# SAMPLE SPECIFICATIONS FOR

# CONSTRUCTION,

# SEED BED PREPARATION,

# SEEDING/SODDING AND

# PLANTINGS IN EPIC SYSTEMS

**<u>*NOT FOR CONSTRUCTION*</u>**

## *ARTICLE I GENERAL*

### SECTION 1.01 SCOPE OF WORK – SUMMARY

The work shall include the following:

1. Survey work shall ensure that the base grade of the installation areas (Individual EPIC cells) is level, smooth, and compacted to +/- 1/2" tolerance, 90% Procter density.
2. Plans and provisions are made for adequate containment of sand and gravel along EPIC cell perimeter edges as specified on plans.
3. EPIC parts assembly and related service components are made according to EPIC approved plans or supervised by an EPIC certified individual.
4. Grading, leveling, and final compaction of the sand fill are to be completed by the Contractor and approved by the Owner, or Owners Representative before proceeding to the final seeding phase.
5. Locate and protect all existing EPIC components, pipe, valves, valve boxes and other physical features on the field and the immediate vicinity.
6. Protect all pavement and hard surface areas. Damaged areas will be replaced at Contractor's expense.
7. Settling and compaction shall be done with water, vibra-plate and/or rolling as specified on plans.
8. Furnish and apply specified nutrient amendments and/or fertilizer.
9. Incorporate amendments using a Toro sand pro, Blekavator or equivalent machine with 2-4" cultivating attachments.
10. Finish grade as specified.
11. Seed or Sod approximately _____ sq.ft. as per specifications on plans.

### SECTION 1.02 SUBMITTALS

The Contractor shall obtain and submit imported sand and gravel samples, if required, to the owner for inspection prior to using imported fill material on the field.

1. The imported bottom gravel (ASTM C33 #89) shall be clean #10 sieve size to ¼" fine gravel.
2. The imported sand (ASTM F2396-04) shall meet specifications detailed by EPIC in regards to particle size, capillary draw, compaction, and drainage characteristics. (Refer to "Choosing the right sand", and "EPIC sand testing procedure" as preliminary screening tools). Submit a 1 quart sample of sand source to an EPIC analyst for acceptance analysis if required.
3. A sieve analysis of the sand shall be reviewed by the owner. The owner has the right to reject the imported sand if it does not meet specifications.
4. Submit executed Guarantee of Contractor/Subcontractor.

## SECTION 1.03 DELIVERY, STORAGE AND HANDLING

1. Deliver undamaged products to job with tags and labels intact.
2. Arrangements to be made for forklift of equivalent to unload palletized EPIC components off delivery truck.
3. Store materials in protected areas, off the ground, and in areas as not to interfere with the progress of the work.
4. Transport, store and handle in strict accord with the manufacture's written recommendations.
5. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this section and that arrangements have been made to properly store, handle and protect such materials and work.

## SECTION 1.04 PROJECT CONDITIONS

Contractor shall acquaint himself with all existing site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

## SECTION 1.05 FIELD MEASUREMENTS

Make and be responsible for all field dimensions necessary for proper fitting and completion of work. Report discrepancies to Architect before proceeding.

# *ARTICLE II – MATERIALS*

## SECTION 2.01 EPIC COMPONENTS

1. EPIC chambers, liner pans, EPDM liner rolls, grommets, control valves and sensors as specified in project plans.
2. Connection pipe shall be 2" Schedule 40 PVC, ABS or approved equal.
3. Header pipes shall be a 6" SDR 35 PVC, or approved eqaul.
4. EPIC supply lines shall be ¾" or larger Schedule 40 PVC.
5. Firestone 45 mil EPDM impermeable waterproof liner, or approved equal.
6. EPIC Drainage Vault
7. EPIC Inlet Vault
8. EPIC inlet unit
9. 1000 gal Plastic Septic recirculation tank.
10. Triton Supplemental Storage reservoir modules.
11. Pump access manhole.
12. EZ Flo Fertigation system

## SECTION 2.02 WATER SUPPLY LINES

Water delivery systems supplying water to the Triton Reservoir zone valve to be installed according to plans with minimum delivery pressure of 20 p.s.i. and delivery volume of 12 GPM per acre of turf.

## SECTION 2.03 SAND AND GRAVEL FILL MATERIAL

1. The sand shall meet EPIC specifications.
2. The fine gravel shall meet EPIC specifications of #10 sieve – ¼" diameter size or equivalent on approval.

## SECTION 2.04 FERTILIZER AND AMENDMENTS

1. Analysis 15-15-15 Best Endure
2. Analysis 6-2-4 Tri C Organic Soil Conditioner/Fertilizer with Micronutrients
3. Elemental Sulfur
4. Granular Gypsum
5. Source references: Ewing Irrigation, Simplot Partners, or other approved regional sources.
6. Regional modifications based on sand analysis, plant species and agronomist recommendations can be variations of items 1-7.
7. Jobe's tree fertilizer spikes (3 per tree)
8. EZ Flo Fertigation to manufacturer's specifications

## SECTION 2.05 SEED

1. Mixture to be the following: 80% Kentucky Bluegrass to consist of 3 of the following varieties in equal amounts; Award, Odyssey, Rugby 2, Absolute, Nuglade, Impact. And 20% Perennial Ryegrass to consist of the 2 of the following varieties in equal amounts; Advent, Caddyshack, Monterrey, TopGun.
2. All seed components shall be Certified Blue Tag Seed.
3. The contractor shall submit seed analysis from Seed Company to Owner prior to seeding.
4. Seed source: Jacklin Seed, West Coast Turf, or approved equal.
5. Other seed acceptable by the owner and suitable for climate zone.

## SECTION 2.06 SOD

1. Sod shall be a minimum of 80% Kentucky bluegrass, varieties to be reviewed by owner.
2. Other approved sand based sod approved by owner and architect.
3. Sod shall be cut to a minimum thickness of ½ inch and grown on a minimum of 85% sand.

## *ARTICLE III - EXECUTION*

### SECTION 3.01 SUBGRADE PREPARATION

1. An excavated 16” (+) deep containment area is prepared to receive the, 2”gravel fill material, 14”- 30” profile of imported of washed sand and EPIC components over the entire landscaped / field surface. Overall depths of EPIC areas are subject to sand testing, however average: 15"-16” in turf areas, 18” in shrub areas, and 30” in designated large tree root ball areas as specified in plans.
2. The base of the EPIC cell containment areas shall be sloped 0% in all directions with a grading tolerance of ±0.5 inches.
3. Sloped areas with a slope grade of less than 1% need not be benched. Level benching of sub-grade is required for overall slope exceeding 1% with a maximum bench drop of 3” vertical between benches.
4. After the sub-grade has been properly graded, it shall be compacted using a suitable vibrating roller or compactor to 90% Proctor density.

### SECTION 3.02 SUBGRADE EVALUATION AND FINISH

1. After sub grade compaction the end result should be a smooth, level and compacted surface.

### SECTION 3.03 SUBGRADE EPDM LINER APPLICATION

1. Roll out protective geo-fabric sub-liner over base if required on plans. Overlap edges with 6” of material.
2. Roll out EPDM liner material over smooth sub-base and remove wrinkles or folds from bottom of liner.
3. EPDM liner is extended up the EPIC containment cells slightly above finished grade along perimeter walls separating non EPIC areas. Do not trim excess material until finished grade is established.
4. EPDM liner converging into EPIC cell corners is neatly folded over itself to form a watertight continuity. Be sure cut edges of liner in fold are near the surface.
5. Create an 8” vertical wall of EPDM liner between adjoining EPIC cells. EPDM liner of adjoining cells is supported by sand fill material from both sides of adjoining EPIC cells to keep the 8” wall in the vertical position. Temporary wall construction can be made through the use of a sacrificial ¾” by 7.24” board (1 x 8), a stretched line along barrier wall 8” above base grade over which is draped EPDM liners from adjoining EPIC cells, a built up and compacted soil hump 8” high and 12” wide at the base, or any other technique suitable and approved by the EPIC certified installer to create a water tight stable containment area.
6. Do not construct more lined EPIC cells as can be filled in a day. Liner placement shall be such as to avoid unnecessary traffic over liner material.

## SECTION 3.04 SYSTEM FEED, RESERVOIR AND DRAIN LINE INSTALLATION

1. Install drain lines according to plans or specifications. Be sure that drain lines are at proper elevations to maintain gravity drain function back to appropriate storage reservoirs without sags that can retain water. Install masonry brick as support block under drain lines where neccesary.
2. Install EPIC pump supply lines according to plans.
3. Drain and feed lines must be surrounded by sand or road base material prior to backfilling with native excavated trench material.
4. All joints in distribution/drain line system outside of EPIC cells must be glued according to accepted industry standards for plastic pipe.
5. Install appropriate number of EPIC distribution start units as specified on plans.
6. Install 1000 gal. Plastic septic tank at elevation specified on plans. Provide a 4" deep compacted sand base for septic tank bottom.
7. Install Triton primary collection reservoir according to separate specified procedure.

## SECTION 3.05 PAN PLACEMENT, EPIC CHAMBER CONNECTION AND GRAVEL FILL

1. Connect EPIC pans, chambers and 2" Sch40 PVC or ABS connectors as specified on plans.
2. Use an appropriate alignment method to maintain straight line separation distance between EPIC chamber rows as specified on plans.
3. Do not glue but insert 2" connection pipes 3.5" into chamber to engage the internal stop nub inside the EPIC chamber.
4. Transition 2" PVC line through upright EPDM liner walls in areas shown on plans. Transition procedure and inspection under the direction of Certified EPIC supervisor to insure a water tight transition between EPIC cells.
5. After 2" connections are made, weigh down all EPIC chambers with sand bags on top of EPIC crown to ensure direct contact with EPDM liner and prevent shifting during gravel and sand fill operations.
6. Place approved #10 gravel 2" deep along bottom of EPDM liner and along sides of EPIC chambers. Do not allow gravel underneath EPIC chambers. The gravel fill must enter and cover the outside sidewall openings in the EPIC chamber.
7. Remove excess gravel from crown of EPIC chamber if present.

## SECTION 3.06 SAND PLACEMENT AND FINAL GRADE

1. Place all imported sand over gravel and to depths specified on plans.
2. Place imported sand over EPIC chambers first to ensure stable buried placement, and then fill remaining landscape / field areas.

3. Compact sand in two steps a) area between pan sides, connectors, and EPIC chamber sides keeping liner pan sides upright, and b) area above chambers to final grade level.
4. Water settle and roll using a 2 ft. x 6 ft. smooth roller delivering approximately 100 pounds weight per linear foot width.
5. Use the color change in sand during the water charging process to identify flow restrictions or anomalies if any. Notify owner or architect if an even moisture pattern does not develop at the finish grade level.
6. Upon completion of fine grading and placement of all sand, the Contractor shall notify the owner and have available a laser plan system with slope control for Owner inspection.

## SECTION 3.07 MATERIAL APPLICATION METHODS

1. After all surface grading is approved; surface materials may be applied using a drop or cyclone type spreader for uniform distribution of materials.
2. Apply 15-15-15 Best Endure at the rate of 4 pounds of material per 1,000 sq. ft. (174 pounds/acre)
3. Apply Elemental Sulfur at the rate of 1 pound of material per 1,000 sq. ft. (45 pounds/acre)
4. Apply Gypsum (Calcium Sulfate) at the rate of 1000 pounds per acre.
5. Apply 6-2-4 Tri C Organic Soil Conditioner/Fertilizer with Micronutrients at the rate of 1000 lbs per acre.
6. Incorporate the materials to a depth of 2-4 inches using a Toro Sand Pro with 2 inch teeth in 2 directions. (45 & 90 degrees)

## SECTION 3.08 FINE GRADING AND SURFACE PREPARATION

1. After completing Section 3.07, drag and smooth the surface to reestablish grade tolerances. This may be accomplished with a box drag, weighted chain link fence, or other device.
2. Apply moisture or irrigation to settle the surface and roll with a 2 ft. x 6 ft. roller having approximately 100 lbs. of weight per linear foot width.
3. Repeat operation until surface is smooth, level, and firm. Foot printing should not be deeper than 0.5 inches.

## SECTION 3.09 SEED APPLICATION

1. Before seed is applied, owner must inspect the field. Seed shall not be applied until further settling is not apparent.
2. Seed shall be applied with a mechanical device such as a Brillion Seed Drill with minimum 2.28 inch spacing. All applications must be in two directions, (90 degrees across) applying one half of the seed in each direction.
3. Apply 3 pounds of seed per 1,000 sq. ft. (130 pounds/acre)

4. In the event that there is washing or erosion from irrigation or rainfall, the Contractor shall reseed areas that are not uniform.
5. EPIC system sub-irrigation elevation must be adjusted so that moisture is present in the top ¼ inch of the surface.

## SECTION 3.10 SOD SELECTION (IF OPTION IS SELECTED)

1. Use only high quality sod of known genetic origin that is free of noxious weeds, disease, and insect problems. It should appear healthy and vigorous and should conform to the following.
2. Sod should have been grown in soil comprising at a minimum 85% sand, or bare rooted sod grown with soil less techniques.
3. Sod should be machine cut at a uniform depth of ½ - 2 in (13-51mm) – excluding shoot growth and thatch.
4. Sod should not have been cut in excessively wet or dry weather.
5. Sections of sod should be a standard size (as determined by the supplier), uniform and untorn.
6. Sections of sod should be strong enough to support their own weight and retain their size and shape when lifted by one end.
7. Harvest, delivery, and installation of sod should take place within a period of 36 hours.

## SECTION 3.11 SOD INSTALLATION

1. Moistening sod after it is unrolled helps maintain viability. Store it in the shade during installation.
2. Rake the soil surface to break the crust just before laying sod. During the summer, the sand should be wet on the surface before laying the sod to cool the sand and reduce any root burning and dieback.
3. Do not sod on gravel or soils that may have been recently treated with sterilants or herbicides.
4. Lay the first row of sod in a straight line with subsequent rows placed parallel to and butting tightly against each other. Stagger strips in a brick-like pattern. Be sure that the sod is not stretched or overlapped and that the joints are butted tightly to prevent voids. Use a knife or sharp spade to trim and fit irregularly shaped areas.
5. As sodding of clearly defined areas is completed, roll sod to provide firm contact between roots and sand.
6. After rolling, irrigate until the soil is wet 4 inches (102 mm) below sod.
7. Keep sodded areas moist to a depth of 4 in. (102 mm) until the grass takes root. This can be determined by gently tugging on the sod – resistance indicates that rooting has occurred.
8. Mowing should not be attempted until the sod is firmly rooted, usually 2-3 weeks.

## SECTION 3.12 SEEDED AREA ESTABLISHMENT

1. In the event that there is lack of uniform turf establishment after a period of 30 days, the Contractor shall re-seed the affected areas at the specified rates. The field will not be accepted as complete until there is uniform germination of turf grass plants.

## SECTION 3.13 TREE AND SHRUB PLANTING PROCEDURE

1. For shrubs, perennials, and annuals after completion of section 3.07, dig out appropriate sand volume to receive root ball of nursery stock.
2. Remove nursery shipping container, loosen root ball and discard any loose greenhouse planting media or soil from plant root zone. Do not damage existing root structure and only discard surrounding soil that falls off easily.
3. Plant directly in sand and refill and press excavated sand fill around root ball of plant. Press down firmly around planting and smooth out sand surface after planting. Crown of plant is just below the finished sand surface.
4. A dedicated EPIC pan and Chamber unit is designated for each large tree planting. After the addition of the 2” gravel layer inside the pan, and 4" of sand to crown of EPIC chamber, do not add remaining sand fill until the tree is ready for planting.
5. For **trees** fill the area above the gravel inside the EPIC pan with sand to a level which coincides with the bottom of the root ball.
6. Remove tree root ball covering, loosen roots, and discard any loose soil not held together by existing roots.
7. While suspending the tree in its proper location centered over the EPIC pan, pour loose sand evenly around root ball to provide support to the tree. If possible use dry sand for better encapsulation flow.
8. With foot pressure compact the loose sand around the tree and add additional sand to meet established finished grade.
9. Insert (3) Jobe’s tree spikes one foot away from tree trunk in a triangular pattern around the tree. The spikes are pushed in to be 6” below final grade.
10. Slowly pour 5 gallons of water around fill area of tree trunk for additional settling of sand fill, add additional sand to fill sink holes around tree.
11. Small trees (recommended) if anchored shall avoid contact with sub-ground EPIC system components.
12. If large top heavy trees are planted provide traditional support stakes for one year. Be sure stakes are not pounded in deeper than 20” from surface grade, and/or placed adjacent to waterproof liner edges, in native soil, to avoid contact with sub-ground EPIC system components.