

**DESIGN CRITERIA  
AND  
CONSTRUCTION SPECIFICATIONS**

**STREETS  
VOLUME I**



**SEPTEMBER 2013**

**DEPARTMENT OF PUBLIC WORKS**

**TOWN OF PLATTEVILLE, COLORADO**





## **FORWARD**

The Town of Platteville's Design Criteria and Construction Specification document is intended to provide guidance for the design, review, and construction of those public improvements in or under the public right-of-way and public easements.

This document represents an attempt to assist those in the design, review, and construction industry in providing quality and long-lasting public improvements. The document also provides for consistency in the design, review, and construction areas.

The document is not intended to replace or restrict the design function of the engineer nor the innovativeness and expertise of developers and contractors. Users of this document are encouraged to submit their ideas and methods of improving the document.

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David Brand  
Public Works Director

# TOWN OF PLATTEVILLE, COLORADO

## DEPARTMENT OF PUBLIC WORKS

### DESIGN CRITERIA

AND

### CONSTRUCTION SPECIFICATIONS

#### VOLUME 1

#### STREETS

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## STREET DESIGN CRITERIA

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**SECTION 1  
MINIMUM DESIGN CRITERIA**

**1.01 SCOPE**

The purpose of this section of this document is to present the Town of Platteville criteria for the design of streets. It is to be used by developers, design architects, and design engineers in the design of public and private streets for which approval by the Town of Platteville Public Works Department is required. All street design, layout, alignment, and classification shall conform to these design criteria, the Town of Platteville Subdivision Regulations, the Town Comprehensive Plan, and Chapter 13 and 18 of the Town Municipal Code.

**1.02 GENERAL**

**A. MINIMUM STANDARDS**

1. The provisions stipulated in this section are general in nature and shall be considered as applicable to all parts of these specifications, including any supplements and revisions. All construction within the public right-of-way shall be designed by or under the direct supervision of a Professional Engineer (P.E.) registered in the State of Colorado. All drawings and support data submitted to the Town for approval must bear their seal and signature. No permits for construction will be issued until these documents have been certified by a P.E. Any over-lot grading completed during the design phase of the project must be certified by a P.E. prior to issuance of any permits for construction.
2. The design criteria as presented is intended to aid in preparation of plans and specifications for the Town of Platteville including minimum standards where required. These design criteria are considered minimum and a complete design will usually require more than is presented in this document. As with any design criteria, occasions may arise where the minimum standards are inappropriate. In these cases a variance shall be considered. Written request for each variance should be directed to the Town Public Works Department and shall conform to the requirements of the Public Works Director.
3. Whenever the provisions of these Standards are found to be inconsistent with any other regulations or codes, the Engineer shall determine the standard to apply. The provisions of these regulations are minimum requirements that do not preclude imposition of more restrictive standards by agreement or by law.
4. Projects shall comply with all laws, regulations, codes, and ordinances applicable to the design and the furnishing and performance of the work. Except where otherwise expressly required by applicable laws, regulations, codes or ordinances, the Town shall not be responsible for monitoring compliance with any law, regulation, code or ordinance.
5. The Town has subdivision regulations and development code that can help define the various processes required for projects.
6. Prior to the contractor beginning work, an approved set of plans and specifications must be on file with the Town of Platteville. All contracts, bonds, insurance, permits, and licenses must be fully executed by the Contractor before beginning work. Contractor shall have a copy of these standards and specifications on the site at all times during construction.
7. Town's review and approval will only be to determine if the plans, specifications, and construction conform to the Town's requirements. Town's review and approval will not relieve the Design Professional and Contractor/Owner from responsibility for any variation from the Town requirements or adequate design standards. The Town's review and approval shall not constitute any assumption of responsibility or liability for the design or construction.

8. It is the intent and purpose of the standards and specifications to obtain high quality construction throughout, with the completed work complying with the standards and specifications.
9. Reference to standard specifications, manuals, or codes of any technical society, organization, or association or to the laws or regulations of any governmental authority, whether such reference is specific or by implication, shall mean the latest standard specification, manual, code, or laws or regulations in effect at the time of Town acceptance. However, no provision of any referenced standard specification, manual, or code shall be effective to change the duties and responsibilities of the Town or any of their consultants, agents, or employees from those set forth in these Standards and Specifications. Work shall be done in compliance with the accepted plans and to the satisfaction of the City.
10. Consideration shall be given, within the established framework of local streets, to provide for uniformity of street widths, proper alignment, street names, and conformity to existing street patterns. The street design shall be directly related to the traffic needs. The streets, intersections, driveways, and pedestrian facilities shall be designed to provide for the greatest safety for motorists, pedestrians, and bicyclists.
11. All alleys, when permitted by the Engineer, shall be paved to a full width and shall provide paved access to a paved street at both ends.
12. Residential lots adjacent to an arterial street shall be served by a local street. Direct access will not be allowed from any residential lot onto an arterial.
13. Streets of less than the entire minimum right-of-way roadway width should be avoided and permitted only by approval of the Town Engineer. Sufficient engineering data shall be provided to establish feasibility of widening without causing unacceptable drainage, sight distance, or other problems. Street improvement plans shall include the entire width.
14. Development projects and/or subdivisions adjacent to existing public roadways must, in addition to dedicating additional right-of-way for future street expansion needs, evaluate existing improvements along those rights-of-ways. These improvements include but are not limited to public and private utilities, storm water facilities, irrigation facilities, fences, etc. Developers must provide for proper engineering and construction as necessary to modify and/or protect those facilities as well as providing proper development grading along the existing roadways to accommodate the design and construction of the future roadway improvements. Engineer shall include preliminary profiles and cross -sections.
15. All proposed projects shall be referenced to the Town of Platteville's adopted control network and shall obtain the location and elevation of the nearest appropriate reference monument from the Public Works Engineering Division prior to survey. If a suitable Town of Platteville control monument is not located within two miles of the proposed project, the Town will provide one within 20 working days of the request date. The monument name and elevation used shall be clearly marked on all construction drawings.

## **B. SOILS REPORT AND PAVEMENT DESIGN REPORT**

A Soils Report and Pavement Design Report shall be submitted to the Town, for review and acceptance, prior to any construction related to the installation of public improvements. The reports shall comply with the requirements outlined in Section II of the Street Design Criteria part of this manual. A checklist is provided in the Appendix to assist in the preparation of the reports.

## **C. TRANSPORTATION IMPACT STUDIES**

Transportation Impact Studies (TIS) are required in order to adequately assess the impacts of a development proposal on the existing and/or planned street system. Unless waived by the Town Engineer, a TIS report shall be required for all development proposals. The TIS shall be prepared by a Professional Engineer.



#### **D. PRECONSTRUCTION CONFERENCE**

A preconstruction conference may be required prior to the issuance of any permits for construction. Attendance shall include representatives from the Public Works Department, Development Coordinator, Developer/Owner, Design Engineer, General Contractor, and Sub-contractors including; earthwork, utilities, curb and gutter, paving, and signing.

#### **E. DEFINITIONS AND ABBREVIATIONS**

Wherever the following words, phrases, or abbreviations appear in these specifications they shall have the following meanings.

1. AASHTO – American Association of State Highway and Transportation Officials.
2. ADA – Americans with Disabilities Act.
3. ADT – Average Daily Traffic Count.
4. ASTM – American Society for Testing Materials.
5. TOWN – An individual employed by the Town of Platteville whom is authorized to make the applicable decisions on behalf of the City.
6. TOWN ENGINEER – a term used in situations where a decision or action may be required by the Town Engineer or his authorized representative employed by the Town of Platteville. The Engineer shall have the authority on behalf of the Town to ascertain that all design and construction is equal to or exceeds the minimum requirements set forth in these criteria and standards.
7. CDOT – Colorado Department of Transportation.
8. CONSTRUCTION DRAWINGS – detailed and working drawings including plan, profile, and detail sheets of proposed utility drainage and street improvements approved by the Engineer.
9. CONSULTANT – the partnership, corporation, or individual who is registered as a professional engineer, according to Colorado statutes, and who is hired by the Developer/ Owner, and is empowered to act as his agent for the project.
10. DESIGN ENGINEER – the partnership, corporation, or individual who is registered as a professional engineer, according to Colorado statutes, and who is hired by the Developer/Owner, and is empowered to act as his agent for the project. The Design Engineer may also be referred to as the Professional Engineer, Civil Engineer, Geotechnical Engineer, or Traffic Engineer.
11. DESIGN SPEED – a speed determined for design and correlation of the physical features of a street that influence vehicle operation; the maximum safe speed maintainable on a specified section of street when conditions permit design features to govern. Design speed is generally higher than the posted speed limit in order to provide a factor of safety and consider other conditions or uses of the street that may affect vehicle operation.
12. DEVELOPER – the owner, corporation, association, partnership, or individual who has entered into an agreement with the Town and has entered into an agreement with the Contractor to perform the construction work.
13. DRIVEWAY APPROACH – that portion of concrete extending from the street gutter lip to the property line or back of sidewalk, or the full width of the access from the public right-of-way to private property.

14. EYEBROW – a bulb or semi-circular extension of a curb on one side of a street or at an elbow intersection.
15. GEOTECHNICAL ENGINEER – the partnership, corporation, or individual who is registered as a Professional Engineer or Professional Geologist, according to Colorado Statutes, and who is hired by the Developer/Owner to prepare the Soils Report and Final Pavement Design Report for the project.
16. MAY – a permissive condition. No requirement for design or application is intended.
17. MGPEC – Metropolitan Government Pavement Engineers Council.
18. MUTCD – Manual of Uniform Traffic Control Devices
19. OWNER – the developer, corporation, association, partnership, or individual who has entered into an agreement with the Town and has entered into an agreement with the Contractor to perform the work.
20. PLANS – detailed and working drawings including plan, profile, and detail sheets of proposed utility improvements, approved by the Town Engineer.
21. PROFESSIONAL ENGINEER – an individual whom has been licensed and has active status as determined by the Colorado Department of Regulatory Agencies, State Board of Registration for Professional Engineers.
22. ROAD OR STREET – as used in this specification shall include the pavement section, right-of-way, sidewalks, driveways, bikeways, alleys, and alley approaches.
23. SHALL – a mandatory condition. Where certain requirements in the design of application are described with the "shall" stipulation, it is mandatory that these requirements be met.
24. SHOULD – an advisory condition. Where the work "should" is used, it is considered to be advisable usage, but not mandatory. Deviations may be allowed when reasons are given which show that the intent of the standard is met.
25. STANDARD STREET SPECIFICATIONS – the current Town of Platteville Design Criteria and Construction Specifications for Streets.
26. STOPPING SIGHT DISTANCE – shall mean that distance measured from the drivers' eye, 3.5 feet above the pavement to the top of any object six inches high on the pavement anywhere on the road.
27. STREET WIDTH – that distance measured from curbface to curbface across a street which should generally include the gutter pans on each side.
28. UTILITIES – shall mean all utilities on site prior to the time of any design; such as but not limited to water lines, sanitary sewer lines, drainage lines, electric lines, gas lines, telephone lines, and cable television lines.

## 1.03 RIGHT-OF-WAYS AND STREET CROSS-SECTIONS

### A. GENERAL

1. Sufficient right-of-way shall be provided as required for the traffic needs and cross-section and maintenance of the street including cut or fill slopes, auxiliary lanes, landscaping, signing, utilities, and other aspects of the development.
2. Standard right-of-way and street widths shall meet or exceed the minimums set forth in the Design Criteria. Additional right-of-way and roadway width may be required to accommodate traffic or other development needs such as turn lanes, deceleration lanes, extra lanes, pedestrian or bicycle facilities, landscaping, utilities, or construction requirements such as cut or fill slopes.

### B. DESIGN CRITERIA

1. See Table 1.03.1 – General Parameters. Standard right-of-way and street widths shall meet or exceed the following minimum criteria.

**Table 1.03.1  
General Parameters**

<b>Street Classification</b>		<b>Major Collector 2-Lanes</b>	<b>Minor Collector 2 Lane</b>	<b>Local Commercial/ Industrial 2 Lane</b>	<b>Local Residential</b>
Right-of-Way Width		80'	60'	55'	55'
Roadway Width*		44''	30'	30'	30'
Width at Intersections*		44'	30'	30'	30'
Number of Travel Lanes		2	2	2	2
Travel Lane Width		N/A	3'	N/A	N/A
Designated Bike Lanes		N	Y	N	N
Bike Lane Width		N/A	3'	N/A	N/A
Parking Lane Width		None	6''	7'	7'
Traffic Volume ADT		5,000 – 12,000	2,500 – 12,000	0-2,500	1,500
Design Speed MPH		50	40	30	30
Posted Speed MPH		35 – 45	35	25	25
Continuity		1 Miles	1 Mile	1 Mile	1 Mile
Turn Lanes **		Required	NO	NO	NO

\*Flow Line to Flow Line

\*\*Left-turn lanes are always required, right-turn lanes are required if TIS indicates need.

\*\*\*Detached Bikeway in lieu of on-street Bike Lane

See standard details for performance options.

**1.04 HORIZONTAL ALIGNMENT**

**A. GENERAL**

1. Horizontal alignment shall provide for the safety of motorists, pedestrians, and bicyclists.
2. The street pattern in a subdivision shall be the most advantageous configuration to serve adjoining areas and the entire neighborhood or district. Where appropriate to the design, proposed streets shall be continuous and in alignment with existing, planned, or platted streets.
3. Proposed streets shall be extended to the boundary lines of the subdivision, except where prohibited by topography or other physical conditions, or where such extension is not necessary for connection to adjacent properties. Where streets will be extended beyond the property line, sufficient engineering data shall be provided to establish feasibility of extension meeting Town standards.
4. Streets shall be placed in accordance with the Town of Platteville Comprehensive Transportation Master Plan where applicable.
5. Utility easements shall be provided as required by utilities for all street classifications.

**B. DESIGN CRITERIA**

1. All proposed streets shall intersect at right angles unless topography and other limiting factors of good design and safety require otherwise.
2. Where streets intersect with other streets are not in alignment, the street's centerline shall be offset in accordance with the following table:

**Table 1.04.1  
Street Flowline Offsets**

INTERSECTING ROADWAY	MINIMUM OFFSET
Collector	330 feet
Local	135 feet

3. Flowline offset distances shall be measured from nearest flowline to nearest flowline.
4. The number of intersecting streets along Arterials and Collectors shall be held to a minimum. The allowable spacing of intersections varies depending on signalization and presence of a raised center median. Refer to access management section of Technical Design Criteria Table 1.04.2.
5. Local streets should not intersect Major Collectors or Arterial streets.

**Table 1.04.2  
Technical Design Criteria**

Design Element		Major Collector				Minor Collector				Local		
		Major 4 Lane				Minor 2 Lane				Commercial	Residential	
<b>Overall Design Parameters</b>												
Design Speed/ Posted Speed		50 MPH 35 - 45				40 MPH 30 - 35				35 MPH 30	35 MPH 30	
Stopping Sight Distance		570'				305'				250'	250'	
<b>Horizontal Alignment</b>												
Minimum Centerline radius		400'				200'				100'	100'	
Maximum Super-elevation		NA				NA				NA	NA	
Minimum Tangent between curves or at		100'				100'				NA	NA	
<b>Vertical Alignment</b>												
Maximum Centerline Grade		5%				6%				7%	7%	
Minimum Gutter Flow line Grades		0.4%				0.4%				0.4%	0.4%	
<b>Intersection Design</b>												
Minimum sight distance at driveways & intersections*		445'				445'				390'	390'	
<b>Access Management</b>												
		(1)		(2)								
Minimum distance between Intersections	Signalized	2640'		2640'		1320'		1320'		NA	NA	NA
	Un-signalized	NA	1320	NA	1320	1320	** 425'	660'	330'	330'	135	135
Minimum distance between driveways		NA	*** 590	NA	*** 350'	660'	*** 300'	660'	*** 250'	200'	135'	10' see S-24
Driveway Configuration		Radial curb return		Radial curb return		Radial curb return		Radial curb return		Curb Cut or Radial	Curb Cut or Radial	Curb Cut
* Left-turn from Stop Sign						(1) Without Raised Median						
** ¾ Movement Only Per Approval of Traffic Engineer						(2) With Raised Median						
*** Right-in / Right-out Only Per Approval of Traffic Engineer												
Note: Deviations require a traffic study and analysis by a licensed engineer and must be approved by the Town Traffic Engineer.												

**STREET FUNCTION, SAFETY, ACCESSIBILITY AND PLANNING CHARACTERISTICS****A. GENERAL**

All street classifications shall be designed for the safety of motorists, pedestrians and bicyclists. Accessibility shall be provided in accordance with all ADA (Americans With Disabilities Act) requirements. Alleys are not mentioned in these criteria because of the large amount of variables in their design. However, any permanent alley design must be approved by the City.

**B. DESIGN CRITERIA**1. LOCAL – Low Volume

**FUNCTION** – Local streets serve local traffic and have low traffic volumes. Traffic carried by Local streets should have an origin or a destination within the neighborhood, and are designed to discourage through traffic. Local streets are typically designed to connect to Collector streets, although they can also be designed as cul-de-sacs or to provide connectivity to adjacent subdivisions.

**CHARACTERISTICS** – Local Low Volume streets shall be for residential developments with a minimum lot size of two (2.0) acres (gross). Local streets should not intersect Major Collectors or Arterial streets. Traffic control shall be provided using stop signs at all intersections. Refer to Standard Detail S-1.

2. LOCAL – Residential

**FUNCTION** – Local streets shall provide local traffic and have low traffic volumes. Traffic carried by Local streets should have an origin or a destination within the neighborhood, and are designed to discourage through traffic. Local streets are typically designed to connect to Collector streets, although they can also be designed as cul-de-sacs or provide connectivity to adjacent subdivisions.

**CHARACTERISTICS** – Local residential streets are intended for use in medium to high density residential neighborhoods. Local streets should not intersect Major Collectors or Arterial streets. Parking shall be allowed on both sides of local residential streets. Traffic control shall be provided using stop signs at all intersections. Refer to Standard Detail S-2-R.

3. LOCAL – Commercial/Industrial

**FUNCTION** – Local streets serve local traffic and have low traffic volumes. Traffic carried by Local streets should have an origin or a destination within the neighborhood, and are designed to discourage through traffic. Local streets are typically designed to connect to Collector streets, although they can also be designed as cul-de-sacs or to provide connectivity to adjacent subdivisions.

**CHARACTERISTICS** – Local Commercial/Industrial streets are intended for commercial/industrial developments. These streets may intersect Major Collectors in some situations, but should not intersect with an Arterial Street. On-street parking, backing, or loading maneuvers shall not be allowed. Traffic control shall be provided using stop signs at all intersections. Refer to Standard Detail S-2.

4. MINOR COLLECTOR

**FUNCTION** – Minor Collectors collect and distribute traffic between Arterials, Major Collectors, and Local streets and serve as main connectors within communities, linking one neighborhood with another.

PLANNING CHARACTERISTICS – Minor Collectors are generally intended for use within residential neighborhoods or to connect smaller neighborhoods. Intersections with other Collector and Arterial streets should be at least one-quarter (1/4) mile apart. Regulation of traffic shall be accomplished through the use of stop signs and channeling. Refer to Standard Detail S-3.

5. MAJOR COLLECTOR

FUNCTION – Major Collector streets shall be designed to permit relatively unimpeded traffic movement and are intended for use on those routes where four (4) moving lanes are required but where a larger classified street is not warranted.

PLANNING CHARACTERISTICS – Major Collector streets should be employed where traffic demands dictate. Major Collector streets are intended for use in commercial/industrial areas or high density residential. See the Street Standards Technical Design Criteria Chart for allowable intersection spacing. Street parking is not allowed on Major Collector streets. Access from streets of lower classification will be permitted, but in all cases will be controlled by traffic control devices. Direct access to abutting property is not permitted unless no other access is reasonably available. Regulation of traffic shall be accomplished through the use of traffic signs, signals, and channeling. Traffic signals will normally be located only at intersections with Arterial Streets. Refer to Standard Detail S-4.

**1.06 VERTICAL ALIGNMENT**

**A. GENERAL**

Vertical alignment and grades shall be designed to bear a logical relationship to the existing topography, drainage needs and shall provide for the safety of motorists, pedestrians, and bicyclists.

**B. DESIGN CRITERIA**

1. All proposed streets shall conform to the minimum and maximum allowable street slope and street grade standards shown in the following table:

**Table 1.06.1  
Minimum and Maximum Allowable Street Slope and Street Grade**

Street Type	Street Grades %Min. / Max.	Cross Slope %
Major Collector	0.4/5.0	2.0 Normal crown (b) 5.0 Max – for super-elevation.
Minor Collector (a)	0.4/5.0	2.0 Normal crown (b)
Local-Com. / Ind. (a)	0.4/5.0	2.0 Normal crown (b)
Local-Residential (a)	0.4/5.0	2.0 Normal crown (b)
Local-Low (a) Volume	0.4/8.0	2.0 Normal crown (b)
Alley (where permitted)	0.4/5.0	2.0 Min.
Emergency	0.4/5.0	2.0 Min.

Notes:

- a. Grading behind sidewalks and between detached sidewalk and curb shall be a maximum of 4:1. Special conditions outside of this range may be approved by the Town Engineer.
- b. Normal crown slope is 2 percent. One percent to 5 percent is allowable at transition and other non-normal sections with special design review.



Special conditions outside of these ranges may be approved by the Town Engineer.

2. Minimum grade on gutter shall be 0.4 percent. Particular attention shall be given to maintain a 0.4 percent minimum grade especially on a sag vertical curve. Crosspans, cul-de-sacs, eyebrow, and curb return gutters shall have a minimum grade of 0.6 percent.
3. Connections with existing streets shall be made in a way that will create a smooth transition. The higher volume street at an intersection shall govern the through grade and cross-sections. The maximum allowable approach grade at an intersection shall be two (2%) percent for a distance as designated by the following table:

**Table 1.06.2  
Minimum Distance for Maximum 2% Approach Grade**

Approaching street	Local	Collector	Arterial
Local	30 Feet	50 Feet	75 Feet
Collector		75 Feet	150 Feet
Arterial			200 Feet

Distances shown are measured from the flowline intersections.

The intersection of any street with a Major street shall be designed to the ultimate street grade of the Major street. The grading of the property adjacent to the Major street shall meet these ultimate grades. A detail of the intersection sufficient to show drainage and grades must be provided.

Connection with existing streets shall be smooth transitions and existing grades shall be shown for at least one hundred and fifty (150') feet on all sides of the connection. The grade and ground lines of all streets that dead end, except cul-de-sacs, shall be continued for five hundred (500') feet beyond the proposed construction. The grade and ground lines of all Arterial Streets shall be designed to continue one-thousand (1000') feet beyond the end of proposed construction.

4. Vertical curves shall meet or exceed the following minimum criteria:

**Table 1.06.3  
MINIMUM LENGTH OF VERTICAL CURVES (IN FEET)**

Grade Change %	Arterial	Collector	Other
0.00 - 0.99	none	none	none
1.00 - 1.99	200	120	60
2.00 - 2.99	300	160	90
3.00 - 3.99	450	220	120
4.00 - 4.99	600	280	150
5.00 - 5.99	700	330	180
6.00 - 6.99	---	380	210
7.00 - 7.99	---	430	240
8.00 - 8.99	---	---	270
9.00 - 9.99	---	---	300
10.00 - 10.99	---	---	330
11.00 - 12.00	----	----	360

Note: Lengths above do not allow passing on crest of vertical curves. Design may warrant a passing move on Collectors or Arterial, which would lengthen the vertical curves. The required lengths for passing will be provided on a case-by-case basis by the Engineer.

Profile may be designed with a maximum one percent (1%) change in grade at the vertical point of intersection (VPI).

5. The purpose of super elevating a roadway is to improve the riding comfort on curves where the traveling speed is great enough to exert a lateral thrust greater than that which can reasonably be resisted by friction alone.

In the Town of Platteville, super elevation may be allowed on Arterial streets and selected Collector streets in order to reduce the minimum centerline radius allowed. Super-elevation shall not be used on Local streets. When super-elevations are required, the super elevation shall be in accordance with the recommendations of AASHTO and approved by the Town Engineer.

When super elevation is used, a minimum one hundred (100') foot run-out shall be used entering and exiting the super-elevated portion. In cases where the super elevation transition changes the gutter on one side of the street from water carrying to non-water carrying, the water must enter a storm sewer system or other acceptable outlet from the street rather than crossing said street in sheet flow. The gutter shall always be inflow type.

When super-elevation is used, the rate of super-elevation shall be clearly shown on the drawings along with exaggerated (preferably 1"= 20' Horizontal, 1"= 1' Vertical) profiles of the centerline and both flowlines. The super-elevation run-out length, crown run-out length, and point at which full super-elevation is reached shall be clearly shown.

6. The design engineer shall show either centerline profile or both flowline profiles. If centerline profiles are provided, the flowline profile information, distances and grades, shall also be provided everywhere it is not parallel to the centerline and along all horizontal curves. If flowline profiles are provided, the design engineer shall also show centerline profiles through intersections and

details at any mid-block crosspans to provide smooth riding transitions. The actual distance and grades of curb returns shall be given for all intersections. Flowline profiles shall be shown around cul-de-sacs, kneecaps, elbows, bulb-outs and elbows.

For arterial and major collector streets and for widening of existing streets, the design engineer shall provide cross-sections to the construction limits at fifty (50') foot intervals on all streets showing existing and proposed construction. Cross-section profiles shall be provided to include the street, curb, gutter and walk to a point twenty (20') feet beyond walk.

## **1.07 INTERSECTIONS**

### **A. GENERAL**

1. Intersections shall be designed to provide for the safety of motorists, pedestrians, and bicyclists.
2. At street intersections, property lines shall be truncated as shown in Standard Detail S-9 to provide adequate right-of-way for curb ramps and utilities.
3. Intersection design shall take into consideration auxiliary turn lanes as required by the approved Transportation Impact Study, or as required for site specific conditions.

### **B. DESIGN CRITERIA**

1. The design criteria for all street intersections shall conform to the Horizontal Alignment Design Criteria outlined in Section 1.04 above. All intersections shall be designed and constructed with pedestrian curb ramp access on all corners in accordance with all ADA requirements. See Standard Details.
2. *Intersection Obstruction Free Areas* – Intersection obstruction-free area shall mean that area which the Town shall be required to maintain in order to preserve the sight, distance, and safety of motorists, pedestrians, and bicyclists, by requiring an unobstructed intersection sight distance (ISD) area. ISD is the unobstructed line of sight necessary for most drivers stopped at an intersection to see an approaching vehicle to avoid a collision. When the lines of sight for both left and right directions are combined, a sight triangle is formed. There should be no visual obstructions.

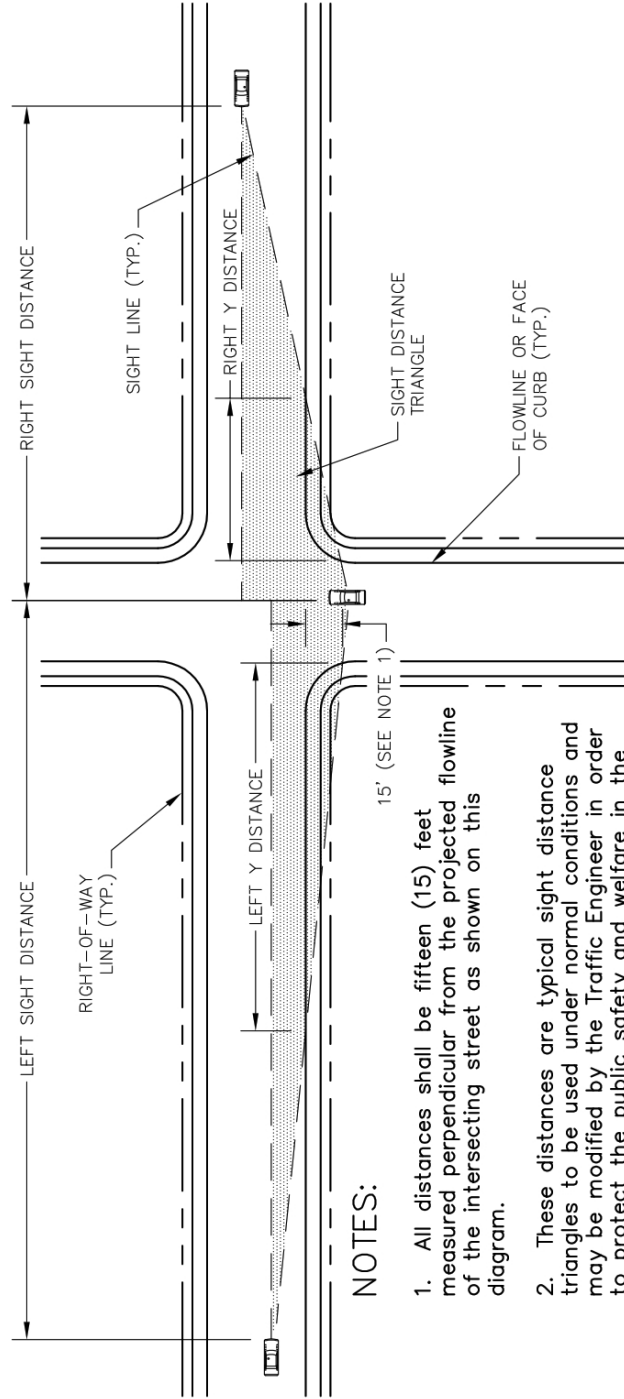
The ISD depends on the street operating speed and desired maneuver of existing vehicle. These areas shall be free from shrubs, ground covers, berms, fences, signs, structures, parked vehicles, or other materials. Trees, within the sight distance triangle (whether within the public right-of-way or on private property) must not impair sight distance. Permits for planting trees are required by the Town Forestry Division which will provide guidelines for the type, location, and spacing of trees.

These distances are typical sight distance triangles to be used under normal conditions and may be modified by the Town in order to protect the public safety and welfare in the event that exceptional sight conditions necessitate such a modification.

FIGURE 1.07.1 (Revised Jan., 2007)

### SIGHT DISTANCE TRIANGLE SETBACKS

Type of Street Distances	Speed of Major Street (feet)	Y
Arterial	30 - 50+	Right=75 Left=150
Collector	30 - 35	Right=75 Left=120
Local	25 - 30	Right=60 Left=100



**NOTES:**

1. All distances shall be fifteen (15) feet measured perpendicular from the projected flowline of the intersecting street as shown on this diagram.
2. These distances are typical sight distance triangles to be used under normal conditions and may be modified by the Traffic Engineer in order to protect the public safety and welfare in the event that exceptional site conditions necessitate such modification.

SITE DISTANCE TRIANGLE DETAIL.DWG

## **1.08 CUL-DE-SACS**

### **A. GENERAL**

Permanent no outlet streets shall be in the form of a cul-de-sac. Such cul-de-sacs are allowed on local streets only. No outlet streets without a cul-de-sac shall not be allowed unless designed to connect with a future street. If the temporary no outlet street is longer than eight hundred (800') feet, or serves as primary access to any lot, a temporary turn-around or a temporary paved connection to another street shall be provided. At least an eighty (80') foot temporary turn-around easement shall be provided when needed on temporary dead-end streets. Such turn-around easement shall not be required if no lots in the subdivision are dependent on such street for access.

### **B. DESIGN CRITERIA**

1. Permanent no outlet streets in the form of a cul-de-sac shall have a maximum length of 500 feet (measured along the centerline, from the centerline of the intersecting street to the center point of the bulb), or a maximum of ten (10) lots on a Local low-volume street or twenty-five (25) lots on a Local Residential street. The right-of-way for a cul-de-sac shall conform to the right-of-way requirements for the specific street classification of the cul-de-sac.
2. Cul-de-sacs on a Local low-volume street shall have a minimum pavement radius of forty (40') feet if no truck traffic is anticipated. Cul-de-sacs on Local streets shall have a minimum pavement radius of fifty (50') feet if truck traffic is anticipated, or if a fire hydrant is located within the cul-de-sac. See Standard Detail S-10.
3. Surface drainage on a cul-de-sac shall be toward the intersecting street, or if that is not possible, a drainage outlet and right-of-way shall be provided from the cul-de-sac.

## **1.09 MEDIANS**

### **A. GENERAL**

Prior to design of any medians on public streets, the Standard Details shall be checked and Town staff consulted for specific requirements; such as median width, landscaping, decorative concrete, median cover design, etc. Generally, medians should be designed to meet the requirements of the AASHTO "Policy on Geometric Design of Highways and Streets" (latest revision).

### **B. DESIGN CRITERIA**

1. The design of medians shall include the evaluation for needed turn lanes and accesses. This need will be determined by a Traffic Impact Study and current AASHTO requirements.
2. Landscaped medians shall be provided with drainage facilities to handle sprinkler runoff and nuisance flows. When low maintenance landscaping is used in conjunction with trickle irrigation, outfall curb and gutter should be used; otherwise, inflow curb and gutter with a properly designed storm drain system shall be installed.
3. The nose of the median on arterial streets should be a minimum of twenty (20') feet behind the flowline of the intersected street and shall not encroach on pedestrian crosswalks. Turning templates must be used to determine the shape of the median.
4. The minimum radius for nose curbs should be two (2') feet to flowline. The minimum width of a median shall be four (4') feet.
5. Medians shall be irrigated and landscaped whenever possible. The minimum width of landscaped medians shall be twelve (12') feet.

## 1.10 SIDEWALKS AND CURB TYPES

### A. GENERAL

1. Sidewalks shall be designed to provide for the safety of pedestrians.
2. All intersections shall be designed and constructed with pedestrian curb ramp access on all corners in accordance with all ADA requirements.
3. Meandering sidewalks shall be subject to special review and approval by the City.
4. The minimum sidewalk width shall be five (5') feet. Wider sidewalks may be required by the Town where warranted by anticipated pedestrian traffic; such as at or near schools and/or parks.

### B. DESIGN CRITERIA

1. Local-Low Volume – Intersections shall be designed at grade with direct access to abutting property permitted. A two (2') foot wide concrete shoulder shall be provided on each side of the street. Curb and gutter and sidewalks are normally not required on Local-Low Volume streets.
2. Local-Residential – The standard curb and gutter for Local Residential streets is the vertical face with curb & gutter detached.
3. Local-Commercial/Industrial – The standard curb and gutter for Local Commercial/Industrial streets is the six (6") inch vertical face curb and gutter. Sidewalks shall be detached.
4. Minor Collector and Major Collector – The standard curb and gutter is the six (6") inch vertical face curb and gutter. Sidewalks shall be detached, and the detached area shall have a minimum width of at least six (6') feet wide.
5. Minor Arterial and Major Arterial – The standard curb and gutter for Arterial streets is the six (6") inch vertical face curb and gutter. Six (6') foot on-street bike lanes shall be provided. Sidewalks shall be detached.

## 1.11 CURB GRADE AND RADIUS

### A. GENERAL

1. Intersections and approved pedestrian crossings shall be designed and constructed with pedestrian curb ramp access in accordance with ADA requirements.
2. Drive approaches shall be constructed in accordance with the Standard Details. Any deviation from these details shall be considered on an individual basis.
3. Minimum grade on gutter shall be 0.4 percent. Particular attention shall be given to maintain a 0.4 percent minimum grade especially on a sag vertical curve.

**B. DESIGN CRITERIA**

**TABLE 1.11.1  
Curb Types and Curb Return Radii Criteria**

STREET CLASS	STANDARD CURB TYPE	CURB DETAIL	RETURN RADII	INTERSECTING STREET
Arterials	Vertical	S-16	50-60' 30-40'	Arterials Collectors
Collectors	Vertical	S-16	30-40' 20-30' 20-30'	Collectors Locals Driveways
Locals				
Major & Commercial/Industrial	Vertical	S-16	20-30'	Locals, Driveways and Alleys
Residential	Vertical	S-16	20'	
Local Low Volume	Shoulder	S-1	40'	

NOTES:

1. The minimum curb return radius is 35' for designated truck routes.

**1.12 DRAINAGE**

Drainage system design shall be in accordance with current Storm Drainage Design Criteria adopted by the Town of Platteville.

**1.13 CROSS PANS**

**A. GENERAL**

Cross pans shall be designed and constructed in accordance with the Structural Design Criteria and Standard Details section of this manual.

**B. DESIGN CRITERIA**

1. Cross pans shall be a minimum of eight (8') feet wide, 8" thick concrete, with a maximum depth of one (1") inch. Mid-block cross pans shall be a minimum of ten (10') feet wide with one and one-quarter (1-1/4") inches maximum depth. Larger widths may be required by the City.
2. No cross pans are allowed on Arterial or Major Collector streets or at signalized intersections.
3. Minimum grade on cross pans at flowline of pan shall be 0.6 percent.
4. Cross pan approaches shall be designed using the appropriate design speeds.
5. Cross pan approaches on Local streets at intersections shall be in accordance with Standard Details.

**1.14 INLETS**

**A. GENERAL**

1. Inlets shall not be installed in the curb return and shall not be in line with accessibility ramps. In residential developments inlets should be located at property lines where possible.

2. Inlets shall be designed and constructed in accordance with Storm Drainage Design Criteria adopted by the Town of Platteville.
3. Inlet structures shall not be constructed until the curb and gutter has been installed, unless approved by the Town Engineer.

#### **1.15 CROSS SLOPE**

##### **A. GENERAL**

See Section 1.06 Vertical Alignment.

##### **B. DESIGN CRITERIA**

1. A normal cross slope on all streets shall be 2.0 percent as measured from the lip of gutter to the street centerline.
2. On streets with raised medians, normal cross slope 2.0 percent shall be measured from lip of median gutter to lip of gutter at street edge.
3. Maximum allowable cross slope shall be 5.0 percent on all new construction.
4. Cross slope for widening an existing street or for adding turn lanes shall be a straight-line grade from crown to lip of new gutter adjacent to new pavement.
5. Cross Slopes other than 2% shall be indicated on plans and approved by the City.

#### **1.16 PAVEMENT DESIGN**

Pavement design shall be in accordance with Section 2 “Soils Investigation and Pavement Design” of this manual.

#### **1.17 TRANSITIONS**

Lane and pavement transition length shall be in accordance with the latest AASHTO requirements.

#### **1.18 STREET PROJECTIONS INTO FUTURE ADJOINING SUBDIVISIONS**

##### **A. GENERAL**

1. The location of projected streets shall allow for the proper extension of the storm drains, sanitary sewer system, water lines, and non-potable water lines where applicable.
2. No-Outlet Street: Where a street is indicated to end into an adjacent unplatted area, the developer shall provide written approval from the adjacent landowner to discharge storm drainage from the street onto the adjacent land, and verification that the storm drainage will be properly detained.
3. No-Outlet Streets shall end at the property line with a temporary cul-de-sac unless the Town recommends otherwise.
4. All stub streets shall be constructed as a part of the development project. Type III barricades shall be installed on all stub streets that do not end on a cul-de-sac.



## 1.19 RECOMMENDED DESIGN STANDARDS FOR BUS STOPS

### A. GENERAL

The following minimum design standards are offered as guidelines for the design and construction of bus stops. The Town may vary any of the following requirements as deemed appropriate for the site and its particular situation. It is important that the applicant contact the Town early in the review process to determine the exact location and proposed capacity of a bus stop in the proposed development.

### B. DESIGN STANDARDS

1. Bus Lane Width – Bus lanes and stops should be asphalt or concrete and at least ten (10') feet wide.

2. Bus Stop Lengths:

Near-side bus stops should be concrete and at least fifty (50') feet long for a single bus, plus a thirty (30 ') to seventy (70 ') foot distance to the radius of intersection.

Far-side bus stops should be concrete and provide a fifty (50') feet loading area plus a thirty (30 ') to seventy (70 ') feet distance to the radius of intersection.

Mid-block bus stops shall be paved and include transition requirements for near and far-side bus bays. Total impacted area for a single bus stop would be seventy feet (70') with a thirty feet (30 ') bus stop and two twenty feet (20 ') transitions before and after the bus stop.

All bus stop locations should be approved by the Town Transit Manager.

3. Bus Shelters – Shelters should be used at major bus stops to protect users from the weather. Locations with high passenger demands and low bus service frequency should be given priority. The shelter should have maximum transparency and be highly visible from the surrounding area to assure users' safety. Shelters should be of vandal proof construction and materials, durable, and easily maintained. The appearance of the shelter should be visually pleasing and in natural tones. Openings should be at least 36 inches wide. Capacity should be based on maximum passenger accumulation at the stop, with approximately 5 square feet per person allowed to develop size requirements. They shall not obstruct pedestrian flow or motorists' sight distance. All bus shelters shall be approved by the Town Transit Manager.

## 1.20 STREET LIGHTING STANDARDS

### A. PURPOSE

The purpose of streetlight installations shall be to illuminate the public traveled ways to a level that provides for the safe passage of public traffic, both vehicle and pedestrian.

### B. RESIDENTIAL AREAS

All lighting in residential areas shall be installed to minimize light shining on or negatively affecting the neighboring residents. Low-light trespass luminaries should be utilized whenever possible.

### C. GUIDELINES

Uniform lighting will be used on new roadway projects involving Arterial and Collector streets. The guidelines shall be the Illuminating Engineering Society (IES) Lighting Handbook, latest edition, and the Design Manual of the Colorado Division of Highways, latest edition and supplemental revisions or guidelines approved by the City. All fixtures, poles, and designs will be reviewed and approved by the power provider. Drawings for installation will be prepared by the Developer/Owner with help from the local power provider and approved by the Town prior to installation. In new subdivisions, a street

lighting plan will be required for approval of the subdivision. A street light will be required for all cul-de-sacs.

#### **D. LAYOUT CRITERIA**

1. Mounting Height – Streetlight mounting height shall not exceed 20 feet in residential areas. In areas other than residential, the mounting height shall not exceed 40 feet.
2. Signalized Intersections – Signalized intersections will be lighted using combined streetlights and mast arms. Mounting of signals will be perpendicular to the flowline.
3. Railroad Crossing Lighting – Railroad crossing lighting will conform to the Railroad-Highway Grade Crossing Handbook (FHWA).
4. Lighting in Underpasses – All bridge underpasses, where vehicles, pedestrians, bicyclists, or equestrians may be present, shall require lighting.
5. Attached Sidewalks – Install street lighting behind sidewalks where sidewalks attached to the curb are used.
6. Detached Sidewalks – For sidewalks detached from the curb, install street lighting with a minimum of 2 feet clearance from back of curb to roadway side of support pole and 2 feet clear from all walks (1 feet on Local Streets).
7. Drawing – Except within the Town power service territories, drawings for installations will be prepared by the Developer with assistance from the power provider and approved by the Town prior to installation. In new subdivisions, a street lighting plan will be required prior to approval of the subdivision.
8. Permission for Alternate Designs – Alternate designs for fixtures, if approved by the City, may be used if installed in more than 20 locations. Victorian Style lighting may be required in the Central Business District and in areas of historical significance; such as, 9th Avenue corridor.
9. Fire Hydrant Conflicts and Property Lines – When locating proposed lighting, avoid possible conflicts with fire hydrants. Light poles shall be a minimum of ten (10') feet from fire hydrants. Light poles should be placed at property lines in residential areas where possible.
10. Roundabout Lighting – Lighting columns should be arranged around the perimeter of the roundabout in a simple ring, with the lights equidistant from the center and from each other. Lighting should extend at least 197 feet back along each approach road. Mounting height should be uniform throughout the intersection and not less than on any approach road. Minimum horizontal illuminance at the curb lines should be as given in Table 1.20-1. The minimum illuminance required should not be less than the highest level of lighting for any of the approach roads.

#### **E. LIGHTING SYSTEMS DESCRIPTIONS**

These lighting standards apply to all new street lighting systems.

#### **F. REFRACTOR STYLE COBRA**

The refractor style cobra with a Type-3 semi-cutoff distribution pattern mounted on poles shall be the standard construction for Major Collector and Arterial streets.

#### **G. TRADITIONAL-STYLE FIXTURE**

A traditional-style fixture with a Type-3 distribution mounted on poles shall be used on local streets.

#### **H. LIGHT TYPES AND LOCATION OF USE**

Specific light types [High Pressure Sodium (HPS), Mercury, etc.] shall be installed according to Town

Standards. Refer to **Table 1.20-2**. Poles or luminaries, which are equivalent to those described below, may be approved by the City.

**I. SPACING**

The Designer shall design the spacing of all street lighting according to **Table 1.20-3**, and shall conform to Average Maintained Illuminance Value and Illuminance Uniform Ratio in **Table 1.20-1**.

**J. POSITIONING AT INTERSECTIONS**

In general, the nighttime visibility of a pedestrian or hazardous object within an intersection is enhanced by increased contrast between the object and the surrounding street area. The optimum contrast (and hence safety) is achieved when the streetlights are situated to silhouette (or backlight) objects in the intersection. Therefore, streetlights at intersections are required to be placed on the downstream side of the intersecting street, as viewed by a motorist approaching the intersection in the lane directly beneath the luminaries. The positioning of light standards at intersecting streets shall be as noted in **Table 1.20-4**.

**K. LIGHT POLE OFFSET DISTANCES**

Distance behind back of walk for local streets shall be at least one (1') foot, and must be within easements or right-of-way on Local residential streets. For Collectors and Arterials, the light must be offset at least two (2') feet from the back of curb and provide a clearance space between the light pole and edge of walk that equals or exceeds the required sidewalk width. Pole with "Break-away" supports should be utilized whenever appropriate.

**L. STREET LIGHTING IN MEDIANS**

Street trees (full shade) shall not be placed within 40 feet of a street light. Ornamental trees shall be no closer than 15 feet to any street light.

**M. UNDERGROUND SERVICE**

Street lighting shall be installed with underground electric service on all newly developed dedicated public streets in the City. The Developer is responsible for coordinating with the appropriate utility company all aspects of design and installation. HDPE SDR 11 conduit or approved equal shall be used for all roadway crossing and may be used for electrical interconnect system if requested by Owner.

**Table 1.20.1  
Recommended Street Illumination Levels**

<b>Street Classification</b>	<b>Area Classification</b>	<b>Average Maintained Illuminance Values</b>	<b>Illuminance Uniformity Ratio (Average to Minimum)</b>
<b>Arterial</b>	Commercial	17 lx (1.7fc)	3 to 1
	Intermediate	13 lx (1.3 fc)	
	Residential	9 lx (0.9 fc)	
<b>Collector</b>	Commercial	12 lx (1.2 fc)	4 to 1
	Intermediate	9 lx (0.9 fc)	
	Residential	6 lx (0.6 fc)	
<b>Local</b>	Commercial	9 lx (0.9 fc)	6 to 1
	Intermediate	7 lx (0.7 fc)	
	Residential	4 lx (0.4 fc)	
<b>Area Classification Definitions:</b>			
<b>Commercial:</b>	A business area of a municipality where ordinarily there are many pedestrians during night hours. This definition applies to densely developed business areas outside, as well as within the central part of a municipality. The area contains land use which attracts a relatively heavy volume of night time vehicular and/or pedestrian traffic on a frequent basis.		
<b>Intermediate:</b>	Those areas of a municipality often with moderately heavy night time pedestrian activity; such as, in blocks having libraries, community recreation centers, large apartment buildings, industrial buildings, or neighborhood retail stores.		
<b>Residential:</b>	A residential development or a mixture of residential and small commercial establishments, with few pedestrians at night.		
<b>Note:</b>	Values in table assume typical asphalt roadway surface (pavement classification R2 or R3). Consult the IES document for other pavement surfaces.		
<b>Source:</b>	Illuminating Engineering Society RP-8 (8).		

**Table 1.20.2  
Street Light Requirements**

<b>Street Classification</b>	<b>Lighting System</b>
Major Collector & Arterials	250-W cobra, semi-cutoff style, steel davit, 32-foot mounting height
Minor Collector & Locals	100-W Traditional-style, fiberglass pole, 20-foot mounting height

**Table 1.20.3  
Street Lighting Spacing**

<b>Classification</b>	<b>Luminaries</b>	<b>Spacing</b>	<b>Layout</b>
Major Arterial	250-W Cobra	120–150 feet	Staggered layout
Minor Arterial	250-W Cobra	150–250 feet	Staggered layout
Major Collector	250-W Cobra	150-250 feet	Staggered layout
Minor Collector	100-W Pole Top	160–250 feet	Staggered layout
Local/Lane	100-W Pole Top	160–250 feet	Staggered layout

**Note:** Spacing to be determined by Average Maintained Illuminance Value and Illuminance Uniform Ratio in **Table 1.20-1**

**Table 1.20-4  
Intersection Light Locations**

Major Collectors/Arterial	4 lights, one on each corner
Arterial/Arterial	4 lights, one on each corner
Collector/Collector	2 lights, one on opposite corners
Local/Collector	2 lights, one on opposite corners
Local/Local	1 light on one corner
End of Cul-de-sac	1 light at end (per Cul-de-sac)

## 1.21 SIGN STANDARDS

### A. GENERAL

All signing shall be in accordance with the following design criteria and construction specifications.

### B. DESIGN CRITERIA

1. All signs shall conform to current Manual on Uniform Traffic Control Devices (MUTCD), Colorado Supplements, and the Town of Platteville Standards Drawings and Specifications.
2. All signs shall be installed on Telespar type perforated posts with anchors at proper heights as per current MUTCD Standards.
3. Sign material shall be as follows:
  - a. 36" x 36" or less shall be .080 gauge aluminum – pre-punched holes.
  - b. 36" x 36" or larger shall be .100 gauge aluminum – pre-punched holes.
  - c. 36" x 8" or greater shall be .080 gauge aluminum – pre-punched holes.
4. All signs shall be 3M High Intensity Prismatic or Diamond Grade Reflective sheeting ten (10) year guarantee, or approved equal. Legends and symbols shall be made with Electro Cut (EC) Film. The Town reserves the right to request material changes to signs.

5. Sign sheeting standard, use reflective white background with green EC Film on top layer with reverse weed which shows reflective white blocked uppercase letters, numbers, and arrows.
6. Street and Avenue signs for post mounting shall be aluminum, 8" x 30" (minimum) in length.
7. Refer to Standard Details for font and height.
8. At signalized intersections these signs shall be sized in accordance with Specifications for Oversize Street Signs or approved equal in Highway Standards. Use Word Font D - 12" uppercase on correct baseline.
9. All signs shall be mounted with Town approved vandal type rivets and with washers.
  - a. 3/8" drive rivet
  - b. 3/8" corner bolt with 5/16" nut
  - c. Street name blade use 5/16" bolt 1/2" thread length 1/2" head
  - d. 1 1/2" metal fender washer with 3/8" hole for signs 24" x 30" or bigger
  - e. 1 1/4" metal fender washer with 3/8" hole for signs 12" x 24" up to 24" x 24"
  - f. 7/8" nylon washer with 3/8" hole for signs 12" x 18" or smaller
10. Telespar type posts shall meet or exceed the following:
  - a. Posts – 2" x 2", 12 gauge, ASTM Specification No. A446, Grade A, drilled on 1" centers.
  - b. Anchors – 2 1/4" x 2 1/4" x 3', 12 gauge, ASTM Specification No. A446, drilled on 1" centers.
  - c. All posts and anchors shall be galvanized to ASTM Specification A525 coating designation G90.
11. Wood/Metal/Fiberglass/post mounting: Band-It Type #201 3/4" stainless steel band, Band-It Type #201 3/4" Ear-Lokt Buckle, Band-It Type #DO22 3/4" Bracket, 5/16" x 3/4" Bolt w/ six-sided head, 5/16" plastic washer.
12. Sign shall have a seven foot (7') clearance (minimum) from the bottom of sign to the ground at installation, or as approved by the MUTCD Standards and the Public Works/Traffic Division.
13. All multiple mounted signs on single post, the lowest sign shall be no lower than six (6') feet on urban roadways, with a one (1") gap between signs. The lowest sign shall be seven (7') feet if near pedestrian or parking traffic.
14. All signs placed, with the exception of STOP and YIELD signs, shall be near property lines; they are not to intrude on driveways, doorways, or any type of entrance.
15. For 36" or longer street name signs, the signs shall be riveted together at ends with a 3/16" rivet.
16. Signs shall be placed behind curb to minimum specifications according to MUTCD. (Part II Signs) Standards and Colorado Supplements. Town of Platteville Traffic Division prefers signs to be placed two (2') feet behind the curb or sidewalk whenever possible.
17. Signs shall be placed a minimum of five (5') feet from fire hydrants.
18. Placement of "Stop" signs shall be in accordance with Town Standards. Behind curb, ramp, or crosswalk with a minimum of 36 inches behind sidewalk at radius point or as approved by Town of Platteville Traffic Division.
19. Street names west of 23rd Avenue shall have a "W" before the street number.
20. Street names east of 1st Avenue shall have an "E" before the street number.
21. Avenue signs north of 1st Street shall have an "N" before the avenue number.

22. Arrows on street blades pointing in the direction of the 100 block shall not be placed where they would face or point across an avenue or street (they point towards the designated block).
23. Signs shall not have any company logos or decals on them.
24. Signs placed in concrete islands shall be either core drilled with a 4' hole, or a piece of 4' PVC pipe may be poured into the full depth of the concrete and flush with the top of concrete.
25. All sign placement shall call for current locates to the 'CALL BEFORE YOU DIG' at 1-800-922-1987 before sign installation. Current locates shall be established before the final inspection of sign installations.

**1.22 LANDSCAPE STANDARDS FOR STREETScape AND MEDIANS**

The Town shall approve all tree and shrub plantings on new and existing streetscapes and medians. A permit is required from the Town Forestry Division prior to any plantings in the public right-of-way.

**1.23 BIKE PATHS OR TRAIL CROSSING UNDER ROADWAYS**

To accommodate both bicycle and pedestrian traffic on the existing and proposed bike path or trail system, the following shall be considered minimum clearances for bridges where the bike path or trail crossed under a roadway:

- Horizontal: Twelve (12') feet from abutment to curb or edge of water.
- Vertical: Ten (10') feet from bike path or trail surface to underside of bridge.
- Note: The bike path of trail surface elevation should be at or above the high water mark for the two (2) year storm.

**1.24 DECELERATION LANES AND TURNING LANES**

**A. GENERAL**

A traffic impact study, along with the Town Engineer, shall determine the need of deceleration lanes and turning lanes.

**B. DESIGN CRITERIA**

1. The required deceleration lengths excluding stored vehicles are based on the design speed for the Arterial and are as follows:

Design Speed (mph)	30	40	45	50	55
Decel. Length (ft)	230	330	430	550	680

2. These lengths include the taper length. On many Arterials, it is not possible to provide the full deceleration length due to existing conditions. In such instances, it will be necessary to coordinate the design with the Town Engineer.
3. On deceleration lanes where it is necessary to store stopped vehicles (such as at traffic signals), additional lengths shall be provided to accommodate the average number of vehicles anticipated at the peak hour, per signal cycle, if indicated from the most recent traffic impact analysis. In such cases, the "storage length" shall be added to the "deceleration length" to arrive at the total length. The recommended storage length for non-signalized intersections is as follows:

Turning vehicles per hour	30	60	100	200	300
Storage Length (ft)	25	50	100	175	250

## **1.25 STREET MARKINGS STANDARDS**

### **A. GENERAL**

All street markings shall be in compliance with the current Manual of Uniformed Traffic Control Devices Standards and the following design criteria.

### **B. DESIGN CRITERIA**

1. Refer to Construction Specifications Section 02618 of this manual for information on materials and construction.
2. The Design Engineer may use the current version of the CDOT M&S Standards, Standard Plan No. S-627-1 "Typical Pavement Markings" for guidance when preparing roadway plans.

## **1.26 TRAFFIC SIGNAL STANDARDS**

### **A. GENERAL**

All traffic signals shall be in compliance with the current Manual of Uniformed Traffic Control Devices Standards and the following design criteria.

### **B. DESIGN CRITERIA**

1. The Traffic Division maintains current standard drawings and construction specifications for traffic signals which can be furnished to the Design Engineer upon request. Before materials are ordered, contact Town of Platteville Traffic Division.
2. In general, the Design Engineer can use the current version of the CDOT Standard Specifications for Road and Bridge Construction, Section 614 "Traffic Control Devices" for guidance when preparing roadway plans.

## **1.27 TRAFFIC IMPACT STUDY (TIS)**

### **A. PURPOSE**

The Traffic Impact Study (TIS) will determine and analyze the traffic impact a development imposes on the existing and 20-year transportation system affected by the development. Site and background traffic should be analyzed as to safety and efficiency in traversing the impacted street system leading up to, entering, circulating within the site, as well as the site and back through the system during the peak hour (PH) traffic period. All intersections, streets, adjacent drives and site access affected by the traffic will be analyzed with consideration given to adjacent land use, traffic generations, and improvements to the system, existing, committed and planned and as covered in comprehensive plans. Recommendations as to improvements, and phasing should be given.

At some point, the development traffic and background traffic growth may trigger the need for an additional travel lane, a signal, or an exclusive turn lane at a signalized intersection or into the development. This may be when the first phase is done, at build out, or within 20 years when the increased background and site traffic will require the improvements. It is the intent of the study to determine if the first phase, build out phase, or 20-year traffic will require improvements on the existing system.

### **B. RESPONSIBILITY FOR TRAFFIC IMPACT STUDIES**

The developer provides a TIS prepared by a Professional Engineer experienced in transportation planning.



### **C. CONDITIONS FOR REQUIREMENT**

Not all developments will generate the traffic required to do a study. The Town will determine if a study is required and the specific scope of the study. In general, a TIS is required when:

1. The site is estimated to generate 50 or more build-out peak hour trips on an arterial or major collector, or 100 or more on a minor collector or local street.
2. A capacity or safety issue exists or will exist before the proposed site is built out.
3. The expansion of an existing development or change in use increases traffic to that stated in number 1, or will add peak hour traffic to the existing background traffic on the adjacent main street or signalized intersections that will decrease Level of Service (LOS) to "D" or lower.
4. A new location or relocation of an access point may create a traffic problem.
5. Estimated traffic will have a negative impact on local streets or intersections.
6. Capacity, sight distance or safety will be compromised.

### **D. SCOPE MEETING**

It is recommended that the developer and Traffic Engineer meet with the appropriate Town staff and present a conceptual map (to scale) with planned use (housing, commercial, office, industrial, etc.), surrounding land use and estimated access points. More detailed information such as the number of employees or homes, hours of operation, and daily and peak hour trip generation can be supplied later. If the project is on a State route, CDOT shall be involved. The following should be agreed upon:

1. Existing, build-out, and 20-year daily traffic volumes.
2. Existing and 20-year, 24-hour traffic count source.
3. Build-out and 20-year trip distribution.
4. Number of travel lanes for collectors and arterials in the build-out and 20-year period.
5. If a grade-separated interchange will be built.
6. Any planned Town streets or improvements.

Twenty-four hour volumes (existing, build-out, and 20 year) and peak-hour distribution should be in written form and used as reference during the TIS review. The peak-hour traffic percent of the daily traffic should be around 10%

### **E. STUDY AREA BOUNDARIES**

The study boundary should include the network impacted by the new development which would include streets, signalized intersections, and those to be signalized in the future, and all commercial and private drives within 400' of the project property boundary.

### **F. STUDY AREA MAP**

A scaled map should include:

1. Site location.
2. All streets and street names internal and adjacent to proposed site.
3. All drives within 400' of the proposed site boundary, including drives & streets on opposite side of roads.
4. All existing and proposed site access drives and spacing dimensioned between them.
5. Footprints, with square footage, of all buildings and their use, if known.
6. Project parking and drive aisles.
7. Adjacent existing land uses.
8. Existing lanes including turn lanes and dimensions.
9. A north arrow and map scale.

## **G. TIS REQUIREMENTS**

### Summary of Major Requirements

1. Project description.
2. Existing 24-hour counts, intersection turn moves and LOS.
3. Use of each building, square footage, and traffic generated.
4. Site build-out and background traffic (daily and peak hour), distribution, peak-hour turning movements, LOS, signal warrants, queuing analysis, and traffic progression analysis.
5. 20-year site and background traffic, distribution, peak-hour turning movements, LOS signal warrants, queuing analysis and traffic progression analysis.
6. Turn lane improvements or new turn lanes resulting from the development.
7. Number all pages including the appendix.

## **H. TRIP GENERATION**

A Trip Table of proposed land uses is required and includes both 24-hour and peak-hour generated traffic for total build-out. Peak hour traffic is the most critical determinate of signal, access point, and turn lane needs. It is not always highest during the usual 4:30 to 5:30 weekday period. Commercial area impact is typically greatest on Saturday afternoon, and homes in the weekday morning or evening. A special generator (stadium, school, library, movie theater, etc.) may have a peak-hour traffic demand different from the usual afternoon peak-hour traffic, and not on weekdays. If these uses will produce the greatest total demand, then use them, along with the other uses, in the Trip Generation Table, and state the reason. The table should include:

1. Land use category and number from the ITE Trip Generation Manual.
2. The square feet of each building, or number of housing units, employees, etc.
3. ITE Trip Generation Rates and Trips for the morning and afternoon peak-hours producing the highest number of trips.
4. Total daily traffic, and total morning and afternoon entering and exiting traffic.
5. If development is proposed in phases, and any phase will produce need for a signal, turn lanes, or degrade the existing LOS to a "D" or lower, then show that phase as a separate Trip Table from the total Trip Table, and the year it may happen, if not within the default five-year span.
6. Pass-by and internal trip reduction, if any.
7. Document the source of trip rates, pass-by, and internal trip reduction rates.

## **I. EXISTING CONDITIONS**

1. Describe the existing zoning, land use, surrounding road names and number of lanes. Include a scale map of the above, with driveway access points within 400'.
2. Prepare a map of the 24-hour daily traffic counts, peak-hour turning movements (AM, PM, and noon if noon is the highest, or Saturday PM counts, if highest). All counts should have existing morning traffic counts on top, and evening on bottom. 24-hour, hourly traffic counts and peak-hour turn moves are taken by the Town Traffic Division. These are available from the City.
3. A map of the peak hour LDS for each turn movement impacted by the development.

## **J. BUILD-OUT AND 20-YEAR CONDITIONS**

For build-out and 20-year conditions provide the following. State the source of all traffic counts. If previous TIS counts are used, reference the study.

1. A map of 24-hour estimated traffic on adjacent streets. The methodology for determining the counts should be included. 20-year traffic analysis zones should account for estimated build-out.
2. Peak-hour project traffic distribution map with arrows and percent at all major intersections and drives.
3. A map of background peak-hour turning movement counts at all major intersections and LOS.
4. A map of total (background and site traffic) peak-hour turning movement counts for all intersections, and site drives with morning on top, evening on bottom.

5. Turning movement LOS table for background and peak-hour traffic for the build-out and 20-year period at intersections and site drives along arterial. Show LOS for intersections needing signals, and after signalization.
6. Map of signalized intersection lanes (new or improved) and adjacent street lanes needed as a result of site and background traffic. Provide a scaled turn lane layout of taper, deceleration, and storage lengths. Turn lane design is part of the TIS. They should be designed for the highest peak-hour turn demand which can be the morning, noon or afternoon to evening weekday or Saturday peak period. Existing turn lanes, or turn lanes needed in phased, or build-out construction, should be shown. Sometimes the greatest impact, and the need for turn lanes, is in the morning period on a collector as large amounts of traffic enter an arterial from side street, or at a signal. A large housing development will have the greatest impact in the morning on the minor street turn lane approach to an arterial, or on a turn lane at a signal. These turn lanes should be addressed in the study and the peak period used mentioned. All turn lanes needed or modified by the development must be shown to scale on a map showing all business and residential drives to determine the impact of the turn lanes on existing or planned development. Development left turn lanes that are back-to-back with another left turn lane should show, through layout, how they will accommodate the 20-year peak-hour turning traffic. Any traffic estimated backing into the through lane and/or through the next intersection should be mentioned.
7. Map of existing, build-out, and 20-year ADT should be provided for all adjacent streets.
8. Signal warrant analysis and LOS at intersection, and site drives should be shown in a table.
9. Stochastic Queuing Analysis results in a table for all site and signalized intersection turn lanes. If the peak-hour queue backs into a through lane, this must be stated, and a design to accommodate the queue drawn to scale.
10. Traffic progression analysis is required for signals spaced closer than ½ mile. Place measures effectiveness (MOE) in a separate table for all signalized intersections and name the intersection.

## **K. STUDY CONCLUSIONS**

TIS Report conclusions shall include:

1. Total traffic generated from the site.
2. Intersections with a LOS higher than “D” in the build-out and 20-year period.
3. If the development and background traffic resulted in a poor LOS, or if the background traffic resulted in a poor LOS, mention which turn moves will be affected, their LOS, and recommendations for improvements.
4. Any through lanes or intersections operating in over saturated conditions.
5. Turn lanes that will experience backing into the through lanes, and through lanes backing into the next intersection.
6. Poor progression resulting from project generated traffic.
7. Through band traffic progression efficiency on all adjacent arterials.
8. Which intersections need traffic signals and when (build-out or in 20 years)

## **L. RECOMMENDED SITE AND AREA OF INFLUENCE IMPROVEMENTS**

Summary of recommendations shall include:

1. Improvements needed at build-out.
2. Improvements needed in 20 years.
3. Needed ROW for improvements.
4. Need for traffic signals and additional turn lanes resulting from the increased traffic.
5. Turn lane geometry at signalized or future signalized intersections, and all site accesses.
6. Pedestrian and wheel chair access.
7. Cost estimates for major improvements generated by the development.



## SECTION 2 SOIL INVESTIGATIONS AND PAVEMENT DESIGN

### 2.01 SOILS INVESTIGATIONS

#### A. GENERAL REQUIREMENTS

Three categories of soils testing and reports are required for all projects requiring right-of-way grading and paving. Soils Report, final Pavement Design Report, and extra testing (e.g., imported fill). All sampling and testing of soils shall be performed under the direct supervision of a Professional Engineer. All required reports shall be prepared and signed by a Professional Engineer.

1. Soils Report – This report evaluates the characteristics of the soils and the general issues of groundwater, soil stability, and swells potential. If groundwater is found to be an issue per the Geotechnical Report measures to mitigate ground water impacts to the proposed use must be provided in the development plans. (See Section 2.03) A Soils Report is required for street and related improvements within the right-of-way, public easements. This report is required as part of the preliminary plat submittal. The Soils Report is valid for three (3) years. If construction has not begun three (3) years following the date the Soils Report is accepted by the City, an updated Soils Report will be required.
2. Final Pavement Design Report – This report is required for all projects with roadway improvements. The soil investigation associated with this report will occur after grading for public roadways is complete to within six (6) inches of anticipated final subgrade elevation, and sanitary sewer lines have been installed. This report must be submitted and approved prior to any concrete or paving installation. The Final Pavement Design Report is valid for one (1) year. If paving construction has not begun one year following the date the report is accepted by the City, an updated report will be required.
3. Extra Testing – If imported fill material is required for the project, this material shall also be tested to meet Town standards before placement.

#### B. TIMING OF SOIL BORINGS

1. Initial Borings – The information from the initial soil borings must be summarized in the Soils Report. The entire site shall be sampled for initial testing. This is required because street locations may not yet be determined or may change. A minimum of one (1) sample for every five (5) acres shall be taken to establish general site grading recommendations, preliminary foundation recommendations, and preliminary pavement section design. In areas where groundwater is suspected within five (5') feet of the original ground surface, borings shall be taken during the time of year that the groundwater table is likely to be highest in elevation. Generally, evaluation for groundwater shall be done between May 1 and October 1.
2. Structures – Soil borings for design of structures shall be taken prior to the design of the structure.
3. Imported Fill – All fill material shall be tested by the Geotechnical Engineer and approved by the Town prior to its use in the public right-of-way and easement. (See 2.01G)

#### C. FREQUENCY OF SOIL BORINGS

1. Basic Requirements – A minimum of two borings shall be provided for each project. The number of borings should be dependent on project size and Geotechnical Engineer's recommendations, but shall not be less than a minimum of one (1) boring per five (5) acres.
2. Structures – Testing frequency for structures shall satisfy AASHTO Bridge Design requirements and CDOT Materials Testing requirements.

#### **D. LOCATION AND DEPTH OF BORINGS**

1. *Basic Requirements* – Borings shall be taken to a minimum depth of 10 feet below the proposed grade. The original ground elevation at the top of each boring shall be clearly identified. If preliminary plans exist, borings shall be taken at the location of future roads, buildings, etc.
2. *Structures* – Borings for structures shall be taken to a minimum depth of 10 feet below the footing elevation.
3. *Piers or Piles* – Initial borings shall extend deeper than 10 feet if it is anticipated that piers or piles will be used within the development as a construction method. In such cases, the depth of borings shall extend to a depth of 10 feet below the anticipated piers or pile depth or to a depth at which sound bedrock is encountered.

#### **E. SOIL GROUPING AND SUBGRADE SUPPORT TESTING**

To simplify subgrade support testing (R-Value), soil samples may be combined to form soil groups consistent with the AASHTO classification, group index, and location for the area investigated. Groupings shall not mix samples with different AASHTO classifications. Soil groupings shall not be used to reduce swell potential of the in-situ subgrade soils. An adequate number of tests should be performed for the Geotechnical Engineer to determine whether or not the subgrade soil is capable of supporting the proposed construction and design loads, but shall never be less than a minimum of two (2) per Soils Report. If the subgrade soils are not suitable, then the Geotechnical Engineer shall provide a specific recommendation for subgrade stabilization. The Final Pavement Design Report shall contain construction details related to the specific mitigation measures recommended in the Soils Report.

#### **F. REQUIRED TESTS**

The tests listed in Table 2.01.1 are required for each boring described in the Soils Report. Soils shall be described in the Soils Report. Soils shall be described visually, then tested in a laboratory to determine the AASHTO Classification of each soil type.

#### **G. IMPORTED FILL MATERIAL TESTING**

All imported fill material shall be tested for swell, atterberg limits, and R-value (1 test for each soil type) and approved by the Town Engineer prior to use in the right-of-way. All imported fill shall have an R-value equal to or greater than the on-site subgrade materials. Imported fill shall not have liquid limit greater than 40 and a plasticity index greater than 20. The swell potential shall be less than 2.0% at 150 psf load.

**Table 2.01.1  
Test Required for Each Boring**

<b>Test</b>	<b>Testing Frequency</b>	<b>Notes / Exceptions</b>
Visual	Each Soil Type	Described in the Field
Liquid Limit	Each Soil Type	Passing No. 40 Sieve
Plastic Limit	Each Soil Type	Passing No. 40 Sieve
Moisture	Each Soil Type	
Percent Passing 200	Each Soil Type	
Gradation	Each Granular Soil	A-1 through A-4 soils
AASHTO Classification	Each Soil Type	
R-Value	See Section 2.01E	
Swell/Consolidation Test	Each Clay Soil Type	A-6 through A-7 soils
Percentage of Soluble Sulfates	Each Clay Soil Type	A-6 through A-7 soils
Standard Penetration Test	Each Soil Type	
Groundwater	Elevation	If encountered
Bedrock Level	Elevation	If encountered
Corrosion Potential Resistivity	Each Soil Type	

**2.02 SOILS REPORT**

**A. REPORT REQUIREMENTS**

A Soils Report shall be submitted with the preliminary plat. The report shall show results from all required testing. The report shall also include a description of site characteristics, e.g., location, topography, drainage features, etc. A checklist (see appendix) has been developed to assist in preparation of Soils Reports. It includes items pertinent for the Town’s review and reflects established professional engineering practice for Soils Reports. The final version of the Soils Report, which has been accepted by the City, must be clearly identified and dated as such.

The following acceptance block must be on the title page of the submittal:

**ENGINEERING REVIEW, TOWN OF PLATTEVILLE**

Review is for general compliance with Town of Platteville Standards and Requirements. The Town of Platteville is not responsible for the correctness of design, dimensions, details, quantities, and design safety.

- No Exceptions Taken
- Make Corrections Noted
- Rejected - See Checklist

Review Engineer \_\_\_\_\_ Date \_\_\_\_\_

In addition to the basic report requirements, each Soils Report shall include the following items:

1. Site location and description
2. Laboratory test reports conducted using the most current AASHTO test methods, for the tests listed in Table 2.01.1
3. Boring logs with ground elevation, of each soil type,  $\pm 0.5$  feet.
4. Depth to bedrock, if encountered.
5. Mitigation plans and recommendations for unsuitable or swelling soils.
6. Additional tests. These may be required for trench backfill evaluation, fill evaluation, slope stability, imported soils, etc.
7. Elevation of groundwater encountered in each boring.

## **2.03 SUBSURFACE WATER INVESTIGATION**

### **A. CONDITIONS FOR REQUIREMENT**

If groundwater is encountered within five (5') feet of the original ground surface, a Subsurface Water Investigation Report shall be submitted for approval by the Town Engineer, unless the Town Engineer has waived this requirement. This report is required to ensure mitigation of high groundwater effects upon public improvements within the right-of-way or easements. This information may be a separate report or may be included in the Soils Report.

Exception for Buried Utility Construction: This report is not required for temporary dewatering activity needed to facilitate construction of buried utilities. However, all applicable State requirements must be followed.

This report is not required for temporary dewatering activity needed to facilitate construction of buried utilities. However, all applicable state requirements must be followed.

### **B. REPORT REQUIREMENTS**

The report shall include recommendations and proposed methods of dealing with groundwater. This shall include proposed methods for dewatering utility trenches and proposed methods for protecting foundations and structures.

The subsurface water investigation report shall include the following information:

1. Site location and description. Include locations of any on-site or nearby irrigation ditches and wetlands.
2. Lowest and highest elevations of water table and likely direction of flow. Elevations for high water to be taken between May 1 and October 1.
3. Potential sources of groundwater. Include proximity to irrigation ditch systems.
4. Other relevant subsurface information, such as, water ownership (water rights), groundwater quality (contamination or other undesirable characteristics).
5. Potential future groundwater conditions and cone of influence.
6. Subsurface drainage recommendations, including its effects on all conditions, including sensitive habitat and wetlands.



7. Subsurface drains: If subsurface drains are recommended, the drains must have a gravity discharge without any possibility of backflow or blockage of the outlet. Any subsurface drain system shall be owned and maintained by the Developer or the Developers assigned successor(s). These drains may discharge into the Town's storm drainage system, including inlets or detention ponds, upon approval of the Town Engineer. Anticipated impacts to the groundwater table on adjacent properties must be quantified. Subsurface drains may be located in the public right-of-way or easements, but shall be maintained by the Developer or the Developers assigned successor(s). Subsurface drains shall have properly designed clean-outs and be designed to prevent any possibility of backflow or blockage from occurring.

## **2.04 UNSUITABLE SOIL MITIGATION**

Mitigation plans for unstable or swelling soils (unsuitable for construction) revealed by the soils investigation shall be submitted by the Geotechnical Engineer. The following specific factors shall be addressed:

### **A. MITIGATION PLANS AND APPROVAL**

All special problems found in soils investigation (e.g., expansion, frost, soluble sulfates, shallow bedrock, groundwater, soil instability, etc.) shall be addressed in the mitigation plans. All mitigation procedures must be approved by the Town Engineer prior to their implementation. If soils mitigation is required, the approved soil treatment shall extend to the back of curb, or to the back of sidewalk for attached of monolithic sidewalk. If the soils beneath the curb, gutter, and attached sidewalk have passed required proof-rolling and compaction tests, then these items may be constructed. In such cases, if soils mitigation is required under the pavement, the approved soil treatment shall extend from lip of gutter to lip of gutter.

### **B. MITIGATION FOR SWELL**

If the swell potential is 2.0 percent or greater at 150 psf (ASTM D 4546, the final Pavement Design Report must provide mitigation measures. The mitigation measures shall reduce destructive swell potential under the public improvements to less than 2.0 percent. The swell test report shall specify sample conditions, surcharge pressures, and other key testing factors. Limits of mitigation shall be clearly identified in the Final Pavement Design Report and shall be based on tested samples.

Possible measures for mitigation may include the following:

1. Over-Excavation. Over-excavation and replacement with suitable non-expansive or low-expansive material to a depth sufficient to mitigate expansion is a common mitigation method.
2. Subsurface Drains: Subsurface drains may be effective at reducing the groundwater, thereby reducing swelling.
3. Moisture Treatments: Soils may be conditioned with moisture and compacted to an appropriate level of compaction for the expansive condition, including stability requirements.
4. Other Procedures. Other procedures may be proposed for review and approval by the Town Engineer. The chosen method must work for the full life expectancy of the roadway.

### **C. SPECIFIC MITIGATION REQUIREMENTS**

Specific mitigation requirements and methods generally accepted by the Town of Platteville are described in Section 02225 – GRADING, COMPACTION, AND UNIMPROVED AREA PREPARATION of this manual.

## 2.05 FINAL PAVEMENT DESIGN REPORT

### A. GENERAL

The purpose of this chapter is to present the Street Structural Design Criteria required for use on all streets in the Town of Platteville. These criteria shall be used in conjunction with **Section I, Minimum**

**Design Criteria.** Soils Investigations and Report requirements are outlined in **Section II, 2.01 through 2.04.** The Final Pavement Design Report shall include follow-up testing for subgrade soil expansion, subsurface water, and R-value.

1. Existing Streets – For existing streets the Town Engineer may require deflection tests or other testing of the existing pavement and base structure to determine if an overlay is feasible, or if reconstruction is necessary. The Town Engineer shall notify the Developer if this testing is required.
2. AASHTO Design – The design criteria and procedures presented follow American Association of State Highway and Transportation Officials (AASHTO) 1993 Guide for the Design of Pavement Structures.
3. Pavement Type – Streets are to be constructed of either asphalt pavement (HBP) or concrete pavement (PCCP) on top of compacted aggregate base course material and subgrade.
4. Treated Subgrade – The use of treated subgrade, or treated base may be acceptable when designed and submitted by the Geotechnical Engineer, and approved by the Town Engineer in accordance with these standards. The subgrade must be within 6 inches of final subgrade elevation prior to any soil tests and borings.
5. Roundabouts – The pavement thickness design for the circulatory roadway shall be based on the sum of the 20-year design volumes from all legs. A separate pavement design is required. The minimum asphalt sections listed in Table 2.05-1 shall also apply to roundabouts.
6. Approval – A preliminary pavement design may be submitted with final construction plans, but will not be approved until subgrade soil samples are analyzed after preliminary grading and sanitary sewer construction. Town’s approval is required prior to subgrade treatment, placement of aggregate base course, or pavement construction.
7. Pavement Design Updates – A new, revised Pavement Design investigation and report shall be required if the following conditions occur:
  - a. Phases – If it has been more than one year since the original design was completed, or if the roadway design or location has been changed.
  - b. Imported Fill Material – If imported fill material is used, tests must be taken to prove that the properties of the imported material meets or exceeds the properties (R-Value) of the on-site materials. If this condition is not met, the Pavement Design the pavement shall be updated.

## 2.06 FINAL PAVEMENT DESIGN – SOILS SAMPLING

### A. SOIL INVESTIGATION REQUIREMENTS

1. Soil borings shall be taken in the existing or proposed street right-of-way. Subgrade samples shall be taken after the installation of the mainline sanitary sewer, or waterline in which the final insitu subgrade strength characteristics may be affected by their installation. The subgrade shall be within six (6) inches of final subgrade elevation. Any required fill material shall be placed to the subgrade elevation prior to sampling. The final Pavement Design Report shall be approved by the City, prior to installation of curb and gutter.
2. Frequency of Testing: A minimum of two borings shall be obtained per project, or a minimum of one boring per 500 lineal feet of new roadway, whichever is greatest. The Geotechnical Engineer

or the Town may require more frequent testing, especially on sites that have high groundwater, swelling, or unstable soils.

3. Depth of Borings: Borings shall be taken to a minimum depth of 4 feet below the proposed subgrade elevation. The Geotechnical Engineer or Town may require deeper borings, especially when related to high groundwater levels, utility trenches, swelling soils, or other design concerns.

## 2.07 FINAL PAVEMENT DESIGN – SOILS TESTING

Soils shall be classified visually and tested in a laboratory to determine the properties listed in Section 2.01 Soils Investigations. A Boring Log and the following tests are required for each sample for Final Pavement Design.

TABLE 2.07-1  
Tests Required for Each Boring

Test	Testing Frequency	Notes / Exceptions
Visual	Each Soil Type	Described in the Field
Liquid Limit	Each Soil Type	Passing No. 40 Sieve
Plastic Limit	Each Soil Type	Passing No. 40 Sieve
Moisture	Each Soil Type	
Percent Passing 200	Each Soil Type	
Gradation	Each Granular Soil	A-1 through A-4 Soils
AASHTO Classification	Each Soil Type	
R-Value	See Section 2.01.E	
Swell / Consolidation Test	Each Clay Soil Type	A-6 through A-7 soils
Percentage of Soluble Sulfates	Each Clay Soil Type	A-6 through A-7 Soils
Standard Penetration Test	Each Soil Type	
Groundwater	Elevation	If encountered
Bedrock Level	Elevation	If encountered

### A. SUBGRADE SUPPORT TESTING

Subgrade samples shall be tested for subgrade support value (R-Value). The Final Pavement Design Report shall clearly state whether or not the subgrade soil is capable of supporting the proposed construction and design traffic loads. Recommendation for subgrade stabilization (See Section 2.04), if required, shall also be provided.

### B. HVEEM STABILOMETER

The subgrade support value shall be determined using Hveem Stabilometer (R-Value). The design R-value shall be for 300 psi (2070 kPa) exudation pressure. Reported data shall be contained in the Final Pavement Design Report and shall include the following:

1. Test procedure reference.
2. Dry density and moisture content for each sample.
3. Expansion pressure for each sample .
4. Exudation Pressure. Corrected R-value curve showing the 300 psi (2070 kPa) design R-value.

### C. SWELL TESTS

Swell tests shall be conducted for all A-6 through A-7 soils. The following table provides a guideline for expansion potential. Surcharge pressure shall be 150 psf.

**Table 2.07-2  
Expansion Potential of Subgrade Soils**

<b>% Passing No. 200 Sieve</b>	<b>Liquid Limit (%)</b>	<b>Standard Penetration Resistance (Blows/Ft)</b>	<b>Volume Change Estimate (% of Total)</b>	<b>Expansion Classification</b>
>95	>60	>30	>10	Very High
60-95	40-60	20-30	4-10	High
30-60	30-40	10-20	1-3	Medium
<30	<30	<10	<1	Low

**2.08 PAVEMENT THICKNESS DESIGN CRITERIA**

Pavement design procedures in this section provide for a 20-year service life of pavement when normal maintenance is provided to keep the roadway surface in an acceptable condition.

**A. DESIGN FACTORS**

1. Equivalent Daily Load Applications (EDLA) – Equivalent Daily Load Applications (EDLA) and Equivalent Single Axle Loads (ESAL) units are based on 18 kip (80 KN) axle loading on each design lane. All data and design procedures in this section use EDLA or ESAL units for pavement loading repetitions. Minimum EDLA and ESAL criteria for each roadway classification are given in Table 2.08-1. The values shall be increased for roadways with a traffic study showing higher traffic numbers.
2. Design Serviceability – The Serviceability Index to be used for all Town Roadways dedicated for public use is given in Table 2.08-1.
3. Minimum Pavement Section – Table 2.08-1 provides the minimum acceptable pavement sections for each roadway classification based on assumed subgrade support and traffic values. These pavement thicknesses may be used for preliminary planning purposes, cost estimates, or final pavement designs when approved by the Geotechnical Engineer and the City. All pavement thickness designs must be based on actual subgrade support test results and traffic projections for the specific project, but shall not be less than the minimum per Table 2.08-1.
4. Flexible Pavement Strength Coefficients – Table 2.08-2 contains the standard design coefficient for various pavement materials. Nonstandard design coefficients may be used, only if approved in advance by the Town Engineer. In addition, design values must be verified by pre-design mix test data and supported by daily construction tests.
5. Portland Cement Concrete Pavement – PCCP roadways shall have a minimum thickness of six (6) inches, and shall meet the requirements of MGPEC Section II.

**TABLE 2.08-1  
Flexible Pavement Design Criteria**

ROAD CLASSIFICATION	20-Year Design Traffic Information		Serviceability Index (psi)			Reliability	Aggregate Base Thickness Class 5 or 6		Asphalt Thickness, inches		Grading S (3/4 inch aggregate)		Grading SG (1-1/2 inch aggregate)		Minimum Structural Number (3)
	Min. EDLA (2)	Min. ESAL	Si Init	St Final	D psi	%	Layer, inches		Layer, inches		Layer, inches		Layer, inches		
							Min	Max	Min	Max	Min	Max	Min	Max	
<u>LOCAL</u>															
Residential two lane(4)	5	36500	4.5	2.0	2.5	65	6	6.5	3.5	5.5	2	3	3.0	4.0	2.39
Residential one lane(1)	10	73000	4.5	2.0	2.5	70	6	9.0	3.5	6.0	2	3	3.0	4.5	2.49
Industrial/commercial	50	365000	4.5	2.3	2.2	75	6	10.0	5.0	7.5	2	3	3.0	6.0	3.29
<u>COLLECTOR</u>															
Minor	25	182500	4.5	2.3	2.2	75	6	7.0	5.0	7.0	2	3	3.0	5.5	2.97
Major	50	365000	4.5	2.3	2.2	85	6	8.0	6.0	8.0	2	3	3.0	6.5	3.48
Industrial/commercial	100	730000	4.5	2.3	2.2	85	6	11.0	6.0	9.0	2	3	3.0	7.5	3.85
<u>ARTERIAL</u>															
Two lane	100	730000	4.5	2.5	2.0	90	6	11.5	6.0	9.5	2	3	3.0	8.0	4.08
Four lane	200	1460000	4.5	2.5	2.0	90	6	15.0	6.5	10.5	2	3	3.0	9.0	4.51
Six lane	300	2190000	4.5	2.5	2.0	90	6	17.0	6.5	11.0	2	3	3.0	9.5	4.77

**NOTES:**

1. Wearing surface course shall be Grading S or SX for residential roadway classification and Grading S for collectors, arterials, and all industrial/commercial roadways.
2. EDLA shall be calculated based on projected traffic uses. Minimum EDLA values are as given for the design lane. The Engineer may require greater EDLA values if warranted
3. Minimum structural numbers are based on subgrade R-value=5 and MR (Resilient Modulus) =555 x R + 1000.
4. Single lane refers to a paved surface less than 20 feet wide, including residential alleys.
5. Min/max lift thicknesses: Grade SX - 1-1/2"/2-1/2", Grades S - 2"/3", Grade SG - 3"/5"

## B. SPECIAL CONSIDERATIONS

1. Staged Construction – This is an alternative for the Developer to provide a minimum thickness pavement (bottom lift) during construction, and after repairs, construct the final lift of asphalt, providing for a new finished pavement surface. If the full pavement section is not to be placed during the same construction season, a pavement design for staged construction may be required by the Town Engineer. The staged construction design must include asphalt thickness for each proposed stage. Calculations, traffic numbers, and construction truck traffic numbers supporting the staged design must also be submitted. For staged construction, accommodations must be provided for the paved surface to drain with no water left standing on the pavement, and all manhole and valve boxes shall be set at grade for the interim paving surface. Manholes and valve boxes shall later be adjusted to final grade, including concrete collars, after placement of the top lift of asphalt. The Town shall inspect the bottom lift(s) of asphalt prior to placement of the top lift. The Town will not accept maintenance responsibilities for any new roadway prior to the full design depth of asphalt being completed.
2. Full Depth Sections – Full depth asphalt pavement sections are not allowed. All new asphalt roadways require a minimum of six (6) inches depth of aggregate base course.
3. Rehabilitating Existing Asphalt Streets – Prior to overlaying existing asphalt, the Town Engineer may require nondestructive testing to determine the amount of overlay necessary to bring the street to current standards. The method of nondestructive testing and the data obtained must be in a form compatible with the pavement management system. The Town shall inspect the existing asphalt street prior to placement of any overlay. Asphalt pavement grading SX may be used for mill/overlay work.
4. Special Requirements – The Town Engineer may require Portland Cement Concrete Pavement (PCCP) in locations where traffic, utilities, type of construction, subsurface drainage, or time of construction requires special consideration.

## C. PAVEMENT STRUCTURE COMPONENTS

The Pavement Structure Components shall be a combination of one or more of the following courses placed on a subgrade to support the traffic load and distribute it to the roadbed. However, the pavement section must be composite in nature.

1. Subbase – The layer(s) of specified or selected material of designed thickness placed on a subgrade to support a base course, surface course, or both.
2. Base Course – The layer or layers of specified or selected material of designed thickness placed on a subbase or a subgrade to support a surface course.
3. Surface Course – One or more layers of a pavement structure designed to accommodate the traffic load; the top layer of which resists skidding, traffic abrasion and the disintegrating effects of climate.

**Table 2.08-2  
Pavement Strength Coefficients**

<b>Pavement Structure Component Conventional Materials</b>	<b>Design Strength Coefficients (Per Inch of Material)</b>	<b>Limiting Test Criteria</b>
Plant Mix Seal Coat	0.25	R 90+
New Bituminous Pavement	0.44	See Note 1
Existing Bituminous Pavement	0.24	R>72
New Aggregate Base Course	0.11	R>69
Existing Aggregate Base Course	0.10	R>50
Granular Subbase Course	0.07	R>78
Recycled Asphalt Pavement	0.12	
<b>Chemically Treated Subgrades<sup>2</sup> (or Approved Substitute)</b>		<b>Compressive Strength of Field Specimen</b>
Cement Treated Subgrade	0.23	5 day, 160 psi
Fly Ash Treated Subgrade	0.10	5 day, 160 psi @ 70°F ±
Lime Treated Subgrade	0.14	5 day, 160 psi, PI<6
Kiln Dust Treated Subgrade	0.10	5 day, 160 psi, PI<6

NOTES:

1. Greater strength coefficient may be considered if derived from deflection data collected on the existing street.
2. Strength coefficient is only acceptable if material is properly mixed and field tests correlate with laboratory results. Strength Coefficient shall be reduced by 50 percent if field test correlations are not performed.
3. Provide the Town with test results for items tested in the above Table 2.08.2.

**2.09 PAVEMENT DESIGN PROCEDURES**

**A. FLEXIBLE PAVEMENT DESIGN**

1. General – Flexible pavements are those pavements that have sufficiently low bending resistance to maintain continuous contact with the underlying structure, yet have sufficient stability to support a given traffic loading condition. An example is asphaltic concrete pavement.
2. Procedure – Computer generated printouts and/or other design calculations must be included with the design submittal. The following procedure should be used in determining the structural number and thickness of the pavement being designed:
  - a. Confirm the roadway classification and corresponding EDLA. The predicted volumes in the traffic impact study must be used whenever they exceed the minimum EDLA values given in **Table 2.08-2**.
  - b. Determine the serviceability index (SI) and reliability for the roadway classification (Table 2.08-1).
  - c. Convert the R-value using the AASHTO conversion for the subgrade to resilient modulus.

- d. Determine the structural numbers using AASHTO pavement design software or monographs from AASHTO along with soil support test results and EDLA values previously determined. If used, copies of the monograph determinations must be included with the design submittal.
- e. Once the structural number (SN) has been determined, the design thickness of the pavement structure can also be determined by the software that uses the general equation:

$$SN = A1D1M1 + A2D2M2 + A3D3M3 + \dots$$

A1 = Hot Bituminous Pavement (HBP) Strength Coefficients

A2, A3, ... = Strength Coefficients of Additional Pavement Components

The strength coefficients for various components of the pavement structure are given in Table 2.08-2

D1 = Thickness of HBP(inches)

D2, D3, ... = Thickness of Additional Pavement Component

M1, M2, . = Drainage Coefficient of Additional Components

These values are available in AASHTO Design Criteria or from Colorado Asphalt Pavement Association. Designers should use a value of 1.0 unless specific drainage information indicates otherwise.

- f. The standard deviation for design of asphalt pavement shall be 0.44.
- g. The design must reference any mitigation measures required when the subgrade contains swelling soils. Design reports recommending permeable layers in the pavement system must present the measures to be used to ensure adequate drainage of such layers and to maintain separation of the layers from the swelling soils.

## B. RIGID PAVEMENT DESIGN

1. *General* – Rigid pavements are those that possess a high bending resistance and distribute loads over a large area of foundation soil. Examples include Portland Cement Concrete Pavement (PCCP) shall have a minimum thickness of six (6) inches and shall meet the requirements of MGPEC Section 11.
2. *Procedure* – Computer generated printouts and/or other design calculations must be included with the design submittal.

The design of rigid pavement is a function of structural quality of the subgrade soil (R-value), traffic (EDLA), and the strength of the concrete (working stress). In comparison to the strength of the concrete pavement, the structural contributions of underlying layers to the capacity of the pavement are relatively insignificant. However, to ensure proper drainage, PCCP shall not be placed directly on fine-grained soils.

The following procedure should be used in determining the structural number and thickness of the pavement being designed:

- a. Confirm roadway classification and corresponding EDLA. The predicted volumes in the traffic impact study must be used whenever they exceed the minimum EDLA values given in Table 2.08-1.
- b. Determine the serviceability index of the roadway classification from Table 2.08-1.
- c. The reliability factor for design of all concrete pavements shall be 90 percent.
- d. The working stress of the concrete is to be obtained from design tables, and verified during construction.
- e. The standard deviation for design of concrete pavements shall be between 0.30 and 0.40.
- f. Determine the structural numbers using **AASHTO** pavement design software or Nomographs. Printouts from software or copies of the Nomographs shall be included with the design submittal.
- g. Determine the pavement section thickness. A minimum thickness of six (6) inches of concrete slab must be provided. If fine-grained subgrade exists, a minimum of six (6) inches of aggregate base course shall be provided.
- h. Design must reference any mitigation measures required when the subgrade contains sulfates.



### **C. RIGID PAVEMENT JOINT DESIGN**

The rigid pavement joint designs shall conform to CDOT M & S Standards. A Joint Layout Plan shall be prepared by the Design Engineer and approved by the Town prior to construction.

#### **2.10 PAVEMENT DESIGN REPORT**

The pavement design report shall be prepared by or under the supervision of and signed and stamped by a Professional Engineer. The report shall make a recommendation for a typical pavement structural section based on known site soil conditions and the valid traffic impact study. The appendix includes a Pavement Design Report checklist.



**TOWN OF PLATTEVILLE**  
**STREET CONSTRUCTION SPECIFICATIONS**  
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**SECTION 01010  
SUMMARY OF WORK**

**PART 1 – GENERAL**

**1.1 SCOPE**

- A. All pavement and street construction within the Town of Platteville on Town right-of-ways or Town owned property shall be constructed in accordance with the requirements of this specification, Colorado Department of Transportation Standard Specifications for Road and Bridge Construction as referenced herein and as related to Town Ordinances. All standard specifications, i.e. ASA, AWWA, ASTM, ACI, CHS, ISSA etc. are made a portion of these specifications by reference and shall be the latest edition and revision thereof. The Town of Platteville standards, specifications, and special provisions shall take precedence over conflicting provisions in the CDOT Standard Specifications and other referenced standards.

Whenever the provisions of these Standards are found to be inconsistent with any other regulations or codes, the Engineer (as defined below) shall determine the standard to apply. The provisions of these regulations are minimum requirements that do not preclude imposition of more restrictive standards by agreement or by law.

- B. Accepted Plans – Pavement and street construction shall be done in accordance with engineered construction plans for the work, prepared under the direction of a Professional Engineer and accepted by the Town of Platteville Department of Public Works. Plans shall conform to the Street Design Criteria section of these specifications and shall show all the information called for on the "Construction Plans Check List" shown in Appendix A. Construction shall conform to the standard detail drawings included in these specifications.

Prior to the Contractor/Owner beginning work, an accepted set of plans and specifications must be on file with the Town of Platteville Public Works Department. All contracts, bonds, insurance, permits, and licenses must be fully executed by the Contractor/Owner before beginning work. Contractor/Owner shall have a copy of the accepted plans and specifications, along with the Town's "Design Criteria and Construction Specifications", on the site at all times during construction.

- C. Preconstruction Conference – A preconstruction conference shall be held prior to the issuance of any permits for construction. Attendance should include the Public Works Department, Developer/Owner, Design Engineer, General Contractor, Subcontractors including; earthwork, utilities, curb and gutter, paving and signing.

**1.2 GENERAL CONDITIONS**

**A. DEFINITIONS**

1. ABILITY – that which a person can do on the basis of present development and training.
2. AGENCY – shall mean the Town of Platteville.
3. BASE COURSE – the layer or layers of specified or selected material placed on a sub-base or a subgrade to support a surface course.
4. CDOT STANDARD SPECIFICATIONS – Colorado Department of Transportation, "Standard Specifications for Road and Bridge Construction" latest edition.
5. CERTIFICATE OF FINAL ACCEPTANCE – At the expiration date of the warranty period and after all deficiencies are corrected to the satisfaction of the Town Engineer a Certificate of Final Acceptance will be issued.
6. CERTIFICATE OF SUBSTANTIAL COMPLETION – shall constitute the initiation of the warranty period.
7. TOWN – The Town of Platteville.

8. **COMPETENT** – a person who has the natural powers, physical or mental, to meet the demands of a situation or work; the word is widely used to describe the ability to meet all requirements, natural, legal, or other of a given task.
9. **CONSTRUCTION DRAWINGS** – Detailed and working drawings, including plan, profile, and detail sheets of proposed utility improvements, approved by the Engineer.
10. **CONSULTANT** – the partnership, corporation, or individual who is a Registered Professional Engineer in the State of Colorado hired by the Owner and is empowered to act as his agent for the project.
11. **CONTRACTOR** – the corporation, association, partnership, or individual who has entered into an Agreement with the Owner to perform the work, and who is licensed and bonded in the Town of Platteville in accordance with the requirements of the Town Code, for public right-of-way work.
12. **DAYS** – intended as calendar days, not normal working days, unless stipulated as working days.
13. **DESIGN ENGINEER** – the partnership, corporation, or individual who is registered as a professional engineer, according to Colorado statutes, and who is hired by the Owner, and is empowered to act as his agent for the project.
14. **DIVISION** – when referred to in the CDOT Standard Specifications shall mean the Town of Platteville Public Works Department.
15. **ENGINEER** – A term used in situations where a decision or action may be required by the Town Engineer with the Town of Platteville.
16. **MAY** – a permissive condition. No requirement for design or application is intended.
17. **NORMAL WORKING DAYS** – Monday through Friday. Saturdays, Sundays, and legal Holidays shall not be considered normal working days.
18. **OR AN APPROVED EQUAL** – as approved to being acceptable by the Engineer.
19. **OWNER** – the developer, corporation, association, partnership, or individual who has entered into an Agreement with the Town and has entered into an agreement with the Contractor to perform the work.
20. **PROJECT AS BUILT RECORD DRAWINGS** – Detailed drawings which have been prepared by the Design Engineer, upon completion and at the time of the certificate of substantial completion, and show actual construction and contain field dimensions, elevations, details, changes made to the construction drawings by modification, details which were not included on the construction drawings, and horizontal and vertical locations of underground utilities which have been impacted by the utility installation.
21. **PROJECT REPRESENTATIVE** – shall mean an authorized representative of the Engineer assigned to complete project observation and review for contract performances, standards, and contract compliance.
22. **PROVIDE** – furnish and install complete in place.
23. **QUALIFIED** – acquired abilities: skill, knowledge, experience, that fits a person for a position, office, or profession.
24. **REMOVE** – remove and dispose of legally.
25. **ACCEPTANCE TESTING** – shall mean test that will be performed by the Town of Platteville Public Works Department or its authorized representative. Acceptance tests shall include but not be limited to the following: **CONCRETE** - slump, compressive strength, air content, and aggregate sieve analysis tests, **SOILS** -moisture density relationship and density tests, **AGGREGATE BASE COURSE** -moisture-density relationship and density tests, **HOT BITUMINOUS PAVEMENT** tests.
26. **SHALL** – a mandatory condition.

27. SHOULD – an advisory condition. Where the word "should" is used, it is considered to be advisable usage, but not mandatory. Deviations may be allowed when reasons are given which show that the intent of the standard is met.
28. STANDARD STREET SPECIFICATIONS – the current Town of Platteville Design Criteria and Construction Specifications for Streets.
29. STREET – as used in this specification shall include the pavement section, right-of-way, sidewalks, driveways, bikeways, alleys and alley approaches.
30. SUBBASE – the layer or layers of specified or selected material placed on a subgrade to support a base course, surface course, or both.
31. SUBGRADE – the top surface of a roadbed upon which the pavement structure, shoulders, and curbs are constructed.
32. SURFACE COURSE – one or more layers of a pavement structure designed to accommodate the traffic load, the top layer of which resists skidding, traffic abrasion, and the disintegrating effects of climate. The top layer is sometimes called "Wearing Course."
33. UTILITIES – Shall mean all utilities on site prior to the time of any design; such as but not limited to water lines, sanitary sewer lines, drainage lines, electric lines, gas lines, telephone lines, and cable television lines.
34. WORK – the entire completed construction or the various separately identifiable parts required to be furnished for the project. Work is the result of performing services, furnishing the labor and furnishing and incorporating materials and equipment into the construction.
35. WORKING DAYS – Any day, exclusive of Saturdays, Sundays, and holidays, on which weather and other conditions not under the control of the Contractor will permit construction operations to proceed with the normal working force engaged in performing those items controlling the completion of the work.
36. WORKING HOURS – The Contractor shall restrict working hours to between 7:00 a.m. and 6:00 p.m. on normal Town of Platteville business days unless prior approval has been obtained from the Town Engineer.

**B. ABBREVIATIONS**

1. AASHTO – American Association of State Highway and Transportation Officials.
2. ACI – American Concrete Institute.
3. APWA – American Public Works Association
4. ASTM – American Society for Testing and Materials
5. AWG – American Wire Gauge
6. AWS – American Welding Society
7. EPA – United States Environmental Protection Agency
8. ITE – Institute of Transportation Engineers
9. ISSA – International Slurry Seal Association
10. MGPEC – Metropolitan Governments Pavement Engineers Council
11. OSHA – Occupational Safety and Health Administration

### **C. INTERPRETATION**

1. These Specifications contain many command sentences which are directed at the Contractor/Owner unless otherwise stated.
2. The Contractor/Owner shall request clarification of all apparent conflicts by contacting the Engineer. The Engineer will not be responsible for any explanations, interpretations, or supplementary data provided by others.

### **D. VARIANCES FROM STANDARDS**

These standards and construction plans are intended to supplement each other. When conflicts and/or questions arise between the accepted plans, specifications, development standards, referenced standards or other contract documents, the Engineer shall make the final decision concerning such matters. If administrative changes are made after approval of the plans, the variance from these standards must be approved in writing by the Engineer. Work shall be completed according to the design accepted by the Engineer. Written clarification shall be obtained from the Engineer for acceptance of omissions, conflicts, or revisions prior to construction.

### **E. OMISSIONS**

1. Any work not specifically set forth in the construction plans or these standards, but which is necessary as determined by the Engineer, shall be completed.
2. The Standards and Specifications are complementary; what is called for by one is as binding as if called for by all. It is the intent of the Standards and Specifications to require a functionally complete Project (or part thereof) to be constructed in accordance with these Standards and Specifications. Any work, materials, or equipment that may reasonably be inferred as being required to produce the intended result will be provided whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe work, materials, or equipment, such words shall be interpreted in accordance with that meaning.

### **F. GENERAL QUALIFICATIONS**

The provisions of the Standards and Specifications apply to the construction, enlargement, removal, alteration, relocation, repair, trenching, and restoration of any Public Improvement or common facilities regulated herein.

1. Exceptions – Requests for exceptions shall be submitted in writing to the Town Public Works Department. The request shall state the variance requested, the justification and supporting data for the variance, and the requested change to the standards or specifications for the specific project. The Engineer may require that exceptions be signed by a professional engineer registered to do work in the State of Colorado and bear their seal.
2. Exceptions to the Construction Specifications for Streets as outlined in this document shall be reviewed by the Public Works Director, or his designee, and shall meet the following criteria for approval:
  - a. Special circumstances or conditions exist which limit the ability of the design to meet the design standards outlined in the document. Financial difficulties, loss of prospective profits, and previously approved exceptions in other developments shall not be considered special circumstances; or
  - b. The exception represents an alternative design that will meet the intent of the standards and requirements set forth in this document.
  - c. In either case, if granted, the exception will not be detrimental to the public interest or other property, nor in conflict with the Town Comprehensive Plan, and will not endanger the public safety, health or welfare.

All exceptions for construction specifications must be reviewed and acted on prior to construction. The Town shall respond promptly and in writing to such requests but reserves a minimum of five (5) working days for review and response. When additional review time is required, the Town shall notify the submitter of the need for additional time within two (2) working days of the submittal.



### 1.3 REGULATIONS FOR STREET CONSTRUCTION

#### A. LICENSES AND PERMITS REQUIRED

1. All paving and street construction, including required cuts and fill on Town rights-of-way shall be done by a licensed and bonded contractor as provided for in Chapter 6.32 of the Town Municipal Code. No person, firm, or corporation may perform any work in the public right-of-way without first obtaining the appropriate permit through the Public Works Department. Once the permit is secured the permittee shall notify Public Works Construction Services 24 hours prior to initiating construction.

Any license application shall be accompanied by a license and permit bond executed by a reliable surety company in the sum of twenty thousand dollars (\$20,000), which bond shall be conditioned upon compliance with all the provisions of the ordinances of the Town of Platteville relating to construction in the public right-of-way and utility easements.

Every applicant shall agree in making application for a permit to be bound by all provisions of the Town Municipal Code Chapter 13, and in particular Article 13.04. The following is required to complete a construction permit:

- a. 8 ½" x 11" Site Plan
- b. Signed and accepted construction plans
- c. Project Schedule
- d. Project Quantities

A Traffic Control Plan and cover sheet must be submitted and reviewed by Traffic Operations before permit for excavation or construction will be issued.

A permit for excavation or construction in public right-of-way/easement is required for the following. (See Appendix)

- a. Street Paving – includes new street construction, reconstruction, overlays, crack sealing and seal coats.
  - b. Curb, Gutter and Sidewalk – includes new, reconstruction, and repair of curbs, gutters, sidewalks, and other various concrete appurtenances in the public right-of-way.
  - c. Utility Construction – includes new, reconstruction and repair of water, sewer, storm sewer, power, gas, telephone, and cable TV lines and other various appurtenances related to these projects in the public right-of-way/easements. This permit also covers Emergency Street Cuts.
2. Other Fees and Permits – The Contractor/Owner shall obtain all necessary permits for construction, unless otherwise directed by the City. All permits must be in accordance with City, County, State, and Federal requirements. Town review and approval of all permits must be accomplished prior to the start of any construction. Examples of permits that might be required and locations where initial contact is to be made are as follows:

<u>Partial List of Permits</u>	<u>Initial Contact</u>
State's Utility Permit	Public Works
State's Access Permit	Public Works
Railroad Use of Right-of-Way	Railroad Company
Railroad Work in Right-of-Way	Railroad Company
E.P.A. N.P.D.E.S. Permit	Colorado Dept. of Health
Corps of Engineer's Permits	Corps of Engineers
Air Quality	Weld County
Work in Ditch Right-of-Way	Individual Ditch Companies

This list is provided as an aid, and shall not be interpreted as a complete list of all permits required. It shall be the responsibility of the Contractor/Utility to determine the type of permits required by the specific development. The Town shall make all available effort to assist the Contractor/Owner in determining, and obtaining permits required. A copy of all permits must be available for inspection on the job site at all times.

All required fees must be paid in advance, prior to issuance of permit and commencement of any construction.

## **B. PROJECT OBSERVATION AND REVIEW**

All construction and installations shall be subject to observation and review by the Engineer or his authorized Project Representative. Certain types of work may have continuous observation and review.

It shall be the responsibility of the person performing the work authorized by the permit to notify the Town that such work is ready for observation and review. The Town requires that every request for observation and review is to be received one working day before such service is desired. Such requests shall be made by telephone to the Public Works Construction Services Division 970-350-9358, Monday through Friday between 7:00 A.M. and 4:30 P.M.

The Contractor/Owner wishing to work outside of these hours and requiring observation and review of such work shall be assessed an observation and review fee based upon the actual costs to the Town associated with supplying a project representative for overtime hours. Additionally, there will be a two (2) hour minimum for observation and review work outside of the normal work hours. The Contractor/Owner is responsible for notifying the Construction Services of his intent to work overtime hours, weekends, or holidays. Such notice shall be given as soon as possible, but, in no case less than 24 hours prior to the overtime work. The Engineer or his representative shall have total control when determining the need for observation and review of any work.

The Engineer may make or require other observations and reviews of any work as deemed necessary to ascertain compliance with the Town's Development Standards, Design and Construction Standards, or other standard specifications and codes.

## **C. AUTHORITY OF PROJECT REPRESENTATIVE**

The Project Representative is authorized to check all work performed in connection with street construction, including but not limited to clearing and grubbing, compaction of subgrade, placement of sub-base, base and asphalt, forms, concrete work, signage, pavement markings, and materials to be used.

The Project Representative is present on the site to advise contractors on these standards. He has authority to reject defective materials and workmanship, until any questions of issue can be resolved by the Engineer, and advise the Contractor/Owner in complying with construction plans and standards.

The Project Representative shall, in no case, act as foreman or perform other duties for the Contractor/Owner, nor interfere with the management of the work done by the Contractor/Owner. The presence or absence of the Project Representative shall not relieve in any degree, the responsibility or the obligation of the Contractor/Owner to perform the work in accordance with the plans or specifications.

The Engineer and Project Representative shall, at all times, have reasonable and safe access to the work whenever it is in preparation or progress and the Contractor/Owner will provide proper facilities for such access for observation and review. The Project Representative has the authority to select locations for tests.

Whenever any portion of these specifications are violated, the Director of Public Works, by written notice, may order that portion of construction which is in violation of these specifications or other approved plans, specifications, and materials to cease until such violation is corrected. A copy of the notice shall be filed with the Contractor's license application for future review. If deficiencies are not corrected, performance shall be required of the Contractor's Surety. A re-inspection of constructed facilities shall occur at the end of the two-year warranty period.

## **D. COMPACTION IN NEW UTILITY TRENCHES, CULVERTS, ETC.**

All utility trenches within the street right-of-way (including service lines) must be mechanically compacted to not less than 95% of maximum density within  $\pm$  two percent (2%) of optimum moisture content as determined by AASHTO T99. Alternatively, utility trenches can also be backfilled with flowable fill to within one foot of finished grade. This includes gas, electric, TV cable, telephone and other utilities lines serving the

development. All water and sewer services, including water and sewer main stub-outs, shall be installed prior to street construction. Trench backfill in utility easements within 20 feet of right-of-way shall be mechanically compacted to 95% maximum density or backfilled with flowable fill to within one foot of finish grade. Trench backfill in utility easements beyond 20 feet from right-of-way shall be compacted to 90% maximum density. Water settlement and/or jetting of trenches shall not be permitted.

#### **E. MATERIALS AND QUALITY CONTROL TESTING**

1. The Contractor/Owner is responsible for the quality control testing and protection of work until a certificate of substantial completion is issued by the Town of Platteville. All quality control test results shall be made available to the Engineer immediately after testing. The Town will provide acceptance testing. Acceptance testing may include but not be limited to tests associated with placing of concrete, asphalt, and base course subgrade preparation, and trench compaction. The Contractor/Owner shall coordinate with the Project Representative as to when he or she is ready for acceptance tests. See Appendix (Schedules For Quality Control and Acceptance Sampling and Testing).
2. The Contractor/Owner shall be responsible for the costs associated with re-testing due to failed acceptance tests.

#### **F. MATERIALS, MANUFACTURER'S CERTIFICATES AND RECOMMENDATIONS**

1. All materials and equipment shall be new and of a quality acceptable to the Town's Engineer.
2. If required by the Town's Engineer, the Contractor/Owner shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to City, or any of Town's representatives, any duty or authority to supervise or direct the furnishing or performance of the work.
3. When deemed necessary by the Engineer, the Contractor/Owner shall submit a certificate to the Engineer, secured from manufacturer of all the material used as a permanent part of the project, certifying that their product as used on the project, conforms to all Town specifications. No material shall be used until the certificates are approved by the Engineer.
4. All manufacturer's recommendations, instructions, or specifications regarding installation and use of products shall be considered a part of these Standards and Specifications and of equal force. Any conflict between the manufacturer's instructions and these Standards and Specifications shall be decided and settled by the Engineer and shall not be open for arbitration. All such manufacturer's instructions and submittals shall be presented to the Engineer for approval prior to scheduling a pre-construction meeting.

#### **G. TRAFFIC CONTROL**

A Traffic Control Plan (TCP) shall be submitted and reviewed by the Traffic Division prior to commencing any work. If the proposed work is in the State Highway right-of-way, then a construction traffic control plan approved by CDOT must be submitted to the Traffic Division prior to commencing any work. The Contractor/Owner shall be responsible for all types of traffic, including pedestrians, in the construction area. SPECIAL ATTENTION SHALL BE GIVEN TO INDIVIDUALS UNDER THE AMERICANS WITH DISABILITY ACT. Any person who makes pavement cuts, excavations, places an embankment, or does any work in public right-of-way, including but not limited to areas along a public street, alley, or sidewalk, shall place barricades, warning signals, detour signs as appropriate, and/or other safety devices at the location, sufficient to warn the public of the hazard, the cut, excavation or embankment. Safety devices must be in compliance with the Manual of Uniform Traffic Control Devices (MUTCD) and the "Colorado Supplement" to the MUTCD.

The Contractor/Owner shall appoint a Traffic Control Supervisor who shall be responsible for traffic control and who shall be certified by the American Traffic Safety Services Association (ATSSA) and/or the Colorado Contractor's Association (CCA). The Supervisor must be available 24 hours per day to resolve traffic control problems during construction. All Traffic Control Supervisors shall have in their possession a current T.C.S. card. A current copy of the T.C.S. card must be in file at the Traffic

Operations Division one (1) week in advance of job setup. Provide a Traffic Control Supervisor on job site at all times during job set-up.

All work areas including but not limited to open cuts, trenches, ditches, manholes, and/or other hazards shall be completely surrounded by approved fencing and other appropriate controls to protect and warn pedestrians and persons using bicycles, wheel-chairs, and other vehicles. Temporary walk ways must be provided, with all weather surfacing.

The Contractor/Owner shall maintain fencing to completely surround open cuts for trenches, manholes, or other hazardous sites.

Intersections and driveways shall be closed only for a minimum amount of time. The Contractor/Owner shall coordinate driveway closures with property owners, one week prior to construction by written notification with final approval by the Engineer.

Removal of any and all signs shall be coordinated with the Traffic Division. It will be the responsibility of the Contractor/Owner to replace/repair said signs until job project is final with Town's acceptance of the project after the two year warranty.

Developments with private streets shall also adhere to these same guidelines; except their traffic control devices shall be permanently maintained by their Homeowner's Association Group.

The Contractor shall maintain responsibility to change or adjust traffic control devices if conditions warrant.

All flaggers shall be properly trained according to State and Federal guidelines. The Contractor/Owner shall submit copies of flagger's certifications card to the Engineer, and/or Traffic Operations prior to construction.

The Contractor/Owner shall repair and replace damaged or missing traffic control devices immediately.

The Contractor/Owner shall maintain all necessary barricades, signs, permanent signs, temporary signs, pavement markings, and other traffic control devices between phases of construction even if construction activity ceases for a year or more.

After the streets are constructed, the new streets must be controlled with either construction traffic control barricades or approved temporary or permanent traffic control signage (stop signs, street signs, etc.) and pavement markings. Building permits cannot be issued until appropriate traffic control is in place because of construction traffic into, out of, and throughout the development site. Also, other traffic which is not construction related frequently drives through these sites. Street signs are included as required signage during the building construction phase to insure that emergency services and building inspection staff can find building addresses.

Prior to issuing building permits for any buildings within a phase of development construction, approved permanent traffic control signage and pavement marking must be in place and approved by Traffic Control Division personal.

All traffic control signage (temporary or permanent) must be in accordance with MUTCD, CDOT Standards, and Town of Platteville standards.

The Town of Platteville will not be responsible for the maintenance of traffic signs or pavement marking as part of a new subdivision until the certificate of substantial completion is issued. At that time Public Works will complete an inspection of the development to assure all the signs and pavement markings were installed in accordance to approved plans.

If there are deficiencies the Contractor/Owner or other party shall be responsible at no cost to the City, to bring Traffic Control signs and pavement markings back in compliance with approved plans.

If the traffic control is deemed insufficient, notice will be given to rectify. If after one hour, the deficiencies have not been corrected, the Town reserves the right to temporarily suspend operations until compliance.

The Contractor/Owner shall hold harmless the Town of Platteville and Town staff against claims resulting from accidents involving construction work or construction traffic control.

The Owner/Contractor shall schedule and expedite the work to cause the least inconvenience to the public. Construction or repair work will not be permitted at or near the vicinity of signalized intersections or on any Arterial and Collector streets that have major traffic volumes between the hours of 7:00 a.m. to 8:30 a.m. and 3:30 p.m. to 6:30 p.m. during the rush hours and school term (except in the case of an emergency or with approval from the Engineer). When the work is stopped for the day, all traffic lanes of an arterial of Collector Street shall be opened to traffic unless extended closure is authorized by the Engineer. A traffic lane shall be considered satisfactory for opening to traffic only if it is paved, patched, or plated in conformance with Section 02595. No full street closures will be allowed except in special conditions. No work will be permitted on holidays except in case of an emergency. Construction may not begin until all traffic control devices are in place.

The Contractor/Owner shall remove all traffic control devices immediately upon completion of work or when they are no longer needed (take off job site or move to designated holding area).

## **H. CONSTRUCTION STAKES**

1. Stakes shall be the responsibility of the Contractor/Owner unless other arrangements are made with the Engineer prior to initial construction.
2. All vertical and horizontal control shall be based on the Town's monumentation and current datum. Proposed reference monumentation shall be approved by the Engineer prior to survey.
3. A 48-hour notice shall be given by the Contractor/Owner prior to the Town providing construction staking.

## **I. PRESERVATION OF SURVEY MONUMENTS**

It shall be the policy of the Town of Platteville to preserve and perpetuate survey monuments existing within the Public Right-of-Way. See Standard Detail S-32.

1. Definitions
  - a. "Aliquot Corner" means any section corner or quarter section corner and any other corner in the Public Land Survey System created by subdividing land according to the rules of procedure set forth in Section 38-50-101, "Laws of the State of Colorado regulating the Practice of Land Surveying".
  - b. "Acceptable monumentation of aliquot corners" means a monument meeting the physical standards for similar monuments set by the United States Bureau of Land Management (Chapter 1V, Manual of Instructions for the Survey of Public Lands, 1973) pursuant to Colorado State Law. Where any aliquot corner falls within the traffic area of a street, road, or highway, the top of the monument shall be placed one-half foot below the surface of the roadway, and if such surface is any form or pavement, the monument shall be provided with a monument box marked "SURVEY", the top of which shall be set one-quarter (1/4") inch below an existing pavement surface and one-half (1/2") inch below the surface of new pavement.
  - c. "Professional Land Surveyor" means any individual who practices professional land surveying and is currently registered with the Board of Professional Land Surveyors to practice in the State of Colorado.
2. All existing aliquot corner monuments in Public Right-of-Way shall be preserved whenever possible. Monuments that must be disturbed during construction shall be referenced by a Professional Land Surveyor before being disturbed and be replaced with acceptable monumentation at the completion of construction.

3. All construction plans or drawings shall show the location of aliquot corner monuments known to be in existence in the area of construction. Should an undiscovered or previously unknown monument be found during construction, it shall be preserved or referenced in compliance with the "Laws of the State of Colorado regulating the Practice of Land Surveying Title 38, Articles 1-101 and Title 38, Articles 53-103" and be replaced with acceptable monumentation at the completion of construction.
4. Should an aliquot corner monument be destroyed by construction or utility repair the Town shall have authority to cause such monument to be legally replaced and monumentated at the Contractor/Owner's expense.

**J. CONFORMITY OF WORK AND MATERIALS**

All work performed and all materials furnished shall be within the lines, grades, cross sections, dimensions, and material requirements, including applicable tolerances, shown on the plans or indicated in these criteria and specifications.

It shall be the responsibility of each individual Contractor/Owner to keep the work area clean during the prosecution of the work.

**K. LOAD RESTRICTIONS**

The Contractor/Owner shall comply with CDOT Section 105 of the latest edition of the Standard Specifications for Road and Bridge Construction for Truck-Load Weights.

**L. UTILITY COORDINATION**

1. During construction the Contractor/Owner shall keep inlets, junction boxes, manholes, control valves, and fire hydrants clear at all times. For all street construction which impacts utilities, the Contractor/Owner shall provide a City-approved means of temporary service during the approved construction time and properly reconnect such utility service immediately following construction.
2. In the event that a manhole frame, valve box, or other fixture is covered up during construction, it shall be made accessible within twenty-four (24) hours and raised to the proper alignment and grade prior to the issuance of the Certificate of Substantial Completion unless otherwise approved by the Engineer.
3. Locating or moving existing utilities or coordinating the installation of new utilities is the responsibility of the Contractor(s)/Owner performing the work. Relocation of utilities which are in a public right-of-way or easements shall be the responsibility of the permittee.

**M. PROTECTION OF EXISTING UNDERGROUND UTILITIES**

The Contractor/Owner shall, at all times, take proper precautions for the protection of utilities, the presence of which are known or can be determined by field location of the utility companies. The Contractor/Owner shall be responsible for all expenses relating to damage to utilities. Hand-excavation shall be used whenever necessary. It is the Contractor/Owner's responsibility to call for utility locates and abide by those requirements as outlined by State Statutes. Call UNCC at 1-800-922-1987 for locates.

**N. ARCHAEOLOGICAL**

If the Contractor's excavating operations encounter remains of historical or archaeological significance, the operations shall be temporarily discontinued. The Contractor/Owner shall notify the Engineer, who will contact the proper authorities, to determine the disposition of the remains and artifacts. The Contractor/Owner shall protect the site in such a manner as to preserve the artifacts encountered.

**O. PRESERVATION OF PROPERTY**

Existing improvements, adjacent property, utilities, trees and plants that are not to be removed shall be protected from injury or damage resulting from the Contractor/Owner's operations.

**P. PROTECTION OF PUBLIC AND PRIVATE INSTALLATIONS**

The Contractor/Owner shall at all times take proper precautions for the protection of driveway culverts, street intersection culverts or aprons, irrigation crossings, mail boxes, driveway approaches, temporary or permanent street markings, signage, and all other identifiable installations that may be encountered during construction. The Contractor/Owner shall be responsible for all expenses relating to damage to public and private installations.

**Q. TIMELINESS OF REPAIRS**

Repairs, which are not termed a hazard to pedestrians, vehicles, or structures, shall be completed within thirty (30) days after receipt of notice to repair from the Public Works Department.

**R. SEQUENCE OF CONSTRUCTION**

All curb, gutter, crosspans, and sidewalk shall be constructed after the sanitary sewer, water, non-potable water, and storm sewer mains and services have been installed in accordance with these standards. All street grades shall be within six (6") inches of finished pavement subgrades prior to curb, gutter and sidewalk installation. Water valve boxes, manholes, and associated appurtenances shall be adjusted to final grade after installation of the pavement. Electrical, telephone, cable TV lines, and all other conduit which are in the public right-of-way shall be installed after sewer, water, non-potable water, and storm sewer mains. Conduit for dry utilities shall be installed prior to curb, gutter, and sidewalk.. Tunneling under existing sections of curb, gutter and sidewalk is not allowed. Utility easements shall be brought to final grade prior to installation of utilities. New signage and pavement markings must not be installed until after all road work and utilities have been installed.

**S. COMPLETION AND WARRANTY**

Upon written request of the Contractor/Owner, the Engineer and Project Representative shall, in accompaniment with the Contractor/Owner or his representative, physically examine the work and/or phase of the work. One reproducible set of project as-built record drawings shall be prepared by the Contractor/Owners' Design Engineer and issued to the Town prior to issuing a Certificate of Substantial Completion. The Project Representative shall issue a "punch list" of deficiencies to be completed prior to the issuing of a Certificate of Substantial Completion. If no deficiencies are found, a Certificate of Completion will be issued. The Certificate of Substantial Completion shall constitute the initiation of the warranty period. The Contractor/Owner shall warranty the completed work to be free of defects in workmanship or materials for a period of **two (2) years**. All work that fails or deteriorates during the first or second year shall be replaced under this warranty. The Contractor/Owner shall be responsible for all costs of material, equipment, labor,

and/or traffic control for warranty work. Warranty work shall be completed in accordance with these specifications within 30 days of written notification by the City, or agreed upon by the engineer.

The determination of the necessity during the warranty period for the repair or replacement in whole or in part of the work shall rest entirely with the Director of Public Works.

**T. ACCEPTANCE**

Upon written request of the Contractor/Owner, the Engineer and Project Representative shall, in accompaniment with the Contractor/Owner, physically examine the work and/or phase of the work. The Engineer or his designee shall issue written partial acceptance of the work with a "punch list" of deficiencies to be completed within 30 days and prior to final acceptance. After all deficiencies are corrected to the satisfaction of the Director of Public Works a Certificate of Final Acceptance will be issued. If no deficiencies are found, the Director of Public Works will issue a Certificate of Final Acceptance. The issuance of a Certificate of Substantial Completion and/or Certificate of Final Acceptance shall not relieve the Contractor/Owner from the responsibility or liability of conforming to the approved plans and specifications.

Such written request shall not be made more than 60 days from the end of the warranty period nor less than 30 days.

**U. PAYMENTS**

When the CDOT Standard Specifications refers to payment or basis of payment, it shall be disregarded unless specifically referred to in other contract documents associated with the work. The Town of Platteville has no responsibility for payments unless the work was contracted by the City.

**V. CONFLICTS/QUESTIONS**

When conflicts and/or questions arise between the accepted plans, specifications, development standards, referenced standards, or other contract documents, the Engineer shall make the final decision concerning such matters.

**W. LIABILITY**

The City, the Engineer, or Engineer's authorized representatives charged with the enforcement of these Standards and Specifications, acting in good faith and without malice in the discharge of their duties, will not thereby be rendered personally liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of their duties.

**X. NO WAIVER OF LEGAL RIGHTS**

The Town will not be precluded or stopped by any measurement, estimate, or certificate (made either before or after the completion and acceptance of the work) from showing the true amount and character of the work performed and the materials furnished by the Contractor/Owner, or from showing that any such measurement, estimate or certificate is untrue or is incorrectly made.



## SECTION 02220

### EXCAVATION, REMOVALS AND EMBANKMENT

#### PART 1 – GENERAL

##### 1.1 SCOPE

The Work covered by this section concerns the furnishing of all labor, equipment, supplies, and materials necessary to perform clearing, grubbing, and removal of objectionable materials from the right-of-way prior to grading operations and placement of embankment to conformity with lines, grades, and typical sections as shown on the plans or as staked.

#### PART 2 – MATERIALS

##### 2.1 SOIL MATERIALS

- A. Generally, soil materials for roadway construction shall be as recommended in the approved soils report. The following soils materials are the minimum requirements for the materials to be used in the construction of roadways.
- B. Embankment and fill material shall consist of soil, granular sand, gravel, and cobble material, free from frozen material, organic material, trash, glass, broken concrete, and other corrosive or deleterious material. The Contractor shall import approved material as necessary. Approval of embankment and fill material is contingent on the material having a resistance value when tested by the Hveem Stabilometer, or equivalent resilient modulus value, of at least that specified in the approved plans or pavement design and a maximum dry density of not less than 90 pounds per cubic foot. The material must be stable and have a liquid limit less than 40 and a plastic index less than 20 when tested in accordance with AASHTO T-89 and T-91, respectively. Size restrictions are as follows:
  1. No material shall have a dimension larger than six (6") inches. Where the subgrade layer is less than six (6") inches the maximum size shall not exceed two thirds (2/3) the depth of the layer.
  2. These size restrictions are contingent upon the material being evenly distributed in finer material such that uniform soil consolidation is achieved. If uniform soil consolidation is not being achieved, the Engineer may reduce the size of materials allowed or change the embankment and fill material requirements.
  3. Where unstable subgrade is encountered, the Contractor shall take steps necessary to stabilize the material by techniques such as over-excavation and backfill with imported material, use of geotextile reinforcement, chemical stabilization or other methods. The Contractor shall notify the Engineer of the proposed solution to stabilize the subgrade. If required by the City, the Owner's Design Engineer will make recommendations on stabilization techniques and materials. See Geotextile Reinforcement Placing, Street Construction Specifications, Section 02225 subsection 3.2-B.
  4. If tests or observations reveal that material being placed is not of suitable quality and structural value, the Contractor shall provide other material as approved by the Engineer.

#### PART 3 – EXECUTION

##### 3.1 CLEARING AND GRUBBING

The natural ground surface shall be cleared of all vegetation; such as, trees, logs, upturned stumps, roots of downed trees, brush, grass, weeds, and all other objectionable materials within the limits of construction. All surface objects and all trees, roots, and other protruding obstructions not designated to remain shall be cleared and/or grubbed, including mowing, as required, except stumps and roots and nonperishable solid objects which will be removed a minimum of two (2') feet below subgrade or slope of embankments. In streets, stumps and root systems shall be removed to below the two (2') foot level. Except in areas to be excavated, all holes resulting from the removal of obstructions shall be backfilled with suitable material and compacted in accordance with subsection 3.5 - Embankment.

Trees which are to be removed shall be removed in such a manner as not to injure standing trees, plants, and improvements which are to remain. Any object that is designated to remain and is damaged shall be repaired or replaced as directed by the Engineer at the Contractor's expense.

Before the start of any overlot grading, stockpiling of soil, or clearing or grubbing operation, the Contractor/Owner shall file and obtain approval for a State of Colorado permit for Erosion and Sediment Control. The Contractor/Owner shall also file and obtain approval for an Erosion Control Plan (ECP) which shall be approved by the City. See the Town's Storm Drainage Design Criteria Manual for details of the ECP. After the approval of the ECP, the Engineer shall issue a grading permit for the work as shown on the ECP. The installation of those items required on the ECP shall be installed and functional prior to the start of any land disturbing activities. Additionally, the Contractor/Owner shall post with the Town a bond in an amount to be determined by and as required by the development agreement.

### **3.2 REMOVAL AND DISPOSAL OF MATERIALS**

All materials removed shall be legally disposed of outside of the right-of-way. No accumulation of flammable material shall remain on or adjacent to the right-of-way. The roadway and related work areas shall be left with a neat and finished appearance. In no case shall the material removed from the right-of-way and stockpiled be left in such a manner as to pose an erosion, weed, or hazard to the public. Stockpiles shall be left with long sloping sides and in such a manner as to accommodate the use of mechanical mowing equipment. The Contractor shall make all arrangements to obtain written permission from property owners for disposal locations outside the limits and view of the project.

The Contractor shall legally dispose of all material that is deemed unusable by the Engineer, off of the project site.

### **3.3 REMOVAL OF EXISTING IMPROVEMENTS**

#### **A. BITUMINOUS PAVEMENT**

Bituminous pavement shall be removed to clean, straight lines by such methods as cutting, drilling, or others that will insure the breaking of pavement in a straight line in accordance with "Utility Cut and Backfill" Section 02595 of this manual. Also see Standard Detail S-31. All saw cutting shall not extend past the construction limits by more than the depth of the structure and such overcut shall be sealed by a method approved by the Engineer.

Pavements which are to be overlaid shall be repaired as required by Section 02595 "Utility Cut and Backfill".

Also see Section 02595 "Utility Cut and Backfill" for restrictions on cutting and patching bituminous pavement.

#### **B. CONCRETE PAVEMENT**

Crosspans, Alley Intersections, and Concrete pavement shall be removed to the nearest construction joint or saw cut to full depth. See Standard Detail S-31. Sections shall be saw cut in straight lines either parallel with the curb or perpendicular to the alignment of the sidewalk or curb. All over sawing shall not extend more than the depth of the structure past the construction limits and shall be sealed in the same manner as joints. If the removed portion falls within less than five (5') feet of a construction joint, cold joint, expansion joint, edge, crack, or existing patch, the concrete shall be removed to the joint, crack, edge, or patch.

See Section 02595 "Utility Cut and Backfill" for restrictions on cutting and patching concrete pavement.

## **C. CONCRETE CURB, GUTTER, SIDEWALK, AND DRIVEWAYS**

Concrete shall be removed to edges neatly sawed to full depth. Sidewalks and driveways shall be saw cut in straight lines either parallel with the curb or perpendicular to the alignment of the sidewalk or curb. No section to be replaced shall be less than three (3') feet in either width or length. If the saw cut in the sidewalk or driveway falls within less than five (5') feet of a construction joint, expansion joint, or edge, the concrete shall be removed to the joint or edge. The sawing of concrete shall be done carefully, and all damages to concrete to remain in place due to Contractor's operations shall be repaired at the expense of the Contractor. All saw cutting shall not extend past the construction limits by more than 3 inches and such overcut shall be sealed in the same manner as cracks.

See Section 02595 "Utility Cut and Backfill" for restrictions on cutting and patching concrete curb, gutter, sidewalks, driveways, etc. See Standard Detail S-25.

### **3.4 TREE REMOVAL**

The Town Forester shall be notified and approval obtained prior to excavation, removal, and/or modification of any tree within the public right-of-way.

### **3.5 EXCAVATION**

- A. Excavation of all materials shall be performed in conformity with the lines and grades indicated on the drawings or as staked. Suitable material removed from the excavations may be used in the formation of embankments and backfilling or any other areas within the right-of-way as permitted by the Engineer. Where material encountered within the limits of the work is considered unsuitable by the Engineer, such material shall be excavated as directed by these standards, the plans, or the Engineer and replaced with suitable material.
- B. Foundations and the pavement structure shall be founded on original, undisturbed soil or on structural backfill extended to the undisturbed soil. Foundations and the pavement structure shall not be founded on existing fill if encountered at the project site. If existing fill is encountered at the subgrade, the Contractor shall excavate to original undisturbed soil and bring the grade to the required elevation with approved material and methods. Existing fill material, if encountered at the site, shall be removed. Existing fill may be stockpiled for reuse in backfills and embankments if it meets the requirements of the specifications. The Contractor shall remove unsuitable soil material as directed by the Engineer. The disposal of unsuitable soil material is the responsibility of the Contractor.
- C. Excavate rock that is encountered at the site to a minimum depth of 6 inches below subgrade within the limits of the roadbed.
- D. The Contractor shall blend the intersection of cut slopes with the slopes of adjacent natural ground surfaces in a uniform manner. The tops of cut slopes shall be flattened and rounded in accordance with the approved plans.
- E. All excavated material shall be stockpiled in a manner that does not endanger the work or workers and does not obstruct sidewalks, streets, alleys, and/or driveways. The work shall be done in a manner that will minimize interference with traffic and/or drainage of the street. The Contractor at the end of each day shall barricade all excavations and ditch lines, remove excess excavated material from travel ways, and thoroughly clean all streets, alleys, and/or sidewalks affected by the excavation.
- F. Materials encountered during excavation; such as, rubbish, organic, or frozen material, and any other material which is unsatisfactory for use as backfill in the opinion of the Engineer, shall be removed from the site and legally disposed of at the Contractor's expense. Stones, concrete, or asphalt chunks larger than six (6") inches or frozen material shall be considered unsatisfactory backfill and removed by the Contractor. Frozen material, however, may be thawed out and used at a later date.

### **3.6 EMBANKMENT**

This work shall consist of the construction of embankments by depositing, placing, and compacting material of acceptable quality and structural value above the natural ground or other surface in conformance with the lines, grades, and cross-sections shown on the drawings or as established. Before any embankment is placed, clearing, tree removal, sod and topsoil removal over the entire area shall be performed in accordance with paragraphs 3.1 through 3.3 above.

When an embankment is to be placed on slopes, it shall be continuously benched in horizontal layers to key into the existing slope. Each layer of the embankment material shall not exceed eight (8") inches in loose depth. The Contractor shall thoroughly mix and insure uniform density and moisture for proper compaction.

Cut areas shall be thoroughly compacted for a depth of eight (8") inches below finished subgrade. Each layer in fill and cut areas shall be thoroughly compacted by static roller or vibratory equipment. See Section 02225 subsection 3.1 for details of grading, compaction, and subgrade preparation. The base of fill areas should be scarified to a depth of not less than eight (8") inches and compacted to not less than 95 percent of maximum density within  $\pm$  two (2%) percent of optimum moisture content as determined by AASHTO T99, prior to placement of embankment material. Each layer shall be wetted or aerated, if necessary. No embankment material shall be placed upon soft, spongy, or frozen material or other material, the stability of which is, in the opinion of the Engineer, unsuitable for the placement thereof.

**SECTION 02223**

**STRUCTURAL BACKFILL**

**PART 1 – GENERAL**

**1.1 SCOPE**

This section includes the material and construction specifications for structural backfill and filter materials.

**PART 2 – MATERIALS**

**2.1 STRUCTURAL BACKFILL**

- A. Structural Backfill shall comply with CDOT Standard Specifications for Class 1 material and meet the following requirements from laboratory sieves:

**CLASS 1**

<b>SIEVE DESIGNATION</b>	<b>% BY WEIGHT PASSING LAB SIEVES</b>
2 inch	100
No. 4	30 - 100
No. 50	10 - 60
No. 200	5 - 20

Class 1 Structural Backfill shall be used on all bridges, box culverts, or where otherwise specified. In addition this material shall have a liquid limit not exceeding 35 and a plasticity index of not over 6 when determined in conformity with AASHTO T 89 and T 90.

- B. Class 2 Structural Backfill shall be composed of suitable materials developed on the project. To be suitable for use under this classification, backfill shall be free of frozen lumps, wood, or other organic material. If the material contains rock fragments or other materials that, in the opinion of the Engineer, will be injurious to the structure, the native material shall not be used for backfilling, and the Contractor shall be required to furnish "Class 1 Structural Backfill" material.
- C. Flowable backfill may be substituted for Structure Backfill (Class 1) and (Class 2) where it is used to backfill culvert pipes, storm sewer pipes and utility cuts. It shall not be used to backfill abutments.

**2.2 FLOWABLE BACKFILL**

Flowable backfill meeting the following requirements shall be used to backfill all open cuts in portions of public right-of-way beneath existing paving, curb, gutter, or sidewalk improvements. Alternate backfill methods for large excavations will be considered on an individual review basis with the Town Engineer.

Flowable backfill shall consist of a controlled low-strength, self-leveling concrete material composed of various combinations of cement, fly ash, aggregate, water, and chemical mixture. It shall have a design compressive strength between 50 psi and 150 psi at 28 days when tested in accordance with ASTM D 4832. The mix shall result in a product having a slump in the range of 7 to 10 inches at the time of placement. The Contractor shall submit a mix design for approval by the Town prior to placement. The mix design shall be supported by laboratory test data verifying compliance with the 28-day compressive strength requirements.

Compaction of flowable backfill will not be required.

Flowable backfill shall not be allowed to freeze.

Flowable fly ash backfill shall be a thoroughly mixed combination of the following ingredients:

<b>Ingredients</b>	<b>Lbs./C.Y.</b>
Class C Fly Ash	200 – 400
Class F Fly Ash	1600 – 1800
Water (96 gallons)	800 (or as needed for proper consistency)

Compaction of flowable fly ash backfill will not be required.

Flowable fly ash backfill shall be delivered and placed from volumetric mobile mixers.

The maximum layer thickness for flowable backfill shall be three feet. Additional layers shall not be placed until the flowable backfill has lost sufficient moisture to be walked on without indenting more than two inches. Damage resulting from placing flowable backfill in layers that are too thick or from not allowing sufficient time between placement of layers shall be repaired at the Contractor's expense.

Flowable backfill will be used on all utility pot holes in right-of-way. This flowable fill may be mixed on job site.

For potholes, a cap of non-shrink grout with thickness of 5½ inches is to be used on all local and minor collector streets, or a cap of non-shrink grout with thickness of 7½ inches is to be used on all arterial and major collector streets. This material also may be mixed on job site.

### 2.3 FILTER MATERIAL

Filter material shall consist of free draining sand, gravel, slag, or crushed stone. The grading requirements are set forth in the following table:

#### **GRADATION SPECIFICATION FOR FILTER MATERIAL**

The following gradations are taken from the CDOT Standard Specifications, Subsection 703.09.

<u>Sieve Size</u>	<u>Percent by Weight Passing Square Mesh Sieves</u>		
	<u>Class A</u>	<u>Class B</u>	<u>Class C</u>
3"	100	---	---
1 ½"	---	100	---
¾"	20 - 90	---	100
No. 4	0 - 20	20 - 60	60 - 100
No. 16	---	10 - 30	---
No. 50	---	0 - 10	10 - 30
No. 100	---	---	1 - 10
No. 200	0 - 3	0 - 3	0 - 3

During progress of construction, the Engineer will determine the class of filter material to be used. The following table is intended to be a guide:

**TABLE OF RECOMMENDED FILTER CLASSES**

Sieve Size or Designation	Percentage of Soil Passing Designated Sieves		
	*Use Class A, B or C	**Use Class B or C	Use Class C
No. 10	less than 85, and	----	----
No. 40	less than 24	less than 85	more than 85
*	Based on the minus 3" portion of the soil adjacent to the filter material.		
**	To drain large quantities of water, use the most open grading recommended.		

**PART 3 – EXECUTION**

**3.1 STRUCTURAL EXCAVATION**

- A. Unsuitable foundation material shall be removed and wasted in a manner acceptable to the Engineer. Unsuitable foundation material which is suitable for embankments and suitable surplus excavated material shall be used in the construction of embankments. Unsuitable material removed below designed elevation shall be replaced with approved material.
- B. Rock, hardpan, or other unyielding material encountered in trenches for culvert pipe or conduit shall be removed below the designed grade for a minimum depth of 12 inches. This extra depth excavation shall be backfilled and compacted with Class 1 or other approved material. The type of compaction shall be the same as that required for structure backfill (Class 1), as specified below.

**3.2 STRUCTURAL BACKFILL**

Backfill shall consist of approved materials uniformly distributed in layers brought up equally on all sides of the structure. Each layer of backfill shall not exceed six inches before compacting to the required density and before successive layers are placed. Structural backfill (Class 1) shall be compacted to a density of not less than 95 percent of maximum density within  $\pm$  two (2%) percent of optimum moisture content as determined by AASHTO T99.

Required density for structural backfill (Class 2) shall conform to Section 02225 Grading, Compaction and Subgrade Preparation Subsection 3.1.

Compaction methods that produce horizontal or vertical earth pressures, which may cause excessive displacement or overturning, or may damage structures, shall not be used.

Backfill material shall not be deposited against newly constructed masonry or concrete structures until the concrete has developed a field compressive strength of equal to the design compressive strength.

Shape the surface of the subgrade under structures such that they are not more than zero inches above or one and one quarter (1-1/4") inches below the required subgrade elevation.

Unless otherwise indicated in the Contract or directed by the Engineer, all sheeting and bracing used in making structure excavation shall be removed by the Contractor prior to backfilling.

**3.3 FLOWABLE BACKFILL**

Compaction of flowable backfill will not be required.

The maximum lift thickness for flowable backfill shall be three feet unless proper consolidation techniques are used. Additional lifts shall not be placed until the flowable backfill has lost sufficient moisture to be walked on without indenting more than two inches. Any damage resulting from placing flowable backfill in lifts that are too thick or from not allowing sufficient time between lifts shall be repaired at the Contractor's expense.

### **3.4 FILTER MATERIAL AND PLACEMENT**

Construction requirements for filter material for subsurface drains shall conform to the applicable requirements of CDOT Standard Specifications Section 605.

Filter material shall be placed behind bridge abutments, wingwalls, and retaining walls as provided in the Contract and in accordance with the following requirements:

Wall drain outlets shall be backed with sacked filter material conforming to the gradation requirements for course aggregate No. 3 or No. 4 set forth in CDOT Standard Specifications Table 703-1.

Filter material shall be placed in horizontal layers along with and by the same methods specified for structural backfill.



## **SECTION 02225**

### **GRADING, COMPACTION SUBGRADE, AND UNIMPROVED AREA PREPARATION**

#### **PART 1 – GENERAL**

##### **1.1 SCOPE**

The work covered by this section concerns the furnishing of all labor, equipment, supplies, and materials needed to perform preparation of subgrade within the public right-of-way.

#### **PART 2 – MATERIALS**

**2.1** See Sections 02220 and 02223 Subsection Part 2 Materials.

**2.2** Geotextile Reinforcement – Geotextile Reinforcement shall be as recommended by an experienced Geotechnical Engineer retained by the Owner and who is a Registered Professional Engineer in the State of Colorado.

#### **PART 3 – EXECUTION**

##### **3.1 COMPACTION OF SUBGRADE**

- A. Field compaction densities for embankments and subgrade soils for improved areas shall be as indicated in the soil report but not less than 95% of maximum density or within + two percent (2%) of optimum moisture content as determined by AASHTO T99.
- B. Field compaction densities for embankments and soils for unimproved areas shall be not less than 90 percent of maximum density within + two (2%) percent of optimum moisture content as determined by AASHTO T99.

Do not compact topsoil.

Soft and yielding material and other portions of the subgrade which will not compact when rolled or tamped shall be removed as directed by the Engineer and replaced with suitable material. The Contractor/Owner shall, when requested by the Engineer, furnish the necessary equipment to proof roll a questionable area even though density tests may indicate compliance with density requirements. If, based on proof rolling, the Engineer determines that the questionable area exhibits any visible deflection in the form of weaving or pumping and/or the soil cracks, the Contractor/Owner shall be required to correct the problem to the satisfaction of the Engineer. One such method of stabilizing the subgrade is the use of geotextile reinforcement as given in subsection 3.2 below.

Subgrade surfaces below excavated areas such as cut areas and undisturbed areas requiring additional preparation; said subgrade shall be scarified to a minimum depth of eight (8") inches, wetted or aerated as needed and compacted until the required density and stability is obtained unless otherwise approved by the Engineer. Such scarification shall be done in such a manner as to achieve a uniform mixture of the subgrade soils. Pockets of clay, sand, dry, wet, or stratified soil layers are to be thoroughly mixed, creating a soil blend of uniform consistency.

Scarification shall mean a thorough mixing of the subgrade soils to the required depth either by equipment mounted ripper teeth or turning the soil with a construction disc. If the scarified soil does not exhibit sufficient subgrade strength for roadway construction, the Owner's Geotechnical Engineer shall be consulted and alternate methods of construction may be approved by the Engineer. Application of geotextile reinforcement may be accepted if recommended by the Owner's Geotechnical Engineer.

If the required compaction is not obtained, it shall be the responsibility of the Contractor to re-compact the material. In cases where there is a failure to achieve the required compaction, the Engineer may require that the backfill be removed and replaced with Town approved backfill material.

If the Contractor's scheduling of work, methods, or inclement weather caused a naturally suitable subgrade to become unstable, the area shall be sub-excavated and stabilized as described above at the Contractor's expense.

Acceptable compaction test results shall not relieve the Contractor from correction or repairing of any substandard work before or during the warranty period.

### 3.2 GEOTEXTILE

- A. Geotextile reinforcement shall be used in areas of unstable subgrade if recommended by the Owner's Geotechnical Engineer and approved by the City.
- B. Geotextile Reinforcement shall be installed as per the manufacturer's recommendations and approved by the City.

### 3.3 POZZOLAN TREATED SUBGRADE (i.e. LIME, CEMENT FLY ASH, KILN DUST)

Town of Platteville Construction Specification for Pozzolan Treated Subgrade hereby references the Metropolitan Government Pavement Engineers Council (MGPEC) Pavement Standards and Construction Specification Manual, Volume 1, latest revisions, **Item 5 - Stabilized Subgrade**, with the following exceptions:

- Section 5.2.3 – Subgrade – Delete the following sentences: *Material in the stabilized zone shall have a soluble sulfate content of less than 0.5 percent. If the subgrade soils have a soluble sulfate content exceeding 0.5 percent, the mix design shall be addressed to the specific methodology used to prevent adverse sulfate reactions.* Replace these sentences with:

**Material in the stabilized zone shall have a soluble sulfate content of less than 0.2 percent. If the subgrade soils have a soluble sulfate content exceeding 0.2 percent, the mix design shall be addressed to the specific methodology used to prevent adverse sulfate reactions.**

- Section 5.4 – Construction Submittals – Add the following after paragraph B:

A. If a lime stabilizing agent is proposed, the Contractor shall supply the source, type and purity of the lime.

- Section 5.5 – **Stabilized Mix Design** – Delete Note #4 under the Stabilization Mix Design Requirements Table. Replace the note with:

**Swell Potential to be less than 1.0 percent at 150 psf, ASTM D 4546.**

- Section 5.6.1 – **Application** – Delete the following sentence: The in-place density shall be at least 95% of maximum dry density as determined by ASTM D 698, Standard Proctor Density, and within 0 to 3% of optimum moisture content. Replace this sentence with the following:

**The in-place density shall be at least 95% of maximum dry density as determined by ASTM D 698, Standard Proctor density, and within 0 to 3% above the optimum moisture content unless otherwise designated in the mix design.**

- Section 5.6.1.3 – **High Sulfate Treatment** – Delete the following sentence: Where sulfates are over 0.5 percent and less than 1.0 percent the ENGINEER must address the method of treatment. Replace this sentence with the following:

**Where sulfates are over 0.2 percent and less than 1.0 percent, the ENGINEER must address the method of treatment.**

- Section 5.7 – **Compaction** – Delete the following sentence: Should the material, due to any reason or cause, lose the required stability, density and finish before the next course or pavement is placed, it shall be corrected and refinished at the sole expense of the CONTRACTOR, as directed by the ENGINEER. Replace this sentence with the following:

**Should the material, due to any reason or cause, lose the required stability, density and/or finish before the next course or pavement is placed, it shall be corrected and refinished at the sole**

**expense of the CONTRACTOR, as directed by the ENGINEER.**

- Section 5.9.1 – Delete “by the use of phenolphthalein”
- Section 5.12 – **Testing and Inspection** – In Table 5.11, under the Minimum Frequency of Tests column in the row Swell, add the following as directed by the Engineer.

**(Minimum of one per soils type)**

If subgrade stabilization is not intended to be part of pavement design (no changes are proposed to final pavement design), but instead is proposed as a remedy to soft subgrade or subgrades failing proof-rolling the following additional exceptions are made to MGPEC Item 5:

- Section 5.5 – Stabilized Mix Design – delete Section and replace with the following:

**A letter with site specific recommendations for subgrade stabilization methods, prepared by a Professional Engineer registered in the State of Colorado, shall be submitted to the Town for approval prior to any stabilization work. At minimum the letter shall contain the following information:**

1. The type of stabilizing agent proposed.
  2. Percent of stabilizing agent to be used.
  3. Depth to which subgrade will be treated.
  4. Moisture requirements if different than that specified in Section 5, as modified herein.
  5. Soluble sulfate content of subgrade (only if lime is to be used).
  6. Swell potential of proposed mix shall be tested and shall be less than 1% at 150 psf, ASTM D4546
- Section 5.9 – **Tolerances** – delete Sections 5.9.1, 5.9.2, and 5.9.4
  - Section 5.9.3 – delete the following sentence: *The stabilized subgrade must develop a laboratory compressive strength of at least 160 psi at 5 days in accordance with Table 5.11.* Replace this sentence with the following:

**If stabilized subgrade develops a laboratory compressive strength of at least 70 psi at 5 days in accordance with Table 5.11, the Engineer may recommend to the Agency that the aggregate base course thickness be reduced by two inches. In no case shall the recommended thickness be less than four inches.**

- Section 5.10 – **Conformity with Plans and Specifications** – delete Section.
- Section 5.11 – **Measurement** – delete Section.
- Section 5.12 - **Testing and Inspection** - the following tests shall be performed in accordance with Table 5.11: *In place moisture content, in place soil density, unconfined compressive strength - optional, see Section 5.9.3 as modified above. Prior to placement of base course the treated subgrade shall meet compaction, moisture and stability requirements. Verification of these items shall be conducted by the Geotechnical Engineer with review by the Town of Platteville.*

### **3.4 SUBGRADE SURFACE TOLERANCE**

The excavation and embankments for the street, intersections, and driveways shall be finished to a reasonable smooth and uniform surface. Variations from the subgrade shall not vary more than one quarter (1/4") inch above or one half (1/2") inch below the required subgrade elevation in soil and shall be sub-excavated to a minimum depth of six (6") inches in rock. Where bituminous or Portland cement concretes are to be placed directly on the subgrade, the subgrade plane shall not vary from design grade.



**SECTION 02227**

**SUB-BASE**

**PART 1 – GENERAL**

**1.1 DESCRIPTION**

The sub-base, when required for stabilization of the subgrade, shall consist of a foundation course composed of granular material constructed on the prepared subgrade in accordance with these specifications and in conformance with the lines and grades and typical cross sections as shown on the plans or established.

**PART 2 – MATERIALS**

**2.1 GRADATION**

This material need not be crushed, but can be of the pit run variety graded to meet the following limits: (CDOT Standard Specifications Class 1)

<b>STANDARD SIZE OF SIEVE</b>	<b>% BY WEIGHT PASSING SIEVES</b>
2 ½ inch	100
2 inch	5 - 100
No. 4	30 - 65
No. 200	5 - 15
Liquid limit	35 maximum
Plasticity index	6 maximum
"R" value	50 minimum
Los Angeles Abrasion test (AASHTO M147)	Loss < 50%

The material supplied shall be a well graded mixture, consisting of sound aggregate particles and sufficient filler or other proper quality binding material, which when placed and compacted will result in a firm, dense, unyielding foundation. Balls of clay within the graded mixture will not be accepted.

**PART 3 – EXECUTION**

**3.1 PLACEMENT AND COMPACTION**

Each layer of sub-base material shall be placed in layers not to exceed six (6") inches in compacted depth. Each layer shall be wetted or aerated, if necessary, and compacted to 95% maximum density at ±2% of optimum moisture as determined by AASHTO T99. No sub-base material shall be placed upon a soft, spongy, frozen subgrade, or other unstable subgrade which is unsuitable for the placement thereof.

**3.2 SUB-BASE SURFACE TOLERANCE**

The prepared surface of the sub-base shall not vary from the established grade by more than one-quarter (1/4") inch above or one-half (½") inch below the required subgrade elevation.



## SECTION 02229

### AGGREGATE BASE COURSE

Town of Platteville Construction Specifications for Aggregate Base Course hereby references the Metropolitan Government Pavement Engineers Council (MGPEC) Pavement Design Standards and Construction Specification Manual, Volume 1, latest revision, **Item 7- Aggregate Base Course**, with the following exceptions:

- MGPEC Item 7.2 – Delete the required resilient modulus, AASHTO T294 test from Table 7.2
- MGPEC Item 7.4.3 – Moisture conditions shall be within 2% of optimum.
- MGPEC Item 7.4.4 – Proof rolling equipment may be loaded trucks, loaders, rollers, etc., and shall be approved by the Construction Services Representative.
- MGPEC Item 7.54 – Replace “resilient modulus” with “R-value”
- MGPEC Item 7.8 – Replace “resilient modulus” with “R-value” and “AASHTO T294” with “AASHTO T190”
- MGPEC Item 7.8 – The testing referred to in Table 7.8 is to be consider quality control testing, and is to be perform be the Developer or Contractor at no cost to the Town of Platteville unless otherwise provided for with Town of Platteville capital improvement projects.
- SOIL STERILIZATION – Soil sterilization shall be applied under all new asphalt paving unless waived by the Engineer on a case-by-case basis. The sterilization shall be with a pre-emergent herbicide agent, which shall be a soluble, dispensable or mixable in water and non-toxic to humans when applied per the manufacturer’s recommendations. The agent shall be active for one year after application. The applicator shall be certified by the U.S. Environmental Protection Agency and licensed in the State of Colorado as a “pesticide applicator” and shall be held responsible for any damage to plant growth outside of the roadway or to the pavement where such damage is attributable to carelessness or improper application of the agent. The agent shall be applied to the aggregate base course no more than 3 days prior to paving. The agent shall not be used where it may contaminate water used for irrigation or drinking purposes.





## SECTION 02575

### BITUMINOUS PAVING

Town of Platteville Construction Specifications for Bituminous Paving hereby references the Metropolitan Government Pavement Engineers Council (MGPEC) Pavement Design Standards and Construction Specification Manual, Volume 1, latest revisions, **Item 9 - Hot Mix Asphalt Pavement**, with the following exceptions:

- MGPEC Item 9.2.3 – Hydrated lime is acceptable, but may be substituted with an approved chemical anti-stripping additive.
- MGPEC Item 9.13.1 – In addition to the surface tolerances stated, there shall be no allowance for standing water on the final pavement surface. After compaction, the asphalt pavement adjoining the concrete gutter pan shall be between ¼" and ½" higher than the lip of the concrete pan.
- MGPEC Item 9.14 – The total thickness of the pavement, as called for on the Plans, shall not differ by more than ten (10%) percent for any one sample. The average total thickness of all samples taken shall not differ by more than seven and one-half (7.5%) percent. If the total thickness is proven to be less than these tolerances, the Town will require asphalt milling and/or overlay to correct the problem. If the total thickness is proven to be greater than these tolerances, the Town will not be responsible for compensating the Contractor for the excess amount of asphalt.
- MGPEC Item 9.15 – The testing referred to in Table 9.15 is to be considered quality control testing, and is to be performed by the developer or contractor at no cost to the Town of Platteville unless otherwise provided for with Town of Platteville capital improvement projects.
- MGPEC Item 9.15 – In Table 9.15, under Minimum Frequency for the density testing, change the 250 lineal feet to 500 lineal feet.



## SECTION 02576

### STREET PAVEMENT PATCHING

Town of Platteville Construction Specification for Asphalt Patching hereby references the Metropolitan Government Pavement Engineers' Council (MGPEC) Pavement Design Standards and Construction Specification Manual, Volume 1, latest revision, **Item 17 - Asphalt Patch**, with the following exceptions:

- Item 17.3 – Subgrade preparation shall be in accordance with Town of Platteville Construction Specifications, Section 02225.
- Item 17.3 – Final replacement thickness of patches shall be 5 ½" for local streets, 7" for industrial, collector and arterial streets, or 1" greater than the existing pavement, whichever is greater.
- Item 17.3 – Replacement of unstable subgrade with flow fill is not required. However, unstable subgrade shall be stabilized in a manner approved by the Town Construction Services Representative prior to patching.
- If pavement patch is made in a concrete pavement, see MGPEC Item 11 for PCCP requirements. Patches in concrete pavement shall consist of Portland Cement Class P concrete, and shall be doweled to the existing pavement in a manner specified by the Town of Platteville Construction Services Representative.
- The contractor shall be responsible for maintaining temporary patches. In the case of an emergency the Town of Platteville may elect to repair the temporary patch and back charge the Contractor for all costs associated with the repairs.



## SECTION 02585

### PORTLAND CEMENT CONCRETE PAVEMENT

Town of Platteville Construction Specifications for Portland Cement Concrete Pavement hereby references the Metropolitan Government Pavement Engineers Council (MGPEC) Pavement Design Standards and Construction Specifications Manual, Volume 1, latest revisions, **Item 11 - Portland Cement Concrete Pavement**, with the following exceptions:

- Item 11.4.1 – Delete “Item 3, Embankment” and replace with Town of Platteville Construction Specifications, Section 02220.
- Item 11.11 – The testing referred to in Table 11.11 is to be considered quality control testing, and is to be performed by the developer or contractor at no cost to the Town of Platteville unless otherwise provided for with Town of Platteville capital improvement projects.
- Item 11.2.6 Admixtures – Calcium chloride or admixtures containing chloride shall not be allowed in reinforced concrete and is strictly prohibited in the production of high early strength concrete.



## SECTION 02595

### UTILITY CUT AND BACKFILL

Town of Platteville Construction Specifications for Utility Cut and Backfill hereby references the Metropolitan Government Pavement Engineers' Council (MGPEC) Pavement Design Standards and Construction Specifications Manual, Volume 1, latest revisions, **Item 18 - Utility Cut and Backfill**, with the following exceptions:

- Excavation for Utility Location (Pot Holing) – All excavations for utility locates, unless otherwise approved by the Town of Platteville Engineering Division, will be made by the pot holing method, with a hole not exceeding 12 inches in diameter. Backfill shall be flowable fill, capped with non-shrink grout in conformance with Section 02223 - 2.2. The caps shall be 5 ½ inches thick in local streets, 7 ½ inches thick in other streets, and shall be finished between ¼ inch and ½ inch below adjacent asphalt pavements.
- Item 18.2 – If the utility patch is made in a concrete pavement, see MGPEC Item 11 for PCCP requirements. Concrete patches shall be doweled to the surrounding concrete pavement. Dowel *in* accordance *with* requirements by the City.
- Item 18.3.2 – Delete the words “tunnel or” in the last sentence of the first paragraph.
- Item 18.3.6 – The Contractor is responsible for maintaining temporary patches. In case of an emergency the Town of Platteville may elect to repair the temporary patch and back charge the contractor for all costs associated with the repairs.
- Item 18.3.6 – If a temporary patch is used and construction traffic control for the project is terminated, the appropriate contractor must obtain another Street Cut Permit, including the approval of a construction Traffic Control Plan, to provide for the final patch work. This is to insure proper approval of traffic control and schedule inspections. If this final patch work is completed within 30 days of the temporary patch, no additional fee will be charged for the follow-up permit.
- Item 18.3.6 – If approved by the City, good quality asphalt milling material may be used as a temporary patch on low volume streets.
- Item 18.3.7 – Gravel surface streets - When trenches are excavated in streets or alleys with a gravel surface, the contractor shall replace the surface with aggregate base course meeting the requirements of MGPEC Item 7. Replacement shall be one (1") inch greater in depth than the original gravel surface, but not less than five (5") inches.
- Item 18.3.7 – Do not place overlays with feathered edges on collectors or arterial streets. Particular care must be taken in constructing joints to provide smooth transitions, and to avoid problems with drainage or access at the edges of gutter pans.
- Item 18.3.7 – Completion of the utility cut including pavement replacement and cleanup shall normally be accomplished within two (2) days after the activity involving the cut is completed.
- Item 18.3.7 – Removal and replacement of unsatisfactory or failed pavement patches shall be completed within thirty (30) days of written notification of deficiency. Failure to comply may result in the Town of Platteville taking action upon the contractor's performance bond.
- Item 18.3.7 – Minimum asphalt patch thickness in the Town of Platteville 5 ½" for local streets and 7" for other streets.
- Item 18.3.7 – Asphalt binder grading for patches in the Town of Platteville is PG 64-22.
- Item 18.3.7 – Damaged concrete curb and gutter shall be removed and replaced to the nearest crack control joints.
- *Backfill Material must conform to one of the following:*
  1. Flowable backfill, in accordance with MGPEC Item 18.
  2. Use aggregate base course material, in accordance with MGPEC Item 7, mechanically compacted in 8" (maximum) lifts, moisture controlled within +/- 2% or optimum, to 95% AASHTO T-180. A density test is required for each 1-foot of backfill placed and a minimum of one test per 200 feet or one test per pipe run (min.). The contractor must pay for all testing costs.
  3. If the contractor wants to use the onsite material, the material must be evaluated by a Geotechnical Engineer. The engineer must confirm in writing that the material meets structural fill requirements. A proctor curve for each different type of the material must accompany the letter from the engineer. The material is to be mechanically compacted in max. 8" lifts. Material to be moisture controlled within +/- 2% of optimum. A density test is required for each 1' of backfill placed and a minimum of one test per 200', or one test per pipe run (min.). The contractor must pay for all testing costs.
- Backfill around manholes, water valves and inlets are required to be installed in 8" lifts and compaction tests on each side of structure at each 8" lift intervals. The contractor must pay for all testing costs.





## SECTION 02610

### MANHOLE AND VALVE BOX ADJUSTMENT

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

The Contractor shall adjust all manholes, valve boxes, survey monument boxes, and other fixtures encountered within the area to be paved to conform to the finished surface of the pavement to be built as per the street plans and details and in accordance with all requirements outlined in these specifications.

#### PART 2 – MATERIALS

2.1 All materials necessary for adjusting manholes or valve boxes as required for resurfacing must be on hand at the job site prior to placement of any asphalt or concrete pavement. See Standard Details S-32, S-33, and S-34.

Concrete or other approved grade rings shall be used for adjusting manhole frames and covers, valve boxes, and other similar devices to proper grade and alignment.

A good grade non-shrink grout shall be used for resetting manhole frames and grade rings.

Concrete used around manholes and valve boxes in asphalt paved streets shall be in accordance with MGPEC Item 11, Portland Cement Concrete Pavement.

Reinforcing Steel shall be specified in CDOT Standards Specifications, Section 709.

#### PART 3 – EXECUTION

##### 3.1 OBSERVATION AND REVIEW

Manhole frames and covers, valve boxes, and all other similar devices shall be raised to final grade. After adjustment, the Contractor shall notify the Town who shall make an inspection to check for cleanliness, proper alignment, and elevation.

All valve boxes shall be inspected by applying a valve key to each operating nut to insure an acceptable alignment.

##### 3.2 SAFETY

To provide proper protection to the public, manhole frames and covers, and valve boxes shall be accessible no later than twenty-four (24) hours after they have been buried by the work in progress and brought to final grade within one week.

##### 3.3 ASPHALT PAVEMENT LOCATIONS

Following installation of the final lift of asphalt pavement, final grading adjustments shall be made for all manhole frames and covers, and valve boxes. Final grading adjustments shall be made within a one-week period following placement of the final wearing surface. The following procedures are required. See Standard Details S-33 and S-34.

Remove bituminous pavement to clean straight lines and excavate as shown on Standard Details S-33 and S-34.

Complete final grading adjustments of the manhole frame or water valve box. Shim and grout into place, checking for proper alignment and slope of the grade ring. Grading requirements are shown in Standard Detail S-33 and S-34.

Following inspection and acceptance by the Project Representative or Construction Service's Representative for proper alignment and slope of grade ring proceed with placing concrete.

### **3.4 ADJUSTMENT FOR CONCRETE PAVEMENT**

After placement of the concrete and jointing has begun, a transverse joint will be placed at each manhole frame and at each water valve box or other similar device. In the event that a manhole frame, water valve box, or other similar device should be covered up during construction, the Contractor will be responsible for raising the manhole frame or water valve box up through the concrete. This work will take place no later than twenty-four (24) hours after completion of the work. The concrete edges will be full-depth saw cut and be a minimum of twelve (12") inches from the manhole frame or water valve box.

After removal of the old concrete, the existing slab will be drilled eight (8") inches deep. Sixteen (16") inches long #4 reinforcing bars will be placed at twelve (12") inches on center. Concrete pavement shall be replaced to the existing depth plus one (1") inch, or a minimum of six (6") inches, whichever is greater. A minimum mix design for concrete, as shown above in Section 2, shall be used.

The concrete shall be protected from the weather and rapid loss of moisture. Concrete shall be protected from the vehicular traffic of a period not less than seven (7) days or three (3) days with high/early or quick strength concretes.

## SECTION 02618

### PAVEMENT MARKING STANDARDS

All pavement marking installations shall be in compliance with the current (M.U.T.C.D.) Manual of Uniformed Traffic Control Devices Standards.

At intersections and 150 feet back in all directions, all markings shall be of a permanent type marking, to include but not limited to: Crosswalks, Stop bars, Arrows Only, Turn bay line, Centerline, etc.

#### PART I – GENERAL

All pavement markings shall be placed in accordance with the following requirements. When the term “full compliance” is used, it means pavement markings shall meet the requirements of these specifications.

- A. *Pavement Marking Plan* – When pavement marking location details are not provided in the Contract, the Contractor shall submit a layout of existing conditions to the Town for approval or modification. This layout is to be used as the final pavement-marking plan.
- B. *Roadways Closed to Traffic During Construction* – Full compliance pavement markings shall be in place on all roadways prior to opening traffic.
- C. *Roadways Constructed Under Traffic* – Full compliance final pavement markings shall be placed within two weeks after final surfacing is completed. Full compliance pavement markings shall also be placed on any roadways open to traffic when the project pavement work is discontinued for more than two weeks.
- D. Temporary pavement markings and control points for the installation of those pavement markings for roadways that are being constructed under traffic are as follows:
  - 1. When one roadway of a normally physically divided highway is closed, and a crossover is constructed, full compliance pavement marking shall be placed along the tapers and through the median crossovers to the two-way traffic section. Pavement marking through the two-way traffic section shall be as shown on the plans.

When a two-lane highway is closed, and a bypass detour is provided, full compliance pavement markings shall be placed the full length of the detour prior to operation of the detour.

In either case, the type of marking materials applied to a final surface, when removed, shall not leave a scar that conflict with permanent markings.

- 2. The following criteria apply to all construction and maintenance on roadways open to traffic other than (D) 1 above.

Control points, four inch by one foot marks at 40 foot intervals, are guide markers for the installation of temporary and / or full compliance markings.

All temporary broken line pavement markings shall be installed daily and shall be at least 18 inches long with a maximum gap of 38 feet. An 18-inch stripe with a maximum gap of 18 feet may be used on curves for roadways with severe curvature. A severe curve is defined as a curve whose safe speed is 10 mph or more below the approach posted speed limit.

Temporary pavement markings for “no passing zones” shall be full compliance.

For short term situation (3 calendar days or less) where temporary broken center lines are installed, “no passing” restrictions may be identified by appropriate signs including R4-1 and R4-2 until final markings are installed.

For roadways with a volume of 750 ADT or less, “no passing” restrictions can be identified for up to two weeks with appropriate signs.

Temporary pavement stencils (school, railroad etc.) are not required unless detailed on the plans.

Temporary pavement markings shall be installed per manufacturer’s recommendations in such a way that the markings adequately delineate the desired alignment.

- E. Control points, temporary pavement markings and Contractor pavement marking plans will not be paid for separately, but shall be included in the work.

**PART II – MATERIALS AND EXECUTION**

A. *Pavement Markings with Paint (Waterborne)*

*Description* – Low VOC, ready mixed, one component, 100% acrylic waterborne traffic paints.

All paints shall be suitable for application to Asphaltic or Portland Cement concrete pavements when applied with or without glass beads.

Striping shall be done when the air and pavement temperatures are at least 50° F and rising. The pavement surface and weather conditions shall be conducive to satisfactory results.

Equipment shall be capable of painting a reasonably clean-edged stripe of the designated width (± ¼ in.) and shall have a bead dispenser directly behind synchronized with the paint applicator. For center lines and lane lines, an automatic skip control shall be used that will paint a stripe with a gap as shown on the plans. Machines having multiple applicators shall be used for center lines with “no passing zones.” In areas where machines are not practical, suitable hand-operated equipment shall be used. All stripes shall be protected until dry. Paint and beads shall be applied within the following limits:

**APPLICATION RATE OR COVERAGE PER GALLON OF PAINT**

	MINIMUM	MAXIMUM
Paint	100 sq. ft	110 sq. ft. (approximately 15 miles when wet)
Beads	5 lbs. 13 oz	6 lbs. 3 oz

Pavement marking paint shall conform to the requirement listed in the following tables. All proportions are by weight. Pigment composition and vehicle composition shall not vary by more than 1.0 percent of each amount specified.

CHARACTERISTICS	YELLOW	WHITE	
Viscosity at 77 degrees F, KU	80-90	80-90	
Dry to no pick up time, ASTM D-711 without beads, minutes	3 max.	3 max.	
No-Track time, Actual @ 77 degrees F/50% RH, seconds	90 max	90 max	
Directional Reflectance %	87 min.	50	
Contrast Ratio @ 15 mils wet	0.98 min	0.95 min.	
Scrub test, Cycles	1000 min	1000 min	
Volatile Organic Compound, grams/liter	Below 150		
Total Pigment, % by Weight	62 min.	62 min.	
Total Solids, % by Weight	76 min.	76 min.	
Total Solids, % by Volume	58 min.	58 min.	
PH	9.6 min.	9.6 min.	
<b>REPORTABLE COMPONENTS:</b>			
<b>YELLOW</b>	<b>Vapor Pressure mm Hg</b>	<b>@ Temp °F</b>	<b>Weight Percent</b>
METHYL ALCOHOL	97.68	68	5
QUARTZ SILICA	N/A	N/A	0.32
OSHA PEL = 200 PPM (skin) (260 MG/M3), STEL 250 PPM ACGIH TLV = 200 PPM (skin) (260 MG/M3) STEL 250 PPM NIOSH = TWA 200 PPM, 800 PPM (CEILING)			
2,2,4 TRIMETHYL - 1,3 - PENTANEDIOL MONOISOBUTYRATE			1
NOISH REL = TWA 0.05 MG/M3, 3,000,000 FIBERS/M3 OSHA PEL = TWA RESPIRABLE: 0.1 MG/M3 TOTAL DUST: 30 MG/M3 ACGIH TLV = TWA RESPIRABLE: 0.1 MG/M3			
<b>WHITE</b>	<b>Vapor Pressure mm Hg</b>	<b>@ Temp °F</b>	<b>Weight Percent</b>
METHYL ALCOHOL	98.68	68	5
QUARTZ SILICA	N/A	N/A	1.24
OSHA PEL= 200 PPM (SKIN), STEL 250 PPM ACGIH = 200 PPM (SKIN), STEL 250 PPM NOISH = TWA 200 PPM, 800 PPM (CEILING)			
2,2,4 TRIMETHYL - 1,3 - PENTANEDIOL MONOISOBUTYRATE			1
NIOSH REL = TWA 0.05 MG/M3, 3,000,000 FIBERS M/3 OSHA PEL = TWA RESPIRABLE: 0.1 MG/M3, TOTAL DUST: 30 MG/M3 ACGIH = TWA RESPIRABLE: 0.1 MG/M3			

B. *Pavement Marking with Paint (Alkyd)*

Striping shall be done when the air and pavement temperatures are at least 40 degrees F for alkyd paints.

The pavement surface and weather condition shall be conducive to satisfactory results.

Equipment shall be capable of painting a reasonably clean-edged stripe of the designated width ( $\pm 1/4$  in.) and shall have a bead dispenser directly behind, synchronized with the paint applicator. For centerline and lane lines, an automatic skip control shall be used that will paint a stripe with a gap as shown on the plans. Machines having multiple applicators shall be used for center lines with “no passing zones.” In areas where machines are not practical, suitable hand-operated equipment shall be used. Stripes shall be protected until dry.

Paint and beads shall be applied within the following limits:

**Application Rate or Coverage per Gallon of Paint**

	MINIMUM	MAXIMUM
Paint	100 sq. ft.	110 sq. ft.
Beads	5 lbs.13 oz.	6 lbs.3 oz.

Alkyd pavement marking paint shall conform to the requirements listed below. All proportions are by weight. Pigment composition and vehicle composition shall not vary by more than 1.0 percent of amount specified. Finished Paint Pigment (White and Yellow) shall be 49.0% to 52%

Pigment Composition:	White	Yellow
Titanium Dioxide, ASTM D 476, Type III	27.0%	8.0%
Chrome Yellow, Medium ASTM D 211 Type III		18.0%
Calcium Carbonate, ASTM D 1199 Type GC-II	18.0%	17.0%
Magnesium Silicate, ASTM D 605	54.3%	56.3%
Pigment Suspending Agent (see below)		

Vehicle Composition:	White	Yellow
Alkyd Resin Solution, AASTO M 248 Type F	70%	
VM&P Naphtha, Fed. Spec. TT-N-95, Type I		30.0%
Driers, ASTM D 600 cl.B, and Anti-Skinning Agent, Methanol		

Pigment Suspending – Organo-montmorillonite shall be added to achieve the desired storage and stability requirements.

Properties of Finished Paint – The paint at the time of container filling shall be free of skins, pigment agglomerates and foreign matter and shall meet the following requirements:

- Fitness of grind, Hegman, minimum: 2
- Consistency, Krebs-Stormer, K.U. @ 77° F (25° C): 70-80
- Drying time, a wet film of paint 15 mils thick tested according to ASTM Method D 711, minutes maximum: 30

Reflectance – The white paint shall have a daylight 45 degree, 0 degree luminous directional reflectance of not less than 80% when compared to magnesium oxide (ASTM E 97).

Color – The yellow paint color shall have visually match color chip No 33538 of Federal Standard 595a.

C. *Epoxy Pavement Markings*

The epoxy pavement marking compound shall be applied with equipment that will precisely meter the two components.

The equipment shall produce the required amount of heat at the mixing head and gun tip to provide and maintain the temperatures specified.

Before mixing, the individual components A and B shall each be heated to a temperature of 80 degrees F to 140 degrees F. After mixing, the application temperature for the combined material at the gun tip shall be 80° F to 140° F. The 140° F upper limit is the maximum temperature under any circumstances.

Both pavement and air temperatures shall be at least 50° F at the time of epoxy pavement application.

The surface areas of new Portland Cement concrete pavement and decks that are to receive markings shall be sandblasted prior to placement of the epoxy pavement marking. The amount of sandblasting shall be sufficient to remove all dirt, and curing compound residue.

The surface areas of new asphalt pavement, and existing asphalt pavement, and existing concrete pavement that are to receive markings shall be cleaned with a high pressure air blast to remove loose material prior to placement of the epoxy pavement marking. Any pavement which has become dirty from tracked mud etc. as determined by the Project Representative or Construction Services' Representative shall be cleaned prior to the placement of the epoxy pavement marking.

When recommended by the epoxy manufacturer, a high pressure water blast integrated into the gun carriage shall be used to clean the pavement surface prior to epoxy pavement marking application. The water blast shall be followed by a high pressure air blast to remove all residual water, leaving only a damp surface.

Epoxy pavement marking shall be applied to the road surface according to the epoxy manufacture's recommended methods at 15 mils minimum thickness. Glass beads shall be applied into the epoxy pavement marking by means of a pressurized bead applicator at a rate of 0.25 pounds per square foot (25 pounds per gallon) minimum.

Epoxy pavement marking and beads shall be applied within the following limits:

	MINIMUM	MAXIMUM
15 mil marking	100 sq. ft	110 sq. ft.
Beads	25 lbs.	

Epoxy Pavement Marking Material:

1. *Formulation* – Epoxy pavement marking material shall be a two component, 100% solids, material formulated to provide simple volumetric mixing ratio of two volumes of component A and one volume of component B unless otherwise recommended by the material manufacturer.

2. *Composition* – The component A of both white and yellow pigments shall be within the following limits.

White		Yellow	
Min% by weight Titanium Dioxide, (ASTM D 476 Type II)	18%	Min% by weight Chrome Yellow,(ASTM D 211,Type III)	23%
Epoxy Resin	75-82%		70-77%

3. *Epoxy Number* – The epoxy number of the epoxy resin shall be  $0.38 \pm 0.05$  as determined by ASTM D 1652 for White and Yellow Component A on pigment free basis.
4. *Amine Number* – The Amine Number on the curing agent (component B) shall be  $410 \pm 50$  per ASTM D 2071.
5. *Toxicity* – Upon heating to application temperature, the material shall not produce fumes, which are toxic or injurious to persons or property.
6. *Color and Weather Resistance* – The mixed epoxy compound, both white and yellow, when applied to 3 inch by 6 inch aluminum panels at  $15 \pm \frac{1}{2}$  mils of thickness with no glass beads and exposed in the Q.U.V. Environmental Testing Chamber as described in ASTM G 53, shall conform to the following minimum requirements. (The test shall be conducted for 75 hours at 50 degrees C, 4 hours humidity, and 4 hours U.V., in alternating cycles. The prepared panels shall be cured at 77 degrees F for 72 hours prior to exposure.) The color of the White Epoxy System shall not be darker than Federal Standard No. 595A17778. The color of the Yellow Epoxy System shall conform to Federal Standard No. 595A13538. The gloss values of both samples shall not be less than 70 degrees after the test.
7. *Drying Time* – The epoxy pavement marking material shall have a setting time to a no-tracking condition of not more than 10 minutes at a temperature of 73 degrees F and above.
8. *Curing* – The epoxy material shall be capable of fully curing under the constant surface temperature condition of 25 degrees F and above.
9. *Adhesion to concrete* – The catalyzed epoxy pavement marking material, when tested according to ACI Method 503, shall have such a high degree of adhesion to the specified (4,000 psi minimum) concrete surface that there shall be a 100% concrete failure in the performance of this test.
10. *Hardness* – The epoxy pavement marking materials, when tested according to ASTM D 2240, shall have a Shore D Hardness between 75 and 100. Samples shall be allowed to cured at room temperature ( $75^\circ \text{F} \pm 2^\circ \text{F}$ ) for a minimum of 12 hours and a maximum of 48 hours prior to performing the indicated test.
11. *Abrasion Resistance* – The abrasion resistance shall be evaluated on Taber Abrader with a 1000 gram load and CS-17 wheels. The wear index shall be calculated based on ASTM test Method C-501 and the wear index for the catalyzed material shall not be more than 70. The test shall be run on cured samples of material which have been applied at film thickness of  $15 \pm \frac{1}{2}$  mils to code S-16 stainless steel plates. The samples shall be allowed to cure at  $75^\circ \pm 2^\circ \text{F}$  for a minimum of 48 hours prior to performing the indicated tests.
12. *Tensile Strength* – When tested according to ASTM D 638, the epoxy pavement marking materials shall have a tensile strength of not less than 6,000 pounds per square inch. The Type IV Specimens shall be cast in a suitable dynamic testing machine. The samples shall be allowed to cure at room temperature ( $75^\circ \text{F} \pm 2^\circ \text{F}$ ) for a minimum of 12 hours and a maximum of 48 hours prior to performing the indicated tests.
13. *Compressive Strength* – When tested according to ASTM D 695, the catalyzed epoxy pavement marking materials shall have a compressive strength of not less than 12,000 pounds per square inch. The cast sample shall be conditioned at room temperature ( $75^\circ \text{F} \pm 2^\circ \text{F}$ ) for a minimum of 12 hours and a maximum of 48 hours prior to performing the tests. The rate of compression of these samples shall be no more that 1/4 inch per minute.



#### D. *Thermoplastic Pavement Marking*

##### Equipment – General.

The material shall be applied to the pavement by an extrusion method wherein one side of the shaping die is the pavement and the other three sides are contained by, or are part of suitable equipment for heating, mixing, and controlling the flow of the material.

The equipment shall be constructed to provide continuous mixing and agitation of the material. Conveying parts of the equipment between the main material reservoir and the shaping die shall be so constructed as to prevent accumulation and clogging. All parts of the equipment which come in contact with the material shall be easily accessible and exposable for cleaning and maintenance.

All mixing and conveying parts up to and including the shaping die, shall maintain the material at the plastic temperature.

The equipment shall be so constructed as to assure continuous uniformity in the dimensions of the stripe. The applicator shall provide a means for cleanly cutting off square stripe ends and shall provide a method of applying “skip” lines. The use of pans, aprons, or similar appliances that the die overruns will not be permitted under this specification.

Beads for the surface of the completed stripe shall be applied by an automatic bead dispenser attached to the applicator in such a manner that the beads are dispensed almost instantly upon the completed line. The bead dispenser shall be equipped with an automatic cutoff control synchronized with the cutoff of the thermoplastic material.

The equipment shall be so constructed as to provide for varying die widths to produce varying widths of traffic markings.

The equipment shall be so designed to permit agitation of the material to prevent scorching, discoloration or excessive high temperatures of any part of the material.

A special kettle shall be provided for melting and heating the composition. The kettle shall be equipped with an automatic thermoplastic control device so that heating can be done by controlled heat transfer liquid rather than direct flame.

The applicator and kettle shall be so equipped and arranged as to satisfy the requirements of the National Fire Underwriters.

The equipment shall be so equipped as to permit preheating of the pavement immediately prior to application of the material.

The applicator shall be mobile and maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc.

##### Types of equipment

- A. *Portable applicator* – The portable applicator shall be a device typically used for painting crosswalk lines, stop bars, short lane lines, and short lane center lines. The applicator shall be easily maneuverable and capable of being propelled by the operator.
- B. *Mobile applicator* – The mobile applicator shall contain equipment to provide for automatic installation of skip lines in any combination of line and skip up to 40 feet. The mobile applicator shall be moved in conjunction with the melting and heating kettles in such a manner as to provide continuous highway operation of the kettles and the mobile applicator as an integral unit.

- C. *Epoxy Primer Equipment* – The epoxy primer application shall be accomplished using equipment having the following features:
1. The main storage tank shall be equipped with a visible gauge which will allow the Engineer to readily ascertain the rate of application.
  2. The main storage tank shall be equipped with a heating device which will maintain the epoxy at a constant efficient temperature.
  3. The spray nozzle and epoxy spray shall be protected from the action of wind to insure placement where needed.
- D. *Cleaning Equipment* – Equipment must be provided to insure removal of dust, debris, paint and other foreign matter from the road surface immediately prior to the installation of the composition, or immediately prior to the application of primer.

Application of Material:

The stripe shall be applied to the pavement either to the right or left of the application unit, dependent upon roadway lane being used. The unit shall not occupy more than one lane of roadway while operating.

The finished lines shall have well-defined edges and be free of waviness. All of the equipment necessary to the preheating and application of the material shall be so designed that the temperature of the material can be controlled within the limits necessary to its pour ability for good application.

At the time of installation of thermoplastic materials, the pavement shall be clean, dry, and free of oil, dirt, grease, paint or other foreign contaminants. Pavement and ambient temperatures shall be at least 50° F.

The marking material shall not be applied until the epoxy resin primer reaches the tacky stage, approximately 15 minutes under normal conditions. An infra-red heating device may be employed to shorten the curing time of the epoxy.

To ensure the best possible adhesion, the marking material as specified, shall be installed at the manufacturer's recommended temperature.

The minimum thickness of thermoplastic lines, as viewed from a lateral cross section, shall not be less than 3/32 inch at the edges, nor less than 1/8 inch at the center. Measurement shall be taken as an average throughout any 36 inch section of the line. The material, when formed into traffic stripes, must be readily renewable by placing an overlay of new material directly over an old line of compatible material. Such new material shall bond itself to the old line in such a manner that no splitting or separation takes place.

Thermoplastic Marking Material

Thermoplastic marking material shall conform to AASHTO M 249 except for the following:

- I. In paragraph 3.1.2. of the AASHTO specifications, delete the first two sentences and replace with the following:
- The material manufacturer shall have the option of formulating the material according to its own specifications. However, the binder shall be composed of alkyd resins wherein a minimum of 70 percent (by weight) of the binder shall be maleic modified glycerol ester of rosin. The physical and chemical properties contained in this specification shall apply regardless of the type of formulation used.
- J. In paragraph 4.3 of the AASHTO specifications, add the following physical characteristics:
- The infra-red spectra of the extracted binder will be compared to the characteristic absorption bands of maleic modified glycerol ester of rosin.

- K. In paragraph 6.1 of the AASHTO specifications, delete the second sentence and replace with the following:  
The containers of thermoplastic material shall weigh approximately 50 pounds (23 kg).

*E. Pavement Primers*

The type and application rate of epoxy resin primer shall be as recommended by the thermoplastic or preformed plastic pavement marking manufacturer.

A primer application rate of zero will not be accepted, except for thermoplastic marking and inlaid preformed plastic pavement marking placed on new asphalt surfaces as recommended by the manufacturer and approved in writing by the Engineer. However, if the Engineer determines that a new asphalt surface has become soiled, prior to placement of the pavement markings, pavement primer will be required and shall be applied as approved.

The epoxy resin primer material may be accepted at the job site on the basis of a manufacturers' certification, or a sample may be sent to the laboratory for testing, in which case three weeks shall be allowed between sampling and intended use.

*F. Preformed Plastic Pavement Marking*

This retro-reflective preformed plastic strip shall be suitable for application on Asphaltic or Portland Cement concrete pavement. The strip shall be applied at the locations called for on the plans as directed.

If recommended by the manufacturer, an epoxy resin primer shall be applied to all pavement surfaces prior to the application of the preformed plastic pavement marking.

The surface of the pavement shall be clean, free of loose foreign material, dry and have no moisture for a minimum of 48 hours to application of the markings.

The surface areas of new Portland Cement concrete pavement and decks that are to receive marking shall be sandblasted prior to placement of primer and marking material. The amount of sandblasting shall be sufficient to remove all dirt, and curing compound residue.

The air temperature shall be at least 60 degrees F.

Material shall be cut and laid out prior to removal of paper backing. During application only two to three feet of backing shall be removed at one time prior to application of pressure from a weighted roller of about 250 lbs. There shall be no more than three splices per 60 yds. of length.

When the marking strip is applied to newly over-laid asphalt concrete pavement, it shall be applied immediately after breakdown rolling. The rolling shall then continue to ensure complete inlay of the marking strip and to obtain the required density of the pavement.

The marking strip as applied shall be in good appearance, free of cracks, and the edges shall be true and straight.

Preformed Plastic Material:

Preformed plastic pavement marking material shall conform to ASTM D 4505, Type I, Class B, C, D, or E, and shall have a minimum thickness of 60 mils.

*G. Pavement Marking Tape (Removable)*

Retro-reflective tape shall be suitable for temporary use on Asphaltic or Portland Cement concrete pavements. The tape shall be applied at the locations shown on the plans or as directed. The surface to which the tape is applied shall be clean, dry and free of dirt, oils and grease. The tape shall be pressed down immediately after application, until it adheres properly and conforms to the surface. Temporary marking tape shall be removed on sections where tape conflicts with revised traffic lanes prior to opening of new lanes to traffic.

Pavement marking tape (removable) shall be installed in accordance with the manufacturer's recommendations, and maintained throughout the required construction phase at no additional cost to the Town's Traffic Operation.

Pavement marking tape designated in the pay item as removable shall conform to ASTM D 4592, Type I, and shall be 4 ± 0.1 inches wide.

*H. Pavement Marking Tape (Removable Material)*

1. Description – The marking tape shall consist of weather and traffic resistant yellow or white colored reflective material. The material shall consist of conformable (metal foil) backing with a pressure sensitive adhesive design for adhesion to asphalt or concrete surfaces.
2. Requirements:
  - a. *Color* – The color of the visible or outer surface shall closely match the White or Yellow traffic marking paint specified for highway delineation. Glass beads shall be strongly adhered to the tape.
  - b. *Reflectance* – The White and Yellow tapes shall have the following initial minimum reflectance values at 0.2° and 0.5° observation angles and 86.0° entrance angles as measured in accordance with the testing procedures of Federal Test Method Standard 370. The photometric quantity measured is specific luminance (SL), and is expressed as millicandelas per square foot per foot-candle.

Color	White		Yellow	
Observation Angle	0.2°	0.5°	0.2°	0.5°
Specific Luminance	1360	760	820	510

- c. *Adhesive* – The striping tape shall be supplied in rolls ready for application and have a protected pressure sensitive adhesive which shall not have a protective liner nor require a solvent activator.
- d. *Adhesion* – The material shall adhere to asphalt and concrete surfaces when applied at surface temperatures of 35 degrees F and above. Once applied, the tape shall adhere to the pavement at sub-freezing temperatures.
- e. *Conformability* – The material shall be thin flexible, conformable, and show no cracking, flaking, or bead loss. Following application, the tape shall remain conformed to the texture of the pavement surface. The thickness shall not be less than 17 mils.
- f. *Removeability* – The tape shall be removable by following manufacturers' recommendations so long as the material is substantially intact. Removal shall not require sandblast, solvents, or grinding methods.
- g. *Durability* – The striping material applied in accordance with manufacturers' recommended procedures shall be weather resistant and show no appreciable fading, lifting, or shrinkage during the useful life of the line.
- h. *Packaging and Delivery* – The striping material as supplied shall be of good appearance and free of cracks. The edges shall be true, straight, and unbroken. The material shall be supplied in rolls with no more than one splice per fifty yards of length.

The striping material shall be packaged in accordance with accepted commercial standards to prevent damage during shipment and storage. The tape as supplied shall be suitable for use for a period of at least one year following delivery when stored at temperatures of 100 degrees F or below.

*I. Raised Pavement Markers*

Raised pavement markers (temporary) shall be installed on centerlines, edge lines, and lane lines where specified in the contract. Single markers shall be installed at five-foot intervals for solid lines. A group of four markers at three-foot spacing and at 40-foot intervals shall be installed for skip lines.

Raised pavement marker shall not be less than 3.5 inches nor more than 4.5 inches in the major dimension and not more than 0.75 inches in height. The marker shall contain a retro-reflective element not less than 0.38 square inch in area. The color of the marker and the retro-reflective element shall match the color of the pavement marking line. The reflective quality requirements shall be at least equal to the following minimum values:

Observation Angle Degrees	Entrance Angle Degrees	Specific Intensity Candlepower per Foot-Candle	
		White	Yellow
0.1	0	1.0	0.60
0.1	20	0.4	0.24

The marker shall be ceramic or plastic and shall be secured to old or new pavement using an adhesive approved by the manufacturer.



## SECTION 03310

### CURBS, GUTTERS, SIDEWALKS, VALLEY GUTTERS, BIKEWAYS, DRIVEWAY AND ALLEY APPROACHES

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

Curbs, gutters, sidewalks, valley gutters, bikeways, driveway and alley approaches constructed within the Urban Growth Area of the Town of Platteville shall be concrete unless approved otherwise by the Engineer.

#### PART 2 – MATERIALS

##### 2.1 REFERENCES

Materials and construction methods shall meet the requirements of the CDOT Standard Specifications except as noted herein.

Concrete shall meet the requirements of the latest edition of MGPEC Item 11 – PCCP.

##### 2.2 MIX DESIGN

- A. All concrete shall be ready mixed concrete. Concrete mix designs consist of selecting the aggregates appropriate for the concrete application, and performing a mix design to determine the properties of the proposed mix. The proposed mix shall be tested in accordance with ACI code requirements. The Contractor must submit one (1) mix design per each concrete type intended for use within the public rights-of-way at the start of each calendar year. **No concrete shall be placed prior to the submittal of such mix designs.**
- B. Concrete for bikeways shall be fiber reinforced. The fibers shall be between  $\frac{3}{4}$  - 1 inch in length and shall be used at a rate of 1  $\frac{1}{2}$  lbs. of fibers per cubic yard of concrete.

##### 2.3 ADDITIVES

- A. Admixtures shall meet the requirements of MGPEC Item 11 – PCCP. Exception: Calcium chloride or admixtures containing chloride shall not be allowed in reinforced concrete and is strictly prohibited in the production of high early strength concrete.
- B. Additives for concrete, other than those specified in the mix design, shall not be used without prior written approval of the Engineer. When approved for use, chemical admixtures or additives shall comply with applicable ASTM or AASHTO standards. Application of admixtures shall be as per manufacturer's specifications.
- C. Coloring for colored concrete shall be accomplished by the addition of an approved commercially pure or synthetic mineral pigment as specified in the contract documents.

#### PART 3 – EXECUTION

##### 3.1 BATCHING

Batching of concrete shall conform to CDOT Standard Specifications, Section 601.06.

##### 3.2 MIXING

- A. Mixing of concrete shall conform to CDOT Standard Specifications, Section 601.07.

- B. The Contractor shall submit to the Town the ready mix delivery ticket for each load upon request by the Town indicating the following:
1. Supplier's name and date.
  2. Truck number.
  3. Project number and location.
  4. Concrete class designation.
  5. Cubic yards batched.
  6. Mix design identification.
  7. Type, brand, and amount of cement.
  8. Brand and amount of all admixtures.
  9. Weights of fine and coarse aggregates.
  10. Moisture content of fine and coarse aggregates.
  11. Gallons of batch water.
  12. Time at which water was added.
  13. Elapsed time between when water was added and concrete load was in place.
  14. Amounts of initial water and the maximum number of gallons of supplemental water allowed to be added for each truck at the job site.
  15. Name of individual authorizing supplemental water.
  16. Numerical sequence of delivery by indicating cumulative yardage delivered on each ticket.
  17. Provide the following titles with blank space to record discharge time, water-cement ratio, air content, slump, and revolutions.

### **3.3 LIMITATIONS OF PLACING CONCRETE**

Refer to MGPEC, Item 11 – PCCP.

### **3.4 PREPARATION OF SUBGRADE**

- A. *Subgrade preparation* – Subgrade preparation shall be completed in accordance with Section 02225, Subsection 3.1 of these specifications entitled "Preparation of Subgrade".
- B. No pea gravel, sand, or other material with less than ten (10%) percent passing the #100 sieve will be allowed as bedding beneath any concrete within the Town right-of-way.
- C. If in the opinion of the City, the foundation soil is of such character that it will swell or shrink with changes in its moisture content to such an extent that the concrete may be damaged; the soil shall be excavated as directed by the Town refilled, and compacted with material which meets the requirements of these specifications.
- D. The subgrade and/or sub-base shall be brought to a firm and unyielding condition with a uniform density. All soft and yielding material and other portions of the subgrade that will not compact readily when rolled or tamped shall be removed and replaced with suitable material. Concrete shall not be placed on a soft, spongy, frozen, or otherwise unsuitable subgrade. Before placing any concrete, the subgrade shall be tested for conformity with the cross-section shown on the plans, using an approved template, or other approved method. The finished subgrade shall be kept smooth, damp, and compacted prior to placing concrete.
- E. *Construction Sequence* – All curb, gutter, valley gutters, and sidewalk (where attached) shall be constructed after installation of sanitary sewer and storm sewer mains, laterals, and service lines have been installed and properly compacted in accordance with these specifications. Water mains and service lines which cross curb, gutter, attached walks, and driveways shall also be installed and properly compacted prior to installation of said curb, gutter, attached walks, and driveway approaches. Tunneling under curb, gutter, and walks will not be allowed. Water valve boxes and manholes should be adjusted to final grade after installation of curb and gutter and pavement. Electrical services should be installed after water services, but prior to installation of curb radii except where previous arrangements for use of conduit have been made and approved by the electric company.



- F. Prior to constructing the infrastructure, the area in the right-of-way should be brought to  $\pm 6"$  of finished subgrade.

### **3.5 CONSTRUCTION OF CURBS, GUTTERS, SIDEWALKS, VALLEY GUTTERS, BIKEWAYS, DRIVEWAY AND ALLEY APPROACHES**

- A. Construction requirements for concrete curbs, sidewalks, and bikeways shall conform to MGPEC Item 11 - PCCP except as modified by these specifications.
- B. Where a section of concrete sidewalk, curb and gutter, valley gutter, bikeways, driveway, or alley approach has been disturbed, it shall be removed to a joint, if the joint is situated within five feet of the proposed or existing cut, otherwise a full depth straight line shall be saw cut prior to replacement.

Where new construction abuts existing, the work shall be accomplished so that the variance in grade between the old and new work does not exceed one quarter ( $1/4"$ ) inch.

### **3.6 PLACING CONCRETE**

- A. *Alignment and Grades* – The alignment and grade elevations of the forms shall be checked by the Contractor immediately ahead of concrete placement and necessary corrections will be made. Any forms that have been disturbed or subgrade that has become unsuitable shall be corrected, forms reset, and rechecked. Any variations in grade and alignment shall be subject to approval by the Town prior to placing the concrete. Forms shall be oiled prior to placement of concrete. The subgrade shall be moist but not wet prior to placing concrete. After the Town has approved the forms and subgrade, the concrete shall be deposited on the subgrade to the required depth and width in successive batches and in a continuous operation. The concrete shall be placed as uniformly as possible to minimize the amount of spreading necessary. While being placed, the concrete shall be consolidated or vibrated with suitable tools to prevent the formation of voids or honeycomb.

All curves with radii less than two-hundred (200) feet shall be constructed with flexible forms.

Curb ramps shall not have a lip between the flowline of the gutter and the ramp approach.

The flowline of all new valley gutters shall be a straight-line grade between the gutters at each end of the new valley gutter. The Contractor is required to set finishing screed points at minimum intervals of ten (10') feet along the flowline to control the finished elevation. The screed points shall be removed or driven through the plastic concrete into the subgrade after the concrete has been finished to the required elevation. The use of timber screed points is expressly prohibited.

No low spots, which cause water to pond, will be acceptable.

Sidewalks, curb and gutter, valley gutters, bikeways, driveways, and alley approaches shall be formed and placed true to line, grade, and cross section. The finished surface must be straight and true to within one-quarter ( $1/4"$ ) inch along any ten-foot length of the new concrete in the vertical or horizontal plane. Forms for sidewalks (attached or detached) shall be so set that the sidewalk shall have a slope toward the street of 1:50 or 2 percent. Bikeways shall have a side slope of 1:50 or 2 percent.

The maximum extended running slope of sidewalks (attached or detached) and bikeways shall not exceed 1:20 or 5 percent.

- B. *Construction Stakes* – The Contractor/Owner shall provide all construction stakes required for curbs, gutters, walks, and structures and will furnish all necessary information relating to lines and grades. The Contractor shall be held responsible for the reasonable preservation of all such stakes. The Contractor shall not remove stakes until three working days after placement of the concrete unless approved by the City.

- C. Concrete shall be thoroughly vibrated or properly consolidated. Care shall be taken in vibrating concrete to bring only a continuous film of mortar to the surface. Vibration shall stop before any segregation of the concrete occurs.

Any evidence of lack of consolidation or over-consolidation shall be regarded as sufficient reason for requiring the removal of the section involved and its replacement with new concrete at the Contractor's expense.

### 3.7 TEST REQUIREMENTS

- A. The Contractor shall provide quality control testing (see Table in Appendix). Copies of quality control test results shall be kept in a notebook which is kept onsite at all times by the contractor. Formal test results shall be sent to the Town on a weekly basis.

The Town of Platteville will provide acceptance testing associated with placing of concrete, base course subgrade preparation, and trench compaction. The Contractor shall coordinate with the Town as to when he or she is ready for acceptance tests.

The Contractor/Owner shall furnish the concrete necessary for acceptance testing. The Contractor/Owner shall be responsible for the costs associated with re-testing due to failed acceptance tests.

- B. Concrete acceptance testing to be completed by the Town will follow recognized ASTM, AASHTO or ACI procedures.

Concrete that does not meet the acceptance criteria shall be removed and replaced.

### 3.8 FINISHING CONCRETE

- A. *Finishing* – After the concrete has been placed and consolidated in the forms, it shall be finished. A wood float shall be used to bring the surface of the concrete to its final form; excessive working of the surface will not be permitted. The Contractor is cautioned against the use of a steel trowel for floating the finished concrete. This practice can excessively seal and trap moisture beneath the surface. Premature surface spalling may occur. Repair of such spalling will be the responsibility of the Contractor/Owner.

The final texture of all exposed surfaces shall be obtained by light brooming. For sidewalks, bikeways, and driveway, broom the surface in the direction perpendicular to the main traffic flow. For all concrete surfaces that are designed to carry storm water; such as, curbs and gutters, valley gutters, and crosspans, broom the surface in the direction of flow.

After completion of brooming and before the concrete has taken its initial set, all edges in contact with the forms shall be tooled with an edger having a one-quarter (1/4") inch radius. No dusting or topping of the surface or sprinkling with water to facilitate finishing will be permitted.

- B. *Remove Forms* – Face forms for concrete curb may be removed for finishing curb face and fillets as soon as the concrete will retain its shape. Do not remove the back forms for concrete curbs until the concrete has been in place for at least six (6) hours.

### 3.9 JOINTS

- A. *Transverse Joints* – See Standard Detail S-22. Transverse joints (contraction joints) shall be located at intervals of ten (10') feet in curbs, gutters, and crosspans. When combination curb, gutter, and walk are used, the joint shall be continuous through all three elements. Joint depth shall be a minimum of one-third (1/3) the thickness of the concrete. Joint width shall be a maximum of one-quarter (1/4") inch wide except at expansion joints. For tooled joints, the edges adjacent to joint shall be rounded with an edger of one-quarter (1/4") inch radius.

Joints for Bikeways shall be removable plastic dummy joint strips or saw-cut at ten (10') feet intervals, tooled joints shall not be allowed on any bikeway except at expansion joints. See Standard Detail S-29.

Saw cutting of joints shall be performed as soon as the concrete surface is hard enough to allow the sawing operation without otherwise marring the concrete surface, prior to any development of shrinkage cracks. Saw-cutting shall proceed around the clock if necessary to meet these requirements.

- B. *Expansion Joints* – Expansion joints shall be required as shown on Standard Detail S-22.

Expansion joints, where required, shall be filled with one-half (1/2") inch thick full depth, preformed expansion joint material as per CDOT Standard Specifications, Subsection 705.01. Expansion joint material must be set vertical and with the top edge 3/4-inch below the finished surface. The joint shall be edged with a one-quarter (1/4") inch radius edging tool. All expansion joints shall be caulked as per Detail S-22.

### 3.10 CURING

- A. Curing of the concrete shall meet the requirements of MGPEC, Item 11 –PCCP.

Concrete shall be cured by protecting it against loss of moisture, rapid temperature change, freezing, rain or hail, flowing water, and mechanical injury. The edge of concrete exposed by the removal of forms shall be protected immediately to provide these surfaces with continuous curing treatment. The coating shall be protected against marring for a period of at least five (5) days after application. Any coating marred, or otherwise disturbed, shall be given an additional coating.

It shall be the Contractor's responsibility to protect the concrete being cured from the elements, traffic, and vandalism.

The Contractor shall have the equipment needed for adequate curing available before commencing concrete placement. Inadequate protection by the Contractor shall be cause for suspension of concreting operations and damaged concrete shall be removed and replaced at the Contractor/Owner's expense.

### 3.11 DRIVEWAY INSTALLATIONS

See Standard Details S-26 and S-27. All driveways constructed of concrete within public right-of-way shall conform to the requirements of these specifications. When constructed of concrete, the thickness shall not be less than six (6") inches. Driveways abutting a curb, gutter, and sidewalk combination or drive-over curb and gutter or driveway gutter pan or any cross gutter shall have a strip of non-extruding expansion joint material one-half (1/2") inch thick, conforming to the cross-sections of the driveway, placed between the driveway and the sidewalk or curb or cross gutter so as to provide for the expansion of the concrete driveway. See Standard Detail S-22.

### 3.12 ALLOWABLE CURB CUTS

See Standard Detail S-24. Curb cuts will be allowed only with authorization from the City. The Town may permit valley gutter or any other types of curb cuts which best serve the property owner.

### **3.13 PROTECTION/DEFACTED/DAMAGED OR DEFECTIVE CONCRETE**

The Contractor shall be responsible for taking adequate steps to protect concrete placed during precipitous, hot, or cold weather. Limitations on the placing and protecting of concrete shall conform to MGPEC Item 11 - PCCP. Any concrete damaged by precipitation or extreme temperatures or otherwise defective shall be removed and replaced at the Contractor/Owner's expense.

- A. *Cold Weather Concreting* – Cold weather concreting requirements shall start when the ambient temperature is less than 40 degrees F. Concrete shall not be placed when the ambient temperature falls below 35 degrees F.

When the ambient temperature drops to or is below 35 degrees F, the contractor shall maintain the concrete surface temperature above 50 degrees F until the concrete reaches a field compressive strength of 4000 psi. It shall be the Contractor's responsibility to determine for himself the necessity of undertaking protective measures and the type of protective measures to be used. Once the concrete reaches a field comprehensive strength of 4000 psi, the cold weather protection can be discontinued.

- B. *Potential Frost Damage* – The following procedures shall be followed if the temperature of the surface of the concrete falls below 32 degrees F before the concrete reaches the required compressive field strength of 4000 psi.

1. The Contractor will take cores at locations designated by the City.
2. The Town will take immediate possession of the cores and submit the cores to a petrographer for examination in accordance with ASTM C 856.
3. All costs associated with coring, transmittal of cores, petrographic examination, and reports shall be born by the Contractor regardless of the outcome of the petrographic examination.
4. Concrete damaged by the frost as determined by the petrographic examination shall be removed and replaced at the Contractor's expense.

### **3.14 BACKFILLING**

Once the concrete has gained sufficient strength to not be damaged, the space adjoining the concrete shall be 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 and the maximum slope shall be 4:1. Where detached walks occur, the space between the curb and walk shall be backfilled on a straight line from the top of walk to the top of curb not to exceed 4:1 slope.

### **3.15 OPENING TO TRAFFIC**

Walks and bikeways shall not be opened to pedestrian or bicycle traffic for at least twenty-four (24) hours after placement; driveways, curb, gutter, and valley gutters shall not be opened to vehicular traffic for at least seven (7) days after placement or until field-cured test cylinder breaks show an average compressive strength of 80% of the 28th day mix design strength psi. Exception will be made where high-early quick strength cement is used. In cases where high-early strength cements are used, the Contractor shall request a variance from the Engineer for opening to traffic sooner. The Contractor shall maintain suitable barricades to comply with the foregoing requirements.

## APPENDIX A

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## **TOWN OF PLATTEVILLE DEVELOPMENT REVIEW CHECKLISTS**

- **Preliminary Subdivision Plat Submittal Checklist (2 pages) – Refer to the Town of Platteville Subdivision Regulations, Chapter 17.3.200**
- **Final Subdivision Plat Submittal Checklist (2 pages) – Refer to the Town of Platteville Subdivision Regulations, Chapter 17.3.550**
- **Construction Plans Checklist (5 pages)**
- **Soils Report Submittal Checklist (1 page)**
- **Pavement Design Report Submittal Checklist (1 page)**

The Town of Platteville requires the submittals listed above on development projects when improvements are proposed within Town easements, or rights-of-way. The following checklists have been developed to assist in preparation of these documents. The checklists include items pertinent for the Town’s review, and reflect established professional engineering practice for preparation of the documents. Please note that all submittals require the preparation to be overseen, stamped, and signed by a Registered Professional Engineer, currently licensed in the State of Colorado.

The items described in the checklists are intended to provide guidance to meet the minimum requirements of the submittals listed. The items described in the checklists are not intended to be all inclusive for every project; therefore, additional work items may be appropriate. For example, the “General Notes” listed in the Construction Plans Checklist will very likely not be the only general notes listed on the final construction drawings.

The submittals listed above shall be complete and self-supporting, including all details and documents necessary for the construction of the proposed improvements. Submittal of incomplete documents will delay the development process.

If you have any questions regarding items on this list, please call the Town Administrator





## PRELIMINARY SUBDIVISION PLAT SUBMITTAL CHECKLIST

NO. TO SUBMIT	SUB- MITTED	REC'D	GENERAL REQUIREMENTS
1	[ ]	[ ]	Preliminary Subdivision Application (from Planning Department):
1	[ ]	[ ]	Vicinity Map: Town zoning map or 1" = 600' scale map extending at least 1/4 mile radius from property boundary. Map to be 8½" x 11". Identify and highlight proposed site location.
7	[ ]	[ ]	<p>Preliminary Plat Map(s): 24" x 36" at 1" = 100' scale for large-scale development and 1" = 50' for all other developments. Maps should include:</p> <ul style="list-style-type: none"> <li>• One 8½" x 11" reduction of the site plan.</li> <li>• Name of development.</li> <li>• Date of preparation.</li> <li>• North arrow (true north).</li> </ul> <p style="padding-left: 40px;">Location and principal dimensions of all recorded section lines, property lines, streets, alleys, walkways, all important improvements, area acreage, oil wells, and setbacks on tank batteries, areas to be reserved or dedicated for parks, schools, or other public uses, and other important features within and adjacent to the tract to be reviewed.</p> <ul style="list-style-type: none"> <li>• Proposed sites of any business, commercial, or industrial areas, churches, or other non-public uses other than single-family residential uses.</li> <li>• Existing and proposed rights-of-way (ROW) as they relate to the centerline of the road.</li> <li>• Any utility, drainage, access, or other easements.</li> </ul>
1	[ ]	[ ]	<b>Project Narrative:</b> Provide a brief description of the proposed project and how this project complies with applicable zoning and comprehensive planning criteria.
7	[ ]	[ ]	<b>Contour Map:</b> Contour map shall contain existing two-foot contour elevations.
7	[ ]	[ ]	<b>Preliminary Engineering Plan:</b> Preliminary engineering plan is to be completed in conformity with the Town's Design Standards and Construction Specifications by a Registered Professional Engineer (Colorado) for streets and sidewalks and shall contain the following:

NO. TO SUBMIT	SUB- MITTED	REC'D	GENERAL REQUIREMENTS
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			<ul style="list-style-type: none"> <li>• Alignment of all proposed roadways and sidewalks.</li> <li>• Maximum grades for all proposed roadways and sidewalks.</li> </ul>
7	[ ]	[ ]	<p><b>Preliminary Utility Plan:</b> Preliminary utility plan is to be completed by a Registered Professional Engineer and shall contain:</p> <ul style="list-style-type: none"> <li>• Alignment of all utility lines.</li> <li>• Existing and proposed easements.</li> <li>• Size of water, sanitary sewer, and storm drain lines.</li> <li>• Location of existing and proposed fire hydrants.</li> </ul>
7	[ ]	[ ]	<p><b>Preliminary Drainage Plan;</b> Preliminary drainage plan is to be completed by a Registered Professional Engineer and shall contain:</p> <ul style="list-style-type: none"> <li>• Designation of any area subject to inundation.</li> <li>• Details of overlot grading proposed, including significant features such as retaining walls and grades matching to adjacent properties.</li> <li>• Directions of storm water flow.</li> <li>• Points of diversion.</li> <li>• Types and locations of existing and proposed storm drainage structures.</li> </ul>
2	[ ]	[ ]	<p><b>Preliminary Traffic Study:</b> Preliminary traffic study is to be completed by a Registered Professional Engineer and shall contain:</p> <ul style="list-style-type: none"> <li>• Projected traffic generated as a result of the proposed development.</li> <li>• Review of existing traffic volumes in the area of the proposed development.</li> <li>• Analysis of affected roadways to accommodate both the existing and the projected traffic.</li> </ul>
1	[ ]	[ ]	<p><b>Copy of Deed Restrictions or Covenants for Property:</b> Information prepared by a Licensed Title Company showing proof of ownership and any deed restrictions, covenants, or liens associated with the subject property.</p>

NO. TO SUBMIT	SUB- MITTED	REC'D	GENERAL REQUIREMENTS
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2

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[ ]

**Other Reports:** Registered Professional Engineer's report should, unless waived by Planning staff, address the following:

- Location of existing water courses, improvements, and other features within and adjacent to the tract to be rezoned.
- Floodway and flood fringe location (if applicable), plus applicable permits.
- Recoverable gravel areas (if applicable).
- Any proposed improvements.
- Proposed parking areas and total number of parking stalls.
- Geologic report to be prepared by a Professional Geologist documenting geologic conditions anticipated at the site and their compatibility with the proposed development.
- Preliminary development phasing plan is to be provided whenever a development is to be constructed in phases and all required improvements in easements and the public right-of-way are not completed prior to occupancy. The plan is to consist of an overall plan of the subdivision and a written document describing the phasing schedule of all improvements (including parks, traffic signals, temporary cul-de-sacs and any associated improvements such as sidewalks, drainage system conveyance, and detention facilities or drainage relocation). The discussion should include who will make the required improvements and how they are to be paid for.



## FINAL SUBDIVISION PLAT SUBMITTAL CHECKLIST

NO. TO SUBMIT	SUB- MITTED	REC'D	GENERAL REQUIREMENTS
1	[ ]	[ ]	Final Subdivision Land Use Development Application:
1	[ ]	[ ]	<p><b>Project Narrative:</b> A brief description of any changes from the preliminary subdivision proposal in the proposed project. Include a review of how the use of any structure has changed and how this revised project complies with applicable zoning and comprehensive planning criteria. If the final subdivision is the same as the preliminary new project narrative and site plan map are not required. If the final plat does not conform to the preliminary plat, a new preliminary plat map and project narrative may be required.</p>
7	[ ]	[ ]	<p><b>Final Plat Map(s):</b> 24" x 36" at 1" = 50' or 1" = 100' on Mylar. Maps should include:</p> <p style="padding-left: 40px;">One 8½" x 11" reduction of the final plat.</p> <p style="padding-left: 40px;">Final plat shall conform to the preliminary plat as approved except that the final plat may constitute only a portion of the territory covered by the preliminary plat. If the final plat does not conform to the preliminary plat, the Planning Director will decide if the change is substantial enough to warrant another preliminary plat.</p> <ul style="list-style-type: none"> <li>• Name of development.</li> <li>• Date of preparation, scale, and symbol designating true north.</li> <li>• Legal description of the property, including acreage.</li> <li>• Complete description of preliminary control points to which all dimensions, angles, bearings, and similar data on the plat shall refer.</li> <li>• Boundary lines of subdivision, right-of-way lines, and dimensions of streets, easements, alleys, and other rights-of-way, irrigation ditches, and block and lot lines with accurate bearings and distances.</li> <li>• Each lot or site shall be identified by a number, and the area in square feet of each lot shall be designated.</li> <li>• Location and description of all monuments.</li> <li>• The dedication statement, surveyors' certifications and approval statements</li> </ul>

NO. TO SUBMIT	SUB- MITTED	REC'D	GENERAL REQUIREMENTS
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must appear on the plat as required by the Town Subdivision Regulations.

7 [ ] [ ]

**Final Plat Accompanying Information:**

- Traverse sheet in form acceptable to Town Engineer.
- Utility Plan showing detailed drawings of all easements, physical lines and other equipment and apparatus for providing water sanitary sewer, fire protection, electric, natural gas, and other required utility services.
- Copies of executed and recorded easements for any water and sanitary and storm lines to be constructed beyond the boundaries of the subdivision.

Drawings showing grades and cross sections of all streets, alleys, and sidewalks.

- Detailed drainage report prepared by a Registered Professional Engineer knowledgeable in the field of hydrology. This report shall follow the guidelines as set forth below:

- All property intended for residential use shall be designated for 2-year and 100-year storm return periods. Streets shall carry a 2-year storm without over-topping the curb and gutter and all permanent improvements shall be protected from inundation due to a 100-year storm.
- All property intended for commercial, business, or industrial use shall be designed for 5-year and 100-year storm return periods. Streets shall carry a 5-year storm without over-topping the curb and gutter and all permanent improvements shall be protected from inundation due to a 100-year storm.
- Drainage report shall show and include the following: Calculated flow quantities at each intersection for the minor storm; flow quantities entering and leaving the property, along with final disposition of these quantities; all drainage basins and sub-basins contributing to flows through the property with design acreage noted; inundation line for 100-year storm; all design data with all calculations; plan, profile, and design sheets for any other drainage facilities required by the Director of Public Works pursuant to his authority as granted in Section 17-45 of the Code of Ordinances, Town of Platteville.

2 [ ] [ ]

**Other Reports:** Registered Professional Engineer's report should, unless waived

NO. TO SUBMIT	SUB- MITTED	REC'D	GENERAL REQUIREMENTS
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by Planning staff, address the following:

- Proposed parking areas and total number of parking stalls.
- Lighting plan which contains one 8½" x 11" reduction, the location and height of all exterior lights, and a description of the light and lumination pattern.
- Sign plan which provides the location of all signs (including traffic signs) plus the description and dimensions of all signs.
- Construction plans for any proposed public improvements. The plans should include the final plat, public and private street plans, utility plans, and drainage elements within easements or the public right-of-way. They may also include signing, pavement marking, and traffic signal plans.
- Soil and pavement design report documents the soil conditions and proposed pavement installation with the structural cross sections for both parking lots and streets.
- Retaining wall design report provides construction documents with all supporting engineering calculations necessary for retaining wall installations that are 30" or more above finished grade located within public right-of-way.
- Development phasing plan is required whenever a development is to be constructed in phases and all required improvements in easements and the public right-of-way are not completed prior to occupancy. The plan consists of an overall plan of the subdivision and a written document describing the various phases, and temporary construction required (e.g. temporary cul-de-sacs), drainage system conveyance and detention facilities, water and sewer utilities, parks, etc.

NOTE: Building permits will not be issued for any lots within a development unless a development phasing plan has been submitted and approved. Once approved, a phasing plan must be followed until a subsequent plan is submitted and approved.





## CONSTRUCTION PLANS CHECKLIST

### 1. GENERAL DRAFTING STANDARDS:

- Sheets maximum size shall be 24" x 36" in size.
- Text should be legible and relocated from areas with congestion or numerous line types.
- No text shall be under a L80 or 0.08" in height.
- Any reduced plans shall not have any text heights under the L80 height.
- All existing improvements, including lot lines, ROW lines, etc. shall be dashed.
- All existing contour lines shall be dashed with a dashX2 or hiddenX2 line.
- Any existing improvements, contours, lot lines, ROW lines, etc. shall continue past the boundary lines at least 100 feet.
- Each sheet shall have a title block and named appropriate with the name of the subdivision and sheet purpose and sheet number.
- Original and revision dates on all sheets.
- Sheets containing plan views shall contain a north arrow, bar scale and written scales for horizontal, along with vertical if appropriate.
- The boundary should always be in a heavy line type.
- Acceptance signature blocks shall be included on all sheets where public improvements are to be constructed.
- Plans shall be checked, sealed, signed and dated by a Registered Professional Engineer.

### 2. COVER SHEET:

- Project Name and Legend.
- All General Notes for entire project.
- Vicinity or location map with site denoted and streets, parks schools, etc. labeled.
- Benchmark description including reference to datum (NAVD29). Descriptions shall be sufficient to provide for locating monuments.
- Basis of bearings, section or control line information including all aliquot corners.
- Sheet Index.

- List of Contacts and Engineer's Signature Block
- Owner, engineer and developer's name, address and telephone numbers.

**3. GENERAL REQUIREMENTS FOR ALL PLAN AND PROFILE SHEETS:**

- Horizontal Scale: 1"=50' or larger. Vertical Scale: 1"=5' or larger.
- Match lines labeled with corresponding sheet number.
- Existing and proposed rights-of-way, easements, and property lines, on and adjacent to the site.
- Label street names. Denote all lot numbers and blocks.
- Curb and gutter, sidewalk, and alleys.
- Beginning station tied and referenced to section line or control line.

**4. PHASING PLAN – IF APPLICABLE:**

- Denote the phases in heavy lines and large lettering.
- Draw and label any temporary traffic signage required for proposed phasing.

**5. GRADING PLAN:**

- Existing site topography extending a minimum 100' past property limits.
- Existing and proposed curb and gutter, sidewalk, bike-paths, alleys, and other improvements including irrigation ditches drainage swales, and structures.
- Location of fixed objects and features (wetlands, trees, poles, fences, buildings, walls, etc.).
- Label all improvements such as structures. Cross-sections and details may be necessary to adequately describe improvements.
- Show and label driveway grades and dimensions.
- 100-year floodplain and floodway lines and flood elevations if applicable.
- Label all proposed and existing finished floor elevations on and adjacent to the site.
- Existing contours (2.0 foot maximum interval).
- Proposed contours (2.0 foot maximum interval). Line types should be heavier than the existing. Index contours should be heavier than others. Show match with existing contours.
- Label street slopes, grade breaks, and approximate high and low point locations.

- Spot elevations at all property corners.
- Survey control points with elevations and coordinates.
- Drainage designation for each lot. Show drainage flow arrows.
- Where parking lots, special entrances, trash enclosures, special structures, etc. are to be constructed spot elevations should be added at all points where curb directions change.
- Do not include existing or proposed utilities.

**6. EROSION CONTROL PLAN:**

- Proposed silt fence and other erosion control devices.
- For plan requirements and symbols see "Storm Drainage Volume II - Design Criteria and Construction Specifications," Section 13.

**7. MASTER UTILITY PLAN:**

- Existing utilities both on and adjacent to site. Draw at an appropriate (readable) scale.
- Proposed utilities on and adjacent to the site. Draw proposed utilities in a heavier weight than the existing. Include all manholes, fire hydrants, valves, inlets, irrigation structures, etc.
- Alignment of all dry utilities including gas, electric, telephone, and cable television.
- Proposed points of connection for water and sewer.
- Proposed abandonment of any existing lines.
- Conduits for dry utility sleeves, labeled with conduct size and utility use.

**8. SIGNAGE, STRIPING AND LIGHTING PLAN:**

- The signage, striping and lighting items set forth on this sheet shall be set in a heavier line weight and shall be appropriately labeled.
- Pavement marking shall include lane lines, cross walks and stop bars, lettering and symbols. Dimension lane widths.
- A sign table shall be included listing all signs, their MUTCD designation and number required.

## 9. STREET PLAN AND PROFILE:

- Existing street improvements for full width of street plus 50' beyond construction limits.
- Proposed street improvements; curb and gutter, storm inlets, sidewalk, bikeways and alleys. Curb types, pan widths, etc. should be denoted on the plan. Limits of construction shall be noted.
- Curve layout information including radius, length of curve, central or deflection angle, stationing of point of curvature (P.C.) and point of tangent (P.T.)
- Plan view shall denote right-of-way widths, flowline to flowline widths, flowline spot elevations at intersections, cul-de-sacs, "knee-caps" and the beginning and ending of horizontal curves with stationing at any alignment changes. If plan is too cluttered intersection details shall be provided. Proposed contours and utilities are not typically shown in the plan view.
- Profile view shall contain a minimum of one profile, that being the centerline. Whenever the street cross section varies from the standard section, other profiles or cross-sections should be added to clarify including flow-line profiles for curb returns and cul-de-sacs. Cross-sections shall be provided for arterial and major collector streets as well as widening of existing streets.
- Profiles shall extend a minimum 100' beyond limits of construction. Cross-sections shall extend a minimum 25' beyond construction limits.
- If centerline profile is used a distance and slope should be denoted on the profile view for all horizontal curves at flowlines.
- Existing and proposed profiles should be shown and labeled. Existing profiles shall be in a dashed line type. Vertical curve data shall include beginning and ending grades, length of curve, stationing for point of vertical curvature, point of vertical intersection, and point of vertical tangent.

## 10. UTILITY PLAN AND PROFILE:

- Separate plan and profile sheets shall be provided for water, sanitary sewers, storm drains, storm water channels, non-potable water, irrigation pipelines, and ditches.
- For storm drains, follow those requirements as set forth in the "Storm Drainage Volume II - Design Criteria and Construction Specifications," Section 2.5 Construction Plans.
- Show all existing and proposed utilities including valves, fire hydrants, manholes, inlets and associated items in the plan view.
- Draw proposed subject utility with a heavy line weight.

- Draw and label any proposed new connections to the existing systems, as well as existing service connections, by station in the plan view.
- Include any benchmarks and horizontal control points.
- Label and draw the pipe alignment with stationing, pipe size, type of material, pipe class and length between fittings or manholes on the plan and profile views.
- Profiles should accurately depict the existing and proposed grades above pipes.
- The profiles should depict all proposed crossings with other existing or proposed utilities. Label all crossings with the type of utility and size and elevation if known. Show any special thrust restraint.
- The profiles for the water lines shall denote the top of pipe elevations for all fittings.
- The profiles for sewer lines shall denote manhole rim elevations along with the various invert elevations.
- Stations that correspond to any pipe appurtenances including air relief valves, pressure reducing valves, blow-offs, lift stations, and clean-outs.

#### 11. DETAIL SHEETS:

- Typical sections shall be provided for all streets showing all improvements and dimensions. This shall include the pavement section design.
- Add any applicable standard details as provided in the "Design Criteria and Construction Specifications" manual.
- Include special details for any item not clearly described or labeled in the Construction Plans or Design Criteria manuals. This is particularly true for drainage channels, rip-rap areas, irrigation structures, retaining walls and all other non-standard structures.

#### 12. GENERAL NOTES:

The following general notes shall be included on construction plans as applicable:

- 1. All work within the public right-of-way, or easement shall conform to the Town of Platteville Construction Specifications and Design Standards.
- 2. The Contractor is responsible for obtaining all required permits prior to commencement of any work on the project. A permit from Public Works Department (970-350-9881) is required for all construction

in public right-of-way or easements. A pre-construction conference shall be held with Town of Platteville representatives before a permit will be issued. Call Utility Notification Center of Colorado at 1-800-922-1987 for utility locates at least 48 hours prior to any excavation work.

- 3. The Contractor shall notify Construction Services (970-350-9358) at least 24 hour prior to required inspection.
  
- 4. It is the Contractor's responsibility to notify the Owner/ Developer, and the Town of Platteville, of any problems in conforming to the accepted plans for any element of the proposed improvements prior to its construction.
  
- 5. It is the responsibility of the Developer during construction activities to resolve construction problems due to changed conditions, or design errors encountered by the Contractor during the progress of any portion of the project. If, in the opinion of the Town of Platteville, the modifications proposed by the Developer, to the accepted plans, involve significant changes to the character of the work, or to the future contiguous public or private improvements, the Developer shall be responsible for re-submitting the revised plans to the Town of Platteville for acceptance prior to any further construction related to that portion of the project. Any improvements not constructed in accordance with the accepted plans, or the accepted revised plans, shall be removed and reconstructed according to the approved plan.
  
- 6. The Contractor shall be solely and completely responsible for the conditions at and adjacent to the job site, including safety of all persons and property, during the performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours. The duty of the Town of Platteville to conduct construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site.
  
- 7. The Contractor shall provide all lights, signs, barricades, flag persons, or other devices necessary to provide for public safety in accordance with the current Manual on Uniform Traffic control Devices, and the Town Supplement to the Manual on Uniform Traffic Control Device
  
- 8. The Contractor is responsible for the protection of all survey monuments. Any monument that must be destroyed for construction shall be replaced. The Contractor shall engage the services of a

Professional Licensed Surveyor (PLS) prior to disturbing any monuments.

- 9. Prior to final placement of surface pavement, all underground utility mains shall be installed and service connections stubbed out beyond curb line, when allowed by the utility. Service from public utilities and from sanitary sewers shall be made available for each lot in such a manner that will not be necessary to disturb the street pavement, curb, gutter, and sidewalk when connections are made.
  
- 10. A Geotechnical Report has been prepared by \_\_\_\_\_ (include report date and project #) for right-of-way grading and paving. Refer to Geotechnical Report for any requirements exceeding Town of Platteville Standards. A Final Pavement Design Report is also required. The soil investigation for this report shall occur after utility construction and grading for streets is completed to within 6" of anticipated subgrade. The final Pavement Design Report shall be accepted by the Town of Platteville prior to any non-structural concrete, pavement or subgrade installation.





## SOILS REPORT SUBMITTAL CHECKLIST

DEVELOPMENT/PROJECT NAME: \_\_\_\_\_

LOCATION: \_\_\_\_\_

SUBMITTED BY: \_\_\_\_\_

FIRM: \_\_\_\_\_

CONTACT: \_\_\_\_\_

PHONE: \_\_\_\_\_

SUBMITTED DATE: (1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

(4)

DATE APPROVED: \_\_\_\_\_

### 1. REPORT FORMAT:

- Title page with project address and approval block.
- 8 ½" x 11" paper size report, bound together.
- Dated, checked, signed, and stamped by a Registered Professional Engineer (Colorado).
- Clearly show original submittal date, and revision dates (if applicable).

### 2. SOILS INFORMATION:

- Boring locations and site plan.
- Boring logs.
- Gradation tests and/or Atterberg limits.
- Proctor curves and compaction tests.

- Swell; if this exceeds 2.0% at 150 psf load, the report shall include proposed mitigation methods.
- Soil classification (AASHTO).
- Problem areas within the site.
- Groundwater levels.
- Trenching restrictions or slope stability issues.

**3. CONSTRUCTION METHODS:**

- Re-testing after rough grading.
- Construction phasing or sequence.
- Lift thickness and compaction requirements.
- Problem areas and recommendations.

## PAVEMENT DESIGN REPORT SUBMITTAL CHECKLIST

DEVELOPMENT/PROJECT NAME: \_\_\_\_\_

LOCATION: \_\_\_\_\_

SUBMITTED BY: \_\_\_\_\_

FIRM: \_\_\_\_\_

CONTACT: \_\_\_\_\_

PHONE: \_\_\_\_\_

SUBMITTED DATE: (1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

(4)

DATE APPROVED: \_\_\_\_\_

### 1. REPORT FORMAT:

- Title page with project address and approval block.
- 8 ½" x 11" paper size report, bound together.
- Dated, checked, signed, and stamped by a Registered Professional Engineer (Colorado).
- Clearly show original submittal date, and revision dates (if applicable).

### 2. REQUIRED INFORMATION:

- Vicinity map to locate the investigated area.
- Scaled drawing showing the location of final borings.
- Final layout with street names.
- Scaled drawings showing the estimated extent of subgrade soil type and EDLA for each street classification.

- Pavement design alternatives for each street classification.
- Tabular listing of sample designation, depth, group number, liquid limit, plasticity index, percent passing #200 sieve, AASHTO classification, group index, and soils description.
- R-Value test results of each soil type used in the design.
- Swell/consolidation test results.
- Identification of any samples consolidated to create composite sample for testing purposes.
- Borrow source identification (on-site or imported).
- Pavement design nomographs or computer software printouts.
- Design calculations and coefficients used for all pavement design section materials.
- Mix design test results if chemical subgrade stabilization methods have been approved by the Town of Platteville.
- A discussion of any potential unsuitable subgrade issues including; heave or settlement, frost, ground water, drainage issues, cold weather construction, organics, etc.
- Recommendations to alleviate or mitigate the impacts of identified unsuitable subgrade soils.

**TOWN OF PLATTEVILLE PRE-CONSTRUCTION MEETING**

PROJECT NAME: \_\_\_\_\_

PROJECT LOCATION: \_\_\_\_\_

DATE: \_\_\_\_\_

1.) **OWNER/DEVELOPER INFORMATION**

Contact Person:

Address:

Phone:

2.) **CONTRACTOR INFORMATION**

Contact Person:

Address:

Phone:

Subcontractors/Suppliers:

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3.

4. \_\_\_\_\_ 5. \_\_\_\_\_ 6.

7. \_\_\_\_\_ 8. \_\_\_\_\_ 9.

Design Engineer:

Surveying/Layout:

Quality Control Testing:

3.) **REQUIRED PERMITS**

Town of Platteville R.O.W. Permit:

CDOT or Weld County:

Storm Water Discharge:

Railroad, Ditch Company, Other:

4.) **CONSTRUCTION SCHEDULE**

Start Date:

Anticipated Duration:

5.) **COORDINATION WITH UTILITIES & TOWN OF PLATTEVILLE**

Water:

Sanitary Sewer: \_

Storm Drains Construction  
Services

Development Coordinator:

Town of Platteville Streets

Traffic Control:

Public Works Dept.:

Others:

6.) **ADDITIONAL INFORMATION/SPECIAL CONDITIONS**

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# TOWN OF PLATTEVILLE PRE-CONSTRUCTION MEETING

PROJECT NAME: \_\_\_\_\_

PROJECT LOCATION: \_\_\_\_\_

DATE: \_\_\_\_\_

NAME	TITLE	AGENCY/ COMPANY	PHONE #	FAX #





**SCHEDULE FOR QUALITY CONTROL SAMPLING AND TESTING**

IDENTIFICATION	TYPE OF TEST REQUIRED	MINIMUM SAMPLING/TESTING FREQUENCY
Sewer/Water /Non-Potable Water Compaction	Moisture/Density Curve	One Per Soils Type
	% Compaction % Moisture	Mainline: One Test Every 200 L.F. Every Other 8" lift of Backfill. Water Service: One Test Every Other 8" lift of Backfill. Sewer Service: One Test Every Other 8" lift of Backfill. Water Valve/Manhole: One Test Each 8" lift of Backfill. Test Opposite Sides
Storm Water Compaction	Moisture/Density Curve	One Per Soils Type
	% Compaction % Moisture	Mainline: One Test Every 200 L.F. Every Other 8" lift of Backfill. Service: One Test Every other 8" lift of backfill.
Structure Backfill	Moisture/Density Curve	One Per Soils Type
	% Compaction % Moisture	1 per 100 C.Y. or Fraction There Of. Minimum 1 per Structure.
	Gradation	1 per 200 C.Y. Or Fraction There Of.
Embankment and Subgrade Soils Compaction	Moisture/Density Curve Gradation	One Per Soils Type
	% Compaction % Moisture	One Test Per 450 CU. Yds. Or Fraction There Of, And/Or Each Lift Placed Shall be Tested for Embankment Fill. One Test for Each 200 Lane Feet, Each Lift (Not Less Than One Test/Day) Shall be Tested for Subgrade Compaction.
Filter Material/Bed Course Material	Gradation	One Per Type, per Project
Aggregate Base Course (See MGPEC Item 7)		
Hot Bituminous Pavement (See MGPEC Item 9)		
Concrete Sampling & Testing	Compressive Strength Air content Slump Temperature Thickness Unit Weight Joint Sealant Pull Test Gradation	ASTM C 39 One set* per 100 cubic yards (minimum of one /day. ASTM C 231 One test per each first three trucks, then one for every 5 trucks.** ASTM C 143 One test per each first three trucks, then one for every 5 trucks.** ASTM C 1064 One test with every air and slump test ASTM C 174 One core test per 500 linear feet per lane.*** ASTM C 138 One per air content test. See MGPEC Item 11 One per 1,000 LF of joints. ASTM C 136 One per Source, per Project. * One set consists of at least 4 cylinders. ** If out of specification, test until in specification. *** For street pavements only.
All other utilities and/or Excavation in the ROW or Easements within 20 feet of ROW (Irrigation, Gas, Power, Cable T.V., Telephone line, etc.) Flowable Fill may be used in lieu of compacting on site material	Moisture/Density Curve	One Per Soils Type
	% Compaction % Moisture	Mainlines: One Test Every 200 L.F./Every Other 8" Lift of Backfill. Services: One Test Every Other 8" Lift of Backfill.
Utility trenches in easements beyond 20 feet of ROW. Flowable fill may be used in lieu of compacting on site material.	Moisture/Density Curve	One Per Soils Type
	% Compaction % Moisture	One Test Every 1,000 Feet.



## GUIDELINE FOR QUALITY ASSURANCE SAMPLING AND TESTING

IDENTIFICATION	TYPE OF TEST REQUIRED	MINIMUM SAMPLING/TESTING FREQUENCY
Sewer/Water Compaction	Moisture/Density Curve	One Per Soils Type
	% Compaction % Moisture	Mainline: One Test Every 1000 L.F. Water Service: One Test Per 20 Services. Sewer Service: One Test Per 20 Services. Water Valve/Manhole: At Inspectors Discretion. Test Opposite Sides
Storm Water Compaction	Moisture/Density Curve	One Per Soils Type
	% Compaction % Moisture	Mainline: One Test Every 1000 L.F. Lateral: One Test Per 4 Laterals.
Structure Backfill	Moisture/Density Curve	One Per Soils Type
	% Compaction % Moisture	1 per 100 C.Y. Minimum 1 per Structure
	Gradation	1 per 1000 C.Y.
Embankment and Subgrade Soils Compaction	Moisture/Density Curve Gradation	One Per Soils Type
	% Compaction % Moisture	One Test Per 2500 CU. Yds for Embankment Fill. One Test for each Soil Type for Subgrade Tests.
Filter Material/Bed Course Material	Gradation	One Per Type
Aggregate Base Course	Moisture/Density Curve Gradation	One Per Type
	% Compaction % Moisture	One Test Every 1000 L.F. Staggered and on Center Line.
Hot Bituminous Pavement	Design Check	Annual Check
	Extraction/Gradation	One Per Project. Depending on Project Size.
	Superpave/Rice	One Sample Per Project
	Density	One Core Per 500 L.F.
Concrete Sampling & Testing for Sidewalks, Bike paths	Slump Air Content Temperature Compressive Strength	One Slump; Air Content, Temp. and 4 Cyl. For each Project or at Inspectors Discretion (1 @ 7 Days. 2 @ 28 Days, 1 hold)
	Gradation	One Per Source
Concrete Sampling & Testing for Structure Concrete	Slump Air Content Temperature Compressive Strength	One Slump, Air Content, Temp. & 4 Cyl. For each for each structure or at the Inspectors Discretion (1 @ 7 Days. 2 @ 28 Days, 1 hold)
	Gradation	One Per Source
Concrete Sampling & Testing for Curb & Gutter	Slump Air Content Temperature Compressive Strength	One Slump, Air Content, Temp. & 4 Cyl. For each 1500 L.F. Or Fraction There Of or at the Inspectors Discretion (1 @ 7 Days. 2 @ 28 Days, 1 hold)
	Gradation	One Per Source.
All other utilities and/or	Moisture/Density Curve	One Per Soils Type

<p>Excavation in the ROW or Easements (Irrigation, Gas, Power, Cable T.V., Telephone line, etc.) Flowable Fill may be used in lieu of compacting on site material</p>	<p>% Compaction % Moisture</p>	<p>Mainlines: One Test Every 1000 L.F./ Services: One test per 20 services</p>
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**TOWN OF PLATTEVILLE / DEPARTMENT OF PUBLIC WORKS  
TRAFFIC CONTROL PLAN REVIEW FORM**

**INSTRUCTIONS:** Complete Section One and attach a work area traffic control plan. Plans must comply with the MUTCD Standards. Fax or return to the Traffic Operations Division office for review. A 72-hour notice is strongly recommended prior to construction. This form and the Traffic Control Plan shall be on the job site at all times.

**SECTION ONE**

DATE SUBMITTED: _____	TYPE OF WORK: _____
LOCATION OF CONSTRUCTION WORK: _____	
CONTRACTOR: _____	
REQUESTED DATE (S) OF WORK FROM: _____	TO: _____
OVERNIGHT SETUP: YES _____ NO _____	
REQUESTED TIME (S) FROM: _____	A.M. / P.M. TO: _____
A.M. / P.M.	

TO BE COMPLETED BY TRAFFIC CONTROL COMPANIE (S)	
TRAFFIC CONTROL COMPANY NAME: _____	
24 HR CONTACT PERSON: _____	
COMPANY ADDRESS: _____	
DAY PHONE: _____	EVENING PHONE: _____
CELLULAR: _____	FAX: _____
TO SET UP FOR: _____	
ADDRESS _____	
DATE REQUESTED ___/___/___	

TO BE COMPLETED TOWN OF PLATTEVILLE DEPARTMENTS, CONTRACTOR, SUB-CONTRACTOR, CITIZEN:	
CONTRACTOR / SUBCONTRACTOR NAME _____	
ADDRESS _____	
PROJECT MANAGER _____ 24 HR	
_____	
DAY PHONE _____	EVENING PHONE _____
CELLULAR _____	FAX _____
_____	

<b>SECTION TWO</b>	
TRAFFIC CONTROL HAS BEEN:	ACCEPTED ( ) DENIED ( ) PUBLIC WORKS PERMIT # _____
BEGINNING / ENDING DATE (S) SETUP	
IS ACCEPTED FOR:	FROM: ___/___/___ TO: ___/___/___ ONLY
ACCEPTED FOR: FROM:	_____ AM PM TO: _____ AM PM
COMMENTS: _____	
_____	
REVIEWED BY:	
TOWN OF PLATTEVILLE REPRESENTATIVE:	_____ DATE: _____
_____	





# CERTIFICATE OF SUBSTANTIAL COMPLETION

**Town of Platteville Public Works Department**

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**Project:** \_\_\_\_\_

**Developer:** \_\_\_\_\_

**Contractor:** \_\_\_\_\_

**Permit Number:** \_\_\_\_\_

**Date 2-Year Warranty Begins:** \_\_\_\_\_

**Type of Work Completed:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Public Works Director

\_\_\_\_\_  
Date







# CERTIFICATE OF ACCEPTANCE

Town of Platteville Public Works Department

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**Project:** \_\_\_\_\_

**Developer:** \_\_\_\_\_

**Contractor:** \_\_\_\_\_

**Permit Number:** \_\_\_\_\_

**Certificate of Substantial Completion** \_\_\_\_\_

**Date 2-Year Warranty Began:** \_\_\_\_\_

**Date 2-Year Warranty Ends:** \_\_\_\_\_

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**Type of Work Accepted:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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Construction Services

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Date





# Town of Platteville Application & Permit Land Grading

Application Date: \_\_\_\_\_ Permit No: \_\_\_\_\_

Applicant's Name: \_\_\_\_\_

Applicant's Address \_\_\_\_\_ City/St/Zip: \_\_\_\_\_

Phone No.(24 hour) \_\_\_\_\_ Ext.: \_\_\_\_\_ Cell No: \_\_\_\_\_

Property Owner's Name: \_\_\_\_\_ Phone No: \_\_\_\_\_

Property Owner's Address: \_\_\_\_\_ City/St/Zip: \_\_\_\_\_

Contractor's Name: \_\_\_\_\_

Contractor's Address: \_\_\_\_\_ City/St/Zip: \_\_\_\_\_

Phone No: (24 hour) \_\_\_\_\_ Ext: \_\_\_\_\_ Cell No: \_\_\_\_\_

Work Site Location: \_\_\_\_\_

Purpose of Land Grading \_\_\_\_\_

Dates of Construction: \_\_\_\_\_ Through \_\_\_\_\_

Size of Effected Area: Acres: \_\_\_\_\_ (or) Sq. Ft. \_\_\_\_\_

Adjacent Property Address Affected by Construction: \_\_\_\_\_

Traffic Lanes Affected: \_\_\_\_\_

Additional Comments: \_\_\_\_\_

*A permit is required if grading work is proposed on sites which are;*

1. *Sites having construction activity including clearing, grading, and excavation activities except operations that result in the disturbance of one (1) acre or more of total land area. Also, sites less than one (1) acre that are part of a larger common plan of developments or sale.*
2. *Other sites not included in section (1) but, due to the nature of their topography or location, provide a potential for significant negative impact on the Town's Stormwater facilities, streets, or receiving basins.*

*An Erosion and Sedimentation Control Plan must be submitted and approved in accordance with Town of Platteville Ordinances and Design Standards and Construction Specifications.*

*This permit does not relieve the applicant of requirements of State of Colorado or Federal laws.*

*I (we), hereby, agree to be bound by the provisions of the Town of Platteville Construction Specifications, the Town Municipal Code, the Manual on Uniform Traffic Control devices, and to such special conditions, restrictions, and regulations, as well as all applicable sales taxes as may be reasonably imposed by the Town of Platteville. It is agreed that the undersigned will save the Town harmless from all suits and damage resulting from the performance of the work*

*In the event work is completed without inspection and approval, the applicant may be required to remove the work and undertake any corrective action at the applicant's expense and an additional after-construction fee of \$50.00 will be charged.*

For Public Works Inspections, call (48-hours in advance) For all utility locates, call

Applicant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

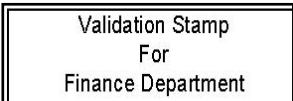
Application/Inspection Fee (\$20 application fee plus \$5 per acre): \_\_\_\_\_

Public Works Approval: \_\_\_\_\_ Date: \_\_\_\_\_

Drawing Required: Yes: \_\_\_\_\_ No: \_\_\_\_\_

Construction Inspector's Approval (after construction): \_\_\_\_\_

Remarks \_\_\_\_\_ Date: \_\_\_\_\_



DETAIL No.	DRAWING DESCRIPTION	DETAIL No.	DRAWING DESCRIPTION
------------	---------------------	------------	---------------------

STANDARD ROADWAY SECTIONS

S-1	STANDARD ROADWAY SECTION - LOCAL STREET
S-1-1	RESERVED
<del>S-2</del>	<del>LOCAL COMMERCIAL/INDUSTRIAL</del>
<del>S-2 R</del>	<del>LOCAL RESIDENTIAL</del>
S-3	STANDARD ROADWAY SECTION - MINOR COLLECTOR
S-4	STANDARD ROADWAY SECTION - MAJOR COLLECTOR
<del>S-5</del>	<del>ARTERIAL</del>
S-6	RESERVED

CONCRETE IMPROVEMENTS

S-7	STREET INTERSECTION CROSS PAN APPROACH DETAIL
S-8	STREET INTERSECTION APPROACH DETAIL
S-9	INTERSECTION RIGHT-OF-WAY
S-10	CUL-DE-SAC DETAIL
S-11	CORNER CURB RAMP DETAIL - 20' RADIUS
S-12	CORNER CURB RAMP DETAIL - 30' RADIUS
S-12-4	DIRECTIONAL CORNER CURB RAMP DETAIL
S-13	MIDBLOCK CURB RAMP DETAIL
S-14	CURB RAMP DETAIL FOR DETACHED SIDEWALK
S-15	DRIVE OVER CURB, GUTTER AND SIDEWALK
S-15A	DRIVE OVER CURB AND GUTTER
S-16	VERTICAL FACE CURB AND GUTTER
S-17	ADA DETECTABLE WARNING DETAIL
S-18	MEDIAN CURBS
S-19	CURB, GUTTER AND SIDEWALK TEMPORARY END SECTION
S-20	CURBHEAD DETAIL
S-21	DETACHED SIDEWALK DETAIL
S-22	CONCRETE JOINT DETAILS FOR SIDE-WALKS, CURBS, GUTTERS & CROSS PANS

S-23-A	SIDEWALK CHASE FOR ATTACHED SIDEWALKS (2 SHEETS)
S-23-D	SIDEWALK CHASE FOR DETACHED SIDEWALKS (2 SHEETS)
S-24	RESIDENTIAL CURB CUT LOCATION STANDARDS
S-25	CURB, GUTTER AND SIDEWALK REPAIR DETAIL
S-26	CONCRETE DRIVEWAY APPROACH FOR VERTICAL FACE CURB & GUTTER W/DETACHED SIDEWALK
S-27	CONCRETE DRIVEWAY APPROACH FOR VERTICAL FACE CURB & GUTTER W/ATTACHED SIDEWALK
S-28	CONCRETE CROSS PAN DETAIL
S-29	BIKEWAY DETAIL

MISC. DETAILS

S-30	NEW DEVELOPMENT TRENCH EXCAVATION & BACKFILL DETAIL
S-31	EXISTING STREET PAVEMENT PATCH DETAIL FOR ASPHALT AND CONCRETE
S-32	SURVEY MONUMENT IN PAVEMENT
S-33	WATER VALVE DETAIL FOR RAISING TO FINISHED GRADE
S-34	MANHOLE RAISING DETAIL

SIGNAGE, STRIPING & MISC. TRAFFIC

S-35	STREET NAME SIGN LAYOUT - D3
S-36	COMBINATION STREET NAME/NO OUTLET SIGN - W14-1P/D3 SPECIAL
S-37	STREET NAME SIGN - D3
S-38	TYPICAL PAVEMENT MARKINGS (3 SHEETS)
S-39	LEFT TURN BAY PAVEMENT MARKINGS
S-40	ROUNDBOUT SIGNAGE AND PAVEMENT MARKINGS (2 SHEETS)
S-41	STREET LIGHT PLACEMENT AT INTERSECTIONS
S-42	STANDARD BUS STOP LOCATIONS
S-43	TYPICAL DIAMOND SIGN INSTALLATION
S-44	TYPICAL ISLAND SIGN INSTALLATION
S-45	TYPICAL NO PARKING SIGN INSTALLATION
S-46	TYPICAL STOP SIGN INSTALLATION
S-47	TYPICAL STREET SIGN PLACEMENT
S-48	RIGHT IN/RIGHT OUT LAYOUT (2 SHEETS)

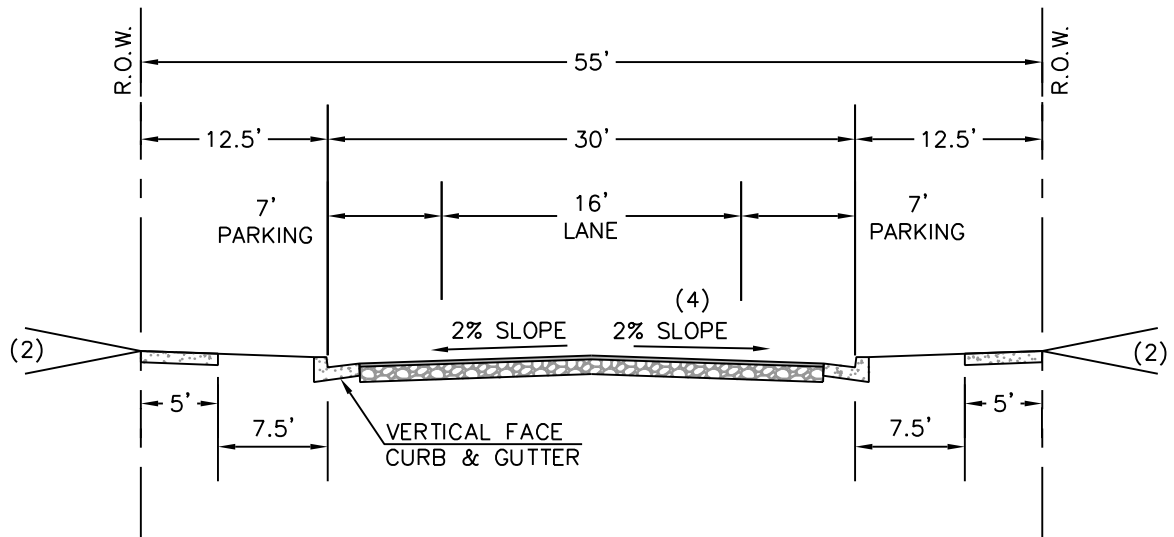
UTILITY NOTIFICATION NOTE - "ONE CALL PHONE No."

PV\_S0.DWG

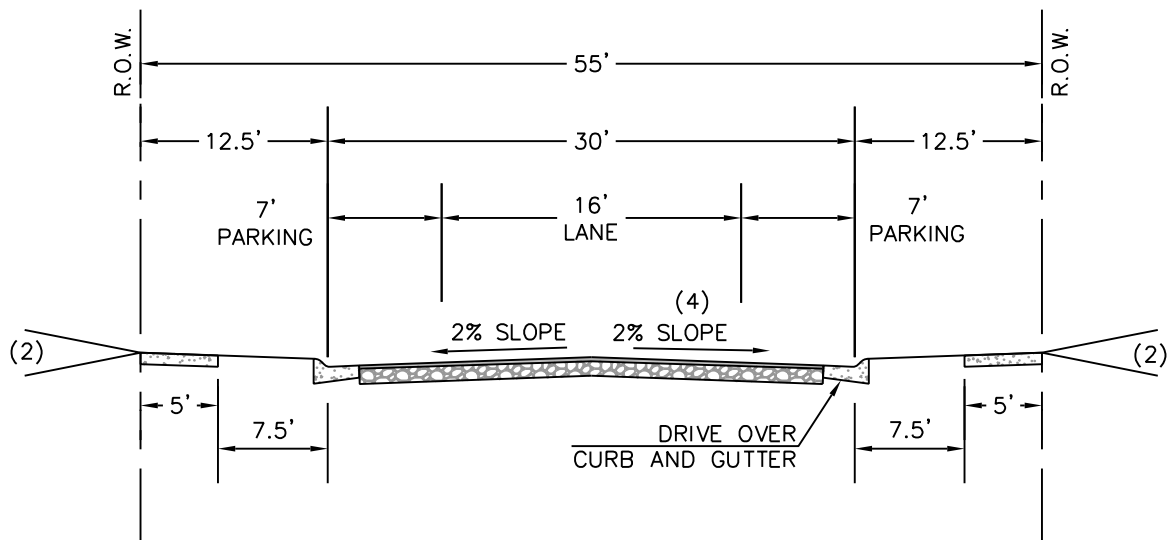


CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

STANDARD DETAILS INDEX SHEET  
March, 2008  
DETAIL No. S-0



LOCAL - COMMERCIAL/INDUSTRIAL



LOCAL-RESIDENTIAL

NOTES:

1. PARKING ALLOWED ON BOTH SIDES OF STREET.
2. CUT AND FILL SLOPES SHALL BE A MAXIMUM OF 4:1.
3. RIGHT-OF-WAY AND EASEMENT AREAS SHALL BE GRADED (CUT AND FILL) TO SUBGRADE (+/-0.5') PRIOR TO AND AFTER UTILITY INSTALLATION.
4. NORMAL CROWN SLOPE IS 2%. WITH SPECIAL DESIGN REVIEW, 1% TO 5% IS ALLOWABLE AT TRANSITION AND OTHER NON-NORMAL SECTIONS.

LOCAL\_RESIDENTIAL\_S-1



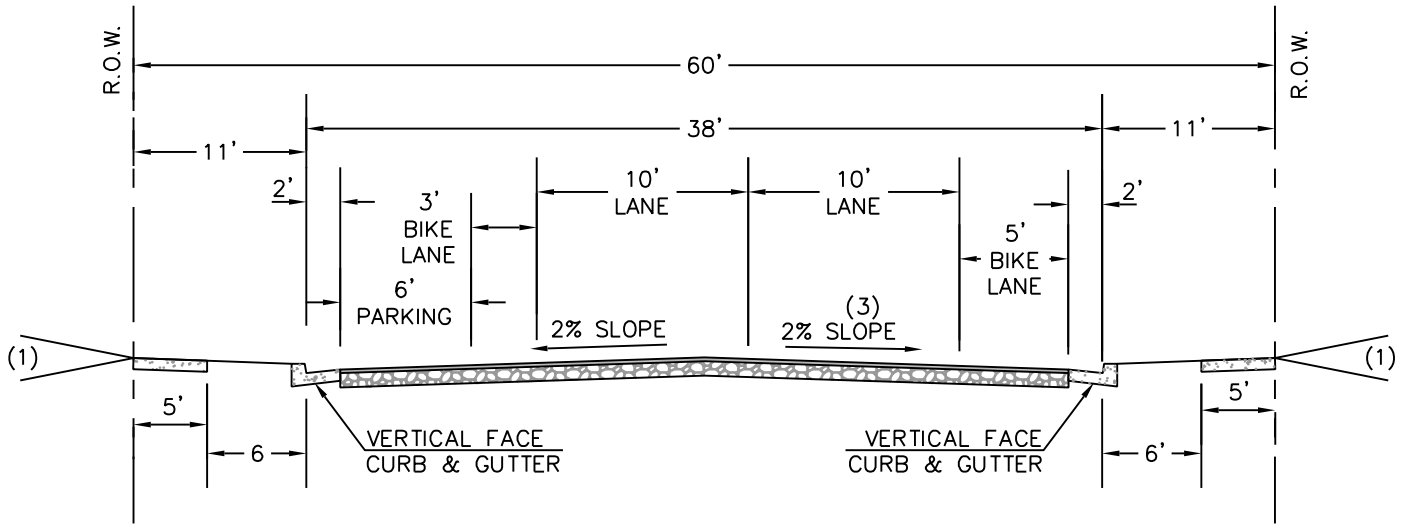
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

STANDARD ROADWAY SECTION  
LOCAL STREET

DETAIL NO. S-1

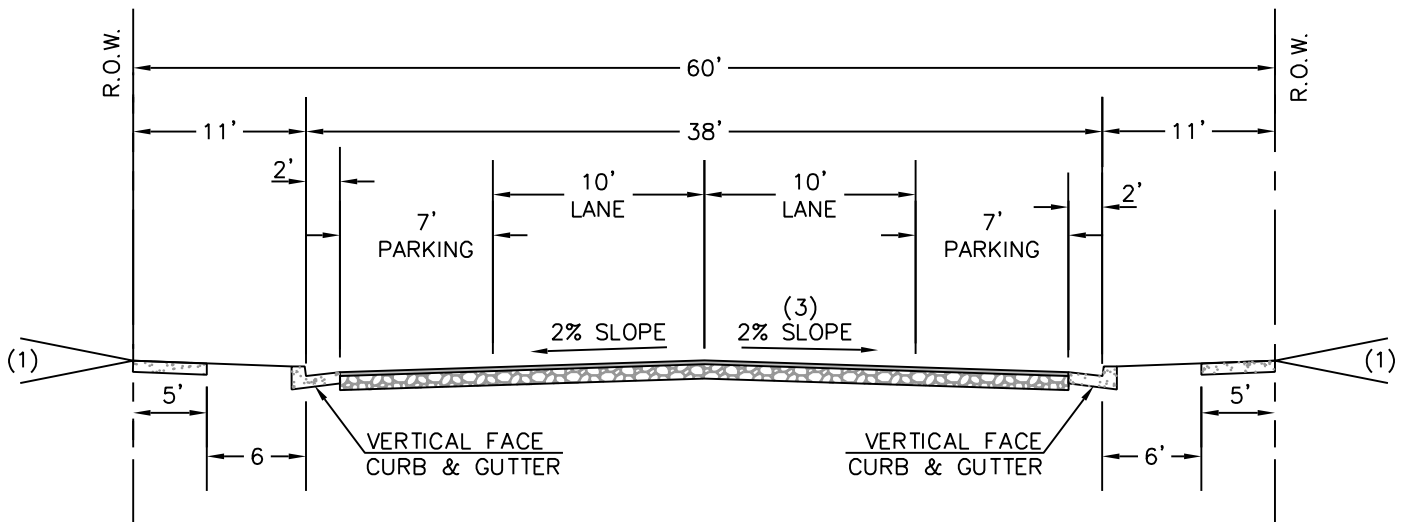
March, 2010

NOT TO SCALE



### SIDEWALK AND BIKE LANES

ONE PARKING LANE



### SIDEWALK AND NO BIKE LANES

TWO PARKING LANES

#### NOTES:

1. CUT AND FILL SLOPES SHALL BE A MAXIMUM OF 4:1.
2. RIGHT-OF-WAY AND EASEMENT AREAS SHALL BE GRADED (CUT AND FILL) TO SUBGRADE (+/-0.5') PRIOR TO AND AFTER UTILITY INSTALLATION.
3. NORMAL CROWN SLOPE IS 2%. WITH SPECIAL DESIGN REVIEW, 1% TO 5% IS ALLOWABLE AT TRANSITION AND OTHER NON-NORMAL SECTIONS.
4. WHERE THIS MINOR COLLECTOR IS ADJACENT TO SIDE LOTS OF SINGLE FAMILY RESIDENTIAL LOTS, THE PARKING LANE MAY BE REMOVED WITH TOWN APPROVAL. RIGHT-OF-WAY CAN BE REDUCED IN THIS INSTANCE WITH TOWN APPROVAL.

MINOR\_COLLECTOR\_S-3



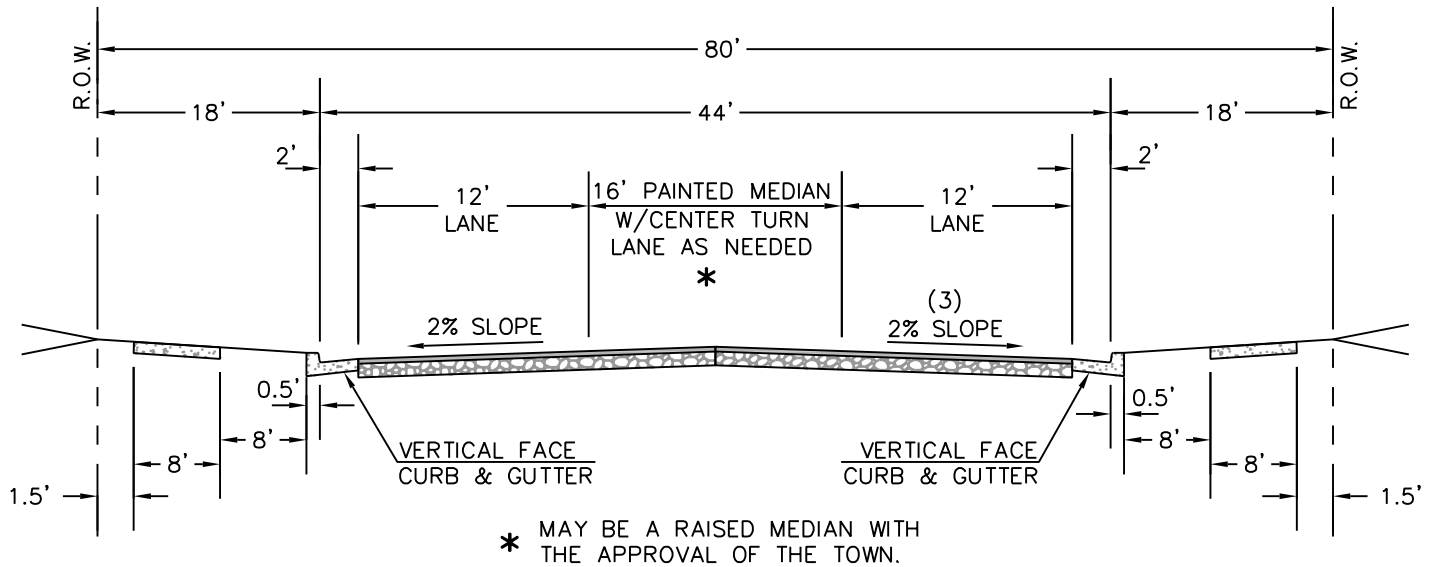
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

## STANDARD ROADWAY SECTION MINOR COLLECTOR

DETAIL NO. S-3

March, 2010

NOT TO SCALE



### TYPICAL SECTION

**NOTES:**

1. CUT AND FILL SLOPES SHALL BE A MAXIMUM OF 4:1.
2. RIGHT-OF-WAY AND EASEMENT AREAS SHALL BE GRADED (CUT AND FILL) TO SUBGRADE (+/-0.5') PRIOR TO AND AFTER UTILITY INSTALLATION.
3. NORMAL CROWN SLOPE IS 2%. WITH SPECIAL DESIGN REVIEW, 1% TO 5% IS ALLOWABLE AT TRANSITION AND OTHER NON-NORMAL SECTIONS.
4. ADDITIONAL RIGHT-OF-WAY WILL BE NEEDED FOR RIGHT TURN LANES WHERE WARRANTED.

MAJOR\_COLLECTOR\_S-4



**CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO**

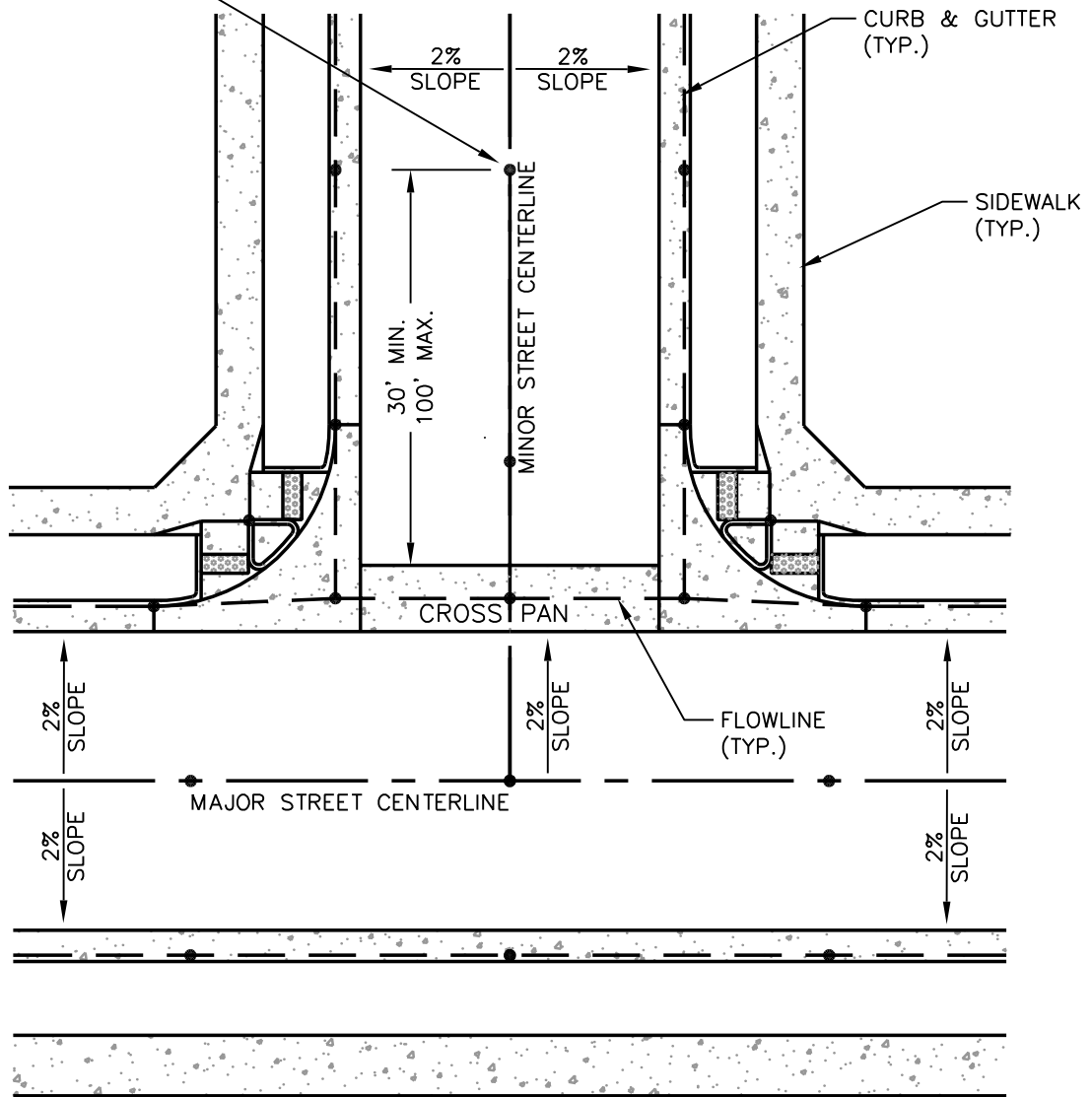
**STANDARD ROADWAY SECTION  
MAJOR COLLECTOR**

DETAIL NO. S-4

March, 2010

NOT TO SCALE

DESIGN ENGINEER—  
 LABEL STATION OF  
 BEGIN TRANSITION TO  
 REMOVE CROWN FROM  
 LOCAL STREET



NOTES:

1. DESIGN ENGINEER SHALL PROVIDE ELEVATIONS AT THESE POINTS (●) ON THE CONSTRUCTION DRAWINGS.
2. ALL ELEVATION POINTS SHALL BE STAKED FOR CONSTRUCTION.
3. ALL FLOWLINE GRADES THAT ARE NOT PARALLEL TO CENTERLINE SHALL BE LABELED ON INTERSECTION DETAILS OR A PROFILE DRAWING SHALL BE PROVIDED.

PV\_S7.DWG

March, 2010  
 NOT TO SCALE



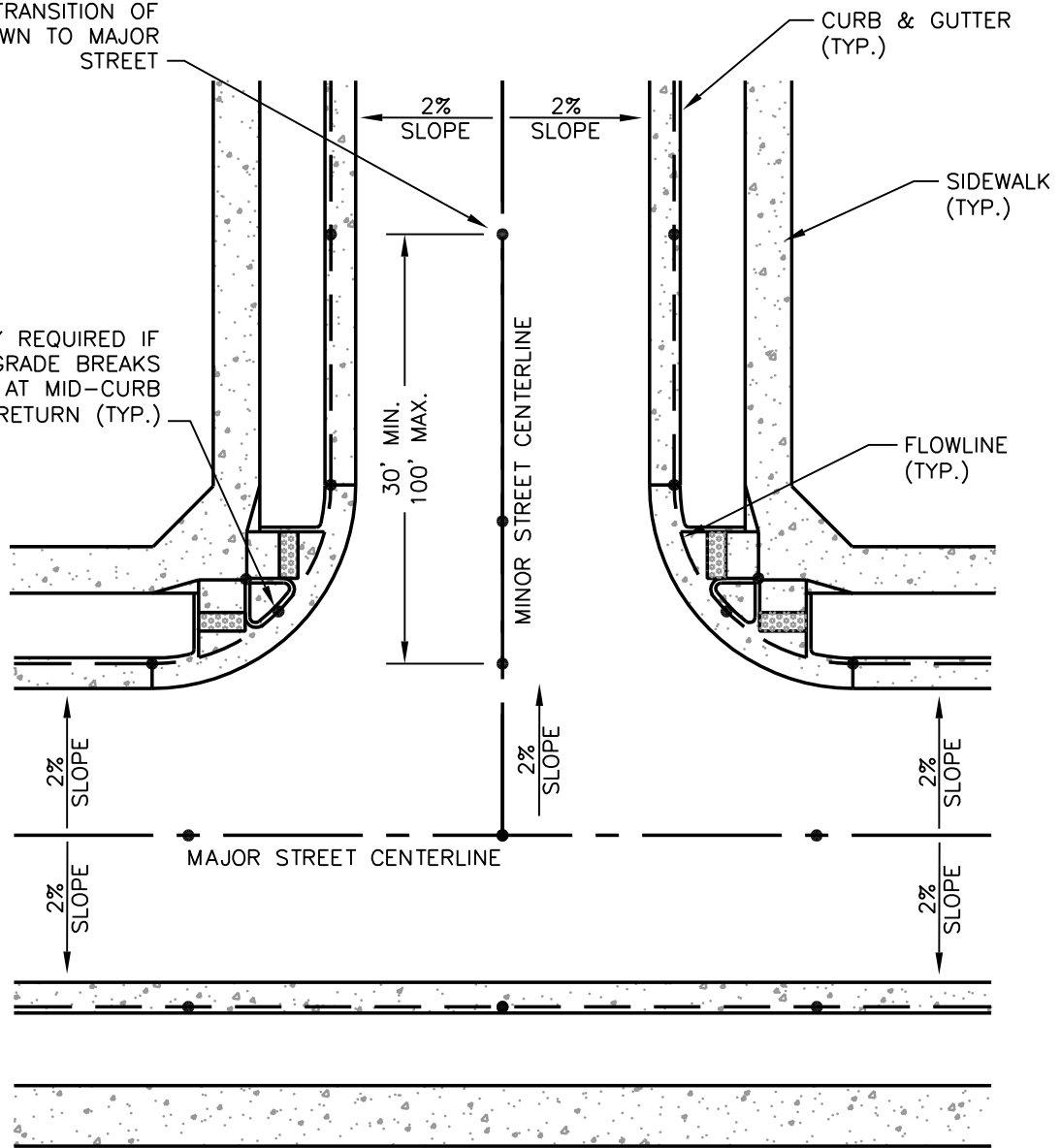
CONSTRUCTION STANDARD  
 TOWN OF PLATTEVILLE, COLORADO

STREET INTERSECTION  
 CROSS PAN APPROACH DETAIL  
 DETAIL No. S-7



DESIGN ENGINEER—  
 LABEL STATION OF  
 BEGIN TRANSITION OF  
 CROWN TO MAJOR  
 STREET

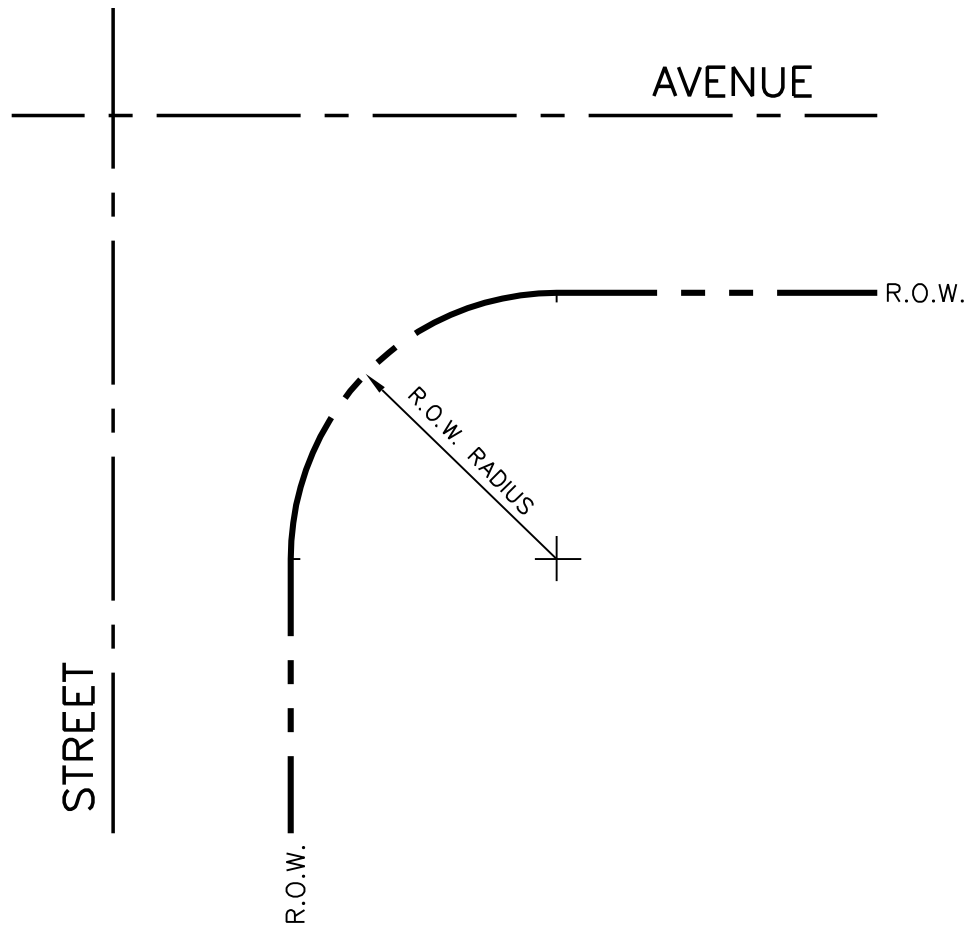
ONLY REQUIRED IF  
 GRADE BREAKS  
 AT MID-CURB  
 RETURN (TYP.)



NOTES:

1. DESIGN ENGINEER SHALL PROVIDE ELEVATIONS AT THESE POINTS (●) ON THE CONSTRUCTION DRAWINGS.
2. ALL ELEVATION POINTS SHALL BE STAKED FOR CONSTRUCTION.
3. ALL FLOWLINE GRADES THAT ARE NOT PARALLEL TO CENTERLINE SHALL BE LABELED ON INTERSECTION DETAILS OR A PROFILE DRAWING SHALL BE PROVIDED.





<u>ROADWAY CLASSIFICATION</u>	<u>RIGHT-OF-WAY MINIMUM WIDTH AT INTERSECTION</u>	<u>R.O.W. RADIUS</u>
LOCAL-COM/IND	55'	20'
LOCAL-RESID.	55'	20'
MINOR COLLECTOR	60'	20'
MAJOR COLLECTOR	80'	30'
MINOR ARTERIAL	110'	30'
MAJOR ARTERIAL	135'	30'

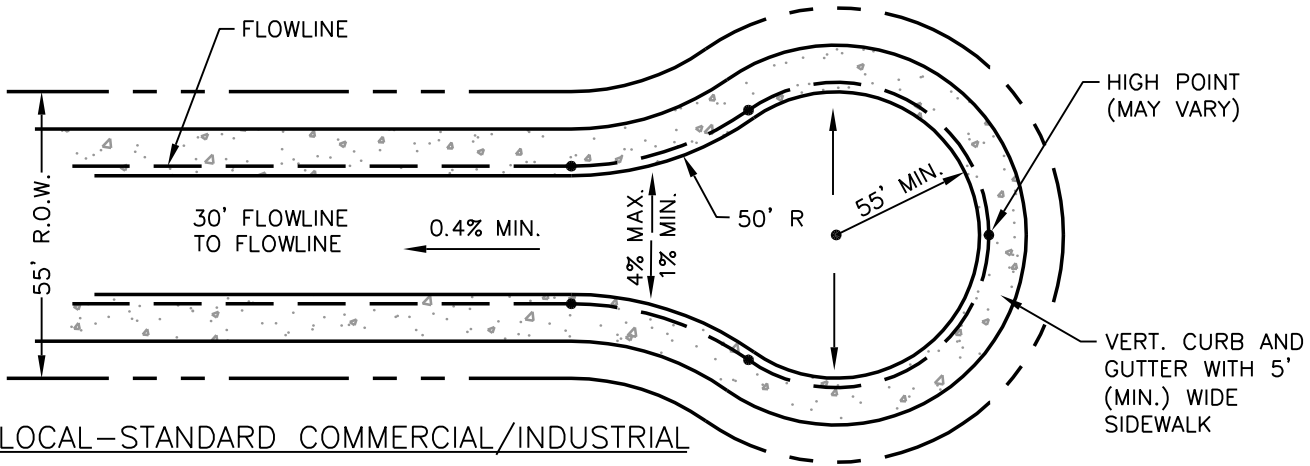
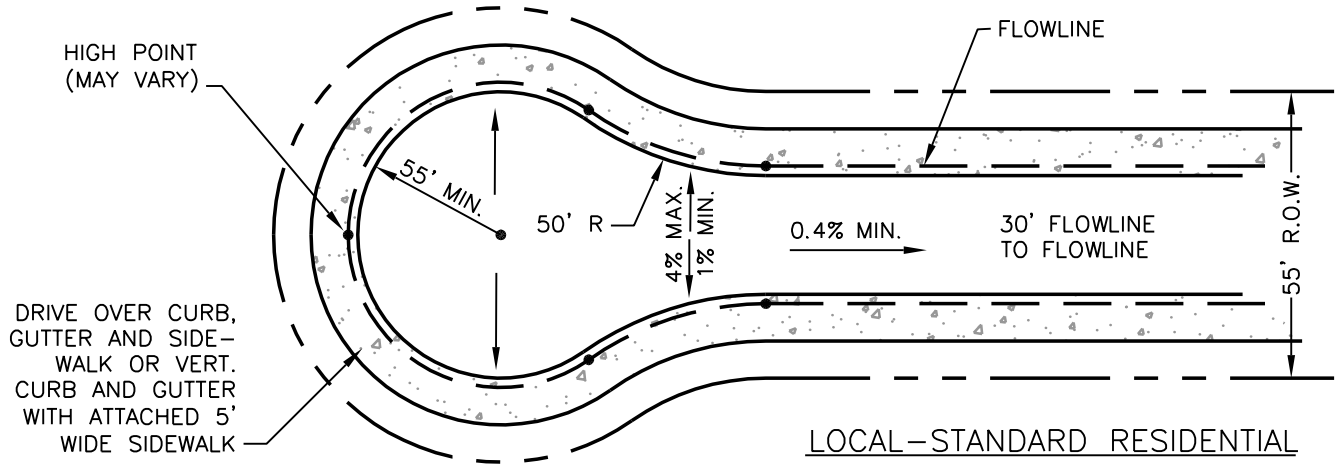
PV\_S9.DWG

March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

INTERSECTION RIGHT-OF-WAY  
DETAIL No. S-9



NOTES:

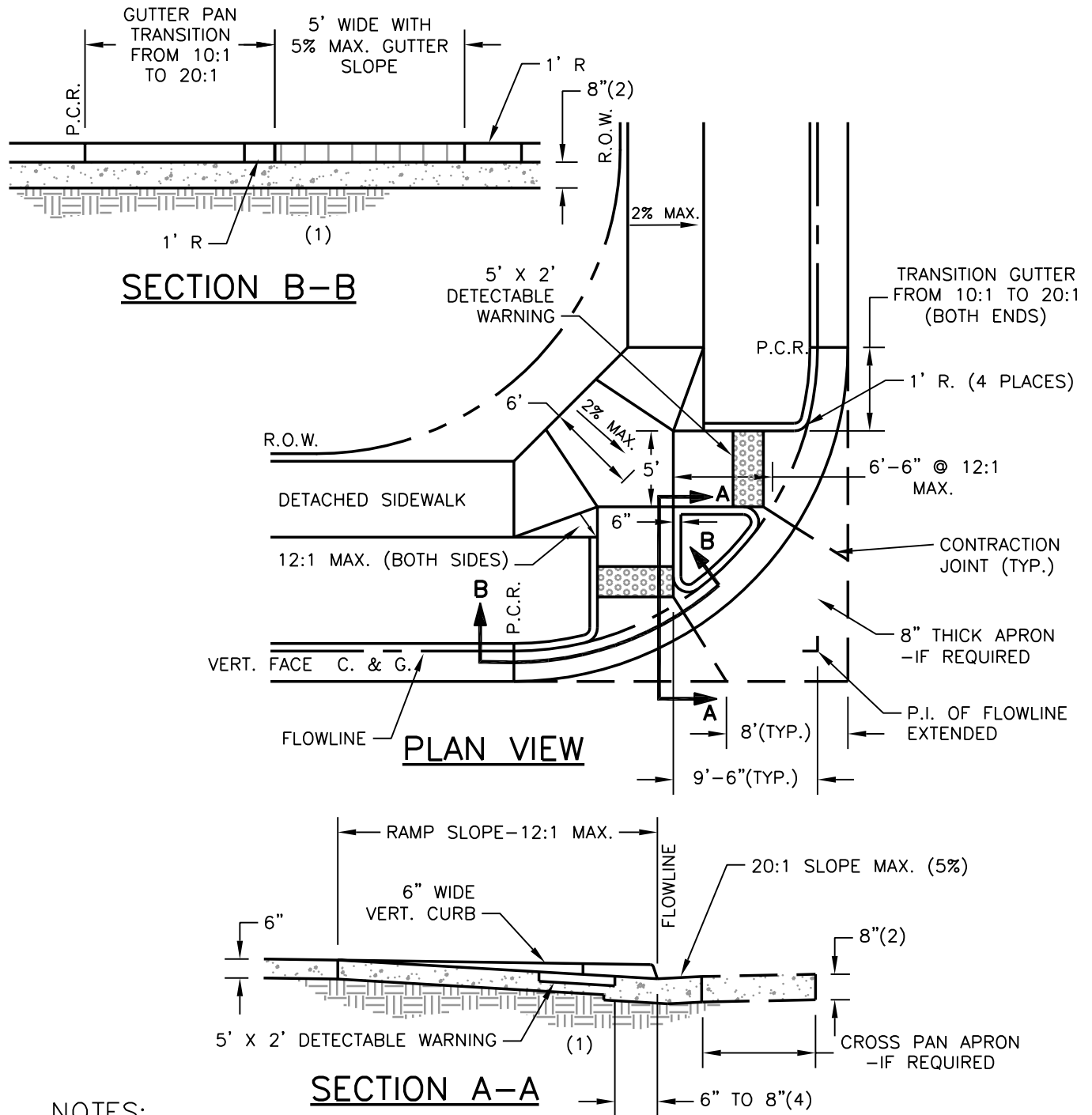
1. DESIGN ENGINEER SHALL PROVIDE ELEVATIONS AT THESE POINTS (•) ON THE CONSTRUCTION DRAWINGS.
2. ALL ELEVATION POINTS SHALL BE STAKED FOR CONSTRUCTION.
3. MINIMUM FLOWLINE SLOPE WITHIN CUL-DE-SAC SHALL BE 0.60%.
4. CUL-DE-SAC SHALL HAVE A MAXIMUM LENGTH OF 500' MEASURED FROM THE INTERSECTION CENTERLINE TO RADIUS POINT.

March, 2010  
NOT TO SCALE

PV\_S10.DWG



**CUL-DE-SAC  
DETAILS**  
DETAIL No. S-10



**NOTES:**

1. COMPACTED SUBGRADE (SEE SPECIFICATIONS).
2. 8" CONCRETE THICKNESS APPLIES TO CURB RETURN CURB AND GUTTER AND CROSS PAN APRON.
3. CONSTRUCT CURB RAMPS AT ALL INTERSECTIONS.
4. ADA DETECTABLE WARNINGS SHALL BE INSTALLED 6" TO 8" FROM THE CLOSEST POINT OF THE FLOWLINE. SEE ADA DETECTABLE WARNING DETAIL.
5. EXTEND 20:1 GUTTER PAN SLOPE THROUGH THE CURB AND GUTTER BETWEEN RAMPS.
6. DIMENSIONS ARE BASED UPON THE USE OF DETACHED SIDEWALK AND A 90° CURB RETURN DELTA. USE OF A DIFFERENT RADIUS OR A SIGNIFICANT DELTA DIFFERENCE WILL ALTER SOME DIMENSIONS.

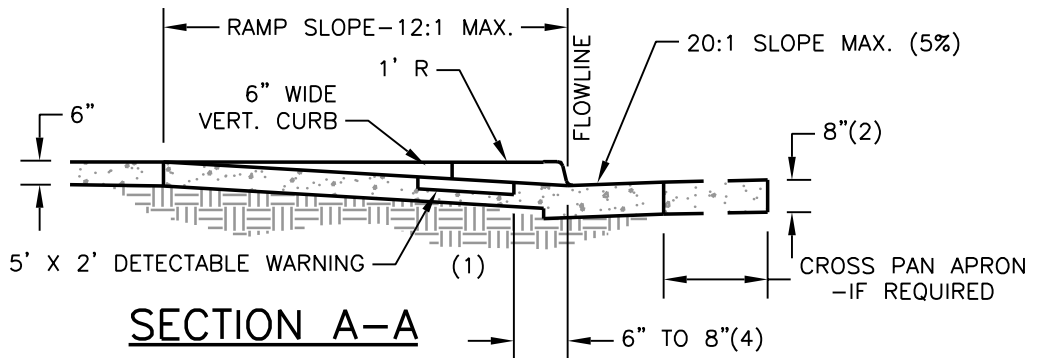
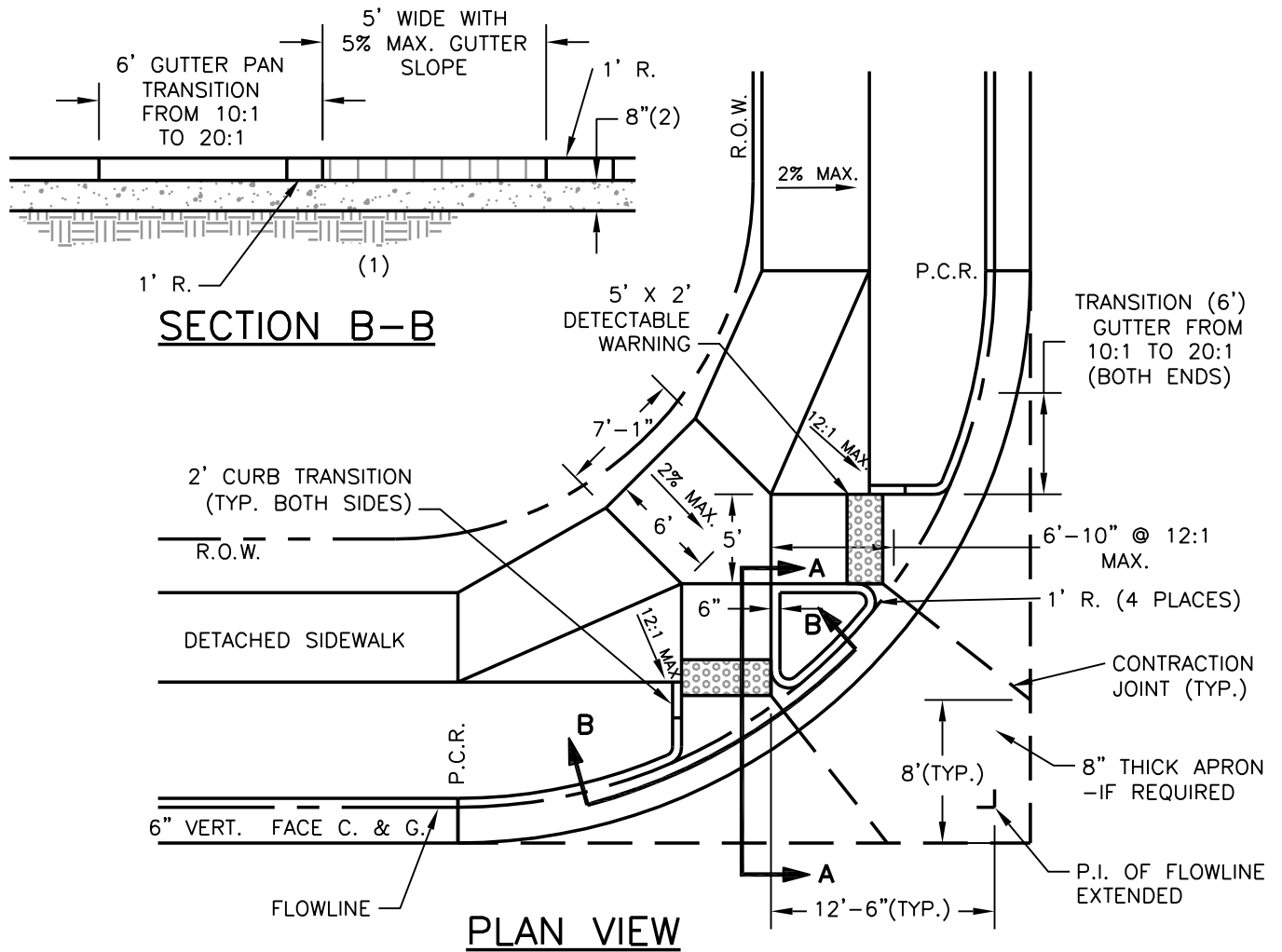
PV\_S11.DWG

March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

CORNER CURB RAMP DETAIL  
20' RADIUS  
DETAIL No. S-11



NOTES:

1. COMPACTED SUBGRADE (SEE SPECIFICATIONS).
2. 8" CONCRETE THICKNESS APPLIES TO CURB RETURN CURB AND GUTTER AND CROSS PAN APRON.
3. CONSTRUCT CURB RAMPS AT ALL INTERSECTIONS.
4. ADA DETECTABLE WARNINGS SHALL BE INSTALLED 6" TO 8" FROM THE CLOSEST POINT OF THE FLOWLINE. SEE ADA DETECTABLE WARNING DETAIL.
5. EXTEND 20:1 GUTTER PAN SLOPE THROUGH THE CURB AND GUTTER BETWEEN RAMPS.
6. DIMENSIONS ARE BASED UPON THE USE OF DETACHED SIDEWALKS AND A 90° CURB RETURN DELTA. USE OF A DIFFERENT RADIUS OR A SIGNIFICANT DELTA DIFFERENCE WILL ALTER SOME DIMENSIONS.

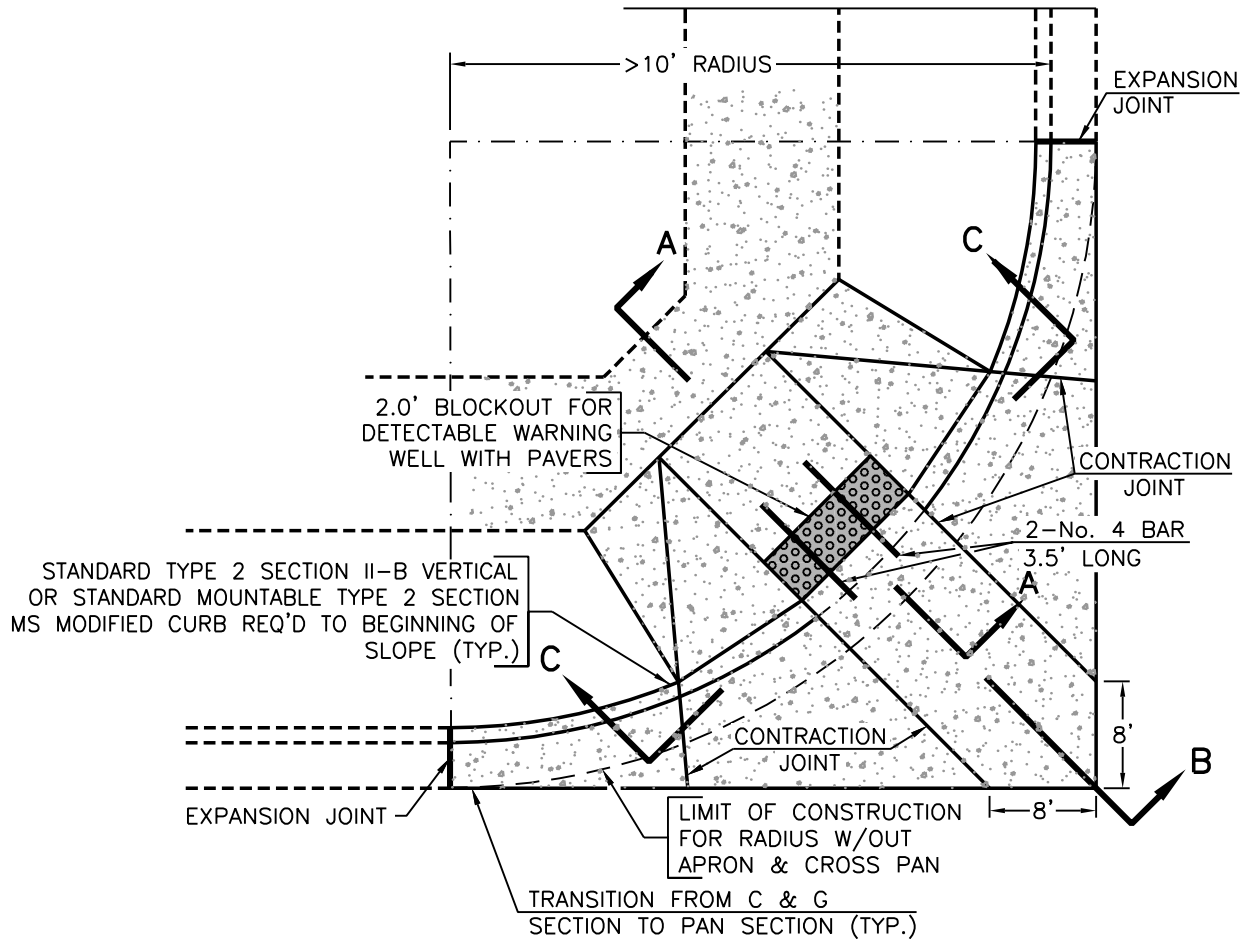
PV\_S12.DWG

March, 2010  
NOT TO SCALE

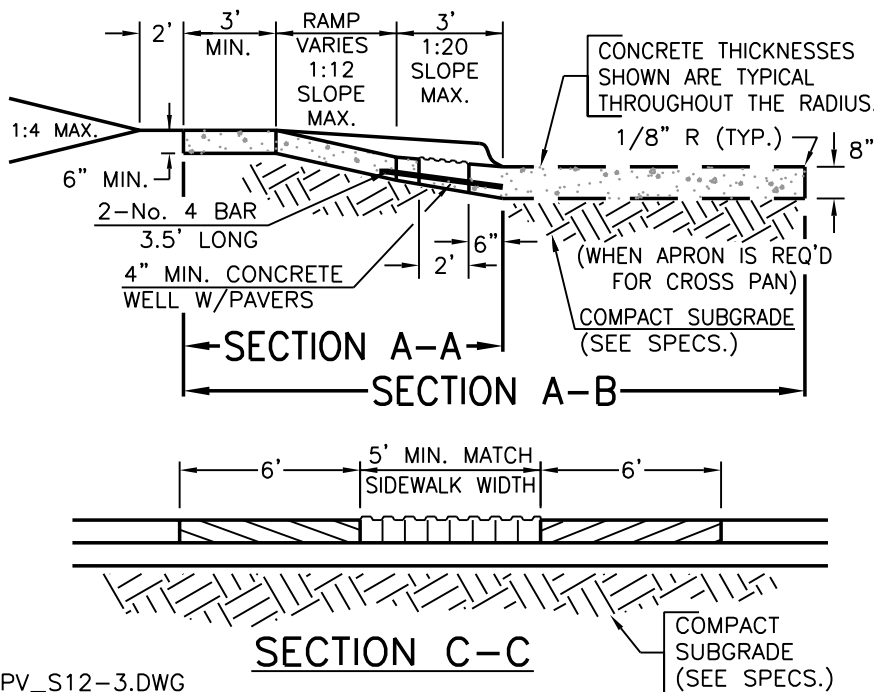


CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

CORNER CURB RAMP DETAIL  
30' RADIUS  
DETAIL No. S-12



**PLAN VIEW**



**NOTES:**

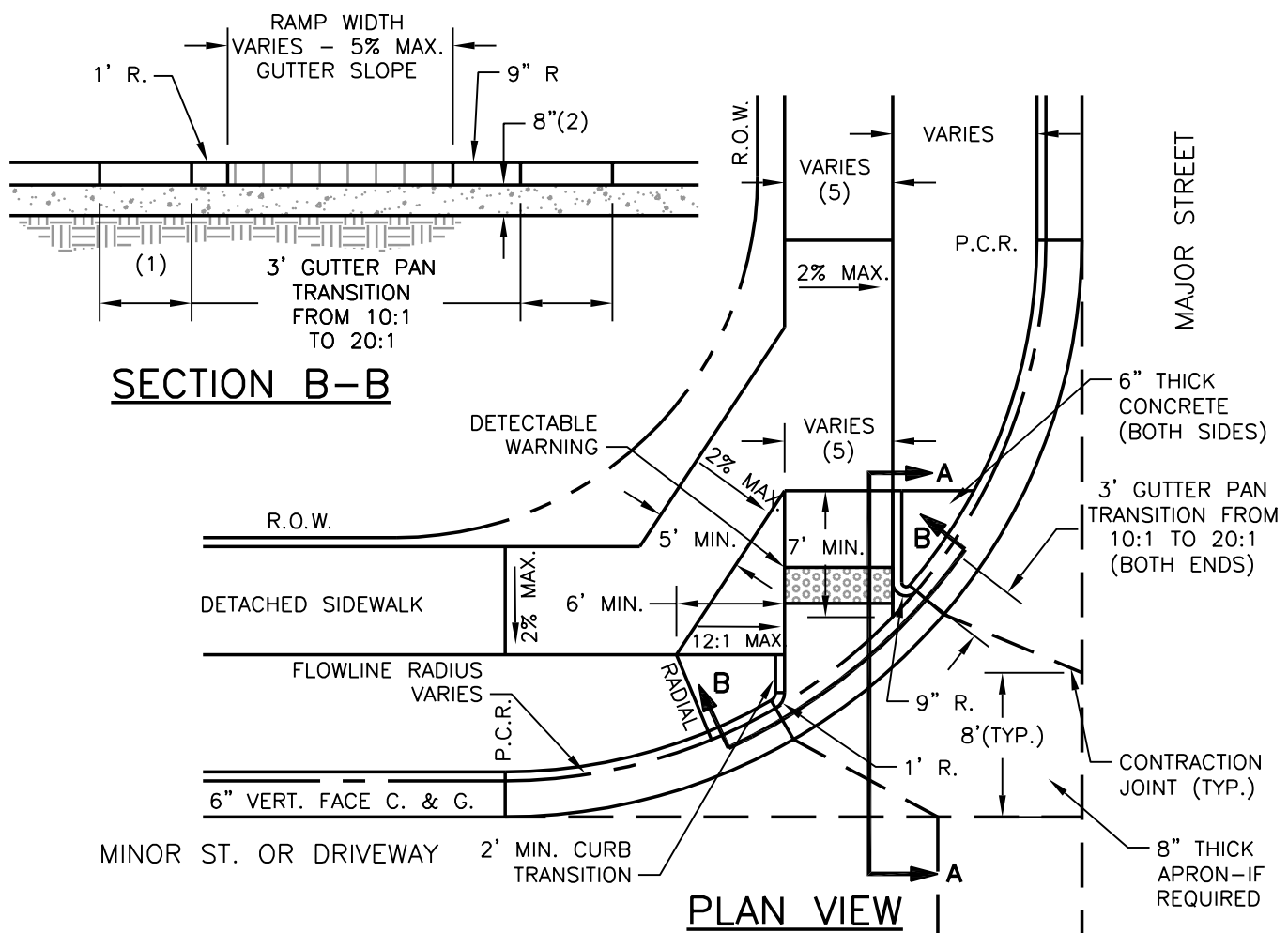
1. COMPACT SUBGRADE (SEE SPECS.)
2. 6" CONCRETE THICKNESS APPLIES TO RAMP, SIDE SLOPES & WALK AREAS.
3. CONSTRUCT CURB RAMPS AT ALL INTERSECTIONS.
4. CONCRETE SHOWN (EXCEPT FOR RAMPS AND WALKS), SHALL BE POURED MONOLITHICALLY.
5. ADA DETECTABLE WARNINGS SHALL BE INSTALLED 6" FROM FLOWLINE USING BRICK PAVERS OR STAMPED COLORED CONCRETE.
6. STAMPED COLORED CONCRETE FOR DETECTABLE WARNINGS SHALL BE IN DAVIS BRICK RED OR OTHER APPROVED COLOR AND SHALL BE FIBER REINFORCED.

PV\_S12-3.DWG



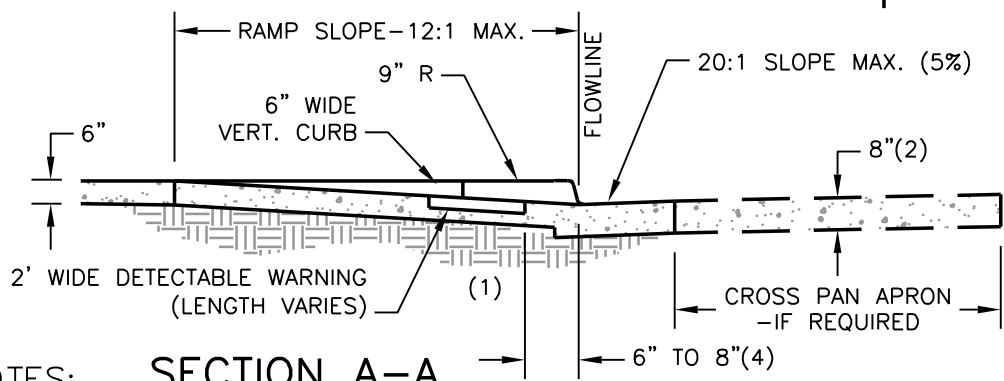
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

CURB RAMP DETAIL RADIAL,  
SINGLE W/DETACHED SIDEWALK  
DETAIL No. S-12-3



**SECTION B-B**

**PLAN VIEW**



**NOTES: SECTION A-A**

1. COMPACTED SUBGRADE (SEE SPECIFICATIONS).
2. 8" CONCRETE THICKNESS APPLIES TO CURB RETURN CURB AND GUTTER AND CROSS PAN APRON.
3. CONSTRUCT CURB RAMPS AT ALL INTERSECTIONS.
4. ADA DETECTABLE WARNINGS SHALL BE INSTALLED 6" TO 8" FROM THE CLOSEST POINT OF THE FLOWLINE. SEE ADA DETECTABLE WARNING DETAIL.
5. THIS DETAIL IS INTENDED FOR USE ALONG STREETS WHEN AT "T" INTERSECTIONS OR DRIVEWAYS WITH CURB RETURNS. THE RAMP SHOULD ONLY BE USED WHERE THE MAJOR STREET PEDESTRIAN CROSSING IS NOT RECOMMENDED. THE RAMP OPENING SHALL BE LOCATED AT THE EXTENSION OF THE SIDEWALK AND BE AS WIDE AS THE SIDEWALK ALONG THE MAJOR STREET.

March, 2010  
NOT TO SCALE

PV\_S12-4.DWG

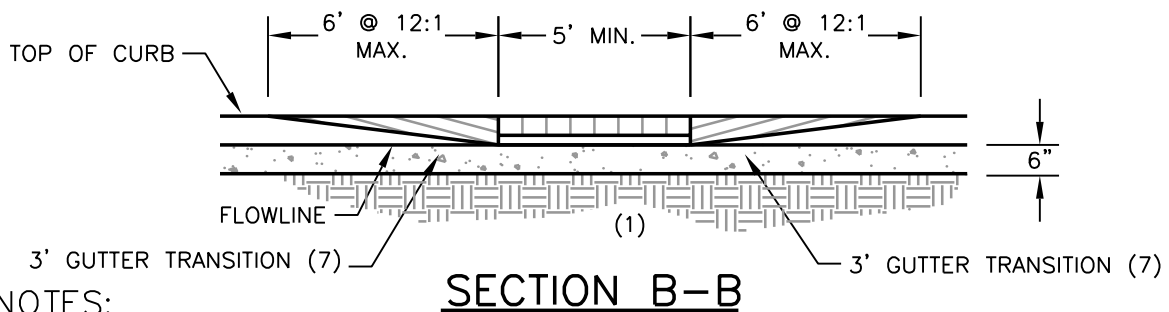
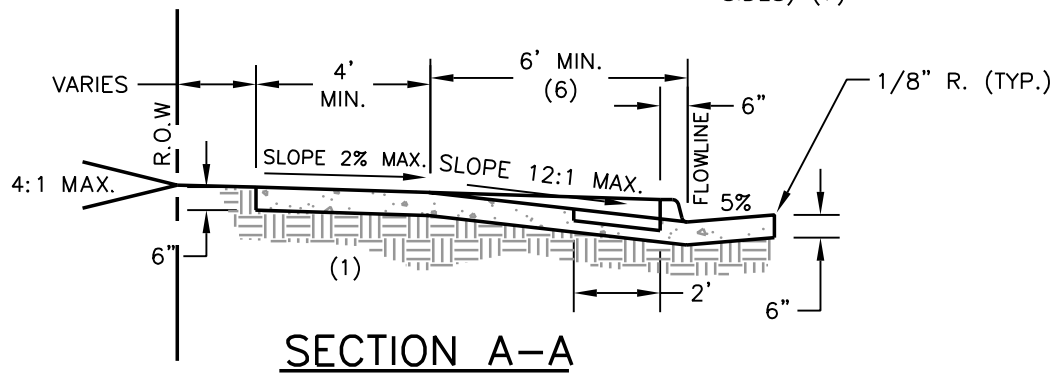
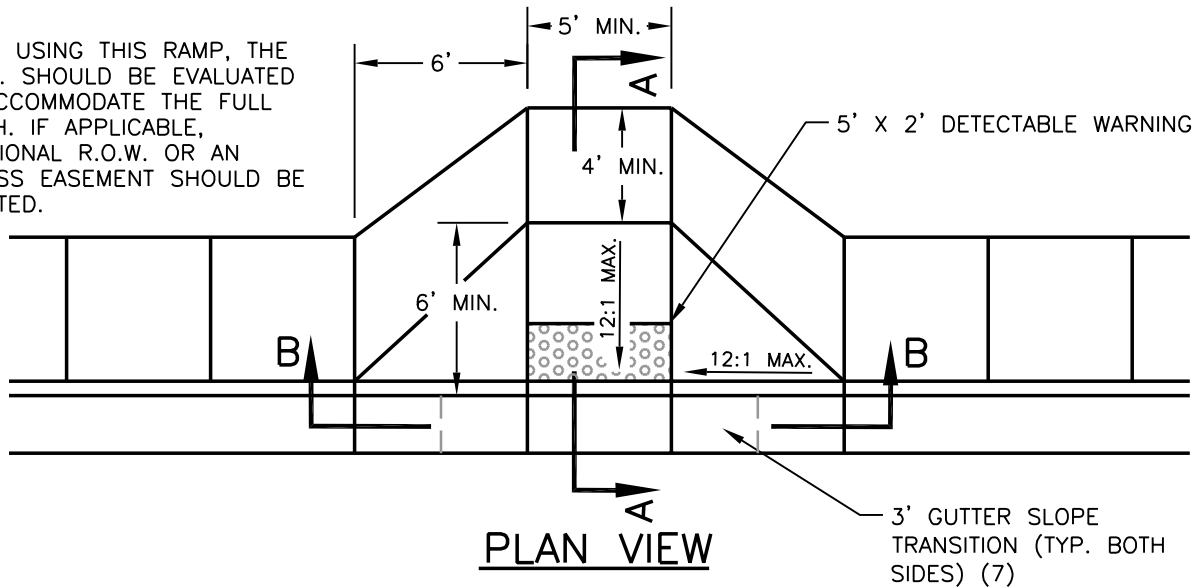


**CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO**

**DIRECTIONAL CORNER  
CURB RAMP DETAIL**

DETAIL No. S-12-4

NOTE:  
 WHEN USING THIS RAMP, THE R.O.W. SHOULD BE EVALUATED TO ACCOMMODATE THE FULL DEPTH. IF APPLICABLE, ADDITIONAL R.O.W. OR AN ACCESS EASEMENT SHOULD BE GRANTED.

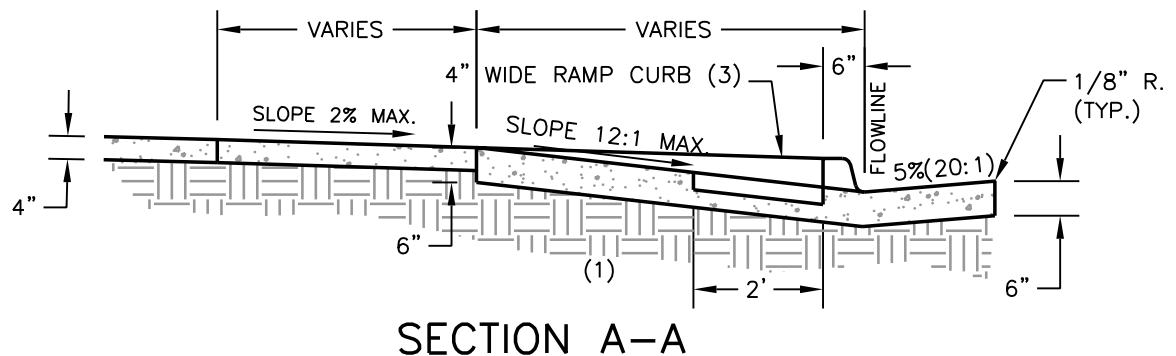
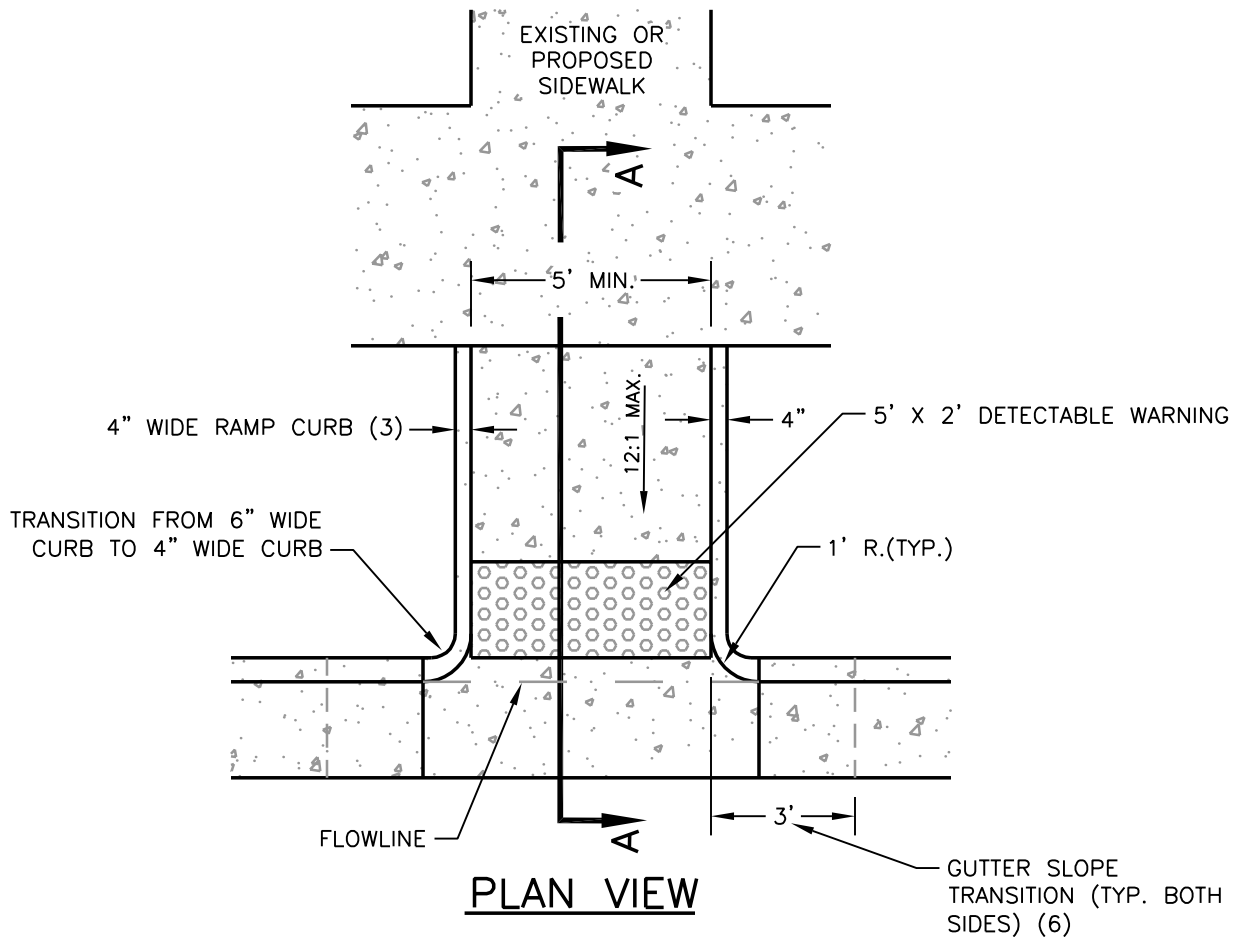


NOTES:

1. COMPACTED SUBGRADE (SEE SPECIFICATIONS).
2. SIX INCH (6") CONCRETE THICKNESS APPLIES TO RAMP, SIDE SLOPES AND WALK AREA.
3. CONSTRUCT A MIN. OF ONE MID-BLOCK CURB RAMP AT "T" INTERSECTIONS, WHERE PEDESTRIAN CROSSING IS DESIRED.
4. ADA DETECTABLE WARNINGS SHALL BE INSTALLED 6" TO 8" FROM FLOWLINE. SEE ADA DETECTABLE WARNING DETAIL.
5. CONCRETE SHOWN (EXCEPT FOR RAMPS AND WALKS) SHALL BE POURED MONOLITHICALLY.
6. THIS DETAIL SHALL ONLY BE USED WHEN IN ASSOCIATION WITH ATTACHED SIDEWALKS OR IN RETROFIT SITUATIONS.
7. PROVIDE A 3' GUTTER SLOPE TRANSITION ON EACH SIDE OF THE BOTTOM OF THE RAMP OPENING. REDUCE SLOPE FROM 12:1 (10:1 ON DRIVE OVER) TO 20:1 AT RAMP OPENING.







NOTES:

1. COMPACTED SUBGRADE (SEE SPECIFICATIONS).
2. SIX INCH (6") CONCRETE THICKNESS APPLIES TO RAMP AREA.
3. RAMP CURB MAY BE OMITTED AT THE DIRECTION OF THE CITY.
4. ADA DETECTABLE WARNINGS SHALL BE INSTALLED 6" TO 8" FROM FLOWLINE. SEE ADA DETECTABLE WARNING DETAIL.
5. CONCRETE SHOWN (EXCEPT FOR RAMPS AND WALKS) SHALL BE POURED MONOLITHICALLY.
6. PROVIDE A 3' GUTTER SLOPE TRANSITION ON EACH SIDE OF THE BOTTOM OF THE RAMP OPENING. REDUCE SLOPE FROM 12:1 TO 20:1 AT RAMP OPENING.
7. CONSTRUCT A MIN. OF ONE MID-BLOCK CURB RAMP AT "T" INTERSECTIONS, WHERE PEDESTRIAN CROSSING IS DESIRED.

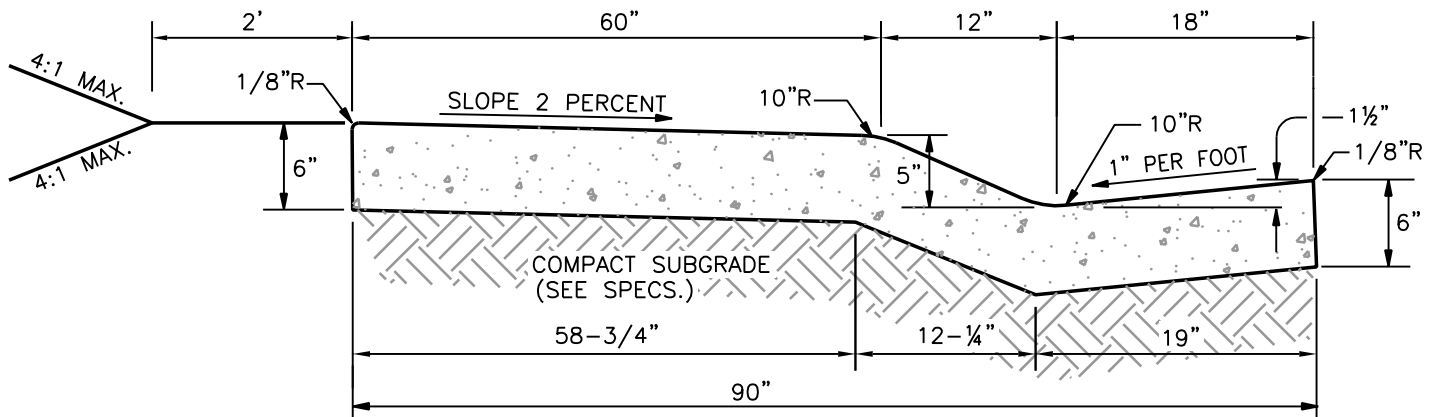
PV\_S14.DWG

March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

CURB RAMP DETAIL FOR  
DETACHED SIDEWALK  
DETAIL No. S-14



### TYPE 2 SECTION MS MODIFIED

#### NOTES:

1. VERTICAL CURB AND GUTTER WITH ATTACHED OR DETACHED SIDEWALK MAY BE USED ON STANDARD ROADWAYS.
2. MAXIMUM SPACING OF CONTRACTION JOINTS – TEN (10) FEET.
3. EXPANSION JOINTS ARE REQUIRED, SEE JOINT DETAILS.
4. FINISHED SURFACES OF CONCRETE TO RECEIVE A LIGHT BROOM FINISH.

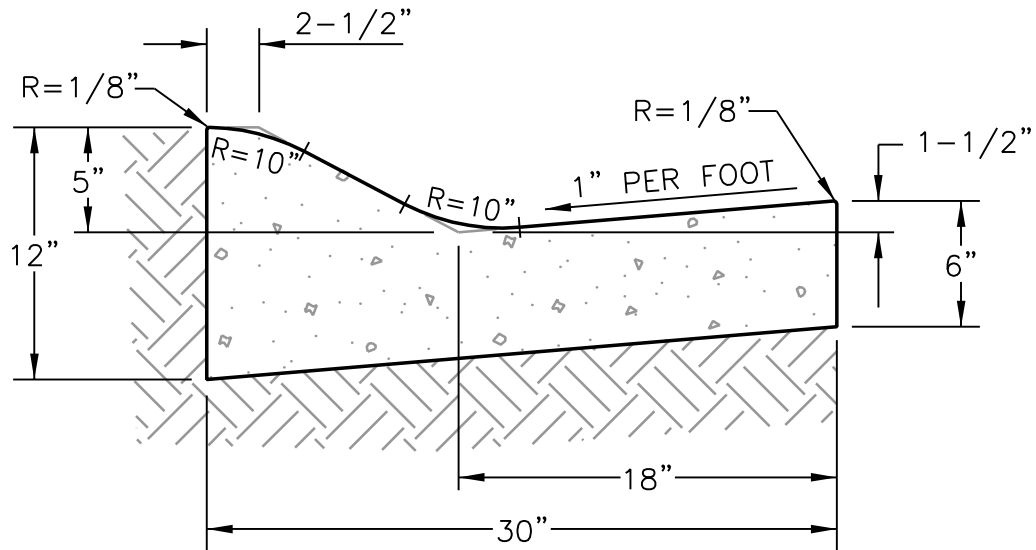
PV\_S15.DWG

March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

DRIVE OVER CURB, GUTTER  
& SIDEWALK  
DETAIL No. S-15



DRIVE OVER CURB AND GUTTER  
SECTION D-1A

NOTES:

1. DRIVE OVER CURB SHALL NOT BE USED ADJACENT TO TRAVEL LANE.
2. DETACHED SIDEWALK WHEN USED WITH THIS SECTION SHALL BE 6" MINIMUM THICKNESS.
3. MAXIMUM SPACING OF CONTRACTION JOINTS - TEN (10) FEET.
4. EXPANSION JOINTS ARE REQUIRED, SEE JOINT DETAILS.
5. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.

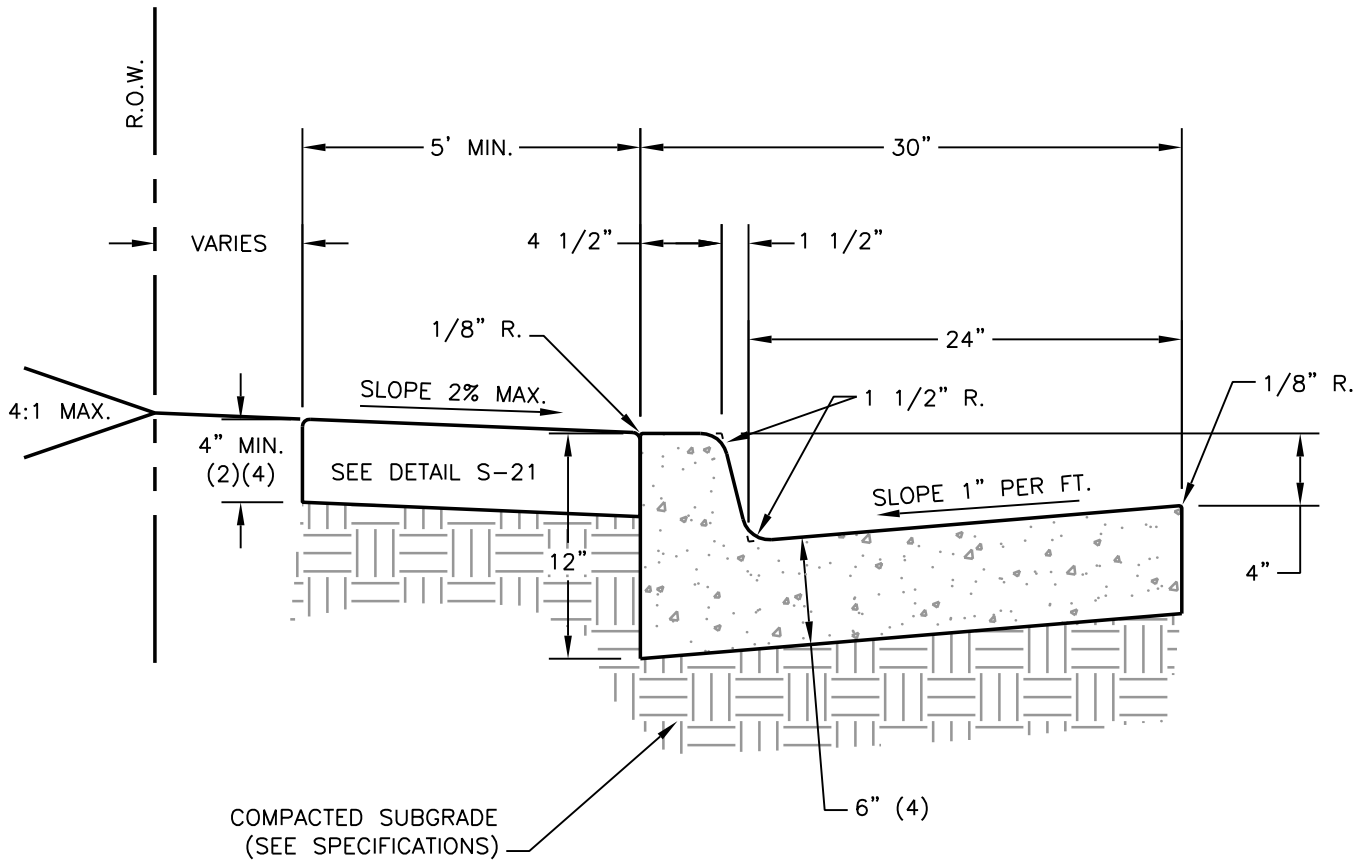
PV\_S15A.DWG

March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

DRIVE OVER CURB AND GUTTER  
DETAIL No. S-15A



NOTES:

1. WHEN CONSTRUCTING ATTACHED SIDEWALK, CONTRACTION JOINTS FOR SIDEWALKS SHALL MATCH CURB AND GUTTER, MAXIMUM SPACING OF TEN (10) FEET.
2. AT RESIDENTIAL DRIVEWAYS, THE SIDEWALK THICKNESS SHALL BE INCREASED TO SIX (6) INCHES.
3. EXPANSION JOINTS REQUIRED AT 400 FOOT MAXIMUM SPACING. ADDITIONAL JOINTS MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER. SEE JOINT DETAILS.
4. AT ALLEYS AND COMMERCIAL DRIVEWAYS, THE CURB AND SIDEWALK THICKNESS SHALL BE INCREASED TO EIGHT (8) INCHES.
5. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.

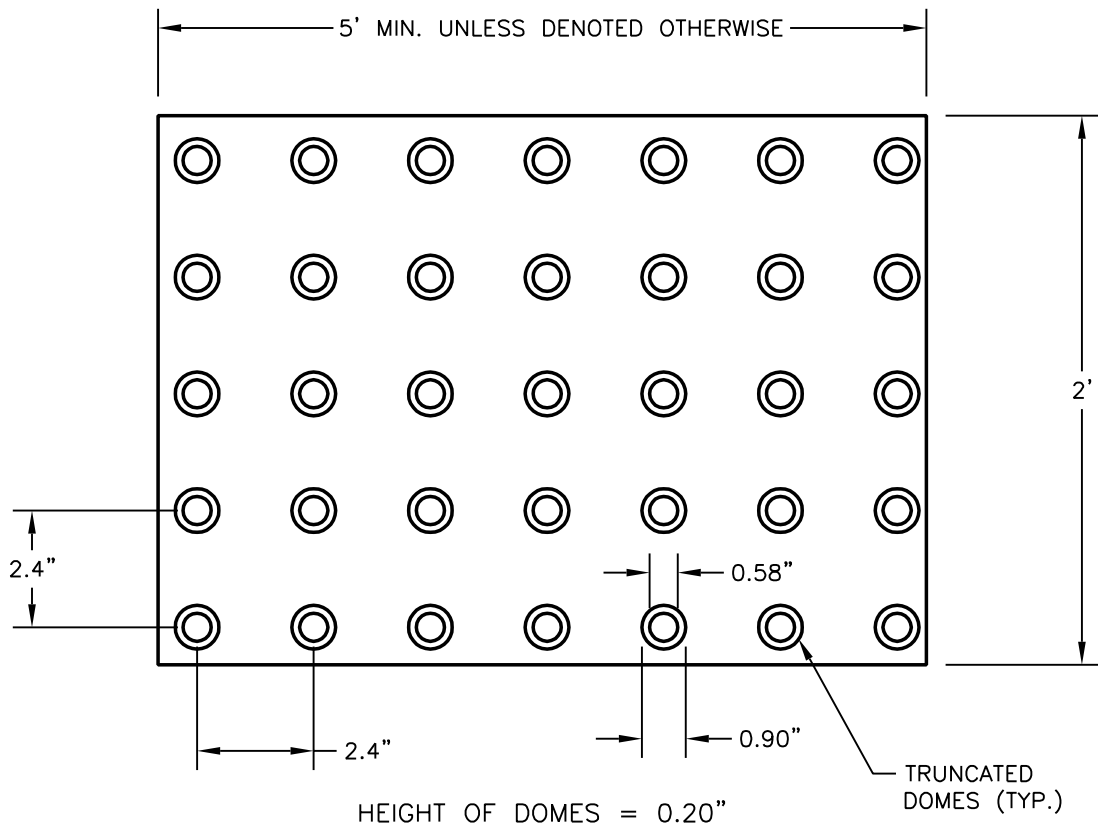
PV\_S16.DWG

March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

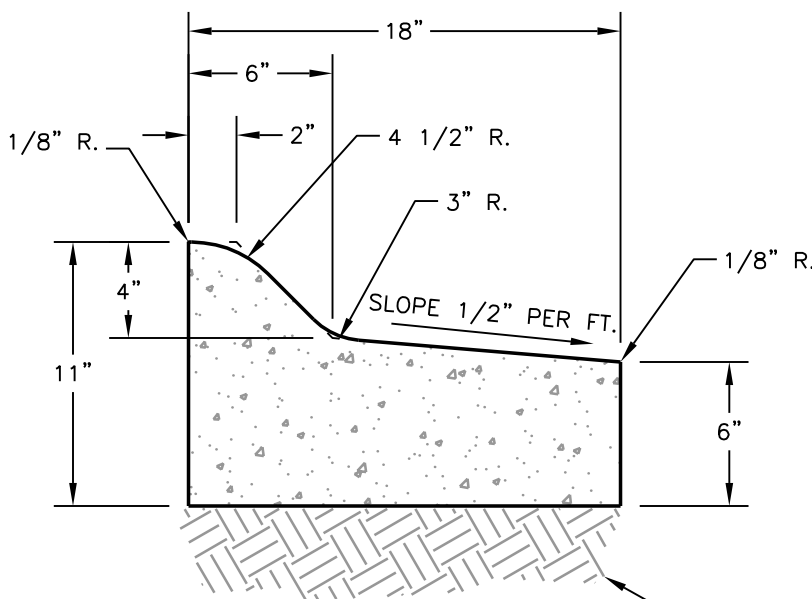
VERTICAL FACE CURB & GUTTER  
DETAIL No. S-16



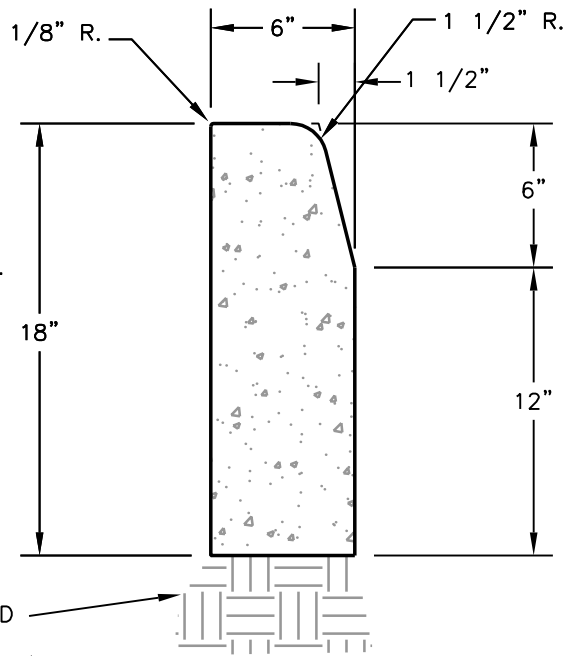
NOTES:

1. COLOR SHALL BE APPROVED BY THE TOWN BUT IN ALL CASES THE COLOR SHALL CONTRAST WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT.
2. ADA DETECTABLE WARNINGS SHALL BE INSTALLED 6" TO 8" FROM FLOWLINE USING APPROVED MATERIAL.

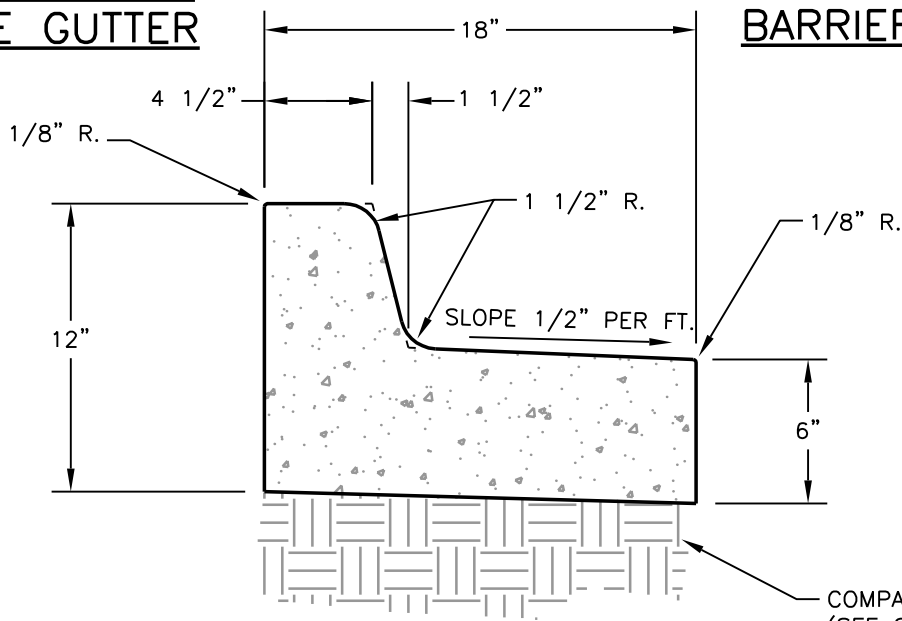




**DRIVE OVER CURB  
WITH REVERSE  
SLOPE GUTTER**



**6" VERTICAL FACE  
BARRIER CURB**



**6" VERTICAL FACE CURB WITH REVERSE SLOPE GUTTER**

**NOTES:**

1. CONTRACTION JOINTS FOR CONCRETE MEDIAN COVER SHALL MATCH CURB AND GUTTER, MAXIMUM SPACING OF TEN (10) FEET.
2. EXPANSION JOINTS REQUIRED AT 400 FOOT MAXIMUM SPACING. ADDITIONAL JOINTS MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER. SEE JOINT DETAILS.
3. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.

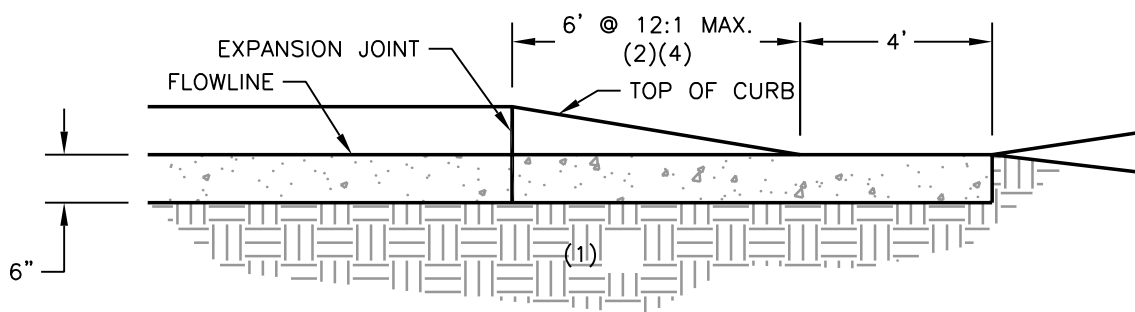
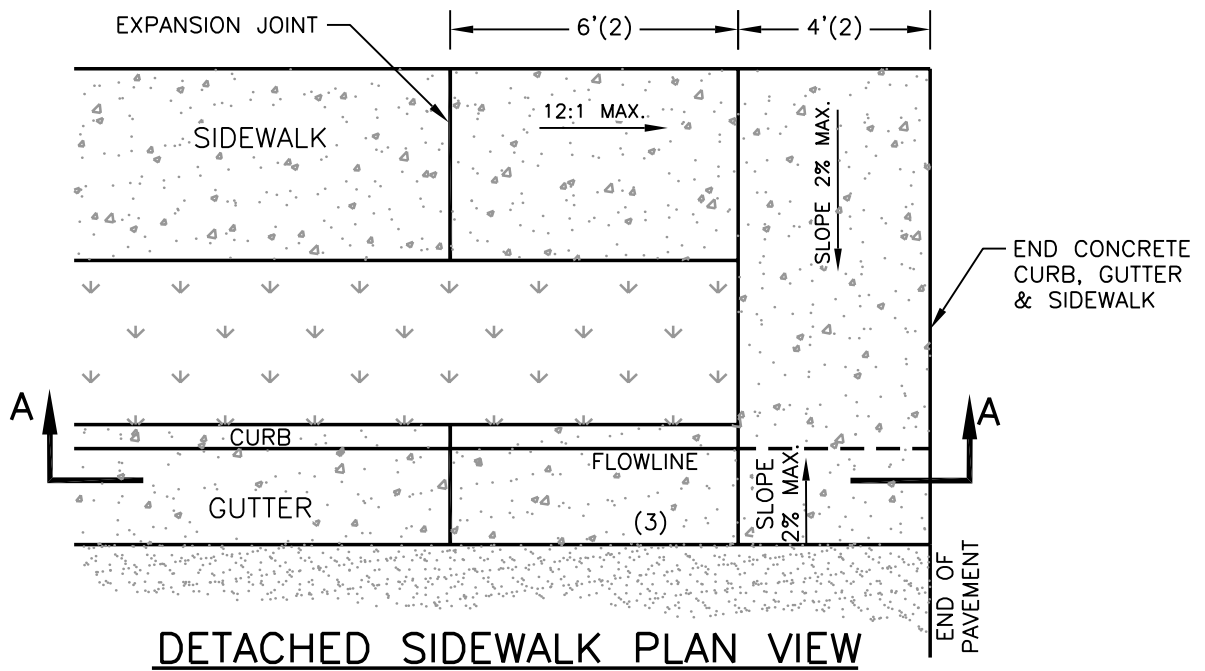
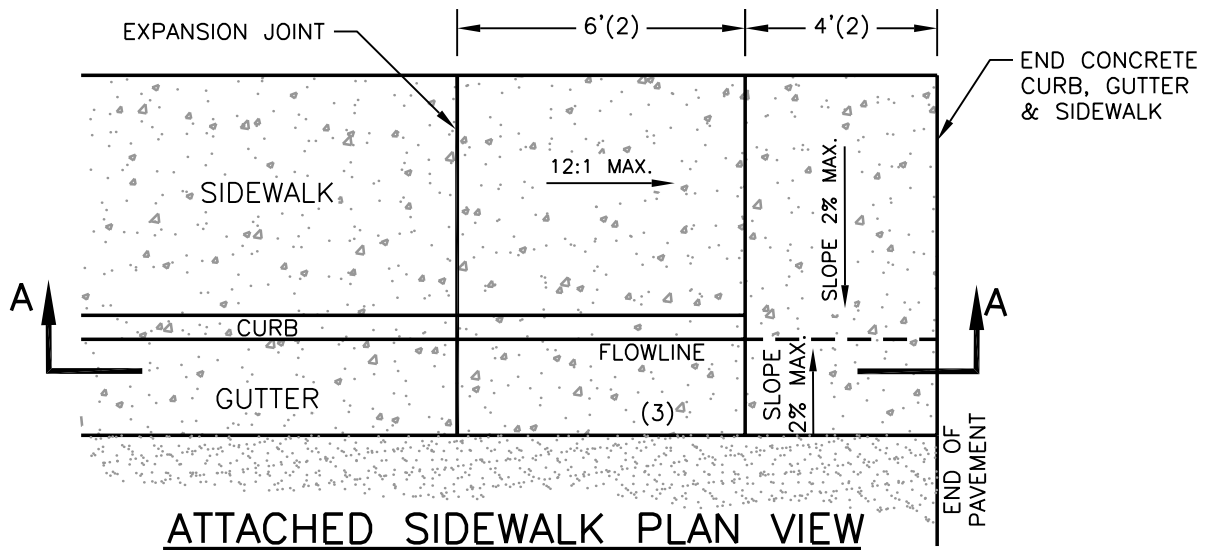
PV\_S18.DWG

March, 2010  
NOT TO SCALE



**CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO**

**MEDIAN CURBS**  
DETAIL No. S-18



NOTES:

1. COMPACTED SUBGRADE (SEE SPECIFICATIONS).
2. TEN FOOT (10') TEMPORARY END SECTION TO BE REMOVED TO CONTINUE CURB, GUTTER AND SIDEWALK.
3. PROVIDE A 6' GUTTER SLOPE TRANSITION AT THE TEMPORARY END SECTION. REDUCE SLOPE FROM 12:1 AT EXPANSION JOINT TO 50:1 AT FINAL 4'.
4. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.

March, 2010  
NOT TO SCALE

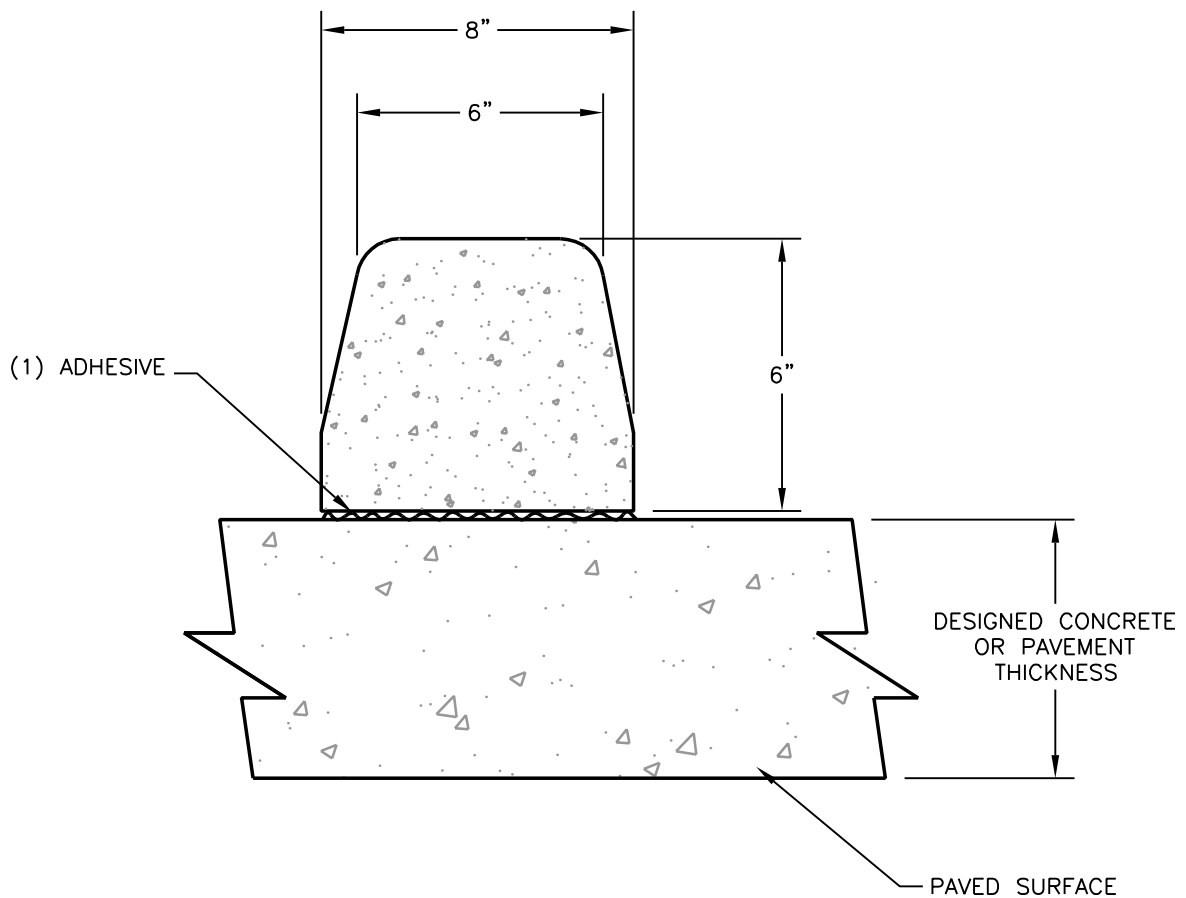
PV\_S19.DWG



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

CURB, GUTTER & SIDEWALK  
TEMPORARY END SECTION

DETAIL No. S-19



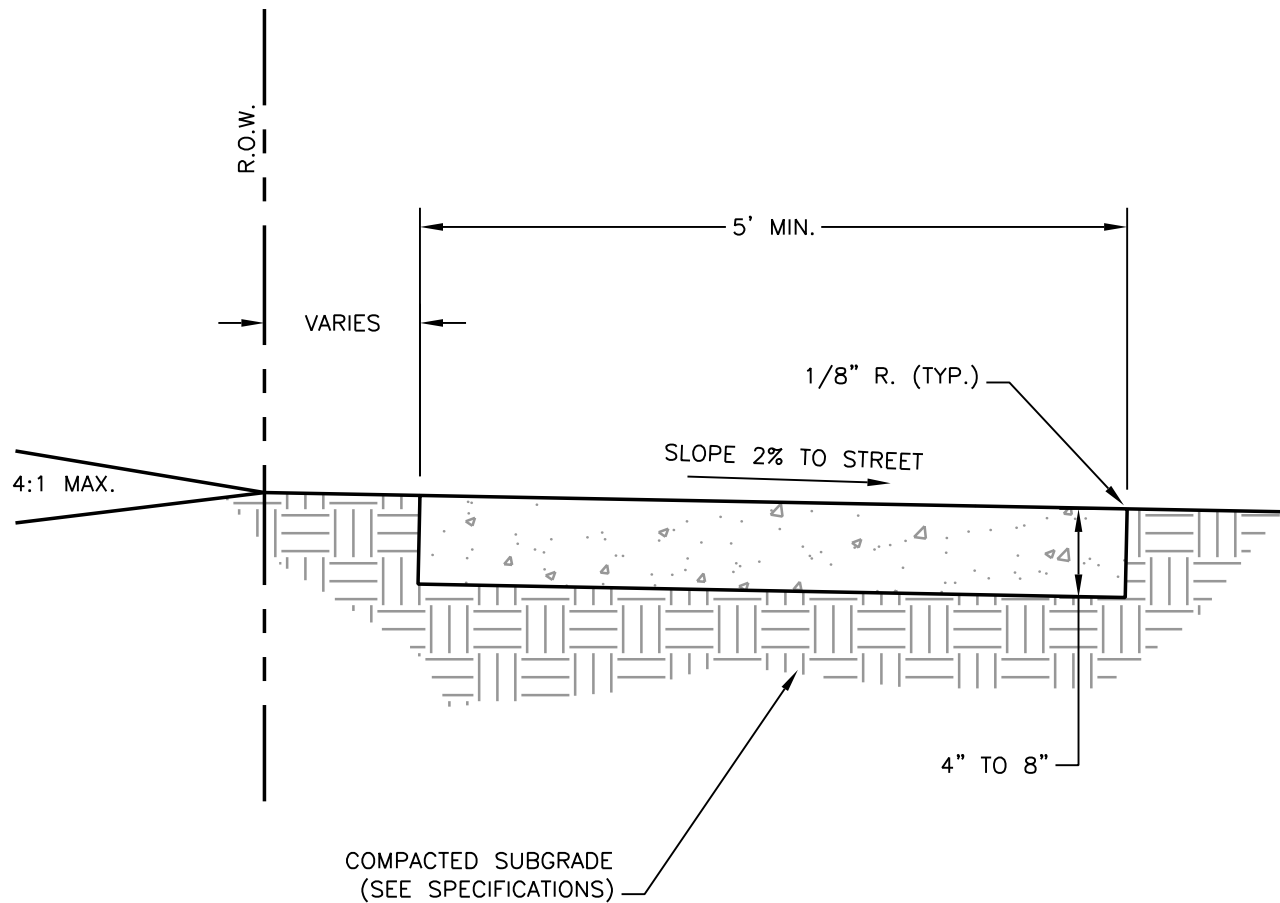
## EXTRUDED CURB

### NOTES:

1. ADHESIVE USED IN BONDING CURBHEAD TO SURFACE SHALL BE SPREAD ON A CLEAN SURFACE.
2. ADHESIVE SHALL BE APPROVED BY THE TOWN PRIOR TO CONSTRUCTION.
3. CONSTRUCT CURBS OF CONCRETE OR ASPHALT AS APPROVED BY THE TOWN.
4. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.







NOTES:

1. MAXIMUM SPACING OF CONTRACTION JOINTS IS TEN (10) FEET.
2. AT RESIDENTIAL DRIVEWAYS, THE SIDEWALK THICKNESS SHALL BE INCREASED TO SIX (6) INCHES.
3. EXPANSION JOINTS REQUIRED AT 400 FOOT MAXIMUM SPACING. ADDITIONAL JOINTS MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER. SEE JOINT DETAILS.
4. AT ALLEYS AND COMMERCIAL DRIVEWAYS, THE SIDEWALK THICKNESS SHALL BE INCREASED TO EIGHT (8) INCHES.
5. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.



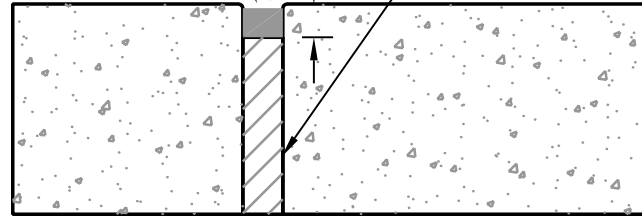
OUTDOOR INDUSTRIAL RATED SILICON  
CHALKING OR APPROVED EQUAL (2)

1/4" R. (TYP.)

JOINT MATERIAL FLUSH WITH SIDEWALK

1/2" PREMOLED NON-EXTRUDING  
EXPANSION MATERIAL TO MEET AASHTO  
SPEC. M-59. EXTEND FULL DEPTH OF  
CONCRETE.

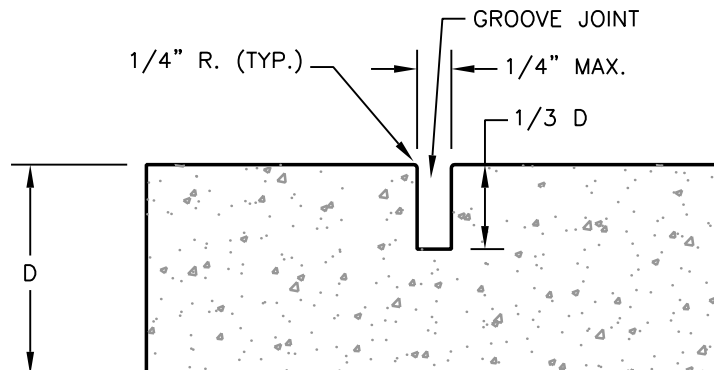
3/4"



## EXPANSION JOINT

### NOTES FOR EXPANSION JOINTS:

1. EXPANSION JOINTS REQUIRED AT 400 FOOT MAXIMUM SPACING. ADDITIONAL JOINTS MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
2. SAND BLAST AND PRIME AS PER MANUFACTURER'S SPECIFICATIONS.



## CONTRACTION JOINT

### NOTES FOR CONTRACTION JOINTS:

1. FORM WITH TOOL TEMPLATE OR SAWCUT JOINTS.
2. SAWCUT JOINTS, IF USED, SHALL BEGIN AS SOON AS CONCRETE IS HARDENED SUFFICIENTLY TO PERMIT SAWING WITHOUT EXCESSIVE RAVELING AND BEFORE UNCONTROLLED CRACKING OCCURS.
3. MAXIMUM DISTANCE BETWEEN JOINTS IS TEN (10) FEET AND MINIMUM DISTANCE IS FIVE (5) FEET.

PV\_S22.DWG

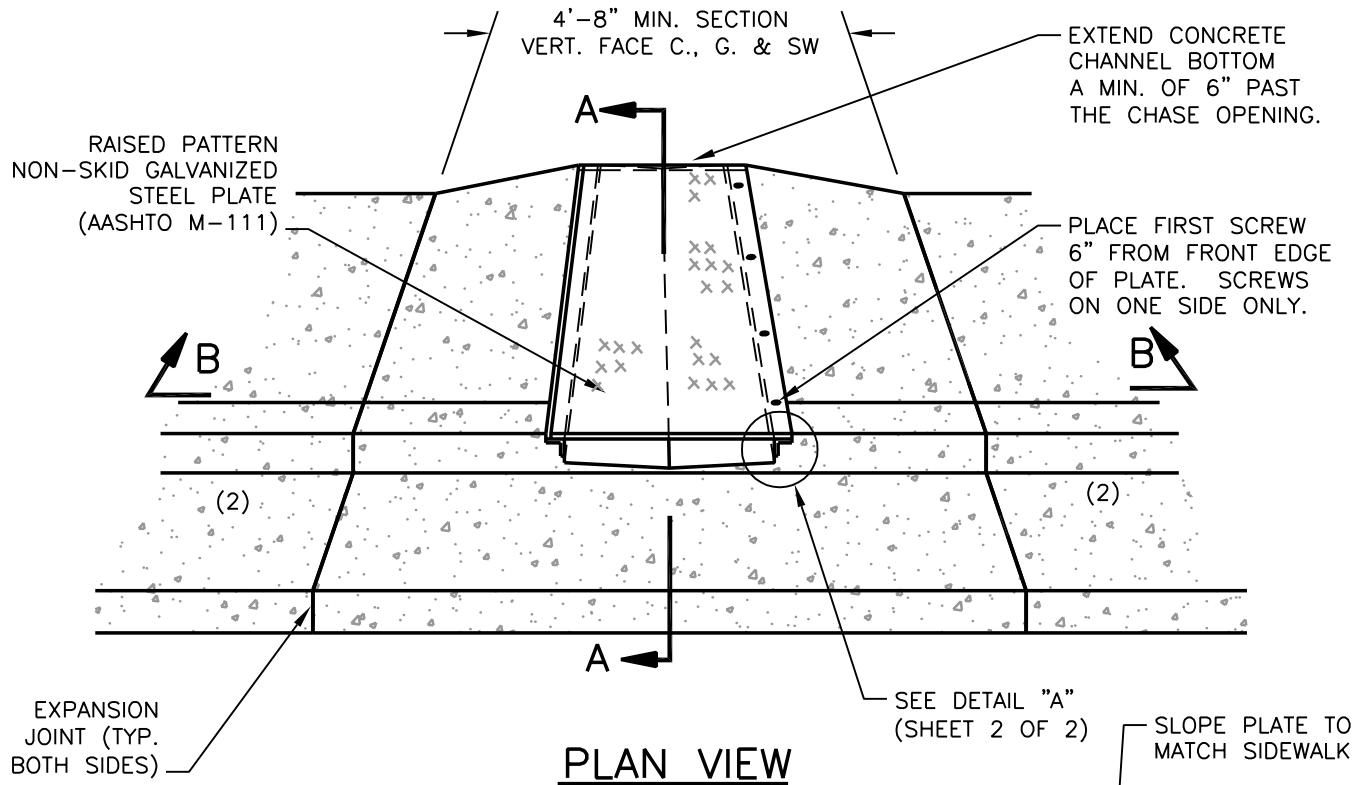
March, 2010  
NOT TO SCALE



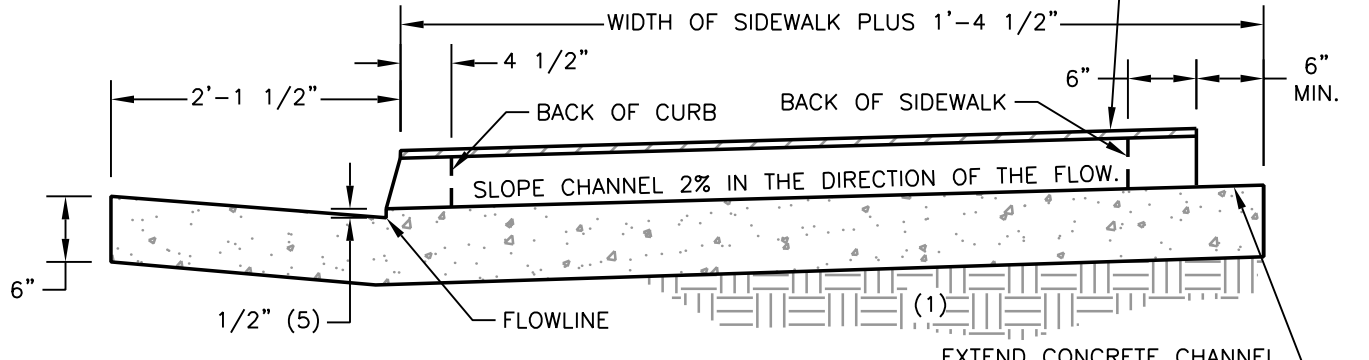
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

CONCRETE JOINT DETAILS FOR SIDEWALKS,  
CURBS, GUTTERS AND CROSS PANS

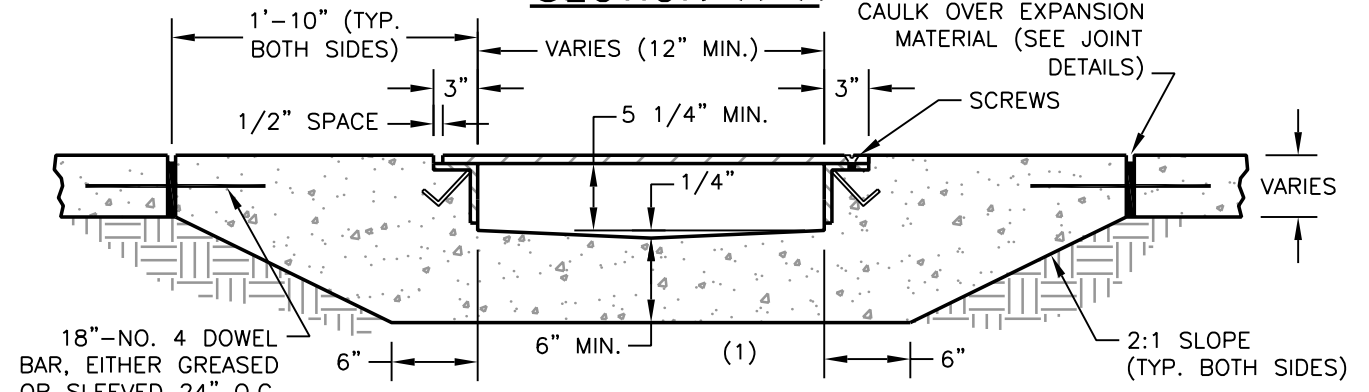
DETAIL No. S-22



**PLAN VIEW**



**SECTION A-A**



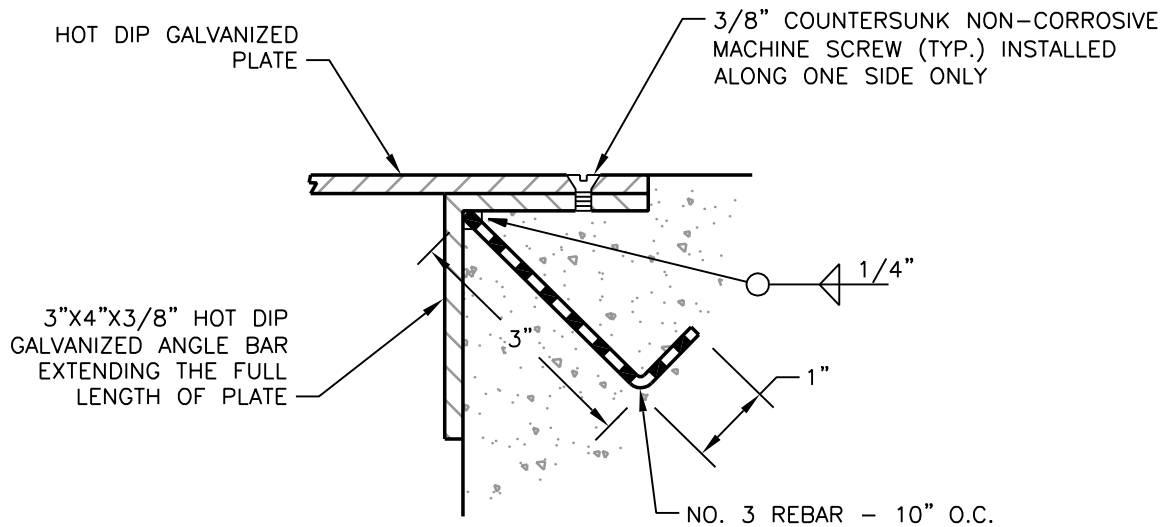
**SECTION B-B**

PV\_S23A-1.DWG

March, 2010  
NOT TO SCALE



**SIDEWALK CHASE FOR ATTACHED SIDEWALK - SHEET 1 OF 2**  
DETAIL No. S-23-A



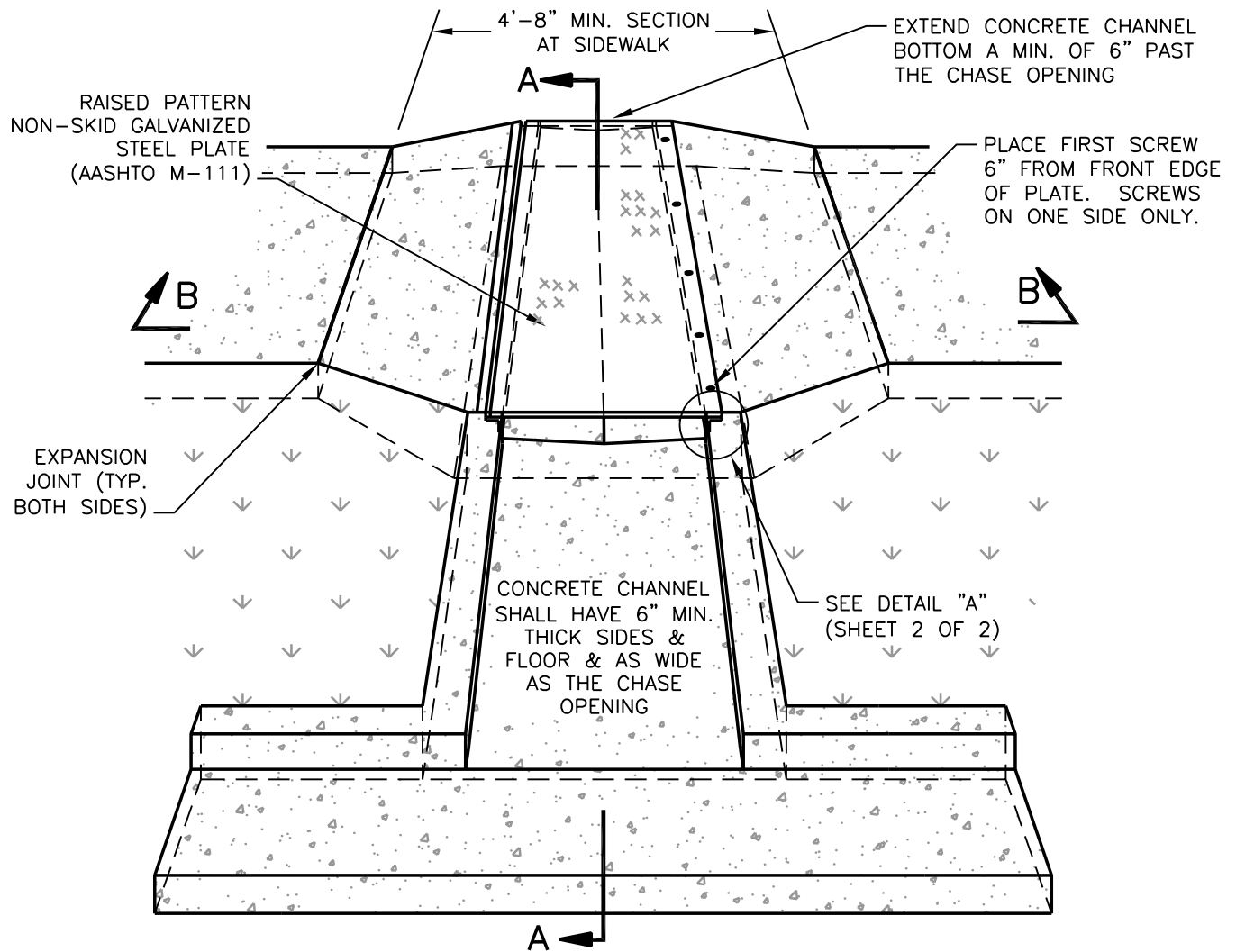
**DETAIL "A"**

WIDTH OF OPENING	THREADPLATE THICKNESS
12"–18"	9/16"
>18"–24"	5/8"
>24"	SPECIAL DESIGN

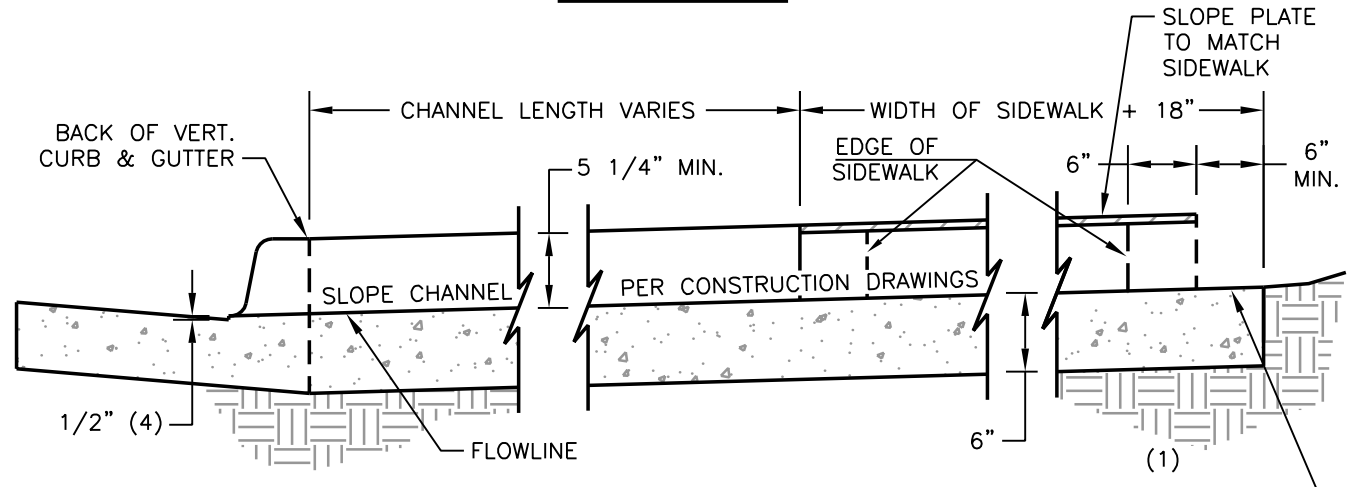
**NOTES:**

1. COMPACTED SUBGRADE (SEE SPECIFICATIONS).
2. FOR DRIVE OVER CURB, GUTTER AND SIDEWALK, TRANSITION (3' MIN.) TO A VERTICAL FACE CURB AND GUTTER FOR CHASE CONSTRUCTION. KEEP GUTTER WIDTH FOR DRIVE OVER.
3. NEENAH R-4999 SERIES BOLTED TRANSVERSE DRAINAGE STRUCTURE, SOLID CHECKERED TYPE D GRATE MAY BE SUBSTITUTED.
4. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.
5. ELIMINATE 1/2" FLOWLINE LIP WHEN STORMWATER DRAINS AWAY FROM THE GUTTER.





**PLAN VIEW**



**SECTION A-A**

EXTEND CONCRETE CHANNEL BOTTOM PAST THE CHASE OPENING

PV\_S23D-1.DWG

March, 2010  
NOT TO SCALE



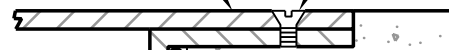
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

SIDEWALK CHASE FOR DETACHED  
SIDEWALK - SHEET 1 OF 2  
DETAIL No. S-23-D

HOT DIP GALVANIZED  
PLATE

3/8" COUNTERSUNK  
NON-CORROSIVE MACHINE  
SCREW (TYP.) INSTALLED  
ALONG ONE SIDE ONLY

3"x4"x3/8" HOT DIP  
GALVANIZED ANGLE BAR  
EXTENDING THE FULL  
LENGTH OF PLATE



1/4"

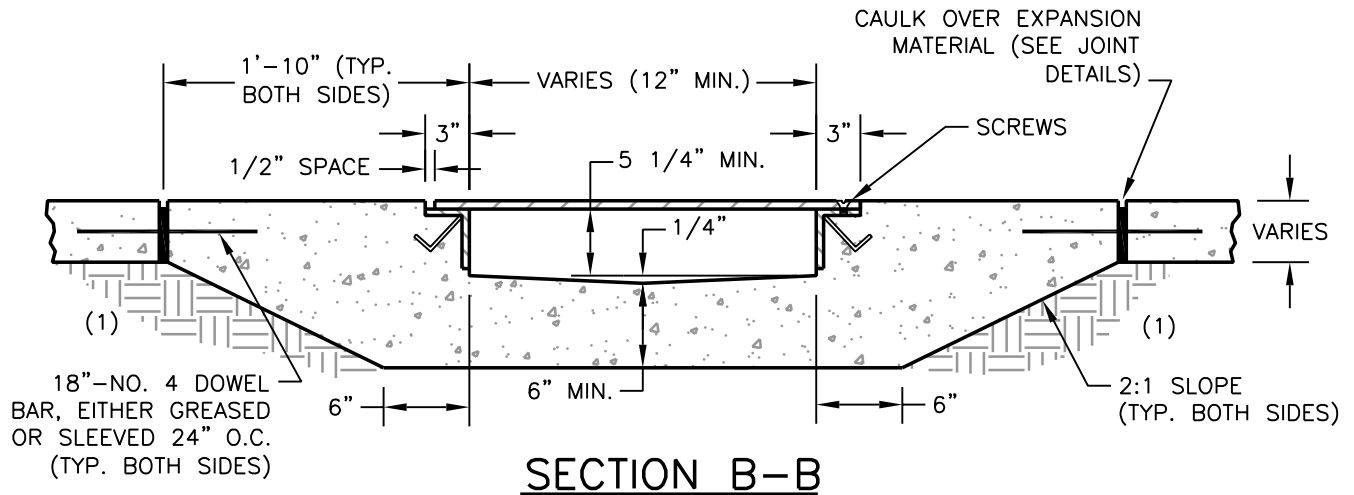
3"

1"

NO. 3 REBAR - 10" O.C.

WIDTH OF OPENING	THREADPLATE THICKNESS
12"-18"	9/16"
>18"-24"	5/8"
>24"	SPECIAL DESIGN

**DETAIL "A"**

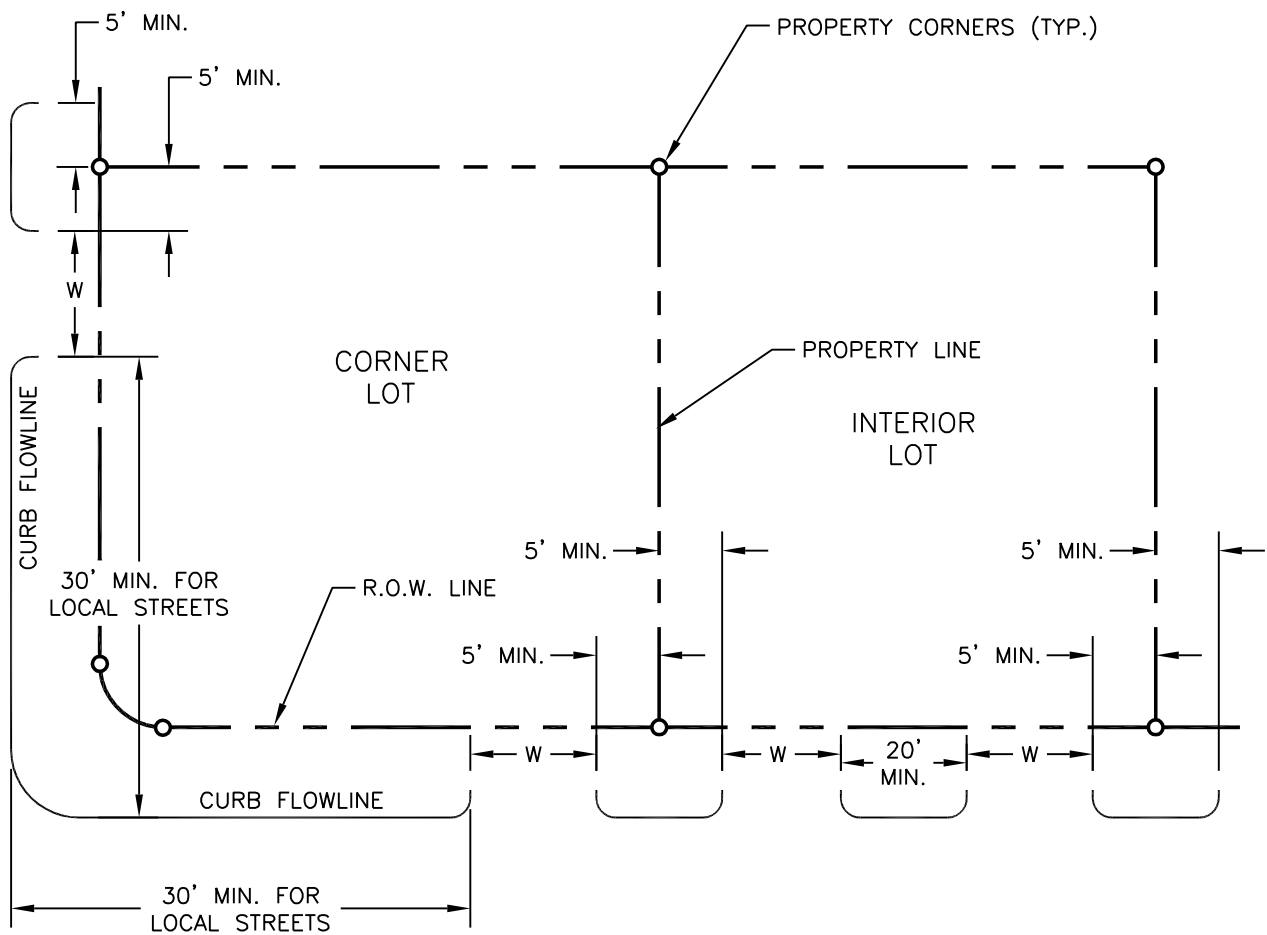


**SECTION B-B**

**NOTES:**

1. COMPACTED SUBGRADE (SEE SPECIFICATIONS).
2. NEENAH R-4999 SERIES BOLTED TRANSVERSE DRAINAGE STRUCTURE, SOLID CHECKERED TYPE D GRATE MAY BE SUBSTITUTED.
3. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.
4. ELIMINATE 1/2" FLOWLINE LIP WHEN STORMWATER DRAINS AWAY FROM THE GUTTER.

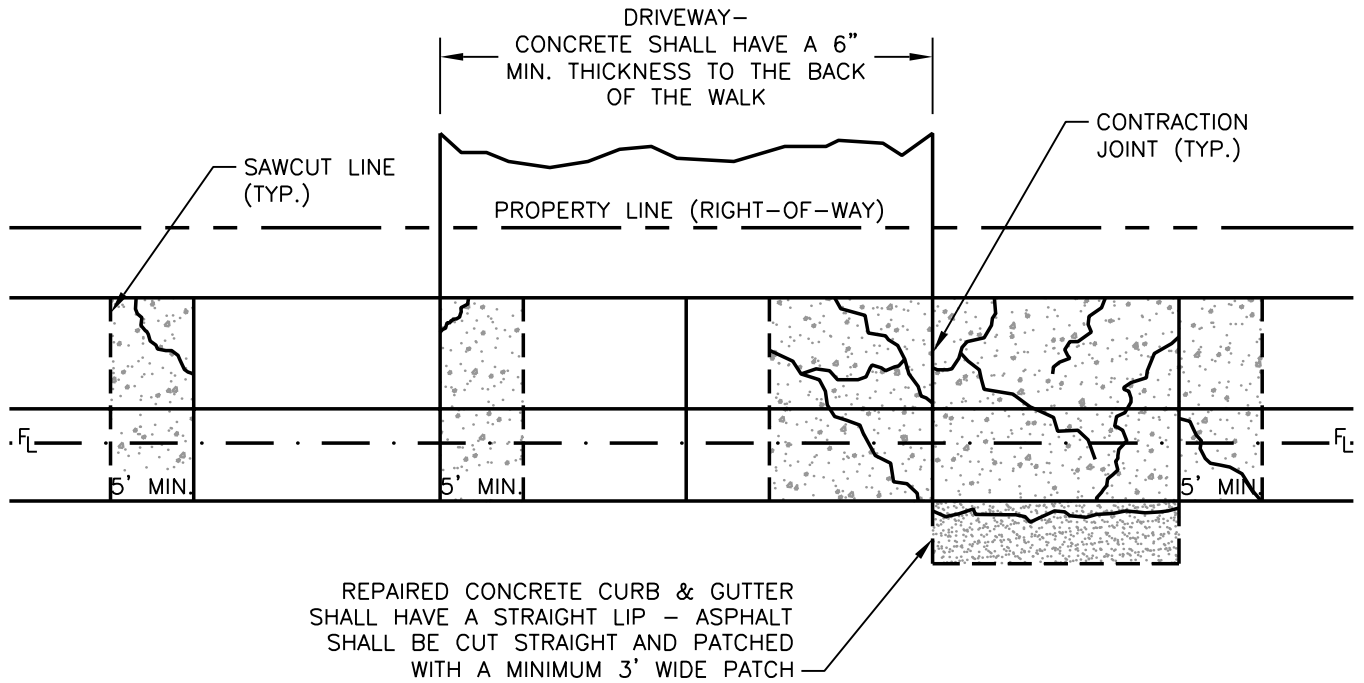




NOTES:

1. FRONTAGES ON CUL-DE-SACS AND ODD SHAPED LOTS NEED SPECIAL REVIEW.
2. LOCATION OF CURB CUTS ADJACENT TO MINOR ARTERIALS AND MAJOR COLLECTORS WILL BE EVALUATED ON AN INDIVIDUAL BASIS BY THE ENGINEER.
3. DRIVEWAY WIDTHS (W) SHALL BE:  
     12' MINIMUM  
     36' MAXIMUM
4. THERE SHALL BE A MINIMUM OF TWENTY (20) FEET CLEAR SEPARATION BETWEEN DRIVEWAYS ON A SINGLE LOT.





#### NOTES:

1. THE FOLLOWING AREAS IN THE PUBLIC RIGHT-OF-WAY SHALL BE CONSIDERED FOR REPAIR:
  - SIDEWALK, CURB, AND/OR GUTTER ADJACENT TO ANY PUBLIC STREET.
  - DETACHED SIDEWALK ALONG ANY PUBLIC STREET.
  - SIDEWALK (CARRIAGE WALKS) BETWEEN THE DETACHED SIDEWALK AND ANY PUBLIC STREET.
  - DRIVEWAY APPROACHES BETWEEN THE DETACHED SIDEWALK AND ANY PUBLIC STREET.
2. FOR DRIVE OVER CURB, GUTTER & SIDEWALK, REPAIRS SHALL BE SAWCUT FROM THE BACK OF THE WALK TO THE LIP OF THE GUTTER AND NO LESS THAN 5' WIDE, AS SHOWN.
3. IN DRIVEWAYS, ALL BROKEN SECTIONS (WHICH MEET THE FOLLOWING CRITERIA FOR REPAIR) SHALL BE REPAIRED AS SHOWN WITH A MINIMUM 6" CONCRETE DEPTH.

#### CRITERIA FOR REPAIR OF CURB, GUTTER, SIDEWALK & DRIVEWAY APPROACHES IN THE PUBLIC RIGHT-OF-WAY:

- A. TWO SECTIONS HAVING AN ELEVATION DIFFERENCE OF 3/4", OR GREATER, AT ANY LOCATION ALONG THE TOOLED JOINT OR CRACK.
- B. ANY SECTION WITH CRACKS 1/2" IN WIDTH, OR GREATER.
- C. SPALLING (CRUMBLING OF CONCRETE SURFACE) OF DEPTHS GREATER THAN 3/4", OR ENCOMPASSING MORE THAN 50% OF THE CONCRETE SECTION.
- D. ANY PORTION OF A CONCRETE SECTION MISSING.
- E. SECTIONS DISPLACED FROM ORIGINAL GRADE AT MORE THAN A 12:1 SLOPE.

PV\_S25.DWG

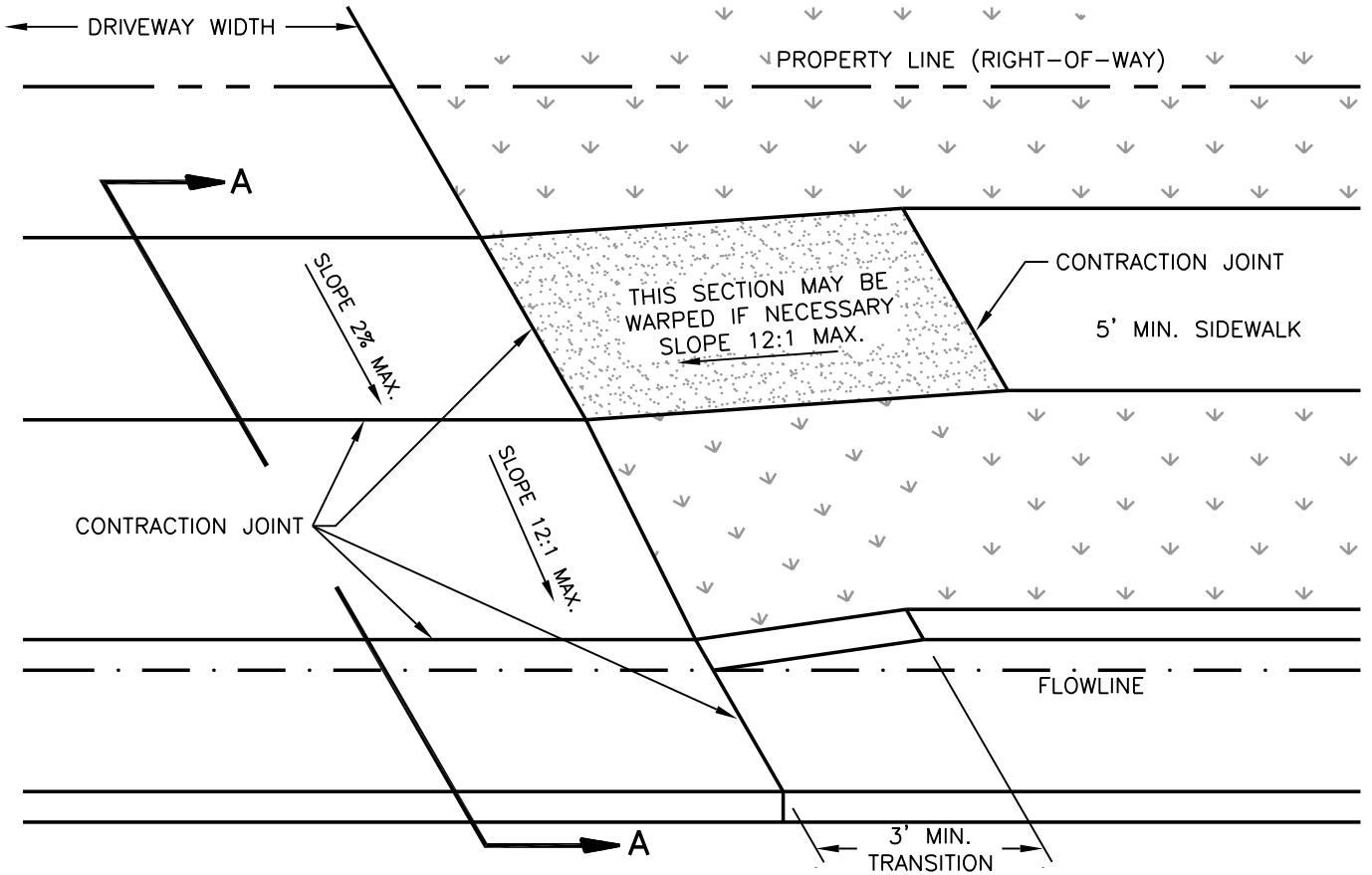
March, 2010  
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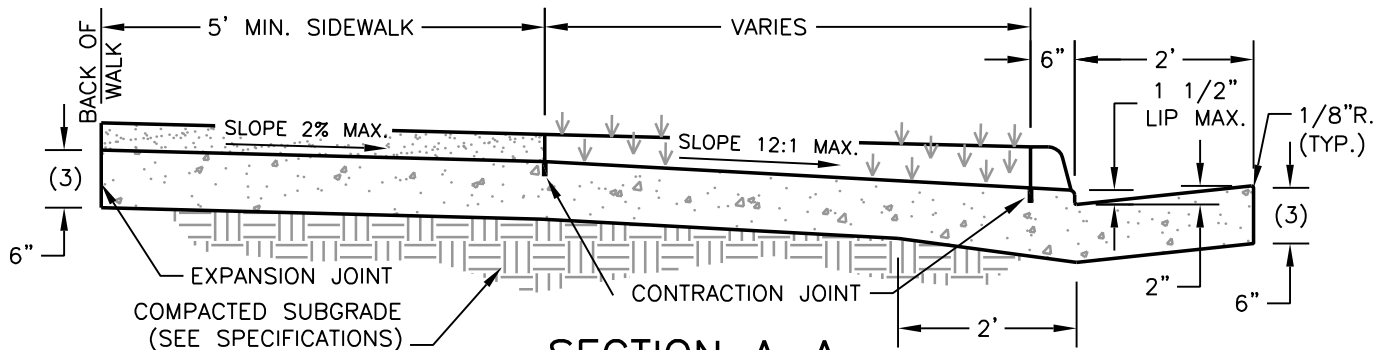
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

CURB, GUTTER & SIDEWALK  
REPAIR DETAIL  
DETAIL No. S-25





**PERSPECTIVE VIEW**



**SECTION A-A**

**NOTES:**

1. CONTRACTION JOINTS ARE REQUIRED AT EACH END OF WARPED SECTION AND SHOULD BE EVENLY SPACED A MAXIMUM OF 10' IN EITHER DIRECTION ALONG THE DRIVEWAY.
2. APPLY LIGHT BROOM FINISH TO SURFACES.
3. DRIVEWAY SECTION SHALL BE 6" THICK ON ALL RESIDENTIAL, MULTIFAMILY RESIDENTIAL, AND 8" THICK ON ALL COMMERCIAL, INDUSTRIAL AND ALLEY DRIVEWAYS.
4. DRIVEWAY WIDTHS: 12' MIN TO 36' MAX.
5. DRIVEWAY WIDTHS FOR COMMERCIAL/INDUSTRIAL AREAS SHALL BE APPROVED BY THE TOWN.
6. SHOW DIMENSIONS AND LOCATIONS OF DRIVEWAY ON CONSTRUCTION PLANS.
7. CONSTRUCTION SHALL CONFORM TO ALL ADA STANDARDS FOR SIDEWALKS.
8. RETROFIT DRIVE APPROACHES SHALL MATCH EXISTING CONDITIONS EXCEPT CONCRETE THICKNESSES SHALL CONFORM TO THIS DETAIL. EXPANSION JOINT LOCATIONS SHALL BE APPROVED BY THE TOWN.

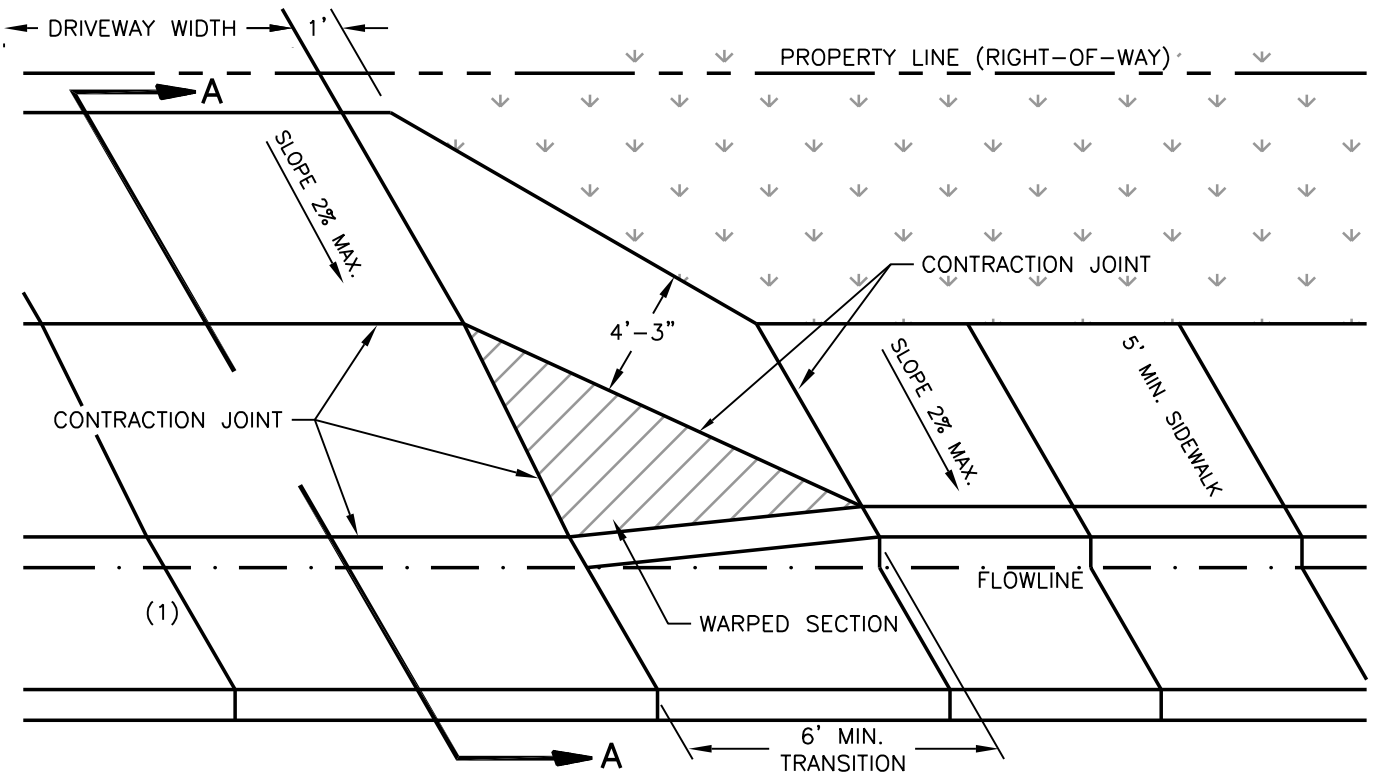
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March, 2010  
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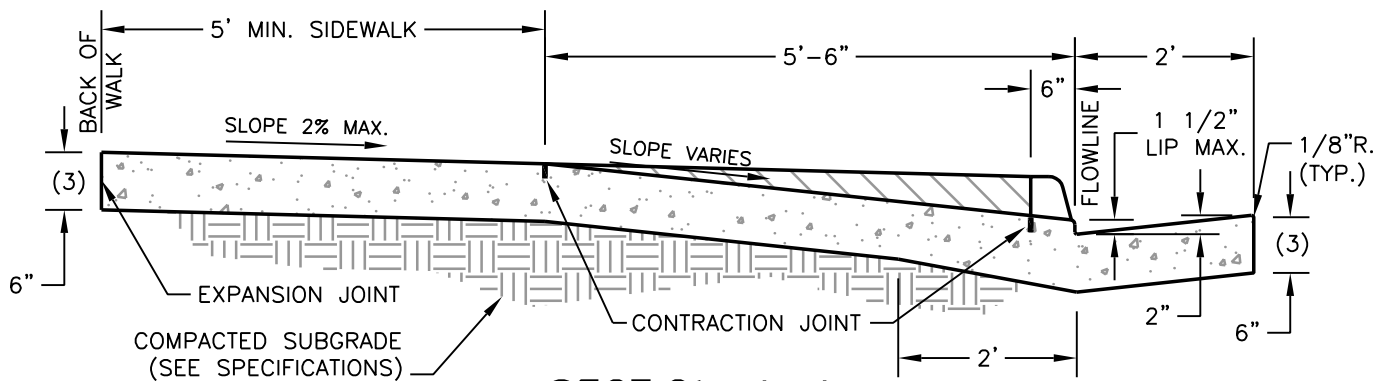


**CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO**

**CONCRETE DRIVEWAY APPROACH FOR VERTICAL  
FACE CURB & GUTTER W/DETACHED SIDEWALK**  
DETAIL No. S-26



**PERSPECTIVE VIEW**



**SECTION A-A**

**NOTES:**

1. CONTRACTION JOINTS ARE REQUIRED AT EACH END OF WARPED SECTION AND SHOULD BE EVENLY SPACED A MAXIMUM OF 10' IN EITHER DIRECTION ALONG THE DRIVEWAY.
2. APPLY LIGHT BROOM FINISH TO SURFACES.
3. DRIVEWAY SECTION SHALL BE 6" THICK ON ALL RESIDENTIAL, MULTIFAMILY RESIDENTIAL, AND 8" THICK ON ALL COMMERCIAL, INDUSTRIAL AND ALLEY DRIVEWAYS.
4. DRIVEWAY WIDTHS: 12' MIN TO 36' MAX.
5. DRIVEWAY WIDTHS FOR COMMERCIAL/INDUSTRIAL AREAS SHALL BE APPROVED BY THE TOWN.
6. SHOW DIMENSIONS AND LOCATIONS OF DRIVEWAY ON CONSTRUCTION PLANS.
7. CONSTRUCTION SHALL CONFORM TO ALL ADA STANDARDS FOR SIDEWALKS.
8. RETROFIT DRIVE APPROACHES SHALL MATCH EXISTING CONDITIONS EXCEPT CONCRETE THICKNESSES SHALL CONFORM TO THIS DETAIL. EXPANSION JOINT LOCATIONS SHALL BE APPROVED BY THE TOWN.

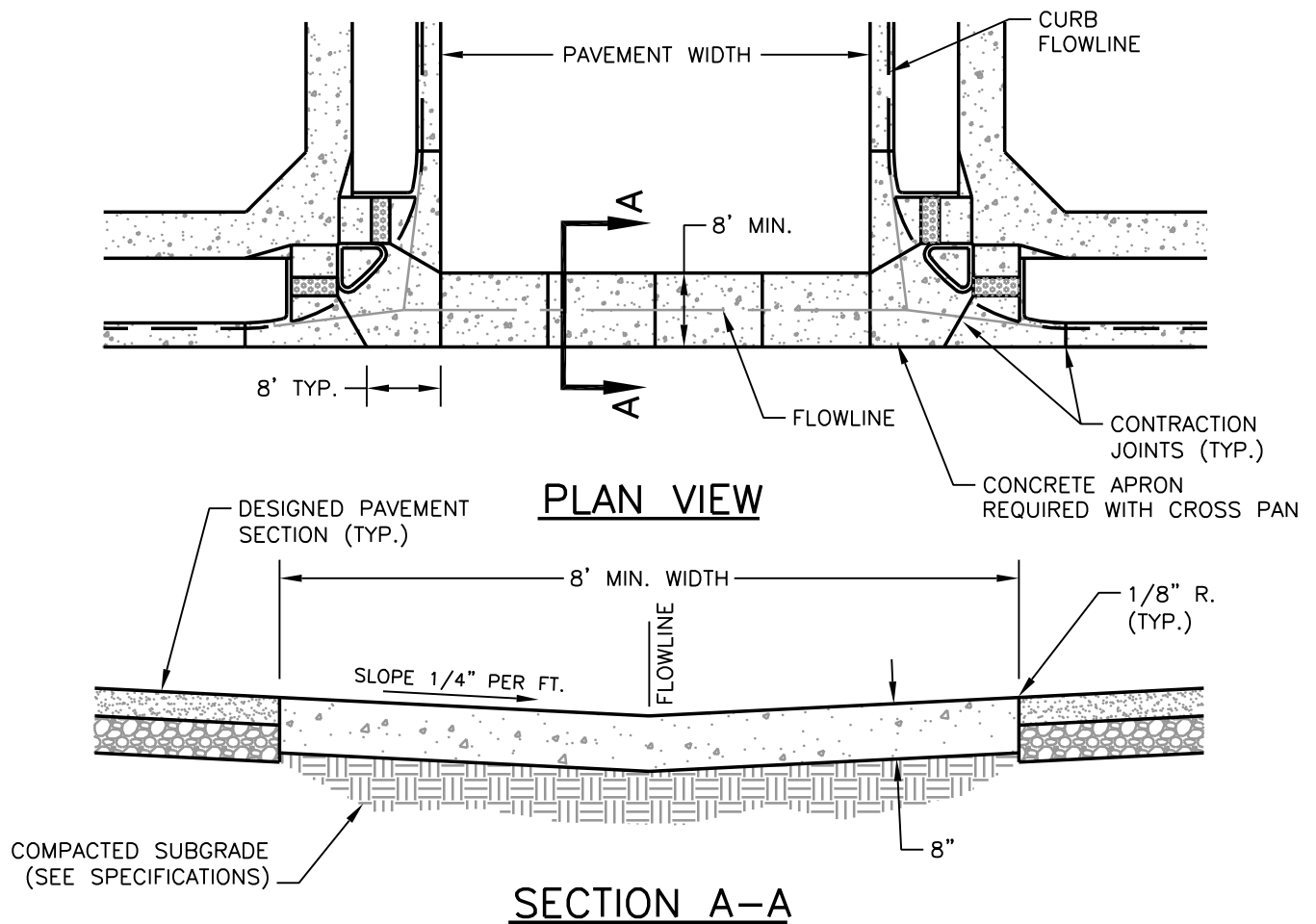
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NOT TO SCALE



**CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO**

**CONCRETE DRIVEWAY APPROACH FOR VERTICAL  
FACE CURB & GUTTER W/ATTACHED SIDEWALK**  
DETAIL No. S-27



**NOTES:**

1. MINIMUM OF 0.6% LONGITUDINAL SLOPE FOR CROSS PANS.
2. MAXIMUM SPACING OF CONTRACTION JOINTS – TEN (10) FEET.
3. CONCRETE APRON SHALL BE POURED MONOLITHICALLY WITH CURB AND SHALL BE 8" THICK (SEE CURB RAMP DETAILS).
4. CROSS PAN AND APRON MAY BE POURED MONOLITHICALLY OR IF POURED SEPARATELY SHALL BE DOWELLED TOGETHER.
5. SEE STREET DESIGN STANDARDS FOR PERMISSIBLE LOCATIONS OF CROSS PANS.
6. MID-BLOCK CROSS PANS SHALL BE A MINIMUM OF TEN (10) FEET WIDE.
7. LARGER WIDTHS MAY BE REQUIRED BY THE TOWN.
8. DOWELING MAY BE REQUIRED AT CERTAIN COLD JOINTS AT THE CITY'S DIRECTION, BASED ON SPECIAL SUBGRADE CIRCUMSTANCES.
9. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.

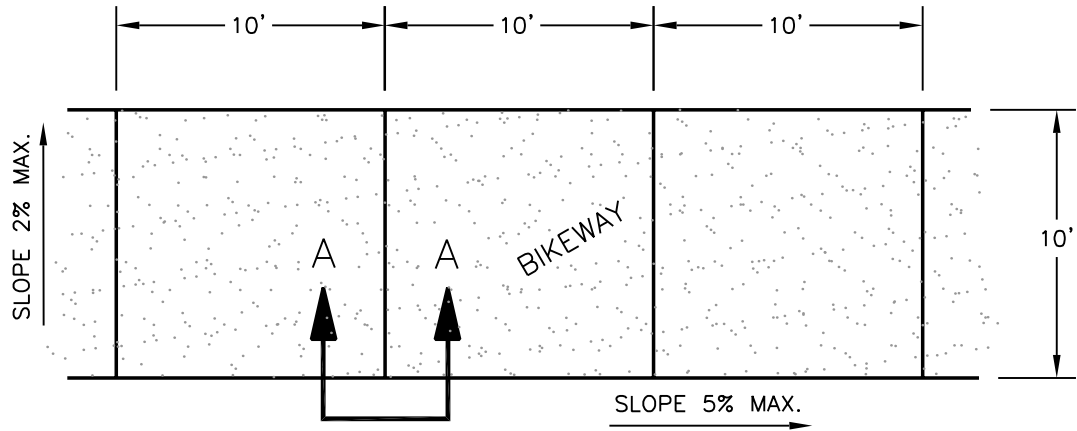
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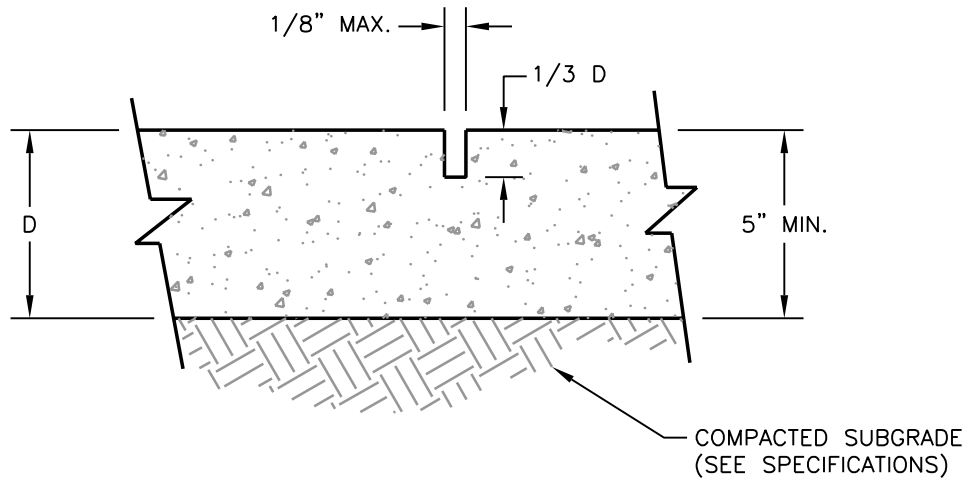


CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

CONCRETE CROSS PAN DETAIL  
DETAIL No. S-28



PLAN VIEW



SECTION A-A

NOTES:

1. SAWCUT, REMOVABLE PLASTIC DUMMY JOINT STRIPS OR OTHER APPROVED JOINTS AT 10' O.C.
2. EXPANSION JOINTS REQUIRED AT 200 FOOT SPACING AND ADDITIONAL JOINTS MAY BE REQUIRED AT THE DISCRETION OF THE TOWN. SEE JOINT DETAILS.
3. CONCRETE SHALL BE FIBER REINFORCED AS APPROVED BY THE TOWN.
4. BIKE PATHS WITH GREATER THAN 5% SLOPE SHALL REQUIRE A SPECIAL DESIGN AND MUST COMPLY WITH ALL ADA REQUIREMENTS.
5. CONCRETE SURFACES TO RECEIVE A LIGHT BROOM FINISH.

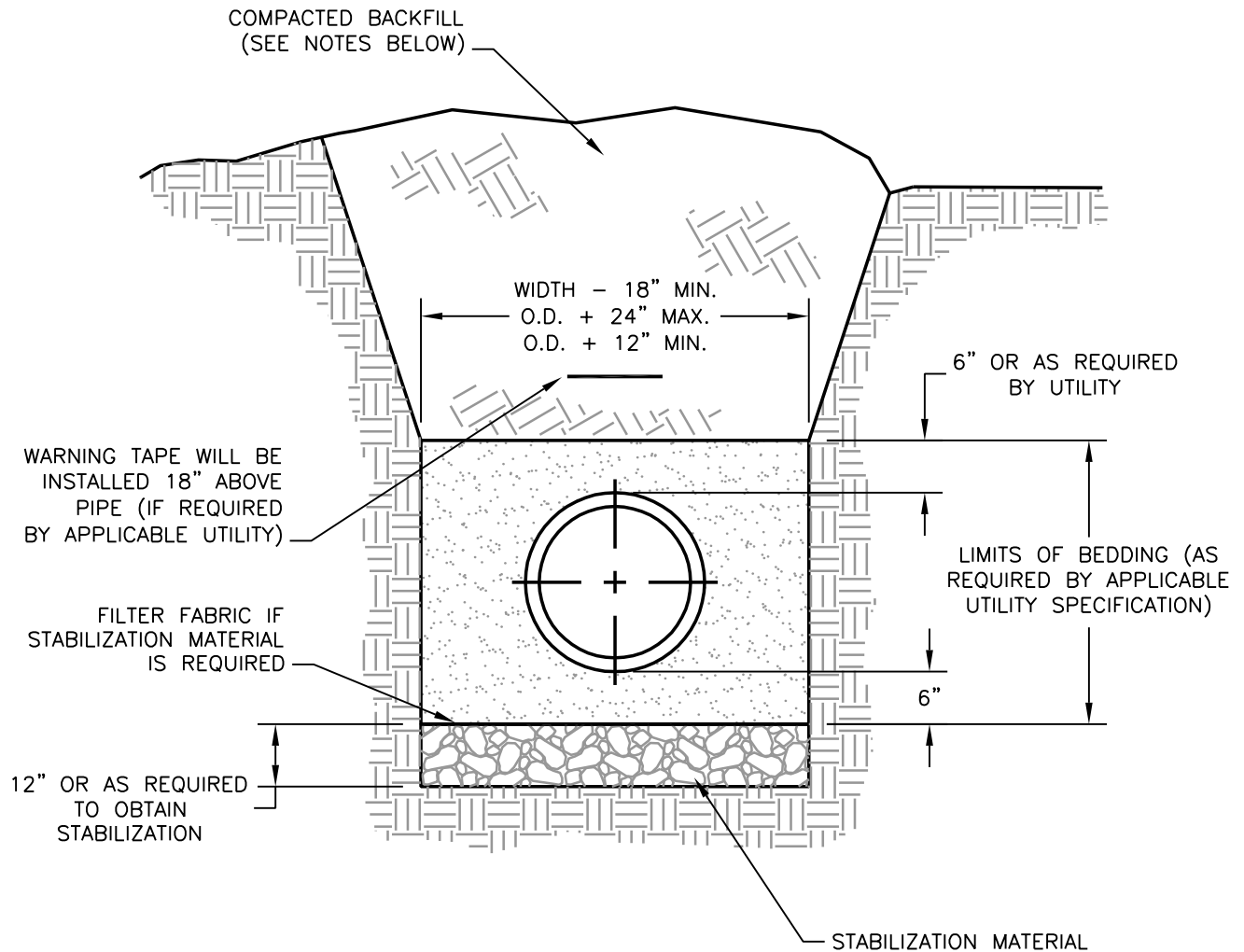
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March, 2010  
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CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

BIKEWAY DETAIL  
DETAIL No. S-29



### NOTES:

1. RIGHT-OF-WAY AND EASEMENT AREAS SHALL BE GRADED (CUT AND FILL) TO SUBGRADE (+/-0.5') PRIOR TO AND AFTER UTILITY INSTALLATION.
2. BACKFILL WITHIN PUBLIC RIGHT-OF-WAY AND IN EASEMENTS WITHIN 20 FEET OF RIGHT-OF-WAY SHALL BE COMPACTED TO 95% WITHIN +/- 2% OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY AASHTO T99 DENSITY. TRENCHES IN EASEMENTS BEYOND 20 FEET OF RIGHT-OF-WAY SHALL BE COMPACTED TO 90%. ALL TRENCHES SHALL BE COMPACTED BY A METHOD APPROVED BY THE TOWN.
3. TRENCH EXCAVATION SHALL COMPLY TO ALL OSHA STANDARDS.
4. FILTER FABRIC IS REQUIRED IF STABILIZATION MATERIAL IS USED. THE FABRIC SHALL BE INSTALLED AS SHOWN IN THE DETAIL.
5. IF NOT SPECIFIED BY APPLICABLE UTILITY, AN APPROVED GRADE OF SAND BEDDING SHALL BE INSTALLED TO SPRINGLINE.

PV\_S30.DWG

March, 2010  
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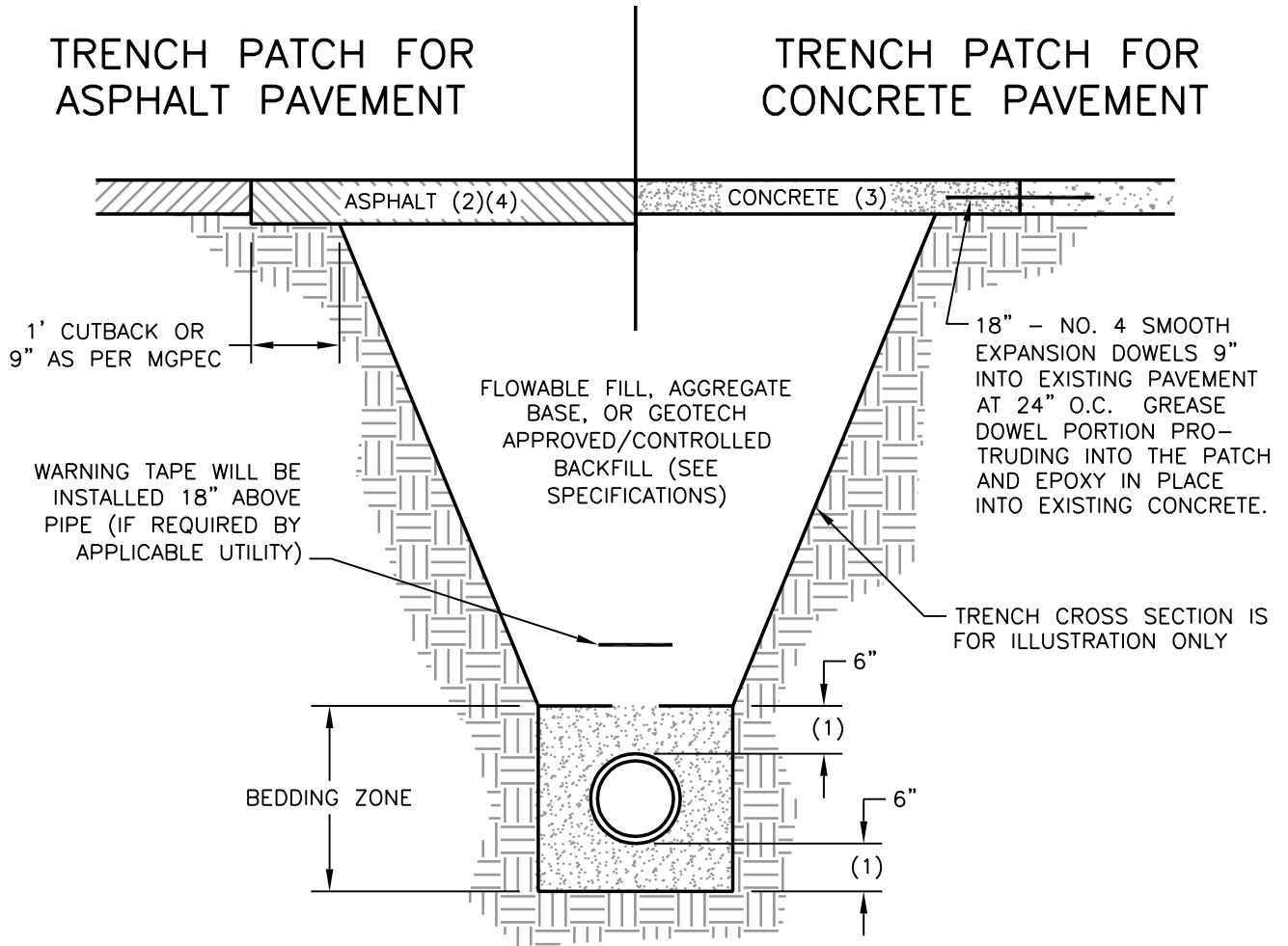


CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

NEW DEVELOPMENT TRENCH  
EXCAVATION & BACKFILL DETAIL  
DETAIL No. S-30

# TRENCH PATCH FOR ASPHALT PAVEMENT

# TRENCH PATCH FOR CONCRETE PAVEMENT



	LOCAL STANDARD & LOCAL LOW VOLUME			MAJOR LOCAL, COMMERCIAL & INDUSTRIAL	COLLECTOR	ARTERIAL
	ALLEY	EMER.ACCESS	RESIDENTIAL			
FULL DEPTH ASPHALT (4)	5 1/2"	5 1/2"	5 1/2"	7"	7"	7"

## NOTES:

1. USE THE LIMITS OF BEDDING SHOWN IF NOT SPECIFIED BY THE APPLICABLE UTILITY.
2. HOT MIX ASPHALT SHALL BE USED TO PATCH ASPHALT AND SHALL BE GRADE S OR SX. TACK COAT REQUIRED.
3. CONCRETE SHALL BE USED TO PATCH CONCRETE. MATCH EXISTING THICKNESS.
4. FULL DEPTH ASPHALT SHALL BE THICKNESSES AS SHOWN ABOVE OR ONE (1) INCH GREATER THAN THE EXISTING PAVEMENT THICKNESS, WHICHEVER IS GREATER.
5. PATCH MAY NOT END WITHIN THE WHEEL TRACK OF TRAVEL LANES. UP TO THREE (3) FEET OF ADDITIONAL ASPHALT PATCH WILL BE REQUIRED TO KEEP THE JOINT OUT OF THE WHEEL TRACK.
6. MINIMUM SIZE OF PATCH SHALL BE 3' X 3'.

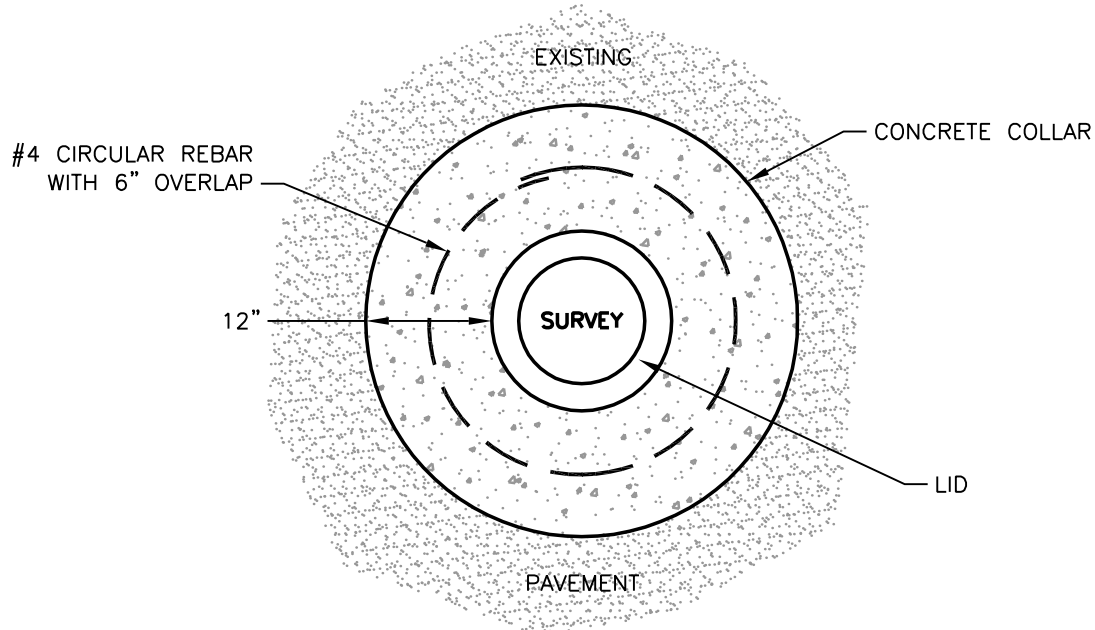
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March, 2010  
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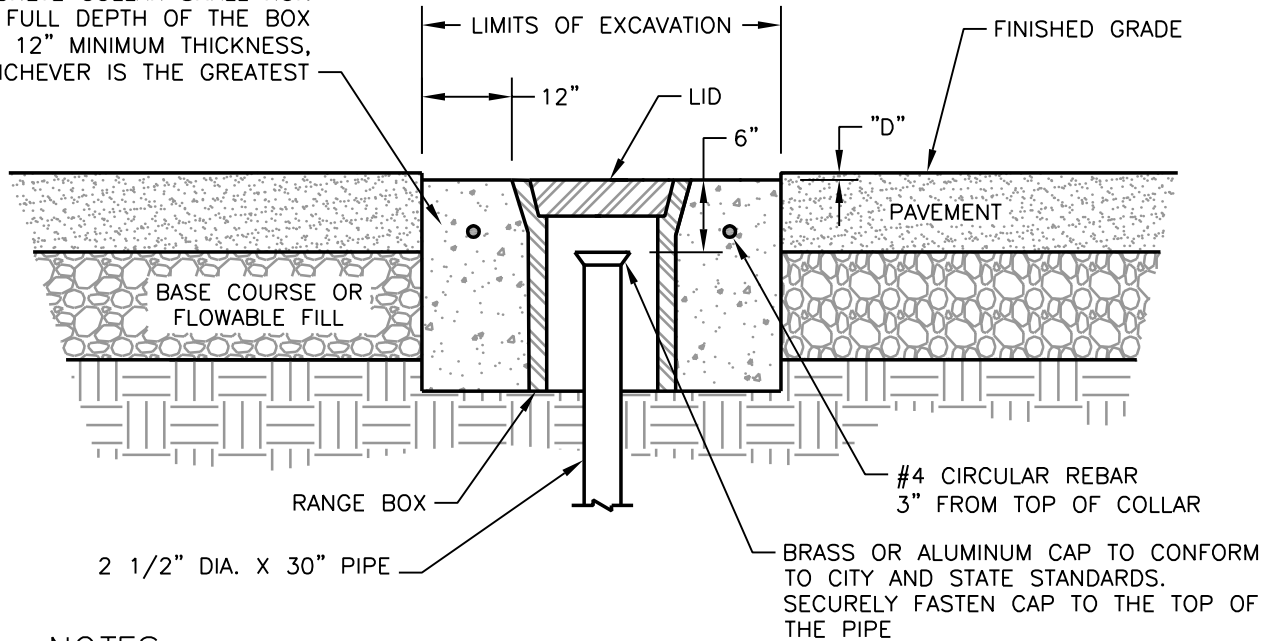


CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

EXISTING STREET PAVEMENT PATCH  
DETAIL FOR ASPHALT & CONCRETE  
DETAIL No. S-31



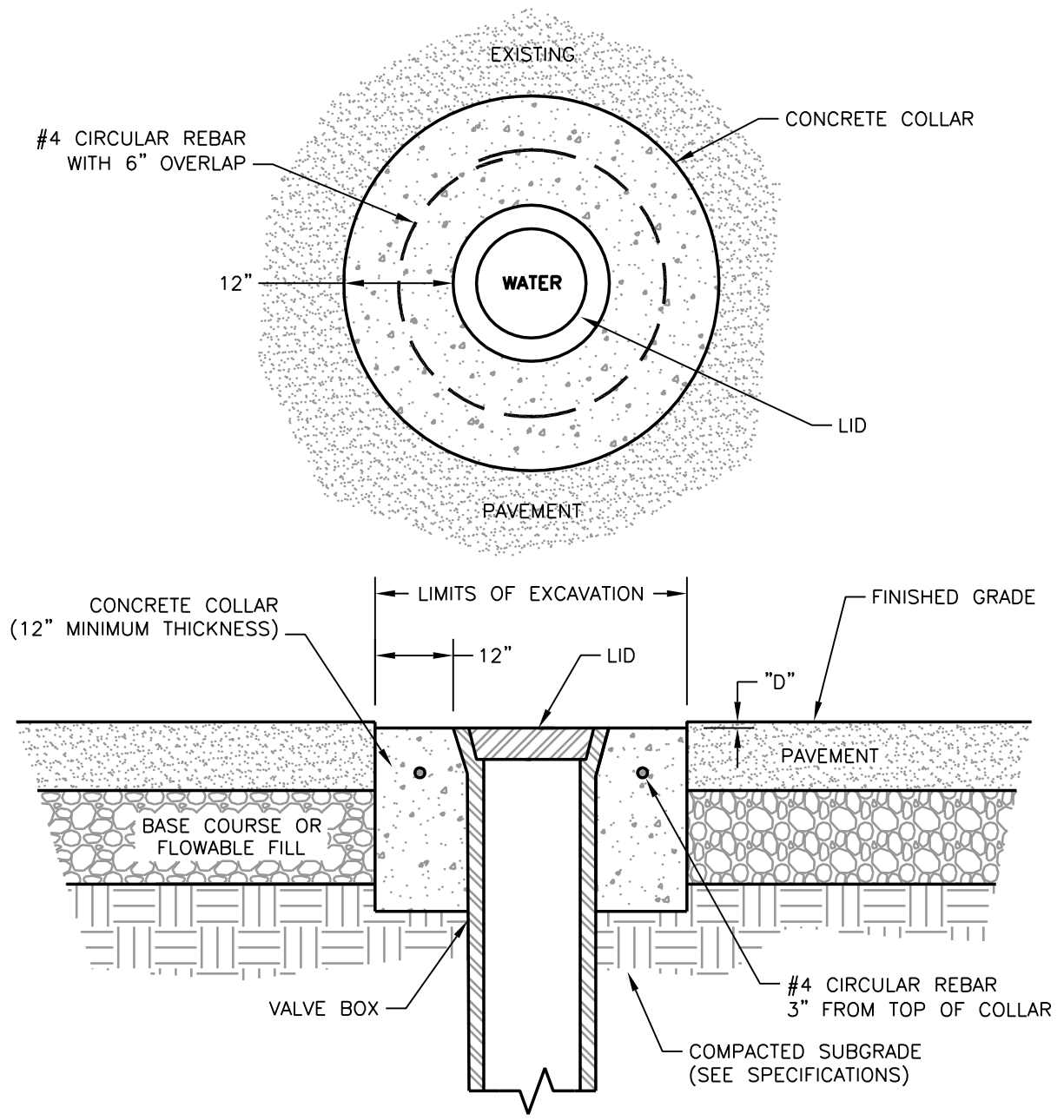
CONCRETE COLLAR SHALL RUN THE FULL DEPTH OF THE BOX OR 12" MINIMUM THICKNESS, WHICHEVER IS THE GREATEST



NOTES:

1. "D" = 1/2" FOR HOT MIX ASPHALT PAVEMENT OVERLAYS, SURFACE TREATMENTS, PAVEMENT RECONSTRUCTION OR NEW CONSTRUCTION.
2. "D" = 1/4" FOR CONCRETE STREETS.
3. THIS MONUMENT TO BE INSTALLED AT ALL ALIQUOT CORNERS.
4. SURVEY MONUMENTS SHALL CONFORM TO ALL LAND SURVEYING REQUIREMENTS AS DETERMINED BY TOWN AND STATE STANDARDS.
5. RANGE BOX, CAP AND MONUMENT PIPE TO BE PURCHASED FROM THE TOWN.





NOTES:

1. "D" = 1/2" FOR HOT MIX ASPHALT PAVEMENT OVERLAYS, SURFACE TREATMENTS, PAVEMENT RECONSTRUCTION OR NEW CONSTRUCTION.
2. "D" = 1/4" FOR CONCRETE STREETS.
3. VALVE BOX MUST BE PLUMB AND CENTERED OVER THE VALVE NUT.
4. THIS DETAIL APPLIES TO BOTH ASPHALT AND CONCRETE STREETS.

PV\_S33.DWG

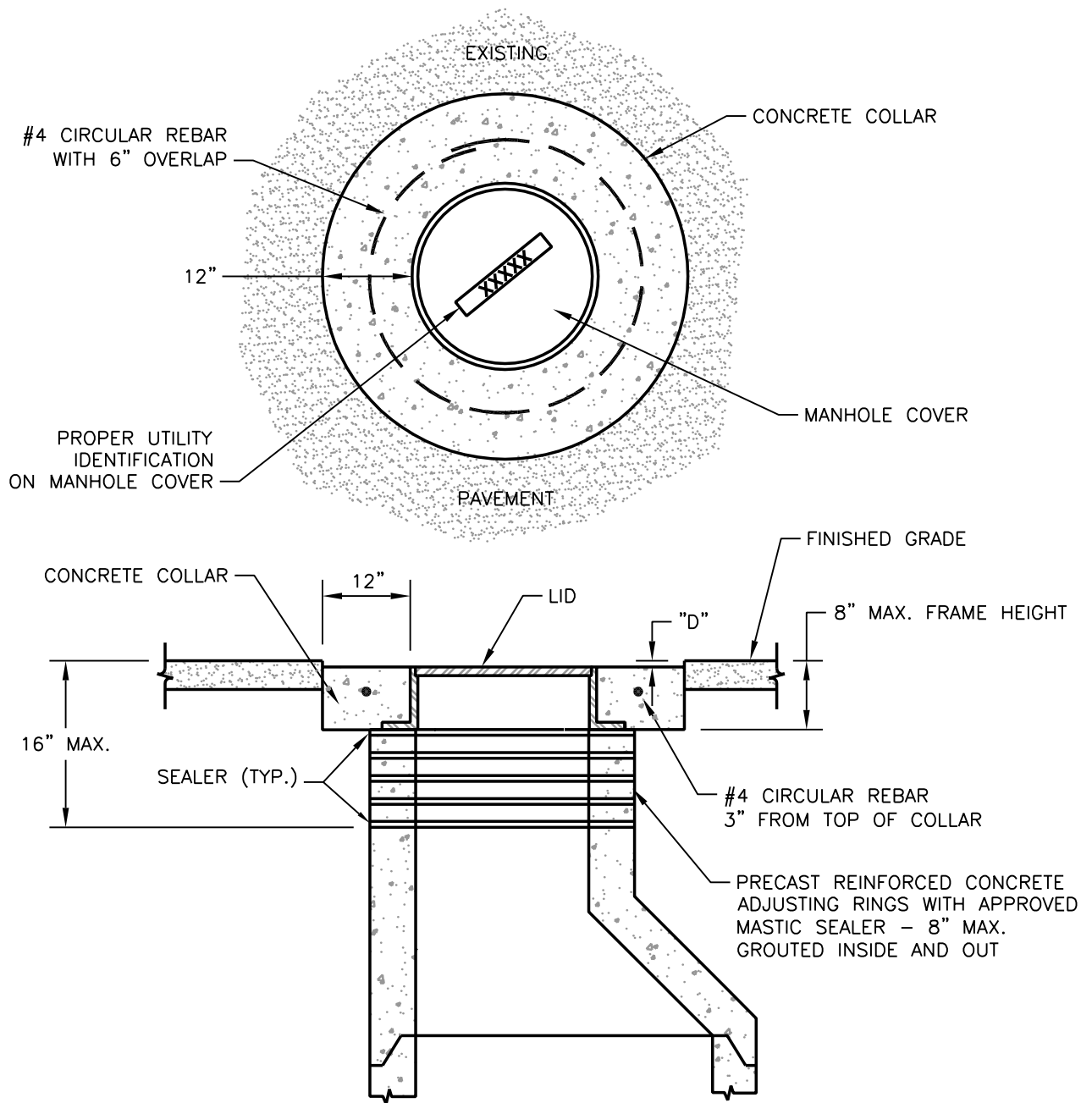
March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

WATER VALVE DETAIL  
FOR RAISING TO FINISHED GRADE  
DETAIL No. S-33





NOTES:

1. "D" = 1/2" FOR HOT MIX ASPHALT PAVEMENT OVERLAYS, SURFACE TREATMENTS, PAVEMENT RECONSTRUCTION OR NEW CONSTRUCTION.
2. "D" = 1/4" FOR CONCRETE STREETS.
3. A SEALER SHALL BE USED BETWEEN ALL ADJUSTING RINGS AS REQUIRED.
4. DROP-IN RISER RINGS NOT ALLOWED.
5. SET AND TILT RING AND COVER TO MATCH SLOPE OF FINISHED STREET.

PV\_S34.DWG

March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

MANHOLE RAISING DETAIL  
DETAIL No. S-34

W 6TH ST 4000 →

← 4000 W 6TH ST

26TH AVE 2000 →

← 2000 26TH AVE

40TH AVE CT 2000 →

← 2000 40TH AVE CT

BUENA VISTA RD 2000 →

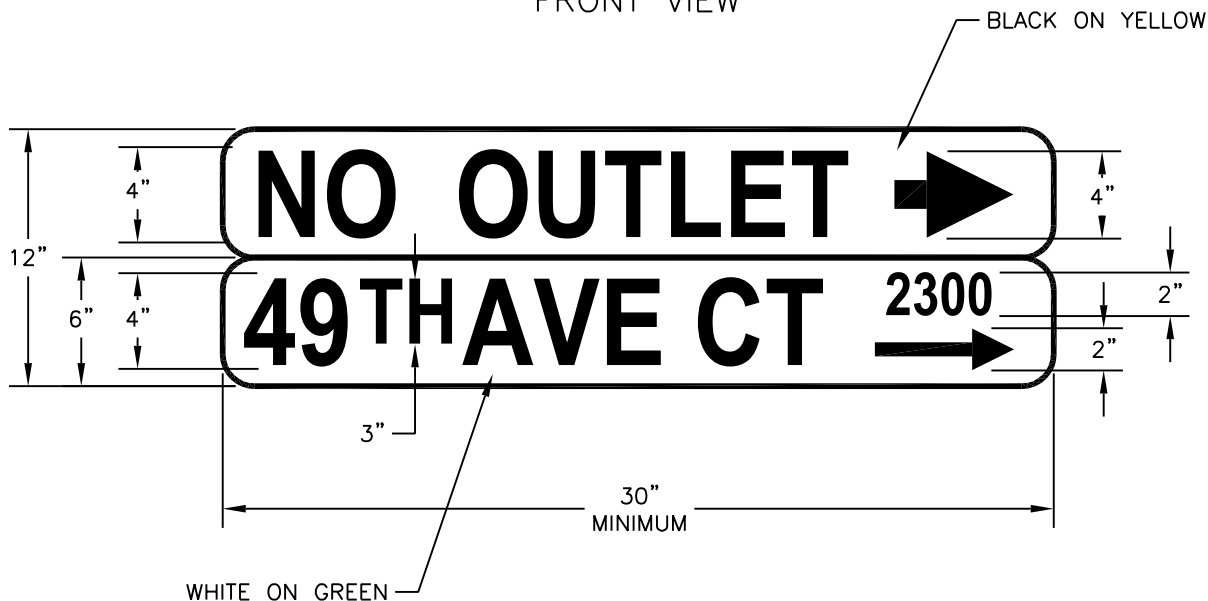
← 2000 BUENA VISTA RD

NOTES:

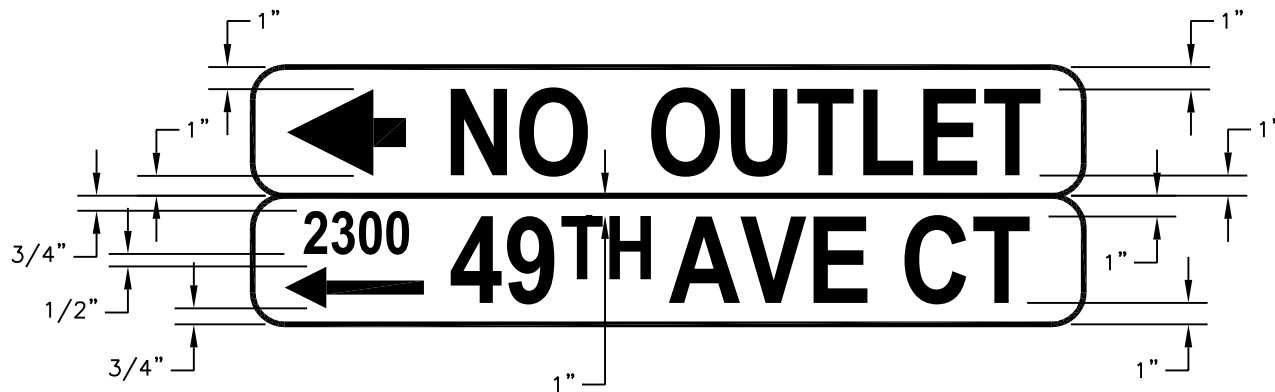
1. ALL TEXT SHALL UTILIZE STANDARD HIGHWAY GOTHIC FONT OR APPROVED EQUIVALENT.
2. HIGHWAY FONT SERIES D SHALL BE USED. IN SOME CASES THE LETTER SERIES MAY VARY DEPENDING ON NUMBER OF LETTERS OR NUMBERS IN THE STREET NAME.
3. STROKE WIDTH OF LETTERS SHOWN ON THIS DRAWING IS FOR ILLUSTRATIVE PURPOSE ONLY AND IS NOT INTENDED TO REPRESENT CORRECT STROKE WIDTH FOR SPECIFIED LETTER SERIES OR LETTER TO LETTER SPACING.
4. SIGN SIZES WILL INCREASE TO 8" HEIGHT, WITH 6" LETTERS, WHENEVER AN INTERSECTION IS LOCATED AT A STREET WITH A SPEED LIMIT OF 40 MPH, OR GREATER.



FRONT VIEW



REAR VIEW

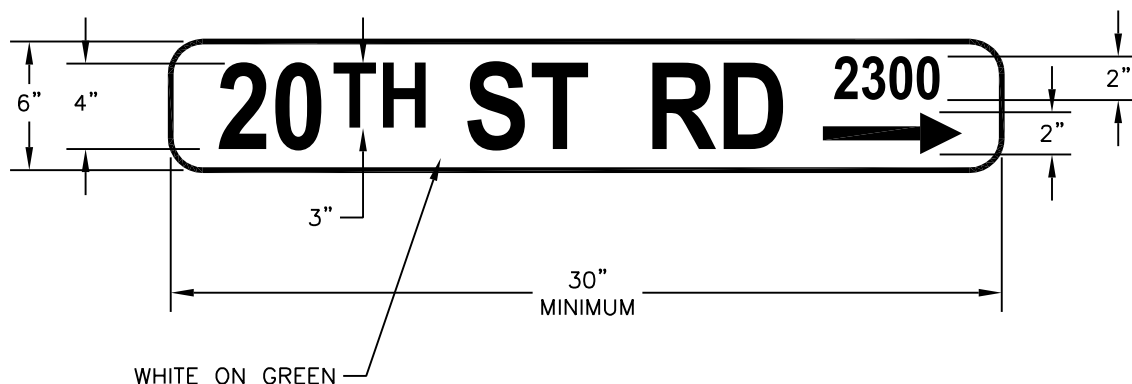


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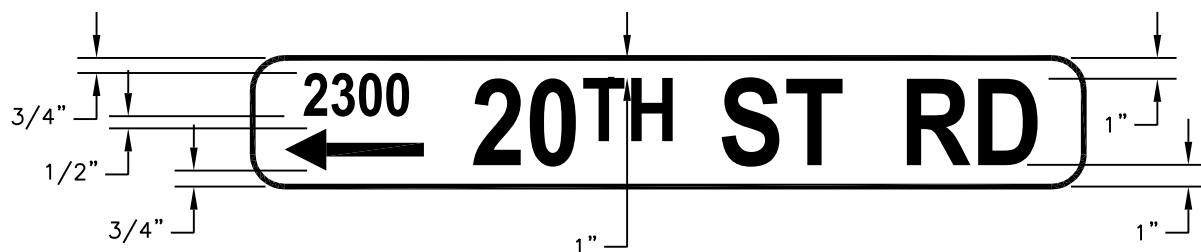
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FRONT VIEW



REAR VIEW



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4. SIGN SIZES WILL INCREASE TO 8" HEIGHT, WITH 6" LETTERS, WHENEVER AN INTERSECTION IS LOCATED AT A STREET WITH A SPEED LIMIT OF 40 MPH, OR GREATER.



# DESIGNATED PAYMENT AREAS

# NOTES

FOR THE FOLLOWING H, W AND S DIMENSIONS PAY:

## H = 4' WORDS

BIKE - 5.5 SQ. FT.                      LANE - 6.0 SQ. FT.  
 ONLY - 6.0 SQ. FT.                    XING - 5.0 SQ. FT.

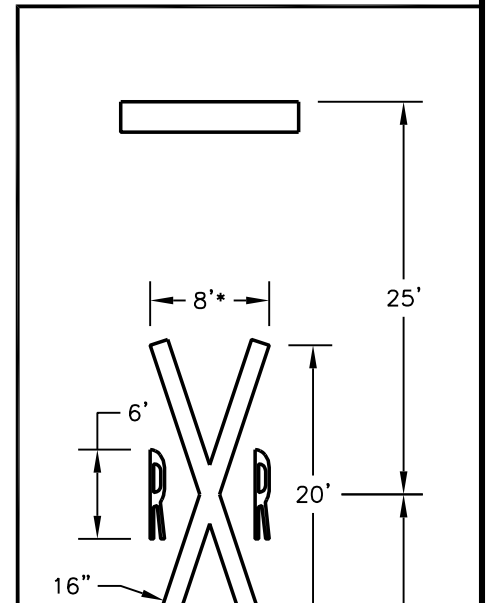
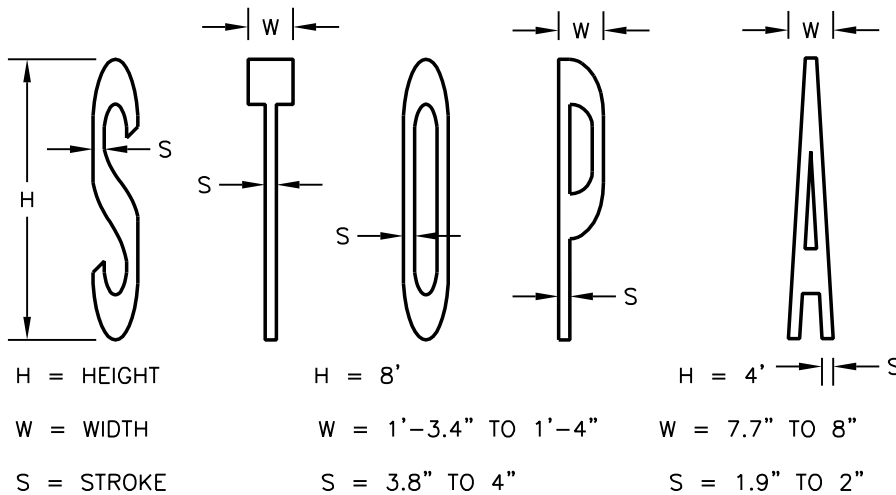
## H = 8' WORDS

STOP - 23.0 SQ. FT.                    XING - 20.0 SQ. FT.  
 ONLY - 22.5 SQ. FT.                   LANE - 22.5 SQ. FT.  
 AHEAD - 29.0 SQ. FT.                BIKE - 21.0 SQ. FT.  
 BUS - 18.5 SQ. FT.                    HWY - 16.5 SQ. FT.  
 THRU - 22.0 SQ. FT.                SCHOOL(1L) - 33.0 SQ. FT.  
 PED - 17.5 SQ. FT.                SCHOOL (2L) - 85.0 SQ. FT.

IF HEIGHT IS INCREASED OR DECREASED THEN ALL MEASUREMENTS CHANGE PROPORTIONATELY. EXAMPLE: "H" MEASUREMENT FOR STOP IS REDUCED TO 4' FROM 8' THEN SQUARE FEET = 5.75 (1/4 OF 23.0 SQ. FT.).

PAVEMENT WORK AND SYMBOL MARKINGS, TRANSVERSE AND LONGITUDINAL (CONTINENTAL) CROSSWALK LINES, AND STOP LINES WILL BE PAID FOR IN SQUARE FEET USING THEIR SPECIFIC BID ITEMS.

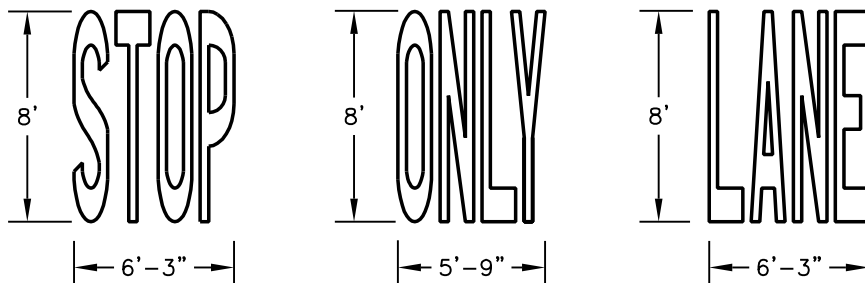
## TYPICAL LETTER MEASUREMENTS



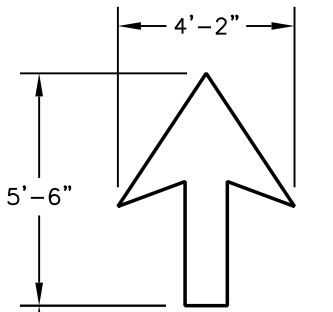
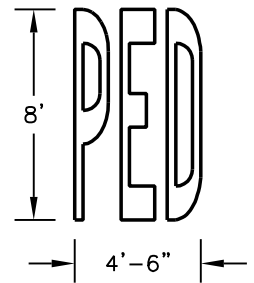
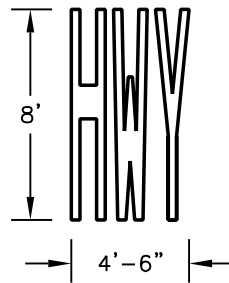
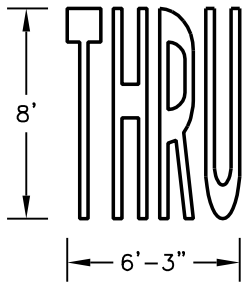
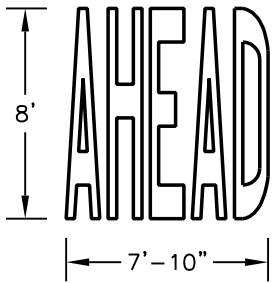
\*WIDTH MAY VARY ACCORDING TO LANE WIDTH

AREA = 69 SQ.FT.  
 NOTE: BARS NOT INCLUDED

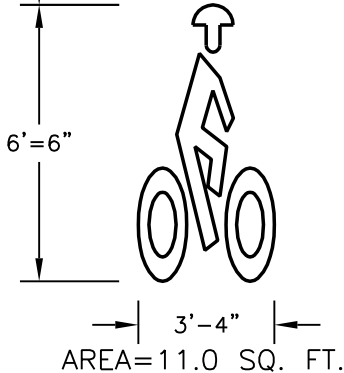
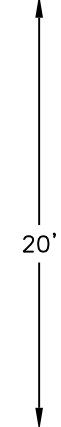
## PAVEMENT MARKING WORDS AND SYMBOLS



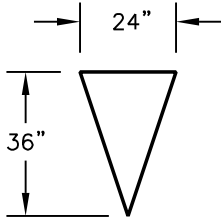
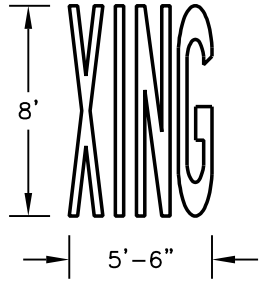
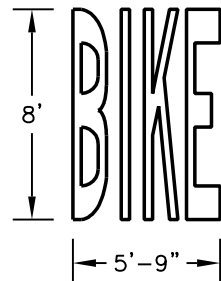
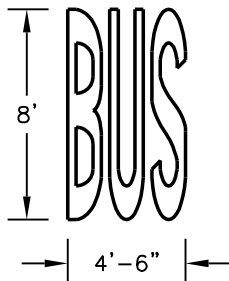
# PAVEMENT MARKING WORDS AND SYMBOLS



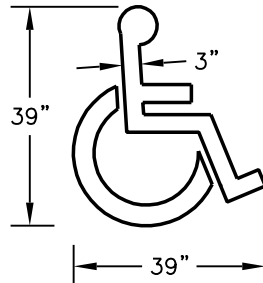
AREA=4.8 SQ. FT.



BIKE LANE



SHARKS TOOTH  
AREA=3.0 SQ. FT.



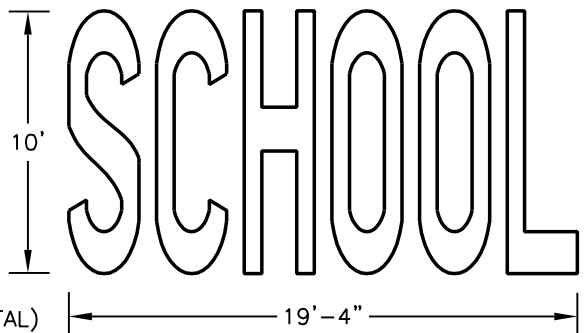
AREA=3.0 SQ. FT.



1-LANE SCHOOL

## NOTE

PAVEMENT WORK AND SYMBOL MARKINGS, TRANSVERSE AND LONGITUDINAL (CONTINENTAL) CROSSWALK LINES, AND STOP LINES WILL BE PAID FOR IN SQUARE FEET USING THEIR SPECIFIC BID ITEMS.



STROKE = 8"  
2-LANE SCHOOL

PV\_S38-2.DWG

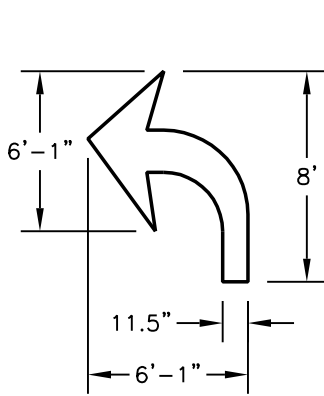
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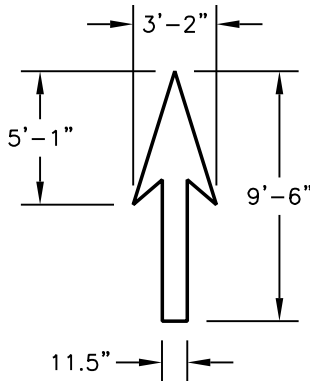
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

TYPICAL PAVEMENT MARKINGS  
SHEET 2 OF 3  
DETAIL No. S-38

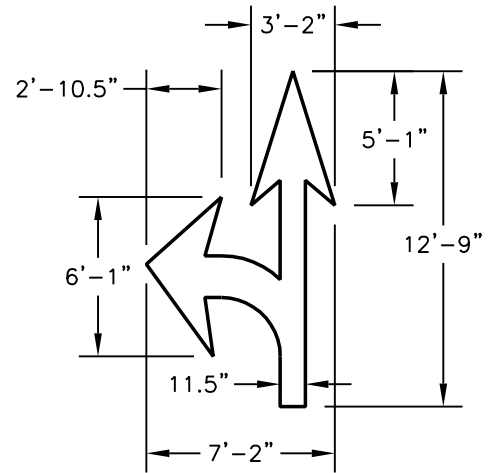
# PAVEMENT MARKING WORDS AND SYMBOLS



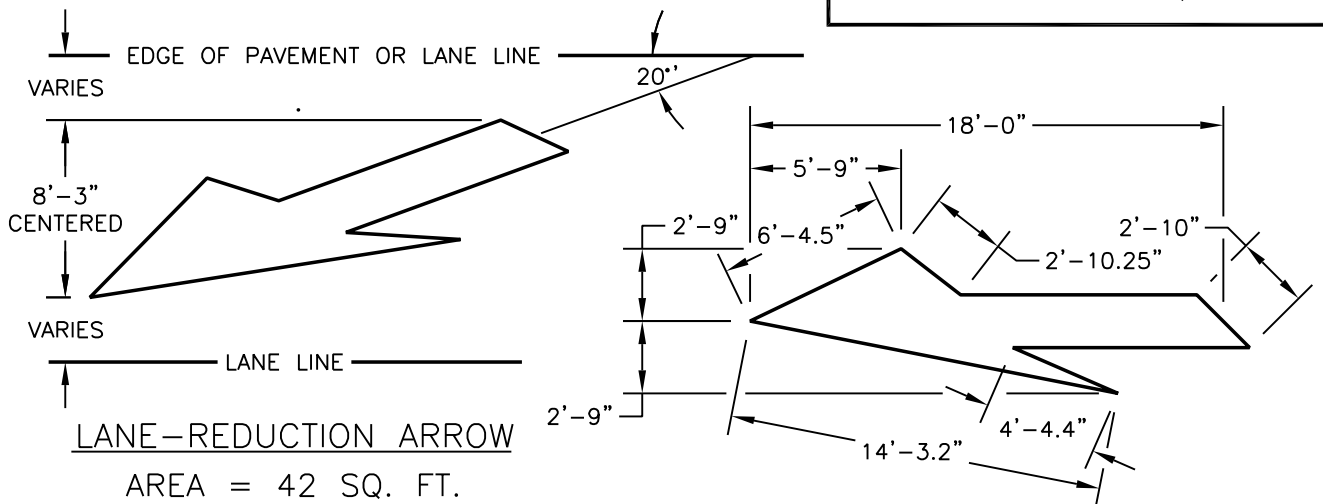
AREA = 15.5 SQ. FT.



AREA = 12.5 SQ. FT.

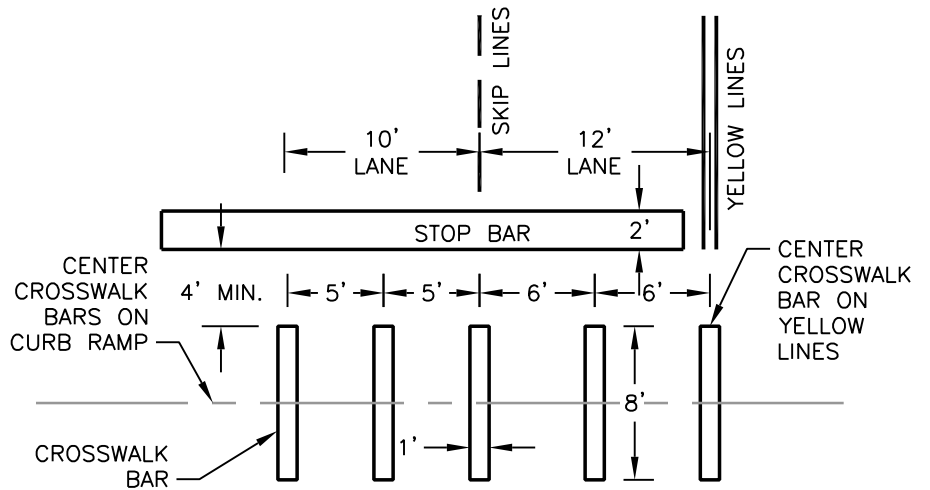


AREA = 27.5 SQ. FT.



## NOTE

PAVEMENT WORK AND SYMBOL MARKINGS, TRANSVERSE AND LONGITUDINAL (CONTINENTAL) CROSSWALK LINES, AND STOP LINES WILL BE PAID FOR IN SQUARE FEET USING THEIR SPECIFIC BID ITEMS.



STOP AND CROSSWALK BARS

March, 2010  
NOT TO SCALE

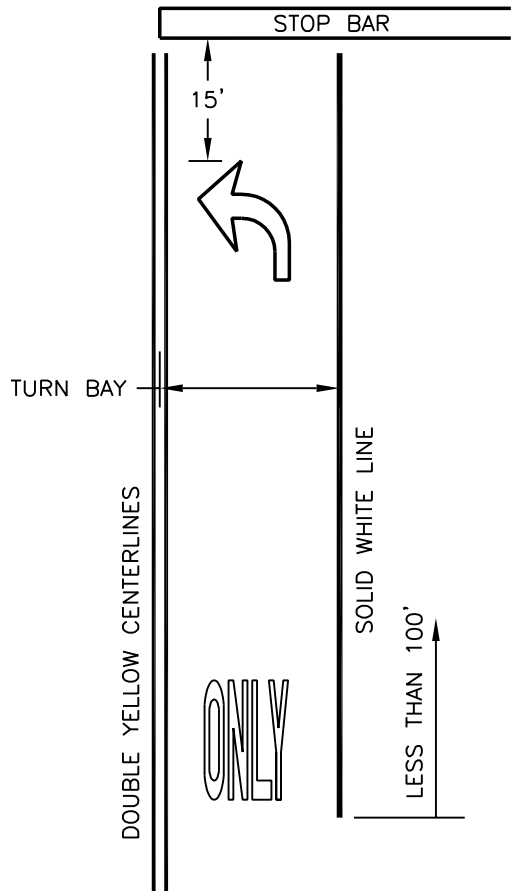
PV\_S38-3.DWG



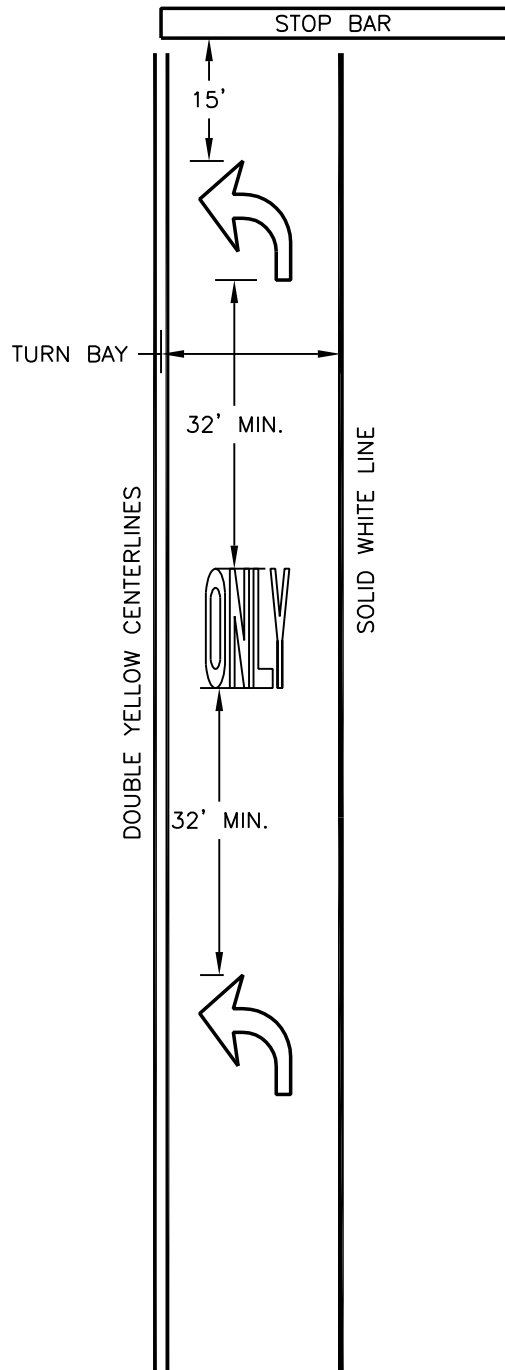
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

TYPICAL PAVEMENT MARKINGS  
SHEET 3 OF 3  
DETAIL No. S-38

# PAVEMENT MARKING WORDS AND SYMBOLS



LEFT TURN BAY  
STACKING LENGTH LESS THAN 100'



LEFT TURN BAY  
STACKING LENGTH OVER 100'

### NOTE

PAVEMENT WORK AND SYMBOL MARKINGS, TRANSVERSE AND LONGITUDINAL (CONTINENTAL) CROSSWALK LINES, AND STOP LINES WILL BE PAID FOR IN SQUARE FEET USING THEIR SPECIFIC BID ITEMS.

March, 2010  
NOT TO SCALE

PV\_S39.DWG

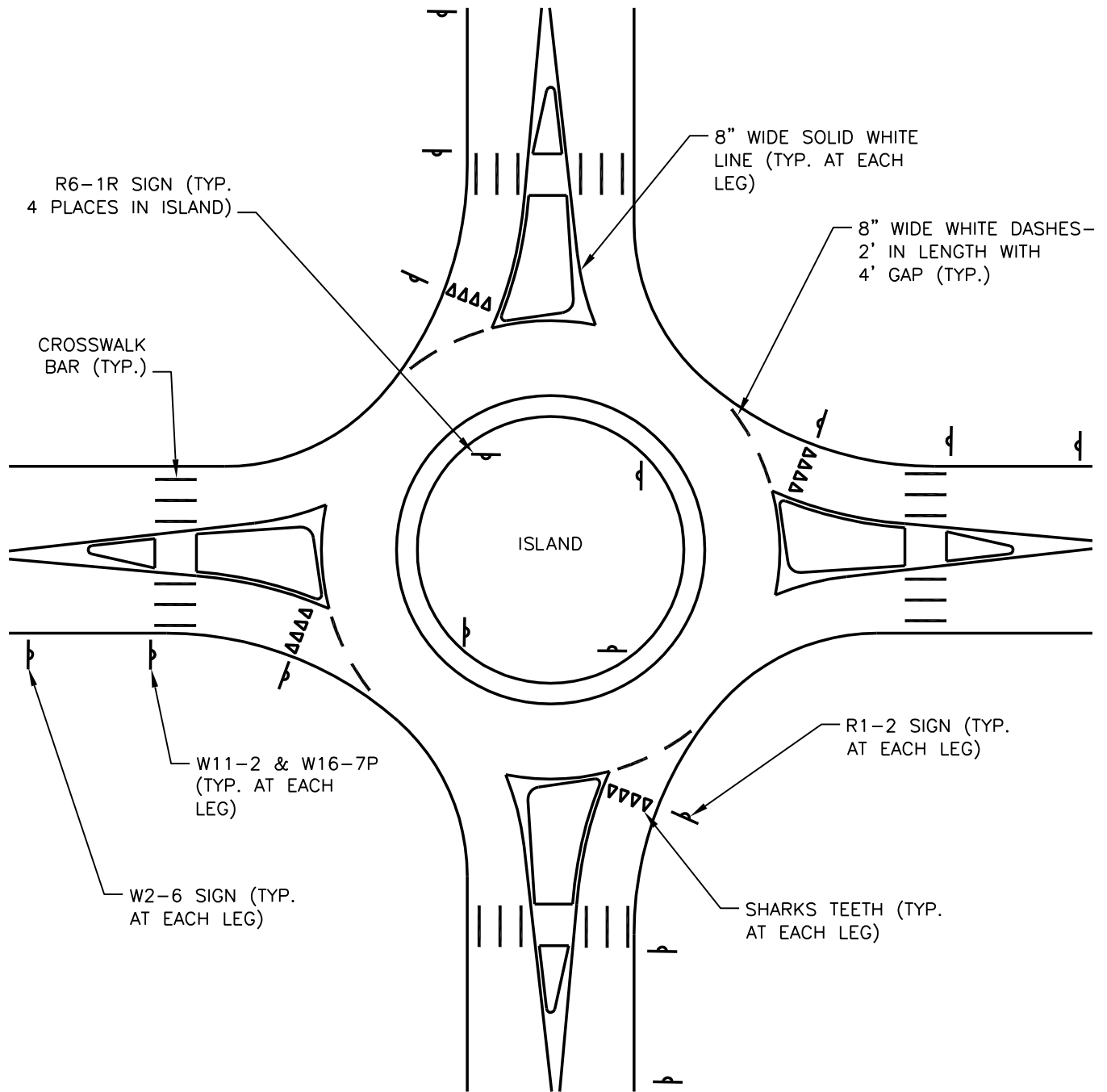


CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

LEFT TURN BAY  
PAVEMENT MARKINGS

DETAIL No. S-39





URBAN SINGLE-LANE ROUNDABOUT

PV\_S40-1.DWG

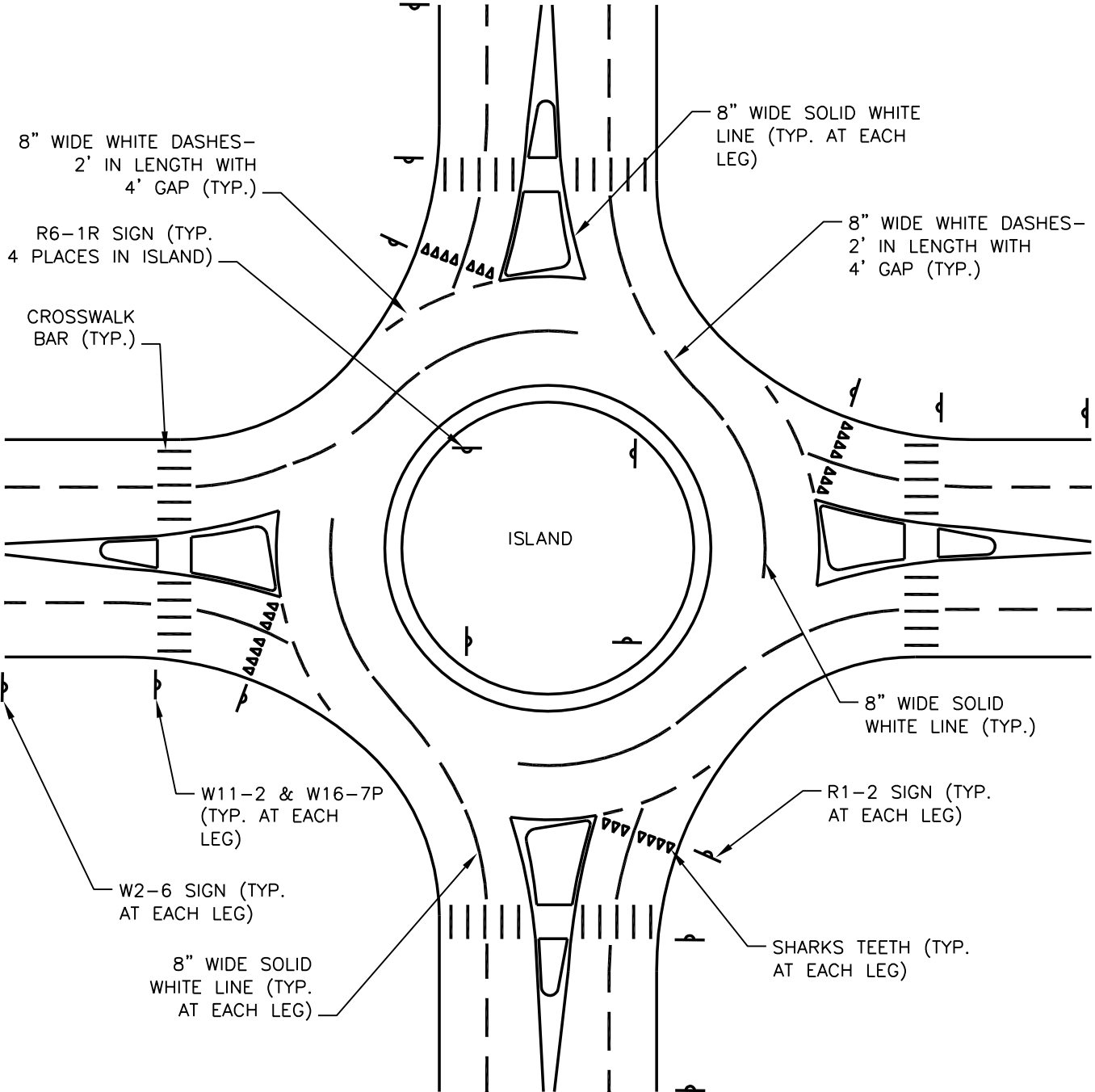
March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

ROUNDABOUT SIGNAGE & PAVEMENT  
MARKINGS - SHEET 1 OF 2

DETAIL No. S-40



URBAN DOUBLE-LANE ROUNDABOUT

PV\_S40-2.DWG

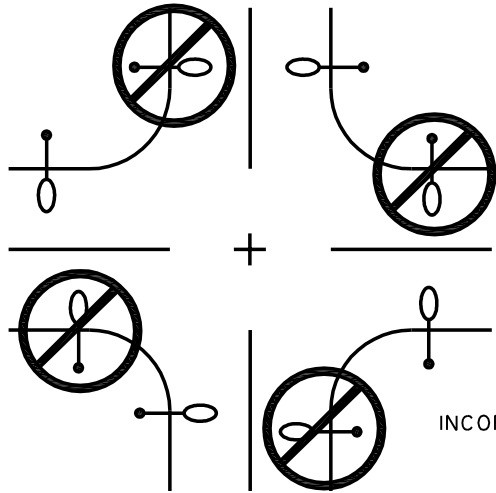
March, 2010  
NOT TO SCALE



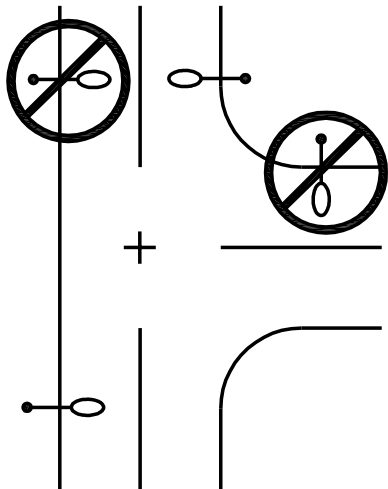
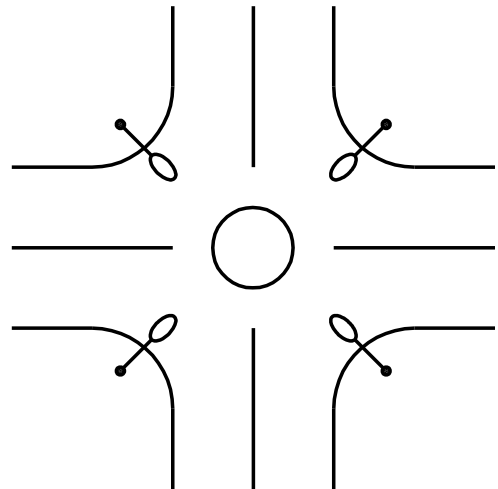
CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

ROUNDABOUT SIGNAGE & PAVEMENT  
MARKINGS - SHEET 2 OF 2

DETAIL No. S-40

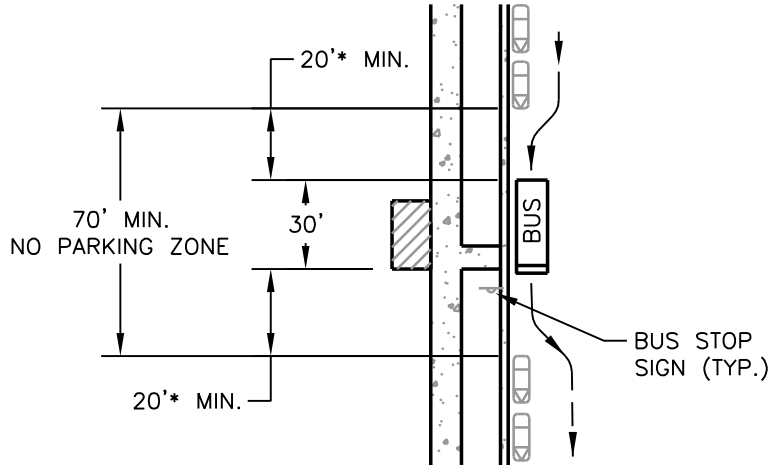


INCORRECT STREET LIGHT PLACEMENT



STREET LIGHTS SHALL BE PLACED ON THE DOWNSTREAM SIDE OF INTERSECTION, AS VIEWED BY A MOTORIST IN THE LANE BENEATH THE LUMINAIRE.

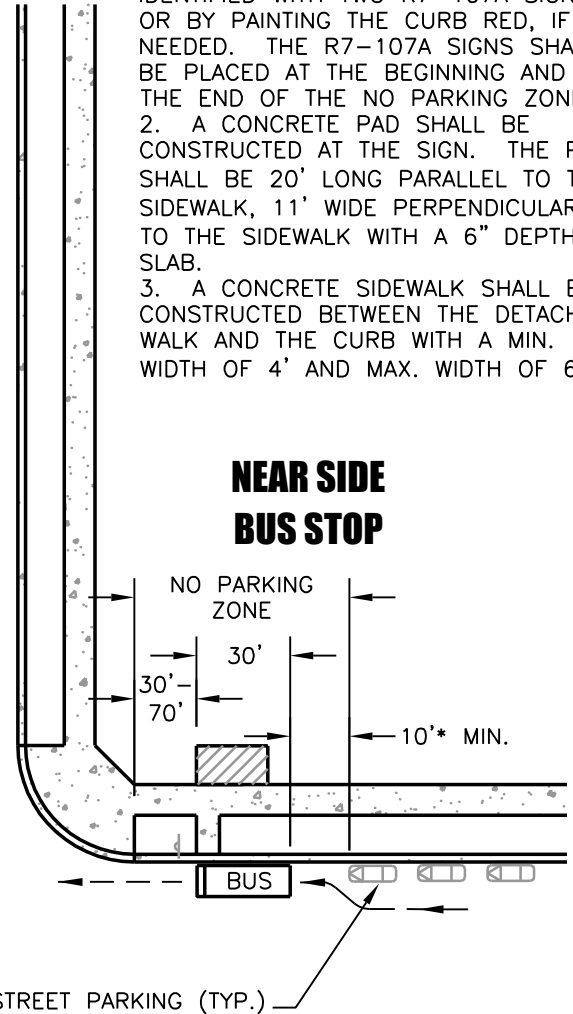




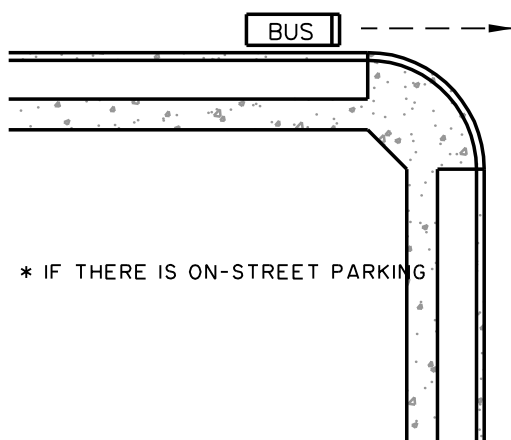
**MID-BLOCK  
BUS STOP**

NOTES;

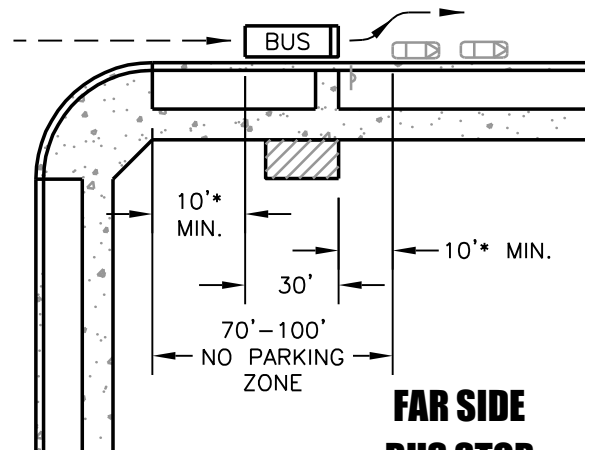
1. A NO PARKING ZONE SHALL BE IDENTIFIED WITH TWO R7-107A SIGNS, OR BY PAINTING THE CURB RED, IF NEEDED. THE R7-107A SIGNS SHALL BE PLACED AT THE BEGINNING AND THE END OF THE NO PARKING ZONE.
2. A CONCRETE PAD SHALL BE CONSTRUCTED AT THE SIGN. THE PAD SHALL BE 20' LONG PARALLEL TO THE SIDEWALK, 11' WIDE PERPENDICULAR TO THE SIDEWALK WITH A 6" DEPTH SLAB.
3. A CONCRETE SIDEWALK SHALL BE CONSTRUCTED BETWEEN THE DETACHED WALK AND THE CURB WITH A MIN. WIDTH OF 4' AND MAX. WIDTH OF 6'.



**NEAR SIDE  
BUS STOP**

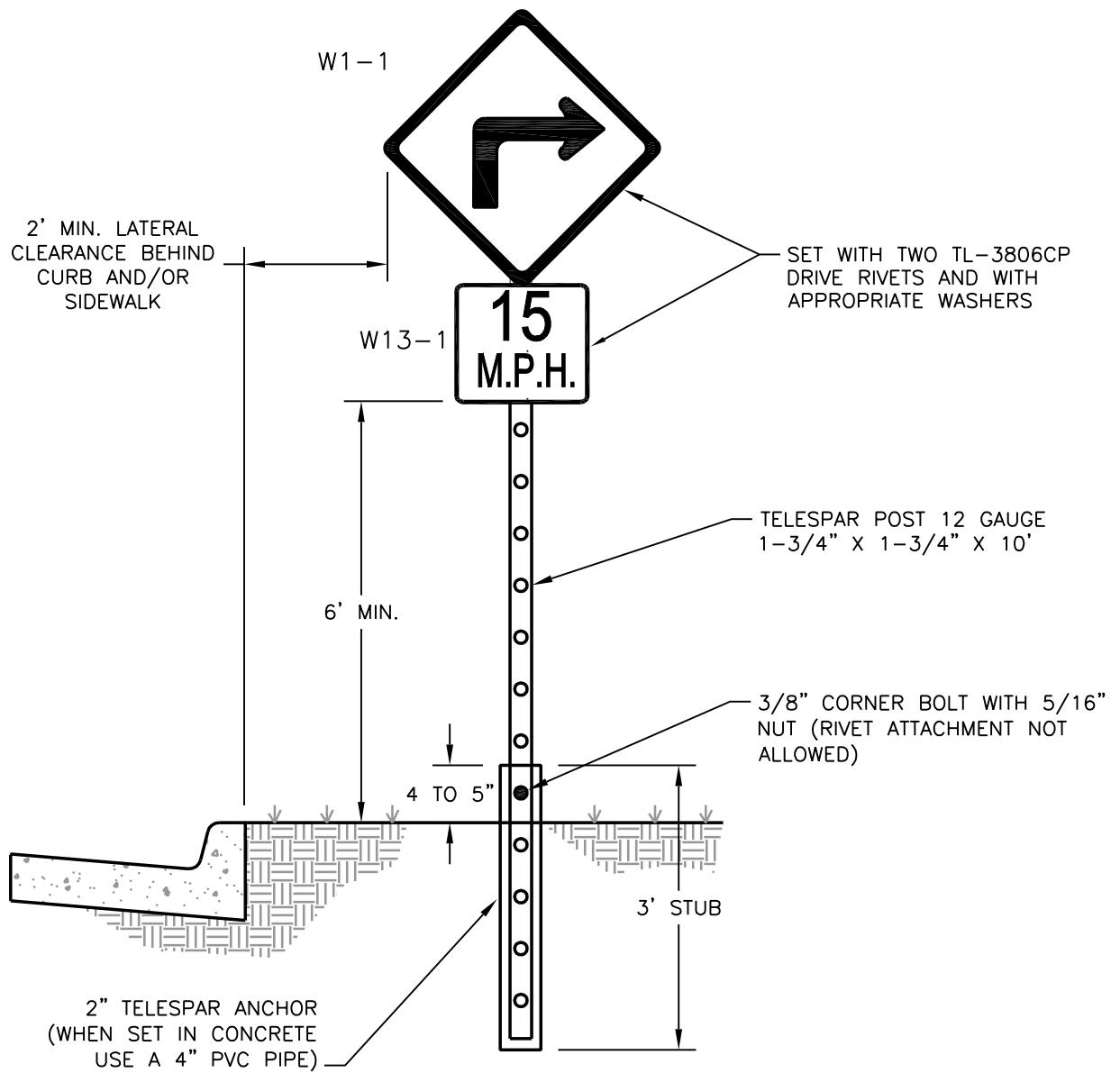


\* IF THERE IS ON-STREET PARKING



**FAR SIDE  
BUS STOP**

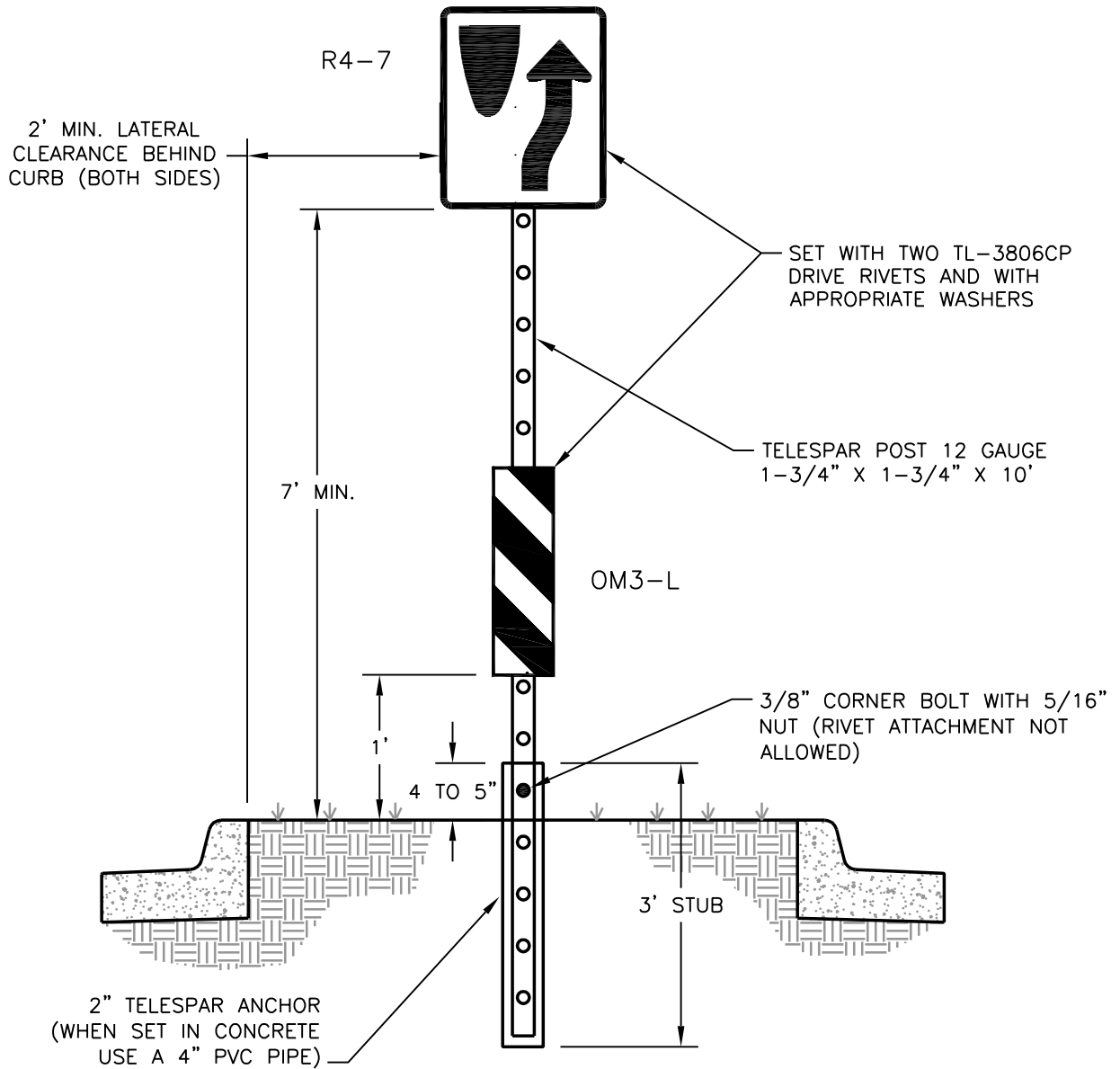




NOTES:

1. SIGN SHOULD BE SET AT AN ANGLE OF 90° AND VISIBLE TO APPROACHING TRAFFIC.
2. ALL SIGNS SHALL MEET THE MOST CURRENT MUTCD STANDARDS.





NOTES:

1. SIGN SHOULD BE SET AT AN ANGLE OF 90° INSIDE NOSE OF ISLAND AND VISIBLE TO APPROACHING TRAFFIC.
2. ALL SIGNS SHALL MEET THE MOST CURRENT MUTCD STANDARDS.

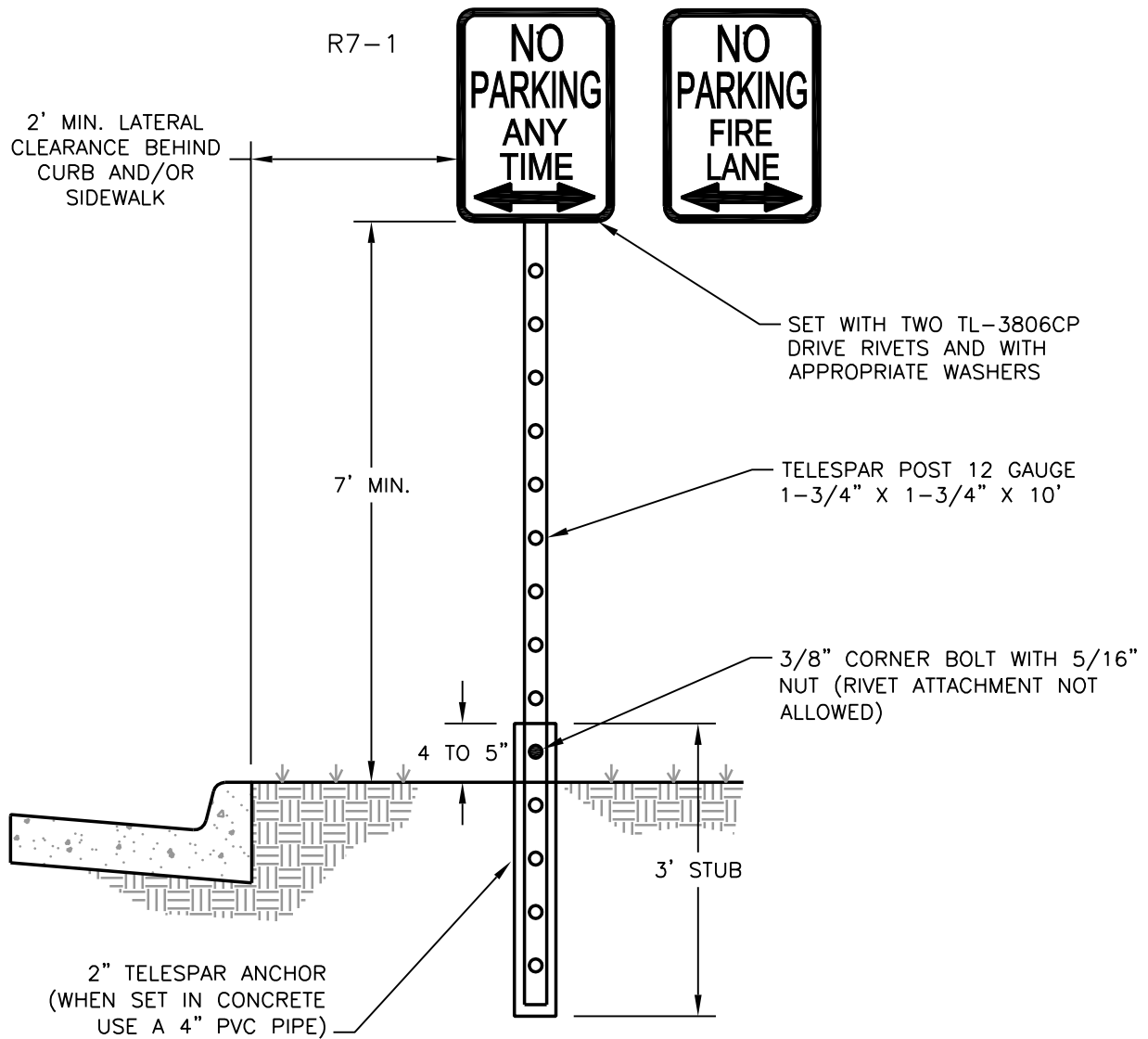
PV\_S44.DWG

March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

TYPICAL ISLAND SIGN INSTALLATION  
DETAIL No. S-44



NOTES:

1. SIGN SHOULD BE SET AT AN ANGLE OF NOT LESS THAN 30° OR MORE THAN 45°, WITH THE LINE OF TRAFFIC FLOW TO BE VISIBLE TO APPROACHING TRAFFIC.
2. ALL SIGNS SHALL MEET THE MOST CURRENT MUTCD STANDARDS.

PV\_S45.DWG

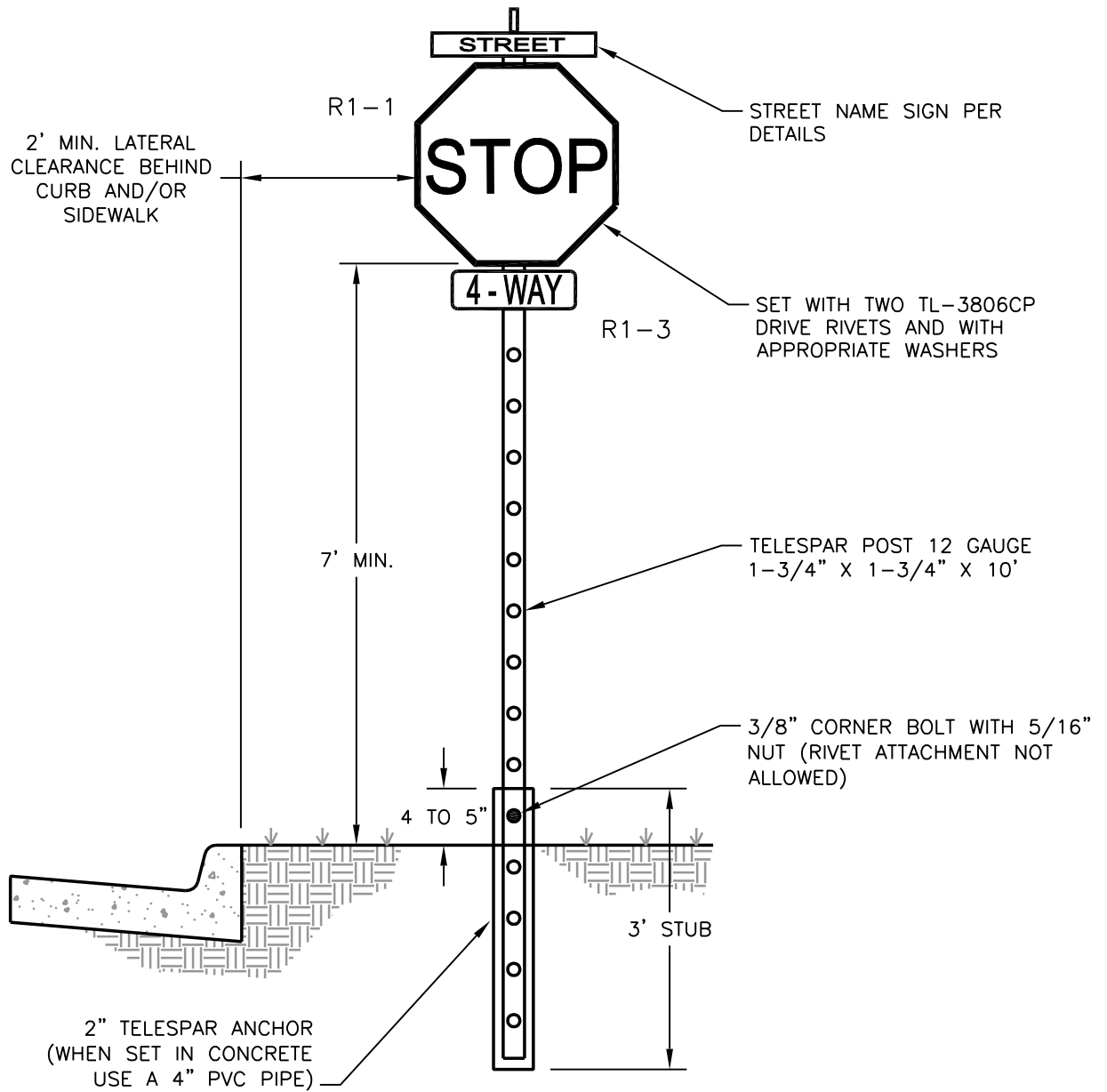
March, 2010  
NOT TO SCALE



CONSTRUCTION STANDARD  
TOWN OF PLATTEVILLE, COLORADO

TYPICAL NO PARKING  
SIGN INSTALLATION

DETAIL No. S-45

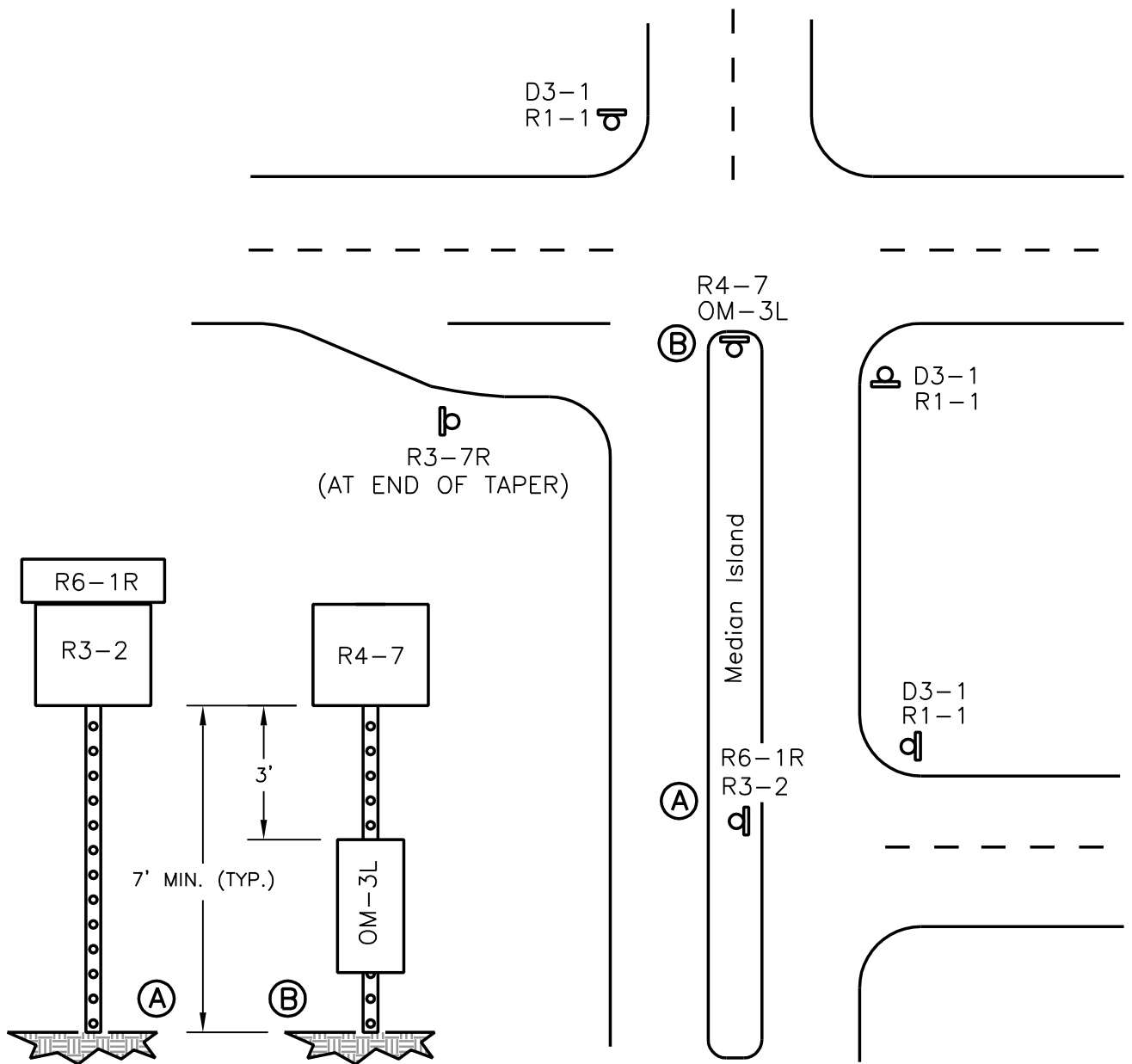


NOTES:

1. SIGN SHOULD BE SET AT AN ANGLE OF 90° AND BE VISIBLE TO APPROACHING TRAFFIC.
2. ALL SIGNS SHALL MEET THE MOST CURRENT MUTCD STANDARDS.







**EXAMPLES**

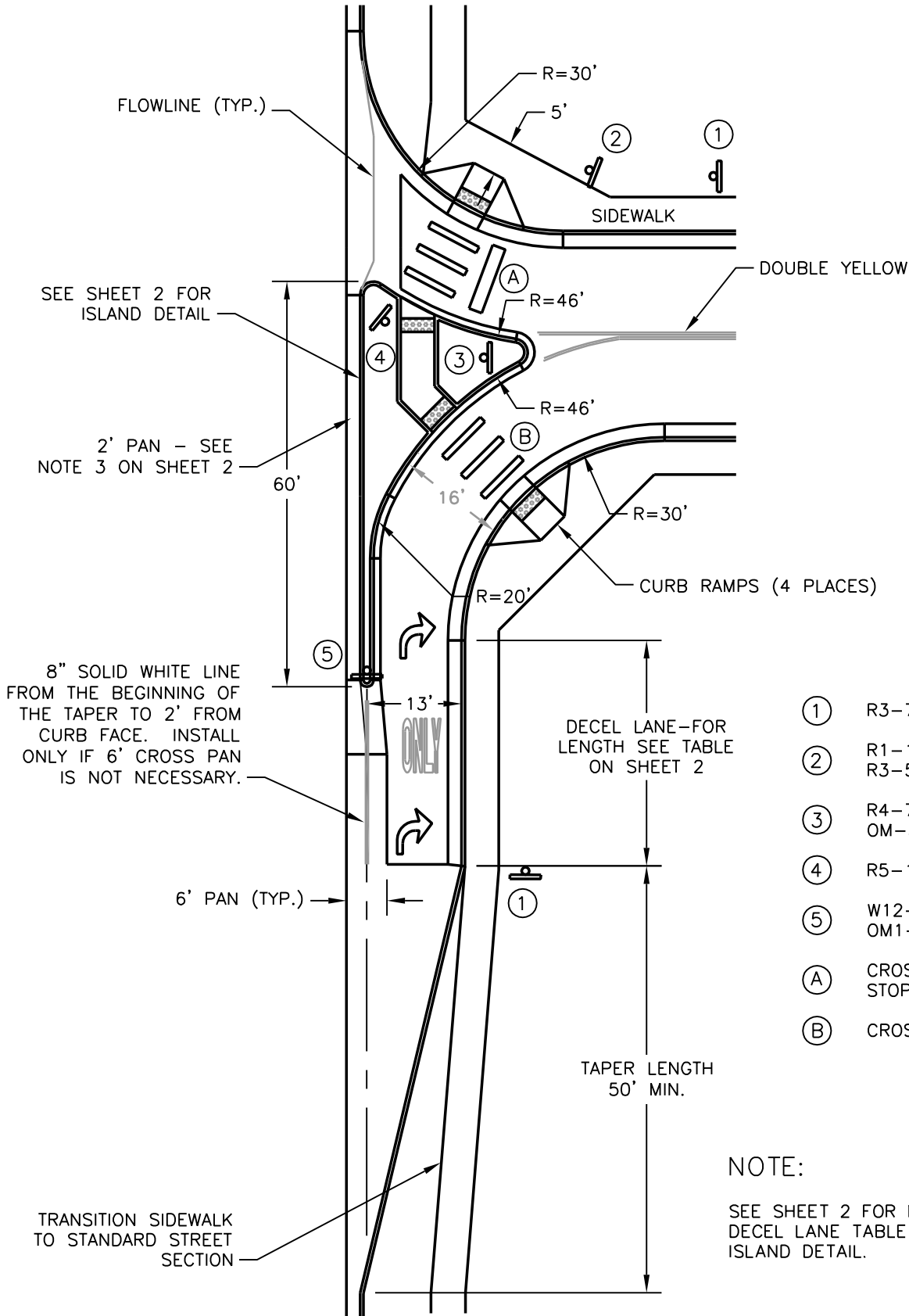
**LEGEND:**

- R1-1 STOP SIGN
- R3-2 NO LEFT TURN SYMBOL
- R6-1R ONE-WAY ARROW RIGHT
- OM-3L RIGHT BRIDGEBOARD
- D3-1 STREET/AVENUE SIGN
- R3-7R RIGHT LANE MUST TURN RIGHT
- R4-7 KEEP RIGHT OF ISLAND SYMBOL

**NOTE:**

THIS IS A GENERAL LAYOUT. SIGNS SHALL BE INSTALLED AT EXACT LOCATIONS PER PLANS AND WITH MATERIALS PER STANDARD SPECIFICATIONS..



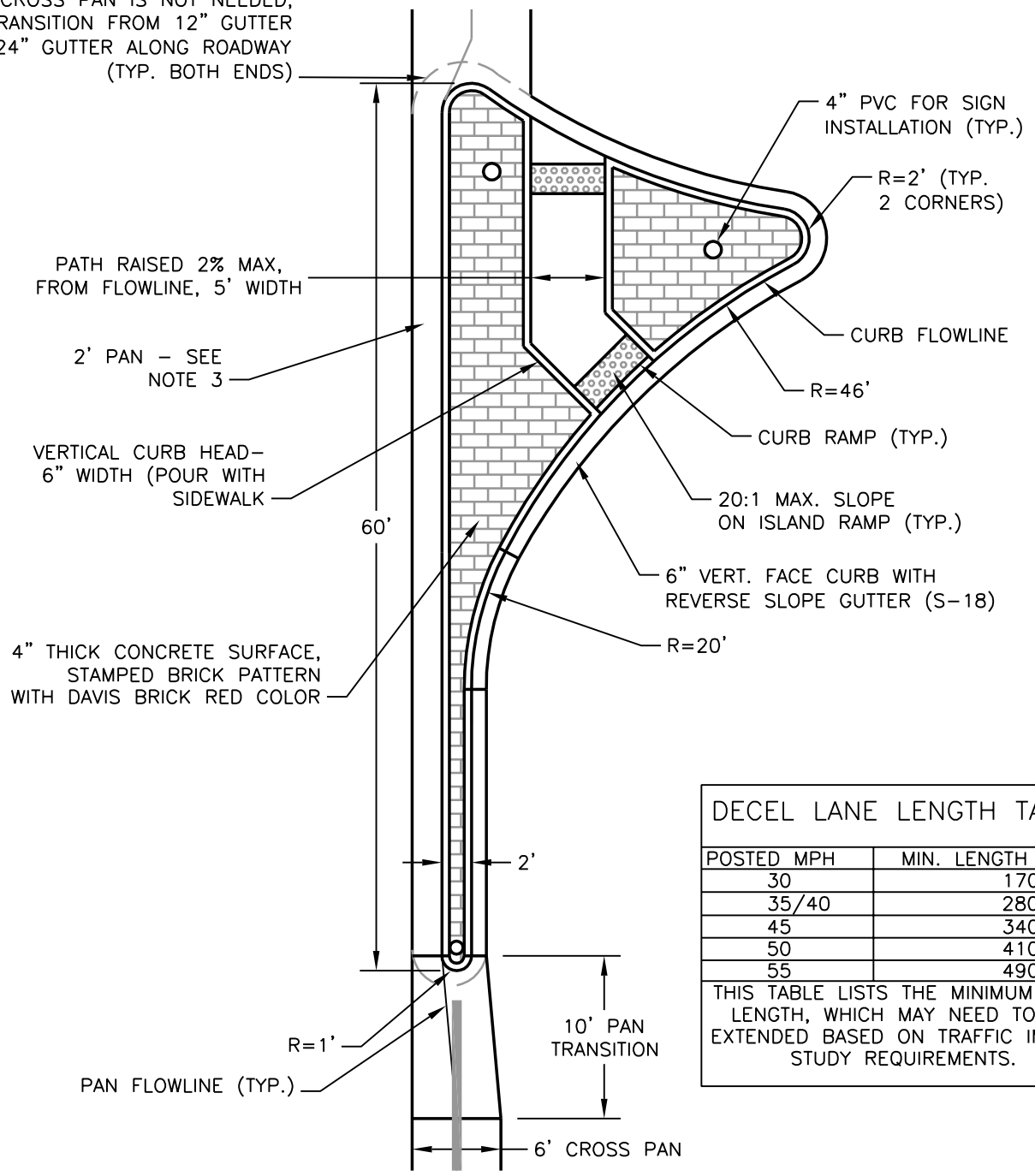


- ① R3-7R
- ② R1-1  
R3-5R
- ③ R4-7  
OM-3L
- ④ R5-1
- ⑤ W12-1  
OM1-3
- Ⓐ CROSSWALK WITH STOP BAR
- Ⓑ CROSSWALK

NOTE:  
SEE SHEET 2 FOR NOTES, DECEL LANE TABLE AND ISLAND DETAIL.



IF CROSS PAN IS NOT NEEDED,  
TRANSITION FROM 12" GUTTER  
TO 24" GUTTER ALONG ROADWAY  
(TYP. BOTH ENDS)



POSTED MPH	MIN. LENGTH IN FT.
30	170
35/40	280
45	340
50	410
55	490

THIS TABLE LISTS THE MINIMUM LANE LENGTH, WHICH MAY NEED TO BE EXTENDED BASED ON TRAFFIC IMPACT STUDY REQUIREMENTS.

NOTES:

1. THIS IS A GENERAL LAYOUT. SIGNS SHALL BE INSTALLED AT EXACT LOCATIONS PER PLANS AND WITH MATERIALS PER STANDARD SPECIFICATIONS.
2. MEDIAN ISLAND CURB AND GUTTER TO BE TOWN STANDARD 6" VERT. FACE CURB WITH REVERSE SLOPE GUTTER. THE CONTRACTOR SHALL WIDEN THE GUTTER TO 24 INCHES AND CONVERT TO IN-FLOW GUTTER ALONG MAIN ROADWAY.
3. ALL RADIUS' ARE FLOWLINE OR FACE OF CURB.

