



**GRADING, EROSION, AND SEDIMENT CONTROL
(GESC) REPORT**

FOR THE

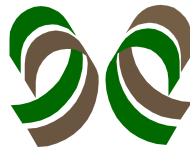
**CHALLENGER REGIONAL PARK – FIELDS #1, 2, AND 3
IMPROVEMENTS**

IN

TOWN OF PARKER, COLORADO

FOR THE

**DOUGLAS COUNTY PARKS, TRAILS, AND
BUILDING GROUNDS**

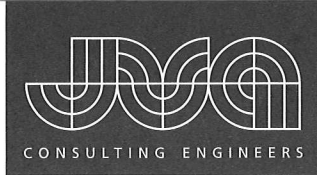


JVA, Inc.

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JVA Project No. 1832c

APRIL 4, 2011



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April 4, 2011

Mr. Erik Nelson
Douglas County Community Planning and Sustainable Development
100 Third Street
Castle Rock, Colorado 80109

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RE: Grading, Erosion and Sediment Control Report for
Challenger Regional Park – Fields #1, 2, and 3 Improvements
JVA Job No. 1832c

Dear Erik:

JVA, Inc. is submitting the following grading, erosion and sediment control report to the Douglas County for approval of the Challenger Regional Park – Fields #1, 2, and 3 grading, erosion and sediment control facilities.

The erosion and sediment control measures proposed within this report have been produced in accordance with the Grading, Erosion and Sediment Control Manual by the Douglas County Public Works and Development. The erosion and sediment control structures for this project have also been designed in accordance with the Douglas County and the Urban Drainage and Flood Control District criteria.

This grading, erosion and sediment control plan has been placed in the Douglas County file for this project and appears to fulfill the applicable Douglas County grading, erosion and sediment control criteria. Additional grading, erosion and sediment control measures may be required of the owner or his/her agents, due to unforeseen erosion problems or if the submitted plan does not function as intended. The requirements of this plan shall run with the land and be the obligation of the land owner, or his/her designed representatives until such times as the plan is properly completed, modified or voided.

If you have any questions regarding this submission, please call.

Sincerely,
JVA, Inc.

A handwritten signature in black ink, appearing to read "Howard M. McHenry", is written over a horizontal line. Below the line, the name "Howard M. McHenry" and title "Senior Associate" are printed in a black serif font.

Howard M. McHenry
Senior Associate

cc: Curt Sloan, Douglas County Parks, Trails, and Building Grounds
Erik Spring, Design Concepts

PROJECT OWNER:

Douglas County Park, Trails, and Building Grounds
Curt Sloan
9651 S. Quebec Street
Littleton, CO 80130
(720) 733-6990

PROJECT OWNER'S STATEMENT:

Douglas County Park, Trails, and Building Grounds hereby certifies that the grading, erosion, and sediment control measures for Challenger Regional Park – Fields #1, 2, and 3 Improvements shall be constructed according to the design presented in this report. I understand that Douglas County government does not and will not assume liability for the grading, erosion, and sediment control measures designed and/or certified by my engineer. Douglas County government does not guarantee that final grading, erosion, and sediment control design review will absolve Douglas County Park, Trails, and Building Grounds and/or its successors and/or assigns of future liability for improper design. I further understand that approval of the Final Plat and/or Final Development Plan does not imply approval of my engineer's grading, erosion, and sediment control design.

Name of Developer _____

Authorized Signature _____

ENGINEERING CONSULTANT/ PLAN PREPARER:

JVA, Inc.
Kevin A. Tone, P.E.
1319 Spruce Street
Boulder, CO 80302
(303) 444-1951

PLAN PREPARER'S STATEMENT:

I hereby certify that the attached Grading, Erosion, and Sediment Control (GESC) Plan for Challenger Regional Park – Fields #1, 2, and 3 Improvements has been prepared by my (or under my direct supervision) in accordance with the latest version of the Douglas County Grading, Erosion, and Sediment Control Manual. I accept full responsibility and liability for this design in the event the design is defective or fails to meet County criteria. I understand that Douglas County government will no assume liability for grading, erosion, and sediment control facilities designed by others.

Registered Professional Engineer _____

State of Colorado No. _____

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GRADING, EROSION & SEDIMENT CONTROL REPORT

PROJECT CONTACTS

Owner: Curt Sloan
Douglas County Parks, Trails, and Building Grounds
9651 S. Quebec Street
Littleton, CO 80130
(720) 733-6990

Project Engineer: Kevin A. Tone, PE
JVA, Inc.
1319 Spruce Street
Boulder, CO 80302
(303) 444-1951

Landscape Architect: Erik Spring
Design Concepts
211 N Public Road
Lafayette, CO 80026
(303) 664-5301

PROJECT DESCRIPTION

Douglas County Parks, Trails, and Building Grounds is planning on upgrading three ballfields at the existing Challenger Regional Park, located in the Town of Parker, Colorado. The project consists of upgrading one existing natural turf field to synthetic turf and upgrading the infields of two existing fields to synthetic. These improvements will not increase the impervious areas on site and include a drainage system under each field. The drains for the fields will connect to an existing storm sewer system and discharge to Newlin Gulch. These improvements were planned for in a previous phase during the development of the park. The total park site area is 47.8 acres with a 3.1 acre area of disturbance. The approximate center of the project has a latitude and longitude of 39°32'11.5"N and 104°47'09.5"W respectively.

EXISTING SITE CONDITIONS

The existing park site is approximately 47.8 acres in size with a ballfields, parking lots, sidewalks, and concession/restroom buildings. The proposed project area is focused specifically on the area of the ballfields which consist of two synthetic fields and one natural turf field. The project varies in elevation from 5801 to 5791 feet and slopes

towards the north. Runoff from the site drains to a Newlin Gulch which runs along the north side of the site. No delineated wetlands are known to have been located within the limits of the project site.

ADJACENT AREAS

The park site is accessed from Lincoln Avenue to the south. The site is bound by Newlin Gulch to the north, open space to the east, undeveloped land to the west and Lincoln Avenue to the south. The area for this project is entirely bound by existing park features and amenities and will affect park usage during construction. No adjacent properties to the park will be affected.

SOILS

U.S. Department of Agriculture, Soil Conservation Service mapping of the area indicates that the soils are predominantly Bresser Sandy Loam (3-9% slopes). These soils are classified as hydrological soil group B.

AREAS AND VOLUMES

The total surface area affected by construction is approximately 3.1 acres. This area includes all existing ballfield and construction activity areas. Cut and fill materials are expected to balance onsite.

EROSION AND SEDIMENT CONTROL MEASURES

NONSTRUCTURAL BMPS

Nonstructural Best Management Practices (BMPs) will be implemented to the maximum extent possible. The utilization of nonstructural BMPs will be an ongoing process directed at preventing erosion. The nonstructural BMPs will receive continuous emphasis throughout construction because they avert problems before they occur and reduce the need for structural BMPs. Nonstructural BMPs will consist primarily of planning and scheduling construction activities aimed at achieving the goal of minimizing erosion. Furthermore, construction personnel will be instructed and supervised in construction methods consistent with erosion prevention practices.

MINIMIZE DISTURBANCE TO EXISTING VEGETATION: Primarily, construction personnel will be directed to preserve as much of the established vegetation as possible. Limits of work are shown on the plans.

GOOD HOUSEKEEPING: Primarily, construction personnel will be directed to maintain a clean and orderly work environment. Good housekeeping would consist of improved operation and maintenance of machinery and processes, material storage practices, material inventory controls, routine and regular clean-up schedules, maintaining well

organized work areas, signage, and educational programs for employees and the general public about these practices. Trash and construction debris will be contained and disposed of as generated.

TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (BMPs)

Temporary BMPs can be broken into Erosion or Sediment control types. Erosion controls are surface treatments that stabilize soil exposed by excavating or grading. Erosion control measures include mulching and temporary seeding, if final landscaping or synthetic turf is not installed in a continuous manner. Erosion control measures need to begin in advance of all major soil disturbances activities on the construction site. Sediment controls capture soil that has already been eroded. Soil particles suspended in runoff can be filtered through a porous media or deposited by slowing the flow and allowing the natural process of sedimentation to occur. Sediment control measures include vehicle tracking control, silt fencing, inlet protection, and sediment control logs. The installation of sediment control facilities must begin before land disturbance activities begin on site.

TEMPORARY SEEDING: Temporary revegetation is required on all disturbed areas having a period of exposure prior to final stabilization of one year or longer. Temporary seeding needs to be placed within 30 days of work of disturbed areas. All temporary seeding shall be protected with mulch. Seeding recommendations are in the following table

Douglas County Temporary Drill Seeding Mix

Species	Variety	Notes	% in Mix	PLS#/AC
Smooth Bromegrass	<i>Lincoln</i>	PICS	30	3.9
Inetermediate Wheatgrass	<i>Oahe</i>	PICS	30	4.5
Pubescent Wheatgrass	<i>Luna</i>	PICS	30	4.2
Annual Ryegrass	<i>N/A</i>	AICB	10	0.8

VEHICLE TRACKING CONTROL: All construction traffic must enter and exit the site through the denoted access points shown on the plans. A vehicle tracking control pad consisting of a layer of 6" rock, is required at each access point. The vehicle tracking control pad is intended to help strip mud from tires prior to vehicles leaving the construction site. One stabilized construction entrance at the north side of the project area, between ballfields #1 and #2 as identified on the plans.

CONCRETE WASHOUT AREA: While no major concrete work is planned for this projects, a portable concrete washout area will be used and located adjacent to the vehicle tracking control pad.

STREET SWEEPING : Street sweeping will occur whenever sediment is transported onto public and private roads, including park access drives and parking areas, and shall be cleaned immediately. Sediment shall be removed from roads by shoveling or sweeping

and be transported to a controlled sediment disposal area. Street sweeping, if necessary, is tracked on the weekly inspection reports.

INLET PROTECTION: Curb cuts along the access drive to the north of the project will have inlet protection installed to prevent capture sediment laden runoff as an extra precautionary measure. Inlet protection will consist of wire-enclosed crush rock with concrete blocks. Location of inlet protection measures are shown on the plans.

SILT FENCING: Silt fence is a temporary sediment barrier constructed of woven fabric stretched across supporting posts. Silt fencing will be provided at the limits of work and around the perimeter of the property where onsite flows may tend to drain offsite. Silt fencing is shown, but not limited to, the locations shown on the plans.

SEDIMENT CONTROL LOGS: Sediment control logs consisting of straw, compost, excelsior, or coconut fiber and form a porous filter and promote sediment deposition on its upstream side. Sediment control logs shall be installed in areas shown on the plans, specifically between the infield and outfield areas of ballfields #2 and #3.

SEEDING AND MULCHING: While unlikely, seeding and mulching will be implemented if disturbed areas of the project remain unstabilized for a period of greater than 14 days. Seeding and mulching consists of loosening soil, applying topsoil if permanent seeding, and drill seeding disturbed areas with grasses and crimping in straw mulch to provide immediate protections against raindrop and wind erosion and, as the grass cover becomes established, to provide long-term stabilization of exposed soils. All disturbed areas must be mulched, or seeded and mulched, within 14 days after final grade is reached on any portion of the site not otherwise permanently stabilized.

Douglas County Permanent Drill Seeding Mix

Species	Variety	Notes	% in Mix	PLS#/AC
Big Bluestem	<i>Kaw</i>	PNWS	10	1.1
Yellow Indiangrass	<i>Cheyenne</i>	PNWS	10	1.0
Switchgrass	<i>Blackwell</i>	PNWS	10	0.4
Sideoats Grama	<i>Vaughn</i>	PNWB	10	0.9
Western Wheatgrass	<i>Arriba</i>	PNCS	10	1.6
Blue Grama	<i>Hachita</i>	PNWS	10	0.3
Thickspike Wheatgrass	<i>Critana</i>	PNCB	10	1.0
Praire Sandreed	<i>Goshen</i>	PNWS	10	0.7
Green Needlegrass	<i>Lodorm</i>	PNCB	10	1.0
Slender Wheatgrass	<i>Pryor</i>	PNCB	5	0.6
Streambank Wheatgrass	<i>Sodar</i>	PNCS	5	0.6

DISPOSITION OF TEMPORARY MEASURES: All temporary erosion and sediment control measures shall be removed within 30 days after final stabilization is achieved, or after the temporary measures are no longer needed, whichever occurs earliest, or as authorized by Douglas County.

TIMING/PHASING SCHEDULE

Construction of this project will begin in June of 2011 with a completion date of September 2011. Ballfield #1 will be upgraded and completed prior beginning the upgrades to ballfields #2 and #3.

PERMANENT STABILIZATION

After construction is complete the permanent stabilization of the site will be comprised of the synthetic turf fields and permanent landscaping features.

STORMWATER MANAGEMENT CONSIDERATIONS

Storm runoff for the site generally flows from the south to the north toward Newlin Gulch. During construction of the field upgrades, stormwater will sheetflow towards silt fencing or sediment control logs, where sediment will be captured, and runoff will be released. Additionally, inlet protection will be placed at curb cuts in the access drive to the north of the site as a precautionary measure to capture any sediment laden runoff that may breach the silt fencing or sediment control logs.

MAINTENANCE

All temporary and permanent erosion and sediment control practices shall be maintained by the contractor during the construction phase as needed to assure continued performance of their intended function.

OPINION OF PROBABLE COSTS

The total cost for the erosion control measures proposed for the construction of the improvements has been estimated as \$5,582. This estimate has been generated using the Douglas County GESG Permit Cost Opinion Spreadsheet (see attached).

REFERENCES

1. “Urban Storm Drainage Criteria Manual, Vol. 1, 2, & 3,” Urban Drainage and Flood Control District, Revised 2001.
2. “Grading, Erosion and Sediment Control (GESC) Manual,” Department of Public Works Engineering Division, Douglas County Colorado, March 2004.
3. “Soil Survey of the Castle Rock Area, Colorado,” U.S. Department of Agriculture, Web Soil Survey 2.0, National Cooperative Soil Survey, March 2004

Douglas County GESC Permit

Cost Opinion Spreadsheet

Mar-04

BMP No.	BMP	ID	Unit	Installation Unit Cost	Quantity	Cost
1	Check Dam	CD	LF	\$ 24.00	0	\$ -
2	Compost Blanket	CB	SF	\$0.36	0	\$ -
3	Compost Filter Berm	CFB	LF	\$ 2.00	0	\$ -
4	Concrete Washout Area	CWA	EA	\$ 100.00	1	\$ 100.00
5	Construction Fence	CF	LF	\$ 2.00	0	\$ -
6	Construction Markers	CM	LF	\$ 0.20	0	\$ -
7	Dewatering	DW	EA	\$ 600.00	0	\$ -
8	Diversion Ditch	DD	LF	\$ 1.60	0	\$ -
9	Erosion Control Blanket	ECB	SY	\$ 5.00	0	\$ -
10	Inlet Protection	IP	LF	\$ 20.00	3	\$ 60.00
11	Reinforced Check Dam	RCD	LF	\$ 36.00	0	\$ -
12	Reinforced Rock Berm	RRB	LF	\$ 9.00	0	\$ -
13	RRB for Culvert Protection	RRC	LF	\$ 9.00	0	\$ -
14	Sediment Basin	SB	AC	\$ 1,100.00	0	\$ -
15	Sediment Control Log	SCL	LF	\$ 2.00	543	\$ 1,086.00
16	Sediment Trap	ST	EA	\$ 600.00	0	\$ -
17	Seeding and Mulching	SM	AC	\$ 2,500.00	0	\$ -
18	Silt Fence	SF	LF	\$ 2.00	1088	\$ 2,176.00
19	Stabilized Staging Area	SSA	SY	\$ 2.00	580	\$ 1,160.00
20	Surface Roughening	SR	AC	\$ 600.00	0	\$ -
21	Temporary Slope Drain	TSD	LF	\$ 30.00	0	\$ -
22	Temporary Stream Crossing	TSC	EA	\$1,000.00	0	\$ -
23	Terracing	TER		\$ -	0	\$ -
24	Vehicle Tracking Control	VTC	EA	\$1,000.00	1	\$ 1,000.00
25	VTC with Wheel Wash	WW		\$ -	0	\$ -
26	Temporary Batch Plant Restoration		AC	\$5,000.00	0	\$ -
TOTAL						\$ 5,582.00