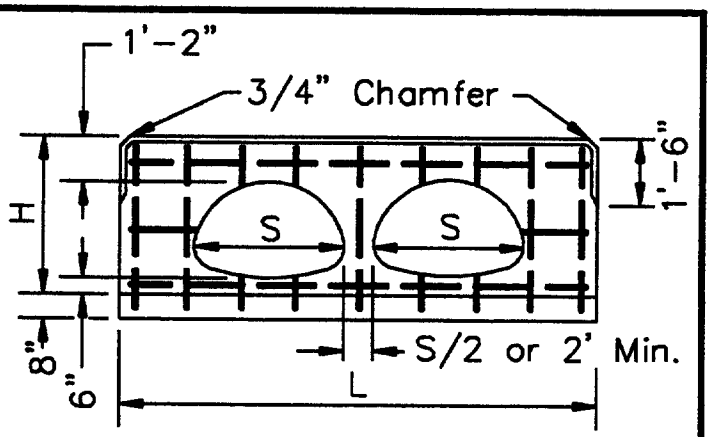
1. All reinforcing steel #4 bars. All vertical and horizontal tie bars 18" o.c. maximum spacing.
2. Length of wall "W" may be varied to suit conditions encountered in the field, and straight line interpolation may be used to calculate quantities.

# STRAIGHT HEADWALLS

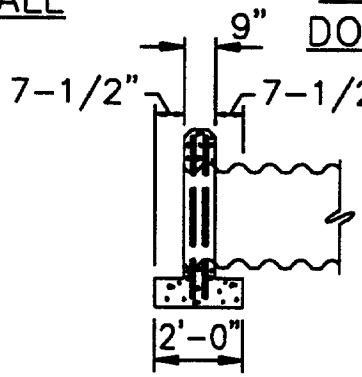
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




FRONT ELEVATION
SINGLE HEADWALL




FRONT ELEVATION
DOUBLE HEADWALL




SECTION, SINGLE &
DOUBLE HEADWALL

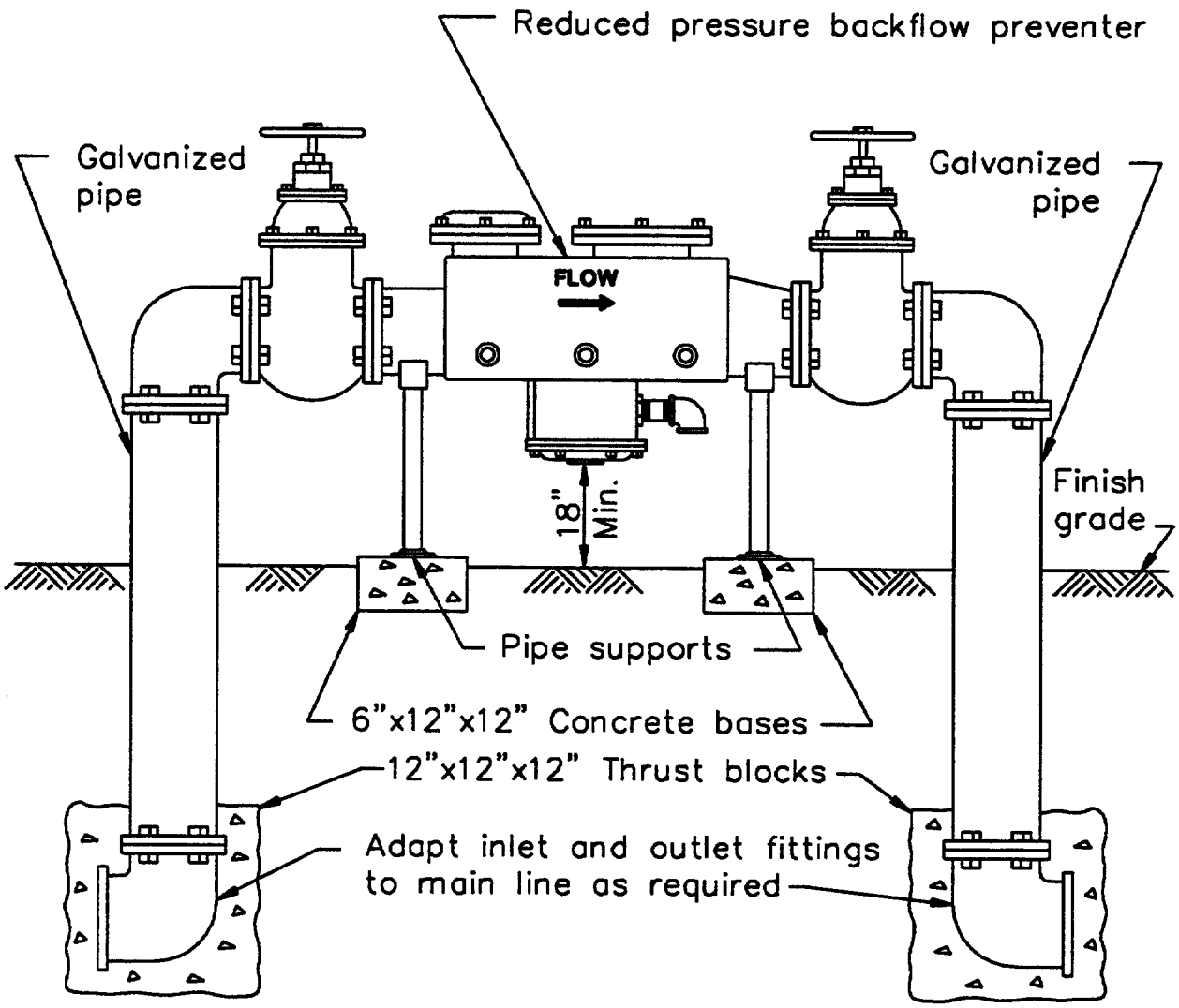
| ARCH SIZE | SINGLE | | DOUBLE |
|---|---|---|---|
| | H | L | L |
| 21" x 15" | 2'-11" | 6'-6" | 10'-0" |
| 24" x 18" | 3'-2" | 7'-6" | 11'-6" |
| 28" x 20" | 3'-4" | 8'-6" | 13'-6" |
| 35" x 24" | 3'-8" | 10'-6" | 15'-6" |
| 42" x 29" | 4'-1" | 12'-6" | 18'-0" |
| 49" x 33" | 4'-5" | 14'-6" | 21'-0" |
| 57" x 38" | 4'-10" | 17'-0" | 24'-6" |
| 64" x 43" | 5'-3" | 19'-0" | 27'-0" |
| 71" x 47" | 5'-7" | 21'-0" | 30'-0" |

GENERAL NOTES:

1. All reinforcing steel #4 bars. All vertical and horizontal tie bars 18" o.c. maximum spacing.
2. Length of wall "W" may be varied to suit conditions encountered in the field, and straight line interpolation may be used to calculate quantities.

# STRAIGHT HEADWALLS

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

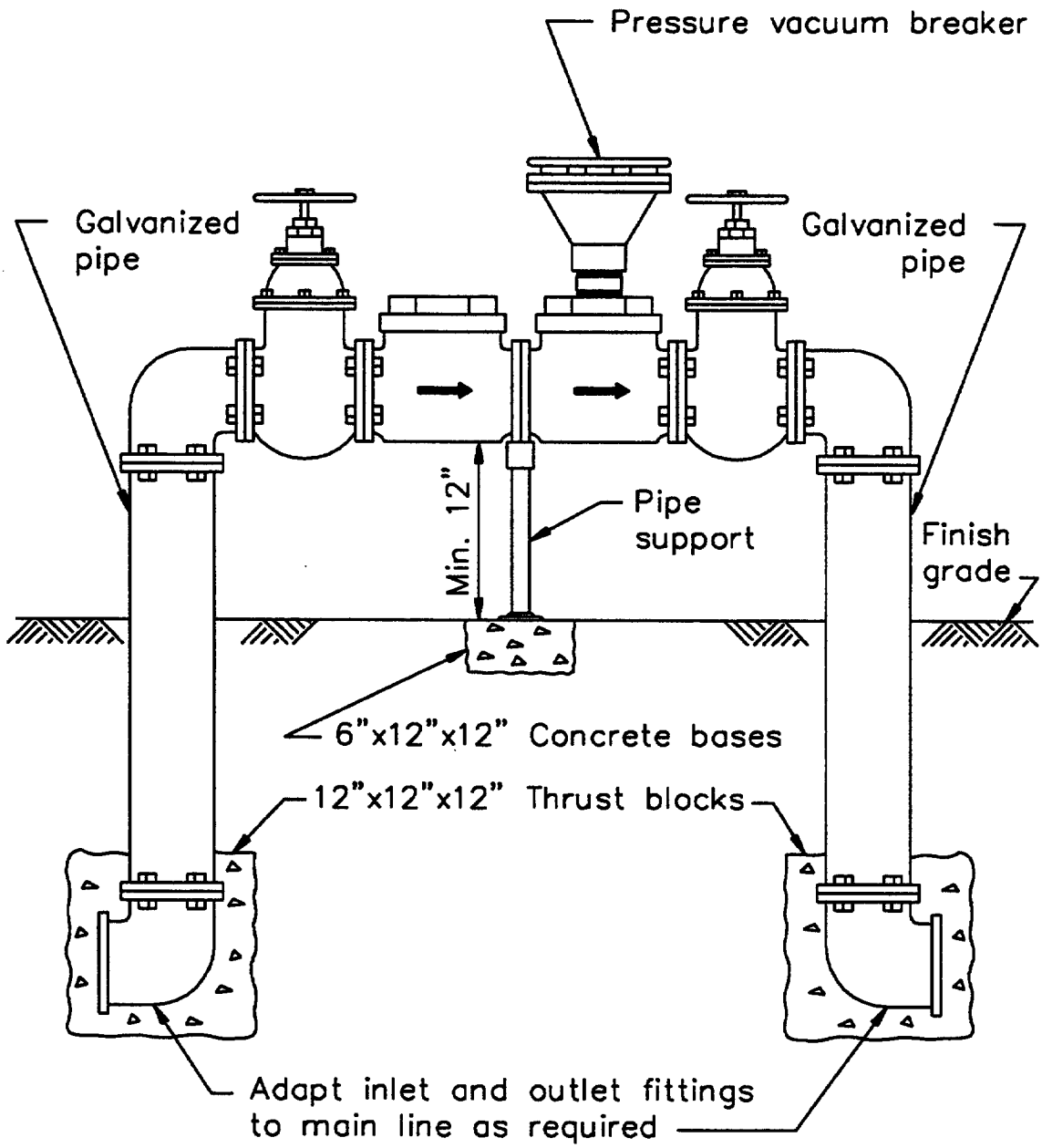



All connections on assembly to be flanged.

# TYPICAL BACKFLOW PREVENTER ASSEMBLY DETAIL

FOR LINE SIZES IN EXCESS OF 2" ø

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

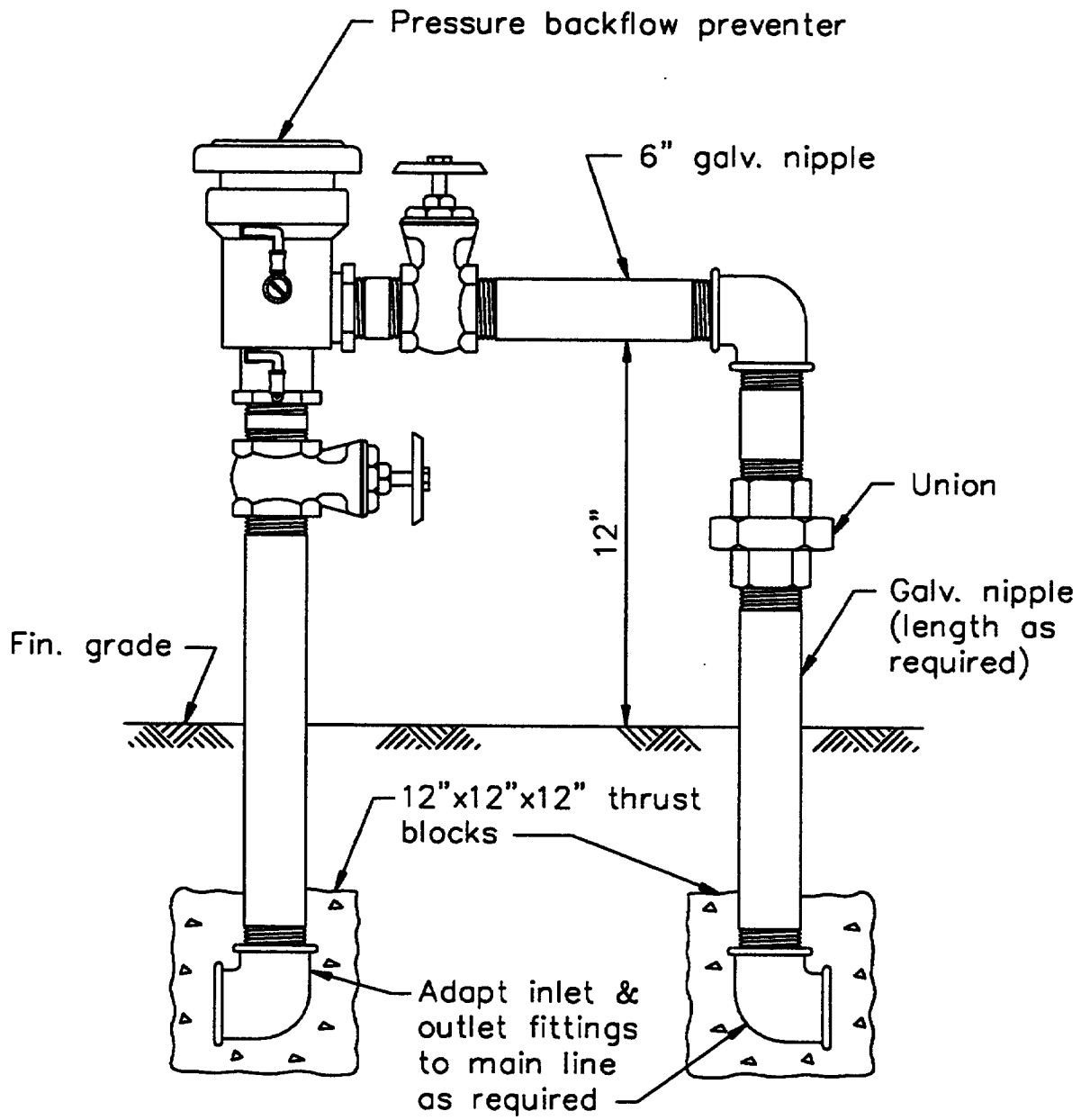



All connections on assembly to be flanged.

# TYPICAL BACKFLOW PREVENTER ASSEMBLY DETAIL

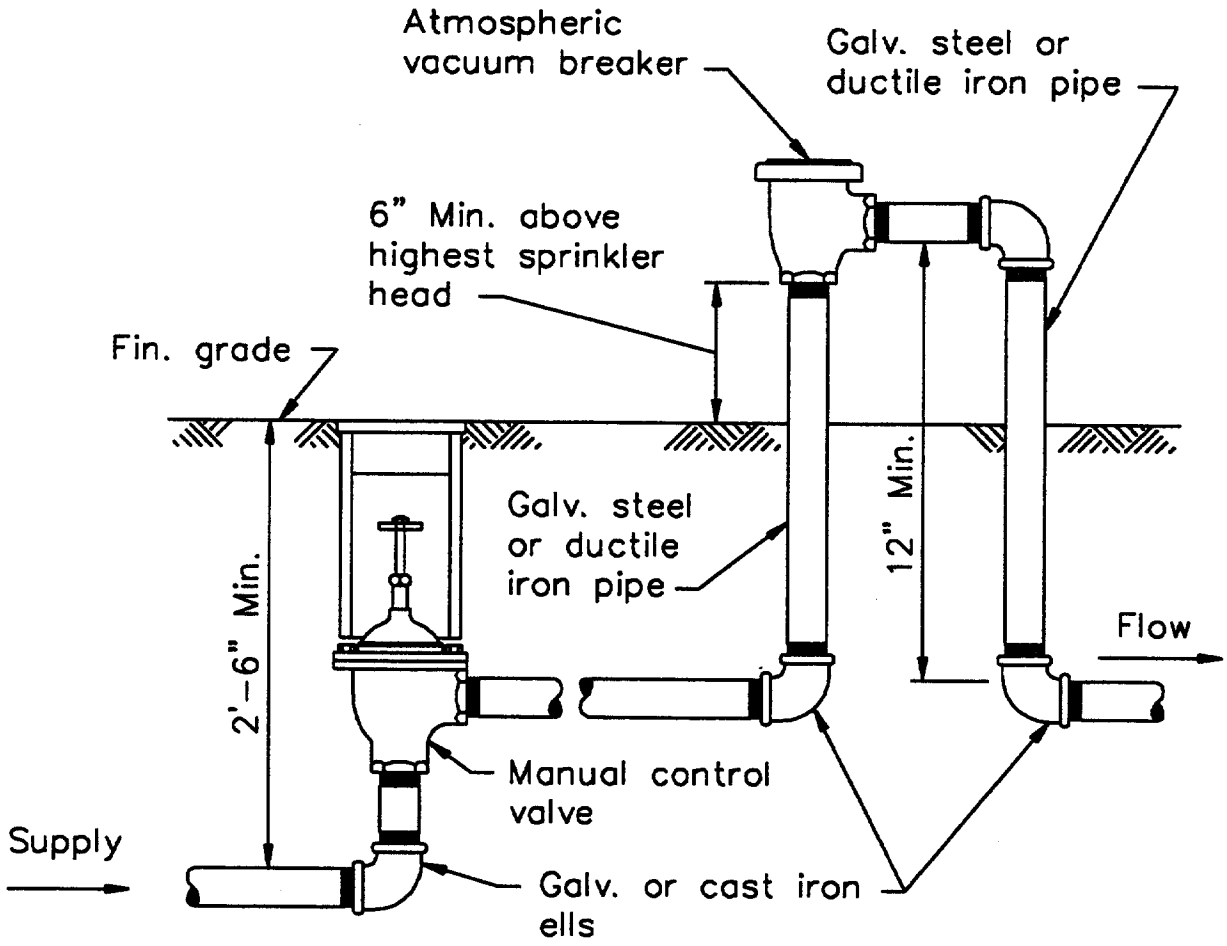
FOR LINE SIZES IN EXCESS OF 2" ø

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




# TYPICAL BACKFLOW PREVENTER ASSEMBLY DETAIL

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

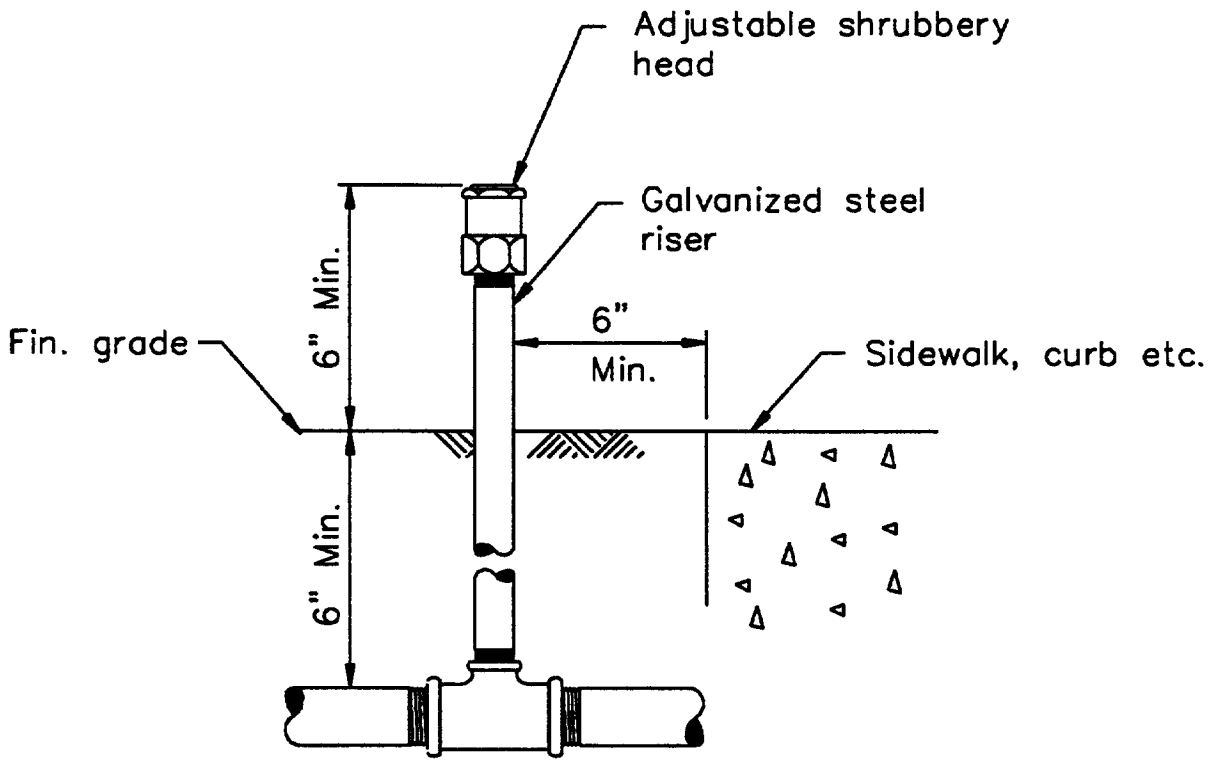



# ATMOSPHERIC VACUUM BREAKER

FOR LINES SIZES UP TO AND INCLUDING 2"ø

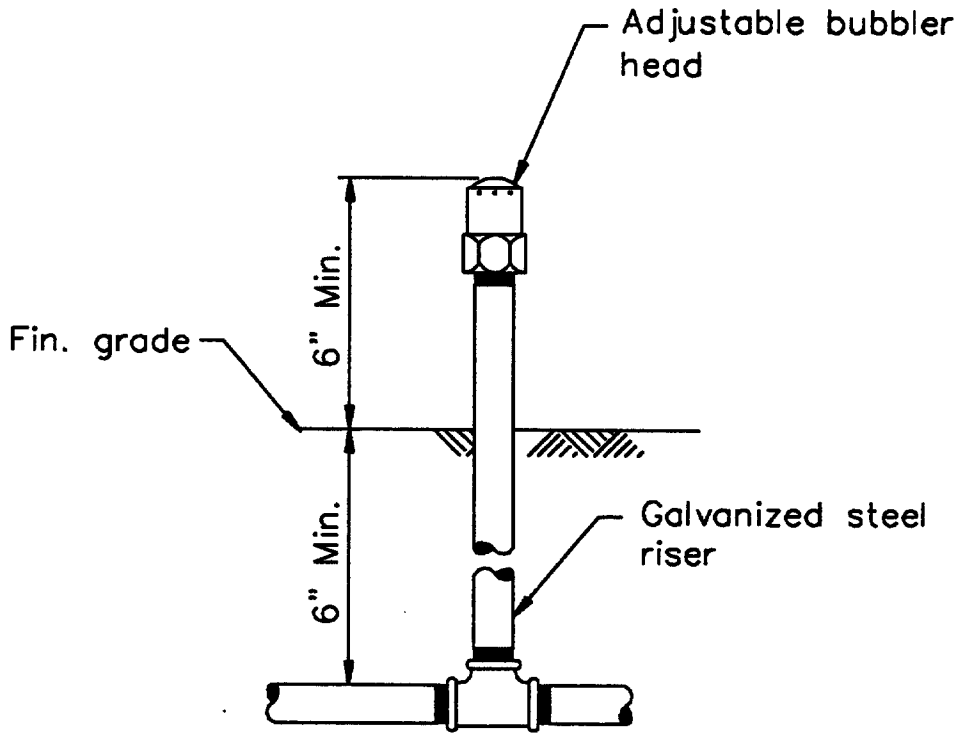
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>LAWN SPRINKLER SYSTEMS | DATE: JAN. 90 |
| LS-4 | |
| 58 | |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




## SHRUBBERY SPRAY HEAD

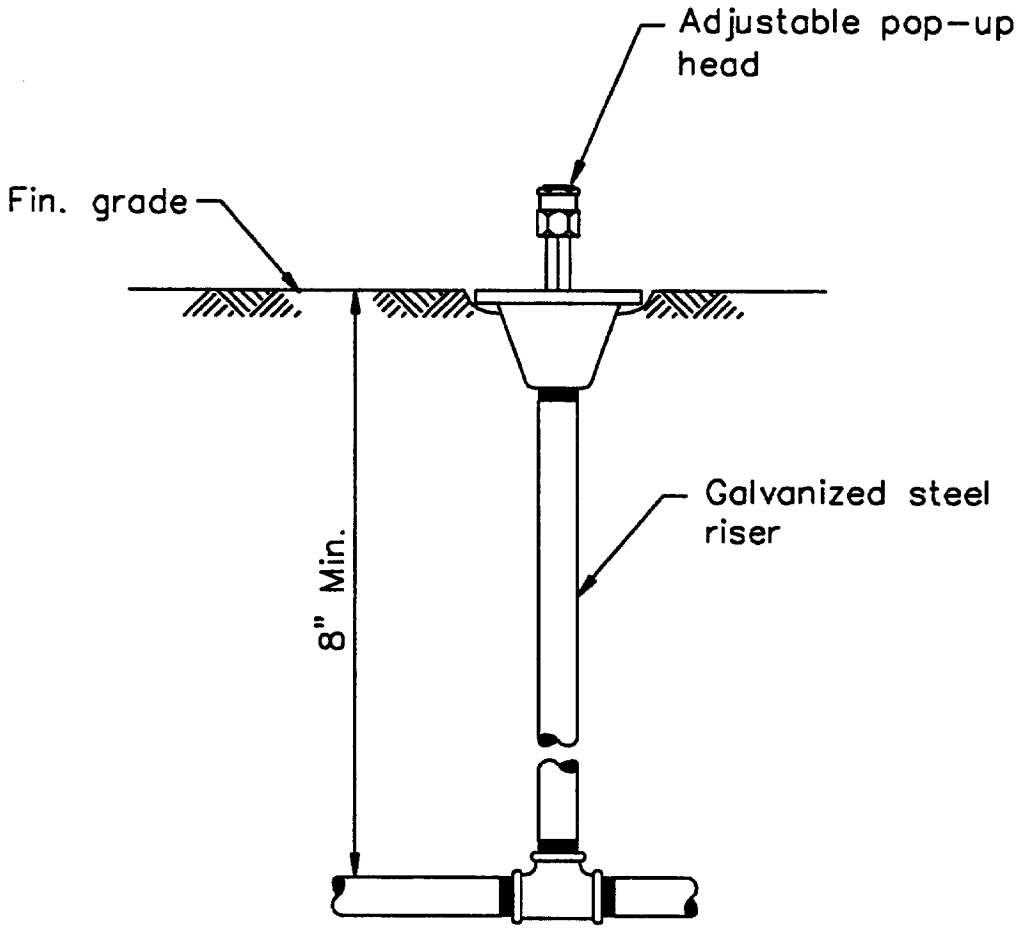
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




# BUBBLER IRRIGATION HEAD

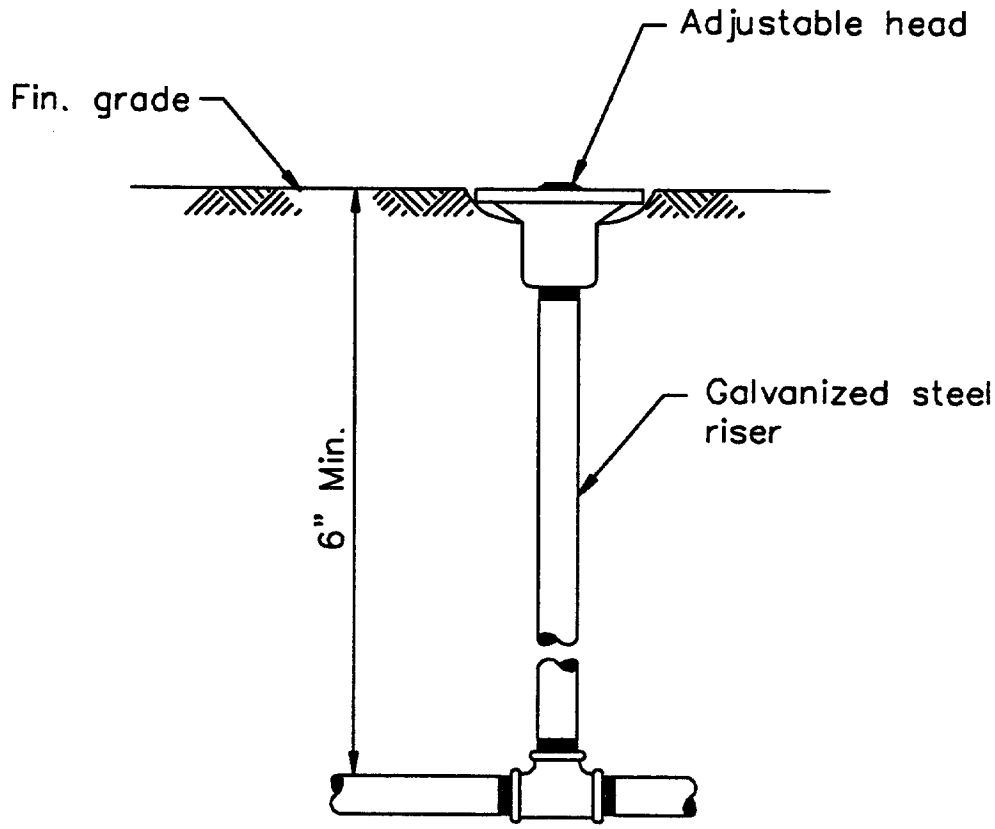
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>LAWN SPRINKLER SYSTEMS | DATE: JAN. 90 |
| LS-6 | |
| 60 | |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



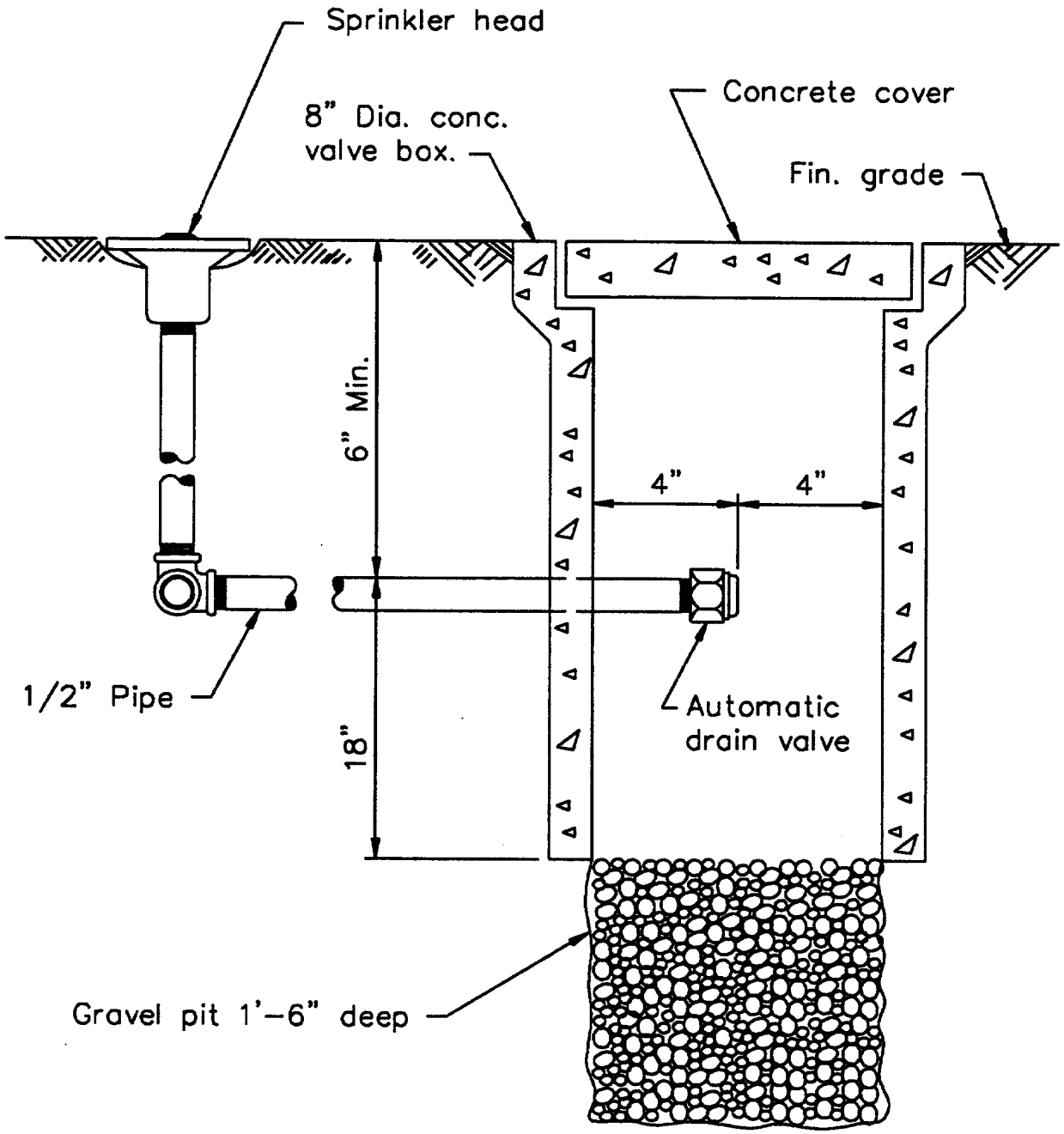

# FIXED HEAD POP-UP NOZZLE SPRINKLER

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



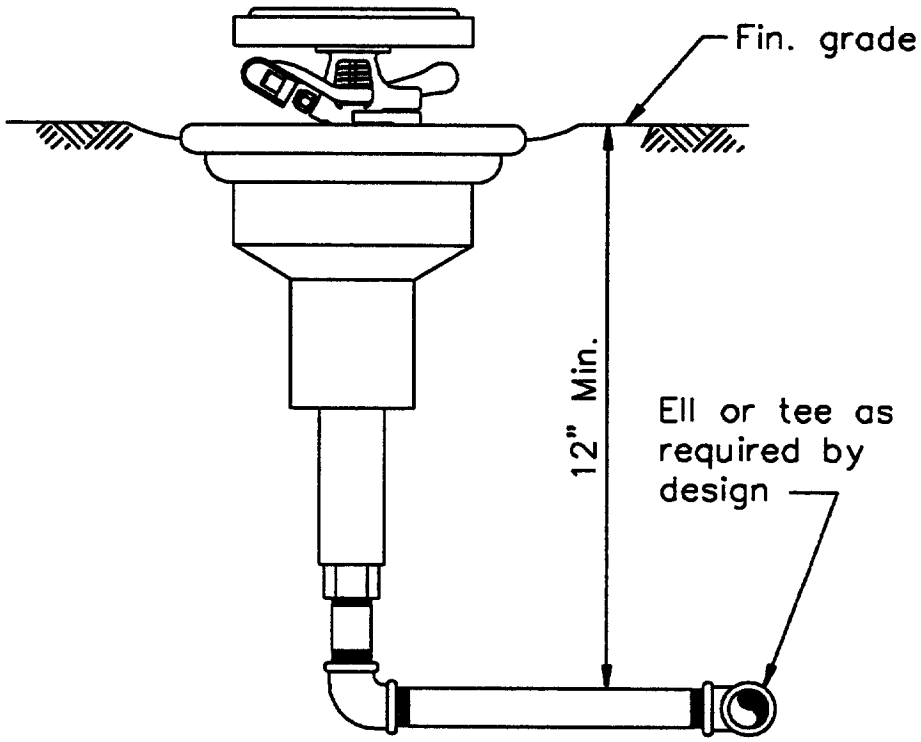

# FIXED HEAD STATIONARY SPRINKLER

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

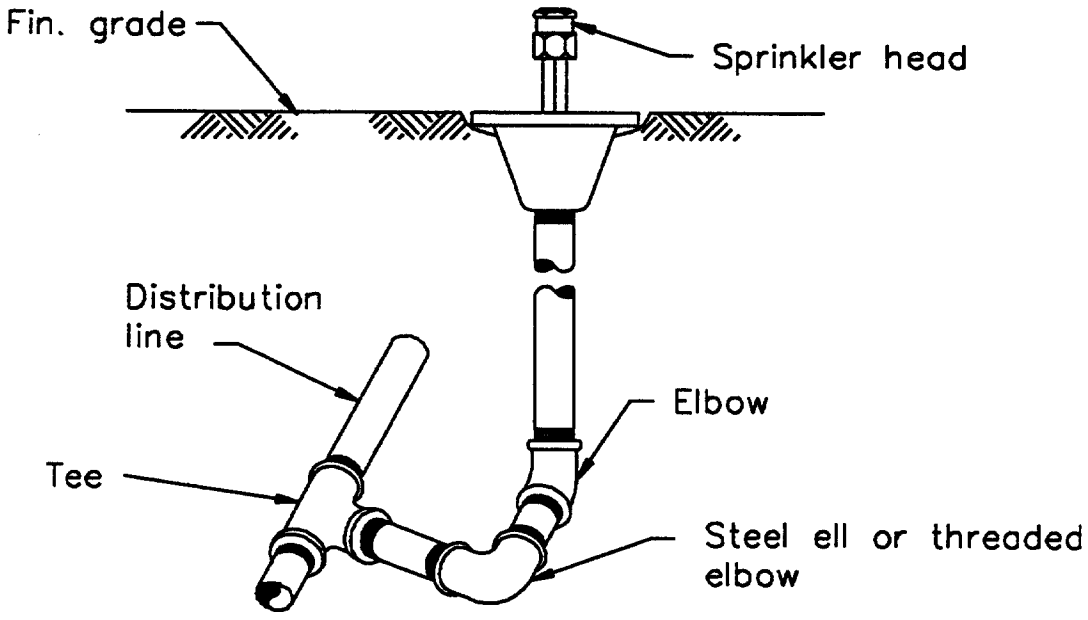



# AUTOMATIC DRAIN VALVE DETAIL FOR SPRINKLER LINES IN FREEZE-PRONE AREAS

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

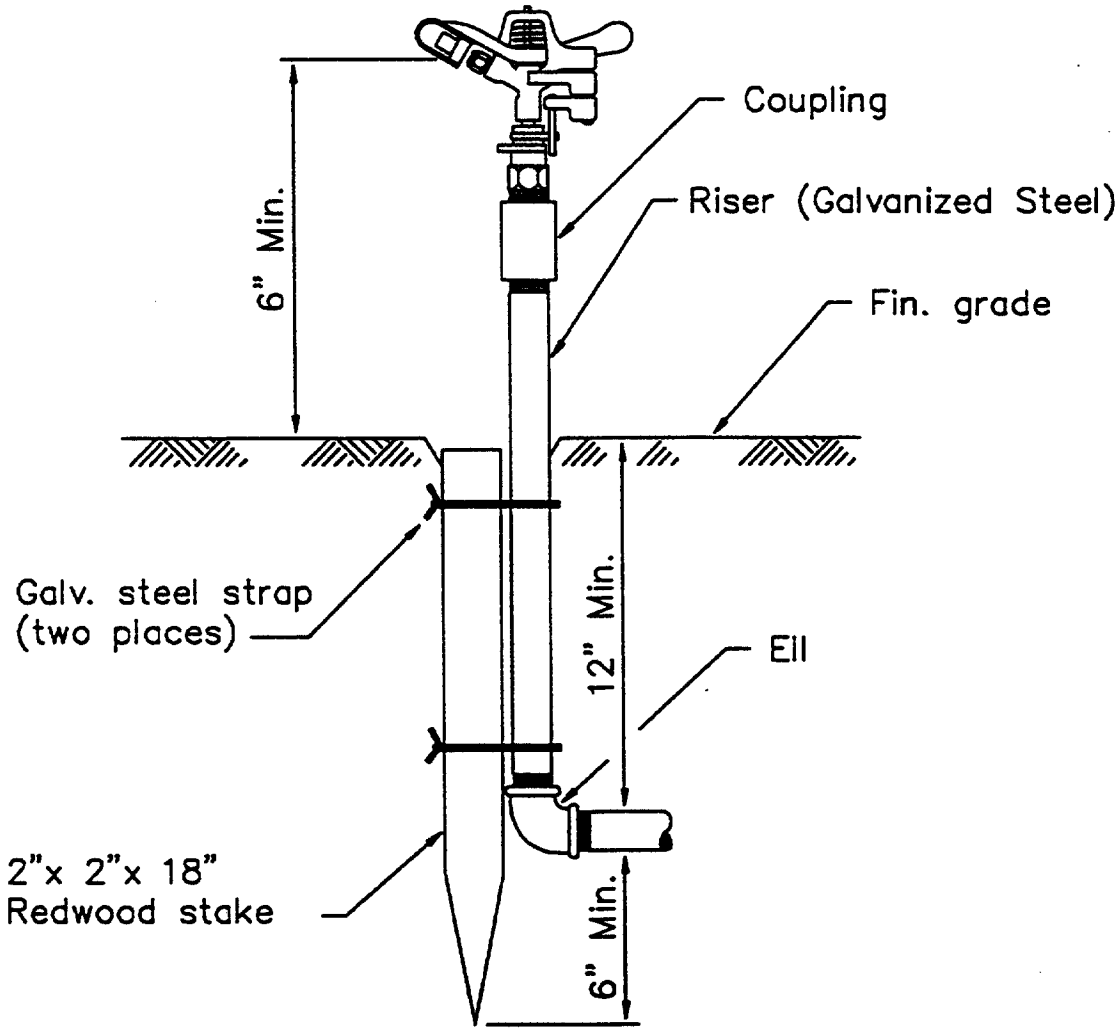



SINGLE NOZZLE ROTARY POP UP SPRINKLER




SWING JOINT DETAIL

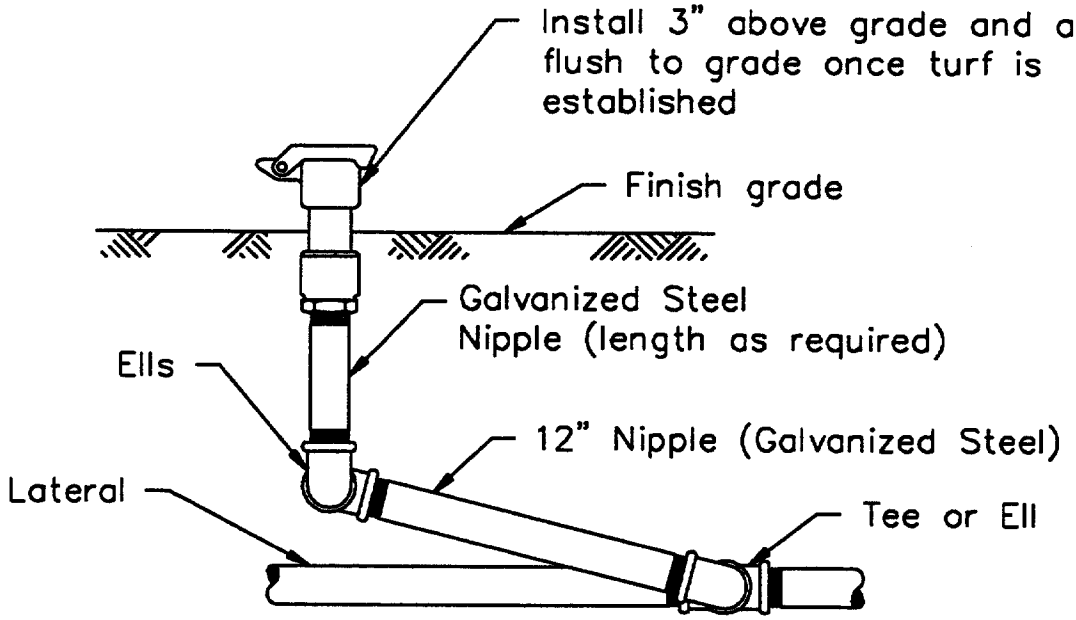
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



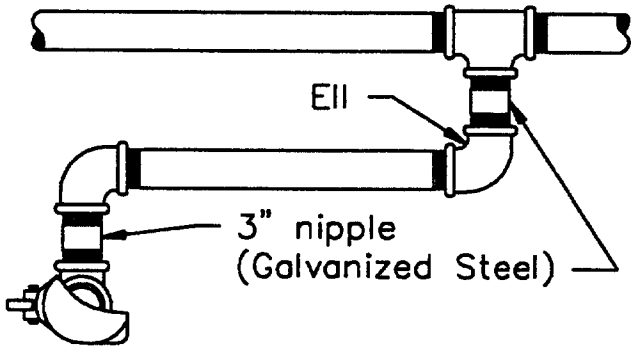

# ROTARY SPRINKLER

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUN. 92<br>LAWN SPRINKLER SYSTEMS | LS-11<br>65 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




SIDE VIEW

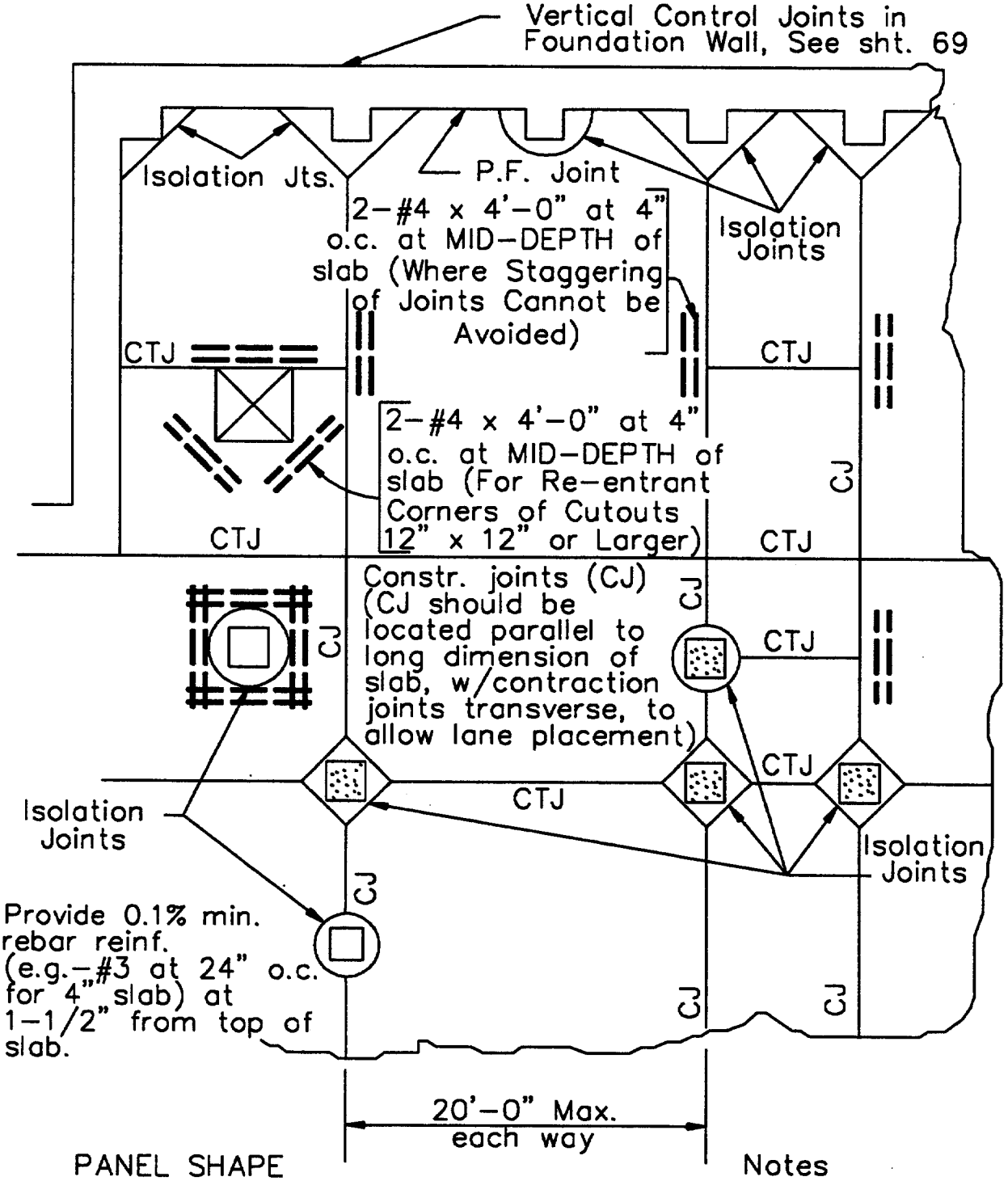



TOP VIEW

# QUICK COUPLING VALVE DETAIL

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

Note: For general notes & legend see sht. 75




PANEL SHAPE

$L/W \leq 2.0$ for $L \leq 10'$

$L/W \leq 1.5$ for $L \leq 20'$

Notes

CJ - Construction Joint

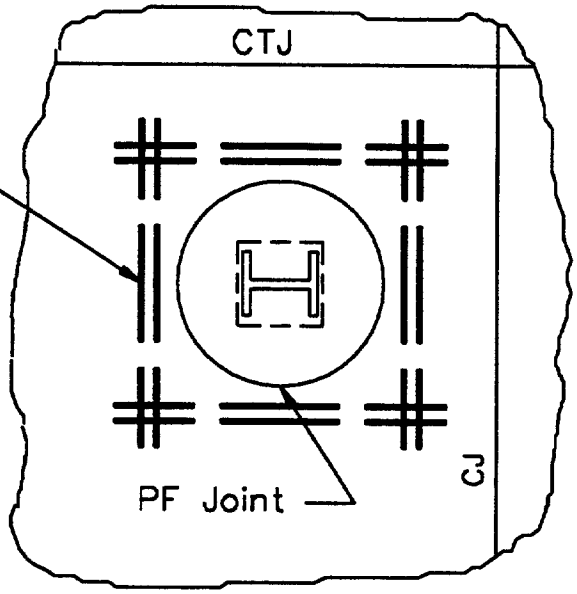
CTJ - Contraction Joint

# JOINT PATTERN DETAILS

## (NON-VEHICULAR)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB. 90<br>STANDARD NON-VEHICULAR SLAB ON GRADE & FOUNDATION DETAILS | F-1<br>67 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



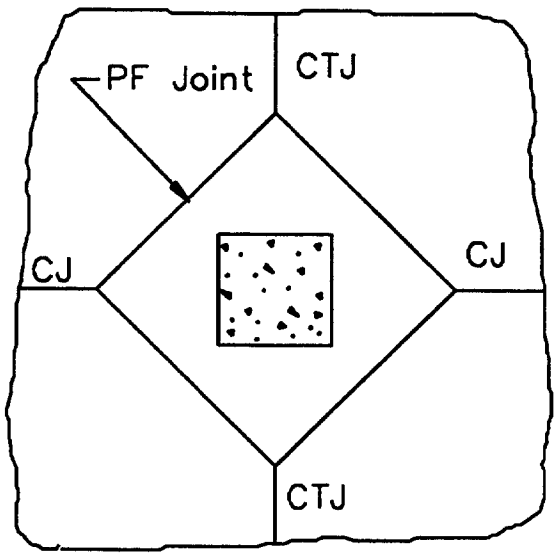

Note:

When possible move joints to intersect column rather than use this detail.

CIRCULAR SHAPED ISOLATION JOINT
NOT CENTERED ON SLAB-ON-GRADE JOINT

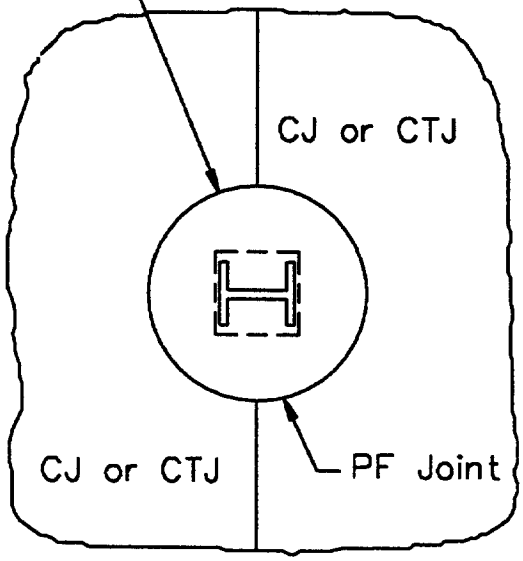
Note:

When joints do not align precisely, the joints can be angled from their point of origin, or the collar slab can be distorted, to insure intersection of joints and corners of diamonds.




DIAMOND SHAPED

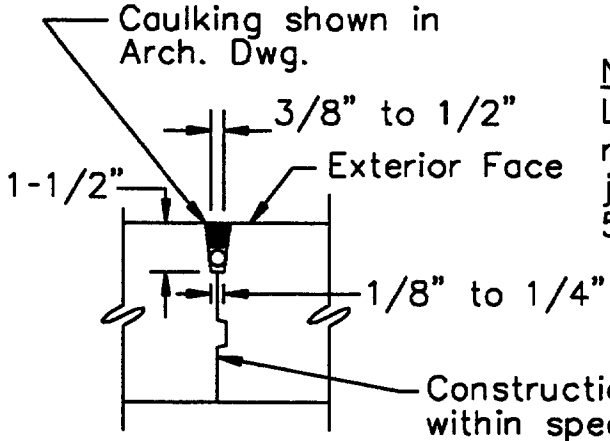
Use circular shaped joint when column does not fall at intersection of slab joints.




CIRCULAR SHAPED

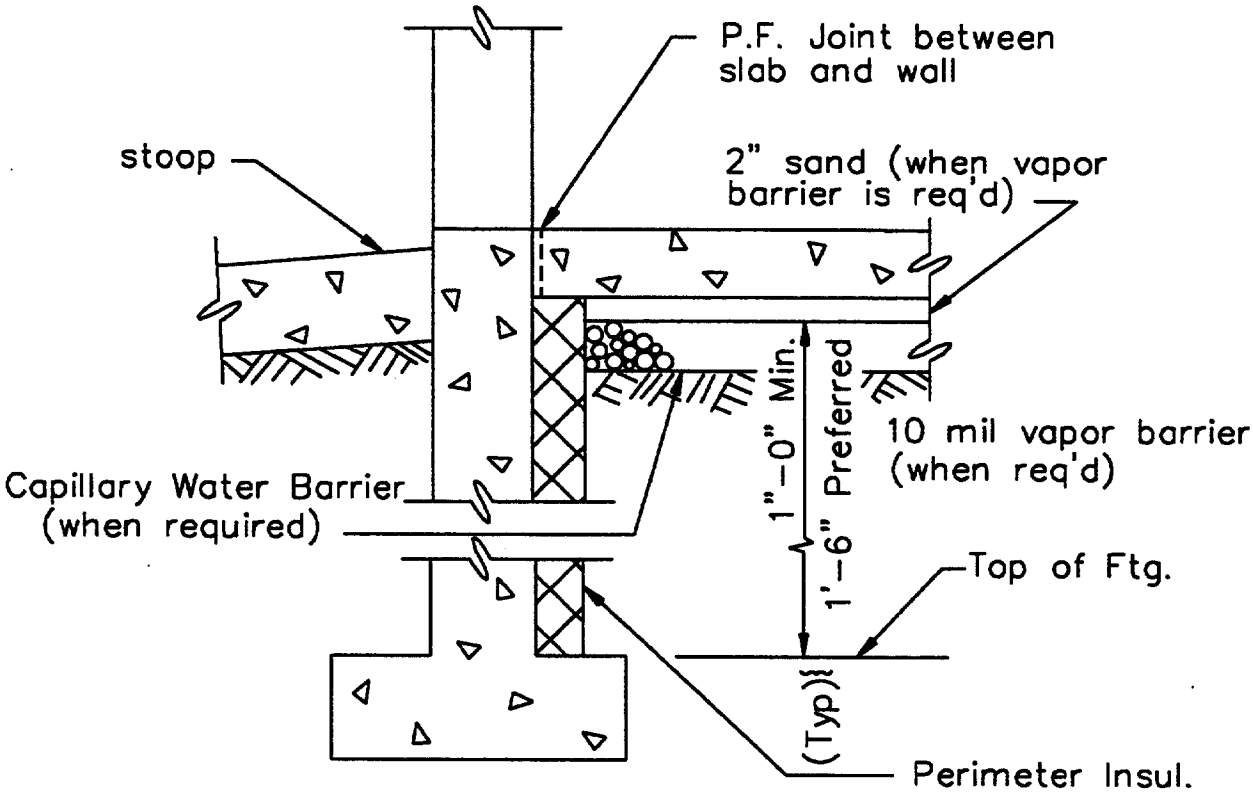
# ISOLATION JOINT DETAILS

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




Note:
Locate joints as continuations of masonry and concrete wall control joints. (See TM5-809-2,Para. 5, 6, & 7, for Design information)

## VERTICAL CONTROL JOINT IN FOUNDATION WALL

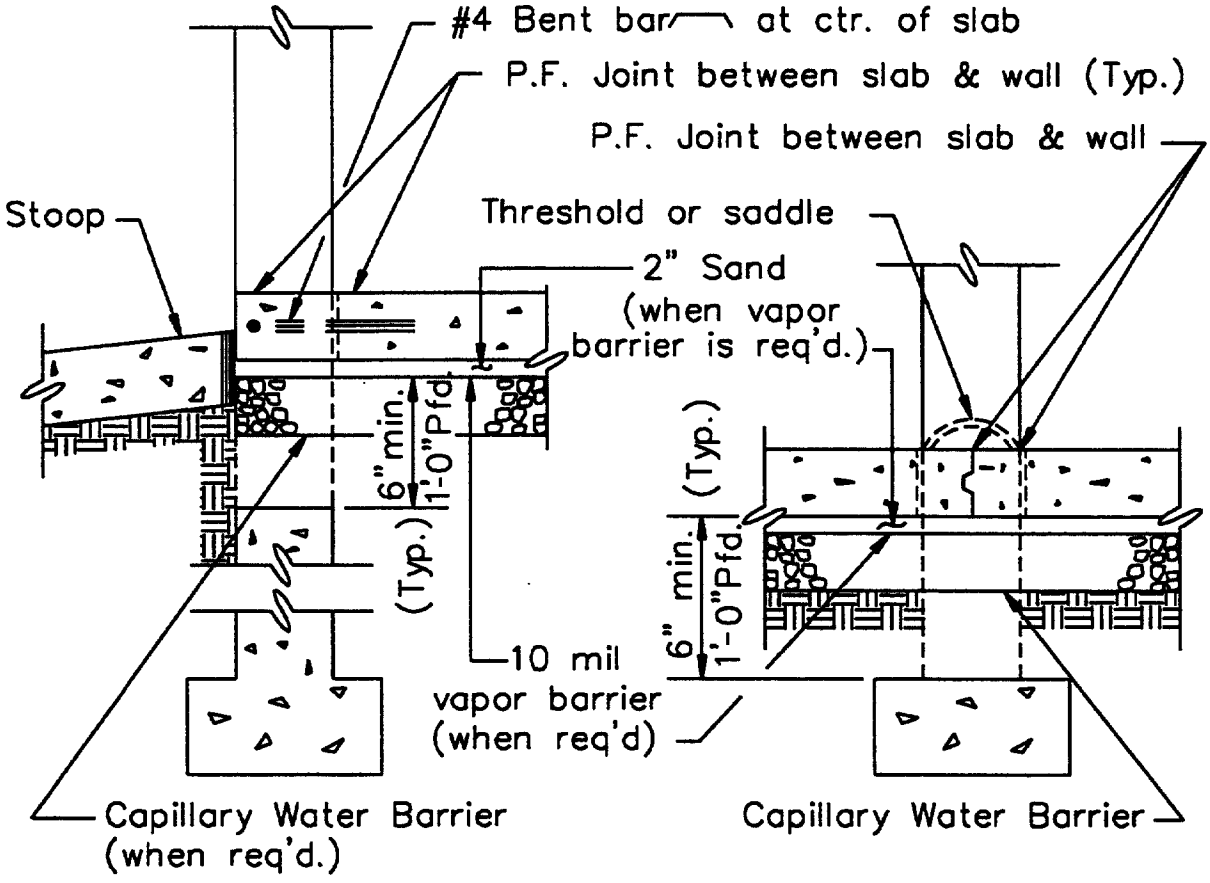



Note: For general notes and legend see sht. 75

## EXTERIOR WALL THROUGH DOORWAY (FROST AREA)

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

Note: For general notes and legend see Sht. 75.




## EXTERIOR WALL THROUGH DOORWAY

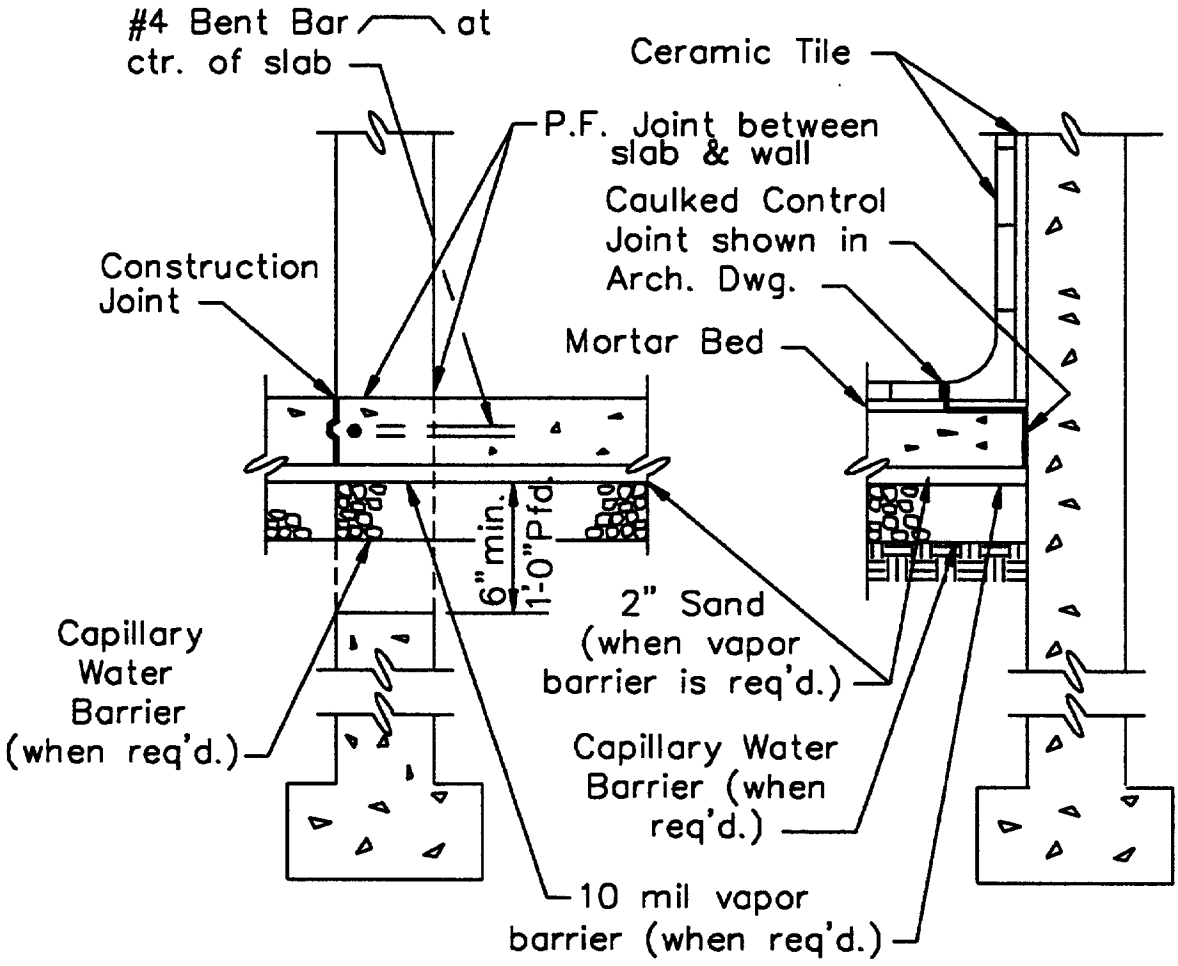
(NON-FROST AREA)

## INTERIOR WALL THROUGH DOORWAY

(WITH THRESHOLD OR SADDLE)

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

Note: For general notes and legend see sht. 75

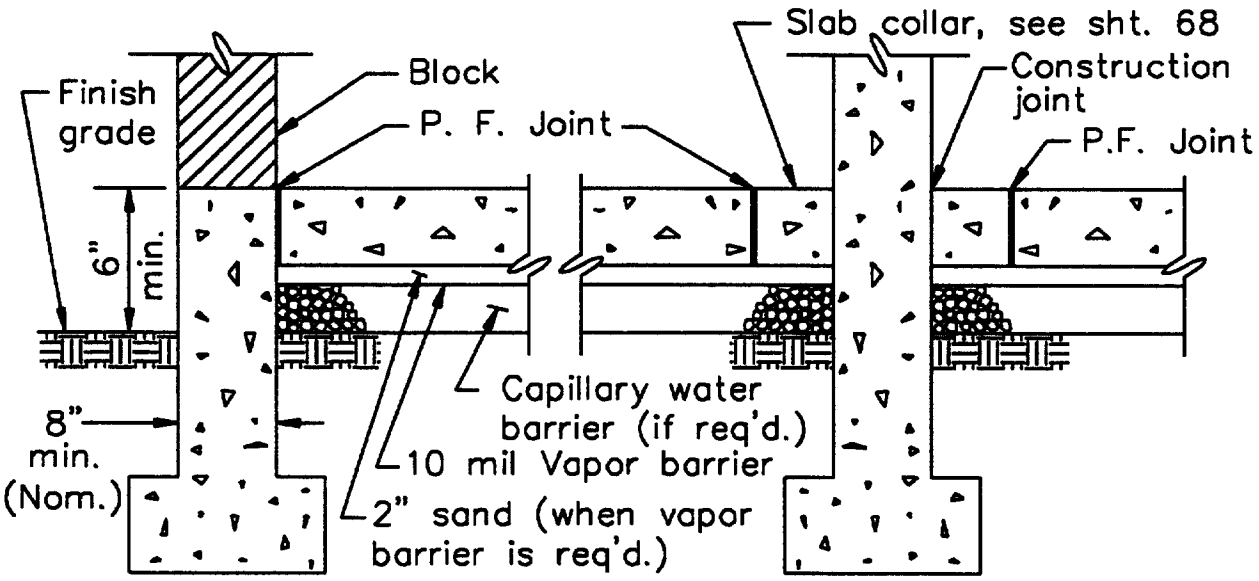



## INTERIOR WALL THROUGH DOORWAY

(WITHOUT THRESHOLD OR SADDLE)

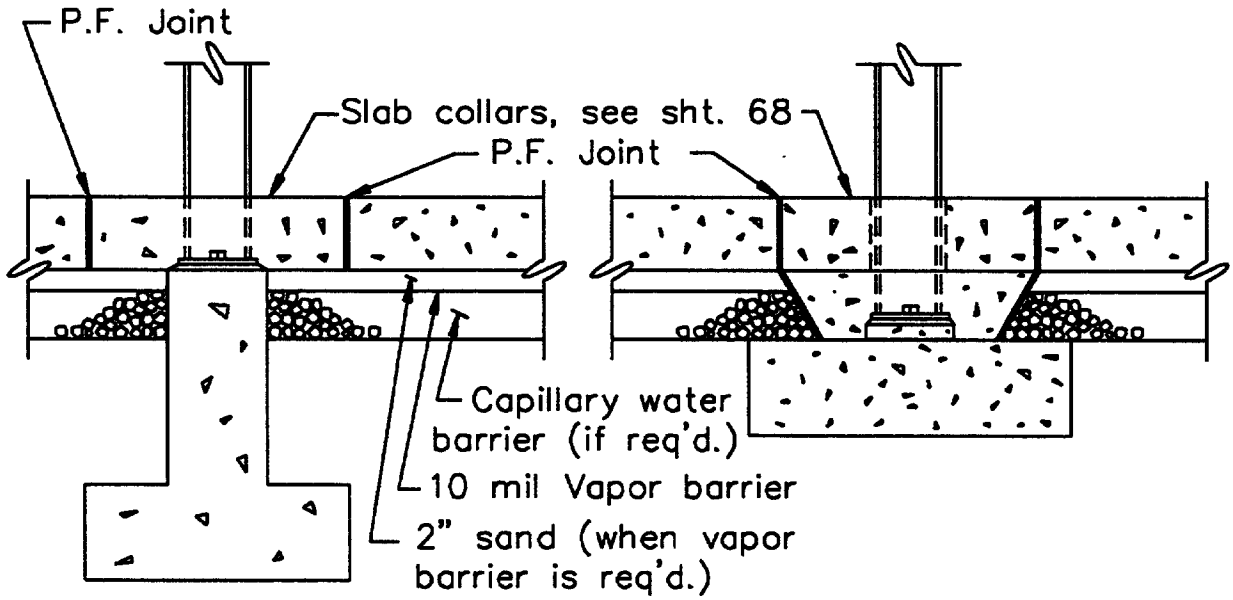
## WALL AT TILE FLOOR

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




EXTERIOR WALL

CONCRETE COLUMN



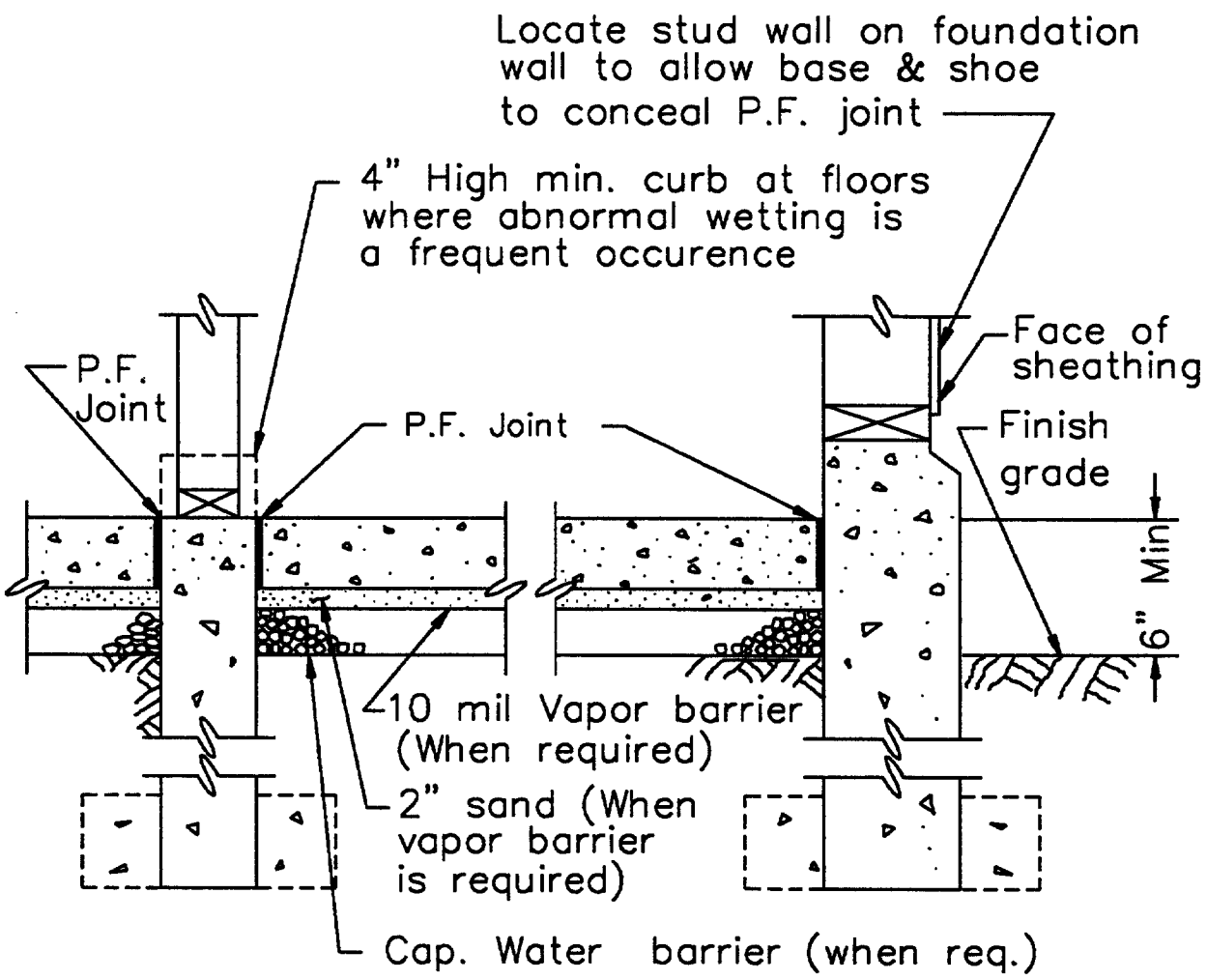

STEEL COLUMNS

Note: For general notes and legend see sht. 75

# TYPICAL LOAD BEARING WALLS & COLUMNS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB. 90<br>STANDARD NON-VEHICULAR SLAB ON GRADE & FOUNDATION DETAILS | F-6<br>72 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

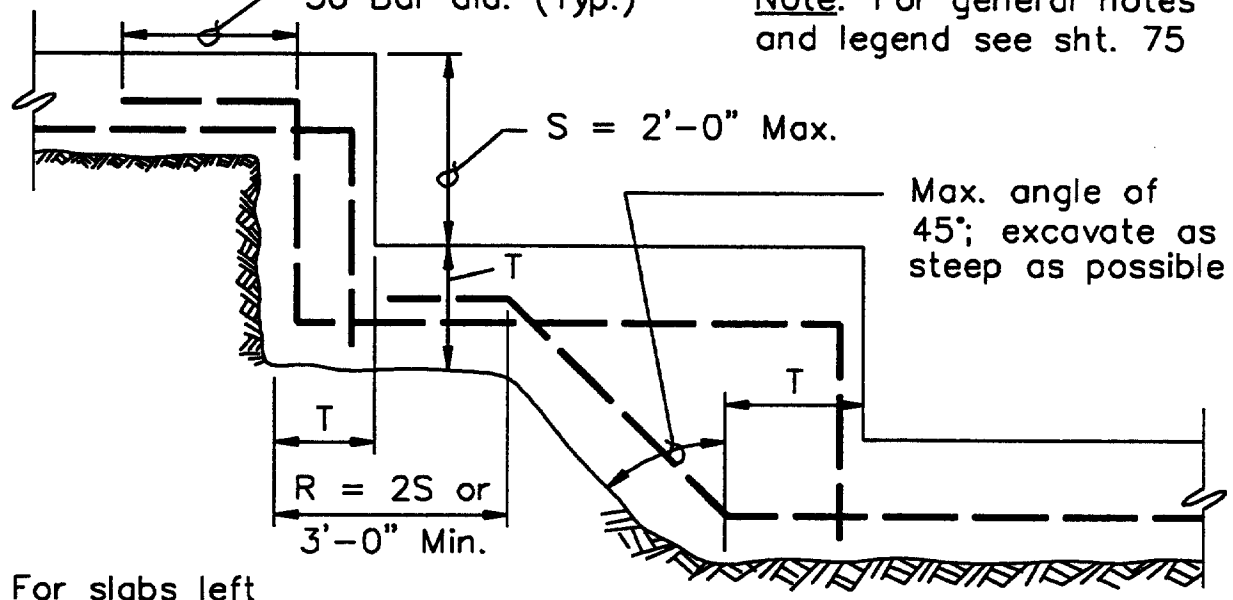



Note: For general notes and legend see sht. 75

# TYPICAL LOAD BEARING WALLS & COLUMNS

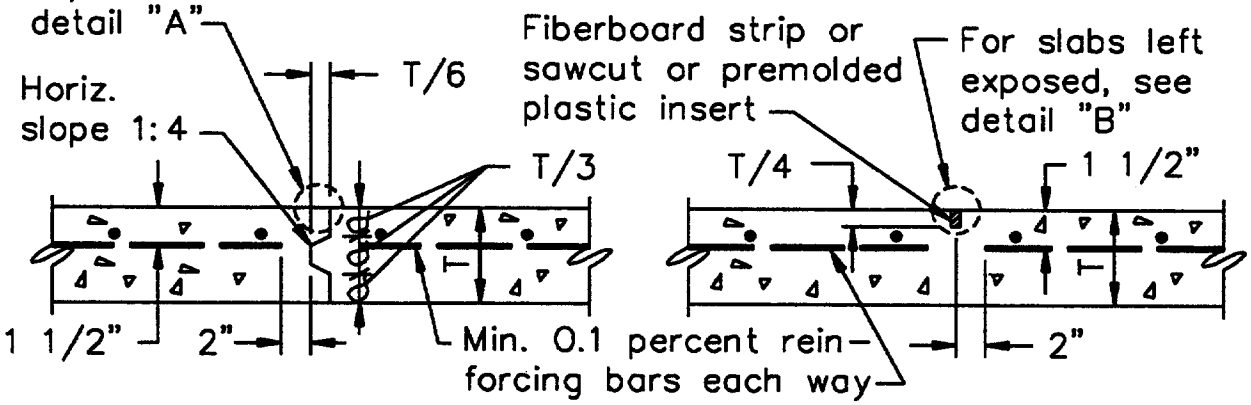
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB. 90<br>STANDARD NON-VEHICULAR SLAB ON GRADE & FOUNDATION DETAILS | F-7<br>73 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

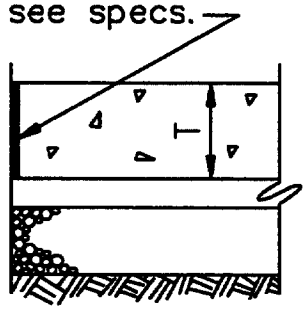



Note: For general notes and legend see sht. 75

STEPPED FOOTING

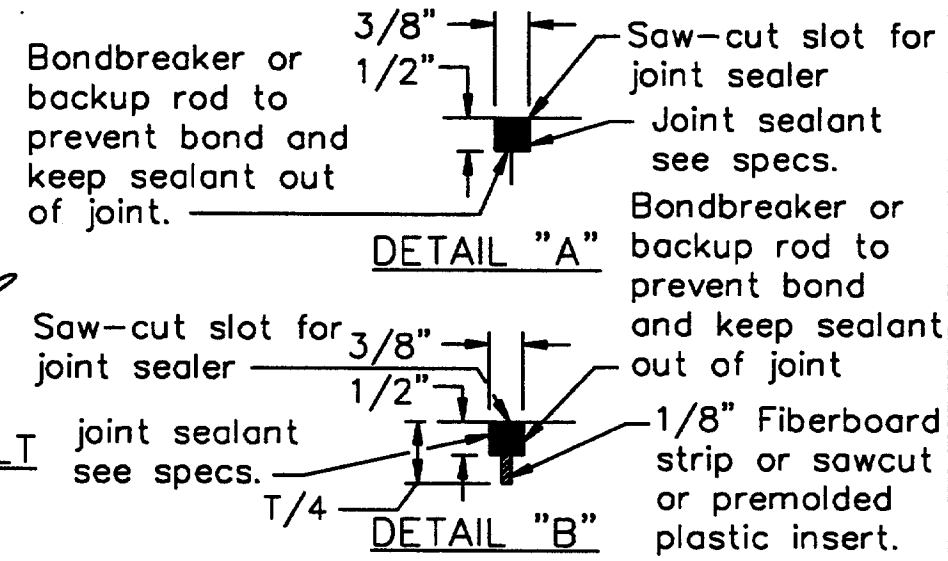



CJ—CONSTRUCTION JOINT




PERIMETER FELT JOINT

CTJ—CONTRACTION JOINT




# STEPPED FOOTING AND JOINTS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 91<br>STANDARD NON-VEHICULAR SLAB ON GRADE & FOUNDATION DETAILS | F-8<br>74 |

# GENERAL NOTES

1. The details apply to interior slabs on grade as prescribed in TM 5-809-2 which will not be subjected to vehicular loads.

2. It is the intent of these standards to provide slabs on grade which are devoid of shrinkage cracks and independent from settlement of the abutting structure. Slabs shall not be tied to walls or footings. Subgrade ties or other means shall be used to transfer lateral loads where required.

3. When capillary water barrier under slab on grade is required, the contract drawings shall show the capillary water barrier on all cross-sections. If capillary water barrier is required only in separate or isolated areas of slabs on grade, the contract plans shall clearly show on cross-sections and/or plan views where capillary water barrier is required. The above instruction also applies to the select fill, vapor barrier and perimeter insulation.

4. Use 3/8" premolded expansion joint filler as follows:

   a. At the perimeter of slabs where the slab will expand due to radiant heating systems.

   b. At the perimeter of slabs where the slab will be subject to extreme temperature changes.

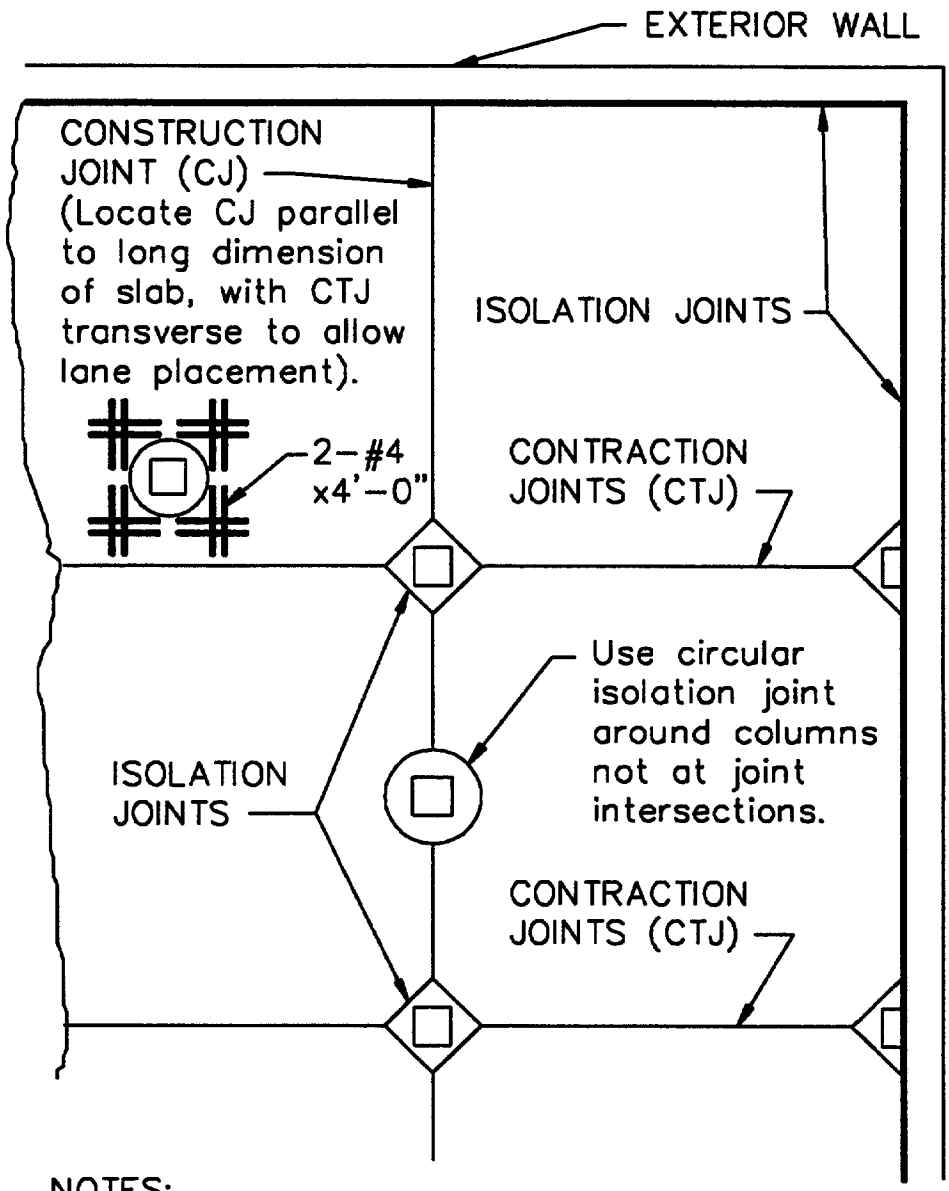
   c. Where structural slabs require isolation from vibrations transmitted through machinery and equipment foundations.

5. Provide construction joints in long direction of slab to allow for lane placement. Contraction joints shall be perpendicular to the construction joints.

## LEGEND

| | |
|---|---|
| P.F. JOINT | Perimeter felt joint |
| T. | Thickness |
| S. | Vertical step height |
| R. | Horizontal run length |
| CTR. | Center |
| PFD. | Preferred |
| CJ | Construction joint |
| CTJ | Contraction joint |
| EJ | Expansion joint |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



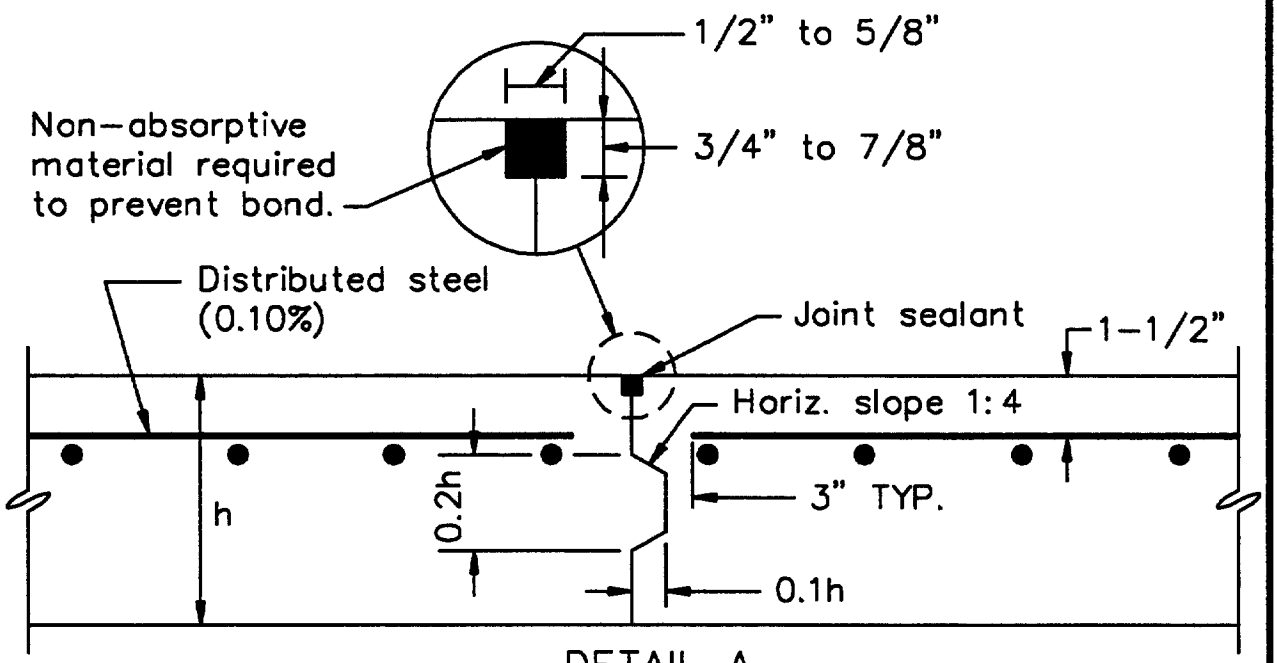

NOTES:

See TM 5-809-12/AFM 88-3, Chap. 15 for joint spacing. Provide 2-#4x4'-0" bars at reentrant corners or discontinued joints.
Use doweled construction joints only for slabs less than 8-inches thick. Use keyed construction joints for most work.
Slab shall contain min. of 0.10 percent reinforcing (e.g.-#3 bars at 12-inches o.c. for an 8-inch slab).

# JOINT PATTERN DETAILS
## (VEHICULAR)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB. 90<br>INTERIOR VEHICULAR SLABS-ON-GRADE | F-10<br>75A |

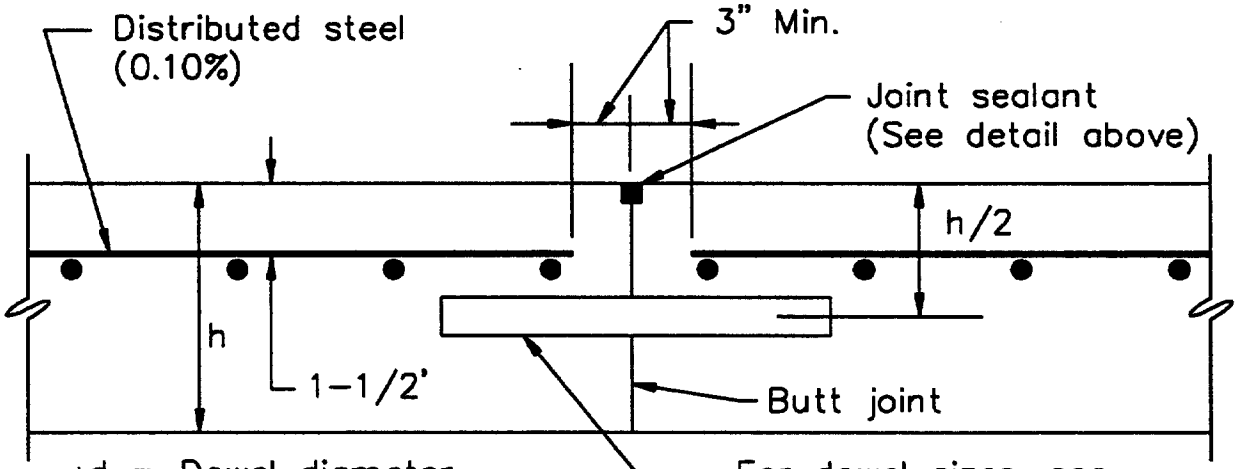
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




DETAIL A

Keyed

(Used only for floor slabs greater than 8" in thickness)




*d = Dowel diameter

For dowel sizes, see TM5-809-12/AFM 88-3 Chap. 15. Paint and oil one end.

Note: Use only bar reinforcement (typ.).

DETAIL B

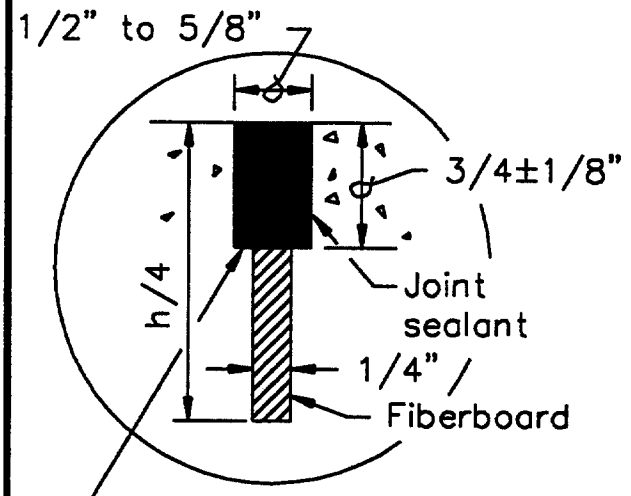
Doweled

(Use only for floor slabs 8" thick or less for thin slabs in concentrated traffic areas.)

# CONSTRUCTION JOINTS

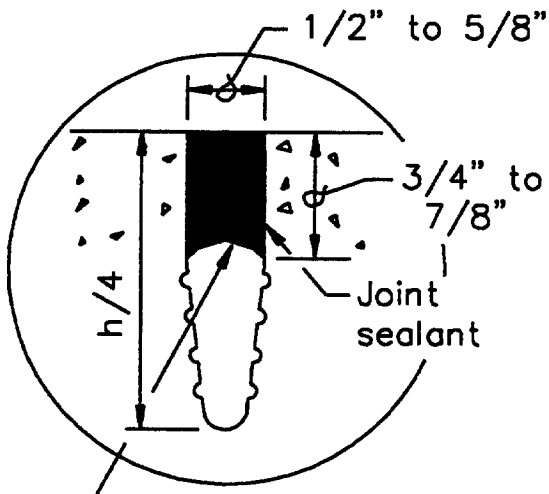
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 91<br>INTERIOR VEHICULAR SLABS-ON-GRADE | F-11<br>75B |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



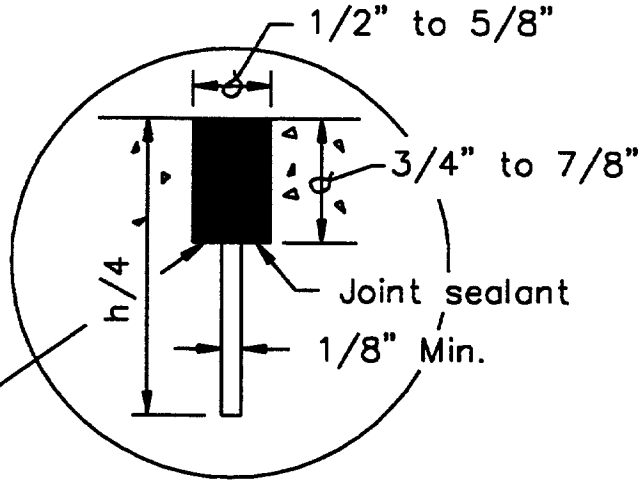

FIBERBOARD FILLER

Non-absorptive separation material required between joint sealant and underlying filler material.



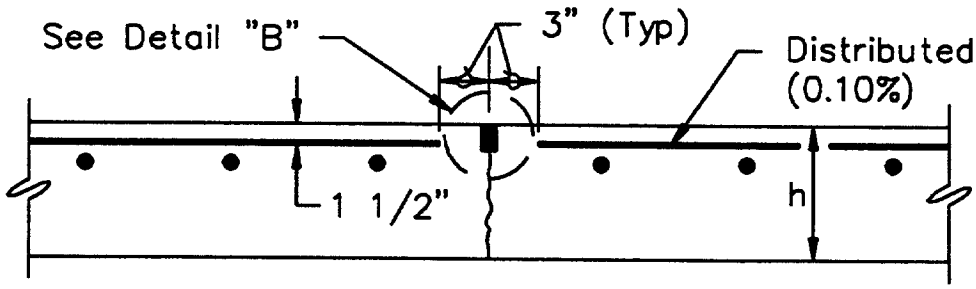

PREFORMED PLASTIC INSERT

Non-absorptive material required to prevent joint sealant from flowing into sawcut and to prevent bond.




SAWED

DETAIL "B"

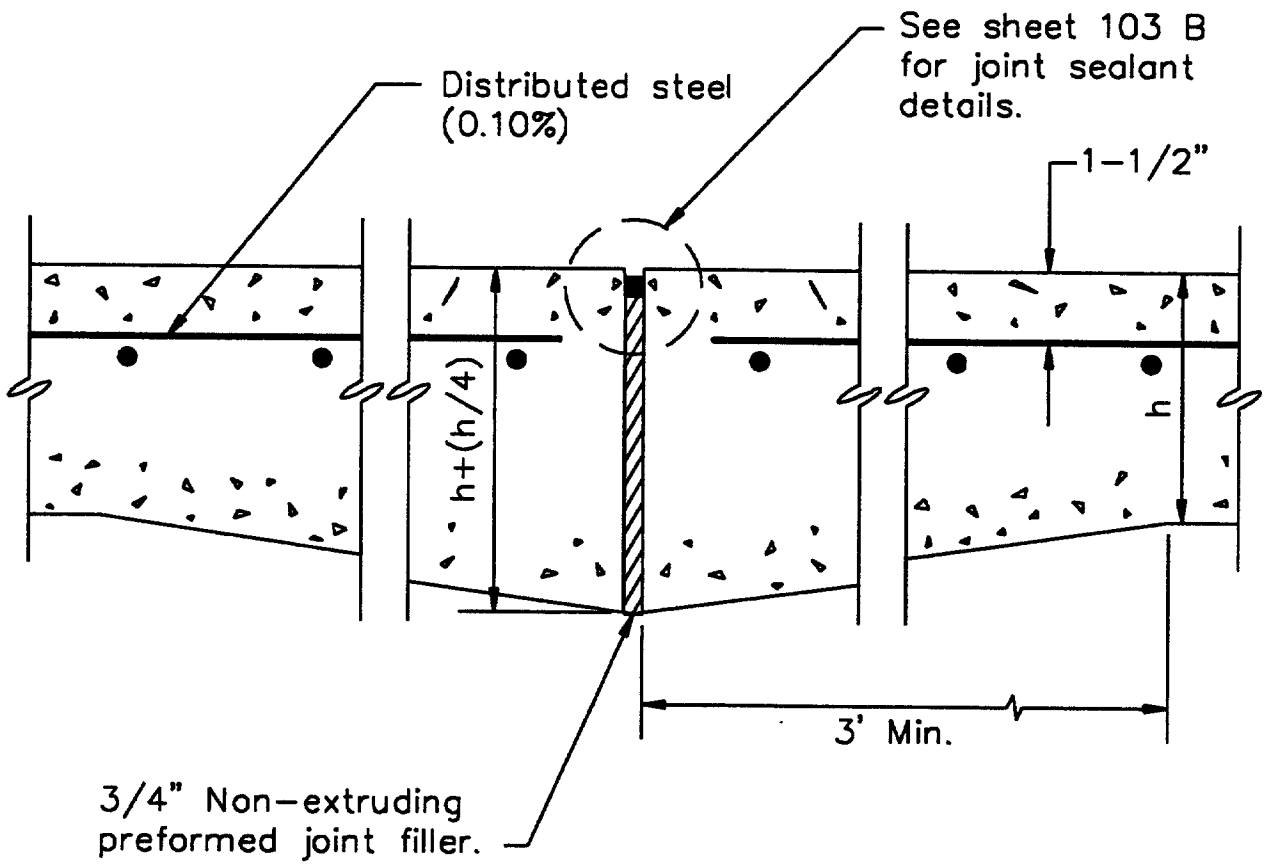



DETAIL "A"

# CONTRACTION JOINTS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAR. 90<br>INTERIOR VEHICULAR SLABS-ON-GRADE | F-12<br>75C |

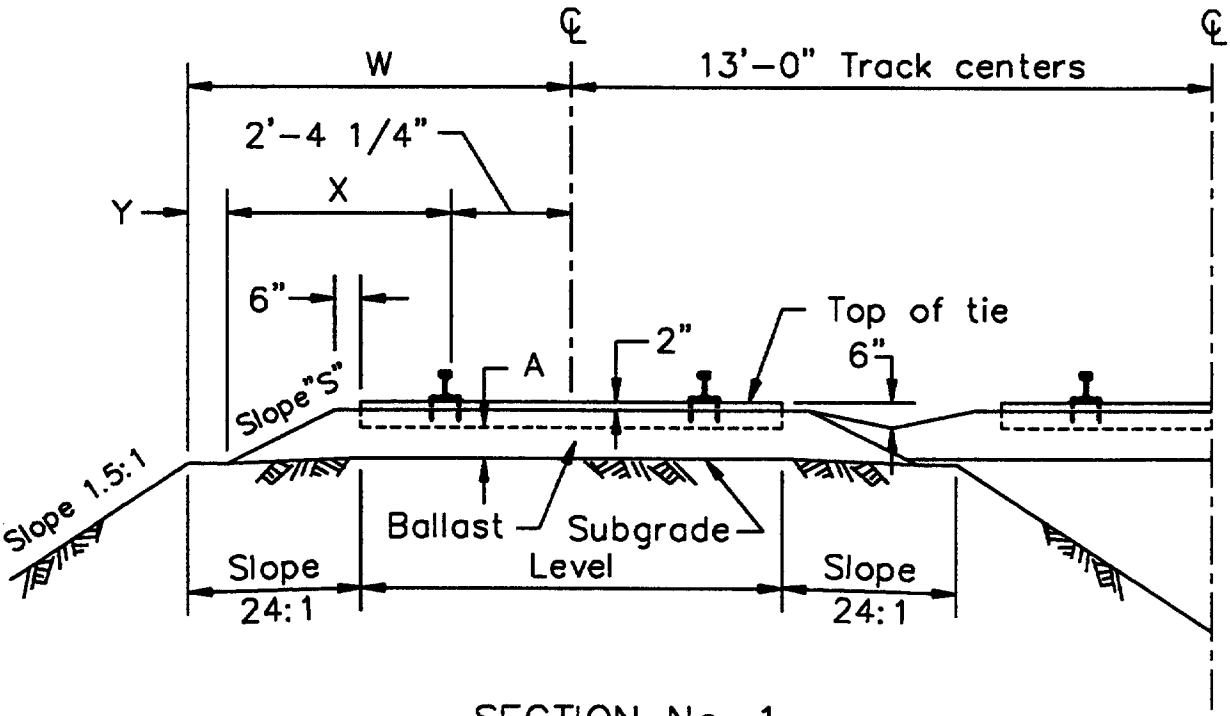
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




# EXPANSION JOINT (EJ)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAR. 90<br>INTERIOR VEHICULAR SLABS-ON-GRADE | F-13<br>75D |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




## SECTION No. 1

PREPARED MATERIALS: stone, slag, and gravel having over 20% crushed particles.

## SECTION No. 2

MATERIALS: Prepared gravel, 0 to 20% crushed particles and pit run gravel.

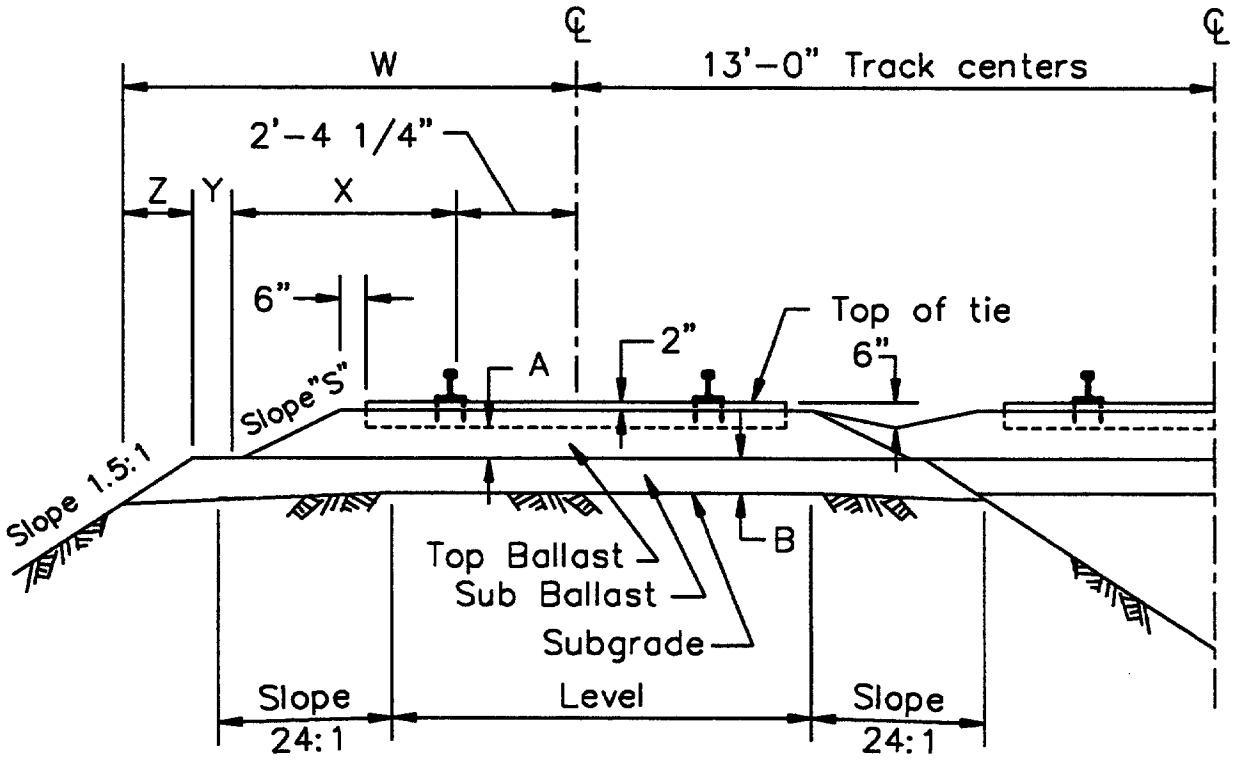
NOTE:

SLOPE "S" is 2:1 in sections 1 and 3
SLOPE "S" is 2.5:1 in sections 2 and 4
SLOPE "S" is 2:1 in sections 5–A, 6–A, 7–A, 8, 8–A.
SLOPE "S" is 2.5:1 in sections 5–B, 6–B, 7–B, 8–B.

# TANGENT TRACK SECTION

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUNE 90<br>TYPICAL RAILROAD ROADBED CONSTRUCTION | R–1<br>76 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




## SECTION No. 3

PREPARED MATERIALS: stone, slag, and gravel having over 20% crushed particles.

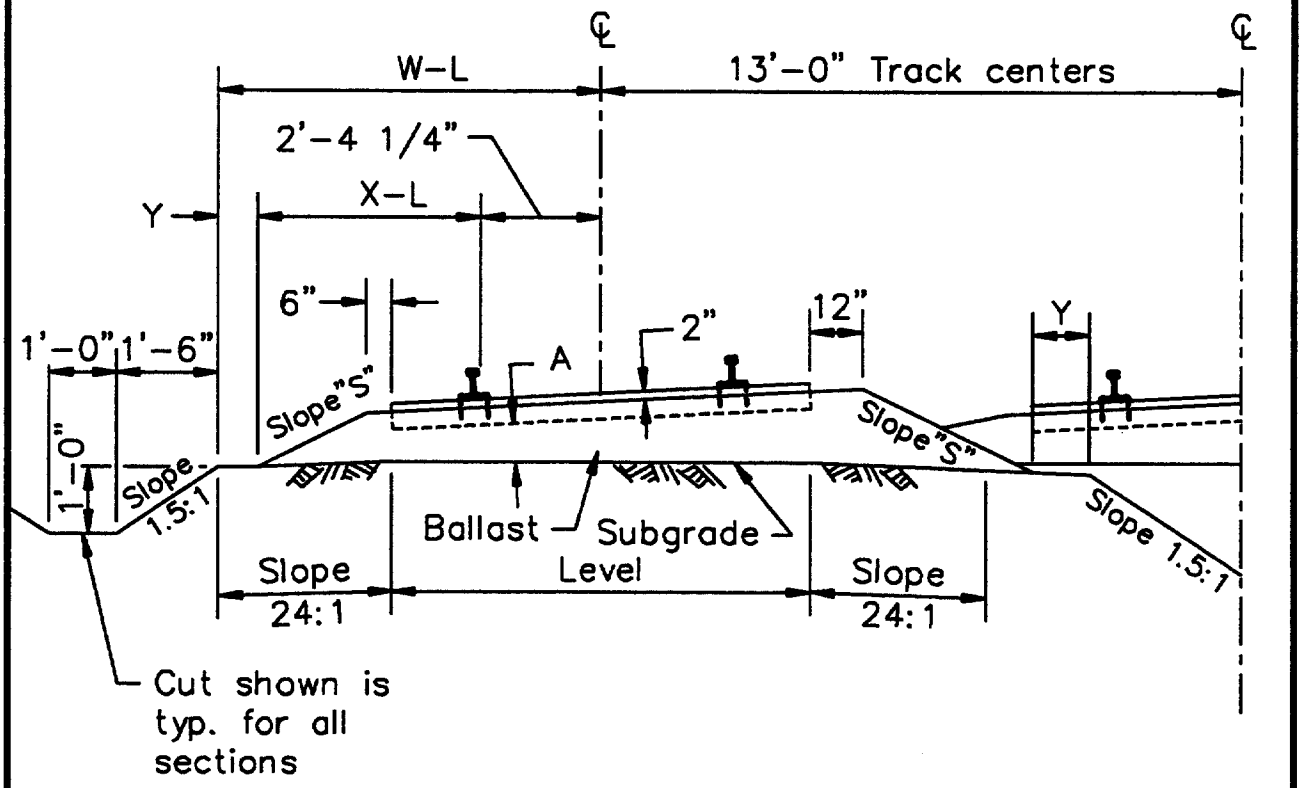
## SECTION No. 4

MATERIALS: Prepared gravel, 0 to 20% crushed particles and pit run gravel.

# TANGENT TRACK SECTION WITH SUB-BALLAST

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUNE 90<br>TYPICAL RAILROAD ROADBED CONSTRUCTION | R-2<br>77 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




## SECTION No. 5 SUPERELEVATIONS UP TO 3"

5-A

PREPARED MATERIALS: stone, slag, and gravel having over 20% crushed particles.

5-B

MATERIALS: Prepared gravel, 0 to 20% crushed particles and pit run gravel.

## SECTION No. 6 SUPERELEVATIONS OVER 3"

6-A

PREPARED MATERIALS: stone, slag, and gravel having over 20% crushed particles.

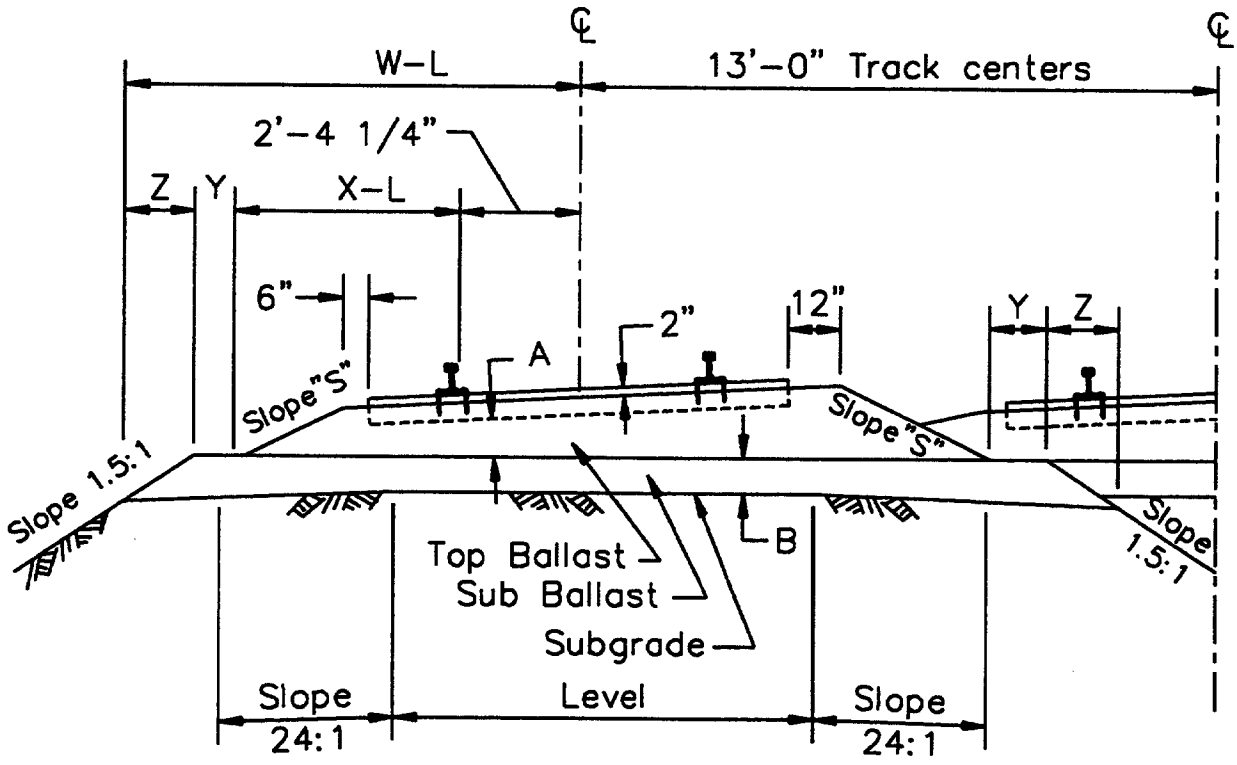
6-B

MATERIALS: Prepared gravel, 0 to 20% crushed particles and pit run gravel.

# CURVED TRACK SECTION

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUNE 90<br>TYPICAL RAILROAD ROADBED CONSTRUCTION | R-3<br>78 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




## SECTION No. 7 SUPERELEVATIONS UP TO 3"

7-A

PREPARED MATERIALS: stone, slag, and gravel having over 20% crushed particles.

7-B

MATERIALS: Prepared gravel, 0 to 20% crushed particles and pit run gravel.

## SECTION No. 8 SUPERELEVATIONS OVER 3"

8-A

PREPARED MATERIALS: stone, slag, and gravel having over 20% crushed particles.

8-B

MATERIALS: Prepared gravel, 0 to 20% crushed particles and pit run gravel.

# CURVED TRACK SECTION WITH SUB-BALLAST

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUNE 90<br>TYPICAL RAILROAD ROADBED CONSTRUCTION | R-4<br>79 |

# GENERAL NOTES

Dinensions shown in tables are minimum dimensions for ideal conditions and light traffic. These tables are for information and guidance and dimensions shown may be increased where conditions warrant.

Dimensions in tables are based on 8'–6" length ties.

Sub–ballast is only recommended in wet spongy places or where the subgrade is of a material difficult to drain, and on new work where embankments are settling and in locations where track heaves from frost.

These sheets are based on the use of prepared ballast. Sand and cinder ballast may be used at locations where their use has been proven, and minor modification may be made in design to comform to local practice for the use of these materials.

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

## SECTION No. 1 TABLE OF VARIABLES

| W | A | X | Y |
|---|---|---|---|
| 9'-0" | 10" | 5'-2" | 1'-6" |
| | 8" | 4'-10" | 1'-10" |

## SECTION No. 2 TABLE OF VARIABLES

| W | A | X | Y |
|---|---|---|---|
| 9'-0" | 10" | 5'-11" | 0'-9" |
| | 8" | 5'-6" | 1'-2" |

## SECTION No. 3 TABLE OF VARIABLES

| W | A | B | X | Y | Z |
|---|---|---|---|---|---|
| 9'-0" | 8" | 6" | 4'-7" | 1'-0" | 1'-1" |
| | 6" | 8" | 4'-3" | 1'-1" | 1'-4" |
| | 6" | 6" | 4'-3" | 1'-4" | 1'-1" |

## SECTION No. 4 TABLE OF VARIABLES

| W | A | B | X | Y | Z |
|---|---|---|---|---|---|
| 9'-0" | 8" | 6" | 5'-1" | 0'-6" | 1'-1" |
| | 6" | 8" | 4'-8" | 0'-8" | 1'-4" |
| | 6" | 6" | 4'-8" | 0'-11" | 1'-1" |

## SECTION No. 5-A TABLE OF VARIABLES

| W-L | A | SUPERELEVATION | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1" | | 2" | | 3" | |
| | | X-L | Y | X-L | Y | X-L | Y |
| 9'-0" | 10" | 5'-1" | 1'-7" | 5'-0" | 1'-8" | 4'-11" | 1'-9" |
| | 8" | 4'-9" | 1'-11" | 4'-8" | 2'-0" | 4'-7" | 2'-1" |

## SECTION No. 5-B TABLE OF VARIABLES

| W-L | A | SUPERELEVATION | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1" | | 2" | | 3" | |
| | | X-L | Y | X-L | Y | X-L | Y |
| 9'-0" | 10" | 5'-10" | 0'-10" | 5'-9" | 0'-11" | 5'-8" | 1'-0" |
| | 8" | 5'-5" | 1'-3" | 5'-3" | 1'-5" | 5'-2" | 1'-6" |

## SECTION No. 6-A TABLE OF VARIABLES

| W-L | A | SUPERELEVATION | | | |
|---|---|---|---|---|---|
| | | 4" | | 5" | |
| | | X-L | Y | X-L | Y |
| 9'-0" | 10" | 4'-10" | 1'-10" | 4'-9" | 1'-11" |
| | 8" | 4'-6" | 2'-2" | 4'-5" | 2'-3" |

## SECTION No. 6-B TABLE OF VARIABLES

| W-L | A | SUPERELEVATION | | | |
|---|---|---|---|---|---|
| | | 4" | | 5" | |
| | | X-L | Y | X-L | Y |
| 9'-0" | 10" | 5'-7" | 1'-1" | 5'-5" | 1'-3" |
| | 8" | 5'-1" | 1'-7" | 5'-0" | 1'-8" |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

## SECTION No. 7-A TABLE OF VARIABLES

| W-L | A | B | SUPERELEVATION | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1" | | | 2" | | | 3" | | |
| | | | X-L | Y | Z | X-L | Y | Z | X-L | Y | Z |
| 9'-0" | 8" | 6" | 4'-6" | 1'-1" | 1'-1" | 4'-5" | 1'-2" | 1'-1" | 4'-4" | 1'-3" | 1'-1" |
| | 6" | 8" | 4'-2" | 1'-2" | 1'-4" | 4'-1" | 1'-3" | 1'-4" | 4'-0" | 1'-4" | 1'-4" |
| | 6" | 6" | 4'-2" | 1'-5" | 1'-1" | 4'-1" | 1'-6" | 1'-1" | 4'-0" | 1'-7" | 1'-1" |

## SECTION No. 7-B TABLE OF VARIABLES

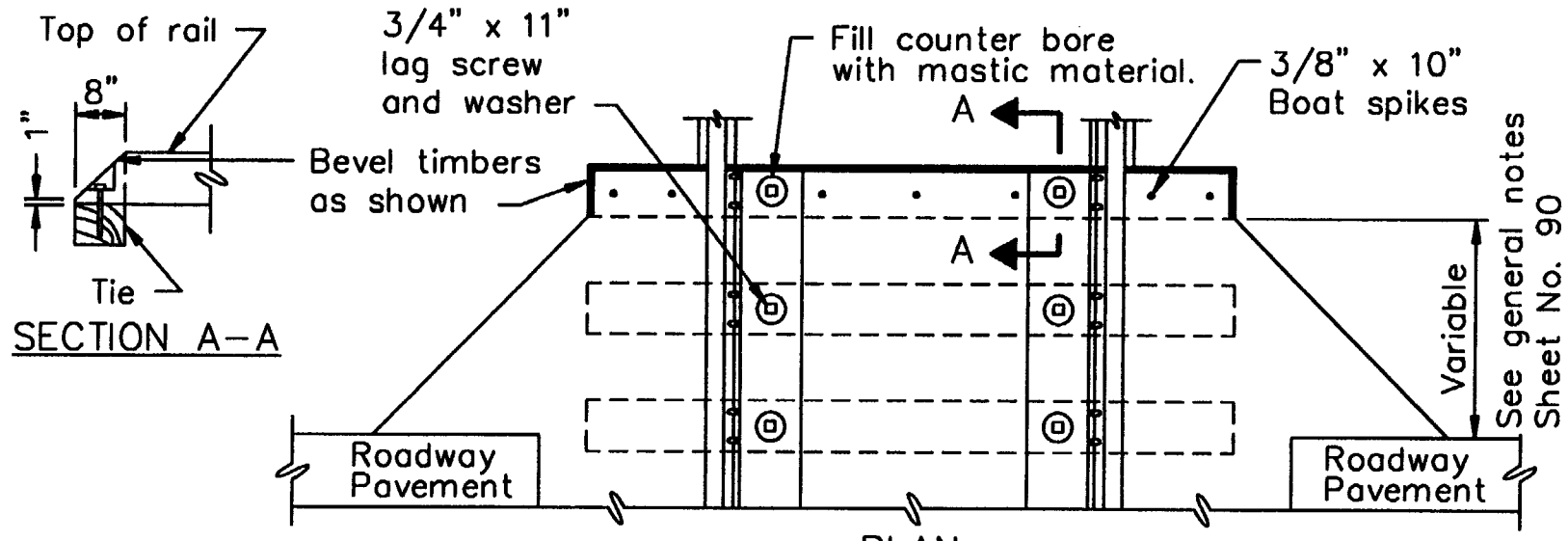
| W-L | A | B | SUPERELEVATION | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1" | | | 2" | | | 3" | | |
| | | | X-L | Y | Z | X-L | Y | Z | X-L | Y | Z |
| 9'-0" | 8" | 6" | 5'-0" | 0'-7" | 1'-1" | 4'-11" | 0'-8" | 1'-1" | 4'-10" | 0'-9" | 1'-1" |
| | 6" | 8" | 4'-7" | 0'-9" | 1'-4" | 4'-6" | 0'-10" | 1'-4" | 4'-5" | 0'-11" | 1'-4" |
| | 6" | 6" | 4'-7" | 1'-0" | 1'-1" | 4'-6" | 1'-1" | 1'-1" | 4'-5" | 1'-2" | 1'-1" |

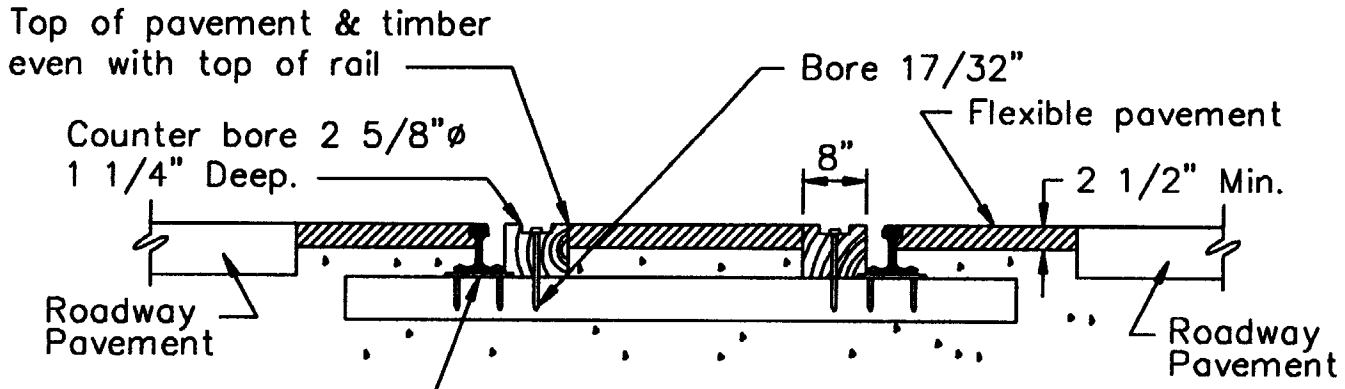
## SECTION No. 8-A TABLE OF VARIABLES

| W-L | A | B | SUPERELEVATION | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 4" | | | 5" | | |
| | | | X-L | Y | Z | X-L | Y | Z |
| 9'-0" | 8" | 6" | 4'-3" | 1'-4" | 1'-1" | 4'-2" | 1'-5" | 1'-1" |
| | 6" | 8" | 3'-11" | 1'-5" | 1'-4" | 3'-10" | 1'-6" | 1'-4" |
| | 6" | 6" | 3'-11" | 1'-8" | 1'-1" | 3'-10" | 1'-9" | 1'-1" |

## SECTION No. 8-B TABLE OF VARIABLES

| W-L | A | B | SUPERELEVATION | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 4" | | | 5" | | |
| | | | X-L | Y | Z | X-L | Y | Z |
| 9'-0" | 8" | 6" | 4'-9" | 0'-10" | 1'-1" | 4'-8" | 0'-11" | 1'-1" |
| | 6" | 8" | 4'-4" | 1'-0" | 1'-4" | 4'-3" | 1'-1" | 1'-4" |
| | 6" | 6" | 4'-4" | 1'-3" | 1'-1" | 4'-3" | 1'-4" | 1'-1" |




Seperators, field side of each rail, keep tops 1/4" below top of rail asphalt–saturated felt (30lb. typ).

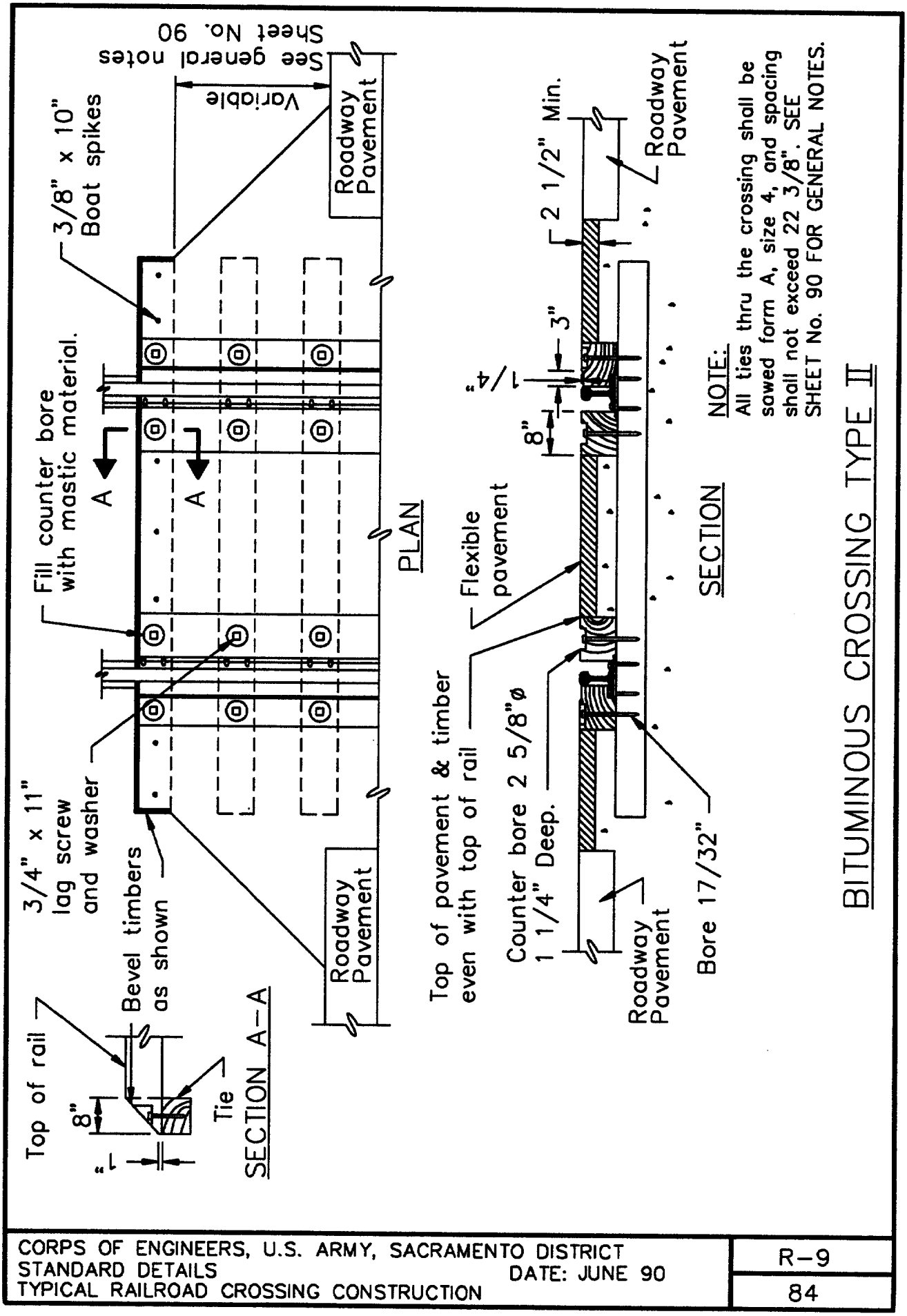
NOTE:
All ties thru the crossing shall be sawed form A, size 4, and spacing shall not exceed 20". SEE SHEET No. 90 FOR GENERAL NOTES.

# BITUMINOUS CROSSING TYPE I

R–8
83

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

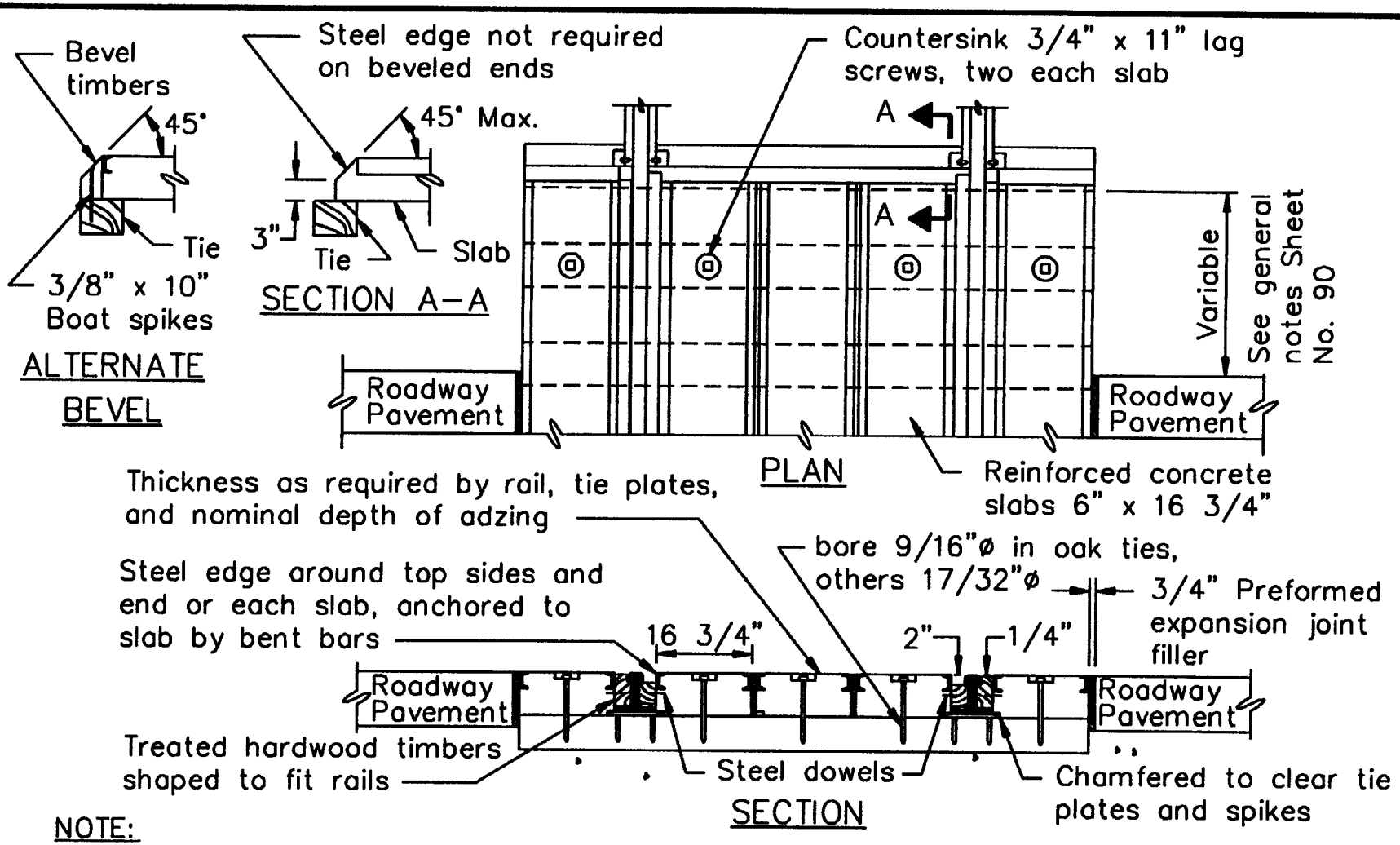
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS
TYPICAL RAILROAD CROSSING CONSTRUCTION
DATE: JUNE 90

R-9

84




NOTE:

All ties thru the crossing shall be sawed form A, size 4, and spaced to provide bearing of half the width of the tie for adjcent ends of slabs. Tie spacing shall not exceed 18".

Slab reinforcement is not shown but it will be provided to meet area requirements for H-20 loading (Max. axle load 32,000 lb.) SEE SHEET No. 90 FOR GENERAL NOTES.

# PRECAST CONCRETE SLAB CROSSING

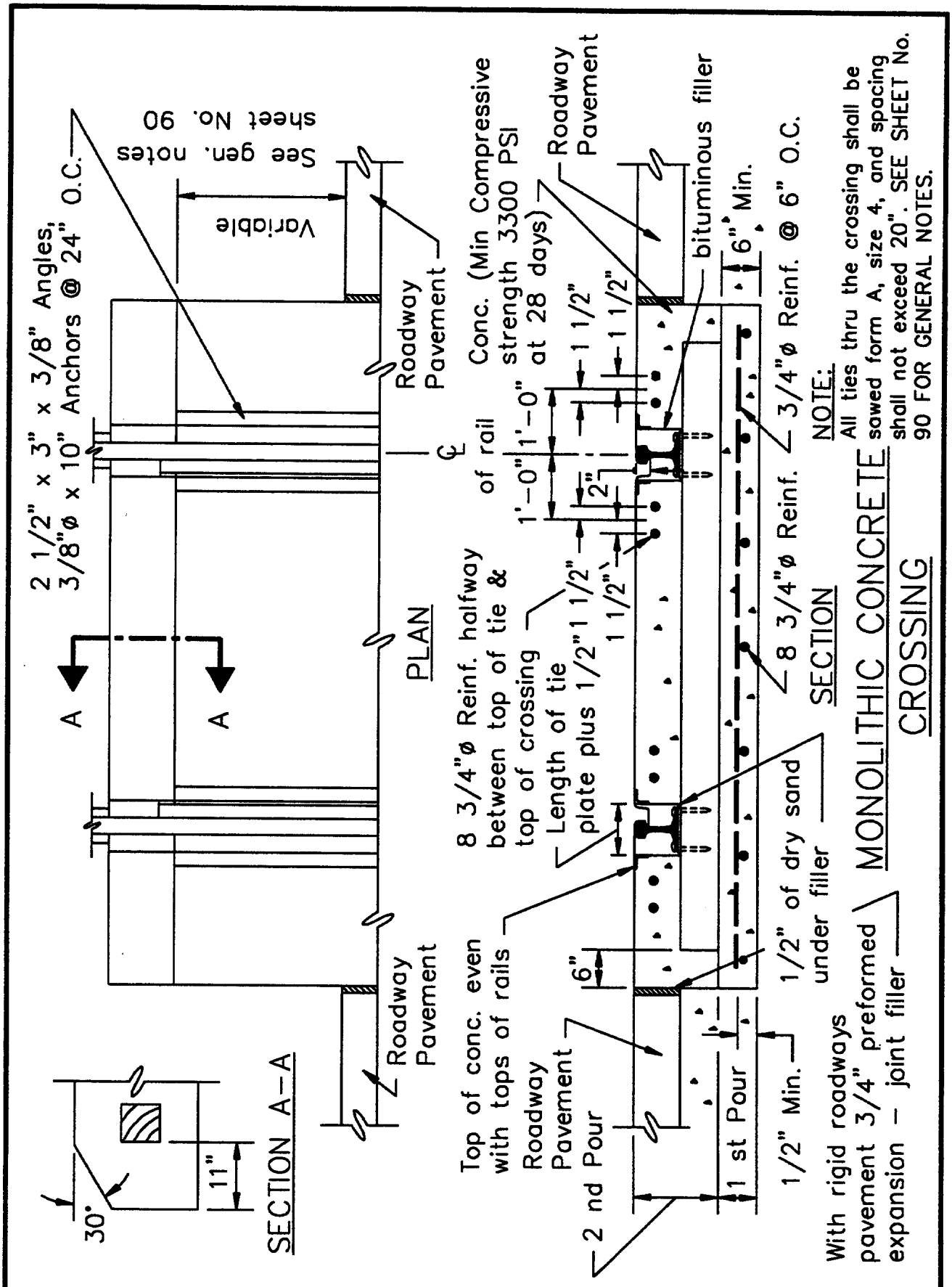
CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS
TYPICAL RAILROAD CROSSING CONSTRUCTION
DATE: JUNE 90

R-10

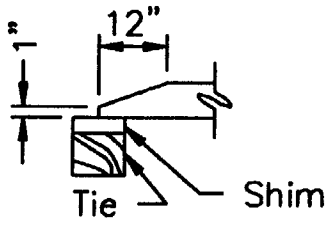
85

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

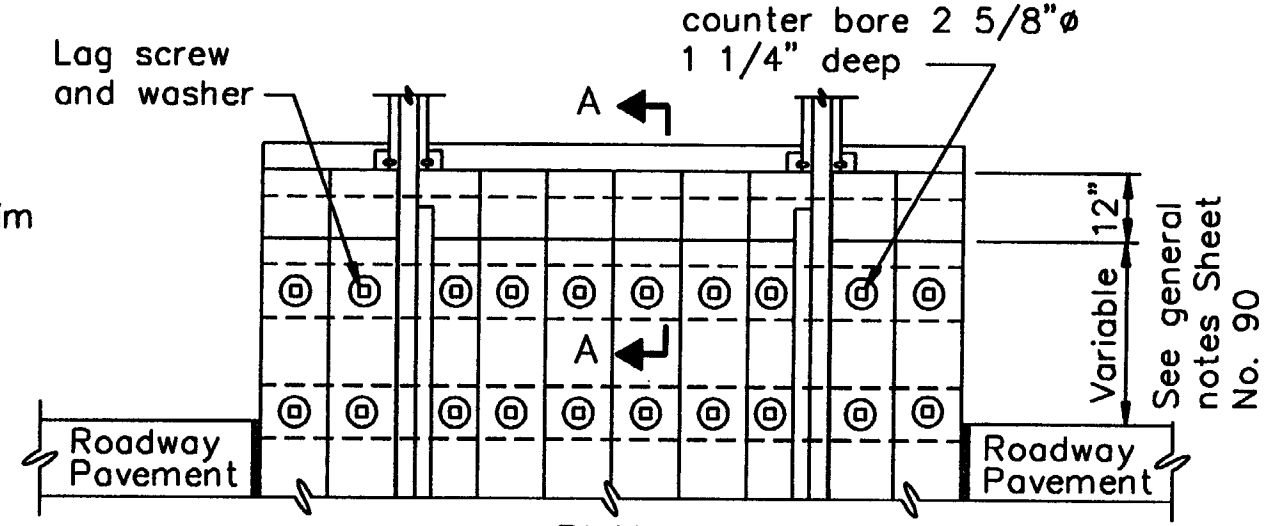
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



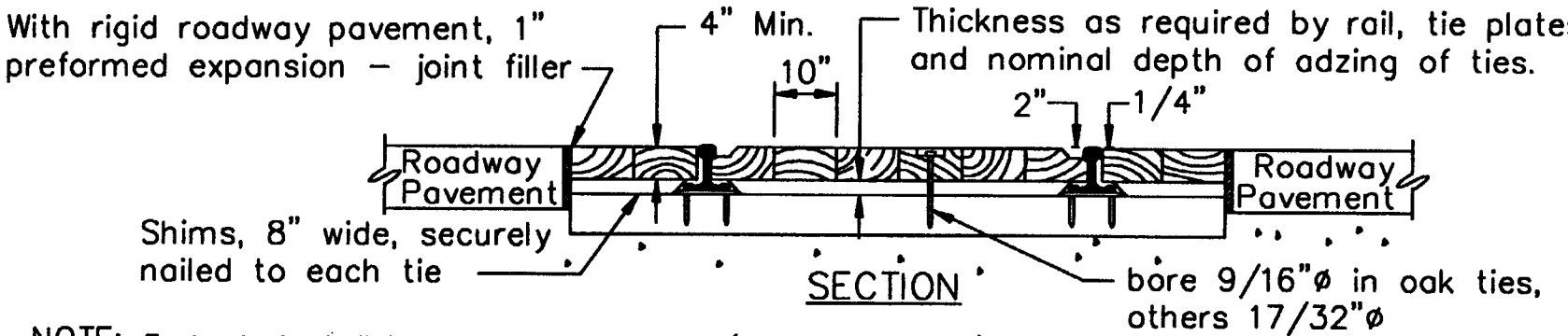

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JUNE 90<br>TYPICAL RAILROAD CROSSING CONSTRUCTION | R-11<br>86 |




SECTION A–A




PLAN

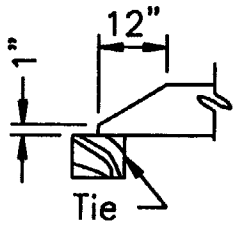



SECTION

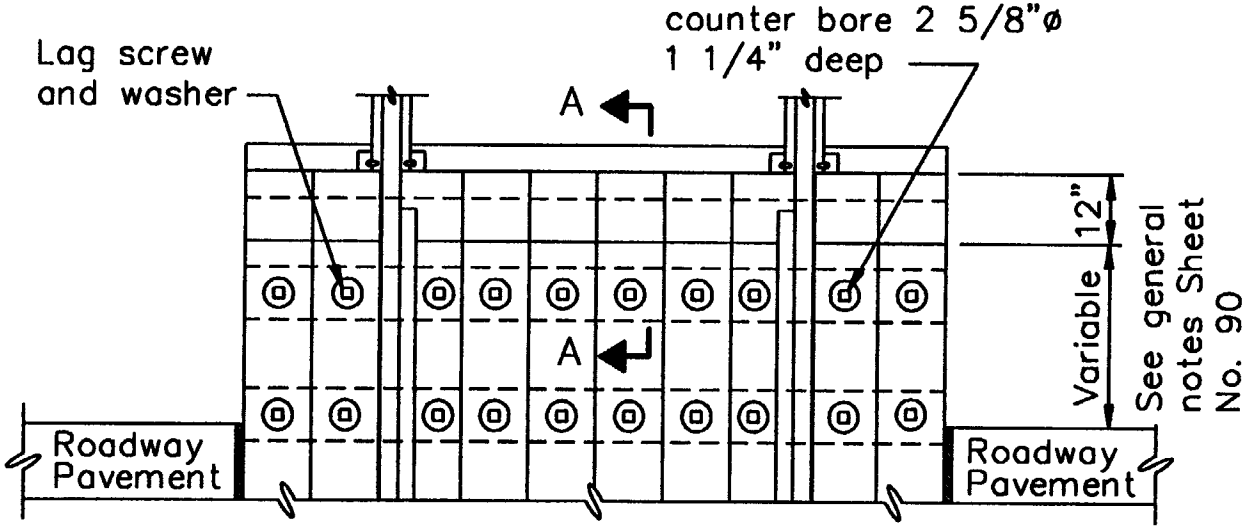
NOTE: Each plank shall be secured at its ends (Except on bevels), and at least every other tie with 3/4" x 11" lag screws. Fill counter bore with mastic materal. The planks adjacent to rails, gage side, shall be shaped to set against rails with proper flangeway dapped out.
Adjacent planks shall not have their intermediate ends on the same tie. Size planks to uniform thickness and width (Except flangeway planks). All ties thru the crossing shall be sawed, form A, size 4; spacing shall not exceed 20 inches. SEE SHEET No. 90 FOR GENERAL NOTES.

# TIMBER CROSSING TYPE I

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

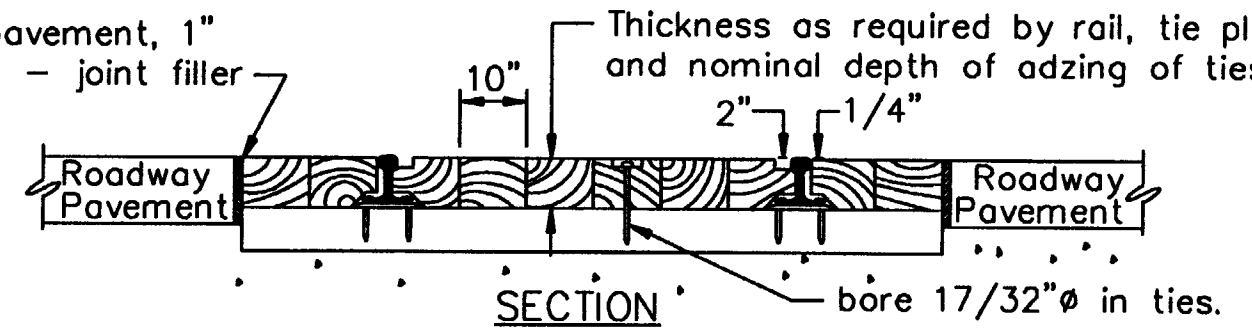



SECTION A–A




PLAN

With rigid roadway pavement, 1"
preformed expansion – joint filler




SECTION

NOTE: Each plank shall be secured at its ends (except on bevels), and at least every other tie with 3/4" x 11" lag screws. Fill counter bore with mastic materal. The planks adjacent to rails, gage side, shall be shaped to set against rails with proper flangeway dapped out.
Adjacent planks shall not have their intermediate ends on the same tie. Size planks to uniform thickness and width (Except flangeway planks). All ties thru the crossing shall be sawed, form A, size 4; spacing shall not exceed 20 inches. SEE SHEET No. 90 FOR GENERAL NOTES.

# TIMBER CROSSING TYPE II

CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS
TYPICAL RAILROAD CROSSING CONSTRUCTION
DATE: JUNE 90

R-13

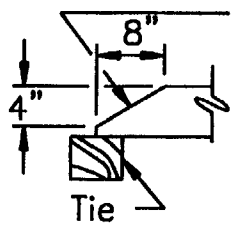
88

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

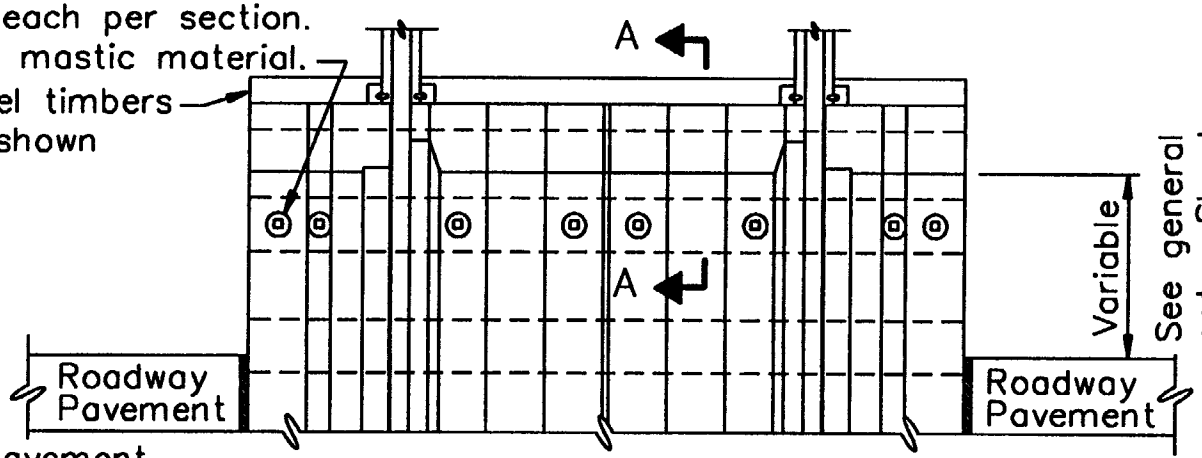
CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS
TYPICAL RAILROAD CROSSING CONSTRUCTION
DATE: JUNE 90

89 R-14

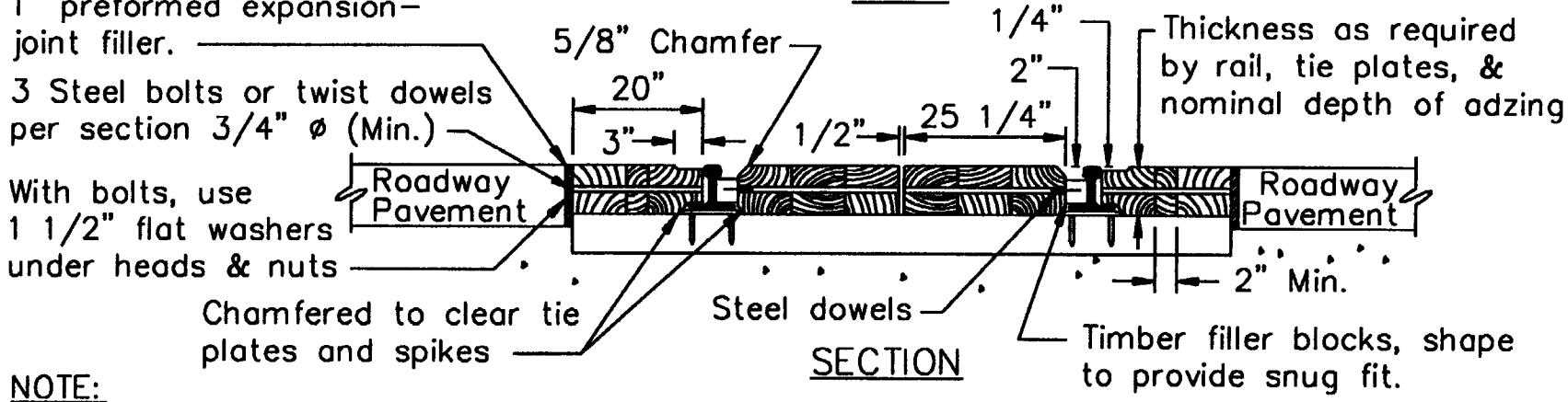
Drill 13/16" counter bore 2 5/8" ø x 1 1/4" deep, 3/4" lag screws 11" long, washers, 6 each per section. Fill counter bore with mastic material.




SECTION A–A




PLAN




SECTION

NOTE:

All ties thru the crossing shall be sawed form A, size 4, and spaced to provide bearing of half the width of the tie for adjacent ends of sections. The spacing shall not exceed 20". Drill ties for lag screws 9/16" ø in oak ties. Others 17/32"ø. The sections shall be 8 ft. long. SEE SHEET No. 90 FOR GENERAL NOTES.

# PREFABRICATED SECTIONAL TIMBER CROSSING

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

# GENERAL NOTES

On primary and secondary roads without curbs, extend crossing pavement through the full width of roadway including shoulders on roads or driveways in warehouse, storage, or industrial areas; and on roads with curbs, extend crossing two feet beyond edge of road pavement.

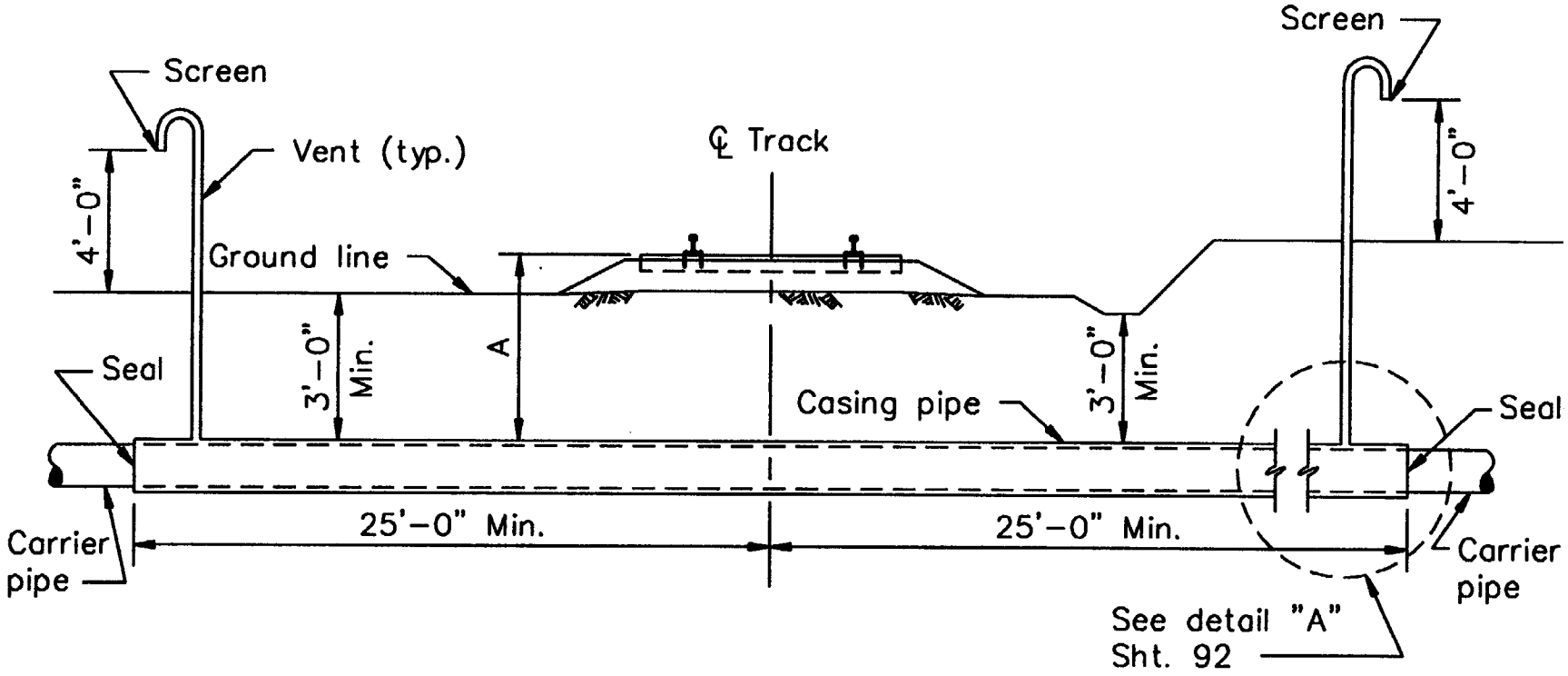
Lay rails to eliminate joints within the crossing. Use long rails where necessary or weld rail ends to form a continuous rail through crossing so the nearest joint is no less than 6 feet from crossing.

Provide 2 1/2 inches minimum width flangeway on tangent track or curves of 8 degrees or under and 2 3/4 inches minimum width on curves over 8 degrees.

All timbers shall be treated in accordance with Federal specification TT-W-571.

Eight rail-holding spikes shall be used on each tie through the crossing.

Crossing timbers shall be fine-grained hardwood timber, Lag screw holes shall be filled with creosote oil before lag screws are placed.




A = 5 1/2 ft. For mainline track
A = 4 1/2 ft. For secondary track or installation track

NOTE:
For general notes & thickness of pipe casing and for supporting track (table I), SEE SHEET 93.

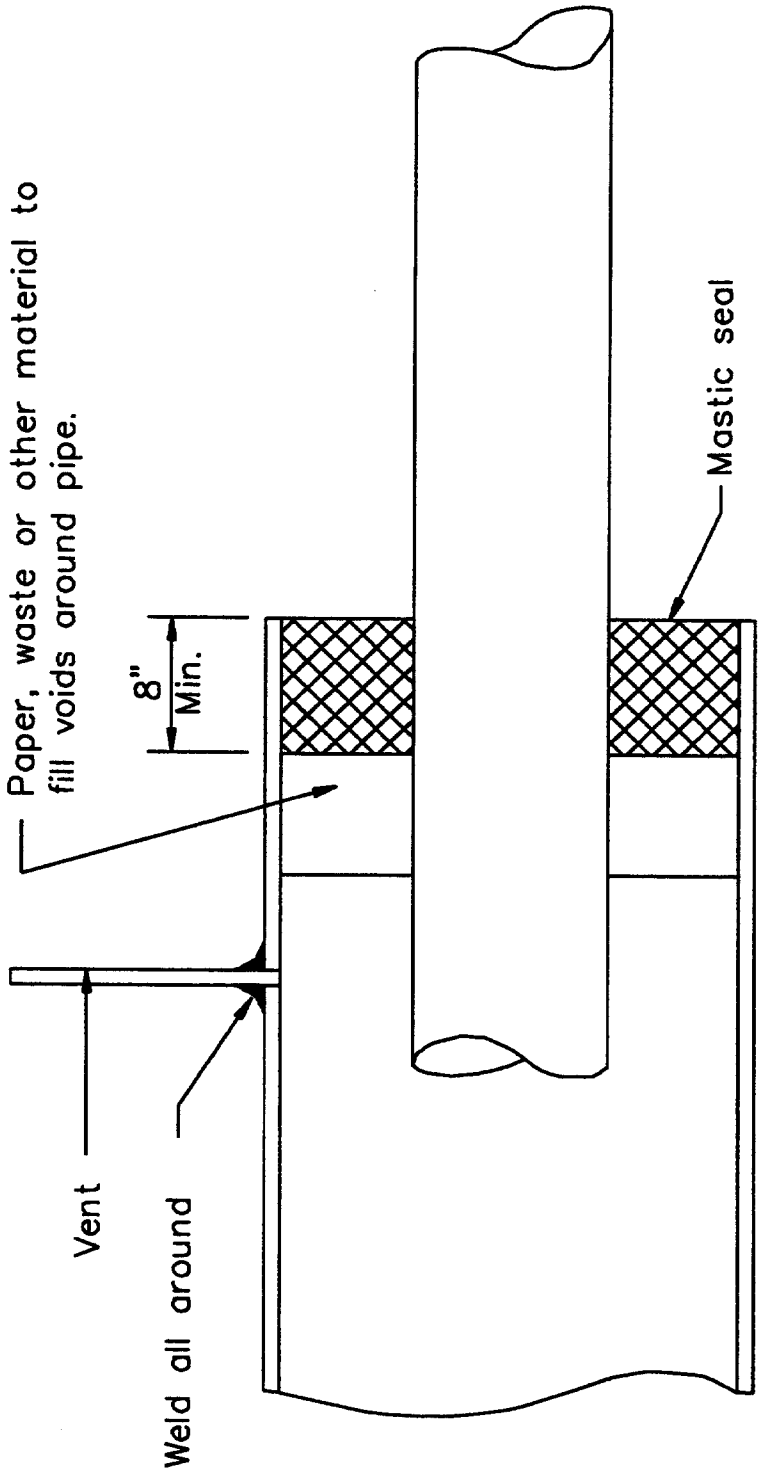
# PIPE LINE

## FOR FLAMMABLE SUBSTANCES CROSSING UNDER TRACK

NOT TO SCALE

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




DETAIL "A"

NOT TO SCALE

NOTE: Pipe line for flammable substances crossing under track. See sheet 91.

CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS DATE: JUNE 90
PIPE LINE FOR FLAMMABLE SUBSTANCES CROSSING UNDER TRACK

R-17

92

## TABLE I

THICKNESS OF PIPE CASTING
FOR SUPPORTING TRACK

| INSIDE DIAMETER INCHES | CORRUGATED STEEL PIPE U.S. STD. GAGE No. | SMOOTH STEEL PIPE MIN. SHICK-NESS INCHES |
|---|---|---|
| 4 TO 10 | 14 | 1/8 |
| 12 | 14 | 3/16 |
| 15,18 | 14 | 1/4 |
| 21,24 | 12 | 1/4 |
| 30,36 | 10 | 5/16 |

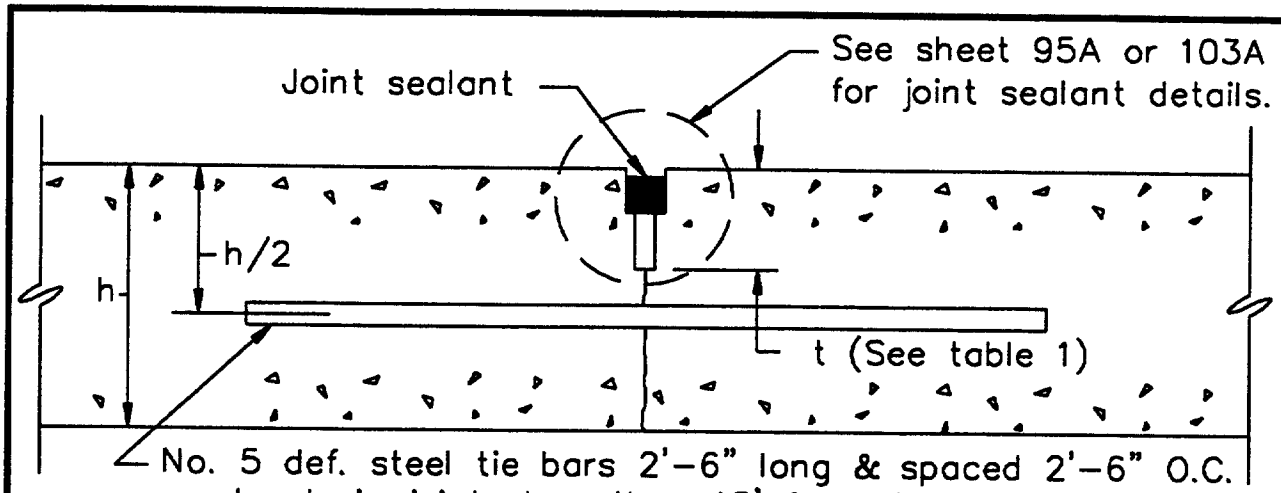
## GENERAL NOTES

1. Distance from bottom of track to top of pipe or casing shall be not less than 4-1/2 ft. Distance from ground surface or ditch bottom to top of casing shall not be less than 3 ft.
2. Pipe lines under railway tracks shall be encased in a larger pipe or conduit called the casing pipe, in accordance with these specifications and as indicated on Sht. 91.
3. When practicable, pipe lines may be installed under tracks by boring or jacking.
4. Pipe lines shall be located, where practicable, to cross tracks at approximately right angles thereto. Pipe lines placed under railway bridges or closer than 25 feet to any portion of a railroad bridge must be buried beneath the ground enclosed within an approved casing.
5. Crossings, where possible, shall be located where the ground surface slopes downward away from the railway.
6. Any replacement of a carrier pipe or a casing pipe shall be considered a new installation, subject to the requirements of these specifications.

CASINGS -

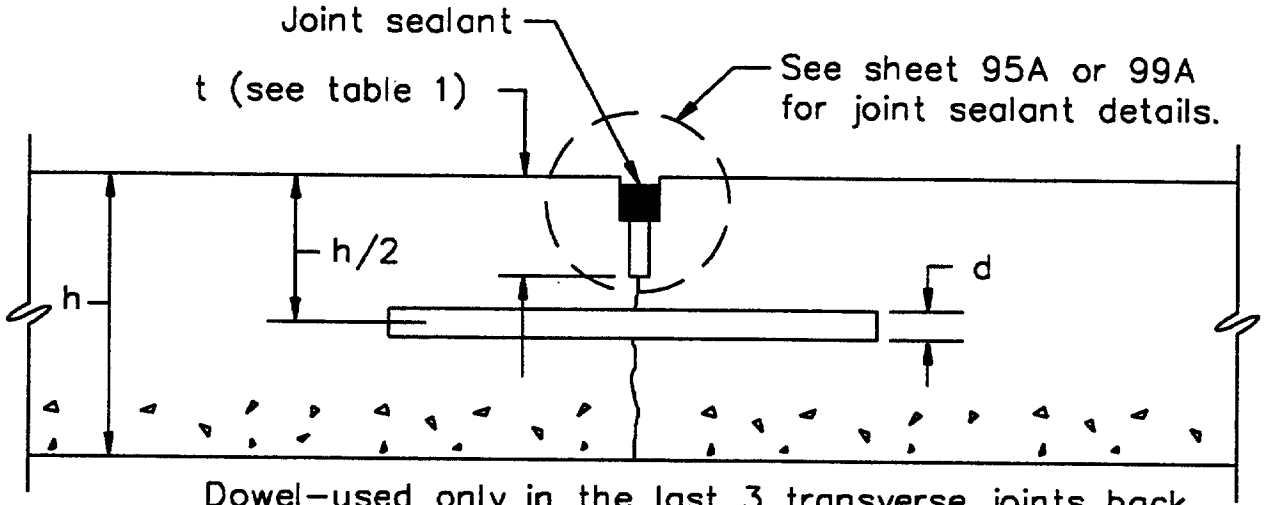
1. The casing pipe and joints shall be of metal and shall be of rigid, leak-proof construction. Thickness of pipe shall conform to the requirements of table 1 and shall have joints of ether screw, welded or riveted type. Casing shall be galvanized or shall be dipped in preserv-ative material and thoroughly coated inside and outside. If preservative material cannot be used inside of casing, then the casing shall be at least one gage or 1/16" thicker than otherwise required.
2. The inside diameter of the casing pipe shall be at least 2 inches greater than the largest outside diameter or the carrier pipe, joints or couplings. It shall, in all cases, be great enough to allow the carrier pipe to be removed subsequently without disturbing the casing pipe or roadbed
3. Casing will extend a minmum distance of 25 feet on each side of center line of track, measured at right angles, or to toe of fill where fill extends beyond 25 feet, unless otherwise authorized by the Cont. officer. If additional tracks are constructed in the future, the casing shall be extended correspondingly.
4. Casing shall be so installed as to prevent formation of a waterway under the railway. It shall have uniform bearing throughout its length and shall slope toward one end.
5. Casing pipe shall be so constructed as to prevent leakage of any matter from the casing throughout its length under track and right of way, except at ends of casing where ends are left open, or through vent pipes when ends are sealed to outside of carrier pipe.
6. Where ends of casing are at or above ground surface and above high water level they may be left open, providing drainage is afforded in such a manner that leakage will be conducted away from railway tracks or structure. Where poper drainage is not provided, the ends of casing shall be sealed.
7. Where ends of casing are below ground, they shall be suitably sealed to outside of carrier pipe.
8. Casing pipe, when sealed, shall be properly vented at both ends with vent pipes of sufficent diameter to permit free evaporation of water or moisture and to prevent internal pressures, but in no case shall they be less than 2 inches in diameter. Vent pipes shall be welded to top of casing and shall extend not less than 4 feet above ground surface as shown on Sht. 92. The outlets shall be properly screened. at their tops.

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




No. 5 def. steel tie bars 2'-6" long & spaced 2'-6" O.C. used only in joints less than 15' from free edges in pavements greater than 100' in width.

## LONGITUDINAL




Dowel—used only in the last 3 transverse joints back from ends of runway or other pavements over 3000 feet long—one end painted and oiled.

NOTE: Designer to refer to TM5-825-3 for design information.

## TRANSVERSE

TABLE 1

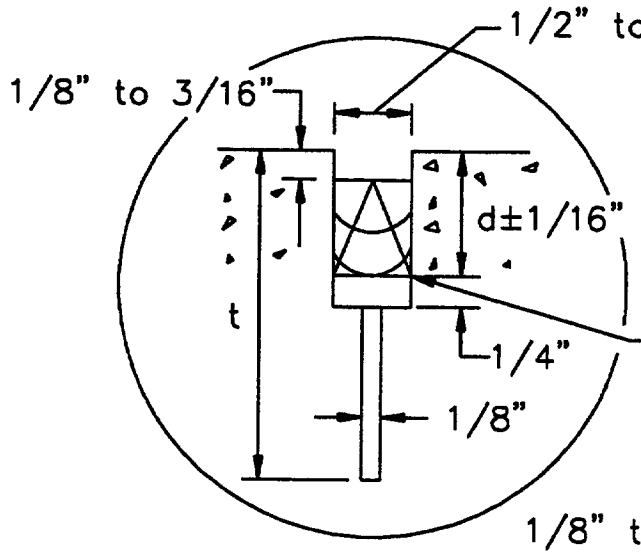
| Slab Thickness (inches.) | t (inches.) |
|---|---|
| <12 | h/4 |
| 12–18 | 3 |
| >18 | h/6 |

# CONTRACTION JOINTS

CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS DATE: MAR. 90
NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS

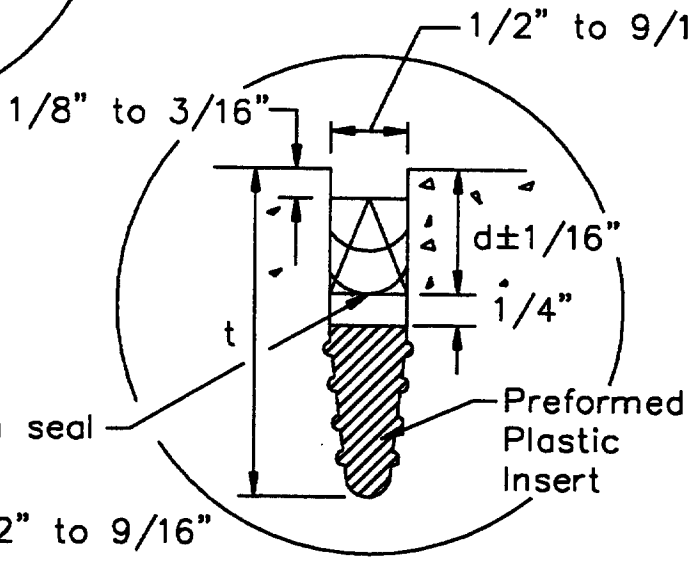
P-1
94

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

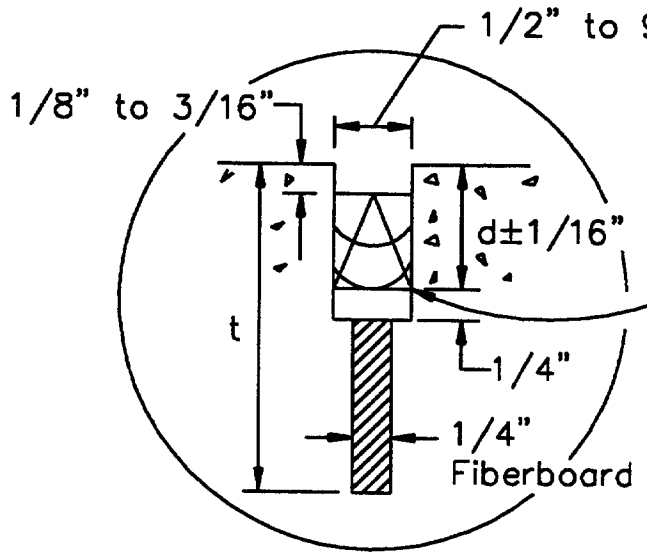



NOTE: d = 1" to 1 1/2", as recommended by the manufacturer

SAWED




PREFORMED PLASTIC INSERT



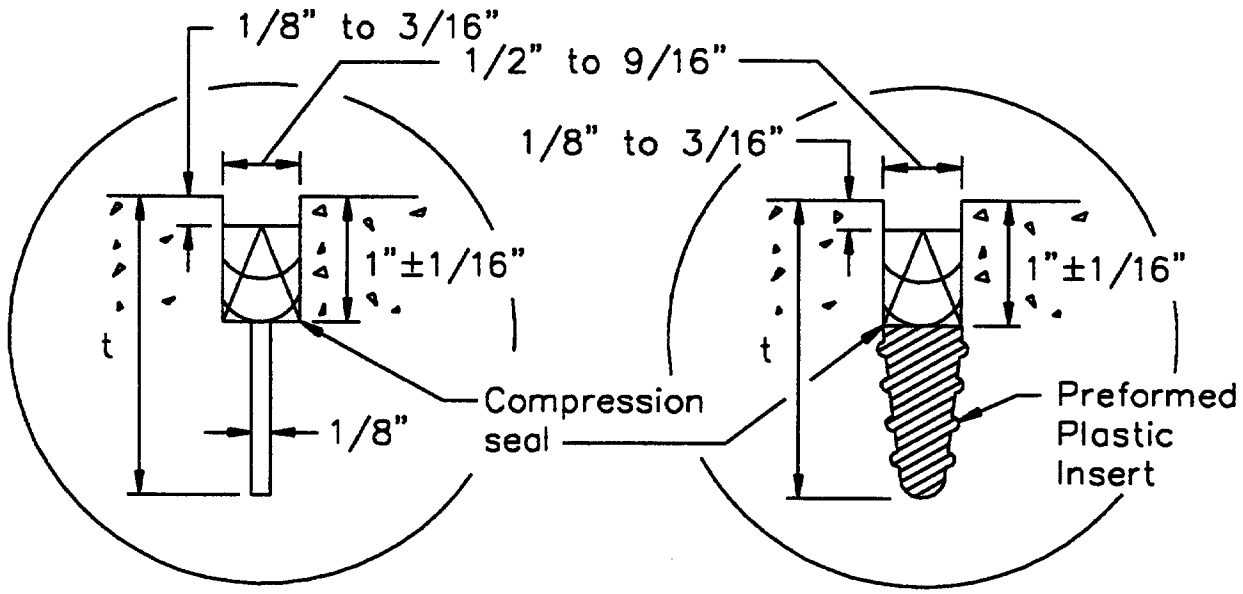

FIBERBOARD FILLER

NOTE: Only sawn contraction joints shall be used if slipform method of placement is chosen. When allowed, longitudinal contraction joints shall be sawn only.

# PREFORMED ELASTOMERIC JOINT SEALANT (COMPRESSION SEAL)

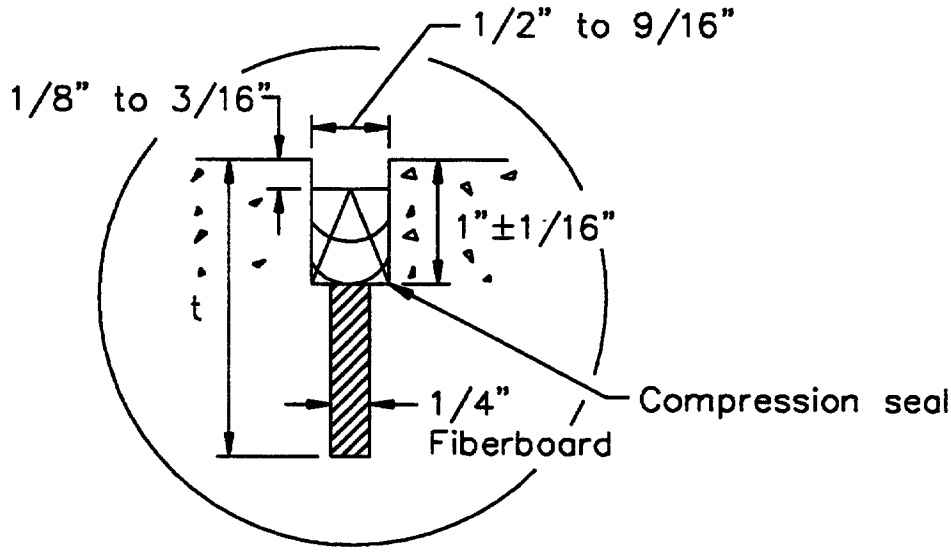
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAR. 90<br>NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-2<br>95 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




SAWED

PREFORMED PLASTIC INSERT




FIBERBOARD FILLER

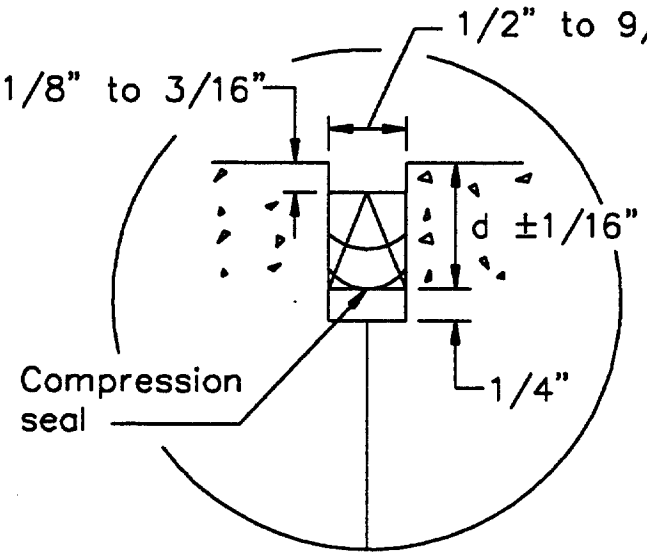
NOTE:

Only sawn contraction joints shall be used if slipform method of placement is chosen. When allowed, longitudinal contraction joints shall be sawn only.

# PREFORMED CONTRACTION JOINT SEALANT (COMPRESSION SEAL)

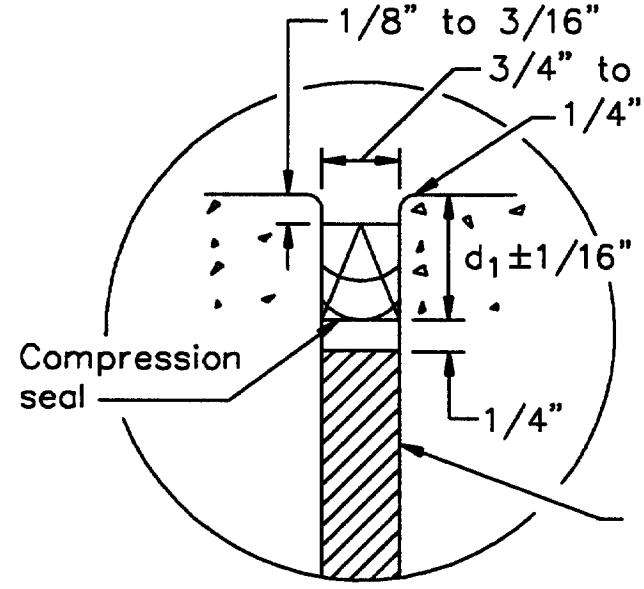
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: JAN. 91<br>NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-2A<br>95A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




NOTE: d = 1" to 1 1/2", as recommended by the manufacturer

CONSTRUCTION JOINT SEALANT DETAIL



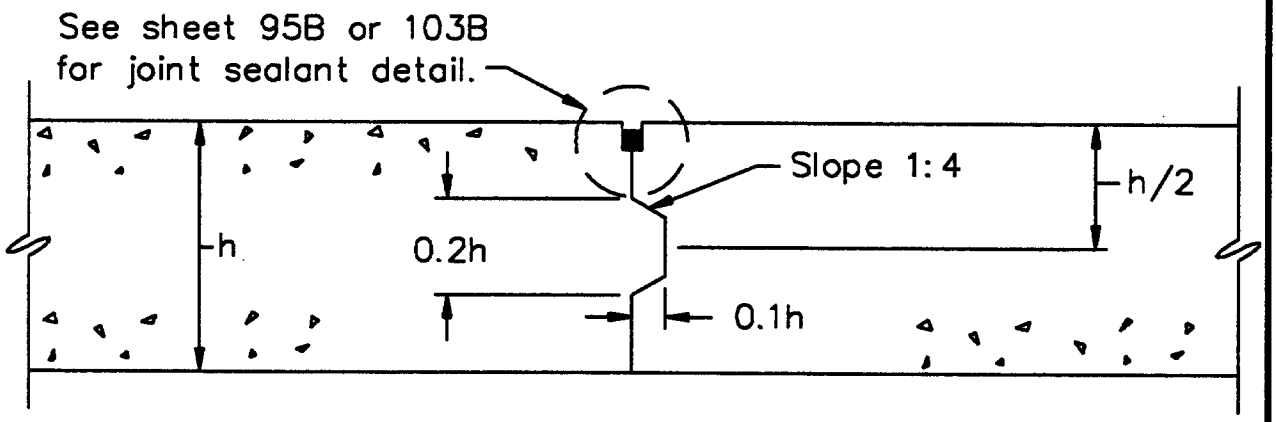

NOTE: $d_1$ = 1" to 2", as recommended by the manufacturer

EXPANSION JOINT SEALANT DETAIL

# PREFORMED ELASTOMERIC JOINT SEALANT (COMPRESSION SEAL)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: APR. 90<br>NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-2B<br>95B |

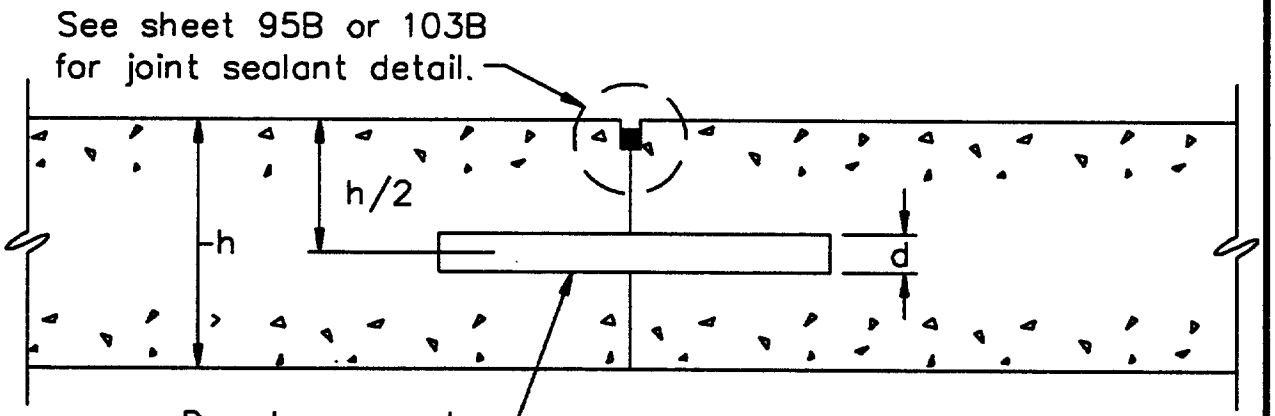
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




NOTES: Designer to refer to TM5-825-3 for type of construction joint used for specific conditions.

## KEYED LONGITUDINAL (K)

(Limited to pavements 9 inches or more in thickness.)




(Use this detail only where req'd due to less than 9" thickness, or for special loading stipulated).

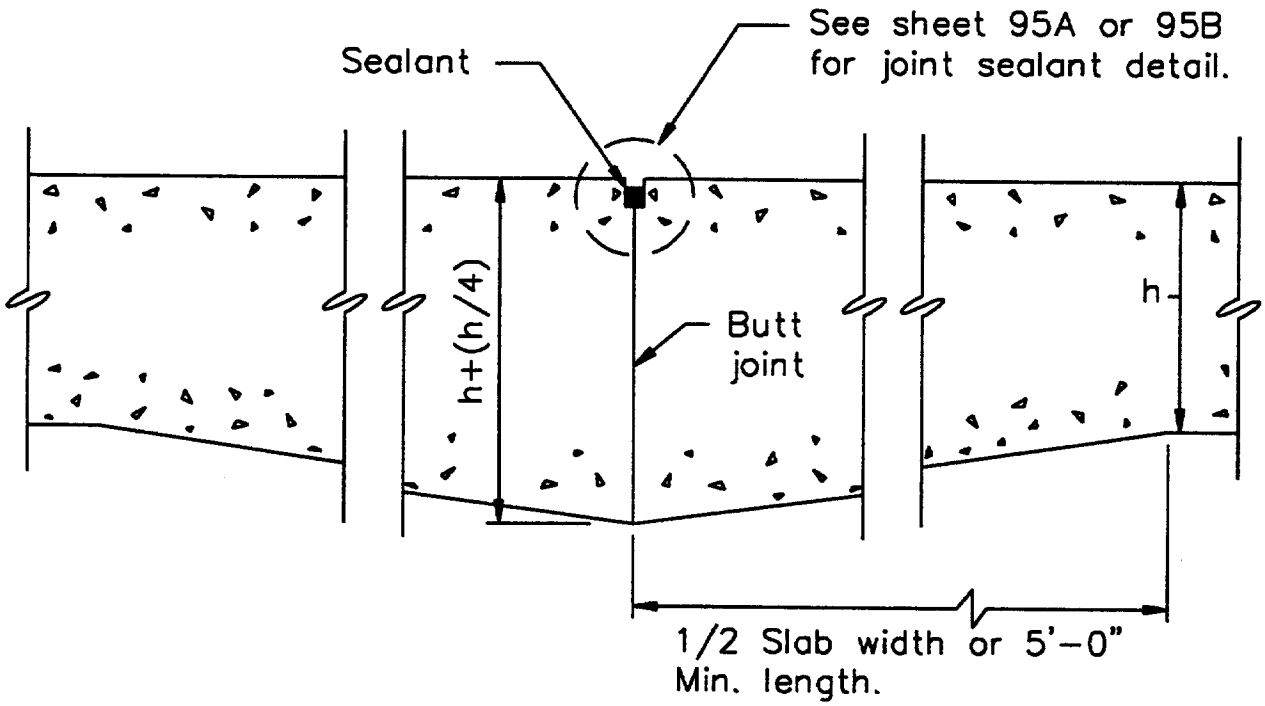
## DOWELED TRANSVERSE OR LONGITUDINAL (D)

(Required for all transverse construction joints.)

# CONSTRUCTION JOINTS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: APR. 90<br>NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-3<br>96 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

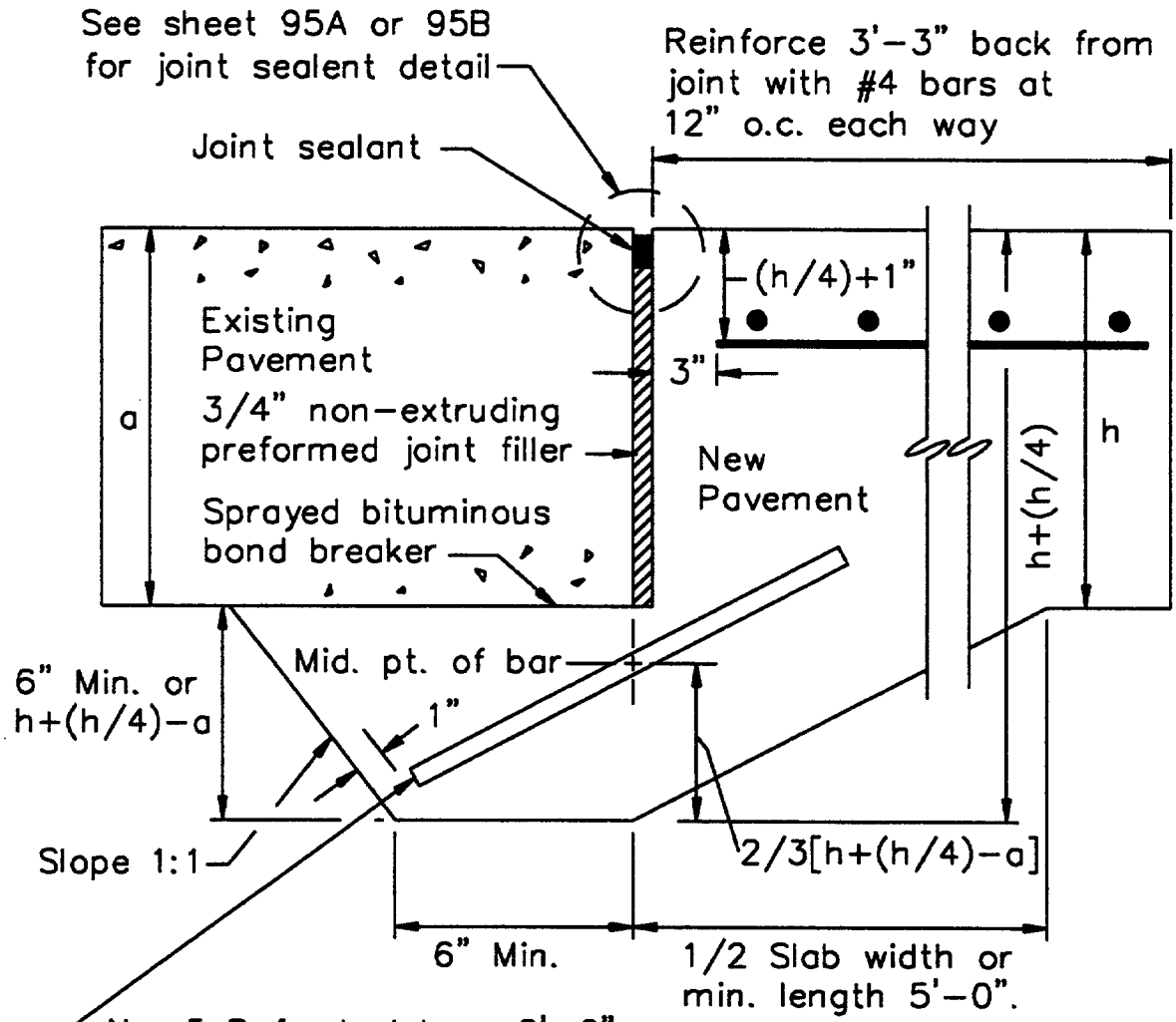



(Not for general use. Use only under exceptional circumstances, with approval of Geotechnical Branch)

# LONGITUDINAL THICKENED EDGE CONSTRUCTION JOINT (LTE)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: APR. 90<br>NON-REIFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-3A<br>96A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



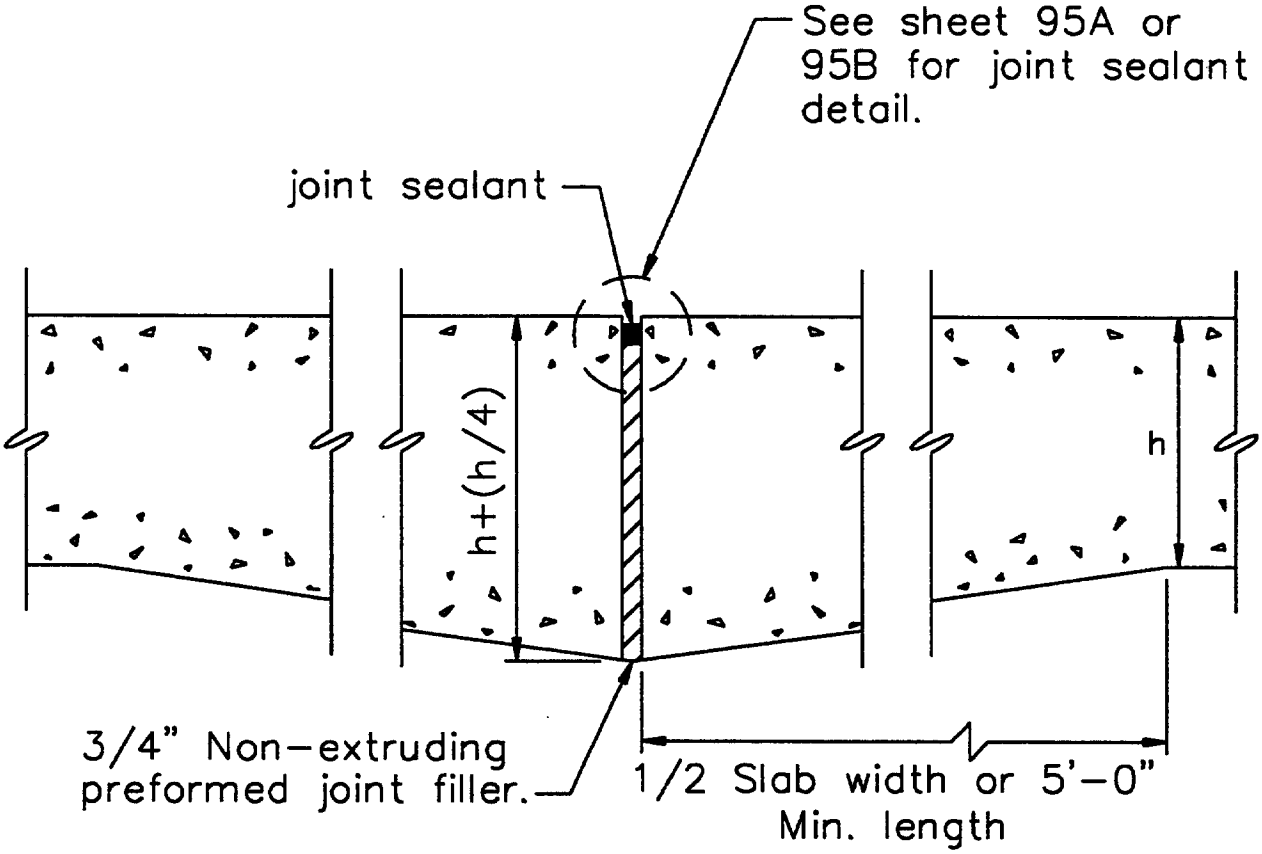

NOTE: Provide non-absorptive material between sealant and filler, compatible with both.

# SPECIAL EXPANSION JOINT (SEJ) BETWEEN NEW AND EXISTING PAVEMENT

## (TRANSVERSE OR LONGITUDINAL)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: APR. 90<br>NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-4<br>97 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




Note: Non-absorbtive separation medium will be used between joint sealant & underlying performed joint filler.

## EXPANSION JOINT (EJ)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: APR. 90<br>NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-5<br>98 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

# CONCRETE JOINT LEGEND

## EXPANSION JOINT

———— EJ ———— EXPANSION JOINT

————SEJ———— SPECIAL EXPANSION JOINT

## CONSTRUCTION JOINT (CJ)

———— K ———— LONGITUDINAL KEYED JOINT

———— D ———— LONGITUDINAL & TRANSVERSE DOWELED JOINT

————LTE———— LONGITUDINAL THICKENED EDGE JOINT

—|—|—|—|—|— JOINT WITH TIE-BAR

## CONTRACTION JOINT (CTJ)

— — —LTE— — — SAWED, FIBERBOARD,OR PREFORMED PLASTIC INSERT JOINT

—|—|— —|—|— —|—|— JOINT WITH TIE-BAR

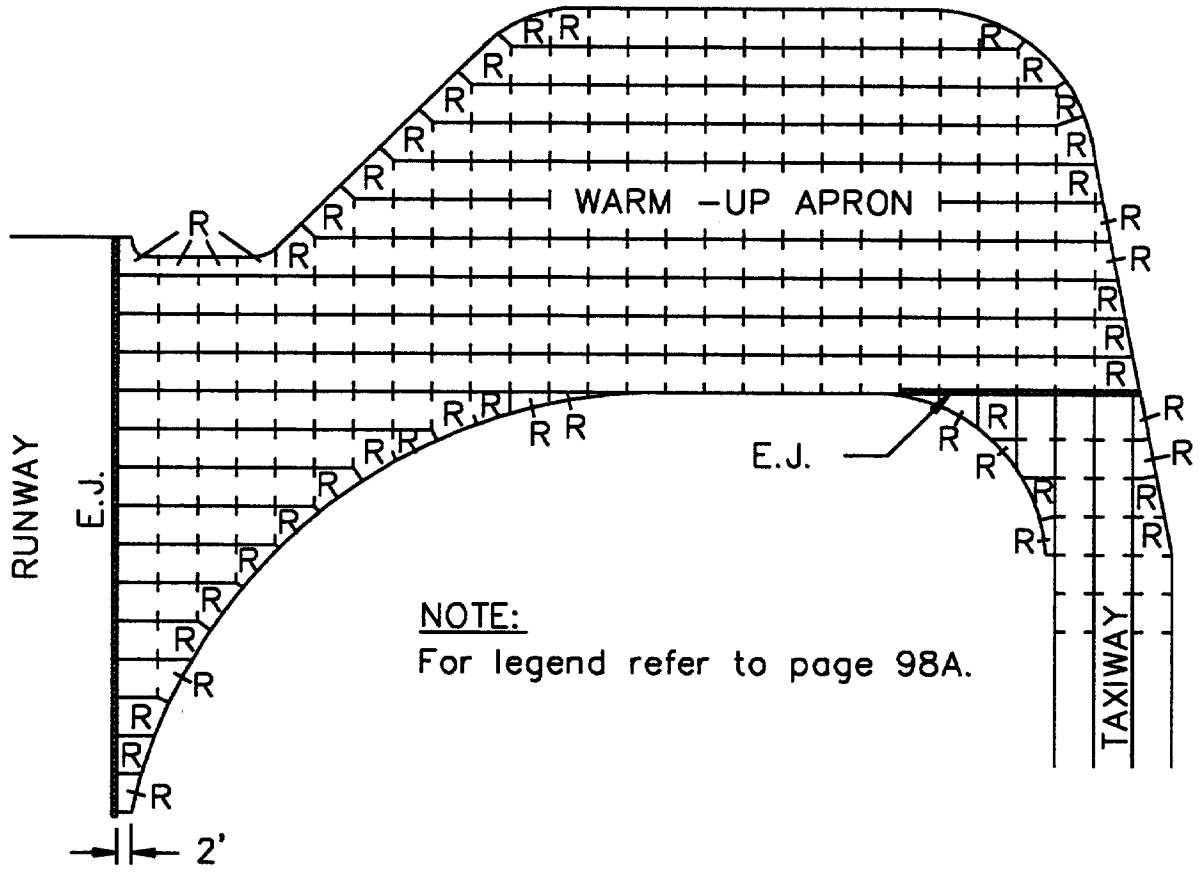
— — — TD — — — TRANSVERSE JOINT WITH DOWEL

(R) REINFORCED ODD SHAPED SLAB (#4 @ 12"O.C. EA. WAY)

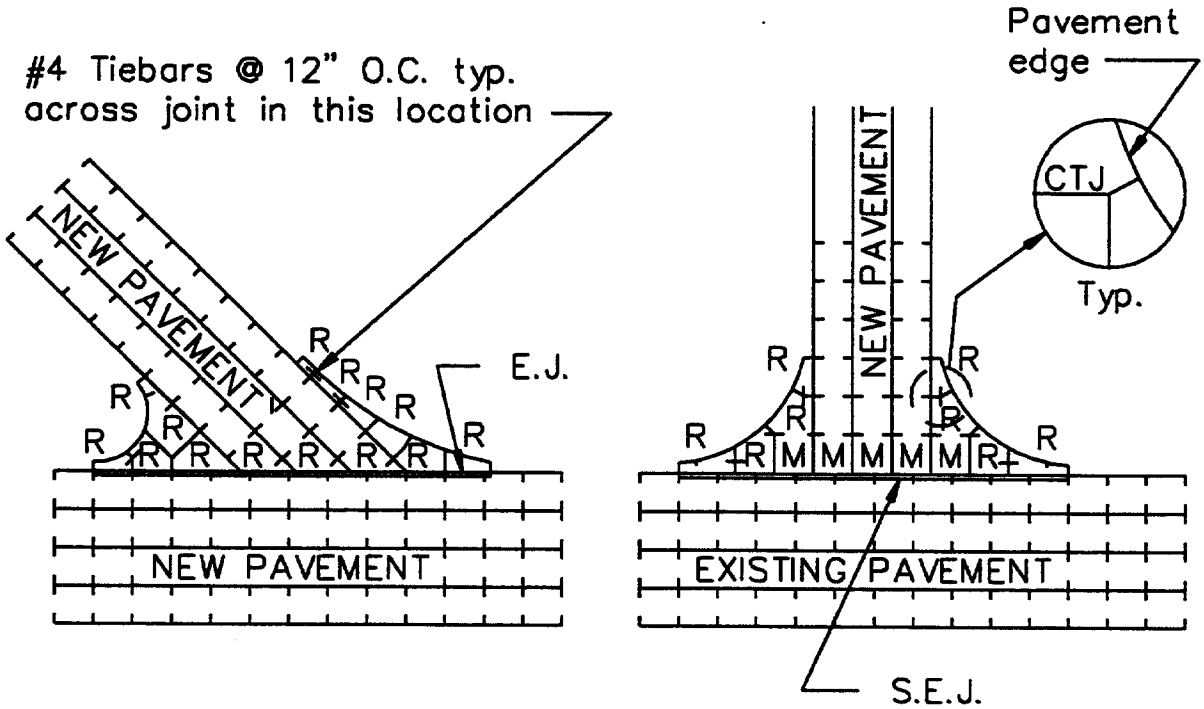
(M) REINFORCED MISMATCHED JOINT (#4 @ 12"O.C. EA. WAY FOR 3'-3" BACK FROM JOINT )

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: APR. 90<br>NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-5A<br>98A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



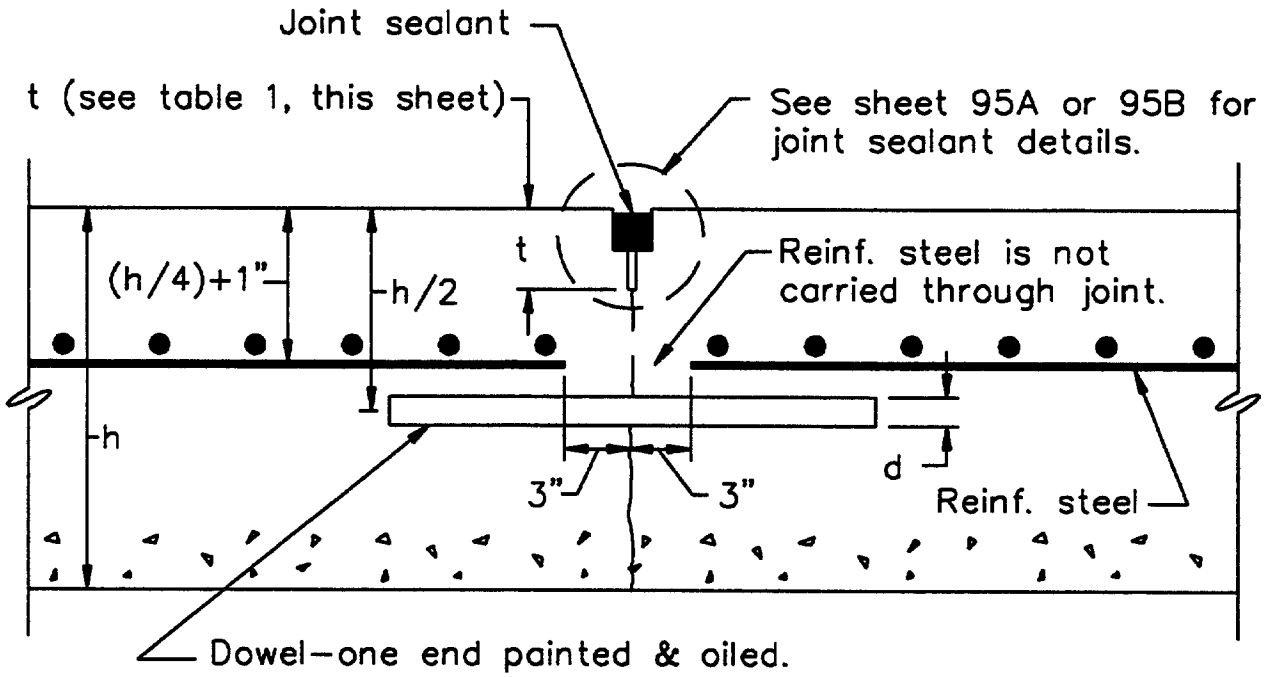

NOTE:
For legend refer to page 98A.




# TYPICAL JOINT LAYOUTS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: APR. 90<br>NON-REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-5B<br>98B |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



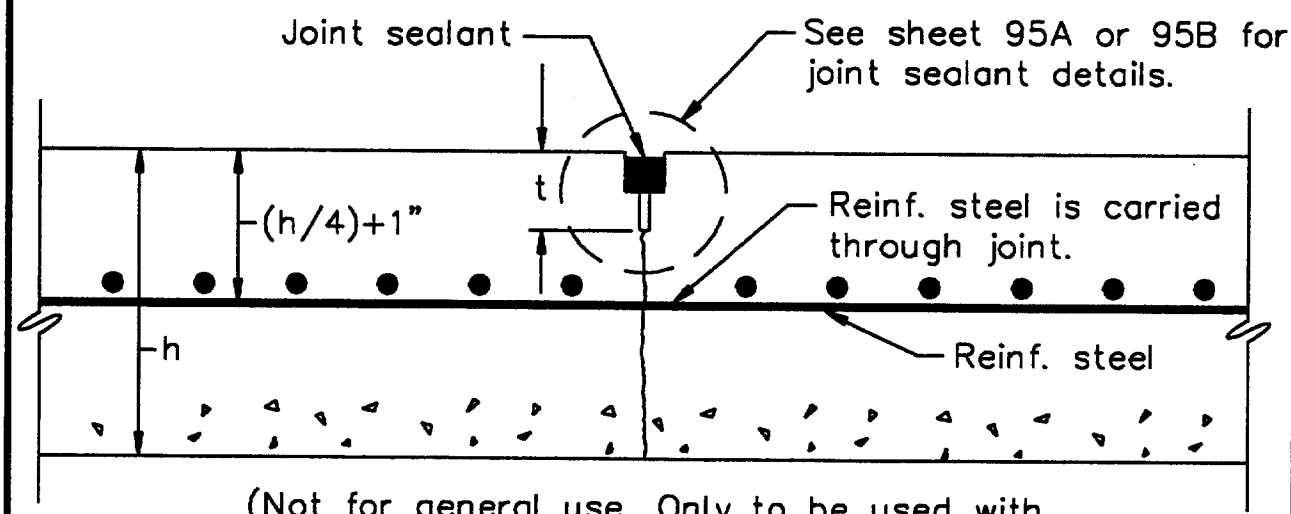

NOTE: Designer to refer to TM–825–3 for design information.

TABLE 1

| Slab Thickness (Inches) | t (Inches) |
|---|---|
| <12 | h/4 |
| 12–18 | 3 |
| >18 | h/6 |

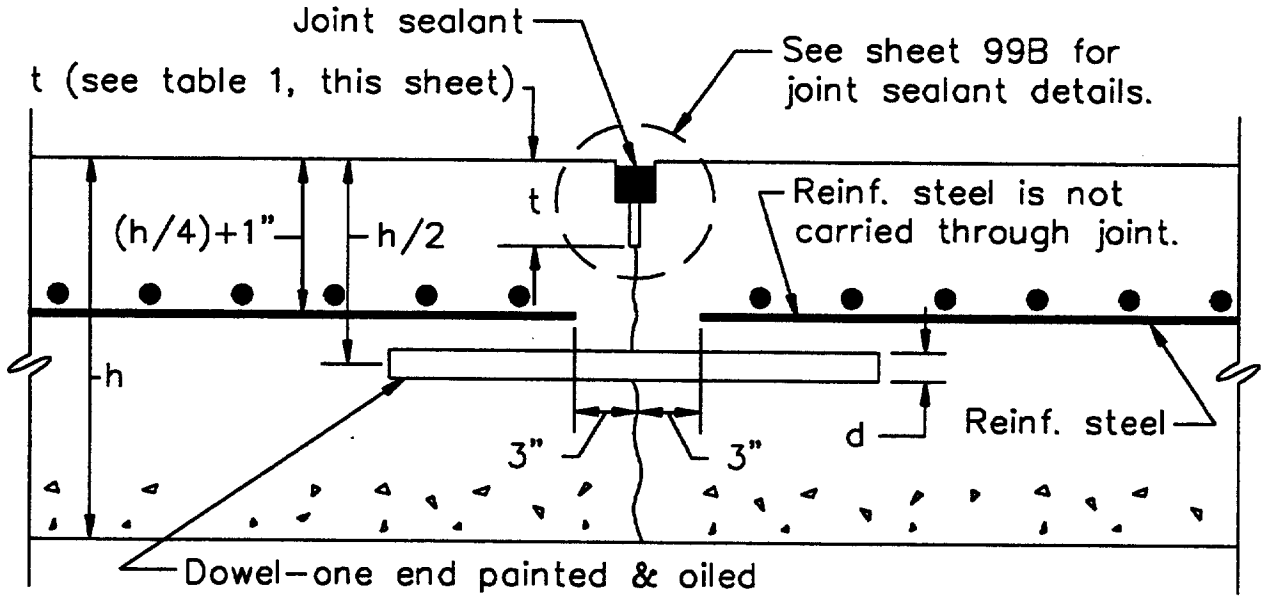
# TRANSVERSE CONTRACTION JOINT

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




(Not for general use. Only to be used with advance approval of Geotechnical Branch.)

## LONGITUDINAL




note:

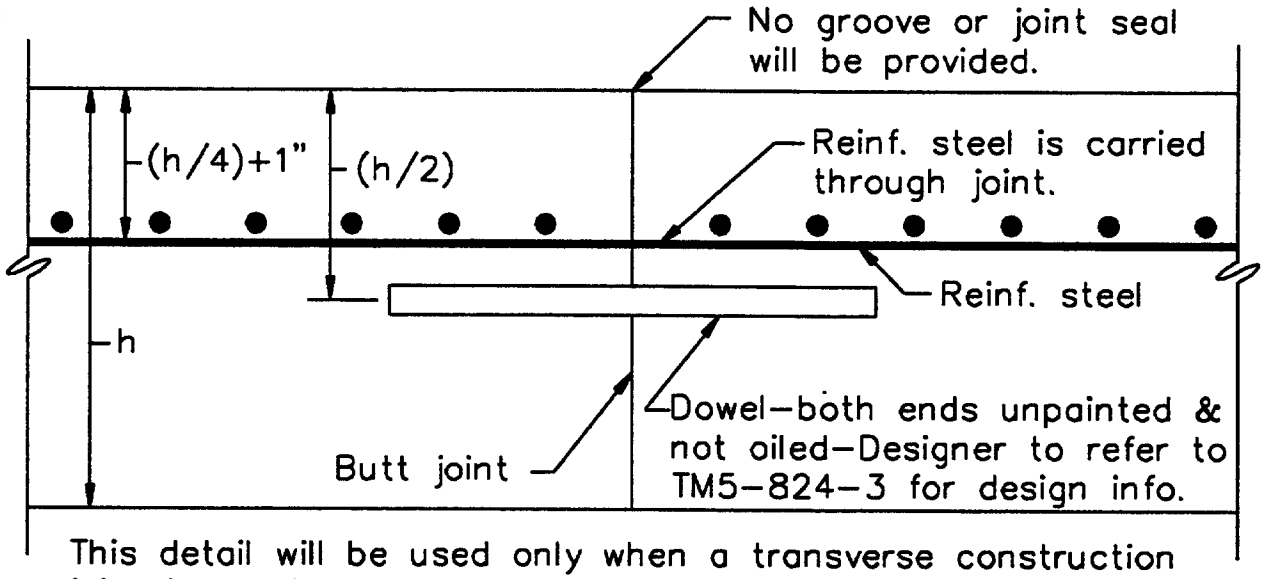
Designer to refer to TM5-825-3 for design information.

| TABLE 1 | |
|---|---|
| Slab Thickness (Inches) | t (Inches) |
| <12 | h/4 |
| 12-18 | 3 |
| >18 | h/6 |

# LONGITUDINAL CONTRACTION JOINTS

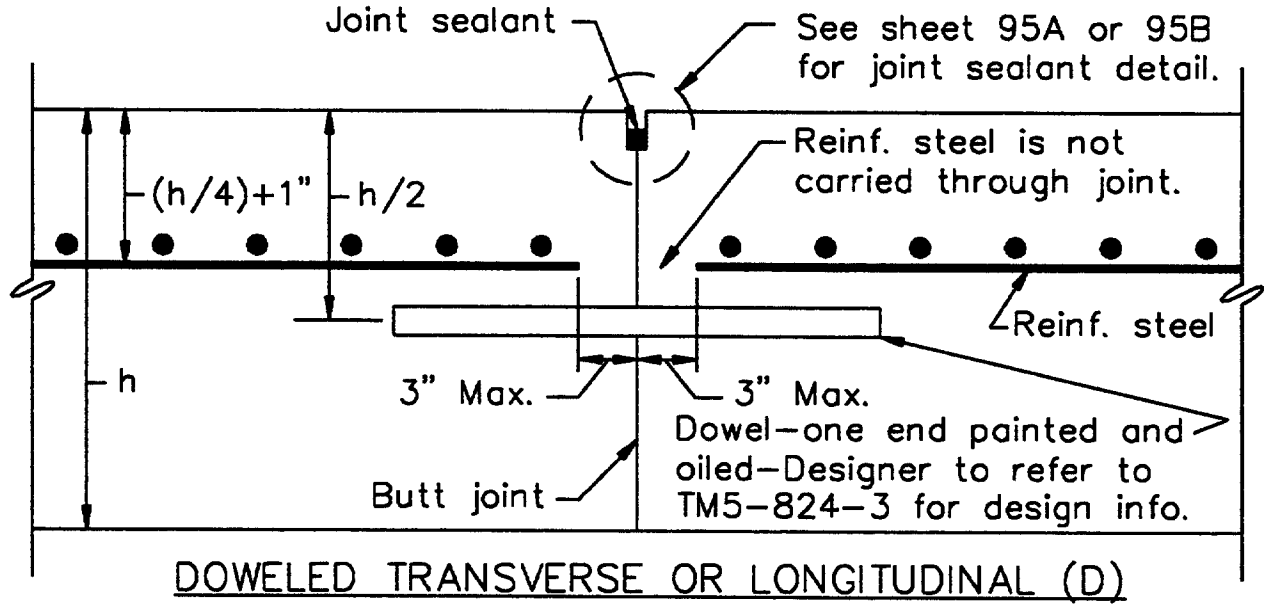
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-6A<br>99A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




This detail will be used only when a transverse construction joint is required at a location other than a regularly scheduled transverse construction joint.

## DOWELED TRANSVERSE



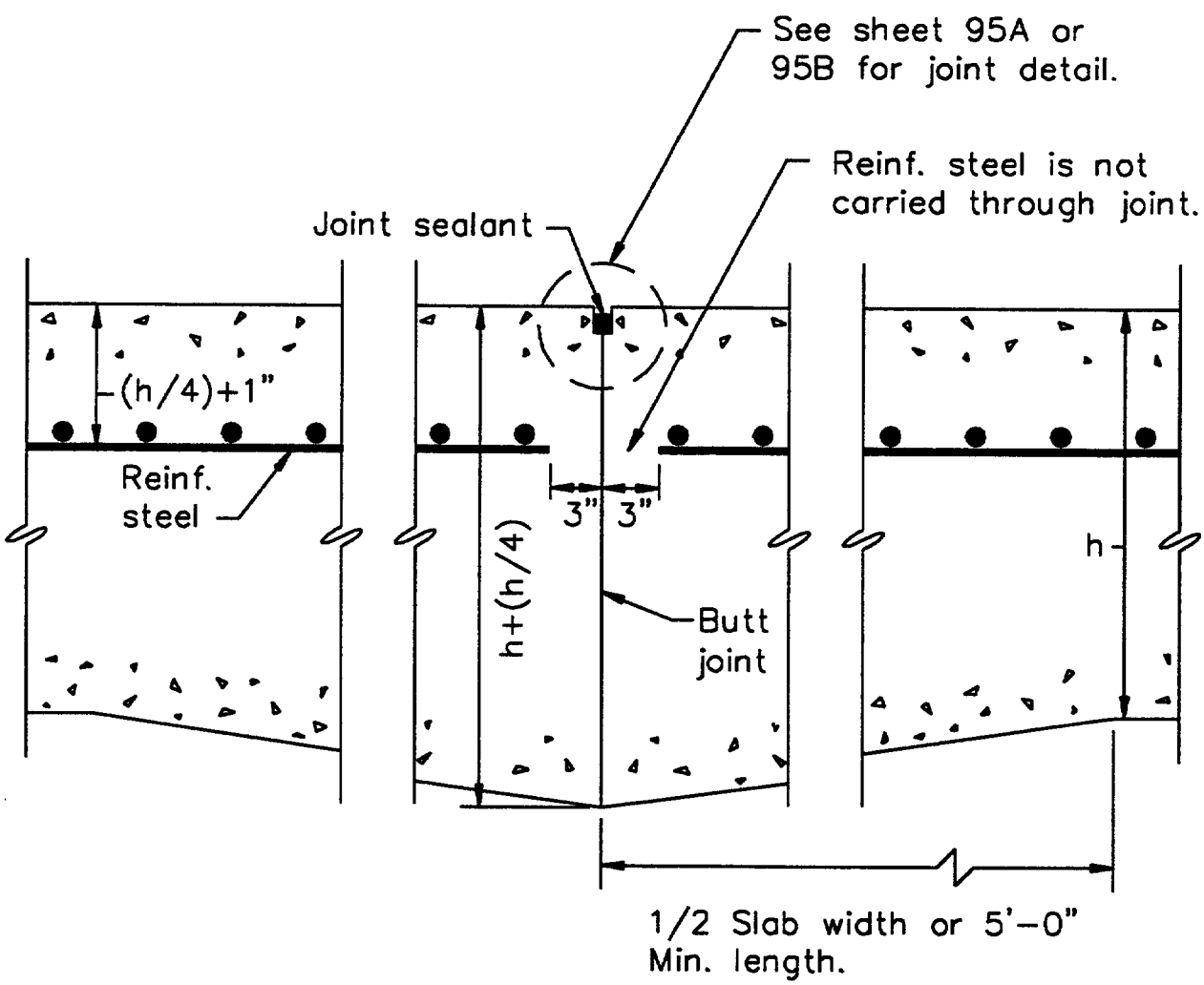

## DOWELED TRANSVERSE OR LONGITUDINAL (D)

This detail will be used when a transverse construction joint is required at a regularly scheduled transverse construction joint, in addition to longitudinal joint.

# CONSTRUCTION JOINTS – DOWELED

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P–7<br>100 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

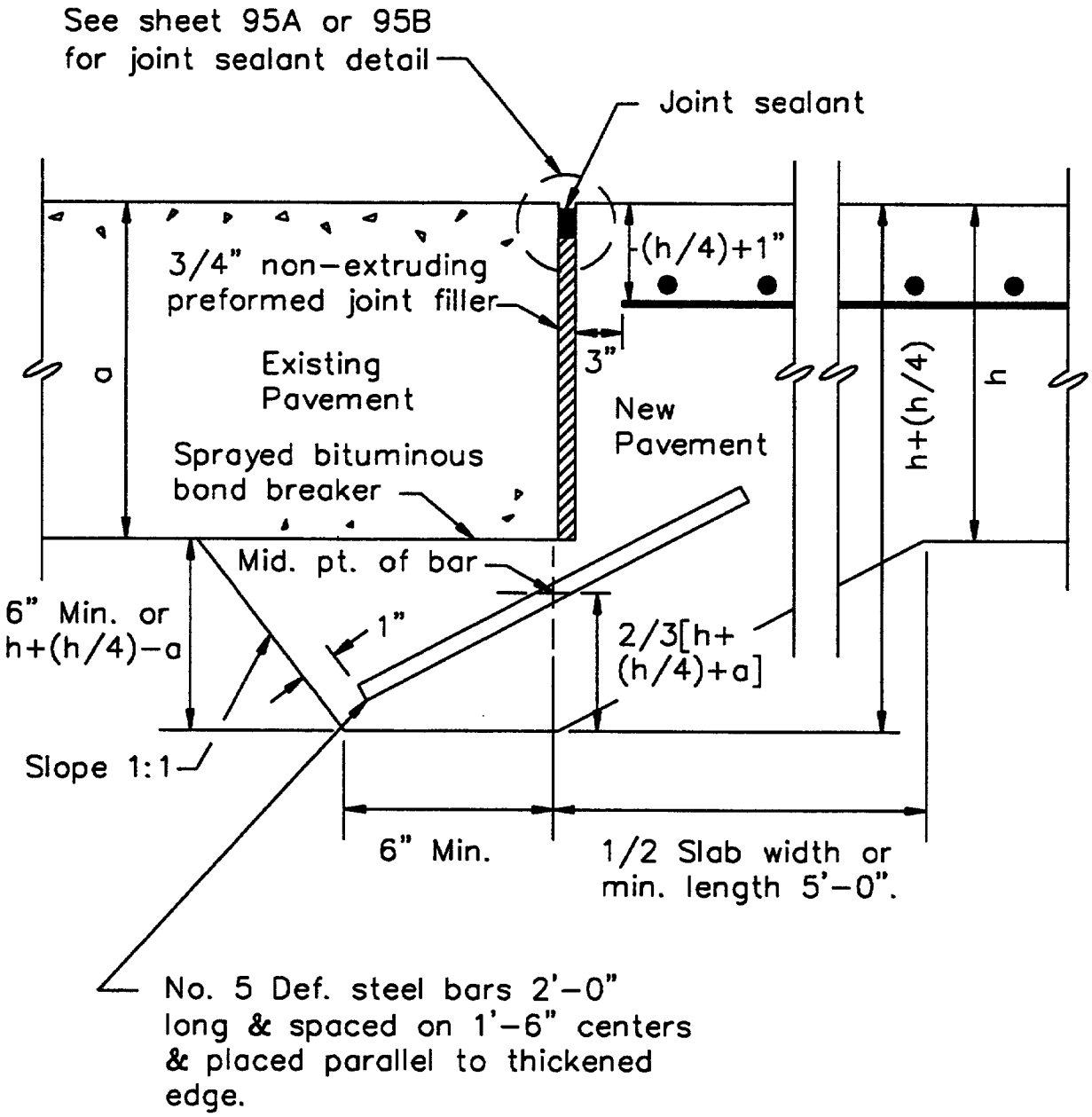



NOTE: Use this detail only under exceptional circumstances with approval of Geotechnical Branch.

# LONGITUDINAL THICKENED EDGE CONSTRUCTION JOINT (LTE)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-7A<br>100A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

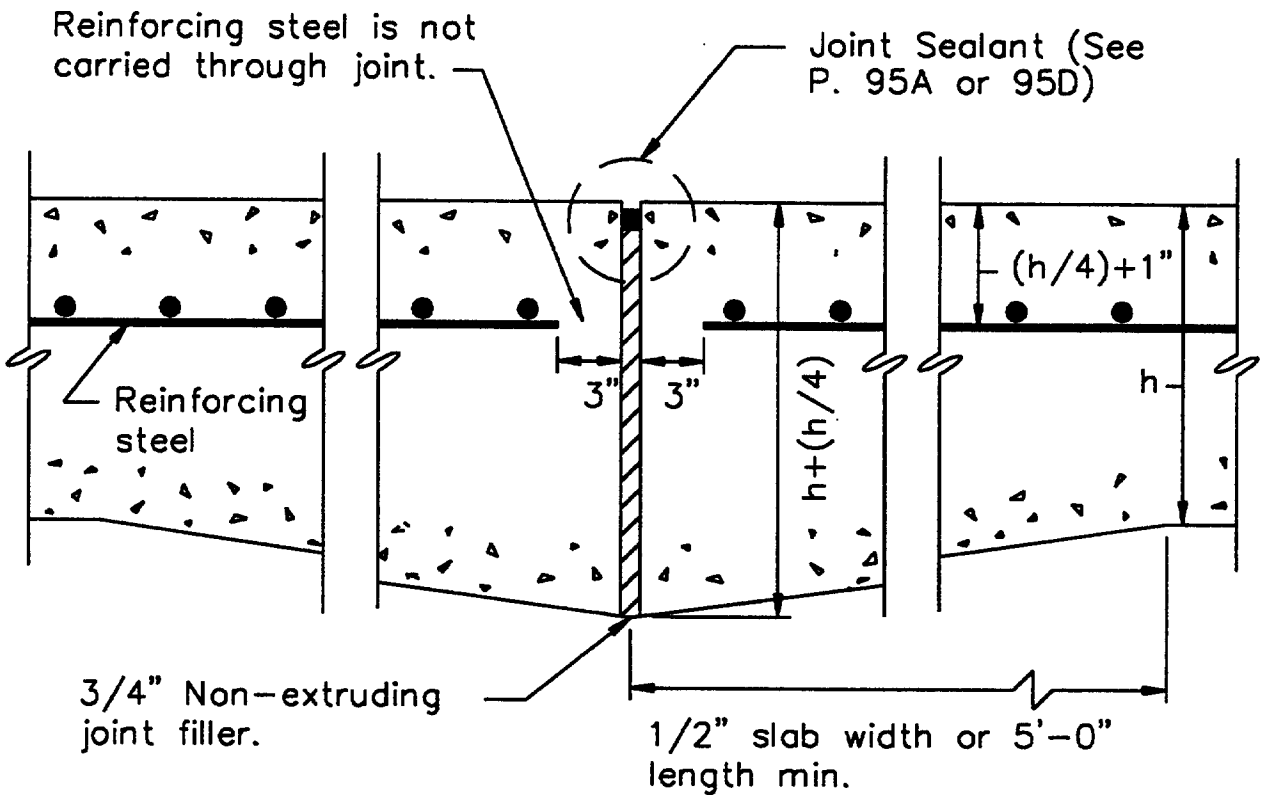



# SPECIAL EXPANSION JOINT (SEJ) BETWEEN NEW AND EXISTING PAVEMENT

## (TRANSVERSE OR LONGITUDINAL)

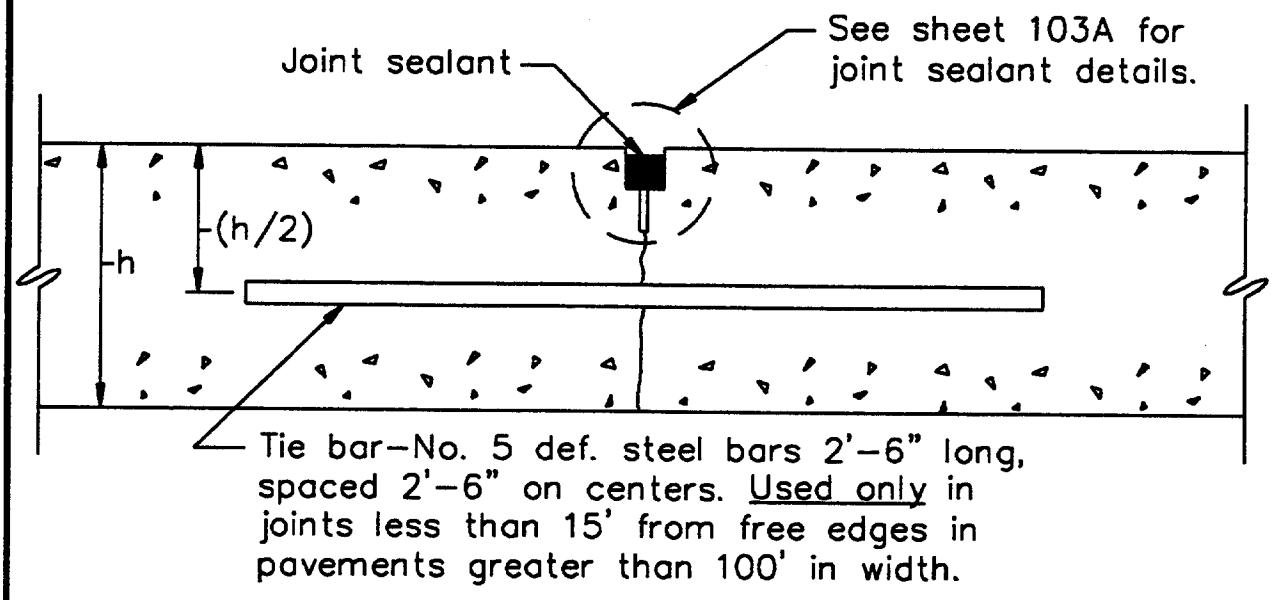
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY. 90<br>REINFORCED AIRCRAFT RIGID PAVEMENT JOINT DETAILS | P-8<br>101 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

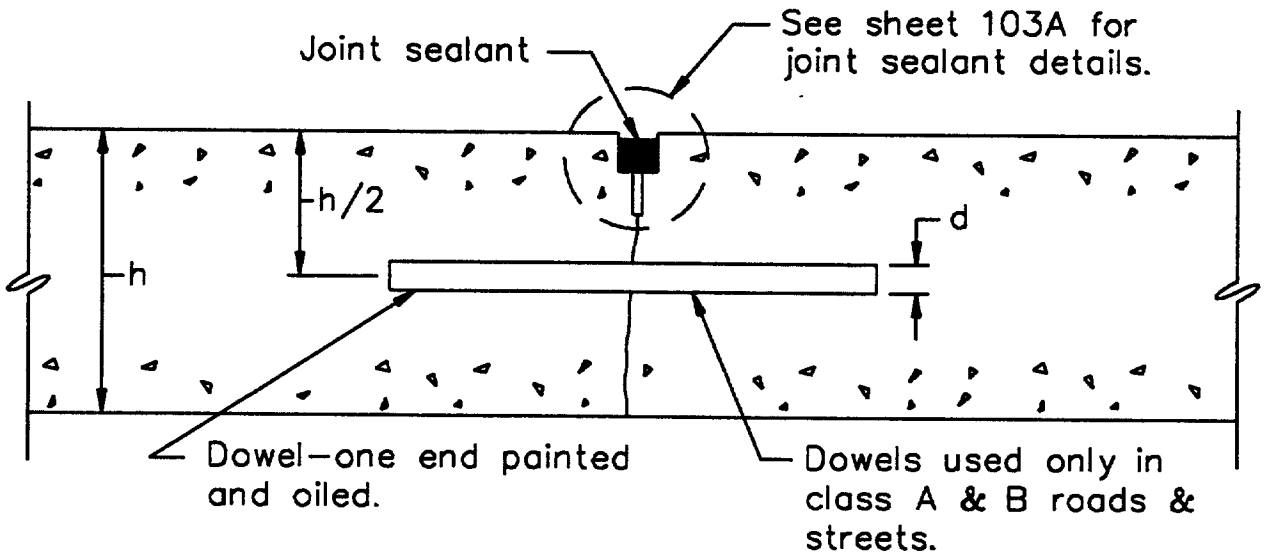



# EXPANSION JOINT (EJ)

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




LONGITUDINAL




TRANSVERSE

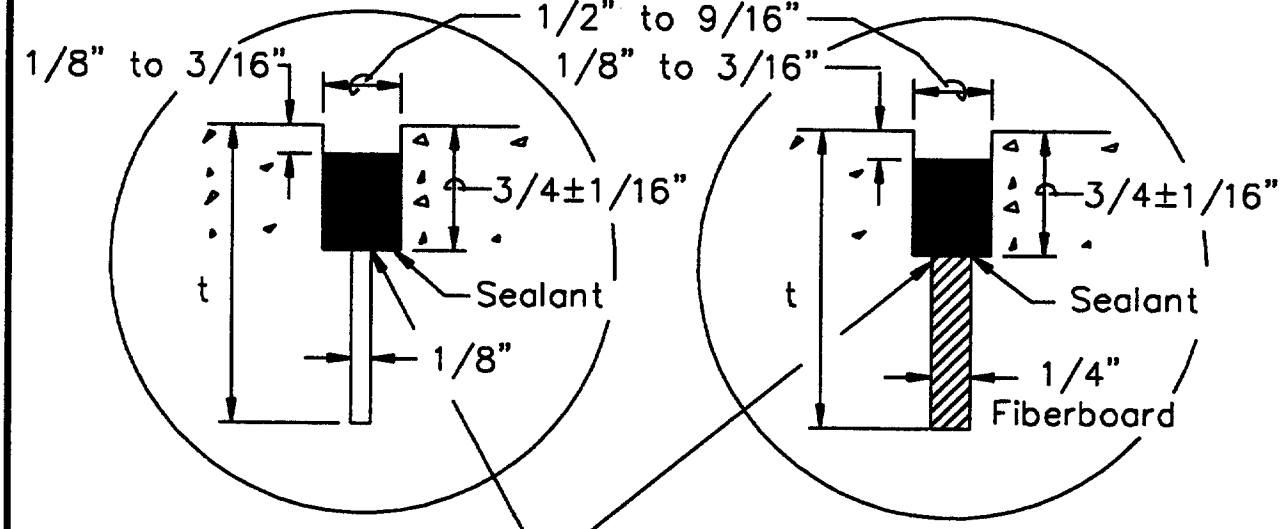
NOTE:

Designer to refer to TM5–822–6 for design info.

# CONTRACTION JOINTS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON–REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P–10<br>103 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

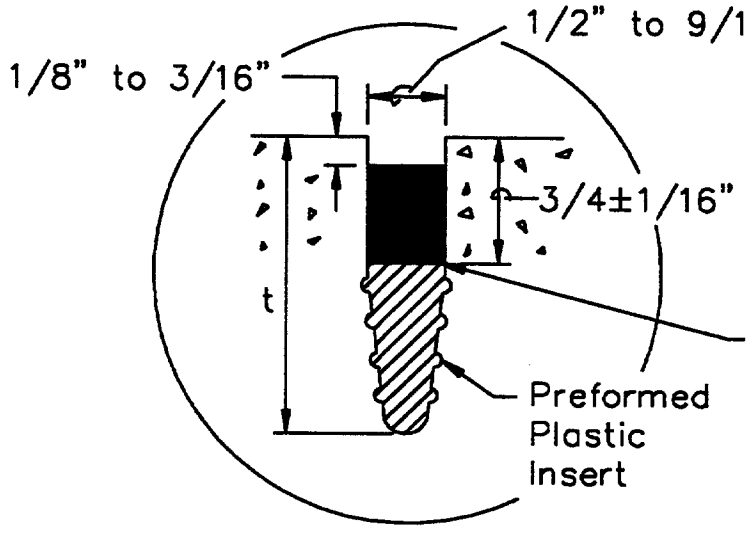



SAWED

Non-absorptive separation medium will be used between joint sealant & underlying material.

FIBERBOARD FILLER

NOTE: Only sawn contraction joints shall be used if slipform method of placement is chosen. When allowed, longitudinal contraction joints shall be sawn only.



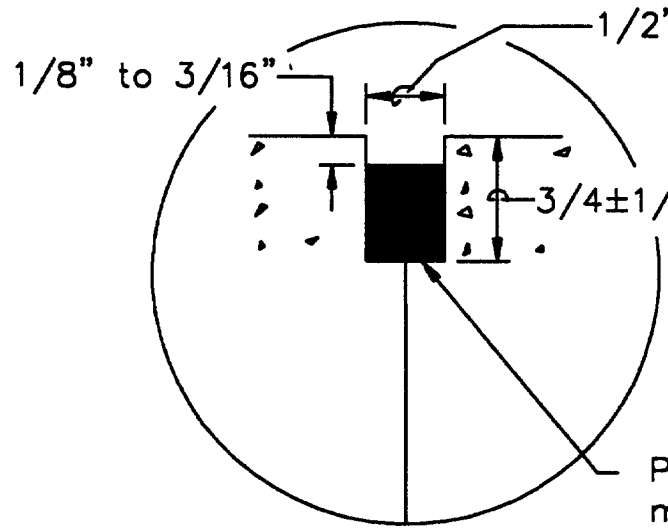

Non-absorptive separation medium will be used between joint sealant & underlying material.

PREFORMED PLASTIC INSERT

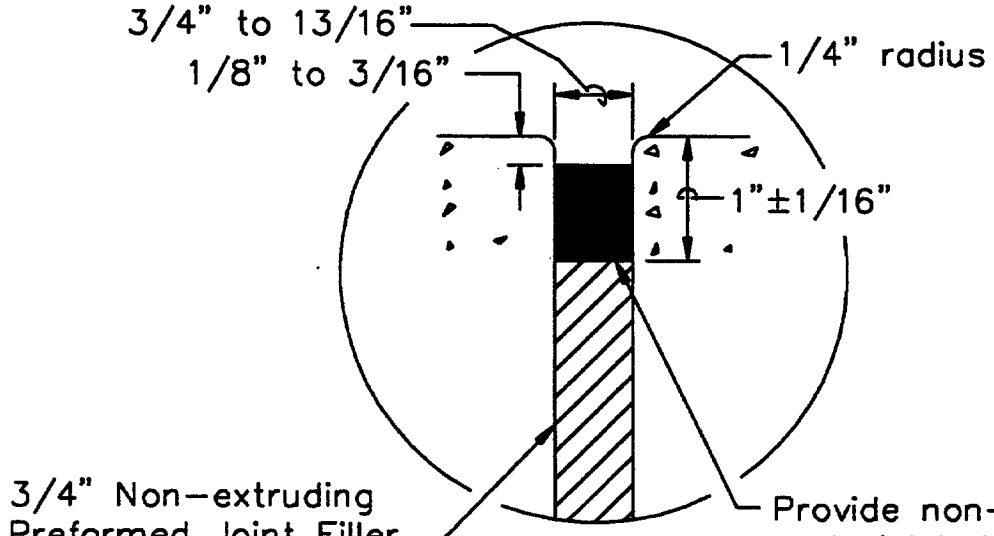
# CONTRACTION JOINTS
# POURED-IN-PLACE JOINT SEALANT

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-10A<br>103A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




CONSTRUCTION JOINT SEALANT DETAIL



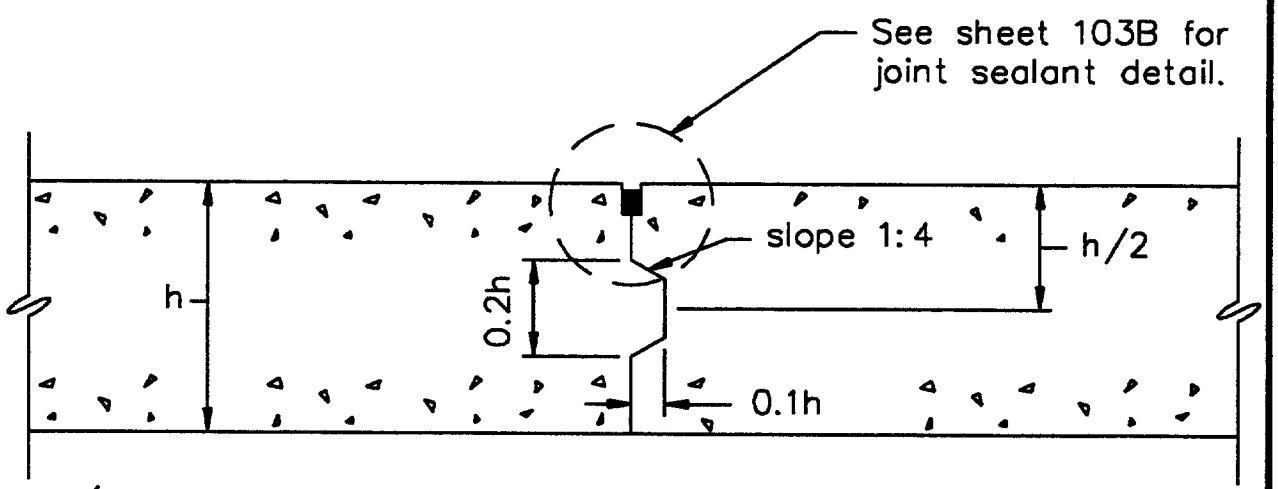

EXPANSION JOINT SEALANT DETAIL

# EXPANSION JOINTS

# POURED-IN-PLACE JOINT SEALANT

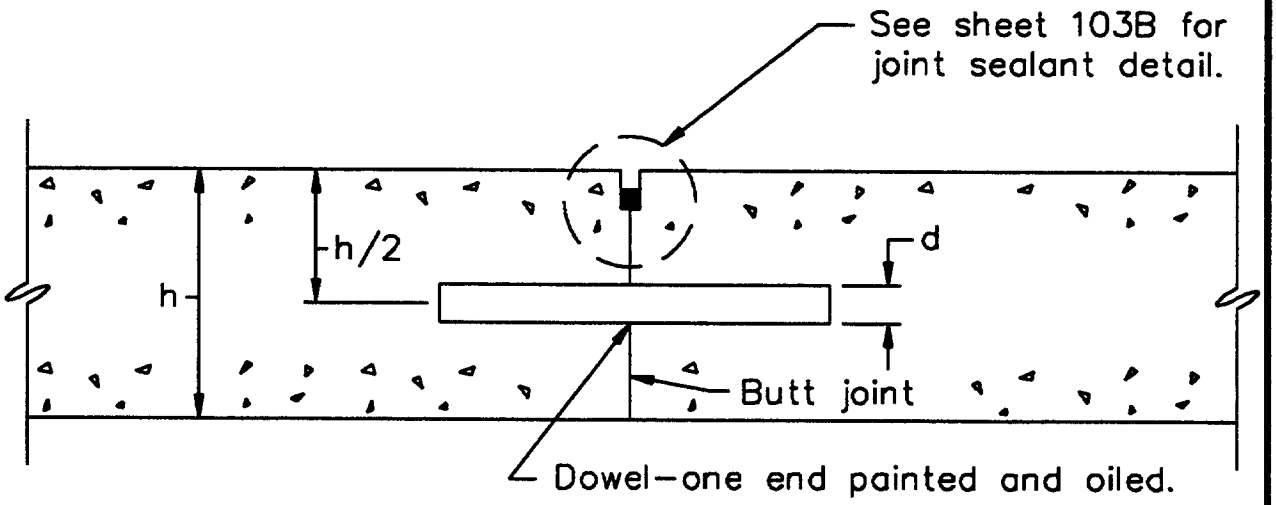
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-10B<br>103B |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




(Limited to 9 inches or more in thickness.)

KEYED LONGITUDINAL




NOTE: See TM5–822–6, for design information.

(Use only on pavements less than 9" thickness or Class A or B traffic.)

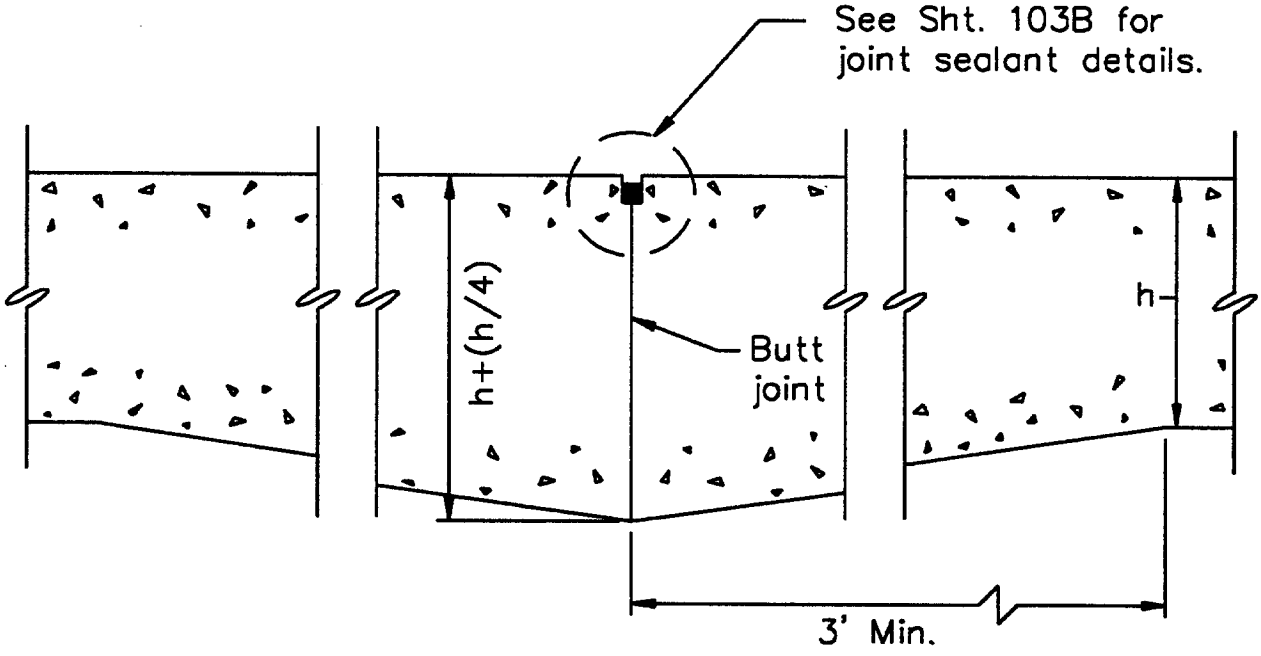
DOWELED TRANSVERSE OR LONGITUDINAL

# CONSTRUCTION JOINTS

(KEYED or DOWELED)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON–REINFORCED VEHICULAR PAVEMENT JOINT DETAILS | P–11<br>104 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



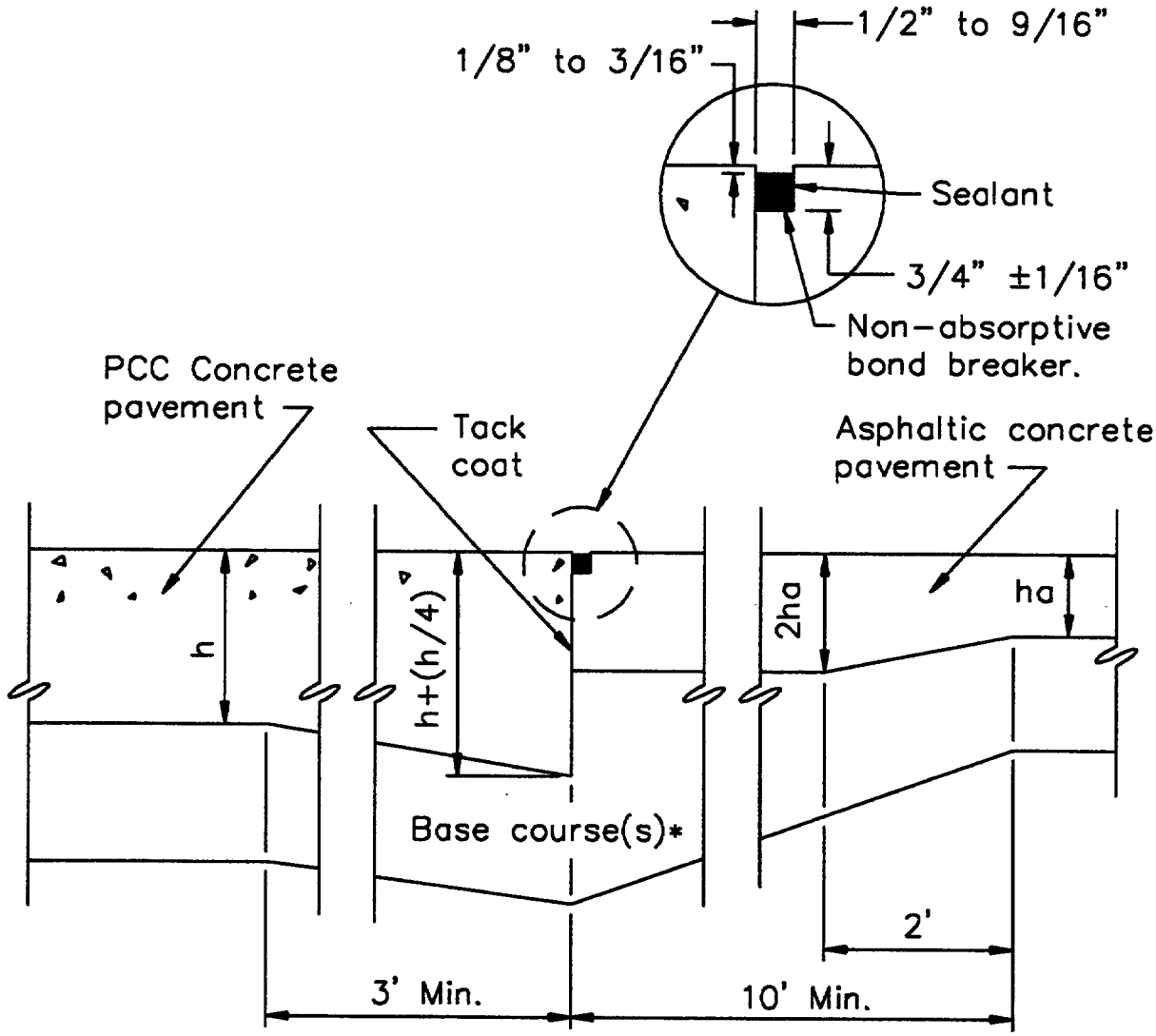

(Not for general use. Use only under exceptional circumstances, with approval of Geotechnical Branch)

# CONSTRUCTION JOINT

## (THICKENED EDGE LONGITUDINAL)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-11A<br>104A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



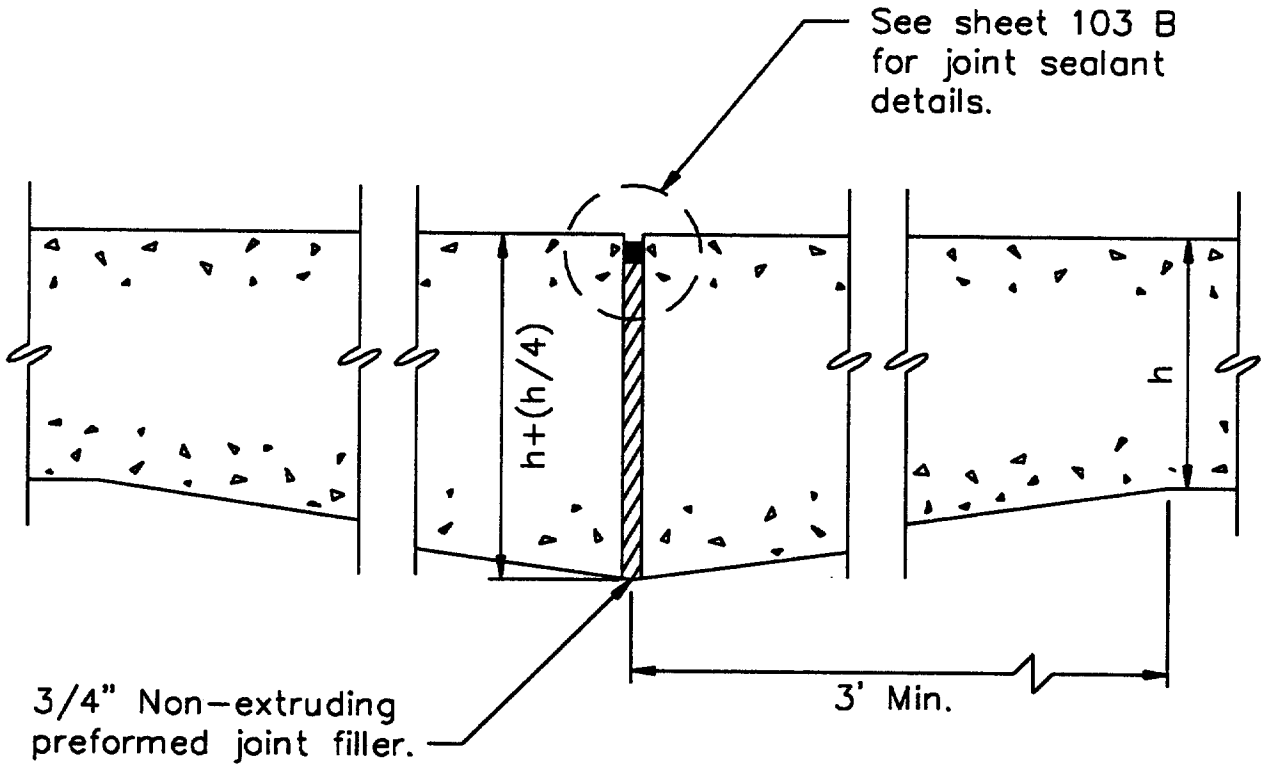

*See geotechnical report for thickness of base course(s).

## CONSTRUCTION JOINT

## (ASPHALTIC CONCRETE TO CONCRETE)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-11B<br>104B |

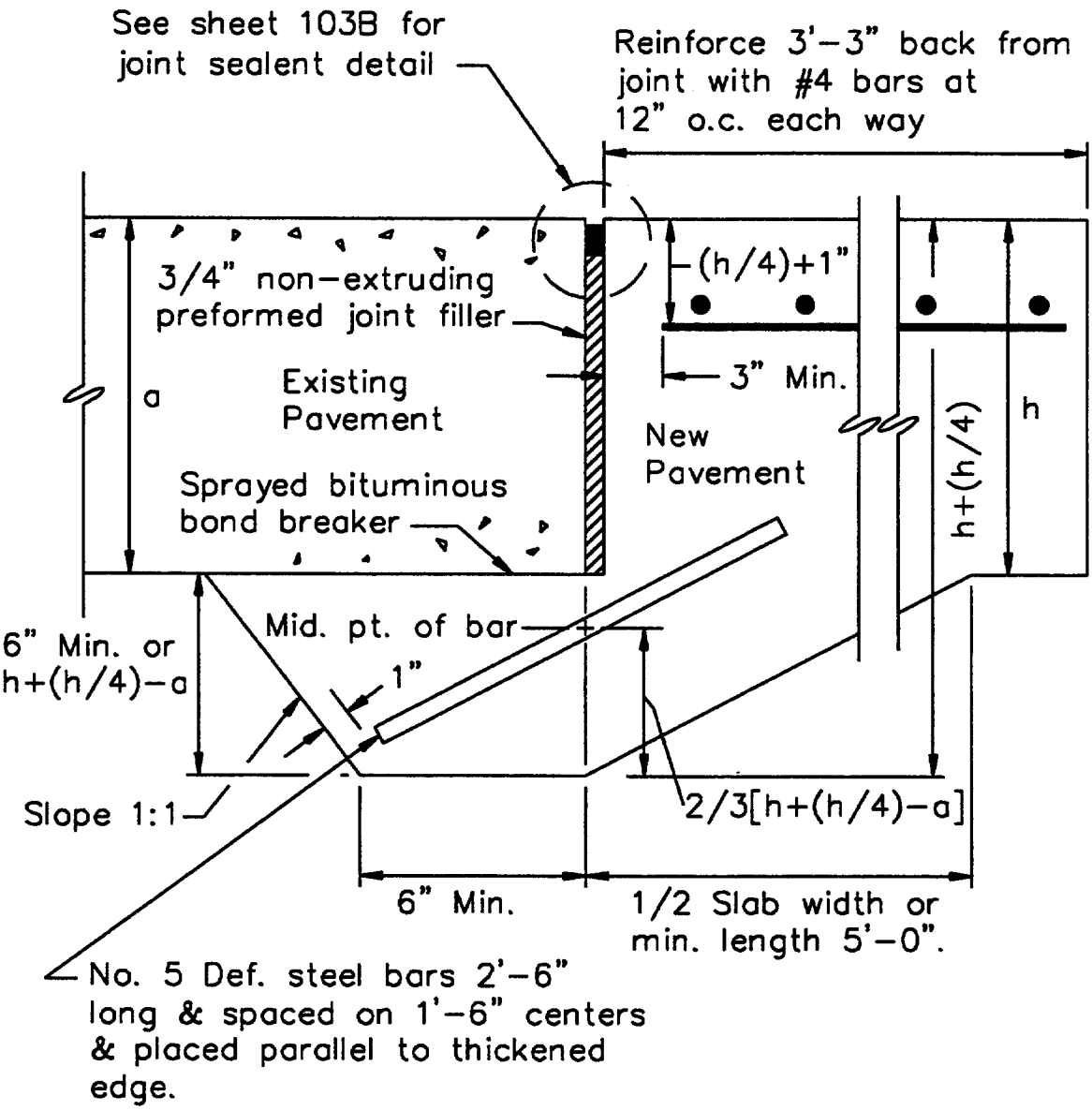
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




# EXPANSION JOINT (EJ)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-12<br>105 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

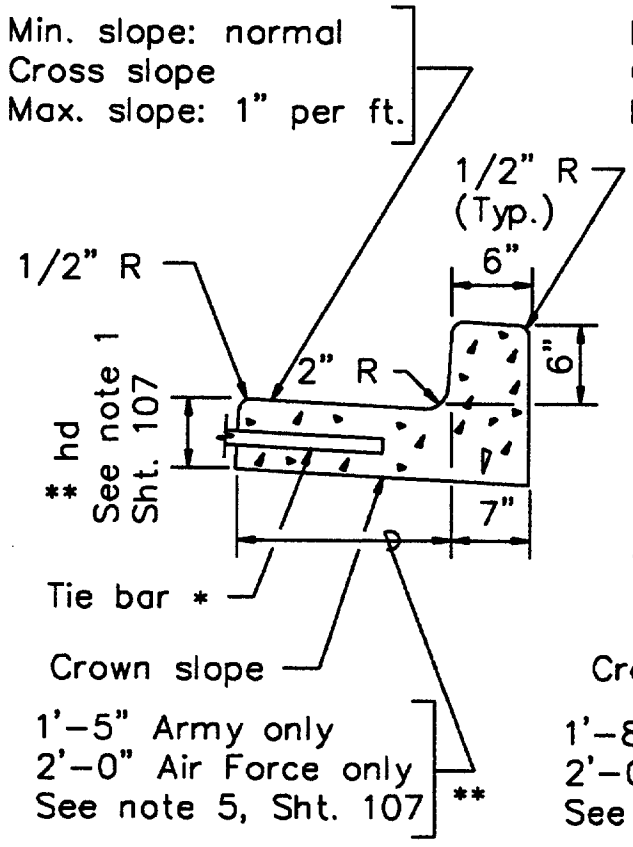



# SPECIAL EXPANSION JOINT (SEJ) BETWEEN NEW AND EXISTING PAVEMENT

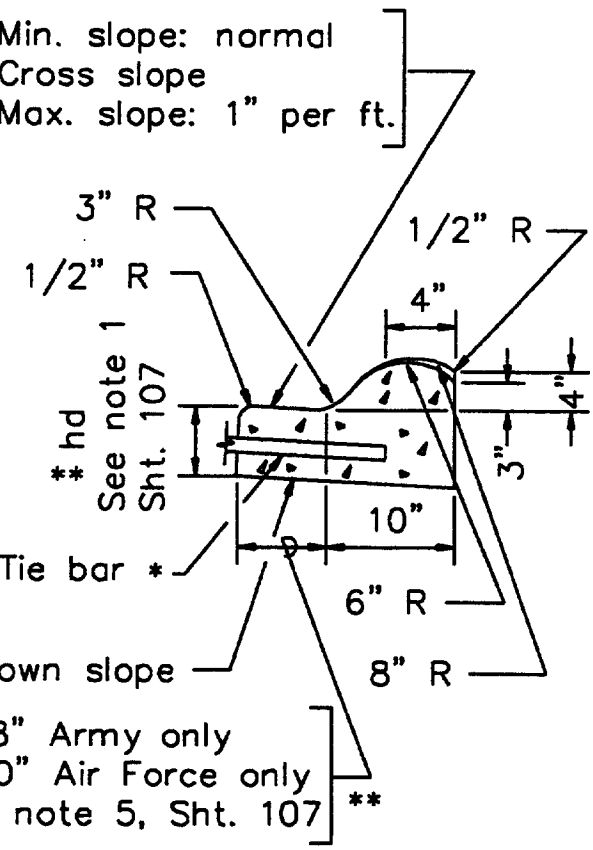
## (TRANSVERSE OR LONGITUDINAL)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-12A<br>105A |

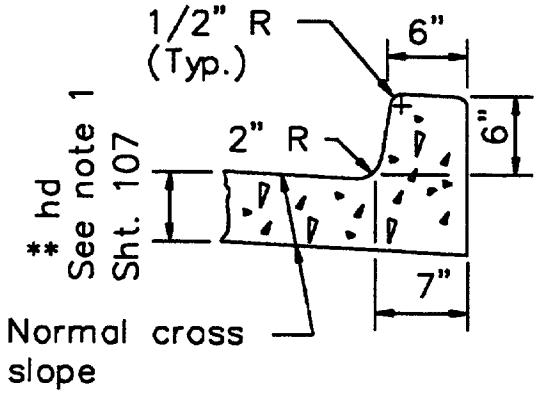
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




TYPE I BARRIER




TYPE II MOUNTABLE




TYLE III BARRIER

NOTES:

* See note 2, Sht. 107

** Insert the appropriate dimension and delete other dimension and wording.

# CURB AND GUTTER DETAILS
## (RIGID PAVEMENT)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAR. 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-13<br>106 |

# NOTES

1. $h_d$ is thickness determined from rigid pavement design curve for the design wheel load but not less than minimum thickness for roads and streets.

2. No. 5 deformed steel bars 2'– 0" long and spaced 2'– 6" on center required at juncture of combined curb and gutter and rigid pavement.

3. Transverse joint in curb and gutter will match transverse joints in road and street pavement.

4. Types 1, 11 & 111 combined curb and gutter construction will not have tie bars when the gutter is adjacent to a flexible pavement.

5. The gutter section or combined curb and gutter for Air Force facilities shall have a minimum width of 24", measured from face of curb as indicated

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

# CONCRETE JOINT LEGEND

## EXPANSION JOINT

——— EJ ——— EXPANSION JOINT

———SEJ——— SPECIAL EXPANSION JOINT

## CONSTRUCTION JOINT (CJ)

——— K ——— LONGITUDINAL KEYED JOINT

——— D ——— LONGITUDINAL & TRANSVERSE DOWELED JOINT

———LTE——— LONGITUDINAL THICKENED EDGE JOINT

—┼—┼—┼—┼—┼— JOINT WITH TIE-BAR

## CONTRACTION JOINT (CTJ)

— — —LTE— — — SAWED, FIBERBOARD,OR PREFORMED PLASTIC INSERT JOINT

—┼┼—┼┼—┼┼— JOINT WITH TIE-BAR

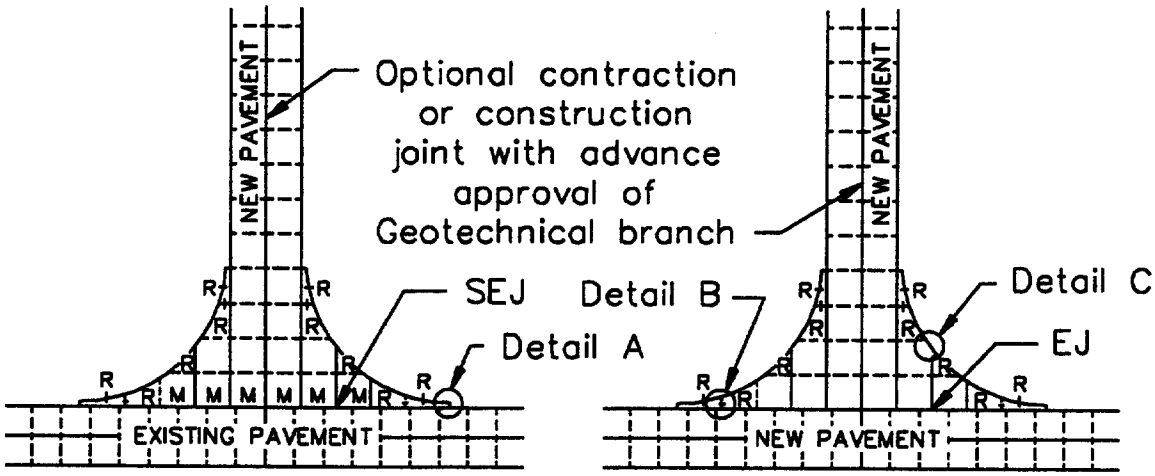
— — — TD — — — TRANSVERSE JOINT WITH DOWEL

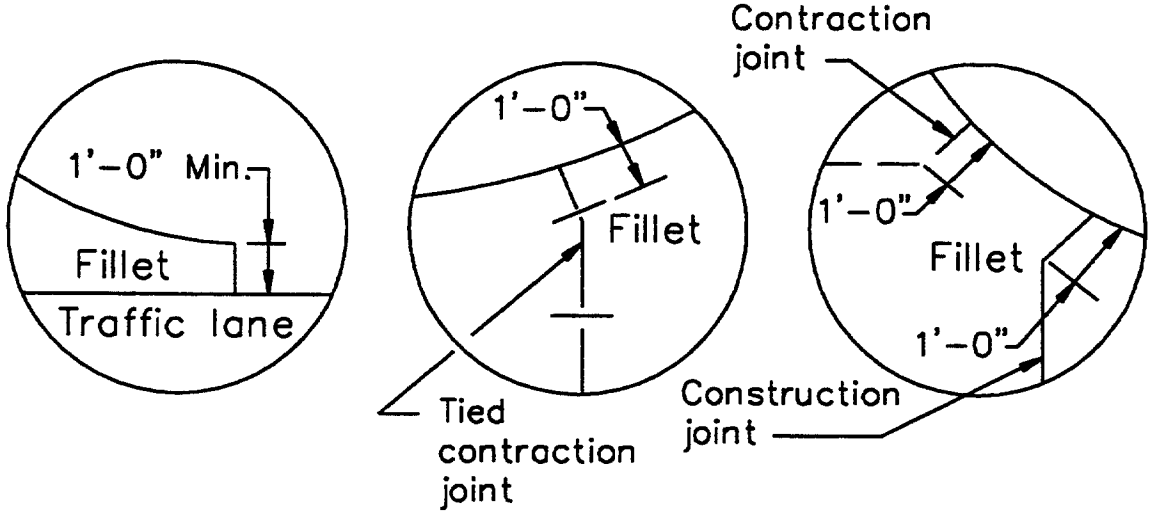
(R) REINFORCED ODD SHAPED SLAB (#4 @ 12"O.C. EA. WAY)

(M) REINFORCED MISMATCHED JOINT (#4 @ 12"O.C. EA. WAY FOR 3'-3" BACK FROM JOINT )

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-14A<br>107A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



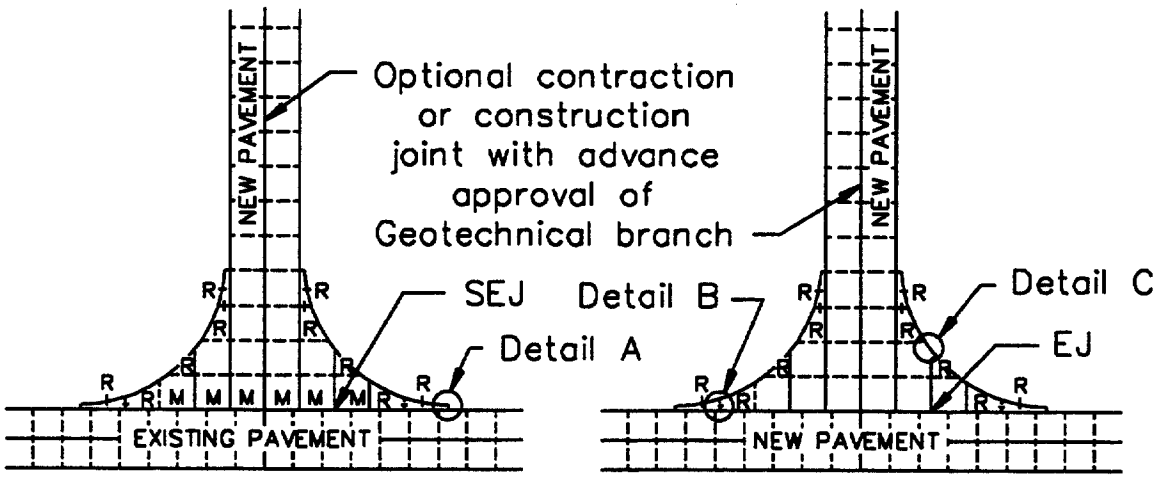

DETAIL A DETAIL B DETAIL C

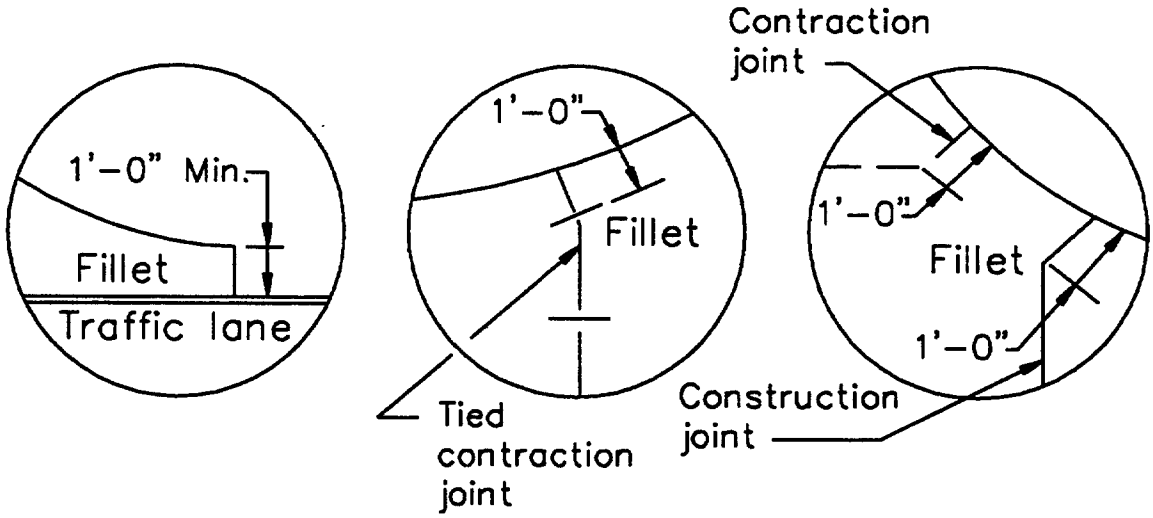
NOTE: See sheet 107A for legend info.

# TYPICAL JOINT LAYOUT

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-14B<br>107B |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




DETAIL A DETAIL B DETAIL C

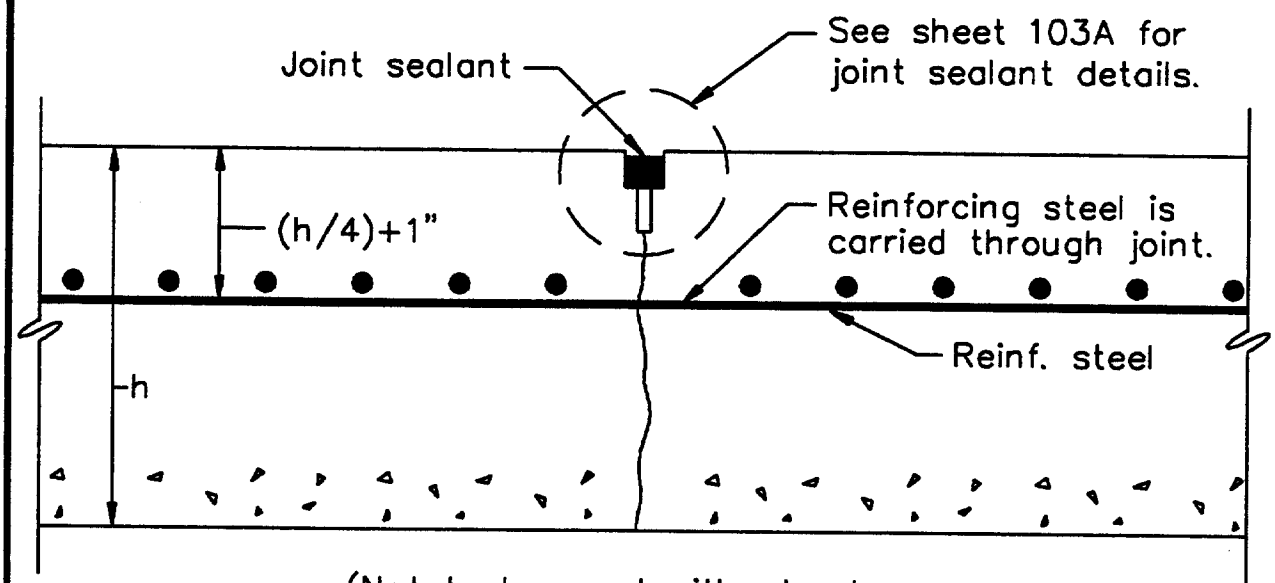
## LEGEND

| | | | |
|---|---|---|---|
| ——— | Construction joints | M | Reinf. mismatched joints (#4 rebar @ 12" O.C. for 3'-3" back from joint each way) |
| - - - - - | Contraction joints | | |
| -\|--\|- | Tied contraction joint | | |
| R | Reinf. odd shaped slabs (#4 rebar @ 12" O.C. each way) | EJ | Expansion joint |
| | | SEJ | Special expansion joint |

# TYPICAL JOINT LAYOUT

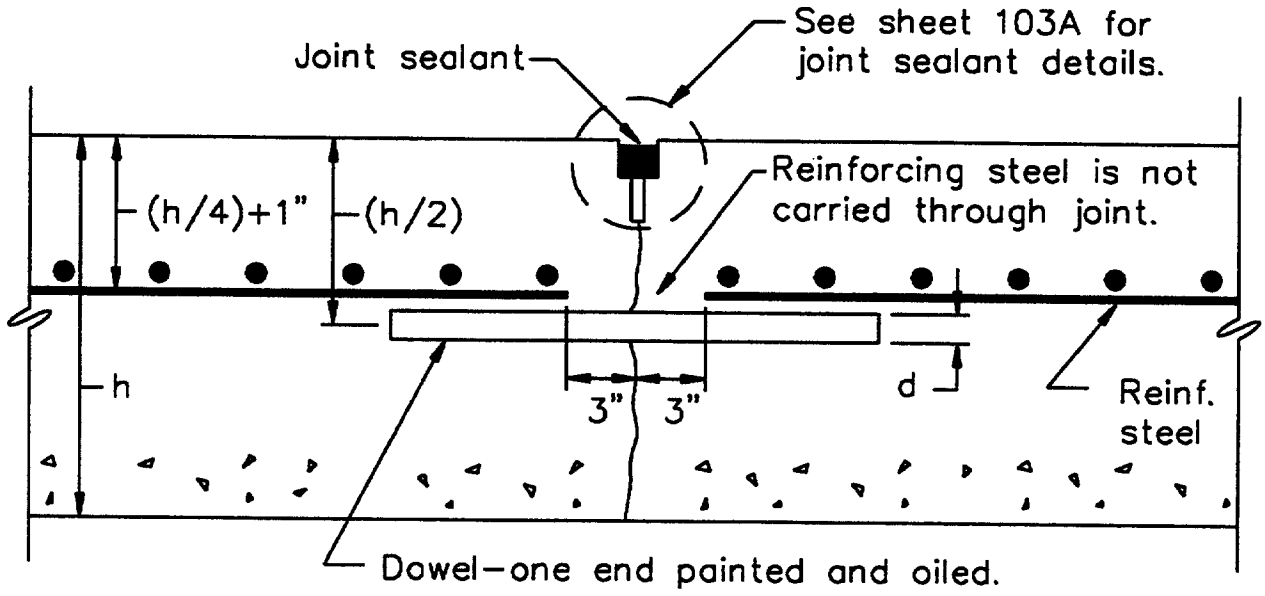
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-14C<br>107C |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




(Not to be used without advance approval of Geotechnical Branch.)

LONGITUDINAL



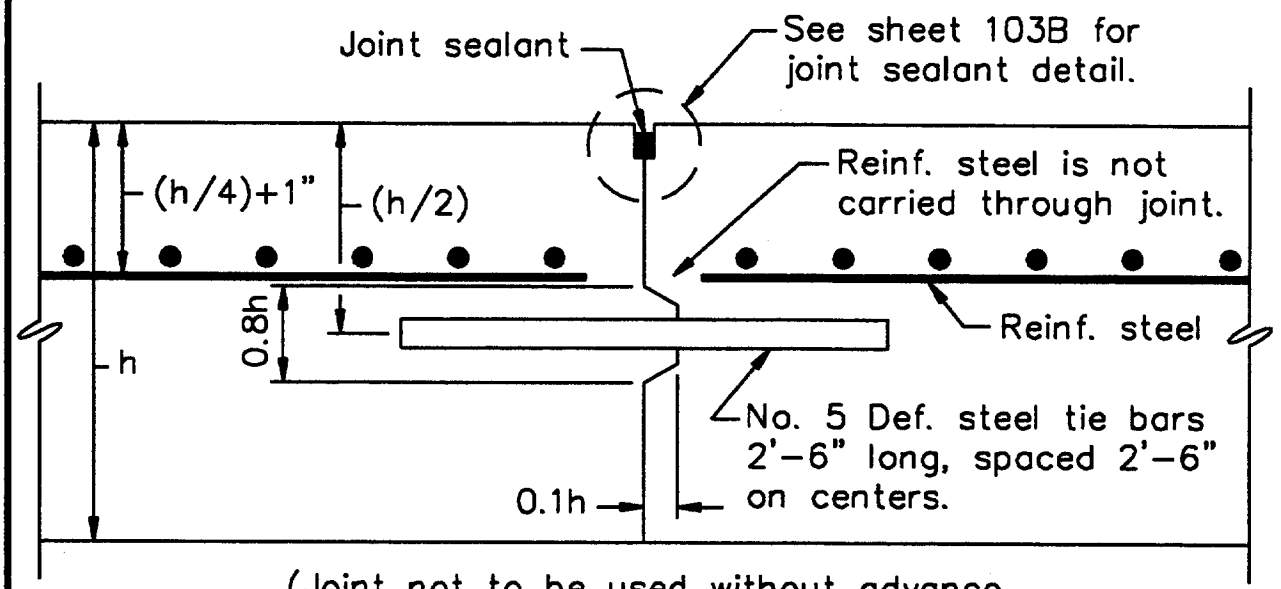

NOTE: See TM5–822–6 for design information.

TRANSVERSE

# CONTRACTION JOINTS – DOWELED

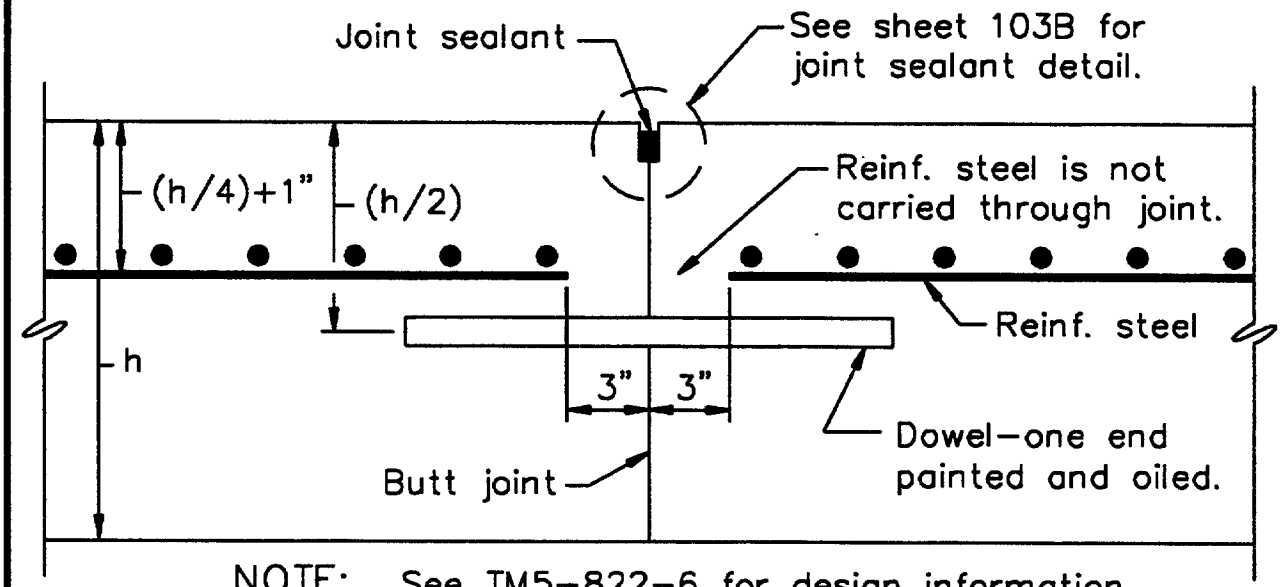
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P–15<br>108 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




(Joint not to be used without advance approval of Geotechnical Branch.)

KEYED LONGITUDINAL




NOTE: See TM5-822-6 for design information.

DOWELED TRANSVERSE OR LONGITUDINAL

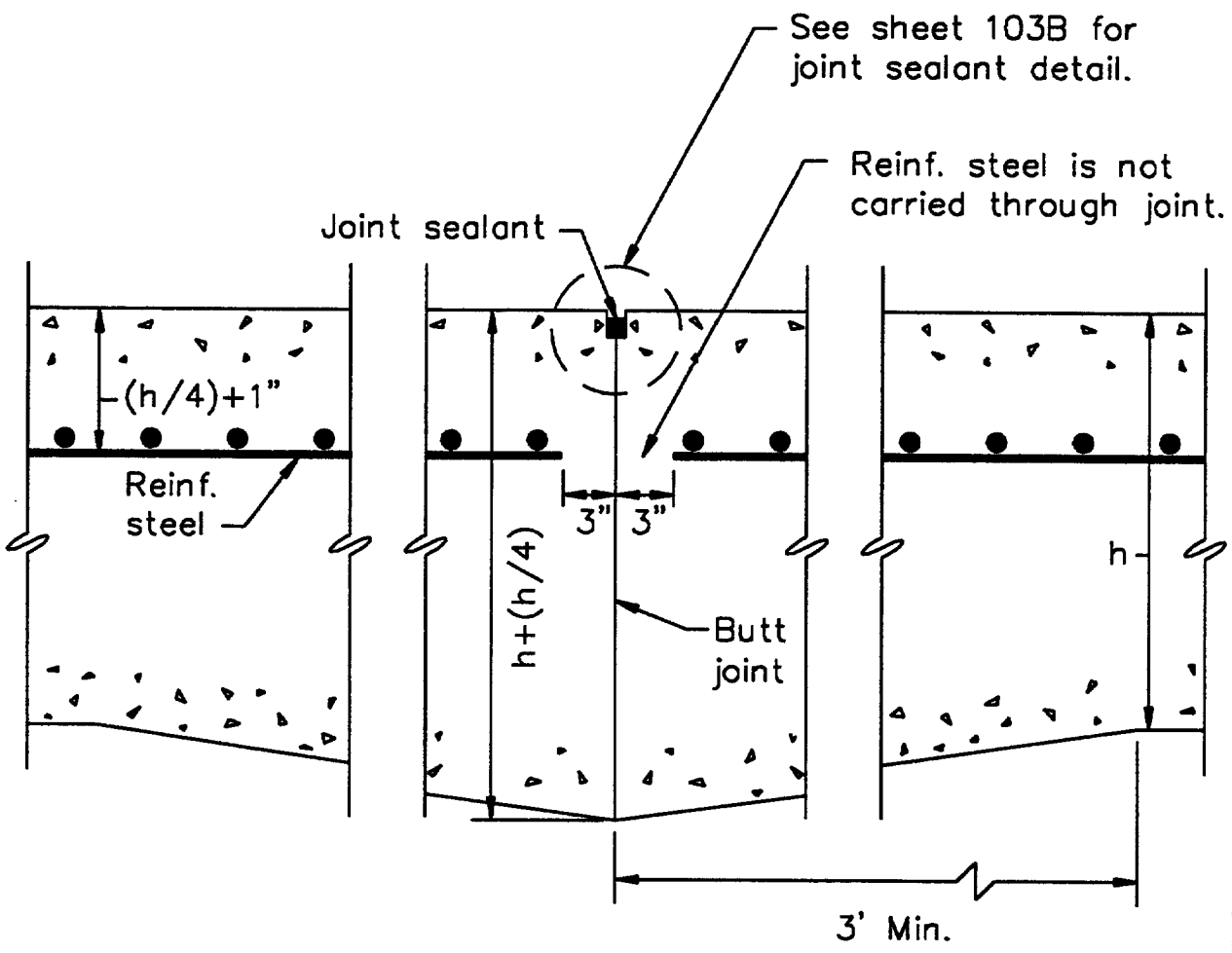
This detail will be used when a transverse construction joint is required at a regularly scheduled transverse construction joint, in addition to longitudinal joint.

# CONSTRUCTION JOINTS

(KEYED or DOWELED)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-16<br>109 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



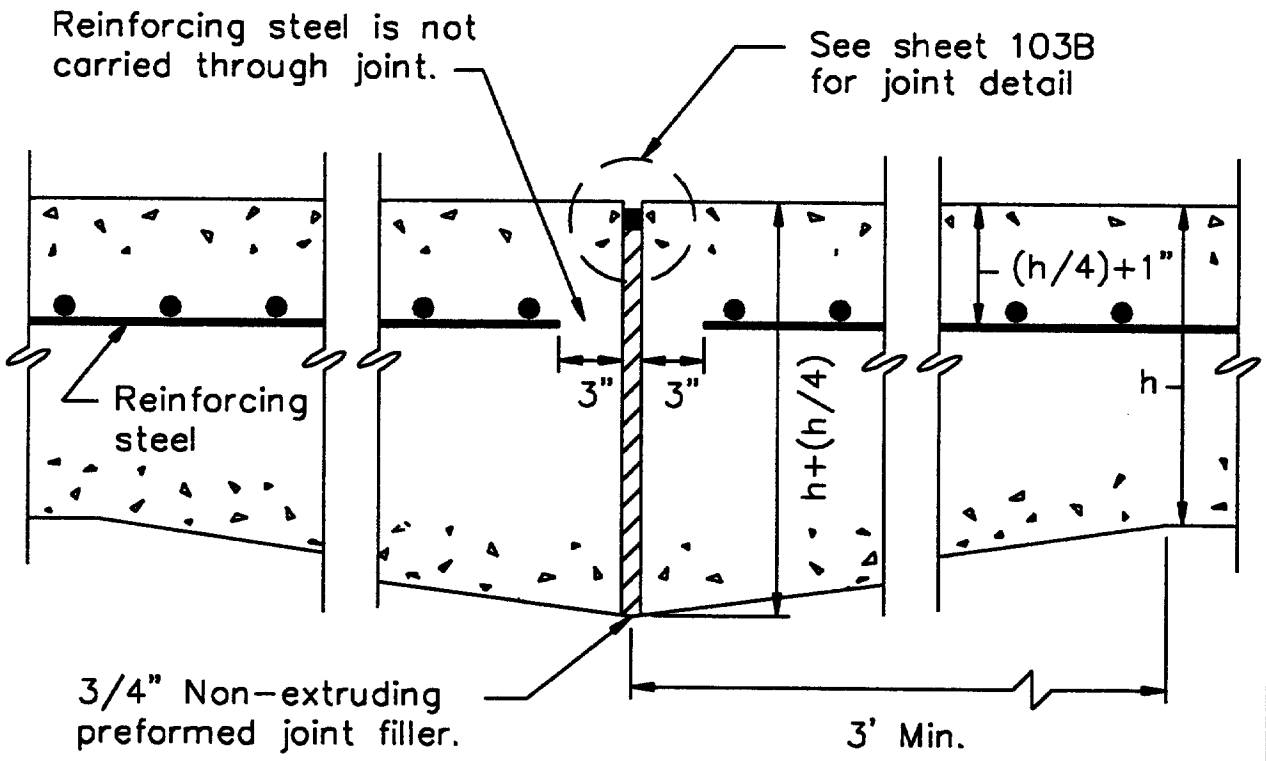

NOTE: Not for general use. Use only under exceptional circumstances, with the advance approval of Geotechnical Branch.

## CONSTRUCTION JOINT (LTE)

(LONGITUDINAL THICKENED EDGE)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-16A<br>109A |

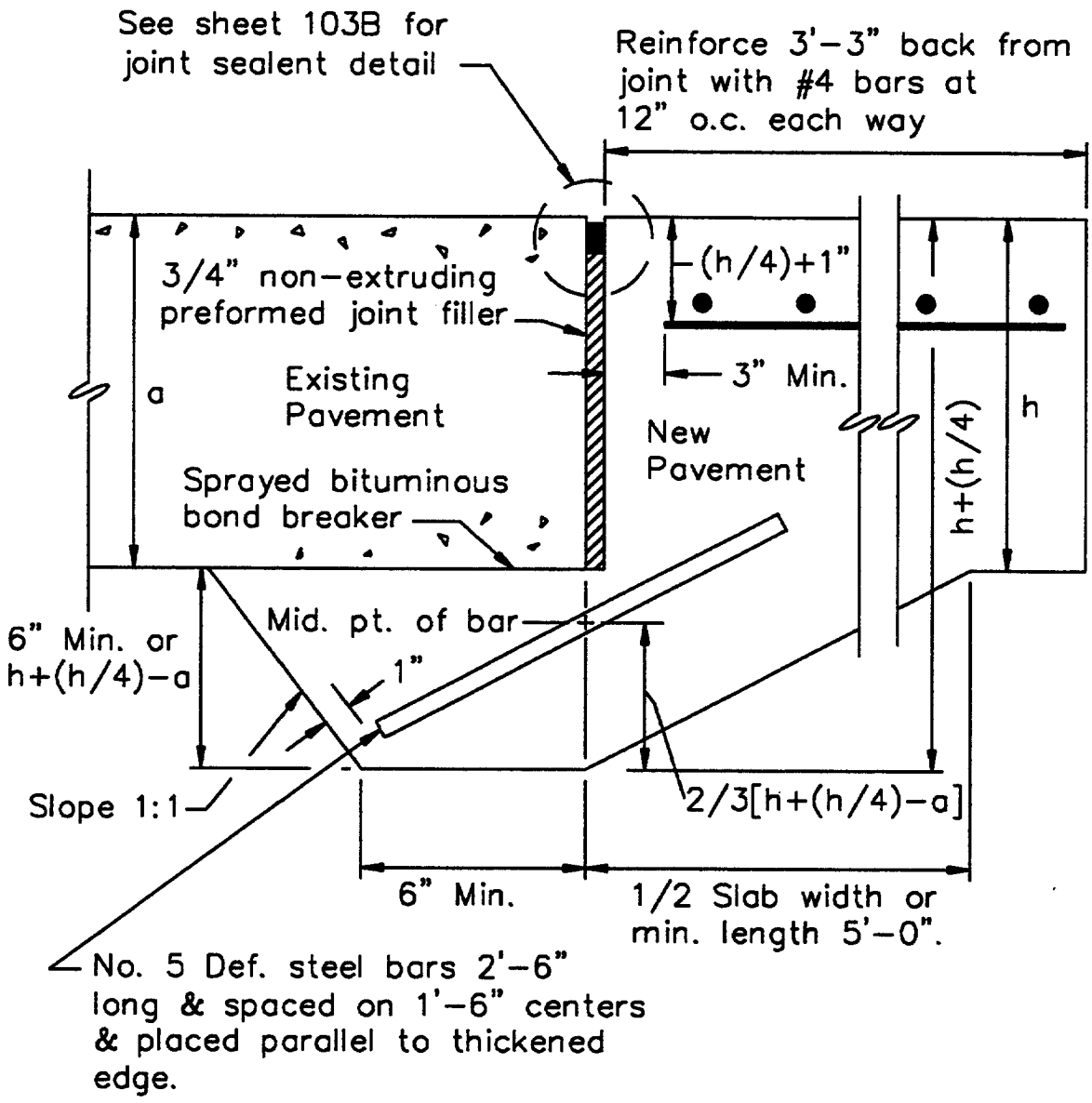
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




## EXPANSION JOINT (EJ)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-17<br>110 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

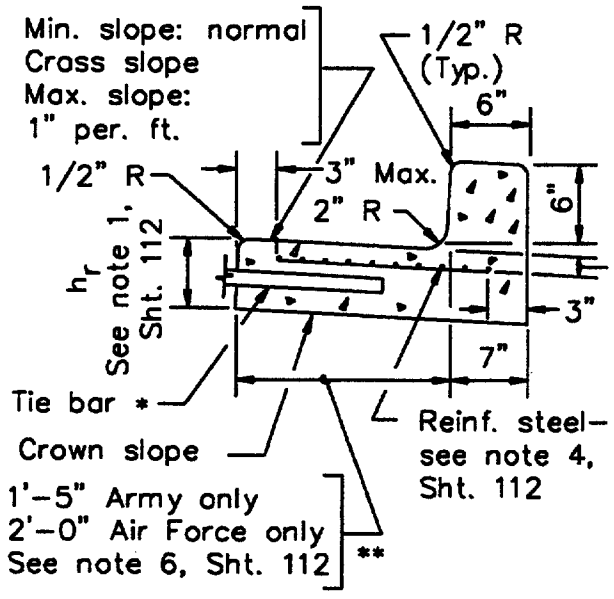



# SPECIAL EXPANSION JOINT (SEJ) BETWEEN NEW AND EXISTING PAVEMENT

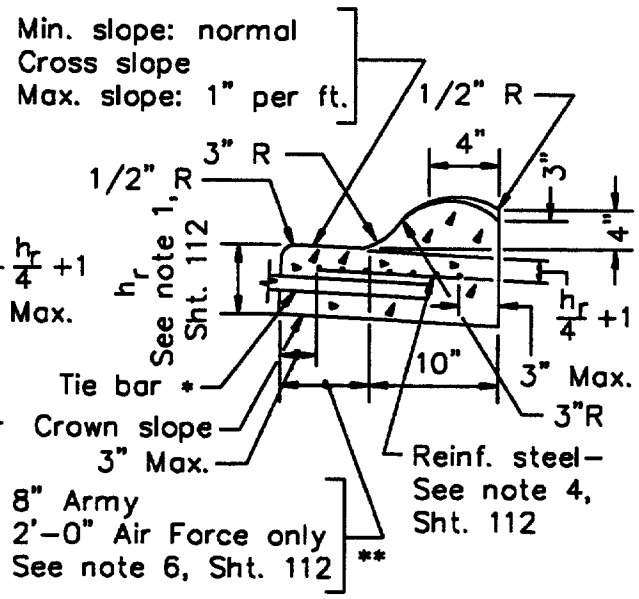
## (TRANSVERSE OR LONGITUDINAL)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS | P-17A<br>110A |

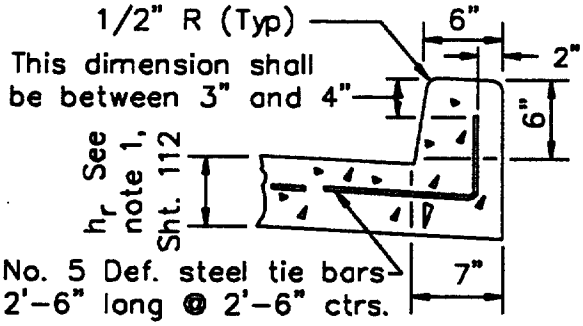
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



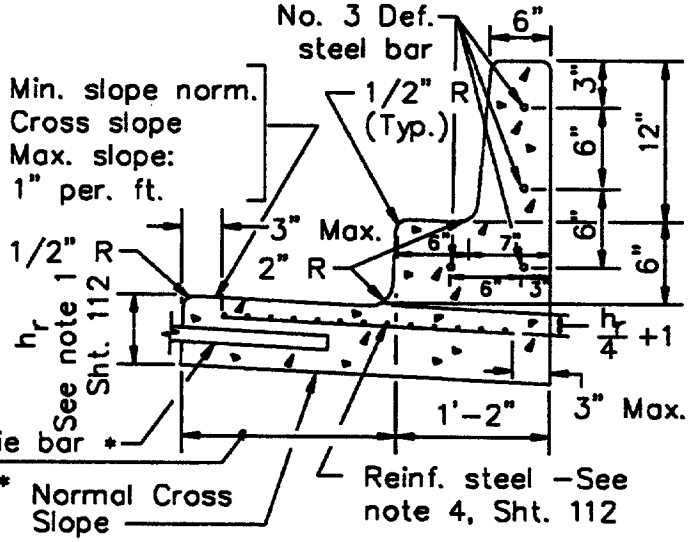

TYPE I BARRIER



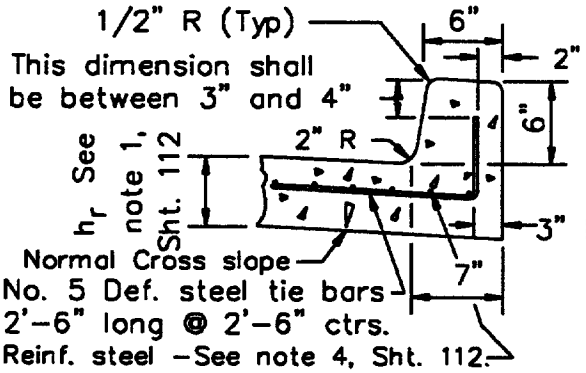

TYPE II MOUNTABLE



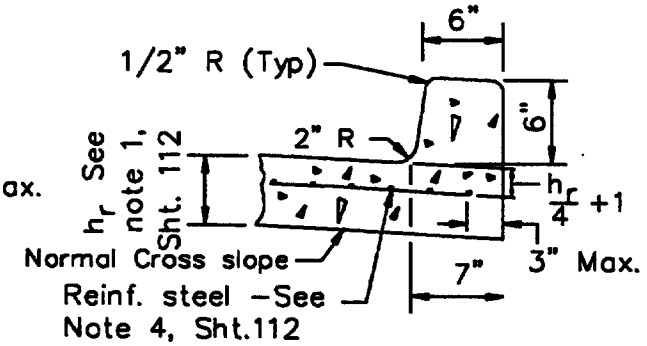

TYPE IV BARRIER




TYPE III BARRIER




TYPE V ALTERNATE BARRIER




TYPE V BARRIER

# CURB AND GUTTER DETAILS

NOTE:
** Insert the appropriate dimension and delete other dimension and wording.

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAY 90<br>REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS. | P–18<br>111 |

# NOTES

1. $h_r$ is the thickness determined from rigid pavement design curve for the design wheel load but not less than minimum thickness for roads and streets.

2. No. 5 deformed steel tie bars 2'–0" long and spaced 2'–6" on centers required at juncture of combined curb and gutter and rigid pavement.

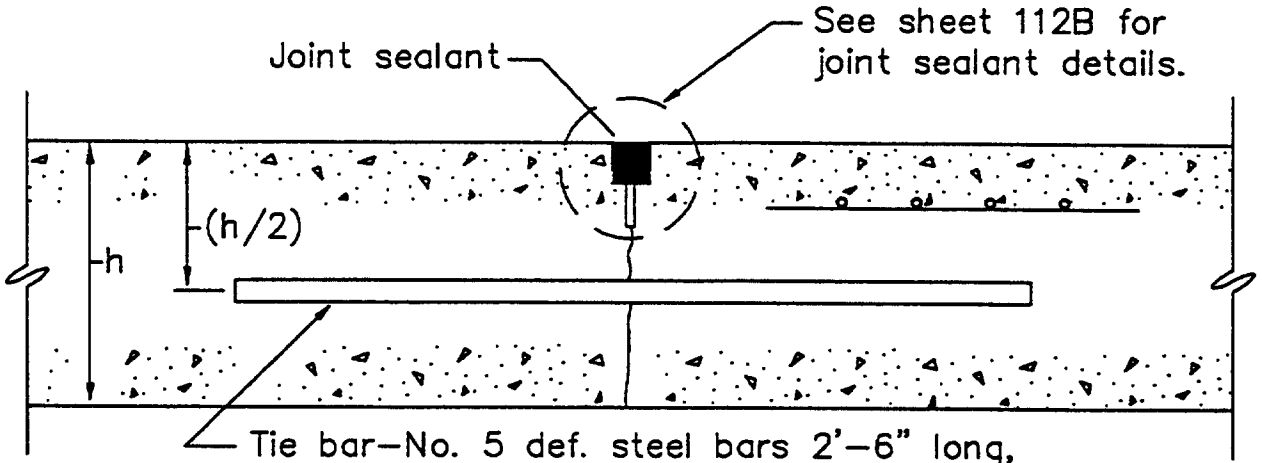
3. Transverse joints in curb and gutter will match transverse joints in road and street pavement.

4. Percent steel reinforcement will be the same as required for roads and streets. Reinforcing steel will not be carried through either transverse or longitudinal construction, contraction, or expansion joints.

5. Types I, II, & III combined curb and gutter construction and Type IV barrier curb will not have tie bars when the gutter is adjacent to a flexible pavement.

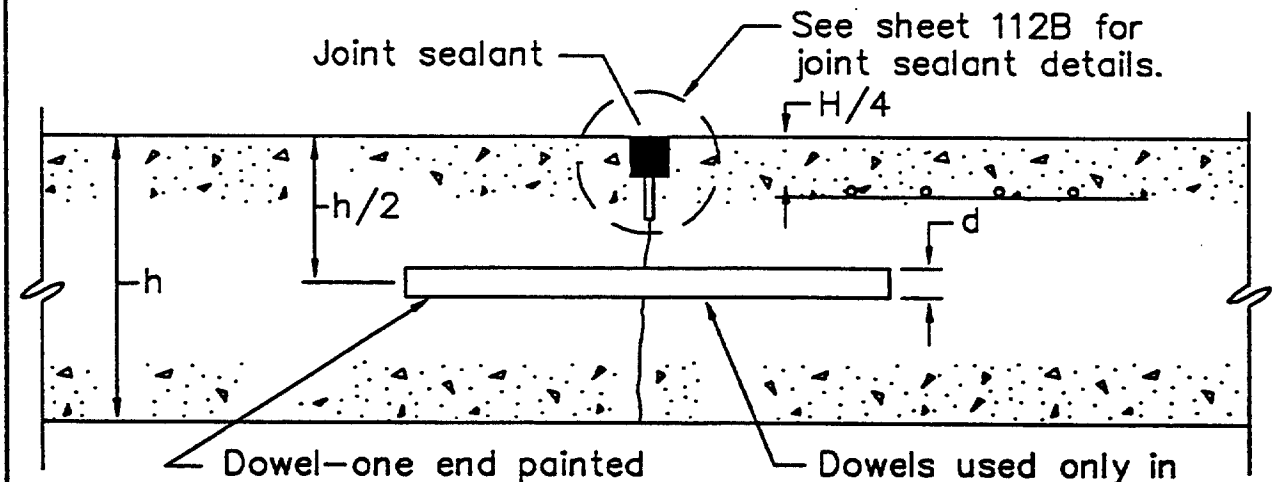
6. The gutter section of combined curb and gutter for Air Force facilities shall have a minimum width of 24", measured from face of curb as indicated.

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




Tie bar–No. 5 def. steel bars 2'–6" long, spaced 2'–6" on centers. Used only in joints less than 15' from free edges in pavements greater than 100' in width.

LONGITUDINAL




Dowel–one end painted and oiled.

Dowels used only in class A & B roads & streets.

TRANSVERSE

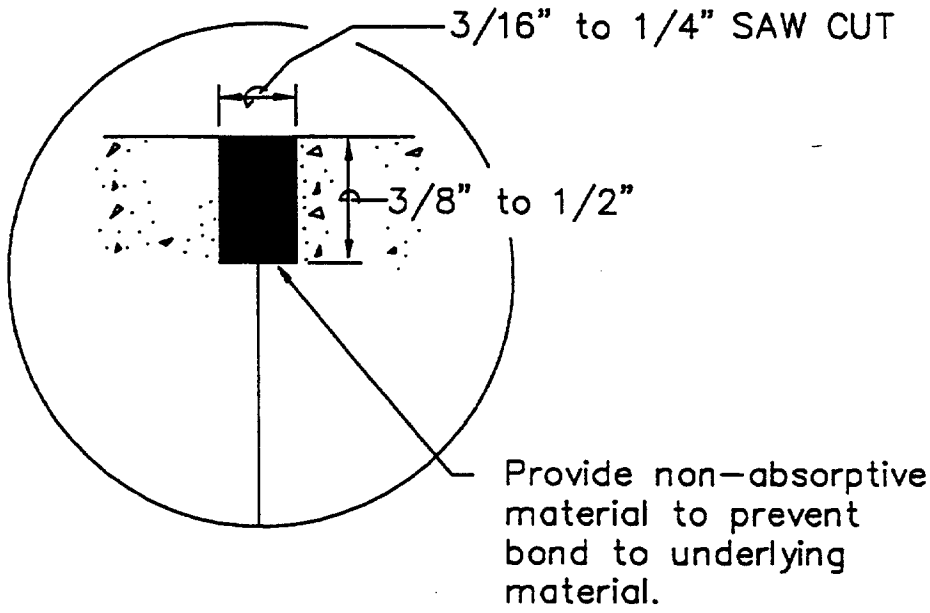
NOTE:

Designer to refer to TM5–809–12 for design info.

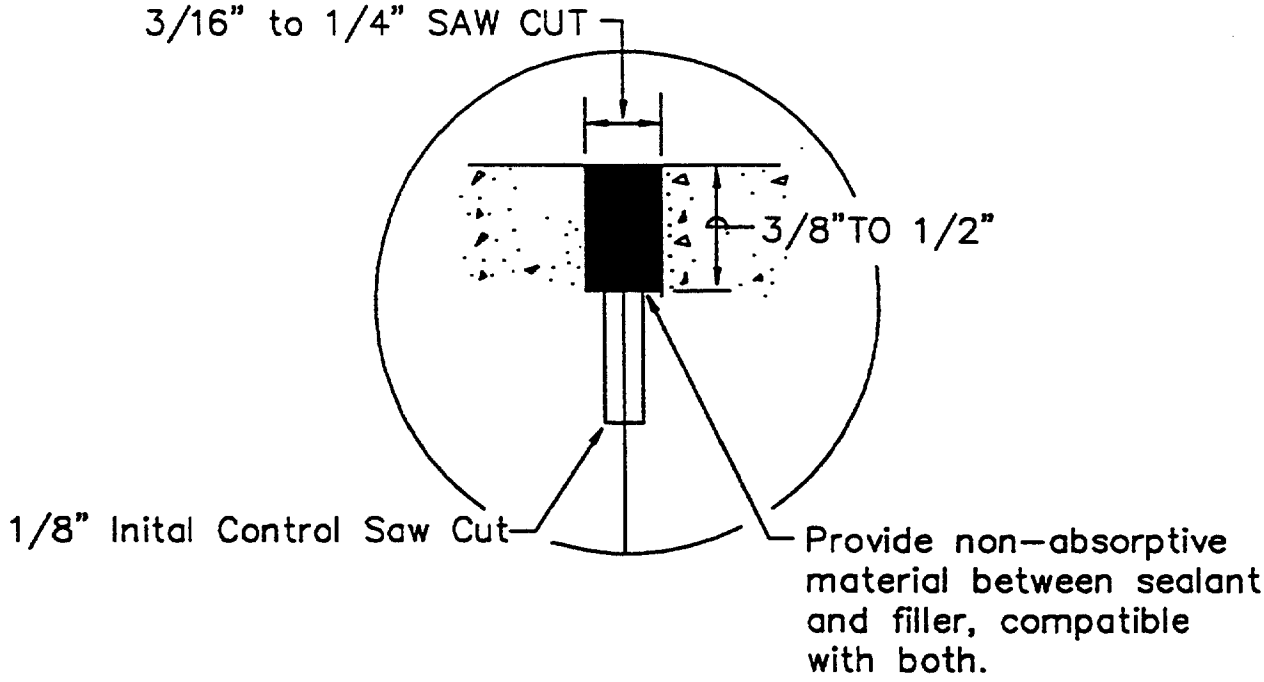
# CONTRACTION JOINTS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB 92<br>NON–REINFORCED VEHICULAR RIGID<br>WAREHOUSE FLOOR SLAB ON GRADE | P–20<br>112A |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




CONSTRUCTION JOINT SEALANT DETAIL

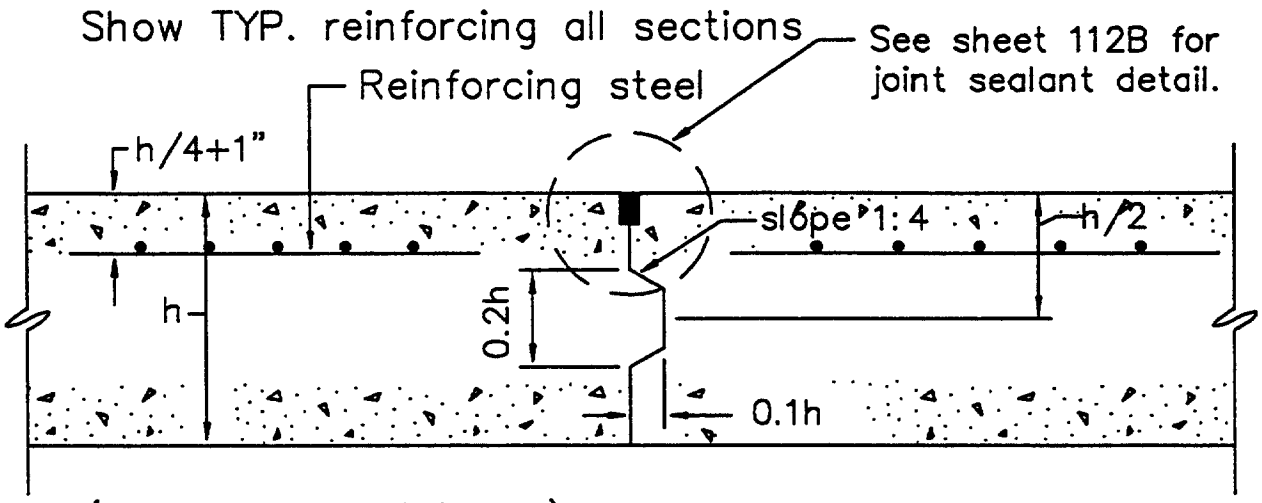



CONTRACTION JOINT SEALANT DETAIL

# POURED-IN-PLACE JOINT SEALANT

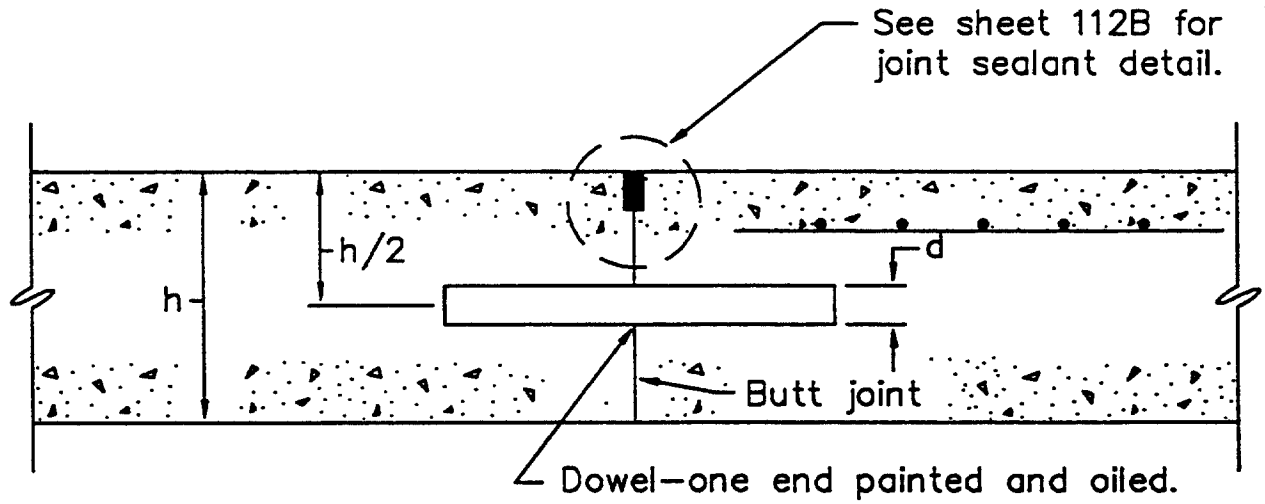
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB 92<br>NON-REINFORCED VEHICULAR RIGID PAVEMENT JOINT DETAILS<br>WARE HOUSE FLOOR SLAB ON GRADE | P-21<br>112B |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




(Limited to h ≥ 9 inches)

KEYED LONGITUDINAL




NOTE: See TM5–809–12, for design information.

(Use if h < 9 inches or Class A or B traffic.)

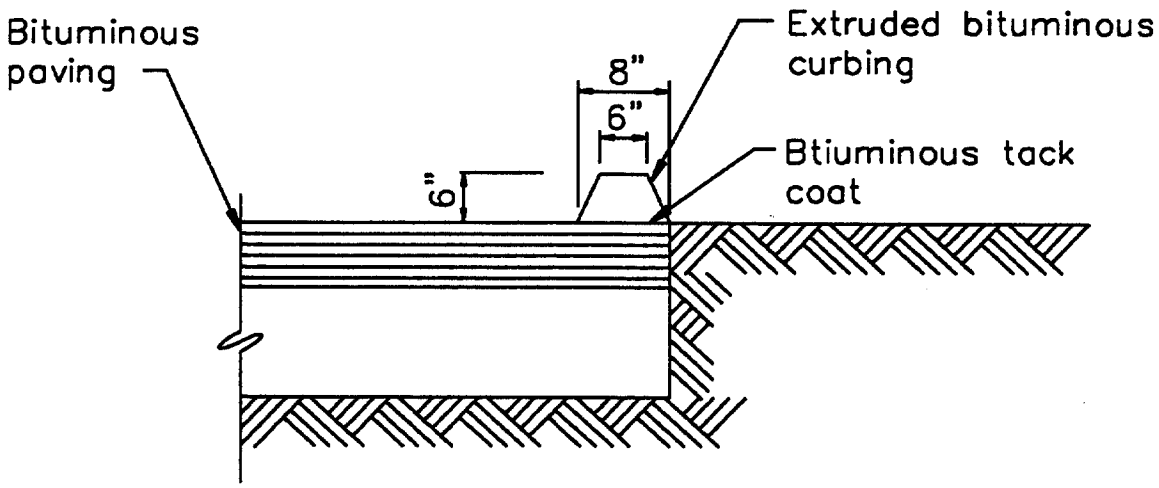
DOWELED TRANSVERSE
OR LONGITUDINAL

# CONSTRUCTION JOINTS

(KEYED or DOWELED)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB 92<br>NON–REINFORCED VEHICULAR PAVEMENT JOINT DETAILS<br>WAREHOUSE FLOOR SLAB ON GRADE | P–22<br>112C |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



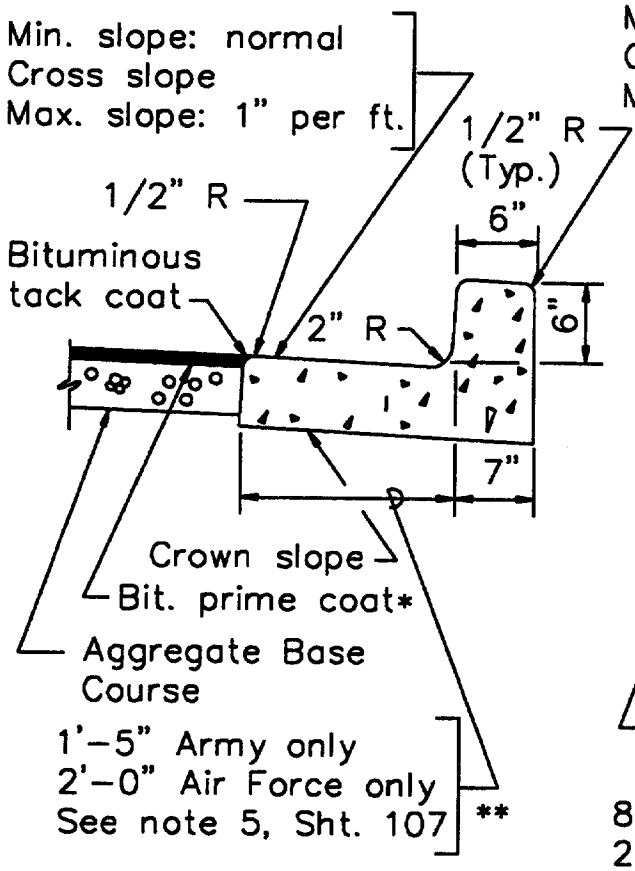

NOTE: Dimensions shown are approximate. Actual dimensions are dependent on machine characteristics.

Designer may vary curb location as required by project.

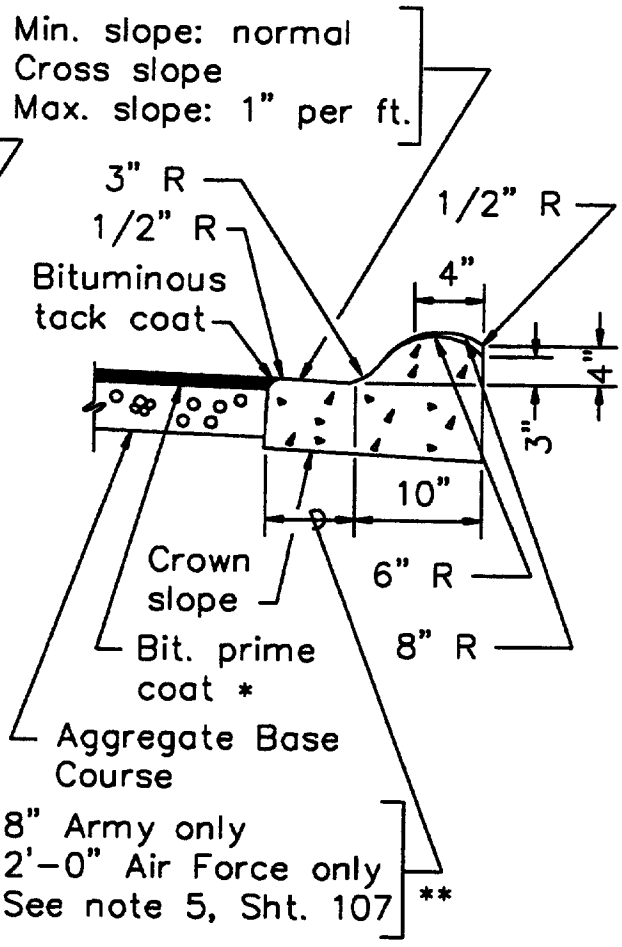
# BITUMINOUS CURB

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAR. 90<br>SITE DETAILS | S-1<br>113 |

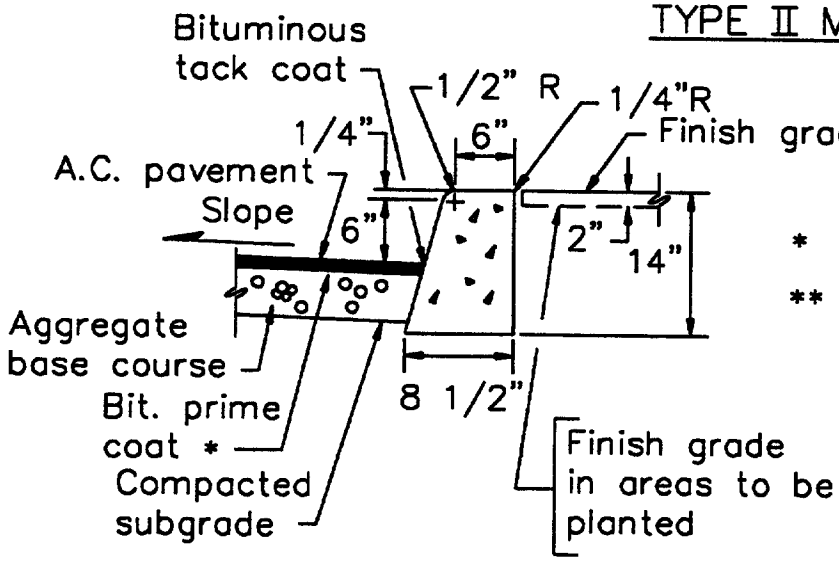
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




TYPE I BARRIER




TYPE II MOUNTABLE




TYLE III BARRIER

NOTES:

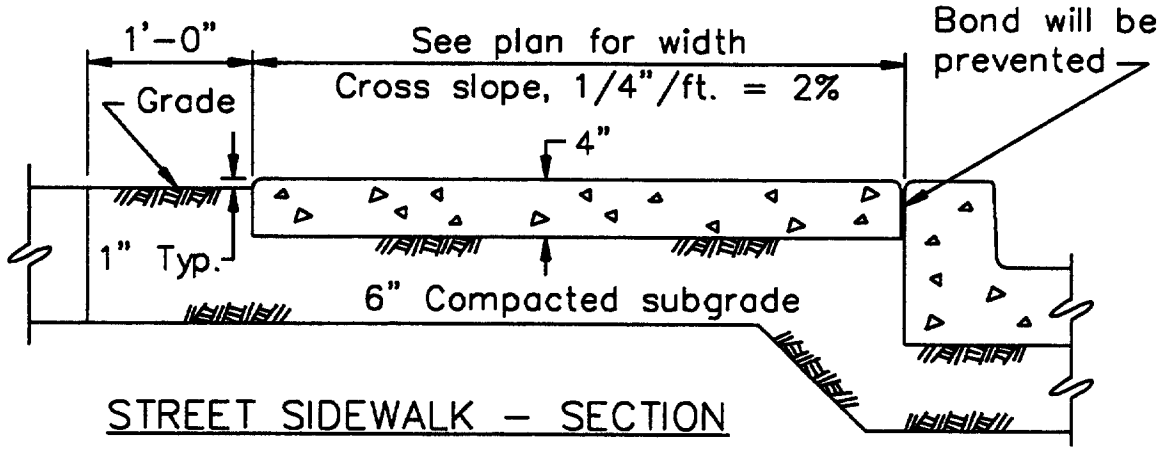
* When specified.

** Insert the appropriate dimension and delete other dimension and wording.

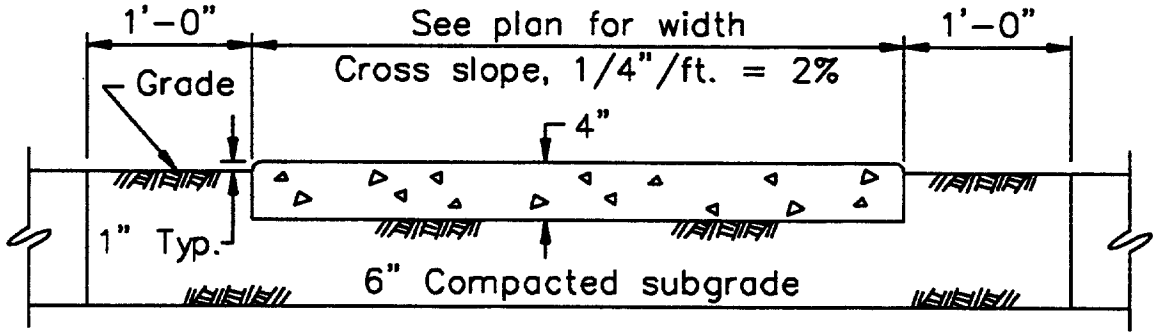
# CURB AND GUTTER DETAILS
## (FLEXIBLE PAVEMENT)

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SITE DETAILS<br>DATE: MAR. 90 | S-1A<br>113A |

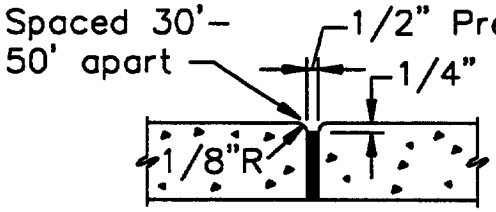
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



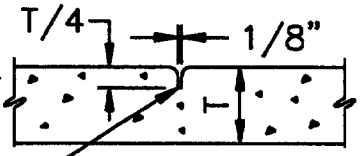

STREET SIDEWALK – SECTION



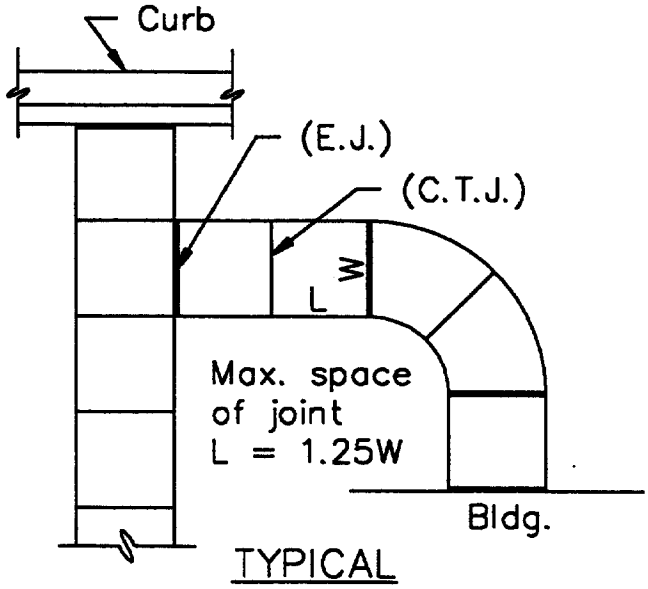

SIDEWALK SECTION – TYPICAL




EXPANSION JOINT (E.J.)




CONTRACTION JOINT (C.T.J.)

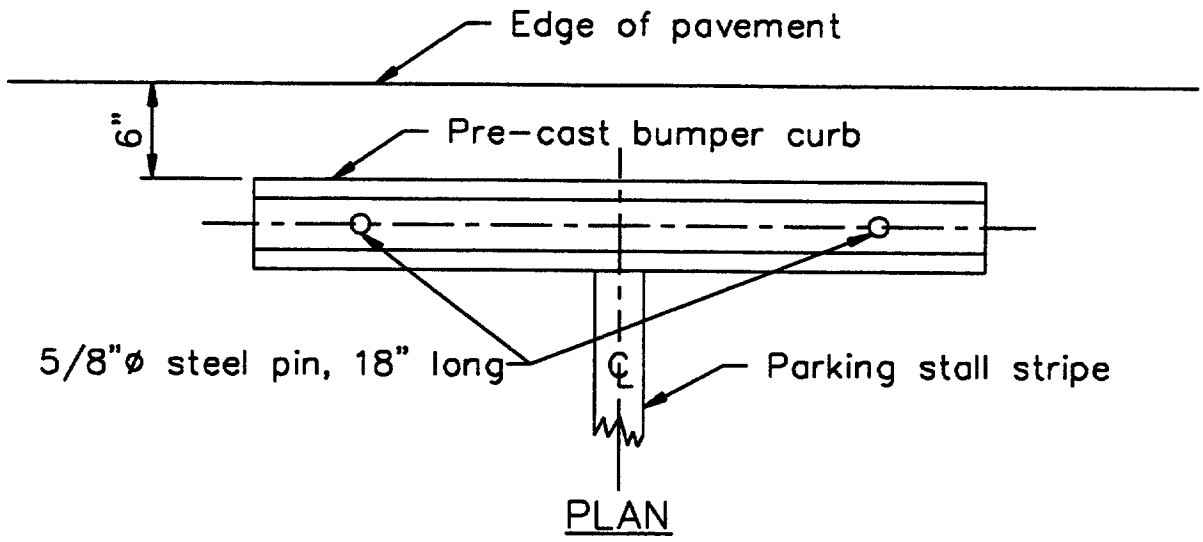



TYPICAL JOINT PATTERN

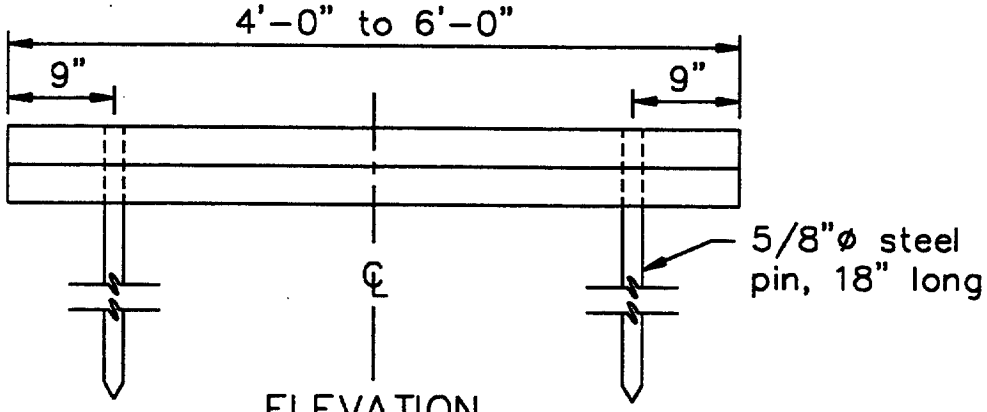
# SIDEWALK DETAIL – TYPICAL

NOT TO SCALE

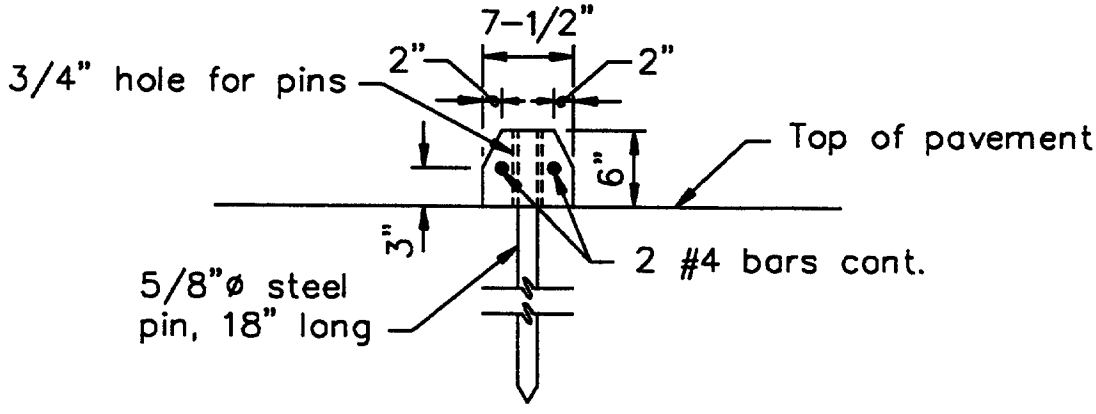
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




PLAN




ELEVATION




SECTION

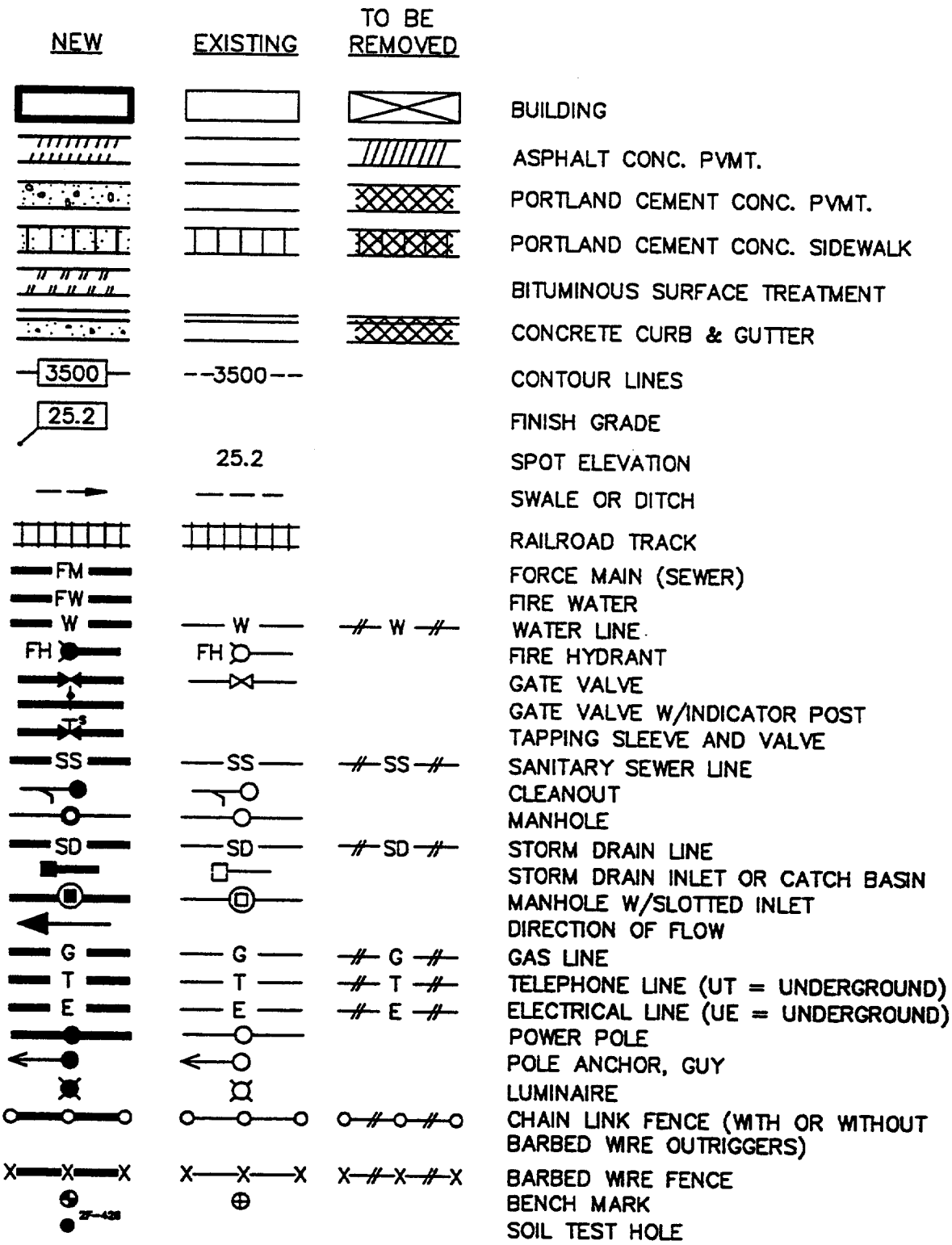
NOTE: Designer may vary dimensions to conform to standard manufactured bumper.

# PRECAST CONCRETE BUMPER DETAIL

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SITE DETAILS<br>DATE: MAR. 90 | S-3<br>115 |

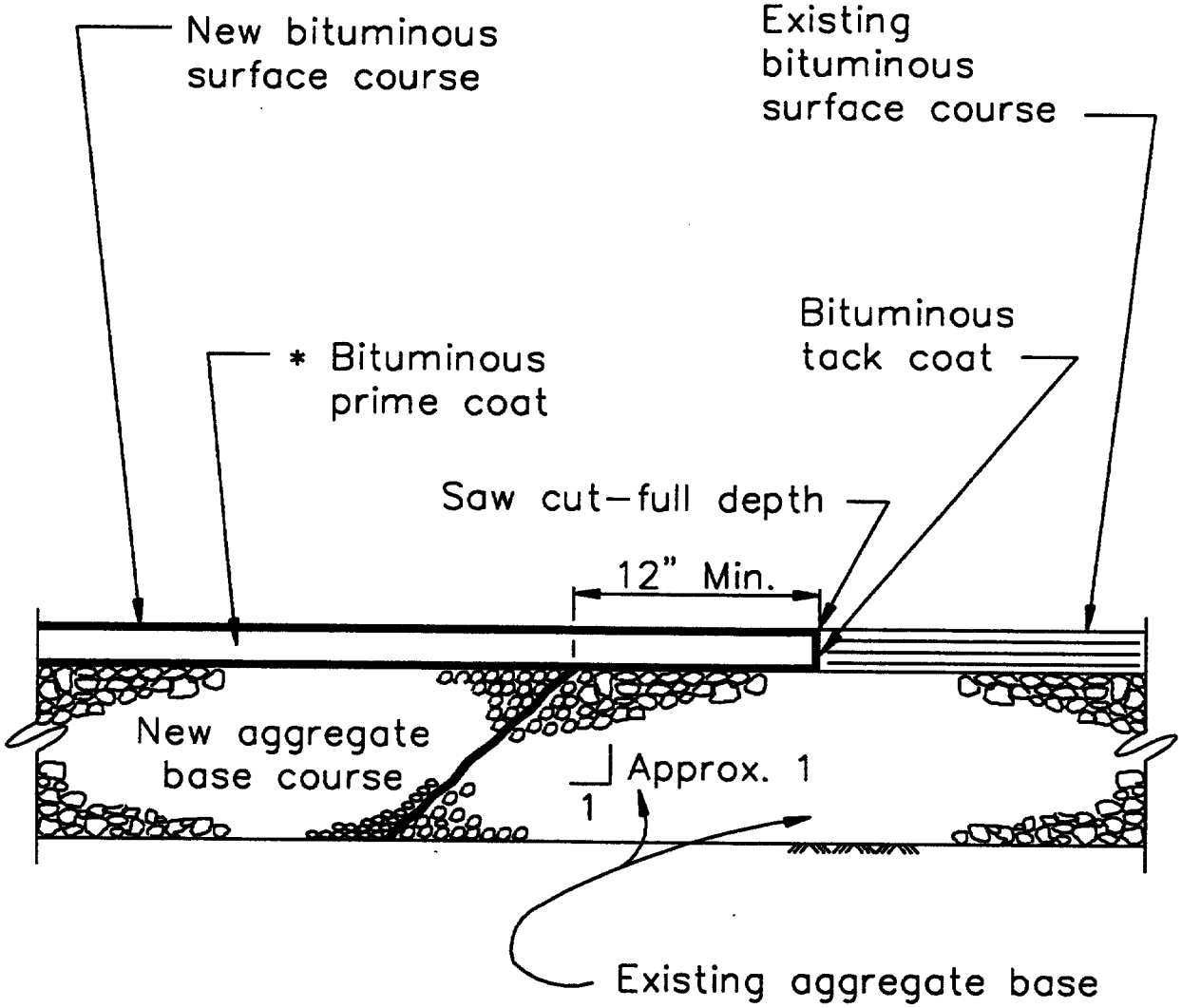
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

# CIVIL LEGEND OF MATERIALS – PLAN




NOTE: Show only those items in the legend of details which actually pertain to the project.

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

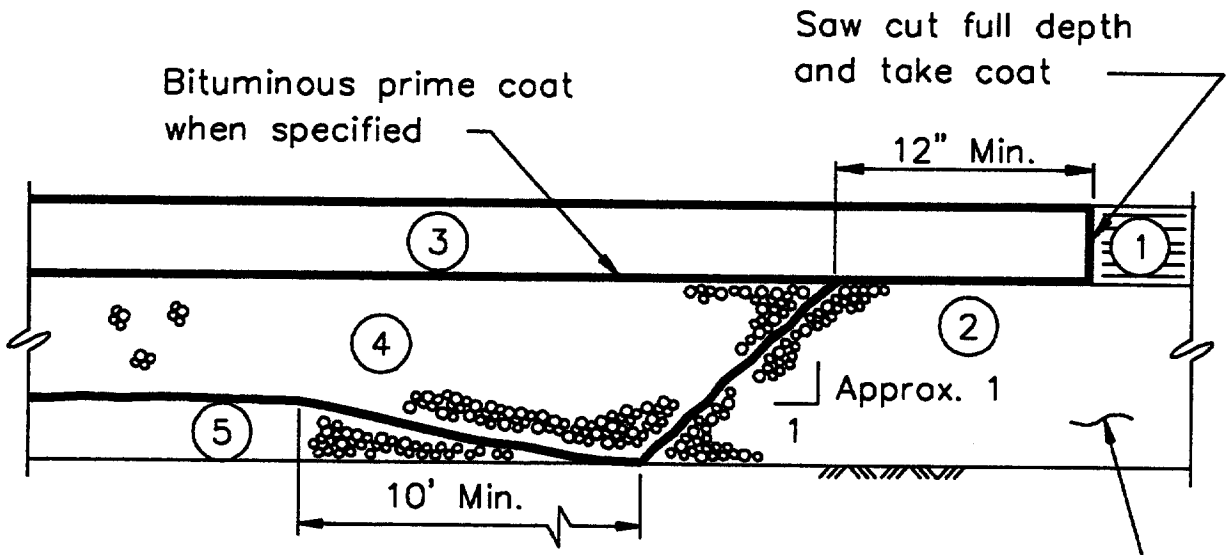



* When specified

# ASPHALT PAVEMENT JOINT DETAIL

NOT TO SCALE

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




The existing base course shall be protected and remain undisturbed to prevent loss of density and support under existing asphaltic concrete pavement.

(1) Existing asphaltic concrete pavement

(2) Existing aggeregate base course

(3) New asphaltic concrete pavement

(4) New aggregate base course (NFS)

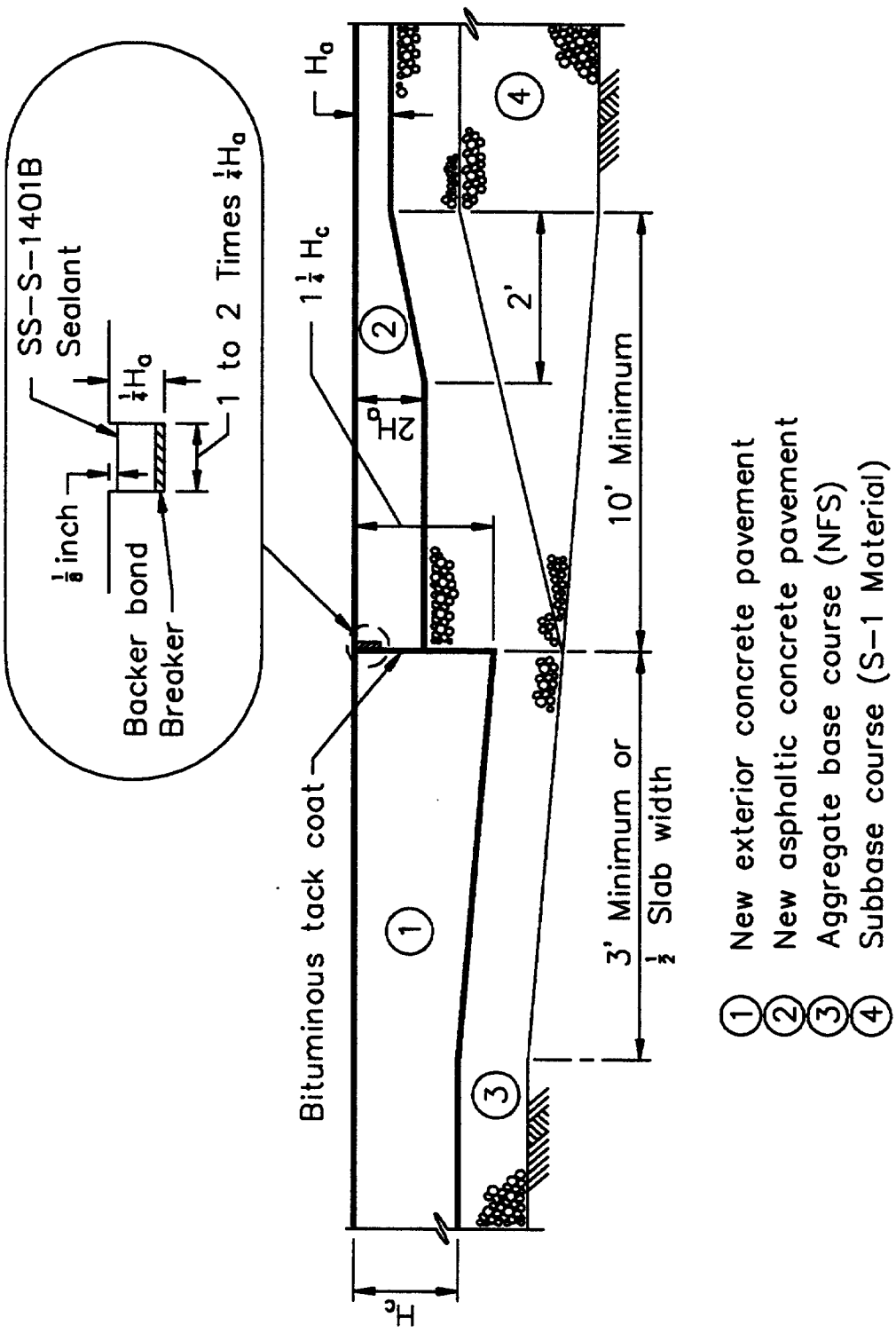
(5) New subbase course (S-1 Material)

# EXISTING-NEW FLEXIBLE PAVEMENT TRANSITION ZONE FOR FROST AREAS

NOT TO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SITE DETAILS | DATE: MAR. 90 |
| S-5A | |
| 117A | |

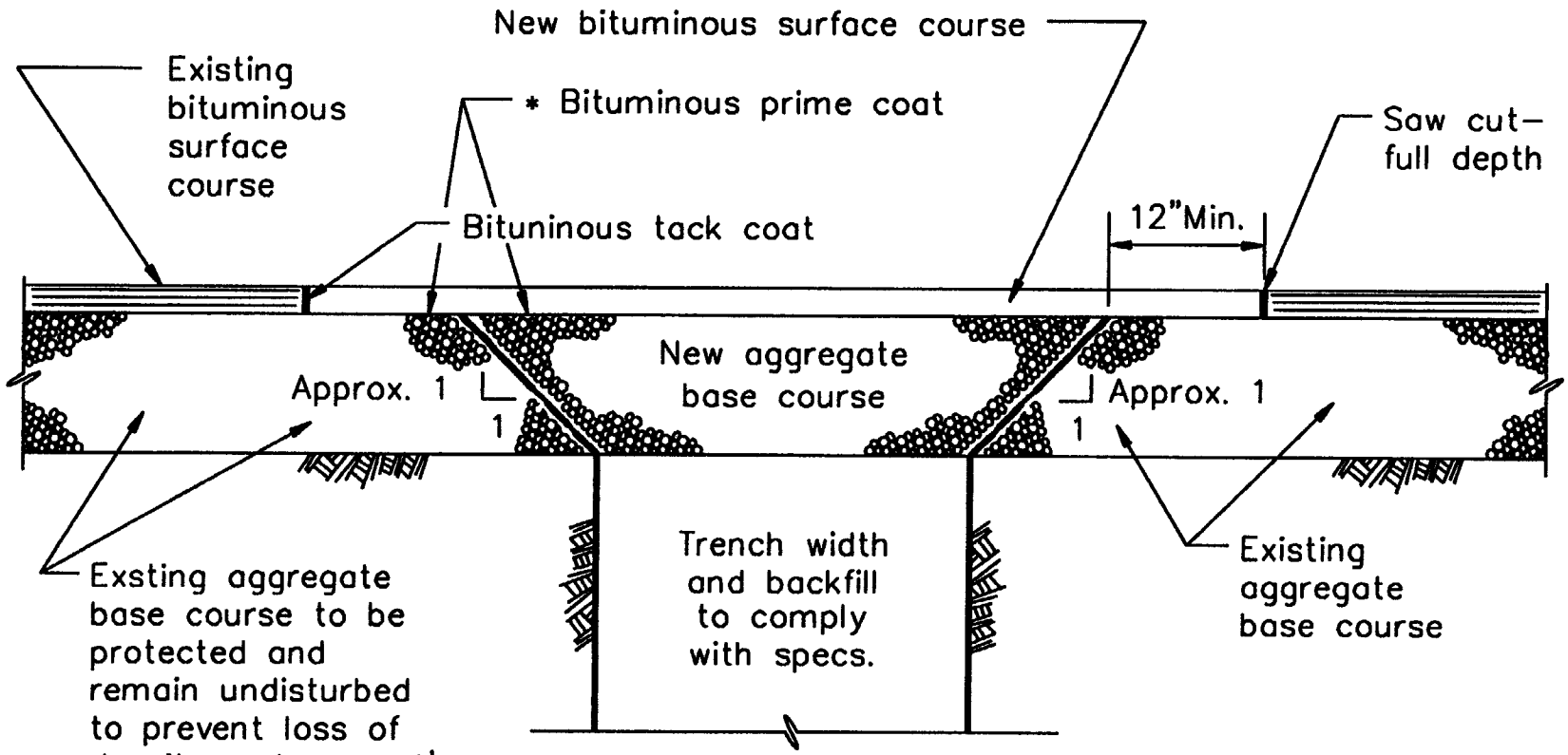
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




RIGID-FLEXIBLE PAVEMENT TRANSITION ZONE
FOR FROST AREAS
NOT TO SCALE

CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS
SITE DETAILS
DATE: OCT 89

S-5B
117B




## ASPHALT PAVEMENT REPAIR DETAIL FOR UTILITY TRENCHES

NOT TO SCALE

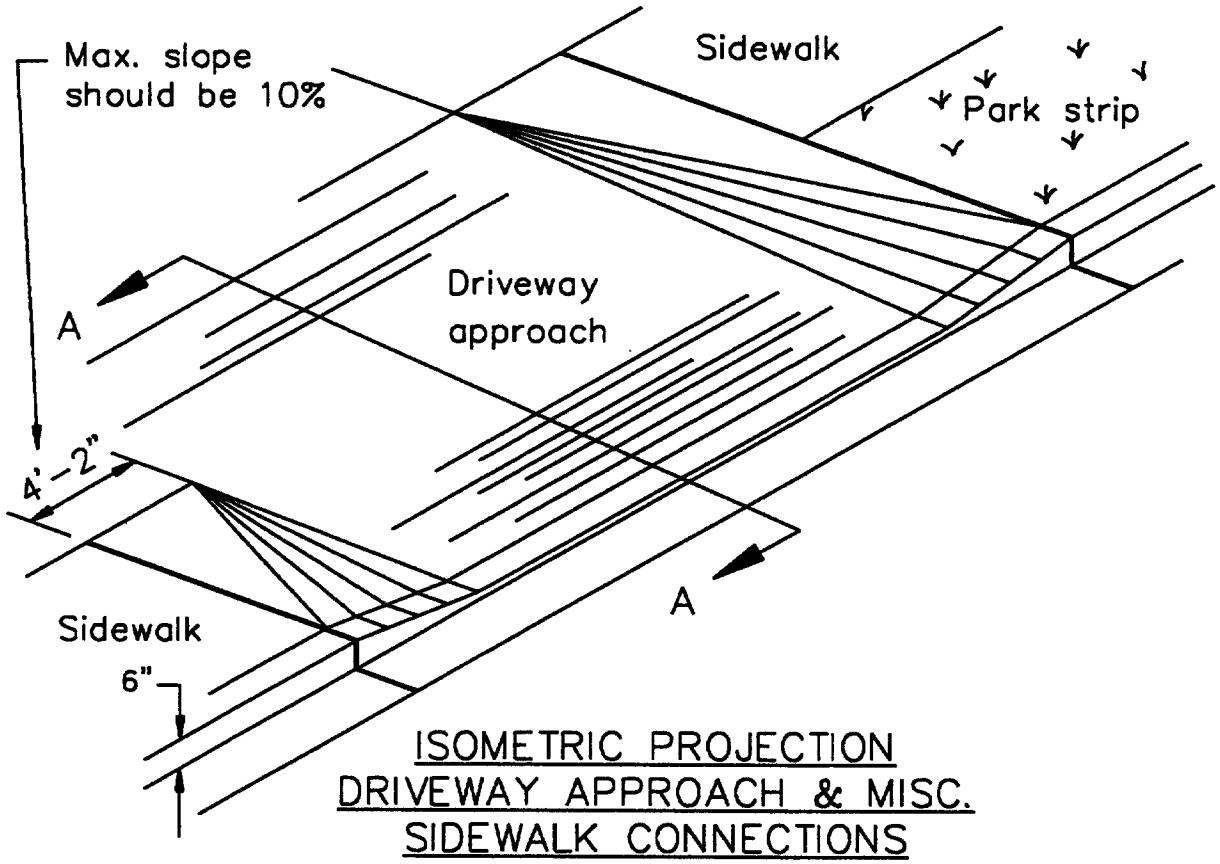
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS
SITE DETAILS
DATE: MAR. 90

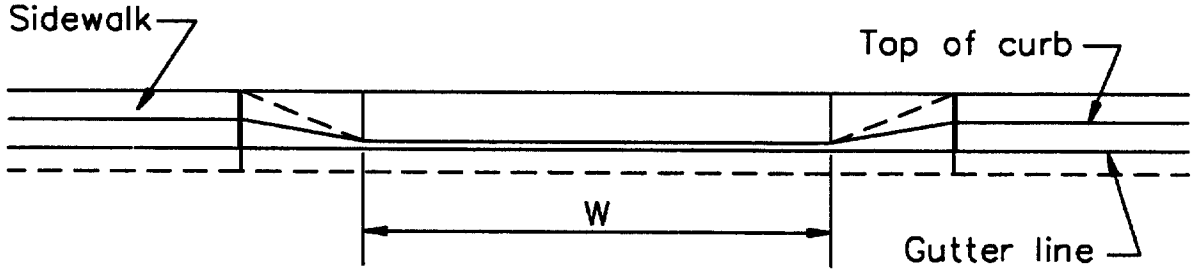
S–6

118

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

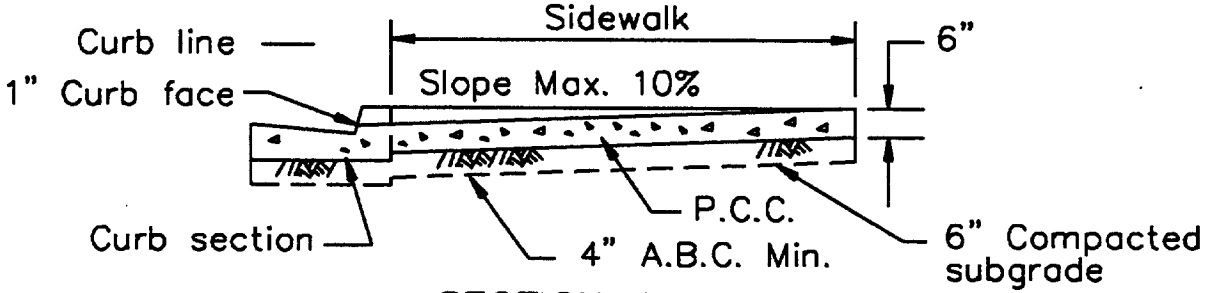



ISOMETRIC PROJECTION
DRIVEWAY APPROACH & MISC.
SIDEWALK CONNECTIONS




ELEVATION

NOTE:
See TM 5-822-6 For pavement thickness

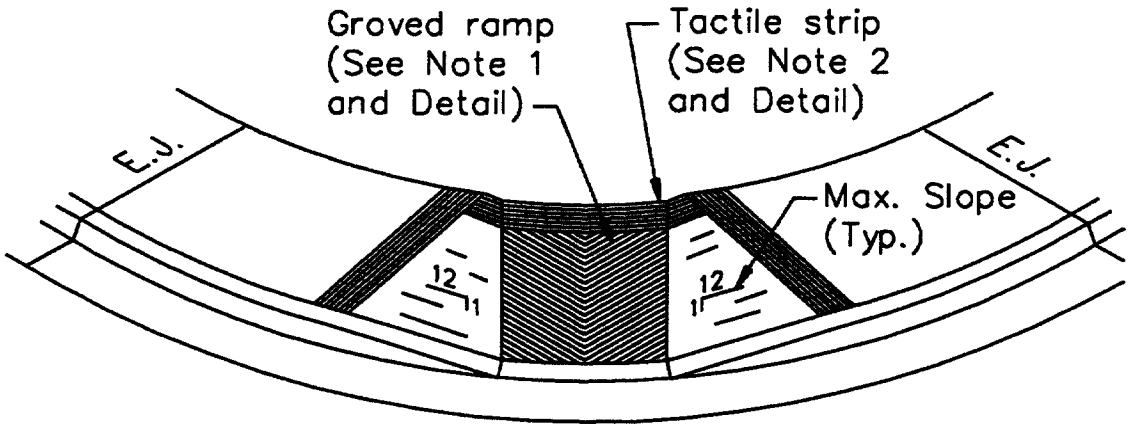



SECTION A-A

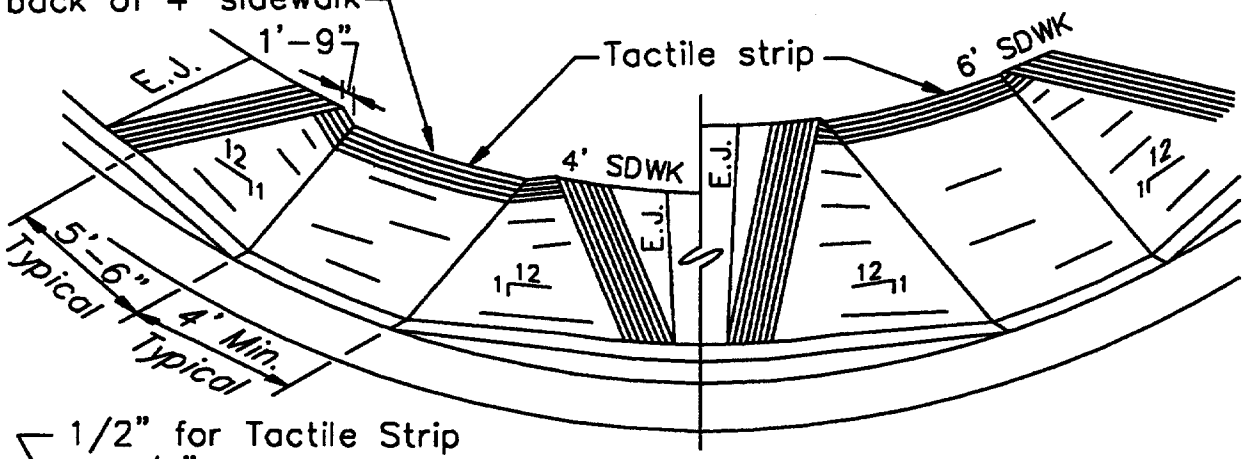
# CONCRETE DRIVEWAY DETAILS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: MAR. 90<br>SITE DETAILS | S-7<br>119 |

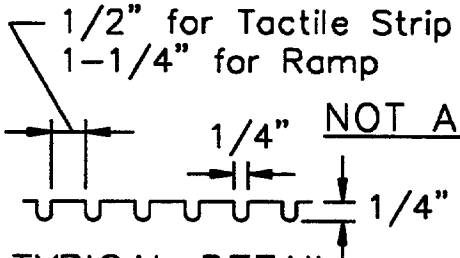
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



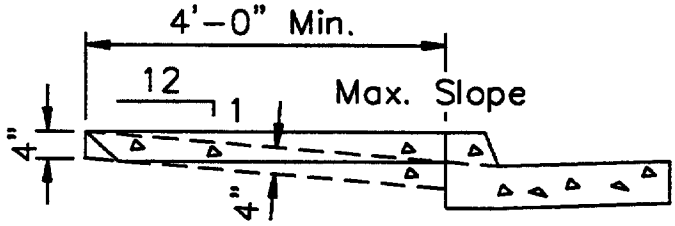

SIDEWALK RAMP AT
CENTER OF CURB RETURN




SIDEWALK RAMP
NOT AT CENTER OF CURB RETURN




TYPICAL DETAIL
FOR GROVES




CROSS SECTION

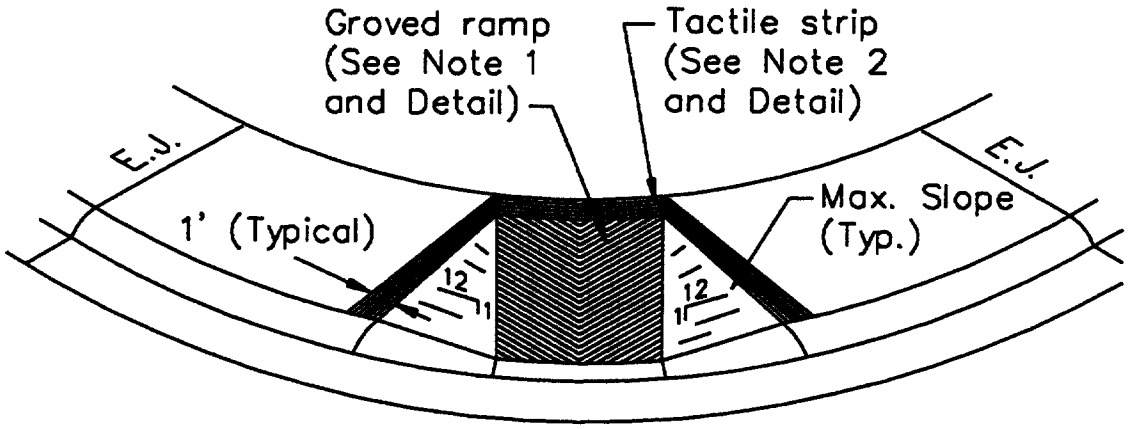
NOTES:

1. Ramps located in the center of curb returns shall be grooved. The grooves shall parallel the crosswalks and form a "V" pattern pointing towards the center of the intersection.
2. Ramps shall have a heavy broom finish transverse to the slope of the ramp and a tactile strip 1' (one ft.) wide along the perimeter.
3. Ramps to be constructed at the center of all curb returns or as shown on the plans.

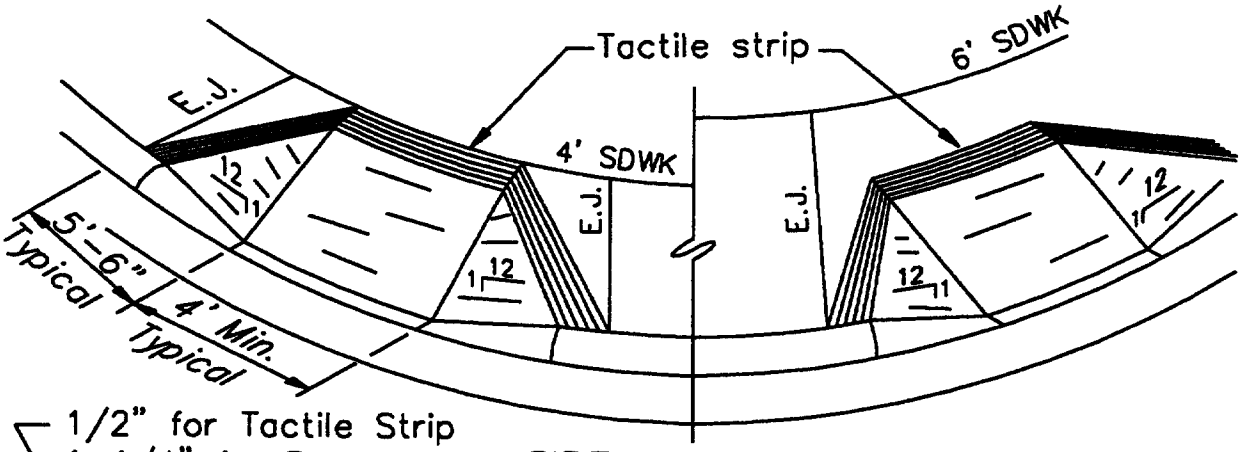
# SIDEWALK RAMPS, TYPE I BARRIER CURB

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SITE DETAILS | DATE: JUNE 90 |
| S-7A | |
| 119A | |

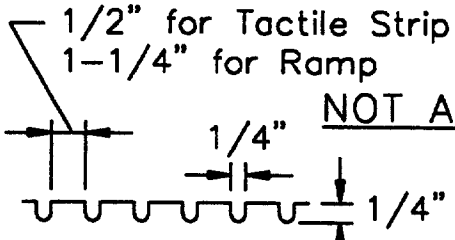
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



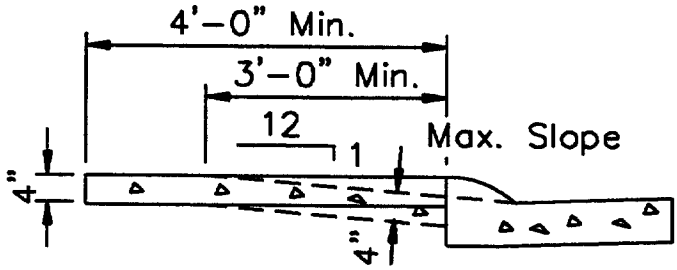

SIDEWALK RAMP AT
CENTER OF CURB RETURN




SIDEWALK RAMP
NOT AT CENTER OF CURB RETURN




TYPICAL DETAIL
FOR GROVES




CROSS SECTION

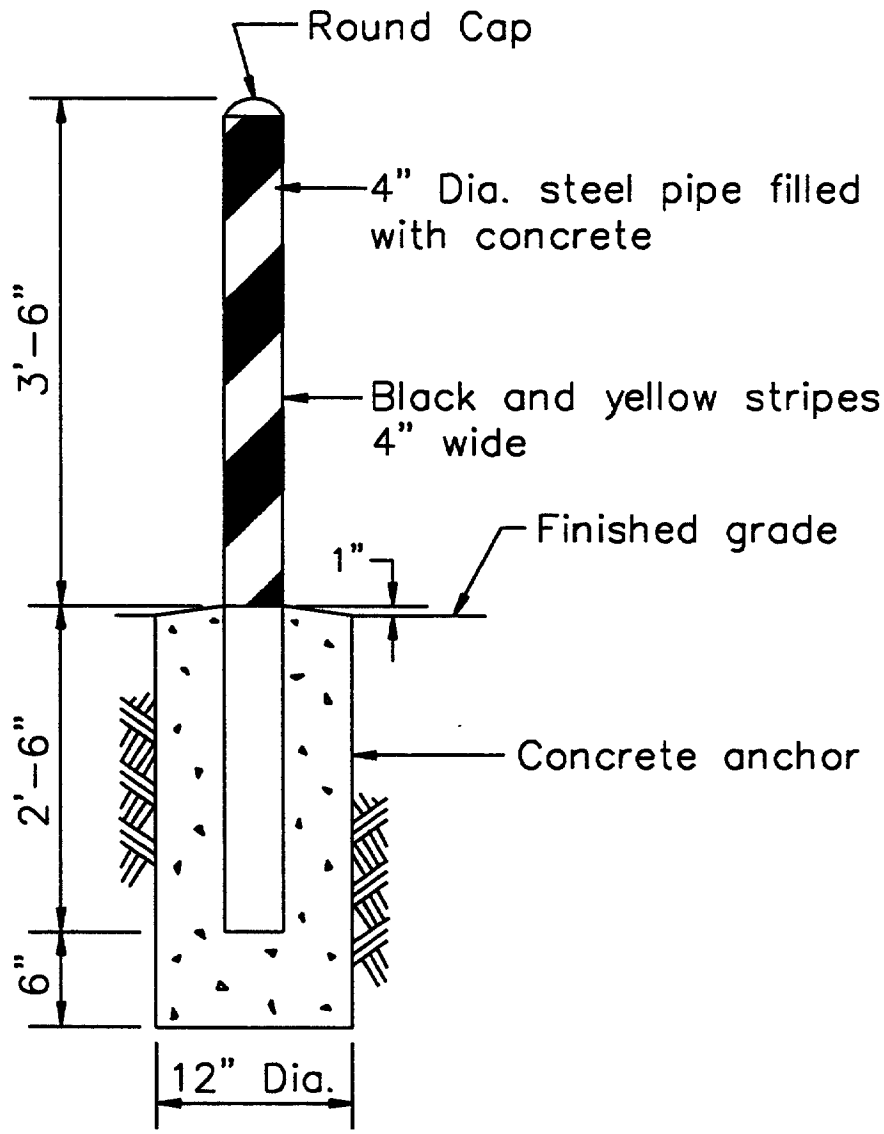
NOTES:

1. Ramps located in the center of curb returns shall be grooved. The grooves shall parallel the crosswalks and form a "V" pattern pointing towards the center of the intersection.
2. Ramps shall have a heavy broom finish transverse to the slope of the ramp and a tactile strip 1' (one ft.) wide along the perimeter.
3. Ramps to be constructed at the center of all curb returns or as shown on the plans.

# SIDEWALK RAMPS, TYPE II BARRIER CURB

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SITE DETAILS | DATE: JUNE 90 |
| S-7B | |
| 119B | |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




GUARD POST DETAIL

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB. 90<br>SITE DETAILS | S-8<br>120 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.


D-3
Variable Width
W x 8"

STREET AND ROAD NAME SIGNS

4" LEGEND, 3" ABBREVIATIONS. WHITE REFLECTORIZED LEGEND AND BORDER ON GREEN REFLECTORIZED BACKGROUND.


R7-8
12" x 18"

HANDICAP PARKING SIGN

2" LEGEND, 4" SYMBOL GREEN LEGEND AND BORDER, WHITE SYMBOL ON BLUE BACKGROUND ON WHITE MAJOR BACKGROUND.

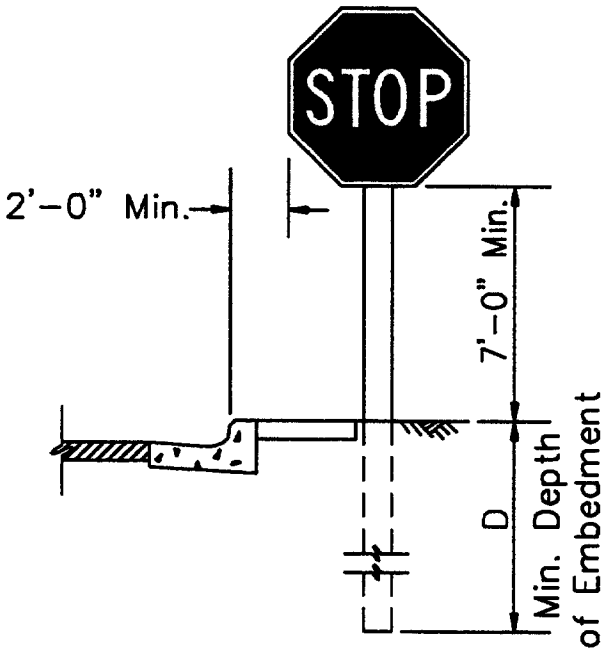

R1-1
30" x 30"

STOP SIGN

10" LEGEND, WHITE RFLECTORIZED LEGEND AND BORDER ON RED REFLECTORIZED BACKGROUND.

# STREET NAME SIGNS, TRAFFIC SIGNS
# HANDICAP PARKING SIGNS

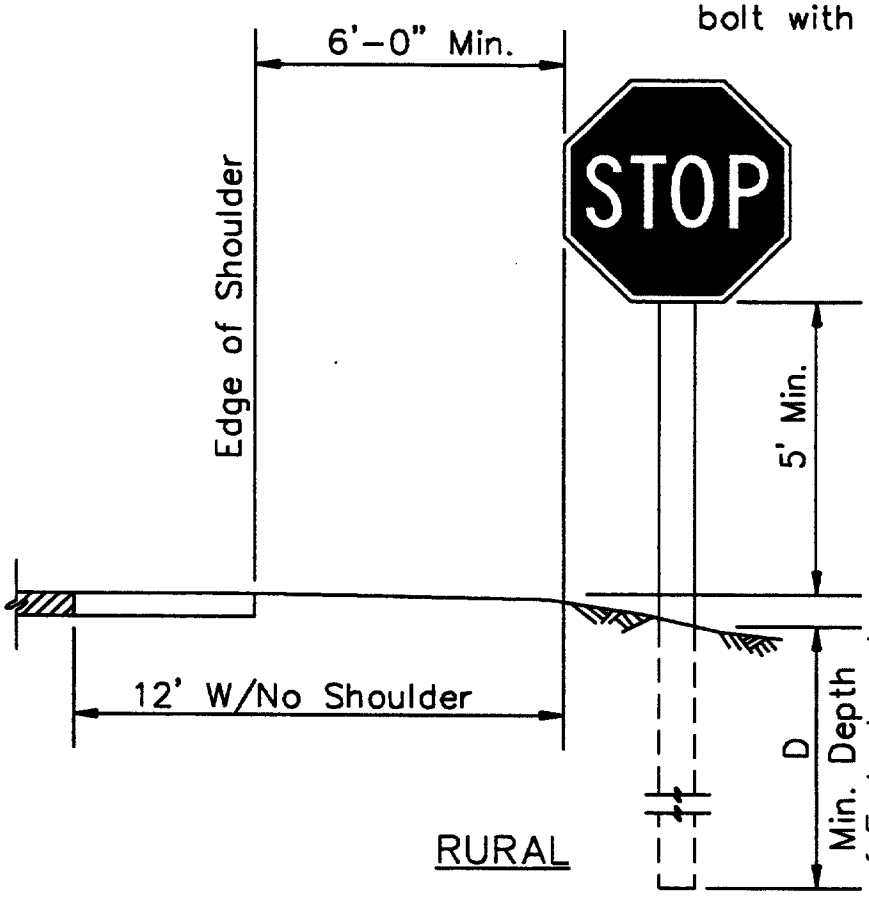
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



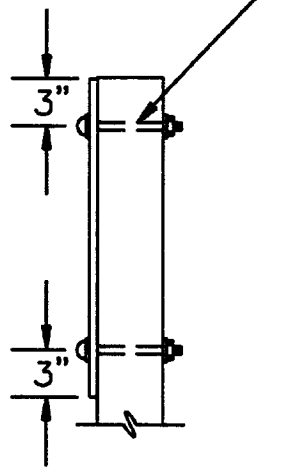

RESIDENTIAL – URBAN

| SPECIFICATIONS | | |
|---|---|---|
| SIGN AREA | POST | EMBED-MENT (D) |
| Sq. Ft. | Size | Ft. |
| 1.5 | 4x4 | 4 |
| 2.0 | 4x4 | 4 |
| 3.0 | 4x4 | 4 |
| 4.0 | 4x4 | 4 |
| 5.0 | 4x4 | 5 |
| 6.25 | 4x4 | 5 |
| 7.5 | 4x4 | 5 |
| 9.0 | 4x6 | 5 |
| 12.0 | 4x6 | 5 |

3/8" x 5", 4 x 4 Post
3/8" x 7", 4 x 6 Post
Cadmium plated machine bolt with 1" fiber washer




RURAL

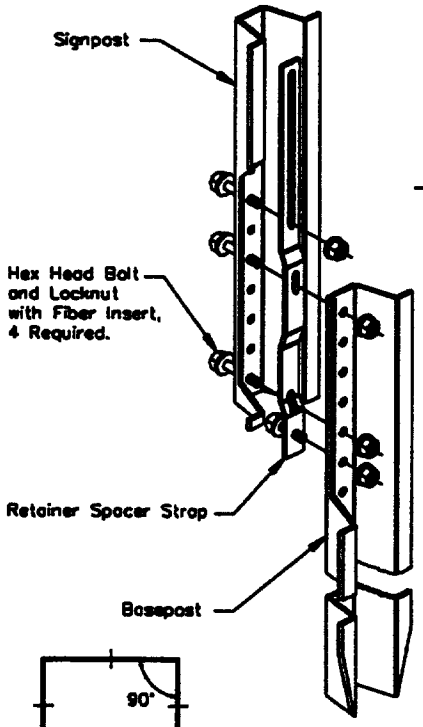


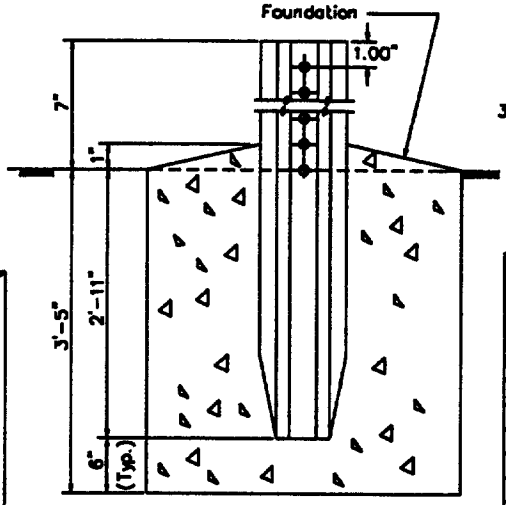

PROFILE

# TRAFFIC SIGN INSTALLATION – WOOD POSTS

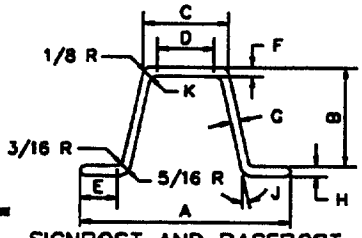
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS<br>SITE DETAILS<br>DATE: FEB. 90 | S-10<br>122 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



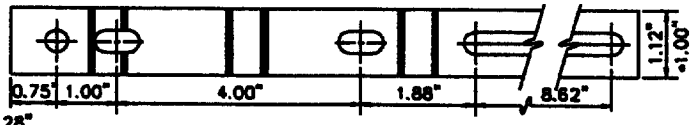




BASEPOST



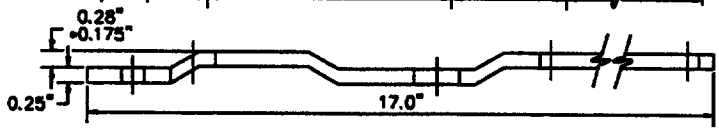

SIGNPOST AND BASEPOST CROSS SECTION

| SIGN POST AND BASE POST DIMENSIONS | | |
|---|---|---|
| | 2.50 LB/FT | 4.00 LB/FT |
| A | 3 1/8" | 3 1/2" |
| B | 1.562" | 1.750" |
| C | 1 1/4" | 1 43/64" |
| D | 1 1/16" | 1 13/32" |
| E | 5/8" | 23/32" |
| F | 0.149" | 0.230" |
| G | 0.132" | 0.175" |
| H | 0.164" | 0.250" |
| J (Angle) | 12 1/2° | 11 1/2° |
| K (Radius) | 1/8" | 3/16" |

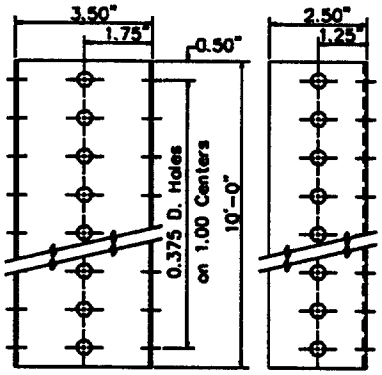






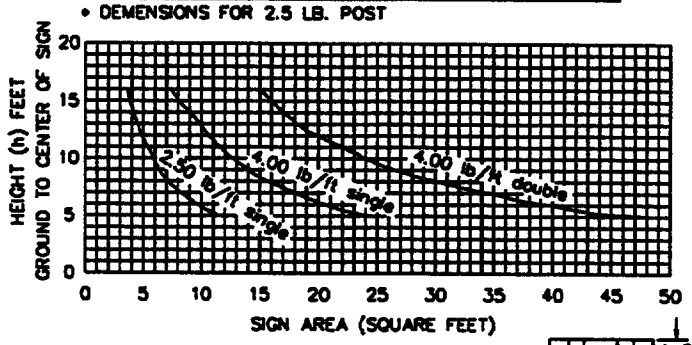


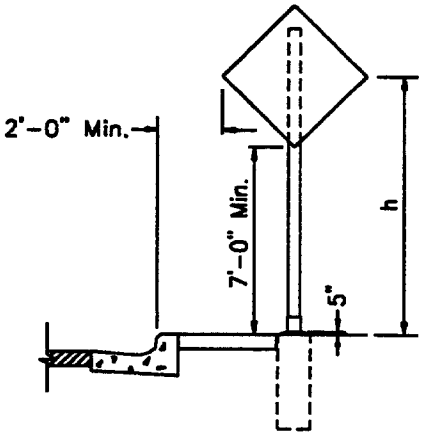

RETAINER-SPACER STRAP FOR 4.0 LB. POST



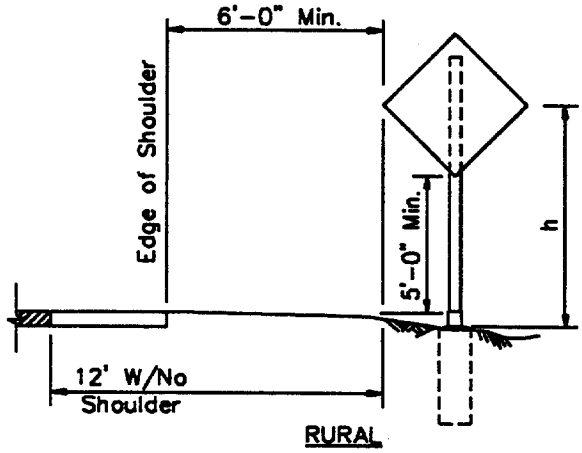

FORMED CHANNEL SIGN MOUNT

• DEMENSIONS FOR 2.5 LB. POST

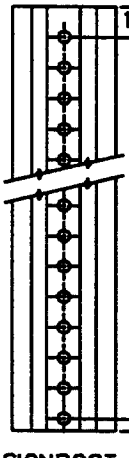



RESIDENTIAL - URBAN




RURAL




SIGNPOST

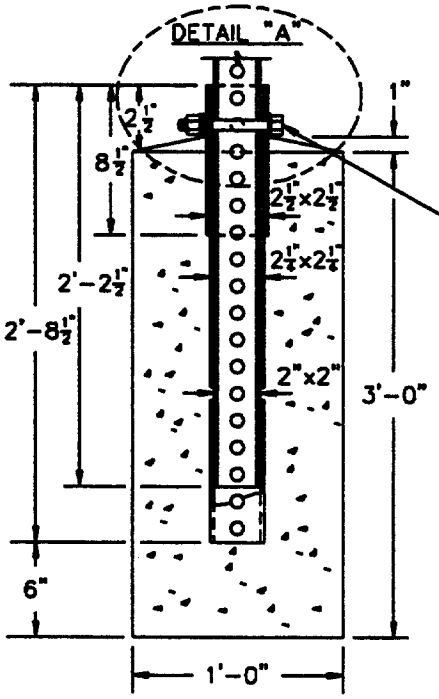
# TRAFFIC SIGN INST.-FLANGED PERFORATED POSTS

CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT
STANDARD DETAILS
SITE DETAILS
DATE: MAR. 90

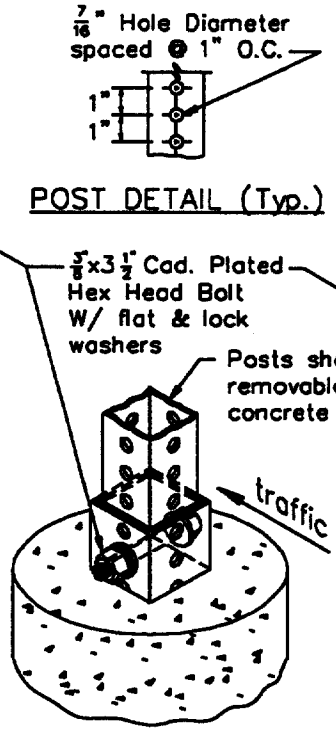
S-10A

123

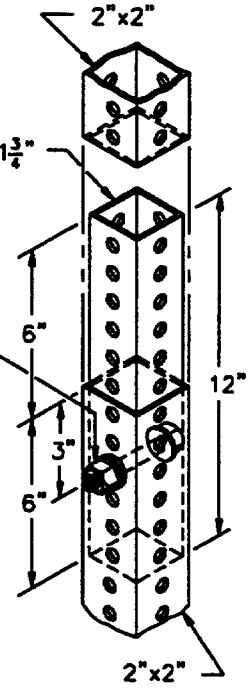
NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



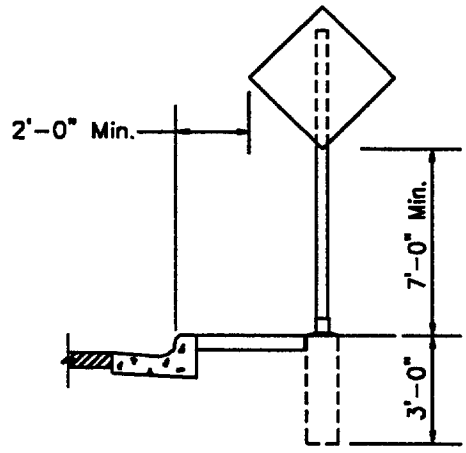

FOUNDATION DETAIL



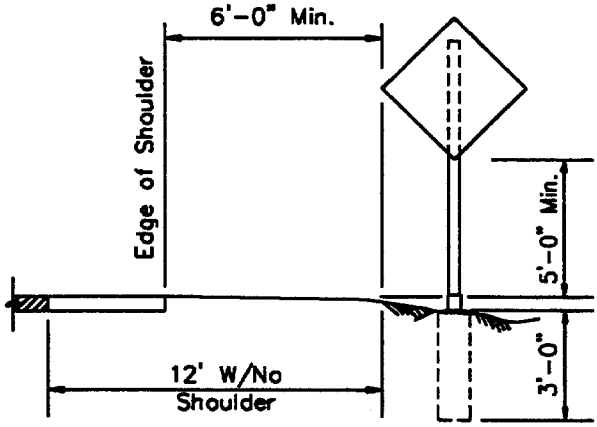

DETAIL "A"




PERMISSIBLE FIELD SPLICE




RESIDENTIAL – URBAN




RURAL

NOTES

Type P-1 & P-2 Perforated posts shall be Square Tube formed from 0.105 U.S.S. gauge ASTM A-366 cold rolled carbon steel. The square tubes shall be welded directly in the corner by high frequency resistance welding or equal. The posts shall be externally scarfed to agree with std. corner radii of $\frac{3}{32}" \pm \frac{1}{64}"$.

Type P-1 & P-2 perforated posts shall be galvanized to conform to ASTM A-525 Coating designation G-90.

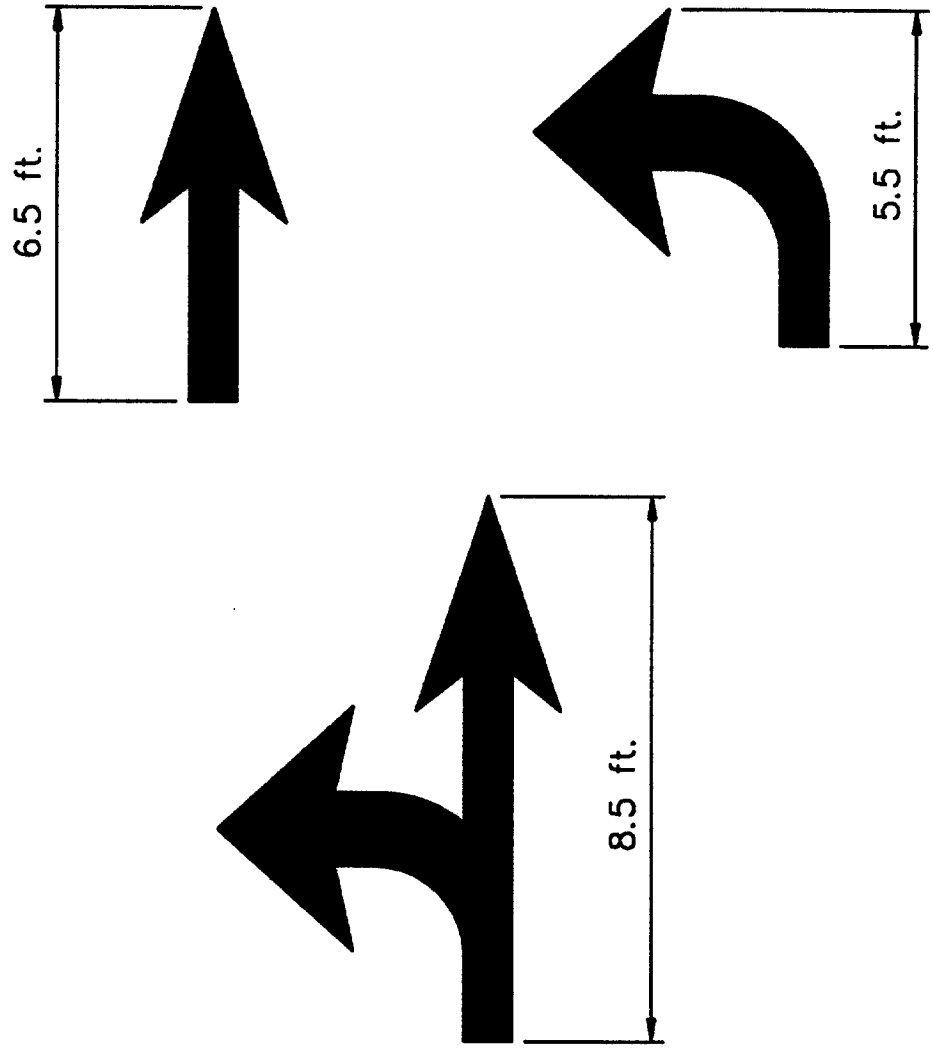
All hardware shall conform to ASTM A-307 Class A.

All hardware shall be galvanized to conform to ASTM A-153 or Cadmium Plated to conform to ASTM A-165.

# TRAFFIC SIGN INST.–TUBULAR PERFORATED POSTS

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: FEB. 90<br>SITE DETAILS | S-10B<br>124 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




NOTE:

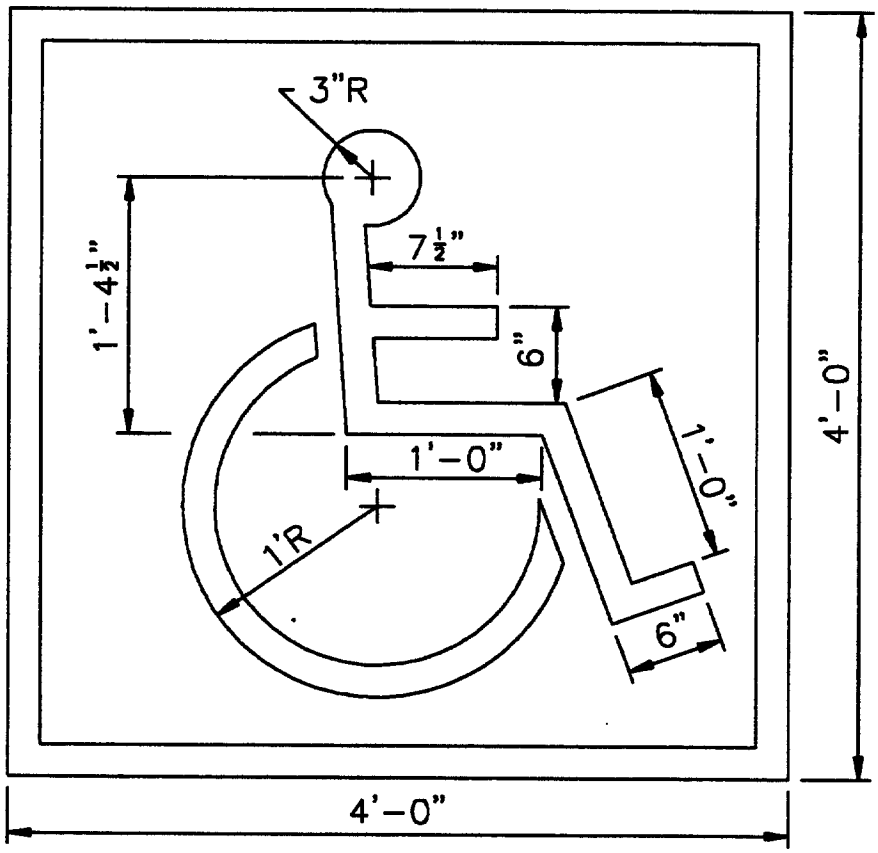
1. Arrows shall be white.

# PAVEMENT MARKING ARROWS

SCALE: NONE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 89<br>SITE DETAILS | S–11<br>125 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




NOTES:

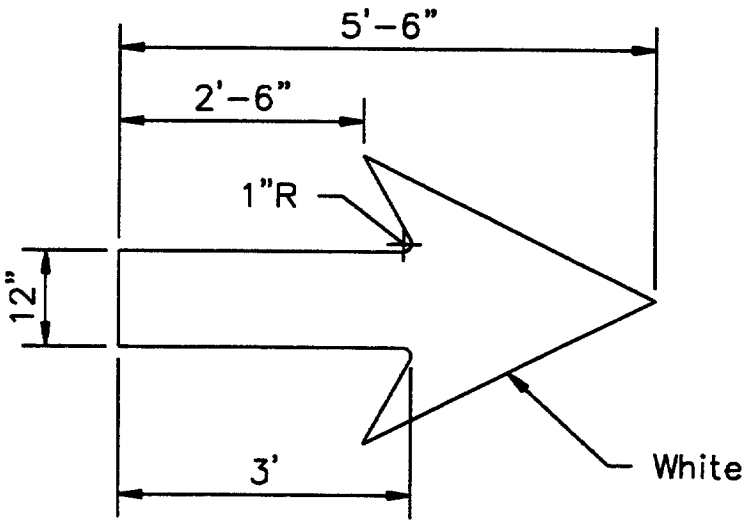
1. INTERNATIONAL PICTOGRAPH SYMBOL WHITE FED. STD. 17875.
2. 4"-BORDER-WHITE FED. STD. 17875.
3. BACKGROUND-BLUE FED. STD. 15180.

# HANDICAP PARKING STALL DETAIL FOR PAVEMENT MARKING

SCALE: 1" = 1'-0"

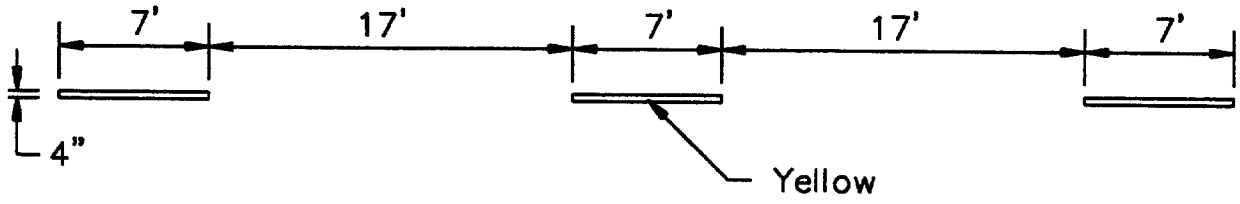
| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: OCT. 89<br>SITE DETAILS | S-12<br>126 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.



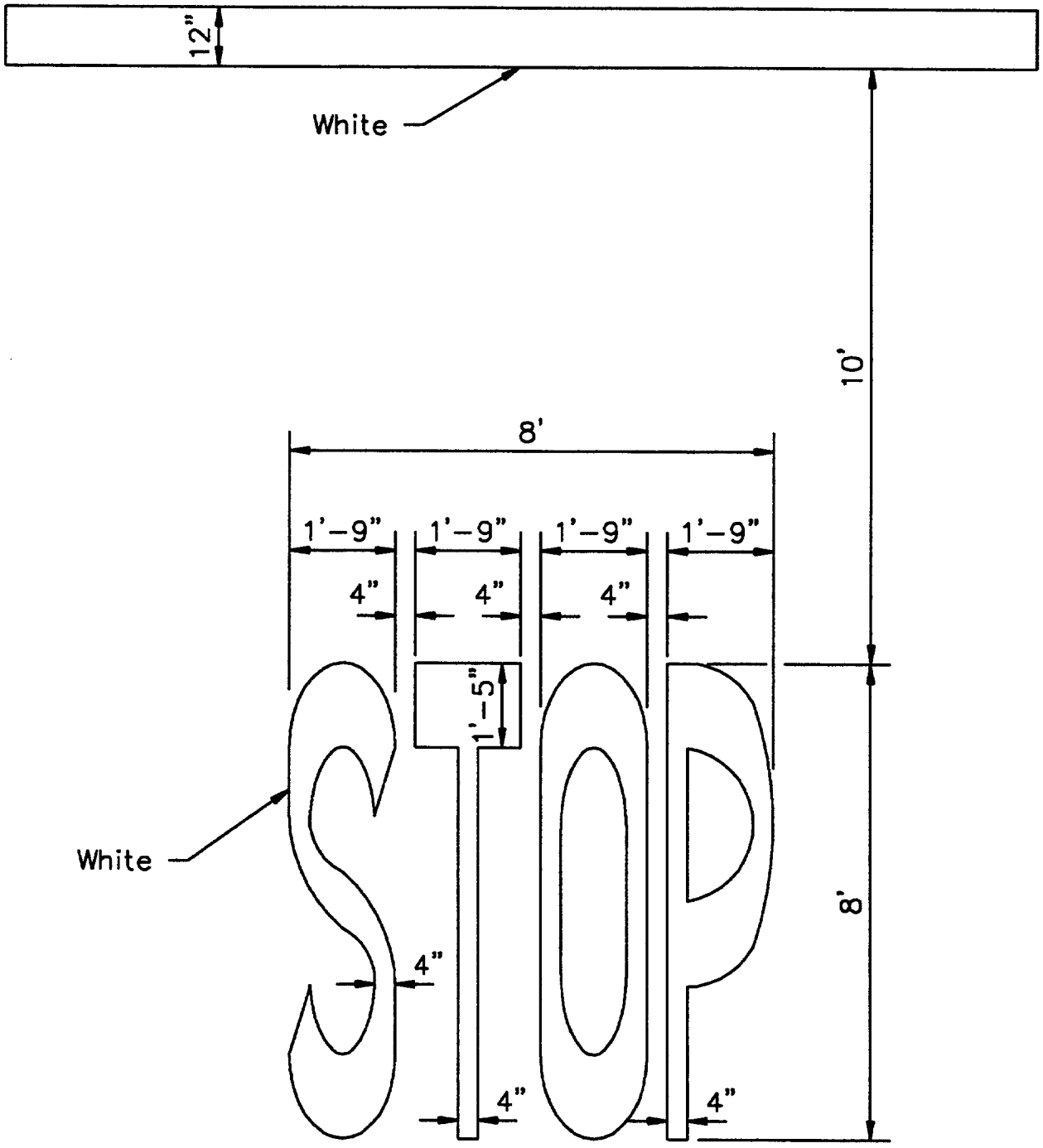

## PARKING LOT DIRECTION ARROW

SCALE: 1" = 2'




## CENTERLINE STRIPING FOR SPEED ZONES 40 MPH OR LESS

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.

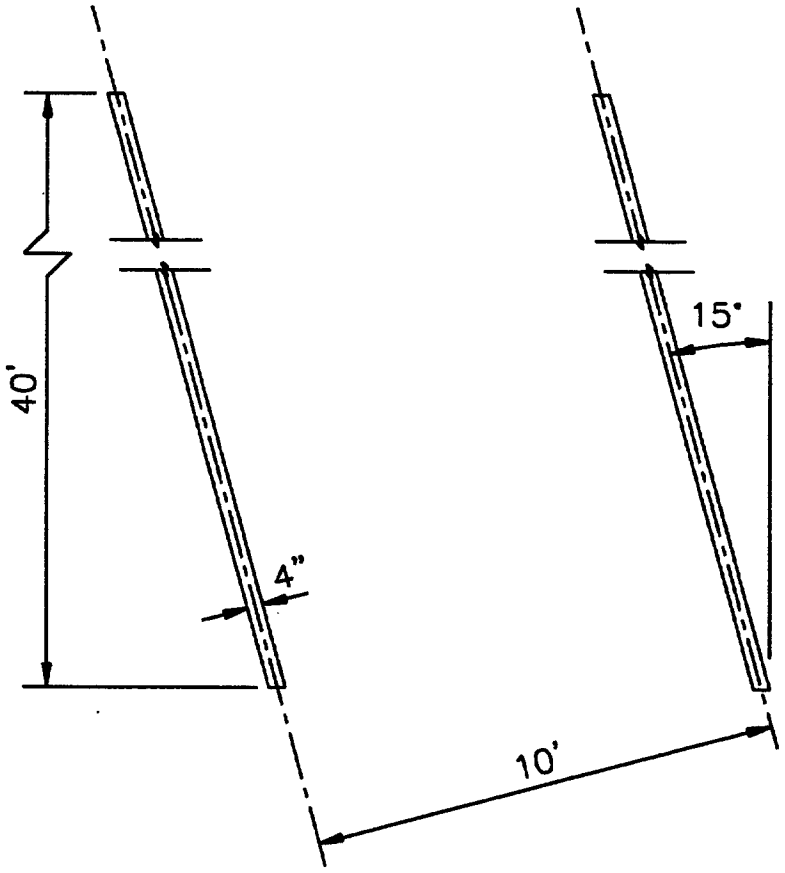



# PAVEMENT STOP MARKING

NOT TO SCALE

| | |
|---|---|
| CORPS OF ENGINEERS, U.S. ARMY, SACRAMENTO DISTRICT<br>STANDARD DETAILS DATE: SEPT. 90<br>SITE DETAILS | S-14<br>128 |

NOTE: ALL LETTERING SHALL BE 1/8" MINIMUM HEIGHT.




# PARKING STRIPING

NOT TO SCALE