

GREENBOOK SEMINAR

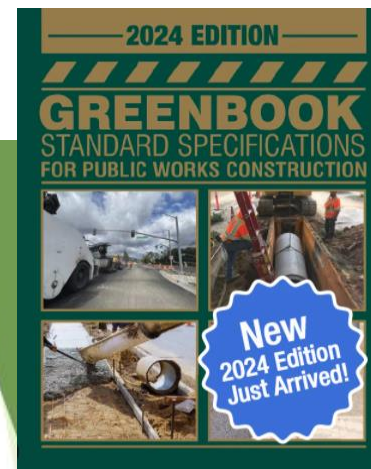
April 2024

PART 8 Landscape and Irrigation

Dave Gallagher, PLA



Part 8 Landscape and Irrigation



Updates to Part 8 Landscape and Irrigation
for the latest GREENBOOK, 2024 edition:

► None

Part 8 Landscape and Irrigation

LEARNING OBJECTIVES:

- ▶ Promote the use and understanding of the “Greenbook”
- ▶ Review the organization used in the “Greenbook” with examples of Special Provisions that amend and supplement the “Greenbook” to further understanding
- ▶ Highlight the necessity and importance of Special Provisions to reflect users’ projects
- ▶ Improve the consistency and uniformity of use of these (2) documents for project success



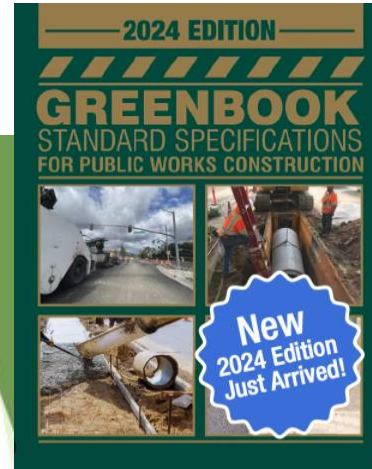
Part 8 Landscape and Irrigation

WHAT IS THE GREENBOOK:

- ▶ AASTHO format Standard Specification with general applicability to public works projects
- ▶ Promulgated by the Greenbook Committee of Public Works Standards, Inc. with input from: APWA, Southern California AGC, ECA, SCCA, local agencies and contractors

HOW TO USE THE GREENBOOK:

- ▶ Use with Agency prepared Supplemental Specifications AND project specific Special Provisions
- ▶ Not all Agencies maintain Supplemental Specifications Some Agencies only prepare project specific Special Provisions
- ▶ Impossible to have a successful contract only referring to the Greenbook. Each Contract has specific or unique requirements



Part 8 Landscape and Irrigation

IS needed:



- Every project that includes proposed living landscape improvements will almost certainly require an irrigation system, even if it is “temporary” such as native planting projects need irrigation to get established.
- Part 8 provides the direction for the Contractor on the MATERIALS and INSTALLATION needed for the project and this information is found in the “Greenbook”

Part 8 Landscape and Irrigation

Is NOT needed:



(Images from Google search: Fake plants WW2)

- If your project is using plastic plants and is during World War 2
- Note that irrigation equipment is still present in photos!

Part 8 Landscape and Irrigation

PART 8 LANDSCAPING AND IRRIGATION SECTION 800 - MATERIALS

800-1 LANDSCAPING MATERIALS.

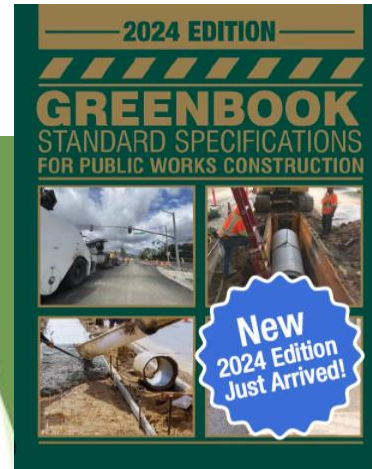
- 1) "Topsoil shall be designated as Class A (imported), Class B (selected) or Class C (unclassified). (800-1.1.1)
- 2) "Topsoil shall be transported from the source to its final position unless stockpiling is specified in the Special Provisions." (800-1.1.1)
- 3) "Class "B" ... designated on the Plans or in the Special Provisions ..." (800-1.1.3)
- 4) "Commercial fertilizer ... having the chemical analysis shown on the Plans or specified in the Special Provisions." (800-1.2.3)
- 5) "Mulch shall be designated by Type in accordance with the requirements herein." (800-1.2.5)
- 6) "Trees shall be of the specified height ..." (800-1.4.2)
- 7) "Shrubs shall be of the specified type and size ..." (800-1.4.3)
- 8) "Stolons shall be ... as specified in the Contract Documents." (800-1.4.5)

800-2 IRRIGATION SYSTEM MATERIALS.

- 1) "The type of pipe materials and fittings shall be as shown on the Plans or specified in the Special Provisions ..." (800-2.1.1)
- 2) "Valves shall be of the size, type, and capacity shown on the Plans or specified in the Special Provisions ..." (800-2.2.1)
- 3) "Sprinkler heads, bubbler heads and spray nozzles shall be of the types and sizes shown on the Plans." (800-2.4)

800-3 ELECTRICAL MATERIALS.

- 1) "The type of controller unit shall be as shown on the Plans."



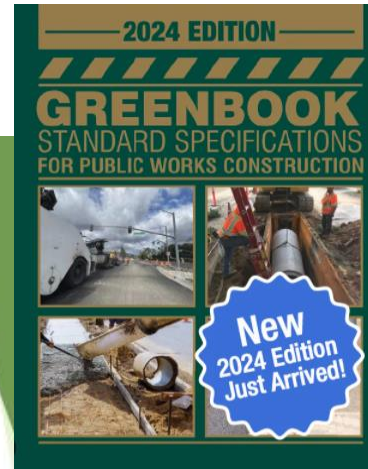
A look into
Part 8:

Part 8 Landscape and Irrigation

A look into
Part 8:

SECTION 801 – INSTALLATION

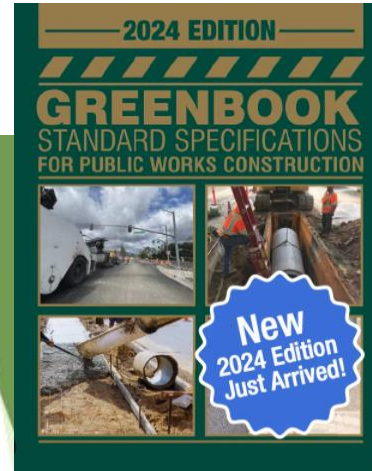
- 1) “This section ... landscape areas shown on the Plans.” (801-1)
- 2) “The type and thickness of topsoil shall be as shown on the Plans ...” (801-2.2.1)
- 3) “Headers shall be installed at the locations and grades shown on the Plans prior to planting.” (801-3)
- 4) “The types, sizes, and quantities of plant materials shall be as specified in the Special Provisions or shown on the Plans.” (801-4.1)
- 5) “Trees ... to be guyed will be shown on the Plans or specified in the Special Provisions.” (801-4.6.3)
- 6) “Vines shall be tied to walls, fences, etc., in the manner prescribed on the Plans.” (801-4.7)
- 7) “The required seed mixture shall be sown uniformly at the specified rate.” (801-4.8.2)
- 8) “The seed, fertilizer, ... shall be as specified in the Special Provisions or shown on the Plans.” (801-4.8.2)
- 9) “The type and thickness of sod and the areas to be sodded shall be as shown on the Plans or specified in the Special Provisions.”
- 10) “Unless otherwise specified, the irrigation system layout shown on the Plans shall be considered schematic.” (801-5.1)
- 11) “Service connections shall be as shown on the Plans.” (801-5.1)
- 12) “Unless otherwise specified, the minimum depth of cover over pipelines and conduit shall be as follows:” (801-5.2)
- 13) “Valves ... shall be furnished and installed as specified.” (801-5.4)
- 14) “Sprinkler head spacing shall not exceed the maximum shown on the Plans ...” (801-5.5.2)
- 15) “The automatic controller shall be installed ... at the location shown on the Plans.” (801-5.6)
- 16) “The minimum service wire shall be ... or larger as specified in the Special Provisions ...” (801-5.6)
- 17) “Unless otherwise specified, all control wiring shall be ...” (801-5.6)



Part 8 Landscape and Irrigation

- 18) "Pressure tests shall be performed such that the test periods are within the working hours specified in the Special Provisions." (801-5.7.2.3)
- 19) "The plant establishment period shall be for a period of 30 Days unless otherwise specified in the Special Provisions." (801-6)

A look into
Part 8:



Part 8 Landscape and Irrigation

Some context and examples in terms of how the “Greenbook” is used for the scale and scope of Public Works’ landscape architecture section for extensive landscape and irrigation projects:

Park and Park-like spaces:

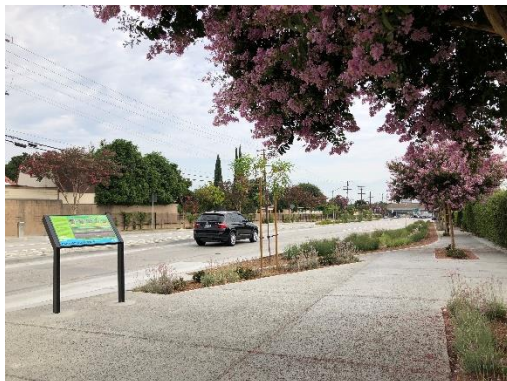


East LA Sustainable Medians



FDR Park Regional Stormwater Capture Project

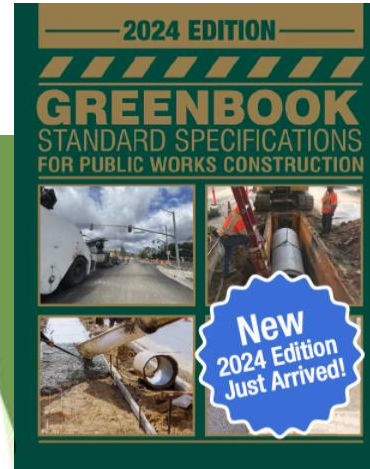
Road and pedestrian spaces:



7th Ave Community Improvements

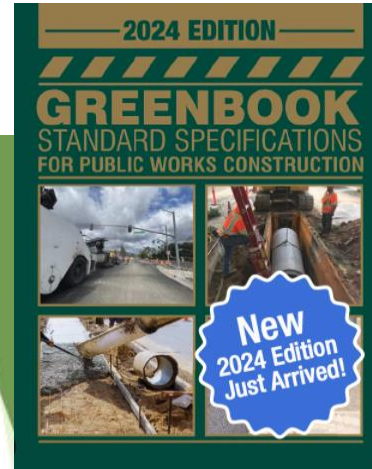


Willowbrook Streetscape



Part 8 Landscape and Irrigation

East LA Sustainable Medians Project (LA County, CA) approx. 200,000 SF using 'Part 8' (with added Special Provisions) for extensive landscape and irrigation project



Google search: Northside Dr & Garfield Ave East Los Angeles, CA 90022

Part 8 Landscape and Irrigation

Today we will discuss (2) resources for your project:

Overview, this presentation is going to:

- Review Sections of the “Greenbook”

“Greenbook”:

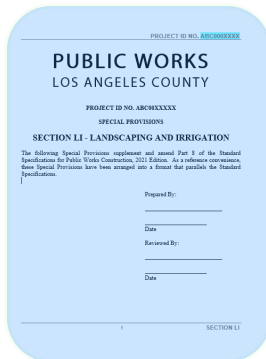


Part 8 is Landscape and Irrigation of the “Greenbook”

Part 8 has (2) main Sections: Materials and Installation

- Give examples of how Special Provisions created by designer can modify the “Greenbook”

Not the “Greenbook”:



An agency’s project will have project specs, with Special Provisions from different disciplines (Electrical, Landscape, etc.,) to direct the Work.

Part 8 Landscape and Irrigation

BEGIN review Sections of the “Greenbook”

“Greenbook”:



Part 8 is Landscape and Irrigation of the “Greenbook”

Part 8 has (2) main Sections: Materials and Installation

Part 8 Landscape and Irrigation

MATERIALS (800) AND INSTALLATION (801)

The following is what we will look at during this presentation. These are examples of sections and subsections in the “Greenbook” along w/photos from construction project at PW:



800-2.4 Sprinkler Equipment (Materials) & 801-5.7.3 Irrigation Coverage Test (Installation)



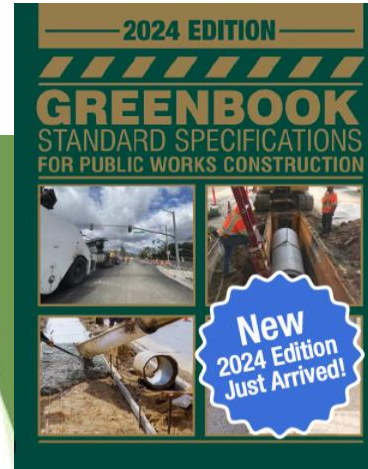
800-1.4 Plants (Materials) & 801-4.3 Layout and Plant Location (Installation)



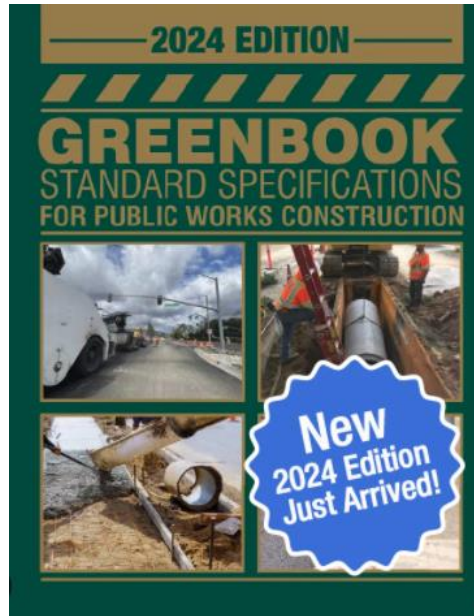
801-6 Maintenance and Plant Establishment



Final walk/acceptance, installation Contractor has completed Work.



Part 8 Landscape and Irrigation



The “Greenbook” introduction:

- The following will share how it is organized and the main sections and subsections will be discussed
- To help understand how the Greenbook is organized we will take an additional step and we will go through **examples of adding a Material and Installation** requirements to a project using Special Provisions WHILE maintaining the organization/structure that is used in the “Greenbook”.

Part 8 Landscape and Irrigation

There are two main sections to Part 8:

Greenbook 2021

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PART 8 LANDSCAPING AND IRRIGATION

SECTION 800 - MATERIALS

800-1 LANDSCAPING MATERIALS.

800-1.1 Topsoil.

800-1.1.1 General. Topsoil shall be designated as Class A (imported), Class B (selected) or Class C (unclassified). The Engineer will determine the suitability of topsoil prior to use. The Engineer may make such inspections and perform such tests as deemed necessary to determine that the material meets the requirements. Topsoil shall be transported from the source to its final position unless stockpiling is specified in the Special Provisions.

800-1.1.2 Class "A" Topsoil. Class "A" topsoil shall be from a source outside the limits of the Work selected by the Contractor.

At least 15 Days before scheduled use, the proposed source of topsoil shall be submitted to the Engineer for approval. The Contractor shall submit a written request for approval which shall be

SECTION 801 - INSTALLATION

801-1 GENERAL. This section includes specifications for the preparation, planting, and irrigation system construction for landscape areas shown on the Plans.

Unless otherwise specified, walls, curbs, planter boxes, walks, irrigation systems, and similar improvements shall be constructed following rough grading and before landscaping.

All work on the irrigation system, including hydrostatic and coverage tests, preliminary operational tests of the automatic control system, and the backfill and densification of trenches, and other excavations shall be performed after topsoil work and before planting.

801-2 EARTHWORK AND TOPSOIL PLACEMENT.

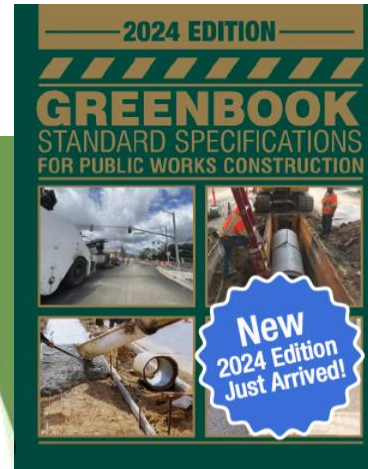
801-2.1 General. Earthwork and topsoil placement shall include the preparation for and the spreading, densification, cultivation, and raking of topsoil, including fertilization and conditioning.

Preliminary rough grading and related work to prepare areas for landscaping work to within 0.1 foot (30 mm) of finish grade, or to subgrade for Class A or Class B topsoil, shall conform to 300-2, 300-4, and 301-1.

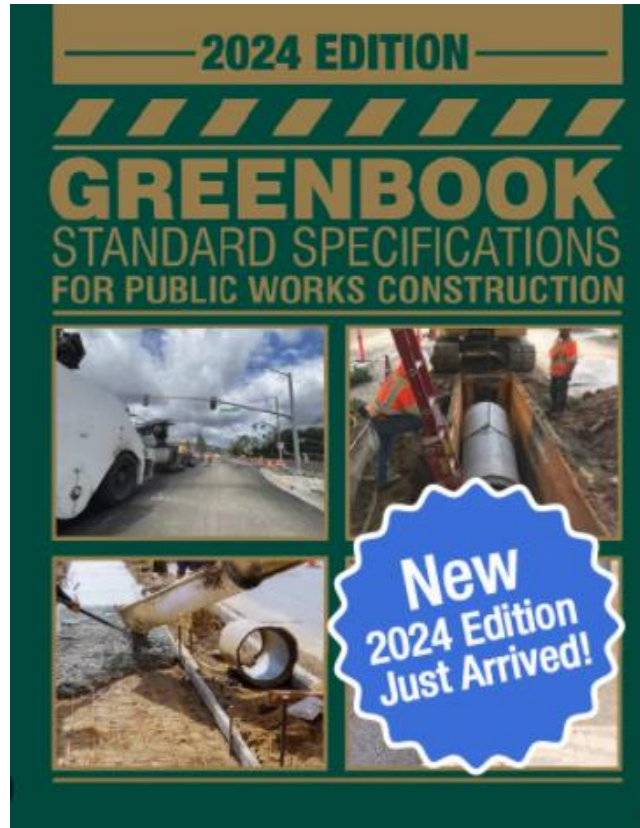
Greenbook 2021

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- The “Section **800 - Materials**” (page 609) is just those items the Contractor will provide such as: soil; a tree; a sprinkler
- The “Section **801 - Installation**” (page 615) details what Work is in terms of placement/install, such as: soil shall not be compacted; tree shall be staked with tree ties; sprinkler heads shall distribute water over the area



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MATERIALS:

- The following slides show the “Greenbook” and just the **Section 800 - Materials** portion for us to discuss typical materials for landscape projects

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PART 8 LANDSCAPING AND IRRIGATION

SECTION 800 - MATERIALS

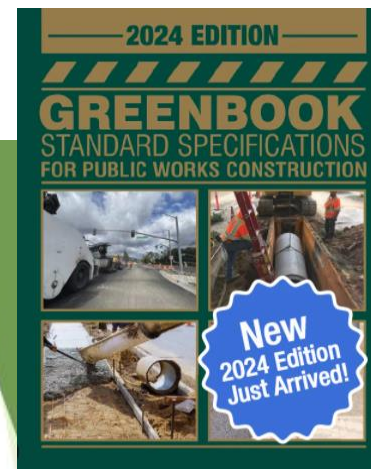
800-1 LANDSCAPING MATERIALS.

800-1.1 Topsoil.

800-1.1.1 General. Topsoil shall be designated as Class A (imported), Class B (selected) or Class C (unclassified). The Engineer will determine the suitability of topsoil prior to use. The Engineer may make such inspections and perform such tests as deemed necessary to determine that the material meets the requirements. Topsoil shall be transported from the source to its final position unless stockpiling is specified in the Special Provisions.

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At least 15 Days before scheduled use, the proposed source of topsoil shall be submitted to the Engineer for approval. The Contractor shall submit a written request for approval which shall be



Section 800 - Materials:

- This section details the components that the project will use in satisfying the needs of the project.
- This section does not list any details or description of the installation process or placement of the proposed.

Part 8 Landscape and Irrigation

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PART 8 LANDSCAPING AND IRRIGATION SECTION 800 - MATERIALS

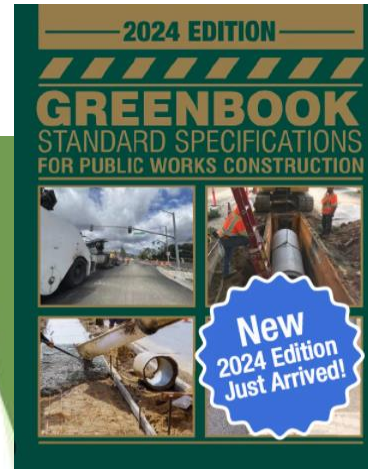
800-1 LANDSCAPING MATERIALS.

800-1.1 Topsoil.

800-1.1.1 General. Topsoil shall be designated as Class A (imported), Class B (selected) or Class C (unclassified). The Engineer will determine the suitability of topsoil prior to use. The Engineer may make such inspections and perform such tests as deemed necessary to determine that the material meets the requirements. Topsoil shall be transported from the source to its final position unless stockpiling is specified in the Special Provisions.

800-1.1.2 Class "A" Topsoil. Class "A" topsoil shall be from a source outside the limits of the Work selected by the Contractor.

At least 15 Days before scheduled use, the proposed source of topsoil shall be submitted to the Engineer for approval. The Contractor shall submit a written request for approval which shall be



Section 800 - Materials:

- Each section and sub-section will follow the naming convention shown above
- In above example, 800-1.1.2 is specific to Class "A" Topsoil (ex Not shown but 800-1.1.3 is Class "B" Topsoil)

Part 8 Landscape and Irrigation

800-1.4 Plants.

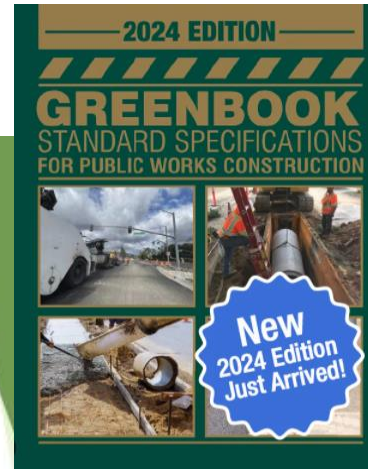
800-1.4.1 General. Plants shall be inspected and approved at the nursery by the Engineer prior to shipment to the planting site.

Plants shall have a growth habit normal to the species and shall be sound, healthy, vigorous and free from insect pests, plant diseases, sun scalds, fresh bark abrasions, excessive abrasions, or other objectionable disfigurements. Tree trunks shall be sturdy and well “hardened off.” Plants shall have normal well-developed branch systems, and vigorous and fibrous roots systems which are neither root-nor pot-bound and are free of kinked or girdling roots.

Other than the normal side pruning during the growth period, no pruning shall be done prior to inspection at the nursery.

800-1.4.2 Trees. Trees shall be of the specified height and crown to the last division of the terminal leader and diameter. The height shall be measured from the root crown. The diameter shall be measured 6 inches (150 mm) above the root crown. The height of palm trees shall be measured from the groundline to the base of the growing bud. The tree shall stand reasonably erect without support.

800-1.4.3 Shrubs. Shrubs shall be of the specified type and size, selected from high quality, well-shaped nursery stock.



Section 800 - Materials:

- For ‘landscape’ items such as plants are found under 800-1.4 Plants.
- The “Greenbook” lists requirements such as the plants must be healthy, free from insect pests, etc.
- Note useful information under the General subsection that states plants will need to be *inspected and approved at the nursery prior to shipment* to the planting site. (At PW we modify this using the Special Provisions so this requirement is for 15 gallon or larger shrubs and trees only.)



Example of “Fail”
at inspection

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800-1.5 Headers, Stakes, and Ties.

800-1.5.1 General. Lumber for landscape work shall be construction heart rough redwood in the sizes specified. Nails, lag screws, and miscellaneous hardware shall be galvanized commercial quality material. Miscellaneous fabricated metal items shall be made from steel conforming to ASTM A36.

800-1.5.2 Headers and Stakes. Headers shall be 2 inches x 4 inches (50 mm x 100 mm) except that 2, 1 inch x 4-inch (25 mm x 100 mm) boards shall be supplied for laminations on turns and curves. Header stock shall be supplied in lengths of at least 10 feet (3 m). Stakes for headers shall be pointed 2 inches x 4 inches (50 mm x 100 mm), at least 18 inches (450 mm) long. Joint splicing lumber shall be 1 inch x 4 inches (25 mm x 100 mm), 2 feet (0.6 m) long.

800-1.5.3 Tree Stakes. The type of tree stake shall be as specified in the Special Provisions. The tree support stakes shall be 10 feet (3 m) long.

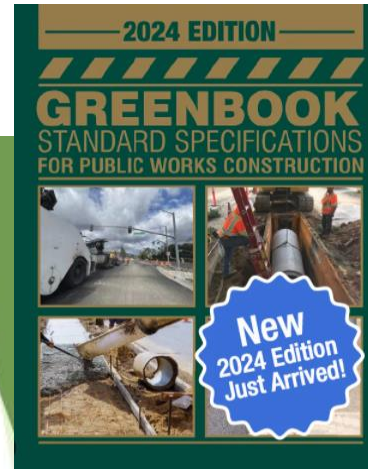
Guy wire shall be No. 12 BWG (2.64 mm) zinc-coated iron. Plastic ribbon tie material shall be 1 inch (25 mm) wide with a minimum tensile strength of 500 pounds (2 kN).

Deadman stakes shall be either 2 inches x 4 inches (50 mm x 100 mm) redwood or 3/4 inch (19 mm) diameter steel pipe 3 feet (1 m) long. Covers for wire shall be garden hose, 1/2 inch (12.5 mm) minimum diameter.

800-2 IRRIGATION SYSTEM MATERIALS.

800-2.1 Pipe and Fittings.

800-2.1.1 General. The type of pipe materials and fittings shall be as shown on the Plans or



Section 800 - Materials:

- For 'landscape' items such as tree stakes are found under 800-1.5.3 Tree Stakes.
- Note that a new section for 'irrigation' items has a designation of 800-**2**, which is a second and separate category of the MATERIALS section which is IRRIGATION

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Greenbook 2021

800-2.4 Sprinkler Equipment. Sprinkler heads, bubbler heads and spray nozzles shall be of the types and sizes shown on the Plans. Such equipment shall be brass, bronze and stainless steel except for minor components. Equipment of one type and flow characteristic shall be from the same manufacturer and all equipment shall bear the manufacturer's name and identification code in a position where they can be identified in the installed position.

Fixed head sprinklers shall have a one-piece housing with provision for interior parts replacement. Pop-up sprinklers shall rise at least 1 inch (25 mm) during operation.

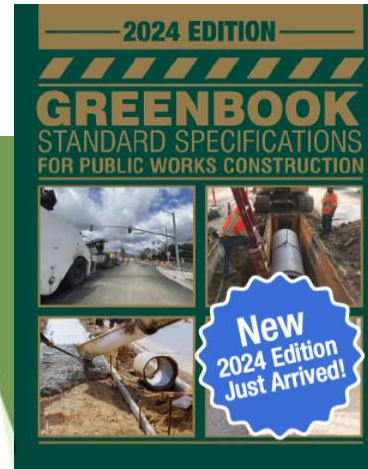
Shrubbery and bubbler heads shall be adjustable from full-flow to shutoff.

800-3 ELECTRICAL MATERIALS.

800-3.1 General. The Contractor shall furnish and install all electrical equipment and materials

Section 800 - Materials:

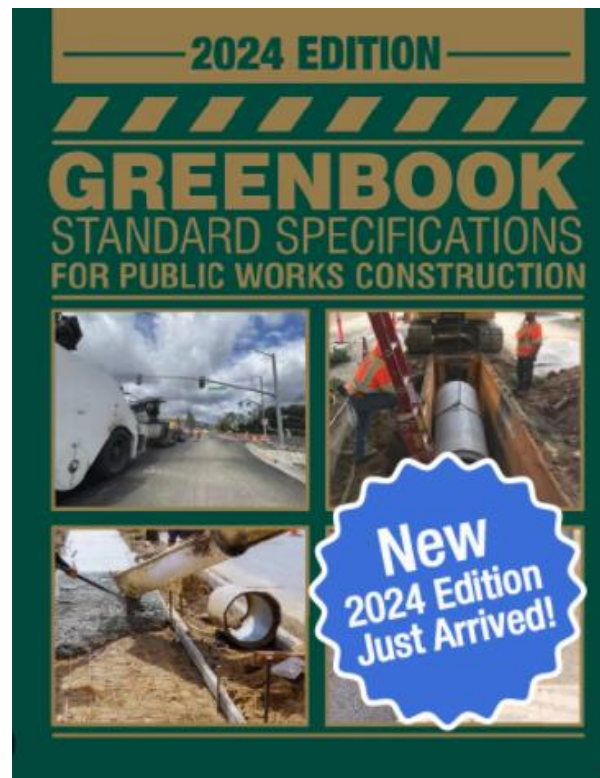
- Note that 800-2.4 Sprinkler Equipment provides requirements in terms of the MATERIALS
- These requirements also detail the need for the equipment of one type and flow characteristic shall be from the same manufacturer. This makes it clear that random and different parts are not acceptable MATERIALS and can not be used.



Part 8 Landscape and Irrigation

INSTALLATION:

- The following slides show the “Greenbook” and just the **Section 801 - Installation** portion for us to discuss



Part 8 Landscape and Irrigation

SECTION 801 - INSTALLATION

801-1 GENERAL. This section includes specifications for the preparation, planting, and irrigation system construction for landscape areas shown on the Plans.

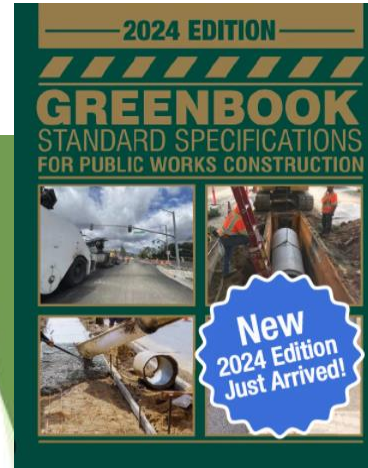
Unless otherwise specified, walls, curbs, planter boxes, walks, irrigation systems, and similar improvements shall be constructed following rough grading and before landscaping.

All work on the irrigation system, including hydrostatic and coverage tests, preliminary operational tests of the automatic control system, and the backfill and densification of trenches, and other excavations shall be performed after topsoil work and before planting.

801-2 EARTHWORK AND TOPSOIL PLACEMENT.

801-2.1 General. Earthwork and topsoil placement shall include the preparation for and the spreading, densification, cultivation, and raking of topsoil, including fertilization and conditioning.

Preliminary rough grading and related work to prepare areas for landscaping work to within 0.1 foot (30 mm) of finish grade, or to subgrade for Class A or Class B topsoil, shall conform to 300-2, 300-4, and 301-1.



Section 801 - Installation:

- Note that we have crossed into a new section which is designated by 801-xxx in front of ea. subsection
- In the above example the requirements shown for 801-2.1 General, it includes information for grading of finish grade and subgrade for the imported topsoil.
- Also note how the “Greenbook” is referencing to other sections to direct the Work and Contractor:
 - 300-2 Unclassified Excavation ; 300-4 Unclassified Fill ; 301-1 Subgrade Preparation

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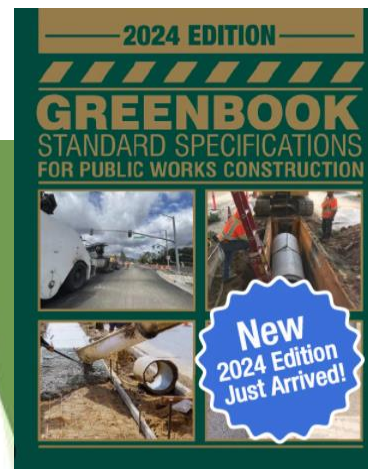
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801-4.2 Protection and Storage. The Contractor shall keep all plant material delivered to the Work site in a healthy condition for planting. Plants shall not be allowed to dry out. Bare root stock shall be separated and “heeled in” moist earth or other suitable material. Balled and burlapped plants shall have the root ball covered with moist sawdust, wood chips, or other approved material.

801-4.3 Layout and Plant Location. Planting areas will be staked by the Engineer. Detailed layout within the planting areas shall be performed by the Contractor and approved by the Engineer prior to planting. Parkway trees will be located in the field by the Engineer before planting.

The first row of plants in areas designated for center-to-center spacing of plants shall be located at one-half of designated spacing from the edge of the area.

801-4.4 Specimen Planting. Plants in boxes 24 inches (600 mm) and larger shall be planted before installation of lateral irrigation lines.



Section 801 - Installation:

- Under the 801-4 Plants, a subsection at 801-4.3 lists a requirement for the layout to be approved by the Engineer (our inspector) prior to installation.
- This is very helpful as it places a necessary step for coordination allowing for review and slight adjustments prior to full installation which would potentially harm the plants if they had to be removed and installed more than once.

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801-5.7 Flushing and Testing.

~~801-5.7.1 General.~~ After completion and prior to the installation of any terminal fittings, the entire pipeline system shall be thoroughly flushed to remove dirt, scale, or other material. After flushing, the following tests shall be conducted by the Contractor in the sequence listed below. All equipment, materials, and labor necessary to perform the tests shall be furnished by the Contractor and all tests shall be conducted in the presence of the Engineer.

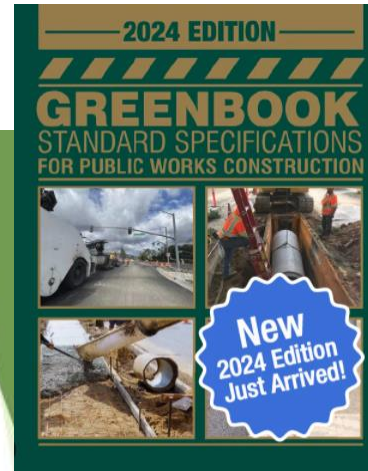
801-5.7.2 Pipeline Pressure Test.

~~801-5.7.2.1 General.~~ Pressure testing for leakage shall be performed on supply lines, pressure mains, and laterals installed by the Contractor, except for non-rigid pipelines and pipelines with spray nozzles installed into the pipe. Pipelines to be tested shall be installed, and each open end of the pipeline shall be plugged or capped prior to testing.

Pipelines installed by trenching and backfilling and pipelines which are completely visible after installation shall be tested by either Method A or Method B. The method used shall be at the

Section 801 - Installation:

- The above is showing how the “Greenbook” requires the flushing of the system to prepare for the pressure test
- This assists in making the Work clear to the Contractor to proceed in refining and finalizing the components as important prior to...next slide...



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repaired. After the leaks have been repaired, the pressure test shall be repeated and additional repairs made until no leaks occur.

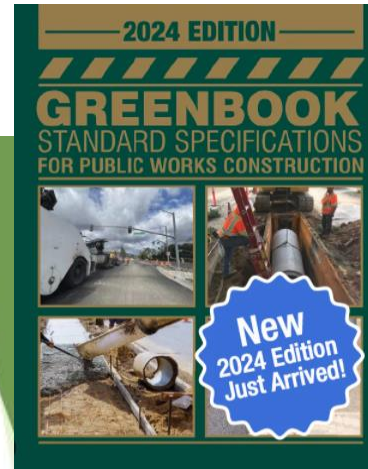
801-5.7.3 Sprinkler Coverage Test. The coverage test shall be performed after sprinkler heads have been installed and shall demonstrate that each section or unit in the irrigation system is balanced to provide uniform and adequate coverage of the areas serviced. The Contractor shall correct any deficiencies in the system in accordance with 801-5.5.4.

801-5.7.4 Operational Test. The performance of all components of the automatic control system shall be evaluated for manual and automatic operation.

During the maintenance period and at least 15 Days prior to final inspection, the Contractor shall set the controller on automatic operation and the system shall operate satisfactorily during such period. All

Section 801 - Installation:

- The above Sprinkler Coverage Test follows the sequence that required flushing of the system
- This allows us the clarity to evaluate the system and attend to any other challenges that would have been made worse if clogs and leaks were not addressed.
- Such challenges could be differences between the design (idealized and work product of designer using CAD) and the unique site conditions that may have changed or become discovered and need to be addressed.



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necessary repairs, replacements, and adjustments shall be made until all equipment, electrical work, controls, and instrumentation are functioning in accordance with the Contract Documents.

801-6 MAINTENANCE AND PLANT ESTABLISHMENT. The Contractor shall maintain all planted areas on a continuous basis as they are completed during the progress of the Work and during the plant establishment period.

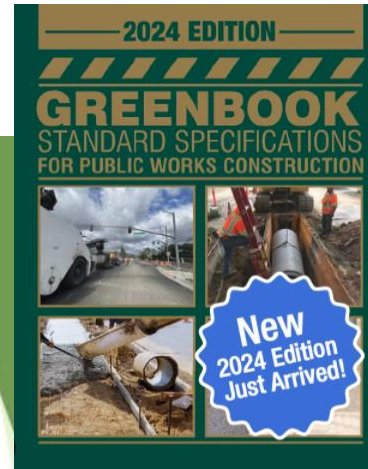
All planted areas shall be kept free of debris and shall be weeded and cultivated at intervals not to exceed 10 Days. The first mowing of lawn areas shall be performed when the grass is 2-1/2 inches (63 mm) high and shall be repeated as often as necessary to maintain the lawn at a height of 2 inches (50 mm). In no case shall the lawn be cut lower than 1-1/2 inches (38 mm) in height.

Any required pruning of plants will be designated by the Engineer at the start of the plant establishment period and the Contractor shall perform the pruning as part of the plant establishment work.

The Contractor shall request a final inspection to begin the plant establishment period after all planting and related work have been completed in accordance with the Contract Documents.

Section 801 - Installation:

- The final tasks for the Contractor that has installed all the proposed improvements is to maintain the site for an interval of time.
- Not shown in this presentation but typically Public Works adds via the Special Provisions a (90) Day Maintenance and Plant Establishment.



Part 8 Landscape and Irrigation

MATERIALS AND INSTALLATION

The following is partial recap from this presentation of sections and subsections in the “Greenbook” along w/photos from construction project at PW:



Photos shows:
800-2.4 Sprinkler Equipment
(Materials)
&
801-5.7.3 Irrigation
Coverage Test (Installation)



Photos shows:
800-1.4 Plants (Materials) &
801-4.3 Layout and Plant
Location (Installation)



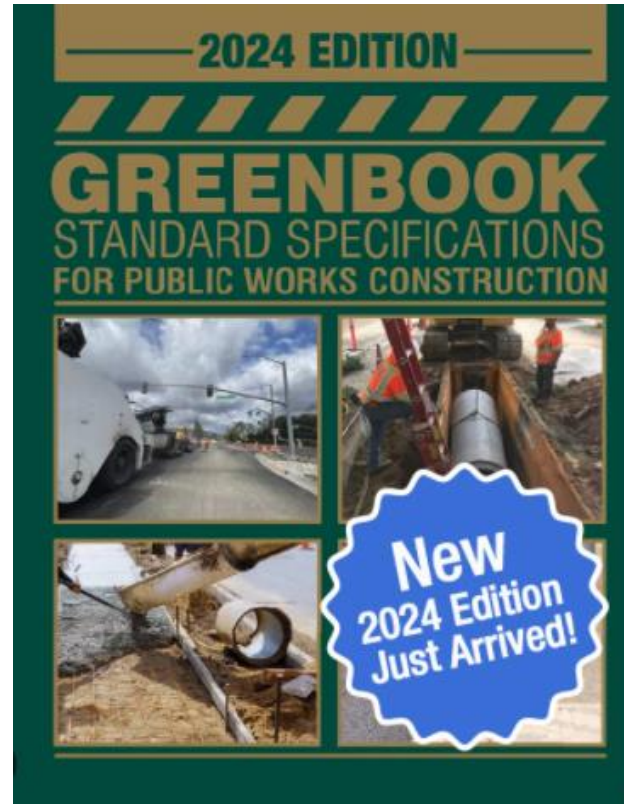
Photos shows:
801-6 Maintenance and
Plant Establishment



Final walk/acceptance,
installation Contractor has
completed Work.



Part 8 Landscape and Irrigation



End of basic overview of
the “Greenbook”

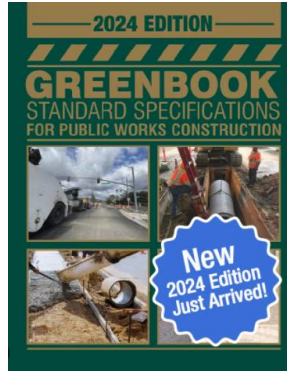
Part 8 Landscape and Irrigation

Today we will discuss (2) resources for your project:

Overview, this presentation is going to:

- Review Sections of the “Greenbook”

“Greenbook”:



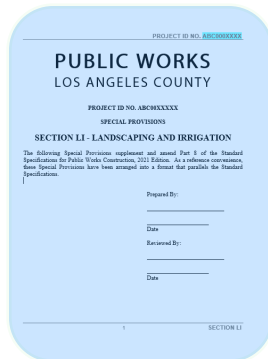
Part 8 is Landscape and Irrigation of the “Greenbook”

Part 8 has (2) main Sections: Materials and Installation



- Give examples of how Special Provisions created by designer can modify the “Greenbook”

Not the “Greenbook”:



An agency’s project will have project specs, with Special Provisions from different disciplines (Electrical, Landscape, etc.,) to direct the Work.

Part 8 Landscape and Irrigation

...we are now going to add to our understanding of the organization of the “Greenbook”

by looking at examples of how the Special Provisions can add and not conflict with directions to the Contractor to perform.

Not the
“Greenbook”:

PROJECT ID NO. ABC000XXXX

PUBLIC WORKS
LOS ANGELES COUNTY

PROJECT ID NO. ABC000XXXX
SPECIAL PROVISIONS

SECTION LI - LANDSCAPING AND IRRIGATION

The following Special Provisions supplement and amend Part 8 of the Standard Specifications for Public Works Construction, 2021 Edition. As a reference convenience, these Special Provisions have been arranged into a format that parallels the Standard Specifications.

Prepared By: _____
Date: _____
Reviewed By: _____
Date: _____

1 SECTION LI

An agency's project will have project specs, with Special Provisions from different disciplines (Electrical, Landscape, etc.,) to direct the Work.

Part 8 Landscape and Irrigation

Example for adding a material:

Section 800 - Materials:

- WHAT does a designer do if they want to add another requirement, for example: “soil testing” to the **Section 800 - Materials** ?



- HOW and WHERE does a designer add that information?

(Hint)

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1 SECTION LI

Part 8 Landscape and Irrigation

Section 800 - Materials:

- *WHAT does a designer do if they want to add another requirement, for example: “soil testing” to the Section 800 - Materials ?*

ANSWER using “soil testing” as example:

- At Public Works, we typically add soil testing to *our* Special Provisions as it is required per California’s MWELO (Model Water Efficient Landscape Ordinance)
- *HOW and WHERE does a designer add that information?*

ANSWER:

- HOW: using **your** added Special Provisions.
- WHERE: Soil testing is added under the **Section 800 - Materials** section



Part 8 Landscape and Irrigation

Section 800 - Materials:

- Let's look at where would be a logical place to add the “soil testing” info to our Special Provisions by looking at the organization of the “Greenbook”



Part 8 Landscape and Irrigation

Greenbook 2021

609

PART 8 LANDSCAPING AND IRRIGATION SECTION 800 - MATERIALS

800-1 LANDSCAPING MATERIALS.

800-1.1 Topsoil.

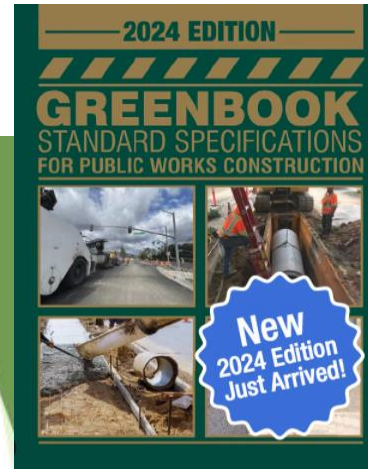
800-1.1.1 General. Topsoil shall be designated as Class A (imported), Class B (selected) or Class C (unclassified). The Engineer will determine the suitability of topsoil prior to use. The Engineer may make such inspections and perform such tests as deemed necessary to determine that the material meets the requirements. Topsoil shall be transported from the source to its final position unless stockpiling is specified in the Special Provisions.

800-1.1.2 Class "A" Topsoil. Class "A" topsoil shall be from a source outside the limits of the Work selected by the Contractor.

At least 15 Days before scheduled use, the proposed source of topsoil shall be submitted to the Engineer for approval. The Contractor shall submit a written request for approval which shall be

Section 800 - Materials:

- Note in the above printscreen, you can see soil testing is absent from the "Greenbook" Material listings.



Part 8 Landscape and Irrigation

Greenbook 2021

609

PART 8 LANDSCAPING AND IRRIGATION SECTION 800 - MATERIALS

800-1 LANDSCAPING MATERIALS.

800-1.1 Topsoil.

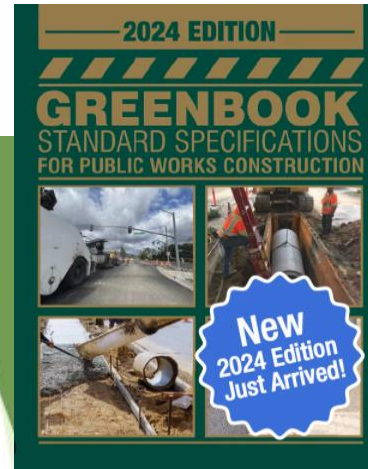
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Section 800 - Materials:

- At the end of 800-1.1.1 General, we have possible location to add "soil testing".
- Adding to Special Provisions soil testing to this section would be best as it will require "soil testing" for: 800-1.1.2 Class "A" Topsoil or 800-1.1.3 Class "B" etc.,



Part 8 Landscape and Irrigation - Example of adding requirement(s) to Greenbook using Special Provisions

PROJECT ID NO. ABC000XXXX

800-1.1 Topsoil. (Page 609 of the SSPWC)

800-1.1.1 General.

Add the following:

a) Agricultural Agronomic Soil Report.

1) Prior to the delivery of imported topsoil and bioswale soil to the Work site, the Contractor shall submit to the Engineer agronomic soil report(s) and growth (herbicide) test results in report form (test report) at a minimum of (1) report and additional report(s) for every 150 cubic yards of soil. The test reports shall include:

Picture is of Public Works
Special Provisions and
NOT from the Greenbook.

PROJECT ID NO. ABC000XXXX

PUBLIC WORKS
LOS ANGELES COUNTY

PROJECT ID NO. ABC000XXXX
SPECIAL PROVISIONS

SECTION LI - LANDSCAPING AND IRRIGATION

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Prepared By: _____
Date: _____
Reviewed By: _____
Date: _____

SECTION LI

MATERIALS:

- Adding this info to the **Section 800 - Materials** section provides a clear requirement that the Contractor's material needs to also conform to the added soil testing results.
- As you see above, Public Work adds to our Special Provisions by adding to 800-1.1.1 General, with the requirements stating the need for Agricultural Agronomic Soil Report.
- It adds that information using the new **a)**

Part 8 Landscape and Irrigation - Example of adding requirement(s) to Greenbook using Special Provisions

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LOS ANGELES COUNTY

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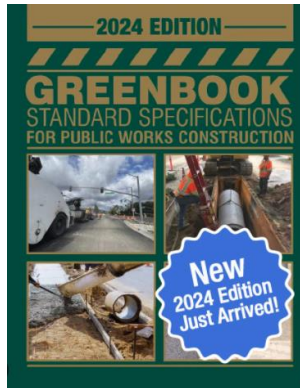
Prepared By: _____
Date: _____
Reviewed By: _____
Date: _____

1 SECTION LI

MATERIALS:

- Adding the soil requirement - in the Special Provisions - is maintaining the organization of the “Greenbook” by adding to the **Section 800 - Materials** section:
 - “Page 609 of the SSPWC”
 - It signals to the Contractor using change in font
 - It ADDS a new “a)” where the Greenbook does not have this sub-section

Part 8 Landscape and Irrigation - Example of adding requirement(s) to “Greenbook” using Special Provisions



PROJECT ID NO. ABC000XXXX

PUBLIC WORKS LOS ANGELES COUNTY

PROJECT ID NO. ABC000XXXX
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1 SECTION LI

PART 8 LANDSCAPING AND IRRIGATION SECTION 800 - MATERIALS

800-1 LANDSCAPING MATERIALS.

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Part 8 Landscape and Irrigation

Example for adding Installation:

How to add to your project, using Special Provisions to the “Greenbook’s”

Section 801 - Installation:

- The following slides show the Special Provision (created by the designer and the agency)
- This added Special Provision will complement the organization structure of the numbering sequence used in the “Greenbook”



Part 8 Landscape and Irrigation

INSTALLATION:

- Let's imagine we want to add a proposed 'drip irrigation system'
- For the purposes of this presentation (AND NOT SHOWN IN THIS PRESENTATION) also imagine that we have already added to the MATERIAL information under the 800 Materials Section of our Special Provisions
- Our next task:
 - We need to add to the INSTALLATION portion of our Special Provisions the proposed 'drip irrigation system'
 - To do this, we are going to apply the same strategy as we did earlier in the presentation when soil testing was added to the 800 Materials section without causing a conflict with the "Greenbook" organizational numbering sequence
 - Let's look to "Greenbook" Installation 801 subsections ...



Part 8 Landscape and Irrigation

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Greenbook 2021

801-5 IRRIGATION SYSTEM INSTALLATION.

801-5.1 General. Unless otherwise specified, the irrigation system layout shown on the Plans shall be considered schematic. With the Engineer's approval, the Contractor may make adjustments where necessary to conform to actual field conditions. The irrigation system shall be operational, with uniform and adequate coverage of the areas to be irrigated, prior to planting.

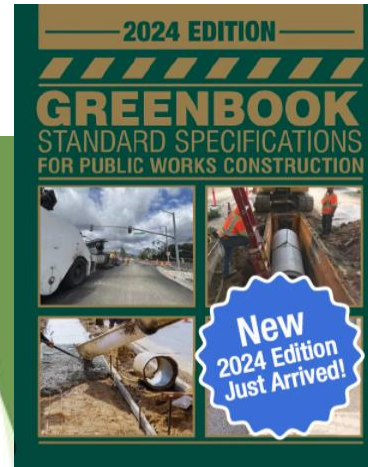
Service connections shall be as shown on the Plans, or designated by the serving utility and will be installed by others at no cost to the Contractor. The Contractor shall notify the Engineer at least 3 weeks prior to the time electrical and water services are required. The Contractor shall be responsible for furnishing the labor and materials to connect to the service connection.

After completing the irrigation system, the Contractor shall submit as-built drawings showing the location of pipe, valves, tubing, wiring, controllers, and electrical services as constructed.

801-5.2 Trench Excavation and Backfill. Trenches and other excavations shall be sized to

INSTALLATION:

- The “Greenbook” begins the Irrigation System Installation at **801-5**



Part 8 Landscape and Irrigation

620

Greenbook 2021

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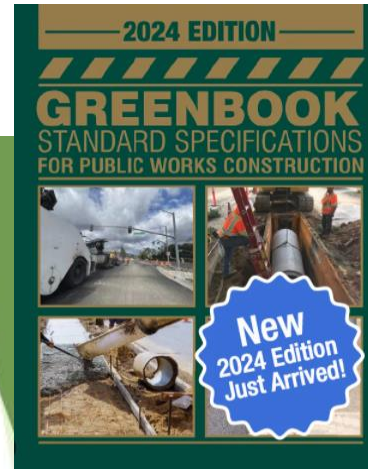
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801-5.2 Trench Excavation and Backfill. Trenches and other excavations shall be sized to

INSTALLATION:

- We need to locate a subsection for the proposed 'drip irrigation system'
- we want to add -via Special Provisions - but keeping with the numbering system found in the "Greenbook" so we don't create any conflicts in our referencing



Part 8 Landscape and Irrigation

801-5.5 Sprinkler Head Installation and Adjustment.

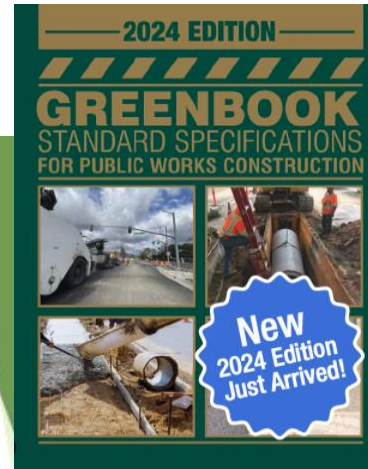
801-5.5.1 General. Mains and laterals, including risers, shall be flushed and pressure tested in accordance with 801-5.7 before installing sprinkler heads, after which a water coverage test shall be performed.

801-5.5.2 Location, Elevation, and Spacing. Sprinkler head spacing shall not exceed the maximum shown on the Plans or recommended by the manufacturer.

In new lawn areas, sprinkler heads shall be installed 3 inches (75 mm) above grade and then reset flush with the finish surface just prior to the first mowing. Lawn sprinklers shall be installed 2 inches (50 mm) clear of adjacent walks, curbs, paving, headers, and similar improvements.

Sprinkler heads shall be installed 4 inches (100 mm) from adjacent vertical elements projecting above grade such as walks, planter boxes, curbs, and fences.

Shrub heads, bubbler heads, and oscillation assemblies shall be installed 6 inches (150 mm) above



INSTALLATION:

- We have located in the “Greenbook” the subsection:
801-5.5 Sprinkler Head Installation and Adjustment

Part 8 Landscape and Irrigation

801-5.5 Sprinkler Head Installation and Adjustment

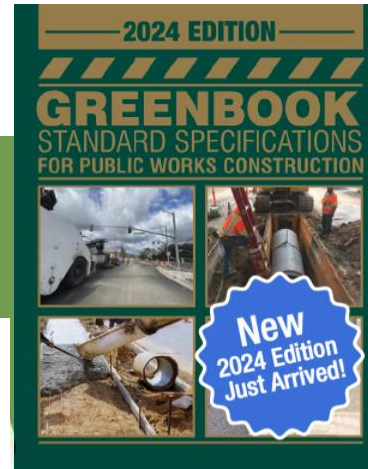
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Sprinkler heads shall be installed 4 inches (100 mm) from adjacent vertical elements projecting above grade such as walks, planter boxes, curbs, and fences.

Shrub heads, bubble heads, and oscillating nozzles shall be installed 6 inches (150 mm) above



INSTALLATION:

- We have located in the “Greenbook” the subsection: **801-5.5 Sprinkler Head Installation and Adjustment**
- The proposed ‘drip irrigation system’ (to be added to our Special Provisions) needs to be part of this subsection numbering sequence but not conflict with a pre-existing subsection...

Part 8 Landscape and Irrigation

nozzle this shall be secured to the top of the stake with 3/8 inch (9.5 mm) anchor bolts, 12 inches (300 mm) long.

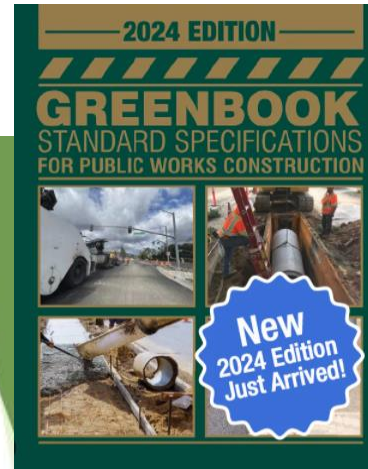
801-5.5.4 Sprinkler Head Adjustment. When all sprinkler heads are installed and the irrigation system is operating, each section or unit shall be adjusted and balanced, with all section control valves fully open to obtain uniform and adequate coverage.

Sprinkler heads having adjustable pin nozzles or orifices shall have the pins adjusted to provide adequate distribution of water over the coverage pattern. The Contractor shall substitute larger or smaller nozzle cores in nonadjustable sprinkler heads as necessary.

If additional work other than the prescribed above is necessary to correct a deficiency in the system installed as specified, such work will be considered as Extra Work.

801-5.6 Automatic Control System Installation. The Contractor shall install a complete automatic irrigation control system including the automatic controller, remote control valves and wiring, and all necessary accessories and utility service connection.

The automatic controller shall be installed outside of the coverage pattern of the irrigation system at the location shown on the Plans. The foundation for the controller shall be walk concrete, as specified in



INSTALLATION:

- What the “Greenbook” is showing us above is:
 - Subsection **801-5.5.4** Sprinkler Head Adjustment is occupied with a designation number
 - Subsection **801-5.6** Automatic Control System Installation is also occupied and is moving away from the little delivery devices and focused on the overall controller

...Where can we add to **your** Special Provisions and not conflict with the “Greenbook”?

Part 8 Landscape and Irrigation - Example of adding requirement(s) to “Greenbook” using Special Provisions

PROJECT ID NO. ABC000XXXX

j) Not exceed the maximum spacing shown on the Plans during installation.

Add the following subsection:

801-5.5.5 Drip Irrigation System.

e) Dripline tubing installation shall conform to the following. The Contractor shall:

- 1) Coordinate with plant material installation for location and orientation of planting layout.
- 2) Verify the dripline inlet pressure shown on the Plans.
- 3) Place dripline tubing to the depth shown, and in conformance with, the details shown on the Plans.
- 4) Install air relief assemblies in each remote control valve at high elevation points

Picture is of Public Works
Special Provisions and
NOT from the Greenbook.

PROJECT ID NO. ABC000XXXX

PUBLIC WORKS
LOS ANGELES COUNTY

PROJECT ID NO. ABC000XXXX
SPECIAL PROVISIONS

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Date: _____
Reviewed By: _____
Date: _____

1 SECTION LI

INSTALLATION:

- What above Special Provisions (produced by designer) is showing us is:
 - Subsection 801-5.5.4 Sprinkler Head Adjustment is occupied
 - We add 801-5.5.5 Drip Irrigation System as a subsection to the Special Provisions - between - the pre-existing subsections of “Greenbook”
 - Subsection 801-5.6 Automatic Control System Installation is also occupied

Part 8 Landscape and Irrigation

Today we *DISCUSSED* (2) resources for your project:

Overview, this presentation is going to:

- Review Sections of the “Greenbook”

“Greenbook”:



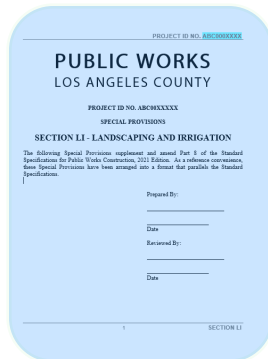
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Part 8 has (2) main Sections: Materials and Installation



- Give examples of how Special Provisions created by designer can modify the “Greenbook”

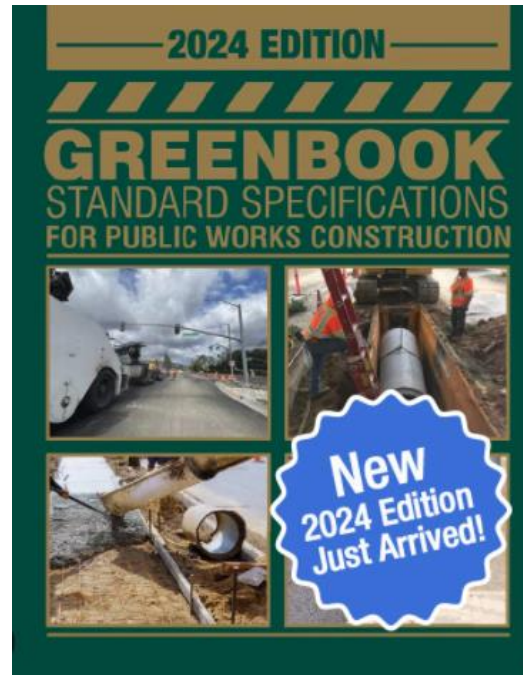
Not the “Greenbook”:



An agency’s project will have project specs, with Special Provisions from different disciplines (Electrical, Landscape, etc.,) to direct the Work.



Part 8 Landscape and Irrigation



RESOURCES:

- Greenbook Style Guide:

<http://www.greenbookspecs.org/documents/StyleGuide072710.pdf>

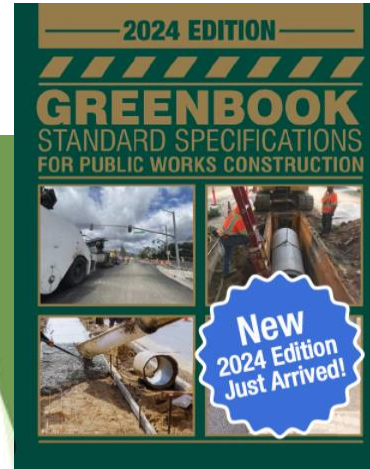
- Special Provisions Guide:

<http://www.greenbookspecs.org/documents/SpecialProvisions.zip>

QUESTIONS?

Part 8 Landscape and Irrigation

Thank you



- ▶ Dave Gallagher, PLA
Los Angeles County Public Works
626-300-3216
DGALLAGHER@dpw.lacounty.gov