# 1.0 GENERAL PROVISIONS

## TABLE OF CONTENTS

1.1 INTRODUCTION ............................................................................................................. 1-2
1.2 DEFINITIONS .................................................................................................................. 1-2
1.3 JURISDICTION ................................................................................................................ 1-2
1.4 PURPOSE ......................................................................................................................... 1-3
1.5 OFFICIAL TOWN CODE .................................................................................................... 1-3
1.6 AMENDMENTS AND REVISIONS .................................................................................. 1-3
1.7 ENFORCEMENT RESPONSIBILITY ................................................................................ 1-4
1.8 DESIGNATED TOWN AUTHORITY ................................................................................ 1-4
1.9 DEVELOPMENT IMPROVEMENTS .................................................................................. 1-4

1.9.1 PUBLIC IMPROVEMENTS ......................................................................................... 1-4
  1.9.1.1 Roadway .............................................................................................................. 1-5
  1.9.1.2 Traffic Control ..................................................................................................... 1-5
  1.9.1.3 Drainage .............................................................................................................. 1-5
1.9.2 SITE IMPROVEMENTS .............................................................................................. 1-6
1.9.3 UTILITIES/OTHER ................................................................................................. 1-6
1.9.4 AGREEMENTS AND SECURITY ............................................................................... 1-6

1.10 FEES ............................................................................................................................. 1-6

1.11 INTERPRETATION ......................................................................................................... 1-7

1.12 VARIANCES .................................................................................................................. 1-7

1.13 REFERENCES ............................................................................................................... 1-7
1.1 INTRODUCTION

These regulations, together with all future amendments, shall be known as the *Town of Parker Roadway Design and Construction Criteria Manual* (hereinafter referred to as "this/the Manual"). The *Roadway Design and Construction Criteria Manual* was adopted by the Town of Parker Town Council in December 1994. The Town of Parker is hereinafter referred to as "the Town.”

1.2 DEFINITIONS

For the purpose of this Manual, the following words shall have the following meanings:

**Town** means the Town of Parker, Colorado.

**Infrastructure** means any facility, system or improvement including, without limitation, water and sewer mains and appurtenances, storm drains and structures, streets and sidewalks, and public safety equipment.

**Public Right-of-Way** or **Right-of-Way** shall mean any public street, easement, sidewalk, landscaped area, park, square, plaza, or any other public property owned or controlled by the Town and/or dedicated for public use to the Town.

**Specifications** or **standards** mean engineering regulations, construction specifications, and design standards adopted by the Town.

**Developer/Permittee** shall refer to any individual, land owner, applicant, contractor/construction company, developer, developer representative, and/or corporation agency (public or private) proposing to develop land and/or construct(ing) improvements within the Town. **Permittee** shall further mean the holder of a permit issued by the Town.

1.3 JURISDICTION

The standards established in this Manual shall apply to all land within the Town of Parker, Colorado. The Town is a Home Rule Municipality as defined under Article XX of the Constitution of the State of Colorado and Title 31, Article 1, Section 202 of the Colorado Revised Statutes. The jurisdiction of the Town in this regard extends to both developed and undeveloped areas within the Town’s corporate limits, except where the Town’s jurisdiction is superseded by Douglas County, State of Colorado, the federal government, or another jurisdiction.

Water, sanitation, fire protection, and various other utilities and services are not provided by the Town of Parker. The agencies that provide these utilities and services are unaffiliated agencies and they have independent approval authority. It is the responsibility of the developer/permittee to contact all appropriate agencies and obtain their approval for all applications.
1.4 PURPOSE

This Manual presents the minimum design and technical criteria for analysis and design of roadway facilities. All site plans, plats, planned unit developments, or any other proposed construction submitted for approval shall conform to the criteria set forth in this Manual. Options to comply with the provisions of the Manual may be provided by the developer/permittee. However, it shall be the responsibility of the developer/permittee to demonstrate that an option meets or exceeds the minimum criteria contained herein. Policies and technical criteria not specifically addressed in this document shall follow the design recommendations found in the most recent editions of the American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets, and the Colorado Department of Transportation’s (CDOT) Standard Specifications for Road and Bridge Construction, and additional technical references, as appropriate. Wherever conflicts exist between outside criteria and the Manual's criteria, the criteria defined within this Manual shall apply in the Town.

This Manual is intended to provide a supplement to and be consistent with the Parker Municipal Code (hereinafter referred to as "the Code"), the Town of Parker Storm Drainage and Environmental Criteria Manual (SDECM), and the Construction Specifications and Design Considerations for Parks, Trails, and Streetscapes manual.

It is the responsibility of the developer/permittee to acquire and comply with all applicable current Town standards. Copies of this Manual are available online at www.parkeronline.org or may be purchased from the Town of Parker, Public Works Department at 20120 E. Mainstreet, Parker, Colorado 80138.

1.5 OFFICIAL TOWN CODE

The Town of Parker has adopted the Parker Municipal Code which sets out Town policies with respect to zoning and other ordinances, subdivision regulations, and construction specifications and details. Some of the Code’s policies apply directly to roadway analysis and design and are therefore referenced throughout this Manual. As a home-rule municipality and in accordance with Title 31 of the Colorado Revised Statutes, the Town of Parker has the legal authority to establish, improve and regulate improvements such as those related to roadways. Other geographic areas within the master planning area may be subject to this Manual. As land surrounding the Town is considered for annexation, the provisions of this Manual, as well as the CODE and subdivision and grading ordinances, will be considered applicable.

The Town’s adoption by reference of this Manual can be found in Title 10.09.010 (Street Requirements) of the Code.

Copies of this Manual are available for inspection at the Town Clerk’s office.

1.6 AMENDMENTS AND REVISIONS
The Manual may be amended from time to time as new technology is developed and/or the experience gained in the application of the Manual indicates a need for revision. Technical amendments shall be approved by the Director of Engineering/Public Works (the “Director”). Policy changes and revisions shall be approved by the Town of Parker Town Council following the recommendations of the Director (or the Director’s named representative). The Director shall monitor the performance and effectiveness of the Manual and will recommend changes, amendments or revisions, as needed.

1.7 ENFORCEMENT RESPONSIBILITY

It shall be the duty of the Director, acting on behalf of the Town Council, to enforce the provisions of this Manual.

1.8 DESIGNATED TOWN AUTHORITY

The Director shall appoint a Designated Town Authority (DTA) as a representative for the Town on the project. The DTA shall protect the Town’s interests and verify that the work of the developer/permittee complies with the terms of the applicable agreement(s), permits, approved plans, Town standards, and/or Town ordinances. The DTA’s responsibilities may include plan review, representing the Town at meetings, field construction observation and materials/construction testing. The Town’s official definition of a DTA can be found 10.02.040 (Appointment of Designated Town Authority) of the Code.

If, in the opinion of the DTA, the work conducted by the developer/permittee violates the terms of the applicable agreement(s), permits, approved plans, Town standards, and/or Town ordinances, the DTA shall notify the developer/permittee of said violation(s). Upon receipt of such notice, the developer/permittee shall immediately cease the violation and perform the necessary corrective work.

The presence on the project of the DTA, or any act or statement by the DTA does not relieve the developer/permittee from compliance with the terms of the agreements, permits, approved plans, Town standards, and/or Town ordinances. Responsibility for damage from, or replacement of, work not in compliance with the terms of the agreements, permits, approved plans, Town standards, and/or Town ordinances shall rest entirely with the developer/permittee. The responsibility of the developer/permittee shall extend for the full period of construction and warranty. The responsibility of the developer/permittee remains, regardless of whether or not they have been previously advised of said noncompliance.

1.9 DEVELOPMENT IMPROVEMENTS

1.9.1 PUBLIC IMPROVEMENTS

In each new development, including redevelopment, the Town shall determine the type, location, and extent of necessary public improvements depending on the characteristics of the proposed development and its relationship to surrounding areas. Improvements shall be made by the developer/permittee at their expense according to the Manual, the SDECM, the CODE, and other applicable regulations.
The developer/permittee shall design and construct all necessary public improvements for the development, including those necessary to upgrade the existing affected infrastructure to the minimum standards required by this Manual and/or the SDECM.

The scope of public improvements includes, but is not limited to, the following:

- Roadway infrastructure located within the Town of Parker right-of-way (ROW) including, but not limited to; roadway pavement, curbs and gutters, sidewalks and streetscape improvements, appurtenant drainage basins or structures, and storm sewer.

- Traffic control including signage, striping, pavement markings, and signals within the ROW.

- Drainage improvements including stormwater facilities located within the Town ROW or are otherwise publicly owned.

- Other drainage infrastructure and facilities located on private land that lie within recorded drainage easements dedicated to the Town, that have been shown on Town approved construction plans, and that are otherwise considered eligible for acceptance into the Stormwater Utility Management by the criteria set forth in the SDECM.

- Regional trails, trail connections, and/or trail extensions whether within Town ROW or located on private property.

1.9.1.1 Roadway

All Town roadways (including, but not limited to sidewalk, curb and gutter, and pavement) to be placed within public ROW, within and/or adjacent to the subdivision, shall be designed and constructed by the developer/permittee in conformance with the Town standards.

The developer/permittee shall also be responsible for their proportional share of the design and construction of adjacent existing and/or future roadway improvements including, but not limited to infrastructure, traffic signals, landscaping, etc. The extent of participation shall be determined by the Public Works Department.

1.9.1.2 Traffic Control

If the traffic analysis identifies the need for traffic signals as a consequence of the development or in combination with other development, whether that need is immediate or in the future, the developer/permittee shall be required to participate in the design and installation of the traffic signals. The extent of participation shall be determined by the Public Works Department.

1.9.1.3 Drainage

The Town requires that all new developments design and construct the necessary drainage system within the development and all required connections of the local drainage system to the major drainageway in accordance with the SDECM.
The Town also stipulates that the developer/permittee is responsible for design and construction of any portion of major drainageway improvements within or serving new development areas. The Town may require the developer/permittee to make all necessary improvements as part of first plat. If the Town decides that major drainageways will not be constructed at the time of the development or if the improvements have already been constructed, the developer/permittee shall be responsible for their proportional share of the design and construction of said improvements. The extent of participation shall be determined by the Engineering/Public Works Department.

1.9.2 SITE IMPROVEMENTS

Not all necessary improvements are considered public, however; depending on the nature of the improvement and the characteristics of the proposed development, additional improvements may be deemed critical for the function of the site. The developer/permittee shall complete all site improvements per the approved plans and agreements with the initial construction prior to Probationary Acceptance unless special conditions for their construction are included in the applicable agreement(s).

1.9.3 UTILITIES/OTHER

The design and construction of additional necessary improvements such as water, sanitary sewer, lighting, dry utilities, etc. are the responsibility of the developer/permittee. The developer/permittee shall contact the applicable agencies to obtain their requirements.

1.9.4 AGREEMENTS AND SECURITY

Public improvements associated with a project shall be secured with a Subdivision Improvement Agreement, Development Agreement, Interim Site Improvement Agreement, a Public Improvement Agreement, or a Right-of Way Use Permit (herein referred to as “Agreements”).

The developer/permittee shall provide an itemized engineer cost estimate of all public and storm water utility eligible private improvements to the Public Works Department for review and approval as part of the plat, site, and/or construction plan submittals.

The Community Development Department will prepare and process all Agreements. Once approved by the Engineering/Public Works Department, the cost estimate shall be incorporated as an exhibit into the applicable Agreement(s).

1.10 FEES

The Charge Back Agreement must be executed prior to any development submittals to the Community Development department. The developer/permittee shall pay for all permits, reviews, meetings, coordination, construction observation/inspection, materials/construction testing (including those ordered by the Town and where required by these specifications or on the approved plans), and any other related costs associated to the project.
The Engineering/Public Works Department charges an hourly rate plus an administration fee, to be billed monthly. For all development applications, a review fee deposit is required. Review fee estimates are available upon request.

Additional testing, where required by these specifications, the approved plans, or as ordered by the DTA shall be paid by the developer/permittee. Testing may include, but is not limited to pavement coring, materials/construction testing, and other specific data reports.

1.11 INTERPRETATION

In the interpretation and application of the provisions of the Manual, the following shall govern:

- In their interpretation and application, the standards found in the Manual shall be regarded as the minimum requirements for the protection of the public health, safety, comfort, convenience, and welfare of the residents of the Town. The Manual shall therefore be regarded as a minimum standard and shall be broadly construed to further their underlying purposes.

- Whenever a provision of this Manual, law, ordinance, resolution, rule, or regulation contain restrictions covering the same subject matter, whichever standard is more restrictive or imposes higher standards or requirements shall govern.

- These standards shall not abrogate or annul any public improvement construction plans or permits which have been filed with and approved prior to the effective date of this Manual, provided that the improvements have been constructed within 12 months from the date of approval. Public improvement construction plans or permits with expired approvals (i.e., improvements have not been constructed within 12 months from the approval date) shall be required to be re-submitted in accordance with the requirements of this Manual.

- The Director shall have the final authority to resolve any conflict in the interpretation of the standards found in this Manual.

1.12 VARIANCES

Variances from these standards will be considered on a case-by-case basis in accordance with procedures in this Manual (refer to section 3.11 of this Manual for the variance procedure).

1.13 REFERENCES

References for the major sections of this Manual will be listed at the end of each section, in the order of appearance in that section. Although this approach requires some duplication, it allows the reader to access references in a more logical manner than a single list at the end of the document.
2.0 DRAWINGS AND SPECIFICATIONS

TABLE OF CONTENTS

2.1 DRAWINGS AND SPECIFICATIONS SUBMITTAL PROCEDURE .................................................. 2-2

2.1.1 INTRODUCTION ........................................................................................................ 2-2
2.1.2 PRE-APPLICATION MEETING(S) ........................................................................ 2-2
2.1.3 PRE-SUBMITTAL MEETING ................................................................................. 2-2
2.1.4 CHARGE BACK AGREEMENT .............................................................................. 2-2
2.1.5 DEVELOPMENT SUBMITTALS .............................................................................. 2-2
2.1.6 AGREEMENTS, COST ESTIMATES, AND SECURITY ........................................... 2-3
   2.1.6.1 Performance Guarantee .............................................................................. 2-3
   2.1.6.2 Financial Guarantee ............................................................................... 2-3
2.1.7 TRAFFIC ANALYSIS ............................................................................................ 2-4
2.1.8 DRAINAGE REPORT .......................................................................................... 2-4
2.1.9 ENGINEERING REVIEW ................................................................................... 2-4
2.1.10 DEVELOPER/PERMITTEE REVISION OF CONSTRUCTION PLANS ............... 2-5
2.1.11 SUBMITTING REVISED PLANS ......................................................................... 2-5
2.1.12 EASEMENTS AND MISCELLANEOUS AGREEMENTS ..................................... 2-5
2.1.13 CONSTRUCTION PLAN APPROVAL ................................................................ 2-5

2.2 REVISIONS TO APPROVED PLANS ......................................................................... 2-6

2.2.1 PLAN EXPIRATION AND EXTENSIONS .............................................................. 2-6
2.2.2 REVISIONS TO APPROVED CONSTRUCTION PLANS ......................................... 2-7
2.2.3 REVISIONS TO APPROVED SITE PLANS ........................................................... 2-7
2.2.4 FIELD CHANGES ............................................................................................. 2-7

2.3 CONSTRUCTION PLAN SUBMITTAL REQUIREMENTS ............................................ 2-7

2.4 REFERENCES ....................................................................................................... 2-8
2.1 DRAWINGS AND SPECIFICATIONS SUBMITTAL PROCEDURE

2.1.1 INTRODUCTION

Consulting engineers and developers seeking approval and acceptance of civil engineering reports and construction plans are required to follow the procedures outlined herein.

2.1.2 PRE-APPLICATION MEETING(S)

The Community Development Department routinely conducts pre-application meetings at which time the developer/permittee may ask questions about the various Town of Parker (the Town) processes and obtain direction or information from Community Development and Engineering staff. Before attending pre-application meetings, the developer/permittee is encouraged to review the checklists provided by the Town in Appendix B Standard Forms and Checklists. Pre-application meetings may be used by the developer/permittee to obtain very basic information about Town procedures, requirements, or standards as a basis to begin development planning. Alternatively, the developer/permittee may use the meeting as a final check by staff to verify if a specific type of application is complete.

2.1.3 PRE-SUBMITTAL MEETING

A pre-submittal meeting with the Engineering Department is required prior to the submittal of any construction documents. A technical review of the submittal will not be performed at this meeting; however, a cursory review will be performed to establish general submittal requirements. Construction plan submittals will not be accepted by Public Works until this meeting is completed.

2.1.4 CHARGE BACK AGREEMENT

The Charge Back Agreement must be executed prior to any development submittals to the Community Development Department. The Engineering Department charges an hourly rate plus a Finance Department administration fee for all associated reviews, meetings, coordination, and inspections.

The Town charges an hourly rate plus a Finance Department administration fee to be billed monthly. A review fee deposit is required for all development applications. Review fee estimates are available upon request.

2.1.5 DEVELOPMENT SUBMITTALS

Development applications submitted to the Community Development Department for all subdivisions, site plans or developments shall include construction drawings and applicable reports for the proposed development. Refer to the Plan Sheet Submittal List in appendix B for the construction plan set outline. All comments from each referral agency shall be adequately addressed within the construction plans prior to site plan and/or plat approval.
Further details regarding the Town’s submittal processes are available within Titles 10 and 13 of the Parker Municipal Code (the “Code”).

2.1.6 AGREEMENTS, COST ESTIMATES, AND SECURITY

The developer/permittee shall provide an itemized engineer’s cost estimate of all public and storm water utility eligible private improvements to the Engineering Department for review and approval as part of the plat, site, and/or construction plan submittals.

The Engineering Department reviews the provided scope and quantities of the public improvements against the plans and compares their associated costs with recent construction bids for other similar projects. Adjustments to scope, quantities, and/or unit costs may be required prior to approval of the cost estimate by the Town.

Once approved by the Engineering Department, the cost estimate will be incorporated as an exhibit into the Subdivision Improvement Agreement, Development Agreement, Interim Site Improvement Agreement, or Public Improvement Agreement.

The Agreements must be signed by the developer/permittee and the security must be provided prior to construction plan approval recordation or the issuance of any permits.

2.1.6.1 Performance Guarantee

In order to secure the construction and installation of the public improvements, the developer/permittee shall provide a performance guarantee as described within the Agreements. The performance guarantee provided by the developer/permittee to the Town shall be an irrevocable letter of credit or cash in an amount equal to one-hundred-ten percent of the estimated costs of the public improvements to be constructed and installed.

Upon completion and Probationary Acceptance of the improvements, the security may be reduced to twenty percent as described in the Agreements and section 10 of the Town of Parker Roadway Design and Construction Criteria Manual (this/the Manual) for the duration of the warranty period.

2.1.6.2 Financial Guarantee

As provided within the Agreements, the developer/permittee may provide the Town with an alternative to the Performance Guarantee security in the form of a Financial Guarantee (cash). The developer/permittee is to provide one-hundred-ten percent of the actual construction contract amount based on the awarded project bids, as approved by the Town. The security in the form of a Financial Guarantee is to be deposited and dispersed by the Town in accordance to the Financial Guarantee Agreement.

Payment requests for completed work will be made to the Town by the developer/permittee using the Public Works’ Schedule of Values as provided in appendix B. The Town will provide a brief review of the submitted completion percentages for verification of completed work; however, it remains the
responsibility of the developer/permittee to ensure that the percentages provided are an accurate representation of the completed work and the associated costs.

The Town will retain ten percent of the total of the deposited construction costs and ten percent of all payments made in accordance with the Financial Guarantee Agreement of any of the public improvements. This twenty percent is to be held by the Town as security for duration of the warranty period in the form of cash or an irrevocable letter of credit.

Construction costs in excess of those secured with the Town are the responsibility of the developer/permittee. The developer/permittee shall disclose all additional costs to the Town and shall update the cost estimate, the Schedule of Values, and the associated security prior to Probationary Acceptance.

2.1.7 TRAFFIC ANALYSIS

A traffic analysis shall be included in submittals to the Town as prescribed within the Land Development Ordinance and shall conform to section 5 of this Manual.

2.1.8 DRAINAGE REPORT

A drainage report or drainage compliance letter shall be included in submittals to the Town as prescribed within the Land Development Ordinance and shall conform to the Storm Drainage and Environmental Criteria Manual (SDECM).

2.1.9 ENGINEERING REVIEW

The Town shall review all submittals for general compliance to these and all other applicable Town standards. During plan review, an attempt is made to identify all of the items which do not meet the Town’s criteria; however, it remains the responsibility of the developer/permittee to ensure that all criteria are met. Minimum criteria and standards for roadway design and construction are provided within this Manual and the documents referenced herein.

The Engineering/Public Works Department’s objective is to issue comments on the construction plans and associated reports within the timeframes specified within the Town’s Code; however, the actual time required is a function of the submittal complexity and the workload of the Engineering/Public Works Department. In the event the construction plans are submitted as part of a Land Use Application, the review time shall coincide with the time allowed for the application submittal review as set forth by the Community Development Department.

After the review has been completed, comments and/or redlines will be returned to the developer/permittee. If the submittal is part of a Land Use Application, comments will be provided through the Community Development Department. If the construction plans are returned to the developer/permittee due to a lack of adequate information or are considered significantly deficient, any resubmitted plans shall be considered a new submittal.
2.1.10 DEVELOPER/PERMITTEE REVISION OF CONSTRUCTION PLANS

The developer/permittee shall make all the requested revisions on their construction drawings and/or reports and resubmit to the Town for review and approval. Deficient plans or technically complex projects may require multiple reviews prior to approval.

2.1.11 SUBMITTING REVISED PLANS

When submitting revised plans or reports to the Engineering Department, the submittal must contain:

1. The revised plans and/or reports
2. All redlines from previous staff reviews
3. A detailed response letter that adequately addresses each staff comment

If all the above items are not included with the package submitted, the submittal may be returned without further action until such time as the above described items are included.

2.1.12 EASEMENTS AND MISCELLANEOUS AGREEMENTS

It is the responsibility of the developer/permittee to obtain all off-site easements, ROW, property, and/or agreements necessary for the proposed development and/or construction. Easements and agreements for all property to be dedicated to the Town shall be reviewed by staff and conveyance approved by the Town Council via resolution.

Private landscaping and/or construction of any permanent structure(s) within the Town ROW will require a Town-approved license agreement.

Signed copies of all off-site easements and agreements including, but not limited to; drainage, access, shared maintenance, and construction must be provided to the Town prior to the approval of any plat, site plan, construction plans, and/or permits. Payment of all recordation costs associated with all Town easements and/or agreements shall be the responsibility of the developer/permittee and shall be received by the Town prior to recordation.

2.1.13 CONSTRUCTION PLAN APPROVAL

Construction plan approval shall be obtained prior to issuance of any permits and the commencement of construction. Approval by the Town does not relieve the developer/permittee, engineer, or designer from responsibility of ensuring that the calculations, plans, specifications, construction, and record drawings are accurate and in compliance with the Manual as stated in the developer/permittee’s and engineer’s certifications. Town approval does not relieve the developer/permittee from all requirements from the applicable outside agencies.
Once all comments on the construction plans and/or reports have been satisfactorily addressed, the Town will recommend that the developer/permittee move forward with the final reports and Record Set production.

The developer/permittee shall refer to the Construction Plan Approval Process in appendix B prior to the submittal of the Record Set to the Town. The construction plan Record Set is to be submitted to the Town for approval once the following items have been completed:

- Easements and agreements must be executed. Copies of all signed private agreements and easements shall be submitted to the Town for confirmation.
- The development plans must be approved by the Parker Planning Commission and/or Town Council (if applicable).
- The Subdivision/Development Agreement has been approved by Town Council (if applicable).
- The required security has been accepted by the Town (if applicable).
- The final plat Mylar has been submitted for recordation (if applicable).
- All outstanding project fees have been paid and associated project securities have been received.
- All approvals and signatures on the construction plan Record Set have been obtained from outside agencies.

The construction plan Record Set submitted to the Town for approval shall be the complete construction plan set including but not limited to the approved utility plan set as identified in the Plan Sheet Submittal List.

Once approved by the Town, the developer/permittee shall provide electronic (PDF) copies of the signed and sealed final drainage report, traffic study, and construction plan Record Set. These documents must be received prior to the preconstruction meeting and issuance of a grading permit.

2.2 REVISIONS TO APPROVED PLANS

2.2.1 PLAN EXPIRATION AND EXTENSIONS

Construction plans, pavement design reports, drainage reports, and other technical documents are approved initially for a period of one year from the date shown on the Town of Parker signature block. If construction has not commenced during this time period, the plans expire and the developer/permittee must resubmit the plans for re-approval or request an extension. Request for construction plan extensions shall be submitted to the Director for consideration and approval. Extensions for site plans, preliminary plans, and final plats shall be submitted to the Community Development Director for consideration (Section 13.01.140 of the Code).

If construction plans are approved by the Engineering Department as part of the Preliminary Plan process, then the expiration of their approval shall coincide with the preliminary plan as described in Title 13.070.070 of the Code, with the concurrence of the Director. If any state and/or federal mandates
occur that require an update to the criteria as presented herein, the plans shall be resubmitted to the Town for approval.

2.2.2 REVISIONS TO APPROVED CONSTRUCTION PLANS

Whenever updates or revisions to previously approved construction plans, specifications, or applicable reports are necessary, the developer/permittee shall submit updates or revisions through the Engineering Department for review. After all the revisions have been approved by the Engineering Department, the sheets containing revisions shall be submitted to the Town for signatures. It is the responsibility of the developer/permittee to ensure that approved revisions are distributed to the applicable agencies and/or responsible parties.

2.2.3 REVISIONS TO APPROVED SITE PLANS

Revisions to approved site plans and plats that impact the associated construction plans shall be submitted to Engineering Department through referral from the Community Development Department.

2.2.4 FIELD CHANGES

Minor changes to construction plans can be made in the field provided that the Engineering Department provides written approval of the changes prior to implementation. Failure to receive written approval of field changes from the Engineering Department may result in non-acceptance. All field changes must be accurately depicted on the record drawings as defined in section 11. The developer/permittee shall provide to the Engineering Department a letter, signed and sealed by the Engineer-of-Record responsible for the original design, stating that the proposed field change does not deviate from the intent of the original design.

2.3 CONSTRUCTION PLAN SUBMITTAL REQUIREMENTS

The developer/permittee shall refer to the following documents to aid in developing construction plans to be submitted to the Town for approval:

- The Plan Sheet Submittal List in Appendix B is a typical list of required construction plan sheets and associated approval information.
- The Construction Plan Requirement Checklist in Appendix B details typical information required on the specific plan sheets. Some items shown on the checklists may not be applicable to all projects. Additional items and/or information may be required.
- The Construction Plan Approval Process provided in Appendix B outlines the typical steps required to obtain plan approval from the Town.

All plans submitted for approval and recordation shall meet the following minimum requirements:
Electronic plan sheets shall be sized at 22” x 34” and scalable at this size and at 11” x 17”. Record sets submitted for final approval shall include electronic seals and signatures that adhere to Colorado DORA standards for Professional Engineers.

Plan and corresponding profiles for roadways and storm sewer shall be shown on the same sheet.

Fonts and line weights shall be consistent and legible for all drawings. The Town of Parker reserves the right to revise drawing details and drafting requirements at its discretion.

Refer to the As-built Drafting Standards in section 11 for additional information.

2.4 REFERENCES

Town of Parker, Title 13 – Land Development Ordinance.
3.0 SUBMITTAL REQUIREMENTS FOR CONSTRUCTION PLANS

TABLE OF CONTENTS

3.1 INTRODUCTION ............................................................................................................................................... 3-3

3.1.1 CERTIFICATION ........................................................................................................................................... 3-3
3.1.2 SEAL AND SIGNATURE ................................................................................................................................. 3-3
3.1.3 SIGNATURE REVIEW BLOCK ...................................................................................................................... 3-3
3.1.4 DATE OF PLAN AND REVISIONS ............................................................................................................... 3-4
3.1.5 KEY MAP ................................................................................................................................................... 3-4
3.1.6 LEGEND ..................................................................................................................................................... 3-4
3.1.7 VICINITY MAP ........................................................................................................................................... 3-4
3.1.8 SIGHT DISTANCE CERTIFICATION ......................................................................................................... 3-4

3.2 UTILITIES ....................................................................................................................................................... 3-5

3.3 PRIVATE IMPROVEMENTS ............................................................................................................................. 3-5

3.4 ROADWAY PLAN AND PROFILES .................................................................................................................. 3-7

3.4.1 PLAN VIEW .................................................................................................................................................. 3-7
3.4.2 PROFILE VIEW ............................................................................................................................................ 3-7

3.5 SIGNING, STRIPING, AND LIGHTING ........................................................................................................... 3-8

3.5.1 SPECIAL SIGNS .......................................................................................................................................... 3-9
3.5.2 CLEARANCE FROM LANDSCAPING AND LIGHTING ................................................................................ 3-9
3.5.3 STREET NAME SIGN LAYOUTS .................................................................................................................. 3-9

3.6 PROJECT DETAILS ......................................................................................................................................... 3-9

3.7 RETAINING WALLS ......................................................................................................................................... 3-9

3.8 LANDSCAPE AND IRRIGATION ..................................................................................................................... 3-9

3.8.1 LANDSCAPE REQUIRED COORDINATION ............................................................................................ 3-10
3.8.2 LICENSE LANDSCAPE AGREEMENT ....................................................................................................... 3-10

3.9 COST ESTIMATES ........................................................................................................................................... 3-10

3.10 SURVEY MONUMENTS ................................................................................................................................. 3-11
3.11 VARIANCES ........................................................................................................... 3-12

3.11.1 GENERAL ........................................................................................................... 3-12
3.11.2 MINIMUM STANDARDS VARIANCE ................................................................. 3-12
3.11.3 ALTERNATE ROADWAY SECTION DESIGN VARIANCE ................................. 3-13

3.12 REFERENCES ......................................................................................................... 3-13
3.1 INTRODUCTION

The information within this section is required with the submittal of construction plans for improvements subject to review by the Town of Parker's (the Town) Engineering/Public Works Department.

All construction plans and detail sheets shall include information as defined in the Construction Plan Requirements Checklist in Appendix B. The information provided in this section is supplemental to the information provided in the checklists and is provided for clarity purposes only. The clarity of the construction plans and details is the responsibility of the developer/permittee.

3.1.1 CERTIFICATION

All construction plans, drainage reports, traffic analyses, and geotechnical reports/pavement designs shall be prepared by or under the direction of a Professional Engineer, registered by the State of Colorado, and shall be reviewed for the minimum requirements set forth herein. The Professional Engineer shall be aware that additional information and analysis, beyond the minimum requirements, may be required for a proposed project.

Unless otherwise identified or noted, all construction plan submittals are assumed to comply with the requirements of The Town of Parker Roadway Design and Construction Manual (the/this Manual) and the Storm Drainage and Environmental Criteria Manual (SDECM). Variances or waivers of the standards of this Manual or the SDECM shall be formally requested from the Engineering/Public Works Department, as set forth in section 3.11. Failure to comply with prescribed procedures may result in review delays and additional review fees.

The policy and practice of the Town of Parker is not to accept the liability for improvements designed by others. The Town does not accept responsibility for the accuracy and adequacy of the design. Through approval of the construction plans, the Engineering/Public Works Department indicates that it has reviewed the document and found it in general compliance with the Parker Municipal Code (Code), this Manual, the SDECM, approved variances thereof, or other approved Town-adopted criteria.

3.1.2 SEAL AND SIGNATURE

The seal and original signature of the registered Colorado Professional Engineer under whose supervision the construction plans and revisions were prepared, along with the corresponding date, shall be located consistently on each sheet of the final construction plan Record Set.

3.1.3 SIGNATURE REVIEW BLOCK

A space for the Town of Parker signature review blocks, as provided in Appendix C, shall be provided in the lower right-hand corner of on all applicable construction plan sheets including, but not limited, to the construction plan sheets for roadway, storm sewer, drainage, and traffic improvements as shown in the Plan Sheet Submittal List in appendix B.
The size of the signature review block shall be 4 inches by 4 inches for a 22-inch-by-34-inch (full size) sheet. The Town will electronically affix the signature review block to all applicable sheets upon completion and approval of the construction plans.

### 3.1.4 DATE OF PLAN AND REVISIONS

The original date of the plans and any revisions must be shown in the title block. The date shall be the initial date of the submittal and revised submittals thereafter. After the plans are approved, the issue date shall be the only date listed in the title block of the plan set for distribution, except for any subsequent revisions to the approved plan set.

### 3.1.5 KEY MAP

The key map shall be to an appropriate scale and included in all plan index categories that contain multiple sheets. The key map shall include the location and name of all roadways within and adjacent to the proposed construction, including future roadways. The key map shall include a north arrow.

### 3.1.6 LEGEND

A detailed and comprehensive legend of existing and proposed infrastructure, right-of-way (ROW), easements, structures, buildings, contours, utilities, etc. shall be provided within the construction plan drawings and/or cover. The legend shall clearly distinguish existing and proposed using varying line types, weights, thicknesses, shading, and symbols. Supplemental labeling may also be used in the construction plan drawings to assist in additional clarification.

### 3.1.7 VICINITY MAP

The vicinity map shall be on the cover sheet at a scale of 1 inch equals 2,000 feet. The vicinity map shall include the location and names of all arterial roadways within one mile of the proposed construction, and all other roadways in the vicinity of the proposed construction. The vicinity map shall also include the major drainageways in this area. Shading shall indicate the project area. The vicinity map shall include a north arrow. This map is required on the cover sheet or first sheet of all submittals.

The minimum size of the vicinity map is 6 inches by 6 inches for a 22-inch-by-34-inch (full-size) sheet.

The vicinity map cannot include any portion of the map that is copyrighted. The construction plans will be part of the public record, where copyrights are prohibited.

### 3.1.8 SIGHT DISTANCE CERTIFICATION

The sight distance certification shall be an acknowledgement that all roadways have been evaluated for the proper sight distance criteria as provided in this subsection, section 4, and Town of Parker Standard Details in Appendix A of this Manual.
The following sight distance certification shall be provided on the cover sheet:

“I, the undersigned, hereby certify that the proposed subdivision, ________________, is designed in accordance with the Town of Parker Sight Distance Criteria and with AASHTO Policy on Geometric Design of Highway & Streets.

A signature line with the responsible Professional Engineer’s license number shall be provided with this certification and shall be stamped and signed by the responsible Professional Engineer.

### 3.2 UTILITIES

Existing and proposed utilities and associated structures shall be clearly shown and labeled in the construction plans.

All drainage infrastructure shall comply with the Town of Parker Storm Drainage and Environmental Criteria Manual.

Utility information shall be provided in accordance with current state law in regards to subsurface utility engineering. Field verified elevations and locations shall be required for all utilities that will potentially affect the design or construction of the improvements prior to the approval of the construction plans. A certification shall be provided on the plan set stating the Quality Level of the utility information provided.

All proposed utilities, public or private, shall be designed to be locatable in accordance with state law.

It will be the responsibility of the contractor to verify the existence and location of all utilities prior to commencing any new construction. Additional utilities discovered during construction shall be added to the record drawings submitted as a condition of Probationary Acceptance of the public improvements.

All utility information shall utilize the USGS NAVD 1988 vertical datum.

### 3.3 PRIVATE IMPROVEMENTS

Private improvements are defined as follows:

- **A private roadway** is defined as any roadway, driveway or alley that is not owned by the Town of Parker in fee or located within Town right-of-way, and that is not covered by a permanent easement or agreement that requires the Town to maintain the roadway.

- **Private drainage infrastructure** is defined as any storm sewer, pipe, swale, detention pond, or other stormwater conveyance item that does not collect or convey runoff from public rights-of-way, and does not otherwise meet the Town’s criteria for Stormwater Utility maintenance assistance, as stated in the Town’s Storm Drainage and Environmental Criteria Manual.
Where private roadways intersect with public roadways, the following infrastructure shall be considered **public**:

- Sidewalk and curb ramps adjacent to the public roadway.
- Curb and gutter and concrete crossovers conveying stormwater along the public roadway. All curb and gutter located past curb ramps will be considered private.
- Traffic signals at such intersections will be owned and maintained by the Town. Easements for maintenance of the traffic signal infrastructure located on the private roadway/property shall be provided.
- Any access control signage at the intersection.

Where private roadways intersect with public roadways, the following infrastructure shall be considered **private**:

- All roadway pavement associated with private roadway, with the exception of crossovers. Where this is no crossover, the private infrastructure will be behind the extension of the mainline public roadway curb and gutter.
- All curb and gutter and sidewalk on the private roadway located past the curb ramps.
- Traffic or street name signage and pavement markings on or across the private roadway. The private roadway street name sign shall the “Private Road” as part of the street name sign to denote the private roadway.
- Landscaping or irrigation on all roadways, private or public, is the responsibility of the adjacent property owner.
- Other items serving the private roadway.

All private improvements shall be designed and constructed in accordance with this Manual. The property owner or appropriate owners association shall be responsible for the maintenance and operation of all private improvements, including snow removal.

Private improvements such as roadways and drainage improvements shall be clearly shown and labeled as “Private” on each sheet of the construction plans. The following note shall appear on each sheet of the construction plans that include private roadways:

“On any private roadways, The Town of Parker shall not be responsible for the maintenance of roadway and appurtenant improvements, including associated storm drainage structures and pipes, unless approved by the Director and Town Council.”

If a request is made for the Town to assume maintenance of any private improvement, it shall be the responsibility of the applicant to satisfactorily demonstrate that the private improvements were constructed in accordance with this Manual. Construction of the private improvements to the standards included in the Town’s Manual does not obligate the Town to assume any maintenance responsibilities unless otherwise approved by Town Council.

Appropriate ground signs, as directed by the Engineering/Public Works Department, shall be prominently posted on private roadways to denote the private nature.
3.4 ROADWAY PLAN AND PROFILES

3.4.1 PLAN VIEW

The plan view shall include, but is not limited to, the following information:

3.4.1.1 Survey lines and stations shall be based on centerline only. Other profiles may be included but shall be referenced to centerline stationing, and shall utilize station equations, as necessary. Stationing along horizontal radius curves and other departures from normal roadway cross sections shall equate flowline and centerline stationing with station equations.

3.4.1.2 Stationing and critical elevations (inlet flowlines) for all existing or proposed inlets within the roadway.

3.4.1.3 Match lines and consecutive sheet numbering, beginning with the cover sheet.

3.4.1.4 Stations and elevations (and offsets as appropriate) shall be provided for the centerline and the left and right flowlines on all roadway plans for all critical points. The right and left flowline and centerline information for each critical point shall be combined into one label to assist in plan clarity.

3.4.1.5 Line and curve tables for roadway alignments, curb returns, and median information may be provided to assist with roadway plan clarity.

3.4.1.6 Spill curbs, catch curbs, and curb transitions (atypical roadway sections or on-street parking) shall be clearly delineated in the roadway plan views. Ensure that curb types are clearly labeled or that the appropriate information is provided in the legend.

3.4.1.7 Construction plans for arterial improvements shall include horizontal and vertical information and lane details for a minimum distance of 300 feet beyond the limits of construction. Arterial roadways shall continue with the same angle and similar alignment across intersections.

3.4.1.8 Construction plans for collector and/or local improvements shall include horizontal and vertical information and lane details for a minimum distance of 150-feet beyond the limits of construction. Collector and local roadways shall continue with the same angle and similar alignment across intersections.

3.4.1.9 Show all existing curb, gutter, sidewalk, and pavement adjacent to the proposed design. Existing grades shall be field verified at intervals not to exceed 25 feet. Previously approved design as-builts are not an acceptable means of establishing existing grades.

3.4.1.10 The elevations and stationing shall be the same and consistent for plan and profile views. The plan and profile views shall be shown on the same sheet.

3.4.2 PROFILE VIEW
The profile shall include, but is not limited to, the following information:

3.4.2.1 All design elevations shall be clearly labeled at the centerline with centerline stationing for standard roadway cross sections. Supplemental flowline profiles with station equations shall be provided for all atypical roadway cross sections, cul-de-sacs, knuckles, and flowline bump-outs, etc.

3.4.2.2 For profiles of non-controlling roadways, the right and left flowline transitions shall be profiled to detail the transition into the controlling roadway (generally the roadway with higher classification or traffic volume).

3.4.2.3 When supplemental flowline profiles are provided in combination with centerline profiles, centerline/flowline station equations must be provided at the flowline profile end points in the profile views.

3.4.2.4 The basis for the design elevations (flowline and/or centerline) shall be clearly labeled on the plan and profile drawings, or included within a sheet note.

3.4.2.5 Existing grade lines shall be dashed line type and design grade lines shall be continuous line type. Both grade lines are to be clearly labeled.

3.4.2.6 Stationing shall be continuous for the entire portion of the roadway shown in the plan view, with centerline station equations clearly labeled (i.e., ROAD A CL STA X = ROAD B CL STA Y) for all intersecting roadways and driveways, excluding single family residential driveways.

3.4.2.7 Stationing and elevations of all existing (field-verified) and proposed vertical grade breaks. The use of grade breaks is limited by this Manual. Refer to section 4 of this Manual for further information.

3.4.2.8 The minimum roadway flowline grade shall be 1 percent except at HP and LP transitions. Flowline grades shall be shown through all horizontal curves.

3.4.2.9 Proposed longitudinal grades and the lengths.

3.4.2.10 Profiles for all curb returns (except medians), see section 4 of this Manual for further information.

3.4.2.11 Cross sections at a 50-foot station interval, or as required for clarity, shall be provided for all arterial roadways.

3.4.2.12 For widening or implementing auxiliary lanes, cross sections shall be provided at 50-foot intervals.

3.5 SIGNING, STRIPING, AND LIGHTING

All traffic control devices shall conform to the federal Manual on Uniform Traffic Control Devices (MUTCD), the latest Town adopted edition and the associated latest edition Colorado Supplement to the MUTCD. Additional specifications and illustrations are located in the Colorado Department of Transportation’s
(CDOT) M&S Standards and CDOT’s Standard Specifications for Road and Bridge Construction. Refer to section 7 of this Manual for further information.

### 3.5.1 SPECIAL SIGNS

Special signs may be required and shall be reviewed and approved by the Engineering/Public Works Department in writing prior to installation.

### 3.5.2 CLEARANCE FROM LANDSCAPING AND LIGHTING

The location of signs, luminaires, and proposed landscaping shall be coordinated to minimize conflicts. A lighting plan may be required. The developer/permittee shall reference the landscaping plans and specify that any proposed trees be located a minimum of fifty feet from any proposed signs on the approaching side.

Luminaires shall be located a minimum of three feet behind the curb or attached sidewalk on collectors and arterials as to not disturb trench drains.

### 3.5.3 STREET NAME SIGN LAYOUTS

The developer/permittee shall refer to the standard detail in Appendix A for each roadway classification. The higher roadway classification shall rule for the designation of type of required street name signs.

### 3.6 PROJECT DETAILS

Applicable Town of Parker Standard Details found in Appendix A of this Manual shall be included in the construction plans. The construction plans shall also include adequate construction details of structures or improvements not covered by the Town of Parker Standard Details.

### 3.7 RETAINING WALLS

Spot elevations for top and bottom (at grade) of all retaining walls shall be shown on the grading plans. Retaining walls four feet high, from the bottom of the foundation to the top of the wall, or greater require a building permit. Plans shall be submitted to and approved by the Building Department prior to construction.

Tiered walls that have a cumulative height of greater than four feet may require a building permit. Plans shall be submitted to and approved by the Building Department prior to construction.

### 3.8 LANDSCAPE AND IRRIGATION

All landscape and irrigation plans shall be prepared in accordance with the Town of Parker landscape regulations in the Code.
Landscaping shall be designed in accordance with the sight distance requirements set forth in section 4 and the Town of Parker Standard Details in Appendix A of this Manual. The sight triangles and sight lines shall be labeled and dimensioned on the landscaping plans.

### 3.8.1 LANDSCAPE REQUIRED COORDINATION

The proposed landscaping and landscape plans shall be coordinated with the proposed street sign and luminare layouts.

Utilities, easements, street signs, and lighting shall be shown and labeled on the landscape plans.

A minimum of seven feet shall be maintained from the edge of all drainage infrastructure and proposed trees.

### 3.8.2 LICENSE LANDSCAPE AGREEMENT

The developer/permittee shall enter into a License Landscape Agreement with the Town of Parker, as a condition of plan approval. The Town will not be responsible for landscaping and irrigation improvements or related appurtenances within the ROW, unless approved otherwise.

### 3.9 COST ESTIMATES

The developer/permittee shall provide a comprehensive, itemized engineer’s cost estimate to the Engineering/Public Works Department for review and approval as part of the plat, site plan, and/or construction plan submittals. Cost estimates shall include all public improvements and storm water utility eligible private improvements that are needed to support the project, including any necessary off-site improvements.

Construction costs within the cost estimate shall be comparable to recent construction costs for similar projects. The developer/permittee shall consider factors which might affect bid prices such as quantities, project location and accessibility, factors that would impact the contractor’s operations and production, material sources and availability, season of the year, etc. Adjustments to scope, quantities, and/or unit costs may be required prior to approval of the cost estimate.

The Town may require the developer/permittee to participate in the cost of design and construction of existing or future improvements that are necessary to support the project. Improvements frequently requiring developer/permittee participation include, but are not limited to public roadways, bridges, traffic signals, and regional detention facilities. The Town may require the developer/permittee to design and construct the improvements concurrently with the development.

The required cost estimate shall be incorporated into the Subdivision Improvement Agreements, Development Agreements, Interim Site Improvement Agreements, and/or Public Improvement Agreements. The Agreements shall be signed by the developer/permittee and the security must be provided prior to construction plan approval, recordation of the plat, and the issuance of any permits.
To assist the developer/permittee in pavement cost estimating of public roadways, the Town’s Pavement Cost Calculator shall be used.

A separate cost estimate for erosion and sediment control measures will be required and secured with the Grading Permit.

Cost estimates shall include 3 percent for survey, 5 percent for mobilization, 12 percent for construction management and testing, and 10 percent for contingency of the public improvements based on the subtotal of the construction costs. The standard cost estimate form is provided within Appendix B and may be customized to include all public improvement costs.

Maintenance costs are not included in these agreements and are the responsibility of the developer/permittee until final acceptance has been granted by the Director.

3.10 SURVEY MONUMENTS

The developer/permittee and contractors shall preserve all existing control and survey monuments, up to and including replacement.

All survey monuments delineating boundaries of property or witness thereof shall be set in accordance with this section and all applicable State of Colorado laws and regulations.

Any “aliquot corner” (section, quarter-section, etc.) as described in the Public Land Survey System, shall be monumented per State of Colorado statutes. If such corner falls within asphalt or concrete, a monument box shall be installed per CDOT M&S Standard Plan No. M-629-1 to protect and provide access to respective corner. If such corner falls within soil, a witness post will be placed to identify the monument.

All range points shall be housed in a monument box as shown in the details on CDOT M&S Standard Plan No. M-629-1. Range boxes shall be set after the roadways, public or private, have been paved. The top of the range box shall be set approximately ¼” below finished grade.

The Town of Parker requires all plats, development plans, construction plans, utility plans, or any plan seeking approval from the Town to utilize the NAVD 1988 vertical datum. The Town of Parker will no longer accept the NGVD 1929 vertical datum.
3.11 VARIANCES

3.11.1 GENERAL

Consideration may be given for variances from the design standards in appropriate cases. It is the sole responsibility of the developer/permittee to request variances from this Manual in writing and provide supporting documentation. Variance requests must accompany the associated land-use application submittal (i.e. Site Plan, Preliminary Plan, etc.) and will be processed during the project’s standard referral period.

There are two types of variances that may be considered. The first is a request to vary from the minimum standards described herein (Minimum Standards Variance). The second type is a request to vary from the standard roadway section design (Alternate Roadway Section Design Variance).

Variances that create a unique benefit to the Town will be evaluated by a variance committee. This variance committee will include three (3) Town staff members, one (1) of which shall be a licensed professional engineer from the Engineering/Public Works Department. Depending on the nature of the variance and suggested unique benefit, the corresponding Department Director will assign the applicable staff to the committee.

The variance committee will review the request and prepare a written recommendation to the Director for use in making a final determination. The decision of the Director shall be final and is not subject to appeal.

3.11.2 MINIMUM STANDARDS VARIANCE

The Director may authorize a Minimum Standards Variance if each condition set forth below is satisfied. The decision of the Director shall be final and is not subject to appeal. These conditions include:

1. The application for Minimum Standards Variance shall not be considered by the Director unless the application is submitted before a preliminary plan is submitted to the Town for approval.

2. The developer/permittee shall submit to the Director documentation that will establish that the requested variance will result in a safe and quality design.

3. The Director must determine that the requested variance satisfies the following:
   a. The developer/permittee demonstrates that criteria contained herein are not appropriate when applied to the situation described in the application which the Director determines is unique.
   b. The developer/permittee is able to mitigate all impacts to the Town if the requested variance is granted.
   c. If applicable and upon Town’s request, the developer/permittee shall demonstrate that the requested variance will create a unique benefit to the Town.
d. The developer/permittee demonstrates that the requested variance will result in a level of safety, service, and quality equal to or greater than that established by the criteria contained in this Manual.

Satisfying the above-listed criteria does not require or obligate the variance request to be approved.

### 3.11.3 ALTERNATIVE ROADWAY SECTION DESIGN VARIANCE

The Director may authorize an Alternate Roadway Section Design if each condition set forth below is satisfied. The decision of the Director shall be final and is not subject to appeal. These conditions include:

1. The application for Alternate Roadway Section Design shall not be considered by the Director unless the application is submitted before the preliminary plan is submitted to the Town for approval.

2. The developer/permittee shall submit to the Director documentation that will establish that the requested variance will result in a safe and quality design.

3. The Director must determine that the requested variance satisfies the following:
   a. The developer/permittee is limited to a variation to the standard roadway section design for collectors or locals and not any of the other criteria contained in this Manual.
   b. The developer/permittee must demonstrate that the alternate roadway design satisfies all other requirements of the criteria contained in this Manual.
   c. The developer/permittee is able to mitigate all impacts to the Town if the requested variance is granted.
   d. If applicable and upon Town’s request, the developer/permittee shall demonstrate that the requested variance will create a unique benefit to the Town.
   e. The developer/permittee demonstrates that the requested variance will result in a level of safety, service, and quality equal or greater than that established by the criteria contained in this Manual.

Any Alternate Roadway Section Design Variance that is granted will be limited to the typical cross section of the alternate design approved by the Director and will not include any other approvals including, but not limited to, access, roadway connections, or other roadway design or construction issues.

Satisfying the above-listed criteria does not require or obligate the variance request to be approved.

### 3.12 REFERENCES


SECTION 3 3-13 NOVEMBER 2020


4.0 STREET CLASSIFICATION AND ROADWAY DESIGN
TECHNICAL CRITERIA

TABLE OF CONTENTS

4.1 INTRODUCTION ................................................................. 4-3

4.1.1 ARTERIAL STREETS ......................................................... 4-3
  4.1.1.1 Principal Arterial ...................................................... 4-3
  4.1.1.2 Arterial ................................................................. 4-4

4.1.2 COLLECTOR STREETS ....................................................... 4-5
  4.1.2.1 Major Collector ....................................................... 4-5
  4.1.2.2 Residential Boulevard Collector ............................. 4-6
  4.1.2.3 Residential Collector ............................................. 4-7
  4.1.2.4 Non-residential Collector ....................................... 4-7

4.1.3 LOCAL STREETS ............................................................ 4-8
  4.1.3.1 Residential Local Street .......................................... 4-8
  4.1.3.2 Non-residential Local Street .................................... 4-9
  4.1.3.3 Alleys ................................................................. 4-9
  4.1.3.4 Cul-de-sac Streets ................................................. 4-10

4.2 ROADWAY ACCESS ......................................................... 4-12

4.2.1 GENERAL POLICY ......................................................... 4-12

4.2.2 DESIGN POLICIES ......................................................... 4-13
  4.2.2.1 Driveway Widths ..................................................... 4-13
  4.2.2.2 Spacing ............................................................... 4-13
  4.2.2.3 Driveway Locations on Local Streets ...................... 4-14
  4.2.2.4 Service Entrances and Access Roads ...................... 4-14
  4.2.2.5 Auxiliary Acceleration and Deceleration Lanes ........ 4-14

4.3 ROADWAY DESIGN CRITERIA ............................................. 15

4.3.1 DESIGN CRITERIA SUMMARY ....................................... 4-15

4.3.2 HORIZONTAL ALIGNMENT ........................................... 4-17
  4.3.2.1 General ............................................................... 4-15
  4.3.2.2 Connectivity ......................................................... 4-15
  4.3.2.3 Horizontal Curves ................................................ 4-17

4.3.3 VERTICAL ALIGNMENT ................................................. 4-17
  4.3.3.1 Grade Breaks ......................................................... 4-17
  4.3.3.2 Allowable Grades ................................................ 4-18
4.3.4 INTERSECTIONS ........................................................................................................ 4-18
  4.3.4.1 General........................................................................................................... 4-18
  4.3.4.2 Permissible Intersection Grades ...................................................................... 4-18
  4.3.4.3 Minimum Curb Return Radii ........................................................................ 4-19

4.3.5 SIGHT DISTANCES .................................................................................................. 4-19
  4.3.5.1 General........................................................................................................... 4-19

4.3.6 ROADSIDE DESIGN CRITERIA ........................................................................... 4-20
  4.3.6.1 Recovery Zones ............................................................................................ 4-20
  4.3.6.2 Clear Zones .................................................................................................. 4-20
  4.3.6.3 Obstructions ................................................................................................ 4-20

4.3.7 ROUNDABOUT DESIGN .................................................................................... 4-20
  4.3.7.1 General........................................................................................................... 4-20

4.3.8 PARKING DESIGN AND LAYOUT ..................................................................... 4-20
  4.3.8.1 General........................................................................................................... 4-20

4.4 REFERENCES ............................................................................................................ 4-21
4.1 INTRODUCTION

Functional classification of streets provides the hierarchy necessary to accomplish the Town of Parker’s (the Town) mobility goals. Streets are divided into three primary classifications: arterial, collector, and local.

- Arterials are streets whose primary purpose is the efficient and continuous movement of through traffic.
- Collector streets shall collect traffic from local streets and channel it to arterials and vice versa.

Local streets provide for direct access to abutting properties and channel traffic to collectors. Cul-de-sac streets are open at one end only and provide the ability for vehicular traffic to turn around at the other end. Each street classification has design criteria which maintains and protects the primary purpose of the street. Functional classification is determined by Town staff using several criteria. A street, once classified, maintains that classification over its entire length, with the exception of those specifically identified in the Parker Transportation Master Plan. These functional classifications are described in the following section and are summarized in table 4-1. Further, the Standard Details noted within each street classification narrative can be found in appendix A.

All streets shall be designed in accordance with the standards provided in this Manual, with the exception of the Old Town streets. These streets are located in the downtown area and require custom design techniques to meet the high pedestrian volumes, right-of-way constraints and specialized character as described in the Parker Transportation Master Plan.

4.1.1 ARTERIAL STREETS

Arterial streets must meet design standards for horizontal and vertical alignments as described in section 4.3 (Roadway Design Criteria) of the Town of Parker Roadway Design and Construction Criteria Manual (the Manual).

4.1.1.1 Principal Arterial

A principal arterial has the following characteristics:

1. **FUNCTION:** The primary purpose of a principal arterial street is to permit rapid and relatively unimpeded traffic movement through or around the Town. Principal arterials should not bisect neighborhoods but should act as boundaries between them.

2. **ACCESS:** Direct access onto principal arterials from adjacent parcels of land will normally be prohibited but may be allowed with an approved traffic study. Approved access locations may require restricted movements. Local street and residential driveway access will be prohibited.

3. **SPEEDS:** The posted speed limit will be 45 miles per hour (mph) with a minimum design speed of 50 mph.
4. **RIGHT-OF-WAY (ROW):** A minimum ROW width of 170 feet with a typical section as shown in appendix A. Additional ROW shall be required should projected traffic volumes warrant. The need for additional ROW will be determined by the Town at the time the traffic study is reviewed or as part of the associated land development application. Arterial/arterial and arterial/collector intersections will reserve an additional 30 feet of ROW—15 feet on each side of the arterial—in all approach directions for additional lanes (see appendix A).

5. **TRAFFIC VOLUMES:** Projected traffic volume greater than 28,000 vehicles per day (vpd) at build-out; that is, when the area that the principal arterial serves is fully developed.

6. **PARKING:** No parking will be allowed on principal arterial streets.

7. **TRAFFIC CONTROL:** Traffic control is typically provided by traffic signals at a minimum of half-mile spacing after traffic signals have met Manual on Uniform Traffic Control Devices (MUTCD) warrants. Closer spacing will only be considered with an approved signal progression study. Intersections with principal arterial streets that do not meet MUTCD traffic signal warrants shall be controlled by stop signs for intersecting roadway and may have turn restrictions.

8. **CONTINUITY:** Principal arterials serve regional through traffic and must be continuous between arterial streets.

9. **THROUGH TRAVEL LANES:** Principal arterials have six through travel lanes.

10. **PEDESTRIAN CROSSINGS:** Crossings shall be designed to ensure pedestrian safety and optimum traffic efficiency. Regional trail crossings shall be grade separated. All other pedestrian crossings shall be located at signalized intersections or grade separated.

11. **OTHER:** Additional design will be required for bike lanes and potential transit routes such as, but not limited to, bus pullouts and analysis of curb return radii. Median landscaping will be required on arterial streets.

### 4.1.1.2 Arterial

An arterial has the following characteristics:

1. **FUNCTION:** The primary purpose of an arterial street is the efficient and continuous movement of through traffic. To facilitate this purpose, arterial street intersections will be limited to collectors and other arterial streets.

2. **ACCESS:** Direct access onto arterials from adjacent parcels of land will normally be prohibited but may be allowed with an approved traffic study. Approved access locations may require restricted movements. Local street and residential driveway access will be prohibited.

3. **SPEEDS:** The posted speed limit will be 40 mph with a minimum design speed of 45 mph.

4. **RIGHT-OF-WAY:** A minimum ROW width of 120 feet with a typical section as shown in appendix A. Additional ROW shall be required should projected traffic volumes warrant. The need for additional ROW will be determined by the Town at the time the traffic study is reviewed or as part of the associated land development application. Arterial/arterial and arterial/collector intersections will reserve an additional 30 feet of ROW—15 feet on each side of the arterial—in all approach directions for additional lanes (see appendix A).
5. **TRAFFIC VOLUMES:** Projected traffic volume greater than 12,000 vpd and less than 28,000 vpd at build-out; that is, when the area that the arterial serves is fully developed.

6. **PARKING:** No parking will be allowed on arterial streets.

7. **TRAFFIC CONTROL:** Traffic control is typically provided by traffic signals at a minimum of half-mile spacing after traffic signals have met MUTCD warrants. Closer spacing will only be considered with an approved signal progression study. Intersections with arterial streets that do not meet MUTCD traffic signal warrants shall be stop sign controlled.

8. **CONTINUITY:** Arterials serve through traffic and must be continuous between arterial streets.

9. **THROUGH TRAVEL LANES:** Arterials have four through travel lanes.

10. **PEDESTRIAN CROSSINGS:** Crossings shall be designed to ensure pedestrian safety and optimum traffic efficiency. Regional trail crossing shall be grade separated. All other pedestrian crossings shall be located at signalized intersections or grade separated.

11. **OTHER:** Additional design will be required for bike lanes and potential transit routes such as, but not limited to, bus pullouts and analysis of curb return radii. Median landscaping will be required on arterial streets.

### 4.1.2 COLLECTOR STREETS

Collectors function to direct traffic between local streets and arterial streets. Three types of collectors exist within the Town and are described below. All types of collectors must meet design standards for horizontal and vertical alignments as described in section 4.3 (Roadway Design Criteria) of the *Town of Parker Roadway Design and Construction Criteria Manual* (the Manual).

#### 4.1.2.1 Major Collector

A major collector has the following characteristics:

1. **FUNCTION:** The primary purpose of a major collector is to provide a moderate travel speed roadway that carries moderate volumes over medium and short travel distances providing intercommunity travel needs. These routes are not of regional significance and will provide a reasonable balance between direct access and mobility needs along with accommodations for bicyclists. Such collectors will provide for access, in commercial or other areas, to adjacent properties along the roadway.

2. **ACCESS:** Access to single properties is discouraged and individual access points may be granted by the Director. Joint access to multiple properties will be required where possible. Driveway access to residential units will not be allowed.

3. **SPEEDS:** A posted speed limit will be 35 mph with a minimum design speed of 40 mph.

4. **RIGHT-OF-WAY:** A minimum ROW of 110 feet with a typical section as shown in appendix A. Additional lanes and ROW may be necessary as determined by the Town approved traffic study or as part of the associated land development application.
5. **TRAFFIC VOLUMES**: Projected traffic volume of 8,000 to 20,000 vpd when the area that is served is fully developed.

6. **PARKING**: Parking will not be permitted on major collectors.

7. **TRAFFIC CONTROL**: Traffic control devices, such as traffic signals, shall not be spaced less than quarter-mile spacing unless reduced spacing is required to provide access to a parcel and the signal is determined to operate efficiently by a traffic study. Direct access points not controlled by traffic signals shall be controlled by stop signs. Access points may be restricted to right in/right out movements at any time as determined by the Town.

8. **CONTINUITY**: Major collectors shall be continuous between collectors and arterials.

9. **THROUGH TRAVEL LANES**: Major collector streets have four through travel lanes.

10. **PEDESTRIAN CROSSINGS**: Crossings shall be designed to ensure pedestrian safety and optimum traffic efficiency. Regional trail crossing shall be grade separated. All other pedestrian crossings shall be located at signalized intersections or grade separated.

11. **OTHER**: Additional design will be required for bike lanes and potential transit routes such as, but not limited to, bus pullouts and analysis of curb return radii. Median landscaping may be permitted where access spacing allows.

### 4.1.2.2 Residential Boulevard Collector

A residential boulevard collector has the following characteristics:

1. **FUNCTION**: The primary purpose of a residential boulevard collector is to move motorists, bicyclists, and pedestrians between local streets and arterial streets and provide access to parks and schools that serve residential neighborhoods. Such collectors will be allowed only within residential subdivisions.

2. **ACCESS**: Driveway access to residential units will not be allowed.

3. **SPEEDS**: The posted speed limit will be 35 mph with a minimum design speed of 40 mph.

4. **RIGHT-OF-WAY**: A minimum ROW of 80 feet with a typical section as shown in appendix A. Additional lanes and ROW may be required.

5. **TRAFFIC VOLUMES**: Projected traffic volume of 2,000 to 12,000 vpd when the area that the collector serves is fully developed.

6. **PARKING**: Parallel pull-out parking, per appendix A, shall be required adjacent to parks and schools or other land uses that require parking. Parking pull-outs shall not be located within the intersection sight triangle.

7. **TRAFFIC CONTROL**: Traffic control devices, such as traffic signals, shall not be spaced less than quarter-mile spacing. Direct access points not controlled by traffic signals shall be controlled by stop signs. Access points may be restricted to right in/right out movements at any time as determined by the Town.

8. **CONTINUITY**: Residential boulevard collectors shall be continuous between collectors and arterials.
9. **THROUGH TRAVEL LANES**: Residential boulevard collector streets have two through travel lanes.

10. **PEDESTRIAN CROSSINGS**: Crossings shall be designed to ensure pedestrian safety. Regional trail crossings shall be grade separated. All other pedestrian crossings shall be located at intersections or mid-block in accordance with Town standards.

11. **OTHER**: Additional design will be required for bike lanes and potential transit routes such as, but not limited to, bus pullouts and analysis of curb return radii. Median landscaping will be required on residential boulevard collectors.

### 4.1.2.3 Residential Collector

A residential collector has the following characteristics:

1. **FUNCTION**: The primary purpose of a residential collector is to move motorists, bicyclists, and pedestrians between local streets and arterial streets and provide access to parks and schools that serve residential neighborhoods. Such collectors will be allowed only within residential subdivisions.

2. **ACCESS**: Driveway access to residential units will not be allowed.

3. **SPEEDS**: The posted speed limit will be 30 mph with a minimum design speed of 35 mph.

4. **RIGHT-OF-WAY**: A minimum ROW of 70 feet with a typical section as shown in appendix A. Additional lanes and ROW may be required.

5. **TRAFFIC VOLUMES**: Projected traffic volume of 2,000 to 8,000 vpd when the area that the collector serves is fully developed.

6. **PARKING**: Parallel pull-out parking, per appendix A, shall be required adjacent to parks and schools or other land uses that require parking. Parking pull-outs shall not be located within the intersection sight triangle.

7. **TRAFFIC CONTROL**: Traffic control devices, such as traffic signals, shall not be spaced less than quarter-mile spacing. Direct access points not controlled by traffic signals shall be controlled by stop signs. Access points may be restricted to right in/right out movements at any time as determined by the Town.

8. **CONTINUITY**: Residential collectors shall be continuous between collectors and arterials.

9. **THROUGH TRAVEL LANES**: Residential collector streets have two through travel lanes.

10. **PEDESTRIAN CROSSINGS**: Crossings shall be designed to ensure pedestrian safety. Regional trail crossings shall be grade separated. All other pedestrian crossings shall be located at intersections or mid-block in accordance with Town standards.

11. **OTHER**: Additional design will be required for bike lanes and potential transit routes such as, but not limited to, bus pullouts and analysis of curb return radii.

### 4.1.2.4 Non-residential Collector

A non-residential collector has the following characteristics:
1. **FUNCTION**: The primary purpose of a non-residential collector will be to channel traffic from non-residential local streets to arterial streets with the secondary purpose to provide access to large sections of adjacent properties. Such collectors will provide for access, in commercial or other non-residential areas, to adjacent properties along the roadway.

2. **ACCESS**: Access to single properties is discouraged and individual access points may be granted by the Director. Joint access to multiple properties will be required where possible.

3. **SPEEDS**: A posted speed limit will be 35 mph with a minimum design speed of 40 mph.

4. **RIGHT-OF-WAY**: A minimum ROW of 80 feet with a typical section as shown in appendix A. Additional lanes and ROW may be required.

5. **TRAFFIC VOLUMES**: Projected traffic volume of 3,500 to 12,000 vpd when the area that is served is fully developed.

6. **PARKING**: Parking will not be permitted on non-residential collectors.

7. **TRAFFIC CONTROL**: Traffic control devices, such as traffic signals, shall not be spaced less than quarter-mile spacing. Direct access points not controlled by traffic signals shall be controlled by stop signs. Access points may be restricted to right in/right out movements at any time as determined by the Town.

8. **CONTINUITY**: Non-residential collectors shall be continuous between collectors and arterials.

9. **THROUGH TRAVEL LANES**: Non-residential collector streets have two through travel lanes.

10. **PEDESTRIAN CROSSINGS**: Crossings shall be designed to ensure pedestrian safety. Regional trail crossings shall be grade separated. All other pedestrian crossings shall be located at intersections or mid-block in accordance with Town standards.

11. **OTHER**: Non-residential collectors will not be permitted within residential subdivisions or local commercial areas within residential developments. Additional design will be required for bike lanes and potential transit routes such as, but not limited to, bus pullouts and analysis of curb return radii.

### 4.1.3 LOCAL STREETS

Local streets function to provide vehicular access to adjacent property. They are designed for the safety of pedestrians and bicyclists and ease of access to adjacent parcels of land. Two types of local streets exist within the Town and are described in the following sections. All types of local streets must meet design standards for horizontal and vertical alignments as described in section 4.3 (Roadway Design Criteria).

#### 4.1.3.1 Residential Local Street

A residential local street has the following characteristics:

1. **FUNCTION**: Residential local streets are intended to provide access to abutting land and private residences. They must intersect local or collector streets only.
2. **ACCESS:** Driveway access to residential units shall be provided.

3. **SPEEDS:** Posted speed limit of 25 mph with a minimum design speed of 30 mph.

4. **RIGHT-OF-WAY:** A minimum ROW of 55 feet with five-foot utility/pedestrian easements on both sides as shown in the typical section on appendix A.

5. **TRAFFIC VOLUMES:** Projected traffic volumes of less than 2,000 vpd.

6. **PARKING:** Parking will be permitted on local streets.

7. **TRAFFIC CONTROL:** Traffic control is by stop signs.

8. **CONTINUITY:** Vehicular travel distance from any residential lot or single access point to a collector street shall not exceed 1,500 feet.

9. **THROUGH TRAVEL LANES:** Residential local streets have two through travel lanes.

10. **OTHER:** Maximum block length (measured centerline to centerline) is 700 feet.

### 4.1.3.2 Non-residential Local Street

A non-residential local street has the following characteristics:

1. **FUNCTION:** Non-residential local streets are intended to provide access to non-residential parcels of land and must only intersect non-residential local streets or collector streets.

2. **ACCESS:** Access to single properties and individual access points will be permitted; however, joint access to multiple properties will be required where possible.

3. **SPEEDS:** Posted speed limit of 25 mph with a minimum design speed of 30 mph.

4. **RIGHT-OF-WAY:** A minimum ROW of 60 feet with a typical section as shown in appendix A.

5. **TRAFFIC VOLUMES:** Projected traffic volumes of less than 3,500 vpd.

6. **PARKING:** Parking will be allowed on non-residential local streets. No parking will be allowed within the intersection sight triangles.

7. **TRAFFIC CONTROL:** Traffic control is by stop signs.

8. **THROUGH TRAVEL LANES:** Non-residential local streets have two through travel lanes.

### 4.1.3.3 Alleys

An alley has the following characteristics:

1. **FUNCTION:** An alley will function as secondary access only. They must primarily intersect local streets or collector streets.

2. **ACCESS:** No alley shall dead-end. Combined travel distance to any lot from a single access point to a local street or collector street shall not exceed 700 feet.
3. **EASEMENT**: A minimum access easement of 20 feet shall be provided in accordance to the typical section shown in appendix A. The access easement shall be dedicated by plat to the representative Homeowners’ Association (HOA) or equivalent as a tract.

4. **PARKING**: No parking will be allowed within the 20-foot access easement. All provisions for parking shall be accommodated outside of the 20-foot access easement.

5. **TRAFFIC CONTROL**: Traffic control is by stop signs.

6. **CONTINUITY**: The maximum length of an alley shall not exceed 700 feet.

7. **OTHER**: Underground utilities, excluding storm water, may be located within the 20-foot access easement. All aboveground utilities or facilities shall be located outside of the 20-foot access easement.

   Alley to alley intersections may be considered if it is in a grid configuration.

   Offset T-intersections shall be avoided when tying alleys to local streets. If offset T-intersections are necessary, a 125-foot separation shall be required.

### 4.1.3.4 Cul-de-sac Streets

A cul-de-sac street has the following characteristics:

1. **FUNCTION**: Cul-de-sac streets are open only at one end and provide the ability for residential vehicular traffic to turn around at the closed end.

2. **RIGHT-OF-WAY**: Cul-de-sac streets are designed as a residential local street with a minimum 104-foot diameter ROW and a minimum 45-foot center point to flowline radius dimension at the bulb-out. See appendix A.

3. **LENGTH**: Cul-de-sac streets shall not exceed 500 feet in length. Cul-de-sac streets which intersect with residential or non-residential collectors shall not be less than 145 feet along the centerline. This distance shall be measured from the flowline of the collector to the center point of the cul-de-sac.

4. **DESIGN**: A landscaped median island may be allowed when the center point to flowline dimension at the bulb-out exceeds 45 feet. Turning templates around the median island will be required, as determined by Town staff.

5. **PARKING**: Parallel parking will be allowed on cul-de-sacs.

6. **OTHER**: Modified cul-de-sacs or “knuckles,” such as shown in appendix A, shall not be permitted along residential or non-residential collectors. Cul-de-sac streets will not be allowed on non-residential local streets.
### Table 4-1: Functional Street Classification Summary

<table>
<thead>
<tr>
<th></th>
<th>ARTERIAL STREETS</th>
<th>COLLECTOR STREETS</th>
<th>LOCAL STREETS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRINCIPAL ARTERIAL</td>
<td>ARTERIAL</td>
<td>Major</td>
</tr>
<tr>
<td>Through Travel Lanes</td>
<td>6</td>
<td>4 (1)</td>
<td>4</td>
</tr>
<tr>
<td>Build-out Traffic Projections (vehicles per day)</td>
<td>Over 28,000</td>
<td>12,000 to 28,000</td>
<td>8,000 to 20,000</td>
</tr>
<tr>
<td>Right-of-Way (minimum)</td>
<td>170 ft</td>
<td>120 ft (2)</td>
<td>110 ft</td>
</tr>
<tr>
<td>Typical Street Sections (See appendix A)</td>
<td>119’ FL-FL 30’ median</td>
<td>75’ FL-FL 16’ median</td>
<td>74’ FL-FL</td>
</tr>
<tr>
<td>Minimum Speeds (mph) Posted / Design</td>
<td>45 / 50</td>
<td>40 / 45</td>
<td>35 / 40</td>
</tr>
<tr>
<td>Parking Allowed (2)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Public Street Intersection</td>
<td>Arterials and Collectors</td>
<td>Arterials, Collectors and Locals</td>
<td></td>
</tr>
<tr>
<td>Private Driveway Access Allowed</td>
<td>Requires Traffic Study</td>
<td>Commercial Driveways may be Allowed</td>
<td>No Residential Driveways Allowed</td>
</tr>
<tr>
<td>Full-Movement Signalized Intersection Spacing (4)</td>
<td>half-mile</td>
<td>quarter-mile</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. Additional through travel lanes may be required based on an approved traffic study.
2. An additional 30 feet of ROW is required at intersections (15 feet on each side) for a minimum of 200 or 500 feet in all approach directions (see appendix A). Also, additional ROW may be required to accommodate additional travel or turning lanes based on traffic projections and traffic study recommendations.
3. No parking pull-outs are allowed within any intersection sight triangle.
4. Alternate spacing will be considered only with an approved traffic study.
5. A five-foot utility/pedestrian easement will be required on both sides of the street.
4.2 ROADWAY ACCESS

4.2.1 GENERAL POLICY

4.2.1.1 An access plan shall be submitted with all sketch plans. The access plan shall detail the type and location of the access and shall address all of the design policies stated in section 4.2.2. The access plan shall also address the traffic control devices and shall have sufficient detail to analyze the design for compliance with the criteria. Access plans shall not be included with any annexation documents.

4.2.1.2 An access permit shall be submitted and reviewed by the Public Works Department for each access point unless accesses are included on an approved site plan.

4.2.1.3 Rezoning, changes of use, changes of lot size or number of lots, or changes in structure location shall require the review of proposed and/or existing access points.

4.2.1.4 A traffic study (see section 5 for minimum requirements) shall accompany all requests for access onto arterial and collector streets. Driveway location and design will be related to the traffic volume and type. Off-site impacts shall be analyzed in all traffic studies.

4.2.1.5 Where access to one site is possible from two or more streets, access will be given to the street where all applicable access criteria can be met and as directed by the Town.

4.2.1.6 Residential subdivisions with 30 or more dwelling units shall be served by two access points. One of these access points shall be from a collector roadway.

4.2.1.7 Adjustments or improvements to existing infrastructure required by the Town, as a result of new land use or new access locations, shall be the responsibility of the developer/permittee. Adjustments may be a condition of the access permit, site plan, or plat.

4.2.1.8 A single access point per property owner/association will be allowed unless the traffic volumes developed in the traffic report show a demand for additional access points. Shared access at common property lines is required unless approved otherwise by the Director.

4.2.1.9 No backout driveways will be allowed except on residential local streets. No backout driveways for trucks or truck maneuvering within the roadway ROW will be allowed.

4.2.1.10 Commercial driveways will be reviewed based on an approved traffic study and will be considered on a case-by-case basis. Commercial driveways shall not exceed 1,000 vpd.
4.2.2 DESIGN POLICIES

4.2.2.1 Driveway Widths

The width of driveways shall be adequate to accommodate the type of vehicle(s) expected. Table 4-2 identifies typical driveway widths for residential and commercial-type properties. Turning templates may be required to determine the required width.

<table>
<thead>
<tr>
<th>TABLE 4-2 Driveway Widths (Typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Width</td>
</tr>
</tbody>
</table>

Driveways shall not be obstructed in any manner. “No Parking” signs and/or other appropriate notice that prohibits obstructions may be required and shall be maintained by the property owner.

4.2.2.2 Spacing

The minimum distance between non-residential driveways shall be 200 feet along collector streets and 100 feet along local streets. This applies to the distance between driveways on the same property and driveways on adjoining properties. Joint entrances will be required whenever physical conditions permit. The minimum distance from an intersecting street corner to the near side of a right in/right out driveway or other curb cut will be as shown in table 4-3.

<table>
<thead>
<tr>
<th>TABLE 4-3 Minimum Spacing between Corner Flowlines (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Classification</td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Principal Arterial / Arterial</td>
</tr>
<tr>
<td>Major Collector</td>
</tr>
<tr>
<td>Non-Residential Collector</td>
</tr>
<tr>
<td>Residential Boulevard Collector</td>
</tr>
<tr>
<td>Residential Collector</td>
</tr>
<tr>
<td>Residential &amp; Non-Residential Locals</td>
</tr>
</tbody>
</table>

Notes:
(1) Increased spacing may be required by acceleration/deceleration lane requirements or signal progression from traffic study.
(2) Spacing for commercial driveways on collectors will be a minimum of 200 feet.
(3) Spacing for commercial driveways on non-residential locals will be a minimum of 100 feet.
(4) Spacing for consecutive left turns as measured between access point flowline and start of next lane taper will be a minimum of 250 feet.
Intersections shall be spaced to provide adequate intersection sight distance for all movements entering and leaving public roadways. Where private roadways intersect public roadways, intersection sight distance shall be provided on both the public road and private road in accordance with AASHTO requirements. Access points on private roadways adjacent to such intersections shall be spaced to provide adequate intersection sight distance to incoming traffic from the public roadway.

Continuous collector streets shall not intersect the same side of an arterial street.

Driveways shall meet the street at an angle of 90 degrees whenever possible. The minimum entrance angle allowed will be 70 degrees.

4.2.2.3 Driveway Locations on Local Streets

Driveways that serve the corner lot of a residential local street shall be placed as far away from the intersection as possible.

Storm sewer inlets and associated curb transitions shall not conflict with driveways. It is the responsibility of the developer to coordinate the designs of the infrastructure and new residential lots to avoid driveway conflicts with storm sewer inlets or other similar infrastructure.

4.2.2.4 Service Entrances and Access Roads

All service entrances and access roads for emergency and oversized vehicle access, whether public or private streets, shall be a minimum of 24 feet wide, except where additional width is required for fire/life safety requirements, exclusive of curb and gutter, be paved, have a minimum vertical clearance of 13 feet 6 inches (subject to local fire district review and approval), and have a minimum 45-foot flowline radius turnaround.

4.2.2.5 Auxiliary Acceleration and Deceleration Lanes

The need for acceleration and deceleration lanes, taper lengths, and storage lengths shall be determined and designed in accordance with the latest version of the State of Colorado State Highway Access Code. The need for such lanes shall be presented in a traffic study. The following table translates the Town’s street classifications to the State Highway Access Code classifications.

<table>
<thead>
<tr>
<th>Town’s Roadway Classifications</th>
<th>State Highway Access Code Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Arterial (over 28,000 vpd)</td>
<td>NR-A</td>
</tr>
<tr>
<td>Arterial (12,000 to 28,000 vpd)</td>
<td>NR-B</td>
</tr>
<tr>
<td>Collector Streets</td>
<td>NR-C</td>
</tr>
</tbody>
</table>
The minimum left turn auxiliary lane shall be 100 feet in length, not including transit

4.3 ROADWAY DESIGN CRITERIA

This section sets forth the minimum design, technical criteria, and specifications to be used in the preparation of all roadway plans.

4.3.1 DESIGN CRITERIA SUMMARY

Table 4-5 shows a summary of the minimum roadway construction requirements and other related information.

4.3.2.1 General

These criteria outline the minimums for roadway design, and designers should strive to exceed the minimum design criteria.

Designs will generally conform to the transportation element of the Town Master Plan.

Roadways will be located with appropriate regard for topography, creeks, wooded areas, and other natural features that would enhance attractive development.

Dedication of half-streets will be prohibited.

Local roadways will be laid out so that their use by through traffic will be discouraged.

4.3.2.2 Connectivity

Existing roadways, including preliminary platted roadways, in adjoining territory will be continued with equal characteristics and in similar alignment and name with roadways proposed in the subdivision.

Roadway connections between adjacent developments will be provided. Collector street connections are preferred.

Where a roadway will eventually be extended beyond the plat, but is temporarily dead-ended, it must meet the intersection design criteria as defined in table 4-7. A sign must be posted on a permanent barricade stating that the roadway will be extended.
<table>
<thead>
<tr>
<th></th>
<th>ARTERIAL STREETS</th>
<th>COLLECTOR STREETS</th>
<th>LOCAL STREETS</th>
<th>ALLEYS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum Design Speed</strong></td>
<td>50 mph</td>
<td>45 mph</td>
<td>Residential</td>
<td>Non-residential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 mph</td>
<td>35 mph</td>
<td>40 mph</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 mph</td>
<td>Residential</td>
<td>Non-residential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 mph</td>
<td>30 mph</td>
<td>15 mph</td>
</tr>
<tr>
<td><strong>Minimum Centerline Radius (Normal Crown)</strong></td>
<td>7,220 ft</td>
<td>1,040 ft</td>
<td>770 ft</td>
<td>510 ft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>770 ft</td>
<td>770 ft</td>
</tr>
<tr>
<td><strong>Minimum Centerline Radius (with Superelevation)</strong></td>
<td>See Table 4-6</td>
<td>Superelevation Not Allowed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Horizontal Stopping Sight Distance (minimum)</strong></td>
<td>425 ft</td>
<td>360 ft</td>
<td>305 ft</td>
<td>250 ft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>305 ft</td>
<td>305 ft</td>
</tr>
<tr>
<td><strong>Reverse Curve Tangent (1) (minimum)</strong></td>
<td>200 ft</td>
<td>200 ft</td>
<td>150 ft</td>
<td>100 ft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150 ft</td>
<td>150 ft</td>
</tr>
<tr>
<td><strong>Approach Tangent at Intersections (minimum)</strong></td>
<td>250 ft</td>
<td>250 ft</td>
<td>100 ft</td>
<td>100 ft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100 ft</td>
<td>100 ft</td>
</tr>
<tr>
<td><strong>Roadway Grades (%) min / max</strong></td>
<td>1.0 / 6.0</td>
<td>1.0 / 6.0</td>
<td>1.0 / 6.0</td>
<td>1.0 / 6.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.0 / 6.0</td>
<td>1.0 / 6.0</td>
</tr>
<tr>
<td><strong>Stopping Sight Distance (minimum)</strong></td>
<td>425 ft</td>
<td>360 ft</td>
<td>305 ft</td>
<td>250 ft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>305 ft</td>
<td>305 ft</td>
</tr>
<tr>
<td><strong>K Values (min) (2) Crest / Sag</strong></td>
<td>85 / 100</td>
<td>65 / 80</td>
<td>45 / 65</td>
<td>30 / 50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>45 / 65</td>
<td>45 / 65</td>
</tr>
<tr>
<td><strong>Vertical Curve Length (minimum)</strong></td>
<td>150 ft</td>
<td>135 ft</td>
<td>120 ft</td>
<td>105 ft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120 ft</td>
<td>120 ft</td>
</tr>
<tr>
<td><strong>Permissible Intersection Grades</strong></td>
<td>See Table 4-7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum Curb Return Radii at Intersections</strong></td>
<td>See Table 4-8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
(1) The tangent length between reverse curves must accommodate superelevation runouts.
(2) Designers shall reference the SDECM for additional requirements.
4.3.2 HORIZONTAL ALIGNMENT

4.3.2.3 Horizontal Curves

Design controls for horizontal alignments are shown in Table 4-5 and Table 4-6.

<table>
<thead>
<tr>
<th>Rate of Superelevation</th>
<th>Alley</th>
<th>Local</th>
<th>Residential Collector</th>
<th>Collector</th>
<th>Arterial</th>
<th>Principal Arterial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Crown (1)</td>
<td>50</td>
<td>340</td>
<td>510</td>
<td>770</td>
<td>1,040</td>
<td>7,220</td>
</tr>
<tr>
<td>2%</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>800</td>
<td>4,940</td>
</tr>
<tr>
<td>3%</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>750</td>
<td>2,290</td>
</tr>
<tr>
<td>4%</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>720</td>
<td>926</td>
</tr>
</tbody>
</table>

Notes:
(1) Assumed to represent negative .02 for reverse side.
(2) Superelevation will not be allowed on alleys, local streets, and collector streets.

4.3.3 VERTICAL ALIGNMENT

This criterion is meant to outline the minimums for roadway design, and designers should strive to exceed the minimum design criteria.

Design controls for vertical alignments are shown in Table 4-5.

All vertical curves must be symmetrical parabolic curves and required stopping sight distance must be maintained.

4.3.3.1 Grade Breaks

The use of grade breaks in lieu of vertical curves is discouraged. If the difference in longitudinal grade does not exceed 0.5 percent along the roadway, the grade break may be allowed at the sole discretion of the Director.
4.3.3.2 Allowable Grades

The minimum allowable grade for roadways is 1 percent. The maximum allowable grade for roadways is shown in table 4-5.

4.3.4 INTERSECTIONS

4.3.4.1 General

Roadways shall intersect as close to right angles as possible. Maximum allowable deviation from 90 degrees shall be 12 degrees. Roadways, including preliminary platted roadways and anticipated roadways, in adjoining territory will be continued at the same angle and in similar alignment with proposed roadways.

Through lanes must be continuous through intersections for roadways with differing widths. A detail must be provided in the construction plans.

Cross streets with centerline offsets of less than 125 feet shall not be permitted.

ROW at all roadway intersections shall be sufficient to include curb ramps and traffic signal equipment.

Turning templates are required for collector-collector, collector-arterial, and arterial-arterial intersections.

4.3.4.2 Permissible Intersection Grades

Design controls for permissible intersection grades are shown in table 4-7.

<table>
<thead>
<tr>
<th>Major Street</th>
<th>Local</th>
<th>Collector</th>
<th>Arterial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>L - 100’</td>
<td>L - 100’</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>G - 4%</td>
<td>G - 4%</td>
<td>-</td>
</tr>
<tr>
<td>Collector</td>
<td>-</td>
<td>L - 200’</td>
<td>L - 200’</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>G - 3%</td>
<td>G - 3%</td>
</tr>
<tr>
<td>Arterial</td>
<td>-</td>
<td>-</td>
<td>L - 200’</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>G - 2%</td>
</tr>
</tbody>
</table>

Notes:

All measurements will be from the curb flowline of the intersecting roadway.

The longitudinal slope of the major street shall continue through the intersection and may be greater than the max “G” shown in the table except at arterials.

LEGEND:

G – Maximum Permissible Grade
L – Minimum Length of G at the Intersection Approach (measured from the flowline of the cross street)
4.3.4.3 Minimum Curb Return Radii

Design controls for minimum curb return radii are shown in table 4-8.

<table>
<thead>
<tr>
<th>Type of Intersection</th>
<th>Curb Radius (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local-Local</td>
<td>25</td>
</tr>
<tr>
<td>Local-Collector</td>
<td>25</td>
</tr>
<tr>
<td>Collector-Collector</td>
<td>30</td>
</tr>
<tr>
<td>Collector-Arterial</td>
<td>30 (b)</td>
</tr>
<tr>
<td>Arterial-Arterial</td>
<td>50 (b)</td>
</tr>
</tbody>
</table>

Notes:
(a) Curb radius measured from back of curb.
(b) Curb returns and pavement widths for turning roadways at Arterial intersections will be evaluated on a case by case basis.

4.3.5 SIGHT DISTANCES

4.3.5.1 General

At all roadway intersections, a clear sight distance and sight distance triangle must be maintained as shown in appendix A. This triangle will be either a dedicated ROW or a sight distance easement and will be shown on plats. Within this sight distance triangle, limited landscaping shall be allowed but no solid structures will be permitted. Solid structures shall include, but not be limited to, fences and utility boxes.

Consideration of initial and mature planting size shall be made for tree placement and canopies. Sight distance will not be compromised for landscaping. Landscaping within the intersection sight distance triangles will be limited to shrubs and plantings that at maturity will be no taller than two feet. Trees planted within the sight distance triangle will not be allowed. Raised medians will not be allowed. Landscaping within the sight distance triangle area and/or median area shall be maintained by the property owner or appropriate association.

The Town reserves the right to modify landscape and irrigation plans and plant locations during the construction process.

Because of the horizontal and vertical alignments, sight distances require a case-by-case analysis to determine the proper visual clearance needed. This analysis is required with submittal of site plans and construction plans and will be reviewed for approval by the Town.
4.3.6 ROADSIDE DESIGN CRITERIA

4.3.6.1 Recovery Zones

Recovery zone is the area adjacent to roadways that is needed to recover a vehicle when it leaves the roadway. This area must meet certain slope requirements and be clear from any obstructions or additional safety measures may be required. On foreslopes (also called fillslopes) a slope of 4:1 or flatter is considered recoverable. Non-recoverable foreslopes (slopes ranging from 3:1 to 4:1) shall be designed in accordance with the latest AASHTO Roadside Design Guide. Critical foreslopes (slopes steeper than 3:1) shall require guardrail or other form of roadside barrier if closer to the traveled roadway than the recommended clear zone distance (see section 4.3.6.2).

4.3.6.2 Clear Zones

Clear zones are the distance necessary to meet the recovery zone slope requirements for safe recovery of a vehicle in the event it leaves the roadway. Acceptable clear zone distance shall be determined utilizing the latest version of the AASHTO Roadside Design Guide for determining clear zone distance for slopes of 4:1 or flatter.

4.3.6.3 Obstructions

Roadside obstructions include non-traversable terrain and fixed objects (drainage structures, trees, buildings, retaining walls, etc.). Roadside obstructions within the clear zone are strongly discouraged. In the event that obstructions do exist within the clear zone, roadside barrier warrants shall be checked to determine if a roadside barrier is necessary. In the event warrants are met, the developer/permittee shall be responsible for providing an acceptable type of roadside barrier.

4.3.7 ROUNDABOUT DESIGN

4.3.7.1 General

Roundabouts will be evaluated by the Town and considered on a case-by-case basis. The Town may hire a specialist at the expense of the developer/permittee to review the validity and capacity of the design.

4.3.8 PARKING DESIGN AND LAYOUT

4.3.8.1 General

Typical 90 degree parking lots shall conform to the Town of Parker Land Development Ordinance. Where parking is angled or where one-way drive aisles adjacent to parking stalls are proposed, the parking lot design shall conform to the latest edition of the Institute of Transportation Engineers Traffic Engineering Handbook (TEH) utilizing “Parking Class A.” Where conflicts between the TEH and the Town of Parker Land Development Ordinance arise for such parking lot designs, the more stringent criteria shall apply.
4.4 REFERENCES


5.0 TRAFFIC IMPACT STUDY GUIDELINES

TABLE OF CONTENTS

5.1 INTRODUCTION ................................................................. 5-3

5.2 TIS SCOPE REQUIREMENTS ...................................................... 5-3

5.3 STANDARD TIS PROCEDURE ..................................................... 5-3

5.3.1 PRE-APPLICATION MEETING .............................................. 5-4
5.3.2 DETERMINATION OF BASE ASSUMPTIONS ......................... 5-5
5.3.3 PREPARATION OF A TIS ................................................... 5-5
5.3.4 TRAFFIC IMPACT STUDY OUTLINE ..................................... 5-5
5.3.5 SUBMITTAL OF A TIS ....................................................... 5-6
5.3.6 TOWN COMMENTS AND RECOMMENDATIONS ................... 5-6

5.4 REDEVELOPMENT TRAFFIC IMPACT STUDY ............................ 5-7

5.4.1 REDEVELOPMENT TIS QUALIFYING CONDITIONS .................. 5-7
5.4.2 PRE-APPLICATION MEETING .............................................. 5-7
5.4.3 DETERMINATION OF BASE ASSUMPTIONS ......................... 5-7
5.4.4 PREPARATION OF A TIS ................................................... 5-8
5.4.5 REDEVELOPMENT TRAFFIC IMPACT STUDY OUTLINE ................ 5-8
5.4.6 SUBMITTAL OF A TIS ....................................................... 5-9
5.4.7 TOWN COMMENTS AND RECOMMENDATIONS ................... 5-9

5.5 TRAFFIC IMPACT STUDY COMPLIANCE LETTER ......................... 5-9

5.5.1 COMPLIANCE LETTER TIS QUALIFYING CONDITIONS ............... 5-9
5.5.2 COMPARISON TO A STANDARD TIS ..................................... 5-10
5.5.3 SUBMITTAL OF A COMPLIANCE LETTER ....................... 5-10

5.6 TRAFFIC IMPACT STUDY SECTIONS ......................................... 5-11

5.6.1 INTRODUCTION/PROJECT DESCRIPTION ............................... 5-11
5.6.2 EXISTING CONDITIONS ................................................... 5-11
5.6.3 PROPOSED CONDITIONS .................................................. 5-11
5.6.3.1 Site Trip Generation .............................................. 5-11
5.6.3.2 Trip Distribution ................................................... 5-12
5.6.3.3 Site Traffic Volumes ................................................ 5-12
5.6.4 FUTURE CONDITIONS ...................................................... 5-12
5.6.4.1 Background Traffic Volumes ......................................... 5-12
5.6.4.2 Total Future Traffic Volumes ....................................... 5-12
5.6.5 SITE CIRCULATION AND DESIGN EVALUATION ................................................................. 5-12
  5.6.5.1 Level of Service ................................................................................................. 5-12
  5.6.5.2 Queuing ........................................................................................................... 5-13
  5.6.5.3 Traffic Control Devices .................................................................................. 5-13
  5.6.5.4 Safety ............................................................................................................... 5-13

5.6.6 PROPOSED MITIGATION MEASURES ................................................................. 5-13

5.6.7 CONCLUSIONS/RECOMMENDATIONS ......................................................... 5-14

5.6.8 APPENDIX ........................................................................................................... 5-14

5.7 REFERENCES ........................................................................................................... 5-14
5.1 INTRODUCTION

The importance of comprehensive and coordinated transportation is critical to the Town of Parker (the Town) in order to provide a functional transportation system. The application of sound design principles for new roadways, preserving roadway capacities in developed areas, providing smooth traffic flow and safe modes of travel are goals the Town must attain. In order for the Town to evaluate the impacts of development proposals on the Town’s transportation system, a professionally prepared traffic impact study (TIS) may be required. The TIS shall be prepared by a registered professional engineer licensed in Colorado with a background in traffic engineering. The developer/permittee is responsible for retaining the services of a transportation consultant engineer. Policies and technical criteria not specifically addressed in this section shall follow the latest guidelines as set forth by American Association of State Highway and Transportation Officials (AASHTO) and the Institute of Transportation Engineers (ITE). Wherever conflicts exist between outside criteria and these criteria, the criteria defined within this Roadway Design and Construction Manual (Manual) shall apply in the Town.

5.2 TIS SCOPE REQUIREMENTS

The need for a traffic impact study depends on site specific characteristics such as location, trip generation, existing road conditions, and type of development submittal. Requirements may vary from site to site.

- A TIS is generally required for all new development.
- A Redevelopment TIS may be allowed for parcel redevelopment if land use, trip generation, and parcel access are unchanged from prior uses. TIS requirements for the redevelopment of existing areas will be determined on a case-by-case basis.
- The TIS requirement may be waived if the average trip generation of the proposed project is less than 200 trips per day and 20 trips or less in the peak hour, or by special variance approved by the Director. If this condition is satisfied, a memo shall be prepared by the developer/permittee’s transportation consultant engineer showing the trip generation of the development and concluding that negligible transportation impacts are anticipated as a result of the proposed project.
- The overall development plan and not the phased implementation shall be considered for the TIS. Traffic impact related to the development of individual lots previously analyzed within a master TIS shall be confirmed with a Compliance Letter.
- The validity of a traffic study shall expire 18 months after the study is received by the Town. If a project has not been completely approved in that timeframe, a new traffic study with updated count information and project area assumptions may be required.

5.3 STANDARD TIS PROCEDURE

A Standard TIS is generally required whenever a parcel of land is first developed, undergoes a change in use, or requires change in access. TIS requirements for a parcel undergoing redevelopment may require a Standard TIS or fall under the guidelines of section 5.4 for a Redevelopment TIS.
The following steps outline the procedure the Town requires for the preparation and submittal of a Standard TIS:

- Pre-application meeting
- Determination of base assumptions
- Preparation of a TIS (as described later in these guidelines)
- Submittal of a TIS
- Town comments and recommendations (there may be more than one iteration of this step to address the Town’s concerns)

### 5.3.1 PRE-APPLICATION MEETING

Pre-application meetings can be arranged through the Town of Parker Engineering/Public Works Department. At the pre-application meeting, site-specific requirements can be discussed.

The developer/permittee’s transportation consultant engineer should attend this meeting. The developer/permittee will provide the following information at this meeting:

- Project description, including type of land uses (single family, restaurant type, etc.), and size (number of dwelling units, square footage, etc.)
- Preliminary project site plan, showing all proposed access locations and proposed land uses
- Anticipated project completion date and project phasing

The Town will review the developer/permittee’s project information and provide feedback as to any anticipated concerns regarding transportation issues such as access locations, access types, potential impacts on adjacent neighborhoods and initial identification of study area. This initial pre-application meeting will assist the Town and the developer/permittee in determining the base assumptions to be utilized in the TIS.

To avoid rework, it is advisable to discuss one or more of the following elements with the Town before proceeding with the full analysis and report preparation that is described later in these guidelines:

- Growth rates
- Time periods for the study
- Trip generation rates
- Trip adjustment factors
- Overall trip distribution
- Mode split assumptions
- Committed roadway improvements

After reviewing all project assumptions the Town will provide guidance on the need for a Standard TIS, a Redevelopment TIS, or a Compliance Letter.
5.3.2 DETERMINATION OF BASE ASSUMPTIONS

The following assumptions will be provided by the Town:

- **Study area boundaries**
- **Scope of traffic data collection**
- **Study intersections**
  - In general, all major driveways that intersect collector or arterial streets and adjacent arterial-arterial, arterial-collector, or collector-collector intersections are to be analyzed.
  - Local driveways or intersections may need analysis based on spacing, queues, or other operational concerns.
- **Study years**
  - Current
  - Project opening year (in phases, if more than 1 year apart)
  - Project design year (20 years from project opening)

Pedestrian movements will also be considered in the evaluation.

5.3.3 PREPARATION OF A TIS

The developer/permittee is responsible for the preparation of a traffic impact study.

Both AM and PM weekday peak hours will be studied to determine the critical movements. In atypical cases where a weekend and/or midday period may be more critical than the weekday peaks, these additional peak hours will need to be analyzed.

The standard checklist of required items shall be bound with the TIS. See appendix B for the TIS standard checklist.

5.3.4 TRAFFIC IMPACT STUDY OUTLINE

Details on requirements for the TIS outline items are found in section 5.6.

The TIS shall follow this general outline and include the following figures and tables:

- **Introduction/Project description**
  - Figure: vicinity map
  - Figure: proposed project site plan
- **Existing conditions**
  - Figure: existing roadway network and traffic volumes
  - Table: existing level of service (LOS) summary
- **Proposed conditions**
  - Site trip generation
Table: trip generation summary
Trip distribution
Figure: site trip distribution
Site traffic volumes
Figure: projected site traffic volumes

- Future conditions
  - Background traffic volumes
  - Figure: future background traffic volumes
  - Total future traffic volumes
  - Figure: total future traffic volumes

- Site circulation and design evaluation
  - Level of Service
  - Figure: LOS for future background traffic volumes
  - Figure: LOS for total future traffic volumes
  - Table: proposed future LOS summary
  - Queuing
  - Traffic control devices
  - Traffic signal progression
  - Safety

  - Proposed mitigation measures
    - Roadway modifications
    - Storage (turn bay) lengths
    - Taper lengths
    - New traffic control

- Conclusions/Recommendations
  - Figure: Recommended improvements/intersection lane configurations

- Appendix
  - Traffic count data
  - Traffic analysis reports
  - Time-Space diagrams (for any traffic signal modifications or new traffic signals)

### 5.3.5 SUBMITTAL OF A TIS

Four copies of the TIS are to be submitted to the Community Development Department as part of the Land Use Application along with other required preliminary development documents. The report shall be complete, in accordance with these guidelines, and be stamped and signed by the developer/permittee’s transportation consultant engineer.

### 5.3.6 TOWN COMMENTS AND RECOMMENDATIONS

The Town will evaluate the TIS and comments will be provided to the developer/permittee. Subsequent analysis may be requested regarding specific transportation issues. Depending on the nature of the comments, the submittal of a new report will be required. In some cases, minor comments raised by Town staff may be addressed in an addendum letter.
After all issues have been resolved, the Town will give notice that the developer/permittee may proceed with final design. If any significant changes to the development plan occur after this notice is given, the developer/permittee shall contact the Town’s Traffic Engineer to determine if the TIS process needs to be revisited.

5.4 REDEVELOPMENT TRAFFIC IMPACT STUDY

A TIS related to a site that has been previously developed may require a Standard TIS as described in section 5.3, or may be limited in scope as described in this section at the discretion of the Town’s Traffic Engineer.

5.4.1 REDEVELOPMENT TIS QUALIFYING CONDITIONS

A Redevelopment TIS may be considered if all of the following conditions are present:

- Trip generation between prior use and proposed use is less than or equal to the previous use
- Land use category (per the ITE Trip Generation Manual or Town definition) does not change
- Roadway network within the project area has no known flow, congestion, or safety deficiencies either currently or under the prior use
- Access to the redeveloped parcel is unchanged from the current condition

5.4.2 PRE-APPLICATION MEETING

Pre-application meetings can be arranged through the Town of Parker Engineering/Public Works Department. Site-specific requirements can be discussed.

The developer/permittee shall provide the following information at this meeting:

- Project description, including type of land uses (single family, restaurant type, etc.), and size (number of dwelling units, square footage, etc.)
- Preliminary project site plan, showing all proposed access locations and proposed land uses
- Comparison with previous uses
- Identification of site deficiencies (if applicable)

The Town’s Traffic Engineer will identify at the pre-application meeting which sections as identified in the TIS standard checklist will need to be included with the TIS.

5.4.3 DETERMINATION OF BASE ASSUMPTIONS

The following assumptions will be provided by the Town:

- Study area boundaries
- Scope of traffic data collection
- Study intersections
In general, all major driveways that intersect collector or arterial streets and adjacent arterial-arterial, arterial-collector, or collector-collector intersections are to be analyzed. Local driveways or intersections may need analysis based on spacing, queues, or other operational concerns.

- Study years (typical years shown below)
  - Current
  - Project opening year (in phases, if more than one year apart)
  - Project design year (20 years from project opening)

Pedestrian movements shall also be considered in the evaluation.

### 5.4.4 PREPARATION OF A TIS

The site developer/permittee is responsible for the preparation of a traffic impact study.

In the case of redevelopment, LOS calculations may be required at the discretion of the Town’s Traffic Engineer.

An abbreviated version of the standard checklist of required items shall be bound with the TIS. See appendix B for the TIS standard checklist.

### 5.4.5 REDEVELOPMENT TRAFFIC IMPACT STUDY OUTLINE

Details on requirements for the TIS Outline items are found in section 5.6.

The Redevelopment TIS shall follow this general outline and include at a minimum the following figures and tables:

- **Introduction/Project description**
  - Figure: vicinity map
  - Figure: proposed project site plan

- **Historic conditions**
  - Original site trip generation
  - Figure: original project site plan
  - Figure: original site trip distribution

- **Existing conditions**
  - Figure: existing roadway network and traffic volumes
  - Current site uses
  - Noted site deficiencies (if any)

- **Proposed conditions**
  - Site trip generation
  - Table: trip generation summary
  - Table: comparison of historic and proposed uses
  - Trip distribution
  - Figure: site trip distribution
  - Site traffic volumes
Conclusions/Recommendations

- Compare/Contrast historic use with proposed use
- Finding of no significant change to any site attributes
  - Operations
  - Access
  - Parcel layout

Appendix

- Traffic count data
- Traffic analysis reports

5.4.6 SUBMITTAL OF A TIS

Four copies of the TIS are to be submitted to the Community Development Department as part of the Land Use Application along with other required preliminary development documents. The report shall be complete, in accordance with these guidelines and be stamped and signed by the developer/permittee’s transportation consultant engineer.

5.4.7 TOWN COMMENTS AND RECOMMENDATIONS

The Town will evaluate the TIS and comments regarding the TIS will be provided to the developer/permittee. Subsequent analysis may be requested regarding specific transportation issues. Depending on the nature of the comments, the submittal of a new report may be required. In some cases, minor comments raised by Town staff may be addressed in an addendum letter.

After all issues have been resolved, the Town will give notice that the developer/permittee may proceed with final design. If any significant changes to the development plan occur after this notice is given, the developer/permittee shall contact the Town Traffic Engineer to determine if the TIS process needs to be revisited.

5.5 TRAFFIC IMPACT STUDY COMPLIANCE LETTER

A Standard TIS approved for a site that has been master planned may be used as reference for the further development of individual lots or subareas. The required TIS for subareas may take the form of a TIS Compliance Letter. The developer/permittee in this case may submit a Compliance Letter confirming the original Standard TIS validity as related to the current application. The Town may also require additional information beyond the Compliance Letter.

5.5.1 COMPLIANCE LETTER TIS QUALIFYING CONDITIONS

A TIS Compliance Letter may be considered if all of the following conditions are present:

- A Standard TIS for the entire master planned area has been completed and approved by the Town.
- Trip Generation (per the ITE Trip Generation Manual) for a lot or subarea is less than or equal to the Standard TIS.
Trip distribution and intersection volume projections for the lot or subarea are less than or equal to those found in the Standard TIS.

Access to the lot or subarea is unchanged from the Standard TIS.

The Standard TIS to be used as base reference is current per section 5.2. If the Standard TIS is out of date, additional data collection and analysis may be required.

**5.5.2 COMPARISON TO A STANDARD TIS**

The developer/permittee shall demonstrate that the traffic associated with the current application was considered under the Standard TIS. Typical comparisons include:

- Trip generation of the proposed use
- Preliminary project site plan showing all proposed access locations and proposed land uses
- Copy of Standard TIS trip generation and access point data
- Notation of any changes between Standard TIS and current application
- Identification of site deficiencies (if applicable)
- Statement of conformance with Standard TIS and suitability of any required improvements noted in the Standard TIS.

**5.5.3 SUBMITTAL OF A COMPLIANCE LETTER**

The developer/permittee will provide the following information in a letter prepared, stamped, and signed by its transportation consultant engineer.

The Compliance Letter shall include at a minimum the following figures and tables:

- Introduction/Project description
  - Figure: vicinity map
  - Figure: proposed project site plan
- Proposed conditions
  - Site trip generation
  - Table: trip generation summary
  - Table: comparison of standard TIS trip generation and proposed site uses
- Conclusions/Recommendations
  - Compare/Contrast standard TIS with proposed site
  - Finding of no significant change to any site attributes
    - Operations
    - Access
    - Parcel layout
  - Conclusion page(s) of standard TIS
- Appendix
  - Cover page of standard TIS
  - Trip generation page(s) of standard TIS
  - Master site plan
5.6 TRAFFIC IMPACT STUDY SECTIONS

Sections of the TIS should include the following elements:

5.6.1 INTRODUCTION/PROJECT DESCRIPTION

This section will include a project description and site plan showing proposed land use with access locations and types (signalized, right in/right out, etc.) and distances between adjacent accesses illustrated. Location of parking areas and parking capacity for the land use should be discussed, if appropriate. Any proposed project construction phasing will be discussed with the anticipated completion date(s).

A summary of current and proposed zoning is to be included. The land use and zoning discussion shall also include areas that are within the study area but are not part of the development for which this TIS is being prepared. The Town can provide assistance regarding assumptions about adjacent vacant land that is not part of this development proposal.

5.6.2 EXISTING CONDITIONS

Traffic data along adjacent roadway segments and at study intersections should be obtained through new counts or other counts not more than one year old that also account for seasonal variations. Roadway segment counts should typically be no more than one year old and intersection counts should typically be no more than six months old. If substantial changes have occurred to either the transportation network or nearby land uses since existing counts were taken, then new counts will need to be collected by the developer/permittee. Raw traffic count data (including ADT [Average Daily Traffic] counts and peak hour turning movements) shall be provided in the appendices of the TIS. A graphic of the existing turning movements at all study intersections shall be included.

5.6.3 PROPOSED CONDITIONS

The following shall be provided for each future year (opening year, phased year, design year), as defined by the Town after the pre-application meeting. All estimates of generation, distribution, modal split and assignment are subject to review and approval by the Town staff.

5.6.3.1 Site Trip Generation

A trip generation summary table listing each type of land use, acreage, average trip generation rates used (total daily traffic and AM/PM peak hours) and resultant total trips generated should be provided. Trip generation will be based on average rates contained within the most recent ITE Trip Generation Guide. The ITE land use type, with number, shall be provided for each land use. The Town’s Traffic Engineer will need to approve any estimated rates in the event that data is not available for the proposed land use.

Internal trips will not exceed 10 percent. Pass-by traffic reductions in generation volumes may be considered, if applicable. Pass-by reductions shall not exceed 15 percent without the review and approval by the Town’s Traffic Engineer.
For modal split, any assumptions regarding trips that will access the site using transit, pedestrian, or bicycle modes shall be described. Justifications for the reasonableness of these assumptions are to be provided.

5.6.3.2 Trip Distribution
Site trip distribution will be presented in a figure. The methods and assumptions used for this task shall be clearly stated, including anticipated customer base and expected travel patterns.

5.6.3.3 Site Traffic Volumes
Daily and peak hour site traffic volumes on study area roadways will be illustrated in appropriate figure(s).

5.6.4 FUTURE CONDITIONS

5.6.4.1 Background Traffic Volumes
Changes to the transportation network that are expected to be made independent of this proposed development will be described. This includes road widening, new roads, and intersection modifications (e.g., new signalization, turn bay modifications, etc.).

Background traffic volumes on existing and new roads and intersections will be estimated and illustrated in a figure. Background volumes may come from the application of growth rates to existing volumes, traffic models, or a combination of the two.

5.6.4.2 Total Future Traffic Volumes
Total future traffic volume is the sum of the projected background traffic and project site traffic. Graphics will be provided that show the daily and AM/PM peak hour traffic for each of the study years.

5.6.5 SITE CIRCULATION AND DESIGN EVALUATION
The operational analysis will show impacts on the existing roadway system and the expected future roadway system. Pedestrian/bicycle movements will need to be considered in the evaluation. Parking capacity within the site may also need to be considered. The latest version of the Highway Capacity Manual (HCM) methods for operational analysis will be used to evaluate intersection operations. Traffic analysis software that implements HCM methods, such as Synchro, is acceptable. Outputs from the operational analysis software are to be included in the appendices of the TIS.

5.6.5.1 Level of Service
The Level of Service, as defined in the latest version of the HCM, will serve as the primary means for evaluating traffic operations. Any deviations from the analysis procedures or default variables presented in HCM should be discussed.

The overall intersection will need to operate at LOS C or better for each peak period of every study year. If any study area intersections have an LOS D or worse for the existing case, the appropriate future LOS requirements will need to be established through discussion with the Town. No approach or movement of an intersection shall fall below LOS E.
Mitigation measures may be applied at any intersections not meeting LOS C.

5.6.5.2 Queuing

Queuing analyses will be completed to identify appropriate vehicle storage at intersections. The queuing analyses should indicate that available vehicle storage will be adequate 95 percent of the time during peak hours. If additional turn, acceleration or deceleration lanes are recommended, include calculations for the length of the turn bay lanes as an appendix and discuss the results in the text. The minimum storage length required by the Town is 100 feet.

For closely spaced intersections or other complex analysis (as determined by the Town’s Traffic Engineer), microsimulation of queuing characteristics during peak hours may be required.

5.6.5.3 Traffic Control Devices

Traffic progression on Town roadways is of paramount importance. Consequently, potential signalized intersections should be placed at minimum half-mile intervals on arterials and at minimum quarter-mile intervals on collectors. Other locations will be considered based on the following criteria:

- Progression band width will be 40-second minimum in both directions
- Cycle length will be 120 seconds or as directed by the Town Traffic Engineer
- Progression speed will be the speed limit of the study roadway
- Minimum splits for left turns shall be 11 seconds
- Minimum splits for through movements shall be 15 seconds

A time-space diagram for each analysis period shall be prepared if new signals or modifications are expected.

5.6.5.4 Safety

This section identifies traffic safety hazards in the area which may be adversely affected or created by the layout or traffic volumes of the project site. The evaluation of safety should consider such items as sight distance (based on AASHTO criteria), driveway approach grades, angles of road intersections, and backing of vehicles. An example of a potential hazard would include placement of a driveway or unsignalized intersection where driver sight distance would be limited due to vertical and/or horizontal roadway alignment or the placement of fences/landscaping. Potential traffic hazards affecting pedestrian movements should also be identified.

5.6.6 PROPOSED MITIGATION MEASURES

In the event that the analysis indicates unsatisfactory levels of service (LOS D or worse) for the study area roadways, a description of proposed improvements to mitigate deficiencies shall be provided. Mitigations should provide for an acceptable level of service in all study years for all intersection movements. The location, nature and extent of proposed improvements are to ensure sufficient roadway capacity and address safety and multimodal issues, such as bike and pedestrian access.
Depending on the problems that exist, possible mitigations might include:

- Access consolidation—consolidating existing and proposed accesses shall be considered when a proposed new access is located close to another access.
- Turn lanes—exclusive turn lanes and/or acceleration and deceleration lanes for both left turns in and out, as well as for right turns in and out, shall be considered when traffic volumes and speeds dictate them. Refer to the CDOT Access Code for typical thresholds. Minimum turn bay storage length shall be 100 feet.
- Access turn restrictions—right in/right out access or three-quarter movement restrictions shall be considered at accesses where high accident rates, sight distance concerns, inadequate gaps, or long delays are expected.
- New or modified traffic signals—new traffic signals shall be considered for accesses or intersections when warranted by the methodology outlined in the MUTCD. Modifications to existing traffic signal timing, phasing, or configuration shall be considered when high traffic volumes or delays are expected.

The developer/permittee shall be responsible for the cost of any mitigation plan for the development’s on-site and off-site impacts. All mitigation plans shall be approved by the Town of Parker.

5.6.7 CONCLUSIONS/RECOMMENDATIONS

The last section of the TIS must be a clear, concise description of the study findings. It is anticipated that this concluding section will serve as an executive summary outlining key issues and proposed mitigation measures.

This section shall include a figure illustrating the proposed improvements and proposed lane configurations at all study intersections.

5.6.8 APPENDIX

The report appendix shall include any traffic counts, time-space diagrams, and the traffic analysis software output reports for all of the periods analyzed.

5.7 REFERENCES


6.0 PAVEMENT SECTION DESIGN

TABLE OF CONTENTS

6.1 INTRODUCTION ................................................................................................................................. 6-2

6.2 PAVEMENT DESIGN REPORT.................................................................................................................. 6-2

6.2.1 GENERAL........................................................................................................................................ 6-2
6.2.2 DEFAULT PAVEMENT SECTION FOR RESIDENTIAL LOCAL ROADWAYS.................................6-2
6.2.3 GEOTECHNICAL INVESTIGATION........................................................................................................6-3
6.2.4 DESIGN ANALYSIS, FLEXIBLE PAVEMENTS..................................................................................6-4
6.2.5 DESIGN ANALYSIS, RIGID PAVEMENTS...................................................................................... 6-5

6.3 MINIMUM PAVEMENT SECTIONS ......................................................................................................... 6-5

6.4 MITIGATION ........................................................................................................................................ 6-6

6.5 SUBGRADE STABILIZATION .................................................................................................................... 6-7

6.6 REFERENCES ....................................................................................................................................... 6-9
6.1 INTRODUCTION

The pavement section consists of the subgrade soils and structural layers. The design of a pavement structure is based on an analysis of the subgrade soils, traffic, and the constructed material layers. All pavement sections in the Town of Parker (the Town) shall be designed according to the AASHTO Guide for Design of Pavement Structures (1993) and the criteria presented here.

Analysis of the subgrade is accomplished by investigating the soils to depths of 5 or 10 feet. The most significant depth is the upper four feet below the proposed subgrade elevation. The investigation includes determining the soil profile, laboratory testing, and considering the adjacent as well as regional environment. The traffic is determined by a traffic study or the Town's classification of the street. The traffic is reduced to a value of Equivalent Single Axle Loads (ESALs) applications for use in calculations. Table 6-1 provides the minimum Equivalent (18 kip) Daily Load Applications (EDLA). The standard design life is 20 years for flexible pavements and 30 years for rigid pavements. The pavement structural layers such as aggregate base course, asphalt, and Portland cement concrete overlie the processed subgrade, which may be chemically or mechanically stabilized.

6.2 PAVEMENT DESIGN REPORT

6.2.1 GENERAL

A Pavement Design Report is required for any new paved street and/or public parking lot proposed for construction within the Town's right-of-way (ROW) and/or Town property. The report shall consist of a description of the project with graphics, a geotechnical investigation, and pavement thickness design that establishes the pavement section. An electronic copy, signed and sealed, of report must be submitted a minimum of 21 days before paving begins. No paving may begin without written approval of the Pavement Design Report. As a minimum, the Pavement Design Report shall include:

- A description of the project, street classification (and source of information), number of lanes, and length of each type of street.
- A vicinity map showing the project location with adjoining streets named, scale to be no less than 1” = 1,000’ and no more than 1” = 200’.
- A scaled map showing the specific roadways covered by the design. This map should be included as part of the geotechnical investigation.

6.2.2 DEFAULT PAVEMENT SECTION FOR RESIDENTIAL LOCAL ROADWAYS

Where the developer/permittee desires to forgo a Pavement Design Report, for residential local streets only, a default pavement section may be considered with prior approval of the Director. Assuming the developer/permittee has already obtained geotechnical data from general site development, the following information must be provided to the Director for the review and consideration of all proposed default pavement sections:
• A description of the project, the proposed streets for which the proposed default pavement section is being considered, length of each street and the projected ESALs from the associated traffic impact study.

• A vicinity map showing the location of all bore/soil data that is clearly labeled.

• A data table that includes the Group Index, Plasticity Index, Swell data/potential and groundwater depths for all bores and soil data labeled on the vicinity map.

• Construction Plans that show the overlot grading, including all cut/fill information and the depth of the proposed utilities.

A default pavement section will be considered for residential local streets only, where testing indicates a Group Index less than 20, a Swell or Consolidation potential less than 2%, a Plasticity Index less than 30, and a compacted dry density greater than 90 pcf.

The default pavement section shall consist of five (5) inches of HMA over eight (8) inches of ABC Class 6. The subgrade shall be scarified and processed with moisture and density control to a depth of twelve (12) inches.

**6.2.3 GEOTECHNICAL INVESTIGATION**

The Pavement Design Report will be prepared, stamped, and signed by a professional engineer registered in the State of Colorado and specializing in geotechnical engineering. The report will describe the methods and procedures used in the field exploration. Geotechnical investigations will address mitigation of expansive soils if expansive soils are present. Expansive soils will include soils which have a swell potential equal to or greater than 2 percent when tested in a swell device or consolidometer under a surcharge of 200 psf and any soils which have the potential to damage the facilities through swell. The Pavement Design Report must address any unusual soil condition, such as very high swell potential, collapse potential, low density (less than 90 pcf) soils or a shallow water table. As a minimum, the following standards and items will apply:

1. A description of the site, previous uses, adjacent property, and the impact on the current project will be included.
2. The date of the field work shall be included.
3. Evaluation of the stability of cuts, fills, and natural slopes shall be documented.
4. Exploratory borings or pits should be at rough subgrade and spaced no more than 250 feet apart with a minimum of three holes per project and minimum of two holes per roadway (2 holes if roadway length is greater than 250 feet, one hole if less than 250 feet). Spacing should be decreased to account for site-specific and project-specific conditions. Samples shall be taken based on proposed subgrade elevation after grading is complete and utilities are installed and backfilled.
5. The depth of exploration below the bottom of the pavement is to be at least five feet deep with at least one boring to a depth of 10 feet. A 10-foot-deep boring shall be required for every five borings.
6. Sampling shall be done with a California sampler or similar device to retrieve a relative undisturbed sample for testing. Cohesionless (GP, GW, SP, SW) soils may be sampled with a standard split spoon. Bulk disturbed samples also should be obtained.
7. Relatively undisturbed samples should be obtained within two and four feet of proposed subgrade elevation as well as where soil types change. Bulk samples should be obtained from subgrade to a maximum depth of five feet unless unusual soil types are encountered and explained. Bulk samples within the upper five (5) feet will be used for Proctor and R-value testing. Bulk samples of similar soils may be combined.

8. If encountered, the depth to groundwater will be documented and measured at least one day after drilling.

9. Laboratory testing of samples should be conducted in accordance with the testing standards in Table 6-2 at the end of this section.

10. Evaluation of material compatibility and any separation requirements if needed will be documented.

11. Evaluation of adverse reactions between soils, groundwater, and substances within the soil or groundwater with concrete, metal, soil additives, and other substances or construction materials will be documented.

12. Samples should be classified in the field according to the Unified System.

The Geotechnical Investigation shall also include the following exhibits:

- A scaled map of the project roadways displaying boring or pit locations, street names and classification, limits of soil types, soil classification, and limits of mitigation. If there is sufficient room, the pavement section may be included; however for clarity, additional figures or tables may be required to present the data.

- Laboratory test results, such as gradation, swell/consolidation, Proctor moisture density curves, and R-values should be graphically displayed.

- A summary table of laboratory test results is to be included showing the AASHTO classification and Group Index.

6.2.4 DESIGN ANALYSIS, FLEXIBLE PAVEMENTS

Refer to the AASHTO Guide for Design of Pavement Structures (1993) for the design of flexible pavements, such as hot mix asphalt (HMA).

1. State the methodology used.
2. Classify soils by the AASHTO system including group index.
3. Select the design soil(s).
4. The 18-kip ESAL used for design will be based on the projected traffic, vehicle mix, and construction truck traffic. The ESALs shall be calculated, but not less than the minimum ESALs shown in table 6-1. Indicate the traffic ESALs and source of number. Traffic studies are required for Arterial and Major Collector streets. Trucks shall be assumed to be a minimum of 4% of the ADT, with 2% being single unit trucks and 2% being combination units.
5. Utilize serviceability loss, reliability and standard deviation found in the AASHTO Manual also shown in Table 6-1.
6. Determine the Resilient Modulus (MR) (psi) either from a test or convert from R-value. A maximum R-value of 25 may be used for subbase material, when supported by testing. Third-party testing may be required by the Town to confirm subbase properties.
TOWN OF PARKER ROADWAY DESIGN AND CONSTRUCTION CRITERIA MANUAL


7. Use one of the Metropolitan Government Pavement Engineers Council (MGPEC) recommended computer programs to solve the AASHTO formula to determine the Design Structural Number (SN).

8. Calculate the pavement thickness from the equation:  SN = a_1(D_1) + a_2(D_2) + a_3(D_3).
   Where: a_1, a_2, etc. = strength coefficients for the following;
   - Hot mix asphalt = 0.44,
   - CDOT Class 6 aggregate base course = 0.12 (minimum R-value of 78)

D_1, D_2, etc. = thickness of pavement layers in inches

9. Round up the pavement section to the nearest half-inch and the aggregate base course thickness to the nearest inch.

10. Thickness of the Aggregate Base Course (ABC) (Class 6) section shall range between 6 and 8 inches for local streets and 8 to 12 inches for collector and arterial streets.

11. The minimum acceptable HMA pavement thickness is five (5) inches for local streets, six (6) inches for residential and residential boulevard collectors, and (8) for all other classifications.

12. Collector and arterial roadways shall use PG 64-22 grade asphalt, with the exception of arterial roadways, which shall use SMA PG 76-28 for the surface course (2-inch minimum). Local roadways shall use PG 58-28 grade for all asphalt.

6.2.5 DESIGN ANALYSIS, RIGID PAVEMENTS

Refer to the AASHTO Guide for Design of Pavement Structures (1993) for the design of rigid pavements, such as Portland cement concrete (PCC).

1. Select a Modulus of Subgrade Reaction (k-value) based on the results of R-value testing and the soil type and properties, and modify it to arrive at the effective k-value. A maximum R-value of 25 may be used for subbase material, when supported by testing. Third-party testing may be required by the Town to confirm subbase properties.

2. Select values for design from the AASHTO Manual.

3. Utilize ESALs based on traffic study, but not less than the minimum ESALs shown in table 6-1. Note that equivalency factors for trucks are greater for PCC than for flexible pavement, if calculating using traffic study information. Trucks shall be assumed to be 4% of the ADT, with 2% being single unit trucks and 2% being combination units.

4. Use one of the MGPEC recommended computer programs to solve AASHTO formula for pavement thickness.

5. Round up the pavement thickness to the nearest half-inch and the aggregate base course thickness to the nearest inch.

6. A minimum 4-inch section of ABC (Class 6) shall be used below the PCC.

7. The minimum acceptable PCC pavement thickness is seven (7) inches.

8. All rigid pavements in the Town shall utilize load transfer dowels and tie bars per CDOT M&S Standards.

6.3 MINIMUM PAVEMENT SECTIONS
The Town requires that all publicly maintained streets and facilities located on Town-owned properties be paved using a composite Asphaltic Concrete or Portland Cement Concrete and Aggregate Base Course section.

The following are considered to be minimum acceptable pavement sections:

**Hot Mix Asphalt**
- Locals: Five (5) inches HMA over six (6) inches ABC (Class 6).
- Residential Collectors: Six (6) inches HMA over eight (8) inches ABC (Class 6)
- Major Collectors and Arterials: Eight (8) inches HMA over eight (8) inches ABC (Class 6)

**Portland Cement Concrete** - Seven (7) inches PCC over four (4) inches ABC (Class 6).

If the developer/permittee intends to construct the minimum pavement section for local residential streets, a Pavement Design Report confirming the section’s adequacy for the project must be submitted to the Director for review and approval.

### 6.4 MITIGATION

If the swell potential, as determined by the test in table 6-2, is more than 2 percent, expansive soil mitigation is required. Mitigation methods for expansive soils shall effectively reduce the swell to a value which will not damage the facilities during the design life of the facilities. The preferred method of mitigation is excavation of expansive materials and replacement with non-expansive fill. Subexcavation of the expansive materials and replacement of the material at a controlled moisture and density is acceptable in the event that the swell can be reduced to no more than 2 percent. The reduction of the swell must be substantiated by laboratory testing. The subexcavation depths should be based on representative swell potential of the in-situ subgrade soils. The following are the minimum required depths of subexcavation based on the swell potential:

- <2 percent: 12 inches of moisture conditioning and recompaction
- 2 to 5 percent: 3 feet of moisture conditioning and recompaction
- >5 percent: 5 feet of moisture conditioning and recompaction

Where the sidewalk is attached to the back of curb, limits of swell mitigation shall extend one foot beyond the back of sidewalk. Where the sidewalk is not attached to the curb, treatment shall extend one foot beyond the back of curb. Design of replacement fills will address drainage of the fill and separation of dissimilar materials, as well as the swell potential. Approval of alternative mitigation methods shall be at the sole discretion of the Director.

Other soil conditions, such as collapsing soils, low density soils, and shallow water table may require mitigation. The Geotechnical Report must address any unusual soil conditions.

Special consideration shall be given to clearances with underground utilities during the soil mitigation process. Where utilities are shallow, it may be desirable to use twelve (12) inches of ABC Class 6 below the design pavement section as a means of mitigation.
6.5 SUBGRADE STABILIZATION

The strength and stability of subgrade soils improve on compaction. The Town of Parker requires a minimum of 12 inches of moisture conditioned and compacted subgrade and subbase before proof roll and paving (see section 9.2.2, Construction Conformance Quality Control/Quality Assurance). A common problem has been soft subgrade conditions after moisture conditioning highly plastic soils as this can cause unstable conditions for the paving operation. Where the optimum moisture (ASTM D 698) is over 24 percent and the soils are A-6 (20) and/or A-7-6 (20) or greater Group Index, subgrade stabilization of the upper 8 to 12 inches directly beneath the pavement may be required by the Town in order to achieve stability for paving. The subgrade stabilization may consist of either chemical stabilization or mechanical stabilization (aggregate base course and geogrid). The subgrade stabilization layer shall not be used as a structural layer of the pavement section.

Stabilizing agents include granular soils, lime, lime/fly ash, Portland cement, and some proprietary chemical stabilizers. Lime is commonly used for stabilizing fine-grained soils. Fly ash and cement work better on sandy soils. The time of year will be important as lime needs a warmer temperature to mellow. If stabilization is proposed, a separate report on the stabilization mix design will be required before paving approval.

**TABLE 6-1**
Minimum Traffic ESALs

<table>
<thead>
<tr>
<th>Functional Classification</th>
<th>HMA Minimum 20-Year ESALs</th>
<th>PCC Minimum 30-Year ESALs</th>
<th>Reliability</th>
<th>Serviceability Index Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Residential &lt; 50 Dwelling Units</td>
<td>58,000</td>
<td>87,000</td>
<td>80</td>
<td>2.5</td>
</tr>
<tr>
<td>Local Residential &gt; 50 Dwelling Units</td>
<td>73,000</td>
<td>110,000</td>
<td>80</td>
<td>2.5</td>
</tr>
<tr>
<td>Residential Collector</td>
<td>365,000</td>
<td>550,000</td>
<td>90</td>
<td>2.0</td>
</tr>
<tr>
<td>Non-Residential Local</td>
<td>365,000</td>
<td>550,000</td>
<td>90</td>
<td>2.0</td>
</tr>
<tr>
<td>Non-Residential Collector</td>
<td>730,000</td>
<td>1,100,000</td>
<td>90</td>
<td>2.0</td>
</tr>
<tr>
<td>Major Collector Arterial</td>
<td>Generated from Traffic Study</td>
<td>Generated from Traffic Study</td>
<td>95</td>
<td>2.0</td>
</tr>
<tr>
<td>Principal Arterial</td>
<td>Generated from Traffic Study</td>
<td>Generated from Traffic Study</td>
<td>95</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**TABLE 6-2**
Laboratory Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Test Reference</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>AASHTO Soil Classification</td>
<td>AASHTO M 145</td>
<td>Each soil type in each boring</td>
</tr>
<tr>
<td>Natural Moisture/Density</td>
<td>AASHTO T 265 &amp; T 204</td>
<td>Each sample</td>
</tr>
<tr>
<td>Percent passing No. 200 sieve</td>
<td>AASHTO T 11</td>
<td>Each soil type in each boring</td>
</tr>
<tr>
<td>Gradation Analysis</td>
<td>AASHTO T 27</td>
<td>Each sample of A-1 to A-4 soil</td>
</tr>
<tr>
<td>Test</td>
<td>Test Method</td>
<td>Notes</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Liquid Limit</td>
<td>AASHTO T 89</td>
<td>Samples within 2 ft. of subgrade &amp; Bulk</td>
</tr>
<tr>
<td>Plastic Limit</td>
<td>AASHTO 90</td>
<td>Samples within 2 ft. of subgrade &amp; Bulk</td>
</tr>
<tr>
<td>Swell/Compression @ 200psf</td>
<td>ASTM 4546 B</td>
<td>A-2-6 and above one from each hole</td>
</tr>
<tr>
<td>Proctor Moisture/density</td>
<td>AASHTO T 99 or T 180</td>
<td>Poorest soil in reach, same as R-value</td>
</tr>
<tr>
<td>R-Value, Hveem Stabilometer</td>
<td>AASHTO T 190</td>
<td>Poorest soil for design</td>
</tr>
<tr>
<td>Resilient Modulus</td>
<td>AASHTO T 307</td>
<td>Same as R-value (test performed in lieu of R-value)</td>
</tr>
<tr>
<td>Sulfate Test</td>
<td>AASHTO T 290</td>
<td>One for 1000 lin. Ft., A-2-6 and above</td>
</tr>
</tbody>
</table>
### TABLE 6-3

<table>
<thead>
<tr>
<th>Material Structural Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot Mix Asphalt (HMA)</td>
</tr>
<tr>
<td>Aggregate Base Course (ABC)</td>
</tr>
<tr>
<td>R-value &gt; 78</td>
</tr>
<tr>
<td>Lime or Cement Stabilized Subgrade</td>
</tr>
</tbody>
</table>

Note: Structural Coefficient of native subbase shall be determined through third-party testing if necessary. A maximum structural coefficient of 30 (if justified by testing) can be used for native materials.

### 6.6 REFERENCES

Colorado Department of Transportation (CDOT) M&S Standards (July 2012)
Metropolitan Government Pavement Engineers Council (MGPEC) Revision #2 – Pavement Design Software
2019 Metropolitan Government Pavement Engineers Council (MGPEC) Pavement Design Standards
# 7.0 TRAFFIC SIGNALS, TRAFFIC SIGNS, PAVEMENT MARKINGS & LIGHTING

## TABLE OF CONTENTS

7.1 TRAFFIC SIGNAL SPECIFICATIONS ................................................................. 7-4

7.1.1 GENERAL REQUIREMENTS ........................................................................... 7-4
  7.1.1.1 Scope and Intent ....................................................................................... 7-4
  7.1.1.2 Permits ..................................................................................................... 7-4
  7.1.1.3 Inspections ............................................................................................... 7-4
  7.1.1.4 Access ..................................................................................................... 7-4
  7.1.1.5 Testing .................................................................................................... 7-4
  7.1.1.6 Field Location ........................................................................................ 7-4
  7.1.1.7 Equipment Salvage ................................................................................ 7-5
  7.1.1.8 Existing Traffic Signals ........................................................................... 7-5
  7.1.1.9 Intersection Power ................................................................................ 7-5
  7.1.1.10 Utilities ................................................................................................ 7-5
  7.1.1.11 Job Site Supervision ............................................................................. 7-5

7.1.2 REGULATIONS AND CODES ...................................................................... 7-5
  7.1.2.1 Reference Documents ............................................................................ 7-5

7.1.3 UNDERGROUND FACILITIES .................................................................. 7-6
  7.1.3.1 Foundations .......................................................................................... 7-6
  7.1.3.2 Conduit .................................................................................................. 7-6
  7.1.3.3 Pull Boxes ............................................................................................... 7-8
  7.1.3.4 Detector Use .......................................................................................... 7-8
  7.1.3.5 Loop Detectors ...................................................................................... 7-8
  7.1.3.6 Grounding and Bonding ....................................................................... 7-9

7.1.4 CONDUCTOR AND CABLE ..................................................................... 7-9
  7.1.4.1 General .................................................................................................. 7-9
  7.1.4.2 Conductor Schedule .............................................................................. 7-10

7.1.5 SIGNAL START-UP PROCEDURES ......................................................... 7-10

7.1.6 MAINTENANCE ....................................................................................... 7-11
  7.1.6.1 Maintenance During Construction .......................................................... 7-11
  7.1.6.2 Emergency and Non-emergency Repairs ............................................... 7-11

7.1.7 TRAFFIC SIGNAL MATERIAL SPECIFICATIONS .................................. 7-11
  7.1.7.1 Vehicle Signal Head .............................................................................. 7-11
  7.1.7.2 Pedestrian Signal Head .......................................................................... 7-12
  7.1.7.3 Illuminated Street Name Sign ............................................................... 7-12
  7.1.7.4 Traffic Signal Lamp .............................................................................. 7-13
7.1.7.5 Electrical Cable ......................................................................................................... 7-13
7.1.7.6 Fiber Optic Cable ....................................................................................................... 7-13
7.1.7.7 Fiber Optic Cable Testing .......................................................................................... 7-18
7.1.7.8 Fiber Optic Cable Termination .................................................................................. 7-22
7.1.7.9 Emergency Vehicle Detector .................................................................................... 7-23
7.1.7.10 Pedestrian Detector ................................................................................................. 7-23
7.1.7.11 Pedestrian Push Button Sign ................................................................................... 7-24
7.1.7.12 Mast Arm and Pole ................................................................................................. 7-24
7.1.7.13 Span Wire Pole ......................................................................................................... 7-25
7.1.7.14 Pedestal Pole ........................................................................................................... 7-25
7.1.7.15 Pedestrian Push Button Pole ................................................................................... 7-25
7.1.7.16 Controller and Cabinet ............................................................................................ 7-25
7.1.7.17 Miscellaneous Hardware ......................................................................................... 7-26
7.1.7.18 Instructions and Wiring Diagrams .............................................................................. 7-26
7.1.7.19 Warning or Regulatory Sign Flashing Beacon Assembly ........................................ 7-27
7.1.7.20 Video Detection Unit ............................................................................................... 7-27
7.1.8 PAINT EQUIPMENT ...................................................................................................... 7-27
7.1.8.1 Paint Existing Structures .......................................................................................... 7-27
7.1.9 GENERAL GUARANTEES AND WARRANTIES ............................................................. 7-27
7.1.9.1 Materials and Parts ................................................................................................. 7-28
7.1.10 GENERAL SIGNAL DESIGN REQUIREMENTS .......................................................... 7-28
7.1.10.1 Scope ..................................................................................................................... 7-28
7.1.10.2 Signal Head Placement and Sizes ............................................................................ 7-28
7.1.10.3 Pole and Cabinet Placement ..................................................................................... 7-28
7.1.10.4 Street Name Signs ................................................................................................... 7-29
7.1.10.5 Future Signal Considerations ................................................................................... 7-29
7.1.10.6 Luminaires .............................................................................................................. 7-29
7.1.10.7 Vehicle Detectors ................................................................................................... 7-29
7.1.10.8 Signal Power .......................................................................................................... 7-29

7.2 TRAFFIC SIGNS AND PAVEMENT MARKING SPECIFICATIONS ..................................... 7-30

7.2.1 TRAFFIC SIGNS .......................................................................................................... 7-30
7.2.1.1 Materials ................................................................................................................ 7-30
7.2.1.2 Supports .................................................................................................................. 7-30
7.2.1.3 Location .................................................................................................................. 7-30
7.2.1.4 Street Name Sign Lengths ...................................................................................... 7-30
7.2.2 PAVEMENT MARKINGS ............................................................................................. 7-30
7.2.2.1 Materials ................................................................................................................ 7-30
7.2.2.2 Surface Preparation ............................................................................................... 7-31
7.2.2.3 Installation ............................................................................................................. 7-31
7.2.2.4 Pay Item ................................................................................................................ 7-31
7.3 ROADWAY LIGHTING ................................................................. 7-32

7.3.1 INTRODUCTION ........................................................................ 7-32
7.3.2 GUIDELINES ........................................................................... 7-32
    7.3.2.1 Town Installation Criteria ................................................ 7-32
    7.3.2.2 Street Light Requests ...................................................... 7-32
    7.3.2.3 Costs ............................................................................. 7-32
7.3.3 DESIGN .................................................................................. 7-33
7.3.4 EASEMENTS ......................................................................... 7-33

7.4 REFERENCES ............................................................................. 7-34
7.1 TRAFFIC SIGNAL SPECIFICATIONS

7.1.1 GENERAL REQUIREMENTS

7.1.1.1 Scope and Intent

These specifications describe the installation of necessary material, equipment, and work procedures to complete traffic signals and/or other electrical systems, as shown on associated drawings, for projects in the Town of Parker (the Town). These specifications provide minimum functional requirements that must be satisfied for all such work.

Contractor as specified herein shall be defined as the individual, firm, or corporation who undertakes responsibility for the execution of the work, including the provision of labor and materials, in accordance with the terms of the contract specifying cost and schedule for completion of the work.

7.1.1.2 Permits

Unless stated otherwise, all roadway and sidewalk work shall be in accordance with this Roadway Design and Construction Criteria Manual (Manual). For all work within the Town’s right-of-way (ROW), the Contractor shall obtain a ROW Use Permit from the Engineering/Public Works Department, in accordance with section 9 of this Manual.

For new installations, the Contractor shall obtain a Town electrical permit.

7.1.1.3 Inspections

For all required inspections, the Contractor shall give at least 48 hours prior notice to the Engineering/Public Works Department, 303-840-9546. Inspections normally will be completed by Town staff.

7.1.1.4 Access

The Contractor will be required to maintain access to all roads and driveways throughout the period of construction.

7.1.1.5 Testing

The Contractor shall retain the services of an independent testing lab to perform all material testing.

7.1.1.6 Field Location

The Contractor shall field survey all proposed detector loops, poles, control cabinets, pull boxes, and pole foundations. The Town will field verify the proposed equipment locations before final placement.
7.1.1.7 **Equipment Salvage**

Unless otherwise specified, all traffic signal equipment which is removed shall remain the property of the Town. Such property is to be removed from the work site and returned by the Contractor to the Town at 12010 Motsenbocker Road, Parker, CO 80134.

7.1.1.8 **Existing Traffic Signals**

When existing traffic signal installations are modified or completely rebuilt, the Contractor shall work around existing traffic signal equipment until the new or modified traffic signal system has been installed and put into operation. The Contractor shall at all times maintain a minimum of two three-section (red, yellow, and green) traffic signal heads for each roadway approach. These displays, and all other signal elements, shall be in conformance with the MUTCD.

7.1.1.9 **Intersection Power**

Unless otherwise directed in the plans, the Contractor shall be responsible for coordinating with Intermountain Rural Electric Association (IREA) to obtain power hook-up to the intersection in a timely fashion. The Town’s Building Division shall inspect all installations prior to meter installations. The majority of the Town is serviced by IREA (303-688-3100).

7.1.1.10 **Utilities**

Utilities will be shown on the plans to the extent that they can be identified, based upon records and surface field indications. All utility locations will require field verification in cooperation with the affected utility companies and public agencies. The Contractor shall be responsible for locating all valve boxes, manholes, etc., and insure that they are properly protected and that signal equipment locations are adjusted accordingly.

7.1.1.11 **Job Site Supervision**

All workers shall wear appropriate clothing and safety equipment and conduct themselves in a safe manner at all times.

An International Municipal Signal Association (IMSA) Level II supervisor shall be on-site when any work is performed in the controller cabinet.

7.1.2 **REGULATIONS AND CODES**

7.1.2.1 **Reference Documents**

All equipment and material shall conform to these standards: Colorado Department of Transportation (CDOT), the Institute of Transportation Engineers (ITE) or IMSA, whichever is applicable. In addition to requirements of all these specifications, the plans, standard details, and the special contract provisions, all material and work shall conform to the requirements of the MUTCD, the Rules for Overhead
Electrical Line Construction of the Colorado Public Utilities Commission (Rules), the standards of the American Society for Testing and Materials (ASTM) and of the American National Standards Institute (ANSI), and local ordinances which may apply. The Town shall have final authority on specifications.

### 7.1.3 UNDERGROUND FACILITIES

#### 7.1.3.1 Foundations

Concrete foundations shall be Class BZ per the Colorado Department of Transportation, *Supplemental Specifications to Standard Specifications for Road and Bridge Construction*, most recent edition.

The bottom of concrete foundations shall rest on firm ground. Cast-in-place foundations shall be poured monolithically where practicable. The exposed portions shall be formed to present a neat appearance.

Forms shall be true to line and grade. Tops of foundations, except as noted on plans, shall be finished to curb or sidewalk grade or as ordered by the Town. Forms shall be rigid and securely braced in place and inspected prior to the pouring of concrete. Conduit ends and anchor bolts shall be placed in proper position and in a template until the concrete sets. Forms shall be completely removed prior to signal turn on.

Anchor bolts shall conform to the manufacturer’s specifications and each individual bolt shall have two flat washers and two nuts. Shims or other similar devices for plumbing or raking will not be permitted. See “Mast Arm Signal Pole” standard detail in appendix D for bolt circle requirements.

Both forms and ground that will be in contact with the concrete shall be thoroughly moistened before placing concrete. Forms shall not be removed until the concrete has thoroughly set.

Whenever excavation for a foundation requires removal of excess ground materials, the excavation shall be backfilled to within 12 inches of ground level with 60-120 psi flowfill concrete, and then backfilled to ground level with native material compacted per the Town’s direction.

Any abandoned foundation shall be fully or partially removed and disposed of by the Contractor per the direction of the Town. Any conduit runs associated with an abandoned foundation shall be extended or abandoned as called for on the plans.

#### 7.1.3.2 Conduit

All cables and conductors not shown on the plans as aerial cable shall be installed in conduit unless installed in poles, pedestals, cabinets, or mast arms. All buried conduit shall be PVC Schedule 80 or heavier. All exposed conduit shall be galvanized, rigid, ductile steel.
The conduit schedule as shown in table 7-1 shall be in effect unless otherwise specified in the plans:

<table>
<thead>
<tr>
<th>Run Type</th>
<th>Quantity</th>
<th>Size</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Crossings</td>
<td>1</td>
<td>3”</td>
<td>120 voltage load wiring</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>3”</td>
<td>Low voltage detection &amp; communications</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2”</td>
<td>Luminaire load</td>
</tr>
<tr>
<td>Signal Pole</td>
<td>1</td>
<td>3”</td>
<td>All signal cables</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2”</td>
<td>Luminaire load</td>
</tr>
<tr>
<td>Controller Cabinet</td>
<td>2</td>
<td>3”</td>
<td>120 voltage load wiring</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2”</td>
<td>Low voltage detection &amp; communications</td>
</tr>
<tr>
<td>Interconnect</td>
<td>1</td>
<td>2”</td>
<td>Interconnect run &amp; communications</td>
</tr>
<tr>
<td>Service Points -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal &amp; Luminaire Power</td>
<td>1</td>
<td>2”</td>
<td>Utility company service run</td>
</tr>
</tbody>
</table>

The Contractor, at its sole expense, may use larger conduit if desired. Where larger conduit is used, it shall be for the entire length of the run. No reducing couplings will be permitted underground.

The ends of all metal conduit, existing or new, shall be well reamed to remove burrs and rough edges. Field cuts of existing or new conduit shall be made square and true, and the ends shall butt together for the full circumference. Slip joints or running threads will not be permitted for coupling metal conduit. When a standard coupling cannot be used, an approved threaded union coupling shall be used. All couplings shall be screwed up tight until the ends of the metal conduits are brought together.

Where factory bends are not used, conduit shall be bent without crimping or flattening, using the longest radius practicable. Conduit bends feeding pull boxes and foundations shall be as shown on the standard details, typically 18 inches.

Conduit shall always enter a pedestal base, pull box, or any other type structure from the direction of the run only. Conduit connections at junction boxes shall be tightly secured.

All conduit shall terminate in a pull box or pedestal and extend approximately two inches above the rock bedding vertically.

All conduit runs shall have a continuous 3/8-inch nylon mule tape pulled into the conduit along with the specified electrical cables. The line shall be firmly secured at each end of the conduit run with a minimum slack of three feet.
Existing underground conduit to be incorporated into a new system shall be cleaned with a mandrel or blown out with compressed air.

New conduit runs shown on the plans are for bidding purposes only and may be changed at the direction of the Town.

Any spare or unused conduits shall be sealed with duct seal and shall include continuous 3/8-inch nylon mule tape.

**7.1.3.3 Pull Boxes**

Pull boxes shall be 20k polymer concrete Quazite® pull boxes (with open bottoms), or approved equivalent (ANSI Tier 15).

Pull boxes shall be installed at all locations shown on the plans and at such additional points as directed by the Town. A 3M locate ball, Model 1408, shall be installed in all pull boxes.

Pull boxes shall be installed so that the covers are level with curb or sidewalk grade or level with the surrounding ground (as applicable). The bottoms of all pull boxes shall be bedded in crushed rock per Town standard detail in appendix D.

When a new conduit run enters an existing pull box, the Contractor shall temporarily remove the pull box, or tunnel under the side at no less than eighteen inches below the pull box bottom and enter from the direction of the run. No new conduit will be allowed to enter a new or existing pull box in any other manner than that shown on the standard details.

**7.1.3.4 Detector Use**

Stopline detection for designated phases shall be provided, as indicated in the plans. Advance detection may be provided on a site-specific basis, to extend green time on high-speed approaches.

**7.1.3.5 Loop Detectors**

Each individual loop detector is to be terminated and spliced within a side-of-road pull box as specified on the standard details. Each loop detector shall consist of one continuous wire, without splicing, to this termination point. Any required series or parallel connections are to be completed at the termination point. Detector lead-in wire shall be continuous from the controller cabinet to the side-of-road pull box.

All detectors shall have a color-coded tag attached to the lead-in to indicate the relative location and the direction served by the detector.

Loop sealant is to be used in all sawcuts whether or not the roadway is to be overlaid.

The use of preformed loop detectors shall not be allowed.
7.1.3.6 Grounding and Bonding

Ground rods shall be provided and installed as shown in the standard details. All poles and ground rods shall be bonded to the signal power ground with a minimum AWG 6 [American Wire Gauge] copper wire.

Loop lead-in drain wire is to be grounded in the control cabinet only. The other end of the sheath shall be taped and left ungrounded. All poles shall be bonded to the signal power source.

7.1.4 CONDUCTOR AND CABLE

7.1.4.1 General

Signal cables shall conform to the appropriate IMSA specifications. Wiring within cabinets, junction boxes, etc., shall be neatly arranged and tagged.

Powdered soapstone, talc, or other approved lubricant shall be used in placing conductors in conduit. Unless otherwise approved by the Town, wiring shall not occupy more than 40 percent of the inside area of all conduit.

At least five feet of slack shall be left for each conductor at each support pole.

Splices will not be allowed in pull boxes except for loops, luminaires and illuminated street signs. Splices shall be kept to a minimum and will only be allowed in handholes at pole bases. A minimum of 24 inches of slack shall be left on each splice wire. In no case shall any shellac compounds be used.

Signal load splices shall utilize copper crimp sleeves that compress from four directions; for example, those manufactured by the Buchanan Company. The crimped sleeve shall then be protected within a flexible rubber insulating cover, for example, an Ideal Wrap Cap.

Detector loop lead-in splices in pull boxes shall be fully waterproofed using a 3M Scotchlok splice kit, or approved equivalent. A minimum of 24 inches of slack shall be left on the detector loop.

When conductors and cables are pulled into the conduit, all ends of the conductors and cables shall use duct seal to exclude moisture and shall be so kept until the splices are made or terminal appliances attached. Ends of spare conductors shall be taped and marked.

A small permanent tag on which the direction and phase is printed, using the codes given in section 7.1.4.2 Conductor Schedule below, shall be securely attached near the end of each conductor at each controller and signal pole. Loop detector lead-in shall be tagged in the splice pull box.
### 7.1.4.2 Conductor Schedule

<table>
<thead>
<tr>
<th>Key-Phase</th>
<th>Color of Signal Load Conductor</th>
<th>“Code” (on tag at each end of conductor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Northbound Left Turn</td>
<td>Red/White</td>
<td>“x-NBLT”</td>
</tr>
<tr>
<td>2. Northbound</td>
<td>Red</td>
<td>“x-NB”</td>
</tr>
<tr>
<td>3. Southbound Left Turn</td>
<td>Green/White</td>
<td>“x-SBLT”</td>
</tr>
<tr>
<td>4. Southbound</td>
<td>Green</td>
<td>“x-SB”</td>
</tr>
<tr>
<td>5. Eastbound Left Turn</td>
<td>Orange/White</td>
<td>“x-EBLT”</td>
</tr>
<tr>
<td>6. Eastbound</td>
<td>Orange</td>
<td>“x-EB”</td>
</tr>
<tr>
<td>7. Westbound Left Turn</td>
<td>Blue/White</td>
<td>“x-WBLT”</td>
</tr>
<tr>
<td>8. Westbound</td>
<td>Blue</td>
<td>“x-WB”</td>
</tr>
<tr>
<td>9. Pedestrian</td>
<td>Yellow</td>
<td>“x-PED”</td>
</tr>
</tbody>
</table>

NOTE: x = phase number. This is a typical conductor schedule and shall be used for the wiring of all signal installations. A new conductor schedule will be noted on the plans at each intersection where different phasing and/or special equipment is required. It should be noted that a band of white is used to indicate a left turn, and yellow is used for pedestrian movement.

Detector conductors shall be tagged at their ends with color-coded electrical tape following the above schedule, including the movement “Codes” (e.g., “1-NBLT”).

Each pedestrian push button shall have a dedicated wire pair lead-in to the controller cabinet. Where included in the plans, a fiber optic interconnect shall be installed.

Separate luminaire wire shall be two conductors, black and white in color with ground.

Illuminated street name signs and luminaires shall be separately fused at each pole.

Signal heads mounted on mast arms are to be wired individually from the head to the handhole splice.

At least three spare conductors shall be provided from the controller cabinet to the handhole of each signal pole.

Span wire and tether cable shall be affixed to the pole using short bail strand vises. If required by the Town, insulators shall be provided, in which case long bail strand vises shall be used.

### 7.1.5 SIGNAL START-UP PROCEDURES

Signal heads installed on standards or poles at new signal locations which are not ready for actual electrical operation shall be bagged with orange material.

Immediately prior to signal turn-on, signals shall be flashed from two to five days, with the exact duration of flashing determined by the Town.

A functional test shall be made in which it is demonstrated that each and every part of the system functions as specified or intended herein. The functional test for each traffic signal system shall consist
of not less than twenty days of continuous, satisfactory operation commencing with full operation of all electrical facilities.

During the twenty-day period, the Contractor shall maintain the system or systems. The cost of any maintenance necessary, except electrical energy and maintenance due to damage by public traffic, shall be borne by the Contractor and will be considered as included in the price paid for the contract item involved, and no additional compensation will be allowed therefore.

**7.1.6 MAINTENANCE**

**7.1.6.1 Maintenance During Construction**

The Contractor shall have full maintenance responsibility of the traffic signal from the time of the Notice to Proceed to the date of written acceptance of the work performed. Continuous maintenance and emergency service shall be provided by the Contractor 24 hours each day during the time period defined above. The Contractor shall provide and maintain a 24-hour continuous telephone answering service with one number.

**7.1.6.2 Emergency and Non-emergency Repairs**

During the period of full maintenance responsibility, 1) all hazardous conditions or 2) all malfunctions of a controller and its accessory equipment following turn-on shall be considered an emergency unless otherwise identified by the Town. Site conditions, equipment malfunctions and/or damage, which in the opinion of the Town or other Town-authorized person constitutes a serious hazard or inconvenience to the public, shall be considered an emergency. Such malfunctions or damage may include, but not necessarily be limited to, situations such as:

1) all indications are out, including bulbs and lenses, for any one traffic movement
2) signal heads give conflicting indications to any intersection approach or approaches
3) a signal has been knocked down

Contractor shall dispatch personnel to ensure each such repair is underway no later than two hours after the Town notifies the Contractor of the emergency.

In instances of repairs that are of a non-emergency nature, such repairs shall be undertaken at the site within two working days after the Town notifies the Contractor of the needed repair.

Should the Contractor fail to perform any maintenance responsibilities within the prescribed time periods, the Town shall perform said maintenance work. The Contractor shall reimburse the Town for labor and equipment charges associated with the repair plus the Town’s administration fee.

**7.1.7 TRAFFIC SIGNAL MATERIAL SPECIFICATIONS**

**7.1.7.1 Vehicle Signal Head**

All vehicle signal heads shall be the modular section type and shall be adjustable with respect to positioning and lens replacement. Heads shall be polycarbonate and black in color and shall meet the
requirements of the latest version of the ITE Vehicle Traffic Control Signal Heads standard. Mounting hardware shall be Sky Bracket type.

Visors shall be the detachable tunnel type, polycarbonate, black in color, and 12 inches in length. All faces shall be LED inserts.

Doors on the signal heads for the installation of lamps and lens replacement or other maintenance shall not require use of any tool to be opened. Doors and lenses shall be equipped with neoprene weatherproof gaskets to insure against infiltration of moisture, road film, and dust. Each three-color signal unit shall have the socket leads from all signal sections connected to a terminal board stamped with identifiable terminals. There shall be a terminal for color indication plus a common terminal where one lead from each socket shall terminate. The terminal board shall be mounted in the middle section and be fully insulated. Gaskets shall be supplied for top and bottom openings.

Backplates shall be required for all mast arm signal faces. Backplates shall be black in color, louvered aluminum, and 5 inches in width.

7.1.7.2 Pedestrian Signal Head

Pedestrian signal heads shall be 16-inch, aluminum and shall be adjustable with respect to positioning. Heads shall be provided without egg crate visors. Heads shall be black in color and shall meet the requirements of the latest version of the ITE Pedestrian Traffic Control Signal Indications standard. Pedestrian inserts shall be LED, filled “countdown” style GE Model GT1 or approved equivalent. “Walk/Don’t Walk” indications shall be the symbol type, with a minimum height of 11 inches. “Countdown” numerals shall have a minimum height of 9 inches. Doors and lenses shall be installed with weatherproof gaskets.

7.1.7.3 Illuminated Street Name Sign

Illuminated street name sign housings shall be constructed of aluminum and painted Federal Green #14056 or other Town-approved equivalent. All ferrous hardware parts shall be galvanized or cadmium-plated.

The reflectors shall have a minimum reflectance of 85%.

Sign panels shall be protected by laminating a 1 mil, clear, UV-resistant Tedlar film to the surface of the 3M Scotchal translucent vinyl lens. The sign colors shall not fade when exposed to an accelerated test of ultraviolet light equivalent to five years of outdoor exposure. The sign panel shall rotate open with a bottom hinge.

The entire surface of the sign panel shall be evenly illuminated. The average of brightness reading for the letters shall be 150 foot–lamberts minimum. The light transmission factor of the sign panel shall provide a letter-to-background brightness ratio between 10:1 and 20:1.

The sign ballasts shall be the high power factor type, rated at 110-125 V. at 60 Hz., and there shall be separate ballast for each fluorescent lamp. Fuses shall be miniature slow-blowing type, with a separate
fuse provided for each ballast. Fluorescent lamps shall meet ANSI Standard C78. One lampholder for each lamp shall be the spring-loaded type. The entire sign and its components shall be operated over a temperature range of -30 degrees F to +160 degrees F.

Terminal blocks shall be the molded, phenolic, barrier type rated at 15 amp., 1,000 V. and shall have waterproof marking strips. No wiring splices will be allowed within the sign without the permission of the Town.

The exposed drip loop wire shall be UV stabilized.

7.1.7.4 Traffic Signal Lamp

All permanent and temporary traffic signal applications will require LED lamps. Red, yellow, and green signal sections shall be twelve inches in diameter in all cases.

All circular and arrow red, yellow, and green signals and pedestrian (“hand” and “walkman”) indications shall use LEDs. Traffic signal section optical units shall meet or exceed ITE Adjustable Face Vehicular Traffic Control and Pedestrian Signal Head standards. In addition to this, LED optical units shall conform to CDOT Standard Specifications for Road and Bridge Construction, latest edition, section 713.

7.1.7.5 Electrical Cable

All electrical cable shall be in conformance with the CDOT Standard Specifications for Road and Bridge Construction, latest edition, sections 614 and 713.

Signal cable shall be multi-conductor, stranded, copper wire manufactured to meet IMSA Specification 19-1 or 19-2. Each conductor in the cable shall be individually insulated and rated at 600 volts.

7.1.7.6 Fiber Optic Cable

Fiber optic cable shall be loose-tube all-dielectric outdoor cable consisting of twelve single-mode fibers and complying with the following specification for fiber optic cable. Fiber optic cable installation in conduit shall meet applicable portions of IMSA Specification 60.2 or approved equal, and include a 14 gauge (min) copper tracer wire. All fiber optic cable runs shall include nylon mule tape. Extra length of fiber optic cable shall be provided with 50 feet of slack in the controller cabinet and 25 feet of slack in each pull box.

1. General Considerations
   a. The fiber optic cable shall meet all requirements stated in the specification. The cable shall be an accepted product of the United States Department of Agriculture Rural Electrification Administration (REA) as meeting requirements of 7CFR1755.900.
   b. The cable shall be new, unused, and of current design and manufacture.

2. Fiber Characteristics
   a. All fibers in the cable must be usable fibers and meet this specification.
   b. All optical fibers shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of this specification.
c. Each optical fiber shall consist of a doped silica core surrounded by a concentric silica cladding.

d. The single-mode fiber utilized in the cable specified herein shall conform to the following specifications:

- Typical Core Diameter: 8.3 µm
- Cladding Diameter: 125 +/- 1.0 µm
- Core to Cladding Offset: ≤ 0.8 µm
- Cladding Non-Circularity: 1.0%
- Defined as: [1 - (min. Cladding dia. + max. Cladding dia.)] x 100
- Coating Diameter: 245 ± 10 µm
- Attenuation Uniformity: No point discontinuity greater than 0.10 dB at either 1310 nm or 1550 nm
- Attenuation at the Water Peak: The attenuation at 1883 ± 3 nm shall not exceed 2.1 dB/km
- Cutoff Wavelength: The cabled fiber cutoff wavelength shall be ≤ 1250 nm.
- Mode-Field Diameter (Petermann II):
  - 9.30 ± 0.50 µm at 1310nm
  - 10.50 ± 1.00 µm at 1550nm
- Zero Dispersion Wavelength (λ₀): 1301.5 nm ≤ (λ₀) ≤ 1321.5nm
- Zero Dispersion Slope (S₀): ≤ 0.092 ps/(nm²/km)
- The coating shall be a dual layered, UV cured acrylate applied by the fiber manufacturer
- Coating shall be mechanically strippable without damaging the fiber

3. Fiber Specifications Parameters

All fibers in the cable shall meet the following requirements:

a. When tested in accordance with FOTP-3, Procedure to Measure Temperature Cycling Effects on Optical Fiber, Optical Cable, and Other Passive Fiber Optic Components, (single-mode only), the average change in attenuation at extreme operational temperatures (-40°C to +70°C) shall not exceed 0.05 dB/km at 1550 nm. The magnitude of maximum attenuation change of each individual fiber shall not be greater than 0.15 dB/km at 1550 nm.

b. Required fiber grade = Maximum Individual Fiber Attenuation.

c. The maximum dispersion for single-mode optical fibers shall be ≤ 3.3 ps/(nm km) for 1285 nm through 1330 nm and ≤ 18 ps/(nm km) at 1550 nm.

4. Specifications for Outdoor Cables

a. Optical fibers shall be placed inside a loose buffer tube.

b. Each buffer tube shall contain up to 6 fibers.

c. The fibers shall not adhere to the inside of the buffer hole.

d. Each fiber shall be distinguishable from the others by means of color coding according to the following:

1. Blue
2. Orange
3. Green
4. Brown
5. Slate
6. White

These colors shall meet EIA/TIA-598, Color Coding of Fiber Optic Cables.
e. Buffer tubes containing fibers shall also be color-coded with distinct and recognizable
colors according to the following:

1. Blue  
2. Orange  
3. Green  
4. Brown  
5. Slate  
6. White  
7. Red  
8. Black  
9. Yellow  
10. Violet  
11. Rose  
12. Aqua

These colors shall meet EIA/TIA-598, Color Coding of Fiber Optic Cables.

d. In buffer tubes containing multiple fibers, the colors shall be stable during temperature
cycling and not subject to fading or smearing onto each other or the gel filling material.
Colors shall not cause fibers to stick together.

g. Buffer tubes shall be of a dual-layer construction with the inner layer made of
polycarbonate and the outer layer made of polyester.

h. Fillers may be included in the cable core to lend symmetry to the cable cross section.

i. The central anti-buckling member shall consist of a glass reinforced plastic rod. The
purpose of the central member is to prevent buckling of the cable.

d. Each buffer tube shall be filled with a non-hygroscopic, non-nutritive to fungus,
electrically non-conductive, homogeneous gel. The gel shall be free from dirt and
foreign matter. The gel shall be readily removable with conventional nontoxic solvents.

k. Buffer tubes shall be stranded around a central member using the reverse oscillation, or
“SZ” stranding process.

l. The cable core interstices shall be filled with a water-blocking compound. The
compound shall be a thixotropic gel containing a Super Absorbent Polymer (SAP)
material. The gel shall be non-nutritive to fungus, electrically non-conductive and
homogeneous. The gel shall be free from dirt and foreign matter and shall be readily
removable using nontoxic solvents.

m. Binders shall be applied with sufficient tension to secure buffer tubes to central member
without crushing the buffer tubes. Binders shall be non-hygroscopic, non-wicking (or
rendered so by the flooding compound), and dielectric with low shrinkage.

n. The cable shall contain at least one ripcord under the sheath for easy sheath removal.

o. Tensile strength shall be provided by high tensile strength aramid yarns and/or
fiberglass yarns.

p. The high tensile strength aramid and/or fiberglass yarns shall be helically stranded
evenly around the cable core.

q. All dielectric cables (with no armoring) shall be sheathed with medium density
polyethylene. The minimum nominal jacket thickness shall be 1.4 mm. Jacketing
material shall be applied directly over the tensile strength members and flooding
compound. The polyethylene shall contain carbon black to provide ultraviolet light
protection and shall not promote the growth of fungus.

r. The jacket or sheath shall be free of holes, splits and blisters.

s. The cable jacket shall contain no metal elements and shall be of a consistent thickness.

t. Cable jackets shall be marked with sequential meter or foot markings, year of
manufacture and a telecommunications handset symbol, as required by section 350G of
the National Electric Safety Code. The actual length of the cable shall be within 0 to 1%
of the length markings. The marking shall be in contrasting color to the cable jacket.
The height of the marking shall be approximately 2.5 mm.
u. The maximum pulling tension shall be 2,700 N (608 lbf) during installation (short term) and 890 N (200 lbf) long term installed.

v. The shipping, storage, and operating temperature range of the cable shall be -40°C to +70°C. The installation temperature range of the cable shall be -30°C to 70°C.

5. General Cable Performance Specifications
   a. The unaged cable shall withstand water penetration when tested with a one meter static head or equivalent continuous pressure applied at one end of a one meter length of filled cable for 24 hours. No water shall leak through the open cable end. When a one meter static head or equivalent continuous pressure is applied at one end of a one meter length of aged cable for one hour, no water shall leak through the open cable end. Testing shall be done in accordance with FOTP-82, “Fluid Penetration Test for Filled Fiber Optic Cable.”
   b. When tested in accordance with FOTP-81, Compound Flow (Drip) Test for Filled Fiber Optic Cable, Method A; the cable shall exhibit no flow, drip or leak of filling or flooding compound at 80°C. If material flow is detected, the weight of any compound that drips from the sample shall be less than 0.05 g (0.002 ounce).
   c. The cable shall withstand a minimum compressive load of 220 N/cm for non-armored cables applied uniformly over the length of the compression plate. The cable shall be tested in accordance with FOTP-41, Compressive Loading Resistance of Fiber Optic Cables, except that the load shall be applied at the rate of 3 mm to 20 mm per minute and maintained for 10 minutes. The magnitude of the attenuation change shall be within the repeatability of the measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience attenuation greater than 0.1 dB at 1500 nm (single mode). The average increase in attenuation for the fibers shall be < 0.20 dB at 1300 nm (multimode). The repeatability of the measurement system is typically 0.05 dB or less. No fibers shall exhibit a measurable change in attenuation after load removal.
   d. When tested in accordance with FOTP-104, Fiber Optic Cable Cyclic Flexing Test, the cable shall withstand 25 mechanical flexing cycles at a rate of 30 ± 1 cycles per minute, with a sheave diameter not greater than 20 times the cable diameter. The magnitude of the attenuation change shall be within the repeatability of the measurement system for 90% of the test fibers. The remaining 10% of the fibers shall not experience an attenuation change greater than 0.1 dB at 1550 nm. The repeatability of the measurement system is typically ±0.05 dB or less. The cable jacket shall not exhibit evidence of cracking or splitting when observed under 5x magnification.
   e. When tested in accordance with FOTP-25, Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies, cable shall withstand 25 impact cycles. Magnitude of the attenuation change shall be within repeatability of measurement system for 90% of test fibers. The remaining 10% of the fibers shall not experience attenuation change greater than 0.1 dB at 1550 nm. The repeatability of measurement system is typically ±0.05 dB or less. The cable jacket shall not exhibit evidence of cracking or splitting at the completion of the test.
   f. When tested in accordance with FOTP-33, Fiber Optic Cable Tensile Loading and Bending Test, using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a tensile load of 2700 N (608 lbf) applied for one hour (using Test Condition II of the procedure). In addition, cable sample, while subjected to a minimum load of 2660 N (600 lbf), shall be able to withstand twist of 360 degrees in a length of
less than 3 m. Magnitude of attenuation change shall be within repeatability of the measurement system for 90% of the test fibers. Remaining 10% of the fibers shall not experience an attenuation change greater than 0.1 dB at 1550 nm. Repeatability of the measurement system is typically ±0.05 dB or less. The cable shall not experience a measurable increase in attenuation when subjected to the rated residual tensile load of 890 N (200 lbf).

g. When tested in accordance with FOTP-85, Fiber Optic Cable Twist Test, a length of cable no greater than 2 m will withstand 10 cycles of mechanical twisting. The magnitude of the attenuation change will be within the limit of the repeatability of the measurement system for 90% of the test fibers. The remaining 10% of the fibers will not experience an attenuation change greater than 0.1 dB at 1550 nm. The repeatability of the measurement system is typically ±0.05 dB or less. The cable jacket will exhibit no cracking or splitting when observed under 5x magnification following completion of the test.

h. When tested in accordance with the proposed FOTP-181, Lightning Damage Susceptibility Test for Optic Cables with Metallic Components, the cable shall withstand a simulated lightning strike with a peak value of the current pulse ≤ 105 kA. The test current used shall be damped oscillatory with a maximum time-to-peak value of 15 µs (which corresponds to a minimum frequency of 16.7 kHz and a maximum frequency of 30 kHz). The time to half-value of the waveform envelope (t_{1/2}) shall be 40-70 µs. In addition to the analysis criterion set forth on FOTP-181, the integrity of the buffer tubes (or analogous loose tube, i.e. core tube) and strength members must be intact after removal of the cable specimens from the test box.

   a. All optical fibers shall be proof tested by the fiber manufacture at a minimum load of 100 ksi.
   b. All optical fibers shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel.

7. Packaging
   a. The completed cable shall be packaged for shipment on non-returnable wooden reels.
   b. Top and bottom ends of the cable shall be available for testing.
   c. Both ends of the cable shall be sealed to prevent the ingress of moisture.
   d. Each reel shall have a weatherproof reel tag attached identifying the reel and cable.
   e. Each cable shall be accompanied by a cable data sheet that contains significant information on the cable.

8. Miscellaneous
   a. The cable manufacturer shall provide installation procedures and technical support concerning the items contained in this specification.

The Contractor shall provide the Town with two copies of the cable manufacturer’s installation instructions for fiber optic cable in conduit. All installation shall be in accordance with these practices except as directed by the Town. The bend radius shall be maintained at a minimum of twenty times the outside diameter of the cable during installation. After installation, the bend radius shall be maintained a minimum of ten times the outside diameter of the cable. Additional cable costs due to damage caused by the Contractor’s neglect of recommended procedures shall be the responsibility of the Contractor.

Single-mode fiber optic cable shall be installed in continuous runs between controllers. The
manufacturer’s recommended limits for cable lengths shall not be exceeded. Cable ends shall be stored in controller cabinets or pull boxes immediately adjacent to cabinets or as directed by the Town. All fibers shall terminate to a rack mounted patch panel.

Under no conditions shall single mode fibers be cut out or spliced at intermediate points without express written direction from the Town.

Prior to installation of interconnect cable, the Contractor shall submit an interconnect schematic diagram to the Town for approval. The diagram shall clearly indicate cable routing, splice points, and fiber connections including identifying the color-coded fibers and buffer tubes. Installation of the cable will not be permitted until the schematic diagram has been approved by the Town.

The same color-coded pairs of fibers and/or wires shall be used throughout the entire project. At the terminal points the jackets shall be stripped and the ends taped. Gel filling compound shall be removed using filled cable cleaner.

For all fiber optic cables, each fiber shall be checked with an Optical Time Domain Reflectometer (OTDR) and full traces documenting fiber performance shall be provided to the Town within 30 days of test. All optical fibers shall be within the manufacturer’s recommended tolerances. In addition, any other acceptance testing recommended by manufacturer shall be provided. Data shall be supplied to the Town prior to completion of the project.

If the fiber cable reel is left outside overnight during installation, the Contractor shall provide security for the cable.

The Contractor shall keep a log that notes the meter (foot) marking on the cable at every pull box to facilitate determining the exact location along the cable run of problems during the OTDR testing.

### 7.1.7.7 Fiber Optic Cable Testing

Testing of single-mode (SM) fiber optic cable shall include both new cable and existing cable. The test procedures involve an OTDR test and an Optical Power Meter Test.

The guidelines for fiber optic cable testing include:

Test jumpers and patch cords must be of the same fiber core size and connector type as the cable system:

- SM fiber 8.3/125 µm

The light source and OTDR must operate within the range of 1310±10 nm or 1550±10 nm for SM testing in accordance with ANSI/EIA/TIA-526-7.

The power meter and the light source must be set to the same wavelength during testing.

The power meter must be calibrated and traceable to the National Institute of Standards and Technology (NIST).
All system connectors, adapters, and jumpers must be cleaned as per the manufacturer’s instructions before measurements are taken.

**Materials**

The following items are required to perform fiber optic cable tests:

- An OTDR
- A test reel, if necessary
- A light source at the appropriate wavelength
- Optical power measurement equipment
- Test jumpers as specified below

CPR Test Jumper-1 and Jumper-2 shall be 1-5 meters long with connectors compatible with the light source and power meter and have the same fiber construction as the link segment being measured.

**Fiber Optic Cable Testing with Optical Time Domain Reflectometer**

The Contractor shall perform an OTDR test of all fibers in all tubes on the reel prior to installation of the fiber. The Test results shall be supplied to the Town prior to installation of the cable.

If the fiber is specified as “Install Only,” the Contractor shall test the fiber on the reel and provide the test results to the Town prior to accepting the cable. After installation, if there are unused portions of cable remaining on the reel, the Town may request the Contractor or other qualified technician to perform a reel test. The Contractor shall provide the Town the test results prior to delivering the cable to the Town. Any cable damaged while in the Contractor’s possession shall be replaced at the Contractor’s expense.

All fiber testing shall be performed on all fibers in the completed end-to-end system. Testing shall consist of a bi-directional, end-to-end OTDR trace performed per TIA/EIA-455-61. The system margin loss measurements shall be provided at 1310 nm and 1550 nm. If the plans require installation of a fiber optic patch panel, the Contractor shall supply patch cords to patch all terminated fibers through the panel for all fiber testing. If patch cords are specified in the plans for final equipment installation, these patch cords shall be connected using a test coupling for the end-to-end test.

OTDR readings will be used to ensure proper installation and to troubleshoot faults. OTDR signature traces will be used for documentation and maintenance. An OTDR provides an indirect estimate of the loss of the cable plant, generally, more accurate or reliable values will be obtained by using an Optical Power Meter. For fibers that are identified in the plans to be left non-terminated, an OTDR shall be used to test end-to-end attenuation.

Loss numbers for the installed link shall be calculated by taking the sum of the bi-directional measurements and dividing that sum by two.

The Contractor shall use and OTDR that is capable of storing traces electronically and shall save each final trace.

To ensure the traces identify the end points of the fiber under test and the fiber designation, the Contractor shall use a test reel, if required, to eliminate the “dead zone” at the start of the trace so that
the start of the fiber under test can be identified on the trace. Indicate the length of the test reel for all test results.

If the fiber designation is not indicated on the trace itself, the Contractor shall provide a cross-reference table between the stored trace file name and the fiber designation.

In compliance with EIA/TIA-455-61 “Measurement of Fiber or Cable Attenuation Using an OTDR”, the Contractor shall record the following information during the test procedure:

1. Names of personnel conducting the test
2. Type of test equipment used (manufacturer, model, serial number, calibration date)
3. Date test is being performed
4. Optical source wavelength and spectral width
5. Fiber identification
6. End point locations
7. Launch conditions
8. Method of calculation for the attenuation or attenuation coefficient
9. Acceptable link attenuation

The complete end-to-end OTDR test on one fiber, including document submission, represents one OTDR test.

Fiber Optic Cable Testing with Optical Power Meter
The Contractor shall conduct an Optical Power Meter Test for each fiber installed. Single-mode segments shall be tested in one direction at both the 1310 nm and 1550 nm wavelength.

In compliance with TIA/EIA-526-7, Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant, the following information shall be recorded during the test procedure:

1. Names of personnel conducting the test
2. Type of test equipment used (manufacturer, model, serial number, calibration date)
3. Date test is being performed
4. Optical source wavelength and spectral width
5. Fiber identification
6. End point locations
7. Test direction
8. Reference power measurement (when not using a power meter with a Relative Power Measurement Mode)
9. Measured attenuation of the link segment
10. Acceptable link attenuation

The minor attenuation differences due to test direction are on par with the accuracy and repeatability of the test method. Lateral segments within a building are limited to 90 meters. Therefore, the attenuation differences caused by wavelength are insignificant, and as a result, single wavelength testing is sufficient.

The complete end-to-end optical power meter test on one fiber, including document submission, represents one optical power meter test.
Acceptable Attenuation Values
Acceptable attenuation values shall be calculated for each fiber tested. These values represent the maximum acceptable test values.

The general attenuation equation for any SM link is as follows:

\[
\text{Acceptable Link Attn.} = \text{Cable Attn.} + \text{Connector Attn.} + \text{Splice Attn.}
\]

8.3 µm Single-mode Attenuation Coefficients:
1. Cable Atten. = Cable Length (km) x (0.34 dB/km@1310 nm or 0.25 dB/km@1550 nm)
2. Connection Attn. (ST or SC connectors) = (No. of Connections x 0.39 dB) + (0.42 dB)
3. Connection Attn. (LC connectors) = (No. of Connections x 0.14 dB) + (0.24 dB)
4. Splice Attn. (Mechanical or Fusion) = Splices x 0.30 dB

Test Procedures
All fiber testing shall be performed on all fibers in the completed end-to-end system.

The SM Optical Power Meter fiber test shall be conducted as follows:
1. Clean the test jumper connections and the test coupling per manufacturer’s instructions.
2. Follow the test equipment manufacturer’s initial adjustment instructions.
3. Connect Test Jumper-1 between the light source and the power meter. Avoid placing bends in the jumper that are less than 100 mm (4 inches) in diameter.
4. If the power meter has a Relative Measurement Mode, select it. If it does not, reduce the Power Meter Measurement \(P_{\text{ref}}\). If the meter can display power levels in dBm, select this unit of measurement to simplify subsequent calculations.
5. Disconnect Test Jumper-1 from the power meter. Do NOT disconnect the test jumper from the light source.
6. Attach Test Jumper-1 to one end of the cable plant to be measured and Test Jumper-2 to the other end.
7. Record the Power Measurement \(P_{\text{sum}}\). If the power meter is in Relative Power Measurement Mode, the meter reading represents the true value. If the meter does not have a Relative Power Measurement Mode, perform the following calculation:
   a. If \(P_{\text{sum}}\) and \(P_{\text{ref}}\) are in the same logarithmic units (dBm, dBU, etc.):
      \[
      \text{CPR (dB)} = P_{\text{sum}} - P_{\text{ref}}
      \]
   b. If \(P_{\text{sum}}\) and \(P_{\text{ref}}\) are in watts:
      \[
      \text{CPR (dB)} = 10 \times \log_{10}\left(\frac{P_{\text{sum}}}{P_{\text{ref}}}\right)
      \]

Test Acceptance
The Contractor shall demonstrate that each Optical Power Test results in acceptable attenuation values.

The Contractor, solely at the Contractor’s cost, shall remake any fusion splices that have test results exceeding acceptable attenuation values.

The Contractor, solely at the Contractor’s cost, shall retest any fiber links that have been re-spliced.

The Contractor, solely at the Contractor’s cost, shall bring any link not meeting the requirements of this specification into compliance.
Submittals
The Contractor shall submit test results documentation as both a hard copy and an electronic copy (PDF file format).

After each test reel, the Contractor shall submit one hard copy of the OTDR trace for every fiber on the reel. After installation, the Contractor shall submit one hard copy of the OTDR trace for every spliced fiber. Hard copy traces shall be organized and bound in logical order in an 8.5” x 11” hard cover binder.

The Contractor shall submit, after approval of the hard copy traces, electronic copies of all traces and appropriate software to allow reading the traces. The Contractor shall submit one copy of the complete contract plans, including additional drawings issued as part of any change orders, with any deviations clearly marked in color. Deviations to be noted include, but are not limited to, the following:
- Fiber splice location
- Fiber splice configuration
- Termination layout

7.1.7.8 Fiber Optic Cable Termination

Color-coded pairs of fibers shall be used for all installations. At the terminal points, the jackets shall be stripped and the ends taped. Gel-filled compound shall be removed using the filled cable cleaner.

At every cabinet or closure, only fibers shown to be spliced and/or connectorized and connected to a patch panel or other internal device are required to be landed. All cut or unconnectorized fibers shall be sealed in a manner recommended by the cable manufacturer.

The same color-coded pairs of fibers and/or wires shall be used throughout the entire project. At the lateral cable terminal points, the jackets shall be stripped and the ends shrink-tubed. Gel filling compound shall be removed using the filled cable cleaner.

The Contractor shall terminate the loose-tube lateral cable at the controller using a buffer tube fan-out kit, Siecor Catalog FAN-BT or approved equal. Fanned-out cables shall be terminated in the contractor-furnished termination enclosure as shown in the plans.

The fiber optic patch cord cables shall consist of SM fibers housed individually in protective jackets. Both ends of the cable shall be connected. Fiber optic patch cord cable shall be suitable for operation over a temperature range of -30°C to +60°C. Fiber optic patch cord cables shall be of sufficient length to be connected between the interconnect panel and the communications equipment (i.e., modems). Appropriate strain relief in the cabinet (through cable ties) shall be installed at a minimum of three locations. Sufficient slack shall be left to allow relocation of the equipment anywhere in the cabinet. The attenuation of a fiber optic patch cord cable after installation, not including the connector loss, shall not exceed 0.1 dB measured at 1310 nm and 1550 nm.

The connector shall have a ceramic ferrule with a nickel-plated nut and body. The connector shall be an AT&T ST-style compatible field mounted connector. The connector shall be compatible with a physical contact (PC) finish. All connectors shall be polished to a PC finish such that the return loss per mated pair of connectors is at least 25 dB. The return loss when the connector is mated with previously
installed connectors shall be at least 18 dB. The connector mean loss shall not be greater than 0.3 dB with a standard deviation of not greater than 0.2 dB. The connector loss shall not vary more than 0.2 dB after 1000 repeated matings and shall withstand an axial load of 135 N.

Index matching fluids or gels shall not be used. The connectors shall be compatible with the optical fiber surrounding the jacket and shall be installed on one end of the optical fiber in accordance with the manufacturer’s recommended materials, equipment, and practices. The connector shall be suitable for the intended environment and shall meet the following environmental conditions:

<table>
<thead>
<tr>
<th>Operating Temperature:</th>
<th>-20° to +50°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Temperature:</td>
<td>-30° to +60°C</td>
</tr>
</tbody>
</table>

The connector loss shall not vary more than 0.2 dB over the operating temperature range. Connectors shall be protected by a suitably installed waterproof protection cap.

Each cabinet to be interconnected shall include slot-mountable interconnect center(s). They are to be complete with connector panels of suitable capacity for all lateral cables. Each interconnect panel shall be compatible for connection to the AT&T ST-style connectors of the lateral and fiber optic patch cord cables. A panel of sufficient size to provide all requisite connections shall be provided.

Installation shall be in accordance with the cable manufacturer’s recommendation.

### 7.1.7.9 Emergency Vehicle Detector

All approaches to the signal shall have emergency vehicle pre-emption detection.

Optical detectors for emergency vehicle pre-emption shall be the Global Traffic Technologies (GTT) Model 711, 721 or 722 Optical Detector, as needed. Placement of the detectors shall be determined by the Town.

Two GTT Model 752 Phase Selectors shall be provided in every cabinet.

### 7.1.7.10 Pedestrian Detector

Pedestrian push buttons shall be Polara Engineering BullDog with LED momentary pedestrian buttons (Part Number BDLM2) or approved equivalent. The pedestrian push buttons shall be equipped with a push button instruction sign.

The assembly shall be weatherproof and constructed to prevent electrical shock under any weather conditions. The housing shall be shaped to fit the curvature of the pole to which it is attached to provide a rigid installation. Saddles shall be provided to make a neat fit as required. Pedestrian push button housing shall be black in color.
7.1.7.11 Pedestrian Push Button Sign

Pedestrian push button signs shall normally be an aluminum sign panel. Payment for pedestrian push button signs shall be incidental to the pedestrian push button pay item.

Signs shall be a minimum of 5” x 9” and conform to the 2009 MUTCD R10-3e signage.

7.1.7.12 Mast Arm and Pole

Mast arm and pole shall consist of a pole with four anchor bolts, a mast arm for support of signs and traffic signals, and, if specified, a luminaire arm and extension for roadway lighting.

Fabricator shall be certified under Category 1, “Conventional Steel Structures,” as set forth by the American Institute of Steel Construction Quality Certification Program. Proof of this certification will be required prior to bid opening to assure that the fabricator has the personnel, organization, experience, procedures, knowledge, equipment, capability and commitment to fabricate quality structures.

Pole shaft, base plate, anchor bolts, mast arm, luminaire arm, and structural connecting hardware shall be designed in accordance with loading and allowable stress requirements of the latest edition of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals. Loading shall be based on 2001 AASHTO Category II with group consideration. If requested, calculations and detail drawings shall be submitted for verification of compliance to these specifications.

The tubular member’s cross section shall be round and shall have a constant linear taper of 0.14 in./ft. It shall be fabricated from United States-produced coil or plate steel conforming to the requirements of ASTM A595 Grade A or ASTM A 572 Grade 65.

The mast arms shall have a horizontal length as called for on the plans. All mast arms that are 45 feet or less shall be manufactured and shipped in one piece with no circumferential splices. Each arm shall be provided with a painted end cap secured in place with setscrews.

For pole shafts, a 6” x 10” handhole reinforcing rim shall be welded into the shaft at eighteen inches from the base of the pole and supplied with a cover attached by bolts. Each pole shall be provided with a pole cap secured in place with setscrews or other suitable fasteners. A J-hook wire support and grounding attachment shall be provided in each pole shaft.

The base plate shall be of steel meeting or exceeding the requirements of ASTM A36 or ASTM A 572 Grade 42. It shall be integrally welded to the pole shaft with either a telescopic welded joint or a full penetration butt weld with a backup bar.

Anchor bolt material shall have a minimum yield strength of 55,000 psi and a minimum tensile strength of 75,000 psi. The bolts shall be galvanized to ASTM A153 for a minimum of eight to ten inches on the threaded end. Each anchor bolt shall be supplied with two hex nuts and two flat washers. The strength of the nuts shall be equal or exceed the proof load of the bolts.
Welding shall be in accordance with AWS (American Welding Society) Structural Welding Code D1.1, sections 1 through 8, and shall be performed by welders certified in accordance with the AWS Code. The tube’s longitudinal seam welds shall be free of cracks and undercutting, performed with automatic processes, and visually inspected with questionable areas inspected by magnetic particle to AWS D1.1.

All miscellaneous hardware shall be galvanized per ASTM A153.

All materials and products shall be produced in the United States of America. They shall be of the ASTM type as called forth in this specification. Mill certifications shall be supplied for proof of compliance to this specification.

Traffic signal poles, mast arms, and luminaire arms, and all incidental mounting hardware (nut covers), excluding banding straps and side of pole hardware, shall be painted Federal Green, color #14056 (or approved equivalent).

**7.1.7.13 Span Wire Pole**

Span wire poles are intended for temporary use only, prior to installation of permanent mast arm signals or for emergency use. In all cases, span wire signals will be allowed only with written authorization of the Town.

Span wire poles and cable shall be in conformance with the CDOT Standard Specifications for Road and Bridge Construction, latest edition, section 614.

Span wire poles shall be painted Federal Green, color #14056 (or approved equivalent) and the luminaire mounting height shall be 30 feet.

**7.1.7.14 Pedestal Pole**

Pedestal poles shall be designed to meet the structure requirement given in the most recent edition of Standard Specifications for Structural Support for Highway Signs, Luminaries and Traffic Signals, published by AASHTO, for a wind velocity of 90 mph. The pole base shall be frangible and shall include a locking base collar.

The pedestal pole finish shall meet the requirements of the standard details.

**7.1.7.15 Pedestrian Push Button Pole**

Pedestrian push button pole shall be illustrated in the standard details. Pole base shall be frangible and shall include a locking base collar.

**7.1.7.16 Controller and Cabinet**

Each controller and cabinet assembly shall be in conformance with section 614 of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, most recent edition, as clarified by the following.
Each controller and cabinet assembly shall include:

1. 170E controller in conformance current CalTrans Specifications. Firmware shall be WAPITI Micro Systems W4IKS, Rev. 18P. CPU shall be HC11 style.

2. 333 aluminum cabinet, in accordance with FHWA 7816 IP-7816 Specification (painted Federal Green, color #14056 or approved equivalent- see additional specifications).

The cabinet shall contain the CalTrans PDA#2 power distribution assembly.

Additional specific items to be included with controller and cabinet assembly shall be:

[1] Transient voltage surge suppression system (Innovative Technologies catalog #HS-P-sp-120-30A-RJ)
[1] Clary SP1000R traffic uninterrupted power supply (UPS)
[2] GTT 752 two-channel phase selector cards

Notes:
1. All products provided, excluding the conflict monitor, shall be on the State of California’s latest qualified products listing (QPL).
2. The cabinet drawings shall be non-fading prints using the xerography method. No blue line drawings will be acceptable.
3. The Town signal maintenance contractor shall be supplied a computer printout of the complete environmental testing results.
4. The cabinet shall have eight flash jumper blocks.
5. The cabinet field terminals shall be silk-screened with the appropriate phase/color designations.

Controllers shall be interconnected to the signal system, unless otherwise directed by the Town. Operation satisfactory to the Town shall be demonstrated during the normal twenty-day testing period.

The controller and cabinet shall be tested by the Contractor at least ten days prior to installation.

The traffic signal controller cabinet shall be factory painted with a baked enamel finish Federal Green, color #14056 (or approved equivalent), matching the traffic signal pole and mast arm structures.

7.1.7.17 Miscellaneous Hardware

All ferrous mounting hardware and weather heads shall be galvanized, cadmium-plated or made of stainless steel to resist corrosion. Payment for miscellaneous hardware, including pole plates for side-of-pole mounting, shall be incidental to the pay item to which the miscellaneous hardware items are attached.

7.1.7.18 Instructions and Wiring Diagrams

All equipment shall be provided with a minimum of two sets of complete installation and operating instructions, including a chart of field connections, as well as a service manual for the controller containing service instructions, wiring diagrams, and trouble-shooting procedures. Each and every
component used shall be clearly referenced in the service manual, and its value, ratings and manufacturer part number shall be given.

7.1.7.19 Warning or Regulatory Sign Flashing Beacon Assembly

A warning or regulatory sign flashing beacon assembly shall be as shown in the CDOT Standard Plan S-614-14. A school flashing beacon assembly shall be as shown in the Town standard plans. Payment for these items shall be inclusive of all work to provide an operational flashing assembly, including materials, installation, and electrical service connection. Signs shall be installed as an integral part of the flashing assembly.

7.1.7.20 Video Detection Unit

Video detection, if shown on the plans, shall be TRAFICON. Inclusion of VIEWCOM/E communication card shall be included and incidental to the detection system.

7.1.8 PAINT EQUIPMENT

7.1.8.1 Paint Existing Structures

Previously installed signal poles shall be field painted when indicated on the plans. When so indicated, all exterior surfaces shall be cleaned and examined for damaged paint, and any such damage shall be removed, given a spot coat of primer and the entire exterior surface repainted. Previously painted services, whether finish or prime coated, shall be scuff sanded and particular attention paid to the lower eight feet of the pole.

Inspection of the poles by the Town prior to application of the finish coats is required. Two finish coats of paint selected by the Town shall be applied over the primer or previously painted surfaces.

The painting shall be done in a neat and workmanlike manner and may be applied either by hand brushing or spraying. The Town reserves the right to require the use of brushes for the application of paint, should the work done by the paint-spraying machine prove unsatisfactory or objectionable.

Touch-up painting shall be completed at the direction of the Town. Nicks and abrasions shall be cleaned and the Town shall designate the appropriate primer coat and finish coat, if applicable.

When indicated on the plans, traffic and pedestrian signal heads shall be painted flat black.

7.1.9 GENERAL GUARANTEES AND WARRANTIES

All work completed by the Contractor shall be guaranteed against defects in workmanship or materials for a period of two years from the date of Substantial Completion, excepting ordinary wear and tear, abuse, or neglect. Labor and performance bonds shall remain in effect for the two-year period.
7.1.9.1 Materials and Parts

The Contractor shall supply the Town of Parker with all manufacturer warranties and/or guarantees covering materials and parts.

7.1.10 GENERAL SIGNAL DESIGN REQUIREMENTS

7.1.10.1 Scope

This section describes general signal design requirements for use in the Town of Parker. Variances from these requirements require written approval of the Town.

7.1.10.2 Signal Head Placement and Sizes

For all installations, one signal head shall be provided centered over each exclusive left turn and through lane. If mast arms do not reach the left turn lane(s), the number and configuration of signal heads should be adjusted in consultation with the Town. Far left and far right pole-mounted signal heads shall also be provided. The need for one signal head per right turn lane should be determined on a site-specific basis.

Pedestrian signal heads shall be provided with corresponding pedestrian push buttons. Pedestrian signal heads shall be located for the pedestrian crossing sight line. Pedestrian push button locations shall meet ADA standards for height and horizontal reach. An exclusive pedestrian push button pole, as shown in the standard details, may be required.

Where left turn arrows are included, at least two signal heads with left arrow sections shall be provided, with one of these located on the far left pole.

All mast arm mounted signal heads shall have black, 5-inch-wide, aluminum, louvered backplates.

Red, yellow, and green signal sections shall be twelve inches in all cases.

Where mast arms extend over the left turn lane(s), left turn only sign(s) should be provided. Double lefts may be covered with one left turn only sign (R3-5L) per lane, or one double left turn only sign located over the lane line between the double lefts. Where a right turn lane is provided, a right turn only sign (R3-5R) should be provided and centered over the lane.

7.1.10.3 Pole and Cabinet Placement

All signal poles, pedestals and cabinets shall be placed a minimum of three feet from face of traffic signal item to face of curb where curbing is present, with a desirable separation of a minimum of five feet. The same separations apply from face of traffic signal item to outside edge of shoulder where pavement and shoulder exist with no curbing. Where only pavement exists without shoulder and curbing, a minimum of five feet from face of traffic signal item to edge of pavement shall be maintained, with a desirable separation of a minimum of seven feet.
**7.1.10.4 Street Name Signs**

Internally illuminated street name signs shall be provided. Such signs shall be in conformance with standard specifications section 7.1.7.3 and the standard details (appendix D).

**7.1.10.5 Future Signal Considerations**

All intersections undergoing initial development or construction that are anticipated to require signalization in the future shall include signal conduit at the time of initial road construction, in conformance with these specifications. The developer/permittee should consult with the Engineering/Public Works Department to identify intersections to which this requirement applies.

All conduit shall be Schedule 80 PVC and shall include pull boxes, locate wire, pull string and locate balls.

**7.1.10.6 Luminaires**

Unless otherwise indicated, the Contractor shall provide luminaires and luminaires' wiring, and shall fully install these items for all corners of the intersection. Luminaire mounting height shall be a minimum of 30 feet. Luminaires shall be 250-watt high pressure sodium, cobra-style head, and shall be cut-off optic.

**7.1.10.7 Vehicle Detectors**

Stop bar protection shall be provided.

On all approaches with free-flow speeds of 40 to 45 mph and greater, consideration should be given to providing advance detection for dilemma zone protection. Site-specific conditions such as grades or sight distance obstructions may also justify use of advance detection. The potential need for advance detection in these cases should be reviewed with the Town.

**7.1.10.8 Signal Power**

In general, circuit breakers and power disconnects should be located internal to service meter assemblies and signal controller cabinets, and should not be readily accessible to the public.

The Town of Parker Building Division is responsible for inspecting service installations and certifying acceptability to the utility company for hook-up.
7.2 TRAFFIC SIGNS AND PAVEMENT MARKING SPECIFICATIONS

7.2.1 TRAFFIC SIGNS

7.2.1.1 Materials

All “Stop” (R1-1) signs, “Yield” (R1-2) signs, and all signs mounted on traffic signal mast arms shall have ASTM D-4956 Type VIII retro-reflective material (3M Diamond grade or approved equivalent).

All other ground signs shall have ASTM D-4956 Type III retro-reflective material (3M High Intensity grade or approved equivalent).

7.2.1.2 Supports

The Town standard is NEX, galvanized tubular steel sign support or equal. All installations shall incorporate a base anchor, be installed in the ground, and include a wedge system intended to provide a controlled breakaway feature. Installation shall be in accordance with the manufacturer’s recommendation.

7.2.1.3 Location

Locations shall be per the MUTCD.

7.2.1.4 Street Name Sign Lengths

Street names shall be limited to 12 letters/character spaces excluding the street type/suffix.

7.2.2 PAVEMENT MARKINGS

7.2.2.1 Materials

Standard-marking materials shall be as follows for Town roadways. All materials shall be in conformance with the CDOT *Standard Specifications for Road and Bridge Construction*, most recent edition, sections 627 and 713.
### TABLE 7-2
Standard Marking Materials

<table>
<thead>
<tr>
<th>Marking Type/ Surface Type</th>
<th>Lane Lines and Channelizing Lines</th>
<th>Crosswalk Bars and Stop Bars</th>
<th>Turn Arrows and Written Legends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Pavement</td>
<td>Epoxy</td>
<td>Preformed Plastic(^{(1)}) or Preformed Thermoplastic</td>
<td>Preformed Plastic or Preformed Thermoplastic</td>
</tr>
<tr>
<td>Asphalt Pavement</td>
<td>Epoxy</td>
<td>Preformed Plastic or Preformed Thermoplastic</td>
<td>Preformed Plastic or Preformed Thermoplastic</td>
</tr>
</tbody>
</table>

**Notes:**
- Preformed Plastic is 60 mils.
- \(^{(1)}\) Crosswalk bars shall be recessed.

Preformed thermoplastic may be used for spot repair/replacement of all marking types on asphalt surfaces.

#### 7.2.2.2 Surface Preparation

New concrete pavement shall have all residues removed, such as mud, dirt, curing compound, etc. Removal shall be by water blasting, sand blasting, or other method approved by the Town.

New asphalt pavements shall be dry and free of dirt.

For all restriping on existing concrete or asphalt pavement, the surface shall be clean and dry. Cleaning shall be by sweeping, air blasting, or other method approved by the Town.

Surface temperature shall be in conformance with the CDOT *Standard Specifications for Road and Bridge Construction*, most recent edition, section 627 and the manufacturer’s recommendations.

#### 7.2.2.3 Installation

All pavement markings shall be applied per the manufacturer’s recommendations, unless otherwise authorized by the Town.

#### 7.2.2.4 Pay Item

Pavement markings shall be measured and paid for on a unit price basis (normally square feet) unless otherwise authorized by the Town.
7.3 ROADWAY LIGHTING

7.3.1 INTRODUCTION

These guidelines apply to all new street lighting systems and retrofit lighting systems, where practical, within the Town of Parker. IREA is responsible for providing residential street lighting and additional street lighting as requested by the Town.

The developer/permittee shall be responsible for installation of residential street lighting as well as intersection lighting of collector and arterial roadways affected by the proposed development prior to probationary acceptance.

7.3.2 GUIDELINES

7.3.2.1 Town Installation Criteria

Street lights may be required by the Town, based upon the following:
   a) Reduction of an identified nighttime traffic accident problem correctable through street light installation
   b) Major traffic corridors with significant turning movement conflicts and nighttime pedestrian activity
   c) Major traffic corridors with significant nighttime turning movement conflicts
   d) Arterial and collector intersections and/or significant horizontal or vertical alignment changes
   e) Commercial alleys with significant nighttime pedestrian activity

7.3.2.2 Street Light Requests

Before considering new or additional local street light requests, the Town will require unanimous consent of all affected owners of property within 100 feet of proposed street light locations and the support of at least 51 percent of the total number of owners of properties within 500 feet of proposed locations. Requests should be initiated by local owners.

7.3.2.3 Costs

The installation costs of street light fixtures shall be paid by the developer/permittee requesting the installation. The Town will assume continued maintenance and energy costs associated with new installations within public ROW on arterial roadways. The developer/permittee will assume continued maintenance and energy costs associated with new installations within public ROW on local streets and collectors.
7.3.3 DESIGN

Street light design shall follow these design standards, the Town of Parker Lighting Ordinance, IREA standards, and the Illuminating Engineering Society’s (IES) American National Standard Practice for Roadway Lighting.

Street lights shall be an energy efficient lighting source (i.e. high pressure sodium, light emitting diode, or metal halide) with a minimum of ambient or reflected light (full cut-off luminaires).

All lighting systems installed shall be of a style maintained and serviced by IREA in agreement with the Town, except decorative lighting and traffic signal luminaires. Decorative lighting is not limited to the IREA styles and may be whatever style is appropriate for the area.

Lighting system design shall follow these general policies:

a) **Arterials:** Street lighting shall be provided at intersections and identified pedestrian crossings. Additional/intermediate locations shall be based on IREA/IES standards and locations with demonstrated need based on changes in horizontal and/or vertical alignment.

b) **Collectors:** Street lighting shall be provided at intersections and identified pedestrian crossings. Additional lighting may be considered at locations with demonstrated need based on changes in horizontal and/or vertical alignment and IREA standards.

c) **Local Streets:** Street lighting shall be provided per IREA standards for subdivisions with lighting required (at a minimum) at all intersections and identified pedestrian crossings. Additional intermediate lighting will be determined by IREA during design. Additional lighting may be considered at locations with demonstrated need based on changes in horizontal and/or vertical alignment.

d) **Private Driveways/Alleys:** Street lighting installed at the intersection of private driveways and Town roadways shall be installed using Town standards, be located outside of the public ROW, and all costs for installation, maintenance, and continued energy expenditures shall be the responsibility of the developer/permittee requesting the lighting installation.

e) **Decorative Lighting:** Any nonstandard lighting system designs proposed for decorative purposes shall be submitted to the Town for review and approval. This submittal shall include the lighting system layout, calculations on the illumination provided by the system, manufacturers and suppliers of the equipment, and an agreement detailing the responsibility and plan for the maintenance of the system. Continued maintenance and energy costs shall be the responsibility of the developer/permittee.

7.3.4 EASEMENTS

Adequate ROW or utility easements shall be dedicated to the Town to allow Intermountain Rural Electric Association (IREA) to install street lights. Facilities with detached bike paths or sidewalks may use a combined signage, utility, and pedestrian easement for placement of the street lights between the curb and sidewalk provided that the required horizontal clearance from the sidewalk or bike path is met. Where a bike path or sidewalk is attached to the street curb and gutter, street lights shall be placed behind the sidewalk or path within a utility easement.
7.4 REFERENCES


IMSA (International Municipal Signal Association). IMSA Standards.

ITE (Institute of Transportation Engineers). ITE Standards.

National Electrical Code, as adopted by the Town of Parker.
8.0 PERMIT APPLICATION REQUIREMENTS AND PROCEDURES

TABLE OF CONTENTS

8.1 INTRODUCTION ....................................................................................... 8-3
8.2 FLOODPLAIN DEVELOPMENT PERMIT .................................................... 8-3
8.3 GRADING PERMIT .................................................................................. 8-4
8.4 ACCESS PERMIT .................................................................................. 8-4
8.5 OVERSIZE/OVERWEIGHT VEHICLE PERMIT .............................................. 8-4
8.6 STREET OCCUPANCY PERMIT ................................................................. 8-4
8.7 ROW USE PERMIT ................................................................................ 8-4

8.7.1 APPLICABILITY ............................................................................... 8-4
8.7.2 PERMIT APPLICATION REQUIREMENTS ............................................. 8-6
  8.7.2.1 Application Form ........................................................................ 8-6
  8.7.2.2 Traffic Control Plan(s) .................................................................. 8-7
  8.7.2.3 Site/Construction Plan(s) ............................................................... 8-8
  8.7.2.4 Certificate of Insurance ................................................................. 8-8
  8.7.2.5 Additional Application Submittals .................................................. 8-8
  8.7.2.6 Fees ............................................................................................ 8-9
8.7.3 PRECONSTRUCTION MEETING ............................................................ 8-9
8.7.4 INSPECTIONS ..................................................................................... 8-10
8.7.5 DURATION OF PERMITS .................................................................... 8-11
8.7.6 WORK HOURS .................................................................................. 8-11
  8.7.6.1 Work Occurring Within Traffic Lanes .............................................. 8-11
  8.7.6.2 Night Work and Overnight Closures .............................................. 8-11
  8.7.6.3 Outside of Regular Business Hours .............................................. 8-12
8.7.7 CONSTRUCTION REQUIREMENTS ...................................................... 8-12
8.7.8 UTILITIES ....................................................................................... 8-12
  8.7.8.1 Locates ....................................................................................... 8-12
  8.7.8.2 Relocation and Protection of Utilities .......................................... 8-12
  8.7.8.3 Utility Repairs and Maintenance Operations .................................. 8-12
8.7.9 EMERGENCY REPAIRS ...................................................................... 8-12
8.7.10 SITE MAINTENANCE ......................................................................... 8-13
  8.7.10.1 Erosion Control ......................................................................... 8-13
  8.7.10.2 Clean Up .................................................................................. 8-13
8.7.11 ADDITIONAL PERMIT CONDITIONS/SPECIFICATIONS .................... 8-13
8.7.12 COMPLETION OF WORK ................................................................. 8-15
8.7.12.1 Probationary Acceptance .......................................................... 8-15
8.7.12.2 Warranty .................................................................................. 8-16
8.7.12.3 Performance/Warranty Guarantee ............................................. 8-16
8.7.12.4 Final Acceptance ...................................................................... 8-16
8.7.13 PUBLIC SAFETY AND NUISANCE ............................................. 8-17
8.7.14 FAILURE TO ABIDE BY TERM AND CONDITIONS ..................... 8-17
8.7.14.1 Stop Work Orders ................................................................. 8-18
8.7.14.2 Revocation and/or Suspension of Permits .............................. 8-18
8.1 INTRODUCTION

It is the responsibility of the developer/permittee for knowing and observing the rules and regulations contained in the Parker Municipal Code (Code). In the event that there is a conflict between the Code and this Manual, the Code shall control.

Dependent upon the location, content and environment of the development, permits may be required prior to the start of construction.

The Town of Parker (the Town) Engineering/Public Works Department issues all roadway access and construction related permits (excluding building permits) for the construction of public infrastructure and grading/excavation activities within the Town of Parker. Further, the Engineering/Public Works Department reviews and issues all permits impacting the Town’s right-of-way (ROW).

The following are permits issued by the Public Works Department:

- Floodplain Development Permit
- Grading Permit
- Access Permit
- Oversize/Overweight Vehicle Permit
- Street Occupancy Permit
- ROW Use Permit

Additional permits that may be required as a result of development include those promulgated by the Colorado Department of Public Health and Environment (CDPHE), Colorado Department of Transportation (CDOT), Urban Drainage and Flood Control District (UDFCD), Federal Emergency Management Agency (FEMA), Parker Water & Sanitation District (PWSD), Cherry Creek Basin Water Quality Authority (CCBWQA), the U.S. Army Corps of Engineers, or others as applicable.

It shall be the responsibility of the developer/permittee to obtain any required easements and/or additional approvals which may be required by the Town, State of Colorado, other governmental agencies, or adjacent landowners.

8.2 FLOODPLAIN DEVELOPMENT PERMIT

Refer to the Town of Parker Storm Drainage and Environmental Criteria Manual (SDECM) for detailed information. The Floodplain Development Permit shall be required for all work to be performed within a regulatory floodplain.
8.3 GRADING PERMIT

A Grading Permit governs the movement of earth, either excavation (cut), embankment (fill), or land disturbance of any type on either public or private property. The developer/permittee shall contact the Public Works Department prior to initiating any such activities. All activities shall be completed in accordance with the SDECM and shall comply with Title 11.10 of the Code.

Current administrative procedures and submittal requirements relating to the Grading Permit are available online and can be obtained by contacting the Town of Parker Public Works Department.

8.4 ACCESS PERMIT

All access points that connect to Town-maintained roadways will require the review and approval from the Public Works Department. Access permits may have specific terms and conditions, and changes may require a new access permit. For access points not reviewed and approved through the Town’s development process, an access permit must be obtained from the Public Works Department.

All state highway access permits within the Town of Parker shall be processed through the Public Works Department in conjunction with CDOT Traffic review.

8.5 OVERSIZE/OVERWEIGHT VEHICLE PERMIT

In accordance with Title 7.01.060 of the Code, an Oversize/Overweight Vehicle Permit must be obtained prior to the operation or moving any oversized/overweight load within the Town. If using Colorado state highways, E-470 Public Highway Authority highways, or Douglas County highways, the applicant must apply for those permits separately with the appropriate agency.

Oversize/Overweight Vehicle Permit will not typically be required for the operation and/or moving any oversized/overweight loads through the Town while staying on Parker Road (State Highway 83) or E-470. Operations or moving requiring coordination from the Town will require a permit.

8.6 STREET OCCUPANCY PERMIT

Street Occupancy Permits are required to place items, including, but not limited to, landscape materials, storage containers, dumpsters, and construction trailers within the Town ROW for more than 24 hours.

8.7 ROW USE PERMIT

8.7.1 APPLICABILITY

The requirements of this section and as provided in Title 10 of the Code shall apply to any person, corporation, municipality, quasi-governmental agency and special districts, including water, sewer,
electric, gas, cable television, or telecommunication utility impacting the Town ROW whether for access or to engage in maintenance, temporary access, and/or construction related activities.

Any work performed inside and/or any use of the Town’s ROW as defined in section 9 of this Manual must have a valid ROW Use Permit (and any other applicable permits as described within this section).

Examples of work requiring a ROW Use Permit include, but are not limited to, the following:

- Construction, removal, repair and/or maintenance of infrastructure, utilities, and other facilities located within the Town’s ROW.
- Activities such as, for example exploratory boring and potholing across and/or within the Town’s ROW.
- Construction or modifications of access points from private property to or through the Town’s ROW.
- Construction access from the Town’s ROW to private property or utility easements.
- The placement, removal, or modification of any traffic signs, pavement striping, or traffic signals.
- The storage of materials and equipment within the Town’s ROW (if a Street Occupancy Permit is not applicable).
- Maintenance of facilities which do not necessitate a pavement and/or curb cut but will cause a disruption in vehicle or pedestrian traffic operations and therefore require a traffic control plan that will be reviewed and approved by the Town.
- Roadway closures for any purpose; a roadway closure request and detour plans shall accompany the permit application. Events such as block parties, races or other community events are handled and permitted through the community event permit process.
- When a traffic lane and/or sidewalk is obstructed for any purpose other than travel for activities such as, for example temporarily parking vehicles, tree trimming, landscape operations, materials storage, or delivery within the Town’s ROW.
- When traffic control for work and/or closures on adjacent private roadways, state, and/or county roadways will impact and/or be located within the Town’s ROW.
- Temporary access for limited duration events such as, for example temporary roadside stands, access through Town ROW to adjacent property, access to utility facilities.
- Construction and/or activities that impact trails, sidewalks, parks, open space and other public uses within Town ROW.

Each permit obtained, along with associated documents, shall be maintained on the job site and available for inspection upon request of the Town.
8.7.2 PERMIT APPLICATION REQUIREMENTS

A completed ROW Use Permit to be considered for approval must include the following:

- Completed ROW Use Permit application
- Detailed traffic control plan(s)
- Site/construction plan(s)
- Certificate of insurance
- Any other information requested by the Town
- Payment of permit fee
- Security/Surety/Warranty/Guarantee

Applications for permits are made electronically through the Town’s eTrakit system. Completed permit applications will typically be reviewed within five business days of their submittal. Complex submittals may require additional time for review and coordination. Once the review is completed, the Town will notify the applicant of any additional/outstanding requirements or of the approval of the permit if deemed acceptable.

Permit approval must be obtained no less than two business days prior to the commencement of construction, access, of any other activities that would impact the Town ROW with the exception of emergency repairs as identified in within this section.

The permit will not be reviewed if the application to the Town is incomplete, if the applicant is delinquent in payments due the Town on prior work, security or insurance has lapsed or is not adequate and/or if the applicant has outstanding permits that are not in compliance with this section and the Code.

8.7.2.1 Application Form

All information required for the application must be provided to be considered for review. For any portions of the permit application that are considered to not be applicable, the contractor must indicate such with “N/A.”

The completed application submitted to the Town for review and approval shall include the following:

(1) The applicant shall provide the date of application and the anticipated beginning and ending dates of the activities within the ROW.

(2) The name and address of the applicant and the name and address of the developer.
(3) The exact location of the proposed construction, excavation, or work activity is to be clearly identified, and if necessary the applicant may be required to provide additional documentation such as a location map for clarification.

(4) The applicant must indicate the full scope of the work and provide a detailed description of the work’s purpose and all impacts to the existing public infrastructure (street pavement, curb and gutter, sidewalks, and/or utilities).

(5) The measurements and quantities must be provided and reflect that of the work identified in the description.

(6) The estimated cost of the ROW restoration must be provided. Restoration costs considered shall include, but not be limited to labor, materials, traffic control, and testing. Restoration costs that meet or exceed $5,000 shall be secured with the Town as described in this section and the Code.

(7) All subcontractors and the material testing firm information shall be provided.

8.7.2.2 Traffic Control Plan(s)

(1) Any permits that will impact the flow of vehicles, bicyclists, pedestrians, or other users of the public ROW will require submittal and approval of a traffic control plan before the permit will be issued. This includes, but is not limited to, street cuts, sidewalk repair/replacement, utility access, lane closures and potholing.

(2) Traffic Control Plans (TCPs) are required for all ROW Use Permits. TCPs shall be consistent with the most recent edition of the Manual of Uniform Traffic Control Devices (MUTCD) and the current revision of the Colorado Supplement thereto, CDOT Standard Specifications for Road and Bridge Construction, and the CDOT M&S Standards. The most recent edition of the MUTCD is available online at http://mutcd.fhwa.dot.gov. The TCP must be prepared by qualified personnel as specified within the CDOT specifications.

(3) TCPs are required for emergency work as well as scheduled work. For emergency work, every effort will be made to expedite the review and approval of TCPs and permits. The Town will not be under any obligation to accept any work performed prior to approval of a TCP and/or issuance of a permit even if the work is performed to Town standards.

(4) Access for pedestrians and bicycles must be maintained and clearly shown on the TCP. Sidewalk or trail closures will require a TCP and may require a temporary access path to maintain access around the disturbed areas.

(5) Roadway closures are not allowed in the Town without prior written approval of the Director. Any plan for traffic control during construction that indicates a complete closure must show detour routes and must be approved by the Director at least one week prior to issuance of the permit. More detailed TCPs will be necessary for complex and/or phased projects. An additional permit from the Fire Authority may be required prior to the issuance of the Town’s ROW Use Permit.
8.7.2.3 Site/Construction Plan(s)

(1) The applicant shall submit a sketch plan showing type, size, and location of the proposed work. Additional information and/or engineered drawings may be required as determined by the Town based on the scope of work.

(2) A satisfactory erosion protection plan, in conformance with the SDECM, for the proposed construction activities shall be provided. Additional protection may be required by the Town.

(3) Provide a satisfactory plan of work showing protection of the subject property and adjacent properties when the Town determines such protection is necessary.

(4) All permit submittals shall incorporate subsurface utility engineering requirements in accordance with current state law.

8.7.2.4 Certificate of Insurance

Prior to the granting of any permit, the applicant must supply the Town with current worker's compensation, general liability, and comprehensive automobile liability insurance policy or certificate with coverage as identified in Chapter 10.09 of the Code. Certificates of insurance submitted for review and approval by the Town’s Risk Manager shall list the Town of Parker as an additionally insured. Information can be obtained on required coverage amounts by contacting the Town’s Risk Manager or visiting the Town’s website at www.parkeronline.org.

8.7.2.5 Additional Application Submittals

(1) Provide mix designs and material certifications for materials used for the construction and/or restoration of the Town’s ROW shall conform to Town and CDOT standards.

(2) Include evidence of all permits or licenses required to do the proposed work if required under the laws of the United States, the State or the ordinances of the Town.

(3) Provide a satisfactory plan for the protection and restoration of impacted landscaping or when the Town determines that damage may occur.

(4) Provide a license agreement, if required, for the installation and/or construction of any structures or landscaping within the Town’s ROW.

(5) Provide the Town the warranty guaranty for restoration costs that meet or exceed $5,000. An itemization cost estimate, including labor and materials, of the work proposed is required.

(6) Provide any other information requested by the Town depending on the nature and scope of the work involved.
8.7.2.6 Fees

Permit & Inspection Fees

Before a permit is issued, the applicant shall pay a permit fee in accordance with the permit fee schedule included in Appendix C.

Additional fees may be assessed for permits that require extensive inspection time, or those that result in additional disturbance. These fees shall be paid prior to the completion and acceptance of the permitted work. The Town reserves the right to restrict future permits requested by the applicant until all outstanding fees are paid.

Penalty Fees

Any entity commencing any work without a valid permit or prior written authorization shall be required to pay an additional penalty fee which shall be in the amount of twice the assessed permit fee.

Revisions to Standard Permit Fees

The Town may waive certain fees or utilize a modified fee schedule in accordance with Title 10 of the Code. For projects in which it is determined that no permit fees are required, inspection fees may still apply.

The applicant shall not begin any work within the ROW, including construction of any improvements or repairs, without a current ROW Use Permit. In the event any entity begins construction prior to the issuance of a permit, all applicable permit fees and penalty fee may apply.

Permit Cancelations & Refunds

Any issued ROW Use Permit may be cancelled by the applicant if no work has commenced. The permit processing fee is not subject to a refund and the applicant will be responsible for any fees necessary to process the cancelation of the permit. Associated fees will be deducted from the overall permit refund amount and/or billed to the applicant as necessary.

8.7.3 PRECONSTRUCTION MEETING

Unless otherwise authorized by the Designated Town Authority (DTA), the ROW Use Permit applicant (Permittee) must participate in a preconstruction meeting with the Town prior to the commencement of work. The preconstruction meeting agenda varies according to the type and complexity of the planned work, as well as the contractor's experience in the Town. The meeting may include:

- Scheduling inspections
- Project specific requirements (such as, for example traffic control)
• Punchlist preparation and repairs
• Warranty period
• Security
• Final Acceptance process

8.7.4 INSPECTIONS

The DTA is authorized to inspect all work performed under the permit including, but not limited to traffic control, clearing and grubbing, excavation, compaction of subgrade, base, forms, asphalt and concrete work, structures, and materials to be used, removed and/or installed.

The permittee must call the Public Works Department (303-840-9546) one business day (at least 24 hours), but not more than five business days, in advance of commencing work or penalties associated with a Stop Work Order may apply. All subsequent inspections must be scheduled in the same manner.

If an inspection is scheduled with the DTA and if, for any reason, work is not performed as scheduled, the permittee must call and cancel the inspection as soon as possible. Failure to cancel the Town’s inspection may result in additional inspection fees being applied for the time incurred.

Repeated failure to schedule the required inspections may result in a Stop Work Order and/or the revocation of the permit. In the case of the revocation of a ROW Use Permit, the Town may, on its own initiative, make required repairs at the expense of the permittee.

Required inspections will be scheduled during normal Town business hours (8:00 a.m. to 5:00 p.m., Monday through Friday, Town holidays excluded) with proper notification to the Town.
8.7.5 DURATION OF PERMITS

ROW Use Permits shall be valid for a period of sixty calendar days from the date of issuance unless revoked by the Town for failure to abide by the terms and conditions of the permit or by operation of the law.

ROW Use Permits may be renewed for one additional thirty-calendar-day period, providing the renewal is obtained in writing prior to the original permit’s expiration date. A renewal fee will apply to all such requests. If the permit expires, a new permit application must be submitted and approved to complete any remaining work.

Annual ROW Use Permits may be obtained by utility providers, special districts, and homeowners associations for general access necessary to maintain utility facilities and landscaping. The annual permit typically applies to short-term operations for access and maintenance, including mowing operations, within the ROW. Repairs, excavations, landscaping installation and removal, and construction activities of any kind are not covered by the annual permit will require additional ROW Use Permits specific to the scope of work.

If the permittee fails to complete installation of the facility covered by the permit within the period specified in the permit, the permit shall be deemed null and void and fees will be retained by the Town to cover costs related to remediation, unless an extension of time is obtained from the Town.

8.7.6 WORK HOURS

The Town’s normal business hours are Monday through Friday, except Town holidays, 8:00 a.m. to 5:00 p.m. The DTA is available for scheduled inspections during these times. Work within the ROW requiring inspection (refer to appendix B for minimum inspections) shall be limited to these times unless otherwise approved by the DTA.

8.7.6.1 Work Occurring Within Traffic Lanes

Traffic lanes may be closed to traffic, Monday through Friday, within in the hours of 9:00 a.m. to 3:30 p.m. Additional consideration may be given on a case-by-case basis for lane closures outside of these hours and Town business days with the approval of the Director.

Emergency repairs on a public utility is permitted in the ROW anytime given that adequate traffic control measures are provided in accordance with the MUTCD.

8.7.6.2 Night Work and Overnight Closures

Overnight closures are not typically permitted. Special circumstances requiring an exception to this requirement will be evaluated on a case-by-case basis and must be requested in writing to the Director. There may be circumstances where the Town will require work to take place at night.
8.7.6.3 *Outside of Regular Business Hours*

Work within the Town’s ROW outside of normal business hours will not be permitted unless authorized by the DTA. Special circumstances to this requirement will be evaluated on a case-by-case basis by the Town. If allowed, the applicant must adhere fully to all inspection requirements and Town standards.

The permittee shall adhere to the Town noise ordinance at all times for all work within the Town of Parker limits in accordance with Title 6 of the Code.

8.7.7 *CONSTRUCTION REQUIREMENTS*

The permittee shall adhere to all construction specifications set forth in the latest edition of this Manual, the SDECM and CDOT’s *Standard Specifications for Road and Bridge Construction*. Refer to section 9 and appendix B of this Manual for additional clarification and requirements.

8.7.8 *UTILITIES*

8.7.8.1 *Locates*

The permittee shall contact the Utility Notification Center of Colorado (UNCC) and request field locations of all utility facilities in the area. Exploratory test holes made within the ROW shall be charged a fee as set forth in the fee schedule on the application form and may require additional repairs. See section 9 for additional utility locate pothole repair requirements. Field locations shall be marked prior to commencing work.

8.7.8.2 *Relocation and Protection of Utilities*

The permittee shall be responsible for relocating, protecting, and/or adjusting any utility facilities located within the Town’s ROW as required. Construction of the utility or other facility by the permittee, his/her agent, or contractor, may be denied if the Town believes that satisfactory arrangements for the relocation or adjustment has not been made with the owner of the affected utility facility. The permittee shall support and protect all pipes, conduits, poles, wires, or other apparatus which may be affected by the work from damage due to construction.

8.7.8.3 *Utility Repairs and Maintenance Operations*

All utilities shall obtain a ROW Use Permit prior to beginning maintenance and/or repair work within the Town’s ROW.

8.7.9 *EMERGENCY REPAIRS*

An emergency repair shall be defined as any work within the Town’s ROW required to restore an essential service which has been disrupted or failed, or where delay of a repair would require further damage to the Town’s ROW. An essential service is defined as electric, telephone, gas, water, sanitary sewer, storm sewer, or other service needed to ensure the health, safety and welfare of the public.
A ROW Use Permit must be obtained for all emergency repairs. The entity doing the work shall apply to the Town for a permit on the first business day after such emergency work has commenced. All emergency work will require telephone notification to the Public Works Department (303-840-9546), the Police Department (303-841-9800) and the South Metro Fire and Rescue Authority (720-488-7200).

Permit applications for emergency work which have not been applied for within one business day of any work within the Town ROW, property, or easements shall be subject to a penalty. If the Town does not receive written and/or verbal notice of the emergency and the submittal of the permit within the allotted time, a penalty fee will be assessed as defined within the Code and a Stop Work Order may be issued. All entities performing emergency repairs shall adhere to the permit requirements within this section.

8.7.10 SITE MAINTENANCE

8.7.10.1 Erosion Control

Prior to, during, and after construction, all applicable erosion protection or Construction Best Management Practices (CBMPs) shall be installed and maintained by the permittee in accordance with the SDECM.

8.7.10.2 Clean Up

As the work progresses, all public ROW shall be thoroughly cleaned of all rubbish, excess dirt, rock and other debris. All clean up operations shall be done at the expense of the permittee.

The permittee shall comply with the requirements to eliminate the tracking of materials upon any street, sidewalk, and/or impervious areas as prescribed by the Town. Equipment and trucks used during construction, excavation, or work activity shall be cleaned of materials prior to leaving any work site. In the event that material is tracked off-site, the permittee shall remove the tracked material immediately.

Trash and construction materials shall be contained and removed from the site daily. Trash dumpsters, storage containers, or construction trailers shall not be placed in the ROW without specific approval of the Town.

8.7.11 ADDITIONAL PERMIT CONDITIONS/SPECIFICATIONS

(1) Any permit issued pertains only to the work performed within the Town’s ROW; in no way does it imply approval from any other entities and/or jurisdictions. The permit does not authorize the permittee to enter onto any private property adjacent to such ROW nor to alter or disturb any facilities or installations existing within the ROW which may have been installed and are owned by others. The permittee is responsible for obtaining all necessary permits, easements, and or approvals necessary to complete the work.

(2) Work performed under a permit may require repairs to Town infrastructure or other Town property. All repairs shall conform to section 9 of this Manual and shall result in the ROW being
returned to a condition equal to or better than the original condition. The repair shall be accomplished in the least possible time and with the least disturbance to the normal functioning of the property.

(3) No permittee shall interrupt access to and from private property; block emergency vehicles; or block access to fire hydrants, fire stations, fire escapes, water valves, underground vaults, valve housing structures, or any other vital equipment, unless permission is obtained in writing from the owner of that facility, equipment, or property.

(4) It shall be the responsibility of the permittee to notify and coordinate all work in the ROW with police, fire, ambulance, and transit organizations when closing a roadway partially or entirely.

(5) Once work has commenced and it is determined that a larger or different area will be impacted than the area identified on the approved permit, the permittee shall notify the Town immediately. Within one business day, the permittee shall file a supplementary application for the modified scope of work.

(6) Traffic control devices, as defined in the MUTCD, must be used whenever it is necessary to work within the ROW. Traffic control devices are to be supplied by the permittee.

(7) Permits shall not be transferable or assignable unless reissued under a revised permit application. Under the reissued permit, the permittee agrees to all obligations, terms, and conditions of the original permit unless otherwise approved by the Town in writing.

(8) The permittee may subcontract the work to be performed under a permit, provided that the holder of the permit is and remains the responsible party for the performance of the work under the permit as well as all insurance and financial security as required. The permittee is to list all subcontractors on the permit application.

(9) The permittee shall protect trees, landscaping, and landscape features within the ROW. All protective measures shall be provided at the expense of the permittee. All restoration shall be at the expense of the permittee.

(10) Paved surfaces shall be protected from damage. Backhoe equipment outriggers shall be fitted with rubber pads whenever outriggers are placed on any paved surface. Tracked vehicles with grousers are not permitted on paved surfaces, unless specific precautions are taken to protect the surface. The permittee will be responsible for any damage caused to the pavement.

(11) The permittee shall protect from injury any adjoining property. The permittee shall, at their own expense, shore up and protect all buildings, walls, fences or other property/improvements likely to be damaged during the work and shall be responsible for all damage to public or private property.

(12) The permittee shall not disturb any surface monuments, hubs, and/or points found unless written approval is obtained from the Town. Any survey monuments, hubs, and/or points disturbed will be replaced by a Colorado registered land surveyor at the permittee’s expense.
(13) The permittee shall make provisions for employee and construction vehicle parking as approved by the DTA.

(14) The permittee shall maintain an adequate and safe unobstructed walkway around a construction site, or for a blocked sidewalk or pedestrian path. A temporary and alternative path may be required.

(15) The permittee shall clear all snow and ice hazards from public sidewalks at in conformance with the Code.

8.7.12 COMPLETION OF WORK

Granting of a permit is contingent on the replacement or restoration of the ROW to a satisfactory condition at the sole discretion of the DTA by the permittee. Damage caused to existing facilities as a result of the work shall be the responsibility of the permittee. All construction work and/or repairs shall be made per the Town standards and in accordance with section 9 and appendix A.

Failure of the permittee to comply with any of the terms and conditions of the permit shall be sufficient cause for cancellation of the permit and may result in removal or completion of the utilities or other facilities by the Town at the applicant’s expense.

The permit, the privileges granted, and the obligations of the permittee shall be binding upon the successors of the permittee. If the permittee fails to complete installation of the facility covered by the permit within the period specified in the permit, the permit shall be deemed null and void. All fees will be retained to cover the cost of remediation, unless a written extension is obtained from the Town.

8.7.12.1 Probationary Acceptance

The permittee shall notify the Town upon the completion of work accomplished under the provisions of the permit and schedule an inspection with the DTA for initial acceptance of the work, otherwise referred to as Probationary Acceptance.

The permittee shall be responsible for assuring all areas within the Town’s ROW, property, or easements associated with the ROW Use Permit are restored and in good repair, are clean and free from dirt and debris, and are generally in an acceptable condition for thorough visual inspection on the date of the scheduled acceptance inspection.

The permittee will be notified of any items to be addressed prior to the issuance of Probationary Acceptance. All repairs shall be completed under a valid ROW Use Permit. The permittee is to complete all repairs in accordance to the Town standards. If the work is determined to be acceptable and meets the Town’s standards, Probationary Acceptance of the restoration work will be granted and the warranty period will commence.

Refer to section 10 for additional information and clarification regarding the requirements for Probationary Acceptance.


8.7.12.2 Warranty

The permittee, by acceptance of the permit, expressly warrants the work in a manner acceptable to the Town for a period of two years from Probationary Acceptance of the work. The permittee agrees to maintain upon demand and to make all necessary repairs during the warranty period. This warranty shall include, but not be limited to, all repairs and actions needed as a result of any of the following:

- Defects in workmanship
- Defects if the work regardless of cause
- Settling of fills or excavations
- Any unauthorized deviations from the approved plans and specifications
- Failure to barricade
- Failure to clean up during and after performance of the work
- Any other violation of this Manual or the Code

8.7.12.3 Performance/Warranty Guarantee

Prior to issuance of a permit, a performance/warranty guarantee (guarantee) shall be required for projects involving an estimated construction cost of $5,000 or greater. This guarantee shall be in the form of cash or an irrevocable letter of credit provided to the Town from a financial institution and in a form acceptable to the Town and shall remain valid for at least two years beyond the anticipated completion of the work identified in the permit as required by the Code. The letters of credit shall be extended as requested by the Town.

The permittee shall provide the Town the guarantee, at the permittee's expense, in an amount equal to one hundred percent (110%) of the Town-approved estimate of the cost of restoration. The cost of restoration shall include all applicable costs to complete the work, including but not limited to removal, recompaction, construction of surface improvements, and mobilization.

Once the work has been satisfactorily completed and has obtained Probationary Acceptance, the guarantee may be reduced to 20 percent. All remaining letters of credit or cash deposited as a guarantee for individual permits will be returned after Final Acceptance or voiding of any permit that is in compliance with the Town's standards and Code.

Failure to obtain Final Acceptance at the end of the warranty period shall result in the Town using the warranty guarantee to complete any warranty work and in the event the warranty guarantee is not sufficient to complete the warranty work, the permittee shall be responsible for any additional costs to complete the warranty work.

8.7.12.4 Final Acceptance

Approximately thirty days prior to the completion of the warranty period, the permittee shall request a final inspection from the Public Works Department. Section 10 provides additional information and clarification regarding Final Acceptance inspections and the acceptance requirements.
If repairs are determined to be necessary by the DTA, the permittee shall renew the ROW Use Permit and perform the repairs in accordance with the Town standards.

Failure to schedule inspections, complete repairs, and/or obtain acceptance from the Town within the warranty period does not release the permittee of their responsibility to adhere to the Town standards and permit requirements.

If the work is determined to be satisfactory at the end of the warranty period, the Town will grant final acceptance of the work. Once Final Acceptance has been granted, any remaining cash or letter of credit warranty guarantees will be returned to the responsible party.

**8.7.13 PUBLIC SAFETY AND NUISANCE**

Any entity who obtains a permit for construction, excavation, work, or access in the Town ROW shall maintain a safe work area that is free of nuisance/hazardous conditions.

Conditions or defects that the Town deems a public safety hazard and/or nuisance shall be repaired and/or satisfactorily corrected within twenty-four hours of discovery. Other critical, but nonemergency repairs shall be completed within thirty days after notice is provided.

If the permittee is unable to respond in a timely manner or the Town determines the danger requires immediate response, the Town may make any repair necessary to eliminate any hazards or nuisances or to rectify work not performed as directed. Any such work performed by the Town shall be completed and billed to the permittee. The permittee shall pay all such charges within thirty days of the statement date.

If the permittee fails to respond to the Town, the permittee shall be barred from performing any work in the public ROW, and under no circumstances will the Town issue any further permits of any kind to the permittee until such time that all outstanding issues have been satisfactorily corrected and all charges have been paid in full.

**8.7.14 FAILURE TO ABIDE BY TERM AND CONDITIONS**

Failure of the permittee to comply with any of the terms and conditions of the permit shall be sufficient cause for cancellation of the permit, may be cause for the refusal of future permits, and/or may result in removal of the utilities or other facilities by the Town at the permittee’s expense. The permit, the privileges granted by the permit, and the obligations of the permittee shall be binding upon the successors and subcontractors of the permittee.

The Town may, on its own initiative, make required repairs and bill the permittee. This charge shall include costs for labor, materials and equipment on a portal to portal basis.

No further permits will be issued until the violation has been satisfactorily corrected by the permittee. Additionally, no further permits will be issued until the Town has been reimbursed for all expenses and additional fees.
8.7.14.1 Stop Work Orders

Any person, corporation, quasi-governmental agency, special district, utility corporation, who without first having obtained a permit and/or has not complied with the permit conditions and Town standards, shall be subject to a Stop Work Order issued by the Town, whereupon that entity shall, except for emergency repair work, discontinue all work within Town ROW until such time as the violation has been satisfactorily corrected. All work shall cease immediately or once conditions are safe to do so as directed by the Town.

No further permits will be issued until the repairs have been completed or the Town has been reimbursed for expenses required to complete the repairs.

8.7.14.2 Revocation and/or Suspension of Permits

Any permit may be revoked or suspended by the Town, after notice to the permittee for any of the following:

- Violation of any condition of the permit or of any provision of this section
- Violation of any provision of the Code, any other ordinance of the Town, state or federal law relating to the work
- Existence of any condition or performance of any act which constitutes or causes a condition endangering life or damage to property

A suspension or revocation by the Town shall take effect immediately upon notice to the person performing the work in the Town’s ROW.

Any suspension or revocation may be appealed by the permittee to the Director by filing a written notice of appeal within ten business days of the action. Any decision rendered by the Director is final and not subject to appeal. No work shall be performed during the appeal process unless directed otherwise by the Town.

No refunds will be given for revoked permits and the permittee shall be responsible for all inspection costs incurred.
# 9.0 CONSTRUCTION PROCESS AND REQUIREMENTS

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1</td>
<td>CONSTRUCTION PROCESS</td>
<td>9-3</td>
</tr>
<tr>
<td>9.1.1</td>
<td>INTRODUCTION</td>
<td>9-3</td>
</tr>
<tr>
<td>9.1.2</td>
<td>PRECONSTRUCTION MEETING</td>
<td>9-3</td>
</tr>
<tr>
<td>9.1.3</td>
<td>PRE-PAVING MEETING</td>
<td>9-3</td>
</tr>
<tr>
<td>9.1.4</td>
<td>CONSTRUCTION HOURS AND NOISE</td>
<td>9-4</td>
</tr>
<tr>
<td>9.1.5</td>
<td>UTILITIES</td>
<td>9-4</td>
</tr>
<tr>
<td>9.1.6</td>
<td>CONSTRUCTION COORDINATION</td>
<td>9-5</td>
</tr>
<tr>
<td>9.1.7</td>
<td>EROSION CONTROL/CONSTRUCTION BEST MANAGEMENT PRACTICES</td>
<td>9-5</td>
</tr>
<tr>
<td>9.1.8</td>
<td>PROTECTION OF WORK, EMPLOYEANS, PUBLIC, AND PROPERTY</td>
<td>9-5</td>
</tr>
<tr>
<td>9.1.9</td>
<td>CONSTRUCTION LIMITS</td>
<td>9-5</td>
</tr>
<tr>
<td>9.1.10</td>
<td>TRAFFIC INTERRUPTION</td>
<td>9-6</td>
</tr>
<tr>
<td>9.1.11</td>
<td>HOUSEKEEPING AND CLEANUP</td>
<td>9-6</td>
</tr>
<tr>
<td>9.1.12</td>
<td>ENFORCEMENT</td>
<td>9-6</td>
</tr>
<tr>
<td>9.1.13</td>
<td>ACCEPTANCE AND WARRANTY</td>
<td>9-7</td>
</tr>
<tr>
<td>9.2</td>
<td>CONSTRUCTION CONFORMANCE</td>
<td>9-8</td>
</tr>
<tr>
<td>9.2.1</td>
<td>GENERAL</td>
<td>9-8</td>
</tr>
<tr>
<td>9.2.2</td>
<td>QUALITY CONTROL/QUALITY ASSURANCE</td>
<td>9-8</td>
</tr>
<tr>
<td>9.2.2.1</td>
<td>Quality Control</td>
<td>9-8</td>
</tr>
<tr>
<td>9.2.2.2</td>
<td>Quality Assurance</td>
<td>9-9</td>
</tr>
<tr>
<td>9.2.2.3</td>
<td>Construction Inspection</td>
<td>9-9</td>
</tr>
<tr>
<td>9.2.2.4</td>
<td>Inspection Scheduling</td>
<td>9-9</td>
</tr>
<tr>
<td>9.2.2.5</td>
<td>Material Approval</td>
<td>9-10</td>
</tr>
<tr>
<td>9.2.2.6</td>
<td>Mix Design Approval</td>
<td>9-10</td>
</tr>
<tr>
<td>9.3</td>
<td>CONSTRUCTION TESTING</td>
<td>9-11</td>
</tr>
<tr>
<td>9.3.1</td>
<td>GENERAL</td>
<td>9-11</td>
</tr>
<tr>
<td>9.3.2</td>
<td>ROADWAY CORING</td>
<td>9-12</td>
</tr>
<tr>
<td>9.3.3</td>
<td>ADDITIONAL TESTING</td>
<td>9-12</td>
</tr>
<tr>
<td>9.4</td>
<td>ANCILLARY REQUIREMENTS</td>
<td>9-13</td>
</tr>
<tr>
<td>9.4.1</td>
<td>EXCAVATION AND BACKFILL FOR STRUCTURES</td>
<td>9-13</td>
</tr>
<tr>
<td>9.4.2</td>
<td>BASE COURSE</td>
<td>9-13</td>
</tr>
<tr>
<td>9.4.3</td>
<td>CONCRETE WORK</td>
<td>9-14</td>
</tr>
</tbody>
</table>
9.4.4 HOT MIX ASPHALT PAVEMENT ................................................................. 9-18
9.4.5 ROW DISTURBANCE AND RESTORATION ........................................... 9-21
  9.4.5.1 General ............................................................................................. 9-21
  9.4.5.2 Permits ............................................................................................ 9-22
  9.4.5.3 Coordination ................................................................................... 9-22
  9.4.5.4 Age of Pavement Surface ............................................................... 9-22
  9.4.5.5 Testing ............................................................................................. 9-22
  9.4.5.6 Excavations and Trenches ............................................................... 9-22
  9.4.5.7 Temporary ROW Cut Patching ........................................................ 9-24
  9.4.5.8 Permanent Patching Requirements ............................................... 9-24
  9.4.5.9 Traffic Signage and Pavement Markings ......................................... 9-26
  9.4.5.10 Traffic Signal .............................................................................. 9-26
  9.4.5.11 Outside of Paved Areas ................................................................. 9-26
  9.4.5.12 Erosion Control ........................................................................... 9-27
  9.4.5.13 Potholes for Locates or Subsurface Investigations ....................... 9-27
  9.4.5.14 Completion of Repairs ................................................................. 9-27
9.4.6 TEMPORARY TRAFFIC CONTROL ...................................................... 9-28
9.4.7 GENERAL SPECIFICATIONS/TOLERANCES ...................................... 9-30
9.1 CONSTRUCTION PROCESS

9.1.1 INTRODUCTION

Public improvements and private improvements within the Town of Parker (the Town) right-of-way (ROW), properties, and easements are subject to compliance within this Manual. Where conflicting standards and/or criteria apply, the stricter criterion or standard will be required unless otherwise approved in writing by the Designated Town Authority (DTA).

The costs for all reviews, meetings, coordination, construction inspection, and materials/construction testing, where required by these specifications or on the approved plans, shall be paid by the developer/permittee. The Public Works staff time is billed to the developer/permittee based on the fee schedule included in Appendix C. All required charge back agreements must be executed prior to issuance of permits and the commencement of work.

The developer/permittee shall perform all tests required by municipal, state, and/or federal regulations. The developer/permittee shall furnish the Town with certificates of inspection required by all state and federal regulatory agencies.

No construction activities, with the exception of the installation of the initial Construction Best Management Practices (CBMP’s), will be allowed until the preconstruction meeting has been held and the Grading Permit has been issued to the developer/permittee.

9.1.2 PRECONSTRUCTION MEETING

Prior to any construction within the Town, the preconstruction meeting shall be held with the Town. Outside agencies, such as the water and sanitation districts, shall hold separate preconstruction meetings. The developer/permittee is responsible for scheduling all other agency preconstruction meetings.

Prior to the commencement of construction activities, the developer/permittee shall implement all initial CBMPs, obtain approval from the Town, and provide the Town with a 72-hour (3 business days) notice of their intent to begin construction.

The developer/permittee shall complete the Preconstruction Meeting packet, and will list all required attendees and their contact information. Required attendees include the developer/permittee, the developer’s engineer, the general contractor, all major subcontractors, and a representative from the testing company. The developer/permittee must also provide the Town with an estimated construction progress schedule showing the proposed date of commencement and completion of the project.

The developer/permittee is responsible for arranging the preconstruction meeting and shall verify with the Town that all requirements have been met prior to scheduling the preconstruction meeting. The preconstruction meeting shall not take place until all applicable development conditions and Grading Permit Checklist requirements have been met (see Appendix C). To schedule the preconstruction meeting, the developer/permittee must contact the Public Works Department.
The Preconstruction Meeting Agenda varies according to the type and complexity of the planned work, as well as the contractors’ experience on completing projects within the Town of Parker. The meeting agenda will include:

- Construction submittal requirements
- Scheduling inspections
- Punchlist preparation and repairs
- Warranty period
- Initial and Final Acceptance process
- Certificate of Occupancy process

Preconstruction meetings with other non-Town agencies typically do not need to be completed prior to issuance of the Grading Permit and/or ROW Permit.

### 9.1.3 PRE-PAVING MEETING

A minimum of one week prior to the commencement of paving operations (both asphalt and concrete), the developer/permittee shall schedule a pre-paving meeting with the DTA and all key personnel necessary for placement, testing, and supply.

Prior to scheduling the pre-paving meeting, the developer/permittee shall submit the completed pre-paving meeting application (see Appendix C). If there is to be any impact to traffic traveling on Town roadways, a ROW Use Permit will also be required prior to the commencement of paving operations.

### 9.1.4 CONSTRUCTION HOURS AND NOISE

Construction-related activities that require inspection from the Town shall occur within the Town’s normal business hours (8:00 a.m. to 5:00 p.m.) and on workdays (no work on Town holidays). Work-related activities that do not require inspection from the Town may occur outside these hours; however, construction hours are restricted by Title 6 as defined within the CODE. Permissible construction hours (without Town inspection) are as follows:

- Weekdays – 7:00 a.m. to 7:00 p.m.
- Saturdays – 8:00 a.m. to 7:00 p.m.
- Sundays and Holidays – 10:00 a.m. to 7:00 p.m.

Emergency work on utilities, emergency work by Town personnel, or work granted by a written variance issued by the Director may be conducted outside of the construction hours described above. Additional restrictions may apply based on special project conditions or in accordance with provisions defined within Town permits.

### 9.1.5 UTILITIES

It is the sole responsibility of all contractors to notify the Utility Notification Center of Colorado (UNCC) in the manner established by Colorado State Law prior to the commencement of all grading, excavation,
and construction activities. Utility coordination, accommodation, and relocation are the responsibility of developer/permittee including any associated delays.

### 9.1.6 CONSTRUCTION COORDINATION

Other development projects and/or Town projects at the site of the project or at a nearby location may be awarded or ongoing. The developer/permittee shall fully cooperate with such work and other contractors and carefully coordinate its own work with the work arising from other projects as directed by the Town. The developer/permittee shall not commit or permit any act that shall interfere with the performance of public improvements by any other contractor.

### 9.1.7 EROSION CONTROL/CONSTRUCTION BEST MANAGEMENT PRACTICES

Prior to, during, and after construction, all applicable erosion protection or CBMPs shall be implemented and maintained by the developer/permittee. CBMPs shall conform to the approved construction plans and the SDECM.

### 9.1.8 PROTECTION OF WORK, EMPLOYEES, PUBLIC, AND PROPERTY

The developer/permittee will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. At a minimum, precautions shall be taken for the following:

- Provide the necessary protection to prevent injury to employees and the public within and adjacent to the site.
- Provide the necessary protection to prevent damage or loss to the materials or equipment within and adjacent to the site.
- Provide the necessary protection to prevent damage or loss to the property within or adjacent to the site, including but not limited to: trees, shrubs, lawns, fences, walks, pavements, roadways, structures, and utilities.

The developer/permittee shall remedy all damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by the contractor, any subcontractor, or anyone directly or indirectly employed by any of them.

### 9.1.9 CONSTRUCTION LIMITS

The developer/permittee shall confine its equipment, apparatus, storage of materials, and operations of their workers to limits indicated by law, ordinances, permits, easements, and/or the direction of the Town. The developer/permittee and its contractor(s) shall not use any vacant lot or private land for access, as a plant site, depository for materials, or as a spoil site without the written authorization of the owner of the land and the Town. A copy of such written authorization with the owner of the land shall be provided to the Town.
**9.1.10 TRAFFIC INTERRUPTION**

The developer/permittee shall not, at any time, stop the flow of traffic (vehicular, pedestrian, or other) along, across, through, or to any private or public properties, without the permission and approval of the Town. Where traffic disturbance is required by construction, a ROW Use Permit shall be obtained by the developer/permittee. The traffic control plan shall be submitted with the ROW Use Permit to the Public Works Department and approved before any interruption occurs.

Construction signing, flagging and any other traffic control devices needed shall be the responsibility of the developer/permittee and shall conform to section 8, the latest edition of the *Manual on Uniform Traffic Control Devices* (MUTCD) and the Colorado Department of Transportation (CDOT) *Standard Plans, M&S Standards*.

In the event that any change to the traffic control plan becomes necessary, the developer/permittee shall immediately notify the DTA of the change and all changes shall be approved by the Town.

Unless approved by the Director, the developer/permittee shall not impede rush hour traffic on arterial or collector streets during the morning or evening rush hours. Traffic interruptions will not be permitted, including traffic lane closures, between the hours of 3:30 p.m. and 9:00 a.m. the following day without the approval of the Director.

**9.1.11 HOUSEKEEPING AND CLEANUP**

At all times during the progress of work the developer/permittee, at their expense, shall maintain the construction site, storage yard, and adjacent properties (both public and private) free of litter or trash. All materials and equipment shall be stored in a neat appearing manner and protected from damage or the elements until installed and/or accepted by the Town.

The developer/permittee shall keep adjacent highways, streets, and private access open to traffic and free of dirt and litter resulting from handling operations. Reasonable precautions shall be made to protect private property adjacent to the project from such nuisances as dust, dirt, trash, rock, and excessive noise.

The developer/permittee, at their expense, shall remove all temporary structures, equipment, rubbish, and waste materials resulting from their operations from the project site and from contiguous private and public property prior to acceptance of the work.

Disposal areas for waste material from the developer/permittee operation shall be approved by the Town and shall comply with local ordinances and state and federal laws.

**9.1.12 ENFORCEMENT**

In the event that any of the provisions of the approved plans, development agreement, or other applicable criteria of the Town are violated by the developer/permittee or by any of their contractors or subcontractors, the Town may serve written notice of the Town’s intention to stop work on the project.
Unless the violations cease and satisfactory arrangements for correction(s) are made, the work shall be stopped immediately after written notice has been served, unless otherwise directed by the Town.

It may become necessary for the Town to immediately stop work on a project to protect the health, safety, and welfare of the citizens of the Town. Such instances may include, but are not limited to: creation of a public safety hazard, lack of required permits, inadequate traffic control, or obstruction of an emergency access. The Town and/or the DTA have the authority to stop work immediately after serving the contractor with written notice. The contractor shall not resume work without written approval from the Town.

### 9.1.13 ACCEPTANCE AND WARRANTY

All public and site improvements shown within the site and construction plans shall be completed prior to the initial acceptance of the development, or issuance of a Certificate of Occupancy for commercial development, unless otherwise specified within the associated Agreements.

The issuance of residential building permits and/or commercial certificates of occupancy are dependent upon Probationary Acceptance being granted for the subdivision and/or property unless otherwise specified within the applicable Agreement.

New roadways shall not be opened for public use until permanent traffic control devices, per the approved plans, have been installed and probationary acceptance has been granted.

The developer/permittee shall guarantee all materials and equipment incorporated in, and warrant all workmanship on, the improvements located within Town ROW for a minimum period of two years in accordance with the associated Agreements and/or ROW Use Permit. Refer to section 10 for further acceptance procedures and requirements.

The developer/permittee shall be responsible for the maintenance, and all associated costs, of all facilities within the Town ROW until final acceptance has been granted by the Town unless specified otherwise in the applicable Agreements.
9.2 CONSTRUCTION CONFORMANCE

9.2.1 GENERAL

Public and private improvements within Town ROW are subject to compliance with the construction plans and the most current edition of the following standards which are used by the Town of Parker or other governing agencies:

2. Parker Storm Drainage and Environmental Criteria Manual (SDECM)
4. Other Parker standards (including, but not limited to, Town of Parker Construction Specifications and Design Considerations for Parks, Trails, and Streetscapes and current development regulations)

The Town conforms to CDOT's current editions of Standard Specifications for Road and Bridge Construction (CDOT Specifications), the CDOT Standard Plans - M&S Standards (M&S Standards), and the CDOT Field Materials Manual, with modifications as set forth within this Manual.

Where conflicting standards and criteria apply, the stricter criterion will be required unless approved otherwise in writing by the Town.

All costs of construction inspection, pavement coring, materials/construction testing and other specific data reports shall be paid by the developer/permittee.

9.2.2 QUALITY CONTROL/QUALITY ASSURANCE

Projects constructed within Town ROW dedicated or to be dedicated to the Town must be constructed under a Quality Control/Quality Assurance program. The developer/permittee will be responsible for daily quality control operations during the construction of public and private improvements within Town ROW.

9.2.2.1 Quality Control

A Quality Control Plan (QCP) shall be prepared in accordance with the minimum sampling, testing, and inspection schedule contained in the CDOT Field Materials Manual, and include compaction, finishing, and vibration, techniques and equipment to be employed. The testing of all materials and construction shall be in conformance with the appropriate specifications unless otherwise specified by the DTA.

The QCP shall be prepared by a qualified materials testing firm and shall include the full name and registration number of the responsible engineer and the names and certifications of all testers and inspectors. The QCP shall be signed and stamped by the responsible professional engineer registered by the State of Colorado and shall be submitted to and reviewed by Town staff prior to the issuance of a Grading Permit.
The developer/permittee will be responsible for compliance with the QCP and documentation of compliance with the QCP. The responsible engineer shall sign and stamp the compiled reports and submit them for review to the Town prior to probationary acceptance.

The developer/permittee will be responsible for daily quality control operations during the construction of the public improvements and private improvements within the Town’s ROW. The developer/permittee shall be fully responsible for the acts and omissions of their subcontractors and of any persons either directly or indirectly employed by the developer/permittee or their subcontractors.

**9.2.2.2 Quality Assurance**

The DTA will be responsible for reviewing the QCP prepared by the developer/permittee and will be responsible for engineering, construction, and administrative supervision of the project.

The DTA may also perform additional tasks for quality assurance including, but not limited to, parallel testing, document review, field technician interviews, reviews of certificates, calibration reports, and periodic sample testing.

**9.2.2.3 Construction Inspection**

All work sites, materials, and equipment used in the construction of projects within the Town shall be subject to inspection and testing in accordance with this Manual. The Town shall have access to the work site at all times and the developer/permittee shall provide proper facilities for access and inspection. The DTA shall have the right to reject materials and workmanship that are defective or that do not meet the Town requirements. Rejected workmanship shall be corrected to the Town’s satisfaction. Rejected materials shall be removed from the premises.

If any work is covered contrary to the instructions or without approval or consent from the DTA, if requested, it shall be uncovered for examination by the DTA and properly restored at the developer/permittee’s expense. See Appendix C for further clarification on required inspections.

Unacceptable work shall be repaired and approved by the DTA at the expense of the developer/permittee. An oversight on behalf of the Town and its representatives shall in no way constitute an acceptance of any part of work later determined to be unacceptable.

**9.2.2.4 Inspection Scheduling**

The developer/permittee shall contact the Public Works Department at least 24 hours (one business day) to schedule the applicable inspections in advance of commencing work. Penalties such as a Stop Work Order, fines, or non-acceptance of the materials and/or workmanship may apply if proper notice is not given. While every effort will be made by the DTA to schedule the inspection for the requested day and/or time, the minimum notice will not guarantee the availability of the DTA. Additional notice may be necessary to ensure availability of the DTA.

If an inspection is scheduled with a DTA and work is not performed as scheduled, the developer and/or developer representative must call and cancel the inspection as soon as possible.
Repeated failure to schedule the required inspections may result in a Stop Work Order and/or the revocation of the permit. In the case of the revocation of a permit, the Town may, on its own sole discretion, make required repairs and invoice the developer/permittee.

### 9.2.2.5 Material Approval

Submittals and the Town’s approvals are required on a project basis for all materials. The Specifications presented within this Manual are performance oriented. Construction will not be allowed without prior written approval of the materials.

Any and all materials used to construct Town public improvements that fail one or more random material tests will be subject to complete removal as a condition of Town acceptance of the public improvement. Additional tests may be required to establish the extent of the nonconforming materials to be removed.

Alternative materials for construction may be proposed for use. Requests must be made in writing and decisions on acceptability of alternative materials will be made by the Director.

Any changes to the originally approved materials from the initial submittal will require a re-submittal to the DTA and approval by the Town prior to the use of the material on the project.

The contractor shall submit all mixture designs, shop drawings, material Certificates of Compliance (COC), and laboratory data to the DTA for review and approval prior to the start of construction. All COCs shall be required prior to probationary and final acceptance.

### 9.2.2.6 Mix Design Approval

All materials and mix designs must meet or exceed all current Town and CDOT specifications. All asphalt and concrete mix designs shall comply with Town and CDOT specifications and must be submitted to, reviewed, and approved by the DTA. Mixture designs shall be performed in a materials laboratory under the direct supervision of and shall be stamped and signed by a Colorado-licensed Professional Engineer. The DTA will review all submitted mix design for general compliance to Town specifications.

- All submitted concrete mix designs shall have current CDOT approval.
- CDOT Form #43 shall be submitted with all asphalt mix designs and shall indicate the project specific criteria concerning mix design method, traffic level, asphalt cement type, mixture grading, and maximum amount of recycled asphalt pavement (RAP) allowed for all hot mix asphalt pavement (HMA).

Mix designs shall be submitted to the Public Works Department a minimum of ten working days prior to placing mix on the project. All mixes furnished for the project shall conform to the approved mix design(s).
9.3 CONSTRUCTION TESTING

9.3.1 GENERAL

The Town requires tests of materials used in the Town ROW or properties to verify compliance with material specifications. The developer/permittee must pay for all required materials testing to be performed by a qualified geotechnical engineer working as or directly under the direct supervision of a Colorado-licensed Professional Engineer.

Testing shall be performed in compliance with this Manual and in conformance to the approved QCP. Any and all material used to construct public improvements that is not an approved material and/or from a certified source, or that is from a certified source and fails one or more random material tests, may be subject to complete removal and replacement as a condition of Town acceptance of that public improvement.

The DTA may alter the onsite testing frequency based upon site or construction conditions to verify compliance with material and construction specifications. The results of all required tests shall be presented to the Town and the DTA for review. Additional tests may also be required to confirm the existence and extent of the substandard material prior to the initiation of remedial action. The extent of the material to be removed will be at the discretion of the DTA.

The Town, at its sole discretion, may order periodic parallel testing to supplement and verify testing performed by the developer/permittee’s contracted testing firm for quality assurance purposes. These tests shall be paid for by the developer/permittee.

If any materials furnished or work performed by the developer/permittee/contractor fails to fulfill the specification requirements, such deficiencies shall be reported to the DTA and the contractor immediately. Preliminary written field reports of all tests taken and inspection results shall be given to the developer/permittee/contractor immediately after they are performed. Field reports shall be made available at the request of the DTA.

Upon the completion of all public improvements within Town ROW, one bound and one electronic copy of all compiled test reports shall be submittal to the Town. The geotechnical firm responsible for the testing shall include a cover letter at the front of each report with the original signature and seal of the responsible Professional Engineer who oversaw the project’s testing and the related conformance of the testing to the QPC and with this Manual. The letter shall include verification of acceptable destructive and nondestructive tests and an evaluation report based on those tests which substantiate compliance to the approved QCP and Town of Parker’s specifications.

The testing report cover letter shall be stamped and signed by a professional engineer registered by the State of Colorado and contain this certification statement:

"I hereby certify that the testing results identified within this report conform to current Town standards and regulations."
If the engineer cannot verify substantial compliance to the construction specifications, a list of proposed changes or exceptions to the specifications shall be provided for consideration of acceptance by the Director.

A quick reference table of the Town’s typical minimum testing requirements is located in appendix B of this manual.

### 9.3.2 ROADWAY CORING

Within 30 days of completion of the roadways, prior to initial acceptance, the Town will order cores to be taken to verify that pavement section and materials are in conformance with the Town’s standards, specifications, and the pavement design. The Town will cut one core per roadway or one core every 500 linear feet each traveled lane (whichever is greater). Additional cores may be ordered by the DTA if deemed necessary. The developer/permittee will be charged for the coring and the related testing.

The cores shall meet the following criteria:

- Ninety percent of cores must meet or exceed the pavement design thickness
- The average of all cores’ tests must meet or exceed the pavement design thickness
- All asphalt cores must meet CDOT asphalt specifications
- No single core shall be less than 85 percent of the pavement design thickness

If the above criteria are not met, additional core tests or approved nondestructive testing at the expense of the developer/permittee may be required to further delineate the areas of unsatisfactory work which may require correction. For concrete pavements, the area so determined to require removal and replacement shall not be taken as less than one full panel (or slab), as defined by the pavement joints.

Coring and/or removal and replacement may extend to adjacent infrastructure if poured integrally with the deficient infrastructure or those suspected to be of inadequate thickness, as determined by the DTA.

### 9.3.3 ADDITIONAL TESTING

The developer/permittee shall perform any and all tests required by utilities, special districts, municipal, state, and federal regulations. The developer/permittee shall furnish, upon request, the Town with certificates of inspection required by all state and federal regulatory bodies upon request.
9.4 ANCILLARY REQUIREMENTS

This discussion covers supplemental criteria to the latest edition of CDOT’s *Standard Specifications for Roadway and Bridge Construction*.

While the Town utilizes the CDOT *Standard Specifications for Roadway and Bridge Construction* manual for standard specifications, various sections including, but not limited to, those regarding payment and pay factors are not applicable to residential and commercial developments within the Town, unless approved otherwise by the Director. For developments within the Town, the contractor shall first refer to the contract documents and this Manual. Conflicting and/or additional requirements provided within this Manual shall supersede those within CDOT.

9.4.1 EXCAVATION AND BACKFILL FOR STRUCTURES

This section covers supplemental criteria to section 206 of CDOT’s *Standard Specifications for Roadway and Bridge Construction*.

Excavation

The bottom of the trench shall be prepared to provide a firm foundation for the pipe or facility in accordance with the bedding conditions specified by CDOT or special district for the type of pipe or facility to be installed.

Loose or soft material shall be removed. The subgrade of the trench shall be kept free of standing water. Where the trench subgrade material is found to be unsuitable and does not afford a solid foundation, the contractor shall excavate to such depth as necessary to construct a stable foundation.

9.4.2 BASE COURSE

The CDOT *Standard Specifications* is hereby revised as follows:

304 Aggregate Base Course

304.02 Aggregate add:

The minimum allowable R-value for aggregate base course shall be 78. The specific gravity of the aggregates shall be greater than 2.0 at the source. The use of crushed reclaimed concrete material may be substituted for natural aggregate in composite roadway sections that have pavement placed directly over them. Aggregate base course used for shouldering and all-weather surfaces shall be from natural sources.
304.04 Placing add:

The base course material shall only be placed on subgrade that has been previously prepared, tested, proof-rolled, and approved by the DTA. Base course shall be placed in conformance with the typical cross sections as provided in the approved pavement design report and within 24 hours of subgrade approval. The use of blue tops on new construction is recommended.

In instances of inclement weather, such as, but not limited to freezing or precipitation, aggregate base materials shall not be placed until the subgrade is reapproved.

**9.4.3 CONCRETE WORK**

This section covers concrete work to include, but not limited to, pavement, curb and gutter, sidewalk, inlets, manhole, drainageways, and related structures.

**Cold and Hot Weather Protection:**

All protection for the job must be on-site prior to beginning the concrete placement.

Hot and cold weather protection shall comply with CDOT Specifications (section 601). It is the developer/permittee’s responsibility to provide proof of temperature compliance when placing and/or curing concrete in hot or cold weather. The contractor’s testing firm shall provide high/low thermometers to be placed within the provided protection, at a minimum, when temperatures are or expected to be greater than 90°F or to drop below 40°F.

It shall be the developer/permittee’s responsibility to provide proof in the form of reports from the testing firm of temperature compliance with the surface temperature recording device(s) and in accordance with CDOT specifications. High/Low temperature readings shall be monitored and reported daily to the contractor and DTA by the testing lab.

If, in the opinion of the DTA, the protection provided is insufficient to protect the concrete, concreting shall cease until conditions or procedures are satisfactory to the DTA.

If the surface temperature devises are not provided, the developer/permittee may be required to provide the Town with an extended warranty or other remedy as approved by the Director.

**Backfilling**

When side forms are removed and the concrete has gained sufficient strength (minimum compressive strength of 2,500 psi), the space adjacent to the concrete shall be promptly backfilled with suitable material, properly compacted, and brought flush with the surface of the concrete and adjoining ground surface.

The backfill shall be level with the top of the concrete for at least 2 feet and then sloped as shown on the construction plans or as directed by the DTA. Adjacent areas shall be graded in such a way to prevent free standing surface water.
Miscellaneous Construction Tolerances

(a) Where new construction abuts existing, the work shall be accomplished so that no abrupt change in grade results (e.g., curb returns from new to existing, driveway entrances, etc.)

(b) No roadway panels shall be allowed which have a joint meeting an adjacent panel at an angle more acute than 45 degrees to a finished edge or control joint.

(c) All concrete work shall have the proper finished grade. No reversal of the flow path will be accepted by Town of Parker.

(d) Combination curb, gutter, and walk and/or vertical curb and gutter flowline depth shall not vary from adopted standards by more than one-half inch, measured vertically from the top of curb to the gutter invert.

(e) Sidewalks shall have a minimum of 1 percent and a maximum of 2 percent slope toward the roadway.

The CDOT Standard Specifications are hereby revised as follows:

412 PORTLAND CEMENT CONCRETE PAVEMENT

412.13 Joints add:

Sawing of the joints shall begin as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling.

412.16 Repair of Defective Pavement

Replace (1) & (2) following “Pavement slabs with any of the following conditions are unacceptable and shall be removed and replaced:” with:

Pavement slabs containing one or more cracks shall be removed and replaced as required by the DTA at the contractor’s expense.

Replace “Cracks that are 30 inches or longer and are between 1 inch and T/3 in depth shall be repaired.” with:

A slab with only a single crack no more than 30 inches in length and penetrating partial depth, 1 inch to T/3, may be considered by the DTA for epoxy injection given that it is an individual isolated instance in the scope of the work and additional concrete removal and replacements is not required in the vicinity. The epoxy injection shall use materials from CDOT’s Approved Products List and methods approved by the Town.

Any slab that cracks within 72 hours of placement shall be removed and replaced regardless of whether or not the crack penetrates the full depth of the slab.
Replace “Joints and cracks that are spalled shall be repaired as follows:” with:

Existing slabs that contain spalled joints and cracks as a result of the contractor’s work and/or new slabs that contain spalled joints and cracks shall be removed and replaced, as determined by the DTA, at the contractor’s expense. Slabs containing spalled joints and/or cracks may be considered by the DTA for repair if the damaged area is an isolated instance in the scope of the work and whose repair would be located outside the wheel path and equivalent to no more than 2 percent of the area of the total slab.

Joints and cracks that are spalled, and approved for repair by the DTA, shall be repaired as follows:

600 MISCELLANEOUS CONSTRUCTION

601.09 Forms add:

Forms shall not be fully installed until a passing subgrade tests and proof roll inspection(s), performed by the contractor and observed by the DTA, have been obtained. Forms shall not be disturbed until the concrete has adequately hardened.

601.12 Placing

(a) General add:

Additional Subgrade Preparation

Concrete will not be placed until the subgrade compaction, including proof-roll, requirements have been met.

Prior to placing the concrete, the subgrade and forms shall be checked for conformity with the cross section shown on the plans by means of an approved template or string line method. Forms shall be checked for grade. If necessary, material shall be removed or added, as required, to bring all portions of the subgrade to the correct elevation. It shall then be thoroughly compacted and again tested with the template.

All debris and loose material shall be removed from the space to be occupied by the concrete, and the forms, including any existing concrete surfaces, shall be thoroughly moistened in advance of the placing of the concrete. The contractor shall ensure that there are no puddles or pockets of mud when the concrete is placed, but the adjacent surfaces shall not be allowed to dry out before the concrete is placed.

Concrete shall not be placed until all forms and reinforcing steel have been observed by the DTA.

(c) Cold Weather Limitations add:
The contractor’s testing firm is to test the subgrade for frost and to verify the removal of all frozen subgrade and notify the contractor and the DTA.

Concrete left unprotected or is injured by frost action shall be removed and replaced at the contractor’s expense.

(e) Vibrating add:

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.

(j) Construction Joints add:

Expansion, contraction, and construction joints shall be provided and constructed as required by the various sections of the CDOT Specifications and M&S Standards, as shown on the approved construction plans, and/or as otherwise directed by the DTA. Hand tooling of roadway joints is not permitted.

Expansion joints in combination curb and walk, vertical curb and gutter, channels, or any other place that is designed or can be expected to carry water shall be recessed a half-inch and filled with a joint sealant complying with CDOT and Town specifications.

New concrete gutter pans, cross pans, and concrete pavements shall be joined to existing concrete cross-pans, gutters, and pavements by means of reinforcing steel in conformance with CDOT specifications.

Restricted to trails and sidewalks, a plastic-parting strip joint (zip strip), shall be inserted with a mechanical device that places the material in a continuous strip, except where intervening structures break the continuity of paving. Splices in the joint material will be permitted providing they are effective in maintaining the continuity of the joint material.

601.13 Curing Concrete Other Than Bridge Decks

Where the membrane forming curing compound method is used for curb, gutter, sidewalks, cross pans, handicap ramps, etc., Type 2 curing compound shall be used in accordance with CDOT Specifications, subsection 601.13. Additional curing compound shall be applied as needed to ensure that 100 percent coverage of all exposed surfaces of the concrete prior to back filling.

Inadequate protection by the contractor shall be cause for suspension of concreting operations and may require replacement, as determined by the DTA, of the affected concrete at no expense to the Town.

602 REINFORCING STEEL
602.02 Materials *add*:

**Placing Welded Wire Fabric**

Wire fabric in cross pans and curb cuts shall be placed as shown in the plans and details. The fabric shall be fully supported on precast mortar blocks or other approved supports prior to placing the concrete. The use of welded-wire fabric from "rolls" is not allowed.

609 Curb & Gutter

609.03 (c) Mixing and Placing *add*:

The contractor shall “knock” the back of the forms to also assure proper consolidation of the curb.

610 MEDIAN COVER MATERIAL, CONCRETE

*Replace 610.03 (b) with:*

**Concrete.** Construction requirements shall conform to the requirements of subsection 608.03. Concrete median cover material, specifically color and maximum aggregate size, shall be installed within the median as shown within the Town of Parker Standard Details (appendix A) and/or as specified on the approved construction plans.

9.4.4 HOT MIX ASPHALT PAVEMENT

Pavement, base course, and subgrade specifications shall conform to any combination of the specifications and provisions established within this Manual and the latest edition of the CDOT’s Specifications.

The CDOT Standard Specifications is hereby revised as follows:

202 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

202.09 Removal of Asphalt (Planing) *add*:

All milled edges shall be saw-cut to the depth of the milled area, unless otherwise approved by the DTA.

Stockpiling of planed materials or cuttings will not be permitted on the project site, unless approved by the DTA in writing.
401 PLANT MIX PAVEMENTS - GENERAL

401.09 Hauling Equipment *add:*

The DTA can reject any mix which shows an excess or deficiency of asphalt cement, damage due to burning or overheating, an improper gradation, or thermal segregation with cold areas 30°F below the minimum discharge temperature.

401.11 Tack Coat *add:*

The application of a tack coat shall be required between all nonconsecutive pavement courses (including where the surface temperature is 100°F or less), to all existing concrete and asphalt surfaces, and structures.

The asphalt shall be placed within 24 hours of applying primer or tack coat.

401.12 Surface Conditioning (also applies to section 407) *add:*

The surface to receive the tack coat shall be dry and cleaned by sweeping, or other approved method, until dust, debris, and foreign matter are satisfactorily removed, as determined by the DTA, immediately prior to the application of the tack. Prior to each application of the tack coat, the contractor must schedule an inspection by the DTA. The tack coat shall not be applied until the contractor has received a passing inspection by the DTA.

Prior to paving, all water must have evaporated from the tack coat. Contaminated areas shall be cleaned and tack coat shall be reapplied.

401.16 Spreading and Finishing *add:*

The mixture shall be laid upon an approved surface, spread, and struck off to obtain the required grade and elevation after compaction. The minimum lift thickness shall be at least three times (preferably four times) the nominal particle size.

Raking is discouraged and will not be allowed except to correct major problems of grade and elevation or where a paving machine cannot be used. Casting or raking that causes any segregation will not be permitted. Minor raking will only be allowed to correct major grade problems or provide mix around manholes and meter covers.

Excess overlap or thickness shall not be raked or cast onto the new mat, but shall be wasted by pulling back and removing. The hot edge shall be blocked or bumped in a smooth line consistent with the previous longitudinal edge. Large surface aggregate shall be raked and struck off to leave a smooth, finely graded surface.

On areas where the use of mechanical spreading and finishing equipment is impractical, the mixture shall be carefully dumped, spread, raked, screeded, and luted by hand tools to the
required compacted thickness. HMA mix shall be carefully moved or minimally worked with the use of rakes, lutes, or shovels to avoid segregation.

Hauling and placement sequences shall be coordinated so that the paver is in constant motion. Excessive starting and stopping shall be limited.

Rounded edges and segregated areas shall be removed to achieve a vertical face at the transverse butt joint before paving is restarted. When a tapered joint is required for traffic access, the ramp shall be removed back to a full depth from the segregated section before paving is restarted.

Paving operations shall be discontinued if any contaminants are tracked upon the asphalt, whether consecutive pavement lifts or those previously inspected and approved, until they have been thoroughly cleaned and retacked.

401.17 Compaction add:

The asphalt material shall be placed to the grade and thickness required for compaction after rolling such that the final grade is a maximum of one-half inch and a minimum of one-fourth inch above all catch gutters and cross-pans, and flush with the gutter lip on all spill curb and gutter.

403 HOT MIX ASPHALT

403.01 add:

Hot mix asphalt (HMA) pavement utilized in the Town of Parker shall conform to the following requirements unless approved otherwise in writing by the Director:

1) The asphalt cement grade shall be used as follows on each roadway classification:
   Arterials – SMA PG 76-28 for surface course (minimum two inch depth); PG 64-22 for all other asphalt.
   Collectors – PG 64-28
   Locals – PG 58-28

   All asphalt grades shall meet the latest version of CDOT Specifications section 702.

2) The HMA pavement shall be 75 gyration designs for SMA PG 76-28 and PG 64-28, and 50 gyrations for PG 58-28

3) The top lift of all HMA pavement sections shall be two inches thick and Grading SX.

4) The pavement section shall consist of Grading SX and Grading S HMA lifts when the pavement section is equal to or less than eight inches thick. In pavement sections greater than eight inches thick, Grading SG HMA may be used for the bottom lift but the intermediate lift(s) shall be Grading S.
5) Maximum HMA lift thicknesses shall be approximately four times the nominal maximum aggregate size.

6) Warm mix asphalt (WMA) may be allowed by the Town of Parker on a case-by-case basis. Warm mix asphalt is a generic term to describe the reduction in production, paving and compaction temperatures achieved through the application of one of several WMA technologies. The maximum production temperature for WMA shall be 275-degrees Fahrenheit. The producer shall submit a mix design for WMA production and the design shall be in accordance with CDOT requirements. The WMA technology utilized shall be approved by CDOT prior to use in the Town of Parker and shall be identified on the mix design. All provisions for the design, production and placement of conventional hot mix asphalt (HMA) as stipulated in CDOT specifications are in full force except as noted below:

Placement: Place WMA only on dry, unfrozen surfaces and only when the weather conditions allow for proper production, placement, handling and compacting. The minimum delivery, placement and compaction temperatures should be reviewed with the Town to accommodate the WMA reduced temperature, achieve workability and density requirements. Documentation that demonstrates a proven history of the WMA technology’s ability to be placed and compacted at the reduced temperatures may be required by the Town. A test strip or initial production verification requirement can be used to demonstrate placement and compaction at the reduced temperature. Minimum ambient (both air and surface) paving temperature limitations may be lowered by 10-degrees Fahrenheit from the placement temperature limitations table but not to below 35-degrees Fahrenheit. When the mix contains unmodified asphalt binders (PG 64-22), the contractor is to allowed to compact below 185-degrees Fahrenheit provided that the contractor can demonstrate that there is no damage to the finished mat.

9.4.5 ROW DISTURBANCE AND RESTORATION

9.4.5.1 General

The following standards are adopted to achieve and maintain the ride quality, structural integrity, safety, life cycle, and aesthetics of new and existing Town roadways and infrastructure. For further criteria and information, refer to the corresponding construction specifications within this section, CDOT Specifications and CDOT M&S Standards.

The contractor shall take precautions to limit the removal of or damage to existing pavement, sidewalks, curbs, lawns, shrubbery, trees, hedges, walls, fences, buildings, or other existing features to the least practicable amounts and shall replace or restore such improvements to their original location, as applicable. All damaged and disturbed areas shall be restored to existing or better conditions than existed prior to construction or disturbance.

The developer/permittee shall be responsible for documentation of any existing damage or conditions that may impact their ability to adhere to these specifications. The developer/permittee shall coordinate with the DTA acceptable repair methods and limits prior to starting work.
In addition to the CODE, any settlement associated with ROW disturbance shall be considered damage incidental to the work and must be repaired. Deficiencies shall include, but will not be limited to, pavement, vegetation or structures settlement and damage caused by settlement. (Ord. 4.53 §1, 1997)

**9.4.5.2 Permits**

Anyone working or affecting (either directly or indirectly) in the Town’s ROW is required to obtain a ROW Use Permit from the Public Works Department prior to the commencement of any work. Refer to section 8 of this Manual for ROW Use Permit information and requirements.

The developer/permittee must obtain all necessary permits, including those from other agencies. The developer/permittee shall schedule the required Town inspections with the Public Works Department.

**9.4.5.3 Coordination**

If any excavation or disturbance will impact privately maintained improvements or landscaping, the developer/permittee shall notify the property owners a minimum of 48 hours prior to beginning work.

**9.4.5.4 Age of Pavement Surface**

No person shall cut or excavate an area in the pavement of any public roadway or alley for a period of five years from the completion of construction or resurfacing except in compliance with the provisions within Title 10 of the Code.

Emergency maintenance repairs, as defined within section 8 will be allowed on new roadways and surface treatment less than five years in age.

If the total area of the proposed excavation exceeds 15 percent of the total area of pavement within a block or involves a trench in excess of 150 feet in length, the developer/permittee shall remediate the damage caused to the pavement. Remediation will consist of a lip to lip profile and overlay, a center line to curb profile and overlay, or a lane line to curb profile and overlay, whichever is necessary, to avoid decreasing the average life expectancy of the roadway or alley surface. (Ord. 4.53.3 §§1—4, 2002; Ord. 4.53.2 §1, 2000; Ord. 4.53 §1, 1997)

**9.4.5.5 Testing**

Testing on all materials, as well as surface and subsurface conditions within the Town ROW shall be in accordance with this Manual and shall be delivered to the DTA upon completion of the work.

**9.4.5.6 Excavations and Trenches**

1. If a utility trench crosses an arterial, collector, or concrete local road, no open roadway cuts shall be allowed unless approved by the Director.
2. Crossings of an arterial, collector, or concrete roadway shall be accomplished by jacking or boring, and the cables, conduit, or pipes shall be encased in sleeves or casing pipe.

3. All excavations within the ROW shall be performed to cause the least possible impact to the roadways, sidewalks, and other improvements. The trenches shall not be excavated wider than necessary for the proper installation and repair of utilities, electrical appliances, and foundations, and shall be kept clean and as free of moisture as possible.

4. Longitudinal trenches within a roadway shall be straight and will generally be a consistent distance from either the centerline of the road or flow line, as specified. Meandering is not allowed.

5. Unless otherwise approved by the DTA, all trenches crossing a roadway shall be perpendicular to the direction of travel. At a minimum, all associated patching limits shall be perpendicular to the centerline of the roadway.

6. Unless preapproved, all small trenches and work within arterials and collectors must be filled and temporarily resurfaced by the end of each workday.

7. At no time will an excavation within the ROW remain open over a weekend or Town holiday without the approval of the Director.

8. No open holes and/or roadway cuts should be left in an open condition overnight or unattended, except for the portion necessary to commence work the following morning as approved by the DTA.

9. A trench shall not be opened for a distance of more than three hundred feet at any one time, unless specifically authorized by the DTA.

10. In trenching across existing roadways, no more than one-half of the traveled way is to be closed to traffic at one time. The trenched roadway shall be completely backfilled and a suitable driving surface restored before trenching the other half of the road.

11. Trenches and other excavations within existing roadways shall be filled with a preapproved controlled high slump material (flow or flash fill) material. Backfill and compaction of suitable native materials or bases may be considered for approval by the DTA for large continuous trenching operations.

12. Steel traffic plates may be allowed with prior approval from the DTA except during months when snow plowing may be required. Plating is not allowed between November 1 and April 1.

13. Loose and/or saturated material from within the trench shall be removed prior to the placing of the backfill material.

14. In the area from the ROW line to the edge of the pavement, the backfill of trenches with excavated material shall be compacted to 95 percent standard compaction, or to the density of the existing ground, whichever is greater.
15. Before paving, the developer/permittee shall provide sufficient testing and demonstrate passing compaction density tests for all backfill from the developer/permittee’s testing firm.

9.4.5.7 Temporary ROW Cut Patching

When approved by the DTA, temporary trench cover material shall be brought to finished grade of the adjacent surfaces and shall be properly maintained by the contractor to be smooth and at the same level as the adjacent undisturbed paved area.

The surface shall be temporarily restored to use by the end of the workday through the use of hot patch asphalt, cold mix asphalt, or steel roadway plate (depending on the time of the year). Flow or flash fill may also be considered for a temporary wearing surface by the DTA. A minimum depth of four inches will be required for all temporary hot patch and cold-mix asphalt patching.

Temporary patching shall not be permitted over weekends and Town holidays unless the contractor can demonstrate, to the satisfaction of the DTA, that they will be able to maintain the temporary patch continuously during that time period.

9.4.5.8 Permanent Patching Requirements

Permanent patching shall be as follows:

**Concrete:**

1. For all damaged and/or defective concrete pavements, sidewalks, curbs, gutters, cross-panns, fillets, handicap ramps, etc., the entire panel must be removed and replaced in accordance with this Manual.

2. Concrete removal and replacement shall be from joint to joint and full stone/slab. A neat saw cut shall be made at the nearest contraction or expansion joint behind the excavation and disturbance. All sections removed shall have edges approximately parallel to adjacent joints.

3. All saw cuts for removal shall be full depth cuts. No rough edges will be permitted where new construction abuts existing.

4. Any over-break, separation, or other damage to the existing concrete outside of the designated removal limits shall be replaced at the expense of the developer/permittee.

5. Removal and replacement of existing concrete (curb and gutter, sidewalk, curb cuts, cross pans, etc.) beyond the limits shown on the plans may be required in order to conform with this Manual, and shall be at the developer/permittee’s expense.

6. Joints within repaired areas shall be cleaned and sealed in accordance with this Manual, CDOT Specifications, and M&S Standards.
7. In concrete roadways, cross-pans, and fillets, the pavement thickness shall be placed to a minimum thickness of ten inches or the thickness of the removed pavement, whichever is greater, unless directed otherwise by the DTA.

8. The concrete for infrastructure such as sidewalks, curbs, gutters, handicap ramps, etc. shall be placed to a minimum thickness of six inches or the thickness of the removed concrete, whichever is greater, unless directed otherwise by the DTA.

9. The roadway panels, cross pan, and gutter pan placed adjacent concrete shall be tied in to the existing in accordance with these specifications, CDOT Specifications, and the M&S Standards.

10. Fast track/high early strength concrete may be required for all roadways to expedite the opening for public use upon the completion of the work where concrete wearing surfaces are involved.

**Asphalt:**

1. The pavement shall be saw cut at full depth at a minimum of one foot beyond the edge of the trench.

2. Final asphalt pavement removal limits shall be saw cut, removed, and replaced along a straight line that is perpendicular and/or parallel to the lane of travel.

3. All roadway cut repairs shall extend to the lip of gutter, edge of pavement, lane line, and/or centerline.

4. Cuts six feet or less from the edge of pavement will require the extension of the restoration to the pavement edge. Final limits will be evaluated and determined by the DTA.

5. Where the trench straddles two or more traffic lanes, both lanes will be milled and paved for the length of the trench. Cuts within the center lane(s) and/or straddling multiple lanes may require restoration from lip to lip. Final limits will be evaluated and determined by the DTA.

6. Unless otherwise approved, the perimeter of all cuts in asphalt road surfaces shall be milled and paved to a depth of two inches for the length of the trench. This restoration section shall extend from the centerline, lane line, and/or edge of pavement, as specified by the DTA.

7. The edge of any repair will not be permitted to align with the wheel path. Where the edge of the trench or full depth portion of the asphalt patch aligns with the wheel path within a travel lane, the limits of the full depth asphalt removal shall be extended to the centerline, edge of the lane, and/or the edge of the pavement for the length of the trench.

8. Where multiple patches and/or irregular cuts/patching are required for a project, a mill and overlay of a continuous portion of the roadway or the roadway in its entirety within a 500 foot length may be required. The minimum limits of the mill and overlay shall be as determined by the DTA.
9. If the existing roadway contains a fabric layer, the contractor shall carefully saw-cut and remove
the layer of asphalt above the fabric a minimum of 12 inches back from the edge of the trench
and overlap the cut limits with new fabric prior to the final lift patch back.

10. Immediately prior to placing the wearing surface, the neatly cut abutting pavement edges and
milled surfaces shall be cleaned and tacked.

11. Removed asphalt pavements shall be replaced at the existing asphalt thickness plus one inch at
a minimum thickness of six inches, unless directed otherwise by the DTA.

**Smoothness:**

Removed and replaced pavement surfaces shall be placed to form a smooth riding surface, matching
the existing pavement and maintaining proper drainage.

In the event the proper smoothness or matching of existing pavement cannot be maintained due to
existing roadway wear or condition, the damaged pavement section shall be repaired or removed and
replaced as directed by the DTA.

**9.4.5.9 Traffic Signage and Pavement Markings**

Missing or damaged markings and signs that may pose a serious risk to the traveling public shall be
repaired or restored immediately. Unless otherwise specified by the DTA or the Town Traffic Engineer,
all signage and striping shall be restored to existing or better condition within 48 hours of notification.

**9.4.5.10 Traffic Signal**

Any and all damage to traffic signal equipment shall be immediately reported to the DTA. Unless
otherwise approved by the Town Traffic Engineer, all repairs shall be made immediately.

**9.4.5.11 Outside of Paved Areas**

Where the original surface was crushed rock or gravel for the wearing surface, CDOT Class 6 aggregate
base course or like material shall be used as replacement material. It shall be placed to a compacted
thickness minimum of eight inches or the thickness of the removed material plus two inches, whichever
is greater.

All disturbances within the ROW shall be backfilled with excavated material and compacted to 95%
standard compaction.

In all other areas not referred to above, including gravel roads, shoulders and roadside ditches to a point
five feet outside of the flowline; all trench compaction shall be in conformance with this Manual.

At a minimum, all disturbed nonpaved and nonlandscape areas shall be seeded and blanketed/mulched
per the SDECM.
9.4.5.12 **Erosion Control**

During and after construction, all applicable Construction Best Management Practices necessary for environmental protection shall be provided and maintained per the SDECM.

9.4.5.13 **Potholes for Locates or Subsurface Investigations**

Unless otherwise approved in writing by the DTA, potholes for utility locates and subsurface investigations shall be done by means of a three- to six-inch diameter core drill through the existing roadway surface.

All small subsurface excavations and potholes within paved areas are to be backfilled using a flowable fill material. All proposed flowable fill shall be submitted and approved by the Public Works Department prior to construction.

Cores in the pavement shall be plugged using a preapproved fast setting pavement concrete. Cores larger than six inches in diameter or open excavations shall be repaired as directed by the DTA.

Excavations outside of paved surfaces shall be filled and compacted by adequate means necessary to restore to the area to a condition equal or better than that prior to the disturbance.

*Asphalt Pavements*

Should there be three or more surface cuts/cores (including any previous cuts) within a 150-square-foot area, or a single disturbed area greater than one square foot, or should the area require extensive repair, the individual disturbed or damaged areas are to be filled/repaved as directed by the DTA and then the entire area, as identified by the DTA, shall be milled to a depth of two inches and repaved per Town Standards.

*Concrete Pavements*

Should the core be located within curb, gutter, or the flowline of a concrete stone or should the stone have more than one core, including any previous core, the entire section/panel shall be removed and replaced unless otherwise directed by the DTA.

Should there be three or more cores within a single panel of concrete pavement (including any previous cuts), a single disturbed area greater than one square foot, or a cut within one foot of the edge of a panel or another cut, the entire panel shall be removed and replaced.

For sidewalks, fillets, handicap ramps, cross-pans, and other small concrete stones, the DTA shall determine the extent of replacement if only one small core is performed.

9.4.5.14 **Completion of Repairs**

Pavements within arterials and collectors shall have the final repairs completed within 24 hours of the completion of the work requiring road cut unless otherwise directed or approved by the DTA.
For all other roadways and surfaces, final surface restoration shall be completed within five working days of temporary surface placement excluding curing of concrete unless otherwise directed or approved by the DTA.

If approved by the DTA, the final asphalt pavement restoration may be accomplished at one time when the utility installation or repair work is complete within a maximum of five working days for the permanent surface replacement.

Repairs affecting access to properties, including, but not limited to, driveways shall be completed within 24 hours and may require fast track concrete.

All other repairs shall be completed within five working days, unless otherwise directed or approved by the DTA.

**9.4.6 TEMPORARY TRAFFIC CONTROL**

**Prior to Construction**

(a) The contractor shall submit a Traffic Control Plan (TCP) as part of a ROW Use Permit in accordance to section 8 of this Manual. Failure to obtain a ROW Use Permit shall result in immediate work stoppage. If the contractor desires to revise an approved traffic control plan, or the need for a revised plan is identified by the contractor and/or DTA, the revision proposal shall be submitted to the DTA for review.

(b) Unless otherwise indicated on the plans, when construction is likely to interfere with or damage a traffic control sign or device, including traffic signals, the contractor shall notify the DTA at least two full Town business days in advance for further coordination. The contractor will be responsible for any repairs or replacement of any sign or device missing or damaged.

(c) The contractor shall notify the DTA and provide the contact information of any appointed Traffic Control Supervisor (TCS), if other than the Project Superintendent.

**During Construction**

(a) The contractor shall adhere to the work hours and days specified within the issued ROW Use Permit and the Code.

(b) The contractor shall not allow construction equipment, personal vehicles, or construction materials to remain on or near the traveled lanes or at any location that may interfere with the safe movement of traffic or cause an unnecessary inconvenience to motorists and pedestrians.

(c) Any cut or fill two inches or greater in depth within five feet of a travel lane will require vertical panels for edge-line delineation immediately behind grading and removal operations at the intervals in accordance with the MUTCD in order to safeguard the traveling public. Additional barricades and/or protective measures may be required.
(d) Excavations in roadways or highways shall be performed in such a manner that at least one lane of traffic in each direction shall be open to public traffic at all times. All lane closures shall be approved by the Town prior to closure. All traffic control shall be in conformance with the MUTCD.

(e) When excavations must remain open overnight, they shall be properly marked to warn motorists and/or pedestrians according to the MUTCD. Flashing barricades shall be provided, unless otherwise authorized in writing by the Town.

(f) The contractor shall provide access, acceptable to the property owners, to existing driveways of businesses and homes in the project area.

(g) The contractor shall remove all dirt, mud, and debris from the travel lanes throughout the day and at the end of the shift.

(h) Construction traffic control signs or devices not in use shall be removed from the roadway and pedestrian walkway (sidewalk). Signs may be laid down in a horizontal position or turned outside the roadway. For locations that do not have sufficient ROW available to store the sign(s) or device(s), they must be picked up or moved to an approved storage area. Signs that are placed in the medians must be dismantled, laid down, or relocated to the approved storage area. Sign(s) or device(s) left out facing traffic after work hours or not picked up at the completion of the work may be confiscated by the Town. Confiscated material may not be returned to the contractor.

(i) Lane closures on any road with a posted speed limit of 35 mph or higher will require arrow boards.

**During Stop Work and/or Outside of Construction Hours**

If the contractor fails to maintain all traffic control devises, the Town may deem it necessary to maintain or remove the traffic control devices. All associated costs for the removal or maintenance of the traffic control devises shall be the responsibility of the contractor.

**After Construction**

Unless otherwise shown in the plans, the contractor shall be responsible for all final lane marking and signing which are to be in place prior to opening the project area to traffic. Installation and removal of temporary striping and signing shall be the responsibility of the contractor.

As soon as possible all equipment shall be removed. If the operations have ceased and the work has been approved, when applicable, all temporary traffic control devices shall be removed.

The CDOT *Standard Specifications* is hereby revised as follows:

**630 Construction Zone Traffic Control**
630.01 Description add:

Traffic control shall include accommodating the needs of bicycles and pedestrians at sites.

9.4.7 GENERAL SPECIFICATIONS/TOLERANCES

This list of construction specification tolerances are intended to be a supplement to the latest edition of the CDOT Specifications and special provisions.

General:

1. All paved surfaces shall have a minimum slope of one percent.

2. Any humps and/or depressions greater than a quarter-inch, as measured with a 10-foot straight-edge, shall be corrected/addressed. Corrective measures shall be approved by the DTA including, but not limited to, removal and replacement.

3. Manhole covers, water valves, and other miscellaneous structures within paved areas above the adjacent paved surface or in excess of one-half inch below grade in paved areas shall be corrected. Dipping or humping of paved surfaces, instead of adjusting the structure, are not considered acceptable means of correction.

4. Grades and elevations not in accordance to the Town standards and the construction plans shall be evaluated by the DTA. Corrective measures shall be approved by the DTA including, but not limited to removal and replacement. Approval of corrective measures by the DTA does not release the developer/permittee of their obligations. Insufficient corrective measures or complications due to their application shall be addressed by the developer/permittee to the Town’s satisfaction prior to final acceptance.

5. Heave, settlement, or general grade variation of ramps and/or sidewalk greater than one-quarter inch shall be cause for corrective action as determined by the DTA.

6. No ponding of water greater than one-quarter inch will be allowed. Multiple locations or extensive ponding will require removal and replacement and correction of grade to meet Town criteria.

Asphalt:

1. Any surface distress or breakage, or other noticeable cracking of asphalt must be corrected or addressed to the satisfaction of the DTA.

2. Individual and non-deflecting cracks in the asphalt shall, at the discretion of the DTA, be sealed with rubberized asphalt sealant meeting CDOT material specifications. This may include cracks or open-sawed joints at patch as determined to be acceptable by the DTA.

3. Surface segregation of fines or aggregate shall be corrected.
4. Asphalt edges **one-half** inch higher than spill curb or lower than catch curb shall be corrected.

**Concrete:**

1. Surface deterioration, spalling and/or scaling concrete shall be removed and replaced at the direction of the DTA.

2. Any crack within curb, gutter, sidewalks, trails, cross pans, handicap ramps, etc. will require removal and replacement of the entire cracked section or slab between joints.

3. Repair action for single hairline cracks shall be as determined by the DTA and may be waived at the discretion of the DTA. For the purpose of this section, a hairline crack is one that is reasonably immeasurable, without separation, spalling, and/or spider cracking, and evaluated to be water tight and as determined by the DTA.

4. Multiple cracks, including hairline cracks, within a concrete stone/panel shall require full stone removal and replacement.

5. All roadway panels with faulted joints resulting from settlement, pumping, and/or curling of the edges shall be repaired by removal and replacement.

6. All joint seal damage that allows the intrusion of water or foreign material shall be cleaned and replaced.

**Traffic Control:**

1. Roadways shall not be opened to general public traffic until necessary traffic control devices have been installed.

2. Before a new roadway is accepted by the Town, it shall be properly signed and striped according to the approved plans. New roadways shall not be opened until the related development has received Probationary Acceptance.

3. If during an acceptance inspection of the new subdivision it becomes evident that additional signage and/or pavement markings are needed, the Town shall inform the developer/permittee in writing. These additional signs shall be the responsibility of developer/permittee to install such signs and to show them on a revised signing and striping plan.

**Drainage Infrastructure:**

1. All drainage infrastructure shall be constructed in accordance to the SDECM.
# 10.0 ACCEPTANCE PROCEDURES AND REQUIREMENTS

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1 INTRODUCTION</td>
<td>10-2</td>
</tr>
<tr>
<td>10.2 PROBATIONARY ACCEPTANCE</td>
<td>10-2</td>
</tr>
<tr>
<td>10.2.1 WRITTEN REQUEST</td>
<td>10-2</td>
</tr>
<tr>
<td>10.2.2 SUBMITTALS AND REQUIREMENTS</td>
<td>10-2</td>
</tr>
<tr>
<td>10.2.2.1 Record Drawings</td>
<td>10-2</td>
</tr>
<tr>
<td>10.2.2.2 Testing Reports</td>
<td>10-3</td>
</tr>
<tr>
<td>10.2.3 ACCEPTANCE</td>
<td>10-3</td>
</tr>
<tr>
<td>10.2.4 SECURITY</td>
<td>10-4</td>
</tr>
<tr>
<td>10.3 WARRANTY PERIOD</td>
<td>10-4</td>
</tr>
<tr>
<td>10.3.1 DURATION</td>
<td>10-4</td>
</tr>
<tr>
<td>10.3.2 MAINTENANCE RESPONSIBILITY</td>
<td>10-4</td>
</tr>
<tr>
<td>10.3.3 EMERGENCY REPAIRS</td>
<td>10-5</td>
</tr>
<tr>
<td>10.3.4 WARRANTY COMPLETION EXTENSIONS</td>
<td>10-5</td>
</tr>
<tr>
<td>10.4 FINAL ACCEPTANCE</td>
<td>10-5</td>
</tr>
<tr>
<td>10.4.1 WRITTEN REQUEST</td>
<td>10-5</td>
</tr>
<tr>
<td>10.4.2 SUBMITTALS AND REQUIREMENTS</td>
<td>10-6</td>
</tr>
<tr>
<td>10.4.3 ACCEPTANCE</td>
<td>10-6</td>
</tr>
<tr>
<td>10.4.4 SUBSTANTIAL COMPLETION</td>
<td>10-6</td>
</tr>
<tr>
<td>10.5 CERTIFICATE OF OCCUPANCY APPROVAL</td>
<td>10-6</td>
</tr>
<tr>
<td>10.6 INSPECTIONS</td>
<td>10-7</td>
</tr>
<tr>
<td>10.6.1 GENERAL INSPECTION CRITERIA</td>
<td>10-8</td>
</tr>
<tr>
<td>10.6.2 GRADING AND SEEDING</td>
<td>10-8</td>
</tr>
<tr>
<td>10.7 PUNCHLIST AND CORRECTION OF DEFICIENCIES</td>
<td>10-8</td>
</tr>
</tbody>
</table>
10.1 INTRODUCTION

All public improvements shall be installed in conformance with the approved construction plans, the Town of Parker (the Town) standards and specifications, and any Subdivision Improvement Agreement, Development Agreement, Interim Site Improvement Agreement, or Public Improvement Agreement herein after referred to as “Agreements.”

All private improvements shall be installed in conformance with the approved site and construction plans, Town of Parker Storm Drainage and Environmental Criteria Manual (SDECM), and any Agreements.

Before the Town will assume ownership and maintenance responsibility for public improvements, the public improvements shall be formally accepted by the Director. The developer/permittee is responsible for the proper installation and maintenance of all public improvements until Final Acceptance is granted.

Failure by the Town to detect improper installations, defects, or damage (no matter the cause) during the construction of improvements or during subsequent inspections does not relieve the developer/permittee of the responsibility to correct such installations, defects, or damage at a later date. There shall be no partial acceptances of public improvements.

10.2 PROBATIONARY ACCEPTANCE

10.2.1 WRITTEN REQUEST

The developer/permittee shall submit a written request for Probationary Acceptance directly to the Director at such time that the developer/permittee believes that the construction of all required public and private improvements have been completed and are in compliance with Town standards, the approved plans, and any Agreements.

10.2.2 SUBMITTALS AND REQUIREMENTS

The developer/permittee shall refer to the Probationary Acceptance Checklist (appendix B) for information and requirements in addition to the information presented herein.

10.2.2.1 Record Drawings

A complete electronic set of as-built drawings of the public improvements, and the Pond Volume Certification(s) and Stormwater Detention and Infiltration Design Data Sheet, if applicable, shall accompany the request for Probationary Acceptance for review. A T.V. (televise) digital/electronic inspection record of all storm pipes 42” in diameter and smaller shall be submitted for review prior to scheduling the probationary acceptance inspection. These items shall meet the requirements as stated in section 11 of this Manual.

If discrepancies and/or deficiencies are found with the as-built drawings and/or during the field review, those items must be addressed in the field and/or on the as-built drawings prior to Probationary Acceptance of the public improvements.
Once all as-built drawing comments and concerns have been addressed, the developer/permittee will be instructed to submit the final as-built electronic record set.

**10.2.2.2 Testing Reports**

Prior to the acceptance of the work, testing reports shall be compiled and presented to the Town in accordance with section 9 of this Manual. The testing reports shall be delivered to the Town at the completion of construction and also following warranty repairs. One bound paper copy (pages 8.5" x 11" and single-sided; using tape binding for the report) and one electronic copy (in PDF format) of the testing reports shall be submitted to the Public Works Department for review. The warranty period shall not begin until the testing reports have been approved by the Director and all other requirements for probationary acceptance are satisfied.

Testing reports shall include copies of all tests completed including, but not limited to, testing on the subgrade, base course, asphalt, concrete, utilities, and all materials as required by the Quality Control Plan (QCP). The testing reports shall be arranged by the material type and then in chronological order.

Each bound test report shall be signed by a certified testing firm and stamped by the responsible professional engineer registered by the State of Colorado. The responsible professional engineer shall certify all testing was performed in accordance to the Town’s standards and specifications and shall verify whether the test results are in compliance with the Town’s standards.

Test results not in compliance with the Town’s standards and specifications shall be identified within the cover letter accompanying the test reports, signed, and sealed by the responsible professional engineer registered by the State of Colorado. The responsible engineer shall identify within this letter if and what remediation is necessary and/or recommended to correct the deficiencies identified within the report in order to comply with the Town’s standards.

The Town may determine that further evaluation of the noncompliant items is necessary and contract with the Town’s geotechnical engineer for additional review and recommended methods of correction. The cost of review and any further analysis will be at the developer/permittee’s expense.

**10.2.3 ACCEPTANCE**

Prior to Probationary Acceptance, the developer/permittee shall satisfy all terms and conditions of the Agreements including the completion of all items noted in the Probationary Acceptance punchlist.

At the request of the developer/permittee and the discretion of the Town, various punchlist items at the time of Probationary Acceptance may be deferred to the Final Acceptance punchlist. Deferred punchlist items may include minor damage in front of lots and tracts that will see additional construction such as the construction of homes or public and/or private facilities prior to Final Acceptance. These items must be agreed upon by the Town in writing.

Upon the satisfactory completion of all items on the punchlist and Probationary Acceptance Checklist, payment of all outstanding fees, reimbursements, and other items owed to the Town of Parker, the
Director will issue a written acknowledgment of the probationary acceptance of the public improvements. The Probationary Acceptance period shall begin on the date of the written notice to the developer/permittee from the Department of Engineering/Public Works.

Until Probationary Acceptance has been granted, residential building permits and commercial certificates of occupancy cannot be issued unless specified otherwise in the Agreements.

10.2.4 SECURITY

The amount of the security for the public improvements may be reduced to 20 percent of the estimated cost of the public improvements after Probationary Acceptance has been granted by the Director. If the original cost estimate is no longer valid due to changed construction costs, a new updated cost estimate may be required as provided by the Agreements.

If the developer/permittee, subject to approval by the Department of Engineering/Public Works, chooses to defer punchlist items, the full cost for all deferred punchlist items shall be added to the warranty security amount to be held by the Town until all work has been completed and has received Final Acceptance from the Town.

10.3 WARRANTY PERIOD

10.3.1 DURATION

All public improvements shall be subject to a warranty period of at least two years after the date of the written acknowledgment of Probationary Acceptance from the Director. The developer/permittee shall warrant that public improvements are to be free of damage, defects in workmanship and/or material defects, no matter the cause, for the warranty period, and shall correct all deficiencies due to damage, design, or construction, no matter the cause, discovered during the warranty period.

10.3.2 MAINTENANCE RESPONSIBILITY

The developer/permittee shall be responsible for the maintenance of all public improvements during the warranty period, with the exception of snow and ice management. Routine maintenance normally performed by the developer/permittee includes, but shall not be limited to the cleaning of roadways, patching and sealing of infrastructure, repair of damaged infrastructure (no matter the cause), removal of blockages from storm sewer infrastructure, and the maintenance of drainage facilities.

The Public Works Department may notify the developer/permittee in writing of any corrective maintenance that may be necessary during this time. Such maintenance shall commence within thirty calendar days after receipt of the written request.

The developer/permittee shall obtain a ROW Use Permit and all necessary inspections for all repairs within the ROW during the warranty period.
10.3.3 EMERGENCY REPAIRS

In the event the Town becomes aware of a condition that warrants immediate correction during the warranty period, it may become necessary for the Town to undertake immediate repairs to the facilities to ensure public safety. Such conditions may include, but not be limited to, roadway or drainage damage/failures, omissions or deficiencies in the design and/or construction, or any other hazard or nuisance identified by the Town. Such conditions may include deferred punchlist items if the Town determines their correction can no longer be delayed until Final Acceptance.

The Town will attempt to contact the developer/permittee in the event of an emergency or when a condition is determined to require immediate repair. If the developer/permittee is not immediately available and/or if the developer/permittee is unable to take immediate action to address the situation, the Town may proceed with such action as deemed necessary by the Director.

The developer/permittee will be responsible for all costs of these emergency actions plus all associated administrative costs.

10.3.4 WARRANTY COMPLETION EXTENSIONS

If the developer/permittee is unable to satisfy all punchlist items by the Final Acceptance date, the developer/permittee may submit a request for an extension in writing, including an explanation of the need for the extension, to the Director. The approval of an extension request is at the sole discretion of the Director. Only a single administrative extension may be approved.

When the Final Acceptance date falls between December 1st to March 31st the completion date may be extended, if approved, to July 1st to allow for appropriate weather conditions to complete the work. All other administrative extensions shall be for a period of no more than three months.

Failure to complete the corrections by the end of the warranty period constitutes a default of the Agreements, and the Town may pursue corrective measures as outlined in the Agreements.

The end of the warranty period will not be acknowledged until all noted deficiencies, no matter the cause, are corrected to the satisfaction of the Town.

10.4 FINAL ACCEPTANCE

10.4.1 WRITTEN REQUEST

Nearing the end of the warranty period, the developer/permittee shall submit a written request for Final Acceptance to the Director. The Town will not receive requests earlier than twenty months into the warranty period.
10.4.2 SUBMITTALS AND REQUIREMENTS

The developer/permittee shall refer to the Final Acceptance Checklist (appendix B) for information and requirements in addition to the information presented herein.

10.4.3 ACCEPTANCE

After the developer/permittee has satisfied all terms and conditions of the Agreements, including the satisfactory completion of all items noted in the Final Acceptance punchlist and checklist, the DTA will recommend Final Acceptance of the public improvements to the Director.

Upon the completion of all the conditions described above and the Town’s receipt of the signed Affidavit of Compliance (appendix C), the Director will then issue a written acknowledgment of the end of the warranty period that the public improvements have received final acceptance. The remaining amount of the warranty security for the public improvements will then be released as provided by the Agreements.

If the developer/permittee fails to complete/satisfy all the requirements of the Agreements by the Final Acceptance date, the Town may issue the developer/permittee a notice of default. Following the notice of default the Town, at its sole discretion, may draw on the security to cure the default.

Final acceptance by the Town shall not relieve the developer/permittee of the responsibility to correct the damage, deficiency or defect caused by the negligent use of faulty materials, faulty and/or negligent workmanship, or design errors or omissions.

10.4.4 SUBSTANTIAL COMPLETION

If punchlist items have not been fully addressed by the final acceptance date and the developer/permittee believes the majority of the work has been completed, the developer/permittee may submit a request for substantial completion. The developer/permittee shall submit a detailed estimate of the remaining work to the Town for review.

If Town staff determines the cost to complete the remaining work is less than 2 percent of the amount of the warranty security held by the Town, the developer/permittee may request an additional thirty calendar days to complete all remaining items.

If the developer/permittee does not complete all work at the end of the extension, the Town will draw on the security and complete the required work.

The developer/permittee shall be responsible for all associated costs to complete the work including, but not limited to, mobilization, traffic control, materials, labor, testing, inspection, and administrative fees. The developer/permittee will be invoiced for costs in excess of the remaining security amount. Any remaining funds will be returned to the developer/permittee once the work has been completed and accepted by the Town.

10.5 CERTIFICATE OF OCCUPANCY APPROVAL
The developer/permittee shall refer to the Certificate of Occupancy Checklist in appendix B for additional information and requirements.

The conditions of the Agreements must be met and Probationary Acceptance must be granted for the associated improvements prior to the issuance of any certificates of occupancy. If Final Acceptance has been granted, a Certificate of Occupancy inspection will be required for each structure.

Near the completion of the project, the developer/permittee shall contact the Public Works Department to schedule a Certificate of Occupancy inspection. The developer/permittee will be invited to accompany the Town’s representative on these inspections.

It is the responsibility of the developer/permittee to ensure adequate time is allotted to address any punchlist items and to schedule a re-inspection prior to the desired date of completion and issuance of a Certificate of Occupancy.

All work within the Town right-of-way and any public improvements shall carry a warranty as required by the CODE and Agreements.

**10.6 INSPECTIONS**

To request Probationary Acceptance, Final Acceptance or Certificate of Occupancy approval, the developer/permittee shall contact the Director to schedule the necessary inspections.

The developer/permittee shall provide a minimum notice of ten business days prior to the desired inspection date. The developer/permittee will be invited to accompany the DTA on these inspections; however, the inspections may be performed without the developer/permittee.

The infrastructure must be visible, clear of dirt, debris, or any other encumbrance that would inhibit the inspector’s ability to perform a thorough inspection. This includes, but is not be limited to, the cleaning and clearing for all surface and subsurface improvements (e.g., sweeping and clearing all roadways, sidewalks, forebays, and trickle channels; flushing and/or jet vacuuming all storm drain pipe; etc.).

If, due to excessive dirt or snow on infrastructure, poor weather conditions, inaccessibility, or other reasons the inspection cannot be performed, the developer/permittee will be notified of the need to postpone these activities until the cause of the delay can be rectified.

Due to the amount of time necessary to perform the required inspections and prepare the associated punchlists, if all infrastructure is not clean and visible for inspection a minimum of one month prior to the end of the warranty period, the Town will not perform the required inspection and will not grant any time extensions.

Upon completion of all corrective work, the developer/permittee shall contact the Director to schedule a follow-up inspection.
10.6.1 GENERAL INSPECTION CRITERIA

The construction of all public improvements and applicable civil site improvements within the Town of Parker will be inspected for conformance with the Town's criteria and standards, the approved construction plans, and Agreements.

Private improvements shall be inspected for general completion, safety, conformance to the approved construction plans, and compliance with the Agreements.

The Director shall be the final authority in the determination of defects and required corrections to public and private improvements.

10.6.2 GRADING AND SEEDING

Finished grades shall be in general conformance with the approved plans and the approved construction plans. No slopes shall exceed a grade of three (horizontal) to one (vertical) (i.e., 3:1), unless otherwise identified and approved on the construction plans.

Detention pond grading shall provide, at a minimum, the required volume as defined in the approved final drainage study. The Pond Volume Certification must be prepared in accordance with the SDECM and submitted to the Town for review as part of the as-built drawing submittal.

All disturbed areas shall be stabilized in accordance with the SDECM and construction documents before Probationary Acceptance can be granted and/or before any Certificate of Occupancy is issued. Additional stabilization may also be required prior to Final Acceptance as identified by the DTA.

Planned landscaped areas where landscaping cannot be installed until the upcoming planting season due to weather conditions will require temporary stabilization measures.

10.7 PUNCHLIST AND CORRECTION OF DEFICIENCIES

The Town will notify developer/permittee in writing of either nonacceptance or final acceptance. If the improvements are not acceptable, the reasons for nonacceptance shall be stated in writing and corrective measures shall be taken by the developer/permittee.

Deficiencies noted during the inspection will be compiled in a punchlist which will be provided to the developer/permittee. Town staff will strive to issue the punchlist to the developer/permittee within ten business days of the completion of the site inspections.

All items on the final acceptance punchlist shall be corrected/addressed by the end of the warranty period. Between the issuance of the final acceptance punchlist and the end of the original warranty period, the Town will not hold the developer/permittee responsible for any additional repairs/work identified or discovered unless the Town, at its sole discretion, determines any of the following:

- On-site damage was a result of warranty work and construction activity
- Hazardous/nuisance conditions exist
- Design errors or omissions exist
- Work was not completed according to the approved construction plans
- Material latent defects

If all of the noted deficiencies have not been corrected within ninety calendar days from the date of issuance of final acceptance punchlist, developments granted warranty extensions shall be subject to re-inspection. Development projects granted extensions over the winter months may be subject to re-inspection the following construction season.

Public improvements will not be accepted until all noted deficiencies are corrected. There shall be no partial acceptances (except for deferred punchlist items described in section 10.2.3 of this Manual), probationary or final, of public improvements within new developments.

The developer/permittee or their contractors must obtain a ROW Use Permit(s) prior to the commencement of any repair work within the ROW. Such permits shall be issued on a no-fee basis; however, the developer/permittee will still be responsible for the inspection fees. The developer/permittee shall notify the DTA before any corrective work commences and shall schedule all necessary Town inspections with the DTA.
11.0 RECORD DRAWINGS

TABLE OF CONTENTS

11.1 REQUIREMENTS FOR CONSTRUCTION PLAN AS-BUILTS......................................................... 11-2

11.1.1 REQUIREMENTS FOR CONSTRUCTION AS-BUILT PLANS........................................... 11-2
11.1.2 CERTIFICATION OF STORM DRAINAGE DETENTION ............................................... 11-3

11.2 REQUIREMENTS FOR ELECTRONIC GIS AS-BUILTS......................................................... 11-3

11.2.1 DRAWING, SURVEY AND PROJECTION INFORMATION........................................... 11-3
11.2.2 GENERAL GEOMETRY RULES .................................................................................... 11-4
11.2.3 ATTRIBUTES ........................................................................................................ 11-4
11.2.4 REQUIRED DATA LAYERS AND ATTRIBUTES ...................................................... 11-5
11.2.5 ADDITIONAL INFORMATION ................................................................................... 11-8

11.3 REFERENCES ................................................................................................................. 11-8
11.1 REQUIREMENTS FOR CONSTRUCTION PLAN AS-BUILTS

Prior to probationary acceptance of public improvements, as-built (i.e., as-constructed) drawings in both construction as-built plans and electronic GIS format shall be received and approved by the Public Works Department. Other intergovernmental agencies may have different as-built requirements.

11.1.1 REQUIREMENTS FOR CONSTRUCTION AS-BUILT PLANS

The developer will be required to first submit a certified set of electronic as-built plans for review. The applicable sheets from the approved construction plans shall be used in preparing the as-built plans. The original design information shall be presented as shown on the approved construction plans and struck through with a single line if the as-built information is different than that of the original design. The as-built information shall be provided directly next to the original design information and “AB” shall be provided next to the as-built information to denote it as such. If the information is identical to the original design information, an “AB” shall be provided next to the original design information.

At a minimum, record drawings shall indicate the horizontal or vertical layout of all underground storm sewer infrastructure (including inlets, manholes, outlet structures, etc.), plan and profiles of streets, signing and striping plans, roadway intersection grading details, as-built details of special or unusual installations, detention pond volumes, and water surface elevations. All revisions to the construction plans, including field changes, shall be depicted clearly on the as-built plans.

Additional clarification and/or information may be requested by the Public Work Department.

Once reviewed, the developer will be instructed to submit the final as-built record set. The final submittal of as-builts shall be electronic, with each sheet bearing these seals and signatures of the Professional Land Surveyor registered by the State of Colorado who is responsible for the land survey and the Professional Engineer registered by the State of Colorado who is responsible for the preparation of the record drawings.

The following statements shall be provided on the cover sheet of the as-built construction drawings and the subsequent as-built drawings:

- The responsible land surveyor, registered as a Professional Land Surveyor in the State of Colorado, shall sign and seal the following statement and all subsequent as-built plan sheets:

  “I, _____________, a registered Land Surveyor in the State of Colorado, do hereby certify that this as-built survey of ______________ represents an actual survey made on the ground in accordance with the laws of the State of Colorado under my direct supervision on ____________ in the State of Colorado.”

- The design engineer, registered as a Professional Engineer in the State of Colorado, responsible for the preparation and any revisions to the approved construction drawings shall sign and seal the following statement and all subsequent as-built plan sheets:

  “I, _____________, a registered Professional Engineer in the State of Colorado, do hereby certify that the site improvements were inspected and to the best of my knowledge, belief, and
opinion, the site improvements were constructed in accordance with the design intent of the approved construction drawings.”

11.1.2 CERTIFICATION OF STORM DRAINAGE DETENTION

Pond Volume Certification(s) shall accompany all applicable as-built drawing submittals. Pond Volume Certification(s) shall be prepared using the Town’s standard Pond Volume Certification form (appendix B), and signed and sealed by the Professional Engineer, registered by the State of Colorado, who is responsible for the preparation of the record drawings.

- Registered Land Surveyor: A land surveyor registered by the State of Colorado shall obtain the as-built detention pond volumes and surface areas at the design depths, outlet structure sizes and elevations, storm sewer sizes and invert elevations at inlets, manholes, and discharge location, and representative open channel cross sections, and dimensions of all the drainage structures. The registered land surveyor shall provide this information to the registered professional engineer of record.

- Registered Professional Engineer: The responsible design engineer shall provide, sign, and seal the following statement on the Pond Volume Certification form:

  “I, ________________, a registered Professional Engineer in the State of Colorado, do hereby certify that the drainage facilities were inspected and to the best of my knowledge, belief, and opinion, the drainage facilities were constructed in accordance with the design intent of the approved drainage report and construction drawings.”

The State Detention and Infiltration Design Data Sheet, available through the Urban Drainage and Flood Control District, shall be completed and submitted to the Town for review with the Pond Volume Certification.

11.1.3 T.V. INSPECTION RECORD OF STORM PIPES

A T.V. (televise) digital/electronic inspection record of all storm pipes 42” in diameter and smaller shall be provided to the Town prior to scheduling of probationary acceptance inspections. All storm pipes shall be cleaned prior to the T.V. inspection to provide a clear and concise inspection record of the condition of the pipe.

11.2 REQUIREMENTS FOR GIS AS-BUILTS

While it is assumed that electronic submissions will be derived from the as-built plans, the following information describes only the requirements for electronic deliverables of drawings.

11.2.1 DRAWING, SURVEY AND PROJECTION INFORMATION
Files can be submitted in an AutoCAD version that is compatible with the Town’s current system or Exchange files, ESRI Shapefiles, ESRI Export files, or an ESRI Geodatabase. No other file formats are accepted.

Electronic drawings must be registered to State Plane, Colorado Central Zone, NAD 83, Feet, projected coordinate system. There are no exceptions.

Include requested data layers and attributes only. Files with additional layers, unless specifically requested by the Town, may be rejected.

The as-built survey should encompass the full extent of the project area.

11.2.2 GENERAL GEOMETRY RULES

All line, point, and polygonal data must be mathematically, geometrically, and spatially correct.

If features of various types (e.g., storm drain facilities, traffic signals, etc.) cannot be clearly differentiated using layers, they should be submitted as separate drawings.

All linear features that intersect must be broken and snapped at a common point.

Linear features with more than two vertices must be digitized as polylines. For example, a street centerline that curves cannot be made up of individual line segments. It must be a single, continuous polyline from intersection to intersection.

All polygons must be closed. They should be cleanly edgematched, vertex to vertex, to adjoining like features.

Point features can be delivered as AutoCAD blocks or in an ESRI point layer. Where the point is part of a larger network, as a manhole along storm pipes, the point should be snapped to line endpoints.

11.2.3 ATTRIBUTES

Attributes for each drawing entity may be submitted using either annotation or attribute fields. However, each submission is required to use only one of these options.

Required attributes are listed below with individual layer details.

If the annotation method is used, a numbered link or a leader line must be incorporated so that there is no confusion as to which map feature the text is describing. If the annotation describes a polygonal feature, then the text should fall entirely within the polygon. If the annotation cannot be legibly enclosed inside of smaller polygons then a leader line can be used.

If attribute tables are utilized, both the field name and the populated entry must be clearly described.
If attributes cannot be adequately described using annotation or data fields, it will be acceptable to submit a spreadsheet with the required information. Spreadsheets should be submitted in Microsoft Excel (.xls or .xlsx) format only. If the spreadsheet option is used, each map entity must have a unique identifier (a number beside the feature) which corresponds to an entry in the Excel file. The Excel file must have clearly named fields and fully populated attribute information for each map entity. A separate spreadsheet (or tab page) and map numbering sequence needs to be submitted for each feature type (e.g., inlet, storm pipe, street centerline, etc.) requiring attribute information. A one-to-one correlation between map features and spreadsheet entries must be maintained.

An example of properly completed attributes using annotation, attribute fields, or an Excel spreadsheet would be:

<table>
<thead>
<tr>
<th>Feature:</th>
<th>Inlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>Type R</td>
</tr>
<tr>
<td>Length_Opening:</td>
<td>5’</td>
</tr>
<tr>
<td>Width_Opening:</td>
<td>0.5’</td>
</tr>
<tr>
<td>Depth:</td>
<td>4.5’</td>
</tr>
</tbody>
</table>

Drawings that do not include clear field names, fully completed attributes, or are unclear regarding which entity the information is referencing, will be rejected.

**11.2.4 REQUIRED DATA LAYERS AND ATTRIBUTES**

The following data layers, if applicable to new construction, are required. A brief description of each follows below:

1. Cadastral information
2. Street Centerlines
3. Edge of Pavement, Curbs, Sidewalks and Trails
4. Roadway Bridges and Culverts
5. Storm Sewer Facilities
6. Signs
7. Traffic Signals/Lighting
8. Floodplains (if altered)

Note: Water and sanitary sewer infrastructure are not Town utilities and do not need to be included with submissions. However, they may be required separately by the appropriate governing agency.

**1. Cadastral Information**

Cadastral information must include, where applicable:
Filing boundary
Tract, lot, and block boundaries
ROW
Easements

Filings, tracts, lots and blocks should be digitized as individual, closed polygons. ROW and easements should be captured as lines or polylines.

Required attributes:  
- Feature type (if not layer name)  
- Filing name  
- Address, lot, and block numbers (for each lot)  
- Easement type

2. Street Centerlines

Centerlines should be captured as polylines, digitized continuously from intersection to intersection, with endpoints snapped. When a median exists, a centerline should be surveyed for each side of the divided roadway. (Address ranges should be identifiable from the cadastral data.)

Required attributes:  
- Street name (full street name including identifiers, for example: Independence Circle, Bradbury Drive)

3. Edge of Pavement, Curbs, Sidewalks, and Trails

Features should be captured as lines or polylines.

Required attributes:  
- Feature type (if not layer name)

4. Roadway Bridges and Culverts

Bridges and major drainage culverts can be captured as lines or polygons as long as they are consistent throughout the submission. Culverts that are constructed as part of the storm drain system should be delivered with the stormwater features.

Required attributes:  
- Feature type (if not layer name)  
- Structure dimensions

5. Storm Sewer Facilities

Stormwater facilities shall include:

- Inlets  
- Storm pipes  
- Manholes  
- Outfalls  
- Culverts
Channels/swales
Drop/check structures
Ponds

Storm pipes, culverts, and channels need to be captured as lines or polylines. They should be a single, continuous line between structures, digitized in the direction of flow, and snapped at endpoints or structures.

Ponds and drop structures should be captured as closed polygons. Pond outlines should delineate the 100-year water surface elevation. It is acceptable to extract these from engineering plans.

Inlets and manholes can be captured as points, blocks, or closed polygons but must remain consistent throughout the submission.

Outfalls can be digitized as either a linear or point feature.

<table>
<thead>
<tr>
<th>Required Attributes:</th>
<th>Inlets:</th>
<th>Storm Pipes:</th>
<th>Manholes:</th>
<th>Outfalls:</th>
<th>Culverts:</th>
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<tbody>
<tr>
<td></td>
<td>Type (e.g., R, 13, etc.)</td>
<td>Material (e.g., RCP, CMP, etc.)</td>
<td>Diameter (Nominal)</td>
<td>Material (e.g., RCP, CMP, etc.)</td>
<td>Material (e.g., RCP, CMP, etc.)</td>
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<tr>
<td></td>
<td>Length of opening</td>
<td>Shape (if not round, such as ellipse, arch, etc.)</td>
<td>Depth (or include rim and invert elevations)</td>
<td>End Type (e.g., FES, Headwall, etc.)</td>
<td>Shape (if not round)</td>
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<tr>
<td></td>
<td>Width of opening (not required on Type R)</td>
<td>Diameter (include width and height if not round)</td>
<td></td>
<td>Diameter of pipe (include width and height if not round)</td>
<td>Width</td>
</tr>
<tr>
<td></td>
<td>Depth (or include rim and invert elevations)</td>
<td></td>
<td></td>
<td></td>
<td>Height (if not round)</td>
</tr>
</tbody>
</table>

Note: Additional attributes are not required for ponds, channels, or drop/check structures as long as they are clearly distinguishable as such.

6. Signs

Signs may be submitted as either point or text files. If text is used, the insertion point of the annotation must represent the geographical location of the sign.
Required Attributes: Feature type “Sign” (if not layer name)
MUTCD identifier
Text (if sign is custom)

7. Traffic Signals/Lighting

Include pole locations as points, pullboxes, cabinets and power source as polylines or closed polygons, and conduit and fiber optic interconnect as lines or polylines.

Required Attributes: Feature type (if not layer name)

8. Floodplains

Floodplains only need to be included if grading changes have affected the designated flood areas. They shall be captured as closed polygons, denoting boundaries between the floodway (if present), 100-year, 500-year, and all other FEMA defined flood designations.

Other requirements, separate from this section, including a Letter of Map Revision or Amendment, as described in the SDECM, will be required for changes made to floodplains.

Required Attributes: FEMA Zone designation
FEMA Floodway designation

11.2.5 ADDITIONAL INFORMATION

The Town can provide, upon request, AutoCAD and Excel templates that can be used in creating electronic as-built deliverables.

Contact the Town of Parker GIS Division at (303) 841-0353 if you would like to receive drawing templates or have any other questions concerning electronic deliverables.

11.3 REFERENCES

# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Revision Date</th>
<th>Number of Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appendix A</td>
<td>Standard Details</td>
<td></td>
</tr>
<tr>
<td>Roadway Standard Details</td>
<td>November 2020</td>
<td>50</td>
</tr>
<tr>
<td>Traffic Signal Standard Details</td>
<td>November 2012</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appendix B</th>
<th>Standard Forms</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Plan Sheet Submittal List</td>
<td>May 2018</td>
<td>1</td>
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<td>Signature Review Blocks</td>
<td>January 2016</td>
<td>1</td>
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<tr>
<td>Construction Plan Approval Process</td>
<td>May 2018</td>
<td>1</td>
</tr>
<tr>
<td>Standard Cost Estimate Template</td>
<td>May 2018</td>
<td>2</td>
</tr>
<tr>
<td>Financial Guarantee Exhibits</td>
<td>May 2018</td>
<td>2</td>
</tr>
<tr>
<td>Construction Plan Requirement Checklist</td>
<td>August 2014</td>
<td>30</td>
</tr>
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<td>TIS Standard Checklist</td>
<td>November 2012</td>
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</tr>
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<table>
<thead>
<tr>
<th>Appendix C</th>
<th>Permit Checklists and Forms</th>
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<tbody>
<tr>
<td>ROW Use Permit Checklist</td>
<td>May 2018</td>
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<td>Grading Permit Checklist</td>
<td>November 2020</td>
<td>1</td>
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<td>Grading Security Release</td>
<td>November 2012</td>
<td>1</td>
</tr>
<tr>
<td>Preconstruction Meeting Packet</td>
<td>November 2020</td>
<td>12</td>
</tr>
<tr>
<td>Minimum Inspections &amp; Typical Minimum Testing</td>
<td>November 2012</td>
<td>2</td>
</tr>
<tr>
<td>Probationary Acceptance Checklist</td>
<td>May 2018</td>
<td>1</td>
</tr>
<tr>
<td>Pond Volume Certification</td>
<td>August 2014</td>
<td>1</td>
</tr>
<tr>
<td>Certificate of Occupancy Checklist</td>
<td>May 2018</td>
<td>1</td>
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<tr>
<td>Final Acceptance Checklist</td>
<td>November 2012</td>
<td>1</td>
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<tr>
<td>Affidavit of Compliance</td>
<td>November 2012</td>
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<td>Asphalt Pavement Pre-Paving Meeting Application</td>
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<td>5</td>
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<tr>
<td>Concrete Pavement Pre-Paving Meeting Application</td>
<td>November 2012</td>
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</tbody>
</table>
Appendix A

Standard Details
Revised November 2020
Number of Pages: 50
# INDEX OF ROADWAY DESIGN STANDARD DETAILS

**DETAIL CATEGORY** | **DETAIL NAME** | **DETAIL NUMBER**
--- | --- | ---
**STREET CROSS SECTIONS AND TYPICAL CURB SECTIONS**
TYPICAL STREET CROSS SECTIONS | 1 OF 3
TYPICAL STREET CROSS SECTIONS | 1 OF 3
TYPICAL STREET CROSS SECTIONS | 1 OF 3
TYPICAL RESIDENTIAL UTILITY LOCATIONS | 2
CURB, GUTTER, AND SIDEWALK SECTIONS | 3
DETACHED SIDEWALK | 4 OF 2
ATTACHED SIDEWALK | 4 OF 2

**LOCAL STREET CUL-DE-SAC LAYOUTS**
RESIDENTIAL LOCAL CUL-DE-SAC TYPICAL LAYOUT | 5
RESIDENTIAL LOCAL KNUCKLE TYPICAL LAYOUT | 6
RESIDENTIAL LOCAL CORNER KNUCKLE TYPICAL LAYOUT | 7

**STANDARD INTERSECTIONS**
RESIDENTIAL LOCAL/LOCAL INTERSECTION LAYOUT | 8
RESIDENTIAL LOCAL/RESIDENTIAL COLLECTOR INTERSECTION LAYOUT | 9
RESIDENTIAL LOCAL/BOULEVARD COLLECTOR INTERSECTION LAYOUT | 10
RESIDENTIAL BOULEVARD COLLECTOR INTERSECTION LAYOUT | 11
NON-RESIDENTIAL COLLECTOR/ARTERIAL INTERSECTION LAYOUT | 12
RESIDENTIAL COLLECTOR/ARTERIAL INTERSECTION LAYOUT | 13
ARTERIAL/ARTERIAL INTERSECTION LAYOUT | 14

**CURB RAMPS**
DIAGONAL CURB RAMP LAYOUT | 15 OF 4
DIAGONAL CURB RAMP LAYOUT | 15 OF 4
DIRECTIONAL CURB RAMP LAYOUT | 15 OF 4
DIRECTIONAL CURB RAMP LAYOUT | 15 OF 4
RAMP ARTERIAL/ARTERIAL LAYOUT | 16
MIDBLOCK CURB RAMP LAYOUT | 17 OF 2
MIDBLOCK CURB RAMP LAYOUT | 17 OF 2
DIRECTIONAL CURB RAMP WITHIN RADIUS LAYOUT | 18 OF 2
DIRECTIONAL CURB RAMP WITHIN RADIUS LAYOUT | 18 OF 2

**DRIVEWAY AND CROSS PAN DETAILS**
INTERSECTION CROSS PAN LAYOUT | 19 OF 2
INTERSECTION CROSS PAN LAYOUT | 19 OF 2
COMMERCIAL DRIVEWAY WITH ATTACHED SIDEWALK | 20 OF 2
COMMERCIAL DRIVEWAY WITH DETACHED SIDEWALK | 20 OF 2
RESIDENTIAL DRIVEWAY WITH 4" MOUNTABLE CURB LAYOUT | 21
RESIDENTIAL DRIVEWAY WITH 6" VERTICAL CURB/GUTTER ISOMETRIC | 22

**MISCELLANEOUS DETAILS**
PARALLEL PARKING LAYOUT AT INTERSECTIONS | 23
INTERSECTION SIGHT DISTANCE REQUIREMENTS | 24 OF 2
INTERSECTION SIGHT DISTANCE REQUIREMENTS | 24 OF 2
MINIMUM STREET PATCH DETERMINATION | 25 OF 2
TEST HOLE RESTORATION | 25 OF 2
ASPHALT CONNECTION BETWEEN EXISTING AND NEW PAVEMENTS | 26
MEDIAN BULL NOSE ISOMETRIC | 27 OF 2
MEDIAN BULL NOSE TYPICAL SECTIONS | 27 OF 2
CURB CHASE DRAIN (RESIDENTIAL) LAYOUT | 28 OF 2
CURB CHASE DRAIN (RESIDENTIAL) LAYOUT | 28 OF 2
CURB CHASE DRAIN (NON-RESIDENTIAL) LAYOUT | 29 OF 2
CURB CHASE DRAIN (NON-RESIDENTIAL) LAYOUT | 29 OF 2
TRENCH DRAIN DETAIL SECTION | 30
INTERSECTION GRADING DETAIL FOR CONSTRUCTION PLANS | 31
GROUND MOUNTED STREET NAME PANELS | 32
MANHOLE COVER | 33

**NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.**
1. TRENCH DRAINS ARE REQUIRED ON ARTERIAL AND COLLECTOR STREETS, SEE STANDARD DETAIL 31.

2. ROW WIDTH SHOWN IS TYPICAL. ADDITIONAL ROW AND/OR LANNES MAY BE REQUIRED BASED ON A TRAFFIC STUDY.

3. SEE STANDARD DETAIL 3 FOR TYPICAL CURB AND GUTTER INFORMATION.

4. SEE STANDARD DETAIL 4 FOR TYPICAL SIDEWALK INFORMATION.

GENERAL NOTES
1. Trench drains are required on arterial and collector streets, see standard detail 31.
2. Row width shown is typical. Additional row and/or lanes may be required based on a traffic study.
3. See standard detail 3 for typical curb and gutter information.
4. See standard detail 4 for typical sidewalk information.
1. Trench drains are required on arterial and collector streets, see standard detail 31.
2. Row width shown is typical. Additional row and/or lanes may be required based on a traffic study.
3. See standard detail 3 for typical curb and gutter information.
4. See standard detail 4 for typical sidewalk information.

GENERAL NOTES
1. Coordinate final utility locations with Town of Parker staff and appropriate water & sanitation district.
**Curbs, Gutter, and Sidewalk Sections**

**Standard Detail**

**Mountable Curb and Gutter Section**
(CDOT Curb and Gutter Type 2 (Section II-B))

**Median Curb and Gutter Section**
(CDOT Curb and Gutter Type 2 (Section I-B))

**Vertical Curb and Gutter Section**
(CDOT Curb and Gutter Type 2 (Section II-B))

**Mountable Curb and Gutter Section**

**Monolithic Combination Curb, Gutter and Sidewalk Section**
DETAIL
OF
DETAILED SIDEWALK
STANDARD DETAIL

JOIN SPACING

SECTION A-A

GENERAL NOTES
1. CONTRACTION JOINTS ON CONCRETE TRAILS SHALL BE SAWCUT.
ATTACHED SIDEWALK
STANDARD DETAIL

SECTION A-A

GENERAL NOTES

1. CONTRACTION JOINTS ON CONCRETE TRAILS SHALL BE SAWCUT.
2. TRANSVERSE SIDEWALK JOINTS SHALL MATCH CURB AND GUTTER JOINTS.
GENERAL NOTES

1. ISLAND TREATMENT WILL REQUIRE LARGER RADII AND SHALL BE REVIEWED ON A CASE BY CASE BASIS FOR APPROVAL BY THE TOWN OF PARKER.

2. IF THE LENGTH OF THE CUL-DE-SAC STREET IS LESS THAN 250 FEET, MIDBLOCK CURB RAMPS MAY BE OMITTED.

3. DRIVEWAY LOCATION(S) SHALL BE LOCATED TO AVOID CURB RAMPS AND STORM SEWER INLETS.
RESIDENTIAL LOCAL KNUCKLE
TYPICAL LAYOUT
STANDARD DETAIL

- PROVIDE TRANSITION
  FROM DETACHED TO
  ATTACHED SIDEWALKS

- MONOLITHIC COMBINATION
  CURB, GUTTER AND
  SIDEWALK PER DETAIL 3

- 6' MIN. LANDSCAPE
  WIDTH

- SEE DETAIL 4 FOR
  DETACHED SIDEWALK
  STANDARD DETAIL

- SIDEWALK AND
  UTILITY EASEMENT
  (TYP.)

- 20' FLOWLINE
  RADIUS TYP.

- 40' ROW
  RADIUS MIN.

- 38' TO 45' RADIUS
  CENTER TO FLOWLINE

- 45' TO 52' RADIUS
  CENTER TO ROW

- 34' FL-FL

- 55' ROW-ROW

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.

DATE
NOVEMBER
2020

DETAIL
6

1 OF 1
GENERAL NOTES

1. LOCATION AND TYPES OF ACTUAL RAMPS WILL BE DETERMINED ON A PROJECT SPECIFIC BASIS.
2. DRIVEWAY LOCATION(S) SHALL BE LOCATED TO AVOID CURB RAMPS AND STORM SEWER INLETS.
1. DRIVEWAY LOCATION(S) SHALL BE LOCATED TO AVOID CURB RAMPS AND STORM SEWER INLETS.
RESIDENTIAL LOCAL/RESIDENTIAL COLLECTOR INTERSECTION LAYOUT

- See Detail 4 for detached sidewalk standard detail
- See Detail 15 for diagonal curb ramp layout
- See Detail 15 for directional curb ramp layout

DATE
NOVEMBER 2020

DETAIL 9
1 OF 1
RESIDENTIAL LOCAL/BOULEVARD COLLECTOR INTERSECTION LAYOUT

STANDARD DETAIL

- 34' FL-FL
- 55' ROW-ROW
- 53' FL-FL

- SEE DETAIL 4 FOR DETACHED SIDEWALK STANDARD DETAIL
- SIDEWALK AND UTILITY EASEMENT (TYP.)
- SEE DETAIL 15 FOR DIAGONAL CURB RAMP LAYOUT
- SEE DETAIL 17 FOR MIDBLOCK CURB RAMP LAYOUT

- TAPER **
- TURN LANE 100' MIN. *

* LENGTH PER TRAFFIC STUDY
** TAPER PER CDOT ACCESS CODE

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.

PARKER COLORADO
RESIDENTIAL LOCAL/BOULEVARD COLLECTOR INTERSECTION LAYOUT
STANDARD DETAIL

DATE
NOVEMBER
2020

DETAIL
10
1 OF 1
GENERAL NOTES

1. TRAFFIC SIGNAL EASEMENTS MAY BE REQUIRED.

* LENGTH PER TRAFFIC STUDY
** TAPER PER CDOT ACCESS CODE
GENERAL NOTES

1. INTERSECTION & ACCELERATION/DECELERATION LANES SHALL BE DETERMINED BY THE APPROVED TRAFFIC STUDY.
2. ALL ARTERIAL INTERSECTION DESIGNS SHALL BE SUBMITTED TO THE TOWN OF PARKER FOR REVIEW AND APPROVAL.
3. THE MEDIAN CURB AND GUTTER CURVE WILL BE ESTABLISHED BY THE SWEPT PATH BASED ON A WB-50 DESIGN VEHICLE.
4. TRAFFIC SIGNAL EASEMENTS MAY BE REQUIRED.

* LENGTH PER TRAFFIC STUDY
** TAPER PER CDOT ACCESS CODE
1. **GENERAL NOTES**

   1. Intersection & Acceleration/Deceleration lanes shall be determined by the approved traffic study.
   2. All arterial intersection designs shall be submitted to the Town of Parker for review and approval.
   3. The median curb and gutter curve will be established by the swept path based on a WB-50 design vehicle.
   4. Traffic signal easements may be required.

---

**NOTES:**

1. All arterial intersection designs shall be submitted to the Town of Parker for review and approval.

2. Intersection & acceleration/deceleration lanes shall be determined by the approved traffic study.

3. The median curb and gutter curve will be established by the swept path based on a WB-50 design vehicle.

4. Traffic signal easements may be required.

---

**FOR MORE DETAILS:**

- See Detail 15 for directional curb ramp layout.
- See Detail 17 for midblock curb ramp layout.
- See Detail 4 for detached sidewalk standard detail.
- See Note 3.

---

**DATE NOVEMBER 2020**

**DETAIL 13**
1. INTERSECTION & ACCELERATION/DECELERATION LANES SHALL BE DETERMINED BY THE APPROVED TRAFFIC STUDY.

2. ALL ARTERIAL INTERSECTION DESIGNS SHALL BE SUBMITTED TO THE TOWN OF PARKER FOR REVIEW AND APPROVAL.

3. THE MEDIAN CURB AND GUTTER CURVE WILL BE ESTABLISHED BY THE SWEPT PATH BASED ON A WB-50 DESIGN VEHICLE.

4. DEDICATED TURN LANE WIDTH AND RADIUS SHALL BE DETERMINED BY THE WB-50 DESIGN VEHICLE TURNING ANALYSIS.

5. THE PEDESTRIAN ISLAND LAYOUT SHALL INCLUDE THE REQUIRED TRAFFIC SIGNAL PLACEMENT AND SHALL BE COORDINATED WITH THE CURB RAMP PLACEMENT.

6. TRAFFIC SIGNAL EASEMENTS MAY BE REQUIRED.
** DETECTABLE WARNINGS SHALL BE ONE OF CAST-IN-PLACE THE PRODUCTS APPROVED FOR USE AS LISTED ON CDOT'S APPROVED PRODUCTS LIST (APL).

** LANDING SHALL HAVE A MAXIMUM OF 2% SLOPE IN EACH DIRECTION.

SIDEWALK GEOMETRY MAY BE CURVED OR SEGMENTED AS APPROVED BY THE TOWN.

FLOW LINE

0.5" EXPANSION JOINT

BACK OF CURB

PARALLEL TRANSITION

TRANSITION

CAST-IN-PLACE DETECTABLE WARNING PANEL 2' X 5' MIN.
SLOPE 12:1 MAX.
SEE SHEET 2 OF 2
** LANDING SHALL HAVE A MAXIMUM OF 2% SLOPE IN EACH DIRECTION.

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.

DIAGONAL CURB RAMP LAYOUT
STANDARD DETAIL

DATE NOVEMBER 2020
DETAIL 15

PARKER COLORADO

SECTION A-A

CAST-IN-PLACE DETECTABLE WARNING PANEL PER CDOT'S APPROVED PRODUCTS LIST (APL)

12:1 SLOPE MAX.

5% SLOPE MAX.

2% SLOPE MAX.

2' (TYP.)

15' MAX.

0.5" EXPANSION JOINT

SIDEWALK/LANDING 1.5% SLOPE TYP.

CURB AND GUTTER PER PLANS

** LANDING
** DETECTABLE WARNINGS SHALL BE ONE OF CAST-IN-PLACE THE PRODUCTS APPROVED FOR USE AS LISTED ON CDOT’S APPROVED PRODUCTS LIST (APL).

** ** LANDING SHALL HAVE A MAXIMUM OF 2% SLOPE IN EACH DIRECTION.

SIDEWALK GEOMETRY MAY BE CURVED OR SEGMENTED AS APPROVED BY THE TOWN

* CAST-IN-PLACE DETECTABLE WARNING PANEL 2' X 5' MIN. SLOPE 12:1 MAX. SEE SHEET 2 OF 2

* LANDINGS SHALL HAVE A MAXIMUM OF 2% SLOPE IN EACH DIRECTION.

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.

DATED NOVEMBER 2020

DIRECTIONAL CURB RAMP LAYOUT
STANDARD DETAIL

DETAILED
**Landing shall have a maximum of 2% slope in each direction.**

No changes are to be made to this drawing without written permission of the Town of Parker.
1. DEDICATED TURN LANE WIDTH AND RADIUS SHALL BE DETERMINED BY THE DESIGN VEHICLE TURNING ANALYSIS.

2. THE PEDESTRIAN ISLAND LAYOUT SHALL INCLUDE THE REQUIRED SIGNAL POLE PLACEMENT AND SHALL BE COORDINATED WITH THE CURB RAMP PLACEMENT.

3. MEDIAN COVER MATERIAL SHALL BE PLACED IN ACCORDANCE TO STANDARD DETAIL 28.

4. CURB RETURN RADII AT ARTERIAL INTERSECTIONS WILL BE EVALUATED ON A CASE BY CASE BASIS (DUE TO THE REQUIRED EVALUATION OF TRAFFIC ISLANDS).

CUT-THROUGH ISLANDS CAN BE CONSTRUCTED WHERE GRADES PERMIT. 1% MIN GRADES SHALL BE PROVIDED TO ENSURE ADEQUATE DRAINAGE.

GENERAL NOTES
MIDBLOCK CURB RAMP LAYOUT
STANDARD DETAIL

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.

DATE
NOVEMBER
2020

DETAIL
17

1 OF 2
MIDBLOCK CURB RAMP LAYOUT
STANDARD DETAIL

ISOMETRIC

SECTION A-A
6"X12" CONCRETE CURB

SECTION B-B
6"X12" CONCRETE CURB

TOP BACK OF CURB
FLOW LINE

MIDBLOCK CURB RAMP

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.
DIRECTIONAL CURB RAMP WITHIN RADIUS
(ATTACHED SIDEWALK)

0.5" EXPANSION JOINT (TYP.)
BACK OF CURB
1' RADIUS (MIN.)

0.5" EXPANSION JOINT (TYP.)
BACK OF CURB
1' RADIUS (MIN.)
DIRECTIONAL CURB RAMP WITHIN RADIUS
(DETACHED SIDEWALK)

- 0.5" EXPANSION JOINT
- PCR
- BACK OF CURB
- LANDING AREA 2% TYP/ 5% MAX
- DETECTABLE WARNING PANEL SEE DETAIL 15
- 1' RADIUS (MIN.) (TYP.)
- SLOPE MAX. 12:1
- SLOPE MAX. 5%
- 1' RADIUS (MIN.) (TYP.)
- TREE LAWN
- PCR

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.
1. CONTRACTION JOINTS SHALL BE PROVIDED AT 10' MAXIMUM SPACING.

**SECTION A-A**

<table>
<thead>
<tr>
<th>WIDTH (W)</th>
<th>DEPTH (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8'-0&quot; (TYP.)</td>
<td>2&quot;</td>
</tr>
<tr>
<td>10'-0&quot;</td>
<td>2 1/2&quot;</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

2% MIN.

2% MIN.

1/8" TO 3/8" LIP

3" MIN. CLEARANCE (SUPPORT AS REQUIRED)

3" MIN. (EPOXY COATED)

#4@18" EW

W=PER TABLE

W/2

W/2

3"
1. Expansion joints shall be sealed in accordance with the latest CDOT M&S standard plans.

2. Reinforcing shall be continuous from cross pan to aprons and placed as shown in standard detail 19.
SECTION A-A

COMMERCIAL DRIVEWAY WITH ATTACHED SIDEWALK
STANDARD DETAIL

DATE
NOVEMBER
2020

DETAIL
20

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.
COMMERCIAL DRIVEWAY WITH DETACHED SIDEWALK

SECTION A-A

- 6' WIDTH OF DRIVEWAY (W)
- 0.5" EXPANSION JOINT (TYP.)
- 0.5" EXPANSION JOINT (TYP.)
- #4 @ 18" EW (EPOXY COATED)
- 10" POUR MONOLITHICALLY
- 1" LIP
- 24"

DATE
NOVEMBER 2020

DETAIL
20

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.
RESIDENTIAL DRIVEWAY WITH 4" MOUNTABLE CURB LAYOUT
STANDARD DETAIL

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.

DATE NOVEMBER 2020
DETAIL 21
1 OF 1
GENERAL NOTES

1. NO PARTIAL REMOVAL OF CURB HEAD WILL BE ALLOWED.
GENERAL NOTES

1. SIGHT DISTANCES SHALL BE PROVIDED PER STANDARD DETAIL 25.
2. ALL PULLOUT PARKING SPACES WILL BE 24" IN LENGTH UNLESS ADJACENT TO A TAPER.
DETAIL
INTERSECTION SIGHT DISTANCE REQUIREMENTS
STANDARD DETAIL

1. CORNER SIGHT DISTANCE MEASURED FROM A POINT ON THE MINOR STREET AT "D" OF 15 FEET BACK FROM EDGE OF THE MAJOR STREET PAVEMENT (FLOWLINE) AND MEASURED FROM HEIGHT OF EYE AT 3.5' ON THE MINOR STREET TO A HEIGHT OF OBJECT AT 3.5' ON THE MAJOR STREET.

2. AT LOCAL-LOCAL STREET INTERSECTIONS ONLY, THE "D" DISTANCE SHALL BE 10'.

3. INTERSECTION SIGHT DISTANCE ANALYSIS SHALL ACCOUNT FOR COMBINED HORIZONTAL & VERTICAL ALIGNMENTS.

4. WITHIN THE INTERSECTION SIGHT DISTANCE TRIANGLE, LIMITED LANDSCAPING SHALL BE ALLOWED BUT NO SOLID STRUCTURES. SOLID STRUCTURES SHALL INCLUDE, BUT NOT BE LIMITED TO, FENCES, UTILITY BOXES AND TREE TRunks. SHRUBS AND PLANTING WILL BE NO TALLER THAN 2 FEET AND TREE CANOPIES WILL BE NO LOWER THAN 8 FEET. LANDSCAPING WITHIN THIS AREA WILL BE MAINTAINED BY THE LANDOWNER OR HOMEOWNERS ASSOCIATION.
SIGHT DISTANCE (SEE TABLE)

GENERAL NOTES

1. A SIGHT DISTANCE AREA IS REQUIRED ON ALL PUBLIC ROADWAYS APPROACHING A STOP SIGN, OR OTHER APPLICABLE INTERSECTION TRAFFIC CONTROL DEVICE.
2. THE SIGHT DISTANCE AREA SHALL BE DISPLAYED ON ALL LANDSCAPING PLANS.
3. LANDSCAPING NO TALLER THAN 2 FEET AT MATURE HEIGHT IS PERMITTED WITHIN SIGHT DISTANCE AREAS.

<table>
<thead>
<tr>
<th>DESIGN SPEED</th>
<th>20 mph</th>
<th>25 mph</th>
<th>30 mph</th>
<th>35 mph</th>
<th>40 mph</th>
<th>45 mph</th>
<th>50 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGHT DISTANCE</td>
<td>115 ft</td>
<td>155 ft</td>
<td>200 ft</td>
<td>250 ft</td>
<td>305 ft</td>
<td>360 ft</td>
<td>425 ft</td>
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</tbody>
</table>

* BASED ON AASHTO STOPPING SIGHT DISTANCE
GENERAL NOTES

1. SEE SECTION 9 OF THE ROADWAY CRITERIA MANUAL FOR LIMITS OF PATCHING. RECOMPACTION PER TOWN STANDARDS IS REQUIRED UNDER THE LIMITS OF THE PATCHING.

ASPHALT PAVEMENT NOTES

1. HOT MIX ASPHALT PATCH TO BE 6" THICK OR EXISTING PAVEMENT THICKNESS +1" (WHICHEVER IS GREATEST).
2. THE MINIMUM LIFT THICKNESS SHALL BE AT LEAST THREE TIMES (PREFERABLY FOUR TIMES) THE NOMINAL AGGREGATE SIZE. MAXIMUM LIFT THICKNESS SHALL BE FIVE TIMES THE NOMINAL AGGREGATE SIZE.
3. THE TOP LIFT OF ALL HMA PAVEMENT SECTIONS SHALL BE 2" THICK AND GRADING SX.

CONCRETE PAVEMENT NOTES

1. CONCRETE PAVEMENT THICKNESS SHALL BE 1 INCH GREATER THAN EXISTING CONCRETE PAVEMENT.
2. CONCRETE SHALL BE CDOT CLASS P.
TRENCH PATCH FOR ASPHALT PAVEMENT

- W = WIDTH OF TRENCH
- D = DEPTH OF TRENCH

ROTOMILLED BUTT JOINT
SAW-CUT EXISTING ASPHALT
EXISTING ASPHALT SHALL BE TACKED WITH EMULSIFIED ASPHALT (TYP.)

CONCRETE REINFORCING STEEL PER CDOT STANDARDS

FLOWABLE FILL SHALL BE PLACED TO THE GRADE OF THE STREET PRIOR TO PAVING AND REMOVED TO THE DEPTH OF THE PAVEMENT AT THE TIME OF PAVING

TRENCH PATCH FOR CONCRETE PAVEMENT

GENERAL NOTES
1. SEE SECTION 9 OF THE ROADWAY CRITERIA MANUAL FOR LIMITS OF PATCHING. RECOMPACATION PER TOWN STANDARDS IS REQUIRED UNDER THE LIMITS OF THE PATCHING.

ASPHALT PAVEMENT NOTES
1. HOT MIX ASPHALT PATCH TO BE 6" THICK OR EXISTING PAVEMENT THICKNESS +1" (WHICHEVER IS GREATEST).
2. THE MINIMUM LIFT THICKNESS SHALL BE AT LEAST THREE TIMES (PREFERABLY FOUR TIMES) THE NOMINAL AGGREGATE SIZE. MAXIMUM LIFT THICKNESS SHALL BE FIVE TIMES THE NOMINAL AGGREGATE SIZE.
3. THE TOP LIFT OF ALL HMA PAVEMENT SECTIONS SHALL BE 2" THICK AND GRADING SX.

CONCRETE PAVEMENT NOTES
1. CONCRETE PAVEMENT THICKNESS SHALL BE 1 INCH GREATER THAN EXISTING CONCRETE PAVEMENT.
2. CONCRETE SHALL BE CDOT CLASS P.
GENERAL NOTES

1. A TEMPORARY CAP SHALL BE PLACED UNTIL PERMANENT GROUT OR HMA IS PLACED.

ASPHALT PAVEMENT NOTES

1. HOT MIX ASPHALT PATCH TO BE 6" THICK OR EXISTING PAVEMENT THICKNESS +1" (WHICHEREVER IS GREATEST).
2. THE HMA PATCH SHALL BE GRADING SX.

CONCRETE PAVEMENT NOTES

1. CONCRETE PAVEMENT THICKNESS SHALL BE 1 INCH GREATER THAN EXISTING CONCRETE PAVEMENT.
2. CONCRETE SHALL BE 4500 psi NON-SHRINK GROUT.
1. SAW-CUT EXISTING PAVEMENT FULL DEPTH TO PROVIDE A VERTICAL EDGE PRIOR TO PLACEMENT OF NEW ASPHALT AND SAW-CUT THE LAP JOINT 2-INCHES DEEP AT THE LAP JOINT DISTANCE.

2. THIS DETAIL APPLIES TO BOTH TRANSVERSE (WITH A 2-FOOT MIN. LAP JOINT) AND LONGITUDINAL (WITH A 1-FOOT MIN. LAP JOINT) ASPHALT JOINTS BETWEEN EXISTING AND NEW PAVEMENT.

3. SPECIFICATIONS AND ILLUSTRATIONS FOR CONCRETE PAVEMENT JOINTS ARE LOCATED IN CDOT'S M&S STANDARD PLANS AND CDOT'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

4. TEMPORARY ASPHALT RAMPS PLACED AT A 20:1 MAX. SLOPE SHALL BE REMOVED OR MILLED PRIOR TO PLACING FINAL ASPHALT.
GENERAL NOTES

1. MEDIAN COVER MATERIAL SHALL BE DAVIS COLOR "RUSTIC BROWN" AND HAVE AN EXPOSED AGGREGATE FINISH. CONCRETE SHALL BE CDOT CLASS "B" WITH 3/8" MAXIMUM AGGREGATE SIZE.

2. TOOLED JOINTS IN THE MEDIAN COVER MATERIAL SHALL MATCH CURB AND GUTTER JOINTS.

* WIDTH VARIES PER ROAD CLASSIFICATION
GENERAL NOTES

1. If median width is greater than 12', additional delineators will be required. Coordinate with designated town authority.
1. 18''-#4 REBAR: WELD ONE BAR APPROX. 8'' FROM EACH END OF TUBE: SUPPLY AT LEAST TWO BARS PER TUBE, MORE IF CONTRACTOR DEEMS APPROPRIATE, REBAR IS USED TO SUPPORT AND ALIGN TUBE UNTIL CONCRETE IS PLACED.

2. ASSEMBLY IS NOT GALVANIZED.

3. CONCRETE REMOVAL LIMITS SHALL BE COORDINATED WITH THE DESIGNATED TOWN AUTHORITY.
CURB CHASE DRAIN ISOMETRIC

(ATTACHED SIDEWALK)

3/16" THICK NON-SLIP STEEL FLOOR PLATE (DIAMOND PLATE)
6" X 4" X 3/16" STEEL TUBE

FOR CONSTRUCTION PURPOSES (SEE NOTE 1)

CURB CHASE DRAIN ELEVATION

(ATTACHED SIDEWALK)

3/16" THICK NON-SLIP STEEL FLOOR PLATE (DIAMOND PLATE)

TOOLED JOINT (TYP.)

6" X 4" X 3/16" STEEL TUBE

#3 REBAR, 6" LONG, WELD TO PLATE AT 18" O.C. EACH SIDE (1/2" ANCHOR BOLT MAY BE USED)

SECTION A-A

GENERAL NOTES

1. 18"-#4 REBAR: WELD ONE BAR APPROX. 8" FROM EACH END OF TUBE: SUPPLY AT LEAST TWO BARS PER TUBE, MORE IF CONTRACTOR DEEMS APPROPRIATE, REBAR IS USED TO SUPPORT AND ALIGN TUBE UNTIL CONCRETE IS PLACED.

2. ASSEMBLY IS NOT GALVANIZED.

3. CONCRETE REMOVAL LIMITS SHALL BE COORDINATED WITH THE DESIGNATED TOWN AUTHORITY.
CURB CHASE DRAIN (NON-RESIDENTIAL) LAYOUT
STANDARD DETAIL

SECTION B-B

- CURB AND GUTTER
- TREE LAWN
- ATTACHED SIDEWALK
- DETACHED SIDEWALK

Expansion Joint (TYP.)

MULTIPLE CHASE

- Width Varies
  - 1.5% SLOPE (TYP.)
  - 2% SLOPE (MAX.)

2-18" Openings in One Location, MAX.

SECTION A-A

- Curb and Gutter
- 6" Min.
- 18" Max.
- 12" Min.

DATE: NOVEMBER 2020

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.

PARKER COLORADO

DETAIL 29
1 OF 2
#3 BAR 6" LONG WELDED TO STRUCT. TEE AT 18" O.C. EACH SIDE (1/2" ANCHOR BOLT MAY BE USED)

1/2" X 1" SCREW (SEE NOTE 1)

ELECTRO-GALVANIZED NON-SLIP RAISED PATTERN STEEL TREAD PLATE. (FOR THICKNESS SEE CHART BELOW)

WELD

STRUCT. TEE WT 2.5 X 8 (SEE BELOW)

DRILLED AND THREADED TO TO ACCEPT SCREW, 2" O.C.

NOTES:
1. STARHEAD SCREW ELECTRO-GALVANIZED FINISH (RECESS HEAD)
2. ASSEMBLY SHALL BE GALVANIZED

WIDTH OF OPENING | TREAD PLATE THICKNESS
---|---
6"-18" | 3/8"
6"-18" | 1/2"

CURB CHASE DRAIN (NON-RESIDENTIAL) LAYOUT STANDARD DETAIL

DATE NOVEMBER 2020 DETAIL 29

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.
TRENCH DRAIN
DETAIL SECTION
STANDARD DETAIL

GENERAL NOTES

1. TRENCH DRAIN SHALL BE LOCATED HORIZONTALLY AT EDGE OF CONTINUOUS IMPERMEABLE SECTION.
2. TRENCH DRAINS SHALL BE TRANSITIONED TO PVC SCH. 40, NON-PERFORATED PIPE WHEN RAN UNDER ROADWAY HARDSCAPES/INTERSECTIONS.
3. CLEANOUTS SHALL BE PROVIDED AT ALL JUNCTIONS, ANGLE POINTS AND SPACED MAX. OF 500’ INTERVALS.
4. TRENCH DRAINS SHALL TIE INTO STORM MANHOLE OR INLETS.
5. PERFORATED PIPE MATERIAL SHALL CONSIST OF CONTECH A-2000 PERFORATED PIPE, SDR-26 PERFORATED PRESSURE PIPE, HDPE SCH. 40 PERFORATED PIPE, N-12 ADS PIPE OR APPROVED EQUAL.
6. 3M ELECTRONIC MARKER SYSTEM (EMS) BALL MARKERS (MODEL 1408) SHALL BE INSTALLED DIRECTLY ABOVE THE 4-INCH PIPE AT A MINIMUM SPACING OF 100-FOOT INTERVALS AND ALL DIRECTION CHANGES AND CLEANOUT LOCATIONS.

*SPECIFICATIONS FOR THESE APPLICABLE MATERIALS ARE LOCATED IN CDOT’S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

PAGE 1 OF 1
**INTERSECTION GRADING DETAIL**

**FOR CONSTRUCTION PLANS**

**STANDARD DETAIL**

---

**Y** = **LONGITUDINAL SLOPE IN PERCENT FOR THE MAJOR STREET**

**TRANSITION LENGTH** = \((Y+2)15\)

**Z** = **CL STATION OF MINOR STREET**

---

**GENERAL NOTES**

1. **STATIONING BASED ON EVEN CENTERLINE (CL) STATIONING \((Z+00, Z+25, Z+50 \ldots)\)**
2. **25' STATION INTERVALS (MIN.)**
3. **CROSS SLOPES SHALL BE CALCULATED FROM THE CROWN TO THE EDGE OF PAVEMENT**
4. **SHOW GRADE BREAKS (GB), HIGH POINTS (HP), AND LOW POINTS (LP) ON DETAILS**
5. **MAXIMUM CROSS SLOPE TRANSITION WITHIN 25' INTERVALS SHALL BE 1.5%**

---

**DRAWING DATE**

**NOVEMBER 2020**

---

**NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.**

---

**PARKER COLORADO**

**DETAIL**

**31**

**1 OF 1**
1. STREET NAME SIGNS SHALL BE ON EXTRUDED ALUMINUM BLANKS. ARTERIALS/COLLECTORS SHALL HAVE 9" HIGH PANELS. LOCALS MAY HAVE 6" HIGH PANELS. ARTERIAL/COLLECTOR SIZE BLANKS SHALL NOT EXCEED 60". LOCAL SIZE BLANKS SHALL NOT EXCEED 48".

2. SIGN POSTS FOR INSTALLING STREET NAME SIGNS SHALL BE 12 GAUGE Nex/S-SquareTube STEEL. FINISH TO BE HOT DIPPED GALVANIZED (ASTM A-653 G90). SIZE OF POST TO BE NOMINAL 2" x 2".

3. SIGN MOUNTING HARDWARE TO BE ZINC OR CADMIUM PLATED.

4. SIGN SHEETING SHALL BE REFLECTORIZED AND AFFIXED TO BOTH SIDES OF STREET NAME SIGN BLANK. PRIMARY SHEETING MATERIAL TO BE HIGH INTENSITY PRISMATIC WHITE WITH GREEN TRANSPARENT ELECTRO-CUT FILM. TOWN LAMP LOGO TO BE BLACK FILM ON WHITE SHEETING.

5. STREET NAME FONTS SHALL BE STANDARD HIGHWAY GOTHIC SERIES. TOTAL CHARACTERS INCLUDING SUFFIX SHALL NOT EXCEED 14.

6. MOUNTING HEIGHTS AND Locations TO BE PER MUTCD GUIDELINES OR AS DIRECTED BY THE TOWN.

* PRIVATE ROADS SHALL USE PRIVATE ROAD GRAPHIC IN PLACE OF TOWN LOGO.
MANHOLE COVER
STANDARD DETAIL

TOP OF COVER

3/4" LETTERING (RECESSED FLUSH)

1" LETTERING RECESSED FLUSH

COVER BOTTOM

23 7/8" DIA.

15/16" MACHINED SURFACE

OPEN PICKHOLE DETAIL

1 1/2"

18 3/16" DIA.

19 5/16" DIA.

SECTION

GENERAL NOTES

1. LOAD RATING - HEAVY DUTY.
2. COATING - UNDIPPED.
3. ESTIMATED WEIGHT - 112 LBS.
4. MATERIAL SPECIFICATION - GRAY IRON ASTM A48 CL35B.
5. FOR USE ON ALL PRIVATE AND PUBLIC STORM SEWER.

NO CHANGES ARE TO BE MADE TO THIS DRAWING WITHOUT WRITTEN PERMISSION OF THE TOWN OF PARKER.

PARKER COLORADO

MANHOLE COVER
STANDARD DETAIL

DATE NOVEMBER 2020

DETAIL 33

1 OF 1
Appendix A

Traffic Signal Standard Details
Revised November 2012
Number of Pages: 8
Three structures are designed in accordance with loading and allowable stress requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, Fourth Edition. Loads are based on impact wind velocity of 150 mph.

Fatigue Design Loads: To avoid fatigue cracks, the following guidelines are used:

1. Vortex Shedding: Steel pole members with a taper of 0.14 in/ft are not susceptible to this type of loading.
2. Galling Design of the structure: Do not design the structure for galling of the horizontal members. Owner approved mitigation device will be installed if galling is noticed.
3. Natural Wind Gusts: All structures need to be designed to natural wind gust conditions; the yearly mean wind speed for natural gusts will be assumed to be 11.2 miles per hour.
4. Truck-Induced Gust Fatigue of Structures: Design truck speed = 65 miles per hour.

Detail 6: Arm Plate Detail
Detail 8: Hanger Hole
Detail 10: Nut Cover
Detail 7: Signal Arm Slip Joint
Detail 9: Hanger Hole
Detail 11: Pole Base
Detail 12: Anchor Bolt
**Traffic Signal Pole Foundation Schedule**

<table>
<thead>
<tr>
<th>Mast Arm Span (ft)</th>
<th>Bolt Circle Dia (in)</th>
<th>Caisson Dia (in)</th>
<th>Caisson Length (ft)</th>
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<tr>
<td>65</td>
<td>2-1/2</td>
<td>42</td>
<td>14</td>
</tr>
<tr>
<td>70</td>
<td>2-1/2</td>
<td>42</td>
<td>14</td>
</tr>
</tbody>
</table>

**Foundation Notes**

1. The standard signal foundations shown on this drawing shall only be used with the Town of Parker Standard Signal Plans. All work shall be in accordance with the most current edition of the Town of Parker, Colorado "Roadway Design and Construction Criteria".

2. All work shall be in accordance with the most current edition of the Town of Parker, Colorado "Roadway Design and Construction Criteria".

3. All caisson concrete shall be code class B2, 1" dia. 4000 psi.

4. All reinforcing steel shall be grade 60, f_y = 60,000 psi.

5. Anchor bolts shall be A36 modified to 35 ksi yield strength.

6. Caissons shall be placed against undisturbed earth.

7. The signal foundation design shown on this drawing assumes the minimum soil characteristics as would typically encountered in Parker, Colorado which are noted below. In the event that soft conditions (a blow count of N<8) are encountered, a specific geotechnical evaluation and foundation design will be necessary.

8. If the following situations are encountered during drilling, contact the Town of Parker engineer:

   (A) Signals will not be installed within the roadway prism.
   
   (B) The soil has a high organic content or consists of saturated silt and clay.
   
   (C) The site won't support the weight of the drilling rig.
   
   (D) The foundation soils are not homogenous.
   
   (E) Firm bedrock is encountered.

9. Heavy hex nuts and flat washers

10. Provide two 3" diameter rigid conduits to pull box (24" min. depth, 30" min. depth under roadway) and two 3" diameter rigid conduit stubs from pull box to pole.

11. Pull box

12. Install anchor bolts (furnished with pole) per manufacturer’s template (furnished with order)
DETAIL

DATE
NOVEMBER 2012

DETAIL 3
1 OF 1

ILLUMINATED STREET
NAME SIGN
STANDARD SIGNAL DETAIL

NOTES
1. FINAL SIGN LAYOUT AND LETTERING DETAILS PER TOWN OF PARKER'S DIRECTION/APPROVAL.
2. SIGN TO BE DOUBLE-SIDED WITH WHITE PRINT ON GREEN BACKGROUND FOR STREET NAME AND LOGO.

GENERAL NOTES
1. STREET NAME SIGN TO BE FREE-SWINGING OR LIMITED-SWINGING. SIGN FIXTURE AND PANELS SHALL WITHSTAND 90 MPH WIND LOADING, WITH STRUCTURAL REQUIREMENTS MEETING AASHO "STANDARD SPECIFICATIONS FOR STRUCTURAL supports for highway signs, luminaires and traffic signals," LATEST EDITION.
2. HOUSING TO BE CONSTRUCTED OF ALUMINUM - PAINTED FEDERAL GREEN #14056 OR APPROVED EQUIVALENT.
3. NEOPRENE GASKETS SHALL BE INSTALLED BETWEEN THE SIGN PANEL FRAME AND FIXTURE HOUSING TO PREVENT WATER ENTRANCE. SCREENED WEEP HOLES SHALL BE PROVIDED ON HOUSING BOTTOM FOR DRAINAGE.

LIGHTED SIGN TYPICAL LAYOUT

12" TOWN LOGO

Lincoln Ave

STANDARD MOUNT

WEATHER TIGHT NIPPLE

2' Drip Loop

3' (MAXIMUM)

1' (MINIMUM)

PHOTOELECTRIC CELL

ADJUSTABLE HANGING BRACKETS, VARIABLE LENGTH

BAND CLAMPS

SIDE VIEW

REFLECTORS

FULL LENGTH COOL WHITE FLUORESCENT LAMPS, PHOTOCELL CONTROLLED

PANELS TO ROTATE OPEN
PEDESTRIAN POLE

STANDARD SIGNAL DETAIL

TYPICAL PEDESTRIAN PUSH BUTTON SIGN

TYPICAL PEDESTAL POLE DETAIL

FOUNDATION DETAIL

PEDESTRIAN PUSH BUTTON POLE

NOTE: PAINT SHALL BE FEDERAL GREEN #14056 OR APPROVED EQUIVALENT
1. Water valve pull box shall be a water valve stem-type pull box made of cast iron. The pull box itself shall have capability of accepting riser rings for future overlays. The lid shall be cast iron or steel and have the word “traffic” printed on it.

2. Pull boxes shall have 3/4” to 1” diameter holes drilled or torched 3” from top to accept a loop detector wire flexible vinyl or polyethylene tubing. The number of holes shall be as per plans or as directed by the town engineer.

3. Care shall be taken during backfill compaction to prevent collapse of the tubes.

4. A minimum 2 feet of slack is to be provided on both feed and loop wires so that all testing and splicing can be done outside the pull box.

5. Pull box is to be located in an area of the street not heavily traveled, if possible, and a minimum of 12” from the concrete gutter pan.

6. Conduit under roadway shall be located at a depth of not less than 30 inches.

**Table of Dimensions (Minimums)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Dimensions (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12”</td>
</tr>
<tr>
<td>B</td>
<td>1/4” – 1/2”</td>
</tr>
<tr>
<td>C</td>
<td>1/2” max.</td>
</tr>
<tr>
<td>D</td>
<td>8” min.</td>
</tr>
<tr>
<td>E</td>
<td>1/2” max.</td>
</tr>
<tr>
<td>F</td>
<td>2’-6” min.</td>
</tr>
<tr>
<td>G</td>
<td>12” min.</td>
</tr>
<tr>
<td>H</td>
<td>18” radius elbow</td>
</tr>
<tr>
<td>I</td>
<td>3” min. clearance</td>
</tr>
</tbody>
</table>

Water valve pull box for loop detector wire.
1. THE DESIGN IS ADAPTED FROM CDOT STANDARD PLAN S-614-14 AS RELEASED 07-04-2006. ALTERATIONS FROM CDOT DESIGN INCLUDE THE ELIMINATION OF THE PULLBOX AND CONDUIT, ADDITION OF 5/8 IN. COPPER GROUND ROD, AND INCREASE OF FOUNDATION DIAMETER TO 2'-0".

2. CONCRETE FOOTINGS FOR FLASHING BEACON INSTALLATIONS SHALL CONFORM TO "DRILLED CAISSONS" AND "STRUCTURAL CONCRETE" (CLASS "BZ" CONCRETE, 60K STEEL REBAR).

3. CAISSON DESIGNS REQUIRE THAT THE CAISSON BE FOUNDED IN COMPACT SAND, CLAY OR SANDY CLAY. IF, BY VISUAL INSPECTION OF THE HOLE, OTHER MATTER IS PRESENT, THE CAISSON DESIGN SHALL BE MODIFIED AS DETERMINED BY THE ENGINEER.

4. ANCHOR BOLTS WILL BE SUPPLIED BY THE VENDOR.

5. GROUND ROD AND FOUNDATION REBAR SHALL BE SUPPLIED BY THE CONTRACTOR.

THE DESIGNS HEREIN ASSUME THAT FLASHING BEACONS ARE INSTALLED WITHIN THE ROADWAY PRISM WITH THE FOLLOWING PARAMETERS:

- SOIL DENSITY \( \gamma = 110 \text{ LB./CU. FT.} \)
- SOIL COHESION \( = 750 \text{ LB./SQ.FT. FOR MEDIUM STIFF COHESIVE SOIL} \)
- SOIL ANGLE \( \phi = 30/0 \text{ FOR MEDIUM STIFF COHESIVE SOIL} \)
- SF = 3.0 FOR FLEXURAL RESISTANCE

CONTACT THE ENGINEER IF THE FLASHING BEACON WILL NOT BE INSTALLED WITHIN THE ROADWAY PRISM IF ANY OF THE FOLLOWING CONDITIONS ARE ENCOUNTERED DURING DRILLING:

- THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
- THE SITE WONT SUPPORT THE WEIGHT OF THE DRILLING RIG.
- THE FOUNDATION SOILS ARE NOT HOMOGENOUS.
- FIRM BEDROCK IS ENCOUNTERED.
- A HIGH GROUNDWATER TABLE IS ENCOUNTERED.
- LARGE BOULDERS ARE ENCOUNTERED.

FOOTING DESIGN IS BASED ON 100 MPH WIND LOAD ON A 48"X 48" DIAMOND SIGN PANEL, MOUNTED 9' ABOVE THE GROUND, WITH A 24"X 24" RECTANGULAR PLAQUE UNDERNEATH AND A FLASHING BEACON 12' ABOVE. IF A SIGN CONFIGURATION IS PROPOSED THAT EXCEEDS THESE DIMENSIONS, THE FOOTING DESIGN MUST BE ENGINEERED AND SIGNED AND SEALED BY A COLORADO LICENSED PE.

GENERAL POLE ASSEMBLY NOTES

1. MAJOR COMPONENTS FOR EACH INSTALLATION ARE TO BE APPROVED BY TOWN OF PARKER. THESE COMPONENTS INCLUDE:
   - SOLAR PANEL/STORAGE BATTERIES
   - 36' PELCO POLE - PAINTED
   - PELCO SQUARE BASE - PAINTED
   - LOCKING COLLAR FOR POLE TO BASE CONNECTION - PAINTED
   - CABINET - PAINTED
   - ELTEC CLOCK WITH WIRELESS COMMUNICATIONS PER TOWN REQUIREMENTS
   - 2 12" POLYCARBONATE HEADS WITH AMBER LED AND MOUNTING HARDWARE (BLACK)
   - 1 8" POLYCARBONATE HEAD WITH AMBER LED AND MOUNTING HARDWARE (BLACK)
   - SCHOOL ZONE SIGN/WHEN FLASHING PLAQUE

2. MISCELLANEOUS EQUIPMENT OR SMALL PARTS NEEDED TO SECURE ALL HARDWARE WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. CONTRACTOR SHALL COORDINATE START UP WITH TOWN OF PARKER.

4. POLE AND FLASHER ASSEMBLY SHALL BE PROPERLY GROUNDED TO FOUNDATION GROUND ROD BY THE CONTRACTOR.

5. PAINT SHALL BE FEDERAL GREEN #14056 OR APPROVED EQUIVALENT.

6. SIGN SIZES SHALL CONFORM TO THE MUTCD (LATEST TOWN ADOPTED VERSION).

POLE ASSEMBLY
Appendix B

Plan Sheet Submittal List
Revised May 2018
Number of Pages: 1
The Utility Plan Set for the water and sanitation district shall be able to stand alone, but shall be provided at the back of all construction plan sets submitted to the Town of Parker. All record sets shall be signed in accordance with Construction Plan Approval Process.

**TOWN OF PARKER CONSTRUCTION PLAN SET**

<table>
<thead>
<tr>
<th>Sheet</th>
<th>Required Signature Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover Sheet</td>
<td>Town</td>
</tr>
<tr>
<td>Construction Notes</td>
<td>Town</td>
</tr>
<tr>
<td>Horizontal Control Plan</td>
<td>Town</td>
</tr>
<tr>
<td>Grading Plan and Details</td>
<td>Town</td>
</tr>
<tr>
<td>CBMP Plan</td>
<td>Town</td>
</tr>
<tr>
<td>CBMP Details and Notes</td>
<td>No Signature Block</td>
</tr>
<tr>
<td>Storm Drainage Plan and Profile</td>
<td>Town</td>
</tr>
<tr>
<td>Storm Drainage Details and Notes</td>
<td>Town</td>
</tr>
<tr>
<td>Roadway Plan and Profile</td>
<td>Town</td>
</tr>
<tr>
<td>Roadway Details and Notes</td>
<td>Town (only on sheets containing non-standard details)</td>
</tr>
<tr>
<td>Signing and Striping</td>
<td>Town</td>
</tr>
<tr>
<td>Signing and Striping Details and Notes</td>
<td>Town</td>
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</tbody>
</table>

**UTILITY PLAN SET**

(Please contact the applicable water and sanitation district for specific plan requirements)

<table>
<thead>
<tr>
<th>Sheet</th>
<th>Required Signature Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover Sheet for Water and Sanitary Plans</td>
<td>Water and Fire/Life Safety</td>
</tr>
<tr>
<td>Water &amp; Sanitary Sewer General Notes</td>
<td>No Signature Block</td>
</tr>
<tr>
<td>Overall Utility Plan</td>
<td>Town and Fire/Life Safety</td>
</tr>
<tr>
<td>Sanitary Sewer Line Plan and Profile</td>
<td>No Signature Block</td>
</tr>
<tr>
<td>Sanitary Sewer Details</td>
<td>No Signature Block</td>
</tr>
<tr>
<td>Water Line Plan and Profile</td>
<td>No Signature Block</td>
</tr>
<tr>
<td>Water Details</td>
<td>No Signature Block</td>
</tr>
<tr>
<td>Irrigation Plan</td>
<td>No Signature Block</td>
</tr>
<tr>
<td>Landscape Plan</td>
<td>Town (Planning)</td>
</tr>
</tbody>
</table>

Note: Standard specifications, notes and details are available on the following websites:

- Cottonwood Water & Sanitation District – [www.cottonwoodwater.org](http://www.cottonwoodwater.org) or at (303) 792-9509
- Parker Water & Sanitation District – [www.pwsd.org](http://www.pwsd.org) or at (303) 841-4627
- Stonegate Village Metropolitan District – [svmd.org](http://svmd.org) or at (303) 858-9909
- Town of Parker – [www.parkeronline.org](http://www.parkeronline.org) or at (303) 840-9546
- South Metro Fire Authority – [www.southmetro.org](http://www.southmetro.org) or at (720) 989-2000
- ACCWA – [www.arapahoeewater.org](http://www.arapahoeewater.org) or at (303) 790-4830
Appendix B

Signature Review Blocks
Revised January 2016
Number of Pages: 1
The Town of Parker Signature Review Blocks, as shown below, shall be provided on all applicable construction plan sheets. See the Plan Sheet Submittal List (Appendix B) for reference.

ENGINEERING REVIEW BLOCK

The Town of Parker review constitutes general compliance with the Town’s Standards and approved variances, subject to these plans being stamped, signed, and dated by the professional engineer of record. Review by the Town does not constitute approval of the plan design or accuracy and correctness of engineering calculations. Errors in the design or calculations remain the responsibility of the registered professional engineer whose stamp and signature are affixed to this document.

This review does not constitute approval of any private on-site improvements which may be shown. Construction cannot commence until all required drainage/traffic report(s), final development plan(s), special review(s), grading permit, and/or other permits are complete, approved and on file with the Town of Parker.

______________________________  Date
Town of Parker, Director of Engineering/Public Works

FIRE/LIFE SAFETY REVIEW BLOCK

All fire hydrants shall be installed according to water utility standards. The number and locations of the fire hydrants as shown on the Overall Utility Plan are correct as specified by the Town of Parker, Community Development Department.

______________________________  Date
Fire Code Official or Designated Representative

(NOTE – Underground Fire Line (UFL) submittal documents must meet the requirements of NFPA 24 when submitting for review.)
Appendix B

Construction Plan Approval Process
Revised May 2018
Number of Pages: 1
Construction Plan Approval Process

Step 1: Construction plans shall be submitted for review during the application process with the Community Development Department through the Town’s eTrakit system. All comments from each referral agency shall be satisfactorily addressed. The Town construction plans and water and sanitation district plans shall be combined and shall follow the Plan Sheet Submittal List found in Appendix B.

Step 2: When all comments from each review agency have been addressed, a project may be scheduled for any necessary hearings before the Town's Planning Commission and/or Town Council.

Step 3: Construction Plans will not be considered for approval until all of the following have been completed:
- The application is approved by the Planning Commission and/or Town Council, as applicable, and formal approval is granted from the Town’s Community Development Department.
- The plat associated with the application shall be recorded (if applicable).
- A copy of all offsite easements necessary for construction shall be provided to the Town for verification.
- A Subdivision Improvement Agreement (SIA) or Development Agreement, as applicable, shall be recorded, including the submittal of any required payments or Public Improvement security.
- All required fees (review, tap, permit, etc.) shall be paid in full to the Town, water and sewer district, and any other applicable agencies.
- All other conditions of approval must be satisfactorily addressed.

Step 4: The Record Set of construction plans shall be submitted for approval as follows:
- A .pdf of a signed and sealed set of the approved Town and Water & Sewer plan sets shall be uploaded to eTrakit.
- First, the Town’s Fire/Life Safety reviewer will review and affix their approval to the appropriate sheets.
- Second, the water and sewer district will review and approve their plan set per each district’s requirements. Hard copies and/or mylars may be required for some districts. Note that this requires the developer to submit all necessary easements, agreements, fees, and security to the district.
- Last, after proof of the water and sewer district’s approval has been provided to the Town, either via hard copy or electronic upload to eTrakit, the Town will affix their approval to the construction plans.

Step 5: After the Record Set of construction plans have been approved, the applicant shall provide the following:
- Seven (7) 11" x 17" hard copies of the fully approved plans for the use of Town staff.
- Copies of the water and sewer plan set to the applicable district, per their standards.
- Signed and sealed .pdfs of all technical reports associated with the project, uploaded to eTrakit.
- A complete .pdf of the entire approved plan set, uploaded to eTrakit. This will remain on eTrakit for the duration of the project, but should be downloaded by the developer for their long-term records.

Step 6: A grading permit will not be issued until the following have been completed:
- All applicable items on the grading permit application checklist have been submitted to an eTrakit permit application and approved by the Town, including financial security for grading and CBMPs. Note that the grading permit application can be started in advance of Construction Plan approval.
- A Preconstruction Meeting shall be held. The meeting will not be scheduled until all items on the Grading Permit Checklist and Preconstruction Meeting Packet have been satisfactorily addressed and Steps 1-5 have been completed.
- A separate Preconstruction Meeting will be held with PWSD; however, it does not need to be completed prior to issuance of the Grading Permit.
- The initial CBMP’s have been installed and accepted by the Town.

Attached is the “Plan Sheet Submittal List” outline for typical projects. Please contact the individual agencies for specifics.
Appendix B

Standard Cost Estimate Template
Revised May 2018
Number of Pages: 2
### Earthwork

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost</th>
<th>Total Cost</th>
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<tbody>
<tr>
<td>Roadway Embankment</td>
<td></td>
<td>CY</td>
<td>$0.00</td>
<td></td>
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</tbody>
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Earthwork Subtotal = $0.00

### Roadway

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; Vertical Curb &amp; Gutter (2' Pan)</td>
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<td>LF</td>
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<td></td>
</tr>
<tr>
<td>6&quot; Vertical Curb &amp; Gutter (1' Pan)</td>
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<tr>
<td>4&quot; Mountable Curb &amp; Gutter</td>
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<td>Hot Mix Asphalt Pavement (XX&quot; Depth)</td>
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<td>Concrete Pavement (XX&quot; Depth)</td>
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<td>SY</td>
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<td></td>
</tr>
<tr>
<td>Aggregate Base Course</td>
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<td>CY</td>
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<td></td>
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<tr>
<td>Subgrade Stabilization</td>
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<td>SY</td>
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<tr>
<td>Roadway Subgrade Prep (Extend 2' Outside Curb)</td>
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<tr>
<td>5' Detached Concrete Sidewalk</td>
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<td>Sidewalk Subgrade Prep (Min 1' Outside Limits)</td>
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<td></td>
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<tr>
<td>Corner Curb Ramp (Includes Subgrade Prep)</td>
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<td>Midblock Curb Ramp (Includes Subgrade Prep)</td>
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<tr>
<td>Cross Pan (Includes Subgrade Prep)</td>
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<tr>
<td>Trench Drain</td>
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<td>Median Cover</td>
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<td>Adjust Water Valve</td>
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Roadway Subtotal = $0.00

### Concrete Trails

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<td>Sidewalk Subgrade Prep (Min 1' Outside Limits)</td>
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Trail Subtotal = $0.00

### Striping

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<th>Total Cost</th>
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</thead>
<tbody>
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<tr>
<td>Crosswalk Bar (2'x10')</td>
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<tr>
<td>Stop Bar (2' Wide)</td>
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<td>Arrow</td>
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Striping Subtotal = $0.00

### Signage (Including Post and Anchor)

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<th>Unit Cost</th>
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</thead>
<tbody>
<tr>
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<td>Ground Sign</td>
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<td>Type III Barricade</td>
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<tr>
<td>Special Sign</td>
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Signage Subtotal = $0.00

### Drainage and Stormwater Improvements


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<th>Description</th>
<th>Quantity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>36” RCP</td>
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<td>$0.00</td>
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<td>36” FES with Concrete Cutoff Wall</td>
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<tr>
<td>5’ Manhole (Depth specific on 10’ increment)</td>
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<td>10’ Type R Inlet (Depth specific on 10’ increment)</td>
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<td>Outlet Structure with Micropool</td>
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<td>Trickle Channel (4’ standard width with 6” vertical curbs)</td>
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<tr>
<td>Forebay</td>
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Drainage & Stormwater Subtotal = $0.00

Public Improvements Subtotal = $0.00

Construction Contingency (10%) = $0.00
Mobilization (5%) = $0.00
Surveying (3%) = $0.00
Construction Management & Testing (12%) = $0.00

Public Improvement Total = $0.00

Security At 110% = $0.00

Notes:
1. All Costs Must Include Labor and Materials.
2. Erosion and Sediment Control (CBMP) Cost Estimate shall be submitted with the Grading Permit.
Appendix B

Financial Guarantee Exhibits
Revised May 2018
Number of Pages: 2
Public Improvements - Pay Request Submittal

Project:
Finance Escrow Account Number:
Developer/Owner:
(Address):

Payment Application No.:
Payment Application Dates:
Amount Approved For Payment:

Developer/Owner Certification & Signature:
I hereby certify that (1) the percentages of improvements described in this payment application have been constructed and (2) the improvements described in this payment application have been constructed in accordance with Town Standards.

Developer/Owner Signature & Date

Town of Parker Authorizations:

Public Works Engineering Inspector Signature & Date

Public Works Engineering Manager Signature & Date

Public Works Director Signature & Date

Distribution List:
  a) Finance Department
  b) Engineering Inspector
  c) Developer/Owner
  d) Project File
### Parker Public Works’ Schedule of Values

**Project:**

**Developer/Owner:**

**Payment Application No.:**

**Dates (From/To):**

<table>
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<th>No.</th>
<th>Description</th>
<th>Value</th>
<th>Previously Completed Percentage</th>
<th>This Pay Application Percentage</th>
<th>Complete To Date Percentage</th>
<th>Previously Completed Value</th>
<th>This Pay Application Value</th>
<th>Complete To Date Value</th>
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<tr>
<td>1</td>
<td>General Conditions (Contingency, Construction Management, Testing, Survey, Mobilization, Traffic Control, Etc.)</td>
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<td>Earthwork (Earthwork, Topsoil, Removals, Etc. (No Erosion Control))</td>
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<td>3</td>
<td>Pavement &amp; Base (Asphalt Pavement, Concrete Pavement, Aggregate Base Course, Chemically Stabilized Subgrade, Etc.)</td>
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<td>4</td>
<td>Structures (Concrete Box Culverts, Bridges, Etc.)</td>
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<td>5</td>
<td>Storm Drainage (Culverts, Inlets, Manholes, Subsurface Drains, Riprap, Detention Pond Appurtenances, Etc.)</td>
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<td>6</td>
<td>Concrete Flatwork (Sidewalks, Curb &amp; Gutter, Median Cover Material, Trails, Etc.)</td>
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<td>7</td>
<td>Signage &amp; Pavement Markings (Signage, Delineators, Pavement Markings, Etc.)</td>
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<td>Traffic Signals/Lighting (Traffic Signals, Lighting, Etc.)</td>
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<td>Miscellaneous (Guardrail, Survey Monumentation, Etc.)</td>
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Total = $0.00

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x 110%

|  | (Security held at 110% per the SIA) | $0.00 |

Total = $0.00

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<th>Overall Percent Complete =</th>
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<td>Warranty Retention @ 10% =</td>
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<td>Net Payment Value Total =</td>
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Security Remaining to date $0.00

10% Retention to date $0.00

Amount Available $0.00

Notes: 1) Erosion Control Security Included with Grading Permit.
Appendix B

Construction Plan Requirement Checklist
Revised August 2014
Number of Pages: 30
## Construction Plan Sheet Checklist (Typical)

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<td>Construction Notes (Optional Sheet)</td>
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<td>Horizontal Control Plan</td>
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<td>Grading Plan</td>
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<td>CBMP Plan</td>
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<tr>
<td>Storm Drainage Plan and Profile</td>
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<td>Roadway Plan and Profile</td>
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<td>Details (Erosion Control, Drainage, Roadway, Etc.)</td>
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<td>Cover Sheet for Water &amp; Sanitary Plans</td>
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<td>Water &amp; Sanitary Sewer General Notes</td>
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<td>Overall Utility Plan</td>
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<td>Irrigation Plan</td>
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<td>Landscape Plan</td>
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## Cover Sheet Checklist

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<td>- KANE B, Rocky Mountain Pipeline, Other</td>
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<td>- Fiber Optic Providers (Level 3, etc.)</td>
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## Horizontal Control Plan Checklist

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<td>- Date (Include Revision Dates For Resubmittals Until Mylar)</td>
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<td>Legend of Symbols</td>
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<tr>
<td><strong>Boundary</strong></td>
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<td><strong>Street Alignments (Centerline)</strong></td>
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<td>See Roadway Plan &amp; Profile Checklist</td>
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<td>- Engineer Seal &amp; Signature</td>
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<td>- Date (Include Revision Dates For Resubmittals Until Mylar)</td>
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<td>North Arrow</td>
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<td>- Contours (100’ outside boundary, sites &lt; 5 acres)</td>
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<td>- Limits of Grading/Disturbance</td>
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<td>Maximum Slopes Checked</td>
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<td>- 2% - 5% Back of Curb to R-O-W</td>
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<td>- 3:1 Maximum</td>
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<td>- 0.5% min. Concrete Channels</td>
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<td>Spot Elevations for High/Low Pts.</td>
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<td>- Top of Wall &amp; Bottom of Wall (@ finished grade)</td>
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<td>- Proper Separation (2 x top wall height minimum)</td>
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<td>- Greater than 4' in Height - Requires Design &amp; Building Permit (Provide note on plans)</td>
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<td>Trails (Proposed &amp; Existing)</td>
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<td>- Proposed 9% Max. Longitudinal Grade (Any Exceeding Must Meet ADA)</td>
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<td>- Proposed 2% Max. Cross Slope</td>
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<td>- Slope Checked (proposed 0.5% max. without stabilization)</td>
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<td>- In Separate Tracts/Easement</td>
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<td>- Cross Sections (as necessary)</td>
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<tr>
<td><strong>Proposed Residential Overlot Grading</strong></td>
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<tr>
<td>Spot Elevations at Lot Corners</td>
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<tr>
<td>- 2% min. Back to Front of all &quot;A&quot; Lots</td>
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<tr>
<td><strong>Commercial Site Detailed Grading</strong></td>
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<tr>
<td>Parking Lots - All Critical Points (PC's, PT's, PCR's, Angle Pt's, Grade Breaks, HP's, LP's)</td>
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<tr>
<td>Building Corners/Finished Floor Elevation</td>
<td>□</td>
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<tr>
<td>Walks (5% maximum or 8.33% w/landings - 2% cross slopes)</td>
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<tr>
<td>Parking Cross Slope (5% maximum, 1% minimum)</td>
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<tr>
<td>- 2% max ADA access aisles &amp; stalls</td>
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<tr>
<td>Driveway Information (FLPI's &amp; PCR's)</td>
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<tr>
<td>Earthwork Quantity Table</td>
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<td><strong>Detention Ponds</strong></td>
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<tr>
<td>4:1 Max. Slope Below 100 yr. WSE (no retaining walls)</td>
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<tr>
<td>3:1 Max. Slope Above 100 yr WSE</td>
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<tr>
<td>Forebay Shown (Detail in Plans)</td>
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<tr>
<td>Overflow Spillway (per Report)</td>
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<tr>
<td>- Riprap Protection</td>
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<tr>
<td>- Verify Impacts</td>
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<td>- Detailed Grading</td>
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<tr>
<td>Shade 100 yr WSE</td>
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<tr>
<td>Outlet Structure</td>
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<tr>
<td>Trickle Channel (Longitudinal Slope = 0.5%)</td>
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<tr>
<td>- Spot Elevation/Slope (0.5% min.)</td>
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<tr>
<td>Basin Bottom Cross Slope (4% for first 25-feet from trickle channel and 1% - 2% thereafter)</td>
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<tr>
<td>Maintenance Access Provided (10% max. slope)</td>
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<tr>
<td>- 10' wide minimum for straight segments</td>
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<tr>
<td>- 12' wide minimum centerline radius of 80’ or greater</td>
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<tr>
<td>- 14’ wide minimum for centerline radius of 50’-80’ (maximum centerline radius of 50’)</td>
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<tr>
<td>- Below EURV WS, 12” thick layer of 3” to 4” fractured face granite over Class A drainage geotextile</td>
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<tr>
<td>- Above EURV WS, 8” thick layer of 3” to 4” fractured face granite over Class A drainage geotextile</td>
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<tr>
<td>- Access to Forebay (24’ max.)</td>
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<tr>
<td>- Access to Outlet Structure (24’ max.)</td>
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<td>Label Water Quality, EURV, 100 yr. Water Surface Elevations</td>
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<tr>
<td>Micropool @ Outlet Structure</td>
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<td>Basin Shape (2:1 - 3:1 Length - Width Ratio)</td>
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<td>Dam Embankment</td>
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<tr>
<td>- &lt; 10’ Tall</td>
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<tr>
<td>- Spillway Protection</td>
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<tr>
<td>- 4:1 Max Slopes below 100-year WS</td>
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<tr>
<td>- 3:1 Max Slopes above 100-year WS and on downstream side of embankment</td>
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<td>- 10’ Wide Flat Top-width</td>
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<tr>
<td><strong>Channels</strong></td>
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<tr>
<td>Maintenance access path adjacent to channel</td>
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<tr>
<td>Pipe outfall locations shown</td>
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<tr>
<td>100 year water surface elevation shown and labeled</td>
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<tr>
<td>Channel layout table</td>
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<td>Channel stationing provided</td>
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<tr>
<td>Proposed contours with slope callouts</td>
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<tr>
<td>Typical channel cross section</td>
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<tr>
<td>Bend radii at least 2 times the top width</td>
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<tr>
<td>Limits of channel lining delineated on plan (riprap, buried riprap, boulders, etc.)</td>
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<td>Grade control structures shown in correct locations and footprint size</td>
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<tr>
<td><strong>Miscellaneous</strong></td>
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<tr>
<td>Field Verify</td>
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<td>Boundary Line (Existing &amp; Proposed)</td>
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<td>Property Lines, include adjacent filings/lot numbers (Proposed &amp; Existing)</td>
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<td>Right-of-way (Proposed &amp; Existing)</td>
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<td>Easements (Proposed &amp; Existing)</td>
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<td>Existing &amp; Proposed Utilities (Water, Sanitary Sewer, Etc.)</td>
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<td>Inlets (Existing &amp; Proposed)</td>
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<td>- Label Size, &amp; Type (&amp; # if proposed)</td>
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<tr>
<td>- Check Size vs. Drainage Report &amp; Profile</td>
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<td>Drainage Pipes (Existing &amp; Proposed)</td>
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<td>- Label Size, &amp; Type (&amp; # if proposed storm sewer)</td>
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<td>Drainage Manholes (Existing &amp; Proposed)</td>
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<td>- Label Size (&amp; # if proposed storm sewer)</td>
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<td>Existing Landscaping (Trees, etc.)</td>
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<td>Site &amp; Adjacent Infrastructure (Existing &amp; Proposed: Roadways, Parking Lots, Etc.)</td>
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<tr>
<td>- Curb, Flowline, Gutter Lip, Sidewalk, Cross-pans, Medians, Etc.</td>
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<td>Structures (Existing &amp; Proposed: Bldgs., Fences, Retaining Walls, Utility Boxes, Etc.)</td>
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<td>Existing and Proposed 100 Year Floodplain (FHAD)</td>
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<td>Stream Buffer Areas</td>
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<td>Wetlands Limits</td>
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<td>Riparian Conservation Zone</td>
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<td><strong>General Info</strong></td>
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<td>Title Block (Along Right Edge of Each Sheet)</td>
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<tr>
<td>- Project Name (Legal Name: Subdivision, Filing, Block, Lot, etc.)</td>
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<tr>
<td>- Engineer Seal &amp; Signature</td>
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<tr>
<td>- Engineering Company (Name, Address, Phone)</td>
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<td>- Date (Include Revision Dates For Resubmittals Until Mylar)</td>
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<td>- Sheet Description &amp; Number</td>
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<td>North Arrow</td>
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<td>Scale</td>
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<td>Town of Parker Review Block</td>
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<td>Key Map</td>
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<td>Legend of Symbols (To correspond to Town CBMP Notes &amp; Details)</td>
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<td>Grading Contours (Shadowed)</td>
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<td><strong>Channel Protection</strong></td>
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<td>Rock Sock in Swale (RSS)</td>
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<tr>
<td>- Low flow swales and gulches</td>
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<td>Check Dams (CD)</td>
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<tr>
<td>- Medium to high flow swales and gulches</td>
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<td>Grass Lined Swales (Erosion Control Blankets (EBC) or Turf Reinforcement Mats (TRM))</td>
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<td><strong>Drainage Infrastructure Protection</strong></td>
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<tr>
<td>Inlet Protection</td>
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<td>- Curb On-Grade (IPCOG) 10’ up-gradient from type ‘R’ inlets located on grading</td>
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<td>- Curb On-Sump (IPCOS) Type ‘R’ inlets in complete sump conditions</td>
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<td>- Area inlets (IPAN - Not surrounded by pavement, IPAP - in pavement)</td>
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<td>Outlet Structure Protection (OSP)</td>
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<td>- in front of all detention pond outlet structures</td>
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<td>Culvert protection (CP)</td>
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<td>- In Front of All Culverts</td>
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<td>Site Access</td>
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<td>Vehicle Tracking Control Pad (VTC, VTC 180, VTCWW)</td>
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<td>- VTC pad at each site entry point (Or below)</td>
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<tr>
<td>- One VTC pad at the main access point (Jersey barriers closing off all other access points)</td>
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<td>- Curb step (CS) in the gutter in front of all VTC pads.</td>
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<td>Jersey Barriers</td>
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<tr>
<td>- Fully extend across all access points not protected by VTC pad</td>
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<td>- Show &amp; Label</td>
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<tr>
<td>Tubular Traffic Marker (TTM)</td>
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<tr>
<td>- Adjacent to inlet protection on streets/roadways</td>
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<tr>
<td>- Adjacent to curb steps (CS)</td>
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<td>General Erosion Control</td>
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<td>Stabilized Staging Area (SSA)</td>
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<td>- Where vehicles, job trailers, materials, etc., will be kept.</td>
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<td>Debris Control (DC)</td>
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<td>- Multiple impervious areas throughout the site</td>
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<td>Rough Cut Street Control (RCSC) (During street/roadway construction)</td>
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<td>- Where slope and up-gradient topography could cause erosion and sedimentation</td>
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<td>Silt Fence (SF)</td>
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<td>- Around the entire perimeter of project (Including subdivision blocks)</td>
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<tr>
<td>- Connected in all areas</td>
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<tr>
<td>- Placed along property lines and encompasses any areas of off-site disturbance</td>
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<tr>
<td>- Immediately behind all curbs and/or sidewalks in all areas of soil exposure (or SCL)</td>
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<tr>
<td>DESCRIPTION</td>
<td>PROVIDED</td>
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<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>- Immediately behind ADA Ramps and extend for 30’ in both directions</td>
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<td>Sediment Control Logs (SCL)</td>
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<td>- Immediately behind all curbs and/or sidewalks in all areas of soil exposure (or SF)</td>
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<tr>
<td>Lot Protection (LP) (Each residential lot)</td>
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<tr>
<td>Erosion Control Blankets (ECB) (Permanent slopes steeper than 4:1)</td>
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<td>Terracing (T) (On excessive slopes - see Grading Checklist)</td>
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<td>Temporary Slope Drains (TSD)</td>
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<td>Diversion Ditch (DD)</td>
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<tr>
<td>- Convey all surface flows to TSB</td>
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<td>Temporary Sediment Basins (TSB) (For areas of disturbance 5 acres or greater)</td>
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<tr>
<td>- 1 for every 5 acres, or 1 appropriately sized for the entire development</td>
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<tr>
<td>Seeding, Mulching and Crimping (SMC)</td>
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<tr>
<td>- All areas of native seeding</td>
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**In Pervious Areas**

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<td>Concrete Washout Area (CWA) (20’ from all impervious areas)</td>
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<td>Masonry work protection (MWP) (20’ from all impervious areas)</td>
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<td>Portable toilet protection (PTP) (20’ from all impervious areas)</td>
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<td>Stockpile protection (SP) (20’ from all impervious areas)</td>
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<td>Surface roughening (SR) (20’ from all impervious areas)</td>
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<td>North Arrow</td>
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<td>Town of Parker Review Block</td>
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<tr>
<td>Legend of Symbols</td>
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<tr>
<td>Check Drainage Infrastructure Against Drainage Report, Plan, &amp; Profile</td>
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<tr>
<td><strong>Plan View</strong></td>
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<tr>
<td>Town Drainage Notes [May Be Provided on the Cover Sheet]</td>
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<tr>
<td>Easements [Existing and proposed]</td>
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<tr>
<td>Right-of-way [Existing and proposed]</td>
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<td>- Roadway Names</td>
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<tr>
<td>Property Lines [Existing and proposed]</td>
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<tr>
<td>Existing &amp; Proposed Street Infrastructure [X-pans, C&amp;G, Pavement, Sidewalks, Etc.]</td>
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<td>Existing &amp; Proposed Utilities [Water, Sanitary Sewer, Etc.]</td>
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<tr>
<td>Grading [Proposed &amp; Existing]</td>
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<tr>
<td>Verify Drainage Infrastructure w/ Drainage Report[s]</td>
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<td>Inlets</td>
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<td>- Size, Type [and # if Proposed]</td>
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<tr>
<td>- Location [STA &amp; OS and/or Northing &amp; Easting]</td>
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<td>Pipe</td>
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<td>- Size, Type, &amp; Class (and # if proposed)</td>
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<tr>
<td>- Verify Size - Length (Min 18” lateral and main)</td>
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<tr>
<td>- 10’ separation from edge to all utilities &amp; structures</td>
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<tr>
<td>- Under Pavement Where Possible</td>
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<tr>
<td>- Length (≤ 400’ for 18” - 36” pipe, ≤ 500’ for 42” + pipe)</td>
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<td>- End Treatments (Location: Sta./Off. or Northing/Easting)</td>
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<tr>
<td>- Flared End Sections</td>
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<tr>
<td>Manholes (Labeled/Numbered)</td>
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<td>- Size (and # if Proposed)</td>
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<td>- Location (STA/OS or Northing/Easting)</td>
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<tr>
<td>- At All Changes in Direction/Grade of Pipe</td>
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<tr>
<td>Trench Drains and Area Drains - Tie into MH or Inlets (Arterials &amp; Collectors Only)</td>
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<tr>
<td>Check Outfall Grading to Major Conveyance Channel</td>
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<td>Riprap</td>
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<td>- Dimensions</td>
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<td>Detention Ponds (Existing &amp; Proposed)</td>
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<td>- Details</td>
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<td>Outlet Structures (Existing &amp; Proposed)</td>
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<td>- Details</td>
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<td>Roof Drains - Tie into MH or Inlets (Commercial Only)</td>
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<td>Chase Drains (Open Width)</td>
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<td><strong>Profile View</strong></td>
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<td>Existing Ground Labeled</td>
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<td>Proposed Ground Labeled</td>
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<td>Inlets</td>
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<tr>
<td>- Size &amp; Type (and # if proposed), Invert ELEV’s</td>
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<td>Manhole</td>
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<td>- Size, Invert ELEV’s, &amp; Rim ELEV</td>
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<td>- Location (Sta./Off or Northing/Easting)</td>
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<td>DESCRIPTION</td>
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<tr>
<td>- Verify Diameter is OK for Pipe Size</td>
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<tr>
<td>- Under Pavement Where Possible (Not in curb, gutter pans, cross pans, etc.)</td>
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<td>Drainage Pipe (Existing &amp; Proposed)</td>
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<td>- Size, Type, &amp; Class (and # if proposed)</td>
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<td>- Length (≤ 400' for 18&quot; - 36&quot; pipe, ≤ 500' for 42&quot; + pipe)</td>
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<tr>
<td>- Slope (0.5% min., 10% max.)</td>
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<tr>
<td>- Flared End Sections</td>
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<tr>
<td>- Design Flows (Major and minor event)</td>
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<tr>
<td>- Minimum Cover (2')</td>
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<tr>
<td>Hydraulic Grade Lines (HGL's)</td>
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<tr>
<td>- Minor Storm in the Pipe (5 year)</td>
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<tr>
<td>- 100 Year Storm below Ground Level</td>
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<tr>
<td>Show all Major Utility Crossings</td>
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<tr>
<td>- Sanitary Sewer below Storm Sewer (18&quot; min clearance, Encase Sanitary Line if &lt; 18&quot;)</td>
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<tr>
<td>- Sanitary Sewer above Storm Sewer - Encase Sanitary Line 10' Each Side of Crossing</td>
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<tr>
<td>- Waterline (18&quot; min clearance, Encase Water Line if &lt; 12&quot;)</td>
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<tr>
<td>- Large Gas Lines (18&quot; min clearance)</td>
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<tr>
<td>Inlets/Manholes (Numbered/Labeled)</td>
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<tr>
<td>Profile Outfall Channel as Necessary</td>
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<td>Riprap (Size and dimensions)</td>
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<td>Outfalls to Major Drainageways</td>
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<td>- 20 Scale Detail</td>
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<tr>
<td>- Flared End Sections Restraints</td>
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<td>North Arrow</td>
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<td>Town of Parker Review Block</td>
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<td>Key Map</td>
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<tr>
<td>Legend of Symbols</td>
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<tr>
<td>Street Names (w/in &amp; Adjacent to the site)</td>
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<tr>
<td>Survey Line Ties to Section or Quadrant Corners (Consistent w/ Final Plat)</td>
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<td>Plan View</td>
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<tr>
<td>Scale (1:50 Min)</td>
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<td>Town Roadway Notes (May Be Provided on the Cover Sheet)</td>
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<td>Typical Roadway Cross-sections</td>
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<tr>
<td>R-O-W (Per Town Detail), Easements, Property Lines</td>
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<tr>
<td>Roadway Infrastructure (Existing &amp; Proposed)</td>
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<tr>
<td>- Pavement Limits, Sidewalks, C&amp;G (TBC, FL, &amp; Gutter Lip), X-pans, Etc.</td>
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<td>- Bridges, Culverts, Guard Rails</td>
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<td>- FL - FL Width</td>
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<td>- SW Width/Offset</td>
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<td>Drainage Inlets (#, STA, OS, &amp; FL ELEV)</td>
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<td>DESCRIPTION</td>
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<tr>
<td>- Check Size (Match profile &amp; drainage report)</td>
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<tr>
<td>- Verify Sump Depth</td>
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<tr>
<td>Drainage Manholes &amp; Pipe (Screened at 50%)</td>
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<td>Trench Drains (Arterials &amp; Collectors, may need overall plan)</td>
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<td>Centerline Alignment</td>
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<tr>
<td>- Tangent Info (Bearing/Distance)</td>
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<td>- Curve Information (R, L, CB, CD, &amp; Delta)</td>
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<td>- Verify Min Reverse Curve Tangent, Radii, Etc.</td>
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<tr>
<td>Roadway Intersections &amp; Driveways</td>
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<tr>
<td>- Provide CL STA for all Driveways and Roadways (Single Family Residential N/A)</td>
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<tr>
<td>- Intersection Station Equations (w/ Northings &amp; Eastings)</td>
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<tr>
<td>- Verify Approach Tangents</td>
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<td>- Verify Access Separation</td>
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<tr>
<td>- Thru Lanes must Align &amp; Match Configuration Across Intersections (Angle &lt;12 deg. From 90)</td>
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<tr>
<td>- Signal Spacing (Min. 1/2 mile on Arterials &amp; 1/4 mile on Collectors)</td>
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<tr>
<td>CL STA, CL &amp; FL ELEV, OS (as needed), &amp; Crown Cross Slopes @ the Following Point's:</td>
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<td>- PC's, PCC's</td>
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<td>- PT's</td>
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<td>- PCR's</td>
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<td>- FLPI's</td>
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<tr>
<td>- LP's, HP's</td>
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<tr>
<td>- 200' intervals starting at even stationing beyond critical points</td>
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<tr>
<td>Curb Return Radii</td>
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<td>Define Medians</td>
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<td>- Radii</td>
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<td>- Station, Elevation, &amp; Offset</td>
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<td>DESCRIPTION</td>
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<tr>
<td>- Cover Type</td>
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<tr>
<td>Define Roadway &amp; FL Transitions (Applicable STA, ELEV, OS, &amp; Radii)</td>
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<tr>
<td>- A-typical Sections, Parking Pull-Outs, Cui-de-sacs, Knuckles, Turn-arounds, Etc.</td>
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<tr>
<td>- Acceleration/Deceleration Lanes</td>
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<tr>
<td>- Lane Shifts/Redirect Tapers</td>
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<tr>
<td>Acceleration/Deceleration Turn Lanes (Verify length to match traffic reports)</td>
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<tr>
<td>- Storage/Length (per CO State Access Code and approved Traffic Study)</td>
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<tr>
<td>- Cross Sections @ 50' Intervals (Proposed Turn Lanes on Existing Roadways)</td>
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<tr>
<td>Block Length (Residential)</td>
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<tr>
<td>Curb Ramp Locations (CL STA)</td>
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<td>Cross-pans Only @ Downgrades Intersecting a Through Street (Not at Signalized Intersections)</td>
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<td>Minimum 1% FL Grade</td>
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<td><strong>Profile View</strong></td>
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<td>Existing Ground</td>
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<td>Profile Grades</td>
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<tr>
<td>Intersection Approach Grades &amp; Distance</td>
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<td>End Points (STA./Elevation)</td>
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Roadway Intersection Grading Checklist

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## Signing & Striping Plan Checklist

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### General Info

- **Title Block (Along Right Edge of Each Sheet)**
- **Project Name (Legal Name: Subdivision, Filing, Block, Lot, etc.)**
- **Engineering Company (Name, Address, Phone)**
- **Date (Include Revision Dates For Resubmittals Until Mylar)**
- **Sheet Description & Number**
- **Scale (if applicable)**
- **Town of Parker Review Block (Not Req'd on Detail Sheets w/ Only T.O.P. Std. Details)**

### Erosion Control Notes and Details

### Roadway Details (Typical)

- **Typical Town Street Section**
- **Sidewalk**
- **Curb & Gutter**
- **Handicap Ramps**
- **Corner**
- **Midblock**
- **Driveway**
- **Cross Pans**
- **Street Patching**
- **Chase Drains**
- **Trench Drains**
- **Asphalt Connection**
- **Street Signs/Markings (Town & CDOT Details Typ.)**

### Storm Sewer (Typical)

- **Manholes**
- **Inlets**
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<tr>
<td>- 10’ separation from edge to all utilities &amp; structures</td>
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<td>- Under Pavement Where Possible</td>
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<td>Manhole (Size)</td>
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<td>- Verify Diameter is OK for Pipe Size</td>
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<td>- Under Pavement Where Possible (Not in curb, gutter pans, cross pans, etc.)</td>
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<td>Check Sizes vs. Drainage Report, Plan, &amp; Profile</td>
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<td>Outlet Structures</td>
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<tr>
<td>- Under Pavement Where Possible</td>
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<tr>
<td>Trench Drains - Tie into MH or Inlets (Arterials &amp; Collectors Only)</td>
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<tr>
<td>Roof Drains - Tie into MH or Inlets (Commercial Only)</td>
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<td>Chase Drains (Width)</td>
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<td>- Not in Curb, Gutter Pans, Cross pans, Etc. Where Possible</td>
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<td>- 10’ separation from all parallel lines</td>
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<td>Manhole (Size)</td>
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<tr>
<td>- Not in Curb, Gutter Pans, Cross pans, Etc. Where Possible</td>
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<td>Services</td>
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<td>Roof Drains - Tie into MH or Inlets (Commercial Only)</td>
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<td>Patching Limits for all Street Cuts</td>
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<td>- Landscaping Architect Company (Name, Address, Phone)</td>
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<td>- Date (Include Revision Dates For Resubmittals Until Mylar)</td>
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<td>Tree Diameter &amp; Landscaping Shown at Full Maturity</td>
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<td>Landscaping Outside Sight Triangles &amp; Lines of Sight (See Section 4 &amp; Std Details)</td>
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<td>- Provide Distance Labels</td>
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<td>- Tree Canopies (No Lower than 8' Min.), Shrubs &amp; Plantings , Other Not to Impede Visibility</td>
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<td>- Trees Trunks &amp; Structures Outside</td>
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<tr>
<td>- Evergreen Trees Entirely Outside Triangle</td>
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<tr>
<td>- Evaluate Existing Structures and Landscaping</td>
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<td>Sight Line Profiles (As Required)</td>
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<td>Check That Sight Triangle Easements Dedicated on Plat (only when outside of ROW)</td>
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<tr>
<td>Provide Sight Distance Certification</td>
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Appendix B

TIS Standard Checklist
Revised November 2012
Number of Pages: 2
### Required Discussions - To be completed by the Transportation Consultant Engineer:

<table>
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<tr>
<th>REPORT SECTION</th>
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<td>Dated, Checked, Sealed &amp; Signed by P.E.</td>
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<td><strong>INTRODUCTION</strong></td>
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<td>Vicinity Map</td>
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<td>Proposed Project Site Plan</td>
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<td>Proposed Development Phasing</td>
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<td>Roadway Counts &lt; One Year Old</td>
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<td>Trip Generation Summary (Table)</td>
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<td>Internal Trip Reduction Justification (&lt; 10%)</td>
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<td>Pass-by Trip Reduction Justification (&lt; 15%)</td>
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<td>Trip Distribution Assumptions</td>
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<td>Site Trip Distribution (Figure)</td>
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<td>Projected Site Traffic Volumes (Figure) - Each Phase</td>
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<td>Background Growth Method &amp; Assumptions</td>
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<td>Background Traffic Volumes (Figure) - Each Phase</td>
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<td>Total Traffic Volumes (Figure) - Each Phase</td>
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<td><strong>SITE CIRCULATION &amp; DESIGN EVALUATION</strong></td>
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<td>Level of Service Analysis - Each Phase (Figures/Table)</td>
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<td>Queuing Analysis - Vehicle Storage Lengths</td>
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<td>Traffic Signal Warrant Analysis</td>
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<td>Traffic Signal Progression</td>
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<td>Safety Analysis</td>
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<td>Level of Service for Each Intersection Movement (Table)</td>
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<td>Traffic Count Data</td>
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<td>Traffic Analysis Software Output Reports (All Periods)</td>
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<td>Time-space Diagrams</td>
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</table>

"I have reviewed the attached report with this checklist and all required items have been included except as noted above."

Signature of Professional Engineer
Appendix C
ROW Use Permit Checklist
Revised May 2018
Number of Pages: 1
Right-of-Way Use Permit applications are made online via the Town’s eTrakit system. All items listed below should be uploaded to the permit record for review. The Engineering/Public Works Department shall review and comment upon the permit application. Depending on the nature of the work proposed, a pre-construction meeting may be required prior to permit issuance. A permit will not be issued until all of the following items have been submitted and approved.

<table>
<thead>
<tr>
<th>Please submit the following information to the Engineering/Public Works Department:</th>
<th>Completed</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A Traffic Control Plan for all necessary impacts to public roadways, in accordance with MUTCD guidance.</td>
<td></td>
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<tr>
<td>2. A certificate of insurance listing the “Property Owner” or “General Contractor” as the insured. The Town of Parker must be listed as the “Certificate Holder” and “Additionally Insured” and the policy must meet the monetary requirements on the attached page. Please ensure that the policy expiration date is appropriate.</td>
<td></td>
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</tr>
<tr>
<td>3. Construction plans showing the proposed work impacting the right-of-way.</td>
<td></td>
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<tr>
<td>4. Permits from any outside authorities (CDOT, E-470, etc).</td>
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<tr>
<td>5. Concrete and asphalt mix designs (as applicable), in accordance with Town requirements.</td>
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<tr>
<td>6. An Engineer’s Cost Estimate for improvements/restoration within the right-of-way.</td>
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<tr>
<td>7. Work schedule</td>
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NOTE: All restoration within public right-of-way must be completed within five days of completion of work.
Appendix C

Grading Permit Checklist
Revised November 2020
Number of Pages: 1
Grading Permit applications are made online via the Town’s eTrakit system. All items listed below should be uploaded to the permit record for review. The Engineering/Public Works Department shall review and comment upon the permit application within **twenty (20) working days from the date of a complete submission**. If the Department determines that the permit application cannot be reviewed within twenty working days, the applicant shall be notified and they shall mutually agree upon the time for completion of the permit application review. Please note that a pre-construction meeting will not be scheduled until all of the following items have been submitted and approved.

**Please submit the following information to the Public Works Department:**

<table>
<thead>
<tr>
<th>Please submit the following information to the Public Works Department:</th>
<th>Completed</th>
<th>Not Applicable</th>
</tr>
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<tbody>
<tr>
<td>1. A completed Grading/Excavation Permit application (done electronically through eTrakit).</td>
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<tr>
<td>2. A certificate of insurance listing the “Property Owner” or “General Contractor” as the insured. The Town of Parker must be listed as the “Certificate Holder” and “Additionally Insured” and the policy must meet the monetary requirements on the attached page. Please ensure that the policy expiration date is appropriate.</td>
<td></td>
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</tr>
<tr>
<td>3. An electronic file of the approved civil construction plans. Plans shall contain the engineer’s seal and signature and the approval signature of the Town and appropriate water/san district.</td>
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<tr>
<td>4. Submit paper copies of plans as follows, plans shall be copied from the approved Record Set and contain all necessary signatures.</td>
<td>Seven (7) 11” x 17” sets of approved construction plans.</td>
<td></td>
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<tr>
<td>5. Submit Lot addresses with acreage. (Lot Permits only)</td>
<td></td>
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<tr>
<td>6. One (1) electronic copy in PDF format of the final drainage report, signed and stamped by a Colorado State registered professional engineer.</td>
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<tr>
<td>7. A disturbance area plan that clearly shows all areas of proposed soil disturbance. A bolded line must be used to delineate all areas of proposed soil disturbance. The total acreage must be accurately computed and clearly stated. The plan must show all areas of soil disturbance including: areas of proposed grading, off-site areas such as proposed underground infrastructure alignments, vehicle access points, construction easements, etc.</td>
<td></td>
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<tr>
<td>8. Projects which are 40 acres or greater in size will require a Town approved phasing plan.</td>
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<tr>
<td>9. A disclosure statement of borrow or waste sites to be utilized, import and/or export volumes and proposed haul routes within the Town limits.</td>
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<tr>
<td>10. One (1) copy of the State of Colorado Storm Water Discharge Permit for Construction Activities (part of the Colorado Discharge Permit System). This Permit is required for any project containing 1 acre or more of disturbance. For additional information, contact the Colorado Department of Public Health and Environment, Water Quality Control Division at (303) 692-3500 or <a href="http://www.cdphe.state.co.us/wq/permissions/FORMSandApplications/APPLICATIONS/SWCONSTFORM.pdf">http://www.cdphe.state.co.us/wq/permissions/FORMSandApplications/APPLICATIONS/SWCONSTFORM.pdf</a>.</td>
<td></td>
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<tr>
<td>11. Projects located in a drainageway or wetland area will require a 404 permit issued by the U.S. Army Corps of Engineers. Any projects located in a floodplain will require a Town of Parker Floodplain Permit and if applicable, a Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (FEMA).</td>
<td></td>
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<tr>
<td>12. Copy of the maintenance eligibility design approval from Urban Drainage and Flood Control District for all major drainageway projects.</td>
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<tr>
<td>13. Grading Permit base fee (per the Grading Permit attached).</td>
<td></td>
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<tr>
<td>14. Grading and CBMP securities (per the Grading Permit attached). The Town of Parker will only accept a letter of credit (LOC) from a bank or personal check.</td>
<td></td>
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</tr>
<tr>
<td>15. A completed Pre-construction Meeting Agenda form (attached). A preconstruction meeting will be scheduled after all of the above items have been submitted and approved. Please ensure that pages 1, 3 &amp; 4 are completed. (Page 4 must contain original ink signatures).</td>
<td></td>
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<tr>
<td>17. Infrastructure Inspection Fee Calc Sheet completed for Town review.</td>
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<tr>
<td>19. Subdivision Improvement Agreement (SIA) or Development Agreement Security (if applicable).</td>
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Appendix C

Grading Security Release
Revised November 2012
Number of Pages: 1
Grading Security Release

The grading security will be released when the following conditions have been achieved:

(1) Developable property: In order for the grading security to be released, the site must meet items a. through h. or item i. (below).
   a. All soil-disturbing activities associated with the grading permit have permanently ceased.
   b. Uniform perennial vegetation cover has been established with an individual plant density of at least seventy percent (70%) of pre-disturbance levels.
   c. All CBMPs have been properly removed from the site.
   d. If any erosion is present, it is insignificant and is not leaving the site and/or leading into any on-site drainage infrastructure that may convey surface water off site.
   e. Weeds represent no more than fifty percent (50%) of the total vegetation on the site.
   f. No weeds are present from List A of the Colorado Noxious Weed List, as amended.
   g. The site is predominantly free of weeds from List B of the Colorado Noxious Weed List, as amended.
   h. Weeds are evenly distributed throughout the site with no large concentrations present.
   i. A new grading permit and replacement security has been submitted and approved for the applicable site OR assignment as provided by Section 11.10.150 of this Code. It is the property owner’s obligation at the time of closing to ensure that the new site owner has provided the Town with a replacement security.

(2) Nondevelopable property: In order for the grading security to be released, the site must meet items a. through h. and j., or items i. and j. (below).
   a. All soil-disturbing activities associated with the grading permit have permanently ceased.
   b. All CBMPs have been properly removed from the site.
   c. Erosion is negligible, if even present.
   d. The vegetation represents a perennial stand of a dense, uniform surface of grass with no area greater than one (1) square foot that is barren of desirable vegetation. Infrequent, widely scattered areas where native vegetation has not yet taken hold may qualify for acceptance at the discretion of the Town.
   e. Weeds represent no more than ten percent (10%) of the total vegetation on site.
   f. No weeds are present from List A of the Colorado Noxious Weed List, as amended.
   g. The site is predominantly free of weeds from List B of the Colorado Noxious Weed List, as amended.
   h. Weeds are evenly distributed throughout the site with no large concentrations present.
   i. A new grading permit and replacement security has been submitted and approved for the applicable site OR the grading permit has been assigned as provided by Section 11.10.150 of this Code. It is the property owner’s obligation, at the time of closing on the sale of a site that is subject to a grading permit, to ensure that the new property owner has provided the Town with a replacement security.
   j. All known drainage issues associated with the project have been mitigated and a sufficient amount of time has passed to ensure that such issues have been corrected. This requirement does not include those drainage issues originating on residential lots.
PROJECT: ________________________________________  Date: ____________________________________

Invoice Information (Invoices are the responsibility of the Owner/Developer):

Owner/Developer: ____________________________________________  Attn: ________________________________

Address: _______________________________________________________________________________________

Office #: __________________________  Email: ________________________________

CONTACTS:

Owner/Developer: ____________________________________________

Contact: _____________________________________  E-mail: ________________________________

Office #: __________________________  Emergency #: ________________

Engineer: ________________________________________________

Contact: _____________________________________  E-mail: ________________________________

Office #: __________________________  Emergency #: ________________

General Contractor: ________________________________________

Contact: _____________________________________  E-mail: ________________________________

Office #: __________________________  Emergency #: ________________

Alternative Contact: ________________________________________

Office Number: __________________________  Emergency Number: ________________________________

Surveyor: ______________________________________________

Contact: _____________________________________  E-mail: ________________________________

Office #: __________________________  Emergency #: ________________

Testing Firm: ____________________________________________

Contact: _____________________________________  E-mail: ________________________________

Office #: __________________________  Emergency #: ________________
**Traffic Control:**
Supervisor (TCS): __________________________ E-mail: __________________________
Office #: __________________________ Emergency #: __________________________

**Erosion Control:**
Supervisor: __________________________ E-mail: __________________________
Office #: __________________________ Emergency #: __________________________

**Flatwork:**
Contact: __________________________ E-mail: __________________________
Office #: __________________________ Emergency #: __________________________

**Paving:**
Contact: __________________________ E-mail: __________________________
Office #: __________________________ Emergency #: __________________________

**Wet Utilities:**
Contact: __________________________ E-mail: __________________________
Office #: __________________________ Emergency #: __________________________

---

**MISCELLANEOUS SUBCONTRACTOR LIST**

<table>
<thead>
<tr>
<th>Type</th>
<th>Company Name</th>
<th>Contact Name</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

---
MATERIAL SUPPLIERS (Submittals only required upon request):

Pipe: 

Precast Storm Sewer Structures: 

Casting (Rings/Cover): 

Bedding Gravel/Riprap/Boulders: 

TOWN OF PARKER CONTACTS

Michael Waugh - Engineering Inspections Supervisor: (303) 805-3231 (Direct) (303) 434-9260 (Cell)
Kevin Rasmussen – Engineering Inspector: (303) 805-3226 (Direct) (720) 668-0683 (Cell)
Robert Seacat – Stormwater Inspector: (303) 805-3239 (Direct) (303) 434-3778 (Cell)
Tyler Sandt, E.I.T. - Development Review Engineer: (303) 805-3182 (Direct) (720) 708-7162 (Cell)
Michael Walton, E.I.T. - Stormwater Project Engineer: (303) 805-3166 (Direct) (720) 636-5305 (Cell)
Michael Grabczyk, P.E. – Stormwater Project Manager: (303) 805-3209 (Direct) (303) 961-1057 (Cell)
Alex Mestdagh, P.E. – Engineering Services Manager: (303) 805-3204 (Direct) (303) 598-0333 (Cell)

UTILITY CONTACTS

Intermountain REA
Mr. Brooks Kaufman
5496 North US Highway 85
Sedalia, CO 80135
(303) 688-3100

CenturyLink
Mr. William Benson
9750 East Costilla Avenue
Englewood, CO 80112
(720) 578-5142

Comcast Cable
Mr. Butch Buster
6850 South Tucson Way
Englewood, CO 80112
(303) 603-5628

Xcel Energy
1123 West 3rd Avenue
Denver, CO 80223
Builders Call Line
(800) 628-2121

Parker Water & Sanitation District
Mr. Robert Ramsey
18100 E. Woodman Drive
Parker, CO 80138
(303) 841-4627

Cottonwood Water & Sanitation District
Mr. Patrick F. Mulhern/Laurie Tatlock
2 Inverness Drive East, Suite 200
Englewood, CO 80112
(303) 649-9509
SPECIAL CONDITIONS (including other utilities and other construction in progress on site):

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JOB SUBMITTALS

The following items are required and shall be submitted for review, reviewed in the field, and/or field tested for conformance with the Town standards.

Pavement Section Designs-(1 for each Filing) The pavement section to be used must be submitted 15 working days prior to the commencement of paving. A composite pavement section is required for all public roadways and facilities. Submitted section shall be supported by pavement design procedures and soils analysis. (Limits of Swell Mitigation shall extend from back of walk to back of walk where the sidewalk is attached to curb, otherwise from back of curb to back of curb. Curb and gutter will be subject to mitigation procedures and cannot be placed until the pavement section design has been approved. (2 copies) 1 Bound and 1 electronic PDF

In addition, test reports that include roadway embankment and trench backfill testing (including services) shall be submitted for review and approval 10 days prior to paving (1 electronic PDF).

Asphalt Mix Design-(MA3) Job mix formulas must be submitted 15 working days prior to commencement of paving. A submittal is required for every different asphalt grading used on a project. (1 electronic PDF) The Town of Parker requires that the top lift be Grading SX (1/2”) Mix.

Concrete Mix Design-(1 for each Type/Class) A CDOT approved 4500 psi mix design must be submitted 15 working days prior to any concrete work commencing. A submittal is required for every class of concrete used on the job. (1 electronic PDF)

Base Course-(1 for each Filing) A gradation report shall be submitted 15 working days prior to placement of material. Gradations shall conform to specifications for CDOT Class 6. (1 electronic PDF)

Lime/Cement Mix Design-(1 for each Filing) Job mix formula must be submitted 5 working days prior to commencement of mixing soil and lime/cement. A submittal is required for every different mix design used on a project. (2 copies- 1 bound and 1 electronic PDF)
**Testing Report** (1 for each Filing) A testing report shall be compiled and presented in bound and electronic format to the Town at the completion of construction. The testing report shall include test numbers corresponding to locations shown on the approved plan and profile sheets. Probationary warranty period will not begin until the testing report is approved. (2 copies- 1 bound and 1 electronic PDF)

**Construction and Grading Permits**

It is the responsibility of the contractor to have all necessary federal, state and local permits prior to construction startup. Town permits are required for grading and street cuts.

The following Town permits are required for this project:

<table>
<thead>
<tr>
<th>Permit</th>
<th>Yes</th>
<th>No</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grading Permit</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ROW Use Permit</td>
<td></td>
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<tr>
<td>Access Permit</td>
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<tr>
<td>Floodplain Permit</td>
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<td></td>
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</tr>
</tbody>
</table>

**Method of Handling Traffic Plans (MHT’s)**

All MHT’s shall follow current MUTCD standards and shall be submitted to the Town for review. Written approval from the Town is required prior to implementing the plan. The MHT shall be updated if changes are necessary. The contractor is responsible to coordinate and receive approval from the Town of Parker Police and the Parker Fire District for all MHT’s if a roadway is to be closed for any length of time. The Town does not typically allow full roadway closures.

**Construction Schedule**

A construction schedule must be submitted to the Town prior to the commencement of construction. The schedule shall include the following: mobilization, over-lot grading, utility installation, storm sewer installation, subgrade preparation, curb and gutter installation, and pavement placement. The schedule shall be updated monthly and delivered to the assigned Development Review Engineer (DRE).

**Notice of Construction Startup and Work Hours**

The Town of Parker must be notified in writing 72 hours prior to the commencement of construction. Permitted work hours within the Town are as follows:

- Monday through Friday – 7:00 a.m. to 7:00 p.m.
- Saturday – 8:00 a.m. to 7:00 p.m.
- Sunday – 10:00 a.m. to 7:00 p.m.

Deliveries and other site activity that produces noise should be restricted to these hours as well. Town staff is available to perform inspections during normal business hours – (Monday through Friday, 8:00 a.m. to 5:00 p.m.). Violations are subject to fines and/or penalties per Town code.
Public Coordination

The Contractor is required to notify affected properties and meet with the existing HOA and interested neighbors. A letter documenting date and items discussed must be sent to the Town. Discussions with the HOA should include information regarding work schedule and local impacts. Impacts including dust, noise, and landscaping should be discussed and mitigation plans discussed. Preservation, removal, and replacement of any trees or significant stands of vegetation should be discussed. Notify the Planning Department of the start date for any landscaping removal.

Construction Observation/Inspections

Construction observation will be performed by the Designated Town Authority (DTA) or a Town representative on a periodic basis. The DTA has the right to access on the site at any time during construction. The DTA also has the right to see the signed and approved plan set. The developer shall have a copy of the approved construction plans, the Roadway Design and Construction Criteria Manual (RDCCM) and the Storm Drainage and Environmental Criteria Manual (SDECM) on site at all times.

The DTA will be onsite as necessary to check the progress of the construction and to assure compliance with the approved plans and construction standards. Should the contractor need the DTA at the job site a specific time for storm sewer backfill, rebar inspections, or proof-rolls, etc., they must schedule that inspection with the DTA at least 24 hours (1 business day) in advance.

The contractor is reminded that he is responsible for inspecting his own materials, workmanship, safety, and finished work and that no statement nor any act on the part of the DTA can relieve the contractor of any part of that responsibility.

Safety, including the requirements of OSHA with respect to protection of the faces of excavation, personal safety equipment, and the safety of the public shall be the responsibility of the Developer/Contractor.

Drainage Facilities/Storm Sewer

The contractor is required to notify the DTA at least 24 hours (1 business day) prior to the installation of storm sewer and drainage structures to ensure proper trench width, bedding, and backfill. The DTA must also be contacted to inspect reinforcing steel prior to the pouring of concrete for all drainage structures. Boulder placement must be inspected by the DTA prior to the pouring of grout for all sloping grouted Boulder Drop Structures. 5. A T.V. (televise) digital/electronic inspection record of all storm pipes 42” in diameter and smaller shall be provided to the Town prior to scheduling of probationary acceptance inspections. All storm pipes shall be cleaned prior to the T.V. inspection to provide a clear and concise inspection record of the condition of the pipe.

See Section 9 of the RDCCM and the Minimum Inspections list for additional information.

Manhole and Valve Box Inspection:

An inspection will be required prior to the final lift of pavement which verifies the conditions of valve boxes, manholes, and other aboveground appurtenances. The contractor will be responsible for contacting the Town of Parker Stormwater Engineer and/or water and sewer observer from the water and sanitation district who will inspect the facilities and provide a punch list of any deficiencies, which must be repaired prior to the construction of the final pavement lift. Manholes and valve boxes shall be adjusted to within ¼” to ⅛” below final pavement surface.

Testing

Construction and materials testing shall be performed in accordance with Section 9 of the RDCCM.
Project Approvals

Refer to the various approval checklists below and in Appendix B of the RDCCM for additional general approval information. It is the responsibility of the contractor and owner/developer to understand the requirements for construction approvals and to initiate the acceptance process with Engineering Staff well in advance of the desired date of acceptance or C/O. The time necessary to complete the acceptance process varies by project and due to the quality and completeness of the work, but a minimum of several weeks should be assumed.

Probationary Acceptance Checklist

1. Developer shall verify completion of all improvements shown on plans and listed in the specific conditions in the Subdivision Improvement Agreement.
2. Developer shall provide a written request for a probationary walk-through to the Town’s inspector.
3. Developer shall ensure all infrastructure is clean and accessible.
4. The inspector will schedule a walk-through to develop a punchlist of all defective or incomplete items.
   - Developer shall arrange for a water truck to be on site during the walk-through.
5. The inspector will provide a written punch list of all defective items to be corrected.
6. The developer shall repair all defective items and contact the inspector to schedule a punchlist follow-up inspection.
7. The inspector will arrange for new streets to be cored to verify correct pavement depth and density.
8. Developer shall provide the “as-constructed” drawings, in electronic format with surveyor signature in accordance with the Town of Parker Roadway Design and Construction Criteria Manual. The as-builts shall include detention basin volume certification and state reporting form per the Town of Parker Storm Drainage and Environmental Criteria Manual.
9. Developer shall provide stamped construction materials testing reports in accordance with the Town of Parker Roadway Design and Construction Criteria Manual. Testing reports shall include: subgrade compaction testing, concrete, asphalt and any other materials testing performed during the construction of public infrastructure. The testing report shall include test numbers corresponding to locations shown on the approved plan and profile sheets. (Two (2) copies).
10. The Director of Public Works and Engineering will provide written notice of the probationary acceptance of public improvements. The probationary acceptance period shall begin on the date of the written notice to the developer from the Public Works Department.
11. Developer shall provide security in the amount of 20% of the cost of infrastructure improvements for the project. The security shall remain in place until final acceptance is granted by the Town. Final acceptance cannot be granted until the 2-year warranty period has expired.
12. Verify all Subdivision Improvement Agreement (SIA – Paragraph 4) conditions have been met.
Final Acceptance Checklist

1. Developer shall provide a written request for a final walk-through to the Town after the 2-year warranty period has elapsed.

2. Developer shall ensure all infrastructure is clean and accessible.

3. The Town will schedule a walk-through to develop a punch list of all defective items.
   - Developer shall arrange for a water truck to be on site during the walk-through.

4. The Town will provide a written punch list of all defective items to be corrected.

5. The Town may request that the detention basin volume be re-certified and/or cleaned if it is apparent that sedimentation has occurred.

6. The Developer shall repair and/or replace all items which are damaged and/or failing due to faulty materials or poor workmanship as required by the Town. All repairs shall be completed to the satisfaction of the Town.

7. The Developer shall contact the Town to schedule a punch list follow-up inspection(s).

8. The Director of Public Works will provide written notice of final acceptance of the public improvements.

9. The Town will release all remaining security for the accepted public improvements.

10. Neither final approval by the Town, nor any provision in these standards, shall relieve the developer of the responsibility for the negligent use of faulty materials, negligent workmanship, or negligent design.

11. A Right of Way Use Permit shall be submitted for review approval for all punch list work.
Certificate of Occupancy Checklist

1. Developer shall verify completion of all improvements shown on plans and specific conditions listed in a Subdivision Improvement Agreement or Developers Agreement.

2. Developer shall provide a written request for a walk-through to the Town’s inspector.

3. Developer arranges for all infrastructure to be clean and accessible.

4. The inspector will schedule a walk-through to develop a punch list of all defective items.
   - Developer shall arrange for a water truck to be on site during the walk-through.

5. The inspector will provide a written punch list of all defective items to be corrected.

6. The developer shall repair all defective items.

7. The Developer shall contact the inspector to schedule a punch list follow-up inspection(s).

8. Developer shall provide the “as-constructed” drawings, in paper and electronic format with surveyor signature in accordance to the Town of Parker Design and Construction Criteria Manual. The as-builts shall include detention basin volume certification per the Town of Parker Storm Drainage and Environmental Criteria Manual.

9. Developer shall provide stamped construction materials testing reports in accordance with the Town of Parker Roadway Design and Construction Criteria Manual. Testing reports shall include: compaction testing, concrete, asphalt and any other materials tested during the construction of public infrastructure. The testing report shall include test numbers corresponding to locations shown on the approved plan and profile sheets. (Two (2) copies).

10. The inspector will electronically approve the inspection record to allow for the issuance of a Certificate of Occupancy. A Certificate of Occupancy will not be issued if probationary acceptance has not been granted for associated public improvements. See Probationary Acceptance Checklist.

*A walkthrough shall be scheduled a minimum of ten (10) working days prior to date that a Certificate of Occupancy is desired. The advance notice is necessary for inspections and potential repairs.
Grading Security Release

The grading security will be released when the following conditions have been achieved:

(1) Developable property: In order for the grading security to be released, the site must meet Subparagraphs a. through h. or Subparagraph i. below.

   a. All soil-disturbing activities associated with the grading permit have permanently ceased.
   b. Uniform perennial vegetation cover has been established with an individual plant density of at least seventy percent (70%) of pre-disturbance levels.
   c. All CBMPs have been properly removed from the site.
   d. If any erosion is present, it is insignificant and is not leaving the site and/or leading into any on-site drainage infrastructure that may convey surface water off site.
   e. Weeds represent no more than fifty percent (50%) of the total vegetation on the site.
   f. No weeds are present from List A of the Colorado Noxious Weed List, as amended.
   g. The site is predominantly free of weeds from List B of the Colorado Noxious Weed List, as amended.
   h. Weeds are evenly distributed throughout the site with no large concentrations present.
   i. A new grading permit and replacement security has been submitted and approved for the applicable site or assignment as provided by Section 11.10.150 of this Code. It is the property owner's obligation at the time of closing to ensure that the new site owner has provided the Town with a replacement security.

(2) Nondevelopable property: In order for the grading security to be released, the site must meet Subparagraphs a through h and j, or Subparagraphs i and j below.

   a. All soil-disturbing activities associated with the grading permit have permanently ceased.
   b. All CBMPs have been properly removed from the site.
   c. Erosion is negligible, if even present.
   d. The vegetation represents a perennial stand of a dense, uniform surface of grass with no area greater than one (1) square foot that is barren of desirable vegetation. Infrequent, widely scattered areas where native vegetation has not yet taken hold may qualify for acceptance at the discretion of the Town.
   e. Weeds represent no more than ten percent (10%) of the total vegetation on site.
   f. No weeds are present from List A of the Colorado Noxious Weed List, as amended.
   g. The site is predominantly free of weeds from List B of the Colorado Noxious Weed List, as amended.
   h. Weeds are evenly distributed throughout the site with no large concentrations present.
   i. A new grading permit and replacement security has been submitted and approved for the applicable site or the grading permit has been assigned as provided by Section 11.10.150 of this Code. It is the property owner's obligation, at the time of closing on the sale of a site that is subject to a grading permit, to ensure that the new property owner has provided the Town with a replacement security.
j. All known drainage issues associated with the project have been mitigated and a sufficient amount of time has passed to ensure that such issues have been corrected. This requirement does not include those drainage issues originating on residential lots.
Anticipated Construction Completion Date: 

I represent the Developer and/or General Contractor shown above and I agree to meet all of the Town’s design and construction standards and ordinances. I have received, read and agree to meet the testing frequencies for construction, and the applicable acceptance or certificate of occupancy checklists.

Owner/Developer:

________________________________________
Company Name

________________________________________
Representative/Title (Print)

________________________________________
(Signature)

and

General Contractor:

________________________________________
Company Name

________________________________________
Representative/Title (Print)

________________________________________
(Signature)
Appendix C

Minimum Inspections & Typical Minimum Testing Requirements
Revised November 2012
Number of Pages: 2
Minimum Inspections

General Note: All inspections require 24 hour (1 business day) advanced notice to the Town of Parker. Inspections will be performed Monday-Friday, 8 AM-5 PM.

<table>
<thead>
<tr>
<th>Spec#</th>
<th>Item</th>
<th>Inspection required</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>203</td>
<td>Potholing</td>
<td>Pavement restoration</td>
<td>Daily</td>
</tr>
<tr>
<td>203</td>
<td>Proofrolling (Subgrade)</td>
<td>All subgrades within ROW, prior to placing any base layer or pavement layer.</td>
<td>All subgrade</td>
</tr>
<tr>
<td>206</td>
<td>Structural Backfill (structures)</td>
<td>Subgrade, tie holes patched</td>
<td>Prior to backfill</td>
</tr>
<tr>
<td>206</td>
<td>Structural Backfill (pipe)</td>
<td>Trench subgrade, bedding</td>
<td>Prior to backfill</td>
</tr>
<tr>
<td>208</td>
<td>Erosion Control</td>
<td>Initial BMP installation, 2 week inspection, after each weather event</td>
<td>Per Town Criteria</td>
</tr>
<tr>
<td>210</td>
<td>Reset Structures</td>
<td>Manhole and valve adjustment</td>
<td>Each Structure</td>
</tr>
<tr>
<td>304</td>
<td>Aggregate Base Course</td>
<td>Proofrolling</td>
<td>Prior to form placement or paving</td>
</tr>
<tr>
<td>307</td>
<td>Treated Subgrade or Base</td>
<td>Proofrolling</td>
<td>Each day</td>
</tr>
<tr>
<td>401, 403</td>
<td>Hot Mix Asphalt</td>
<td>Proofroll, temperatures, placement</td>
<td>Each day</td>
</tr>
<tr>
<td>401, 403</td>
<td>Asphalt Patching</td>
<td>Patch preparation, temperature, placement</td>
<td>Each day</td>
</tr>
<tr>
<td>407</td>
<td>Tack Coat</td>
<td>Surface conditions, rate of application</td>
<td>Each day</td>
</tr>
<tr>
<td>408</td>
<td>Joint and Crack Sealant</td>
<td>Joint or crack condition, temperature, placement</td>
<td>Each day</td>
</tr>
<tr>
<td>412</td>
<td>Concrete Pavement (Pre-pour)</td>
<td>Proofroll, grade checks, weather protection</td>
<td>Prior to form placement or paving</td>
</tr>
<tr>
<td>412</td>
<td>Concrete Pavement</td>
<td>Temperature, dowel basket and tie bar placement, forms, concrete placement, flow test</td>
<td>Each day</td>
</tr>
<tr>
<td>412</td>
<td>Concrete Pavement (Panel Replacement or patching)</td>
<td>Temperature, dowel basket and tie bar placement, concrete placement</td>
<td>Each day</td>
</tr>
<tr>
<td>503</td>
<td>Drilled Caissons</td>
<td>Condition of hole, rebar and anchor bolt placement, concrete placement</td>
<td>Each caisson</td>
</tr>
<tr>
<td>603</td>
<td>Culverts and Sewers</td>
<td>Pipe, gaskets or mechanical connections, line and grade, bedding</td>
<td>Each day</td>
</tr>
<tr>
<td>604</td>
<td>Manholes, Inlets and Vaults</td>
<td>Foundation soils, forms, rebar, concrete placement</td>
<td>Each structure</td>
</tr>
<tr>
<td>608</td>
<td>Sidewalks and Bikeways</td>
<td>Proofroll, forms, grades, concrete placement</td>
<td>Each day</td>
</tr>
<tr>
<td>608</td>
<td>Curb Ramps</td>
<td>Forms, grades, concrete placement, flow test</td>
<td>Each day</td>
</tr>
<tr>
<td>609</td>
<td>Curb and Gutter</td>
<td>Proofroll, forms, grades, concrete placement, flow test</td>
<td>Each day</td>
</tr>
<tr>
<td>609</td>
<td>Concrete Crossspan</td>
<td>Proofroll, forms, rebar, grades, concrete placement, flow test</td>
<td>Each day</td>
</tr>
<tr>
<td>610</td>
<td>Median Cover Material</td>
<td>Subgrade, expansion board, concrete placement</td>
<td>Each day</td>
</tr>
<tr>
<td>612</td>
<td>Delineators/Reflectors</td>
<td>Placement</td>
<td>Each day</td>
</tr>
<tr>
<td>614</td>
<td>Traffic Sign Installation</td>
<td>Placement</td>
<td>Each day</td>
</tr>
<tr>
<td>627</td>
<td>Pavement Markings</td>
<td>Temperature, layout, placement</td>
<td>Each day</td>
</tr>
<tr>
<td>630</td>
<td>Construction Zone Traffic Control</td>
<td>Initial installation and daily, as required</td>
<td>Each MHT</td>
</tr>
</tbody>
</table>
## Typical Minimum Testing Requirements

**General Note:** All items above are generalizations; please reference Town of Parker Roadway Design and Construction Criteria Manual, the Colorado Department of Transportation (CDOT) Specifications and the CDOT Field Materials Manual for additional information. Testing frequencies may be adjusted by the Town based on site conditions.

<table>
<thead>
<tr>
<th>SPEC #</th>
<th>ITEM</th>
<th>TYPE OF TEST</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>203</td>
<td>Roadway (Subgrade)</td>
<td>Moisture/Density</td>
<td>1 per 500 LF every 1' of fill, each lane</td>
</tr>
<tr>
<td>203</td>
<td>Roadway (Subgrade)</td>
<td>Proof Roll</td>
<td>All subgrade</td>
</tr>
<tr>
<td>203</td>
<td>Utilities; gas electric, phone &amp; cable TV trenches</td>
<td>Moisture/Density</td>
<td>1 per 250 LF every 1' of backfill &amp; each 1' lift within 1' of all structures</td>
</tr>
<tr>
<td>301</td>
<td>Roadway (Base Course)</td>
<td>Gradation &amp; Atterberg Limits</td>
<td>1 per 1,000 tons</td>
</tr>
<tr>
<td>304</td>
<td>Roadway (Base Course)</td>
<td>Moisture/Density</td>
<td>1 per 500 LF each lane and 1 per each 1' lift within 1' of all structures</td>
</tr>
<tr>
<td>304, 203</td>
<td>Roadway (Base Course)</td>
<td>Proof Roll</td>
<td>All subgrade, each day</td>
</tr>
<tr>
<td>401</td>
<td>Roadway (Asphalt)</td>
<td>Asphalt Cement Content, Gradation, Max Theoretical</td>
<td>1 per 1,000 tons, minimum 1 per day</td>
</tr>
<tr>
<td>401</td>
<td>Roadway (Asphalt) (Full Time Tester Required)</td>
<td>Density</td>
<td>1 per 500 LF each lane, all lifts</td>
</tr>
<tr>
<td>401, 412</td>
<td>Roadway (Asphalt &amp; Concrete)</td>
<td>Cores (Density &amp; Thickness Verification)</td>
<td>1 per 500 LF each lane</td>
</tr>
<tr>
<td>412</td>
<td>Roadway (Concrete) (Full Time Tester Required)</td>
<td>Slump, Air, Cylinders</td>
<td>First 3 batches. If passing, every 100 CY thereafter. One (1) set cylinders cast for every 100 CY.</td>
</tr>
<tr>
<td>603</td>
<td>Sanitary Sewer/Sanitary Service</td>
<td>Moisture/Density</td>
<td>1 per 200 LF for every 1' lift of backfill &amp; each 1' lift within 1' of all structures. Each 1' lift every service and all isolated runs.</td>
</tr>
<tr>
<td>603</td>
<td>Storm Sewer</td>
<td>Moisture/Density</td>
<td>1 per 200 LF every 1' lift of backfill &amp; each 1' lift within 1' of all structures.</td>
</tr>
<tr>
<td>604</td>
<td>Inlets and Manholes (Concrete)</td>
<td>Slump, Air, Cylinders</td>
<td>1 per day</td>
</tr>
<tr>
<td>604, 206</td>
<td>Inlets and Manhole</td>
<td>Moisture/Density</td>
<td>Each 1' of backfill lift around structure</td>
</tr>
<tr>
<td>608</td>
<td>Sidewalk, Curb &amp; Gutter</td>
<td>Slump, Air, Cylinders</td>
<td><strong>Machine</strong> - First 3 trucks. If passing, then 1 per 100 CY yds. <strong>Hand</strong> - 2 trucks day. If passing, then 1 per 50 CY yds.</td>
</tr>
<tr>
<td>608, 203</td>
<td>Sidewalk, Curb &amp; Gutter</td>
<td>Moisture/Density</td>
<td>1 per 250 LF every 6&quot; of fill</td>
</tr>
<tr>
<td>608, 203</td>
<td>Sidewalk, Curb &amp; Gutter</td>
<td>Proof Roll</td>
<td>All subgrade</td>
</tr>
<tr>
<td>619</td>
<td>Water Main/Water Service</td>
<td>Moisture/Density</td>
<td>1 per 250 LF every 1' of backfill &amp; each lift within 1' of all structures. Each service trench every 1' of backfill. 80% of tests under pavement.</td>
</tr>
</tbody>
</table>
Appendix C

Probationary Acceptance Checklist
Revised May 2018
Number of Pages: 1
### Probationary Acceptance Checklist

<table>
<thead>
<tr>
<th></th>
<th>Completed</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Developer shall verify completion of all improvements shown on plans and listed in the specific conditions in the Subdivision Improvement Agreement.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Developer shall provide a written request for a probationary walk-through to the Designated Town Authority (DTA).</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Developer shall ensure all infrastructure is clean and accessible.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>The DTA will schedule a walk-through to develop a punchlist of all defective or incomplete items.</td>
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<tr>
<td>5.</td>
<td>Developer shall arrange for a water truck to be on site during the walk-through.</td>
<td></td>
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<tr>
<td>6.</td>
<td>The DTA will provide a written punch list of all defective items to be corrected.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>The developer shall repair all defective items and contact the DTA to schedule a punchlist follow-up inspection.</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>The DTA will arrange for new streets to be cored to verify correct pavement depth and density.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Developer shall provide the “as-constructed” drawings, in paper and electronic format with surveyor signature in accordance to the Town of Parker Design and Construction Criteria Manual. The as-builds shall include detention basin volume certification, pond compliance design data workbook, and a video inspection of all storm sewer infrastructure in accordance with the Town of Parker Roadway criteria.</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Developer shall provide stamped construction materials testing reports in accordance with the Town of Parker Roadway Design and Construction Criteria Manual. Testing reports shall include: subgrade compaction testing, concrete, asphalt and any other materials testing performed during the construction of public infrastructure. (Two (2) copies).</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>The Director of Public Works will provide written notice of the probationary acceptance of public improvements. The probationary acceptance period shall begin on the date of the written notice to the developer from the Public Works Department.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Developer shall provide security in the amount of 20% of the cost of infrastructure improvements for the project. The security shall remain in place until final acceptance is granted by the Town. Final acceptance cannot be granted until the 2-year warranty period has expired.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix C

Pond Volume Certification
Revised August 2014
Number of Pages: 1
# Certification Form for Detention/Water Quality Basin

**Project Name:**

**Project Description:**

**Date:**

---

**THIS DOCUMENT MUST BE PREPARED, SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Design</th>
<th>As-Constructed</th>
<th>Notes/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>EURV Volume (Including WQCV)</td>
<td>acre-ft</td>
<td>acre-ft</td>
<td></td>
</tr>
<tr>
<td>EURV Water Surface Elevation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-Year Volume</td>
<td>acre-ft</td>
<td>acre-ft</td>
<td></td>
</tr>
<tr>
<td>100-Year Water Surface Elevation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EURV Weir Elevation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottom Width of EURV Weir</td>
<td>ft</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Water Quality Plate Configuration (Rows/Quantity/Size)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowest Water Quality Hole Elevation</td>
<td></td>
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<tr>
<td>Invert Elevation of Outlet Structure Outlet Pipe</td>
<td></td>
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<tr>
<td>Outlet Pipe Orifice Size (Diameter for circular orifice and height from pipe invert for plate orifice)</td>
<td>in</td>
<td>in</td>
<td></td>
</tr>
<tr>
<td>Emergency Spillway Crest Elevation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Spillway Crest Length</td>
<td>ft</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Emergency Spillway Crest Depth</td>
<td>ft</td>
<td>ft</td>
<td></td>
</tr>
<tr>
<td>Emergency Spillway Capacity (With 1 foot min freeboard)</td>
<td>cfs</td>
<td>cfs</td>
<td></td>
</tr>
</tbody>
</table>

---

**Printed Name**

**P.E. #**

**Signature**
Appendix C

Certificate of Occupancy Checklist
Revised May 2018
Number of Pages: 1
<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Completed</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Developer shall verify completion of all improvements shown on plans and specific conditions listed in a Subdivision Improvement Agreement or Developers Agreement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Developer shall provide a written request for a walk-through to the Designated Town Authority (DTA) a minimum of two weeks prior to desired date of C/O.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Developer arranges for all infrastructure to be clean and accessible. Failure to do so may require a re-inspection at a later date.</td>
<td></td>
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</tr>
<tr>
<td>4.</td>
<td>The DTA will schedule a walk-through to develop a punchlist of all defective items.</td>
<td></td>
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<tr>
<td>5.</td>
<td>Developer shall arrange for a water truck to be on site during the walk-through.</td>
<td></td>
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<tr>
<td>6.</td>
<td>The DTA will provide a written punch list of all defective items to be corrected.</td>
<td></td>
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<tr>
<td>7.</td>
<td>The developer shall repair all defective items.</td>
<td></td>
<td></td>
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<tr>
<td>8.</td>
<td>The Developer shall contact the DTA to schedule a punchlist follow-up inspection(s).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Developer shall provide the As-Built construction drawings and all associated certifications, in electronic format with surveyor and engineer signatures in accordance to the Town of Parker Design and Construction Criteria Manual. The as-builts shall include detention basin volume certification, pond compliance design data workbook, and a video inspection of all storm sewer infrastructure in accordance with the Town of Parker Roadway criteria.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Developer shall provide electronic versions of stamped construction materials testing reports in accordance with the Town of Parker Roadway Design and Construction Criteria Manual and the project’s Quality Control Plan (if applicable). Testing reports shall include: compaction testing, concrete, asphalt and any other materials tested during the construction of public infrastructure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>DTA will sign building permit to allow for the issuance of a Certificate of Occupancy. A Certificate of Occupancy will not be issued if probationary acceptance has not been granted for associated public improvements. See Probationary Acceptance Checklist.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A walkthrough shall be scheduled a minimum of two weeks prior to date that a Certificate of Occupancy is desired. The advance notice is necessary for inspections and potential repairs.
Appendix C

Final Acceptance Checklist
Revised November 2012
Number of Pages: 1
1. Developer shall provide a written request for a final walk-through to the Designated Town Authority (DTA) after the 2-year warranty period has elapsed.

2. Developer shall ensure all infrastructure is clean and accessible.

3. The DTA will schedule a walk-through to develop a punchlist of all defective items.

4. Developer shall arrange for a water truck to be on site during the walk-through.

5. The DTA will provide a written punch list of all defective items to be corrected.

6. The Town may request that the detention basin volume be re-certified and/or cleaned if it is apparent that sedimentation has occurred.

7. The Developer shall repair and/or replace all items which are failing due to faulty materials or poor workmanship as required by the DTA. All repairs shall be completed to the satisfaction of the Town.

8. The Developer shall contact the DTA to schedule a punchlist follow-up inspection(s).

9. The Director of Public Works will provide written notice of final acceptance of the public improvements.

10. The Town will release all remaining security for the accepted public improvements.

11. Neither final approval by the Town, nor any provision in these standards, shall relieve the developer of the responsibility for the negligent use of faulty materials, negligent workmanship, or negligent design.
Appendix C

Affidavit of Compliance
Revised November 2012
Number of Pages: 1
DATE: ____________________________________________

DEVELOPER: ______________________________________

PROJECT: ________________________________________

I, ____________________, certify that the public improvements constructed within the ______(subdivision) have been completed in accordance with the Town of Parker standards. I, ____________________, am responsible for the negligent use of faulty materials or negligent workmanship concerning the public improvements described herein that are discovered after the warranty period, but before the expiration of the applicable statute of limitations under state law.

________________________________________
(Print and sign your name)

________________________________________

Title
Appendix C

Asphalt Pavement Pre-Paving Meeting Application
Revised November 2012
Number of Pages: 5
Asphalt Pavement Pre-Paving Meeting Application

Project Name:
Project No.: 

Date: ____________________________

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Email</th>
<th>Phone / Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>P:</td>
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<td>F:</td>
</tr>
</tbody>
</table>
I. PROJECT ORGANIZATION AND STATUS

A. Testing Information:

1. Is (Are) the mix design(s) approved by the Owner/Agency? (CDOT Form 43)

2. Test locations determined by?

3. Frequency of tests to be performed? Refer to table 106-1 of CDOT section 106.05 of the Standard Specifications for minimum sampling and testing for asphalt pavement.

No change shall be made in the ingredients comprising the approved mix design without prior written approval of the town. This includes asphalt binder suppliers.

II. SCHEDULING

A. Materials:
Materials will be available for sampling on:

B. Asphalt Plant:

- What is the location of the primary plant to be used?
- What is the backup plan if the designated plant breaks down? (Mix design)
- Type of release agent to be used?

C. Paving Sequence:

1. The Contractor will commence paving on:

2. How many days per week does the Contractor intend to work?

3. Town of Parker work hours are 7:00 am – 7:00 pm, Monday through Friday. Work outside of these times requires prior approval in writing.

4. The Contractor proposes to work the following hours:

5. Where will paving start?

6. What paving sequence will the Contractor follow?

D. Quality Control Plan. A quality control plan shall provide information to control the quality of the following:

1. Segregation:
   - Submitted: Date Submitted
   - Approved: Date Approved

2. Longitudinal Joint Construction:
   - Submitted: Date Submitted
   - Approved: Date Approved
### II. SCHEDULING (Continued)

3. Transverse Joint Construction:
   - Submitted: [ ] Date Submitted
   - Approved: [ ] Date Approved

4. Legal Weight Limits:
   All hauling vehicles shall comply with legal weight limits. Comments:

### III. PREPARATION

#### A. Method of Approving Pavement Surface? (IE: Soil Subgrade, ABC, Milled Surface, ETC.)

Ready for inspection on what date?

**Proofroll:**

**Stringline:**

**Cleanliness:**

Comments:

#### B. Temperature Requirements:

Per CDOT Section 401.07 “Weather Limitations”

#### C. Tack Coat:

1. Material type
2. Application Rate?
3. How will the Contractor protect the tacked surface after placement, and prior to the placement of the asphalt pavement?

Comment: The Town will verify all surfaces to accept a new layer of asphalt pavement will have the proper amount and coverage of tack placed.
### IV. TRAFFIC CONTROL

**A. Method of Handling Traffic:**

Has the Method of Handling Traffic been submitted for the Asphalt Pavement placement operation? If not, when will it be submitted?


### V. Special Provision Requirements

*The following Special Provisions for Concrete Pavement are reviewed and discussed below:*

**A. Special Provision:**

Comments:

---

**B. Special Provision:**

Comments:
VI. Follow Up Items

Items discussed during the meeting, which will need follow up:

<table>
<thead>
<tr>
<th>Items for follow up</th>
<th>Who will follow up</th>
<th>Date of completion or response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
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<td>2.</td>
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<td>3.</td>
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<td>10.</td>
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</table>
Appendix C

Concrete Pavement Pre-Paving Meeting Application
Revised November 2012
Number of Pages: 9
Concrete Pavement Pre-Paving Meeting Application

Project Name: ____________________________

Project No.: ____________________________

Date: ____________________________

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Email</th>
<th>Phone / Fax</th>
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</table>
# CONCRETE PAVEMENT PRE-PAVING MEETING APPLICATION

## I. Pre-Paving Requirements and Inspections

The Contractor is hereby notified that no concrete pavement shall be placed prior to the review, inspection, and approval of the following items:

### A. Concrete Mix Design:

Mix pre-approved by CDOT:

Comments:

### B. Subgrade:

Subgrade should be inspected and approved in accordance with the requirements of CDOT subsection 412.08 of the *Standard Specifications*. Comments:

### C. Jointing Plan:

What method will be used for placing tie bars?

1. Longitudinal construction joints shall be constructed in accordance with CDOT subsection 412.13(a)1 of the *Standard Specifications*. Tie bars shall be placed perpendicular to the longitudinal joint by an approved method. The tie bar should be inserted in front of the vibrators so that the concrete is consolidated around the tie bar. Approval of the Contractor's method should be contingent on his showing that the method will provide proper consolidation around the tie bar and the necessary pull-out resistance. Comments:

2. Longitudinal weakened plane joints shall be constructed in accordance with CDOT subsection 412.13(b)1 of the *Standard Specifications*. Epoxy coated deformed steel tie bars shall be placed perpendicular to the longitudinal joint by an approved method. The Contractor's method must properly space the tie bars and place them at the correct depth. Comments:
## II. Scheduling

### A. Materials:

Materials will be available for sampling on:

### B. Paving Equipment:

Paving equipment will be set up and ready for approval on (see CDOT subsection 412.07 of the *Standard Specifications*):

### C. Paving Sequence:

1. The Contractor will commence paving on:

2. Town of Parker work hours are 7:00 am – 7:00 pm, Monday through Friday. Work outside of these times requires prior approval in writing.

3. The Contractor proposes to work the following hours:

4. How many days per week does the Contractor intend to work?

5. Concrete batching will start at:

6. Concrete will be delivered to the paver at:

7. What paving sequence will the Contractor follow?

   a. Where will paving start?

   b. What width will be paved?

   c. The Contractor shall detail their plan to complete the rest of the paving, including widths and proposed starting dates. Comments:

### D. Sawing:

1. Sequence:

2. Sawing within working time:
**II. Scheduling (Continued)**

<table>
<thead>
<tr>
<th>E. Sealing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When will sealing begin?</td>
</tr>
</tbody>
</table>

2. Sealing will be performed in accordance with CDOT subsection 412.18 of the *Standard Specifications*. Before installation of the backer rod or sealant, the following shall be completed:

   a. Repair of defective pavement slabs and repair and proper curing of cracks or spalls in accordance with CDOT subsection 412.16 of the *Standard Specifications*.
   b. Corrective work for pavement smoothness in accordance with CDOT subsection 412.17(c) of the *Standard Specifications*.

   Comments:

---

<table>
<thead>
<tr>
<th>F. Profilograph:</th>
</tr>
</thead>
</table>

The profilograph should be on the project three working days after the start of any concrete pavement work. Final determination for smoothness can be evaluated per CDOT subsection 412.17 & CDOT subsection 105.08a2.

---

<table>
<thead>
<tr>
<th>G. Other Scheduled Items:</th>
</tr>
</thead>
</table>

Other scheduling items that will affect the start of concrete paving include:

1. 

2. 

3. 

4. 

5. 
## III. Haul Routes, Legal Loads, and Traffic Control

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Method of Handling Traffic (MHT in both locations):</strong></td>
<td>Has a detailed Method of Handling Traffic been submitted and approved?</td>
</tr>
<tr>
<td><strong>B. Legal Weight Limits:</strong></td>
<td>All hauling vehicles shall comply with legal weight limits. Comments:</td>
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<tr>
<td><strong>C. Concrete Protection:</strong></td>
<td>Traffic will not be permitted on the concrete pavement until 14 days after the pavement has been placed or until the compressive strength has reached 3,000 pounds per square inch in accordance with CDOT subsections 105.13 and 412.22 of the Standard Specifications. Comments:</td>
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## IV. Special Provision Requirements

The following Special Provisions for Concrete Pavement are reviewed and discussed below:

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<tbody>
<tr>
<td><strong>A. Special Provision:</strong></td>
<td>Comments:</td>
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<tr>
<td><strong>B. Special Provision:</strong></td>
<td>Comments:</td>
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<tr>
<td>V. Standard Specification Requirements</td>
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<td>----------------------------------------</td>
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<tr>
<td>The following Standard Specifications for concrete pavement are reviewed and discussed below:</td>
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<tr>
<td>A. Equipment (CDOT subsection 412.07):</td>
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<td>1. If any vibrator ceases to function properly, the paving operation shall be stopped immediately and not resumed until the faulty vibrator has been repaired or replaced, in accordance with CDOT subsection 412.07(b) of the Standard Specifications. Comments:</td>
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<td>2. The Contractor shall furnish a movable bridge that conforms to CDOT subsection 601.05e for use by the Town, in accordance with CDOT subsections 412.07(d) of the Standard Specifications. The Town will use this bridge for testing and inspection. Comments:</td>
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<td>B. Limitations of Placing Concrete (CDOT subsections 412.15 and 601.12[b] and [c]):</td>
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<td>Comments:</td>
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<tr>
<td>C. Placing Concrete (CDOT subsection 412.10):</td>
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<td>Concrete for areas which contain load transfer devices shall not be dumped directly from the hauling vehicles onto the grade. Concrete shall be placed by an approved placement spreader machine. Construction equipment other than standard paving equipment will not be allowed to handle plastic concrete in advance of the paver in the roadway without approval. Comments:</td>
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## V. Standard Specifications Requirements (Continued)

### D. Finishing (CDOT subsection 412.12):

1. The addition of superficial water to the surface of the concrete to assist in finishing operations will not be permitted. This also means that superficial water cannot be added by soaking the burlap drag. The burlap drag should be kept damp, but not so wet that free water is deposited on the surface of the pavement. Comments:

2. Inability of the finish machine to provide an acceptable surface finish, after corrective action, will be cause for requiring replacement of the finish machine. Comments:

3. Hand finishing will be permitted only in the event of a mechanical breakdown or for narrow widths or areas of irregular dimensions. Comments:

4. After the concrete has been struck off, vibrated, and consolidated, it shall be further smoothed, trued, and consolidated by an approved mechanical oscillating float. Hand floating will be permitted only as specified in Item 3 above. Comments:

5. The Contractor shall have materials available to protect the pavement slab from the effects of rain until the concrete has hardened. Comments:
<table>
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<th>E. Joints (CDOT subsection 412.13):</th>
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<tr>
<td>1. Immediately after sawing, the sawed joints shall be flushed with water to remove any saw residue, and the saw residue shall be completely removed from the surface of the pavement. This residue shall be removed by approved methods. Comments:</td>
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<td>2. The time of sawing shall be determined by the Contractor to prevent random cracking and raveling from the sawing. If uncontrolled cracking occurs during or prior to joint sawing, the Contractor shall move the sawing operation ahead and, if necessary, add additional sawing units to eliminate uncontrolled cracking. Comments:</td>
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<td>3. When dowel bars are specified in the Contract, they shall be installed within the tolerances and of the size, grade, and spacing specified. Dowel assemblies shall be securely stacked or attached to the subgrade to retain their installation tolerance during concrete placement. The center of the dowel assembly shall be marked on both sides of the pavement slab for reference in sawing the joint. Comments:</td>
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<th>F. Curing (CDOT subsection 412.14):</th>
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<td>1. Immediately after the finishing operation has been completed, the entire surface, including tined grooves and exposed sides of the newly placed concrete, shall be sprayed uniformly with an impervious membrane curing compound meeting the requirements of AASHTO M 148 Type 2. The concrete shall not be left exposed for more than 30 minutes before being covered with curing compound. Failure to cover the surface of the concrete within 30 minutes shall be cause for immediate suspension of the paving operations. Comments:</td>
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<td>2. Should the curing film become damaged from any cause, within 72 hours after application, the damaged portions shall be repaired immediately with additional curing compound. Comments:</td>
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<tr>
<th>G. Repair of Defective Concrete Pavement (CDOT subsection 412.16):</th>
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<tr>
<td>Defective concrete pavement shall be repaired or replaced at the Contractor’s expense. The Contractor’s corrective work plan shall be approved prior to performing the work. Comments:</td>
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## VI. Follow Up Items

Items discussed during the meeting, which will need follow up:

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<thead>
<tr>
<th>Items for follow up</th>
<th>Who will follow up</th>
<th>Date of completion or response</th>
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