RESOLUTION NO. 24-04

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF RIDGWAY, COLORADO, AMENDING THE TOWN OF RIDGWAY STANDARD SPECIFICATION AND TYPICAL DRAWINGS FOR INFRASTRUCTURE CONSTRUCTION

WHEREAS, the Town of Ridgway's set of engineering design standards is formally referred to as "Town of Ridgway Standard Specification and Typical Drawings for Infrastructure Construction"; and

WHEREAS, the Town Council adopted by Resolution No. 01-03 on April 11, 2001 the Town of Ridgway Standard Specifications, General Requirements and Typical Drawings for Infrastructure dated 1992 and updated in 1995; and

WHEREAS, subsequently the same was amended by Resolution No. 01-04 on July 11, 2001, by Resolution No. 06-03 on June 14, 2006, by Resolution No. 20-06 on June 10, 2020, by Resolution No. 22-08 on September 14, 2022 and again by Resolution No. 22-12 on December 14, 2022; and

WHEREAS, the Town Engineer has prepared more changes to said standard specification and typical drawings; and

WHEREAS, the purpose of these standards is to provide minimum standards to safeguard life, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use, location, and maintenance of all public improvements and private improvements of common ownership including, but not limited to, sanitary sewer systems, water supply systems, storm drainage systems, wire utilities, streets, pedestrian facilities, open space, parking lots, and appurtenances thereto; and

WHEREAS, the purpose of these standards is also to ensure that the Town receives public facilities which are constructed with the care and materials such that the facility meets or exceeds the normal service life requirements for similar installations; and

WHEREAS, these standards are intended to ensure that when said facilities are transferred to the Town's ownership that they will be free from all defects and in suitable working order to provide the service capabilities anticipated with such a facility while protecting public and private interests.

NOW THEREFORE, BE IT RESOLVED by the Town Council of the Town of Ridgway, Colorado, as follows:

1. The ***Minimum Design Standards – Curb, Gutter, Sidewalks & Streets*** is hereby amended to read as set forth in ***Exhibit A: Minimum Design Standards – Curb, Gutter, Sidewalks & Streets***.

2. The ***Curb, Gutter & Sidewalk Standards and Specifications*** are hereby amended to be referred to as ***Concrete Standards*** and to read as set forth in ***Exhibit B: Concrete Standards***.

3. The ***Street Design and Construction Standard Specifications*** are hereby amended to read ***Design Standards – Streets*** and to read as set forth in ***Exhibit C: Design Standards – Streets***.

4. The attached document, labeled as Exhibit D and titled "Town of Ridgway Standard Specification and Typical Drawings for Infrastructure Construction, Addendum #1 – January 10, 2024", shall be added to, and shall amend the ***Town of Ridgway Standard Specification and Typical Drawings for Infrastructure Construction*** dated October 2022.

ADOPTED AND APPROVED this _____ day of January, 2024.

_____
John Clark, Mayor

ATTEST:

_____
Pam Kraft, Town Clerk

EXHIBIT A

MINIMUM DESIGN STANDARDS

CURB, GUTTER, SIDEWALKS & STREETS

General

All curb, gutter, sidewalk, and street construction design, rights of way widths and street widths shall conform to the minimum requirements enumerated on the Town typical drawings and the requirements of the Subdivision Regulations of the Town of Ridgway. Care shall be taken to ensure continuity of grades, widths, etc, of proposed, existing, and future installations. Deviations from these standards and specifications may be permitted, when in the opinion of the Town, the quality of the finished work would not vary materially from the intent of these requirements.

Gravel Street Construction

Gravel streets shall only be accepted on residential, low traffic volume and low load streets when specifically approved by the Town.

Paved Street Construction

Minor residential streets shall have a minimum of six (6") of Class 6 base course with prime coat and a three (3") asphaltic concrete surface. Other residential and collector streets shall have a minimum of six (6") of Class 6 base course with prime and four (4") of asphaltic concrete surface. Base and surface treatment for arterial streets shall be designed by an engineer based on traffic load and soils conditions.

All paved streets shall have curb, gutter, or valley pan and sidewalk on both sides. The curb, gutter, and sidewalk shall conform with Town standard drawings and specifications for that work.

Street Layout

Street, Alleys and Lots shall be designed in accordance with RMC 7.5.4 and the following. Street widths shall conform to Town of Ridgway standard drawings for the type of street being designed. Gravel streets shall have a cross slope of 3% and paved streets shall have at least 2% cross slope. The maximum slope on both surfaces is 3.5%.

The minimum profile for all streets is 0.5 percent. The maximum slope of local streets shall not exceed 7% and not exceed 5% for other streets. Driveway approaches shall not exceed 7% within the right of way. The minimum length of vertical curves for all streets shall be 300 ft except that where the algebraic change in grade is less than two percent, vertical curves may be omitted. On local streets the minimum radius of horizontal curves shall be 100 ft and 150 ft for all over streets.

Roads shall be designed with connectivity to other roads. Intersections shall be at approximate right angles. Street design shall take into account both sides of the street and all intersections to ensure all designs fit not only with current development but also with any existing development and potential future development, public and private.

Where justified to the Town, dead end roads shall terminate in a cul de sac with a minimum radius of 100 ft and a length of 500 ft or less as measured from the center of the intersection of the cross road and the center of cul de sac.

In special topographic conditions, the Town may allow deviations from these requirements in order to provide the Town with better drainage or a better intersection design.

Offset tee intersections shall have those legs at least 125' apart centerline to centerline to facilitate a reasonable line of sight between the intersections.

Service Line Installation

All service lines shall be installed (accordance with the appropriate Town standards) prior to paving any street.

Drainage

All streets shall be designed to provide continuous surface drainage directed to storm drain inlets and drainage courses. Grade shall permit flow without ponding. Use of drainage swales along the roadway are encouraged. Drainage shall be designed in accordance with the Town's Storm Water Standards.

A check shall be made to be sure of continuity of drainage design between the proposed construction and existing or future construction. In no case shall surface drainage be permitted to flow onto private property. The responsible party shall accommodate any run on water and remedy any problems which are created by the addition of the Responsible Party's facilities and/or development to any existing drainage.

Culverts shall only be installed where V-ditches, gutters, and/or valley pans will not carry the necessary flow. Diameter and slope shall be based on design flow per the Storm Water Standard. Minimum diameter in roadways shall be 18" and minimum in driveways shall be 12".

Monumentation

Centerline monuments shall be set at each street intersection upon completion of the street construction. If an existing road is resurfaced, the monuments shall be restored or set as necessary. Monuments shall be set in accordance with the Town typical details for centerline monuments.

Concrete Standards

I. General Provisions

General

Concrete work within any street, park, trail or alley. Town owned easement of right of way or in any part of the water system, wastewater system, parks, and storm drainage system of the Town shall meet the requirements of these Standards and Specifications. This includes any work being performed directly for the Town or any work being performed for which the Town will have ownership or maintenance responsibilities as well as work within Town controlled property. Engineering, plans, licenses, permits, inspections, warranties and acceptance shall be as detailed in these applicable Standards and Specifications for the type of construction involved.

For all concrete work, where CDOT standards address issues not covered below or are more stringent than those contained herein, CDOT requirements shall be met.

Refer to the General Requirements of these Standards for Abbreviations and Definitions.

Reference Documents

CDOT Standards shall refer to the most recent version of the CDOT Standard Specifications for Road and Bridge Construction, and CDOT Standard plans (M and S Standards).

Submittals and Method Statements

Mix Design. Prior to the placement of any concrete the Responsible Party shall provide a design mix for review and approval by the Town. Once approved that will be the only mix to be used on the project**.** Additional mixes or changes to the mix requires resubmittal and approval of the new mix.

Concrete Proportioning**.** Proportioning the "dry" constituents of concrete mixtures shall be accomplished by weighing. The Supplier for the Responsible Party shall provide adequate and accurate scales for this work. The accuracy and tolerances of all scales shall be as prescribed by state law. The scales shall be sealed by the measurement standards section of the Colorado Department of Agriculture at least once each year, each time the scales are relocated, and as often as the Town deems necessary. Weighers certified by the measurement standards section of the Colorado Department of Agriculture shall operate scales. The certified weigher shall perform the duties according to the Colorado Department of Agriculture's regulations. There shall be no variance permitted in the minimum cement factor (sacks per cubic yard) as specified for the mix design. The total quantity of mixing-water per sack of cement, including free water in the aggregates, shall not exceed the maximum specified herein. The Responsible Party shall develop the proper proportions of aggregates, cement and water that shall meet or exceed minimum requirements of these Standards and Specifications. Mix design shall be submitted to the Town, along with at least two (2) sets of 3 certified twenty-eight (28) day compressive strength test results of the mix proposed for use, for review and approval. No concrete shall be incorporated into the work until the Town approves the concrete mix.

The concrete shall have a compressive strength of not less than four five hundred (4,500) pounds per square inch at twenty-eighth (28th) day after pouring. The minimum cement content of this concrete shall be six

(6) standard 94-pound sacks of cement per cubic yard of concrete. The water-cement ratio shall not exceed 0.40, including moisture in aggregates and water added in field adjustments, for watertight structures nor exceed 0.43 for other work. Slump shall not exceed 4" when the middle third of the truck is tested. If greater slump is required (and approved in writing by the Engineer), additional water may be added with a proportional increase in cement to maintain the same water-cement ratio or the use of water reducing agents may be proposed, with sufficient support data, for review and approval by Engineer. Entrained air shall be between 5% - 8 %. Where concrete is to be subject to traffic or other loads in less than 10 days, concrete mix shall be designed to achieve a laboratory compressive strength of at least thirty six hundred (3,600) psi in 72 hours. During hot or cold weather or if the Responsible Party wishes to open the concrete to traffic or load in less than 7 days, additional cylinders shall be formed and those cylinders left on site and cured as the concrete is cured until the day of testing. For flatwork, a CDOT D mix is acceptable as long as the design mix test results include the same admixtures as the concrete furnished.

Reinforcement. Submit shop drawings of the reinforcement for Town review. The Town's review of shop drawings and bar schedules shall not relieve the Responsible Party of fulfilling his responsibilities as outlined in the plans and specifications and ensuring that the shop drawings are consistent with the plans and design intent.

Method Statements. Provide Method Statements for any processes for which the Town requests.

Quality control

Quality control testing to confirm the concrete meets the Town Standards including air, slump, temperature, and yield, shall be performed on all trucks with the samples taken in the middle 1/3 of the delivery. A minimum of 5 compressive strength cylinders shall be taken for every day of pour from a truck selected by the Town. If more than 35 cubic yards is placed in a single day, compressive strength cylinders shall be taken for each 35 cy or fraction of that placed in a single day. During hot or cold weather or if the Responsible Party wishes to open the concrete to traffic in less than 7 days, additional cylinders shall be formed and those cylinders left on site and cured as the concrete is cured until the day of testing.

If water is added at the job site, slump tests shall be run and test cylinders cast following the addition of the water.

The Responsible Party is encouraged to test the concrete air and slump in advance of placing any concrete to ensure that the material is within specification; however that testing is not a substitute for the quality control testing required above.

The required testing services shall be performed by a testing agency approved by the Town, and testing agencies shall meet the requirements of ASTM E329. A representative of a qualified testing agency shall inspect, sample, and test material and production of concrete as required by the Town at the Responsible Party's expense. When it appears to the testing representative that any material furnished or work performed by the Responsible Party fails to meet minimum specification requirements, the testing agency shall promptly report the deficiency to the Town and the Responsible Party.

The testing agency shall report test and inspection results to the Town and Responsible Party immediately after they are performed. Test reports shall include the exact location of the work at which the batch represented by a test was deposited. The report of the strength test shall include detailed

information on storage and curing of specimen prior to testing, the project number, and the location of the concrete (curb, manhole, inlet, sidewalk, paving, etc.). Test reports shall bear the seal and signature of a PE registered in the State of Colorado and competent in the field of concrete testing. Reports not properly certified shall not be accepted.

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

II. Materials

General

Concrete shall be composed of Portland cement, aggregate, and water, and shall be reinforced with steel bars, steel wire fabric or fibrous reinforcing where required. No admixture other than air-entraining agents, or water reducing agents shall be used without written permission from the Town and those admixtures shall be the same as used in the concrete for which the supplier provides test results.

Cement

Cement used in concrete work will be Portland cement conforming to the requirements of ASTM C-150, Type I, IA, Type I/II modified, II, Type V, or IIA. In general, Type II or IIA shall be used in concrete which shall be in contact with the soil, unless otherwise allowed or directed by the Town. Cement that for any reason has become partially set or that contains lumps of caked cement shall be rejected. When preparing the mix design, the Responsible Party shall provide for protection against sulfate attack. By reference the section 601.04 and referenced Table 601-2 of the CDOT Specifications is incorporated. Consideration must also be given to the soils and water with which the concrete may come in contact as well as the aggregates in the mix.

The Supplier for the Responsible Party shall ensure the proper storage of cement until it is used. No damaged cement shall be used in the work, and such cement shall be immediately removed from the site when so ordered by the Town. When requested by the Town, the Responsible Party shall, at his own cost and expense, furnish a certificate from an acceptable testing laboratory for each batch of cement from which cement is taken for use in the work, stating that the cement meets the requirements of these Standards and Specifications for Portland cement.

Flyash

Approved fly ash may be substituted for ASTM C150 cement up to a maximum of 20 percent Class C or 20 percent Class F by weight of total cementitious material. Percentage shall be calculated as follows:

$$(\text{Flyash}_{\text{lbs}} / (\text{Cement}_{\text{lbs}} + \text{Flyash}_{\text{lbs}}))$$

Aggregates

Aggregates from different sources and of different gradings shall not be stockpiled together. The test results for the mix design shall utilize the same aggregates as will be furnished to the project.

Aggregate shall be handled from stockpiles or other sources to the batching plant in such a manner as to secure a uniform grading of the material. Aggregates that have become segregated, or mixed with earth or foreign material, shall not be used. All aggregates produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. If aggregates contain high or non-uniform moisture content, a storage or stockpile period in excess of 12 hours may be required.

Coarse Gravels. Coarse aggregate shall conform to the grading in Table 703-1 of the CDOT Standards. Number 57 and Number 67 shall each be furnished in two separate sizes and combined in the plant in the proportions necessary to conform to the grading requirements. Compliance with grading requirements will be based on the combination and not on each individual stockpile.

Fine Aggregate. Fine aggregate for concrete shall conform with CDOT requirements in Section 703 and Colorado Procedure 31, Method D, unless otherwise specified. The minimum sand equivalent, as tested in accordance with AASHTO T 176 shall be 80 unless otherwise specified. The fineness modulus as determined by AASHTO T 27, shall not be less than 2.50 or greater than 3.50 unless otherwise approved.

Water

Water for concrete shall be clean and free from sand, oil, salt, acid, alkali, organic matter, or other deleterious substances. Water not from a potable source must be tested in accordance with and meet the suggested requirements of AASHTO T 26. Potable water from public supplies or water which has been proven to be suitable for drinking is preferred and does not need to be tested.

Air Entrainment

Air entraining admixtures for concrete that will have exposed surfaces shall conform to the requirements of AASHTO M 154. Air-entraining admixtures shall conform to the requirements of ASTM C-260. Admixtures which have been frozen will be rejected. Air content shall be between 5% and 8%. At acceptance testing if the air content is below 5% the Responsible Party can authorize additional air entraining admixture. The mix must then be mixed at mixing speed a minimum of 20 revolutions and re-tested to confirm the adjustment prior to discharging. Delivery of a mixture in excess of 8% will be rejected.

Admixtures

The Responsible Party may elect to use another admixture provided the Town specifically approves the admixture. Admixtures to be used for plasticizing, densifying, retarding, or acceleration of hardening of concrete shall, when added to the mixture, produce a concrete of the specified strengths in seven (7) day and twenty-eight (28) day tests. Documented evidence of acceptability shall be required when new or unknown admixtures are proposed for use.

Flowfill Specifications

Flow-fill shall meet the requirements of Section 206.02(a) of the current *CDOT Standard Specifications for Road and Bridge Construction.* Flow fill may be made from different ingredients and/or at different proportions than those specified in the CDOT Standard Specifications when approved by the Town.

Reinforcement

Fiber Reinforcement. Fibrous reinforcing shall be used in Portland cement concrete used for curb, gutter, sidewalks, curb turn fillets, cross pans, and valley pans. Note that valley pans wider than 4' also require wire mesh. Fibrous concrete reinforcement shall consist of one hundred (100) percent virgin polypropylene fibrillated fibers specifically manufactured for use as concrete reinforcement, containing no reprocessed olefin materials. Substitutions may be considered at the discretion of the Town. The following shall be submitted to the Town during the submittal process:

> One copy of manufacturer's printed product data, clearly marked, indicating proposed fibrous concrete reinforcement materials. Quantity of fiber added should be consistent with manufacturer's recommendation and the proposed use.
>
> One (1) copy of manufacturer's printed batching and mixing instructions.
>
> One copy of a certificate prepared by the concrete supplier stating that the approved fibrous concrete reinforcement materials at the rate of one and one-half (1.5) pounds per cubic yard were added to each batch of concrete delivered to the project site. Each certificate shall be accompanied by one (1) copy of each batch delivery ticket indicating the amount of fibrous concrete reinforcement material added to each batch of concrete.

Steel Reinforcement. Steel reinforcement bars shall conform to Standard Specifications for Concrete Steel Reinforcing Bars, Designation A-615, Grade 60, and A-305, of ASTM. Deformations of reinforcing steel bars shall comply with the latest revision of ASTM A 305. All rebar in structures that could potential contain water or sewage shall be epoxy coated. The use of cold twisted bars will not be permitted.

Welded Wire. Welded wire fabric (WWF) for concrete reinforcement shall be of the gauge, spacing, dimensions, and form specified on the plans or detailed drawings and shall comply with "Specifications for Welded Steel Wire Fabric for Concrete Reinforcement" (ASTM A-185) or "Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement" (ASTM A-497). Welded wire fabric shall be adequately supported and in no case will WWF smaller than 6X6/4X4 be used.

Snap Ties

Snap ties shall all be cone style and in all work that may need to be water tight have a neoprene waterstop on the tie.

Water Stop

Waterstop shall be extruded multi-rib elastomeric PVC as manufactured by Waterseals Inc, Chicago, IL, Greenstreak Plastic Products, St Louis, MO or equal. Unless otherwise specified the water stop shall be 6-inch.

Expansion Joint Material

Expansion joint material shall be non-extruding preformed joint filler and shall conform to ASTM Specification D1751 or D1752.

Curing Compound

Membrane curing compounds for concrete shall be the pigmented type conforming to the requirements of AASHTO-M-148 and/or ASTM-C-309. The type of membrane curing compound chosen shall not permanently discolor the concrete surface.

Concrete Sealer

Sealer shall be a 40% silane penetrating sealer that chemically reacts with and bonds with the concrete substrate such as Dayton J29 or approved equal.

III. Execution

Subgrade Preparation

The subgrade shall be excavated or filled to the required grades and lines. Soft, yielding, or otherwise unsuitable material shall be removed and replaced with suitable material. Filled sections shall be compacted and the compaction shall extend a minimum of six (6) inches outside the form lines. The subgrade shall be compacted to the density shown on the plans and consistent with the Town standards for the work (more stringent will apply) and trimmed to provide a uniform surface at the correct elevation. Subgrade preparation supporting concrete shall not exceed 1/4" from true line and grade.

Forming

Forms shall be of suitable material and of type, size, shape, quality, and strength to enable construction as designed. The forms shall be set true to line and grade, mortar tight, and sufficiently rigid to resist any appreciable amount of springing out of shape during placing of concrete. The responsibility for the adequacy shall rest with the Contractor. All dirt, chips, sawdust, nails, and other foreign matter shall be completely removed from forms before any concrete is deposited therein. The surfaces of forms shall be smooth and free of irregularities, dents, sags, and holes that would appreciably deface the finished surface. Forms previously used shall be thoroughly cleaned of all dirt, mortar, and foreign matter before being reused, and the reuse of forms shall be subject to approval of the Engineer.

Any form which is not clean and/or has not had the surface prepared with a commercial form oil that shall effectively prevent bonding and that will not stain or soften concrete surfaces shall not be used. Wood forms shall be straight and solid, free of warps and cracks. Butt end splices shall be backed to ensure continuous straight forming throughout the full depth of the splice.

Plywood forms, plastic coated plywood forms, or steel forms shall be used for surfaces requiring forming which are exposed to view, whether inside or outside any structure. Surfaces against backfilled earth, interior surfaces of covered channels, or other places permanently obscured from view, may be formed with forms having sub-standard surfaces.

Form snap ties, clamps, or bolts shall be used to fasten forms. The use of twisted wire loop ties to hold forms in position will not be permitted, nor shall wooden spreaders be used unless approved by the Town. Clamps or bolts shall be of sufficient strength and number to prevent spreading of the forms. They shall be of such type that they can be entirely removed or cut back 1 inch below the finished surface of the concrete (cone shape only) and in watertight applications should have a waterstop on the snap tie. A 2" clearance shall be

provided between snap ties and any rebar. Rebar shall not be supported on the snap ties. Forms for outside surfaces shall be constructed with stiff wales at right angles to the studs and all form clamps shall extend through and fasten such wales, all based on the rate of concrete pour.

Before concrete is placed in forms, all inside surfaces of the forms shall be thoroughly treated with an approved releasing agent that will leave no objectionable film on the surface of forms that can be absorbed by the concrete. Care shall be exercised that no releasing agent is deposited on previously placed concrete.

Unless otherwise designated on the plans, all exposed edges shall have a 3/4 inch chamfer. Forms for curved surfaces shall be so constructed and placed that the finished surface will not deviate appreciably from the arc of the curve.

Forms shall be so constructed that portions, where finishing is required, may be removed without disturbing portions of form to remain.

Forms shall not be disturbed until the concrete has cured sufficiently to permit their removal without damaging the concrete or until the forms are not required to protect the concrete from mechanical damage. Minimum time before removal of forms after placing concrete shall be one (1) day for footings and Class "D" concrete and two (2) days for other concrete except in curbs, gutters, sidewalks and pavements. The use of slip forms and concrete paving machines is encouraged.

Slip Form. Slip form equipment shall be provided with traveling side and top forms of suitable dimensions, shape, and strength to support the concrete for sufficient time during placement to produce the required cross section for the work. The equipment shall spread, consolidate, and screed the freshly placed concrete in such a manner as to provide a dense homogeneous product.

The slip form equipment shall have automatic sensor controls which operate from an offset control line. The line and grade of the slip form equipment shall be automatically controlled.

Reinforcement

Before being positioned, reinforcing steel shall be thoroughly cleaned of mill and rust scale and of coatings that will destroy or reduce the bond. Where there is delay in depositing concrete, reinforcement shall be re-inspected and, if necessary, cleaned. Reinforcement shall be carefully formed to the dimensions indicated on the plans by the cold bending method. Cold bends shall be made around a pin having a diameter of six (6) or more times the diameter of the reinforcing bars. Reinforcement shall not be bent and then straightened. Bars with kinks or bends not shown on the plans shall not be used. Precast mortar blocks, or other non-metal supports shall be as approved by ACI.

Concrete Mixing

Plant Mixed. Batching and mixing shall be in accordance with ASTM C94, Specifications for Ready Mixed Concrete and CDOT Section 412. Site mixed concrete will not be accepted except for volumes of less than 1/2 cubic yard. The concrete shall be uniform in composition and consistency throughout the mixed batch, and from batch to batch, except where changes in composition or consistency are directed. Concrete shall be continuously mixed or agitated from the time the water is added until the time of use. The stationary mixing (prior to adding water) time shall be between 50-90 seconds. Excessive overmixing requiring the addition of water to preserve the required consistency will not be permitted. The temperature of the

concrete when it is being placed shall be not more the 85° F and not less than 40° F in moderate weather, or 50° F when the mean daily temperature drops below 40° F. From the time water is added to the mix or cement comes in contact with aggregate, until the concrete is deposited in place, time shall not exceed 45 minutes if hauled in non-agitating trucks, and 90 minutes if hauled in agitating or mixing trucks.

The Town shall have free access to the mixing plant during times of operation. The organization supplying the concrete shall have sufficient plant and transportation facilities to assure continuous delivery of the concrete at the required rate.

The Responsible Party shall collect batch tickets from the driver for concrete used on the project and deliver them to the Town before discharge.

When the truck arrives at the project site the truck must be mixed at mixing speed for 70 to 100 revolutions. The initial testing of the mix is performed (air content, slump, and temperature) after such mixing. Should there be a need to adjust slump or air content, the mix may be modified in the field with concurrence from the Town to adjust water content (not exceeding the specified water/cement ratio), air content, and chemical modifiers to either delay or accelerate set. The mix should then be mixed in the drum at mixing speed for a minimum of an additional 30 rotations and retested to confirm the adjustments. After initial acceptance testing and before any concrete is placed and through the duration of the discharge of the mix no additional modifications can be made to the mix.

The use of ready-mixed concrete in no way relieves the Responsible Party of proper proportion, mix, delivery, or placement of concrete; concrete must conform to the requirements of these Standards and Specifications and ASTM C-94.

Site Mixed. Concrete mixed on site shall be mixed in a drum type mixer which shall conform to the standards of Volumetric Mixer Manufacturer Bureau. The mixer shall be capable of combining the aggregate, cement, and water into a thoroughly mixed and uniform mass and discharging the material without segregation. Concrete shall be thoroughly mixed for a period of not less than two (2) minutes after the materials, including the water, have been placed in the drum. During the mixing period, the drum shall be operated at the speed specified by the manufacturer of the equipment. The entire contents of the mixer shall be discharged before recharge, and the mixer shall be cleaned frequently. The concrete shall be mixed only in quantities that are required for immediate use. The volume of the mixed materials per batch shall no exceed the manufacturer's rated capacity of the mixed. Mixer must be kept clean of hardened concrete.

When concrete is mixed at the site, cement must be Type IA or IIA. The addition of any admixture at the job is prohibited, except where approved by the Town representative. Job mixed concrete must meet the same quality specifications as plant mixed concrete.

On site mixing of concrete other than in a drum is prohibited.

Concrete Delivery

Batch tickets shall provide the following information:

(a) weight and type of cement;
(b) weights of fine and coarse aggregates;

(c) volume (in gallons) of water including surface water on aggregates; (d) quantity (cubic yards) per batch;
(e) times of batching and discharging of concrete;
(f) name of batch plant;
(g) name of Responsible Party;
(h) name and amount of admixture if approved; and,
(i) date and truck number.

Additional field information shall be provided as follows:

1. time of batch arrival
2. any modifications to the mix at acceptance and prior to discharge such as gallons of water added
3. time of discharge
4. temperature of discharge mix
5. slump of discharge mix
6. air content of discharge mix
7. yield of discharge mix

The consistency of concrete shall be kept uniform for each class of work and shall be checked by means of slump tests or Kelly ball tests. The workability of the concrete shall be determined by the installer but adjusting the workability shall not create a deviation from the design mix specifications. Concrete shall have a consistency such that it can be worked into corners and angles of the forms and around joints, dowels and tie-bars by the construction methods, which are being used without excessive spading, segregation or undue accumulation of water or latent material on the surface.

If, through accident, intention, or error in mixing, concrete fails to conform to the proportions of the approved mix design, such concrete shall not be incorporated in the work but shall be properly disposed of off the project site as waste material at the Responsible Party's expense.

Placement

General. Before depositing concrete, debris shall be removed from the space to be occupied by the concrete, and the forms, including any existing concrete surfaces, shall be thoroughly wetted. Concrete shall not be placed until forms and reinforcing steel have been inspected by the responsible party in the presence of the Town. Concrete shall be handled from the mixer to the place of final deposit as rapidly as possible by methods that prevent separation or loss of ingredients. The concrete shall be deposited in the forms as nearly as practical in its final position to avoid re-handling. It shall be deposited in continuous layers, the thickness of which generally shall not exceed twelve (12) inches. Concrete shall be placed in a manner that shall avoid segregation and shall not be dropped freely more than five (5) feet. If segregation occurs, the Town may require the concrete to be removed and replaced at the Responsible Party's expense. Concrete shall be placed in one continuous operation, except where keyed construction joints are shown on the plans or as approved by the Town. Delays in excess of thirty (30) minutes may require removal and replacement of that pour, as determined by the Town. The course aggregate shall be worked back from the forms and worked around the reinforcement without displacing the bars. After initial set of the concrete, the forms shall not be jarred and strain shall not be placed on the ends of projecting reinforcement.

Pipes, fittings, chutes, troughs, spouts, or tremies that are fabricated of aluminum materials for pumping, conveying, or placing concrete shall not be used.

Concrete, except for cofferdam seals, shall not be deposited under water, unless approved by the Town. If approved, care shall be exercised to prevent the formation of laitance. Concrete shall not be deposited until all laitance, which may have formed on concrete previously placed, has been removed. Pumping shall be discontinued while depositing foundation concrete if it results in a flow of water inside the forms. If concrete, except for cofferdam seals, is deposited under water, the proportion of cement used shall be increased at least 25 percent at the Responsible Party's expense.

No re-tempering of concrete shall be permitted. Hand-mixed concrete shall not be permitted except by written approval of the Town, and then in only small quantities or in case of an emergency. If the work requires more than ½ cubic yard shall be batched at a ready mix plant.

Placement of form stakes in the concrete should be avoided. Where such placement cannot be avoided, form stakes shall be removed as soon is the concrete is hardened sufficiently to not require the staking. Holes left when the stakes are removed shall be packed full depth with concrete and not, just finished over the top.

Reinforcement

Steel Placement. Reinforcing steel shall be in accordance with the approved plans and ACI requirements and shall be accurately placed and secured against displacement by using annealed iron wire no thinner than No. 18 gauge, or by suitable clips at intersections. Where necessary, reinforcing steel shall be supported by metal chairs or spacers, precast mortar blocks, or metal hangers. Splicing of bars, except where shown on the plans, shall not be permitted without approval of the Town.

Reinforcing steel shall not be supported by form ties. Form ties shall be set so there is at least 2" clear between form ties and reinforcing steel.

Unless otherwise shown on the plans, the minimum clear cover for reinforcing steel shall be the following, which is specified in ACI 30l, Section 5.5. Note that "clear" distance is measured from the edge of the bar closest to the form or earth to the form. Where minimum distances are called out, there is no tolerance for the minimum distance.

Consolidation

Concrete shall be thoroughly compacted and/or vibrated. Concrete shall be compacted by internal vibration using mechanical vibrating equipment, except that concrete in floor slabs, sidewalks, or curb and gutter, not poured against form linings, shall be either tamped or vibrated. Care shall be taken in vibrating the concrete to vibrate only long enough to bring a continuous film of mortar to the surface. Vibration shall stop before any segregation of the concrete occurs. Mechanical vibrators shall be an approved type as specified in ACI Publication 309, Chapter 5. Vibrators shall not be used to move or spread the concrete.

Any evidence of segregation, the lack of consolidation or over-consolidation shall be regarded as sufficient reason to require the removal of the section involved and its replacement with new concrete

at the Responsible Party's expense. The Responsible Party shall remedy any defects in the quality and appearance of the completed work.

Backfilling

When side forms are removed and the concrete has gained sufficient strength, the space adjoining the concrete shall be promptly backfilled with suitable material, properly compacted, and brought flush with the surface of the concrete and adjoining ground surface. In embankments, the backfill shall be level with the top of the concrete for at least two (2) feet and then sloped as shown on the drawings or as directed by the Town.

Contraction Joints

Transverse joints shall be placed at maximum intervals of ten (10) feet to control random cracking; joints shall be formed, sawed, or tooled to a minimum depth of one-quarter (¼) of the total thickness. Tooled joints shall not be used in sidewalks. If divider plates are used, the maximum depth of plates shall not be greater than one-half (½) depth at the finished surface and shall be no less than one (1) inch.

Bar placement shall be in accordance with the approved plans and ACI requirements.

Contraction Joint. Joints shall be spaced as follows:

1. Not more than ten (10) feet nor less than five (5) feet apart in curb and gutter and combination curb-sidewalk.
2. Not more than the width of the sidewalk (up to eight (8) feet), nor less than five (5) feet apart in sidewalk.
3. At least two (2) joints, equally spaced at not greater than ten (10) foot intervals applicable in driveways.
4. Around all valves, manholes.
5. Should be placed to avoid a joint having a point.
6. As directed by the Town.

Expansion Joints

Expansion joint material shall be provided at the following locations and shall be in place in the forms prior to the placement of concrete:

1. At each end of curb return.
2. At both edges of driveway.
3. Between back of sidewalk and driveway slab or service walk.
4. Between new concrete and existing - buildings.
5. As shown on the drawings.
6. As directed by the Town.
7. Between new and existing concrete. Note: existing concrete is any concrete one day or more old
8. Every one hundred (100) feet in sidewalk curb and gutter when hand-formed.
9. Every two hundred (200) feet in sidewalk, curb and gutter when placed slip formed.
10. Inlets

Dowel Joints

When new concrete to be placed against existing, the work shall be accomplished so that there is no abrupt change in grade between the old section and the new work. Smooth dowels and full depth expansion material shall be placed between the new and old concrete. Install caulk over the joint once the concrete has cured. Where new sidewalk construction abuts existing sidewalks, no addition to existing sidewalks or other flat work concrete shall be made less than four (4) feet in width.

Finishing

Concrete shall be placed and finished under the direct supervision of an individual with a current ACI Concrete Flatwork Technician certification, or approved equal. Exposed faces of curbs and sidewalks shall be finished to true-line and grade as shown on the plans. After the water has stopped bleeding and the water sheen has left the surface, the surface shall be floated to a smooth but not slippery finish. Sidewalk and curb shall be broomed or combed and edged, unless otherwise directed by the Town. After completion of brooming and before concrete has taken its initial set, edges in contact with the forms shall be tooled with an edger having a three-eighth (⅜) inch radius. No dusting or topping of the surface or sprinkling with water to facilitate finishing shall be permitted. Should there need to be assistance to facilitate finishing, the Responsible Party shall submit on a finishing aid material to the Town for approval. If allowed the finishing aid shall be mixed and applied to the manufacture's recommendation. Application of finishing aid not in accordance with manufacture's recommendation or used in excess will be cause for rejection of the work. Steel trowels shall not be used on air entrained (exterior service) concrete.

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

Curing

Fresh concrete shall be protected from weather damage and mechanical injury during the curing periods. The use of a membrane-curing compound is required unless otherwise approved by the Town. The membrane-curing compound shall be applied at the rate of one hundred fifty 150) square feet per gallon unless the manufacturer recommends otherwise and at no less than needed to provide a uniform seal.

Membrane curing compound shall not be used when the concrete surface will be painted. The selected curing process shall be started as soon as possible without injury to the concrete surface. The following curing procedures may be used subject to the approval of the Town:

(a) Ponding (for slabs or footings)

(b) Membrane curing compound

(c) Wet burlap, earth, or cotton mats

(d) Waterproof paper or polyethylene plastic cover

Surfaces being wetted by ponding, spraying, or wetted material shall be kept completely wetted, with an excess of free water on the surface, for the first 120 hours. After this period, for the next 3 days, a wetting schedule shall be followed whereby the concrete is wetted on a schedule approved by the Town.

Surfaces being protected by waterproof paper or polyethylene plastic cover shall receive special attention during the first 120 hours to ensure there is actually free moisture on the surface of the concrete under the waterproof surface. The Town may require the removal of the cover and a wetting of the surface when, in its judgment, there is insufficient moisture for curing. After the first 120 hours, the cover shall be kept tightly in place for the remainder of the curing period.

Cold Weather

During cold weather concreting conditions, concrete construction shall be accomplished in accordance with ACI 306. In all cases, the concrete supplier shall furnish concrete suitable for placement in cold weather conditions. At a minimum cold weather procedures shall be followed when:

A period when more than three successive days the average daily outdoor temperature is below forty degrees (40^{o}) F (the average of the highest and lowest temperatures from midnight to midnight).

November, December, January, February, and March regardless of temperature.

The following prohibitions and conditions shall be in effect during cold weather:

The mixed concrete temperature shall be between 50 and 85˚F at the time of placement. Water aggregates, or both shall be heated when necessary under such control and in sufficient quantities to avoid fluctuations in the temperature of the concrete of more than 10˚ from batch to batch.

To avoid the possibility of flash set when the water is heated to a temperature of exceed of 100˚F, the water and the aggregates shall be charged into the mixer before the cement is added.

Heating equipment or methods that alter or prevent the entrainment of the required amount of air in the concrete shall not be used. Equipment used shall be capable of heating the materials uniformly. Aggregates and water used for mixing shall not be heated to a temperature exceeding 150 ˚F.

Materials containing frost or lumps of frozen materials shall not be used

Stockpiled aggregates may be heated by use of dry heat or steam. Aggregates shall not be heated by gas or oil flame or on sheet metal over fire.

When aggregates are heated in bins, steam-coil or water coil heating, or other methods that will not be detrimental to the aggregates may be used.

Concrete shall not be placed on a surface with a temperature of less than 40 F.

Before concrete placement, all ice, snow, and frost shall be completely removed.

Insulating materials shall be available and easily accessible.

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

Always use ASTM-approved curing compounds to ensure proper curing and to prevent rapid drying and loss of moisture.

If the concrete is found to have frozen in the first 48 hours, it shall be rejected.

Hot Weather

Except by written authorization of the Town accompanied by an acceptable method statement prepared by Responsible Party to protect the concrete, concrete shall not be placed if the temperature of the plastic concrete cannot be maintained at ninety degrees (90º) Fahrenheit or lower and moisture can be kept in the concrete. The placement of concrete in hot weather shall at a minimum comply with ACI 305.

Inclement Weather

In order that concrete may be properly protected against the effects of rain, hail, or snow before the concrete is sufficiently hardened, the Contractor will be required to have material available at all times for the protection of the edges and surfaces of all unhardened concrete. Such protective material shall consist of material which will protect the surfaces from finish damage or a local shift in cement water ratio. When rain appears imminent, all placement operations shall stop, forms shall be placed against the sides of work and protective covering shall be placed over the surface of the unhardened concrete. Damage caused by inclement weather or vandalism including dimples, changes in the surface water/cement ratio, or damage from protective plastic shall be cause for rejection of the work.

Protection of Concrete

As a minimum, insulated blankets are required as cover for concrete placed during cold weather. It is the responsibility of the Responsible Party, in extreme conditions, to determine if additional measures are needed to meet the temperature requirements.

Backfilling**.** Backfilling or opening to traffic shall not occur until the concrete has achieved at least 80% of design strength. Backfilling shall be completed consistent with the requirements of Section 22000 of the Town Standards and the approved plans.

Repairs. After stripping of the forms, if any concrete is found to be not formed as shown on the drawings or is out of alignment or level, or shows a defective surface, segregation, honeycombing, etc.,

it shall be removed and replaced by the Responsible Party at his expense unless the Town gives written permission to patch the defective area. In this case, patching shall be done as described in the following paragraphs. Defects that require replacement or repair are those that contain honeycomb, damage due to stripping of forms, loose pieces of concrete, bolt-holes, tie-rod holes, uneven or excessive ridges at form joints, and bulges due to movement of the forms.

Ridges and bulges shall be removed by grinding no more than ¼". If in excess of ¼", concrete will be rejected, removed and replaced.

Honeycombed and other defective concrete that does not affect the integrity of the structure shall be chipped out, and the vacated areas shall be filled in a manner acceptable to the Town. The repaired area shall be patched with a non-shrink, non-metallic grout with a minimum compressive strength of five thousand (5,000) psi in twenty-eight (28) days. Repair areas treated with an epoxy-bonding agent shall have the approval of the Town before the repair filling is placed.

Bolt-holes, tie-rod holes, and minor imperfections as approved by the Town shall be filled with dry-patching mortar composed of one (1) part Portland cement to two (2) parts of regular concrete sand (volume measurement) and only enough water so that after the ingredients are mixed thoroughly, the mortar shall stick together on being molded. Mortar repairs shall be placed in layers and thoroughly compacted by suitable tools. Care shall be taken in filling rod and bolt holes so that the entire depth of the hole is completely filled with compacted mortar. The mortar mix proportions described above are approximate.

Those areas with excessive deficiencies as determined by the Town shall be removed and replaced at the Responsible Party's expense.

When it is necessary to remove a section of existing sidewalk, the entire plate of concrete between the contraction joints shall be removed unless the amount that needs to be removed is less than 40% of the length of the piece. In addition, no plate less than 5' in length shall be left in place. When removing, all edges of the old sidewalk that are intended remain shall be sawcut to a minimum depth of 1-1/2". If in removing the section to be removed, damage is done to other sections of the concrete, those too shall be removed and replaced.

Defaced, Defective and Damaged Concrete

It shall be the Responsible Party's responsibility to protect fresh concrete from damage as a result of vandalism, or other cause. Defective concrete, whether damaged or otherwise not consistent with these standards and the design intent shall be removed and replaced at the expense of the Responsible Party.

Sealer

All concrete flat work shall be sealed. Concrete shall have cured for minimum of 30 days before placing sealer. In preparation for applying the sealer, the concrete shall be throughout cleaned and all curing compound removed. Sealer shall only be applied in strict accordance with manufacturer's recommendations.

EXHIBIT B

Acceptance Requirements

The acceptance of all concrete improvements by the Town will be based on the following.

Submittal of all required test results and inspection reports certified by the Engineer or a qualified independent laboratory.

Confirmation that all work has been completed in accordance with these Standards.

Passing a final inspection of the work by the Town.

Submittal of two sets of "As-Built" construction drawings on twenty-four by thirty-six inch (24"x 36") paper. All "As-Built" drawings shall be certified by a Professional Engineer currently licensed by the State of Colorado and shall state the name of the Responsible Party. "As-Built" drawings shall also be submitted as an electronic AutoCAD file in accordance with the Town submittal standards in Section 19 of the General Requirements.

Any ADA curb ramp measurements, slopes, shapes, function, locations, tolerances, and/or dimension requirements outside of those defined by Public Right-of-Way Accessibility Guidelines (PROWAG) shall be rejected.

Dimensions of formed shapes shall not exceed ¼" from true line and grade. If exceedances are identified, Responsible Party shall submit a plan to correct the deficiency for Town review.

Flat Surface castings shall not exceed ¼" in 10 feet, exceedances greater than this shall be cause for rejection.
Written notice of rejection shall be given to Responsible Party in the event any aforementioned conditions given by the Town are not met, and work shall be halted until such time as corrective action is taken.

Penalties for non-conformance**.** Table 601-3 Pay Factors in Section 601 of the CDOT Specifications (see below), provides pay reduction factors for deviation from the specified air entrainment, slump, and compressive strength requirements. If in the case of the Town directly contracting the work, the pay reduction factors will be applied to the pay items related to each day of work the test result represents. If in the case the Town is accepting the work the Contractor/Developer is paying for, the Contractor/Developer will pay the Town the amount of the calculated reduction in pay according to table 601-3. When the test results are at a level the table states "Reject", all concrete work for that day that the test represents is rejected and shall be removed and replaced.

Warranty

The Responsible Party shall guarantee all portions of the work for a period of one year after completion and initial acceptance against defective workmanship and materials and shall keep the work in good repair and comply with the requirements of 20.02 of the General Requirements.

The Town possesses sole authority to require the repair or replacement of dedicated public improvements during the warranty period whose decision upon the matter shall be final and obligatory upon the Responsible Party.

EXHIBIT B

Table 601-3
PAY FACTORS

Percent Total Air		Strength		
Deviations From Specified Air (%)	**Pay Factor (%)**	**Below Specified Strength (psi) [< 4500 psi Concrete]**	**Pay Factor (%)**	**Below Specified Strength (psi) [≥ 4500 psi Concrete]**
0.0-0.2	98	1-100	98	1-100
0.3-0.4	96	101-200	96	101-200
0.5-0.6	92	201-300	92	201-300
0.7-0.8	84	301-400	84	301-400
0.9-1.0	75	401-500	75	401-500
Over 1.0	Reject	Over 500	Reject	
			65	501-600
			54	601-700
			42	701-800
			29	801-900
			15	901-1000
			Reject	Over 1000

EXHIBIT C

Design Standards

Streets

General

The purpose of these Standards is to provide minimum standards to safeguard life and limb, health, property and public welfare by regulating the design of, construction of, choice of materials used for, location of, maintenance and use of all public improvements and common facilities including, but not limited to, public and private streets, traffic signals and devices, public and private parking lots and appurtenances thereto. All equipment and material shall be new unless approved by the Town of Ridgway (Town).

These Standards represent minimum requirements and design values. Additional requirements of higher design values, commensurate with conditions, may be required by the Town if, in the Town's judgment, they are in the best interest of the Town. These design guidelines have been prepared to assist engineers preparing plans for roads and other street related public improvement projects in the Town of Ridgway. Variations may be considered based solely on sound engineering practice and will be reviewed and approved by the Town on an individual basis. Such variations must be requested in writing along with sufficient documentation supporting the request.

CDOT Specifications. Section 101 and Sections 200 through 717 of the current Standard Specifications for Road and Bridge Construction of the Colorado Department of Transportation, State of Colorado, (*CDOT Specifications*) as re-emphasized, supplemented or amended by the State and by these specifications shall govern all road and bridge construction work within the public right-of-way and in other areas of Town jurisdiction or ownership. Where a conflict in Standards exists, the more stringent shall apply unless otherwise approved by the Town.

Street System Design Criteria

Layout. Layout of all street systems shall conform to the Town subdivision requirements as defined in the Subdivision Regulations and with the Town Standards. Generally, local residential cross sections shall be used in areas where average daily traffic (ADT) is not likely to exceed 400 vehicles per day. Collector and arterial streets shall be constructed whenever engineered traffic analysis of the future traffic volumes indicates the need of a cross section greater than that of a local service street.

Additional ROW and/or easements may be required to satisfy other criteria contained in these Standards, or as deemed necessary by the Town. Areas outside the ROW shall be contour graded, compacted, and sloped, as required for proper drainage, soil stability, and maintenance accessibility. Outside the clear zone, cuts and fills proposed on slopes greater than three (3) horizontal to one (1) vertical shall require supporting calculations provided by a qualified geotechnical engineer based on a soils analysis. Within the clear zone slopes shall not exceed 6:1.

Staking Requirements

The professionally licensed surveyor shall set stakes at the bottoms of the approaches, the vertical point of change (VPC), the design elevation at the vertical point of intercept (VPI) station, the high point or low point, and the vertical point of tangent (VPT), as well as 25' stationing for the vertical alignment. For the

horizontal alignment, provide stakes at 25 ft stations for flow line and top back of walk if not attached to curb, for ADA ramps include the beginning of the drop and end of the drop, sidewalk, begin curb return (BCR), ½ delta, and end curb return (ECR), and the details for the valley pans and fillets.
Survey stakes shall be set so that they are not in the way of construction and a set precisely due to precision that is needed especially on Frederick.

Provide the Town cut/fill sheets that have the name of the point being staked, the station, the offset, the elevation of the top of stake, the design grade at that location, and the cut or fill.

Design Element Coordination

Horizontal and vertical alignment continuity shall be provided between new and existing streets to achieve safe and aesthetically pleasing transitions. Sufficient data on existing infrastructure shall be depicted on plans, and limits of construction shall be designated to ensure that the desired continuity is achieved. Drainage and utility facilities are to comply with all applicable sections of Town Standards and are to be fully coordinated with the street design and proposed construction. Where new construction adjoins existing development, the design of the new construction shall incorporate the same standards to the adjoining existing development unless more stringent requirements are deemed necessary and demonstrate in the plans no adverse impacts on existing facilities, public and private

Traffic Impact Study

All requests for subdivision, zoning and other site developments shall provide a Traffic Impact Study using the Institute of Traffic Engineers (I.T.E.) informational manual, when requested by the Town, in a form specified by the Town. Impact Studies will typically be required for developments adding more than 12 additional lots.

Driveway Construction Regulation

Every driveway hereafter constructed, reconstructed or altered, in the Town right-of-way, shall conform with RMC 14-5-15 and to the following regulations.

(1) No driveway shall be so located as to create a hazard to pedestrians, motorists, or to invite or compel illegal or unsafe traffic movements.

(2) Unless otherwise approved by the Town, all driveways shall be constructed within lines at right angles to the curb or street line.

(3) No driveway shall be constructed in such a manner as to create a hazard to any existing street lighting standard, utility pole, traffic regulating device or fire hydrant. The cost of relocating any such street structure when necessary to do so shall be borne by the responsible party. Relocation of any street structure shall be performed only by or through the person holding authority for the particular structure involved.

(4) No construction, alteration or repair shall be permitted for any driveway which can be used only as a parking space or which provides access only to the area between the street roadway and private property.

(5) All driveways shall be so constructed that they shall not interfere with the drainage system of the street.

(6) Where curbs exist, or are required, driveways shall be paved for their full width from the back of curb to the property line.

(7) A driveway or curb cut on a corner lot shall be set back a minimum of ten (10) feet from the property line at the corner or shall be a minimum of twenty (20) feet from the cross street curb line whichever is greater.

(8) No property shall be allowed more than one driveway (no looped driveways).

(9) Allowable widths for driveways are listed on the driveway typical drawings.

(10) Water meter pits shall not be located in any driving or parking surface unless otherwise approved by the Town.

(11) No curb cuts shall be allowed on a State Highway except with written permission of the Colorado Department of Transportation. The responsible party shall obtain all required permits.

(12) Where curbs do not exist and a driveway crosses a drainage ditch, if practical driveway shall have a pan at the barrow ditch. If approved by the Town, a culvert may be installed by the property owner at a diameter sized according to the ditch capacity, but in no case less than twelve (12) inches. The minimum length of any culvert shall be five (5) feet greater than the driveway width or twenty (20) feet whichever is greater. Culvert installation shall include flared end sections with geotextile beneath riprap to prevent erosion.

(13) Any deviation from these standards shall be allowed only by special written permission from the Town.

<u>Angled Parking in Town-Owned Rights-of-Way</u>

(1) Proposed angled parking in rights-of-way shall not be allowed on Federal or State Highways, Town major arterial streets, or Town minor arterial streets,

(2) New angled parking in the right-of-way where there is adequate width, shall be constructed in sections not less than half (½) of a town block in length.

(3) The applicant shall submit two (2) sets of construction drawings to the Town, and receive approval from the Town staff of said drawings, prior to initiating construction of any angled parking in the right-of-way. The entity performing the construction shall obtain any necessary permits to work in the Town right-of-way.

(4) Angled parking in the right-of-way shall meet the following design standards:

(a) A six (6) foot wide sidewalk with a minimum six (6) foot landscaped area between the sidewalk and the vertical curb section, or a fourteen (14) foot sidewalk with a two (2) foot strip of a different pattern or texture before the beginning of the curb/gutter section shall be included, with street trees placed at

required intervals in appropriately designed tree grates.

(b) Trees shall be planted between the sidewalk and the parking area at approximately twenty-five (25) foot intervals.

(c) Angled parking in the right-of-way shall be delineated by vertical curbs. However parking blocks are prohibited.

(d) Landscaped islands defined by vertical curb and gutter extending as far into the street as is necessary to define the required depth of the parking spaces, and a twelve (12) foot to fourteen (14) foot travel lane shall be built at all corners, and at mid-block. The islands at the corners shall be of sufficient size to accommodate adequate snow storage during the winter. The specific size(s) for said islands shall be determined during the review of the construction plans.

(e) Sidewalks and a striped crosswalk at the mid-block crossing may be required. The decision as to the necessity of a sidewalk and crosswalk shall be made during the review of construction plans, and shall be based upon the location and projected level of use.

(f) Angled parking in the right-of-way shall be at either a sixty degree (60^{O}) or forty-five degree (45^{O}) angle. The size of parking spaces shall be in conformance with the parking typical drawing in the Town Standards

(g) Angled parking in the right-of-way shall not be allowed within forty (40) feet of corners (as measured from the existing curb line) where parked cars back into the travel lane toward an intersection; said parking shall comply with the distance requirements set forth in the edition of the 2010 edition of *Model Traffic Code for Colorado Local Governments* currently adopted by the Town of Ridgway:

(i) No parking within five (5) feet of a driveway
(ii) No parking within fifteen (15) feet of a hydrant
(iii) No parking within twenty (20) feet of a crosswalk

(iv) No parking within thirty (30) feet of a traffic control signal

(h) All designs shall meet standards of the Americans with Disabilities Act, 42 U.S.C. § 12101, *et seq*., as amended. Design guidance is available in the Public Right-of Way Accessibility Guidelines (PROWAG).

(i) It shall be the applicant's responsibility to provide engineering drawings stamped by a registered engineer that show adequate drainage capacity, and integrate well with the drainage pattern throughout the rest of the block. Covered drains may only be allowed in the discretion of the Town in areas where no other reasonable options exist.

(j) Landscaping plans for the islands and the entire parking arrangement shall be submitted and approved by the Town prior to construction. Landscaping shall be consistent with the Town Landscape regulations and be consistent with Low Impact Development criteria. Drip irrigation shall be provided where needed to establish the landscaping. Nonfunctional turf is discouraged. No vegetation or other objects shall intrude into clear vision areas.

(k) Deviations from these design standards require written request for the deviation with sufficient support documentation for the Town to assess the request.

(5) Adjacent property owners shall be responsible for maintaining the street trees, vegetated islands, and any planting strips located in the Town's right-of-way in accordance with RMC 14. Adjacent landowners shall also be responsible for snow removal, striping, and pavement repair and/or replacement within any right-of-way.

(6) Angled parking in the right-of-way shall be for use by the general public, and not solely for the private use of the person requesting it, or the adjacent landowner, or business entity owned by said requesting person. Signage is prohibited which purports to limit the public's use of angled parking spaces that have been installed in the right-of-way.

Subgrade Investigation and Pavement Design Report. This report shall be prepared by or under the supervision of and signed by a Professional Engineer currently registered in the State of Colorado and shall include the following information.

(1) Vicinity map to locate the investigated area.

(2) Scaled drawings showing the location of soil borings.

(3) Scaled drawings showing the estimated extent of subgrade soil types

(4) ESAL for each street.

(5) Pavement design alternatives for each street on a scaled drawing.

(6) Tabular listing of sample designation, sample depth, Group Number, Liquid Limit, Plasticity Index, percent passing the No.200 sieve, Group Index, Unified and AASHTO Classification, and soil description.

(7) Proctor Compaction Curves.

(8) R-value test results of each soil type used in the design. Minimum R values shall meet the Town Standards

(9) Pavement design methodology following AASHTO *Guide for Design of Pavement Structures*– with all assumptions and variables clearly defined.

(10) Design calculations.

(11) A narrative describing potential subgrade soil problems including, but not limited to, heave or settlement prone soils, frost susceptible soils, ground water, drainage considerations (surface and subsurface), cold weather construction (if appropriate), and other factors, properties, or fill areas which could affect the design or performance of the pavement system.

(12) Recommendations to alleviate or mitigate the impact of problems discussed above.

Quality Control

The Responsible Party is responsible for quality control of all work performed and shall implement whatever procedures, methods, testing, surveying, and supervision that is required in order to insure that the work conforms to the approved plans and Street System Standards.

The Responsible Party is responsible for submission of HMA quality control testing documentation to verify that the mix design for the work performed conforms to the Standards for Hot Mix Asphalt (HMA) as shown in Table 1.

TABLE 1 – REQUIRED QUALITY ASSURANCE (QA) / *QUALITY CONTROL (QC)* TESTING

TEST SPECIFICATION TEST REQUIRED	TEST PROCEDURE TOLERANCE	FREQUENCY PART TIME INSPECTION	FREQUENCY FULL TIME INSPECTION
Compaction of subgrade under curbs, gutters, and sidewalks.	AASHTO T 99 95% minimum	1 per 200 LF	1 per 400 LF
Compaction of subgrade and embankment under roadways.	AASHTO T 99 CDOT 203.07	1 per 400 SY	1 per 600 SY
Compaction of agg. base course under concrete curbs, gutters, and sidewalks,	AASHTO T 180 95% minimum	1 per 200 LF	1 per 400 LF
Compaction agg. base course under fillets and drainage pans	AASHTO T 180 95% minimum	1 per fillet; 1 per 50 LF pan	1 per fillet 1 per 100 LF pan
Compaction of aggregate base course materials under roadways.	AASHTO T 180 95% minimum	1 per 400 SY	1 per 600 SY
Compaction of Structure Backfill	AASHTO T 180 95% minimum	1 for each 2 ft. of vertical depth per 100 LF of structure perimeter	
Gradation of aggregate base course *(QC)*	CDOT Table 703-2	1 per 5000 Ton	1 per 5000 Ton
HMA *			
Asphalt Content *(QC)*	CP41 method A or E, or CPL 5120	1 per 1000 Ton 1 per day min.	1 per 1000 Ton 1 per Day min.
Gradation of aggregate *(QC)*	CP31 CDOT Table 703-3	1 per 1000 Ton	1 per 1000 Ton
Air Voids (Pa) *(QC)*	AASHTO T 269 2.8% to 5.2%	1 per 1000 Ton	1 per 1000 Ton
Voids in Mineral Aggregate (VMA) *(QC)*	CP48 See Table 5	1 per 30,000 Ton	1 per 30,000 Ton
Percent Relative Compaction *(QC)*	CP81 92% to 96%	1 per 500 SY	1 per 800 SY
CONCRETE TESTS *			
Compressive Strength *(QC)*	ASTM C 31 and C 39 4500 psi min in 28 days	1 set/100 CY (4 cylinders per set)	1 set/day/500 CY
Air Content *(QC)*	ASTM C231 5-8%	1 per 100CY	1/day/500 CY
Slump *(QC)*	ASTM C 143 4" maximum	1 per 100CY	1/day/500 CY

CP= Colorado Procedure (CDOT) Field Materials Manual

* The job mix formulas for HMA and Portland Cement concrete shall be submitted in typed form by the Contractor to the City Engineer at least ten (10) days prior to the start of paving or concrete placement.

Part Time Inspection. Where the Engineer or representative of the Engineer is on the project for periodic observation, documentation, and/or testing of the project construction, in an as needed capacity.

Full Time Inspection. Where the Engineer or representative of the Engineer is on the project for continuous observation, documentation and/or testing during the hours of project construction.

Quality Assurance

The developer, owner or Responsible Party for administering the construction of public facilities shall

provide a quality assurance program. This program shall include systematic inspection and testing of the work and materials during construction to assure the owner and the Town that the Contractor is providing work that is in conformance with the Town-approved plans and specifications.

Initial testing shall be performed at the beginning of each construction phase in order to identify and correct any non-compliant work.

A minimum of one test will be required for any portion of material less than that shown in the "Frequency" column on Table 1 above.

All failing tests shall be re-tested after the material has been reworked, modified or adjusted by the Contractor. The Contractor will be required to remove and replace any work or materials that do not meet test requirements or specifications to the satisfaction of the Town.

Removals, Excavation, Backfilling, and Restoration Specifications

General. This section covers surface removals, excavation, backfilling, compaction, disposal of surplus material, restoration of disturbed surfaces, and all other work required for the safe and proper road construction.

Concrete Removal. Concrete pavement shall be cut vertically along pre-marked lines, unless otherwise specified. The depth of the saw cut shall be to the full depth of the concrete section. Cut shall begin at construction joint and extend to the next construction joint unless the plate remaining will be more than 4 ft long.

HMA Pavement Removal. HMA pavement designated to be cut for removal, where new HMA pavement will be placed against the cut face, shall be wheel cut or saw cut, along a neat line. HMA pavement designated for removal, where concrete pavement will be placed against the cut face, shall be saw cut along a straight line with a vertical face. Cut faces of concrete and HMA pavement shall be protected from damage until the new pavement is placed against them.

Excavation and Backfill of Structures. Pipe bedding and trench backfill material and compaction requirements are specified in Section 02200 of these Standards.

Flow-fill where approved by the Town for use shall meet the requirements of CDOT Standards. The Town may require that a sample of the proposed flow-fill mix be prepared, tested and/or placed in the backfill to demonstrate its performance prior to approval of the mix. Flow-fill shall be placed to the depth indicated on the plans or as directed by the Town. Bleed water shall be drained off or otherwise removed from the surface of the flow-fill after it has been placed.

Excavation and backfill for the installation of all pipe, manholes, valves, vaults and other structures and appurtenances shall be in accordance with Sections 02200, 02713, and 02723

Topsoil Placement. Topsoil shall be furnished in and installed in accordance with the requirements in Section 02200 of these standards

Dust Control. The Responsible Party shall furnish and apply a dust palliative on portions of the roadway, haul roads and other locations as necessary or as directed to prevent air borne dust. This shall include

prevention of dust generated from the Contractor's operations and from windy weather conditions. Dust abatement shall be provided, as needed, throughout the construction period, including nights, weekends and holidays.

Subgrade Stabilization. Subgrade stabilization shall be provided in accordance with Section 02200 of these Standards.

Base Course Construction

General. Materials shall be placed on an approved subgrade that has been proof rolled within the previous twenty-four hours and found to be stable and non-yielding. Should weather conditions change, such as freezing, precipitation, etc., aggregate base materials shall not be placed until the subgrade has been retested and proof rolled and is re-approved by the Town. Each subsequent lift shall be density tested and proof rolled before placing the following lift.

(1) The required thickness of the base course may be reduced, subject to the approval of the Town, by increasing the depth of HMA at the rate of two (2) inches of aggregate base course to one (1) inch of HMA, or appropriate depths based on strength coefficients.

(2) If the required compacted thickness exceeds six (6) inches, the base course shall be constructed in two or more lifts of equal thickness. The maximum thickness of any lift to be compacted shall not exceed six (6) inches.

(3) The minimum depth of base course on streets and alleys shall be six (6) inches. Class 5 and 6 material shall be classified as base course. Class 5 and Class 6 material shall have a minimum "R" value of 78 Class 6 shall meet the requirements of Sub section 2.04 of Section 02200.

(4) Class 2 material shall be classified as subbase course and shall be used only when the base requirement is greater than six (6) inches. Class 2 material shall have a minimum "R" value of 70. Class 2 shall meet the requirements of Sub section 2.04 of Section 02200.

Base Course Placement**. T**he base course material shall be placed on the previously prepared subgrade at the locations and in the proper quantities to conform to the typical cross sections as shown on the plans. Placing and spreading shall be done by means of a spreader machine, moving vehicle, motor grader, or by other approved equipment methods. The material shall be placed without segregation. Any segregated areas shall be removed and replaced with uniformly graded material at the Responsible Party's expense.

The base material may be placed in lifts of up to six (6) inches, providing that after compaction, uniform density is obtained throughout the entire depth of the lift. If the required depth exceeds six (6) inches, it shall be placed in two (2) or more lifts of approximate equal thickness. If uniform density cannot be obtained by six (6) inch lifts, the maximum lift shall not exceed four (4) inches in final thickness.

Base material shall not be placed on a foundation that is soft or spongy or one that is covered by ice or snow. Base material shall not be placed on a dry or dusty foundation where the existing condition would cause rapid dissipation of moisture from the base material and hinder or preclude its proper

compaction. Such dry foundations shall have water applied to them and shall be reworked or re-compacted. A geotechnical engineer shall provide base material recommendations where foundations are not stable.

Care shall be exercised in the hauling and placing of base course so as to avoid segregation of the coarse and fine materials. The base course material shall be placed on the previously prepared and approved subgrade in sufficient quantity to conform to the thickness specified on the approved cross section. The material shall be mixed and watered to obtain a uniform mixture at optimum moisture.

Compaction. Rolling shall be continuous until the base material has been compacted thoroughly in accordance with Section 304 of the current CDOT Standard Specifications. Water shall be uniformly applied as needed during compaction to obtain optimum moisture content and to aid in consolidation. The surface of each lift shall be maintained during the compaction operations such that a uniform texture is produced and the aggregates are firmly placed.

Optimum Moisture Content

(1) Native material shall be placed and compacted near optimum moisture plus or minus two percent +/- 2%). The compaction shall be continued until the base course has a density of not less than ninety-five percent (95%) of its Modified Proctor near optimum moisture.

(2) At least twenty percent (20%) of the tests shall be taken within one (1) foot of a manhole or valve box.

(43) Nuclear testing equipment and methods are acceptable when performed by an approved certified testing laboratory and when performed in accordance with the requirements of ASTM D-2922 and ASTM D-3017.

(4) Each lift shall be proof rolled prior to the placement of the next lift.

Final Proof-Rolling**.** The finished base course surface shall be smooth and free of ruts and irregularities, and shall be true to grade and crown as shown on the plans. The base course shall be maintained in this condition by watering, drying, rolling, or blading until the final surface is placed.

After the base course has been compacted, tested and found to meet specifications, the entire base shall be proof-rolled with a heavily loaded vehicle with the Town or approved representative onsite for observation. The vehicle must have a certified loaded GVW of fifty thousand (50,000) pounds with a loaded single axle weight of at least eighteen thousand (18,000) pounds and a tire pressure of ninety (90) psi. Subbase that is pumping, deforming, or failing in any way shall be reworked, replaced or otherwise modified to form a smooth, stable, non-yielding base for subsequent paving lifts. The Town shall be notified at least twenty-four (24) hours before final proof rolling.

Field Density Testing**.** The Responsible Party shall provide and pay for laboratory and field testing at the rate of 1 test for every 500 square feet of surface on every finished subgrade, sub base and base surface to demonstrate quality assurance.

Base Course Approval**.** The results of field density tests and proof rolling shall be submitted and reviewed by the Town. Provided all tests are acceptable, compaction shall be approved for the

placement of the HMA. Should testing indicate unsatisfactory work, the necessary reworking, compaction or replacement shall be required prior to continuation of the paving process. The approval is valid for twenty-four (24) hours. Changes in weather, such as freezing or precipitation, shall require re-approval of the base course.

Shape Control. Responsible Party shall demonstrate by string lining that the base course is shaped to the design shape.

HMA Pavement Materials and Construction.

General

This work consists of one or more lifts of a bituminous mixture constructed on a prepared foundation in accordance with these Street Standards. The placement of HMA shall conform to the lines, grades, thickness and typical cross sections shown on the plans or established. Each lift shall be compacted to the required density and approved before placement of the next lift.

HMA for patching consists of those quantities required for the replacement of unstable corrugated areas in the existing pavement, pipe trenches, areas removed for curb and gutter forms, areas between the curb and gutter or sidewalk and the existing paved parking lots, and areas designated on the plans.

Weather Limitations

Apply prime and tack only when the ambient temperature in the shade is 50 F and when the temperature has not been below 35F in the previous 12 hours

Do not pave when base surface is wet or contains an excess of moisture

Place asphalt only when the air temperature is 40 F or above, when the underlying base dry and the weather is expected to not precipitate.

Traffic Control

Control vehicular and pedestrian traffic as needed to protect the public and the paving operations in accordance with the MUTCD.

Provide flagman, barricades, warning signs, and warning lights for movement of traffic and safety to cause the least disruption to the work and inconvenience to the public.

Street closures require approval of the Town and notice to all impacted users of the roadway.

Aggregates

Aggregates shall be of uniform quality, clean, hard, durable particles of crushed stone, crushed gravel, natural gravel, or crushed slag free from clay balls, organic matter, or other deleterious materials. Aggregates meeting the requirements of Table 2 shall be used to develop the Job Mix Formula and the HMA mixture. The aggregate should be composed of angular, coarse textured, cube shaped particles. Excess of fine material shall be wasted before crushing. Sand may be used to obtain gradation of the

blended aggregate mixture but should not exceed more than fifteen percent (15%). If the percent aggregate passing the #4 sieve is greater than ten percent (10%) by weight of the individual aggregate sample, plasticity will be determined in accordance with AASHTO T 90.

TABLE 2: AGGREGATE PROPERTIES

Property	Test Procedure	Coarse Retained on #4 Sieve	Fine Passing the #4 Sieve
Fine Aggregate Angularity Traffic Level Low, Moderate Trails and Pathways Traffic Level 3 to 5 Moderate, High, Parking Lots	CP-L5113 Method A		40% Minimum 45% Minimum
Fractures Faces (minimum 2)	CP-45	80% Minimum	
LA Abrasion	AASHTO T 96	45% Minimum	
Flat and Elongated Places	AASHTO M 283	10% Maximum	
Sodium Sulfate Soundness	AASHTO T 104	12 % Maximum Combined Coarse and Fine	
Adherent Coating (Dry Sieve)	ASTM D 5711	0.5 %	45% Minimum
Sand Equivalent	AASHTO T 176		45% Minimum

(1) Sources of Aggregates. Sources of aggregates shall be designated by the Responsible Party with the submittal of the job mix formula.

(2) Gradation. The gradation of aggregates used in the mixture shall meet the criteria shown in Table 3, the Aggregate Master Range Table, and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa, but shall be well graded from coarse to fine. The nominal size aggregate used in the HMA mixture shall not be more than one-third (1/3) the thickness of the HMA lift being constructed.

TABLE 3: AGGREGATE MASTER RANGE TABLE

Sieve Size	Percent by Weight Passing Square Mesh Sieves		
	Grading S	Grading SG	Grading SX
1 ½"		100	
1"	100	90 - 100	
¾"	90 - 100		100
½"			90 - 100
3/8"			
#4			
#8	23 - 49	19 - 45	28 - 58
#30			
#200[1]	2 - 8	1 - 7	2 - 10

HMA Material**.** Binder (asphaltic cement) shall be from an approved source and shall meet the requirements listed in Table 702.2 of the current *CDOT Standard Specifications for Road and Bridge Construction.* Based on climatic conditions and reliability, the binder grade approved for use in the Ridgway area is PG 64-22 or PG 58-28 Non-Modified Binder and PG 64-28 Modified Binder.

(1) Composition of Mixture. The HMA plant mix shall be composed of a mixture of well-graded aggregate, filler (if required), bituminous material and anti-stripping additive. The aggregate fractions shall be sized, handled in separate size groups and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula.

(2) Job Mix formula. No HMA mixture shall be produced until the Town has approved a job mix formula.

(a) The job mix formula shall be submitted by the Responsible Party to the Town at least ten (10) days prior to the start of paving operations.

TABLE 4 DESIGN CRITERIA	
Test Property	**Requirements**
Stability	28 min
Compaction Gyrations (N design)	75*
Air Voids (percent by volume of mix)	3.0 to 5.0
Voids Filled (percent by volume of mix)	65 TO 78
Voids in Mineral Aggregate	See Table 5

* On roadways with high traffic loading, Ndesign greater than seventy-five (75) gyrations may be specified by the Engineer of record (See Table 2-1 in the CAPA *Guideline for the Design and Use of Asphalt Pavements for Colorado Roadways*)

TABLE 5 Voids in Mineral Aggregate (VMA)				
Nominal Maximum Particle Size *		**Minimum VMA (percent)**		
		Percent Design Air Voids		
mm	**In.**	**3.0**	**4.0**	**5.0**
9.5	3/8	14	15	16
12.5	½	13	14	15
19	¾	12	13	14
25	1	11	12	13
37.5	1-1/2	10	11	12
* The nominal maximum particle size is one sieve size larger than the first sieve to retain more than ten percent (10%).				

(b) The maximum size aggregate used shall not be more than one-third (⅓) of the thickness of the lift being constructed. (3:1 ratio)

(c) Job mix control testing shall be performed by the contractor at the start of plant production and in conjunction with calibration of the plant for the job mix formula. It should be recognized that the aggregates produced by the plant may not satisfy the gradation requirements or produce a mix that exactly meets the job mix formula. In those instances, it will be necessary to reevaluate and redesign the mix using plant-produced aggregates.

(d) Contractor may propose a design using rubber additives, recycled asphalt, warm mix asphalt, or other new technologies. The design shall be submitted to the Town for approval.

Job Mix Testing Requirements

All commercial testing and laboratory work necessary to establish the job mix formula and all testing necessary to assure conformance of materials and workmanship to the requirements of the specifications shall be arranged for and paid for by the Contractor. Copies of all test reports shall be submitted directly to the Town.

Volumetric Tolerances

HMA mix design volumetric tolerances for the approved HMA mixture shall be within the limits shown in Table 6. Mixture being produced by the plant shall be verified prior to the start of the placement of the mixture. Verification shall be performed by a **LabCAT Level C** certified technician to verify the volumetric properties of the mixture. If the mixture has been produced for another project within the last ninety (90) days, verification results from that project may be submitted for this verification.

TABLE 6: HMA MIXTURE DESIGN VERIFICATION TOLERANCES

Property	Tolerances
Air Voids	± 1.2%
VMA	± 1.2%
Binder Content	± 0.3%
Stability	applicable minimum

Lift Thickness

Each lift of compacted HMA shall be of uniform thickness. The minimum compacted lift thickness shall be three (3) times the maximum nominal aggregate size. The maximum thickness shall be three (3) inches unless the contractor can demonstrate the ability to achieve compaction of thicker lifts.

Patching

Unless otherwise approved by the Town, all trenches and excavations in collector or arterial streets shall be patched before the street is reopened to traffic. All longitudinal trenches shall be repaved with an asphalt paving machine. The Responsible Party shall maintain all temporary patches until a permanent patch is installed. Between November 15th and March 1st, a four (4) inch thick concrete cap will be required on all excavations in asphalt section of right-of-way unless otherwise approved by the Town that is to be replaced with asphalt when the hot mix asphalt is available.

Prime Coat

EXHIBIT C

Prime coat materials and application shall be in accordance with the requirements of the current CDOT Standard Specifications, Section 407. Prime coat shall be applied to compacted base course except when the base has been processed and compacted in the last 24 hours. Prime coat material shall be allowed to cure a minimum of twenty-four (24) hours prior to asphalt paving unless otherwise authorized by the Town.

(1) Surface Prep. Before applying the prime coat, all loose material shall be removed from the surface. That portion of the surface prepared for treatment shall be dry and in satisfactory condition. Dust or contamination of prime coats shall require brooming and reapplication.

(2) Emulsified Application. Asphalt Emulsified Prime (AEP) shall be applied in accordance with the manufactures recommendations. The prime coat shall be carefully applied. If excessive amounts of curb, sidewalks, or other structures are sprayed with liquid asphalt, they shall be cleaned at the Responsible Party's expense. The prime coat shall not be applied when the surface is excessively wet, when the atmospheric temperature is less than forty degrees (40º) Fahrenheit, when precipitation is imminent, or as recommended by the manufacturer.

(3) Curing. Curing shall be required for all prime coats. The prime coat shall be sticky, or tacky, when cured. The length of time required for curing shall depend on the air temperature, humidity and wind conditions, and the prime coat shall be black when cured. The prime coat shall be allowed to cure for a minimum of twenty-four (24) hours prior to the paving operation unless otherwise authorized by the Town. If after the curing period the prime coat has not penetrated the base material, and the surface must be used by traffic, a suitable blotter material shall be applied in amounts necessary to absorb excess liquid asphalt. The blotter material shall be a dry, gritty sand.

(4) Coverage. Prime coat AEP shall be uniformly applied at a rate of three-tenth (0.3) gallons per square yard to the surface of the aggregate base course. Application rates for other approved prime coat materials shall be as specified in the Contract Documents or as directed by the Town.

<u>Tack Coat</u>

When tack coat is specified on the approved plans or required by the Town, all materials and construction shall be in accordance with the requirements of the current CDOT Standard Specifications, Section 407. Tack coat shall be applied where additional HMA is to be placed over existing asphalt or concrete surfaces. Tack coats shall not be required where prepared surface has not been opened to traffic and is less than twenty-four (24) hours old and remains free of dust, dirt or debris.

(1) Surface Preparation. Before applying the tack coat, all loose material shall be removed from the surface. That portion of the surface prepared for treatment shall be dry and in satisfactory condition. Dust or contamination of tack coats shall require brooming and reapplication.

(2) Liquid Asphalt. The liquid asphalt used for tack coat shall be an emulsified asphalt grade CSS-1h or SS-1h and shall satisfy the requirements of ASTM D977. Other emulsified asphalts may be used upon written permission of the Town.

(3) Application. The surface shall be allowed to cure to permit drying and setting of the tack coat prior to the paving operation. A 1:1 dilution should be applied at the rate of 0.05 to 0.15 gallons per square yard.

A wand, spray bar, or hand spray nozzle attached to the spray bar can be used for applying tack to gutter faces, valve boxes, manholes and rings.

Appurtenances

Valves and manholes and other surface appurtenances shall be protected by plastic and paved over and then adjusted to ¼" below the finished elevations.

Surface Smoothness

The finished surface of all pavements may be subject to testing by the 10-foot straightedge method. At the request of the Town, the Responsible Party shall furnish an approved ten (10) foot straightedge and depth gauge and provide an operator to assist the Town in testing the finished pavement surface. Areas to be tested shall be determined by the Town or the Construction Inspector. The variation between any two contacts with the surface shall not exceed three-sixteenth (3/16) inch in ten (10) feet. Areas showing deviation of more than three-sixteenth (3/16) inch shall be marked and corrected at the Responsible Party's expense. This test may be waived by the Town.

Asphalt Content

Asphalt content control shall be part of the Contractor's Quality Control. If the materials are within the specification limits, the lot shall be acceptable. Volumetrics falling outside the limits of the job mix formula will warrant corrective action, which may include removal and replacement of the represented day's production.

Asphalt Testing

The Responsible Party shall provide and pay for all laboratory and field testing at the rate of 1 test per 1000 square foot of asphalt area on the top of each lift for quality assurance.

Final Inspection and Acceptance

The acceptance of all road and bridge improvements by the Town will be based on the following.

(1) Submittal of satisfactory results of all required quality assurance (QA) tests certified by the Responsible Party's Engineer or a qualified independent laboratory.

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

(3) Passing a final inspection of the work by the Town.

(4) Submittal of two sets of Record (As-Built) Drawings in accordance with the Town of Ridgway submittal standards in Sub Section 19 of the General Requirements for the Town Standards.

(5) The Responsible Party shall guarantee all portions of the street for a period of two (2) years after completion against defective workmanship and materials and shall keep the street in good repair during that period. The Town shall possess sole authority to require the Responsible Party to repair or replace

dedicated public improvements throughout the warranty period. This decision shall be final and obligatory upon the Responsible Party.

Signs

General - Regulatory and street name signs shall be on breakaway posts and generally conform to the Manual of Uniform Traffic Control Devices section 2D.38. Colors used shall be those specified in the MUTCD.

Design - Town street names signs shall be as directed by the Town to match other signs in the Town. The font shall be Standard Alphabets for Traffic Control Devices Series B. The Town logo shall be affixed to the left of the street name. Punctuation shall not be used.

EXHIBIT D

TOWN OF RIDGWAY STANDARD SPECIFICATION AND TYPICAL DRAWINGS FOR INFRASTRUCTURE CONSTRUCTION

ADDENDUM #1 – JANUARY 10, 2024

Div. 1 Pg 3, Definitions, After Backsiphonage, Add to following:

> CDOT STANDARDS shall refer to the Colorado Department of Transportation. Standard Specifications for Road and Bridge Construction

Div. 1 Pg 3, Definitions, Developer's Representative. Add the following at the end of the definition:

> Notify the Town in writing of who the Developer's Representative is no later than at the preconstruction conference.

Div. 1 Pg 4, Definitions SubContractor, Add the following at the end of the definition of subcontractor:

> The responsible Party is responsible for the work performed by sub contractors, suppliers and his design professionals.

Div. 1, 9 Plans for Review, sub section 9.03 Modify the last sentence to read:

> All other proposed improvements including a flushing and disinfection plan shall be shown on the plans as should all existing infrastructure and improvements as shall be all easements existing and proposed.

Div. 1, 13. Notifications, 3.01, Change the notice required resuming work from one day to two work days

Div. 1, 13. Notifications, 13.04 Change to notice required from 24 hours to two work days. At the end of this section add the following:

> The responsible party shall provide all testing equipment.

Div 1, 19. Record Drawings 19.01 Revise the first paragraph to read:

> Unless otherwise agreed in writing, during construction the Responsible Party shall ~~all~~ log all of the construction progress and ~~-~~engage a registered professional land surveyor~~the~~ to field locat~~ion~~e all of the new facilities. All buried facilities and lines shall be tied to permanent surface monuments, using centerline monuments when available, at 200 foot intervals or less. Valves, fittings, changes in direction, appurtenances, vaults, cleanouts, and manholes shall be tied to a minimum of three permanent surface monuments. Water service connection informations~~s~~ shall also include distance from the closest ~~vale to~~ valve box to the tap and for sewer services the distance from the manhole to the wyeand the depth from the sidewalk to the invert of the dead end stub. Depths and elevations shall be recorded at each station as well. Record Drawings shall be clean drawings, not design drawings with updates, at a scale at least as large as required in Section 8, shall be prepared noting the final sizes, locations, and ties at all of the required locations. These drawings shall also note the brand names, model numbers, and sizes of all manufactured equipment installed as part of the project. Approved Record Drawings shall be a requirement for release of security and/or final completion unless the deadline is specifically extended by the Town. Once the Record Drawings have

been approved by the Town, the Responsible Party shall promptly submit a mylar copy of the approved drawings, a digital copy in an AutoCAD 2020 readable and edit-able format and a shape file the Town can insert in to their GIS system per the following:

Div 1, 20. Acceptance, 20.02 Revise to read:

Following the Town determining that all ~~infrastrcture~~infrastructure construction has been satisfactorily completed, ~~all required~~ satisfactory testing of all work as defined in applicable minimum and standard specifications being completed and submitted, and delivery of all required equipment and materials and necessary documents (including Record Drawings and any required O&M data) to convey the system and appurtenant easements to the Town, the Town will give preliminary acceptance to the project. At this time the facilities may be tied into the Town system and service provided. For the first twelve months thereafter, longer if agreed to by Town and the Responsible Party, referred to as the Correction Period, the Responsible Party will be responsible for all operation, maintenance, and repair costs including but not be limited to, the cleaning of streets, patching of potholes, and maintenance and repair of water, storm and sanitary sewer facilities. The cost of any routine maintenance not performed by the Responsible Party that must be performed by the Town will be billed to the Responsible Party at cost plus twenty five percent (25%). During ~~that~~ the Correction period, the Town shall be notified when O & M and/or repairs will be performed on the facilities that will be accepted by the Town, and at the Town's option it may elect to have an Inspector present during such operations.

Section 02200 2.03 Bedding and Pipe Zone Materials Classification Revise Class C to read:

Class C - Selected soils of low permeability, free from clods and stones greater than ¾" in maximum dimension, free of angular or abrasive materials, and free of all unsuitable materials as defined below.

Section 02200 3.08 Bedding Backfill, and Compaction Sub- Section F. Revegetation, Modify the last paragraph to read:

Where shrubs or tress were present prior to the disturbance and have been damaged or removed, ~~it is recommended that~~ the same type of shrubs and trees shall be replanted at approximately the same density and size as originally present unless the slope prohibits such planting, ~~or~~ the vegetation was larger than is practical to replant, or a more water wise shrub or tree is requested by the Town. ~~Where trees in excess of 3" caliber are damaged or removed during the project, replace trees with trees of similar species at twice the density.~~ In ~~that case~~the case that vegetation was larger than practical to replant, replant vegetation at twice the original density using the cross section diameter as a measure of the original density. Provide irrigation as needed to establish and support the plantings.. Protect such plantings from wildlife damage.

Section 02713 2.04 B. Water Service Materials, Revise sub section B to read:

Service Saddles: Service saddles shall be Mueller 13000 bronze saddle with bronze straps and O Ring sealed outlet, sized for the pipe to which it will be connected with the correct tap size and thread. Saddles shall be AWWA C-800 and NSF 61 certified. **Only this model will be allowed**.

Section 02713 3.06 Pipe Laying, Add a new section H. to read:.

H. For all temporary taps or taps that are no longer needed, the connection should be removed, a full bodied wrap around clamp installed centered over the hole and fully wrapped with 2 layers of 4 mil plastic taped closed and carefully backfilled to not damage the plastic.

Section 02713 3.11 Hydrostatic Testing. Modify this section as noted:

The Contractor shall be required to perform hydrostatic tests on all water mains, laterals, dead ends, and service lines in accordance with AWWA specifications C600 for PVC pipe and C605 for ductile iron pipe . Prior to making the test the Contractor shall advice the Town of the time and place of the test so that adequate inspection can be provided. Prior to performance of the test the pipeline shall be completely filled with water for a period of 24 hours.

The test shall be conducted in the presence of the Town or its authorized representative. The testing of the lines shall be done without being connected to existing lines unless approved by the Town. All necessary apparatus for pressure testing including the pump, pipe connection, gauges, and measuring devices shall be furnished by the Contractor at no cost to the Town. If connections to the existing lines are allowed by the Town, it is with the understanding that the Contractor assumes any and all responsibility in

case of damage or failure of the existing system. Leakage through connections to the existing system, leaks in the existing lines, or leaking valves under the test pressure will invalidate the test and required the Contractor to find another means to test the line.

Prior to testing, all air shall be bled from the lines. If permanent air vents are not located at all high points, the Contractor shall install corporation stops at such high points so the air can be expelled as the line is filled then the corps closed. The lines shall be tested at 150 psi or 1.5 times the normal working pressure of the lines, whichever is greater, for not less than two (2) hours when performing the combined pressure and leakage test. Test pressure shall be measured at the high point in the line. All taps, gauges (3" face, liquid filled, 0- 200 psi, at least ~~5~~ 2 psi gradations), and necessary equipment shall be provided by the Contractor as approved by the Town; however, the Town may utilize its own gauges if it so elects. Each section of the new line, between valves shall be tested to demonstrate that each valve will hold the test pressure. No pipe installed will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{N * D * \sqrt{P}}{7400}$$

Where:

L = Allowable leakage (gal/hr)
N = Number of joints in the line
D = Nominal Pipe Diameter (in)
P = Testing pressure (psig)

During the test, the test pressure shall not lose more than 5 psig without being pumped back up to the test pressure. The total gallons of water required to return the line to the test pressure at the end of the test period is the total leakage. If the total leakage is less than the allowable, the line can be given preliminary acceptance. All visible leaks will be repaired regardless of the amount of leakage. If leakage exceeds that allowed based on the above formula, Contractor shall identify problems, make repairs, and repeat the test until the leakage is less than or equal to the allowable leakage.

When separate pressure and leakage tests are to be performed, test procedures shall conform with the procedures detailed in AWWA C600 or C605 as applicable. The duration of the pressure test shall be a minimum of one (1) hour and the duration of the leakage test shall be a minimum of four (4) hours.

~~Each gate valve shall be tested to~~Pressure test against each gate valve to ensure that it operates properly and provides watertight seal under 1 1/2 times operating pressure in the closed position.

Section 02713 3.12 Disinfection, Revise Sub-Section A to read as follows.

A. General: Flushing and disinfection of potable waterlines shall be done in accordance with the procedure set forth in AWWA C651 Disinfecting Water Mains, be consistent with CDPHE requirements and the requirements herein. All water lines and sections of water line which have been exposed including lines owned by other parties must be disinfected before being put in service. The Contractor shall provide all temporary blowoffs, pumps, chlorination equipment, chlorine and all other necessary apparatus required. The placement of powder chlorine in each joint of pipe will not be allowed. The use of the tablet method, the slug method listed in C651 or other methods may be proposed for Town consideration and will be reviewed on a case by case basis based on the situation.

Section 02713 3.12 Disinfection Revise sub section D as noted below:~~.~~

D. Chlorine Application: In general, chlorine shall be applied using the continuous feed method. ~~The tablet method may be used on short extensions (up to 2500 ft.) of small diameter mains (12 inch and smaller). Longer line segments require using the continuous feed method.~~

Section 02713 3.12 Disinfection. Revise Sub Section E. to read as follows:

E. Continuous Feed Method: Introduce water into the line at a constant rate while adding chlorine at a minimum concentration of 25 mg/l. Maintain the chlorinated water in the pipeline for a minimum of 24 hours after which period the treated water shall contain no less than 10 mg/l of chlorine throughout the entire length. Repeat the above procedure if the residual at the end of the 24 hours fails to meet the minimum concentration. ~~Note that use of the slug method, requires 3 hours contact with not less than 100 mg/l solution and not less than 50 mg/l free Cl2 at the end of the 3 hours.~~

Section 02713 3.12 Disinfection. Delete sub sections F.

Section 02713 3.12 Disinfection. Revise Sub Section G. to read as follows:

G. Final Flushing: After the required retention period, flush all heavily chlorinated water from the main until the chlorine concentration is no higher than that prevailing in the system, or less than 1 mg/l. If ~~When~~ the tablet method has been used, provide a flushing velocity equal to that of the preliminary flushing specified above.

Section 02713 3.12 Disinfection. Revise Sub Section I. to read as follows:

I. Bacteriologic Tests: After completion of the final flushing and prior to placing the pipeline in service, collect samples from the end of the line and test for bacteriologic quality to show the absence of coliform organisms. The number and frequency of samples shall conform to the requirements of the public health authority having jurisdiction but in no case shall the number be less than ~~one for chlorinated supplies and two collected 24 hours apart for unchlorinated supplies.~~two sets of samples collected at least 16 hours apart or two sets collected 15 minutes apart after at least a 16 hour rest period. Collect samples in sterile bottles from a standard corporation stop installed in the main. Do not collect samples using a hose or fire hydrant. Sterilize the corporation stop prior to sampling.

Section 02733 2.01 Products, Sub Section G. After the first sentence add the following:

Couplings used to connect or reconnect to a main or service shall be PVC unless otherwise approved by the Town for cause.

Section 02733 3.10. Connecting Existing Pipes. Revised to read:

3.10 Connecting Existing Pipes to New Manholes and New Pipelines: Where an existing manhole is to be replaced, Contractor shall excavate and remove and dispose of the existing manhole and replace the manhole with a precast base with pipe boots to accommodate each of the sewer lines which needs to be connected to the new manhole. No more than two couplings per manhole shall be used to reconnect all the pipes one of which at a minimum shall be a PVC coupling.. Manhole base shall be bedded in ~~flowable fill~~in accordance with the manhole and trench typical drawing ~~from the manhole to three feet past the coupling for the depth of the pipe zone.~~ A PVC coupling shall be used to connect between an existing pipe and a new pipe.

Section 02733 3.15 F. Procedure of Test. Add the following sentence at the end of this paragraph:

Responsible Party shall furnish the gauge to monitor the pressure. Gauge shall be liquid filled and must be marked in 1 psi increments.

Stormwater Standards

1. Introduction. Modify the 2nd to last sentence in this section to read:

All proposed Development as defined below and including any improvements that alter the flow of storm water shall submit to the Town a drainage report that contains all design calculations, imperviousness's spreadsheets, nomographs, and other documentation necessary for the design and review of the proposed improvements in accordance with these standards.

1.1 Standards Overview. Add a 5th bullet that reads as follows:

Any Development that causes changes in runoff patterns must demonstrate how that water will be rerouted to a location acceptable to the Town.

1.2.1 Definitions. Development. Add the following before the last sentence:

However, development does include changes in imperviousness for private benefit even within a Town right of way.

Table 3. Add a line to the table as follows:

Class 6	80% impervious

6.5 Water Quality Capture Volume, Modify Equation 19 to read:

(~~0.65*~~ A*a (0.91(i^3)-1.19(i^2)+0.78i)/