

**SUBJECT: RESOLUTION NO. 41, SERIES 2025 – A RESOLUTION
APPROVING AN AGREEMENT FOR THE 2025 MEDIAN
LANDSCAPE RENOVATIONS PROJECT**

DATE: JUNE 17, 2025

PREPARED BY: BRYON WEBER, PROS PROJECT MANAGER

**PRESENTED BY: ADAM BLACKMORE, PROS DIRECTOR
BRYON WEBER, PROS PROJECT MANAGER**

SUMMARY:

Staff requests Council approve a sole source construction contract with Green Landscape Solutions (Green) for the purpose of installing phase two of the city's median landscape renovation project.

Phase two work is proposed as continuation of phase one which was completed in 2023 along portions of 88th, McCaslin and Via Appia – and was also installed by Green. Work is projected to take place during summer/fall of 2025 and includes median segments along the following roadways:

- 1) Via Appia (between McCaslin Blvd and Eldorado Ln)
- 2) Dillon Rd (between West Dahlia Street and 88th St)
- 3) McCaslin Blvd (between Dillon Road and W Century Dr)

Broad objectives for the project include conversion of non-functional bluegrass turf to water efficient low-mow varieties, removal of ash trees and replacement with a more diverse tree canopy, construction of stacked rock walls and installation of planting beds with xeric plantings in high visibility areas. Further details on the goals and intentions of the renovation project can be found in the enclosed staff report.

BACKGROUND / PRIOR DISCUSSIONS:

- Planning for median renovations pre-dates many current PROS staff, however traces of past discussions can be found in archived minutes from the Parks and Public Landscaping Advisory Board (PPLAB).
- PPLAB minutes dated 6/2/22 ([see packet dated 10/6/22](#)) include median landscape discussion by previous PROS staff. Noteworthy items include the desire to modify 2018 landscape design plans (which stalled out due to a funding lapse and the COVID pandemic) to include more sustainable designs through items such as: removal of existing bluegrass turf, incorporation of pollinator-friendly and native plantings, and addressing threats from the Emerald Ash Borer to existing Ash trees.
- A Request for Proposal (RFP) for the updated designs was advertised in May of 2022. Following competitive bidding, a contract with Design Concepts Landscape

Architecture was presented to Council and awarded via consent agenda on August 16, 2022. See [Council Packet](#) and [Meeting Minutes](#)

- PPLAB minutes from 10/6/22 (see [packet dated 11/3/22](#)) indicate a determination was made to prioritize fire impacted and fire adjacent areas for phase one of the median landscape renovations, including focus on xeric plantings.
- Phase one installation was advertised for competitive bidding in March of 2023. Four bids were received, all of which were over the City's identified budget. The City pursued the lowest bidder, Green Landscape Solutions, for value engineering discussions in hopes of bringing the project within budget.
- Following value engineering discussions, staff were able to lower the cost of the phase one by roughly 30%, but still not within available budget. Therefore, additional funding was requested at the June 6th, 2023 Council meeting to increase the project budget from \$680,000 to \$880,000, which was subsequently approved via consent agenda. See [Council Packet](#) and [Meeting Minutes](#)
- Green Landscape Solutions performed installation of phase one renovations in the summer and fall of 2023, with limited work items continuing into 2024. Of the \$880,000 allocated to the project in 2023, \$729,418 was used and the remaining \$150,581 carried forward to the 2024 budget.
- The 2024 budget included an additional \$680,000 for the overall project, bringing the total available to \$830,581. Approximately \$35,000 was spent in 2024 – mostly modifying rock walls built near Via Appia and Pine Street in response to resident complaints on traffic visibility. Funds were also spent contracting Green for follow-up maintenance services in phase one areas, such as additional mowing.
- Despite the available 2024 funds, pursuit of phase two was delayed as staff and design consultants focused their work capacity on completing design and public engagement for Enclave & Sunflower parks to accelerate their reconstruction in 2025.
- Feedback was received throughout phase one construction and into 2024 for concerns regarding median plantings, grass seed mix, traffic visibility, loss of mature trees, overall aesthetics, etc. This feedback along with staff observations was taken into account to inform limited design modifications for phase two.
- A presentation of "lessons learned" from phase one was reviewed by PPLAB at their December 4, 2024 meeting (see [packet dated 1/8/25](#)). Much discussion centered around the grass seed mix, including staff's desire to revise the mix to feature grasses with a lower overall height and to modify mowing procedures to better eliminate an annual rye grass used in the phase one seed mix. A plant schedule for phase two was also reviewed. The December 2024 PPLAB presentation with lessons learned became the foundation of the staff memo enclosed with this communication.
- The project's 2024 budget finished with an account balance of \$795,207 which was approved by City Council & Finance Committee to be carried forward to the 2025 budget and remains available.

- Phase 3 of the project has approved allocated funding in the 2026 budget and Phase 4 & Phase 5 funding is currently approved in 2027 & 2028 budgets, respectively, as projects in the 6-year Capital Improvement Plan. Exact areas and prioritization of phases 3-5 has not been determined, however segments that will still need completion following phases 1 and 2 include A) finishing McCaslin Boulevard north to South Boulder Rd B) finishing Via Appia east to South Boulder Rd and C) South Boulder Rd between McCaslin and Highway 42.

Design drawings which incorporated phase one lessons learned were completed to a 60% level for staff review in early 2025 and advanced to a 95% level to obtain pricing from Green in spring of 2025.

ANALYSIS:

A majority vote from Council is needed to award and execute a sole source construction contract with Green Landscape Solutions in the amount of \$673,968.37 for the purpose of completing phase two renovations. Approval would also authorize staff to spend up to an additional \$76,031.63 for potential contingency needs (approximately 11% of contract value). This approval would therefore result in authorization of total spending not-to-exceed \$750,000.

Council should consider the staff's recommendation to continue contracting with Green for phase two as sole source provider. Following successful completion of phase one and with a proven partnership since 2018, staff desire to continue working with Green with the intention of bringing technical continuity from phase one and realizing both cost and time efficiencies on the project.

Notably, Green has maintained their 2023 Labor Rates going into phase two as incentive to continue the partnership and reduce expenses to the city. The labor savings of 2023 rates compared to 2025 has helped keep phase two within the available budget, while also allowing for sufficient contingency funds. To verify their current pricing is consistent with what the City received in 2023 by way of competitive bidding, staff have analyzed the price per square foot of both phases. In 2023, Green was the lowest competitive bidder at a cost of \$15.05 per square foot compared with \$16.01 and \$28.66 proposed by other bidders. Following phase one value engineering, Green's 2023 executed contract translated to a rate of \$11.56 per square foot. With the proposed 2025 contract currently at \$11.11 per square foot despite inflation and industry cost escalations, staff are of the opinion that the proposal remains competitive in today's market.

2025 COUNCIL WORK PLAN:**CITY COUNCIL COMMUNICATION**

The Phase Two Median Landscape Renovations are not specifically identified in the 2025 work plan. However, this project aligns with environmental sustainability lens of the work plan and is at the forefront of the project's intention with overlap to 1) the city's water conservation goals (such as waterwise landscapes, bluegrass turf conversion and irrigation efficiencies) and 2) ecological health (such as pollinator plantings, diversifying the urban tree canopy and increasing community awareness of impact opportunities).

FISCAL IMPACT:

Budgeted?: Yes

The 2025 budget currently has \$795,207 allocated to the median landscape renovation project. Of that, ~\$115,000 is carry forward from the 2023 capital budget from phase one and the other ~\$680,000 originated in the 2024 capital budget to be used on phase two.

A table of funds and anticipated expenditure is outlined below.

Available Budget	
Acct. No. 310313-630143 (Median Landscape Reno)	\$795,207.32
Total Available: \$795,207.32	
Anticipated Expenditures	
Green Landscape Solutions	\$673,968.37
Contingency (~11%)	\$76,031.63
Total Not-to-Exceed: \$750,000.00	
Budget Remaining	(\$45,207.32)

ALTERNATIVE(S):

One alternative is to reduce the scope of the project by eliminating certain roadways and/or segments from phase two and delaying completion to further years.

Staff believe this alternative will result in increased cost of construction in future years due to inflation and will continue staff's reliance on outdated irrigation systems to maintain high water use non-function turf and ash trees in poor condition. It will also delay establishing new, diverse trees to serve as the next generation of Louisville's urban tree canopy.

A secondary alternative would be to decline to move forward with the project as currently proposed and staff can work on alternative designs (at a cost) with the design consultants
OR

Council can elect to not move forward with this phase of the work as a 2025 capital project.

A third alternative would be to reject the sole source option and to competitively bid the project using the proposed scope and location.

RECOMMENDATION:

Staff recommend the City Council vote in support of the sole-source award to Green Landscape Solutions, approve spending for an amount not-to-exceed \$750,000 and authorize the Mayor, City Manager, Parks, Recreation, and Open Space Director and City Clerk to sign and execute contract documents on behalf of the City.

ATTACHMENT(S):

1. Resolution No. 41, Series 2025
2. Council Brief: Lessons Learned & Planned Improvements
3. Agreement with BeGreen Landscapes, LLC d/b/a Green Landscape Solutions
4. Green Landscape Solutions Contract Documents
5. Presentation

**RESOLUTION NO. 41
SERIES 2025**

**A RESOLUTION APPROVING AN AGREEMENT FOR THE 2025 MEDIAN
LANDSCAPE RENOVATIONS PROJECT**

WHEREAS, an Agreement has been proposed between the City and BeGreen Landscapes, LLC d/b/a Green Landscape Solutions for the 2025 Median Landscape Renovations Project (the “Project”); and

WHEREAS, by this resolution the City Council desires to approve the Agreement and to authorize additional contingency for the Project.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF LOUISVILLE, COLORADO:

Section 1. The City Council hereby approves the Agreement by and between the City of Louisville and BeGreen Landscapes, LLC d/b/a Green Landscape Solutions for the Project (the “Agreement”) in substantially the same form as the copy of such Agreement accompanying this Resolution.

Section 2. The City Council hereby approves an additional \$76,031.63 in contingency for the Project for a total not-to-exceed amount of \$750,000. The Parks, Recreation & Open Space Director is authorized to execute change orders to the Agreement in a total amount not to exceed \$76,031.63 if deemed necessary for the Project.

Section 3. The Mayor and City Clerk are hereby authorized to execute the Agreement on behalf of the City, and the Mayor is hereby further authorized to negotiate and approve such revisions to the Agreement as the Mayor determines are necessary or desirable for the protection of the City, so long as the essential terms and conditions of the Agreement are not altered.

PASSED AND ADOPTED this 17th day of June 2025.

Christopher M. Leh, Mayor

ATTEST:

Genny Kline, Interim City Clerk

Council Brief: Phase Two Median Landscape Renovations Lessons Learned & Planned Improvements

Project Goal: The goal of the median landscape renovation project is to

- Enhance landscape infrastructure and design aesthetics along major roads in the City of Louisville while creating a consistent, attractive look across the city.
- Reduce water use and lower long-term maintenance needs
- Proactively remove ash trees affected by the Emerald Ash Borer (EAB).
- Upgrade outdated irrigation systems
- Convert high-water-use, non-functional turf to drought-tolerant, pollinator-friendly landscaping.

History: The Median Landscape Renovation Project began in late 2018 with an evaluation of the current medians, many of which were installed 20-30 years ago. The process included community meetings, input from the Parks and Public Landscaping Board (PPLAB), and approval from City Council. Phase 1 construction was completed in 2023, focusing on medians impacted by the 2021 Marshall Fire or in close proximity to fire-damaged areas.

While Phase 1 achieved the sustainability and infrastructure goals, it also prompted public concerns around visibility, plant height, mature tree removal, and plant selection. As we prepare to move into Phase 2, staff have made targeted adjustments to improve safety, simplify maintenance, and reflect community feedback.

Phase 2: Phase two is scheduled for Q3 of 2025. The second phase is anticipated to include the Dillon Road corridor between McCaslin and 88th, Via Appia at McCaslin (adjacent to the Police Station) and McCaslin commercial area, as budget allows.

This selection is based on:

- Poor health of ash trees
- Corridor's visibility and role as a key gateway into the city
- Prior recommendations from the Parks & Public Landscape Advisory Board (PPLAB)

Key Improvements in Phase 2 (based on Phase 1 lessons):

Improved Visibility & Safety

- No stacked rock walls or tall grasses in sight distance triangles
- Wall heights reduced from 36" to 24"
- Substitute tall plants with shorter species (see below)
- Use smaller boulders for improved installation and safety

Better Plant & Grass Seed Selection

- Modify plant species based on Phase 1 performance and public feedback
- Increase number of trees per median segment
- Replace small shrubs (e.g., sumac, yucca) at median ends with larger, multi-stem shrubs for easier maintenance
- Reduce number and density of perennials/grasses in bullnose beds
- Substitute Big Bluestem with shorter species (e.g., Siskiyow Blue Fescue) to improve visibility
- Replace Prairie Sage with plants no taller than 18" near walls for better wall visibility
- Revise grass seed mix to limit mature height (Verge mix preferred – see information next page)

Enhanced Maintenance & Irrigation

- More mowable slopes and easier contractor access
- Shift from microspray to pop-up irrigation heads
- Adjusted gravel and mulch layout to reduce overspray and heat retention

While incorporating these improvements, the Phase 2 medians will maintain a similar look and feel to those already completed, ensuring visual consistency throughout the city's corridors.

Information on Verge Seed Mix

Verge Pollinator Seed Mixture is a low-growing minimal water use lawn alternative that provides aesthetic beauty, shelter for pollinators, and an ecological carbon bank for your homescape. The mixture features several low growing, fine textured, cool and warm season grasses that combine with various yellow, orange, pink and white flowers creating a resilient lawnscape built for the 21st century.



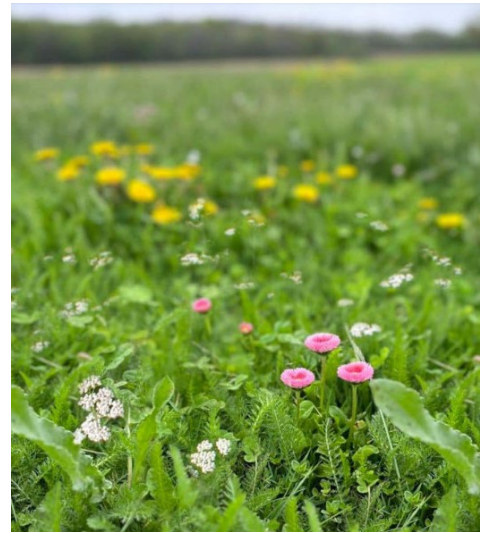
GROWING A BRIGHTER, BETTER WORLD

- Increases Habitat for Pollinators
- Minimize Labor with No Mowing or Greatly Reduce Mowing to 2x per Year
- No Fertilizer or Herbicides Required
- Reduce Irrigation/Improve Carbon Sink Capacity
- Increases Oxygen, Reduces CO₂/Carbon Footprint

SEEDS/POUND: ~460,000
MATURE HEIGHT: 6 Inches
GERMINATION: 5-14 Days
MIXTURE COMPONENTS: Native Red Fescue, Blue Grama, Annual and Perennial Wildflowers, Misc Other Cool Season Grasses

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AGREEMENT

THIS AGREEMENT is made and entered into this **18th day of June** in the year 2025 by and between:

CITY OF LOUISVILLE, COLORADO
(hereinafter called OWNER)

and

BEGREEN LANDSCAPES LLC dba GREEN LANDSCAPE SOLUTIONS
(hereinafter called CONTRACTOR)

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows.

ARTICLE 1. WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

PROJECT: 2025 PHASE TWO MEDIAN LANDSCAPE RENOVATIONS
PROJECT NUMBER: 301313-630143

ARTICLE 2. CONTRACT TIMES

- 2.1 The CONTRACTOR shall substantially complete all work within **72 Contract Days** from the date when the Contract Time commences to run as identified in the Notice to Proceed. The Work shall be completed and ready for final payment in accordance with paragraph 14.13 of the General Conditions.
- 2.2 **LIQUIDATED DAMAGES.** The OWNER and the CONTRACTOR agree and recognize that time is of the essence in this contract and that the OWNER will suffer financial loss if the Work is not substantially complete by the date specified in paragraph 2.1 above, plus any extensions thereof allowed in accordance with the Article 12 of the General Conditions. OWNER and CONTRACTOR also agree that such damages are uncertain in amount and difficult to measure accurately. Accordingly, the OWNER and CONTRACTOR agree that as liquidated damages, and not as a penalty, for delay in performance the CONTRACTOR shall pay the OWNER **One Hundred and 00/100 dollars (\$100.00)** for each and every **Contract Day** and portion thereof that expires after the time specified above for substantial completion of the Work until the same is finally complete and ready for final payment. The liquidated damages herein specified shall only apply to the CONTRACTOR's delay in performance, and shall not include litigation or attorneys' fees incurred by the OWNER, or other incidental or consequential damages suffered by the OWNER due to the CONTRACTOR's performance. If the OWNER charges liquidated damages to the CONTRACTOR, this shall not preclude the OWNER from commencing an action against the CONTRACTOR for other actual harm resulting from the CONTRACTOR's performance, which is not due to the CONTRACTOR's delay in performance.

ARTICLE 3. CONTRACT PRICE

- 3.1 The OWNER shall pay in current funds, and the CONTRACTOR agrees to accept in full payment for performance of the Work, subject to additions and deductions from extra and/or omitted work and determinations of actual quantities as provided in the Contract Documents, the Contract Price of **SIX HUNDRED SEVENTY THREE THOUSAND NINE HUNDRED SIXTY EIGHT and 37/100 dollars (\$673,968.37)** set forth in the Cost Proposal of the CONTRACTOR dated June 2, 2025.

As provided in paragraph 11.9 of the General Conditions estimated quantities are not guaranteed, and determinations of actual quantities and classification are to be made by PROJECT MANAGER as provided in paragraph 9.10 of the General Conditions. Unit prices have been computed as provided in paragraph 11.9 of the General Conditions.

ARTICLE 4. PAYMENT PROCEDURES

CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by OWNER as provided in the General Conditions.

- 4.1 PROGRESS PAYMENTS. OWNER shall make progress payments on the basis of CONTRACTOR's Applications for Payment as recommended by PROJECT MANAGER, on or about the third Wednesday of each month during construction as provided below. All progress payments will be on the basis of the progress of the Unit Price Work based on the number of units completed as provided in the General Conditions.

- 4.1.1.1 Prior to final completion and acceptance, progress payments will be made in the amount equal to 95 percent of the calculated value of completed Work, and/or 95 percent of materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in 14.2 of the General Conditions), but in each case, less the aggregate of payments previously made and such less amounts as PROJECT MANAGER shall determine, or OWNER may withhold, in accordance with paragraph 14.7 of the General Conditions.

If OWNER finds that satisfactory progress is being made in any phase of the Work, it may, in its discretion and upon written request by the CONTRACTOR, authorize final payment from the withheld percentage to the CONTRACTOR or subcontractors who have completed their work in a manner finally acceptable to the OWNER. Before any such payment may be made, the OWNER must, in an exercise of its discretion, determine that satisfactory and substantial reasons exist for the payment and there must be provided to the OWNER written approval from any surety furnishing bonds for the Work.

Nothing contained in this provision shall preclude the OWNER and CONTRACTOR from making other arrangements consistent with C.R.S. 24-91-105 prior to contract award.

- 4.2 FINAL PAYMENT. Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, OWNER shall pay the remainder of the Contract Price as provided in said paragraph 14.13 of the General Conditions.

ARTICLE 5. CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

- 5.1 CONTRACTOR has examined and carefully studied the Contract Documents, (including the Addenda listed in paragraph 6.8) and the other related data identified in the Bidding Documents including "technical".
- 5.2 CONTRACTOR has inspected the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work.
- 5.3 CONTRACTOR is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and furnishing of the Work.
- 5.4 CONTRACTOR has carefully studied all reports of exploration and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions relating to surface or subsurface structures at or contiguous to the site (Except Underground facilities) which have been identified in the General Conditions as provided in paragraph 4.2.1 of the General Conditions. CONTRACTOR accepts the determination set forth in paragraph 4.2 of the General Conditions. CONTRACTOR acknowledges that such reports and drawings are not Contract Documents and may not be complete for CONTRACTOR's purposes. CONTRACTOR acknowledges that OWNER and PROJECT MANAGER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to such reports, drawings or to Underground Facilities at or contiguous to the site. CONTRACTOR has conducted, obtained and carefully studied (or assume responsibility for having done so) all necessary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto. CONTRACTOR does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the performance and furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.
- 5.5 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.
- 5.6 CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the site that relates to the Work as indicated in the Contract Documents.
- 5.7 CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests studies and data with the Contract Documents.

- 5.8 CONTRACTOR has given PROJECT MANAGER written notice of all conflicts, errors, ambiguities or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by PROJECT MANAGER is acceptable to CONTRACTOR, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing the Work.

ARTICLE 6. CONTRACT DOCUMENTS

The Contract Documents, which constitute the entire agreement between OWNER and CONTRACTOR concerning the Work, are all written documents, which define the Work and the obligations of the Contractor in performing the Work and the OWNER in providing compensation for the Work. The Contract Documents include the following:

- 6.1 This Agreement
 - 6.2 Documentation submitted by CONTRACTOR prior to Notice of Award, as applicable:
 - 6.2.1 Cost Proposal
 - 6.2.2 Schedule of Unit Prices
 - 6.2.3 Schedule of Subcontractors
 - 6.2.4 Anti-Collusion Affidavit
 - 6.3 General Conditions
 - 6.4 Supplementary Conditions
 - 6.5 General Requirements
 - 6.6 Technical Specifications
 - 6.7 Drawings with each sheet bearing the title: **Louisville Median and Streetscape Improvements, Tier 2 Improvements**
 - 6.8 Other documents which may be required or specified including:
 - 6.8.1 Addenda No. 0 to 0 exclusive
 - 6.8.2 Notice of Award
 - 6.8.3 Performance Bond
 - 6.8.4 Labor and Material Payment Bond
 - 6.8.5 Certificates of Insurance
 - 6.8.6 Notice to Proceed
 - 6.8.7 Change Order
 - 6.8.8 Field Order
 - 6.8.9 Work Change Directive
 - 6.8.10 Application for Payment
 - 6.8.11 Contractor Proposal Request
 - 6.8.12 Contractor Overtime Request
 - 6.8.13 Certificate of Substantial Completion
 - 6.8.14 Claim Release
 - 6.8.15 Claim Release for Subcontractors
 - 6.8.16 Final Inspection Report
 - 6.8.17 Certificate of Final Completion
 - 6.8.18 Guarantee Period Inspection Report
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- 6.9 The following which may be delivered or issued after the Effective Date of the Agreement and are attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to paragraphs 3.5 and 3.6 of the General Conditions.
- 6.10 In the event of conflict between the above documents, the prevailing document shall be as follows:
1. Permits from other agencies as may be required.
 2. Special Provisions and Detail Drawings.
 3. Technical Specifications and Drawings. Drawings and Technical Specifications are intended to be complementary. Anything shown or called for in one and omitted in another is binding as if called for or shown by both.
 4. Supplementary Conditions.
 5. General Conditions.
 6. City of Louisville Design and Construction Standards.
 7. Reference Specifications.

In case of conflict between prevailing references above, the one having the more stringent requirements shall govern.

There are no Contract Documents other than those listed above in this Article 6. The Contract Documents may only be amended, modified or supplemented as provided in paragraphs 3.5 and 3.6 of the General Conditions.

ARTICLE 7. MISCELLANEOUS

- 7.1 Terms used in this Agreement, which are defined in Article 1 of the General Conditions, shall have the meanings indicated in the General Conditions.
- 7.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge that assignor from any duty or responsibility under the Contract Documents.
- 7.3 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

ARTICLE 8. OTHER PROVISIONS

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in duplicate. One counterpart each has been delivered to OWNER and CONTRACTOR. All portions of the Contract Documents have been signed, initialed or identified by OWNER and CONTRACTOR.

This Agreement will be effective on **June 18th, 2025**.

**OWNER: CITY OF LOUISVILLE,
COLORADO**

By: _____
Christopher Leh, Mayor

(CORPORATE SEAL)

Attest: _____
Genny Kline, Interim City Clerk

Address for giving notices:

749 Main Street
Louisville, Colorado
80027

Attention: Project Manager - PROS

**CONTRACTOR: BEGREEN LANDSCAPES LLC
dba GREEN LANDSCAPE SOLUTIONS**

By: _____
Josh Wagner, CEO

(CORPORATE SEAL)

Attest: _____
Julia L. Beck

Address for giving notices:

150 Wells St. #310
Erie, CO
80516

Attention: Josh Wagner

PROJECT: 2025 PHASE TWO MEDIAN LANDSCAPE RENOVATIONS
PROJECT NUMBER: 301313-630143

AGREEMENT



CITY OF LOUISVILLE
749 MAIN STREET
LOUISVILLE, COLORADO 80027

Sales: Tim Chitester

Medians Phase 2

mccasalin, via appia, and Dillon Rd. Louisville, Colorado
80027

Est ID: EST5444565

Date: Jun-10-2025

Thank you for the opportunity to participate in your landscaping project. If you have any questions about the proposal please feel free to call or email to discuss.

Bonding	\$19,630.15
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Cost of Performance bond for the project.

Mobilization	\$11,308.25
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Crews and equipment to the job site. Includes a porta potty and fuel charges.

Mobilization (C)	Loading trucks with equipment needed for the job
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Porta Potty per Month

Porta Potty SETUP/REMOVAL

Traffic Control	\$36,234.13
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Estimated 90 Days of traffic control needed. Traffic control to be left in place over night. This does not include flaggers for a one way road along Dillon.

Arrow Board *

ONE LANE ROAD AHEAD, W20-4AH
48X48

FLAGGER SYM, W20-7A 48X48

Flagging / Per Hour / 7A-5P M-F

TRAFFIC CONE 36" HI STANDARD (TC) *

TRANSITION UNIVERSAL SYM, W4-2
48X48 *

___ LANE CLOSED ___, W20-5 48X48 *

ROAD WORK AHEAD, W20-1A 48X48 *

Laborer/Per Hr/7A-5P/M-F

Traffic Control Plan per Hour

Set up - 7a-5p M-F

Pickup - 7a-5p M-F

Zone 2 Deliver Mobilization

Zone 2 Pick up mobilization

Stagging Area

\$2,568.55

A budgetary number for temporary orange construction fence around the stagging area. Area size not yet determined.
Repairing damage to flagging area.

Temp Orange Fence

20 Each 6' Steel T Post

Commercial Landscape Construction Crew
- LR

1575 SF Sod, Kentucky Bluegrass

1 Each Soil, Sustane Granular Fertilizer

Disposal/Recycle Fee >
Wood/Rock/Concrete

Equipment > Skid Loader

Delivery > Sod Under 2,220

Commercial Landscape Construction Crew
- LR

Inlet Protection

\$1,498.20

Inlet protection for 22 inlets using green rock socks. Does not include any silt fence.

430 LF Green Rock Sock

Irrigation Contingency	\$15,000.00
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A 10% contingency for potential unforeseen issues with the existing irrigation system.

VAA-1	\$80,246.96
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Cost of VAA-1 Median.

VAA-2	\$21,638.21
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Cost of VAA-2 Median.

MCC-1	\$26,824.29
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Cost of MCC-1 Median.

MCC-2	\$21,170.86
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Cost of MCC-2 Median.

MCC-3	\$79,528.71
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Cost of MCC-3 Median.

MCC-4	\$68,033.41
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Cost of MCC-4 Median.

MCC-5	\$9,456.79
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Cost of MCC-5 Median.

DIL-1	\$44,275.07
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Cost of DIL-1 Median.

DIL-2	\$53,025.28
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Cost of DIL-2 Median.

DIL-3	\$20,906.52
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Cost of DIL-3 Median.

DIL-4	\$37,214.37
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Cost of DIL-4 Median.

DIL-5	\$125,408.62
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Cost of DIL-5 Median.

	Subtotal	\$673,968.37
	Taxes	\$0.00
	Estimate Total	\$673,968.37

Contractor: _____
Tim Chitester

Client: _____

Signature Date: _____
06/10/2025

Signature Date: _____

UNIT COST SCHEDULE

Contractor: Green Landscape Solutions

Issued: 6/10/2025

Contractor: These unit prices are for addition and deletion of bid items by the Owner. The Total Cost is to equal the Unit Cost times the estimated quantity. The Unit Cost is to be for each item installed and completely finished. Contractor to determine his/her own quantities. These items listed are not to be construed as all inclusive. Any item not included should be added and described under Additional Items. Contractor is responsible for all items shown on plans and described in the specifications. The bid is to be lump sum. Unit Costs are to be used for quantity changes of 25% or less.

ITEM	UNIT	
GENERAL CONDITIONS & SITE WORK		
Bonding	LS	\$ 19,630.15
Mobilization	LS	\$ 11,308.25
General Conditions	MONTH	N/A
Construction Surveying	LS	N/A
Traffic Control	LS	\$ 36,234.13
Demo Miscellaneous Materials	LS	\$ 137,768.04
Clear & Grub	SF	\$ 1.96
Cut, Fill and Compact Onsite Material (Allowance)	LS	N/A
Cut, Fill and Compact Onsite Material	CY	N/A
Import Common Fill (Allowance)	LS	\$ 6,683.17
Import Common Fill	CY	\$ 89.10
Import Borrow - Class VI Roadbase	CY	N/A
Tree Removal	LS	\$ 16,194.12
Tree Protection	LF	N/A
Temporary Construction Fencing - 4' orange fencing	LF	\$ 2.60
Additional Items (List):		
		\$
		\$
		\$
		\$
		\$
EROSION CONTROL		
Silt Fence	LF	\$ 1.61
Concrete Washout	EA	\$ 475.00
Inlet Protection	EA	\$ 68.10
Vehicle Tracking Control	EA	\$ 560.00
Straw Wattles	EA	\$ 3.75
Additional Items (List):		
		\$
		\$
		\$
		\$
		\$
PAVEMENTS		
Concrete - 4" Colored Patterned Concrete	SF	\$ 14.05
Saw Cut and Remove Curb and Gutter (as needed for damage)	LF	\$ 50.21
Saw Cut and Remove Asphalt (as needed for damage)	SF	\$ 10.28
Replace Curb and Gutter (as needed for damage)	LF	\$ 36.80
Asphalt Patch - SX 8" on Via Appia (as needed for damage)	SY	\$ 130.00
Asphalt Patch - S 10" on McCaslin (as needed for damage)	SY	\$ 150.00
Additional Items (List):		
		\$

		\$
		\$
SITE CONSTRUCTION		
6" Concrete Edger	LF	\$ 25.80
4" Metal Edger	LF	\$ 7.16
Stone Wall	LF	\$ 192.29
Additional Items (List):		
		\$
		\$
		\$
		\$
LANDSCAPE AND IRRIGATION		
Native Seed and Soil Prep	SF	\$ 1.36
Soil Amendment	CY	\$ 132.33
Amended Planting Soil	CY	\$ 133.44
Landscape Boulder	EA	\$ 432.02
Irrigation - Spray zones	SF	\$ 0.68
Gravel Mulch	SF	\$ 2.73
Shredded Cedar Mulch	SF	\$ 2.03
Trees - Deciduous 2"	EA	\$ 884.12
Trees - Deciduous 6' Clump	EA	\$ 659.12
Trees - Ornamental	EA	\$ 659.13
Shrubs - #5 Cont	EA	\$ 96.69
Perennials and Grasses - #1 Cont	EA	\$ 20.80
Irrigation Adjustments to Existing Components	LS	\$ 122,540.30
Irrigation - Lower & Sleeve 1.5" Mainline as needed	LF	\$ 7.37
Irrigation - Lower & Sleeve 2" Mainline as needed	LF	\$ 9.49
Irrigation - Drip/Micro Sprays/Bubblers	SF	\$ 8.50
Irrigation - Sprays	SF	\$ 1.00
Irrigation - Wiring	LF	\$ 0.40
Irrigation Allowance for testing, wire tracing, addit'l piping as needed	LS	\$ 15,000.00
Additional Items (List):		
		\$
		\$
		\$
		\$
Total Bid:	\$	673,968.37

SCHEDULE OF SUBCONTRACTORS

This Bid is based on subcontracting certain portions of the work to subcontractors as listed below.

Name: Colorado Barricade Co. Telephone No. 303-922-7815
Address: 2295 S Lipan St
City: Denver State: CO Zip Code: 80223
Services/equipment to be provided: Traffic control services

Name: Rays Four Season Concrete Telephone No. 970-737-2237
Address: 19592 Co Rd 29
City: Platteville State: CO Zip Code: 80651
Services/equipment to be provided: Concrete Services

Name: Blue River Forestry and Tree Care Telephone No. 720-256-9056
Address: 3900 Walnut St #3
City: Boulder State: CO Zip Code: 80301
Services/equipment to be provided: Tree removal services

Name: Telephone No.
Address:
City: State: Zip Code:
Services/equipment to be provided:

Name: Telephone No.
Address:
City: State: Zip Code:
Services/equipment to be provided:

Name: Telephone No.
Address:
City: State: Zip Code:
Services/equipment to be provided:

ANTI-COLLUSION DISCLOSURE STATEMENT

Vendor must disclose any possible conflict of interest with the City of Louisville including, but not limited to, any relationship with any City of Louisville elected official or employee.

Your response must disclose if a known relationship exists between any principal of your firm and any City of Louisville elected official or employee. If, to your knowledge, no relationship exists, this should also be stated in your response.

Failure to disclose such a relationship may result in cancellation of a contract as a result of your response. This form must be completed and returned in order for your proposal to be eligible for consideration.



NO KNOWN RELATIONSHIPS EXIST



RELATIONSHIP EXISTS (Please explain relationship)

I CERTIFY THAT:

1. I, as an officer of this organization, or per the attached letter of authorization, am duly authorized to certify the information provided herein are accurate and true as of the date; and
2. My organization shall comply with all State and Federal Equal Opportunity and Non-Discrimination requirements and conditions of employment.

Josh Wagner
Printed or Typed Name

CEO
Title


Signature

6/10/25
Date

Technical Specifications for
Construction of:

LOUISVILLE MEDIAN AND STREETSCAPE IMPROVEMENTS

THE CITY OF LOUISVILLE
749 MAIN STREET
LOUISVILLE CO, 80027

Prepared by:



City of
Louisville



DESIGN
CONCEPTS

REVISED June 10th, 2025

PROJECT DIRECTORY

LOUISVILLE MEDIAN AND STREETScape IMPROVEMENTS

OWNER:

City of Louisville

Contacts: Bryon Weber, Marla Olson

749 Main St

Louisville CO, 80027

Tel: 303-666-6565

Email: bweber@louisvilleco.gov

molson@louisvilleco.gov

LANDSCAPE

ARCHITECT:

Design Concepts

Contacts: Erik Spring, Carter Marshall

211 North Public Road, Suite 200

Lafayette, CO 80026

Tel: (303) 664-5301

Email: eriks@dcla.net

carterm@dcla.net

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DATE: June 10, 2025

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ARTICLE 1 - DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

- 1.0 Abnormal Weather** - Snowfall, rainfall, freezing temperatures, or wind conditions, in excess of those encountered in the project area of Boulder County during the past 10 years that necessitates cessation of Work and causes consequence to the project.
- 1.1 Addenda** - Written or graphic instruments issued prior to the opening of Bids, which clarify, correct or change the Bidding Requirements or the Contract Documents.
- 1.2 Agreement** - The written contract between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.
- 1.3 Application for Payment** - The form accepted by OWNER'S REPRESENTATIVE which is to be used by CONTRACTOR in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
- 1.4 Asbestos** - Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
- 1.5 Bid** - The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- 1.6 Bidding Documents** - The advertisement or invitation to Bid, instructions to Bidders, the Bid form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).
- 1.7 Bidding Requirements** - The advertisement or invitation to Bid, instructions to bidders, and the Bid form.
- 1.8 Bonds** - Performance and Payment bonds and other instruments of security.
- 1.9 Change Order** - A document recommended by OWNER'S REPRESENTATIVE, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
- 1.9.1 Contract Day** - A Contract Day specifies that construction will be completed Monday through Sunday, excluding OWNER-observed holidays and Abnormal Weather days.
- 1.10 Contract Documents** - The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments,

Change Orders, Work Change Directives, Field Orders and OWNER'S REPRESENTATIVE's written interpretations and clarifications issued pursuant to paragraphs 3.5, 3.6.1, and 3.6.3 on or after the Effective Date of the Agreement. Shop Drawing submittals approved pursuant to paragraphs 6.26 and 6.27 and the reports and drawings referred to in paragraphs 4.2.1.1 and 4.2.2.2 are not Contract Documents.

- 1.11 Contract Price** - The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).
- 1.12 Contract Times** - The numbers of days or the dates stated in the Agreement: (i) to achieve Substantial Completion, and (ii) to complete the Work so that it is ready for final payment as evidenced by OWNER'S REPRESENTATIVE's written recommendation of final payment in accordance with paragraph 14.13.
- 1.13 CONTRACTOR** - The person, firm or corporation with whom OWNER has entered into the Agreement.
- 1.14 Defective** - An adjective which when modifying the work refers to Work that is unsatisfactory, faulty or deficient, in that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to OWNER'S REPRESENTATIVE's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.8 or 14.10).
- 1.15 Drawings** - The drawings that show the scope, extent and character of the Work to be furnished and performed by CONTRACTOR and which have been prepared or approved by OWNER'S REPRESENTATIVE and are referred to in the Contract Documents. Shop drawings are not Drawings as so defined.
- 1.16 Effective Date of the Agreement** - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
- 1.17 OWNER'S REPRESENTATIVE** - The word "OWNER'S REPRESENTATIVE" refers to the City of Louisville, authorized representative, designated by the OWNER as its representative.
- 1.18 OWNER'S Consultant** - A person, firm or corporation having a contract with OWNER to furnish services as OWNER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.
- 1.19 Field Order** - A written order issued by OWNER'S REPRESENTATIVE which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Times.
- 1.20 General Requirements** - Sections of Division 1 of the Specifications.
- 1.21 Hazardous Waste** - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

- 1.22 Laws and Regulation: Laws or Regulations** - Any and all applicable laws, rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.
- 1.23 Liens** - Liens, charges, security interests or encumbrances upon real property or personal property.
- 1.24 Milestone** - A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
- 1.25 Notice of Award** - The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.
- 1.26 Notice to Proceed** - A written notice given by OWNER to CONTRACTOR (with a copy to OWNER'S REPRESENTATIVE) fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR's obligations under the Contract Documents.
- 1.27 OWNER** - The public body or authority, corporation, association, firm or person with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided.
- 1.28 Partial Utilization** - Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.
- 1.29 PCBs** - Polychlorinated biphenyls.
- 1.30 Petroleum** - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.
- 1.31 Plans** - The term plans as used in these Contract Documents shall have the same meaning as Drawings.
- 1.32 Product** - Includes materials, equipment and systems.
- 1.33 Project** - The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.
- 1.34 Provide** - Furnish and install specified materials and equipment, unless the context requires otherwise.
- 1.35 Radioactive Material** - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
- 1.36 Resident Project Representative** - The authorized representative of OWNER'S REPRESENTATIVE who may be assigned to the site or any part thereof.

- 1.37 Samples** - Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
- 1.38 Shop Drawings** - All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.
- 1.39 Specifications** - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.
- 1.40 Subcontractor** - An individual, firm or corporation having a contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.
- 1.41 Substantial Completion** - The Work (or a specified part thereof) has progressed to the point where, in the opinion of OWNER'S REPRESENTATIVE as evidenced by OWNER'S REPRESENTATIVE's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work is complete and ready for final payment as evidenced by OWNER'S REPRESENTATIVE's written recommendation of final payment in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.
- 1.42 Supplementary Conditions** - The part of the Contract Documents, which amends or supplements these General Conditions.
- 1.43 Supplier** - A manufacturer, fabricator, supplier, distributor, material man or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.
- 1.44 Underground Facilities** - All pipeline, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.
- 1.45 Unit Price Work** - Work to be paid for on the basis of unit prices.
- 1.46 Work** - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

- 1.47 Work Change Directive** - A written directive to CONTRACTOR, issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by OWNER'S REPRESENTATIVE, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or emergencies under paragraph 6.23. A Work Change Directive will not change the Contract Price or the Contract Times, but is evidence that the parties expect that the change directed or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times as provided in paragraph 10.2.
- 1.48 Written Amendment** - A written amendment of the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the non-OWNER'S REPRESENTATIVE or non-technical rather than strictly construction-related aspects of the Contract Documents.

END ARTICLE 01

ARTICLE 2 - PRELIMINARY MATTERS

Delivery of Bonds:

- 2.1 When CONTRACTOR delivers the executed Agreement to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds and Certificates of Insurance as CONTRACTOR may be required to furnish in accordance with Article 5.

Copies of Documents:

- 2.2 OWNER shall furnish to CONTRACTOR up to four copies of the contract documents for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

Commencement of Contract Times; Notice to Proceed:

- 2.3 The Contract Times will commence to run on the day indicated in the Notice to Proceed. Timing and completion of the **Phase Two Median & Streetscape Improvements** is required on or prior to **October 9, 2025**. The OWNER has set the proposed project schedule and plans to implement the following schedule for this project. The CONTRACTOR shall be required to start construction on or before the start date listed below:

Proposed Project Schedule:

City Council Meeting	June 17
Notice of Award.....	June 18
Notice to Proceed, Bonds, Insurance, etc.	June 27
Construction/Installation/Site Restoration - Substantial Completion	September 26
Final Project Completion	October 9, 2025

Starting the Work:

- 2.4 CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run, but no Work shall be done at the site prior to the date on which the Contract Times commence to run.

Before Starting Construction:

- 2.5 Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to OWNER'S REPRESENTATIVE any conflict, error, ambiguity or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from OWNER'S REPRESENTATIVE before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or OWNER'S REPRESENTATIVE for failure to report any conflict, error, ambiguity or discrepancy in

the Contract Documents, unless CONTRACTOR knew or reasonably should have known thereof.

- 2.6 Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to OWNER'S REPRESENTATIVE for review:

2.6.1 a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestone specified in the Contract Documents;

2.6.2 a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing and processing such submittal.

Preconstruction Conference:

- 2.7 Before any Work at the site is started, a conference attended by CONTRACTOR, OWNER'S REPRESENTATIVE and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.6, procedures for handling Shop Drawings and other submittal, processing Applications for Payment and maintaining required records.

Initially Acceptable Schedules:

- 2.8 Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, OWNER'S REPRESENTATIVE and others as appropriate will be held to review the Application for Payment for acceptability to OWNER'S REPRESENTATIVE. No progress payment shall be made to CONTRACTOR until the schedules are submitted to and acceptable to OWNER'S REPRESENTATIVE as provided below. The progress schedule will be acceptable to OWNER'S REPRESENTATIVE as providing an orderly progression of the Work to completion within any specified Milestones and the Contract Times, but such acceptance will neither impose on OWNER'S REPRESENTATIVE responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor. CONTRACTOR's schedule of Shop Drawing and Sample submissions will be acceptable to OWNER'S REPRESENTATIVE as providing a workable arrangement for reviewing and processing the required submittals.

END ARTICLE 02

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Intent:

- 3.1 The Contract Documents comprise the entire agreement OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.
- 3.2 It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for. When words or phrases, which have a well-known technical or construction industry or trade meaning, are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning. Clarifications and interpretations of the Contract Documents shall be issued by OWNER'S REPRESENTATIVE as provided in paragraph 9.4.
- 3.3 Reference to Standards & Specifications of Technical Societies; Reporting and Resolving Discrepancies:**
- 3.3.1. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
- 3.3.2 If, during the performance of the Work, CONTRACTOR discovers any conflict, error ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the Work or of any such standard, specification, manual or code or of any instruction of any Supplier referred to in paragraph 6.5, CONTRACTOR shall report it to OWNER'S REPRESENTATIVE in writing at once, and, CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as authorized by paragraph 6.23) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.5 or 3.6; provided, however, that CONTRACTOR shall not be liable to OWNER or OWNER'S REPRESENTATIVE for failure to report any such conflict, error, ambiguity or discrepancy unless CONTRACTOR knew or reasonably should have known thereof. Upon notification to the OWNER'S REPRESENTATIVE, the CONTRACTOR shall proceed with other parts of the Work not affected by the conflict, error, ambiguity or discrepancy.
- 3.3.3 Except as otherwise specifically stated in the Contract Documents or as may be provided by amendment or supplement thereto issued by one of the methods indicated in paragraph 3.5 or 3.6, the provisions of the Contract Documents shall

take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

- 3.3.3.1 the provisions of any such standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
- 3.3.3.2 the provisions of any such Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

No provision of any such standard, specification, manual, code or instruction shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or OWNER'S REPRESENTATIVE, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to OWNER, OWNER'S REPRESENTATIVE or any of OWNER'S REPRESENTATIVE's Consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of paragraph 9.13 or any other provision of the Contract Documents.

- 3.4 Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of OWNER'S REPRESENTATIVE as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to OWNER'S REPRESENTATIVE any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.13 or any other provision of the Contract Documents.

Amending and Supplementing Contract Documents:

- 3.5 The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:
 - 3.5.1 a formal Written Amendment,
 - 3.5.2 a Change Order (pursuant to paragraph 10.4), or
 - 3.5.3 a Work Change Directive (pursuant to paragraph 10.1)
- 3.6 In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:
 - 3.6.1 a Field Order (pursuant to paragraph 9.5)

- 3.6.2 OWNER'S REPRESENTATIVE's approval of a Shop Drawing or Sample (pursuant to paragraphs 6.26 and 6.27), or
- 3.6.3 OWNER'S REPRESENTATIVE's written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents:

- 3.7 CONTRACTOR, and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of OWNER'S REPRESENTATIVE or OWNER'S REPRESENTATIVE's Consultant, and (ii) shall not reuse any of such Drawings, Specifications, other documents or copies on extensions of the Project or any other project without written consent of OWNER and OWNER'S REPRESENTATIVE and specific written verification or adaption by OWNER'S REPRESENTATIVE.

END ARTICLE 03

**ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS;
REFERENCE POINTS**

Availability of Lands:

- 4.1 OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. OWNER shall identify any encumbrances or restrictions not of general application but specifically related to use of lands so furnished with which CONTRACTOR will have to comply in performing the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR and OWNER are unable to agree on entitlement to or the amount or extent of any adjustments in the Contract Price or the Contract Times as a result of any delay in OWNER's furnishing these lands, rights-of-way or easements, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

Subsurface and Physical Conditions:

- 4.2 BIDDER'S are responsible for examining and determining for themselves the location and nature of the proposed Work, the amount and character of the labor and materials required therefor, and the difficulties, which may be encountered. BIDDER's may not rely on oral or written representations made by the OWNER, including reports and drawings identified pursuant to 4.2.1 and subparagraphs thereof, unless the OWNER has guaranteed in writing that such representation is factually accurate, and by submitting a Bid, each BIDDER waives all liability for any error in any representation made by the OWNER to the BIDDER. BIDDER's shall inspect the site and its surroundings and conduct such supplementary examinations, investigations, and tests concerning conditions at or contiguous to the site (including surface, and subsurface) which may affect cost, progress, performance, or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto for performing the Work in accordance with the Contract Documents. By failing to make such an inspection, the BIDDER waives all rights to claim extra payment or time extensions due to unexpected conditions, which could have been determined had the site been reasonably inspected. If concealed or unknown conditions differ materially from those ordinarily encountered and generally recognized as inherent in the Work, or differ materially from the conditions indicated in the Contract Documents, then an equitable adjustment in the Contract Price or in the Contract Time will be allowed by change order as provided in Article 11 or Article 12 respectively. By submitting a Bid, the BIDDER represents that the BIDDER's observations at the site are not inconsistent with the requirements of the proposed Contract Documents, unless otherwise noted by the BIDDER.

4.2.1 Reports and Drawings: Reference is made to the Supplementary Conditions for identification of:

The following reports of explorations and tests of subsurface conditions at the site of the Work:

4.2.1.1 Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the site that have been utilized by the Engineer in preparing the Contract Documents; and

Report dated **N/A**, **N/A**, prepared by **N/A**
entitled: **N/A**. The technical data contained in
such report upon which CONTRACTOR may rely is **N/A**.

Copies of these reports that are not included with Bidding Documents may be examined at OWNER'S REPRESENTATIVE's office during regular business hours. Please call for appointment. Copies of such reports are not available for distribution. These reports and drawings are not part of the Contract Documents, but the technical data contained therein upon which CONTRACTOR is entitled to rely as provided in GC-4.2 and as identified and established above are incorporated therein by reference.

4.2.1.2 Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) that have been utilized by OWNER'S REPRESENTATIVE in preparing the Contract Documents.

4.2.2 Limited Reliance by CONTRACTOR authorized; Technical Data: Reports and drawings identified pursuant to paragraph 4.2 are not Contract Documents. Unless otherwise set forth in the Contract Documents or OWNER has otherwise guaranteed in writing that such representation is factually accurate, CONTRACTOR may not rely upon or make any claim against the OWNER, OWNER'S REPRESENTATIVE or OWNER'S REPRESENTATIVE's consultants with respect to the accuracy of any "technical data" contained in reports and drawings and CONTRACTOR may not rely upon or make any claim against the OWNER, OWNER'S REPRESENTATIVE or OWNER'S REPRESENTATIVE's consultants with respect to:

4.2.2.1 The completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto, or

4.2.2.2 other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings, or

- 4.2.2.3 any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such data, interpretations, opinions or information.
- 4.2.3 CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Times if:
 - 4.2.3.1 CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a bid or becoming bound under a negotiated contract; or
 - 4.2.3.2 the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment.

If OWNER and CONTRACTOR are unable to agree on entitlement to or as to the amount or length of any such equitable adjustment in the Contract Price or Contract Times, a claim may be made therefor as provided in Articles 11 and 12. However, OWNER, OWNER'S REPRESENTATIVE and OWNER'S REPRESENTATIVE's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses or damages sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.3 Physical Conditions - Underground Facilities:

- 4.3.1 **Shown or Indicated:** The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to OWNER or OWNER'S REPRESENTATIVE by the owners of such Underground Facilities or by others.
 - 4.3.1.1 OWNER and OWNER'S REPRESENTATIVE shall not be responsible for the accuracy or completeness of any such information or data; and
 - 4.3.1.2 The cost of all of the following will be included in the Contract Price and CONTRACTOR shall have full responsibility for: (i) reviewing and checking all such information and data, (ii) locating all Underground Facilities shown or indicated in the Contract Documents, (iii) coordination of the Work with the owners of such Underground Facilities during construction, and (iv) the safety and protection of all such Underground Facilities as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work.
- 4.3.2 **Not Shown or Indicated:** If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.23),

identify the owner of such Underground Facility and give written notice to that owner and to OWNER and OWNER'S REPRESENTATIVE. CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or the amount or length of any such adjustment in Contract Price or Contract Times, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. However, OWNER, OWNER'S REPRESENTATIVE and OWNER'S REPRESENTATIVE's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses or damages incurred or sustained by CONTRACTOR on or in connection with any other project or anticipated project.

Reference Points:

- 4.4 OWNER shall provide Engineering surveys to establish baseline and benchmarks for construction, which in OWNER'S REPRESENTATIVE's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to OWNER'S REPRESENTATIVE whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

OWNER shall provide survey reference points for the CONTRACTOR to locate construction stakes, lines and grades required for the completion of the work specified in the specifications, on the plans, or in the Special Conditions. Additional staking required will be at the CONTRACTOR'S expense. When the CONTRACTOR requires staking review, he shall notify the OWNER in a reasonable length of time in advance of starting work. Under no circumstances, shall a notice of less than 2 contract days be considered a reasonable length of time. Failure of the CONTRACTOR to provide 2 contract days' notice to the OWNER of his staking requests shall relieve the OWNER from any responsibility for additional costs or delays caused by such failure. The CONTRACTOR shall carefully preserve all stakes. When stakes are destroyed or damaged, the CONTRACTOR will be charged for the cost of necessary replacement or restoration of stakes.

4.5 Asbestos, PCB's Petroleum, Hazardous Waste or Radioactive Material:

- 4.5.1 OWNER shall be responsible for any Asbestos, PCB's, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the site. OWNER shall not be responsible for any such materials brought to the site by CONTRACTOR, Subcontractor, Suppliers or anyone else for whom CONTRACTOR is responsible.

- 4.5.2 CONTRACTOR shall immediately: (i) stop all Work in connection with such hazardous condition and in any area affected thereby (except in an emergency as required by paragraph 6.23), and (ii) notify OWNER and OWNER'S REPRESENTATIVE (and thereafter confirm such notice in writing). OWNER shall promptly consult with OWNER'S REPRESENTATIVE concerning the necessity for OWNER to retain a qualified expert to evaluate such hazardous condition or take corrective action, if any. CONTRACTOR shall not be required to resume Work in connection with such hazardous condition or in any such affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR special written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of such Work stoppage or such special conditions under which Work is agreed by CONTRACTOR to be resumed, either party may make a claim therefor as provided Articles 11 and 12.
- 4.5.3 If after receipt of such special written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order such portion of the Work that is in connection with such hazardous condition or in such affected area to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a claim therefor as provided in Articles 11 and 12. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.
- 4.5.4 The provisions of paragraphs 4.2 and 4.3 are not intended to apply to Asbestos, PCB's, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site.

END ARTICLE 04

ARTICLE 5 - BONDS AND INSURANCE

Performance, Payment and Other Bonds:

- 5.1 CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act. The CONTRACTOR shall furnish the performance and payment bond in the form provided in the Contract Documents or approved by the OWNER; the earlier of ten (10) days after the OWNER has issued the notice of award or delivery of the executed Agreement. The OWNER reserves the right to exclude any Surety Company on any ground it deems appropriate. The cost of the bonds shall be included in the bid.
- 5.2 If the surety on any Bond furnished by CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.1, CONTRACTOR shall within ten days thereafter substitute another Bond and surety, both of which must be acceptable to OWNER.
- 5.3 **Licensed Sureties and Insurers; Certificates of Insurance:**
- 5.3.1 All Bonds and insurance required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety or insurance companies acceptable to OWNER that are duly licensed to transact business in the State of Colorado and to issue Bonds or insurance policies for the limits and coverage so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.
- 5.3.2 CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain accordance with paragraph 5.4. The certificates shall be reviewed and approved by OWNER prior to execution of the Agreement. The OWNER shall have the right to request and obtain copies of any insurance policies required under paragraph 5.4 of the General Conditions. The completed certificates of insurance shall be sent to: City of Louisville, 749 Main Street, Louisville, Colorado 80027, attention: CITY OWNER'S REPRESENTATIVE.

CONTRACTOR's Liability Insurance:

- 5.4 (a) The CONTRACTOR agrees to procure and maintain, at its own cost, a policy or policies of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by the CONTRACTOR pursuant to paragraphs 6.12, 6.16, 6.31, 6.32 and 6.33, and 6.5 in addition to any other insurance requirements imposed by the Contract Documents or by law. The CONTRACTOR shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to paragraphs 6.12, 6.16, 6.31, and 6.33 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.
- (b) CONTRACTOR shall procure and maintain, and shall cause any Subcontractor or Supplier of the CONTRACTOR to procure and maintain or insure the activity of his Subcontractors and Suppliers in his own policy, the minimum insurance coverages listed below. Such coverages shall be procured and maintained with forms and insurers acceptable to the OWNER. All coverages shall be continuously maintained from the date of commencement of the Work to cover all liability, claims, demands, and other obligations assumed by the CONTRACTOR pursuant to paragraphs 6.31 and 6.33. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage.
- (1) Workers' Compensation insurance to cover obligations imposed by the Workers' Compensation Act of Colorado and any other applicable laws for any employee engaged in the performance of Work under this contract, 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. Evidence of qualified self-insured status may be substituted for the Workers' Compensation requirements of this paragraph.
 - (2) Comprehensive 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 completed operations. The policy shall include coverage for explosion, collapse, and underground hazards. The policy shall contain a severability of interests' provision.
 - (3) Comprehensive Automobile Liability insurance with minimum combined single limits for bodily injury and property damage of not less than ONE MILLION DOLLARS (\$1,000,000) each occurrence and ONE MILLION DOLLARS (\$1,000,000) aggregate with respect to each of CONTRACTOR's owned, hired or non-owned vehicles assigned to or used in performance of the services. The policy shall contain a severability of interests' provision.
 - (4) The CONTRACTOR shall provide and maintain builder's risk insurance upon the entire project equal to one hundred percent (100%) of the insurable value

thereof. Such insurance shall cover any and all physical damage including, without limitation, damage caused by fire, vandalism, malicious mischief, blasting, excessive surface runoff or storm water, high winds and other occurrences covered in a standard extended coverage endorsement. The policy shall remain in effect until the Work is accepted as substantially complete.

- (c) The policy required by paragraph (2) above, by paragraph (3) and by (4) above shall be endorsed to include the OWNER, the OWNER'S REPRESENTATIVE and its consultants, and each of their officers, agents and employees as additional insureds. Every policy required above shall be primary insurance, and any insurance carried by the OWNER, its officers, or its employees, shall be excess and not contributory insurance to that provided by CONTRACTOR. No additional insured endorsement to the policy required by paragraph (1) above shall contain any exclusion for bodily injury or property damage arising from completed operations. The CONTRACTOR shall be solely responsible for any deductible losses under any policy required above.
- (d) The certificate of insurance provided to OWNER shall be completed by the CONTRACTOR's insurance agent as evidence that policies providing the required coverages, conditions, and minimum limits are in full force and effect, and shall be reviewed and approved by the OWNER prior to commencement of the contract.
- (e) 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 OWNER may immediately terminate this 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 OWNER shall be repaid by CONTRACTOR to the OWNER upon demand, or the OWNER may offset the cost of the premiums against any monies due to CONTRACTOR from the Owner.
- (f) The OWNER reserves the right to request and receive a certified copy of any policy and any endorsement thereto.
- (g) The parties hereto understand and agree that the OWNER, the City of Louisville, is relying on, and does not waive or intend to waive by any provision of this contract, the monetary limitations (presently \$150,000 per person and \$600,000 per occurrence) or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, § 24-10-101 et seq., 10 C.R.S., as from time to time amended, or otherwise available to the City of Louisville, its officers, or its employees.

OWNER's Liability Insurance:

- 5.5 In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.4, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

Property Insurance:

5.6 The OWNER shall be responsible for maintaining its own property insurance and, at its option, may maintain such insurance as will protect it against claims which may arise from operations under the Contract Documents.

END ARTICLE 05

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

- 6.1 CONTRACTOR shall supervise, inspect and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or specification of a specific means, method, technique, sequence or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.
- 6.2 CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and OWNER'S REPRESENTATIVE except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications to the superintendent shall be as binding as if given to CONTRACTOR.

Labor, Materials and Equipment:

- 6.3 CONTRACTOR shall provide competent, suitably qualified personnel to survey, layout and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except as otherwise required for the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER's written consent given after prior written notice to OWNER'S REPRESENTATIVE. No extra payment will be paid to the CONTRACTOR by the OWNER due to labor overtime or other increased costs of performing the Work on Saturdays, Sundays, OWNER-observed holidays, or at night. Should the CONTRACTOR desire to work on Saturdays, Sundays, OWNER-observed holidays, or at night between the hours of 5:00 p.m. and 7:00 a.m. on **Contract Days** the CONTRACTOR shall submit a written request to the OWNER'S REPRESENTATIVE 24 hours prior. If approval is given by OWNER'S REPRESENTATIVE to CONTRACTOR for authorized overtime work, OWNER'S REPRESENTATIVE's and OWNER'S REPRESENTATIVE's authorized personnel will charge overtime and other incidental administrative expenses necessary for performing inspections on Saturdays, Sundays, OWNER-observed holidays, or at night between the hours of 5:00 p. m. and 7:00 a. m., the CONTRACTOR will be responsible to pay for all such rates and charges, and shall not be granted a Contract Price increase for such charges.
- 6.4 Unless otherwise specified in the General Requirements, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.
- 6.5 All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called

for by the Specifications shall expressly run to the benefit of OWNER. If required by OWNER'S REPRESENTATIVE, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

Progress Schedule:

6.6 CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.8 as it may be adjusted from time to time as provided below:

6.6.1 CONTRACTOR shall submit to OWNER'S REPRESENTATIVE for acceptance (to the extent indicated in paragraph 2.8) proposed adjustments in the progress schedule that will not change the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

6.6.2 Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of paragraph 12.1. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.7 Substitutes and "Or-Equal" Items:

6.7.1 Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment of other Suppliers may be accepted by OWNER'S REPRESENTATIVE under the following circumstances:

6.7.1.1 **"Or-Equal":** If in OWNER'S REPRESENTATIVE's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by OWNER'S REPRESENTATIVE as an "or-equal" item, in which case review and approval of the proposed item may, in OWNER'S REPRESENTATIVE's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed substitute items.

6.7.1.2 **Substitute Items:** If in OWNER'S REPRESENTATIVE's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under subparagraph 6.7.1.1, it will be considered a proposed substitute item. CONTRACTOR shall submit sufficient information as provided below to allow OWNER'S REPRESENTATIVE to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute

therefor. The procedure for review by the OWNER'S REPRESENTATIVE will include the following as supplemented in the General Requirements and as OWNER'S REPRESENTATIVE may decide is appropriate under the circumstances. Requests for review of proposed substitute items of material or equipment will not be accepted by OWNER'S REPRESENTATIVE from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute items of material or equipment, CONTRACTOR shall first make written application to OWNER'S REPRESENTATIVE for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by OWNER'S REPRESENTATIVE in evaluating the proposed substitute. OWNER'S REPRESENTATIVE may require CONTRACTOR to furnish additional data about the proposed substitute.

6.7.1.3 CONTRACTOR's Expense: All data to be provided by CONTRACTOR in support of any proposed "or-equal" or substitute item will be at CONTRACTOR's expense.

6.7.2 Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to OWNER'S REPRESENTATIVE. CONTRACTOR shall submit sufficient information to allow OWNER'S REPRESENTATIVE, in OWNER'S REPRESENTATIVE's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by OWNER'S REPRESENTATIVE will be similar to that provided in subparagraph 6.7.1.2.

6.7.3 OWNER'S REPRESENTATIVE's Evaluation: OWNER'S REPRESENTATIVE will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.7.1.2 and 6.7.2. OWNER'S REPRESENTATIVE will be the sole judge of acceptability. No "or-equal" or

substitute will be ordered, installed or utilized without OWNER'S REPRESENTATIVE's prior written acceptance, which will be evidenced, by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any "or-equal" or substitute. OWNER'S REPRESENTATIVE will record time required by OWNER'S REPRESENTATIVE and OWNER'S REPRESENTATIVE's Consultants in evaluating substitutes proposed or submitted by CONTRACTOR pursuant to paragraphs 6.7.1.2 and 6.7.2 and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not OWNER'S REPRESENTATIVE accepts a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of OWNER'S REPRESENTATIVE and OWNER'S REPRESENTATIVE's Consultants for evaluating each such proposed substitute item.

6.8 Concerning Subcontractors, Suppliers and Others:

- 6.8.1 CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization, whether initially or as a substitute, against whom OWNER or OWNER'S REPRESENTATIVE may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.
- 6.8.2 The Contract Documents require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials or equipment) to be submitted to OWNER with the Bid in the Bid Form prior to the Effective Date of the Agreement for acceptance by OWNER and OWNER'S REPRESENTATIVE, and if CONTRACTOR has submitted a list thereof in accordance with the Contract Documents, OWNER'S or OWNER'S REPRESENTATIVE's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in Contract Documents) of any such Subcontractor, Supplier, or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute. No acceptance by OWNER or OWNER'S REPRESENTATIVE of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or OWNER'S REPRESENTATIVE to reject defective Work.
- 6.8.3 Subletting of Contract. The Contractor shall not sublet, sell, transfer, assign, or dispose of the Contract or Contracts, or any portion thereof without written consent of the OWNER'S REPRESENTATIVE. The Contractor will be permitted to sublet a portion of the Contract, however, the Contractor's organization shall perform work amounting to not less than 50 percent of the total contract cost.

The calculation of the percentage of subcontracted work shall be based on the prime contract unit prices rather than subcontract unit prices. Proportional value for a subcontracted partial contract item shall be verified by the OWNER'S REPRESENTATIVE. For the purpose of calculating the value of subcontracted work, the cost of procuring materials and manufactured products can be included in either the prime contract or subcontract. However, when a firm both sells

material to a prime contractor and performs the work of incorporating the materials into the project, these two phases shall be considered in combination and as constituting a single subcontract.

Subcontracts, or transfer of Contract shall not release the Contractor of liability under the Contract and bonds.

- 6.9.1 CONTRACTOR shall be fully responsible to OWNER and OWNER'S REPRESENTATIVE for all acts and omissions of the Subcontractors. Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. OWNER or OWNER'S REPRESENTATIVE may furnish to any such Subcontractor, Supplier or other person or organization, to the extent practicable, evidence of amounts paid to CONTRACTOR in accordance with CONTRACTOR's Applications for Payment. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier or other person or organization any contractual relationship between OWNER or OWNER'S REPRESENTATIVE and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of OWNER or OWNER'S REPRESENTATIVE to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.
- 6.9.2 CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR. CONTRACTOR shall require all Subcontractors, Suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with the OWNER'S REPRESENTATIVE through CONTRACTOR.
- 6.10 The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- 6.11 All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier, which specifically binds the Subcontractor or Supplier to the applicable terms and, conditions of the Contract Documents for the benefit of OWNER and OWNER'S REPRESENTATIVE.

Patent Fees and Royalties:

- 6.12 CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or OWNER'S REPRESENTATIVE its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, OWNER'S REPRESENTATIVE, OWNER'S

REPRESENTATIVE's Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages arising out of or resulting from any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents.

Permits:

6.13 Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

6.13.1 Prior to the commencement date for the Work set forth in the Notice to Proceed, The CONTRACTOR and all subcontractors shall be or shall become a CONTRACTOR licensed in accordance with the applicable ordinance of the City of Louisville, Colorado.

6.13.2 If water is required for the project, CONTRACTOR shall obtain a bulk water permit from the City of Louisville, Public Works Department in accordance with the permit requirements.

6.13.3 CONTRACTOR shall obtain a Right-of-Way Permit from the City of Louisville, Public Works Department for all Work to be completed within the City right-of-way.

6.13.4 CONTRACTOR shall obtain and pay for all other necessary construction permits and licenses.

Laws and Regulations:

6.14.1 CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor OWNER'S REPRESENTATIVE shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.

6.14.2 If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses and damages caused by, arising out of or resulting therefrom: however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.3.2.

Taxes:

- 6.15 CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project, which are applicable during the performance of the Work. City of Louisville municipal taxes shall be waived upon application for and acceptance of "tax exemption."

The CONTRACTOR shall apply for and receive a Certificate of Exemption from the Colorado Department of Revenue for construction materials to be physically incorporated into the Work. This Certificate of Exemption provides that the CONTRACTOR shall neither pay nor include in his bid prices Sales and Use Taxes collected by the State of Colorado on those building and construction materials physically incorporated into the Work. Sales and Use Taxes of the State of Colorado, RTD and the County are collected by the State of Colorado. All applicable Sales and Use Taxes (including State collected taxes) on any items other than construction and building materials physically incorporated into the Work are to be paid by the Contractor and are to be included in the appropriate bid items. CONTRACTOR and any Subcontractor assume all liability for the nonpayment of taxes, or the payment of exempt taxes resulting from a failure to use the Certificate of Exemption required by this paragraph.

Use of Premises:

- 6.16 CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any adjacent land or areas, resulting from the performance of the Work. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless OWNER, OWNER'S REPRESENTATIVE, OWNER'S REPRESENTATIVE's Consultant and anyone directly or indirectly employed by any of them from and against all claims, costs, losses and damages arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, OWNER'S REPRESENTATIVE, or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.
- 6.17 During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials. CONTRACTOR shall leave the site clean and ready for occupancy by OWNER at Substantial Completion of the Work. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.

- 6.18 CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

Record Documents:

- 6.19 CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to OWNER'S REPRESENTATIVE for reference. Upon completion of the Work, these record documents, Samples and Shop Drawings will be delivered to OWNER'S REPRESENTATIVE for OWNER.

Safety and Protection:

- 6.20 CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

6.20.1 all persons on the Work site or who may be affected by the Work:

6.20.2 all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3 other property at the site or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures, fences, gates, ditches, utilities, and underground facilities not designated for removal, relocation, or replacement in and during the course of construction.

6.20.4 The CONTRACTOR shall take all measures necessary to mitigate the impact of weather so that the project may continue on schedule. In no event shall OWNER be liable for extra costs incurred on materials and any part of the Work due to CONTRACTOR's failing to take all measures necessary protect the Work from weather and CONTRACTOR shall not be entitled to such claims. Also, no extension of the Contract Time shall be allowed if the CONTRACTOR is able, notwithstanding the weather, to proceed with other Work of the Contract.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR. CONTRACTOR's duties and responsibilities for safety and for protection of the work shall continue until such time as all the Work is completed and OWNER'S REPRESENTATIVE has issued a notice to OWNER and

CONTRACTOR in accordance with paragraph 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

Safety Representative:

- 6.21 CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

Hazard Communication Programs:

- 6.22 CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in accordance with Laws or Regulations.

Emergencies:

- 6.23 In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from OWNER or OWNER'S REPRESENTATIVE, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give OWNER'S REPRESENTATIVE prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If OWNER'S REPRESENTATIVE determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change directive or Change order will be issued to document the consequences of such action.

6.24 Shop Drawings and Samples:

- 6.24.1 After checking and verifying all field measurements, CONTRACTOR shall submit to OWNER'S REPRESENTATIVE for review and approval in accordance with the accepted schedule of shop drawings and sample submittal (see paragraph 2.8), three copies (or at OWNER'S REPRESENTATIVES option, one reproducible copy) of all shop drawings, which shall have been checked and approved by the CONTRACTOR. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show OWNER'S REPRESENTATIVE the materials and equipment CONTRACTOR proposes to provide and to enable OWNER'S REPRESENTATIVE to review the information for the limited purposes required by paragraph 6.26.
- 6.24.2 CONTRACTOR shall also submit Samples to OWNER'S REPRESENTATIVE for review and approval in accordance with said accepted schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended and otherwise as OWNER'S REPRESENTATIVE may require to enable OWNER'S REPRESENTATIVE to review the submittal for the limited purposes required by paragraph 6.26. The numbers of each Sample to be submitted will be as specified in the Specifications.

6.26 Submittal Procedures:

6.25.1 Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

- 6.25.1.1 all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto,
- 6.25.1.2 all materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work, and
- 6.25.1.3 all information relative to CONTRACTOR's sole responsibilities in respect of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.

CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

6.25.2 Each submittal will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.

6.25.3 At the time of each submission, CONTRACTOR shall give OWNER'S REPRESENTATIVE specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to OWNER'S REPRESENTATIVE for review and approval of each such variation.

6.26 OWNER'S REPRESENTATIVE will review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals accepted by OWNER'S REPRESENTATIVE as required by paragraph 2.8. OWNER'S REPRESENTATIVE's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. OWNER'S REPRESENTATIVE's review and approval will not extend to means, methods, techniques, sequences or procedures of construction (except where a particular means, method, technique, sequence or procedure of construction is specifically and expressly called for by the Contract documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by OWNER'S REPRESENTATIVE, and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by OWNER'S REPRESENTATIVE on previous submittals.

- 6.27 OWNER'S REPRESENTATIVE's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called OWNER'S REPRESENTATIVE's attention to each such variation at the time of submission as required by paragraph 6.25.3 and OWNER'S REPRESENTATIVE has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by OWNER'S REPRESENTATIVE relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.25.1.
- 6.28 Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submissions accepted by OWNER'S REPRESENTATIVE as required by paragraph 2.8, any related Work performed prior to OWNER'S REPRESENTATIVE's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

Continuing the Work:

- 6.29 CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.5 or as OWNER and CONTRACTOR may otherwise agree in writing.

6.30 CONTRACTOR's General Warranty and Guarantee:

- 6.30.1 CONTRACTOR warrants and guarantees to OWNER, OWNER'S REPRESENTATIVE and OWNER'S REPRESENTATIVE's Consultants that all Work will be in accordance with the Contract Documents and will not be **defective**. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

6.30.1.1 abuse, modification or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors or Suppliers; or

6.30.1.2 normal wear and tear under normal usage.

- 6.30.2 CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the work in accordance with the Contract Documents:

6.30.2.1 observations by OWNER'S REPRESENTATIVE;

6.30.2.2 recommendation of any progress or final payment by OWNER'S REPRESENTATIVE;

6.30.2.3 the issuance of a certificate of Substantial Completion or any payment by OWNER to CONTRACTOR under the Contract Documents;

- 6.30.2.4 use or occupancy of the Work or any part thereof by OWNER;
 - 6.30.2.5 any acceptance by OWNER or any failure to do so;
 - 6.30.2.6 any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by OWNER'S REPRESENTATIVE pursuant to paragraph 14.13;
 - 6.30.2.7 any inspection, test or approval by others; or
 - 6.30.2.8 any correction of **defective** Work by OWNER.
- 6.30.3 The CONTRACTOR warrants that, unless otherwise specified in the Contract Documents, the materials and equipment installed in the Work will be new, merchantable, and fit for the purpose for which they are intended, and that the Work will be performed in a workmanlike manner. The CONTRACTOR also warrants the workers who perform the Work will be sufficiently skilled to produce a high quality product which is free of blemishes, (surface defects) and flaws (internal defects).

The CONTRACTOR is under a continuing duty to warn the OWNER and OWNER'S REPRESENTATIVE of any possible defect in the design of the Work and materials incorporated in the Work and against potentially unsafe uses of products incorporated in the Work which may cause personal injury or property damage, as soon as the CONTRACTOR discovers the possible defect or has notice that the product may be unsafe. The CONTRACTOR's duty under this paragraph shall be continuing, and shall not expire when the OWNER accepts the Work or when the CONTRACTOR's guarantee expires. If the CONTRACTOR fails to warn the Owner of a design or product defect of which the CONTRACTOR is aware, and if personal or property damage thereafter results from such design or product defect, the CONTRACTOR shall be liable jointly and severally with any other party responsible at law for all damages resulting from such defect.

6.31 Indemnification:

The CONTRACTOR agrees to indemnify and hold harmless the OWNER (City of Louisville), OWNER'S REPRESENTATIVE, OWNER'S REPRESENTATIVE's consultants, and their officers, employees, agents and insurers, from and against all liability, claims, and demands, on account of injury, loss, or damage, including without limitation claims arising from bodily injury, personal injury, sickness, disease, death, property loss or damage, or any other loss of any kind whatsoever, which arise out of or are in any manner connected with this contract, if such injury, loss, or damage is caused in whole or in part by, or is claimed to be caused in whole or in part by, the act, omission, error, professional error, mistake, negligence, or other fault of the CONTRACTOR, any Subcontractor of the CONTRACTOR, or any officer, employee, representative, or agent of the CONTRACTOR or of any Subcontractor of the CONTRACTOR, or which arise out of any workers' compensation claim of any employee of the CONTRACTOR or of any employee of any subcontractor of the CONTRACTOR. The CONTRACTOR agrees to investigate, handle, respond to, and to provide defense for and defend against, any such liability, claims or demands at the sole expense of the CONTRACTOR. The CONTRACTOR also agrees to bear all other costs and expenses related thereto,

including court costs and attorney fees, whether or not any such liability, claims, or demands alleged are groundless, false, or fraudulent.

- 6.32 In any and all claims against OWNER or OWNER'S REPRESENTATIVE or any of their respective consultants, agents, officers, directors or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.31 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.

Survival of Obligations:

- 6.33 All representations, indemnifications, warranties and guarantees made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the work and termination or completion of the Agreement.

END ARTICLE 06

ARTICLE 7 - OTHER WORK

Related Work at Site:

- 7.1 OWNER may perform other work related to the Project at the site by OWNER's own forces, or let other direct contracts therefor which shall contain General Conditions similar to these, or have other work performed by utility owners. If the fact that such other work is to be performed was not noted in the Contract Documents, then: (i) written notice thereof will be given to CONTRACTOR prior to starting any such other work, and (ii) CONTRACTOR may make a claim therefor as provided in Articles 11 and 12 if CONTRACTOR believes that such performance will involve additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the amount or extent thereof.
- 7.2 CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the additional work with OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly connect and coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of OWNER'S REPRESENTATIVE and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.
- 7.3 If the proper execution or results of any part of CONTRACTOR's work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to OWNER'S REPRESENTATIVE in writing any delays, defects or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure so to report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent or non-apparent defects and deficiencies in such other work.

Coordination:

- 7.4 Unless otherwise provided in the Supplementary Conditions, OWNER shall have sole authority and responsibility in respect of such coordination.

Should CONTRACTOR cause damage to the Work or property of any separate CONTRACTOR at the site, or should any claim arising out of CONTRACTOR's performance of the Work at the site be made by any separate contractor against CONTRACTOR, OWNER, OWNER'S REPRESENTATIVE, or any other person, CONTRACTOR shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws, and Regulations, indemnify and hold OWNER and OWNER'S REPRESENTATIVE harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of OWNER'S

REPRESENTATIVES, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any separate contractor against OWNER or OWNER'S REPRESENTATIVE to the extent based on a claim arising out of CONTRACTOR's performance of the Work. Should a separate contractor cause damage to the Work or property of CONTRACTOR or should the performance of Work by any separate CONTRACTOR at the site give rise to any other claim, CONTRACTOR shall not institute any action, legal or equitable, against OWNER or OWNER'S REPRESENTATIVE or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from OWNER or OWNER'S REPRESENTATIVE on account of any such damage or claim. If CONTRACTOR is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and OWNER and CONTRACTOR are unable to agree as to the extent of any adjustment in Contract Time attributable thereto, CONTRACTOR may make a claim for an extension of time in accordance with Article 12. An extension of the Contract Time shall be CONTRACTOR's exclusive remedy with respect to OWNER and OWNER'S REPRESENTATIVE for any delay, disruption, interference or hindrance cause by any separate contractor. This paragraph does not prevent recovery from OWNER or OWNER'S REPRESENTATIVE for activities that are their respective responsibilities.

END ARTICLE 07

ARTICLE 8 - OWNER'S RESPONSIBILITIES

- 8.1 Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through OWNER'S REPRESENTATIVE.
- 8.2 In case of termination of the employment of OWNER'S REPRESENTATIVE, OWNER shall appoint an OWNER'S REPRESENTATIVE whose status under the Contract Documents shall be that of the former OWNER'S REPRESENTATIVE.
- 8.3 OWNER shall furnish the data required of OWNER under the Contract documents promptly and shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.4 and 14.13.
- 8.4 OWNER's duties in respect of providing lands and easements and providing OWNER'S REPRESENTATIVE surveys to establish reference points are set forth in paragraphs 4.1 and 4.4.
- 8.5 OWNER is obligated to execute Change Orders as indicated in paragraph 10.4.
- 8.6 OWNER's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.4.
- 8.7 In connection with OWNER's right to stop Work or suspend Work, see paragraphs 13.10 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.
- 8.8 The OWNER shall not supervise, direct or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences or procedures of construction or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work. OWNER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.
- 8.9 OWNER's responsibility in respect of undisclosed Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Materials uncovered or revealed at the site is set forth in paragraph 4.5.
- 8.10 If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

END ARTICLE 08

ARTICLE 9 - OWNER'S REPRESENTATIVE'S STATUS DURING CONSTRUCTION

OWNER's Representative:

- 9.1 OWNER'S REPRESENTATIVE will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of OWNER'S REPRESENTATIVE as OWNER's representative during construction are set forth in the Contract Documents and shall not be extended without written consent of OWNER and OWNER'S REPRESENTATIVE.

Visits to Site:

- 9.2 OWNER'S REPRESENTATIVE will make visits to the site at intervals appropriate to the various stages of construction as OWNER'S REPRESENTATIVE deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, OWNER'S REPRESENTATIVE will endeavor for the benefit of OWNER to determine, in general, if the Work is proceeding in accordance with the Contract Documents. OWNER'S REPRESENTATIVE will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. OWNER'S REPRESENTATIVE's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and on-site observations, OWNER'S REPRESENTATIVE will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against **defective** Work. OWNER'S REPRESENTATIVE's visits and on-site observations are subject to all the limitations on OWNER'S REPRESENTATIVE's authority and responsibility set forth in paragraph 9.13 and particularly, but without limitation, during or as a result of OWNER'S REPRESENTATIVE's on-site visits or observations of CONTRACTOR's Work OWNER'S REPRESENTATIVE will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work.

Project Representative:

- 9.3 OWNER'S REPRESENTATIVE will furnish a Resident Project Representative, assistants and other field staff to assist OWNER'S REPRESENTATIVE in observing the performance of the Work of the CONTRACTOR. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.13 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the site who is not OWNER'S REPRESENTATIVE's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other person will be as provided in the Supplementary Conditions.
- 9.3.1 Resident Project Representative is OWNER'S REPRESENTATIVE's Agent and will act as directed by and under the supervision of OWNER'S REPRESENTATIVE, and will confer with OWNER'S REPRESENTATIVE regarding his actions. His dealings in matters pertaining to the on-site Work will

in general be with OWNER'S REPRESENTATIVE and CONTRACTOR keeping the OWNER'S REPRESENTATIVE advised as necessary. His dealings with Subcontractors will only be through or with the full knowledge and approval of CONTRACTOR.

Duties and Responsibilities:

Resident Project Representative will:

Schedules:

Review the progress schedule, schedule of Shop Drawing submittal, schedule of values and other schedules prepared by CONTRACTOR and consult with OWNER'S REPRESENTATIVE concerning acceptability.

Conferences and Meetings:

Attend meetings with CONTRACTOR, such as preconstruction conferences, progress meetings and other job conferences and other project related meetings.

Liaison:

Serve as OWNER'S REPRESENTATIVE's liaison with CONTRACTOR, working principally through CONTRACTOR's superintendent and assist him in understanding the intent of the Contract Documents. Assist OWNER'S REPRESENTATIVE in serving as OWNER's liaison with CONTRACTOR when CONTRACTOR's operations affect OWNER's on-site operations.

Assist in obtaining from OWNER'S REPRESENTATIVE additional details or information, when required for proper execution of the Work.

Shop Drawings and Samples:

Record date of receipt of Shop Drawings and samples.

Receive samples, which are furnished at the site by CONTRACTOR for OWNER'S REPRESENTATIVE's review, and notify OWNER'S REPRESENTATIVE of their availability for examination.

Advise OWNER'S REPRESENTATIVE and CONTRACTOR of the commencement of any Work requiring a Shop Drawing or sample submission if the submission has not been approved by OWNER'S REPRESENTATIVE.

Review of Work, Rejection of Defective Work, Inspections and Tests:

Conduct on-site observations of the Work in progress to assist OWNER'S REPRESENTATIVE in determining that the Work is proceeding in accordance with the Contract Documents.

Report to OWNER'S REPRESENTATIVE whenever he believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspections, tests or approvals required to be made; and advise OWNER'S REPRESENTATIVE when he believes Work should be corrected or rejected or

should be uncovered for observation, or requires special testing, inspection or approval.

Verify that tests, equipment and systems startups and operating and maintenance training are conducted in presence of the appropriate personnel, and that CONTRACTOR maintains adequate records thereof; observe, record and report to OWNER'S REPRESENTATIVE appropriate details relative to the test procedures and start-ups.

Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to OWNER'S REPRESENTATIVE.

Interpretation of Contract Documents:

Report to OWNER'S REPRESENTATIVE when clarifications and interpretations of the Contract Documents are needed and Transmit to CONTRACTOR clarification and interpretation of the Contract Documents as issued by OWNER'S REPRESENTATIVE.

Modifications:

Consider and evaluate CONTRACTOR's suggestions for modification in Drawings or Specifications and report with his recommendations to OWNER'S REPRESENTATIVE. Transmit to CONTRACTOR decisions issued by OWNER'S REPRESENTATIVE.

Records:

Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and samples, reproductions or original Contract Documents including all Work Directive Changes, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Agreement, OWNER'S REPRESENTATIVE's clarifications and interpretations of the Contract Documents, progress reports and other Project related documents.

Keep a diary, daily report form, or log book, recording hours on the job site, weather conditions, data relative to questions of Work Directive Changes, Change Orders, or changed conditions, list of job site visitors, daily activities, decisions, observations in general and specific observations in more detail as in the case of observing test procedures.

Record names, addresses and telephone numbers of all CONTRACTOR's, subcontractors and major suppliers of equipment and materials.

Reports:

Furnish OWNER'S REPRESENTATIVE periodic reports as required of progress of the Work and of CONTRACTOR's compliance with the progress schedule and schedule of Shop Drawings and sample submittal.

Consult with OWNER'S REPRESENTATIVE in advance of scheduled major tests, inspections or start of important phases of the Work.

Draft proposed Change Orders and Work Directive Changes, obtaining backup material from CONTRACTOR and recommend to OWNER'S REPRESENTATIVE Change Orders, Work Directive Changes, and Field Orders.

Report immediately to OWNER'S REPRESENTATIVE upon the occurrence of any accident.

Payment Requests:

Review applications for payment with CONTRACTOR for compliance with the established procedure for their submission and forward with his recommendations to OWNER'S REPRESENTATIVE, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the site but not incorporated in the Work.

Certificates, Maintenance and Operations Manuals:

During the Course of Work verify that certifications, maintenance and operation manuals and other data required to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to OWNER'S REPRESENTATIVE for review and forwarding to OWNER prior to final payment of the Work.

Completion:

Before OWNER'S REPRESENTATIVE issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring correction or completion.

Conduct final inspection in the company of OWNER'S REPRESENTATIVE and CONTRACTOR and prepare a final list of items to be corrected or completed.

Observe that all items on final list have been corrected or completed and make recommendations to OWNER'S REPRESENTATIVE concerning acceptance.

Limitation of Authority:

Resident Project Representative shall not:

Authorize any deviations from the Contract Documents or accept any substitute materials or equipment, unless authorized by OWNER'S REPRESENTATIVE.

Exceed limitations of OWNER'S REPRESENTATIVE's authority as set forth in the Contract Documents.

Undertake any of the responsibilities of CONTRACTOR, Subcontractors, or CONTRACTOR's superintendent.

Advise on, or issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures for construction unless such is specifically called for in the Contract Documents.

Advise on or issue directions regarding or assume control over safety precautions and programs in connection with the Work.

Shall not accept Shop Drawings or sample submittals from anyone other than CONTRACTOR.

Authorize OWNER to occupy the Work in whole or in part.

Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by OWNER'S REPRESENTATIVE.

Clarifications and Interpretations:

- 9.4 OWNER'S REPRESENTATIVE will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as OWNER'S REPRESENTATIVE may determine necessary, which shall be consistent with the intent of and reasonably inferable from Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER or CONTRACTOR believes that a written clarification or interpretation justifies an adjustment in the Contract Price or the Contract Times and the parties are unable to agree to the amount or extent thereof, if any, OWNER or CONTRACTOR may make a written claim therefor as provided in Article 11 or Article 12.

Authorized Variations in Work:

- 9.5 OWNER'S REPRESENTATIVE may authorize minor variations in the work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR who shall perform the Work involved promptly.

Rejecting Defective Work:

- 9.6 OWNER'S REPRESENTATIVE will have authority to disapprove or reject Work which OWNER'S REPRESENTATIVE believes to be **defective**, or that OWNER'S REPRESENTATIVE believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. OWNER'S REPRESENTATIVE will also have authority to require special inspection or testing of the work as provided in paragraph 13.9, whether or not the work is fabricated, installed or completed.

Shop Drawings, Change Orders and Payments:

- 9.7 In connection with OWNER'S REPRESENTATIVE's authority as to Shop Drawings and Samples, see paragraphs 6.24 through 6.28 inclusive.
- 9.8 In connection with OWNER'S REPRESENTATIVE's authority as to Change Orders, see Articles 10, 11, and 12.
- 9.9 In connection with OWNER'S REPRESENTATIVE's authority as to Applications for Payment, see Article 14.

Determinations for Unit Prices:

- 9.10 OWNER'S REPRESENTATIVE will have authority to determine the actual quantities and classifications of items of Unit Price Work performed by CONTRACTOR, and the written decisions of OWNER'S REPRESENTATIVE on such matters will be final, binding on OWNER and CONTRACTOR and not subject to appeal (except as modified by OWNER'S REPRESENTATIVE to reflect changed factual conditions).

Decisions on Disputes:

- 9.11 OWNER'S REPRESENTATIVE will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and Claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract Times will be referred initially to OWNER'S REPRESENTATIVE in writing with a request for a formal decision in accordance with this paragraph. Written notice of each such claim, dispute or other matter will be delivered by the claimant to OWNER'S REPRESENTATIVE and the other party to the Agreement promptly (but in no event later than fifteen days) after the start of the occurrence or event giving rise thereto, and written supporting data will be submitted to OWNER'S REPRESENTATIVE and the other party within thirty days after the start of such occurrence or event unless OWNER'S REPRESENTATIVE allows an additional period of time for the submission of additional or more accurate data in support of such claim, dispute or other matter. The opposing party shall submit any response to OWNER'S REPRESENTATIVE and the claimant within thirty days after receipt of the claimant's last submittal (unless OWNER'S REPRESENTATIVE allows additional time). OWNER'S REPRESENTATIVE will render a formal decision in writing within thirty days after receipt of the opposing party's submittal, if any, in accordance with this paragraph. OWNER'S REPRESENTATIVE's written decision on such claim, dispute or other matter will be final and binding upon OWNER and CONTRACTOR.
- 9.12 When functioning under paragraphs 9.10 and 9.11, OWNER'S REPRESENTATIVE will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by OWNER'S REPRESENTATIVE pursuant to paragraphs 9.10 or 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.15) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations.

9.13 Limitations on OWNER'S REPRESENTATIVE's Authority and Responsibilities:

- 9.13.1 Neither OWNER'S REPRESENTATIVE's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by OWNER'S REPRESENTATIVE in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise or performance of any authority or responsibility by OWNER'S REPRESENTATIVE shall create, impose or give rise to any duty owed by OWNER'S REPRESENTATIVE to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them.
- 9.13.2 OWNER'S REPRESENTATIVE will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work. OWNER'S REPRESENTATIVE will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.
- 9.13.3 OWNER'S REPRESENTATIVE will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.
- 9.13.4 OWNER'S REPRESENTATIVE's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds and certificates of inspection, tests and approvals and other documentation required to be delivered by paragraph 14.12 will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests and approvals that the results certified indicate compliance with, the Contract Documents.
- 9.13.5 The limitations upon authority and responsibility set forth in this paragraph 9.13 shall also apply to OWNER'S REPRESENTATIVE's Consultants, Resident Project Representative and Assistants.

END ARTICLE 09

ARTICLE 10 - CHANGES IN THE WORK

- 10.1 Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work. A Written Amendment, a Change Order, or a Work Change Directive will authorize such additions, deletions or revisions. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved, which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- 10.2 If OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an adjustment in the Contract Price or an adjustment of the Contract Times that should be allowed as a result of a Work Change Directive, a claim may be made therefor as provided in Article 11 or Article 12.
- 10.3 CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.5 and 3.6 except in the case of an emergency as provided in paragraph 6.23 or in the case of uncovering Work as provided in paragraph 13.9.
- 10.4 OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by OWNER'S REPRESENTATIVE (or Written Amendments) covering:
- 10.4.1 changes in the Work which are (i) ordered by OWNER pursuant to paragraph 10.1., (ii) required because of acceptance of **defective** Work under paragraph 13.13 or correcting **defective** Work under paragraph 13.14, or (iii) agreed to by the parties;
- 10.4.2 changes in the Contract Price or Contract Times which are agreed to by the parties; and
- 10.4.3 changes in the Contract Price or Contract Times, which embody the substance of any written decision rendered by OWNER'S REPRESENTATIVE pursuant to paragraph 9.11;
- 10.5 If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

END ARTICLE 10

ARTICLE 11 - CHANGE OF CONTRACT PRICE

- 11.1 The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at CONTRACTOR's expense without change in the Contract Price.
- 11.2 The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an adjustment in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to OWNER'S REPRESENTATIVE promptly (but in no event later than fifteen days) after the start of the occurrence or event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within thirty days after the start of such occurrence or event (unless OWNER'S REPRESENTATIVE allows additional time for claimant to submit additional or more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the adjustment claimed covers all known amounts to which the claimant is entitled as a result of said occurrence or event. OWNER'S REPRESENTATIVE shall determine all claims for adjustment in the Contract Price in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.
- 11.3 The value of any Work covered by a Change Order or of any claim for an adjustment in the Contract Price will be determined as follows:
- 11.3.1 where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1 through 11.9.3 inclusive);
 - 11.3.2 where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2);
 - 11.3.3 where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 11.3.2, on the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 11.6).

Cost of the Work:

- 11.4 The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in paragraph 11.5:
- 11.4.1 Certified payroll record costs for employees in the direct employment of CONTRACTOR in the performance of the Work under schedules of job classifications shall be submitted to the OWNER'S REPRESENTATIVE with the claim. Such employees shall include without limitation superintendents, foremen and other

personnel employed full-time at the site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by OWNER.

- 11.4.2 Invoices for cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith shall be submitted to the OWNER'S REPRESENTATIVE with the claim. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall be in accordance with the State Department of Highways, Division of Highways, and State of Colorado Standard Specifications for Road and Bridge Construction 1991 Edition. If the materials used in performing the extra Work are taken from the CONTRACTOR's stock, then in lieu of invoices the CONTRACTOR shall furnish an affidavit, certifying that such materials were taken from its stock, that the quantity claimed was actually used in the Work, and that the price and transportation claimed represent the actual cost to the CONTRACTOR shall be submitted to the OWNER'S REPRESENTATIVE with the claim.
- 11.4.3 Payments made by CONTRACTOR to the Subcontractors for Work performed or furnished by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of OWNER'S REPRESENTATIVE, which bids, if any, will be accepted. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in paragraphs 11.4, 11.5, 11.6 and 11.7. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.
- 11.4.4 Costs of special consultants (including but not limited to OWNER'S REPRESENTATIVES, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.
- 11.4.5 Supplemental costs including the following:
- 11.4.5.1 The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.
 - 11.4.5.2 Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost

less market value of such items used but not consumed which remain the property of CONTRACTOR.

- 11.4.5.3 Rentals rates of all construction equipment and machinery and the parts thereof which has been authorized by the OWNER'S REPRESENTATIVE, the CONTRACTOR will be paid for the use of equipment in the manner hereinafter specified. Rental rates will be from the current edition of the Rental Rate Blue Book for Construction Equipment and will be determined as follows:

Hourly rate: $RR = (ADJ\ BB/176)(RF)(SAF) + EOC$

Where: RR = Hourly rental rate
ADJ BB/176 = Blue Book Monthly Rate adjusted for year of manufacture/176
RF = Regional Factor of 1.06
SAF = State Adjustment Factor of 1.05
EOC = Estimated Hourly Operating Costs from Blue Book

With each claim, the CONTRACTOR shall submit the rental rate calculations including copies of the appropriate pages of the Blue Book for each piece of equipment listed in the claim.

Rental of equipment not owned by the CONTRACTOR will be paid for by invoice cost plus operating cost (EOC). Copies of the applicable pages of the Rental Rate Blue Book for Construction Equipment shall be submitted to the OWNER'S REPRESENTATIVE with the claim.

The costs of transportation, loading, unloading, installation, dismantling, and removal thereof all in accordance with the terms of said rental agreements. If equipment is used intermittently and when not in use could be returned to its rental source at less expense to the OWNER than holding it at the Work site, it shall be returned unless the CONTRACTOR elects to keep it at the Work site at no expense to the OWNER. The rental of any such equipment, machinery or parts shall cease when the use of the equipment is no longer necessary for the Work. No payment will be made for the use of tools, which have a replacement value of \$200.00 or less. Operators will be paid for separately as provided in paragraph 11.4.1. Certified invoices for rental cost of all construction equipment and machinery incorporated in the Work shall be submitted to the OWNER'S REPRESENTATIVE with the claim.

- 11.4.5.4 Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

- 11.4.5.5 Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable.

- 11.4.5.6 Losses and damages (and related expenses) caused by damage to the work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance and furnishing of the Work, (except losses and damages within the deductible amounts of property insurance established by OWNER in accordance with paragraph 5.9), provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraph 11.6.2.
- 11.4.5.7 The cost of utilities, fuel and sanitary facilities at the site.
- 11.4.5.8 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

11.5 The term Cost of the Work shall not include any of the following:

- 11.5.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, OWNER'S REPRESENTATIVES, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by paragraph 11.4.4--all of which are to be considered administrative costs covered by the CONTRACTOR's fee.
- 11.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
- 11.5.3 Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.
- 11.5.4 Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same. (except for the cost of premiums covered by subparagraph 11.4.5.9 above).
- 11.5.5 Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of **defective** Work, disposal

of materials or equipment wrongly supplied and making good any damage to property.

Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

- 11.6 The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

11.6.1 a mutually acceptable fixed fee; or

11.6.2 if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the work:

11.6.2.1 for costs incurred under paragraphs 11.4.1 and 11.4.2, the CONTRACTOR's fee shall be fifteen percent;

11.6.2.2 for costs incurred under paragraph 11.4.3, the CONTRACTOR's fee shall be five percent;

11.6.2.3 where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraphs 11.4.1, 11.4.2, 11.4.3 and 11.6.2 is that the Subcontractor who actually performs or furnishes the Work, at whatever tier, will be paid a fee of fifteen percent of the costs incurred by such Subcontractor under paragraphs 11.4.1 and 11.4.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

11.6.2.4 no fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5 and 11.5;

11.6.2.5 the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and

11.6.2.6 when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 11.6.2.1 through 11.6.2.5, inclusive.

- 11.7 Whenever the cost of any Work is to be determined pursuant to paragraphs 11.4 and 11.5, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in form acceptable to OWNER'S REPRESENTATIVE an itemized cost breakdown together with supporting data.

Cash Allowances:

- 11.8 It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be furnished

and performed for such sums as may be acceptable to OWNER and OWNER'S REPRESENTATIVE. CONTRACTOR agrees that:

- 11.8.1 the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and
- 11.8.2 CONTRACTOR's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances and no demand for additional payment on account of any of the foregoing will be valid.

Prior to final payment, an appropriate Change Order will be issued as recommended by OWNER'S REPRESENTATIVE to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.9 Unit Price Work:

- 11.9.1 Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by OWNER'S REPRESENTATIVE in accordance with paragraph 9.10.
- 11.9.2 Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.
- 11.9.3 OWNER or CONTRACTOR may make a claim for an adjustment in the contract Price in accordance with Article 11 if:
 - 11.9.3.1 the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - 11.9.3.2 there is no corresponding adjustment with respect to any other item of Work; and
 - 11.9.3.3 if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense of, OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.
- 11.9.4 In no event shall a claim be made or an adjustment of Unit Price allowed if a variation in actual quantities used does not equal or exceed 25 percent (25%) of the total Bid Price.

END ARTICLE 11

ARTICLE 12 - CHANGE OF CONTRACT TIMES

- 12.1 The Contract Times (or Milestones) may only be changed by a Change Order or a Written Amendment. Any claim for an adjustment of the Contract Times (or Milestones) shall be based on written notice delivered by the party making the claim to the other party and to OWNER'S REPRESENTATIVE promptly (but in no event later than fifteen days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within thirty days after such occurrence (unless OWNER'S REPRESENTATIVE allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Times (or Milestones) shall be determined by OWNER'S REPRESENTATIVE in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Times (or Milestones) will be valid if not submitted in accordance with the requirements of this paragraph 12.1.
- 12.2 Liquidated damages. The OWNER and the CONTRACTOR agree and recognize that time is of the essence for every time period set forth in the Contract Documents and that the OWNER will suffer financial loss if the Work is not substantially complete within the time set forth in the Contract Documents, plus any extensions thereof allowed in accordance with this Article 12 of the General Conditions. If the CONTRACTOR fails to perform the Work within the specified time set forth in the Contract Documents as adjusted pursuant to Article 12, the OWNER and CONTRACTOR agree that as liquidated damages, and not as a penalty, for delay in performance the Contractor shall pay OWNER in the amount stipulated below for each and every contract day that expires after the time set forth in the Contract Documents for Substantial Completion of the Work until the same is finally complete and ready for Final Payment. The OWNER shall have the right to deduct liquidated damages from any amount due or that may become due to the CONTRACTOR, or to collect such liquidated damages from the CONTRACTOR or the Surety. The OWNER has the option to enforce liquidated damages or to waive such damages. The liquidated damages herein specified shall only apply to the CONTRACTOR's delay in performance. Liquidated damages are intended only to compensate the OWNER for additional OWNER personnel efforts in administering the Contract after normally scheduled completion dates, and for City governmental and citizen inconvenience, lost opportunities, and lost confidence in government and morale of government when work is not completed on time. Such damages are uncertain in amount and difficult to measure and prove accurately. By executing this contract, the CONTRACTOR agrees that the liquidated damages specified in the Contract Documents are reasonable in amount and are not disproportionate to actual anticipated damages. Liquidated damages do not include any sums of money to reimburse the OWNER for extra costs which the OWNER may become obligated to pay on other contracts which are delayed or extended because of CONTRACTOR's failure to complete the Work within the time periods set forth in the Contract Documents. Liquidated damages are not intended to include litigation or attorneys' fees incurred by the OWNER, or other incidental or consequential damages suffered by the OWNER due to the Contractor's performance. If the OWNER charges liquidated damages to the CONTRACTOR, this shall not preclude the Owner from commencing an action against the CONTRACTOR for other actual harm resulting from the CONTRACTOR's performance, which is not due to the CONTRACTOR's delay in performance. In order to recover liquidated damages, OWNER is under no obligation to prove the actual

damages sustained by OWNER due to the CONTRACTOR's delay in performance. In no event shall the CONTRACTOR be assessed liquidated damages if the contract is suspended or terminated for events beyond the control of the CONTRACTOR for which a time extension beyond the original schedule of performance could be granted under 12.3.

The parties agree that liquidated damages shall be in the amount set forth in Article 2 of the Agreement.

- 12.3 Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a claim is made therefor as provided in paragraph 12.1. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.
- 12.4 The CONTRACTOR specifically waives any and all claims against the OWNER for damages resulting from any hindrance or delay caused by circumstances beyond the control of CONTRACTOR that prevents completing any part of the Work within the Contract Times (or Milestones), whether or not caused by the OWNER. The CONTRACTOR may instead be granted an extension of the Contract Times for which the OWNER will not claim liquidated damages, provided that the hindrance or delay is beyond the control of the CONTRACTOR. An extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay. In no event shall OWNER be liable to CONTRACTOR, any subcontractor, any supplier, any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from delays caused by or within the control of Contractor, or delays beyond the control of CONTRACTOR whether or not caused by the OWNER.

END ARTICLE 12

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

- 13.1 **Notice of Defects:** Prompt notice of all **defective** Work of which OWNER or OWNER'S REPRESENTATIVE has actual knowledge will be given to CONTRACTOR. All **defective** Work may be rejected, corrected or accepted as provided in this Article 13.

Access to Work:

- 13.2 OWNER, OWNER'S REPRESENTATIVE, OWNER'S REPRESENTATIVE's Consultants, other representatives and personnel of OWNER, independent testing laboratories and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's site safety procedures and programs so that they may comply therewith as applicable.

Tests and Inspections:

- 13.3 CONTRACTOR shall give OWNER'S REPRESENTATIVE timely notice of readiness of the Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- 13.4 OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
- 13.4.1 for inspections, tests or approvals covered by paragraph 13.5 below:
 - 13.4.2 that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.9 below shall be paid as provided in said paragraph 13.9; and
 - 13.4.3 as otherwise specifically provided in the Contract Documents.
 - 13.4.4 any and all retesting of soil necessitated by the CONTRACTOR's operations or inability to obtain specified density test results on the first attempt shall be the sole responsibility and costs of the CONTRACTOR to achieve required passing test results. Retesting required because of non-conformance to specified requirements shall be performed by the independent firm employed by the OWNER. Payment for retesting will be charged to the CONTRACTOR by deducting inspection, testing and administrative charges from the Contract Price.
- 13.5 If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish OWNER'S REPRESENTATIVE the required certificates of inspection, or approval. CONTRACTOR shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for OWNER's and OWNER'S REPRESENTATIVE's acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work.

- 13.6 If any Work (or the work of others) that is to be inspected, tested or approved is covered by CONTRACTOR without written concurrence of OWNER'S REPRESENTATIVE, it must, if requested by OWNER'S REPRESENTATIVE, be uncovered for observation.
- 13.7 Uncovering Work as provided in paragraph 13.6 shall be at CONTRACTOR's expense unless CONTRACTOR has given OWNER'S REPRESENTATIVE timely notice of CONTRACTOR's intention to cover the same and OWNER'S REPRESENTATIVE has not acted with reasonable promptness in response to such notice.

Uncovering Work:

- 13.8 If any Work is covered contrary to the written request of OWNER'S REPRESENTATIVE, it must, if requested by OWNER'S REPRESENTATIVE, be uncovered for OWNER'S REPRESENTATIVE's observation and replaced at CONTRACTOR's expense.
- 13.9 If OWNER'S REPRESENTATIVE considers it necessary or advisable that covered Work be observed by OWNER'S REPRESENTATIVE or inspected or tested by others, CONTRACTOR, at OWNER'S REPRESENTATIVE's request, shall uncover, expose or otherwise make available for observation, inspection or testing as OWNER'S REPRESENTATIVE may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is **defective**, CONTRACTOR shall pay all claims, costs, losses and damages caused by, arising out of or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefor as provided in Article 11.

OWNER May Stop the Work:

- 13.10 If the Work is **defective**, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any surety or other party.

Correction or Removal of Defective Work:

- 13.11 If required by OWNER'S REPRESENTATIVE, CONTRACTOR shall promptly, as directed, either correct all **defective** Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by OWNER'S REPRESENTATIVE, remove it from the site and replace it with Work that is not **defective**. CONTRACTOR shall pay all claims, costs, losses and damages caused by or resulting from such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.12 Correction Period:

- 13.12.1 If within one year after the date of Final Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or

by any specific provision of the Contract Documents, any Work is found to be defective, CONTRACTOR shall within seven calendar days after receiving notice from OWNER, without cost to OWNER and in accordance with OWNER's written instructions: (i) correct such defective Work, or if it has been rejected by OWNER, remove it from the site and replace it with WORK that is not defective, and (ii) satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If CONTRACTOR does not within seven calendar days after receiving notice from OWNER comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or the rejected Work removed and replaced, and all claims, costs, losses and damages caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

- 13.12.2 In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.
- 13.12.3 Where **defective** Work (and damage to other Work resulting therefrom) has been corrected, removed or replaced under this paragraph 13.12, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

Acceptance of Defective Work:

- 13.13 If, instead of requiring correction or removal and replacement of **defective** Work, OWNER (and, prior to OWNER'S REPRESENTATIVE's recommendation of final payment, also OWNER'S REPRESENTATIVE) prefers to accept it, OWNER may do so. CONTRACTOR shall play all claims, costs, losses and damages attributable to OWNER's evaluation of and determination to accept such **defective** Work (such costs to be approved by OWNER'S REPRESENTATIVE as to reasonableness). If any such acceptance occurs prior to OWNER'S REPRESENTATIVE's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, CONTRACTOR will pay an appropriate amount to OWNER.

OWNER May Correct Defective Work:

- 13.14 If CONTRACTOR fails within a reasonable time after written notice from OWNER'S REPRESENTATIVE to correct **defective** Work or to remove and replace rejected Work as required by OWNER'S REPRESENTATIVE in accordance with paragraph 13.11, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. In connection with such corrective and remedial

action, OWNER may exclude CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors and OWNER'S REPRESENTATIVE and OWNER'S REPRESENTATIVE's Consultants access to the site to enable OWNER to exercise the rights and remedies under this paragraph. All claims, costs, losses and damages incurred or sustained by OWNER in exercising such rights and remedies will be charged against CONTRACTOR and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. Such claims, costs, losses and damages will include but not be limited to all costs of repair or replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR's **defective** Work. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

END ARTICLE 13

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

Schedule of Values:

- 14.1 Progress payments on account of Unit Price Work will be based on the number of units completed.

Application for Progress Payment:

- 14.2 At least twenty days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to OWNER'S REPRESENTATIVE for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens, claims, security interests, or encumbrances and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER's interest therein, all of which will be satisfactory to OWNER. The amount of retainage with respect to progress payments will be as stipulated in the Agreement. With each application for payment the CONTRACTOR shall submit a notarized waiver(s) of claim signed by the CONTRACTOR acceptable in form to the OWNER'S REPRESENTATIVE. The waiver of claim for payment for the work of the CONTRACTOR shall equal the amount of the previous payment distributed to the CONTRACTOR for work of the CONTRACTOR and the amount of the total previous payment distributed to the CONTRACTOR.

CONTRACTOR's Warranty of Title:

- 14.3 CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

Review of Applications for Progress Payment:

- 14.4 OWNER'S REPRESENTATIVE will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER, or return the Application to CONTRACTOR indicating in writing OWNER'S REPRESENTATIVE's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. Ten days after presentation of the Application for Payment to OWNER with OWNER'S REPRESENTATIVE's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by OWNER to CONTRACTOR.
- 14.5 OWNER'S REPRESENTATIVE's recommendation of any payment requested in an Application for Payment will constitute a representation by OWNER'S REPRESENTATIVE to OWNER, based on OWNER'S REPRESENTATIVE's on-site observations of the executed Work as an experienced and qualified design professional and on OWNER'S REPRESENTATIVE's review of the Application for Payment and the

accompanying data and schedules, that to the best of OWNER'S REPRESENTATIVE's knowledge, information and belief:

14.5.1 the Work has progressed to the point indicated.

14.5.2 the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10 and to any other qualifications stated in the recommendation), and

14.5.3 the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled insofar as it is OWNER'S REPRESENTATIVE's responsibility to observe the Work.

However, by recommending any such payment OWNER'S REPRESENTATIVE will not thereby be deemed to have represented that: (i) exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to OWNER'S REPRESENTATIVE in the Contract Documents or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

14.6 OWNER'S REPRESENTATIVE's recommendation of any payment, including final payment, shall not mean that OWNER'S REPRESENTATIVE is responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of Work, or for any failure of CONTRACTOR to perform or furnish Work in accordance with the Contract Documents.

14.7 OWNER'S REPRESENTATIVE may refuse to recommend the whole or any part of any payment if, in OWNER'S REPRESENTATIVE's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.5. OWNER'S REPRESENTATIVE may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in OWNER'S REPRESENTATIVE's opinion to protect OWNER from loss because:

14.7.1 the Work is **defective**, or completed Work has been damaged requiring correction or replacement,

14.7.2 the Contract Price has been reduced by Written Amendment or Change Order,

14.7.3 OWNER has been required to correct **defective** Work or complete Work in accordance with paragraph 13.14, or

14.7.4 OWNER'S REPRESENTATIVE has actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.3 inclusive.

In addition to the retainages set forth in the Contract Documents, the Owner may retain one hundred percent (100%) of all progress payments for any

unsatisfactory performance of the Work and any payment recommended by the OWNER'S REPRESENTATIVE, including without limitation:

Defective work or failure to repair or replace defective work;

Claims filed against the CONTRACTOR, or reasonable evidence indicating probable filing of such claims;

Failure of the CONTRACTOR to make adequate or proper payments to subcontractors or suppliers for materials, equipment or labor;

Failure to obtain necessary permits or licenses, or to comply with applicable laws, ordinances, codes, or regulations, unless such noncompliance is due to reasons beyond the control of the CONTRACTOR, or due to act of the OWNER or and OWNER'S REPRESENTATIVE hired by the OWNER, or agents or employees thereof;

Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price then unpaid;

Reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

Persistent failure to carry out the Work in accordance with the Contract Documents;

As a set off for amounts due the Owner on other items;

Collusion with other bidders in preparing the bid;

Actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.7.1 through 14.7.3 or paragraphs 15.2.1 through 15.2.3 inclusive.

When the above reasons for withholding payment are removed and corrected to the OWNER's satisfaction, OWNER shall make payment to the CONTRACTOR of the sums withheld pursuant to this paragraph, subject to the amounts required to be retained by the Contract Documents.

Progress Payments to Suppliers and Subcontractors. The CONTRACTOR shall make partial payments of the amount due to each of the CONTRACTOR's suppliers and subcontractors in the same manner as the OWNER is required to pay the CONTRACTOR under Article 4 of the Agreement and Article 14 of the General Conditions, provided that the suppliers and subcontractors are performing to the CONTRACTOR's satisfaction. If the OWNER is notified that the CONTRACTOR is in arrears in payments to the CONTRACTOR's suppliers or subcontractors, the OWNER shall notify the CONTRACTOR and determine why such funds are being withheld. If the OWNER determines that no legitimate basis exists for the CONTRACTOR's withholding of such payments, the OWNER may, five (5) days after the mailing of written notice to the CONTRACTOR, make such payments directly to the CONTRACTOR's suppliers or subcontractors from funds which otherwise would be due the CONTRACTOR.

Substantial Completion:

- 14.8 When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and OWNER'S REPRESENTATIVE in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that OWNER'S REPRESENTATIVE issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR and OWNER'S REPRESENTATIVE shall make an inspection of the Work to determine the status of completion. If OWNER'S REPRESENTATIVE does not consider the Work substantially complete, OWNER'S REPRESENTATIVE will notify CONTRACTOR in writing giving the reasons therefor. If OWNER'S REPRESENTATIVE considers the Work substantially complete, OWNER'S REPRESENTATIVE will prepare and deliver to OWNER a tentative certificate of Substantial Completion, which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to OWNER'S REPRESENTATIVE as to any provisions of the certificate or attached list. If, after considering such objections, OWNER'S REPRESENTATIVE concludes that the Work is not substantially complete, OWNER'S REPRESENTATIVE will within fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, OWNER'S REPRESENTATIVE considers the Work substantially complete, OWNER'S REPRESENTATIVE will within said fourteen days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as OWNER'S REPRESENTATIVE believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion, OWNER'S REPRESENTATIVE will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform OWNER'S REPRESENTATIVE in writing prior to OWNER'S REPRESENTATIVE's issuing the definitive certificate of Substantial Completion. OWNER'S REPRESENTATIVE's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.
- 14.9 OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

Partial Utilization:

- 14.10 Use by OWNER at OWNER's option of any substantially completed part of the Work which: (i) has specifically been identified in the Contract Documents, or (ii) OWNER, OWNER'S REPRESENTATIVE, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:
- 14.10.1 OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRAC-

TOR will certify to OWNER and OWNER'S REPRESENTATIVE that such part of the Work is substantially complete and request OWNER'S REPRESENTATIVE to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and OWNER'S REPRESENTATIVE in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request OWNER'S REPRESENTATIVE to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR and OWNER'S REPRESENTATIVE shall make an inspection of that part of the Work to determine its status of completion. If OWNER'S REPRESENTATIVE does not consider that part of the Work to be substantially complete, OWNER'S REPRESENTATIVE will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If OWNER'S REPRESENTATIVE considers that part of the Work to be substantially complete, the provisions of paragraphs 14.8 and 14.9 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof land access thereto.

Final Inspection:

- 14.11 Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, OWNER'S REPRESENTATIVE will make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or **defective**. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

Final Application for Payment:

- 14.12 After CONTRACTOR has completed all such corrections to the satisfaction of OWNER'S REPRESENTATIVE and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required by paragraph 5.4, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents. CONTRACTOR may make application for final payment following the procedure for progress payments. The final application for payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence satisfactory to the OWNER of the continuation of completed operations insurance and any insurance coverage written on a claims-made basis at final payment and one year thereafter; (ii) the consent of surety to final payment and that the performance bond shall remain in effect throughout the guarantee period; (iii) complete and legally effective claim releases signed by all suppliers and subcontractors in the form provided in the Contract Documents certifying that all outstanding claims for payment have been paid. The CONTRACTOR shall not receive final payment due under the Agreement until the CONTRACTOR obtains and files the foregoing items (i), (ii), and (iii).

- 14.12.1 LIENS. Colorado Statutes do not provide for any right of lien against public buildings. In lieu thereof, §38-26-107, Colorado Revised Statutes, as amended, provides adequate relief for any claimant having furnished labor, materials, rental machinery, tools, equipment, or services toward construction of the particular public work in that final payment may not be made to a CONTRACTOR until all such creditors have been put on notice by publication of such pending payment and given opportunity to stop payment to the CONTRACTOR in the amount of such claims. Pursuant to §38-26-107, C.R.S., any supplier may bring a suit and file a notice of lis pendens against the OWNER within ninety (90) days after the date set for final settlement. If any such supplier or person files any such claim and notice of lis pendens, the OWNER shall withhold retained amounts from final payments to the CONTRACTOR as are necessary to satisfy fully such claims. References to liens appearing in Article 14 shall be deemed as references to claims made pursuant to C.R.S. §38-26-101 et seq. unless the context requires otherwise.

Final Payment and Acceptance:

- 14.13 If, on the basis of OWNER'S REPRESENTATIVE's observation of the Work during construction and final inspection, and OWNER'S REPRESENTATIVE's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, OWNER'S REPRESENTATIVE is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, OWNER'S REPRESENTATIVE will, within ten days after receipt of the final Application for Payment, indicate in writing OWNER'S REPRESENTATIVE's recommendation of payment and present the Application to OWNER for payment. At the same time OWNER'S REPRESENTATIVE will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.15. Otherwise, OWNER'S REPRESENTATIVE will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application. Upon receipt of the OWNER'S REPRESENTATIVE's recommendation for payment and the final Application for Payment, OWNER shall order the publication of Notice of Final Payment as required by C.R.S. §38-26-107(1) and shall make final payment in accordance with C.R.S. 38-26-107(3).
- 14.14 If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed and if OWNER'S REPRESENTATIVE so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of OWNER'S REPRESENTATIVE, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.1, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to OWNER'S REPRESENTATIVE with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

Waiver of Claims:

- 14.15 The making and acceptance of final payment will constitute:

- 14.15.1 a waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from **defective** Work appearing after final inspection pursuant to paragraph 14.11, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and
- 14.15.2 a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

END ARTICLE 14

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

OWNER May Suspend Work:

- 15.1 At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and OWNER'S REPRESENTATIVE, which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

OWNER May Terminate:

- 15.2 Upon the occurrence of any one or more of the following events:
- 15.2.1 if CONTRACTOR persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.8 as adjusted from time to time pursuant to paragraph 6.6);
 - 15.2.2 if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;
 - 15.2.3 if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety, if any,) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses and damages sustained by OWNER arising out of or resulting from completing the Work such excess will be paid to CONTRACTOR. If such claims, costs, losses and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses and damages incurred by OWNER will be reviewed by OWNER'S REPRESENTATIVE as to their reasonableness and when so approved by OWNER'S REPRESENTATIVE incorporated in a Change Order, provided that when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

- 15.3 Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.4 Upon seven days' written notice to CONTRACTOR and OWNER'S REPRESENTATIVE, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Agreement. In such case, CONTRACTOR shall be paid (without duplication of any items):

15.4.1 for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

15.4.2 for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

15.4.3 for all claims, costs, losses and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

15.4.4 for reasonable expenses directly attributable to termination.

CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

CONTRACTOR May Stop Work or Terminate:

15.5 If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or OWNER'S REPRESENTATIVE fails to act on any Application for Payment within thirty days after it is submitted or OWNER fails for thirty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and OWNER'S REPRESENTATIVE, and provided OWNER or OWNER'S REPRESENTATIVE do not remedy such suspension or failure within that time, terminate the Agreement and recover from OWNER payment on the same terms as provided in paragraph 15.4. In lieu of terminating the Agreement and without prejudice to any other right or remedy, if OWNER'S REPRESENTATIVE has failed to act on an Application for Payment within thirty days after it is submitted, or OWNER has failed for thirty days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may upon seven days' written notice to OWNER and OWNER'S REPRESENTATIVE stop the Work until payment of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.5 are not intended to preclude CONTRACTOR from making claim under Articles 11 and 12 for an increase in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping Work as permitted by this paragraph.

END ARTICLE 15

ARTICLE 16 - MISCELLANEOUS

Giving Notice:

- 16.1 Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

Computation of Times:

- 16.2.1 When any period of time is referred to in the Contract Documents by days, it will be computed to include the first and the last day of such period.

Notice of Claim:

- 16.3 Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 16.3 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

Cumulative Remedies:

- 16.4 The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by paragraphs 6.12, 6.16, 6.30, 6.31, 6.32, 13.1, 13.12, 13.14, 14.3 and 15.2 and all of the rights and remedies available to OWNER and OWNER'S REPRESENTATIVE thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

Professional Fees and Court Costs Included:

- 16.5 Whenever reference is made to "claims, costs, losses and damages," it shall include in each case, but not be limited to, all fees and charges of OWNER'S REPRESENTATIVES, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs.

Interest:

- 16.6 In the event that any payment of interest is to be made pursuant to any provision of the Contract Documents, excluding any bid bond, labor and materials bond or performance bond entered into by the CONTRACTOR, interest shall be paid at the average rate

earned by the City of Louisville on its invested funds during the quarterly fiscal period prior to the period during which the interest was accrued.

Third Parties:

- 16.7 The contract is not intended to create any right in or for the public or any member thereof, any subcontractor or supplier, or any other third party, or to authorize anyone not a party to the contract to maintain a suit to enforce its terms. The duties, obligations, and responsibilities of the parties to the contract, with respect to third parties, shall remain as imposed by law. This paragraph shall not apply to any surety to the extent it is acting under any labor and materials bond or performance bond entered into by the CONTRACTOR.

Severability:

- 16.8 To the extent that the performance of the parties' obligations may be accomplished within the intent of the contract, the terms of the contract are severable, and should any term or provision of the contract be declared invalid or become inoperative for any reason, such invalidity or failure shall not affect the validity of any other contract term or provision.

Equal Opportunity Employer:

- 16.9 The CONTRACTOR will not discriminate against any employee or applicant for employment because of race, color, religion, age, sex, disability or national origin. The CONTRACTOR will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard for their race, color, religion, age, sex, disability or national origin. 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. The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notice to be provided by an agency of the federal government, setting forth the provisions of the Equal Opportunity Laws.

The CONTRACTOR shall be in compliance with the appropriate areas of the Americans with Disabilities Act of 1990 as enacted and from time to time amended and any other applicable federal regulation. A signed, written certificate stating compliance with the Americans with Disabilities Act may be requested at any time during the life of any contract and with any contract entered by the OWNER.

END ARTICLE 16

CONDITIONS OF THE CONTRACT

These Supplementary Conditions amend or supplement the General Conditions of the Project Manual as indicated below. All provisions, which are not so amended or supplemented, remain in full force and effect.

1. GC-1 DEFINITIONS

- A. Section 1.9.1, **CONTRACT DAY** of Article 1 of the General Conditions, delete the definition in its entirety and add the following language:

CONTRACT DAY - A calendar day of 24 hours each, excluding Saturdays, Sundays, OWNER observed holidays and Abnormal Weather days.

- B. Section 1.41, **SUBSTANTIAL COMPLETION** of Article 1 of the General Conditions,

Add the following language:

The Work will not be considered suitable for Substantial Completion review until all project Bid Items and incidentals in the Work are completed and operational as designed, all designated or required governmental inspections and certifications have been made and posted, designated instruction of Owner's personnel in the operation of systems has been completed, and all final finishes within the Contract are in place. In general, the only remaining work shall be minor in nature, so that the Owner could occupy the building or utilize the improvements on that date and the completion of the Work by the Contractor would not materially interfere or hamper the Owner's normal operations. As a further condition of Substantial Completion acceptance, the Contractor shall certify that all remaining "punch list" work will be completed within twenty (20) Contract Days after receipt of notification or as agreed upon following the date of issuance of Certificate of Substantial Completion.

2. GC-2 PRELIMINARY MATTERS

Add the following language to Section 2.3 of Article 2 of the General Conditions:

- Contractor shall not park equipment and employee vehicles on abutting side streets that can be used by residents that are directly impacted by the reconstruction.
- Contractor is to achieve substantial completion (minus seeding) for work on Dillon Road east of St Andrews Lane no later than Friday August 8th, 2025 to minimize disruptions to school traffic.

All Locations

- a. Provide ingress, egress to private drives and single access developments.
- b. No work shall be performed on the follow dates and timeframes:

5pm July 3rd through 7am July 7

5pm August 29th through 7am September 2nd

3. GC-4 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS

- A. Section 4.4, **REFERENCE POINTS**, of Article 4 of the General Conditions, delete the second paragraph in its entirety and add the following language:
The OWNER shall not provide survey reference points, construction stakes, lines and grade for the work unless otherwise noted.

4. GC-6 CONTRACTOR'S RESPONSIBILITIES

- A. **Labor, Materials and Equipment**, delete paragraph 6.3 in its entirety and insert the following:

- 6.3 CONTRACTOR shall provide competent, suitably qualified personnel to survey, layout and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except as otherwise required for the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours and CONTRACTOR will not permit overtime work or the performance of Work, or at night without OWNER's written consent given after prior written notice to PROJECT MANAGER. No extra payment will be paid to the CONTRACTOR by the OWNER due to labor overtime or other increased costs of performing the Work on Friday afternoons, or at night. Should the CONTRACTOR desire to work at night between the hours of 5:00 p.m. and 8:00 p.m., Monday-Thursday, from 5 p.m. to 8:00 p.m. Friday, the CONTRACTOR shall submit a written request to the PROJECT MANAGER 24 hours prior. If approval is given by PROJECT MANAGER to CONTRACTOR for authorized overtime work, PROJECT MANAGER and PROJECT MANAGER'S authorized personnel will charge overtime and other incidental administrative expenses necessary for performing inspections between the hours of 5:00 p. m. and 8:00 p.m., Monday-Thursday and 3:30 p.m. to 8:00 p.m. Friday, the CONTRACTOR will be responsible to pay for all such rates and charges, and shall not be granted a Contract Price increase for such charges. Overtime and other incidental administrative expenses for PROJECT MANAGER and PROJECT MANAGER'S authorized personnel are as follows:

DESCRIPTION	HOURLY RATE
Engineer	\$60.00
Construction Inspector	\$45.00
Operations Supervisor	\$45.00
Operations Technician	\$30.00
Clerical	\$25.00
Vehicle	\$15.00

ARTICLE 6 – Page 78, Permits:

- a. Paragraph 6.13.2, add the following language

“A deposit is required for the 2” water meter in an amount of \$2500 and the deposit is reimbursed when the 2” meter is returned, in good condition. Charges for water consumption are waived when water is used for this project. Bulk Water Permit and meter are available from the City of Louisville Operations Division, located at 739 S. 104th St.”

- b. Paragraph 6.13.3, add the following language:

“Right of Way Permit fee is waived for this project.”

5. GC-12 CHANGES OF CONTRACT TIMES

- A. Add the following language to Article 12 of the General Conditions:

12.4 EXTENSIONS OF TIME

- a. The OWNER and CONTRACTOR are both aware that construction will be conducted during spring and summer and that variable weather conditions are typical for the site of the work.
- b. The CONTRACTOR expressly agrees that the Contract Price is based on completion of the work within the times specified in the Agreement and under weather conditions typically encountered during the contemplated construction period at the site of the work.

- C. For purposes of evaluating requests for extensions of time due to abnormal weather conditions, the following conditions, and no others, will be considered unusually severe:
- 1) Precipitation volume exceeding the historical mean for the months of the construction period by more than one standard deviation.
 - 2) Isolated abnormal weather occurrences of a severely destructive nature, which in fact, cause such destruction at the site of the work.
- D. For the purpose of determining mean conditions, all available data contained in the records of the National Weather Service for reporting from Denver, as well as data available from the State Climatologist for the same areas.
- E. The CONTRACTOR further agrees that should a request for time extension due to abnormal weather conditions, the CONTRACTOR shall submit all necessary historical and detailed daily data during the construction period to support the claim.
7. **GC-13 TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

Section 13.11, **CORRECTION OR REMOVAL OF DEFECTIVE WORK** of Article 13 of the General Conditions, add the following language:

Failure or neglect on the part of the PROJECT MANAGER to condemn unsatisfactory material or reject inferior workmanship will in no way release the CONTRACTOR, nor shall it be construed to mean the acceptance of such work, nor shall Final Acceptance bar the OWNER from recovering damages in case fraud was practiced, or for defective work resulting from the CONTRACTOR'S dishonesty.

Work done contrary to or regardless of the instructions of the PROJECT MANAGER, work done without lines, grade and/or cross section stakes and grades shown on the Plans or as given by the PROJECT MANAGER, or any deviation made from the Plans and Specifications without written authority will be considered unauthorized and at the expense of the CONTRACTOR, and will not be measured or paid for by the OWNER. Any and all work so done may be ordered removed and replaced immediately at the CONTRACTOR'S expense.



1.1 GENERAL

- A. Measurement and payment criteria applicable to (portions of) the Work performed under a unit price payment method.
- B. Defect assessment and non-payment for rejected work.

1.2 AUTHORITY

- A. Measurement methods delineated in the individual specification sections complements the criteria of this section. (In the event of conflict, the requirements of the individual specification section govern.)
- B. Take all measurements and compute quantities. The Project Manager will verify measurements and quantities.

1.3 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the City's Project Manager determine payment.
- B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit/lump sum prices contracted.
- C. If the actual Work requires a change that is equal to an increase or decrease that is 25 percent (25%) or more of the Bid Price, then the Owner or Contractor may claim for a Contract Price adjustment.
- D. The Owner reserves the right to remove work from the Contract. If an item is removed from the contract, no payment will be made for said item.

1.3.1 LUMP SUM SCHEDULES

- A. There will be no measurement for lump sum items included in the lump sum schedule.

1.3.2 FORCE ACCOUNT – MINOR CONTRACT REVISIONS

- A. Force account items include the Project Manager's estimate for items included in the Contract. The estimated amounts marked with "AL" will be added to the total bid to determine the amount of performance and payment bonds. Force Account work shall be performed as directed and approved by the City's Project Manager. This is not a lump sum bid item, but rather an allowance for work not reasonably anticipated in the above items.
- B. Payment will be made in accordance with the General Conditions. If additional work as described above is not encountered, this item will not be used.

C. Force Account Descriptions

- i. F/A Minor Contract Revisions – This work consists of minor work and approved by the Project Manager, which is not included in the Contract drawings or specifications, and is necessary to accomplish the scope of work of this contract.

1.4 MEASUREMENT OF QUANTITIES

- A. Measurement by volume: Measured by cubic dimension using mean length, width and height or thickness.
- B. Measurement by area: Measured by square dimension, using mean length and width or radius.
- C. Linear measurement: Measured by linear dimension, at the item centerline or mean chord.
- D. Measurement by weight: The term “ton” will mean the short ton consisting of 2000 pounds avoirdupois.

Materials measured or proportioned by weight shall be weighed on accurate scales. Scales shall be accurate within the allowable tolerances as prescribed by State law. The scales shall be sealed by the measurement Standards Section of the Colorado Department of Agriculture at least once each year, each time the scales are relocated, and as often as the Engineer may deem necessary. Scales shall be furnished by the Contractor or the contractor may utilize commercial scales.

Scales shall be operated according to the Colorado Department of Agriculture’s regulations. Weighers, scales, scale tickets, scale house, and verification of the scales’ accuracy will not be measured and paid for separately, but shall be included in the work.

The Contractor may use either certified hopper scales or certified platform scales.

When platform scales are used to weigh vehicles carrying material paid for by weight, each vehicle shall be weighed by a certified weigher. Hopper scales used to directly measure material paid for by weight shall be operated by certified weighers and provide an accurate net weight.

The operator of each vehicle carrying material measured and paid for by weight shall obtain a scale ticket (certificate of correct weight) from the certified weigher and deliver the ticket to the Engineer at the point of delivery of the material.

The scale ticket shall include the following information:

1. Project Number
2. Date
3. Ticket Number
4. Haul Unit Number
5. Gross weight
6. Tare Weight
7. Net Weight
8. Material Type
9. Certified Weigher's Name

1.5 PAYMENT

- A. Payment includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.
- B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit price for Work which is incorporated in or made necessary by the Work.

1.6 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.

1.7 NON-PAYMENT FOR REJECTED PRODUCTS

- A. Payment will not be made for any of the following:
 1. Products wasted or disposed of in a manner that is not acceptable.
 2. Products determined as unacceptable before or after placement.
 3. Products not completely unloaded from the transporting vehicle.
 4. Products placed beyond the lines and levels of the required Work.
 5. Products remaining on hand after completion of the Work.
 6. Loading, hauling and disposing of rejected Products.

2.0 PRODUCTS - Not Used

3.0 EXECUTION - Not Used

PART 1 - SUMMARY**1.1 SUMMARY:****1.1.1 WORK INCLUDED:**

- A. This Section contains a summary of industry-accepted and recognized standards published by trade associations, government, and institutional organizations, which are referred to in the various sections of these specifications or elsewhere in the Contract Documents.
- B. Standards listed herein are included in the Contract Documents by this reference, and become a part of the Contract Documents to the same extent as though included in their entirety unless specific limitations are noted in the individual Specifications Sections.
- C. Listings of reference standards include name and address of the organization publishing the standard, plus the full name and designator of each of the standards referenced herein.
- D. If a publication date or edition number is listed with the reference standard, that publication date or edition number shall apply; otherwise, the publication date of edition number in effect at the Contract Date shall apply.
- E. Inclusion of reference standards herein does not make the Engineer an agent of the publishing agency, nor does it obligate the Engineer to perform inspections required by or enforce rules or regulations contained in the reference standards.

1.2 REFERENCES:

- 1.2.1 RELATED DOCUMENTS: General Conditions, Supplementary Conditions, and applicable provisions of other Division 1 sections apply to this section.
- 1.2.2 PRECEDENCE OF REQUIREMENTS: In the event of a conflict between the requirements of a published reference standard and the specific requirements of the general conditions, supplementary conditions, or other Contract Documents, or between one reference standard and another reference standard, the more stringent requirements shall take precedence.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1.1 AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

444 North Capital Street NW, Suite 225, Washington, DC 2002

3.1.2 AMERICAN CONCRETE INSTITUTE (ACI)

P.O. Box 19150, Redford Station, Detroit, MI 48219 (313) 372-9800

3.1.3 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

1916 Race Street, Philadelphia, PA 19103 (215) 299-5585

3.1.4 AMERICAN WATER WORKS ASSOCIATION (AWWA):

6666 W. Quincy Ave., Denver, CO 80235 (303) 794-7711

Specifications and Test Methods Specifically Referenced Herein.

3.1.5 PORTLAND CEMENT ASSOCIATION (PCA)

5420 Old Orchard Road, Skokie, IL 60077

(312) 966-6200

Design and Control of Concrete Admixtures.

3.1.6 CITY OF LOUISVILLE

Department of Public Works - Engineering Division

749 Main Street Louisville, Colorado 80027 (303) 335-4608

Design and Construction Standards, 1994 Edition

3.1.7 COLORADO DEPARTMENT OF TRANSPORTATION (CDOT)

4201 E. Arkansas Avenue, Denver, CO 80222

(303) 757-9011

Standard Specification for Road and Bridge Construction, current Edition.

- END OF SECTION -

PART 1 - GENERAL**1.1 SUMMARY:****1.1.1 WORK INCLUDED:**

- A. This section contains a summary of submittals required by the Contract Documents, and establishes the general procedures and requirements for submittals.
- B. Submittals covered under this section include, but are not necessarily limited to, schedules, reports, product data, shop drawings, samples, and miscellaneous data specifically prepared for the work by the Contractor or any subcontractor, manufacturer, or supplier, to illustrate some portion of the work.

1.1.2 RELATED WORK: Specific requirements for submittals are included in the individual specification sections.**1.2 REFERENCES:****1.2.1 RELATED DOCUMENTS:** General conditions, supplementary conditions, and applicable provisions of Division 1 sections apply to this section.**1.3 DEFINITIONS:**

- 1.3.1 **PRODUCT DATA:** As used herein, the term "product data" includes standard printed information published by the manufacturer describing materials, products, systems, and installation instruction not specifically prepared for this project, other than designation of selections from among available choices printed.
- 1.3.2 **SHOP DRAWINGS:** As used herein, the term "shop drawings" includes specially prepared technical data forms including drawings, diagrams, performance curves, data sheets, schedules templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for application to more than one project. Supplier's standard component drawings may be submitted if they clearly show the exact items required for the work, in context with adjacent materials and with such relationships clearly shown. Shop drawings are not part of Contract Documents.
- 1.3.3 **SAMPLES:** As used herein, the term "samples" includes fabricated and unfabricated physical examples of materials, products, and units of work; as complete units or smaller portions of units of work; either for limited visual inspection or, where indicated, for more detailed testing and analysis.
- 1.3.4 **MOCK-UPS:** As used herein, the term "mock-ups" means special on-site or off-site forms of samples, which are too large or otherwise inconvenient for handling in transmittal or submittal form.

- 1.3.5 MISCELLANEOUS DATA: As used herein, the term "miscellaneous data" means various documents related directly to the work, including project photographs, survey data and reports, physical work records, statements of applicability, copies of certificates, bonds, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operation and maintenance materials, overrun stock, security/protection/safety keys, and similar information, devices, materials, which are applicable to the work but not processed as shop drawings, product data, or samples.

1.4 QUALITY ASSURANCE:

1.4.1 GENERAL

- A. No extension of time will be granted, nor will consideration be given to claims arising out of the Contractor's failure to submit shop drawings, product data, samples, or related submittals which do not allow adequate lead time for Engineer's review, and also do not allow ample time for revision, resubmission, and subsequent review by Engineer as required.

- 1.4.2 PERFORMANCE: Promptly check each submittal for accuracy, completeness, and applicability, and review, approve, and submit - in sequence according to the submittal schedule so as to cause no delay in the work or in the work of the OWNER or any separate Contractor - all submittals required by the Contract Documents. Identify each submittal to include name of project, specification section, supplier, source, finish, and location of use in the project.

1.4.3 VERIFICATION:

- A. By making a submittal to the ENGINEER, the Contractor represents that he has approved such submittals and has determined and verified:
1. The applicability of the submittal to the project,
 2. all quantities and sizes of materials, detailed fabricating dimensions, temporary erection connections or closures, tolerances and the proper fit and mating with adjacent materials,
 3. related field measurements and field construction criteria, and
 4. information pertaining to fabrication process and techniques of construction and erection.
- B. The Contractor further represents that he has checked and coordinated information contained within such submittal with requirements of the work and of the Contract Documents.

- 1.4.4 RESPONSIBILITY: The Contractor shall not be relieved of responsibility for any deviation from requirements of the Contract Documents by the Engineer review of submittals, unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submission, and the Engineer has taken no written exception to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in submittals by the Engineer's review of or action upon such submittals.
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- 1.4.5 SUBMITTAL VALIDITY: Submittals submitted which are not required to be submitted or are submitted without the Contractor's approval will not be processed by the Engineer, but will be returned to the Contractor for his compliance with Contract Document requirements, in which event it shall be deemed that the Contractor has not complied with requirements of the Contract Documents, and the Contractor shall bear responsibility for all delays as if no submittals had been submitted.
- 1.4.6 COMMENCEMENT OF WORK: No portion of the work requiring submittals shall be commenced until submittals have been acted on by the Engineer. All such portions of the work shall be in accordance with appropriate, required submittals. **All submittals shall be submitted to the Project Manager prior to commencement of project construction.**

1.5 GENERAL SUBMITTAL REQUIREMENTS:

- 1.5.1 SCHEDULING: Where appropriate in various required administrative submittals (listing of products, manufacturers, suppliers, sub Contractors, and in the progress schedule), show principal work-related submittal requirements and time schedules for coordination and integration of submittal activity with related work.
- 1.5.2 COORDINATION AND SEQUENCING: Coordinate preparation and processing of submittals with performance of work so that the work will not be delayed by submittals. Coordinate and sequence different categories of submittals for the same work, and for interfacing units of work, so that one will not be delayed by coordination with another. No extension of time will be allowed because of failure to properly coordinate and sequence submittals.
- 1.5.3 PREPARATION OF SUBMITTALS: Provide permanent marking on each submittal to identify project, date, Contractor, subcontractor, submittal name, applicable specification section, and similar information to distinguish it from other submittals. Show evidence of Contractor's review by clearly exhibiting check marks and stamped approval marking acceptance, and provide space for the Engineer's and Engineer's consultant's review or action marking. Package each submittal appropriately for transmittal and handling.
- 1.5.4 SPECIFIC CATEGORY SUBMITTAL REQUIREMENTS: Except as otherwise indicated in individual specifications sections, comply with general requirements specified herein for each indicated submittal category. Furnish and process intermediate submittals, where required between initial and final, similar to initial submittals(s).
- 1.5.5 PROGRESS SCHEDULE: Refer to supplementary conditions for progress schedule requirements.
- 1.5.6 DAILY REPORTS: Furnish copies of each daily report prepared by the Contractor's Project Superintendent to the Engineer and the OWNER "Transmit reports on a daily basis.

1.5.7 SHOP DRAWINGS:

- A. Furnish newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated), with name of preparer (firm name) indicated thereon. Affix seal of Contractor's or fabricator's design Engineer where applicable. Show all dimensions, and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards, and special coordination requirements.
- B. Where shop drawings are normally required, and where specifically called for in the specifications, submit to the Engineer four (4) blue-line or blackline prints of each shop drawing and/or schedule required. Two prints will be returned.
- C. Subsequent submittal(s) if required for correction or confirmation of corrective items shall be same as initial submittal except as otherwise requested by Engineer or specified in conditions of the contract.
- D. Shop drawings and schedules will be reviewed for general conformance with the design concept contained within the Contract Documents.
- E. Do not allow shop drawing copies into field without appropriate final markings by Engineer.

1.5.8 PRODUCT DATA:

- A. Collect required data into one submittal for each unit of work or system. Mark each copy in a legible and reproducible manner to show which choices and options are applicable to the project; "highlighting" with colored markers not acceptable. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements.
- B. Do not submit product data, or allow its use on the project, until compliance with requirements of Contract Documents has been confirmed by Contractor. Submittals of product data are for information and record, unless otherwise indicated.
- C. The initial submittal will be the only submittal required unless returned promptly by the Engineer, marked with an action which indicated an observed noncompliance. Submit 4 copies, each marked or labeled with project name, date, Contractor, subcontractor, submittal name, applicable specification section, and similar information to distinguish it from other submittals. Provide sufficient space for Engineer's action stamp. The Engineer will retain two copies for himself and return the rest.
- D. Do not proceed with installation of materials, products, or systems, until a copy of applicable product data is in the possession of the installer.
- E. Maintain one set of product data for each submittal at the project site.

- 1.5.9 PUBLISHED STANDARDS: Where submittal of published standards is required, except where specified integrally with "Product Data" submittals, submit a single copy for the Engineers use. Where workmanship at the project site and elsewhere is governed by published standards, furnish additional copies to fabricators, installers and others involved in performance of the work.
- 1.5.10 CONSTRUCTION PHOTOGRAPHS: Unless otherwise provided in the Contract Documents, the OWNER will arrange and pay for construction photographs, and/or videotapes.

PART 2- PRODUCTS (Not Used)

(Not Used)

PART 3 - EXECUTION

3.1 SCHEDULES:

- 3.1.1 SUBMITTAL SCHEDULE: The following scheduled is included as a checklist for convenience only, and may not include all submittals required. Failure to include submittals in this schedule does not relieve the Contractor from providing submittals if required by individual specification sections.

General Requirements		
Section	Title	Submittals Required
01 00 60	Testing and Inspections	Concrete Inspection
01 00 80	Contract Closeout	Record documents, Certificates of Compliance, Certificates of Inspection, Warranties, Guaranties, Bonds, Insurance Certificates, Consent of Surety, Releases of Liens, List of subcontractors and suppliers Acknowledgment of date of commencement of warranties and guaranties.
Technical Specifications		
Section	Title	Submittals Required
02 40 00	Concrete	Mix Design, Color
02 60 00	Traffic Control	Diagrams by phase
02 50 00	Asphalt	As needed for repairs
03 84 00	Irrigation	Pipe, Glue, Wire, Heads, Nozzles, Valves if needed
Drawings	Boulders	Source, Size, Color (Photo of materials)
Drawings	Rock Walls	Source, Size, Color (Photo of materials)
32 92 19	Seed	Seed mix
32 93 13	Groundcover	Fabric, Bed Materials (1 gallon Samples)

- END OF SECTION -

PART 1 - SUMMARY:**1.1.1 WORK INCLUDED:**

- A. This section defines the responsibilities of the various agencies or parties performing testing and inspection services as specified herein or required by the Contract Documents.
- B. Quality assurance testing and inspections will be provided by an independent testing and inspections agency selected and paid for by the OWNER.
- C. Cooperate with the selected testing and inspections agency and all others who may be responsible for testing and inspection of the work.

1.1.2 RELATED WORK: Specific testing and inspection requirements are described in the various sections of these specifications. Failure to list specific testing or inspection requirements does not relieve the Contractor from providing all tests, which are indicated to be his responsibility, or from cooperating with the testing and inspections agency.

1.1.3 LIMITATION OF AUTHORITY: The testing and inspections agency is not authorized to release, revoke, or alter the requirements of the Contract Documents, or to approve or accept any portion of the work without the Engineers written consent.

1.2 REFERENCES:

1.2.1 RELATED DOCUMENTS: General conditions, supplementary conditions, and applicable provisions of other Division 1 Sections apply to this Section.

1.2.2 REFERENCE STANDARDS: Comply with the requirements of all reference standards, codes, ordinances, rules, and regulations contained in the various sections of these specifications, except where more stringent requirements are listed herein or otherwise required by the Contract Documents. A complete listing of applicable reference standards, including full name of publishing agency and date or number is contained in section 01 00 40.

1.3 DEFINITIONS:

1.3.1 QUALITY ASSURANCE TESTS AND INSPECTIONS: All tests and inspections specified herein or elsewhere in the Contract Documents which are performed by an independent testing and inspections agency to determine compliance of materials, products, equipment, or completed work with the requirements of the Contract Documents.

1.3.2 CODE COMPLIANCE TESTS AND INSPECTIONS: Mandatory tests or inspections required by codes or ordinances, or other authorities having jurisdiction over the work.

1.3.3 CONTRACTOR'S CONVENIENCE TESTS AND INSPECTIONS: Tests or inspections informed exclusively for the Contractor's convenience or information.

- 1.3.4 RE-TESTING:** Subsequent testing or inspections of the work or any portion of the work for which initial testing has indicated non-compliance with the Contract Documents or with applicable codes, ordinances, rules, and regulations.
- 1.4 SUBMITTALS:**
- 1.4.1 TEST AND INSPECTION REPORTS:** Copies of all test and inspection reports will be promptly delivered by the testing and inspections agency directly to the OWNER and ENGINEER.
- 1.5 PAYMENT FOR TESTS AND INSPECTIONS:**
- 1.5.1 INITIAL QUALITY ASSURANCE TESTS AND INSPECTIONS:** Paid for by the OWNER.
- 1.5.2 CODE COMPLIANCE TESTS AND INSPECTION:** Paid for by the Contractor.
- 1.5.3 CONTRACTOR'S CONVENIENCE TESTS AND INSPECTIONS:** Paid for by the Contractor.
- 1.5.4 ADDITIONAL OR ALTERNATIVE TESTS AND INSPECTIONS:** Paid for by the OWNER if the materials or work tested is found to be in compliance with the Contract Documents; otherwise paid for by the Contractor.
- 1.5.5 RE-TESTING:** Paid for by the Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

- 3.1 COOPERATION WITH TESTING AND INSPECTIONS AGENCY:**
- 3.1.1 ACCESS TO THE WORK:** Representatives of the testing and inspections agency or other legally constituted testing or inspections personnel shall have unrestricted access to the site and all other locations where the work is in progress, including borrow pits, batch plants, material yards, or other locations where materials are being obtained, fabricated, or stored.
- 3.1.2 FACILITIES FOR TESTING:** Provide all necessary facilities required for testing and inspecting the work, including but not limited to, lifts, and suitable safe storage areas for freshly poured concrete test cylinders.
- 3.1.3 NOTIFICATION:** Notify the ENGINEER not less than forty-eight (48) hours prior to tentative date or time when testing and inspection services will be required. Re-confirm date and time not less than twenty-four (24) hours prior to time when such services will be required. Engineer will schedule testing and inspection agency.
- 3.2 TEST AND INSPECTION PROCEDURES:**

- 3.2.1 GENERAL:** Gathering of specimens or samples, measuring, and testing of all materials, products, or other work shall be performed according to the procedures of the referenced standard test method.
- 3.2.2 TAKING SPECIMENS:** Unless otherwise indicated, all specimens and samples for testing will be taken by the testing and inspections agency personnel, either at the source of the material or at the site for work in progress.
- 3.2.3 DELIVERY OF SPECIMENS:** Unless otherwise indicated, pick-up and delivery of specimens or samples to the testing and inspections agency's laboratory will be done by the agency's personnel. This includes concrete test cylinders, which have been stored on site for the initial curing period.
- 3.2.4 RE-TESTING:** When initial tests or inspections indicate non-compliance of the work or any portion thereof, the non-complying portion shall be removed, replaced, or reworked (re-compacted in the case of subgrade, fill, or backfill material), and re-tested by the same agency performing the initial test or inspection. Do not proceed with additional work until the non-complying work has re-tested and found to be in compliance.

3.2.5 ADDITIONAL OR ALTERNATIVE TESTS:

- A. The Owner and the Engineer reserve the right to require additional or alternative tests or inspections of materials or work for which either has reason to believe may not be in compliance with the requirements of the Contract Documents.
- B. Examples of such additional tests may include, but are not limited to, additional sieve analysis of aggregates or granular fill material; additional field density tests of subgrade, fill, or backfill materials; additional slump tests of concrete as it is being placed; core tests of in-place structural concrete; load testing of concrete structures; x-ray or other non-destructive testing of structural steel; and field-cut test strips of membrane roofing.
- C. Payment for additional or alternative tests will be determined as provided herein above.

3.3 SCHEDULES:

3.3.1 SCHEDULE OF QUALITY CONTROL TESTS AND INSPECTIONS:

- A. The following schedule is included for information only, as a convenience to the Contractor, and is not intended to limit the number and type of tests to be performed by the testing and inspections agency.
- B. Carefully examine the individual sections of these specifications for additional or complete quality control testing and inspections requirements. Failure to include any test or inspection in this schedule does not relieve the Contractor from the testing and inspection requirements contained in the individual sections of the specifications.

- C. This schedule includes quality control tests and inspections only, which will be performed by the selected testing and inspections agency and paid for as previously mentioned in Article 13 of the General Conditions. Code compliance tests and inspections, Contractor's convenience tests and inspections, and additional or alternative tests and inspections requested by the City are not included.

Section	Description of Test or Inspection	Test Qty/Interval
Earthwork	Fill and Backfill Material (Lab):	1 each test/soil type
	Moisture Content - ASTM D2216	
	Max. Index Density - ASTM D4253	
	Moisture/Density Rel. - ASTM D698 or ASTM D1557	
	Plasticity Index - ASTM D4318	
	Particle Size Analysis - ASTM D422	
	Field Density Tests - ASTM D 1556, D2167, or D2922, Field Moisture	
	Tests - ASTM D3017:	
	Subgrade:	One/500 sf
	Fill, Bldg and Paved Areas:	One/500 sf per lift
	Backfill:	One/250 sf/2 ft vert.
	Site and Misc. Fills:	One/500 sf/1 ft vert.

Section	Description of Test or Inspection	Test Qty/Interval
Utilities	Bedding material (Laboratory):	
	Particle Size Analysis -	
	ASTM D422	1/soil type
	Backfill Material (Laboratory):	
	Moisture/Density Relation -	
	ASTM D698 or D1557	1/soil type
	Field Density Tests - ASTM D1556, D2167, or D2922; Field Moisture	
	Tests - ASTM D3017:	One/150 lf @ trench bottom at 2 ft. vert intervals, and at top
Paving	Asphalt Content - ASTM D 2172; Asphalt Gradation - ASTM in C136; Bulk specific gravity - ASTM D1188; AASHTO T 166;	
	Marshall Test - ASTM D 1559:	
		One each/500 tons, min 2/day
Concrete	Concrete Quality:	
	Fresh Concrete - ASTM C172	One each/50 C.Y. or
	Compressive Strength - ASTM C39	major fraction thereof;
	Unit Weight - ASTM C138	min 1/pour
	Slump - ASTM C143;	
	Air Content - ASTM C173 or C231:	
	Hardened Concrete (failings only) ASTM C42, C803, C805, or load tests:	One each/truck As determined by Engineer

- END OF SECTION -

PART 1 - GENERAL**1.1 SUMMARY:**

- 1.1.1 WORK INCLUDED: Provide temporary utilities and miscellaneous temporary facilities required during construction, including installation, maintenance, and removal upon completion of the work.

1.2 REFERENCES:**1.2.1 RELATED DOCUMENTS:**

- A. General conditions, supplementary conditions, and applicable provisions of other Division 1 sections apply to this section.
- B. Section 02600 Construction Zone Traffic Control.

PART 2 - PRODUCTS**2.1 TEMPORARY CONSTRUCTION FACILITIES:**

- 2.1.1 STORAGE STRUCTURES: Provide enclosed, weather tight storage facilities for materials and equipment, which require protection from the elements.

2.1.2 SANITARY FACILITIES:

- A. Provide temporary toilet facilities for duration of work, for use by any and all employees engaged in the work. Comply with requirements of applicable codes, regulations, laws, and ordinances.
- B. **PROJECT MANAGER shall approve locations of all temporary toilet facilities for the work. Contractor shall instruct any and all employees engaged in the work to use the designated temporary toilet facility or other approved toilet facility.**

2.1.3 FENCES AND BARRICADES:

- A. Provide temporary orange fences along the property owner side of the construction limits as shown on the plans. In the remaining work areas and streets provide traffic control devices as may be specified elsewhere within certain sections of the specifications, and as may be required by local code or authority and as required to maintain safety of work place.
- B. Maintain temporary fences, bulkheads, and other protective facilities in good condition throughout the term of the work. Remove at completion of the work and replace or repair all work damaged thereby. Repair or replace on a daily basis safety facilities or devices damaged or removed during the course of the work.

2.1.4 CONSTRUCTION STAGING

- A. Coordinate construction activities with the property and business owners to minimize impacts.
- B. The Contractor will not be permitted to operate trucks and equipment or store equipment and supplies on private property unless he has written permission to do so.

2.1.5 STORAGE OF MATERIALS/EQUIPMENT ETC.

- A. CONTRACTOR shall not be allowed to park any vehicles (including worker's personal vehicles) or equipment in any on-street parking spaces that are open to traffic.
- B. No construction trailers or storage yards will be allowed in the work area and neighborhood. Contractor shall locate trailer/storage yard subject to approval of ENGINEER.

2.3 TEMPORARY CONTROLS

- A. Noise Control. Equip construction machinery and vehicles with practical sound and muffling devices and operate in a manner to minimize noise consistent with efficient performance of the work.
- B. Dust Control.
 - 1. Take reasonable measures to prevent unnecessary dust.
 - 2. Moisten dirt roads used for transportation and haul with water or apply a chemical dust suppressant to control dust.
 - 3. Cover dusty material in transit when necessary to prevent blowing.
- C. Pollution Control.
 - 1. Prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris and other substances resulting from construction activities.
 - 2. Retain all spent oils, hydraulic fluids and other petroleum fluids in containers for disposal off the site.
 - 3. Do not perform equipment maintenance or fueling within 50 feet of any water course.
- D. Erosion Control.
 - 1. Take such measures as are necessary to prevent erosion of soil on the site and adjacent properties that might result from construction activities.
 - 2. Provide temporary materials such as hay bales, sand bags or plastic sheets, to prevent the erosion of banks or excavation where runoff may be increased or concentrated due to construction activities.

3. Take such measures as are necessary to prevent soil, mud, debris, etc. from entering the storm sewer system. Contractor shall be responsible for cleaning existing storm sewer downstream of the site if any soil, mud, debris, etc. enter it from the site. Engineer shall inspect system prior to final inspection and required cleaning will be noted on the punch list. Contractor shall clean to the satisfaction of the engineer.

2.4 OTHER TEMPORARY SERVICES:

2.4.1 CLEANING:

- A. Provide daily sweeping and cleanup of dust, debris, litter, trash containers, and other items required to maintain a clean, orderly, and accessible site. Hauling of debris to legal dump or landfill is required daily as a minimum.
- B. Provide daily sweeping or cleaning of adjacent streets and walkways as required to prevent accumulation of mud, dust, or soil thereon from construction traffic and personnel.
- C. The CONTRACTOR shall at his/her own expense clean up and removed all refuse and unused materials of any kind resulting from the work. Upon failure to do so within seventy-two (72) hours after request by the ENGINEER, the work may be done by the OWNER and the cost thereof be charged to the CONTRACTOR and deducted from his/her final estimate.

2.4.2 ACCESS RAMPS:

- A. During resurfacing activities (milling and leveling) provide hard surface ramps as directed by the Engineer to access private property, public property, pedestrian crossings, streets and alleys.

2.4.3 OWNER MAINTAINED FACILITIES:

- A. During construction activities including but not limited to demolition, unclassified excavation, subgrade cement treatment, and asphalt paving, CONTRACTOR shall protect from damage all OWNER maintained facilities. Street signage, storm sewer inlets and manholes, sanitary sewer manholes, water main valve boxes and water service curb stop boxes damaged or backfilled during construction shall be repaired, replaced and made accessible. Backfilled manholes and inlets shall be cleaned immediately. Upon failure to repair, replace or clean OWNER maintained facilities promptly, the work may be completed by the OWNER and the cost thereof be charged to the Contractor and deducted from his/her final estimate.

PART 3 - EXECUTION

3.1 MAINTENANCE OF TEMPORARY FACILITIES:

- 3.1.1 TEMPORARY STRUCTURES: Maintain temporary offices, storage facilities, sanitary facilities, fire protection facilities, trailers, fences, barricades, and other structures in a neat, orderly appearance for the duration of the work.
- 3.1.2 REMOVAL OF TEMPORARY FACILITIES: Remove temporary facilities and structures from the site as soon as practicable or when no longer required by the Contractor or subcontractors. Restore areas occupied by temporary facilities to like new condition, or to match surrounding areas.

PART 4 - MEASUREMENT AND PAYMENT

4.1 SUMMARY

- 4.1.1 Temporary Facilities and Controls and Services will not be paid for separately but shall be included in the work.

- END OF SECTION -

PART 1 - GENERAL**1.1 SUMMARY:**

- 1.1.1 WORK INCLUDED: This section includes administrative procedures and closeout submittals required at substantial completion and final completion of the work.
- 1.1.2 RELATED WORK: Additional specific requirements are specified in the various sections of these specifications.

1.2 REFERENCES:

- 1.2.1 RELATED DOCUMENTS: General conditions, supplementary conditions, and applicable provisions of these specifications apply to this section.

1.3 DEFINITIONS:

- 1.3.1 CONTRACT CLOSEOUT: Contract close-out is defined to include general administrative requirements near the end of the contract time, in preparation for final acceptance, final payment, normal completion of the contract, occupancy by Owner, and similar actions evidencing completion of the work. Time of close-out is directly related to substantial completion, and therefore may be either a single time period for the entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates. That time variation, if any, shall be applicable to other provisions of this section.

1.4 SUBMITTALS**1.4.1 RECORD DOCUMENTS - GENERAL:**

- A. Additional or specific requirements for record documents are indicated in individual sections of these specifications.
- B. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire resistive location.
- C. Provide access to record documents for Engineer's or Owner's reference during normal working hours.
- D. Review record documents for progress and accuracy at regularly scheduled job progress meetings.
- E. Upon completion of mark-up, submit record documents to the Engineer for the Owner's records.

1.4.2 RECORD DRAWINGS (FIELD SET):

- A. Maintain at the project site during the course of the work a white print set (blueline or blackline) of contract drawings and shop drawings in clean, undamaged condition, with mark-ups of actual installations which vary substantially from the work as originally shown.
- B. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark up, record a cross reference at corresponding locations on the contract drawings.
- C. Mark changes or deviations with red erasable pencil. Where feasible, use other colors to distinguish between variations in separate categories of work.
- D. Record new information, which is recognized to be of importance to the Owner, but was not shown on either the contract drawings or shop drawings. "Give particular attention to concealed work which would be difficult to measure and record at a later date. Note related change order or field order numbers where applicable.
- E. Record all deviations in sizes, locations, or other features of work from the Contract Documents. It shall be possible, using these drawings, to correctly and easily locate, identify, and establish sizes of all piping, directions of flow, and other features of the work which will be concealed in finished work or underground.
- F. Establish locations of concealed and underground work by accurate dimensions to column lines or permanent walls, locating all bends or turns, and properly referencing invert elevations and rates of fall.
- G. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on cover of each set.

1.4.3 FINAL RECORD DRAWINGS (AS-BUILTS):

- A. Submit the final marked-up field copy of record drawings to the Engineer for review and approval.

1.4.4 RECORD SPECIFICATIONS:

- A. Maintain one copy of specifications, including addenda, change orders, and similar modifications issued in printed form during construction. Mark up variations of substance in actual work in comparison with text of specifications and modifications as issued.
- B. Give particular attention to substitutions, selection of options, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation.
- C. Note related record drawing information and product data where applicable.
- D. Label record specifications with the words "RECORD COPY" and the date submitted, stamped or neatly printed in block letters on the cover.

1.4.5 OTHER DOCUMENTS: Submit the required number of the following additional documents, which may be required by the various specification sections:

- 1) Certificates of compliance with applicable reference standards.
- 2) Certificates of inspection or other evidence of compliance with governmental agencies or authorities having jurisdiction over the work.
- 3) Warranties, guarantees, and bonds.
- 4) Certificates of insurance for products and completed operations.
- 5) Written consent of surety.
- 6) Evidence of payment and release of liens for subcontractors, suppliers, and other goods and services (Claims Release Forms).
- 7) Certificate of substantial completion form signed by Contractor accepting the date of substantial completion.
- 8) Final Inspection report signed by Contractor.
- 9) Certificate of final completion signed by the CONTRACTOR acknowledging the date of final completion.
- 10) Operations and maintenance manuals as required.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PREREQUISITES:

3.1.1 FINAL COMPLETION: Prior to requesting the City's final observation for certification of final acceptance and payment, as required by the general and supplemental conditions, complete the following:

- 1) Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required. List known exceptions to final completion of the work, if any, in the request.
- 2) Submit updated final statement, accounting for additional changes to contract sum.
- 3) Submit certified copy of final punch list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.
- 4) Submit written consent of surety.
- 5) Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.

- END OF SECTION -

SECTION 02 40 00**CONCRETE AND CONCRETE REPLACEMENT****1.0 SCOPE OF WORK**

- A. The work shall consist of, but not be limited to, removal and replacement of the following: sidewalk, vertical curb and gutter, curb walk, bike trail, modified curb and gutter, median curb and gutter, ramp drives, crosspans, handicap ramps and truncated domes as shown on the plans.

2.0 CITY DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS

Any and all materials required for this project shall be pursuant to the requirements of the City of Louisville, Colorado "Design and Construction Standards, adopted February 15, 1994 and the latest revisions thereto except as modified by these plans and/or specifications.

3.0 MATERIALS**CEMENT**

All cement used in concrete work shall be Portland cement Type II or Type IIA conforming to all requirements of AASHTO M85. **Fly ash and water reducer shall not be permitted to be used as a substitute for any portion of the cement content required in the mix, unless otherwise approved by the City Engineer.**

The concrete mix shall not contain less than 660 lbs. (7 sacks) of cement per cubic yard.

WATER

Water used in mixing shall be reasonably clean and free of oil, salt, acid, alkali, sugar, organic matter, or other substance injurious to the finished product. Water shall be in accordance with and shall meet the suggested requirements of AASHTO T-26. Where the source of water is relatively shallow, the intake shall be so enclosed as to exclude silt, mud, grass, or other foreign materials. In addition the pH shall be between 4.5 and 8.5. Neutralization by chemical additives will not be permitted. Water known to be of potable quality may be used without test.

The water to cement ratio including surface water on the aggregates shall not exceed 0.45 upon placement of the concrete.

ADMIXTURES

Water Reducing Agent shall be incorporated in the dense medium strength concrete mix (CDOT Class D) for high-early mix only.

AIR-ENTRAINING AGENTS

An air-entraining agent shall be added to the concrete mixture. Air entraining admixtures shall conform to ASTM C 260. All air-entraining agents shall be reasonably new material, thoroughly mixed and protected at all times from freezing. The air content in the concrete mix shall be 5 to 8 percent as determined by ASTM C 231 or ASTM C 173.

FINE AGGREGATE

1) Composition: Fine aggregate shall consist of natural sand, composed of clean, hard, durable, uncoated grains, preferably of siliceous materials.

	<u>Maximum Percent by Weight</u>
CLAY LUMPS	1.0
COAL, LIGNITE, OR SHALE	1.0
MATERIAL PASSING NO. 200 SIEVE	4.0

The sum of the above materials and other deleterious substances such as shale, alkali, mica, coated grains or soft and flaky particles shall not exceed four percent by weight.

2) Deleterious Substances: The maximum percentage of deleterious substances shall not exceed the following values:

Material finer than 200 mesh sieve	3% by weight
Shale	1% by weight
Coal and lignite	1/4% by weight
Clay lumps	1% by weight
Other deleterious substances	2% by weight

The sum of the percentages of the above deleterious substances shall not exceed five per cent (5%) by weight. All fine aggregate shall be free from injurious amounts of alkali and organic impurities.

3) Grading: Fine aggregate shall be well graded from coarse to fine, and when tested by standard laboratory sieves, shall conform to the following:

	<u>Percent by Weight</u>
Passing 3/8"	100
Passing No. 4 Sieve	95-100
Passing No. 16 Sieve	45-80
Passing No. 50 Sieve	10-30
Passing No. 100 Sieve	2 -10

4) Other Requirements: The fine aggregate shall conform to AASHTO M6.

COARSE AGGREGATE

1) Composition: Coarse aggregate shall consist of crushed limestone, trap rock, granite, washed gravel or other approved inert materials having clean, hard, strong, durable pieces, free from adherent coatings and conforming to the requirements of these specifications.

2) Deleterious Substances: The maximum percentage of deleterious substances shall not exceed the following values:

Material finer than 200 mesh sieve	1% by weight
Coal and lignite	1/4% by weight
Clay lumps	1/4% by weight
Soft fragments	3% by weight
Other deleterious substances	2% by weight

The sum of the percentages of the above deleterious substances shall not exceed five per cent (5%) by weight.

3) Grading: Coarse aggregate shall be well graded between the limits specified and shall conform to the following requirements:

Nominal Maximum Maximum Size	Percentages by Weight Passing Standard Laboratory Sieve having Square Openings					
	1 1/2"	1"	3/4"	1/2"	3/8"	No. 4
3/4"		100	90-100		20-55	0-10

Not more than 5% shall pass a No. 8 sieve.

4) Wear and Soundness: Coarse aggregates for concrete shall have a percentage of wear of not more than 40 when tested in accordance with AASHTO T-96 or show a sodium sulfate loss not to exceed 12 percent (12%) when tested in accordance with AASHTO T-104. The wear and soundness requirements may be waived, or modified, by the Engineer provided that the coarse aggregate has a proven service record for similar service and exposure.

5) Other Requirements: Coarse aggregate shall conform to the requirements of AASHTO M80.

MIX DESIGN

A mix design is required to be made by a certified testing laboratory, and submitted to the Engineer for approval two weeks prior to the placing of any concrete. The minimum 28 day compressive strength shall be 4500 psi based on field cast cylinders. Compressive strength shall be as determined by ASTM C 39. The maximum slump of the delivered concrete shall be 4". Batching proportions shall conform to the approved mix design. If any concrete fails to conform to the proportions of the approved mix design, such concrete shall not be incorporated in the work, but shall be discarded off the project site as waste material at the Contractor's expense.

CONCRETE CROSSPANS

Regarding repair of crosspans, only one half of a crossspan shall be closed to traffic at anytime unless secondary access is available to the streets and businesses impacted or unless otherwise approved by the engineer. **When individual panels or when one half of a**

crossspan is constructed, contractor shall provide high early strength concrete at no additional compensation.

HIGH EARLY MIX

CONCRETE MIX PROPORTIONS:

	<u>ASTM</u>	<u>Varies</u>	<u>Cubic Yard</u>	<u>Units</u>	
Cement	C-150		705	lbs	
Sand	C-33		1210	lbs	
#57/67 Agg.	C-33		1770	lbs	
AEA	C-260	0 to 8 oz/cy	4.5	oz	
MRWR	C-494	0 to 10 oz/cwt	50.0	oz	
HRWR	C-494	0 to 10 oz/cwt	7.0	oz	
Hyd Stab.	C-494	0 to 9 oz/cwt	0.0	oz	
Water	C-94		266.6	lbs	32 Gal.

PHYSICAL PROPERTIES OF MIX

TARGET

Slump	5.00-800"
Air content	4.5-7.5%
Unit Weight	143.30
Water/Cement Ratio	.40 Max
Yield	27

4.0 EXECUTION

CONCRETE REMOVAL

The Engineer will delineate the limits to which the existing concrete is to be removed and replaced. Removal and replacement of existing concrete beyond the limits designated by the Engineer shall be at the Contractor's expense. The minimum length of replacement concrete shall be 5 feet on vertical curb and gutter and curbside and 4 feet on sidewalk. All removals shall be full depth saw cut or removed at existing cold or expansion joints. Sections of concrete that are removed shall be replaced the same day. When weather conditions restrict replacing sections of concrete the same day, lighted barricades must be provided.

Where repairs are made in existing concrete all edges of the existing concrete and asphalt to remain shall be a full depth saw cut. No rough, chipped or broken edges will be permitted where new construction joins old. The Contractor shall maintain a straight, true break line. The Contractor shall be responsible for removal and replacement of all over break. The Contractor will be responsible for damage to existing asphalt and concrete adjacent to concrete replacement. Damages to existing asphalt and concrete due to Contractor's operations, shall be removed and replaced by the Contractor at his expense.

No pruning shall be allowed wherever concrete is adjacent to hedges, evergreens or other landscaping that overhangs existing concrete marked for replacement. The Contractor shall tie back hedges, evergreens or other landscaping.

Contractor shall not remove asphalt adjacent to concrete unless approved by the Engineer. Saw cutting between existing asphalt and concrete for removal shall not be paid for separately but included in the work.

Prior to concrete removal the Contractor shall locate all water service and sewer service crossings where previously designated or inscribed on the curb and gutter. Owner will paint water and sanitary sewer service crossings on non-inscribed concrete. Contractor shall inscribe on the curb face the service crossing locations with "V" for water services and "X" for sewer service.

If construction involves a driveway, the Contractor shall schedule arrangements of construction with the resident.

The Contractor shall properly dispose of broken concrete, unusable materials and surplus excavated materials due to concrete replacement off site the same day and the construction site shall be left clean and orderly. All parts of the construction site shall be left in a condition acceptable to the Engineer. The Contractor shall make all necessary arrangements for obtaining suitable disposal locations.

COMPACTION

All areas in which concrete has been removed shall receive compaction by vibrating, tamping, or combination to achieve the degree of compaction specified.

Maximum dry density of all soil types encountered or to be used will be determined in accordance with AASHTO T99, or AASHTO T 180.

The amount of water to be used in compacting all materials shall not deviate from optimum by more than two percentage points as determined by AASHTO T 99 or T 180.

The percent of compaction specified shall be equal to or greater than minimum values as shown in the following table for the various classes of soil and type of compaction.

Soil Classification (AASHTO M 145)	<u>AASHTO T 99</u>	<u>AASHTO T 180</u>
	Minimum Relative (Percent)	Minimum Relative (Percent)
A-1 through A-5		95
All Others	95	

Density testing will be performed by an independent soils testing firm employed by the Owner. Any and all retesting of soil to achieve required passing test results necessitated by the Contractors operations or inability to obtain specified results on the first attempt shall be the sole responsibility and cost of the Contractor.

WATER QUALITY

Contractor shall provide labor, equipment, and materials required to contain concrete spoils, concrete slurry, dirt, tack, asphalt, construction debris, etc. and protect the City's storm sewer facilities from construction contaminants. Contractor shall promptly remove from the site any potential storm water contaminants. Removal and disposal methods shall meet local and state regulations.

AIR QUALITY

The Contractor shall be responsible to see that dust from waste concrete be kept to a minimum during removal, loading, transferring and disposal of concrete.

EXCAVATION

Excavation on concrete replacement shall be made to a minimum depth of 8 inches below the proposed concrete subgrade to provide a stable, uniform subgrade. All soft and yielding material shall be removed and replaced with acceptable material. **No separate payment will be made for excavation to depth mentioned and replacement of unacceptable material.** All excess excavated materials shall become the property of the Contractor.

SUBGRADE PREPARATION AND FILL

Fill shall be placed in lifts, brought to proper moisture and compacted to the percent specified. The Contractor will provide backfill material if required. The Contractor will be responsible for loading, haul, installation and placing fill material, subgrade preparation, compaction and grading.

BACKFILL AND LANDSCAPE RESTORATION

Upon removal of the concrete forms, all concrete replacement items shall be backfilled with suitable material (topsoil) and landscaping restored. Contractor shall restore the entire surface area that has been disturbed by the Work to match the condition that existing prior to the construction.

Should the Contractor fail to backfill and restore landscaping within ten (10) days after receiving written notice from the Engineer, the Owner may backfill and restore landscaping at the Contractor's expense.

The landscaped area to be restored shall be 18" wide or as determined by the Engineer. The Contractor shall clean the area of all debris (i.e. concrete spoils, rocks, etc.) to a minimum depth of six (6) inches, prepare all edges to be clean and vertical and backfill (place topsoil), compact, grade and restore landscaping (e.g. topsoil, sod, mulch, gravel, etc.).

Topsoil shall consist of loose friable loam free of subsoil, refuse, stumps, roots, rocks, brush, weeds, heavy clay, hard clods, toxic substances, or other material which would be detrimental to its use for landscaping restoration. The topsoil placed shall be fine graded to eliminate rough and low areas, match existing levels profiles, contours and ensure positive drainage prior to re-sodding.

Sod shall be placed behind all replaced concrete where it abuts existing grassed areas, as directed by the ENGINEER. The minimum width of sodded areas (as measured perpendicular to the replaced concrete) shall be 18", unless otherwise approved by the ENGINEER.

Sod shall be Colorado-grown, 100% certified Kentucky Bluegrass, or a mixture approved by the OWNER. The sod source shall be made known to and approved by the OWNER prior to installation.

Re-sodding shall be completed with sod of high quality and shall not be dried out or dying when placed. Re-sodding shall be rolled and thoroughly watered once by the Contractor. The Contractor shall notify the property owner in writing of the nature of the work that has been performed and inform the property owner that the sod will only be watered once. The notification format shall be approved by the Engineer prior to distribution to the property owner.

Mulch and gravel shall be replaced with similar material.

STREET BACKFILL – ASPHALT PATCHING

Excavations in paved streets caused by concrete replacement work shall be backfilled with 8" of approved base course material provided by the Contractor and is incidental and shall be merged into the pay items shown in the Schedule of Unit Prices.

Upon removal of the forms, the Contractor will be responsible for loading, haul, installation and placing fill material, compaction and grading to the existing street surface and maintained until hot asphalt patching is installed.

Hot asphalt patching shall occur at concrete replacement locations after 7 days of concrete placement and continue as construction progresses unless otherwise directed by the Engineer.

READY-MIXED CONCRETE

All concrete shall be ready-mixed in accordance with ASTM C 94 and shall conform to the requirements of these specifications.

Ready-mixed concrete shall be continuously mixed or agitated from the time the water is added until the time of use. The concrete shall be completely discharged from the truck mixer or truck agitator within one and one half (1 1/2) hours or before the drum has revolved 300 revolutions after the cement comes in contact with the mixing water, or with the aggregates (retempered concrete shall not be allowed).

The 90 minute time limit for mixer or agitating trucks may be extended to 120 minutes if:

- (1) No water is added after 90 minutes.
- (2) The concrete temperature prior to placement is less than 90° F.

The Contractor shall collect delivery or batch tickets from the ready-mix driver for all concrete used on the project and submit them to the Engineer daily. Batch tickets shall provide the following information: Weight and type of cement, weights of fine and coarse aggregates, weight (or gallons) of water, including surface water of aggregates and water added by the truck, quantity (cu. yd.) of batch, times of batching and discharging of the concrete, name of batch plant, name of Contractor, starting revolution count, name and amount of all admixtures used, date and truck number. Deletion of any item listed above for inclusion on the batch ticket shall be cause for rejection of the entire load of concrete.

PLACING CONCRETE

Before placing concrete, debris shall be removed from the space to be occupied by the concrete, and the forms, including any existing concrete surfaces, shall be thoroughly wetted. Concrete shall not be placed until all forms and reinforcing steel have been inspected and approved by the Engineer.

The concrete temperature shall be between 50 degrees F and 90 degrees F at time of placement. If the concrete does not fall within the specified temperature range, the concrete shall not be used or placed on the project and shall be immediately returned to the batch plant or an appropriate dumpsite.

Concrete shall be placed in a manner that will avoid segregation and shall not be dropped freely more than five (5) feet. If segregation occurs, the Engineer will require the concrete to be removed and replaced at the Contractor's expense. Concrete shall be placed monolithically in one continuous operation, except where keyed or doweled construction joints are shown on the plans or as approved by the Engineer. Delays in excess of 30 minutes shall require removal and replacement of that pour, at the Contractor's expense.

Concrete shall not be placed on soft, spongy, frozen, or otherwise unsuitable subgrade. The finished subgrade shall be kept smooth and compacted prior to placing concrete.

WORKABILITY

The consistency of concrete shall be kept uniform for each class of work and shall be checked by means of slump tests conforming to ASTM C 143. **NO WATER MAY BE ADDED AT THE JOB SITE WITHOUT THE PERMISSION OF THE ENGINEER.** If approval is obtained and water is added at the job site, the concrete shall be mixed for not less than 20 revolutions. The added water shall not cause the water/cement ratio to exceed 0.51 and shall not cause the maximum

slump to be exceeded. Slump tests shall be run and test cylinders cast following the addition of the water as required by the Engineer. Any expense incurred, in excess of ordinary tests, in such testing will be borne by the Contractor.

PUMPING CONCRETE

Pumping of concrete shall be permitted.

SAMPLING

- 1) AGGREGATE: The Contractor shall, before starting concrete work, furnish representative samples of concrete aggregate proposed for use to a testing laboratory designated by the Engineer and sampled in accordance with ASTM D 75.
- 2) CONCRETE: Concrete shall be sampled in accordance with ASTM C 172, "Sampling Fresh Concrete".

FIELD QUALITY CONTROL

1. General: An approved testing laboratory shall perform all testing, with the exception of slump tests. The following tests and procedures are subject to change during construction at the discretion of the Owner's Representative.
2. Test Priority: Control tests shall be used to determine the concrete quality throughout the project, however, special tests shall have precedence over control tests, and core tests shall have precedence over all previous tests.
3. Control Tests: Control tests of concrete work shall be made at such times and in such manner as directed by the Owner's Representative at the expense of the Owner. Each test shall consist of 4 standard 6" test cylinders cast and cured in accordance with C31 and C172. One cylinder shall be broken at the end of 7 days after placing, two cylinders shall be broken at the end of 28 days after placing and the remaining cylinder shall be stored until their disposition is determined by the Owner's Representative. The remaining cylinder will be broken only when the previous test reports indicate unsatisfactory results. The Owner's Representative reserves the right to stop all future concrete work when the 7 or 28 day tests indicate unsatisfactory results; until, in his opinion, proper corrective measures have been taken to assure quality concrete in future work. Tests shall be made at the time test cylinders are taken, and recorded on the reports to determine the slump, air content, unit weight, and temperature of the concrete. All tests shall be made in accordance with C39, C138 or C231. Minimum 28-day compressive strength shall be **4,500 psi**, based on field cast cylinders.

CONCRETE THICKNESS

It is the intent of the specifications that Concrete shall be constructed in accordance with the thickness requirements of the plans and specifications. Tolerances allowed for subgrade construction and other specification provisions, which may affect thickness, shall not be construed to modify such thickness requirements. Thickness measurements will be made at the rate of not less than one measurement for each one 500 linear feet or fraction thereof, of concrete placed.

Insufficient thickness' from 0.20 to 0.60 inches will be price reduced for each lot of 500-foot, in accordance to PRICE REDUCTIONS.

If the concrete is deficient by more than 0.6 inches, additional measurements will be made to identify the boundary of insufficient thickness. The boundary shall be at longitudinal or transverse joints and pavement edges. After the deficient area is identified the Engineer will determine as to whether the concrete shall remain in place or be removed in accordance with the following procedures:

- a. The CONTRACTOR shall, at his expense, remove and replace the concrete in the area determined by the Engineer with new concrete meeting the thickness requirements. Subgrade shall be lowered as necessary to meet full thickness requirements.
- b. The CONTRACTOR shall leave the concrete in place without payment, if it meets all of the other requirements.

COMPRESSIVE STRENGTH

When a compressive strength test fails below the specified 28-day compressive strength on field cast cylinders, the Engineer shall make a determination whether the concrete shall be removed and replaced or allowed to remain in place. This determination shall be based on an evaluation of the durability and other qualities of the concrete necessary to the integrity of the pavement. If after review, the concrete is allowed to remain in place, price reductions for each lot of 100 cubic yards or fraction thereof, will be in accordance with PRICE REDUCTIONS.

REINFORCING STEEL (DOWELS)

Reinforcing steel dowels are required at all concrete replacement items.

- 1) Bars: Reinforcing steel bars shall conform to the requirements of the "Standard Specifications for Deformed Billet-Steel Bars for Concrete Reinforcement" of ASTM. Bars shall be new billet steel conforming to AASHTO M31. Bars shall be #4 rebar with minimum lengths of 18 inches.
- 2) Placing: Reinforcing steel, before being placed, shall be thoroughly cleaned of coatings that will destroy or reduce bond. A light coating of rust may be allowed by the Engineer. Reinforcement shall be carefully formed to the dimensions indicated on the Plans. It shall not be bent or straightened in a manner that will injure the material. THE USE OF HEAT IN BENDING BARS SHALL NOT BE PERMITTED. Bars with kinks or bends not shown on the plans shall not be used. All reinforcing steel shall be placed in the position and at the spacing shown on the plans with the tolerance specified in ACI 301 Section 5.4.

FIBERMESH

- 1) Fibermesh: Concrete Engineered Reinforcing Fibers shall be commercial grade, 100% virgin polypropylene, collated, fibrillated fibers from Fibermesh Co. or approved equal. Fibermesh shall be used in all concrete as indicated on the detail drawings or as specified. Fibermesh fibers shall be added to the concrete mix at the rate of 1 1/2 lbs. per cubic yard of concrete.

FORMS

Forms shall be straight and true and conform to the shape, lines and dimensions as shown on the plans. Damaged forms shall be rejected and replaced. Approved flexible forms shall be used for construction where the radius is 150 feet or less. Unexposed surfaces shall have forms of No. 2 common (or better) lumber. Forms shall not be disturbed until the concrete has adequately hardened. In no case shall the minimum time between placing concrete and removal of forms be less than 12 hours.

JOINTS

EXPANSION JOINTS

Expansion joint materials: expansion joints shall be constructed with preformed cork expansion joint filler, conforming to Federal Specification MR-F-341, or wood fiberboard conforming to AASHTO Designation M59. Expansion shall extend to the full depth of the concrete sections. All expansion joints shall be one-half inch (1/2") thick, unless otherwise stated.

Expansion joint material shall be one half inch preformed joint filler (Bituminous Type) and shall be provided as shown on the plans or as directed by the Engineer. Expansion joints shall be installed at existing joints, structures, PCR's, every 100 feet, and as shown on the plans or as directed by the Engineer.

On new sidewalk, storm sewer Type R inlets, bike path installation, and at 18" median curb and gutter/median cover interface, expansion joint material shall be installed with a removable plastic spacer cap to be removed prior to joint sealing. Joints shall be sealed a minimum depth of one half inch with Sonneborn Sonolastic SL 1 one-part self-leveling polyurethane sealant (Color - gray) or approved equal.

CONTRACTION JOINTS

Transverse joints shall be placed at maximum intervals of ten (10) feet to control random cracking. The joints shall be formed, sawed or tooled to a minimum depth of one-quarter (1/4) of the total thickness.

If divider plates are used, the maximum depth of plates shall not be greater than one-half (1/2) the total thickness.

The joints shall be finished with a jointer having a width no greater than 5/16 inch and a depth not less than 3/4 inch. A maximum joint width at the finished surface shall be no greater than 5/16 inch. **Jointing tools shall be in good condition. Worn or damaged jointing tools shall be rejected and replaced.**

Contraction joints must be straight ($\pm 1/4"$) and perpendicular ($\pm 1/2"$) to the longitudinal axis of work. If contraction joints are not provided as specified, Contractor shall saw cut contraction joints as directed by Engineer.

SAW CUT JOINTS

Contraction joints in bike path shall be saw cut a minimum of 1/8" wide and 1/3 of the depth; no tooled joints will be permitted. Saw cut joints are required at 8-foot intervals for 8-foot wide paths and at 10-foot intervals for 10-foot wide paths, as directed by the Engineer. Joints shall be saw cut within 24 hours of construction.

TOOL JOINTS

Tool joints shall be spaced as follows:

- 1) Not more than ten (10) feet nor less than five (5) feet apart in curb and gutter and curbwalk.
- 2) Not more than five (5) feet nor less than four (4) feet apart in sidewalk.
- 3) In ramp drives as shown on the details.
- 4) To match existing adjacent concrete.
- 5) As directed by the Engineer.

FINISHING

Exposed faces of concrete shall be finished to true lines and grade as shown on the plans. The surface shall be floated, troweled, edged and broomed. The completed surface shall have a light/medium broomed surface. Contractor shall provide an ACI Flatwork Certified Finisher on each crew performing concrete finish work.

No dusting or topping of the surface, or sprinkling with water retardant, or evaporation reducer to facilitate finishing shall be permitted.

All concrete spoils and overburden that accumulates on existing concrete and asphalt from concrete replacement shall be removed immediately after concrete finishing.

MARKINGS

The letters "W" and "S" or "V" and "X" shall be stamped in the face of the curb at the locations marked by the Engineer to designate a water service or sanitary service, respectively. The letters shall be 3 inches long by ½ inch deep.

CURING

All concrete, regardless of temperature, weather or season, shall be protected from premature drying for a period of not less than seven (7) days after the concrete is placed, except that where concrete is being protected from freezing, the time period for concrete saturation shall be one (1) day less than that of the frost protection.

The application rate shall be as per manufacturer's recommendation (approximately 150 sq. ft./gal.). Curing will not be required longer than 72 hours if high-early strength concrete is used. It shall be the Contractor's responsibility to protect the concrete being cured, from the elements, traffic, and vandalism. Curing methods applied to other surfaces shall be applied to those surfaces covered by forms as soon as the latter are removed. Inadequate protection by the Contractor shall be cause for suspension of the Work and damaged concrete shall be replaced at the expense of the Contractor.

CURING NON PIGMENTED CONCRETE

Clear pigmented, Liquid, Membrane-forming compounds shall conform to ASTM C-309, Type I, Class A and B, AASHTO M148, and meet local, state and federal VOC and air quality regulations.

HOT AND COLD WEATHER REQUIREMENTS

COLD WEATHER PROTECTION

When concrete is placed when ambient temperatures are expected to fall below 40 degrees F, the Contractor shall provide satisfactory methods and means to protect the mix from injury by freezing.

Aggregates and mixing water shall be heated to a temperature of at least 70 degrees F., but not more than 150 degrees F., the aggregates may be heated by either steam or dry heat. Heating equipment or methods which alter or prevent the entrainment of the required amount of air or which develop hot spots in the aggregate shall not be used. Placing of concrete may be started in the morning if the contractor desires, but shall be discontinued at 3 P.M. of the same day if freezing weather threatens. The concrete or aggregates shall be protected during transit, mixing and before and after placing, as directed by the Engineer, to retain all heat possible in the concrete mix.

After the concrete has been placed, the contractor shall provide sufficient protection such as insulating blankets, canvas, framework, heating apparatus, etc., to enclose and protect the concrete and maintain the temperature of the concrete at not less than 50° F. for 7 days.

Cold weather protection shall not be paid for separately but be included in the work.

Except as provided above, cold weather concreting shall be in accordance with ACI 306. If in the opinion of the Engineer, the protection provided is inadequate, concreting shall cease until conditions or procedures are satisfactory to the Engineer.

HOT WEATHER CONCRETING

The placement of concrete in hot weather shall comply with ACI 305.

MISCELLANEOUS**FINAL SURFACE TEST**

Prior to acceptance of the work, the Contractor shall test the surfaces with a 10' straightedge. All surfaces varying more than 1/8" from line and grade of the correct surface shall be removed and replaced by the Contractor at his expense.

Any areas, which hold or cause water to pond shall be removed and replaced at the expense of the Contractor.

REPAIRS

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 with the intent of these Specifications and shall be removed and replaced by the Contractor at his expense.

CONNECTION WITH EXISTING SIDEWALKS

Where new sidewalk construction abuts existing sidewalks, the work shall be accomplished so that no change in grade results.

OPENING TO TRAFFIC

Walks shall not be opened to pedestrian traffic for at least twenty-four (24) hours after placement. Driveways, curb-gutter, and crosspans shall not be opened to vehicular traffic for at least seven (7) days after placement. The Contractor shall provide and maintain suitable barricades to comply with foregoing requirements.

The Contractor, with approval of the Engineer may use high early for ramp drives. There will be no additional payment to the Contractor for the use of high early concrete.

PRICE REDUCTIONS

Insufficient Thickness' and compressive strengths shall be subjected to price reductions at the following rates:

Average Thickness Deficiency (inches)	Price Reduction* %
0.00 to 0.20	0
0.21 to 0.30	10
0.31 to 0.40	15
0.41 to 0.50	25
0.51 to 0.60	30

* Price reduction is equal to the full price of the entire pavement system. Price reductions reflect reduced fatigue life as a result of the deficiency.

Percent of Specified 28-Day Compressive Strength*	Price Reduction** %
100	0
95	0
94	3
93	6
92	9
91	12
90	15
89	18
88	21
87	24
86	27
85	30

* Strengths less than 85 percent of the design strength shall be removed and replaced.

** Price reduction is equal to the full price of the entire pavement system. Price reductions reflect reduced fatigue life as a result of the deficiency.

5.0 SPECIAL CONDITIONS

TREE ROOT REMOVAL

When any tree roots are encountered during construction operations, the Contractor shall immediately notify the Engineer prior to the disturbance of any of the roots. The Engineer shall then make a determination regarding removal. In the locations where trees roots are anticipated, the Contractor shall take the necessary precautions to prevent any damage to the root with tools or equipment.

Tree roots shall not be removed or disturbed unless directed by the Engineer. Tree roots shall be removed with a sharpened, sanitized saw to leave the freshly cut root surface in a clean and smooth condition. Axes, backhoes, bobcats and other blunt objects shall not be used to remove the tree roots.

PIGMENTED/PATTERNED CONCRETE

An air-entraining agent complying with ASTM C-260 and/or a normal set or retarded-set water-reducing admixture complying with ASTM C-494 may be used, but nothing containing calcium chloride is permitted in the mix. Air-entrainment shall be five (5) to eight (8) percent. Concrete mix design shall be as follows:

MIX PROPORTIONS:

Materials:	Type or Size	ASTM Standard	Design Weights per Cubic Yard
Total Cementitious Cement	1-2	C-150	705 lb. min.
SCM		C-618	100 % min.
Total Aggregate			0 % max.
Coarse Aggregate	#8	C-33	2725 lb.
Int. Aggregate		C-33	35-40 %
Fine Aggregate	Sand	C-33	
AEA		C-260	60-65 %
WRA	A	C-494	0.5 oz.
MRWR	A	C-494	oz/cwt
HRWR	F	C-494	oz/cwt
Water	City	C-94	oz/cwt
Special Material			320 lb. 38.4 gal.

The above weights are based upon aggregates in a saturated, surface dry (SSD) condition. Batch plant corrections must be made for moisture in aggregates. Mix proportions may be adjusted in accordance with ACI 301-05, section 4.2.3.5.

COLOR & PATTERN

~~While the concrete is still in the plastic stage BRICKFORM ANTIQUE POWDER RELEASE BLACK shall be applied and imprinted with a BRICKFORM BASKET WEAVE NEW BRICK to make the desired pattern surface. The pattern-forming tool shall be supplied by and returned~~

~~to the City. Pattern-forming tool shall be replaced when damaged or lost when in the Contractor's possession. The concrete shall be imprinted with the long dimension of each brick perpendicular to the back of curb line.~~

Patterned Concrete – Aggregates shall conform to ASTM C33 and be less than 3/8 inch. Mixing water shall be fresh, clean, and potable. An air-entraining agent complying with ASTM C260 or a normal-set or retarded-set water-reducing mixture complying with ASTM C494 may be used. Nothing containing calcium chloride is permitted in the mix. **Patterned Concrete shall be Soloman No. 417 (Brick Red) Colors Inc. or approved equal.**

Patterned Concrete shall be colored integrally. Pigment shall be added by weight directly into the mixer along with the aggregate, cement, and water. While adding color, the transit mixer should operate at charging speed or at mixing speed for 5 to 10 minutes or from 50 to 100 revolutions. Design slump shall be 2 inches. Field slump shall be within 3/4 inch of design slump. The mix shall be placed and struck off to the proper grade and wood floated to a uniform surface.

There will be no separate payment for concrete pigmentation.

TEST SECTIONS

When pigmented concrete is specified, the Contractor shall provide and place a minimum of 3 pigmented concrete test sections, apply a medium broom finish and cure compound sealer on a 4 foot x 4 foot test panel for approval by the OWNER prior to commencing the work. The location of constructing the pigmented concrete test sections will be on City of Louisville property in an area designated by the Engineer. If the test panels are unacceptable to the OWNER, the Contractor shall construct additional test panels until the correct color and finish is approved by the OWNER. The Engineer requires a 3-day review and approval of the concrete test sections. Labor and equipment used on the test panel shall be the same as that used in the final construction of the pigmented concrete. Contractor shall submit the concrete mix designs to the ENGINEER for approval prior to test panel placement.

CURING PIGMENTED CONCRETE

All pigmented concrete shall be cured with BRICKFORM Satin Cure and Seal 1315 or approved equal. All concrete, regardless of temperature, weather or season, shall be protected from premature drying for a period of not less than seven (7) days after the concrete is placed, except that where concrete is being protected from freezing, the time period for concrete saturation shall be one (1) day less than that of the frost protection.

The application rate shall be as per manufacturer's recommendation. Curing will not be required longer than 72 hours if high-early strength concrete is used. It shall be the Contractor's responsibility to protect the concrete being cured from the elements, traffic and vandalism. Curing methods applied to other surfaces shall be applied to those surfaces covered by forms as soon as the latter are removed. Inadequate protection by the Contractor shall be cause for suspension of the Work and damaged concrete shall be replaced at the expense of the Contractor.

Curing compound shall be applied to the surface of existing (remaining) patterned concrete and the proposed patterned concrete.

EXPOSED AGGREGATE CONCRETE MIX DESIGN

An air-entraining agent complying with ASTM C-260 and/or a normal set or retarded-set water-reducing admixture complying with ASTM C-494 may be used, but nothing containing calcium chloride is permitted in the mix. Air-entrainment shall be five (5) percent (□ 2). Concrete mix design shall be as follows:

MIX PROPORTIONS:

<u>(Per Cubic Yard of Concrete)</u>		
Cement	ASTM C-150	564 lbs.
Sand	ASTM C-33	1075 lbs.
Size #57 Agg.	ASTM C-33	1100 lbs
Size #4 Agg.	ASTM C-33	900 lbs.
AEA	ASTM C-260	6.2 oz.
Water	ASTM C-94	275 lbs. (33.0 gal.)

EXPOSED AGGREGATE SURFACE RETARDANT

Surface retarding agent for exposed aggregate concrete shall be "Retard-X" SRO-5 manufactured by Protex Industries, Inc., Denver, Colorado, or approved equal. Approved equal products shall meet the following composition and material requirements: the retarding agent shall be that which retards the set of the concrete matrix on the surface to allow for the exposing of the aggregate, containing thixotropic agents and shall be in a liquid form.

EXPOSED AGGREGATE CONCRETE ETCHER

Exposed aggregate concrete etcher and cleaner shall be 5% muriatic acid solution. Acid neutralizer shall be sodium bicarbonate.

EXPOSED AGGREGATE ACRYLIC SEALER

Exposed aggregate acrylic sealer shall be "Acry-seal" manufactured by Protex Industries, Inc., Denver, Colorado, or approved equal meeting ASTM D-156 and C-309. Approved equal products shall meet the following composition and material requirements: the acrylic sealer shall contain a selected acrylic resin that resists yellowing and is suspended in a mineral carrier. The sealer shall be that which is used as a cure and seal on exposed aggregate concrete that is subject to abrasion and spillage of common chemicals and deicers.

JOINT SEALER

Cold-applied joint sealer shall be of such character that a homogeneous mix can be obtained by combining the separate substances, either mechanically or manually, without having to heat the blended material above a temperature of 100° F. The material shall pour or extrude readily at a temperature of 70° F immediately after preparation for use and shall remain in a condition suitable for application for at least one hour. Joint sealant shall be Sonolastic SL1 or approved equal.

RESIDENT/BUSINESS/RTD NOTIFICATION

At least 48 hours prior to the start of construction at each location, the Contractor shall notify in writing the residents or businesses adjacent to the work. The notification shall include a description of the work, a schedule for completion of the work and the name and phone number

of the Contractor's contact person. **The notification format shall be approved by the Engineer prior to distribution.**

Contractor shall notify RTD (michelle.sims@rtd-denver.com and lindsey.smith@rtd-denver.com) a minimum of 10 business days before construction at bus stop locations. RTD will post rider alerts and coordinate removal and re-installation of bus stop signs.

CONCRETE MIXER TRUCKS

Concrete Mixer trucks shall be restricted to public roadways when transporting concrete material within the City of Louisville. Concrete material delivery to Parks and Recreation Concrete Replacement shall be accomplished utilizing a concrete buggy, unless otherwise approved by the owner.

6.0 BASIS OF PAYMENT - CONCRETE

The entire cost of the work and material necessary to complete all items in the Schedule of Unit Prices, shown or implied or specified herein shall be included and merged into the pay items shown in the Schedule of Unit Prices. All associated work necessary for the proper and complete installation of this project and associated bonding, maintenance and guarantees shall be merged into the pay items shown in the Schedule of Unit Prices. All payments shall be subject to the conditions of these specifications.

BACKFILL AND LANDSCAPE RESTORATION shall include but not limited to backfill, compaction, top soil, grading, sod, seed/mulch and sprinkler system repairs. BACKFILL AND LANDSCAPE RESTORATION is incidental and shall be merged into the pay items shown in the Schedule of Unit Prices, unless otherwise noted.

Front face and back forms shall be used for handicap ramp concrete vertical curbhead construction.

No payment will be made for any removal beyond the limits marked by the Engineer. Payment for concrete shall include the cost of fibermesh reinforcement at crosspans, ramp drives and alley aprons. Fibermesh reinforcement is required for 8" Concrete.

No separate payment will be made for inscribing curb face at water and sewer service crossings, but shall be included in the work.

No separate payment will be made for steel reinforcement but shall be included in the work.

No separate payment will be made for cold weather protection, expansion material, pigmentation, curing compound, sealant and incidentals but shall be included in the work. Minor items and minor details are not listed but shall be part of the complete contract.

No additional payment will be made to the Contractor for the use of high early strength concrete, unless otherwise noted.

No additional payment will be made to the contractor for the use of concrete shuttle buggies and shall be incidental and included in the work.

The following items in this section are representative of all work items required and therefore are not referred to by proposal or item number for each individual work item.

MOBILIZATION

1. Scope of Work

This item consists of the mobilization of personnel, equipment, and supplies to the project sites. This item also includes obtaining of all permits and conformance to all permit requirements, bonds, insurance, public and media relations, administrative items, furnishing and erecting temporary construction facilities, project signs, and all other work and operations that must be performed or costs incurred before beginning work on the project site, as well as demobilization and project closeout, all as required for the complete and proper performance and completion of the work. All gasoline, oil, fuel hydraulic fluids, and other contaminating fluids shall be properly removed and disposed of offsite. No objectionable materials shall be allowed to blow from, wash off or drain off of the staging area on to adjacent property.

2. Method of Measurement and Payment

Payment will be made based on the lump sum price in the Bid Form.

Bid price for mobilization shall not exceed, in any case, 6% of the total bid price (Items 4 through 33) for the project.

EROSION CONTROL

1. Scope of Work

This work shall consist of furnishing all labor, materials, equipment, installation and removal of curb socks, concrete washout, silt fence, and other BMPs as required by the Project Manager. Contractor shall provide submittal sheet for approval of BMPs as requested.

2. Method of Measurement and Payment

Payment for EROSION CONTROL shall be made on a lump sum basis and shall be full compensation to all work necessary to complete the item.

UNCLASSIFIED EXCAVATION

1. Scope of Work

This work shall consist of furnishing all labor, materials, equipment for UNCLASSIFIED EXCAVATION and shall include saw cutting, removal, loading, and haul of existing crusher fines and landscape fabric to a disposal site. The work shall also include removal, loading, haul and disposal of existing base course sub base and other miscellaneous material to the depth of final finished subgrade. The work shall include subgrade preparation to a minimum depth of 12" as specified on the drawings or in the specifications and recompacted in accordance with the city of Louisville Construction Standards, unless otherwise noted. Existing asphalt shall become the property of the Contractor.

2. Method of Measurement and Payment

Payment will be made on a field measured removed square yard basis. Payment for UNCLASSIFIED EXCAVATION and shall be full compensation of all work necessary to complete the item.

No payment will be made for over excavation beyond plan limits.

IMPORTED BORROW (COMPLETE IN PLACE)

1. Scope of Work

This work shall consist of furnishing all labor, materials, equipment, loading, haul, placing, shaping, and compaction of IMPORTED BORROW (COMPLETE IN PLACE). Imported Borrow shall be **recycled concrete base** course and conform to the requirements of Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, 2011 Edition Class 6 Classification for Aggregate Base Course Section 703. Samples and test data on material to be used shall be submitted to the Engineer stating the borrow meets these requirements.

2. Method of Measurement and Payment

Payment will be paid by the ton for IMPORTED BORROW (COMPLETE IN PLACE) and shall be full compensation for all work necessary to complete the item.

REMOVE 6" CONCRETE

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of concrete, excavation, load, haul, disposal, incidentals and construction necessary to provide REMOVE 6" CONCRETE to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for REMOVE 6" CONCRETE will be made on a field measured square foot basis and shall be full compensation for all work necessary to complete the item.

NEW 6" CONCRETE

1. Scope of Work

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of subgrade material, excavation, concrete removal, subgrade preparation, load, haul, disposal, compaction, backfill, grading, concrete, admixtures, expansion material, steel reinforcement, curing compound, sealant, incidentals and construction necessary to provide NEW 6" CONCRETE to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for NEW 6" CONCRETE will be made on a field measured square foot basis and shall be full compensation for all work necessary to complete the item.

NEW 8" CONCRETE WITH FIBERMESH**1. Scope of Work**

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of subgrade material, excavation, concrete removal, subgrade preparation, load, haul, disposal, compaction, furnish and install fill material, backfill, grading, concrete, admixtures, fibermesh, expansion material, steel reinforcement, curing compound, sealant, incidentals and construction necessary to provide NEW 8" CONCRETE WITH FIBERMESH to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for NEW 8" CONCRETE WITH FIBERMESH will be made on a field measured square foot basis and shall be full compensation for all work necessary to complete the item.

NEW 30" VERTICAL CURB AND GUTTER**1. Scope of Work**

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of subgrade material, excavation, concrete removal, subgrade preparation, load, haul, disposal, compaction, furnish and install fill material, backfill, grading, concrete, admixtures, fibermesh, expansion material, steel reinforcement, curing compound, sealant, incidentals and construction necessary to provide NEW 30" VERTICAL CURB AND GUTTER to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for NEW 30" VERTICAL CURB AND GUTTER will be made on a field measured lineal foot basis and shall be full compensation for all work necessary to complete the item.

REMOVE 30" CURB AND GUTTER**1. Scope of Work**

Work shall consist of furnishing all labor, materials, equipment, demolition, saw cutting, removal of concrete, excavation, load, haul, disposal, incidentals and construction necessary to provide REMOVE 30" CURB AND GUTTER to the limits as shown on the plans and as directed by the Engineer.

2. Method of Measurement and Payment

Payment for REMOVE 30" CURB AND GUTTER will be made on a field measured lineal foot basis and shall be full compensation for all work necessary to complete the item.

END OF SECTION 02 40 00

SECTION 02 41 00**DEMOLITION****PART 1 - GENERAL****1.1 SECTION INCLUDES**

- A. Demolition, removal, salvage and disposal of existing site features, fences, structures and materials where indicated on the drawings and as specified in this section.
- B. Demolition and removal of concrete foundations, sidewalks, concrete and asphaltic paving

1.2 RELATED SECTIONS

- A. Section 01 50 00 - Temporary Construction Facilities
- B. Section 31 00 00 - Earthwork
- C. Section 32 92 11 - Seeding

1.3 SUBMITTALS

- A. Permits and Certificates.
 - 1. Permits and notices authorizing building demolition.
 - 2. Certificates of severance of utility service.
 - 3. Permit for transport and disposal of debris.

1.4 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division One specifications.
- B. Accurately record actual locations of capped utilities and subsurface obstructions.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable State and local codes for demolition of structures, safety of adjacent structures, dust control, and disposal.
- B. Obtain required permits from authorities.
- C. Notify affected utility companies before starting work and comply with their requirements.

- D. Do not close or obstruct roadways, sidewalks, or hydrants without written permission from Owner.
- E. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

1.6 SCHEDULING

- A. Schedule and submit under provisions of Division One specifications.
- B. Provide detailed descriptions for demolition and removal procedures.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Fill Material: Use on site fill material under provisions of Section 31 00 00.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify areas to be demolished are unoccupied and discontinued in use.
- B. Do not commence work until conditions are acceptable to Engineer.

3.2 PREPARATION

- A. Provide, erect, and maintain temporary barriers, enclosures, security fences and shoring at demolition locations in accordance with Division One and other related specifications to protect personnel.
- B. Protect existing structures and utilities which are not to be demolished.
- C. Provide temporary wiring and connections to maintain existing telephone, electrical, instrumentation and control systems in service during construction.
- D. Protect designated trees and plants from damage.
- E. Mark location of existing utilities.

3.3 GENERAL REQUIREMENTS

- A. Sprinkle Work with water to minimize dust where applicable. Provide hoses and water connections for this purpose.
- B. Do not use water to extent causing flooding, contaminated runoff, or icing.

- C. Remove demolished material from the site.
- D. Repair damage to adjacent structures.
- E. Remove existing exposed piping and electrical wiring and conduit to be abandoned to structural surface, cut flush, and finish to match existing surfaces.
- F. Remove buried piping, wiring, and conduit to be abandoned as required for the Work. Plug the remainder flush.

3.4 DISPOSAL

- A. Do not store or burn waste materials on-site.
- B. Transport demolition debris to designated off-site disposal area.

3.5 SITE DEMOLITION

- A. Disconnect, remove, cap and identify designated utilities within demolition area.
- B. Remove asphalt paving, parkway, curb, gutter, sidewalk and other concrete work to facilitate construction. Remove concrete to nearest joint beyond demolition area.
- C. Remove and dispose of all existing site fencing
- D. Remove storm sewer items where shown on the drawings.
- E. Backfill areas excavated caused as a result of demolition, in accordance with Section 31 00 00.
- F. Rough grade and compact areas affected by demolition to maintain site grades and contours as shown on drawings.
- G. Remove demolished materials from site.
- H. Do not burn or bury materials on site, unless otherwise directed by Owner. Leave site in clean condition.

3.6 ELECTRICAL DEMOLITION

- A. General:
 - 1. Remove, relocate and extend existing installation to accommodate new construction.
- B. Existing electrical service:
 - 1. Work by Public Service Company
 - a. Remove and relocate light poles as detailed on the electrical plans and specifications.

2. Work by Contractor:

- a. Provide standby power conduit and cables for temporary use during construction. Completely remove temporary service after new permanent service is installed.

3.7 TREE REMOVAL

- A. Use caution to prevent disturbances to the roots of existing trees that are to remain. Stumps of trees that are removed shall be ground to a depth of two feet below surface elevation, using caution to avoid damage to any utilities. Coordinate with landscape architect.

END OF SECTION 02 41 00

SECTION 02 50 00

ASPHALT

1. DESIGN INTENT

These specifications include general requirements applicable to all types of plant mix, asphalt cement concrete pavements (ACCP). This work consists of one or more courses of asphalt mixture constructed on a prepared foundation in accordance with specifications. The design intent is to provide pavement with adequate thickness and quality to provide a serviceable life of 20 years. It is also the intent to provide construction in accordance with these specifications and with a high standard of practice. This item shall include all labor, equipment, materials to manufacture, place and compact asphalt cement concrete for pavement purposes.

2. MATERIALS

The asphalt plant mix shall be composed of a mixture of aggregate, filler, hydrated lime, asphalt cement, polymer and reclaimed asphalt pavement (RAP).

Aggregate – Aggregates for ACCP shall be of uniform quality, composed of clean, hard, durable particles of crushed stone, crushed gravel, or crushed slag. Excess of fine material shall be wasted before crushing. The material shall not contain clay balls, vegetable matter, or other deleterious substances and shall meet the following requirements.

TABLE 2.1.1 - AGGREGATE PROPERTIES

Aggregate Test Property	Course: Retained on #4	Fine: Passing the #4
Fine Aggregate Angularity, ASTM C-1252 Method A		
Traffic Level 1 & 2	- -	42% Min.
Traffic Level 3 to 5	- -	45% Min.
Two Fractured Faces, CP 45		
Top and Middle Lifts	80% Min.	- -
Bottom Lifts	70% Min.	- -
LA Abrasion, AASHTO T 96	45% Max.	- -
Flat and Elongated (Ratio 3:1) %, AASHTO M 283	10% Max.	- -
Adherent Coating (Dry Sieving) ASTM D 5711	0.5% Max.	- -
Sand Equivalent, AASHTO 176	- -	45 % Min.

Reclaimed Asphalt Pavement material (RAP) shall be used only where specifically allowed as shown on the plans and shall be of uniform quality and gradation with a maximum size no greater than the nominal aggregate size of the mix. Mixes shall not contain more than 20 percent RAP. **RAP is not permitted in Asphalt Top Lifts and Overlays, unless otherwise approved by the Engineer.**

The ACCP gradation shall be wholly within the control point gradation range set forth in the following table. The gradation of the design job mix shall report all sieve sizes listed in the table.

TABLE 2.1.2 - GRADATION RANGE
(Percent by Weight Passing Square Mesh Sieves, AASHTO T 11 & T 27)

Sieve Size	SX*		S*		SG*	
	Control Points	Restricted Zone	Control Points	Restricted Zone	Control Points	Restricted Zone
1 1/2	---	---	---	---	100	---
1"	---	---	100	---	90-100	---
3/4"	100	---	90-100	---	---	---
1/2"	90-100	---	---	---	---	---
3/8"	---	---	---	---	---	---
#4	---	---	---	---	---	39.5
#8	25-58	39.1	23-49	34.6	19-45	26.8-30.8
#16	---	25.6-31.6	---	23.3-28.3	---	18.1-24.1
#30	---	19.1-23.1	---	16.7-20.7	---	13.6-17.6
#50	---	15.5	---	13.7	---	11.4
#200**	2.0-7.0	---	2.0-7.0	---	1.0-7.0	---

* The gradation should pass above the restricted zone boundaries, on the "fine" side.

** These limits shall include the weight of lime at 1.0%

VMA shall be based on tests of the Bulk Specific Gravity of the Compacted Mix (CP-L 5103) and Aggregate (T 84 & T 85), and calculated according to CP-48. All mixes shall meet the minimum VMA specified in the table below.

TABLE 2.1.3 - MINIMUM VMA, %

Nominal Maximum** Particle Size	Air Voids	
	4%	5%
1 1/2	12	13.0
1"	13.0	14.0
3/4"	14.0	15.0
1/2"	15.0	16.0

** Nominal Maximum Particle Size is defined as one sieve size larger than the first sieve to retain more than 10%, but shall not exceed the 100% passing size.

Maximum Particle Size can vary during mix production even when the 100% passing size is constant.

Minimum VMA criteria applies to both design and plant produced mix. The VMA minimum shall be interpolated based on actual air voids.

2.2 Asphalt Cement

The Contractor shall provide to the Owner complete laboratory test results of supplied asphalt cement along with "Certifications of Compliance". A minimum of three working days shall be allowed for this review prior to mixture design. Upon non-conformance with the specifications the asphalt cement may be rejected as directed by the Owner.

Asphalt Cement binder shall meet the requirements of the Superpave Performance-Graded Binders (PG) as presented in Table 2.2.1 below:

TABLE 2.2.1 – PROPERTIES OF SUPERPAVE PERFORMANCE GRADED BINDERS

Property	PG 58-28	PG 64-22	PG 76-28
Traffic Level	1 or 2	1 or 2	3 to 5
Flash Point Temperature, °C, AASHTO T 48	230 Min	230 Min	230 Min.
Viscosity at 135 °C, Pas, ASTM D 4402	3 Max.	3 Max.	3 Max.
Dynamic Shear, Temperature °C, where $C^*/\sin \delta @ 10\text{rad/sec.} \geq 1.00 \text{ Kpa}$, AASHTO TP5	58	64	76
Rolling Thin Film Oven Residue Properties, AASHTO T 240			
Mass Loss, %, AASHTO T240	1.00 Max.	1.00 Max	1.00 Max.
Dynamic Shear, Temperature °C Where $G^*/\sin \delta @ 10 \text{ rad/sec.} \geq 2.20 \text{ Kpa}$, AASHTO TP 5	58	64	76
Elastic Recovery ¹ , 25° C, % Min.*	N/A	N/A	50 Min.
Pressure Aging Vessel Residue Properties, Aging Temperature 100° C AASHTO PP1			
Dynamic Shear, Temperature °C Where $G^*/\sin \delta @ 10 \text{ rad/sec.} \leq 5,000 \text{ Kpa}$ AASHTO TP 5	19	25	28
Creep Stiffness, @ 60 Sec. Test Temperature in °C, AASHTO TP 1	-18	-12	-18
S, Mpa, AASHTO TP 1	300 Min.	300 Min.	300 Min.
m-value, AASHTO TP 1	0.300 Max	0.300 Max	0.300 Max
Direct Tension Temperature in °C, @ 1.0 mm/min., Where Failure Strain > 1.0%, AASHTO TP 3	-18	-12	-18

* Elastic Recovery by Task Force 31, Appendix B Method

Asphalt Cement binder shall be as described on the drawings and specified on MGPEC, Form #9 Mixture Design Requirements for Hot Mix Asphalt Pavements (HMAP).

2.3 Additives

Lime shall be added at the rate of 1% by dry weight of the aggregate and shall be included in the amount of material passing the No. 200 sieve. Hydrated lime for aggregate pretreatment shall conform to the requirements of ASTM C 207, Type N. In addition, the residue retained on a 200-mesh sieve shall not exceed 10% when determined in accordance with ASTM C 110. (Drying of the residue in an atmosphere free from carbon dioxide will not be required.)

2.4 Tack Coat

An emulsified asphalt tack coat shall be applied to existing surfaces as shown on the plans. The emulsified asphalt shall be CSS-1 h or SS-1 h and conform to AASHTO M208 or MI 40, respectively.

3. **MIX DESIGN AND PLANT PRODUCED MIXTURE REQUIREMENTS**

The mixture shall be designed to produce an acceptable mixture at an optimum air void content of 4.0 percent (96.0 percent density) in the total mix. The mix design shall be performed using the materials listed in Section 9.3 and used in the field. No substitutions are allowed.

Level of compaction for local and collector streets is N=75, level of compaction for arterial streets is N=100.

3.1 Marshall Mixture Design Method

The **CONTRACTOR** shall submit a proposed design job mix for each mixture required by the Contract. The design AC content shall be determined using the Marshall Method of Mixture Design as described in "Mix Design Methods for Asphalt Concrete" Manual Series 2 (MS-2) published by the Asphalt Institute. Grading SG (1-inch nominal aggregate) shall not be designed using the Marshall method. Mix design shall meet the following:

TABLE 3.1 – MARSHALL MIXTURE PROPERTIES

Traffic Level	I	II
Traffic Loading 18 kip ESALs Over 20 years	<300,000	300,000 to 1,000,000
Property	Specification	
Compaction Number of Blow, Each End	50	70
Stability, lb.	1,800 Min.	2,000 Min.
Flow, 0.01 in.	8-18	8-16
Air Voids, %	4.0-5.0	4.0-5.0
Voids Filled with Asphalt, % MS-2	70-80	65-78
Tensile Strength Ratio, % Retained CP-L 5190	80 Min.	80 Min.
Dry Tensile Strength, psi CP-L 5109	30 Min.	30 Min.
VMA %, CP 48	Table 2.1.3	Table 2.1.3

3.2 Superpave Mixture Design

The Contractor shall submit a design job mix for each mixture required by the Contract. The design shall be determined using Colorado Procedure CP-L 5115 for the Superpave Method of Mixture Design. Other guidance is provided in "Superpave Level 1 Mix Design "SP-2 published by the Asphalt Institute. Mix designs shall meet the following:

TABLE 3.2 – SUPERPAVE MIXTURE PROPERTIES

Traffic Level	1	2	3	4	5
Traffic Loading, Total 18 kip ESALs Over Design Life (Usually 20 Years)	<300,000	300,000 to 1.0 Million	1.0-3.0 Million	3.0-10.0 Million	>10.0 Million
Initial (Air Void > 11.0%)	7	7	7	8	8
Design (Air Void 4.0 to 5.0%)	68	76	86	96	109
Max (Air Void > 2.0%)	104	117	134	152	174
Hveem Stability (100 mm Plugs)	35	39	39	42	42
Voids Filled with Asphalt, % MS-2	70-80	65-78	65-78	65-75	65-75
Tensile Strength Ratio, % Retained	80 Min.	80 Min.	80 Min.	80 Min.	80 Min.
Dry Tensile Strength, Min. psi	30 Min.	30 Min.	30 Min.	30 Min.	30 Min.
VMA %, CP 48	Table 2.1.3				

4. MIXTURE DESIGN SUBMITTALS

The Contractor shall submit all mixture designs, certificates, refinery reports, and laboratory data to the Owner for approval at least 7 days before construction is to begin. The job mix formula may be rejected as directed by the Owner on the basis of incompleteness, timeliness or changes in materials. Submittals shall be in a timely fashion such that rejection will not delay completion of the project.

Mixture designs shall be performed in a materials laboratory under the direct supervision of and shall be stamped and signed by a Professional Engineer licensed in Colorado and practicing in this field. In addition, the Contractor shall submit as part of the mixture design, document to verify the following:

1. Source of materials.
2. Gradation, specific gravity, source and description of individual aggregates and the final blend.
3. Aggregate physical properties
4. Asphalt cement properties
5. Design Job Mix
6. Mixing and compaction temperatures used.
7. Mixture properties determined at a minimum of four asphalt contents and interpolated at optimum and graphs showing mixture properties versus asphalt content.

The Owner reserves the right to test the Contractor's mix for each hot asphalt pavement grading utilizing materials actually produced and stockpiled. Contractor shall provide a sufficient quantity of each aggregate, mineral filler, RAP, and additive for the required laboratory tests, if required by the Owner.

Should a change in the source of Asphalt Cement (AC) or Lime occur, a one point verification 34 test (at optimum asphalt content) of the mix must be performed to verify that the applicable Table 2.1.3, 3.1 and 3.2 criteria is still met. If this testing shows noncompliance, a new design job mix shall be established before the new AC or Lime source is used.

Prior to the start of the project, a sample shall be submitted to an independent laboratory to verify the volumetric properties of the mix. If the mix has been produced for another project

within the last month, data from that project can be submitted for verification if testing was performed by an independent laboratory. If volumetric properties are not within the following tolerances, the mixture shall be redesigned and retested.

Air Voids	1.0%
VMA	1.0%
Asphalt Content	0.3%

5. EQUIPMENT

5.1 Mixing Plant

The mixing plant shall be capable of producing a uniform material, have adequate capacity, and be maintained in good mechanical condition. Defective parts shall be replaced or repaired immediately if they adversely affect the proper functioning of the plant or plant units, or adversely affect the quality of the hot bituminous plant mix.

Dust, smoke, or other contaminants shall be controlled at the plant site to meet all air quality requirements in the "Colorado Air Quality Control Act," Title 25, Article 7, CRS and regulations promulgated thereunder.

Acceptable safety equipment, approved by the Owner, shall be provided by the

CONTRACTOR to accommodate sampling and testing.

The Contractor shall provide the Owner with results from Contractor's quality control testing at the plant and in the field during paving operations.

5.2 Hauling Equipment

Trucks used for hauling ACCP shall have tight, clean, smooth metal beds thinly coated with a minimum amount of paraffin oil, lime solution, or other approved release agent. **Petroleum distillates such as kerosene, diesel or fuel oil are not approved release agents.** Each truck shall have and use a cover of canvas or other suitable material to protect the mixture from the weather and excessive temperature loss or cooled layers of mix in truck.

6. MANUFACTURE

6.1 Preparation of Aggregates

Heating and drying of the aggregates shall be accomplished without damaging the aggregate. Lime shall be added to achieve complete and uniform coating of the aggregate. When hydrated lime is used it shall be added to the aggregate in accordance with one of the following methods:

- a. Lime Slurry Added to Aggregate: The hydrated lime shall be added to the aggregate in the form of a slurry and then thoroughly mixed in an approved pugmill. The slurry shall contain a minimum of 70 percent water by weight.
- b. Dry Lime Added to Wet Aggregate: The dry hydrated lime shall be added to wet aggregate (a minimum of three percent above saturated surface dry) and then thoroughly mixed in an approved pugmill.

The lime-aggregate mixture may be fed directly into the hot plant after mixing or it may be stockpiled for not more than 90 days before introduction into the plant for mixing with the asphalt cement. The hydrated lime may be added to different sized aggregates and stockpiled, by adding 75 percent of the lime to the aggregate passing the No. 4 sieve and 25 percent to the aggregate retained on the No. 4 sieve.

6.2 Mixing

The dried aggregates and asphalt cement shall be combined in the mixer in the quantities required to meet the design job mix. The materials shall be mixed until the aggregate is completely and uniformly coated, and the asphalt cement is uniformly distributed throughout the aggregate. The output rate shall not exceed the manufacturer's capacity rating.

Baghouse fines shall be fed back to the mixing plant in a uniform and continuous manner so as to maintain uniformity in the mixture. The Baghouse, fines feeder, auger, and related equipment, shall be in good working condition and operated in accordance with manufacturer's recommendation. If the Owner determines that non-uniform operation of the equipment is detrimental to the mixture, he may halt all construction until the Contractor takes appropriate action.

The minimum temperature of the mixture when discharged from the mixer shall be as shown in the following table:

TABLE 6.2.1 – MIXTURE DISCHARGE TEMPERATURES

Asphalt Grade	Minimum Mix Discharge Temperature, ° F*	Minimum Delivered Mix Temperature ° F**
PG 58-28	275° F	235° F
PG 64-22	290° F	235° F
PG 76-28	320° F	280° F
* The maximum mix discharge temperature shall not exceed the minimum discharge temperature by more than 30 ° F.		
** Delivered mix temperature shall be measured behind the paver screed.		

ACCP mix shall be produced at the lowest temperature within the specified temperature range that produces a workable mix and provides for uniform coating of aggregates (95 percent minimum in accordance with AASHTO T 195), and that allows the required compaction to be achieved.

ACCP mix shall not be stored longer than 9 hours, unless additional protective measures are used and approved. If storing or holding of the mixture causes segregation, excessive heat loss, or adversely affects the quality of the finished product, corrective action shall be taken. Unsuitable mixture shall be disposed of at the Contractor's expense.

When placing hot bituminous mixture over bridge decks covered by waterproofing membrane, the minimum temperature of the mixture when rolling operations begin shall be 250° F. The job mix temperature may be increased up to 300° F to obtain this temperature.

6.3 Hauling

Each truck shall use covers to protect the mix during transport. The Owner can reject mix, which is hauled without a cover. Should the mixture show an excess or deficiency of asphalt cement, damage due to burning or overheating, or an improper gradation shall be rejected.

7. TACK COAT

Prior to placement of ACCP, a tack coat shall be applied. The material shall be in accordance with 2.4. The emulsified asphalt shall be diluted 1: 1 with water and applied at 0.10 ± 0.01 gallons per square yard of diluted material. The Owner may direct other application rates to match the age of condition of the surface.

All work shall be done at locations and with the grade and quantities of material designated on the plans. The surface to receive the tack coat shall be dry and cleaned by sweeping or other approved method until dust, debris, and foreign matter are removed. The tack coat shall then be applied uniformly by distributor as specified below. Prior to paving, all water must have evaporated from the tack coat. Contaminated areas shall be cleaned and tack coat shall be reapplied.

WEATHER LIMITATIONS

Prime coat and tack coat shall not be applied under the following conditions:

1. When the surface is wet.
2. When weather conditions would prevent the proper penetration or curing of the prime or tack coat.
3. When the temperature in the shade is below 55 degrees F.

EQUIPMENT

The Contractor shall provide necessary equipment for heating and uniformly applying bituminous material and blotter material when required.

The distributor and equipment shall be capable of uniformly distributing bituminous material at even temperature and uniform pressure on variable widths of surface up to 15 feet at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard. The allowable variation from any specified rate shall not exceed plus or minus 0.02 gallon per square yard.

Distributor equipment shall include a tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. Distributors shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically. The distributor for rejuvenating agent shall conform to the foregoing and shall also be equipped with the following:

1. Heating facilities with controls to reach a temperature of 130 degrees F.
2. Circulating system to maintain proper mixture of the rejuvenating agent.

The use of a pull behind tack pot with wand will not be permitted except for applying tack next to the curb or crosspans.

PREPARATION OF SURFACE

Preparation of the surface to be treated shall include all work necessary to provide a smooth, dry, uniform surface. Work shall include patching, brooming and shaping to the required grade and section, compaction removal of unstable corrugated areas and removal of all vegetation. The edges of existing pavements, which are to be adjacent to new pavement, shall be cleaned to permit the adhesion of bituminous materials.

8. PLACEMENT

Asphalt concrete shall be placed only on approved, properly constructed surfaces that are free from loose material, water, frost, snow or ice. The asphalt concrete mixtures and tack coat shall be placed in accordance with the temperature limitations of Table 8.1 and only when weather conditions permit the pavement to be properly placed and finished as determined by the Owner.

TABLE 8.1 - PLACEMENT AIR AND SURFACE TEMPERATURE LIMITATIONS

Compacted Layer Thickness	Top Layer of Pavement*		Lower Layer	
	PG 58-28 PG 64-22	PG 76-28	PG 58-28 PG 64-22	PG 76-28
2 inches	50° F	65° F	40° F	50° F
>3 inches	50° F	60° F	40° F	40° F

* Air temperature is taken in the shade. Surface temperature is taken on the subgrade or base. The Owner may not wave the above temperature limitations for PG 76-22.

The mixture shall not be placed at a temperature lower than 245° F or 290° F for mixes containing polymer modified asphalt. Mix which is too cold or damaged by weather will be rejected.

If an unsatisfactory mix has been placed, it shall be removed, disposed of and replaced as directed. No compensation will be allowed for rejected material.

12. COMPACTION

The temperature of the mixture immediately behind the screed be at least 245° F (290° F for PG76-28) and breakdown compaction shall be completed before the mixture temperature falls 20° F.

The ACCP shall be compacted by rolling. Both steel wheel and pneumatic tire rollers are required. The number, weight, and type of rollers furnished shall be that which is sufficient to obtain the required density while the mixture is in a workable condition. Compaction shall begin immediately after the mixture is placed and be continuous until the required density is obtained. If the required density is not achieved and the surface temperature falls below 185° F, or there is obvious surface distress or breakage, no further compaction effort will be permitted unless approved by the Owner. The criteria for mixtures containing PG76-28 asphalt cements shall be 235° F. Pavement operations shall be suspended when density requirements are not met, and the problem resolved prior to continuing paving operations.

All roller marks shall be removed with the finish rolling. Use of vibratory rollers with the vibrator on will not be permitted during surface course final rolling and will not be permitted on any rolling on bridge decks covered with waterproofing membrane.

All ACCP paving shall be compacted to between 92 and 96 percent of Maximum Theoretical Density (AASHTO T-209: Maximum Specific Gravity of Bituminous Paving Mixtures) with the average of five random and consecutive density tests equaling at least 93 percent of T-209. If more than three random density tests fall below 93 percent of T-209, corrective measures shall be taken by the Contractor. Compaction of less than 90 percent of T-209 will be cause for removal and replacement. The most recent T-209 Rice value shall be used in calculating Relative Compaction according to CP-44.

The Contractor shall core the pavement as required by the Owner for field density tests in accordance with Colorado Procedure 44, Method B (AASHTO T-230), or for field calibration of nuclear density equipment in accordance with the Appendix of Colorado Procedure 81 (ASTM D- 2950). At a minimum, cores for nuclear density equipment calibration shall be taken at the beginning of placement of each pavement layer or change of mixture materials or gradation. Untested areas during placement will also require cores to be taken to verify compaction.

Along forms, curbs, headers, walls, and all other places not accessible to the rollers, the mixture shall be thoroughly compacted with mechanical tampers.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective, shall be immediately removed and replaced with fresh hot mixture, and compacted to conform with the surrounding area.

Except for leveling courses, the minimum compacted depth of pavement placed in one layer shall be 1½ inches, unless approved by the Engineer. The maximum compacted depth shall be three (3) inches.

13. TOLERANCE

13.1 Gradation and Asphalt Cement Tolerances

The gradation shall not deviate from the design job mix by more than the following:

TABLE 13.2.1 - GRADATION TOLERANCES

Item	
Passing No. 3/8" and Larger ¹	± 6%
Passing No. 4 and No. 8	± 5%
Passing No. 30	± 4%
Passing No. 50	± 3%
Passing No. 200 ²	± 2%
Asphalt Content	±0.3 %
Asphalt Content, Mixes with >10% RAP	±0.4%

¹There is 0 percent tolerance for the maximum sieve size.

²Mixes with -No. 200 sieve material produced over 7.0 percent is allowed only when Air Voids are kept within 3.0 percent to 5.0 percent and VMA still meets requirements.

When disagreements concerning determination of specification compliance occur between sampling and testing procedures, solvent extracted aggregate testing shall take precedence over burnoff oven extracted aggregate, which shall take precedent over cold feed belt testing.

WEATHER LIMITATIONS

Bituminous plant mix shall be placed only on properly constructed surfaces that are free from water, frost, snow or ice. The bituminous mixtures shall be placed within the air temperature limitations of the following table, when the temperature is rising and only when weather conditions otherwise permit the pavement to be properly placed and finished as determined by the Engineer.

Placement Air Temperature Limitations

Compacted Thickness	Top Layer	Layers Below Top
1" or less	60 Deg. F.	50 Deg. F.
>1" to 3"	50 Deg. F.	40 Deg. F.
Greater than 3"	50 Deg. F.	40 Deg. F.

Placement temperatures as stated in the above table shall be increased by 5 Degrees for each 10 miles-per-hour wind velocity to a maximum of 70 degrees F.

When it is in the public interest and taking in consideration the construction season, the Engineer may waive minimum temperature requirements for placing prime coats and layers of bituminous mixtures below the top layer of the completed pavement. Pavement operations will be suspended when density requirements are not met.

Asphalt overlays and top lifts shall not be applied when weather conditions or the threat of rain may prevent completion of the full width asphalt mat.

SURFACE TOLERANCES

For new streets the final surface pavement adjacent to concrete gutter shall be finished from 1/8 inch to 1/4 inch above the lip of the gutter into which it drains.

Any surface pavement that is above the lip more than 1/4 inch shall be removed and replaced to the specified height. Any surface pavement that is below the lip of the gutter shall be corrected as specified above; for new street construction. For street overlays the surface pavement may be 1/2" above the lip.

3.0 BASIS OF PAYMENT

The entire cost of the work and material necessary to complete all terms shown or implied on the drawings or specified herein shall be included and merged into the pay items shown in the Bid Proposal. All associated work necessary for the proper and complete installation of this project and associated bonding, maintenance and guarantees shall be merged into the pay items shown in the Bid Proposal. All payments shall be subject to the conditions of these specifications. All pay items shall include sales tax, licenses, permits, and other taxes required to complete the work. No additional compensation will be allowed for any item unless a change order is issued by the Engineer.

Minor items and minor details are not listed but shall be part of the complete contract.

HOT ASPHALT PATCH GRADE SX (6"), (8"), (9")

1. Scope of Work

This work shall consist of furnishing all labor, materials and equipment to install a HOT ASPHALT PATCH GRADE SX (6"), (8"), (9") to the limits and depths on the plans and specifications.

This work shall consist of saw cutting, removing, loading, haul, and disposal of existing asphalt, subgrade and roadbase material, removal of tree roots within the top 6" of the subgrade, preparing and compacting the subgrade and installing hot asphalt patching.

2. Removal of Asphalt

The areas to be patched shall be cut out and removed leaving neat straight edges. All removed material shall become the property of the Contractor and will be disposed of properly. Prior to removal the Engineer will mark out the limits of the patch, only the marked area is to be removed, any additional removal will not be paid for and will be corrected at the Contractor's expense.

3. Acceptable Methods of Patching

Acceptable methods for the installation of asphalt patching shall include, but not be limited to, with the use of a self-propelled leeboy paver or approved equal, to uniformly spread the hot bituminous materials in lifts, prior to rolling. The self-propelled Leeboy paver or approved equal is required for the final lift installation. The area to be patched shall be adequately tacked. Compaction of the hot asphalt shall be completed in lifts and conform to the City of Louisville Design and Construction Standards.

4. Method of Measurement and Payment

Payment will be made on field measured installed square yard basis for HOT ASPHALT PATCH GRADE SX (6"), (8"), (9") except that the area will be marked and measured prior to construction. Payment for removing existing asphalt, subgrade and roadbase material, preparing subgrade and replacing asphalt with a hot asphalt patching and shall be full compensation for all work necessary to complete the item.

HOT ASPHALT PATCH GRADE S (10")

1. Scope of Work

This work shall consist of furnishing all labor, materials and equipment to install a HOT ASPHALT PATCH GRADE S (10") to the limits and depths on the plans and specifications.

This work shall consist of saw cutting, removing, loading, haul, and disposal of existing asphalt, subgrade and roadbase material, removal of tree roots within the top 6" of the subgrade, preparing and compacting the subgrade and installing hot asphalt patching.

2. Removal of Asphalt

The areas to be patched shall be cut out and removed leaving neat straight edges. All removed material shall become the property of the Contractor and will be disposed of properly. Prior to removal the Engineer will mark out the limits of the patch, only the marked area is to be removed, any additional removal will not be paid for and will be corrected at the Contractor's expense.

3. Acceptable Methods of Patching

Acceptable methods for the installation of asphalt patching shall include, but not be limited to, with the use of a self-propelled leeboy paver or approved equal, to uniformly spread the hot bituminous materials in lifts, prior to rolling. The self-propelled Leeboy paver or approved equal is required for the final lift installation. The area to be patched shall be adequately tacked. Compaction of the hot asphalt shall be completed in lifts and conform to the City of Louisville Design and Construction Standards.

4. Method of Measurement and Payment

Payment will be made on field measured installed square yard basis for HOT ASPHALT PATCH GRADE S (10") except that the area will be marked and measured prior to construction. Payment for removing existing asphalt, subgrade and roadbase material, preparing subgrade and replacing asphalt with a hot asphalt patching and shall be full compensation for all work necessary to complete the item.

END OF SECTION 02 50 00

SECTION 02 60 00**CONSTRUCTION ZONE TRAFFIC CONTROL****PART 1 - GENERAL****1.1 DESCRIPTION**

Construction zone traffic control shall apply to any and all construction and related construction on the 2023 Concrete Replacement Project to complete the work.

This work consist of furnishing, installing, moving, maintaining and removing temporary traffic signs, advance warning arrow panels, variable message boards, flashing portable beacons, barricades, channelizing devices, delineators, and flagging as required by the Manual on Uniform traffic Control Devices for Streets and Highways and the Colorado Supplement thereto, in accordance with the plans and these specifications. When a device is not in use, the contractor may remove it from the project for the period it is not needed. Devices temporarily not in use shall not be stored in the roadway or walkways.

1.2 GENERAL REQUIREMENTS

Pertinent provisions of the following listed documents shall apply to this work, except as they may be modified herein, and are hereby made a part of this specification to the extent required.

- A. Standard Specifications for Road and Bridge Construction by the Colorado Department of Transportation (CDOT), Section 630, Construction Zone Traffic Control, and Section 627, Pavement Marking.
- B. Manual on Uniform Traffic Control Devices for Streets and Highways, FHWA, and the latest revision of the Colorado Supplement thereto.
- C. CDOT Standard Plan S-630-1 (sheets 8 and 9), S-630-2 and S-630-3.

1.3 SUBMITTALS

- A. Five (5) CONTRACT DAYS prior to the start of any construction activity, submit copies of the following:
 - 1. Proposed detour plan and traffic control elements as described under Section 3.2.
 - 2. Schedule of proposed duration and sequence of operations.

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. In accordance with CDOT Section 627.02 regarding pavement marking tape.
- B. In accordance with CDOT Section 630.02 regarding signs and barricades.
- C. In accordance with CDOT Section 630.05 regarding traffic cones.

PART 3 - EXECUTION**3.1 GENERAL**

In accordance with CDOT, Subsection 630.09 through Subsection 630.13, Construction Zone Traffic Control - Construction Requirements, except as modified herein.

In accordance with CDOT, Section 627.10, Pavement Marking Tape.

3.2 METHOD OF HANDLING TRAFFIC

Delete the second paragraph of Subsection 630.09.

Subsection 630.08 shall include the following:

ALL TRAFFIC CONTROL DEVICES MUST BE IN GOOD AND CLEAR CONDITION, INSTALLED PRIOR TO ALL AND ANY CONSTRUCTION ACTIVITY. THE ENGINEER MAY DIRECT MINOR MODIFICATIONS TO THE APPROVED TRAFFIC CONTROL PLAN BASED ON OBSERVATIONS OF FIELD CONDITIONS AT ANY TIME OR SUSPEND WORK UNTIL APPLICABLE SAFETY MEASURES ARE TAKEN WITHOUT ANY CHANGES TO THE COST OF THE PROJECT.

DEFICIENCIES IN TRAFFIC CONTROL SHALL BE CORRECTED IMMEDIATELY OR WORK SHALL BE SUSPENDED. THE OWNER WILL REQUEST A REDUCTION IN COST IF TRAFFIC CONTROL IS NOT PROVIDED PER APPROVED METHOD OF HANDLING TRAFFIC.

In Subsection 630.09, add the following:

The City Engineer must approve all street closures. At least 24 hours before a street closure, it shall be the responsibility of the Contractor to notify the following agencies:

- | | | |
|----|--|--------------|
| 1. | Police Department | 303-441-4444 |
| 2. | Louisville Fire Protection District | 303-666-8809 |
| 3. | City of Louisville Operations and Maintenance Department | 303-335-4750 |
| 4. | AMR Ambulance Service | 303-665-6623 |
| 5. | Boulder Valley School District | 303-447-1010 |
| 6. | Boulder County Communications | 303-441-4444 |
| 7. | Regional Transportation District | 303-443-0100 |

In addition to the above agencies and organizations, the Contractor shall notify the Post Office and local Trash Companies.

At the completion of work, the agencies must be notified of resumption of normal service.

Changes to the approved traffic control plan necessitated by unforeseen circumstances, such as utility conflicts, must be reviewed and authorized by the Engineer.

Contractor shall include the cost for purchasing "NO PARKING" signs necessary to restrict parking within the work limits. "NO PARKING" signs shall be placed not less than 24 hours in advance of commencement of work in a work zone. The sign shall state, for example "No Parking 7 a.m. to 7 p.m.", together with the day of the week.

A copy of the Right of Way Permit and the approved MHT shall be available at the project site in order that City personnel may verify compliance with the specified traffic control requirements.

The specified elements of the MHT shall also include the number of flag persons to be used.

Approval of the proposed MHT 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.

The Contractor shall coordinate and cooperate fully with agents of the City of Louisville, utility owners, and other contractors. He shall also coordinate and cooperate fully with agents of other entities to assure adequate and proper traffic control is provided.

The Contractor is advised that other significant construction might be occurring in the area and that he shall cooperate fully with the City of Louisville and all other contractors occupying public right-of-way in terms of work location, work schedule and traffic control requirements.

Through traffic shall be carried on a paved surface at all times unless otherwise approved by the Engineer. The Contractor shall maintain at his own expense that portion of the existing roadway being used to carry traffic so that traffic may readily pass over it.

All traffic control devices supplied by the contractor must be maintained in good and clear condition and meet minimum national standards for reflectivity. Devices shall comply with minimum size and shape as specified in the MUTCD. **No bent, broken, damaged, defaced, dented, dirty, discolored, faded, non-conforming traffic control devices and/or supports shall be used in this project.**

All traffic control devices shall bear the name, address, and phone number of the barricade company that owns them. The phone number shall be a 24-hour a day dispatched hotline in the event an emergency situation occurs where additional devices are needed or existing devices must be removed.

The Contractor shall install construction traffic control devices in locations that do not block or impede sidewalks for pedestrians, or bicyclists or other existing traffic control devices. This strategy shall include, but is not limited to, strapping signs to streetlight or utility poles. Devices may only be attached to wooden street light and utility poles.

All existing traffic control devices, including traffic signs and pavement markings that are compatible with the construction zone traffic control shall remain visible and fully operational. If any devices are incompatible with the temporary construction traffic control devices, they shall be covered, relocated or removed.

The Contractor shall not be allowed to begin operations, which require traffic control until the setup of traffic control devices is completed. Also, the Contractor shall clear his operations allowing 30 minutes for removals of traffic control devices in accordance with the designated hours of work and roadway closures.

During non-working hours, the roadways shall be restored to safe pre-construction travel conditions for the free flow of traffic. Any maintenance required to restore the roadways to this condition, including pavement patching and grading, shall be done prior to opening the areas to traffic or completing work for the day. Temporary pavement markings shall be placed at the direction of the Engineer. All costs incidental to the foregoing requirements in this paragraph shall be included in the original contract prices for the project, including any additional traffic control items required for haul routes into or away from the project.

Any existing signs damaged due to Contractor operations shall be replaced in kind or repaired to the satisfaction of the Engineer by the Contractor at no cost to the project.

Any existing traffic signs removed or relocated during construction as part of the approved traffic control plan are the responsibility of the Contractor to reset upon completion of construction, unless noted otherwise in the plans or specifications. Existing signs may not be removed without prior approval of the Engineer.

The Contractor shall not have construction equipment or materials in the lanes open to traffic at any time. Brief lane closures (of 5 minutes or less), as approved by the Engineer, may be permitted for moving construction equipment. Flaggers will be required for such operations. All personal vehicles and construction equipment parking will be prohibited where it conflicts with safety, access, or flow of traffic.

During non-construction periods (evenings, weekends, holidays, etc.) all work shall be adequately protected to ensure the safety of vehicular and pedestrian traffic, using materials meeting the approval of the Engineer.

Lane widths in work zones shall be 12 feet, minimum.

The vertical cut or fill, including rotomilling over 1" height differences resulting from construction operations adjacent to traffic lanes shall be temporarily sloped at a 3:1 or flatter slope, or as shown on the typical plan section, and barrier protected, or delineated at 25-foot intervals immediately after grading or removal operations. The 3:1 slope requirement applies to roadway construction projects and would not generally apply to

utility construction or rehabilitation projects. Slope or shoring requirements for these type projects shall be reviewed on a project by project basis.

The Contractor shall equip all vehicles operating within the moving lanes with flashing amber lights visible from all directions.

Any portable device that requires weight to prevent overturning shall be weighted with appropriate sized sand bags. Rocks, asphalt, or any other debris will not be permitted.

MAINTENANCE OF ACCESS

The Contractor shall maintain access to the parking lot at all times unless otherwise approved by the Engineer. During non working hours the Contractor shall maintain access to the roadways and driveways within the construction zone with temporary ramps.

Protection of Adjacent Property and Drives. The Contractor shall use extra care so as to minimize disruption to adjacent property and drives and shall leave the construction site clean, with all debris and concrete removed. If the Engineer determines that the Contractor did not exercise reasonable care to protect the parking areas or street sections from unnecessary damage while accomplishing his work, the Contractor will be required to restore the damaged items to their original condition at his own expense. The Contractor will not be permitted to operate trucks and equipment or store equipment and supplies on private property unless he has written permission to do so.

Work Limits. Work limits shall be marked by the Contractor with orange plastic fencing in pedestrian areas and other suitable materials in the street prior to beginning work. He shall confine all work to within these limits except as provided in the contract documents. If work limits are not established by permit or contract documents, said limits shall be determined by the Engineer and shall be suitably marked by the Contractor, prior to beginning work.

Should the Contractor be unable to obtain written approval of property owners or occupants, documentation of a "Good Faith Effort" to obtain said approval must be submitted.

CONTACTS

The Contractor shall notify the following 72 hours prior to beginning construction and 48 hours prior to changing traffic patterns. The Contractor shall also notify these persons in case of an emergency.

City of Louisville Public Works - Craig M. Duffin, P.E. 303-335-4602
City of Louisville Operations Division – 303-335-4750
City of Louisville Police Department – Boulder Dispatch 303-441-4444
City of Louisville Fire Department - Fire Marshall 303-666-8809

3.3 TRAFFIC CONTROL MANAGEMENT

Subsection 630.10(6) shall include the following: A day shall be defined as the time from 12:00 midnight to 12:00 midnight. The log shall list all devices and personnel deployed within the limits of construction for each day and shall be available for review by the Engineer at all times.

In subsection 630.09, first paragraph, delete the first sentence and replace with the following:

The Contractor shall designate an individual, other than the superintendent, to be the traffic control supervisor.

In subsection 630.09, second paragraph, delete parts (1), (5) and (6) and replace with the following:

- (1) Preparing, revising, and implementing each required method of handling traffic in accordance with the traffic control plan.
- (5) Preparing traffic control diary on every calendar day traffic control devices are in use. This diary shall be submitted to the Engineer daily and become a part of the Department's project records.
- (6) Inspecting traffic control devices on every calendar day that traffic control devices are in use, masked, or turned away from traffic. These inspections shall include at least one night inspection per week. These inspections shall be performed by the traffic control supervisor or another representative who is certified as a worksite traffic supervisor.
- (10) Supervising the cleaning and maintenance of all traffic control devices.

In subsection 630.09, delete the third paragraph and replace with the following:

Traffic control management shall be provided by a certified traffic control supervisor on a 24-hour-per-day basis. The traffic control supervisor or another representative who is certified as a worksite traffic supervisor shall be available and reasonably accessible to the job site on every working day, on call at all times, and available upon The Engineer's request at other than normal working hours. During non-work periods, the traffic control supervisor or another representative shall respond to the job site within 45 minutes. The traffic control supervisor or another representative who is certified as a worksite traffic control supervisor shall arrive at the job site within two hours after notification. The Contractor shall maintain a 24-hour telephone number at which the traffic control supervisor can be contacted. The traffic control supervisor shall not act as a flagger except in an emergency or in relief for short periods of time.

In subsection 630.11, delete the first paragraph and replace with the following:

630.11 General. Portable construction traffic signs shall be removed when temporarily not required. Permanently mounted construction traffic signs shall be masked or turned away from traffic when temporarily not required. When work is suspended, or the project is in free time, and there is no condition requiring traffic control devices or construction traffic signs, all of the construction traffic signs shall be masked or turned away from traffic. If this condition is to exist for more

than 30 days, all construction traffic signs shall be removed. When storing portable signs or supports within the project they shall be stored laying flat and the location shall be at least four feet outside the edge of the shoulder and not on landscaped areas or sidewalks. When masking is used, it shall be done in accordance with subsection 630.10.

The retroreflective surfaces of all signs and other traffic control devices shall be cleaned as frequently as necessary to preserve their legibility and retro reflectivity. However, all devices shall be cleaned a minimum of once every two weeks.

In subsection 630.12, first paragraph, delete the fifth sentence and replace with the following:

When storing portable signs or supports within the project they shall be removed beyond the clear zone and shall not be visible to traffic. All storage areas shall be approved. The minimum clear zone distance shall be 18 feet, measured from the edge of traveled way. If the signs cannot be stored at least 18 feet from the traveled way, they shall be removed. Under no circumstances shall signs be stored on the paved surface.

3.4 FLAGGING

Subsection 630.13(a) shall include the following:

The flagger's STOP/SLOW sign paddle shall be 18 inches with letters six inches high.

Delete Subsection 630.13(a) and replace with the following:

- (a) The Contractor shall provide all flagging through the project necessary to assure proper safety to traffic. All flagging personnel shall be certified by the American Traffic Safety Services Association (ATSSA).

PART 4 - MEASUREMENT AND PAYMENT

- 4.1** Delete Subsection 630.14, 630.15 and replace with the following:

- 4.2 CONSTRUCTION ZONE TRAFFIC CONTROL**

Construction Zone Traffic Control shall be paid for at the lump sum price indicated in the Schedule of Unit Prices. The lump sum price shall be full compensation for flagging and for furnishing, erecting, cleaning, maintaining, moving, removing and disposing of construction traffic control devices, including labor, material equipment and incidentals necessary to complete the work. All construction traffic control devices, which are not permanently incorporated into the project, will remain the property of the Contractor.

Traffic Control Supervisor will not be paid for separately, but shall be included in the work.

Preparation of the MHT will not be paid for separately but shall be included in the work.

Construction fencing and temporary walkways will not be paid for separately but shall be included in the work.

Construction phasing and staging will not be paid for separately but shall be included in the work.

End of Section 02 60 00

SECTION 31 11 00**SITE PREPARATION****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Remove and dispose according to plans all site elements including trees, shrubs, fences, pavements, pipes, utilities, wells and structures indicated to be removed. If there is a question as to the removal of an item, contact the Owner's Representative prior to removal.
- B. Clear area to be graded of plant life, grass, gravel and surface debris.
- C. Remove all irrigation heads and valves and reuse or return to owner.
- D. Remove all signs made unnecessary by construction and reuse or return to Owner. Remove no signs which belong to another government agency.

1.2 RELATED WORK

- A. Section 31 00 00: Earthwork.
- B. Drawings and general provisions of the Construction Contract, and Division-01 Specification sections apply to work of this section.

1.3 PROTECTION

- A. Protect bench marks, existing structures, roads, sidewalks, paving, and curbs that are to remain.
- B. Protect above or below grade utilities that are to remain.
- C. Protect all trees to remain using a strong barrier at least ten feet from the trunk throughout construction.
- D. Maintain and protect existing utilities to remain which pass through work area.

PART 2 - PRODUCTS**2.1 MATERIALS TO BE REMOVED**

- A. All items within the construction area indicated to be removed and not indicated for reinstallation or removal by Owner shall become the property of the Contractor who shall remove them from the site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Locate and identify all existing utilities prior to any demolition. Arrange and pay for disconnecting, removing, and capping utility services within areas of demolition if required. Notify the affected utility company in advance and obtain approval before starting this work.
- B. Place markers to indicate location of disconnected services. Identify service lines and capping locations on project record documents.

3.2 DEMOLITION

- A. Remove existing materials as indicated on plan. Where new concrete wall, concrete paving, or asphalt adjoin existing asphalt, cut existing asphalt to a straight line using a masonry saw or similar tool.
- B. At areas to be landscaped, remove existing paving and base course in preparation for finish grading under Earthwork.
- C. At areas to be graded, landscaped, or paved, clear and grub area prior to grading operations to remove all rocks, roots, stolons, seeds, vegetative and deleterious material. Contractor to remove from site.
- D. Site Clearing: Limits of site clearing are as indicated on the drawings. The Contractor shall repair any injury to vegetation or other objects beyond the limits of work as directed by the Owner, or replace the items without additional compensation for such repair or replacement. Complete repairs within two days after the cutting. Paint required for cut or scarred surfaces of trees or shrubs designated to remain shall be an approved asphaltum base paint prepared especially for tree surgery.
 - 1. Cut, mow, rake, collect, haul, and dispose of all vegetation not designated to remain within the limits of the work. The stumps of all trees, large brush (larger than 4 inches) and major roots shall be grubbed and chipped. Chips shall not have any nominal dimension larger than 4 inches in any direction. All material which cannot be chipped shall be removed from the site and disposed of in a legal manner in accordance with local regulations.
 - 2. Use caution to prevent disturbances to the roots of existing trees that are to remain. Stumps of trees that are removed shall be ground to a depth of two feet below surface elevation, using caution to avoid damage to any utilities. Coordinate with landscape architect.
- E. Remove all fences, wire, posts and rails. Fill post holes.
- F. Remove all underground tanks and cisterns. Fill holes.
- G. Remove structures including foundation and surrounding paving and appurtenances unless specified to remain.

- H. Conduct demolition operations and debris removal in a manner to ensure minimum interference with streets, walks, and other adjacent facilities. Do not close, block, or otherwise obstruct streets, walks, or other facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- I. Provide, erect and maintain barricades, lighting, and guard rails as required by applicable regulatory requirements to protect the public and workers.
- J. If unanticipated mechanical, electrical, or structural elements which conflict with intended function or design are encountered, investigate the nature and extent of the conflict and submit to the Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative rearrange demolition schedule as necessary to continue overall job progress without delay.

3.3 CLEAN UP AND REPAIR

- A. During the demolition operations, keep the premises free from accumulated waste material or rubbish caused by employees or work, and at the completion of the work remove rubbish, tools, and surplus material and leave the premises clean and ready for subsequent work. Promptly remove waste, rubbish, or debris from the site.
- B. Repair all demolition performed in excess of that required and all damage to remaining elements due to demolition, at no cost to the Owner.

END OF SECTION 31 11 00

SECTION 31 20 00**EARTHWORK****PART 1- GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, and Division One and other related specification sections apply to work of this section.

1.2 SECTION INCLUDES

- A. Clearing, grubbing and site preparation
- B. Removal and disposal of debris
- C. Handling, storage, transportation, and disposal of excavated material
- D. Sheeting, shoring, bracing and protection work
- E. Pumping and dewatering as required or necessary
- F. Backfilling
- G. Pipe embedment
- H. Construction of fills and embankments
- I. Excavation for buildings & structures
- J. Pavement Subgrade preparation
- K. Trench Stabilization
- L. Final grading
- M. Slope Stabilization
- N. Erosion Control
- O. Appurtenant work

1.3 RELATED SECTIONS

- A. Section 32 13 00 – Rigid Paving

1.4 REFERENCES

- A. AASHTO – American Association of State Highway and Transportation Officials

B. ASTM – American Society for Testing and Materials

1. C33 – Concrete Aggregates
2. C136 – Sieve Analysis of Fine and Coarse Aggregates
3. D698 – Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb Rammer and 12-Inch Drop
4. D1241 – Material for Soil Aggregate Subbase, Base and Surface Courses
5. D4253 – Test Methods for Maximum Index Density of Soils and Unit Weight of Soils Using a Vibratory Table
6. D4254 – Test Methods for Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density
7. D6938 – Test Method for In-Place Density and Water Content of Soil and Soil Aggregate by Nuclear Methods (Shallow Depth)

C. ACI – American Concrete Institute

1. 229 – Controlled Low-Strength Materials

D. CABO/ANSI – Council of American Building Officials/American National Standards Institute

1. A117.1 – Accessible and Useable Buildings and Facilities Standards

E. CDOT – Colorado Department of Transportation

F. OSHA – Occupational Safety and Health Administration

1.5 SUBMITTALS

- A. Submit under provisions of Division One specifications.
- B. Product Data: Submit on all products or materials supplied herein
- C. Test Reports: Indicate supplier, sieve analysis, optimum moisture content and density in accordance with ASTM D698 if appropriate for crushed rock or gravel, pipe embedment and material for fills and embankment

1.6 REGULATORY REQUIREMENTS

- A. Burning will not be allowed on-site. Comply with all applicable codes, regulations, and laws.
- B. Comply with applicable requirements of CABO/ANSI A117.1 for accessibility requirements related to walks, ramps, parking areas, drives, curb ramps, etc.
- C. Obtain and comply with all requirements of City of Louisville and CDPHE Stormwater and/or Groundwater Discharge Permits, as required.
- D. For public improvements only, in the event of a conflict between municipal standards and this specification, municipal standards for products and installation will govern.

- E. Excavation work shall be performed in compliance with City of Louisville and current OSHA requirements.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Protect adjacent structures and surrounding areas from damage during excavation, filling, and backfilling
- B. Protect work from erosion or other similar types of damage until the project has been accepted. Leave protection in place for building contractors use.
- C. Do not backfill or construct fills during freezing weather. Backfill or construct fills only when temperature is 35°F and rising
- D. Do not use frozen materials, snow, or ice in any backfill or fill area
- E. Do not backfill or construct fill on frozen surfaces
- F. Protect excavated material from becoming frozen
- G. Do not remove trees from outside excavation or fill areas unless authorized by the Owner; protect from permanent damage by construction activities
- H. Provide temporary bridges for roadways, walkways, driveways, etc.

1.8 QUALITY ASSURANCE

- A. All imported material to be free of hazardous and organic wastes, "clean" as defined by EPA, and approved for its intended use by the Owner or project Geotechnical Owner.

PART 2 - PRODUCTS

1.9 MATERIALS

- A. General - Soil materials, whether from sources on or off the site must be approved by the soils Owner as suitable for intended use and specifically for required location or purpose.
- B. Classification of Excavated Materials:
 - 1. No classification applies. Remove and handle all excavated materials regardless of its type, character, composition, condition, or depth. This includes the sandstones and claystones encountered onsite which can be ripped from place using a Caterpillar Model 235 trackhoe or equivalent, rippers, chisels, breaker bars, and/or other hand or mechanical methods.
 - 2. Excavation of rock that cannot be excavated as outlined above will be considered rock excavation and may require alternative means that may include drilling, blasting, or expansive compounds.
 - 3. Transport and properly dispose of any rubble and waste materials found in excavation off the Owner's property

- a. If transite or asbestos containing materials are found in excavation, notify the Owner immediately and comply with special handling requirements.

C. Fills and Embankments

1. To the maximum extent practical use excess earth from onsite excavation for fills and embankments.
2. Free from rocks or stones larger than 12 inch in greatest dimension and free from brush, stumps, logs, roots, debris, and organic and other deleterious materials
3. Fill and embankment material must be acceptable to Owner
4. No rocks or stones larger than 6 inch in upper 18 inches of fill or embankment. Where allowed, distribute rocks and stones through the fill to not interfere with compaction.

D. Imported Fill for Fills and Embankments:

1. The contractor is responsible for obtaining additional material for fills and embankments as necessary to meet the requirements shown on the plans.
2. Imported fill conforming to the following:
 - a. Gradation (percent finer by weight ASTM C136): 3" – 100% passing, No. 4 Sieve – 50-100% passing, and No. 200 Sieve – 35% passing (max)
 - b. Liquid Limit: 35 (max), Plasticity Index: 15 (max), Group Index: 10 (max)

E. Structural Fill

1. Imported structural fill, such as a ½-inch minus, CDOT Class 7 Aggregate Road Base, conforming to the following:
 - a. Gradation: 1" – 100% passing (percent finer by weight ASTM C136), No. 8 Sieve – 20-85% passing, and No. 200 Sieve – 20% (max)
 - b. Liquid Limit: 35 (max), Plasticity Index: 15 (max), R- Value: 50 (min)

F. Topsoil

1. Topsoil is defined as fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of rocks, stumps, stones larger than 2" in any dimension, and other extraneous or toxic matter harmful to plant growth for areas to be seeded or planted. Coordinate testing requirements with Landscape Architect and Owner.

G. Grubbings

1. Grubbings are defined as the first 1 inch of surface vegetation and topsoil consisting of primarily existing grass groundcover free of roots, brush, and other objectionable material and debris.

H. Pipe Embedment: Graded gravel

1. Comply with City of Louisville requirements for pipe embedment for public utilities.
2. 3/4" – 1" Crushed rock – AASHTO 57/67

Sieve Size (Inch)	Percent Passing by Weight
1	100
3/4"	90-100
1/2"	25-60
3/8"	20-55
NO. 4	0-10
NO. 8	0-5
NO. 200	0-2

3. Squeegee

Sieve Size	Percent Passing by Weight
3/8"	100
No. 4	85-100
No. 8	30-70
No. 16	5-40
No. 30	0-15
No. 50	0-10
No. 100	0-5
No. 200	<1

I. Compacted Trench Backfill

1. Job excavated material finely divided, free of debris, organic material, and stones larger than 6 inch in greatest dimension without masses of moist, stiff clay, or topsoil

J. Controlled Low Strength Material (Flow Fill)

1. Comply with City of Louisville requirements and ACI 229 for the use of flowable fill within the right-of-way or for public utility trench backfill.
2. Product shall be a lean, sand-cement slurry, "flowable fill" or similar material with a 28-day unconfined compressive strength between 50 and 200 psi.

K. Non-woven geotextile fabric

1. Needle-punched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Product must be inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. Product must meet AASHTO M288-06 Class 3 for elongation > 50%.
 - a. Mirafi 140N or accepted substitution

1.10 EROSION AND SEDIMENT CONTROL ACCESSORIES

- A. Comply with all applicable municipal or local Municipal Separate Storm Sewer System (MS4) requirements.
- B. Silt Fence Fabric: woven polypropylene

1. Mirafi 100X, "Envirofence"
 2. Or accepted substitution
- C. Temporary Slope Stabilization Mat (short term): 1.5 pound photodegradable polypropylene top and bottom nets, 100% straw fiber matrix, with a longevity of 12 months.
1. North American Green S150
 2. Or accepted substitution

PART 2 EXECUTION

2.1 EXAMINATION

- A. Field verify the location of all underground utilities, pipelines and structures prior to excavation

2.2 PERFORMANCE—GENERAL

- A. Contractor to verify quantities of cuts and fills and perform all earthwork required to meet the grades as shown on the plans, including but not limited to, additional import or export required to handle compaction, building and pavement subgrade preparation, and pipe bedding.
- B. Perform work in a safe and proper manner with appropriate precautions against hazard
- C. Provide adequate working space and clearances for work performed within excavations and for installation and removal of utilities
- D. Contain all construction activity on the designated site and within the limits of work. Cost of restoration off site will be the responsibility of the Contractor

2.3 PRESERVATION OF TREES

- A. Do not remove trees outside fill or excavated areas, except as authorized by Owner
- B. Protect trees and their roots within the drip line that are to remain from permanent damage by construction operation
- C. Trim standing trees in conflict with construction operations as directed by Owner and Landscape Architect

2.4 PREPARATION

- A. Clear all site areas within the limits of work of grasses, roots, brush, and other objectionable material and debris.
- B. Strip subgrade for fills and embankments of surface vegetation, sod, tree stumps and organic topsoil. Strip and stockpile all on-site material meeting the topsoil definition for all areas receiving grading where shown on drawings

- C. Remove all waste materials from site and dispose. Stockpile all acceptable grubblings for reuse in revegetation areas.
- D. Remove debris including all demolished trees, underbrush, stumps, roots and other combustible materials from site and dispose of off-site; on-site burning is not permitted

2.5 TOPSOIL

- A. At the completion of work in each area, place and grade topsoil to maintain gradient as indicated and required.
- B. Clean topsoil, free of plants and seed will be spread to 4 inch minimum depth, or as specified by landscaping specifications and plans, whichever is greater, for areas of the site as detailed by the landscape plans.
- C. Reuse grubblings and surface topsoil containing plants and seeds in designated revegetation areas only.

2.6 DEWATERING

- A. Provide and maintain adequate dewatering equipment (including power supply, if necessary) to remove and dispose of surface and groundwater entering excavations, trenches, and other parts of the work
- B. Keep each excavation dry during subgrade preparation and continually thereafter until the structure to be built or the pipe to be installed is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result
- C. Dewater excavations which extend to or below groundwater by lowering and keeping the groundwater level beneath such excavation at least 12 inches below the bottom of the excavation
- D. Divert surface water or otherwise prevent it from entering excavated areas or trenches to the extent practical without damaging adjacent property
- E. Maintain all drainage pipes, keep clean and free of sediment during construction and final cleanup
- F. Dewatering to surface waterways requires Colorado Department of Public Health and Environment dewatering permit. Contractor must obtain dewatering permit and comply with discharge requirements therein, if necessary

2.7 SHEETING, SHORING AND BRACING

- A. Provide proper and substantial sheeting, shoring, and bracing, in accordance with OSHA Standards as required, to prevent caving or sliding, to protect workmen and the Work, and to protect existing structures and facilities
- B. Design and build sheeting, shoring, and bracing to withstand all loads that might be caused by earth movement or pressure, and to be rigid, maintaining shape and position under all circumstances

- C. Do not pull trench sheeting before backfilling unless pipe strength is sufficient, to carry trench loads based on trench width to the back of sheeting
- D. Do not brace sheeting left in place against the pipe, but support it in a manner that precludes concentrated loads or horizontal thrusts on pipe
- E. Cross braces installed above the pipe to support sheeting may be removed after pipe embedment is completed
- F. Contractor responsible for obtaining all required permits or easements for encroachments into the public right-of-way and for coordinating any encroachments onto adjacent properties.

2.8 TRENCH STABILIZATION

- A. Thoroughly compact and consolidate subgrades for concrete structures, precast structures, and utility trench bottoms so they remain firm, dense and intact during required construction activities
- B. Remove all mud and muck during excavation
- C. Reinforce subgrades with crushed rock or gravel if they become mucky during construction activities
- D. Finished elevation of stabilized subgrades are to be at or below subgrade elevations indicated on drawings
- E. Allow no more than ½ inch depth of mud or muck to remain on trench bottoms when pipe bedding material is placed thereon

2.9 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot
- B. Remove existing unsuitable/uncompacted fill, old foundations, rubble/debris, soft or otherwise unsuitable material, and replace with suitable material in excavation
- C. Provide dewatering and temporary drainage as required to keep excavations dry.
- D. Reshape subgrade and wet as required

2.10 PAVEMENT OVEREXCAVATION AND SUBGRADE PREPARATION

- A. Excavate subgrade for asphalt pavement areas per the lines, grades, and dimensions indicated on drawings within a tolerance of plus or minus 0.10 foot. Excavate subgrade for concrete pavement areas per the lines, grades, and dimensions indicated on drawings within a tolerance of plus or minus 0.05 foot.
- B. Overexcavate and scarify existing soil as required under pavement areas, slabs, curbs and walks to meet the moisture and compaction specifications herein to depth shown on drawings.

- C. Extend subgrade preparation a minimum of 1 foot beyond back of proposed pavement, slabs, curbs and walks.
- D. Proof roll with a pneumatic tire equipment with a minimum axle load of 18 kips per axle a maximum of 24 hours prior to paving to locate any soft spots that exhibit instability and deflection beyond subgrade tolerances listed above. Areas that are observed to have soft spots in the subgrade, where deflection is not uniform or is excessive as determined by the Geotechnical Owner, shall be ripped, scarified, dried or wetted as necessary and recompacted to the requirements for density and moisture at the Contractor's expense. After recompaction, these areas shall be proof rolled again and all failures again corrected at the Contractor's expense.
- E. If the Contractor fails to place the sub base, base course, or initial pavement course within 24 hours or the condition of the subgrade changes due to weather or other conditions, proof rolling and correction shall be performed again at the Contractor's expense.

2.11 FILLS AND EMBANKMENTS

- A. Level and roll subgrade so surface materials will be compact and bond with the first layer of fill or embankment
- B. Place in horizontal layers at maximum uncompacted depth per compaction specifications herein.
- C. Spread and level material deposited in piles and windrows before compacting
- D. Thoroughly compact each layer by rolling or other means acceptable to Geotechnical Owner to meet the moisture and compaction specifications herein.
- E. Alter compaction methods if material fails to meet specified density
- F. Where a trench passes through a fill or embankment, place and compact fill or embankment to 12 inch above the top of the pipe before excavating the trench
- G. Add water and harrow, disc, blade, or otherwise work each layer to obtain the uniform moisture content and adequate compaction
- H. Refer to geotechnical report for additional requirements for fill and subgrade preparation requirements.

2.12 COMPACTION

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure as described herein.

- C. Refer to geotechnical report for additional requirements for site development material, subexcavation, compaction, etc.
- D. Percentage of Maximum Dry Density Requirements: Moisture treat and compact soil to not less than the following percentages of maximum dry density and to within the specified moisture content range of optimum moisture content according to ASTM D 698 as follows:

Surface Improvement	Compaction %	Moisture Content
Structures	98%	-2 to +2
Paved Areas	95%	-2 to +2
Synthetic Turf Fields	95%	-2 to +2
Utility Trenches	95%	-2 to +2
Lawns or Unpaved Areas	90%	-2 to +2
Public Right-of-way	Per municipal standards	

1. Do not deposit or compact tamped or otherwise mechanically compacted backfill if frozen or if in water.
2. Take particular care to compact backfill which will be beneath slabs, pipes, drives, roads, parking areas, curb, gutters, or other surface construction.

2.13 BORROW OR SPOIL AREA

- A. Obtain suitable material required to complete fill and embankments from excavation, on-site areas.
- B. The location, size, shape, depth, drainage, and surfacing of borrow or spoil pits shall be acceptable to Owner.
- C. Make all areas regular in shape with graded and surfaced side and bottom slopes when completed
- D. Cut side slopes not steeper than 1:1 and uniform for the entire length of any one side
- E. Final grade disturbed areas of borrow to uniform slope (maximum slope = 4:1, minimum slope = 50:1).
- F. Use material free of debris and deleterious material
- G. Provide erosion and sediment control measures for borrow or spoil areas as required by municipal or local Municipal Separate Storm Sewer System (MS4) requirements.

2.14 DISPOSAL OF EXCESS EXCAVATED MATERIALS

- A. Use excess excavated materials in fills and embankments as indicated on the drawings to the extent needed. Coordinate with Owner and Owner on locations for excess material placement.
- B. The Contractor is responsible for disposing of excess excavated materials from the site to a location approved by the Owner or Owner and permitted with the local authorities.

- C. Remove debris, junk, broken concrete, broken asphalt, rock, stones, stumps, logs, roots, and other unsuitable material from the site and dispose of it

2.15 BLASTING

- A. Blasting or other use of explosives is not permitted without City of Louisville approval

2.16 TRENCH EXCAVATION

- A. Establish alignment and grade or elevation from offset stakes provided by the contractor's surveyor.
- B. Excavate trenches so pipes can be laid straight at uniform grade without dips or bumps, between the terminal elevations indicated on the drawings
- C. Comply with pipe specification sections regarding vertical and horizontal alignment and max joint deflection
- D. Where grades or elevations are not fixed on the drawings, excavate trenches to provide a minimum depth of backfill cover over the top of pipe as follows. Coordinate depth of cover with utility owners. Increase depth as required by utility owner and at crossings.
 - 1. 2.5 feet for gas piping
 - 2. 2.5 feet for electric, telecom, and fiber optic conduit.
 - 3. 2.0 feet for irrigation piping
 - 4. Increase depth as required at vertical curves and for clearance beneath existing pipes, conduits, drains, drainage structures, or other obstructions encountered at normal pipe grades
- E. Measure pipe cover depth vertically from top of pipe to finished ground or surface elevation
- F. Do not open more trench in advance of pipe laying than is necessary to expedite the work; not more than 200 feet
- G. Except where tunneling or boring is indicated on the drawings, specified, or permitted by Owner, excavate trenches by open cut from the surface
- H. Limiting trench widths
 - 1. Excavate to a width which will provide adequate working space and pipe clearances for proper pipe installation, jointing, embedment
 - 2. If needed to reduce earth loads to prevent sliding, cut banks back on slopes which extend not lower than 1 foot above the top of the pipe
 - 3. Stipulated minimum clearances are minimum clear distances, not minimum average distances
 - 4. Maximum trench width from 1 foot above the top of pipe to trench bottom is the pipe outside diameter plus 24 inches
 - 5. If the width of the lower portion of the trench exceeds the max permitted, provide special pipe embedment, or concrete encasement as required by loading conditions
- I. Mechanical excavation

1. Do not use where its operation would damage buildings, culverts, or other existing property, structures, or utilities above or below ground; hand excavate only in such areas
 2. Use mechanical equipment of a type, design, and construction and operated so that
 - a. Rough trench bottom elevation can be controlled
 - b. Uniform trench widths and vertical sidewalls are obtained from 1 foot above the top of the installed pipe to the bottom of the trench
 - c. Trench alignment is such that pipe is accurately laid to specified alignment and is centered in the trench with adequate clearance between pipe and trench sidewalls
 3. Do not undercut trench sidewalls
 4. Recompact trench bottom disturbed by bucket teeth prior to placement of embedment material
- J. Except as otherwise required, excavate trenches below the underside of pipes as indicated in the drawings to provide for installation of granular embedment pipe foundation material
- K. Where in earth, trench bottoms for 6 inches and smaller pipe may be excavated below pipe subgrade and granular embedment provided or the trench may be graded to provide uniform and continuous support (between bell holes or end joints) of the installed pipe, Contractor's option
- L. Whenever so directed by Owner, excavate to such depth below grade as Owner directs and bring the trench bottom to grade with such material as Owner may direct
- M. For unstable soils, provide concrete or other bedding as directed by Owner
- N. Do not allow any part of bells or couplings to contact the trench bottom, walls, or granular embedment when pipe is joined
- O. Cuts in existing surface construction
1. No larger than necessary to provide adequate working space
 2. Cut a clean groove not less than 1½ inch deep along each side of trench or around perimeter of excavation area
 3. Remove pavement and base pavement to provide shoulder not less than 6 feet wide between cut edge and top edge of trench
 4. Make pavement cuts to and between straight or accurately marked curved lines parallel to trench centerline or limits of excavation
 5. Remove pavement for connections to existing lines or structures only to the extent required for the installation
 6. Replace the pavements between saw cuts to match original surface construction
- 2.17 PIPE EMBEDMENT
- A. Embed pipes above and below the bottom of pipe as indicated in the drawings and as specified herein

- B. Spread and surface grade granular embedment to provide continuous and uniform support beneath pipe at all points between pipe joints
- C. After grading, aligning, and placing pipe in final position, and shoring home, deposit and compact sufficient embedment under and around each side of the pipe and to hold the pipe in proper position and alignment during subsequent operations
- D. Place and compact embedment material uniformly and simultaneously on both sides of pipe to prevent lateral displacement
- E. Granular embedment compact by slicing with shovel or vibrating
 - 1. Maximum uncompacted thickness of layers: 6 inch
- F. Compacted embedment: Place in horizontal layers at maximum uncompacted depth per compaction specifications herein. Thoroughly compact each layer to meet the moisture and compaction specifications herein.

2.18 TRENCH BACKFILL

- A. Compacted backfill needed for all trench excavations
- B. Where the trench for one pipe passes beneath the trench of another pipe, compact the backfill for the lower trench to the bottom of the upper trench
- C. Place job excavated materials in 8 inch max uncompacted thickness, uniform layers
 - 1. Increased layer thickness may be permitted for uncohesive material if Contractor demonstrates to Owner's satisfaction that specified compacted density will be achieved
 - 2. Thoroughly compact each layer to meet the moisture and compaction specifications herein.
- D. Use methods and equipment appropriate to the material to be compacted to prevent transmission of damaging shocks to pipe
- E. Graded gravel
 - 1. Deposit in uniform layers of 12 inch max uncompacted thickness
 - 2. Compact with suitable vibrating roller or platform vibrator to not less than 70 percent relative density per ASTM D4253/D4254
- F. Finish the top portion of backfill with at least 4 inches of topsoil or as specified by landscaping specifications, whichever is greater, corresponding to, or better than, that underlying adjoining turf areas.
- G. Trench backfill within the public right-of-way shall conform to municipal street and utility standards.
- H. Trench backfills through unimproved areas should be restored to previous conditions and left 3" above adjacent grades to allow for settlement. Seed all disturbed areas according to landscape specifications.

2.19 PROTECTION OF TRENCH BACKFILL

- A. Where trenches are constructed in ditches or other water courses, protect backfill from erosion
- B. Install ditch checks where the ditch grade exceeds 1 percent
 - 1. Minimum depth: 2 feet below the original ditch or water course bottom for the full bottom width
 - 2. Minimum width: 18 inches into the side slopes
 - 3. Minimum thickness: 12 inches

2.20 DRAINAGE MAINTENANCE

- A. Do not backfill trenches across roadways, drives, walks or other trafficways adjacent to drainage ditches or water courses prior to backfilling the trench on the upstream side of the trafficway to prevent impounding water after pipe is laid
- B. Backfill so that water does not accumulate in unfilled or partially filled trenches
- C. Remove materials deposited in roadway ditches or other water courses crossed by the trench line immediately after backfilling is completed and restore ditches and water courses to original section, grade, and contours
- D. Do not obstruct surface drainage any longer than necessary
- E. Provide and maintain temporary bridges and other structures across unfilled trenches as required to maintain traffic
- F. Provide adequate storm flow conveyance through the site at all times during construction to avoid flooding of any buildings or adjacent property. Provide overland drainage routing when storm sewer inlets are not fully functioning due to erosion and sediment control measures.

2.21 FINAL GRADING

- A. After completion of all other outside work and after backfilling is completed and settled, bring to grade at the indicated elevations
- B. Graders and other power equipment may be used for final grading and slope dressing if the result is uniform and equivalent to hand work
- C. Grade all surfaces for effective drainage, provide a 2 percent minimum slope except as otherwise shown on the plans
- D. Provide a smooth transition between adjacent existing grades and new grades
- E. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances
- F. Slope grades to direct water away from buildings and prevent ponds from forming where not intended.

- G. Finish subgrades at lawns and unpaved areas to required elevations within a tolerance of plus or minus one (1) inch.
- H. Coordinate final subgrade depth with finish landscape treatment.

2.22 SLOPE AND CHANNEL STABILIZATION

- A. Cover channel banks, slopes, bottom and thalweg (water flowline at lowest point in channel) with erosion control fabric mat where grade is steeper than 3H to 1V and where indicated on the Drawings
- B. Lay fabric smoothly on surface, bury top end of each section in 6-inch deep excavated topsoil trench. Provide 6-inch overlap minimum of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil
- C. Secure outside edges and overlaps at 48 inch intervals with 4-inch to 6-inch U-shaped type pins or wooden stakes depending on ground condition
- D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil
- E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches
- F. Maintain integrity of erosion control fabric
- G. Prior to laying fabric, seed disturbed areas under provisions of related seeding and landscaping specification sections

2.23 SETTLEMENT

- A. Warranty for settlement of all fills, embankments, and backfills is stipulated in the General Conditions from final completion of Contract under which Work is performed
- B. Repair or replace within 30 days after notice by Owner

2.24 FIELD QUALITY CONTROL

- A. Provide under provisions of General Conditions and Division One Specifications
- B. Coordinate testing with Owner. Coordinate testing with Owner. Contractor shall provide all field testing (pass or fail) using Owner approved testing agency to determine compliance of in-place and backfill materials and compaction in accordance with the specifications, and to verify design bearing capacities.
- C. Fills and Embankment Testing
 - 1. Two moisture-density relationship tests, ASTM D698, on each type of fill material
 - 2. One in-place compaction test for each 5,000 square feet every 1.5 feet of vertical lift of material placed
 - 3. Additional in-place compaction tests at the discretion of the Owner
- D. Pipe Embedment and Backfill Testing

1. Two moisture-density relationship tests, ASTM D698, or two relative density tests, ASTM D4253/D4254, as appropriate for each type of embedment on backfill material proposed, except granular embedment material
2. One in-place compaction test every 200 lineal feet of trench in the compacted embedment zone and at every 1.5 feet of vertical lift of backfill materials, ASTM D2922/D3017
3. One in-place compaction test near top of trench for trench depth of 2 feet or less, ASTM D2922/D3017
4. Additional in-place compaction tests at the discretion of the Owner

E. Pavement and Structural Subgrade Testing

1. At a minimum, two moisture-density relationship tests, ASTM D698, or two relative density tests, ASTM D4253/D4254, as appropriate and adequate for each type backfill material proposed.
2. Perform tests for each footing, concrete site feature, and drainage structure subgrade. Perform tests at every 100 linear feet of subgrade of foundation walls, retaining walls, and every 150 feet for curbing, pans, drainage features, walks, etc. (or portions thereof). Perform tests every 2,000 square feet required of building slab area, exterior slabs and pavement/flatwork areas (with no less than 3 tests). Test at subgrade and at every vertical lift of backfill materials placed.
3. Additional in-place compaction tests at the discretion of the Owner

END OF SECTION 31 00 00

SECTION 31 25 00**EROSION AND SEDIMENTATION CONTROLS****PART 1 - GENERAL****1.1 SECTION INCLUDES**

- A. This work consists of temporary measures needed to control erosion and water pollution. These temporary measures will include, but not be limited to, berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses, slope drains, and other erosion control devices or methods. These temporary measures shall be installed at the locations where needed to control erosion and water pollution during the construction of the project and during site restoration, as shown on the drawings, and as required by jurisdictional inspector. The Contractor shall provide measures as required to obtain the required protection.
- B. Contractor shall include in the bid price for erosion control a minimum of measures required by the City for this project and any additional items that may be needed to control erosion and water pollution.

1.2 RELATED SECTIONS

- A. Section 31 00 00 – Earthwork
- B. Section 32 13 00 – Rigid Paving

1.3 REFERENCES AND STANDARDS

- A. CDOT – Colorado Department of Transportation
- B. UDFCD – Urban Drainage and Flood Control District
- C. CDPHE – Colorado Department of Public Health and Environment

1.4 SUBMITTALS

- A. Submit under provisions of the Project Manual.
- B. Submit the following information:
 - 1. Erosion Control Plan,
 - 2. Construction schedule for Erosion Control per Article Scheduling,
 - 3. Sequencing Plan per Article Scheduling,
 - 4. All applicable permits for Erosion Control.
- C. Product data: Submit on all products or materials supplied herein.

1.5 REGULATORY REQUIREMENTS

- A. Obtain and comply with all requirements of City and CDPHE Stormwater and/or Groundwater Discharge Permits, as required.

- B. In the event of conflict between these requirements and erosion and pollution control laws, rules, or regulations of other Federal, State, or local agencies, the more restrictive laws, rules, or regulations shall apply.

1.6 SCHEDULING

- A. Sequencing Plan:
 - 1. Contractor shall submit a sequencing plan for approval for erosion control in conformance with Contractor's overall Construction Plan for approval by the City.
 - 2. Changes to the Erosion Control Sequencing Plan may be considered by the City only if presented in writing by the Contractor.
- B. Temporary Erosion Control:
 - 1. When directed by the City, Contractor shall prepare construction schedules for accomplishing temporary erosion control work including all maintenance procedures.
 - 2. These schedules shall be applicable to clearing and grubbing, grading, structural work, construction, etc.
- C. Contractor shall submit for acceptance the proposed method of erosion control on haul roads and borrow pits and a plan for disposal of waste material.
- D. Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the accepted schedule. Temporary erosion control measures shall then be used to correct conditions that develop during construction.
- E. Work shall not be started until the erosion control schedules and methods of operations have been accepted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with all applicable municipal or local Municipal Separate Storm Sewer System (MS4) requirements.
- B. All materials shall be submitted for approval prior to installation.
- C. Natural or biodegradable materials shall be reasonably clean, free of deleterious materials, and certified weed free. Materials may include, but are not limited to, hay bales, straw, fiber mats, fiber netting, wood cellulose, fiber fabric, gravel.
- D. Grass Seed:
 - 1. Temporary grass cover (if required) shall be a quick growing species, suitable to the area, in accordance with local criteria and permit requirements, which will provide temporary cover, and not compete with the grasses sown for permanent cover.
 - 2. All grass seed shall be approved by Landscape Architect, City, and in accordance with local regulations prior to installation.

- E. Fertilizer and soil conditioners shall be approved by Landscape Architect and City and in accordance with local regulations prior to installation.
- F. Silt Fence Fabric: woven polypropylene
 - 1. Mirafi 100X, "Envirofence", or approved equal
- G. Temporary Slope Stabilization Mat (short term): 1.5 pound photodegradable polypropylene top and bottom nets, 100% straw fiber matrix, with a longevity of 12 months.
 - 1. North American Green S150, or accepted substitution
- H. Temporary Slope Stabilization Mat (extended term): 3.0 pound UV-stable polypropylene top net, 1.5 pound photodegradable polypropylene bottom net, 70% straw/30% coconut fiber matrix with a longevity of 24 months.
 - 1. North American Green SC150, or accepted substitution
- I. Biodegradable Slope Stabilization Mat (short term): 9.3 pound leno-woven biodegradable jute top net, 7.7 pound woven biodegradable jute bottom net, 100% straw fiber matrix with a longevity of 12 months.
 - 1. North American Green S150BN, or accepted substitution
- J. Biodegradable Slope Stabilization Mat (extended term): 9.3 pound leno-woven biodegradable jute top net, 7.7 pound woven biodegradable jute bottom net, 70% straw/30% coconut fiber matrix with a longevity of 18 months.
 - 1. North American Green SC150BN, or accepted substitution

PART 3 - EXECUTION

3.1 GENERAL

- A. All temporary and permanent erosion and sediment control practices will be maintained and repaired as needed to ensure continued performance of their intended function.
- B. City will monitor Contractor's erosion control methods. If the overall function and intent of erosion control is not being met, City will require Contractor to provide additional measures as required to obtain the desired results.
- C. The erosion control features installed by Contractor shall be adequately maintained by Contractor until the project is accepted.

3.2 PROTECTION OF ADJACENT PROPERTIES

- A. Properties adjacent to the site of a land disturbance shall be protected from sediment deposition.
- B. In addition to the erosion control measures required on the drawings, perimeter controls may be required if damage to adjacent properties is likely, and may include, but is not limited to:
 - 1. Vegetated buffer strip around the lower perimeter of the land disturbance.

- a. Vegetated buffer strips may be used only where runoff in sheet flow is expected and should be at least twenty (20) feet in width.
2. Sediment barriers such as straw bales, erosion logs, and silt fences.
3. Sediment basins and porous landscape detention ponds.
4. Combination of above measures.

3.3 CONSTRUCTION

- A. Stabilization of Disturbed Areas:
 1. Temporary sediment control measures shall be established within five (5) days from time of exposure or disturbance.
 2. Permanent erosion protection measures shall be established within five (5) days after final grading of areas.
- B. Stabilization of Sediment and Erosion Control Measures:
 1. Sediment barriers, perimeter dikes, and other measures intended to either trap sediment or prevent runoff from flowing over disturbed areas shall be constructed as a first step in grading and be made functional before land disturbance takes place.
 2. Earthen structures such as dams, dikes, and diversions shall be stabilized within five (5) days of installation.
 3. Stormwater outlets shall also be stabilized prior to any upstream land disturbing activities.
- C. Stabilization of Waterways and Outlets:
 1. All onsite stormwater conveyance channels used by Contractor for temporary erosion control purposes shall be designed and constructed with adequate capacity and protection to prevent erosion during storm and runoff events.
 2. Stabilization adequate to prevent erosion shall also be provided at the outlets of all pipes and channels.
- D. Storm Sewer Inlet Protection: All storm sewer inlets which are made operable during construction or which drain stormwater runoff from a construction site shall be protected from sediment deposition by the use of filters.
- E. Construction Access Routes:
 1. Wherever construction vehicles enter or leave a construction site, a Stabilized Construction Entrance is required.
 2. Where sediment is transported onto a public road surface, the roads shall be cleaned thoroughly at the end of each day.
 3. Sediment shall be removed from roads by shoveling or sweeping and be transported to a sediment controlled disposal area.
 4. Street washing shall be allowed only after sediment is removed in the manner described above.

3.4 DISPOSITION OF TEMPORARY MEASURES

- A. All temporary erosion and sediment control measures shall be disposed of within thirty (30) days after final site stabilization is achieved or after the temporary measures are no longer needed as determined by the City.

- B. Trapped sediment and other disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion.
- C. Substantial Completion of Erosion Control Measures:
 - 1. At the time specified in the Contract Documents, and subject to compliance with specified materials and installation requirements, Contractor shall receive a Substantial Completion Certificate for temporary erosion control measures.
 - 2. Maintenance of Erosion Control Measures after Substantial Completion: Contractor shall be responsible for maintaining temporary erosion control measures as specified in the drawings and Contract Documents until such time as work has been accepted by the City and as specified in Division 1 for Closeout Procedures.

END OF SECTION 31 25 00

SECTION 32 84 00**PLANTING IRRIGATION****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Underground Sprinkler System.
- B. Installation.
- C. Testing.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Drawings and general provisions of the Construction Contract, and Division-01 Specification sections apply to work of this section.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide underground sprinkler system as a complete unit produced by acceptable manufacturers indicated on drawings, including heads, valves, piping circuits, controls, and accessories.
- B. Installer Qualifications: Have satisfactorily installed acceptable underground sprinkler system(s) on at least three other projects of comparable complexity.
- C. Irrigation Drawings: The irrigation drawings are essentially diagrammatic. Due to the scale of the drawings, all characteristics of the system (i.e., sleeving, fittings, etc.) may not be represented. The Contractor shall carefully inspect the site and plan his work accordingly, supplying any materials and equipment necessary to install said characteristics.

The Contractor shall notify Owner's Representative of any discrepancies of site dimensions, obstructions, etc. that were not shown on the drawings and that might not have been known during preparation of irrigation drawings. If such notification is not made, Contractor shall assume all expenses and responsibility for any revisions necessary. Work called for on the drawings by notes or on details shall be furnished and installed whether or not specifically mentioned in the specifications.

Design locations of heads, valves and lines are approximate. Contractor shall make minor adjustments of locations to avoid obstacles. Contractor to flag all head locations and chalk all pipe lines. Any adjustments or additional heads due to trees, lights, or other obstacles will be approved by Owner and Owner's Representative prior to any work. All finish grades shall be approved prior to installation of the irrigation system.

- D. Ordinances and Regulations: Contractor shall observe all state and local laws, ordinances and regulations concerning the materials and installation of the irrigation system.

1.4 SUBMITTALS

- A. As-Built or Record Drawings/Maintenance Manual: Acceptance of the system is based on the furnishing by the contractor of a complete as-built plan showing exact location of all valves and any changes in location of sprinkler heads, piping, etc. which is acceptable to the Owner's Representative. Submit record drawing information in AutoCAD format prepared by a qualified computer operator on site plan disk furnished by Owner's Representative. Show locations of main

connection, pressure lines, zone lines, all valves, additional wires, drip line blowout valves, changes in zoning, changes in numerical sequence at control valves, and other items required by Owner's Representative.

Contractor shall furnish to the Owner a mylar plot of irrigation system, and two 11" x 17" reductions of the drawings, product cut-sheets and operation instructions for same, and complete maintenance instructions, including system winterization and start-up procedures, all neatly assembled in plastic sheet covers into one hard-cover three ring notebook with project name on cover. Also provide:

- (2) Manual drain valve keys, 4' length.
- (2) Quick coupler keys, each with a hose swivel and 3/4" hose adapter.
- (2) Automatic controller keys.
- (2) Isolation gate valve keys, 6' length with tee handle.
- (2) Of each type of head and nozzle installed on project.
- (2) Wrenches for removing and installing each type of head installed
- (2) Valve box locking bolts.
- (2) Keys/tools for valve box bolt removal.

- B. Quality Control Submittals: Any deviations from the proposed irrigation design must be approved by the Landscape Architect prior to construction. Submit three (3) copies of any design deviations before commencing any work.
- C. As of the date of Final Acceptance for the entire project, the Owner shall be solely responsible for setting of irrigation controllers. Within three calendar days of the date of Final Acceptance, the landscaping subcontractor shall provide in writing, the program of the existing irrigation settings, and any other information necessary to the proper operation of the irrigation system, if not already provided.

During the warranty period for the project, the landscape subcontractor may inspect the clock to review controller settings. If, as a result of a landscape subcontractor's inspection, it is determined that adjustments to those settings are necessary, the landscaping subcontractor shall notify the Owner, in writing, as to when the settings were inspected, what specific changes are recommended, and why.

The landscape subcontractor shall not make any changes to the irrigation settings during the warranty period.

If, in the opinion of the Owner, the changes are necessary, the Owner will make the changes to the clock and controller settings and notify the landscape subcontractor of the change. The Owner shall also notify the landscape subcontractor if the Owner determines that the recommended changes are not necessary and the basis for this determination.

If the landscaping subcontractor makes any changes to the irrigation control settings during the warranty period, the landscaping subcontractor assumes full financial responsibility for any damage and loss that occurs as a result of those changes.

During the warranty period, the Owner shall notify the landscaping subcontractor whenever the Owner makes adjustments to the irrigation control settings.

1.5 GUARANTEE

- A. Guarantee: During the period of one full year after final acceptance, make all necessary repairs or replacements due to defective workmanship or materials within two (2) calendar days of receipt of notice of malfunction by the Owner. Any unwatered area due to poor placement or insufficient number of heads to be corrected by the contractor.

1.6 PROTECTION OF PROPERTY AND SAFETY MEASURES

- A. Property and Utilities: All trees, shrubs, flowers, fences, buildings, walks, roadways, and other property shall be protected from damage. Any damage to said property shall be repaired or replaced to the Owner's satisfaction at the Contractor's expense. Open trenches left exposed shall be flared and barricaded as per OSHA regulations by the Contractor. Contractor shall restore all areas to their original condition. Contractor shall be responsible to contact utility companies and the Owner's representative for staked locations of all utilities on the property. If staked utilities are damaged by the Contractor, the utilities shall be repaired at the Contractor's expense.

All trenching and other work within dripline of existing trees shall be done by hand so as not to damage tree roots or limbs. All trenches shall be no less than one foot from the trunk of any tree. Promptly notify Owner's Representative of unexpected sub-surface conditions.

- B. Replacement of Paving and Curbs: Damage caused by trenching, crossing existing and/or proposed roadways, paths, curbing, etc. shall be kept to a minimum and all damaged areas shall be restored to their original condition. This will include compaction of subgrade to 95% relative compaction.

Restoration shall take the following course:

Match existing paving sections for asphalt paving. Thoroughly compact sub-base, base course, and bituminous course, matching grade of existing paving. No rough or rolled grades will be allowed.

Blacktop curbs - hot mix bituminous curb mix tamped and shaped to match adjoining curbs.

Concrete paving - concrete to match adjoining concrete work, with expansion joints.

Sidewalks - concrete to match adjoining concrete work.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, those specified on drawings.

2.2 MATERIALS

- A. Main Lines: All lines under continuous pressure shall be PVC as indicated.
1. Mainline Pipe: Shall be Polyvinylchloride (PVC) pipe, bell end, ASTM D2241 or commercial standard C5256, Type 1, normal impact, Class 200 (SDR21) as applicable. It shall be continuously and permanently marked as to grade and manufacturer. Pipe 3" and larger shall be gasketed, ring tite and receive mechanical fittings and joint restraints.
 2. PVC Fittings: Schedule 40 molded, solvent weld type PVC, or schedule 80 PVC if threaded.
 3. Mechanical fittings for mainline 3" or larger shall be Leemco self-restrained fittings for mainline in accordance with ASTM A-536, Grade 65-45-12 & AWWA C153, epoxy coated interior and exterior.
 3. Solvent: Primer/Cleaner and heavy bond cement conforming to ASTM D-2564.

- B. Branch Lines: All lines not under continuous pressure shall be PVC as indicated on drawings.
1. Shall be Polyvinylchloride (PVC) pipe, bell end, ASTM D2241 or commercial standard C5256, Type 1, normal impact, Class 200 (SDR21) as applicable. It shall be continuously and permanently marked as to grade and manufacturer.
 2. Joints: Plastic pipe joints shall be molded as the pipe and shall be suitable for solvent weld.
 3. Fittings: Plastic pipe fittings shall meet all the requirements of ASTM D2241 for Type 1, Grade PVC. Pressure rating and types of pipes shall be compatible with the pipe being used.
 4. Solvent: Primer/Cleaner and heavy bond cement conforming to ASTM D-2564.
- C. Drip Tubing: 3/4-inch polyethylene pipe (NSF approved), UV resistant, SDR pressure rated pipe, only as approved for drip applications.
- D. Sleeving Pipe: Class 200 PVC. Sleeves to be at least 2 pipe sizes larger than line carried. Wiring shall be sleeved separately in 2" minimum pipe.
- E. Valves: Manufacturer's standard, of type and size indicated, and as follows:
1. Electric Control Valves: In-line with manual flow adjustment. Include Pressure regulator and gauge (if specified). Brand valve box cover with SV # and corresponding zone on time clock with 1" minimum letters.
 2. Key operated mainline valves: Manual main resilient seated valve, gate type, MATCO with square nut top. Brand valve box covers with 'GV' in 1" min. letters containing gate valves.
 - a. Furnish 1 key (manual cross handle).
 3. Key operated drain valves: Manual drain valves, 1" globe type, fitted for key operation.
 - a. Furnish 2 valve keys, 3-feet long with tee handles and key end to fit drain valves.
 4. P.V.C. Swing Joints: Install quick couplers and rotary heads on P.V.C. double swing joints. Assemble by using three (3) schedule 80 elbows and four (4) schedule 80 nipples (3-3" nipples and 1-12" nipple). The male threaded nipples need to be wrapped with teflon tape. Optional Lasco or Dura prefabricated swing joints are also acceptable.
- F. Sprinkler Heads:
1. Hi Pop-up Spray Heads:
 - a. Body: Non-corrosive Cylolac plastic body, 1/2" Female I.P.S. threads.
 - b. Nozzle: plastic
 - c. Stainless steel nozzle-adjustment screws.
 - d. Positive stainless steel spring retraction.
 - e. Pop-up projection shall be no less than 4". 12" for shrub, flower, and ground cover areas.
 2. Pop-up Rotary Gear Driven Heads:
 - a. Body: High impact plastic.
 - b. Drive: Sealed, oil packed gear assembly.
 - c. Cover: rubber cover kit.
 - d. Stainless steel retraction spring.
 - e. Adjustable radius and full 360 radius.
 - f. Stainless steel riser.
- G. Quick Coupling Assemblies:
1. Quick Coupling Valves: 2-piece all brass construction with locking rubber covers. Mounted in valve box as shown. Brand in 1" min. letters 'QC' on valve box cover containing quick coupler.
 2. Coupler Keys:

- a. Provide coupler keys and hose swivels for each site as noted in this specification.
 - b. Brass construction, heavy duty, double lug type.
- H. Valve Box: Highline with locking cover, jumbo and standard. Provide extensions. Provide 3" deep gravel sump with geotextile wrap for each box. Allow no space where soil can invade box or sump. Use jumbo boxes for all control valves.
- I. Drainage Backfill: Clean gravel or crushed stone, graded from 1 1/2" maximum to 3/4" minimum. Seal completely in geotextile wrap. Allow no contact with soil!
- J. Automatic Controller
 - 1. General: Furnish low voltage system manufactured expressly for control of automatic circuit valves of underground sprinkler systems. Provide unit of capacity to suit number of circuits as indicated; connect to 120 power source provided by owner.
 - 2. Switch Box: Supply separate 3 amp fuse box w/sp switch on locking Handy box and 6 amp fuse.
 - 3. Power Surge Protection: Provide adequate lightning protection to prevent loss of circuit panels during electrical storms. Ground box to 5 ohm resistance as measured with a megger.
 - 4. Exterior Control Enclosures: Manufacturer's standard with locking cover, complying with NFPA 70.
 - 5. Transformer: To convert building service voltage to control voltage of 24 volts (included within controller).
 - 6. Circuit Control: Each circuit variable from approximately 2 to 60 minutes. Include switch for manual or automatic operation of each circuit.
 - 7. Timing Device: Adjustable, 24-hour and 7- or 14-day clocks to operate any time of day and skip any day in a 7- or 14-day period
 - a. Allow for manual or semi-automatic operation without disturbing preset automatic operation.
 - 8. Weather Sensor: Provide rain/freeze sensor as specified. Final location of sensor to be verified in the field with Owner.
 - 9. Grounding: Providing grounding in accordance with manufacture's specifications.
- K. Low Voltage Control Wire:
 - 1. Use American Wire Gauge (AWG) No. 14-1 solid copper, 600 volt, Type UF or PE cable, UL approved for direct underground burial for individual control wires and spare control wires from the controller assembly to each remote control valve or stub-out location. Use American Wire Gauge (AWG) No. 12-1 solid copper, 600 volt, Type UF or PE cable, UL approved for direct underground burial for common ground wire and spare common wires from controller assembly to each remote control valve or stub-out location.
 - 2. Color: Use white for common ground wire. Use easily distinguished colors for other control wires. Spare control wires shall be of color different from that of active control wire. Wire color shall be continuous over entire length.
 - 3. Splices: Use 3M DBR/Y-6 wire connector.
 - 4. Electrical conduit: Use PVC Schedule 40 conduit conforming to dimensions and tolerances established by ASTM Standard D-1785. Use Schedule 40, Type 1, PVC solvent weld sweep fittings for PVC conduit conforming to ASTM Standards D2466 and D1784 for buried installations. Use rigid metallic conduit with sweep elbows for above grade installations.
 - 5. Warning tape: Inert plastic film highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils. Three inches wide, colored red, and imprinted with "CAUTION: BURIED ELECTRIC LINE BELOW."

PART 3 - EXECUTION

LOUISVILLE MEDIAN AND STREETScape IMPROVEMENTS

3.1 SYSTEM DESIGN

- A. Design Pressures: As indicated on Drawings, at connection to main pipe and at last head in circuit. Contractor to verify existing pressure prior to starting work.
- B. Location of Heads: Design location is approximate. Make minor adjustments as necessary to avoid plantings and other obstructions. Flag head locations for approval before installation.
- C. Minimum Water Coverage:
 - 1. Turf Areas: 100% minimum
 - 2. Other Planting Areas: 100% or as indicated.

3.2 TRENCHING AND BACKFILLING

- A. General: Excavate straight and true with bottom uniformly sloped to low points. 3"/100' run to drain valve. Pipe should be snaked in trenches to allow for expansion and contraction. Chalk all areas to be trenched for approval before excavation.
- B. Trench Depth: Excavate trenches to a depth of invert of pipe, unless otherwise indicated.
 - 1. PVC Mainline Piping: 24" to top of pipe
 - 2. Lateral Piping: 18" to top of pipe (rotors and sprays)
- C. Installation of Piping Under Paving: Contractor is to match and install new paving and base with existing paving and base where cutting of paving is necessary for installation of piping.

Any cracking or breaking of the walk is to be repaired at Contractor's expense.
- D. Backfill: Backfill with clean material from excavation. Remove organic material as well as rocks and debris larger than 1" diameter. Place acceptable backfill material in 6" lifts, compacting each lift. Puddle each trench thoroughly and assure that no sinking occurs.

3.3 INSTALLATION

- A. General: Unless otherwise indicated, comply with requirements of the Uniform Plumbing Code.
- B. Section Valves: Install a jumbo valve box, Carson, arranged for easy adjustment and removal. Brand cover in 1" min. letters 'SV' for section valve and the appropriate station number to controller.
 - 1. Adjust automatic control valves to provide flow at rated operating pressure required for each sprinkler circuit.
 - 2. Provide PVC ball valve on upstream side.
 - 3. Provide one union on upstream side, and one union on downstream side.
 - 4. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler zone.
 - 5. Install one valve per box, arranged for easy adjustment and removal. Allow minimum 12" between valves. Adjust valves to provide flow rate of rated operating pressure required for each lateral.
 - 6. Valve Boxes and Covers: Install one box and cover for each valve installed. Place top 1" above finished grade. Arrange adjacent valve boxes parallel to each other and the same distance apart. Install boxes perpendicular to and on a line with adjacent pavement or walls.

C. Sleeving:

1. Main and Lateral Line Sleeving:
 - a. Install under all paved surfaces as indicated on the drawings.
 - b. Minimum depth to top of pipe shall be determined by depth of mainline and lateral lines.
 - c. Lay sleeve to drain at minimum grade of 3"/100'.
 - d. Ends of Sleeves: Mark in manner to ensure easy location in future. Do not allow sleeves to become filled with soil or other undesirable material.

D. Drainage Backfill: Seal with geotextile wrap by taping fabric to inside of valve box and pipe with duct tape.

E. Piping: Lay pipe on solid sub-base, uniformly sloped without humps or depressions. Piping shall be installed in straight lines without bends or curves placing tension on the pipe. Changes in direction shall be made with fittings as specified.

1. For Mainline Piping: Slope to drain valve at least 1/2" in 10' run.
2. Install PVC Pipe: Install in dry weather when temperature is above 40 degrees F. (4 deg. C.) in strict accordance with manufacturer's instructions. Allow joints to cure at least 24 hours at temperature above 40 deg. F. (4 deg. C.) before testing, unless otherwise recommended by manufacturer. Open trenches until testing has been performed. No pipe joints shall be located within sleeve pipes.
3. Install poured concrete thrust blocks according to pipe manufacturer's requirements for all mainline pipe larger than 2 1/2" and for all gasket seal pipe.

F. Dielectric Protection: Use dielectric fittings at connection where pipes of dissimilar metals are joined. Use dissimilar metals only with architect's approval.

G. Sprinkler Heads: Flush circuit lines with full head of water and install heads after hydrostatic test is completed.

Install lawn heads at manufacturer's recommended heights.

Locate part-circle heads to maintain a minimum distance of 6" from walls and other boundaries, unless otherwise indicated. Allow no backwash or over spray onto walls or fences.

H. Control Wiring: Bury control wiring between controller and electric valves in sprinkler main line trenches.

1. Make electrical connection at valve to allow for pigtail so solenoid can be removed from valve with sufficient slack to allow ends to be pulled 12" above ground for examination and cleaning.
2. Bundle 24 volt wires at 15' to 20' intervals and lay with mainline pipe below and to one side only of the trench. (Inside of loop on looped mainline).
3. All valve wire is to be single strand 14 gauge below 1000', 12 gauge for runs above 1000'.
4. Provide a white common wire and red valve wires. Extend four black and one yellow spare wires from controller along full length of mainlines.
5. Provide 3' valve wire loop every 100' formed by wrapping wire for at least twelve inches, a minimum of sixteen coils around a 0.75" pipe leaving pipe in place.
6. Make splices and connections in accordance with NEC. Locate splices and connections at valve boxes, using a 3M DBY kit. Buried splices prohibited.
7. Install as per manufacturer's instructions or detail. Connect remote control valves to controller in numerical sequence as shown on the drawings.
8. All work performed as electrical installation shall conform to applicable codes. All high voltage electrical work shall be performed by a licensed electrician. The Contractor shall

be responsible for the electrical connection of the controller with the metered electrical line at the base of the controller.

3.4 TESTING

- A. General: Notify Owner's representative in writing not less than 16 working hours in advance of when testing will be conducted. Conduct tests in the presence of the Owner's representative.
 - 1. Before sprinkler heads are set, thoroughly flush the lines to remove all foreign matter.
 - 2. Flush from dead end fittings for a minimum of five minutes under a full head of pressure.
- B. ~~Hydrostatic Test: Test main piping and valves, before backfilling trenches, to a hydrostatic pressure of not less than 100 psi for a period of 4 hours. If the pressure loss is greater than 2 PSI over the testing period, repairs shall be made and the system re-tested until it passes. Piping may be tested in sections to expedite work.~~
- C. Operational Testing: Perform operational testing after hydrostatic testing is completed, backfill is in place, and sprinkler heads adjusted to final position.
 - 1. Demonstrate to Owner's representative that system meets coverage requirements and that automatic controls function properly.
 - 2. Coverage requirements are based on operation of one circuit at a time.
 - 3. After completion of grading, seeding or sodding, and rolling of grass areas, carefully adjust lawn sprinkler heads so they will be flush with finish grade.
 - 4. Flush and adjust all sprinkler heads for optimum performance and to prevent overspray onto walks, roadways, and buildings.
 - 5. If it is determined that adjustments in the irrigation equipment will provide proper and more adequate coverage, make such adjustments prior to final acceptance at direction of Owner's Representative. Adjustments may also include changes in nozzle sizes and degrees of arc as required.
 - 6. Correct areas which do not conform to designated operation requirements due to unauthorized changes or poor installation practices.

3.5 WINTERIZATION

- A. If warranted prior to written project acceptance by the Owner, Installer shall winterize by draining the complete system at the conclusion of the first sprinkling season OR within 3 days of notification by the Owner. Drain by using compressed air or similar method. ~~Re-open, operate and adjust system malfunctions accordingly during April of the following year as requested by the Owner.~~
- B. See plan for additional specifications.

END OF SECTION 32 84 00

SECTION 32 91 00**LANDSCAPE MAINTENANCE****PART 1 - GENERAL****1.1 WORK INCLUDED**

A. Section includes maintaining the following items through final acceptance:

1. Irrigation System.
2. Sod areas and seeded areas.
3. Trees and shrubs.
4. Mulch and cobble.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 32 84 00: Planting Irrigation.
- B. Section 32 92 19: Seeding.
- C. Section 32 93 00: Plants.
- D. Drawings and general provisions of the Construction Contract, and Division-01 Specification sections apply to work of this section.

1.3 SUBMITTALS

A. Notices - Submit the following written notices to the Owner:

1. A minimum of one (1) week prior to the start-up and/or winterization of the irrigation system.
2. A minimum of one (1) week prior to fertilization and/or the broad application of any chemicals or insecticides of any kind.

1.4 QUALITY ASSURANCE

A. Applicable Codes and Standards

1. Abide by the codes, specifications, and standards of all governmental and industry regulations including but not limited City, County, State of Colorado, and the standards of the American Association of Nurserymen (ANN), American Society for Testing and Materials (ASTM), National Plumbing Code (NPC), Colorado Technical Plumbing Code, Uniform Building Code (UBC), Sprinkler Irrigation Association (SIA), National Electric Code (NEC), American Sod Producers Association (ASPA), United States Department of Agriculture (USDA), and the Association of American Seed Control Officials (AASCO).
2. All labor shall be United States citizens or have current, valid work permits for work within the United States.
3. At all times when work is being performed, Contractor shall have an individual who has successfully completed the Standard First Aid and Personal Safety Course

(intermediate level) offered by the American Red Cross or other training as accepted by the Owner.

4. No chemicals or fertilizers shall be utilized on the work without a state licensed operator in attendance.

B. Equipment:

1. All equipment shall be well maintained and equipped with current safety features including audible reverse warning, trimming guards, etc.

1.5 MAINTENANCE PERIOD

- A. Required maintenance for all items shall extend until date of final acceptance of the entire project. ~~This period will last through a minimum of two lawn cuttings for sodded areas.~~
- B. After acceptance of the entire project, the Owner will assume responsibility for maintenance. A one year warranty will begin at date of acceptance of all landscape construction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 IRRIGATION SYSTEM

A. Start-Up:

1. The Contractor shall be responsible for the start-up of the automatic irrigation system. Unless modified by extreme weather conditions, the system shall be activated not before April 1 and not later than April 30.
2. To activate system, pressurize and then run each zone a minimum of 15 minutes. Each zone shall be observed for leaks, pressure defects, adequate coverage, and other conditions which shall impact the effective operations of the system. Any leaks or defects shall be corrected immediately.

B. Controller Settings:

1. Properly program the irrigation controller to insure adequate but not excessive watering throughout the year.
2. Following acceptance of the entire project by Owner, the Owner will assume responsibility for controller settings. Contractor may monitor controller settings during the warranty period, but shall not alter the settings without first notifying the Owner in writing.

C. Testing System:

1. At a minimum of once each month between May and October, manually operate each and every irrigation zone to insure continued and adequate coverage, pressure, and the absence of leaks. All system leaks or defects shall be corrected immediately.

D. Winterization:

1. ~~The Contractor shall be responsible for the first winterization of the automatic irrigation system. Unless modified by extremely mild weather conditions, the system may be shutdown and winterized by November 25. The requirement shall remain in effect even if the Owner has accepted the project.~~
2. ~~In the week immediately prior to closing of the system, all landscape areas shall receive a minimum of 1.5" of watering (either through natural conditions or through operation of the system).~~
3. ~~Winterize the system by closing the main pressure valve opening, all stop and waste valves, removing water from the lines, de-energizing the controller, and all other actions deemed prudent. Remove water from drip lines by opening flushing points and blowing out all water.~~

3.2 SODDED AREAS

A. Fertilization:

1. Fertilize all sodded areas four (4) weeks minimum after installation.
2. Fertilizer shall be a Urea based only mixture with the following chemical composition: 46 percent nitrogen, 0 percent phosphorous, and 0 percent potash. All applications shall be at a rate of 5 lbs. nitrogen per 1000 square feet.
3. These feedings are specifically in addition to those required by the installation specification.
4. All fertilizer applications shall occur using a commercial spreader on a calm, dry morning. The sod should be moist. Never fill the spreader over the lawn areas or when "on". Sweep all concrete and asphalt areas that may have been pelleted with fertilizer.
5. In addition to the lawn fertilization, one (1) application of elemental iron shall be made at a rate of 0.5 lbs. per 1000 square feet.

B. Weeding and Insect Toxins: Contractor is responsible for weed control until acceptance of the entire project. No application of weed killer, insecticides, or antifungal chemicals are specified. Apply these elements as necessary to maintain healthy, weed free sod throughout the year. Apply as per manufacturer's recommendations whenever necessary to protect the sod condition.

1. If site is open to the public, post notice of the applications.
2. Take all precautions when applying weed killers, insecticides or antifungal remedies, including gloves, masks, goggles, etc., and shall not apply on windy or rainy days.
3. This section includes insects, molds, fungus, broadleaf, and viney weeds and specifically includes grasshoppers.

C. Cuttings: Cut sod with a reel or rotary type mower. Keep grass an average of 2 inches in height and cut whenever the clippings will measure approximately 0.5 inch or 25

percent of the grass plant. Never cut off more than 33 percent of the plant height. Between May 1 and September 15, cut grass a minimum of once every two weeks.

1. If mowing creates visible accumulations of clippings, clippings must be removed. Remove all clippings immediately. Cross slope all mowing. All areas around walks, buildings, curbs, walls, rocks, plants, lights, or other structures must be trimmed by hand or mechanical trimmer each time the grass is cut. All cuttings must be done diagonal to the way the sod was laid. Clean cuttings from walks, plazas, drives, etc.

3.3 SEEDED AREAS

- A. General: The maintenance period shall begin immediately after each area is seeded and continue until final acceptance of entire project. During this time, the Contractor shall be responsible for watering, mowing, spraying, weeding and all related work as necessary to ensure that seeded areas are in a vigorous growing condition. Provide all supervision, labor, material, and equipment to maintain seeded areas.
- B. Materials: Conform to specifications or to be acceptable to by Owner.
- C. Watering: Water irrigated areas at regular schedule to be accepted by Owner until stand of grass is established. Water in repeated short time periods. After grass is established, water irrigated grass at a regular schedule to be accepted by Owner. Native and dryland grasses are not required to be watered. Water shall be free of substances harmful to plant growth. Be responsible for furnishing water from underground sprinkler system, quick couplers or other source.
- D. Reseeding: Per Section 32 92 19.
- E. ~~Fertilization: Per Section 32 91 13.~~
- F. Weed Control: Native Seed/Dryland Grasses: As required or requested by Owner, using selective herbicides only if pre-approved by Owner.
- G. Insect and Disease Control: As required, apply insecticide and fungicide approved by Owner.

3.4 TREE AND SHRUB CARE

- A. Maintenance crew shall inspect the plant material on a monthly basis. A written report of problems shall occur after each inspection.
- B. Immediately remove any dead plant or dead part of the plants. Maintenance crew shall remove all tree suckers and leafing on main stems.
- C. Each spring, no later than June 1, shall trim all winter dieback, undesirable shoots, and correct branching problems.
- D. Replace at no cost to the Owner any plant material which dies due to failure to comply with this specification or negligence or insect damage. This guarantee applies to trees which are damaged due to maintenance crew's mowing operations.

- E. Remove tree stakes, tree guys, guy wire, and tree wrap prior to completion of one-year warranty period.

3.5 WINTER WATERING

- A. Contractor's maintenance crew to water all sod, irrigated seed and plant material areas once each month during December, January, February, and March as needed to adequately sustain plant material through the winter, unless the Owner has accepted the project.
- B. This watering shall occur from sillcocks of the building or quick couplers and must include the cost of supplying all necessary hoses and fittings. If sillcocks are frozen or cannot be activated Contractor shall utilize a water truck.

END OF SECTION 32 91 00

SECTION 32 91 13**FINE GRADING AND SOIL PREPARATION****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Ripping.
- ~~B. Fertilizer.~~
- C. Soil amendments.
- D. Fine grading.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 31 00 00: Earthwork.
- B. Section 32 84 00: Planting Irrigation.
- C. Section 32 92 19: Seeding.
- D. Section 32 93 00: Plants.
- E. Drawings and General and Special Conditions of the Contract, including Division One and other related specification sections apply to work of this section.

1.3 SUBMITTALS

- A. Quality Control Submittals:
 - 1. Provide minimum three representative soil samples to help determine amendments.
 - 2. Certificates: State, federal and other inspection certificates shall accompany invoice for all materials showing source or origin. Submit to Owner's Representative prior to acceptance of materials.
 - 2. Soil Amendment Test Report: Submit soil conditioner test analysis to Owner's Representative 3 weeks prior to delivery to site with laboratory analysis specific to the sample dated within thirty days of date of submittal.
 - 3. Submit load tickets of all amendments.

1.4 QUALITY ASSURANCE

- A. The work of this section shall be performed by an experienced landscape Installer having not less than 5 years successful experience in landscape projects of similar size and scope as this project. Include work of Sections 32 92 19, 32 92 23, and 32 93 00 for undivided responsibility.

1.5 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with Section 01 60 00.
- B. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to state law, bearing name and warranty of producer.
- C. Notify Owner's Representative of delivery schedule in advance so material can be inspected upon arrival at project site. Immediately remove unacceptable material from project site.

1.6 PROJECT/SITE CONDITION

- A. General: Do not perform work when climate and existing site conditions will not provide satisfactory results.
- B. Vehicular accessibility on site shall be as directed by owner's representative. Repair damage to prepared ground and surfaces caused by vehicular movement during work under this section to original condition at no additional cost to Owner.
- C. Perform soil preparation just prior to planting operations and in accordance with final planting schedule. Coordinate with irrigation system installation to avoid damage to work of one by the other.
- D. Utilities: Determine location of underground utilities and perform work in a manner which will avoid damage. Hand excavate, as required.

PART 2 - PRODUCTS

2.1 SOIL AMENDMENTS

- A. Composted Amendment: 'Biocomp' Class 1 non-manure based compost as supplied by A-1 Organics, Eaton, CO or approved equal, meeting the following:

1. Organic Matter Content	> 20% and < 35%
2. Soluble Salts	< 5 mmhos/cm
3. pH units	6.0 to 7.0
4. Nitrogen total	> 0.75%
5. Phosphorus total	> 0.5%
6. Potassium total	> 0.25%
7. Calcium total	> 0.8%
8. Magnesium total	> 0.15%
9. Carbon to Nitrogen ratio	12:1 to 16:1
10. Particle size	99.8% < 9.5mm. No silt or clay. Screened to 3/8" minus.

Apply at a rate of 4 cubic yards per 1,000 square feet, tilled to a minimum of 6" depth, for seed and planting bed areas. For native seed areas, apply at a rate of 2 cubic yards per 1,000 square feet, tilled to a minimum of 6" depth.

- B. Compost Certification Specifications:

1. Composted soil amendments must be produced at a facility permitted and regulated under the State of Colorado Department of Public Health and Environment and/or the county in which the facility operates for the production of compost and soil amendments.
2. The product must be certified to have been produced in a manner that meets the US EPA 40CFR 503.13 minimum standards for pathogen destruction under a controlled, monitored, and documented process.
3. The supplier must certify that no supplemental nitrogen or other chemicals have been added to the compost to alter or enhance the results of the laboratory analysis, unless specifically requested by the design architect.
4. The contractor must supply a letter of certification from the manufacturer which confirms that the product being supplied has met the referenced requirements and that supporting documentation exists and is available for inspection (if requested).

2.3 FERTILIZER

~~A. Commercial Fertilizer:~~

~~1. Native Seeded Areas:~~

- ~~a. Commercial fertilizer as 1200 lb/Ac if high organic results up to 1800 lbs/Ac if low organic results Biosol min 800lb/Ac topically applied after drilling (Pawnee Buttes Seed Company, Rocky Mountain Bio Products or equal).~~
- ~~b. Humate at minimum 400 lb/Ac or 1/2 the amount/Ac Biosol~~

~~2. Sodded Lawns:~~

- ~~a. Commercial granular fertilizer as 18-46-0 at the rate of 3 lb/1000 square feet with the following composition by weight: Nitrogen, eighteen percent (18%) and phosphoric acid (P205), forty-six percent (46%). These elements may be organic, inorganic, or a combination of the two, and shall be measured according to the methods of the Association of Official Chemists.~~

2.3 HERBICIDE

- A. To be approved by Owner

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Verify that existing site conditions are as specified and indicated before beginning work under this section.
 1. Grades: Inspect to verify rough grading is within + 0.1 foot of grades indicated and specified.
 2. Damaged Earth: Inspect to verify that earth rendered unfit to receive planting due to concrete water, mortar, limewater or any other contaminant dumped on it has been removed and replaced with clean earth from a source approved by the Owner's Representative.
- B. Unsatisfactory Conditions: Report in writing to General Contractor with copy to Owner's Representative.
- C. Acceptance: Beginning of installation means acceptance of existing conditions by installer.

3.2 PREPARATION

- A. Protection:
 - 1. Locate sewer, water, irrigation, gas, electric, phone and other pipelines or conduits and equipment prior to commencing work.
 - 2. Be responsible for proper repair to landscape, utilities, walls, pavements and other site improvements damaged by operations under this section.
 - 3. Pay for repairs made by contractor(s) designated by Owner.
- B. Weed Control: ~~Remove perennial weeds by applying herbicide 2 weeks before grading and as needed.~~ Remove annual weeds by tilling. Water prepared soil for two weeks if possible and remove exposed weeds by hand. Owner shall approve planting areas as substantially weed free before addition of amendment.
- C. Surface Grade: Remove weeds, debris and rocks larger than 1/2". Dispose of accumulated debris from site.
- D. Runoff: Take measures and furnish equipment and labor necessary to control the flow, drainage, and accumulation of water to run off the grounds as is intended by the grades.
- E. Erosion Control: Take measures and furnish equipment and labor necessary to control and prevent soil erosion, blowing soil and accumulation of wind-deposited material on the site throughout duration of work.

3.3 INSTALLATION

- A. Soil Amendment
 - 1. Limit preparation to areas which will be planted promptly after preparation.
 - 2. Before tilling, clean topsoil of stones, clay lumps, and other extraneous materials harmful or toxic to plant growth.
 - 3. Sodded Lawns: Spread soil amendments and phosphate at the rate specified after topsoil (if specified) is spread. Till in thoroughly to a minimum depth of 9", and grade to meet lines, grades and elevations shown, allowing for natural settlement.
 - 4. Native Seed: Spread soil amendments and fertilizer at the rate specified after topsoil (if specified) is spread. Till in thoroughly to a minimum depth of 6", and grade to meet lines, grades and elevations shown, allowing for natural settlement.
- B. Fine Grading in all Landscape Areas:
 - 1. Do fine grading for areas immediately prior to planting.
 - 2. For ground surface areas surrounding buildings to be landscaped, maintain required positive drainage away from buildings.
 - 3. Establish finish grades to within 0.05 foot of grades indicated. The intent of this spec is to prevent 'bird baths' or ponding.
 - 4. Finish grade to be below edge of pavement prior to sodding, seeding or planting.
 - b. Shrub Beds: Allow 4" for mulch.
 - c. Seeded Areas: Allow 1" for seed.
 - 5. Noxious weeds or parts thereof shall not be present in the surface grade prior to landscaping.

6. Compaction of Surface Grade Prior to Landscape Installation: Firm, but not hard (80% standard Proctor density within 2% optimum moisture).
7. Prior to acceptance of grades, rake to smooth, even surface free of debris, clods, rocks, and vegetable matter greater than 1". Native seed areas should not be raked smooth but left in a uniform condition after tilling. Rough raking may occur parallel to the contour only.
9. Restore planting areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

3.4 NOTIFICATION AND INSPECTION

- A. Inspection: Provide notice to Owner's Representative requesting inspection at least 7 days prior to anticipated date of completion.
- B. Deficiencies: Owner's Representative will specify deficiencies to Contractor who shall make satisfactory adjustments and shall again notify Owner's Representative for final inspection.

3.5 CLEANING

- A. General: Remove debris and excess materials from site. Clean out drainage inlet structures. Clean paved and finished surfaces soiled as a result of work under this section, in accordance with direction given by Owner's Representative.

3.6 PROTECTION

- A. General: Provide and install barriers as required to protect completed areas against damage from pedestrian and vehicular traffic until acceptance by Owner. Contractor is responsible for malicious destruction caused by others.

3.7 WARRANTY

- A. Contractor to warrant for a period of two years that puddling, sinking or caving directly due to earthwork operations does not occur.

END OF SECTION 32 91 13

SECTION 32 92 19**SEEDING****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Seeding and fertilizing.
- B. Hydromulching
- C. Maintaining seeded areas until acceptance.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 32 84 00: Plant Irrigation.
- B. Section 32 91 13: Fine Grading and Soil Preparation.
- C. Section 32 93 00: Plants.
- D. Drawings and general provisions of the Construction Contract, and Division-01 Specification sections apply to work of this section.

1.3 REFERENCES

- A. Reference Standards: Comply with U.S. Department of Agriculture Rules and Regulations under Federal Seed Act and be equal in quality to standards for Certified Seed.

1.4 SUBMITTALS

- A. Quality Control Submittals:
 - 1. Certificates: State, federal or other inspection certificates shall accompany the invoice for materials showing source or origin. Submit to Owner's Representative prior to acceptance of the material.
- B. Contract Closeout Submittals:
 - 1. Operating and Maintenance Data: At completion of work, submit 3 copies in accordance with Section 01 70 00. Include directions for irrigation, aeration, mowing, fertilizing and spraying as required for continuance and proper maintenance through full growing season and dormant period.
 - 1. Contractor to provide all delivery load tickets for seed, fertilizer, and mulch prior to acceptance of work under this section.
 - 3. Warranty for Seed Areas: At completion of work, furnish written warranty to Owner based upon requirements as specified. See Section 3.8.

1.5 QUALITY ASSURANCE

- A. Planting and seeding shall be done with the approval of the Owner's Representative only when the ground is not frozen, snow covered, or in an otherwise unsuitable condition for planting. Special conditions may exist that warrant a variance in the specified planting dates or conditions. A written request shall be submitted to or originate from the Owner's Representative stating the special conditions and proposed variance.
- B. Seeding shall be done within the following dates:
 - 1. Native Seed - From March 1 to May 1 for spring seeding; and from October 1 to November 15 for fall seeding.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with Section 01 60 00.
- B. Seed: Deliver seed in sealed standard containers stating correct name and composition on the outside of the container. Seed damaged in transit or storage will not be accepted. Retain tickets for submittal to Owner's Representative.
- C. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened container bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to state law, and bearing name and warranty of producer. Retain tickets for submittal to Owner's Representative.
- D. Material may be inspected upon arrival at project site.
- E. Immediately remove the unacceptable material from job site.

1.7 EXISTING CONDITIONS

- A. Beginning work means acceptance of existing conditions.

PART 2 - PRODUCTS

2.1 SEED

- A. Provide seed mixture at 30 Lbs/Acre composed of the following available from Pawnee Buttes Seed Inc. 605 25th Street, Greeley, CO 80632, 1-800-782-5947:
 - 1. 85% - Buffalograss, Texoka
 - 2. 10% - Blue Grama, Bad River
 - 3. 5% - Annual Rye
- B. All seed shall be furnished in bags or containers clearly labeled to show the name and address of the supplier, the seed name, the lot number, net weight, the percent of weed seed content, and the guaranteed percentage of purity and germination. All brands furnished shall be free from such noxious seeds such as Russian or Canadian Thistle, European Bindweed, Johnson Grass, and Leafy Spurge. The Contractor shall furnish to the Owner's Representative a signed statement certifying that the seed furnished is from

a lot that has been tested within six months prior to the date of delivery. Seed which has become wet, moldy, or otherwise damaged in transit or in storage will not be acceptable. Seed shall be certified to be a hardy strain of the following seeds at the indicated rates of pure live seed per acre.

- C. Computations for quantity of seed required are based on the percent of purity and percent of germination: Pounds of seed x purity x germination = pounds of pure live seed (PLS).
- D. Seed and seed labels shall conform to all current State and Federal regulations and will be subject to the testing provisions of the Association of Official Seed Analysis.

2.2 ACCESSORIES

- A. Mulching Material: For slopes up 4:1 or less, use Profile Wood with Tackifier, or approved equal. Apply the hydromulch material at a minimum of 2,000 lbs/ac or as specified by the manufacturer. For slopes 4:1 or more, use Profile ProMatrix applied per manufacturer specifications, or approved equal. Field mixing of wood mulch and tackifier will not be approved.
- B. Netting: Soil Saver jute netting or accepted substitute.
- C. Staples: No 11-gauge steel wire formed into a "U" shape 6" long.

PART 3 - EXECUTION

3.0 CONVERSION FROM EXISTING TURF

- A. Cut existing turf with a sod cutter at a 2" depth.
- B. No glyphosate or other spray applications without Owner approval.

3.1 PREPARATION OF FINAL GRADE

- A. Protect existing underground improvements from damage.
- B. Prepare soil as specified in Section 32 91 13.
- C. Moisten prepared seed areas in irrigated areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting seed. Do not create a muddy soil condition.
- D. Restore seed areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

3.2 FERTILIZING

- A. ~~Apply fertilizer as specified in Section 32 91 13.~~

~~B. Do not apply grass seed or fertilizer in same machine at same time.~~

3.3 SEEDING

- A. Drill seeding: Seed to be accomplished using an approved drill seeder. Do not apply seed and straw mulch in same machine at same time.
- B. Do not sow immediately following rain, or when ground is too dry, or during windy periods.
- C. Apply water with fine spray immediately after each area has been sown.
- D. Broadcast Seeding:
 - 1. Small areas inaccessible to seed drilling equipment to be seeded by broadcast method using a drop or whirly-bird type spreader. Seed shall be broadcast at double the application rates specified above. Apply seed in two equal applications, in perpendicular directions, to assure uniformity.
 - 2. Lightly rake seeded areas after seed is broadcast. Final raking shall be in a direction perpendicular to the slope of the land.
 - 3. Seeding will not be permitted when wind velocity is such as to prevent uniform seed distribution. No application shall be undertaken during inclement or the forecast of inclement weather. No application shall take place in the presence of free surface water or when the ground is frozen or otherwise untillable.
- E. Secondary Seeding: In areas identified on the plans, provide secondary seeding application as indicated on the plan notes (sheet L-400).

3.4 MULCHING

- A. No straw products are allowed.
- B. Mulch Application: Mulching of seed areas to be accomplished using an approved hydromulcher to apply wood cellulose fiber and tackifier at rate of 2,000 pounds per acre or as specified by the manufacturer.
- C. All areas shall be seeded and hydromulched within thirty (30) days from the date the erosion control permit is issued. Additional time may be granted with written approval from the Erosion Control Inspector.
- D. Mulching shall not be done in the presence of free surface water resulting from rains, melting snow, or other causes.
- E. Areas not properly mulched, or damaged due to the Contractor's negligence, shall be repaired and remulched in an acceptable manner at the Contractor's expense. Mulch removed by wind prior to acceptance shall be re-established by the contractor at his own expense.
- F. The seeded area shall be mulched within 24 hours after seeding. Areas not mulched within 24 hours after seeding must be re-seeded with the specified seed mix at the Contractor's expense.

- G. Contractor is to remove all hydromulch from plant materials, fences, paved areas, and buildings as directed by owner.

3.5 EROSION CONTROL

- A. If Contractor fails to control such areas and soil erosion subsequently occurs, Contractor shall re-establish finish grade, soil preparation, seed bed, and apply erosion control at his own expense.

3.6 CLEAN UP AND PROTECTION

- A. During landscape work, keep pavements clean and work area in an orderly condition. Any damage to other work done by landscape crew is to be reported and repaired immediately.
- B. Protect landscape work and materials from damage due to landscape operations, operations by other Contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.7 ACCEPTANCE

- A. Seeded areas will be accepted upon the establishment of an even, uniform grass cover. This does not imply that a full sod is necessary. The result is based on a visual evaluation indicating a uniform ground cover of about 90% germination with no bare spots larger than 6" diameter. Contractor to maintain seeded areas until acceptance, and through maintenance period.

3.8 WARRANTY

- A. Warranty for Native Seeded Areas: Warrant areas in seed to be in a healthy, vigorous growing condition, and for consistency and completion of coverage at the end of a period of one year from date of acceptance. During the warranty period, re-seed any spots where seed has not germinated within the total seeding area. Continue this procedure until a successful stand of grass is growing and accepted by the Owner's Representative. Warranty period will be extended if necessary until a uniform 90% germination rate has been accomplished.

END OF SECTION 32 92 19

SECTION 32 93 00**PLANTS****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Plants.
2. Tree-watering devices.
3. Landscape edgings.
4. Temporary support.
5. Mulch.

1.2 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.
- C. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 32 91 13 "Soil Preparation" for drawing designations for planting soils.
- D. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
- B. Plant Selection: Trees shall be selected (tagged) by Landscape Architect at the nursery.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples of each type of mulch.

1.5 INFORMATIONAL SUBMITTALS

- A. Product certificates: Submit certificates of inspection as required by governmental authorities. Submit manufacturer's or vendor's certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.
- B. Sample warranty.
- C. Planting Schedule: Verbally submit proposed planting schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year.

1.7 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 1. Pesticide Applicator: State licensed, commercial.
- B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
- C. Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability to Owner's Representative, together with proposal for use of equivalent material.
- D. Hardiness: Plants grown in hardiness zones 1, 2, 3, and 4 only will be accepted. Hardiness zones are defined in U.S. Dept. of Agriculture publications. Grower's certificates may be required when doubt exists as to the origin of plant material.
- E. Plant Source: All plants shall be nursery grown or gathered native plants approved by Owner's Representative. Imported plants shall have been growing in a nursery for a minimum of one growing season. Trees and shrubs shall have been root-pruned during their growing period in the nursery in accordance with standard nursery practice.
- F. Each tree and shrub shall be labeled with securely attached waterproof tag bearing legible designation of botanical and common name.
- G. Inspection: The Owner's Representative may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size, and quality. Owner's Representative retains right to further inspect trees and shrubs for size and condition of balls and root systems, insects, injuries, and latent

defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- B. Handle planting stock by root ball.
- C. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots and plant moist.
- D. Move plant materials with solid balls wrapped in burlap, or in approved containers.
- E. Reject plants when ball of earth surrounding roots has been cracked or broken prior to or during process of planting.
- F. Reject plants when burlap, stakes, and ropes required in connection with transplanting have been displaced prior to acceptance.

1.9 JOB CONDITIONS

- A. Proceed with and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.
- B. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- C. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Owner's representative before planting.
- D. Planting Time: Plant or install materials during normal planting seasons for each type of landscape work required. Correlate planting with specified maintenance periods to provide maintenance from date of substantial completion.

1.10 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

LOUISVILLE MEDIAN AND STREETScape IMPROVEMENTS

- a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
 - b. Structural failures including plantings falling or blowing over.
2. Warranty Periods: From date of Final Acceptance.
 - a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
 - b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
 - c. Annuals: Three months.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- C. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.
- D. Deciduous Trees: Provide trees of height and caliper scheduled or shown and with branching configuration recommended by ANSI Z60.1 for type and species required. Provide single-stem trees, except where special forms are shown or listed.
 1. Provide balled and burlapped (B&B) deciduous trees.
 2. Container grown deciduous trees will be acceptable in lieu of balled and burlapped deciduous trees subject to specified limitations of ANSI Z60.1 for container stock.
 3. Field dug deciduous trees will be accepted based on prior approval by Owner's representative.
- E. Deciduous Shrubs: Provide shrubs of the container size shown or listed and with not less than minimum number of canes required by ANSI Z60.1 for type and height of shrub required. All shrubs will be container grown in the sizes indicated on the plans.
- F. Coniferous and Broadleafed Evergreens: Provide evergreens of sizes shown or listed. Dimensions indicate minimum height for upright trees, such as globe, dwarf, cone, pyramidal, broad upright, and columnar. Provide normal quality evergreens with well-balanced form complying with requirements for other size relationships to the primary dimension shown.

1. Provide balled and burlapped (B&B) evergreens.
2. Container grown evergreens will be acceptable subject to specified limitations for container grown stock.
3. Field dug evergreen trees will be accepted based on prior approval by Owner's representative.

2.2 PLANTING PIT BACKFILL

A. Soil backfill for planting pits shall consist of the following mixture:

1. Four parts native soil from pit excavation.
2. One part soil amendment per Section 32 91 13.
3. Materials to be thoroughly blended.

2.3 FERTILIZERS

A. Planting Tablets: Not permitted.

2.4 MULCHES

~~A. Mulching: All planting beds shall be mulched per Section 32 92 13. All single trees shall be mulched with 4" depth clean wood chips (chipper chips) produced from tree and brush trimmings by a mechanical chipper. Mulch shall form a circle, 2'-6" diameter, around single trees.~~

~~B. Organic Mulch: Shredded hardwood.~~

2.5 BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

B. Soil Stabilization/Weed Barrier Fabrics:

Geotextile Fabric: Tencate Geosynthetics Marifi 140N, or approved equal. Fabric to be made from spun bonded non-woven polyester fibers thermally bonded or mechanically bonded by needling. Fabric shall meet or exceed the following properties:

			Minimum Average Roll Value	
Mechanical Properties	ASTM Test Method	Unit	MD	CD
Grab Tensile Strength	D 4632	lbs (N)	120 (534)	120 (534)

Grab Tensile Elongation	D 4632	%	50	50
Trapezoid Tear Strength	D 4533	lbs (N)	50 (223)	50 (223)
CBR Puncture Strength	D 6241	lbs (N)	310 (1380)	
			Maximum Opening Size	
Apparent Opening Size (AOS)	D 4751	U.S. Sieve (mm)	70 (0.212)	
			Maximum Roll Value	
Permittivity	D 4491	sec-1	1.7	
Flow Rate	D 4491	gal/min/ft ² (l/min/m ²)	135 (5500)	
			Minimum Test Value	
Ultraviolet Resistance (500 hrs)	D 7238	% Str. Ret. @ 500 lt. hrs.	70	

Submit sample and properties for approval prior to installation.

2.6 PESTICIDES

- A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

2.7 TREE-WATERING DEVICES

- A. Slow-Release Watering Device: See Section 32 84 00 – Planting Irrigation.

2.8 ACCESSORIES

- A. Wrapping: Tree wrap tape not less than 4" wide, designed to prevent borer damage and winter freezing.
- B. Stakes and Guys: As indicated on drawing details.

PART 3 - EXECUTION

3.1 PLANTING AREA ESTABLISHMENT

- A. General: Prepare planting area for soil placement and mix planting soil according to Section 32 91 13 "Soil Preparation."
- B. Placing Planting Soil: Blend planting soil in place.
- C. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.
- D. Layout individual tree and shrub locations and areas for multiple plantings. Stake locations and outline areas and secure Owner's Representative's acceptance before start of planting work. Make minor adjustments that may be requested.
- E. Preparation of Soil Backfill for Planting Pits:
 - 1. Before mixing, clean pit excavations of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful or toxic to plant growth.
 - 2. Mix specified soil amendments with soil at rates specified.
- F. Sequencing and Scheduling:
 - 1. Planting Time: Proceed with, and complete landscape work as rapidly as portions of site become available, working within seasonal limitations. Plant or install materials during normal planting seasons for each type of plant material required.
 - 2. Correlate planting with specified maintenance periods to provide maintenance from date of substantial completion.

3.2 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits.
 - 1. Excavate planting pits with vertical sides. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
 - 2. Excavate approximately three times as wide as ball diameter.
 - 3. Loosen hard subsoil in bottom of excavation. For bare root trees and shrubs, make excavations at least 12" wider than root spread and deep enough to allow for setting of roots on a layer of compacted backfill and with collar set at same grade level as in nursery, but 2" above finished grade at site. Allow for 9" setting layer of planting soil mixture.
 - a. For balled and burlapped (B&B) trees and shrubs, or container grown stock, make excavations at least 12" wider than the ball diameter and 2" shallower than ball depth.

- b. For container grown stock, excavate as specified for balled and burlapped stock, and excavate pits to a width at least twice as wide as the containers and at least as deep as the containers.
 - c. Dispose of unacceptable subsoil removed from landscaped excavations. Do not mix with planting soil or use as backfill.
 - d. Use prepared plant backfill mix for setting and filling all plants.
 - e. Where rubble fill is encountered, notify Landscape Architect and prepare planting pits properly by removal of rubble or other acceptable methods. When conditions encountered are severe and extensive (as determined by Architect) proceed with additional work at the direction of the Architect.
 - f. Drainage: If subsoil conditions indicate the retention of water in planting areas, as shown by seepage or other evidence indicating presence of underground water, notify the Landscape Architect before backfilling.
4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
 5. Fill excavations for trees and shrubs with water and allow to percolate out before planting.
- B. Backfill Soil: Subsoil and topsoil removed from excavations may be used in backfill soil mixture unless otherwise indicated.

3.3 TREE, SHRUB, AND VINE PLANTING

- A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.
1. Backfill: Planting soil. For trees, use excavated soil mixed with amendment for backfill.
 2. Balled and Burlapped Stock: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 3. Balled and Potted and Container-Grown Stock: Carefully remove root ball from container without damaging root ball or plant.
 4. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 5. Continue backfilling process. Water again after placing and tamping final layer of soil.

6. For container grown stock, remove plant from container, split root ball 50% up from bottom, spread roots over mounded backfill under roots as required to eliminate voids and prevent settling. Complete backfilling on top of pit.
 7. Mound top of backfill in irrigated areas. Provide bowl for water retention in dryland areas.
 8. Anti-desiccant: If deciduous trees or shrubs are moved in full-leaf, spray with anti-desiccant at nursery before moving.
 9. Remove and replace excessively pruned or misformed stock resulting from improper pruning.
 10. Wrap tree trunks of 1" caliper and larger. Start at ground and cover trunk to height of first branches and securely attach with flexible tie. Do not use duct tape. Inspect tree trunks for injury, improper pruning, and insect infestation and take corrective measures before wrapping. Double wrap all maples.
 11. Guy and stake trees immediately after planting, as indicated.
- D. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.4 TREE, SHRUB, AND VINE PRUNING

- A. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- B. Do not apply pruning paint to wounds.

3.5 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.
- B. Use planting soil for backfill.
- C. Dig holes large enough to allow spreading of roots.
- D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.6 PLANTING AREA MULCHING

- A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 6 inches and secure seams with galvanized pins.
- B. Mulch backfilled surfaces of planting areas and other areas indicated.
 - 1. Trees and Treelike Shrubs in Turf Areas: Apply organic mulch ring of 4-inch average thickness, with 36-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks or stems.
 - 2. Organic Mulch in Planting Areas: Apply 4-inch average thickness of organic mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.7 INSTALLING SLOW-RELEASE WATERING DEVICE

- A. See Section 32 84 00 – Planting Irrigation.

3.8 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
- D. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- E. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- F. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.9 MAINTENANCE SERVICE

~~A. Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:~~

- ~~1. Maintenance Period for Plant Material: 12 months from date of Substantial Completion.~~

END OF SECTION 32 93 00

SECTION 32 93 13**INERT GROUND COVER MATERIALS****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Rake, level and compact grade to prepare area for inert ground cover materials.
- B. Apply pre-emergent herbicide.
- C. Spread geotextile fabric (also referred to as filter fabric).
- D. Rock ground covers.

1.2 RELATED SECTIONS AND DOCUMENTS

- A. Section 31 00 00: Earthwork.
- B. Drawings and general provisions of the Construction Contract, and Division-01 Specification sections apply to work of this section.

1.3 QUALITY ASSURANCE

- A. Coordination: All inert ground cover materials to be placed after final grades are established.
- B. Perform work with personnel experienced in the work required under direction of a skilled foreman.
- C. Place no sand or pea gravel until all plants have been planted or structures have been placed.

1.4 SUBMITTALS

- A. Submit sample of sand and pea gravel in the specified sizes to the Landscape Architect for approval at least 48 hours prior to installation.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Any inert ground cover material shall be delivered to site and stored at location arranged by contractor.

1.6 EXISTING CONDITIONS

- A. Contractor shall approve existing conditions prior to beginning all landscape work. Beginning work indicates acceptance of existing conditions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Geotextile Fabric: Tencate Geosynthetics Mirafi 140N, or approved equal. Fabric to be made from spun bonded non-woven polyester fibers thermally bonded or mechanically bonded by needling. Fabric shall meet or exceed the following properties:

			Minimum Average Roll Value	
Mechanical Properties	ASTM Test Method	Unit	MD	CD
Grab Tensile Strength	D 4632	lbs (N)	120 (534)	120 (534)
Grab Tensile Elongation	D 4632	%	50	50
Trapezoid Tear Strength	D 4533	lbs (N)	50 (223)	50 (223)
CBR Puncture Strength	D 6241	lbs (N)	310 (1380)	
			Maximum Opening Size	
Apparent Opening Size (AOS)	D 4751	U.S. Sieve (mm)	70 (0.212)	
			Maximum Roll Value	
Permittivity	D 4491	sec-1	1.7	
Flow Rate	D 4491	gal/min/ft ² (l/min/m ²)	135 (5500)	
			Minimum Test Value	
Ultraviolet Resistance (500 hrs)	D 7238	% Str. Ret. @ 500 lt. hrs.	70	

Submit sample and properties for approval prior to installation.

- B. Pre-Emergent Herbicide: Pendulum AquaCap or approved equal.

C. Landscape Boulders:

1. Mix of three types
 - a. 70% 24"-36" Pioneer Granite
 - b. 20% Onyx Boulder Brown
 - c. 10% Rawlings Moss Boulder
2. Contact Pioneer Materials

D. Gravel Mulch: 1-1/2" Mountain Granite

1. Contact Pioneer Materials
2. Provide sample for approval.

E. Roll Top Metal Edger: 14 gauge, black, 4" depth x 10' length

1. Contact DuraEdge or approved equal
2. Provide sample for approval.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Fine grade all areas to receive rock cover. Remove all sticks, stones, or clods over 1" in diameter and grade soil smoothly and evenly.
- B. Apply pre-emergent herbicide to areas to receive rock ground cover, following manufacturer's directions.

3.2 INSTALLATION

- A. Gravel Mulch: Place evenly and uniformly at 3" depth.
- B. Metal Edger: Install as per manufacturer guidelines.

3.03 MAINTENANCE

- A. Contractor is responsible to see that inert ground cover materials stay intact and solid until final acceptance.
- B. During maintenance period, Contractor is responsible for repairing or replacing any areas where sand slumps or ground fabric shows through. Contractor will also be responsible for controlling weed growth in sand areas.

END OF SECTION 32 93 13

LOUISVILLE MEDIAN AND STREETSCAPE IMPROVEMENTS

TIER 2 MEDIANS

BID SET
MAY 21, 2025

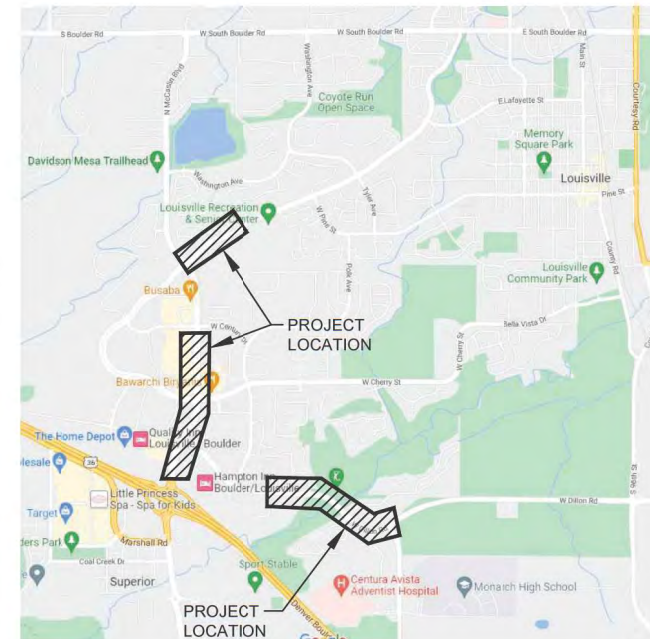
SHEET INDEX

SITE, LANDSCAPE & IRRIGATION

L0.0 - COVER
L0.1 - VIA APPIA EXISTING CONDITIONS
L0.2 - MCCASLIN EXISTING CONDITIONS
L0.3 - MCCASLIN EXISTING CONDITIONS
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L3.0 - SITE DETAILS
L3.1 - SITE DETAILS
L3.2 - IRRIGATION DETAILS
L3.3 - IRRIGATION DETAILS

PLANT SCHEDULE

CODE	DECIDUOUS TREES	COMMON NAME	CONT
AS GL	<i>Aesculus glabra</i>	Ohio Buckeye	2" B&B
CA SP	<i>Catalpa speciosa</i>	Northern Catalpa	2" B&B
CE OC	<i>Celtis occidentalis</i>	Western Hackberry	2" B&B
GY DI	<i>Gymnodorus dioica</i>	Kentucky Coffeetree	2" B&B
KD PA	<i>Koeleruteria paniculata</i>	Golden Raintree	2" B&B
QU MA	<i>Quercus macrocarpa</i>	Bur Oak	2" B&B
T CO	<i>Tilia mongolica 'Harvest Gold'</i>	Harvest Gold Linden	2" B&B
UL AM	<i>Ulmus americana 'Valley Forge'</i>	Valley Forge Elm	2" B&B
ORNAMENTAL TREES		COMMON NAME	CONT
AM AL	<i>Amelanchier alnifolia</i>	Saskatoon Serviceberry	B&B clump
AC GR	<i>Acer grandidentatum</i>	Bigtooth Maple	B&B clump
AC TA	<i>Acer tataricum 'Garann'</i>	Hot Wings Maple	B&B clump
CR MO	<i>Crotaegus mollis</i>	Downy Hawthorn	2" B&B
SHRUBS		COMMON NAME	CONT
AM NA	<i>Amorpha nana</i>	Dwarf Leadplant	#1 cont.
E1 NA	<i>Ericameria nauseosa nana</i>	Dwarf Blue Rabbitbrush	#5 cont.
GRASSES		COMMON NAME	CONT
BO GR	<i>Bouteloua gracilis</i>	Blue Grama Grass	#1 cont.
DE CA	<i>Deschampsia caespitosa</i>	Tufted Hair Grass	#1 cont.
KD MA	<i>Koeleria macrantha</i>	Prairie Junegrass	#1 cont.
SC SC	<i>Schizachyrium scoparium</i>	Little Bluestem	#1 cont.
PERENNIALS		COMMON NAME	CONT
AC MI	<i>Achillea millefolium</i>	Common Yarrow	#1 cont.
DE BA	<i>Delosperma basuticum 'Gold Nugget'</i>	Yellow Iceplant	#1 cont.
E1 UM	<i>Eriogonum umbellatum</i>	Sulphur Buckwheat	#1 cont.
GA AR	<i>Gallardia aristata</i>	Blanket Flower	#1 cont.
PE ST	<i>Penstemon strictus</i>	Rocky Mountain Penstemon	#1 cont.
RA CO	<i>Ratibida columnifera</i>	Prairie Coneflower	#1 cont.
PE LI	<i>Penstemon linarioides subsp. coloradoensis 'P0145'</i>	Silverton® Bluemat Penstemon	#1 cont.
SP CO	<i>Sphaeralcea coccinea</i>	Scarlet Globemallow	#1 cont.



VICINITY MAP
NOT TO SCALE



OWNER:
CITY OF LOUISVILLE
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Contacts: Bryon Weber
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Marla Olson
molson@louisvilleco.gov



CONSULTANTS:
LEAD CONSULTANT
LANDSCAPE ARCHITECT:

Design Concepts
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Lafayette, CO 80026
Phone: 303-664-5301
Contact: Erik Spring
Email: eriks@dcla.net

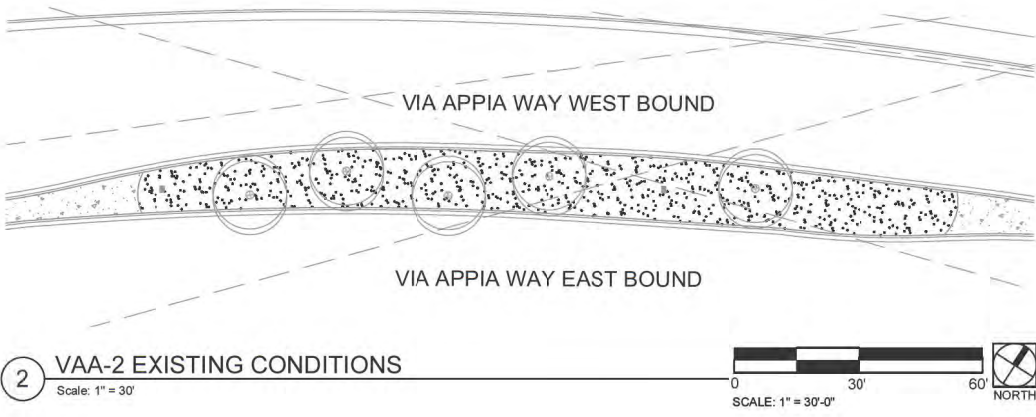
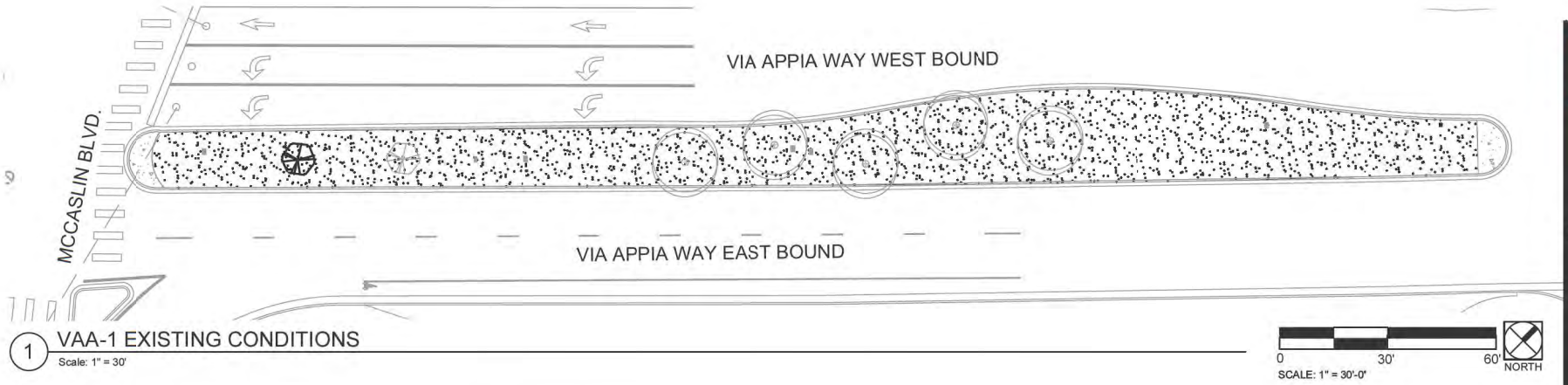


**LOUISVILLE MEDIAN AND
STREETSCAPE IMPROVEMENTS**
TIER 2 MEDIANS

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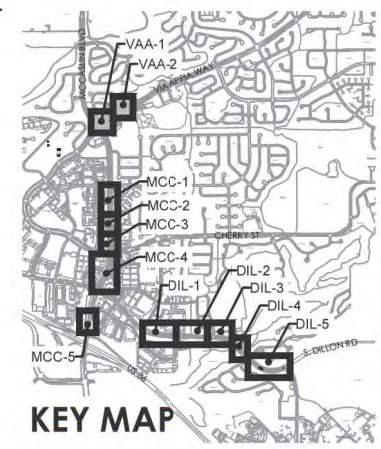
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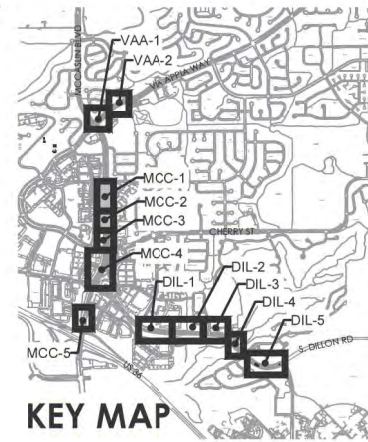
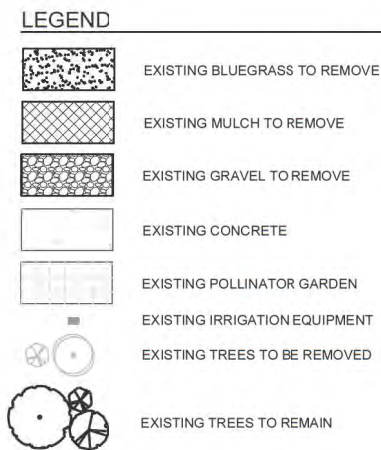
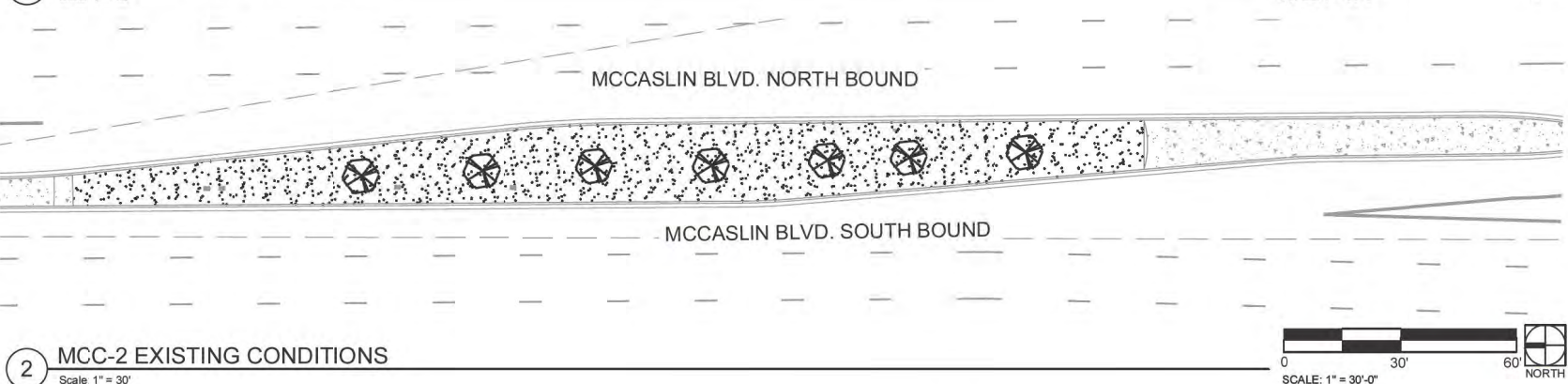
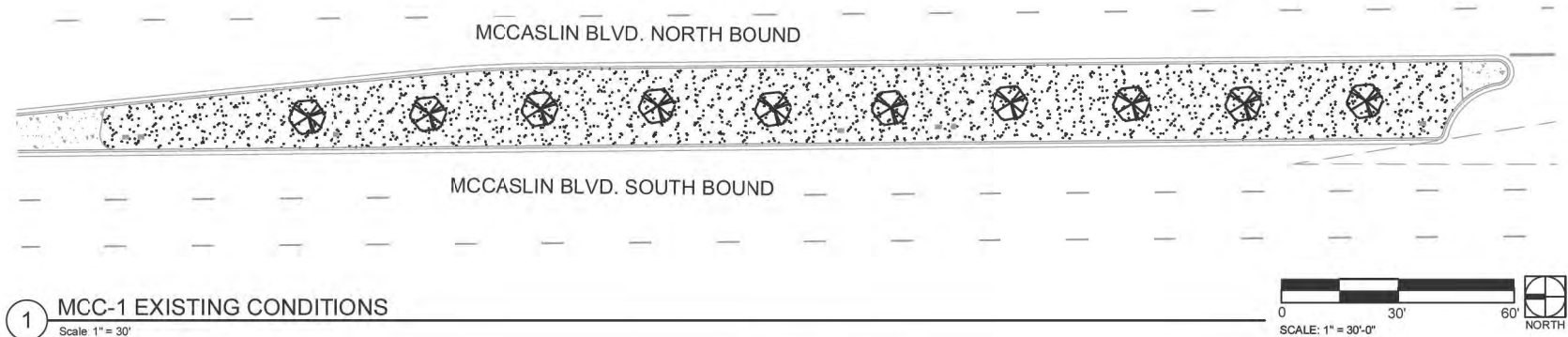
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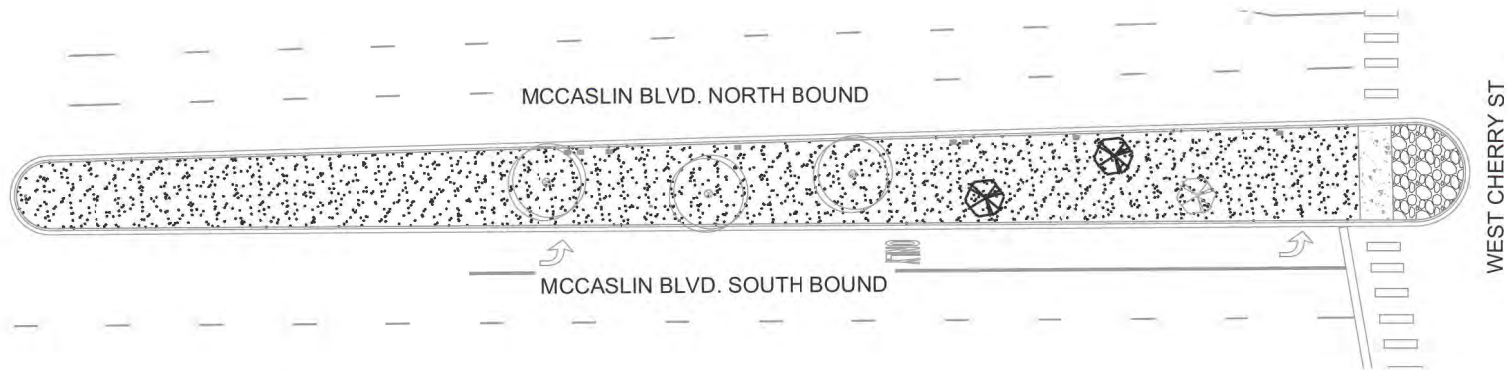


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	EXISTING CONCRETE
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	EXISTING IRRIGATION EQUIPMENT
	EXISTING TREES TO BE REMOVED
	EXISTING TREES TO REMAIN





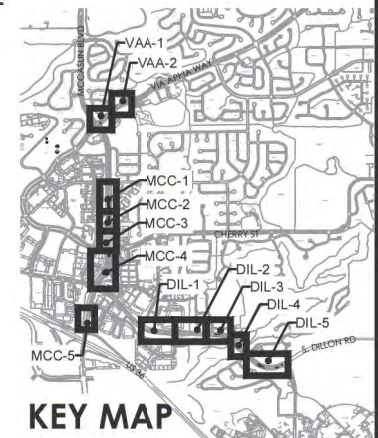


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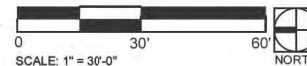
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MCCASLIN BLVD. NORTH BOUND

MCCASLIN BLVD. SOUTH BOUND

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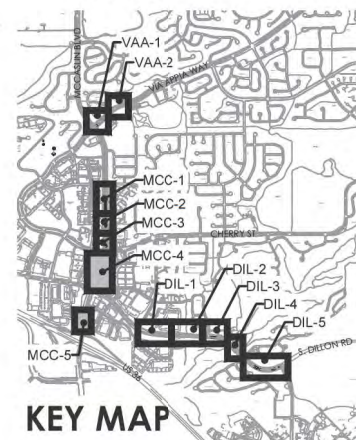
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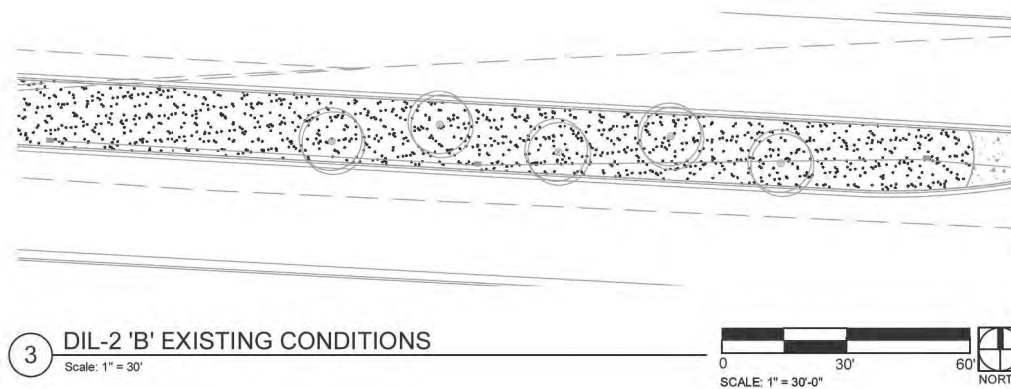
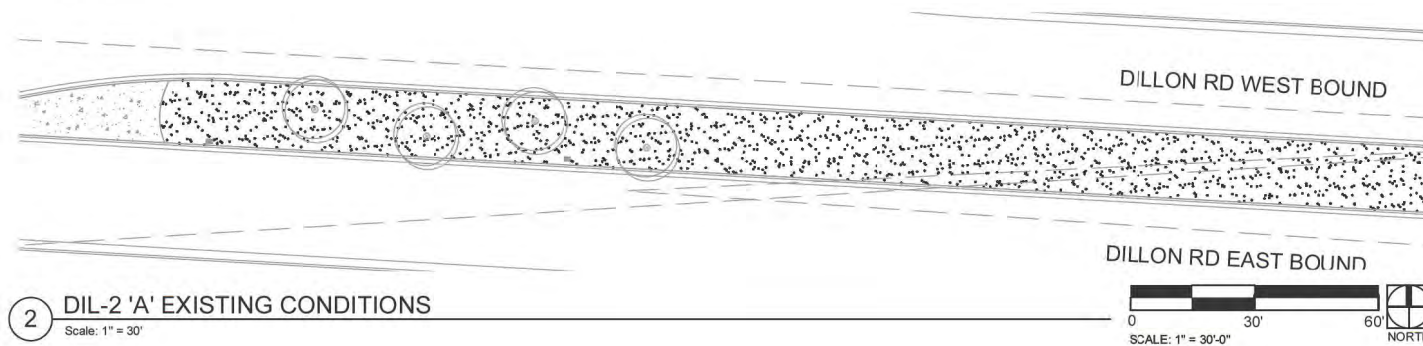
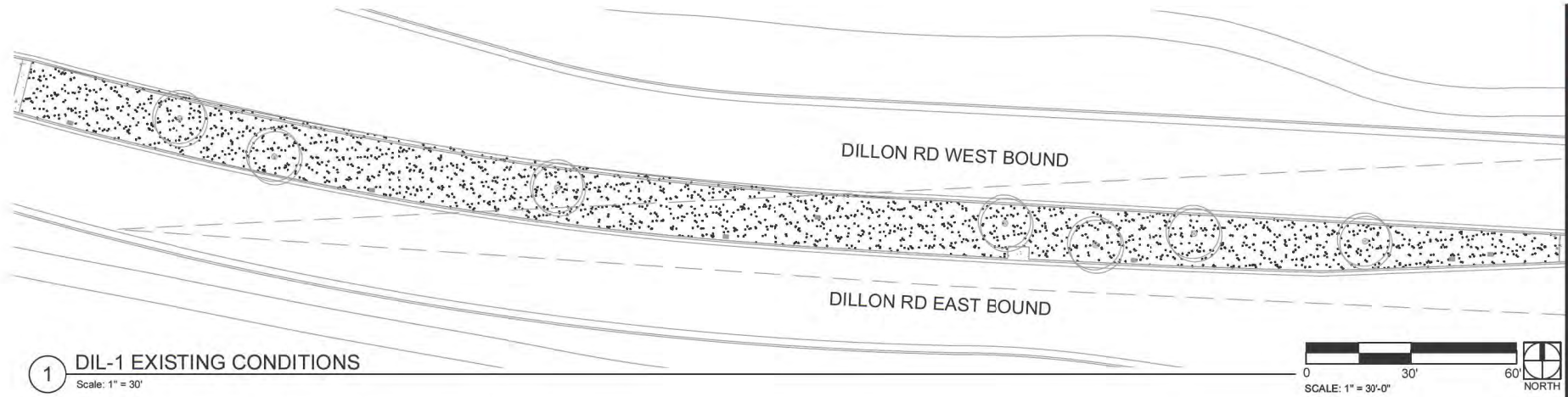
**DESIGN
CONCEPTS**

Community + Landscape Architects
271 North Public Road, Suite 200
Littleton CO 80120
303.654.5301 www.dcdco.net

**LOUISVILLE MEDIAN AND
STREETSCAPE IMPROVEMENTS**
TIER 2 MEDIANS

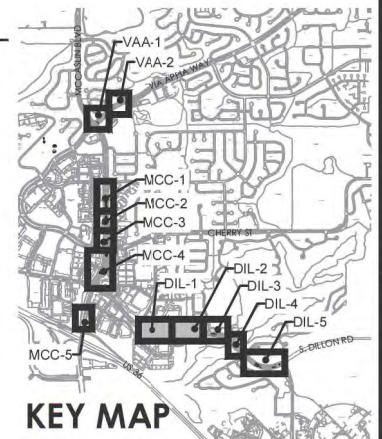
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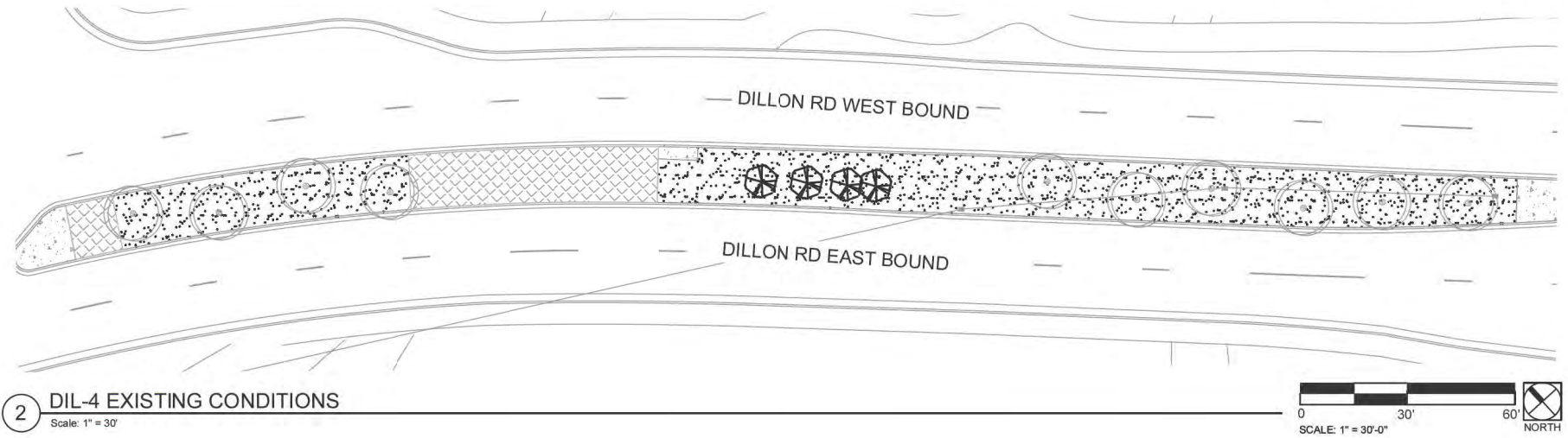
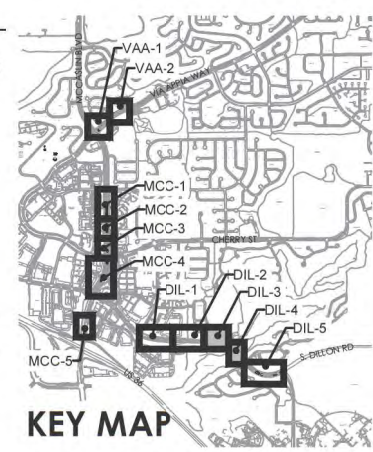
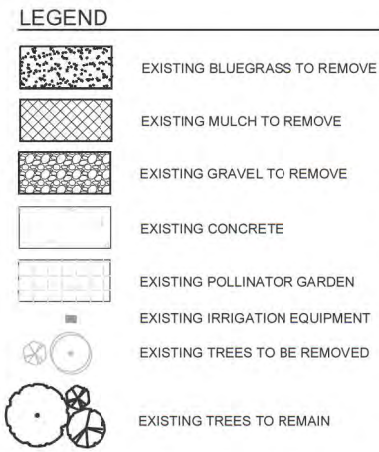
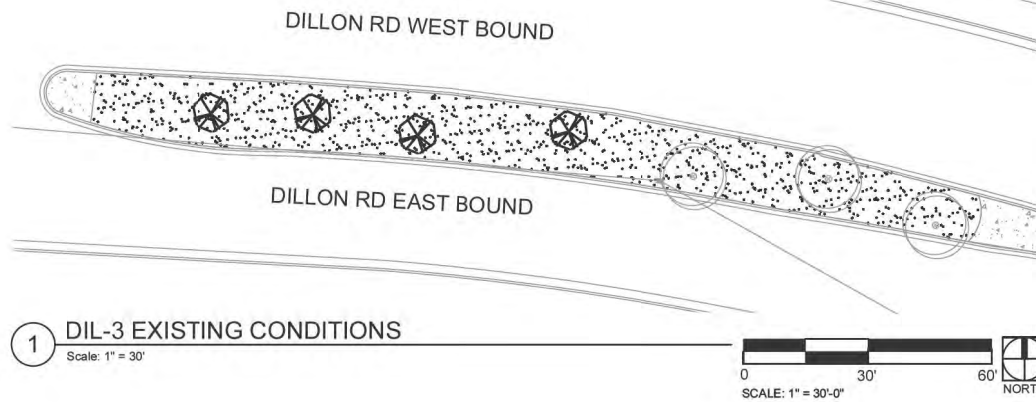
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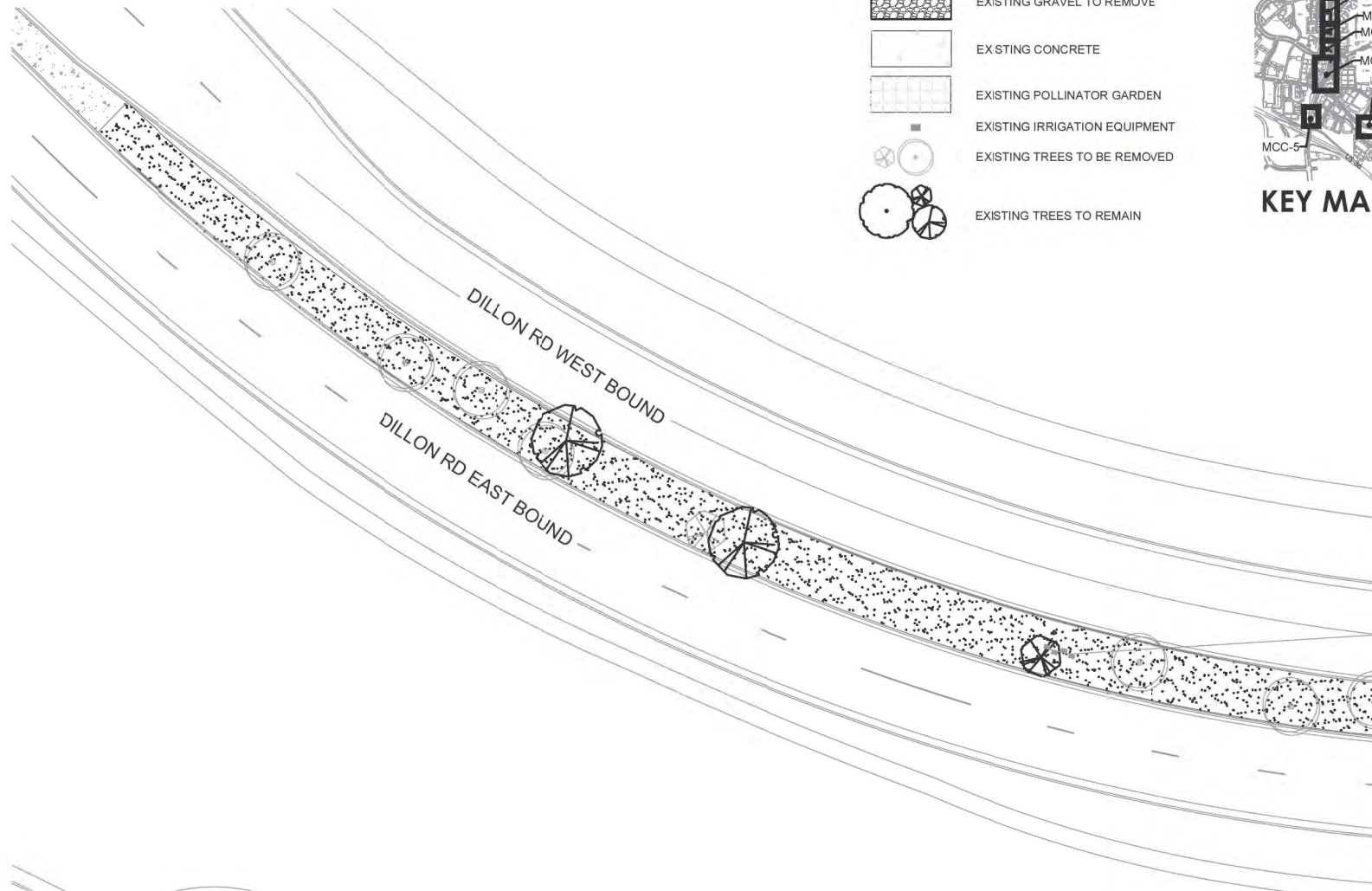


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	EXISTING TREES TO REMAIN

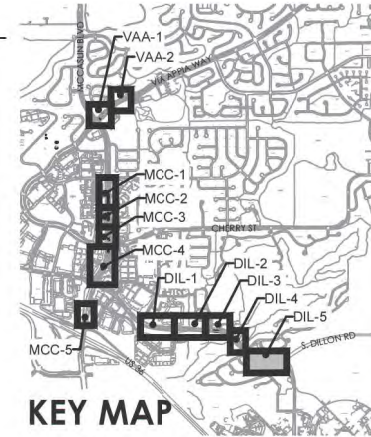


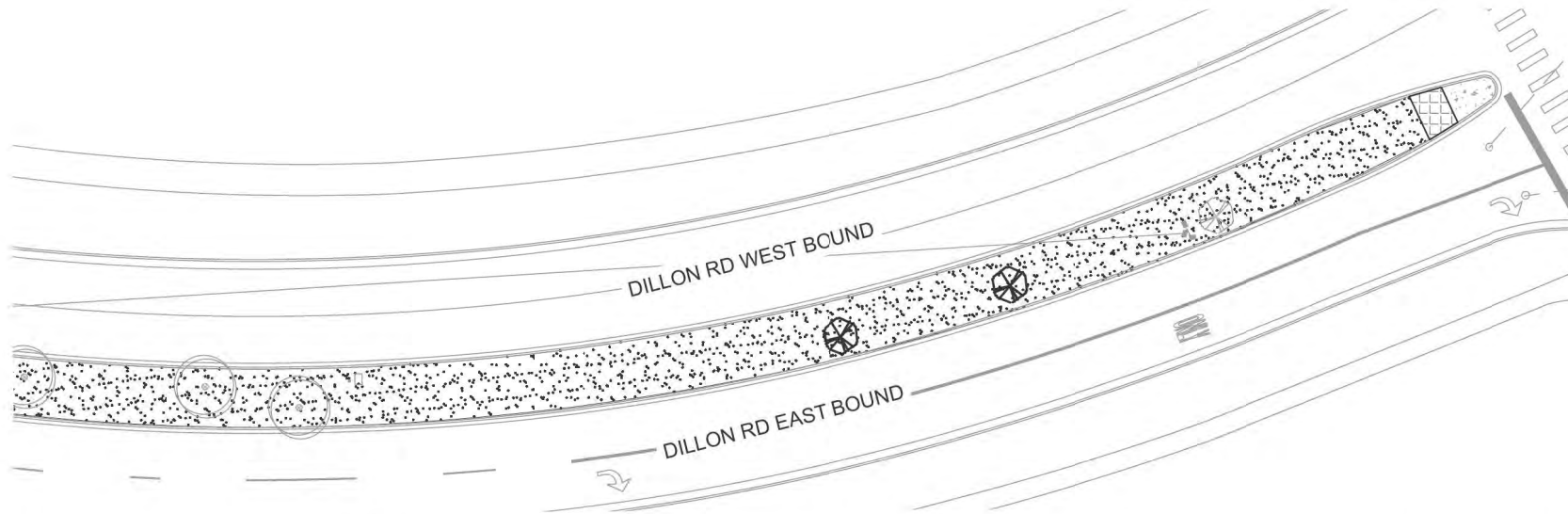




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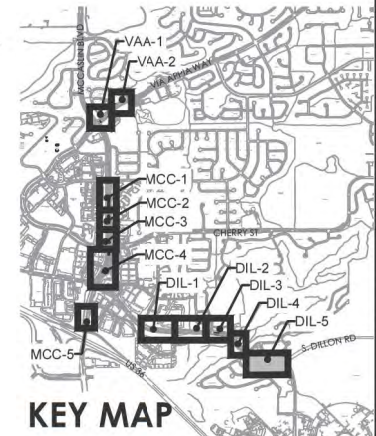




1 DIL-5 'B' EXISTING CONDITIONS
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-  EXISTING POLLINATOR GARDEN
-  EXISTING IRRIGATION EQUIPMENT
-  EXISTING TREES TO BE REMOVED
-  EXISTING TREES TO REMAIN



SITE NOTES

1. The overall site plan is to be used in conjunction with irrigation, documents and specifications to complete the site information.
2. The preparer of these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes of these plans must be in writing and must be approved by the preparer prior to construction.
3. Contractor shall maintain a complete set of current drawings used at the project site. The on-site drawing set must include all revisions and issuances made during construction.
4. The contractor shall be solely responsible for safety in, on or about the project site. Any damage to adjacent property or utilities, not designated for removal, relocation or replacement, shall be repaired to original condition and/or replaced by the contractor at the contractor's expense.
5. The contractor shall be responsible for obtaining any permits or licenses required for the performance of the work as applicable to the project.
6. The contractor shall obtain, at his own expense, all applicable codes, licenses, standard specifications, permits, binds, etc., which are necessary to perform the proposed work, including, but not limited to a local and state groundwater discharge and Colorado Department of Health and Environment (CDHPE) stormwater discharge permit associated with construction activity.
7. Contractor shall be responsible for notifying the Owner if any significant inconsistencies between the existing conditions and these plans are discovered.
8. The Contractor shall be responsible for all construction surveying. Layout and staking of all improvements shall be approved by the Owner prior to installation of improvements. Discrepancies to the base information shall be brought to the Owner attention for a decision prior to commencing with the work. Notification

of request for field review shall be made a minimum of 24 hours in advance.

9. Contractor shall examine the site conditions and notify the Owner in writing of unsatisfactory conditions. Do not proceed until conditions have been corrected.
10. Contractor shall field verify and examine all existing conditions prior to bidding or performing any construction operation.
11. Contractor staging area and construction access to be determined with Owner at pre-construction meeting.
12. Contractor shall be responsible for his/her own construction quantity estimates.
13. All concrete flatwork (including sidewalks) shall have 2% cross slope, unless otherwise noted.
14. The Owner makes no warranty as to the correctness and/or completeness of the existing utility locations shown or not shown on the plans. The contractor shall be responsible for field verifying the horizontal and vertical location of all existing utilities including water, sewer, storm drains, gas transmission lines, and other utilities above and below the surface that may affect the project. Should discrepancy or conflict be discovered the contractor shall notify the owner immediately, and shall not continue construction until said conflict can be resolved in writing. The contractor is responsible for the protection of all utility lines during the construction period, responsible for repairing any and all damage to utilities, structures, site appurtenances, etc. that occur as a result of construction.
15. The contractor shall notify all utility companies at least 48 hours prior to beginning construction to verify depth and location of all utilities.
16. Any construction debris or mud-tracking in the public right-of-way resulting from the work shall be removed immediately by the contractor.
17. The contractor shall provide all lights, signs, barricades, flagmen and other devices necessary to provide for the public safety on

and about the site. The contractor shall furnish appropriate traffic control and safety measures in accordance with the requirements of applicable highways and transportation authority.

18. Contractor shall take appropriate measures to protect both on site and adjacent property, trees and vegetation. Areas outside the limits of work as shown on the plans and/or cross sections shall remain undisturbed. Any items not intended for demolition must be protected. Any damage will be repaired at contractor's expense.
19. Contractor shall clear and grub the area disturbed by grading. Debris, vegetation, roots and other materials not suitable for backfill shall be removed from the site and disposed of by the contractor.
20. Contractor shall remove all debris from demolition operations on a daily basis.
21. Additional layout information may be provided to the contractor prior to construction, upon request. Owner will provide digital files of the site plan in AutoCAD format. Allow 72 hours after request for delivery of files.
22. Written dimensions will take precedence over scaled dimensions. All dimensions shall be field verified by contractor prior to construction. Any deviation from these plans must be approved by the Owner's Rep prior to construction.
23. Curved walks and curb edges are intended to be constructed with smooth flowing curves using flexible form materials. Anything other than smooth flowing curves will be rejected. All forms to be inspected & approved by owner. Contractor to give owner 48 hours notification of form inspection.
24. Owner's Rep shall approve final staking by contractor of all concrete walls prior to construction and/or all form work prior to pouring. Contractor to give Owner 48 hours notification of form inspection.
25. All site improvements must be field surveyed and staked by contractor. Landscape Architect

and/or Owner's Rep shall approve staked location of improvements prior to installation.

26. It is the responsibility of the Contractor to provide all submittals and cut sheets to the Landscape Architect for approval prior to the commencement of work. See specifications for detailed submittal information.
27. Sight triangles and sight lines shall remain unobstructed by equipment, construction materials, plant material or any other visual obstacle during the contract period and at maturity of plants per local jurisdictional requirements. No plant material other than ground cover is allowed to be planted adjacent to fire hydrants as stipulated by jurisdictional requirements.
28. All work shall conform to the City's Design and Construction Standards found at: <https://www.louisvilleco.gov/home/showpublishedocument/456/637182390741170000>
29. Coordinate with applicable City departments (including Public Works) as needed for all work to be performed.

DEMOLITION NOTES:

1. The terms "Remove" or "Demo" shall include removal and disposal of the element, unless otherwise noted.
2. Trees to be removed shall have their stumps ground to 12" below top of finished grade, unless otherwise noted. Fill holes with topsoil or fill material suitable for finished surface condition.
3. All new irrigation valves to be installed in existing valve boxes. Existing valves are to be reused if viable, or to be replaced if size, type, or condition meet warrant replacement with Owner approval. All conditions and exact locations to be field verified by Contractor.
4. Estimated demolition quantities:
Turf: 67280 SF
Mulch: 1212 SF
Trees: 56
Contractor to verify final quantities.



LOUISVILLE MEDIAN AND STREETSCAPE IMPROVEMENTS TIER 2 MEDIANS

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Sheet Name:
SITE AND
DEMOLITION
NOTES
Sheet No.:
L1.0

LANDSCAPE NOTES

1. All plants are to be nursery grown stock from growers located in USDA hardiness zones 1, 2, 3 or 4. All plant material shall be in accordance with American Association of Nurserymen specification for number one grade.
2. Install mulch in all planting beds as indicated on plans and details. Sample of mulch to be approved by landscape architect prior to installation. For all single trees and shrubs not in a planting bed, provide shredded western red cedar mulch ring, 30" diameter, 4" depth.
3. The contractor is responsible for verifying all plant quantities. graphic quantities takes precedence over written quantities.
4. Contractor to install geotextile fabric for weed protection beneath all shrub beds per specs.
5. All planting beds, sod, & trees to be irrigated with a permanent underground irrigation system. All turf areas to be irrigated with automatic pop-up irrigation system. All shrub beds and trees to be irrigated with automatic drip (trickle) irrigation, or acceptable alternate. The irrigation system is to be adjusted to meet the water requirements of the individual plant material.
6. All trees to be balled and burlapped, root control bag, or containerized.
7. The landscape contractor shall be responsible for ensuring positive drainage exists in all landscape areas. Surface drainage on landscape areas shall not flow toward structures and foundations. All landscape areas between walks and curbs shall drain freely to the curb unless otherwise identified on the grading plan. In no case shall the grade, turf thatch, or other landscape materials dam water against walks. Minimum slopes on landscape areas shall be 2%; maximum slope shall be 25% unless specifically identified on the plans or approved by the owner's representative.
8. Trees shall not be located in drainage swales, drainage areas, or utility easements. Trees shall be located a minimum of 10' from utilities. Contact owner's representative for relocation of plants in questionable areas prior to installation.
9. To the maximum extent feasible, topsoil that is removed during construction activity shall be

conserved for later use on areas requiring revegetation and landscaping.

10. Minimum clearance of three (3') feet on each side of the fire department connection (FDC). No vegetation other than turf or ground covers planted in front of FDC.
11. At seed area boundaries adjacent to existing native areas, overlap abutting native areas by the full width of the seeder.

TOPSOIL NOTES

1. All imported topsoil shall be a loam or sandy loam. At least 10 days prior to topsoil delivery, notify Owner's Representative of the source(s) from which topsoil is to be furnished. Topsoil shall be furnished by the contractor and shall be a natural, friable soil representative of productive soils in the vicinity. It shall be obtained from the top 12" of well drained areas, and shall be free of admixture of subsoil, large clods, foreign matter, objects larger than one inch in any dimension, toxic substances, and any material or substances that may be harmful to plant growth. For all topsoil, the pH value shall fall between a range of 6.0 to 7.5, and it shall have a minimum organic matter content of 2.9%.
2. Submit soil analysis report for proposed topsoil in accordance with "Method of Soil Analysis – Agronomy #9" as published by the American Society of Agronomy.
3. Before delivery of topsoil, furnish Landscape Architect a soil analysis made by an acceptable soil testing laboratory stating percentages of silt, clay, sand and organic matter, pH and mineral and plant nutrient content of topsoil for both plant and lawn growth. If not suitable, state recommended quantities for nitrogen, phosphorus, potash and trace elements; and any limestone, aluminum sulphate or other soil amendments to be added to make topsoil suitable for trees/shrubs, for lawn and for planters.
4. Provide topsoil for the entire scdded field area to a minimum depth of 4". Contractor to provide written verification of topsoil quantity at the time of delivery. Owner's Representative to be notified after stockpiling to inspect quantity and quality of topsoil. Contractor to protect topsoil through all construction. If quantity stockpiled is insufficient, contractor is to import remainder of topsoil at his own expense.
5. At the completion of other work in each area to be sodded, place and grade topsoil to Owner's Representative's satisfaction. Scarify top 4" of backfill prior to placing topsoil.

TURF TO NATIVE SEED CONVERSION NOTES

Methodology – 8 week conversion (starting mid-June)

1. Initiate conversion when vegetation is actively growing; May 1-September 1
2. Flag irrigation heads, valve boxes, etc.
3. Cut existing turf with a sod cutter at 2" depth. Remove/Dispose of turf debris.
4. Apply topsoil as needed to match existing grade where tying in at curb lines and to establish earthen berms per plans.
5. Evenly spread class 1 compost at 2CY per 1,000SF
6. Till compost to minimum 6" depth
7. Fine grade, per Section 32 91 13
8. Apply native seed mix by drill seed and/or broadcast, per Section 32 92 19
9. Drag entire area thoroughly
10. Apply hydromulch and erosion control fabrics, per Section 32 92 19
11. Begin establishment irrigation

Native seed mix per Owner.

Establishment Irrigation Scheduling

1. Phase one irrigation: 4 weeks until substantial germination: critical stage (July 1 - July 31)
 - 1.1. 2 times per day 3 to 4 weeks
 - 1.2. Approximately 1.0 inch per week
2. Phase two irrigation: 2 weeks (Aug. 1-15th)
 - 2.1. 2 to 3 watering nights per week
 - 2.2. .75 - 1.0 inch per week
3. Phase three irrigation: 4 weeks (Aug. 15 -Sept. 15)
 - 3.1. 1 to 2 watering nights per week
 - 3.2. Approximately .75 - 1.0 inch per week
4. Phase four irrigation: 4 weeks (Sept 15 - end of season)
 - 4.1. 1 watering per week
 - 4.2. Approximately .50 - .75 inches per week

Contractor's Maintenance Procedures - Until Project Acceptance by Owner

1. Remove weeds by hand as needed or requested by Owner
 - 1.1. No use of chemical herbicides or spraying unless approved by Owner
 - 1.2. Repeat application as needed



LOUISVILLE MEDIAN AND STREETSCAPE IMPROVEMENTS TIER 2 MEDIANS

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Sheet Name:
LANDSCAPE
NOTES

Sheet No.:
L1.1

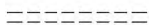
IRRIGATION NOTES:

- The irrigation system is designed to operate off the existing system in place. Existing mainline to be protected and retained. Contractor to verify pressure PRIOR TO INSTALLATION and notify Owner of reading in writing prior to construction. Design pressure at heads to be as noted in legend. Adjust pressure at valves. Contractor to notify owner if source pressure can be reduced, and by how much.
- No irrigation work to begin until final grade has been approved.
- Locate all spray heads 6" min. from any wall, walk, curb, or building. Locate all rotary heads 12" minimum from any wall, walk, or curb.
- Do not stack pipes. Pipes in shared trenches to be 4" minimum apart.
- Brand all appropriate box lids with 1" minimum letters (per specifications) with the following abbreviations:
SV# Section Valve & Corresponding Controller Station #
ISO Isolation Gate Valve
QC Quick Coupler
WS Wire Splice
FP Drip Flush Point
- All pipe under pavement to be sleeved in 4" minimum PVC class 200 and extend 18" beyond each edge of pavement, sloped to drain. All sleeves shall be minimum 2 pipe sizes larger than the pipe passing through them. Install all sleeving prior to paving. Sleeve wires separately in 4" class 200 PVC. Bore under existing pavement for new sleeves, unless otherwise indicated on the plans.
- Heads are diagrammatic. Contractor to select and install correct arcs as needed for part circle heads. Adjust radii and arc as necessary for no overspray/backwash onto adjacent concrete sidewalks or surfaces, buildings, walls, or fences.
- Electric power to the controller shall be provided by Contractor.
- All damage to existing irrigation system due to construction shall be to original condition at no additional cost to owner. All repairs shall be complete prior to system startup.
- Plan has been prepared using limited on-site observation. Plan is diagrammatic and does not reflect all equipment, etc., that could be encountered during construction. All tie locations, mainline locations and lateral locations are approximate and shall require exact location by Contractor.
- Water settle all trenches for proper compaction.
- Paint location of the mainline and laterals, and flag location of all heads & valves for approval by Owner prior to any trenching.

- Pre-construction meetings:
 - The Contractor shall schedule an irrigation specific pre-construction meeting with the OAC team which shall commence prior to starting any irrigation construction. Provide a minimum of 48 hours notice for meeting.
 - Provide Owner with written documentation of existing pressure prior to construction.
- Provide red zone wires, white common wires, and (4) blue spare wires for the entire length of all mainline segments. Wire material to be per specifications.
- Provide new sleeving for all mainline and wires where new walls cross over mainline. Cut sleeving pipe lengthwise, place around mainline/wires and duct tape to secure at both ends and every 36" between ends. Extend both ends of all sleeves 18" beyond walls. Sleeving pipe to be 2 pipe sizes larger than pipe passing through sleeve, and provide separate 4" sleeve for all wire sleeves.
- Remove all existing heads, valves, and boxes. Fill all holes. Protect all existing mainline, wires and controllers for reuse.
- Install all new valves on existing mainlines and use existing wires. Field verify size and location of existing mainlines and wires.
- All sprinklers in areas of native seed shall be 12" pop-up height.
- where proposed wall crosses existing mainline adjust mainline depth as needed to provide 24" min. cover under base of wall. provide separate sleeves for mainline and wires at all wall crossings, typ. To install sleeve for existing mainline and wires, cut sleeve pipe lengthwise, place around mainline/wires and secure with duck tape every 30" and at both ends.
- Install Rainbird Xeri-Bug drip emitters as described below. Use Xeri-Bug emitters with check valve (XBCV) where elevation change is greater than 8' on a zone.

1 gallon material	Rain Bird XB-05PC	2 ea.
5 gallon material	Rain Bird XB-05PC	3 ea.
Deciduous Trees	Rain Bird XB-10PC	5 ea.
Evergreen Trees	Rain Bird XB-10PC	4 ea.

IRRIGATION SCHEDULE:

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	Rain Bird RD-12-S-P30 w/MP1000 Nozzles Turf Rotary, 12in. pop-up with check valve, reclaimed body cap, pressure regulated to 30 psi. Hunter MP Rotator nozzle. M=Maroon adj arc 90 to 210, L=Light Blue 210 to 270 arc, O=Olive 360 arc.
	Rain Bird RD-12-S-P30 w/MP2000 Nozzles Turf Rotary, 12in. pop-up with factory installed check valve, pressure regulated to 30 psi. MP Rotator nozzle on PRS30 body. K=Black adj arc 90-210, G=Green adj arc 210-270, R=Red 360 arc.
	Rain Bird RD-12-S-P30 w/MP3000 Nozzles Turf Rotary, 12in. pop-up with factory installed check valve, pressure regulated to 30 psi. MP Rotator nozzle on PRS30 body. B=Blue adj arc 90-210, Y=Yellow adj arc 210-270, A=Gray 360 arc.
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	Rain Bird XCZ-100-PRB-COM Wide Flow Drip Control Kit for Commercial Applications. 1" Ball Valve with 1" PESB Valve and 1" Pressure Regulating 40psi Quick-Check Basket Filter. 0.3gpm to 20gpm.
	Flush Valve 3/4" PVC Ball valve in 10" round valve box.
	Tree Drip Ring: Rain Bird XFS-CV-09-12 See details for tubing layout.
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	Rain Bird PEB 1", 1-1/2", 2" Plastic Industrial Valves. Low Flow Operating Capability, Globe Configuration.
	Irrigation Lateral Line: PVC Class 200 SDR 21
	Pipe Sleeve: PVC Class 200 SDR 21 Typical pipe sleeve for irrigation pipe. Pipe sleeve size shall allow for irrigation piping and their related couplings to easily slide through sleeving material. Extend sleeves 18 inches beyond edges of paving or construction.
	Valve Callout Valve Number Valve Flow Valve Size

NOTE: ALL NEW IRRIGATION VALVES TO BE INSTALLED IN EXISTING VALVE BOXES. EXISTING VALVES ARE TO BE REUSED IF VIABLE, OR TO BE REPLACED IF SIZE, TYPE, OR CONDITION WARRANT REPLACEMENT WITH OWNER APPROVAL. ALL CONDITIONS AND EXACT LOCATIONS TO BE FIELD VERIFIED BY CONTRACTOR.



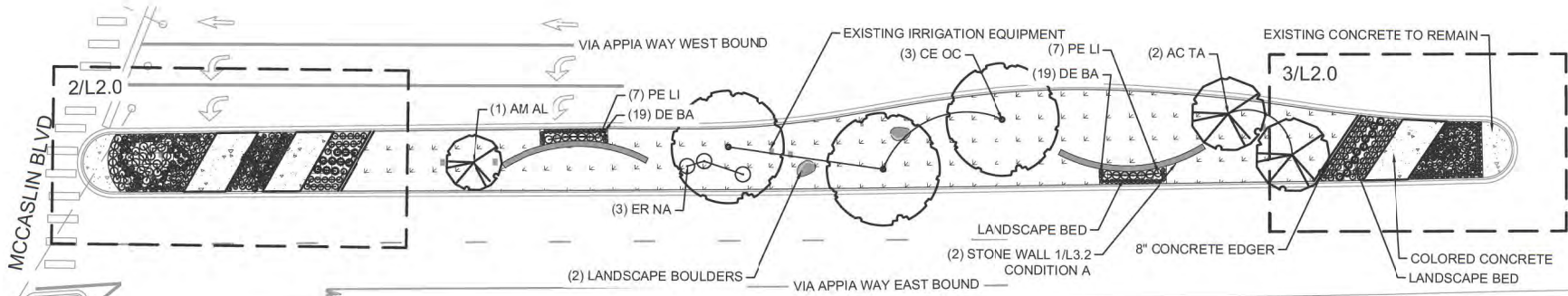
LOUISVILLE MEDIAN AND STREETSCAPE IMPROVEMENTS TIER 2 MEDIANS

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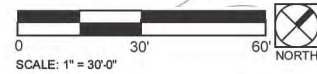
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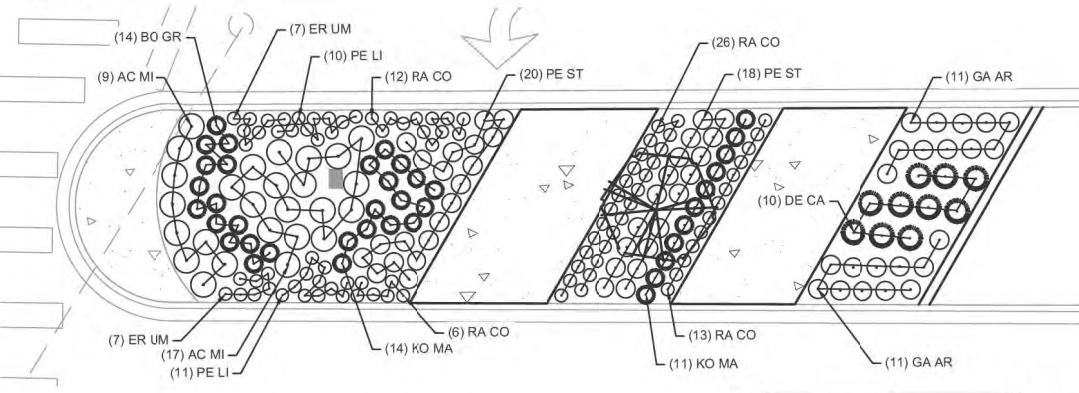
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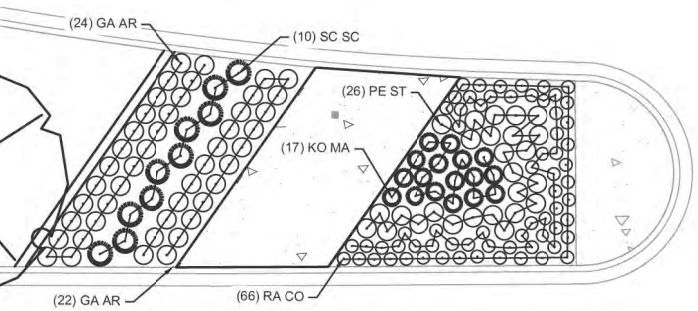
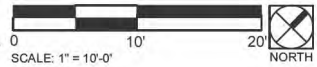
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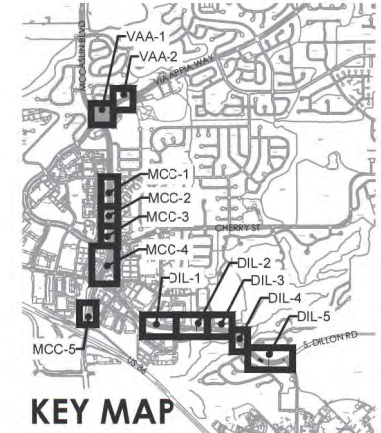
- LEGEND**
- NATIVE SEED
 - MULCH
 - CONCRETE
 - EXISTING CONCRETE
 - EXISTING POLLINATOR GARDEN
 - LANDSCAPE BOULDERS
 - EXISTING TREES TO REMAIN
 - SHADE TREES
 - ORNAMENTAL TREES



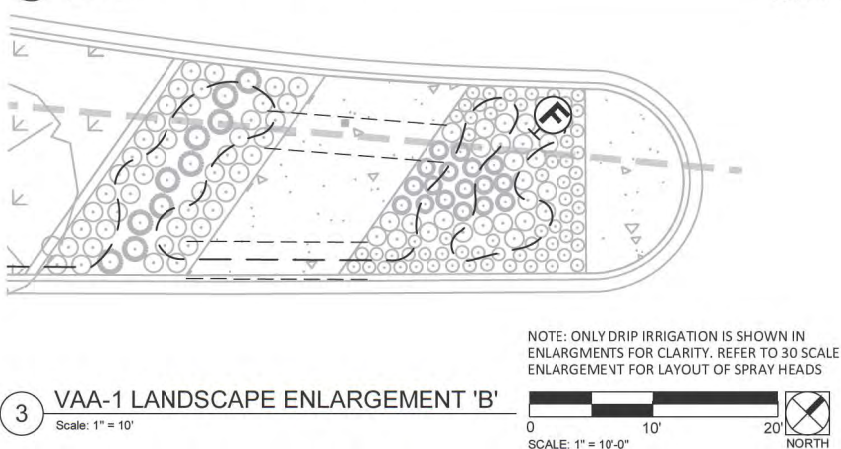
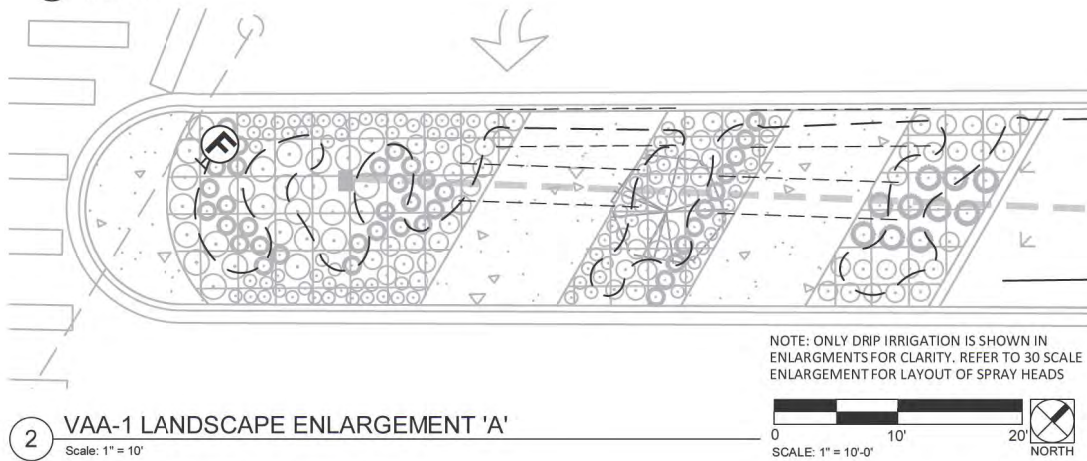
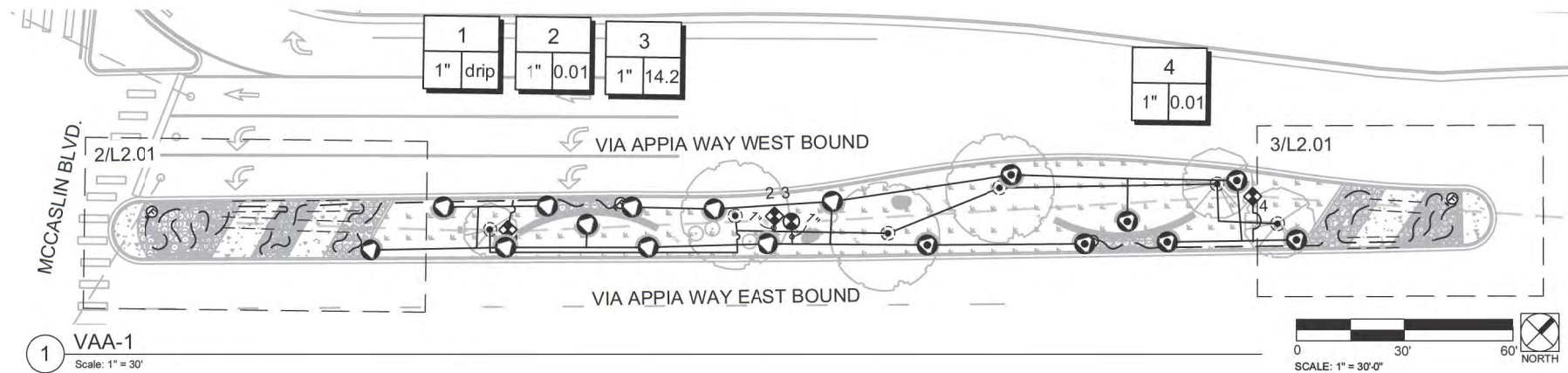
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Scale: 1" = 10'

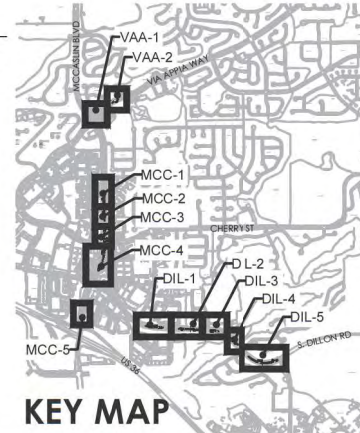


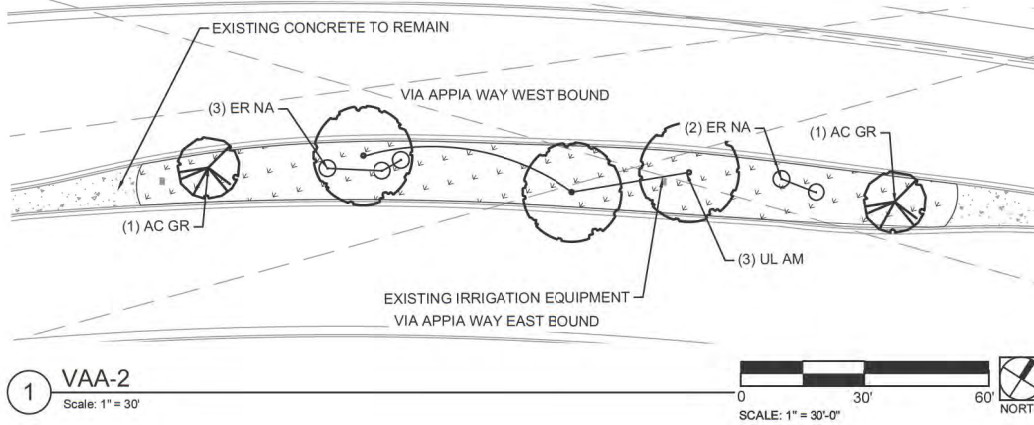
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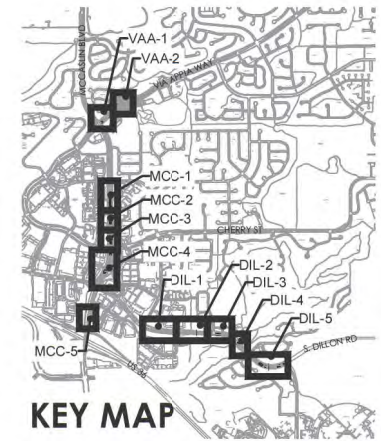
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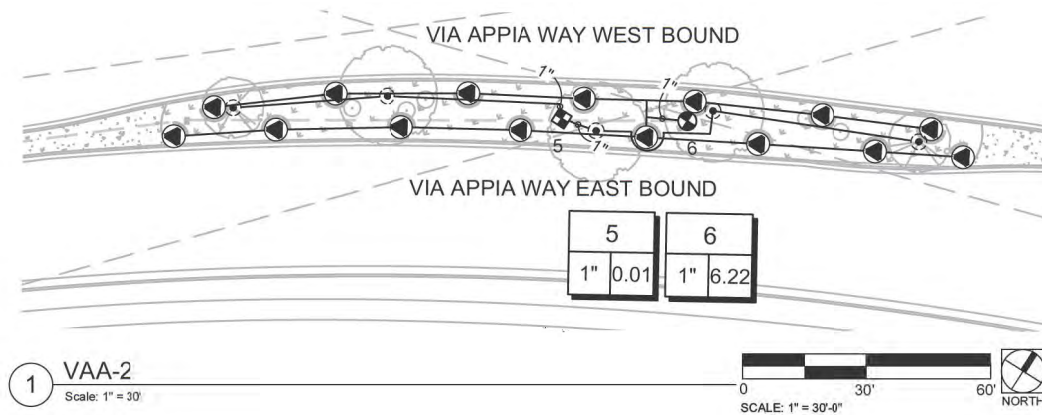
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- 2000 Rain Bird RD-12-S-P30 w/MP2000 Nozzles
- 3000 Rain Bird RD-12-S-P30 w/MP3000 Nozzles
- Rain Bird XCZ-100-PRB-COM
- Flush Valve
- Tree Drip Ring: Rain Bird XFS-CV-09-12
- Rain Bird PEB
- Rain Bird Drip Tubing





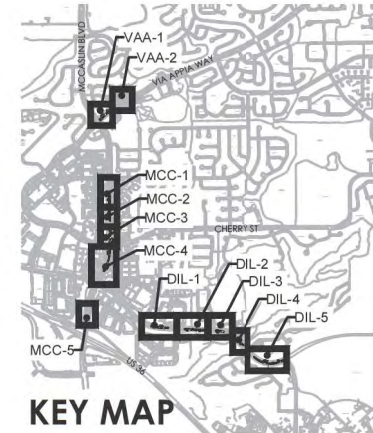
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	MULCH
	CONCRETE
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	EXISTING TREES TO REMAIN
	SHADE TREES
	ORNAMENTAL TREES

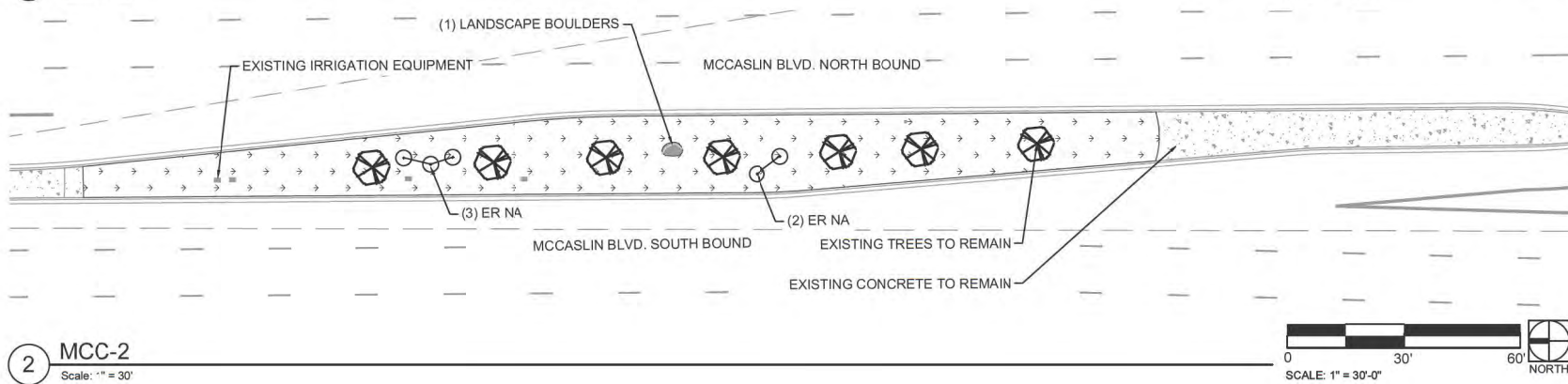
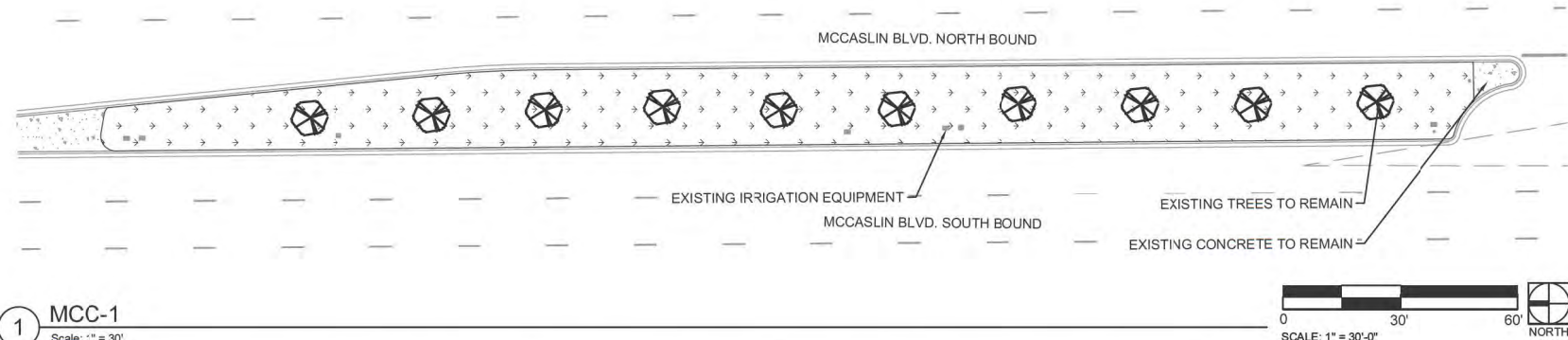




IRRIGATION SCHEDULE

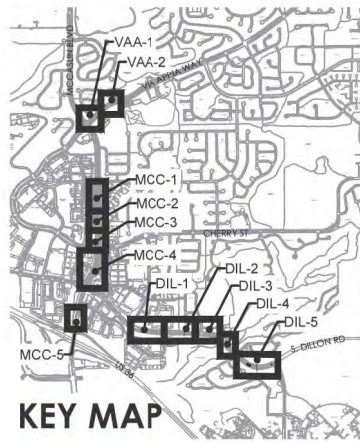
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- Flush Valve
- Tree Drip Ring: Rain Bird XFS-CV-09-12
- Rain Bird PEB
- Rain Bird Drip Tubing

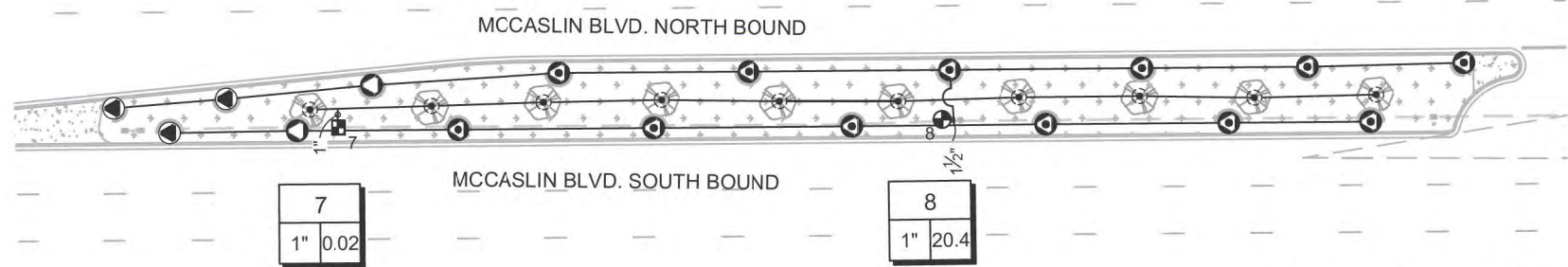




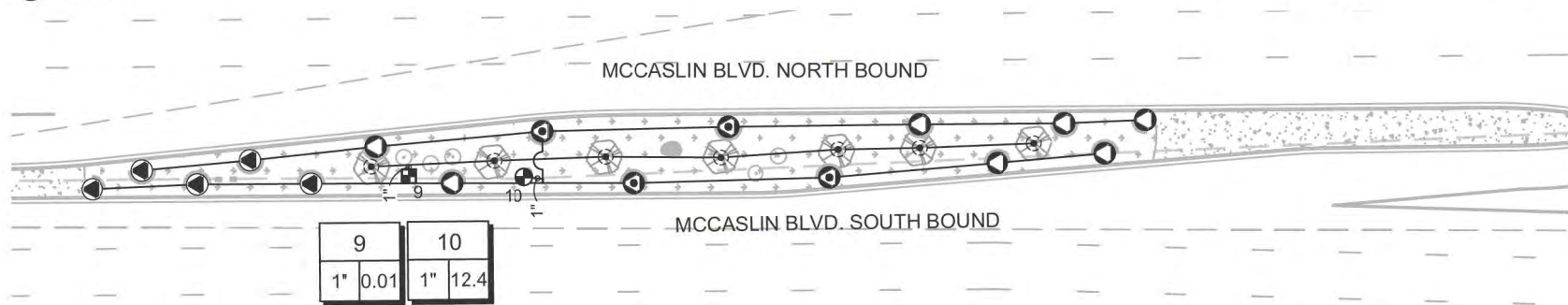
LEGEND

	NATIVE SEED
	MULCH
	CONCRETE
	EXISTING CONCRETE
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	EXISTING TREES TO REMAIN
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	ORNAMENTAL TREES





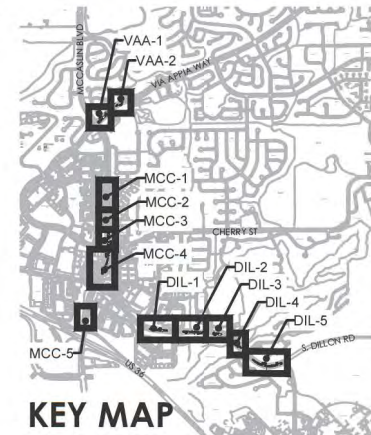
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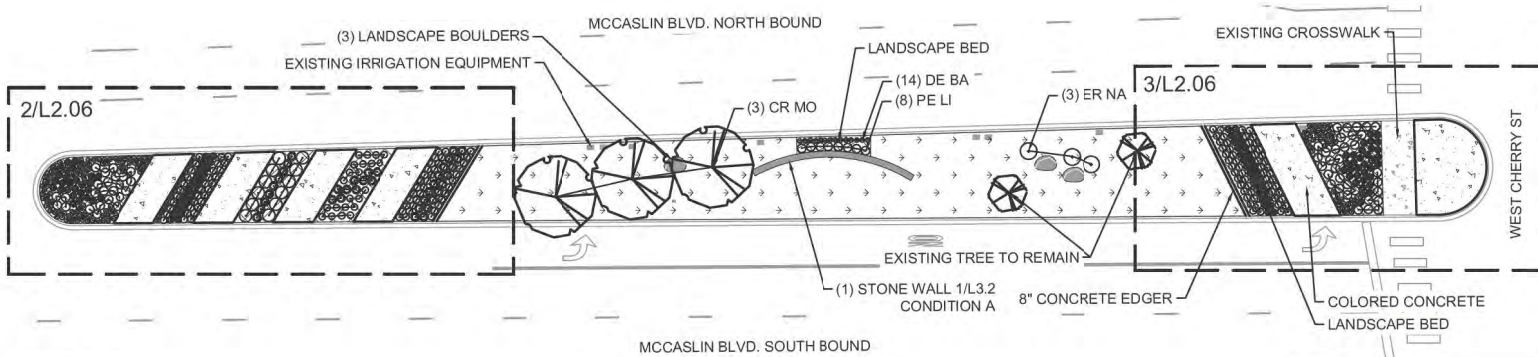


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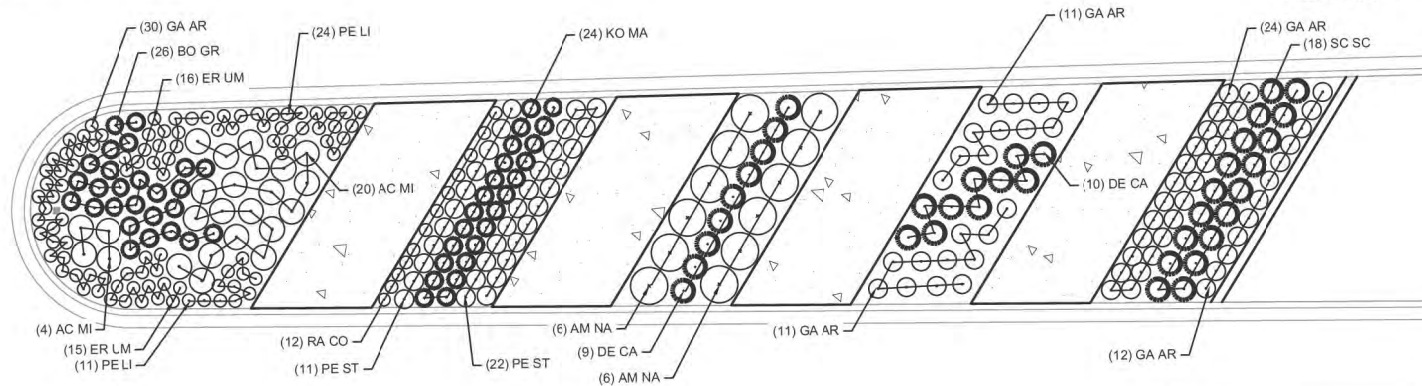
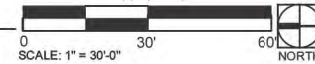
IRRIGATION SCHEDULE

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-  Rain Bird RD-12-S-P30 w/MP3000 Nozzles
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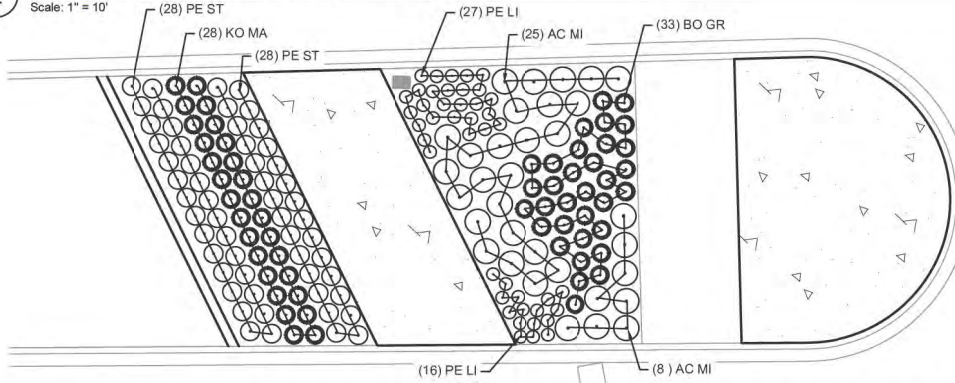




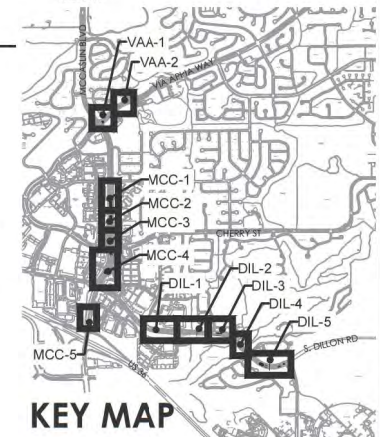
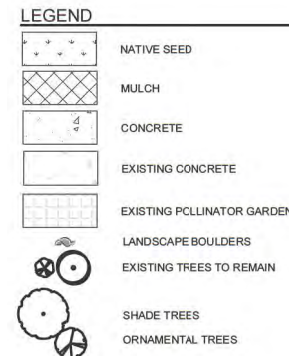
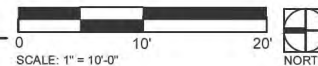
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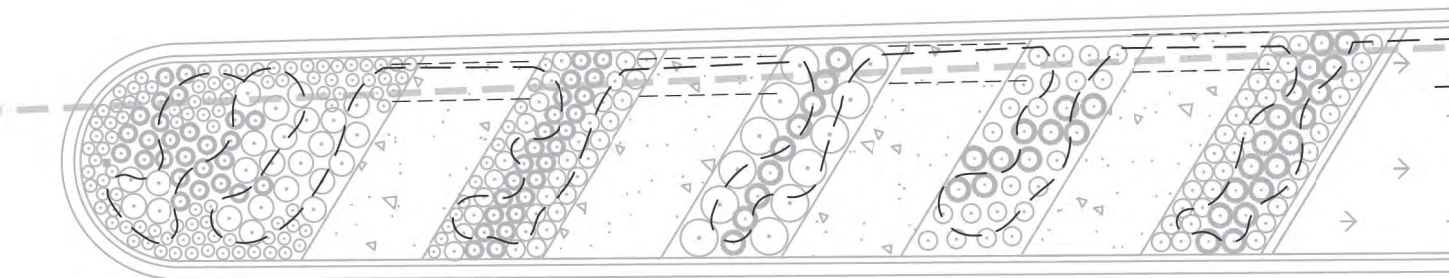
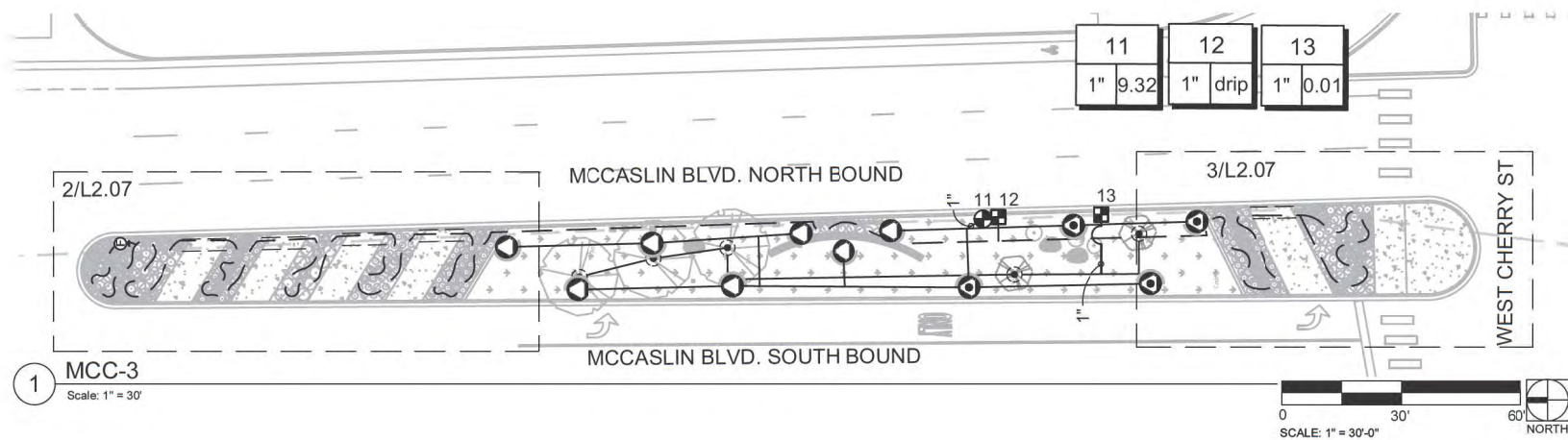


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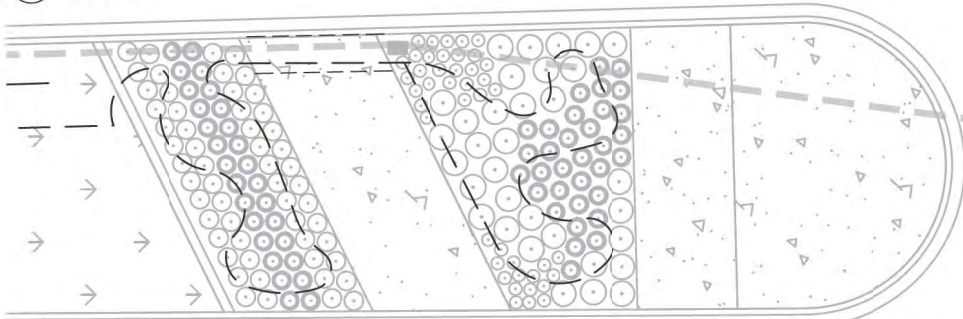


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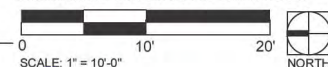




NOTE: ONLY DRIP IRRIGATION IS SHOWN IN ENLARGMENTS FOR CLARITY. REFER TO 30 SCALE ENLARGEMENT FOR LAYOUT OF SPRAY HEADS

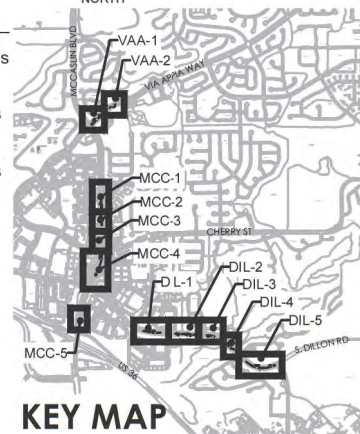


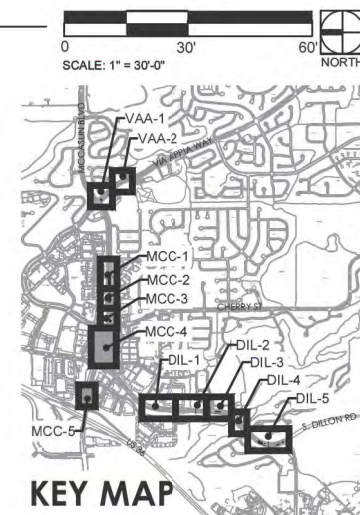
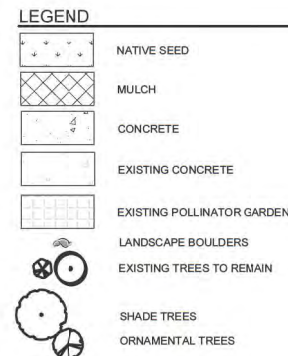
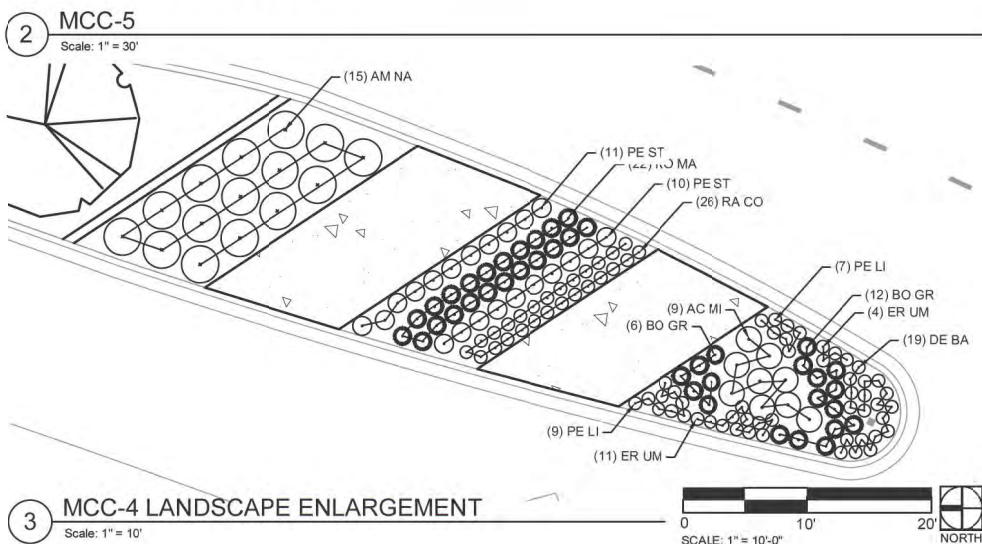
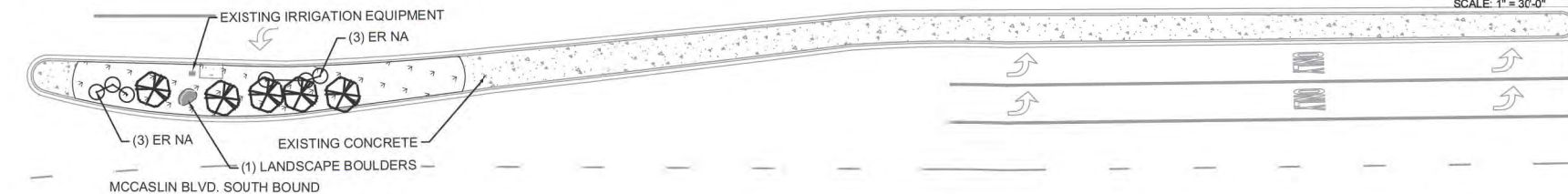
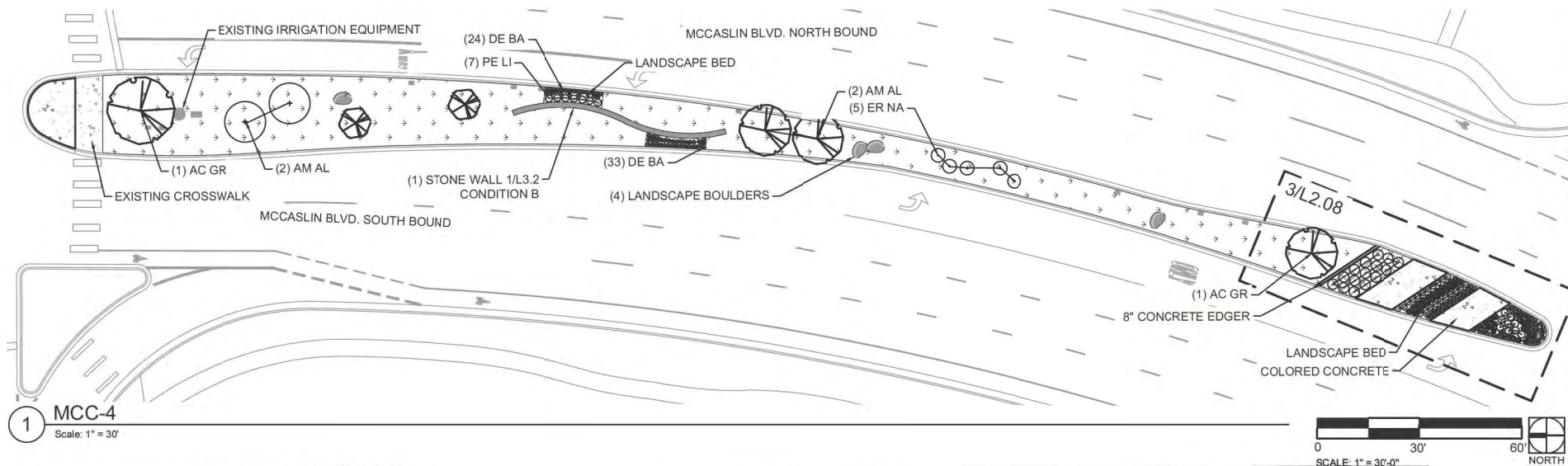
NOTE: ONLY DRIP IRRIGATION IS SHOWN IN ENLARGMENTS FOR CLARITY. REFER TO 30 SCALE ENLARGEMENT FOR LAYOUT OF SPRAY HEADS



IRRIGATION SCHEDULE

- 1000 Rain Bird RD-12-S-P30 w/MP1000 Nozzles
- 2000 Rain Bird RD-12-S-P30 w/MP2000 Nozzles
- 3000 Rain Bird RD-12-S-P30 w/MP3000 Nozzles
- Rain Bird XZ-100-PRB-COM
- Flush Valve
- Tree Drip Ring: Rain Bird XFS-CV-09-12
- Rain Bird PEB
- Rain Bird Drip Tubing





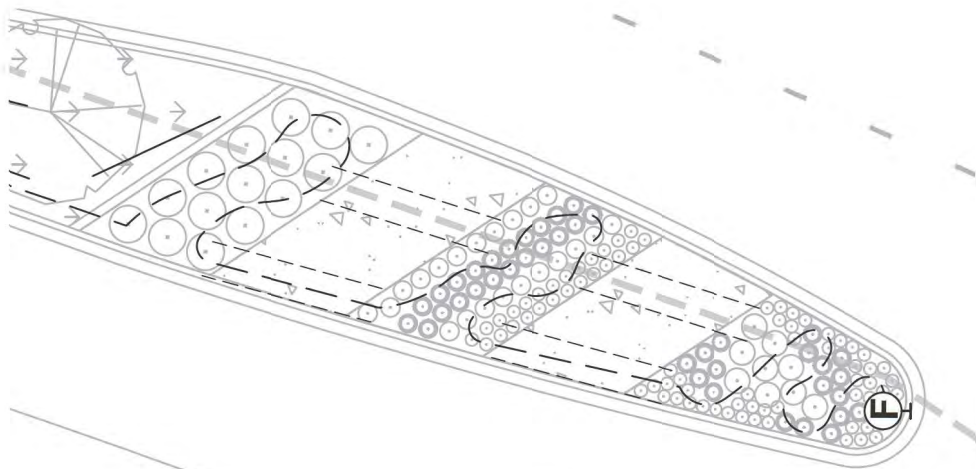
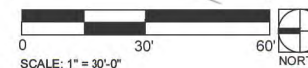
WEST CHERRY ST

MCCASLIN BLVD. NORTH BOUND

MCCASLIN BLVD. SOUTH BOUND

14	15	16
1" 0.01	1" 18.5	1" drip

1 MCC-4
Scale: 1" = 30'



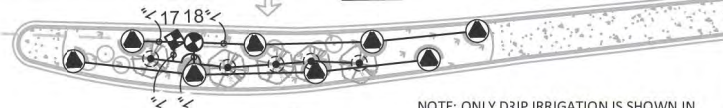
2 MCC-4 LANDSCAPE ENLARGEMENT
Scale: 1" = 10'

NOTE: ONLY DRIP IRRIGATION IS SHOWN IN ENLARGMENTS FOR CLARITY. REFER TO 30 SCALE ENLARGEMENT FOR LAYOUT OF SPRAY HEADS



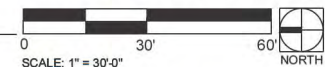
MCCASLIN BLVD. NORTH BOUND

17	18
1" 0.01	1" 3.09



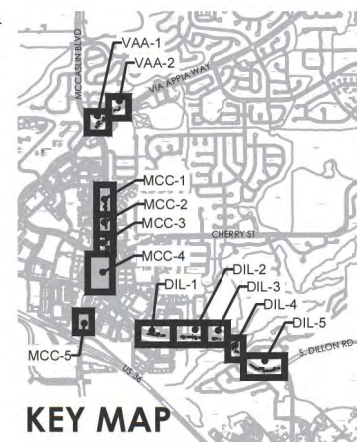
NOTE: ONLY DRIP IRRIGATION IS SHOWN IN ENLARGMENTS FOR CLARITY. REFER TO 30 SCALE ENLARGEMENT FOR LAYOUT OF SPRAY HEADS

3 MCC-5
Scale: 1" = 30'

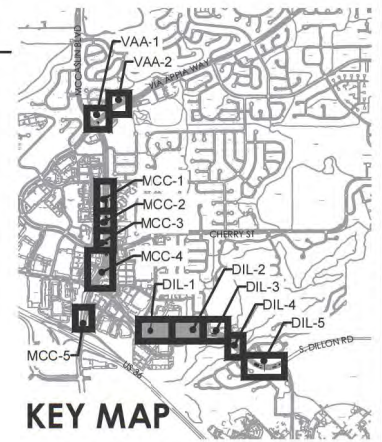
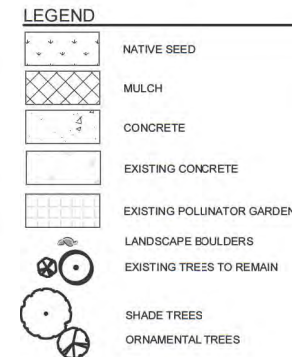
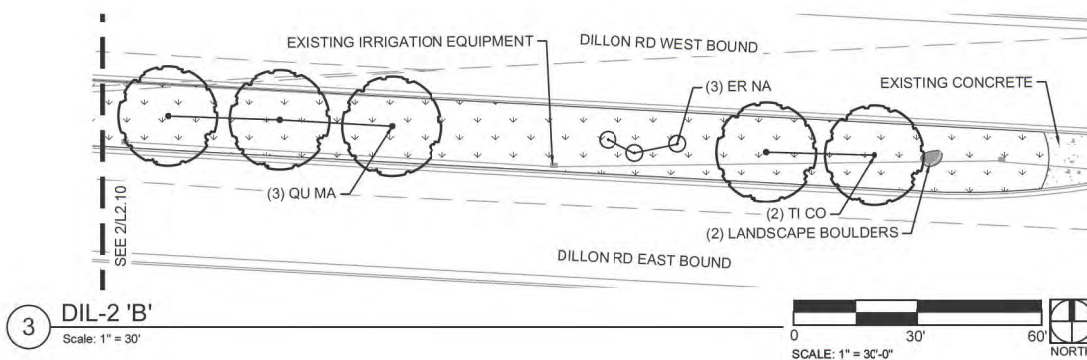
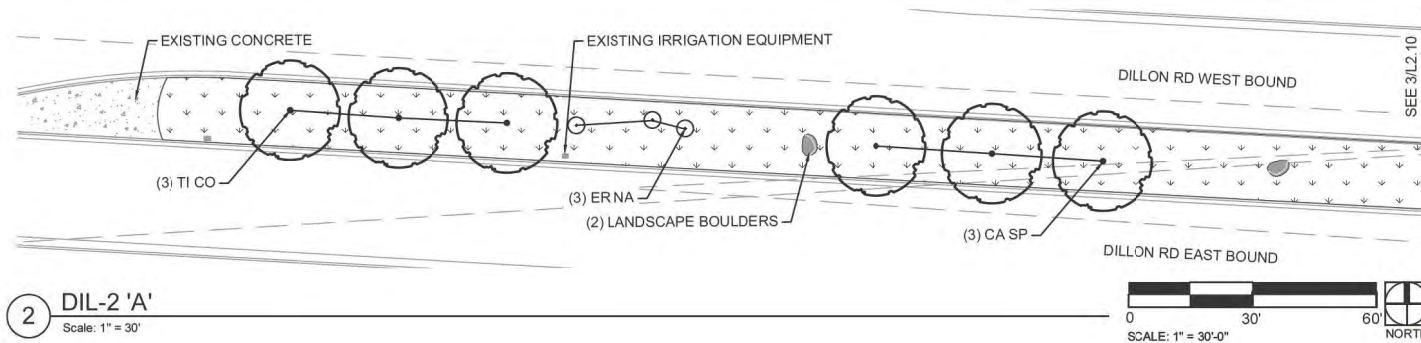
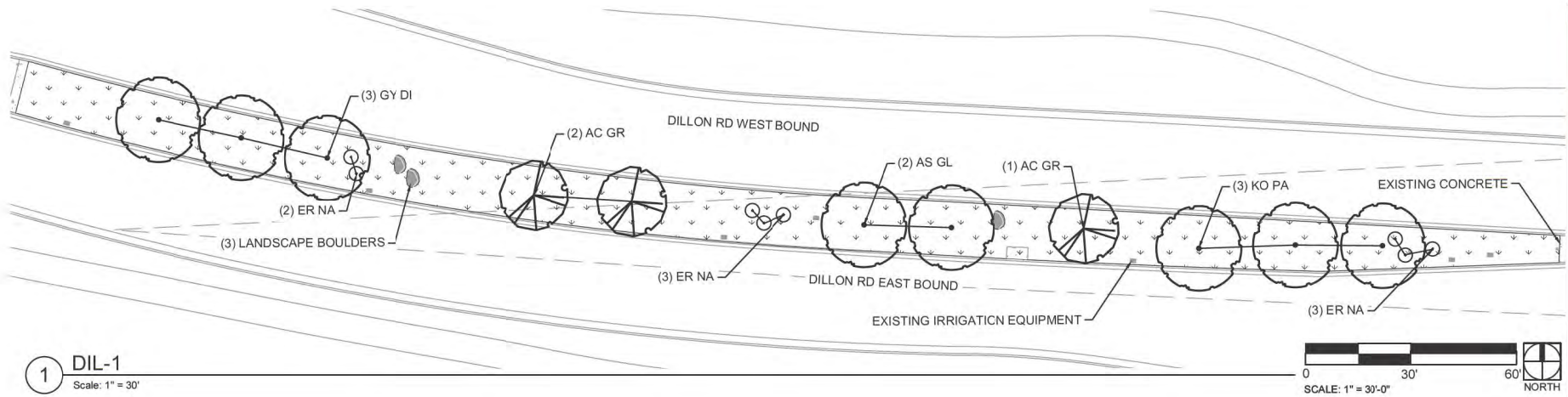


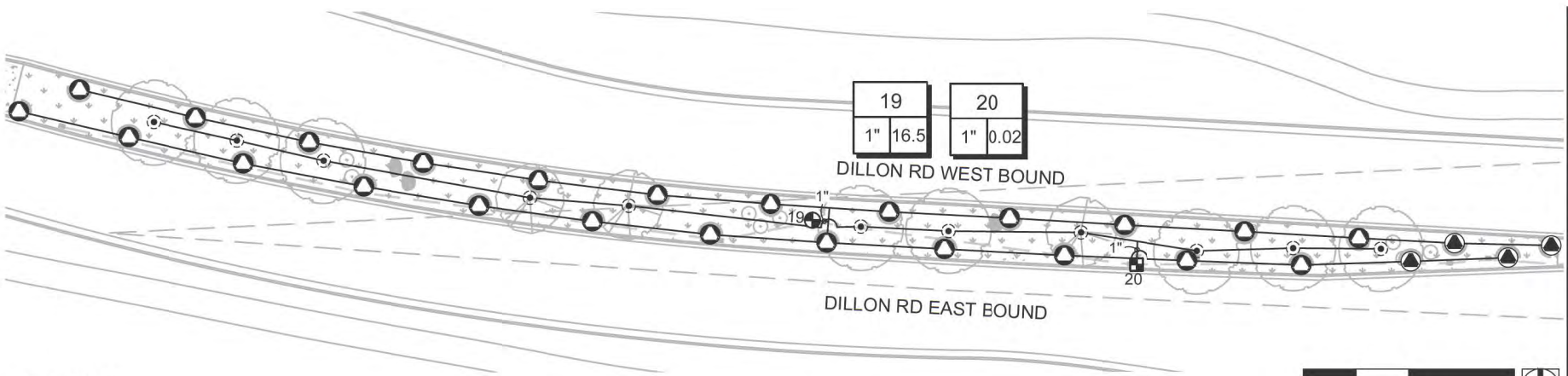
IRRIGATION SCHEDULE

- Rain Bird RD-12-S-P30 w/MP1000 Nozzles
- Rain Bird RD-12-S-P30 w/MP2000 Nozzles
- Rain Bird RD-12-S-P30 w/MP3000 Nozzles
- Rain Bird XZ-100-PRB-COM
- Flush Valve
- Tree Drip Ring: Rain Bird XFS-CV-09-12
- Rain Bird PEB
- Rain Bird Drip Tubing

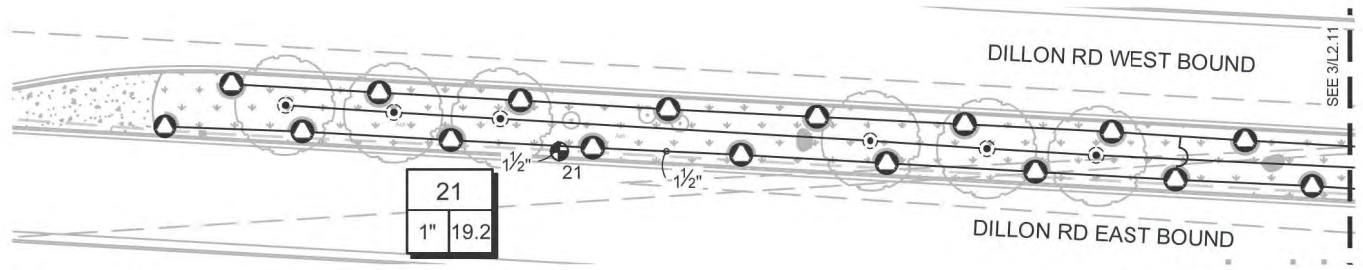


KEY MAP

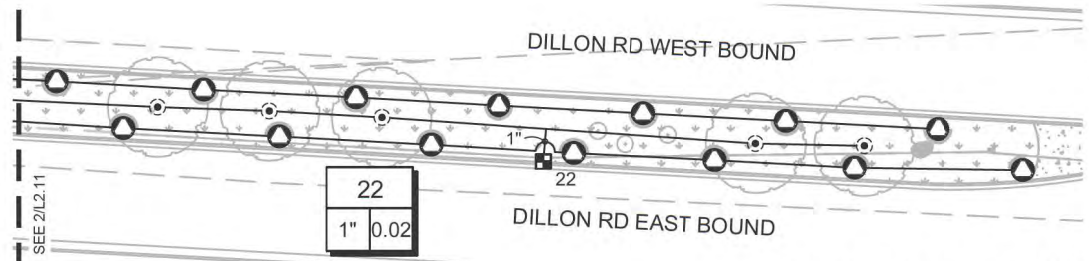




1 DIL-1
Scale: 1" = 30'

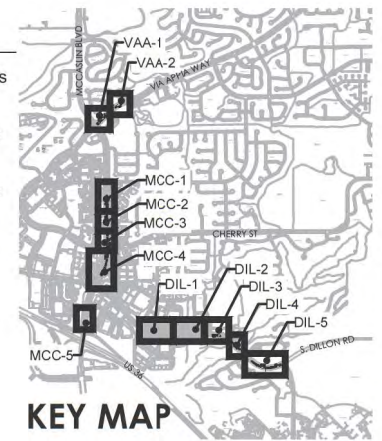


2 DIL-2 'A'
Scale: 1" = 30'

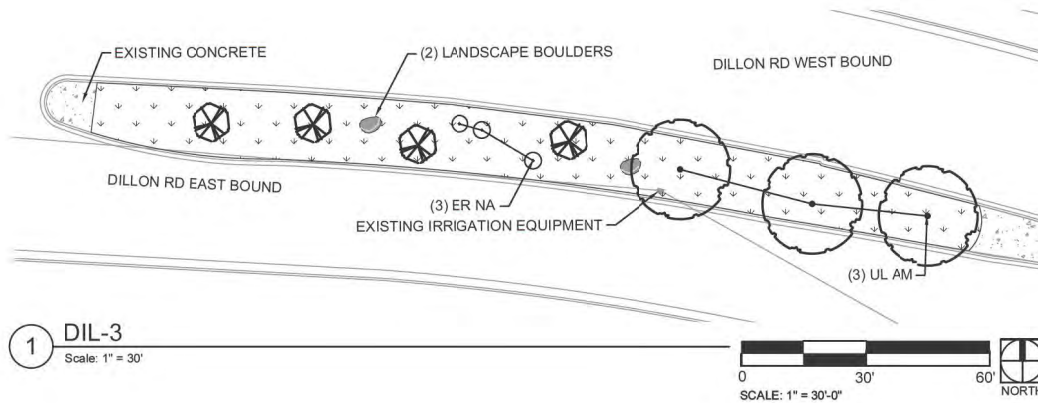


3 DIL-2 'B'
Scale: 1" = 30'

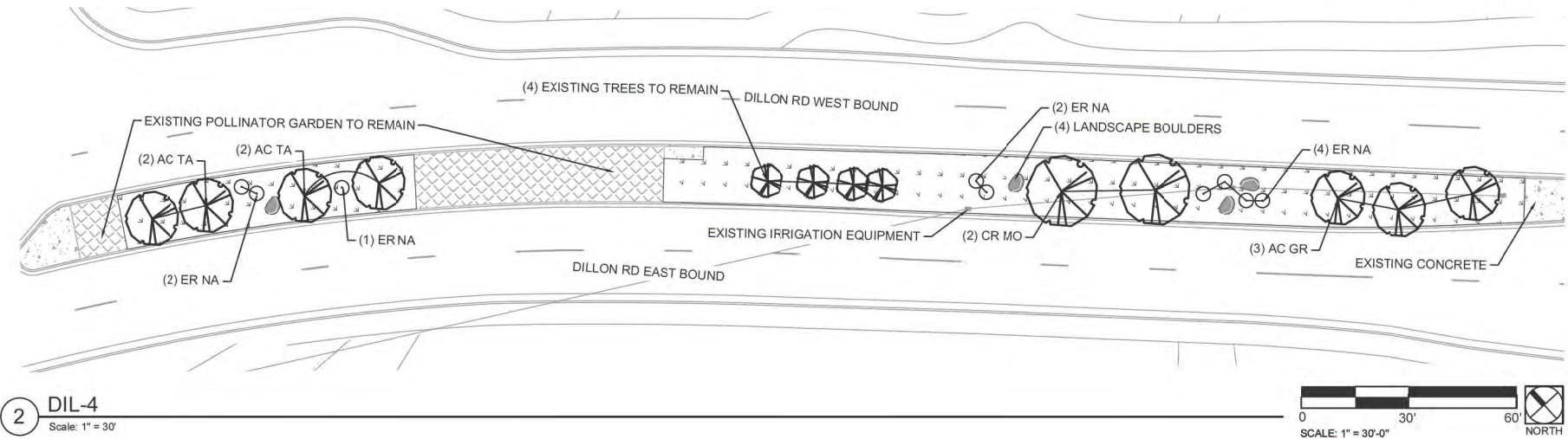
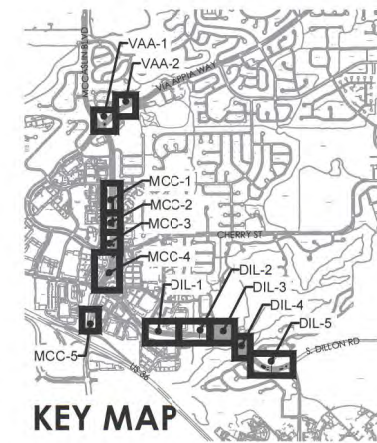
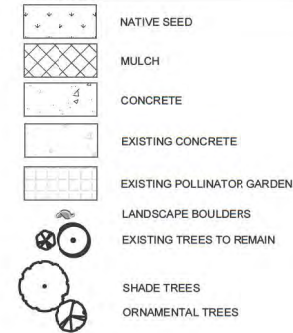
- IRRIGATION SCHEDULE**
- Rain Bird RD-12-S-P30 w/MP1000 Nozzles
 - Rain Bird RD-12-S-P30 w/MP2000 Nozzles
 - Rain Bird RD-12-S-P30 w/MP3000 Nozzles
 - Rain Bird XCZ-100-PRB-COM
 - Flush Valve
 - Tree Drip Ring: Rain Bird XFS-CV-09-12
 - Rain Bird PEB
 - Rain Bird Drip Tubing

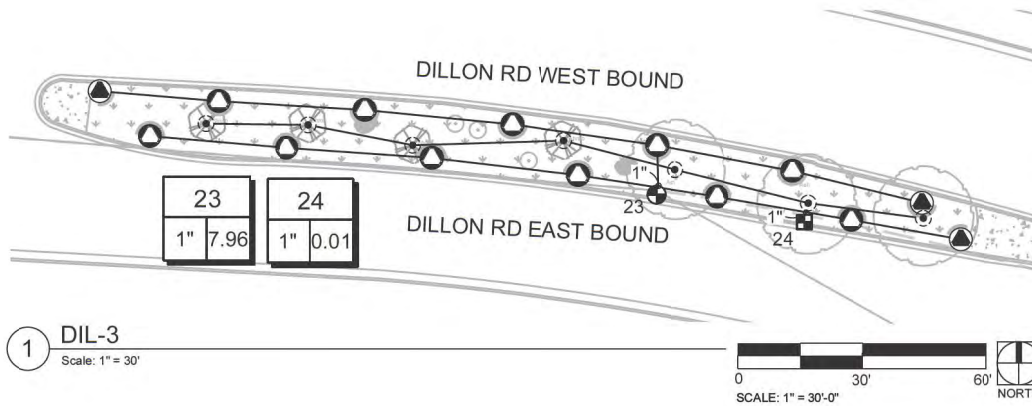


KEY MAP



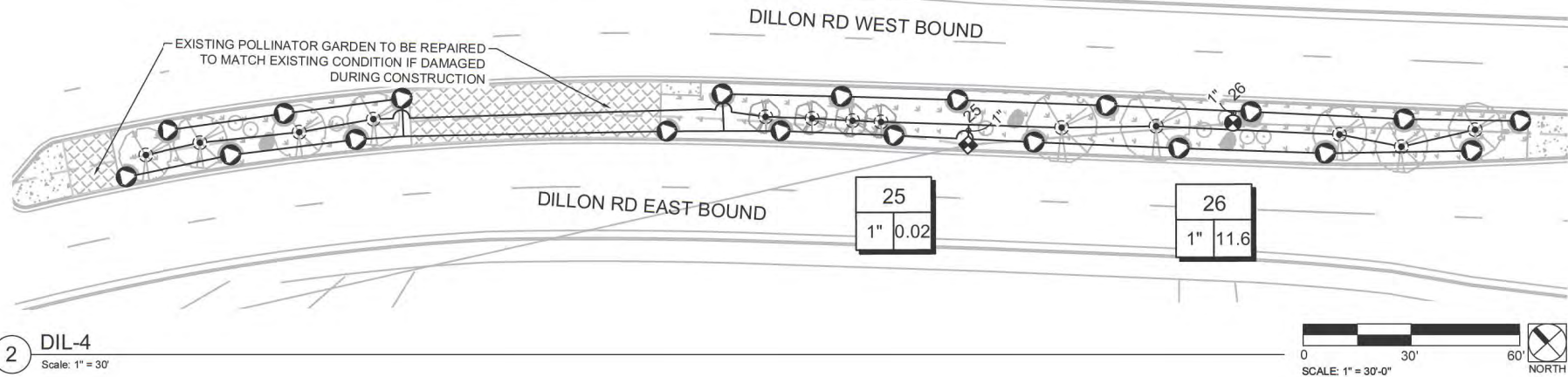
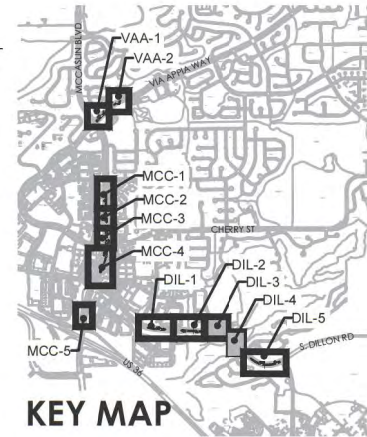
LEGEND

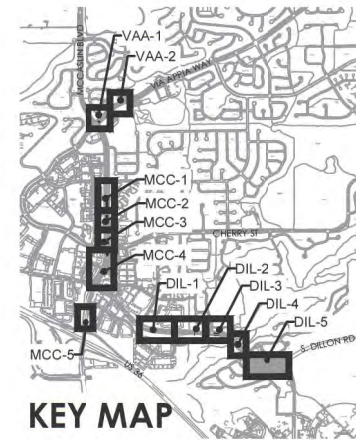
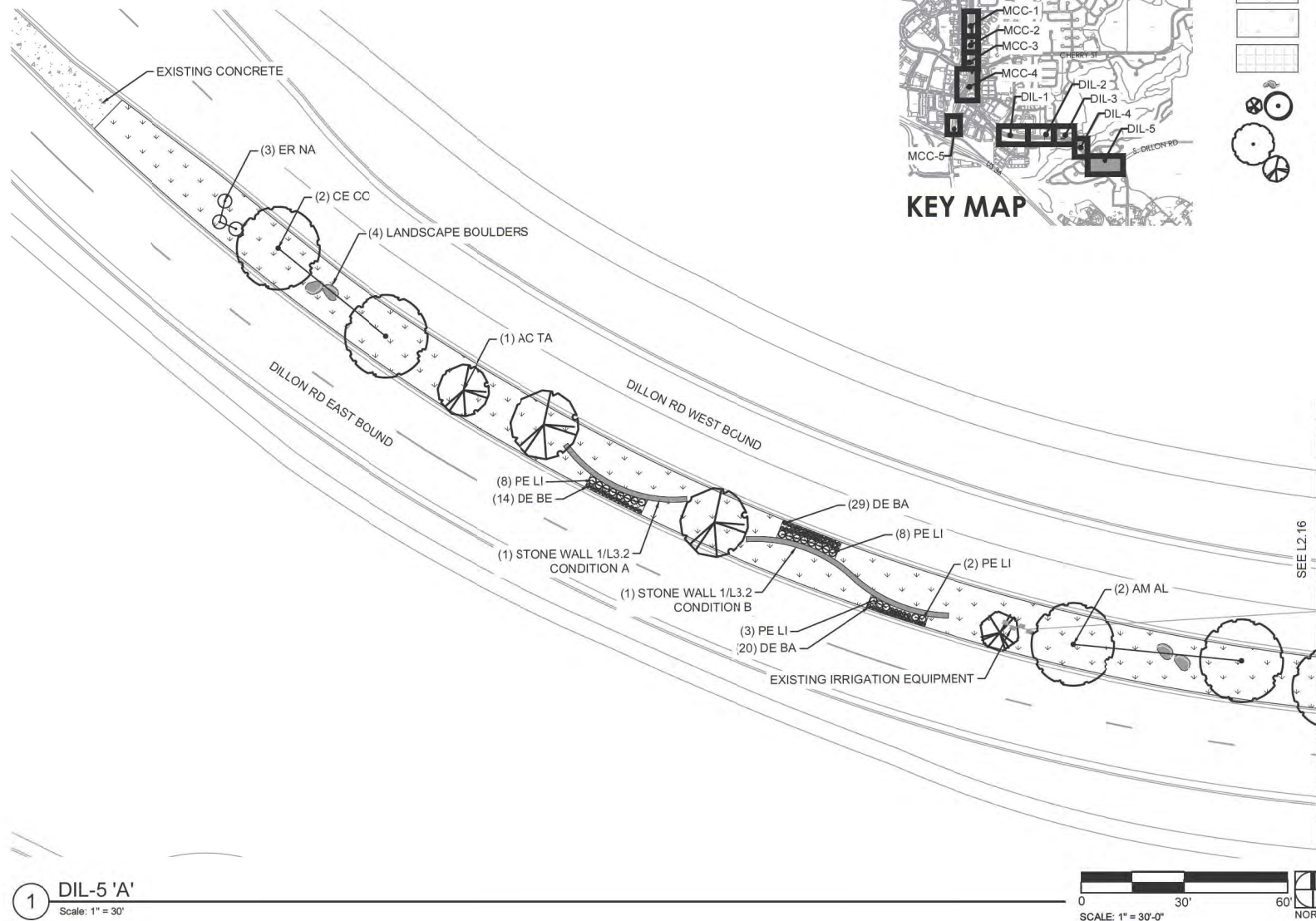




IRRIGATION SCHEDULE

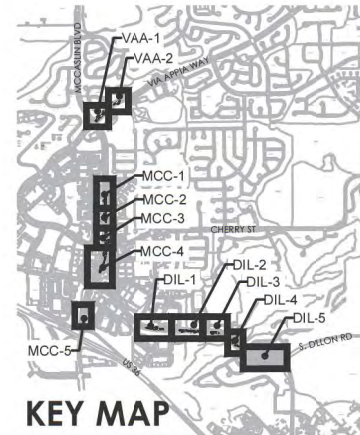
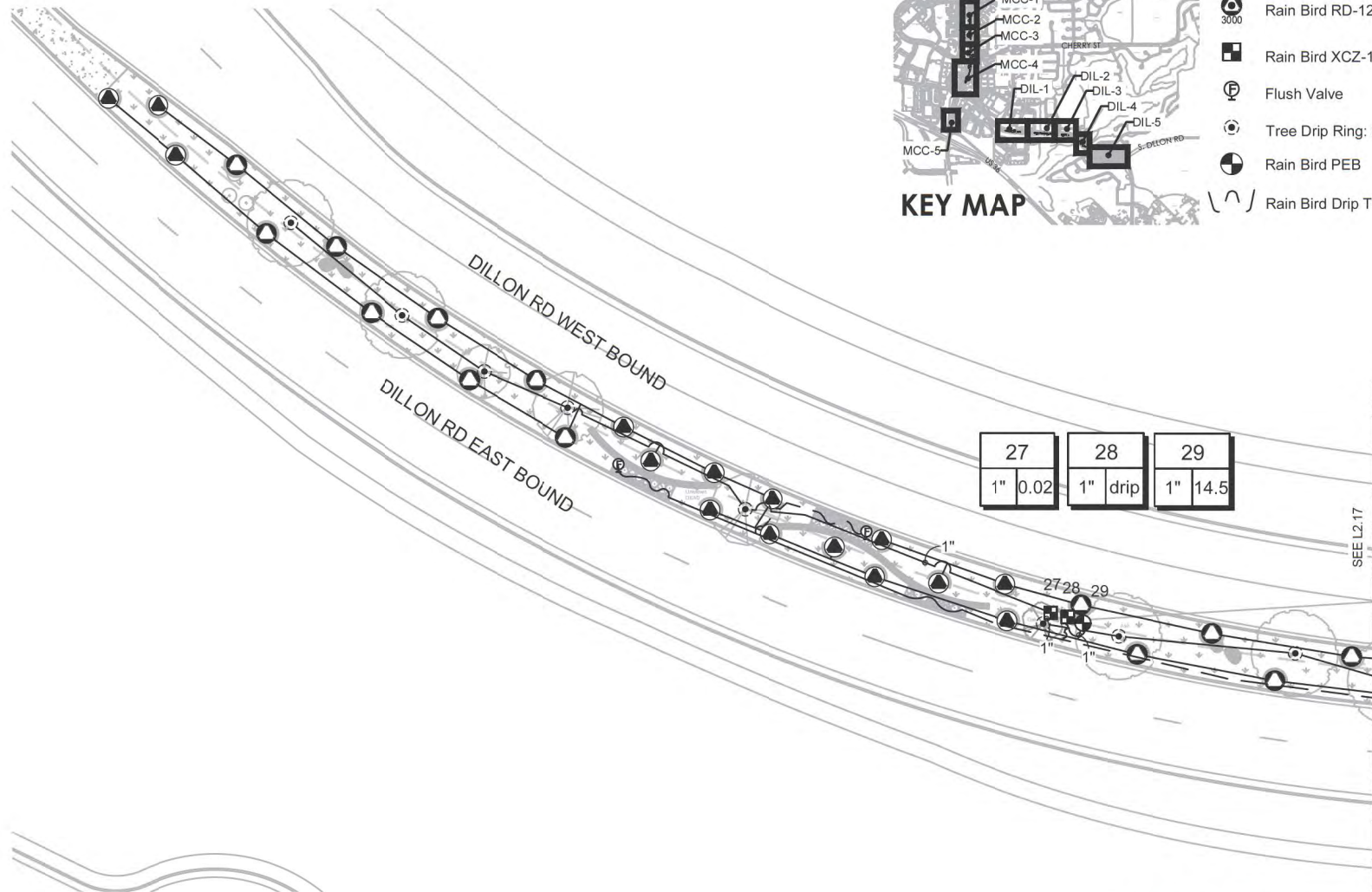
- Rain Bird RD-12-S-P30 w/MP1000 Nozzles
- Rain Bird RD-12-S-P30 w/MP2000 Nozzles
- Rain Bird RD-12-S-P30 w/MP3000 Nozzles
- Rain Bird XCZ-100-PRB-COM
- Flush Valve
- Tree Drip Ring: Rain Bird XFS-CV-09-12
- Rain Bird PEB
- Rain Bird Drip Tubing





LEGEND

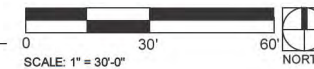
- NATIVE SEED
- MULCH
- CONCRETE
- EXISTING CONCRETE
- EXISTING POLLINATOR GARDEN
- LANDSCAPE BOULDERS
- EXISTING TREES TO REMAIN
- SHADE TREES
- ORNAMENTAL TREES

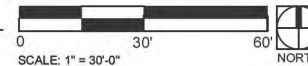
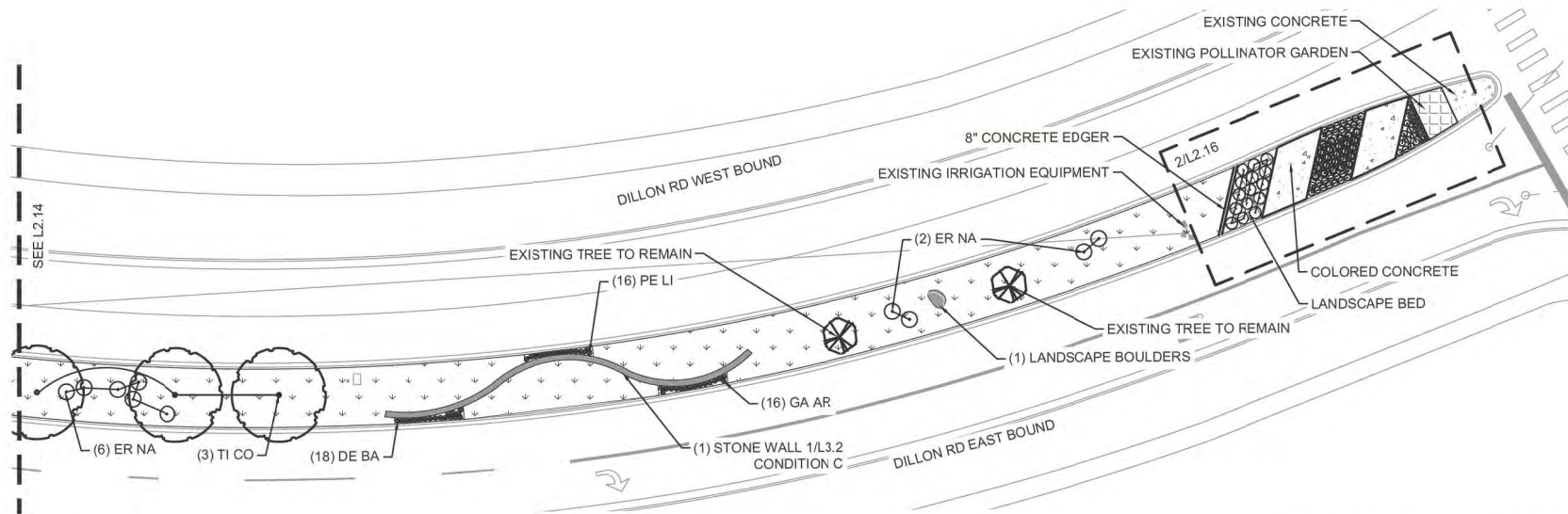


IRRIGATION SCHEDULE

- Rain Bird RD-12-S-P30 w/MP1000 Nozzles
- Rain Bird RD-12-S-P30 w/MP2000 Nozzles
- Rain Bird RD-12-S-P30 w/MP3000 Nozzles
- Rain Bird XCZ-100-PRB-COM
- Flush Valve
- Tree Drip Ring: Rain Bird XFS-CV-09-12
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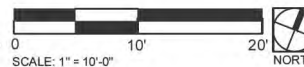
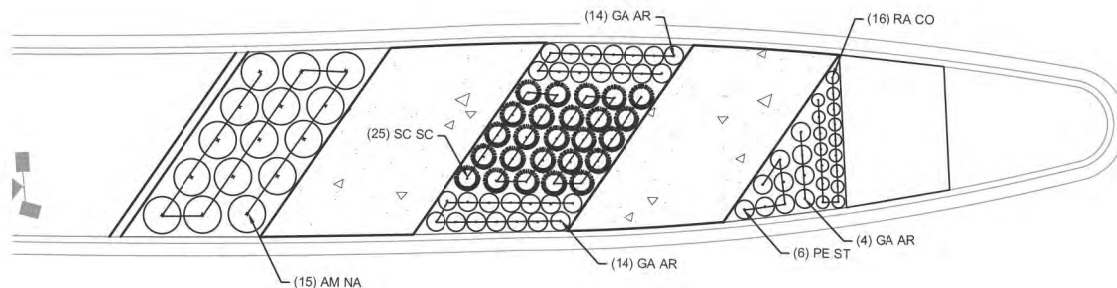
27	28	29
1" 0.02	1" drip	1" 14.5





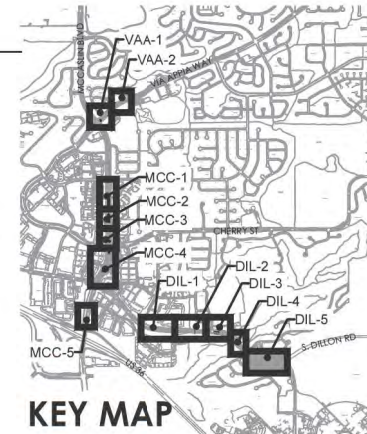
1 DIL-5 'B'

Scale: 1" = 30'



LEGEND

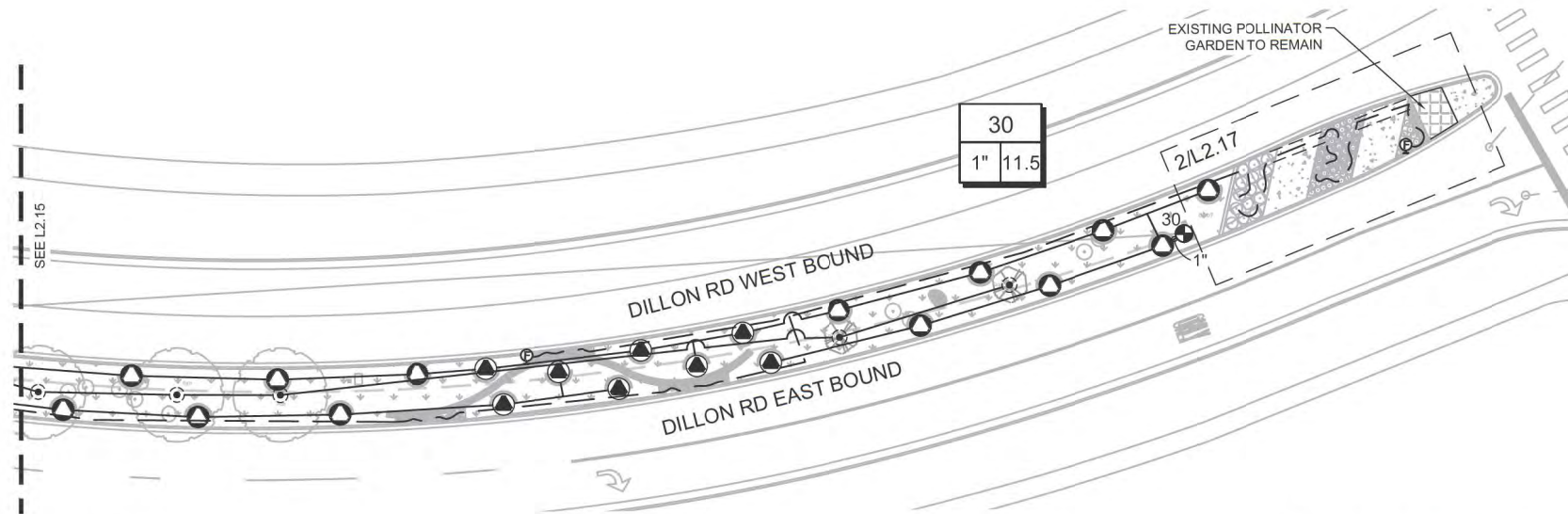
	NATIVE SEED
	MULCH
	CONCRETE
	EXISTING CONCRETE
	EXISTING POLLINATOR GARDEN
	LANDSCAPE BOULDERS
	EXISTING TREES TO REMAIN
	SHADE TREES
	ORNAMENTAL TREES



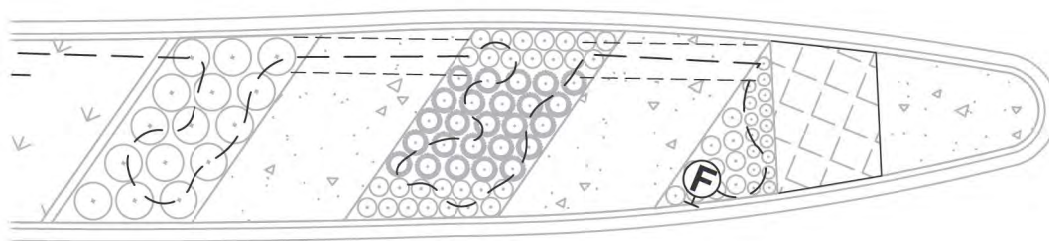
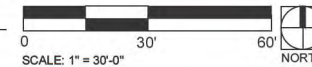
KEY MAP

2 DIL-5 LANDSCAPE ENLARGEMENT

Scale: 1" = 10'

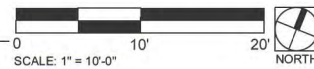


1 DIL-5 'B'
Scale: 1" = 30'



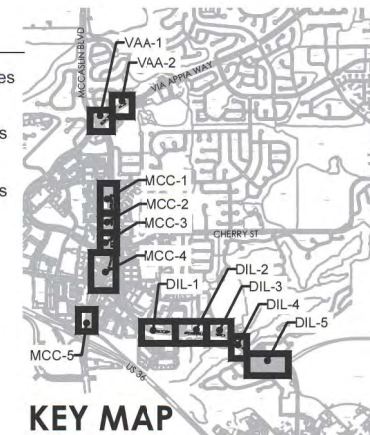
2 DIL-5 LANDSCAPE ENLARGEMENT
Scale: 1" = 10'

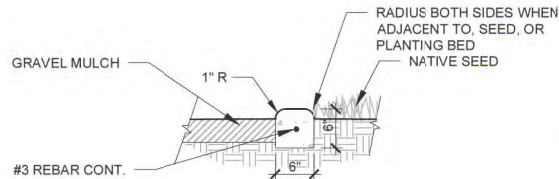
NOTE: ONLY DRIP IRRIGATION IS SHOWN IN ENLARGEMENTS FOR CLARITY. REFER TO 30 SCALE ENLARGEMENT FOR LAYOUT OF SPRAY HEADS



IRRIGATION SCHEDULE

- Rain Bird RD-12-S-P30 w/MP1000 Nozzles
- Rain Bird RD-12-S-P30 w/MP2000 Nozzles
- Rain Bird RD-12-S-P30 w/MP3000 Nozzles
- Rain Bird XCZ-100-PRB-COM
- Flush Valve
- Tree Drip Ring: Rain Bird XFS-CV-09-12
- Rain Bird PEB
- Rain Bird Drip Tubing

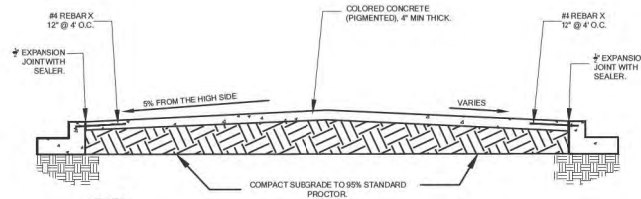




- NOTE:
1. PROVIDE CONTROL JOINTS AT 20' O.C., AND WHERE MOW BAND ABUTS PAVING OR STRUCTURES.
 2. TOP OF CURBWALL TO BE THE FOLLOWING DIMENSION ABOVE TOP OF ADJACENT MATERIAL:
- 1" ABOVE SEED
 3. CONCRETE TO BE STANDARD GREY

1 CONCRETE EDGER

Scale: NTS

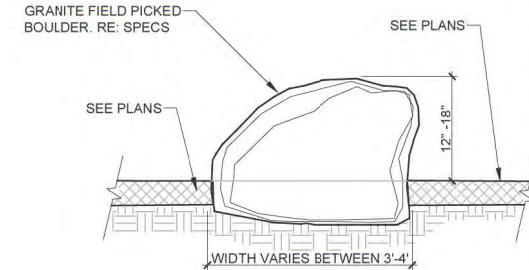


- NOTES:
1. JOINTS SHALL BE SAW CUT AT THE DIRECTION OF THE ENGINEER.

2 COLORED CONCRETE

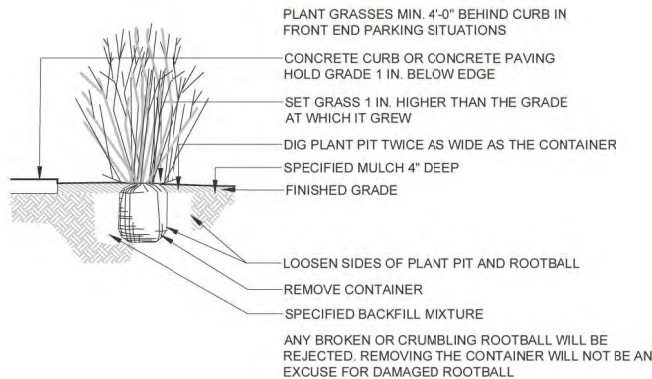
Scale: NTS

- NOTES:
1. BOULDERS TO BE BURIED 4" BELOW SUBGRADE.
 2. BOULDERS TO BE SET WITH A FLAT SIDE UP TO PROVIDE LEVEL SEATING SURFACE. PLACE ROCKS TIGHTLY TO EACH OTHER FOR MAXIMUM SEAL & TIGHT JOINT. HEIGHT OF BOULDERS TO BE 12-18".



3 LANDSCAPE BOULDER

Scale: NOT TO SCALE



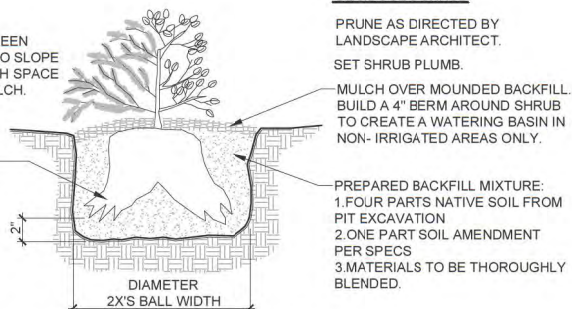
4 GRASS PLANTING

Scale: NOT TO SCALE

EVERGREEN SHRUB

PLACE SPREADING EVERGREEN SHRUBS PERPENDICULAR TO SLOPE OF GROUND. LEAVE ENOUGH SPACE UNDER BRANCHES FOR MULCH.

MOUND BACKFILL UNDER ROOTBALL.
REMOVE CONTAINER. SPLIT BOTTOM 1/2 OF BALL, SPREAD AND PLANT



DECIDUOUS SHRUB

PRUNE AS DIRECTED BY LANDSCAPE ARCHITECT.
SET SHRUB PLUMB.

MULCH OVER MOUNDED BACKFILL. BUILD A 4" BERM AROUND SHRUB TO CREATE A WATERING BASIN IN NON-IRRIGATED AREAS ONLY.

PREPARED BACKFILL MIXTURE:
1. FOUR PARTS NATIVE SOIL FROM PIT EXCAVATION
2. ONE PART SOIL AMENDMENT PER SPECS
3. MATERIALS TO BE THOROUGHLY BLENDED.

PRUNE AS DIRECTED BY OWNER'S REPRESENTATIVE. DC NOT PRUNE OR DAMAGE CENTRAL LEADER.

DIG HOLE TWO TIMES THE SIZE OF THE ROOTBALL.

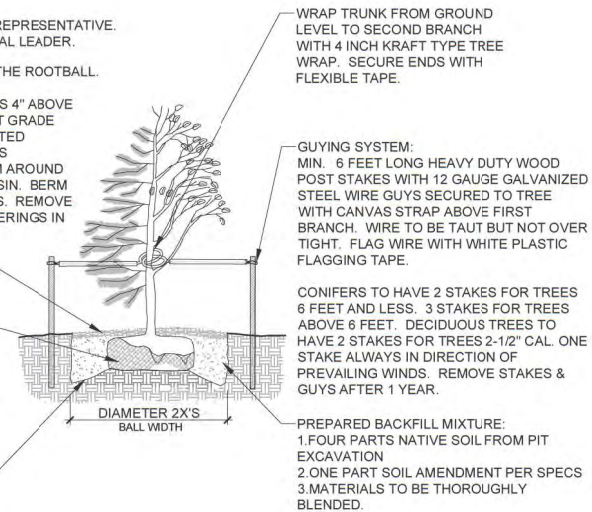
NOTE: SET ROOT BALL OF ALL TREES 4" ABOVE GRADE IN IRRIGATED AREAS AND AT GRADE TO 2" ABOVE GRADE IN NON-IRRIGATED AREAS. MODIFY IF SOIL CONDITIONS WARRANT. INSTALL A 5" HIGH BERM AROUND TREES TO CREATE A WATERING BASIN. BERM IS TEMPORARY IN IRRIGATED AREAS. REMOVE BERM AFTER TWO THOROUGH WATERINGS IN IRRIGATED AREAS AND MULCH

MULCH FLUSH WITH SCD AT EDGE. PROVIDE 4" DIAMETER CIRCLE

REMOVE BOTTOM 1/3 OF WIRE BASKET. SET TREE IN PIT TO PROPER GRADE AND PLUMB. REMOVE REMAINING WIRE AND TWINE. IF PLASTIC OR TREATED BURLAP, REMOVE AS MUCH AS POSSIBLE AND BACKFILL. IF REGULAR BURLAP, BACKFILL 2/3 OF PIT. REMOVE 1/3 OF BURLAP AND COMPLETE BACKFILL.
UNDISTURBED SOIL

6 TREE PLANTING

Scale: NOT TO SCALE



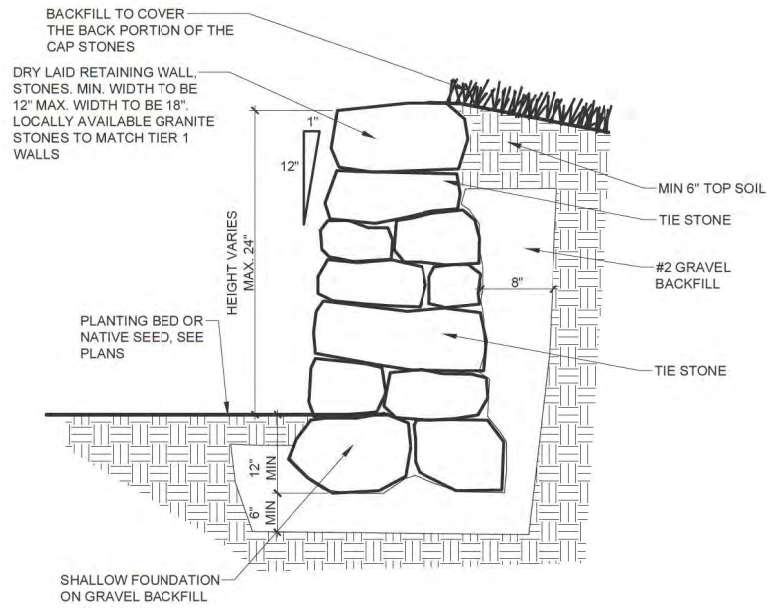
WRAP TRUNK FROM GROUND LEVEL TO SECOND BRANCH WITH 4 INCH KRAFT TYPE TREE WRAP. SECURE ENDS WITH FLEXIBLE TAPE.

GUYING SYSTEM:
MIN. 6 FEET LONG HEAVY DUTY WOOD POST STAKES WITH 12 GAUGE GALVANIZED STEEL WIRE GUYS SECURED TO TREE WITH CANVAS STRAP ABOVE FIRST BRANCH. WIRE TO BE TAUT BUT NOT OVER TIGHT. FLAG WIRE WITH WHITE PLASTIC FLAGGING TAPE.

CONIFERS TO HAVE 2 STAKES FOR TREES 6 FEET AND LESS. 3 STAKES FOR TREES ABOVE 6 FEET. DECIDUOUS TREES TO HAVE 2 STAKES FOR TREES 2-1/2" CAL. ONE STAKE ALWAYS IN DIRECTION OF PREVAILING WINDS. REMOVE STAKES & GUYS AFTER 1 YEAR.

PREPARED BACKFILL MIXTURE:
1. FOUR PARTS NATIVE SOIL FROM PIT EXCAVATION
2. ONE PART SOIL AMENDMENT PER SPECS
3. MATERIALS TO BE THOROUGHLY BLENDED.

SECTION DETAIL

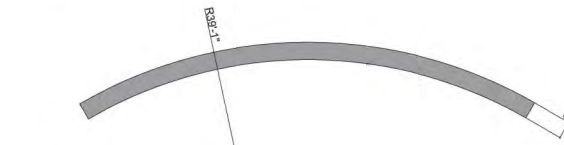


3D VISUALIZATION

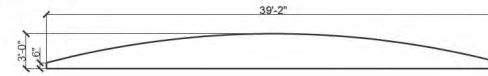
1 STONE WALL

Scale: NTS

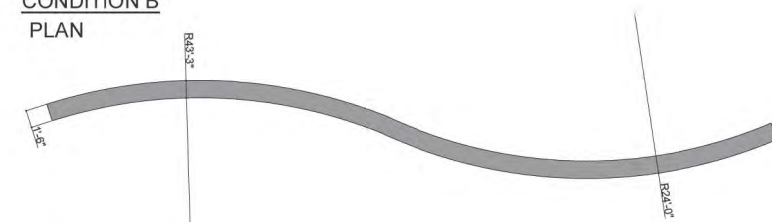
CONDITION A PLAN



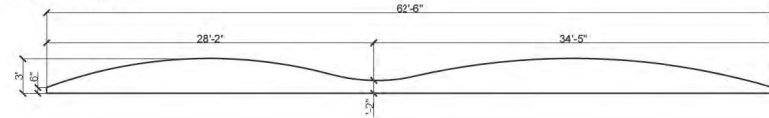
ELEVATION



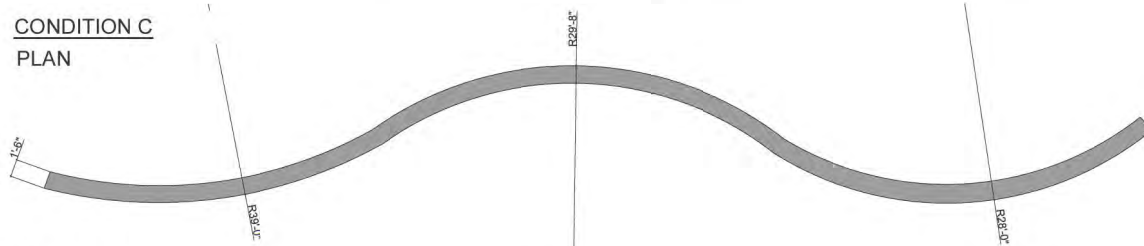
CONDITION B PLAN



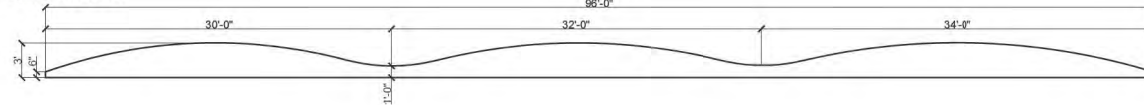
ELEVATION

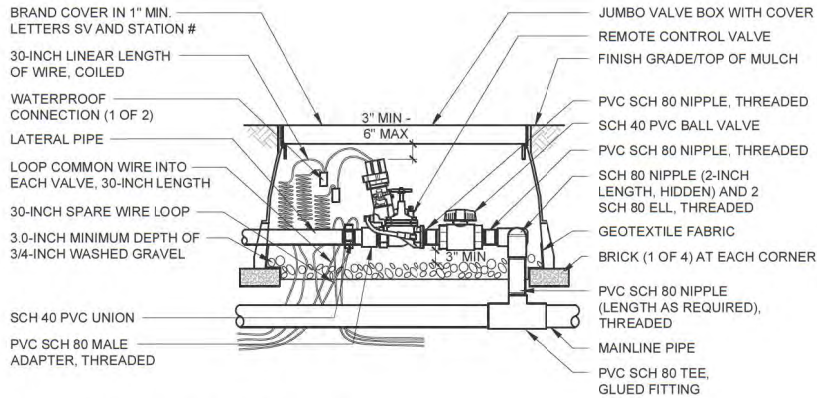


CONDITION C PLAN

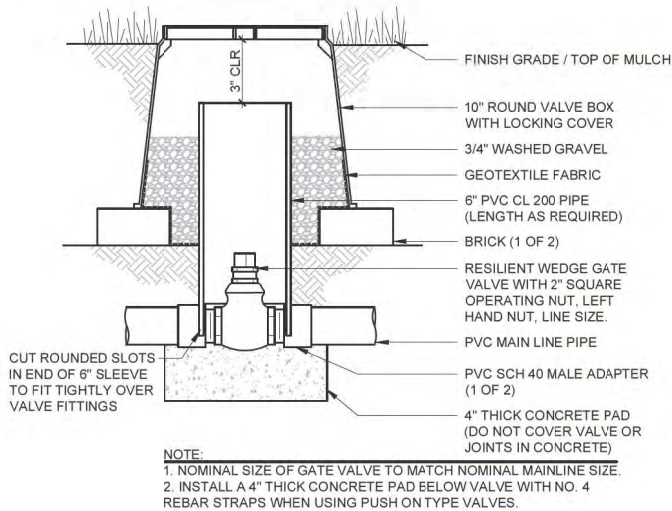


ELEVATION

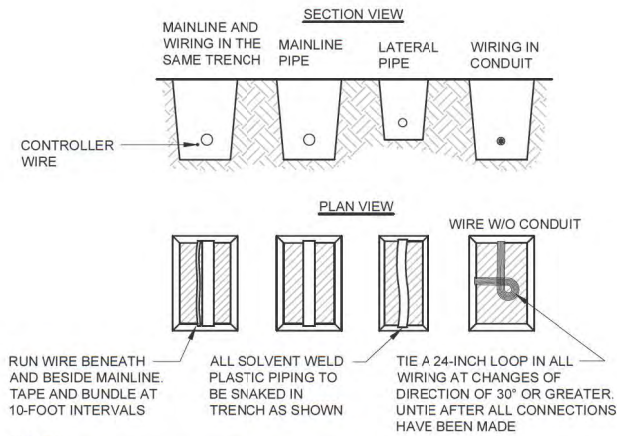




1 AUTOMATIC STATION VALVE
Not To Scale

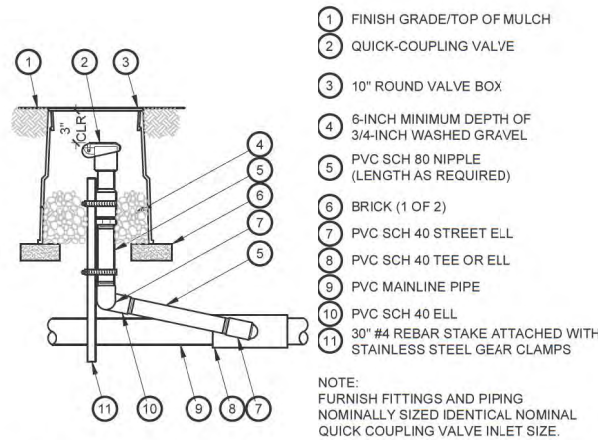


3 ISOLATION VALVE
Not To Scale

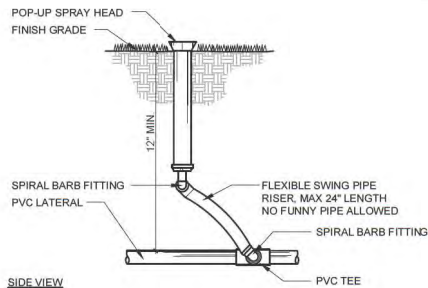


NOTES:
1. SLEEVE BELOW ALL HARDSCAPE ELEMENTS WITH CLASS 200 PVC TWICE THE DIAMETER OF THE PIPE OR WIRE BUNDLE WITHIN.
2. FOR PIPE AND WIRE BURIAL DEPTHS SEE SPECIFICATIONS.

2 PIPE AND WIRE TRENCH
Not To Scale



5 QUICK COUPLING VALVE
Not To Scale



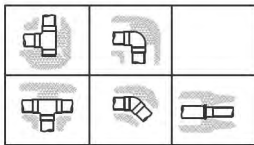
SIDE VIEW

NOTES:

1. ALL PVC NIPPLES AND FITTINGS TO BE SCHEDULE 80.
2. COMPACT BACKFILL PER SPECIFICATIONS.

1 POP-UP SPRAY HEAD

Not To Scale



THRUST BLOCK BEARING AREA AGAINST UNDISTURBED SOIL (SF)

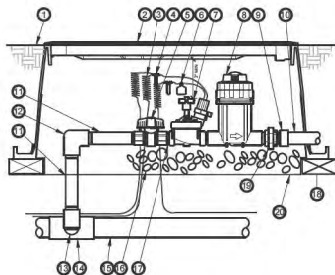
FITTING SIZE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE OR DEAD END
3"	2.02	1.11	0.67	0.30	1.44
4"	3.32	1.82	0.93	0.48	2.36

NOTES:

1. INSTALL AND TEST ALL MAINLINE ACCORDING TO MANUFACTURERS INSTALLATION SPECIFICATIONS.
2. REFER TO SPECIFICATIONS FOR ALL TRENCH DEPTHS AND WIDTHS.
3. USE NO. 4 REBAR WITH MASTIC COATING WHERE PIPE MUST BE ANCHORED TO THRUST BLOCK.
4. INSTALL THRUST BLOCK SO THE HORIZONTAL AND VERTICAL DIMENSIONS OF THE THRUST BLOCK ARE APPROXIMATELY EQUAL.
5. USE 3000 PSI CONCRETE.
6. WRAP ALL FITTINGS IN 3 MIL CLEAR PLASTIC PRIOR TO POURING CONCRETE.
7. DO NOT COVER FITTINGS WITH CONCRETE. CONCRETE IS TO BE POURED TO THE SIDES OF THE FITTINGS, NOT ON TOP OF THE FITTINGS.

4 THRUST BLOCKING

Not To Scale

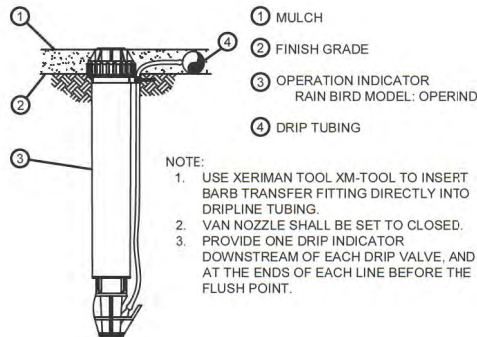


- 1 FINISH GRADE/TOP OF MULCH
- 2 JUMBO VALVE BOX WITH COVER
- 3 30-INCH LINEAR LENGTH OF WIRE, COILED
- 4 WATERPROOF CONNECTION: DBY KIT
- 5 1-INCH 1 BALL VALVE, INCLUDED IN DRIP ZONE ASSEMBLY KIT
- 6 ID TAG
- 7 REMOTE CONTROL VALVE, INCLUDED IN DRIP ZONE ASSEMBLY KIT
- 8 FILTER, INCLUDED IN DRIP ZONE KIT
- 9 PVC SCH 40 FEMALE ADAPTOR
- 10 LATERAL PIPE

- 11 PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
- 12 (2) PVC SCH 40 ELLS
- 13 PVC SCH 80 NIPPLE (2-INCH LENGTH, HIDDEN) AND (2) PVC SCH 40 ELLS
- 14 PVC SCH 40 TEE OR ELL
- 15 MAINLINE PIPE
- 16 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL
- 17 PVC SCH 80 NIPPLE, INCLUDED IN DRIP ZONE ASSEMBLY KIT
- 18 BRICK (1 OF 4) AT EACH CORNER
- 19 PVC SCH 80 UNION
- 20 GEOTEXTILE FABRIC

7 DRIP ZONE VALVE ASSEMBLY

Not To Scale

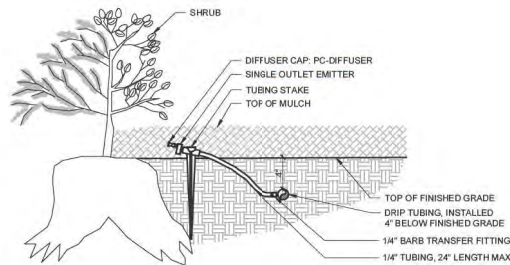


NOTE:

1. USE XERIMAN TOOL XM-TOOL TO INSERT BARB TRANSFER FITTING DIRECTLY INTO DRIPLINE TUBING.
2. VAN NOZZLE SHALL BE SET TO CLOSED.
3. PROVIDE ONE DRIP INDICATOR DOWNSTREAM OF EACH DRIP VALVE, AND AT THE ENDS OF EACH LINE BEFORE THE FLUSH POINT.

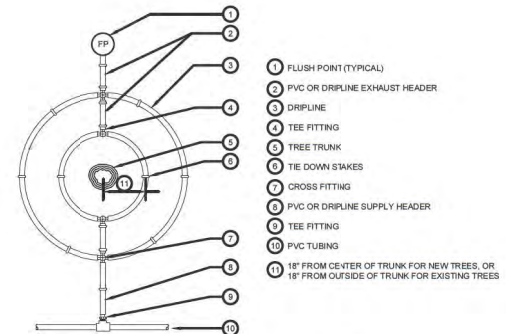
2 DRIP INDICATOR

Not To Scale



5 DRIP EMITTER ASSEMBLY

Not To Scale

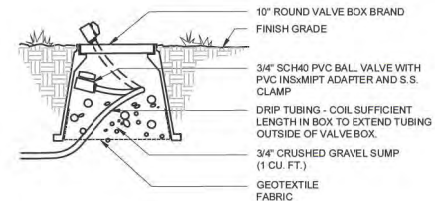


NOTES:

1. INSTALL DRIPLINE ON SURFACE TO MAXIMUM OF 6 INCHES BELOW GRADE, STAPLE IN PLACE PER MANUFACTURERS RECOMMENDATIONS. BACKFILL AND SPREAD SURFACE TREATMENT AS SPECIFIED.

3 TREE DRIP RINGS

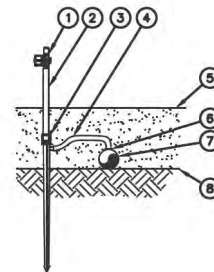
Not To Scale



6 DRIP FLUSH POINT

Not To Scale

- 1 MICRO-SPRAY WITH 1032 THREADED INLET: RAIN BIRD XERI-SPRAY
- 2 1/2" POLYFLEX RISER: RAIN BIRD PFR-12
- 3 THREADED RISER STAKE: RAIN BIRD RS-025T
- 4 1/4" DISTRIBUTION TUBING: RAIN BIRD XQ TUBING (LENGTH AS REQUIRED)
- 5 TOP OF MULCH
- 6 1/4" BARB TRANSFER CONNECTOR: RAIN BIRD XBF1CONN
- 7 1/2" POLYETHYLENE TUBING: RAIN BIRD XF SERIES TUBING OR RAIN BIRD XT-700 XERI-TUBE OR RAIN BIRD XBS BLACK STRIPE TUBING
- 8 FINISH GRADE



NOTES:

1. USE RAIN BIRD XERIMAN TOOL XM-TOOL TO INSERT TRANSFER TEE DIRECTLY INTO 1/2" POLYETHYLENE TUBING.
2. RAIN BIRD XERI-SPRAY AVAILABLE IN THE FOLLOWING MODELS:
XS-090 - QUARTER CIRCLE - SPRAY - 31 GPH MAX
XS-180 - HALF CIRCLE - SPRAY - 31 GPH MAX
XS-360 - FULL CIRCLE - STREAM SPRAY - 31 GPH MAX
X360 ADJUST - FULL CIRCLE - MIST - 31 GPH MAX

8 MICRO-SPRAYS

Not To Scale

NOTICE OF AWARD

June _____, 2025

Josh Wagner
Green Landscape Solutions

Mr. Wagner,

Please be advised that on _____ the City of Louisville, Colorado City Council awarded the **2025 Phase Two Median Landscape Renovations** project to your company in the amount of _____ per your bid submitted _____.

In accordance with the Contract Documents, you are required to execute two copies of the Agreement and return both copies with the required bonds and certificates of insurance within **10 days** of the date of this Notice of Award by _____.

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

CITY OF LOUISVILLE, COLORADO

ACCEPTED BY:

By: _____
Bryon Weber

By: _____
Josh Wagner

Title: Project Manager – PROS

Title: CEO – Green Landscape Solutions

PERFORMANCE BOND

_____, as Principal, hereinafter called the Contractor,
And _____, as Surety, with general offices in

_____ a Corporation organized under the laws of the State of _____, and authorized to transact business in the State of Colorado, are hereby bound unto the City of Louisville, Colorado, as Oblige, hereinafter called the City, in the penal sum of _____

(\$_____) in the United States currency, for the payment of which sum the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally.

WHEREAS, the Contractor has entered into a written contract with the City dated _____, 2025, for _____ in accordance with plans and specifications contained in the Contract, a copy of which Contract is attached hereto and made a part hereof and is hereinafter referred to as the Contract;

NOW, THEREFORE, the conditions of this performance bond are such that, if the Contractor shall satisfactorily perform the Contract, then this bond shall be null and void; otherwise, the Surety shall promptly remedy the default, or shall promptly 1) Complete the Contract in accordance with its terms and conditions, or 2) Obtain a Bid or Bids for completing the contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or if the City elects, upon determination by the City and the Surety jointly of the lowest responsible bidder, arrange for a Contract between such Bidder and the City, 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 costs of completion plus liquidated damages additional costs pursuant to Section 12.2 of the General Conditions of the Contract less the balance of the contract price, but not exceeding the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by the City to the Contractor under the Contract and any amendments thereto, less the amount paid by the City to Contractor.

In addition, if the Contractor or a subcontractor shall fail to duly pay for any labor, materials, team hire, sustenance, provisions, provender, or other supplies used or consumed by such Contractor or subcontractor in performance of the Contract, or shall fail to duly pay any person who supplies rental machinery, tools, or equipment, all amounts due as the result of the use of such machinery, tools or equipment in the prosecution of the Work, then the Surety shall pay the same in the amount not exceeding the sum specified in the bond together with interest at a rate of eight percent per annum.

In addition to the other conditions hereof, this bond shall include all provisions set forth in Section 38-26-106, C.R.S.

Performance Bond (Continued)

THE UNDERSIGNED SURETY for value received hereby agrees that no extension of time, change in, addition to, or other modification of the terms of the Contract of Work to be performed thereunder or the specifications of the Contract Documents shall in any way affect its obligation on this bond and the Surety does hereby waive notice of any such extension of time, change, addition, or modifications.

SIGNED AND SEALED this _____ day of _____, 2025.

(Contractor)

By: _____
(President)

(Surety Company)

Address: _____

(Attest)

By: _____
(Attorney-in-fact)

LABOR AND MATERIAL PAYMENT BOND

BOND NUMBER:

KNOW ALL MEN BY THESE PRESENCES: that

(Firm) _____
(Address) _____
(an Individual), (a Partnership), (a Corporation), hereinafter referred to as "the Principal", and

(Firm) _____
(Address) _____
hereinafter referred to as "the Surety", are held and firmly bound unto the
CITY OF LOUISVILLE, 749 MAIN STREET, LOUISVILLE, COLORADO a Municipal Corporation,
hereinafter referred to as "the Owner", in the penal sum of

_____ Dollars
(\$ _____) in lawful money of the United States, for the payment of which sum
well and truly to be made, we bind ourselves, successors and assigns, jointly and severally, firmly by
these presents.

THE CONDITIONS OF THIS OBLIGATION are such that whereas the Principal entered into a certain
Agreement with the Owner, dated the _____ day of _____, 2023, a copy of which
is hereto attached and made a part hereof for the performance of

NOW, THEREFORE, if the Principal shall 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 Agreement, and any authorized extension or modification thereof, including all amounts due for
materials, lubricants, repairs on machinery, equipment and tools, consumed, rented or used in
connection with the construction of such work, and all insurance premiums on said Work, and for all
labor, performed in such Work whether by Subcontractor or otherwise, then this obligation shall be
void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no
change, extension of time, alteration or addition to the terms of the Agreement or to the Work to be
performed thereunder or the specifications accompanying the same shall in any way affect its
obligation on this Bond; and it does hereby waive notice of any such change, extension of time,
alteration or addition to the terms of the Agreement or to the Work or to the Specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge
the right of any beneficiary hereunder, whose claim may be unsatisfied.

In addition to the other conditions hereof, this bond shall include all provisions set forth in Section 38-
26-105, C.R.S.

Labor and Material Payment Bond (Continued)

IN WITNESS WHEREOF, this instrument is executed in (3) counterparts, each one of which shall be deemed an original, this _____ day of _____, 2025.

IN THE PRESENCE OF:

PRINCIPAL

PRINCIPAL:

BY: _____

(Title)

(Corporate Seal)

Addresses:

IN THE PRESENCE OF:

OTHER PARTNERS:

By: _____

By: _____

IN THE PRESENCE OF:

SURETY:

By: _____

(Attorney-in fact)

(Surety Seal)

Address:

NOTE: Date of Bond must not be prior to date of Agreement.
If Contractor is a Partnership, all partners must execute Bond.

IMPORTANT: Surety Company must be authorized to transact business in the state of Colorado and be acceptable to the Owner.

NOTICE TO PROCEED

DATE: _____

TO: _____

You are hereby notified that the Contract Time under the above Contract will commence to run on _____. On that date, you are to begin performing the Work in accordance with the Contract Documents and you are to complete the Work within **72 Contract Days** thereafter. The date of substantial completion of all Work is therefore **September 26, 2025**.

OWNER: CITY OF LOUISVILLE, COLORADO

By: _____
Bryon Weber

Title: Project Manager – Parks, Recreation & Open Space

ACKNOWLEDGEMENT

Receipt of the above Notice to Proceed is hereby acknowledged.

CONTRACTOR: _____

By: _____

Title: _____

Date: _____



COLORADO • SINCE 1878

CHANGE ORDER

CHANGE ORDER # _____

DATED: _____

AGREEMENT DATE: _____

The following changes are hereby made to the Contract Documents:
Description: _____

			Unit S	\$ COST
	TOTAL			

Attachments: _____

ADJUSTMENT TO CONTRACT PRICE:

Original contract price	\$
Set change previous Change Orders No. <u>0</u> to <u>0</u>	\$
Contract price prior to this Change Order	\$
Net adjustment resulting from this Change Order (+/-)	\$
Current contract price including this Change Order	\$

ADJUSTMENT TO CONTRACT TIME:

Original contract time (days or date) _____

Net change previous Change Orders No. __ to __ (days) _____

Contract time prior to this Change Order (days or date) _____

Net Adjustment Resulting from this Change Order (days) _____

Current contract time including this Change Order (days or date) _____

The Contractor's signature below indicates acceptance of full settlement for the work described, both direct and indirect costs. Any claims for additional costs associated with this Change Order will not be considered.

Recommended:	Approved:	Accepted:
PROJECT MANAGER	CITY OF LOUISVILLE, COLORADO OWNER	CONTRACTOR

By: _____ By: _____ By: _____

Date: _____ Date: _____ Date: _____

FIELD ORDER

No. _____

TO: _____

DATE ISSUED: _____

You are hereby directed and instructed to execute promptly minor variations in the Work by this Field Order as follows:

Attachments:

This form shall be used to authorize minor variations in the Work from the requirements of the Contract Documents, which do not include an adjustment in the Contract Price or the Contract Times.

CITY OF LOUISVILLE

BY: _____

TITLE: _____

DATE: _____

ACCEPTED BY CONTRACTOR

BY: _____

TITLE: _____

DATE: _____

WORK CHANGE DIRECTIVE INSTRUCTIONS

A. GENERAL INFORMATION

This document was developed for use in situations involving changes in the Work that, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order.

For supplemental instructions and minor changes not involving a possible change in the Contract Price or the contract Times a Field Order may be used.

B. COMPLETING THE WORK CHANGE DIRECTIVE FORM

Engineer initiates the form, including a description of the items involved and attachments.

Based on conversations between Engineer and Contractor, Engineer completes the following:

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE. Mark the method to be used in determining the final cost of Work involved and the estimated net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed Work is completed, another Work Change Directive must be issued to change the estimated price or Contractor may stop the changed Work when the estimated price is reached. If the Work Change Directive is not likely to change the Contract Price, the space for estimated increase (decrease) should be marked "Not Applicable".

METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT TIMES: Mark the method to be used in determining the change in Contract Times and the estimated increase or decrease in Contract Times. If the change involves an increase in the Contract Times and the estimated times are approached before the additional or changed Work is completed, another Work Change Directive must be issued to change the times or Contractor may stop the changed Work when the estimated times are reached. If the Work Change Directive is not likely to change the Contract Times, the space for estimated increase (decrease) should be marked "Not Applicable".

Once authorized by Engineer a copy will be sent to Contractor. Price and Times may only be changed by Change Order signed by Owner and Contractor.

Once the Work covered by this directive is completed or final cost and times are determined, Contractor should submit documentation for inclusion in a Change Order.

THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR THE CONTRACT TIMES. A CHANGE ORDER, IF ANY, SHOULD BE CONSIDERED PROMPTLY.

WORK CHANGE DIRECTIVE

DIRECTIVE No. _____

DATE ISSUED: _____

EFFECTIVE DATE: _____

You are directed to proceed promptly with the following change(s):

Description:

Purpose of Work Change Directive:

Attachments (List documents supporting change):

If a claim is made that the above change(s) have affected Contract Price or Contract Times any claim for a Change Order based thereon will involve one or more of the following methods of determining the effect of the change(s).

Method of determining change in
Contract Price:

☐ Unit Prices
☐ Lump Sum
☐ Other _____

Method of determining change in
Contract Times:

☐ Contractor's Records
☐ Engineer's Records
☐ Other _____

Estimated increase (decrease) in Contract Price:

\$ _____
If the change involves an increase, the estimated amount
is not to be exceeded without further authorization.

Estimated increase (decrease) in Contract Times

Substantial Completion: _____ days;
Ready for final payment: _____ days.
If the change involves an increase, the estimated
times are not to be exceeded without further
authorization.

RECOMMENDED:

ENGINEER

BY: _____

ACCEPTED:

CONTRACTOR

BY: _____

CONTRACTOR'S PROPOSAL REQUEST
(Not a Change Order)

DATE SUBMITTED: _____

No. _____

TO: _____

We hereby request the cost of the following proposed change in the Contract. A breakdown of the proposed cost is attached.

Description of the proposed change:

All work shall be in accordance with the terms, stipulations, and conditions of the Contract Documents. If the Work herein requested is approved by Change Order, the time of completion will be (increased), (decreased), (unchanged) by _____ calendar days.

New Substantial Completion Date: _____, 2025

This change will:

☐ Increase the Contract by \$ _____
☐ Decrease the Contract by \$ _____
☐ No change in the Contract

SUBMITTED BY CONTRACTOR

BY: _____

TITLE: _____

DATE: _____

CITY OF LOUISVILLE

☐ Contractor's Proposal Request Accepted

☐ Contractor's Proposal Request Not Accepted

BY: _____

TITLE: _____

DATE: _____

CONTRACTOR'S OVERTIME REQUEST

DATE SUBMITTED: _____

TO: _____

We hereby request to perform work on overtime in accordance with the terms, stipulations, and conditions of the Contract Documents.

Requested date of overtime work: _____

Requested hours of overtime work: _____ (a. m./p. m.) to _____ (a. m./p. m.)

Description of proposed overtime work:

No extra payment will be paid to the CONTRACTOR by the OWNER due to labor overtime or other increased costs of performing the Work on Friday afternoons, Saturdays, or at night. Should the CONTRACTOR desire to work on Friday afternoons or at night between the hours of 5:00 p.m. and 8:00 p.m., Monday-Thursday, or from 3:30 p.m. to 8:00 p.m. Friday, the CONTRACTOR shall submit a written request to the ENGINEER 24 hours prior. If approval is given by ENGINEER to CONTRACTOR for authorized overtime work, ENGINEERS and ENGINEER's authorized personnel will charge overtime and other incidental administrative expenses necessary for performing inspections on Friday afternoons, or at night between the hours of 5:00 p. m. and 8:00 p.m., Monday-Thursday and 3:30 p.m. to 8:00 p.m. Friday, the CONTRACTOR will be responsible to pay for all such rates and charges, and shall not be granted a Contract Price increase for such charges.

Hours of overtime work shall only be allowed from 5:00 p.m. to 8:00 p.m. Monday thru Thursday, and from 3:30 p.m. to 8:00 p.m. Friday.

SUBMITTED BY CONTRACTOR

BY: _____

TITLE: _____

DATE: _____

CITY OF LOUISVILLE

____ Contractors Proposal Request Accepted

____ Contractors Proposal Request Not Accepted

BY: _____

DATE: _____

TITLE: _____

CERTIFICATE OF SUBSTANTIAL COMPLETION

Date:

To: Green Landscape Solutions

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on:

01/01/01

DATE OF SUBSTANTIAL COMPLETION

A tentative list of items to be completed or corrected is attached/enclosed hereto. This list may not be all-inclusive, and the failure to include an item in the list does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within **ten (10)** days of the issuance of this Certificate of Substantial Completion.

CONTRACTOR shall maintain all contractual responsibilities until Final Acceptance.

The following items are to be made a part of this Certificate of Substantial Completion:

- 1) ITEM ONE
 - 2) ITEM TWO
-

(For items to be attached see definition of Substantial Completion as supplemented and other specifically noted conditions precedent to achieving Substantial Completion as required by the Contract Documents.)

(CONTINUED NEXT PAGE)

CERTIFICATE OF SUBSTANTIAL COMPLETION (CONTINUED)

This certificate does not constitute an acceptance of Work or start of the guarantee period nor its release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents. Issuance of Substantial Completion does not commence the guarantee period with this certificate.

CITY OF LOUISVILLE, COLORADO

ACCEPTED BY CONTRACTOR

BY: _____

BY: _____

TITLE: Project Manager - PROS _____

TITLE: _____

DATE: _____

DATE: _____

FINAL CLAIM RELEASE & ACCEPTANCE

Application for Payment Number: _____
Application for Payment Amount: _____
Application for Payment Date: _____

For valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the undersigned hereby releases the City of Louisville, Colorado, and waives all rights of the undersigned to file a claim for material, equipment, tools, machinery or services heretofore furnished for use in and for labor heretofore performed upon the construction, alteration, addition to or repair of the structure or improvements described in the Contract Documents as:

Project: PROJECT NAME

Description of Property: PROJECT LOCATION, CITY OF LOUISVILLE

Owner: CITY OF LOUISVILLE, COLORADO

We acknowledge that the foregoing is an adequate description of the real property and improvements to which this Claim Release pertains inasmuch as the foregoing description is the description given in the Contract Documents, which govern the performance of the Work for which consideration has been received.

In executing this release, we certify that all claims for labor or materials, or both, furnished or performed by the undersigned or on our behalf by our material suppliers or subcontractors have been paid or that satisfactory arrangements for payment have been made and we hereby waive and release any and all rights, claims and liens which the undersigned may now or hereafter have, claim or assert against the project, the Owner, or any funds in Owner's possession or control concerning the project, or against all land and any improvements and appurtenances to the land improved by the project.

In consideration of the final payment made or to be made to the undersigned and to induce said payment, we hereby further release and forever discharge the City of Louisville, its officers and employees, from any and all liability, actions, causes of action, claims, demands, damages, costs, loss of services, loss of properties, expenses, compensation and any and all consequential damages or injuries, which the undersigned may now or hereafter have, claim or assert on account of, relating to, or in any way arising out of the above described project.

In further consideration of the payment made or to be made to the undersigned and to induce said payment, we agree to defend and indemnify the City of Louisville, its officers and employees from any claim or claims on the part of our material suppliers, laborers, employees, servants, and agents, or subcontractors arising from our work on this project, and we further agree to fully satisfy any such claim brought against the City of Louisville and reimburse the City of Louisville for any and all costs, including reasonable attorney fees, which it may incur as a result of such claims.

FINAL CLAIM RELEASE & ACCEPTANCE (CONTINUED)

As contactor on the above described project, we further accept the pay quantities and final payment indicated on the final payment application as correct. The above noted final payment of \$_____ results in total cumulative payment of \$_____ for this project. By accepting this final payment, we accept that the final payment application is full and complete, that no other or further amounts are due to the undersigned, and we hereby waive and release all rights, claims and liens arising from the completion of work under the Contract Documents.

The undersigned representative certifies to have full authority to execute this instrument and to bind the contractor to all statement and provisions herein contained.

PRIME CONTRACTOR

By:

President

Date: _____

CLAIM RELEASE – SUBCONTRACTOR/SUPPLIER

For valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the undersigned hereby releases the City of Louisville, Colorado, and waives all rights of the undersigned to file a claim for material, equipment, tools, machinery or services heretofore furnished for use in and for labor heretofore performed upon the construction, alteration, addition to or repair of the structure or improvements described in the Contract Documents as:

Project: PROJECT NAME

Description of Property: PROJECT LOCATION, CITY OF LOUISVILLE

Owner: CITY OF LOUISVILLE, COLORADO

We acknowledge that the foregoing is an adequate description of the real property and improvements to which this Claim Release pertains inasmuch as the foregoing description is the description given in the Contract Documents, which govern the performance of the Work for which consideration has been received.

In executing this release, we certify that all claims for labor or materials, or both, furnished or performed by the undersigned or on our behalf by our material suppliers or subcontractors have been paid or that satisfactory arrangements for payment have been made, and we hereby waive and release any and all rights, claims and liens which the undersigned may now or hereafter have, claim or assert against the project, the Owner, or any funds in Owner's possession or control concerning the project, or against all land and any improvements and appurtenances to the land improved by the project.

In consideration of the final payment made or to be made to the undersigned and to induce said payment, we hereby further release and forever discharge the City of Louisville, its officers and employees, from any and all liability, actions, causes of action, claims, demands, damages, costs, loss of services, loss of properties, expenses, compensation and any and all consequential damages or injuries, which the undersigned may now or hereafter have, claim or assert on account of, relating to, or in any way arising out of the above described project.

In further consideration of the payment made or to be made to the undersigned and to induce said payment, we agree to defend and indemnify the City of Louisville, its officers and employees from any claim or claims on the part of our material suppliers, laborers, employees, servants, and agents, or subcontractors arising from our work on this project, and we further agree to fully satisfy any such claim brought against the City of Louisville and reimburse the City of Louisville for any and all costs, including reasonable attorney fees, which it may incur as a result of such claims.

SUPPLIER OR SUBCONTRACTOR

By: _____
President

Date: _____

PRIME CONTRACTOR

By: _____
President

Date: _____

FINAL INSPECTION REPORT

DATE:

TO: Green Landscape Solutions

The OWNER has performed final inspection of the Work, and accepts the Work subject to the Contractor's performance and completion of the following repairs, corrections and/or replacements:

The OWNER **does**/does not (circle) hereby finally accept the portion of work performed on Via Appia Way and McCaslin Boulevard, and hereby certifies that the Contractor is eligible to receive final payment for this portion of the Work.

CITY OF LOUISVILLE, COLORADO

CONTRACTOR

BY: _____

BY: _____

TITLE: Project Manager - PROS _____

TITLE: _____

DATE: _____

DATE: _____

CERTIFICATE OF FINAL COMPLETION

DATE:

TO:

This Certificate of Final Completion applies to all Work under the Contract Documents, or to the following specified parts thereof:

(specify) _____

The Work to which this Certificate applies has been inspected by authorized representatives of the ENGINEER and the Work is hereby declared to be complete in accordance with the Contract Documents on

DATE OF FINAL COMPLETION

In consideration therefor, the OWNER agrees to make Final Payment to Contractor of all amounts retained by OWNER, except such amounts that are subject to verified claims pursuant to Section 38-26-107, C.R.S, if any.

CITY OF LOUISVILLE, COLORADO

CONTRACTOR

BY: _____

BY: _____

TITLE: _____

TITLE: _____

DATE: _____

DATE: _____

GUARANTEE PERIOD INSPECTION REPORT

DATE:

TO:

The City of Louisville's authorized representative performed the guarantee period inspection on _____, 20 ____, which guarantee was originally due to expire on _____, 20 ____.

The OWNER hereby determines that the project has ____ / has not ____ satisfactorily met the conditions required to pass the guarantee period inspection.

The identified following items of Work are defective and must be repaired, corrected and/or replaced:

The guarantee period shall be extended for the items listed above until the following date:

CITY OF LOUISVILLE, COLORADO

CONTRACTOR

BY: _____

BY: _____

TITLE: _____

TITLE: _____

DATE: _____

DATE: _____



Median Landscape Renovations Phase 2



City Council Presentation
June 17, 2025

Parks, Recreation & Open Space Department (PROS)

Adam Blackmore, PROS Director
Bryon Weber, PROS Project Manager

6/17/2025

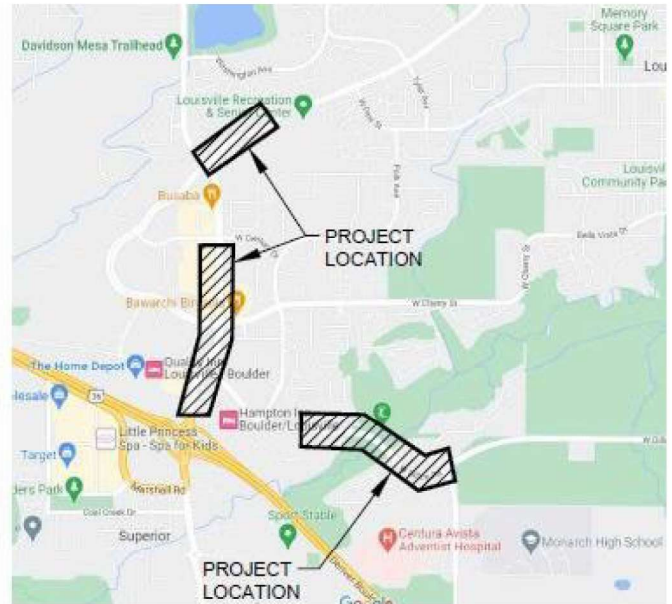
Background

- Initial design approval in 2019, reiterative approval for Phase 1 in 2023.
 - Phase 1 design completed by Design Concepts and installed by Green Landscape Solutions in 2023.
 - Phase 2 funding approved for 2024 budget and carried forward as a part of an approved budget amendment in 2025.
 - Phase 2 location(s) and level of priority approved by PPLAB in December 2024.
 - Requesting sole source award to Green Landscape Solutions for Phase 2. Intended for continuity of design, technical irrigation infrastructure / planning replacement and continuation of 2023 labor rates offered by Green.



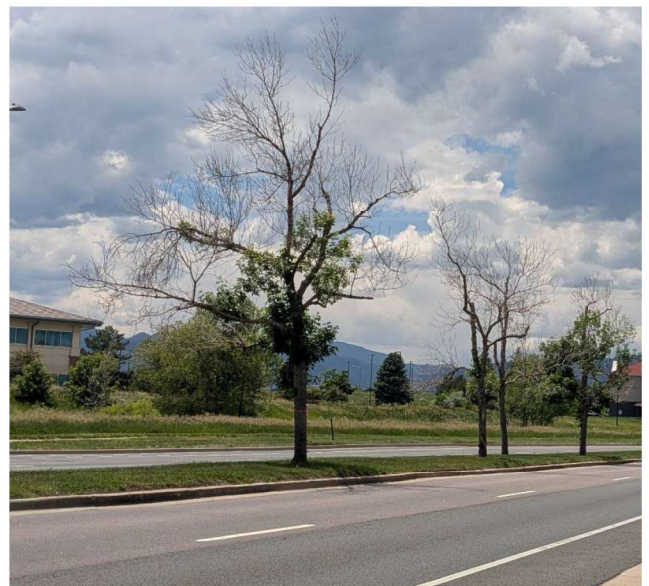
Installation locations

- **Via Appia**
 - Between McCaslin & Eldorado Ln
- **Dillon Road**
 - Between W. Dahlia St & 88th St
- **McCaslin Blvd.**
 - Between Dillon Rd & W. Century Dr



Benefits and Project Adjustments

- Phase 2 aligns with Ash Tree removal (EAB infection) and Irrigation infrastructure improvement needs in desired location(s).
- Aligns with sustainability goals to reduce water use in parks and parks-maintained areas.
- Remove of non-functional bluegrass turf consistent with Colorado House Bill 25-1113

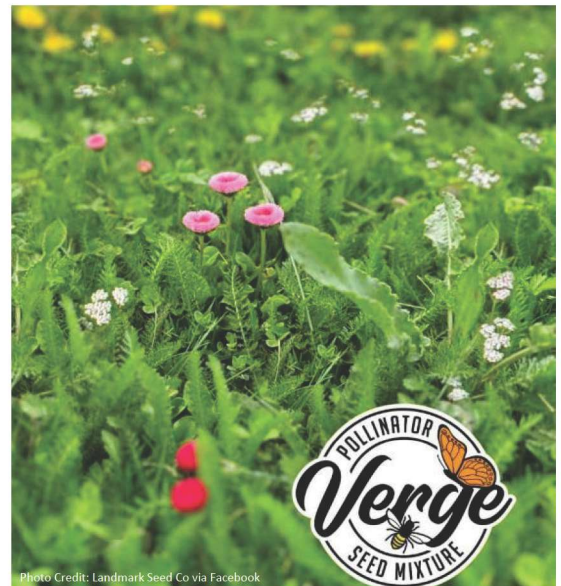


Benefits and Project Adjustments

- **Lessons Learned from Phase 1** (see Council Brief for more)
 - A new seed mix featuring grasses of lower height and including wildflowers
 - Lower rock wall heights
 - No walls within vehicle sight distance triangles
 - Revisions to plant schedule based on rate of success
- **Project contract is \$45k under available funding due to continuity of contractor from Phase 1 and continuation of 2023 labor costs.**

Benefits and Project Adjustments

- **Biggest overall aesthetic change is inclusion of a new seed mixture called Verge**
(see description in Council Brief)



Additional Information

- Staff anticipates the full makeover of the center medians of the primary corridors throughout Louisville to require up to 5 similarly sized/priced phases.
- Phase 2 was carried forward from 2024 to 2025.
- Phases 3 thru 5 have equal funding currently approved in the 6-year Capital Improvement Plan
 - Phase 3 in 2026
 - Phase 4 in 2027
 - Phase 5 in 2028

Next Steps (options)

- Proceed with sole source contract to Green Landscape Solutions and move into construction of Phase 2 of the Median Landscape Renovation project
- Request modifications to bid process and direct staff to open Phase 2 to a public bidding process that could impact the 2025 project scope, timing and/or feasibility
- Request modifications to the proposed design and staff will seek alternate pricing estimates (will need more design fee)
- Direct staff to either put this phase (or this project) on hold indefinitely and/or to remove the project from the PROS CIP list