
NAVFAC IGS-02930 (SEPTEMBER 2002)

Preparing Activity: LANTNAVFACENGCOM Based on UFGS-02930N

ITALIAN GUIDE SPECIFICATIONS

Use for ITALIAN projects only

SECTION 02930

EXTERIOR PLANTS

09/02

NOTE: This guide specification is issued by the Atlantic Division, Naval Facilities Engineering Command for regional use in Italy.

NOTE: This guide specification is intended for use where planting is required.

Comments and suggestion on this specification are welcome and should be directed to the technical proponent of the specification. A listing of the technical proponents, including their organization designation and telephone number, is on the Internet.

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

NOTE: The following information shall be shown on the project drawings:

1. All areas to be planted, with plant layout provided.
2. Plant list.
3. Subsurface drainage.
4. Planting accessories.

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ITALIAN NATIONAL ASSOCIATION FOR UNIFICATION OF STANDARDS (UNI)

NOTE: A UNI Norm is a technical normative recognized as Italian Law, submitted by a private organization "Ente Nazionale Italiano di Unificazione" for Italy and is available only in the Italian language. It is the National Standard.

- UNI 3598 (1954) Standard steel wire - Types, requirements, tests
- UNI 7549-3 (1976) Lightweight aggregates - Sieve or screen analysis
- UNI 9092-2 (1987) Wood preservative treatment - Pressure impregnation in a closed cylinder - Determination of the impregnating liquid net retention
- UNI 9738 (1990) Low density polyethylene flexible film for mulching of vegetables, flowers and fruits growing cultures - Dimensions, requirements and test methods
- UNI E13.08.378.0 (1993) Unplasticized polyvinylchloride (PVC-U) flexible perforated corrugated pipes for land drainage - Types, dimensions and requirements

ITALIAN/EUROPEAN HARMONIZATION STANDARDS (UNI EN)(UNI ENV)(CEI EN)
(UNI EN ISO)(UNI ISO)

NOTE: A UNI EN, UNI ENV, CEI EN, UNI EN ISO or UNI ISO is a European Standard with a coincident Italian National Standard or International Standard. The two standards are identical, with most (but not all) EN's available in the English language and the UNI available only in the Italian language.

- UNI EN 295-1/A1/A2/A3 (1992/97/97/00) Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 1: Requirements

- UNI EN 295-4 (1997) Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 4: Requirements for special fittings, adaptors and compatible accessories
- UNI EN 295-5 (1995) Vitrified clay pipes and fittings and pipe joints for drains and sewers - Part 5: Requirements for perforated vitrified clay pipes and fittings
- UNI EN 1401-1 (1998) Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized poly(vinyl chloride) (PVC-U) - Part 1: Specifications for pipes, fittings and the system
- UNI EN 10277-1 (2000) Bright steel products - Technical delivery conditions - Part 1: General

1.2 RELATED REQUIREMENTS

Section 02935, "Landscape Maintenance" applies to this section for pesticide use and plant establishment requirements, with additions and modifications herein.

1.3 SUBMITTALS

NOTE: Where a "G" in submittal tags follows a submittal item, it indicates Government approval for that item. Add "G" in submittal tags following any added or existing submittal items deemed sufficiently critical, complex, or aesthetically significantly to merit approval by the Government. Submittal items not designated with a "G" will be approved by the QC organization.

Submit the following in accordance with Section 01330, "Submittal Procedures."

SD-03 Product Data

- Organic mulch
- Fertilizer
- Weed control fabric
- Root control barrier
- Metal edging
- Plastic [or rubber] edging

Metal anchors

Include physical characteristics, application and installation instructions and recommendations.

ANTIDESICCANTS

SD-06 Test Reports

Topsoil composition tests

SD-07 Certificates

Authorized agronomist verification

The planting material names, types, quality and sizes shall be verified and certified in writing by an authorized agronomist.

SD-08 Manufacturer's Instructions

Metal edging

Plastic [or rubber] edging

Erosion control materials

Metal anchors

Root control barrier

Include physical characteristics, application and installation instructions, and recommendations.

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 Delivery

1.4.1.1 Branched Plant Delivery

Deliver with branches tied and exposed branches covered with material which allows air circulation. Prevent damage to root balls and desiccation of leaves.

1.4.1.2 [Fertilizer,] [Gypsum,] [Sulfur,] [Iron,] [and] [Lime] Delivery

Deliver to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, or trademark, and indication of conformance to local and national laws. Instead of containers, [fertilizer,] [gypsum,] [sulfur,] [iron,] [and] [lime] may be furnished in bulk with a certificate indicating the above information.

1.4.1.3 Plant Labels

Deliver plants with durable waterproof labels in weather-resistant ink. Provide labels stating the correct plant name and size as specified in the list of required plants. Attach to plants, bundles, and containers of plants. Groups of plants may be labeled by tagging one plant. Labels shall be legible for a minimum of 60 days after delivery to the planting site.

1.4.2 Storage

1.4.2.1 Plant Storage and Protection

Store and protect plants not planted on the day of arrival at the site as follows:

- a. Shade and protect plants in outside storage areas from the wind and direct sunlight until planted.
- b. Heel-in bare root plants.
- c. Protect balled and burlapped plants from freezing or drying out by covering the balls or roots with moist burlap, sawdust, wood chips, shredded bark, peat moss, or other approved material. Provide covering which allows air circulation.
- d. Keep plants in a moist condition until planted by watering with a fine mist spray.
- e. Do not store plant material directly on concrete or bituminous surfaces.

1.4.2.2 [Seed,] [Fertilizer,] [Gypsum,] [pH Adjusters] and [Mulch] Storage

Store in dry locations away from contaminants.

[1.4.2.3 Topsoil

Prior to stockpiling topsoil, eradicate on site undesirable growing vegetation. Clear and grub existing vegetation three to four weeks prior to stockpiling existing topsoil.

]1.4.2.4 [Root Control Barrier] [and] [Weed Control Fabric]

Store materials on site in enclosures or under protective covering in dry location. Store under cover out of direct sunlight. Do not store materials directly on ground.

1.4.3 Handling

Do not drop or dump plants from vehicles. Avoid damaging plants being moved from nursery or storage area to planting site. Handle [balled and burlapped] [bare root] [balled and platformed] [container] plants carefully to avoid damaging or breaking the earth ball or root structure. Do not handle plants by the trunk or stem. [Puddle bare-root plants after removal from the heeling-in bed to protect roots from drying out.] Remove damaged

plants from the site.

[1.4.3.1 Specimen Plants

Protect against breaking soil from root area when digging, binding and wrapping or boxing specimen plants. Prune lightly plants dug and moved by portable hydraulic split shells or four-spade plant moving equipment or plants jerked bare root from the soil and treat the root system with vitamin B extract and plant hormone solution according to manufacturer's directions. Mulch and guy specimen plants in a basin and fertilize within 48 hours after removal from previous location.

]1.5 TIME RESTRICTIONS AND PLANTING CONDITIONS

NOTE: Check with the local Office of the Italian
Agriculture Economy National Institute for
recommended planting dates for the project area.
Allow for planting period in the construction
completion time provided in the Additional General
Paragraphs. Delete time restrictions for continuous
growing conditions.

1.5.1 Planting Dates

1.5.1.1 Deciduous Material

Deciduous material from [_____] to [_____] for spring [/summer] planting
and from [_____] to [_____] for fall [/winter] planting.

1.5.1.2 Evergreen Material

Evergreen material from [_____] to [_____] for spring [/summer] planting
and from [_____] to [_____] for fall [/winter] planting.

1.5.2 Restrictions

Do not plant when ground is [frozen,] [snow covered,] muddy, or when air
temperature exceeds [32] [_____] degrees Celsius.

1.6 GUARANTEE

NOTE: This guarantee is premised on a fall planting
season from approximately October 1 to December 15
and a spring season from the time ground can be
worked to May 15. In areas where the growing season
is continuous, shorten the guarantee period to 6
months from date of installation. Check with the
local Office of the Italian Agriculture Economy
National Institute for the recommended planting
seasons for the project area.

[[All plants shall be guaranteed for [one year] [_____] beginning on the date of inspection by the Contracting Officer to commence the plant establishment period.] [Transplanted plants require no guarantee.] [Any plant that is 20 percent or more dead during the guaranteed period shall be replaced with a new plant meeting all the requirements of this specification and the drawings.]]

1.7 QUALITY ASSURANCE

Plant materials shall be selected and identified by name, type, quality and size by an authorized agronomist recognized by the Italian Agriculture Economy National Institute.

PART 2 PRODUCTS

2.1 SOURCE MANUFACTURERS

2.1.1 Fertilizer

The following manufacturers provide fertilizer that generally complies with these specifications:

AGRIMPORT S.p.A.
Via Piani, 1
39100 Bolzano
Tel: 0471-976598
Fax: 0471-976739

ALBA MILAGRO International S.p.A.
Via Corridoni, 19
20015 Parabiago (MI)
Fax: 0331-557953

EUROCHEMICALS
Viale Emilia 92
20093, Cologno Monzese (MI)
Tel: 02-27306243
Fax: 02-27306220
e-mail: eurochemicals@eurochemicals.it
www.eurochemicals.it

2.1.2 Weed Control Fabric

The following manufacturers provide weed control fabric material that generally complies with these specifications:

ARRIGONI SpA
Via Monte Prato, 3
1-22029 Uggiate Trevano (CO)
Tel: 39-031-803200
Fax: 39-031-803206

ITALDRENI

Via Papa Giovanni XXIII n. 14
42020 S. Polo d'Enza (RE)
Tel: 0522-244211
Fax: 0522-244244
e-mail: info@italdreni.it
www.italdreni.it

GEOSINTEX
via Leonardo da Vinci n. 1
36066 Sandrigo (VI)
Tel: 0444-750180
Fax: 0444-750181
www.geosintex.com

2.1.3 Erosion Control Materials

The following manufacturers provide erosion control materials that generally comply with these specifications:

GEOSINTEX
Via Leornardo Da Vinci, n. 1
36066 Sandrigo (VI)
Tel: 0444.750180
Fax: 0444.750181
www.abnet.it/geosintex

ITALDRENI
Via F. Turati, 40
20121 MI
Tel: 02.29003034
Fax: 02.29002452
www.italdreni.it

TERRA ARMATA ITALIA S.p.A.
voa Ro,omo 24
20142 - Milano
Tel: 02-89531378
Fax: 02-89540286
www.terra-armata.it

2.1.4 Root Control Barrier

The following manufacturers provide root control barrier materials that generally comply with these specifications:

GEOSINTEX
Via Leornardo Da Vinci, 1
36066 Sandrigo (VI)
Tel: 0444.750180
Fax: 0444.750181
www.abnet.it/geosintex

ITALDRENI
Via Papa Giovanni XXIII n. 14

42020 S. Polo d'Enza (RE)
Tel: 0522-244211
Fax: 0522-244244
e-mail: info@italdreni.it
www.italdreni.it

GEOTEX 2000
Via 25 Aprile n. 3
36020 San Nazario (VI)
Tel: 0424-98330
Fax: 0424-98593
e-mail: info@geotex2000.com
www.geotex2000.com

2.2 PLANTS

**NOTE: Check with local Office of the Italian
Agriculture Economy National Institute for the
species and varieties of plants recommended for the
project area.**

2.2.1 Regulations and Varieties

Each plant or group of planting shall have a "key" number indicated on the plant schedule. Furnish plants grown under climatic conditions similar to those in the locality of the project. Plants of the same specified size shall be of uniform size and character of growth. Follow additional requirements as indicated by authorized local Agronomist.

2.2.2 Shape and Condition

Well-branched, well-formed, sound, vigorous, healthy planting stock free from disease, sunscald, windburn, abrasion, and harmful insects or insect eggs and having a healthy, normal, and undamaged root system.

2.2.2.1 Deciduous Trees and Shrubs

Symmetrically developed and of uniform habit of growth, with straight boles or stems, and free from objectionable disfigurements.

2.2.2.2 Evergreen Trees and Shrubs

Well developed symmetrical tops with typical spread of branches for each particular species or variety.

2.2.2.3 Ground Covers and Vines

Number and length of runners and clump sizes indicated, and of the proper age for the grade of plants indicated, furnished in removable containers, integral containers, or formed homogeneous soil section.

2.2.3 Plant Size

Minimum sizes measured after pruning and with branches in normal position, shall conform to measurements indicated, based on the average width or height of the plant for the species as indicated by authorized Agronomist. Plants larger in size than specified may be provided with approval of the [Contracting Officer] [_____]. When larger plants are provided, increase the ball of earth or spread of roots in accordance with authorized Agronomist instructions.

2.2.4 Root Ball Size

**NOTE: Check with the local Office of the Italian
Agriculture Economy National Institute for
recommended type of plantings, bare root, balled,
plantation, container etc., which are most suitable
for the project area.**

[2.2.4.1 Balled and Burlapped and Balled and Potted Plants

Ball plants with firm, natural balls of soil. Wrap balled and burlapped (B&B) plants firmly with burlap or strong cloth, and tie securely. Wrappings and ties shall be biodegradable.

] [2.2.4.2 Balled and Platformed (BP) Plants

Wrap and ball in the same manner as B&B plants and fasten securely to strong platforms.

] [2.2.4.3 Bare-Root Plants

Dig with root system substantially intact but with the earth carefully removed. Cover roots with a thick coating of mud by puddling after plants are dug or wrap with moist material immediately after digging.

] [2.2.4.4 Container Grown Plants

Root growth shall be sufficient to hold earth intact when removed from containers. Root bound plants will not be accepted.

] [2.2.4.5 Collected Plants

From native stands or established plantings, with good fibrous root development and vigorous growing condition. Minimum root spread for collected plant materials obtained bare-root shall be one-third greater than minimum root spread of bare-root nursery-grown stock; minimum ball sizes for collected plant materials obtained balled and burlapped shall be the next larger ball size than for nursery-grown stock in accordance with local authorized Agronomist.

] [2.2.4.6 Plantation-Grown Stock

Plantation-Grown Stock shall be in accordance with local authorized Nursery

instructions.

]2.2.5 Seed

NOTE: The specified species and varieties used should be based on recommendations of the local Office of the Italian Agriculture Economy National Institute.

2.2.5.1 Classification

Provide seed of the latest season's crop delivered in original sealed packages, bearing producer's guaranteed analysis for percentages of mixtures, purity, germination, weedseed content, and inert material. Label in conformance with applicable local and national seed laws. Wet, moldy, or otherwise damaged seed will be rejected. [Field mixes will be acceptable when field mix is performed on site in the presence of the Contracting Officer.

]2.2.5.2 Composition

[Tree,] [Shrub,] [and] [Ground Cover,] [and] Botanical and common name.

Seed	Min. Percent Pure Seed	Min. Percent Germination and Hard Seed	Max. Percent Weed Seed
[_____]	[_____]	[_____]	[_____]
[_____]	[_____]	[_____]	[_____]
[_____]	[_____]	[_____]	[_____]

2.2.5.3 Seed Mixture

Planting Season	Variety	Percent (by Weight per [100] [_____] sq. m
Spring [/Summer]	[_____]	[_____]
	[_____]	[_____]
Fall [/Winter]	[_____]	[_____]
	[_____]	[_____]

]2.2.6 Existing Plants for Transplanting

Ball sizes shall conform to requirements for collected plants in of local Nursery recommendations. Dig, handle, and replant plants in accordance with this section.

2.3 TOPSOIL

NOTE: If topsoil properties are included in another section of Division 2, delete this paragraph and include a cross-reference to the appropriate

section. Otherwise, select appropriate paragraphs on topsoil. Check with the local Office of the Italian Agriculture Economy National Institute for soil properties appropriate for the plant materials to be planted. If existing topsoil is used, insert materials, if required, to properly condition for pH and friability. Where suitable topsoil is available within limits of the work area, include stripping and stockpiling of topsoil in the applicable section of Division 2 of the specification. If suitable topsoil is not available within the limits of the work area, consider whether it is more economical to treat the soil of the graded areas with fertilizer and supplements so as to be conducive for plant establishment and maintenance or to transport topsoil to the project site. If treatment of the soil is more economical, include requirements for fertilizer and supplements. Prior to stockpiling topsoil, treat all weed-grasses, such as quack grass, with an application of amitrole, round-up, or dalapon herbicide. This treatment should occur when the foliage is 150 to 250 mm high and approximately 4 to 6 weeks prior to stockpiling. Air Force Manual AFM-88-17, Chapter 2, may be used for additional guidance regarding soils attributes.

2.3.1 Existing Soil

Modify to conform to requirements specified in paragraph entitled "Composition."

2.3.2 On-Site Topsoil

Surface soil stripped and stockpiled on the site, that meet requirements specified for topsoil in paragraph entitled "Composition."

2.3.3 Off-Site Topsoil

Conform to requirements specified in paragraph entitled "Composition." Additional topsoil shall be [furnished by the Contractor] [obtain from topsoil borrow areas indicated].

2.3.4 Composition

From 5 to 8 percent organic matter as determined by the topsoil composition tests performed by an independent certified testing laboratory. Maximum particle size, 19 mm, with maximum 3 percent retained on 6 mm screen. Topsoil shall be free of sticks, stones, roots, and other debris and objectionable materials. Other components shall conform to the following limits:

pH 5.5 to 7.0
Soluble Salts [600] [_____] ppm maximum

Silt 25 to 50
Clay 10 to 30
Sand 20 to 35

2.4 pH ADJUSTERS

NOTE: Prior to including these provisions in project specifications, perform tests of on-site topsoil to determine its suitability and the possible need of pH adjusters or soil conditioners. Delete these requirements in developed areas and on small projects where planting is minimal.

2.4.1 Lime

NOTE: Check with the local Office of the Italian Agriculture Economy National Institute to determine the required percentage of carbonates, calcium, and magnesium for the project area.

Commercial grade [ground] [hydrate] [or] [burnt] limestone containing not less than 50 percent of total oxides, [_____] percent calcium oxide, and [_____] percent magnesium oxide, gradation as follows: minimum 75 percent passing 150 micrometers sieve, and 100 percent passing 850 micrometers sieve.

2.4.2 Aluminum Sulfate

Commercial grade.

2.4.3 Sulfur

100 percent elemental

2.4.4 Iron

100 percent elemental

2.5 SOIL CONDITIONERS

NOTE: Prior to including these provisions in project specifications, perform tests of on-site topsoil to determine its suitability and the possible need of pH adjusters or soil conditioners. Delete these requirements in developed areas and on small projects where planting is minimal.

Provide singly or in combination as required to meet specified requirements

for topsoil. Soil conditioners shall be nontoxic to plants.

2.5.1 Peat

Natural product of peat moss derived from a freshwater site as modified herein. Shred and granulate peat to pass a 12.5 mm mesh screen and condition in storage pile for minimum 6 months after excavation.

2.5.2 Sand

Clean and free of materials harmful to plants.

2.5.3 Perlite

Horticultural grade.

2.5.4 Rotted Manure

NOTE: Manure is recommended as an additive to improve soil for planting only. It is not recommended as a mulch due to odor and unless worked well into the soil, it would encourage surface rooting and weed growth.

Composted, horse or cattle manure containing a maximum 25 percent by volume of straw, sawdust, or other bedding materials. Manure shall be free of stones, sticks, and soil, viable weed seed, and other materials harmful to plants.

2.5.5 Composted Derivatives

Ground bark, nitrolized sawdust, humus or other green wood waste material free of stones, sticks, and soil stabilized with nitrogen and having the following properties:

2.5.5.1 Particle Size

Minimum percent by weight passing:

4.75 mm screen	95
2.36 mm screen	80

2.5.5.2 Nitrogen Content

Minimum percent based on dry weight:

Fir Sawdust	0.7
Fir or Pine Bark	1.0

2.5.6 Gypsum

Coarsely ground gypsum comprised of calcium sulfate dihydrate 91 percent,

calcium 22 percent, sulfur 17 percent; minimum 96 percent passing through 850 micrometers, 100 percent passing thru 970 micrometers screen.

2.6 PLANTING SOIL MIXTURES

NOTE: Check with the local Office of the Italian
Agriculture Economy National Institute for
recommended planting soil mixture for specified
plants and for the project area.

100 percent topsoil as specified herein.

2.7 FERTILIZER

NOTE: Check with the local Office of the Italian
Agriculture Economy National Institute for
recommended fertilizer mixture for local conditions.
Recommended practice would be to use a slow release
fertilizer.

Fertilizer shall be slow release tablets with a [20] [___] percent nitrogen, [10] [___] percent phosphorus, and [5] [___] percent of potassium. The tablets shall provide fertilizer for a minimum of [one] [___] year.

2.8 WEED CONTROL FABRIC

NOTE: Check with the local Office of the Italian
Agriculture Economy National Institute for
recommended type of membrane for the project area.
Specify only one type of membrane for the project.

NOTE: Choose one of the following options.

[2.8.1 Sheet Polyethylene

NOTE: Use only where no plant material is to be
installed.

Black, conforming to UNI 9738, minimum thickness [0.10] [0.15] mm.

]2.8.2 Roll Type Polypropylene or Polyester Mats

Fabric shall be woven, needle punched and treated for protection against

deterioration due to ultraviolet radiation. Fabric shall be minimum 99 percent opaque to prevent photosynthesis and seed germination from occurring, yet allowing air, water and nutrients to pass thru to the roots. Minimum weight shall be 0.08 kg per square meter with a minimum thickness of 0.50 mm.

2.9 DRAINAGE PIPE FOR PLANT PITS AND BEDS

NOTE: Check with the local Office of the Italian Agriculture Economy National Institute for recommended type of drainage pipe. Specify only one type of drainage pipe for the project.

NOTE: If Section 02630 is utilized, delete requirements for "DRAINAGE PIPE FOR PLANT PITS AND BEDS."

Plastic polyvinyl chloride pipe, [_____] mm. in diameter, [unperforated] conforming to UNI EN 1401-1 [perforated] conforming to UNI EN 1401-1. [Corrugated plastic drainage tubing, [_____] mm in diameter, [unperforated] [perforated] conforming to UNI E13.08.378.0.] [Clay drain tile, [_____] mm in diameter, [unperforated conforming to UNI EN 295-4] [perforated conforming to UNI EN 295-5] [[extra strength] [standard strength] conforming to UNI EN 295-1/A1/A2/A3 and UNI EN 295-5].]

2.10 GRANULAR FILL FOR PLANT PIT AND BED DRAINAGE

Uniformly graded sand, stone, gravel, or stone screenings free from an excess of soft or unsound particles or other objectionable material. When tested in accordance with UNI 7549-3, material shall conform to the following gradation limits:

<u>Sieve Size</u>	<u>Percent Passing</u>
9.5 mm	100
4.75 mm	85 - 100
1.18 mm	45 - 80
300 micrometers	10 - 30
150 micrometers	0 - 10
75 micrometers	0 - 3

2.11 MULCHES TOPDRESSING

NOTE: Check with the local Office of the Italian Agriculture Economy National Institute for recommended and locally available mulch material. Specify only one type of mulch for the project.

Free from noxious weeds, mold, or other deleterious materials.

2.11.1 Inert Mulch Materials

[Riverbank stone] [crushed pit-run rock] [granite chips] [marble chips]
[crushed bricks] [volcanic rock] [_____] ranging in size from [_____] to
[_____] mm.

2.11.2 Organic Mulch Materials

[Wood chips] [ground or shredded bark] [shredded hardwood] [bark peelings]
[pine straw mulch] [pine needles] [peanut, pecan, or cocoa bean shells]
[recovered materials of either paper-based (100 percent) or wood-based (100
percent) hydraulic mulch] ranging in size from [_____] to [_____].

[2.12 TRUNK WRAPPING MATERIAL

Two thicknesses crinkled paper cemented together with bituminous material,
minimum 100 mm width, with stretch factor of 33 1/3 percent. Tying
material shall be 3 ply, lightly tarred medium or coarse sisal yarn twine.

]2.13 STAKING AND GUYING MATERIAL

**NOTE: In lieu of guying and staking materials as
described, tree guards such as used on public
housing projects or steel braces may be specified.
In areas of high visibility and when deemed
necessary, specify that stakes be painted or stained
dark brown to render them less obtrusive.**

2.13.1 Staking Material

2.13.1.1 Tree Support Stakes

Rough sawn hard wood free of knots, rot, cross grain, bark, long slivers,
or other defects that impair strength. Stakes shall be minimum 50 mm
square or 64 mm diameter by 2.4 m long, pointed at one end. [Paint or
stain wood stakes dark brown.].

2.13.1.2 Ground Stakes

50 mm square are by 0.91 m long, pointed at one end.

2.13.2 Guying Material

2.13.2.1 Guying Wire

2.6 mm dia. annealed galvanized steel, UNI 3598 and UNI EN 10277-1.

2.13.2.2 Guying Cable

Minimum five-strand, 5 mm diameter galvanized steel cable [plastic coated].

2.13.3 Hose Chafing Guards

New or used 2 ply 19 mm diameter reinforced rubber or plastic hose, black or dark green, all of same color.

2.13.4 Flags

White [surveyor's plastic tape,] [12.70 mm diameter PVC pipe], [150 mm] [300 mm] long, fastened to guying wires or cables.

2.13.5 Turnbuckles

Galvanized or cadmium-plated steel with minimum 75 mm long openings fitted with screw eyes. Eye bolts shall be galvanized or cadmium-plated steel with 25 mm diameter eyes and screw length 38 mm, minimum.

2.13.6 Deadmen

NOTE: Avoid the use of concrete or brick materials.

100 by 200 mm rectangular or 200 mm long, [pine] [fir] [_____] wood material.

2.13.7 Metal Anchors

2.13.7.1 Driven Anchors

Malleable iron, arrow shaped, galvanized, sized as follows:

<u>Tree Caliper</u>	<u>Anchor Size</u>
50 mm	75 mm
75 to 150 mm	100 mm
150 to 200 mm	150 mm
200 to 250 mm	200 mm
250 to 300 mm	250 mm

2.13.7.2 Screw Anchors

Steel, screw type with welded-on 75 mm round helical steel plate, minimum 10 mm diameter, 375 mm long.

2.14 EDGING MATERIAL

2.14.1 Wood Edging

NOTE: Indicate type of wood. If a decay resistant species is specified, preservative treatment will not be required.

[Pine] [Red Alder] [Chestnut] [Douglas Fir] [_____] wood edging shall be free of solvent at time of delivery. Minimum 200 by 13 mm [treated in accordance with UNI 9092-2 before installation]. Anchoring stakes shall be the same material as wood edging, [13 by 50] [_____] mm, 300 mm long.

2.14.2 Metal Edging

NOTE: Check manufacturer's literature for the type best suited for the project.

Galvanized steel or aluminum with slots for stakes and [16] [5] [3] mm thick by [100] [125] mm thick by [100] [130] mm deep in [4.90] [6.10] m lengths. Treat steel edging with rust preventative and factory finish in color [green.] [black.] [brown.] Anchoring stakes shall be tapered galvanized steel with same finish as metal edging, 400 to 450 mm long.

2.14.3 Plastic [or Rubber] Edging

NOTE: Check manufacturer's literature for the type best suited for the project.

[[Green,] [Black] 113 mm deep by 4 mm thick in 6.1 m lengths for standard edging 116 mm deep by 6 mm thick in 4.6 m lengths for heavy-duty edging.] [Dimensions indicated are minimum.] [Plastic and/or rubber edging shall have a recycled-content level of 30-100 percent recovered materials.]

2.14.4 Concrete Edging

[150 by 150] [_____] by [_____] mm concrete mowstrip. Provide [tooled] [saw cut] [_____] contraction joints to a depth of [19] [_____] mm after the surface has been finished. Provide joints every [1500] [_____] lineal mm. Provide [12.70] [_____] mm thick expansion joints at change of direction and where mowstrip abuts rigid pavement. [Provide [#4] [_____] reinforcement bar and other devices necessary to install and secure reinforcement.] Provide a floated finish, then finish with a flexible bristle broom. [20] [_____] MPa compressive concrete strength at 28 days as specified under Section 03300, "Cast-In-Place Concrete."

[2.15 ANTIDESICCANTS

Sprayable, water insoluble vinyl-vinledine complex which produce a moisture retarding barrier not removable by rain or snow. Film shall form at temperatures commonly encountered out of doors during planting season and have a moisture vapor transmission rate (MVT) of the resultant film of maximum 10 grams per 24 hours at 70 percent humidity.

]2.16 EROSION CONTROL MATERIALS

NOTE: If Section 01561, "Erosion and Sediment Control" is utilized, delete requirements for EROSION CONTROL MATERIALS.

2.16.1 Net

[Heavy, twisted jute mesh], [plastic net], [biodegradable paper fabric with twisted yarns], [standard weave burlap.] [_____].

2.16.2 Blanket

[Fiber] [Excelsior] [_____].

2.17 ROOT CONTROL BARRIER

[Flexible and permeable geotextile fabric with permanently attached time-released nodules impregnated with a herbicide. Color to be [black] [gray] [_____].] [Pre-formed, [round, tapered cylinder] [linear] barrier with integral vertical root deflecting ribs constructed of ultraviolet resistant polypropylene material. Color to be [black] [_____].]

2.17 WATER

Source of water to be approved by Contracting Officer and suitable quality for irrigation.

2.18 SOURCE QUALITY CONTROL

The [Contracting Officer] [_____] will inspect plant materials at the [project] site and approve them. Tag plant materials for size and quality.

PART 3 EXECUTION

3.1 EXTENT OF WORK

Provide soil preparation, [fertilizing,] [tree,] [shrub,] [vine,] [groundcover,] [and] [hydroseeding] planting, [edging,] [staking and guying,] [weed control fabric,] [and] [root control barrier] installation [and] [a mulch topdressing] of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

3.2 PREPARATION

3.2.1 Layout

Stake out approved plant material locations and planter bed outlines on the project site before digging plant pits or beds. The Contracting Officer reserves the right to adjust plant material locations to meet field conditions. Do not plant closer than [300] [600] [900] [_____] mm to a [building wall,] [pavement edge,] [fence or wall edge] [and] [other similar structures].

3.2.2 Soil Preparation

NOTE: Choose one of the following options.

NOTE: Elevation of subgrade will vary depending upon the needs for additional topsoil, mulch topdressing, or other treatment.

[Remove existing topsoil to a minimum depth of [50] [_____] mm and stockpile. After areas have been brought to finish subgrade elevation, thoroughly till to a minimum depth of [150] [_____] mm by scarifying, disking, harrowing or other method approved by the Contracting Officer. Remove debris and stones larger than 25 mm in any dimension remaining on surface after tillage. Spread stockpiled topsoil evenly to provide positive drainage. [Provide off-site topsoil to meet indicated finish grade.] Do not spread topsoil when [frozen or] excessively wet or dry. Thoroughly mix subgrade [and] topsoil [and off-site topsoil] to a depth of [200] [_____] mm by disking, harrowing, tilling or other method approved by Contracting Officer. Correct irregularities in finished surfaces to eliminate depressions. Protect finished prepared soil areas from damage by vehicular or pedestrian traffic.]

[[Provide off-site topsoil to meet indicated finish grade.]After areas have been brought to indicated finish grade, incorporate [fertilizer] [pH adjusters] [soil conditioners] into soil to a minimum depth of [150] [_____] mm by disking, harrowing, tilling or other method approved by Contracting Officer. Remove debris and stones larger than 25 mm in any dimension remaining on the surface after tillage. Correct irregularities in finished surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.]

[3.2.2.1 pH Adjuster Application Rates

NOTE: Check with the local office of the Italian Agriculture Economy National Institute and specify amounts applicable for the project area.

Apply pH adjuster at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

[Lime [_____] kg per square meter [_____] kg per 100 square meters] [Sulfur [_____] kg per square meter [_____] kg per 100 square meters] [Iron [_____] kg per square meter [_____] kg per 100 square meters] [Aluminum Sulfate [_____] kg per square meter [_____] kg per 100 square meters.]

]3.2.2.2 Soil Conditioner Application Rates

**NOTE: Check with the local office of the Italian
Agriculture Economy National Institute and specify
amounts applicable for the project area.**

Apply soil conditioners at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rates for the following:

[Peat [_____] cubic meters per square meter [_____] cubic meters per 100 square meters] [Sand [_____] cubic meters per square meter [_____] cubic meters per 100 square meters] [Perlite [_____] cubic meters per square meter [_____] cubic meters per 100 square meters] [Rotted Manure [_____] cubic meters per square meter [_____] cubic meters per 100 square meters] [Compost Derivatives [_____] cubic meters per square meter [_____] cubic meters per 100 square meters] [Gypsum [_____] cubic meters per square meter [_____] cubic meters per 100 square meters.]

]3.2.2.3 Fertilizer Application Rates

**NOTE: Check with the local office of the Italian
Agriculture Economy National Institute and specify
amounts applicable for the project area. Two
fertilizer applications may be required when
hydroseeding with wood fiber mulch.**

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site. For bidding purposes only apply at rate of [_____] kg per square meter

]3.2.3 Plant Bed Preparation

NOTE: Choose one of the following options.

**NOTE: Coordinate relationship between top of ball
and existing grade with standard local practice.**

[Verify location of underground utilities prior to excavation. Protect existing adjacent turf before excavations are made. Where planting beds occur in existing turf areas, remove turf to a depth that will ensure removal of entire root system. Measure depth of plant pits from finished grade. Depth of plant pit excavation shall be as indicated and provide proper relation between top of root ball and finished grade. Install plant material as specified in paragraph entitled "Plant Installation."]

[Prior to excavating for plant pits, the area shall conform to the lines and grades shown. Verify location of underground utilities. Repair any

damage done to utility lines shown. If utility lines not shown on the drawings are encountered, notify the Contracting Officer immediately. If lawns have been established prior to planting operations, cover the surrounding turf before excavations are made. Dig plant pits so that pits have vertical sides and flat bottoms. When pits are dug with an auger and sides of plant pits become glazed, scarify the glazed surface. Minimum allowable dimensions of plant pits shall be as indicated. Install plant material as specified in paragraph entitled "Plant Installation."]

3.2.3.1 Ball Diameter 300 mm or Less

Balled, potted or container plants with ball or container 300 mm or less in diameter, excavate pits at least [[400] [_____] mm larger] [twice as large] in diameter and [[150] [_____] mm deeper than] [the same depth as] the size of ball or container. Ground cover in 50 to 75 mm pots shall require pits [100] [_____] mm deeper than] [the same depth as] the size of the container.

3.2.3.2 Ball Diameter Greater Than 300 mm

Balled, potted or container plants, with ball or container greater than 300 mm in diameter, excavate pits at least [[600] [_____] mm larger] [twice as large] in diameter and [[150] [_____] mm deeper than] [the same depth as] the size of ball or container.

3.2.3.3 Trees

Excavate pits at least [[900] [_____] mm larger] [twice as large] in diameter and [[150] [_____] mm deeper than] [the same depth as] the size of ball or spread of the root system.

3.2.4 Earth Mounded Watering Basin

[Form with topsoil around each plant by replacing a mound of topsoil around the edge of each plant pit. Watering basins shall be 150 mm deep for trees and 100 mm deep for shrubs. Eliminate basins around plants in plant beds containing multiple plants.]

3.2.5 Root Control Barrier

NOTE: Contact a local arborist for projects involving root pruning of existing plant material to determine required amount of root structure to be removed.

[Install geotextile fabric in the soil in a [vertical] [horizontal] [and] [surrounding] application. Use appropriate holding device to assure fabric position. For vertical or horizontal application, a minimum [50] [_____] mm soil cover is required over the top [surface] [edge]. A minimum [450] [_____] mm extension of fabric beyond the structure area to be protected is required to prevent root growth from growing around fabric edges.]
[Install [cylindrical] [linear] polypropylene barrier a minimum [12.70] [25] [_____] mm above finish grade to prevent root growth over the barrier.]

Backfill the outside of the barrier with 19 to 25 mm gravel a minimum width of [50] [_____]. For linear barrier application use appropriate device to connect two pieces.]

3.2.6 Subsoil Drainage for Plant Pits and Beds

NOTE: Drawings shall indicate areas where subsoil drainage will be required to provide for adequate drainage of areas to be planted.

NOTE: If Section 02630 is utilized, delete requirements for Subsoil Drainage for Plant Pits and Beds.

Provide as indicated. [Lay perforated drain pipe with perforations down.] Backfill trenches as specified in Section 02315, "Excavation and Fill."

3.3 PLANT INSTALLATION

3.3.1 Handling and Setting

NOTE: The level at which plants shall be planted depends upon soil conditions and rainfall. High rainfall, heavy soil or poorly drained soils require planting 25 to 50 mm above the depth at which the plants were grown in the nursery. Conversely low rainfall or light, fast draining soil requires planting [even with] the depth at which the plants were grown in the nursery. Planting at the same depth as in the nursery is the normal condition.

Move [balled and burlapped] [bare root] [potted] [container-grown] plant materials only by supporting the [root ball] [container]. Set plants on hand compacted layer of prepared backfill soil mixture [150] [_____] mm thick and hold plumb in the center of the pit until soil has been tamped firmly around root ball. Set plant materials, in relation to surrounding finish grade, [[25 to 50] [_____ to _____] mm above] [[_____] mm below] depth at which they were grown in the nursery, collecting field or container. Replace [balled and burlapped] [and] [container] plant material whose root balls are cracked or damaged either before or during the planting process.

3.3.1.1 Mulch Topdressing

NOTE: Check with the local Office of the Italian Agriculture Economy National Institute for recommended thickness of the specified mulch for the

project area.

Provide mulch topdressing over entire planter bed surface including earth mound watering basin around plants to a depth of [75] [_____] mm after completion of plant installation and before watering. Keep mulch out of the crowns of shrubs. Place mulch a minimum 75 to 100 mm away from trunk of shrub or tree.

3.3.2 Balled and Burlapped Stock

Backfill with [prepared soil mixture] [topsoil] to approximately half the depth of ball and then tamp and water. Carefully remove or fold back excess burlap and tying materials. Tamp and complete backfill, place mulch topdressing, and water. Remove wires and non-biodegradable materials from plant pit prior to backfill operations.

3.3.3 Bare-Root Stock

Plant so roots are arranged in a natural position. Apply tree wound dressing to cuts larger than 13 mm in diameter. Carefully work [prepared soil mixture] [topsoil] among roots. Tamp remainder of backfill, place mulch topdressing and water.

3.3.4 Container Grown Stock

Remove from container and prevent damage to plant or root system. Cut root ball vertically in two to three places with sharp knife before planting.

3.3.5 Ground Covers and Vines

[Plant after placing mulch topdressing. Do not remove plant materials from flats or containers until immediately before planting. Space at intervals indicated. Plant at a depth to sufficiently cover all roots. Start watering areas planted as required by temperature and wind conditions. Apply water at a rate sufficient to ensure thorough wetting of soil to a depth of [150] [_____] mm without run off. Smooth planting areas after planting to provide even, smooth finish. [Mulch as indicated.]]

3.3.6 Seeding

3.3.6.1 Seed Application Seasons and Conditions

NOTE: Check with the local office of the Italian Agriculture Economy National Institute to determine proper season for seed application of specie specified and for the optimum cover depth. Allow for seeding application in the construction completion time. Delete time restrictions for continuous growing conditions.

Immediately before seeding, restore soil to the proper grade and thoroughly

moisten soil to a depth of 150 mm. Do not seed when ground is muddy [frozen,] [snow covered,] or in an unsatisfactory condition for seeding. If special conditions exist that may warrant a variance in the above seeding dates or conditions, submit a written request to the Contracting Officer stating the special conditions and proposed variance. Apply seed within 24 hours after seedbed preparation.

3.3.6.2 Hydroseeding

NOTE: Check with the local office of the Italian Agriculture Economy National Institute to determine rate of application. This rate of application will vary due to site requirements for fertilizer, mulch material, and rates of seeding.

Mix seed, fertilizer, and wood cellulose fiber in required amount of water to produce a homogeneous slurry. Add wood cellulose fiber after seed, water, and fertilizer have been thoroughly mixed and apply at the rate of [225] [_____] kg per [10,000] [_____] square meters dry weight. When hydraulically sprayed on the ground, material shall form a blotterlike cover impregnated uniformly with grass seed. [Immediately following the application of the slurry mix, make separate application of wood cellulose mulch at the rate of [900] [1120] [_____] kg, dry weight per 10,000 square meters.] Cover shall allow rainfall or applied water to percolate to underlying soil.

3.3.6.3 Watering

Start watering areas seeded as required by temperature and wind conditions. Apply water at a rate sufficient to ensure thorough wetting of soil to a depth of [150] [_____] mm without run off. During the germination process, seed is to be kept actively growing and not allowed to dry out.

3.3.8 Fertilization

NOTE: Fertilizer planting tablets are the most commonly used and convenient method of pre-planting fertilization. Other types of fertilizer including bone meal or other organic fertilizers or granular fertilizers may be specified when appropriate. Number of tablets or quantity of other fertilizers should be inserted in blanks and should be based on agronomist's recommendations.

Place [fertilizer planting tablets] [_____] evenly spaced around the plant pits to the manufacturer's recommended depth at the following rate:

- a. [[_____] tablets [_____] for each 100 mm of root ball-diameter]
- b. [[_____] tablets [_____] for 57 liters containers]

- c. [[_____] tablets [_____] for 19 liters containers]
- d. [[_____] tablets [_____] for 3.78 liters containers]

3.4 FINISHING

[3.4.1 Edging

Uniformly edge beds of individual plants to provide a clear cut division line between planted area and adjacent turf areas. Form bed shapes as indicated. Make individual plant pits circular in shape. Install [wood] [plastic] [metal] [concrete] edging materials as specified.

]3.4.2 Mulching

**NOTE: Check with the local Office of the Italian
 Agriculture Economy National Institute for
 recommended thickness of the specified mulch for the
 project area.**

Provide mulching materials at other indicated locations to a depth of [75] [_____] mm. Keep mulch off buildings, sidewalks, roadways, light standards, and other structures.

3.4.2.1 Placing Inert Mulch Topdressing

Install weed control fabric with edges lapped [150 to 300] [_____] mm to receive inert mulch topdressing. [Punch a grid of 6 mm holes for drainage in the black polyethylene membrane 300 mm on center over entire area.] Spread mulch topdressing to a depth of [[75] [_____] mm] [as indicated].

3.4.2.2 Placing Organic Material

Spread to a uniform depth of [[75] [_____] mm] [as indicated].

3.4.3 Erosion Control Material

Install in accordance with manufacturer's instructions.

[3.4.4 Wrapping

Tie trunk wrapping material to trunks of deciduous trees with specified material within the next full working day after planting. [Contracting Officer] [_____] will inspect the trunks of deciduous trees for physical damage, insect infestation, or disease, and determine required treatment or rejection prior to wrapping operation. Begin wrapping at base and extend to first branches. Overlap wrapping half the width of underlying wrap and securely tie at top, bottom, and 450 mm maximum intervals with twine.

]3.4.5 Staking and Guying

**NOTE: Use the staking method applicable to the type
and size of plant material.**

3.4.5.1 Staking

**NOTE: Select methods of staking each tree based on
the size of the tree and local wind conditions.**

Stake items [with the number of stakes indicated in the plant schedule]
[[_____] and [_____] with two stakes, items [_____] and [_____] with three
stakes and items [_____] and [_____] with four stakes] complete with [cross
bracing] [double strand of 12 gage guy wire] [_____] as detailed. Attach
[cross bracing] [guy wire] [_____] half the tree height but not more than
1.5 m high. Drive stakes to a depth of [0.80 to 0.91] [_____] m into the
ground outside the plant pit. Do not injure the root ball. [Tie trees to
cross bracing using plastic nurseryman's tape to protect tree trunks.]
[Use hose chaffer guards where guy wire comes in contact with tree trunk.]

3.4.5.2 Guying

**NOTE: Select methods of guying each tree based on
the size of the tree and local wind conditions.**

Guy items [_____] and [_____] with [three] [four] guys evenly spaced around
each tree. Attach [two strands of guying wire] [guying cable] around the
tree trunk at an angle of 0.785 rad at approximately 1/2 of the trunk
height. Protect tree trunks with chafing guards where guying [wire] [cable]
contacts the tree trunk. Anchor guys to [deadmen wood blocks] [wood ground
stakes] [malleable iron anchors] [steel screw anchors]. Fasten flags to
each guying [wire] [cable] approximately 2/3 of the distance up from ground
level. [Provide turnbuckles as indicated.]

3.4.5.3 Chafing Guards

Use hose chafing guards, as specified where guy [wire] [cable] will contact
the plant.

[3.4.5.4 Deadmen

Place deadmen minimum 450 mm below ground surface. Place equal distance
from tree trunk and around the plant pit.

]3.4.5.5 Wood Ground Stakes

Drive wood ground stakes into firm ground outside of plant pit with top of
stake flush with ground. Place equal distance from tree trunk and around
the plant pit.

][3.4.5.6 Iron Anchors

Drive malleable iron anchors into firm ground outside of plant pit a minimum 750 mm below finish grade. Place equal distance from tree trunk and around the plant pit.

][3.4.5.7 Steel Screw Anchors

Insert steel screw anchors as recommended in manufacturer's data. Place equal distance from tree trunk and around the plant pit.

][3.4.5.8 Flags

Securely fasten flags on each guy [wire] [and][cable] [approximately two-thirds of the distance up from ground level].

]3.4.6 Pruning

**NOTE: Check with the local Office of the Italian
Agriculture Economy National Institute for
recommended pruning season for the project area.
Insert recommended pruning season dates in the
subject paragraph.**

Prune in accordance with safety requirement of ASL (Local Sanitary Agency).

3.4.6.1 Trees and Shrubs

Remove dead and broken branches. Prune to correct structural defects only. Retain typical growth shape of individual plants with as much height and spread as practical. Do not cut central leader on trees. Make cuts with sharp instruments flush with branch collars so that collars remain in place. Do not flush with trunk or adjacent branches requiring collars to be removed.

3.4.6.2 Wound Dressing

Do not apply tree wound dressing to cuts.

-- End of Section --