



**SUGGESTED LANGUAGE to SPECIFY  
 AXIS SOIL AMENDMENTS and PLAY BALL! INFIELD CONDITIONER  
 in CSI FORMAT**

The following was developed to assist Landscape Architects interested in Specifying AXIS Calcined Diatomaceous Earth as a soil amendment into a variety of Landscape applications, Sportsfields, and Golf Course Construction; and for Specifying Play Ball! Infield Conditioner into Infield Mixes of Baseball and Softball Fields in CSI Format. Each section has suggested language available to be “cut and pasted” into the two sections of CSI Format necessary to specify our products; Section 2.2 – Soil Amendment, and Section 3.10 - Soil Preparation. Electronic copies are available to download from our website listed below.

Please let us know if this text does not parallel the scope and requirements of a current project and we would be happy to provide appropriate language to suit your needs.

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2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS “Regular” Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, [www.axisplayball.com](http://www.axisplayball.com), applied at 15% by volume. Soil Conditioner shall contain the following properties:

Opaline Silica (SiO <sub>2</sub> )	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

2.40 PLANTING BACKFILL MIX

- A. Planting Backfill Mix for trees and shrubs shall be accurately measured and thoroughly mixed and shall consist of the following ingredients (per cubic yard):

- 7 parts by volume soil
- 1.5 parts AXIS “Regular” Calcined Diatomaceous Earth (this equates to 105 lbs.)
- 1.5 parts organic compost or mulch



2.2 SOIL AMENDMENT

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Opaline Silica (SiO2)	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

3.10 PLANTING HOLE PREPARATION (Using Existing Soil)

- A. Dig planting hole at least twice the diameter of plant material size. Apply AXIS "Regular" over the excavated dirt at the rates per plant below. Mix thoroughly with excavated dirt and other fertilizer, organic material, or biological components before backfilling and during backfilling for a homogenous backfill blend.

1.	Container/Plant Size	Pounds of AXIS	Equivalent Measure
	4"	.37 lbs.	2 cups
	1 gal.	1.5 lbs.	1.5 quarts
	2 gal.	3 lbs.	3.0 quarts
	5 gal.	7.5 lbs.	1.25 gallons
	24" shrub	3 lbs.	3.0 quarts
	48" shrub	15 lbs.	2.5 gallons
	6' tree	15 lbs.	2.5 gallons
	8' tree	25 lbs.	1.0 bag
	12' tree	60 lbs.	2.4 bags
	2" caliper	50 lbs.	2.0 bags
	3" caliper	75 lbs.	3.0 bags

For sizes not listed, alternate applications or further information, please contact EnviroTech Soil Solutions, Inc., 866-546-3722, www.axisplayball.com



## AMENDING INTENSIVE ROOFTOP GARDEN SOIL



### 2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS "Regular" Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, www.axisplayball.com, applied at 20% by volume. Soil Conditioner shall contain the following properties:

Opaline Silica (SiO2)	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

### 3.10 ROOFTOP SOIL PREPARATION (Soil Blended Offsite with AXIS)

- A. AXIS "Regular" shall be blended homogenously with the Rooftop soil by either a bucket loader blending on a flat, hard surface; or by conveyor blender at the rate of 8 parts soil and 2 parts AXIS to equal 20% by volume. This amount is equivalent to blending 140 pounds of AXIS with .8 cubic yards of soil.

## AMENDING EXTENSIVE ROOFTOP GARDEN SOIL

### 2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS "Regular" Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, www.axisplayball.com, applied at 20% by volume. Soil Conditioner shall contain the following properties:

Opaline Silica (SiO2)	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

### 3.10 ROOFTOP PREPARATION (Soil Blended Offsite with AXIS) *(Choose appropriate 3.10)*

- A. AXIS "Regular" shall be blended homogenously with desired soil by either loader blending on a flat, hard surface; or by conveyor blender at the rate of 8 parts soil and 2 parts AXIS to equal 20% by volume. This amount is equivalent to blending 140 pounds of AXIS with .8 cubic yards of soil.

### 3.10 ROOFTOP PREPARATION (Soil Placed and AXIS Added for 4" Soil)

- A. AXIS "Regular" shall be spread evenly over 3.2" of existing (or imported) soil at the rate of 1.8 pounds per square foot and mixed very thoroughly to equal 20% by volume for a rooftop soil 4" deep.

### 3.10 ROOFTOP PREPARATION (Soil Placed and AXIS Added for 6" Soil)

- A. AXIS "Regular" shall be spread evenly over 4.8" of existing (or imported) soil at the rate of 2.6 pounds per square foot and mixed very thoroughly to equal 20% by volume for a rooftop soil 6" deep.



## 2.2 STRUCTURAL SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS “Regular” Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, [www.axisplayball.com](http://www.axisplayball.com), applied at 10% by volume. Soil Conditioner shall contain the following properties:

Opaline Silica (SiO <sub>2</sub> )	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

## 3.10 STRUCTURAL SOIL PREPARATION

- A. AXIS “Regular” shall be blended homogenously with desired soil by front end loader on a flat, hard surface at the rate of 7 parts crushed rock, 2 parts clay loam, and 1 part AXIS. This amount of AXIS is equivalent to blending 70 pounds of AXIS with .9 cubic yards of soil. Add the desired amount of organic material to this mixture.

## DISCUSSION

Structural Soil ingredients are typically applied at a rate of approximately 80% crushed rock, 20% clay loam, a small percentage of organic compost, and a very small amount of hydrogel to act as a tackifier.

Some limitations of Structural Soil are the exchange of free gas and the ability for moisture to recharge. Recent information also suggests that the potential for root development is limited to the percentage of clay loam.

AXIS has the unique ability to simultaneously increase the volume of oxygen, water holding capacity, *available water*, and plant root mass due to it’s highly porous structure. Repeated testing of soils with just 10% AXIS by volume, increased, on average; Water Holding Capacity by 35-40%, Non-Capillary (oxygen holding) Pore Space by 27%, and Root Mass by 400%. Using AXIS increases water holding capacity of tree soil to accommodate larger volumes of water from hard surface runoff and reduces outflow. Using AXIS allows the same volume of tree soil to manage runoff off from a larger area. These are attractive options for all sites; and especially compelling where there is competition for space between building footprints, parking, landscape and water runoff areas.

To create Structural Soil with AXIS, we recommend using the following percentage of ingredients.

- 70% Crushed Rock
- 20% Clay Loam
- 10% AXIS
- 3-4% Organic Compost (peats do not normally displace any volume used at low percentages)
- Trace Hydrogel



2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS "Regular" Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, www.axisplayball.com, applied at 20% by volume. Soil Conditioner shall contain the following properties:

Opaline Silica (SiO2)	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

3.10 BIOSWALE PREPARATION (Existing Soil) (Choose appropriate 3.10)

- A. AXIS "Regular" shall be spread evenly over the existing (or imported) soil at the rate of 2,600 pounds per 1,000 square feet, and rototilled thoroughly to a minimum depth of 6 inches to equal 20% by volume. This amount is equivalent to 1.2" and will raise the grade by the same amount.

3.10 BIOSWALE PREPARATION (Offsite or Imported Soil)

- A. AXIS "Regular" shall be blended homogenously with desired soil by front end loader blending on a flat, hard surface; or by conveyor blender at the rate of 8 parts soil and 2 parts AXIS to equal 20% by volume. This amount is equivalent to blending 140 pounds of AXIS with .8 cubic yards of soil.



2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS “Regular” Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, [www.axisplayball.com](http://www.axisplayball.com), applied at 10% by volume. Soil Conditioner shall contain the following properties:

Opaline Silica (SiO <sub>2</sub> )	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

3.11 GROUND COVER AND VINE PLANTING PREPARATION (Existing or Imported Soil)

- A. AXIS “Regular” shall be spread evenly over the existing (or imported) soil at the rate of 650 pounds per 1,000 square feet, and rototilled thoroughly to a minimum depth of 3 inches to equal 10% by volume. This amount is equivalent to .3” and will raise the grade by the same amount.



## AMENDING SOIL for GRASS PAVERS for FIRE LANES, ACCESS LANES and OVERFLOW PARKING



### 2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS "Regular" Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, [www.axisplayball.com](http://www.axisplayball.com), applied at 20% by volume.

Soil Conditioner shall contain the following properties:

Opaline Silica (SiO <sub>2</sub> )	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

### 3.11 GRASS PAVER SOIL PREPARATION (Offsite or Imported Soil)

- A. AXIS "Regular" shall be blended homogenously with desired soil by front end loader blending on a flat, hard surface, or by conveyor blender; at the rate of 8 parts soil and 2 parts AXIS, to equal 20% by volume. This amount is equivalent to blending 140 pounds of AXIS with .8 cubic yards of soil.



## AMENDING SOIL 6" DEEP for TURF



### 2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS "Regular" Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, www.axisplayball.com, applied at 20% by volume.

Soil Conditioner shall contain the following properties:

Opaline Silica (SiO2)	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

### 3.12 LAWN PLANTING PREPARATION (Existing Soil) (Choose appropriate 3.10)

- A. AXIS "Regular" shall be spread evenly over the existing soil at the rate of 1,300 pounds per 1,000 square feet, and rototilled thoroughly to a minimum depth of 6 inches to equal 10% by volume. This amount is equivalent to .6" and will raise the grade by the same amount.

### 3.12 LAWN PLANTING PREPARATION (Offsite or Imported Soil)

- A. AXIS "Regular" shall be blended homogenously with desired soil by front end loader blending on a flat, hard surface, or by conveyor blender; at the rate of 9 parts soil and 1 part AXIS, to equal 10% by volume. This amount is equivalent to blending 70 pounds of AXIS with .9 cubic yards of soil.

## AMENDING SOIL 4" DEEP for TURF

### 2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS "Regular" Calcined Diatomaceous Earth, manufactured by EP Minerals, LLC, applied at 10% by volume. Contact AMS, Inc., 866-546-3722 for local Distributor.

Soil Conditioner shall contain the following properties:

Opaline Silica (SiO2)	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

### 3.10 LAWN PLANTING PREPARATION (Existing Soil) (Choose appropriate 3.10)

- A. AXIS "Regular" shall be spread evenly over the existing soil at the rate of 900 pounds per 1,000 square feet, and rototilled thoroughly to a minimum depth of 4 inches to equal 10% by volume. This amount is equivalent to .4" and will raise the grade by the same amount.

### 3.10 LAWN PLANTING PREPARATION (Offsite or Imported Soil)

- A. AXIS "Regular" shall be blended homogenously with desired soil by front end loader blending on a flat, hard surface, or by conveyor blender; at the rate of 9 parts soil and 1 part AXIS, to equal 10% by volume. This amount is equivalent to blending 70 pounds of AXIS with .9 cubic yards of soil.



## AMENDING GOLF GREEN ROOTZONES



### 2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS "Fine" Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, [www.axisplayball.com](http://www.axisplayball.com), applied at 10% by volume. Soil Conditioner shall contain the following properties:

Opaline Silica (SiO <sub>2</sub> )	90%
Porosity	82%
Absorption (ASTM F-726)	142%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

### 3.13 GOLF GREEN ROOTZONE PREPARATION (Existing Soil) (Choose appropriate 3.10)

- A. AXIS "Fine" shall be spread evenly over the existing soil at the rate of 1,300 pounds per 1,000 square feet, and rototilled thoroughly to a minimum depth of 6 inches to equal 10% by volume. This amount is equivalent to .6" and will raise the grade by the same amount.

### 3.13 GOLF GREEN ROOTZONE PREPARATION (Offsite or Imported Soil)

- A. AXIS "Fine" shall be blended homogenously with desired soil by front end loader blending on a flat, hard surface, or by conveyor blender; at the rate of 9 parts soil and 1 part AXIS, to equal 10% by volume. This amount is equivalent to blending 70 pounds of AXIS with .9 cubic yards of soil.



## AMENDING SAND BASE TEES, FAIRWAYS OR SPORTSFIELD ROOTZONES



### 2.2 SOIL AMENDMENT

- A. Soil Conditioner shall be AXIS "Regular" Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, [www.axisplayball.com](http://www.axisplayball.com), applied at 10% by volume.

Soil Conditioner shall contain the following properties:

Opaline Silica (SiO <sub>2</sub> )	90%
Porosity	82%
Absorption (ASTM F-726)	114%
Pore Size	0.1-1.0 micron
pH	7
CEC	27

### 3.14 SAND BASE ROOTZONE PREPARATION (Existing Soil) (Choose appropriate 3.10)

- A. AXIS "Regular" shall be spread evenly over the existing soil at the rate of 1,300 pounds per 1,000 square feet, and rototilled thoroughly to a minimum depth of 6 inches to equal 10% by volume. This amount is equivalent to .6" and will raise the grade by the same amount.

### 3.14 GOLF GREEN ROOTZONE PREPARATION (Offsite or Imported Soil)

- A. AXIS "Regular" shall be blended homogenously with desired soil by front end loader blending on a flat, hard surface, or by conveyor blender; at the rate of 9 parts soil and 1 part AXIS, to equal 10% by volume. This amount is equivalent to blending 70 pounds of AXIS with .9 cubic yards of soil.



## AMENDING INFIELD SOIL 6” Deep



### 2.923 INFIELD CONDITIONER

- A. Infield Conditioner shall be Play Ball! “Regular” Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, www.axisplayball.com, and applied at 10% by volume. Infield Conditioner shall contain the following properties:

Opaline Silica (SiO <sub>2</sub> )	90%
Porosity	82%
Absorption (ASTM F-726)	90%
Bulk Density (pounds/cu.ft.)	25

### 3.20 INFIELD PREPARATION (Existing Soil)

- A. Play Ball! “Regular” shall be spread evenly over the existing (or imported) infield soil at the rate of 1,300 pounds per 1,000 square feet, and rototilled thoroughly to a minimum depth of 6 inches to equal 10% by volume. This amount is equivalent to .6” and will raise the finished grade by the same amount.

### 3.20 INFIELD PREPARATION (Offsite or Imported Soil)

- A. Play Ball! “Regular” shall be blended homogenously with desired infield soil by front end loader blending on a flat, hard surface, or by conveyor blender; at the rate of 9 parts soil and 1 part Play Ball!, to equal 10% by volume. This amount is equivalent to blending 70 pounds of Play Ball! with .9 cubic yards of soil.

## CSI Format to Specify PLAY BALL! into Infields 4” Deep

### 2.923 INFIELD CONDITIONER

- A. Infield Conditioner shall be Play Ball! “Regular” Calcined Diatomaceous Earth, available from EnviroTech Soil Solutions, Inc., 866-546-3722, www.axisplayball.com, and applied at 10% by volume. Infield Conditioner shall contain the following properties:

Opaline Silica (SiO <sub>2</sub> )	90%
Porosity	82%
Absorption (ASTM F-726)	90%
Bulk Density (pounds/cu.ft.)	25

### 3.20 INFIELD PREPARATION (Existing Soil)

- A. Play Ball! “Regular” shall be spread evenly over the existing infield soil at the rate of 900 pounds per 1,000 square feet, and rototilled thoroughly to a minimum depth of 4 inches to equal 10% by volume. This amount is equivalent to .4” and will raise the finished grade by the same amount.

### 3.20 INFIELD PREPARATION (Offsite or Imported Soil)

- A. Play Ball! “Regular” shall be blended homogenously with desired infield soil by front end loader blending on a flat, hard surface, or by conveyor blender; at the rate of 9 parts soil and 1 part Play Ball!, to equal 10% by volume. This amount is equivalent to blending 70 pounds of Play Ball! with .9 cubic yards of soil.



## General Application Rates

**Turf, Groundcover, or Garden Area:** AXIS is safe and effective for all edible plants and turf! Spread AXIS evenly at the rates below and incorporate to the desired depth to equal 10% by volume:

- 2" deep - use 450 lbs. per 1,000 sq. ft.
- 4" deep - use 900 lbs. per 1,000 sq. ft.
- 6" deep - use 1,300 lbs. per 1,000 sq. ft.
- 8" deep - use 1,750 lbs. per 1,000 sq. ft.

**Turf Aeration:** Topdressing AXIS after Aerating with 5/8" tines on a 3" x 4" pattern will require 100 to 125 lbs. of AXIS per 1,000 square feet. We recommend harvesting the cores, and then applying the AXIS with a broadcast or drop spreader. Using a rake or blower will help get the AXIS into the holes.

**DryJect Injection:** Aeration patterns are either 3" x 2" or 3" x 4".

3 x 2 spacing, figure 4 to 6 cubic feet (4 to 6 Bags of AXIS Fine) per 1,000 square feet.

3 x 4 spacing, figure 2 to 3 cubic feet (2 to 3 Bags of AXIS Fine) per 1,000 square feet.

**Hanging Baskets & Rooftop Gardens:** We recommend 20% by volume for best results in these specialty applications. Use 140 lbs. per cubic yard to achieve 20% by volume.

**Offsite Mixing or Pre-blending:** Use 70 lbs. per cubic yard to achieve 10% by volume in a mix for planting media, sand based systems or other blended mixes. AXIS Regular should be used for the majority of all applications. Use AXIS Fine for golf green rootzone construction.

## Quantities for Individual Plantings

Application Rates and Worksheet to Apply 10% by Volume in the backfill.

# of Plants	Container or Plant Size	Pounds of AXIS / plant	Volume of AXIS / plant	Total	Added Available Water per Plant*
_____	4" pot	.37 lbs.	2 cups	_____	.39 lb. / 6 oz.
_____	1 gal.	1.5 lbs.	1.5 quarts	_____	1.5 lb. / 24 oz.
_____	2 gal.	3 lbs.	3 quarts	_____	3.0 lb. / 1.5 quarts
_____	5 gal.	7.5 lbs.	1.25 gal.	_____	7.5 lb. / .9 gal.
_____	24"	3 lbs.	3 quart	_____	3.0 lb. / 1.5 quarts
_____	48"	15 lbs.	2.5 gal.	_____	15 lb. / 1.8 gal.
_____	6'	15 lbs.	2.5 gal.	_____	15 lb. / 1.8 gal.
_____	8'	25 lbs.	1.0 bag	_____	25 lb. / 3.0 gal.
_____	12'	60 lbs.	2.4 bags	_____	60 lb. / 7.2 gal.
_____	2" cal.	50 lbs.	2.0 bags	_____	50 lb. / 6.0 gal.
_____	3" cal.	75 lbs.	3.0 bags	_____	75 lb. / 9.0 gal.

\*Additional Available Water figures rely upon the amount of AXIS used per plant, AXIS Regular's absorption rate of 114% it's weight in water, and results from Labosport that state that 93% of the water AXIS absorbs is available to the plant.