Chapter 5

CONCRETE STANDARDS

Sections.

5.1: General Provisions

(A) **General.** Concrete work within any street, park, trail or alley ROW or in any part of the water system, wastewater system, parks and storm drainage system of the City shall meet the requirements of these Standards and Specifications. Engineering, plans, licenses, permits, inspection, warranties and acceptance shall be as detailed in these applicable Standards and Specifications for the type of construction involved.

For work within existing traveled rights-of-way, an excavation and right-of-way permit shall be obtained before work begins. Copies of the approved drawings and the permit shall be on the job site and available to the Inspector.

5.2 Mix Design Criteria

(A) **General.** All concrete designed, reinforcement, materials, mixing, placing finishing, etc. shall conform to American Concrete Institute (ACI) Codes, specifically Codes 301 and 318, latest edition.

(B) **Classification.** The classification for all General Use or flatwork concrete in the City of Fruita shall conform to City of Grand Junction Section 601 – Class B Concrete. All structural work shall be CDOT Standards Specifications Table 601-1 Class D unless otherwise noted.

(C) **Ready-Mixed Concrete.** The use of ready-mixed concrete in no way relieves the Responsible Party of the responsibility for proportion, mix, delivery or placement of concrete; concrete must conform to the requirements of these Standards and Specifications and ASTM C-94.

Concrete shall be continuously mixed or agitated from the time the water is added until the time of use and shall be completely discharged from the truck mixer or truck agitator within one and one-half (1½) hours after it comes in contact with the mixing water or with the aggregates. Re-tempered concrete shall not be allowed.

The City shall have free access to the mixing plant during times of operation. The organization supplying the concrete shall have sufficient plant and transportation facilities to assure continuous delivery of the concrete at the required rate. If requested, batch tickets shall be provided containing the following information:

(a) weight and type of cement;
(b) weights of fine and coarse aggregates;
(c) volume (in gallons) of water including surface water on aggregates;
(d) quantity (cubic yards) per batch;
(e) times of batching and discharging of concrete;
(f) name of batch plant;
(g) name of person placing the order;
(h) name and amount of admixture if approved;
(i) date and truck number, and;
(j) ticket number and cumulative total (per job).

5.3: Materials Specifications

General. Refer to ACI Code 301.

5.4: Concrete Placement

(A) **General.** Before depositing concrete, debris shall be removed from the space to be occupied by the concrete and the forms, including any existing concrete surfaces, shall be thoroughly wetted. Concrete shall not be placed until forms and reinforcing steel have been inspected and approved by the City. Concrete shall be handled from the mixer to the place of final deposit as rapidly as possible by methods that prevent separation or loss of ingredients. The concrete shall be deposited in the forms as nearly as practicable in its final position to avoid re-handling. It shall be deposited in continuous layers, the thickness of

which generally shall not exceed twelve (12) inches. Concrete shall be placed in a manner that shall avoid segregation and shall not be dropped freely more than five (5) feet. If segregation occurs, the City may require the concrete to be removed and replaced at the Responsible Party's expense. Concrete shall be placed in one continuous operation, except where keyed construction joints are shown on the plans or as approved by the City. Concrete slump shall not exceed 4 inches. Delays in excess of thirty (30) minutes may require removal and replacement of that pour, as determined by the City.

(B) **Subgrade Preparation.** The subgrade shall be excavated or filled to the required grades and lines. Soft, yielding or otherwise unsuitable material shall be removed and replaced with suitable material. Filled sections shall be compacted and compaction shall extend a minimum of six inches outside the form lines. The subgrade shall be compacted to the density shown on the plans and trimmed to provide a uniform surface at the correct elevation.

(C) **Vibrating.** Concrete shall be thoroughly compacted and/or vibrated. Concrete shall be compacted by internal vibration using mechanical vibrating equipment, except that concrete in floor slabs, sidewalks, or curb and gutter, not poured against form linings, shall be either tamped or vibrated. Care shall be taken in vibrating the concrete to vibrate only long enough to bring a continuous film of mortar to the surface. Vibration shall stop before any segregation of the concrete occurs. Mechanical vibrators shall be an approved type as specified in CDOT Specifications 601.12e Concrete Vibrating. Vibrators shall not be used to move or spread the concrete.

Any evidence of the lack of consolidation or over-consolidation shall be regarded as sufficient reason to require the removal of the section involved and its replacement with new concrete at the Responsible Party's expense. The Responsible Party shall be responsible for any defects in the quality and appearance of the completed work.

(D) **Workability.** The consistency of concrete shall be kept uniform for each class of work and shall be checked by means of slump tests. The workability of the concrete shall be varied as directed by the City. Concrete shall have a consistency such that it can be worked into corners and angles of the forms and around joints, dowels and tie-bars by the construction methods, which are being used without excessive spading, segregation or undue accumulation of water or latent material on the surface. If, through accident, intention, or error in mixing, concrete fails to conform to the proportions of the approved mix design, such concrete shall not be incorporated in the work but shall be properly disposed of off the project site as waste material at the Responsible Party's expense. If water is added at the job site, slump tests shall be run and test cylinders cast following the addition of the water. In no case shall concrete slump exceed four inches. Expenses incurred in excess of ordinary tests shall be borne by the Responsible Party.

(E) **Backfilling.** When side forms are removed and the concrete has gained sufficient strength, the space adjoining the concrete shall be promptly backfilled with suitable material, properly compacted and brought flush with the surface of the concrete and adjoining

ground surface. In embankments, the backfill shall be level with the top of the concrete for at least two (2) feet and then sloped as shown on the drawings or as directed by the City.

(F) **Detectable Warnings.** Detectable warnings shall be installed on new curb ramps and other locations where pedestrian ways blend with vehicular ways without tactile cues. Detectable warning surfaces shall consist of raised truncated domes with a diameter of nominal 0.9 in (23 mm), a height of nominal 0.2 in (5 mm) and a center-to-center spacing of nominal 2.35 in (60 mm). The domes shall be "in line" both parallel and perpendicular to the ramp to form a square grid pattern. The detectable warning shall contrast visually with adjoining surfaces, either light-on-dark, or dark-on-light. The domes and the underlying surface shall have a minimum of 70% contrast with the light reflectivity of the adjoining surface. Detectable warning surfaces shall extend 24 inches in the direction of pedestrian travel and shall match the width of the curb ramp (48" typical), landing or blended transition. The detectable surface shall be located so that the edge nearest the roadway is 6 inches minimum and 8 inches maximum from the face of curb line or from the edge of roadway where there is no curb.

An approved detectable warning plate or panel shall be "wet set" into the surface of freshly placed concrete during construction of each new curb ramp. Detectable warnings may be attached to the surface of hardened concrete only when retrofitting pre-existing curb ramps or when otherwise approved by the Engineering Manager.

The following detectable warning systems are approved for use in new curb ramp construction:

- Cast iron detectable Warning Plates manufactured by East Jordan Iron Works (800) 626-4653 or Neenah Foundry Company (303) 809-6315
- Cast iron detectable warning plates SWP2424 and SWP1224 furnished by Castings, Inc. (970) 243-2032
- Replaceable Composite (wet-set) Tactile manufactured by ADA Solutions, Inc. (800) 372-0519
- ADA Replaceable Tiles manufactured by ADA Replaceable Tiles (970) 245-3400

The following products are approved for retrofitting pre-existing curb ramps with surface applied detectable warnings:

- Armor-Tile Ridged Plastic Mat manufactured by Engineered Plastics, distributed by White Cap Construction Supplies (970) 245-6787
- Surface Mount composite Tactile manufactured by ADA Solutions, Inc. (800) 372-0519
- USA Safety Domes, Surface Mount System (800) 540-9277

All other detectable warning types, materials and manufacturers shall be approved by the City's Engineering Manager prior to installation.

All detectable warnings, except cast iron plates, shall be brick red I color (note: yellow detectable warnings are being phased out and will not be allowed after June 30, 2009).

Detectable warnings shall be installed in accordance with the manufacturer's instructions and the City of Grand Junction Standard Concrete Detail C-23.

(G) **Repairs.** After stripping of the forms, if any concrete is found to be not formed as shown on the drawings or is out of alignment or level, or shows a defective surface, it shall be considered as not conforming with the intent of these Standards and Specifications and shall be removed and replaced by the Responsible Party at his expense unless the City gives written permission to patch the defective area. In this case, patching shall be done as described in the following paragraphs. Defects that require replacement or repair are those that contain honeycomb, damage due to stripping of forms, loose pieces of concrete, bolt-holes, tie-rod holes, uneven or excessive ridges at form joints, and bulges due to movement of the forms. Ridges and bulges shall be removed by grinding. Honeycombed and other defective concrete that does not affect the integrity of the structure shall be chipped out, and the vacated areas shall be filled in a manner acceptable to the City. The repaired area shall be patched with a non-shrink, non-metallic grout with a minimum compressive strength of five thousand (5,000) psi in twenty-eight (28) days. Repair areas treated with an epoxy-bonding agent shall have the approval of the City before the repair filling is placed. Bolt-holes, tie-rod holes, and minor imperfections shall be filled with dry-patching mortar as approved by the City. Mortar repairs shall be placed in layers and thoroughly compacted by suitable tools. Care shall be taken in filling rod and bolt holes so that the entire depth of the hole is completely filled with compacted mortar. The mortar mix proportions described above are approximate.

Those areas with excessive deficiencies as determined by the City shall be removed and replaced at the Responsible Party's expense. Where repairs are made in existing sidewalks, all edges of the old sidewalk allowed to remain shall be saw cut to a minimum depth of two (2) inches. No rough edges shall be permitted where new construction joins the old section. Unless directed by the City, no section less than five (5) feet in length shall be placed or left in place. Where new sidewalk construction abuts existing sidewalks, the work shall be accomplished so that there is no abrupt change in grade between the old section and the new work.

No addition to existing sidewalks or other flat work concrete shall be made less than four (4) feet in width. The City may require doweling into the existing concrete.

5.5: Joints and Joint Spacing

(A) **Expansion Joint.** Expansion joint material shall be provided at the following locations and shall be in place prior to the placement of concrete:

(1) At each end of curb returns.
(2) Between back of sidewalk and driveway slab or service walk.
(3) Between new concrete and existing masonry buildings.
(4) As shown on the drawings.
(5) As directed by the City Engineer.
(6) Between new and existing concrete.
(7) Every one hundred (100) feet in sidewalk curb and gutter when hand-formed.

(8) Every two hundred (200) feet in sidewalk, curb and gutter when placed slip formed.

(B) **Contraction Joint.** Control joints shall have the same meaning as contraction joints. Construction joints referred to in subsection 608.03(e) of the CDOT Standard Specifications shall have the same meaning as isolation joints.

Transverse expansion joints shall be placed in curb, gutter and sidewalk at both ends of intersection radii and at other locations shown on the plans. The maximum spacing of expansion joints in continuous curb, gutter and/or sidewalk shall be 500 feet.

Isolation joints shall be placed around all appurtenances such as manholes, utility poles, sign posts, etc. and between new concrete and any fixed structure such as a building or bridge. Isolation joints and expansion joints shall be formed with preformed joint filler conforming to AASHTO M213 unless otherwise specified or approved. Preformed joint filler shall be extended to the full depth of the concrete section and be set or trimmed to ½ inch below the finished surface. All expansion and isolation joints shall be sealed in accordance with the detail shown in the Standard Concrete Details.

Curb, gutter and sidewalk shall be divided into uniform sections by forming contraction joints with a jointing tool, or by saw cutting after the concrete has hardened. Contraction joints in trails and detached sidewalks shall be made by saw cutting or with preformed plastic strips.

Contraction joints shall extend into the concrete at least ¼ of the depth of the concrete and shall be 1/8 to ¼ inch wide. Joints shall be spaced at intervals of (10) ten feet unless otherwise specified or approved. Where the length of a pour precludes even ten-foot joint spacing, the end section(s) may be less than (10) ten feet but not less than (5) five feet in length. Sawed joints shall be installed immediately after the concrete has hardened and before irregular shrinkage cracks form in concrete. When contraction joints are saw cut, hand tooled contraction joints shall be installed at intervals not to exceed (50) fifty feet to prevent shrinkage cracking before the remaining joints are cut.

Where new concrete is placed adjacent to existing concrete the joint type and spacing shall match to those in the existing concrete.

(C) **Tool Joint.** Tool joints shall be spaced as follows:

(1) Not more than ten (10) feet or less than five (5) feet apart in curb and gutter and combination curb-sidewalk.

(2) Not more than the width of the sidewalk (up to eight (8) feet), nor less than five (5) feet apart in sidewalk.

(3) At least two (2) joints equally spaced at not greater than ten (10) foot intervals applicable to driveways.

(4) Joints shall be placed, in addition, at the mid-point of V-pans at street crossings.

(5) Other locations as directed by the City or as shown on the plans.

(D) **Joint Materials.** Joint materials shall conform to AASHTO, ASTM Specifications according to type as follows:

	AASHTO	ASTM
Concrete joint sealer, hot poured elastic or	M173	D6690-01
Cold applied conforming to ASTM C920	C920	
Preformed expansion joint filler (Bituminous Type)	M 33	D99-98
Preformed sponge rubber and cork expansion joint fillers	M 153	D1752-84
Preformed expansion joint fillers, non-extruding and resilient bitumen	M 213	D1751-99

5.6: Finishing and Curing

(A) **Finishing.** Exposed faces of curbs and sidewalks shall be finished to true-line and grade as shown on the plans. Surface shall be floated to a smooth but not slippery finish. Sidewalk and curb shall be broomed or combed and edged, unless otherwise directed by the City. After completion of brooming and before concrete has taken its initial set, edges in contact with the forms shall be tooled with an edger having a three-eighths (3/8) inch radius. **No dusting or topping of the surface or sprinkling with water to facilitate finishing shall be permitted. A steel trowel finish is unacceptable for exposed concrete within City right-of-way.**

Immediately following the removal of the forms, fins and irregular projections shall be removed from surfaces except from those that are not to be exposed or are not to be waterproofed. On surfaces, the cavities produced by form ties, honeycomb spots, broken corners or edges and other defects, shall be thoroughly cleaned, moistened with water and carefully pointed and trued with a mortar consisting of cement and fine aggregate. The surface shall be left sound, of acceptable finish, even, and uniform in color. Mortar used in pointing shall not be more than thirty (30) minutes old. Construction and expansion joints in the completed work shall be left carefully tooled and free of mortar and concrete. The joint filler shall be left exposed for its full length with clean and true edges.

(B) **Curing.** All flatwork and all slip formed combination curb/ gutter/ sidewalk shall be coated with an approved spray applied curing compound. Fresh concrete shall be protected from weather damage and mechanical injury during the curing periods. The use of a

membrane-curing compound is required. Membrane curing compound shall be Type 2, Class B in accordance with CDOT Specification 711.01 Concrete Curing Materials. The membrane-curing compound shall be applied at the rate of three hundred (300) square feet per gallon.

Membrane curing compound shall not be used when the concrete surface will be painted. The type of membrane curing compound chosen shall not permanently discolor the concrete surface. Where membrane-curing compound is not used, the curing process shall be carefully adhered to as follows:

(1) Optional curing processes described herein may be used at discretion of the City. The selected curing process shall be started as soon as it can be done without injury to the concrete surface. The following curing procedures may be used subject to the approval of the City.

(a) Ponding (for slabs or footings)

(b) Wet burlap, earth or cotton mats

(c) Waterproof paper or polyethylene plastic cover

(B) Concrete that is poorly finished or improperly cured shall be removed at the City's discretion.

5.7 Extreme Weather Protection

(A) **Cold Weather Concreting.** A period when more than three successive days of average daily outdoor temperature is below 40^{o} F (the average of the highest and lowest temperatures from midnight to midnight) constitutes cold weather concreting conditions. During cold weather concreting conditions, concrete construction shall be accomplished in accordance with CDOT Specifications 601.12 (c) and ACI 306-R88. November, December, January, February, and March are designated as cold weather months and require concrete protection regardless of temperature. In all cases, the concrete supplier shall furnish concrete suitable for placement in cold weather conditions.

(B) **Proper Placing and Protection of Concrete.** Insulated blankets are required as cover for concrete placed during cold weather. It is the responsibility of the contractor, in extreme conditions, to determine if additional measures are needed to maintain the temperature requirements. The following prohibitions and conditions shall be in effect during cold weather:

(1) Concrete shall not be placed on frozen subgrade.

(2) Concrete shall not be placed on or against forms covered with snow or ice.

(3) Insulating materials shall be available and easily accessible.

(4) Avoid direct contact of fresh concrete with carbon dioxide emitted from poorly ventilated space heaters.

(5) Always use ASTM approved curing compounds to insure proper curing and to prevent rapid drying and loss of moisture.

(6) Maintain concrete at 55^{o} F for three days (two days if ad-mixture is used). If the temperature requirements are not met, the concrete must continue to be protected until twice the deficiency in degree-days is met. For example, if the average temperature for the three days was maintained at 50^{o} F (5^{o} below the requirement), the concrete will need to be maintained at 65^{o} (twice the deficiency) for an additional three days, or at 55^{o} for an additional 6 days.

In practice, if the contractor is unable to maintain 55^{o} F, he may also be unable to provide the increased protection requirement, three days after placement, without the use of heat generating equipment. Failure to provide the additional protection required, after first failing to provide the three days at 55^{o} F, shall be grounds for rejecting the concrete.

Note: If the concrete is found to have frozen in the first 24 hours, it shall be rejected.

(C) **Hot Weather Concreting.** Except by written authorization, concrete shall not be placed if the temperature of the plastic concrete cannot be maintained at ninety (90) degrees Fahrenheit or lower. The placement of concrete in hot weather shall comply with CDOT Specification 601.12 Placing Concrete.

5.8 Testing, Final Inspection and Acceptance

(A) **General.** The requirements of this section shall apply to testing services for concrete curb and gutter, sidewalk, pavement, slope paving, retaining walls, structures, and for miscellaneous concrete testing. Refer to Table 4.1 for testing requirements.

Concrete materials and operations shall be tested as directed by the City and as herein stipulated. The required testing services shall be performed by a testing agency approved by the City and testing agencies shall meet the requirements of ASTM E329.

A representative of the testing agency shall inspect, sample, and test material and production of concrete as required by the City at the Responsible Party's expense. When it appears that any material furnished or work performed by the Responsible Party fails to fulfill specification requirements, the testing agency shall report such deficiency to the City and the Responsible Party.

The testing agency shall report test and inspection results to the City and Responsible Party immediately after they are performed. Test reports shall include the exact location of the work at which the batch represented by a test was deposited. The report of the strength test shall include detailed information on storage and curing of specimen prior to testing, the project number and the location of the concrete (curb, manhole, inlet, sidewalk, paving, etc.). Test reports shall bear the seal and signature of a PE registered in the State of Colorado and competent in the field of concrete testing. Reports not properly certified shall not be accepted.

The testing agency or its representative is not authorized to revoke, alter, relax, enlarge or release any requirements of these Standards and Specifications, nor approve or accept any portion of the work.

(B) The acceptance of all concrete improvements by the City will be based on the following.

(1) Submittal of all required test results certified by the Engineer or a qualified independent laboratory.

(2) Submittal of a copy of the daily inspection reports prepared by the Engineer or his representative.

(3) Passing a final inspection of the work by the City

5.9: Flowcrete/Flowfill Specifications

(A) General. There are many flow-fill mix designs available from local concrete producers that represent a variety of construction conditions. A minimum of 50 psi compressive strength will be required for all conditions. Each contractor is required to submit the specific proposed design mix to the City. Written approval by the City is required prior to commencing with the flow-fill work.

5.10: Concrete Details

A. Accessible Detail Notes

B. Detectable Warning Curb Ramp

C. Ramp in Curb, Gutter and Sidewalk w/Fillet

D. Ramp with Monolithic Curb, Gutter and Sidewalk

E. Ramp with Detached Sidewalk

F. Ramps at Intersecting Sidewalks

G. Retrofit Ramp Existing Streets

H. Intersection and Pan Details and Sections

I. Driveway Detail w/Sidewalk Sections

J. Drive-over Curb, Gutter and Sidewalk

K. Curb and Gutter Details

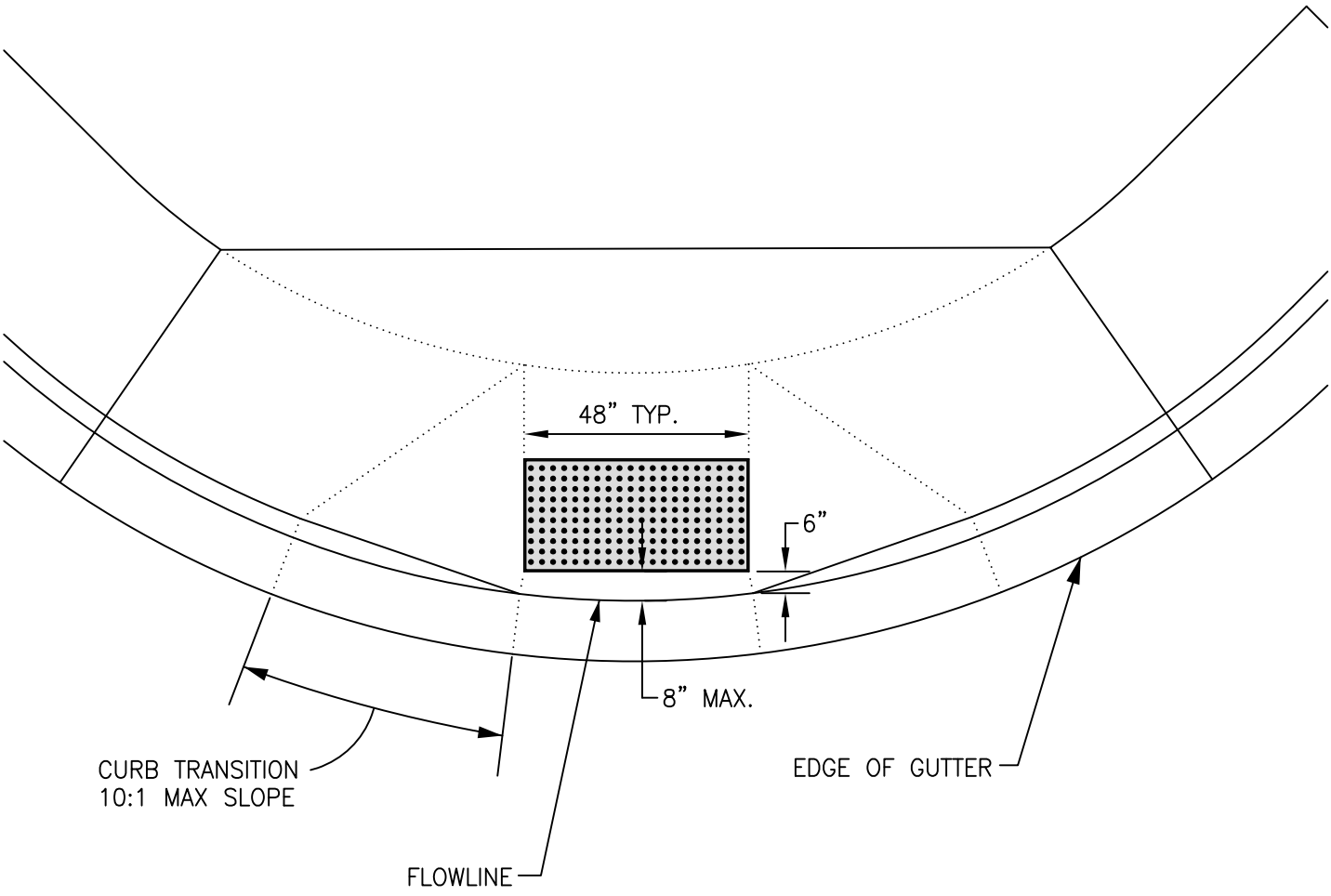
L. Drive-over Curb and Gutter Detail

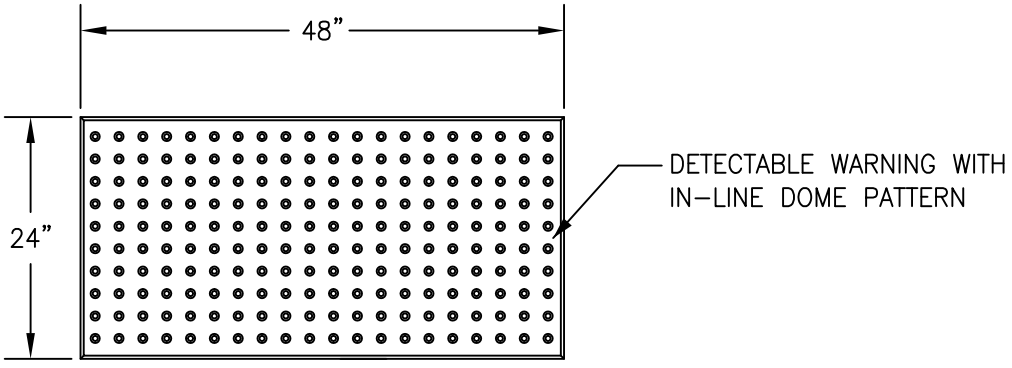
M. Concrete Joint Details

N. Flow-fill

1. All general use Portland Cement Concrete shall conform to the City of Grand Junction Specification 601 (structural concrete Class B). All concrete shall be mixed, placed, cured and tested in accordance with City of Fruita street construction specifications. All structural work shall be CDOT Standard Specifications Table 601-1 Class D, unless otherwise noted.
2. All concrete work within public right-of-way shall be performed by a licensed curb, gutter & sidewalk contractor. A permit is required at each site where concrete is removed, altered or placed.
3. All concrete ramps, sidewalks, curbs, gutters and other concrete work shall be underlaid with aggregate base course (class 6) compacted to at least 95% of AASHTO T-180 maximum density. See details for base thickness. The top 6" of subgrade under all concrete shall be compacted to at least 95% of AASHTO T-99 maximum density. All saturated or unsuitable subgrade material shall be removed and replaced.
4. Any existing pavement not designated for removal which is damaged by construction shall be replaced in-kind by contractor.
5. Drawing indicates typical sections only. Conditions and/or obstructions may necessitate variations or repositioning. All locations shall be approved on an individual basis by the City Engineer or his/her representative.
6. Accessible curb ramps at intersections shall be aligned with street crosswalks.
7. An approved curing/sealing compound shall be applied to all exposed concrete surface immediately after finishing (refer to section 5.6(B)).
8. All concrete shall be protected from freezing for 5 days after being placed. No concrete shall be placed on frozen ground.
9. Minimum spacing between joints in curb, gutter & sidewalk is 5'. Maximum spacing is 10'.
10. Water shall not be added to concrete surfaces during finishing operations.
11. The surface of all accessible ramps and flared sides shall be finished with a course broomed texture perpendicular to the slope of the ramp.
12. All handicap ramps, parking stalls and landings shall conform to the Uniform Federal Accessibility Standards (UFAS) lates edition.

CITY OF FRUITA ENGINEERING DEPARTMENT	SCALE HORIZONTAL: N/A VERTICAL: N/A	REVISION: 2009 STANDARDS REVISION DATE: 3/18/09 REVISION: _____ DATE: _____ REVISION: _____ DATE: _____	ACCESSIBLE DETAILS NOTES	FILE: SHEET: 5.10A	DRAWN BY: CLD DATE DRAWN: 5/06 CHECKED BY: ___





DETECTABLE WARNING:

AN APPROVED DETECTABLE WARNING SHALL BE "WET SET" INTO THE FRESHLY FINISHED CONCRETE SURFACE OF EACH NEW CURB RAMP. SURFACE APPLIED DETECTABLE WARNINGS MAY BE USED ONLY FOR RETROFITTING PRE-EXISTING CURB RAMPS. SEE SECTION 608.03, PARAGRAPH (j) OF THE CITY OF GRAND JUNCTION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION FOR APPROVED DETECTABLE WARNING MATERIALS AND MANUFACTURERS. DETECTABLE WARNING SHALL BE INSTAILED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS UNLESS OTHERWISE APPROVED.

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DETECTABLE WARNING FOR CURB RAMP

REVISION: 2009 STANDARDS REVISION DATE: 3/18/09
REVISION: _____ DATE: _____
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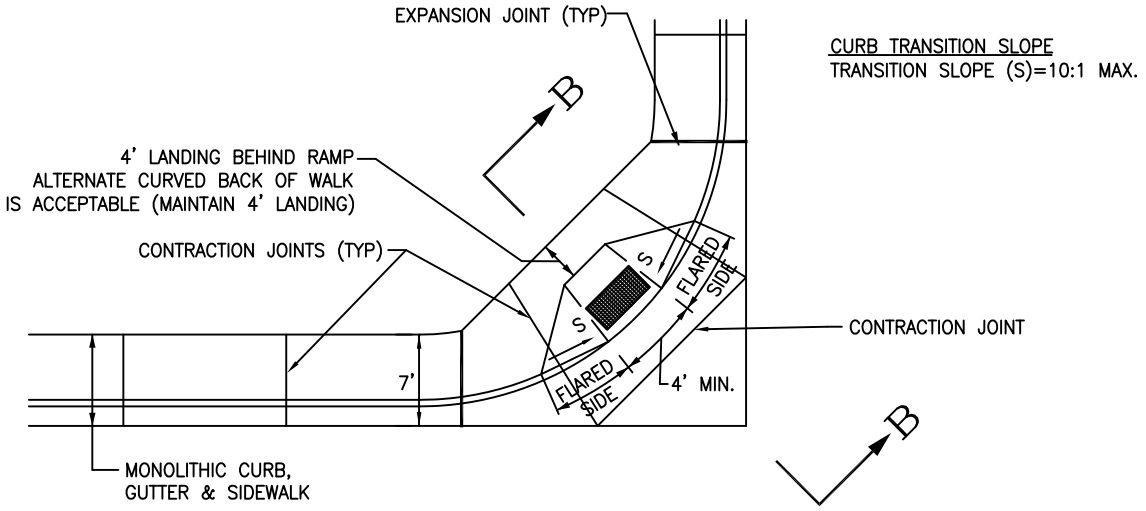
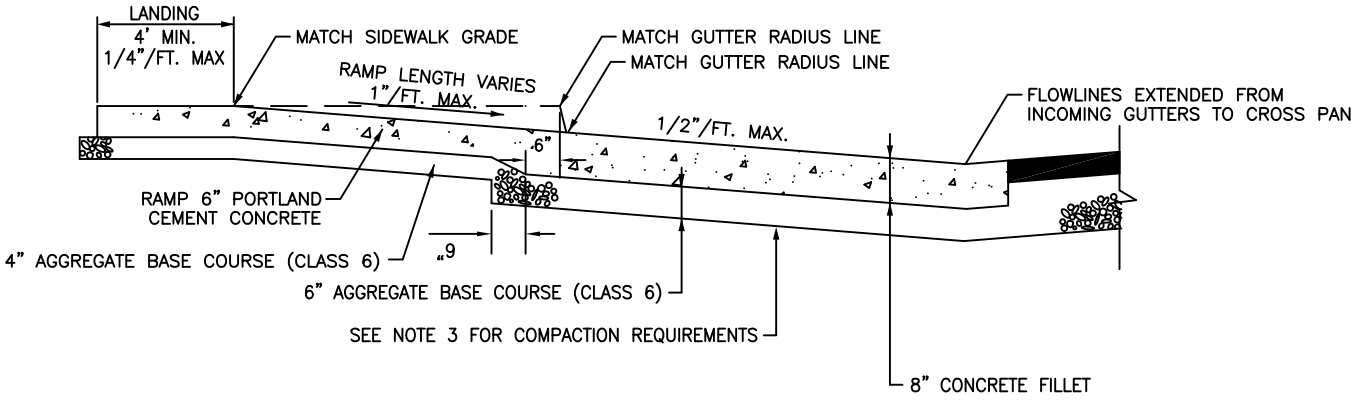
SCALE
HORIZONTAL: N/A
VERTICAL: N/A

CITY OF FRUITA
ENGINEERING DEPARTMENT



RAMP IN MONOLITHIC CURB, GUTTER AND SIDEWALK WITH CONCRETE FILLET



SECTION B–B

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RAMP IN CURB, GUTTER & SIDEWALK WITH FILLET

REVISION: 2009 STANDARDS REVISION DATE: 3/18/09
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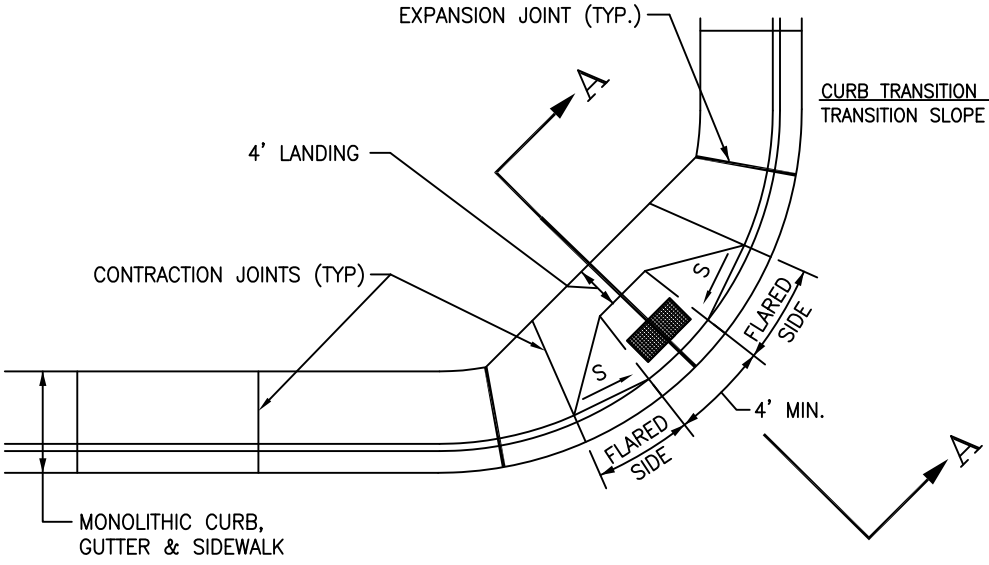
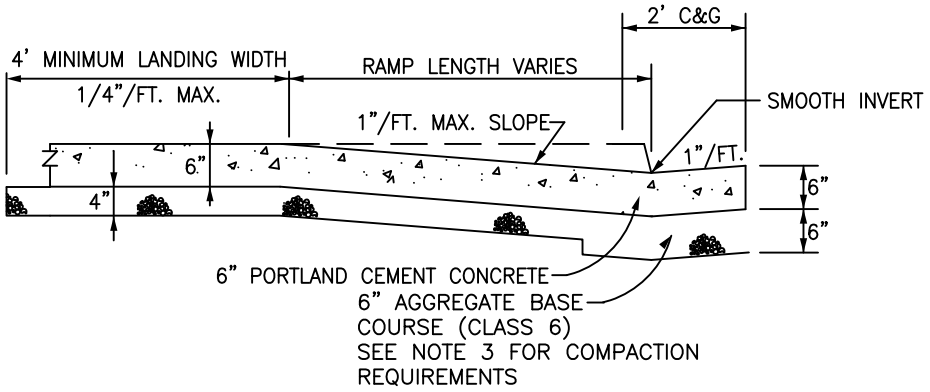
SCALE
HORIZONTAL: N/A
VERTICAL: N/A

CITY OF FRUITA
ENGINEERING DEPARTMENT



RAMP IN MONOLITHIC CURB, GUTTER AND SIDEWALK



SECTION A—A

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RAMP WITH MONOLITHIC CURB, GUTTER & SIDEWALK

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SCALE
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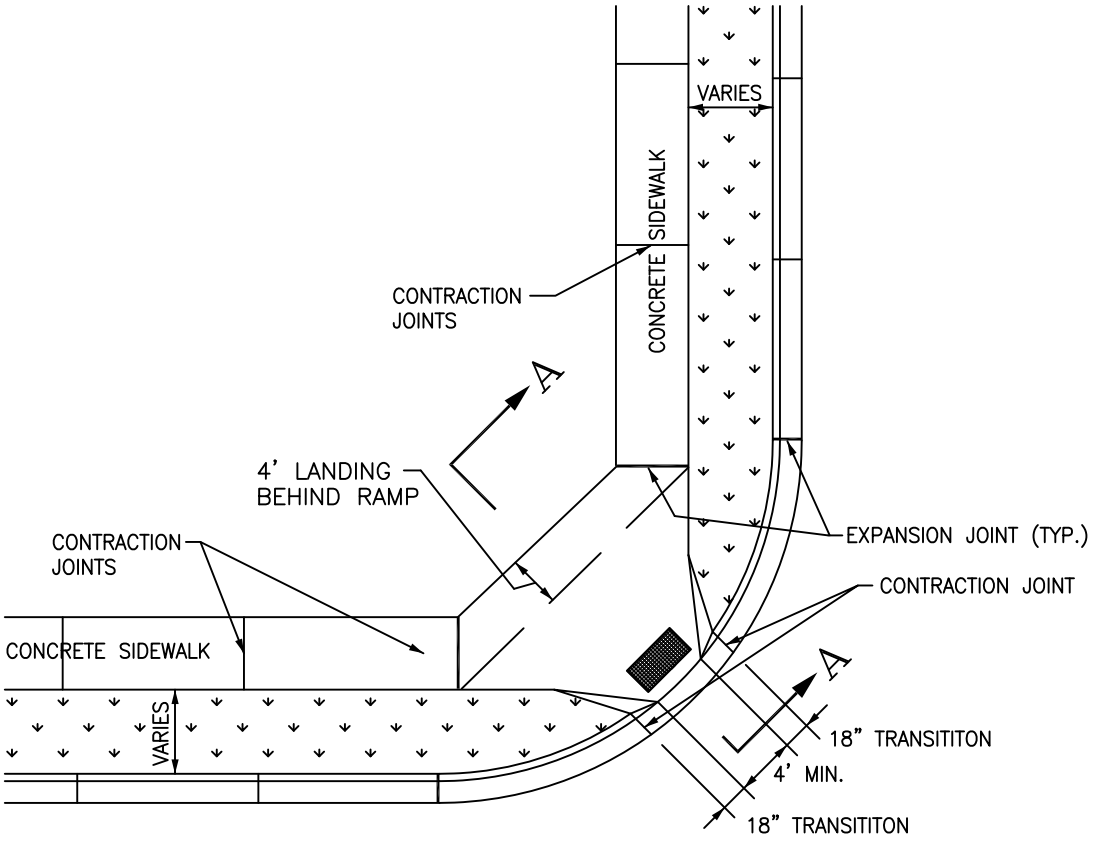
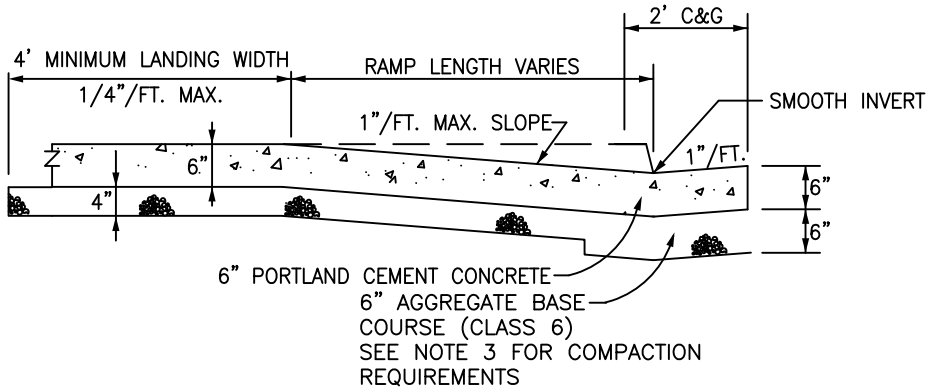
VERTICAL: N/A

CITY OF FRUITA
ENGINEERING DEPARTMENT



CURB RAMP WITH DETACHED SIDEWALKS



SECTION A—A

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RAMP WITH DETACHED SIDEWALK

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SCALE
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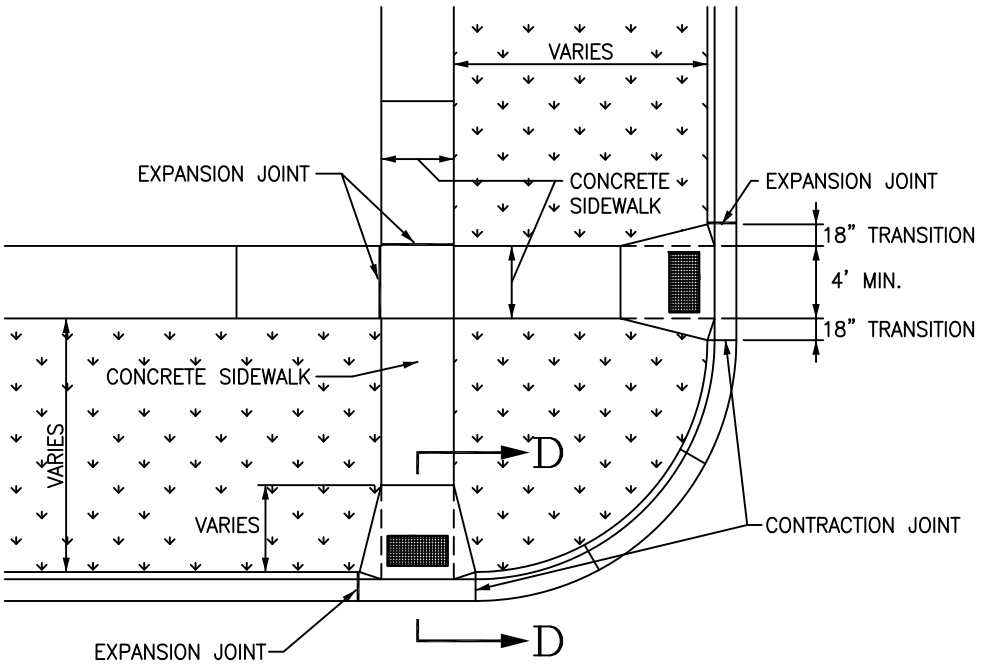
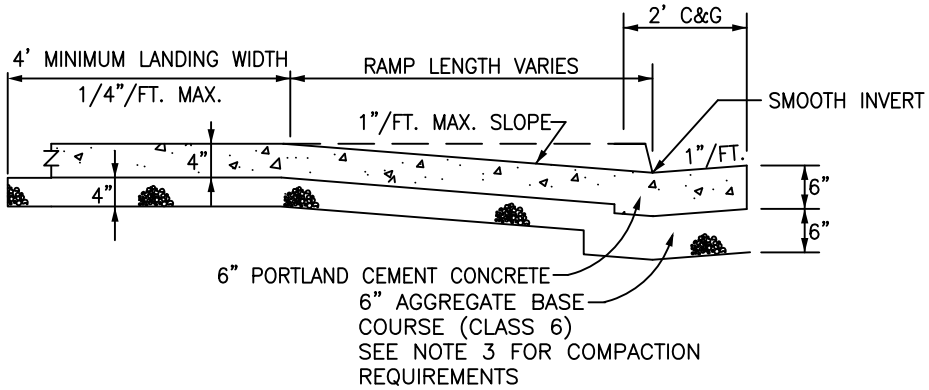
CITY OF FRUITA
ENGINEERING DEPARTMENT



CURB RAMP(S) AT INTERSECTING SIDEWALK



SECTION D–D

DRAWN BY: CLD
DATE DRAWN: 5/06
CHECKED BY: ___

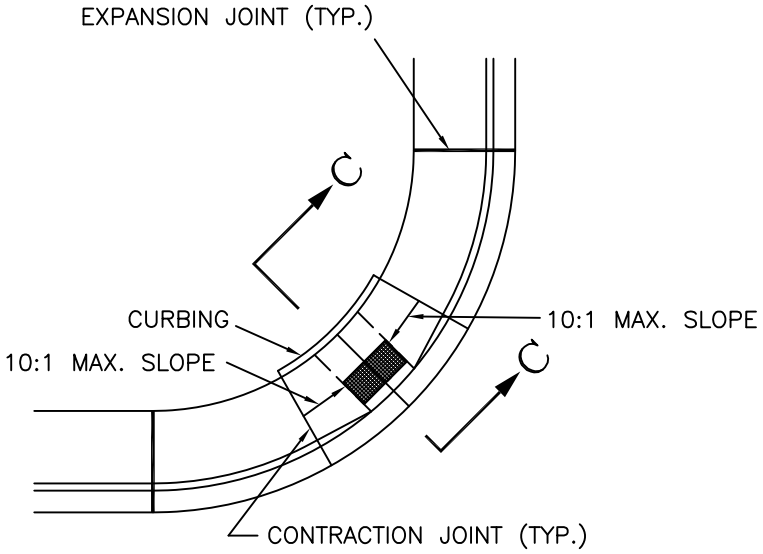
FILE:
SHEET: 5.10F

RAMPS AT INTERSECTING SIDEWALKS

REVISION: 2009 STANDARDS REVISION DATE: 3/18/09
REVISION: _____ DATE: _____
REVISION: _____ DATE: _____

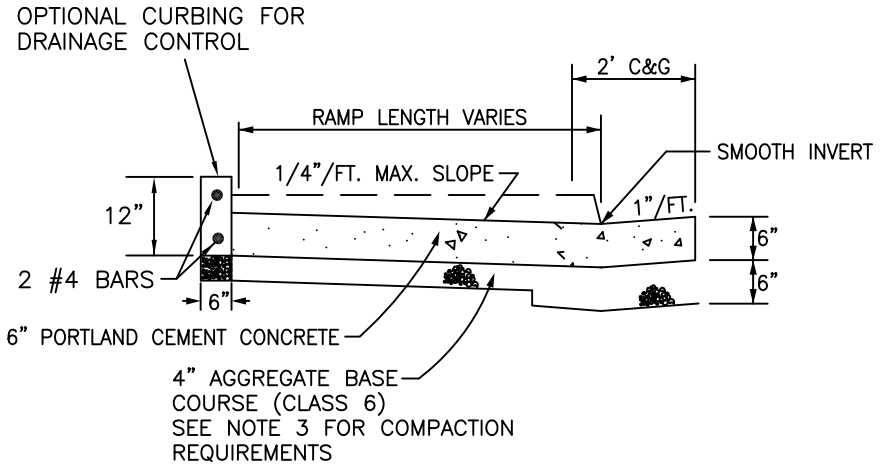
SCALE
HORIZONTAL: N/A
VERTICAL: N/A

CITY OF FRUITA
ENGINEERING DEPARTMENT



ALTERNATE RAMP

WITHOUT LANDING BEHIND RAMP
(FOR RETROFIT ON EXISTING STREETS ONLY)



SECTION C—C

DRAWN BY: CLD
DATE DRAWN: 5/06
CHECKED BY: ___

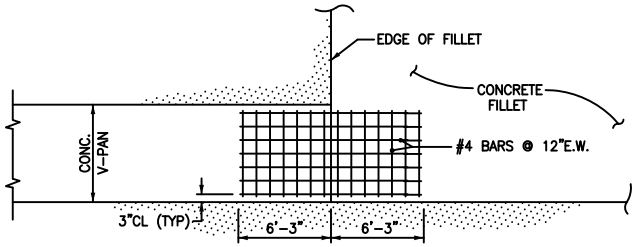
FILE:
SHEET: 5.10G

RETROFIT RAMP EXISTING STREETS

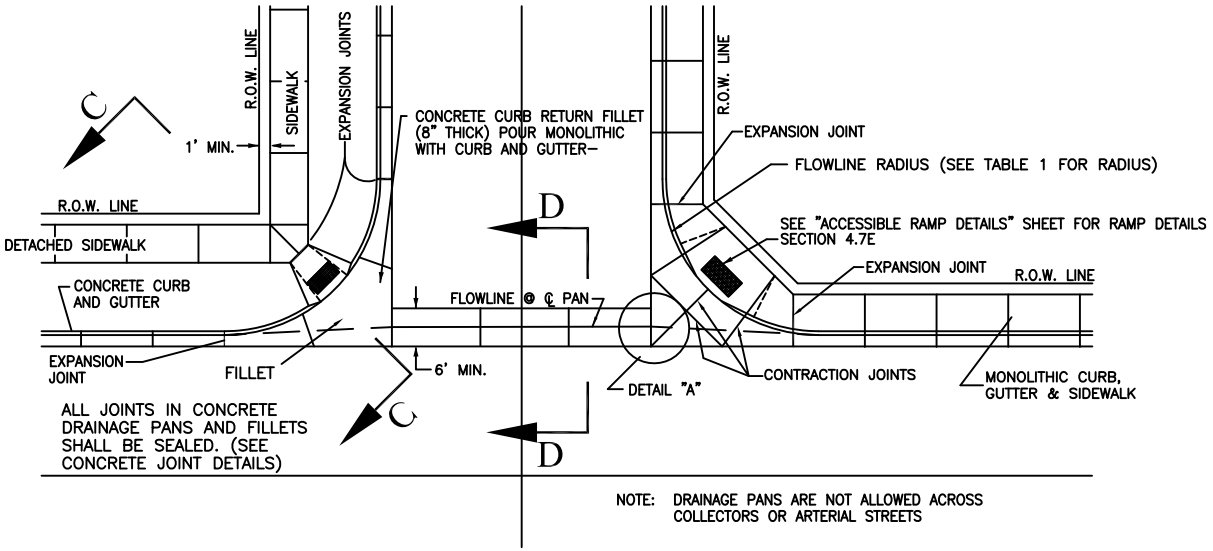
REVISION: 2009 STANDARDS REVISION DATE: 3/18/09
REVISION: _____ DATE: _____
REVISION: _____ DATE: _____

SCALE
HORIZONTAL: N/A
VERTICAL: N/A

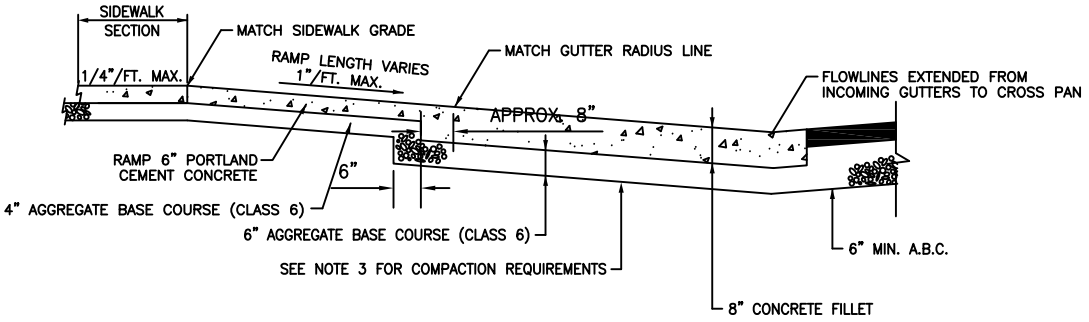
CITY OF FRUITA
ENGINEERING DEPARTMENT



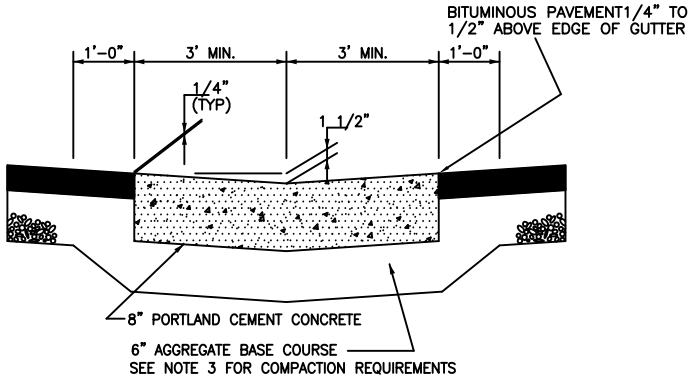
DETAIL "A"



STREET INTERSECTION AND DRAINAGE PAN DETAILS

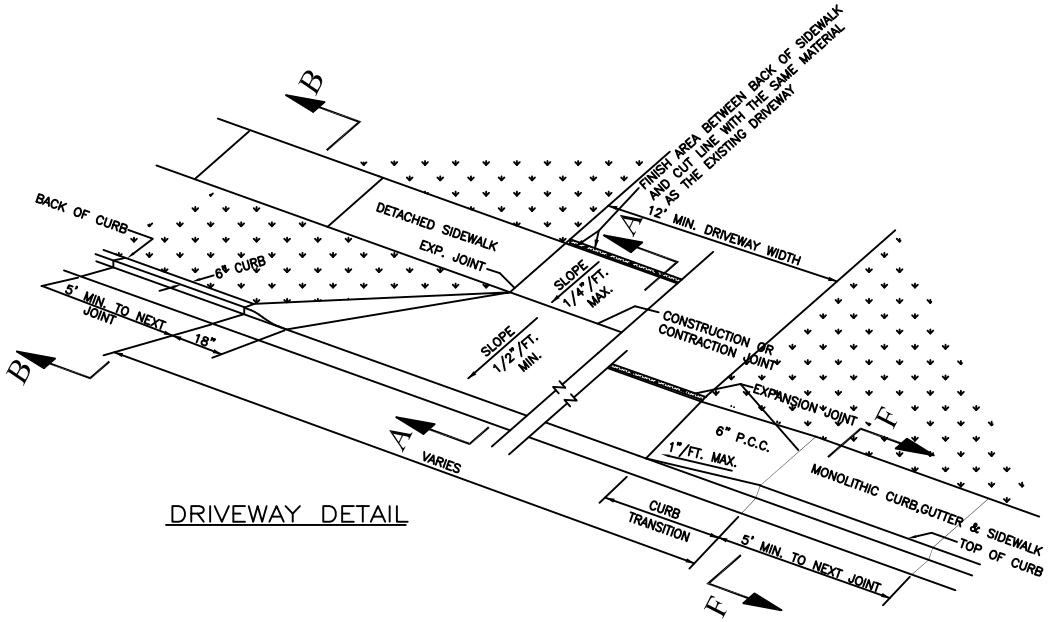


SECTION C–C

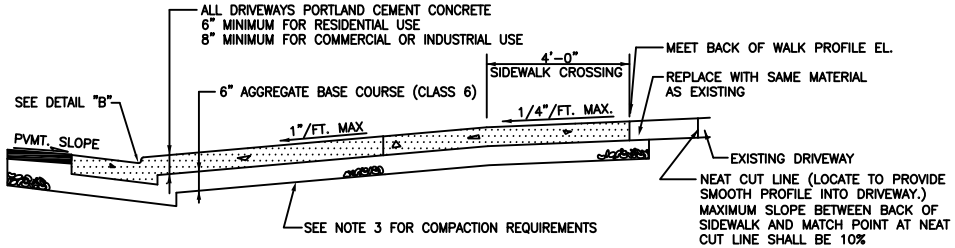


SECTION D–D

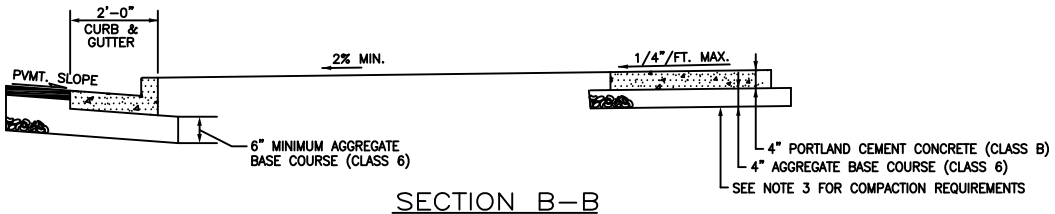
CITY OF FRUITA ENGINEERING DEPARTMENT	SCALE HORIZONTAL: N/A VERTICAL: N/A	REVISION: 2009 STANDARDS REVISION DATE: 3/18/09 REVISION: _____ DATE: _____ REVISION: _____ DATE: _____	INTERSECTION & PAN DETAILS & SECTIONS	FILE: SHEET: 5.10H	DRAWN BY: CLD DATE DRAWN: 5/06 CHECKED BY: ___



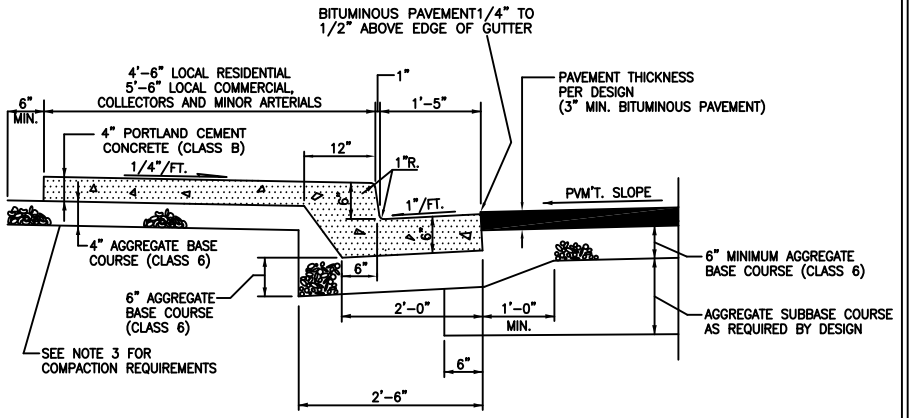
DRIVEWAY DETAIL



SECTION A–A

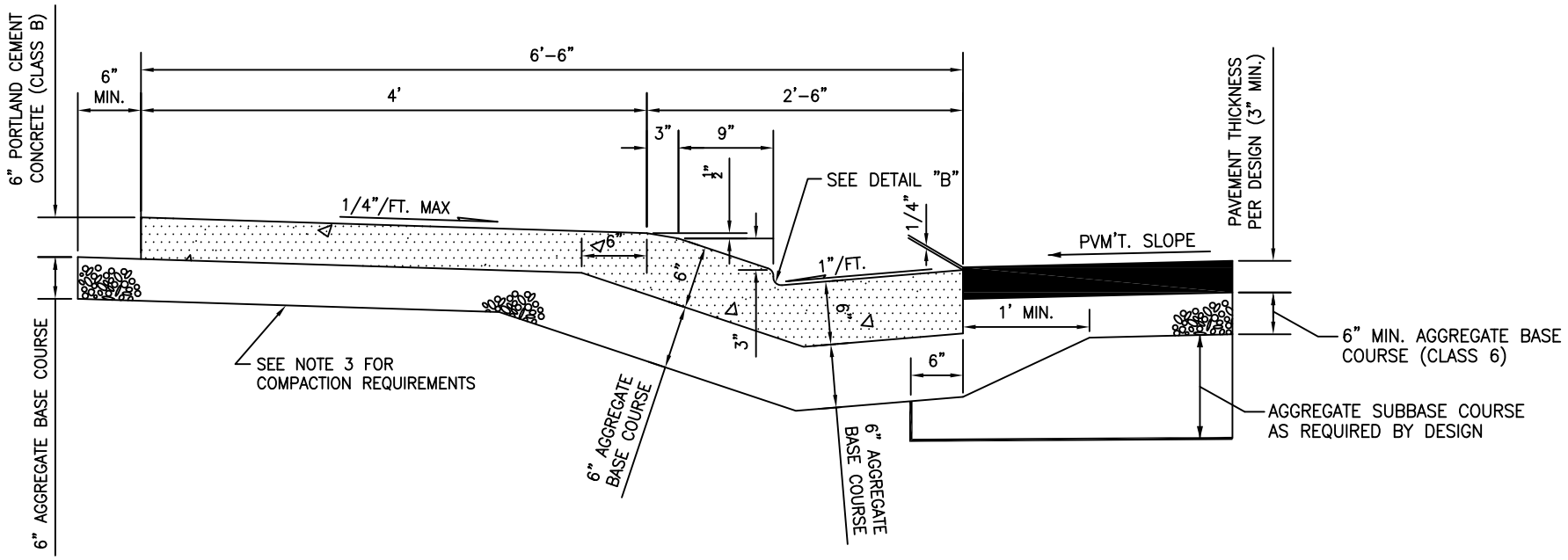


SECTION B–B

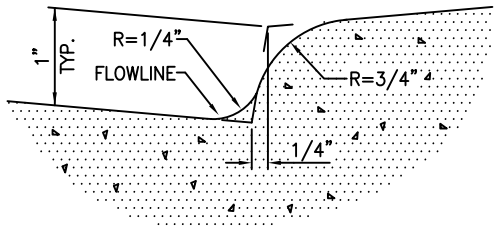


MONOLITHIC CURB, GUTTER & SIDEWALK
SECTION F–F

CITY OF FRUITA ENGINEERING DEPARTMENT	SCALE HORIZONTAL: N/A VERTICAL: N/A	REVISION: 2009 STANDARDS REVISION DATE: 3/18/09 REVISION: _____ DATE: _____ REVISION: _____ DATE: _____	DRIVEWAY DETAIL W/ SIDEWALK SECTIONS	FILE: SHEET: 5.101	DRAWN BY: CLD DATE DRAWN: 5/06 CHECKED BY: ___

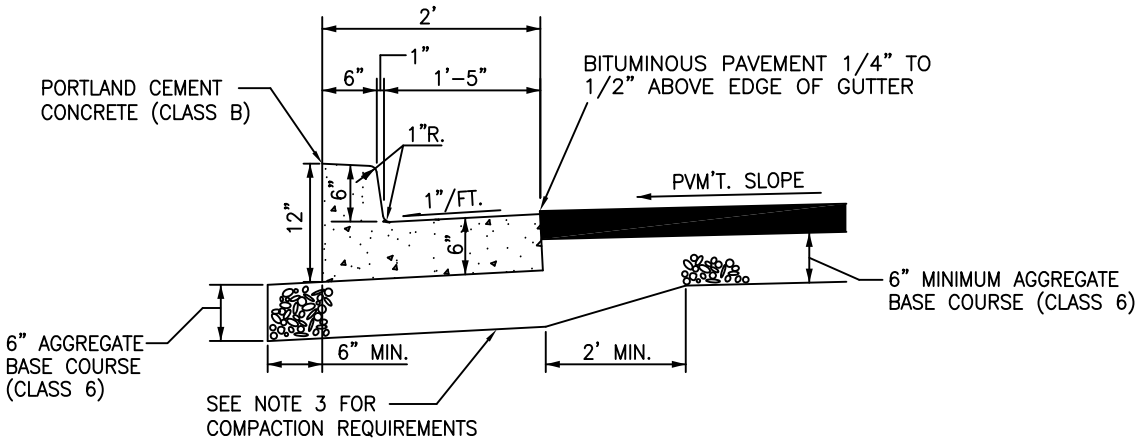


DRIVE–OVER CURB, GUTTER & SIDEWALK
(URBAN RESIDENTIAL STREETS ONLY)

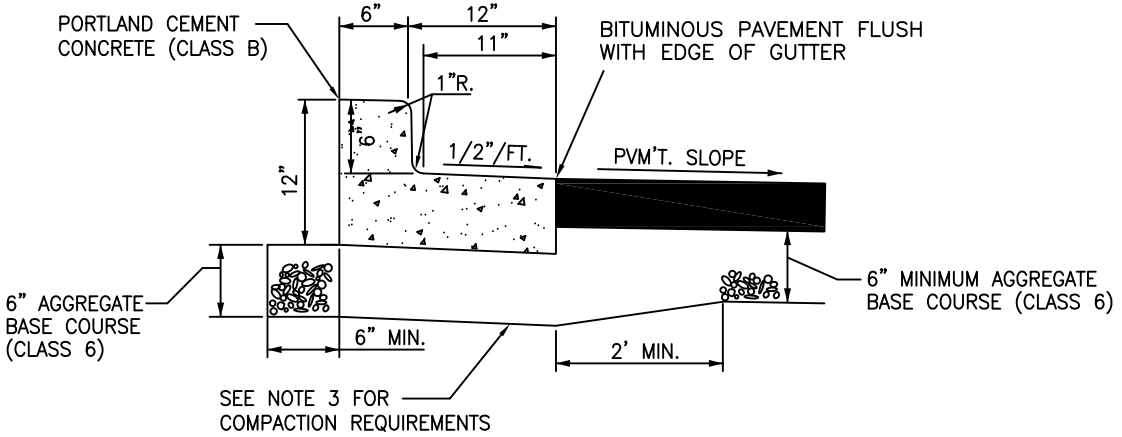


DETAIL "B"

CITY OF FRUITA ENGINEERING DEPARTMENT	SCALE HORIZONTAL: N/A VERTICAL: N/A	REVISION: 2009 STANDARDS REVISION DATE: 3/18/09 REVISION: _____ DATE: _____ REVISION: _____ DATE: _____	DRIVE–OVER CURB, GUTTER & SIDEWALK	FILE: SHEET: 5.10J	DRAWN BY: CLD DATE DRAWN: 5/06 CHECKED BY: ___

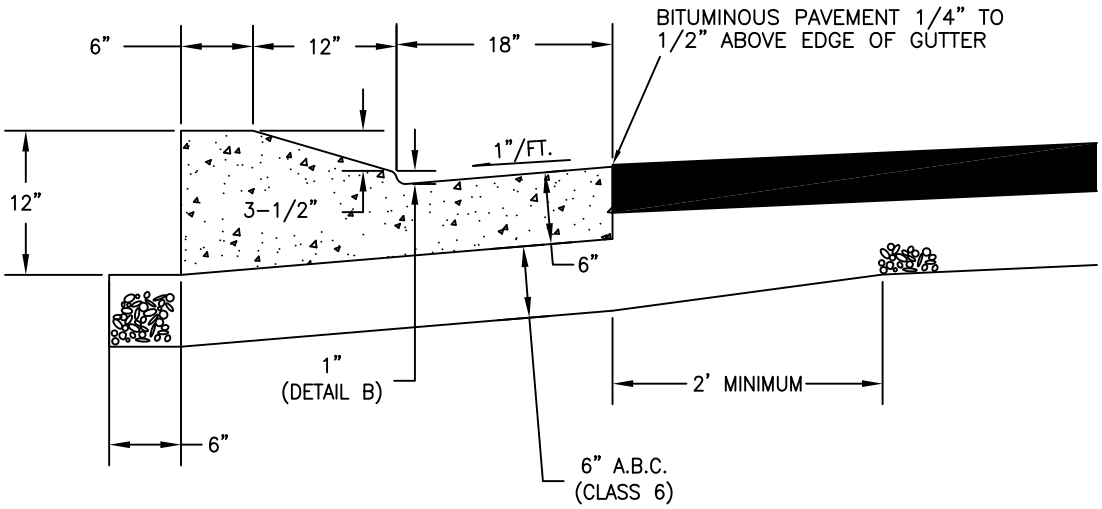


STANDARD CURB & GUTTER

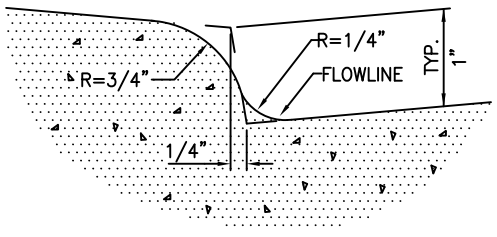


CURB WITH SPILL GUTTER

CITY OF FRUITA ENGINEERING DEPARTMENT	SCALE HORIZONTAL: N/A VERTICAL: N/A	REVISION: 2009 STANDARDS REVISION DATE: 3/18/09 REVISION: _____ DATE: _____ REVISION: _____ DATE: _____	CURB & GUTTER DETAILS	FILE: SHEET: 5.10K	DRAWN BY: CLD DATE DRAWN: 5/06 CHECKED BY: ___



DRIVE-OVER CURB & GUTTER



DETAIL "B"

DRAWN BY: CLD
DATE DRAWN: 5/06
CHECKED BY: ___

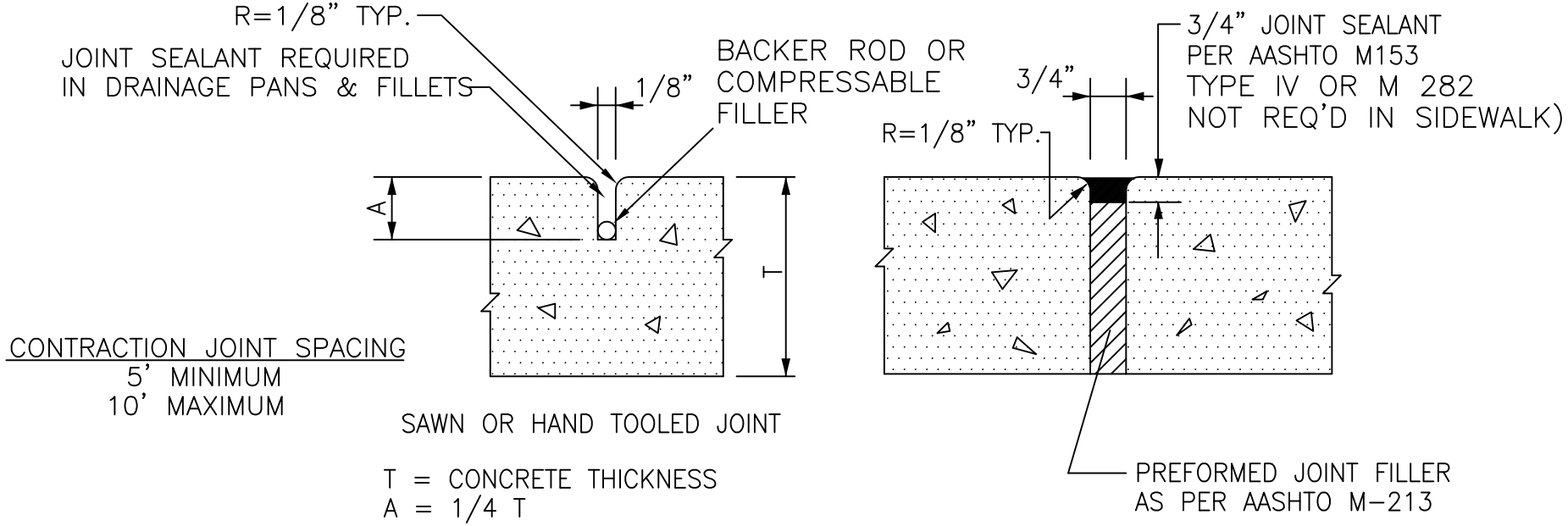
FILE:
SHEET: 5.10L

DRIVE-OVER CURB & GUTTER DETAILS

REVISION: 2009 STANDARDS REVISION DATE: 3/18/09
REVISION: _____ DATE: _____
REVISION: _____ DATE: _____

SCALE
HORIZONTAL: N/A
VERTICAL: N/A

CITY OF FRUITA
ENGINEERING DEPARTMENT



CONTRACTION JOINT

EXPANSION JOINT
200' MAXIMUM SPACING

CONCRETE JOINT DETAILS

CITY OF FRUITA ENGINEERING DEPARTMENT	SCALE HORIZONTAL: N/A VERTICAL: N/A	REVISION: 2009 STANDARDS REVISION DATE: 3/18/09 REVISION: _____ DATE: _____ REVISION: _____ DATE: _____	CONCRETE JOINT DETAILS	FILE: SHEET: 5.10M	DRAWN BY: CLD DATE DRAWN: 5/06 CHECKED BY: ___

MISCELLANEOUS NOTES:

1. THERE ARE MANY FLOW–FILL MIX DESIGNS AVAILABLE FROM LOCAL CONCRETE PRODUCERS THAT REPRESENT A VARIETY OF CONSTRUCTION CONDITIONS. CONSULT WITH THE CITY ENGINEER REGARDING THE CORRECT MIX DESIGN TO USE FOR EACH PROJECT AND EACH SPECIFIC CONDITION. EACH CONTRACTOR IS REQUIRED TO SUBMIT THE SPECIFIC PROPOSED DESIGN MIX TO THE CITY ENGINEER AT THE PRE–CONSTRUCTION MEETING. WRITTEN APPROVAL BY THE CITY ENGINEER IS REQUIRED PRIOR TO COMMENCING WITH THE FLOW–FILL WORK.

PLACEMENT OF FLOWABLE FILL CONCRETE BACKFILL

AFTER ALL PIPE AND APPURTENANCES HAVE BEEN PLACED IN THE TRENCH, BEDDED, AND THE WORK APPROVED IN PLACE, THE TRENCH SHALL BE BACKFILLED WITH FLOW–FILL CONCRETE TO BASE OF SUBGRADE OR PAVEMENT AS SPECIFIED. THE FLOW–FILL CONCRETE SHALL BE RODDED OR VIBRATED AS NECESSARY TO ASSURE VOIDS WILL NOT BE PRESENT IN THE FLOW–FILL CONCRETE OR AROUND OR UNDER PIPE, FITTINGS, AND APPURTENANCES.

PLACEMENT OF BASE COURSE OR PAVING SHALL NOT OCCUR UNTIL THE FLOW–FILL CONCRETE BACKFILL HAS ATTAINED SUFFICIENT STRENGTH TO SUPPORT CONSTRUCTION EQUIPMENT WITHOUT OBSERVABLE DEFORMATION.

CITY OF FRUITA ENGINEERING DEPARTMENT	SCALE HORIZONTAL: N/A VERTICAL: N/A	REVISION: 2009 STANDARDS REVISION DATE: 3/18/09 REVISION: _____ DATE: _____ REVISION: _____ DATE: _____	MISCELLANEOUS NOTES	FILE: SHEET: 5.10N	DRAWN BY: CLD DATE DRAWN: 5/06 CHECKED BY: ___