

SUBJECT: RESOLUTION NO. 1, SERIES 2026 – A RESOLUTION APPROVING AN AGREEMENT FOR THE CONVERSION OF THE INLINE SKATING RINK TO DEDICATED PICKLEBALL COURTS

DATE: JANUARY 6, 2026

PREPARED BY: BRYON WEBER, PROS PROJECT MANAGER

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

SUMMARY:

Staff requests Council approve a contract with Pickletile LLC to convert the existing inline skating rink to dedicated pickleball courts and install their proprietary sound reduction system known as Pickleglass.

Following Council discussion on April 15, 2025, Staff obtained a noise impact study from the acoustic engineering firm Pickleball Sound Mitigation (PSM). The PSM report recommended sound reduction for much of the court complex's perimeter to alleviate potential nuisance impacts to adjacent residences. After researching products and strategies to meet PSM's suggestions, Staff recommend Pickleglass which is uniquely capable of satisfying noise objectives while also maintaining open sight lines for safety and spectating.

As there was no sound mitigation expense within the original CIP project request or budget of \$200,000, the current \$285,000 spending request requires a future budget amendment for an additional ~\$90,000 to cover Pickleglass installation and project contingency.

BACKGROUND / PRIOR DISCUSSIONS:

- The inline skating rink was originally built in 2003 in response to the inline skating and hockey craze of the 1990s. The rink has not been programmed by the city for inline hockey for more than a decade due to a decline in leagues and lack of community participation in inline hockey program offerings.
- The current Parks, Recreation, Open Space, and Trails (PROST) [Master Plan](#), which was developed in partnership with the community and adopted by City Council in 2012, identified the underutilized inline skating rink as a prime opportunity for repurposing.
- In 2014/2015, three temporary pickleball courts were striped on the basketball gym floor at the Recreation & Senior Center, with use allowed during scheduled hours. Demand for these courts remains strong, with waiting lines often formed by players desiring court space.

- In 2019, in response to growing community interest, the City added pickleball court striping to the existing inline rink and provided moveable nets to support drop-in pickleball play. Over the past six years, a demographically diverse group of players have used the rink informally for outdoor pickleball, demonstrating a sustained interest in this activity.
- The City Council's February 2024 Work Plan identified outdoor recreation amenities, including pickleball, as a medium priority.
- On August 20, 2024, following community input at RAB meetings and public comments received at the Recreation & Senior Center, indicating strong support for dedicated outdoor pickleball courts, a [memo was submitted by the RAB](#) to the City Council recommending the proposed project to convert the existing inline skating rink to dedicated pickleball courts.
- In [November 2024](#), the City Council approved \$200,000 funding for the rink conversion project as part of the 2025 Capital Improvement Program.
- In February 2025, the City posted a [progress update](#) regarding the conversion of the inline skating rink to pickleball courts. The City Council and staff immediately received, and continue to receive, feedback from the public related to the project.
- Further discussions were held at the [April 15, 2025](#) City Council meeting, with staff presenting project background and rationale for converting the existing rink as opposed to constructing a new facility elsewhere. The decision/direction was made by City Council at that time to move forward with the conversion and continue exploring potential noise mitigation opportunities to address community concerns.
- In May of 2025, staff obtained a site-specific noise impact analysis from an acoustic engineering firm Pickleball Sound Mitigation (PSM) who specialize in estimating sound impacts and prescribing mitigation measures specific to pickleball courts. The report recommended mitigation measures for much of the court complex's perimeter to prevent decibel levels at surrounding residences from exceeding the levels known by the firm to generate noise complaints. See attached report.
- Since receiving the PSM report, staff have researched options of sound mitigation products and construction methods feasible for implementation on the existing rink's post-tension concrete slab including fencing with sound "curtains". Based on conversations with industry vendors, Staff recommend Pickleglass by Pickletile LLC as the preferred product.
- Pickleglass is preferred over acoustic curtains for multiple reasons, including:
 - The product's transparency (versus an opaque curtain) allows for sightlines to/from the courts to maintain safety, better enable spectating and prevent shadows which could exacerbate snow and ice on the playing surfaces during winter months.
 - The product can remain installed year-round and does not require annual maintenance by contractors to hang and remove acoustic curtain panels.
 - The installation can be designed and stamped by a licensed structural engineer prior to construction.

- In Staff updates to the Recreation Advisory Board (RAB), board members have continued to emphasize the need for the project and a desire for the courts to be constructed as soon as possible.

DEVELOPMENT PROPOSAL:

Not Applicable

ANALYSIS:

A majority vote from Council is needed to award and execute a contract with Pickletile LLC in the amount of \$259,797.70 for the purpose of constructing dedicated pickleball courts with the Pickleglass sound mitigation system. Approval would also allow staff to spend an additional \$25,202.30 on potential contingency needs (approximately 9.5% of contract value). This approval would therefore result in authorization of total spending not-to-exceed \$285,000.

As depicted on drawing sheet 2 of the attached Contract Documents, the proposed sound mitigation would extend to heights up to 16' tall. The Pickleglass system, which is projected to reduce noise levels by 50%, is comprised of framed glass panels between 8'-13' tall and anchored on top of a concrete foundation wall between 1-3' tall. Per the sound engineer's site-specific guidance, the system would be constructed with heights as follows:

- East Side: mostly open as mitigation is not needed for the Recreation & Senior Center tennis courts and parking lot.
- South Side: 9' high system (1' concrete wall + 8' tall Pickleglass)
- West Side: 12' high system (2' concrete wall + 10' tall Pickleglass)
- North Side: 16' high system (3' concrete wall + 13' tall Pickleglass)

City Council should consider that a future budget amendment of \$89,900 would be needed to fully fund the project at the requested amount. This budget amendment would come in 2026 from the Finance Director and could be covered by the fund balances of the Capital Fund (forecasted at ~\$13.3m) and/or the Recreation Fund (forecasted at ~\$2.8m) as directed by Council at the time of formal amendment. City Council should also consider staff's recommendation of contracting Pickletile as a sole source provider given the proprietary nature of the Pickleglass product and its unique sport-specific application.

2025 COUNCIL WORK PLAN:

Conversion of the inline rink to pickleball courts was not specifically identified in the 2025 work plan. However, it most closely aligns with the 2025 focus on maintaining existing infrastructure and assets shown under the Core Services priority.

FISCAL IMPACT:

Budgeted?: Yes

The approved 2025 budget allocated \$200,000 for the conversion project, with \$120,000 (60%) coming from Recreation Fund 208 and \$80,000 (40%) from Parks Capital Fund 301. After completion of the \$4,900 noise study with PSM, \$195,100 remains available. A table of funds and anticipated expenditure is outlined below.

Available Budget	
Acct. No. 208538-660307 (Convert Inline Rink – Pickleball) 60%	\$120,000.00
Acct. No. 301511-660307 (Convert Inline Rink – Pickleball) 40%	\$75,100.00
Total Available:	\$195,100.00
Anticipated Expenditures	
Pickletile LCC	\$259,797.70
Contingency (~9.5%)	\$25,202.30
Total Not-to-Exceed:	\$285,000.00
Budget Remaining	(-\$89,900.00)

ALTERNATIVE(S):

One alternative is to eliminate the sound mitigation system and proceed with standard chain-link fencing at the perimeter. While the chain-link fence is cheaper than Pickleglass, Staff anticipate this would result in noise complaints as projected by the acoustic engineering sound analysis.

A secondary alternative would be to build fewer than five pickleball courts. While not all project costs can be isolated “per court” (such as contractor mobilization), reductions in scope may result in savings of approximately \$28,000 per court eliminated. Five is the highest number that will fit on the existing concrete slab with industry standard spacing and the amount desired, and currently recommended, by the Recreation Advisory Board (RAB). However, it is possible to build fewer courts if needed to obtain cost savings. Staff believe current demand warrants five courts and that a reduced number will not satisfy the pickleball community.

RECOMMENDATION:

Staff recommend the City Council award a sole-source contract to Pickletile LLC, approve spending for an amount not-to-exceed \$285,000 and authorize execution of contract documents on behalf of the City as set forth in Resolution No. 1, Series 2026. Approval of the contract will require a future budget amendment in the amount of \$89,900.

ATTACHMENT(S):

1. Resolution No. 1, Series 2026
2. Agreement with Pickletile LLC

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3. Pickletile Pickleglass Proposal
4. Sound Analysis – PMS Consulting LLC

**RESOLUTION NO. 1
SERIES 2026**

**A RESOLUTION APPROVING AN AGREEMENT FOR THE CONVERSION OF THE
INLINE SKATING RINK TO DEDICATED PICKLEBALL COURTS**

WHEREAS, an Agreement has been proposed between the City and Pickletile LLC for the conversion of the inline skating rink to pickleball courts (the "Project"); and

WHEREAS, by this resolution the City Council desires to approve the Agreement and to authorize additional expenses and 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 Pickletile LLC 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 additional expenses of \$25,202.30 for court dividers and/or contingency for the Project for a total not-to-exceed amount of \$285,000. The Parks, Recreation & Open Space Director is authorized to execute change orders to the Agreement in a total amount not to exceed \$25,202.30 if deemed necessary for the Project.

Section 3. The Mayor is 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 6th day of January 2026.

Christopher M. Leh, Mayor

ATTEST:

Genny Kline, City Clerk

AGREEMENT

THIS AGREEMENT is made and entered into this **6th day of January** in the year **2026** by and between:

CITY OF LOUISVILLE, COLORADO
(hereinafter called OWNER)

and

PICKLETILE LLC
(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: Convert Inline Rink to Pickleball Courts
PROJECT NUMBER: 208538-660307

ARTICLE 2. CONTRACT TIMES

- 2.1 The CONTRACTOR shall substantially complete all work within **124 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 **TWO HUNDRED FIFTY NINE THOUSAND SEVEN HUNDRED NINETY SEVEN and 70/100 dollars (\$259,797.70)** set forth in the Cost Proposal of the CONTRACTOR dated December 10, 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 Pickleball Proposal
 - 6.2.2 Schedule of Sub-Contractors
 - 6.2.3 Disclosure Statement (Anti-Collusion Affidavit)
- 6.3 Project Specifications
 - 6.3.1 General Conditions
 - 6.3.3 Supplementary Conditions
 - 6.3.3 General Requirements
 - 6.3.4 Technical Specifications
- 6.4 Drawings with each sheet bearing the title: **Inline Rink Conversion – Louisville, CO**
- 6.5 Other documents which may be required or specified including:
 - 6.5.1 Addenda No. 0 to 0 exclusive
 - 6.5.2 Notice of Award
 - 6.5.3 Performance Bond
 - 6.5.4 Labor and Material Payment Bond
 - 6.5.5 Certificates of Insurance
 - 6.5.6 Notice to Proceed
 - 6.5.7 Change Order
 - 6.5.8 Field Order
 - 6.5.9 Work Change Directive
 - 6.5.10 Application for Payment
 - 6.5.11 Contractor Proposal Request
 - 6.5.12 Contractor Overtime Request
 - 6.5.13 Certificate of Substantial Completion
 - 6.5.14 Claim Release
 - 6.5.15 Claim Release for Subcontractors
 - 6.5.16 Final Inspection Report
 - 6.5.17 Certificate of Final Completion
 - 6.5.18 Guarantee Period Inspection Report
- 6.6 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.

6.7 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 **January 6, 2026**.

**OWNER: CITY OF LOUISVILLE,
COLORADO**

By: _____
Christopher Leh, Mayor

(CORPORATE SEAL)

Attest: _____
Genny Kline, City Clerk

Address for giving notices:

749 Main Street
Louisville, Colorado
80027

Attention: Project Manager - PROS

CONTRACTOR: PICKLETILE LLC

By: _____
Scott Miller, CEO

(CORPORATE SEAL)

Attest: _____
Name: **Steven Blustein** Title: **President**

Address for giving notices:

8501 N Mopac Expy. Ste 170
Austin, TX
78759

Attention: Scott Miller

PICKLEGLASS™ PROPOSAL

CITY OF LOUISVILLE | JOB 1662

12/10/25



REQUESTED BY

BRYON WEBER
CITY OF LOUISVILLE
BWEBER@LOUISVILLECO.GOV
+1 (303) 335-4736

JOB LOCATION

900 VIA APPIA WAY, LOUISVILLE, CO 80027

PREPARED BY: LEJEND BAIN

JOB NUMBER: 1662

THIS PROPOSAL IS VALID FOR 30 DAYS



WE ARE THE OFFICIAL COURT BUILDER OF



PICKLETILE™ IS THE OFFICIAL COURT BUILDER OF USA PICKLEBALL. A NATIONWIDE RECOGNITION OF OUR RELENTLESS PURSUIT OF DESIGN EXCELLENCE AND INNOVATION. EVERY DETAIL IS ENGINEERED FOR PERFORMANCE, AESTHETICS, AND LONGEVITY. BUILT TO ELEVATE THE GAME.

TRUSTED TO LEAD THE FUTURE OF THE SPORT.



COURT CONSTRUCTION PROJECT SCOPE

SURFACING OF 5 OUTDOOR PICKLEBALL COURTS ON A 10,860 SQUARE FOOT POST-TENSIONED CONCRETE SLAB. APPLICATION OF LAYKOLD ADVANTAGE PRO (OR EQUAL) ACRYLIC THREE-TONE SPORT SURFACING SYSTEM. INSTALL PREMIUM PICKLEBALL NETS. INSTALL PICKLEGLASS™ SOUNDPROOF GLASS FENCING SYSTEM.

COURT CONSTRUCTION BREAKDOWN

DISCLAIMER: ALL COSTS PROVIDED AT THE ESTIMATE STAGE ARE PRELIMINARY AND SUBJECT TO CHANGE. THESE ESTIMATES ARE BASED ON CURRENT INFORMATION AND ASSUMPTIONS, AND FINAL COSTS MAY VARY DUE TO CHANGES IN PROJECT SCOPE, MATERIAL PRICES, LABOR RATES, AND OTHER UNFORESEEN FACTORS. A MORE ACCURATE COST ASSESSMENT WILL BE PROVIDED UPON FURTHER DEVELOPMENT AND FINALIZATION OF THE PROJECT PLANS.

- **SITE PREP/CRACK REPAIR:** ROUTINE CRACK REPAIR & SURFACE PREP | 10,860 SF
- **ACRYLIC COURT SURFACING:** LAYKOLD ADVANTAGE PRO SYSTEM | 10,860 SF
- **NETS, POSTS, SLEEVES:** PREMIUM BRAND DOUGLAS, DOMINATOR OR EDWARD | 5 SETS

COURT CONSTRUCTION ESTIMATE: \$56,512

COST BREAKDOWN

DISCLAIMER: A 25% NON-REFUNDABLE DESIGN DEPOSIT, BASED ON THE ESTIMATED PROJECT COST, IS REQUIRED TO INITIATE ENGINEERING AND SHOP DRAWING PREPARATION. IF PE-STAMPED DRAWINGS AND STRUCTURAL CALCULATIONS ARE REQUIRED, AN ADDITIONAL \$3,500 FEE WILL APPLY, BILLED SEPARATELY FROM THE DESIGN DEPOSIT.

PICKLEGLASS™ SOUNDPROOF GLASS COURT SYSTEM

ESTIMATE

PICKLEGLASS™ 8, 10, & 13FT SOUNDPROOF GLASS PERIMETER

- **DESIGN** ARCHITECTURAL SHOP DRAWINGS
- **GLASS** HIGH-IMPACT 1/2 INCH TEMPERED
- **FRAME** HSS 500B AMERICAN-MADE STEEL | ZINC POWDER COAT FINISH
- **SOUND** 50% SOUND-SUPPRESSION | STC 35
- **DOOR** SINGLE GLASS DOOR | ACCESSORIES INCLUDED | 3 DOORS
- **MAINTENANCE** POLYSILOXANE-INFUSED GLASS | 90% SELF-CLEAN
- **WIND** HIGH-PERFORMANCE BARRIER
- **WARRANTY** 10 YEAR NON-CORROSIVE
- **INSTALL** ESTIMATED COST INCLUDED

13FT OPTION: 211 LF | \$72,850

10FT OPTION: 44 LF | \$12,760

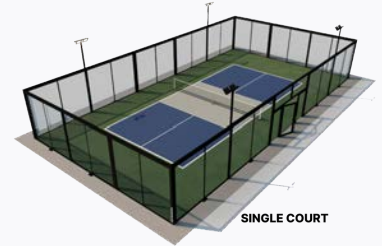
8FT OPTION: 171 LF | \$45,315

EQUIPMENT RENTAL FEE: \$5,000

CONCRETE BEAM WORK: \$31,950

ANCHOR BOLT PACKAGE: \$6,390

STANDARD DOOR PACKAGE (3): \$9,000



SALES TAX: EXEMPT

ESTIMATED SHIPPING COST: \$7,600

STAMPED ENGINEERING DRAWINGS: \$3,500

BOND PREMIUM (3.5%): \$8,920.70

PROJECT PROPOSAL: \$259,797.7

PICKLEGLASS™ NEXT STEPS

MODEL, FABRICATE, SHIP, AND INSTALL PICKLEGLASS™ COURT

STEP 1: MODEL PICKLEGLASS™ SHOP DRAWINGS

ENGAGE WITH ENGINEER TEAM TO PRODUCE SHOP DRAWINGS INTEGRATED WITH ARCHITECTURAL BLUEPRINTS

PAYMENT DUE | 25% DESIGN DEPOSIT

ESTIMATED 15 DAY DELIVERABLE UPON PAID DESIGN DEPOSIT

STEP 2: FABRICATE PICKLEGLASS™ COURT DESIGN

SUBMIT SHOP DRAWINGS TO FACTORY AND MANUFACTURE SITE SPECIFIC PLANS

PAYMENT DUE | 25% PRODUCTION DEPOSIT

ESTIMATED 90 DAY DELIVERABLE UPON PAID PRODUCTION DEPOSIT

STEP 3: SHIP DIRECT TO FINAL DESTINATION

COORDINATE, PACKAGE, SHIP, AND DELIVER ALL PRODUCT TO JOBSITE

PAYMENT DUE | 25% SHIP DEPOSIT

ESTIMATED 5 DAY DELIVERABLE UPON PAID BILL OF LADING DEPOSIT

STEP 4: INSTALL PICKLEGLASS™ COURT

MANAGE AND OVERSEE ALL INSTALLATION OF CONTRACTED WORK.

ESTIMATED 3-7 DAY DELIVERABLE UPON DELIVERY OF MATERIAL

STEP 5: PUNCHOUT CONFIRM AND TURNOVER

FINAL INSPECTION AND CONFIRMATION THAT PROJECT MEETS SPECIFICATIONS FOR COMPLETION

PAYMENT DUE | CLOSING BALANCE

ESTIMATED 1 DAY DELIVERABLE UPON COMPLETION OF INSTALLATION

STANDARD VS. RUSH DELIVERY

STANDARD: 90-DAY LEAD TIME ESTIMATED FROM FINALIZED DESIGNS AND RECEIPT OF PRODUCTION DEPOSIT

RUSH (+\$5,000): 60-DAY LEAD TIME ESTIMATED FROM FINALIZED DESIGNS AND RECEIPT OF PRODUCTION DEPOSIT

PICKLEGLASS™ EXECUTION

- MODEL AND PRODUCE ARCHITECTURAL SHOP DRAWINGS
- ANCHOR PICKLEGLASS™ HSS 500B STEEL COLUMNS INTO CONCRETE FOUNDATION
- INSTALL PANORAMIC SOUNDPROOFING 1/2 INCH GLASS PANELS
- ESTIMATED TIME FOR PICKLEGLASS™ INSTALLATION IS 3-7 DAYS DEPENDING ON SIZE
- PRICE INCLUDES MATERIAL, LABOR, AND MOBILIZATION

IF LIGHTS ARE PART OF THE PROJECT SCOPE:

- MOUNT LIGHT POSTS AND CONNECT HIGH-PERFORMANCE LSI ZONE LED LIGHTING SYSTEM (OFFICIAL LIGHTS OF USA PICKLEBALL)
- CUSTOMER RESPONSIBLE FOR FINAL ELECTRICAL CONNECTION TO PANEL AND INSTALLATION FOR TIMERS, DIMMERS, AND SWITCHES IF DESIRED.

WARRANTY

10 YEAR PICKLEGLASS™ WARRANTY ON STEEL RUST AND CORROSION

5 YEAR PICKLEGLASS™ WARRANTY ON HIGH-PERFORMANCE LED LIGHT FIXTURES

3 YEAR PICKLEGLASS™ WARRANTY ON MATERIAL DEFECTS

OUR VISION | IMMERSIVE RENDERINGS



TERMS OF PROPOSAL

1. THIS IS OFFERED FOR ACCEPTANCE WITHIN (30) DAYS FROM DATE SHOWN ABOVE, AFTER WHICH DATE IT WILL BE SUBJECT TO RECONFIRMATION OR REQUOTATION. WHEN DULY EXECUTED BY YOU AND DELIVERED TO US IT SHALL CONSTITUTE A LEGAL CONTRACT BINDING BOTH PARTIES, SUBJECT ONLY TO YOUR CREDIT APPROVAL BY PICKLETILE™ LLC.
2. THE WORK COVERED BY THIS PROPOSAL SHALL BE ONLY THAT SPECIFICALLY OUTLINED HEREIN AND TO PROVIDE A PRICE FOR THE WORK IN ACCORDANCE WITH PLANS AND SPECIFICATIONS AS FURNISHED. ANY CHANGE IN THE WORK OR WORK NOT COVERED IN THIS PROPOSAL WILL BE CONSIDERED AS EXTRA WORK AND WILL BE SUBJECT TO FURTHER NEGOTIATION. WHERE THERE IS A VARIANCE BETWEEN THE PLANS AND SPECIFICATIONS AND THIS PROPOSAL, THE PRICES QUOTED WILL BE ONLY FOR THE WORK AS OUTLINED IN THE SCOPE OF THIS PROPOSAL. LOCAL, CITY, OR COUNTY LICENSES (IF REQUIRED) ARE NOT INCLUDED IN THIS QUOTE. THE OWNER SHALL OBTAIN REQUIRED PERMITS AND WILL CONFORM ALL PLANS AND SPECS WITH ALL GOVERNMENTAL REQUIREMENTS.
- 2.1 IF THE WORK COVERED BY THIS PROPOSAL DOES NOT INCLUDE THE INSTALLATION OF CONCRETE, PICKLETILE™ IS RELYING ON THE ADEQUACY AND INTEGRITY OF THE EXISTING SURFACE TO BE SUFFICIENT AND TO SUPPORT THE INSTALLATION OF THE PICKLEGLASS™ SYSTEM. IF IT IS LATER DETERMINED THAT THE EXISTING SURFACE IS INADEQUATE AND REQUIRES CONCRETE WORK, THEN PICKLETILE™ WILL PREPARE A MODIFICATION OF THE SOW TO INCLUDE THE ADDITIONAL MATERIALS AND/OR ADDITIONAL LABOR HOURS TO SUCCESSFULLY COMPLETE THE PROJECT.
- 2.2 IF EXCAVATION OR GRADING IS INCLUDED, BOULDER AND HEAVY ROCK REMOVAL IS EXCLUDED. ANY SUCH MATERIALS REQUIRING ADDITIONAL EQUIPMENT OR LABOR WILL REQUIRE A SEPARATE CHANGE ORDER.
3. ESCALATION: IN THE EVENT OF SIGNIFICANT DELAY OR PRICE INCREASE OF MATERIAL OCCURRING DURING THE PERFORMANCE OF THE CONTRACT THROUGH NO FAULT OF PICKLETILE™ LLC, THE CONTRACT SUM, TIME OF PERFORMANCE, AND CONTRACT REQUIREMENTS SHALL BE EQUITABLY ADJUSTED BY CHANGE ORDER. A CHANGE IN PRICE OF AN ITEM OF MATERIAL SHALL BE CONSIDERED SIGNIFICANT WHEN THE PRICE OF AN ITEM INCREASES BY AT LEAST 10 PERCENT (10%) BETWEEN THE DATE OF THE PROPOSAL OR CONTRACT AND THE DATE OF INSTALLATION. FOR EXAMPLE, IN THE EVENT OF A 10% INCREASE IN THE COST OF THE STEEL COLUMNS, CUSTOMER AGREES TO EXECUTE A CHANGE ORDER REFLECTING A 10% INCREASE IN THE PRICE OF THE PROJECT PERTAINING TO THE STEEL COLUMNS.
4. UNOBSTRUCTED VEHICULAR ACCESS IS GUARANTEED BY OWNER UNTIL COMPLETION OF WORK. OWNER TO PROVIDE STORAGE AREA FOR MATERIALS, ELECTRICITY, DUMPSTER AND POTABLE WATER SUPPLY WITHIN 100' OF COURT(S).
5. UNLESS SPECIFICALLY INCLUDED IN THE CONTRACT PRICE, THE COST OF ANY SURETY BONDS OR PERMITS WILL BE ADDED TO THE CONTRACT PRICE.
6. ANY CONTRACT OR PURCHASE ORDER DIRECTED TO PICKLETILE™ LLC AS A RESULT OF OR BASED UPON THIS PROPOSAL MUST INCLUDE REFERENCE TO THIS PROPOSAL TO BECOME ACCEPTABLE TO PICKLETILE™ LLC.
7. PICKLETILE™ LLC IS NOT OBLIGATED TO CONTINUE WORK UNTIL TERMS OF PAYMENT ARE FULLY MET. OWNER IS SOLELY RESPONSIBLE FOR ALL DELAYS AS PER TERMS OF CONTRACT.
8. ANY PAYMENTS NOT RECEIVED AS PER CONTRACT SHALL BEAR INTEREST AT THE RATE OF 1 1/2% PER MONTH, AND YOU ALSO AGREE TO PAY PICKLETILE™ LLC COST AND EXPENSE OF COLLECTION INCLUDING REASONABLE ATTORNEY'S FEES WHETHER OR NOT A SUIT IS FILED.
9. ADDITIONAL TERMS AND CONDITIONS CAN BE FOUND AT [HTTPS://PICKLETILE.COM/TERMS-CONDITIONS/](https://pickletile.com/terms-conditions/)
10. YOU ARE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS. ANY INACCURACIES OR POST-APPROVAL CHANGES MAY INCUR ADDITIONAL COSTS AND DELAYS. YOUR SIGNATURE CONFIRMS APPROVAL, MEASUREMENT ACCURACY, AND AUTHORIZATION TO PROCEED WITHOUT LIABILITY FOR DISCREPANCIES.

TERMS OF PAYMENT

- **DESIGN DEPOSIT 25% BALANCE DUE UPON ACCEPTANCE OF THIS PROPOSAL**
- **PRODUCTION DEPOSIT 25% BALANCE DUE UPON APPROVED DESIGN**
- **SHIP DEPOSIT 25% BALANCE DUE UPON BILL OF LADING**
- **PROJECT CLOSEOUT BALANCE DUE UPON PROJECT TURNOVER**

DESIGN DEPOSIT BALANCE DUE: \$64,949.43

ACCEPTANCE

THE ABOVE COST, SPECIFICATIONS AND CONDITIONS ARE SATISFACTORY AND ARE HEREBY ACCEPTED. PICKLETILE™ LLC IS AUTHORIZED TO PERFORM THE WORK AS SPECIFIED ABOVE. TO INDICATE ACCEPTANCE PLEASE RETURN ONE SIGNED COPY OF THE CONTRACT TO THE EMAIL SCOTT@PICKLETILE.COM

ACCEPTED BY: _____
PRINT NAME

SIGNATURE

DATE

OFFERED BY: SCOTT MILLER, CEO
PICKLETILE™ LLC

SIGNATURE

12/10/2025

DATE

EXCLUSIONS (UNLESS OTHERWISE SPECIFIED)

1. ANY ITEM OF WORK NOT SPECIFIED ABOVE
2. SITE WORK IF NOT SPECIFIED ABOVE
3. SUBGRADE STABILIZATION ENHANCEMENTS
4. ALLOWANCES OR CONTINGENCIES
5. PREVAILING OR UNION WAGES
6. ANY PERMITS, SURVEYS, OR FEES
7. PERIMETER SAFETY FENCING OR SECURITY
8. CONSTRUCTION DRAWINGS OR ENGINEER'S STAMP
9. HEAVY ROCK AND BOULDER REMOVAL
10. EROSION CONTROL MEASURES
11. LANDSCAPING AND SPRINKLER REPAIR
12. ELECTRICAL WORK REQUIRING A LICENSED ELECTRICIAN

THIS PROPOSAL IS VALID FOR 30 DAYS





Certificate of Membership

This is to certify that

PICKLETILE

is a Member of the Builder Division of the

American Sports Builders Association

a nonprofit association, is a national organization for builders, designers, and suppliers of materials for courts, running tracks, sports fields, and indoor and outdoor sports surfaces. It is recognized as a centralized source for technical information, including construction guidelines.



The membership hereby conferred entitles the above named to use the name and membership mark of the Association on all proper forms, notices, and advertising subject to the conditions set forth in the By-Laws of the Association. In Witness Whereof, The American Sports Builders Association has caused this certificate to be executed and its seal affixed by the Chairman and Secretary-Treasurer on July 17, 2024.

Allen C Verdeni R. J. J.

Secretary-Treasurer

Chairman

SCHEDULE OF SUBCONTRACTORS

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

Name: Altitude Athletic Surfaces, LLC Telephone No. 303-885-1315
Address: 4604 Fenwood Drive
City: Highlands Ranch State: CO Zip Code: 80130
Services/equipment to be provided: Sports Surfacing, grade beam work, PickleGlass Installation, net installation

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: _____

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: _____

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.

Scott Miller

CEO/Co-Founder

Printed or Typed Name

Title

Scott Miller

12/16/2025

Signature

Date

Project Specifications for
Construction of:

CONVERSION OF THE INLINE HOCKEY RINK TO PICKLEBALL COURTS

THE CITY OF LOUISVILLE
749 MAIN STREET
LOUISVILLE CO, 80027

Prepared by:



Revised: December 16, 2025

PROJECT DIRECTORY

LOUISVILLE CONVERSION OF INLINE RINK TO PICKLEBALL COURTS

OWNER:	City of Louisville Contacts: Bryon Weber 749 Main St Louisville CO, 80027 Tel: 303-335-4736 Email: bweber@louisvilleco.gov
STRUCTURAL ENGINEER	Pickletile, LLC dba Pickleglass Contacts: Mark Caruso Tel: 512-710-1564 Email: mark@pickletile.com
PROJECT CONTRACTOR:	Pickletile, LLC dba Pickleglass Contacts: Lejend Bain 8501 N Mopac Expy Ste 170 Austin, TX 78757 Tel: 512-710-1564 Email: lejend@pickletile.com

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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 **Conversion of Inline Rink to Pickleball Courts** is required on or prior to **July, 17th 2026**. 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	January 6
Notice of Award	January 7
Notice to Proceed, Bonds, Insurance, etc.	January 20
Construction/Installation/Site Restoration - Substantial Completion.....	July 1
Final Project Completion.....	July 17, 2026

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 Bond 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 PROS PROJECT MANAGER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of PROS PROJECT MANAGER 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 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 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 visits and on-site observations are subject to all the limitations on OWNER'S REPRESENTATIVE authority and responsibility set forth in paragraph 9.13 and particularly, but without limitation, during or as a result of OWNER'S REPRESENTATIVE 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 and 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 or within the parking lot for the Recreation & Senior Center located east of the work site.
- All construction traffic (equipment, vehicles and foot traffic) should use access points from the west (skate park parking lot) and be kept on hardscape surfaces to prevent damage to surrounding vegetation.

- Contractor is to maintain the existing hockey fencing and dasher boards in place unless partial removal is required for access and coordinated in advance with the PROS Project Manager. In the event of partial removal, Contractor is to provide, at their own expense, temporary fencing to replace the removed portions and ensure a continuous safety closure of the work site during non-working hours.

All Locations

- Provide ingress and egress to public parking lot, skateboard park, ADA parking, walkway on south side of rink and pedestrian bridge at all times. If temporary closures of these areas are needed, they must be coordinated a minimum of 48 hours in advance with the PROS Project Manager.
- No work shall be performed on the following dates and timeframes:

5pm May 22nd through 7am May 26th (Memorial Day Weekend)

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

- 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

- 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.

PART 1 - GENERAL**1.1 SUMMARY:**

1.1.1 PROJECT NAME: Conversion of Inline Rink to Pickleball Courts

1.1.2 PROJECT NUMBER: 208858-660307

PROJECT LOCATION: Inline hockey rink. Located west of 900 Via Appia Louisville, Colorado 80027.

1.1.3 OWNER: City of Louisville

1.1.4 WORK INCLUDED: The Work consists of construction of a perimeter concrete grade beam between 1-3' high by 2' wide, installation of noise-mitigating sound barrier consisting of metal framings and transparent glass panels of heights between 8'-13', minor repair of the concrete slab, surface preparation and application of colored surfacing and striping for five pickleball courts and installation of 5 series of net posts and nets. Work is to include furnishing all materials, labor and equipment needed for the above.

1.1.5 OVERVIEW OF PROJECT AREAS

Inline rink located west and downhill of Louisville Recreation & Senior Center

For construction access use service drive opposite of Eldorado Ln, as shown by red arrow.



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) blueline 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 Engineers 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.

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**

The work shall consist of, but not be limited to, construction of the reinforced concrete grade beam system shown on design and future engineering plans. If damaged during construction, work may include removal and replacement of vertical curb and gutter, curb walk, handicap ramps and truncated domes existing on site.

2.0 STANDARDS AND SPECIFICATIONS

- 1) 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.
- 2) **Structural design, calculations, drawings, and/or specifications will be provided by the Structural Engineer of Record (SEOR) following contract execution.**
 - a. These future documents will become part of the Contract Documents upon issuance.
 - b. The Contractor shall incorporate and comply with all structural requirements once issued.
 - c. Any work affected by the future structural documents shall not proceed until such documents are issued and approved by the PROS Project Manager.
 - d. The Structural Engineer’s drawings and specifications, once issued, shall supersede conflicting requirements in other documents unless specifically noted otherwise.
 - e. Issuance of the SEOR’s documents is not grounds for additional cost or time unless changes differ materially from the performance criteria included herein.

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"
3/4"		100	90-100		20-55
					No. 4 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.

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	5.00-8.00"
Air content	4.5-7.5%
Unit Weight	143.30
Water/Cement Ratio	.40 Max
Yield	27

<This section left intentionally blank.>

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.

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.**

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 Proposal, shown or implied or specified herein shall be included and merged into the pay items shown in the 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 Proposal. All payments shall be subject to the conditions of these specifications.

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.

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 crossspans, 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.

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.

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 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 materials 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 recompact 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 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 District303-666-8809
- 3. City of Louisville Operations and Maintenance Department303-335-4750
- 4. AMR Ambulance Service303-665-6623
- 5. Boulder Valley School District303-447-1010
- 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 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 1823.53**ACRYLIC COLOR SURFACING FOR POST-TENSIONED
CONCRETE TENNIS COURTS****PART I – GENERAL****1.01 SCOPE OF WORK**

- A. The contract work to be performed under this section consists of furnishing all required labor, materials, equipment, implements, parts and supplies necessary for the colored/texture surfacing of tennis courts constructed with proper slope for positive drainage in accordance with these specifications.

1.02 QUALITY ASSURANCE

- A. Work is to be performed by contractor with a minimum of six (6) similar, successfully completed projects within the past two (2) years. Contractor will be a builder member of the American Sports Builders Association and will have a Certified Tennis Court Builder on staff. The color surfacing foreman will be a Certified Installer of the color coating manufacturer. All surface coatings shall be supplied from a single manufacturer.

1.03 REFERENCES

- A. Post Tensioning Institute (PTI)
- B. American Concrete Institute (ACI)
- C. United States Tennis Association (USTA)
- D. American Sports Builders Association (ASBA)
- E. International Tennis Federation (ITF)

1.04 SUBMITTAL

- A. Manufacturer specifications for components, color chart and installation instructions.
- B. Authorized Applicator Certificate from the surface system manufacturer.
- C. ITF Pace Classification Certificate for the system to be installed.
- D. Reference list from the installer of at least 6 projects of similar scope completed in the past 2 years.
- E. Current Material Data Safety Sheets (MSDS).
- F. Product Substitution: If other than the product specified, the contractor shall submit at least 7 days prior to bid date a complete type written list of proposed substitutions with enough data, drawings, samples and literature to demonstrate to the architect/engineer's satisfaction that the proposed substitution is of equal quality and utility to that originally specified. Information must include a QUV test of at least 2000 hours illustrating the UV stability of the system. Test method similar to ASTM G154. The color system shall have an ITF pace rating

in Category 3 (medium). Under no circumstances will systems from multiple manufacturers be considered.

1.05 LIMITATIONS FOR APPLICATION OF SURFACING

- A. Application temperature shall be a minimum of 50°F in direct sunlight with no shade. Do not apply coatings if temperatures are at or below 50°F at night. The surface temperature shall not exceed 140°F. Do not apply when surface is wet or if rain is imminent or forecasted. Keep all coatings from freezing. Do not store in direct sunlight for an extended period. Containers shall be closed when not in use.

1.06 WARRANTY

- A. Contractor shall guaranty that all materials and workmanship incorporated into the project will be of new quality and free from defects, and that all work will be installed as specified and drawn, and in conformance with the project documents. Any material or workmanship found to be defective or out of specification will be replaced, at the sole cost of the contractor, for a period of one (1) year from date of acceptance.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. RSS Color Coatings - 775 Canosa Court, Denver, CO 80204 (800) 738-8106 or approved equal.

2.02 ADHESIVE PRIMERS AND SEALERS

- A. Adhesion Primers - RSS Concrete Sealer and RSS Latex Concrete Primer- RSS Concrete Sealer is undiluted and RSS Latex Concrete Primer is mixed 1 gallon of RSS Latex to 4 gallons of clean potable water (1:4).

2.03 PATCHING MIX

- A. Patching Mix - RSS Rhino Patch Binder- is mixed 3 gallons of RSS Latex Patch Binder, 1 gallon of Portland Cement Type 1 or 2 and 100 lbs. of Silica Sand.

2.04 CRACK SEAL

- A. Crack Seal - RSS Epoxy Crack Seal or Rhino Crack Filler. The RSS Epoxy Crack Seal is mixed as a two (2) Parts Component A and one (1) Part Component B. Rhino Crack Filler is mixed 3 gallons of RSS Latex Patch Binder, 1 gallon of Portland Type 1 or 2 Cement and 100 lbs. of silica sand.

2.05 ACRYLIC RESURFACER

- A. Acrylic Resurfacer - RSS Acrylic Resurfacer. RSS Acrylic Resurfacer is mixed with 55 gallons of RSS Acrylic Resurfacer, 400 to 500 lbs. of Washed White Silica Sand and 20-28 gallons of clean potable water.

2.06 ACRYLIC COLOR PLAY SURFACE

- A. Acrylic Color Play Surface- The RSS Acrylic Color to provide an ITF Pace Rating Category 3 (medium) tennis surface which consists of the following mix- 55 gallons of RSS Acrylics Color Concentrate, 400 lbs. of Washed White Silica Sand (40-70 mesh) and 20 to 28 gallons of clean potable water.

****Factory Fortified RSS Color Coatings are available for all colors if specified****

2.07 TAPE SEALER AND TEXTURED LINE PAINT

- A. Play Lines- RSS Tape Sealer and RSS Textured Line Paint. Lines shall be accurately located and marked. Lines shall be primed first with (1) coat of RSS Tape Sealer to ensure crisp edges. Playing lines shall be (2") wide and painted using RSS Textured White Line Paint.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. Prior to the surfacing applications, the courts shall be thoroughly cleaned by pressure washing to remove all dirt and debris.
- B. Cracks and rock holes (if applicable) will be cleaned of debris and filled full depth and level with the playing surface using RSS Epoxy Crack Seal or RSS Rhino Crack Filler. RSS Rhino Crack Filler shall be ground smooth to court surface prior to the application of RSS Acrylic Resurfacer. RSS Epoxy Crack Seal shall have silica sand broadcast into wet mixture to provide texture.
- C. Flood the courts and after a (1) hour wait in direct sunlight with temperatures seventy (70) degrees and rising. Any areas of standing water remaining that cover a US Nickle shall be patched with RSS Rhino Patch Binder. Areas to receive patches shall be primed first with a mix of Water and RSS Latex Concrete Primer mixed at a 4:1 ratio. Reflood patches to ensure compliance. Light misting with water on the edges to feather out is allowed as needed to maintain workability.

3.02 CONCRETE SEALER AND LATEX CONCRETE PRIMER

- A. One (1) coat of RSS Concrete Sealer shall be applied over the concrete with a sprayer. When the sealer coat has dried and cured apply one (1) coat of RSS Latex Concrete Primer using 1 gallon of Latex mixed with 4 gallons of clean potable water. Apply with a rubber bladed squeegee to aid in the mechanical bonding of the RSS Coating System to the concrete substrate. Apply the first

coat of RSS Acrylic Resurfacer while Latex Primer Coat is tacky to the touch. Care should be taken not to leave any puddles of material.

3.03 ACRYLIC RESURFACER

- A. In order to provide a smooth underlayment for RSS Color Coating Systems one (1) coat of RSS Acrylic Resurfacer shall be applied over each court per the mix ratio stated in Section 2.05. The mixture will be agitated in a paddled mortar mixer or in drums to provide a consistent and homogeneous solution. The acrylic resurfacer coat shall provide a uniform surface with no ridges.

3.04 ACRYLIC COLOR

- A. Two (2) coats of color mixture (3 coats may be required depending on concrete texture) will be agitated in a paddled mortar mixer or drum to provide a consistent and homogeneous solution. The mixture will be applied over the entire court surface using a rubber-tipped squeegee in two separate applications with enough drying time allowed between coats per mix ratio stated in Section 2.06. The finished color surface is to be free of ridges and shall have a uniform appearance.

3.05 PLAYING LINES

- A. All lines will be painted first with (1) coat of RSS Tape Sealer to provide a uniform crisp line. Once the Tape Sealer has dried apply one (1) coat of RSS White Textured Line Paint two inches (2") wide which shall be accurately located and marked by snapping a chalk line and placing (1"+) masking tape using a line taper. All lines shall conform to USTA Specifications for doubles play.

3.06 PROTECTION

- A. Erect temporary barriers to protect coatings during drying and curing if needed.
- B. Lock gates to prevent use or entry until acceptance by the owner's representative.

3.07 CLEAN UP

- A. Remove all containers, surplus materials and debris. Dispose of materials in accordance with local, state and federal regulations.
- B; Leave site in a clean orderly condition.

END OF SECTION 32 1823.53

SECTION 32 3113.30**PICKLEBALL COURT EQUIPMENT****PART 1 – GENERAL****1.01 SCOPE OF WORK**

- A. The contract work to be performed under this section consist of furnishing all required labor, materials, equipment, implements, parts and supplies necessary for, or appurtenant to, sport court equipment in accordance with these specifications.

1.02 WARRANTY

- A. Contractor shall guaranty that all materials and workmanship incorporated into the project will be of new quality and free from defects, and that all work will be installed as specified and drawn, and in conformance with the project documents. Any material or workmanship found to be defective or out of specification will be replaced, at the sole cost of the contractor, for a period of one (1) year from date of acceptance.

PART 2 – PRODUCTS

Douglas Industries- 3441 S. 11th Ave., Eldridge, IA 52748 800-553-8907 or Approved Equal

2.01 PICKLEBALL COURT NET POSTS

- A. Douglas Pickleball Premier XS, 2 7/8" OD round posts 8-gauge steel. Posts shall have chrome plated drive gears and a continuous lacing rod. Ground sleeves to be 24" schedule 40 PVC pipe or aluminum. COLOR: Black (#63075)
- B. If needed, substitute with Douglas Pickleball Premier SQ Surface Mount (#63080).

2.02 PICKLEBALL NETS

- A. Douglas JTN-30 net with 2-ply vinyl-coated polyester headband, weight 65 oz., 20oz/sq.yd., 3.0mm braided solid core polyethylene netting with 1¾" square mesh. Net cable shall be 5/32" diameter galvanize steel by 21'9 for pickleball courts.

2.03 CENTER STRAPS

- A. Douglas Classic ACS Adjustable Center Strap. Strap is 2" wide, white polyester webbing with adjustable buckle and a double-ended snap hook.

2.04 CENTER STRAP ANCHOR

- A. Douglas 1 7/8" OD tubular anchor pipe, galvanized inside and out. One end will be flattened for anchorage into concrete foundation. A 5/16" OD anchor pin will be fastened through pipe near the top of the anchor.

2.05 WINDSCREEN (IF SPECIFIED)

- A. Douglas OMP Polypro Plus Premium Windscreens in 6' to 9' tall heights either green or black in color. Owners will specify height and color upon acceptance. Fastening grommets to be 18" on center with center with anti-billow tabs and fastening grommets at mid-height. All 9' tall windscreen to have AVR Air Vents 10' on center.

PART 3 - EXECUTION

3.01 NET POSTS – PICKLEBALL COURTS

- A. Net post sleeves for pickleball courts will be set in concrete foundations, 12" diameter x 24" deep for a post-tensioned concrete slab, unless surface mounted post are needed. Net posts to be located per the drawings and in conformance with the American Sports Builders Association and USTA specifications. Net post sleeves to be set flush with finished grade and 22 feet apart to the middle of ground sleeves. Net Posts height shall be set at 36" to top of the post from finished grade of the pickleball court.

3.03 CENTER STRAP ANCHORS

- A. Center strap anchor will be set in 8" diameter x 12" deep concrete foundations flush with finished grade. Center strap anchor to be installed in the middle of the net posts.

3.04 NETS

- A. Tie net flush against net posts at 36" high with lacing twine for pickleball courts.

3.05 CENTER STRAPS

- A. Loop center strap around net, hook into anchor, and tighten so that the net is thirty-four inches (34") high from the top of finished grade in the center of the tennis court.

3.06 WINDSCREENS (IF SPECIFIED)

- A. Windscreens are installed straight and even with limited amount of wrinkles. The top, bottom, sides and center anti-billowing tabs to be fastened and secured on grommets with 120 lbs. tie wraps.

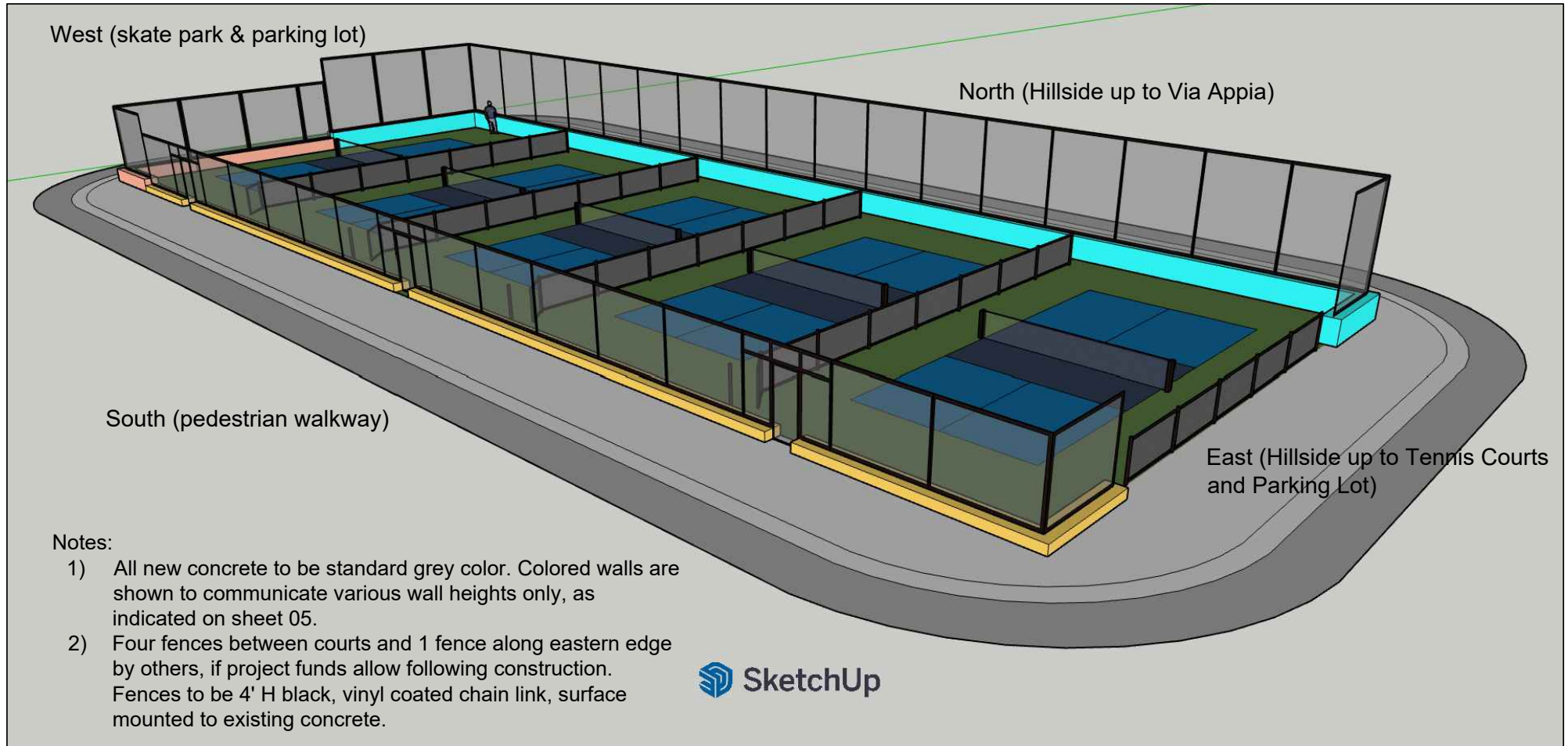
END OF SECTION 32 3113.30

Site Location & Access

Inline Rink Conversion - Louisville, CO



Scale: NTS



Color Scheme (Laykold Standard Colors)

Outer: Medium Green

Inner: Light Blue

Kitchen: Pro Blue

Striping: White

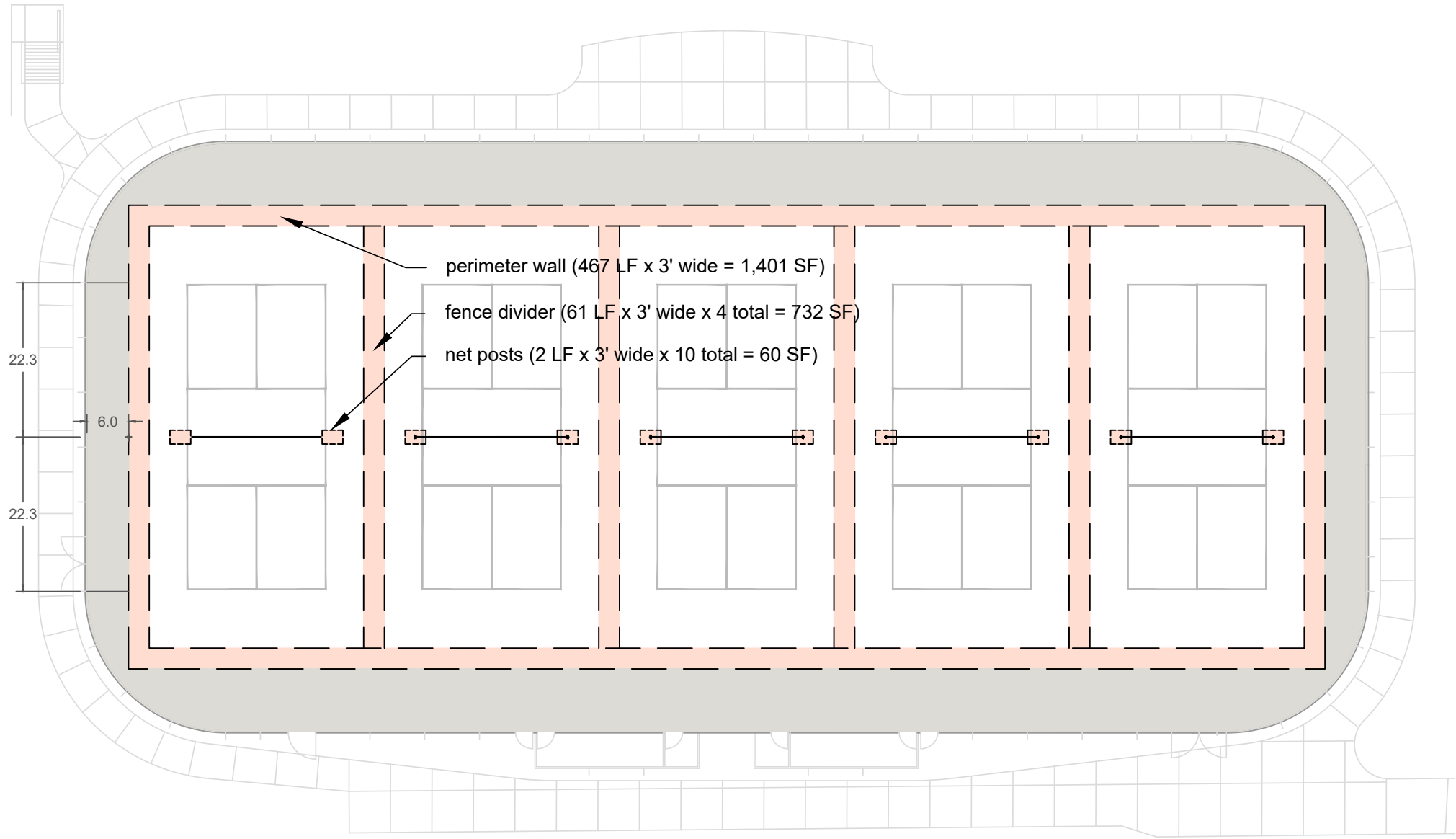
Scale: NTS

03

GPR Survey Locations

Inline Rink Conversion - Louisville, CO

12/10/25



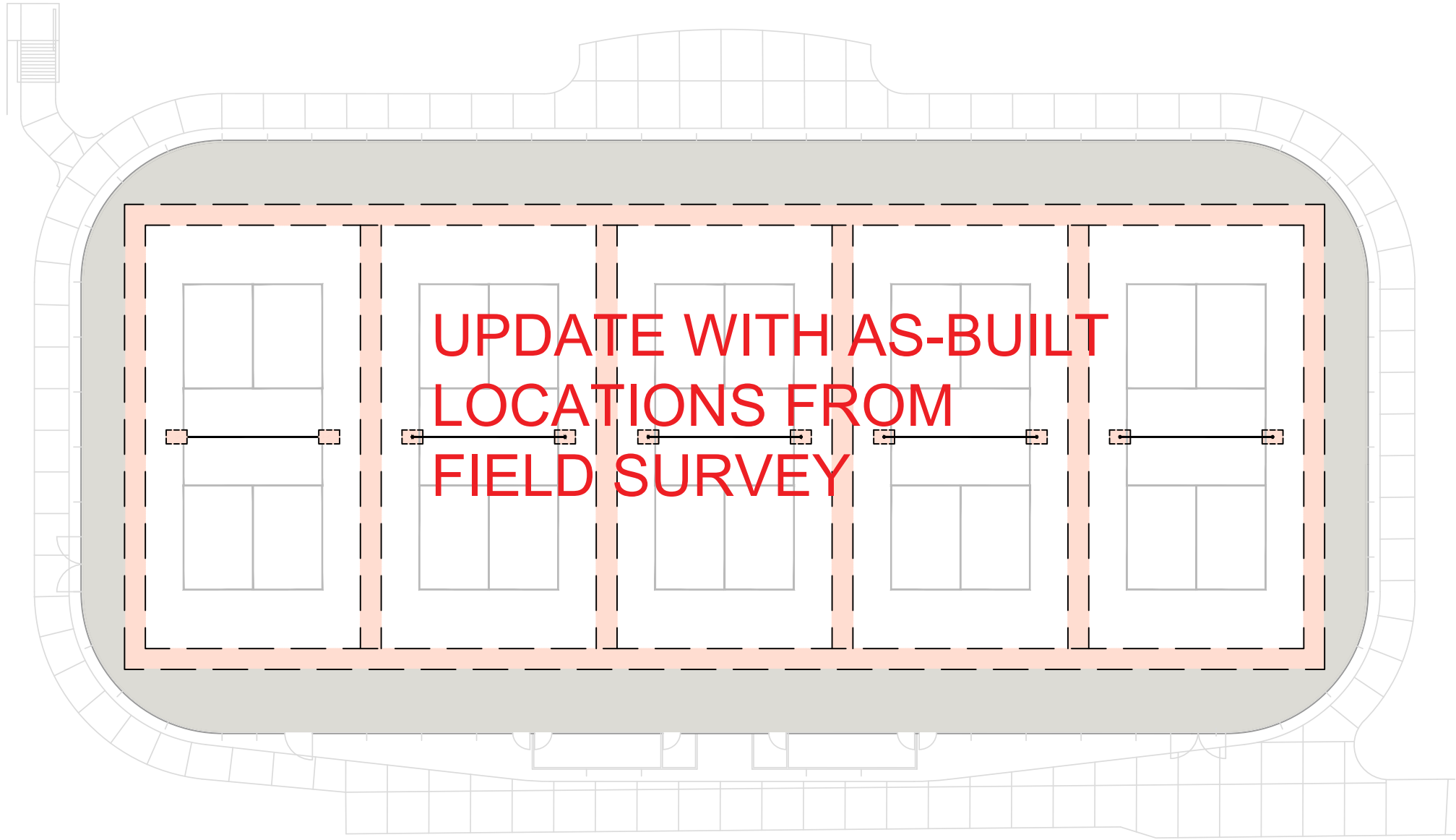
Areas scanned by GPR for existing post-tension cables (2,193 SF total)



0 10 20
Scale: 1" = 20'

Post-Tension Tendon Locations

Inline Rink Conversion - Louisville, CO

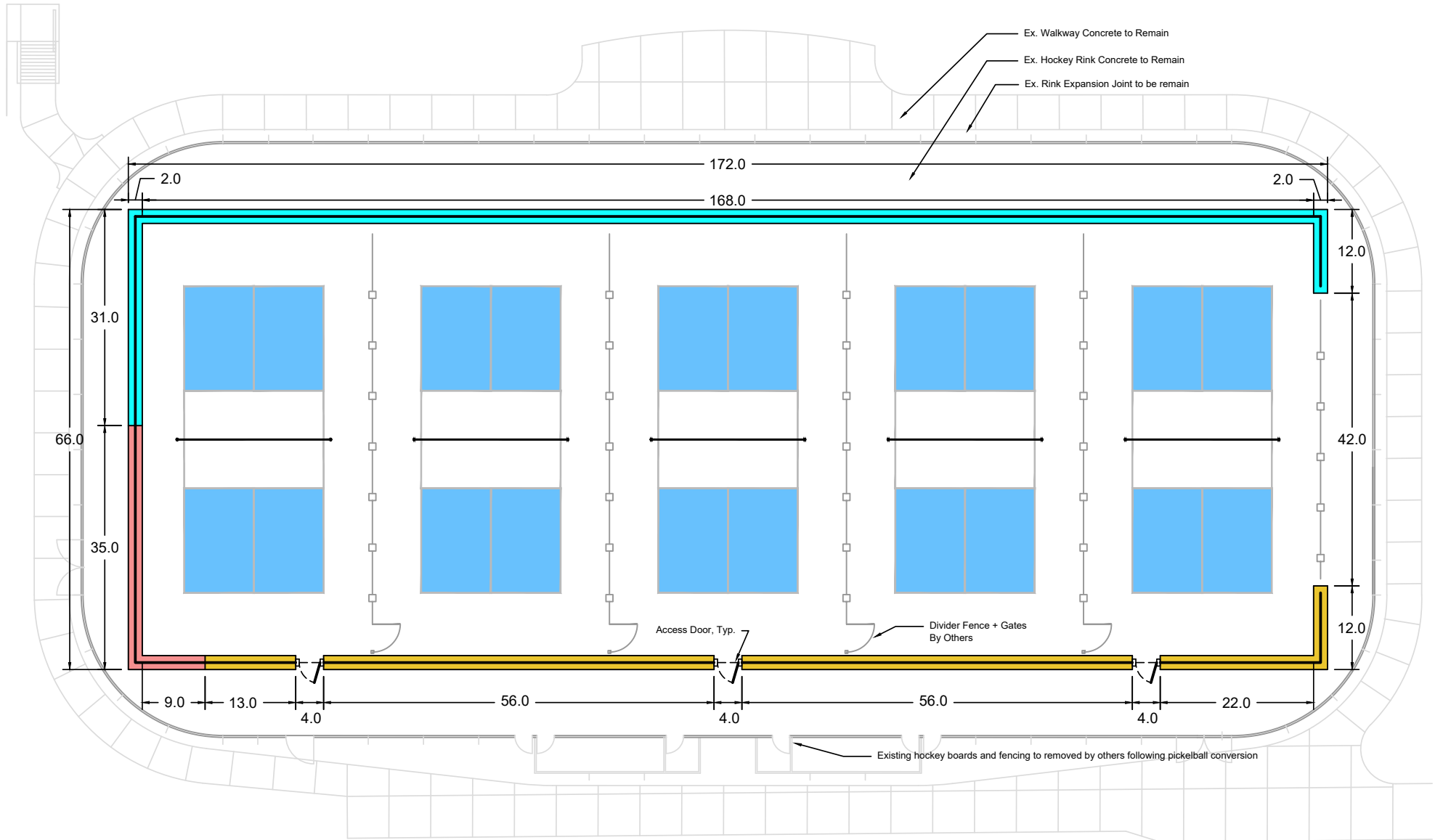


0 10 20

Scale: 1" = 20'

Gradebeam & Pickleglass Layout

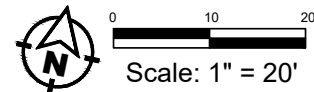
Inline Rink Conversion - Louisville, CO



- 1' h x 2' w Concrete + 8' Pickleglass
- 2' h x 2' w Concrete + 10' Pickleglass
- 3' h x 2' w Concrete + 13' Pickleglass

- Pickleglass Panel
- 4' Fence & Gate (by others)

Inline Rink Conversion - Louisville, CO



NOTICE OF AWARD

January_____,2026

Contact Name
Company Name

CONTACT,

Please be advised that on _____ the City of Louisville, Colorado City Council awarded the **Conversion of the inline rink to pickleball courts** 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: _____
SIGNING PARTY

Title: Project Manager – PROS

Title:

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)

(Attest)

(Surety Company)

Address: _____

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: _____



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 0__	\$ _____
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:
_____	<u>CITY OF LOUISVILLE, COLORADO</u>	_____
PROJECT MANAGER	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 of 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:

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:

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: _____



**Analysis of Pickleball Sound
from
Louisville Recreation Center
Louisville, Colorado
by
PSM Consulting LLC**

May 7, 2025

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Executive Summary

PSM Consulting LLC (PSMC) used sound modeling software to create sound maps for pickleball sound from the proposed court location at the Louisville Recreation Center, Louisville, Colorado. The sound maps included elevations around the court because several homes at elevations above the courts have a direct line of sight into the courts. A direct line of sight means a direct path of sound propagation.

Sound levels with no sound mitigation were estimated at the property lines of homes closest to the courts on Larkspur Court, Trails Edge Drive, West Mulberry Street, and West Pinyon Way. Next, sound barriers of several heights and designs were positioned at the hockey fence perimeter so that the reduced sound levels could be estimated at these locations. A design objective of 50 dB LAFmax that has been successfully used by PSMC to address pickleball sound at pickleball sites was used for this site.

With no sound mitigation in place, the highest sound levels from pickleball were 60 dB and 56 dB LAFmax at Larkspur Court and Trails Edge Drive, respectively. These sound levels are louder than the recommended design objective and would be considered objectionable. This is caused by the nearness of the courts to these property lines. The sound levels to the east at West Pinyon Court were 40 dB, well below the design objective. This is due to the greater distance to the courts and lower sound at 90 degrees to the courts.

With an 8 foot sound barrier on the 8 foot hockey fence, a negligible sound reduction was estimated at the closest homes. This barrier is not high enough to block the direct line of sight from the courts to the homes. Alternative sound barrier heights and sound barrier materials were evaluated. Four sound mitigation options were identified that yield acceptable sound reduction. They are:

For 5 courts in a north south direction -

1. Hockey perimeter - 18 foot sound absorbing barrier on north side, 10 foot sound absorbing barrier on south side, open east and west sides
2. Court perimeter - 16 foot sound absorbing barrier on north side, 10 foot sound absorbing barrier on south side, 16 foot barrier on west side; open east side

For 4 courts in an east west direction -

3. Hockey perimeter - 16 foot sound absorbing barrier on north side, 10 foot sound absorbing barrier on south side, open east and west sides
4. Court perimeter - 14 foot sound absorbing barrier on north side, 10 foot sound absorbing barrier on south side, 14 foot barrier (transparent) on west side, open east side

These designs would not require the use of quieter paddles and quieter balls from the Blue List (Appendix B). This mandate is often unfavorable to both recreational and competitive players and was not preferred by the Louisville Recreation Center. If equipment restrictions were implemented, then the barrier heights could be reduced to meet the design objective. The Louisville Recreation Department should review the structural capabilities of the hockey fence and the fence foundation along with the zoning height restrictions to select the sound mitigation option that provides the best balance of player enjoyment, homeowner comfort from sound, and project cost.

Introduction

Pickleball is a game played with two to four players using paddles, a ball, and a net on a court that is approximately one half the length and one half the width of a tennis court. The paddles are made of wood, plastic, or composite materials, and the ball is made of plastic. Each paddle and ball impact during a game creates a short pulse of sound that varies in intensity, duration, and frequency content. For homeowners near pickleball courts, pickleball sounds can become objectionable, depending on the distance from the courts and the sound mitigation in place. These objections are also because the frequency of a paddle and ball impact is near 1000 Hz, which aligns with the maximum sensitivity of human hearing.

To help explain the details in this sound study, background information is provided on the properties of sound, pickleball sound impulses, sound measurements, human hearing, sound ordinances, design objectives, and sound mitigation options.

Pickleball sound levels are then presented at several locations surrounding the proposed pickleball courts at the Louisville Recreation Center, Louisville, Colorado using sound maps. Sound maps are presented first with no mitigation and then with mitigation in place.

The Sounds of Pickleball

A typical pickleball game will produce a series of random paddle and ball impacts each time the ball is struck. These impacts are described as “popping sounds of varying loudness.” The loudness of each impact varies based on a player’s position on a court, the paddles and balls being used, the skill level of each player, and the force of each impact. Higher skill players will generate louder sound from pickleball via their forceful paddle strikes than lower skill players.

A paddle/ball impact is an impulsive sound with a duration of 10 to 20 milliseconds. The maximum loudness occurs in the first 5 milliseconds and then the loudness subsides. Impulsive sounds are defined as sounds lasting less than one second with an abrupt onset and abrupt decay (1). The peak acoustical energy is near 1000 Hz, which corresponds with the most sensitive region of human hearing.

In a game of pickleball, a rally will generate several random impacts until the rally is over. A game involves several rallies (and impacts) until a team wins. A typical pickleball game will generate 12 to 15 impacts per minute or 720 to 900 impacts per hour – per court. If multiple courts are in use at the same time, then the number of impacts per hour will be increased by the number of courts. However, not all impacts are of the same loudness. Soft paddle strikes can be barely audible and forceful paddle strikes can be much louder. This results in a range of sound levels from any game. An effective sound study must consider the highest sound levels rather than an average sound level. This has been done in this study.

In addition, the probability of any two paddle strikes occurring at the same time is extremely low. This is because the loudest sound of any single impact lasts only 5 milliseconds or 1/200th of a second. A typical

sound measurement interval is 125 milliseconds. More than 25 courts would have to be in use for two impacts of 5 milliseconds each to overlap in this interval and increase the loudness of a single impact. The resulting sound with more courts in use is therefore not greater loudness but more pickleball impacts in any period of play.

The goal in sound mitigation is to reduce the loudest impacts – regardless of the number of courts - to a low enough level so that the loudest impacts will not be objectionable. If the loudest impacts are not objectionable, then lower loudness impacts will not be a problem. In this manner, the number of courts will not be a problem.

Measurement of Pickleball Sound

Sound is measured with a sound level meter as shown in Figure 1. The units of sound measurement are decibels, abbreviated as dB. Higher dB levels represent louder sounds.



Figure 1 - Sound Level Meter

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Reference dB levels for common sounds follow.

- 120 dB – ambulance sirens, jet planes at takeoff
- 110 dB - car horns
- 100 dB – factory machinery
- 90 dB – lawnmowers, blenders, power tools
- 80 dB – truck traffic, alarm clocks, garbage disposals
- 70 dB – washing machines, hairdryers, highway sound, city streets
- 60 dB – dishwashing machines, electric toothbrushes
- 50 dB – moderate rainfall, large offices
- 40 dB – refrigerators, quiet offices, quiet residential area
- 30 dB – library, a whisper

The human ear does not hear all sounds equally. It has more sensitivity in a mid-frequency range of 1000 to 4000 Hz and has diminished sensitivity at frequencies above and below this range. A frequency weighting can be applied to any sound measurement to match the hearing sensitivity of the human ear. This is called the A-weighting. Decibel measurements with the A-weighting are listed as dBA.

Because sound is not constant and varies with time, the sound level meter has several measurement settings to average these sound fluctuations over the measurement period (1). These settings report the sound level for the measurement period selected. The meter setting must be properly selected to capture the sound level based on the duration of the sound and the response time of the human ear.

What meter setting is best for pickleball play? For short duration sounds like pickleball impacts, the fast meter response with an A weighting best corresponds to the averaging time and sensitivity of the human ear (2). A maximum hold setting on the meter can also be used. The maximum hold setting “listens” for the maximum sound level within the measurement time interval and continues to update the maximum level. In this manner, the maximum level of these rapid fluctuations can be captured over the measurement period.

The fast meter setting will always measure a higher sound level for a pickleball impact than a slow setting. The slow meter setting averages sound over a longer averaging period that includes intervals with no pickleball impacts. The slow setting is appropriate for continuous sound and for background sound but is not appropriate for pickleball impacts. The slow setting understates the loudness of the short duration pickleball impact heard by the human ear. Different time averaging intervals will therefore report different dB levels for the same sound event.

When the A-weighting setting on a sound level meter is selected, dB measurements are described as dBA. If the sound level (L) is measured with an A-weighting (A) and a fast (F) setting, it is described as LAF. When the maximum level is captured in the measurement interval, this is called LAFmax. Unless otherwise

noted, pickleball sounds in this report will be described in units of LAFmax. LAFmax measures the maximum sound, regardless of the number of impacts. If the LAFmax sound level can be reduced through sound mitigation to a low enough level to not be objectionable, then the number of impacts (or the number of courts in use) will not be important.

LAFmax is the preferred metric over LAeq, which is the continuous equivalent-energy level (3) or an average sound level. The LAeq is the level of a continuous sound having the same sound energy as a given time-varying sound. For an impulsive sound that is only present for a short period of time, the time averaged LAeq dB level will understate annoyance. For pickleball, the LAeq will be lower than the LAFmax level for the short duration pickleball sound impulse.

LAFmax addresses the maximum sound in the measurement interval. If LAFmax is reduced to a low enough level to not be objectionable, then the number of lower level pickleball impacts will not be an issue. The maximum value of the LAFmax sound level to avoid objections from pickleball has been determined by PSMC from site evaluations and from human response and is described in a later section.

Sound Maps

Sound maps were created using the dBmap.net Sound Mapping Tool, which is a commercial software (4). The topography of the surrounding area was applied to the sound map before the positions for a sound source and for receivers were selected. Ground elevations were selected from Google Earth. In addition, buildings and homes were added in the vicinity of the pickleball courts. The size of each building together with the roof height were selected from Google Earth or from Zillow and applied to the model for the site. The pickleball sound source was then placed on the court, and the receiver locations were selected. Because this is European software, all distances, site elevations, building sizes, and barrier heights must be added to the model in meters. The resulting sound maps with distance scales can only be shown in meters. (One meter = 3.3 feet)

All colored sound maps have the legend shown in Figure 2. Each colored band represents a 5 dB change in sound level. The number beside each band indicates the lowest sound level within the band. In addition, sound maps shown in color have white lines within each band of colors to show the 1 dB changes within this 5 dB interval.

For example, the yellow band indicates sound levels from 50 dBA to 54.9 dBA; the orange band indicates sound levels from 55 dBA to 59.9 dBA; and the pink band indicates sound levels from 60 dBA to 64.9 dBA. The colors represent increasing sound levels from 30 dBA in dark green to over 80 dBA in dark grey.

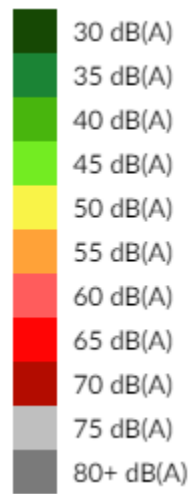


Figure 2 – Color legend for sound maps

All sound maps are shown with north oriented to the top of each map. This provides a link to any local maps which also have north oriented to the top of the map.

Sound Propagation

Sound travels away from its source with a reduction of 6 dB for each doubling of distance from the source. This means that sound decreases in loudness as the distance from the sound source increases. Figure 3 shows sound propagating away from a point source over level ground using the sound modeling software (4). This figure shows the horizontal plane of sound propagation. Each colored ring represents a 5 dB decrease of sound as indicated by the legend. Sound decreases in level as either a listener moves away from a sound source or as the sound source is moved farther away from a stationary listener. (Distances in sound plots can only be shown in meters because the software used is a European software which only displays meters. One meter = 3.3 feet) The 6 dB reduction for every doubling of distance is evident with the increasing diameter of each ring outward from the center.

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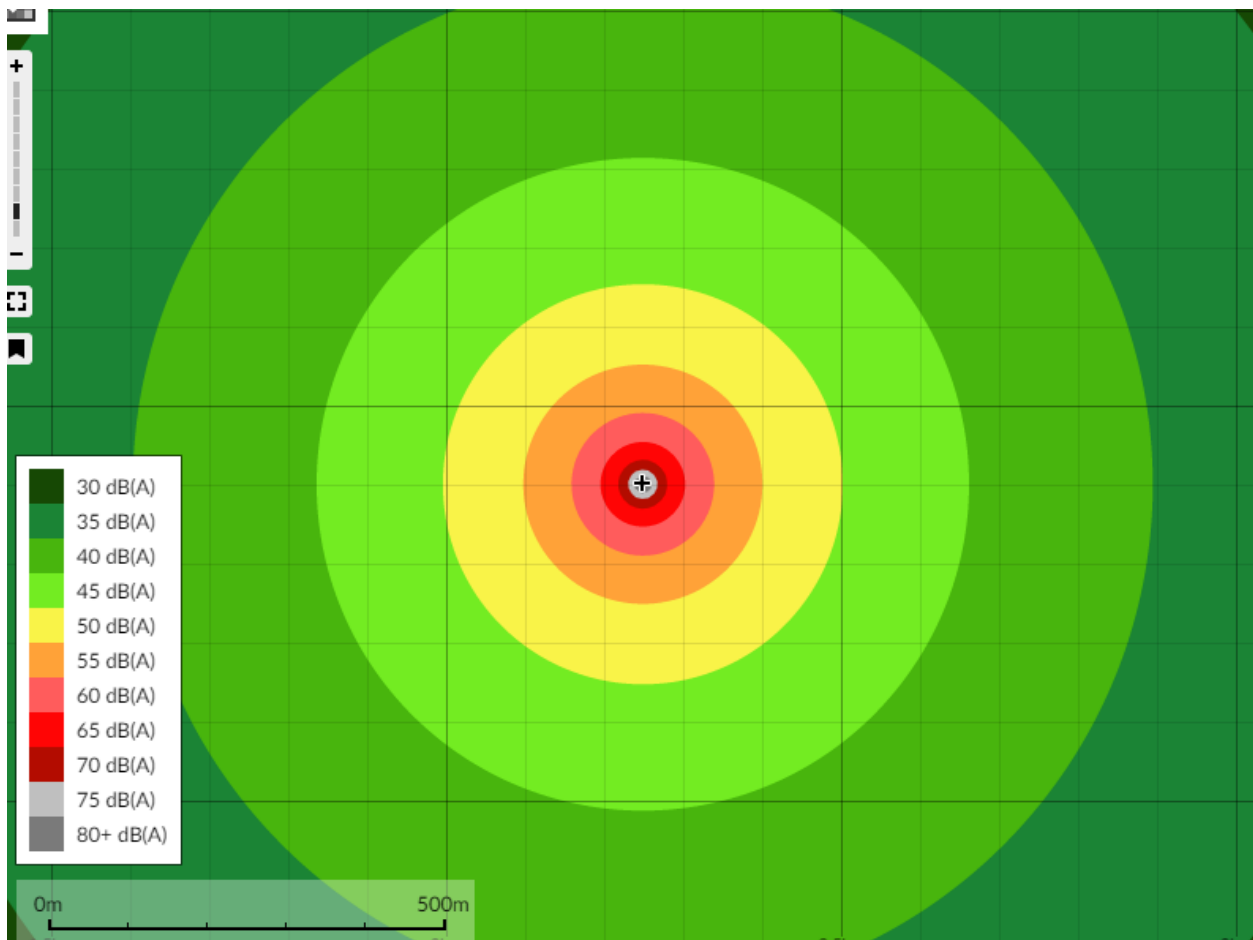


Figure 3 – Sound propagating away from a point source in a horizontal plane (1 meter= 3.3 feet)

Sound also propagates away from a source in a vertical direction. Figure 4 shows a three dimensional view of the vertical plane of sound propagation together with the horizontal plane. (The sound mapping software does not display distances in three dimensional plots.) The three dimensional behavior of sound becomes important to estimate the sound traveling up a hill, to a second story window, over a building, or to an apartment/condominium balcony.

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Figure 4 – Sound propagating away from a point source in a horizontal and vertical plane

Human Hearing and Annoyance

The human ear is sensitive to a sound's level, its frequency content, its duration, and its frequency of occurrence (2). All of these contribute to annoyance. The higher the sound level, the greater the annoyance becomes. The human ear is only sensitive enough to detect a change in sound level of 3 dB. Each 10 dB increase in sound level is perceived as a doubling in the sound level. In the same manner, each decrease of 10 dB is perceived as one half the loudness. A 20 dB increase is perceived as 4 times as loud. Similarly, a 20 dB decrease is perceived as 1/4 as loud.

Hearing is more sensitive to high frequency sounds than to low frequency sounds. Sound measurements made with an A weighting scale match the frequency sensitivity of the human ear. These are described as dBA levels.

Another factor in annoyance is the interval or space between sounds. Intermittent sounds or impulsive sounds are considered more annoying than a steady state sound of the same dB level. All these elements contribute to annoyance and are critical to the sound measurements in sound ordinances.

To reduce the annoyance of any sound level, the distance between the source and receiver must be increased or sound control measures must be implemented.

Sound Ordinances

Community sound ordinances establish dB sound levels so that sound is not objectionable, even though it may be audible. These ordinances are not intended to establish a dB level where sound is inaudible. They are intended to establish a dB level where the presence of sound above a background sound level will not be objectionable to a person with normal hearing sensitivity. The background sound level is the result of wind, trees, birds, normal ambient sounds, and traffic. Sound ordinances use different sound metrics to quantify the time varying loudness of different types of sound.

Continuous sounds and impulsive sounds have distinct characteristics that cause them to be perceived differently by human hearing. Therefore, the measurement intervals for both types of sounds must be separately stated. This is because the ear responds differently to continuous and impulsive sounds. Nearly all sound ordinances lack enough information or proper metrics to properly quantify the annoyance from the impulsive sound associated with pickleball.

Noise Ordinance for Louisville, Colorado

The Louisville municipal code, Sec 9.34.010. – Disturbance of the Peace (5), states that is unlawful to disturb the peace and quiet of others by making unreasonably loud or unusual noises. This is described as a nuisance ordinance because it lacks a dB level or measurement method for the noise. The resolution of any “disturbance” is decided in a courtroom, and the outcomes vary.

Recommended PSM Consulting Design Objective for Pickleball Sound

PSM Consulting (PSMC) has used its experience with pickleball sound measurements to develop a design objective for pickleball sound. The PSMC design objective for pickleball sound is based on the pickleball sound level in relation to the background sound. Background sound should be measured using A-weighted equivalent sound level (LAeq) or A-weighted slow response (LAS). These are both long term averages of sound fluctuations with an A-weighting. These measurements are commonly used for environmental studies of background sound. PSMC sets an LAFmax level as a design objective where pickleball sound would not be objectionable.

The recommended design objective at a property line for pickleball play to avoid objections follows.

- When the background sound level is at or below 47 dB LAeq, the design objective for pickleball sound should be 50 dB LAFmax.
- When the background sound level is above 47 dB LAeq, the design objective for pickleball sound should be 3 dB LAFmax above the background level.

These design objectives refer to sound levels at a property line. This location follows the standard practice for most community sound ordinances of setting sound levels at a property line. The sound levels at a

pool, at a backyard patio, or at the house will be even lower due to the added distance from the property line.

If pickleball courts are in a quiet residential neighborhood with background sound at 47 LAeq, then a design objective for pickleball sound at 50 dB LAFmax should be set. With the background sound level at 47 dB LAeq, pickleball impacts at 50 dB LAFmax will be faintly audible. For any lower levels of background sound, pickleball impacts may be more perceptible.

Pickleball sound at 50 dB LAFmax should not be objectionable to a person with normal hearing sensitivity for these reasons.

- 50 dB LAFmax is the sound level of a large, busy office or of moderate rainfall.
- 50 dB LAFmax is not loud enough to be objectionable even due to its intermittent nature.

Our experience has been that sound levels above 50 dB LAFmax and up to 55 dB LAFmax may cause complaints and sound levels above 55 dB LAFmax frequently can be objectionable.

If pickleball courts are near a location with high background sound at 55 LAeq, then a design objective for pickleball sound at 58 dB LAFmax (55+3) should be set.

This guideline provides a variable design objective for pickleball sound at a property line depending on the background sound levels. Its use has been supported by successful applications at multiple pickleball sites. This design objective for pickleball sound is recommended to avoid community or homeowner objections to pickleball play.

PSM has successfully applied these design objectives to several pickleball facilities and to homeowner associations concerned with pickleball sound. They have been used to judge annoyance at specific home locations with no mitigation in place and to confirm the performance of sound mitigation strategies.

Louisville Recreation Center

Figure 5 shows an aerial view from Google Earth of the proposed pickleball court location on an existing hockey rink at Louisville Recreation Center with the nearest homes or receiver locations to the north, the south, and the east (6). The distance from the hockey fence to the closest property line to the northwest on Larkspur Court is 100 meters. The distance from the fence to the closest property line to the north on Trial Ridge Drive is 160 meters. The distance from the fence to the closest property line to the south on West Mulberry Street is 170 meters. The distance from the fence to the closest property line to the east on West Pinyon Way is 300 meters. The distance from the fence to the police station parking area to the west is 305 meters. Figure 6 shows the planned layout of 5 courts in a north south direction.

In general, pickleball sound will be louder for locations closest to the courts than farther from the courts. Also, at the same distance from the courts, pickleball sound will be slightly louder in the direction of play than at 90 degrees to the direction of play.



Figure 5 – Proposed pickleball court location at Louisville Recreation Center

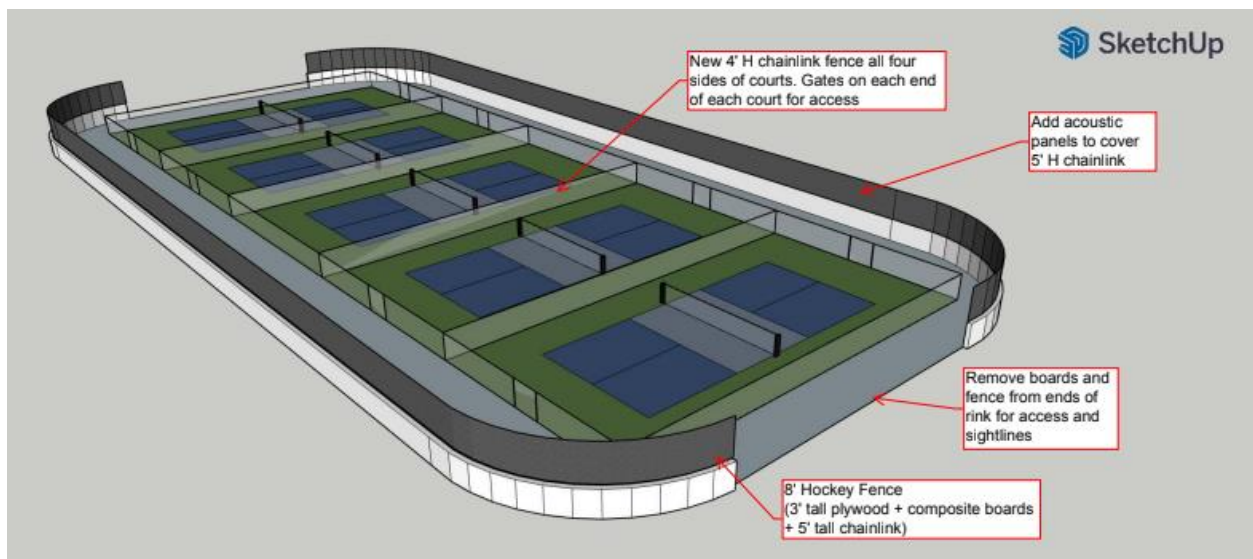


Figure 6 – Proposed pickleball courts at Louisville Recreation Center

The topography for the area was taken from Google Earth and was included on the sound map. The area has higher elevation north of the courts and slightly lower elevation south of the courts. Figure 7 shows the topography with a higher elevation from Trail Ridge Drive to West Mulberry Street.

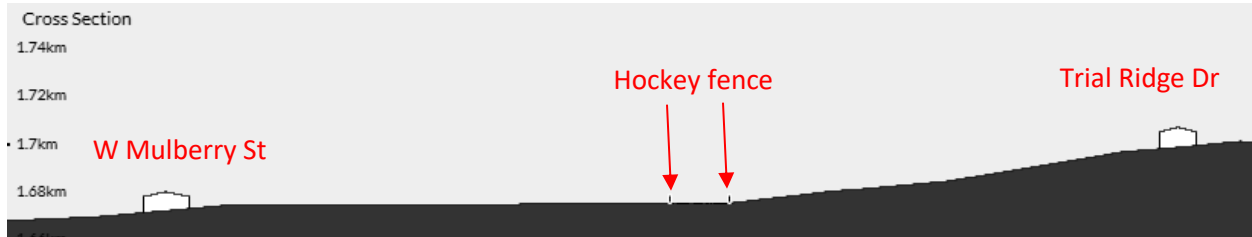


Figure 7 – Ground elevation to the north and south of courts

The closest homes on each of the streets mentioned were added to the sound map. The dimensions of the homes and the roof heights for nearby homes were taken from Google Earth for inclusion in the sound map. Figure 8 shows a three dimensional view of the homes to the northwest and north and the fire station to the northeast. Additional homes were included in the south and east directions. The background sound level was assumed to be 47 dB LAeq, which is typical of a residential neighborhood. The PSMC design objective of 50 dB LAFmax was therefore used.

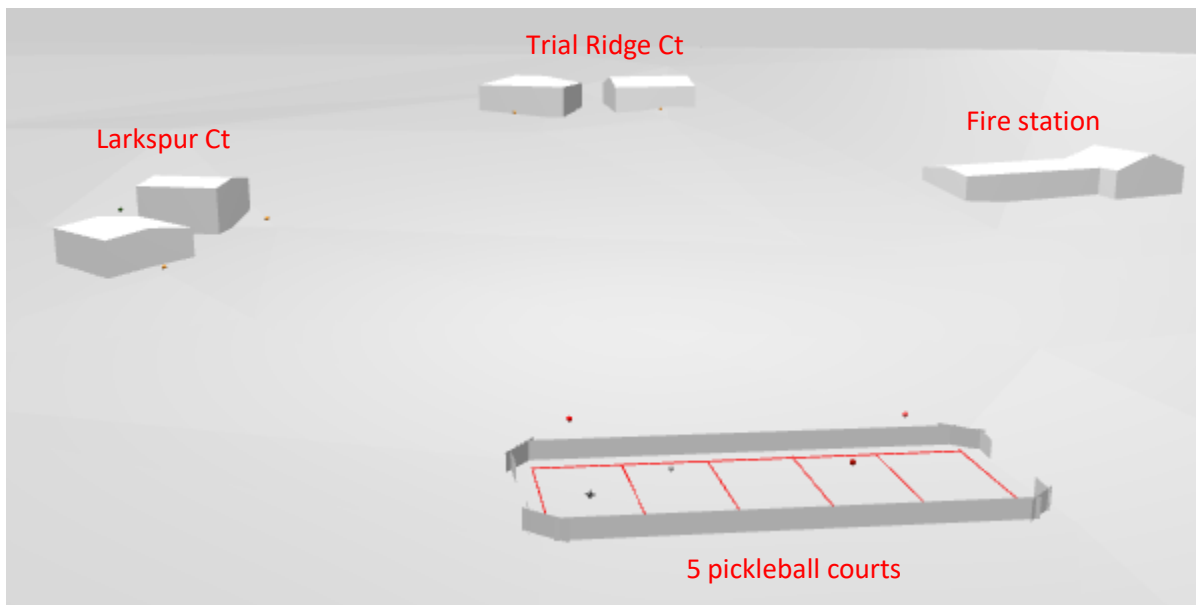


Figure 8 – Sound map details for Louisville pickleball courts – three dimensional model

Pickleball sound can come from any location on a pickleball court when a player strikes a ball. Pickleball sound travels away from the source in all directions. The loudest pickleball sounds will occur in the primary direction of ball travel across the net. Lower sound levels occur to the side, at 90 degrees to the direction

of ball travel. In addition, the positions of players change frequently during a game so that some shots (and the direction of sound) will continually change. The sound maps will display sound levels at multiple receiver positions for sound in the direction of play and for sound at 90 degrees to the direction of play.

Four court positions were selected on the pickleball courts to show the sound propagation from these positions in all directions to the nearby homes. Figure 9 shows the four sound source locations. The following sound maps will show the relationship between the source location (on the court) and the distance to a receiver (a home).

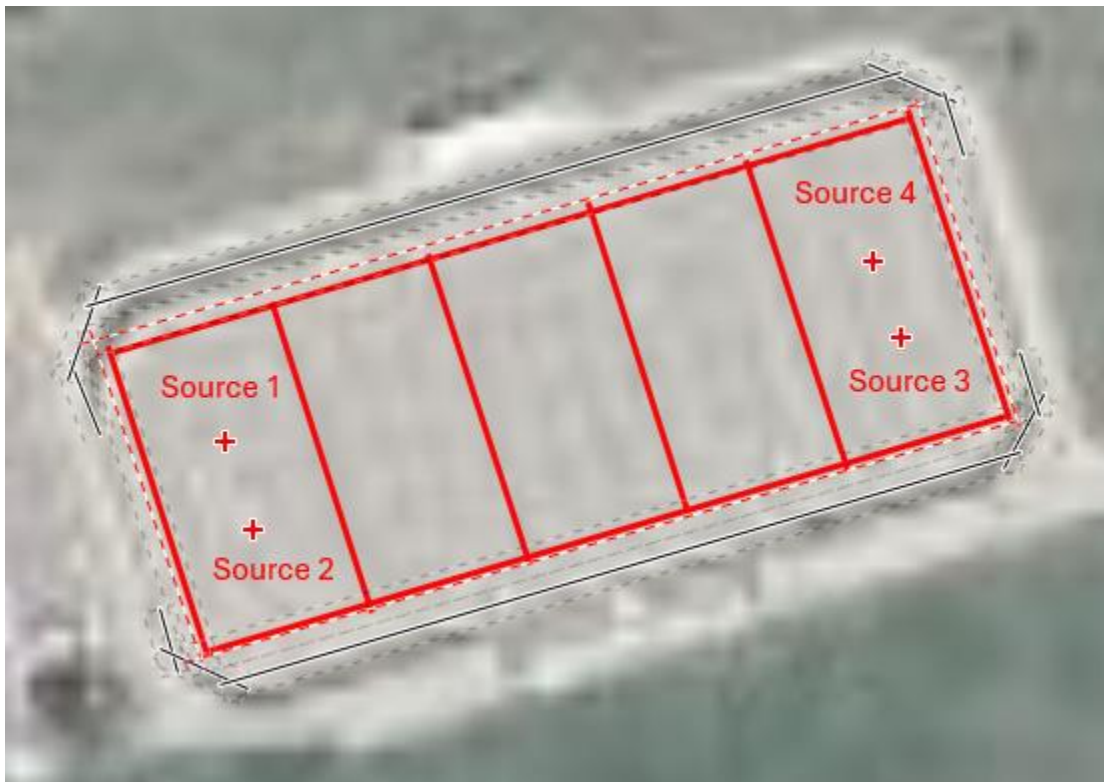


Figure 9 – Sound sources for the proposed 5 court layout

As a reference point for pickleball sound levels, the sound levels from tennis were estimated in all directions. In general, tennis is one half as loud as pickleball with a lower tone at impact and fewer impacts per minute of play. One half as loud means 10 dB lower sound level. Figure 10 shows the sound levels from a tennis source position closest to the homes to the north. The white circles indicate LAFmax levels in dB at each receiver at a height of 1.5 meters or 5 feet. This is the height at ear level for most people. This color map shows how sound propagates away from the courts. The design objective would be to have all homes in a green zone where sound is below 50 dB LAFmax. This is achieved with tennis.

Several points about sound propagation from tennis are seen in this figure.

- The sound level decreases at greater distances from the source.
- The sound level on the side of a house away from the source is lower than on the side facing the source – the house acts as a sound barrier and creates a shadow zone for sound.
- A shadow zone exists on the side of the house away from the courts – the house and the roof line function as sound blockers or barriers.
- All the sound levels are below 50 dB LAFmax – no complaints would be expected.

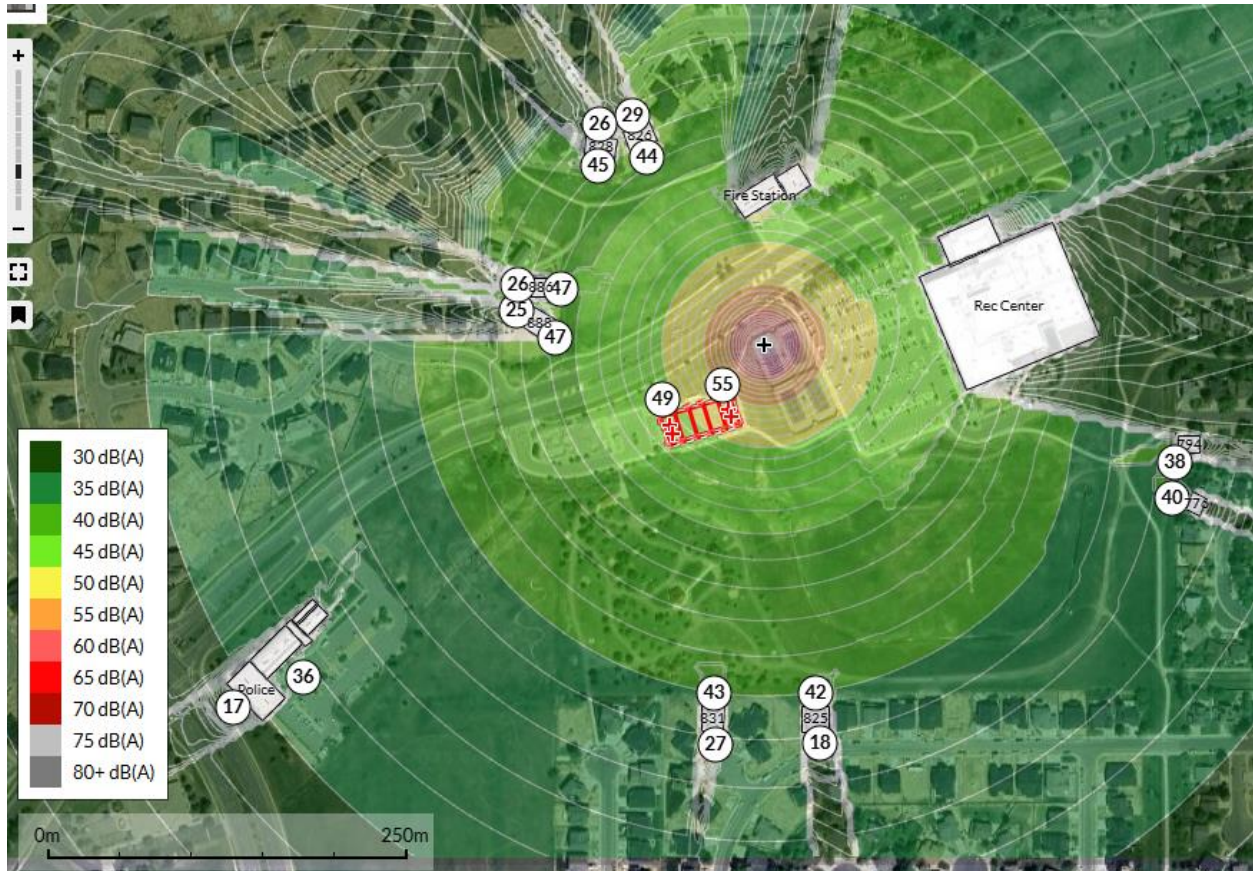


Figure 10 – Sound estimates from tennis

Pickleball sound is louder than tennis. Figure 11a shows the pickleball sound levels from source 1 at multiple locations for sound traveling to the north if no sound mitigation were in place. The black “plus symbol” shows the sound source at a height of 1.5 meters above the ground. This source location is at the non-volley zone line closest to the north. The non-volley zone is the position where the hardest paddle strikes are made and where most rallies occur. The white circles indicate LAFmax levels in dB at each receiver at a height of 1.5 meters or 5 feet. This is the height at ear level for most people. Home addresses are indicated on each roof. This color map shows how sound propagates away from the courts and

transitions from zones of red to pink to orange to yellow and to green. The design objective would be to have all homes in a green zone where sound is below 50 dB LAFmax.

Sound levels at 56 dB to 61 dB LAFmax occur at the closest property lines to the north with no mitigation in place. These are above the design objective and would be objectionable. Figure 11b shows the pickleball sound levels from source 1 for sound traveling to the south if no sound mitigation were in place. Lower sound levels are seen due to the greater distance to the homes, but these levels at 56 dB LAFmax are still above the design objective. Figures 11a and 11b will serve as a baseline for later estimating the effectiveness of a sound barrier in reducing pickleball sound. Receiver positions just north of the courts are included to later show the effectiveness of a barrier at receivers near the court versus greater distances.

Note: Table 1 at the end of the report has a summary of these sound plots for source position 2 for all simulations and for all 4 source positions for the preferred designs.

Figure 11c shows a cross section of sound moving up the hill and down the hill from the courts. The higher elevation becomes critical for selecting the height of a sound barrier to reduce sound.

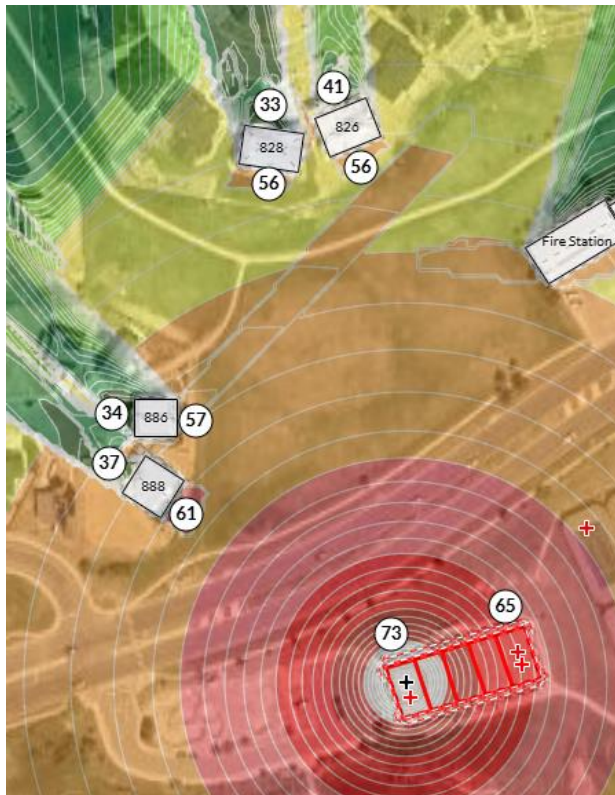


Figure 11a – North, Source 1, no barrier

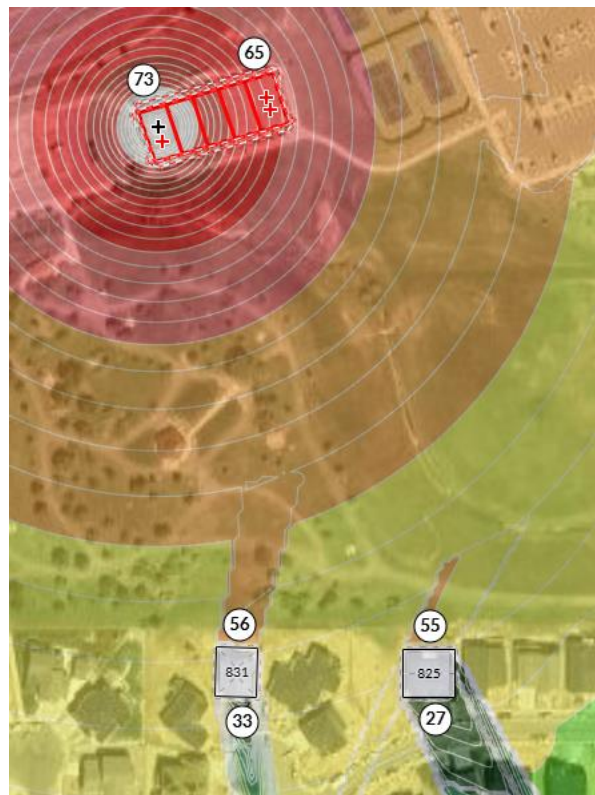


Figure 11b – South, Source 1, no barrier

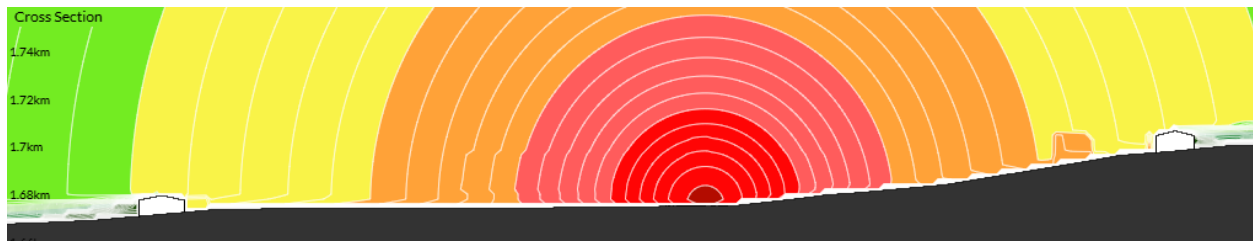


Figure 11c – Sound to the north and south, Source 1, no barrier

Next, the sound source was moved to location 2 on the courts. This is done to establish a second baseline with no mitigation since the effectiveness of a sound barrier can change based on distance from the sound source.

Figure 12a shows the pickleball sound levels from source 2 for sound traveling to the north if no sound mitigation were in place. Figure 12b shows the pickleball sound levels from source 2 for sound traveling to the south if no sound mitigation were in place. Sound levels change slightly due to this source position change but still range from 56 dB to 60 dB LAFmax. These sound levels would be considered objectionable. However, the source position change is more noticeable with a barrier in place.

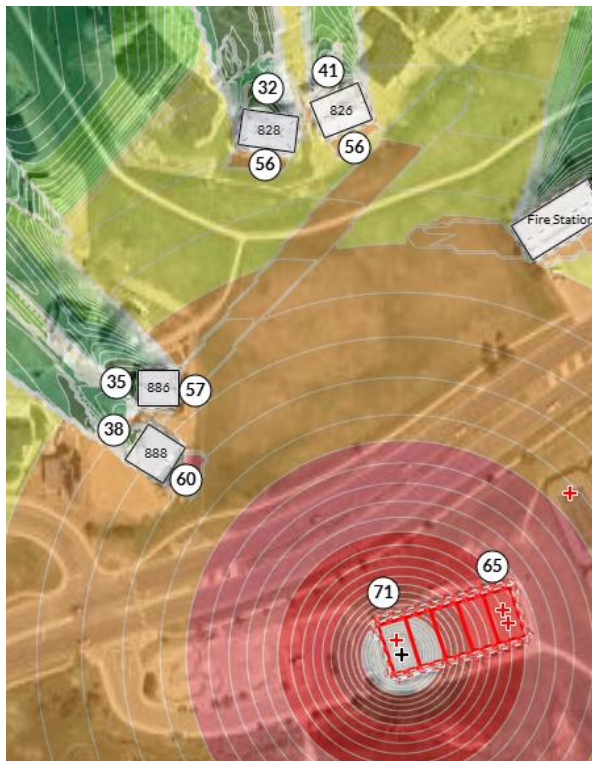


Figure 12a – North, Source 2, no barrier

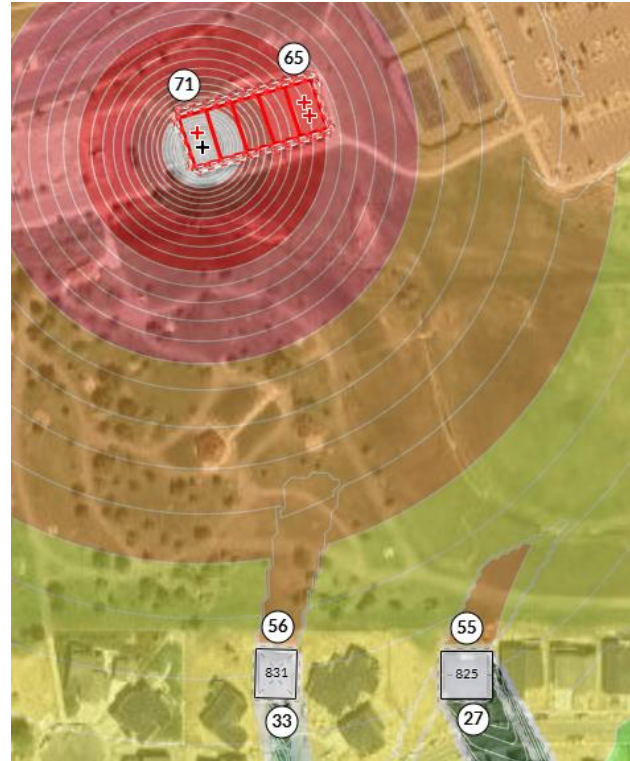


Figure 12b – South, Source 2, no barrier

Figure 12c shows the pickleball sound levels from source 2 for sound traveling to the east and west if no sound mitigation were in place. The sound levels at West Pinyon Way and the police station are lower due to a greater distance from the courts and due to lower pickleball sound at 90 degrees to the direction of play. No objections would be expected in this case as sound levels are below 50 dB LAFmax.

These results show this behavior for pickleball sound with no mitigation.

- The sound level decreases at greater distances from the source.
- With no homes blocking a direct line of sight to the courts, sound levels decrease with distance from the courts.
- Homes with a backyard facing the courts will have a direct line of sight to the courts and sound levels are above the design objective.
- The sound level on the side of a house away from the source is lower than on the side facing the source – the house acts as a sound barrier and creates a shadow zone for sound.
- A shadow zone exists on the side of the house away from the courts – the house and the roof line function as sound blockers or barriers.

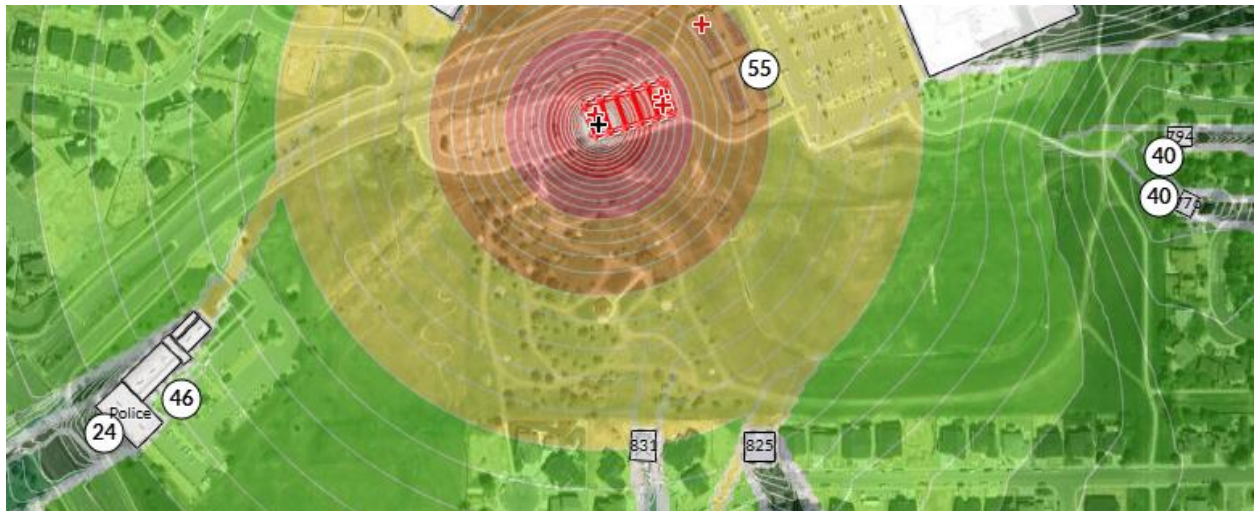


Figure 12c – Sound to the east and west, Source 2, no barrier

Sound mitigation strategies were next evaluated to create green sound zones for homes nearest the courts. The most effective way to reduce pickleball sound is a sound barrier of a height that will block the horizontal path of sound and limit the amount of sound “spilling” over the top of the barrier. A description of sound barriers, best practices for installing sound barriers, and sound barrier suppliers is presented in Appendix A.

When sound barriers are used to mitigate the sound, they are most effective when placed nearest the source (or receiver). The higher the barrier, the more effective it is in limiting the sound spilling over the

top. To reduce the sound levels at higher elevations above the courts (Larkspur Court and Trail Ridge Drive), the line of sight between the sound source and the receiver must be blocked.

The most cost effective sound barrier system would use the existing eight foot fencing of the hockey rink with a simple mass loaded vinyl barrier. A mass loaded vinyl barrier is a sound blocking barrier, but it also reflects sound in the opposite direction. An 8 foot sound barrier was placed on the hockey fence on the north and south sides of the courts, including the corners. The east and west sides are kept open because of the lower sound levels at the more distant homes in these directions. Figures 13a, 13b, 13c, and 13d show the sound levels at the nearest properties to the north and south with an 8 foot sound barrier for source positions 1 and 2.

Figures 13a and 13b compare sound to the north from source positions 1 and 2, respectively. Slightly higher sound levels are seen at the same receiver positions with the source farther from the sound barrier. Comparing 13a with an 8 foot barrier to Figure 11a with no barrier, only a 1 dB reduction in sound levels is seen. The barrier is not high enough to provide sound reduction at higher elevations above the court.

Figure 13e shows the cross section of sound from source 2 with the 8 foot barrier. Trivial difference in the sound pattern is seen when compared to Figure 11c with no barrier.

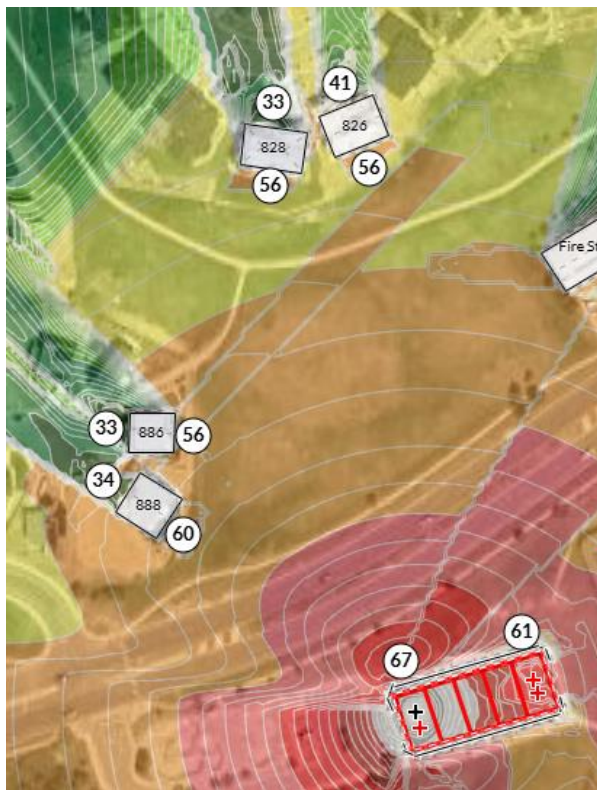


Figure 13a – Source 1, 8 foot sound barrier

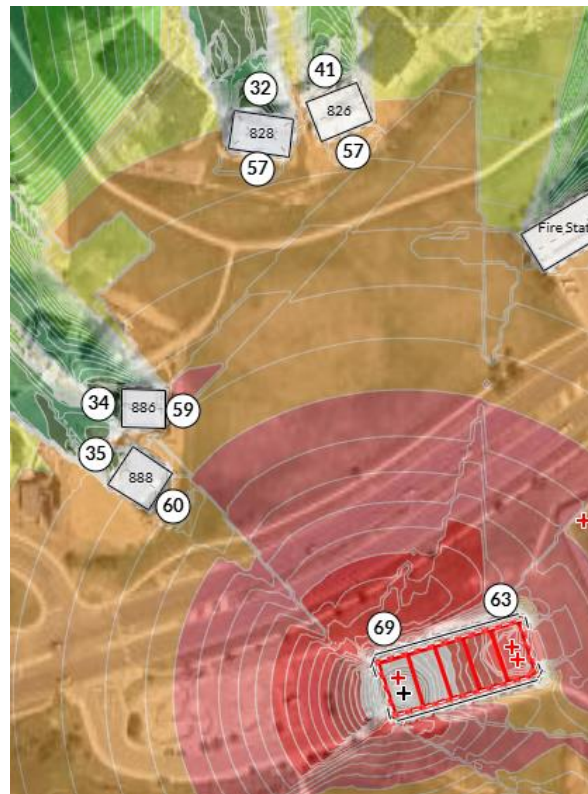


Figure 13b – Source 2, 8 foot sound barrier

Figures 13c and 13d compare sound to the south from source positions 1 and 2, respectively. Slightly higher sound levels are seen at the same receiver positions with the source farther from the sound barrier. Comparing 13C with an 8 foot barrier to Figure 12a with no barrier, a 1 dB increase in sound levels is seen at Trail Ridge Drive. The barrier is not high enough to provide noise reduction at higher elevations above the court. Also, sound is reflected from the south barrier and redirected in the opposite direction.

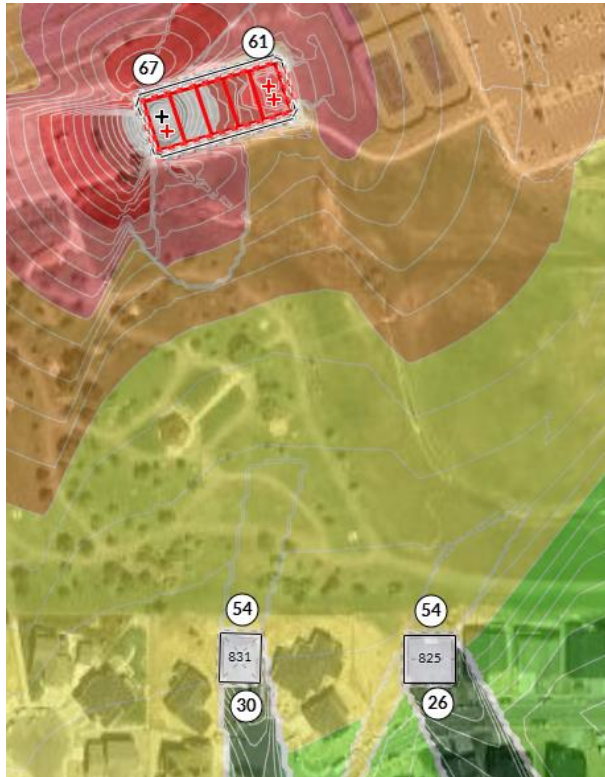


Figure 13c – Source 1, 8 foot sound barrier

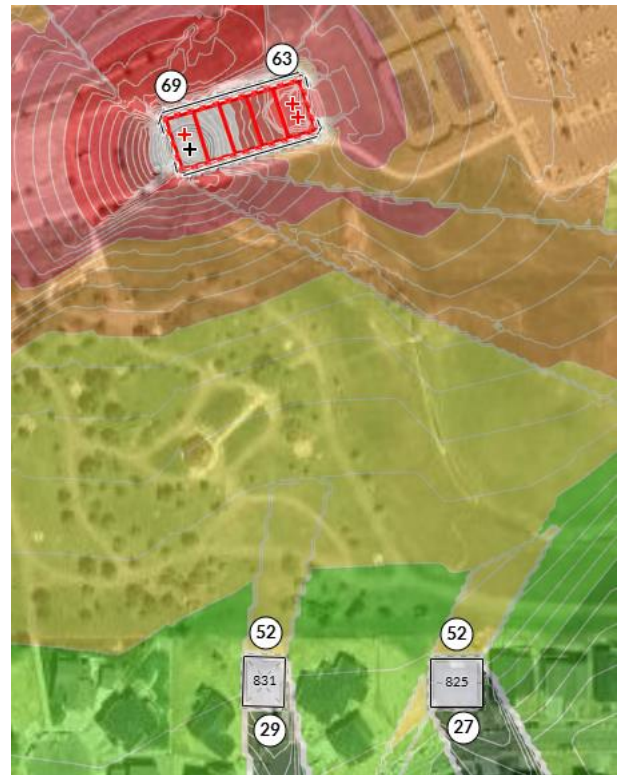


Figure 13d – Source 2, 8 foot sound barrier

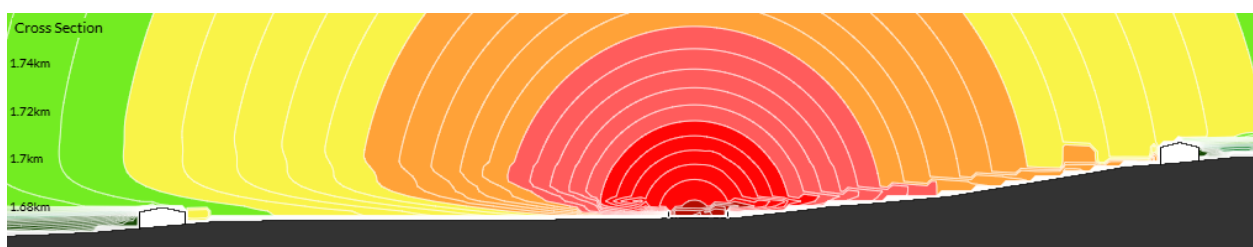


Figure 13e – Source 2, 8 foot sound barrier, cross section

Figure 13f shows the impact of the rise in elevation from the court to Trails Edge Drive. The angle of the slope is approximately 7 degrees. The black dots represent a source at 5 feet above ground level at the center of the court and a receiver at 5 above ground level at Trails Edge Drive. The dotted line shows the line of sight into the center of the court. The black square is a 10 foot barrier wall that just touches this line of sight. If a line of sight exists between the source and the receiver, sound will easily travel along this path. The only sound reduction will be sound reduction with distance as shown in Figures 3 and 4.

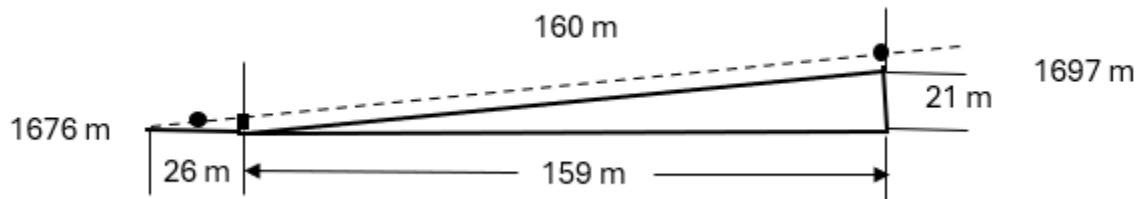


Figure 13f – Elevation between court and Trails Edge Drive (not to scale)

This shows that the effectiveness of sound barriers depends on height, placement, and reflecting surfaces. Also, the most critical source location is position 2, farthest from the sound barrier. For effective noise mitigation at these courts, these 3 points must be considered:

1. The sound barrier must be high enough to limit the sound spilling over the top.
2. The sound barrier becomes more effective the closer it can be placed to the court (the source)
3. The sound barrier on the opposite wall can reflect sound in the opposite direction.

The highest sound levels on Larkspur Court and Trail Ridge Drive show that attention must be focused on a sound mitigation design that addresses these receivers.

Next, a 12 foot mass loaded vinyl barrier was evaluated in the same position as the hockey fence boundary. This reduced sound levels to 57 dB LAFmax at Larkspur Court and Trail Ridge Drive and 51 dB LAFmax at West Mulberry. These are still above the design objective. Additional sound estimates were made with 14, 16, and 18 foot sound barriers, but none were able to achieve favorable sound levels at or near the design objective at all homes.

To reduce reflected sound, a 12 foot barrier with a sound absorbing inner liner was evaluated. Figures 14a and 14b show the sound levels to the north and south respectively from source position 2. The sound level to the north is still above the design objective, indicating that a higher barrier is needed. The sound level to the south meets the design objective, indicating that a lower barrier is possible. Figure 14c shows the cross section to the north and south which indicates how sound still spills over the top of the barrier.

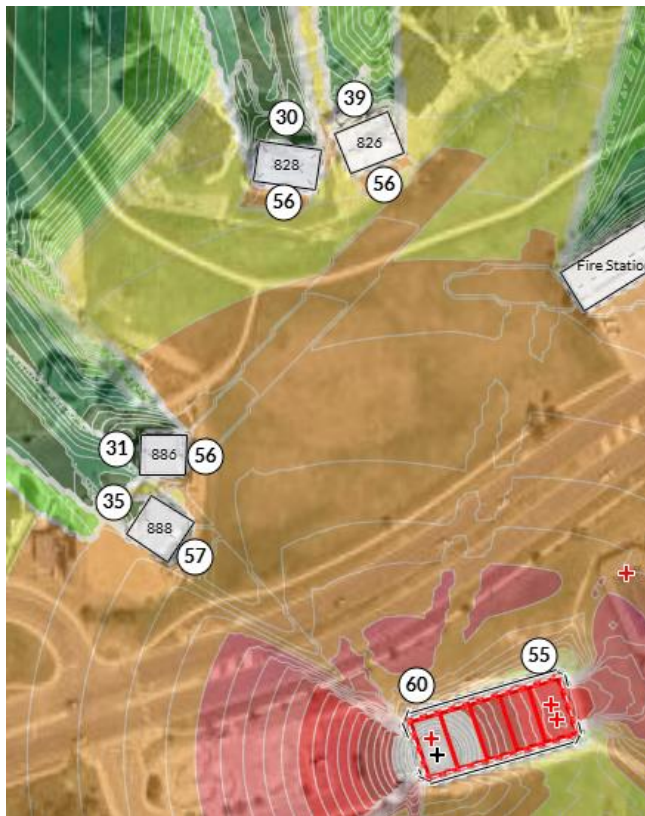


Figure 14a – Source 2, 12 foot absorbing barrier

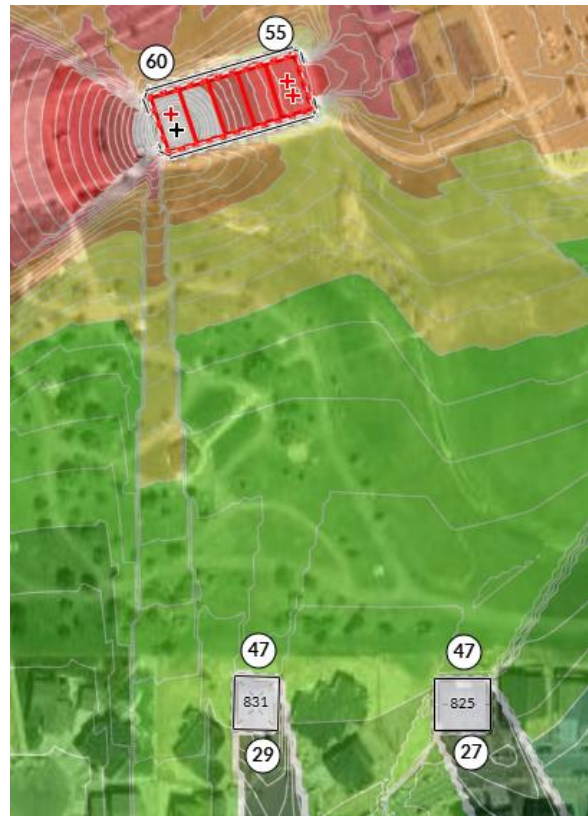


Figure 14b – Source 2, 12 foot absorbing barrier

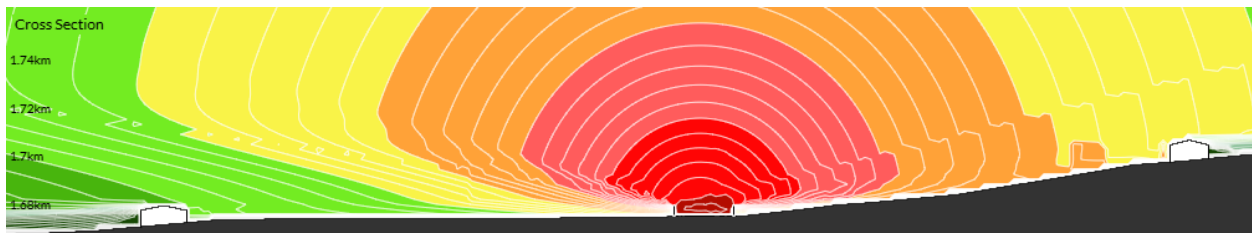


Figure 14c – Source 2, 12 foot absorbing barrier, cross section

The sound barrier was raised in 2 foot increments on the north side until the design objective was met. This required a barrier at 18 feet on the north side. The south side barrier was lowered to 10 feet. Figures 15a and 15b show that the sound levels to the north for this source position are within 1 to 2 dB of the design objective. This is considered acceptable.



Figure 15a – Source 2, 18 ft absorbing barrier on N wall and 10 ft absorbing barrier on S wall



Figure 15b – Source 2, 18 ft absorbing barrier on N wall and 10 ft absorbing barrier on S wall

The 3 other source positions were next evaluated for the same 18 foot/10 foot sound barrier design. The sound levels are shown in Figures 16a, 16b, 16c, and 16d.

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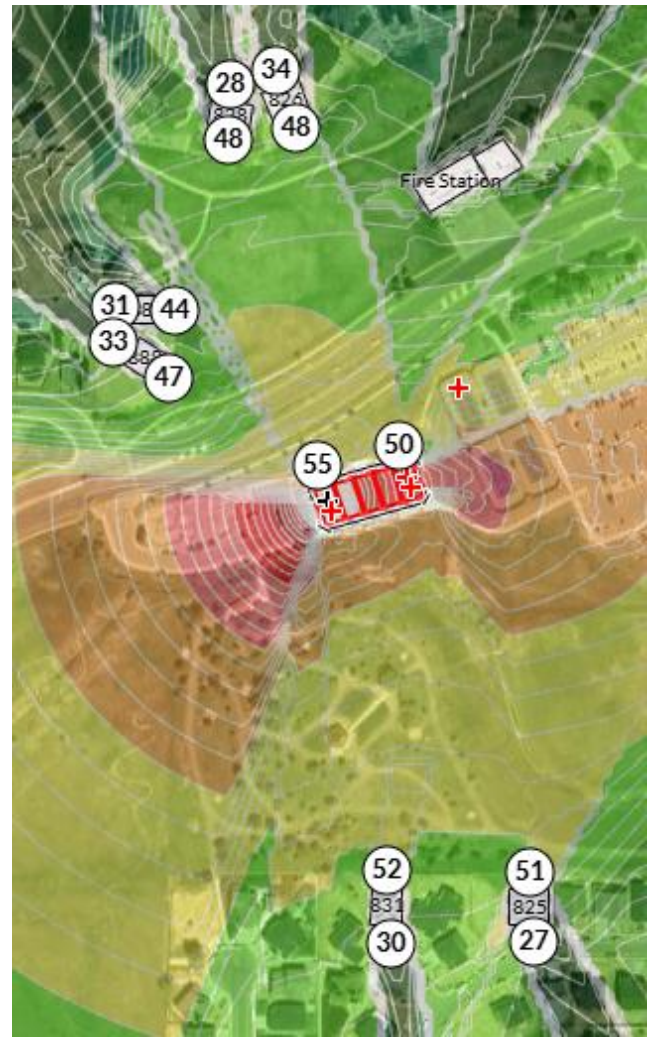
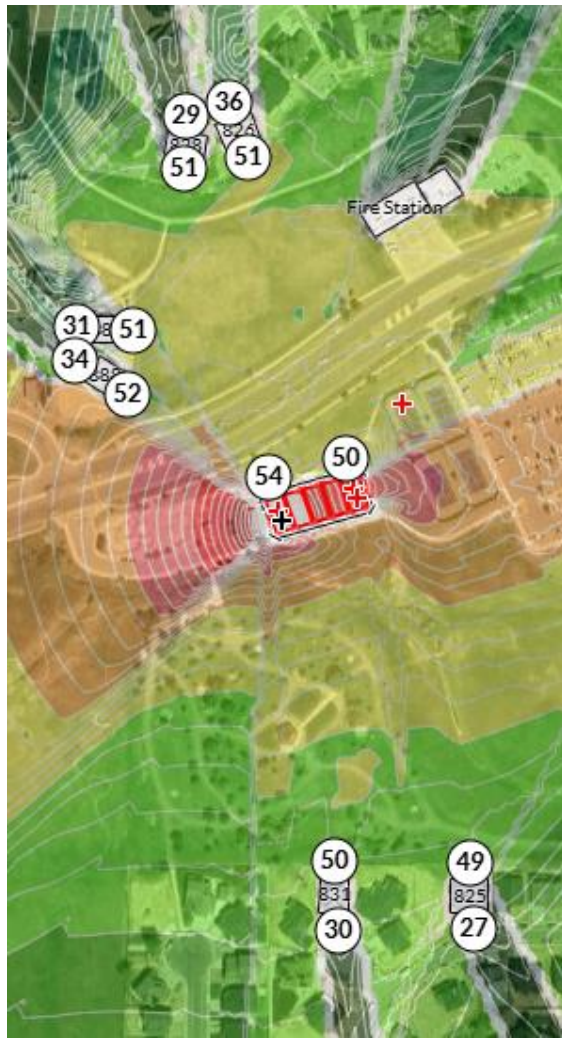


Figure 16a – Source 2, 18 ft/10 ft absorbing barrier Figure 16b – Source 1, 18 ft/10 ft absorbing barrier

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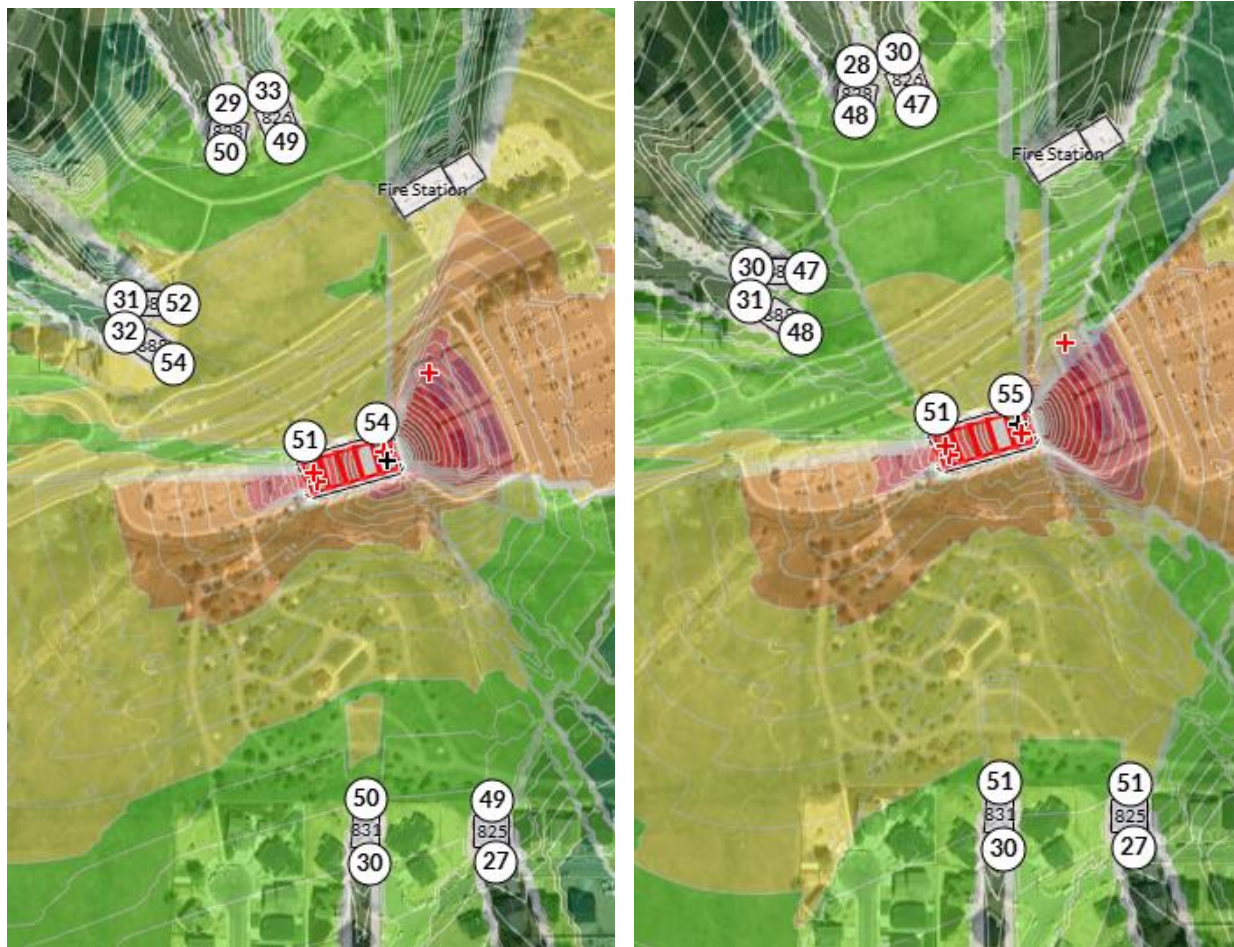


Figure 16c – Source 3, 18 ft/10 ft absorbing barrier Figure 16d – Source 4, 18 ft/10 ft absorbing barrier

Figure 16e is a cross section of the sound field and shows how the higher barrier to the north directs the sound upward. This is much different than Figure 13e with an 8 foot barrier and Figure 14c with a 12 foot barrier where sound spills over the top of the barrier and continues to travel uphill.

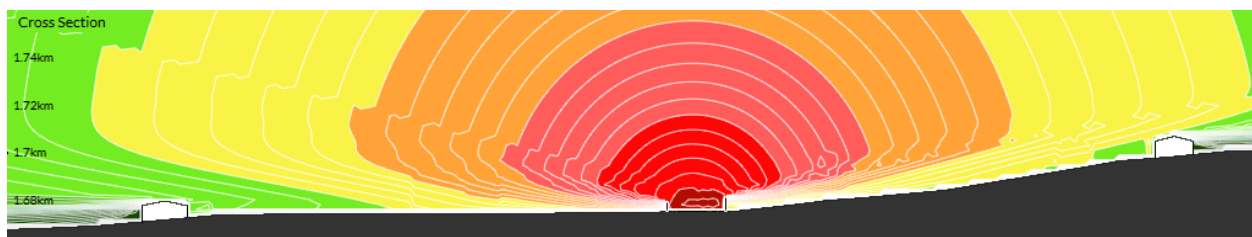


Figure 16e – Source 2, 18 ft/10 ft absorbing barrier, cross section

Sound levels to the east and west would not be above the design objective since the “no sound mitigation” baseline in Figure 12c showed levels below 50 dB on West Pinyon Way.

The previous sound maps showed sound from three individual courts. If all 5 courts were active at the same time, the sound levels would not be 5 times louder. This is because the individual pickleball impacts from each court are separate events that occur randomly in time. With simultaneous activity on 5 courts, the number of impacts per hour would be 5 times the number of impacts from one court. The goal of sound mitigation is to reduce the sound from the loudest pickleball impacts so that a listener is unbothered by activity from the loudest sound from one court or from all 5 courts. With proper sound mitigation, sound levels below the loudest levels will then be even less noticeable.

All the previous models placed the sound barrier on the perimeter of the hockey rink. An option was considered with the sound barrier placed on the perimeter of the pickleball courts. This moves the barrier closer to the sound source and makes the barrier more effective in reducing sound. Figure 17a shows the sound levels with a 16 foot sound absorbing barrier on the north side, a 16 foot reflecting barrier on the west side of the court, and a 10 foot sound absorbing barrier on the south side. The west side of the court could also be a sound absorbing barrier. If an open viewing area to the west is required, then transparent sound barriers in mass loaded vinyl or impact glass (Pickleglass) could be used – see Appendix A. Sound levels with this design meet the design objective. The tradeoff is a 16 foot high barrier on the north and west sides of the courts against an 18 foot barrier on the north side (and the north corners of the hockey rink) with an open west wall.

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Figure 17a – Source 2, 16 ft absorbing barrier on north court side, 16 foot reflecting barrier on west court side (transparent), 10 ft sound absorbing barrier on south court side

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Figure 17b shows the cross section of the sound traveling to the north and to the south. The sound is contained by the walls surrounding the court and blocked at higher elevations.

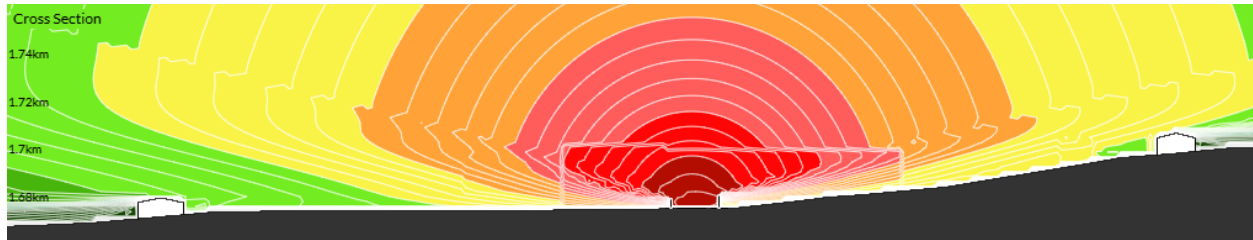


Figure 17b – Source 2, 16 ft absorbing barrier on north court side, 16 foot reflecting barrier on west court side, 10 ft sound absorbing barrier on south court side

The client requested an analysis of a design with a 15 foot barrier at the hockey rink elevation of 5505 feet and a 5 foot barrier near the road at an elevation of 5515 feet (7). The top of both walls would be 5520 feet. Figure 18a shows that the sound levels are higher than either Figure 16a with an 18 foot barrier or in Figure 17a with a 16 foot barrier. This is because the added 5 foot wall adds no sound blocking as shown in the cross section on Figure 18b. A barrier above 5 feet and preferably closer to 10 feet is needed for this additional wall farther from the court.

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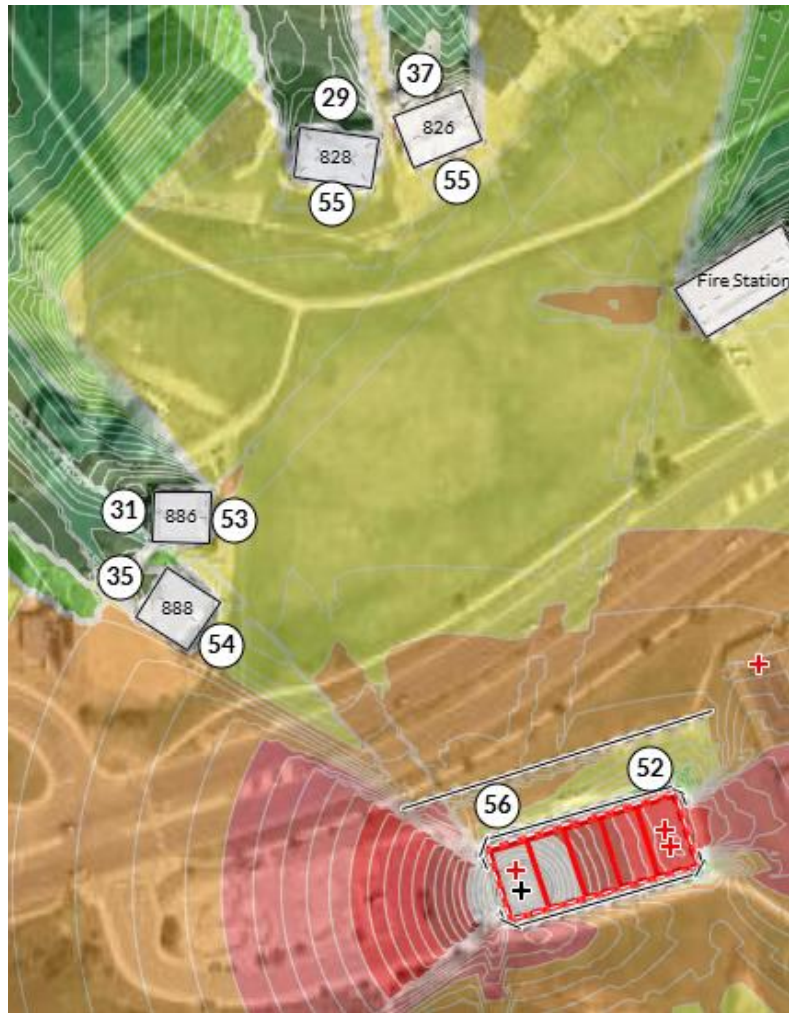


Figure 18a – Source 2, 15 ft absorbing barrier on north side, 10 ft sound absorbing barrier on south side, 5 foot barrier near road

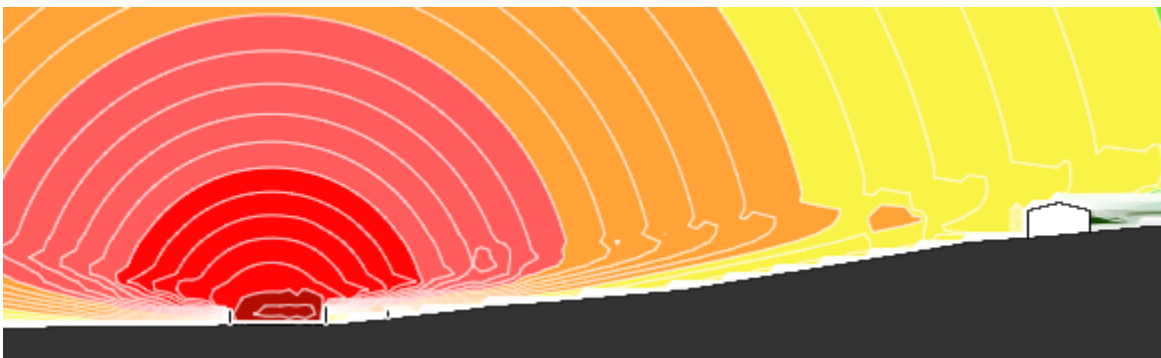


Figure 18a – Source 2, 15 ft absorbing barrier on north. 10 ft sound absorbing barrier on south court side, 5 foot barrier near road

An alternative option for pickleball would be to orient the courts in the east west direction. This layout directs the highest sound in the east west direction of play. Figure 19 shows a proposed court layout for 4 courts. (A 6 court east west layout is possible, but this requires elimination of the rounded corners of the hockey rink.) The closest homes to the east are farther from the courts than homes to the north. These homes to the east also are at an elevation near or below the court elevation where sound barriers more effectively block sound than they do for receivers at higher elevations. A lower level of sound is now directed to the nearest homes at higher elevations on Larkspur Court and Trails Edge Drive.



Figure 19 - 4 court layout in east west direction with sound sources

Starting with the 8 foot fence of the hockey rink, Figures 20a and 20b show the sound levels in the north south direction with an 8 foot barrier on the north side, south side, and all 4 corners. Sound levels at Larkspur Court and Trails Edge Drive are above the design objective.

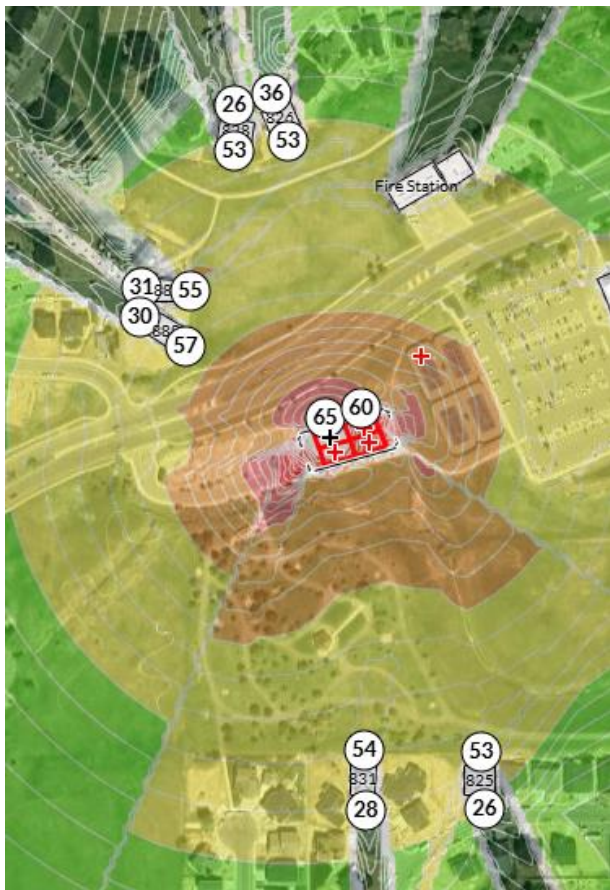


Figure 20a – Source 1, 8 foot barrier

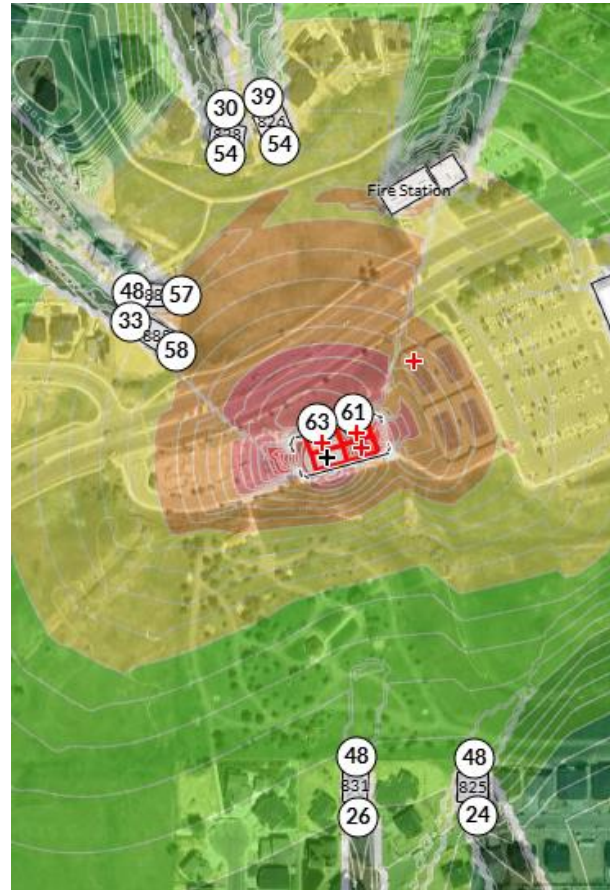


Figure 20b – Source 2, 8 foot barrier

Several sound barrier designs were evaluated considering barrier height and sound absorbing liners to arrive at an optimized design for this east west layout. This design included a 16 foot high sound absorbing barrier for the north side of the hockey rink and 10 foot sound absorbing barrier for the south side of the hockey rink. The north corners must extend to the centerline of the north courts. The barrier on the south side must extend 12 feet beyond the baseline but no corners are needed. Figures 21a, 21b, 21c, and 21d show the sound levels to the north and south for each source position. Figures 21a and 21d show that all sound levels meet the design objective with the sound source closest to the north barrier. Figures 21b and 21c show sound levels above the design objective when the ball is struck from positions farther from the barrier. The levels are considered just above the design objective. They are considered acceptable since the design objective is not exceeded at other positions. Also, the minimum change in sound detectable by the human ear is a 3 dB change.

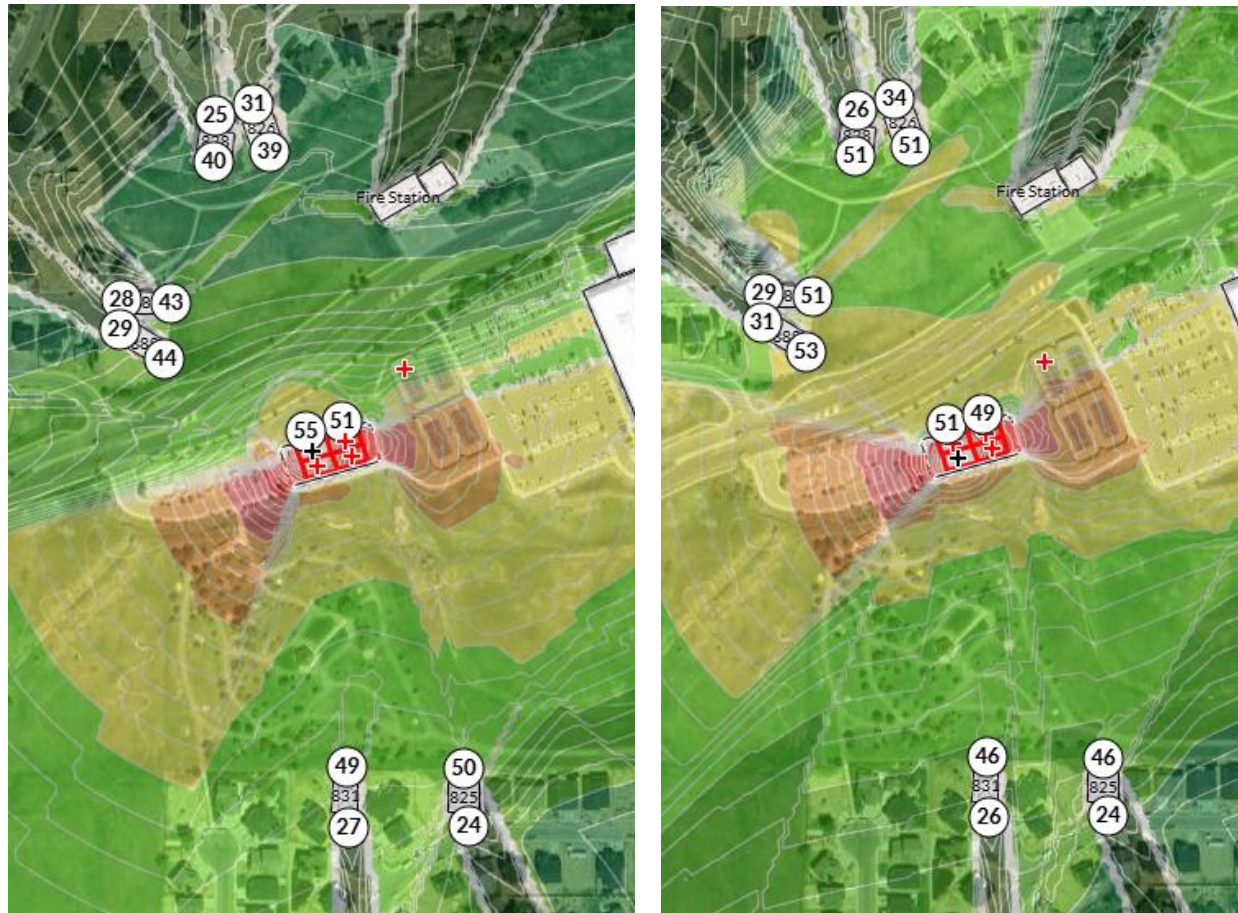


Figure 21a – Source 1, 16 ft/10 ft absorbing barrier Figure 21b – Source 2, 16 ft/10 ft absorbing barrier

Figure 21e shows sound levels to the east and west. These sound levels are well below the design objective. Figure 21f shows the sound barriers in place.

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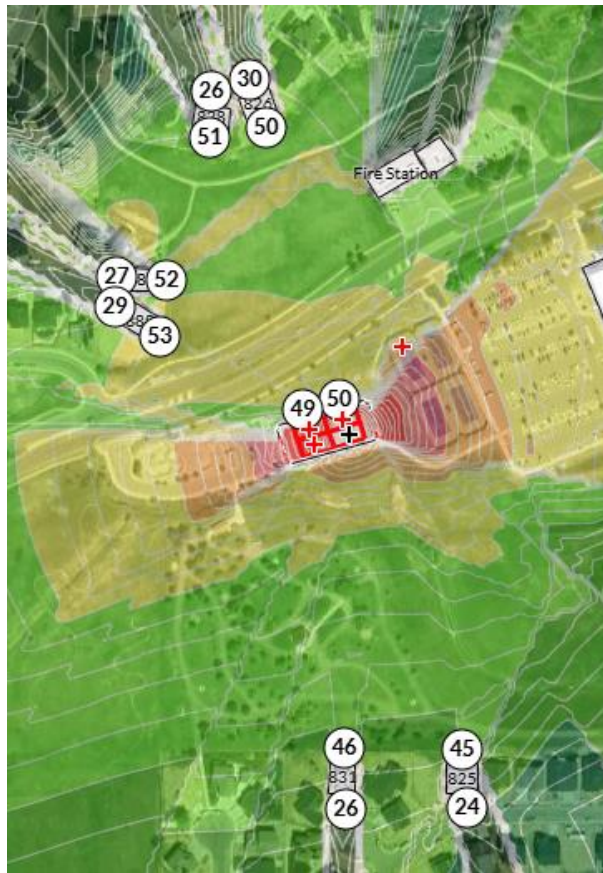


Figure 21c – Source 3, 16 ft/10 ft absorbing barrier Figure 21d – Source 4, 16 ft/10 ft absorbing barrier

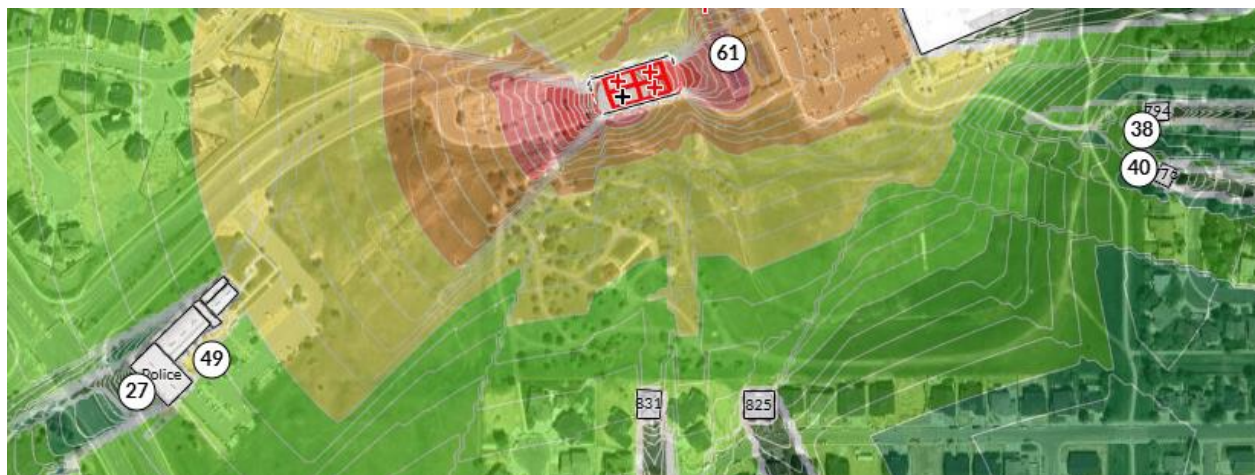


Figure 21e – Source 2, 16 ft/10 ft absorbing barrier

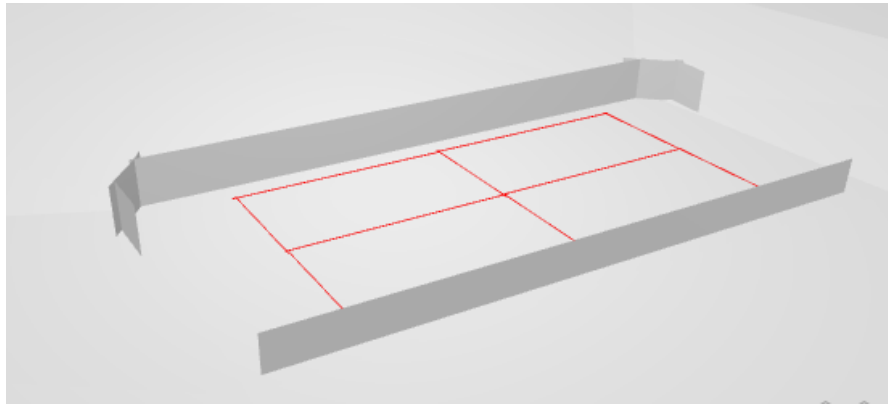


Figure 21f –16 ft absorbing barrier on north side and 10 ft absorbing barrier on south side

Recognizing that a 16 foot wall is above the common 12 foot chain link fence height, a comparison was made with a reduction in height on the north to a 12 foot barrier. Figure 22 shows the sound levels with the 12 foot north and 10 foot south sound absorbing walls.



Figure 22 – Source 2, 12 ft/10 ft absorbing barrier

Next, the 16 foot and 10 foot barriers were moved to the perimeter of the pickleball fence to evaluate sound levels. A closer placement to the source allowed a north fence height of 14 feet. With the elimination of the extended barrier on the northwest hockey corner, a sound barrier was needed on the west wall to block sound to the northwest (like in Figure 17a). Comparing Figure 23 (court perimeter barrier with west barrier) to Figure 21b (hockey perimeter barrier), lower sound levels are achieved at homes to the north. To permit spectator viewing from the west, the west wall could be a transparent mass loaded vinyl or high impact glass. Figure 24 shows the barriers placed on the court perimeter.



Figure 23 – Source 2, 14 ft absorbing barrier N, 10 ft absorbing barrier S, 14 foot reflecting barrier (transparent) W – on court perimeter

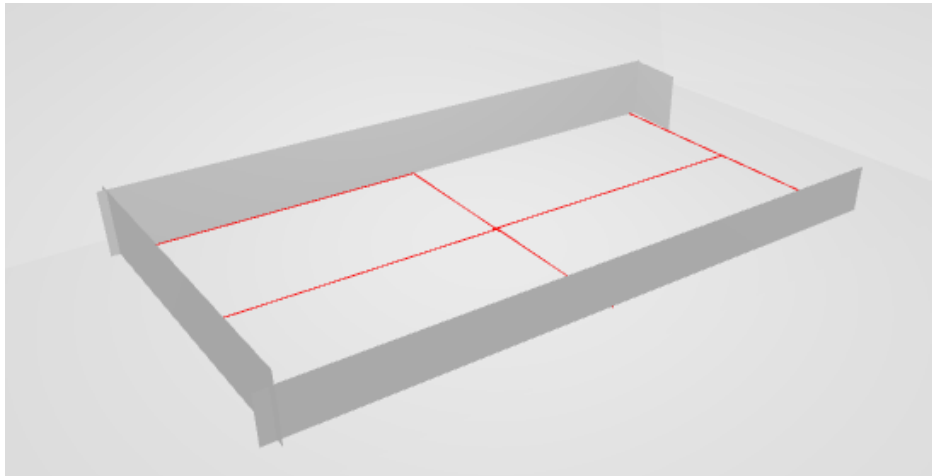


Figure 24 –14 ft absorbing barrier N, 10 ft absorbing barrier S, 14 foot reflecting barrier (transparent) W

The court layout in Figure 19 could be separated to create a north south spectator area between the courts with no change in sound levels. This provides a viewing area if sound barriers are placed on the court perimeter.

The prior figures show the sound reduction that can be achieved with barriers. If additional sound reduction is needed or if the height of the barriers is limited by local zoning, then additional sound reduction can be achieved with a select group of quieter paddles and balls. The paddles in Appendix B have been tested to be quieter than the loudest paddles in use. Louisville Recreation Center (7) did not wish to consider this option for noise mitigation, but it is mentioned for completeness or if barrier heights are not permitted per zoning requirements.

Noise reduced paddles and balls are being developed and promoted. However, these special paddles and balls are not silent – they are a few dB quieter than the loudest paddles and balls sold at the big box sporting goods stores and commonly used by recreational players. A description of quiet balls and paddles is in Appendix B. These Blue List paddles will reduce any sound level by 3 dB or more. This means that a sound level of 53 dB LAFmax will now be 50 dB LAFmax, or less depending on paddle type. It also means that barrier heights can be reduced by about 3 feet or more. It should be noted that a mandate to only use approved special equipment often requires players to purchase new equipment. A policy to use preferred equipment is difficult to enforce and requires either a method to assure compliance or an on-site court monitor.

A few pickleballs on the Blue List will provide an additional 3 dB of noise sound when used with any paddle. This means that a Blue list paddle (-3 dB) and a quieter ball (-3dB) can provide an additional 6 dB sound reduction in addition to the sound reduction by the barrier. Again, these balls are not used for tournament play, not favored by skilled players, and require a court monitor to assure their use.

One nonstandard ball does provide noticeable noise reduction of 18 dB when used with any paddle. This is the Gamma Librarian foam pickleball. This ball is quieter than any plastic pickleball but has several drawbacks compared to the standard pickleball. It has a different bounce; it has a different response from the paddle; and it is easily affected by wind. Most players only favor this ball for indoor practice. This approach also requires a control system or court monitor during all hours of play to check that no plastic pickleballs are in use. This ball is not recommended as it will not find favor among recreational or skilled players because of its different response compared to the traditional plastic ball.

Restricted court times can reduce the exposure to pickleball sounds to certain hours of the day. This has the disadvantage of limiting court availability and creating longer waiting times for the players when the courts are available. This is more of an on-off noise strategy.

Table 1, which follows, is a summary of noise levels for different barrier designs. Sound levels at each receiver (or home) will vary based on source position. For some barrier designs, sound levels are shown for all 4 source positions. This table should be compared to the sound maps for each figure which show green zones where sound would not be objectionable. The goal would be to have all homes in a green zone. The minimum sound change detectable by the human ear is 3 dB.

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Table 1 – Sound Levels and Sound Reduction Options

	Sound Barrier Height	Barrier position	Barrier type	Source Position	Figure	dB LAFmax per source position					Sound reduction vs no barrier - dB LAFmax				
						Fence perimeter	888 Larkspur	828 Trail Ridge	831 W Mulberry	794 W Pinyon	Fence perimeter	888 Larkspur	828 Trail Ridge	831 W Mulberry	794 W Pinyon
Tennis															
	no barrier			Tennis	10	49	47	45	43	38					
Pickleball - 5 courts north south															
	no barrier		no barrier	1	11a,11b	73	61	56	56						
	no barrier		no barrier	2	12a, 12b, 12c	71	60	56	56	40					
	8 feet	Hockey rink	Reflecting	2	13b, 13d	69	60	57	52		-2	0	1	-4	
	12 feet	Hockey rink	Reflecting	2	None	62	57	57	51		-9	-3	1	-5	
	16 feet	Hockey rink	Reflecting	2	None	58	53	55	46		-13	-7	-1	-10	
	18 feet	Hockey rink	Reflecting	2	None	56	52	54	44		-15	-8	-2	-12	
	12 feet	Hockey rink	Absorbing	2	14a,14b	60	57	56	47		-11	-3	0	-9	
	18 ft N/10 ft S	Hockey rink	Absorbing	2	15a,15b,16a	54	52	51	50		-17	-8	-5	-6	
	18 ft N/10 ft S	Hockey rink	Absorbing	1	16b	55	47	48	52		-18	-14	-8	-4	
	18 ft N/10 ft S	Hockey rink	Absorbing	3	16c	51	54	50	51						
	18 ft N/10 ft S	Hockey rink	Absorbing	4	16d	51	48	47	51						
	16 ft N/10 ft S/16 ft W	PB court	Absorb/Refl	2	17a	57	47	51	49		-14	-13	-5	-7	
	15 ft N/10 ft S/5 ft road	Hockey rink	Absorbing	2	18a	56	54	55			-15	-6	-1		
Pickleball - 4 courts east west															
	8 feet	Hockey rink	Reflecting	2	20b	63	58	54	48		-8	-2	-2	-8	
	14 ft N/10 ft S	Hockey rink	Absorbing	2	None	52	55	53	46	38	-19	-5	-3	-10	-2
	14 ft N/10 ft S	Hockey rink	Absorbing	1	None	56	47	42	46		-17	-14	-14	-10	
	14 ft N/10 ft S	Hockey rink	Absorbing	3	None	51	55	53	49						
	14 ft N/10 ft S	Hockey rink	Absorbing	4	None	53	46	42	49						
	16 ft N/10 ft S	Hockey rink	Absorbing	2	21b	51	53	51	46	38	-20	-7	-5	-10	-2
	16 ft N/10 ft S	Hockey rink	Absorbing	1	21a	55	44	40	49		-18	-17	-16	-7	
	16 ft N/10 ft S	Hockey rink	Absorbing	3	21c	49	53	51	46						
	16 ft N/10 ft S	Hockey rink	Absorbing	4	21d	51	44	40	49						
	12 ft N/10 ft S	Hockey rink	Absorbing	2	22	54	57	53	46		-17	-3	-3	-10	
	14 ft N/10 ft S/14 ft W	PB court	Absorb/Refl	2	23	55	50	52	45		-16	-10	-4	-11	
					50 or less										
					51 to 54 dB										
					55 dB or more										

Conclusions

The following conclusions are made from the results of this study.

1. Without sound mitigation, pickleball play on the proposed 5 courts at the hockey rink at Louisville Recreation Center would create sound levels of 56 dB to 60 dB LAFmax at the closest residences to the north on Larkspur Court and Trails Edge Drive and to the south on West Mulberry Street. These levels are above the design objective of 50 dB LAFmax and would lead to complaints.
2. Without sound mitigation, the pickleball sound level to the east on West Pinyon Way is 40 dB LAFmax, which is below the design objective.
3. The closest homes north of the courts are at a higher elevation than the courts, have the highest sound levels from pickleball, and are the primary focus for noise mitigation. These homes have a direct line of sight into the courts which is also a direct path of sound travel.
4. When an 8 foot sound barrier was placed on the north and south sides of the existing 8 foot high fence of the hockey rink, the sound levels to the north were not noticeably reduced. Pickleball sound is spilling over the top of an 8 foot sound barrier to receivers at a higher elevation.
5. Several design options with higher barriers and sound absorbing liners were evaluated until the sound levels at the closest homes to the north and south were at or just above the design objective. These 2 options are:
 - a. Using the hockey rink perimeter - 18 foot sound barrier with sound absorbing barrier on the north fence and north corners; 10 foot sound barrier with sound absorbing barrier on the south fence and south corners; open east and west walls.
 - b. Using the pickleball court perimeter - 16 foot sound barrier with sound absorbing barrier on north fence and north corners; 10 foot sound barrier with sound absorbing barrier on south fence and south corners; 16 foot sound barrier on west wall, east wall open
6. With the courts oriented in an east west direction, the sound level is reduced in the critical north to south direction but still requires sound barriers. This orientation allows 4 courts without removing the rounded hockey corners.
7. With an east west court orientation, several design options with higher barriers and sound absorbing liners were evaluated until the sound levels at the closest homes to the north and south were at or just above the design objective. These 2 options are:
 - a. Using the hockey rink perimeter - 16 foot sound barrier with sound absorbing barrier on north fence and north corners; 10 foot sound barrier with sound absorbing barrier on south fence; open east and west sides.
 - b. Using the pickleball court perimeter - 14 foot sound barrier with sound absorbing barrier on north fence and north corners; 10 foot sound barrier with sound absorbing barrier on south fence and south corners; 14 foot reflecting (transparent) barrier on west fence; open east side.
8. No single sound barrier design will provide the same sound levels everywhere unless even higher sound barriers are used, or an enclosure is placed around the courts. Any reduction in the height

of any sound barrier will increase the sound level by approximately 1 dB per foot in the direction of sound over the barrier.

9. Options to further reduce sound levels or to reduce barrier height are described using quieter paddles and balls than the loudest equipment in use but this requires purchase of select equipment and a court monitor to assure use of this select equipment.

Recommendations

Due to the challenge of noise reduction for the closest homes at elevations above the courts that have a direct line of sight into the courts, the following recommendations are made for pickleball courts at the Louisville Recreation Center hockey rink.

1. The structural capabilities of the existing hockey fence foundation should be evaluated and compared to sound barrier height and weight for sound mitigation.
2. Of the 2 court layouts - 5 courts in north south direction or 4 courts in east west direction – the east west court layout allows lower fence heights.
3. While Table 1 provides a summary of sound levels under different sound mitigation scenarios for source position 2, the selected option should be based on the greatest area of green zones closest to the courts. All 4 options described in the conclusions are similar in terms of sound level results.
4. A sound barrier should be chosen from the supplier list in Appendix A or from any comparable vendor. A visit to nearby pickleball facilities with barriers in place will give an idea of design options which are simple to execute.
5. If the fence or foundation cannot support the weight of the barrier (1 pound per square foot or TL greater than 20 dB at 1000 Hz), then a structural wall as used on highway systems can be considered.
6. If pickleball courts are to be viewed by spectators, then the west sound barrier wall can be a transparent barrier as supplied by Hushtec, USA or a high impact glass material such as Pickleglass - when this wall is included in the chosen option.
7. The height of any sound barrier should not be reduced as this will increase the sound level by approximately 1 dB per foot of height reduction in the direction of sound over the barrier.

PSM Consulting LLC has provided these conclusions and recommendations on pickleball sound at Louisville Recreation Center to balance the growth and popularity of pickleball with acceptable sound levels for quality of life for the residents living near the courts. The goal is to develop pickleball recreational facilities at Louisville Recreation Center and to perform due diligence on sound mitigation for nearby residents. PSM Consulting LLC is available to answer any questions related to this work.

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Disclaimer

The results, conclusions, and recommendations presented here are based on information provided to PSMC LLC by the client and on measurements made using calibrated equipment and standard acoustical practices. These results are intended to address maximum sound levels from play. Pickleball sound assessment is a random process where the sound from each impact and from each game can vary based on player skill, force of impact, and equipment in use. Sound levels from pickleball are random impulsive events, meaning that it is predictable over a range and has averages and other statistical characteristics, but it has no exact single level. Actual sound levels will vary over time. In addition, it is not possible to determine what any particular person believes is an acceptable sound level. Because additional variables may be associated with the site, the players, or the equipment in use, PSMC LLC assumes no liability for work undertaken by the client based on these recommendations, or for results that do not conform to the client's expectations.

Barry R Wyerman, PhD, PE
Principal Acoustical Consultant
PSM Consulting LLC

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PSMC LLC Information

PSM Consulting LLC

PSMC LLC was created in 2022 after 8 years of pickleball sound studies and advice on pickleball sound mitigation. This work included field measurements of pickleball play at multiple sites, analysis of the sound from different pickleball paddles and balls, consultation with USA Pickleball on equipment standards, and evaluation of suppliers of sound barrier systems. PSMC has designed successful sound reduction systems for pickleball courts and has evaluated multiple paddles and balls to create lists of “quieter” paddles and balls. It has also completed field studies of pickleball sound to provide guidance to homeowners regarding local sound ordinances. In total, PSMC has completed or has been involved in sound surveys and recommended sound mitigations measures for 100 pickleball sites. PSMC is at the forefront of pickleball technology and is working directly with USA Pickleball to develop acoustical test methods for paddles, to identify quieter gear, and to create improved community standards for pickleball sound. It is also working with paddle manufacturers to help bring improved, quieter paddles to the market. PSMC LLC has developed the industry’s first anechoic chamber for testing both pickleball paddles and balls under controlled speed conditions. This provides baseline data on paddles without the variables of background sound and player skill in hitting the ball.

The mission of PSMC is to support pickleball clubs, pickleball players, communities, parks and recreation departments, country clubs, and homeowner associations with an understanding of pickleball sound and of strategies and measures to control pickleball sound.

Barry Wyerman, PhD, PE

Barry Wyerman, PhD, is the Principal Acoustical Consultant for PSMC LLC. He is a pickleball player and a USA Pickleball Level 2 Referee. His professional background includes over 45 years of acoustical experience in creating innovative acoustical products, solving industrial sound control and vibration problems, and designing solutions for automotive noise and vibration control. He is the owner of Acoustical Design and Consulting, LLC, which provides engineering and consulting support in all areas of acoustics and noise control. He has a BS degree in physics from Ohio University and MS and PhD degrees in engineering acoustics from Penn State University. He became involved in pickleball sound mitigation when he provided initial recommendations on pickleball sound control from his work experience and acoustical training. His professional associations include:

- The Acoustical Society of America
- Society of Automotive Engineers, Noise and Vibration Committee
- Society of Automotive Engineers, Acoustical Materials Committee
- Professional Engineer, registered in Ohio

Appendix A - Sound Barriers

Sound barriers block the direct path of sound as it travels from a source to a receiver. A barrier must be massive enough to block sound that could pass through it. The recommended weight for a barrier is one pound per square foot or a transmission loss of 20 dB at 1000 Hz. A small amount of sound still passes over the top or around the edges of a barrier. This is called “diffracted sound.” With this weight barrier, the sound reduction is limited only by the height and width of the barrier.

The barrier must be solid with no holes, no gaps at the bottom, and no gaps between adjoining panels. Any holes or openings will allow sound to leak to the other side. Earth mounds and buildings can function as barriers if they are high enough and wide enough to disrupt a direct path of sound.

Shrubs, bushes, and trees are NOT barriers even though they block a line of sight. They are not massive enough and not solid enough to block sound. A small amount of sound attenuation may be achieved with a dense planting of hedges, but this would not provide more than 1 dB sound reduction even if the hedges were 3 or 4 feet in depth and 12 feet high. These are primarily a visual barrier.

The effectiveness of a high mass barrier is controlled primarily by its height and then by its width. The barrier must be tall enough and wide enough so that it minimizes the sound that is diffracted or bent over the top and around the edge. The amount of sound diffracted over the top and around the edge can be minimized as the barrier becomes higher and longer. As the height of a sound barrier increases, a point of diminishing returns is reached. This means that a percentage increase in height (and cost) will result in a lower percentage improvement (or return on benefits) in sound reduction. In some cases, it may be best to enclose all four sides of a pickleball court with the highest barrier possible. If there are no homes exposed to pickleball sounds from one side of the court, then a barrier can be eliminated on that side.

Common vendors for sound barriers are:

- Acoustiblok, Tampa, FL, 813-980-1400, <https://acoustiblok.com/acoustiblok-soundproofing-product-lines/acoustifence-noise-reducing-fences/> (printed barriers)
- Insul-Quilts USA, South El Monte, CA, 833-853-6444, <https://www.insulquilt.com/>
- eNoise Control, Noblesville, IN, 866-481-2024, <https://www.enoisecontrol.com/>
- DDS Acoustical Specialties, Westfield, MA 413-248-8118, <https://ddsacoustical.com/>
- Hushtec USA, Connecticut, 860-289-8033, <https://hushtecusa.com/> (clear barriers)
- Putterman Athletics LLC, DeLand, FL, 800-621-0146, <https://www.puttermanathletics.com/>
- FenceScreen, Grand Prairie, TX, 888-313-6613, <https://www.fencescreen.com/>
- Pickletile, Austin, TX, 561-342-0038, <https://pickletile.com/pickleglass/> (Pickleglass)

All barriers of the same weight would perform the same. None of these products are noticeably different other than by the color or by printing. Any differences in product sheets can be due to lab differences in testing. Sound barriers should weigh one pound per square foot to block any sound that could pass

through the barrier. The effectiveness of this high weight barrier can still be compromised by the sound that is diffracted over the top or around an edge. A contractor must be consulted to assure that an existing fence or a new fence can support the added weight of a barrier. Wind loads on the barrier are also to be considered.

Some barriers are available with a sound absorbing lining material on the side facing the sound source – if this is needed. This sound absorbing lining can reduce the sound level on the court by reducing the reflected sound as it bounces between the side walls. It can also be effective in reducing reflected sound in the opposite direction away from a barrier if only one side of a court has a barrier. The sound absorbing lining can also reduce a reflected sound wave that can travel over the opposite wall. However, the sound absorbing lining has no impact on the direct sound passing over the top of the barrier. This direct path of sound is not influenced by anything on the side walls. The sound absorbing liner can also help with sound reduction for the players.

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Appendix B – PSMC Blue List of Pickleball Paddles

The Pickleball Paddle Blue List

List updated: January 12, 2025

Introduction: The following paddles have been selected and qualified for 'Blue List' status through a testing procedure that uses a combination of metrics in addition to loudness (sound pressure). This includes measuring the 'pitch' and duration of the sound produced when a pickleball is struck by a paddle (the "decay time").

This latest version of the Blue List categorizes paddles as "Reduced Sound," which means quieter than ordinary paddles and "Extra Quiet," and it includes paddle covers that can be added to any paddle to reduce the sound level produced.

The metrics and criteria were selected after reviewing with players and non-players the sound characteristics of a typical pickleball hit. The categories were established by PSM LLC as a means of recommending paddles to communities and pickleball clubs that are attempting to mitigate the sound of pickleball to an acceptable level without overly restricting a player's paddle preferences.

Test Procedure: PSM LLC is a pickleball acoustics consulting firm. We have assembled a tall (16 feet) echo free (or anechoic) ball drop chamber for testing pickleballs and paddles. An ordinary tournament approved pickleball is dropped from the top of the chamber and it reaches a speed of about 19 mph just before it strikes a rigidly mounted paddle at a slight angle to cause the bouncing ball to travel away from the paddle face after the hit.

A calibrated microphone is mounted in this chamber and a computer outside of the chamber analyzes the microphone output using REW and Audacity software.

Criteria: The paddles on this list are in two categories, "Reduced Sound" and "Extra Quiet." "Reduced Sound" paddles have a measured sound level of at least 3 decibels below typical ½ inch thick honeycomb poly-core fiberglass face models and a prime "pitch" below 900 Hz. "Extra Quiet" paddles are quieter still, with a sound level of 6 decibels, or more, below ordinary models and a main pitch below 700 Hz. In addition, all of these paddles have vibration decay times of the primary vibration mode (to less than 10% of its initial peak value) of under 6 milliseconds. This ensures that there is no well-defined "pitch" to the sound produced.

Using this list: PSM LLC updates this list as it tests and identifies additional paddles that meet the criteria and as suppliers release new models.

Updating this list: To arrange additional paddle or pickleball testing, contact PSM LLC via email at bob@pickleballsound.com.

For an updated version of The Blue List, see the Pickleball Sound Labs web page at pickleballsoundlabs.com as well as the Pickleball Sound Mitigation Facebook group page. The Pickleball Paddle Blue List is copyright free.

Reduced Sound Paddles (paddles are listed alphabetically by vendor name)

<u>Paddle Vendor</u>	<u>Paddle Model Name</u>	<u>Notes</u>
CRBN	1 & 2	
CRBN Pickleball Rocks Edition	Marked "Recreational Play Only"	1
Diadem	Warrior	
E6	16s	
Electrum	E Pro II	
Focus	Silencer	
Gearbox	CX11, CX14, GX5 and GX6	
Joola	Ben Johns 16 mm, Radius	
Joola	Simone Jardim 16 mm	
One More	Vibe	
One More	Pro Custom	
One Shot	Stealth	
PIKKL	VANTAGE Pro 16mm	
Pro Drive	DRIVE	
Pro Kennex	Pro Speed	
Pro Pickleball	Infinity Widebody 16 MM	
TMPR	Tantrum and TC-16	
Versix	Pro XL	
Wild Monkeys	Grizzly	
Wowly	Surge XL	
Wolfe	Bite	

Note 1: Not USA Pickleball Approved for Tournament Play

Reduced Sound Paddle Guidance: Tests have shown that many paddles that are at least 16 mm thick with carbon fiber surfaces and deemed to be "Control" models by paddle suppliers are generally quieter and have a lower main pitch sound and are likely to qualify for the "Reduced Sound" list but they may not have been tested by Pickleball Sound Labs.

Extra Quiet Paddles and Paddle Attachments

The following products are several decibels quieter than the Reduced Sound Models listed above and they have an audio pitch about an octave lower than ordinary fiberglass face paddles.

<u>Paddle Vendor</u>	<u>Paddle Model Name</u>	<u>Notes</u>
Diadem	Vice and Hush	1
Master Athletics	Q1	1
NINEFOUR	Apex Series 3K	2
Owl Sports	Founders Edition, Owl CX, CXE and the Silent Storm	2
Pro XR	Quiet Luxury	1
Stafford	Blackbird	2

Note 1: Not USA Pickleball Approved for Tournament Play

Note 2: The Quietest Tournament Approved Paddles

Aftermarket options – attachments/covers that reduce the sound level produced by any paddle

The Pickleball Muffler (may be used with any paddle)	This is a paddle attachment/cover	1
Quiet Strike	Removable attachment Pads	1
QuietSSHOT	Removable attachment Pads	1

Note 1: Not USA Pickleball Approved for Tournament Play

Paddles (or pad attachments) that qualify as “Quiet” generally have additional design features on the face or internally that substantially reduce both sound level and pitch. These paddles are specifically designed to achieve a low sound level.

Pickleballs

Somewhat Popular Quieter Balls: The Onix Fuse and Onix Pure 2 (higher bounce) outdoor models

The quietest USA P tournament approved ball: Monarch Outdoor ball by Dicks Sporting Goods

Other Quiet Balls

The Gamma Librarian: this is a foam ball that is the very quietest ball tested.

The Diadem Quiet Ball

The Accel Digital 3D printed ball (available in several colors and firmness variations)

The LOUDEST tournament approved ball tested by PSM LLC was the Dura Fast 40 although we have measured even louder sound levels from some less expensive discount store models.



**Analysis of Pickleball Sound
from
Louisville Recreation Center
Louisville, Colorado
Part 2
by
PSM Consulting LLC**

September 10, 2025

Introduction

In a May 7, 2025 report, PSM Consulting LLC (PSMC) provided estimates of pickleball sound for planned courts at Louisville Recreation Center, Louisville, Colorado. Background information on this site and on pickleball sound can be found in that report and will not be repeated here. This report analyzes seven additional designs for noise mitigation that were presented for evaluation by the Louisville Recreation Center staff and that were based upon the earlier results. Improvements to these designs are provided.

The planned pickleball courts at Louisville Recreation Center present a challenge to balance pickleball sound traveling to the closest homes to the north at a higher elevation (Larkspur and Trail Ridge) with sound traveling to homes at a greater distance to the south (West Mulberry). A sound barrier between a source and receiver blocks sound that would normally travel in a straight line to the receiver. This is favorable. This barrier also reflects this sound in the opposite direction. This reflected sound can pass over a second barrier in the opposite direction. This is unfavorable. Therefore, the height of all barriers must be considered. This creates tradeoffs in the sound levels to the north and the south to achieve an acceptable balance in both directions.

Results

Table 1 lists the 7 noise mitigation designs identified as case 1 to case 7. Figure 1 shows the sound barrier design from Louisville Recreation Center with sound barriers on the perimeter of the court and with all 4 corners extending 10 feet. The heights of the barriers on each side are listed in Table 1.

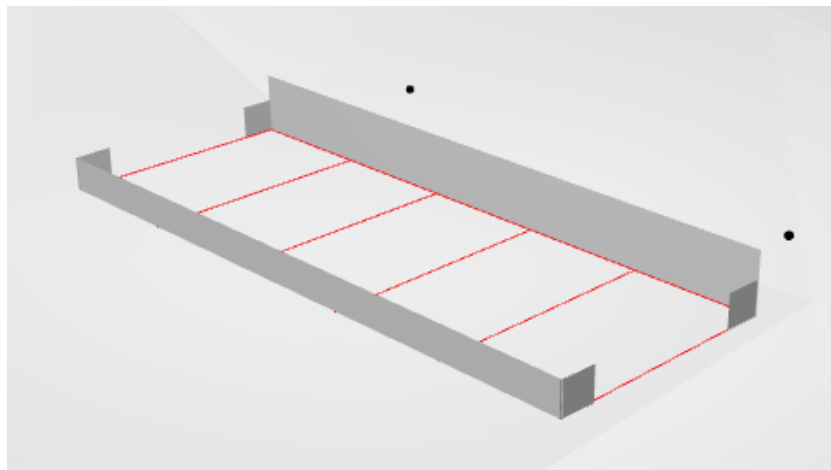


Figure 1 – Layout for barrier designs in case 1 to case 7

Table 1 shows the sound levels at 3 home locations near the courts and at perimeter court locations. Because the noise reduction by a barrier will change depending on source and receiver positions, the sound levels from four source positions in the initial report were analyzed. The design objective is a sound level at 50 dB LAFmax as stated in the initial report.

Baseline sound levels are listed with no barriers to show the sound reduction impact of each barrier design. With no sound mitigation, the sound levels at homes are all above the design objective of 50 dB LAFmax. These would be objectionable.

The initial report showed that showed that sound barriers on the court perimeter are more effective than on the perimeter of the hockey rink. These 7 designs leverage those results. Table 1 shows the sound levels at 3 homes for the 7 initial barrier designs. For each case, Table 1 shows several sound levels above the design objective depending on source location. The barriers are most effective in reducing sound levels at all home locations when the source is closest to the barrier that is between the source and receiver. For source positions farther from the barrier, less sound reduction with the barrier is achieved at homes that are elevated above the courts or that are farther from the source.

The pink cell in each row of Table 1 indicates the receiver with the highest sound level for each source position. The highest sound level is associated with one or more sound paths to the receiver which are the weak links of the design. The weak link for this highest sound level from each position is listed in the table to show the dominant path for the highest sound level. This shows where improvements are needed.

For all seven designs, the open west side between the northwest and southwest corners is the weakest link between source 2 and 888 Larkspur. This path is shown in Figure 2. The barriers do not block this sound path.

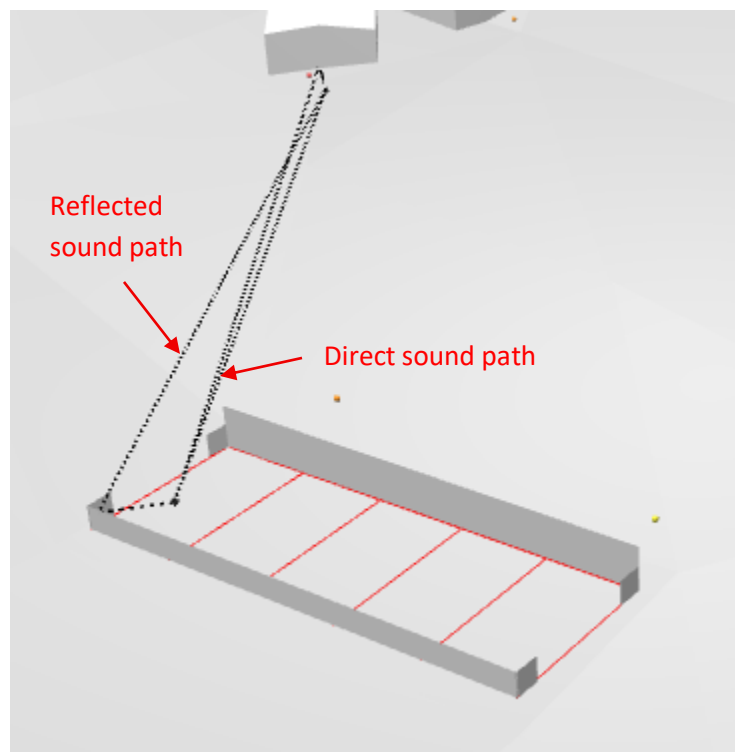


Figure 2 – Direct sound path around northwest corner, case 1

For other source positions, the weak link is a reflected sound path from the closest barrier that travels in the opposite direction over the top of the opposite barrier. This sound path combines with a diffracted sound path from the source over the top of the barrier. Figure 3a and Figure 3b show these paths from source 3 and source 1, respectively.

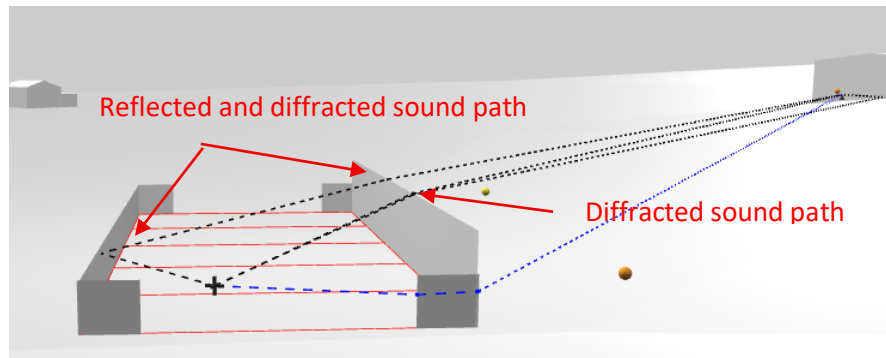


Figure 3a – Reflected sound path from south wall and over north barrier, case 1

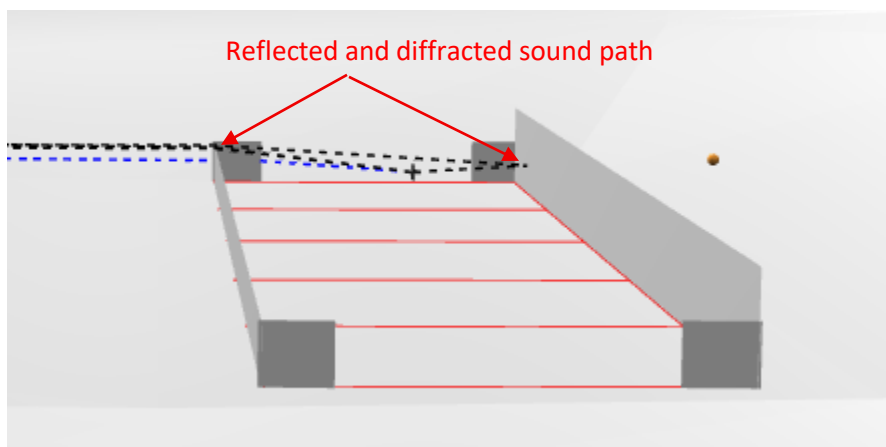


Figure 3b – Reflected sound path from north wall and over south barrier, case 1

This diffracted sound path can only be reduced by increasing the height of the barrier. However, increases in barrier height reflect more sound in the opposite direction. This is the tradeoff, and a balance must be achieved. The yellow cells in case 1 and case 2 provide a clue on how reflected sound to the north can be reduced. This can be done by lowering the south sound barrier from 10 feet to 9 feet. This lower height minimizes the reflected sound to the north.

Since source 2 was the most critical source position for the direct path, the west wall was extended the entire length to block this path. A 9 foot south barrier was used to minimize reflected sound to the north. The sound barriers on the east wall can be eliminated. This can be done since no houses are directly to the west. Figure 4 shows the design with a continuous west wall.

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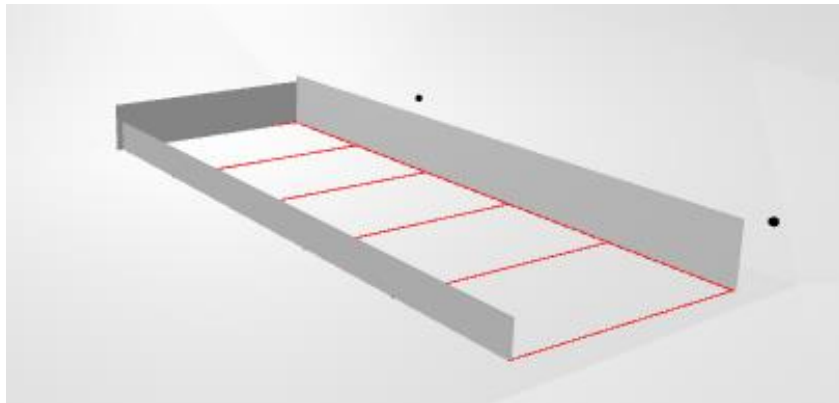


Figure 4 – Barrier design with continuous west wall and open east wall

Table 2 shows the sound levels for design improvements with a sound barrier on the west wall and source 2. Cases 8, 9, 10, 11, and 12 Table 2 show the impact of raising the height of the continuous west sound barrier from 9 to 16 feet for sound from source 2. With increasing barrier height, the sound levels at 888 Larkspur decrease. Figure 5 shows the reduced sound levels with increasing height.

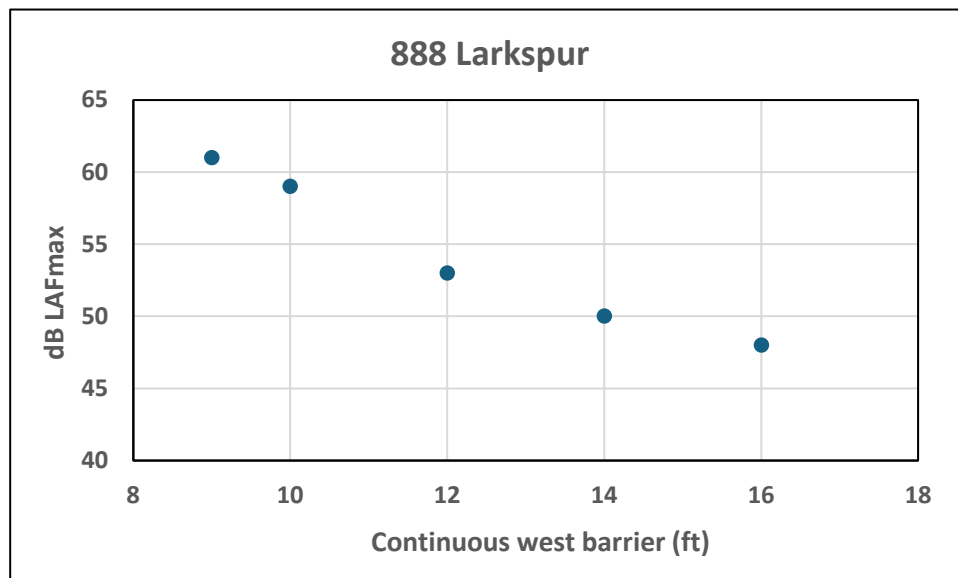


Figure 5 – Sound levels at 888 Larkspur from source 2 with height of west barrier and 9 foot south barrier

With a design objective of 50 dB LAFmax, the recommended west barrier height is 14 feet. The extra 2 feet height in a 16 foot high west barrier reduces the sound level below the design objective.

All four source locations are next analyzed for case 12 and case 13. The 9 foot high south barrier reduces the reflected sound that travels back over the north barrier but allows more sound to travel over the barrier to the south. This is another tradeoff. When the south side barrier is raised to 10 feet, Case 13 shows that the 10 foot barrier on the south wall does not change the sound level at 888 Larkspur, but it increases the sound level from source 1 by 10 dB LAFmax at 828 Trail Edge due to more sound being reflected to the north.

The height decrease of the south barrier from 10 feet to 9 feet has a noticeable 9 dB to 10 dB LAFmax sound level decrease at 828 Trail Ridge from source positions 1 and 4. The green cells highlight the lowest sound levels with a 9 foot south barrier in this design. This decrease is favorable at Trail Ridge. The tradeoff with the 10 foot south barrier is a 1 dB to 2 dB LAFmax sound level increase to the south.

Next, designs were analyzed with the length of the west barrier reduced to consider corner designs. This can be done since no houses are directly to the west. The preferred design includes a 30 foot northwest corner at 14 feet and a 10 foot southwest corner at 12 feet. This design is shown in Figure 6.

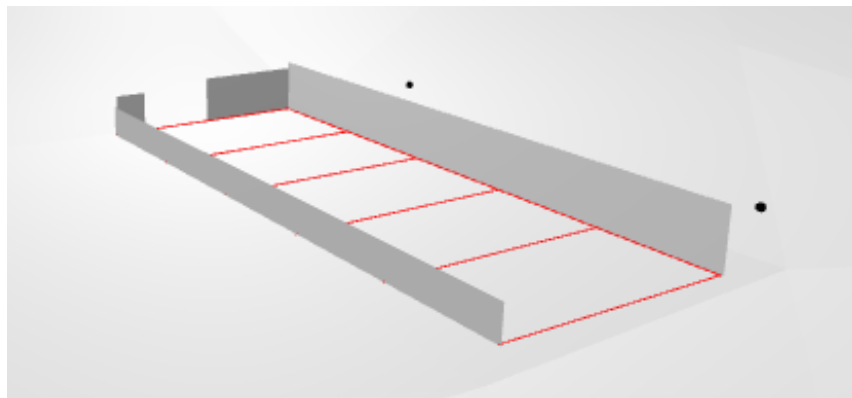


Figure 6 – Barrier design with NW and SW corners, open east wall

Case 14 and case 15 show the sound levels with 9 foot and 10 feet south barriers, respectively. The 10 dB to 9 dB sound level improvement for Trail Edge from sources 1 and source 4 overrides and offsets the 1 dB to 2 dB increase in sound level at West Mulberry.

All these cases considered a sound reflecting barrier. These reflecting barriers could be Pickleglass, a mass loaded vinyl, or a transparent mass loaded vinyl (Hushtec). These barriers can be installed at ground level or on a raised concrete wall with a shorter barrier material if the overall height is maintained. To provide a viewing area of the courts for players waiting to play or for spectators, one or more of the sound barriers should be transparent. The north side of the courts will provide a better viewing area than the west or east sides. It is hard to look over several courts from the west or east ends. In that case, the west and south barrier sides can be mass loaded vinyl. This decision is left to the Louisville Recreation Center.

Table 2, case 16 shows sound levels for a 10 foot sound absorbing barrier for the south side with the 30 foot northwest corner extension and 10 foot southwest corner extension. This minimizes the sound reflected to the north from source 2 and source 3 by 3 dB LAFmax at Larkspur and Trail Edge. The increase in height from 9 feet to 10 feet for the south barrier also helps to reduce sound levels at West Mulberry 1 dB to 2 dB LAFmax over case 14 with a 9 foot reflecting south barrier. This requires a south barrier with a sound absorbing liner.

Case 17 in Table 2 shows the sound levels with no sound barrier for the south side. This eliminates all sound reflected to the north. The resulting sound levels to the north are all near the design objective. The tradeoff is that sound levels to the south are increased to 57 dB and 59 dB LAFmax. This design is not favored for the residents to the south, but it does show the impact of minimizing reflected sound traveling to the north. This shows the balancing act with barrier height and barrier surfaces.

Conclusions and Recommendations

Based on the comparisons in Table 1 and Table 2, case 14 is the most efficient design that balances sound levels to the north and south. Case 14 is shown in Figure 6. It includes these sound barrier heights and lengths:

- north barrier at 16 feet high
- south barrier at 9 feet high
- northwest corner - 30 foot extended length at 14 feet high
- southwest corner - 10 foot extended length at 12 feet high
- east wall open

Barrier materials for each side can be chosen that are either transparent or opaque, depending on the preference of the Louisville Recreation Center. A transparent north side for viewing is recommended. Other barrier sides can be lower cost mass loaded vinyl on a chain link fence. Case 14 shows that the sound levels at each home are just above the 50 dB LAFmax design objective. These sound levels represent the best noise reduction that can be achieved without reducing sound levels in one direction at the expense of increasing sound levels in the opposite direction.

Further reduction in all sound levels can only be achieved by increasing the height of the barriers, by using sound absorbing liners on barriers (these are not transparent), by mandating the use of quieter paddles and balls, or by enclosing the courts in a building. Case 14 is the best balance for sound levels from pickleball at homes to both the north and the south.

Case 15 and case 16 provide tradeoffs in sound levels for residents to the north and to the south and could be considered as alternatives to the recommended case 14. Case 15 and case 16 show small sound level improvements of 1 dB to 2 dB LAFmax at West Mulberry but these would not be noticeable over case 14. If a sound absorbing liner is not used for Case 16, then Case 14 becomes the preferred design.

Table 3 shows the results for these three cases compared to the baseline using colored cells to differentiate sound levels.

Table 3 – Recommended case 14 and alternative case 15 and case 16

	Sound Barrier Heights by Side (feet)					Sound levels at respective property lines (dB LAFmax)			
Case	North	South	West (1)	East (1)	Source Position	Fence Perimeter (2)	888 Larkspur (to northwest)	828 Trail Ridge (to north)	831 W. Mulberry (to south)
Base	0'	0'	0'	0'	1	73	61	56	56
						71	60	56	56
						72	59	56	56
						74	59	56	56
14	16'	9'	14'- 30 ft	0'	1	56	47	43	55
			12'-10 ft		2	57	50	54	54
					3	58	57	54	53
					4	57	48	44	55
15	16'	10'	14'- 30 ft	0'	1	57	47	53	54
			12'-10 ft		2	57	50	54	53
					3	58	57	54	52
					4	58	48	53	53
16	16'	10' abs	14'- 30 ft	0'	1	56	47	48	54
			12'-10 ft		2	55	50	51	53
					3	57	54	51	52
					4	58	48	48	53
	55 dB or greater								
	51 dB to 54 dB								
	50 dB or below								
(1) Fence length is entire side unless indicated									
(2) Fence perimeter is position outside of court that is nearest sound source									

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Table 1 – 7 barrier designs

	Sound Barrier Heights by Side (feet)					Sound levels at respective property lines (dB LAFmax)				
Case	North	South	West (1)	East (1)	Source Position	Fence Perimeter (2)	888 Larkspur (to northwest)	828 Trail Ridge (to north)	831 W. Mulberry (to south)	Highest noise path (weak link)
Base	0'	0'	0'	0'	1	73	61	56	56	Direct path
						71	60	56	56	Direct path
						72	59	56	56	Direct path
						74	59	56	56	Direct path
1	16'	9'	9'	9'	1	56	50	43	55	Reflected from north wall and over south wall
					2	57	62	54	54	Direct path
					3	57	57	54	53	Reflected from south wall and over north wall
					4	56	48	44	55	Reflected from north wall and over south wall
2	16'	10'	10'	10'	1	57	50	53	54	Reflected from north wall and over south wall
					2	57	61	54	53	Direct path
					3	57	57	54	52	Reflected from south wall and over north wall
					4	57	48	53	53	Reflected from north wall and over south wall
3	12'	10'	12'	12'	1	61	54	54	54	Reflected from north wall and over south wall
					2	61	60	57	53	Direct path
					3	60	60	56	52	Reflected from south wall and over north wall
					4	61	54	54	53	Reflected from south wall and over north wall
4	13'	10'	13'	13'	1	60	52	53	54	Reflected from north wall and over south wall
					2	60	60	56	53	Direct path
					3	59	59	56	52	Reflected from south wall and over north wall
					4	60	52	53	53	Reflected from north wall and over south wall
5	14'	10'	14'	14'	1	59	52	53	54	Reflected from north wall and over south wall
					2	59	60	55	53	Direct path
					3	58	58	55	52	Reflected from south wall and over north wall
					4	59	50	53	53	Reflected from north wall and over south wall
6	15	10'	15	15	1	58	51	53	54	Reflected from north wall and over south wall
					2	58	60	55	53	Direct path
					3	57	57	55	52	Reflected from south wall and over north wall
					4	58	49	53	53	Reflected from north wall and over south wall
7	16'	10'	16'	16'	1	57	50	53	54	Reflected from north wall and over south wall
					2	57	60	54	53	Direct path
					3	57	57	54	52	Reflected from south wall and over north wall
					4	57	48	53	53	Reflected from north wall and over south wall
	Highest sound level for source position									
(1) 10 foot corner extensions at NW, SW, NE, SE corners										
(2) Fence perimeter is position outside of court that is nearest sound source										

Table 2 – Improved barrier designs

Case	Sound Barrier Heights by Side (feet)				Source Position	Sound levels at respective property lines (dB LAFmax)				Highest noise path (weak link)
	North	South	West (1)	East (1)		Fence Perimeter (2)	888 Larkspur (to northwest)	828 Trail Ridge (to north)	831 W. Mulberry (to south)	
8	16'	9'	9'	0'	2	56	61	54		Over west wall
9	16'	9'	10	0'	2	56	59	54		Over west wall
10	16'	9'	12	0'	2	56	53	54		Reflected from south wall and over north wall
11	16'	9'	14	0'	2	56	50	54		Reflected from south wall and over north wall
12	16'	9'	16	0'	2	58	48	54		Reflected from south wall and over north wall
13	16'	10'	14	0'	2	56	50	54		Reflected from south wall and over north wall
12	16'	9'	14	0'	1	55	47	43	55	Reflected from north wall and over south wall
					2	56	50	54	54	Reflected from south wall and over north wall
					3	58	57	54	53	Reflected from south wall and over north wall
					4	57	48	44	55	Reflected from north wall and over south wall
13	16'	10'	14	0'	1	57	47	53	53	Reflected from south wall and over north wall
					2	56	50	54	52	Reflected from south wall and over north wall
					3	58	57	54	52	Reflected from south wall and over north wall
					4	58	48	53	53	Reflected from south wall and over north wall
14	16'	9'	14'- 30 ft	0'	1	56	47	43	55	Reflected from north wall and over south wall
			12'-10 ft		2	57	50	54	54	Reflected from south wall and over north wall
					3	58	57	54	53	Reflected from south wall and over north wall
					4	57	48	44	55	Reflected from north wall and over south wall
15	16'	10'	14'- 30 ft	0'	1	57	47	53	54	Reflected from north wall and over south wall
			12'-10 ft		2	57	50	54	53	Reflected from south wall and over north wall
					3	58	57	54	52	Reflected from south wall and over north wall
					4	58	48	53	53	Reflected from south wall and over north wall
16	16'	10' abs	14'- 30 ft	0'	1	56	47	48	54	Reflected from north wall and over south wall
			12'-10 ft		2	55	50	51	53	Reflected from north wall and over south wall
					3	57	54	51	52	Reflected from south wall and over north wall
					4	58	48	48	53	Reflected from north wall and over south wall
17	16'	0'	14'- 30 ft	0'	1	56	47	43	58	Direct path and reflected from north wall
					2	55	50	49	58	Direct path and reflected from north wall
					3	57	52	49	57	Direct path and reflected from north wall
					4	57	48	44	57	Direct path and reflected from north wall
	Highest sound level for source position									
	(1) Fence length is entire side unless indicated									
	(2) Fence perimeter is position outside of court that is nearest sound source									

PSM Consulting LLC has provided these conclusions and recommendations on pickleball sound at Louisville Recreation Center to balance the growth and popularity of pickleball with acceptable sound levels for quality of life for the residents living near the courts. The goal is to develop pickleball recreational facilities at Louisville Recreation Center and to perform due diligence on sound mitigation for nearby residents. PSM Consulting LLC is available to answer any questions related to this work.

Disclaimer

The results, conclusions, and recommendations presented here are based on information provided to PSMC LLC by the client and on measurements made using calibrated equipment and standard acoustical practices. These results are intended to address maximum sound levels from play. Pickleball sound assessment is a random process where the sound from each impact and from each game can vary based on player skill, force of impact, and equipment in use. Sound levels from pickleball are random impulsive events, meaning that it is predictable over a range and has averages and other statistical characteristics, but it has no exact single level. Actual sound levels will vary over time. In addition, it is not possible to determine what any particular person believes is an acceptable sound level. Because additional variables may be associated with the site, the players, or the equipment in use, PSMC LLC assumes no liability for work undertaken by the client based on these recommendations, or for results that do not conform to the client's expectations.

Barry R Wyerman, PhD, PE
Principal Acoustical Consultant
PSM Consulting LLC