CONSTRUCTION CONTRACT

THIS CONSTRUCTION CONTRACT ("Contract") is made and entered into on the date of the last signature set forth below, by and between the **City of Littleton**, a municipal corporation within the State of Colorado ("City"), and **Fasick Concrete, Inc.**, a Colorado corporation ("Contractor"). The Contractor and the City are referred to as a "Party" or collectively the "Parties."

1.1 **Contract Documents and Exhibits**. The term "Contract Documents" consist of this Contract together with the following:

Exhibit A	Scope of Work
Exhibit B	Bid Schedule
Exhibit C	Performance and Payment Bond
Exhibit D	Littleton Engineering Design Standards ("Standards and Specifications") (Incorporated by Reference Only) (Exhibit D Available online)
Exhibit E	Drawings and Specifications
Exhibit F	Special Conditions

All exhibits referred to in this Contract are attached hereto and are, by reference, incorporated herein for all purposes. Any forms provided within the Contract are not intended to be considered final, and the City expressly reserves the right to modify said contract forms, in its sole discretion. In the event any matter, term, provision, or condition that is the subject of this Contract requires clarification or is in dispute, or is the subject of a difference of opinion, the purpose and intent of the Contract shall be first ascertained by reference to the Contract Documents in their entirety. In the event of any dispute or differences between the respective documents that constitute the Contract Documents, then the Contractor shall secure the written instructions from the City before proceeding with the performance of the services affected by such conflicts, omissions or discrepancies.

1.2 **Project.**

1.2.1 The Contractor shall commence and complete the Scope of Work ("Work"), **Exhibit A**, in accordance with the Contract Documents, as defined herein. The Contractor agrees to perform and complete the Work in a proper and workmanlike manner, consistent with the highest standards of professional and construction practices and in full compliance with, and as required by or pursuant to, this Contract, and with the greatest economy, efficiency, and expedition consistent therewith. The Contractor shall, at its own expense, furnish all labor, materials, tools, supplies, machinery, utilities, permits, licenses, and other equipment that may be necessary for the completion of the Work, as outlined in the Contract Documents. The Contractor shall have no property right in materials after they have been attached, affixed or

incorporated in the Work or the soil.

1.2.2 Further, the Contractor acknowledges that all reasonably necessary steps were taken to ascertain the nature and location of the Work, and the general and local conditions which can affect the Work or the cost of the Work. Failure by the Contractor to do so will not relieve it from responsibility for successfully performing Work without additional expense to the City. The City will not be responsible for any understanding or representations concerning conditions unless such understanding or representations are expressly stated in the Contract.

1.2.3 The City shall furnish all lands and rights-of-way required for completion of the Work. In acquiring rights-of-way, the City will proceed as expeditiously as possible, but in the event all rights-of-way or easements are not acquired prior to the beginning of construction, the Contractor shall begin Work on such lands and rights-of-way as have been acquired. No claim for damage will be allowed or shall be made by reason of the City's delay in obtaining lands, easements or rights-of-way. In the event of litigation or other delays in acquiring rights-of-way, the time allowed herein for completion will be extended to compensate for the time actually lost by such delay.

1.3 **Commencement and Completion of the Project**. The Contractor understands and agrees that all Work required under this Contract shall not commence until a Notice to Proceed is issued and shall be fully completed within **90 (ninety) calendar days of receiving Notice to Proceed from the City**. The Contractor acknowledges and understands that it is an essential term of this Contract that Contractor maintain a rate of progress in the Work that will result in completion of the Work in accordance with the Contract Documents, and to that end, Contractor agrees to proceed with all due diligence to complete the Work in a timely manner in accordance with the Contract Documents.

1.4 **Contract Price**. The City accepts the Contractor's bid as set forth in the Bid Schedule, **Exhibit B**, in the total amount of **$1,350,437.00**. The City shall make payment(s) to Contractor in the manner and at such times as set forth in the Standards and Specifications. Should the Contract price exceed one-hundred and fifty-thousand dollars ($150,000.00), the City shall deduct and retain five (5) percent from the total amount of each approved invoice, including Change Orders. The City may also deduct in addition to retainage as stated above, the additional amount(s) of any and all outstanding claims pursuant to Colorado Revised Statute ("C.R.S.") §38-26-107 from each approved invoice.

1.5 **Payments to Constitute Current Expenditures.**

1.5.1 Notwithstanding any other term, provision, or condition herein, all financial obligations of the City are contingent on funds for that purpose being appropriated, budgeted and otherwise made available by the City Council.

The City's obligations under the Contract shall not constitute a multiple-fiscal year direct or indirect debt or other financial obligation of the City within the meaning of Article X, Section 20 of the Colorado Constitution.

1.5.2 Further, pursuant to 103.6(2) of Article 91, Title 24, C.R.S., no Change Order, Amendment, or other form of order or directive by the City which requires additional compensable work to be performed, and which work causes the aggregate amount payable under this Contract to exceed the amount appropriated for the original Contract, shall be executed, or shall work be performed by the Contractor, unless the City provides written assurances to the Contractor that lawful appropriations to cover the costs of such additional work have been made or unless such work is covered under a remedy-granting provision of this Contract. For purposes of this paragraph, "remedy-granting provision" shall be defined as set forth in C.R.S. §24-91-103.6(4).

1.6 **Confidentiality.** Notwithstanding any provision in the Contract Documents to the contrary, the City is obligated to comply with the Colorado Open Records Act (C.R.S. §§24-72-101 *et seq.*), which may require the City to disclose all or a portion of communications relating to the Contract, or terms of same, or of any transaction under the Contract, and other related matters. The Contractor shall familiarize itself with the Colorado Open Records Act. In no event shall the City be liable to the Contractor for the disclosure of all or a portion of communications, or relating documents, or electronic imaging, including all documents and exhibits that may be included as part of this Contract.

1.7 **Bonds**.

1.7.1 Contemporaneous with the Contractor's execution of this contract, the Contractor shall provide a Performance Bond and a Labor and Material Payment Bond as security for the faithful performance and payment of all the Contractor's obligations under the Contract Documents. All bonds shall be in the form prescribed by the City, executed by a surety company i) licensed to do business in the State of Colorado; ii) with a general rating of A and a financial size category of Class X or better in Best's Insurance Guide, each in the penal sum of the contract price; and iii) in conformance with C.R.S. §§ 38-26-105 and 106 ("Bonds"). All Bonds signed by an agent or attorney-in-fact shall be accompanied by a certified copy of the signatory's authority to act. The Contractor shall, at all times while providing, performing, or completing the Work including without limitation at all times while correcting any failure to meet warranty pursuant to the Standards and Specifications, maintain and keep in force the Bonds at the Contractor's expense.

1.7.2 If the Surety for any Bond furnished by the Contractor is placed in a receivership or declared bankrupt, or its rights to do business in Colorado

are terminated, or it ceases to meet the requirements specified herein, the Contractor shall within five (5) days thereafter substitute another Bond and Surety, both of which shall be acceptable to the City.

1.8 **Insurance.**

1.8.1 The Contractor shall not commence work, and shall not allow any subcontractor to commence work, until it has obtained all insurance required herein and such insurance has been approved by City. For the duration of the Contract, the Contractor must maintain the insurance coverage required in this section. The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements set forth in this Contract shall not act as a waiver of the Contractor's breach of Contract or of any of the City's rights or remedies under this Contract.

1.8.2 The Contractor shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to the Contract Documents by reason of its failure to procure or maintain insurance, or by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types.

1.8.3 The Contractor shall procure and maintain at its own cost and shall cause each subcontractor of the Contractor to procure and maintain at its own cost (or shall insure the activity of Contractor's subcontractors in Contractor's own policy with respect to), the minimum insurance coverages listed below. Such coverages shall be procured and maintained with forms and insurers acceptable to the City. All coverages shall be continuously maintained from the date of commencement of the Work. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage.

i. Workers' Compensation and Employers' Liability insurance with minimum limits of FIVE HUNDRED THOUSAND DOLLARS ($500,000) each accident, FIVE HUNDRED THOUSAND DOLLARS ($500,000) disease - policy limit, and FIVE HUNDRED THOUSAND DOLLARS ($500,000) disease - each employee. The policy shall cover obligations imposed by the Workers' Compensation Act of Colorado and any other applicable laws for any employee engaged in the performance of Work.

ii. Commercial General Liability insurance with minimum combined single limits of ONE MILLION DOLLARS ($1,000,000) each occurrence and TWO MILLION DOLLARS ($2,000,000) aggregate. The policy shall be applicable to all premises and operations. The policy shall include coverage

for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, independent contractors, products, and both ongoing and completed operations. The policy shall include coverage for explosion, collapse, and underground hazards (XCU). The policy shall contain a severability of interests provision.

iii. Comprehensive Automobile Liability insurance with a minimum combined single limit for bodily injury and property damage of ONE MILLION DOLLARS ($1,000,000) with respect to each of Contractor's owned, hired and/or non-owned vehicles assigned to or used in performance of the Work. The policy shall contain a severability of interests provision.

iv. Installation Floater/Inland Marine insurance with minimum limits of not less than the insurable value of the work to be performed at completion. The value shall include the aggregate value of any City-furnished equipment and materials to be erected or installed by the Contractor not otherwise insured. The policy shall protect the Contractor and the City from all insurable risks of physical loss or damage to materials and equipment not otherwise covered, while in warehouses or storage areas, during installation, during testing, and after the Work under this Contract is completed. The policy shall be of the "all risks" type, with coverages designed for the circumstances which may occur in the particular Work to be performed under this Contract. The policy shall provide for losses to be payable to the Contractor and the City as their interests may appear. The policy shall contain a provision that in the event of payment for any loss under the coverage provided, the insurance company shall have no rights of recovery against the Contractor or the City.

1.8.4 The City of Littleton shall be included as additional insured for Commercial General Liability and Comprehensive Automobile Liability insurance. The City of Littleton shall be included as additional insured or loss payee for Installation Floater/Inland Marine insurance. All policies of insurance providing additional insured status shall be primary insurance, and any insurance carried by the City, its officers, or its employees, shall be excess and not contributory insurance to that provided by Contractor. The additional insured endorsement for the Commercial General Liability insurance required above shall not contain any exclusion for bodily injury or property damage arising from completed operations. The Contractor shall be solely responsible for any deductible losses under each of the policies

required above.

1.8.5 Certificates of insurance shall be completed by the Contractor's insurance company as evidence that policies providing the required coverages, conditions, and minimum limits are in full force and effect, and shall be subject to review and approval by the City. The certificate cannot contain "endeavor to" language in the portion of the certificate addressing cancellation. The City of Littleton shall be included as Certificate Holder. The City reserves the right to request and receive a certified copy of any policy and any endorsement thereto.

1.8.6 The coverages afforded under the policies shall not be cancelled, terminated or materially changed until at least thirty (30) days' prior written notice has been given to the City. Failure on the part of the Contractor to procure or maintain policies providing the required coverages, conditions, and minimum limits shall constitute a material breach of Contract upon which the City may immediately terminate the Contract, or at its discretion may procure or renew any such policy or any extended reporting period thereto and may pay any and all premiums in connection therewith, and all monies so paid by the City shall be repaid by Contractor to the City upon demand, or the City may offset the cost of the premiums against any monies due to Contractor from the City.

1.8.7 The Parties hereto understand and agree that the City is relying on, and does not waive or intend to waive by any provision of this Contract, the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, C.R.S. § 24-10-101 et seq., as from time to time amended, or otherwise available to the City, its officers, or its employees.

1.9 **Patented Devises, Materials and Processes**. If the Contractor is required or desires to use any design, device, material or processes covered by patent or copyright, the Contractor shall provide for such use by suitable legal agreement with the patentee or patent owner. The Contractor shall warrant that the materials, equipment or devices used on or incorporated in the Work shall be delivered free of any rightful claim of any third-party for infringement of any United States patent or copyright. If notified promptly in writing and given authority, information and assistance, the Contractor shall defend, or may settle, at its expense, any suit or proceeding against the City so far as based on a claimed patent or copyright infringement which would result in a breach of this warranty, and the Contractor shall pay all damages and costs awarded therein against the City due to such breach. In case any use of any materials, equipment or devices is in such suit held to constitute an infringement and such use is enjoined, the Contractor shall, at its expense and option, either procure for the City the right to continue using said materials, equipment or devices, or replace same with non-infringing materials, equipment or devices, or modify the same so it becomes non-infringing. The

Contractor shall report to the City promptly and in reasonable written detail each notice or claim of patent or copyright infringement based on the performance of this Contract of which the Contractor has knowledge. In the event of any claim or suit against the City as a result of any alleged patent or copyright infringement arising out of the performance of this Contract or out of the use of any supplies furnished or Work or services performed hereunder, the Contractor shall furnish to the City when requested by the City, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the City except where the Contractor has agreed to indemnify the City. This clause shall be included in all subcontracts.

1.10 **Taxes.** The City of Littleton is not subject to taxation. The Contractor shall not invoice the City for any state, federal or local taxes whatsoever. Upon written notification by the City, the Contractor shall reimburse the City in a timely manner for any taxes erroneously paid by the City.

1.11 **Termination for Convenience of City.** This Contract and the performance of the Work hereunder may be terminated at any time, in whole or in part, for convenience. Any such termination shall be effected by delivery to the Contractor of a written notice ("Notice of Termination") specifying the extent to which performance of Work is terminated, the date upon which termination becomes effective, and any necessary actions to be taken by the Contractor to effectuate termination and close-out the Contract. If the Contract is terminated, the Contractor shall be paid on a prorated basis of Work satisfactorily completed, under the Work. The portion of Work satisfactorily completed but not yet accepted by the City shall be determined by the City.

1.12 **Cooperation with Other Contractors.** In connection with the improvements under this Contract, the right is reserved by the City to award any Work not included in the Contract to another contractor for performance during the progress of this Contract, or to perform such Work with the City's forces, and the Contractor shall cooperate and so conduct its operation as to minimize the interference therewith, as directed by the Project Manager.

1.13 **Termination of Contractor's Responsibility**. This Contract will be considered complete when all Work and final cleanup has been finished, the Work has been accepted by the City, and all claims for payment of labor, materials, or services of any kind used in connection with the Work have been settled for by the Contractor or its Surety. The Contractor will then be released from further obligation except as set forth in the Bond and for its responsibility for injury to persons or property arising from its duties and obligations under the Standards and Specifications. The Bond executed for performance of this Contract shall be in full effect for a period of one (1) year following acceptance of the Work; except with regard to the representation regarding copyright infringement found in Section 1.9 where the Bond shall remain in effect for three (3) years, and except with regard to the representation regarding patent infringement found in Section 1.9, where the Bond

shall remain in effect for six (6) years. Neither the final payment nor any provision in the Contract Documents shall relieve the Contractor of the responsibility for negligence or faulty materials or workmanship. Payment to the Contractor will not relieve the Contractor of any obligation under this Contract.

1.14 **Subcontracting or Assignment of Work.** No contractual relationship will be recognized under the Contract other than the contractual relationship between the City and Contractor. No portion of the Contract shall be subcontracted, assigned or otherwise disposed of except with the written consent of the City, which consent shall not be unreasonably withheld. Requests for permission to subcontract, assign or otherwise dispose of any portion of the Contract shall be in writing to the Project Manager and shall be accompanied by documents demonstrating the organization which will perform the Work is particularly experienced and equipped for such Work. Consent to subcontract, assign or otherwise dispose of any portion of the Contract shall not be construed to relieve the Contractor of any responsibility for the fulfillment of the Contract.

1.15 **Waiver of Breach.** A waiver by any Party to the Contract or the breach of any term or provision of the Contract shall not operate or be construed as a waiver of any subsequent breach by either Party.

1.16 **No Third-Party Beneficiaries.** It is expressly understood and agreed that enforcement of the terms and conditions of this Contract, and all rights of action relating to such enforcement, shall be strictly reserved to the City and the Contractor and nothing contained in this Contract shall give or allow any such claim or right of action to any other third-party on this Contract. It is the express intention of the City and the Contractor that any person other than the City or the Contractor receiving services or benefits under this Contract shall be deemed to be an incidental beneficiary only.

1.17 **Independent Contractor.** The Contractor shall perform the Work as an independent contractor and shall not be deemed by virtue of this Contract to have entered into any partnership, joint venture, employer/employee or other relationship with the City other than as a contracting party and independent contractor.

1.18 **Accessibility Standards.** The Contractor shall comply with the accessibility standards for an individual with a disability adopted by the Colorado Office of Information Technology, in accordance with C.R.S. § 24-85-103 and its implementing regulations. Notwithstanding the foregoing, this requirement shall not be applicable to contracts or agreements for professional services, as defined by C.R.S. § 24-30-1402, or to any portion or part of the contract or agreement that is providing professional services. Further, the contractor shall indemnify, hold harmless, and assume liability on behalf of the city and the city's officers, employees, and agents, for all costs, expenses, claims, damages, liabilities, court awards, attorney fees and related costs, and any other amounts incurred by the

city in relation to the contractor's noncompliance with the accessibility standards for an individual with a disability adopted by the Colorado Office of Information Technology, in accordance with C.R.S. § 24-85-103, and its implementing regulations.

1.19 **Non-Discrimination.** In connection with the performance of the Work, the Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ethnicity, citizenship, immigration status, sex, gender, age, sexual orientation, gender identity or gender expression, marital status, source of income, military status, protective hairstyle, genetic information, pregnancy, or disability, or any other status protected by applicable law. The Contractor will take affirmative action to ensure applicants are employed, and employees are treated during employment, without regard to their race, color, religion, national origin, ethnicity, citizenship, immigration status, sex, gender, age, sexual orientation, gender identity or gender expression, marital status, source of income, military status, protective hairstyle, genetic information, pregnancy, disability, or any other status protected by applicable law. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

1.20 **Indemnification.** The Contractor agrees to investigate, defend, indemnify and hold harmless the City, its officers, employees, insurers, and self-insurance pool, from and against all liability, claims and demands on account of any losses, injuries, and damages, including but not limited to, alleged personal injury claims, and/or death claims, or property damage claims, or errors and omissions, which arise solely out of the Contractor's and/or any of its agents' officers or employees performance of the Contractor's obligations under this Contract. The City is prohibited by Article XI, Section 1, Colorado Constitution, from indemnifying any individual or entity. Therefore, the City does not indemnify the Contractor, successors, or assigns under this Contract. Notwithstanding the foregoing, nothing herein is intended to constitute a covenant, promise, or agreement to indemnify and hold harmless the City from any liability or damages directly caused by or attributable to the City's own negligence, nor is anything herein intended to be nor may be construed as a waiver of the immunities, protections, or limitations on damages provided to the City by the Colorado Governmental Immunity Act, C.R.S. §§24-10-101 et seq., as it may from time to time be amended.

1.21 **Governing Law and Venue.** The Contract shall be governed by the laws of the State of Colorado. Venue for any action arising under the Contract or for the enforcement of the Contract shall be in the appropriate court for Arapahoe County, Colorado.

1.22 **Additional Documents or Action**. The Parties agree to execute any additional documents and to take any additional action that is necessary to carry out this

Contract.

1.23 **Binding Effect.** This Contract shall inure to the benefit of, and be binding upon, the Parties, their respective legal representatives, successors, heirs, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Contract except as otherwise expressly authorized herein.

1.24 **Integration, Amendment, and Severability.** This Contract represents the entire agreement between the Parties and there are no oral or collateral agreements or understandings. This Contract may be amended only by an instrument in writing signed by the Parties or as otherwise provided herein. If any other provision of this Contract is held invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of this Contract shall continue in full force and effect.

1.25 **Binding Authority.** The Contractor represents and affirms that the signature page hereof accurately states the full legal name of Contractor (whether as a corporation, partnership, limited liability company, sole proprietorship, or other), contains all requisite signature(s) on behalf of Contractor, has been properly acknowledged by attestation, notary acknowledgment, or both, and in all other respects is effective to bind Contractor, in accordance with all applicable statutes, regulations, resolutions, rules, bylaws, agreements, or similar sources of authority or limitation. This Contract may be executed in counterpart(s), each of which shall be deemed to be an original, and all of which, taken together, shall constitute one instrument.

1.26 **Subject to Legislative Approval and Compliance with Law.** The Contractor acknowledges and agrees that if a Change Order is required under the terms of the Contract, the City shall not incur any liability whatsoever for claims of payment, compensation, damages, or adjustment of any kind by the Contractor due to any delays for the required approvals and execution under the City's Purchasing Ordinance. The Contractor further acknowledges and agrees that this Contract's execution may be contingent upon approval by the City Council, in compliance with all applicable provisions of the City Charter and City Code. The City shall not incur any liability whatsoever if this Contract is not approved by City Council.

1.27 **Notices.** All notices required under this Contract shall be in writing and shall be sent by registered or certified mail, return receipt requested, to the addresses of the Parties herein set forth. A Party may change its mailing address by giving written notice of such change of address to other Party.

Notice to City:
City of Littleton
City Manager
2255 West Berry Avenue
Littleton, CO 80120

Notice to Contractor: Fasick Concrete, Inc.
10799 W. Alameda Avenue # 150217
Lakewood , CO 80226

1.28 **Force Majeure.** Neither Party shall be responsible for a delay in its respective performance under this Contract, other than a delay in payment for Work already performed, if such delay is caused by extraordinary weather conditions or other natural catastrophes, war, terrorist attacks, sabotage, computer viruses, riots, strikes, lockouts or other industrial disturbances, epidemics, pandemics, acts of governmental agencies or authorities, discovery of hazardous materials or differing and unforeseeable site conditions, or other events beyond the reasonable control of the claiming Party. Contractor shall be entitled to an equitable adjustment to the project schedule in accordance with the Standards and Specifications. When a delay on any aspect of the Work occurs, the Contractor, to the maximum extent possible, shall utilize its resources elsewhere in the Work.

1.29 **Electronic Signatures and Electronic Records.** The Contractor consents to the use of electronic signatures by the City. The Contract, and any other documents requiring a signature hereunder, may be signed electronically by the City in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Contract solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Contract in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

DATED this ____ day of _____, 2026.

CITY OF LITTLETON, COLORADO

_____
Kyle Schlachter
MAYOR

APPROVED AS TO FORM:

_____
Reid Betzing
CITY ATTORNEY

ATTEST

_____
Colleen Norton
CITY CLERK

CONTRACTOR

_____ _____
Alan Kuettel Date
President

Exhibit A
Scope of Work

Contractor shall complete the following work:

- removal of approximately 7,400 square yards of concrete;
- removal of 2,700 square yards of asphalt;
- installation of approximately 8,100 linear feet of monolithic curb gutter sidewalk; and
- installation of gutters, curb ramps, pans and aprons.

Work will also involve associated traffic control, landscape restoration, and erosion control. Work will occur on various local and collector streets located throughout the City.

The Contractor shall commence work within seven (7) calendar days of receiving the Notice to Proceed from the City.

Exhibit B
Bid Schedule

Code	Description	UOM	Price	Quantity	Total Cost
202-00175	REMOVAL OF CONCRETE	Square Yard	$18.00	7,441	$133,938.00
202-00220	REMOVAL OF ASPHALT MAT	Square Yard	$10.00	2,694	$26,940.00
202-00212	REMOVAL OF DRIVEWAY RAMP	Each	$200.00	11	$2,200.00
208-00200	EROSION CONTROL	Lump-Sum	$5,000.00	1	$5,000.00
210-04010	ADJUST MANHOLE	Each	$500.00	1	$500.00
210-04050	ADJUST VALVE BOX	Each	$500.00	1	$500.00
304-06000	AGGREGATE BASE COURSE (CLASS 6)	Ton	$50.00	1,635	$81,750.00
403-00720	HOT MIX ASPHALT (PATCHING) (ASPHALT)	Ton	$190.00	889	$168,910.00
608-00000	CONCRETE SIDEWALK	Square Yard	$90.00	495	$44,550.00
608-00010	CONCRETE CURB RAMP	Each	$2,000.00	96	$192,000.00
609-21020	GUTTER TYPE 2 (Section IIB)	Linear Foot/Feet	$45.00	140	$6,300.00
609-22021	CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)	Linear Foot/Feet	$50.00	8,156	$407,800.00
609-24000	GUTTER TYPE 2	Square Yard	$117.00	1,197	$140,049.00
626-00000	MOBILIZATION	Lump-Sum	$10,000.00	1	$10,000.00
630-00016	TRAFFIC CONTROL	Lump-Sum	$30,000.00	1	$30,000.00
700-70010	FORCE ACCOUNT				$100,000.00
				TOTAL	**$1,350,437.00**

EXHIBIT C

Bond Number: 108368621

PERFORMANCE, LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that Fasick Concrete, Inc. (Contractor), as Principal (the "Principal") and Travelers Casualty and Surety Company of America, a corporation organized under the laws of the State of Connectiut, and authorized to transact business in the State of Colorado, as "Surety", jointly and severally, including their heirs, personal representatives, successors and assigns, are held and firmly bound unto the City of Littleton as Obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the amount of one million three hundred fifty thousand four hundred thirty-seven dollars and 00 cents ($1,350,437.00), for the payment and interest as provided by law for the performance of the Contract between the Principal and the Owner, dated _____, 2026, for the Miscellaneous Concrete Program (City project #25-05) in accordance with drawings and specifications; which the Contract is made a part hereof, and is hereinafter referred to as the Contract, and incorporated by this reference.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal, at all times, shall promptly and faithfully perform said Contract, and shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contact, any authorized modifications thereof during the original term of the Contract, any extensions thereof that may be granted by the Owner, and during the term of any guarantee or warranty required under the Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense when the Owner may incur in making good any default, then the Principal and Surety shall have no obligation under this Bond, otherwise it shall remain in full force and effect for a period of one (1) year following execution of the Contract. Upon expiration, this Bond shall be extended by a continuation certificate for an additional one (1) year, and extended thereafter until the warranty period has expired in accordance with the terms of the Contract.

The Surety, for value received, agrees that no extension of time, change in, addition to, or other alteration or modification of the terms of the Contract or work to be performed there under or any other forbearance on the part of either the Owner or the Principal to the other shall in any way release or impact the Surety's liability or obligation on this Bond, and the Surety hereby waives notice of any extension of time, change in, addition to, or other alteration or forbearance.

Whenever the Owner terminates the Contract in accordance with the terms thereof, the Surety shall, within fifteen (15) calendar days after written notice of such termination, notify the Owner in writing of its election to complete the Contract in accordance with its terms and conditions, or notify the Owner that the Surety elects not to complete the Contract. If the Surety fails to provide the written notice within the fifteen (15) calendar day period, then it will have deemed to have not elected to complete the Contract. Should the Surety elect to complete the Contract, then it shall, within fifteen (15) additional calendar days, following written notice of such election, obtain a bid or bids for submission to Owner for completing the Contract in accordance with its terms and conditions. The Surety shall arrange for a contract between bidder and Owner, and make

available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs, attorneys fees of the Owner and damages for which the Surety shall be liable hereunder, the amount set forth in the first paragraph hereof. In the event of termination, the Surety may not engage the Principal to complete the Contract, without prior written consent of the Owner, which consent may be withheld in the Owner's sole discretion. If the Surety elects to complete the Contract, then it shall be entitled to receive the balance of the Contract price, less i) any amounts paid by the Owner to the Principal; ii) costs incurred by the Owner in correcting the defective work; iii) any additional legal, design professional or other costs incurred by the Owner resulting from Principal's default; and iv) any liquidated damages caused by the delayed performance or nonperformance of the Principal. Any progress payments, less retainage, due but not paid at the date of termination shall be paid to the Surety so long as the Surety has agreed to indemnify the Owner for the amount thereof and no other claims have been made to such funds by subcontractors or suppliers in accordance with the Contract or any applicable law. In the event that the Surety elects not to complete the Contract, the Owner may then have work completed by such means and in such manner, as it may deem advisable. The Surety, in such event, shall at all times make available, as work progresses under the Contract between the Owner and new contractor, sufficient funds to pay the cost of completion of the Contract pursuant to the its terms together with the other amounts set forth above, but in no event shall the Surety be responsible for the payment of any sums to the Owner until the Owner has paid in full its total obligation under the terms of the original Contract, plus Change Orders or amendments less deductions and claims chargeable by law or by the Contract, if any, and less the retainage which will be disbursed as provided by the Contract and any applicable law.

Any proceeding, whether legal or equitable, under this Bond, except for claims for payment of labor and material, or copyright or patent infringement, must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

Further, the above named Principal and Surety hereby jointly and severally agree with the Owner that the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract ("claimant"), and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, repairs or machinery, equipment and tools, consumed or used in connection with the construction of such work, whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

The above-named Principal and Surety hereby jointly and severally agree with the Owner that every claimant, who has not been paid in full at any time up to and including the time of final settlement for the work contracted to be done, file with the Owner, a verified statement of the amount due and unpaid in accordance with Section 38-26-107, C.R.S. Provided, further, that no final settlement between the Owner and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. The Owner shall not be liable for the payment of any costs, attorney fees, or other expenses of any such legal remedies a claimant may have against the Principal or Surety.

SIGNED this 7th day of May 20 26.

In the presence of:

Fasick Concrete, Inc.

(Contractor / Principal) Alan Kuthel, President

Travelers Casualty and Surety Company of America

(Surety) **Ashlea McCaughey, Attorney-In-Fact**

(Accompany this Bond with Attorney in-fact's authority from the Surety to execute the Bond, certified to include the date of the Bond.)

APPROVED FOR THE OWNER:

BRENT SODERLIN
DIRECTOR OF PUBLIC WORKS AND UTILITIES

TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and the Companies do hereby make, constitute and appoint **Ashlea McCaughey** of **GREENWOOD VILLAGE**, **Colorado**, their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **16th** day of **February, 2024.**

SEAL SEAL SEAL

State of Connecticut

By: _____
Bryce Grissom, Senior Vice President

City of Hartford ss.

On this the **16th** day of **February, 2024**, before me personally appeared **Bryce Grissom**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June, 2026**

ANNA P. NOWIK NOTARY PUBLIC CONNECTICUT

_____
Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this day of , **2026** .

SEAL SEAL SEAL

_____
Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.

HOLMES MURPHY.

THINKING AHEAD

May 5, 2026

City of Littleton
2255 West Berry Avenue
Littleton, CO 80120

Bond Number: 108368621
Bond Amount: $1,350,437.00
Principal: Fasick Concrete, Inc.
Obligee: City of Littleton
Project Description: Miscellaneous Concrete Program, (City project #25-05) Littleton, CO

To Whom It May Concern:

Please note that the enclosed bonds and accompanying Power of Attorney forms are currently undated as the contract has not yet been dated.

This letter authorizes you to insert the appropriate dates once the contracts have been executed. It is essential that the dates on the bond and the Power of Attorney are on or after the contract date for the bond to be effective. The bond may be considered invalid if either the bond or the Power of Attorney is dated prior to the contract date.

Upon dating the bonds, kindly inform our office within 24 hours of the relevant date so that we can update our records and those of the surety accordingly.

Sincerely,

Ashlea McCaughey

Ashlea McCaughey
Email: amccaughey@holmesmurphy.com
Phone: 720-458-5775
Holmes, Murphy and Associates, LLC
5619 DTC Pkwy, Suite 1000
Greenwood Village, CO 80111
HOLMESMURPHY.COM

2026 MISCELLANEOUS CONCRETE PROJECT
CITY PROJECT No. 25-05
CITY OF LITTLETON, COLORADO

PROJECT SPECIAL PROVISIONS

MODIFICATIONS TO COLORADO DEPARTMENT OF TRANSPORTATION
STANDARD SPECIFICATIONS

The technical specifications for this project shall be the Colorado Department of Transportation 2025 Standard Specifications for Road and Bridge Construction and the most recent version of the Metropolitan Government Pavement Engineers Council Pavement Design Standards and Construction Specifications. The following special provisions supplement or modify the Standard Specifications and Supplemental Specifications and take precedence over the Standard Specifications, Supplemental Specifications, and plans.

PROJECT SPECIAL PROVISIONS

COLORADO
DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS

STANDARD SPECIAL PROVISIONS

Name	Date	No. of Pages
Revision of Section 105 – Control of Work	October 1, 2022	1
Revision of Section 106 – Buy America Requirements – Non-Federal Aid Highway (FHWA)	July 7, 2023	1
Revision of Section 106 – Certificates of Compliance and Certified Test Report	July 7, 2023	4
Revision of Section 107 – Applicable Taxes	July 7, 2023	1
Revision of Section 109 – Measurement and Payment	December 9, 2022	1
Revision of Section 207 – Topsoil	October 1, 2022	6
Revision of Section 212 – Soil Amendments, Seeding, and Sodding	October 1, 2022	18
Revision of Section 213 – Mulching	July 7, 2023	2
Revision of Section 601 – Structural Concrete	March 22, 2023	6
Revision of Section 601 – Sulfate Mitigation	December 9, 2022	1
Revision of Section 630 – Traffic Control Management	October 1, 2022	1
Affirmative Action Requirements Equal Employment Opportunity	October 1, 2022	11

NOTICE TO BIDDERS

It is recommended that proposers review the work site and plan details prior to submitting a bid.

The City of Littleton Procurement Specialist is the Designated Contact; all inquiries and questions must be submitted in writing to the City of Littleton Procurement Specialist. From the date of issuance of the RFP through completion of the selection process, any proposer who contacts City employees other than the Designated Contact may be disqualified from further participation in the selection process, at the City's sole discretion. This supersedes any other subsections containing conflicting instructions regarding who to contact during the bid process.

The City will not be responsible for any oral instructions or interpretations given by or to anyone. It shall be conclusively presumed that the proposer did, before submitting a bid, closely review the RFP, all exhibits/attachments, and other items relevant to the RFP. The above-referenced individual is the only City representative with authority to provide any information, clarification, or interpretation regarding the plans, specifications, and any other contract documents or requirements.

COMMENCEMENT AND COMPLETION OF WORK

The Contractor shall commence work under the Contract within seven (7) calendar days after the date of the "Notice to Proceed" and work shall be completed within **90 Calendar Days.**

Minimum Salient features to be shown on the Contractor's Progress Schedule for the tabulation of quantities are:

1. Submittals
2. Traffic Control
3. Erosion Control
4. Removals
5. Concrete Forming
6. Concrete Pouring
7. Hot Mix Asphalt Laydown
8. Roadway Sweeping and Clean Up
9. Landscaping
10. Final Acceptance

All work on the streets within a highly trafficked area of a school shall be completed prior to August 3rd, 2026. Work shall include all construction activities. If work is not completed prior to the milestone date, then working hours will be reduced to between the hours of 9:00 a.m. and 3:00 p.m. with traffic being able to use the roadway at 3:00 p.m.

REVISION OF SECTION 101 GENERAL PROVISIONS

SECTION 101 of the Standard Specifications is hereby revised for this project as follows:

101 DEFINITIONS & TERMS

Technical Specifications related to construction materials and methods for the work embraced under this Contract shall consist of the Colorado Department of Transportation's 2025 Standard Specifications for Road and Bridge Construction.

Certain terms utilized in the Specifications referred to in the paragraph above shall be interpreted to have different meaning within the scope of this Contract. A summary of redefinitions follows:

Subsection 101.28 "Department" shall mean the City of Littleton, Colorado.

Subsection 101.29 "Chief Engineer" shall mean the City Engineer, Littleton, Colorado, or designated representative (DTA).

Subsection 101.39 "Laboratory" shall mean Littleton, Colorado or their designated representative.

Subsection 101.51 "Project Engineer" or "Project Manager" shall mean the City Engineer, Littleton, Colorado, or their designated representative (DTA).

Subsection 101.76 "State" shall mean Littleton, Colorado (where applicable).

REVISION OF SECTION 105 CONTROL OF WORK

SECTION 105 of the Standard Specifications is hereby revised for this project as follows:

105.17 Removal of Unacceptable Work and Unauthorized Work

Shall include the following:

Contractor will verify all items to be removed and replaced with the Engineer. The Contractor shall verify, with the Engineer, any marked locations not included within the contract documents prior to any removal. Any removal NOT listed in the contract or otherwise verified and approved by the Engineer will be at the Contractor's expense.

Existing condition or damage to any adjacent infrastructure and/or structures shall be the responsibility of the Contractor to fully document prior to any work. The Contractor shall notify the Engineer of any existing damage, provide photographs or videos of pre-construction conditions and to confirm the various locations, and their limits, of existing damage prior to any work.

Damage observed following the removal of the adjacent items, not previously documented and confirmed by the Engineer as existing, will be the responsibility of the Contractor to repair at no cost to the City.

Contactor shall not chip or crack adjacent concrete panels or stones. If damage occurs, contractor will saw beyond the damaged area as approved by the Engineer, remove and replace at no additional expense to the City. If repair is larger than a single panel, saw cutting of control joints is required after proper cure time.

Damage caused to adjacent asphalt pavement shall be patched at no additional expense to the City. Repair limits are to be determined by the Engineer, but at a minimum shall require a mill and fill of a minimum 12" width the length of the damaged area(s), at a minimum depth of 2 inches. Saw-cutting to remove any concrete over spill shall be included in the repair.

REVISION OF SECTION 107 PUBLIC CONVENIENCE AND SAFETY

SECTION 107 of the Standard Specifications is hereby revised for this project as follows:

107.02 PERMITS, LICENSES, AND TAXES *shall be revised to include the following:*

Unless otherwise specified, the Contractor shall procure all required permits and licenses; pay all charges, fees, and taxes, including permits procured for this project by others; and give all notices necessary and incidental to the due and lawful prosecution of the work. The costs of these permits will not be paid for separately, but shall be included in the work.

Prior to beginning work, the Contractor shall furnish the Engineer with a written list of all permits required for the proper completion of the contract. The list shall clearly identify the types of permits that must be obtained before work on any particular phase or phases of work can be started. Copies of the fully executed permits shall be furnished to the Engineer upon request.

107.07 PUBLIC CONVENIENCE AND SAFETY *shall be revised to include the following:*

The Contractor shall provide the following services on an ongoing basis throughout the duration of the project:

(a) Contact person
A contact person for the project shall be designated by the Contractor at the reconstruction conference. This individual shall be primarily responsible for maintaining communications with the Engineer and businesses; provide information on a regular basis to private individuals, local organizations interested in the project and the affected agencies.

(b) The following agencies shall be coordinated with on an ongoing basis:

City of Littleton
Fire Districts – South Metro Fire/Rescue
Emergency Response
Adjacent Businesses/Residences
Regional Transportation District / Railroads
South Suburban Parks & Recreation

A letter of introduction shall be delivered to all property owners and tenants at least five (5) business days and no more than ten (10) business days prior to mobilization and the commencement of work for each project site.

Updates shall be on a weekly basis after mobilization and one (1) week prior to any major traffic control switches.

The letter shall include the following as a minimum:

Contractor – Name, Address, Phone Number
Field Superintendent – Name, Mobile Phone Number
Schedule and description of work
Information regarding private property and construction procedures

In the event a driveway entrance will be impacted, the Contractor shall notify the property owner, providing written notice a minimum of forty-eight (48) hours prior to the actual commencement of construction activities at that location.

Payment for the above requirements will not be made separately, but shall be included in the work.

107.10 BARRICADES AND SIGNS *shall be revised to include the following:*

Construction traffic control signs or devices not in use shall be removed from the roadway and pedestrian walkway (sidewalk & trails). Laying the sign down in a horizontal position or turning the sign parallel is not permitted on the sidewalk and/or within private property such as residential yards.

Any missing or defaced signs shall be replaced within twenty-four (24) hours.

"NO PARKING" signs shall be placed a minimum of forty-eight (48) hours in advance of any conflicting construction activities on specific segments of streets with proposed improvements where on-street parking is permitted. No Parking signs shall specify the date range and time where no parking will be allowed due to construction activities.

Any other signs as required by the Traffic Engineer shall be placed.

For locations that do not have sufficient right-of-way available to store the sign(s) or device(s), they must be picked up or moved to an approved storage area. Signs that are placed in the medians must be dismantled, laid down, or relocated to the approved storage area.

107.12 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE *shall be revised to include the following:*

(a) The contractor shall replace and/or repair all damaged landscaping within seven (7) days of completion of the adjacent removal and replacement.

(b) Sod damage resulting from construction operations shall be cleanly cut to the limits of the damaged area(s) and parallel to the sidewalk or curb and gutter and

replaced at a minimum removal and replacement width of 18” wide for the full length of the damaged area(s). Sod will be measured and paid for according to Section 212.

(c) The contractor shall repair and/or replace any damaged irrigation pipes. Coordinate repairs with property owner.

(d) Repeated failure to complete repair in the time specified above may result in the suspension of additional work until the specified repairs have been made and are determined to be satisfactory by the Engineer. Additional contract time will not be given for such suspensions.

REVISION OF SECTION 108 PROSECUTION AND PROGRESS

SECTION 108 of the Standard Specifications is here by revised for this project as follows:

108.03 SCHEDULE ***shall be revised to include the following:***

The contractor shall provide a construction schedule at the pre-construction meeting for review by the Engineer. The Engineer may adjust the construction schedule, with notification to the Contractor, to ensure completion of certain road segments by certain dates.

108.05 LIMITATION OF OPERATIONS ***shall be revised to include the following:***

The Contractor shall limit hours of operation to **7:00 a.m. to 7:00 p.m. Monday thru Friday** or as otherwise approved in writing by the Engineer.

The Contractor shall work on, at most, three (3) streets and only one (1) side of the street at any given time. Additional work zones may be approved by the Owner if the contractor demonstrates the ability to perform the work in a timely manner.

108.09 FAILURE TO COMPLETE WORK ON TIME ***shall be revised to include the following:***

A daily charge will be made against the Contractor for each calendar day that work is performed outside the working times listed in 108.05, Limitation of Operations. A penalty of $500 per occurrence will be applied as Liquidated Damages.

REVISION OF SECTION 250 ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT

SECTION 250 of the Standard Specifications is here by revised for this project as follows:

250.03 GENERAL *shall be revised to include the following:*

Job materials and equipment may be stockpiled and stored at locations near the job site. A list of sites to be used for this purpose and written permission from the property owner shall be submitted to the Engineer for approval at least ten (10) days prior to any use. The proposed truck route for ingress and egress to such sites shall also be submitted to the Engineer for approval. Using such job-site storage requires the following:

1. Obtaining written permission from the property owner, which shall include a brief description of the area of the property to be used, the length of time the property will be used for this purpose, any access restrictions (i.e. times of day), and the name and phone number of the property owner. A copy of the written permission shall be submitted to the Project Manager at least one week prior to delivery of material to the site.

2. Keeping stockpiles and equipment confined to the approved area.

3. Providing security for job materials and equipment and for public safety at the site.

4. Keeping all access roads clean and in good condition.

5. Returning site to original condition.

Precautions shall be taken to ensure that stockpiles are carefully mixed just prior to use to ensure uniform distribution of the moisture, and that they do not become contaminated with over-sized seed rock, clay, silt or excessive amounts of moisture. The stockpile shall be kept in areas that drain readily. Segregation of the aggregate will not be permitted.

REVISION OF SECTION 304 AGGREGATE BASE COURSE

SECTION 304 of the Standard Specifications is hereby revised for this project as follows:

304.02 AGGREGATE ***shall be revised to include the following:***

The minimum allowable R-value for Aggregate Base Course shall be 78. The specific gravity for the aggregates shall be greater than 2.0 at the source. The use of crushed reclaimed concrete material under some circumstances may be substituted for natural aggregate for use in roadbed stabilization upon review and written approval of the Engineer. Aggregate base course for use in shouldering and all-weather surfaces shall be natural and approved by the City of Littleton. All-weather surfaces will be required in-place at the end of each shift when traffic is not running on pavement. Base course from within the existing roadway section, if encountered, can be used as an all-weather surface.

Base course shall have a minimum unit weight of 125 pounds per cubic foot.

The Contractor shall have adequate Aggregate Base Course available for use on project as required by the Engineer.

304.08 BASIS OF PAYMENT ***is deleted in its entirety and replaced with the following:***

Payment for aggregate base course shall be made at the applicable contract unit price for Aggregate Base Course and shall include full compensation for all transportation, materials, labor, equipment, supervision, tools, placement, compaction and all other appurtenant items to complete the work.

Excavation and removal of subgrade deemed unsuitable by the Engineer shall not be measured and paid of separately, but shall be included in the work.

Water will not be measured and paid for separately, but shall be included in the work.

If the Contractor utilizes imported crushed reclaimed concrete in lieu of aggregate base course, payment will be made on the accepted quantity of Aggregate Base Course, Class 6.

If the Contractor elects to utilize Aggregate Base Course to correct subgrade imperfections or control depths at their convenience this will not be paid for separately but shall be included in the Asphalt Pavement pay item.

Pay Item	Pay Unit
Aggregate Base Course (Class 6)	Cubic Yard

REVISION OF SECTION 630 PEDESTRIAN BARRICADE (ADA)

Section 630 of the Standard Specifications is hereby revised for this project as follows:

Subsection 630.01 ***shall include the following:***

This work consists of the construction of temporary pedestrian barricades which are fully ADA compliant.

Subsection 630.02 ***shall include the following:***

The pedestrian barricade shall conform to MUTCD 6F.71 for pedestrian traffic control. The barricade shall be made of High Density Polyethylene (HDPE) with Ultraviolet (UV) stabilizers, or other approved material. It shall be able to interlock with adjacent barricades of the same product such that it forms a wall or a rail.

The pedestrian barricade shall comply with the crash test requirements contained in NCHRP Report 350 (only applicable for pedestrian barricades developed prior to 2011) or MASH Level TL3.

The pedestrian barricade shall have a continuous detectable bottom and top surface to be detectable to users of long canes. The bottom of barricade shall be no more than 2 inches above the ground. The top of barricade shall be no lower than 32 inches above the ground. The gap to the bottom of the barricade may be used for drainage. The barricade shall be reflectorized in accordance with subsection 630.02. No extended bases or protrusions shall extend into the walkway.

The Contractor shall submit manufacturer's documentation confirming that the barricade meets all applicable ADA requirements for barricades or rail.

Subsection 630.13 ***shall include the following:***

Placement of the Pedestrian Barricade (ADA) shall be in accordance with manufacturer recommendations.

The ADA pedestrian barricade may be moved to other locations as shown on the plans or as directed upon completion of use at one location.

In subsection 630.15, ***delete the third paragraph and replace with the following:***

Traffic channelizing devices consisting of vertical panels, traffic cones, or drum channelizing devices will be measured by the unit. Concrete barriers will be measured by the linear foot. Barricades will be measured by the number used, except Pedestrian Barricade (ADA). Barricade warning lights shall be furnished as a part of this item when required by the Traffic Control Plan (TCP). Advance Warning Flashing or Sequencing Arrow Panels will be measured by the unit according to size.

Pedestrian Barricade (ADA) will be measured as the actual linear feet of barricade installed and accepted.

Subsection 630.16 ***shall include the following:***

Payment will be made under:

Pay Item	**Pay Unit**
Pedestrian Barricade (ADA)	Linear Foot

Movement of the Pedestrian Barricade (ADA) to different locations, when required, will not be measured and paid for separately, but shall be included in the work.

FORCE ACCOUNT ITEMS

DESCRIPTION

This special provision contains the City's estimate for force account items included in the Contract. Such estimated amounts will be added to the total bid to determine the Project Commitment Amount and the amount of the performance and payment bonds. Force Account work shall be performed as directed by the Engineer.

BASIS OF PAYMENT

Payment will be made in accordance with subsection 109.04. Payment will constitute full compensation for all work necessary to complete the item.

Force account work valued at $5,000 or less, that must be performed by a licensed journeyman in order to comply with federal, state, or local codes, may be paid for after receipt of an itemized statement endorsed by the Contractor.

Force Account Item	Quantity	Estimated Amount
F/A	F.A.	$100,000.00

UTILITIES

Known utilities within the limits of this project are:

Utility	Contact	Phone / Email
Denver Water	Marty Buckstein	720-233-5329, marty.buckstein@denverwater.org
Xcel Energy – Electric	Builders Call Line	800-628-2121
Xcel Energy – Gas	Liz Gardner Brent Aldred	Elizabeth.T.Gardner@xcelenergy.com Brent.Aldred@xcelenergy.com
CenturyLink	Tammy Norton	720-578-5138
CenturyLink – Long Distance	Shayne Bracken	303-885-8867
Comcast	Butch Buster	303-603-5682
Sanitary & Storm Sewer – Littleton	Deric Romero	303-795-5360, dromero@littletongov.org
Grounds and Open Space	Brian Nevans	303-734-8083, bnevans@littletonco.gov
Streets	Scott Schlecht	303-795-3949, sschlecht@littletonco.gov
Traffic Signals	Tim Weaver	303-795-3834, tweaver@littletonco.gov

GENERAL:

The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavating or grading is planned in the area of underground utility facilities. The Contractor shall notify all affected utilities at least two (2) business days, not including the actual day of notice, prior to commencing such operations. The Contractor shall comply with Article 1.5 of Title 9, CRS ("Excavation Requirements") when excavating or grading is planned in the area of underground utility facilities. The Contractor shall notify all affected utilities at least two (2) business days, not including the actual day of notice, prior to commencing such operations. The Contractor shall contact the Utility Notification Center of Colorado (UNCC) at phone no. 811, to have locations of UNCC registered lines marked by member companies. All other underground facilities shall be located by contacting the respective owner. Utility service laterals shall also be located prior to beginning excavation or grading.

All costs incidental to the foregoing requirements will not be paid for separately but shall be included in the work.

30.1 DESCRIPTION

The concrete shall be composed of fine and coarse aggregates, portland/hydraulic cement, supplementary cementitious materials, admixtures, and water. The ingredients are specified in Sections 30.2A through 30.2F. Reference documents ACI 301 and ACI 318.

30.2 MATERIALS

All materials used in concrete shall be the same materials used in the concrete represented by the field test records or trial batch mixtures. Materials substitution shall be approved by the AGENCY.

A. Aggregate

Aggregate is defined as granular material, such as sand, gravel, crushed stone, and iron blast furnace slag, used with a cementing medium to form hydraulic-cement concrete or mortar as per ASTM C125. Other materials that are significantly detrimental to the concrete mix should be excluded from the aggregate or aggregate blend utilized.

1. Alkali-Silica Reactivity

Aggregates containing certain ingredients can react with the cement in concrete causing expansion of the concrete. The following tests shall be performed to help produce concrete resistant to alkali-silica reaction. Individual aggregates shall be tested and considered innocuous if it complies with the following:

- ASTM C1260 14-day expansion less than or equal to 0.10%, or
- ASTM C1293 1-year expansion less than or equal to 0.040%

For aggregates that do not meet these criteria, mitigation measures shall be demonstrated in accordance with the below to meet the minimum requirements:

- ASTM C1567 14-day expansion less than or equal to 0.10%*, or
- ASTM C1293 2-year expansion less than or equal to 0.040%*

*Tested with submitted concrete mix design cement, supplementary cementitious materials, and aggregate(s) Individual aggregate proportions or the aggregate blends which shall be used in the mix design shall be tested. Alternative mitigation measures will be considered case by case (see Table 30.2A-3).

2. Fine Aggregate

Fine aggregate shall meet the requirements in ASTM C33, except as follows. The gradation shall meet the requirements in Table 30.2A-1.

Table 30.2A-1
Fine Aggregate Gradation

Sieve	Percent Passing, %
3/8 inch	100
No. 4	95 - 100
No. 8	80 – 100
No. 16	50 – 85
No. 30	25 – 60
No.50	5 – 30
No. 100	0 – 10
No. 200	0 – 3*

*Manufactured sand that consists of over 50% crushed particles limits No. 200 to a maximum of 5%.

Sulfate soundness loss by weight (ASTM C88) shall not exceed 10% (Sodium Sulfate,) or 15% (Magnesium Sulfate.)
The maximum deleterious substances and organic impurities shall not exceed the limits listed in ASTM C33 (Table 30.2A-2).

Table 30.2A-2
Fine Aggregate Deleterious Substances and Organic Impurities

Material	ASTM	Limit
Material finer than 200 mesh sieve	C117	3% by weight
Shale	Petrographic analyses	1% by weight
Coal and Lignite	C123	0.5% by weight
Clay lumps and friable particles	C142	3% by weight
Organic Impurities	C40	Plate 3
3/8 inch	20 to 55	- -

The sum of the percentages of the above deleterious substances shall not exceed 5% by weight.

3. Coarse Aggregate

Coarse aggregate gradation shall meet the requirements in ASTM C33 (Table 30.2A-3).

Table 30.2A-3

Coarse Aggregate Gradation

Sieve Size	No. 67 (3/4" Nominal) % Passing	No. 57 (1" Nominal) % Passing	No. 467 Combined Grading % Passing
2 inch	- -	- -	100
1 1/2 inch	- -	100	95 to 100
1 inch	100	95 to 100	- -
¾ inch	90 to 100	- -	35 to 70
½ inch	- -	25 to 60	- -
3/8 inch	20 to 55	- -	10 to 30
No. 4	0 to 10	0 to 10	0 to 5
No. 8	0 to 5	0 to 5	- -
No. 200	- -	- -	- -

Note: Grading No. 57 or 67 shall be used when the concrete section thickness is six (6)-inches or less, unless otherwise specified.

Wear shall not exceed 50% as tested in accordance with ASTM C131/C535 (based on nominal maximum aggregate size). Sulfate soundness loss by weight (ASTM C88) shall not exceed 12% (Sodium Sulfate), or 18% (Magnesium Sulfate).

The maximum percentage of deleterious substances shall not exceed the limits in ASTM C33 (Table 30.2A-4).

Table 30.2A-4

Coarse Aggregate Deleterious Substances

Material	ASTM	Limit
Material finer than 200 mesh sieve	C117	1% by weight
Lightweight fragments (specific gravity < 2.4)	C123	3% by weight
Coal and Lignite (specific gravity < 2.4)	C123	0.5% by weight
Clay lumps and friable particles	C142	3% by weight

Non-aggregate material such as wood, sealant, and backer-rod are considered deleterious substances. The sum of the percentages of the above deleterious substances shall not exceed 5% by weight.

4. **Combined Aggregate Blends**

Combined aggregate blends will be allowed. Individual aggregates that do not meet the gradations in Table 30.2A-3 may be blended to achieve the gradations in Table 30.2A-3. Intermediate aggregates may also be added to improve fresh and hardened properties of concrete.

Optimized gradations may be used by following a Shilstone, KU Mix, or similarmethod. The combined aggregate gradation usually falls within Zone II of Figure 30.2 but is not required to be within this Zone. Coarseness factor and workability factor shall be computed as follows:

$$Q\ (Quality) = \%\ combined\ aggregate\ retained\ on\ {}^{3}/_{8}\ inch\ sieve$$

$$I\ (Intermediate) = \%\ combined\ aggregate\ passing\ {}^{3}/_{8}\ inch\ sieve\ and\ retained\ on\ \#8\ sieve$$

$$W\ (Workability) = \%\ combined\ aggregate\ passing\ \#8\ sieve$$

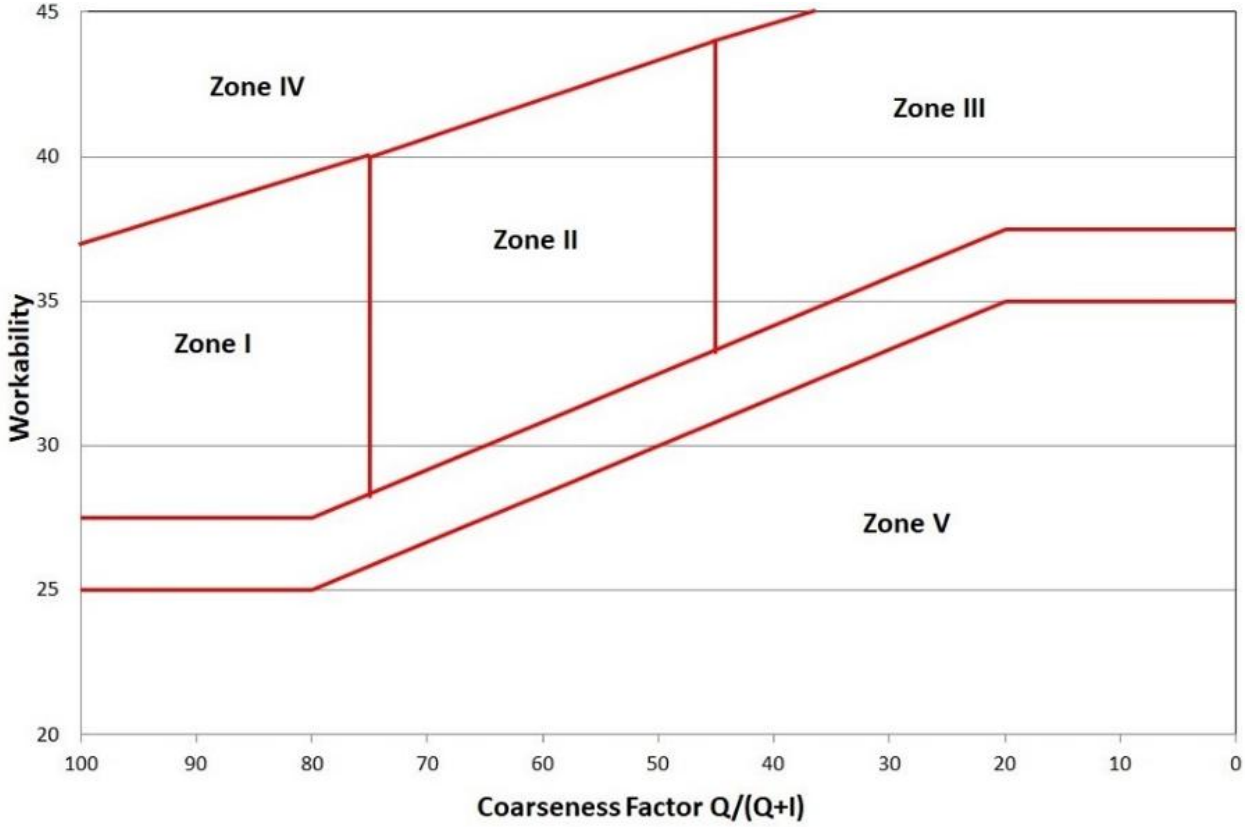
$$CF\ (Coarseness\ Factor - X\ axis) = \frac{Q}{(Q+I)}$$

$$WF\ (Workability\ Factor - Y\ axis) = W$$

The workability factor should be adjusted based on the total cementitious content (cement plus any supplementary cementitious materials) prior to plotting using the following equation:

$$WF_{adj}\ (Adjusted\ Workability\ Factor) = W + \left(\frac{wt.cementitious}{94\ lbs.} - 6\right) * 2.5$$

Figure 30.2A-1
Shilstone Coarseness Factor Chart



B. Cement

Portland/hydraulic cement shall conform to the following specifications:

Table 30.2B-1 Cement Types

Description	Specification	Type
Portland Cement[1]	ASTM C150	I, II, or V[2]
Blended Hydraulic Cement	ASTM C595	IL(MS), IL(HS), IP, IP(MS), IP(HS) or IT
Hydraulic Cement[3]	ASTM C1157	GU, MS, HS, shall be limited to a maximum of 15% limestone

1 ASTM C150 Type III may be allowed for fast-track applications.

2 ASTM C150 Type II cement meeting the optional limits in accordance with ASTM C452 may be substituted for ASTM C150 Type V cement. ASTM C452 documentation shall be valid for two (2) years.

3 ASTM C1157 Type HE may be allowed for fast-track applications.

C. Supplementary Cementitious Materials

1. Fly Ash

Fly ash or natural pozzolans shall conform to ASTM C618, for Class C, F, N, or AASHTO M321 for High Reactivity Pozzolans.

2. Slag Cement
   Slag cement shall conform to ASTM C989, Grade 100 or Grade 120.

D. Admixtures

Air-entraining admixtures shall conform to ASTM C260.
Chemical admixtures shall conform to ASTM C494, according to the following types:
Type A – Water-reducing
Type B – Retarding
Type C – Accelerating
Type D – Water-reducing and retarding
Type E – Water-reducing and accelerating
Type F – Water-reducing, high range admixtures
Type G – Water-reducing, high range, and retarding
Type S – Specific performance

Calcium chloride shall not be used for exterior concrete. Written approval by the Agency shall be obtained prior to the use of any Type S admixtures. Application of admixtures shall be per manufacturer's recommendations.
Corrosion inhibiting admixtures shall meet ASTM C1582.
Pigments for integrally coloring concrete shall meet ASTM C979.

E. Water

Water shall be potable or qualified by conforming to ASTM C1602.

F. Fibers

Fibers shall be allowed and must conform to ASTM C1116:

Type I Steel fiber-reinforced concrete or shotcrete.
Contains stainless steel, alloy steel, or carbon steel fibers.

Type II Glass fiber-reinforced concrete. Contains alkali-resistant glass fibers.

Type III Synthetic fiber-reinforced concrete. Contains virgin homopolymer polypropylene fibers or other synthetic fibers.

Type IV Natural fiber-reinforced concrete that contains cellulose fibers.

G. Reinforcing Steel

All steel shall meet the requirements as noted or as shown in the project plans. Mesh reinforcement shall meet ASTM A1064 for plain and deformed

welded wire.

1. Tie Bars for Pavement

Tie bars shall be ASTM A615 Grade 60 deformed steel bars and conform to the requirements of ASTM A775, except that ends need not be patched and frames are not required to be epoxy coated. Tie bars fabricated with ASTM A615 Grade 40 steel may be used for construction requiring bent bars.

2. Dowel Bars for Pavement

Dowel bars shall be ASTM A615 Grade 60 plain steel bars conforming to ASTM A775, except that ends and frames need not be epoxy coated. Dowel bars shall be free from burring or other deformation restricting slippage in the concrete. The dowels shall be coated with a bond-breaker recommended by the manufacturer.

3. Tie Bars for Curb, Gutter and Cross Pans

Epoxy coated #4 rebar shall be placed and secured, using epoxy grout, in all transitions between old concrete and newly placed concrete. The rebar will be placed in the curb and gutter portion of both monolithically placed curb, gutter and walk and standalone curb and gutter. The rebar will have at minimum 2" of coverage of concrete in all directions and will be placed every 1 subsequent foot after the first 2".

Rebar placement shall be considered incidental to the overall cost of the concrete placement and will not be paid separately.

4. Expansion Joint Material

Expansion material will be placed explicitly at the direction of the Engineer and shall be considered incidental overall cost of placement of the material and will not be paid separately.

H. **Curing Materials**

Curing materials shall conform to one of the following:

Table 30.2H-1 Curing Materials

Material	Specification
Liquid membrane-forming curing compounds	ASTM C309, Type 2, Class A, or Class B
Liquid membrane-forming compounds having special properties for curing and sealing concrete	ASTM C1315, Type I or II, Class A

White polyethylene film	ASTM C171
White burlap-polyethylene sheeting	ASTM C171
Waterproof paper	ASTM C171

I. Joint Sealant, Backer Rod & Expansion Joint Materials

The joint sealant for all sawed longitudinal and transverse joints shall be a silicone joint sealant meeting ASTM D5893. ASTM C1193 provides guidance for use of joint sealants.

Blocking medium shall be an expanded closed cell polyethylene foam backer rod or non-plastic rope that is compatible with the joint sealant material and meets ASTM C1330, Type C or ASTM D5249.

Polyethylene expansion joint materials shall be flexible, low density, expanded extruded polyethylene plank formed by the expansion of polyethylene base resin, extruded as a multicellular, closed cell, homogeneous foamed polyethylene. Laminations shall not be permitted. The joint material shall conform to ASTM D1751, ASTM D1752, or ASTM D8139.

J. Miscellaneous Additional Products

Use of additional products and or special ingredients may be approved by the Agency on a project specific basis.

30.3 CONCRETE MIXTURE PROPORTIONING

The following criteria is for general use exterior flatwork and concrete pavement, both of which may be exposed to deicing chemicals, as detailed in the application types in Table 30.3A-1.

A. Mixture Requirements

Jobsite, placement size, and exposure conditions may require modifications to these general criteria.

Table 30.3A-1 Mix Design Criteria

		EXTERIOR - General, Deicer Resistant	PAVING – Deicer Resistant
MIX SELECTION BY USE	Designation	EXT-DR	P-DR
	Acceptable CDOT Mix Substitution Class	D, B, S35	P
	Typical Application Type	Flatwork, sidewalk, curb and gutter, curb ramps, bridge structure and decks, other structures	Concrete pavement, bus pullouts, curb and alley cuts or pans
	Typical Cure Environment	Year-Round	Year-Round
STRENGTH REQUIREMENTS	Minimum Design Compressive Strength (f'c)* at 28 Days	4,500 psi	4,500 psi
	Minimum Lab Mix Design Compressive Strength at 28 Days	5,200 psi	5,200 psi
	Minimum Design Flexural Strength at 28 Days	Not Required	650 psi
	Minimum Opening Compressive Strength	2,000 psi (before construction traffic) 2,500 psi (before normal traffic) All opening strengths must be verified with maturity methods. Alternative mitigation measures will be reviewed individually	
MIX COMPONENTS	Allowable Cement Types	Refer to Table 30.6	
	Allowable Supplementary Cementitious Materials	ASTM C618 Class F Fly Ash, Class C Fly Ash, or other approved pozzolans (20-30% replacement of cement) ASTM C989 Slag Cement, Grade 100 or 120 (20-50% replacement of cement) Supplementary cementitious materials are required to mitigate deicer impacts	
	Minimum Cementitious Material Content (cement + supplementary cementitious materials)	520 lbs./cy (flatwork) 565 lbs./cy (structures; inlets, buried sewer box culverts, vaults)	520 lbs./cy
	Maximum Water-to-Cementitious Material (W/CM) Ratio [water/(cement + supplementary cementitious materials)]	0.45	0.44
	Sulfate Resistance	Subject to the limits in CDOT 601.04 Sulfate Resistance	
SLUMP	Lab Mix Design Slump Range	Slump requirements will vary based on application (hand vs. machine placement or other) Slump acceptance is based on approved supplier mix design and set limits	
TEMPERATURE	Fresh Concrete Temperature (for placement)	Between 50 F and 95 F	
	In-Place Concrete Temperature (during curing)	A minimum of 50 F for at least 48 hours, or until it reaches 2,000 psi compressive strength. Use curing blankets as needed and verify using temperature monitoring devices, such as a min-max thermometer or maturity logger	

*f'c = Minimum Specified Compressive Strength

The concrete mixture shall include a supplementary cementitious material to mitigate winter deicer impacts, and the type(s) of supplementary cementitious materials allowed are dependent on sulfate contents in the subgrade soils.

The supplier should have available a range of mixtures that will work with

various placing temperatures, slumps, climates, and need to adhere to required setting and opening time to pedestrian and vehicular traffic.

Allowable air content ranges for concrete mixture shall be according to the following table:

Table 30.3A-2 Air Content Requirements for Mix Design (ACI 318, 19.3.3.1)

Nominal maximum aggregate size, inches	Air content, %
3/8	6.0 – 9.0
½	5.5 – 8.5
¾	4.5 – 7.5
1	4.5 – 7.5
1½	4.0 – 7.0
2	3.5 – 6.5
3	3.0 – 6.0

Nominal maximum size (of aggregate) is defined in ASTM C125 as the smallest sieve opening through which the entire amount of the aggregate is permitted to pass.

Application and performance requirements will dictate the maximum nominal aggregate size.

B. **Mix Design Submittal**

Mix Design submittals will follow ACI 318 and include the following items at a minimum:

- Certified material test reports for aggregate, including all tests required; reporting each test, test method, test result, and other requirement specified (criteria).
- Aggregate gradations and analysis.
- Reactivity test results.
- Coarse aggregate quality test results, including deleterious materials.
- Fine aggregate quality test results, including deleterious materials.
- Mill certificates for cement and supplementary cementitious materials.
- Certified test results or certifications for all admixtures.
- Specified strength, slump, air content and maximum water-cementitious materials (w/cm) ratio.
- Recommended proportions, weights/volumes for proposed mixture and trial water cementitious materials (w/cm) ratio, including actual slump

and air content. Include material supplier and location of materials (pit name, cement plant, etc.)

- Compressive (and flexural when required) strength summaries and plots, including all individual beam and cylinder break results. Maturity Method data and curves showing the basis of criteria for allowing the opening of traffic on pavement.
- Submit a new design mix based on the above requirements when a significant change occurs in the mix proportions, source or type of cement, fly ash, or aggregate, or failure of field tests to meet specifications.
- The limits to possible field added weights for air, water, slump, other materials shall be clearly shown on individual dispatch tickets during production. The mix design shall be reviewed and stamped by a Professional Engineer registered in the State of Colorado. Alternatively, a mix design on the current CDOT Approved Products List (APL,) may be submitted for use.

Review of the design mix by the AGENCY does not constitute acceptance of the concrete deliveries.

C. **Field Acceptance**

1. Fresh Properties

Concrete may be placed when slump, air content and water to cementitious materials ratio are determined to be in accordance with the AGENCY approved mix design parameters. Use Tables 30.3A-1 and 30.3A-2, and maximum water added dictated by the supplier in the mix design or delivery batch ticket when the AGENCY has no parameters. Concrete may be placed when batch tolerances are in accordance with ASTM C94, including the onsite addition of water and admixtures, and discharge time limits.

2. Strength

The strength level of standard or field cured concrete mixture specimen shall be acceptable if:

- The arithmetic average of any three consecutive strength tests equals or exceeds the Minimum Specified Compressive Strength, f'c, and,
- No strength test falls below f'c by more than 500 psi if f'c is 5,000 psi or less; or by more than 0.10f'c if f'c exceeds 5,000 psi.

If either of these requirements are not satisfied, steps shall be taken to increase the average of subsequent strength results. Evaluation of strength test results, and investigation of low strength-test results shall be in accordance with ACI 301 and ACI 318. When 28-day strength test results are

below the minimum specified strength, 56-day cylinders can be valuated to verify minimum specified strength. Otherwise, if concrete is determined to not meet required compressive strength, in-place coring can be performed for material evaluation up to 65 days after placement. If the average of three core specimens achieve at least 85% of f'c, the concrete placement is considered acceptable. Concrete determined to have low strength shall be removed and replaced at the Contractor's expense or may remain in place at a reduce cost at the AGENCY's discretion. Core specimens must be obtained following ASTM C42. Additional testing or coring of concrete shall be performed at the Contractor's expense.

D. Testing

Testing of Concrete shall be performed in accordance with Table 30.3D-1.

TABLE 30.3D-1

Contractor's QC SCHEDULE FOR MINIMUM MATERIALS SAMPLING AND TESTING

Test Type	Test Standard	Minimum Frequency (General Use)	Minimum Frequency (Pavement)
Strength	ASTM C31 ASTM C39	One set* per 100 cubic yards (minimum of one set per day)	One set* per 500 CY (minimum of one set per day)
Air Content	ASTM C231	One test per each first three trucks, then one for every five trucks** and with each set of strength samples	One test per each first three trucks, then one for every 500 CY** and with each set of strength samples
Slump	ASTM C143	One test per each first three trucks, then one for every five trucks** and with each set of strength samples	One test per each first three trucks, then one for every 500 CY** and with each set of strength samples
Temperature	ASTM C1064	One test with every air and slump test	One test with every air and slump test
Unit Weight	ASTM C138	One per air content test	One per air content test
Thickness	ASTM C174	--	One core per 1,500 LF per lane or utilize MIT Scan T3 or equivalent

+QA testing may be less frequent than that required for QC testing.

*One set consists of at least 5 cylinders, with a minimum of 3 cylinders tested at 28 days. One cylinder may be tested at 7 days, and one held for compressive strength testing at 56 days, in case compressive strength tests do not meet requirements at 28 days.

**If out of specification, test each truck until within specification.

Testing shall be performed by ACI Concrete Field Testing Technician Grade I certified technicians. The AGENCY shall determine who is responsible for performing QA testing, and the CONTRACTOR shall be responsible for QC testing. QC testing will not be paid for separately but shall be considered part of the work.

The CONTRACTOR shall provide and maintain onsite facilities that will allow for the initial curing of test specimens to meet the requirements of ASTM C31. The AGENCY, CONTRACTOR, TESTING LABORATORY, AND CONCRETE SUPPLIER shall meet to discuss the adequacy and location of the on-site initial curing facilities location. Test results will be distributed by the TESTING LABORATORY to the AGENCY, CONTRACTOR, CONCRETE SUPPLIER, and any other appropriate representatives after specified project break dates of compressive strength specimen.

Laboratories performing tests shall be accredited by a nationally recognized accrediting organization. The laboratory will meet the requirements of ASTM C1077 and E329 for Aggregates and Concrete. Temporary field laboratories shall meet the same requirements, but the principal laboratory shall be accredited. Testing shall be performed by individuals certified in the testing conducted or under the direct observation of certified individuals while in training and in pursuit of certification (within 3 months). Results of tests determined to have not been performed in accordance with applicable ASTM standards or criteria stated here shall not be used in the determination of acceptance. (Note: Records of technician certifications, and equipment calibrations and verifications shall be maintained and made available for review.)

30.4 MATURITY (TIME-TEMPERATURE) METHOD AND ESTIMATING CONCRETE STRENGTH

The Maturity Method may be used to make reliable estimates of the in-place strength of concrete, particularly when early opening is desired or required by the AGENCY. This is a two-step procedure:

- First, a relationship must be established between the maturity values and the concrete strength as measured by destructive methods in a laboratory in order to determine the Maturity Index. The development of the maturity curve shall be done prior to beginning construction and shall use the approved materials and mix design for the project.

- The second step is the instrumentation of the concrete to be measured. Maturity loggers are installed in the concrete and measured at predetermined intervals. By comparing those maturity readings to the laboratory curve, the in-place strength can be estimated. The contractor and the agency shall jointly develop a plan for performing the maturity testing.

A. Terminology

Datum Temperature	"The datum temperature is a selected temperature value at which it is assumed that no reactions occur to contribute to strength." (TIP 15)
Maturity Logger	A device required to monitor and record the concrete temperature as a function of time and compute the Maturity Index.
Maturity Method	"A technique for estimating concrete strength that is based on the assumption that samples of a given concrete mixture attain equal strengths if they attain equal values of the maturity index." (ASTM C1074)
Strength-Maturity Relationship	"An empirical relationship between concrete strength and maturity index that is obtained by testing specimens whose temperature history up to the time of test has been records." (ASTM C1074) In this document the Strength-Maturity Relationship is referred to as the Maturity Curve.
Temperature-Time Factor	"The maturity index computed as the area between the concrete temperature and the datum temperature from the plot of measured concrete temperature versus time, expressed in units of degree-days or degree hours." (ASTM C125) In this document the Temperature-Time Factor is referred to as the Maturity Index.

B. Laboratory Curve Development

Input the recorded data into the maturity software system that is being utilized. Provide a report that summarizes the following data from the trial:

- Batch Date
- Batch time
- Logger activation time
- Datum temperature
- Mix Code
- Concrete slump, air content, unit weight, temperature and water to cementitious ratio at the time of testing

- Minimum and maximum temperatures recorded
- At each test age list averages of the maturity values, temperature and compressive strengths
- What size cylinder or beam that was used as a specimen type
- The time-temperature factor for the target compressive strength
- The appropriate equation from ASTM C1074 Section 6 used
- Plotted maturity curve with the maturity value on the X axis and the strength listed on the Y axis

If specified, a flexural strength maturity relationship is permitted. Use the same procedures found in Section 30.4B above to develop the flexural maturity curve.

Development of a new maturity curve due to material source, or proportion changes, in a concrete mix may be waived by use of the verification procedure found in Section 30.4D.

C. **Field Measurement**

The AGENCY is responsible for the maturity determination of in-place concrete such as designating the location and quantity of maturity sensors and verifying the required maturity index for the project.

Prior to concrete placement, install maturity loggers at locations in the structure that are critical in terms of exposure conditions and structural requirements. Sensors should be surrounded by concrete and not be in direct contact with metallic embedment's or other features that are partially exposed to the environment. For pavements, insert the maturity loggers into the concrete until the probe is at approximately the slab mid- depth, and at least two feet from the edge. Consult the AGENCY for smaller sections of pavement where this is not possible.

D. Determination of In-Place Strength

The field placement will likely reach the target maturity index faster than the cylinder specimens did during the development of the maturity curve. This is more accentuated when using high early concrete. A plan should be developed for each pour as to when maturity readings in the field will begin based on the anticipated rate of strength gain of the concrete placement. Consult with the Ready-Mix supplier to understand this in more detail.

When the strength at a location is to be estimated, read the maturity index from the logger.

Verification of the strength maturity relationship is performed when safety critical elements are identified by the AGENCY. Cast at least three field-molded cylinders. A maturity logger will be placed in the center mass of one cylinder. Activate the

maturity logger immediately after molding is complete. Subject these cylinders to the same curing method used during maturity curve development. When the logger reads 90-100% of the target maturity index, transport all cylinders, including the one with the logger, to the testing location. Prior to testing any cylinders, record the temperature, maturity index and elapsed time of the embedded logger. Test at least two cylinders to determine the average compressive strength. If the average compressive strength of the cylinders is more than 10% below the strength indicated by the maturity curve at that time, a new strength maturity relationship should be developed. If the average compressive strength of the cylinders is more than 10% over the strength indicated by the maturity curve at that time, it is not necessary to develop a new curve unless more accuracy is deemed necessary by the AGENCY.

E. Factors Requiring a New Curve

Changes in material sources, proportions, and mixing equipment all affect the maturity value of a given concrete mixture. If the w/c ratio of the production concrete exceeds the w/c ratio of the concrete used to develop the strength-maturity curve by more than 0.02, a new curve shall be Item 30 - Page 16 developed. Therefore, development of a new maturity curve is generally required for any change to a concrete mix.

Development of a new maturity curve due to material source or proportion changes in a concrete mix may be waived by use of the validation procedure. If the average strength is greater than the original maturity curve at the TTF the validation beams were tested, a new curve shall not be required. A new curve shall be required if the average strength is less than the original curve at the TTF the validation beams were tested.

30.5 REFERENCES

See MGPEC VOLUME I - PAVEMENT DESIGN STANDARDS & CONSTRUCTION SPECIFICATIONS 2019 Version for references.

31.1 DESCRIPTION

This work shall consist of constructing curbs, gutters, sidewalks, ramps, local depressions and driveways of the form and dimensions shown on the plans.

31.2 MATERIALS

Materials shall conform to the applicable requirements of Item 30, Portland Cement Concrete Pavement (PCCP).

31.3 EQUIPMENT

A. General

Equipment and tools necessary for handling materials and performing all parts of the work must have adequate capacity and be in good mechanical condition. This equipment shall be on the site, available for inspection and testing, before paving operations are started. All equipment, tools, and machinery shall be maintained in satisfactory working condition.

Equipment shall be approved by the AGENCY. All equipment and machinery shall be kept in good working order, free of leaks and properly muffled. All taxes, licenses and fees shall have been paid and proper licenses and permits shall be posted as required by law.

B. Forms

The depth of forms for curbs shall be equal to the full depth of the curb. The depth of outside forms for concrete gutter shall be equal to the full thickness of the gutter. Timber forms, if used, shall be surfaced on the side placed next to the concrete, shall have a true smooth upper edge, and shall not be less than 1/4 inches thick after being surfaced. Warped forms and forms not having a smooth, straight upper edge shall not be used. Benders or thin plank forms, rigidly placed, shall be used on curves, grade changes or for curb returns. Steel forms shall not be used on curved sections with radii less than 200 feet. Back forms for curb returns shall be made of a minimum of ½-inch benders, for the full height of the curb, cleated together. Forms shall be carefully set to alignment and grade and to conform to the dimensions required.

Forms shall be held rigidly in place by the use of pairs of steel stakes placed at intervals not to exceed 4 feet. If metal forms are used, steel stakes shall not be spaced more than 6 feet apart. Clamps, spreaders and braces shall be used where required to ensure rigidity in the forms.

C. Slip Forms

Slip-form paving equipment shall be equipped with traveling side forms of sufficient dimensions, shape, and strength to support the PCCP laterally for a sufficient length of time during placement to produce pavement of the required cross section. No

abrupt changes in longitudinal alignment of the pavement will be permitted. The horizontal deviation shall not exceed 0.04 foot from the alignment established by the AGENCY. All forms shall be cleaned thoroughly each time they are used and coated with a light soil often as necessary to prevent the PCCP from adhering to them.

31.4 CONSTRUCTION

Curbs, gutters and sidewalks shall be placed in sections of 90 feet maximum length, unless allowed by the Owner. Moisture treatment and stabilization of the subgrade will be required at all locations.

A. Earthwork

The subgrade shall be constructed true to the grade and cross section as shown on the plans or established by the AGENCY. It shall be thoroughly moisture conditioned and rolled or hand tamped until the subgrade from front of curb to back of sidewalk reaches the compaction required for the adjacent roadway. All soft and yielding material shall be removed to a depth of not less than 12 inches and the resulting space filled with compacted earth, sand or gravel. The City mandates that all removed soil be replaced with compacted fill. The contractor may elect to use up to three inches (3”) of compacted ABC or Class 6 to establish grade, however, additional base must be approved by the City or will be considered to be “Contractor Means and Methods” and will not be compensated for the material.

The completed subgrade shall be tested for grade and cross section by means of a template extending the full depth and supported on the side forms. The subgrade and forms shall be watered in advance of placing Portland cement concrete.

B. Existing Curbs. Gutters and Sidewalks

The CONTRACTOR shall remove existing curbs, gutters and sidewalks to the limits shown on the plans or directed by the Owner. Removal and replacement beyond the plan limits shall be at the CONTRACTOR's expense and no additional compensation will be allowed. Saw-cutting is included in the price of removals and will not be measured and paid for separately.

C. Curb and Gutter Expansion Joints

Expansion joints 1/2-inch wide shall be constructed in curbs and gutters at 90-foot intervals, at each side of structures and at the ends of all curb returns or driveways; except that expansion joints shall not be installed within 20 feet of an island nose. Expansion joints shall be filled with joint filler strips 1/2-inch-thick conforming to ASTM D 1751, Fiber Type. The filler for the joint shall be furnished in a single piece for the full depth and width required for the joint. Expansion joint filler shall be shaped to the cross section of the curb and gutter.

D. Sidewalk Expansion Joints

Transverse expansion joints 1/2-inch wide shall be constructed at all sidewalk returns and in line with expansion joints in adjacent curb. Where curb is not adjacent, expansion joints shall be constructed at intervals of 100 feet. Expansion joints shall coincide where curb and gutter are adjacent, even if not integral. Expansion joints shall be placed where sidewalk abuts adjacent structures, appurtenances or driveways. Expansion joints shall be filled with joint filler strips 1/2 inch thick conforming to ASTM D 1751, Fiber Type. The filler for the joint shall be furnished in a single piece for the full depth and width required for the joint unless otherwise authorized by the AGENCY.

The joint filler shall be placed with the top edge 1/4 inch below the concrete surface and shall be held in place by means of steel pins driven into the subgrade and spaced sufficiently close to prevent warping of the filler during floating. Upon completion of floating, the pins shall be removed and when finishing operations have been completed, the joint shall be edged with an edging tool having a radius of 1/8 inch.

E. Curb and Gutter Construction

In constructing curbs, entrances for driveways shall be constructed according to the dimensions shown on the plans. With approval of the AGENCY, the curb may be constructed by the use of a curb forming machine.

Where hot mix asphalt pavement (HMAP) or portland cement concrete pavement (PCCP) is to be placed around or adjacent to manholes, drop inlets or catch basins in gutter, local depressions or driveways, such structures shall not be constructed to final grade until after the curbs and gutters have been constructed on each side of the structure in order to maintain a true grade.

The forms shall be filled to the top and the concrete shall be consolidated so that there will be no rock pockets or voids. Concrete shall be consolidated by means of mechanical vibrators approved, by the AGENCY. No concrete over 90° F shall be used.

Immediately after removing the front curb forms, the face of the curb shall be troweled smooth to a depth of not less than 2 inches below the flow line or to the flow line of integral curb and gutter, and then finished with a steel trowel. The top shall be finished and the front and back edges rounded as shown on the plans.

After the face of the curb has been troweled smooth, it shall be given a final fine brush finish with brush strokes parallel to the line of curb. In no case shall the minimum time between placing concrete and removal of forms be less than 12 hours. No dusting or topping of the surface, or sprinkling with water, to facilitate finishing shall be permitted.

The top and face of the finished curb shall be true and straight, and the top surface of curbs and gutters shall be of uniform width, free from humps, sags or other irregularities. When a straightedge 10 feet long is laid on the top or face of the curb or on the surface of the gutters, the surface shall not vary more than 1/4 inch from the edge of the straightedge, except at grade changes or curves. The exposed

surface shall be cured for a period of not less than 72 hours in accordance with the requirements in MGPEC Item 30, Portland Concrete Pavement.

F. Sidewalk Construction

The structures shall be finished to smooth, NOT troweled, and uniform texture by floating with wooden or magnesium floats, and, if so directed by the AGENCY, by cross brooming or burlap-finishing. No concrete over 90° F shall be used. The surface shall be lightly grooved or marked into squares or other shapes to match other such markings on similar existing structures in the vicinity, or as designated by the AGENCY.

No dusting or topping of the surface, or sprinkling with water, to facilitate finishing shall be permitted. The minimum time between placing concrete and removal of forms is at least 12 hours. When a 10-foot straightedge is placed on the sidewalk, the surface shall not vary more than 3/4 inch from the edge of the straightedge, except at grade changes, and the finished surface shall be free from blemishes.

Immediately after the surface of the sidewalk is finished, the concrete shall be cured for a period of not less than 72 hours in accordance with the requirements of MGPEC Item 30, Portland Concrete Cement.

Contraction joints in sidewalks must be placed at a spacing equivalent to width up to 12 feet. All joints in curb and gutter must be continuous through adjacent sidewalk.

G. Cold Weather Protection

When concrete is placed with ambient temperatures below 40° F during or within the initial 72 hours of placement, the CONTRACTOR shall provide satisfactory methods and means to protect the mix from injury by freezing. The aggregates, or water, or both, shall be heated in order to place the concrete at temperatures between 50° and 90° F. Placing of concrete may be started in the morning if the CONTRACTOR desires, but shall be discontinued at 3:00 p.m. of the same day if freezing weather threatens.

The concrete or aggregates shall be protected before and after placing, as directed by the AGENCY, to retain all heat possible in the concrete mix. After the concrete has been placed, the CONTRACTOR shall provide sufficient protection such as blankets, canvas, framework, heating apparatus, etc., to enclose and protect the structure and maintain the temperature of the concrete at not less than 50° F until at least 60 percent of the 28-day field strength has been attained. Temperatures shall be measured and recorded using a recording thermometer by the Contractor's QC Testing. Except as provided above, cold weather concreting shall be in accordance with ACI 306. If in the opinion of the AGENCY, the protection provided is inadequate, concrete placement shall cease until conditions or procedures are satisfactory to the AGENCY. No additional payment for cold weather concrete protection shall be made.

H. Hot Weather Concreting

Except by written authorization, concrete shall not be placed if its temperature exceeds 90° F. The placement of concrete in hot weather shall comply with ACI 305.

I. **Opening**

Walks shall not be opened to pedestrian traffic for at least 24 hours after placement. Curb cuts, curb and gutter and crosspans shall not be opened to vehicular traffic for at least 7 days after placement or until concrete has attained two-thirds of the required 28-day strength. The CONTRACTOR shall maintain suitable barricades to comply with these requirements. Early opening may be approved by the City if "High-Early" concrete has been placed and has demonstrated the approved compressive strength. Concrete shall be backfilled within 24 hours of opening to eliminate potential tripping hazards or uneven surfaces.

31.5 TOLERANCES

Surface irregularities (measured with a 10-foot long straightedge) exceeding 1/4 inch, but less than 1/2 inch, shall be ground by the CONTRACTOR at his expense. When surface irregularities exceed the foregoing limits, the CONTRACTOR shall remove and replace that portion of work at his expense.

If, after stripping of forms, any concrete is found to be not formed as shown on the Plans, or is out of alignment or level, or shows a defective surface, it shall be considered as not conforming to these specifications. The defective area shall be removed and replaced at the CONTRACTOR's expense.

31.6 MEASUREMENT

The quantity of curb and gutter measured for payment will be the number of linear feet along the base of the curb face or along the flow line of the gutter, and such measurement shall be continuous along such line extended across driveway and alley entrance returns. The quantity of sidewalk, ramps and driveway shall be measured for payment by area in square yards. All quantities herein will be complete and in place.

31.7 TESTING AND INSPECTION

Testing of Portland cement concrete pavement shall be performed in accordance with Table 31.7-1.

TABLE 31.7-1 SCHEDULE FOR MINIMUM MATERIALS SAMPLING AND TESTING

Compressive Strength	ASTM C 39	Minimum of one (1) set per day or one (1) set per 100 cubic yards
Air Content	ASTM C 231	One test per each first three trucks, then one for every five trucks thereafter
Slump	ASTM C 143	One test per each first three trucks, then

		one for every five trucks thereafter
Temperature	ASTM C 1064	One test with every air and slump test

31.8 PAYMENT

All quantities of concrete measured will be paid for at the contract unit price. All excavation or backfill work required other than roadway quantities will be considered subsidiary and no further payment will be made. Saw cutting of existing installations prior to removal will not be paid for directly but the cost shall be considered as included in the contract unit price. The price shall be full compensation for furnishing all materials required and for all manipulations, labor, tools, equipment and incidentals necessary to complete the work.

Item	Description	Payment
202-00175	REMOVAL OF CONCRETE	SY
202-00212	REMOVAL OF DRIVEWAY RAMP	EA
608-00000	CONCRETE SIDEWALK	SY
608-00010	CONCRETE CURB RAMP	EA
609-21020	GUTTER TYPE 2 (Section IIB)	LF
609-22021	CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)	LF
609-24000	GUTTER TYPE 2	SY

REVISION OF SECTION 630 CONSTRUCTION ZONE TRAFFIC CONTROL

Section 630 of the Standard Specifications is hereby revised as follows:

630.01 ***is revised to include the following:***

1. Working hours shall be 7:00 a.m. to 7:00 p.m. Monday through Friday in all residential areas, or as otherwise approved in writing by the Engineer.
2. All work done outside the times above must be approved by the Engineer in writing.
3. The use of alternate one-way traffic may be approved on a case-by-case basis.

As required by, in descending order of precedence, these plans and special specifications, the current Standard Specifications, as augmented by the Colorado Department of Transportation M and/or S standards, and the manual on Uniform Traffic Control Devices for Streets and Highways.

Subsection 630.02 through 630.14 ***shall be modified to read:***
Traffic control thought the construction area is the responsibility of the Contractor. Before starting construction, the Contractor shall submit, in writing, the proposed Method of Handling Traffic (MHT) for the initial phase of construction. When a different MHT is required for a subsequent construction phase, it must be submitted two weeks prior to starting that phase. All proposed methods of handling traffic shall be approved, in writing, by the Engineer. No phase of construction shall start until an acceptable MHT has been received and approved by the Engineer.

The proposed methods shall include, as a minimum, the following:

A detailed diagram which shows the location of all sign placements, including advance construction signs (if not previously approved) and speed limit signs; method length and time duration for lane closures; and location of flag persons.

A tabulation of all traffic control devices shown in the detailed diagram including, but not limited to: construction signs, vertical panels; vertical panel with light; barricades; cones; drum channelizing devices; concrete barrier (temporary); advance warning flashing or sequencing arrow panel.

Approval of the proposed MHT is intended to indicate all devices to complete the project safely. Such approval does not relieve the contractor of liability specifically assigned to him under the contract. The Contractor shall erect and maintain warning lights, signs, barricades, and sufficient safeguards around all excavations, embankments, and obstructions.

Non-metallic drums may be substituted for vertical panel channelizing devices if site dimensions allow.

The Contractor shall, at the preconstruction conference, designate one of their employees, other than the Superintendent, to be responsible for traffic control management. This responsibility shall include management for the contractor's signing and all other details covered by the specifications which contribute to the convenience, safety, and orderly movement of traffic and to the comfort of the traveling public. The designated employee will have the Certification of the Traffic Control Supervisor as a Worksite Traffic Supervisor by the American Traffic Safety Services Association (ATSSA) in lieu of completion of the CDOT minimum training requirements.

Traffic control managements shall be maintained on a 24-hour per day basis. The contractor shall make arrangements so that the Traffic Control supervisor or their approved representative will be available on every working day, "on call" at all times and available upon the Engineer's request at other than normal working hours. The Traffic Control Supervisor shall have an up-to-date copy of Part VI of the MUTCD, pertaining to traffic controls for street and highway constructions, available at all times.

The contractor shall apply for and receive a City of Littleton right-of-way use permit (at no cost to the contractor) prior to commencing operations.

Due to the mobility of the operation, the contractor will need to provide traffic control consistent with the MUTCD. For sweeping operations, the contractor will need to provide an MHT.

Subsection 630.13 is revised to include the following:

Towing

Vehicles shall be identified by the Engineer and shall be limited to any class of vehicle that is upright and on wheels. 'No Parking' signs shall have been in-place and maintained for a minimum of forty-eight (48) hours along the proposed street segment prior to towing a vehicle.

The Contractor shall make every reasonable attempt as determined by the Engineer, including but not limited to door-to-door investigation, to locate the owner/operator of the vehicle prior to initiating the towing process.

Towing shall be limited to towing a vehicle conflicting with the current or proposed

work activities. Vehicles shall be towed using techniques that do not damage the towed vehicle or the roadway, adjacent structures, or other public property or assets. Vehicles shall be towed to a location designated by the Engineer at the time of towing, typically to an adjacent street beyond the proposed work area. Towed vehicles shall be positioned in a legal parking space within a public roadway in a manner that permits through traffic.

Immediately after towing a vehicle, the Contractor shall affix a notice to the windshield or other appropriate place on the motor vehicle, stating "This vehicle was parked within a Temporary Construction Work Zone. It was moved to this location by order of the City of Littleton Public Works.", or similar language approved by the Engineer.

The City shall not grant additional time or compensation for any resulting delays or loss of production because of failure to comply with the requirements of the Contract Documents including posting of notices and identifying and towing vehicles.

Towing Tickets

The Contractor shall deliver a towing ticket identifying the following information:

- Date and time towing request received,
- Make, model, and license number of vehicle towed,
- Locations vehicle towed from and to, and
- Signature of an authorized City Representative with time and date work performed.

Towing Equipment Requirements

Towing equipment shall, at a minimum, be equipped with a power winch, two-way radio, ten-pound dry fire extinguisher, motorcycle sling, dollies or flatbed equipment, and other modern towing and safety devices. All equipment shall be in good working condition when reporting for use.

630.17 METHOD OF MEASUREMENT and 630.18 BASIS OF PAYMENT ***are hereby deleted in their entirety and replaced with the following:***

Traffic control shall be paid on a lump sum basis to be paid for as follows: 50 percent of the Schedule amount upon first utilization and the remaining 50 percent of the Schedule amount when 75 percent of the original schedule amount has been earned.

In the event towing services are required, the Contractor shall furnish certified invoices

for reimbursement through the Force Account Item. The City will reimburse the contractor up to $150.00 per towing event, contingent upon the contractor providing certified invoices as well as proof of appropriate construction signage and timely placement. Any towing performed without required signage or pre-authorization will not be paid for.

PAY ITEM	UNIT
Traffic Control	Lump Sum

ADDITIONS, ALTERATIONS AND MODIFICATIONS TO EXISTING FACILITIES

1. GENERAL: The existing facilities shall be altered in accordance with the drawings and notes. Materials removed may be re-used if in good condition and insofar as they are adaptable to the requirements of the drawings and specifications, and if approved by the Engineer, except as hereinafter specified or noted on the drawings to be replaced with new materials. Re-used material, if and when so directed, shall be altered to suit new requirements and items in need of repair shall be repaired as directed.
   Materials and construction of additions and altered portions shall conform with present material and type of construction unless otherwise indicated or noted on drawings or otherwise herein specified. Joining of new and old construction shall be made tight and uniform in appearance. Salvaged materials not used in new construction shall become the property of the Contractor and removed from the site. Present work or existing facilities damaged during alteration or otherwise marred or disfigured as a result of the completion of this contract shall be repaired or replaced as directed by the Engineer. Rough, raw or unfinished areas, exposed as a result of removal of existing items shall be patched, repaired and finished as shown on drawings or as directed by the Engineer.

2. INCIDENTAL WORK: This portion of additions, alterations and modifications covers the performance of incidental work including cleaning of existing inlets and storm drains, and removal and/or relocation of existing fences.
   a. Removal and/or Relocation of Existing Fences: Existing fences where noted on the drawings, shall be carefully removed and relocated in a manner similar to the original installation. The new location of the fence shall be as determined by the Engineer. Should the Engineer determine that the fence need not be reinstalled, the Contractor shall pile all materials neatly in the location directed by the Engineer for handling by the appropriate property owner.

3. EXISTING CURBS, WALKS AND PAVEMENTS: All existing sidewalks, curbs, and paved or surfaced areas removed or damaged during the construction shall be repaired and/or replaced with materials and construction similar to the existing facilities, unless otherwise directed by the Engineer.

4. EXISTING LAWN AREAS: Existing lawn areas destroyed or damaged during construction shall be back-filled, graded and re-sodded as directed by the

Engineer. The area shall be thoroughly moistened prior to cutting and replacing the sod. The sod shall be pressed firmly into contact with the sod bed by tamping or rolling so as to eliminate air pockets and to provide a true and even surface and insure knitting. Soil of good quality shall be used to fill all cracks between sod. Where required, sod shall be fastened to stay in the slope. Work performed within existing lawn areas shall be included with the Landscape Restoration pay item.

5. WATER FOR CONSTRUCTION: The Contractor will be responsible for obtaining any water which may be needed for backfill compacting, line flushing, or any other purpose during construction. All costs, fees, permits and arrangements for obtaining water shall be the responsibility of the Contractor.

PROJECT DESCRIPTION

The work will involve the removal of approximately 7,400 square yards of concrete, 2,700 square yards of asphalt, installation of approximately 8,100 linear feet of monolithic curb gutter sidewalk, and installation of gutters, curb ramps, pans and aprons. Work will also involve associated traffic control, landscape restoration, and erosion control. The scope of work will be on various local and collector streets located throughout the City of Littleton, Colorado.

CONSTRUCTION NOTES

1. All construction shall be in accordance with the most recent versions of the "Colorado Department of Transportation – Standards Specifications for Road and Bridge Construction" and "Colorado Department of Transportation – Standard Plans, Metropolitan Government Pavement Engineers Council Pavement Design Standards and Construction Specifications and the project drawings and specifications included herein.

2. After an award has been made, a Preconstruction Conference will be held at the offices of the City of Littleton, Engineering Division. The Contractor shall submit a construction schedule to the Engineer for approval before the Preconstruction Conference.

3. The City will issue the Contractor a "No Fee" City of Littleton Right of Way Permit for the Work.

4. The Contractor shall make continuous progress on each street or location and must complete all work prior to starting work on another street or location, unless obtaining specific written City of Littleton approval.

5. The City will allow the Contractor to temporarily store equipment and/or materials within the Right-Of-Way. All storage locations must be approved by the Engineer. If the Contractor chooses to store any equipment and/or material on private property, the Contractor shall provide a copy of any written agreement or approval from the owner of the property which is to be utilized. The City may allow the Contractor to store equipment or materials at secured City storage facilities, if space is available.

6. The Contractor shall familiarize themselves with the extent of landscaping, walls, fences, sod and irrigation lines which may be affected by the construction prior to preparing their bid. The cost of replacement of landscaping, walls,

fences, sod or irrigation lines shall be incidental to the work and will not be paid for separately. Removal of landscaping shall be kept to a minimum.

7. The Contractor shall verify and be responsible for all features, including all underground and above ground utilities, prior to beginning any work. See "CDOT Standard Specifications for Road and Bridge Construction", Subsection 105.11. For utility construction coordination, the Contractor shall contact the utility notification center for Colorado at 800.922.1987. The Contractor shall be responsible for field locating, verifying, and protecting all existing utilities within the project areas. The Contractor shall:
    a. Work with the appropriate utility company in verifying locations.
    b. Pay for any damage to and arrange for the repair of any existing utilities damaged or disrupted during construction. "Utilities" shall include lawn irrigation pipes and appurtenances.

8. In the event widened sidewalks encroach onto existing landscape irrigation systems the contractor shall realign the existing landscape irrigation systems. A claim against the Force Account may be given for the realignment of the existing landscape irrigation systems. Damaged sprinklers due to the Contractor's removal and forming process and not because of altered configuration shall be repaired at the Contractor's expense.

9. The concrete and asphalt removal shall be limited to what is marked in the field by the Engineer. Maximum asphalt removal for payment purposes shall be 2.0 feet from the edge of proposed gutters but may be less provided a neat line or front form can be used and properly compacted, as marked in the field by the Engineer and verified by the Inspector. Adjustment to these limits may be made as specified by the Engineer and all payment for removal work shall be considered payment in full regardless of thickness of each removal area. The asphalt shall be saw-cut to a smooth line and the cost of saw-cutting shall be included in the work. Asphalt removed beyond these limits, and not approved previously by the Engineer, shall be replaced by the Contractor at their expense. Asphalt patching shall be Grade S 64-22 at a compacted thickness to match the existing pavement thickness with a maximum total thickness of 6 inches with no single lift exceeding 3 inches, and shall be paid for by the ton, complete in place, including tack oil.

10. All concrete shall be replaced to six (6) inches thickness except for pans and aprons, which shall be eight (8) inches. Concrete shall be paid for by the square yard or linear foot as noted on the plans and in these contract documents, complete in place, including any specified reinforcement.

11. Prior to mobilization, the Contractor shall submit the job mix design for Hot Mix Asphalt Pavement and Portland Cement Concrete for approval by the Owner.

12. All excess excavation, destroyed sod and other material determined unsuitable for backfill in the opinion of the Engineer shall be removed (including loading, hauling, and dumping fees, etc.) from the site at no additional cost to the Owner. The Contractor shall not carelessly remove material suitable for backfill from the site. New concrete shall be backfilled with clean soil in the area behind the concrete, to match the adjacent existing landscape elevation. Existing soil generated from concrete work may be used for backfill, provided it does not contain trash, organic material or broken concrete or asphalt.

13. Any portions of existing facilities not reused on this project shall become the property of the Contractor and are to be removed from the site at no additional cost to the Owner.

14. The Contractor shall be responsible for securing the safety of the construction area with adequate fence, tape or other approved measures. The cost of erecting and removing fence or other approved devices to secure the construction area shall not be paid for separately but shall be included in the cost of the Work.

15. The Contractor shall be responsible for repairing all pavement surfaces not marked for removal, but which might be damaged by staging, stockpiling materials or equipment operation. The Engineer and the Contractor shall together document existing conditions and other information prior to any construction activities.

16. For this project no soils investigation was carried out. It shall be incumbent upon the Contractor to do their own testing at their sole expense, if they so desire.

17. Access to adjacent properties and driveways shall be maintained for the duration of the Work and shall be the responsibility of the Contractor. This will require constructing pans, alleys, sidewalks and driveways in phases.

18. The Contractor is responsible for setting any needed line or grade construction staking, the cost of which shall be considered included in the cost of the work.

19. Measurement and payment for “Curb Ramp” shall be for the ramp, transition, and truncated domes but shall not include any pan or apron. Leveling, fine grading and compaction and any other necessary work shall be included in the unit cost for the work.

20. Only cast-iron truncated dome detectable warning plates, as manufactured by EJ, Neenah Foundry, Duralast, or approved equal will be allowed.

21. Excavation, filling and compaction of soft spots shall be paid with the pay item "ABC (Class 6)", which shall consist of Class 6 aggregate base course material. This pay item shall cover any "unclassified excavation" and "embankment material". This material shall be placed at the direction of the owner. Any material placed without direct approval by the Engineer or Inspector will not be paid separately but will be considered included in the work.

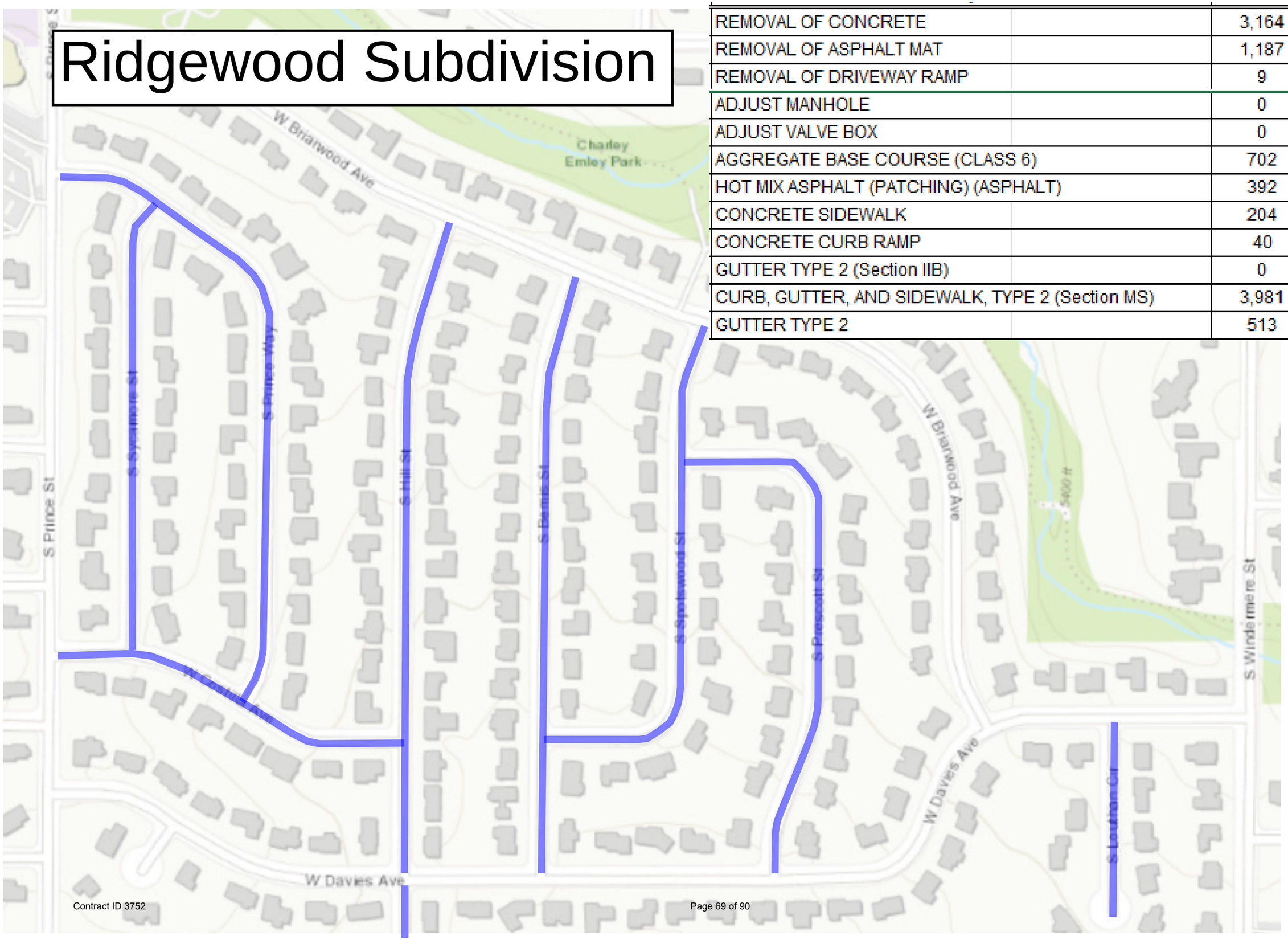
22. The Contractor shall be responsible for preparing a construction Erosion and Sediment Control Plan (ESCP) for erosion control. This plan shall be submitted at the pre-construction meeting for City of Littleton approval. The Contractor shall be required to inspect and maintain erosion and sediment control devices to ensure they are functioning as intended and submit inspection reports for Owner's review at 2-week intervals and also following precipitation events. Payment shall be under "Erosion Control".

23. The Contractor shall be responsible for the project and shall take such precautions as may be necessary to construct the work in a dry condition and provide for drainage, dewatering, and control of all surface and subsurface water. The Contractor shall erect any necessary temporary structures or other facilities at their expense, which will not be paid for separately, but shall be considered part of the work.

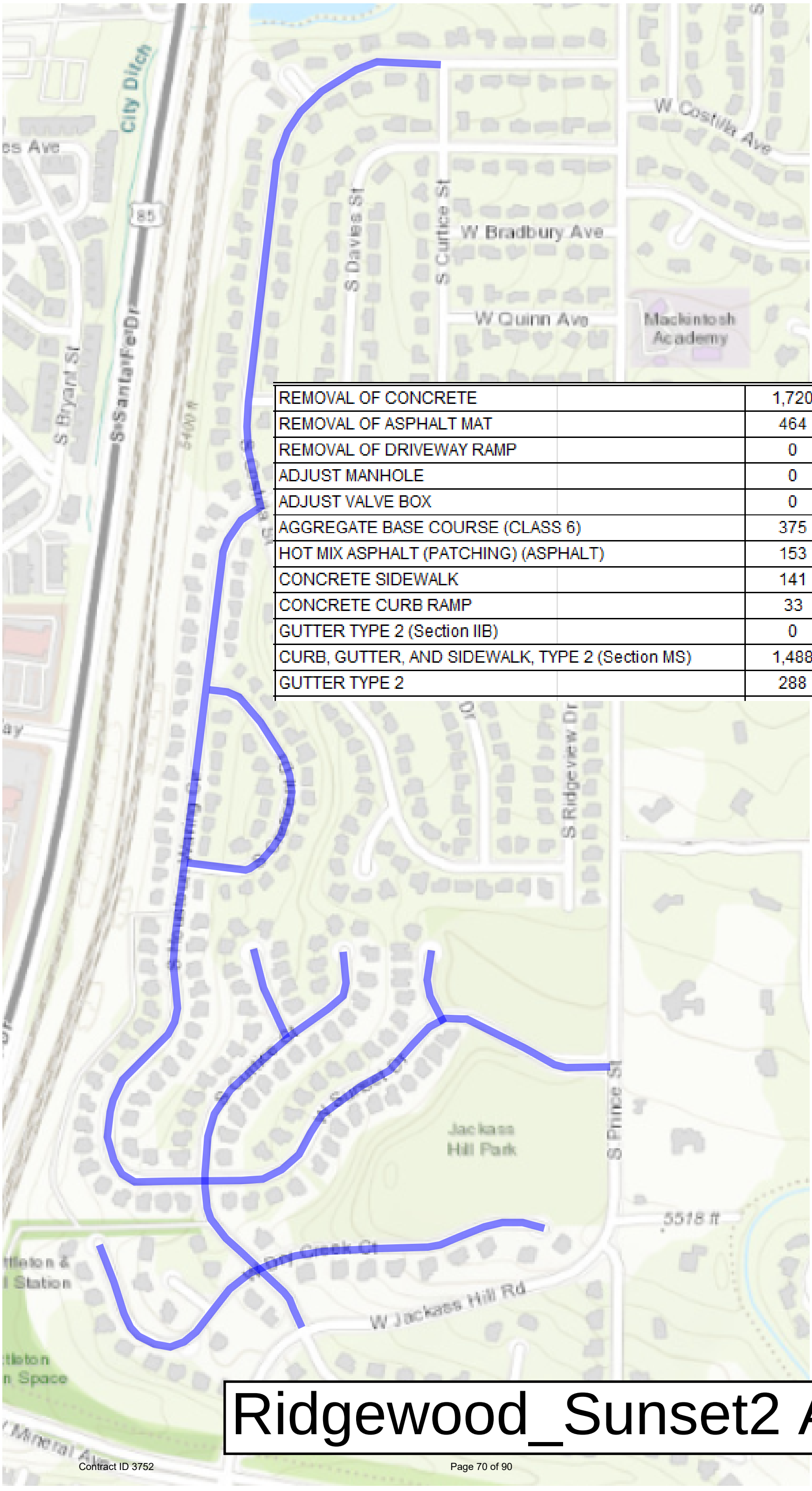
24. The Contractor shall minimize excavations for formwork at landscaping adjacent to the work. All lawn surfaces adjacent to the work shall be backfilled and compacted with clean topsoil.

PROJECT PLANS

Ridgewood Subdivision



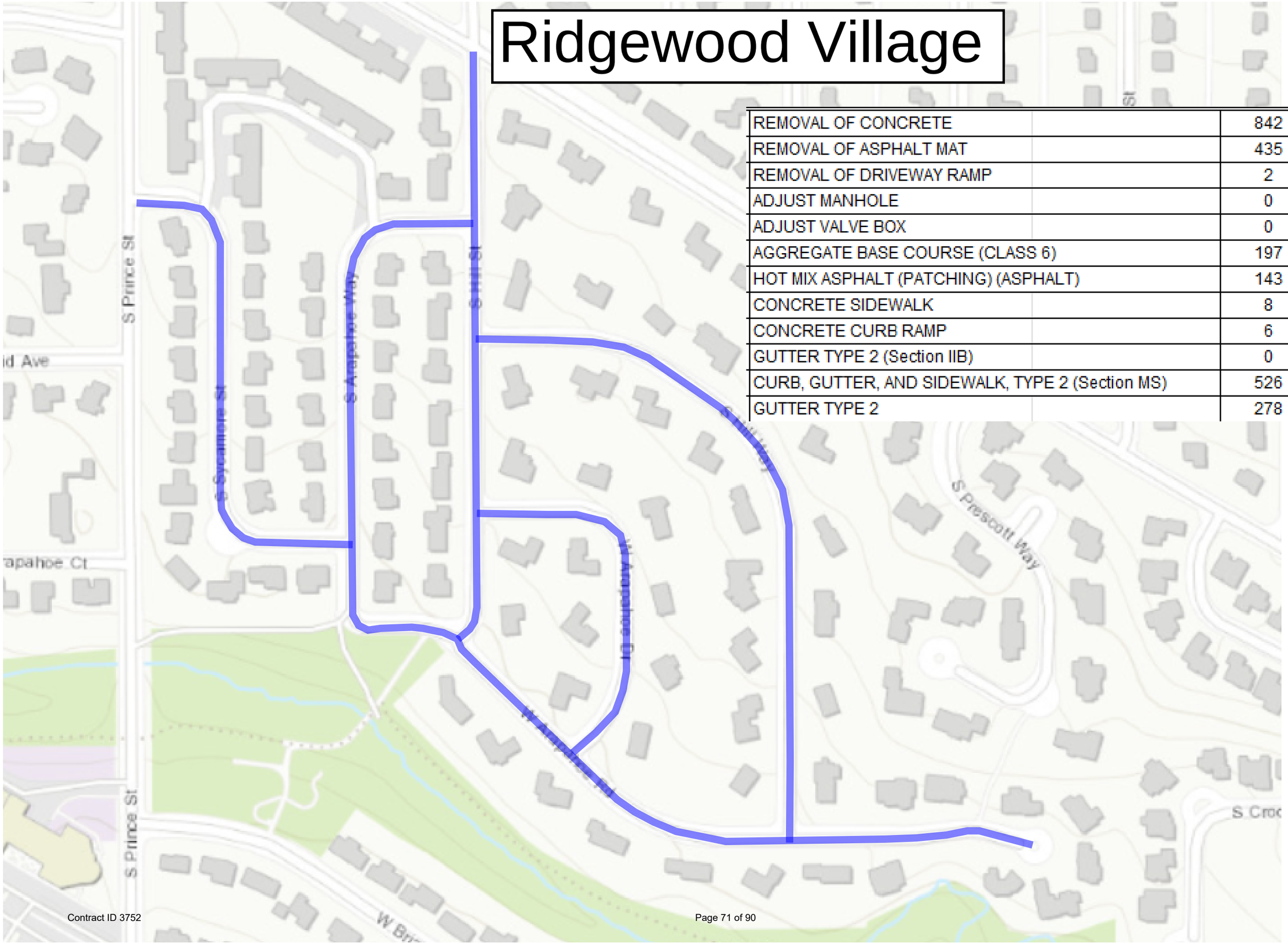
REMOVAL OF CONCRETE	3,164	SY
REMOVAL OF ASPHALT MAT	1,187	SY
REMOVAL OF DRIVEWAY RAMP	9	EA
ADJUST MANHOLE	0	EA
ADJUST VALVE BOX	0	EA
AGGREGATE BASE COURSE (CLASS 6)	702	TON
HOT MIX ASPHALT (PATCHING) (ASPHALT)	392	TON
CONCRETE SIDEWALK	204	SY
CONCRETE CURB RAMP	40	EA
GUTTER TYPE 2 (Section IIB)	0	LF
CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)	3,981	LF
GUTTER TYPE 2	513	SY



REMOVAL OF CONCRETE		1,720	SY
REMOVAL OF ASPHALT MAT		464	SY
REMOVAL OF DRIVEWAY RAMP		0	EA
ADJUST MANHOLE		0	EA
ADJUST VALVE BOX		0	EA
AGGREGATE BASE COURSE (CLASS 6)		375	TON
HOT MIX ASPHALT (PATCHING) (ASPHALT)		153	TON
CONCRETE SIDEWALK		141	SY
CONCRETE CURB RAMP		33	EA
GUTTER TYPE 2 (Section IIB)		0	LF
CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)		1,488	LF
GUTTER TYPE 2		288	SY

Ridgewood_Sunset2 Area

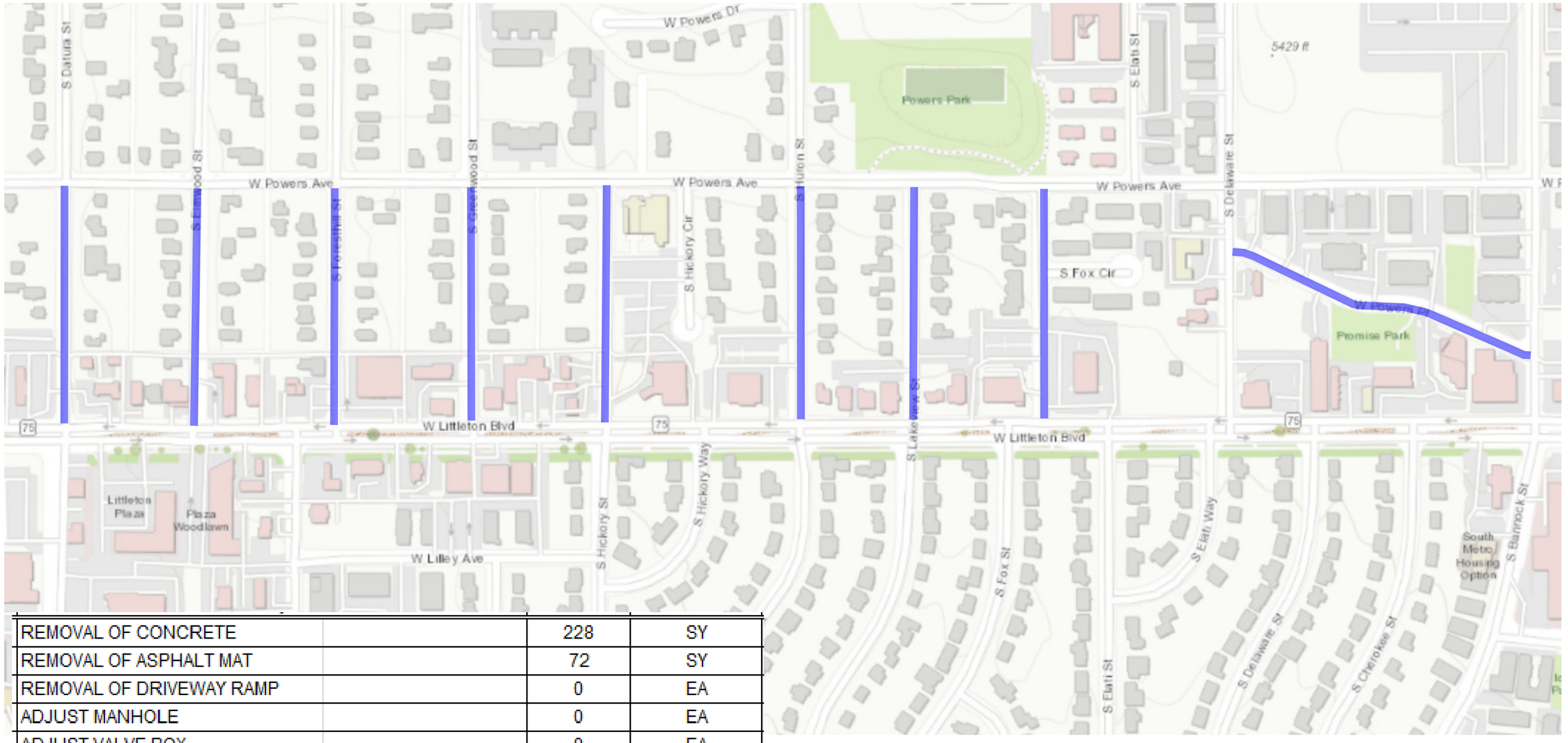
Ridgewood Village



REMOVAL OF CONCRETE	842	SY
REMOVAL OF ASPHALT MAT	435	SY
REMOVAL OF DRIVEWAY RAMP	2	EA
ADJUST MANHOLE	0	EA
ADJUST VALVE BOX	0	EA
AGGREGATE BASE COURSE (CLASS 6)	197	TON
HOT MIX ASPHALT (PATCHING) (ASPHALT)	143	TON
CONCRETE SIDEWALK	8	SY
CONCRETE CURB RAMP	6	EA
GUTTER TYPE 2 (Section IIB)	0	LF
CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)	526	LF
GUTTER TYPE 2	278	SY

Description		Quantity	Unit
REMOVAL OF CONCRETE		285	SY
REMOVAL OF ASPHALT MAT		72	SY
REMOVAL OF DRIVEWAY RAMP		0	EA
ADJUST MANHOLE		0	EA
ADJUST VALVE BOX		0	EA
AGGREGATE BASE COURSE (CLASS 6)		64	TON
HOT MIX ASPHALT (PATCHING) (ASPHALT)		24	TON
CONCRETE SIDEWALK		0	SY
CONCRETE CURB RAMP		6	EA
GUTTER TYPE 2 (Section IIB)		140	LF
CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)		189	LF
GUTTER TYPE 2		40	SY

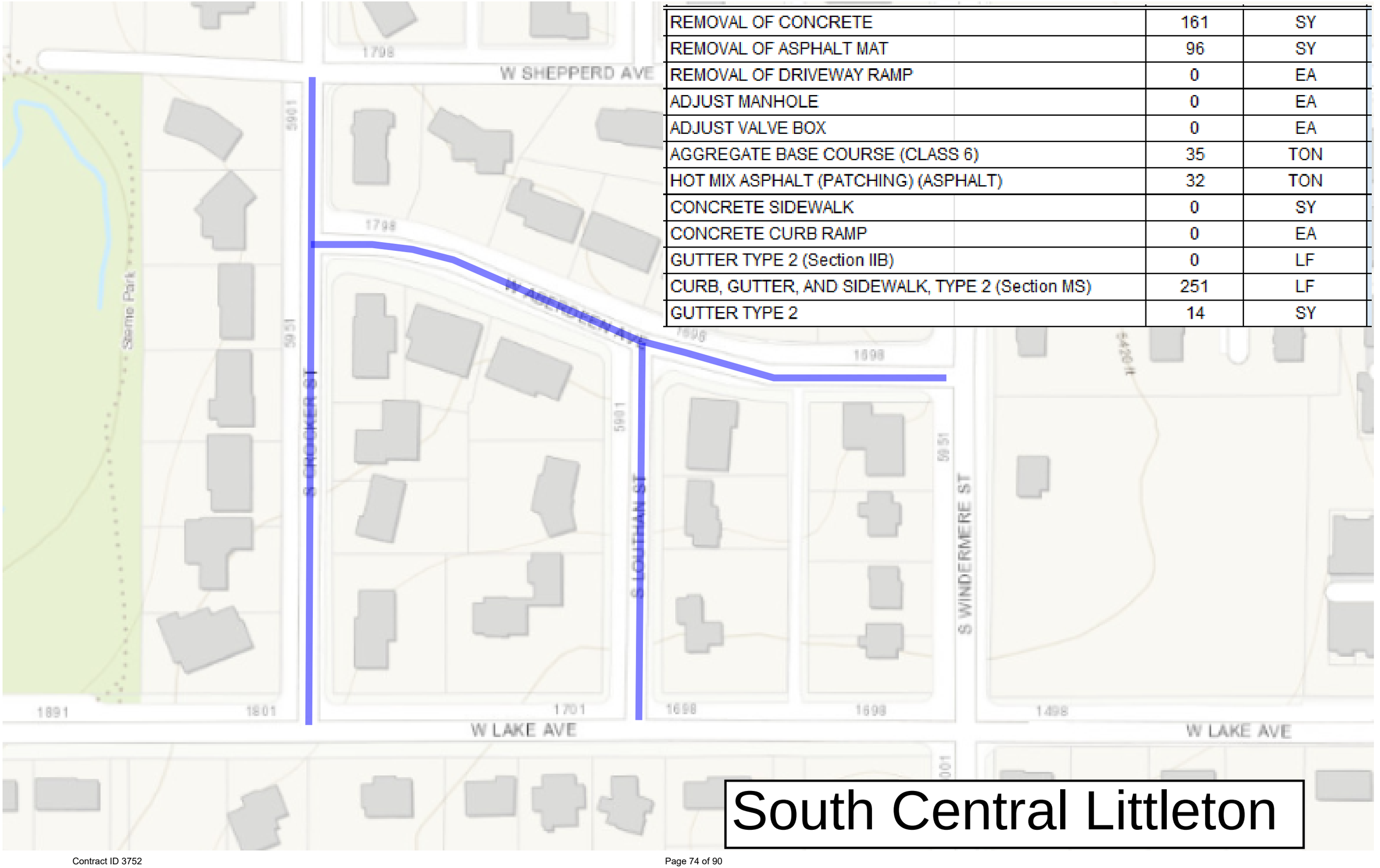
Southbridge 2nd Flag



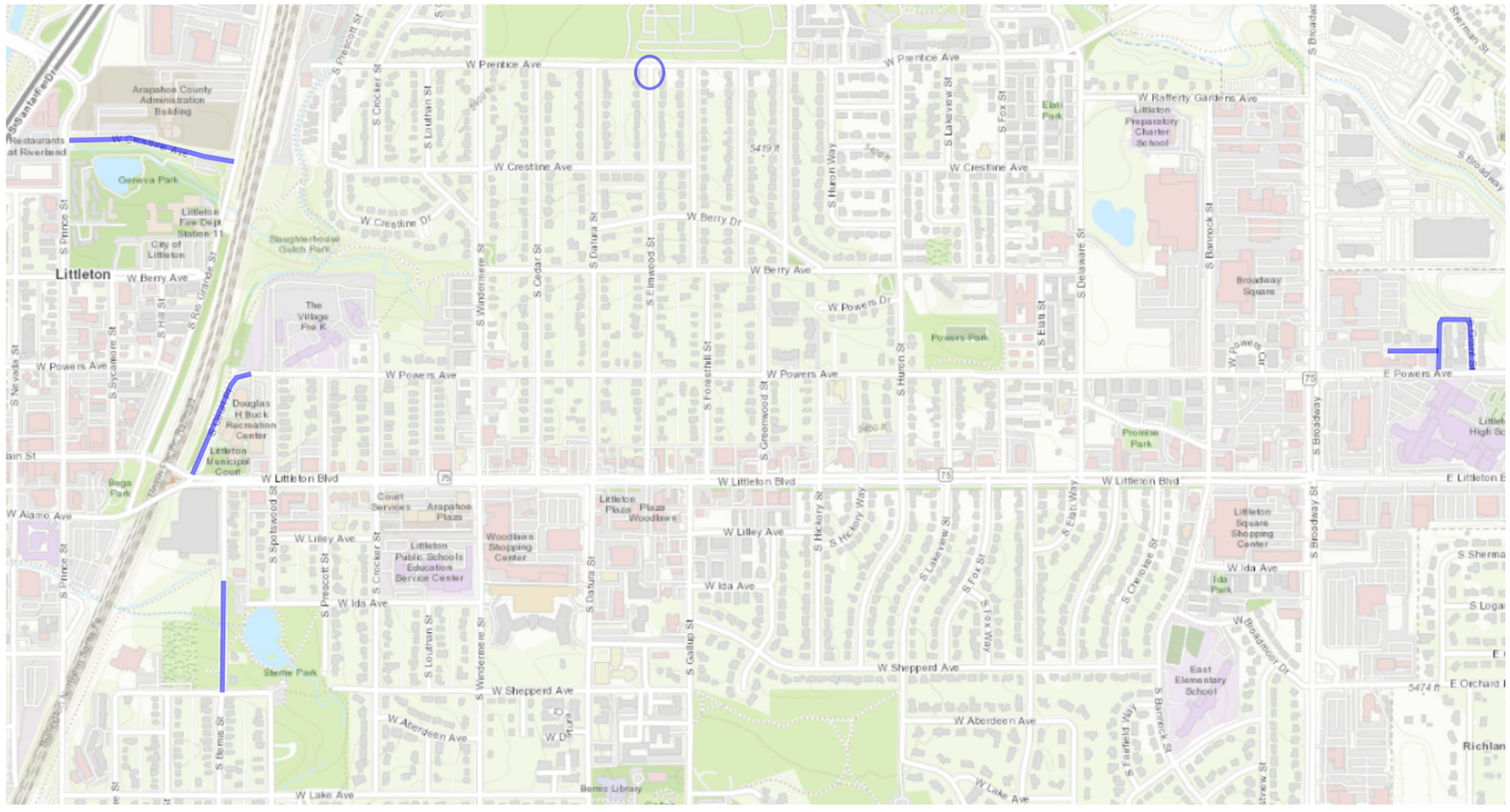
REMOVAL OF CONCRETE	228	SY
REMOVAL OF ASPHALT MAT	72	SY
REMOVAL OF DRIVEWAY RAMP	0	EA
ADJUST MANHOLE	0	EA
ADJUST VALVE BOX	0	EA
AGGREGATE BASE COURSE (CLASS 6)	46	TON
HOT MIX ASPHALT (PATCHING) (ASPHALT)	24	TON
CONCRETE SIDEWALK	0	SY
CONCRETE CURB RAMP	4	EA
GUTTER TYPE 2 (Section IIB)	0	LF
CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)	235	LF
GUTTER TYPE 2	12	SY

S Datura St to W Powers Pl

REMOVAL OF CONCRETE	161	SY
REMOVAL OF ASPHALT MAT	96	SY
REMOVAL OF DRIVEWAY RAMP	0	EA
ADJUST MANHOLE	0	EA
ADJUST VALVE BOX	0	EA
AGGREGATE BASE COURSE (CLASS 6)	35	TON
HOT MIX ASPHALT (PATCHING) (ASPHALT)	32	TON
CONCRETE SIDEWALK	0	SY
CONCRETE CURB RAMP	0	EA
GUTTER TYPE 2 (Section IIB)	0	LF
CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)	251	LF
GUTTER TYPE 2	14	SY



South Central Littleton



REMOVAL OF CONCRETE		449	SY
REMOVAL OF ASPHALT MAT		168	SY
REMOVAL OF DRIVEWAY RAMP		0	EA
ADJUST MANHOLE		0	EA
ADJUST VALVE BOX		0	EA
AGGREGATE BASE COURSE (CLASS 6)		96	TON
HOT MIX ASPHALT (PATCHING) (ASPHALT)		56	TON
CONCRETE SIDEWALK		8	SY
CONCRETE CURB RAMP		6	EA
GUTTER TYPE 2 (Section IIB)		0	LF
CURB, GUTTER, AND SIDEWALK, TYPE 2 (Section MS)		650	LF
GUTTER TYPE 2		17	SY

City Wide Small Sections

CURB RAMP GENERAL NOTES:

1. IN NEW CONSTRUCTION OR FULL-DEPTH RECONSTRUCTION, PROVIDE A SEPARATE CURB RAMP FOR EACH MARKED OR UNMARKED PEDESTRIAN STREET CROSSING. CURB RAMPS SHALL BE CONTAINED WHOLLY WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING OR CROSSWALK THEY SERVE, OR AS SHOWN ON THE CONTRACT PLANS.

2. ALTERATIONS ARE DEFINED AS CHANGES TO AN EXISTING HIGHWAY THAT AFFECT PEDESTRIAN ACCESS, CIRCULATION, OR USE. ALTERATIONS INCLUDE, BUT ARE NOT LIMITED TO, RESURFACING, REHABILITATION, RECONSTRUCTION, CURB RAMP RETROFITS, HISTORIC RESTORATION, OR CHANGES OR REARRANGEMENT TO STRUCTURAL PARTS OR ELEMENTS OF A PEDESTRIAN FACILITY.

3. A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP OR TURNING SPACE, WITHOUT RAISED OBSTACLES, THAT COULD BE MISTAKENLY TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.

4. IN ALTERATIONS, WHERE AN EXISTING PHYSICAL CONSTRAINT PREVENTS PROVIDING A SEPARATE CURB RAMP FOR EACH PEDESTRIAN STREET CROSSING, A SINGLE DIAGONAL RAMP (ON THE APEX) SHALL BE PERMITTED TO SERVE BOTH PEDESTRIAN STREET CROSSINGS. THE USE OF A SINGLE DIAGONAL RAMP SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. DIAGONAL RAMPS ARE NOT ACCEPTABLE IN NEW CONSTRUCTION OR FULL-DEPTH RECONSTRUCTION.

5. DETECTABLE WARNINGS SURFACES (DWS) ARE INTENDED TO INDICATE THE BOUNDARY BETWEEN A PEDESTRIAN ROUTE AND VEHICULAR ROUTE WHERE THERE IS A FLUSH RATHER THAN CURBED CONNECTION. DWS ARE NOT INTENDED TO PROVIDE WAYFINDING. DWS SHALL BE PROVIDED AT THE FOLLOWING LOCATIONS;
   1. CURB RAMPS, BLENDED TRANSITIONS, AND DEPRESSED CORNERS AT PEDESTRIAN STREET CROSSINGS;
   2. PEDESTRIAN REFUGE ISLANDS (6 FEET IN WIDTH OR GREATER);
   3. BOARDING PLATFORMS AT TRANSIT STOPS WHERE THE EDGE OF THE PLATFORM IS NOT PROTECTED TO PEDESTRIAN CROSS TRAFFIC; AND
   4. BOARDING AREAS AT SIDEWALK OR STREET LEVEL TRANSIT STOPS WHERE THE AREA IS NOT PROTECTED TO PEDESTRIAN CROSS TRAFFIC.

6. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH THE ADJACENT GUTTER, HIGHWAY, OR PEDESTRIAN ACCESS ROUTE SURFACE, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. FEDERAL YELLOW COLOR IS PREFERRED, HOWEVER, OTHER COLORS MAY BE USED IF APPROVED BY THE ENGINEER.

7. IN ALTERATIONS, TO AVOID CHASING GRADE INDEFINITELY ON STEEP ROADWAYS, A CURB RAMPS LENGTH IS NOT REQUIRED TO EXCEED 15 FEET REGARDLESS OF THE RESULTING RAMP RUNNING SLOPE.

8. ALL SLOPES ARE MEASURED WITH RESPECT TO A LEVEL PLANE.

9. DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, OR OTHER OBSTRUCTIONS SHALL NOT BE INSTALLED ON THE CURB RAMP, OR TURNING SPACE AREAS.

10. IN NEW CONSTRUCTION, PULL BOXES, METER BOXES, MAINTENANCE HOLE COVERS, VAULT LIDS, OR SIMILAR, SHALL NOT BE CONSTRUCTED WITHIN ANY PART OF CURB RAMP OR TURNING SPACE. IN ALTERATIONS, WHERE THESE ITEMS CANNOT BE RELOCATED OUTSIDE OF THE CURB RAMP OR TURNING SPACE, THEY MUST NOT CREATE A VERTICAL DISCONTINUITY GRATER THAN 1/2 INCH. ANY VERTICAL DISCONTINUITY BETWEEN 1/4 INCH AND 1/2 INCH SHALL BE BEVELED WITH A SLOPE NOT STEEPER THAN 1V:2H. THE BEVEL SHALL BE APPLIED ACROSS THE ENTIRE SURFACE DISCONTINUITY.

11. CONSTRUCTION OF ANY REQUIRED PEDESTRIAN CURB SHALL BE INCLUDED IN THE BID PRICE OF THE CONCRETE CURB RAMP AND WILL NOT BE PAID FOR SEPARATELY.

12. ALL CURB RAMP JOINTS AND GRADE BREAKS SHALL BE FLUSH (0'-1/8"). THE JOINT BETWEEN THE ROADWAY SURFACE AND THE GUTTER PAN SHALL BE FLUSH.

13. THE CONTRACTOR SHALL VERIFY REMOVAL LIMITS ARE SUFFICIENT TO PROVIDE POSITIVE DRAINAGE, MAINTAIN EXISTING DRAINAGE PATTERNS, AND AVOID PONDING IN THE FINAL CONFIGURATION.

14. FLARED SIDE SLOPES MAY EXCEED 10.0% ONLY WHERE THEY ABUT A NON-WALKABLE SURFACE, OR WHERE THE ADJACENT RAMP SURFACE IS BLOCKED TO PEDESTRIAN TRAFFIC.

15. THE CHANGE IN GRADE AT THE BOTTOM OF THE CURB RAMP SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 13.33%. THE COUNTER SLOPE OF THE GUTTER AT THE FOOT OF A RAMP, TURNING SPACE, OR BLENDED TRANSITION SHALL NOT EXCEED 5.0%.

16. GRADE BREAKS AT THE TOP AND BOTTOM OF RAMP RUNS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. GRADE BREAKS SHALL NOT BE PERMITTED ON THE SURFACE OF THE RAMP RUN OR TURNING SPACE. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.

17. A BROOM FINISH, WITH SWEEPS PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAFFIC, SHALL BE APPLIED TO ALL RAMP AND TURNING SPACE SURFACES.

18. IN ALTERATIONS, WHERE A RAMP OR TURNING SPACE MUST TIE INTO AN EXISTING GRADE THAT CANNOT BE ALTERED, THE RAMP OR TURNING SPACE MAY BE WARPED TO TRANSITION TO THE REQUIRED CROSS SLOPE. THE TRANSITION TO THE REQUIRED CROSS SLOPE SHALL BE SPREAD EVENLY OVER THE LENGTH OF THE RAMP OR TURNING SPACE TO MINIMIZE THE DEGREE OF WARPING. THE RATE OF CHANGE ON A RAMP OR TURNING SPACE SHALL NOT EXCEED 3% PER LINEAR FOOT.

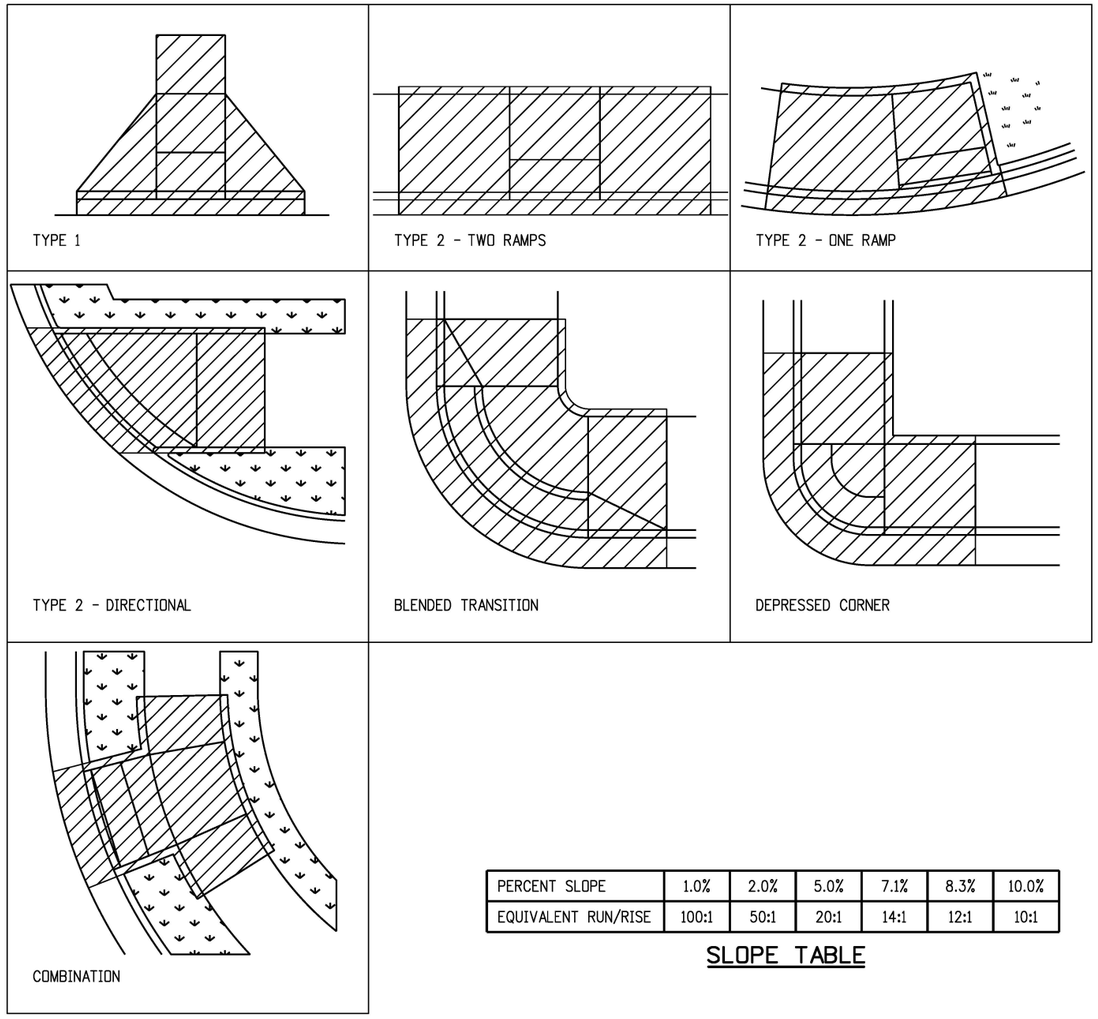
19. DESIGN AND CONSTRUCT CURB RAMPS, TURNING SPACES, AND FLARE SLOPES WITH THE FLATTEST SLOPES POSSIBLE. THE SLOPES INDICATED IN THESE DETAILS SHOW THE MAXIMUM SLOPES ALLOWABLE. **PREFERRED VALUES** TO BE USED DURING DESIGN, LAYOUT, AND CONSTRUCTION ARE:
   - **RAMP RUNNING SLOPE 7.5%**
   - **RAMP CROSS SLOPE 1.5%**
   - **TURNING SPACE RUNNING SLOPE 1.5%**
   - **TURNING SPACE CROSS SLOPE 1.5%**
   - **FLARE SLOPE 8.0-9.0%**

20. WHERE SNOW REMOVAL EQUIPMENT WILL BE USED TO CLEAR THE PEDESTRIAN ACCESS ROUTE, CONSULT THE ENGINEER PRIOR TO CONSTRUCTION TO ENSURE THE WIDTH AND THICKNESS OF CURB RAMPS IS SUFFICIENT TO ACCOMODATE SUCH EQUIPMENT.

21. PROVIDE EXPANSION JOINT MATERIAL 1/2" THICK WHERE CURB RAMPS ADJOIN ANY RIGID PAVEMENT, OR STRUCTURE. THE TOP OF THE JOINT FILLER MATERIAL SHALL BE FLUSH WITH ADJOINING CONCRETE SURFACES. THE EXPANSION JOINT MATERIAL SHALL EXTEND FOR THE FULL DEPTH OF THE CONCRETE SURFACE.

22. PROVIDE TIE BAR REINFORCING BETWEEN INDEPEDENTLY POURED CONCRETE CURB RAMPS OR TURNING SPACES AND CURB AND GUTTER. DRILL AND GROUT NO. 4 12 INCH LONG REINFORCEMENT BARS (EPOXY COATED) AT 18 INCHES CENTER TO CENTER MINIMUM.

CURB RAMP PAY AREAS



PERCENT SLOPE	1.0%	2.0%	5.0%	7.1%	8.3%	10.0%
EQUIVALENT RUN/RISE	100:1	50:1	20:1	14:1	12:1	10:1

SLOPE TABLE

GENERAL NOTES & PAY AREAS

Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

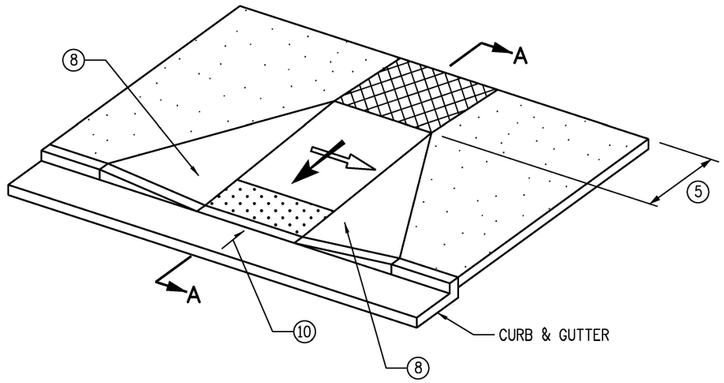
Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

CURB RAMPS

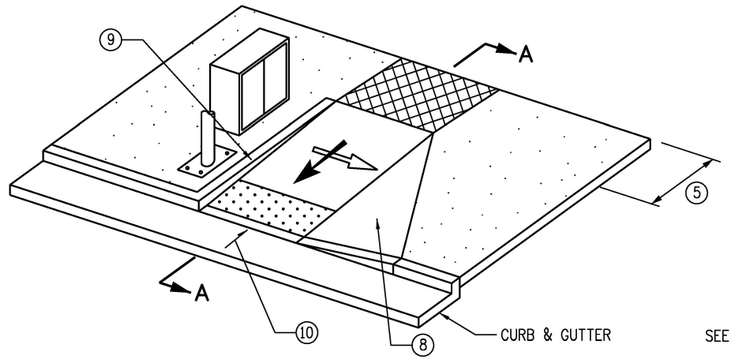
STANDARD PLAN NO.
M-608-1
Standard Sheet No. 1 of 10

Issued by the Project Development Branch: July 31, 2019

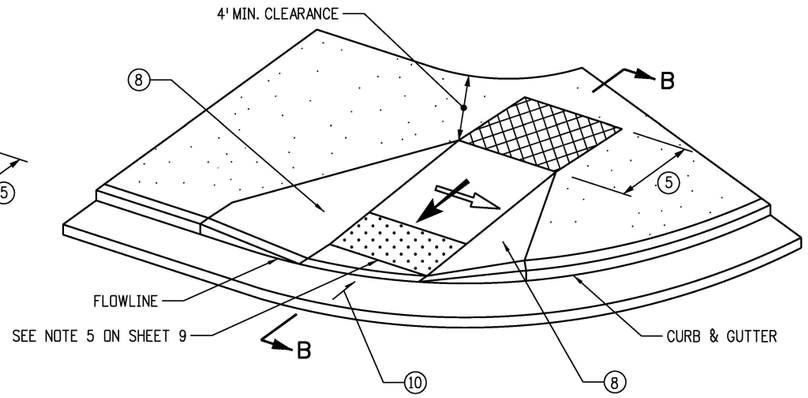
Project Sheet Number:



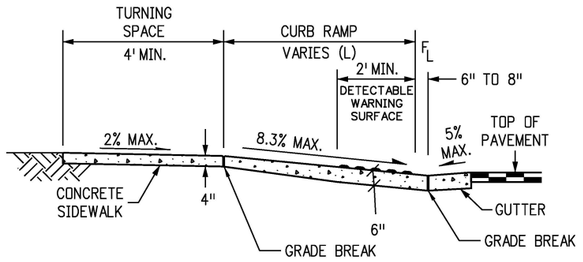
PERPENDICULAR RAMP
(TYPICAL)



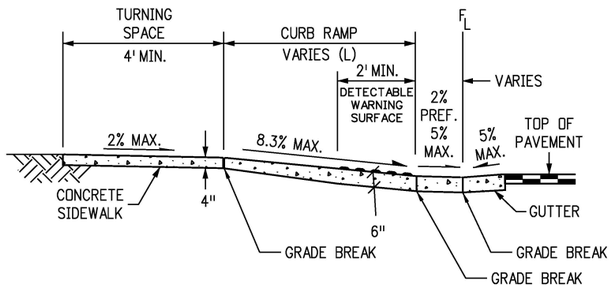
PERPENDICULAR RAMP
(WITH VERTICAL RETURN CURB)



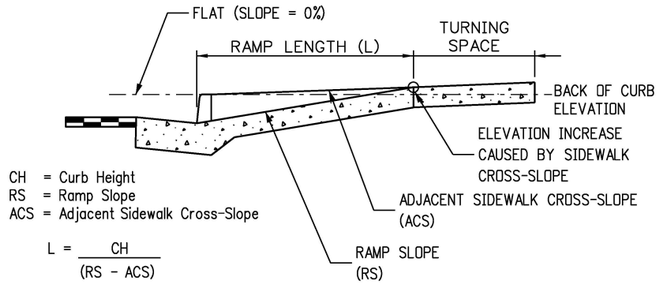
PERPENDICULAR RAMP
(DIRECTIONAL)



SECTION A-A



SECTION B-B



EXAMPLE: CH = 6" (0.5 ft.), RS = 7.5% (0.075), ACS = 1.5% (0.015)
L = 0.5/(0.075-0.015) = 8.3 ft.

DETAIL A - RAMP LENGTH

SIDEWALK

TURNING SPACE ③ ④ ⑤

DETECTABLE WARNING SURFACE (DWS)

PERPENDICULAR RAMP NOTES

① RAMP WIDTH - PROVIDE 5 FT. OR GREATER WHERE POSSIBLE. IF SITE CONSTRAINTS DO NOT PERMIT, PROVIDE 4 FT. MINIMUM. RAMPS SERVICING SHARED USE PATHS SHALL MATCH THE WIDTH OF THE PATH.

② RAMP RUNNING SLOPE - 8.3% MAX.

③ TURNING SPACE RUNNING SLOPE - 2.0% MAX. TURNING SPACE RUNNING SLOPE IS MEASURED IN THE SAME DIRECTION AS THE RAMP RUNNING SLOPE.

④ RAMP AND TURNING SPACE CROSS SLOPE - 2.0% TYPICAL. AT CROSSINGS WITHOUT YIELD OR STOP CONTROL, OR WITH A SIGNAL WHERE VEHICLES CAN PROCEED THROUGH THE INTERSECTION WITHOUT SLOWING OR STOPPING, THE CROSS SLOPE OF RAMPS AND TURNING SPACES MAY EQUAL THE HIGHWAY GRADE. AT MIDBLOCK PEDESTRIAN STREET CROSSINGS THE RAMP AND TURNING SPACE CROSS SLOPE MAY EQUAL THE HIGHWAY GRADE.

⑤ TURNING SPACE DIMENSIONS - PROVIDE A TURNING SPACE AT THE TOP OF PERPENDICULAR RAMPS WITH A WIDTH EQUAL TO THE WIDTH OF THE CURB RAMP. TURNING SPACE LENGTH MUST BE 4 FT. MINIMUM, MEASURED IN THE DIRECTION OF THE RAMP RUN. WHEN A TURNING SPACE IS CONSTRAINED AT THE BACK OF SIDEWALK, INCREASE LENGTH TO 5 FT. MINIMUM IN THE DIRECTION OF THE RAMP RUN.

⑥ RAMP ALIGNMENT - RAMPS SHALL BE ALIGNED TO BE FULLY CONTAINED WITHIN THE CROSSWALK OR STREET CROSSING THEY SERVE. PROVIDE ONE RAMP FOR EACH STREET CROSSING DIRECTION. IN ALTERATIONS, WHERE EXISTING PHYSICAL CONSTRAINTS PREVENT PROVIDING ONE CURB RAMP FOR EACH CROSSING DIRECTION, A SINGLE DIAGONAL CURB RAMP (ON THE APEX OF A CORNER) SHALL BE PERMITTED TO SERVE BOTH PEDESTRIAN STREET CROSSINGS. IF A DIAGONAL RAMP IS USED, A CLEAR SPACE 4 FT. X 4FT. MUST BE PROVIDED AT THE BASE OF THE RAMP. THE CLEAR SPACE MUST BE WITHIN BOTH CROSSWALKS AND WHOLLY OUTSIDE OF ANY ADJACENT VEHICULAR TRAVEL LANES. DIAGONAL RAMPS ARE NOT ACCEPTABLE IN NEW CONSTRUCTION, OR FULL-DEPTH RECONSTRUCTION.

⑦ RAMP LENGTH - PERPENDICULAR RAMP LENGTH IS DEPENDENT UPON THE RAMP SLOPE, HEIGHT OF CURB, AND ADJACENT SIDEWALK CROSS-SLOPE WHICH MUST BE INTERCEPTED. SEE DETAIL A FOR CALCULATING RAMP LENGTH WHEN CHASING SIDEWALK CROSS-SLOPE. WHERE TERRAIN IS SLOPING A RAMP IS NOT REQUIRED TO CHASE GRADE MORE THAN 15 FT. REGARDLESS OF THE RESULTING RAMP SLOPE.

⑧ RAMP FLARES - WHERE A RAMP EDGE ABUTS A WALKABLE SURFACE, A FLARED SIDE SHALL BE PROVIDED. RAMP FLARE SLOPES SHALL NOT EXCEED 10.0%.

⑨ VERTICAL CURB RETURNS - VERTICAL CURB RETURNS MAY BE USED ONLY WHERE A RAMP ABUTS A NON-WALKABLE SURFACE, OR WHERE A RAMP IS PROTECTED FROM PEDESTRIAN CROSS TRAFFIC (FOR EXAMPLE BY A SIGNAL CABINET OR UTILITY POLE WHICH BLOCKS PASSAGE).

⑩ GUTTER COUNTER SLOPE - 5.0% MAX.

TYPE 1 PERPENDICULAR CURB RAMPS

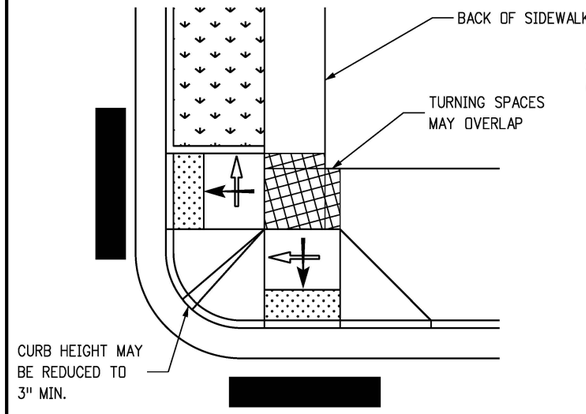
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

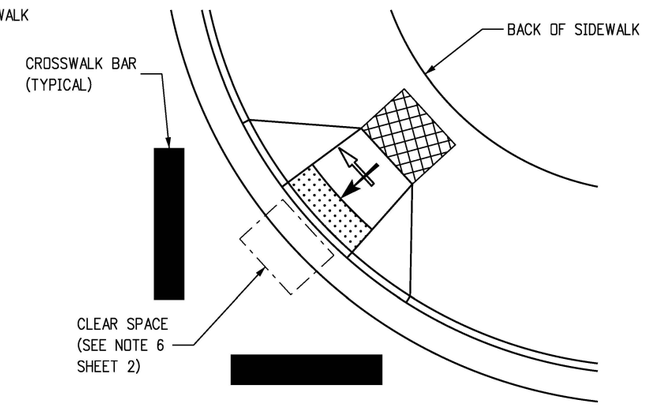
CURB RAMPS

Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.
M-608-1
Standard Sheet No. 2 of 10
Project Sheet Number:

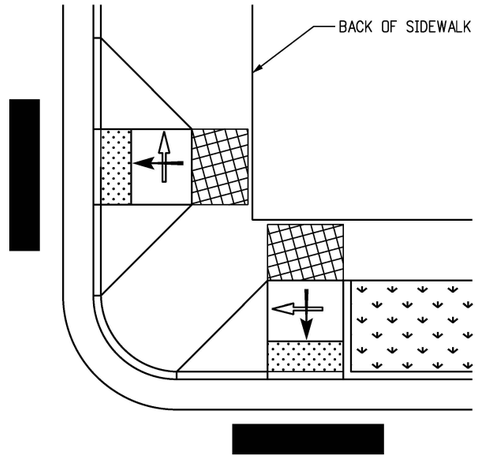


TYPE 1 RAMPS FOR WIDE SIDEWALK
(3" REDUCED CURB)



TYPE 1 RAMP
(DIAGONAL)

NOT ALLOWABLE IN NEW CONSTRUCTION/FULL DEPTH RECONSTRUCTION
SEE GENERAL NOTE 4



TYPE 1 RAMPS FOR WIDE SIDEWALK

TURNING SPACE
(SEE NOTES 3, 4, 5 - SHEET 2)

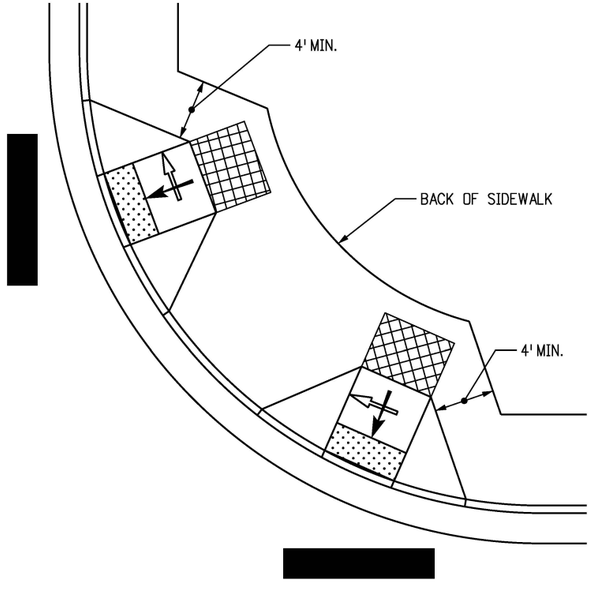
DETECTABLE WARNING SURFACE (DWS)
SEE DWS SHEETS FOR PLACEMENT DETAILS

RAMP RUNNING SLOPE

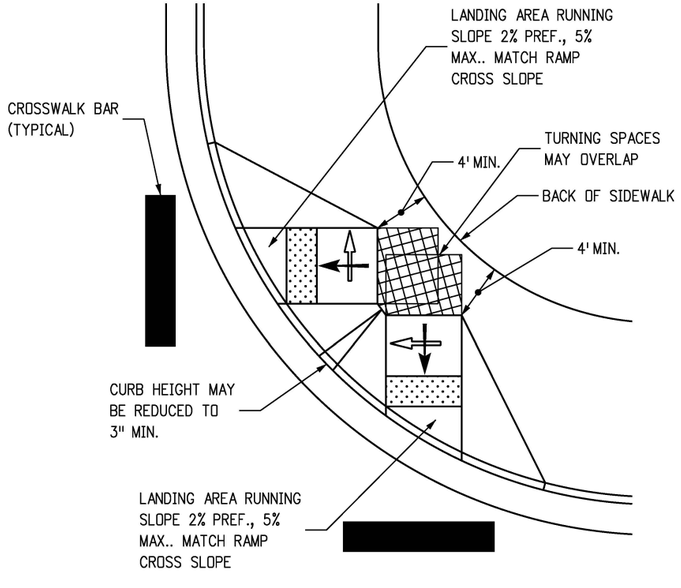
RAMP CROSS SLOPE

NOTE

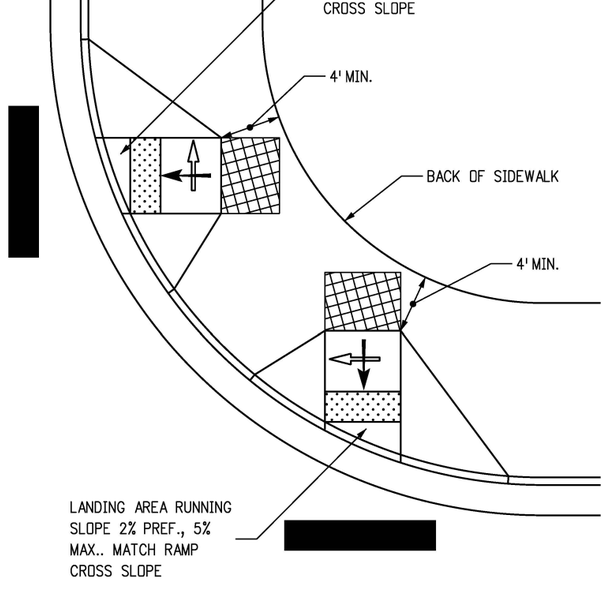
PLACEMENTS SHOWN ARE TYPICAL CONFIGURATIONS ONLY AND NOT INDICATIVE OF ALL OPTIONS. OTHER RAMP CONFIGURATIONS MAY BE ACCEPTABLE AS LONG AS THEY CONFORM TO THE CRITERIA IN THESE STANDARDS, AND ARE APPROVED BY THE ENGINEER.



TYPE 1 PERPENDICULAR RAMPS



TYPE 1 DIRECTIONAL RAMPS
(3" REDUCED CURB)



TYPE 1 DIRECTIONAL RAMPS
(LARGE RADIUS)

TYPE 1 CURB RAMPS TYPICAL CONFIGURATIONS

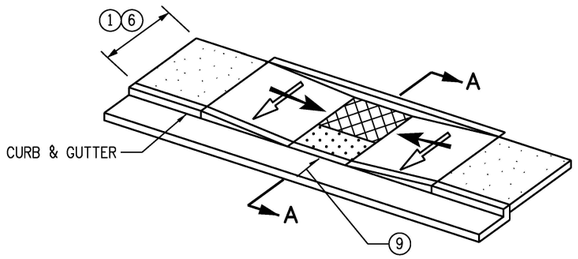
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

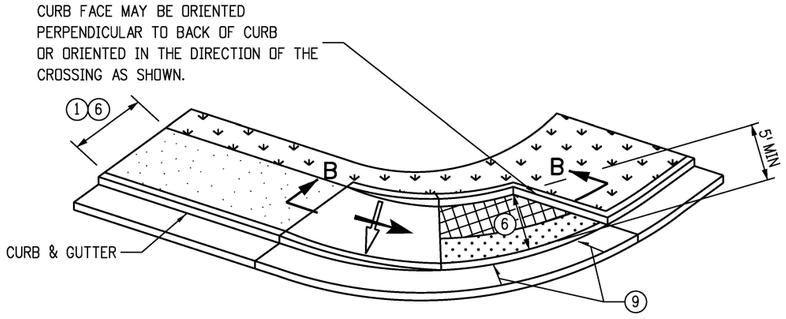
CURB RAMPS

Issued by the Project Development Branch: July 31, 2019

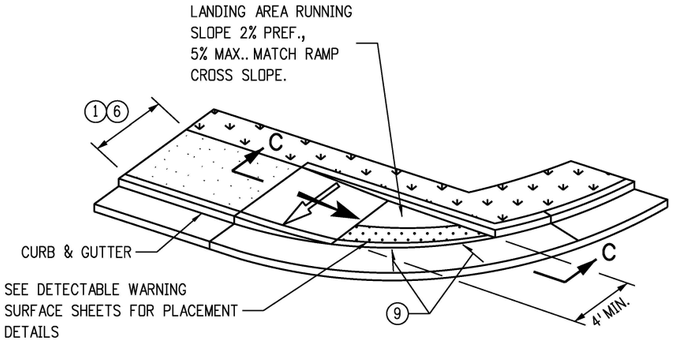
STANDARD PLAN NO.
M-608-1
Standard Sheet No. 3 of 10
Project Sheet Number:



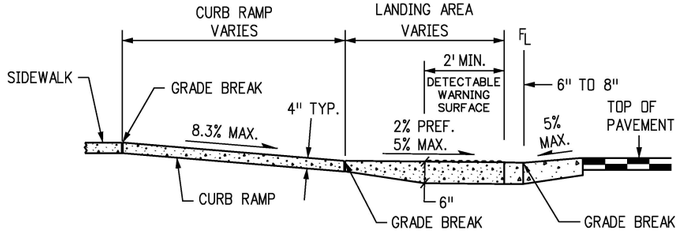
PARALLEL RAMP
(TYPICAL)



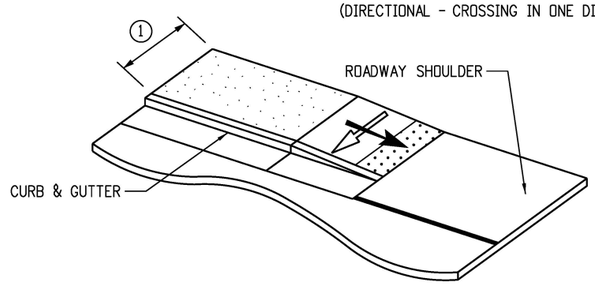
PARALLEL RAMP
(SIDEWALK ENDS)



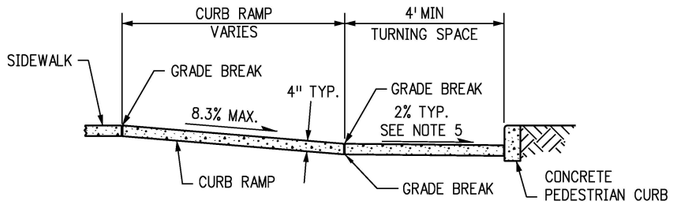
PARALLEL RAMP
(DIRECTIONAL - CROSSING IN ONE DIRECTION ONLY)



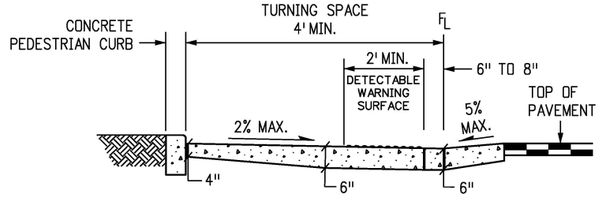
SECTION C-C



SIDEWALK TO SHOULDER TRANSITION



SECTION B-B



SECTION A-A

SIDEWALK

TURNING SPACE (4) (5) (6)

DETECTABLE WARNING SURFACE (DWS)

PARALLEL RAMP NOTES

(1) RAMP WIDTH - PROVIDE A RAMP WIDTH EQUAL TO THE ADJOINING SIDEWALK, PROVIDE 4 FT. WIDTH MINIMUM. RAMPS SERVICING SHARED USE PATHS SHALL MATCH THE WIDTH OF THE PATH.

(2) RAMP RUNNING SLOPE - 8.3% MAX.

(3) RAMP CROSS SLOPE - 2.0% MAX.

(4) TURNING SPACE RUNNING SLOPE - 2.0% MAX. TURNING SPACE RUNNING SLOPE IS MEASURED PERPENDICULAR TO THE BACK OF CURB.

(5) TURNING SPACE CROSS SLOPE - 2.0% TYPICAL, AT CROSSINGS WITHOUT YIELD OR STOP CONTROL, OR WITH A SIGNAL WHERE VEHICLES CAN PROCEED THROUGH THE INTERSECTION WITHOUT SLOWING OR STOPPING, THE CROSS SLOPE OF THE TURNING SPACE MAY EQUAL THE HIGHWAY GRADE. AT MIDBLOCK PEDESTRIAN STREET CROSSINGS THE TURNING SPACE CROSS SLOPE MAY EQUAL THE HIGHWAY GRADE. TURNING SPACE CROSS SLOPE IS MEASURED IN THE DIRECTION OF THE RAMP RUN.

(6) TURNING SPACE DIMENSIONS - PROVIDE A TURNING SPACE AT THE BOTTOM OF PARALLEL RAMPS WITH A WIDTH EQUAL TO THE WIDTH OF THE CURB RAMP. PROVIDE 4 FT. MINIMUM, MEASURED IN THE DIRECTION OF THE RAMP RUN. IF THE TURNING SPACE IS CONSTRAINED ON TWO SIDES, PROVIDE 5 FT. MEASURED IN THE DIRECTION OF PEDESTRIAN STREET CROSSING. THE TURNING SPACE MAY CONTAIN THE DETECTABLE WARNING SURFACE.

(7) RAMP ALIGNMENT - RAMPS SHALL BE ALIGNED SO THE TURNING SPACE IS FULLY CONTAINED WITHIN THE CROSSWALK OR STREET CROSSING THEY SERVE. PROVIDE ONE RAMP FOR EACH STREET CROSSING DIRECTION. IN ALTERATIONS, WHERE EXISTING PHYSICAL CONSTRAINTS PREVENT PROVIDING ONE CURB RAMP FOR EACH CROSSING DIRECTION, A SINGLE DIAGONAL CURB RAMP (ON THE APEX OF A CORNER) SHALL BE PERMITTED TO SERVE BOTH PEDESTRIAN STREET CROSSINGS. DIAGONAL RAMPS ARE NOT ACCEPTABLE IN NEW CONSTRUCTION, OR FULL-DEPTH RECONSTRUCTION.

(8) RAMP LENGTH - PARALLEL RAMP LENGTH IS DEPENDENT UPON THE RAMP SLOPE AND THE CHANGE OF ELEVATION FROM THE TURNING SPACE TO THE SIDEWALK. WHERE TERRAIN IS SLOPING A RAMP IS NOT REQUIRED TO CHASE GRADE MORE THAN 15 FT. REGARDLESS OF THE RESULTING RAMP SLOPE.

(9) GUTTER COUNTER SLOPE - 5.0% MAX.

TYPE 2 PARALLEL CURB RAMPS

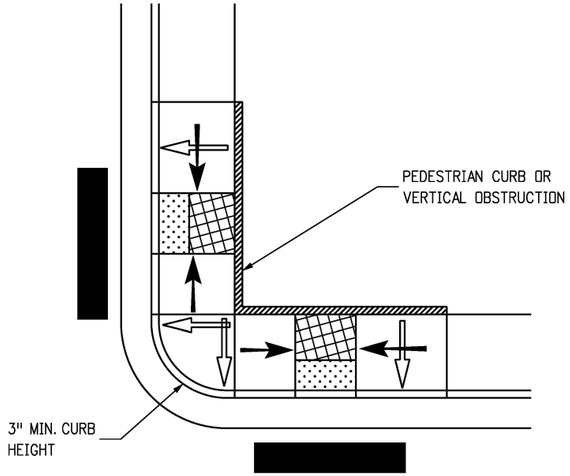
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

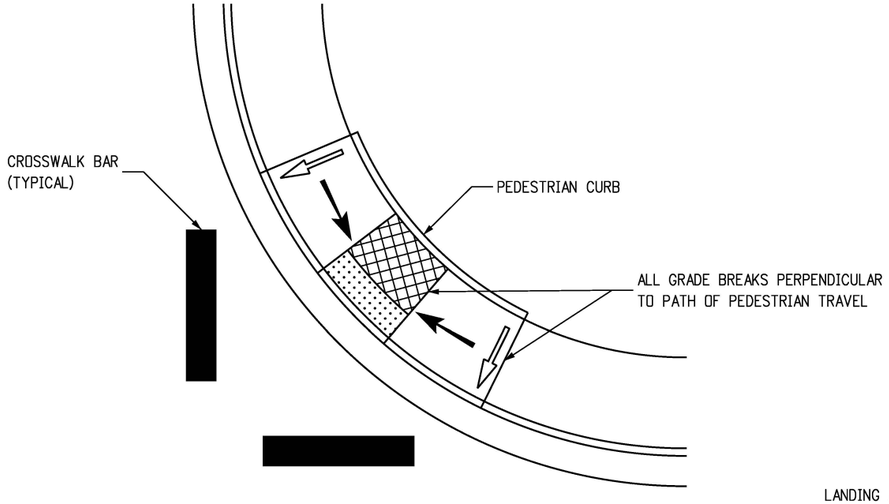
CURB RAMPS

Issued by the Project Development Branch: July 31, 2019

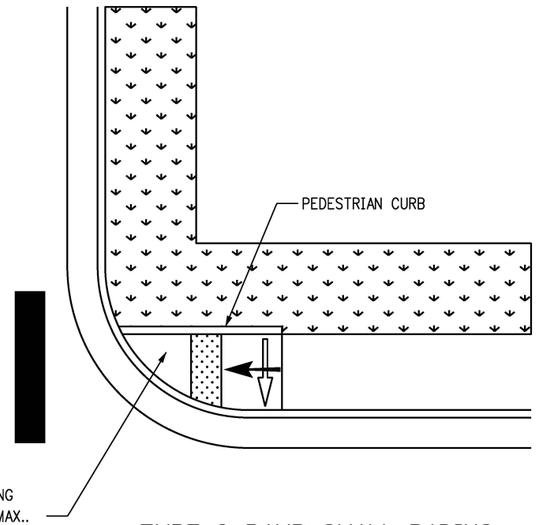
STANDARD PLAN NO.
M-608-1
Standard Sheet No. 4 of 10
Project Sheet Number:



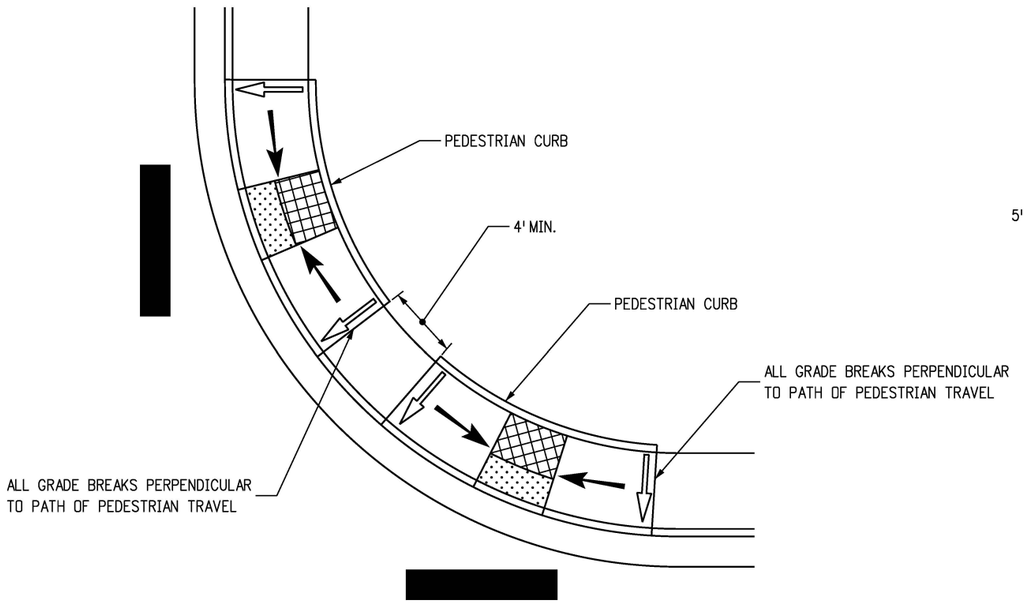
TYPE 2 RAMPS SMALL RADIUS
(3" REDUCED CURB)



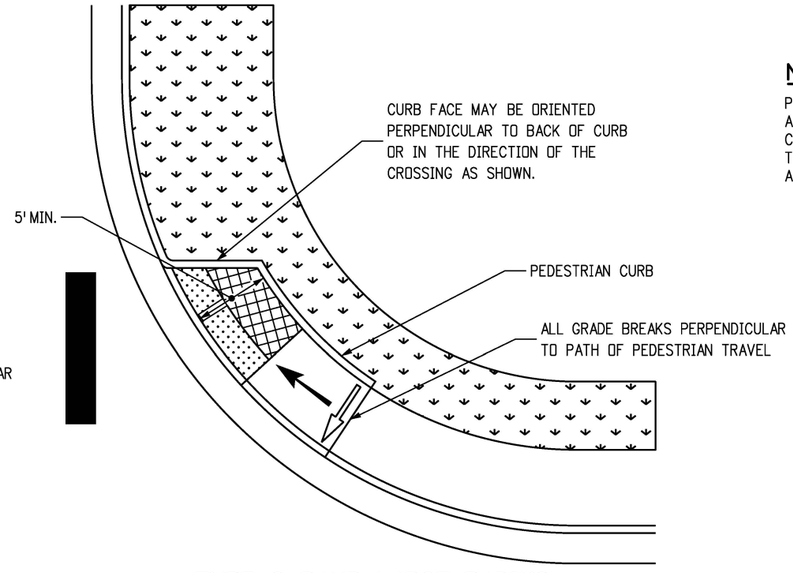
TYPE 2 RAMP (DIAGONAL)
NOT ALLOWABLE IN NEW CONSTRUCTION/FULL-DEPTH RECONSTRUCTION
SEE NOTE GENERAL NOTE 4



TYPE 2 RAMP SMALL RADIUS
(CROSSING IN ONE DIRECTION)



TYPE 2 RAMPS LARGE RADIUS



TYPE 2 RAMP LARGE RADIUS
(CROSSING IN ONE DIRECTION)

NOTE
PLACEMENTS SHOWN ARE TYPICAL CONFIGURATIONS ONLY AND NOT INDICATIVE OF ALL OPTIONS. OTHER RAMP CONFIGURATIONS MAY BE ACCEPTABLE AS LONG AS THEY CONFORM TO THE CRITERIA IN THESE STANDARDS, AND ARE APPROVED BY THE ENGINEER.

TURNING SPACE
(SEE NOTE 4, 5, 6 - SHEET 4)

DETECTABLE WARNING SURFACE (DWS)
SEE DWS SHEETS FOR PLACEMENT
DETAILS

RAMP RUNNING SLOPE

RAMP CROSS SLOPE

TYPE 2 CURB RAMPS TYPICAL CONFIGURATIONS

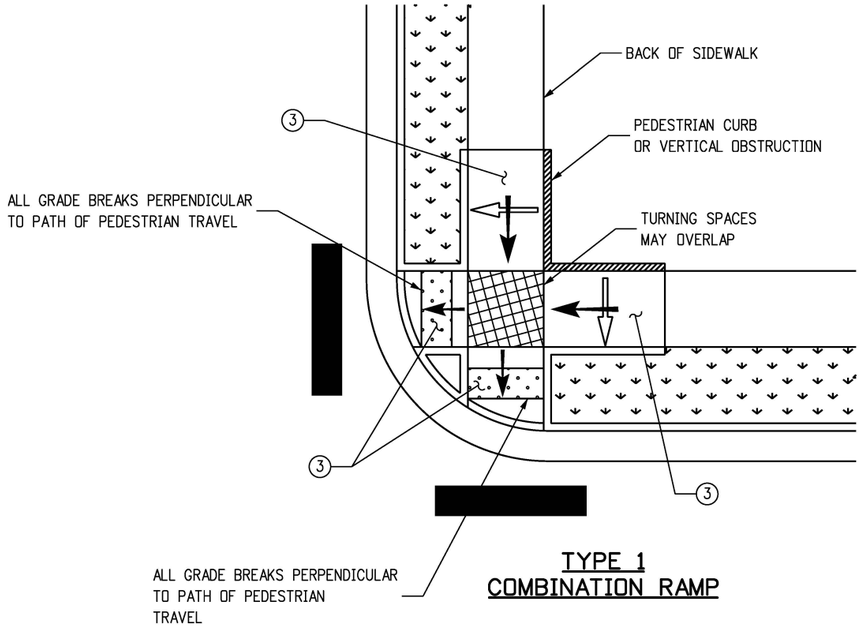
Computer File Information		Sheet Revisions	
		Date:	Comments
Creation Date: 07/31/19			
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

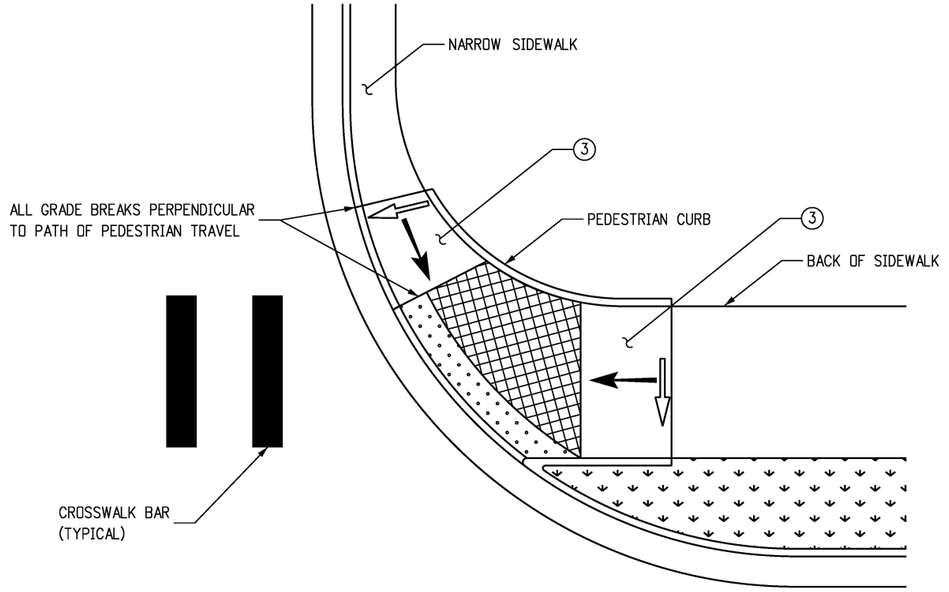
CURB RAMPS

Issued by the Project Development Branch: July 31, 2019

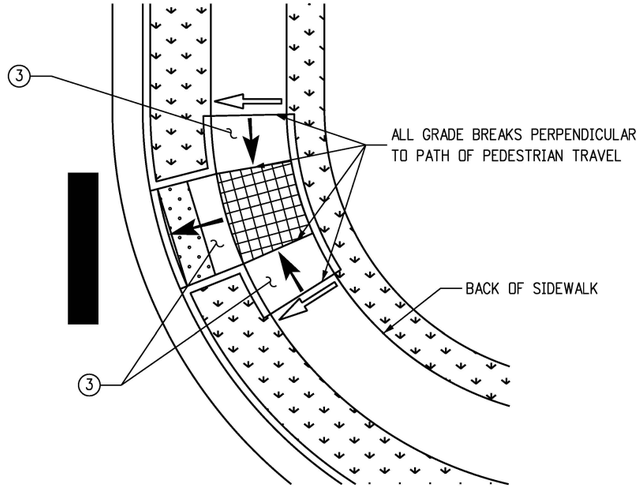
STANDARD PLAN NO.
M-608-1
Standard Sheet No. 5 of 10
Project Sheet Number:



TYPE 1
COMBINATION RAMP



TYPE 1/TYPE 2
COMBINATION RAMP



TYPE 1/TYPE 2
COMBINATION RAMP

COMBINATION CURB RAMP NOTES:

1. THE CURB RAMP PLACEMENTS SHOWN ARE TYPICAL CONFIGURATIONS ONLY AND NOT INDICATIVE OF ALL OPTIONS. OTHER CURB RAMP CONFIGURATIONS MAY BE ACCEPTABLE AS LONG AS THEY CONFORM TO THE CRITERIA IN THESE STANDARDS, AND ARE APPROVED BY THE ENGINEER.

2. RAMP AND TURNING SPACE CROSS SLOPE - 2.0% TYPICAL. AT CROSSINGS WITHOUT YIELD OR STOP CONTROL, OR WITH A SIGNAL WHERE VEHICLES CAN PROCEED THROUGH THE INTERSECTION WITHOUT SLOWING OR STOPPING, THE CROSS SLOPE OF THE RAMP AND TURNING SPACE MAY EQUALTHE HIGHWAY GRADE. AT MIDBLOCK PEDESTRIAN STREET CROSSINGS THE RAMP AND TURNING SPACE CROSS SLOPE MAY EQUAL THE HIGHWAY GRADE.

3. WHERE IT IS ACCEPTABLE FOR A RAMP OR TURNING SPACE CROSS SLOPE TO EXCEED 2.0% AND MATCH THE HIGHWAY GRADE, THE RAMP ABOVE THE TURNING SPACE MAY BE WARPED TO TIE INTO THE ADJOINING SIDEWALK CROSS SLOPE. THE TRANSITION TO THE SIDEWALK CROSS SLOPE SHALL BE SPREAD EVENLY OVER THE LENGTH OF THE RAMP TO MINIMIZE WARPING. THE RATE OF CHANGE IN CROSS SLOPE MAY NOT EXCEED 3.0% PER LINEAR FOOT.

TURNING SPACE (2) (3)

DETECTABLE WARNING SURFACE (DWS)
SEE DWS SHEETS FOR PLACEMENT DETAILS

RAMP RUNNING SLOPE

RAMP CROSS SLOPE (2) (3)

COMBINATION CURB RAMPS TYPICAL CONFIGURATIONS

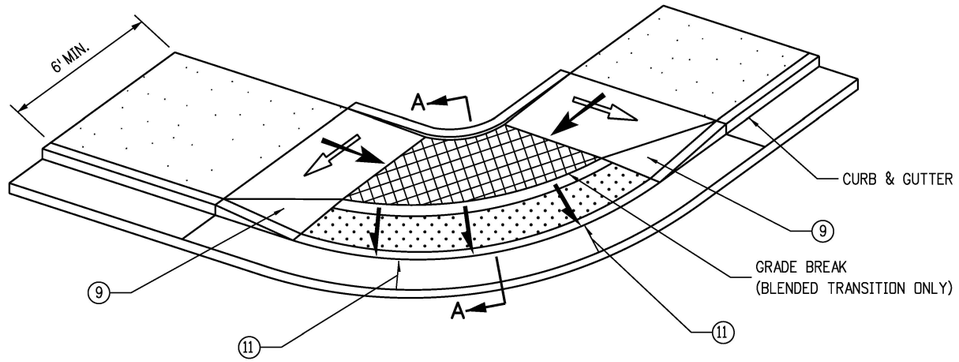
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

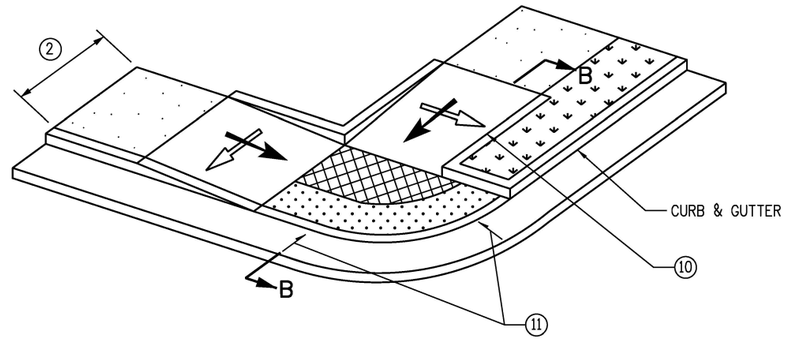
CURB RAMPS

Issued by the Project Development Branch: July 31, 2019

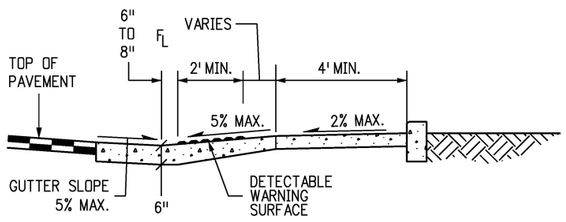
STANDARD PLAN NO.
M-608-1
Standard Sheet No. 6 of 10
Project Sheet Number:



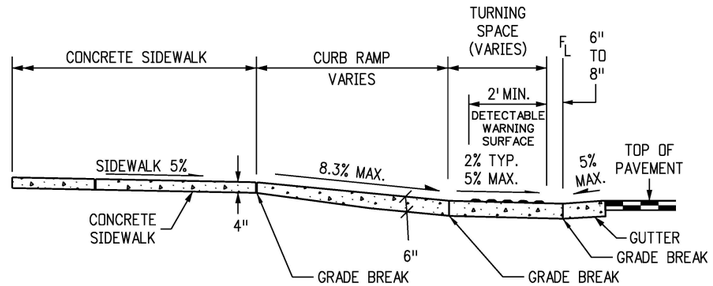
BLENDED TRANSITION



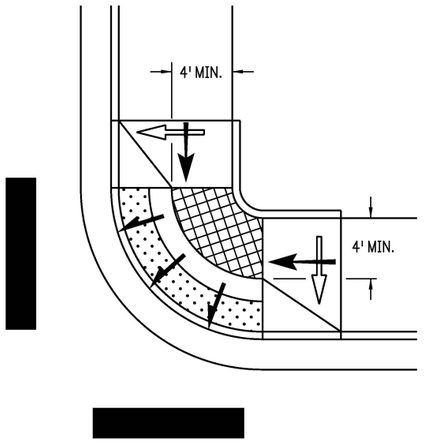
DEPRESSED CORNER



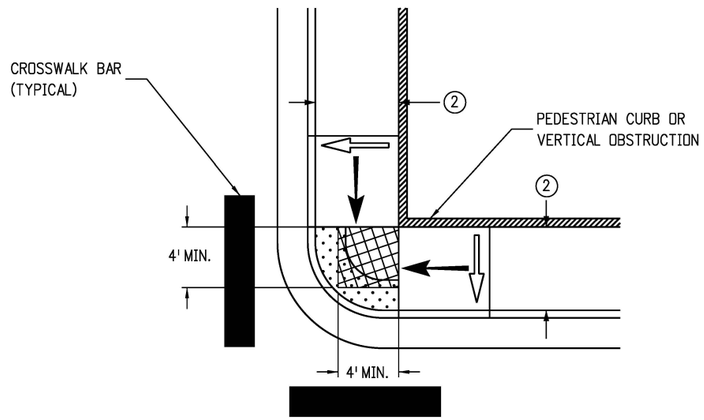
SECTION A-A



SECTION B-B



BLENDED TRANSITION



DEPRESSED CORNER

SIDEWALK

TURNING SPACE (4) (5) (6)

DETECTABLE WARNING SURFACE (DWS)

BLENDED TRANSITION & DEPRESSED CORNER NOTES

(1) PERPENDICULAR AND PARALLEL RAMP CONFIGURATIONS ARE PREFFERED. BLENDED TRANSITIONS AND DEPRESSED CORNERS SHOULD ONLY BE USED WHERE SITE CONDITIONS MAKE THEM A MORE APPROPRIATE OPTION, OR WHERE PERPENDICULAR OR PARALLEL RAMPS CANNOT BE INSTALLED DUE TO A PHYSICAL SITE CONSTRAINT.

(2) RAMP WIDTH - PROVIDE 5 FT. OR GREATER WHERE POSSIBLE. IF SITE CONSTRAINTS DO NOT PERMIT, PROVIDE 4FT. WIDTH MINIMUM. RAMPS SERVICING SHARED USE PATHS SHALL MATCH THE WIDTH OF THE PATH.

(3) RAMP RUNNING SLOPE - 8.3% MAX.

(4) BLENDED TRANSITION RUNNING SLOPE - 5.0% MAX.

(5) RAMP AND TURNING SPACE CROSS SLOPE - 2.0% TYPICAL. AT CROSSINGS WITHOUT YIELD OR STOP CONTROL, OR WITH A SIGNAL WHERE VEHICLES CAN PROCEED THROUGH THE INTERSECTION WITHOUT SLOWING OR STOPPING, THE CROSS SLOPE OF RAMPS AND TURNING SPACES MAY EQUAL THE HIGHWAY GRADE.

(6) TURNING SPACE DIMENSIONS - PROVIDE A 4 FT. X 4 FT. MIN. TURNING SPACE AT THE BOTTOM OF RAMP RUNS. THE TURNING SPACE MAY CONTAIN THE DETECTABLE WARNING SURFACES.

(7) RAMP ALIGNMENT - TURNING SPACE SHALL BE ALIGNED TO BE FULLY CONTAINED WITHIN THE CROSSWALK OR STREET CROSSING(S) THEY SERVE.

(8) RAMP LENGTH - RAMP LENGTH IS DEPENDENT UPON THE RAMP SLOPE AND THE CHANGE OF ELEVATION FROM THE TURNING SPACE TO THE SIDEWALK. WHERE TERRAIN IS SLOPING A RAMP IS NOT REQUIRED TO CHASE GRADE MORE THAN 15 FT. REGARDLESS OF THE RESULTING RAMP SLOPE.

(9) RAMP FLARES - WHERE A RAMP EDGE ABUTS A WALKABLE SURFACE, A FLARED SIDE MUST BE PROVIDED. RAMP FLARE SLOPES SHALL NOT EXCEED 10.0%.

(10) VERTICAL CURB RETURNS - VERTICAL CURB RETURNS MAY BE USED ONLY WHERE A RAMP ABUTS A NON-WALKABLE SURFACE, OR WHERE A RAMP IS PROTECTED FROM PEDESTRIAN CROSS TRAFFIC (FOR EXAMPLE BY A SIGNAL CABINET OR UTILITY POLE WHICH BLOCKS PASSAGE).

(11) GUTTER COUNTER SLOPE - 5.0% MAX.

(12) DWS PLACEMENT - DWS SHALL BE PLACED AROUND THE RADIUS AND LOCATED AT THE BACK OF CURB ON BLENDED TRANSITION AND DEPRESSED CORNER RAMPS.

TYPE 5 - DEPRESSED CORNER/BLENDED TRANSITION

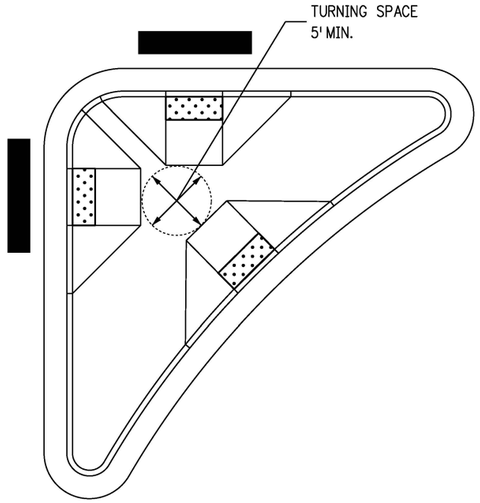
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

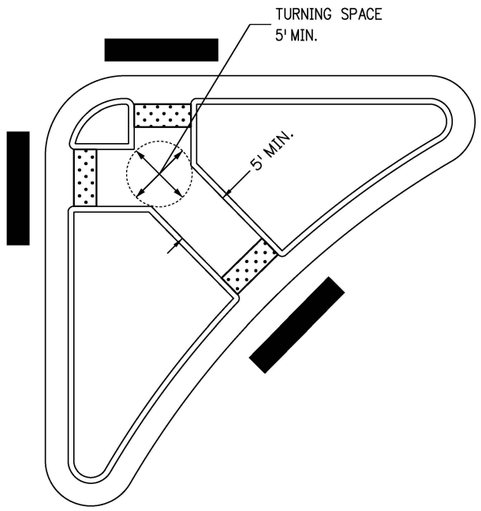
Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

CURB RAMPS

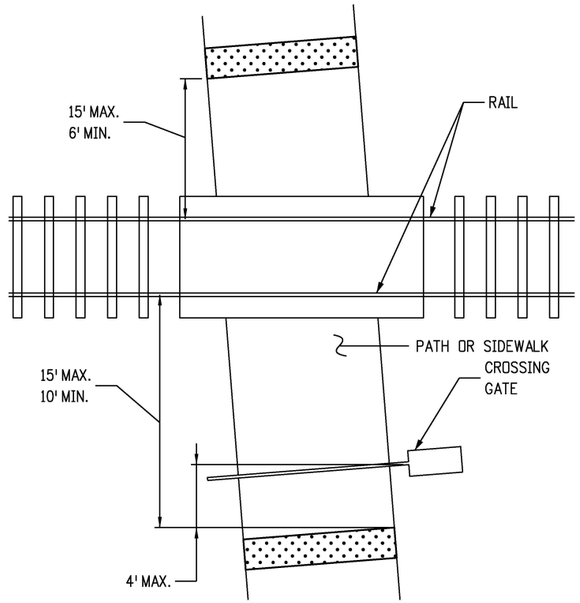
Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.
M-608-1
Standard Sheet No. 7 of 10
Project Sheet Number:





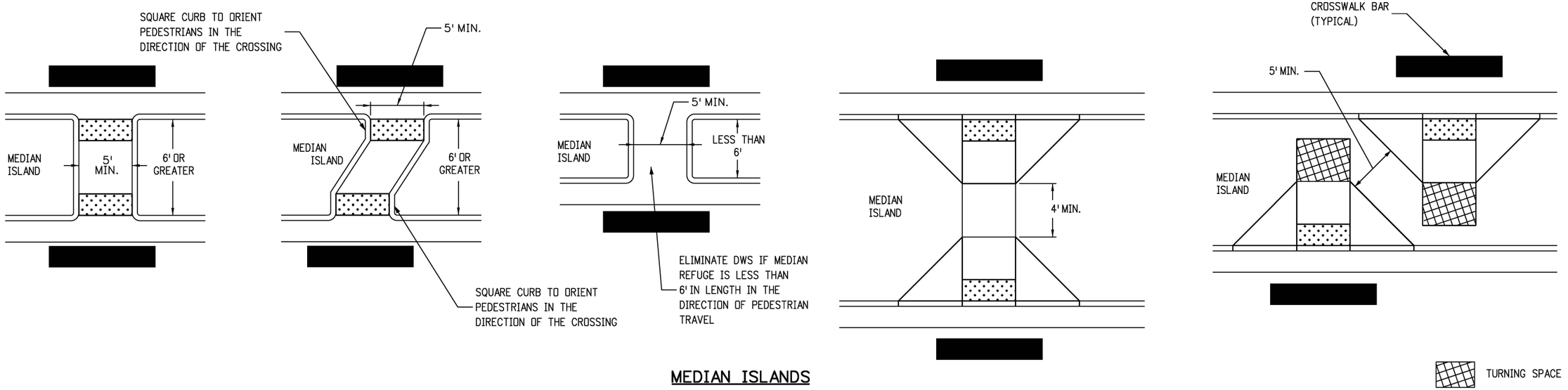
INTERSECTION ISLANDS



AT-GRADE RAIL CROSSING

NOTES:

1. DETECTABLE WARNING SURFACES SHALL BE PLACED IN ALIGNMENT WITH THE BACK OF CURB.
2. FLARED SIDES ARE PREFERENTIAL ON RAISED INTERSECTION ISLANDS AND SHOULD BE PROVIDED ON ISLANDS WHICH SERVE SHARED USE PATHS, OR AT LOCATIONS WHERE BICYCLE USE IS EXPECTED.
3. FOR CUT-THROUGH MEDIAN ISLANDS, DETECTABLE WARNING SURFACES SHALL BE PLACED IN ALIGNMENT WITH THE BACK OF CURB AND BE SEPARATED BY A MINIMUM 2 FOOT SPACE WITHOUT DWS. IF A 2 FOOT SEPARATION BETWEEN DETECTABLE WARNING SURFACES CANNOT BE PROVIDED NO DETECTABLE WARNING SURFACE SHALL BE INSTALLED.
4. CURB RAMP AND CUT-THROUGH WIDTHS SHOULD BE THE SAME WIDTH AS ANY SIDEWALK OR SHARED USE PATH WHICH THEY SERVE.



MEDIAN ISLANDS

MEDIANS / RAILROADS / ISLANDS

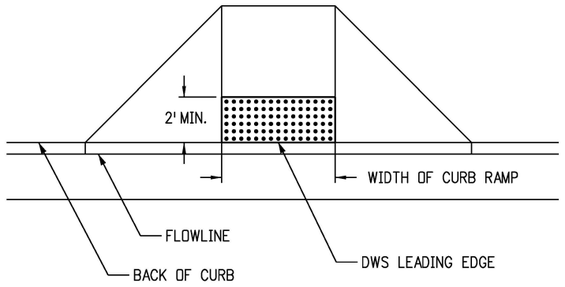
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

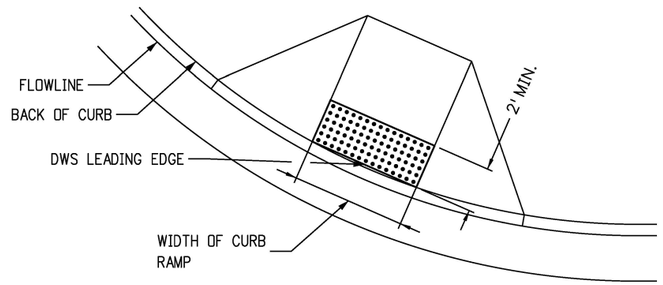
CURB RAMPS

Issued by the Project Development Branch: July 31, 2019

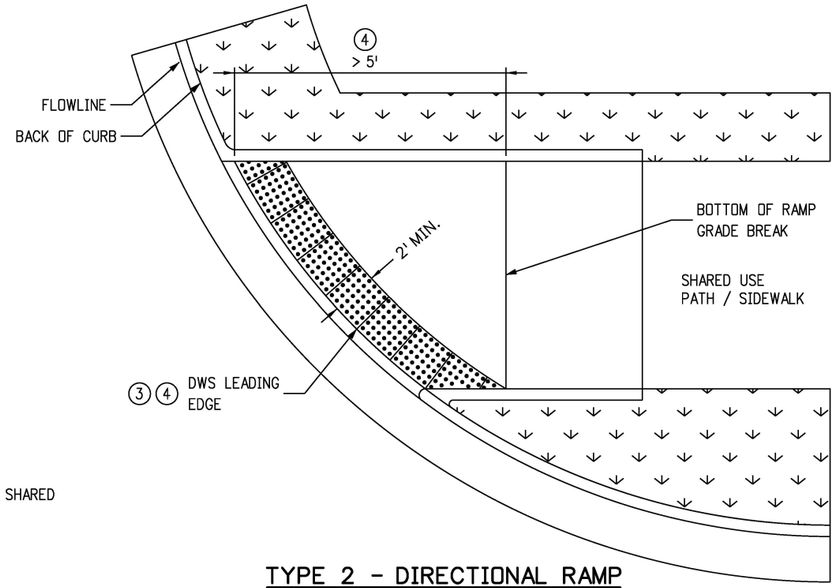
STANDARD PLAN NO.
M-608-1
Standard Sheet No. 8 of 10
Project Sheet Number:



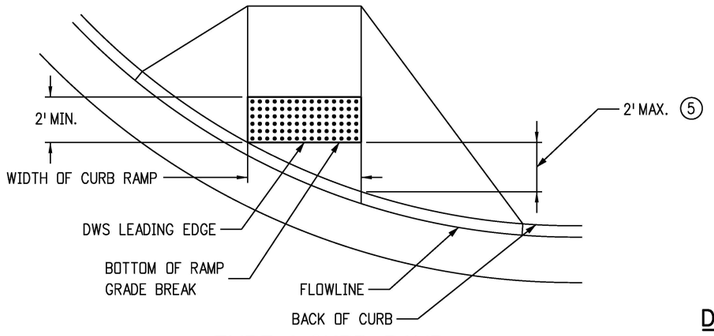
TYPE 1 CURB RAMP
(PERPENDICULAR ON TANGENT)



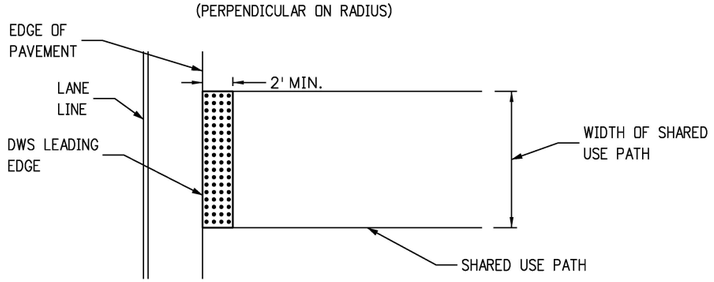
TYPE 1 CURB RAMP
(PERPENDICULAR ON RADIUS)



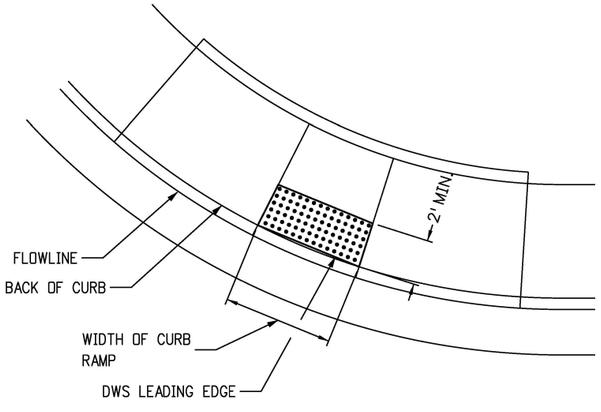
TYPE 2 - DIRECTIONAL RAMP



TYPE 1 CURB RAMP
(DIRECTIONAL ON RADIUS)



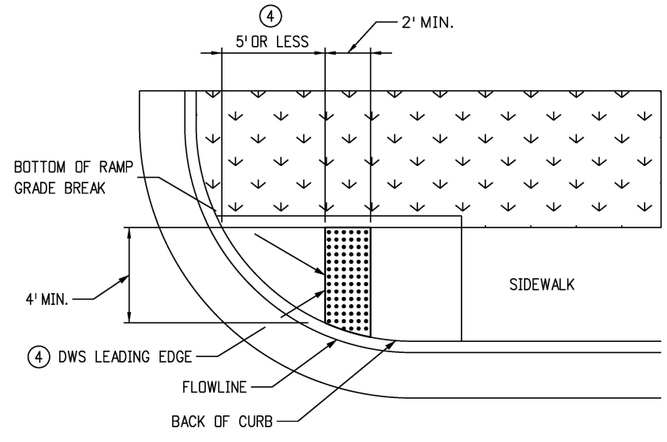
SHARED USE PATH CROSSING



TYPE 2 CURB RAMP

DETECTABLE WARNING SURFACE NOTES:

1. DETECTABLE WARNING SURFACES (DWS) SHALL BE INSTALLED AT SIDEWALK, OR SHARED USE PATH, TO STREET TRANSITIONS, AND SHALL CONSIST OF TRUNCATED DOME SURFACES. ANY TRUNCATED DOME PANELS OR PAVERS WHICH ARE USED MUST BE ON THE CDOT APPROVED PRODUCTS LIST (APL).
2. THE DETECTABLE WARNING SURFACE SHALL SPAN THE FULL WIDTH OF THE CURB RAMP, SHARED USE PATH, OR OTHER ROADWAY ENTRANCE AS APPLICABLE. A GAP OF 2 INCHES FROM THE EDGE OF THE DETECTABLE WARNING SURFACE TO THE EDGE OF THE CURB RAMP OR SHARED USE PATH IS PERMITTED.
3. WHEN DETECTABLE WARNING SURFACES ARE PLACED ON A SLOPE GREATER THAN 5.0%, TRUNCATED DOMES SHOULD BE ALIGNED IN THE DIRECTION OF THE RAMP RUN; OTHERWISE DOMES ARE NOT REQUIRED TO BE ALIGNED. TRUNCATED DOMES SHALL BE IN A SQUARE GRID OR RADIAL PATTERN. WHEN PLACED RADIALLY, PLACE ADJACENT DWS PLATES EDGE TO EDGE. EDGES OF CUT PLATES SHALL BE STRAIGHT.
4. LOCATE ONE CORNER OF THE DWS LEADING EDGE AT THE BACK OF CURB. NO POINT ON THE LEADING EDGE OF THE DWS MAY BE MORE THAN 5 FT. FROM THE BACK OF CURB. WHEN ANY POINT OF THE LEADING EDGE OF THE DWS WILL BE GREATER THAN 5 FT. FROM THE BACK OF CURB, PLACE THE DWS RADIALLY AT THE BACK OF CURB.
5. WHERE PERPENDICULAR DIRECTIONAL RAMPS ABUT A WALKABLE SURFACE, THE LEADING EDGE OF THE DWS SHALL NOT BE PLACED FURTHER THAN 2 FEET FROM THE BACK OF CURB. IF THE RADIUS OF A CORNER MAKES THIS IMPOSSIBLE, ORIENT THE CURB RAMP PERPENDICULAR TO THE CURB AND GUTTER.
6. IF THE DETECTABLE WARNING SURFACE IS CUT, GRIND OFF THE REMAINING PORTION OF ANY CUT TRUNCATED DOMES. SEAL ALL CUT PANEL EDGES WITH AN APL SEALANT TO PREVENT WATER DAMAGE.
7. TRUNCATED DOME PLATES SHALL BE EMBEDED IN THE CONCRETE CURB RAMP WHILE THE CONCRETE IS PLASTIC.
8. DWS SHALL NOT BE PLACED OVER GRADE BREAKS.



TYPE 2 - DIRECTIONAL RAMP

DETECTABLE WARNING SURFACE (DWS)

DETECTABLE WARNING SURFACE PLACEMENT

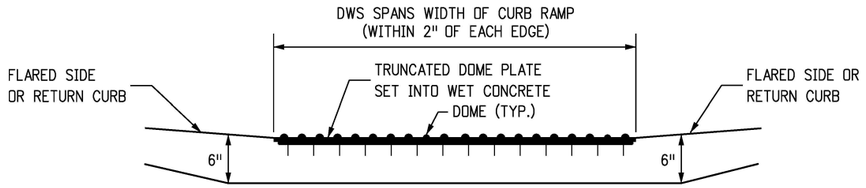
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

CURB RAMPS

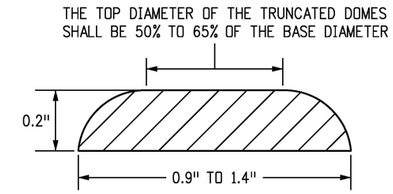
Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.
M-608-1
Standard Sheet No. 9 of 10
Project Sheet Number:

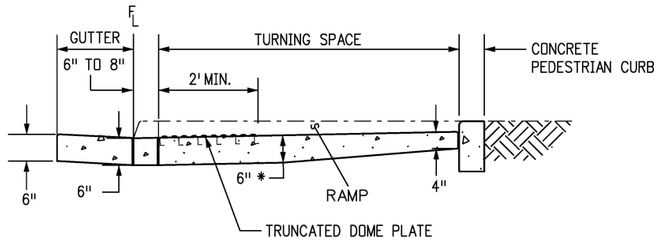


SECTION VIEW OF DETECTABLE WARNING SURFACE PLATE

(LOOKING AT PERPENDICULAR RAMP
RUN FROM STREET)

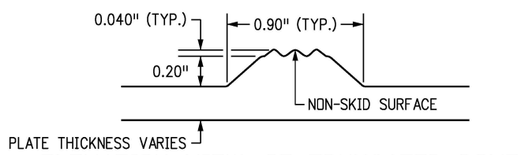


ELEVATION VIEW OF SINGLE TRUNCATED DOME

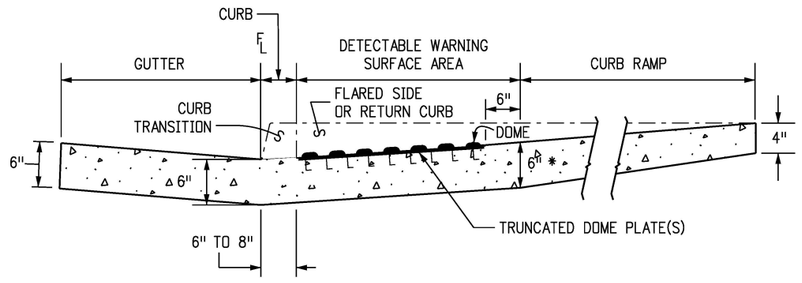


SECTION VIEW FOR PARALLEL CURB RAMP TYPES

(LOOKING PERPENDICULAR TO TURNING SPACE)

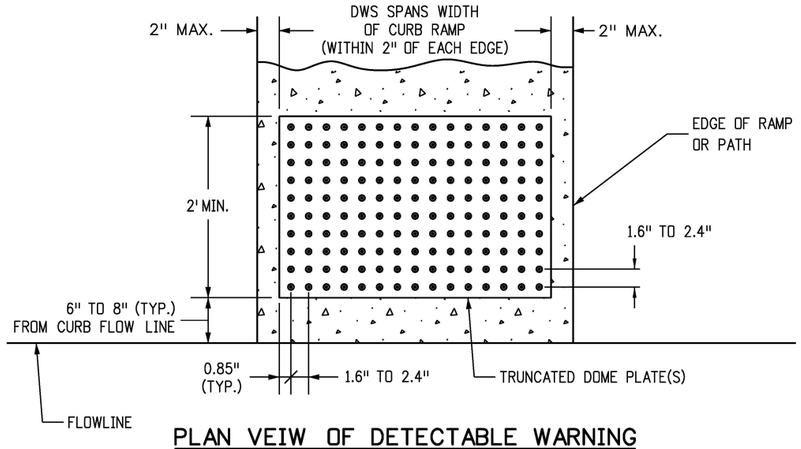


ELEVATION VIEW OF TRUNCATED DOME FOR DETECTABLE WARNING PLATE



SECTION VIEW FOR PERPENDICULAR CURB RAMP TYPES

(LOOKING PERPENDICULAR TO RAMP RUN)



PLAN VEIW OF DETECTABLE WARNING SURFACE PLATE

DETECTABLE WARNING SURFACE DETAILS

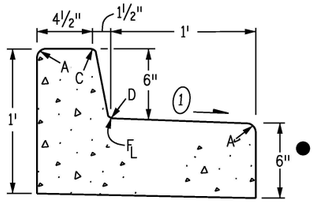
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

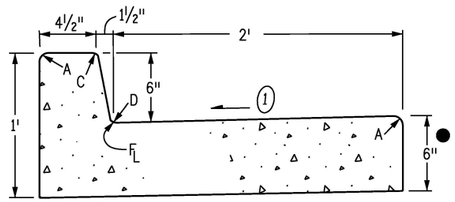
CURB RAMPS

Issued by the Project Development Branch: July 31, 2019

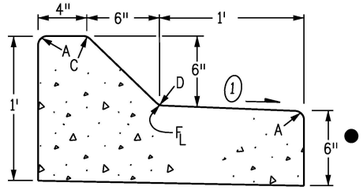
STANDARD PLAN NO.
M-608-1
Standard Sheet No. 10 of 10
Project Sheet Number:



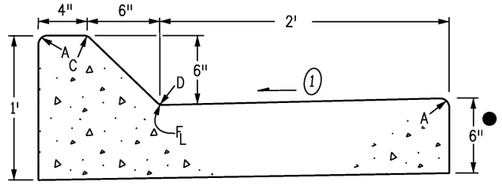
CURB AND GUTTER TYPE 2
(SECTION IB)
(6 IN. BARRIER - 1 FT. GUTTER)



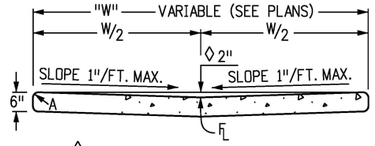
CURB AND GUTTER TYPE 2
(SECTION IIB)
(6 IN. BARRIER - 2 FT. GUTTER)



CURB AND GUTTER TYPE 2
(SECTION IM)
(6 IN. MOUNTABLE - 1 FT. GUTTER)

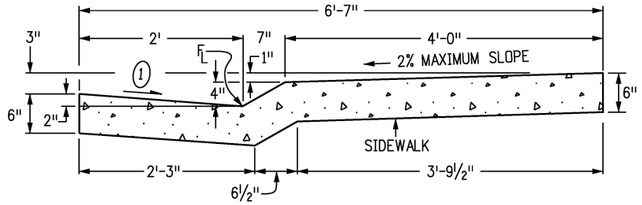


CURB AND GUTTER TYPE 2
(SECTION IIM)
(6 IN. MOUNTABLE - 2 FT. GUTTER)



◊ 2 IN. DEPTH WHEN USED AS A CROSSPAN IN AN INTERSECTION

GUTTER TYPE 2



CURB AND GUTTER TYPE 2
(SECTION MS)
(4 IN. MOUNTABLE WITH SIDEWALK)

GENERAL NOTES

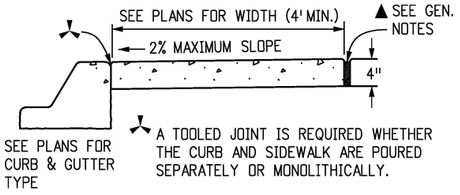
1. ON ROADWAY CURVES WITH A RADIUS OF 1,900 FT. OR LESS, CURBS AND GUTTERS ARE TO BE PLACED ON THE ARC OF THE CURVE, UNLESS OTHERWISE NOTED ON THE PLANS. A MAXIMUM CHORD LENGTH OF 10 FT. MAY BE USED WHEN THE CURVE RADIUS IS GREATER THAN 1,900 FT.
2. CONCRETE SHALL BE CLASS B.
3. PROFILE GRADE OF CURBS AND GUTTERS SHALL BE LOCATED AT THE FLOW LINE.
4. CURB TYPE 4 (KEY-WAY) MAY BE USED IN LIEU OF CURB AND GUTTER TYPE 2 (SECTIONS IB AND IM) UNLESS OTHERWISE SPECIFIED ON THE PLANS.
5. GUTTER CROSS SLOPES MAY BE ADJUSTED TO FACILITATE DRAINAGE FOR PROFILE GRADES AS SHOWN ON THE PLANS.
6. THICKNESS OF CURB AND GUTTER SECTION SHALL MATCH CONCRETE PAVEMENT THICKNESS IF SHOWN ON THE PLANS. CURB AND GUTTER SHALL BE CLASS P CONCRETE IF PLACED MONOLITHICALLY WITH CONCRETE PAVEMENT.
7. INCREASE SIDEWALK THICKNESS TO 6 IN. AT LOCATIONS SHOWN ON THE PLANS.
8. MINIMUM SIDEWALK WIDTH IS 4 FT.

▲ EXPANSION JOINTS SHALL BE INSTALLED WHEN ABUTTING EXISTING CONCRETE OR FIXED STRUCTURE. EXPANSION JOINT MATERIAL SHALL BE ½ IN. THICK AND SHALL EXTEND THE FULL DEPTH OF CONTACT SURFACE.

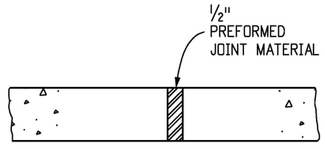
(1) GUTTER CROSS SLOPES SHALL BE ½ IN./FT. WHEN DRAINING AWAY FROM CURB AND 1 IN./FT. WHEN DRAINING TOWARD CURB (WITH EXCEPTION TO IMMEDIATELY ADJACENT TO CURB RAMPS - SEE STANDARD PLAN M-608-1 FOR SLOPE REQUIREMENTS).

● WHEN TIE BARS ARE REQUIRED, THE GUTTER THICKNESS SHALL BE INCREASED TO THE PAVEMENT THICKNESS (T). BARS SHALL BE EPOXY-COATED #4 CONFORMING TO AASHTO M 284 AND SPACED AT 3 FT. INTERVALS. THEY SHALL BE INSERTED T/2 AND 1#2 LENGTH INTO THE GUTTER.

LEGEND FOR RADII
A = ⅛" TO ¼"
B = 1"
C = 1½"
D = 1½" TO 2"



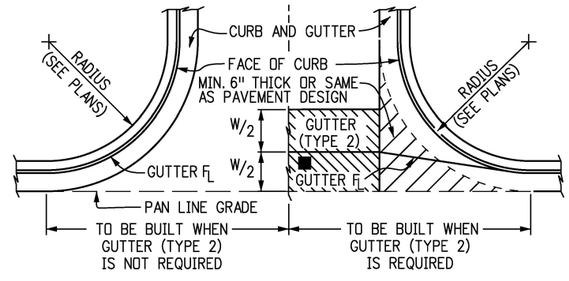
CONCRETE SIDEWALK



NOTES: 1. EXPANSION JOINTS SHALL BE PLACED IN THE SIDEWALK AT INTERVALS OF NOT MORE THAN 500 FT.

2. EXPANSION JOINTS MAY BE SEALED WHEN SPECIFIED ON THE PLANS.

SIDEWALK EXPANSION JOINT



▨ THIS AREA SHALL BE POURED MONOLITHICALLY WITH CURB AND GUTTER AND PAID FOR AS "CONCRETE PAVEMENT".

■ FLOW LINE LOCATION WILL BE ESTABLISHED BY W/2 SHOWN ON PLANS.

CONSTRUCTION OF CONCRETE GUTTERS AT INTERSECTION

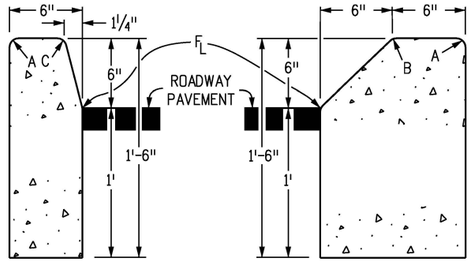
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

CURB, GUTTERS, AND SIDEWALKS

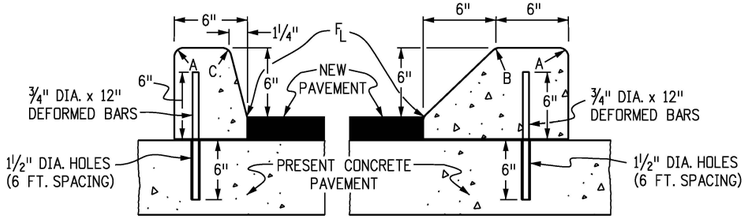
Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.
M-609-1
Standard Sheet No. 1 of 4
Project Sheet Number:



CURB TYPE 2
(SECTION B)
6 IN. BARRIER

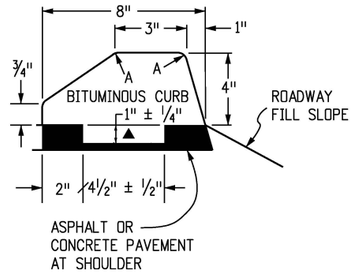
CURB TYPE 2
(SECTION M)
6 IN. MOUNTABLE

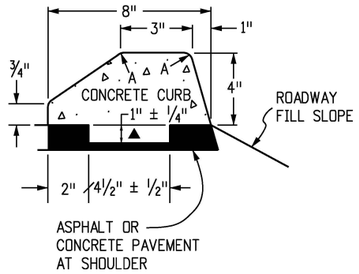


¾" DIA. x 12" DEFORMED REINFORCING BARS AT 6 FT. SPACING SHALL BE GROUTED IN 1¼" DIA. HOLES IN EXISTING CONCRETE. GROUT SHALL CONSIST OF 2 PARTS CLEAN SAND AND 1 PART CEMENT. COST OF INSTALLATION SHALL BE INCLUDED IN THE PRICE BID FOR CURB.

CURB TYPE 4
(SECTION B)
6 IN. BARRIER

CURB TYPE 4
(SECTION M)
6 IN. MOUNTABLE



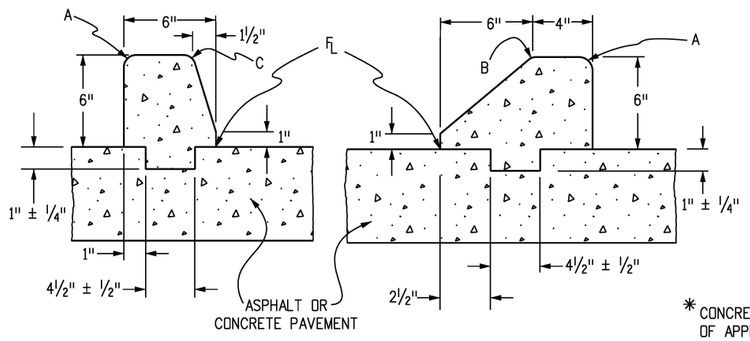


CURB TYPE 6
(SECTION M)
4 IN. MOUNTABLE

NOTE: BITUMINOUS OR CONCRETE * UNLESS OTHWISE SPECIFIED ON THE PLANS.

▲ KEY-WAY MAY BE OMITTED WHEN PLACED UNDER GUARDRAIL.

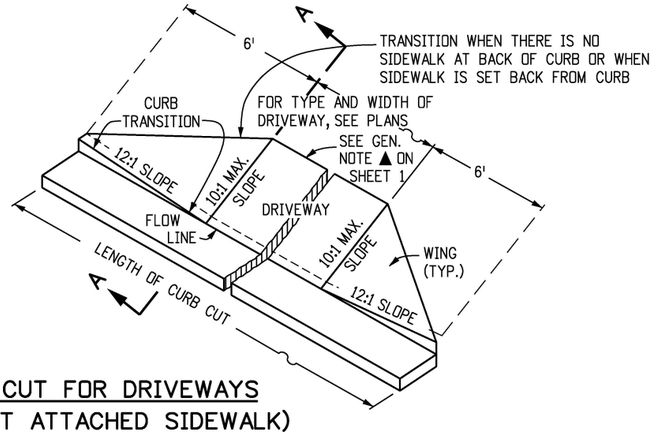
LEGEND FOR RADII
A = 1/8 TO 1/4"
B = 1"
C = 1½"
D = 1½" TO 2"



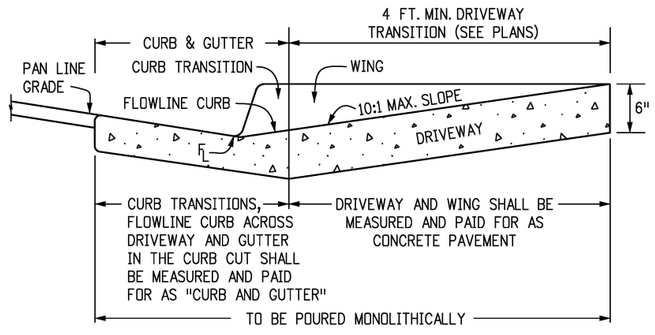
(SECTION B) (SECTION M)

CURB TYPE 4 (KEY-WAY) *

* CONCRETE CLASS B SHALL CONTAIN 1.5 POUNDS PER CUBIC YARD OF APPROVED POLYPROPYLENE FIBERS AND MAY HAVE A NOMINAL AGGREGATE SIZE OF ⅜ IN.

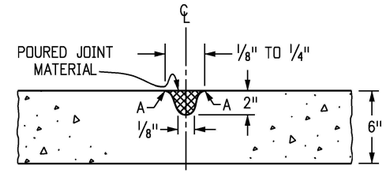


CURB CUT FOR DRIVEWAYS
(WITHOUT ATTACHED SIDEWALK)



SECTION A-A

CONCRETE PAVEMENT (DRIVEWAYS)



NOTE: RECOMMENED JOINT SPACING IS EVERY 8 FOOT ALONG THE WIDTH AND LENGTH OF DRIVEWAY. FOR DRIVEWAYS WIDER THAN 12 FEET, JOINTS ARE REQUIRED.

TRANSVERSE CONTRACTION JOINT
FOR CONCRETE PAVEMENT (DRIVEWAYS)

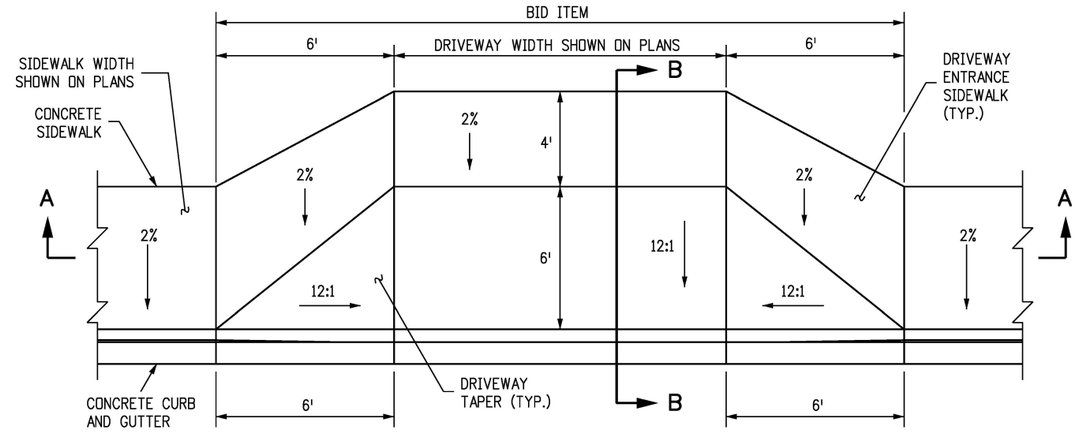
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

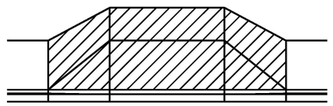
CURB, GUTTERS, AND SIDEWALKS

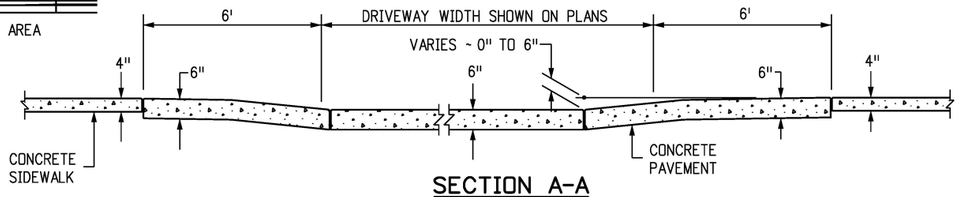
Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.
M-609-1
Standard Sheet No. 2 of 4
Project Sheet Number:

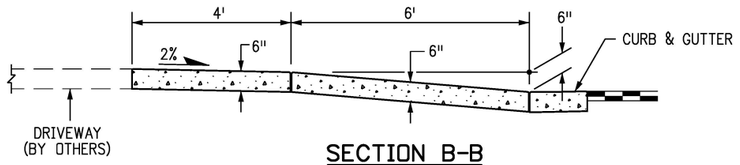


CONCRETE DRIVEWAY ENTRANCE TYPE 1

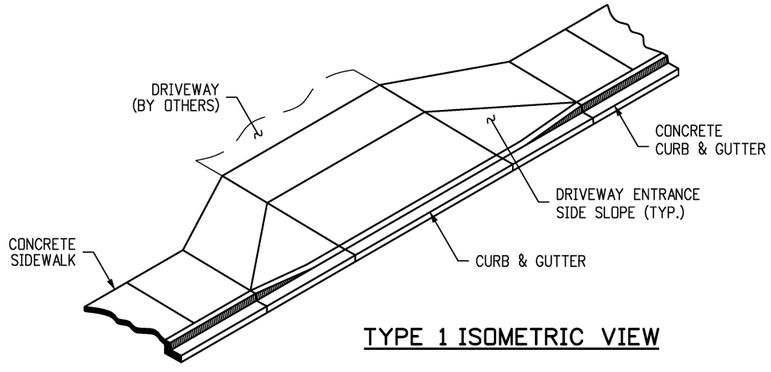




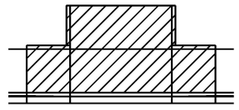
SECTION A-A

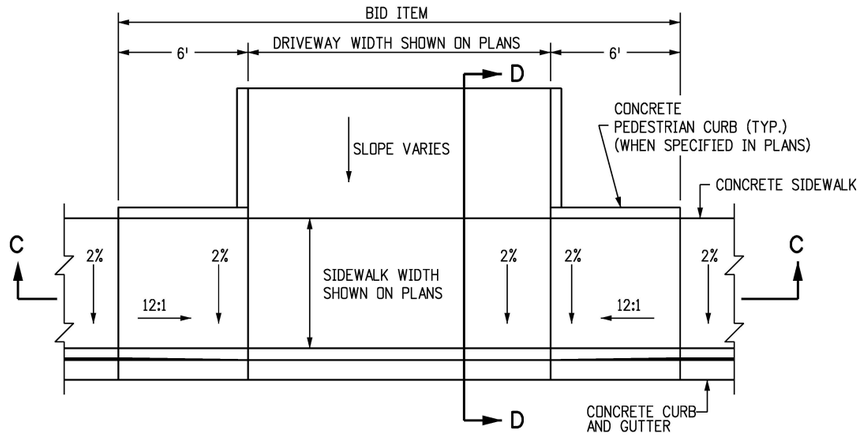


SECTION B-B

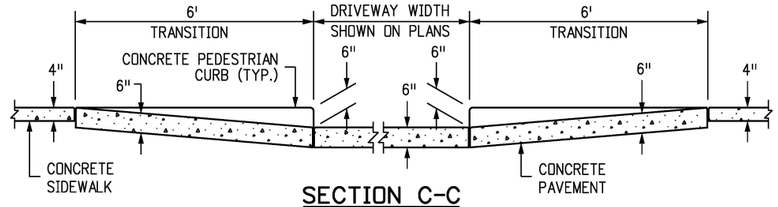


TYPE 1 ISOMETRIC VIEW

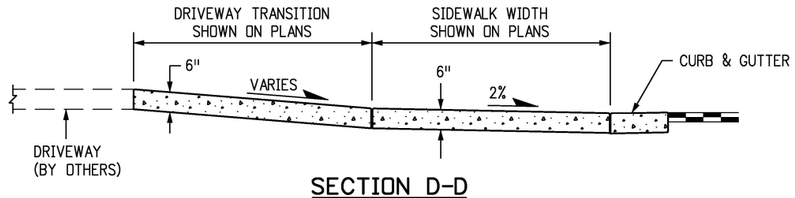




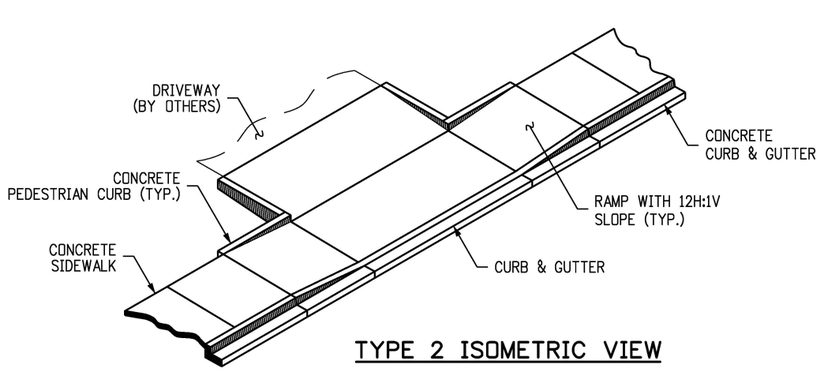
CONCRETE DRIVEWAY ENTRANCE TYPE 2



SECTION C-C



SECTION D-D



TYPE 2 ISOMETRIC VIEW

NOTES

1. DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES, AND OTHER OBSTRUCTIONS SHOULD NOT BE PLACED IN FRONT OF THE DRIVEWAY RAMP ACCESS AREAS.
2. FOR THE CURB AND GUTTER SHOWN, SEE PLANS FOR CURB TYPE.
3. RAMP SLOPES SHALL BE 12:1 OR FLATTER.
4. CONSTRUCTION OF THE CONCRETE PEDESTRIAN CURB SHALL BE INCLUDED IN THE BID PRICE OF THE CONCRETE PAVEMENT.

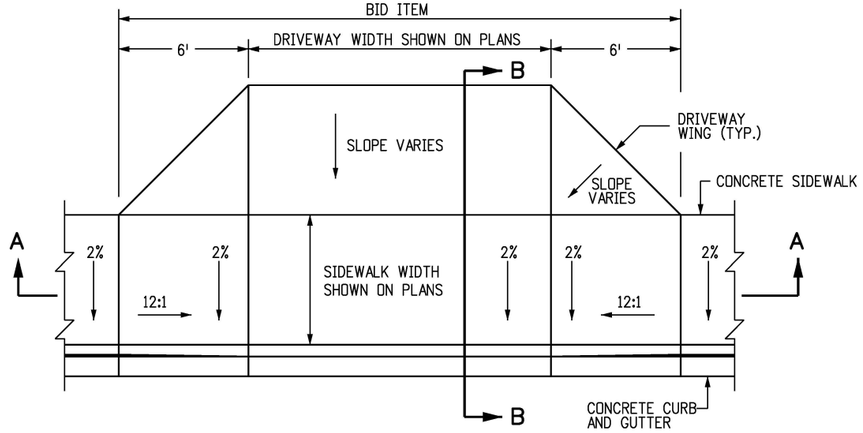
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

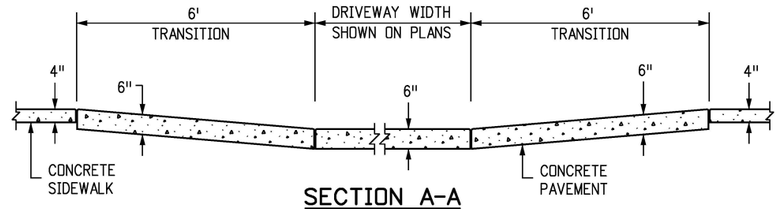
CURB, GUTTERS, AND SIDEWALKS

Issued by the Project Development Branch: July 31, 2019

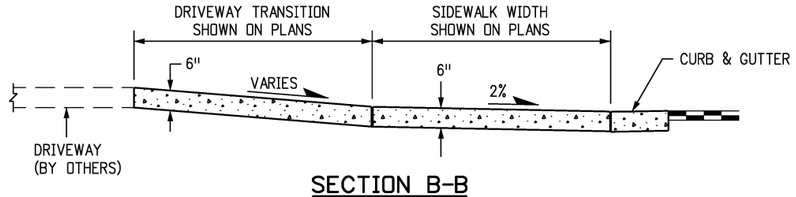
STANDARD PLAN NO.
M-609-1
Standard Sheet No. 3 of 4
Project Sheet Number:



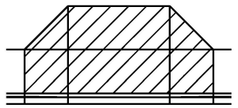
CONCRETE DRIVEWAY ENTRANCE TYPE 3



SECTION A-A



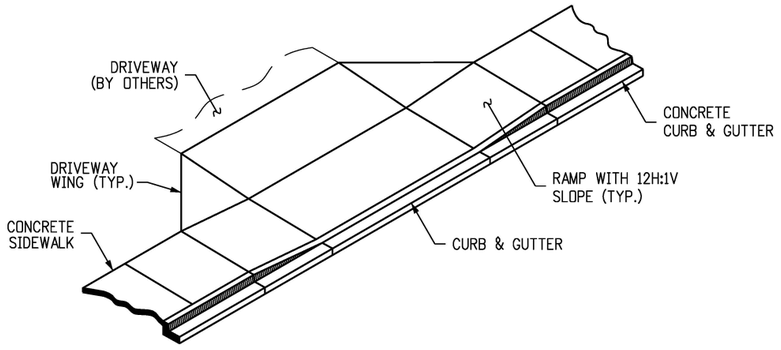
SECTION B-B



CONCRETE PAVEMENT PAY AREA

NOTES

1. DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES, AND OTHER OBSTRUCTIONS SHOULD NOT BE PLACED IN FRONT OF THE DRIVEWAY RAMP ACCESS AREAS.
2. FOR THE CURB AND GUTTER SHOWN, SEE PLANS FOR CURB TYPE.
3. RAMP SLOPES SHALL BE 12:1 OR FLATTER.



TYPE 3 ISOMETRIC VIEW

Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK	(R-X)		
Last Modification Date: 07/31/19	(R-X)		
Detailer Initials: LTA	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

CURB, GUTTERS, AND SIDEWALKS

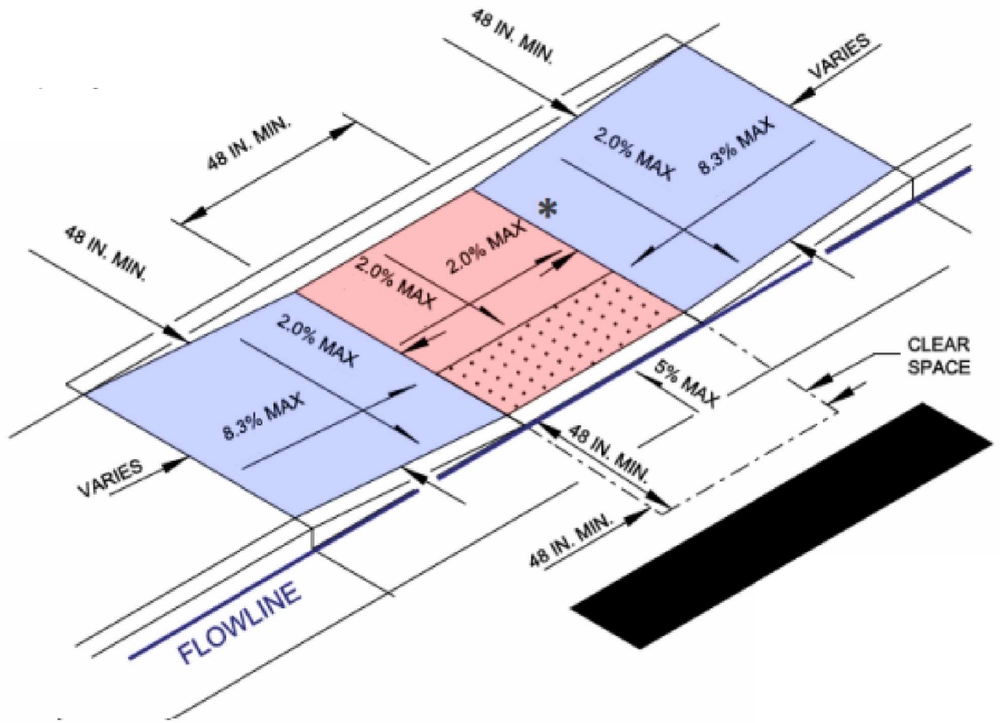
Issued by the Project Development Branch: July 31, 2019

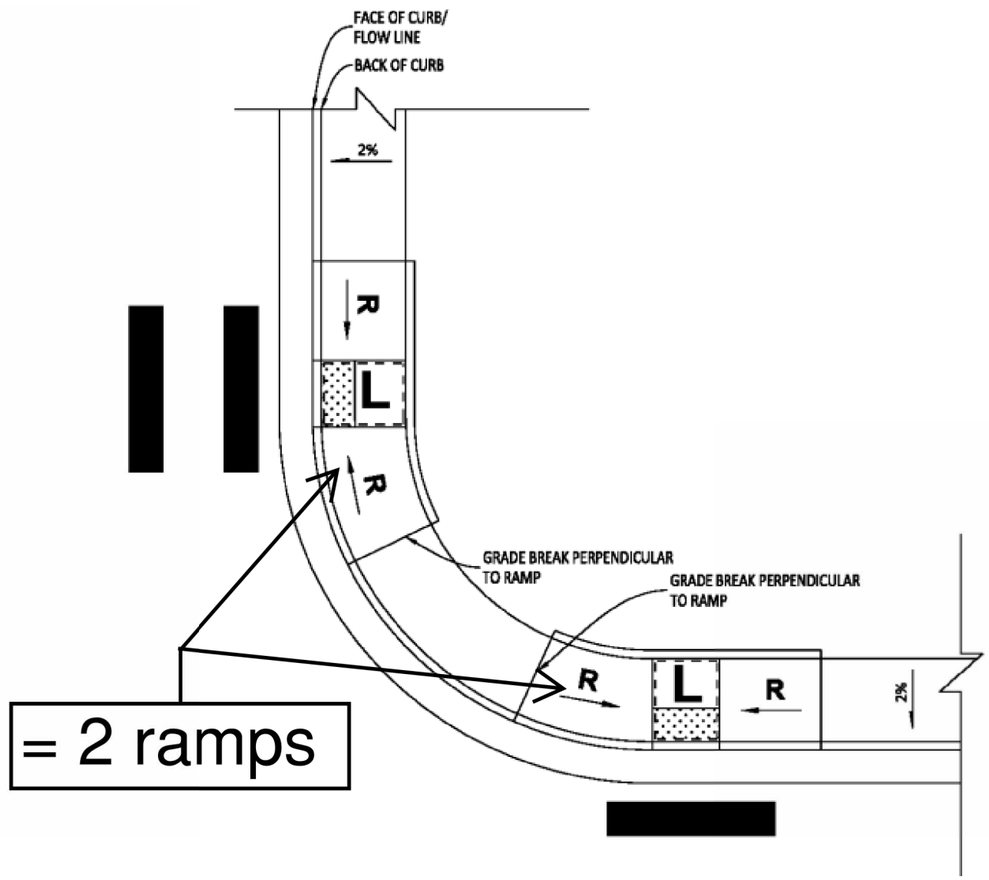
STANDARD PLAN NO.
M-609-1
Standard Sheet No. 4 of 4
Project Sheet Number:

1 Ramp = (2) 6'6"x6' wings,
(1) 4'x6'6" landing area

Total dimensions = 16'x6'6"

Total area = 11.6 SY





= 2 ramps

PROJECT NUMBER
25-05

CURB RAMP DETAIL

Designer	KC
Detailer	KC
Checked	MM

Littleton Colorado
ENGINEERING & UTILITIES DIVISION
2255 West Berry Avenue
Littleton, CO 80120 (303) 795-3865
www.littletongov.org

INDEX OF REVISIONS

DATE	DESCRIPTION

SHEET 1 of 1

Date 03/23/2026