

APPENDIX C

Design Guidelines for City of Bozeman Parks

NEW PARK CONSTRUCTION

New park construction must be approved by the City of Bozeman's Parks Division and the Recreation and Parks Advisory Board, and must comply with the adopted PROST Plan and individual park master plan, if applicable. Any changes must be approved and/or amended in the individual park master plan.

SOIL PREPARATION

All soils to be used on public parkland shall be inspected by and meet the approval of City of Bozeman Parks Division staff prior to installation, and shall meet the minimum depth requirement of 10 inches. All rock in excess of 1 inch in diameter shall be removed. Soil tests (a sieve analysis and soil analysis) shall be performed prior to planting to determine the classification and texture of the soils, along with any nutrient deficiencies. The classification and texture will determine what amendments, if any, are needed, while the soil analysis will help correct any nutrient problems with a pre-plant fertilization.

Guidelines for Soils. The soil will be deemed acceptable if it is less than 35 percent clay, less than 70 percent sand, and 70 percent silt. Ph must not exceed 8.4. The soil will be screened at 1 inch minus for rocks and debris, and topsoil depth will be at least ten inches. The sub-base, after grading, will be scarified to a depth of twelve inches to insure drainage throughout the profile.

Amendments may vary depending on existing soils, but will generally consist of 60 percent coarse sand (generally concrete sand), 20 percent organics (C : N ratio below 30) and 20 percent approved native soil. Soils will be mixed prior to installation with a screener / mixer machine, or applied in layers on site and mixed thoroughly with a deep rototiller. Depth of amended soil will be a minimum of 10 inches. There will be no compaction following the grading process. Fertilizer, and the rate at which it will be applied, should be dictated by the soil test report.

SEEDING

Seeding ratios and mixes will be approved by the City of Bozeman Parks Division. Seeding will be applied with a slit-type or drill-type seeder to insure good soil to seed contact. Before seeding the soil shall be loosened to a minimum depth of 6 inches in order to improve initial root development. The soil *will not* be compacted in any manner. Sufficient compaction is readily achieved through the grading process and normal rainfall. Fertilizer should be applied prior to planting to insure healthy plant development. Generally, a seed mix combination of Bluegrasses and Rye are used in formally maintained parks. Some low maintenance Kentucky bluegrasses that perform well are Kenblue, Park, Plush, Vantage, Victa, Vanessa, Barblue, Parade and S-21. Perennial ryegrass will be used instead of annual ryegrass. Athletic fields will be planted with new and improved Kentucky bluegrass (KBG) types and new cultivars of perennial rye. Examples of some of the new, aggressive types of KBG's are Award, Total Eclipse, Midnight, Nustar, Ram I, Limousine and Touchdown. Lower maintenance parkland may require different seed mixes, and will be specified by the Parks Division.

IRRIGATION

Irrigation systems will be compatible with Maxicom systems. All water lines shall be schedule 40 PVC. Black poly pipe is unacceptable for any mainline and may only be used for lateral lines when approved by the Parks Division. Pipe shall be installed at a minimum depth of 12 inches, with main lines at 18 inch minimum depth. If this depth is unachievable the Parks Division must be consulted. No stacking of irrigation lines shall be permitted. Four (4) inches of sand shall be placed beneath pipe, and 4 inches of sand above the pipe, to prevent compaction and settling. Sprinkler heads will be installed on manufactured swing joints (schedule 80 w/ o-rings). Heads to be installed must be approved by the Parks Division and shall be gear driven, with interchangeable nozzle sizes, unless noted otherwise. The heads shall be capable of producing the specified gpm and coverage area and shall be set to manufacturers' specifications. Electrical locate tape shall be installed along all main lines. Upon completion of installation all warranty and maintenance information, as well as well logs and pump warranties and information, if applicable, shall be supplied to the City of Bozeman Parks Division along with and an "as-built" map.

Irrigation clocks shall be Rain Bird ESP_MC with metal casing (for the purpose of consistency, being Maxicom compatible, training of employees, and to reduce vandalism).

WELLS

Wells installed on City of Bozeman property must be registered in the City's name. All wells must have a stainless steel screen at the intake. Any well installed in a public dedicated park that is larger than two acres must have a minimum potential of 100 gpm.

PLAYGROUNDS

Playgrounds must be installed on parkland managed by the City of Bozeman. All playgrounds must be approved by a Certified Playground Safety Inspector (CPSI) and meet ASTM F1487-01, CPSC and ADA guidelines and specifications. Playgrounds shall be age appropriate, for area served, and be signed accordingly. There must be an adequate use zone area around equipment, approved material in the use zone, which meets impact attenuation criteria as specified in ASTM 1292, and accessibility guidelines ASTM F 1951-99, and have adequate drainage. All installation plans, surfacing Certificate of Liability, materials list, construction guidelines, maintenance information and manufacturer's name must be supplied to the City of Bozeman's Parks Division, upon completion of playground installation. All work will be overseen and approved by a CPSI. Playgrounds must be inspected by a CPSI before opening playground to the public. No wooden structures will be approved.

FENCING

Fencing shall be constructed with 9-gauge, commercial grade chain link fabric. All posts and top rails shall be schedule 80 galvanized pipe. Corner post will be 2 and 3/8 inch, line post will be 1 7/8 inch, top and bottom rails will be 1 1/4 inch. All post are to be set in concrete, spaced at 10 foot intervals, and a concrete pad, 12 inches in width and 4 inches in depth, shall be installed beneath the fence line along the entire length. A bottom rail will be installed between all sections of fence for the purpose of tying the fabric down as well as maintaining the strength and integrity of the fabric. Appropriate heights of fences shall be determined by the City of Bozeman Parks Division.

LAKES AND PONDS

If the development includes a lake or pond that is dedicated to the public, the water shall be tested twice a year, once in the spring and once in the fall, by the developer until the Homeowner's Association forms at which time the HOA assumes the responsibility for testing. Testing shall include Fecal Coliform, Fecal Enterococci, Staphylococcus, and Pseudomonas, and copies of reports shall be submitted to the City of Bozeman Parks Division for their records.

PUBLIC RESTROOMS

New park restroom plans and construction must be approved by Parks Division and must comply with the individual park master plan, if applicable. Any changes must be approved and/or amended in the individual park master plan.

Rest room buildings, plumbing, electrical, and general construction must meet or exceed all City, County, State, and Federal building codes. Restrooms must meet or exceed all ADA and ADAAG guidelines.

Unless otherwise approved, restrooms (building) exterior and interior walls must be of CMU construction. All exterior walls must be insulated. The building will have a metal roof and rain gutters with down spouts. Security lights will be installed on two sides of the building. The building will consist of a Women's and a Men's restroom with each rest room having fluorescent lighting and ventilation fan activated by a motion sensor switch. Each restroom will consist of 3 stalls. The Women's will have three 3 toilets and the Men's will have two 1 toilets and one 1 urinal. Each restroom will have 1 sink, 1 soap dispenser, and 1 hand drier and/or 1 towel dispenser. Any and all windows will be of glass blocks. The building will have a utility room between the Men's and Women's restrooms measuring no less than 4 feet wide and run the length of the restrooms. All plumbing and water lines will be within the utility room and easily accessible. The water meter will be located in the utility room. The building's water lines will be copper. The size of the main feed line to the building will be determined by the City of Bozeman. The floors in each restroom will have either a single 4 inch floor drain or a trench drain. The utility room will also have a floor drain. The floor will slope to the drain with no low or flat areas that hold water. All the restrooms toilets, sinks, and urinals must be stainless steel. Each toilet and urinals will have a motion sensor flush valve. The building will have a heating system large enough to keep each restroom and utility room from freezing during winter months. The heating unit is to be located with in the utility room. Drinking fountains, showers and other amenities will be at the discretion of the City of Bozeman.

TRAIL CONSTRUCTION

1. Trail Classifications

Class IA. These trails are heavily used with full access, and are designed for recreational and commuter use along major transportation corridors. These trails are designed to permit two-way traffic using an impervious surface material such as asphalt or concrete. These trails are 12 feet wide with full ADA accessibility.

Class IB. These trails are the same as Class IA trails with the exception of being 10 feet wide. These trails are typically used in interior subdivision settings where Class I trails are appropriate, but a full 12 feet width is not necessary.

Class IIA. These trails receive heavy to moderate use with a very high degree of ADA accessibility. They are intended for multiple non-motorized, recreational and commuter use. Class II trails are constructed of natural fines and are 6 feet in width.

Class IIB. These trails receive moderate use and provide moderate ADA accessibility depending on grades and/or obstacles. Construction standard is the same as Class IIA.

Class III. These trails receive moderate to low use and are typically 3 feet in width. They are either natural trails developed by use, or constructed with natural fines. ADA accessibility is extremely limited.

Class IVA. These trails are generally mowed corridors used for ski trails in winter, or occasional special activities such as cross-country running meets, and are 16 feet in width.

Class IVB. These trails are the same as Class IVA trails with the exception that they are 10 feet in width.

Class V. These trails are used for equestrian traffic, and when constructed parallel to pedestrian trails are built with a sufficient buffer and physical barrier between them to prevent horse/pedestrian conflicts.

2. **Class I Trail Construction**

Class I trails must be constructed to support a minimum of 12,500 pounds.

- Asphalt – Width of trails shall be a minimum of 10 feet, with a minimum cross slope of 2 percent or maximum of 5 percent and a 1 foot wide gravel border along each edge. Trail bed shall be excavated to a minimum depth of 11.5 inches. A soil sterilant, approved by the City of Bozeman Parks Division, shall be applied to trail bed prior to construction. The trail bed shall consist of a minimum of 9 inches of crushed gravel compacted to 95 percent of maximum density as determined by AASHTO T99, unless otherwise dictated by sub-soil type materials being compacted to road standard. The overlay shall consist of 2.5 inches of asphalt compacted to 93 percent of maximum density, as determined by ASTM D 2041. Construction seal shall be applied at 0.08 gallon/square yard after installation.
- Concrete – Width of trails shall be a minimum of 10 feet with a minimum cross slope of 2% percent or maximum of 5 percent. The trail base shall consist of a minimum of 3 inches of crushed gravel compacted to 95 percent of maximum density as determined by AASHTO T99. Concrete shall be a minimum of 6 inches of M4000 reinforced with 1.5 lbs. per cubic yard of Fiber mesh. Where terrain allows, slope of trail should not exceed 12:1.

3. **Class II Trail Construction**

Class II trails shall be a minimum of 72 inches in width. The trail bed must be excavated 6 inches deep, prior to installation of tread mix. Tread mix shall be installed in two parts. The first 3 inch lift shall be of ¾ inch Road mix, compacted, and then 3/8th inch minus gravel (natural fines). Natural fines used for these trails shall consist of 80 percent sand, 10 percent silt and 10 percent clay. If the material falls outside of these parameters, the City Of Bozeman Parks Divisions must be consulted for approval or modification. If the natural fines tread mix does not contain enough clay or silt binder, additional binder must be mixed in. Alternative soil stabilizer products are acceptable, but

must be approved by the City of Bozeman Parks Division. The trail bed must be filled up to original surface along both edges with a cross slope of no less than 2 percent and no more than 5 percent to provide for water drainage. Tread mix must be rolled flat and compacted after installation, maintaining a 2 to 5 percent cross slope. (If moisture content is not adequate for compaction, water should be added prior to rolling and compacting). Where terrain allows, slope of trail should not exceed 12:1 with a cross slope no greater than 20:1 (5 percent) to provide for ADA accessibility. All damage to surrounding features and/or vegetation shall be reclaimed immediately. Encroaching weeds, due to trail construction, shall be treated and controlled for a minimum of 2 years after trail section is completed. Minimum overhead clearance shall be 96 inches for pedestrian and bike traffic, and 120 inches for equestrian traffic.

4. **Street/Trail Connections**

Mid block trail crossings shall have a painted pedestrian crossing, with crossing and advanced crossing signs at either end. Curb cuts shall be provided at all street / trail connections.

5. **ADA Accessibility**

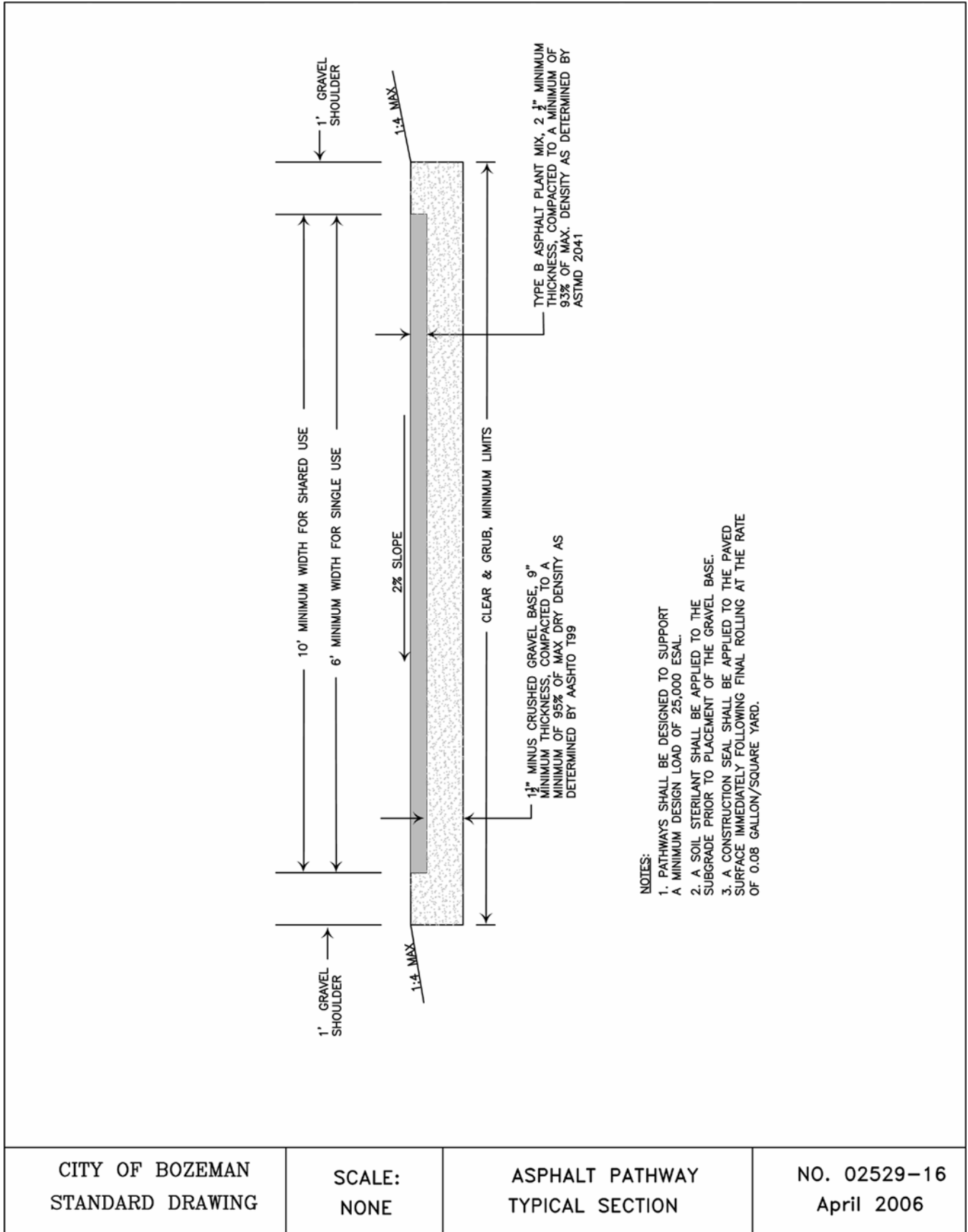
Full ADA trail accessibility is defined as a slope not exceeding a 12:1 angle and a cross slope of no more than 2 percent. There can be no abrupt change in surface level greater than ½ inch.

BRIDGES

Bridges shall have a minimum width of 96 inches, to allow wheelchair turn around and passing. The height of the bridge is measured from the bridge deck to the bottom of the stream or river. If the deck is more than 30 inches high a protective rail is required. Rails are to be 42 inches high, with at least one midrail at 34 inches, to be used as a handrail. A protective barrier must be installed along the length of the rail system with either solid paneling or vertical bars. Spacing between bars shall be no greater than 3.5 inches or less than 9 inches. All bridges to be installed on public lands must be certified by a civil or structural engineer. If the bridge does not require a rail it must have a 3 inch high curb on both sides along the entire length of the bridge. The deck should be constructed of slip-resistant material. The deck of the bridge shall not exceed a 12:1 slope along any part of its length. The deck and ends of the bridge must have no abrupt change in surface level greater than ½ inch. Cross slope shall not exceed 2 percent. Bridges must be rated for weight load distribution in accordance with ASTM standards and display a permanent label indicating the load limit, year it was built and manufacturer.

HILLSIDE GRADES

Hillside grades within park landscapes shall be 7:1 when achievable, and no steeper than 5:1, to allow for maintenance equipment access and to minimize water runoff. Appropriate measures such as hydroseeding, erosion control matting, or other approved measures shall be taken to stabilize and allow for the specified re-vegetation of all disturbed parkland areas, regardless of slope.

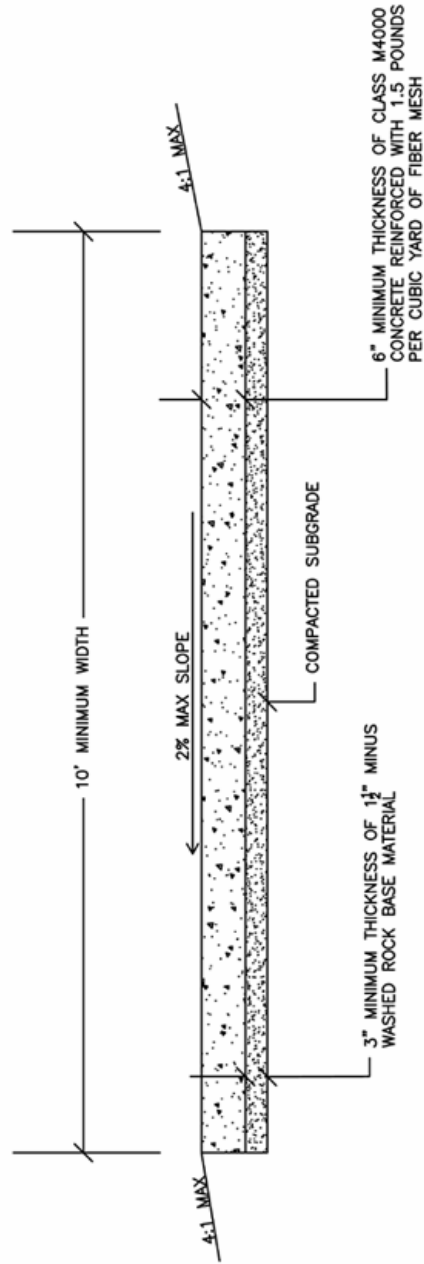


CITY OF BOZEMAN
STANDARD DRAWING

SCALE:
NONE

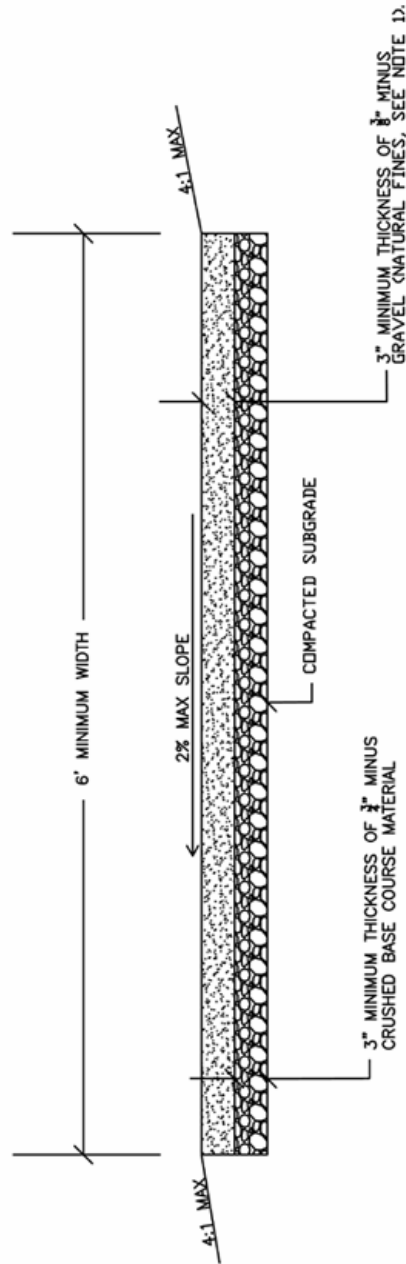
ASPHALT PATHWAY
TYPICAL SECTION

NO. 02529-16
April 2006



- NOTES:
1. SPACE CONTRACTION JOINTS TO MATCH THE WIDTH OF TRAIL.
 2. INSTALL EXPANSION JOINT MATERIAL AT EVERY FIFTH JOINT FOR THE FULL DEPTH OF CONCRETE.
 3. FINISH CONCRETE WITH LIGHT BRUSH FINISH.

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| <p>CITY OF BOZEMAN STANDARD DRAWING</p> | <p>SCALE: NONE</p> | <p>CONCRETE CLASS I TRAIL TYPICAL SECTION</p> | <p>NO. 02529-17 April 2006</p> |
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NOTES:

1. NATURAL FINES SHALL CONSIST OF 80% SAND, 10% SILT, AND 10% CLAY.
2. A SOIL STERILANT SHALL BE APPLIED TO THE SUBGRADE PRIOR TO PLACEMENT OF THE GRAVEL BASE.

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| <p>CITY OF BOZEMAN STANDARD DRAWING</p> | <p>SCALE: NONE</p> | <p>CLASS II TRAIL TYPICAL SECTION</p> | <p>NO. 02529-18 April 2006</p> |
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