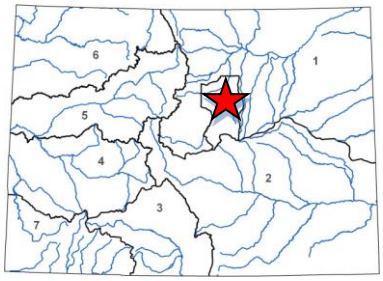
COLORADO
Colorado Water Conservation Board
Department of Natural Resources

# Westerly Creek Restoration and Water Quality Project
# Mile High Flood District
**January 2020 Board Meeting**

## Colorado Watershed Restoration Program Application




| LOCATION | |
|---|---|
| *County/Counties:* | Adams |
| *Drainage Basin:* | South Platte |

| DETAILS | |
|---|---|
| *Total Project Cost:* | $6,650,000 |
| *Colorado Watershed Restoration Program Request:* | $500,000 |
| *Recommended amount:* | $250,000 |
| *Other CWCB Funding:* | $0 |
| *Other Funding Amount:* | $5,750,000 |
| *Applicant Match:* | $400,000 |
| *Project Type(s):* Design & Construction | |
| *Project Category(Categories):* Watershed and Stream Restoration, Flood Hazard Mitigation | |
| *Measurable Result:* Stream Restoration of 2,100 linear feet | |

The Mile High Flood District (MHFD) partners with metro cities and counties to design and construct flood control and warning measures, open space, regional paths, and remove trash and debris in our streams. Established by the Colorado legislature in 1969, MHFD covers an area of 1608 square miles and includes Denver, parts of the 6 surrounding counties, and all or parts of 35 incorporated cities and towns. The District runs on a $30 million annual budget with only 32 employees. Contracting out the work keeps overhead low, costs down, and ensures all the jobs stay local.

The Westerly Creek Restoration and Water Quality Project has been initiated to restore 2,100 LF of stream corridor along Westerly Creek. In addition to stream restoration, a water quality facility will be constructed within the stream corridor to provide water quality to the redeveloping property adjacent to Westerly Creek. The project is located entirely within Adams County with the City and County of Denver bounding the western limits of the stream corridor. The project will restore the reach of Westerly Creek previously impacted by Stapleton International Airport, which was replaced by Denver International Airport in 1995. Within the project reach, Westerly Creek is relatively void of any channel sinuosity and is actively widening. Various known contaminants that are relic from the Stapleton International Airport, exist along the easterly edge of Westerly Creek's floodplain. The perennial base flow is disconnected from the floodplain resulting in a potential safety hazard and lack of ecological diversity within the reach.

The proposed project will reconnect the active channel with the floodplain and dissipate energy through riffle- pool sequencing, well-vegetated floodplain benches, and a multi-stage, natural channel design. The project will identify and mitigate site contaminants and realign Westerly Creek to the west, limiting impacts to the contaminated areas. An extensive planting effort will be implemented in the stream corridor to reintroduce native vegetation and integrate the proposed water quality feature. This project will also include trails and open space amenity to the surrounding community. These trail improvements will complete connectivity to the existing trails to the north and south of the project reach. All stream corridor improvements will be dedicated to the City of Aurora in an easement to ensure future preservation.

# Colorado Watershed Restoration Program Watershed/Stream Restoration Grant Application


## Applicant Contact Information:

Morgan Lynch, Mile High Flood District, Project Manager
Phone: 303-455-6277; mlynch@udfcd.org
Project Sponsors: Mile High Flood District, Aurora Water, Aurora Parks and Open Space


## Westerly Creek Restoration and Water Quality Project – East 22nd Avenue to East 26th Avenue

| | |
|---|---|
| Nearest Town or City | City of Aurora |
| County | Adams |
| Latitude/Longitude | 39.7529, -104.8787 |
| Stream Name and Watershed | Westerly Creek Tributary to Sand Creek, Middle South Platte River Watershed |

Figure 1 in Appendix A is a location map for the project area.

## Watershed/Stream Restoration Grant Request

| | |
|---|---|
| Total Project Cost | $6,650,000 |
| Grant Request | **$500,000** |
| Funding Sources (Cash Match Funding): | |
| Project Sponsors Trust/Project Account | $1,750,000 |
| Aurora Water 2020/2021 Budget | $3,900,000 |
| Aurora Parks and Open Space 2019 Budget | $100,000 |
| MHFD 2020/2021 Budget | $400,000 |
| **Total Budgeted** | $6,650,000 |

## Project Description

The Westerly Creek Restoration and Water Quality Project has been initiated to restore 2,100 LF of stream corridor along Westerly Creek. In addition to stream restoration, a water quality facility will be constructed within the stream corridor to provide water quality to the redeveloping property adjacent to Westerly Creek. The project is located entirely within Adams County with the City and County of Denver bounding the western limits of the stream corridor. The project will restore the reach of Westerly Creek previously impacted by Stapleton International Airport which was replaced by Denver International Airport in 1995. Within the project reach, Westerly Creek is relatively void of any channel sinuosity and is actively widening. Various known contaminants, that are relic from the Stapleton International Airport, exist along the easterly edge of Westerly Creek's floodplain. The perennial base flow is disconnected from the floodplain resulting in a potential safety hazard and lack of ecological diversity within the reach.

The proposed project will reconnect the active channel with the floodplain and dissipate energy through riffle- pool sequencing, well-vegetated floodplain benches, and a multi-stage, natural channel design. The project will identify and mitigate site contaminants and realign Westerly Creek to the west, limiting impacts to the contaminated areas. An extensive planting effort will be implemented in the stream corridor to reintroduce native vegetation and integrate the proposed water quality feature. This project will also include trails and open space amenity to the surrounding community. These trail improvements will complete connectivity to the existing trails to the north and south of the project reach. All stream corridor improvements will be dedicated to the City of Aurora in an easement to ensure future preservation. The team will also pursue the Adams County Open Space Grant for this project. CWCB funding is integral to the success of this project. Without CWCB's support, the project partners will have to value engineer out critical restoration components, providing only flood benefit and losing the holistic improvements.

## Technical Feasibility of the Project

### Project Need/Definition of the Problem

In 1995, Stapleton International Airport was replaced with Denver International Airport. Since then the old airport site has transformed to a vibrant neighborhood consisting of housing, retail, and connected open spaces. With the airport redevelopment, Westerly Creek, which was once piped under a series of airport runways, was restored to a natural corridor from East 26th Avenue to the confluence with Sand Creek. South of East 26th Avenue to north of Montview Boulevard, the immediate area has remained largely industrial with some commercial development. Within the last few years this community has experienced rapid redevelopment. The Stanley Marketplace was one of the first sites to redevelop and is located along the eastern edge of the Westerly Creek floodplain, south of East 26th Avenue. The Original Aurora Masterplan (2017) identified an opportunity to incorporate regional water quality into the existing stream corridor adjacent to Stanley Marketplace. Through the vision of the City of Aurora, MHFD and the consultant team, an opportunity to think beyond a regional water quality pond and restore the reach of Westerly Creek was pursued. The City of Aurora has engaged the adjacent development community to partner and restore the Westerly Creek corridor and provide water quality and open space to future redevelopment sites. Through this partnership, the stream corridor will be dedicated to the City in the form of an easement to ensure future preservation.

In this project reach, Westerly Creek is experiencing active widening with a perennial base flow that is disconnected from the floodplain. Much of the channel instability is related to the straightening the channel underwent to accommodate Stapleton International Airport. The inability to dissipate energy and connect with the floodplain has resulted in these impairments to the stream corridor:

- lack of floodplain connection
- loss of a riparian habitat
- diminishing wetlands
- diminishing water quality with bank erosion
- unsafe open space for users

### Multi-objective Aspects of Project

The purpose of the Westerly Creek Restoration Project is to restore natural stream function, improve wetland and riparian habitat, restore ecologic function, and reduce the flood hazard through the reach.

The following are the identified objectives of the project:

- restore ecologic process
- connect the stream and its floodplain
- protect people, property, and the environment from flood hazard
- protect the watershed
- provide for local pedestrian connectivity from the adjacent community to the stream corridor
- provide for regional pedestrian mobility between Denver and Aurora
- enhance instream water quality
- enhance water quality for adjacent development
- create an open space for passive and active recreation
- create a longer lasting, lower maintenance stream corridor

Floodplain benches will be created adjacent to the active channel to expand the riparian corridor and

improve flood capacity. By restoring connection with the geomorphic floodplain and reintroducing native vegetation, the project will provide a much stronger flood corridor. The improved conveyance will increase safety for the surrounding public and infrastructure, while keeping 100-year flood flows within the open space corridor. The stabilized channel will also improve water quality by reducing the degradation experienced by the existing channel.

### Stream Health

This reach of Westerly Creek has been passively managed since the removal of Stapleton International Airport. The stream corridor upstream and downstream of the project reach has been enhanced through a series of stream restoration projects. The project reach is over widened and relatively straight resulting in a lack of ecological diversity. The site has known contaminants that are a result of the historic land use. This project will identify the type and limits of contaminants and these areas as necessary. One goal of the project is to realign Westerly Creek to limit impacts to contaminated areas and restore steam function. Low head riffle structures will be constructed along the project reach. In addition, the riffles will be constructed with loose rock (void-filled riprap) to simulate natural river bed material, all of which is very conducive to aquatic habitat.

The current redevelopment plans for the Westerly Creek corridor include high residential housing, mixed use and commercial land uses. The vision of this corridor is to provide an amenity to the current and future residents. As a result, the corridor will be multiuse. This project will restore stream health and serve as a connection to the existing trail system and an open space that will provide a variety of events year round. The project includes creating more floodplain benches to provide riparian habitat and re-stabilize the banks with native riparian and upland seed. Creating wetland/riparian benches will enhance the wildlife habitat along this reach. Turf grasses will be located areas located outside the 100-year to accommodate the needs of the community. Due to the project reach's eroded condition, little to no riparian or wetland vegetation is present along the creek banks.

### Recreation and Community

Northwest Aurora is a vibrant, diverse community with one of the largest immigrant communities in the State. This area is experiencing redevelopment resulting in challenges and opportunities for existing and future residents. The Westerly Creek Corridor is a focus point of the community, where many trails, parks and open space exist. This project will help link Montview Park to Westerly Creek Park and the Stapleton Greenways. Upstream and downstream of the project reach, Westerly Creek has been restored to more of a natural amenity and improved to help increase flood conveyance. Restoring this reach of Westerly Creek, will bring the vision of working groups and communities come to fruition. The planned improvements will create a natural corridor that will be safe the communities to enjoy and experience. This section of Westerly Creek lies directly west of the Stanley Marketplace, which is a large draw for foot traffic in the area, forming a number of social pathways through the existing stream corridor. Part of this rehabilitation effort would formalize those paths to connect with other regional trailways, and mirror the new, realigned stream corridor. The Stanley Marketplace also makes use of the existing land to hold periodic events such as Top Taco and made it a priority to retain some area in the open space to continue to be able to host such events. With that in mind, the improvements to this area would give the community open space, as well as a larger grass soccer field.

## Project Implementation

### Schedule

A project schedule has been completed for design and construction of the improvements. Coordination and preliminary design is already well underway and is scheduled to be completed in summer 2020. This will provide adequate time to complete environmental clearances and CLOMR approval from FEMA. Construction will start in winter 2022 and is anticipated to take six to nine months to complete.

Partners will achieve the multi-objective aspects of the project simultaneously. Conceptual designs are complete and the team is working to finalize limits of potential site contaminants. Permitting and Final Design shall be complete by fall 2021. A contractor will be selected by winter 2020. The Design, Construction, and Final Implementation Plan, will be as follows:

- Install temporary construction erosion- and sediment-control best management practices (BMPs)
- Dewater Westerly Creek around the work area to allow creek work to be completed in a dry condition for best results and to minimize sediment discharges. Sheet pile will be used as the primary dewatering material. Seepage and subsurface water will be pumped to a settlement basin.
- Grade bankfull channel, floodplain/vegetation benches, flood terraces and install bank stabilization installed on a portion of the creek.
- Install post-construction erosion control using erosion-control blankets on all slopes at 4:1 and steeper and all banks that could experience active river flow.
- Plant vegetation and provide temporary watering until established.
- Remove temporary construction erosion-control BMPs once vegetation is established.

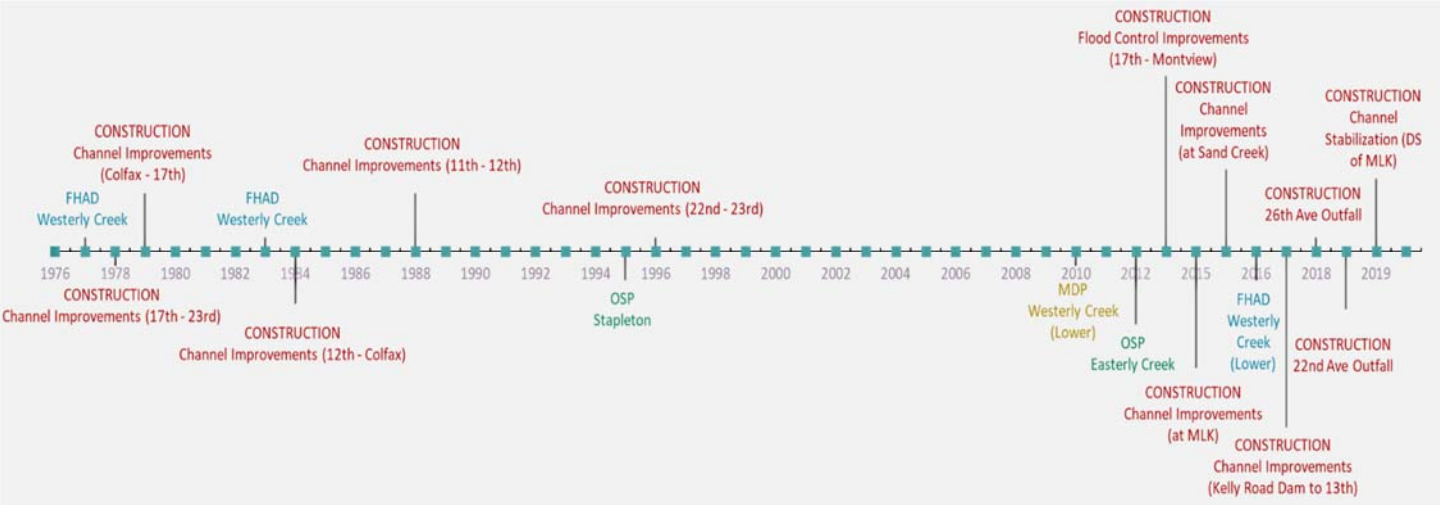
### Monitoring Plan

MHFD will be responsible for monitoring the project. MHFD is financially supported by a property tax mill levy specifically collected for Adams County. MHFD annually inspects and performs stream management services five times a year that consist of a crew walking the reach to provide vegetation management, removing debris and trash, and identifying any potential problem areas. In addition to the above maintenance, this project will follow the Colorado Mitigation Procedures, using the Colorado Stream Quantification tool to quantify the amount of mitigation required. This process includes field data collection methodologies, as well as workbooks to calculate function list and loss at mitigation and impact sites, respectively. This data is later verified through as-built and monitoring data to ensure mitigation requirements are met. The length and extent of this monitoring would be established through discussions with the Army Corp of Engineers.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Expected (Ft): | | Observed (ft): | | | |
| **Station ID:** | | Expected (L Bank): | | Expected (R Bank): | | Expected (Ft): | |
| Channel Width: | | Observed (L Bank): | | Observed (R Bank): | | Observed (Ft) | |
| Check Observed Indicators: | | | | | | Riparian Width %: | |
| | Valley Edge | | Slope break/Terrace | Notes: | | | |
| | Change in Sediment | | Other: | | | | |
| | Evidence of Flooding | | | | | | |
| | Change in Vegetation | | | | | | |

## Qualifications of the Applicant

The City of Aurora and Adams County along with MHFD have been working together as project partners for more than four decades master planning, designing, building, and maintaining projects along Westerly Creek in the District Boundary. Since the completion of the 1977 watershed masterplan, the project partners have built several projects along Cherry Creek leading up to this project. A timeline is provided below summarizing the collective efforts of the project partners over the four decades. In addition, other studies have been completed along the Westerly Creek Corridor including the Westerly Creek Greenway Master Plan, dated 2011 and funded by the Colorado Water Conservation Board and the Original Aurora Master Plan completed by the City of Aurora in 2018. This project will use the goals outlined in these studies to inform the design.




## Project Staffing

A talented and diverse team has been assembled to plan and implement this project. Resumes of *key* project team members are included in Appendix G. This team provides expertise for all aspects of the project and has direct experience with completing similar successful past projects. The following is a list o f agency staff commitments and level of effort:

- MHFD – 2 staff, 200 hours
- City of Aurora – 2 staff, 200 hours
- Aurora PROS – 2 staff, 80 hours
- Stanley Marketplace- 3 staff, 200 hours
- ICON Engineering – 6 staff, 3,000 hours
- Stream Design – 4 staff, 1,200 hours
- Corvus – 2 staff, 100 hours
- Kumar – 2 staff, 120 hours

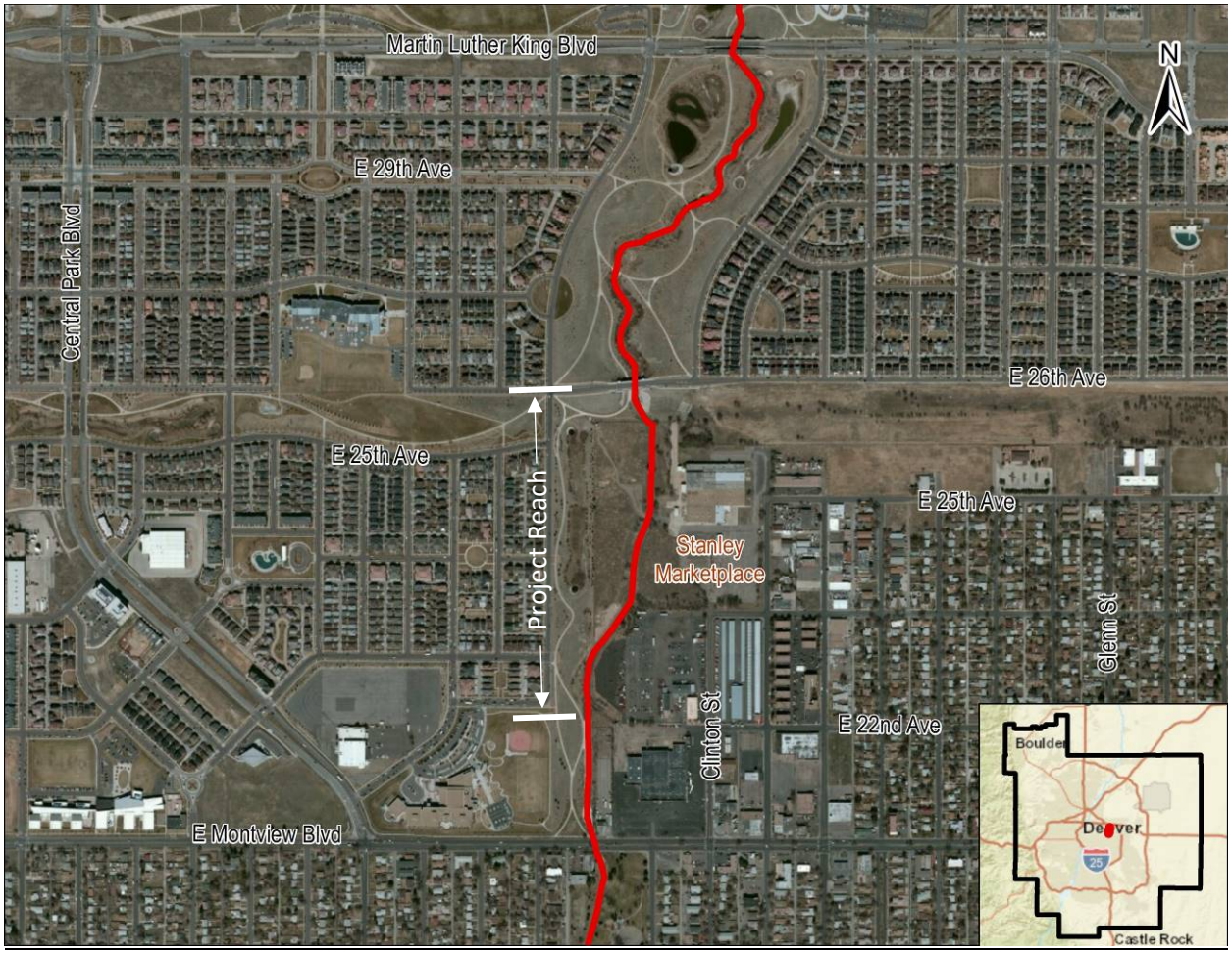
## Collaborative Approach and Partnerships

The City of Aurora and MHFD are the major funding sponsors of the Westerly Creek Restoration Project. The adjacent development community and the City of Aurora Parks, Recreation and Open Space are also collaborating on the project and have been involved from the beginning to help meet the multi-functional goal of the project. See Appendix F for support letters. Planning documents in the Westerly Creek Corridor have been developed over the last 40 years. In large part this project reach has been void of a plan due to the fact that Westerly Creek is located entirely on private property north of 23rd Avenue. However, the common goals of all the masterplans to reduce flood risk and develop greenway corridors consisting of open space and parks, accompanied by open channel are not exclusive of property boundaries.

Through the relationships developed by the City of Aurora and the local development community, the possibility of restoring this project reach was able to come to fruition. Each entity, City of Aurora, Public Works and Parks, Recreation and Open Space, MHFD, and Stanley Marketplace were able to come to the table to determine goals of the project and corridor enhancements that would benefit the stream function, reduce flood risk, provide valuable parkland, regional water quality and programmable space that is an amenity to the surrounding communities. This project may serve as a model of how beneficial multi-use stream corridors can be in an urban setting.

The City of Aurora, along with Stanley Marketplace, will continue to reach out to the community during the design process to gather support for the improvements. The community will be informed as redevelopment in the area continues.

## Appendix A – Location Map



## Appendix B – Existing Conditions Photos

*Picture 1: Upstream limits of the project*

*Picture 2: Upstream of bridge crossing*

*Picture 3: Looking north at Westerly Creek and Stanley Marketplace*

*Picture 4:  Looking North at Downstream Limits of Project*

Appendix C – Scope of Work and Budget

**Scope of Work**

**GRANTEE and FISCAL AGENT (if different)**
Mile High Flood District, City of Aurora

**PRIMARY CONTACT**
Morgan Lynch

**ADDRESS**
2480 West 26th Avenue Suite 156-B, Denver, CO 80211

**PHONE**
(303) 455- 4277

**PROJECT NAME**
Westerly Creek Restoration and Water Quality Project – East 22nd Avenue to East 26th Avenue

**GRANT AMOUNT**
$500,000

**INTRODUCTION AND BACKGROUND**
The Westerly Creek Restoration and Water Quality Project has been initiated to restore 2,100 LF of stream corridor along Westerly Creek. The project will restore the final reach of Westerly Creek impacted by Stapleton International Airport which was replaced by Denver International Airport in 1995. Within the project reach, Westerly Creek is relatively void of any channel sinuosity and is actively widening. Various known contaminants, that are relic from the Stapleton International Airport, exist along the easterly edge of Westerly Creek's floodplain. The perennial base flow is disconnected from the floodplain resulting in a potential safety hazard and lack of ecological diversity within the reach.

The restoration project was initiated by the City of Aurora and Mile High Flood District (MHFD). The proposed restoration will use a wide range of innovative technical expertise complemented by traditional stream stabilization design with blended techniques from natural stream restoration, geomorphic approaches, and bio-engineering. CLOMR and LOMR submittals will be completed to document the changed floodplain condition before and after construction and environmental permitting through an individual 404 permit will be completed as well to attain all necessary environmental clearances to construct the project. This includes proper mitigation of any disturbed contaminants as a result of this project.

The project was initiated in 2018. Preliminary and Final Design Phases will be completed in fall 2020 and construction will start in the fall 2021.

**OBJECTIVES**
The following objectives have been defined for this project:

- Improve the quality of water flowing through the project and being received by downstream waters.
- Create a stream corridor that maintains/improves the current flood capacity and protects life and

property.
- Protect existing infrastructure from stream erosion.
- Preserve where appropriate, restore where needed, and enhance the overall wildlife habitat and ecological function in the Westerly Creek channel and overbank areas.
- Enhance recreational amenities.

**TASKS**

The following tasks are to be carried out to complete construction in accordance with the drawings and specifications. The design and quantities for work items are still in progress. As a result, it should be noted, that further refinement of the design and further coordination with the stakeholders and landowners could affect the final quantities discussed below.

**TASK 1 – Complete Final Design Drawings, Specifications and Permitting – Not Funded through this Grant**

**TASK 2 – Construct channel stabilization improvements**

Description of Task

Reshape Westerly Creek to form an appropriate sized bank-full channel geometry and sinuosity. Create floodplain benches adjacent to the active channel to expand the riparian corridor and improve flood capacity. Then stabilize the new channel with grade control structures and bank protection.

Method/Procedure

This task will involve clearing and grubbing, topsoil removal, and earthwork to shape the channel, floodplain benches, and overbanks. Then, grade control structures will be constructed consisting of a low-height/low capacity loose rock riffle structures. Two outfalls will be removed and replaced to align with the channel improvements. Concurrently, approximately 2,100 linear feet of bioengineered bank protection will be constructed consisting of varying combinations of buried loose rock and biodegradable erosion control blanket.

**TASK 3 – Construct water quality pond**

Description of Task

An approximate 2.4 ac-ft water quality feature will be constructed on the west overbank of Westerly Creek. The current configuration consists of an approximate 300 LF concrete weir and level spreader that will receive offsite flows via a storm sewer pipe and spread the flows received from the water quality event over the entire length of the structure. The flows will be conveyed into a shallow pond prior to infiltrating into the riparian area.

Method/Procedure

The pond will be excavated per plan and the concrete structure will be formed and cast in place. Storm sewer needed to convey offsite flows will be constructed with these improvements. The area will be stabilized with erosion control blanket.

**TASK 4– Construct recreational facilities.**

Description of Task

Re-align and construct the trail system and recreational amenities.

Method/Procedure

This task will include a new 12-foot wide concrete trail and one creek crossing. Additional 10-ft social trails will be graded in during construction activities to help promote access to the stream corridor.

**TASK 5 – Revegetate the site**

Description of Task

All disturbed areas resulting from the work completed in Tasks 2, 3 and 4 will be restored with native riparian and upland vegetation.

Method/Procedure

This task will include placement of topsoil and soil amendments and seeding and mulching all disturbed areas within the stream corridor with a native seed mix specific to the climate and elevation at the project site. Other revegetation methods will include planting trees, shrubs, live and grass plugs according to the appropriate riparian zone (proximity to creek). Planting and seeding will occur down to the normal water level. As mentioned in Task 2 and 3, biodegradable erosion control blanket will be used on select slopes to provide immediate protection until the vegetation can establish.

**REPORTING AND FINAL DELIVERABLE**

Reporting: The applicant shall provide the CWCB a progress report every six months, beginning from the date of the executed contract. The progress report shall describe the completion or partial completion o f the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant shall provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

**Budget and Timeline Table**

| Task | Description | Target Start Date | Target Completion Date | CWCB Grant Funding | Stakeholder Funding* | Total |
|---|---|---|---|---|---|---|
| 1 | **Complete Final Design Drawings, Specifications and Permitting – Not funded through this Grant** | 1-Oct-19 | 1-Feb-20 | $0 | $435,878.09 | $435,878.09 |
| 2 | **Construct Channel Stabilization Improvements** | 1-Sept-21 | 31-Nov-23 | $250,000 | $1,757,497.16 | $2,007,497.16 |
| 3 | **Construct Water Quality Pond** | 1-Sept-21 | 31-Nov-23 | $150,000 | $794,532.00 | $994,532.00 |
| 4 | **Construct Recreation Facilities** | 1-Apr-22 | 31-Nov-23 | $100,000 | $1,970,177.27 | $2,070,177.27 |
| 5 | **Revegetation** | 1-Feb-23 | 1-May-23 | $0 | $1,185,088.80 | $1,185,088.80 |
| **TOTALS** | | | | **$500,000.00** | **$5,873,012** | **$6,643,173** |
| | *All totals represent a 20% design contingency | | | | | |

## Appendix D – Concept Plan

*Basis of Bearings: Bearings used in the calculations of coordinates are based upon the North Line of the Northeast Quarter of the Northwest Quarter of Section 34, Township 3 South, Range 67 West of the 6th P.M. assumed to bear North 89°36'46" East, a distance of 1325.99 feet (North 89°36'23" East, 1326.01' COA Modified Ground Coordinate System). Monumented by a 3 1/4" brass cap "URS Corp PLS 20683 2007" in concrete walk at the West Sixteenth Corner and by a 3 1/4" alum cap "URS Corp PLS 31928 2005" in range box the West Quarter Corner of said Section 21. The survey data was obtained from a Global Positioning System (GPS) survey.*

*Basis of Elevations: This survey is referenced to the City of Aurora (COA) Vertical Datum and originates from COA Benchmark COA ID. 3S6734SW002 published elevation 5321.476'. A 3" brass cap on a 30" steel pipe in concrete at the sw corner of E. Montview Boulevard and Dayton Street. Old Benchmark ID F-005.0. NAVD88 datum published elevations. Adams County Benchmark Station Name 95.0240 published elevation 5251.18 feet. A standard Adams County 3 ¼" aluminum Survey Disk stamped "92.0240 1995". Station is located at the intersection of E. 48th Avenue and Ivy Street. NAVD88 datum published elevations.*

*COORDINATE DATUM: This survey is referenced to a Modified Ground Coordinate System, Colorado State Plane Central Zone, which is referenced by the following Points:*

| Point | Latitude | Longitude | Ellipse Ht. | Project N. | Project E. | Elevation | Description |
|---|---|---|---|---|---|---|---|
| J 392 | 39°45'14.29588"N | 104°53'00.96531"W | 5255.918 | 1700529.21811 | 3174106.52902 | 5313.08 | NGS J 392 1983 |
| 240 | 39°47'02.08876"N | 104°55'12.50920"W | 5193.979 | 1710832.36286 | 3170338.56500 | 5251.18 | ADCO 95.0240 |

*Project Mapping Projection – Modified State Plane Ground Coordinate System – Colorado State Plane Central Zone 502*

*Name: US State Plane 1983*
*Datum: NAD 1983 (Conus)*
*Zone: Colorado Central 0502*
*Geoid: Colo12B*

*Local Site Settings*
*Project latitude: N39°45'17.07886"*
*Project longitude: W104°53'04.73662"*
*Ground scale factor: 1.00025130814*
*Project height: 5257.59 ft*

*Coordinate System Definition*
*Projection: Lambert Conformal Conic Two Parallel*
*Origin latitude: N37°50'00.00000"*
*Origin longitude: W105°30'00.00000"*
*False northing: 1000000.000 ft*
*False easting: 3000000.000 ft*

*Vertical Site Calibration:*
*Shift at origin: 0.041 ft*
*Slope North: 0.000 ppm*
*Slope East: 0.000 ppm*
*Origin north: 1698116.624 ft*
*Origin east: 3176433.954 ft*

NORTH
0 100' 200'

23RD AVE
22ND AVE
26TH AVE
DAYTON ST
DALLAS ST
CLINTON ST
MONTVIEW BLVD
BEELER ST

*COA BENCHMARK*
*COA ID. 3S6734SW002*
*PUBLISHED ELEVATION 5321.476' NAVD 88*
*3" BRASS CAP ON A 30" STEEL PIPE IN CONCRETE AT THE SW CORNER OF E. MONTVIEW BOULEVARD AND DAYTON STREET*
*OLD BENCHMARK ID F-005.0*

STANLEY MARKETPLACE

EXISTING 24" STORM DRAIN OUTFALL
EXISTING STREAM CENTERLINE
EXISTING 30" STORM DRAIN OUTFALL
EXISTING 48" STORM DRAIN OUTFALL
EXISTING 8' X 8' RCBC EASTERLY CREEK STORM DRAIN OUTFALL
EXISTING 8' X 5' RCBC STORM DRAIN OUTFALL
PROPOSED STREAM CENTERLINE

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00

CITY OF AURORA
CITY OF DENVER

*COA BENCHMARK*
*COA ID. 3S6734NW001*
*PUBLISHED ELEVATION 5315.496' NAVD 88*
*3" BRASS CAP ON THE NORTH SIDE OF A CONCRETE INLET AT THE NE CORNER OF WESTERLY CREEK AND E. MONTVIEW BOULEVARD*
*OLD BENCHMARK ID N/A*

| No. | DATE | REVISIONS | APPR. |
|---|---|---|---|

811 Know what's below. Call before you dig.

PREPARED FOR: MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING, INC.

IN COOPERATION WITH: stream 1240 E. COLFAX AVE, STE. 401 DENVER, CO 80218 www.streamla.com | 720.663.7352

# WESTERLY CREEK STREAM RESTORATION

30% DESIGN PHASE

SURVEY CONTROL & EXISTING SITE CONDITIONS

ICON PROJECT No. 19-013

DATE OCT 2019

SHEET 2.01

P:\ICP\19-013 Stanley Marketplace\Water Quality Pond\06 DWG\04 CIVIL\04 PLAN SETS\2-10 SURVEY CONTROL.dwg, Jdelacher, Page Setup---, ICON ath, 10/29/2019 5:10 PM


| No. | DATE | REVISIONS | APPR. |
|---|---|---|---|

811 Know what's below. Call before you dig.

PREPARED FOR: MHFD MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING, INC.

IN COOPERATION WITH: stream 1245 E. COLFAX AVE. STE. 401 DENVER, CO 80218 www.streamla.com | 720.663.7352

# WESTERLY CREEK STREAM RESTORATION

30% DESIGN PHASE

PROPOSED SITE - PLAN

ICON PROJECT No. 19-013

DATE OCT 2019

SHEET 3.01

P:\DP\19-013 Stanley Marketplace\Water Quality Pond\06 DWG\04 CIVIL\04 PLAN SETS\3.05 PROPOSED SITE PLAN.dwg, Jdelacher, Page Setup---, ICON stb, 10/29/2019 5:19 PM

| No. | DATE | REVISIONS | APPR. |
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| | | | |

Know what's below. Call before you dig.

PREPARED FOR: MILE HIGH FLOOD DISTRICT

PREPARED BY: ICON ENGINEERING, INC.

IN COOPERATION WITH: stream

1245 E. COLFAX AVE. STE. 401 DENVER, CO 80218
www.streamla.com | 720.663.7352

# WESTERLY CREEK STREAM RESTORATION

30% DESIGN PHASE

SITE RENDERING - EXISTING

ICON PROJECT No. 19-013

DATE
OCT 2019

SHEET
3.02

| No. | DATE | REVISIONS | APPR. |
|---|---|---|---|
| | | | |

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PREPARED FOR: MHFD MILE HIGH FLOOD DISTRICT

AURORA

PREPARED BY: ICON ENGINEERING, INC.

IN COOPERATION WITH: stream

1245 E. COLFAX AVE. STE. 401 DENVER, CO 80218
www.streamla.com | 720.663.7352

# WESTERLY CREEK STREAM RESTORATION

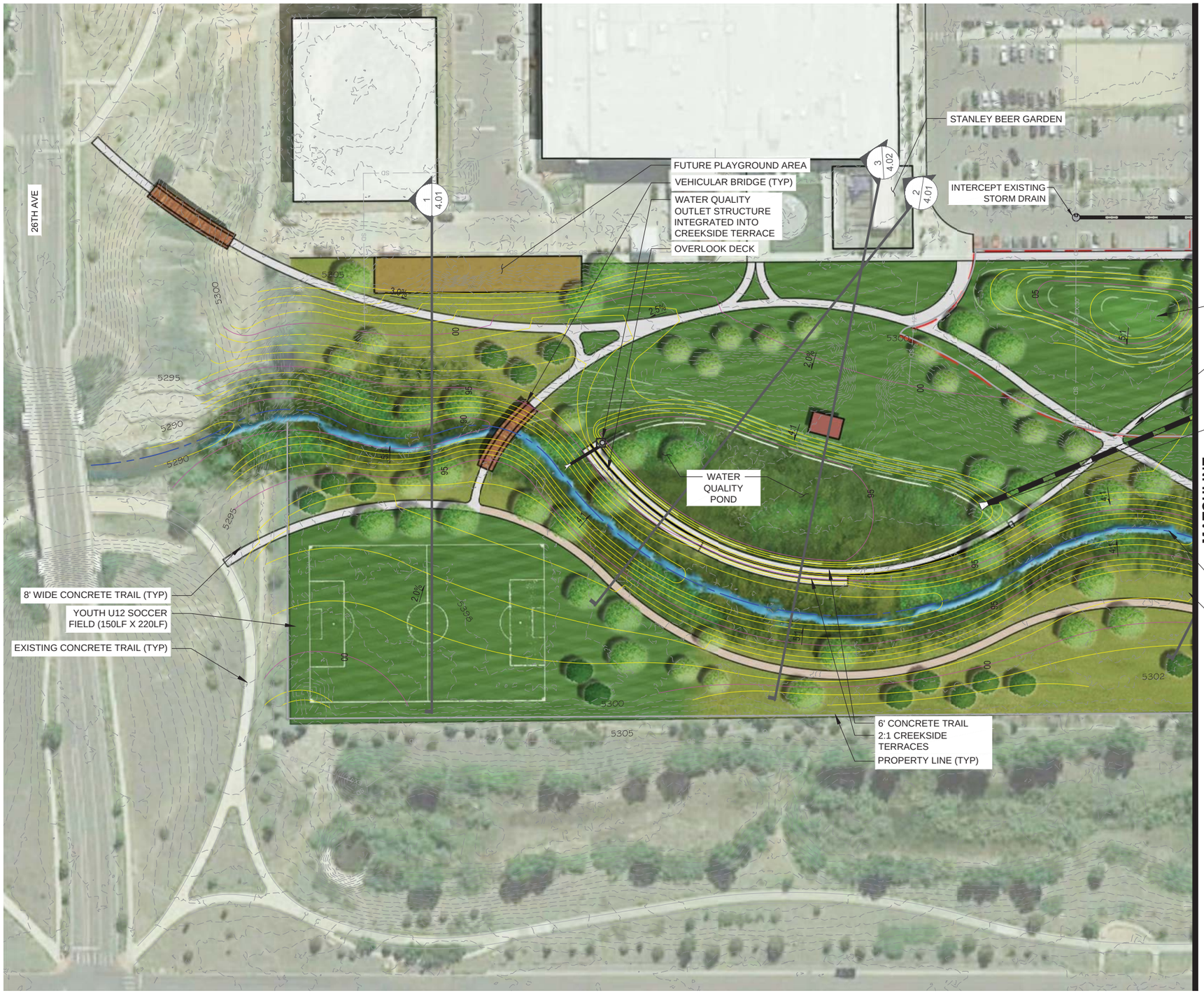
30% DESIGN PHASE

SITE RENDERING - PROPOSED

ICON PROJECT No. 19-013

DATE
OCT 2019

SHEET
3.03

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AURORA

PREPARED BY: ICON ENGINEERING, INC.

IN COOPERATION WITH: stream

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www.streamla.com | 720.663.7352

# WESTERLY CREEK STREAM RESTORATION

30% DESIGN PHASE

OVERALL GRADING SHEET - 1

ICON PROJECT No. 19-013

DATE
OCT 2019

SHEET
3.04

MATCHLINE
SEE SHEET 3.04

NORTH

0 50' 100'

23RD AVE

22ND AVE

PROPOSED STORM DRAIN IMPROVEMENTS

FUTURE DEVELOPMENT

INLET COLLECTION FROM FUTURE DEVELOPMENT

CONCRETE TRAIL (TYP)

CHANNEL CENTERLINE (TYP)

RENOVATED OUTFALL STRUCTURE

PEDESTRIAN BRIDGE

CRUSHER FINES TRAIL (TYP)

PROPERTY LINE (TYP)

EXISTING PEDESTRIAN BRIDGE

EXISTING CONCRETE TRAIL

5300 5301 5305 5310

2.0% 3.0% 5.0%

4.02

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IN COOPERATION WITH: stream

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www.streamla.com | 720.663.7362

# WESTERLY CREEK STREAM RESTORATION

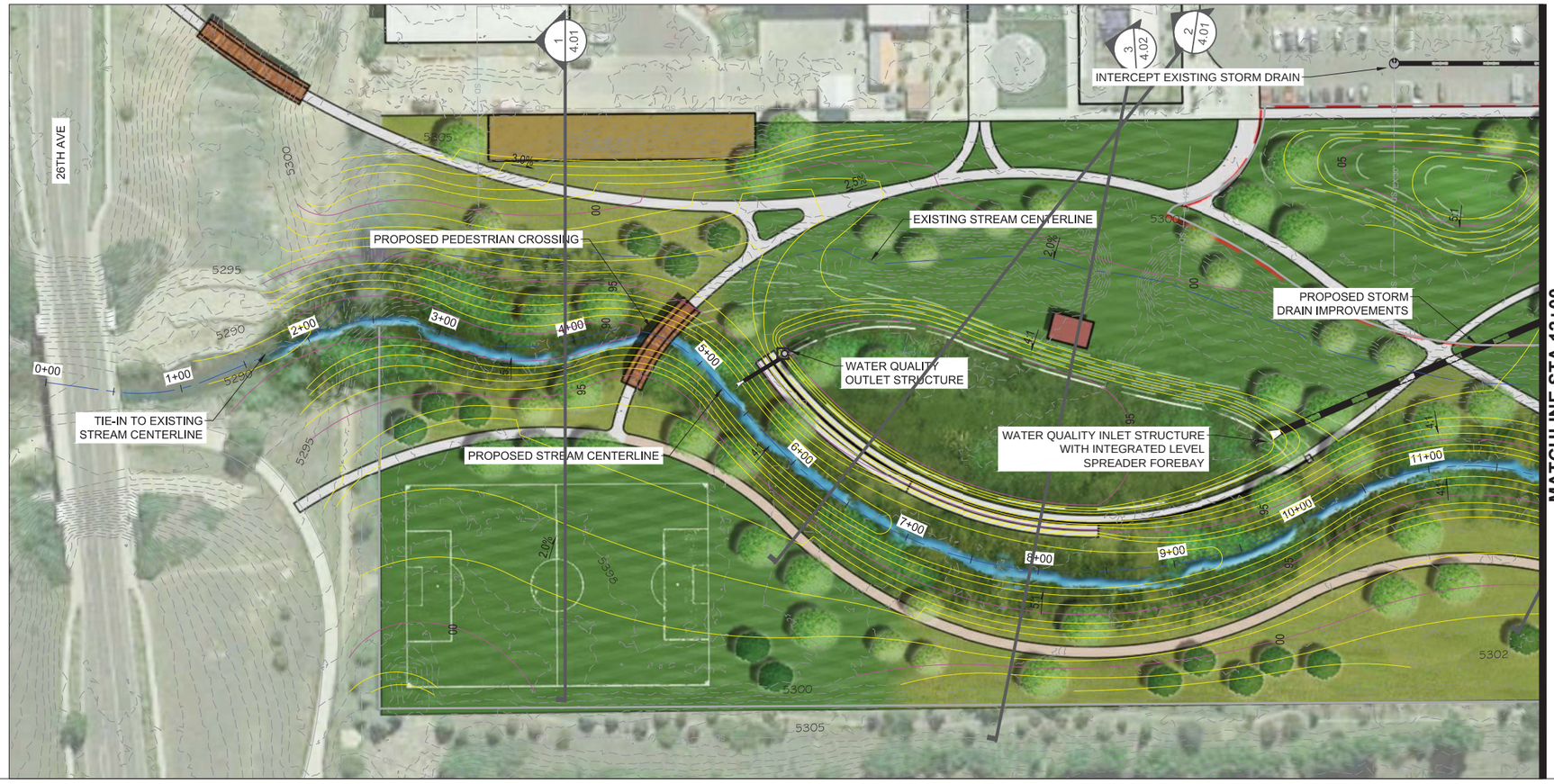
30% DESIGN PHASE

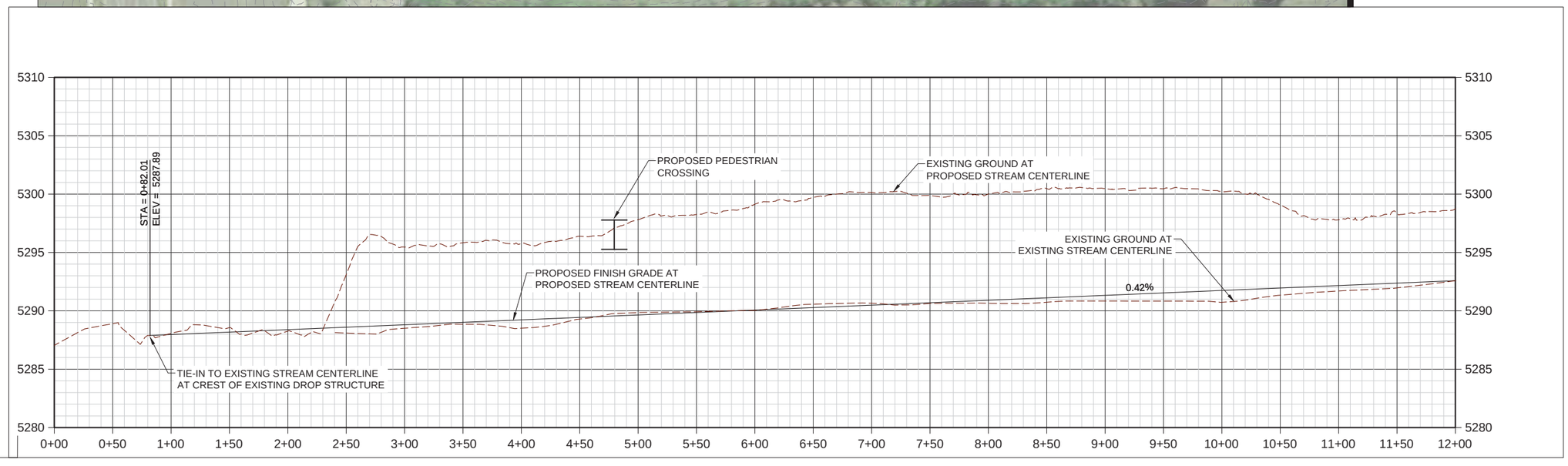
OVERALL GRADING SHEET - 2

ICON PROJECT No. 19-013

DATE
OCT 2019

SHEET
3.05




NORTH

0 50' 100'

| No. | DATE | REVISIONS | APPR. |
|---|---|---|---|

811 Know what's below. Call before you dig.

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# WESTERLY CREEK STREAM RESTORATION

30% DESIGN PHASE

PLAN AND PROFILE - STA 0+00 - 12+00

ICON PROJECT No. 19-013

DATE OCT 2019

SHEET 3.06

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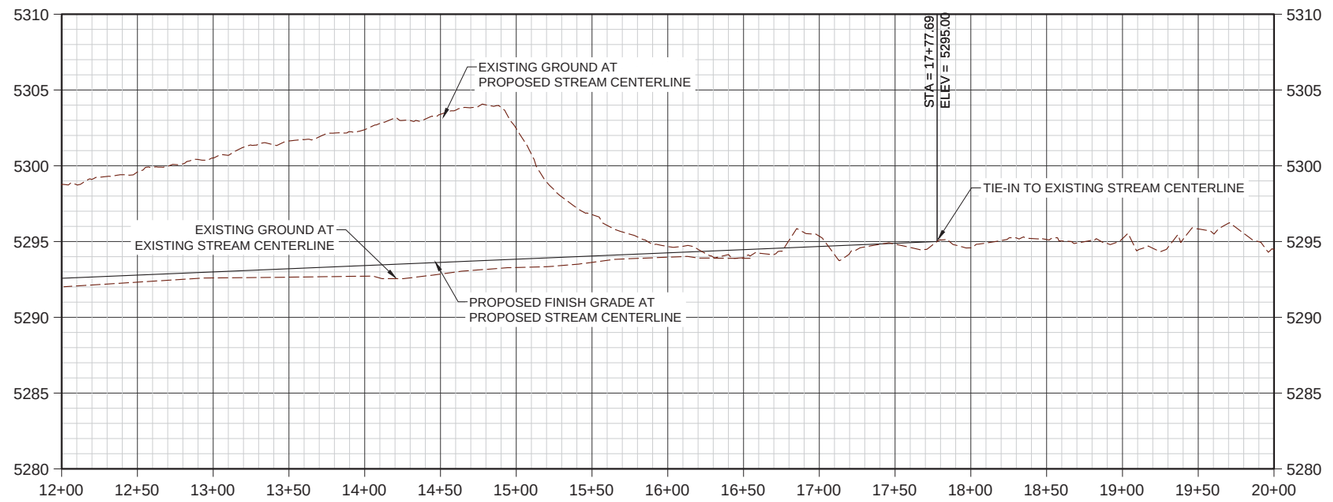


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|---|---|---|---|

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PREPARED BY: ICON ENGINEERING, INC.

IN COOPERATION WITH: stream

1246 E. COLFAX AVE, STE. 401 DENVER, CO 80218
www.streamla.com | 720.663.7352

# WESTERLY CREEK STREAM RESTORATION

30% DESIGN PHASE

PLAN AND PROFILE - STA 12+00 - 20+00

ICON PROJECT No. 19-013

DATE
OCT 2019

SHEET
3.07

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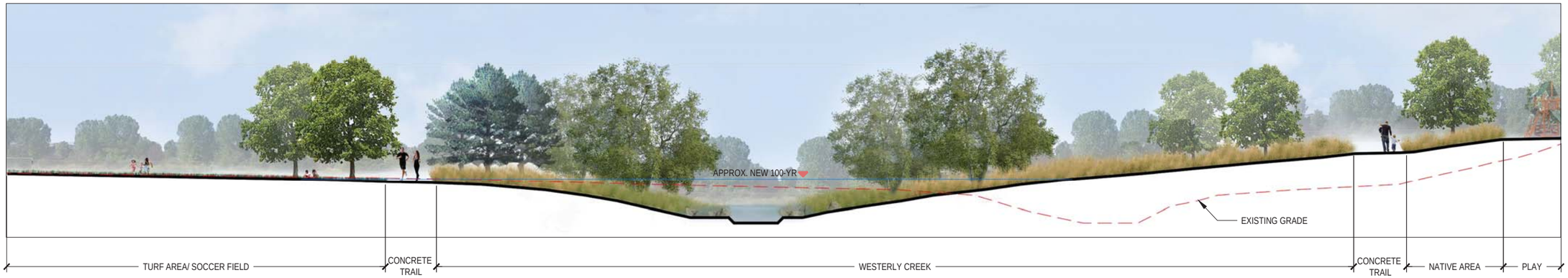
0 10' 20'

## SECTION 1

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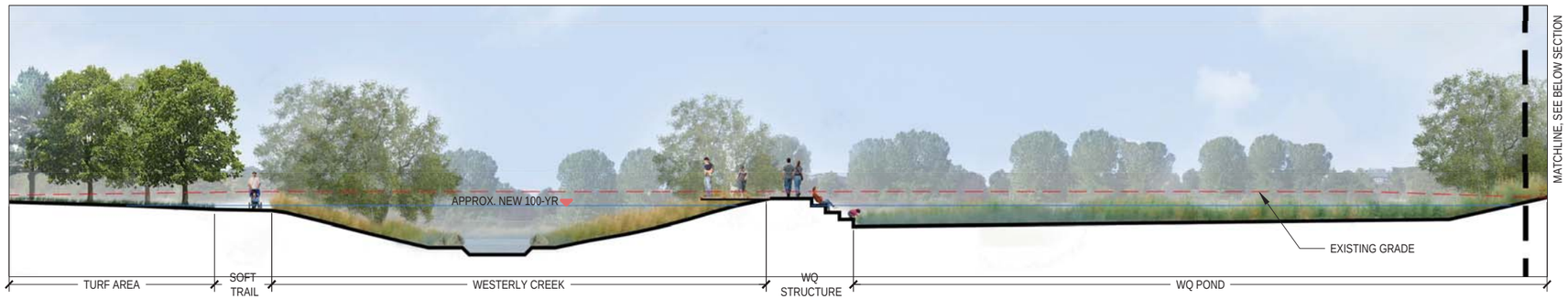


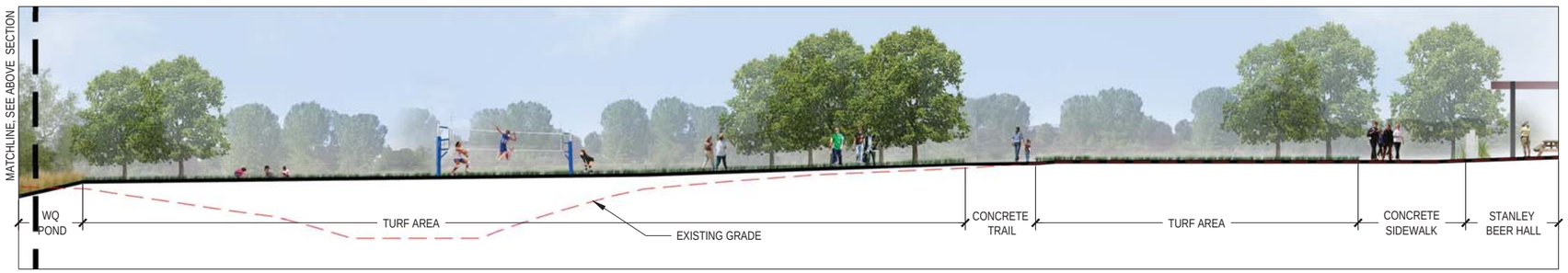


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| | | | |

811 Know what's below. Call before you dig.

PREPARED FOR: MHFD MILE HIGH FLOOD DISTRICT

AURORA

PREPARED BY: ICON ENGINEERING, INC.

IN COOPERATION WITH: stream

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www.streamla.com | 720.663.7352

**WESTERLY CREEK STREAM RESTORATION**

30% DESIGN PHASE

CROSS SECTIONS - 1

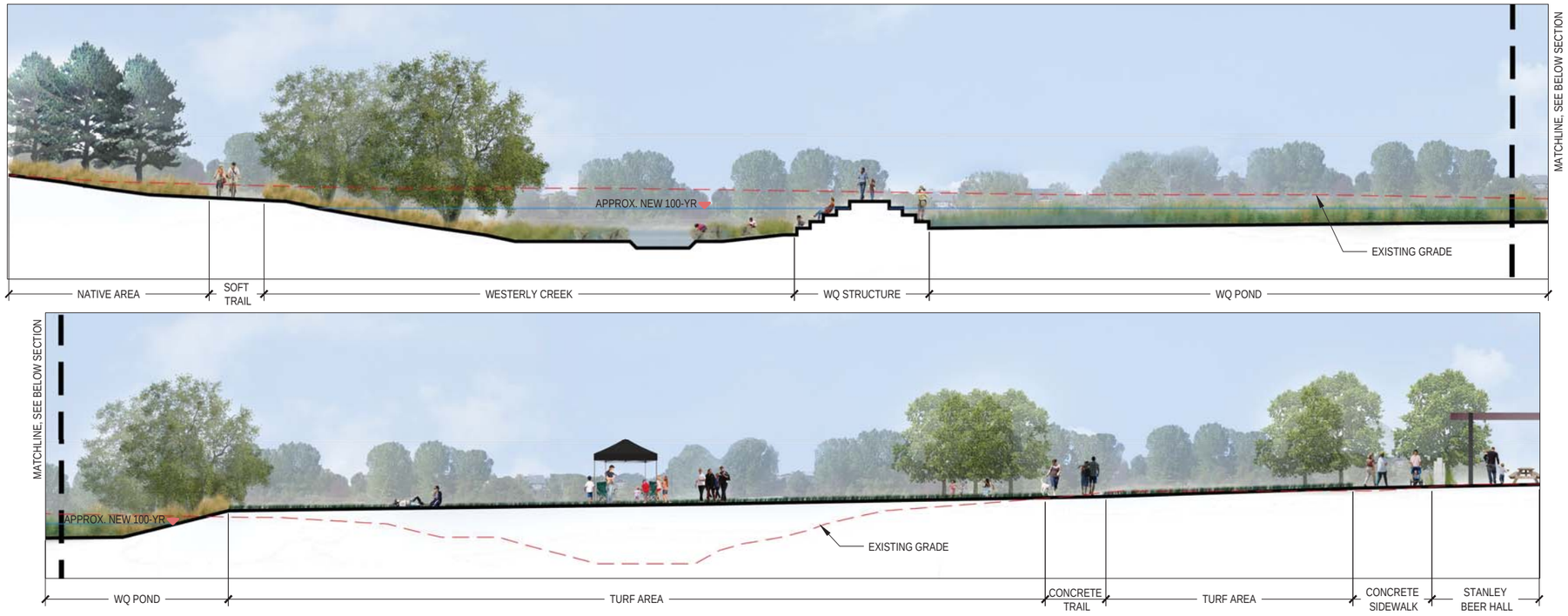
ICON PROJECT No. 19-013

DATE OCT 2019

SHEET 4.01

0 10' 20'

## SECTION 3

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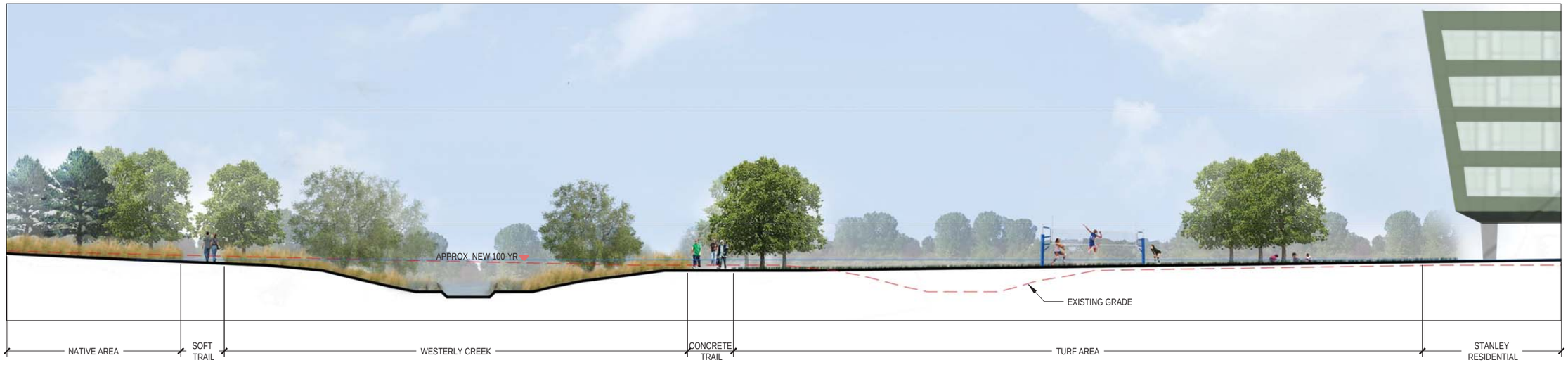


| No. | DATE | REVISIONS | APPR. |
|---|---|---|---|

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PREPARED BY: ICON ENGINEERING, INC.

IN COOPERATION WITH: stream 1245 E. COLFAX AVE. STE. 401 DENVER, CO 80218 www.streamla.com | 720.663.7352

**WESTERLY CREEK STREAM RESTORATION**

30% DESIGN PHASE

CROSS SECTIONS - 2

ICON PROJECT No. 19-013

DATE OCT 2019

SHEET 4.02

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## Appendix E – Support Letters

STANLEY JV, LLC
4221 BRIGHTON BOULEVARD
DENVER, COLORADO 80216
303.298.1111

www.westfield-co.com

October 30, 2019

Colorado Water Conservation Board
Attn: Chris Sturm
1313 Sherman Street, Room 721
Denver, CO 80203

Re: *Westerly Creek Restoration and Water Quality Project – East 22nd Avenue to East 26th Avenue*

Dear Evaluation Team:

On behalf of Stanley JV, LLC, I am writing to express our full support for Mile High Flood District's (MHFD) application for grant funding to support the Westerly Creek Restoration and Water Quality Project between East 22nd Avenue & East 26th Avenue.

Stanley JV, LLC, owner of the Stanley Marketplace, is excited about this project and its efforts to not only restore natural stream function, improve wetland and riparian habitat, restore ecologic function, and reduce the flood hazard, but to also enhance recreational amenities and trail systems that will complete connectivity to the surrounding communities.

We look forward to a successful project.

Sincerely,

Jonathan Alpert
Stanley JV, LLC - Manager
jalpert@westfield-co.com

November 1, 2019
Colorado Water Conservation Board
Attn: Chris Sturm
1313 Sherman Street, Room 721
Denver, CO 80203

Dear Evaluation Team,

Please consider this letter in support of the Westerly Creek Restoration and Water Quality Project grant application.

The Aurora Parks, Recreation and Open Space Department's mission is "*Encouraging active lifestyles and creating healthy environments for people, nature and community*".
This project aligns perfectly with that mission and will provide environmental both recreational benefits to the surrounding community.

- The proposed trails will provide connectivity from the surrounding residential areas to the Stanley Marketplace, a vibrant community hub as well as other area trails.
- The realignment of the floodplain will provide recreational spaces for current and future residents.
- Enhancing the stream and addition of native riparian vegetation will improve the water quality and potential for wildlife habitat in the project area as well as downstream of the site.

This project is a great opportunity several agencies to partner on a multi-faceted improvement to Westerly Creek, adjacent properties and the surrounding community.
We appreciate the opportunity to provide our support on this project and encourage your favorable evaluation of the request.

Brooke Bell
Director, Aurora Parks, Recreation and Open Space Department

## Appendix F – Staff Biographies

Morgan Lynch, PE, CFM, Project Manager – MHFD Morgan Lynch graduated in 2003 from Colorado State University with a Bachelor of Science degree in Civil Engineering. Morgan's career has been focused in the water resources industry, specializing in hydrology and hydraulics. For the last two years, Morgan has worked at the Mile High Flood District and CH2M (Jacobs) prior to her employment at MHFD. At MHFD, Morgan leads and manages design, construction and planning projects in the Sand Creek Watershed, as well as routine and maintenance projects in the City and County of Denver. Morgan is currently Chair of the Colorado Association of Stormwater and Floodplain Managers, a member of the Colorado Riparian Association, and serves on the South Platte River Metro Round Table.

Clint Weisz, PE, Project Manager – City of Aurora, Aurora Water Clinton Weiz graduated from North Dakota State University in 1994 with a degree in Civil Engineering. As a project manager for the Aurora Water Department, he has spent the past 11 years managing major drainage, water supply, water distribution and sanitary sewer system capital improvements projects. These projects have ranged in size from a few hundred thousand dollars to over $10M. In addition, Mr. Weisz has 25 years of experience designing detention ponds, channel improvements, and water, sanitary and storm pipe infrastructure.

Sarah Young, PE, Deputy Director – City of Aurora, Aurora Water Sarah graduated in Civil Engineering from UC Denver and she has been working in the industry for over 20 years. She brings her 12 years of experience working for a private engineering firm and 3 years specializing in construction support to her role of the Deputy Director of Aurora Water. For the last 7 years, Sarah has led the planning and engineering department in various capacities with her expertise in master planning.

Tracy Young, Manager – City of Aurora, Parks, Recreation and Open Space Tracy Young is a licensed landscape architect with over 25 years experience developing parks and public spaces for communities in large urban areas. Ms. Young currently manages the Planning, Design and Construction Division for the City of Aurora's Parks, Recreation and Open Space Department. She oversees a dedicated staff of landscape architects, planners, construction project managers and a GIS specialist. Together, her team has completed a number of award winning park revitalization projects. The success of these public spaces is attributed to extensive efforts to engage the surrounding community. Residents, businesses, youth and all area stakeholders are encouraged to participate in the visioning and implementation of improvements. Tracy believes strongly that these parks, open spaces, trails, community gardens and recreational opportunities contribute positively to the quality of life of Aurora's citizens by providing outdoor spaces for wellness and social interaction.

Craig Jacobson, PE, CFM, Principal in Charge – ICON Engineering, Inc. As a Principal at ICON, Craig has a strong background in water resource engineering with an emphasis in floodplain management, hydrologic and hydraulic analyses, and master planning. Craig has managed and designed a large array of stormwater improvements through- out the state of Colorado. Many of these projects have included, channel stabilization and restoration, maintenance, detention, and water quality. Along with his design experience, Craig's projects routinely involve the preparation of specifications and project documents, cost estimating, quantity take-offs, and construction management. Craig frequently speaks at floodplain management conferences and participates as a co-instructor for floodplain management courses offered through the Colorado Association of Stormwater and Floodplain Managers (CASFM) and the Urban

Watersheds Research Institute (UWRI).

Kent Barringer, PE, Project Manager – ICON Engineering, Inc. Kent is one of the most experienced engineers on staff at ICON. Kent has a strong engineering design background in water resources, parks and roadway planning, design, and construction. He has served as the primary design engineer on numerous flood control projects throughout Colorado, and has an extensive resume in working with landscape architects on parks and recreation facilities. His capabilities include preparing erosion and sediment control plans, grading plans, hydrologic and hydraulic modeling, as well as preparing preliminary and final designs, cost estimates, and technical specifications. He is skilled in preparing preliminary and final utility design and in preparing final designs, construction drawings, and contract documents for roadways, streets, and park development. His skills also include preparing water distribution master plans and preparing preliminary and final grading and drainage plans for land development projects. Kent supplements his engineering back- ground with his trained artistic skills. His award winning designs on Goose Creek in Boulder and Marston Lake North Park in Denver attest to his ability to blend aesthetic considerations with engineering functionality. In addition to drainage and flood control projects, he has extensive experience working with landscape architects on the design of ADA compliant parks within the District Boundary.

Jesse Clark, RLA LEED AP, President – Stream Landscape Architecture Jesse is a licensed and registered Colorado Landscape Architect with over 20 years of professional experience in project management, design, and construction implementation in public urban and open space environments with a focus on waterway design, natural area restoration, stream channel reclamation, environmental mitigation, municipal parks, and recreation facilities. Mr. Clark has lived in the arid west and Rocky Mountain region for 45 years, and is the founder and managing partner of the design and planning firm Stream Landscape Architecture. His work has been recognized both nationally and locally with awards and publications by the American Society of Landscape Architecture (ASLA), the American Planning Association (APA), Colorado American Council of Engineering Companies (ACEC), the Colorado Association of Stormwater and Floodplain Managers (CASFM), the Colorado American Public Works Association (APWA), Landscape Architect magazine, Topos magazine, ColoradoBiz, and others. He has served as an adjunct graduate-level design studio instructor at the University of Colorado, and has been invited on numerous occasions to present on the topic of green stormwater infrastructure, integrating waterways and recreation facilities, and sustainable park planning and design.