

Table 2.4 Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate*		Seeding Depth (inches) [†]	Recommended Seeding Dates and Hardiness Zone 7a and 7b [‡]
	lb/ac	lb/1,000 ft ²		
Cool-Season Grasses				
Annual Ryegrass	40	1.0	0.5	Feb. 15 to Apr. 30; Aug. 15 to Nov. 30
Barley	96	2.2	1.0	Feb. 15 to Apr. 30; Aug. 15 to Nov. 30
Oats	72	1.7	1.0	Feb. 15 to Apr. 30; Aug. 15 to Nov. 30
Wheat	120	2.8	1.0	Feb. 15 to Apr. 30; Aug. 15 to Nov. 30
Cereal Rye	112	2.8	1.0	Feb. 15 to Apr. 30; Aug. 15 to Dec. 15
Warm-Season Grasses				
Foxtail Millet	30	0.7	0.5	May 1 to Aug. 14
Pearl Millet	20	0.5	0.5	May 1 to Aug. 14

Notes:
 *Seeding rates for the warm-season grasses are in pounds of pure live seed (PLS). Actual planting rates must be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not made for the cool-season grasses.
 †Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mix, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding rate. Generally, do not use cereal rye as a nurse crop unless planting will occur in very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above. Oats are the recommended nurse crop for warm-season grasses.
 ‡For planting sites, plant seeds at twice the depth listed above.
 §For sandy soils, listed rates are averages and may require adjustment to reflect local conditions.

Table 2.5 Permanent Seeding Summary

No.	Permanent Seeding Summary			Lime Rate
	Species	Application Rate (lb/ac)	Seeding Depth (in.)	
7	Kentucky Bluegrass (perennial turfgrass)	0.5 lb/1,000 ft ²	0.5 in.	2 tons/ac
		(1.0 lb/1,000 ft ²)	(2 in./1,000 ft ²)	(90 lb/1,000 ft ²)

Turfgrass Mixtures

Select a seed mixture from Table 2.6, using Table 2.7 (conditions by mix) as a guideline. Some guidelines for common mixes is as follows:

- Kentucky Bluegrass (full sun mixture)** – For use in areas that receive intensive management. The recommended certified Kentucky bluegrass cultivars seeding rate is 1.5 to 2.0 pounds per 1,000 square feet. Choose a minimum of three bluegrass cultivars ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.
- Kentucky Bluegrass/Perennial Rye (full sun mixture)** – For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. The certified perennial ryegrass cultivars/certified Kentucky bluegrass seeding rate is 2 pounds mixture per 1,000 square feet. A minimum of three Kentucky bluegrass cultivars must be chosen, with each cultivar ranging from 10% to 35% of the mixture by weight.
- Tall Fescue/Kentucky Bluegrass (full sun mixture)** – For use in drought prone areas and/or for areas receiving low to medium management in full sun to mediums shade. The recommended mixture includes 95% to 100% certified tall fescue cultivars and 0% to 5% certified Kentucky bluegrass cultivars. The seeding rate is 5 to 8 pounds per 1,000 square feet. One or more cultivars may be blended.
- Kentucky Bluegrass/Fine Fescue (shade mixture)** – For use in areas with shade in bluegrass lawns or for establishment in high quality, intensively managed turf area. The mixture includes 30% to 40% certified Kentucky bluegrass cultivars and 60% to 70% of certified fine fescue. The seeding rate is 1½ to 3 pounds per 1,000 square feet. A minimum of 3 Kentucky bluegrass cultivars must be chosen, with each cultivar ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

Note: Select turfgrass varieties from those listed in the most current Maryland-Virginia Turfgrass Variety Recommendation Work Group link (<http://www.vpnbs.edu/edu>).

Sod grass

- Use sod grass to provide quick cover on disturbed areas (2:1 grade or flatter).
- Class of turfgrass sod must comply with the grass varieties listed in Table 2.7. Make sod labels available to the job foreman and inspector.
- Machine cut sod at a uniform soil thickness of ¾ inches, plus or minus ¼ inches, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Individual pieces of sod must be cut to the supplier's width and length. Maximum allowable deviation from standard widths and lengths is 5%. Broken pads and torn or uneven ends will not be acceptable.
- Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grip on the upper 10% of the section.
- Do not harvest or transplant sod when moisture content (excessively dry or wet) may adversely affect its survival.
- Harvest, deliver, and install sod within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.

Planting Dates

The recommended planting dates for permanent cover can be found in Table 2.8.

From Table 2.7:

Plant Species	Seeding Rate (lb/ac)	Seeding Depth (inches)	Planting Dates	Notes
11. Creeping Red Fescue (Perennial turfgrass)	30	0.69	Feb 15 to Apr 30 Aug 15 to Oct 31 Nov 1 to Nov 30 [†]	Use this mix in good shade situations.
Kentucky Bluegrass (Perennial turfgrass)	15	0.34	W-SP	
2. Tall Fescue (Perennial turfgrass)	100	3.3	A-0	Tall fescue produces a dense turf of highly resistant, but tends to be clumpy if mowed only occasionally. For best results, mow frequently using a blend of scythes.
3. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
4. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
5. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
6. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
7. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
8. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
9. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
10. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
12. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
13. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
14. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
15. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
16. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
17. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
18. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
19. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
20. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
21. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
22. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
23. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
24. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
25. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
26. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
27. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
28. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
29. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
30. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
31. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
32. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
33. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
34. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
35. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
36. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
37. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
38. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
39. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
40. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
41. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
42. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
43. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
44. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
45. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
46. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
47. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
48. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
49. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.
50. Kentucky Bluegrass (Perennial turfgrass)	100	3.3	A-0	Use this mix in areas where intensive mow grass.

Table 2.8 Recommended Planting Dates for Permanent Cover

Type of Plant Material	Planting Dates
Seeds – Cool-Season Grasses (includes mixes with forbs and/or legumes)	Feb 15 to Apr 30 Aug 15 to Oct 31 Nov 1 to Nov 30 [†]
Seeds – Warm-Season/Cool-Season Grass Mixes (includes mixes with forbs and/or legumes)	Feb 15 to Apr 30 [†] May 1 to May 31 [†]
Sod – Cool-Season	Feb 15 to Apr 30 May 1 to Sep 30 [†] Oct 1 to Dec 1 [†]

- Notes:
- When seeding toward the end of the listed planting dates, or when conditions are expected to be less than optimal, select an appropriate nurse crop from Table 2.4 Temporary Seeding for Site Stabilization and plant together with the permanent seeding mix.
 - When planted during the growing season, most of these materials must be purchased and kept in a dormant condition until planting.
 - Warm-season sodding a nurse crop, as noted above, if planting during this period.
 - Warm-season grasses need a soil temperature of at least 50 degrees F in order to germinate. If soil temperatures are colder than 50 degrees, or moisture is not adequate, the seeds will remain dormant until conditions are favorable. In general, planting during the latter portion of this period allows more time for weed emergence and weed control prior to planting. When selecting a planting date, consider the need for weed control vs. the likelihood of having sufficient moisture for later plantings, especially on droughty sites.
 - Additional planting dates during which supplemental watering may be needed to ensure plant establishment.
 - Frequent watering and hoeing of weeds must be done in frost-free areas. If plants have not sufficiently rooted in place, Sod usually needs 4 to 6 weeks to become sufficiently rooted.

Minimum Soil Criteria

Minimum soil conditions required for permanent vegetative establishment include the following:

- Soil pH must be between 6.0 and 7.0.
- Soluble salts must be less than 500 parts per million (ppm).
- The soil must contain less than 40% clay but enough fine grained material (> 30% silt plus clay) to provide the capacity to hold a moderate amount of water. As an exception, it is acceptable to plant legumes or cereals loessic in sandy soil (< 30% silt plus clay).
- Soil must contain 1.5% minimum organic matter by weight.
- Soil must contain sufficient pore space to permit adequate root penetration.
- If these conditions cannot be met by soils on site, topsoil must be added as required in Section 2.6 Topsoiling.

Soil Amendments (Fertilizer and Lime Specifications)

- Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites with disturbed areas over 5 acres. Soil analysis may be performed by the University of the District of Columbia or a certified commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
- Fertilizers must be uniform in composition, free flowing, and suitable for accurate application by approved equipment. Manure may be substituted for fertilizer with prior approval from DOEI. Deliver all fertilizers to the site fully labeled per applicable laws and bear the name, trade name or trademark, and warranty of the producer.
- Lime materials must be ground limestone (hydrated or burnt lime may be substituted) containing at least 50% total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50% will pass through a #100 mesh sieve and 98% to 100% will pass through a #20 mesh sieve.

2.10.5 Construction Specifications

Site Preparation

- Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms, waterways, and sediment control basins.
- Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary seeding.
- Schedule required soil tests to determine soil amendment composition and application rates for sites having disturbed area over 5 acres.
- Distribute lime and fertilizer evenly and incorporate them into the top 3 to 5 inches of soil by diskling or other suitable means.
- Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons per acre (200 to 400 pounds per 1,000 square feet) prior to the placement of topsoil.

Seedbed Preparation

- Temporary Seeding**
 - Seedbed preparation must consist of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disk harrows or chisel plows or rippers mounted on construction equipment. After soil is loosened, do not roll or drag smooth but leave in the roughened condition. Track loaded areas (greater than 3:1) leaving the surface in an irregular condition with ridges running parallel to the contour of the slope.
 - Apply fertilizer and lime as prescribed on the plans.
 - Incorporate lime and fertilizer into the top 3 to 5 inches of soil by diskling or other suitable means.

2. Permanent Seeding – Maintain areas previously graded in conformance with the drawings in a true and even grade, then aerify or otherwise loosen the soil to a depth of 5 inches to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.

Apply soil amendments as per soil test or as indicated on the plans.

Mix the soil amendments into the top 3 to 5 inches of topsoil by diskling or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and benches, and rake the area for seed application. Where site conditions will not permit normal seeded preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Track step slopes (steeper than 3:1) by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. The top 1 to 3 inches of soil should be loose and friable. Seedbed loosening may not be necessary on newly disturbed areas.

- Methods of Seeding – Apply seed uniformly with hydroseeder (slurry includes seed, fertilizer and mulch), broadcast or drop seeder, or a cultipacker seeder.
 - If fertilizer is being applied at the time of seeding, the sedimentation rates will not exceed the following: nitrogen, maximum of 100 pounds per acre of total soluble nitrogen; P₂O₅ (phosphorus), 200 pounds per acre; K₂O (potassium), 200 pounds per acre.
 - Lime – Use only ground agricultural limestone, (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons per acre are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
 - Seed and fertilizer must be mixed on site and seedbed must be done immediately and without interruption.

iv) Fiber mulch may be incorporated into the hydroseeding mixture. Consult Section 2.7 Mulching for standards and specifications for mulch materials.

(v) Dry Seeding – This includes use of conventional drop or broadcast spreaders.

i) Incorporate seed spread dry into the subsoil at the rates prescribed on the Temporary or Permanent Seeding Summaries or Tables 2.4 or 2.7. The seedbed area must then be rolled with a weighted roller to provide good seed to soil contact.

ii) Where practical, apply seed in two directions perpendicular to each other. Apply half the seeding rate in each direction.

(c) Drill or Cultipacker Seeding – Mechanized seeders that apply and cover seed with soil.

i) Cultipacking seeders are required to bury the seed in such a fashion as to provide at least ¼ inches of soil covering. Seedbed must be firm after planting.

ii) Where practical, apply seed in two directions perpendicular to each other. Apply half the seeding rate in each direction.

- Sod Installation** – During periods of excessively high temperature or in areas having dry subsoil, the subsoil must be lightly irrigated immediately prior to laying the sod. The first row of sod must be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints must be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids, which would cause air drying of the roots. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg, or otherwise secure sod to prevent slippage on slopes and to ensure solid contact between sod roots and the underlying soil surface. Immediately water sod following rolling or tamping until the underside of the new sod and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.

5. Interim Stabilization – Cut Slopes

Dress, prepare, seed, and mulch all cut slopes as the work progresses. Excavate and stabilize slopes in equal increments not to exceed 15 feet.

The construction sequence is as follows (refer to Figure 2.1):

- Excavate and stabilize all temporary swales, side ditches, or berms that will be used to convey runoff from the excavation.
- Perform phase 1 excavation, dress, and stabilize.
- Perform phase 2 excavation, dress, and stabilize. Overseed phase 1 areas as necessary.
- Perform final phase excavation, dress, and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.

2.10.6 Maintenance

Grass Maintenance

- Inspect all seeded areas for failures and make necessary repairs, replacements, and reseeding within the planting season.
- Once the vegetation is established, the site must have 95% ground cover to be considered adequately stabilized.
- If the stand provides less than 40% ground coverage, reestablish following original lime, fertilizer, seedbed preparation and seeding recommendations.
- If the stand provides between 40% and 94% ground coverage, overseed and fertilizing using half of the rates originally applied may be necessary.

5. Maintenance fertilizer rates for permanent seedings are shown in Table 2.9.

Table 2.9 Maintenance Fertilization for Permanent Seeding

Seeding Mixture	Type	Seeding Rate		Time	Mowing
		lb/ac	lb/1,000 ft ²		
Tall fescue makes up 70% or more of cover.	10-10-10	500	11.5	Yearly or as needed.	Not closer than 3 inches, if occasional mowing is desired.
Cincofoil.	30-10-10	400	9.2	Fall.	
Fairly uniform stand of tall fescue or cincifoil turf.	0-20-0	400	9.2	Spring, the year following establishment, and every 4 to 5 years, after. Fall, the year following establishment, and every 4 to 5 years, after.	Mow no closer than 2 inches.
Weeping lovegrass fairly uniform plant distribution.	5-10-10	500	11.5	Spring, the year following establishment, and every 3 to 4 years, after. December, 30 days later.	Not required, not closer than 4 inches in fall after seed has matured.
Red & chewings fescue, Kentucky bluegrass, hard fescue mixtures.	20-10-10	250	5.8	December, May 20, June 30, if needed.	Mow no closer than 2 inches for red fescue and Kentucky bluegrass, 3 inches for fescue.
Red & chewings fescue, Kentucky bluegrass, hard fescue mixtures.	100	2.3		September, 30 days later.	Mow no closer than 2 inches for red fescue and Kentucky bluegrass, 3 inches for fescue.
Red & chewings fescue, Kentucky bluegrass, hard fescue mixtures.	20-10-10	100	2.3	December, May 20, June 30, if needed.	

Sod Maintenance

- In the absence of adequate rainfall, perform watering daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4 inches. Water during the heat of the day to prevent wilting.
- After the first week, sod watering is required as necessary to maintain adequate moisture content.
- Do not attempt the first mowing of sod until the soil is firmly rooted. Do not remove more than a third of the grass leaf by the initial cutting or subsequent cuttings. Maintain grass height between 2 to 3 inches unless otherwise specified.

2.6 Topsoiling

2.6.1 Definition

Placement of topsoil over prepared subsoil prior to establishing permanent vegetation.

2.6.2 Purpose

To provide a suitable soil medium for vegetative growth.

2.6.3 Conditions Where Practice Applies

This practice is recommended for areas with 2:1 or flatter slopes where one or more of the following apply:

- The texture, pH, or nutrient balance of the exposed subsoil/parent material is not adequate to produce vegetative growth.
- The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
- The original soil to be vegetated contains material toxic to plant growth.
- The soil is so acidic that treatment with limestone is not feasible.

4. Areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. These areas must have the appropriate stabilization shown on the plans.

2.6.4 Design Criteria

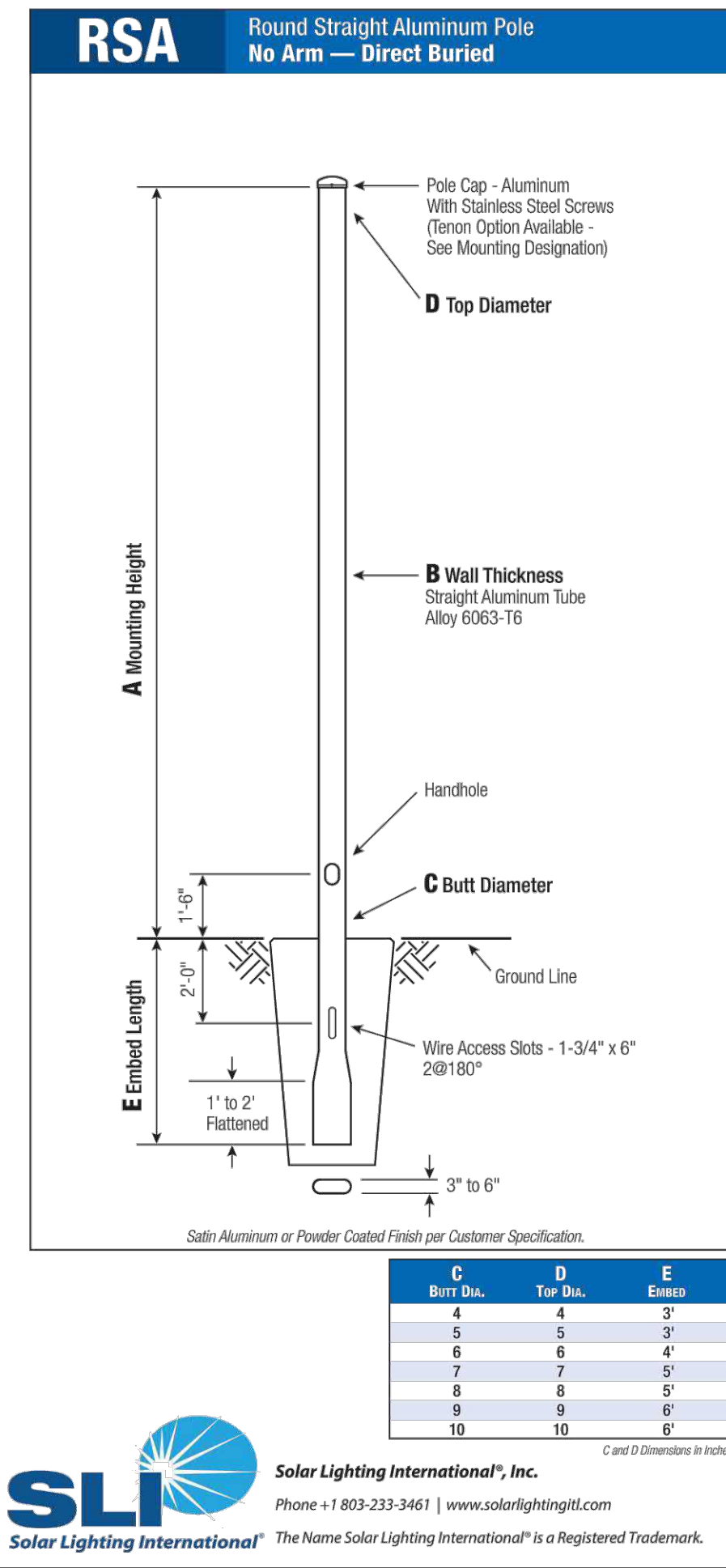
Topsoil salvaged from the existing site may be used if it meets the standards in these specifications. Place topsoil and apply soil amendments as specified in Section 2.10 Vegetative Stabilization. Soil to be used as topsoil must meet the following specifications:

- Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by DOEI. Regardless, topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 inch in diameter.
- Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quackgrass, Johnsongrass, nutgrass, poison ivy, thistle, other poisonous plants, or others as specified in Section 2.10 Vegetative Stabilization. Topsoil must also be free from invasive plants or plant parts.
- Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons per acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Distribute lime uniformly over designated areas and work into the soil in conjunction with tillage operations as described in the next step.

For sites with disturbed areas over 5 acres, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the requirements set forth in Section 2.10 Vegetative Stabilization. Alternatives to natural topsoil and alternative soil amendments, such as composted sewage sludge or other composted materials, may be used in place of fertilizer and lime, as allowed by other applicable regulations and as approved by a certified agronomist or soil scientist.

For sites with disturbed areas over 5 acres, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the requirements set forth in Section 2.10 Vegetative Stabilization. Alternatives to natural topsoil and alternative soil amendments, such as composted sewage sludge or other composted materials, may be used in place of fertilizer and lime, as allowed by other applicable regulations and as approved by a certified agronomist or soil scientist.

For sites with disturbed areas over 5 acres, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the requirements set forth in Section 2.10 Vegetative Stabilization. Alternatives to natural topsoil and alternative soil amendments, such as composted sewage sl



Pole
The pole shaft will be constructed of anodized aluminum 6063 Aluminum Alloy per the requirements of ASTM B221. The shaft assembly shall be full length heat treated to produce a T6 temper.

Handhole
4" x 6" Butt Diameter - 2-1/2" x 5" Handhole with curved Lip Style Aluminum Door and two (2) SS Self-Tapping Attaching Screws. A Grounding Provision is provided as part of the handhole.
6" Butt Diameter - Reinforced, 3" x 5" curved Cast Aluminum Frame Alloy 356-T6 with Aluminum Door and two (2) SS Hex Head Screws. A Grounding Provision incorporating a 3/8" diameter hole is provided opposite the Handhole.
7" Butt Diameter - Reinforced, 4" x 6" curved Cast Aluminum Frame Alloy 356-T6 with Aluminum Door and two (2) SS Hex Head Screws. Reinforced Frame will contain a tapped 3/8" 16NC Grounding Provision.

Embed Detail
Direct Buried Pole bottom section on 6" Butt Diameter poles will be partially flattened into an anti-rotational, oval cross section. Wire access will be provided 24" below ground line. Soil conditions vary by site. Foundation requirements should be determined by a qualified Structural Engineer with knowledge of jobsite soil conditions.

Vibration Damper
When determined necessary, a Vibration Damper will be factory-installed inside the pole shaft. Customer specification of the damper is available.

Mounting Designation
Side Drill Mount
For Side Drill Mount applications specify luminaire type, quantity and orientation. A luminaire drilling template must be supplied at time of order.

Tenon Mount
For Tenon Mount applications specify both tenon diameter (2.375", 2.875", 3.375", etc.) and length (2", 4", etc.).

WARNING: Do not install light pole without luminaires.

A	B	C	Truss	Max. EPA	100	110	120	130	Column
Height	Top Dia.	Butt Dia.	Material	100	110	120	130	140	Model
10	0.125"	4	100	11.4	9.0	8.3	6.8	5.6	RS4094E-*
10	0.125"	4	100	9.1	8.2	5.7	4.8	3.7	RS4104E-*
10	0.125"	5	100	15.8	12.4	11.6	9.6	8.2	RS4109E-*
12	0.125"	4	100	6.8	4.4	4.0	3.1	2.5	RS4104E-*
12	0.125"	5	100	12.0	9.3	8.6	7.2	6.0	RS4125E-*
12	0.156"	5	100	15.4	12.0	11.2	9.2	7.8	RS4125E-*
12	0.188"	5	100	13.6	14.8	13.6	11.2	9.5	RS4125E-*
14	0.125"	4	40	4.4	3.1	2.7	1.9	1.3	RS4148E-*
14	0.125"	5	100	9.2	7.0	6.4	5.2	4.4	RS4148E-*
14	0.156"	5	100	14.0	11.4	10.6	8.8	7.4	RS4148E-*
14	0.188"	5	100	14.8	11.4	10.6	8.8	7.4	RS4148E-*
16	0.125"	4	100	3.1	2.1	1.9	1.3	1.0	RS4165E-*
16	0.125"	5	100	3.1	2.1	1.9	1.3	1.0	RS4165E-*
16	0.156"	5	100	9.4	7.0	6.5	5.3	4.4	RS4165E-*
16	0.188"	5	100	11.8	9.0	8.2	6.8	5.6	RS4165E-*
16	0.156"	6	100	22.8	18.2	17.0	14.0	11.8	RS4165E-*
16	0.188"	6	100	25.8	20.6	19.2	16.0	13.4	RS4165E-*
18	0.125"	4	60	2.4	1.6	1.3	0.9	0.6	RS4165E-*
18	0.156"	5	100	7.2	5.2	4.8	3.8	3.1	RS4182E-*
18	0.188"	5	100	9.2	6.8	6.2	5.1	4.2	RS4182E-*
18	0.188"	6	100	21.6	17.2	16.0	13.2	11.2	RS4182E-*
20	0.125"	5	40	3.8	2.3	2.1	1.5	1.1	RS4205E-*
20	0.156"	5	60	5.6	3.7	3.4	2.6	2.1	RS4205E-*
20	0.188"	5	95	7.2	5.0	4.6	3.7	2.9	RS4205E-*
20	0.125"	6	100	11.6	9.2	8.4	6.9	5.7	RS4205E-*
20	0.156"	6	100	15.6	12.4	11.6	9.4	7.8	RS4205E-*
20	0.188"	6	100	18.0	14.4	13.2	11.0	9.2	RS4205E-*
20	0.156"	7	100	23.8	19.0	17.8	14.6	12.2	RS4205E-*
20	0.188"	7	100	26.6	21.2	19.8	16.4	13.8	RS4205E-*
20	0.156"	8	100	33.2	26.6	24.8	20.6	17.4	RS4205E-*
20	0.188"	8	100	36.4	29.4	27.2	22.8	19.2	RS4205E-*
25	0.156"	6	100	9.4	7.2	6.8	5.4	4.4	RS4252E-*
25	0.188"	6	100	11.8	9.0	8.4	6.8	5.4	RS4252E-*
25	0.156"	7	100	13.8	10.4	9.8	8.0	6.4	RS4252E-*
25	0.188"	7	100	16.2	12.4	11.6	9.4	7.6	RS4252E-*
25	0.156"	8	100	23.0	18.4	17.0	14.0	11.8	RS4252E-*
25	0.188"	8	100	25.8	20.6	19.2	15.8	13.2	RS4252E-*
25	0.219"	8	100	28.8	22.6	21.2	17.4	14.4	RS4252E-*
25	0.250"	8	100	29.8	23.6	22.2	18.2	15.2	RS4252E-*
30	0.188"	6	40	7.0	5.2	4.8	3.8	2.8	RS4302E-*
30	0.156"	7	100	10.4	8.0	7.4	5.8	4.8	RS4302E-*
30	0.188"	7	100	12.4	9.6	9.0	7.2	5.8	RS4302E-*
30	0.156"	8	100	16.2	12.8	11.8	9.6	8.0	RS4302E-*
30	0.188"	8	100	18.6	14.6	13.6	11.2	9.2	RS4302E-*
30	0.219"	8	100	19.6	14.6	13.6	11.2	9.2	RS4302E-*
30	0.250"	8	100	19.6	14.6	13.6	11.2	9.2	RS4302E-*
30	0.188"	9	100	25.8	20.4	18.8	15.4	12.4	RS4302E-*
30	0.250"	9	100	25.8	20.4	18.8	15.4	12.4	RS4302E-*
30	0.188"	10	100	33.4	26.6	24.4	19.8	16.0	RS4302E-*
35	0.156"	8	100	11.2	8.6	7.8	6.3	5.1	RS4352E-*
35	0.188"	8	100	13.4	10.4	9.6	7.6	6.2	RS4352E-*
35	0.250"	8	100	13.4	10.4	9.6	7.6	6.2	RS4352E-*
35	0.188"	9	100	19.2	15.0	14.0	11.2	8.8	RS4352E-*
35	0.250"	9	100	19.2	15.0	14.0	11.2	8.8	RS4352E-*
35	0.188"	10	100	25.6	20.4	18.8	14.6	11.6	RS4352E-*
35	0.219"	10	100	25.6	20.4	18.8	14.6	11.6	RS4352E-*
35	0.250"	10	100	25.6	20.4	18.8	14.6	11.6	RS4352E-*
35	0.312"	10	100	25.6	20.4	18.8	14.6	11.6	RS4352E-*
40	0.188"	8	100	9.2	7.0	6.4	5.0	4.0	RS4402E-*
40	0.219"	8	100	9.2	7.0	6.4	5.0	4.0	RS4402E-*
40	0.250"	8	100	9.2	7.0	6.4	5.0	4.0	RS4402E-*
40	0.188"	9	100	14.2	11.0	10.2	8.0	6.0	RS4402E-*
40	0.250"	9	100	14.2	11.0	10.2	8.0	6.0	RS4402E-*
40	0.188"	10	100	19.8	15.6	14.0	10.8	8.2	RS4402E-*
40	0.219"	10	100	19.8	15.6	14.0	10.8	8.2	RS4402E-*
40	0.250"	10	100	19.8	15.6	14.0	10.8	8.2	RS4402E-*
40	0.312"	10	100	19.8	15.6	14.0	10.8	8.2	RS4402E-*

Catalog Number System
The catalog number for SLI's poles utilizes the following identification system.

Mounting Designation
MOUNTING BUTT BASE
HEIGHT DIA. STYLE
SHAFT WALL TOP FLUSH
ASSEMBLY THICK. DIA.

Catalog Number Example -
RSA 30 D 6 - E - 01
Round Straight Aluminum, 30" Mounting Height, .188" Wall Thickness, 6" Butt Diameter, No Taper, Direct Buried, Satin Aluminum Finish.

Wall Thickness
B = .125"
C = .156"
D = .188"
E = .219"
F = .250"
G = .312"

Butt Diameter
4 = 4"
5 = 5"
6 = 6"
7 = 7"
8 = 8"
9 = 9"
10 = 10"

Top Diameter
- = No Taper

Base Style
E = Direct Buried

Finish
01 = Satin Aluminum
BA = Black Powder Coat
BH = White Powder Coat
BM = Dark Bronze Powder Coat
BV = Dark Green Powder Coat
CC = Gray Powder Coat
*** = Specify Finish

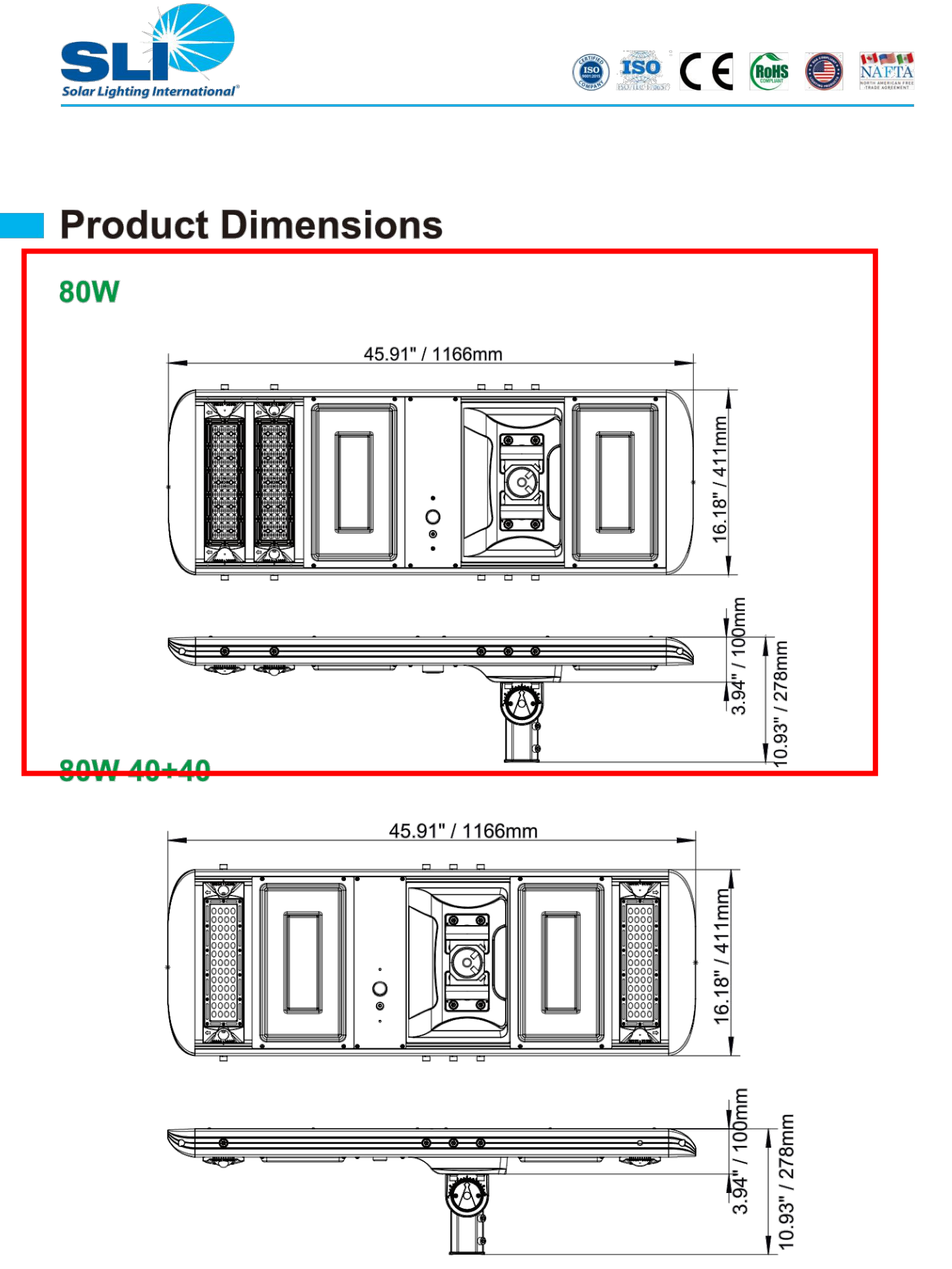
EPA Notes:
Effective Projected Area (EPA) is square feet. EPA's calculated using solar intensity (direct) included in accordance with 2009 IESNA L75-8 using a 25 year design life. Maximum EPA is based on the luminaire weight shown. Increased luminaire weight may reduce the maximum EPA. If weight is exceeded, or if other design life or code is required, please consult the factory.

Specifications

Product Model	STEALTH II 40W-23	STEALTH II 80W-23	TEALTH II 80W-23 40+40
Power	40W	80W	80W
Lumen / LED Type	7,400 Lumens (Philips 5050)	14,800 Lumens (Philips 5050)	14,800 Lumens (Philips 5050)
Color Temperature	4000K ± 300K	4000K ± 300K	4000K ± 300K
BUG Rating	B1-U0-G2	B1-U0-G2	B1-U0-G2
Battery	LiFePO ₄ 24AH, 12.8V / 307.2Wh	LiFePO ₄ 48AH, 12.8V / 614.4Wh	LiFePO ₄ 48AH, 12.8V / 614.4Wh
Solar Panel	Mono-crystalline 48 Watt	Mono-crystalline 65 Watt	Mono-crystalline 65 Watt
Light Dimensions	34.1" x 16.2" x 3.94" 866x411x1277mm	45.9" x 16.2" x 3.94" 1168x411x1277mm	45.9" x 16.2" x 3.94" 1168x411x1277mm
Working Time	Up to 14 hrs if fully charged, Alternate working modes and working times, ranges from 3 - 6 nights.		
Charging Time	Requires 6 hours of direct sunlight at optimal angle. Optimal direction is magnetic south and the optimal angle equals the latitude of the installation. Performance is reduced if product is installed different than the optimal angle or non-south facing.		
Beam Angle	Standard Distribution: 150 x 75° - Type III or Bat-Wing Style Optional: Lens Distribution for Type I, Type II & Type V*		
PIR Sensor	2 PIR Sensors Detection angle: 150° Detection distance: up to 5 Meters / 50 Feet		
IP Class	IP66		
Working Temp	-10°F - 140°F / -23°C - 60°C		
Housing Material	Powder Coated Aluminum Salt Spray Coating		
Weight N.W./G.W.	41 lbs. / 48 lbs. 18 kg / 22 kg	57 lbs. / 71 lbs. 26 kg / 32 kg	57 lbs. / 71 lbs. 26 kg / 32 kg
Box Dimensions	43.9" x 19.5" x 7.1" 1115 x 495 x 180mm	55.7" x 19.5" x 7.1" 1415 x 495 x 180mm	55.7" x 19.5" x 7.1" 1415 x 495 x 180mm
Installation Height	10' - 15' or 3-5m	15' - 25' or 5 - 8m	15' - 25' or 5 - 8m
Installation Spacing	32' - 50' or 10-15m	50' - 82' or 15 - 25m	50' - 82' or 15 - 25m
EPA	2	4	4
Warranty	3 years**		

* Default lens is Type III, other options available.
** Provided if not installed per optimal instructions.

Customer Requests: Ping 85 Warning
Warning: Center and Reproductive Harm
Web: www.safelighting.com



SOLAR LIGHT POLE AND BASE SPECIFICATIONS

SOLAR LIGHT SPECIFICATIONS



GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Parks and Recreation

DPR
The Department of Parks and Recreation
Thomnie Freeman
Director

Capital Projects and Planning

DPR Lighting Guidelines:

This document was developed as a holistic Lighting Standards Package and is shared with designers to assist in park lighting planning with a special focus on a Lighting Management Plan using the IDA and IES Principles along with addressing DPR's needs.

Key Elements to determine:

- Lighting Management Plan (below)
- Standard Locations: ie. front doors, parking lots, walking tracks, trails
- Standard Fixtures: Pole Lights, Bollards, Wall Packs, pool decks, parking lots, etc.
- Footcandles, Kelvin, Lumens, Shielding, Dimming/Timers

Lighting Management Plan that reflects IDA and IES: "Five Principles for Responsible Outdoor Lighting."

- Useful: All Light should have a clear purpose
- Targeted: Light should be directed only to where needed
 - reduce light trespass and glare
- Low Light Levels: Light should be no brighter than necessary
- Controlled: Light should be used only when it is has a clear purpose
- Color: Use Warmer Color Lights (2200K preferred, max 2700K)

Best Practices are to install fully shielded fixtures with zero uplight with timers for cut-off times, and/or motion sensors or dimmers to reduce lighting at night when a facility or area is not in use.

Lighting at DPR's outdoor courts and athletic fields should follow IDA's *Criteria for Community-Friendly Outdoor Sports Lighting*. Sports lighting should mitigate light pollution into the community and glare into neighboring properties. Sports lighting should use the lowest luminaire Color Correlated Temperature (CCT) possible (max 5700K), while ensuring safe play is met for recreational and/or high school level sports lighting.

DPR go for gold

1275 First Street, NE | Washington, D.C. 20002 | P: (202) 673-7647 | F: (202) 673-2087 www.DPR.DC.gov

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DPR LIGHTING STANDARDS:
This guideline is to be used for specific tasks and locations based on learned experiences and real world needs of DPR. Below are specific standard light fixtures and/or recommended Foot Candle (FC) for a variety of scenarios. BUG rating shall not exceed B1-U0-G1. The preferred luminaire shall have a nominal correlated color temperature (CCT) of 2,200K (maximum 2700K. Park light fixtures should be no more than 3500 lumens per fixture at full power. The color rendering index (CRI) shall be a minimum 70 but preferred above CRI 80. All fixtures should have 7-pin photocontrol receptacles that enable dimming based on site needs (astronomical or occupancy photocell control and timers). Black is the standard fixture color.

Area and Path Lighting: (standard or equivalent will be considered)

Option 1 (preferred):
Invue Arbor Pole Mount (ARB) for area lighting (10-14' pole)

Option 2 (VE Option):
Invue LXS Luxescape (LXS) for area lighting (10-14' pole)

Localized Path, Trail and Plaza Lighting:

Option 1 (preferred):
Invue Arbor Bollard (ARB)

Option 2 (VE Option):
McGraw-Edison (BRT6)

Parking Lot Lighting (Area and Site):

Option 1 (preferred):
Invue LuxeScape Arm Mount (LXS)

Option 2 (VE Option):
Invue Icon (ICS/ICM) for area lighting

Facility Perimeter Lighting:

Option 1 (preferred):
Invue ClearCurve (CCW)

Option 2 (VE Option):
Invue Entri Series (CCW)

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Athletic Field and Court Lighting:
Option 1 (preferred):
Musco TLC LED (Total Light Control): 4000-5700K LED Fixture with Musco App Control.
Note: Athletic Field Lighting is typically mounted on 40'-60' poles for recreational sports

Location of Lights and Recommended Light Levels (*from IES):

- Building Perimeter*: Average 1.5 FC (min. 0.75FC - max. 3.0FC)
- Front Doors: max. 5.0FC
- Pathways/Safety*: Average 1.0 FC (min. 0.5FC - max. 2.0FC)
- Very Urban Pathways/Safety*: Average 1.5 FC (min. 0.75FC - max. 3.0FC)
- Trails: Average 0.5FC (min 0.25FC - max. 1.5FC)
- Parking Lots*: Average 1.5 FC (min. 0.75FC - max. 3.0FC)
- Pool Decks Security (during seasonal uncovered pool only): Average 1.0 FC (min. 0.5FC - max. 1.5FC)

All of the above lighting levels are shown at 100% when facilities are in active use. These lights should be dimmed to no more than 50% of maximum or turned off completely when facilities are not in active use. When safe passage is required during seasonal shorter days the fixtures may be dimmed to no more than 50% of maximum.

Illumination for specific sports should conform to the recommendations for play in IES *RP-6-20 Lighting Sports and Recreational Areas* and in *IDA-Criteria for Community-Friendly Outdoor Sports Lighting*. Most DPR Courts and fields will be lit for Class IV levels of play, but some designs may require Class II or III levels of lighting.

Class IV Lighting Examples:

- Basketball Courts: 20FC
- Tennis Courts: 30FC
- Athletic Fields: 20FC
- Baseball: infield: 30FC / outfield: 20FC
- Volleyball: 20FC



