

CONCEPT DESIGN REPORT



Sandpoint Parks and Recreation

CONTENTS

	INTRODUCTION	•	3
INVENTORY & ANALYSIS OF EXISTING CONDITIONS		•	4
	SPECIFIC SITES	•	7
OPTIONS FOR FIELD REDEVELOPMENT & ENHANCEMENT		•	11
	RECOMMENDATIONS	•	15
PHASING, COSTING AND MAINTENANCE		•	16



INTRODUCTION

This report is a summary of studies completed from 2015-2018 for several park sites in the City of Sandpoint Parks and Recreation System.

- In 2015-16, SPVV Landscape Architects in association with DCI Engineers of Spokane analyzed existing conditions at Memorial Field, including soil types, existing drainage, and recommendations for reconstruction/remediation to provide more usable hours for activities on the field.
- In 2016-17, SPVV reviewed reconstruction options for Memorial Field, including a complete reconstruction with natural turf in a sand-based field system; complete reconstruction using artificial turf for the playing surface; and a hybrid system providing artificial turf in the baseball infield and natural-turf outfield. This information was gathered and presented at a series of meetings with the Citizens Advisory Committee and staff members, as well as members of the public at two public workshops.
- In 2017-18, SPVV reviewed current conditions at Great Northern, Centennial and Travers Park playfields, with the goal of increasing play at each of these parks as well. Preliminary information on redevelopment options has been presented to the Citizens Advisory Committee.

The information provided in this report is intended to provide stakeholders and key decision makers adequate background information to understand the existing conditions at each field and potential redevelopment scenarios for each facility that may be completed through funding under the 2015 ballot measure.



INVENTORY & ANALYSIS OF EXISTING CONDITIONS

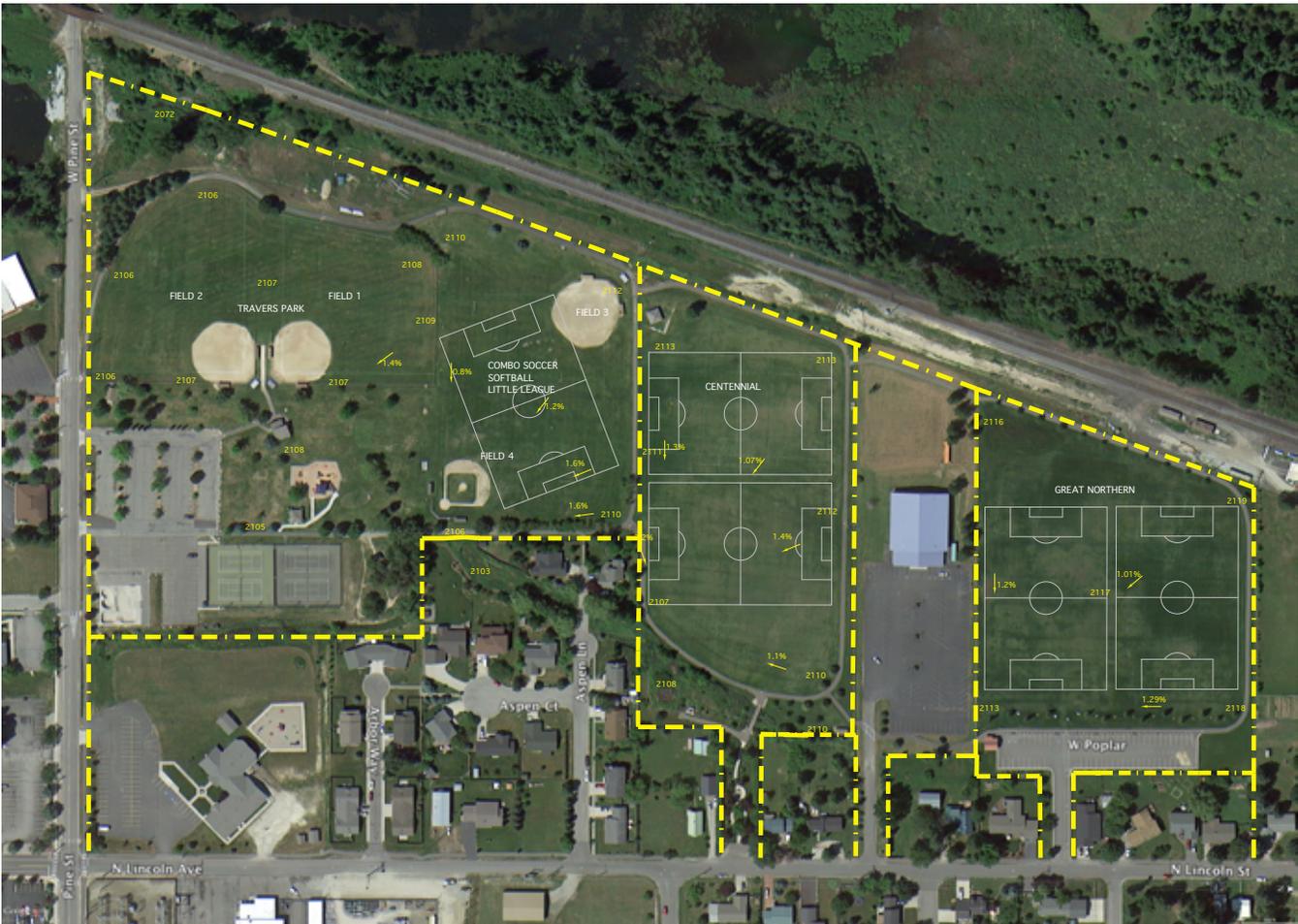


Ownership and Drainage

Veteran's Memorial Field, Great Northern, Centennial and Travers Park are all owned by the City of Sandpoint and available for school and community shared use.

Memorial Field has a very shallow slope from northwest to southeast, with surface flow likely running into the Pend Oreille River. The field area is bordered by Ontario Street and residences to the north, the boat launch to the east and additional park property to the west. A 'french drain' drainage channel was installed on the east sideline of the football field, between that line and the outer edge of the skinned infield for the baseball field, and drains to the south to a rock sump. This area is a low spot in the field of play for baseball, and impacts play in that area. Field lighting is provided for baseball and football, with a scoreboard on the south end of the field. Electrical conduit and electrical service provisions for the Festival are provided at the perimeter of the field.





Great Northern, Centennial and Travers Park are north of West Pine Street and bordered to the west by railroad property. Property to the east of these three facilities includes private residential developments and a church property between Great Northern and Centennial. Great Northern, Centennial and Travers Park and are connected with a pedestrian trail on an easement on the eastern edge of the church property.

Historically, a drainage channel existed within the Great Northern/Centennial/Travers Park property, generally east of center of the three properties, and encompassing parts of the east property lines. Approximately half of this drainage channel has been filled in, eliminating the ability of the properties in the area to use surface drainage to transport water to the lower areas southwest of the subject properties. Essentially, there is no 'surface flow' condition that might be easily utilized to drain the fields and direct drainage water to an off-site location. Drainage options that transport water from subsurface drainage systems to an outfall will require additional permitting, especially if drainage water is drained to 'waters of the State'.

Slopes on the three park properties are virtually all below a 'best practice' slope of 2 percent, which is the minimum slope required to drain water through turfgrass areas. All of the fields suffer from poor drainage, with some fields being severely impacted (Great Northern and Centennial in particular.) Low areas on the southwest corner of the overall site are steeply sloped and groundwater is present, approximately thirty feet below the Travers Park elevation.



Subsurface Soil Conditions

Soil types in the Sandpoint area are generally similar across the lowlands, consisting of alluvial and lacustrine deposits, often mixed with glacial and flood related deposits. Soils on the subject properties are typical of the lowland region, with layers of poorly draining clay, silt and limited gravels that may be meters to hundreds of meters thick. These clearly defined or mixed layers of varying soils may result in perched water in mixed clay and gravel lenses over clay layers, with potentially free-draining gravels below. Conversations with geotechnical specialists, however, discount the potential to install drywells or other gravel galleries to successfully drain areas in this region, due to the unpredictable nature of the soils.

Memorial Field appears to have a very deep layer of poorly draining organic soil throughout the field, unlike the Travers/Centennial/Great Northern facilities. Great Northern and Centennial have shallow imported topsoil overlying heavy clay soils; while Travers has several inches of topsoil over mixed fill and potentially refuse.

Given these soil types, drainage from the fields will require a piping system beneath the fields to daylight into either a drainage structure off-site or to 'daylight' into exposed surface water channels in the area. The latter option will require a permitting process with the State as waters will be discharged into surface waters.



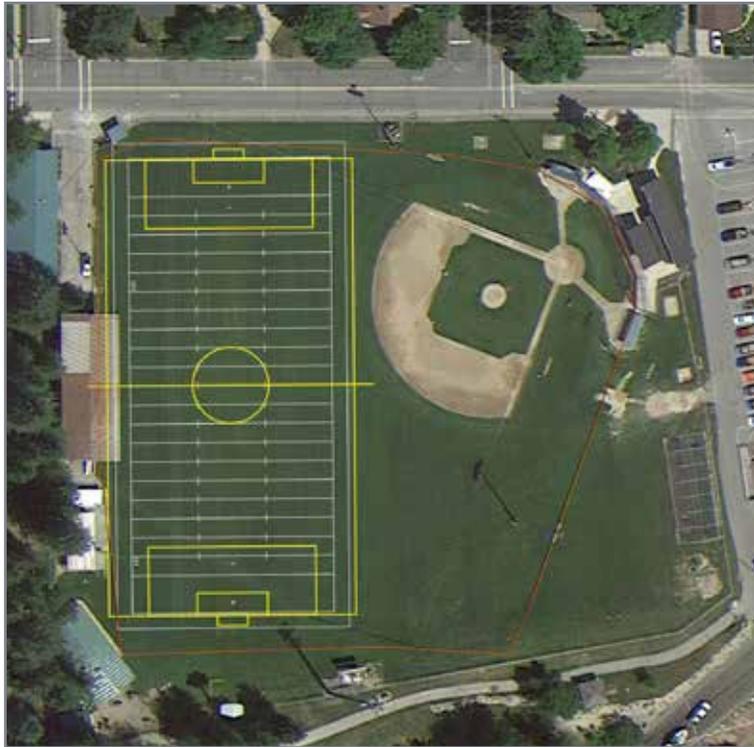
SPECIFIC SITES

Memorial Field, the focus of the initial study, is a fairly flat, poorly drained site with a high demand for sports and civic use throughout the year.

Geotechnical investigations identified a fairly high water table coupled with heavy, deep, poorly drained organic soils and limited root growth.

Demands on the field include varsity football, soccer, and baseball, club sports throughout the year, and the Festival at Sandpoint. Turfgrass conditions on the site are fair, with a root zone penetration of three to four inches but deteriorate rapidly under use.

Extensive varsity sports play in wet weather rapidly churns the heavy organic soil to mud, creating an unsafe condition for athletic play. Wet conditions at Memorial have repeatedly forced relocation of scheduled games to other facilities. The overall site is approximately 4.75 acres, with approximately 3.4 acres used for playing surface for football, soccer and baseball.



Memorial Field

7

The Festival at Sandpoint occupies the site for approximately two weeks in August of each year, with ten days of performances. During this period of time a large performance tent shelter is installed, back-of-house dressing rooms and support facilities installed on the baseball field, and many vendor tents are installed on the north end of the field. The large tent structure requires anchor stakes, weighted anchors and guy wire points which impact the field condition. Smaller structures are currently installed with grounding stakes rather than weighted anchor barrels, plates or concrete blocks. Spectator seating is provided on the grass between the grandstand and the large tent structure which is installed on the eastern part of the football field, centered on the grandstands.

The site is automatically irrigated with river water during summer months, approximately May through early October. There are no subsurface drains within the field.

Numerous options for redevelopment of Memorial Field were studied in 2015-16, including reconstruction as a sand-based field with sub-drains; partial- and full-artificial turf fields. Potential complications were identified with the Festival at Sandpoint, with perceived difficulty in the limitations to the installation of stakes for vendor tents; concerns about the field temperature, and the aesthetics of artificial turf.



The fields at **Great Northern**, located west of North Lincoln at Poplar Street, include a large, open natural grass field used for soccer and other field sports. The overall site is approximately 6.75 acres, with approximately 5 acres used for playfields.

The site slopes from northwest to southeast, with a maximum slope of approximately 1.3%, and a minimum slope of 1%. These slopes are well below a minimum of 2%, which would allow surface drainage to flow over and through turfgrass.

The field routinely retains snow melt and rainfall, resulting in a flooded, non-playable condition in the spring and the fall. Evidence in irrigation valve boxes illustrates that perched drainage and groundwater in the field has been present at an elevation of 8" below finished grade. Off-site low areas to the east of the field which historically served as the surface drainage channel for the area, did not have any surface flow reaching the area from the fields.



Great Northern

Soil probes used on the field easily penetrated to a depth of 10" with minimal effort, illustrating that the fields were not compacted when saturated or wet. The soil samples illustrated two to three inches of organic-based topsoil with turfgrass roots present, which overlaid clay- and silt-based soils. The top two inches of the clay material was damp and was able to be compacted into a cohesive shape; material below the topsoil and two inch clay layer was dry and crumbled.

The site is automatically irrigated with potable water during summer months, approximately May through early October. There are no subsurface drains within the field. Field orientation can be both east to west and north to south for a single full-size soccer field, or east to west for two full-size soccer fields.



The fields at **Centennial Park**, located west of North Lincoln and south of Great Northern and the Sandpoint Assembly of God Church, include a large, open natural grass field used for soccer and other field sports with a shelter in the southwest corner of the site.

The overall site is approximately 6.75 acres, with approximately 4 acres used for playfields. Similar to Great Northern, the site slopes from northwest to southeast, with a maximum slope of approximately 1.3%, and a minimum slope of 1%. These slopes are well below a minimum of 2%, which would allow surface drainage to flow over and through turfgrass.

The field routinely retains snow melt and rainfall, resulting in a flooded, non-playable condition in the spring and the fall. Low areas to the east of the field, which historically served as the surface drainage channel for the area, did not have significant surface flow reaching the area from the fields.

Soil probes used on the field easily penetrated to a depth of 10" with minimal effort, illustrating that the fields were not compacted when saturated or wet. The soil samples illustrated two inches of organic-based topsoil with turfgrass roots present, which overlaid clay and silt-based soils. The top two inches of the clay material was damp and was able to be compacted into a cohesive shape; material below the topsoil and two inch clay layer was dry and crumbled.

The site is automatically irrigated with potable water during summer months, approximately May through early October. There are no subsurface drains within the field. Field orientation can be both east to west and north to south for full size soccer fields.



Centennial Park



Travers Park, located south of Great Northern and Centennial, fronts on West Pine Street and includes four ball fields. The fields include three full-skinned adult softball fields and one partially skinned Little League field. All skinned areas are natural earth, consisting of sand, clay and amendments typically found in recreational ball fields.

The two northern fields (Fields 3 and 4) can also accommodate a full-sized soccer field, oriented southwest to northeast. Other park components include parking; four tennis courts; a skate park; and a restroom, shelter and playground area.

The overall site is approximately 16 acres, with approximately 8.3 acres used for ball fields. The site has very minimal slopes with a maximum of 1.6% and minimal slopes approaching zero percent on fields 1 and 2. The two northern fields are poorly drained and hold water; the two southern fields appear to have better subsoil conditions and are 'more playable' but still do not drain water aggressively to enable full play.



Travers Park

Topsoil depths vary between 4" on the two south fields to 2" on the northern fields. Under the topsoil layer, the top two inches of the underlying clay material was damp and was able to be compacted into a cohesive shape; material below the topsoil and two-inch clay layer was dry and crumbled.

The site is automatically irrigated with potable water during summer months, approximately May through early October. There are no subsurface drains within the field areas.

Scheduled sports seasons have repeatedly been rescheduled and interrupted by poor field conditions at Travers, Centennial and Great Northern, due to standing water, muddy conditions, damaged turf and poor drainage.



OPTIONS FOR FIELD REDEVELOPMENT AND ENHANCEMENT

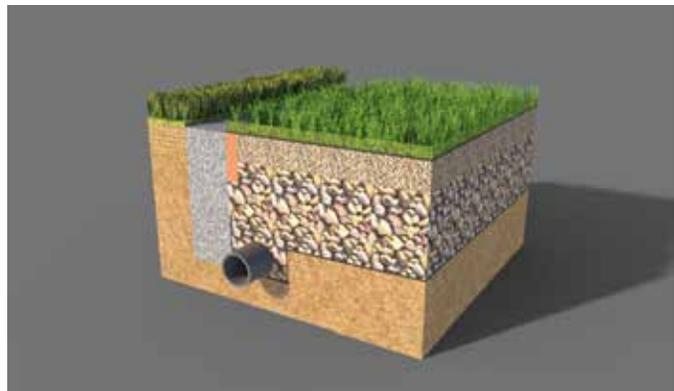
In order for the fields at Memorial Field, Travers, Centennial, and Great Northern to be brought into a playable condition for the majority of the playing season, drainage at each of the facilities must be improved and the surfacing system adequately maintained to handle the anticipated level of use. This may be accomplished with either an artificial turf option with an integrated drainage system or through the installation of subdrains in existing natural grass fields. A third option would involve complete reconstruction and regrading of each field. SPVV did study this option and set it aside due to high cost and extreme disruption to field scheduling and potentially less than ideal results.

Artificial Turf Surfacing

Artificial turf systems include an integrated drainage system beneath the field surface, tying into drainage facilities (municipal drain systems) to evacuate stormwater from the playing surface. The artificial turf system typically includes excavation of existing material to a depth of approximately 12-15"; installation of a geotextile fabric and drainage collector lines in a 'herringbone' pattern; connection of the drainage collectors to drain transport piping; installation of a relatively coarse drain rock layer capped by a finer gravel surfacing stone; and the turf matrix and infill material. The field area would be surrounded by a concrete curb and turf matrix nailing strip, with utilities (power, communications, water) located below the drainage system.

Playability and community use of the field would be limited primarily by the hours of operation established for the facility, as the field itself would not be impacted by rainfall, groundwater or adverse weather. In winter, snow can be removed via plows equipped with offset 'shoes' and the field cleared for late- or early-season use. Routine maintenance completed regularly includes field cleaning and raking, installation of additional infill material, and repairs.

Several key concerns were expressed during the Memorial Field Steering Committee and Public Meeting phases of the work regarding potential toxicity of infill materials, retained heat of the playing surface, and the desire to continue to use ground stakes through a playing surface material. SPVV researched each of these items, with conclusions as follows:



Artificial Turf Soccer Field



- Perceived toxicity of infill material: The concern included a perception that rubberized infill material is linked to a series of cancers in soccer players. A study completed by the Washington State Department of Health concluded, however, that the incidence of cancer in soccer players who played on rubber-infilled soccer fields was actually lower than the regular population, and could find no link whatsoever between the use of rubber infill and adverse health effects. Regardless of this study, SPVV from the outset recommended an organic infill material comprised primarily of cork or ground olive pits. Natural materials are less susceptible to static electricity over time, and with non-sporting activities planned for a playing surface, 'cling' of infill materials onto clothing is greatly minimized. Ground-up materials such as these also tend to interlock, providing a lower level of infill that can be displaced into the air.
- Retained and radiated heat on artificial turf fields: The concern centered on a perception that artificial turf fields are dramatically hotter in the summer sun than natural turf fields and that the air temperature above the fields is also much higher.

Studies completed on several fields in Connecticut showed that with natural turf playfields with an ambient air temperature of 99° at 2:30PM, turf surface temperatures 104° were observed, and temperatures between 1" and 6" below the surface ranged from 87° to 78° respectively; and the air temperatures above the field ranged from 97° to 99° between 2' and 5' above the surface, respectively.

Similar studies in Connecticut on artificial turf fields showed that artificial turf playfields with an ambient air temperature of 99° at 2:30PM, turf surface temperatures of 138° were observed, and temperatures in a crumb-rubber infill mix were 107°. Air temperatures above the field ranged from 104° to 101° between 2' and 5' above the surface, respectively. Further information was obtained by SPVV illustrating that temperature gains with a natural (cork and sand) infill mix resulted in a surface temperature of 126° under similar temperature and exposure conditions.

To summarize: Artificial turf surfaces may be up to 22° warmer than natural turf surfaces in mid-afternoon on a hot day; and that air temperatures 2' above artificial turf may be 7° warmer, and that temperatures 5' above artificial turf may be 2° warmer than natural grass. Temperatures after 3PM in all cases, both natural and artificial, dropped as the solar gain decreased due to the angle of the sun.

Ground staking: Currently, the Festival at Sandpoint uses a combination of weighted ground anchors and plates with in-ground stakes to secure the large main stage tent. Smaller vendor tents and back-stage performance and host tents use ground stakes pounded into the playing surface of the baseball and football field. As currently operated, the Festival has the ability to relocate tents to different locations on a year-to-year basis with minimal advance planning, providing flexibility as the Festival changes through the years.

Securing such structures on artificial turf surfaces is routinely completed around the globe through either pre-positioning key anchor points beneath the playing surface, and providing removable patches in those areas; or through the use of weighted anchors in the form of water-weighted barrels or portable concrete anchors. Where heavy vehicle traffic is anticipated, protective panels are installed on top of the artificial turf surface to minimize damage to the turf system. Installation of an artificial turf system at Memorial Field would require selecting a permanent location for the large event tent, and either pre-planned anchor points beneath the turf for smaller tents or weighted anchors and plates for smaller tents. Additionally, vehicle traffic areas for setup and operation would require turf protection plates to ensure the turf system is undamaged during setup, operation, and tear-down.



Natural Turf Surfacing

Natural turf surfacing for playfields performs best when either the fields have sufficient grade to drain surface water or the fields are equipped with sub-drains and a free-draining soil material. None of the fields within the study currently have sufficient cross-slope to effectively drain surface water from the fields without complete reconstruction of each field. The following options are presented as summaries of each type of remediation work.

Reconstruction Option

This option would reconstruct each playfield area to provide a minimum of 2% cross slope in a crowned field configuration across each playing surface.

During the reconstruction effort, material currently on site would be used as fill, with new sand-based topsoil provided in a 6" lift. On the sidelines of each field, drainage water would be collected and piped to an outfall. This option would result in each field being taken out of use for at least a year, and would result in increased construction traffic during the work versus other options.

The reconstruction option is very complex in terms of grading and playability of the fields. Currently, with the very shallow slopes, the fields might be regarded by coaches and players as being fairly ideal in terms of grade. Reconstructing the fields introduces new slopes and playing challenges to the fields, and does result in impacts beyond the playing surface where abutting other finished construction (pathways, buildings, backstops, irrigation components, etc.).



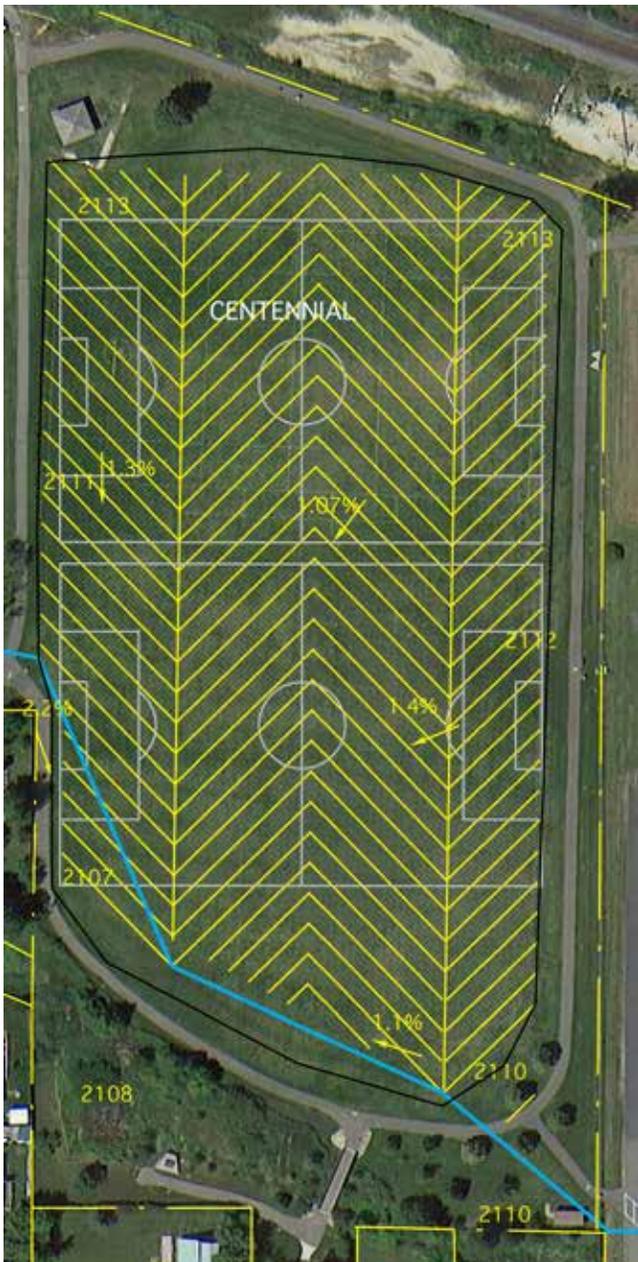
Partial plan showing re-contouring



Vertical Sand Column Drainage Option

This option would provide an extensive under-drain system in each of the subject fields. The process of installation includes cutting in a narrow trench, installing a vertical, geotextile-wrapped 'multi-flow' drainage pipe; and backfilling the trench with free-draining coarse sand. The multi-flow pipe would be installed in a layout that is generally perpendicular to the natural slope to collect water flowing down slope, and then piped through transport piping to an outfall. For optimum drainage, the 'multi-flow' pipe trenches would be placed at 15' centers. Due to the extensive trenching required to install the drainage system, the existing irrigation systems in these fields would require replacement or extensive repair. The majority of the turf, however, would remain in place, providing a quicker return of the field to active play. The project could include a phased option to address individual field drainage, although a single transport pipe would disrupt other fields during initial construction.

Below, a conceptual layout for the field at Centennial is shown in yellow, with a herringbone pattern of vertical sand column drains installed at 12-15' centers. These drains collect to the blue transport pipe at the east end of the fields.



Below is a typical vertical sand-column field drain detail, with 6" or 12" tall multi-flow piping installed in the sand channel. Irrigation piping is shown below the drain system.



Sand Column Field Drain System



RECOMMENDATIONS

It is SPVV's recommendation that the best course of action for the City of Sandpoint is to proceed with phased construction of field improvements completed over several years.

- Memorial Field, due to the expected use of the field, may be reconstructed with either artificial turf and drainage or through a natural turf system with a sand profile and subdrains.
- Centennial, Travers 3 and 4 and Great Northern would likely best be served by installation of subdrainage systems within the existing turfgrass.

Phasing of the projects needs to be discussed in terms of actual sequencing of construction and expected funding levels to provide a predictable delivery date for the fields as well as an understood funding level throughout the multi-phase project.

Suggested phasing could include:

- A first-phase construction effort at Memorial Field, possibly beginning in late September or early October, requiring coordination with athletic team scheduling. Regardless of natural or artificial turf options for this site, the work would require completion by early Summer of the following year in order to accommodate a grow-in period (natural turf option) ahead of the Festival schedule in late July/early August.
- A second-phase construction effort at Centennial/Travers, which lays the groundwork for the final phase at Great Northern. The second phase would provide subdrains at Centennial and Travers 3 & 4, transport piping through Travers 1 & 2; a new irrigation system throughout the work area; potentially expanded parking for Travers Park; potentially a new restroom location within Travers; and accessory work. Centennial/Travers work could begin immediately after Memorial Field is completed, with completion of that work required by late autumn.
- Final phase work would include the subdrainage system at Great Northern, which would connect to the Centennial drainage transport piping; a new irrigation system; and accessory work. Final phase work would be anticipated the following construction season, after completion of Centennial/Travers.



PHASING, COSTING, AND MAINTENANCE

With the redevelopment scenarios that follow, we have prepared detailed cost estimates for each, and prepared draft schedules for design and implementation. Anticipated maintenance and operations costs were also prepared for each phase of work. The following scenarios focus on redevelopment of the existing fields, maintaining natural turf, without alternatives for artificial turf installation.

Phase 1: Memorial Field

Option 1, Artificial Turf

First-phase work would include removal of the existing natural grass playfield, reconfiguration of existing utilities and construction of a new all-weather artificial turf system with anchor points for the large Festival event tent. Smaller tents would be anchored with on-grade weighted plates, barrels or weights. The existing baseball field would be shifted closer to the existing backstop and reconfigured slightly as a result. Field drainage would be metered into existing drainage facilities. Access for the project area would likely include a construction entry on the north side of the site and the east side of the baseball field.



Phase 1 Option 1 Artificial Turf Estimated Costs

Estimated Costs:

Memorial Field Reconstruction Option 1, Artificial Turf: \$2,006,390

Expected Duration of Design: 90 working days.

Expected Duration of Construction: 60 working days, April 1 - Late June of target year, or August 15 - early November of Target year.



Option 2, Natural Turf, Complete Reconstruction

First-phase work would include removal of the existing natural grass playfield and six inches of the existing heavy topsoil, reconfiguration of existing utilities and construction of a new sand-based natural turf playfield with drainage. The existing baseball field would be shifted closer to the existing backstop and reconfigured slightly as a result. Field drainage would be metered into a filtration system to minimize fertilizer into surface water systems. Access for the project area would likely include a construction entry on the north side of the site and the east side of the baseball field.



Phase 1 Option 2 Estimated Costs and Schedule

Estimated Costs:

Memorial Field Reconstruction Option 2, Natural Turf: \$1,041,210

Expected Duration of Design: 90 working days.

Expected Duration of Construction: 75 working days, March 1 - mid-June of target year, or August 15 - mid November of target year.



Phase 2: Travers 3&4 and Centennial

Second-phase work would include installation of new drain lines on Travers 3 and 4 along with Centennial, and rehabilitation/replacement of the irrigation system at Travers 1 and 2. An accessory project would expand parking at Travers, adding approximately 87 stalls of parking adjacent to the existing parking lot. The anticipated routing for the main drain pipe would be along the east side of Centennial and Travers 3 and 4, and pass under Travers 1 and 2 to the southwest, daylighting below the crest of the slope above exposed surface water.

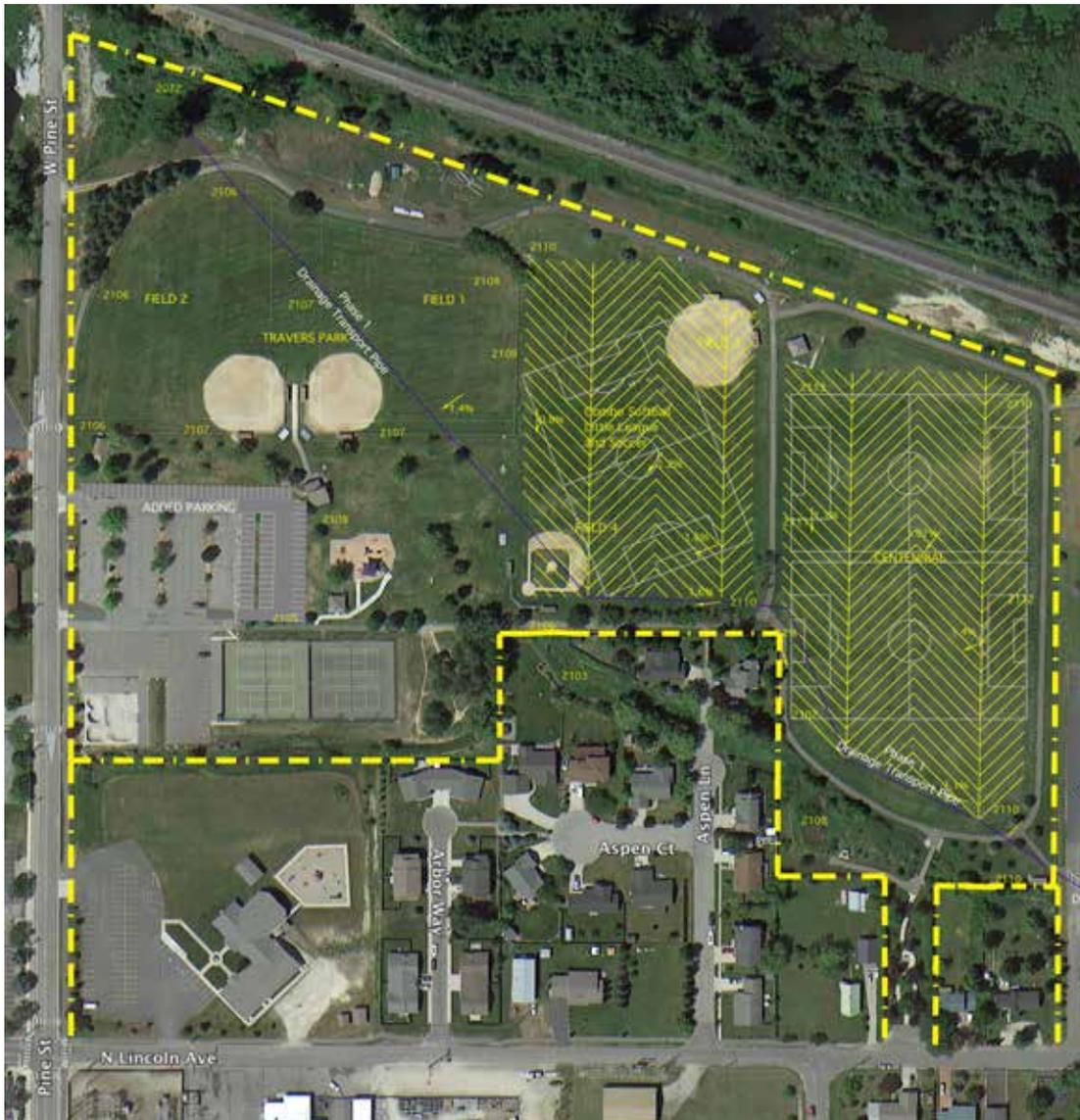
Phase 2 Estimated Costs and Schedule

Travers 3 & 4 and Centennial: Construct new drainage line from outfall through Travers 1 and 2, connecting to new under-drains covering Travers 3 and 4 as well as Centennial.

Estimated Costs:

Travers 1 and 2 Irrigation rehabilitation and repairs:	\$131,159.
Travers 3 and 4 under-drain, field rehab and new irrigation:	\$308,523.
Centennial Field under-drain, field rehab and new irrigation:	\$502,287.
Total cost, Phase 1:	\$941,969.

Added project: Travers Additional parking (87 Stalls) \$151,949.



Estimated Schedule: Phase 2 Project: Centennial, Travers 3 and 4, Transite Drainage Line, Travers 1-4 Irrigation Replacement/Upgrade and parking lot expansion

Expected Duration of Design: 90 working days
Expected Duration of Construction: 90 working days

Phase 3: Great Northern

With second-phase work complete, a third phase of work will connect the Travers/Centennial drain system to a new field drain system at Great Northern. The work would include installation of new drain lines and replacement of the irrigation system. Scheduling for the work would include a Summer/Fall construction period for Great Northern potentially reaching into the following spring depending on weather and completion of a required maintenance period.

Phase 3-Estimated Costs and Schedule

Construct new under-drain on Great Northern, tie drains into Centennial/Travers drain line system.

Estimated Costs:
Great Northern: \$544,916

Expected Duration of Design: 45 working days
Expected Duration of Construction: 60 working days



Estimated Annual Maintenance Costs: Includes labor and benefits, domestic water and sewer, fertilization and aeration, aeration and topdressing, major equipment replacement; Drain water filtration and pump maintenance (Memorial).

Centennial/Great Northern/Travers: \$200,766.00

Memorial: \$183,164.10

