

Existing Erosion Problems

Ransom Consulting, Inc. is not aware of any existing erosion problems on site.

Protected Natural Resources

There are no wetlands on-site that have been observed or delineated.

Erosion Control Measures and Site Stabilization

The primary emphasis of the erosion & sediment control plan is as follows:

- Rapid vegetation of exposed areas to minimize the period of soil exposure.
- Rapid stabilization of drainage paths to avoid channel erosion.
- The use of on-site measures to capture sediment (hay bale dam, erosion control berm)
- Development of a careful construction sequence.

The following temporary and permanent erosion and sediment control devices will be implemented as part of the site development. These devices shall be installed as indicated on the plans or as described within this report. For further reference, see the Maine Erosion and Sediment Control BMPs (most recent revision).

Temporary Erosion Control Measures

The following measures are planned as temporary erosion & sedimentation control measures during construction. These temporary erosion control measures should be removed within 30 days after permanent stabilization has been established.

1. Crushed stone-stabilized construction entrances shall be placed at site entrances.
2. Wood waste compost berms (erosion control berm) shall be installed downstream of any disturbed areas to trap runoff borne sediments until the tributary areas are vegetated. The erosion control berms shall be installed per the details provided and inspected regularly, including before and after a storm event of 0.5 inches or greater. Repairs shall be made if there are any signs of erosion or sedimentation below the fence or berm line. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind berm, the barrier shall be replaced with a stone check dam.
3. Straw, hay mulch and hydroseeding is intended to provide cover for bare or seeded areas until vegetation is established and should be applied within 7 days at a rate a 115 pounds per 1000 square feet. Mulch placed between April 15th and October 15th (on slopes of less than 15 percent) shall be anchored by applying water. Mulch placed on slopes of equal to or steeper than 15 percent shall be covered by fabric netting and anchored with staples in accordance with manufacturer's recommendation. Slopes steeper than 3:1 shall receive erosion control blankets or rip rap.
4. Temporary stockpiles of stumps, grubbing, or common excavation will be protected as follows:
 - Stockpiles shall be stabilized within seven days by either temporarily seeding the stockpile by a hydroseed method containing an emulsified mulch tackifier or by covering the stockpile with mulch, such as shredded hay, straw, or erosion control mix.
 - Stockpiles shall be surrounded by sedimentation barrier at the time of formation.
5. All disturbed areas that are within 75 Feet of an undisturbed wetland shall receive mulch or erosion control mesh fabric within 48 hours of initial disturbance of soil. All areas within 75 Feet of an undisturbed wetland shall be mulched prior to any predicted rain event regardless of the 48 hour window. In other areas, the time period may be extended to 7 days.
6. State and local roads shall be swept to control mud and dust as necessary. Additional stone shall be added to the stabilized construction entrance to minimize the tracking of material off the site and onto the surrounding roadways.
7. Stormdrain catch basin inlet protection shall be provided through the use of stone sediment barriers or approved sediment bags (such as Silt Sack). Installation details are provided in the plan set. The barriers shall be inspected after each rainfall and repairs made as necessary. Sediment shall be removed and the barrier restored to its original dimensions when the sediment has accumulated to half the design depth of the barrier. The barrier shall be removed when the tributary drainage area has been stabilized.
8. Water and/or calcium chloride shall be furnished and applied in accordance with MDOT specifications--Section 637--Dust Control.
9. Loam and seed is intended to serve as the primary permanent vegetative measure for all bare areas not provided with other erosion control measures, such as riprap.
10. Water from construction trench dewatering or temporary stream diversion shall pass first through a filter bag or secondary containment structure (e.g. hay bale lined pool) prior to discharge. The discharge site shall be selected to avoid flooding, icing, and sediment discharges to a protected resource. In no case shall the filter bag or containment structure be located within 75 feet of a protected natural resource.

Permanent Erosion Control Measures

The following permanent erosion control measures have been designed as part of the Erosion/Sedimentation Control Plan:

1. All areas disturbed during construction, but not subject to other restoration (paving, riprap, etc.) will be loamed, limed, fertilized, mulched, and seeded. Fabric netting, anchored with staples, shall be placed over the mulch in areas as noted. All areas within 75 feet of an undisturbed wetland shall be mulched prior to any predicted rain event regardless of the 48 hour window. Native topsoil shall be stockpiled and reused for final restoration when it is of sufficient quality.
2. All stormdrain pipe outlets shall have riprap aprons at their outlet to protect the outlet and receiving channel from scour and deterioration. Installation details are provided in the plan set. The aprons and plunge pools shall be installed and stabilized to the extent practicable prior to directing runoff to the tributary pipe or culvert.
3. Catch basins shall be provided with sediment sumps and inlet hoods for all outlet pipes that are 18" in diameter or less.

Implementation Schedule

The following construction sequence shall be required to insure the effectiveness of the erosion and sedimentation control measures are optimized:

Note: For all grading activities, the contractor shall exercise extreme caution not to overexpose the site by limiting the disturbed area. The construction of BMPs should either be performed after the tributary area is stabilized or temporary erosion control measures need to be implemented to protect the BMPs from being clogged with construction sediment.

1. Install crushed stone to stabilized construction entrances.
2. Install perimeter erosion control berm.
3. Clear and grub site within the specified clearing limits.
4. Commence installation of drainage infrastructure.
5. Commence earthwork and grading to subgrade.
6. Commence construction of building foundation.
7. Continue earthwork and grading to subgrade as necessary for construction.
8. Complete remaining earthwork operations.
9. Complete installation of drainage infrastructure.
10. Install subbase and base gravel within proposed expansion and parking.
11. Loam, lime, fertilize, seed and mulch disturbed areas.
12. Install surface course paving for driveway and parking areas.
13. Once the site is stabilized and a 90% catch of vegetation has been obtained, remove all temporary erosion control measures.
14. Touch up loam and seed.

Note: All bare areas not subject to final paving, riprap, or gravel; shall be vegetated.

Prior to construction of the project, the contractor shall submit to the owner a schedule for the completion of the work, which will satisfy the above construction sequence in the specified order, however, several separate items may be constructed simultaneously. Work must also be scheduled or phased to reduce the extent of the exposed areas as specified below. The intent of this sequence is to provide for erosion control and to have structural measures such as erosion control and construction entrances in place before large areas of land are stripped.

The work shall be conducted in sections which shall:

- Limit the amount of exposed area to those areas in which work is expected to be undertaken during the preceding 30 days.
- Vegetate the disturbed areas as rapidly as possible. All areas shall be permanently stabilized within seven days of final grading or before a storm event; or temporarily stabilized within 48 hours of initial disturbance of soil for areas within 75 feet of an undisturbed wetland and 7 days for all other areas.
- Incorporate planned inlets and drainage system as early as possible into the construction phase. The ditches shall be immediately lined or vegetated as soon as their installation is complete.

Winter Stabilization Plan

The winter construction period is from November 1 through April 15. If the construction site is not stabilized with pavement, a road gravel base, 75% mature vegetation cover or riprap by November 15th, then the site shall be protected with over-winter stabilization.

Winter excavation and earthwork shall be completed such that any area left exposed can be controlled by the contractor. Exposed areas shall be limited to those areas in which work is expected to commence and complete in the next fifteen (15) days and that can be mulched within one day prior to any snow event.

All areas shall be considered to be bare until the subbase gravel is installed within pavement/building areas or the areas have been loamed, seeded and mulched. Hay and straw mulch rate shall be a minimum of 150 pounds per 1,000 square feet (3 tons/acre) and shall be properly anchored.

The contractor shall install any added measures, which may be necessary to control erosion/sedimentation from the site dependent upon the actual site and weather conditions. Continuation of earthwork operations on additional areas shall not begin until the exposed soil surface on the area being worked has been stabilized, in order to minimize areas without erosion control protection.

1. Soil Stockpiles
Stockpiles of soil or subsoil shall be mulched for over winter protection with hay or straw at twice the normal rate or at 150 lbs/1,000 SF. (3 tons per acre) or with a four-inch layer of woodwaste erosion control mix. This shall be done within 24 hours of stocking and re-established prior to any rainfall or snowfall. Any soil stockpile shall not be placed (even covered with hay or straw) within 100 feet from any natural resources.

2. Sediment Barriers
During frozen conditions, sediment barriers shall consist of woodwaste filter berms as frozen soil prevents the proper installation of hay bales and sediment silt fences.

3. Mulching
An area shall be considered bare until areas of future loam and seed have been loamed, seeded and mulched. Hay and straw mulch shall be applied at a rate of 150 lb. per 1,000 square feet or 3 tons/acre (twice the normal accepted rate of 75-lbs./1,000 SF. or 1.5 tons/acre) and shall be properly anchored. Mulch shall not be spread on top of snow. The snow shall be removed down to a one-inch depth or less prior to application. After each day of final grading, the area shall be properly stabilized with anchored hay or straw or erosion control matting. An area shall be considered to have been stabilized when exposed surfaces have been either mulched with straw or hay at a rate of 150 lb. per 1,000 square feet (3 tons/acre) and adequately anchored that ground surface is not visible through the mulch.

Between the dates of November 1st and April 15th all mulch shall be anchored by peg line, mulch netting, tracking, or wood cellulose fiber. When ground surface is not visible through the mulch then cover is sufficient. After November 1st, mulch and anchoring of all bare soil shall occur at the end of each final grading workday.

4. Mulching on Slopes and Ditches
Slopes shall not be left exposed for any extended time of work suspension unless fully mulched and anchored with peg and netting or with erosion control blankets. Mulching shall be applied at a rate of 230 lbs/1,000 s.f. on all slopes greater than 8%.

Mulch netting shall be used to anchor mulch in all drainage ways with a slope greater than 3% for slopes exposed to direct winds and for all other slopes greater than 3%. Erosion control blankets shall be used in lieu of mulch in all drainage ways with slopes greater than 8%. Erosion control mix can be used to substitute erosion control blankets on all slopes except ditches.

5. Seeding
Between the dates of October 15th and April 1st, loam or seed will not be required. During periods of above freezing temperatures, finished areas shall be fine graded and either protected with mulch or temporarily seeded and mulched until such time as the final treatment can be applied. If the date is after November 1st and if the exposed area has been loamed, final graded with a uniform surface, then the area may be dormant seeded at a rate of three times higher than specified for permanent seed and then mulched. Dormant seeding may be selected to be placed prior to the placement of mulch and fabric netting anchored with staples. If dormant seeding is used for the site, all disturbed areas shall receive 4" of loam and seed at an application rate of 5 lbs/1000 SF.

All areas seeded during the winter shall be inspected in the spring for adequate catch. All areas insufficiently vegetated (less than 90% catch) shall be revegetated by replacing loam, seed and mulch. If dormant seeding is not used for the site, all disturbed areas shall be revegetated in the spring.

6. Dewatering
Water from construction trench dewatering or temporary stream diversion shall pass first through a filter bag or secondary containment structure (e.g. hay bale lined pool) prior to discharge. The discharge site shall be selected to avoid flooding, icing, and sediment discharges to a protected resource.

7. Inspection and Monitoring
Maintenance measures shall be applied as needed during the entire construction season. After each rainfall, snow storm or period of thawing and runoff, the site contractor shall perform a visual inspection of all installed erosion control measures and perform repairs as needed to insure their continuous function. Following the temporary and/or final seeding and mulching, the contractor shall in the spring inspect and repair any damages and/or unestablished spots. Established vegetative cover means a minimum of 85% to 90% of areas vegetated with vigorous growth.

Standards for Timely Stabilization of Construction Sites During Winter

Standard for the timely stabilization of disturbed soils
By September 15th the applicant shall seed and mulch all disturbed soils on areas having a slope less than 15%. If the applicant fails to stabilize these soils by this date, then the applicant shall take one of the following actions to stabilize the soil for late fall and winter.

Stabilize the soil with temporary vegetation--By October 1st the applicant shall seed the disturbed soil with winter rye at a seeding rate of three pounds per 1000 square feet, lightly mulch the seeded soil with hay or straw at 75 pounds per 1000 square feet, and anchor the mulch with plastic netting. The applicant shall monitor growth of the rye over the next 30 days. If the rye fails to grow at least three inches or cover at least 75% of the disturbed soil before November 15th, then the applicant shall mulch the area for over-winter protection as described above.

Stabilize the soil with sod--The applicant shall stabilize the disturbed soil with properly installed sod by October 1st. Proper installation includes the applicant pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil.

Stabilize the soil with mulch--By November 15th the applicant shall mulch the disturbed soil by spreading hay or straw at a rate of at least 150 pounds per 1000 square feet on the area so that no soil is visible through the mulch. Prior to applying the mulch, the applicant shall remove any snow accumulation on the disturbed area. Immediately after applying the mulch, the applicant will anchor the mulch with plastic netting to prevent wind from moving the mulch off the disturbed soil.

Maintenance of Facilities

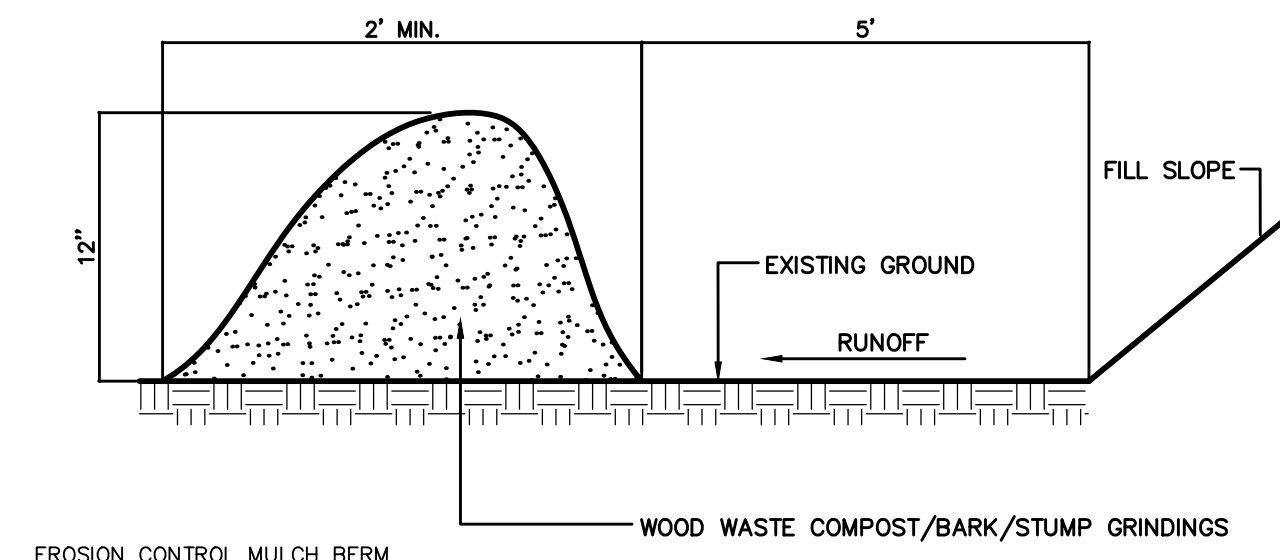
The stormwater facilities will be maintained by the Owner. The contract documents will require the contractor to designate a person responsible for maintenance of the sedimentation control features during construction as required by the Erosion Control Report and/or Construction Plans. Long-term operation/maintenance recommended for the stormwater facilities is presented below and should be recertified every five years.

The responsible party may contract with such professionals, as may be necessary in order to comply with this provision and may rely on the advice of such professionals in carrying out its duty hereunder, provided, that the following operation and maintenance procedures are hereby established as a minimum for compliance with this section.

Inspection and Maintenance Frequency and Corrective Measures: The following areas, facilities, and measures will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments and debris.

Underdrained Surface Soil Filter Basin:
Inspect basin two times per year (preferably in spring and fall) to ensure that water infiltrates into the subsurface completely (Treatment volume must drain over a minimum time 24 hours and a maximum time of 48 hours) and that vegetation is carefully managed to prevent creating mosquito and other vector habitats. The use and regular maintenance of pretreatment BMPs will significantly minimize maintenance requirements for the basin. Scarification or other disturbance should only be performed when there are actual signs of clogging or significant loss of infiltration capacity, rather than on a routine basis. Always remove deposited sediments as required.

Parking Surfaces:
Clear accumulations of winter sand in parking lots at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping.



EROSION CONTROL MULCH BERM

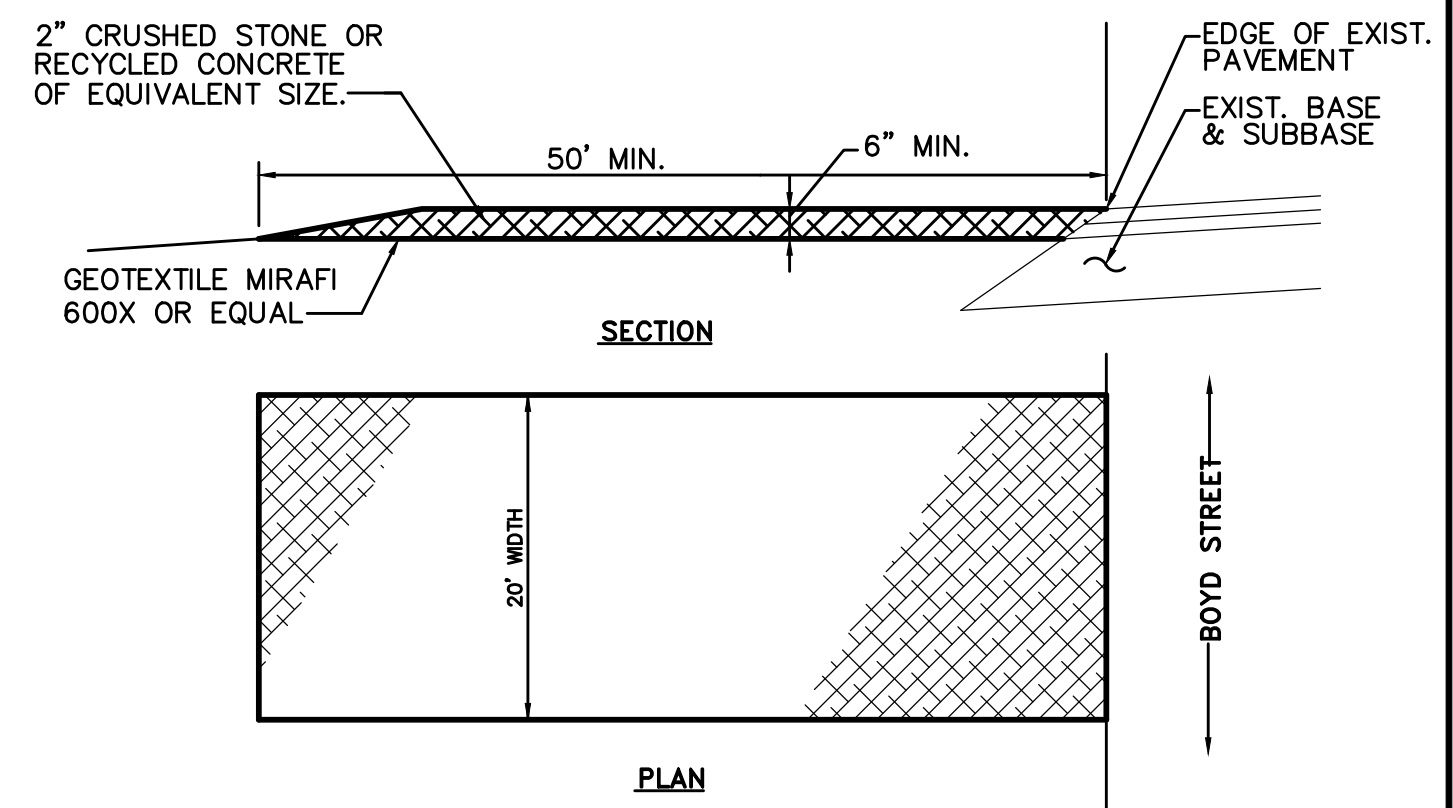
EROSION CONTROL MULCH CAN BE MANUFACTURED ON OR OFF THE PROJECT SITE. IT SHALL CONSIST PRIMARILY OF ORGANIC MATERIAL AND MAY INCLUDE: SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS WILL NOT BE ACCEPTABLE AS THE ORGANIC COMPONENT OF THE MIX.

COMPOSITION

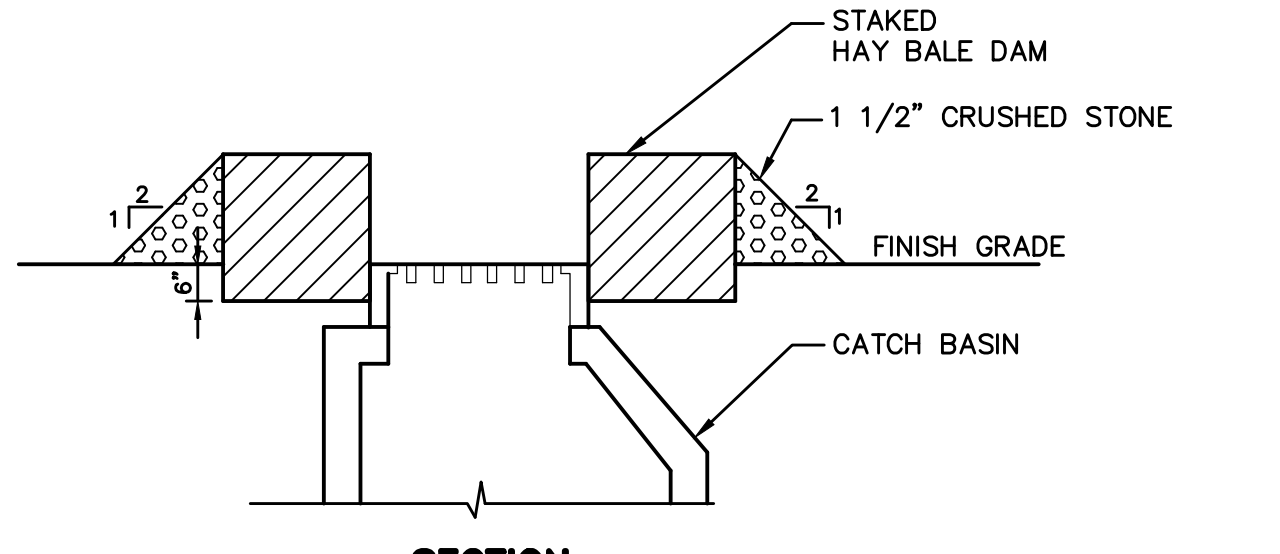
EROSION CONTROL MIX SHALL CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS:

- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80 AND 100% DRY WEIGHT BASIS.
- PARTICLE SIZE BY WEIGHT SHALL BE 100 % PASSING A 6" SCREEN AND A MINIMUM OF 70% MAXIMUM OF 85% PASSING A 0.75" SCREEN.
- THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
- LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
- SOLUBLE SALTS CONTENT SHALL BE < 4.0 MMHOS/CM.
- THE PH SHOULD FALL BETWEEN 5.0 AND 8.0.
- EROSION CONTROL MULCH BERM TO BE REMOVED AFTER SITE IS STABILIZED.

EROSION CONTROL MULCH BERM
NOT TO SCALE



STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



CATCH BASIN PROTECTION
NOT TO SCALE

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ISSUED FOR PERMITTING ONLY



ESC Details & Notes

A	City Permitting	2-19-15
No.	Revision/Issue	Date
Design by:	JIM	Checked by: SJB
Drawn by:	JIM	Approved by: SJB
Project:	131.06132	
Sheet No:	C3	