CITY OF

HANFORD

CALIFORNIA

public works construction standards

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SANITARY SEWER

WATER

CITY OF HANFORD

CALIFORNIA

STREET TREE WELL LOCATION CRITERIA

The only locations that tree wells and trees are specified are in commercial or industrial areas where full width commercial sidewalk (curb to property line) is to be constructed. This results in total sidewalk width of 7½ to 9½ feet. In these instances, there is enough room for the construction of a tree well immediately behind the curb and still allow for the passage of pedestrians around the tree. We do not attempt to place tree wells in any sidewalk narrower than 7½ feet. Some of the most common obstacles to pedestrians are signs, utility poles, hydrants, parking meters, and building doors that swing out.

Street tree placement varies from street to street. In some areas of the City where existing trees are to be saved, and there is a requirement for a narrow sidewalk of 4 to 5 feet, meander the sidewalk along the street frontage in an attempt to save these trees. We further recommend the review of watering needs and tree selection to reduce operating and maintenance costs.

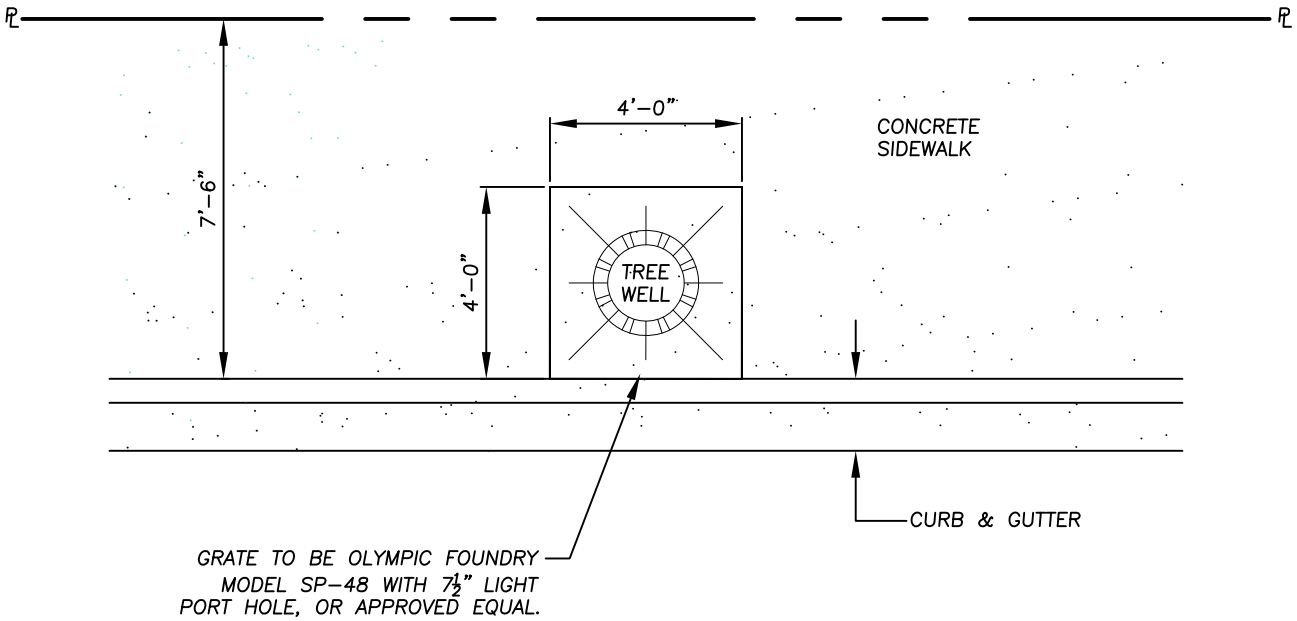
The general guidelines relating to the spacing of trees, are that they be located not closer than 30 feet to intersections, have a spacing between trees of approximately 30 to 35 feet (varies on size of trees at maturity) and no tree to be planted closer than 10 feet to an interior property line nor closer than 10 feet to a driveway. The former instance is to clearly indicate to a property owner that the tree is in front of their property and lot line where adjacent property owners could conceivably have conflicting requests regarding tree maintenance or removal. With respect to driveway locations, it is to insure that the tree does not create a blind spot for motorists attempting to exit the driveway into oncoming traffic.

Regarding the spacing of trees along the streets, a number of considerations are involved in addition to the above mentioned intersection, property lines, and driveways. Power poles, street light standards, fire hydrants, the location of underground utilities and services, the placement of parking meters and stalls along the street, and the architecture of a building itself often dictates when and where a tree is to be located. We do not want a tree located in the middle of a parking stall so that it hinders or obstructs a person from opening a car door to enter or exit a vehicle. With respect to power poles and street lights, you cannot have a tree so close that the spread of the tree would interfere with access to the pole by utility companies or obliterates the lighting effect from the street lights. Likewise, it cannot be near a fire hydrant so as to hinder the Fire Department when they need to use the hydrant.

Utility service connections normally terminate at the property line and we attempt to keep this area free of trees. Neither can we plant a tree over a water meter or service line. We also have to consider the location of trees as they effect the safety of our Street Sweeper Operator. The placement of information or traffic control signs should be placed in accordance with good traffic engineering practices and tree type as location can obstruct the effectiveness of these signs.

With respect to the architecture of the buildings, either existing or planned, we do not want to plant the tree directly in front of a doorway where persons using the buildings are apt to walk into the tree or where the tree will hide the entrance to the building.

As you can see, the tree street location policy is not one that is set forth in a neat set of rules and must be determined on an individual basis as the projects are developed. Initially it is started in the office with a good set of building plans, but finally it is determined in the field by our inspectors and the contractor when they construct the sidewalk. We can only hope that the end result is pleasing to the eye, affords a functional and safe layout and meets the aesthetic values of the many interested parties.



PLAN

NOTES:

1. SPACING AND LOCATION TO BE DESIGNATED BY THE CITY ENGINEER.
2. ANY TREES IN PARKSTRIPS MUST BE OF A VARIETY APPROVED BY THE PARK SUPERINTENDENT PRIOR TO PLANTING.
3. STREET TREE IRRIGATION SHALL BE PROVIDED AND MUST BE APPROVED BY THE CITY PARKS SUPERINTENDANT PRIOR TO INSTALLATION.
4. ALL IRRIGATION MUST BE INSTALLED & APPROVED BY THE CITY PARKS SUPERINTENDENT PRIOR TO INSTALLATION OF ANY PLANT MATERIAL.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

48" TREE WELL

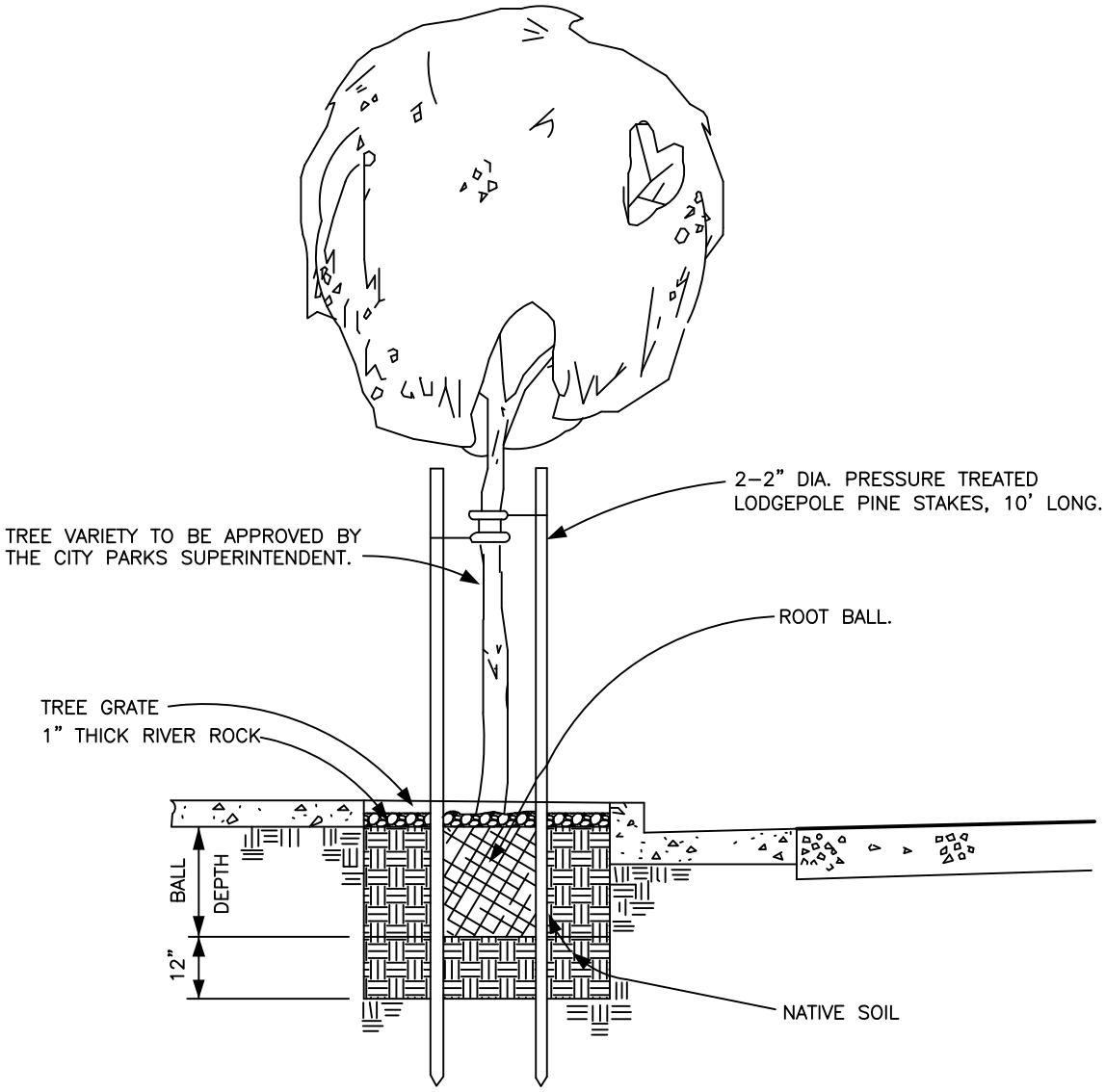
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 08/09/10

DRAWING NO. GE–10



NOTES:

1. TREE SIZE IN THE DOWNTOWN 2010 PLAN AREA SHALL BE 24" BOX SIZE FOR SIDEWALK LOCATIONS AND 36" BOX SIZE FOR PLANTER ISLAND LOCATIONS. ALL OTHER TREE PLANTINGS WITHIN CITY RIGHT OF WAY LIMITS AND EASEMENT AREAS SHALL BE 15 GALLON SIZE UNLESS APPROVED OTHERWISE BY CITY ENGINEER.
2. PLACE 4 TREE FERTILIZER TABLETS IN THE PREPARED SOIL MIX IN THE TREE WELL.
3. STREET TREE IRRIGATION SHALL BE PROVIDED AND MUST BE APPROVED BY THE CITY PARKS SUPERINTENDENT PRIOR TO INSTALLATION.
4. ALL IRRIGATION MUST BE INSTALLED & APPROVED BY THE CITY SUPERINTENDENT PRIOR TO INSTALLATION OF ANY PLANT MATERIAL.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

TREE PLANTING DETAIL

(IN SIDEWALK)

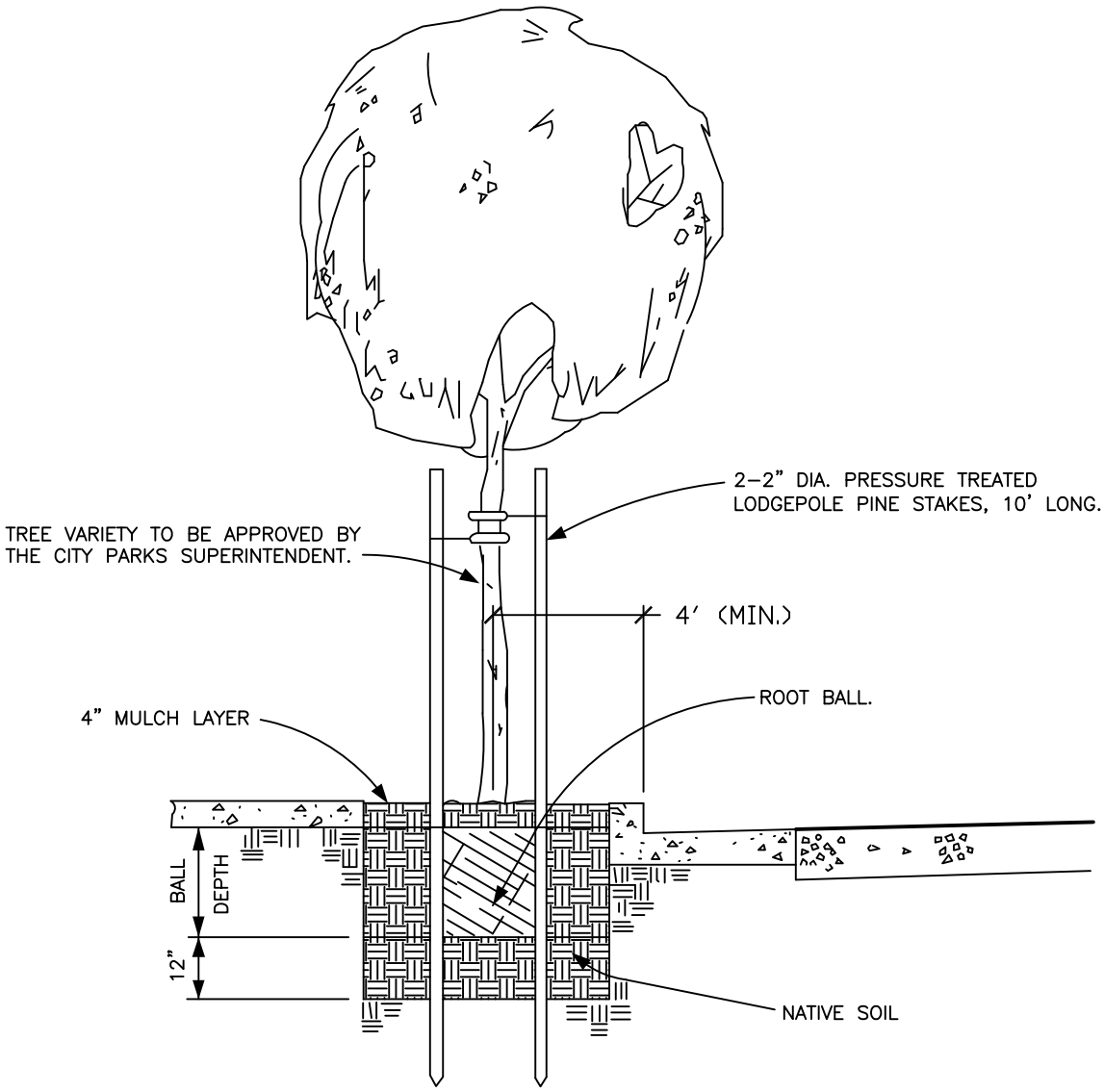
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 08/09/10

DRAWING NO. GE–12



NOTES:

1. TREE PLANTINGS WITHIN PARK STRIP AND LANDSCAPE EASEMENT AREAS SHALL BE 15 GALLON SIZE UNLESS APPROVED OTHERWISE BY CITY ENGINEER.
2. PLACE 4 TREE FERTILIZER TABLETS IN THE PREPARED SOIL MIX IN THE TREE WELL.
3. STREET TREE IRRIGATION SHALL BE PROVIDED AND MUST BE APPROVED BY THE CITY PARKS SUPERINTENDENT PRIOR TO INSTALLATION.
4. ALL IRRIGATION MUST BE INSTALLED & APPROVED BY THE CITY SUPERINTENDENT PRIOR TO INSTALLATION OF ANY PLANT MATERIAL.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

TREE PLANTING DETAIL

(IN PARKSTRIP)

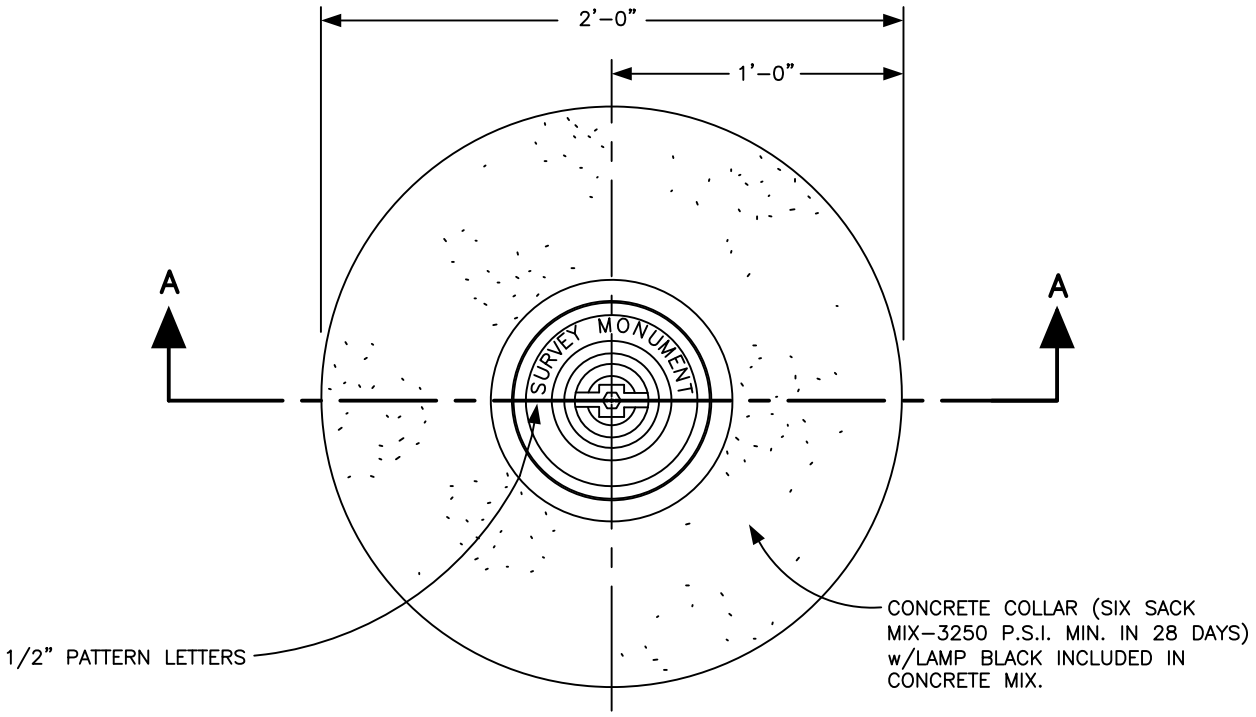
STANDARD DRAWING

APPROVED BY:

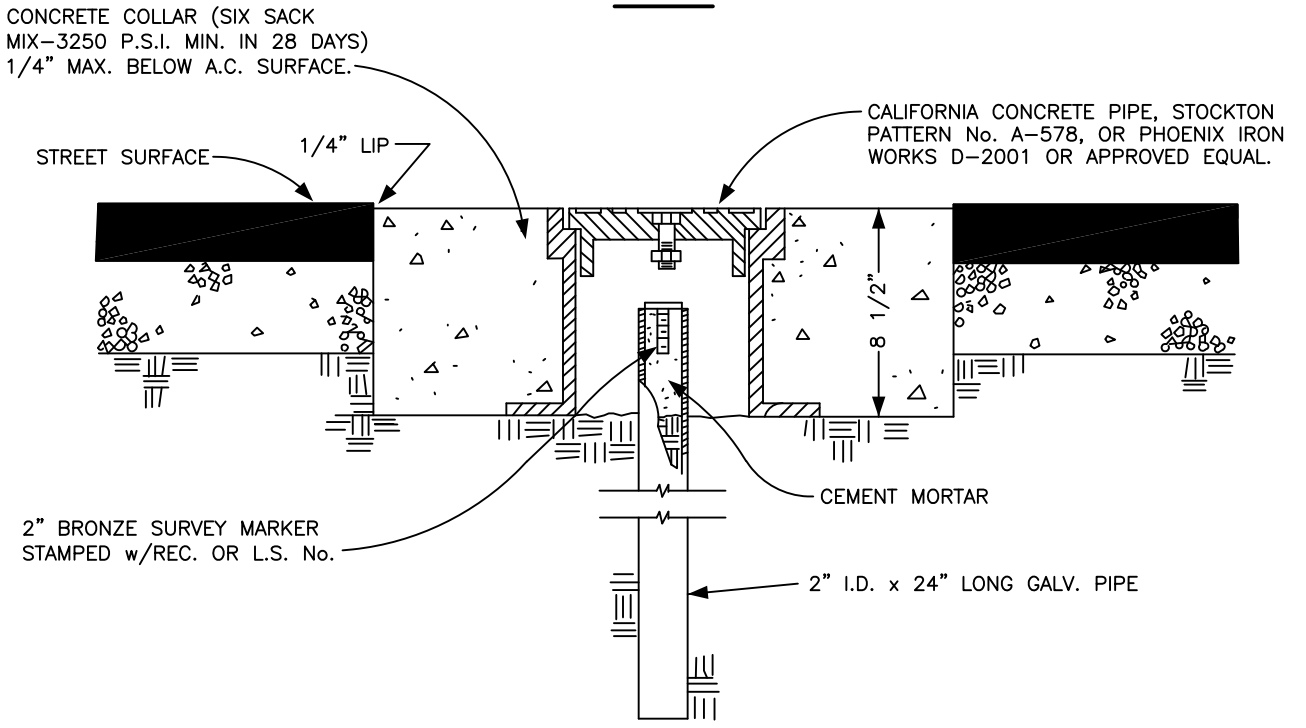
CITY ENGINEER R.C.E. 062044

REVISED: 08/09/10

DRAWING NO. GE–13



PLAN



SECTION A – A

NOTE:
LOCATE SURVEY MONUMENTS AT ALL STREET INTERSECTIONS

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

STREET INTERSECTION SURVEY MONUMENT

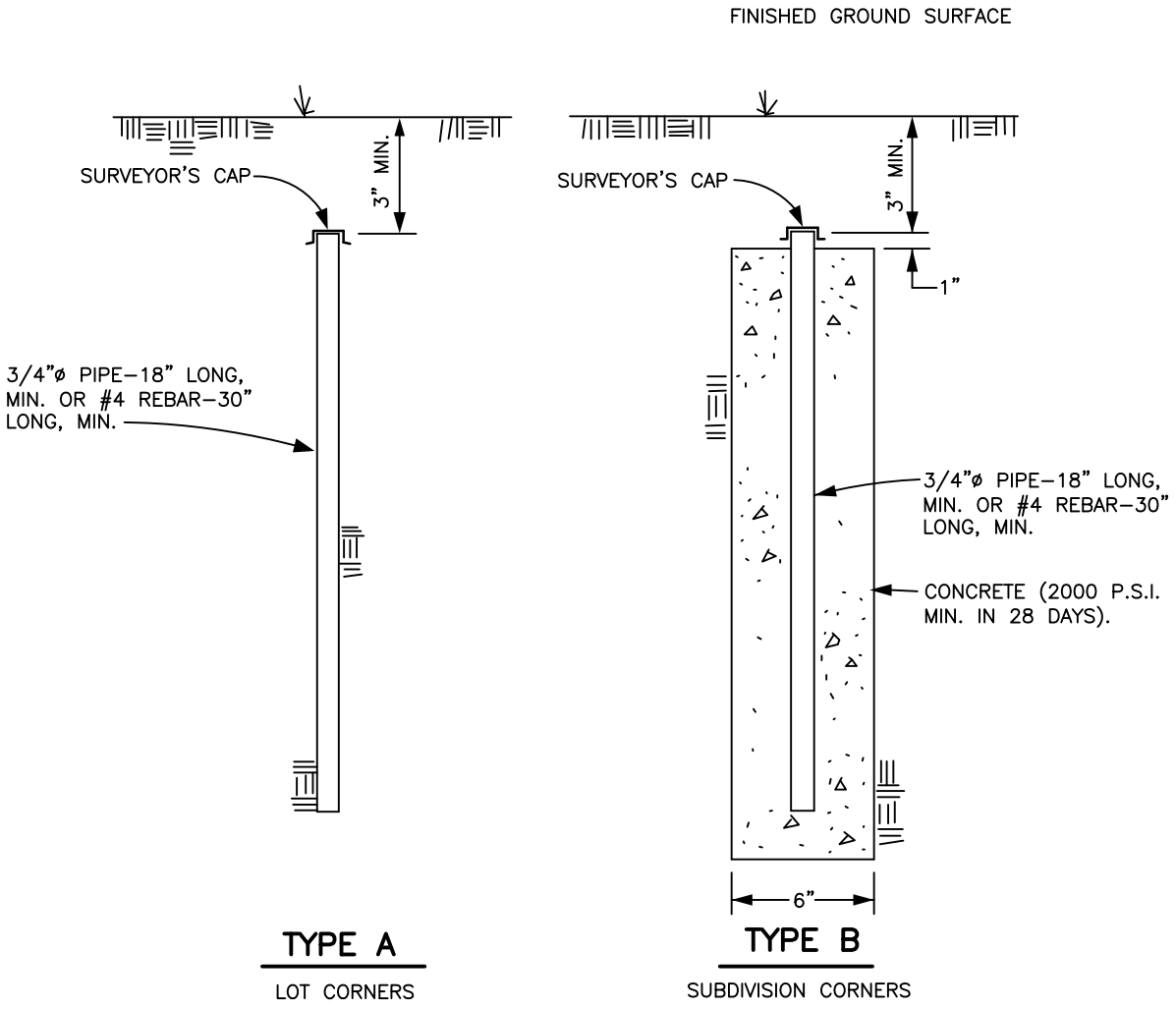
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. GE-14



NOTES:

1. STATE LAW REQUIRES ALL CORNERS TO BE TAGGED WITH SURVEYOR'S NUMBER.
2. ALL SUBDIVISION LOT CORNERS SHALL REQUIRE TYPE A MONUMENTS.
3. REGULAR SHAPED SUBDIVISIONS SHALL REQUIRE TYPE B MONUMENTS AT ALL CORNERS. IRREGULAR SHAPED SUBDIVISIONS SHALL HAVE ALL ANGLE AND CURVE POINTS MARKED WITH TYPE B MONUMENTS.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

PROPERTY MONUMENT DETAILS

STANDARD DRAWING

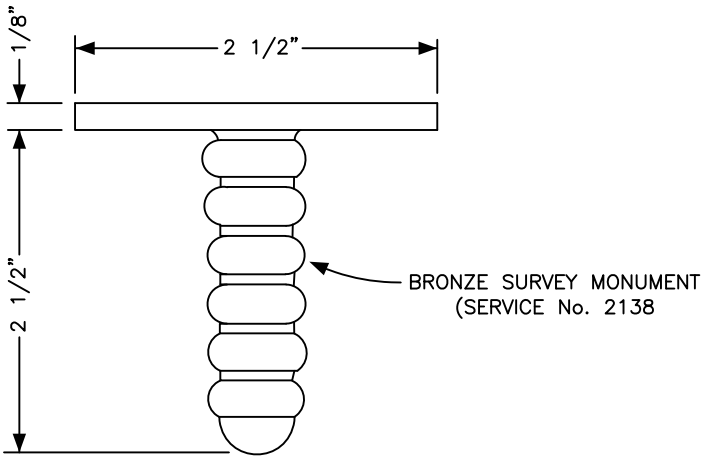
APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

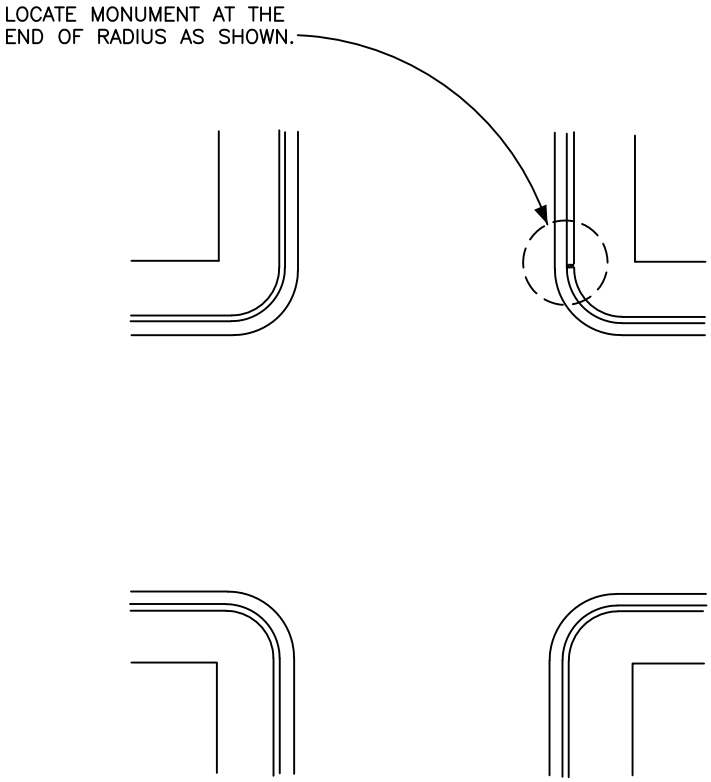
DRAWING NO. GE–17

TOP

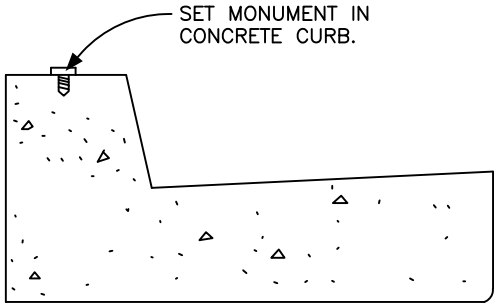


FRONT

SURVEY MONUMENT



BENCHMARK LOCATION



STANDARD CURB & GUTTER

NOTES:

1. LOCATE BENCHMARKS AT THE NORTHEAST CORNER OF INTERSECTIONS APPROVED BY THE CITY ENGINEERING DEPARTMENT.

2. COMPLETE NOTES SHOWING LOCATIONS, ELEVATIONS AND CLOSURES SHALL BE FILED WITH THE CITY ENGINEERING DEPARTMENT.

3. ELEVATIONS SHALL BE BASED ON DATUM USED ON U.S.C., G.S. AND CITY RECORD BENCHMARKS.

4. BENCHMARK NUMBER SHALL BE STAMPED WITH DIES ON TOP.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

ELEVATION BENCHMARK DETAILS

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. GE-20

CHAINLINK FENCE DETAILS

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

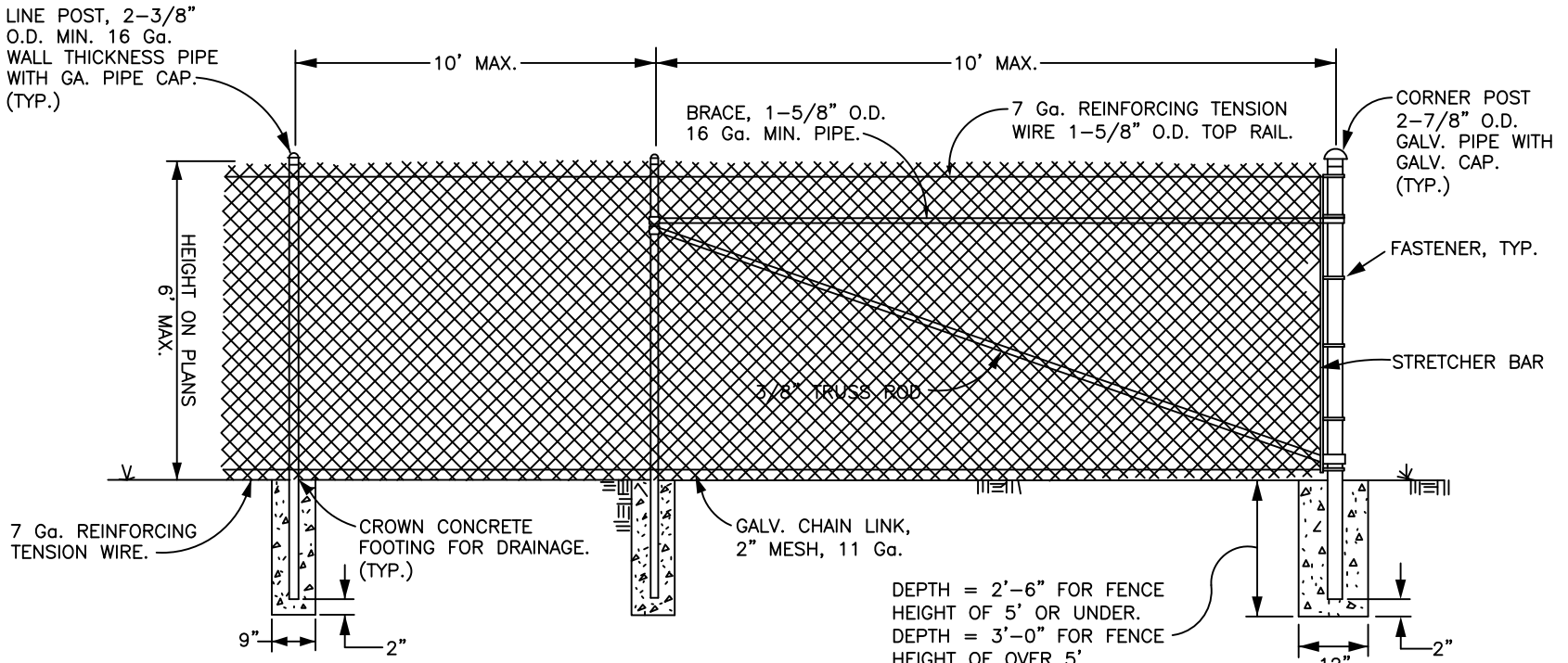
ENGINEERING DIVISION

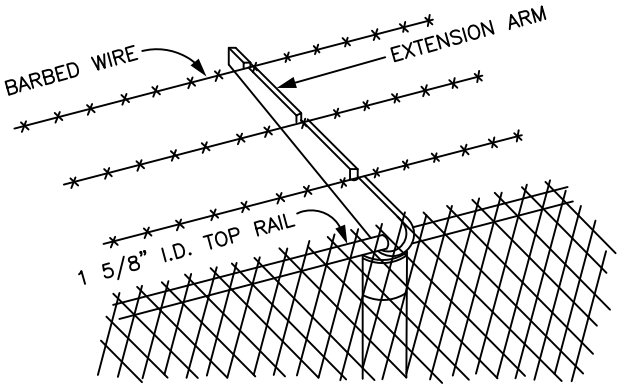
APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. GE-23





DETAIL A

NOTES:

1. DEPTH OF FOOTINGS ARE INTO NATURAL UNDISTURED SOIL OR TESTED OR APPROVED COMPACTED FILL.
2. CONCRETE FOOTINGS SHALL BE A MIN. FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).
3. THE FOLLOWING ITEMS SHALL BE FURNISHED & INSTALLED ONLY WHEN SHOWN ON PLANS AND/OR CALLED FOR IN THE SPECIAL PROVISIONS:
   A. BARBED WIRE
   B. EXTENTION ARM
   C. TOP RAIL
   D. VINYL SLATS
4. 9 Ga. WIRE FASTENERS SHALL BE USED.
5. DETAIL A REFERS TO ALL PUBLIC ENCLOSURES UNLESS SPECIFICALLY NOTED OTHERWISE.
6. WHEN FENCE IS AROUND A DRAINAGE BASIN A 6"w x 8"d CONCRETE CURB SHALL BE POURED UNDER FENCE, FLUSH WITH BOTTOM OF FENCE FABRIC.
7. WHERE SLATS ARE CALLED FOR ON PLANS, ALL LINE POSTS SHALL BE 2-3/8" O.D. SCH. 40 PIPE.

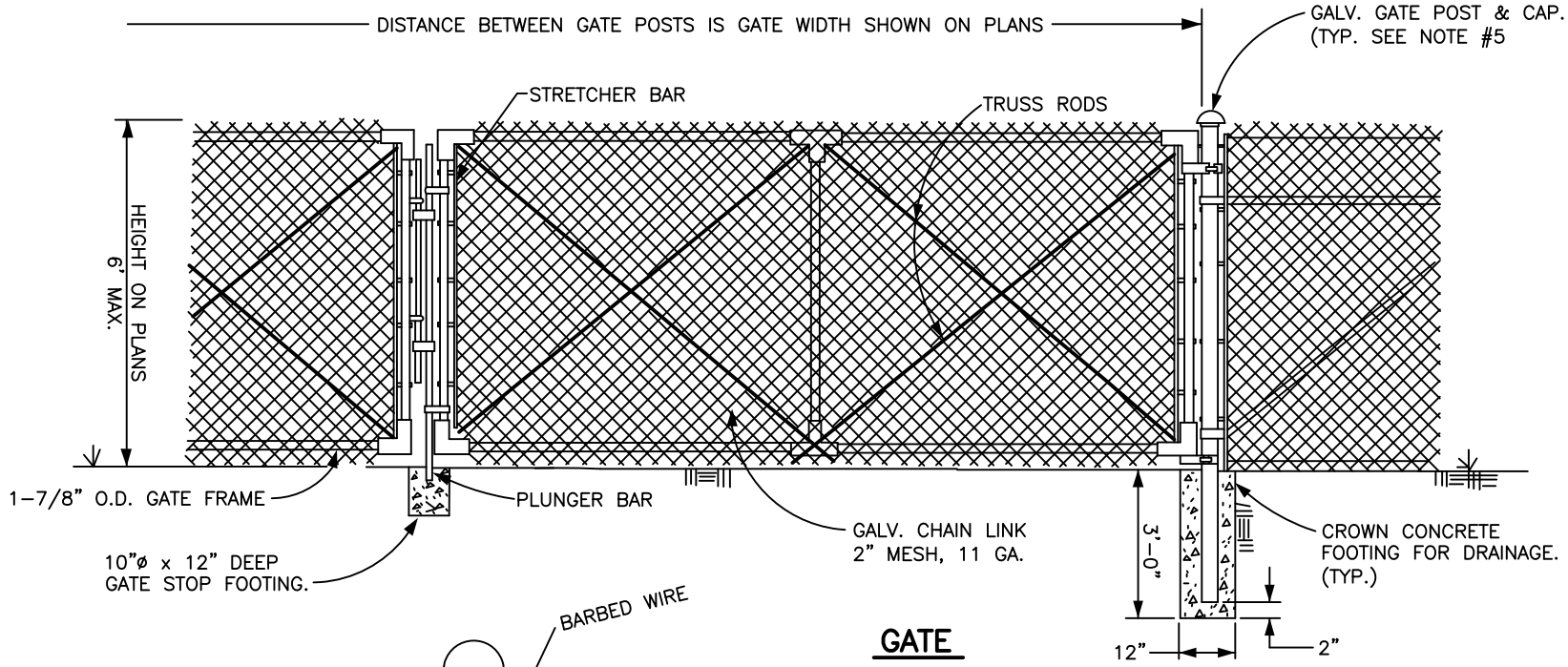
DEPT. OF PUBLIC WORKS

CITY OF HANFORD

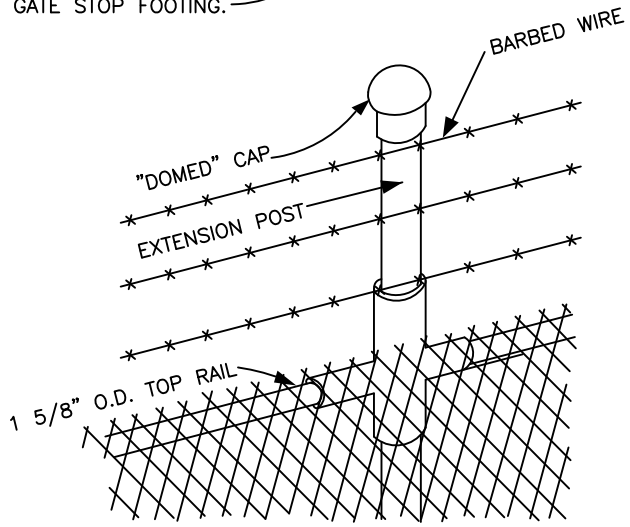
ENGINEERING DIVISION

CHAINLINK GATE DETAILS

STANDARD DRAWING



GATE



DETAIL A

NOTES:

1. DEPTH OF FOOTINGS ARE INTO NATURAL UNDISTURED SOIL OR TESTED OR APPROVED COMPACTED FILL.

2. CONCRETE FOOTINGS SHALL BE A MIN. FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).

3. THE FOLLOWING ITEMS SHALL BE FURNISHED & INSTALLED ONLY WHEN SHOWN ON PLANS AND/OR CALLED FOR IN THE SPECIAL PROVISIONS:
   A. BARBED WIRE
   B. EXTENTION ARM

4. 12 Ga. WIRE FASTENERS SHALL BE USED.

   4.1. GATE POSTS – USE 2-7/8" O.D. PIPE FOR DBL. GATE, WIDTHS UP TO 12' AND 4" O.D. PIPE FOR DBL. GATE WIDTHS 12' TO 24'.

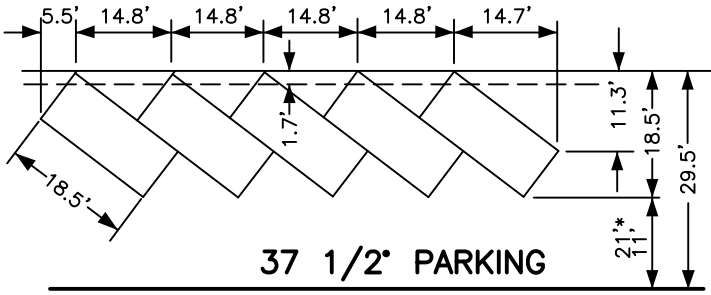
5. DETAIL A REFERS TO ALL PUBLIC ENCLOSURES UNLESS SPECIFICALLY NOTED OTHERWISE.

APPROVED BY:

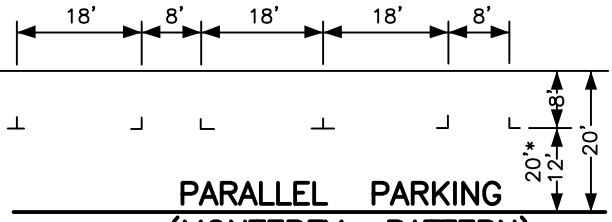
CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

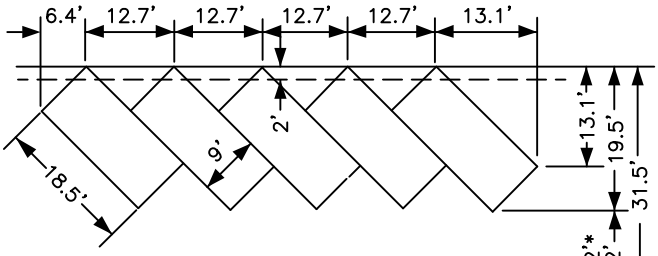
DRAWING NO. GE-26



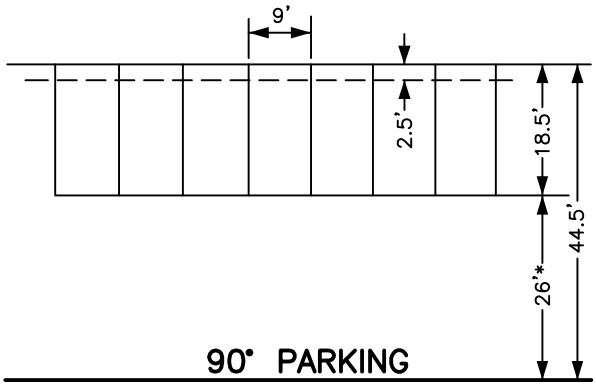
37 1/2° PARKING



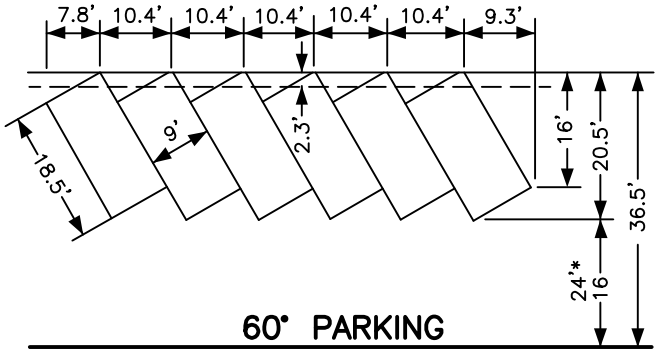
PARALLEL PARKING
(MONTEREY PATTERN)



45° PARKING

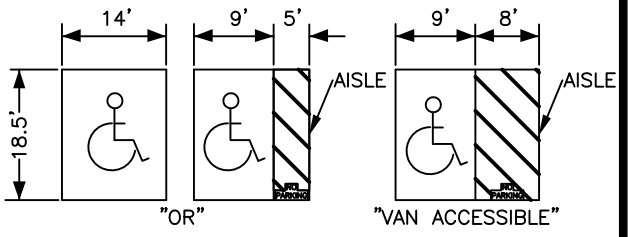


90° PARKING



60° PARKING

*MINIMUM AISLE FOR TWO WAY TRAFFIC



ACCESSIBLE PARKING SPACES

1. ACCESSIBLE PARKING SPACES SHALL INCLUDE A SIGN FOR THE INTENDED USE. THE ACCESSIBLE LEGEND SHALL BE "WHITE" SYMBOL OF ACCESSIBILITY TO BE 36" HIGH X 36" WIDE ON A "BLUE" BACKGROUND AT EACH DESIGNATED SPACE.

2. THE WORDS "NO PARKING" SHALL BE PAINTED IN THE LOADING AND UNLOADING AREA IN WHITE LETTERS NO LESS THAN 12" IN HIGH ON A CONTRASTING BACKGROUND AND LOCATED SO THAT IT IS VISIBLE TO TRAFFIC ENFORCEMENT OFFICIALS.

3. ONE IN EVERY EIGHT ACCESSIBLE SPACES, BUT NOT LESS THAN ONE, SHALL BE SERVED BY AN ACCESS AISLE 8' WIDE MIN. AND SHALL BE DESIGNED "VAN ACCESSIBLE".

ACCESSIBLE SPACES REQD.

TOTAL SPACES	ACCESSIBLE SPACES
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2% OF TOTAL
1001 AND OVER	20 PLUS 1 PER 100 ABOVE 1000

NOTE:

1. INSTALL 36" MIN. x 6" HIGH CONCRETE WHEEL STOPS WITH #6x18" REBAR TO PREVENT PARKED CARS FROM ENCROACHING OVER SIDEWALKS, ADJOINING PROPERTY OR CITY RIGHT-OF-WAY.

2. PROVIDE THE REQUIRED NUMBER OF PARKING STALLS AS REQUIRED BY THE CITY PLANNING DEPARTMENT BASED ON ZONING AND LAND USE.

3. COMPACT STALL SPACES SHALL BE 8'x16' & MARKED "COMPACT" WHEN APPROVED BY THE CITY ENGINEER. PLANNING DEPARTMENT SHALL DETERMINE MAX. No. OF COMPACT SPACES ALLOWED.

CITY OF HANFORD

DEPT. OF PUBLIC WORKS — ENGINEERING DIVISION

PARKING LOT REQUIREMENTS

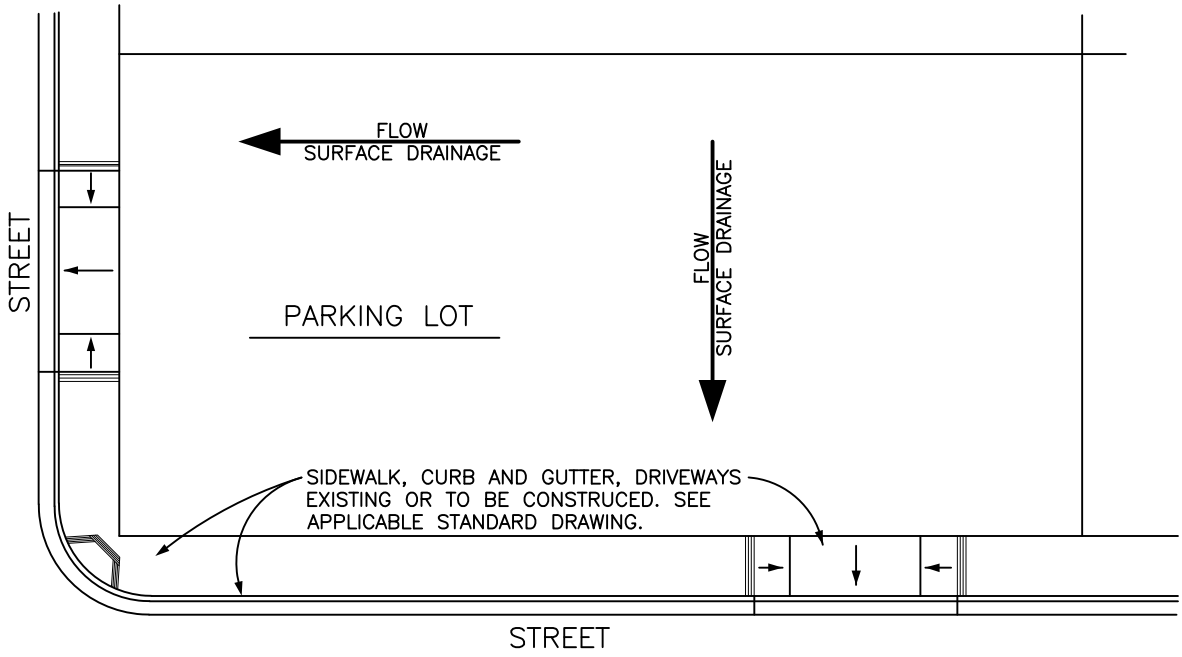
STANDARD DRAWING

APPROVED BY:

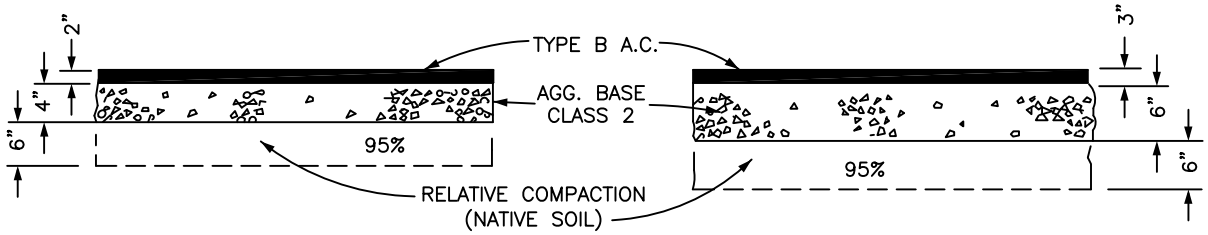
CITY ENGINEER R.C.E. 062044

REVISED: 04/10/18

DRAWING NO. GE-29

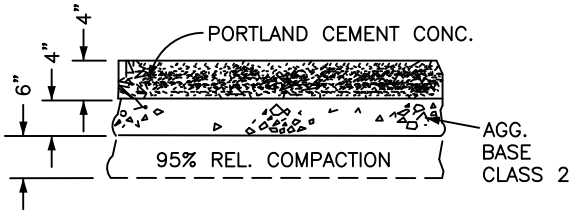


PLAN



PARKING LOT

INDUSTRIAL PARKING LOT



1. A COMPLETE DRAINAGE PLAN AND PARKING STALL LAYOUT SHALL BE SUBMITTED TO THE CITY ENGINEERING DEPARTMENT FOR APPROVAL PRIOR TO ANY CONSTRUCTION.

2. MINIMUM SLOPE SHALL BE 1.0% FOR ASPHALT SURFACE AND 2% FOR ASPHALT CONCRETE FLOWLINES, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

3. PROVIDE ADEQUATE DRAINAGE THRU APPROVED CATCH BASINS AND PIPES TO THE MEAREST STREET GUTTER. FLOW OVER SIDEWALKS IS NOT PERMITTED. FLOW OVER DRIVE APPROACHES IS ACCEPTABLE.

4. SURFACE DRAINAGE TO ALLEY MAY BE ALLOWED BY CITY ENGINEER, WHEN IMPRACTICAL TO DRAIN OTHERWISE. IMPROVEMENTS TO ALLEY MAY BE REQUIRED.

5. WEED KILLER SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

6. STRUCTURAL SECTIONS SHOWN ABOVE ARE MINIMUM THICKNESS. ACTUAL SECTIONS TO BE DETERMINED BY AN ACCEPTED FLEXIBLE PAVEMENT DESIGN METHOD.

ALTERNATE PARKING LOT

PARKING LOTS CONTINUALLY USED BY REFUSE & OTHER TYPES OF HEAVY TRUCKS SHALL REQUIRE ADDITIONAL STRUCTURAL STRENGTH. CONCRETE PAVEMENTS SHALL BE DESIGNED TO CONFORM WITH AMERICAN CONCRETE INSTITUTE (ACT) RECOMMENDATIONS.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

CITY ENGINEER R.C.E. 062044

PARKING LOT REQUIREMENTS

STANDARD DRAWING

REVISED: 04/04/06

DRAWING NO. GE-32

CITY OF HANFORD

CALIFORNIA

REFUSE REQUIREMENTS AND STANDARDS

1. **Bin Capacity Requirements:**

   Bin capacity requirements shall be based on four apartment units per one yard of bin capacity with twice a week collection service. The City of Hanford uses one, two and three yard bins. Any combination of bin sizes may be used to meet the bin capacity requirements. Refuse rates are set up for up to six day per week collection (if necessary).

2. **Refuse Enclosure Requirements:**

   The City of Hanford requires that all refuse bins be placed in enclosures. The refuse enclosures shall be constructed as follows:

   Concrete block or stucco where the enclosure is fully visible to the general public.

   Chain-link fencing with vinyl slats where the enclosure is not visible from streets, parking lots or general public view.

   Wood frame where the enclosure may have potential public view but not visible from streets or parking lots.

   The refuse enclosures shall be a minimum of six feet high. Minimum inside enclosure dimensions are as follows:

   One – 1 yard bin – 10 feet x 10 feet
   One – 2 yard bin – 10 feet x 10 feet
   Two – 2 yard bins – 10 feet x 15 feet
   One – 3 yard bin – 10 feet x 10 feet
   Two – 3 yard bins – 10 feet x 20 feet

3. **Refuse Enclosure Access Requirements:**

   All refuse enclosures shall be situated adjacent to major roadways and shall not be situated such that parked vehicles block access. All major roadways which must be traveled by refuse trucks shall not have any turning radius less than 30 feet.

4. **Refuse Enclosure Use Requirements:**

   The enclosure shall be used only for placing refuse to be picked up by the City of Hanford Refuse Division. All other uses must be provided for in a separate area.

TRASH BIN – BLOCK ENCLOSURE

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

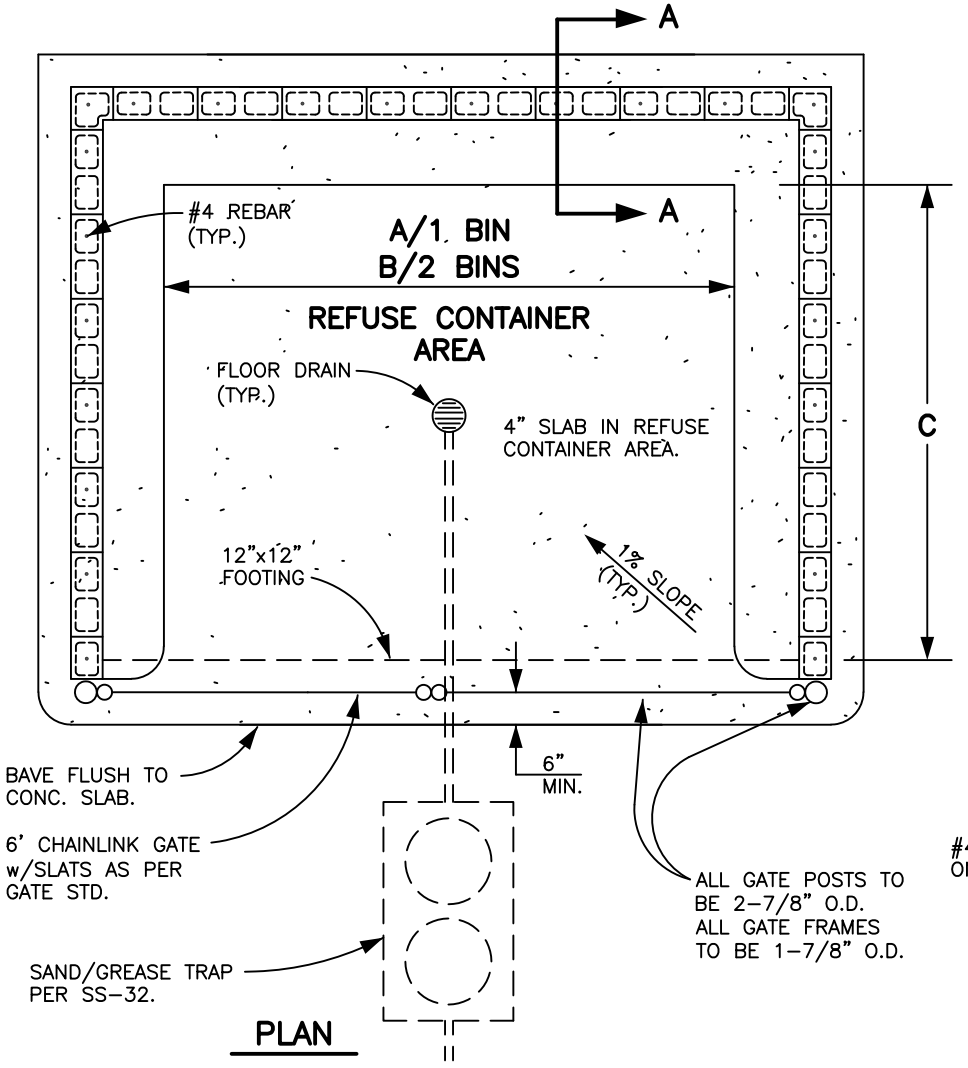
ENGINEERING DIVISION

APPROVED BY:

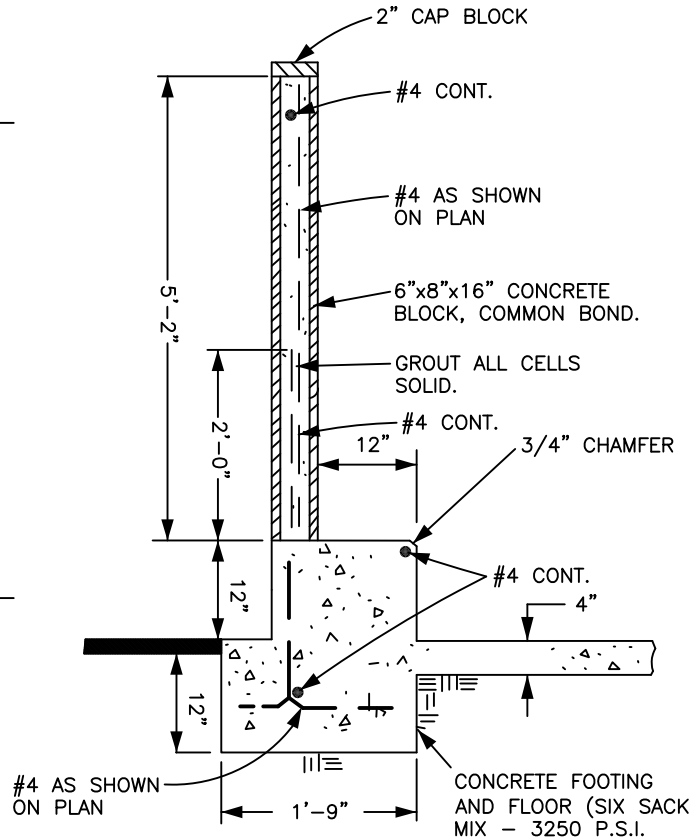
CITY ENGINEER R.C.E. 062044

REVISED: 07/10/17

DRAWING NO. GE-35



PLAN



SECTION A – A
(TYP.)

NOTE:

1. PUBLIC WORKS RECOMMENDED ENCLOSURE.
2. CUT CORNER BLOCK ENDS AND CENTER WEB TO FORM A CONT. BOND BEAM.
3. GROUND TO BE SLOPED AWAY FROM WALL.
4. LOCATION OF BIN ENCLOSURE TO BE APPROVED BY THE CITY ENGINEER.
5. A BUILDING PERMIT SHALL BE OBTAINED FROM THE CITY BUILDING DEPARTMENT.

MIN. INSIDE ENCLOSURE DIMENSIONS

	1 YD.	2 YD.	3 YD.
A	15'	15'	15'
B	15'	15'	20'
C	10'	10'	10'

TRASH BIN – BLOCK ENCLOSURE (FOR RESTAURANT USE)

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

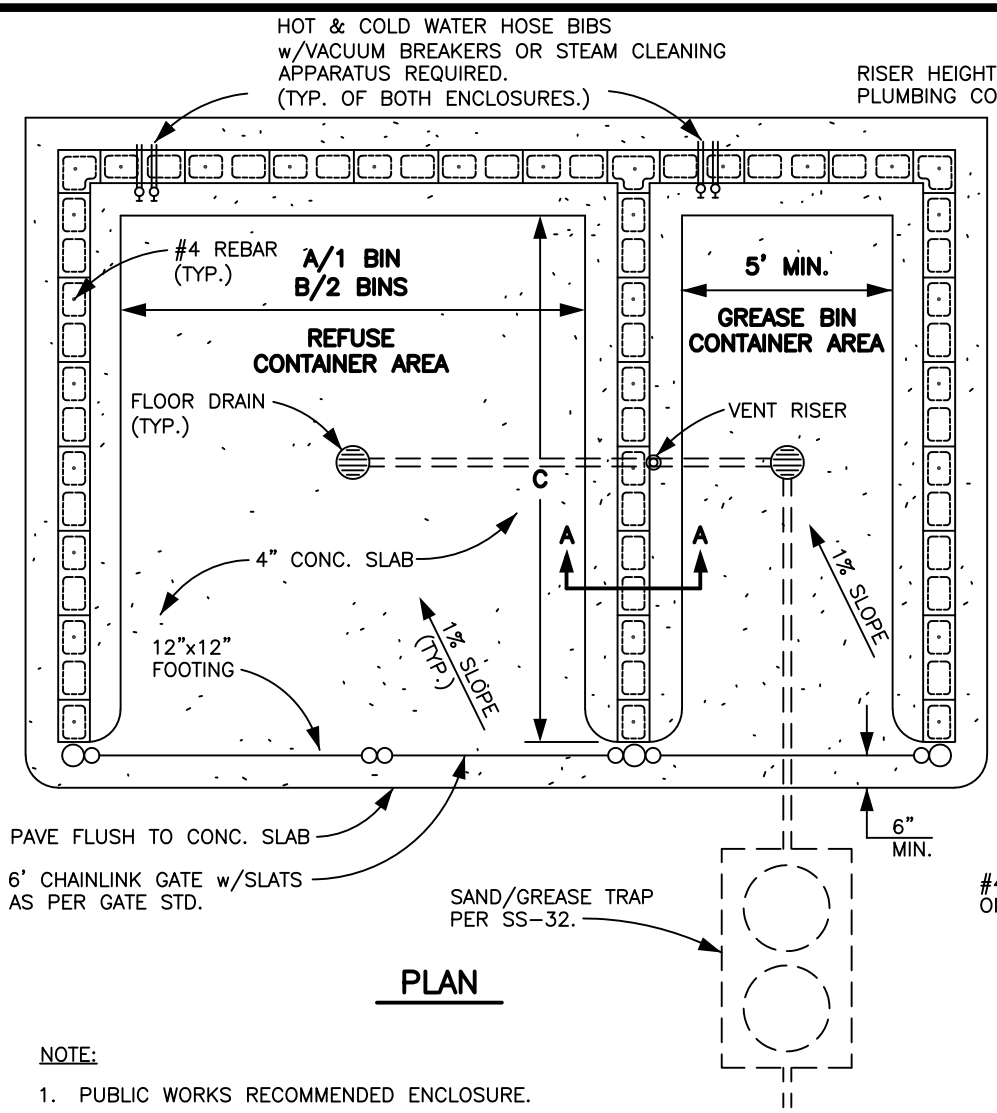
CITY OF HANFORD

ENGINEERING DIVISION

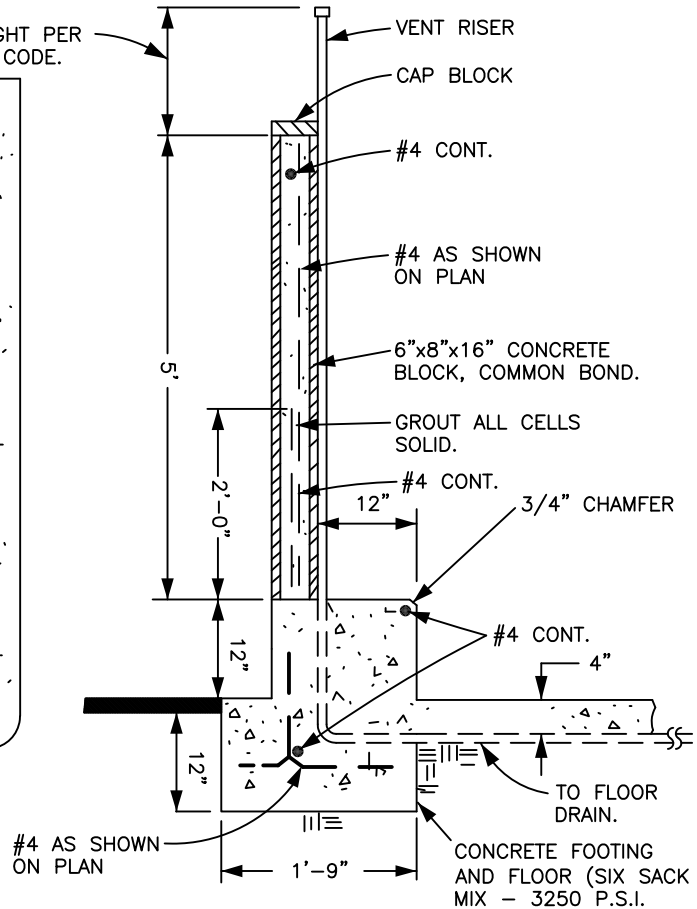
APPROVED BY: _____ CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. GE-41



PLAN



SECTION A – A (TYP.)

NOTE:

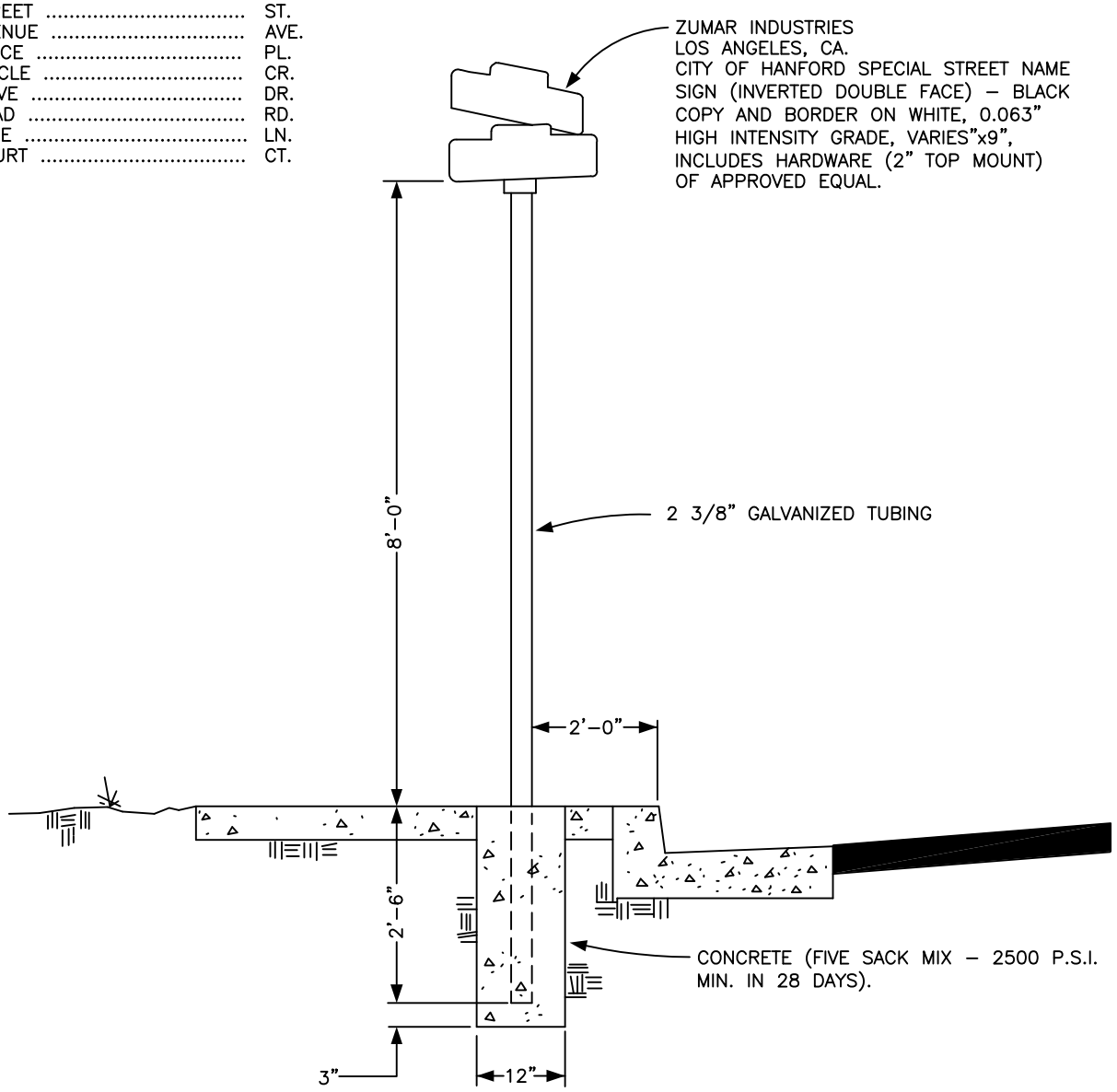
1. PUBLIC WORKS RECOMMENDED ENCLOSURE.
2. CUT CORNER BLOCK ENDS AND CENTER WEB TO FORM A CONT. BOND BEAM.
3. GROUND TO BE SLOPED AWAY FROM WALL.
4. LOCATION OF BIN ENCLOSURE TO BE APPROVED BY THE CITY ENGINEER.
5. A BUILDING PERMIT SHALL BE OBTAINED FROM THE CITY BUILDING DEPARTMENT.
6. ALL PLUMBING REQUIRED FOR CLEANING & DRAINAGE DEVICE MUST BE PERMITTED THROUGH CITY BUILDING DEPARTMENT.

MIN. INSIDE ENCLOSURE DIMENSIONS

	1 YD.	2 YD.	3 YD.
A	10'	10'	10'
B	–	15'	20'
C	10'	10'	10'

ALLOWABLE ABBREVIATIONS

BOULEVARD	BLVD.
STREET	ST.
AVENUE	AVE.
PLACE	PL.
CIRCLE	CR.
DRIVE	DR.
ROAD	RD.
LANE	LN.
COURT	CT.



NOTES:

1. STREET NAME SIGNS SHALL BE LOCATED AS DESIGNATED BY THE CITY ENGINEER.
2. WHERE A VEHICLE CONTROL SIGN IS REQUIRED, THE STREET NAME SIGN SHALL BE MOUNTED ABOVE IT. CLEARANCE TO THE BOTTOM OF ALL VEHICLE CONTROL SIGNS SHALL BE 7 FEET MIN. IF A SECONDARY SIGN IS LOCATED BELOW IT, CLEARANCE TO THE BOTTOM OF THE SECONDARY SIGN MAY BE 6'–6" MIN. UNLESS APPROVED BY THE CITY ENGINEER.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

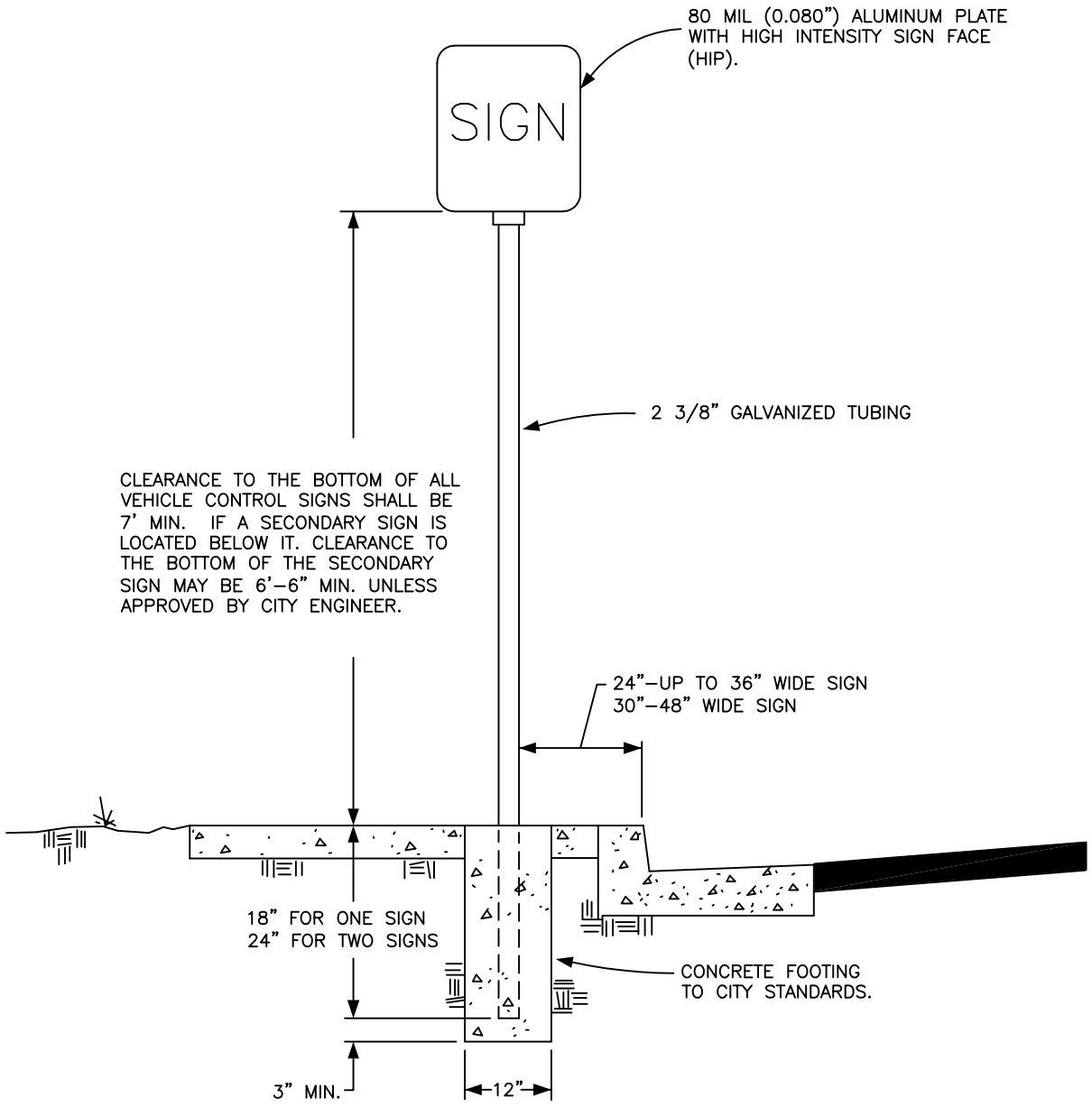
CITY ENGINEER R.C.E. 062044

STREET NAME SIGN

STANDARD DRAWING

REVISED: 04/04/06

DRAWING NO. GE–47



DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

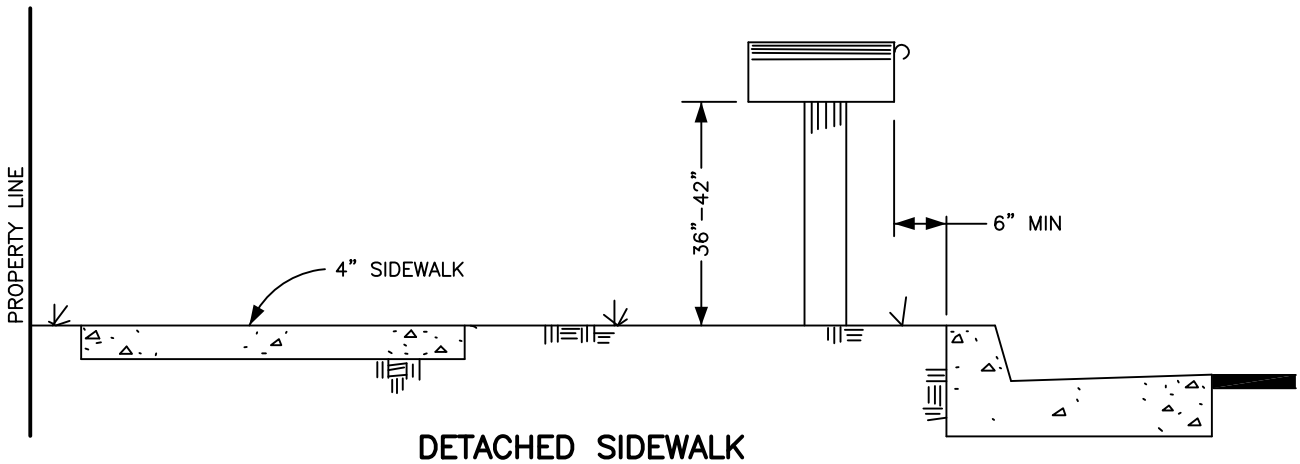
CITY ENGINEER R.C.E. 062044

STREET SIGN DETAIL

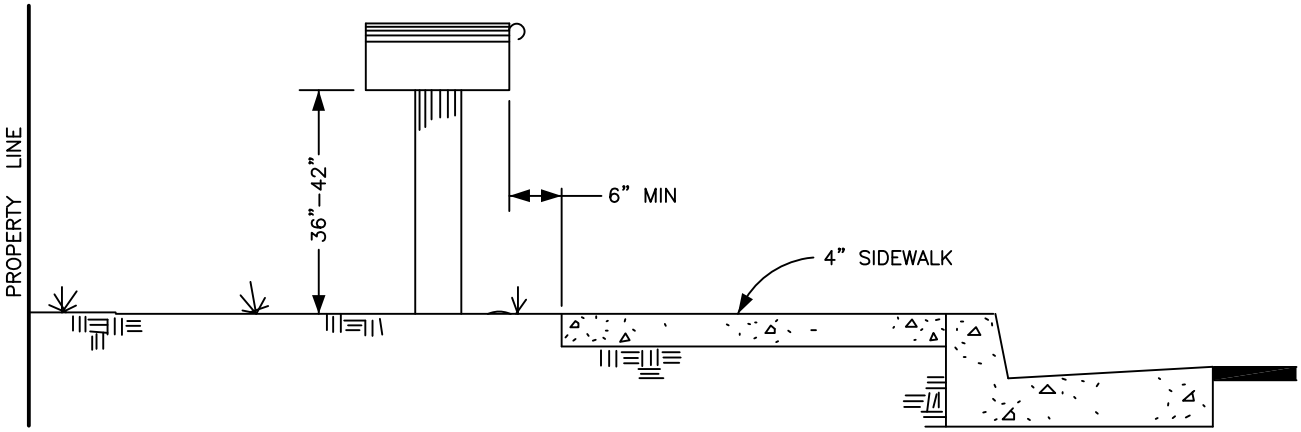
STANDARD DRAWING

REVISED: 08/09/10

DRAWING NO. GE-48



DETACHED SIDEWALK



ADJACENT SIDEWALK

NOTES:

1. MAIL BOXES SHALL BE CLUSTERED IN GROUPS OF 2 MIN.
2. CLUSTERED MAIL BOXES SHALL SERVE HOUSES ON ONE SIDE OF THE STREET ONLY.
3. EACH MAIL BOX SHALL BE NUMBERED WITH THE ADDRESS OF THE RESIDENCE WHICH IT SERVES.
4. THE LOCATION OF MAIL BOXES SHALL BE DETERMINED BY THE CITY ENGINEER.
5. THE OWNERS ARE RESPONSIBLE FOR ALL MAINTENANCE & REPAIR.
6. MAIL BOXES SHALL MEET U.S. POSTAL SERVICE REQUIREMENT.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

MAIL BOX

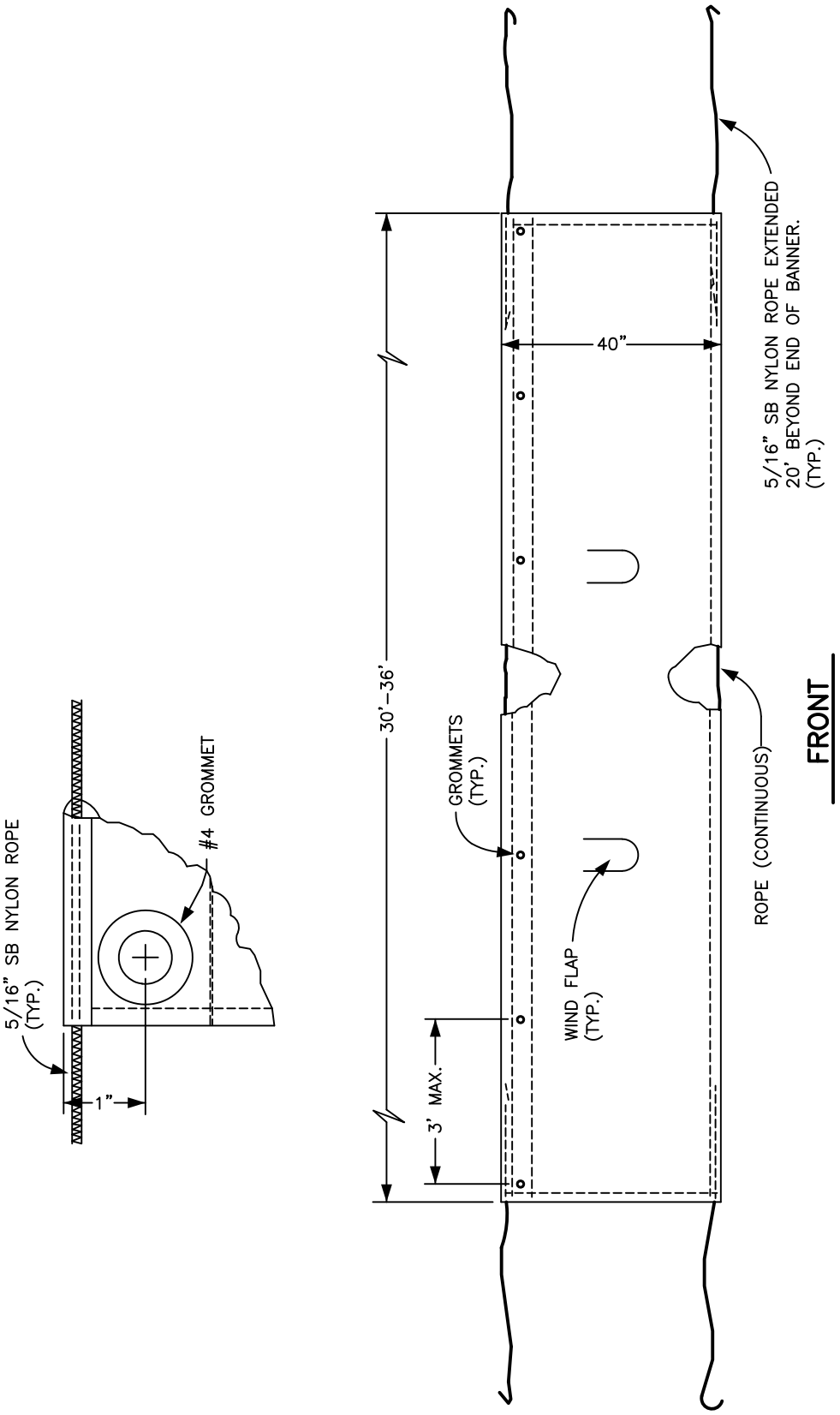
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 08/09/10

DRAWING NO. GE-50



1. BANNER MATERIAL SHALL BE CANVAS OR APPROVED EQUAL.
2. ROPE SHALL BE SEWN INTO TOP AND BOTTOM EDGE OF THE BANNER LEAVING 20' OF ROPE EXTENDED BEYOND EACH END OF THE BANNER FOR TYING PURPOSES AND RUNNING ENTIRE LENGTH THRU EDGES OF BANNER.
3. EACH BANNER SHALL HAVE (4) - 6"x8" WIND FLAPS CUT INTO IT AS SHOWN.
4. EACH GROMMET SHALL HAVE A 5/16" CARABINEER ATTACHED.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

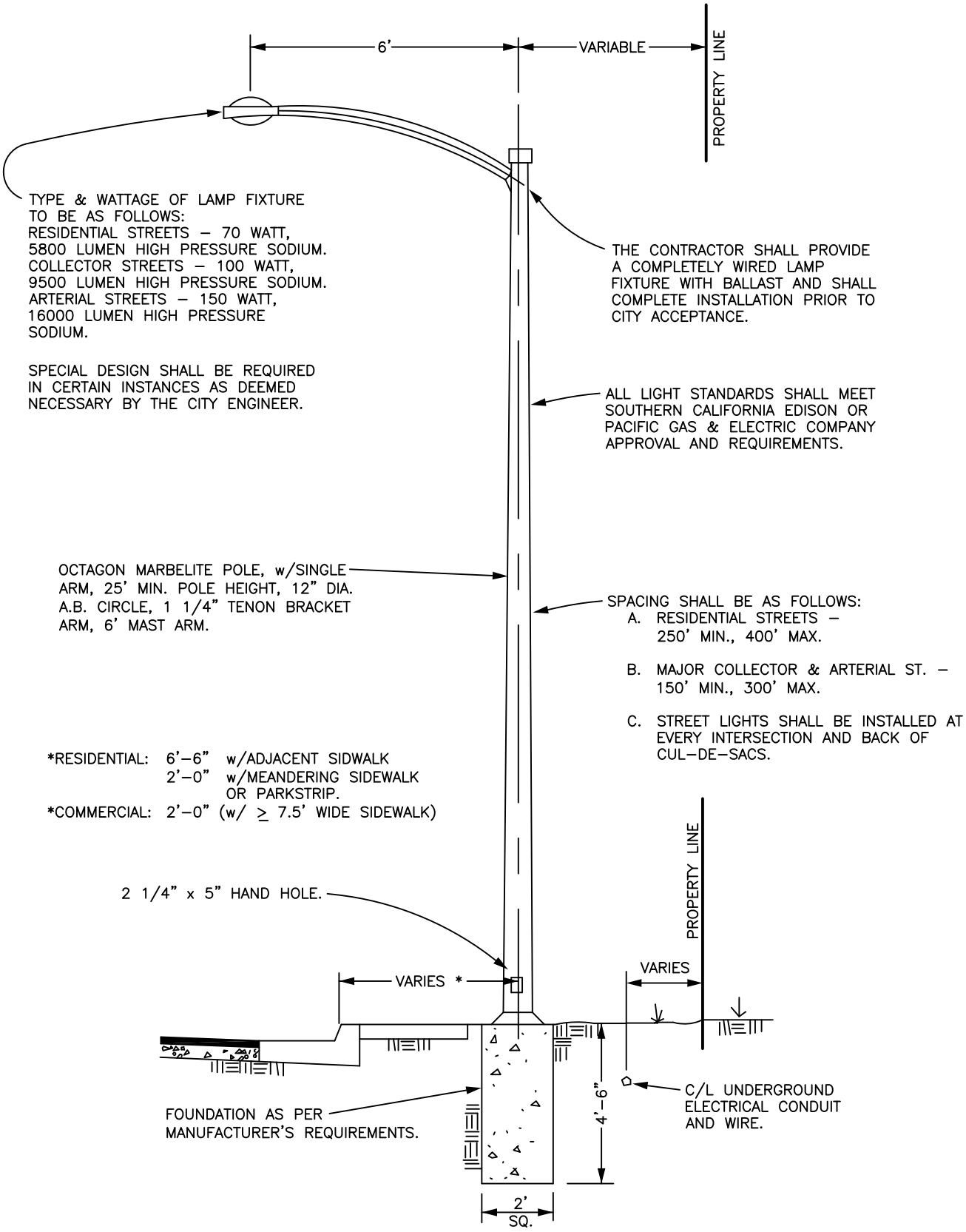
CITY ENGINEER R.C.E. 062044

BANNER DETAIL

STANDARD DRAWING

REVISED: 09/17/14

DRAWING NO. GE-53



DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

STREET LIGHT INSTALLATION

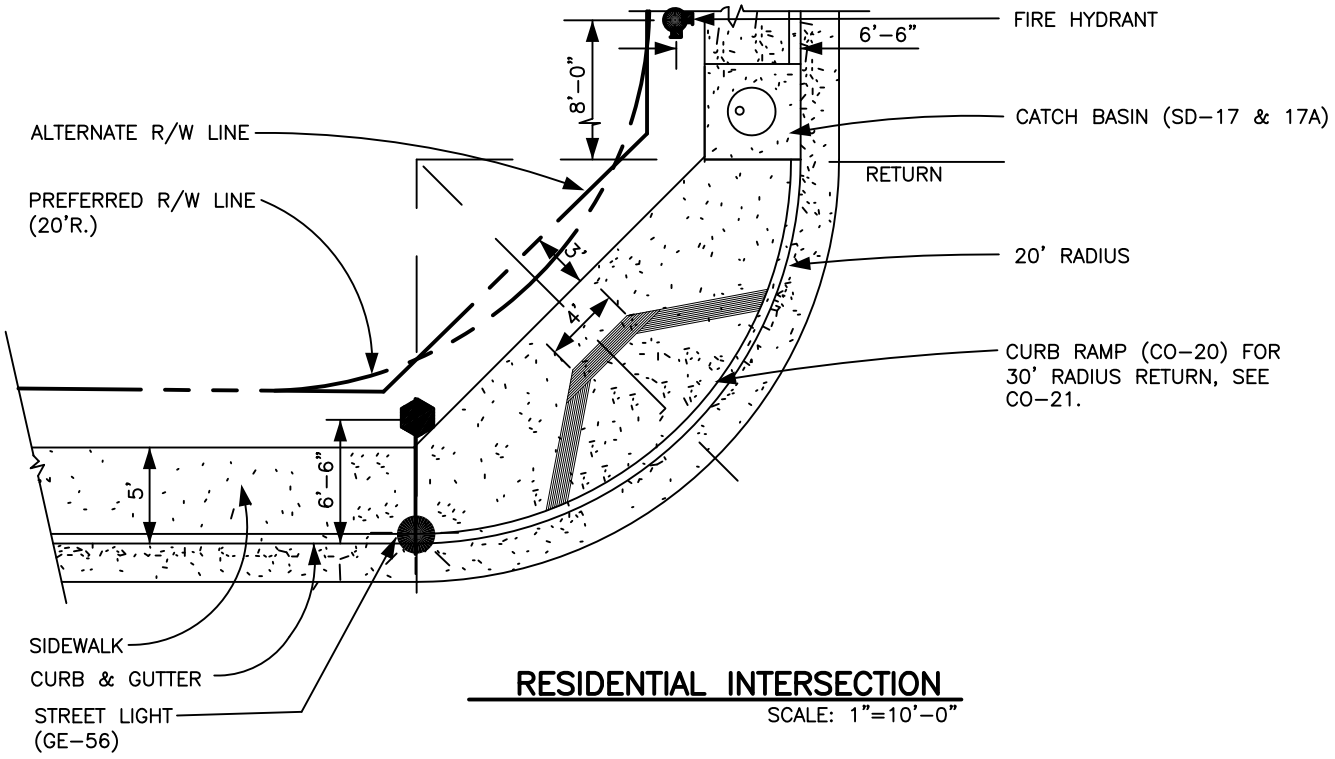
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

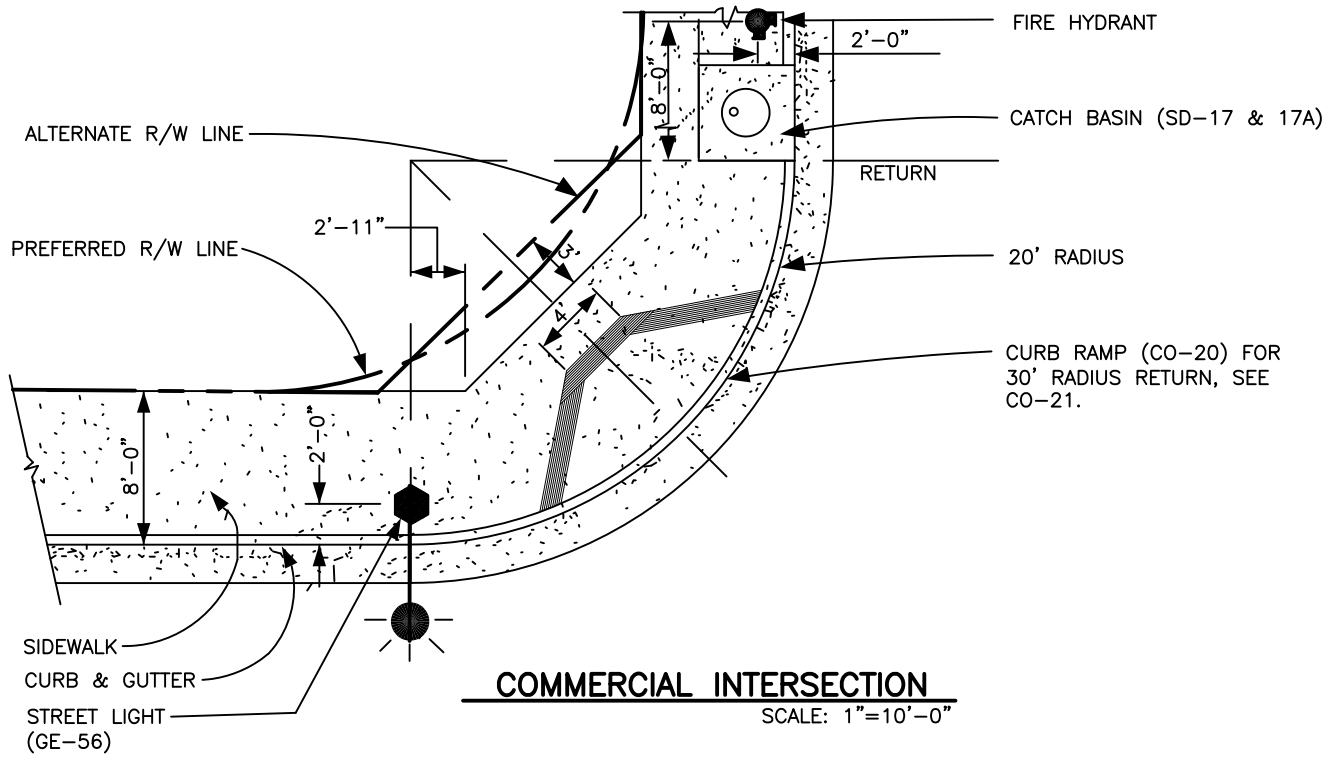
REVISED: 08/09/10

DRAWING NO. GE–56



RESIDENTIAL INTERSECTION

SCALE: 1"=10'-0"



COMMERCIAL INTERSECTION

SCALE: 1"=10'-0"

CITY OF HANFORD

DEPT. OF PUBLIC WORKS

ENGINEERING DIVISION

STREET LIGHT, FIRE HYDRANT & CATCH BASIN LOCATION DETAIL

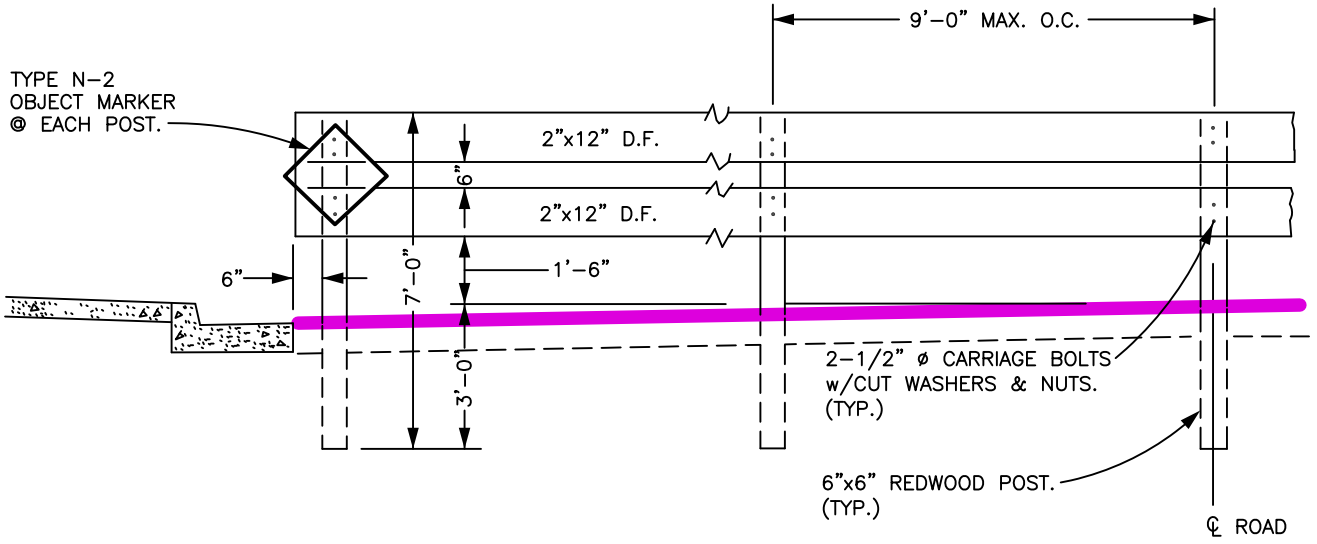
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/12/18

DRAWING NO. GE-57



NOTES:

1. THE BARRICADE MUST EXTEND ACROSS THE FULL WIDTH OF PAVEMENT.
2. WOOD PRESSURE TREATED WITH A PRESERVATIVE MAY BE SUBSTITUTED FOR REDWOOD MATERIAL.
3. BARRICADES SHALL BE PAINTED WITH 2 COATS OF COMMERCIAL QUALITY WHITE BEADED ENAMEL. MARKINGS ON BARRICADE RAILS SHALL BE CALIFORNIA DEPT. OF TRANSPORTATION TYPE N-2 OBJECT MARKER (18"x18" RED REFLECTIVE SIGN WITH BLACK BORDER) ON EACH POST.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

TIMBER BARRICADE

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. GE-59

CITY OF HANFORD

CALIFORNIA

STREET COMPACTION CRITERIA

In order to clarify our requirements for the compaction of street subgrade and base materials, the following criteria shall apply:

Relative compaction shall be determined in accordance with *California* Test Method No. ~~California~~ 216, ~~and/or~~ *California* Test Method ~~California~~ *No.* 231~~.~~ *, or ASTM 1557.*

Subgrade soil materials (cohesive, non-free draining and non-cohesive, free draining materials) shall be compacted to a minimum relative compaction rate of 95 percent of maximum density.

Aggregate base and sub-base materials shall be compacted to a minimum relative compaction rate of 95 percent of maximum density.

Asphalt concrete pavement shall be compacted to a minimum relative compaction rate of 95 percent of maximum density.

Class I, II and III backfill for trenches shall be compacted to 95 percent relative compaction, within top 2 feet in street section, and 90 percent relative compaction in remainder of trench.

All engineered fills *(including aggregate base and sub-base*) shall be moisture conditioned to within two (2) percent of optimum moisture content and compacted in thin lifts not to exceed eight (8) inches maximum compacted thickness.

The requirements for maximum density-optimum moisture relationships for all other fills as specified in the Uniform Building Code shall apply to those fills placed on private properties outside of street right-of-way.

The City Engineer retains the option to reject any compacted material regardless of the degree of compaction if that material is considered to be unstable or if future instability is suspected. A specific example of a fill material passing this required percent compaction is a fill which has been compacted with an in-situ moisture content significantly less than optimum moisture. This type of dry fill (brittle fill) is susceptible to future settlement if it becomes saturated or flooded.

CITY OF HANFORD

CALIFORNIA

FLEXIBLE PIPE (PVC) CRITERIA

1. EMBEDMENT (BEDDING) CLASSES FOR PVC PIPE

There is only one embedment (bedding) class for PVC pipe and that is within the ″EMBEDMENT ZONE.″ This embedment zone will have compaction to 90% Standard Proctor Density. The trench width will vary from narrow trench to a trench width of five (5) pipe diameters minimum, depending on the side soil support.

ASTM D-2321 – 7.1.8 recommends a soil exploration program be conducted prior to excavation to determine, in advance, soil conditions that relate to trench construction.

2. EMBEDMENT MATERIAL FOR PVC PIPE AND SOIL SUPPORT

Class 1 – Crushed, ¼″to 1½″ graded stone, including a number of fill materials that have regional significance such as coral slag, cinders, crushed shells and crushed stone.

Class II – Coarse sands and gravels with maximum particle size of 1½″, including variously graded sands and gravels containing small percentage of fines, generally granular and noncohesive, either wet or dry.

Class III– Fine sand and clayey (clay-filled) gravels including fine sands, sand-clay mixtures and gravel-clay mixtures.

Class IV – Silt, silty clays and clays including inorganic clays and silts of low to high plasticity and liquid limits. Soil types MH, ML, CH and CL. Class IV materials are not recommended for the bedding haunching or initial backfill.

Class V – This material is not recommended for the Embedment Zone.

3. USE OF EMBEDMENT MATERIAL FOR PVC PIPE

A. When Class I material is used for bedding, little or no compaction is necessary due to the nature of the angular particles. A depth of 4 to 6 inches of Class I material is generally sufficient to provide uniform bedding. If Class I material is used for bedding, it must also be utilized for haunching up to or higher than the spring line of the pipe to avoid loss of side support through migration of Class II or Class III material into the bedding.

B. Care must be taken with Class II material to provide a uniform compacted bedding. The bedding material must be placed to a point above the pipe bottom, so that after compaction, the bedding material can be brought to grade. Hand or mechanical tamping should be used to compact the bedding material to a minimum of 90% STANDARD PROCTOR DENSITY. Slightly damp material will generally result in maximum compaction with a minimum of effort. Class III is the same as Class II.

4. EMBEDMENT DETAILS FOR PVC PIPE

****ASTM D-2321 and UNI BELL HANDBOOK****

<u>There is only one Embedment detail for PVC pipe</u>

Consider the following from the Plastic Engineering Handbook, Page 747, ---." "Too much emphasis cannot be placed on dimensional stability as an engineering property, for it is common knowledge that a high percentage of failures of plastic is due to dimensional instability."

The type of gradation of the material used in the bedding, haunching and initial backfilling, as well as the method and care it is installed, are important factors in achieving successful installations of PVC pipe. The amount of diametric deflection can be anticipated by the type and gradation of the embedment material and pipe stiffness, as well as the care it is placed under, around and over the top of pipe. Therefore, careful consideration should be given to the material and methods of placement and compaction.

CITY OF HANFORD

CALIFORNIA

MAJOR STREET DESIGN STANDARDS

To maximize the capacity of the major street system, it is important to incorporate features that safe traffic flow into the design of the street section and access.

Section 1. Major Street Designations and Descriptions Used by the City of Hanford.

A) Major arterial streets shall be built at an approximate separation of one (1) mile. Major arterial streets are planned for newly developing areas where acquisition of ultimate right-of-way can be achieved without significant disruption of existing uses. Because of existing right-of-way limitations, major arterial streets may connect with minor arterial streets employing design modifications.

B) Minor arterial streets shall be on an approximate one (1) mile separation and may be an extension of the major arterial streets. The design of the minor arterial is constrained by significant right-of-way limitations; however, the roadway must function at arterial traffic levels.

C) Major collector streets shall be built at an approximate separation of one (1) mile, typically one-half mile from arterial streets. Major collector streets are planned for newly developing areas where acquisition of ultimate right-of-way can be achieved without significant disruption of existing uses. Because of existing right-of-way limitations, major collector streets may connect with minor collector streets employing design modifications.

D) Minor collector street may be on less than one (1) mile separation and may be an extension of a major collector street or may be an existing street which connects one part of the City

with another. The design of the minor collector is constrained by significant right-of-way limitations; however, the roadway must function at collector traffic levels.

E) Minor collector streets are typically constructed in new development areas of the City, and their function is to carry a higher traffic capacity than local streets and connect to major collectors or occasionally major arterial streets.

F) Arterial and collector street standards have been developed which provide adequate capacity for their appropriate function. However, consideration of variances to City standards may be necessary to respond to design conflicts.

G) Arterial and collector street standards have been developed which provide adequate capacity for their appropriate function. However, consideration of variances to City standards may be necessary to respond to design conflicts.

Section 2. <u>Street Geometric Design Issues</u>.

The following issues and potential solutions have been identified in response to increased traffic and the need to minimize conflicts between access and through traffic:

A) Arterial Streets

1) Deceleration. On major streets it is beneficial to widen the street in advance of driveway access in order to provide the opportunity for deceleration outside of the through travel lanes. The type of treatment employed can range from uniform shoulders to approach tapers to complete deceleration lanes. Uniform shoulders are simply the extra width made available for emergency vehicle parking, bicycles, etc. and incorporated into the standard street design. Approach tapers are short (i.e. 100 feet) areas where the street width ″flares″ in the area immediately prior to a driveway. This treatment is applicable on major roads where turning traffic volumes are low such as secondary access to less intense uses. Full right turn lanes are typically long enough to accommodate much of the deceleration needed in advance of a driveway and are employed in high volume locations.

Right turn lanes that are at least 20 feet long and are preceded by a 70 to 90 foot transition.

2) Median breaks and driveway standards shall generally conform to the following standards:

a) Ingress and egress to shopping centers should minimize left hand movements into and out of parking/loading areas.

b) Where there is no adopted design for median breaks on an arterial street, there should be not less than 1,000 feet between median breaks (excluding left turn provisions). Median breaks should be consistent with the standards for driveways (not less than 200 feet from an adjacent intersection of a collector street or 300 feet from an arterial street).

c) Right turn only access driveways should be located far enough apart to avoid motorist confusion, and the number of driveways should be minimized to preclude impacts to through traffic. Right turn only access driveways should not be closer than 250 feet from other access driveways and should be at least 200 feet from intersections. (Measurement shall be from the nearest edge to the nearest edge of the driveway and from the curb return to the nearest edge of the driveway).

d) Driveway access to major activity centers, including multi-family development, should be located no closer than 200 feet to the intersection of a major collector or arterial street. (Measurements shall be from the curb return of the intersection to the nearest edge of the driveway).

e) The distance between commercial driveways on arterial streets should not be less than 400 feet. (Measurement shall be from the nearest edge to the nearest edge of the driveway).

f) Where practical and desirable, commercial driveways should be located on adjacent collector streets rather than on arterial streets.

g) If parcel size demands and alternative shared access is not available, commercial driveways may be provided not less than 50 feet from an intersection (measurement shall be from the curb return to the nearest edge of the driveway). These driveways shall not be serviced by median breaks. If more than one is required to serve a property, the driveways shall be separated by 50 feet. (The separation is to be measured from the nearest edge to the nearest edge of the driveways).

h) Existing points of ingress and egress shall be consolidated whenever possible. Driveway consolidation for new developments shall be encouraged through access agreements along arterial streets where standards (c) through (g) are exceeded.

B) Collector Streets

1) Median, driveway and intersecting street shall generally conform to the following standards:

a) Raised concrete medians may be provided where left turn control is needed, and painted medians may be used at two-way left turn pockets where appropriate. Where concrete medians are provided, median breaks should be spaced not less than 300 feet apart.

b) Driveway access to major activity centers should be located no closer than 200 feet to the adjacent intersection of a major collector or arterial street. (Measurement shall be from the curb return to the nearest edge of the driveway).

c) The distance between driveways and intersecting minor collectors or local streets should be not less than 300 feet. (Measurements shall be from curb return to the nearest edge of the driveway).

d) Right turn only access driveways should not be closer than 200 feet from other access driveways or street intersections. (Measurement shall be from nearest edge to the nearest edge of the driveway and from the curb return to the nearest edge of the driveway).

e) If parcel size demands and alternative shared access is not available, driveways may be provided not less than 50 feet from the intersection (measurement shall be from the curb return to the nearest edge of the driveway). These driveways shall not be services by median breaks. If more than one is required to serve a property, the driveways shall be separated by 50 feet. (The separation is to be measured nearest edge to nearest edge of the driveways).

f) Driveway consolidation for new development shall be encouraged through access agreements along major collector streets where standards (b) through (3) are exceeded.

g) Driveways to multi-family residential property along major collector streets should be consolidated whenever possible.

Section 3. <u>Connectivity, Intersection and Onsite Design</u>.

1) Separation of minor collection street entry points should not be less than 500 feet apart on arterial streets, major collector streets. Median standards of 1,000 feet apply to minor collector intersections with arterial streets.

2) Where possible, arterial collector streets shall form four-leg right angle intersections; jogs, offset and skewed intersections of streets in near proximity shall be avoided.

3) Driveway design/throat depth/aisle width. These issues can be fully addresses when a formal site plan is available; these standards will help in that preparation. The configuration of new driveways on all arterial streets and where determined appropriate on collector streets should incorporate features that safely move traffic off of and onto major streets as quickly as possible.

a) On arterial and major collector streets ″dust pan″ drive approaches should be avoided; ″easy access returns″ should be used on all driveways.

b) It is important that each driveway provide adequate distance between the adjoining street and the first onsite turning opportunity beyond the driveway; this distance is termed ″throat″ depth. The minimum throat for access from all arterial and major collectors shall be 50 feet; however, multi-use development will require an increase in throat depth.

c) Onsite aisles that provide direct connection to public streets shall provide the necessary width for site circulation and access to parking spaces. The minimum width for these aisles shall be 30 feet.

d) Signalized driveway access connections to public streets shall generally conform to the following standards:

1) Onsite driveway approach to the signal shall include three lanes: separate left turn, one through and a separate right turn lane. Each of these lanes should be a minimum of 300 feet long. While three lane approaches are desirable, a two lane approach may be adequate if the design is wide enough to allow right turns around one or two vehicles waiting to proceed straight.

2) Street approach to signalized private access should include inbound left turn lanes. While this design issue may need review as formal plans for development are considered, at a minimum left turn lanes should be 240 feet long and should be proceeded by a 90 foot long bay taper. This standard would provide room outside the through lanes to decelerate to a stop from 35 mph prior to reaching a two vehicle queue.

Section 5. <u>Residential</u>.

1) Single family residential driveways are prohibited on new arterial street and shall be discouraged on existing arterial streets.

2) Single family residential driveways should be prohibited along major collector streets including ″no access strips″ along residential side or rear yards.

3) Residential development shall be oriented away (side on or rear on) from arterial and major arterial and major collector streets and property buffered so that the traffic carrying capacity on the street will be preserved and the residential environmental protected from the potentially adverse characteristics of the street.

4) ″Daylighted″ cul-de-sacs providing pedestrian access from residential areas to arterial and collector streets is encouraged.

Section 6. <u>Public Transportation</u>.

1) The need for and location of downstream pull-outs and/or onsite bus stops shall be required as part of the development project as determined through consultation with the public transit provider.

2) Transit stops at intersections of major streets should be evaluated as development occurs.

CITY OF HANFORD

CALIFORNIA

FLEXIBLE PIPE (PVC) CRITERIA

1. EMBEDMENT (BEDDING) CLASSES FOR PVC PIPE

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ASTM D-2321 – 7.1.8 recommends a soil exploration program be conducted prior to excavation to determine, in advance, soil conditions that relate to trench construction.

2. EMBEDMENT MATERIAL FOR PVC PIPE AND SOIL SUPPORT

Class 1 – Crushed, ¼″to 1½″ graded stone, including a number of fill materials that have regional significance such as coral slag, cinders, crushed shells and crushed stone.

Class II – Coarse sands and gravels with maximum particle size of 1½″, including variously graded sands and gravels containing small percentage of fines, generally granular and noncohesive, either wet or dry.

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Class V – This material is not recommended for the Embedment Zone.

3. USE OF EMBEDMENT MATERIAL FOR PVC PIPE

A. When Class I material is used for bedding, little or no compaction is necessary due to the nature of the angular particles. A depth of 4 to 6 inches of Class I material is generally sufficient to provide uniform bedding. If Class I material is used for bedding, it must also be utilized for haunching up to or higher than the spring line of the pipe to avoid loss of side support through migration of Class II or Class III material into the bedding.

B. Care must be taken with Class II material to provide a uniform compacted bedding. The bedding material must be placed to a point above the pipe bottom, so that after compaction, the bedding material can be brought to grade. Hand or mechanical tamping should be used to compact the bedding material to a minimum of 90% STANDARD PROCTOR DENSITY. Slightly damp material will generally result in maximum compaction with a minimum of effort. Class III is the same as Class II.

4. EMBEDMENT DETAILS FOR PVC PIPE

****ASTM D-2321 and UNI BELL HANDBOOK****

<u>There is only one Embedment detail for PVC pipe</u>

Consider the following from the Plastic Engineering Handbook, Page 747, ---." "Too much emphasis cannot be placed on dimensional stability as an engineering property, for it is common knowledge that a high percentage of failures of plastic is due to dimensional instability."

The type of gradation of the material used in the bedding, haunching and initial backfilling, as well as the method and care it is installed, are important factors in achieving successful installations of PVC pipe. The amount of diametric deflection can be anticipated by the type and gradation of the embedment material and pipe stiffness, as well as the care it is placed under, around and over the top of pipe. Therefore, careful consideration should be given to the material and methods of placement and compaction.

5. TRENCH WIDTHS FOR PVC PIPE

The Uni-Bell Handbook shows the minimum(s) trench widths for PVC pipe in several tables. The tables cover for example: Narrow Trench Widths Minimums and supported Trench Widths Minimums. The trench width minimum(s) is dependent on the side-soil strength evaluation. If a Narrow Trench Width Minimum could be allowed for an 8″PVC pipe, the minimum trench width would be 24″. However, the minimum trench width of 36″ would be required in a ″Supported Trench″ for the same trench condition.

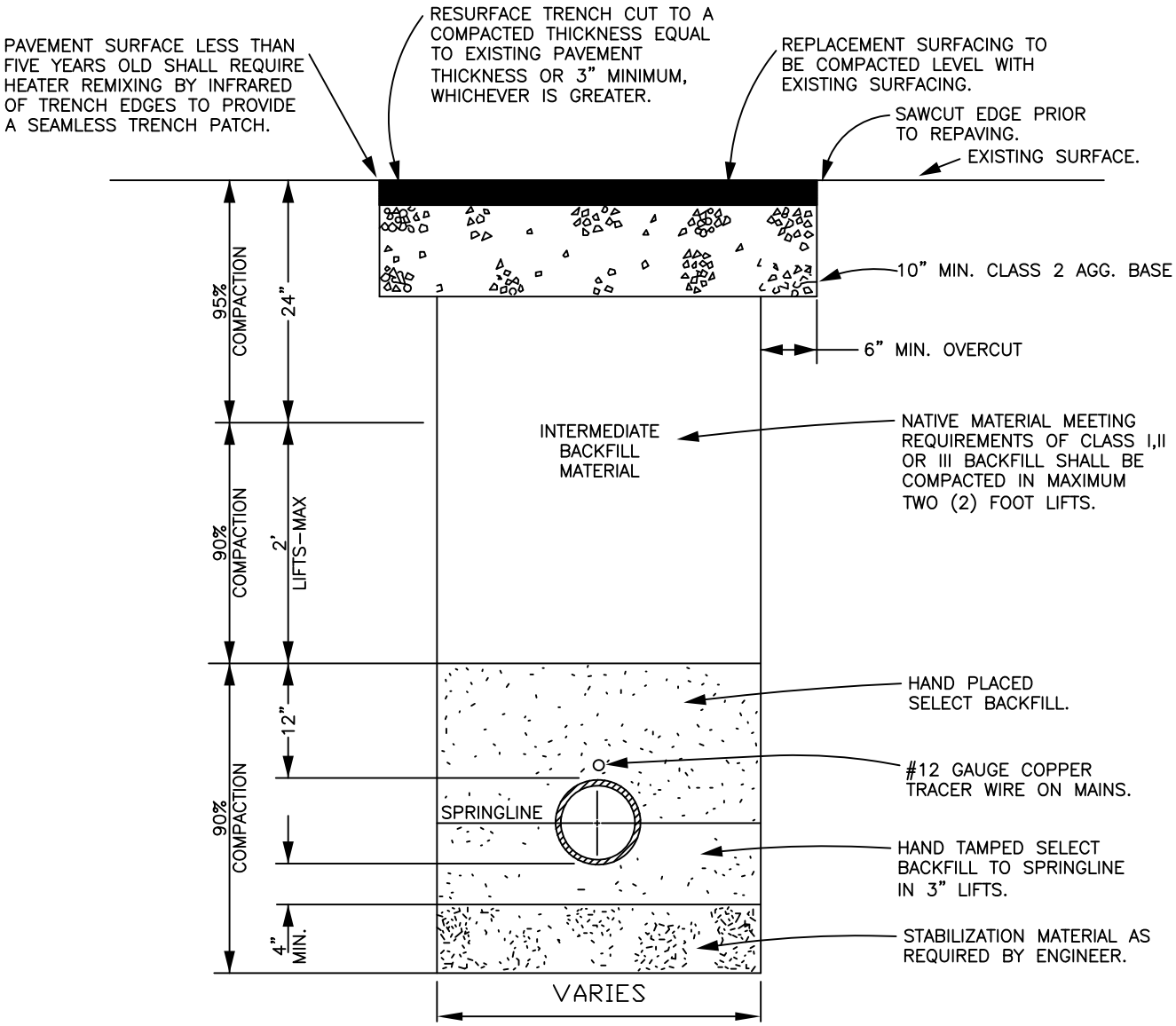
Uni-Bell Handbook also states the minimum trench conditions if movable sheeting, trench boxes or shields are to be used, which is ″When using movable trench support, care should be exercised not to disturb the pipe location, jointing or its embedment. Removal of any trench protecting below the top of pipe and within 2½ pipe diameters of each side of the pipe should be prohibited after the pipe embedment has been compacted --.″ Trench boxes that are pulled along the trench have a clear space constructed at the bottom to allow for ″embedment zone″ material to be placed against soil trench wall.

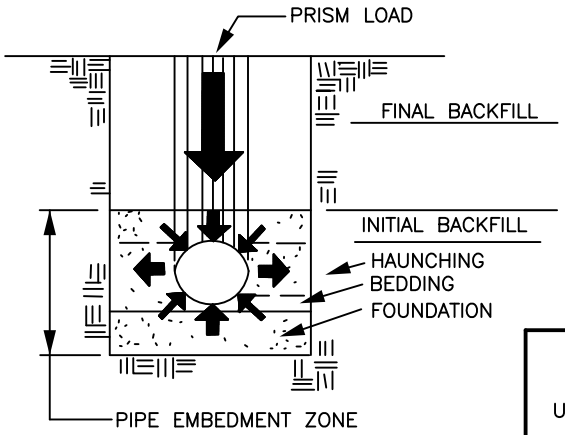
ASTM D-2321 - 7.1.2 – Unstable Trench Walls, ″---To obtain the desired lateral support for pipe laid, under unstable trench wall conditions where sheeting or other similar means are not left in place, the trench widths should be minimum of five pipe diameters.″

ASTM D-2321 – 9.1.1.1 – Use Under Wet Conditions - ″In any area where the pipe will be installed below existing or future ground water levels or where the trench could be subject to inundation Class I material, **when used, shall be placed to the top of pipe.
Note – When used was added in 1980.″

NARROW TRENCH WIDTHS, MINIMUMS		
Nominal Pipe Size/Inches	No. of Pipe Diameters (O.D.)	Trench Width Minimum/Inches
4	4.3	18
6	2.9	18
8	2.9	24
10	2.5	26
12	2.4	30
15	2.0	30
18	1.8	32
21	1.6	34
24	1.5	36
27	1.5	40

SUPPORTED TRENCH WIDTHS, MINIMUMS		
Nominal Pipe Size	No. of Pipe Diameters	Trench Width Minimum
4	8.5	36
6	5.7	36
8	4.3	36
10	4.0	42
12	3.4	42
15	3.1	48
18	2.7	48
21	2.4	50
24	2.2	52
27	2.1	56





NOTES:

1. USE SPECIAL CARE IN BEDDING FLEXIBLE PIPE TO INSURE SIDEWALL SUPPORT.
2. LESS COVER FOR 6" AND 8" PIPE MAY BE ALLOWED AT THE DISCRETION OF THE CITY ENGINEER.
3. TRACE WIRE TO BE INSTALLED ON:
   (A) CURVILINEAR PIPELINE INSTALLATIONS.
   (B) INSTALLATIONS OF PIPELINE NOT PERPENDICULAR.
4. SEE PRECIDING PAGES FOR FLEXIBLE PIPE INSTALLATION CRITERIA.

SEWER MAIN	WATER MAIN
UP THRU 12" PIPE – 42" COVER OVER 12" PIPE – 48" COVER COVER SHOWN IS MINIMUM.	UP THRU 10" PIPE – 36" COVER OVER 10" PIPE – 42" COVER COVER SHOWN IS MINIMUM.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

FLEXIBLE PIPE TRENCH DETAIL

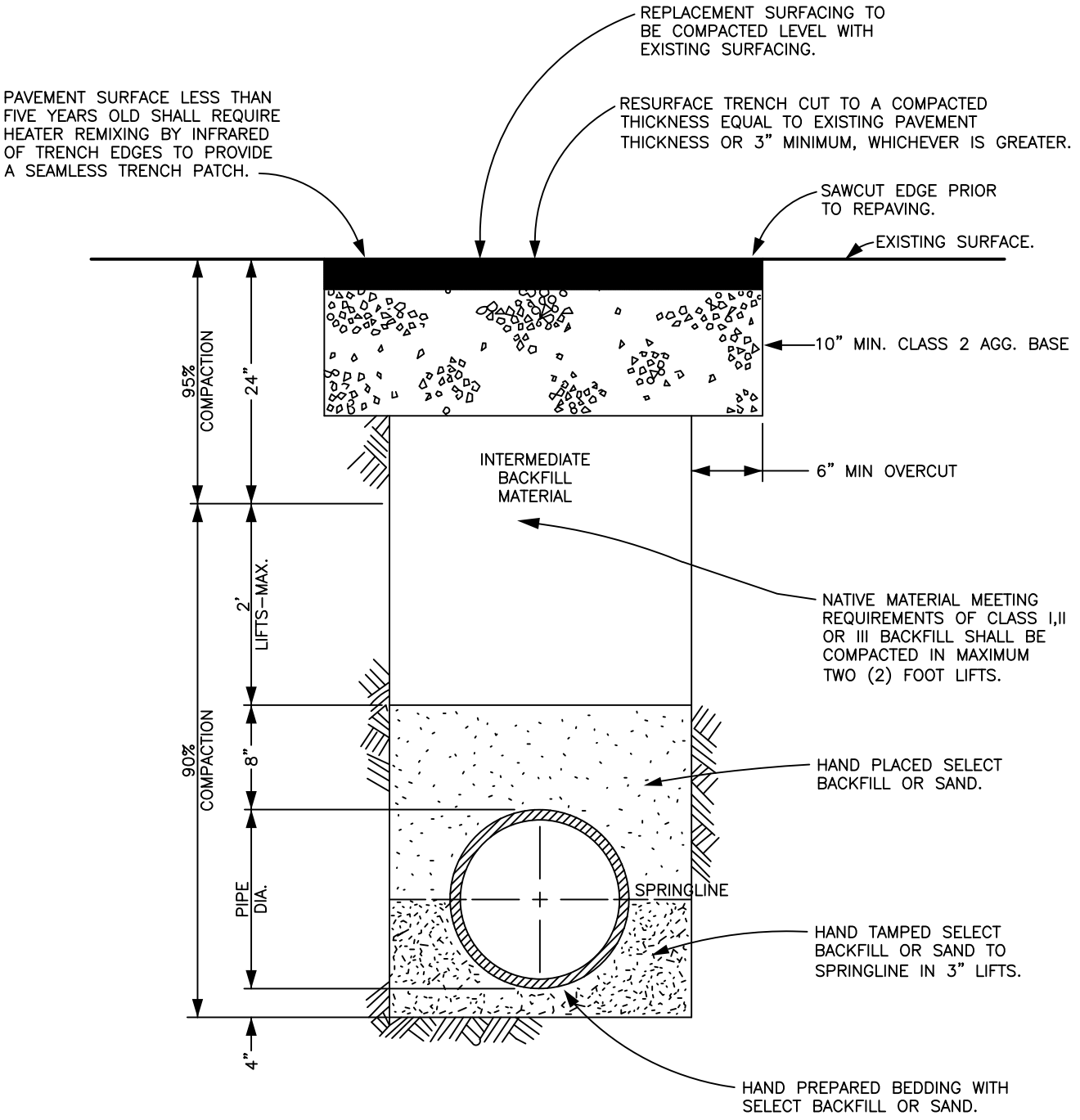
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 01/11/18

DRAWING NO. ST-8



NOTE: LESS COVER FOR 6" AND 8" PIPE MAY BE ALLOWED AT THE DISCRETION OF THE CITY ENGINEER.

TRENCH WIDTH MINIMUMS

PIPE SIZE	PIPE SIZE
6" THRU 15"	PIPE O.D. + 15"
18" THRU 36"	PIPE O.D. + 18"
>36"	PIPE O.D. + 24"

SEWER MAIN

UP THRU 12" PIPE – 42" COVER
OVER 12" PIPE – 48" COVER
COVER SHOWN IS MINIMUM.

WATER MAIN

UP THRU 10" PIPE – 36" COVER
OVER 10" PIPE – 42" COVER
COVER SHOWN IS MINIMUM.

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CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

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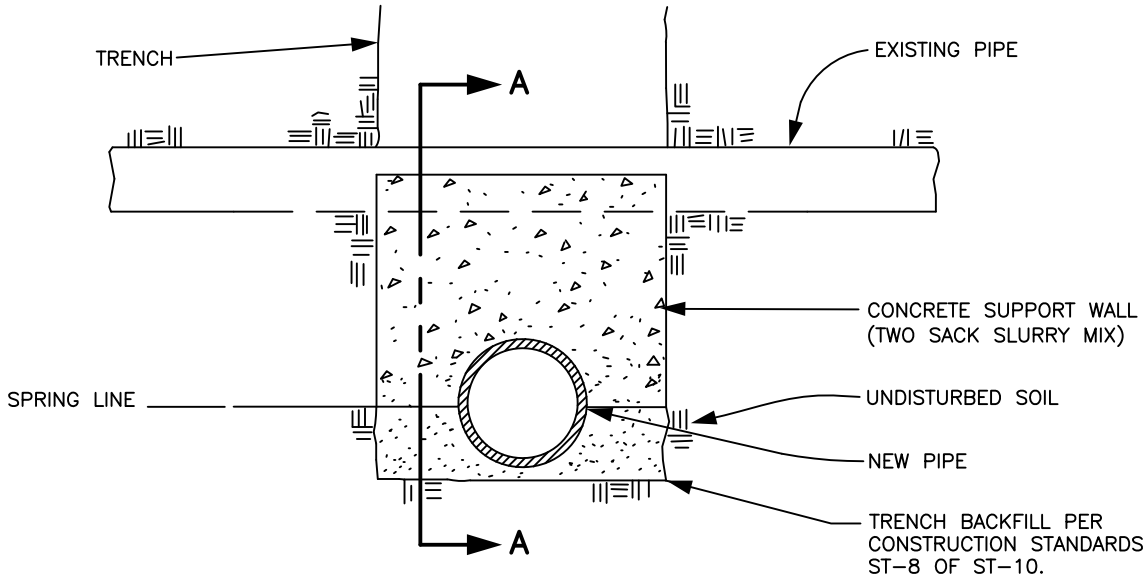
RIGID PIPE TRENCH DETAIL

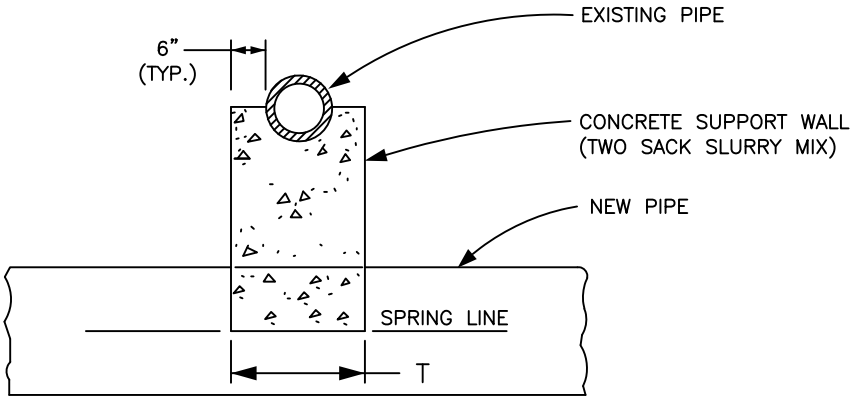
STANDARD DRAWING

REVISED: 01/11/18

DRAWING NO. ST-10



TYPICAL SECTION



SECTION A – A

NOTES:

1. THE SUPPORTING WALL SHALL HAVE A FIRM BEARING ON THE SUBGRADE AND AGAINST THE SIDES OF THE EXCAVATION.
2. THE WALL SHALL BE AT LEAST 2" FREE AND CLEAR OF DAS OR WATER MAINS OR OTHER CONDUIT OF DUCT.
3. THE WALL THICKNESS (T) SHALL BE EQUAL TO THE O.D. OF THE PIPE + 12".
4. THE EXISTING PIPE SHALL BE ENCASED TO THE SPRINGLINE.
5. AN ALTERNATIVE MAY BE CONCRETE MIX (FIVE SACK–2500 P.S.I. MIN. IN 28 DAYS).

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

PIPE SUPPORTS ACROSS TRENCHES

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST–11

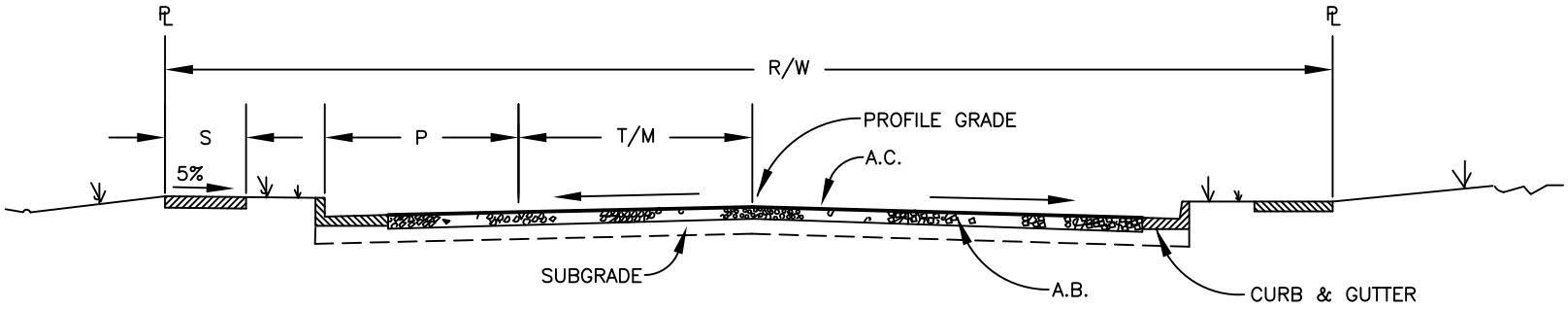
STREET SUMMARY SHEET

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION



STREET SECTION TABLE					
TYPE OF STREET	R/W	T/M	P	S	T.I.(min.)
MAJOR ARTERIAL	110'	26'/8'	10'	4.5'/7.5'	8*
ARTERIAL	100'	24'/8'	10'	4.5'/7.5'	8*
MAJOR COLLECTOR	84'	24'	8'	4.5'/7.5'	7*
MINOR COLLECTOR	68'	12'	8'	4.5'	6*
COMMERCIAL/INDUSTRIAL	68'	14'	10'	4.5'	7*
RESIDENTIAL	60'	10'	8'	4.5'	5*
RESIDENTIAL CUL-DE-SAC	100'	32'	8'	4.5'	4.5
RESIDENTIAL - MOBILE HOME **	42'	8'	8'	4.5'	4.5
MOBILE HOME CUL-DE-SAC **	88'	32'	8'	4.5'	4.5

**SPECIAL CASES ONLY - APPROVAL OF CITY ENGINEER REQUIRED.

LEGEND

R/W - - -RIGHT-OF-WAY - INCREASE IN "P" OR "T" FROM THE VALUES GIVEN IN THE ABOVE TABLE WILL REQUIRE A CORRESPONDING INCREASE IN R/W.

T - - - -TRAVELED WAY

M - - - -MEDIAN

P - - - -PARKING LANE

S - - - -SIDEWALK - A FULL WIDTH SIDEWALK WILL BE REQUIRED ON COMMERCIAL STREETS DESIGNATED BY THE CITY ENGINEER AS PEDESTRIAN ORIENTED

T.I.- - - -TRAFFIC INDEX - A CONSTANT USED IN THE DESIGN OF FLEXIBLE PAVEMENT BASED ON THE ESTIMATED VOLUME ON TRUCK TRAFFIC (EAL) T.I. VALUES SPECIFIED ARE

MINIMUMS ALLOWED - IN NO CASE WILL A STREET SECTION DESIGN BE APPROVED USING T.I. VALUES LESS THAN THE MINIMUM LISTED ABOVE.

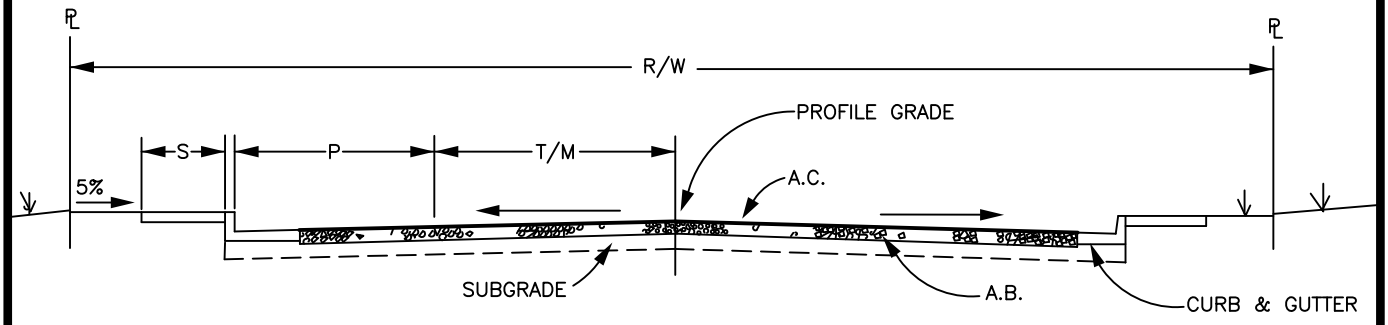
*T.I. VALUES FOR STREETS AS REFERENCED SHALL BE BASED ON ACTUAL TRAFFIC COUNTS AND SHALL BE VERIFIED WITH THE CITY ENGINEER PRIOR TO DESIGN.

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-12



TRAFFIC INDEX (T.I.)	TYPE "B" ASPHALT CONCRETE (MINIMUM)	CLASS 2 AGGREGATE (MINIMUM)	SUBGRADE (MINIMUM)
4.5	2–1/2"	4"	8"
5	2–1/2"	5"	8"
6	3–1/4"	6"	12"
7	4"	7"	12"
8	4–1/2"	9"	12"
9	5–1/4"	10"	12"

NOTES:

1. THE A.C., A.B. & SUBGRADE THICKNESSES LISTED ABOVE ARE MINIMUMS. ACTUAL SECTION THICKNESSES SHALL BE CALCULATED BY A REGISTERED CIVIL ENGINEER USING AN APPROVED FLEXIBLE PAVEMENT DESIGN METHOD. IN NO CASE SHALL A STREET SECTION DESIGN BE APPROVED USING A SECTION LESS THAN THE MINIMUMS LISTED ABOVE.

2. A GRAVEL EQUIVALENT SAFETY FACTOR OF 0.20' SHALL BE APPLIED TO THE ASPHALT CONCRETE LAYER.

3. R–VALUE TEST RESULTS SHALL BE SUBMITTED WITH DESIGN CALCULATIONS. TESTS SHALL BE TAKEN EVERY 500' MIN. OR EVERY INTERSECTION, WHICHEVER IS LESS.

4. COMPACTION REQUIREMENTS:
   A. SUBGRADE SOIL MATERIALS SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION RATE OF 95 PERCENT OF MAXIMUM DENSITY.

   B. AGGREGATE BASE AND SUBBASE MATERIALS SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION RATE OF 95 PERCENT OF MAXIMUM DENSITY.

   C. ASPHALT CONCRETE PAVEMENT SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION RATE OF 95 PERCENT OF MAXIMUM DENSITY.

DEPT. OF PUBLIC WORKS — CITY OF HANFORD — ENGINEERING DIVISION

FLEXIBLE PAVEMENT MINIMUM THICKNESS CHART

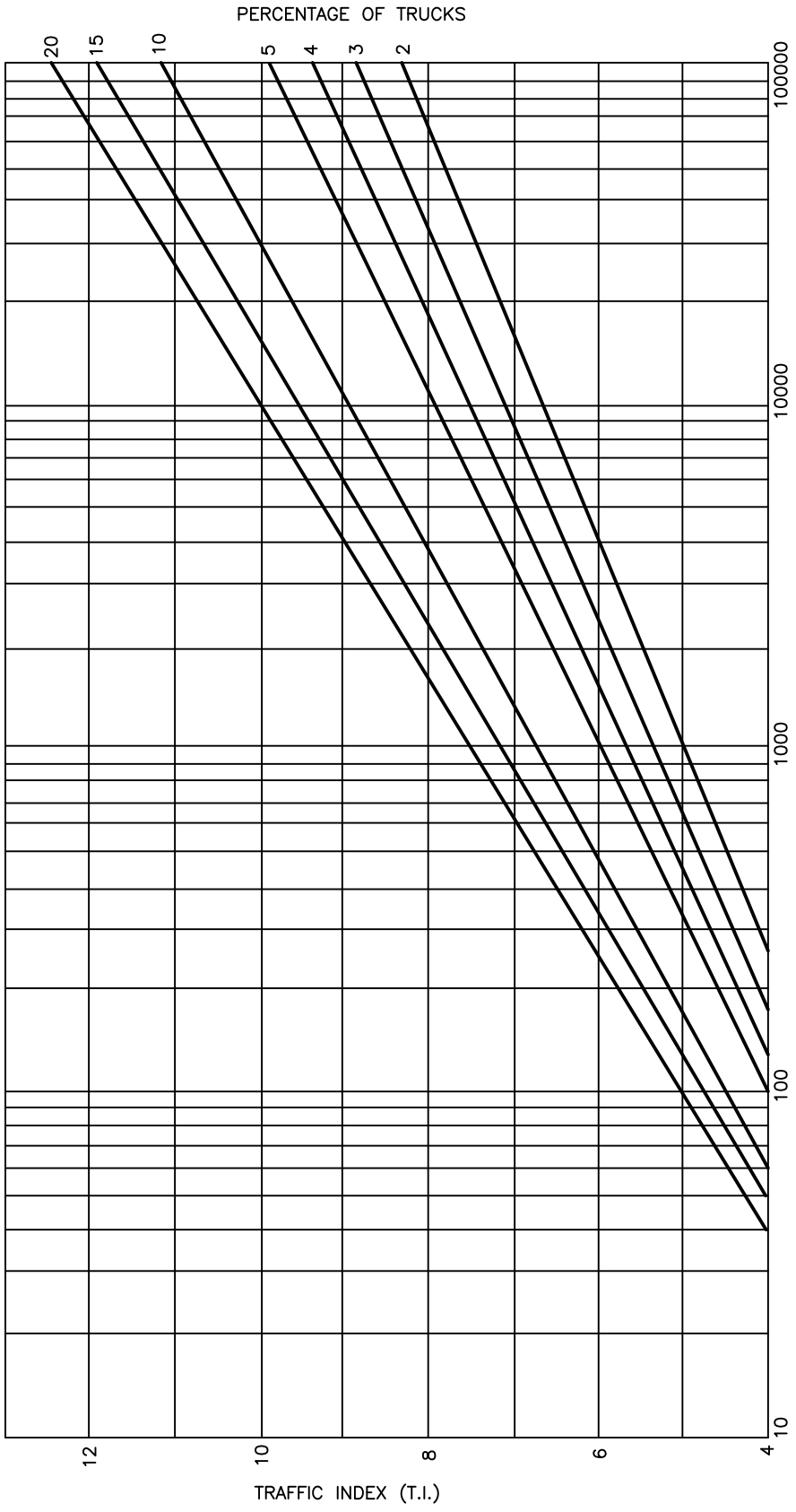
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 08/09/10

DRAWING NO. ST–13



CITY OF HANFORD

DEPT. OF PUBLIC WORKS

ENGINEERING DIVISION

CONVERSION CHART
AVERAGE DAILY TRAFFIC TO TRAFFIC INDEX

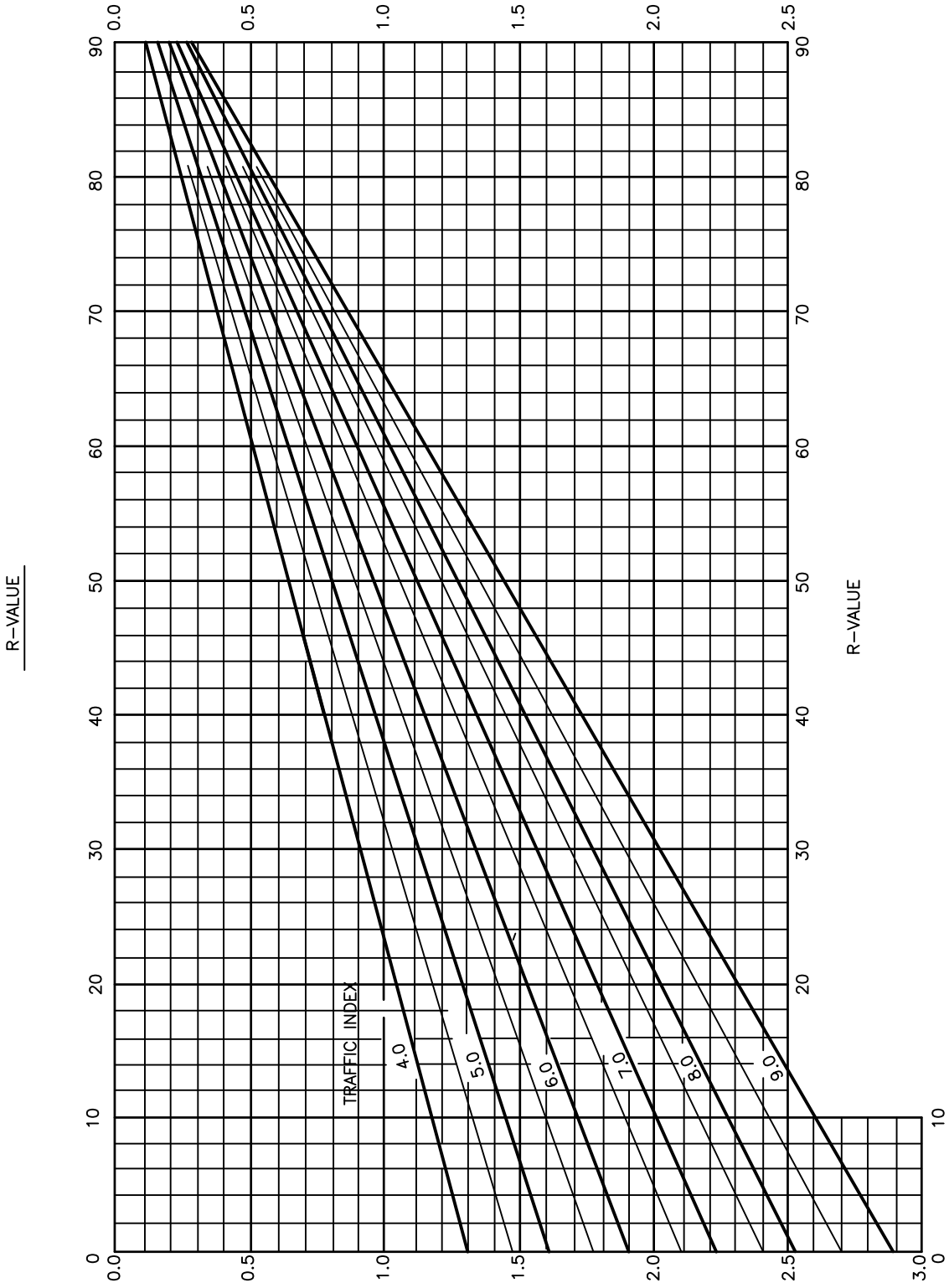
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-14



GRAVEL EQUIVALENT IN FEET

GE=0.0032 (T.I.)(100−R)

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

FLEXIBLE PAVEMENT STRUCTURAL DESIGN CHART

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 08/09/10

DRAWING NO. ST−15

ACTUAL THICKNESS IN FEET	GRAVEL EQUIVALENT IN FEET							
	ASPHALT CONCRETE						CL.2 AGG. BASE Rv=78	CL.2 SUB BASE Rv=50
		5 & BELOW	5.5 6.0	6.5 7.0	7.5 8.0	8.5 9.0		
	Gf	2.54	2.32	2.14	2.01	1.89	1.1	1.0
0.20 MIN. 0.25		0.51 0.63	0.46 0.58	0.54	0.50			
0.30 0.35		0.76 0.89	0.70 0.81	0.64 0.75	0.60 0.70	0.57 0.66	0.39	0.35
0.40 0.45		1.02	0.93 1.04	0.86 0.96	0.80 0.90	0.76 0.85	0.44 0.50	0.40 0.45
0.50 0.55			1.16	1.07 1.18	1.00 1.11	0.95 1.04	0.55 0.61	0.50 0.55
0.60 0.65					1.21 1.31	1.13 1.32	0.66 0.72	0.60 0.65
0.70 0.75						1.32	0.77	0.70 0.75
0.80 0.85								0.80 0.85

A. Gf=GRAVEL EQUIVALENCY FACTOR.

B. T.I. VALUES SHALL BE ROUNDED TO NEAREST HALF.

C. GRAVEL EQUIVALENT=(T.I.)(100−R)(0.0032)

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

GRAVEL EQUIVALENT AND MINIMUM THICKNESS

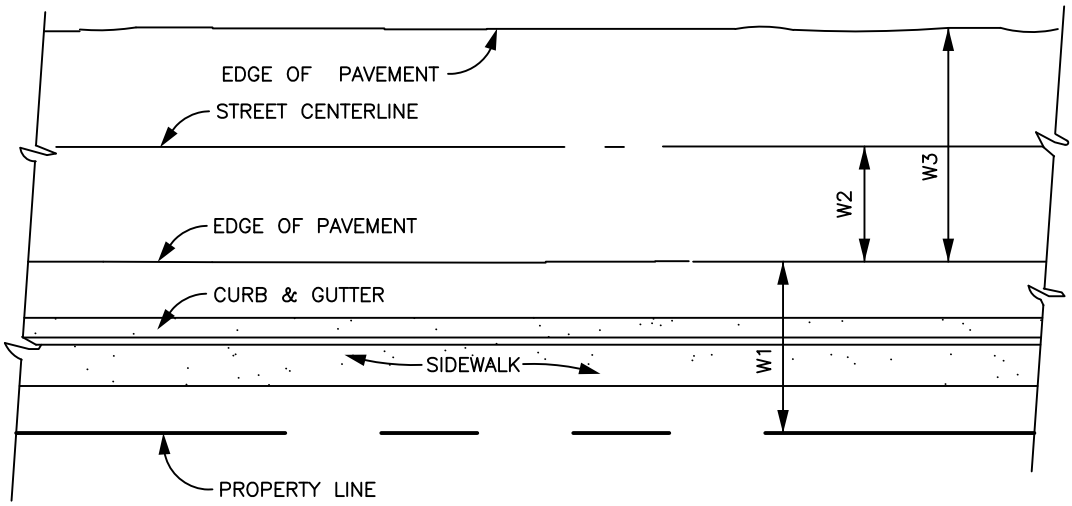
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 08/09/10

DRAWING NO. ST−16



REQUIRED CONDITIONS

CONDITION 1: THE CROSS SLOPE FROM THE EXISTING EDGE OF PAVEMENT TO THE PROPOSE LIP OF GUTTER, AND THE OVERALL, CROSS-SLOPE FROM THE CENTERLINE OF THE ROAD TO THE PROPOSED LIP OF GUTTER, SHALL BE WITHIN THE LIMITS SHOWN ON STANDARD DRAWING ST-18 THROUGH ST-35.

CONDITION 2: THE STRUCTURAL SECTION OF THE EXISTING PAVEMENT MUST BE ADEQUATE FOR THE TRAFFIC INDEX SHOWN ON STANDARD DRAWING ST-12 FOR THE ROAD'S OFFICIAL DESIGNATION AS SHOWN ON THE CURRENT CITY OF HANFORD GENERAL PLAN.

A. IF CONDITION 1 & CONDITION 2 ABOVE CAN BE MET, THE DEVELOPER WILL BE REQUIRED TO CONSTRUCT ALL IMPROVEMENTS FOR W1.

B. IF CONDITION 1 CANNOT BE MET, THEN THE DEVELOPER SHALL BE REQUIRED TO CONSTRUCT IMPROVEMENTS FOR W1 PLUS RECONSTRUCT W2.

C. IF CONDITION 1 STILL CANNOT BE MET BY THE METHOD OUTLINED IN B ABOVE, THEN THE DEVELOPER SHALL COSTRUCT ALL IMPROVEMENTS OR W1, PLUS RECONSTRUCT W3.

D. IF CONDITION 2 IS NOT MET, THEN THE DEVELOPER SHALL BE REQUIRED TO CONSTRUCT IMPROVEMENTS FOR W1, PLUS RECONSTRUCT W3.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

IMPROVEMENTS REQUIRED ON EXISTING CITY-MAINTAINED STREETS

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-17

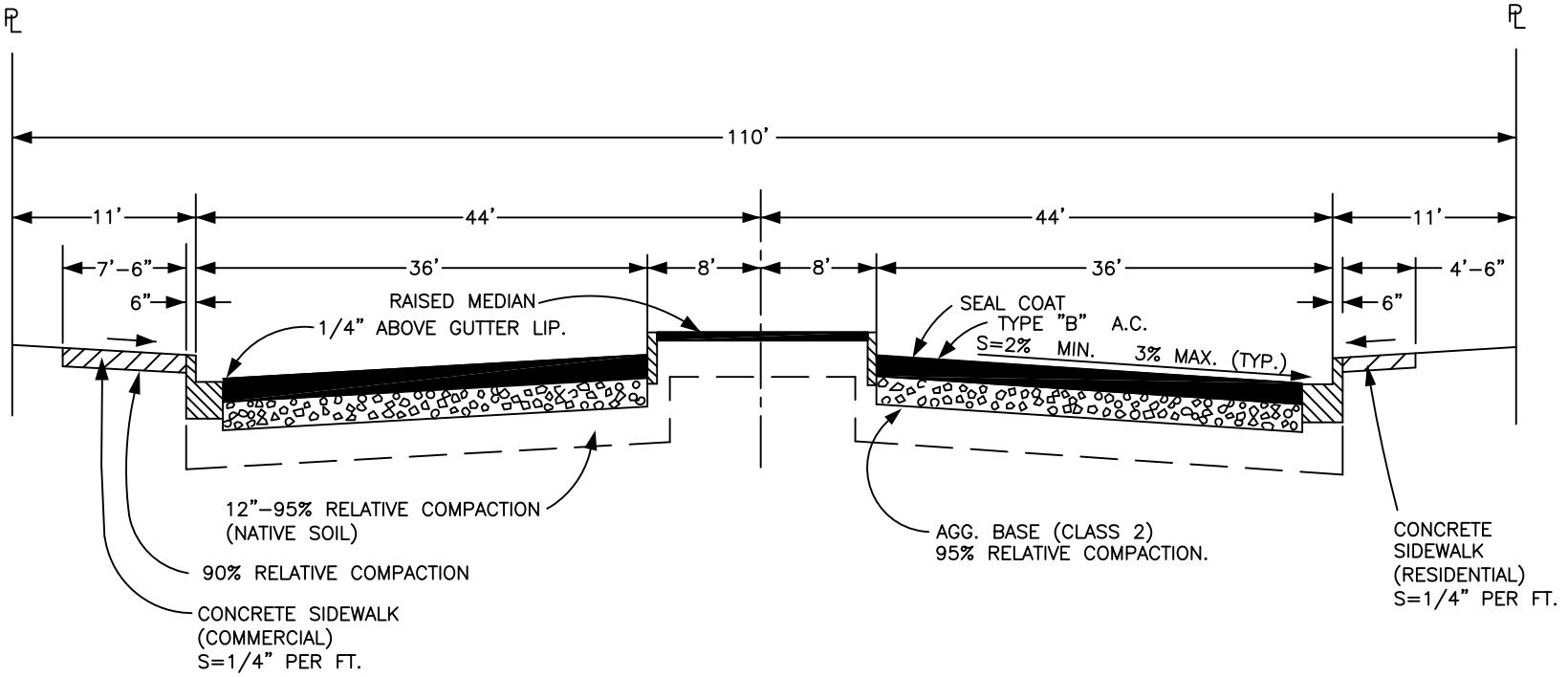
MAJOR ARTERIAL STREET

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION



DEFINITION

A STREET THAT SERVES A LARGE VOLUME OF VEHICULAR TRAFFIC WITH INTERSECTIONS AT GRADE AND GENERALLY HAVING DIRECT ACCESS TO ABUTTING PROPERTY, AND ON WHICH GEOMETRIC DESIGN AND TRAFFIC CONTROL MEASURES ARE USED TO EXPIDITE THE SAFE MOVEMENT OF THROUGH TRAFFIC.

NOTES:

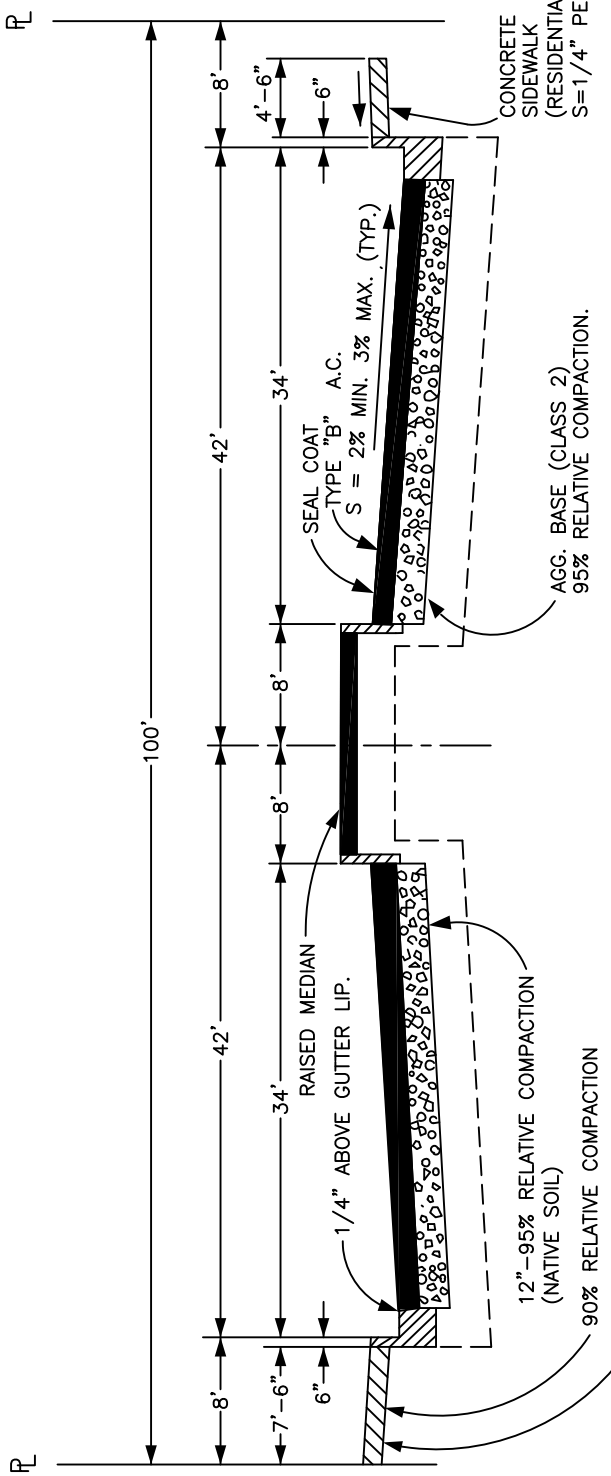
1. MEDIAN STRIP FINISH SHALL BE AS DIRECTED BY THE CITY ENGINEER.
2. SEE STANDARDS ST–12 AND ST–13 FOR STRUCTURAL SECTION REQUIREMENTS.
3. ASPHALT CONCRETE COURSES SHALL BE CONSTRUCTED WITH 3/4" MAXIMUM, MEDIUM GRADED MATERIAL OR AS APPROVED BY THE CITY ENGINEER.
4. ASPHALT CONCRETE SHALL BE SPREAD AND COMPACTED IN LAYERS NOT TO EXCEED 0.25 FEET COMPACTED THICKNESS.

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 08/09/10

DRAWING NO. ST–18



DEFINITION

A STREET THAT SERVES A LARGE VOLUME OF VEHICULAR TRAFFIC WITH INTERSECTIONS AT GRADE AND GENERALLY HAVING DIRECT ACCESS TO ABUTTING PROPERTY, AND ON WHICH GEOMETRIC DESIGN AND TRAFFIC CONTROL MEASURES ARE USED TO EXPIDITE THE SAFE MOVEMENT OF THROUGH TRAFFIC.

NOTES:

1. MEDIAN STRIP FINISH SHALL BE AS DIRECTED BY THE CITY ENGINEER.
2. SEE STANDARDS ST-12 AND ST-13 FOR STRUCTURAL SECTION REQUIREMENTS.
3. ASPHALT CONCRETE COURSES SHALL BE CONSTRUCTED WITH 3/4" MAXIMUM, MEDIUM GRADED MATERIAL OR AS APPROVED BY THE CITY ENGINEER.
4. ASPHALT CONCRETE SHALL BE SPREAD AND COMPACTED IN LAYERS NOT TO EXCEED 0.25 FEET COMPACTED THICKNESS.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

ARTERIAL STREET

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 11/27/06

DRAWING NO. ST-20

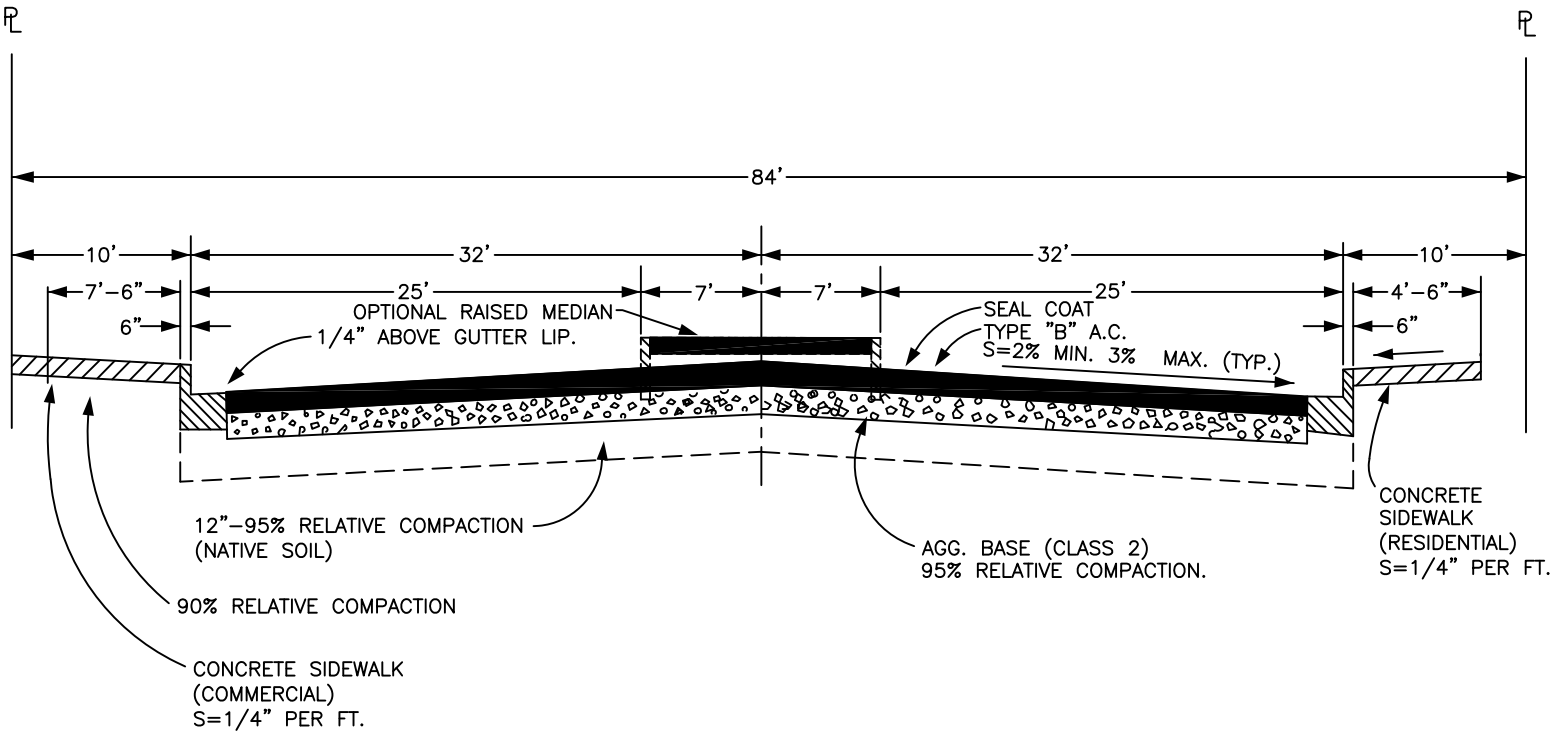
MAJOR COLLECTOR STREET

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION



DEFINITION

A STREET THAT SERVES ABUTING PROPERTY AND CARRIES TRAFFIC TO THE ARTERIALS.

NOTES:

1. RAISED MEDIAN FINISH SHALL BE AS DIRECTED BY THE CITY ENGINEER.
2. SEE STANDARDS ST-12 AND ST-13 FOR STRUCTURAL SECTION REQUIREMENTS.
3. ASPHALT CONCRETE COURSES SHALL BE CONSTRUCTED WITH 3/4" MAXIMUM, MEDIUM GRADED MATERIAL OR AS APPROVED BY THE CITY ENGINEER.
4. ASPHALT CONCRETE SHALL BE SPREAD AND COMPACTED IN LAYERS NOT TO EXCEED 0.25 FEET COMPACTED THICKNESS.
5. CITY ENGINEER APPROVAL REQUIRED FOR CONSTRUCTION OF OPTIONAL RAISED MEDIAN.

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-23

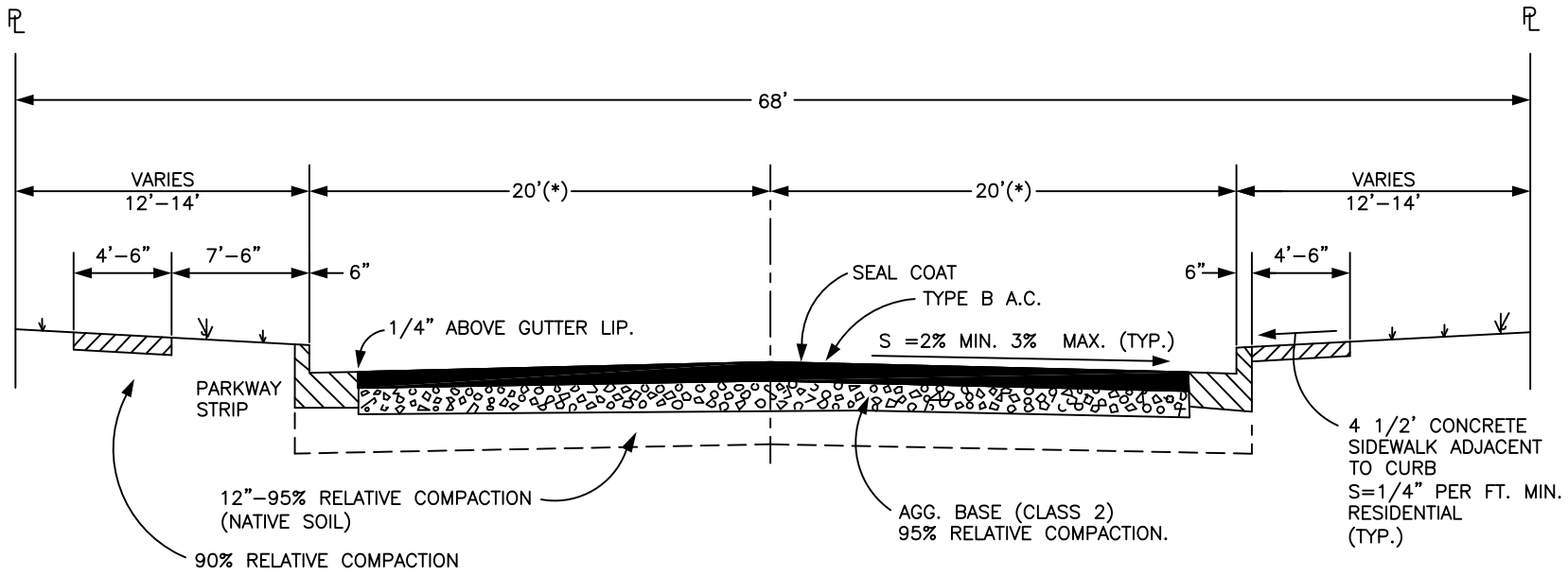
MINOR COLLECTOR STREET

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION



DEFINITION

A STREET THAT SERVES ABUTTING PROPERTY AND CARRIES TRAFFIC TO THE ARTERIALS.

NOTES:

1. SEE STANDARDS ST–12 AND ST–13 FOR STRUCTURAL SECTION REQUIREMENTS.
2. ASPHALT CONCRETE COURSES SHALL BE CONSTRUCTED WITH 3/4" MAXIMUM, MEDIUM GRADED MATERIAL OR AS APPROVED BY THE CITY ENGINEER.
3. ASPHALT CONCRETE SHALL BE SPREAD AND COMPACTED IN LAYERS NOT TO EXCEED 0.25 FEET COMPACTED THICKNESS.

* AT INTERSECTIONS WITH MAJOR COLLECTORS & ARTERIALS CURB TO CURB DISTANCE SHALL BE 44' MIN. TRANSITION LENGTH TO BE DETERMINED BY THE CITY ENGINEER.

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST–26

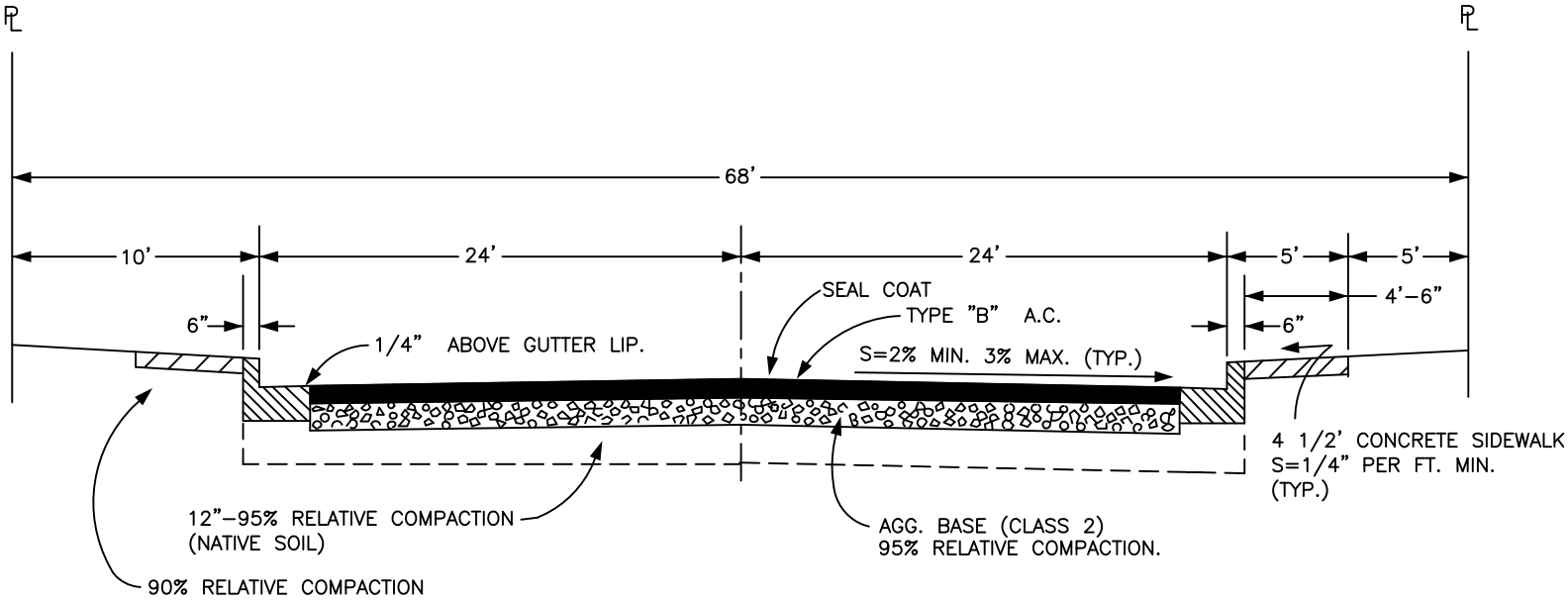
DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

COMMERCIAL/INDUSTRIAL STREET

STANDARD DRAWING



DEFINITION

A STREET SERVING TRAFFIC WITHIN AN INDUSTRIAL DEVELOPMENT.

NOTES:

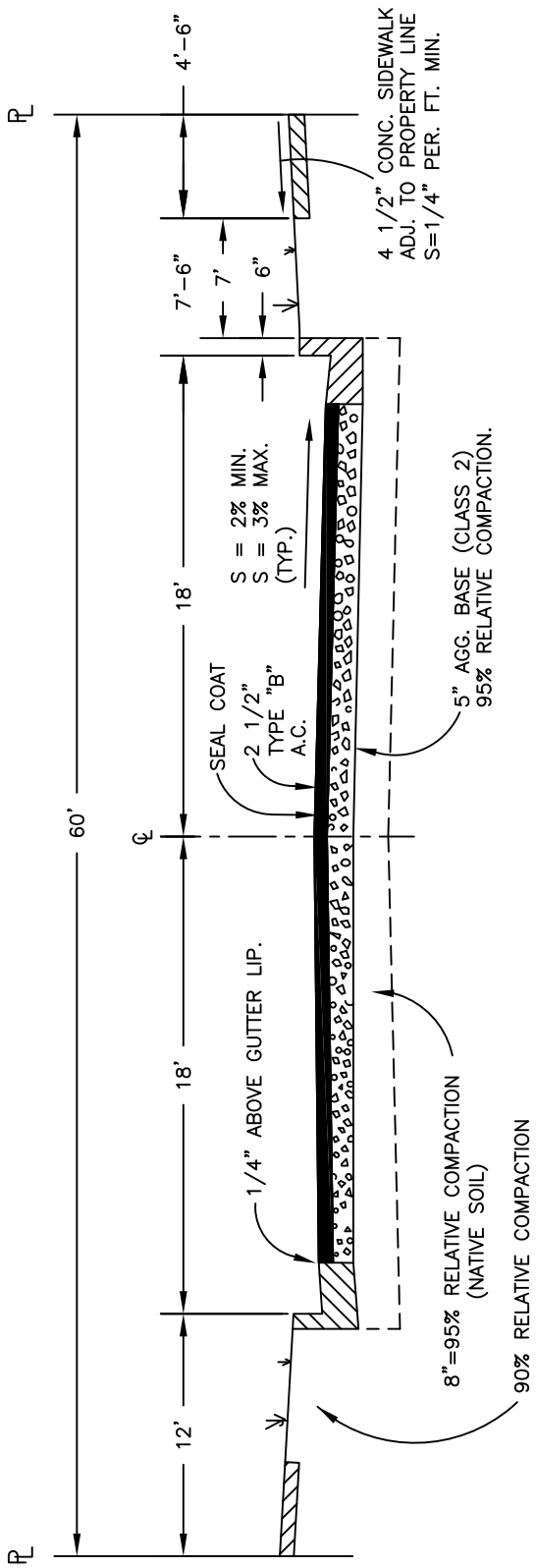
1. SEE STANDARDS ST–12 AND ST–13 FOR STRUCTURAL SECTION REQUIREMENTS.
2. ASPHALT CONCRETE COURSES SHALL BE CONSTRUCTED WITH 3/4" MAXIMUM, MEDIUM GRADED MATERIAL OR AS APPROVED BY THE CITY ENGINEER.
3. ASPHALT CONCRETE SHALL BE SPREAD AND COMPACTED IN LAYERS NOT TO EXCEED 0.25 FEET COMPACTED THICKNESS.

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST–29



DEFINITION:

A STREET THAT SERVES THE LOCAL NEEDS OF RESIDENTIAL PROPERTIES IN A NEIGHBORHOOD.

NOTE:

ASPHALT AND AGG. BASE ARE SHOWN AT MIN. REQUIRED THICKNESS.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

RESIDENTIAL STREET

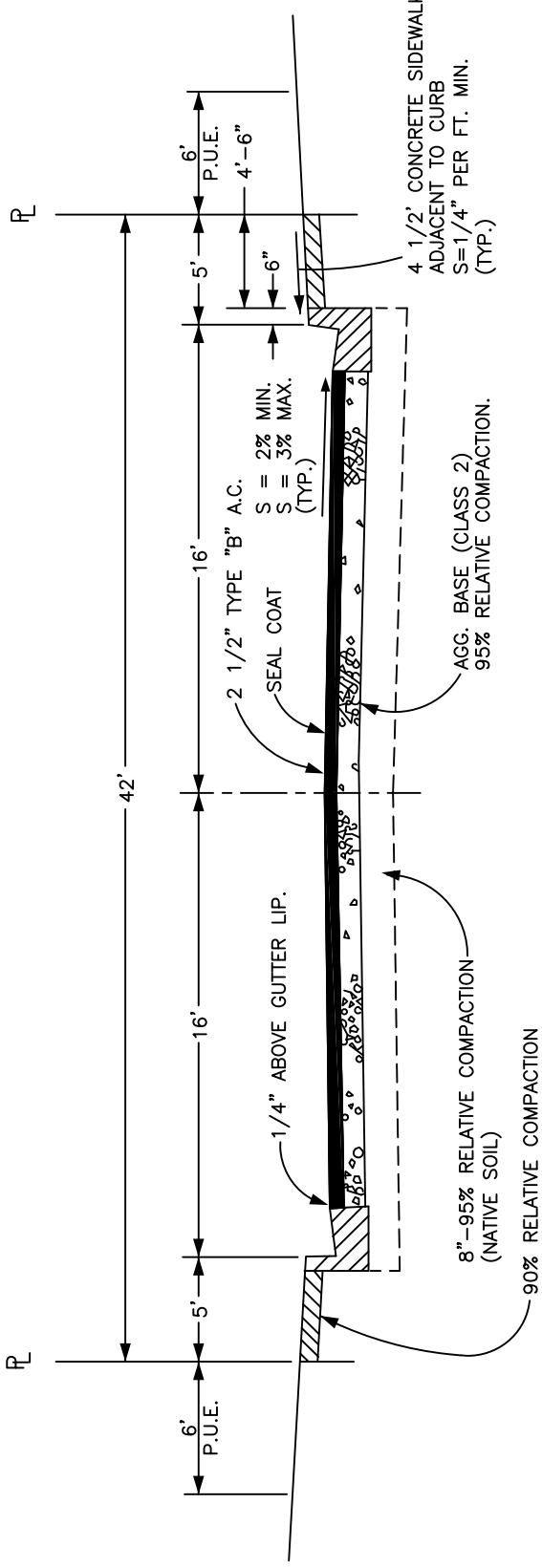
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 11/27/06

DRAWING NO. ST-32



DEFINITION

A STREET THAT SERVES THE LOCAL NEEDS OF RESIDENTIAL PROPERTIES IN A NEIGHBORHOOD

NOTES:

ASPHALT AND AGG. BASE ARE SHOWN AT MIN. REQUIRED THICKNESS.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

RESIDENTIAL–MOBILE HOME SUBDIVISION

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 11/27/06

DRAWING NO. ST–35

FIRE DEPARTMENT ACCESS ROADS

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

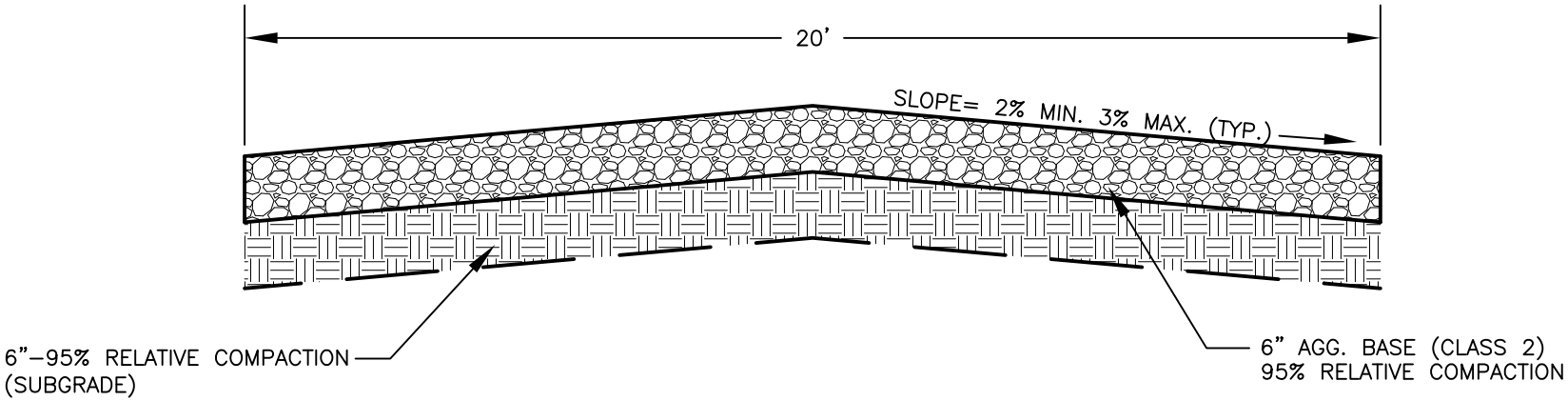
ENGINEERING DIVISION

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-36



*AGG. BASE AND SUBGRADE ARE SHOWN AT MIN. REQUIRED THICKNESSES.

DEFINITION

FIRE APPARATUS ACCESS ROADS:
ALL WEATHER FIRE APPARATUS ACCESS ROADS SHALL HAVE AN UNOBSTRUCTED WIDTH OF NOT LESS THAN 20' AND AN UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13 FEET 6 INCHES. MORE THAN ONE FIRE ACCESS ROAD MAY BE REQUIRED WHEN IT IS DETERMINED BY THE FIRE CHIEF. CFC 2001 ARTICLE 9 SECTION 902.

TIMING OF INSTALLATION

WHEN FIRE PROTECTION, INCLUDING FIRE ACCESS ROADS, WATER SUPPLIES AND FIRE HYDRANTS FOR FIRE PROTECTION ARE REQUIRED TO BE INSTALLED, SUCH PROTECTION SHALL BE INSTALLED AND MADE SERVICEABLE PRIOR TO AND DURING THE TIME OF CONSTRUCTION. CFC 2001 ARTICLE 9 SECTION 901.

CFC=2001 CALIFORNIA FIRE CODE

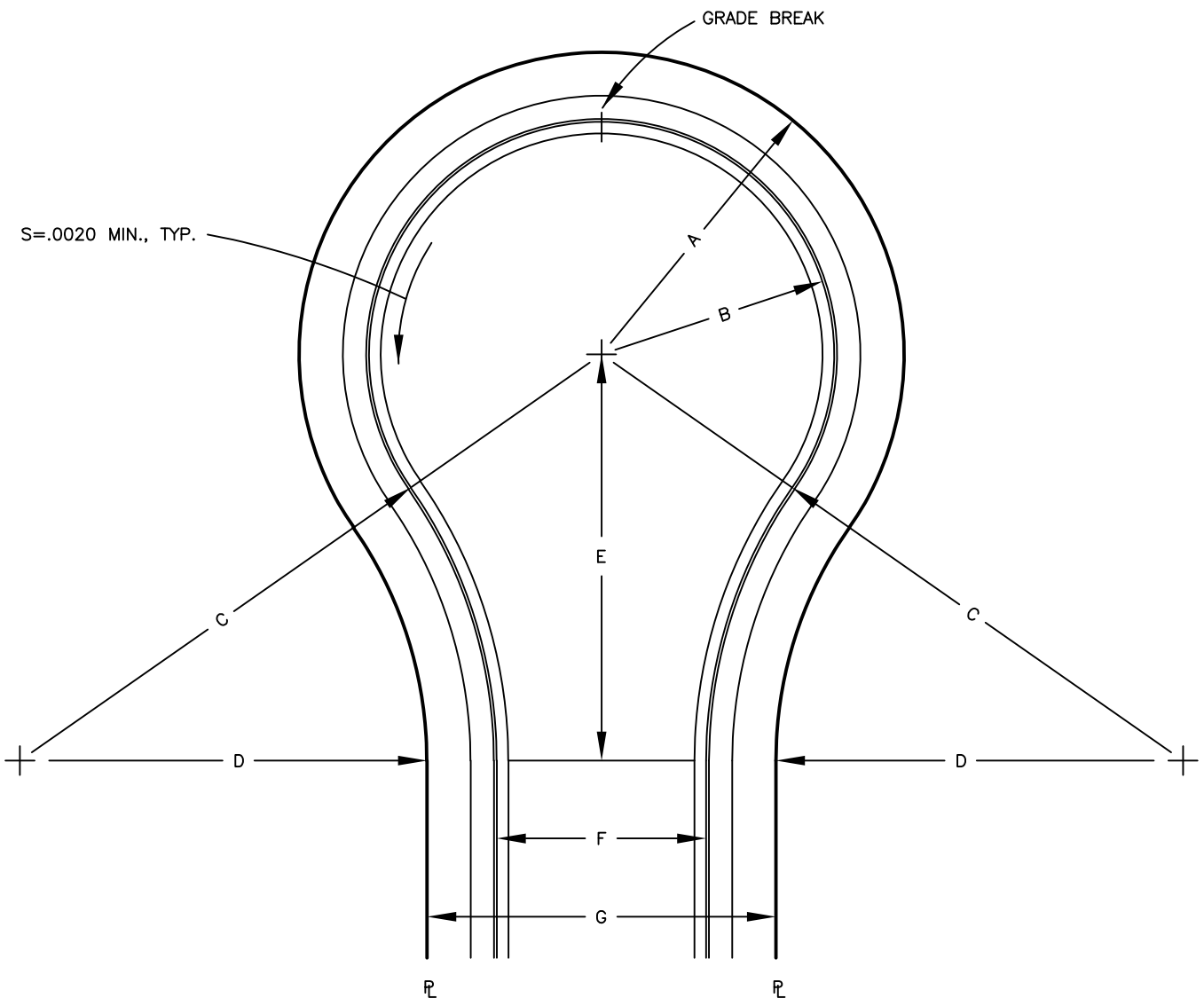


TABLE OF DIMENSIONS							
TYPE OF CUL-DE-SAC	**A**	**B**	**C**	**D**	**E**	**F**	**G**
RESIDENTIAL	52'	40'	80'	70'	69.9'	36'	60'
MOBILE HOME	44'	40'	60'	50'	60.4'	32'	42'

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

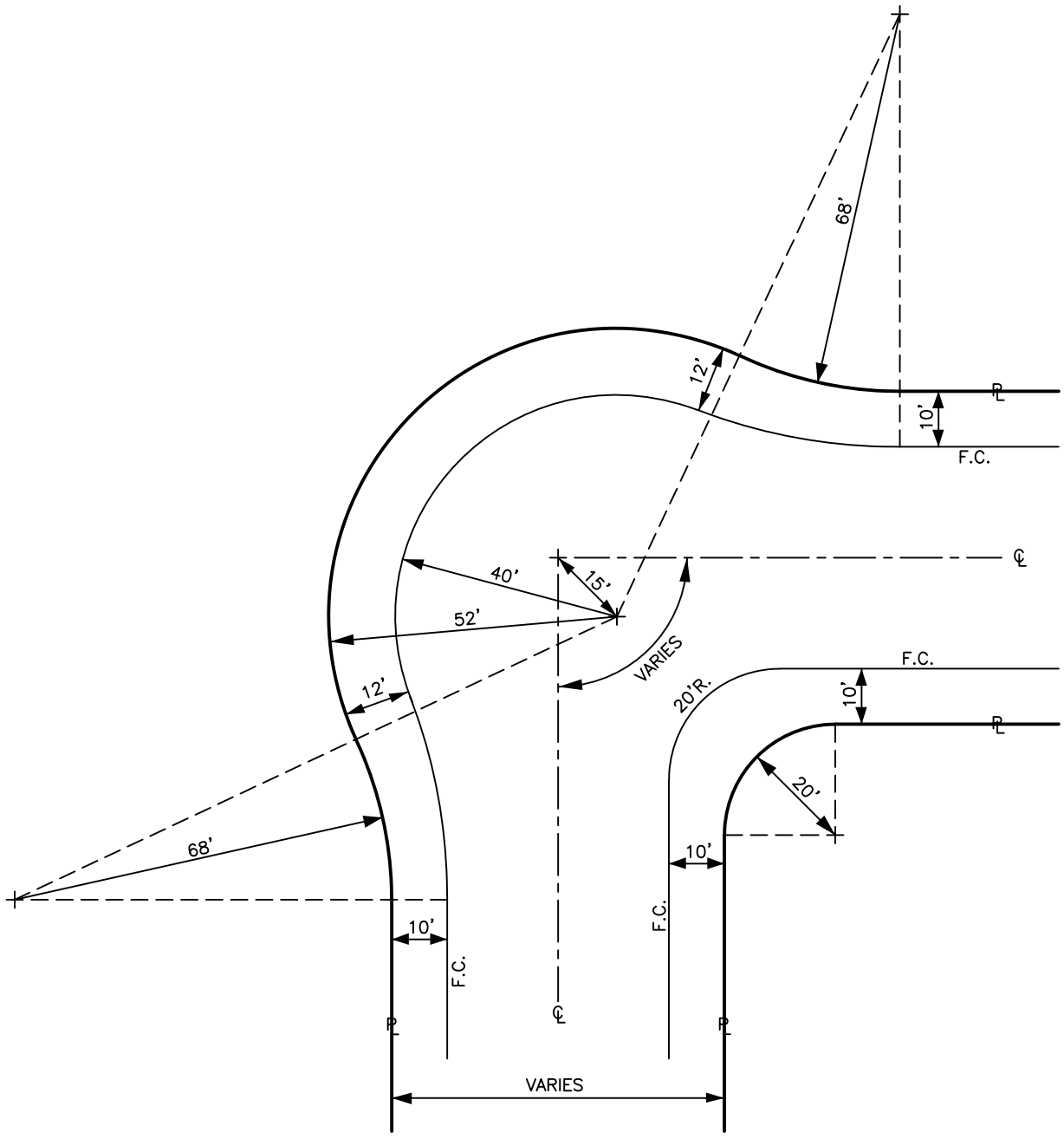
CITY ENGINEER R.C.E. 062044

TYPICAL CUL-DE-SAC

STANDARD DRAWING

REVISED: 11/10/08

DRAWING NO. ST-38



NOTE: ALTERNATE DESIGNS REQUIRE APPROVAL BY CITY ENGINEER.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

STREET BULB CONNECTION

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-39

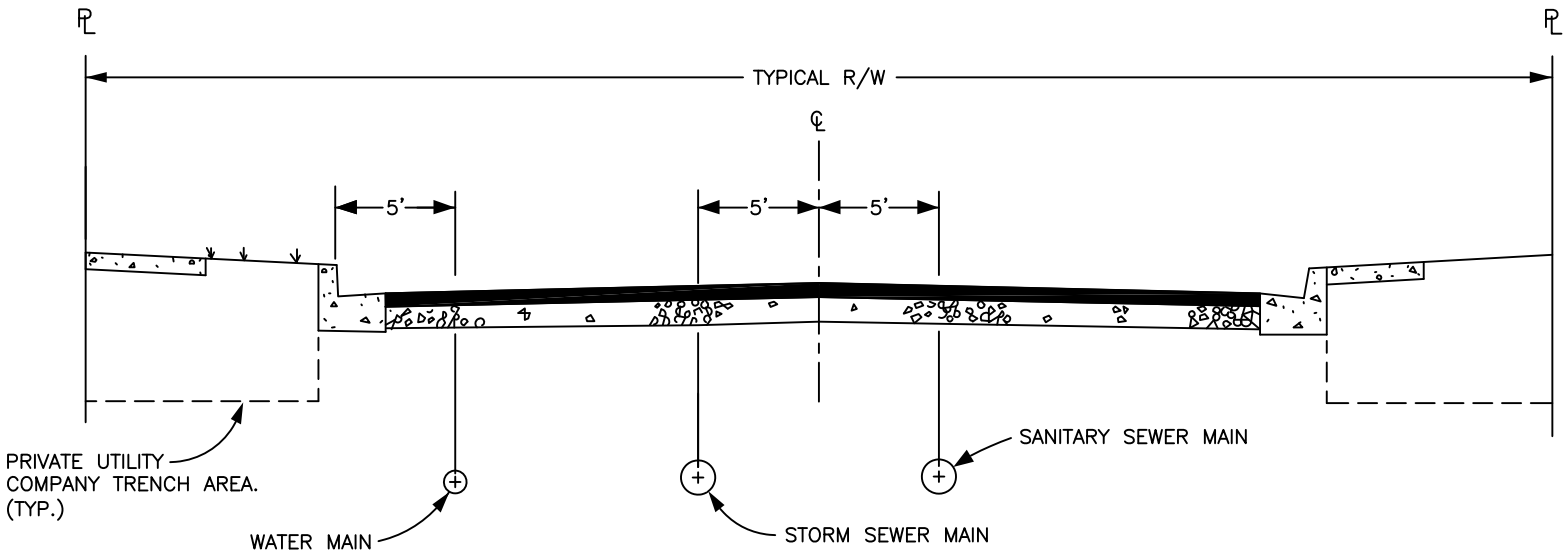
DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

UTILITY LOCATIONS

STANDARD DRAWING



NOTE:

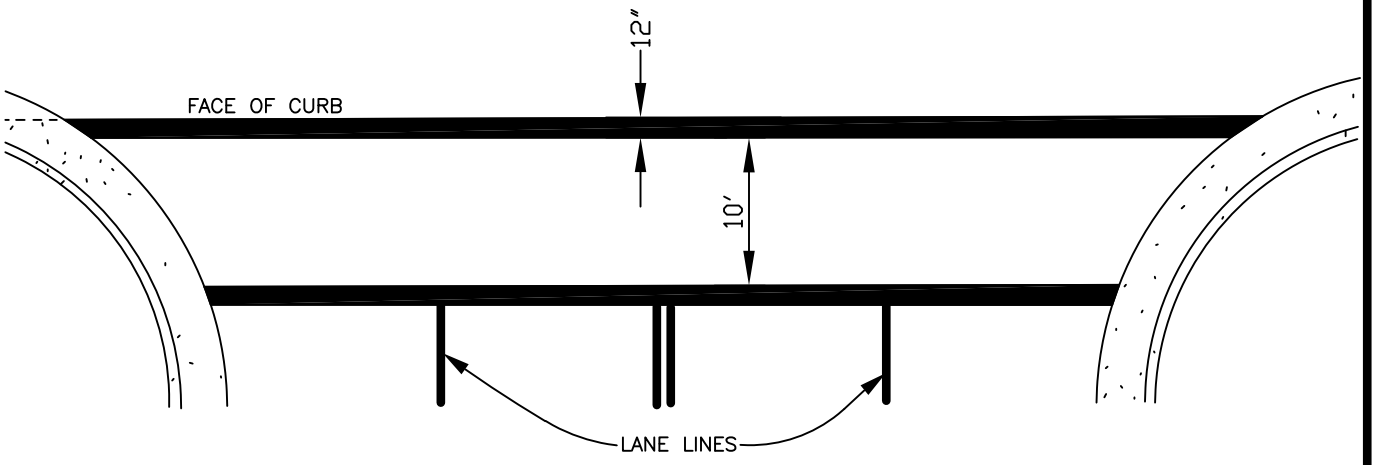
1. WATER MAINS AND STORM SEWER MAINS SHALL BE PLACED NORTH OR WEST OF THE CINTERLINE OF THE STREET.
2. SEWER MAINS SHALL BE PLACED TO THE SOUTH OR EAST OF THE CENTERLINE OT THE STREET.
3. WATER SERVICES SHALL BE PLACED TWO FOOT FROM INTERIOR PROPERTY LINES.
4. SEWER SERVICES SHALL BE PLACED 10' MIN. AWAY FROM WATER SERVICES.
5. THERE SHALL BE 10' MIN. BETWEEN WATER & SEWER MAINS, & WATER SERVICES & SEWER LATERALS.
6. BACKFILL IN PARKWAY OR STREET INSTALLATIONS SHALL BE IN ACCORDANCE WITH STANDARDS ST-8 OR ST-10.
7. NORMAL UTILITY LOCATION OF TRENCH IN PARKWAY SHALL
8. BE BEHIND THE SIDEWALK.
8. WHERE PRACTICAL, LOCATE UTILITY BOXES AT ALTERNATE LOT LINES FROM THE WATER METER BOXES TO MINIMIZE CONFLICTS.
9. AT NO TIME WILL SANITARY SEWER LINES OR WATER SERVICES BE ALLOWED IN A TRENCH OCCUPIED BY PRIMARY OR SECONDARY POWER.
10. EACH UTILITY COMPANY MAY HAVE ONE OR MORE CONDUITS OR CONDUCTORS IN A TRENCH.
11. DEPTHS TO VARY ACCORDING TO CONDUIT SIZES AND LATERAL INTERFERENCE.
12. ALL CONDUCTORS OR CONDUITS SHALL HAVE 3" MIN. CLEARANCE FROM TRENCH SIDEWALL.
13. THERE SHALL BE A MIN. 3' SEPARATION BETWEEN WATER & SEWER MAINS AND OTHER UTILITIES.

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-41



STANDARD CROSSWALK MARKING

NOTES:

1. DOUBLE YELLOW CENTERLINE, RAISED MARKERS, WHITE CENTERLINE AND LANE LINES SHALL STOP AT CROSSWALK.
2. WIDTH OF CROSSWALK LINES SHALL BE 12".
3. WIDTH OF CROSSWALK SHALL BE 10'.

DEPT. OF PUBLIC WORKS — CITY OF HANFORD — ENGINEERING DIVISION

STANDARD CROSSWALK MARKINGS

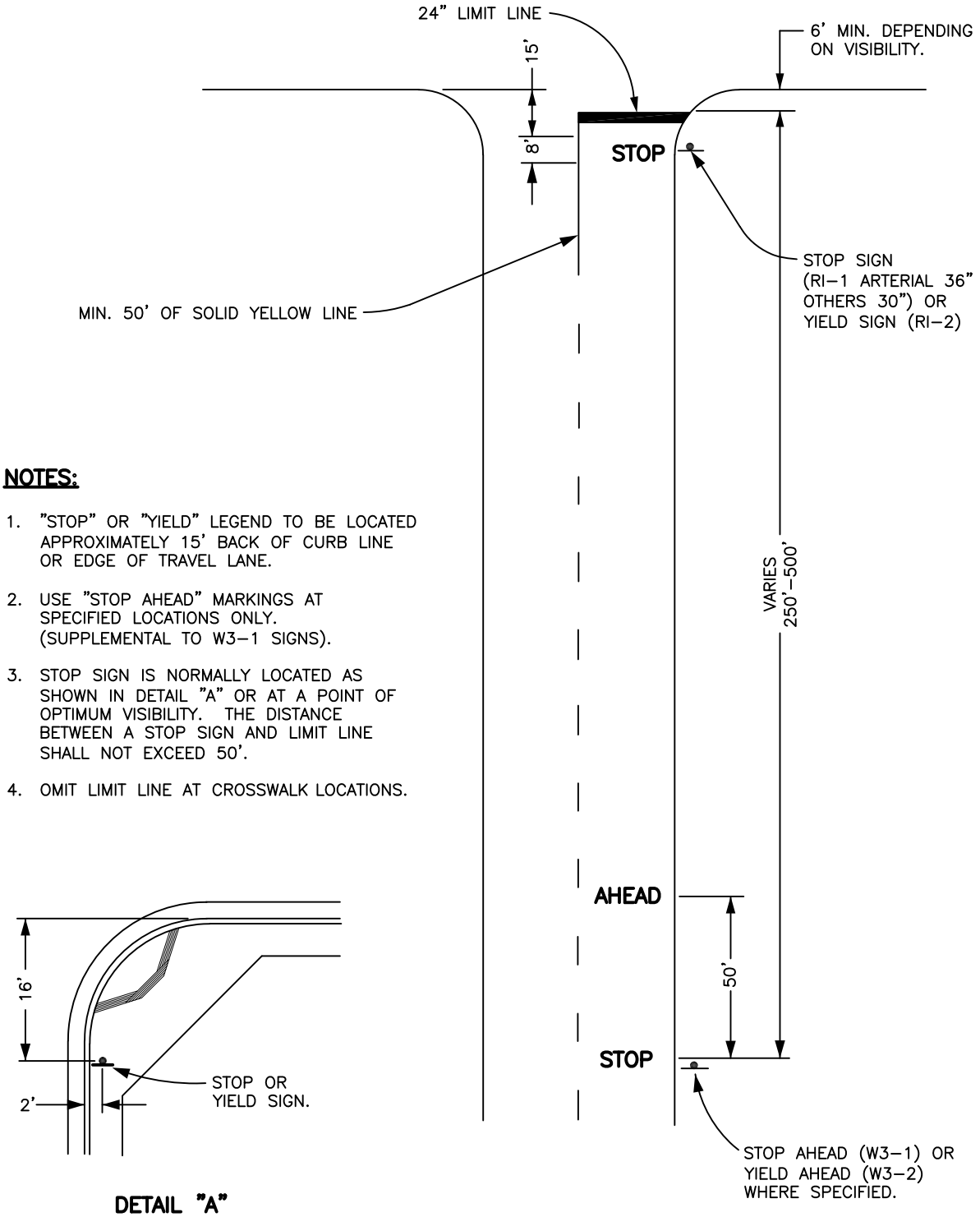
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-44



NOTES:

1. "STOP" OR "YIELD" LEGEND TO BE LOCATED APPROXIMATELY 15' BACK OF CURB LINE OR EDGE OF TRAVEL LANE.
2. USE "STOP AHEAD" MARKINGS AT SPECIFIED LOCATIONS ONLY. (SUPPLEMENTAL TO W3-1 SIGNS).
3. STOP SIGN IS NORMALLY LOCATED AS SHOWN IN DETAIL "A" OR AT A POINT OF OPTIMUM VISIBILITY. THE DISTANCE BETWEEN A STOP SIGN AND LIMIT LINE SHALL NOT EXCEED 50'.
4. OMIT LIMIT LINE AT CROSSWALK LOCATIONS.

DETAIL "A"

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

STOP & YIELD PAVEMENT MARKINGS

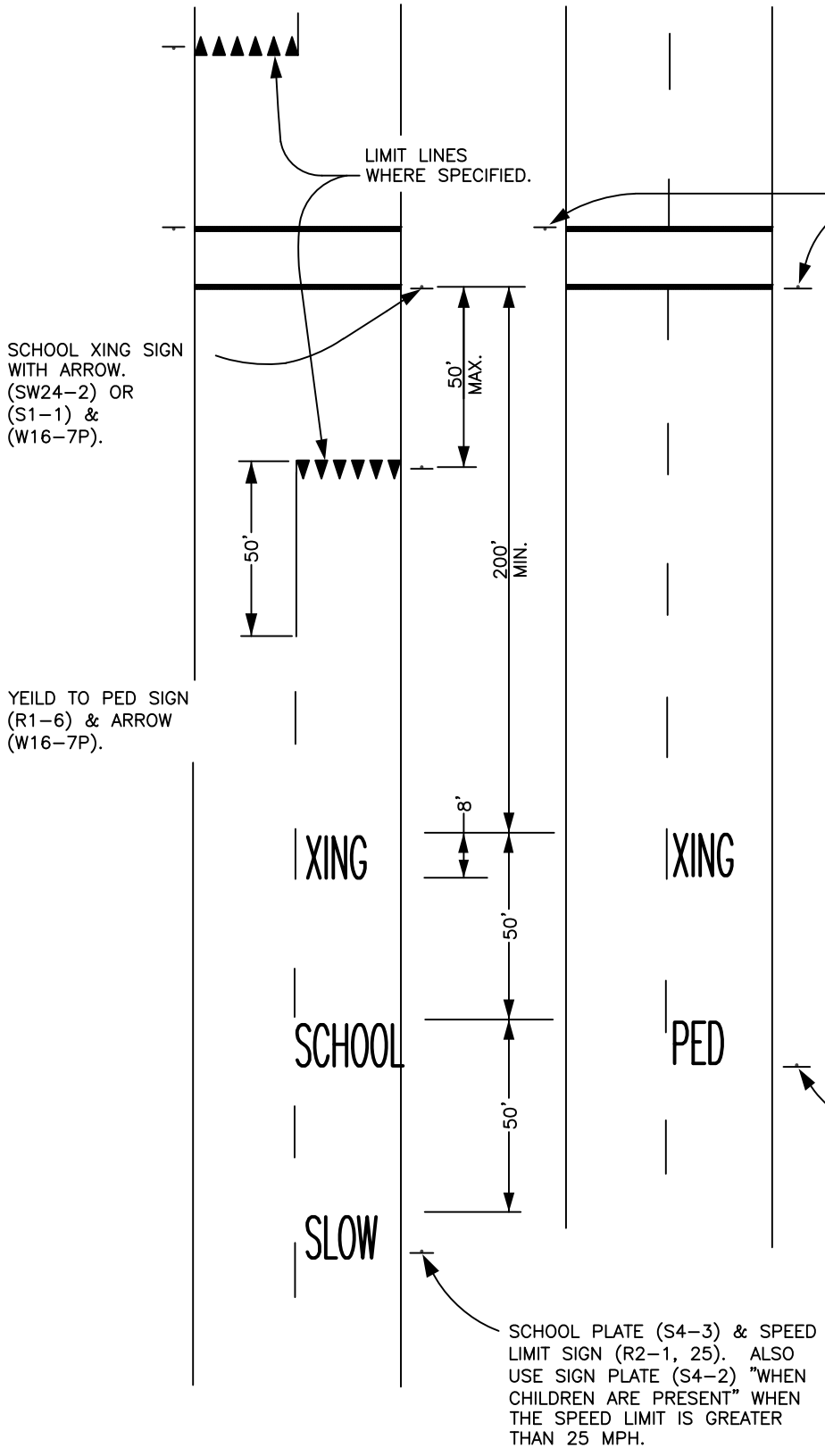
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-47



NOTES:

1. CROSSWALK LINES SHALL BE 12" WIDE.
2. ALL LIMIT LINES SHALL BE 24" WIDE.
3. ALL SCHOOL MARKINGS SHALL BE YELLOW, UNLESS OTHERWISE SPECIFIED.
4. ALL PAVEMENT MARKINGS SHALL BE REFLECTORIZED.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

SCHOOL XING & PEDESTRIAN XING PAVEMENT MARKINGS

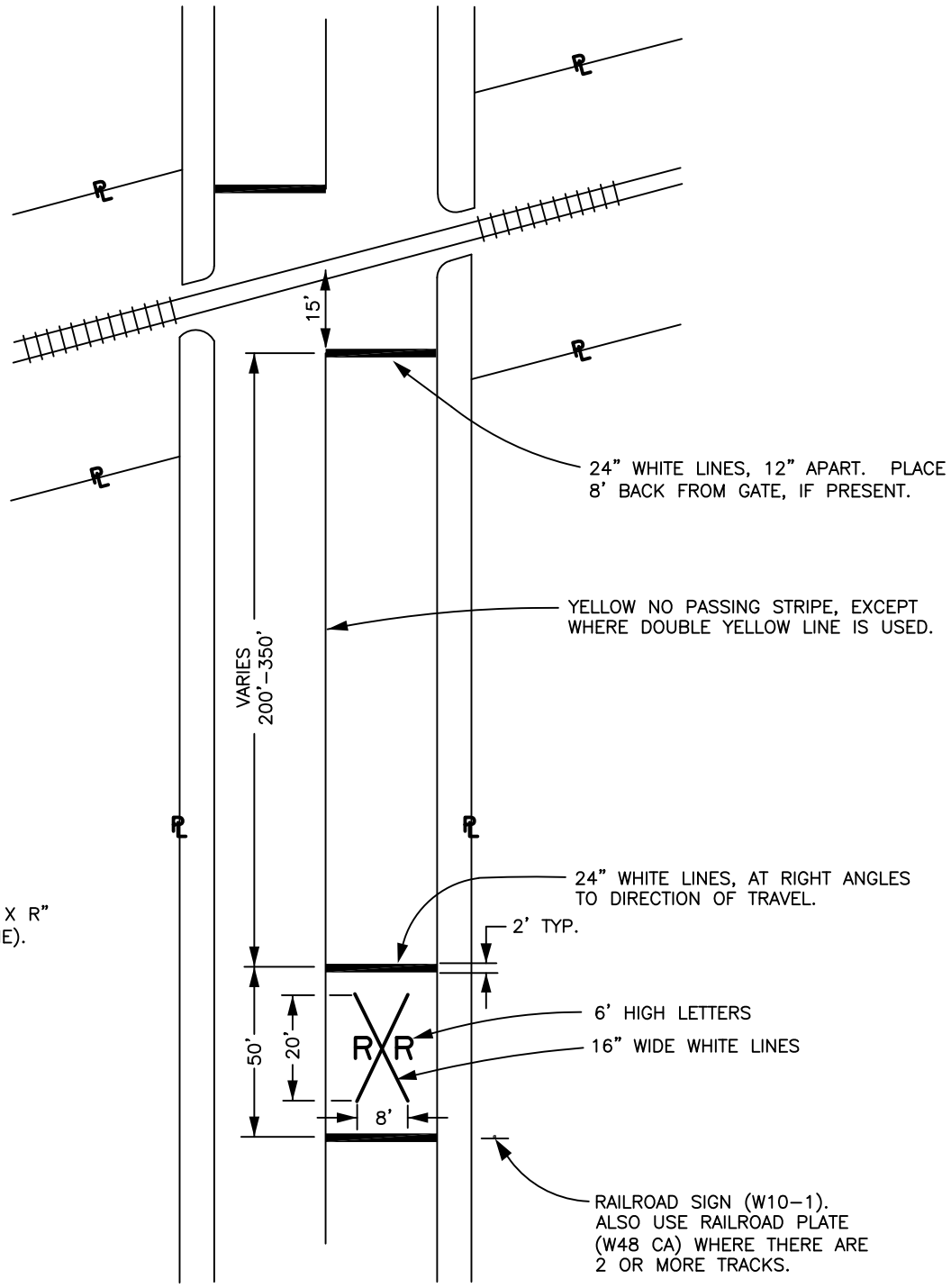
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST–50



NOTE:

CENTER THE WHITE "R X R" MARKING (IN EACH LANE).

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

RAILROAD XING PAVEMENT MARKINGS

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. ST-53

CITY OF HANFORD

CALIFORNIA

CURB, GUTTER AND SIDEWALK CRITERIA

Reason for Curb and Gutter

Curb and gutter is required to protect the edge of pavement, to channel storm drainage to collection points, to define the right-of-way for vehicular traffic, to make better use of the City′s street sweeping program and to protect pedestrian sidewalk traffic. It is our opinion that curb and gutter reduces the City′s street maintenance costs. A secondary benefit is that it also establishes reference points for property lines and shows where underground utilities are stubbed out.

Reason for Sidewalks

The principal reason for a sidewalk is pedestrian safety. The sidewalk gives the pedestrian a place to walk outside of the vehicular travel lanes. The City′s experience has been that graded or graveled areas have not been a satisfactory replacement for sidewalks as property owners′ plants, vegetation, landscaping or fences force people into the street.′

Requirement by Permit

Generally, curb, gutter and sidewalk are required for all new development in the City. This requirement occurs in several areas under City procedures:

A. Building Permits

Pursuant to Title 15 of the Hanford Municipal Code, any person obtaining a building permit is required to construct curb, gutter and sidewalk along all public street frontage adjacent to the lot. In addition, the developer is required to pave between the edge of the existing road and the gutter. Exception to this basic requirement occurs only when a portion of the project site is developed; when a pre-existing single family lot exceed ½ acre, or in the case of a remodel and the cost of the remodeling is less than 50 percent of the value of the existing building.

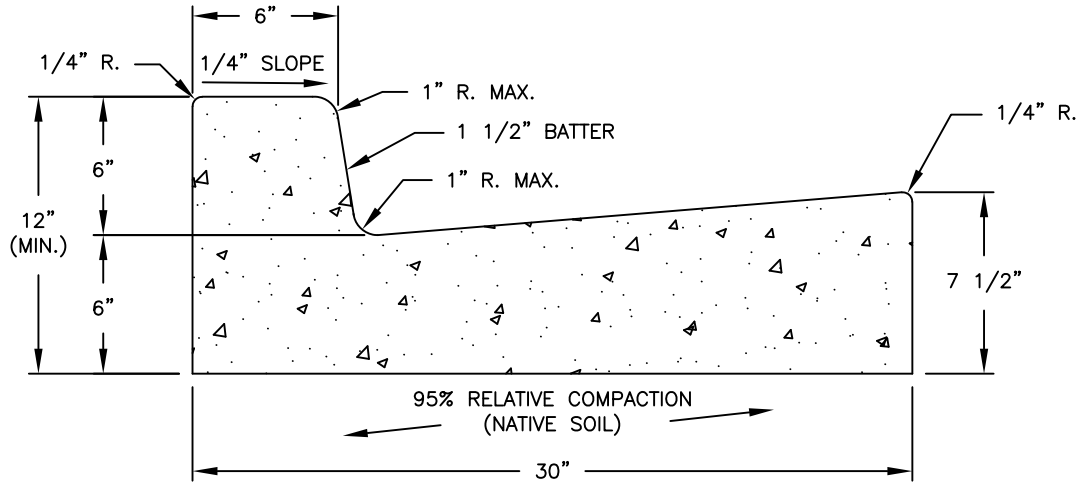
In situations where it not possible to set grades or carry away water from the improvements, the property owner must sign a ″Deferred Improvement Agreement″ that essentially provides that curb, gutter and sidewalk will be installed upon demand of the City. Said Agreement shall provide provision for an automatic ″yes″ vote in any future assessment district for street improvements.

B. Subdivisions

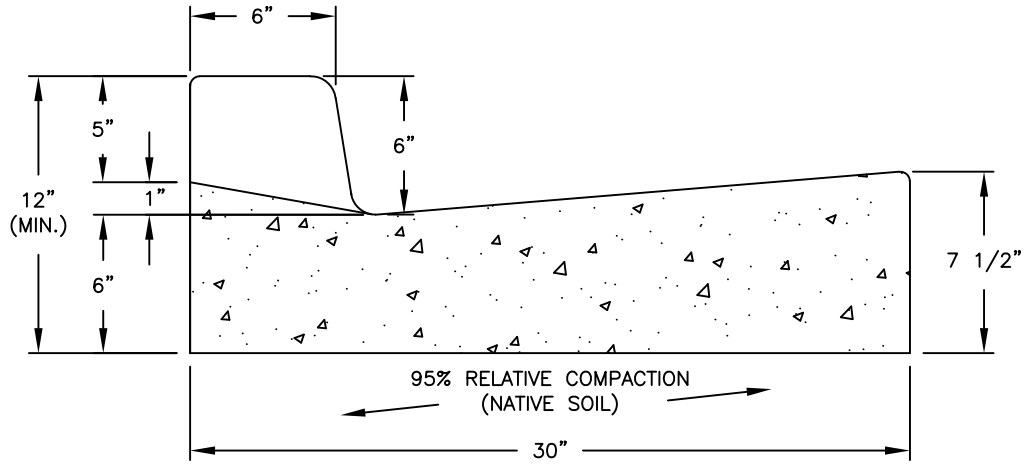
It is the general policy of the City that curb, gutter and sidewalk are required as a condition of approval of any subdivision. They are required on lot sizes up to one-half (1/2) acre in area. For subdivisions by parcel map, curb, gutter and sidewalk are required as a condition to recording of final map. For subdivisions by parcel map, they are required at the time of development. The condition for curb, gutter and sidewalk is noted on the recorded parcel map. It should be noted that the City does not permit a residential lot to be created without frontage on a public street. Improvements are not required at the time of map recording when the division is made for the sole purpose of creating a parcel for sale to another developer who will further divide or develop the property. Said exception shall apply only when no development or increase in utilization is proposed by the subdivider.

C. Use Permits, Site Plan Reviews and Variances

Curb, gutter and sidewalk are also required as a condition of approval of use permits, site plan reviews, variances and issuance of commercial and new construction Certificates of Occupancy. In addition, the developer is also required to pave between the edge of the existing pavement and the gutter. Generally, the conditions on these applications are more of an information item since most would fall under the building permit requirements.



RAISED CURB



DEPRESSED CURB

NOTES

1. CONFORM TO EXISTING CURB & GUTTER WIDTH IF GREATER THAN 30".
2. FORMS TO REMAIN FOR A MIN. OF 24 HOURS.
3. WOOD FORMS SHALL HAVE A NORMAL THICKNESS OF 2", EXCEPT ON CURVE CONSTRUCTION WHERE THE THICKNESS SHALL BE DETERMINED BY THE CITY INSPECTOR.
4. MINIMUM GRADE FOR CURB & GUTTER SHALL NEVER BE LESS THAN .0015 SLOPE, EXCEPT CURVE PORTIONS OF CUL–DE–SAC STREETS WHICH SHALL HAVE .0020 SLOPE MINIMUM.
5. 1"x2" LINE & GRADE STAKES ARE TO BE SET 3' FROM FACE OF CURB. STAKE SPACING SHALL BE 25' MAX. FOR A SLOPE OF .0015 AND 50' MAX. FOR SLOPES OF .0020 OR MORE (OR EQUIVALENT CONTROLS).
6. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. IN 28 DAYS).
7. SEE CONCRETE NOTES (DRAWING No. CO–32) CITY STANDARD SPECIFICATIONS.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

30" CURB AND GUTTER

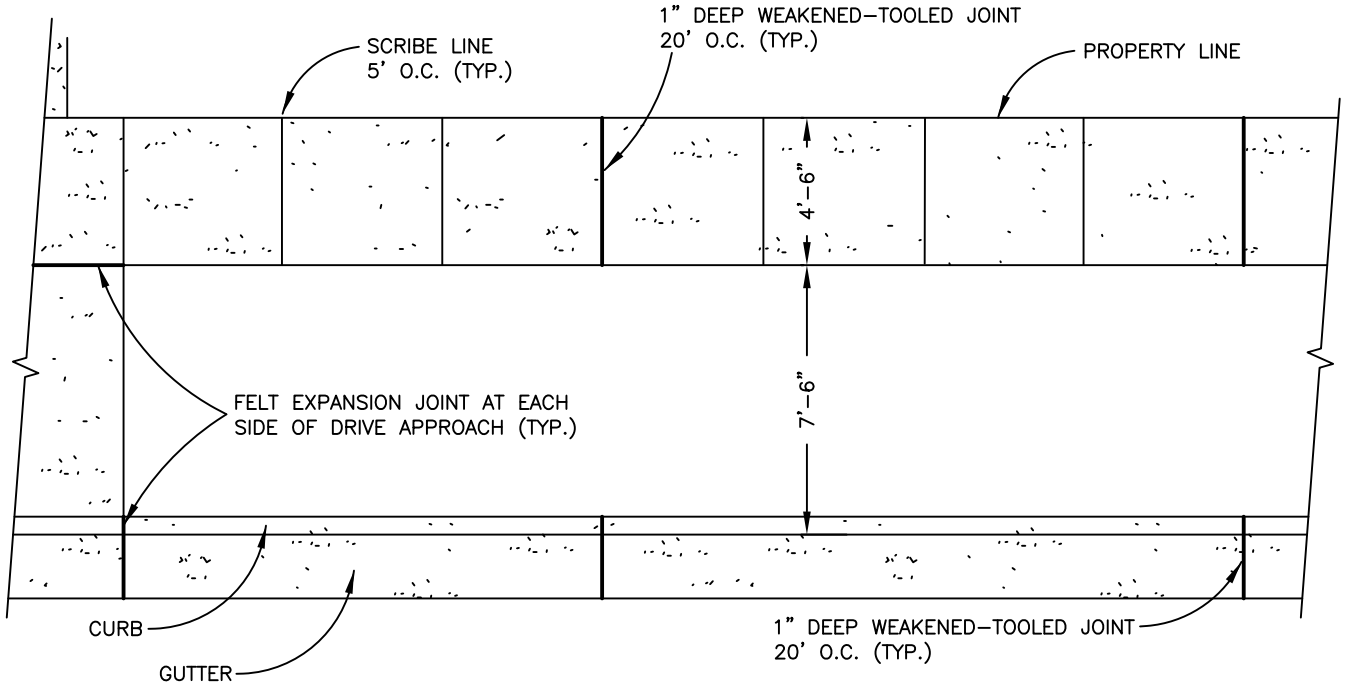
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

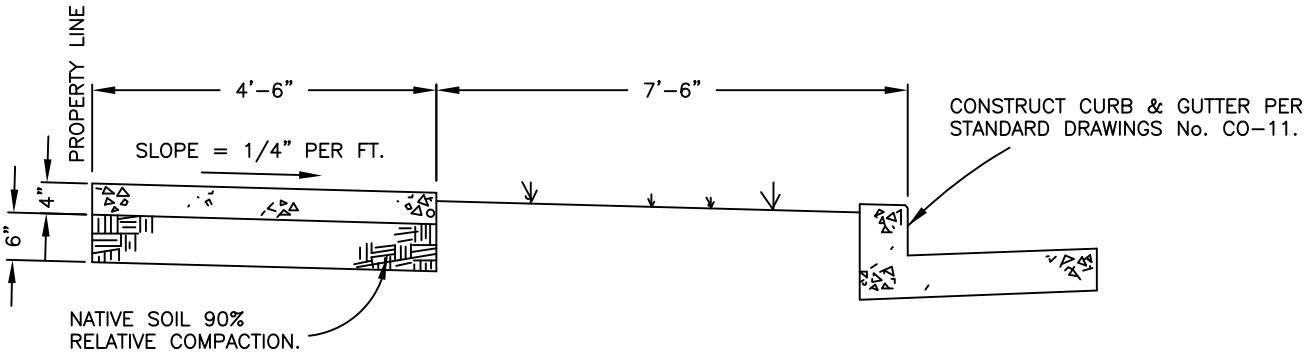
REVISED: 04/04/06

DRAWING NO. CO–11



CURB, GUTTER & SIDEWALK SCRIBE LINE DETAIL

NO SCALE



CURB, GUTTER AND SIDEWALK CROSS-SECTION

NO SCALE

NOTES:

1. FORMS TO REMAIN FOR A MIN. OF 24 HOURS.
2. WOOD FORMS SHALL HAVE A NOMINAL THICKNESS OF 2", EXCEPT ON CURVE CONSTRUCTION WHERE THE THICKNESS SHALL BE DETERMINED BY THE CITY ENGINEER.
3. SEE CONCRETE NOTES (DRAWING No. CO-32) AND CITY STANDARD SPECIFICATIONS.
4. EXPANSION JOINTS SHALL BE INSTALLED WITHIN CURVILINEAR SIDEWALKS AT MIN. 60 FEET O.C.
5. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).
6. PARK STRIP TREES SHALL BE PLACED 4'-0" FROM FACE OF CURB. SEE DETAIL GE-13.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

PARKSTRIP SIDEWALK DETAIL

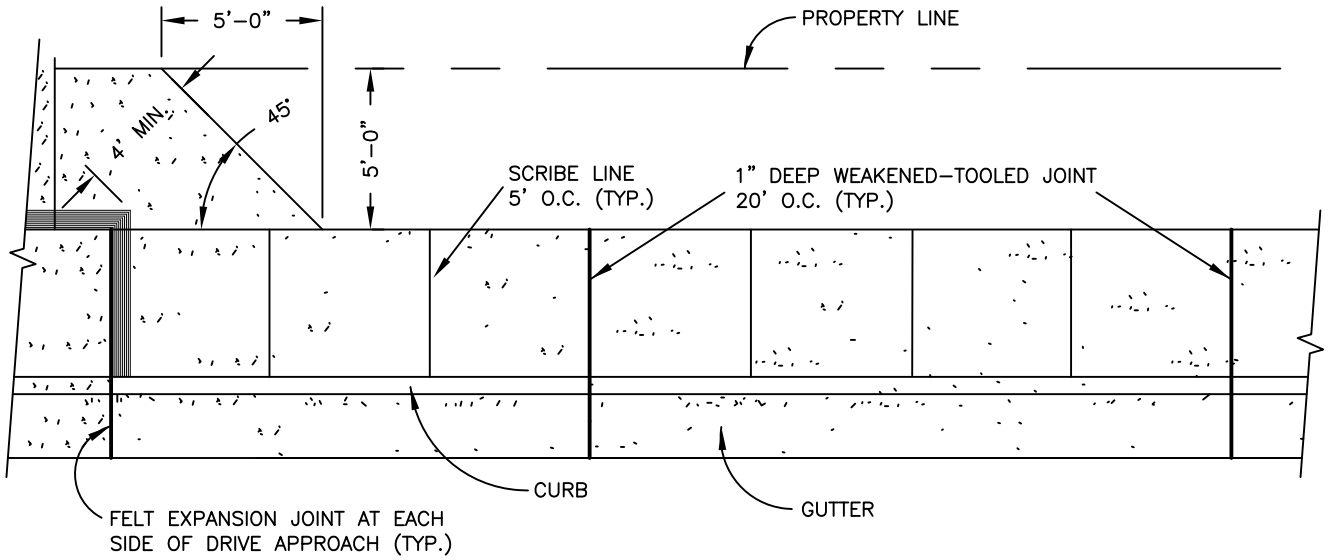
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

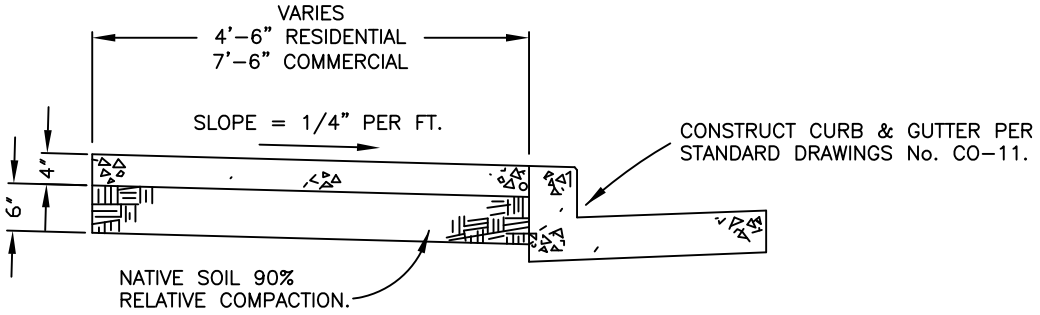
REVISED: 04/04/06

DRAWING NO. CO-14



CURB, GUTTER & SIDEWALK SCRIBE LINE DETAIL

NO SCALE



CURB, GUTTER AND SIDEWALK CROSS-SECTION

NO SCALE

NOTES:

1. FROMS TO REMAIN FOR A MIN. OF 24 HOURS.
2. WOOD FORMS SHALL HAVE A NOMINAL THICKNESS OF 2", EXCEPT ON CURVE CONSTRUCTION WHERE THE THICKNESS SHALL BE DETERMINED BY THE CITY ENGINEER.
3. SEE CONCRETE NOTES (DRAWING No. CO-32) AND CITY STANDARD SPECIFICATIONS.
4. EXPANSION JOINTS SHALL BE INSTALLED WITHIN CURVILINEAR SIDEWALKS AT MIN. 60 FEET O.C.
5. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).
6. FOR DOWNTOWN 2010 PLAN AREA SEE DESIGN GUIDELINES FOR SIDEWALK SCORING PATTERN.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

ADJACENT SIDEWALK DETAIL

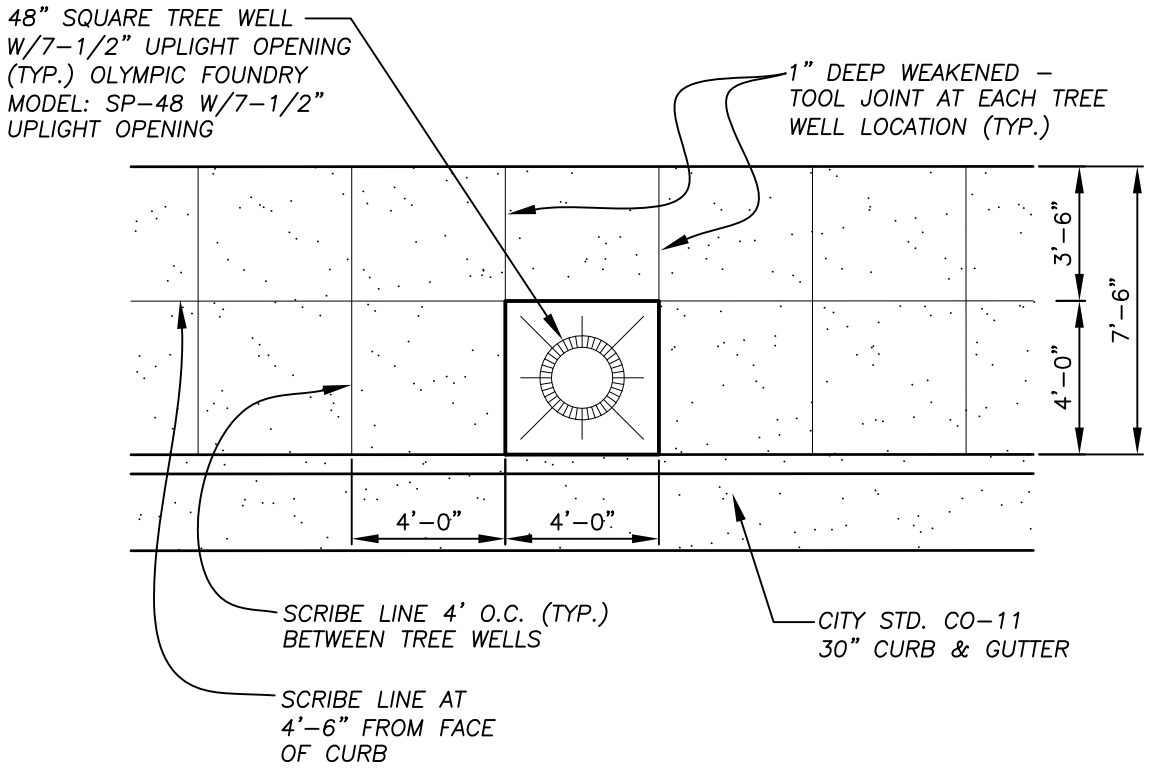
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. CO-15



8' SIDEWALK TREE WELL DETAIL

NOT TO SCALE

NOTES:

1. FORMS TO REMAIN FOR A MIN. OF 24 HOURS.
2. WOOD FORMS SHALL HAVE A NOMINAL THICKNESS OF 2", EXCEPT ON CURVE CONSTRUCTION WHERE THE THICKNESS SHALL BE DETERMINED BY THE CITY ENGINEER.
3. SEE CONCRETE NOTES (DRAWING No. CO-32) AND CITY STANDARD SPECIFICATIONS.
4. EXPANSION JOINTS SHALL BE INSTALLED WITHIN CURVILINEAR SIDEWALKS AT MIN. 60 FEET O.C.
5. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).
6. FOR DOWNTOWN 2010 PLAN AREA SEE DESIGN GUIDELINES FOR SIDEWALK SCORING PATTERN.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

8' SIDEWALK WITH TREE WELLS

FOR DOWNTOWN 2010 PLAN

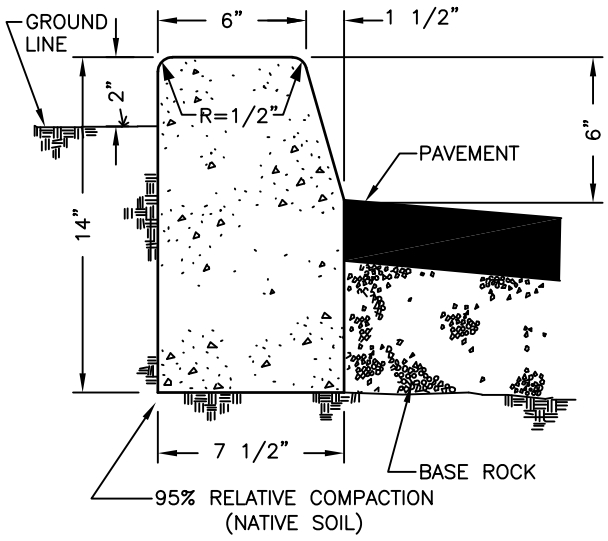
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

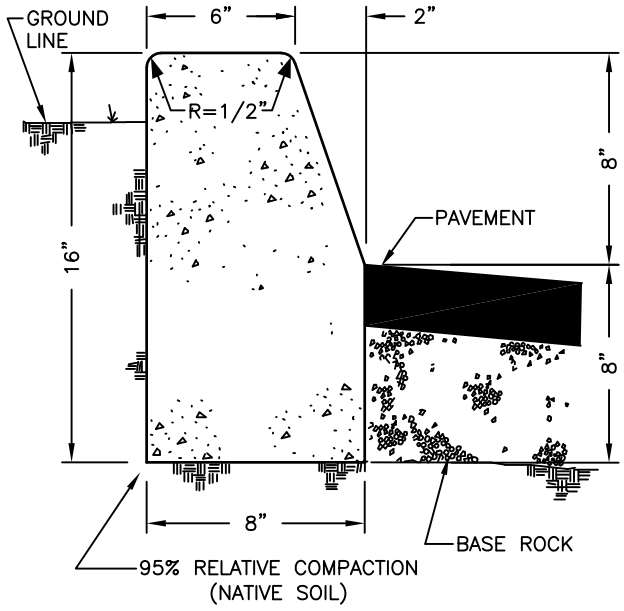
REVISED: 04/04/06

DRAWING NO. CO-16



LANDSCAPE PLANTER CURB

NO SCALE



MEDIAN ISLAND CURB

NO SCALE

NOTES:

1. FORMS TO REMAIN FOR A MIN. OF 24 HOURS.
2. WOOD FORMS SHALL HAVE A NOMINAL THICKNESS OF 2" EXCEPT ON CURVE CONSTRUCTION WHERE THE THICKNESS SHALL BE DETERMINED BY THE CITY INSPECTOR.
3. 1"x2" LINE & GRADE STAKES ARE TO BE SET 3' FROM FACE OF CURB.
4. SEE CONCRETE NOTES (DRAWNIG No. CO–32) AND CITY STANDARD SPECIFICATIONS.
5. WEAKEND PLANE JOINTS SHALL BE CONSTRUCTED AT 20' CENTERS, AND SHALL BE A MIN. DEPTH OF 1" & SHALL BE FINISHED W/A SCORING TOOL LEAVING THE EDGES ROUNDED. FILL JOINTS AT BACK OF CURBS WITH EPOXY OR AN APPOROVED ALTERNATIVE, TO PROHIBIT DRAINAGE TO PAVED AREAS.
6. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

CONCRETE CURB DETAILS

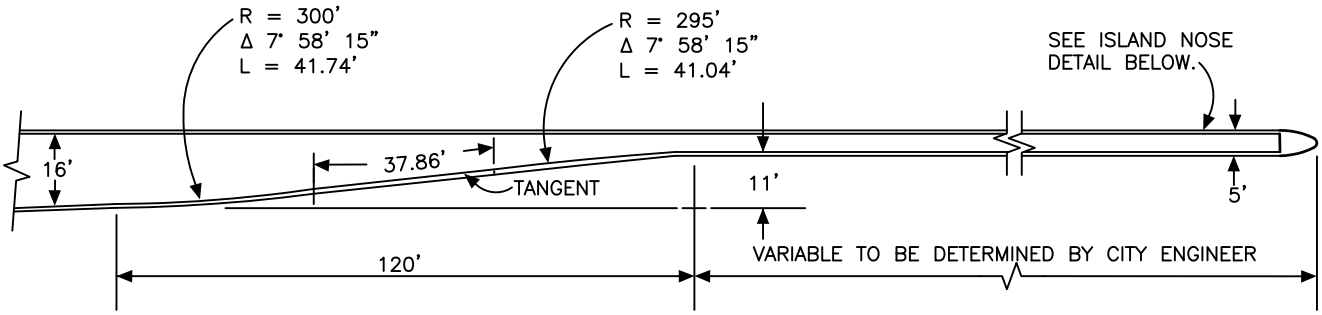
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

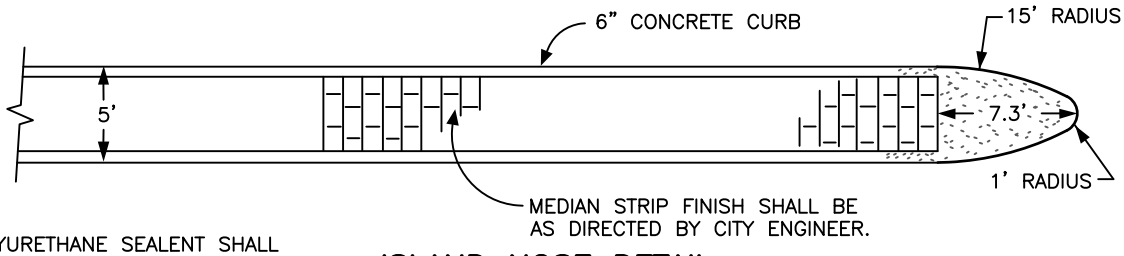
REVISED: 04/04/06

DRAWING NO. CO–17



MEDIAN POCKET DETAIL

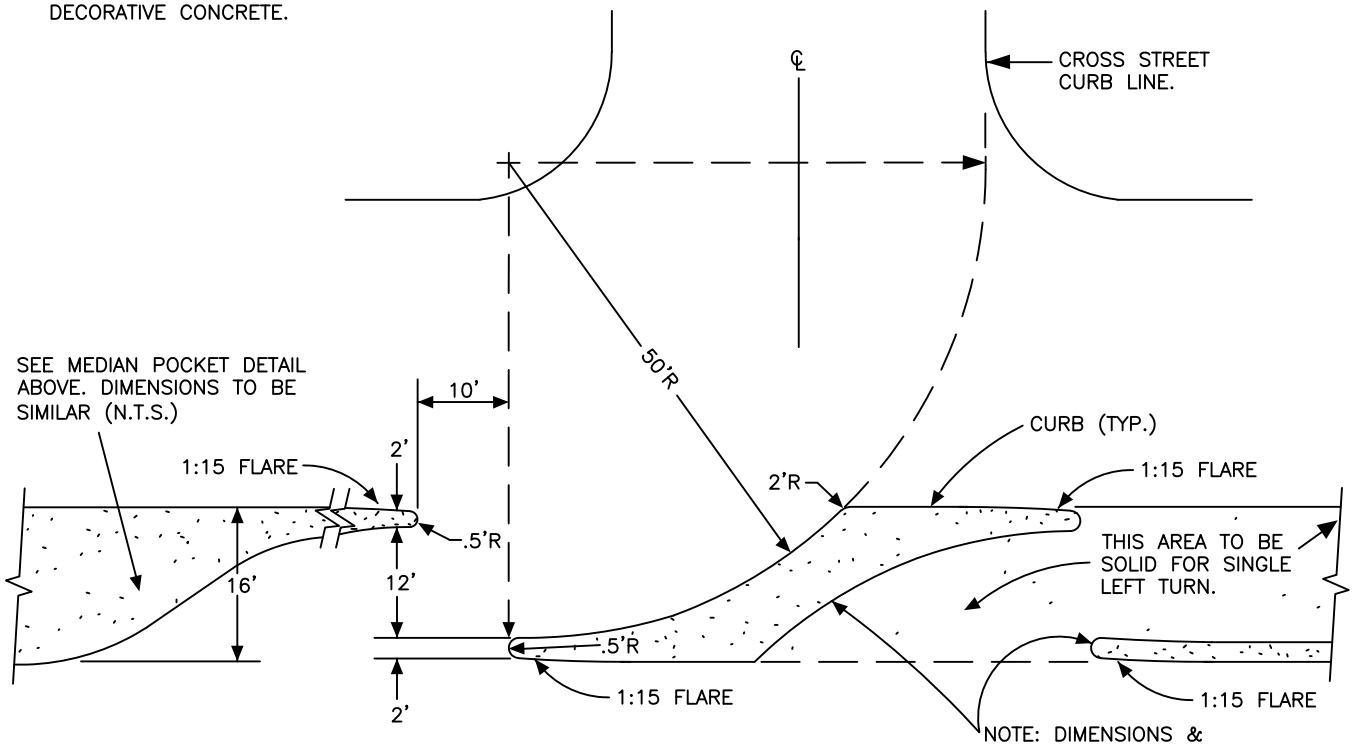
SCALE: 1"=40'



NOTE:
A POLYURETHANE SEALENT SHALL BE APPLIED TO THE BACKSIDE OF ALL JOINTS AT MEDIAN CURBING PRIOR TO BACKFILL OF MATERIAL OR PLACEMENT OF DECORATIVE CONCRETE.

ISLAND NOSE DETAIL

SCALE: 1"=10'



CENTER ISLAND TURNOUT DETAIL

SCALE: 1"=20'

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

MEDIAN DETAILS

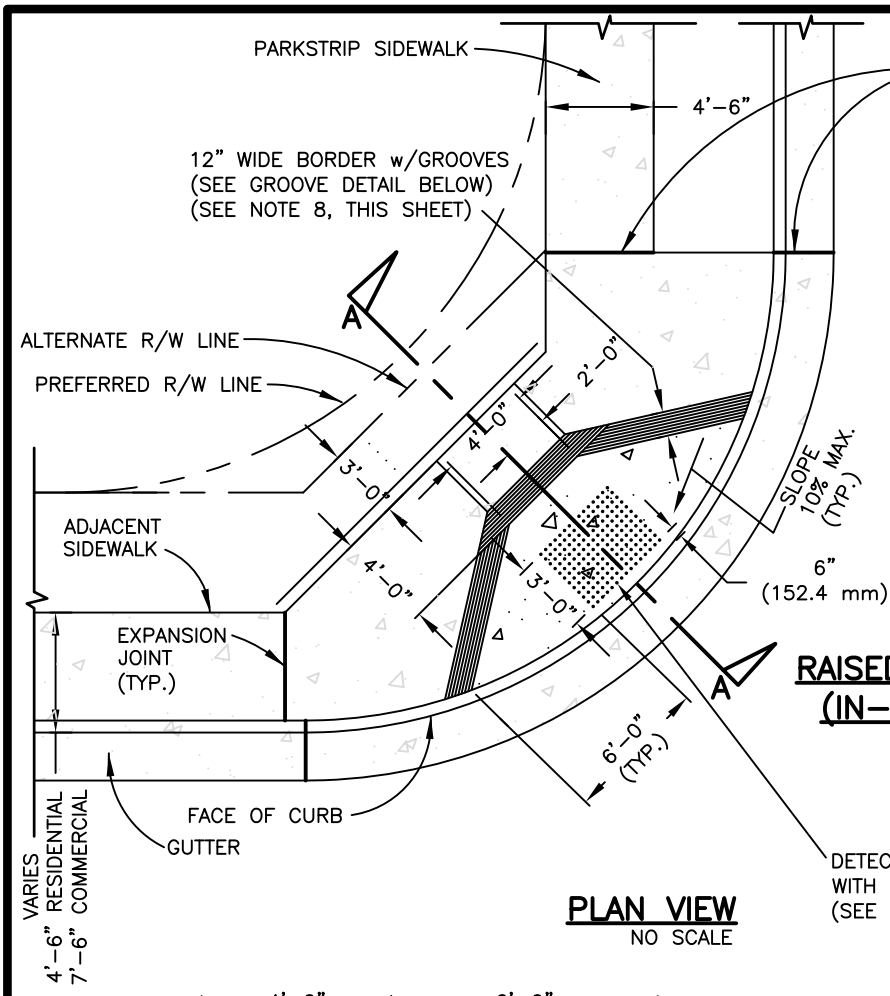
STANDARD DRAWING

APPROVED BY:

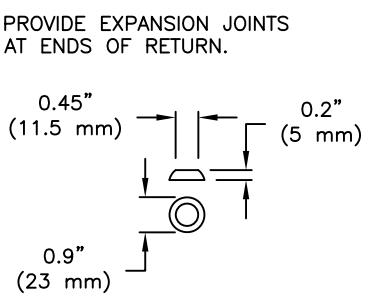
CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

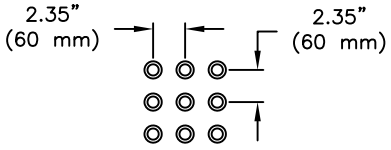
DRAWING NO. CO-18



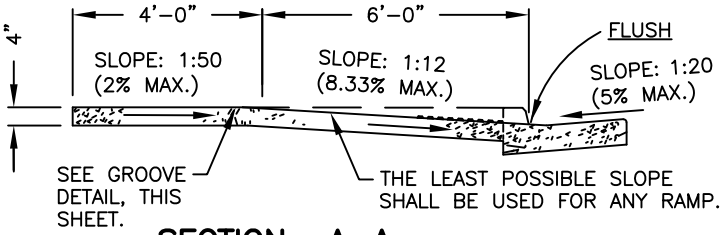
PLAN VIEW
NO SCALE



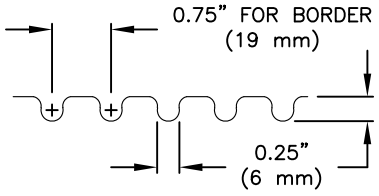
RAISED TRUNCATED DOME
NO SCALE



RAISED TRUNCATED DOME PATTERN (IN-LINE) DETECTABLE WARNING SURFACE
NO SCALE



SECTION A-A
NO SCALE



GROOVE DETAIL
NO SCALE

NOTES:

1. RAMPS SHALL HAVE NO ABRUPT CHANGES IN ELEVATION OF ANGLE OF SLOPE.
2. SIDEWALK & RAMP THICKNESS SHALL BE 4". COMPACT SUBGRADE TO 90% MINIMUM.
3. ARTERIAL AND MAJOR COLLECTOR STREET INTERSECTIONS (ARTERIAL-ARTERIAL, ARTERIAL-MAJOR, MAJOR-MAJOR) SHALL HAVE 30' MIN. RADIUS RETURNS WHERE FEASIBLE (CO-21). ALL OTHER STREETS SHALL REQUIRE A 20' MIN. RADIUS RETURN.
4. THERE SHALL BE A 0.20' MIN. ELEVATION CHANGE AROUND A TYPICAL RETURN.
5. FORMS TO REMAIN FOR A MIN. OF 24 HOURS.
6. THERE SHALL BE NO SIDEWALK OBSTRUCTIONS. ALL POWER POLES, STREET LIGHTS, FIRE HYDRANTS & MAIL BOXES SHALL BE SET BACK BEHIND SIDEWALK UNLESS APPROVED OTHERWISE BY CITY ENGINEER.
7. SIDEWALK RAMP SHALL HAVE A HEAVY BROOM FINISH ACROSS THE SLOPE OF THE RAMP.
8. DEEP JOINT TO BE AT PERIMETER OF 12" WIDE BORDER w/GROOVES.
9. SEE CONCRETE NOTES (DRAWING No. CO-32) AND CITY STANDARD SPECIFICATIONS.
10. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).

CITY OF HANFORD

DEPT. OF PUBLIC WORKS — ENGINEERING DIVISION

CURB RAMP DETAIL
(20 FOOT RADIUS RETURN)

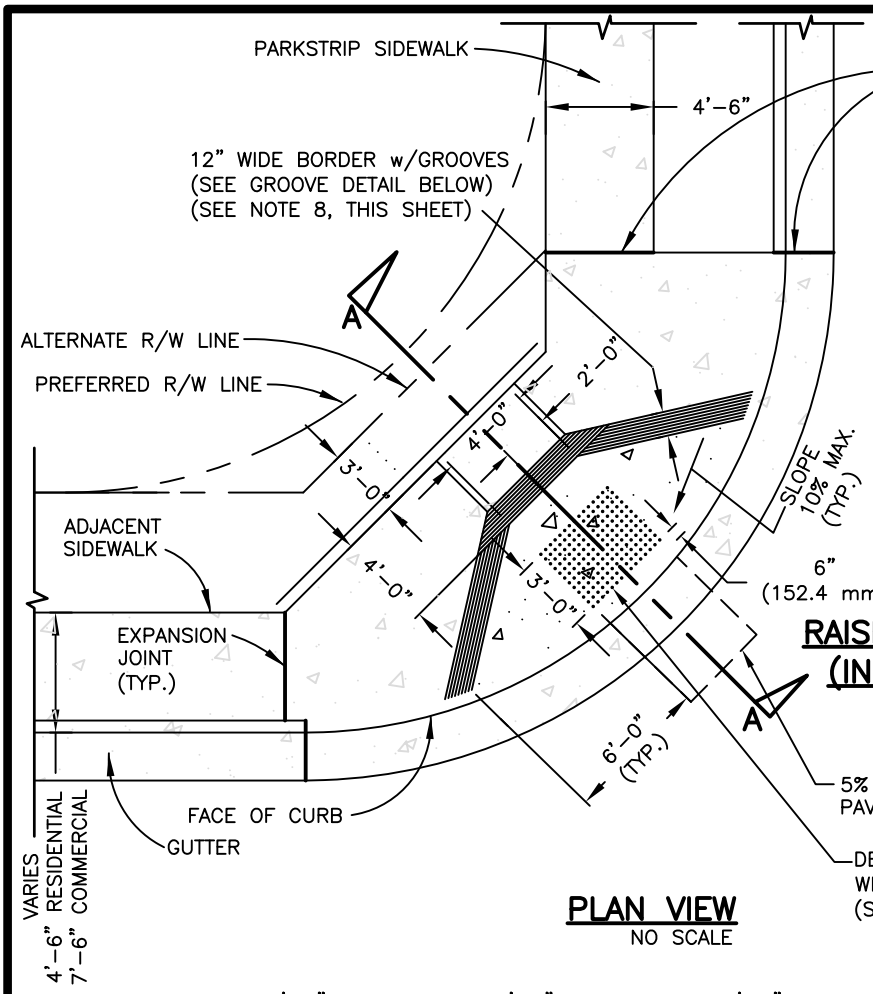
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

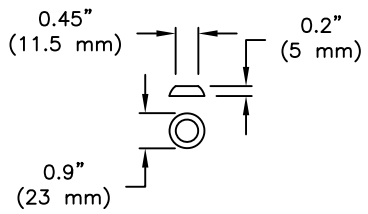
REVISED: 04/04/06

DRAWING NO. CO-20

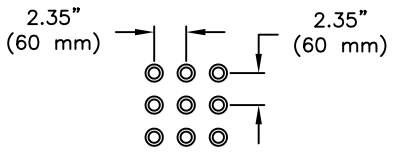


PLAN VIEW
NO SCALE

PROVIDE EXPANSION JOINTS AT ENDS OF RETURN.



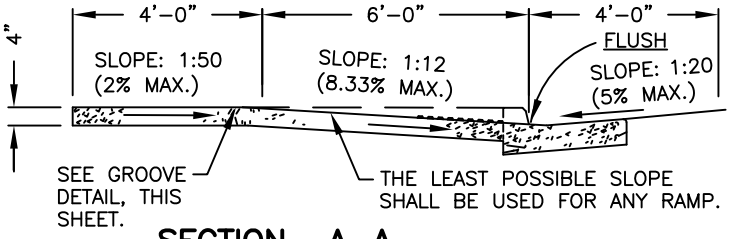
RAISED TRUNCATED DOME
NO SCALE



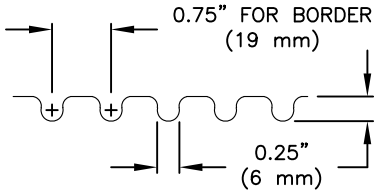
RAISED TRUNCATED DOME PATTERN (IN-LINE) DETECTABLE WARNING SURFACE
NO SCALE

5% MAXIMUM SLOPE ACROSS GUTTER PAN AND PAVEMENT IN FRONT OF RAMP PER SECTION A-A.

DETECTABLE WARNING SURFACE TO BE PLACED WITH CLOSEST EDGE 6" FROM FLOWLINE. (SEE DETAILS ABOVE AND ADA STANDARDS.)



SECTION A-A
NO SCALE



GROOVE DETAIL
NO SCALE

NOTES:

1. RAMPS SHALL HAVE NO ABRUPT CHANGES IN ELEVATION OF ANGLE OF SLOPE.
2. SIDEWALK & RAMP THICKNESS SHALL BE 4". COMPACT SUBGRADE TO 90% MINIMUM.
3. ARTERIAL AND MAJOR COLLECTOR STREET INTERSECTIONS (ARTERIAL-ARTERIAL, ARTERIAL-MAJOR, MAJOR-MAJOR) SHALL HAVE 30' MIN. RADIUS RETURNS WHERE FEASIBLE (CO-21). ALL OTHER STREETS SHALL REQUIRE A 20' MIN. RADIUS RETURN.
4. THERE SHALL BE A 0.20' MIN. ELEVATION CHANGE AROUND A TYPICAL RETURN.
5. FORMS TO REMAIN FOR A MIN. OF 24 HOURS.
6. THERE SHALL BE NO SIDEWALK OBSTRUCTIONS. ALL POWER POLES, STREET LIGHTS, FIRE HYDRANTS & MAIL BOXES SHALL BE SET BACK BEHIND SIDEWALK UNLESS APPROVED OTHERWISE BY CITY ENGINEER.
7. SIDEWALK RAMP SHALL HAVE A HEAVY BROOM FINISH ACROSS THE SLOPE OF THE RAMP.
8. DEEP JOINT TO BE AT PERIMETER OF 12" WIDE BORDER w/GROOVES.
9. SEE CONCRETE NOTES (DRAWING No. CO-32) AND CITY STANDARD SPECIFICATIONS.
10. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).

CITY OF HANFORD

DEPT. OF PUBLIC WORKS — ENGINEERING DIVISION

CURB RAMP DETAIL
(20 FOOT RADIUS RETURN)

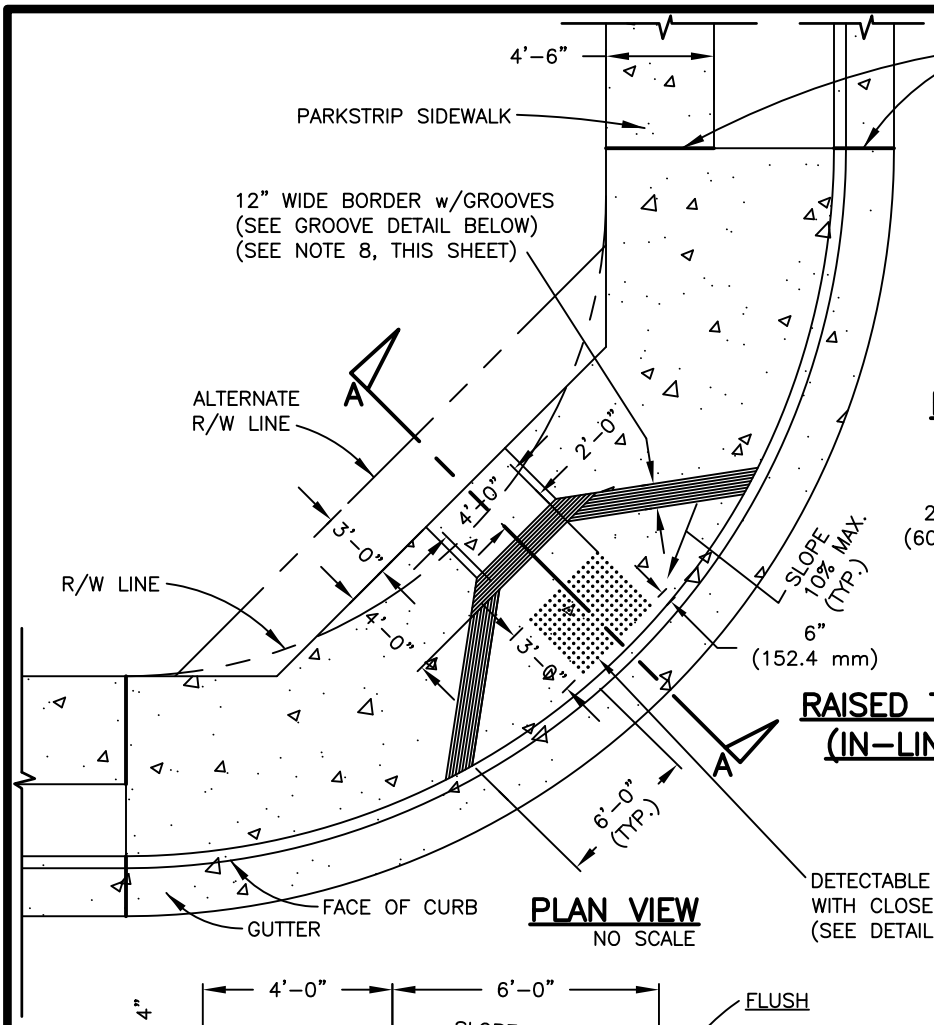
STANDARD DRAWING

APPROVED BY:

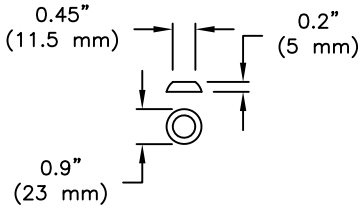
CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

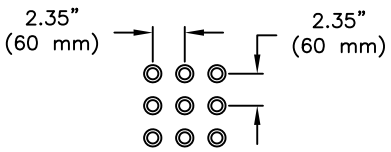
DRAWING NO. CO-20



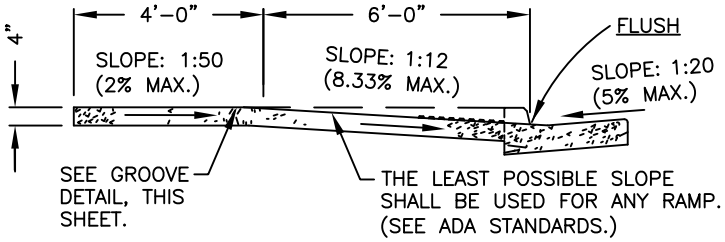
PLAN VIEW
NO SCALE



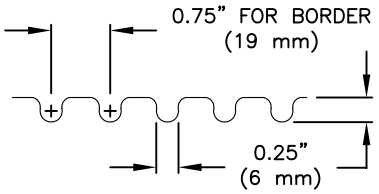
RAISED TRUNCATED DOME
NO SCALE



RAISED TRUNCATED DOME PATTERN (IN-LINE) DETECTABLE WARNING SURFACE
NO SCALE



SECTION A-A
NO SCALE



GROOVE DETAIL
NO SCALE

NOTES:

1. RAMPS SHALL HAVE NO ABRUPT CHANGES IN ELEVATION OF ANGLE OF SLOPE.
2. SIDEWALK & RAMP THICKNESS SHALL BE 4". COMPACT SUBGRADE TO 90% MINIMUM.
3. ARTERIAL AND MAJOR COLLECTOR STREET INTERSECTIONS (ARTERIAL-ARTERIAL, ARTERIAL-MAJOR, MAJOR-MAJOR) SHALL HAVE 30' MIN. RADIUS RETURNS WHERE FEASIBLE (CO-21). ALL OTHER STREETS SHALL REQUIRE A 20' MIN. RADIUS RETURN.
4. THERE SHALL BE A 0.20' MIN. ELEVATION CHANGE AROUND A TYPICAL RETURN.
5. FORMS TO REMAIN FOR A MIN. OF 24 HOURS.
6. THERE SHALL BE NO SIDEWALK OBSTRUCTIONS. ALL POWER POLES, STREET LIGHTS, FIRE HYDRANTS & MAIL BOXES SHALL BE SET BACK BEHIND SIDEWALK UNLESS APPROVED OTHERWISE BY CITY ENGINEER.
7. SIDEWALK RAMP SHALL HAVE A HEAVY BROOM FINISH ACROSS THE SLOPE OF THE RAMP.
8. DEEP JOINT TO BE AT PERIMETER OF 12' WIDE BORDER w/GROOVES.
9. SEE CONCRETE NOTES (DRAWING No. CO-32) AND CITY STANDARD SPECIFICATIONS.
10. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

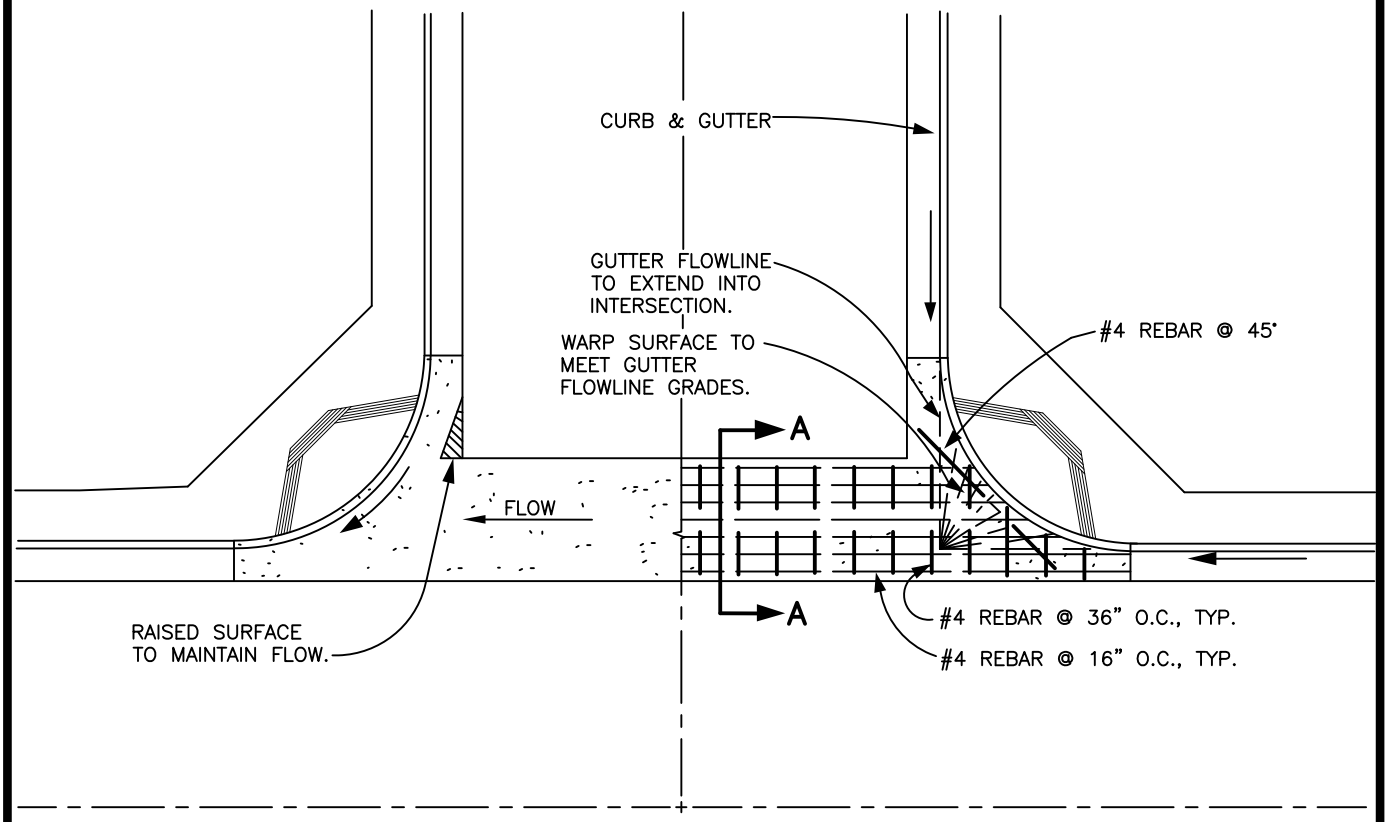
CITY ENGINEER R.C.E. 062044

CURB RAMP DETAIL
(30 FOOT RADIUS RETURN)

STANDARD DRAWING

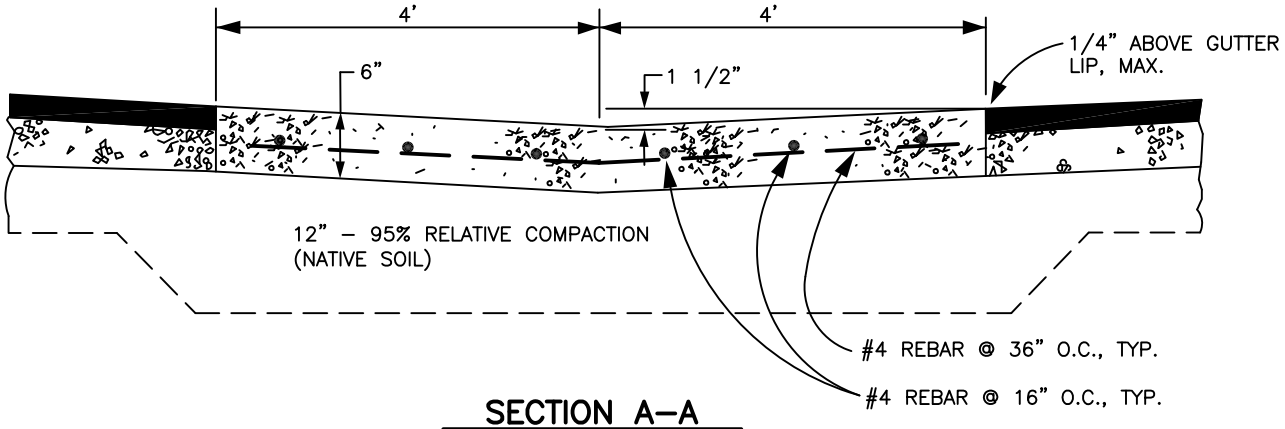
REVISED: 04/04/06

DRAWING NO. CO-21



NOTE:

THE VALLEY GUTTER SHALL HAVE A MIN. NET SLOPE OF 0.0030 IN THE DIRECTION OF FLOW.



SECTION A–A

NOTES:

1. SEE CONCRETE NOTES (DRAW No. CO–32) AND CITY STANDARD SPECIFICATIONS.
2. CONCRETE SHALL BE MINIMUM SIX SACK MIX. (3250 P.S.I. MIN. IN 28 DAYS).

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

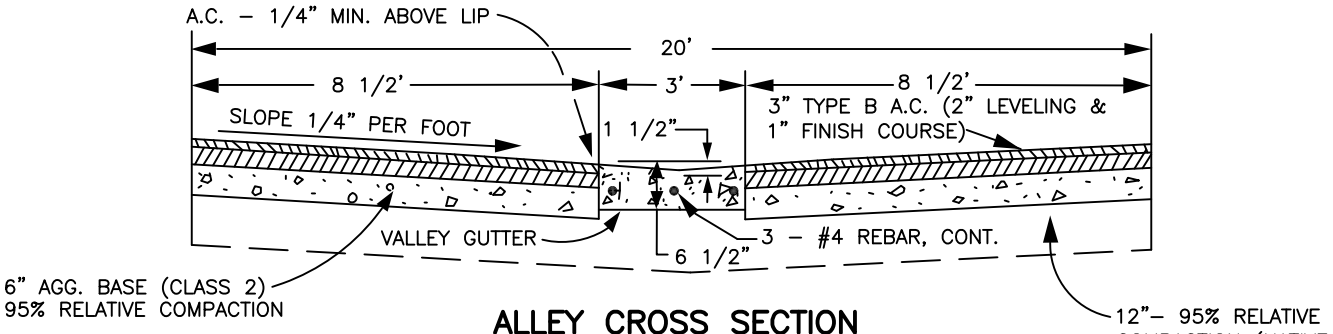
CITY ENGINEER R.C.E. 062044

VALLEY GUTTER

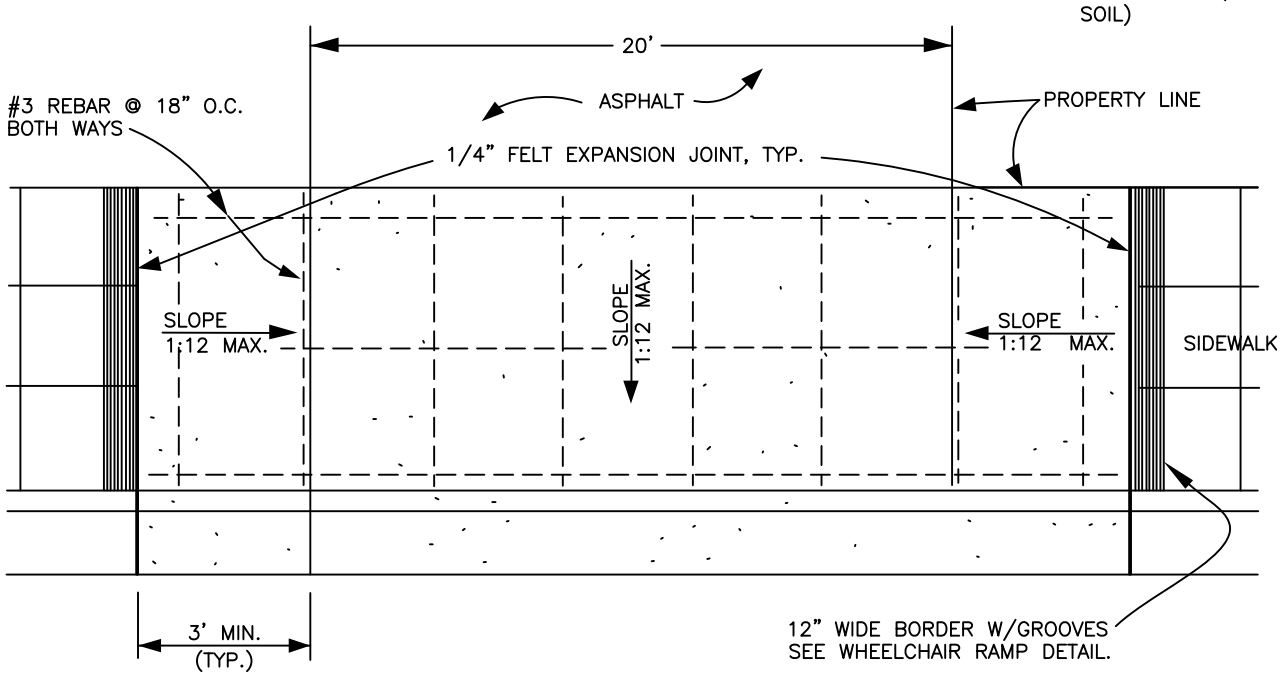
STANDARD DRAWING

REVISED: 04/04/06

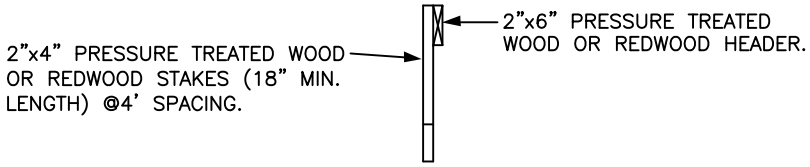
DRAWING NO. CO–23



ALLEY CROSS SECTION



ALLEY APPROACH



HEADER DETAIL

NOTES:

1. REBAR SHALL BE CONTINUOUS THROUGH THE JOINT (NO SPLICES).
2. CONCRETE SHALL BE MIN. SIX SACK MIX. (3250 P.S.I. MIN. IN 28 DAYS).
3. WOOD FORMS SHALL HAVE A NOMINAL THICKNESS OF 2", EXCEPT ON CURVE CONST. WHERE THE THICKNESS SHALL BE APPROVED BY THE CITY INSPECTOR. FORMS SHALL REMAIN FOR A MIN. OF 24 HOURS.
4. HEADERS SHALL BE USED AT THE EDGE OF PAVEMENT EXCEPT WHEN BUILDINGS OR OTHER PERMANENT IMPROVEMENTS ABOUT THE ALLEY, AND SHALL BE LEFT IN PLACE AFTER CONST. THEY SHALL BE FOUNDATION GRADE OR BETTER.
5. INSTALL EXPANSION JOINTS EVERY 48' IN VALLEY GUTTER.
6. WORK PERFORMED AND MATERIALS SUPPLIED SHALL CONFORM TO THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", LATEST EDITION.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

ALLEY DETAILS

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. CO–26

ADDITIONAL NOTES:

1. CROSS SECTIONAL AREA OF 30" CURB AND GUTTER–1.64 SQ. FT.
2. 30" CURB AND GUTTER–16.4 L.F. PER CU. YD. OF CONCRETE.
3. AN APPROXIMATE 4" FLOW LINE SHALL BE TROWELED SMOOTH.
4. ALL CONCRETE SHALL HAVE A LIGHT BROOM FINISH, AND ALL BROOMING SHALL BE PARALLEL TO THE DIRECTION OF FLOW.
5. 1/2" PRE–MOLDED JOINT FILLER SHALL BE INSTALLED IN EXPANSION JOINTS AT ALL DRIVE APPROACHES AND AT THE BEGINNING AND END OF ALL CURB RETURNS; AND SHALL BE HELD FIRMLY IN PLACE PRIOR TO PLACING CONCRETE. WEAKEND PLANE JOINTS SHALL BE AT 20' INTERVALS.
6. AT CONTRACTOR'S OPTION OR IF A JOINT IS MISSED AND SLIP FORM EQUIPMENT IS USED, CONTROL JOINTS SHALL BE SAW CUT TO A DEPTH OF 2" AT LOCATIONS AS SPECIFIED IN NOTE 5. THE TOP 3/4" OF THE CONTROL JOINT SHALL BE FILLED WITH A POLYURETHANE SEALANT (SIKAFLEX–IA OR EQUAL).
7. ALL WORK TO BE DONE AND ALL MATERIALS SUPPLIED SHALL CONFORM TO THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" LATEST EDITION.
8. CURING COMPOUND SHALL BE APPLIED TO FRESH CONCRETE BY ROLLING, BRUSHING, OR SPRAYING, CURING COMPOUND SHALL BE MASTER BUILDERS "MASTERSEAL", W.R. GRACE AND CO. "HORN CLEARSEAL" OR APPROVED EQUAL.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

CONCRETE NOTES

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. CO–32

CITY OF HANFORD

CALIFORNIA

DRIVEWAY STANDARDS AND CRITERIA

1. Driveways - General

All driveway approaches, hereinafter called driveways, in City right-of-way shall be constructed in conformance with City Specifications and Standard Driveway drawings or as modified for special situations described herein.

a. A residential driveway apron shall be constructed between the curb and the property line with Portland cement concrete per driveway standards.

b. A commercial driveway apron to a parking lot or ″drive-in″ business shall be constructed between the curb and the property line with an approved Portland cement concrete structural section.

c. An industrial driveway apron shall be constructed between the curb and the property line with an approved Portland cement concrete structural section based on the amount of truck traffic (TI) and the ability of the soil (R-value) to withstand truck wheel loads.

d. In all cases above, it shall be the responsibility of the abutting property owner to maintain the driveway apron in a safe and suitable condition for the traffic to be carried, whether pedestrian or vehicular.

2. Commercial – Industrial High Volume Driveways

Commercial and industrial driveways that serve a substantial number of vehicles or trucks shall have dimensions, sight distance, geometrics, spacing, etc., determined by the City Engineer.

3. One-Way Driveways

One-way entrance or exit driveways shall conform to the City Standard for commercial driveways or as modified by the City Engineer for special situations.

4. Amount of Frontage Allowed for Driveways

Not more than 40 percent of residential or 40 percent of commercial frontage of any parcel may be devoted to driveways.

5. Driveway Width ″W″

The width of driveways shall be measured between the bottom points of the driveway.

6. **Minimum Width "W"**

   a. **The minimum width of driveways for one and two family residences shall be 12 feet.**

   b. **The minimum width of all other driveways shall provide for the safe, efficient and economical movement of traffic and should be approximately 24 feet.**

7. **Maximum Width "W"**

   a. **The maximum width for a residential driveway shall be 20 feet, unless approved otherwise by the City Engineer.**

   b. **The maximum width of all commercial driveways shall be 35 feet except this may be increased by the City Engineer where necessary to provide for the safe, efficient and economical movement of traffic.**

   c. **In the case of a driveway located adjacent to an alley, if approved by the City Engineer, the driveway apron may be combined with the alley but the total combined width shall not exceed 40 feet.**

   d. **The driveway width may be modified by the City Engineer to facilitate turning movements where curb lanes are used.**

8. **Distance Between Driveways**

   a. **No driveway shall be located closer than three feet (at top of apron) from a side property line.**

   b. **The minimum length of full height curb between driveways on adjacent lots shall be six feet except as allowed by specific zoning ordinance.**

   c. **No driveway shall be located closer than six feet from an existing or future alley entrance except as provided elsewhere in these standards.**

   d. **Where two or more driveways are constructed on the same lot, the minimum length of full height curb between driveways shall be 22 feet. Where practical to provide parking, the total length of full height curb between driveways shall be in multiples of 24 feet.**

9. **Driveway Grade (Slope)**

   The minimum grade for driveways shall be 2 percent.

10. **Driveway Distance from Utility or Safety Devices**

    No driveway shall be located closer than five feet from a fire hydrant, traffic signal, street light standard, utility pole or guy wire.

11. Utility Relocation

Relocation of utility company′s facilities or other public improvements in order to accommodate a driveway shall be accomplished without cost to the City.

12. Signal and Electrical Conduit

Where traffic signal or highway lighting is planned or anticipated, a minimum of one 2-inch PVC – P & C TC-6 conduit shall be placed under any new driveway apron and extend a minimum of one foot beyond the ends of the driveway. The conduit shall be placed behind and 24″ below the top of the curb.

13. Removal of Existing Driveways

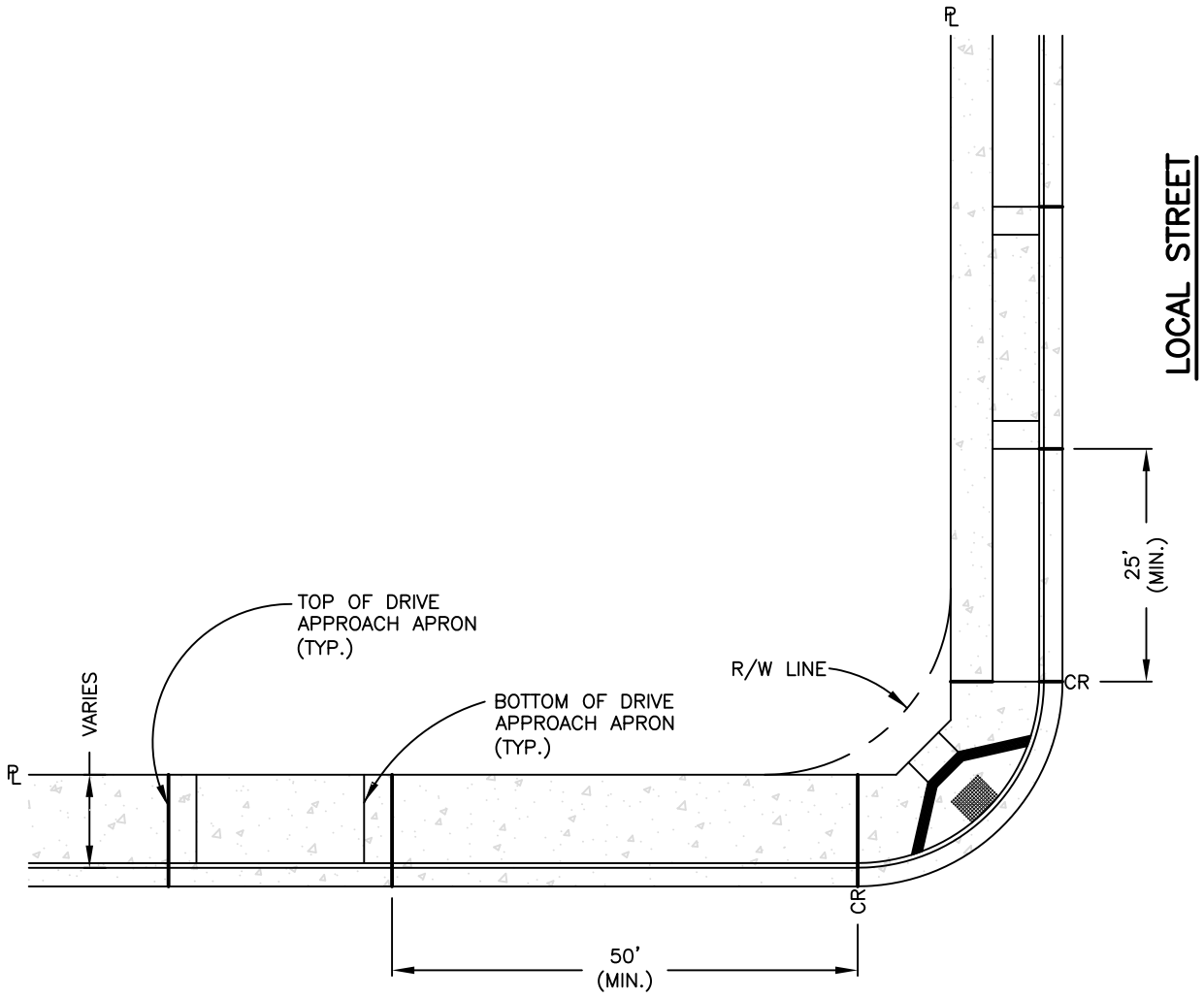
When driveway construction is to take place on a parcel, any abandoned driveways shall be removed and replaced with standard curb, gutter and sidewalk concurrently with the new construction and without cost to the City.

14. Modification

The above standards may be modified by the City Engineer for hardship conditions or where necessary to provide for the safe and efficient movement of traffic or to achieve appropriate drainage.

15. Specifications

All work to be done and all materials supplied shall conform to ″Public Works Standard Specifications″ latest edition and City of Hanford Standard Construction Plans.



MINOR COLLECTOR ST. & ABOVE

NOTES:

1. NO PORTION OF ANY DRIVEWAY SHALL BE PERMITTED WITHIN DISTANCES SHOWN FROM THE END OF CURB RETURN.

2. ON ALL INTESECTIONS WHERE CHANNELIZATION AND/OR COMPOND CURVES ARE TO EXIST, THE DRIVEWAY LOCATION SHALL BE SUBJECT TO APPROVAL OF THE CITY ENGINEER.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

CITY ENGINEER R.C.E. 062044

DRIVE LOCATIONS

STANDARD DRAWING

REVISED: 04/04/06

DRAWING NO. CO-35

RESIDENTIAL DRIVEWAY WITH PARKSTRIP SIDEWALK

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

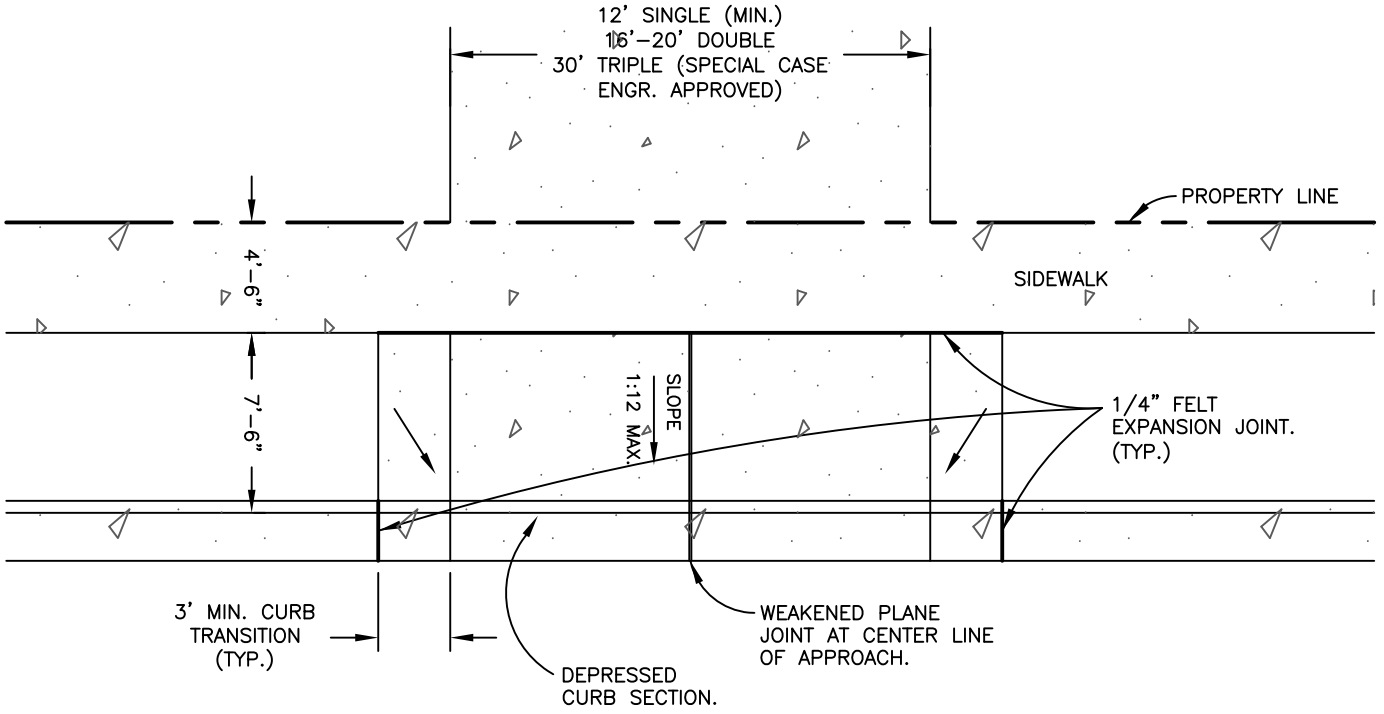
CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY: _____
CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. CO-38



NOTES:

1. ENTIRE WIDTH OF DRIVE APRON TO PROPERTY LINE SHALL HAVE A MIN. THICKNESS OF 6" OF CONCRETE.

2. DRIVE OPENINGS SHALL BE A MIN. OF 24' APART WHEN LOCATED ON THE SAME PROPERTY, NOT MORE THAN 40% OF THE BUILDING SITEFRONTAGE SHALL BE USED FOR VEHICULAR ACCESS.

3. THERE SHALL BE 25' MIN. SETBACK FROM STREET INTERSECTION OF PROPERTY LINE TO DRIVE APPROACH FOR LOCAL STREETS 50' MIN. FOR ALL OTHER STREETS PER CO-35. THIS DISTANCE MAY BE INCREASED AT DISCRETION OF THE CITY ENGINEER.

4. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).

5. DRIVEWAYS SHALL BE FORMED TO FULL DEPTH OF POUR, WOOD FORMS SHALL HAVE A NOMINAL THICKNESS OF 2". FORMS TO REMAIN FOR A MIN. OF 24 HOURS.

6. ALL SIDEWALKS SHALL HAVE A MAX. SLOPE OF 1/4" PER FOOT. COMPACTION SHALL BE 90% R.C. MIN.

7. SUBGRADE UNDER DRIVEWAY APPROACH SHALL BE COMPACTED TO 95% R.C. MIN.

8. THE DRIVEWAY SURFACE SHALL HAVE A HEAVY BROOM FINISH.

9. THE BOTTOM OF THE DRIVEWAY SHALL HAVE NO LIP.

10. WHERE CURB IS EXISTING, IT SHALL BE SAW CUT AT THE LIMITS OF THE DRIVEWAY.

RESIDENTIAL DRIVEWAY WITH ADJACENT SIDEWALK

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

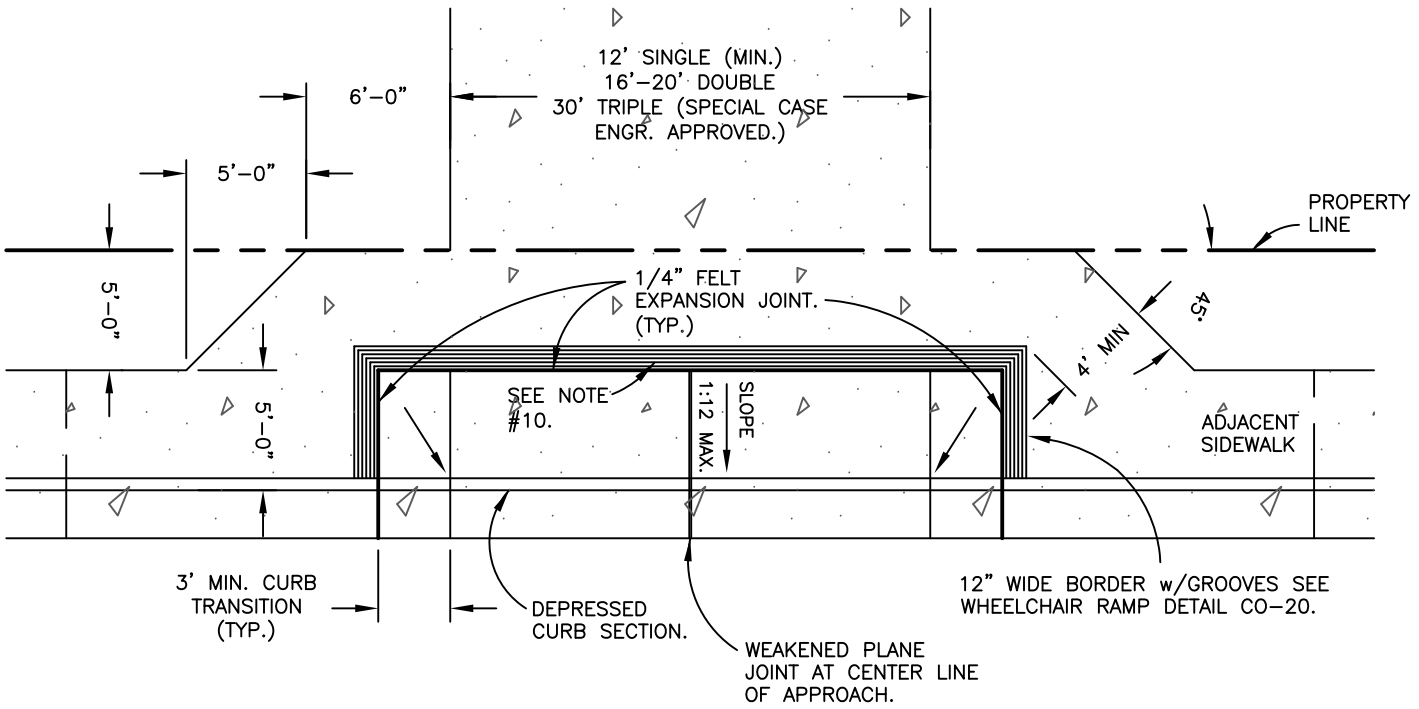
CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY: _____
CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. CO-39



NOTES:

1. ENTIRE WIDTH OF DRIVE APRON TO PROPERTY LINE SHALL HAVE A MIN. THICKNESS OF 6" OF CONCRETE.

2. DRIVE OPENINGS SHALL BE A MIN. OF 24' APART WHEN LOCATED ON THE SAME PROPERTY, NOT MORE THAN 40% OF THE BUILDING SITEFRONTAGE SHALL BE USED FOR VEHICULAR ACCESS.

3. THERE SHALL BE 25' MIN. SETBACK FROM STREET INTERSECTION OF PROPERTY LINE TO DRIVE APPROACH FOR LOCAL STREETS 50' MIN. FOR ALL OTHER STREETS PER CO-35. THIS DISTANCE MAY BE INCREASED AT DISCRETION OF THE CITY ENGINEER.

4. CONCRETE SHALL BE MINIMUM FIVE SACK MIX. (2500 P.S.I. MIN. IN 28 DAYS).

5. DRIVEWAYS SHALL BE FORMED TO FULL DEPTH OF POUR, WOOD FORMS SHALL HAVE A NOMINAL THICKNESS OF 2". FORMS TO REMAIN FOR A MIN. OF 24 HOURS.

6. ALL SIDEWALKS SHALL HAVE A MIN. SLOPE OF 1/4" PER FOOT. COMPACTION SHALL BE 90% R.C. MIN.

7. SUBGRADE UNDER DRIVEWAY APPROACH SHALL BE COMPACTED TO 95% R.C. MIN.

8. THE DRIVEWAY SURFACE SHALL HAVE A HEAVY BROOM FINISH.

9. THE BOTTOM OF THE DRIVEWAY SHALL HAVE NO LIP.

10. A 12" WIDE BORDER OF 1/4"x1/4" WIDE GROOVES 3/4" APART SHALL BE LOCATED ON THE LEVEL SIDEWALK SURFACE AT THE TOP OF THE DRIVE APPROACH.

11. WHERE CURB IS EXISTING, IT SHALL BE SAW CUT AT THE LIMITS OF THE DRIVEWAY.

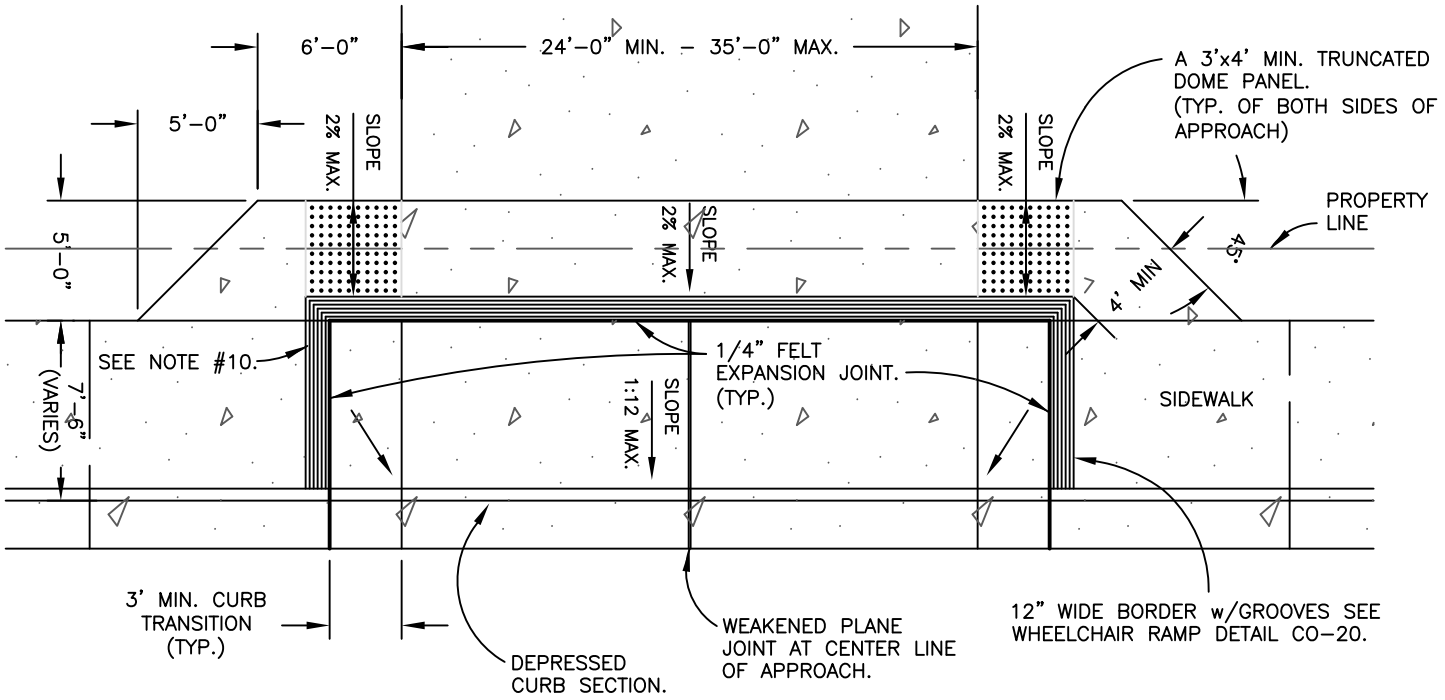
DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

COMMERCIAL & INDUSTRIAL DRIVEWAY

STANDARD DRAWING



NOTES:

1. ENTIRE WIDTH OF DRIVE APRON TO PROPERTY LINE SHALL HAVE A MIN. THICKNESS OF 6" OF CONCRETE.
2. DRIVE OPENINGS SHALL BE A MIN. OF 24' APART WHEN LOCATED ON THE SAME PROPERTY, NOT MORE THAN 40% OF THE BUILDING SITE FRONTAGE SHALL BE USED FOR VEHICULAR ACCESS.
3. THERE SHALL BE 25' MIN. SETBACK FROM STREET INTERSECTION OF PROPERTY LINE TO DRIVE APPROACH FOR LOCAL STREETS 50' MIN. FOR ALL OTHER STREETS PER CO-35. THIS DISTANCE MAY BE INCREASED AT DISCRETION OF THE CITY ENGINEER.
4. CONCRETE SHALL BE MINIMUM SIX SACK MIX. (3250 P.S.I. MIN. IN 28 DAYS).
5. DRIVEWAYS SHALL BE FORMED TO FULL DEPTH OF POUR, WOOD FORMS SHALL HAVE A NOMINAL THICKNESS OF 2". FORMS TO REMAIN FOR A MIN. OF 24 HOURS.
6. ALL SIDEWALKS SHALL HAVE A MIN. SLOPE OF 1/4" PER FOOT. COMPACTION SHALL BE 90% R.C. MIN.
7. SUBGRADE UNDER DRIVEWAY APPROACH SHALL BE COMPACTED TO 95% R.C. MIN.
8. THE DRIVEWAY SURFACE SHALL HAVE A HEAVY BROOM FINISH.
9. THE BOTTOM OF THE DRIVEWAY SHALL HAVE NO LIP.
10. A 12" WIDE BORDER OF 1/4"x1/4" WIDE GROOVES 3/4" APART SHALL BE LOCATED ON THE LEVEL SIDEWALK SURFACE AT THE TOP OF THE DRIVE APPROACH.
11. WHERE CURB IS EXISTING, IT SHALL BE SAW CUT AT THE LIMITS OF THE DRIVE APPROACH.
12. APPROACHES CONTINUALLY USED BY HEAVY VEHICLES MAY REQUIRE REINFORCING STEEL FOR ADDITIONAL STRENGTH.
13. A TRUNCATED DOME WANING DEVICE SHALL BE USED AT ALL LOCATIONS WHERE PATH OF TRAVEL IS SUBJECT TO HIGHER VOLUMES OF VEHICLE TRAFFIC. TO BE DETERMINDED BY CITY ENGINEER.

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. CO-41

CITY OF HANFORD

CALIFORNIA

STORM DRAINAGE DESIGN CRITERIA

Developers shall be required to design and furnish drainage systems in conformance with this article and adopted City of Hanford Storm Drainage Master Plan and Hydrology Manual reports.

A. GENERAL

Improvement plans shall be submitted to City Engineer for review and approval and shall conform to the following requirements:

1. **All submittals shall be in quadruplicate.**

2. **Topographic maps shall have elevations adequate to define boundaries and slope of drainage area.**

3. **Each drainage basin shall be identified and correlated to calculations for that basin.**

4. **Engineering calculations (Hydrologic and Hydraulic) shall be submitted with plans to substantiate design of all drainage conveyance facilities. Calculations shall be complete, have reasonable clarity and shall be prepared by a Registered Civil Engineer.**

5. **Hydrologic computations shall be based on either of the following design methods:**

   A) **HEC-1 Design Method – A computer preprocessor program (HPRE), provided by the City upon request, shall be used to develop all HEC-1 input files.**

   B) **Rational design method (Q=CIA) where:**

      Q = Flow in (C.F.S.)
      C = Runoff coefficient (See Table Page 6)
      I = Intensity Factor (In/Hr., See Table Page 7)
      A = Drainage Areas (Acres)

Time of concentration values (travel time) for use in determining intensity factors shall be calculated using formulas as identified in City Hydrology Manual.

B. DESIGN CRITERIA FOR COLLECTION SYSTEMS

1. **For residential areas, a two year storm recurrence interval shall be used for peak flow sizing of all conveyance facilities for all drainage areas. For hydrologic calculations based on the HEC-1 Method, a six hour design storm shall be used with a two year storm recurrence interval.**

2. **For commercial and industrial areas, a minimum five year storm recurrence interval shall be used for peak flow sizing of all conveyance facilities for all drainage areas. For hydrologic calculations based on the HEC-1 Method, a six hour design storm shall be used with a five year storm recurrence interval.**

3. **Developers shall include provisions in their design so that storm water depth does not exceed the tops of curbs by more than one foot or an elevation of 6″ below finished floor grade, whichever is less, during a 100 year storm recurrence interval for a duration of six hours.**

4. **Drainage conveyance facilities shall be sized so that the hydraulic grade line of the system does not exceed an elevation of gutter flowline at the lowest inlet structure within the collection system, using the above-referenced design storm recurrence intervals. For calculation purposes, designer shall assume that the water surface elevation in a drainage retention basin is at 75% storage volume at buildout conditions. For detention basins (where a relief pump exists), the hydraulic grade line is the water surface elevation in a basin after a 100 year 10 day event inflow, less five day pumping outflow or soffit control (whichever results in higher value).**

5. **Drain inlets shall be required at locations where the depth of storm water exceeds the tops of curbs during a design storm event. The maximum distance that drainage may surface flow in a gutter between inlets shall be 1,320 feet.**

6. **Minor collection system losses shall be equal to 1.15 times pipe friction losses, unless determined otherwise by Engineer.**

7. **Storm drain lines shall be a minimum of 12″ in diameter.**

C. <u>BASIN CAPACITY CRITERIA</u>

1. **Retention basins shall be sized to accommodate a volume of storm water produced during a 100 year storm recurrence interval for a duration of 10 days (5.7″ of rainfall).**

    a. **For new basins in areas designated as residential, all 10% supplemental capacity to accommodate potential land use changes.**

    b. **For design of basins where the site has been previously purchased and capacity is constrained by the existing area, supplemental capacity may vary from 0% to 10%. The goal is to provide the maximum supplemental capacity while maintaining the standards set forth herein.**

2. **Detention basins shall be sized to accommodate a volume of storm water produced during a 100 year storm recurrence interval for a duration of two days (3.3″ of rainfall). A pump station to evacuate storm water off peak shall be required. Pump capacity and design shall comply with City requirements. In special circumstances, the City Engineer will consider alternative means to reduce design peak flows.**

3. **Developers shall include provisions in their design so that storm water depth does not exceed the tops of curbs by more than one foot or an elevation of 6″ below finished floor grade, whichever is less, during a 100 year storm recurrence interval for a duration of 30 days (8.2″of rainfall).**

4. **Basin capacities may be calculated using the following formula:**

   V req = (CA) in acre feet where:
   V req = The required storage volume in acre foot
   C = Coefficient of runoff (Composite ″C″ of entire drainage service area)
   A = Area of drainage service in acres
   R = Total amount of rainfall to be expected measured in feet

   a.) **Retention basin use 0.475 feet**
   (100 year, 10 day storm recurrence interval)

   b.) **Detention basin use 0.275 feet, unless otherwise approved by City Engineer**
   (100 year, two day storm recurrence interval)

5. **Due to the unpredictability of the effects of silting and soil type on percolation, it shall be assumed that percolation within the basin site is negligible. The storage requirements calculated above will therefore be the value used in design.**

   Basin design volume may be calculated using the following formula:

   $$V = \frac{AT + AB + \sqrt{AT \; AB}}{3} \; (D)$$, **Where:**

   V = Volume in acre feet

   AT = Area of water surface in acres

   AB = Area of bottom in acres

   D = Average water depth in feet

D. BASIN DESIGN CRITERIA

1. General Design Standards

a. **Basin designs shall consist of improvement plans and accompanying drainage calculations prepared by a Registered Civil Engineer.**

b. **The design drawing shall locate all property lines as accurately as possible, show centerlines of all adjacent streets, label streets and account for any future dedication of right-of-way.**

c. **All elevation grades shall be shown to the nearest 1/10 foot and shall include but not be limited to: Basin floor, changes in slope, top and toe of banks, high water line, hydraulic grade line control elevation and other points necessary to accurately depict improvements.**

d. The design drawing shall show the size and location of all incoming pipelines, outfall structures, internal pipelines and pump stations.

e. The design drawings shall show the total area within property lines, storage volume required, storage volume provided and depths of excavation.

f. Minimum radius at the bottom of basin shall be 20 feet unless otherwise authorized by the City Engineer.

g. Minimum radius at the top of basin shall be 30 feet unless otherwise authorized by the City Engineer.

h. Minimum width of bank tops shall be 15 feet unless otherwise authorized by the City Engineer.

i. Design drawings shall have accompanying calculations including tabulated data used to compute the storage volume required and the storage volume provided. This information shall be presented so as to enable someone else to reproduce the capacity calculations with minimal effort.

2. <u>Recreational Basin Design Standards</u>

a. Meet all site and general design standards.

b. Recreational basins shall have a recreational area and a flow area.

c. Recreation area design criteria are as follows:

1) The side slope shall be no steeper than 6:1 along access frontage side and no steeper than 4:1on all other sides. In cases where there are two sides with street frontage, the primary access frontage side shall have a maximum side slope of 6:1 and the other side shall have a maximum slope of 4:1.

d. Maximum Excavation Depth:

1) Basin sites totaling 0 – 9 acres shall not exceed 15 feet in depth, less one foot of depth per each acre less than 10 acres (i.e., and 8 acre basin shall not exceed 13 feet in depth).

2) Basins totaling 10 – 15 acres shall be not more than 15 feet deep.

3) Basins totaling 16 – 20 acres shall be excavated to no more than 15 feet deep plus one additional foot in depth for each acre of basin areas in excess of 15 acres (i.e., an 18 acre basin shall be excavated 18 feet deep).

4) Basins totaling 20 or more acres shall be excavated to a maximum of 20 feet deep.

e. **Basin design shall consider the recreation potential of the area in terms of baseball diamonds and/or football/soccer fields. The design shall show possible configurations of such uses on the basin drawing.**

   1) **Baseball diamond - 250′ radius is best, 225′ is acceptable.**

   2) **Football field - 300′ x 150′.**

   3) **Soccer field - 360′ x 225 ′ is best, 300′ x 150′ is acceptable.**

f. **The recreation floor shall slope to an outfall structure at a minimum floor slope of 0.5%.**

g. **Low flow area design criteria are as follows:**

   1) **Capacity of the low flow shall equal 10% of the V req.**

   2) **The side slopes shall be no steeper than 4:1.**

   3) **The low flow area shall be located in the lowest corner of the basin or where relief facilities are existing or planned.**

   4) **The excavation depth shall not exceed 25 feet.**

   5) **The low flow area floor shall slope to an outfall structure at a minimum floor slope of 0.5%.**

3. **<u>Nonrecreational Basin Design Standards</u>**

   a. **Meet all site and General Design Standards.**

   b. **Side slopes shall be no steeper than 4:1 on all sides except in the case of a capacity problem where the side slope shall not exceed 3:1. Authorization by the City Engineer is required for side slopes steeper than 4:1.**

   c. **Excavation depth shall not exceed 20 feet except in the case of a capacity problem. Authorization by the City Engineer is required for any excavation in excess of this standard.**

   d. **Basin floors shall be sloped to outfall structures at a minimum slope of 0.5%.**

   e. **If relief potential is available to the basin, the basin floor shall be sloped to drain to an outfall connected to the relief facility.**

   f. **If no relief potential is available, a basin shall be constructed in two levels: One area (low flow area) shall have a capacity of 5% of V req. below the elevation of the lowest point in the second area.**

CITY OF HANFORD
DRAINAGE RUNOFF COEFFICIENTS

LAND USE/ZONING	IMPERVIOUS PERCENT, % (C-Factor)
Basins, Slough, Canals	**100**
Commercial Districts:	
Neighborhood Commercial (NC)	**90**
Downtown Commercial (DC)	**90**
Community Commercial (CCO)	**90**
Regional Commercial (RC)	**90**
Service Commercial (SC)	**90**
Mixed Commercial (MC)	**90**
Industrial Districts:	
Light Industrial (LI)	**80**
Heavy Industrial (HI)	**80**
Schools/Public Facilities (PF)	**70**
Office Districts:	
Office District (O)	**60**
Office Residential (OR)	**60**
Multi-Family Residential Districts:	
3,000 SF. Min Site Area Per Du. (RM-3)	**50**
2,000 SF. Min Site Area Per Du. (RM-2)	**60**
Single-Family Residential Districts:	
20,000 SF. Min Site Area (R-1-20)	**20**
12,000 SF. Min Site Area (R-1-12)	**40**
8,000 SF. Min Site Area (R-18)	**40**
6,000 SF. Min Site Area (R-1-6)	**40**
5,000 SF. Min Site Area (PUD)	**40**
Conservation and Open Space District:	
Parks (P)	**10**
Agriculture (AG)	**10**

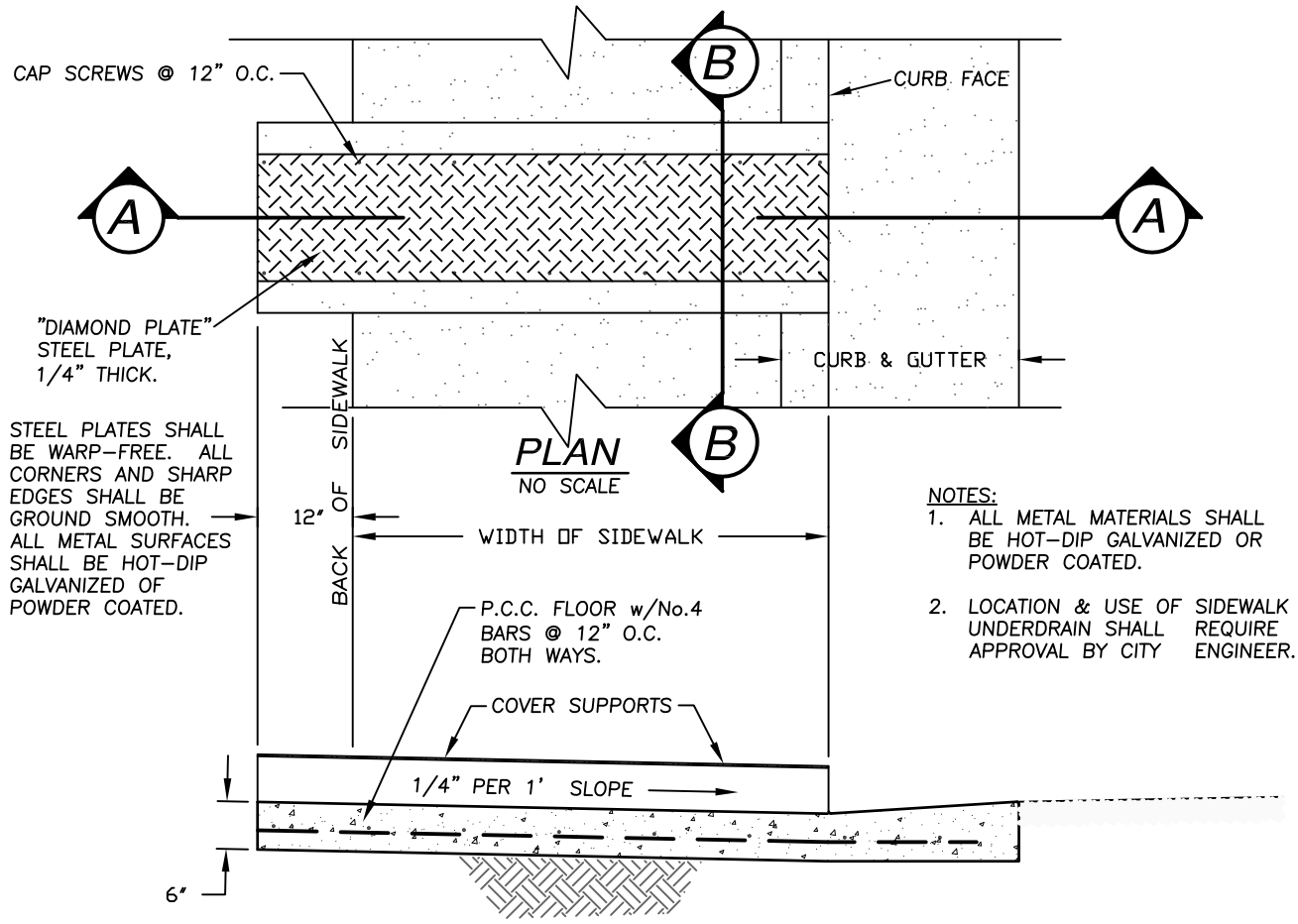
NOTE: Runoff coefficients may be modified by the City Engineer when probable runoffs obviously are inconsistent with the above table.

CITY OF HANFORD

RAINFALL DURATION – FREQUENCY TABLE

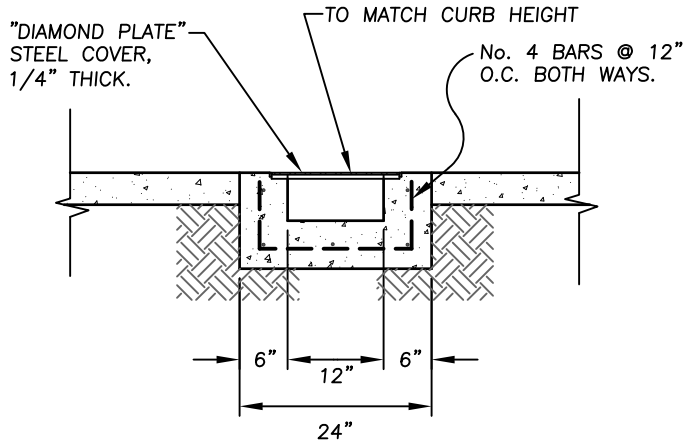
DURATION	2-YEAR		5-YEAR		10-YEAR		100-YEAR	
	in	in/hr	in	in/hr	in	In/hr	in	in/hr
5-Min	0.15	1.83	0.22	2.61	0.26	3.13	0.40	4.77
10-Min	0.19	1.15	0.27	1.64	0.33	1.97	0.50	3.00
15-Min	0.22	0.88	0.31	1.25	0.38	1.50	0.57	2.29
30-Min	0.28	0.56	0.39	0.79	0.47	0.95	0.72	1.45
1-Hr	0.35	0.35	0.50	0.50	0.60	0.60	0.91	0.91
2-Hr	0.44	0.22	0.63	0.31	0.75	0.38	1.15	0.57
3-Hr	0.50	0.17	0.72	0.24	0.86	0.29	1.31	0.44
6-Hr	0.64	0.11	0.91	0.15	1.09	0.18	1.66	0.28
12-Hr	0.80	0.07	1.14	0.10	1.37	0.11	2.09	0.17
24-Hr	1.01	0.04	1.44	0.06	1.73	0.07	2.63	0.11
2-Day	1.27	0.03	1.81	0.04	2.18	0.05	3.32	0.07
10-Day	2.15	0.009	3.10	0.013	3.72	0.015	5.68	0.024
30-Day	3.15	0.004	4.48	0.006	5.38	0.007	8.20	0.011
45-Day	3.61	0.003	5.13	0.005	6.16	0.006	9.39	0.009
60-Day	3.97	0.003	5.65	0.004	6.78	0.005	10.33	0.007

- 2-year Depth = 0.0891 * (Minutes ^ 0.334)
- 5-year Depth = 0.1268 * (Minutes ^ 0.334)
- 10-year Depth = 0.1522 * (Minutes ^ 0.334)
- 100-year Depth = 0.2320 * (Minutes ^ 0.334)



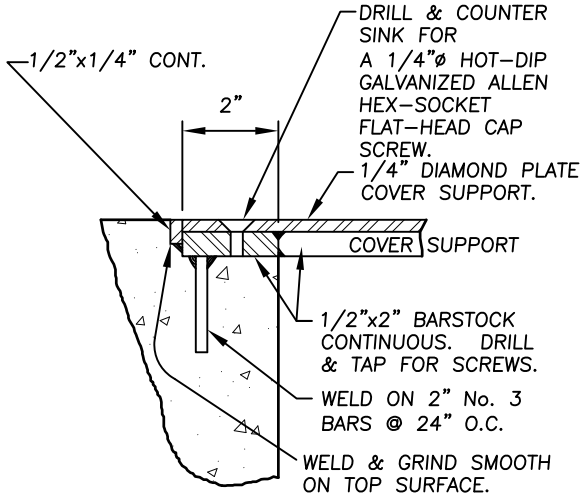
SECTION A-A

NO SCALE



SECTION B-B

NO SCALE



LOCKING DEVICE DETAIL

NO SCALE

CITY OF HANFORD

DEPT. OF PUBLIC WORKS

ENGINEERING DIVISION

SIDEWALK UNDERDRAIN

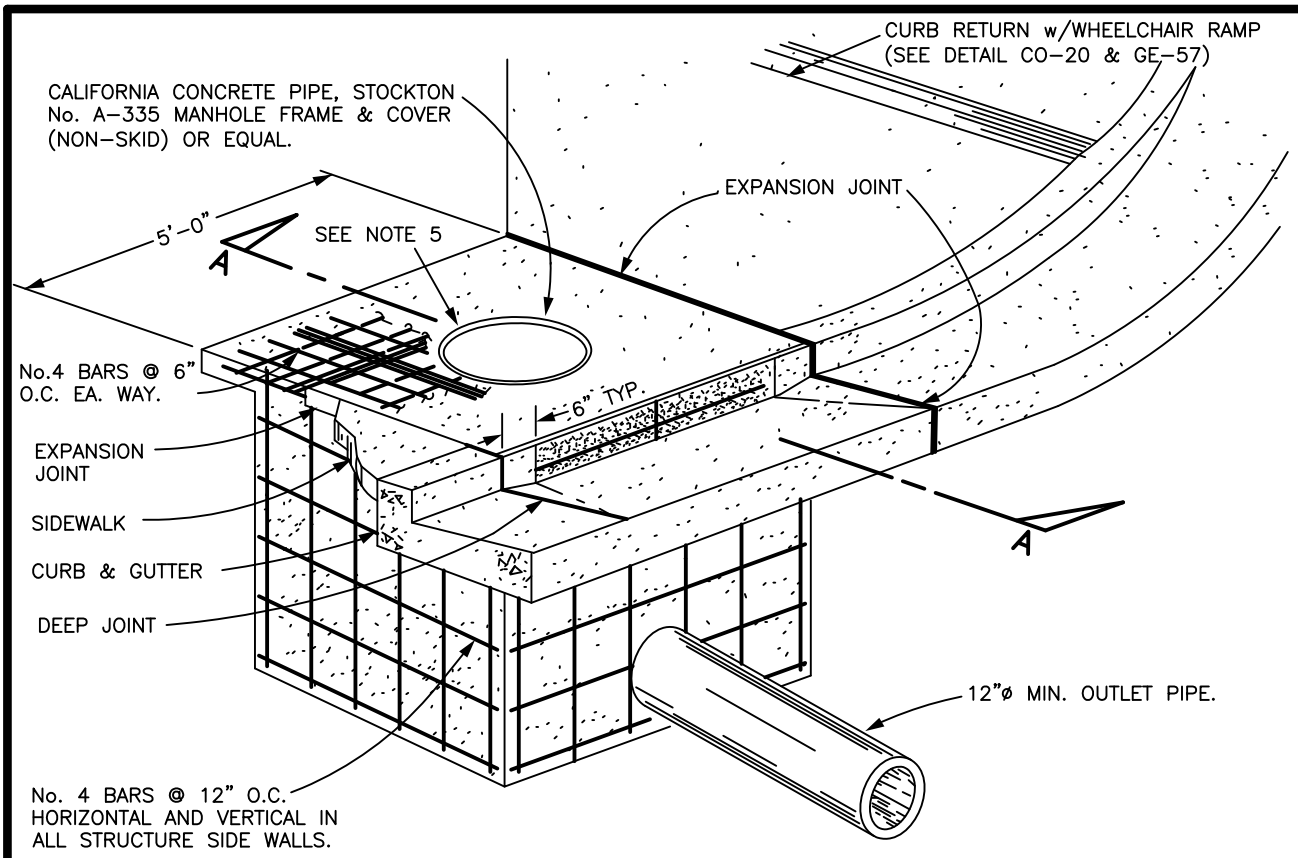
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

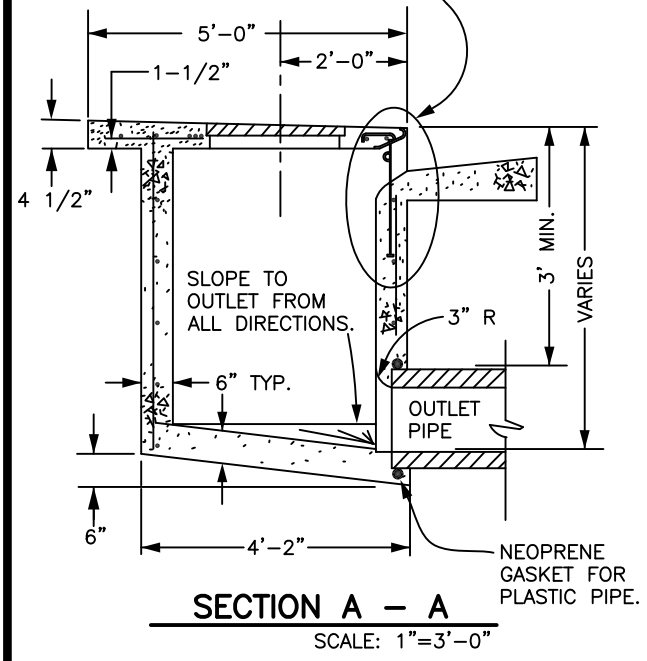
DRAWING NO. SD-16



ISOMETRIC VIEW

SCALE: 1"=3'-0"

SEE DETAIL SD-17A



SECTION A – A

SCALE: 1"=3'-0"

NOTES:

1. CONCRETE SHALL BE MIN. SIX SACK MIX (3250 P.S.I. MIN. IN 28 DAYS).

2. THE REINFORCING STEEL SHALL BE NUMBER FOUR (4) DEFORMED BARS.

3. THE SURFACE OF ALL EXPOSED CONCRETE SHALL CONFORM TO SLOPE, GRADE, COLOR, FINISH & SCORING IN THE EXISTING OR PROPOSED CURB & WALK ADJACENT TO THE BASIN. THE BASIN FLOOR SHALL BE GIVEN A TIGHT WOOD FLOAT FINISH. CURVATURE OF THE LIP & SIDEWALLS AT THE GUTTER OPENING SHALL NOT BE MADE BY PLASTERING. THE OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE THE CONCRETE IS POURED.

4 SPECIAL DESIGN MAY BE REQUIRED BY CITY ENGINEER WHEN DEPTH OF CATCH BASIN EXCEEDS 6 FEET.

5. INSTALL 2 – No. 4 BARS (SEE NOTE 2) AT 2" O.C. 2" FROM & ADJACENT TO COVER FOR ADDITIONAL STRENGTH.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

SIDE INLET CATCH BASIN DETAIL

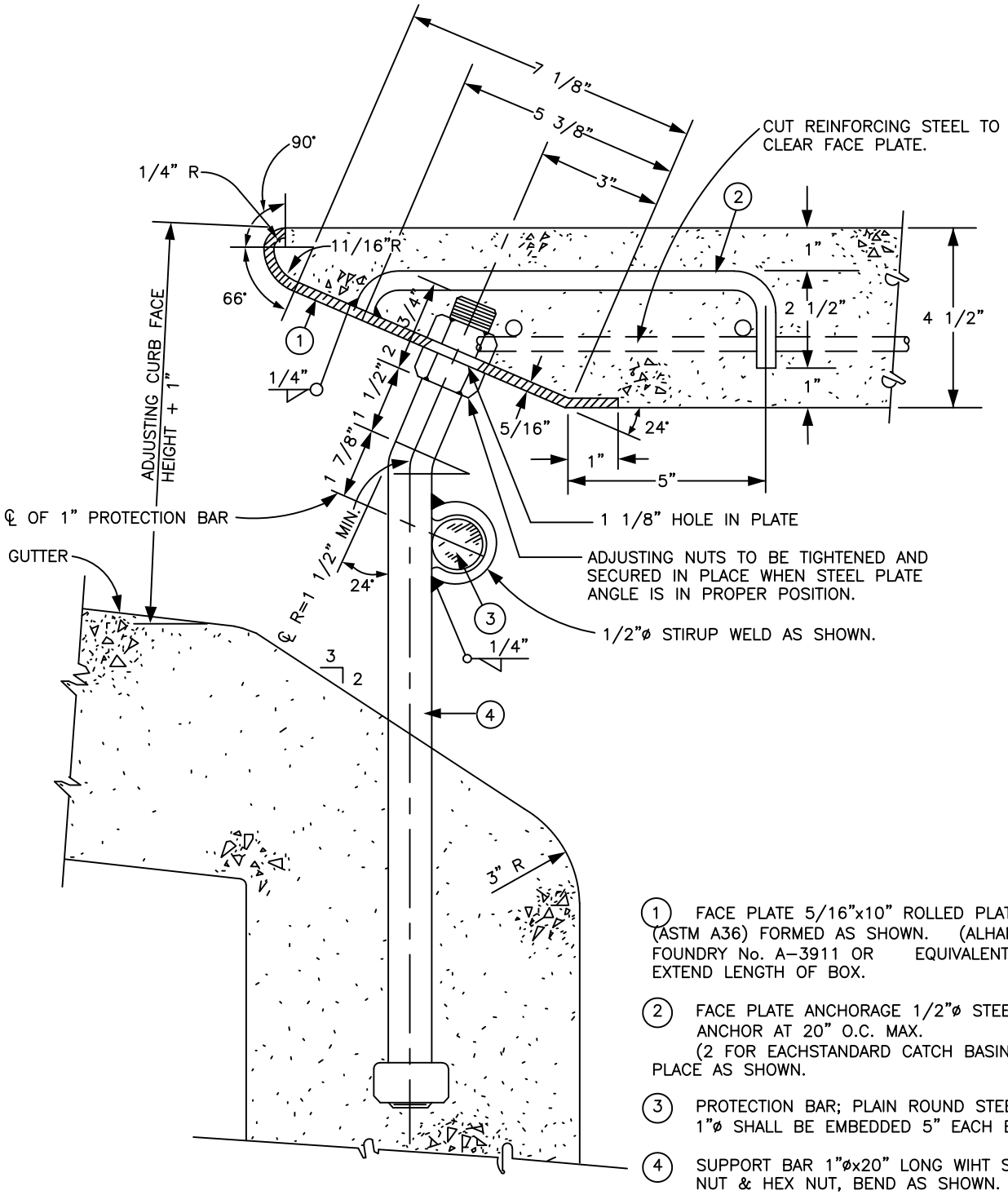
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. SD-17



(1) FACE PLATE 5/16"x10" ROLLED PLATE (ASTM A36) FORMED AS SHOWN. (ALHAMBRA FOUNDRY No. A–3911 OR EQUIVALENT) & EXTEND LENGTH OF BOX.

(2) FACE PLATE ANCHORAGE 1/2"ø STEEL ANCHOR AT 20" O.C. MAX. (2 FOR EACHSTANDARD CATCH BASIN) PLACE AS SHOWN.

(3) PROTECTION BAR; PLAIN ROUND STEEL BAR 1"ø SHALL BE EMBEDDED 5" EACH END.

(4) SUPPORT BAR 1"øx20" LONG WIHT SQ. HEAD NUT & HEX NUT, BEND AS SHOWN. SPACING SHALL NOT EXCEED 4 FEET.

NOTE:
ALL EXPOSED METAL PARTS SHALL BE HOT–DIPPED GALVANIZED.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

SIDE INLET CATCH BASIN DETAIL

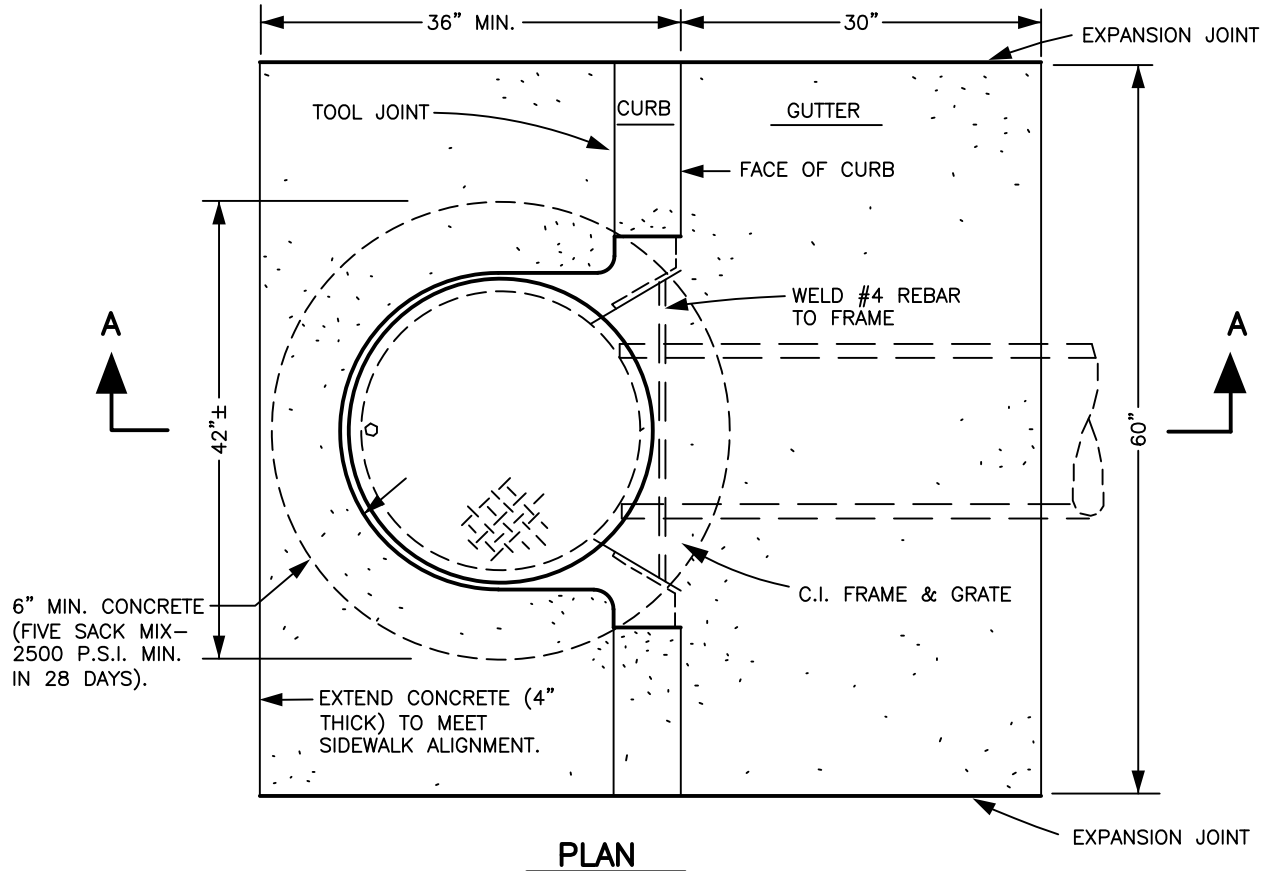
STANDARD DRAWING

APPROVED BY:

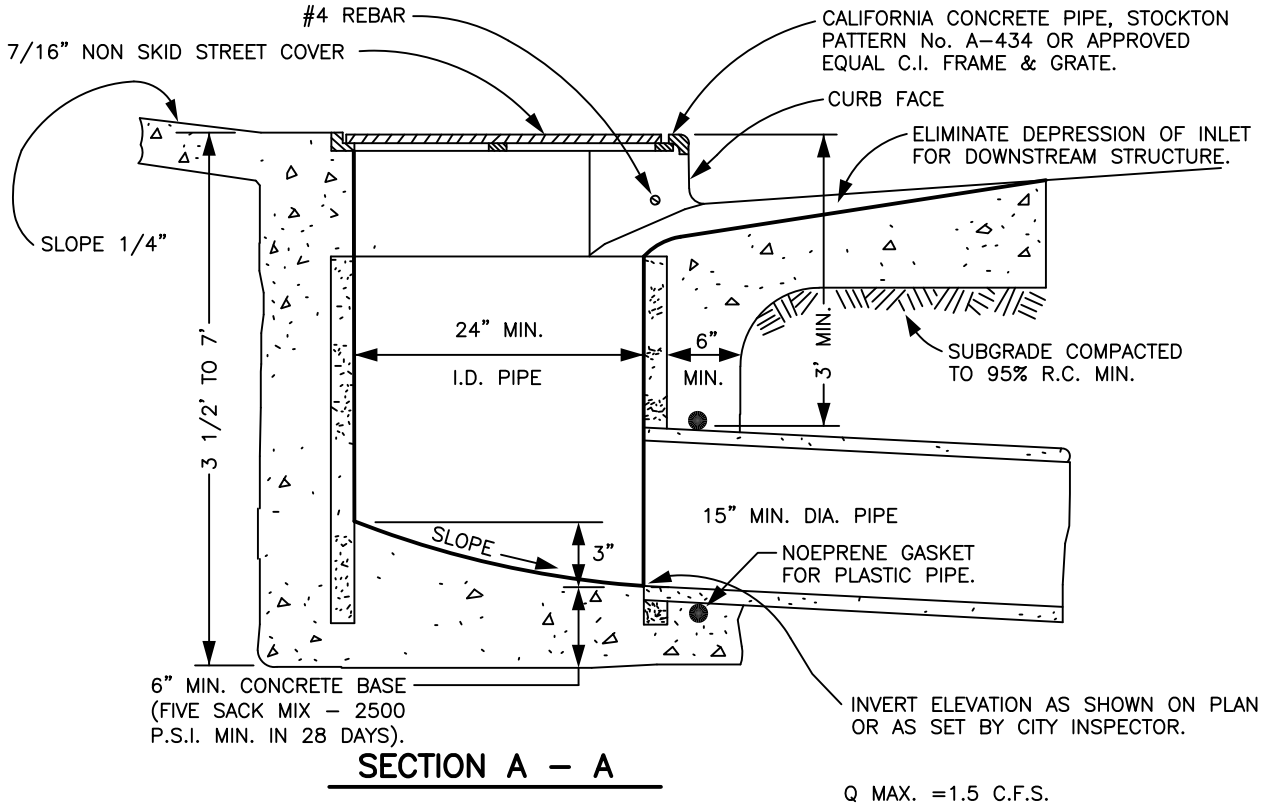
CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. SD–17A



PLAN



SECTION A – A

Q MAX. =1.5 C.F.S.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

INLET AND OUTLET STRUCTURE FOR INVERTED SYPHON

STANDARD DRAWING

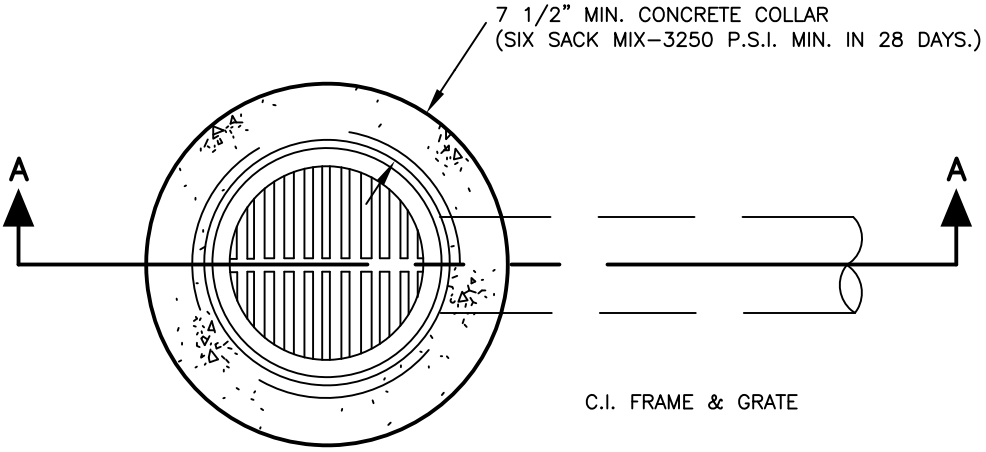
APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

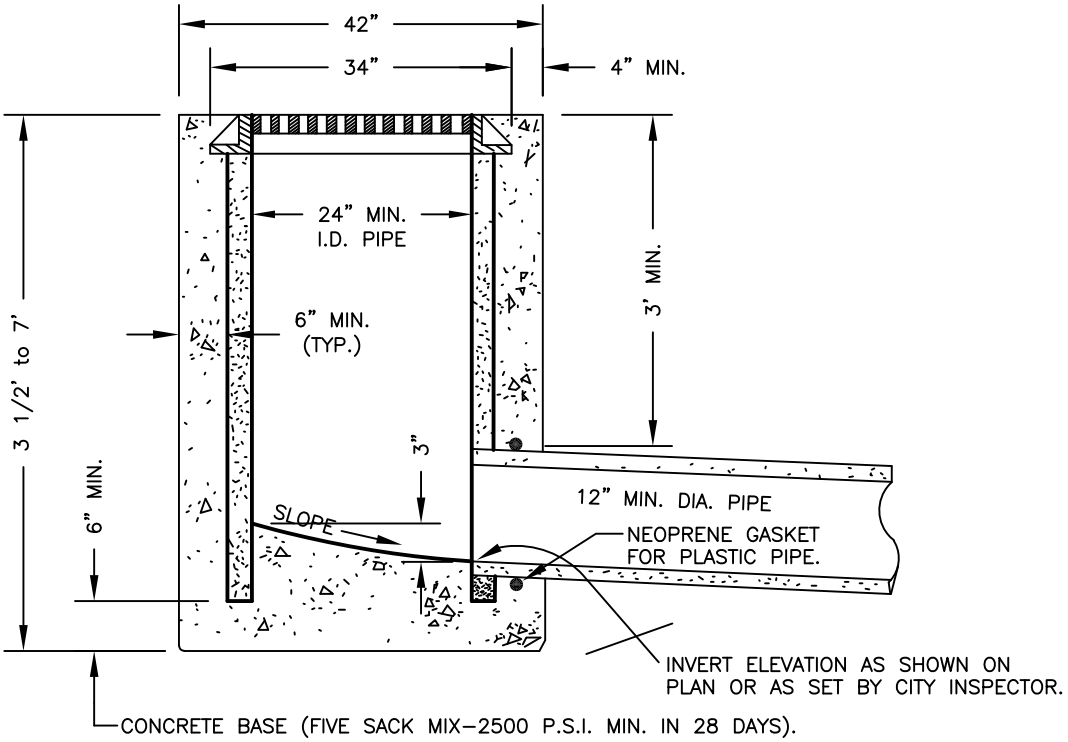
DRAWING NO. SD–20

NOTE: THIS CATCH BASIN MAY BE USED ONLY WITH SPECIFIC APPROVAL OF THE CITY ENGINEER.



PLAN

CALIFORNIA CONCRETE PIPE, STOCKTON No. A–108 GRATE & A–515 FRAME OR APPROVED EQUAL.



SECTION A – A

Q MAX. = 2.8 C.F.S.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

STANDARD FLAT GRATE CATCH BASIN

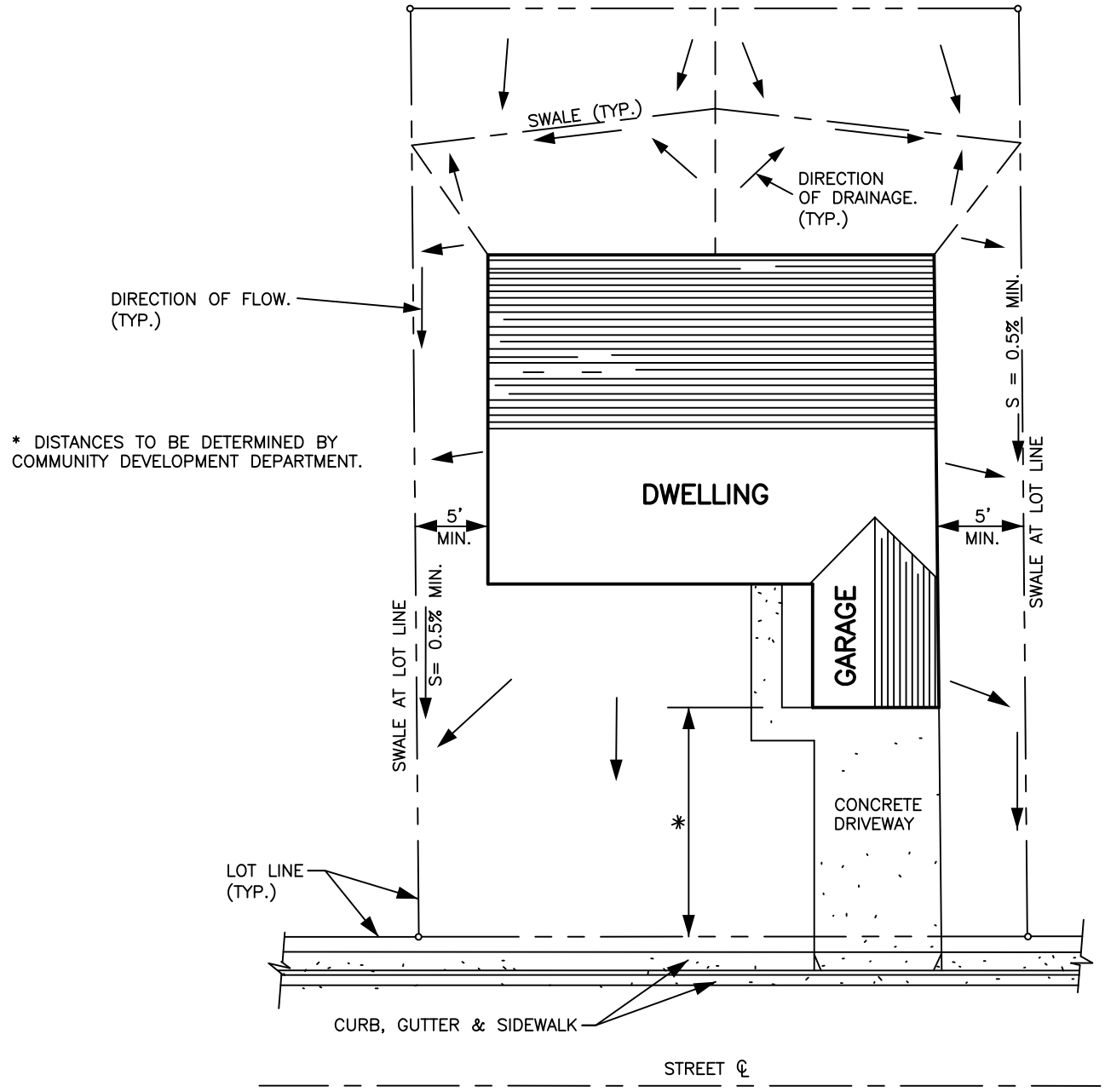
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. SD–23



NOTES:

1. LOTS SHALL BE GRADED TO DRAIN TO THE STREETS.

2. FINISH FLOOR ELEVATION SHALL BE A MINIMUM OF 16" ABOVE TOP OF CURB AT LOWEST POINT ALONG PROPERTY FRONTAGE.

3. MAINTAIN POSITIVE DRAINAGE AWAY FROM DWELLING STRUCTURE, MINIMUM 5' AT 2%.

4. A RETAINING STRUCTURE SHALL BE REQUIRED ALONG ALL SIDE AND BACKYARD PROPERTY LINES WHERE GRADE DIFFERENTIAL EXCEEDS 6 INCHES. GRADE DIFFERENTIALS GREATER THAN 10 INCHES WILL BE REQUIRED TO BE INSTALLED WITH BLOCK OR CONCRETE, UNLESS APPROVED BY THE CITY ENGINEER.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

TYPICAL LOT DRAINAGE

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. SD-25

CITY OF HANFORD

CALIFORNIA

SANITARY SEWER SYSTEM CRITERIA

1. **Acceptable materials:**

Trunks, mains, collectors: (6″ and larger)	**Vitrified clay pipe – extra strength** **PVC ASTM D3034 - 6″ - 15″** **ASTM F679 - 18″ - 27″** **High-density polyethylene pipe:** **ASTM F894 (Spirolite)**

2. **All sewer pipe shall have either compression-type or rubber gasketed joints.**

3. **Design of sewer mains shall be based on the following land use flow coefficients:**

LAND USE CLASSIFICATION	UNIT AVERAGE FLOW COEFFICIENT (mgd/acre)
Low-Density Residential	0.0014
Medium-to-High Density Residential	0.0020
Commercial	0.0010
Industrial	0.0012*

*** Industrial and institutional users with flow characteristics higher than shown shall be evaluated on a case-by-case basis.**

4. **Design peak sewer flows shall be based on the following:**

$Q_{peak} = 1.80 \times Q_{avg}^{0.92}$ (cfs units)
$Q_{peak} = 1.74 \times Q_{avg}^{0.92}$ (mgd units)

5. **The design peak flow depth shall conform to the following:**

PIPE DIAMETER (INCHES)	MAXIMUM DEPTH TO DIAMETER RATIO (dD)
Smaller than 12	0.50
12 to 18	0.75
Larger than 18	0.90

6. **In general the minimum sewer main line slopes and maximum number of single-family residential connections tributary to a line shall be as follows:**

PIPE DIAMETER INCHES	MINIMUM SLOPE (ft/ft)	MAXIMUM SINGLE-FAMILY RESIDENTIAL CONNECTIONS (NO.)*
6	.0040	200
8	.0030	400
10	.0025	700
12	.0019	
15	.0014	
18	.0011	

*** Based on an average wastewater discharge of 250 gallons per day per unit.**
Minimum slopes less than the values listed above may be allowed at the sole discretion of the City Engineer when impractical to drain otherwise.

Line slopes shown on the Hanford Sewer System Master Plan that have greater slopes than the minimum slopes shown above shall take precedence over the above.

7. **The minimum size sewer line shall be 6 inches.**

8. **The radius of curvature and angle of deflection that will be allowed in sewer lines shall not exceed the manufacturer′s recommended guidelines.**

9. **Minimum depth of cover:**

   a. **3.5′ over main line in street.**

   b. **3.0′ over service connections at property line.**

10. **Manhole spacing:**

    a. **Sewers 6″ - 8″ - 400′ maximum**

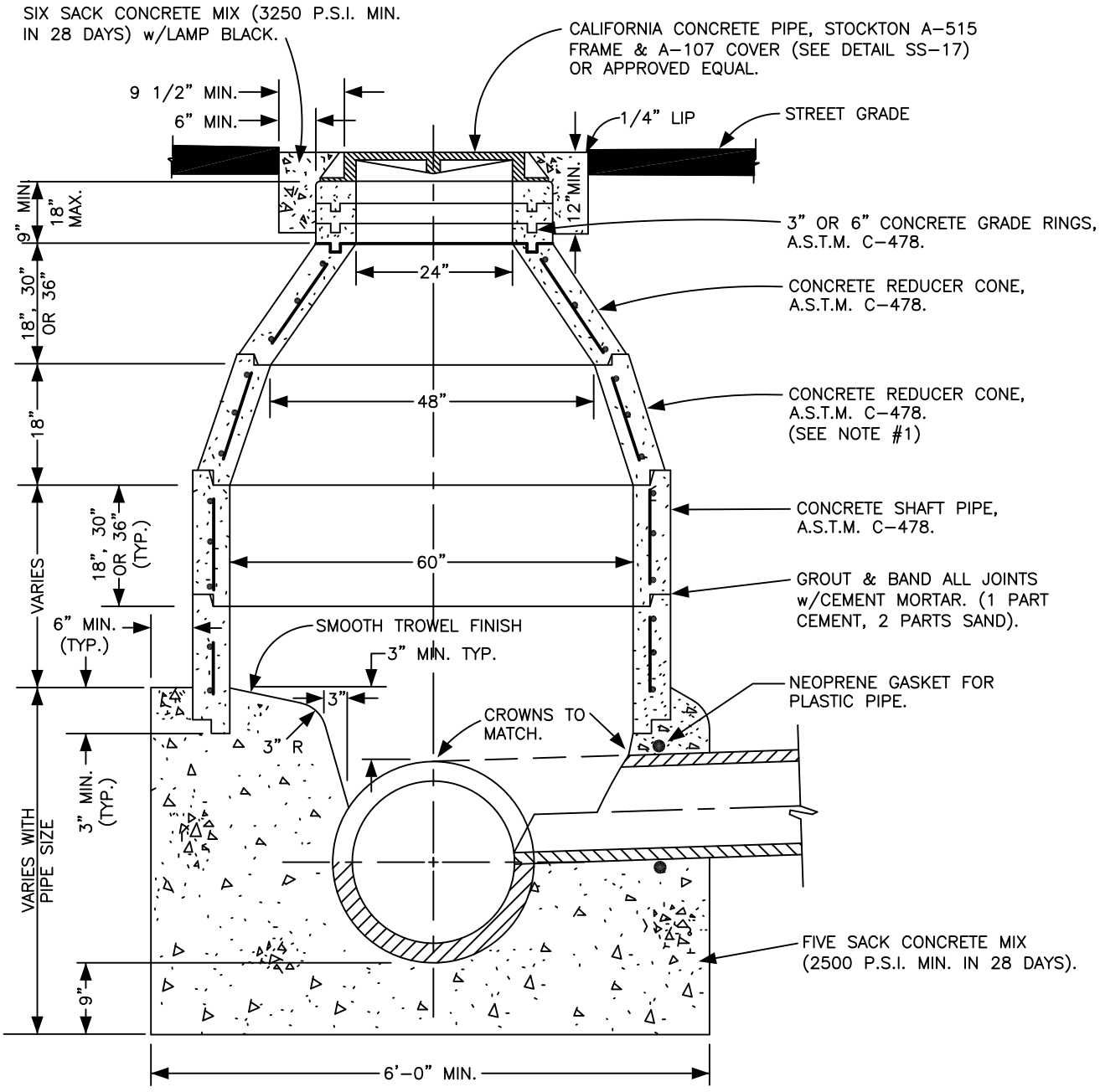
    b. **Sewers 10″ and larger - 500′ maximum**

    c. **At all angle points in horizontal and vertical alignment.**

    d. **At the terminal end of all lines.**

11. **Drop manholes will not be permitted unless approved by the Engineer.**

12. **Lampholes will only be allowed on the temporary terminal of a line or when the line serves four (4) or less connections.**



NOTES:

1. IF LARGEST PIPE SIZE IS LESS THAN 24" THE 48"x60"x18" REDUCER CONE CAN BE ELIMINATED AND 48" SHAFT PIPE SECTIONS SUBSTITUTED FOR THE 60" SHAFT PIPE SECTION. (SEE STANDARD DRAWING SS-14 FOR SIMILAR.)

2. WHERE MANHOLES ARE NOT LOCATED IN STREETS OR TRAVELED WAY, PLACE TOP OF MANHOLE 12"-24" ABOVE EXISTING GROUND UNLESS OTHERWISE SHOWN ON CONSTRUCTION PLANS.

3. THE TOP HALF OF ALL PIPE WITHIN THE M.H. IS TO BE CUT AWAY. COVER THE CUT EDGES WITH MORTAR CONSTRUCTING THE BENCHING.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

STANDARD MANHOLE

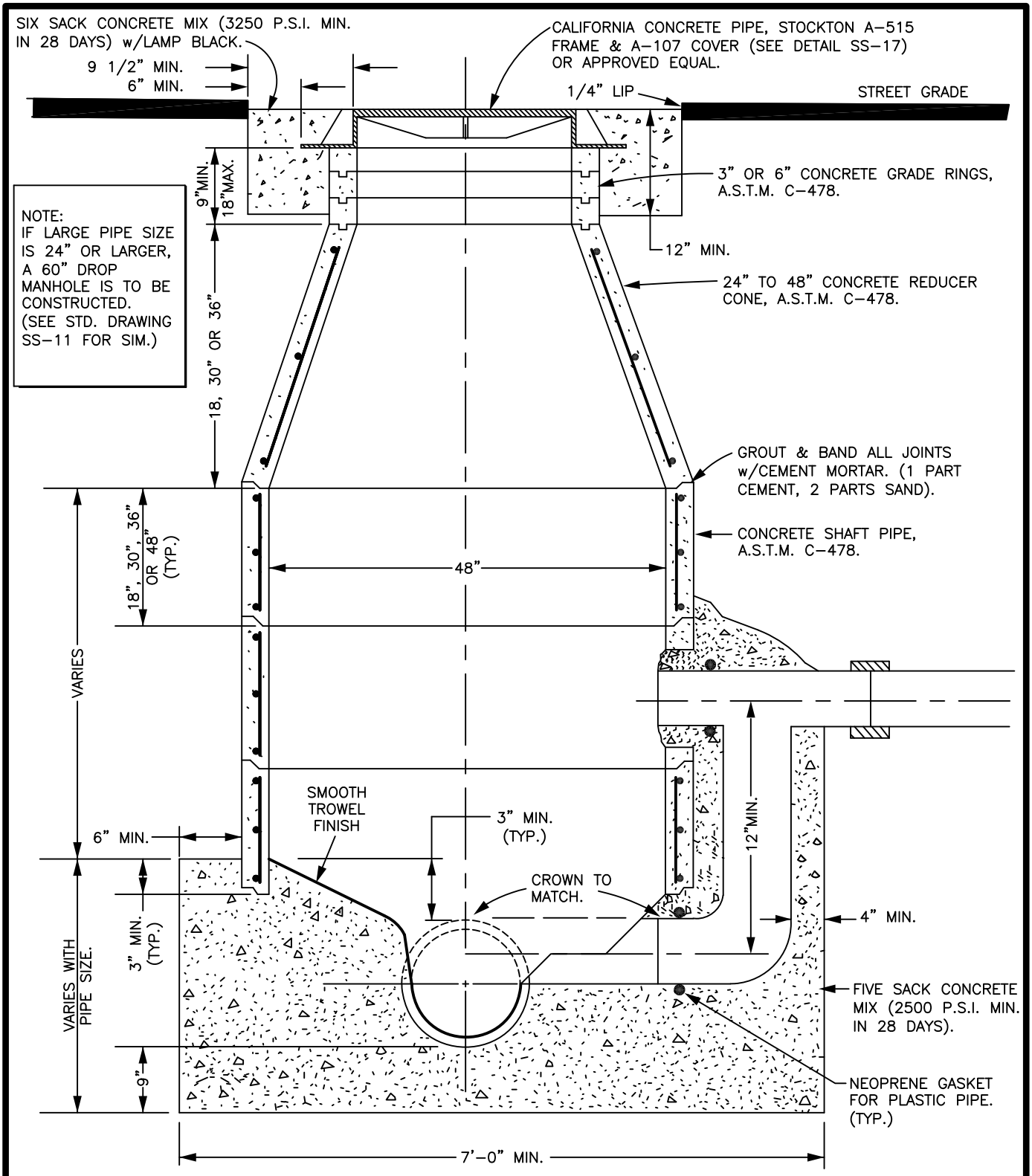
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. SS-11



NOTE:

WHERE MANHOLES ARE NOT LOCATED IN STREETS OR TRAVELED WAY, PLACE TOP OF MANHOLE 2"-24" ABOVE EXISTING GROUND UNLESS OTHERWISE SHOWN ON CONSTRUCTION PLANS.

DEPARTMENT OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

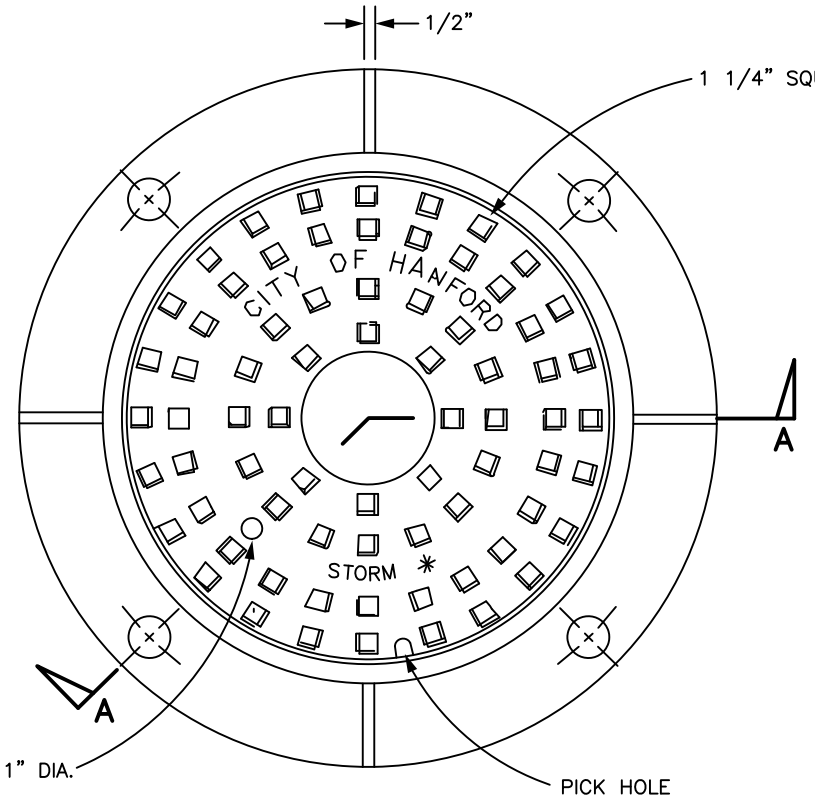
CITY ENGINEER R.C.E. 062044

DROP MANHOLE

STANDARD DRAWING

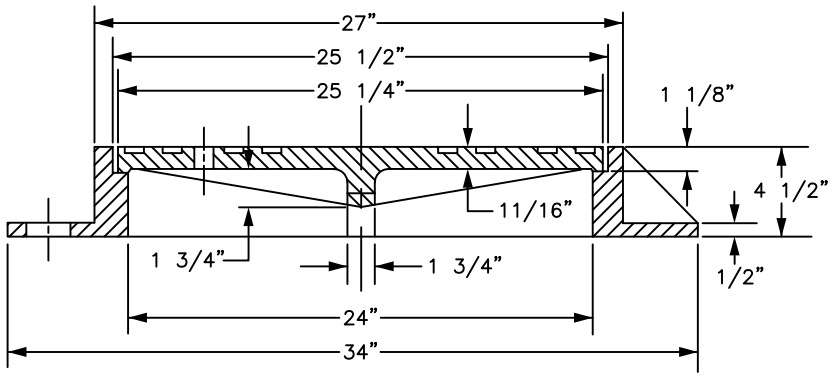
REVISED: 04/04/06

DRAWING NO. SS-14



*STORM OR SEWER, WHATEVER IS APPROPRIATE.

PLAN



SECTION A – A

NOTE:

MANHOLE FRAME & COVER TO BE CAST IRON. FRAME PART No. A–515 APPROX. WT. 220 LBS., COVER PART No. A–107 APPROX. WT. 132 LBS., CALIFORNIA CONCRETE PIPE CORP. STOCKTON, CA. OF APPROVED EQUAL.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

MANHOLE FRAME & COVER

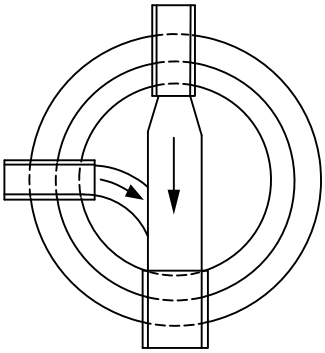
STANDARD DRAWING

APPROVED BY:

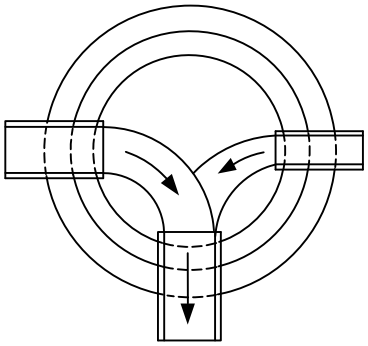
CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

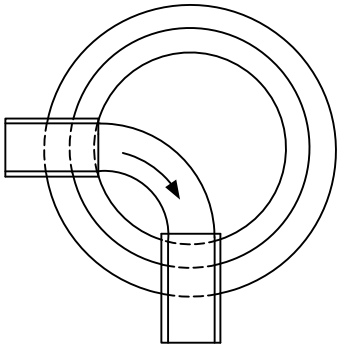
DRAWING NO. SS–17



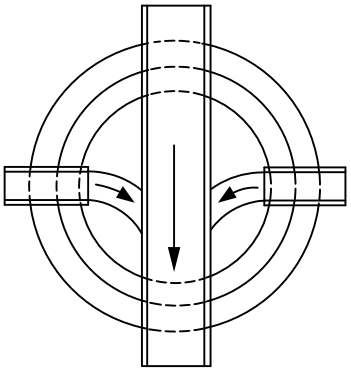
SIZE CHANGE IN THE MAIN



MAIN TERMINATING IN A M.H.



ALIGNMENT CHANGE IN THE MAIN



PIPE CONTINUOUS THROUGH M.H.

NOTES:

1. FLEXIBLE PIPE THROUGH A MANHOLE REQUIRES A WATER STOP.
2. TERMINATING PIPES TO EXTEND INTO M.H. INTERIOR A MAX. DISTANCE OF 4".
3. THE TOP HALF OF ALL PIPE WITHIN THE M.H. IS TO BE CUT AWAY. COVER THE CUT EDGES WITH MORTAR CONSTRUCTING THE BENCHING.
4. PREPARE A SMOOTH TROWLED CONC. CHANNEL HAVING UNIFORM GRADIENT BETWEEN PIPE INVERTS. END OF PIPE TO BE BEVELED AT 45°.
5. EXTEND THE CHANNEL WALLS UP TO A HEIGHT EVEN WITH TOP OF THE PIPE.
6. HAND TAMP 9" OF SELECT BACKFILL MATERIAL UNDER ALL PIPING COMING OUT OF THE MANHOLE UP TO THE FIRST JOINT.
7. THE BREADTH OF THE CHANNEL AT EACH JUNCTION MUST ALWAYS BE AS GREAT AS THE DIAMETER OF THE CONNECTED PIPE.
8. INSIDE RADIUS OF CHANNEL TO BE GREATER THAN THE DIAMETER OF THE LARGEST CONNECTED PIPE UP TO 2 PIPE DIAMETERS.
9. SLOPE THE BENCHING UP TOWARD THE M.H. WALL AS INDICATED IN THE M.H. SECTION. TROWEL THE SURFACE SMOOTH.
10. INCOMING NON–STRAIGHT LINES SHALL HAVE AN INVERT THAT IS AT LEAST .10' HIGHER THAN THE OUT GOING LINE.

DEPARTMENT OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

INVERT PLANS OF STANDARD MANHOLES

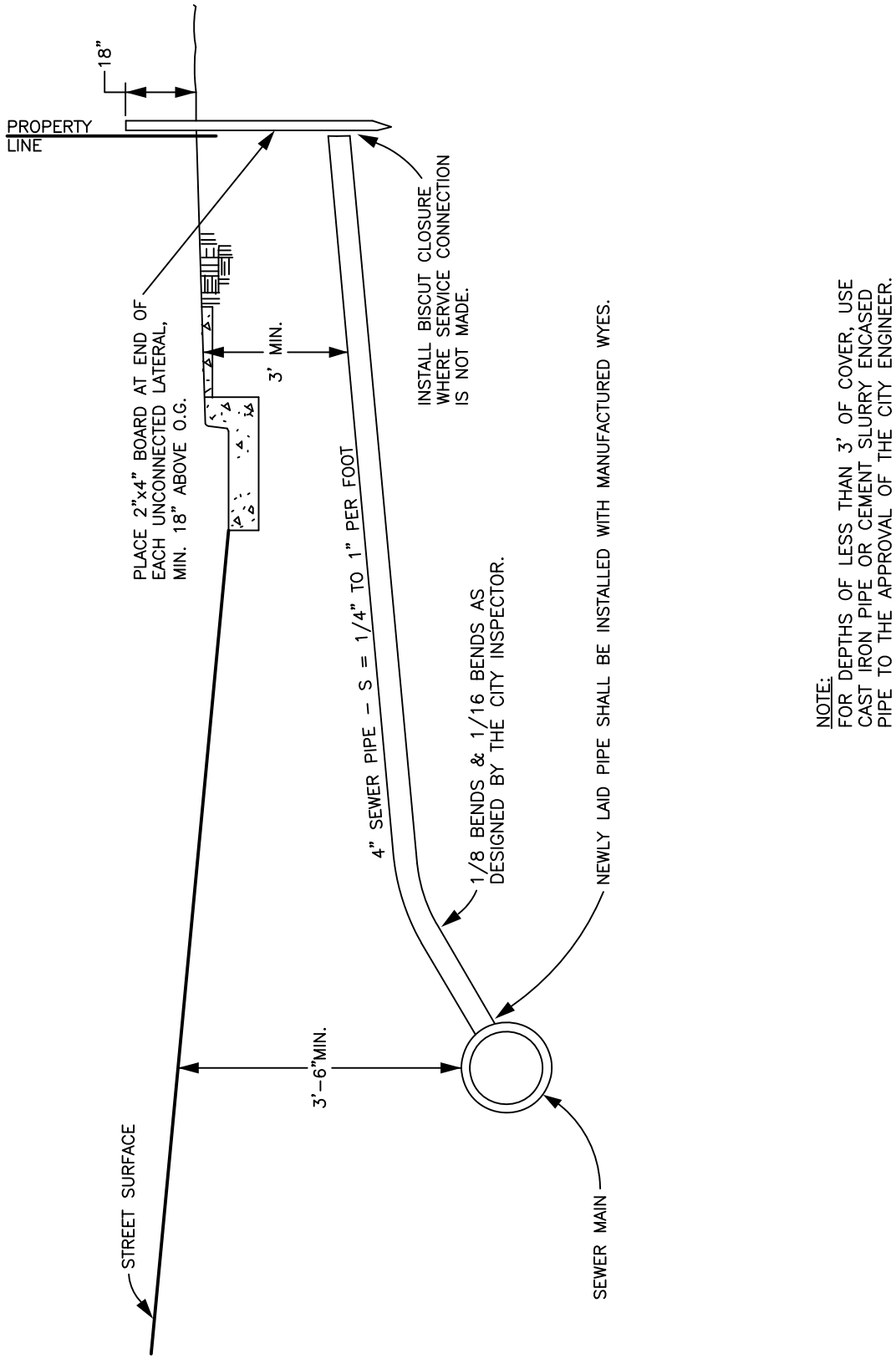
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 11/10/08

DRAWING NO. SS–20



NOTE:
FOR DEPTHS OF LESS THAN 3' OF COVER, USE CAST IRON PIPE OR CEMENT SLURRY ENCASED PIPE TO THE APPROVAL OF THE CITY ENGINEER.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

SEWER LATERAL

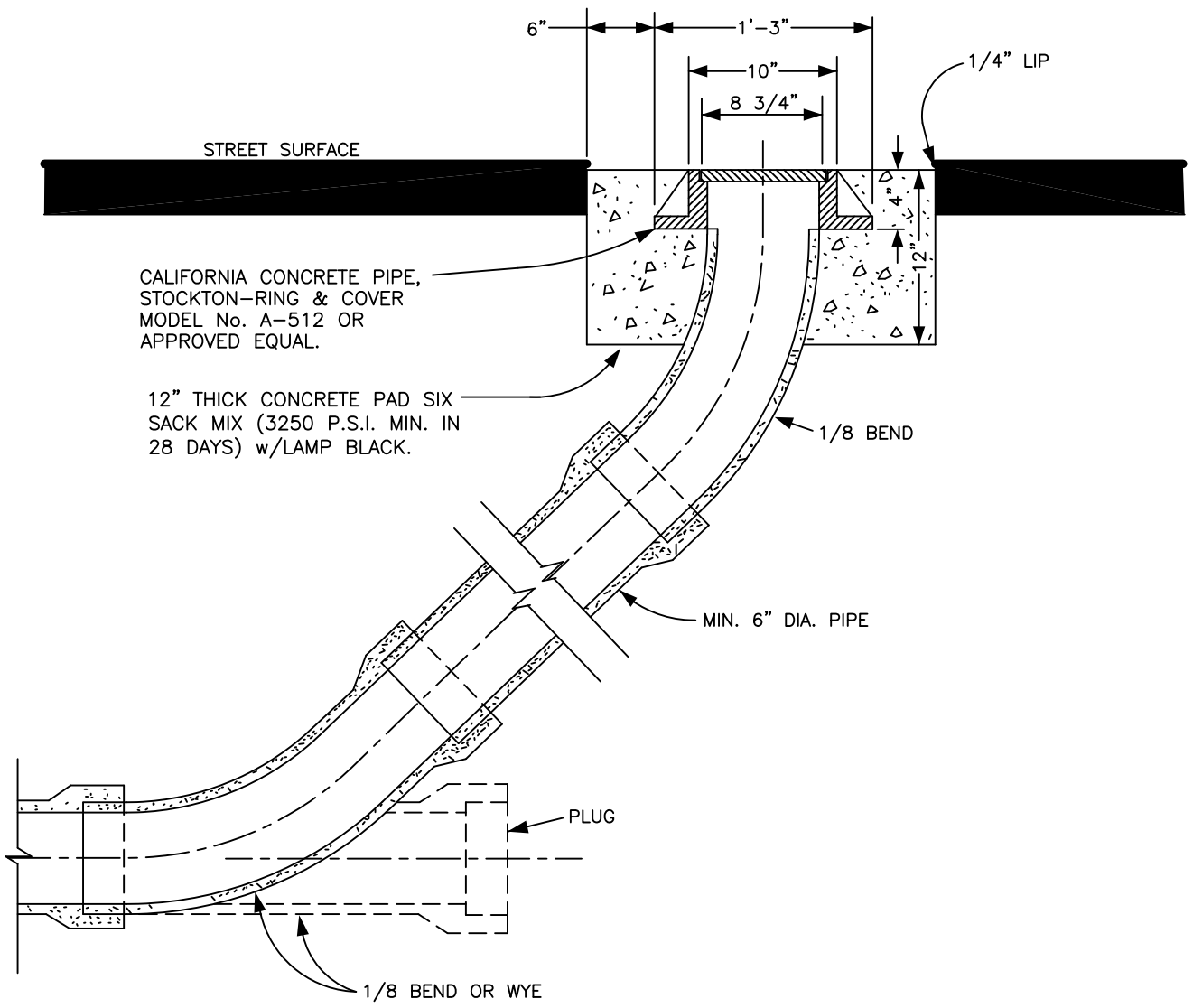
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 05/28/09

DRAWING NO. SS-23



DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

CLEANOUT

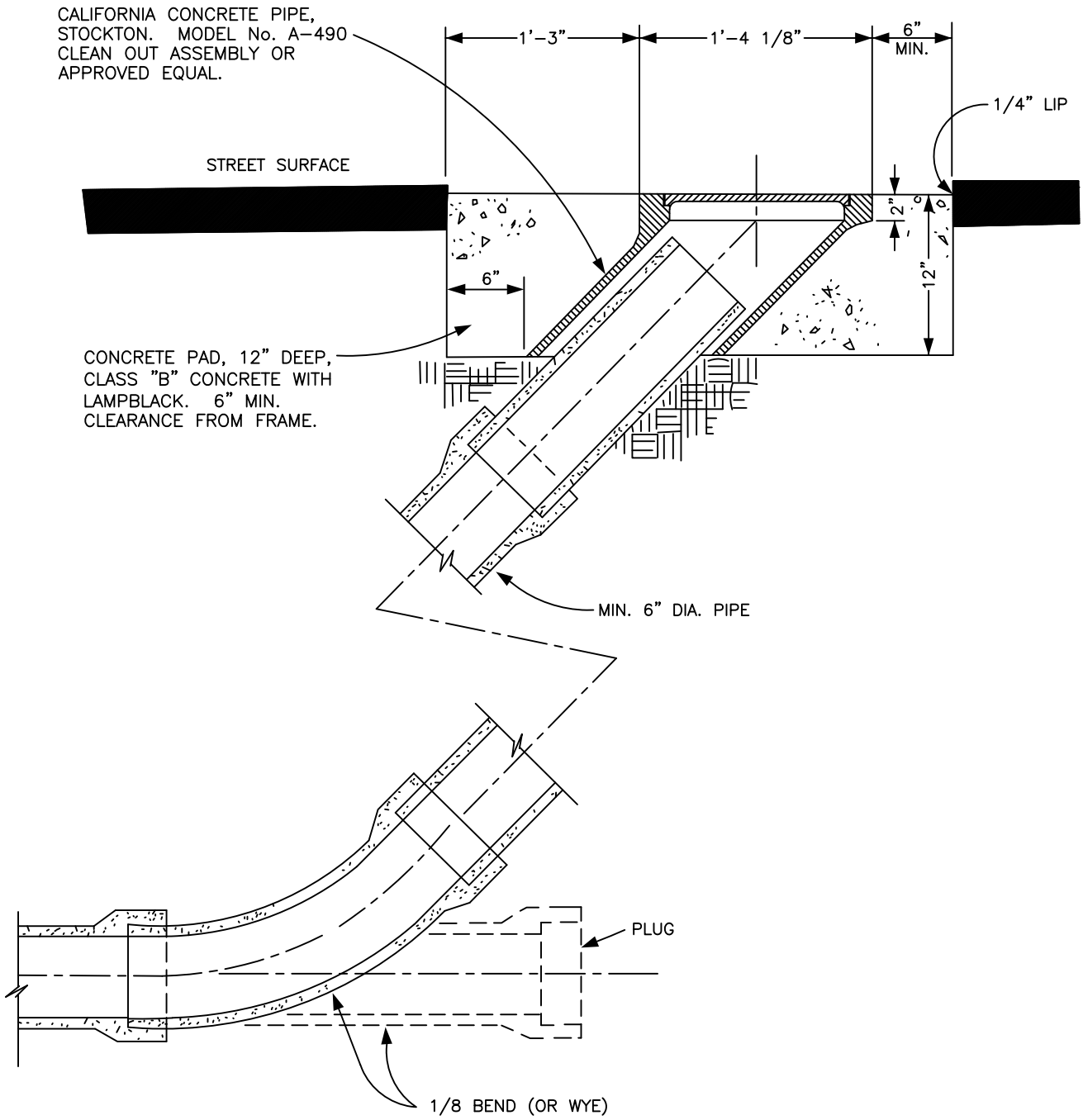
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. SS-26



DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

CLEAN-OUT ASSEMBLY (SPECIAL CASES)

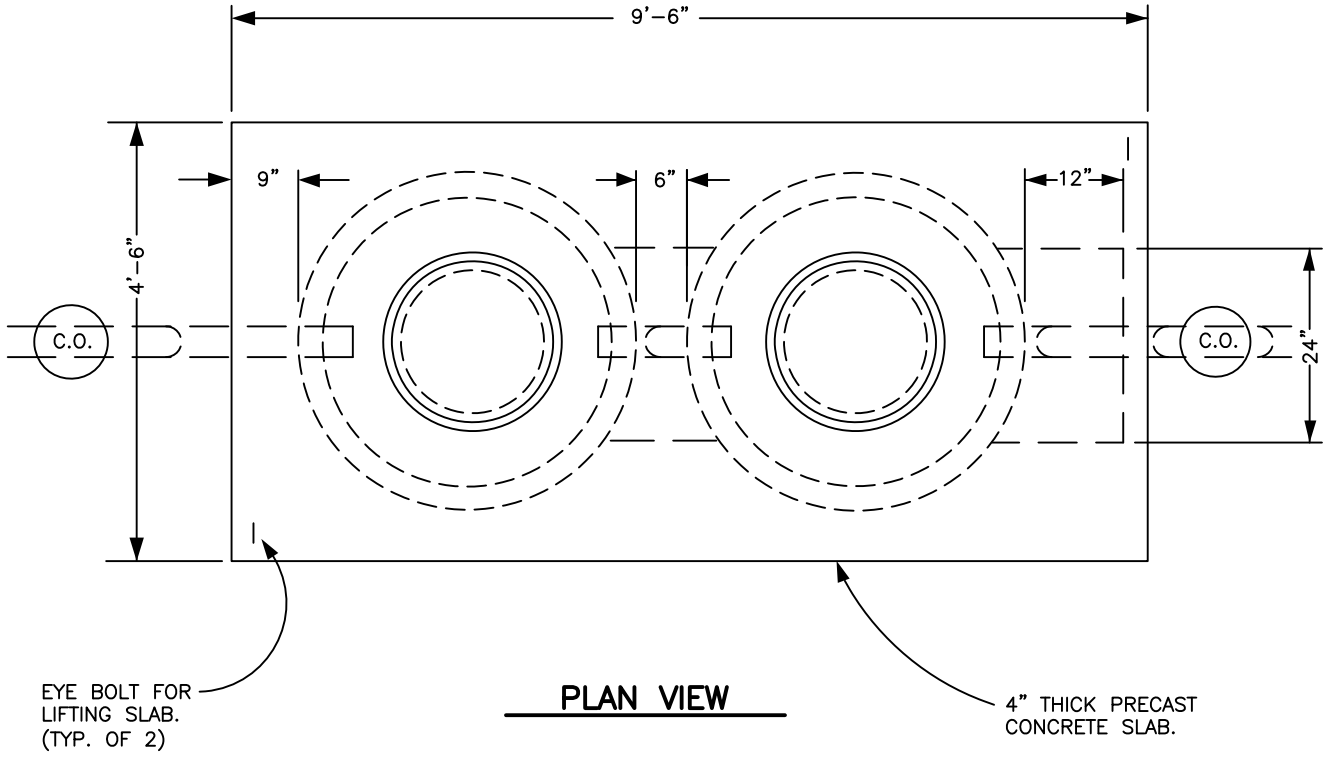
STANDARD DRAWING

APPROVED BY:

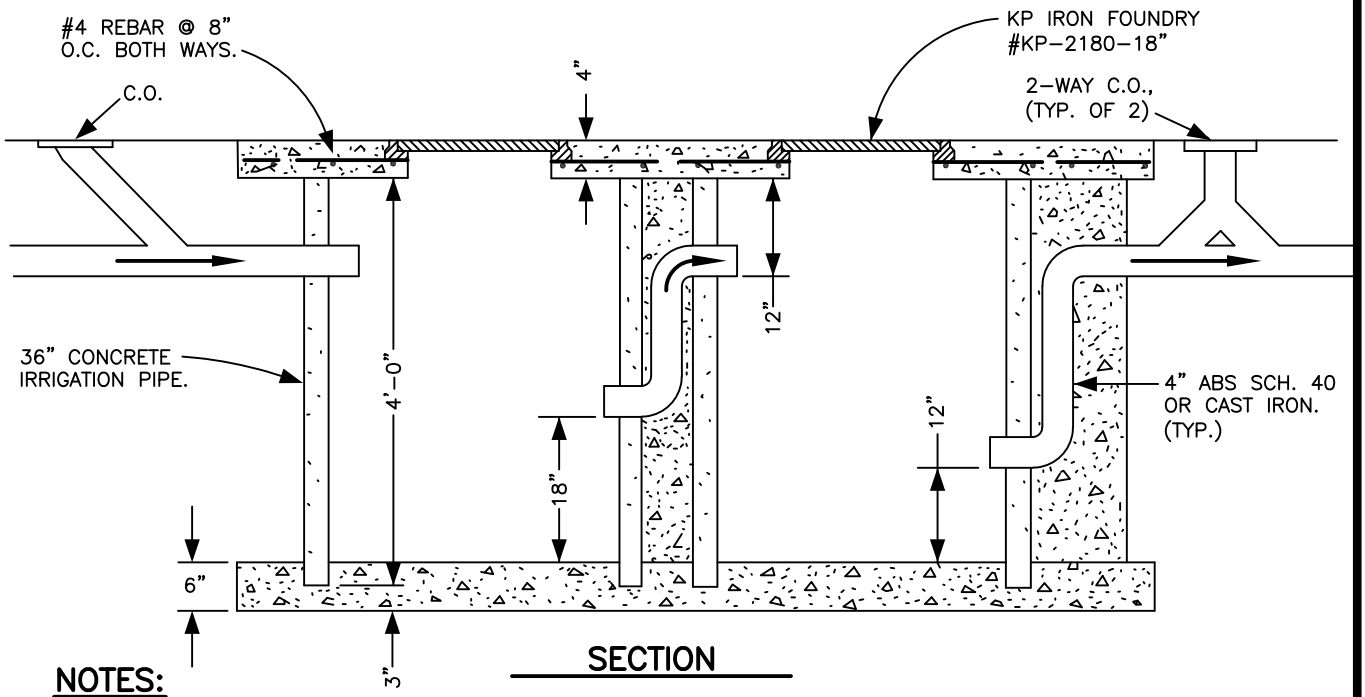
CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. SS-29



PLAN VIEW



SECTION

NOTES:

1. SLAB MAY BE POURED IN PLACE AT CONTRACTOR'S OPTION.
2. CONTRACTOR MAY SUBSTITUTE A MANUFACTURED GREASE TRAP w/APPROVAL OF BUILDING OFFICIAL.
3. THE ABOVE DRAWING DEPICTS A MIN. SIZE GREASE TRAP ENCLOSURE. ACTUAL SIZE WILL VARY DEPENDING UPON QUANTITY OF FLOW. THE CITY BUILDING OFFICIAL MUST APPROVE ALL INSTALLATIONS.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

SAND/GREASE TRAP

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. SS-32

CITY OF HANFORD

CALIFORNIA

WATER CRITERIA

WATER SUPPLY

Ideally, a water distribution system should be operated at a constant daily water supply rate with consistent supply from water source pumps at the wells. On the day of maximum demand, it is desirable to maintain a water supply rate equal to the maximum day demand rate. Additional water required for either peak hour demands or for fire flows would normally come from storage or a combination of storage and excess well capacity. However, due to specific water supply and water quality limitations in some areas and the economics of storage reservoirs, wells and transmission mains, other scenarios must also be considered for communities such as Hanford.

WATER STORAGE

The principal function of storage is to provide a reserve supply of water for operational equalization, fire reserve and emergency needs, briefly described as follows:

- **Operational Storage. This storage, also known as ″peaking storage″, is used to regulate fluctuations in demand so that extreme variations will not be imposed on the source of supply. Additionally, depending on the locations of the storage reservoirs, system pressures can be improved and stabilized to better serve customers throughout the service area. The needed operational storage is commonly estimated at between 25 and 50 percent of the total average day water use.**

- **Fire Storage. This storage is the amount required when the capacity of the production facilities is insufficient to meet the necessary maximum day demand plus fire flow demands for a certain duration of time. The Insurance Service Office (ISO), a nonprofit association of insurers that sets guidelines on which it evaluates the relative insurance risks in communities, recommends the following fire flow durations for various fire flow requirements:**

  - **2,500 gpm or less – 2 hours**
  - **3,000 gpm to 3,500 gpm – 3 hours**
  - **4,000 gpm and higher – 4 hours**

- **Emergency Storage. This storage is the volume recommended to meet demand during emergency situations such as well pump failures, electrical power outages or natural disasters. The amount of emergency storage included within a particular water distribution system is usually based on an assessment of risk and the desired degree of system dependability. Because Hanford′s system is currently comprised of many single wells throughout the City, many of which have their own standby power source, it is less vulnerable to complete loss of water supply during a disaster.**

Based on historical data that point to the rarity of prolonged power outages in California cities, there is a general philosophy stating that ″water stored in a city′s underlying groundwater basin offsets the need to store water above ground,″ provided that pumping methods and standby power sources are reliable.

SYSTEM PRESSURES

There are differences in the pressure maintained in distribution systems in various cities. It is essential that the water pressure in a consumer′s residence or place of business be neither too high nor too low. Low pressures (below 30 psi) cause annoying flow reductions when more than one water-using appliance is used. High pressures may cause faucets to leak and valve seats to wear out quickly. Additionally, high pressures usually result in wasted water and high electrical utility bills. The Uniform Plumbing Code (UPC) requires water pressures not exceed 80 psi at service connections unless the service is provided with a pressure reducer.

Due to the relatively flat topography of Hanford, the maximum pressure criteria during low demand conditions should be between 60 and 70 psi, and the minimum pressure criteria during maximum day conditions should be 40 psi. The minimum acceptable pressure criteria during peak hour demand conditions should be 30 psi.

Another pressure criteria is related to fire flows and is devised to ensure adequate positive pressure head for the booster pumps in fire trucks. For purposes of evaluating a water distributing system′s capacity to provide fire protection, the maximum daily demand plus the fire flow demand is normally applied with a minimum pressure of 20 psi at the connecting hydrant used for fighting a fire.

DISTRIBUTION MAINS

Distribution mains are generally sized to carry the greater of:

1) **the peak hour demand, or**
2) **the maximum day demand plus fire flow. Other criteria related to the distribution piping include the maximum and minimum velocities and the maximum allowable friction losses.**

High velocities for long durations of time can cause damage to pipes and to their appurtenances. Normally, velocities of 10 feet per second (fps) or higher do not cause ill effects if they occur for a limited duration. It is normally good practice to limit normal pipe velocities to 5 fps or less.

As long as the maximum velocity criteria and the pressure criteria are not violated, high head loss by itself is not an important factor. However, it may be a warning that the pipe is nearing the limits of its carrying capacity or that other problems, such as obstructions, exist and that the pipe may not have excess capacity to perform under stringent conditions. It is normally good practice to monitor pipes that have a head loss in excess of 8 feet per 1,000 feet.

Water mains supplying hydrants should be so installed as to constitute a distribution system, frequently cross-connected in order to provide circulating flow and comprised of pipe not less than 6 inches in size. Smaller pipe may be utilized but usually is deficient in carrying capacity

even when system pressure is exceptionally high. Eight inch and larger pipe will be necessary where normal system demands and higher fire flows so dictate. Valves should be installed with sufficient frequency and spaced so that no large portion of the system will be out of service at any one time during repairs and new construction.

ANAYLSIS CRITERIA

Analysis criteria for the Hanford water system are summarized as follows:

- **Source of Supply. An adequate source of supply from wells or storage reservoirs shall provide water during maximum day demands plus fire flows or during peak hourly demands, whichever is greater.**

- **Peaking Factors. Fluctuations in flows are estimated as follows:**

  Maximum day demand: 1.75 x Average day demand
  Peak hour demand: 2.5 x Average day demand

- **Average Day Demand Coefficients. The following demand coefficients shall be applied to the various land use categories to generate future average flows:**

  Residential

  Low density: 1.10 gpm/acre
  Medium desnity: 1.50 gpm/acre
  High density: 2.10 gpm/acre

  Commercial 1.40 gpm/acre

  Industrial 1.70 gpm/acre

  Public
  Schools: 0.80 gpm/acre
  Parks: 1.40 gpm/acre

  Industrial Park 1.0 gpm/acre (may be significantly higher for specific industries)

  (Gross acreages are used which include streets and public right-of-way. Residential use is based on approximately 250 gpcpd average daily use.)

Since engineering problems are encountered when designing a water distribution system and its related facilities, it is suggested that the services of competent consultants be utilized so that design and installation will be compatible with local needs and projected future demands. In any event, the standards and manuals of the American Water Works Association serve as excellent guiding material.

There are many factors to be considered. The foregoing discussion only briefly touches upon a few of the more important issues as they affect adequacy and reliability for normal service and fire protection issues.

FIRE HYDRANTS

Fire hydrants should be designed and installed in accordance with the recommended practice of the American Water Works Association Standard C503-88 and should be located as recommended by the fire chief. Even though the water main in the street may be 4-inch in size, a valved 6-inch street connection to the hydrant is considered good practice. Hydrants should have one or more large outlets for pumper use. Hydrant installations should form a good ″pattern″ with due recognition to street and block layout so the fire department will not encounter impractical hose-lay distances. In general, at least two hydrants should be available for the protection of any structure.

The following fire hydrants are presently approved for service within the City of Hanford:

RESIDENTIAL:	COMMERCIAL:
With One 2.5 – inch Hose Outlet and One 4.5 – inch Pumper outlet	With Two 2.5 – inch Hose Outlets And One 4.5 – inch Steamer Outlet
James Jones J3740 American AVK, Series 2470	James Jones J3760 American AVK, Series 2470

A water distribution system should not be dependent upon a single supply line or connection and, insofar as possible, sources of supply should be multiple and reliable. Where supply is dependent upon pumps, there should be duplicate installations providing for continued service in the event of failure of any given unit. Where supply is dependent upon pumps and the pumps are electrically driven, reliability is improved through the installation of a standby electric power unit or through some type of auxiliary power such as gasoline, diesel or natural gas engine. There should be enough wells or ground-level storage reservoirs equipped with auxiliary power sources to meet average day demands for up to 3 hours or longer.

DESIGN CRITERIA

The distribution system should be analyzed under various demand conditions including:

- **Maximum day demand plus fire flow**
- **Peak hour demands**

The following criteria should be used for judging the adequacy of existing and new pipelines:

- **Maximum desirable pipeline velocity: 5 feet per second**
- **Maximum desirable headloss: 8 feet per 1,000 feet**

<u>Service Pressures</u>. The recommended high/low pressures are as follows:

- **Maximum pressure: 60 to 70 psi**
- **Minimum pressure (no fire flow): 30 psi**
- **Minimum pressure (with fire flow): 20 psi**

Fire Flows. Individual fire flows that shall be met as follows unless otherwise approved by the City Fire Marshal.

- **Residential and multi-family fire flow: 1,000 gpm (1,500 gpm at buildout per Water Master Plan)**

- **Commercial fire flow: 2,500 gpm (recent/future developments)**
  3,000 gpm (older developments near downtown area)

- **Industrial fire flow: 3,000 gpm (recent/future developments)**
  5,000 gpm (industrial park)

- **Fire flow duration: 3 hours**

Fire Hydrant Spacing. Fire hydrant spacing shall be as follows unless otherwise approved by the City Fire Marshal.

- **Residential and multi-family: 500 feet**
- **Commercial and industrial: 300 feet**

Distribution Mains. Spacing and sizes of distribution grid mains shall be as follows unless otherwise approved by the City Engineer:

- **Residential and multi-family:**
  - **6″ - not greater than 660 feet**
  - **8″ - 660 feet to not greater than 2,640 feet**
  - **12″ - 2,640 feet and per Master Plan**
  - **14″ - and larger – per Master Plan**

- **Commercial and industrial:**
  - **6″ - not greater than 660 feet**
  - **8″ - per Uniform Fire Code (UFC) flow calculations**
  - **10 ″- per UFD flow calculations**
  - **12″ - per UFC and per Master Plan**
  - **14″ - and larger - per Master Plan**

Pipe Materials for Distribution Mains. Pipe materials and pressure classes for mains shall be as follows unless otherwise approved by the City Engineer:

Pipe Material and Class

- **6″ pipe: PVC, CL150, AWWA C-900, or DIP CL350, AWWA C-151**
- **8″ pipe: PVC, CL150, AWWA C-900, or DIP CL350, AWWA C-151**
- **10″ pipe: PVC, CL150, AWWA C-900, or DIP CL350, AWWA C-151**
- **12″ pipe: PVC, CL150, AWWA C-900, or DIP CL350, AWWA C-151**
- **14″ pipe: PVC, CL235, AWWA C-905, or DIP CL250, AWWA C-151**
- **16 to 20″: DIP, CL250, AWWA C-151**
- **24″: DIP, CL200, AWWA C-151**

1" RESIDENTIAL WATER SERVICE

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

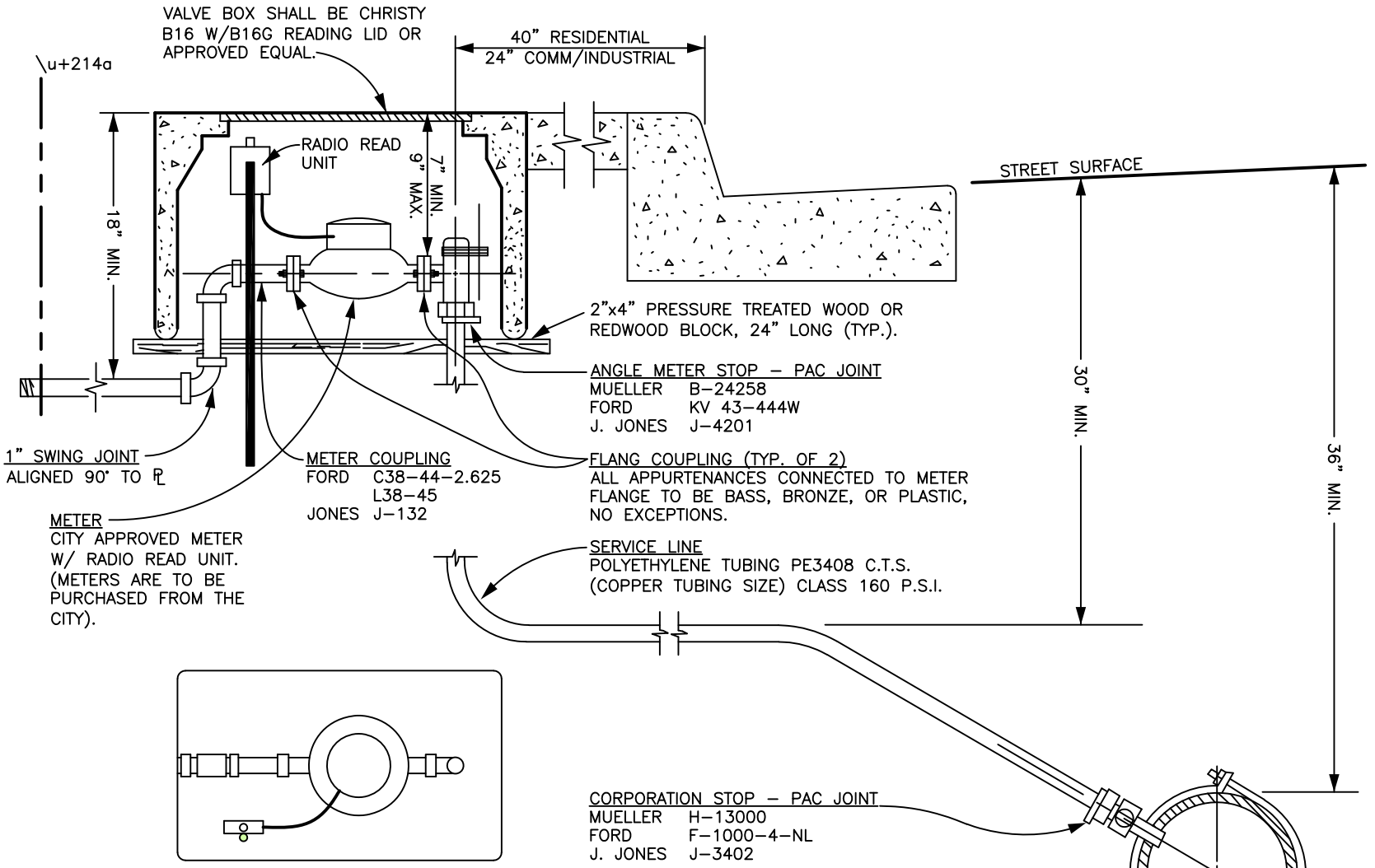
ENGINEERING DIVISION

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. WA-11



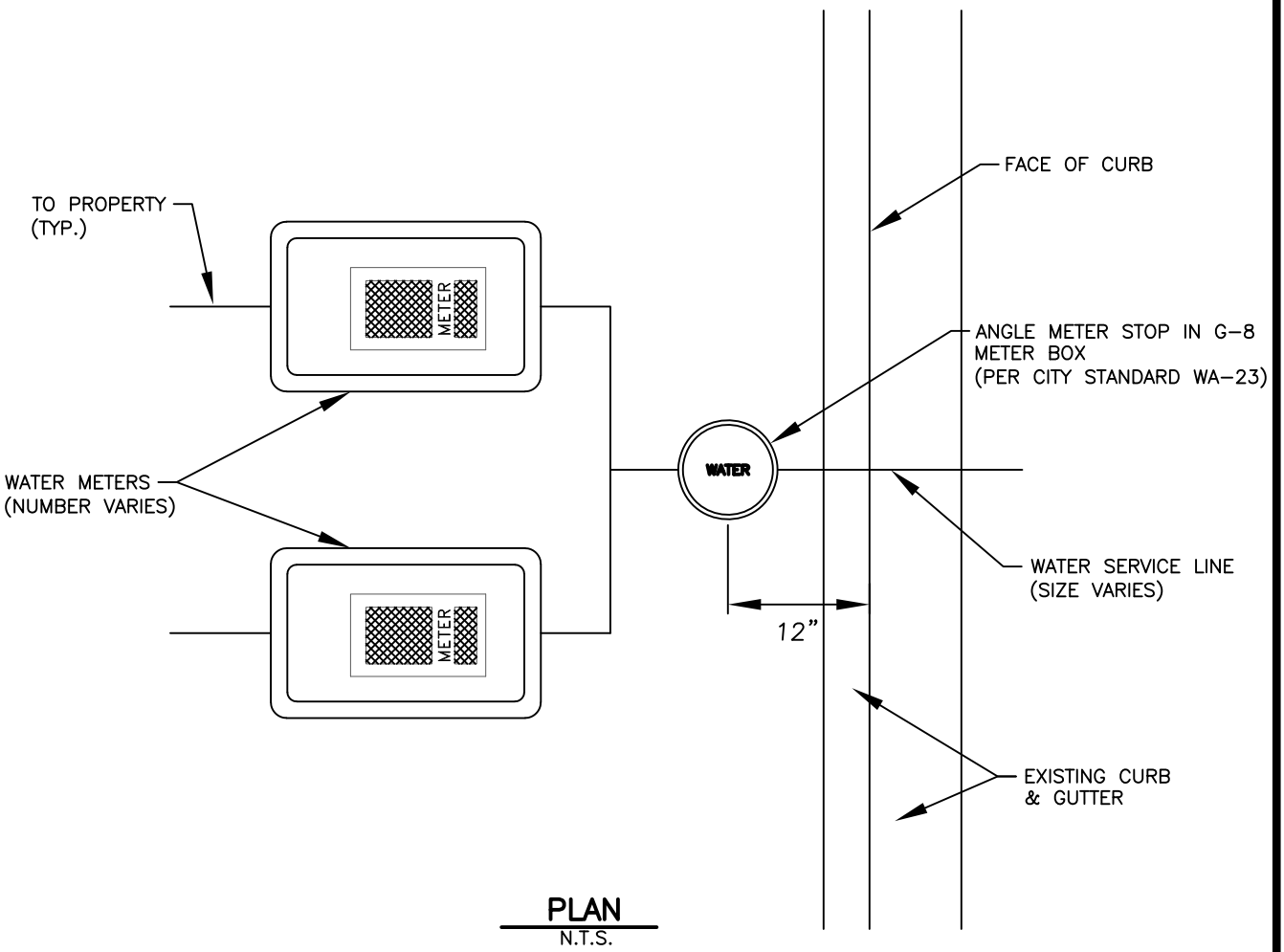
TOP VIEW

NOTES:

NEW SERVICE ADDITIONS TO EXISTING MAINS SHALL BE HOT – TAPPED.

1. SERVICE SHALL BE PLACED TWO FEET FROM INTERIOR PROPERTY LINES.
2. TRAFFIC RATED LID TO BE USED IF SERVICE IS LOCATED IN DRIVEWAY.

*ALL MAINS LESS THAN 8" DIA. AND ALL P.V.C. PIPE SHALL HAVE BRONZE DOUBLE STRAP SADDLE OR APPROVED EQUAL.



PLAN
N.T.S.

NOTE:

1. DISTANCE BETWEEN METER BOXES ARE DETERMINED BY SERVICE SIZE.
2. SEE CITY STANDARDS WA–11, WA–14, WA–17 FOR SPECIFICS RELATED TO METER, BOX & ANGLE METER STOP LOCATION.
3. ALL FITTINGS AND PIPE FROM ANGLE METER STOP TO THE METERS SHALL BE BRASS.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

WATER SERVICE MANIFOLD DETAIL

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. WA–12

2" WATER SERVICE

STANDARD DRAWING

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

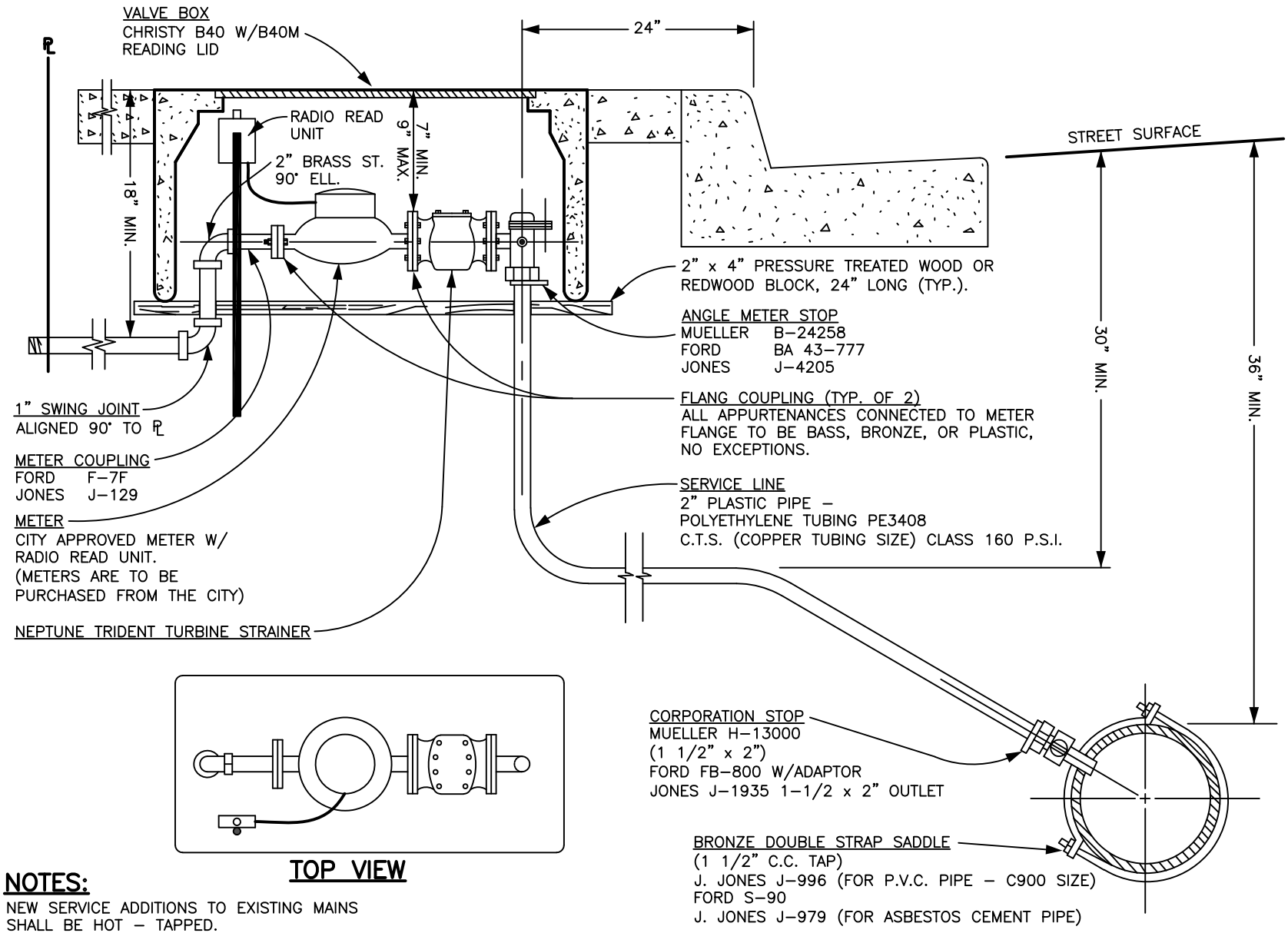
ENGINEERING DIVISION

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 11/10/08

DRAWING NO. WA–14

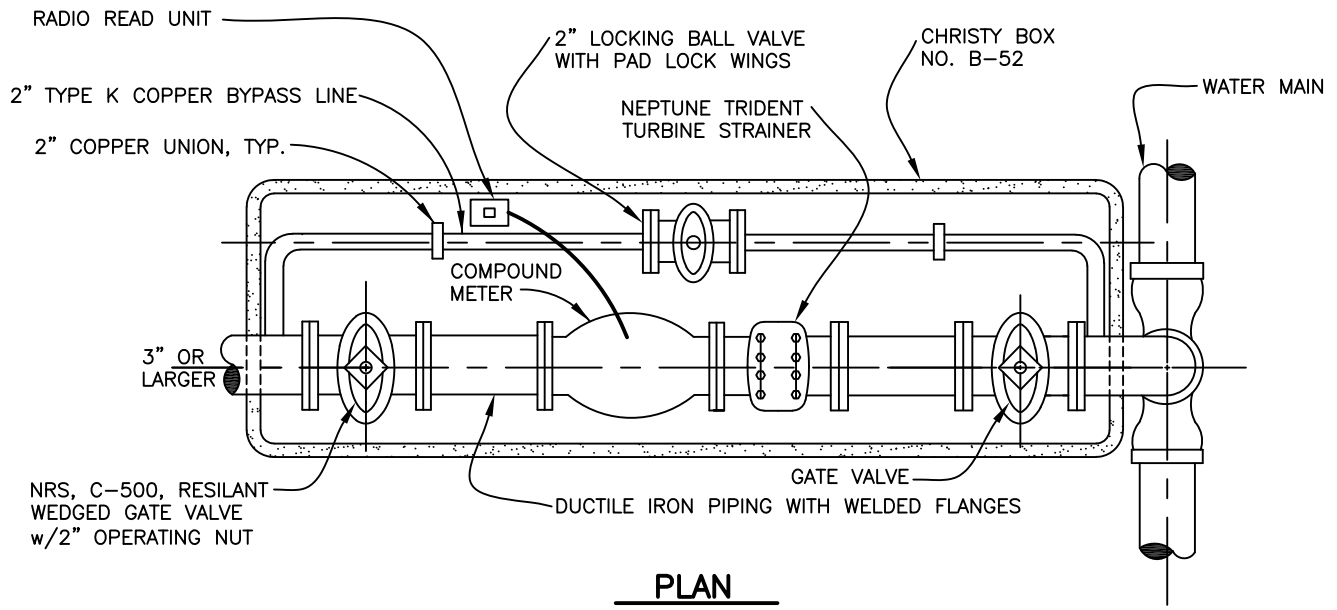


TOP VIEW

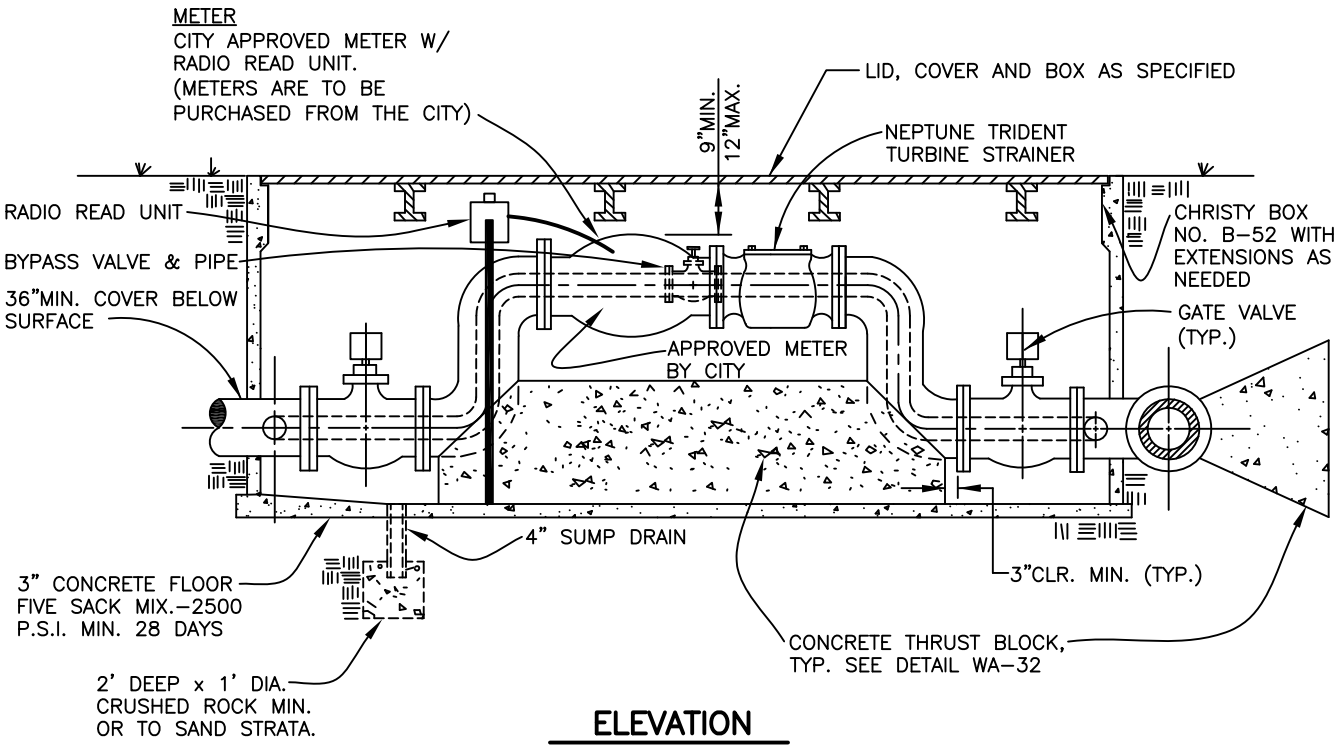
NOTES:

NEW SERVICE ADDITIONS TO EXISTING MAINS SHALL BE HOT – TAPPED.

1. SERVICE SHALL BE PLACED TWO FEET FROM INTERIOR PROPERTY LINES.
2. TRAFFIC RATED LID TO BE USED IF SERVICE IS LOCATED IN DRIVEWAY.



PLAN



ELEVATION

NOTES:

1. HOT TAP OF EXISTING WATER MAIN WILL REQUIRE A TAPPING VALVE & TAPPING SLEEVE.
2. THE FIREFLY (DATAMATIC) RADIO READ UNIT MUST BE CONNECTED TO THE REGISTER PRIOR TO INSTALLATION.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

3" OR LARGER WATER SERVICE

STANDARD DRAWING

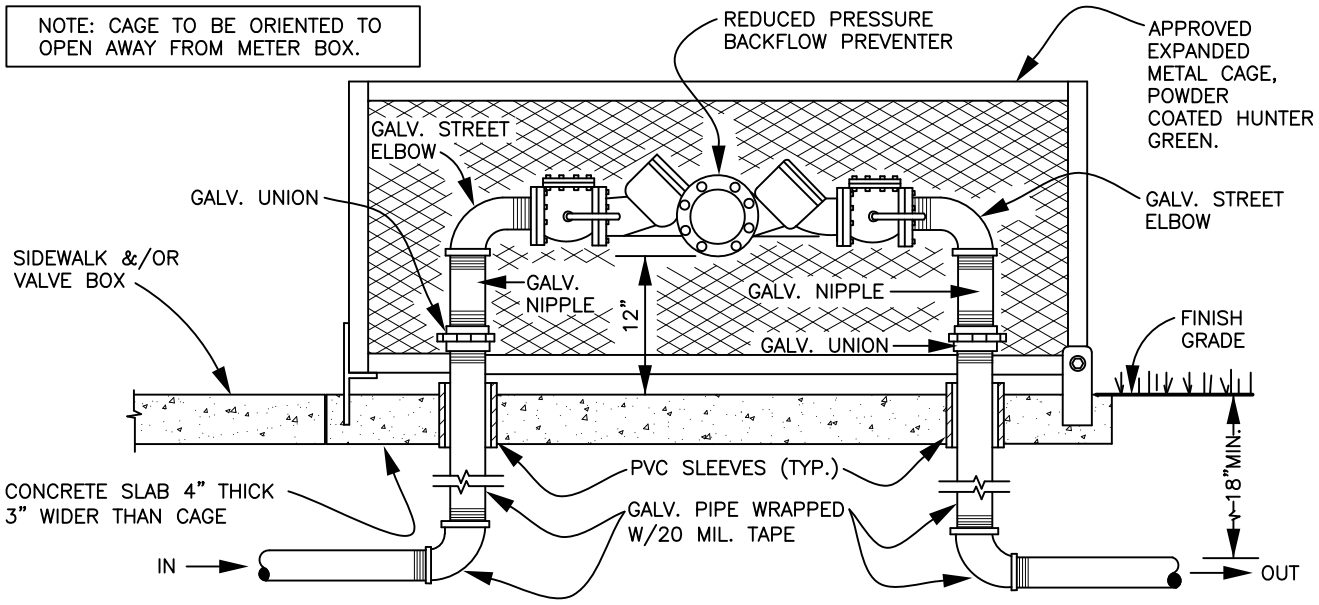
APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. WA-17

NOTE: CAGE TO BE ORIENTED TO OPEN AWAY FROM METER BOX.



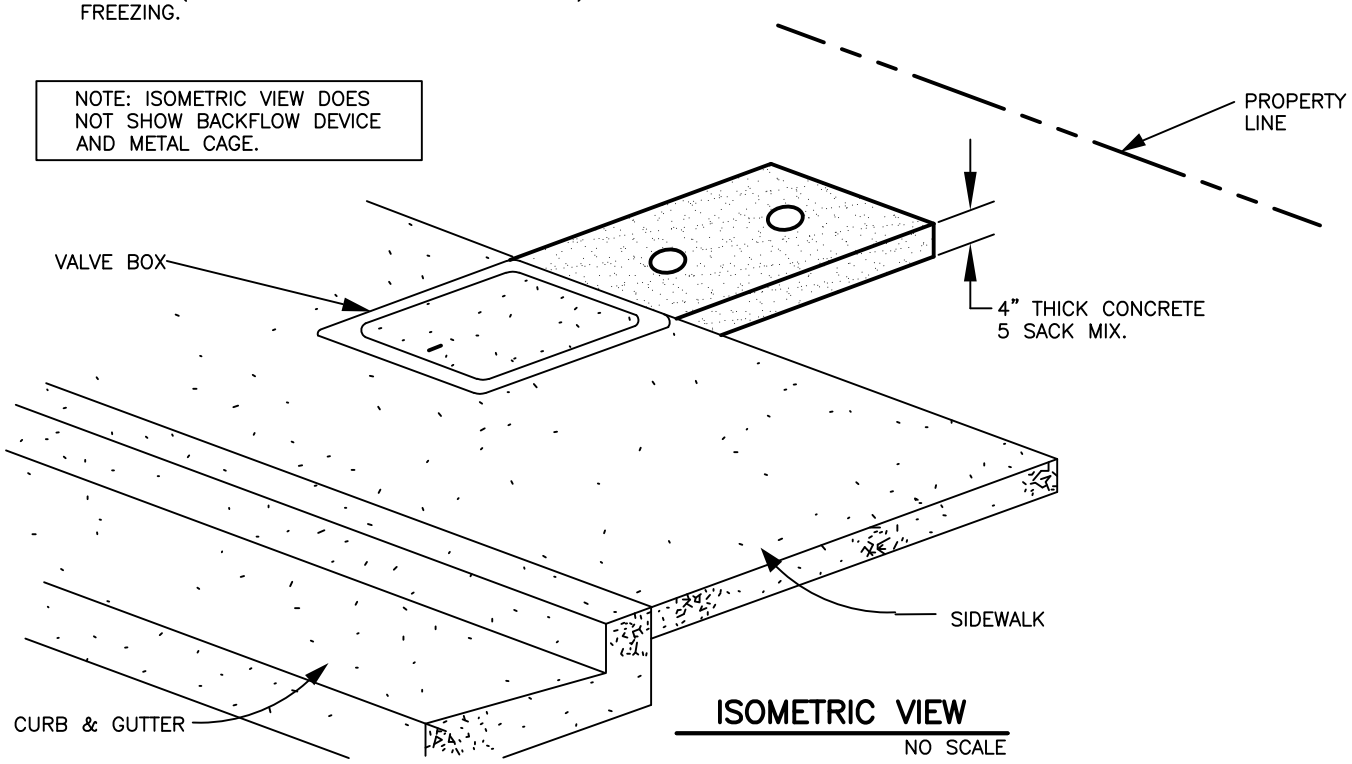
PROFILE

NO SCALE

NOTES:

1. BACKFLOW DEVICE (WILKINS 975XL OR APPROVED EQUAL) SHALL BE SUBJECT TO APPROVAL BY THE CITY UTILITY SUPERINTENDENT.
2. BACKFLOW DEVICES LARGER THAN 2" DIAMETER SHALL REQUIRE REVIEW & APPROVAL BY THE CITY UTILITY SUPERINTENDENT. EXPANDED METAL CAGE NOT REQUIRED.
3. BACKFLOW DEVICE SHALL BE COVERED WITH AN INSULATION BLANKET (WEATHERGUARD OR APPROVED EQUAL) TO PREVENT FREEZING.

NOTE: ISOMETRIC VIEW DOES NOT SHOW BACKFLOW DEVICE AND METAL CAGE.



ISOMETRIC VIEW

NO SCALE

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

WATER SERVICE BACKFLOW PREVENTER ASSEMBLY

STANDARD DRAWING

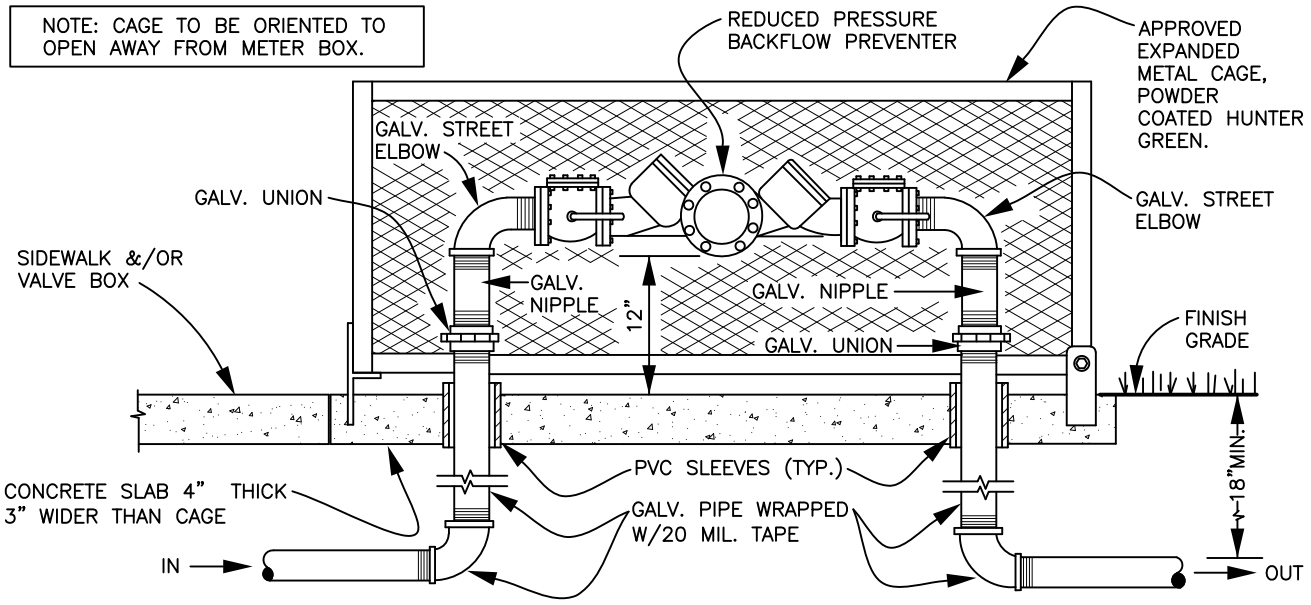
APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. WA–18

NOTE: CAGE TO BE ORIENTED TO OPEN AWAY FROM METER BOX.

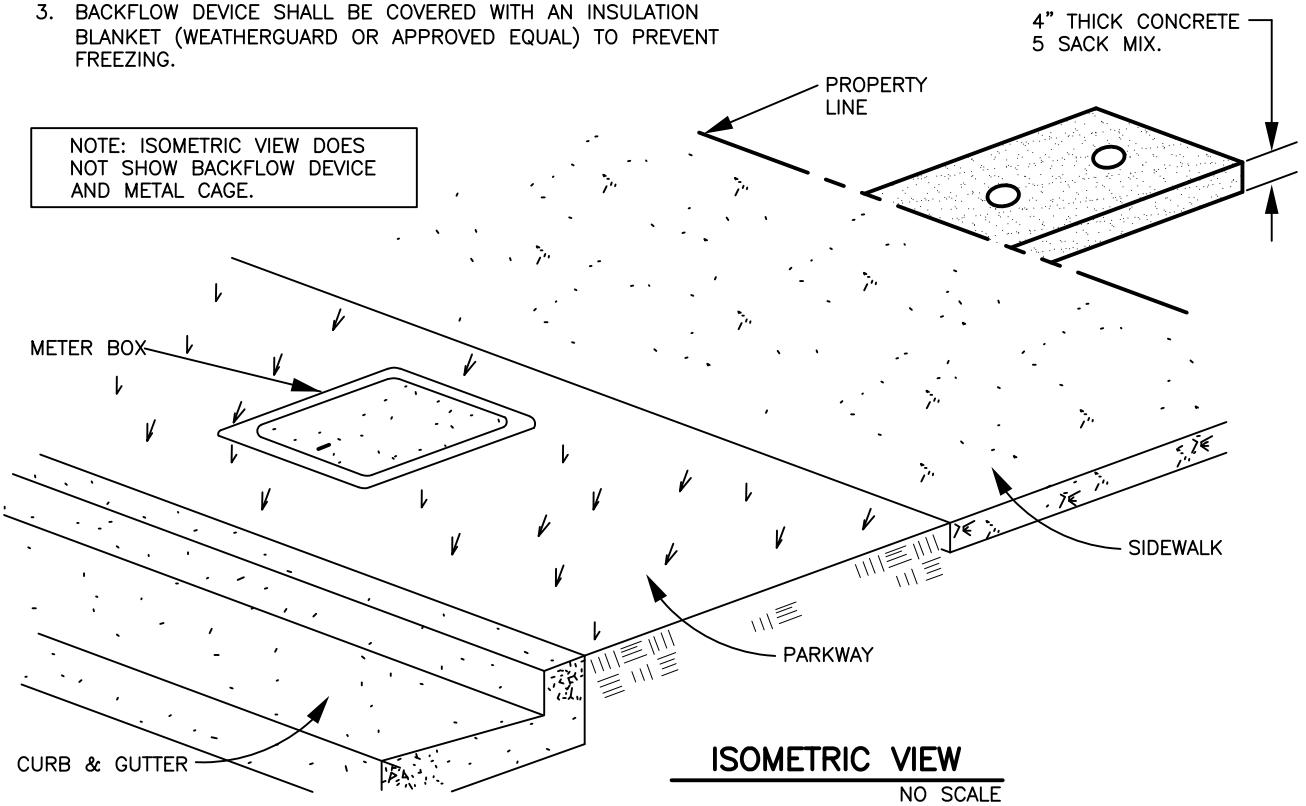


PROFILE
NO SCALE

NOTES:

1. BACKFLOW DEVICE (WILKINS 975XL OR APPROVED EQUAL) SHALL BE SUBJECT TO APPROVAL BY THE CITY UTILITY SUPERINTENDENT.
2. BACKFLOW DEVICES LARGER THAN 2" DIAMETER SHALL REQUIRE REVIEW & APPROVAL BY THE CITY UTILITY SUPERINTENDENT. EXPANDED METAL CAGE NOT REQUIRED.
3. BACKFLOW DEVICE SHALL BE COVERED WITH AN INSULATION BLANKET (WEATHERGUARD OR APPROVED EQUAL) TO PREVENT FREEZING.

NOTE: ISOMETRIC VIEW DOES NOT SHOW BACKFLOW DEVICE AND METAL CAGE.



ISOMETRIC VIEW
NO SCALE

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

WATER SERVICE BACKFLOW PREVENTER ASSEMBLY

(IN PARKSTRIP)

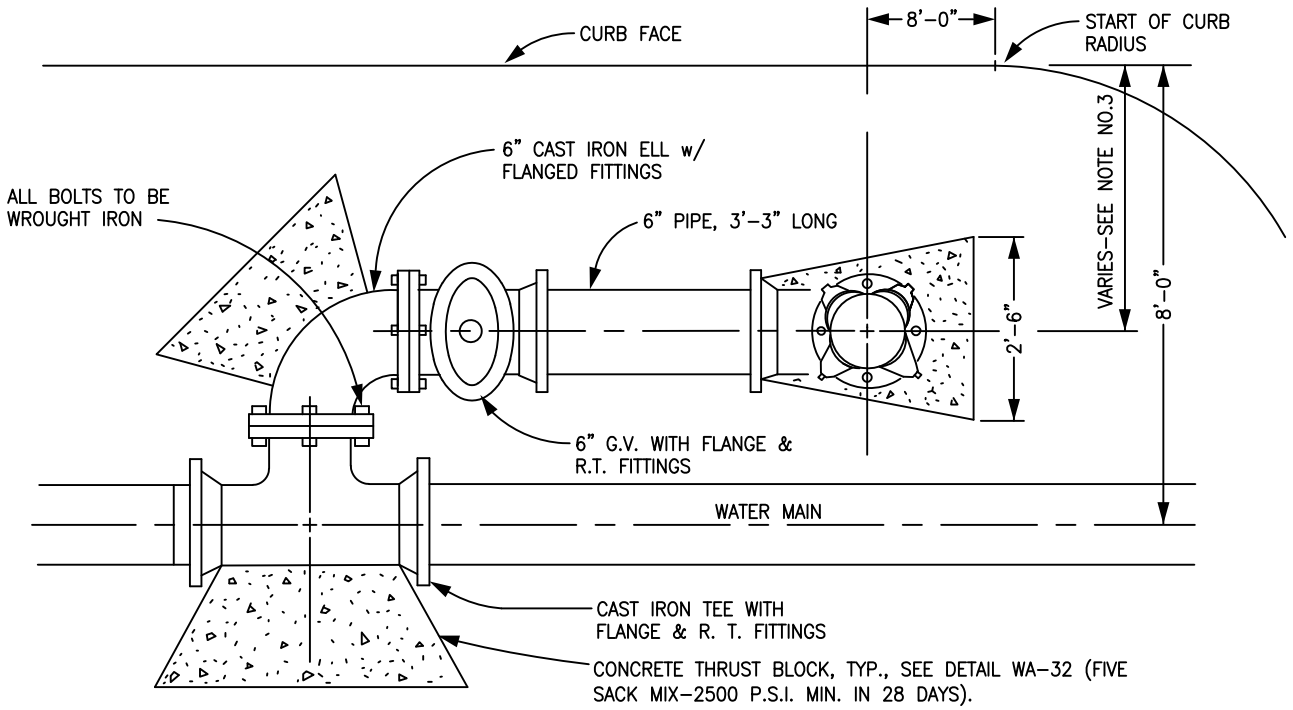
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

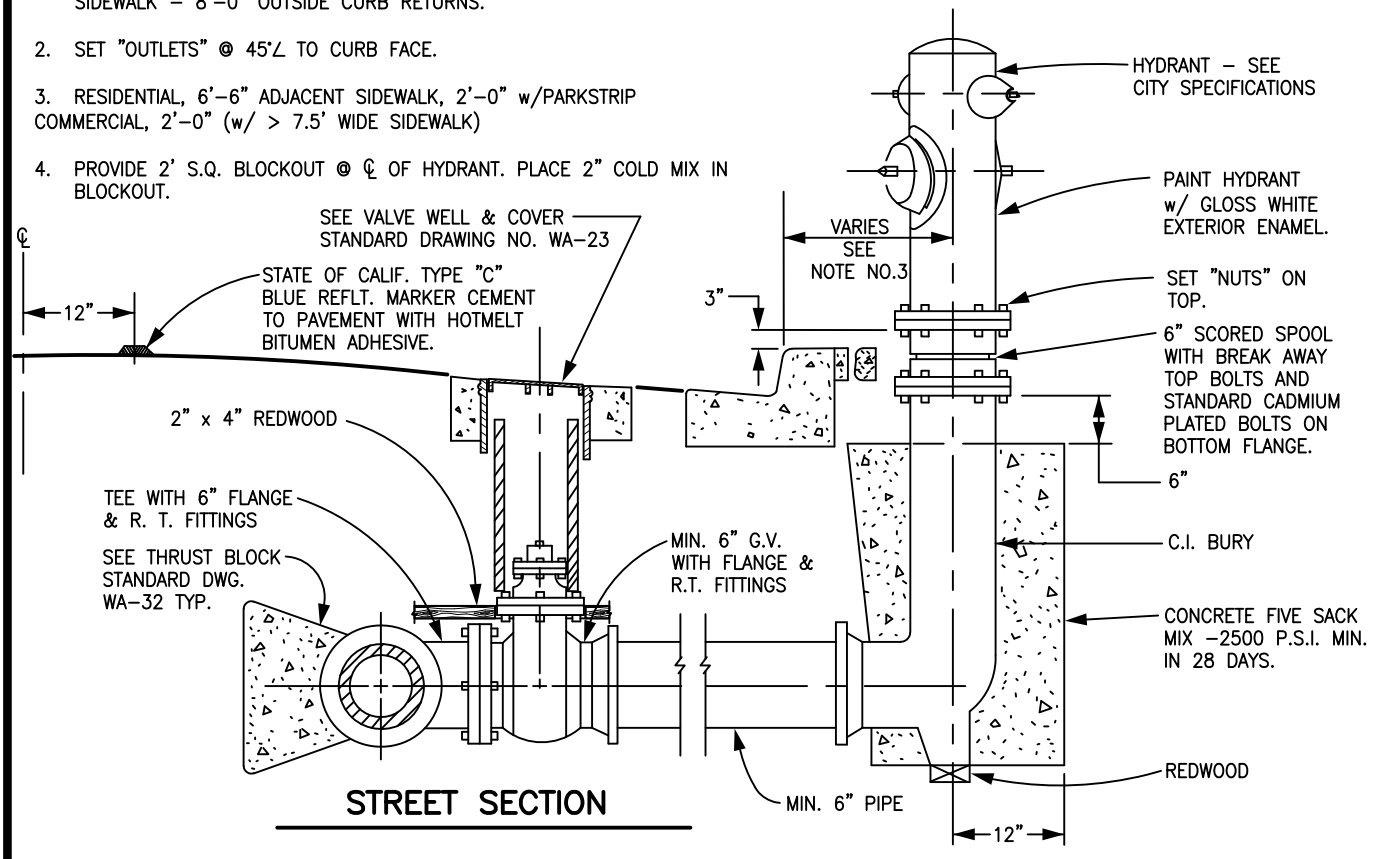
DRAWING NO. WA–19



PARKWAY PLAN

NOTES:

1. FIRE HYDRANTS AT STREET CORNERS SHALL BE LOCATED BEHIND THE SIDEWALK – 8'-0" OUTSIDE CURB RETURNS.
2. SET "OUTLETS" @ 45°∠ TO CURB FACE.
3. RESIDENTIAL, 6'-6" ADJACENT SIDEWALK, 2'-0" w/PARKSTRIP COMMERCIAL, 2'-0" (w/ > 7.5' WIDE SIDEWALK)
4. PROVIDE 2' S.Q. BLOCKOUT @ ℄ OF HYDRANT. PLACE 2" COLD MIX IN BLOCKOUT.



STREET SECTION

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

FIRE HYDRANT INSTALLATION

SEE SECTION X OF SPECIFICATIONS FOR TYPE OF HYDRANT REQUIRED.

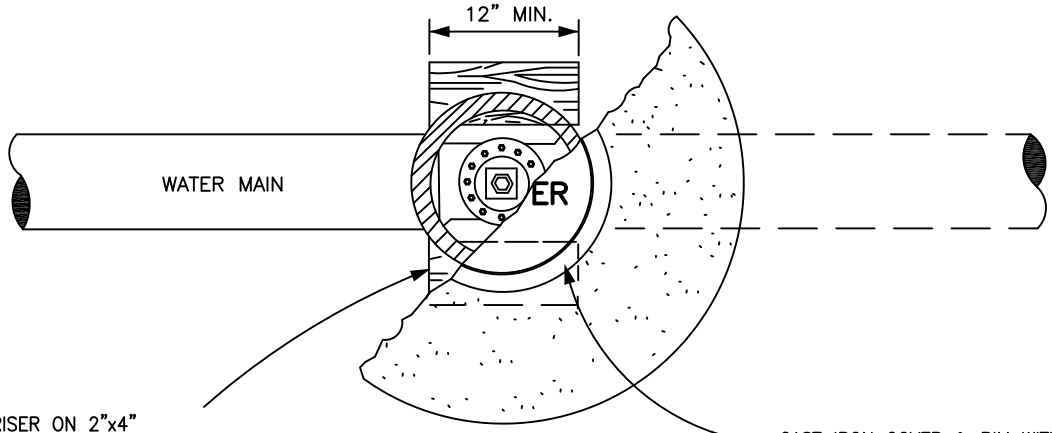
STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

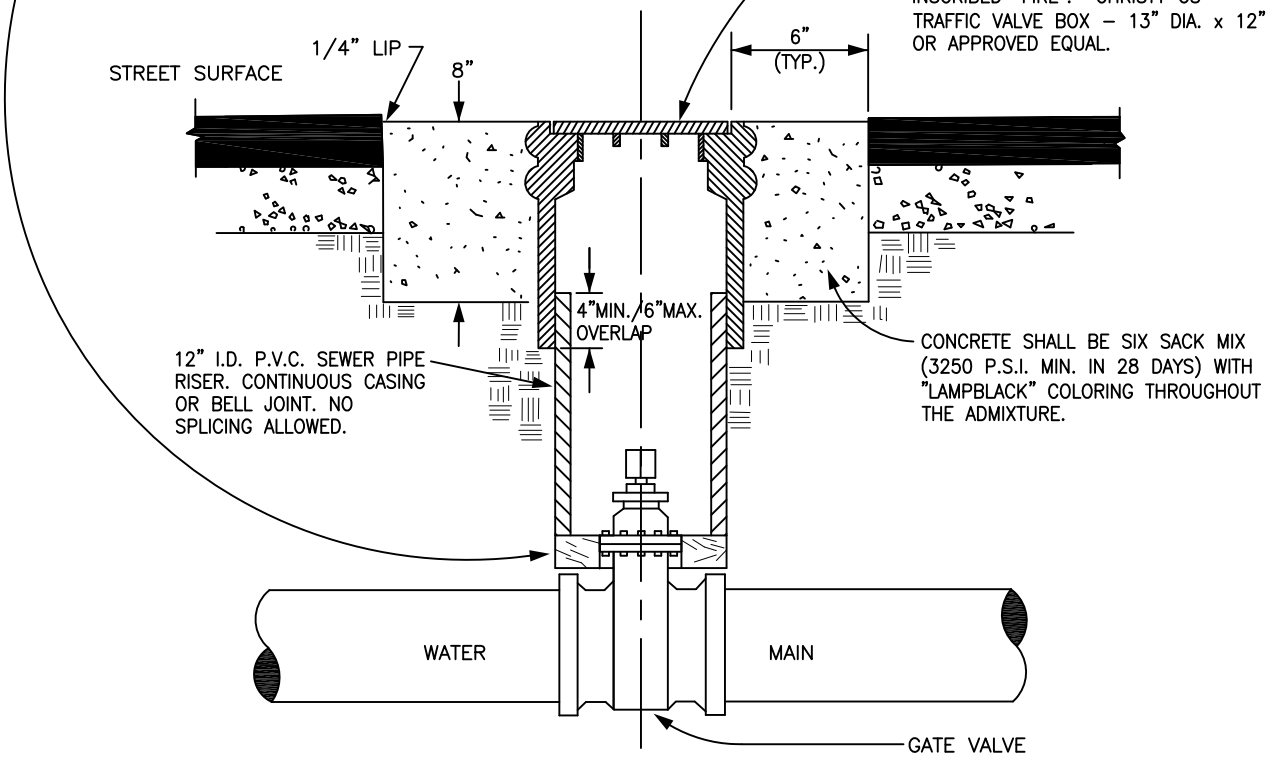
DRAWING NO. WA-20



PLAN

SUPPORT RISER ON 2"x4" PRESSURE TREATED WOOD OR REDWOOD BOARDS PARALLEL WITH WATER LINE

CAST IRON COVER & RIM WITH STREET TREAD INSCRIBED "WATER", OR ON FIRE HYDRANT RUNS COVER SHALL BE INSCRIBED "FIRE". CHRISTY G8 TRAFFIC VALVE BOX – 13" DIA. x 12" OR APPROVED EQUAL.



PROFILE

APPROVED GATE VALVES

C–500, RESILIENT WEDGE W/2" OPERATION NUT

CLOW RESILIENT WEDGE

KENNEDY 1573X–RING–TITE x RING–TITE

KENNEDY 1579X–RING–TITE x FLANGE

M & H DRESSER 3067–02–FLANGE x FLANGE

AMERICAN AVK SERIES 25

M & H DRESSER 3067–04–RT x RT

MUELLER A–2370–24–RT x RT

MUELLER A–2370–26–RT x FLANGE

WATEROUS SERIES 500

ALL VALVES SHALL BE A.W.W.A. APPROVED RESILIENT WEDGE

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

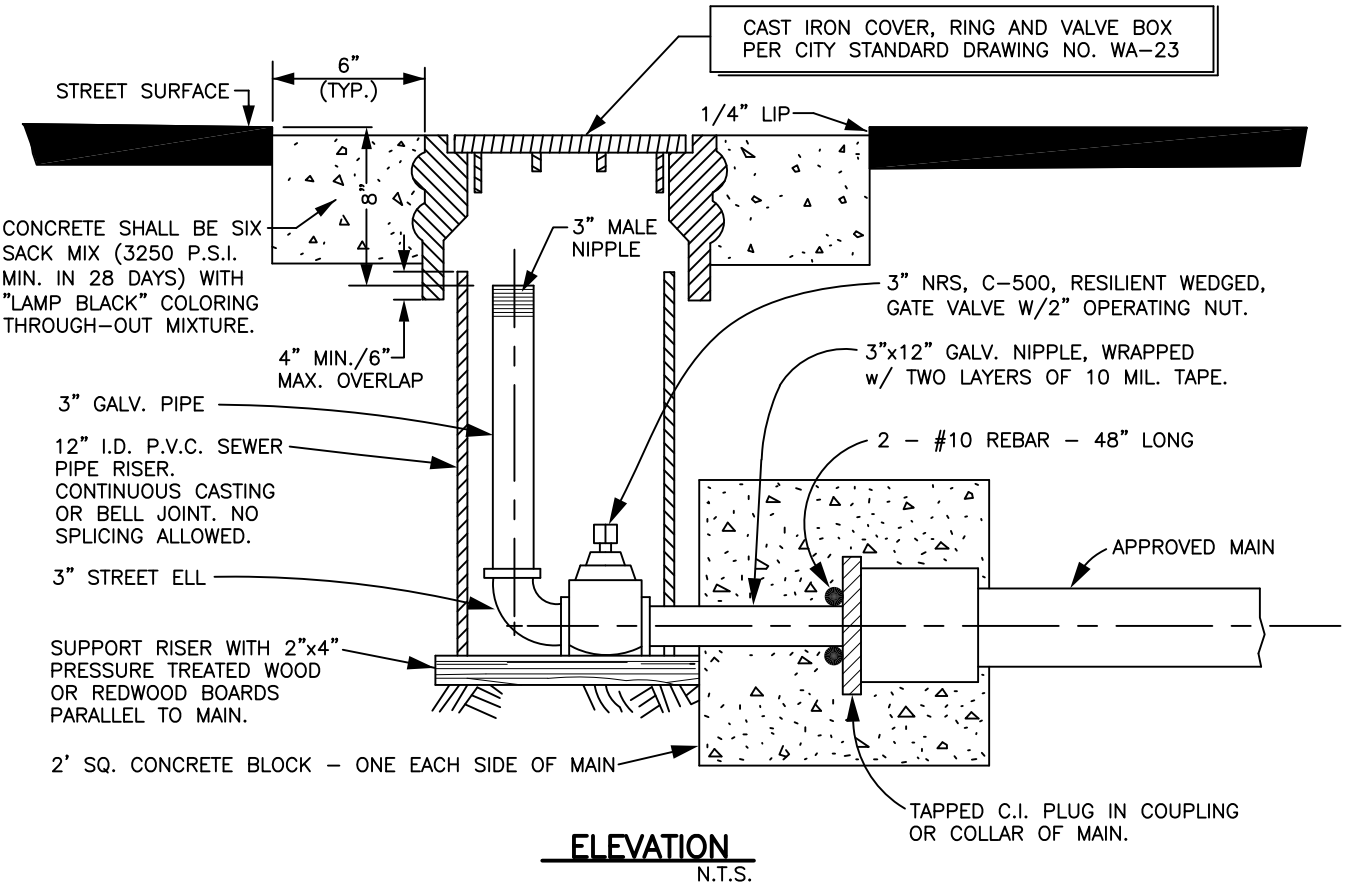
CITY ENGINEER R.C.E. 062044

VALVE WELL & COVER

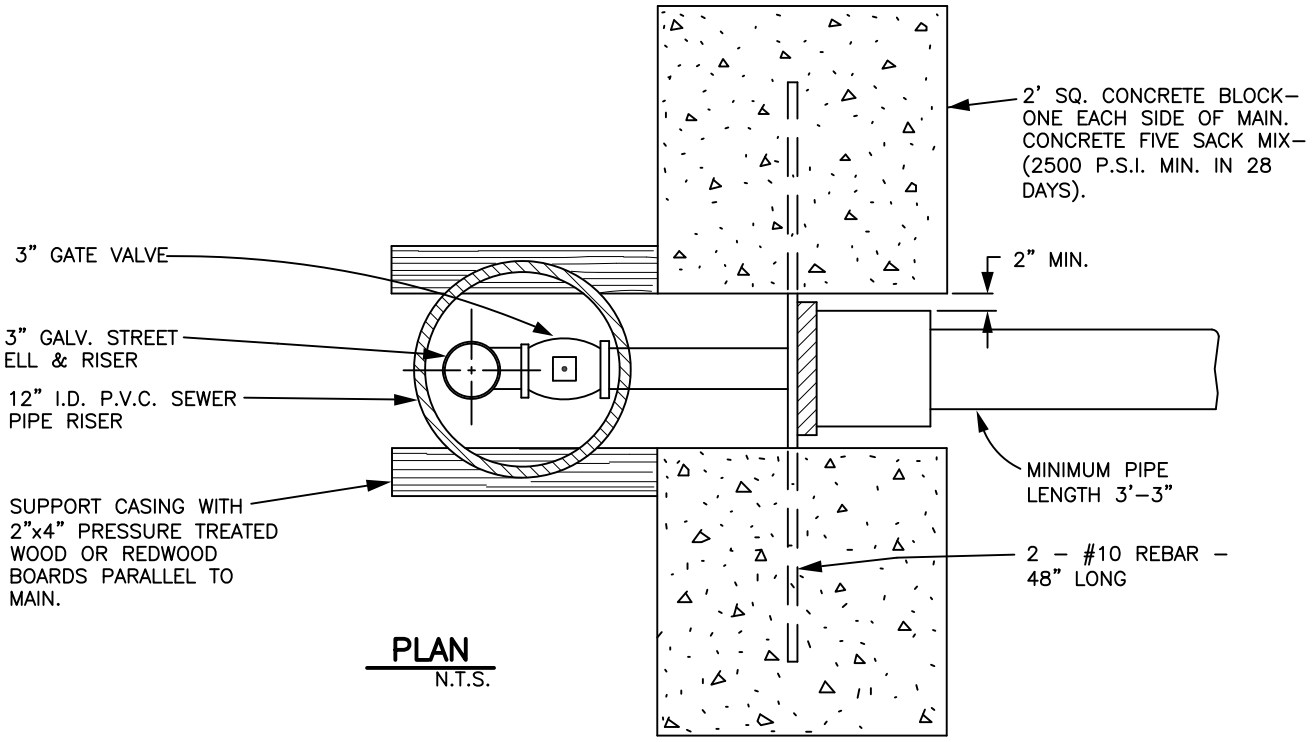
STANDARD DRAWING

REVISED: 04/04/06

DRAWING NO. WA–23



ELEVATION
N.T.S.



PLAN
N.T.S.

DEPT. OF PUBLIC WORKS

CITY OF HANFORD

ENGINEERING DIVISION

APPROVED BY:

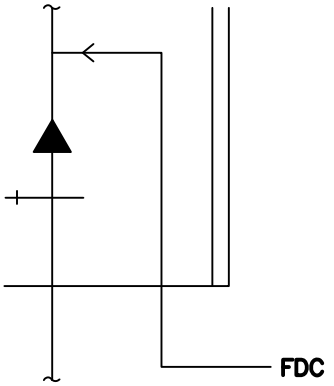
CITY ENGINEER R.C.E. 062044

BLOW-OFF ASSEMBLY

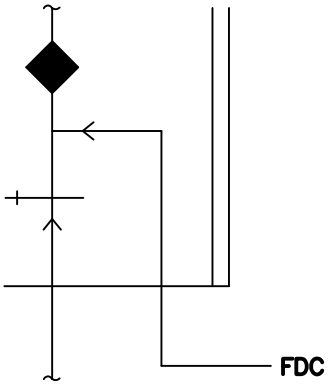
STANDARD DRAWING

REVISED: 04/04/06

DRAWING NO. WA-26

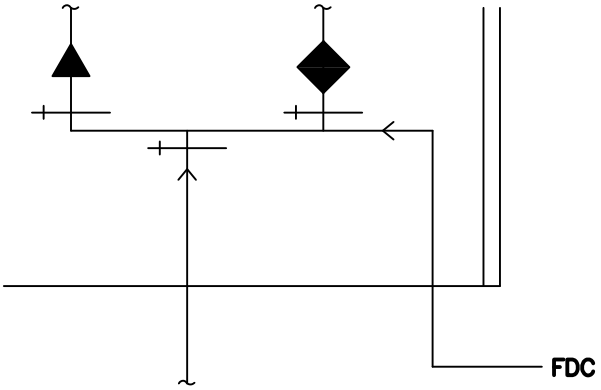


WET PIPE SYSTEM

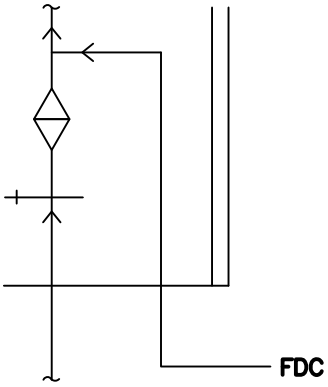


DRY PIPE SYSTEM

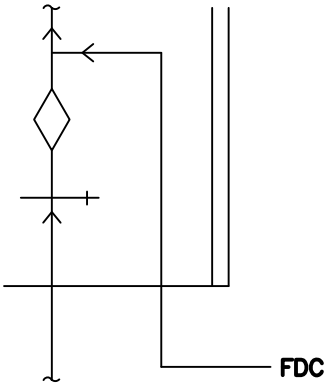
NOTE:
RISER SHALL BE LOCATED IN A ROOM ACCESSIBLE FROM THE OUTSIDE BY THE FIRE DEPT. THE DOOR SHALL BE LABELED "FIRE SPRINKLER RISER ROOM" AS PER FIRE DEPT. STANDARDS.



WET PIPE AND DRY PIPE SYSTEM



PREACTION SYSTEM



PREACTION SYSTEM

CHECK VALVE — OS & Y VAVLE — ALARM VALVE — DRY PIPE VALVE

DELUGE VALVE — PREACTION VALVE — FDC FIRE DEPARTMENT CONNECTION

EXAMPLES OF ACCEPTABLE ARRANGEMENTS PER NFPA 13

NOTE:
DIAGRAMS ARE SCHEMATIC CROSS SECTIONS—NOT PLAN VIEWS.

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CITY OF HANFORD

ENGINEERING DIVISION

FIRE SPRINKLER RISER INSTALLATION

STANDARD DRAWING

APPROVED BY:

CITY ENGINEER R.C.E. 062044

REVISED: 04/04/06

DRAWING NO. WA–27

FIRE PUMPER CONNECTION

STANDARD DRAWING

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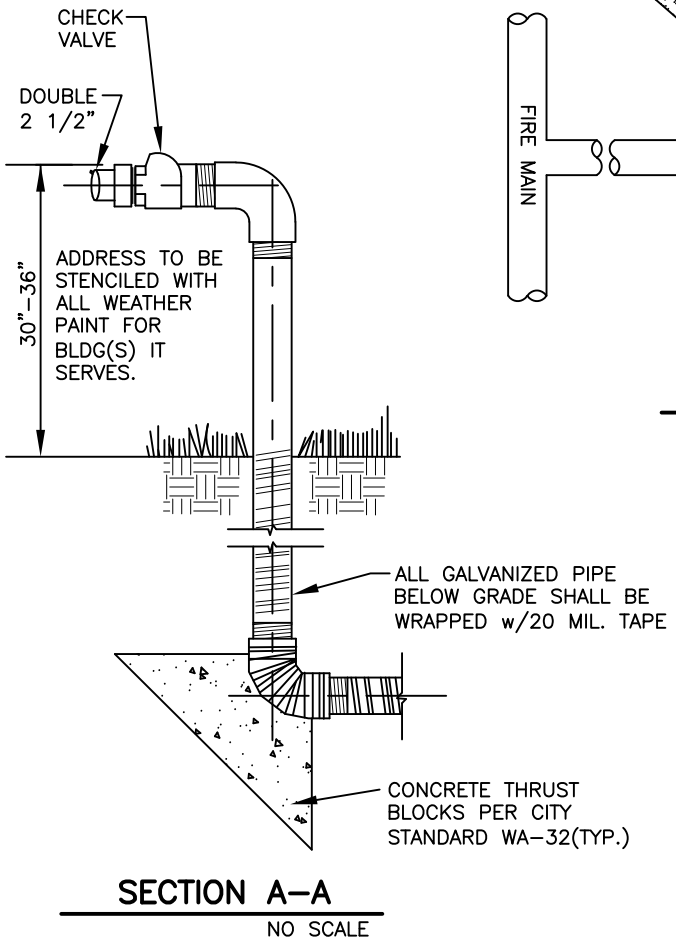
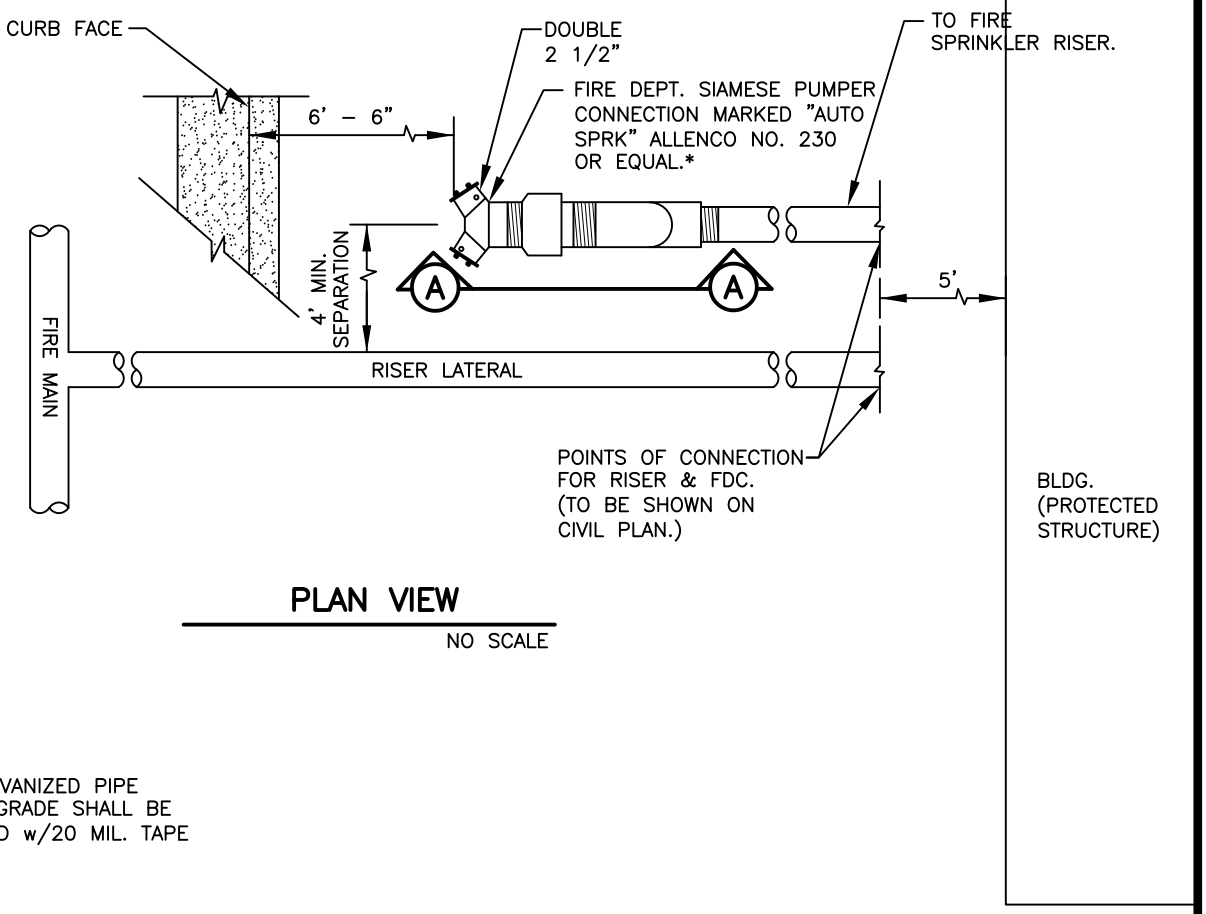
REVISED: 04/04/06

DRAWING NO. WA-28



SECTION A-A

NO SCALE



PLAN VIEW

NO SCALE

NOTE:

UNDERGROUND PIPING FOR FIRE LINES SHALL BE TESTED HYDRAULICALLY AT 200 PSI FOR 2 HOURS AS PER NFPA 13. UNDERGROUND PIPE SHALL NOT BE BURIED BUT MAY BE CENTER LOAD BURIED DURING 200 PSI TEST. PIPE STAMP WORDING SHALL BE FACING UPWARD. FIRE DEPT. TO WITNESS TEST. FIRE DEPARTMENT CONNECTION SHALL BE WITHIN 25 FEET OF A FIRE HYDRANT.

FIRE SERVICE BACKFLOW PREVENTER ASSEMBLY

STANDARD DRAWING

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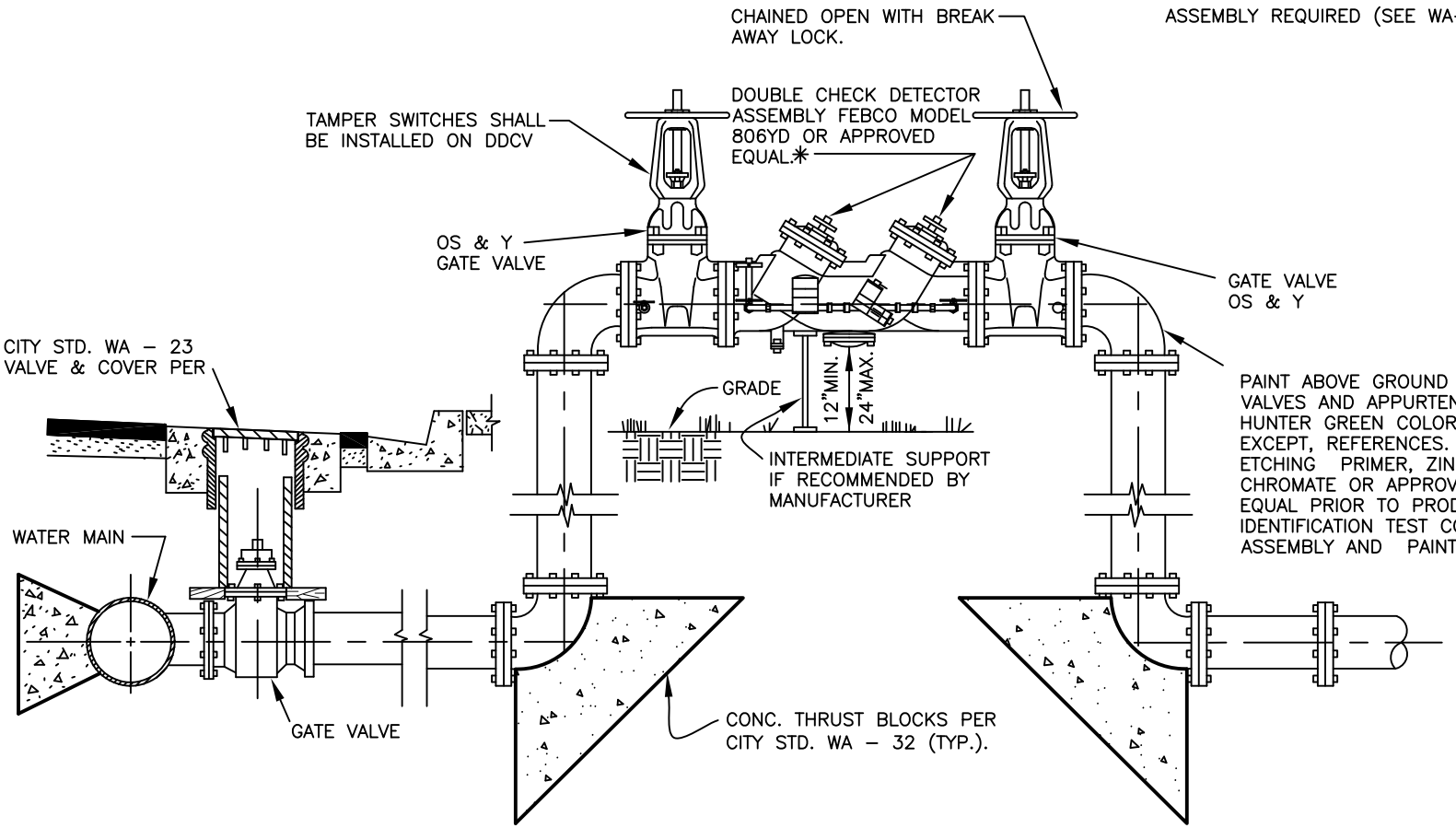
DRAWING NO. WA–29

NOTE:

FOR DOMESTIC WATER SERVICES, REDUCED PRESSURE BACKFLOW ASSEMBLY REQUIRED (SEE WA–18).

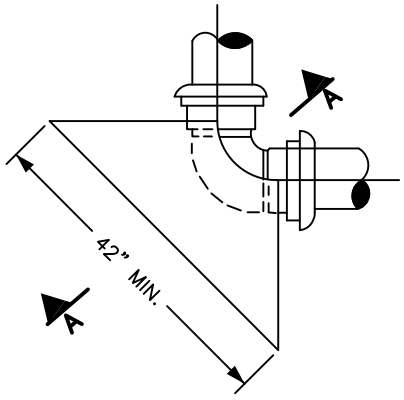


SECTION VIEW

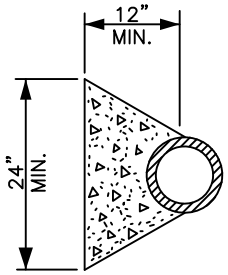
NO SCALE

NOTE:

UNDERGROUND PIPING FOR FIRE LINES SHALL BE TESTED HYDRAULICALLY AT 200 PSI FOR 2 HOURS AS PER NFPA 13 UNDERGROUND PIPE SHALL NOT BE BURIED BUT MAY BE CENTER LOAD BURIED DURING 200PSI TEST. PIPE STAMP WORDING SHALL BE FACING UPWARD FIRE DEPT. TO WITNESS TEST.

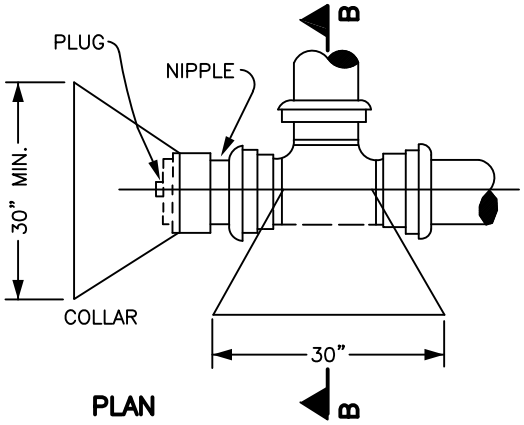


PLAN

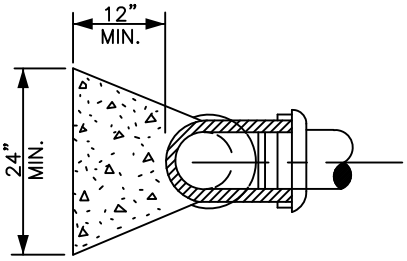


SECTION A – A

BENDS

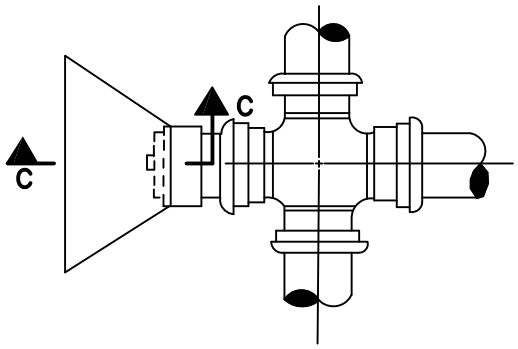


PLAN

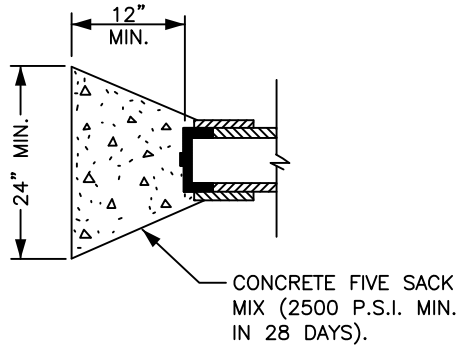


SECTION B – B

TEES & PLUGS



PLAN



SECTION B – B

PLUGGED CROSSES

NOTE:

THRUST BLOCKS ACCORDING TO PIPE MANUF. INSTALLATION GUIDE AND APPROVAL OF CITY ENGINEER

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CONCRETE THRUST BLOCKS

STANDARD DRAWING

APPROVED BY:

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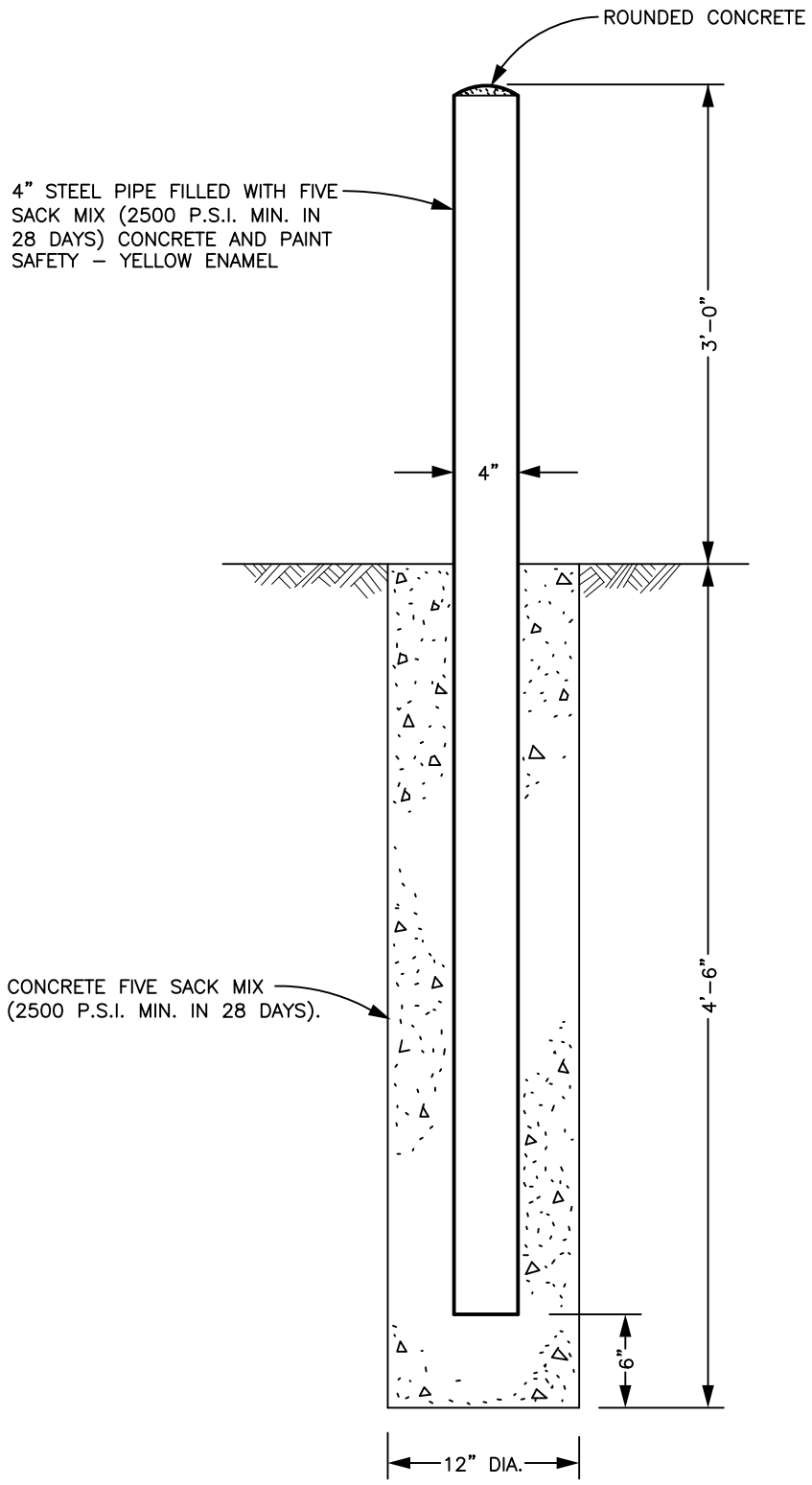
REVISED: 04/04/06

DRAWING NO. WA–32



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PROTECTION POST

STANDARD DRAWING

REVISED: 04/04/06

DRAWING NO. WA–35