SECTION 7

GRADING (G)

CONSTRUCTION
IMPROVEMENT STANDARDS

SECTION 7

GRADING CONSTRUCTION

7-1 GENERAL -- Grading improvements shall include: excavation and embankment work for channels, pads and roadways, erosion control measures and retaining walls. These improvements shall be installed in accordance with the approved improvement plans, these Improvement Standards, the latest edition of the Uniform Building Code (UBC), the Loomis Grading Ordinance and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the Caltrans Standard Specifications. Prior to the start of any grading projects, 50 yards and greater, the Town Engineer will require a grading permit and may require a soils report.

7-2 CONSTRUCTION STAKING -- Construction staking shall be provided by the Developer for all grading improvements as indicated below: The Town Inspector shall be supplied with two (2) sets of cut sheets prior to construction, without exception.

A. Channels -- Channel staking shall provide the station and offset, as well as the cut to the nearest tenth of a foot, 0.1 foot. Stakes shall be provided at a minimum of every 50 feet in tangent sections and every 25 feet in curved sections.

B. Erosion Control Measures -- Erosion control measures shall be staked as needed.

C. Pads -- Pad staking shall provide the station and offset, as well as the cut to the nearest tenth of a foot, 0.1 foot. Stakes shall be provided at each property corner, front and rear.

D. Retaining Walls -- All retaining walls shall be staked for line and grade to the nearest tenth of a foot, 0.1 foot.

E. Roadways -- Roadway excavation staking shall provide the station and offset, as well as the cut to the nearest tenth of a foot, 0.1 foot. Minimum staking intervals shall be 50 feet in tangent sections and 25 feet in curves. Stakes shall also be placed at curve beginnings, ends, point of reverse curvature, point of compound curve, horizontal angle points and at changes of grade.

7-3 INSTALLATION -- All grading improvements shall be installed per provisions in Chapter 70 of the UBC, per recommendations of site specific geotechnical reports and geotechnical engineer, per provisions in Sections 16 through 19 of the Caltrans Standard Specifications, Town of Loomis Grading Ordinance, per the approved plans and per the following specifications:

A. Channels -- All fill areas in channels shall receive suitable fill material to be compacted to a minimum of 90 percent relative compaction or more depending on proposed use after development. Suitable fill material will be determined by the Developer's geotechnical engineer. Unsuitable materials shall be removed from the channel and replaced with suitable backfill material based on recommendations provided by the Developer's licensed geotechnical engineer.

B. Erosion Control Measures -- Construction activities occurring between October 1 and April 15 shall have erosion and sediment control measures in place, or capable of being placed within 24 hours. The Contractor shall ensure that the construction site is prepared prior to the onset of any storm. Waterways under the jurisdiction of governmental agencies other than the Town of Loomis may be subject to additional erosion control measures or criteria and is the responsibility of the Developer/Owner. Town of Loomis erosion control provisions shall include:

1. Broadcast Seed -- Where required, broadcast seed shall be applied as follows:

Brando Brome	12 lbs/acre
Rose Clover	9 lbs/acre

Areas with sandy, dry soil shall receive:

Zorro Annual Fescue	6 lbs/acre
Rose Clover	9 lbs/acre

A fertilizer consisting of 16-20-0 shall be applied at a rate of 500 pounds per acre. If hydroseeding/mulching is used, seed quantities shall be increased by 30 percent.

2. Drainage Areas -- All bare areas, regardless of slope, within 50 feet of perennial and intermittent drainage swales shall be covered with straw and pressed in place.

No grading or trenching, except as required for erosion or sediment control, shall occur within 35 feet from the centerline of perennial and intermittent drainage swales between October 1 and April 15 unless approved by the Engineering Division, as well as any other governmental agency which may have additional jurisdiction and/or requirements.

3. Dust/Mud Control

a. Adjacent Streets -- Adjacent street frontages shall be kept clean by sweeping and /or other method at least once a day to remove silt and other dirt which is evident from construction activities.

b. Construction Vehicles -- The Contractor is responsible for cleaning construction vehicles leaving the site on a daily basis to prevent dust, silt, mud and dirt from being released or tracked offsite.

c. Grading Spoils -- Dry stockpiles of soil shall be watered to prevent the generation of airborne dust. Trucks transporting dry soil shall be covered with tarpaulins.

d. Water -- Water shall be sprayed on all exposed earth surfaces during clearing, grading, earth moving and other site preparation activities. The exposed earth shall be watered throughout the day to minimize dust. The Contractor shall obtain a hydrant permit from the Water Agency.

e. Wind Allowances -- Grading activities shall be restricted or halted when winds exceed 15 miles per hour as deemed necessary by the PWD Inspector.

4. Inlet Filters -- Drain inlet filters may be employed in lieu of straw bales. Mesh filters attached to the top of the drain inlet grate shall not be allowed. The type of filter used shall be preapproved by the Public Works Inspector.

5. Silt Fence -- Silt fences may be employed in lieu of, and are preferred over, straw bales. Adequate supply shall be on-site by September 25.

6. Slopes -- All slopes greater than 10:1 shall be covered with broadcast straw at a rate of 50 bales or 4,000 pounds per acre. Slopes exceeding 4:1 shall have straw pressed in place.

   All slopes along building frontages (from the building setback line to the Town right-of-way) exceeding 4:1 shall have erosion netting installed.

   Slopes steeper than 4:1 and adjacent to Town of Loomis right-of-way, flood plains, natural drainages, park land or designated open space shall require broadcast seeding and covered with straw matting.

7. Straw Bales -- Straw bales, if utilized, shall be stockpiled on the site at a rate of 1.5 bales per acre by September 25. Measures shall be provided to keep straw dry.

C. Pads -- All pads shall be compacted to a minimum of 90 percent relative compaction. Unsuitable materials shall be removed from the pad areas per the recommendations of the Developer's licensed geotechnical engineer. The Developer shall submit a letter from the Geotechnical Engineer stating that the grading was performed in substantial conformance with the geotechnical report (and subsequent updates).

D. Retaining Walls

1. Concrete/Masonry Walls -- All concrete or masonry walls are to be installed per the manufacturers or design engineer's recommendations. (see G-1, G-3, G-4 and G-4a). Structural stamp plans shall be submitted and reviewed by the Town.

2. Wood Retaining Walls -- All wood retaining walls shall be installed in accordance with Standard Details G-2.

E. Roadways

1. Compaction -- Relative compaction of not less than 95 percent shall be obtained for a minimum depth of 0.5 feet below the subgrade grading plane for the width between the outer edges of shoulders, including curb and gutter areas, whether in excavation, embankment or at original ground level. All other material shall be compacted to a relative compaction of 90 percent, including subgrade prior to placement of aggregate base under sidewalk areas.

2. Grade Control -- When the next layer to be placed on the subgrade is an asphalt concrete pavement, asphalt concrete base or asphalt concrete subbase, the subgrade grading plane at any point shall not vary more than 0.05 foot above or below the grade established by the project surveyor.

3. Stability Testing -- The Contractor shall proof roll the subgrade areas with a full, 3,000 gallon water truck prior to placement of aggregate base or aggregate subbase. The equipment used for proof rolling shall be approved by the PWD Inspector.

4. Unsuitable Materials -- Any unsuitable material encountered within 2 feet below subgrade or 2 feet below original ground shall be removed and replaced with a suitable backfill material. Suitable backfill materials and methods for placement are to be reviewed and approved by the on-site geotechnical engineer. Other methods for subgrade stability may be used upon review and approval of the Developer's geotechnical engineer.

7-4 MATERIALS

A. Retaining Walls

1. Concrete/Masonry Walls -- All concrete or masonry walls are to conform to materials and specifications provided by the wall manufacturer or designing engineer.

2. Wood Retaining Walls -- All wood retaining wall materials are to be in accordance with Standard Detail G-2.

B. Tree Fencing

1. Signs -- The size of each sign shall be a minimum of 2 feet by 2 feet and shall contain the following language:

WARNING
THIS FENCE SHALL NOT BE REMOVED
OR RELOCATED WITHOUT WRITTEN
AUTHORIZATION FROM THE
PLANNING DEPARTMENT

7-5 DUST CONTROL

A. PURPOSE – To reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions.

B. APPLICABILITY – The provisions of this rule shall apply to any activity of man-made condition capable of generating fugitive dust.

C. EXEMPTIONS – The provisions of this rule shall not apply to:

1. Agricultural activities conducted and maintained for commercial agricultural purposes.
2. Active operations conducted during emergency life-threatening situations, or in conjunction with any officially declared disaster or state of emergency.
3. Active operations conducted by essential service utilities to provide electricity, natural gas, telephone, water and sewer during periods of service outages and emergency disruptions.
4. Any contractor subsequent to the time the contract ends, provided that such contractor implemented the required control measures during the contractual period.
5. Weed abatement operations, fire hazard abatement, or vegetation clearing for fire defense purposes ordered by a county agricultural commissioner or any state, county, or municipal fire department, or required by local ordinance. The provisions of this clause does not exempt the owner of any property from controlling fugitive dust emissions emanating from disturbed surface areas which have been created as a result of the weed abatement actions.
6. Unpaved roads, provided such roads:
   a. Are not within and part of a property under development or construction, or an access road to such a property; or
   b. Are public unpaved roads, except for public road construction or maintenance.
7. Any active operation, open storage pile, or disturbed surface area for which necessary fugitive dust preventive or mitigating actions are in conflict with the federal Endangered Species Act.
8. Non-routine or emergency maintenance of flood control or irrigation channels, canals, and water spreading basins.
9. The provisions of Section E, "Standards" shall not apply to blasting operations that have been permitted by the California Division of Industrial Safety.
10. The provisions of Section F.2.e. shall not apply to earth coverings of public paved roadways where such coverings are approved by a local government agency for the protection of the roadway, and where such coverings are used as roadway crossings for haul vehicles.

11. The provisions of Section E.3. shall not apply to any facility having non-fugitive particulate matter emissions that are permitted by the District in accordance with Rule 501, General Permit Requirements.

12. Quarrying and surface mining operations, or to sand and gravel mining, rock crushing, and aggregate and sand processing operations, provided that a permit has been issued by the District in accordance with Rule 501, General Permit Requirements, for such operations.

13. The provisions of Section F. shall not apply to any facility permitted by the District in accordance with Rule 501, General Permit Requirements.

D. DEFINITIONS

1. ACCESS ROAD – Any road extending from a public thoroughfare onto the property of a construction project or development project.

2. ACTIVE OPERATIONS – Any activity capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, or heavy- and light-duty vehicular movement on disturbed surface areas, including inactive disturbed surface areas, and unpaved roads within a construction or a development project site or an access road.

3. AGRICULTURAL ACTIVITY – Any activity, operation, facility, or appurtenances thereof, including, but not limited to, the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and harvesting of any agricultural commodity including timber, viticulture, apiculture, or horticultural, the raising of livestock, fur bearing animals, fish, or poultry, and game birds, and any practices performed by a farmer or on a farm incident to or in conjunction with those farming operations, including preparation for marketing, delivery to storage or to market, or delivery to carriers for transportation to market.

4. ASBESTOS – Asbestiforms of the following minerals: chrysotile (fibrous serpentine), crocidolite (firous riebeckite), amosite (fibrous ummingtonite-grunerite), fibrous tremolite, fibrous actinolite, and fibrous anthophyllite.

5. ASBESTOS AIRBORNE TOXIC CONTROL MEASURE FOR CONSTRUCTION, GRADING, QUARRYING, AND SURFACE MINING OPERATIONS – A regulation adopted as section 93105, title 17, California Code of Regulations (CCT) by the California Air Resources Board per Health and Safety Code section 39666, which requires the adoption of regulations to reduce emissions of identified airborne toxics to the lowest level achievable.

6. BULK MATERIAL – Any material which can emit dust when stored, disturbed, or handled, and is generally un-packaged, including sand, gravel, soil, aggregate material less than two inches in length or diameter, and other organic or inorganic particulate matter.

7. CHEMICAL STABILIZERS – A non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Board, the California Air Resources Board, the Environmental Protection Agency, or any applicable law, rule or regulation; and should meet any specifications, criteria, or tests

required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

8. CONSTRUCTION/DEMOLITION ACTIVITIES – Any on-site mechanical activities preparatory to or related to the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities; grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.

9. CONTRACTOR – any person who has a contractual arrangement to conduct an active operation for another person.

10. DISTURBED SURFACE AREA – A portion of the earth's surface that has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust. This definition excludes those areas that have;

    a. Been restored to a natural state, such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby natural conditions;

    b. Been paved or otherwise covered by a permanent structure; or

    c. Sustained a vegetative ground cover over at least 95 % of an area for a period of at least 6 months.

11. DUST SUPRESSANTS – Water, hydroscopic materials, or non-toxic chemical stabilizers used as a treatment materials to reduce fugitive dust emissions.

12. EARTH-MOVING ACTIVITIES – Include, but are not limited to, grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, or soil mulching.

13. FUGITIVE DUST – any solid particulate matter that becomes airborne without first passing through a stack of duct directly or indirectly as a result of the activities of man (i.e. anthropogenic), including the raising and/or keeping of animals.

14. GEOGRAPHIC ULTRAMAFIC ROCK UNIT – A geographic area that is designated as an ultramafic rock unit or ultrabasic rock unit on maps identified in the California Air Resources Board's Asbestos Airborne Toxic Control Measure or Construction, Grading, Quarrying, and Surface Mining Operations.

15. INACTIVE DISTURBED SURFACE AREA – Any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of seven (7) consecutive days.

16. NATURALLY-OCCURRING ASBESTOS – Asbestos that have not been processed in an asbestos mill.

17. NON-ROUTINE – Any non-periodic active operation that occurs no more than three times per year, lasts less than 30 cumulative days per year, and is scheduled less than 30 days in advance.

18. OPEN STORAGE PILE – Any accumulation of bulk materials with 5 percent or greater silt content which is not fully enclosed, covered or chemically stabilized, and which attains a height of three feel or more and a total surface area of 150 or more square feet. Silt content level is assumed to be 5 percent or greater unless a person can show, by sampling and analysis in accordance with ASTM Method C-136 or other equivalent method approved in writing by the Executive Officer of the California Air Resources Board, that the silt content is less than 5 percent.

19. PARTICULATE MATTER – Any material, except uncombined water, which exists in a finely divided form as a liquid or solid at standard conditions.

20. PAVED ROAD – An improved street, highway, alley, public way, or easement that is covered by typical roadway materials excluding access roadways hat connect a facility with a public paved roadway and are not open to through traffic.

    Public paved roads are those open to public access and that are owned by any federal, state, county, municipal or any other governmental or quasi-governmental agencies. Private paved roads are any paved roads not defined as public.

21. PM10 – Is particulate matter with an aerodynamic diameter smaller than or equal to a nominal 10 microns as measured by an applicable reference teat method or methods found in Article 2, Subchapter 6, Title 17, California Code of Regulations (commencing with Section 94100)

22. PROPERTY LINE – The boundaries of an area in which either a person causing the emission or a person allowing the emission has the legal use or possession of the property. Where such property is divided into one or more sub-tenancies, the property line(s) shall refer to the boundaries dividing the area of all sub-tenancies.

23. ROAD CONSTRUCTION AND MAINTENANCE – Activities undertaken to build roads, highways, railroads, bridges, culverts, drains and other works incidental to road or highway construction, and maintenance activities that involve grading or excavation. Road construction and maintenance does not include the construction or rest stops, maintenance buildings, or parking lots.

24. SERPENTINE – any form of the following hydrous magnesium silicate minerals; antigorite, lizardite, and chrysotile.

25. SILT – Any aggregate material with a particle size less than 74 micrometers in diameter that passes through a No. 200 Sieve.

26. SIMULTANEOUS SAMPLING – the operation of two PM10 samplers in such a manner that one sampler is started within five minutes of the other, and each sampler is operated for a consecutive period which must be not less than 290 minutes and not more than 310 minutes.

27. STABILIZED SURFACE – mean:

    a. Any disturbed surface area or open storage pile, that is resistant to wind-driven fugitive dust.

    b. Any unpaved road surface in which any fugitive dust plume emanating from vehicular traffic does not exceed 20 percent opacity.

28. TRACK-OUT/CARRY-OUT – Any and all bulk materials that adhere to and agglomerate on the exterior surface of motor vehicles and/or equipment (including tires) that may then fall onto a paved road.

29. ULTRAMAFIC ROCK – An igneous rock composed of 90 percent or greater of one or a combination of the following iron/magnesium-rich, dark-colored silicate minerals: olivine, pyroxene, or more rarely amphibole. For the purposes of this section, "ultramafic rock" includes the following rock types: dunite, pyroxenite, and peridotite; and their metamorphic derivatives.

30. UNPAVED ROADS – Any unsealed or unpaved roads, equipment paths, or travel ways that are not covered by one of the following: concrete, asphaltic concrete, recycled asphalt, or asphalt. Public unpaved roads are any unpaved roadway owned by Federal, State, county, municipal or other governmental or quasi-governmental agencies. Private unpaved roads are all other unpaved roadways not defined as public.

31. VISIBLE EMISSIONS – Visible emissions means any particulate matter that is visually detectable without the air of instruments other than corrective lenses.

32. VISIBLE ROADWAY DUST – Any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper, or a wet sweeper under normal operating conditions.

33. WIND-DRIVEN FUGITIVE DUST – Visible emissions from any surface area that is generated by wind action alone.

E. STANDARDS

1. VISIBLE EMISSIONS NOT ALLOWED BEYOND PROPERTY LINE – A person shall not cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area, such that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source.

2. VISIBLE EMISSIONS FROM ACTIVE OPERATIONS – In addition to the requirements of Rule 202, VISIBLE EMISSIONS, a person shall not cause or allow fugitive dust generated by active operations, an open storage pile, or disturbed surface area, such that the fugitive dust is of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke as dark or darker in shade as that designated as No. 2 on the Ringelmann Chart (i.e. 40% opacity), as published by the United States Bureau of Mines.

3. CONCENTRATION LIMIT – A person shall not cause or allow PM10 levels to exceed 50 micrograms per cubic meter, 24 hour average, when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other EPA-approved equivalent method for PM10 monitoring. Sampling shall be conducted in accordance with the procedures specified in Section G.

4. TRACK-OUT ON TO PAVED PUBLIC ROADWAYS – Visible roadway dust as a result of active operations, spillage from transport trucks, and the track-out of bulk material onto public paved roadways shall be minimized and removed:

   a. The track-out of bulk material onto public paved roadways as a result of operations, or erosion, shall be minimized by the use of track-out and erosion control, minimization, and preventative measures, and remove within one hour from adjacent streets such material anytime the track-out extends for a cumulative distance of greater than 50 feet onto any paved public road during active operations; and

   b. All visible roadway dust tracked-out upon public paved roadways as a result of active operations shall be removed at the conclusion of each work day when active operations cease, or every twenty-four (24) hours for continuous operations. Wet sweeping or a HEPA filter equipped vacuum device shall be used for roadway dust removal.

   c. Any material tracked-out, or carried by erosion, and clean-up water, shall be prevented from entering waterways or storm water inlets as required to comply with the Town's water quality control requirements under the National Pollutant Discharge Elimination System Permit.

   d. Track-out control in geologic ultramafic rock units or in identified naturally-occurring asbestos, serpentine, or ultramafic rock areas, shall comply with the requirements of the California Air Resources Board's Asbestos Airborne Toxic Control Measure or Construction, Grading, Quarrying, and surface mining operations.

F. ADMINSITRATIVE REQUIREMENTS

1. MINIMUM DUST CONTROL REQUIREMENTS – The following dust mitigation measures are to be initiated at the start and maintained throughout the duration of the construction or grading activity, including any road construction or maintenance activities:

   A. Unpaved areas subject to vehicle traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered. In geologic ultramafic rock units, or when naturally occurring asbestos, ultramafic rock, or serpentine is to be disturbed, the cover material shall contain less than 0.25 percent asbestos as determined using the bulk sampling method for asbestos; and

   B. The speed of any vehicles and/or equipment traveling across unpaved areas must be no more than fifteen (15) miles per hour unless the road surface and surrounding area is sufficiently stabilized to prevent vehicles and equipment traveling more than 15 miles per hour from emitting dust exceeding Ringelmann 2 or visible emissions from crossing the project property line; and

   C. Storage piles and disturbed areas not subject to vehicular traffic must be stabilized by being kept wet, treated with a chemical dust suppressant, or covered when material is not being added to or removed from the pile.

   D. Prior to any ground disturbance, including grading, excavating, and land clearing, sufficient water or a chemical dust suppressant, must be applied to the area to be

disturbed to prevent emitting dust exceeding Ringelmann 2 and to minimize visible emissions from crossing the property line.

E. Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt, from being released or tracked offsite.

F. When wind speeds are high enough to result in dust emissions crossing the property line, despite the application of dust mitigation measures, grading and earthmoving operations shall be suspended.

G. No trucks are allowed to transport excavated material on-site unless the trucks are maintained such that no spillage can occur from holes or other openings in cargo compartments; and loads are either covered with tarps; or wetted and loaded such that the material does not touch the front, back or sides of the cargo compartment at any point less than six inches from the top of the cargo compartment.

H. In geologic ultramafic rock units, or when naturally-occurring asbestos, ultramafic rock, or serpentine is disturbed, all equipment must be washed down before moving from the property onto a paved public road.

I. In geologic ultramafic rock units, or when naturally-occurring asbestos, ultramafic rock, or serpentine is to be disturbed, upon completion of the project disturbed surface shall be stabilized using one or more of the following methods:

(i) Establishment of vegetative cover;

(ii) Placement of at least three (3.0) inches of non-asbestos-containing material;

(iii) Paving;

(iv) Any other measure deemed sufficient to prevent wind speeds of ten (10) miles per hour or greater from causing visible dust emissions.

2. WIND-DRIVEN FUGITIVE DUST CONTROL – A person shall take action(s) such as surface stabilization, to minimize wind-driven dust from inactive disturbed surface areas.

3. REQUIREMENTS FOR NATURALLY OCCURRING ASBESTOS AREAS: No person shall engage in any road construction or maintenance operations or construction or grading operations where the area to be disturbed is greater than one (1.0) acre without complying with the requirements of the State's Asbestos Airborne Toxic Control Measure or Construction, grading, Quarrying, and Surface Mining Operations where:

(a) Any portion of the area to e disturbed is located in a geographic ultramafic rock unit; or

(b) Any portion of the area to be disturbed has naturally-occurring asbestos, serpentine, or ultramafic rock as determined by the person, owner/operator, or the Air Pollution Control Officer (APCO).

(c) Naturally-occurring asbestos, serpentine, or ultramafic rock is discovered by the owner/operator, a registered geologist, or the APCO, in the area to be disturbed after the start of any construction or grading operation.

4. COMPLIANCE WITH STANDARDS – Any person conducting active operations, or who is responsible for man-made condition of open storage piles, or disturbed surface areas, including disturbance as result of the raising and/or keeping of animals or by vehicles, and including inactive disturbed surface areas, shall take all measures to comply with the

Standards of Section E. The property owner, contractors, and any person, that conducts active operations that result in conditions generating fugitive dust is responsible for complying with the provisions of this rule.

5. REASONABLE PRECAUTIONS – The APCO in determining compliance with Section E will take into consideration causative factors, the fugitive dust control measures taken to comply with Section E, the extent that all reasonable fugitive dust control measures are implemented prior to a violation, and the timeliness and extent of corrective actions taken. If both preventative and corrective measures were taken and were reasonable under the circumstances, as determined by the APCO, the APCO may find that enforcement action is not warranted.

G. MONITORING AND RECORDKEEPING

1. MONITORING

A. Sampling to determine compliance with the particulated matter concentration limit of Section E.3. is only required when deemed necessary by the APCO.

B. The conduct of sampling to demonstrate compliance with Section E.3. may be required, with reasonable notice, of the person discharging emissions, or sampling may be conducted by the Town with the costs of sampling, not to exceed actual costs, borne by the person discharging emissions.

C. Samplers shall be operated, maintained, and calibrated in accordance with 40 Code of Federal Regulations (CFR), Part 50, Appendix J, or appropriate EPA-published document for EPA-approved equivalent method(s) for PM10.

D. Samplers shall be placed upwind and downwind of key activity areas and as close to the property line as feasible, such that other sources of fugitive dust between the sampler and the property line are minimized.

E. Procedures for the conduct of simultaneous sampling to determine compliance with Section E.3., and the reporting of results, shall be approved by the APCO.

2. TEST METHODS

A. Ultramafic Rock- The ultramafic rock composition of any material shall be determined using standard analysis techniques including, but not limited to, color index assessment, microscopic examination, petrographic analysis or rock thin sections, or chemical analysis techniques, such as X-ray fluorescence spectrometry or inductively coupled plasma analysis.

B. Bulk Sampling Methods: ARB Test Method 435, or an alternative asbestos bulk test method approved in writing by the executive officer of the California Air Resources Board, shall be used to determine the asbestos content of a bulk sample. For the purposes of determining compliance with this section, references in ARB Test Method 435 to "serpentine aggregate" shall mean "gravel" or other "bulk materials" to be tested for asbestos content.

3. RECORDKEEPING

A. Record of control implementation: Any person engaged in any active operation subject to this rule shall maintain records of actions to stabilize surface areas sufficient to establish location, type and date of treatment. Records shall be maintained and be

readily accessible for two (2) years after the date of each entry and shall be provided to the District upon request and shall be open for inspection during unscheduled audits during normal business hours.

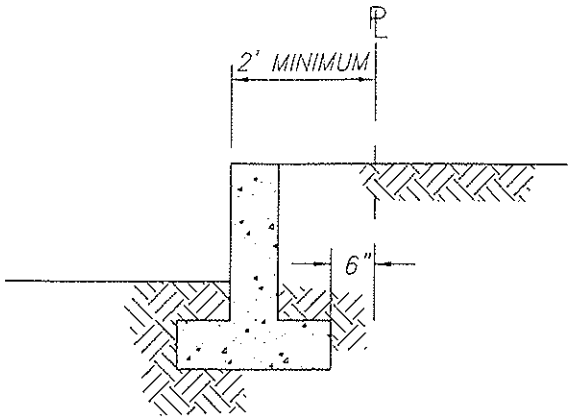
B. Sampling Recordkeeping Requirements: Any person subject to this rule shall maintain for at least two (2) years all of the following records and such additional records required by the State's Asbestos Airborne Toxic Control Measures or Construction, Grading, Quarrying, and Surface Mining Operations when this regulation applies. Results of any air sampling or air monitoring conducted at the request of the APCO;

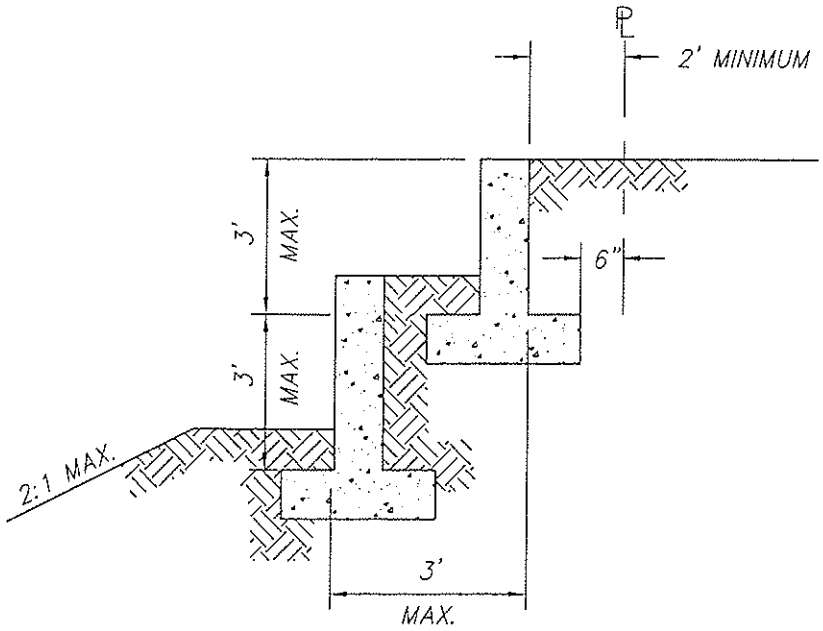
C. The results of any asbestos bulk sampling that meets any of the following conditions:

    1. The asbestos bulk sampling was conducted by the owner/operator to document that cover material in geologic ultramafic rock units, or when naturally-occurring asbestos, ultramafic rock, or serpentine is to disturbed, contains less that 0.25 percent asbestos.

    2. The asbestos bulk sampling was done at the request of the APCO.

GRADING STANDARD DETAILS





RETAINING WALLS

NOTES: 1. NO DOUBLE RETAINING WALLS TO BE CONSTRUCTED ON SIDE YARDS FOR LOTS TO BE IN CONFORMANCE TO F.H.A. STANDARDS.

2. FENCE LOCATION SHALL BE ON THE PROPERTY LINE 6" MIN. OUTSIDE OF THE FOOTING EDGE.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

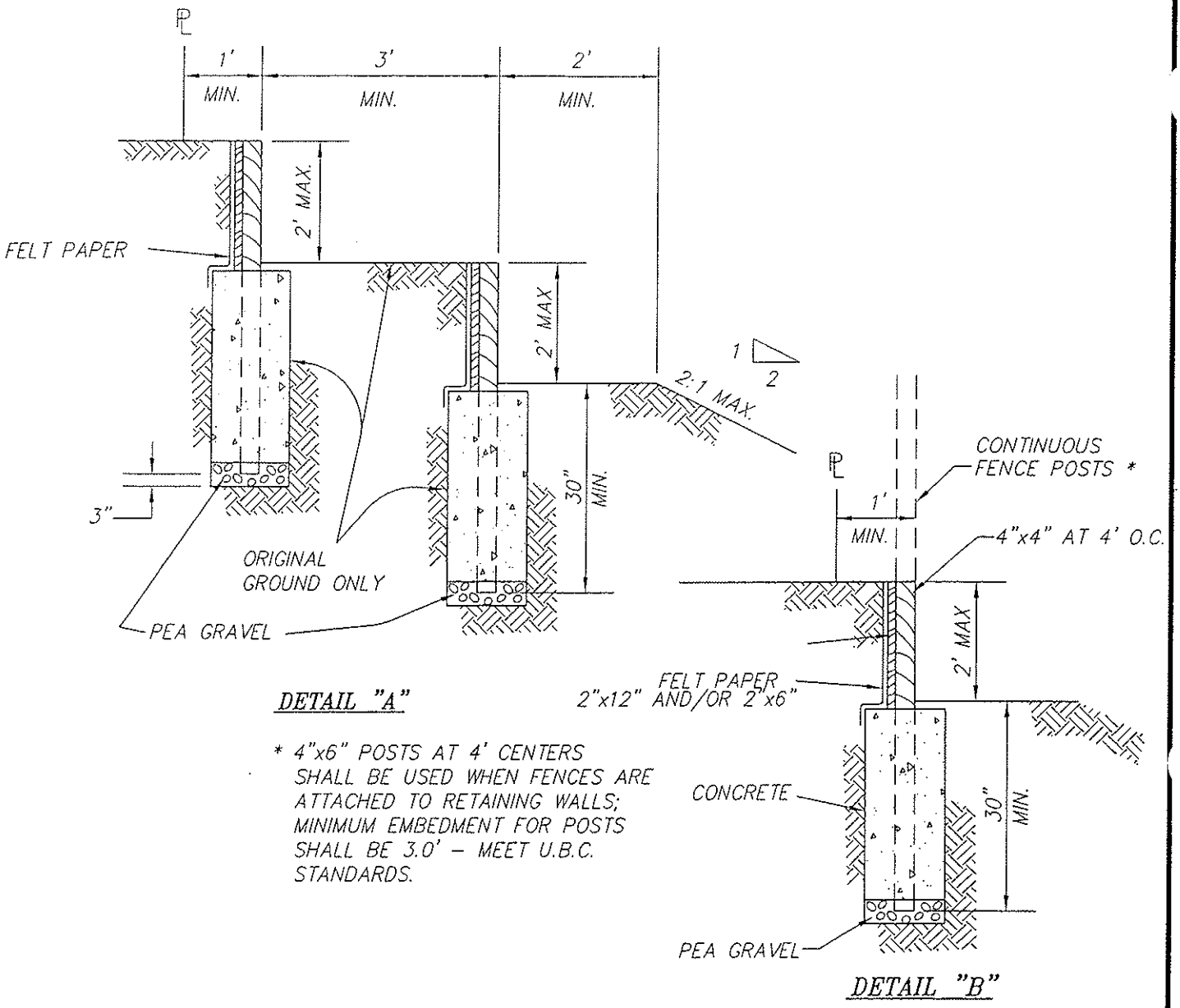
REVISED:

TOWN OF LOOMIS

INTERIOR PROPERTY LINE RETAINING WALLS

DEPARTMENT OF PUBLIC WORKS

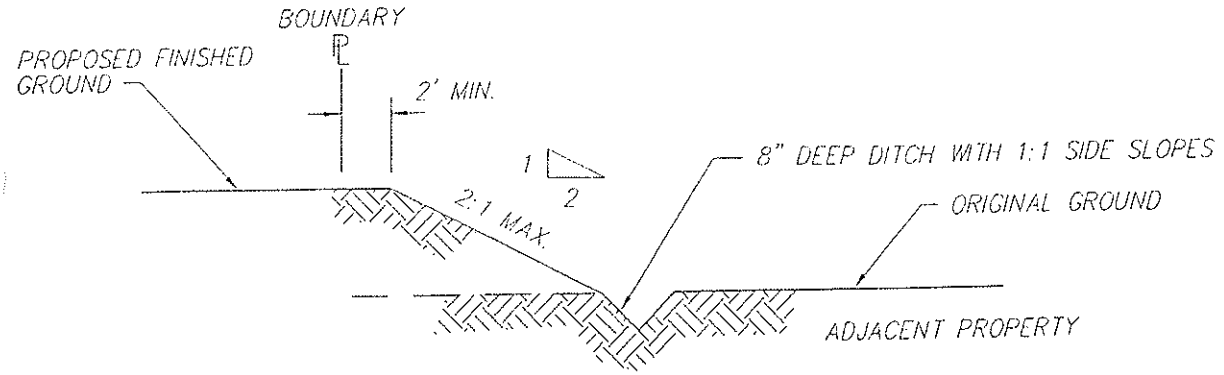
G-1



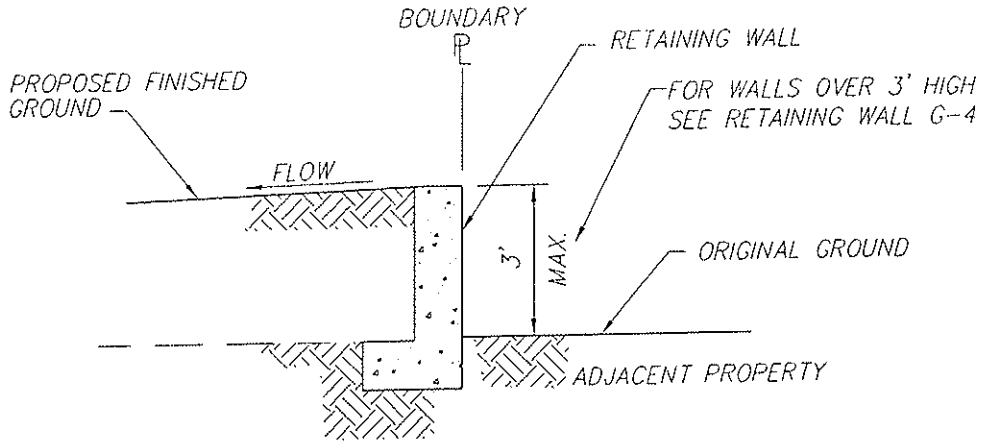
NOTES:

1. ALL MATERIAL FOR WOODEN WALLS SHALL BE PRESSURE TREATED DOUGLAS FIR.
2. ALL WOODEN MATERIALS SHALL BE GRADE NO. 2 OR BETTER WITH NO OPEN GRAIN MATERIAL ALLOWED.
3. WOODEN WALLS SHALL NOT BE USED ADJACENT TO STREET RIGHT-OF-WAYS.
4. CONCRETE, CONCRETE BLOCK AND OTHER WALL DETAILS SHALL BE SUBMITTED TO THE TOWN ENGINEER FOR APPROVAL.
5. A BUILDING PERMIT SHALL BE OBTAINED FOR ALL RETAINING WALLS >4' IN HEIGHT(UBC 2308(b)).
6. A BUILDING PERMIT SHALL BE OBTAINED FOR ALL TERRACED WALLS >4' IN HEIGHT(UBC 2308(b)).
7. REINFORCED CONCRETE OR MASONRY WALLS ARE REQUIRED IF EXISTING STRUCTURES ARE LOCATED LESS THAN 10' FROM THE HIGHER WALL (SEE DETAIL "A").

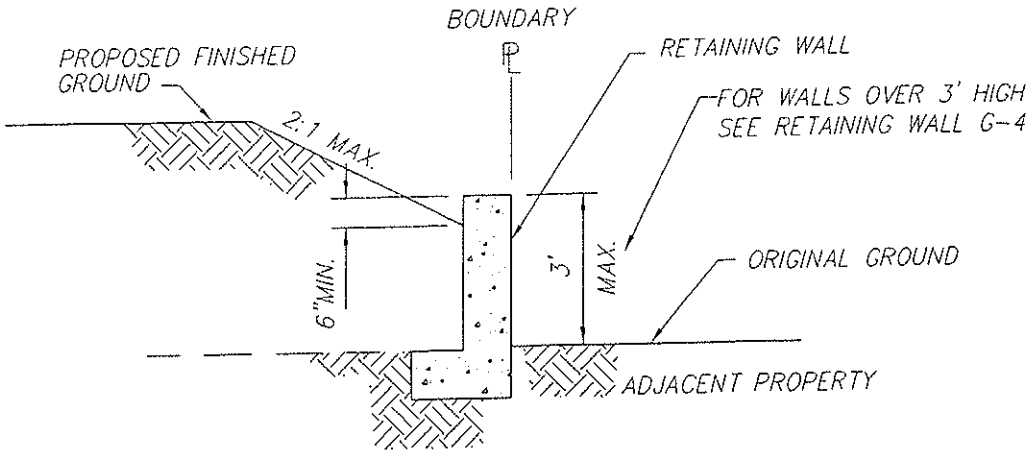
APPROVED BY: BRIAN J. FRAGIAO DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER REVISED:		TOWN OF LOOMIS **WOOD RETAINING WALL** DEPARTMENT OF PUBLIC WORKS	G-2



MOST DESIRABLE
ALTERNATE "A"



ALTERNATE "B"



ALTERNATE "C"

NOTES:

1. SEE G-3A FOR CUTS ADJACENT TO EXTERIOR PERIMETER PROPERTY LINES.
2. ALTERNATE "A" REQUIRES CONSTRUCTION EASEMENT FROM ADJACENT PROPERTY OWNER.
3. RIGHT OF ENTRY FROM ADJACENT PROPERTY OWNER IS REQUIRED FOR ALTERNATES "B" & "C".

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

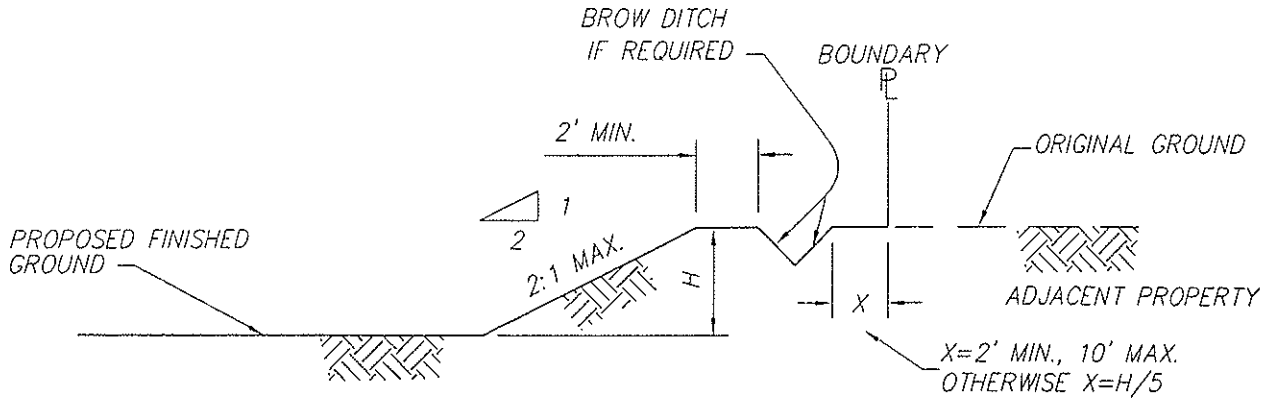
REVISED:

TOWN OF LOOMIS

EXTERIOR PERIMETER PROPERTY LINE GRADING & WALLS

DEPARTMENT OF PUBLIC WORKS

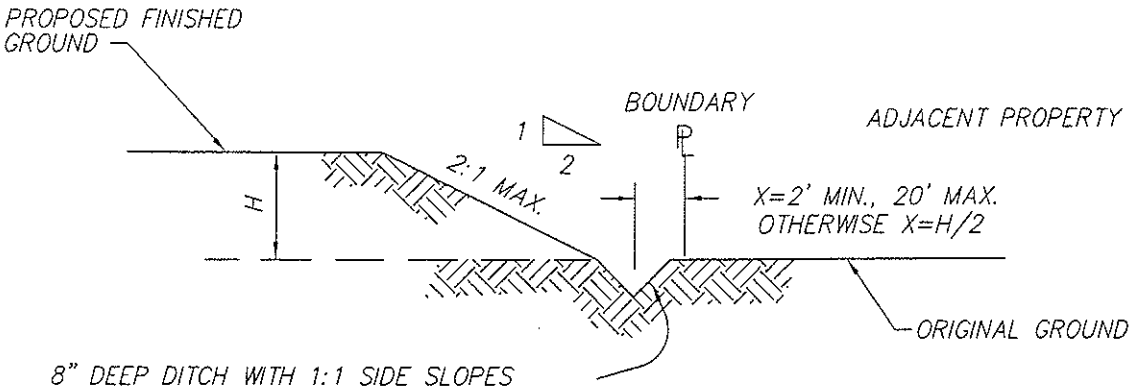
G-3



NOTES:

1. IF BROW DITCH IS NOT REQUIRED, X=2' MIN. FROM THE TOP OF THE SLOPE.
2. IF REQUIRED BY TOWN ENGINEER.

CUT AREAS
(OPTIONAL)



FILL AREAS

ALTERNATE "D"

NOTE:

WHENEVER POSSIBLE THE PROPERTY LINE FENCE SHALL BE AT THE TOP OF THE SLOPE.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

TOWN OF LOOMIS

EXTERIOR PERIMETER PROPERTY LINE GRADING

DEPARTMENT OF PUBLIC WORKS

G-3A

DESIGN NOTES:

1. THE DESIGN REQUIRES A NON-SATURATED BACKFILL. SURFACE AND SUBSURFACE DRAINAGE CONTROL IS REQUIRED TO PREVENT SATURATION OF THE BACKFILL, OR TO RELIEVE HYDROSTATIC PRESSURES. DRAINAGE CONTROL SHALL BE AS SPECIFIED IN THE CONSTRUCTION DRAWINGS, PROJECT PLANS OR AS DIRECTED BY THE TOWN ENGINEER.

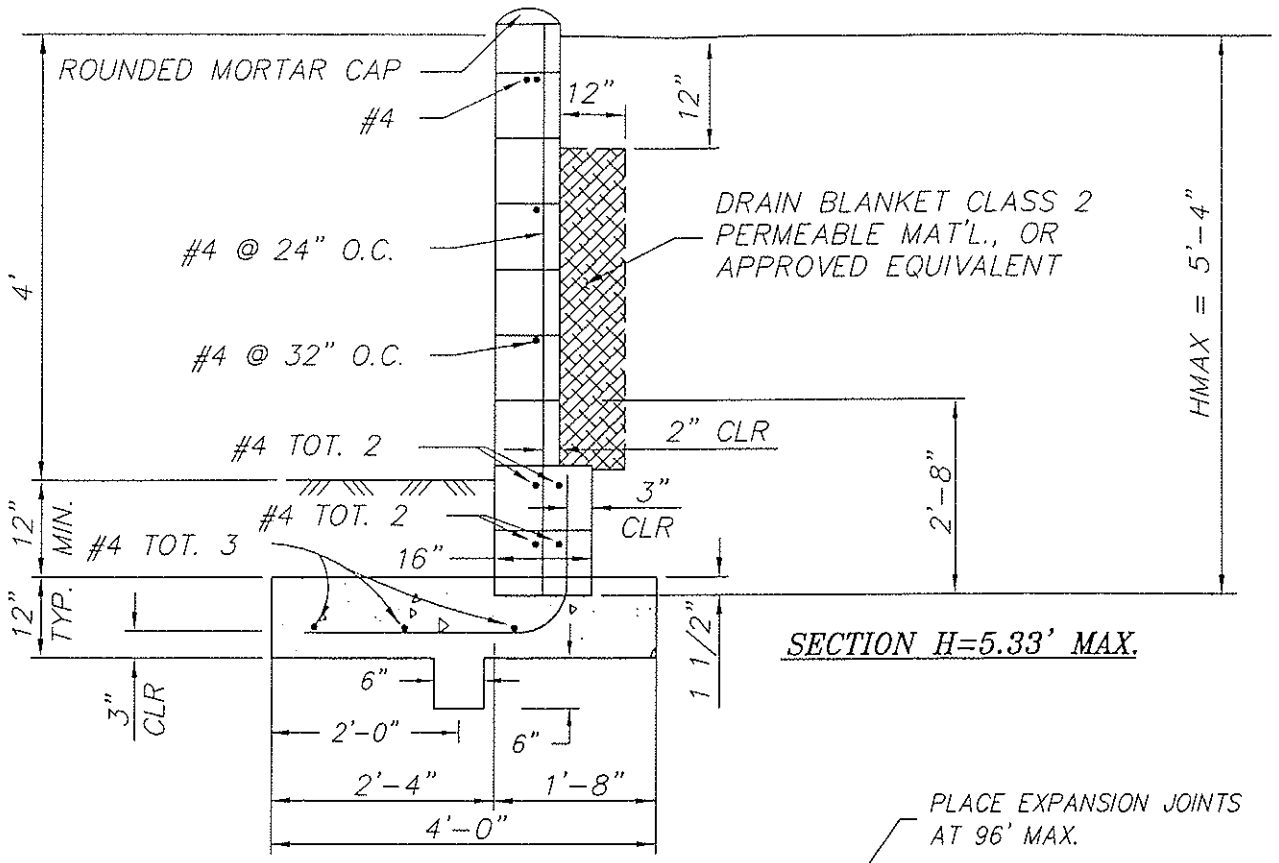
2. THE DESIGN IS BASED ON THE FOLLOWING ASSUMPTIONS:
   - A. ALLOWABLE SOIL BEARING 2500 PSF
   - B. EQUIVALENT FLUID WEIGHT 35 PCF
   - C. SOIL FRICTION FACTOR 0.3
   - D. SURCHARGE OVER HEEL 250 PSF
   - E. SOIL DENSITY 125 PCF
   - F. LEVEL BACKFILL

   THESE ASSUMPTIONS SHOULD BE VERIFIED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.

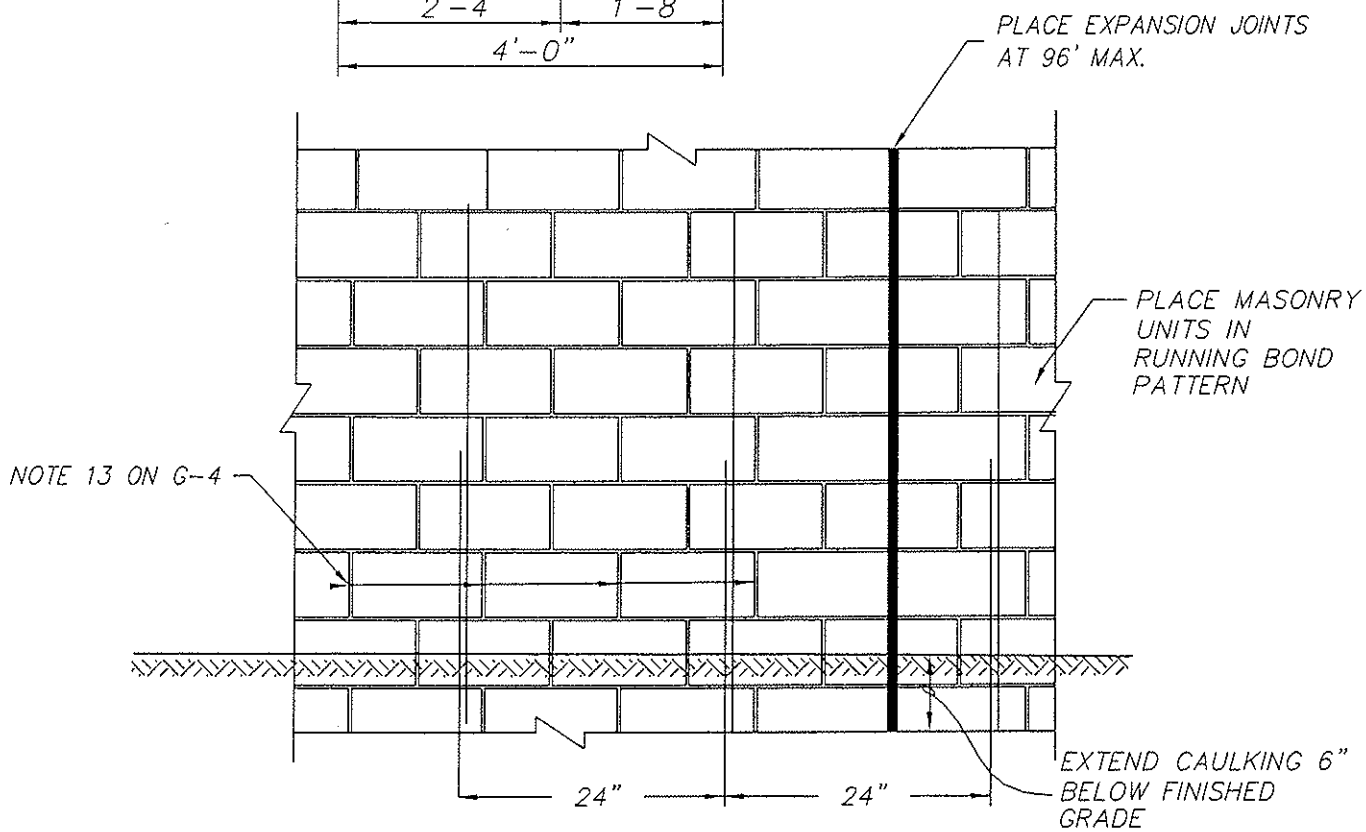
CONSTRUCTION NOTES:

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 psi IN 28 DAYS.
2. REINFORCING STEEL SHALL BE GRADE 60.
3. THE BACK OF WALL SHALL BE SPRAYED WITH A WATER SEAL COMPOUND.
4. LAP ALL HORIZONTAL STEEL AT LEAST 40 BAR DIAMETERS AT SPLICES.
5. USE CONCRETE MASONRY BLOCK TYPE N PER ASTM C-90.
6. MORTAR SHALL BE TYPE S OR M AND SHALL CONFORM TO ASTM C 270.
7. GROUT SHALL BE A 6 SACK MIX AND SHALL CONFORM TO ASTM C 476.
8. FULLY GROUT (SOLID) ALL CELLS AND CONSOLIDATE PER 1996 U.B.C.
9. f'm = 2,500 psi. NO SPECIAL INSPECTION IS REQUIRED.
10. THE FOUNDATION SOIL SHALL BE FIRM AND COMPACTED TO 95% OF MAXIMUM DRY DENSITY, AS DETERMINED BY ASTM D-1557.
11. COMPACTION WITHIN 3 FEET OF THE BACK FACE OF THE WALL SHALL BE ACHIEVED BY LIGHTWEIGHT MECHANICAL TAMPERS, ROLLERS, OR VIBRATORY SYSTEM ONLY.
12. NO BACKFILL SHALL BE PLACED AGAINST THE WALL UNTIL THE CONCRETE OR GROUT HAS REACHED THE DESIGN STRENGTH.
13. OMIT MORTAR FROM VERTICAL JOINT IN FIRST COURSE ABOVE PROPOSED GROUND LINE AT 32" CENTERS FOR WEEP HOLES. FILL ALL CELLS WITH GROUT.
14. SEE DETAIL G-4A

APPROVED BY: BRIAN J. FRAGIAO DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER REVISED:		TOWN OF LOOMIS **MASONRY OR CONCRETE RETAINING WALL** DEPARTMENT OF PUBLIC WORKS	G-4



SECTION H=5.33' MAX.



RETAINING WALL DETAIL

NOTE:
PROPOSED RETAINING WALLS GREATER THAN 5.33' SHALL BE SUBMITTED TO THE TOWN ENGINEER FOR APPROVAL.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

TOWN OF LOOMIS

MASONRY OR CONCRETE RETAINING WALL

DEPARTMENT OF PUBLIC WORKS

G-4A

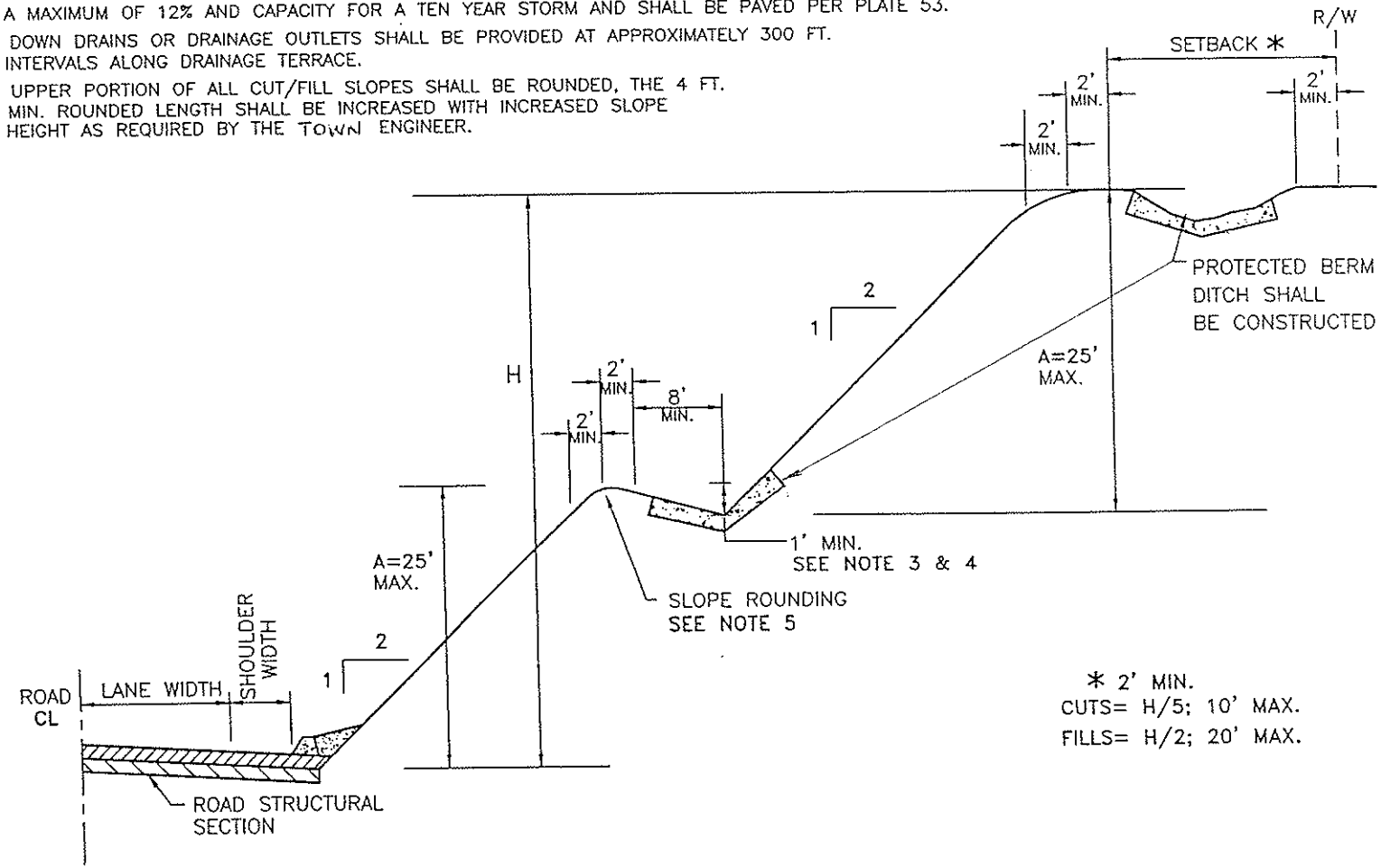
APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

NOTES:

1. FOR ALL CUT OR FILL SLOPES WHERE H (HEIGHT) IS GREATER THAN 30 FT., TERRACES SHALL BE CONSTRUCTED AS RECOMMENDED BY GEOTECH ENGINEER. THIS PLATE SHALL BE USED AS A GUIDE.
2. THE MAXIMUM HEIGHT (A) OF EACH SLOPE BETWEEN TERRACE SHALL BE 25 FT.
3. DRAINAGE SWALES ON TERRACES SHALL HAVE A MINIMUM LONGITUDINAL GRADE OF 4% AND A MAXIMUM OF 12% AND CAPACITY FOR A TEN YEAR STORM AND SHALL BE PAVED PER PLATE 53.
4. DOWN DRAINS OR DRAINAGE OUTLETS SHALL BE PROVIDED AT APPROXIMATELY 300 FT. INTERVALS ALONG DRAINAGE TERRACE.
5. UPPER PORTION OF ALL CUT/FILL SLOPES SHALL BE ROUNDED, THE 4 FT. MIN. ROUNDED LENGTH SHALL BE INCREASED WITH INCREASED SLOPE HEIGHT AS REQUIRED BY THE TOWN ENGINEER.



TOWN OF LOOMIS

TERRACE DRAINAGE FOR CUT AND FILLS

DEPARTMENT OF PUBLIC WORKS

G-5

APPROVED BY:

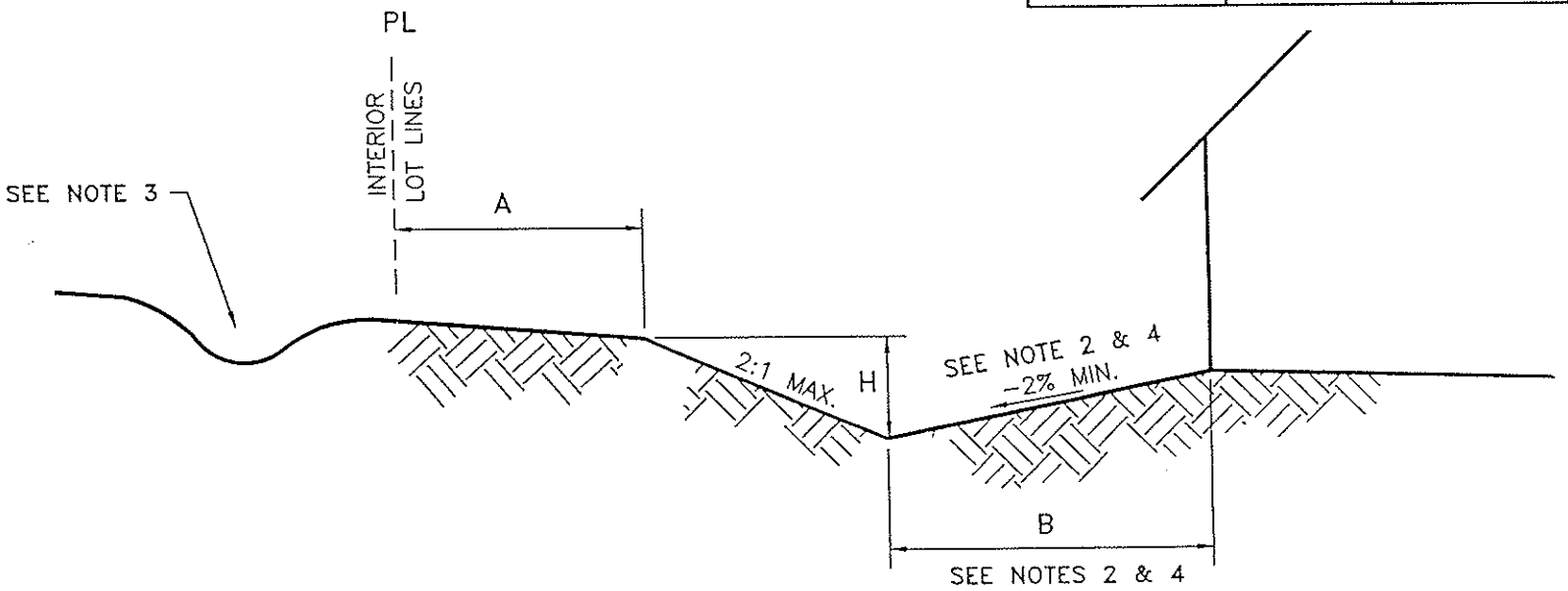
BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

NOTES:

1. THE SETBACKS SHOWN ON THIS PLATE ARE FOR USE WITH PROPOSED GRADED SUBDIVISIONS FOR INTERIOR PROPERTY LINES ONLY. SEE G3 & G3A FOR REQUIRED SETBACKS ALONG SITE BOUNDARY LINES.
2. DIMENSION B MUST BE LARGE ENOUGH TO ALLOW FOR DRAINAGE AROUND BUILDINGS. THE SLOPE GRADING TO BE COMPLETED AS PART OF THE BUILDING CONSTRUCTION.
3. DRAINAGE DITCH MAY BE REQUIRED AT TOP OF SLOPE.
4. DURING ROUGH GRADING BUILDING PADS SHALL BE GRADED TO MINIMIZE EROSION OF SITE AND SLOPES AND TO PROVIDE FOR FINAL GRADING AT BUILDING STAGE TO PROVIDE −2% SLOPE AWAY FROM BUILDING AS WELL AS ADEQUATE DRAINAGE ON LOT.

H	A MIN.	B
≤2'	1'	H/2 BUT 2' MIN., 15' MAX.
>2 AND ≤10'	2'	
>10'	H/5 BUT 2' MIN., 10' MAX.	



TOWN OF LOOMIS
PROPERTY LINE GRADING
INTERIOR
DEPARTMENT OF PUBLIC WORKS

G−6

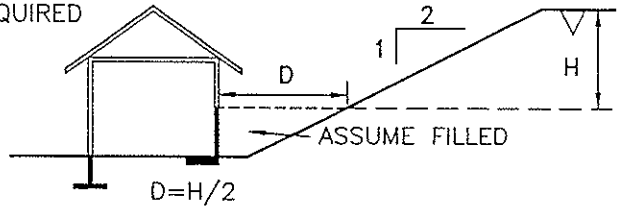
APPROVED BY:
BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER
REVISED:

TOWN OF LOOMIS
BUILDING & SLOPE SETBACKS
DEPARTMENT OF PUBLIC WORKS

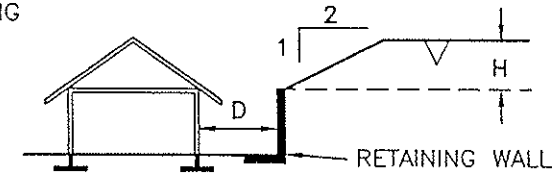
G-7

NOTES:

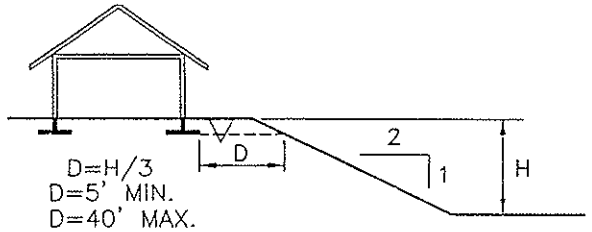
1. REFER TO GRADING ORDINANCE FOR ALLOWABLE CUT, FILL, & ETC.
2. BROW DITCHES MAY BE REQUIRED AT TOP OF SLOPES.
3. IF S IS LESS THAN 7 FT., POOL WALL TO BE CAPABLE OF SUPPORTING THE WATER WITHOUT SOIL SUPPORT.
4. FINAL LOCATION OF BUILDING SHALL CONFORM TO THIS REQUIREMENT AT THE BUILDING STAGE. SITE GRADING FOR PADS SHALL ALLOW FOR THIS REQUIREMENT.



D=H/2
D=5' MIN.
D=15' MAX.

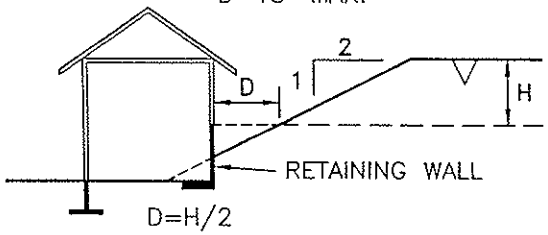


D=H/2
D=5' MIN.

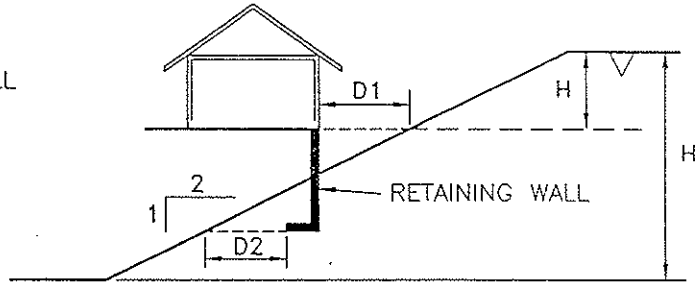


D=H/3
D=5' MIN.
D=40' MAX.

D=15' MAX.

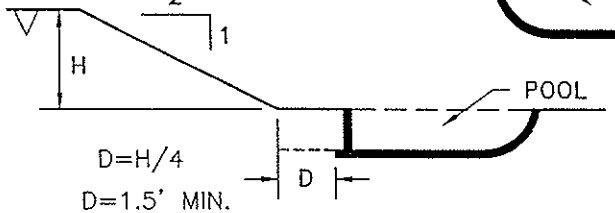


D=H/2
D=5' MIN.
D=15' MAX.

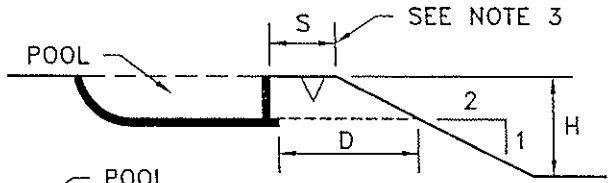


D1=H/2 D=5' MIN.
D=15' MAX.

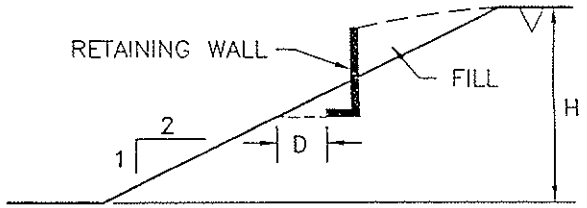
D2=H/3 D=5' MIN.
D=40' MAX.



D=H/4
D=1.5' MIN.
D=7.5' MAX.



D=H/6
D=2.5' MIN.
D=20' MAX.



D=H/3 D=5' MIN.
D=40' MAX.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

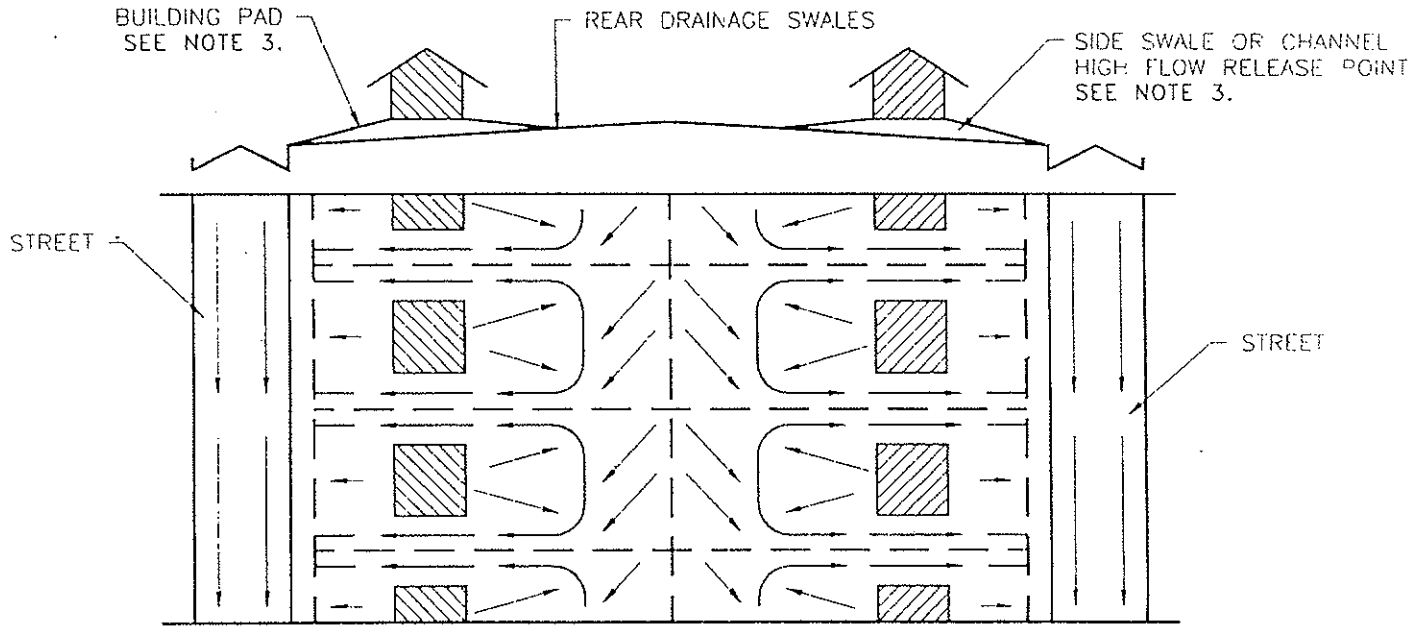
REVISED:

NOTES:

1. AFTER HOUSE CONSTRUCTION, LOT GRADING SHALL PROVIDE FOR ADEQUATE RELEASE POINTS FOR ALL BACK LOT DRAINAGE WITH A MINIMUM 1% SLOPE.

2. ALL GRADING FOR SINGLE FAMILY RESIDENTIAL LOTS SHALL CONFORM WITH CLASS 1 REQUIREMENTS.

3. MINOR SWALES AROUND BUILDINGS WHICH WILL CARRY WATER ONLY FROM THE ONE LOT ARE TO BE CONSTRUCTED AS PART OF THE BUILDING CONSTRUCTION. SWALES AND DRAINAGE SYSTEMS WHICH WILL CARRY WATER FROM MORE THAN ONE LOT SHALL BE SHOWN ON THE IMPROVEMENT PLANS AND CONSTRUCTED AS PART OF THE IMPROVEMENTS.



CLASS 1

TOWN OF LOOMIS
CLASS 1 RESIDENTIAL
LOT GRADING & DRAINAGE
LOT AREA < 1 ACRE
DEPARTMENT OF PUBLIC WORKS

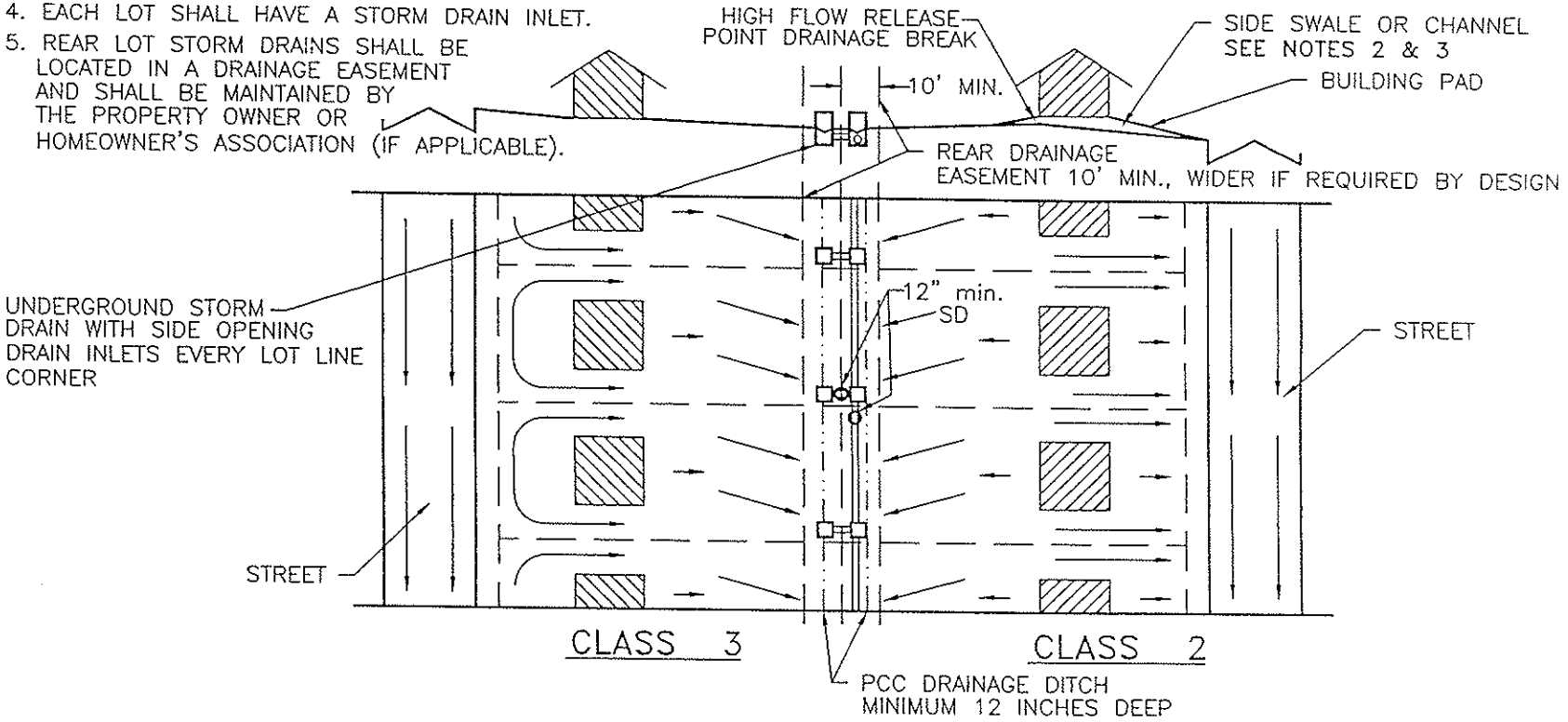
APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

NOTES:

1. CLASS 2 AND CLASS 3 GRADING REQUIRE SPECIFIC APPROVAL FROM THE ENGINEER AND ONLY WHEN CLASS 1 GRADING IS NOT FEASIBLE. CLASS 2 IS PREFERRED LOT GRADING OVER CLASS 3.
2. AFTER HOUSE CONSTRUCTION, LOT GRADING SHALL PROVIDE FOR ADEQUATE RELEASE POINTS FOR ALL BACK LOT DRAINAGE WITH A MINIMUM 1% SLOPE.
3. MINOR SWALES AROUND BUILDINGS WHICH WILL CARRY WATER ONLY FROM THE ONE LOT ARE TO BE CONSTRUCTED AS PART OF THE BUILDING CONSTRUCTION. SWALES AND DRAINAGE SYSTEMS WHICH WILL CARRY WATER FROM MORE THAN ONE LOT SHALL BE SHOWN ON THE IMPROVEMENT PLANS AND CONSTRUCTED AS PART OF THE SUBDIVISION IMPROVEMENTS.
4. EACH LOT SHALL HAVE A STORM DRAIN INLET.
5. REAR LOT STORM DRAINS SHALL BE LOCATED IN A DRAINAGE EASEMENT AND SHALL BE MAINTAINED BY THE PROPERTY OWNER OR HOMEOWNER'S ASSOCIATION (IF APPLICABLE).



TOWN OF LOOMIS

CLASS 2 & 3 RESIDENTIAL LOT GRADING & DRAINAGE LOT AREA < 1 ACRE

DEPARTMENT OF PUBLIC WORKS

G-9

SECTION 8

LANDSCAPING & IRRIGATION (LSC)

CONSTRUCTION
IMPROVEMENT STANDARDS

SECTION 8

LANDSCAPING & IRRIGATION

8-1 GENERAL-- All landscaping and irrigation work shall be performed in accordance with these Improvement Standards, approved plans and the manufacturer's recommendations.

8-2 PRESERVATION OF PROPERTY-- The planting and irrigation operations shall be conducted in such a manner that no damage shall result to existing site improvements and plantings. The Contractor shall be responsible for any damage resulting from this operations, and shall repair or replace such damage at his own expense. Vehicles of any kind shall not be allowed to passs over curbs, sidewalks, planting areas, etc., unless proper protection is provided.

8-3 PERSONNEL-- Planting and seeding operations shall be performed by personnel familiar with planting procedures and under the supervision of a certified landscape technician.

8-4 WEATHER-- No planting shall occur during weather conditions which will adversely affect materials or when soil is in a muddy condition.

8-5 IRRIGATION INSTALLATION

A. **Backfilling**-- Backfill material shall be of native material free from lumps or stones and placed in 6 inch layers thoroughly compacted by mechanical tamping until reaching 92 percent relative compaction outside of paving areas and 95 percent relative compaction within paving areas.

B. **Control Wiring**

1. Connections between the automatic controllers and the electric control valves shall be made with direct burial copper wire AWG-U.F. 600 volt. Two spare wires of different colors shall be run from the valve furthest from the controller, back to the controller. Pilot wires shall be of a different color for each automatic controller.

2. Common wires shall be white with a different color stripe for each automatic controller. Installations to be made in accordance with the valve manufacturer's recommendations and wire chart. Wire size shall be no less than #14.

3. Wiring shall occupy the same trench as pressure supply or lateral lines. The wiring shall be the same elevation as the supply or lateral lines, being neither above or below these lines.

4. When more than one wire is placed in a trench, the wiring shall be taped together at intervals of 6 feet.

5. Wires installed in conduits shall not be taped together to facilitate replacement of individual wires.

6. An expansion curl should be provided within 3 feet of each wire connection and at least every 100 feet of wire length. Expansion curls shall be formed by wrapping at least five turns of wire around a one-inch diameter pipe, then withdrawing the pipe.

7. Field splices between the automatic controller and electric control valves will not be allowed without the approval of the Town Inspector.

8. There shall be no twinned valves, all RCV's shall be wired to an individual station on the controller.

C. **Irrigation Controller** -- All controller locations are diagrammatic only. Placement of the controllers will be coordinated with a Town Inspector. All local and applicable codes shall apply in installing the 120 volt electrical service to the controller. The Contractor shall provide the electrical service connections from the power service point to the controller. Adequate coverage and protection of the 24 volt service wire leading from the controller shall be maintained from the bottom of the controller.

D. **PVC/Brass Pipe**

1. PVC pipe shall be cut with a fine toothed hacksaw or approved cutting tool and any burrs shall be removed. The outside of the pipe and the inside surface of the fittings shall be wiped with a clean cloth and then primered to remove all dirt and moisture prior to applying cement solutions.

2. The cement solution shall be applied to the pipe and fitting socket with a brush having a width approximately one-half the diameter of the pipe. The cement solution shall be applied freely with a light wiping action to spread the cement uniformly over the surfaces. The pipe surface or fitting socket shall not be rubbed with a brush any more than is necessary to spread the cement.

   Immediately after the cement has been applied to the surface to be joined, the pipe shall be inserted into the fitting with a twisting motion to the full depth of the fitting socket. Immediately after joining is completed, excess cement shall be thoroughly wiped form the pipe and fitting. The joined members shall be allowed to cure for at least 5 minutes before they are handled. In cold or damp weather, the curing period shall be increased due to slower evaporation of the solvent. An additional fitting or pipe section may be added to the completed joint within 3 minutes if care is exercised in handling so that a strain is not placed on the previous joint.

3. Except as shown on the approved plans, PVC pipe shall be laid in a level trench on compacted or undisturbed earth and solvent-weld pipe shall be placed from side to side in the trench at intervals of approximately 50 feet. Pipe shall be held down between joints with small mounds of earth to prevent movement.

4. Pressure test of mainline shall be made with all RCV's installed and under pressure. After completion of pressure tests on the pipelines, the trench shall be

immediately backfilled, covering the pipe with soft earth to prevent damage from rocks

5. Brass pipe joints shall be threaded couplings, rated at 150 psi. Threaded joints shall be made by placing Teflon tape on the male threads only. Use of thread cement or caulking to make the joints tight is not permitted. All cut ends shall be reamed to full pipe bore before assembly. Brass pipe fittings shall be joined to the pipe in the same manner as specified for pipe joints.

6. All main lines to have a bare copper trace wire installed, running the entire length of the main.

7. All taps on main lines 3 inches or larger shall be made with saddle taps.

8. All piping shall be sleeved under paving.

E. **Sprinkler Heads** -- Nozzles on stationary sprinklers shall be tightened after installation and sprinklers having an adjustment stem shall be adjusted on a lateral line for proper radius, diameter and gallonage. They shall be set perpendicular to finished grade and shall be installed as indicated on the approved plans and as shown in these Improvement Standard Details.

F. **Trenching**

1. Excavation shall be open vertical construction sufficiently wide to provide free working space around the work to be installed and to provide ample space for backfilling and compacting. Trenches for pipe shall be cut to required grade-lines, and the trench bottom shall be compacted to provide an accurate grade and uniform bearing for the full length of the line. When two pipes are to be placed in the same trench, 6 inches of separation shall be required between pipes and/or conduits.

2. The excavation required for the installation of conduit, foundations and other appurtenances shall be preformed in such a manner as to cause the least possible injury to the streets, sidewalks and other adjacent improvements. All landscape or other improvements disturbed in excavating shall be replaced or reconstructed. The material from the excavation shall be placed in a position that will not cause damage or obstruction to vehicular and pedestrian traffic, nor interfere with surface drainage.

3. The depth of trenches shall provide a minimum cover above the conduit or wiring as follows:

   a. 12 inches over non-pressure, lateral lines

   b. 18 inches over pressurized main lines.

   c. 18 inches over pipe crossing underneath pavement.

G. Valves -- Remote control valves shall be adjusted so the most remote sprinkler heads operate at the pressure recommended by the head manufacturer and so a uniform distribution of water is applied by the sprinkler heads to the planting areas for each individual valve system. Each valve assembly shall have its own outlet; multiple assemblies are not allowed. All valves shall be installed as indicated on the approved plans and as shown in these Improvement Standard Details.

H. Valve Boxes

1. All remote control valves, gate valves, manual angle or globe valves shall be installed in a plastic valve box as shown in the Construction Standard Details, complete with cover, unless otherwise specified on the approved plans. All plastic valve boxes shall be Brooks, Ametek, Carson, each with locking lids, or approved equal.

2. All valve boxes shall be set 1/4 inch above finish grade in lawn areas and 2 inches above finish grade in ground cover areas. Valve boxes in athletic field areas shall be set 12 inches below grade with a 3M Ball, or approved equal.

3. Valve boxes located near walks, curbs, headerboards or paving shall be installed in such a way as to allow for valve boxes to abut those items with top surface matching planes.

4. All valve boxes shall be blocked for support with brick or concrete block.

I. **Water Service and Meter** -- The water service and meter shall be installed in accordance with PCWA requirements.

8-6 PLANTING INSTALLATION

A. Soil Preparation and Fine Grading

1. **Soil Preparation** -- Prior to any planting bed preparation or planting, finish grade all planting areas, fill as needed or remove surplus dirt and float areas to a smooth, uniform grade as indicated on the approved Grading Plans. Slope all planting areas to drain. Roll, scarify, rake and level as necessary to obtain true, even planting surfaces. Finish grades shall be approved by the Town Inspector before planting is started. All planting areas shall be thoroughly wet down and sprinkler emitter coverage and operation confirmed. Allow soils to dry so as to be workable after which thoroughly cultivate to a depth of 12 inches and allow to dry out.

2. **Soil Conditioning** -- Soil amendment and fertilizers shall be spread evenly over all areas as specified below:

   a. Fertilizer -- Per soils fertility analysis.

   b. Soil Amendment -- Per soils fertility analysis.

Soil amendments and fertilizers are to be incorporated into the top 12 inches of soil by repeated rotary-hoe cultivation.

3. **Fine Grading**

   a. Grades not otherwise indicated on the approved plans shall require uniform levels or slopes between points where elevations are given, or between established walks, curbs, paving or other fixed structural elements. Planting areas, including lawns, shall be true to grade within one inch tested in any direction with a 10 foot straightedge. Finish grades shall be smooth, even plane with no abrupt change of surface. Tops and toes of slopes shall be rounded to produce gradual transitions.

   b. Finished grades of all shrubs, annuals and ground cover areas shall be 1 inch below top of adjacent structural elements unless otherwise indicated on the approved plans.

      Finished grades of lawn areas shall be 1/2 inch below top of adjacent structural elements. All grades to provide for gravity, surface runoff of water. Low pockets are not allowed.

B. **Tree, Shrub and Ground Cover Planting**

1. **Locations** -- Tree and shrub locations are to be marked on-site using survey stakes, paint marks or other approved methods. Locations shall be approved by the Town inspector prior to plant holes being dug.

2. **Pit Digging** -- Dig pits circular, 3 times the diameter of the planting can.

3. **Root Balls** -- Plants are to be lifted so that the root ball is supported from the underside. Plants that do not have a satisfactory root system will be rejected. If plants do not have young feeder roots showing at the edge of the container, loosen their roots and cut in several places to encourage new feeder root development along the perimeter of the root ball. Root balls are to be checked for girding roots around the stems.

4. **Planting plants** -- All plants shall be planted immediately after the containers are cut and containers shall be immediately removed from the site. Ground cover shall be installed at spacings indicated on the approved plans and shall be evenly spaced and staggered in rows. Place each plant in a pit so the root system lies free without doubling and so the roots are planted vertically. Firm the soil around each plant and sprinkle the area immediately to avoid drying out.

5. **Planting trees** -- Place plants in the pits in an upright position and place approved fertilizer tablets. Backfill until the hole is one-half full, thoroughly water, then complete backfilling. Place a 3 inch high berm outside the excavated area, and fill the watering basin with water. Trees shall be planted on a packed mound, 2 inches above grade at the time of planting. The crown on the plant after settlement shall be 1 inch above finish grades for shrubs and 3 inches above

finished grades for trees. Basins are not required if plants are in a lawn area or are watered by an emitter system. Mulch is not to be placed within the basin areas, or within 6 inches of the stems for areas without basins.

6. **Fertilizers & Herbicides** -- Apply fertilizer consisting of a mixture of 16% nitrogen, 6% phosphorous, 8% potassium (16-6-8) at a rate of 5 pounds per 1,000 square feet uniformly over area to receive ground cover. Pre-emergent herbicide shall be applied to all shrub and ground cover areas, including plant basins, prior to any required mulching.

7. **Supporting trees** -- After pruning (only suckers are to be pruned, no pruning on-stem of the tree, up to the primary branches) place stakes along the side of the root ball and two feet into undisturbed soil. Trees are to be tied to the stakes per Improvement Standard Details. No mulch is to be placed within the tree basin, or within 6 inches of the stem if a basin is not required. Specimen trees shall be guyed as specified in Improvement Standard Detail. Specimen trees planted in parks or areas subject to pedestrian traffic shall receive a 24 inch long by 1/2" diameter white PVC pipe on each guy wire for visibility.

C. **Hydromulch Seeding**

1. **Preparation** -- The slurry preparation shall take place on the site. The slurry preparation shall begin by adding water to the tank when the engine is at half throttle. When the water level has reached the height of the agitator shaft, good recirculation shall be established; the seed shall be added at this time. Fertilizer shall then be added, followed by wood pulp. The wood pulp shall only be added to the mixture after the seed, and, when the tank is at least one-third filled with water.

   The engine throttle shall be opened to full speed when the tank is half filled with water. All the wood pulp shall be added by the time the tank is two thirds to three fourths full. Spraying shall commence immediately when the tank is full.

2. **Application** -- Any areas to receive hydromulch shall be sprayed with a uniform, visible coat by using green color wood pulp as a guide. The slurry shall be applied in a sweeping motion, in an arched stream, so as to fall like rain, allowing the wood fibers to build on each other until a good coat is achieved. Application rates shall be based on site conditions and season. Hydromulch shall not be allowed to fall on the ground cover and shrub areas.

3. **Time Limit** -- Any slurry mixture which has not been applied to the slope within 4 hours of mixing will be rejected by the Town Inspector and shall be removed from the project at the Contractor's expense.

D. Seeding

1. **Preparation** -- Installation of all plants and ground cover shall have been completed prior to seeding operations. Just prior to sowing, areas to be seeded shall be made sufficiently loose and friable to receive the seed.

2. **Application** -- Seed shall be sowed evenly using a mechanical spreader at the rate specified on the approved plans. One-half the seed shall be sowed in one direction, and the remaining one-half sowed in a direction 90 degrees to the first during a windless period. Turf seed shall be applied with an implant seeder that implants the seed into the soil. Broadcast seeding is not allowed for turf seed. Apply fertilizer (16-6-8) at a rate of 5 pounds per 1,000 square feet uniformly over seeded areas. Lightly rake surface to cover seed and to mix with fertilizer and then compact with a 200 pound roller. Soil shall be kept moist but not saturated until the seed has germinated.

3. **Protection** -- Protect grass areas with temporary fencing as necessary. Barriers shall be maintained by the Contractor and kept in orderly condition at all times until work has been accepted by the Town. Any damage to turf shall be repaired at the expense of the Contractor.

E. **Sod Planting**

1. **Application** -- Unroll the sod, fitting each strip tightly to the preceding strip. Do not stretch the sod. Force each strip together as tightly as possible. Stagger the strips of sod to prevent the seams on adjacent rows from matching. Care shall be taken to prevent heel or foot prints in the grade as the sod is being placed.

2. **Rolling** -- As soon as the sod is placed, roll it with a light roller, making certain that no air space is left under the sod. After the first rolling, moisten the sod lightly and then allow the grass to dry off before the second rolling. The second rolling should be at a cross angle to the first rolling.

3. **Maintenance** -- Upon completion of the rolling, apply sufficient water to wet the sod and soil to a depth of 6 inches. Sod shall be kept moist for the next 10 days. The grass is to be mowed to a height of 2 inches at the end of the 10 day period. Care shall be taken to leave no foot prints in the sod.

8-7 IRRIGATION MATERIALS

A. **Backflow Prevention Device** -- The backflow prevention device shall be of a reduced pressure type and shall be in accordance with Improvement Standard Details.

B. **Electrical**

1. **Control Wire** -- All wiring to be used for connecting the automatic controller to the electric solenoid actuated remote control valve shall be type UF-600V, solid copper, PVC insulation, single conductor, UL approved underground feeder cable. All pilot or "hot" splicing wire at the valves or in the field shall be made as follows: The splice shall be insulated with a 3-M DBR #09053 Splice Kit, or approved equal. Field splices between the controller and valves will not be allowed without prior approval of the Inspector.

2. **Pull Box Covers** -- Pull boxes shall have reinforced concrete covers and shall be inscribed "Irrigation 24 Volt". Covers shall be provided with two-3/8 inch brass hold down bolts with brass washers and nuts. Nuts shall be recessed below the surface of the cover. Pull boxes set in traffic areas shall have steel covers designed to handle vehicle loading.

3. **Service Unit and Meter Socket** -- The combination service and termination point for metered service shall be Tesco Class 21-000 service pedestal State of California Type 3, or approved equal.

4. **PVC Conduit** -- All PVC conduit shall be heavy-wall, schedule 40, with factory made bends, couplings and fittings.

C. **Irrigation Controller** -- The irrigation system controller shall be a UL approved micro-processor based, solid state unit capable of fully automatic or manual operation of the system. It shall be housed in an exterior (16 gauge) weatherproof pedestal mounted lodging case. It shall operate on 117 volts AC, 50/60 Hz power input and be capable of operating 24 volt AC electric control valves. In addition, the controller shall be equipped with or shall be capable of the following:

1. Each station shall have the capability of being individually programmed to operate from one minute to nine hours, and from 59 minutes in one minute intervals.

2. It shall have a a quick stations function which allows for rapid programming of a block of stations with the same watering period.

3. It shall have three independent programs with four automatic starts per day per program.

4. Each program shall have its own percentage function which allows the watering length of all stations in the program to be changed from 0% to 300% in 1% increments and at all times be able to display the original watering length of each station.

5. Each program shall be capable of being set on either a seven day weekly repeat cycle where the active days are displayed all at once or on a skip day basis where the user may select the number of days skipped, from one to thirty, between waterings with the starting day selectable.

6. The controller shall have a review program function which, with one button, will sequentially bring all its programming information to the displays at a readable rate. The recall display shall be interruptible at any time for changing of the program. Each program shall provide a total duration watering time in hours and minutes.

7. The controller shall allow for setting in a "rain mode" for up to seven days, after which it will revert to the "automatic mode".

8. Program may be protected by use of an access code.

9. Controller shall be capable of being operated manually at any time without affecting the original program.

10. The controller shall have a rechargeable battery back-up to maintain time and the user's program.

11. The controller shall have the capability of responding to external remote control signals when coupled to a master remote control system.

12. The controller shall have a built-in self test which allows the user to check each of the following:

    a. LED's for lighting and shorts
    b. the digital display for lighting and shorts
    c. each key of the keyboard for integrity and proper function
    d. all stations capable of being operated manually at any valve.

13. Output power capacity shall be 24 VAC, 1 amp maximum, equivalent to 24VA.

14. When the battery operated controller is used, a PT2 Nicad rechargeable battery pack shall be used.

The controller shall be housed in a pedestal type enclosure installed on a Class A Portland Cement Concrete foundation as recommended by the manufacturer of the controller. Enclosure shall be a weatherproof, 16 gauge zinc coated metal locking case to which 2 keys shall be provided. Enclosure shall be grounded with a minimum 6 foot copper clad ground rod. The enclosure and accessories shall be installed in conformance with the manufacturer's instructions and recommendations. Foundation to be a minimum of 4 inches deep and with sufficient width to prevent tipping.

D. Pipes and Fittings

1. **Mains** -- Irrigation mains shall be 3/4 inch or larger polyvinyl chloride pipe (PVC) Class 315 and shall be manufactured of Type 1, Grade I or II, 2,000 psi design stress compound designated as PVC 1120 or 1220, and shall conform to ASTM designation D1784 for rigid PVC compounds. All main lines of 3 inches or larger shall be ring tite. All plastic fittings shall be molded Schedule 40 fittings manufactured of the same material as the pipe and shall be suitable for either solvent weld or screwed connections. Solvent weld type couplings and fittings shall have a pressure rating equal to or greater than that of the pipe and shall be a type recommended by the pipe manufacturer.

2. **Laterals** -- Laterals shall be 1/2 inch or larger PVC Class 200 and shall be manufactured of Type 1, Grade I or II, 2,000 psi design stress compound designated as PVC 1120 and shall conform to ASTM designation D1784 for rigid PVC compounds.

All plastic fittings shall be molded fittings manufactured of the same material as the pipe and shall be suitable for either solvent weld or screwed connections. Solvent weld type couplings and fittings shall have a pressure rating equal to or greater than that of the pipe and shall be a type recommended by the pipe manufacturer. Brass pipe fittings shall be 150 psi, banded pattern. All nipples shall be of the same material as the pipe.

E. PVC Pipe Cements

1. **Primer** -- For all sizes of PVC pipe and fittings, primer shall be IPS P-70 PVC, Weld On #P-70 Primer, or approved equal.

2. **Cement** -- For all sizes of PVC pipe and fittings, cement shall be IPS 711, Weld On #711 Glue, or approved equal.

F. Sprinkler Heads -- All sprinkler heads shall be constructed of plastic or stainless steel and shall be matched precipitation rate (MPR) nozzles equipped with a Seal-A-Matic (SAM) check valve, or approved equal.

All sprinkler heads of a particular type or function in the system shall be of the same manufacturer and shall be marked with the manufacturer's name and identification in such a position that they can be identified without being removed from the system. All tree bubblers shall be placed below grade in perforated pipe with crushed rock and geotex fabric.

G. Sprinkler Risers -- All 1/2 inch riser nipples shall be threaded Schedule 80 PVC and swing joints shall be Schedule 80 PVC threaded street ells. All 1 inch riser assemblies shall consist of swing joints rated at 200 psi, 2-Schedule 80 PVC nipples and 1-Schedule 80 nipple.

H. Valves and Valve Boxes

1. **Remote Control Valves** -- All Remote Control Valves (RCV) shall be 24 volts, 3.5 watt maximum, normally closed, spring-loaded and diaphragm actuated. They should have a mechanical self-cleaning internal control system. The RCV shall be slow closing with no adjustments or settings required. A manual flow stem or throttle or close shall be provided. Each RCV will be equipped with a petcock. The solenoid is to be corrosion proof and molded in epoxy resin to form one integral unit. The RCV shall have two inlet tappings (furnished with one plugged) and capable of being installed as either a globe or angle valve. It must have a removable seat and be completely serviceable in the field without removing the valve body from the system.

   All RCV are to be isolated from the main line with a PVC Ball Valve and connected to the lateral with a schedule 80 union in the valve box. RCV used in drip irrigation systems shall incorporate an adjustable pressure regulator with a regulating range of 5 to 200 psi. The RCV shall be an electric solenoid type, and shall be the Hydrorain Series 100 or approved equal.

2. **Gate Valves** -- Gate valves shall be bronze body, bronze mounted, double disc, parallel seat with non-rising stem. Gate valves shall have "O" ring seals and have hubs suitable for use with the main distribution pipe furnished for the sprinkler system.

3. **Quick Coupling Valves** -- Quick coupling valves shall be two piece, 1 inch diameter Rain Bird 44RC with a coupler key, single lug-Rain Bird 44K or approved equal.

4. **Valve Boxes** -- Valve boxes shall be plastic with lock snap cover, green, with the word "Irrigation" embossed on the cover. Valve boxes shall be of the Brooks 1100 series, or approved equal. Valve boxes installed below the finish grades shall also include a 3M Marling Ball, or approved equal.

8-8 PLANTING MATERIAL

A. **Backfill** -- Backfill used in tree and shrub holes shall be a mixture of soil amendment (one-third) and excavated material (two-thirds) , thoroughly mixed.

B. **Fertilizer** -- Fertilizer shall be a commercial inorganic fertilizer in the granular or pellet form. Fertilizer shall be delivered to the site in containers labeled in accordance with the applicable State of California regulations, bearing the warranty of the producer for the grade furnished, and shall be uniform in composition, dry and free-flowing.

1. **Turf and Planting Areas** -- Pelleted types with analysis of 16-6-8.

2. **Planting Holes** -- Tablet types with an analysis of 20-10-5, Agriform Blue-Chip Tablets, 21 gram size, or approved equal.

C. **Herbicide** -- A list of approved products include: Surflan, Ronstat G, Ronstat WP, or approved equal.

D. **Hydromulch Seed**

1. Seed -- As specified on the approved plans.

2. **Fertilizer** -- Rate shall be applicable to site and type of seed used.

3. **Cellulose** -- The mulch shall be a green colored, fibrous, wood cellulose mulch containing no growth or germination inhabiting factors. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with fertilizer, seed, water, and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry; and, that when hydraulically
sprayed on the ground, the material will form a blotter-like ground cover impregnated uniformly with seed and mulch.

After application, this mixture will allow the for the absorption of moisture and allow the rainfall to percolate to the underlying soil. Cellulose shall be certified to indicate that laboratory and field testing of the product has been accomplished and that it meets all of the foregoing requirements. Weight specification of this material from suppliers and for all applications shall refer only to air dry weight of the fiber material. Cellulose rate shall be applicable to site and type of seed used.

4. **Water** -- Water for hydromulching shall be clean, potable and added to the slurry mixture in sufficient amount to spread uniformly the required quantity of hydromulch solids (approximately 3,000 gallons per acre).

5. **Equipment** -- Hydromulching equipment used for the application of the seed, fertilizer and slurry shall have a built-in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing up to 40 pounds of fiber plus a combined total of 70 pounds of fertilizer solids and seed for each 100 gallons of water. The slurry distribution lines shall be large enough to prevent stoppage. This discharge line shall be equipped with a set of hydraulic spray nozzles which will provide a continuous non-fluctuating discharge and delivery of the slurry in the prescribed quantities uniformly, without misses, waste or erosion. The slurry tank shall have a minimum capacity of 1,000 gallons and shall be mounted on a traveling unit which may be either self-propelled or drawn. The Town Inspector may authorize equipment with smaller tank capacity provided that the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat.

E. **Imported Topsoil** -- Topsoil shall be an imported fertile, friable soil of loamy character containing a normal amount of organic matter. It shall be obtained from well drained, arable land and shall be free from refuse, roots, heavy or stiff clay and stones larger than 1 inch in size. Soil shall, by particle examination, containing the following percentages: Sand--between 45 and 52%; Silt--between 26 and 50%; Clay--between 6 and 26%. Sands shall range form 2 to 0.05 millimeters in diameter; Silt from 0.05 to 0.002 millimeters in diameter; and Clay less than 0.002 millimeters in diameter.

F. **Mulch** -- Mulch shall be a fibrous, woody bark mixture. A list of approved products includes: Sun-Up Forest Products, "Walk-on-Bark", or approved equal.

G. **Plant Stock and Ground Cover** - Plants shall be the variety, quantity and size indicated on the approved plans. Quality and size shall conform to the State of California Grading Code of Nursery Stock, No. 1 grade. Nursery grown stock only shall be used and shall be free from insect pests and diseases.

All plants shall comply with Federal and State laws requiring inspection for plant diseases and infestations. Inspection certificates required by law shall accompany each shipment of plants, and certificates shall be delivered to the Town Inspector. All plants shall be true to specified and size indicated, and shall be tagged in accordance with the standard practice recommended by the American Association of

Nurserymen; however, determination of plant species or variety will be made by the Public Works Director and shall be final.

Plants shall be healthy, shapely and well rooted, and roots shall show no evidence of having been root bound, restricted or deformed. Root conditions of plaints in containers will be inspected by the Town Inspector and determined by removal of earth from the roots of not less than two plants of each specified or variety from each source. In case the sample plants inspected are found to be defective, the Inspector reserves the right to reject the entire lot or lots of plants represented by the defective samples. All plants rendered unsuitable for planting because of this inspection shall be immediately removed from the site.

Each plant shall be handled and packed in the approved manner for that species or variety and all necessary precautions shall be taken to ensure that the plants will arrive at the site of the work in the proper condition for successful growth without scarred or broken branches. Trucks used for transporting plants shall be equipped with covers to protect plants from wind burn.

Substitutions will not be permitted unless proof is submitted to the Town Inspector that any plant specified is not obtainable. The Inspector will consider use of the nearest equivalent size or variety.

Plants shall have straight trunks with the leader intact, undamaged and uncut. Trees shall be well tapered in the trunk so that they will stand alone without the support of the nursery stake. Branching on the main leader shall be in alternate locations and well spaced apart with no severe crossing of branches. All old abrasions and cuts shall be completely calloused over. All plants shall be measured when their branches are in their normal positions. Height and spread dimensions indicated refer to the main body of the plant and not from branch or root tip to tip. Indicated sizes shown are before pruning. Plants shall be pruned prior to delivery except upon approval of the Town Inspector.

Ground cover shall be rooted plants, grown in flats unless otherwise approved by the Inspector.

H. Seed -- Seed mixture shall be 98 percent pure, and noxious weed free, with a minimum of 88 percent Germination. Seed variety or mix shall be as specified on the approved plans. All seed shall be cleaned Grade A "new crop" seed, delivered in the original unopened containers, and shall bear a guaranteed analysis and dealer's label. The dealer may mix the seed provided a guaranteed statement or composition of mixture and percentages of purity and germination of each variety is attached to the sealed container. The seed shall be pre-treated with a pre-emergence fungus preventative in accordance with the manufacturer's specifications. The seed containers shall be stored immediately in a dry, weather and damp proof structure. Any seed which has become wet, moldy or is otherwise damaged in transit or storage will not be acceptable. Supplier shall be approved by the Town Inspector prior to delivery.

I. **Soil Amendment** -- Soil amendment shall be delivered to the job site bearing the warranty of the producer for the grade furnished and shall be uniform in composition and free flowing. Grade shall be 0 to 1/4 inches with 15% maximum proportion of 1/4 inch particles.

Soil amendment shall be nitrogen stabilized (1-0-0) and shall be Sequia Forest Products' Forest Humas, Mallard Creek Nitro Plus, or approved equal.

J. **Tree Stakes and Ties**

1. **Tree Stakes** -- Tree stakes shall be straight, close grained hardwood, pointed at one end. Stakes shall be pointed prior to treatment with copper naphthalene which shall penetrate stake surfaces to a minimum depth of 1/4 inch. Tree stakes will consist of 2-two inch diameter by 8 foot long, round stakes.

2. **Tree Ties** -- A list of approved products include: Gro-Strait, or approved equal

3. **Earth Anchors** -- The size of trees to be supported shall determine the necessary holding capacity of these anchors. Anchor holding capacity to be approved by the Public Works Director. A list of approved products include: Landscape Supply Co.'s "Duckbill", or approved equal.

8-9 IRRIGATION TESTING

A. **Service Lines and Irrigation Main** -- Upon completion of the main line distribution system, lateral lines and installation of the electric control valves, the system shall be flushed and then capped. After notifying the Town Inspector 72 hours in advance, the system will be pressure tested by applying a continuous static water pressure and shall meet the following conditions:

1. Main lines to hold 150 psi for four hours.

2. Lateral lines at line pressure for four hours.

Repair any leaks resulting from the pressure tests. Pressure testing shall continue until no leakage or loss of pressure is shown over the entire prescribed test period. At the conclusion of the pressure tests, the heads shall be installed and tested for operation in accordance with design requirements under normal operating pressures.

B. **Electrical System** -- Prior to the acceptance of the improvements, the Contractor shall pass the following tests to the electrical system:

1. Continuity of each circuit
2. Grounds in each circuit
3. A megger test on each circuit
4. A functional test in which it is demonstrated that each and every part of the system functions as specified or intended herein.

8-10 MAINTENANCE PERIOD

A. **Preliminary Inspection** -- Upon completion of all irrigation and planting work, the Contractor shall notify in writing the Town that the landscaping is ready for preliminary inspection. The approval of the completed work will establish the beginning of the maintenance period. No partial approvals will be given.

B. **Maintenance Period** -- The maintenance period shall be 120 calendar days from the approval of the constructed improvements. A longer period may be required to establish acceptable stands of thriving plants.

C. **Overall Maintenance Requirements** -- Maintenance shall include all watering, weeding, mowing, fertilizing, cultivation, spraying and pruning necessary to keep the plant material in a healthy, growing condition and to keep the planted areas neat and attractive in appearance throughout the maintenance period. Maintenance shall also include responsibility for maintaining adequate protection for all landscaped areas. Any damaged areas shall be repaired at no additional expense to the Town.

During the maintenance period, should the appearance of any plant indicate weakness and the probability of dying (in the opinion of the Town Inspector) that plant shall be replaced immediately by the Contractor at his own expense. Replacements shall be made in the same manner as specified for the original planting. At the end of the maintenance period, all plant material shall be in a healthy, growing condition and free of physical injury of any kind.

Maintenance includes all items constructed under the approved plans. All items shall be maintained in an optimum working condition. The site shall be kept free of debris, including emptying trash containers, by means of a general clean-up twice a week.

D. **Watering** -- All plants shall be watered not less than twice a week. Each watering shall be of such quantity as to provide optimum growth conditions. The Contractor shall provide the equipment and means for its proper application.

E. **Lawn Maintenance** -- Lawn areas which fail to germinate shall be re-seeded at maximum 10 day intervals until a vigorous, uniform stand of turf is established. Lawn areas shall be kept free of weeds, by hand pulling, or they may be sprayed with an approved selective chemical herbicide before the weeds exceed 2 inches in height.

Lawns shall be mowed for the first time after establishment of a vigorous, uniform stand of turf has reached 3 inches. Lawns shall be trimmed at the edges of curbs, walks, paving and other surface improvements. Clippings and debris shall be removed from the site. Lawn shall be mowed a second time when it again reaches a 3 inch height, except that the second cutting shall be performed no sooner than 10 days after the first. Mowing shall then take place at maximum 1 week intervals until final acceptance.

After the second mowing, apply the second application of fertilizer. Apply fertilizer (16-6-8) at the rate of 5 pounds per 1,000 square feet uniformly over the turf area. Fertilizer is to be applied one more time just prior to final inspection.

F. **Plants** -- Plants installed shall be properly maintained by regular watering, cultivating, weeding, re-mulching, repair of stakes, pruning, and treatment of insects and pests. Any plants which are vandalized, diseased, dead or in an unhealthy condition shall be replaced by the Contractor at his own expense within two weeks after notification from the Town Inspector. Any lawn or plants damaged by herbicide shall be replaced by the Contractor at his own expense. Maintenance shall also include treatment or replacement due to fungus, diseases, rodents and insects.

G. **Weeding and Grading** -- All areas to be weeded at intervals of not more than 10 days. Rocks, clods and debris which appears on the surface shall be removed. Heaved, settled or eroded areas shall be restored by excavating, filling, finish grading, rolling and re-seeding as required.

8-11 CLEANING UP -- The Contractor shall at all times keep the premises from accumulations of waste, material or rubbish caused by his employees, or employees of the subcontractors, and at the completion of his work, shall remove all rubbish from and about the site and all tools, scaffolding and/or surplus materials.

8-12 FINAL INSPECTION AND ACCEPTANCE

A. **Timing** -- Final inspection will be conducted at the end of the maintenance period. Notice requesting the final inspection shall be submitted in writing by the Contractor to the Public Works Director at least 7 days prior to the anticipated date.

B. **Review** -- Acceptance of the project by the Town will be contingent upon proper maintenance and the establishment of a vigorous, uniform stand of turf, healthy plants, weeded site, repair of any damaged surface improvements, repair of any damaged irrigation components and a through cleaning of the site.

Just prior to final inspection, Contractor shall apply fertilizer (16-6-8) to the areas as follows:

15 g.c. plants	1 cup
5 g.c. plants	1/2 cup
1 g.c. plants	1/4 cup
Ground cover	10 pounds per 1,000 square feet
Lawn areas	5 pounds per 1,000 square feet

Fertilizer shall be spread around plant bases and thoroughly watered.

C. **Corrective Work**

1. Turf -- Any portion of turf which does not show a vigorous, uniform stand shall be replaced and shall make all lawn areas subject to continued maintenance at the Contractor's expense.

2. Plants -- Plants which are missing, vandalized, dead or unhealthy shall be replaced by the Contractor at his expense with the same species and sizes as specified on the approved plans. The Contractor shall make replacements within two weeks after final inspection and maintain the plants for an additional 30 days.

3. Irrigation -- The irrigation system shall be repaired to conform to the requirements of the approved plans and associated specifications.

D. Final Acceptance -- If project improvements, corrective work and maintenance have not been performed as specified to the satisfaction of the Town Inspector, maintenance shall continue at the Contractor's expense until such time as work has been successfully completed. Once work has been performed as specified and to the Town Inspector's satisfaction, the Town will assume maintenance responsibilities following the final inspection.

8-13 GUARANTEE

A. Plants -- All trees, shrubs, ground covers and other plant materials shall be guaranteed to take root, grow and thrive for a period of one year after final acceptance of work. Any trees or other plant materials that die back and lose the form and size specified on the approved plans shall be replaced by the Contractor at his own expense, even though they have taken root and are growing after the die-back.

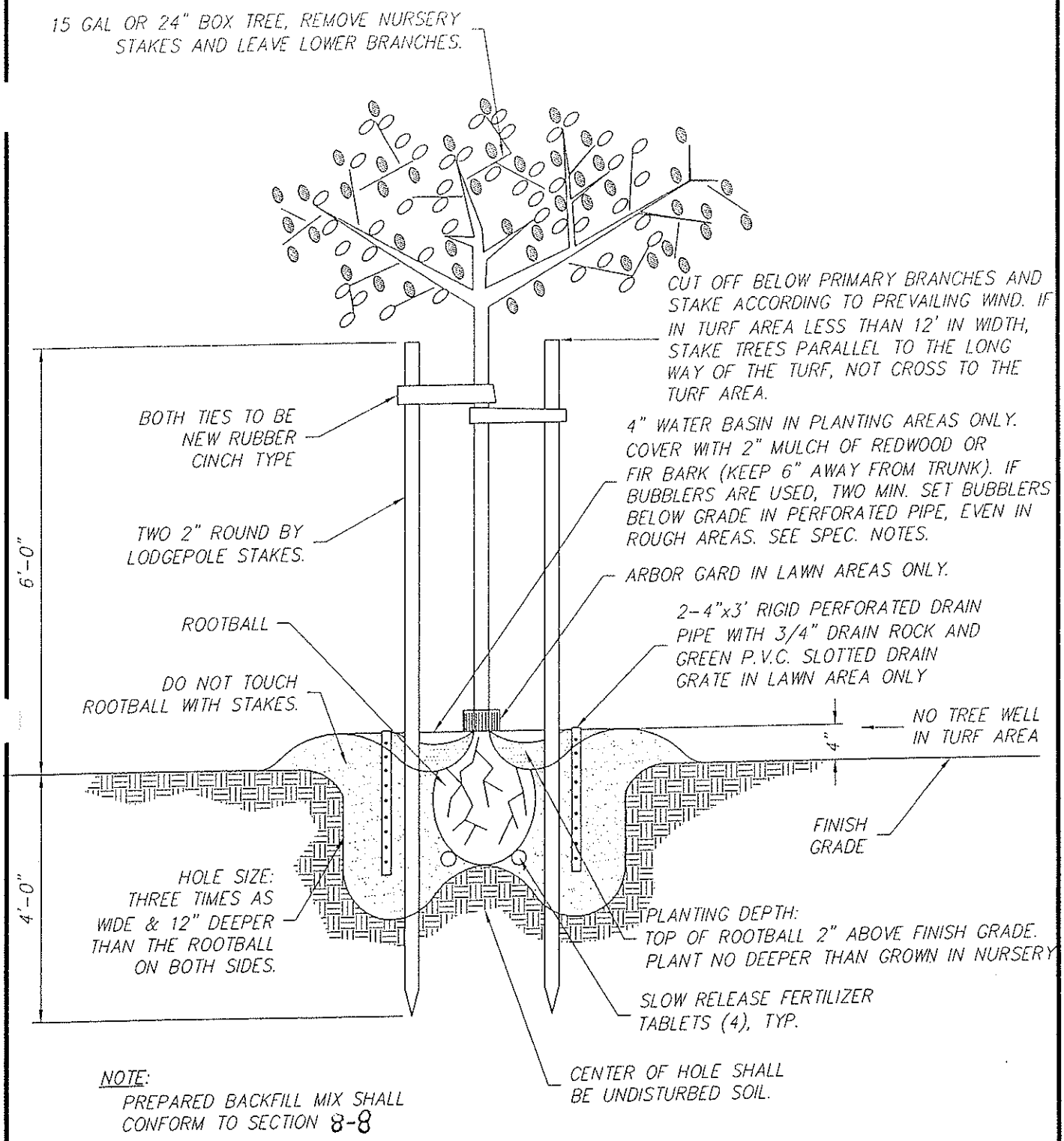
Within 15 days of written notification by the Town, the Contractor is to remove and replace all guaranteed plant materials which, for any reason, fail to meet the requirements of this guarantee. Replacements shall be made to the same specifications and materials as required on the approved plans and shall carry this same guarantee from the time they are replaced.

B. Irrigation -- The entire sprinkler system shall be unconditionally guaranteed by the Contractor as to material and workmanship, including settling or backfilling areas below grade, for a minimum period of one year following the date of the final acceptance of the work.

If, during the guarantee period, settlement occurs and adjustments in pipes, valves, sprinkler heads, sod or paving is necessary to bring the system, sod or paving to the proper level of the permanent grades, the Contractor shall make the adjustments at his own expense, including the complete restoration of all damaged planting, paving or other improvements of any kind.

Should any operational difficulties in connection with the sprinkler system develop within the specified guarantee period, which, in the opinion of the Town, may be due to inferior material and/or workmanship, said difficulties shall be immediately corrected by the Contractor to the satisfaction of the Town at no additional costs to the Town, including any and all other damage caused by such defects.

LANDSCAPING STANDARD DETAILS



NOTE:
PREPARED BACKFILL MIX SHALL CONFORM TO SECTION 8-8

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

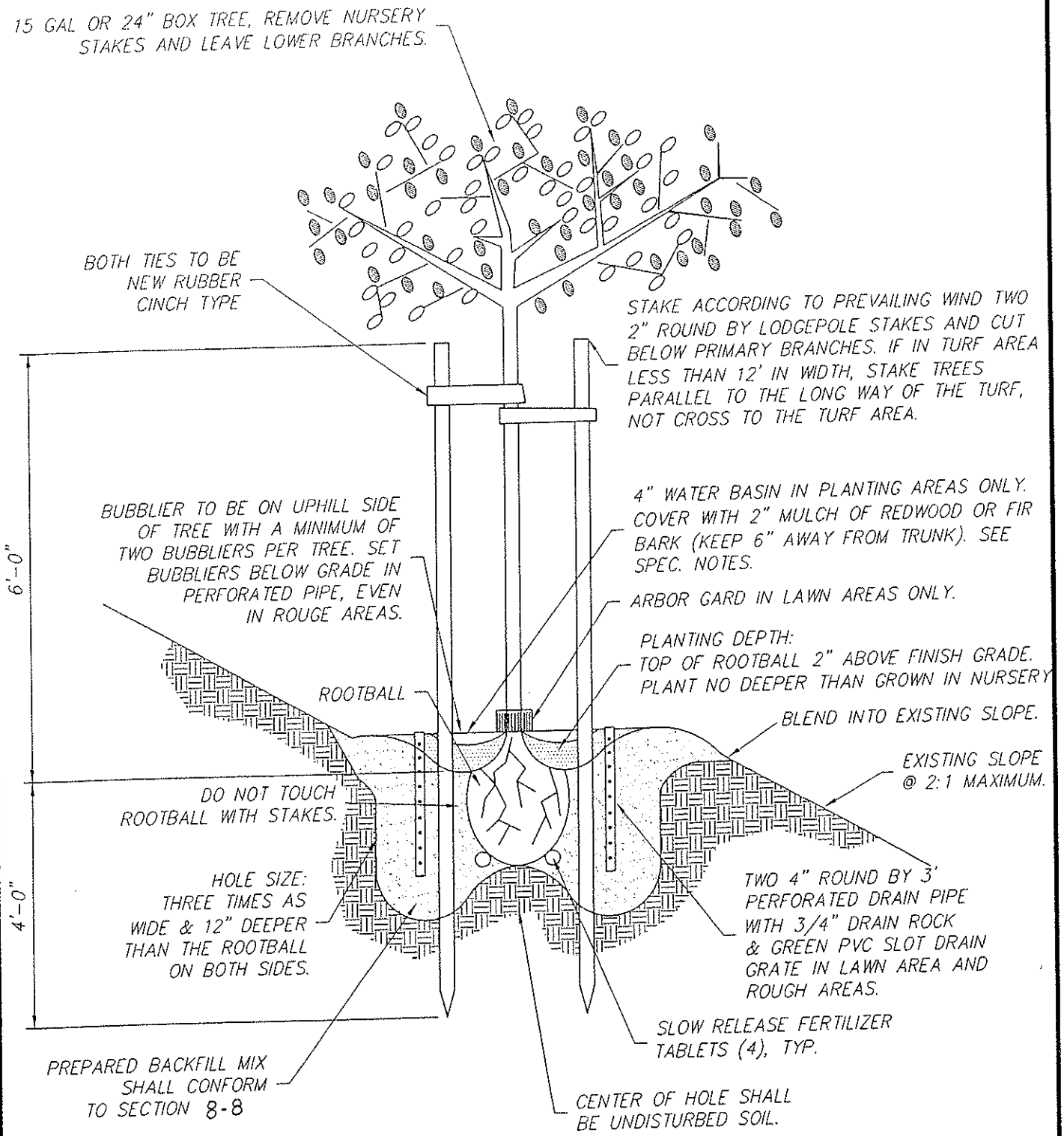
REVISED:

TOWN OF LOOMIS

TREE PLANTING

DEPARTMENT OF PUBLIC WORKS

LSC-1



APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

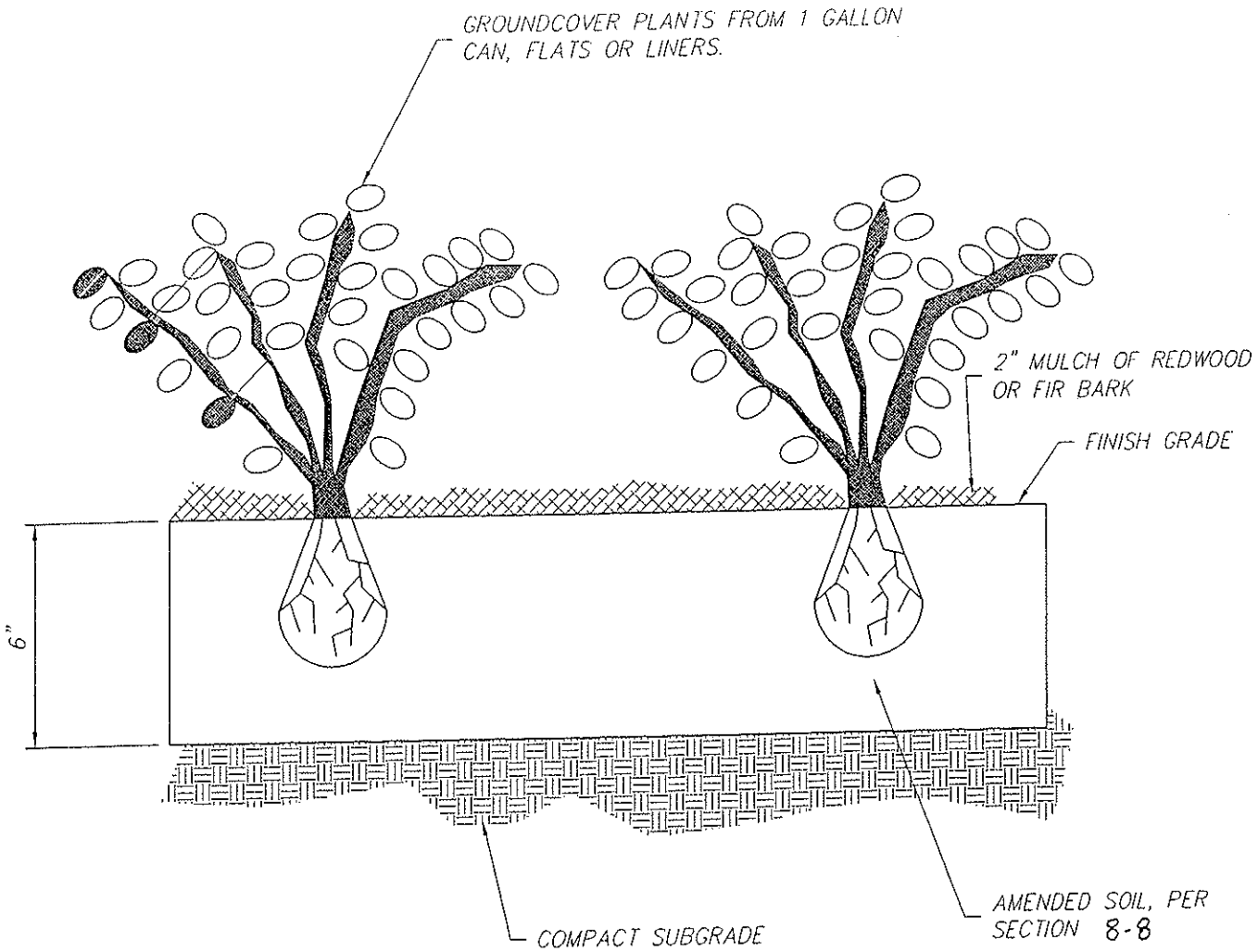
REVISED:

TOWN OF LOOMIS

TREE PLANTING ON SLOPE

DEPARTMENT OF PUBLIC WORKS

LSC-2



APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

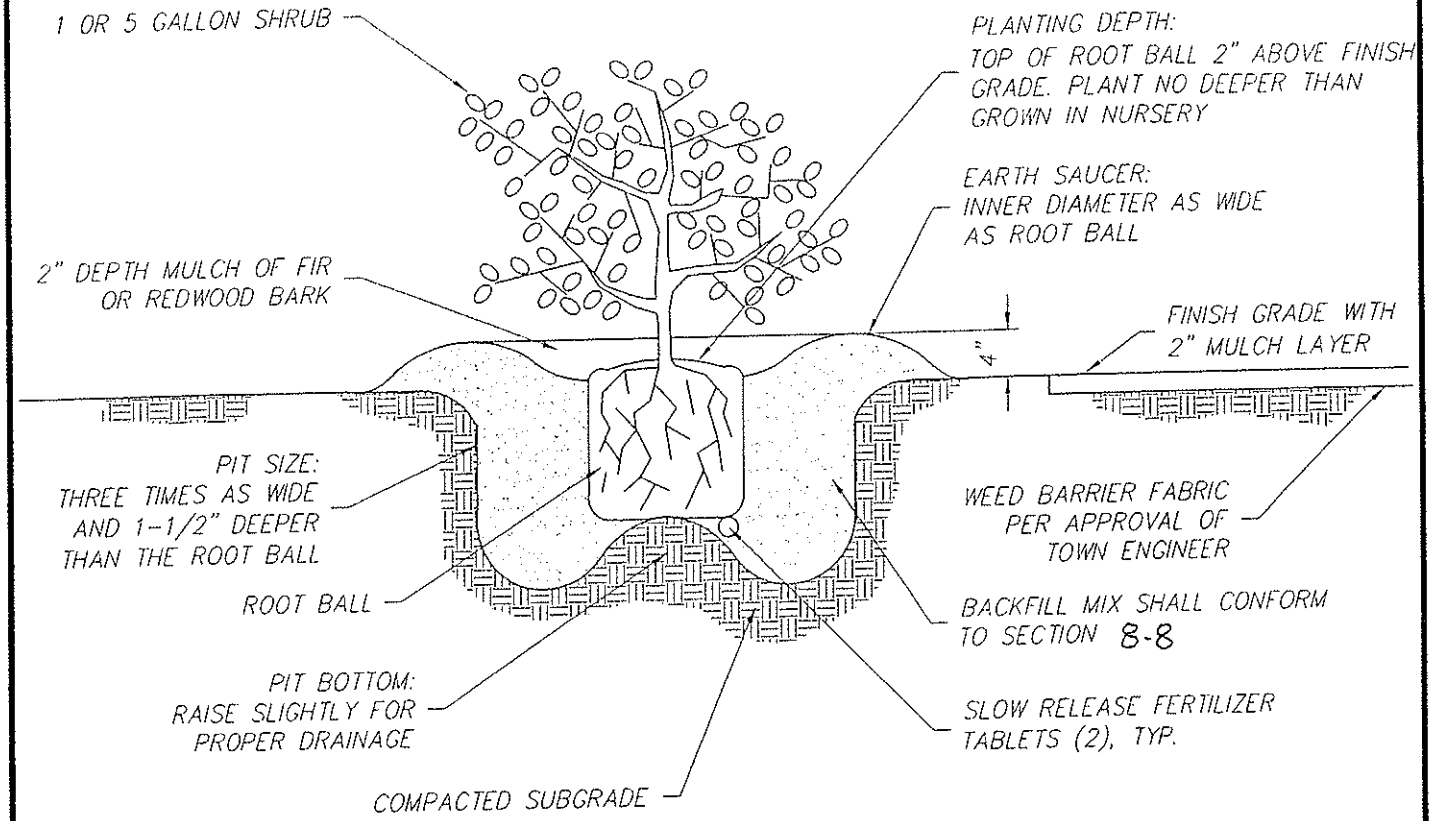
REVISED:

TOWN OF LOOMIS

GROUNDCOVER PLANTING

DEPARTMENT OF PUBLIC WORKS

LSC-3



NOTES:

1. PROVIDE CITY WITH PLANTING MIXTURE SPECIFICATIONS
2. PLANTER AREA SHOULD HAVE PRE-EMERGENT HERBICIDE APPLIED BEFORE PLANTING TO PREVENT GERMINATION OF WEED SEEDS
3. WEED BARRIER FABRIC SHALL BE UTILIZED IN ALL PUBLIC MAINTAINED LANDSCAPE AREAS.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

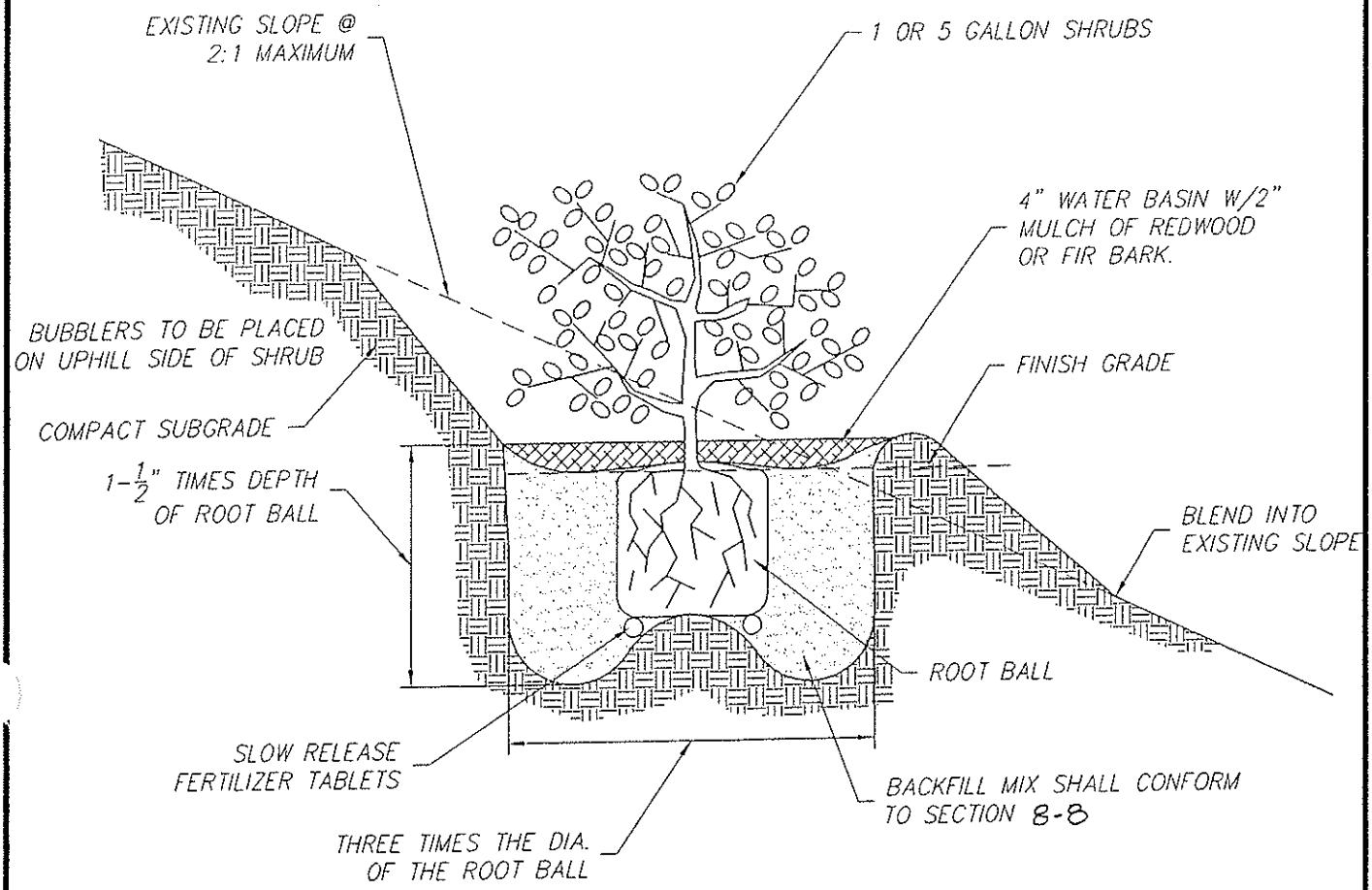
REVISED:

TOWN OF LOOMIS

SHRUB PLANTING DETAIL

DEPARTMENT OF PUBLIC WORKS

LSC-4



NOTE: PLANTER AREAS SHALL HAVE PRE-EMERGENT HERBICIDE APPLIED BEFORE PLANTING TO PREVENT GERMINATION OF WEED SEEDS

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

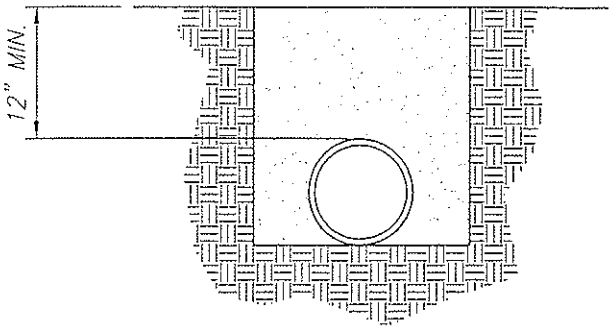
TOWN OF LOOMIS

SHRUB PLANTING ON SLOPE

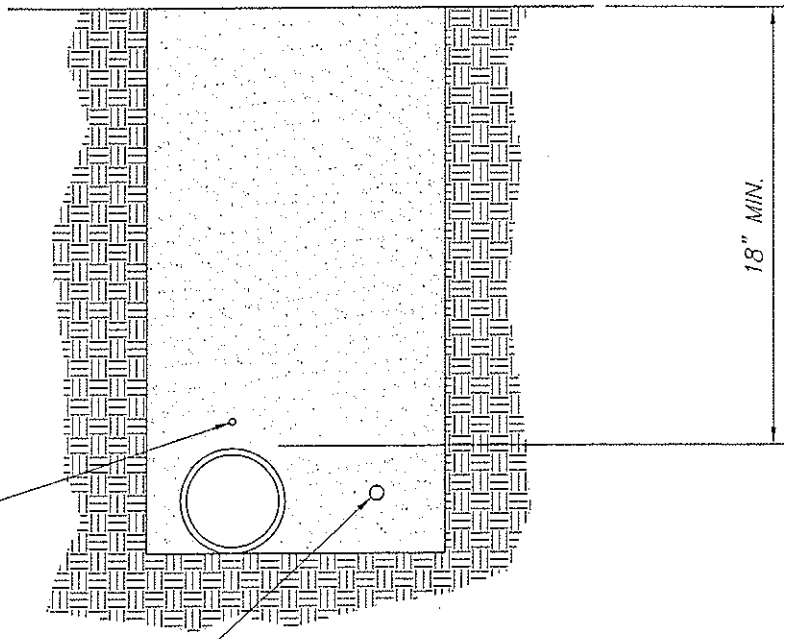
DEPARTMENT OF PUBLIC WORKS

LSC-5

NON PRESSURE LATERAL



PRESSURE MAIN LINE



INSTALL #10 BARE COPPER TRACE WIRE IN MAINLINE TRENCH, LEAVE 8" LOOP EXPOSED IN EACH VALVE BOX. SOLDER ANY SPLICES IN TRACE WIRE.

CONTROL WIRE ADJACENT TO PRESSURE MAIN LINE. BUNDLE TAPE AT 10'-0" INTERVAL TO PIPE.

BUNDLE TAPE AT 4'-6" INTERVALS FOR MORE THAN ONE WIRE.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

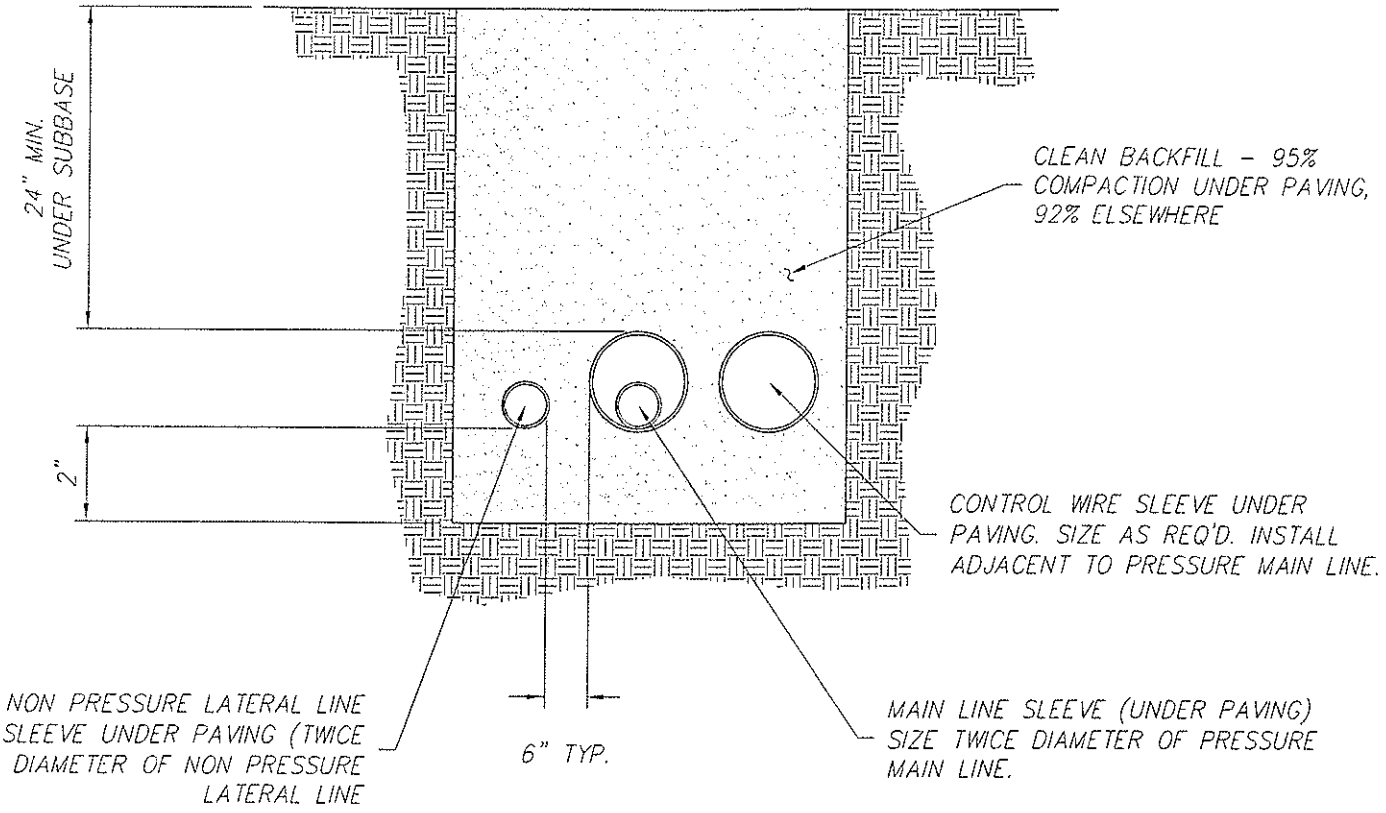
REVISED:

TOWN OF LOOMIS

LANDSCAPE PIPE TRENCHING DETAIL

DEPARTMENT OF PUBLIC WORKS

LSC-6



NOTES:

1. ALL SLEEVES TO BE SCH 40 PVC
2. EXTEND ALL SLEEVES 12" BEYOND EDGE OF HARDSCAPING AT BOTH ENDS, CAP ENDS AND FLAG LOCATIONS

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

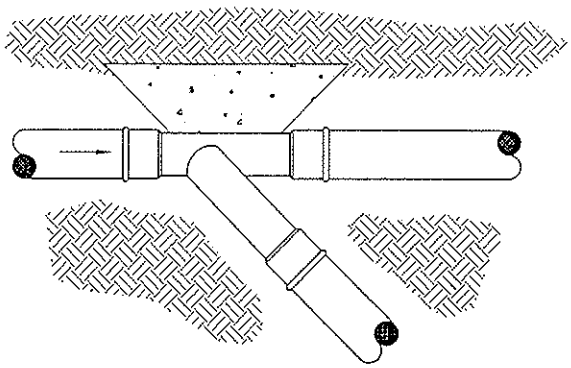
REVISED:

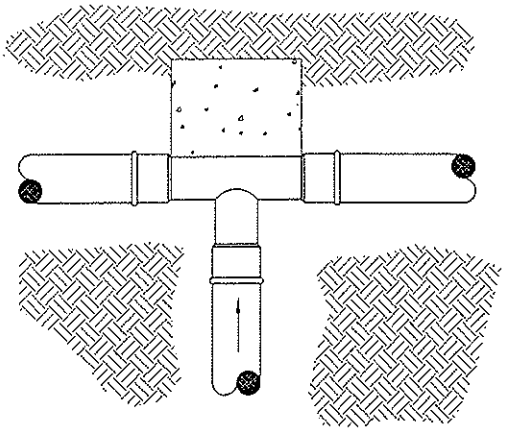
TOWN OF LOOMIS

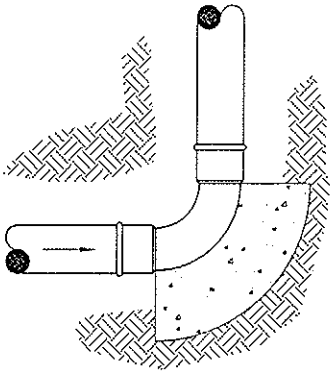
LANDSCAPE
PIPE TRENCHING
UNDER PAVEMENT

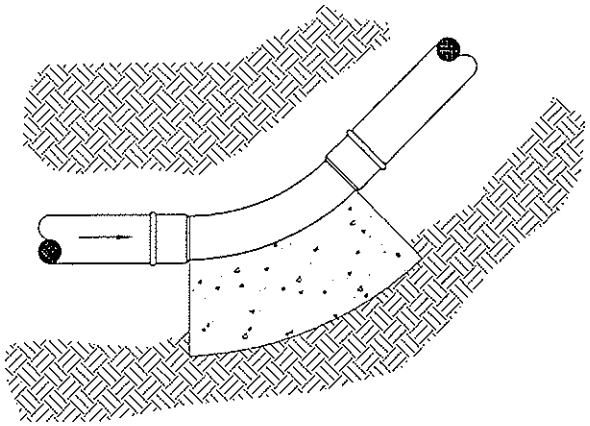
DEPARTMENT OF PUBLIC WORKS

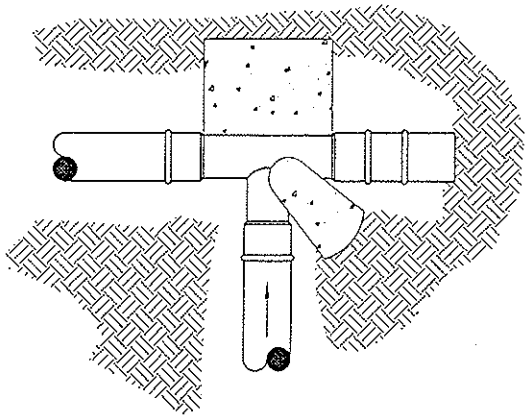
LSC-7

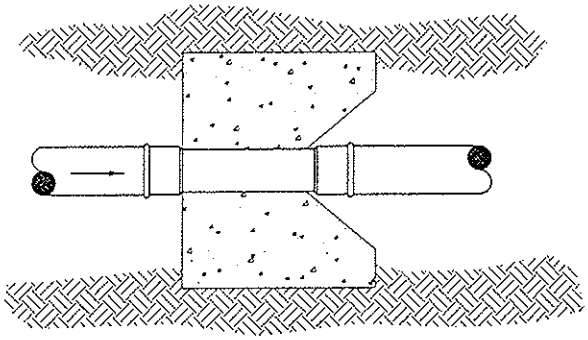








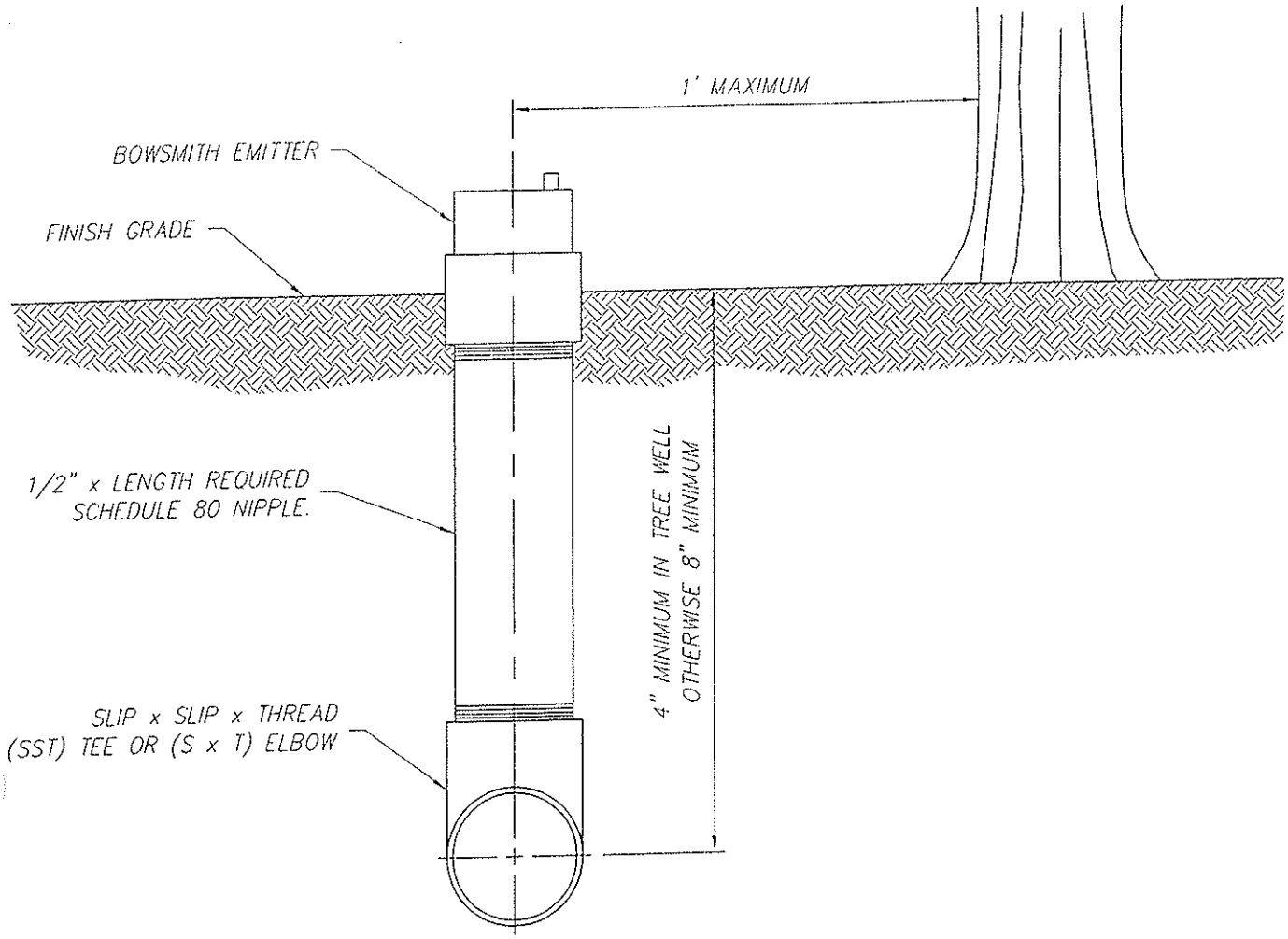




NOTES:

1. *DO NOT COVER JOINTS WITH CONCRETE.*
2. *SIZE THE THRUST BLOCKS AS SPECIFIED BY THE PIPE MANUFACTURER.*
3. *FOR 4" AND GREATER PIPE.*

APPROVED BY: BRIAN J. FRAGIAO DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER REVISED:		TOWN OF LOOMIS **IRRIGATION THRUST BLOCK DETAILS** DEPARTMENT OF PUBLIC WORKS	LSC-8



NOTES:

1. LOCATE EMITTER ON UP-HILL SIDE OF THE TREE OR SHRUB.
2. DO NOT TEE STRAIGHT UP OFF LATERAL. TEE HORIZONTAL THEN 90 DEGREES VERTICAL.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

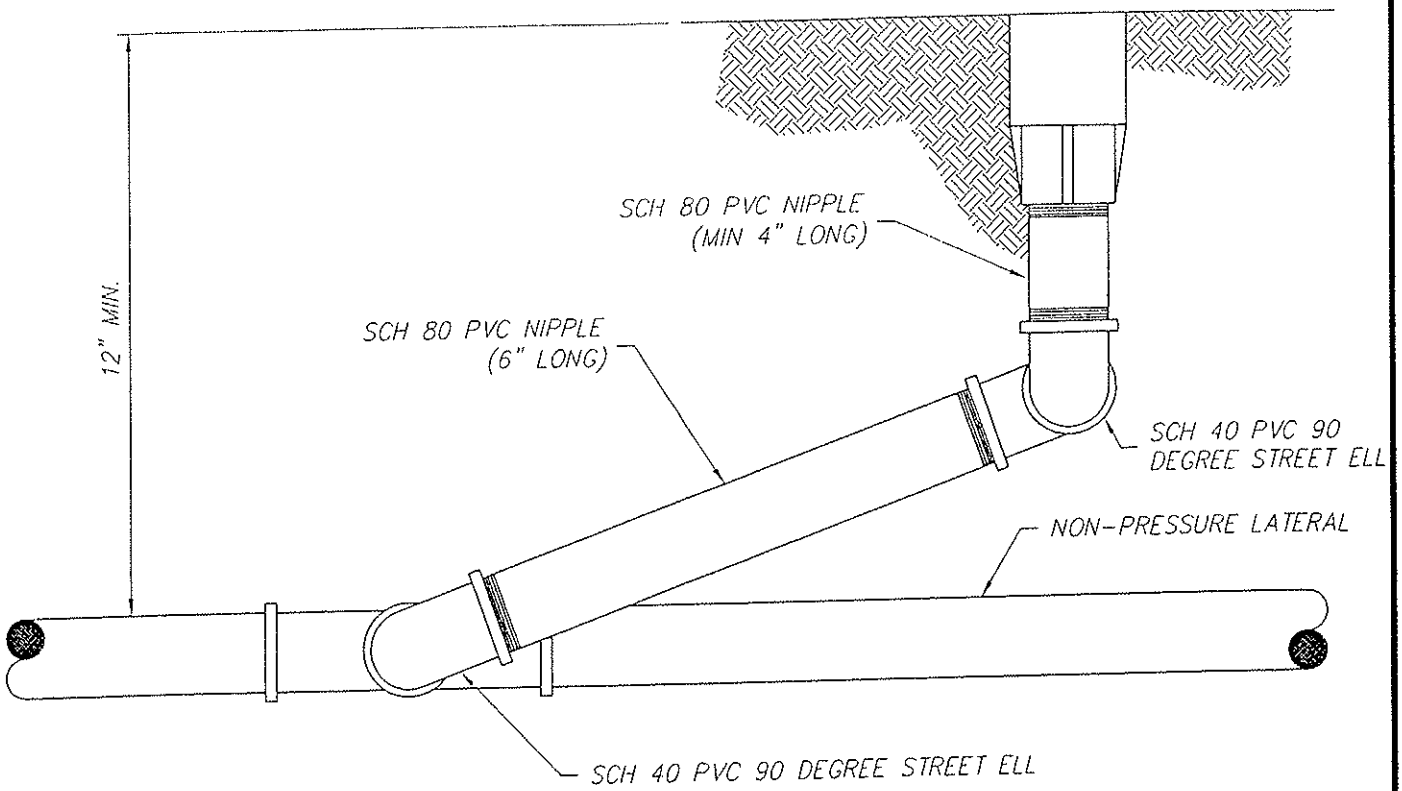
REVISED:

TOWN OF LOOMIS

ABOVE GRADE EMITTER

DEPARTMENT OF PUBLIC WORKS

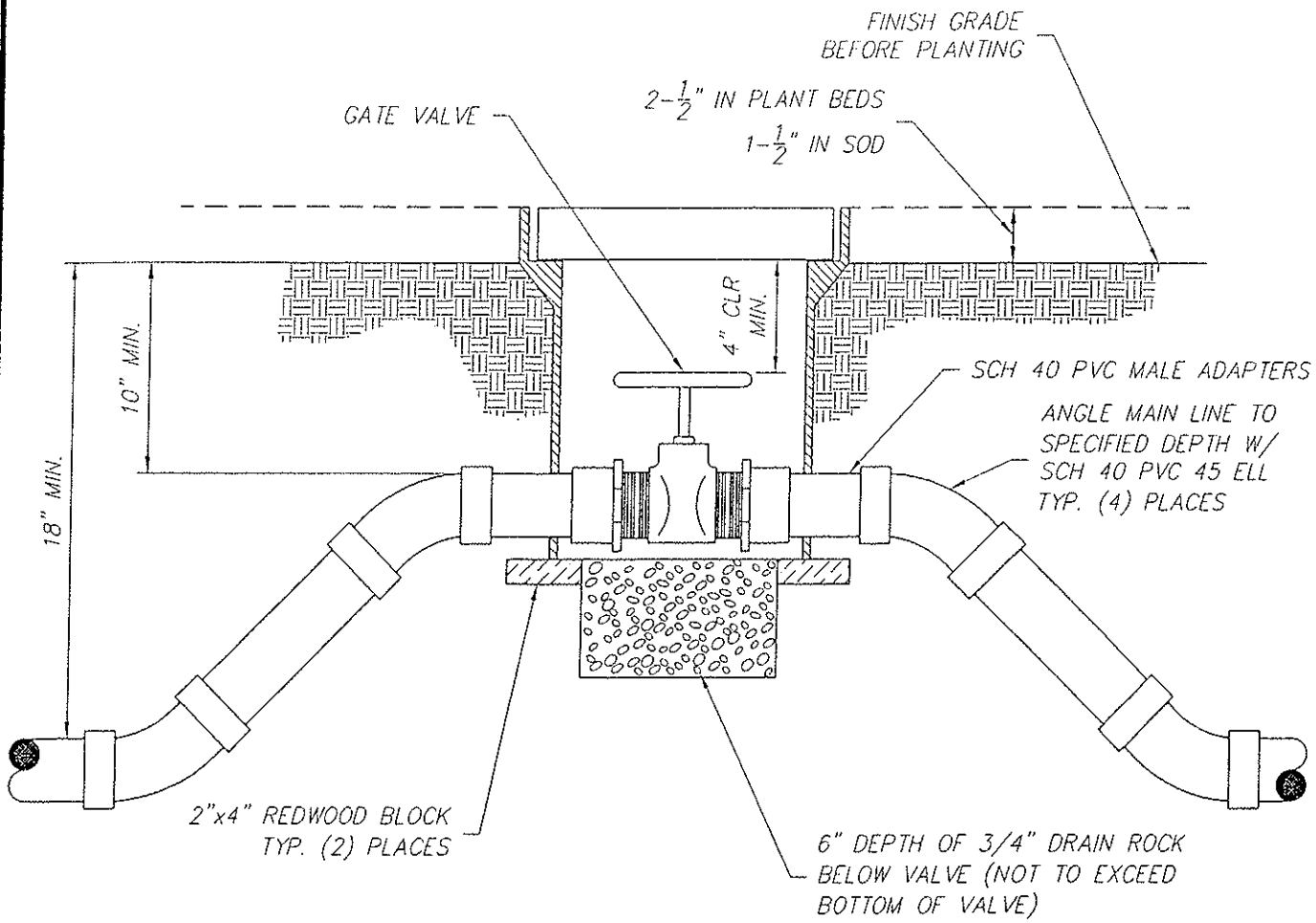
LSC-9



NOTES:

1. LOCATE HEAD 2" FROM WALKS, CURBS, HARDSCAPING, MOW STRIPS, AND HEADER BOARDS.
2. LOCATE STREAM SPRAY/BUBBLIERS 6" FROM ALL STRUCTURES, AND SPRAY HEADS 12" FROM ALL STRUCTURES, BUT 6" FROM ALL STRUCTURES IN GROUND COVER AREAS.
3. USE TEFLON TAPE ON ALL THREADED FITTINGS EXCEPT BETWEEN MARLEX FITTINGS.

APPROVED BY: BRIAN J. FRAGIAO DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER REVISED:		TOWN OF LOOMIS POP-UP SPRAY HEAD DEPARTMENT OF PUBLIC WORKS	LSC-10



NOTES:

1. PLACE 3/4" DIA. ROCK PRIOR TO INSTALLATION OF VALVE BOX.
2. GATE VALVE AND FITTINGS SHALL BE LINE SIZE UNLESS NOTED OTHERWISE.
3. USE TEFLON TAPE ON ALL THREADED FITTINGS.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

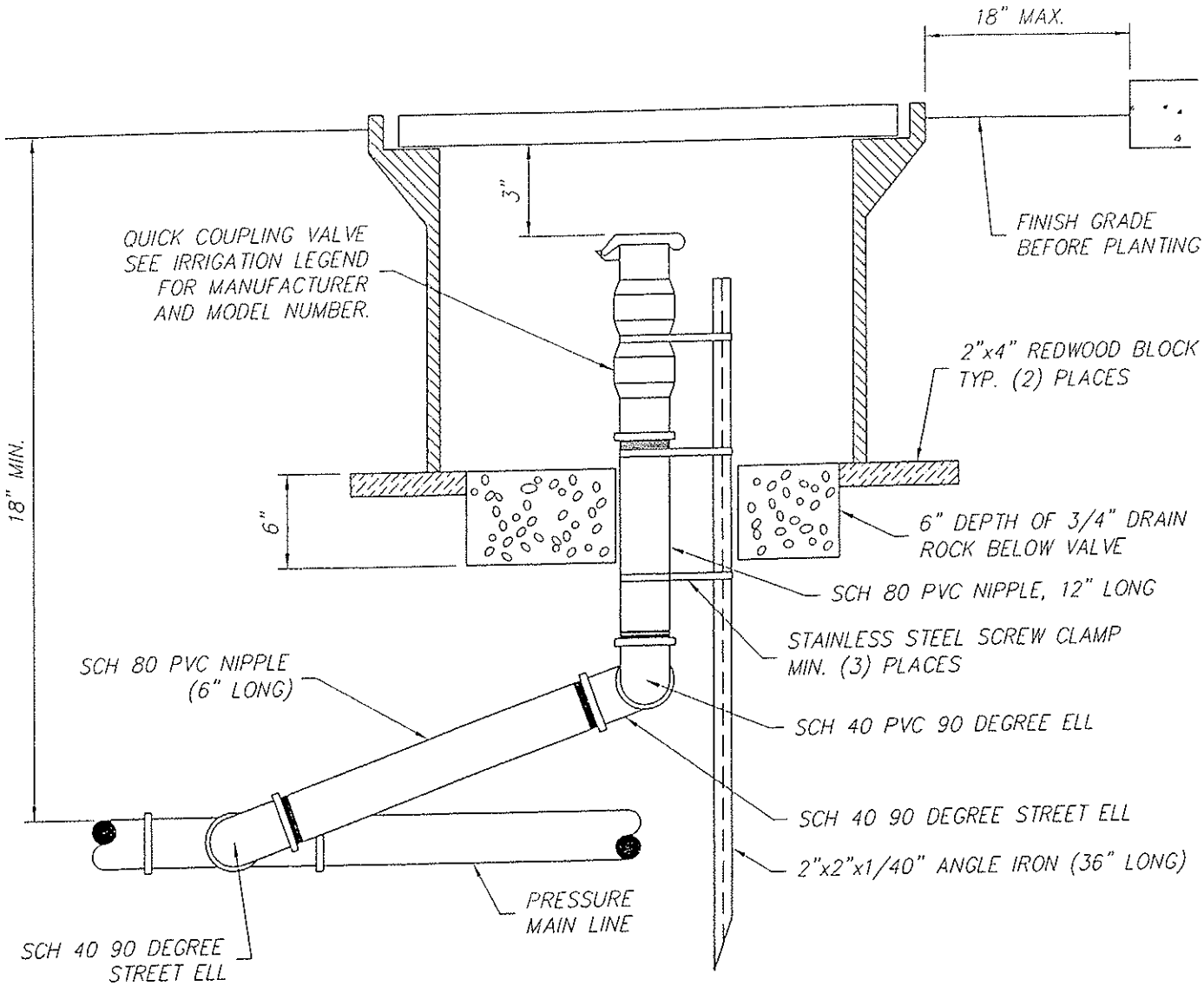
REVISED:

TOWN OF LOOMIS

GATE VALE - 3" & SMALLER

DEPARTMENT OF PUBLIC WORKS

LSC-11



NOTES:

1. INSTALL VALVE BOXES SO THAT THE TOP OF THE BOX IS FLUSH WITH THE TOP OF THE ADJACENT HARDSCAPE.

2. USE TEFLON TAPE ON ALL THREADED CONNECTIONS.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

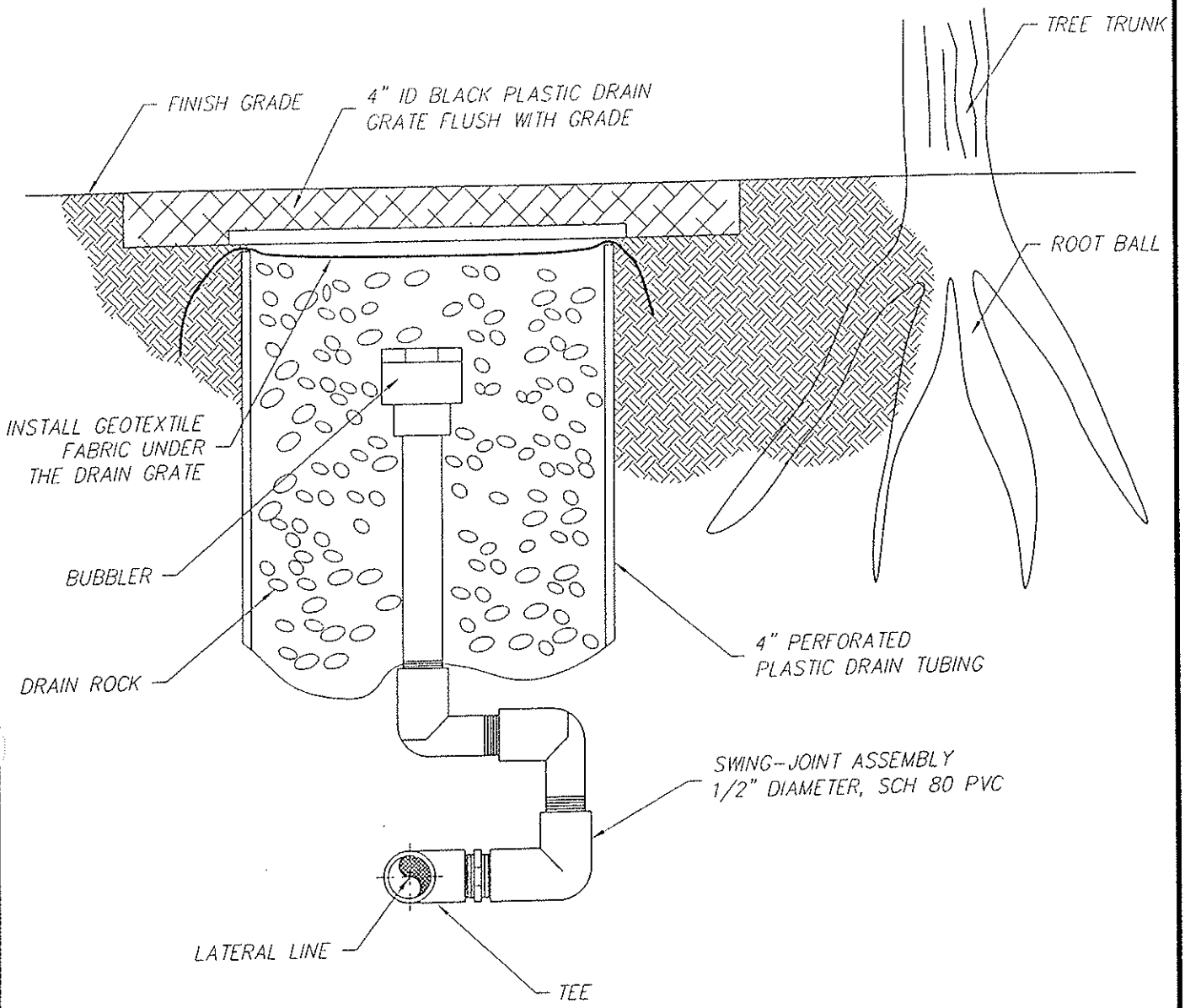
REVISED:

TOWN OF LOOMIS

QUICK COUPLING VALVE DETAIL

DEPARTMENT OF PUBLIC WORKS

LSC-12



NOTE: ROOT BALL ADJACENT TO PERFORATED PIPE HOLES TO FACE ROOT BALL.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

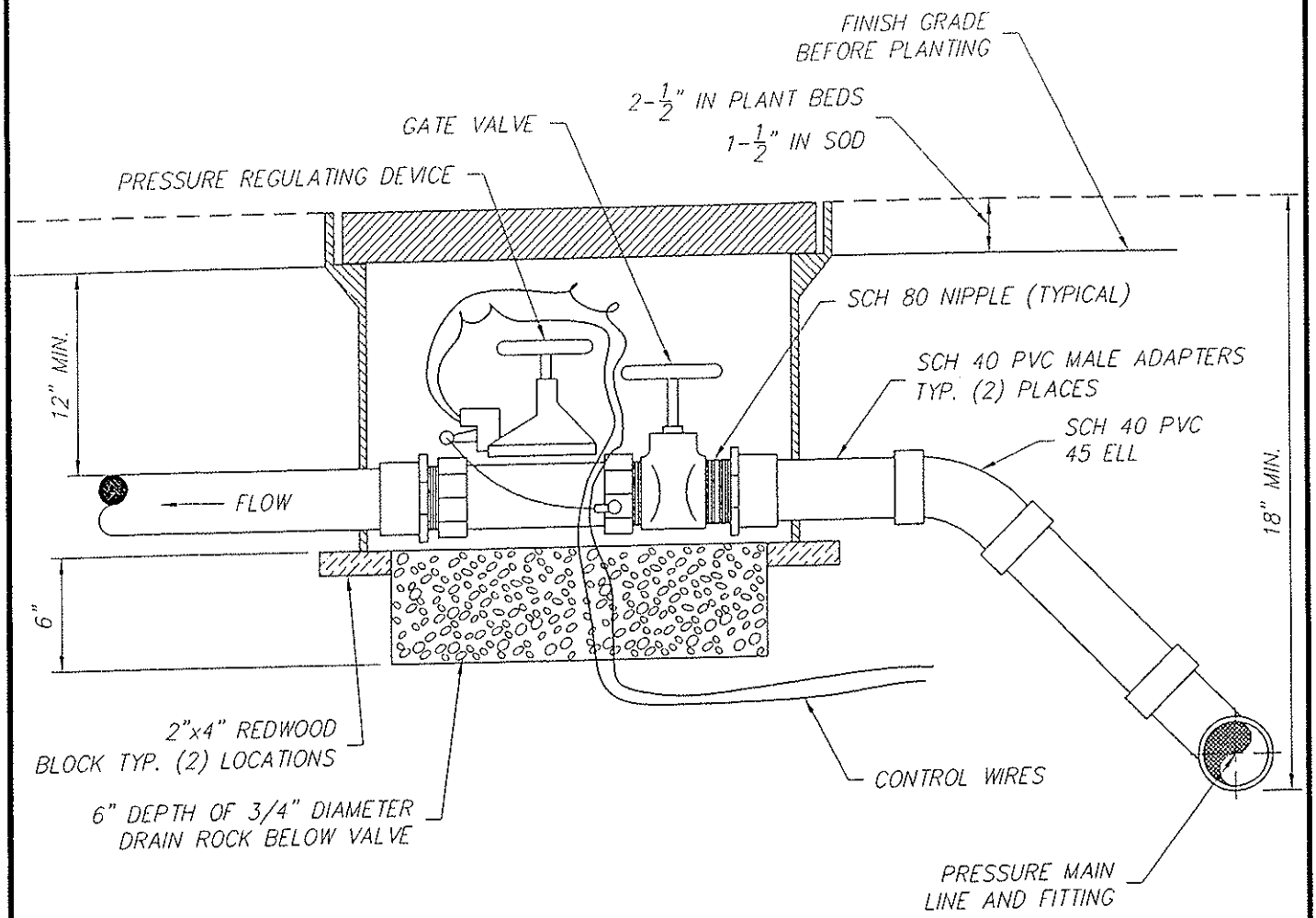
REVISED:

TOWN OF LOOMIS

TREE BUBBLER

DEPARTMENT OF PUBLIC WORKS

LSC-13



NOTES:

1. INSTALL CONTROL VALVES A MINIMUM OF 12" FROM STRUCTURES OR HARDSCAPING.
2. INSTALL VALVES IN PLANT BEDS WHEREVER POSSIBLE.
3. PLACE VALVE BOX AT RIGHT ANGLES TO STRUCTURES OR HARDSCAPING.
4. INSTALL VALVE BOX SO THAT TOP OF BOX IS FLUSH WITH ADJACENT HARDSCAPING.
5. USE TEFLON TAPE ON ALL MALE THREADS.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

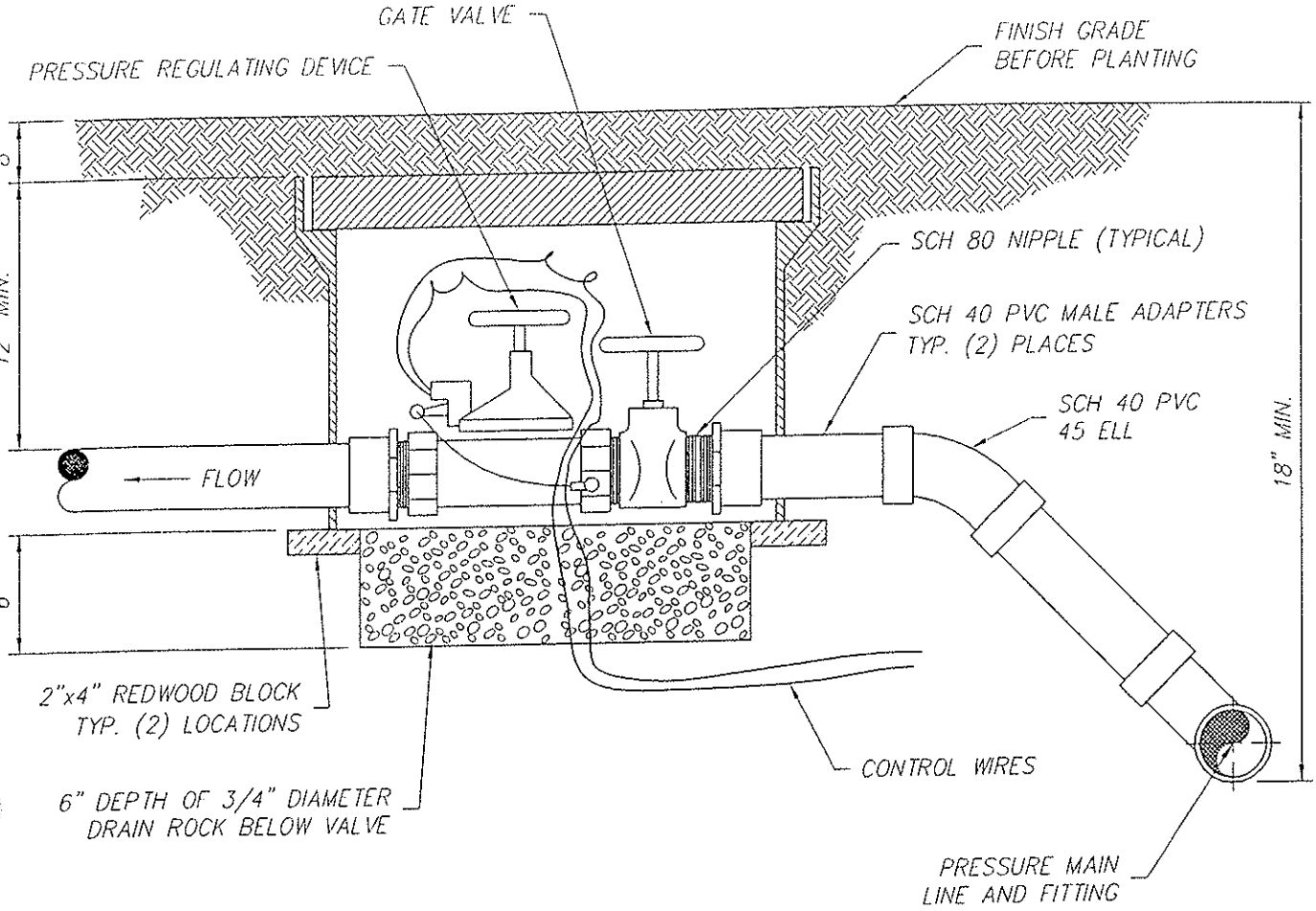
REVISED:

TOWN OF LOOMIS

ELECTRIC CONTROL VALVE AND GATE VALVE

DEPARTMENT OF PUBLIC WORKS

LSC-14



NOTES:

1. INSTALL CONTROL VALVES A MINIMUM OF 12" FROM STRUCTURES OR HARDSCAPING.
2. INSTALL VALVES IN PLANT BEDS WHEREVER POSSIBLE.
3. PLACE VALVE BOX AT RIGHT ANGLES TO STRUCTURES OR HARDSCAPING.
4. INSTALL VALVE BOX SO THAT TOP OF BOX IS FLUSH WITH ADJACENT HARDSCAPING.
5. USE TEFLON TAPE ON ALL MALE THREADS.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

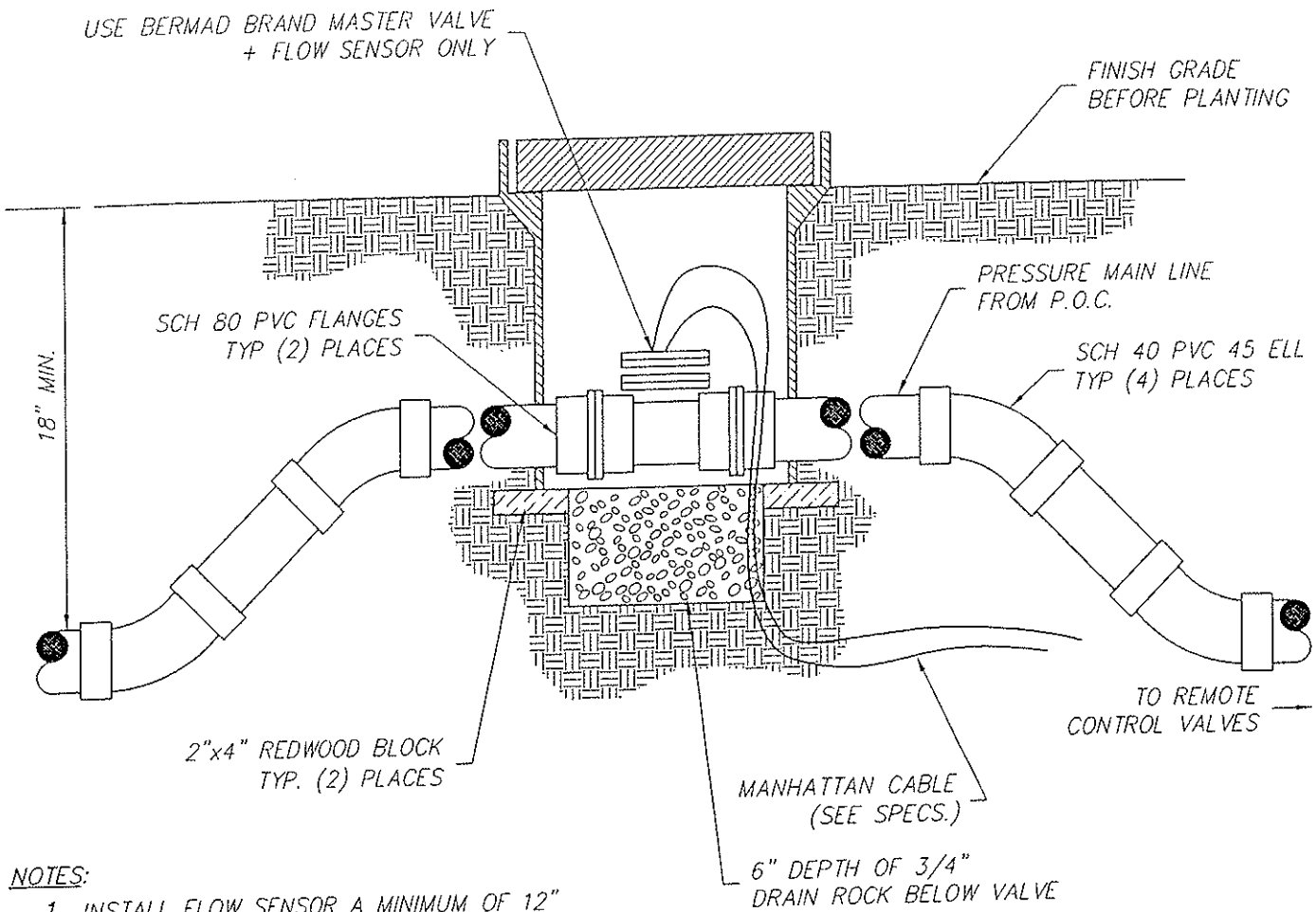
REVISED:

TOWN OF LOOMIS

BELOW GRADE ELECTRIC CONTROL AND GATE VALVE

DEPARTMENT OF PUBLIC WORKS

LSC-15



NOTES:

1. INSTALL FLOW SENSOR A MINIMUM OF 12" FROM STRUCTURES OR HARDSCAPING
2. INSTALL FLOW SENSOR IN PLANT BEDS WHEREVER POSSIBLE
3. PLACE VALVE BOX AT RIGHT ANGLE TO STRUCTURES OR HARDSCAPING
4. SENSOR CABLE SHALL BE BROUGHT BACK TO CONTROLLER IN 1" GRAY SCH 40 PVC CONDUIT

APPROVED BY:

BRIAN J. FRAGIA
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

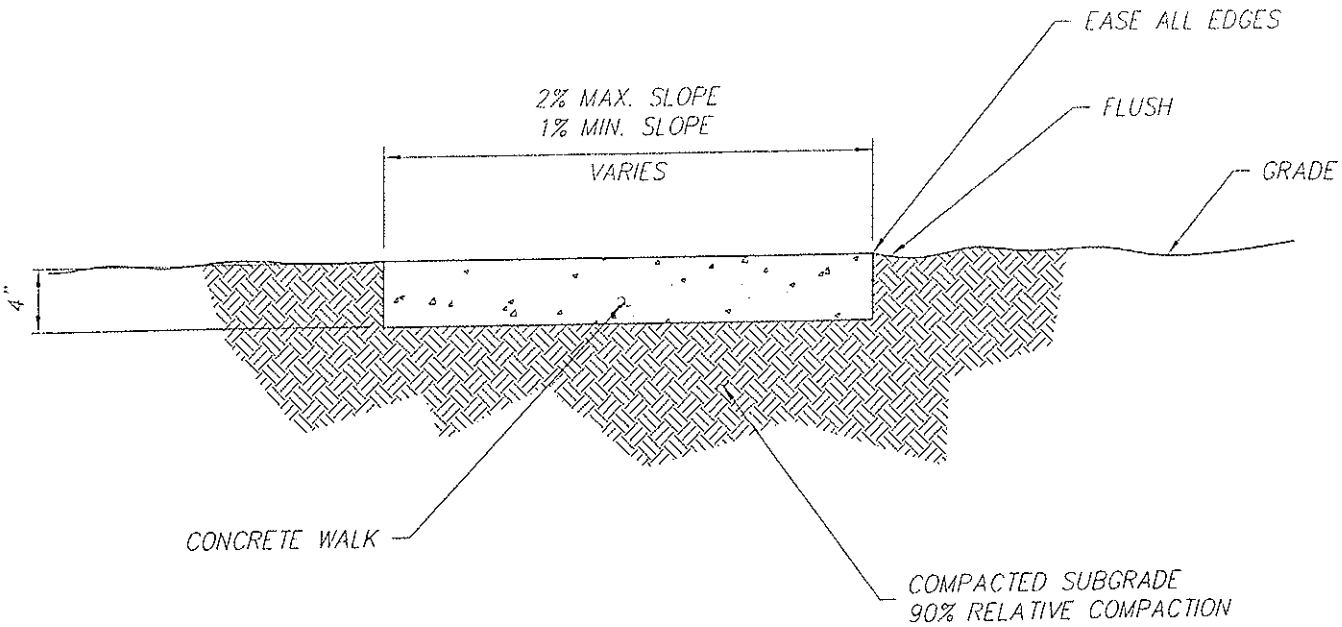
REVISED:

TOWN OF LOOMIS

FLOW SENSOR DETAIL

DEPARTMENT OF PUBLIC WORKS

LSC-16



NOTES:

1. PROVIDE WEAKENED PLANE JOINTS 1" DEEP AT 10'-0" INTERVALS.
2. PROVIDE EXPANSION JOINT AT 20'-0" INTERVALS WHERE CONCRETE WALK JOINS ANOTHER.
3. CLASS "A" SIX SACK CONCRETE.
4. BROOM FINISHED UNLESS SPECIFIED OTHERWISE.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

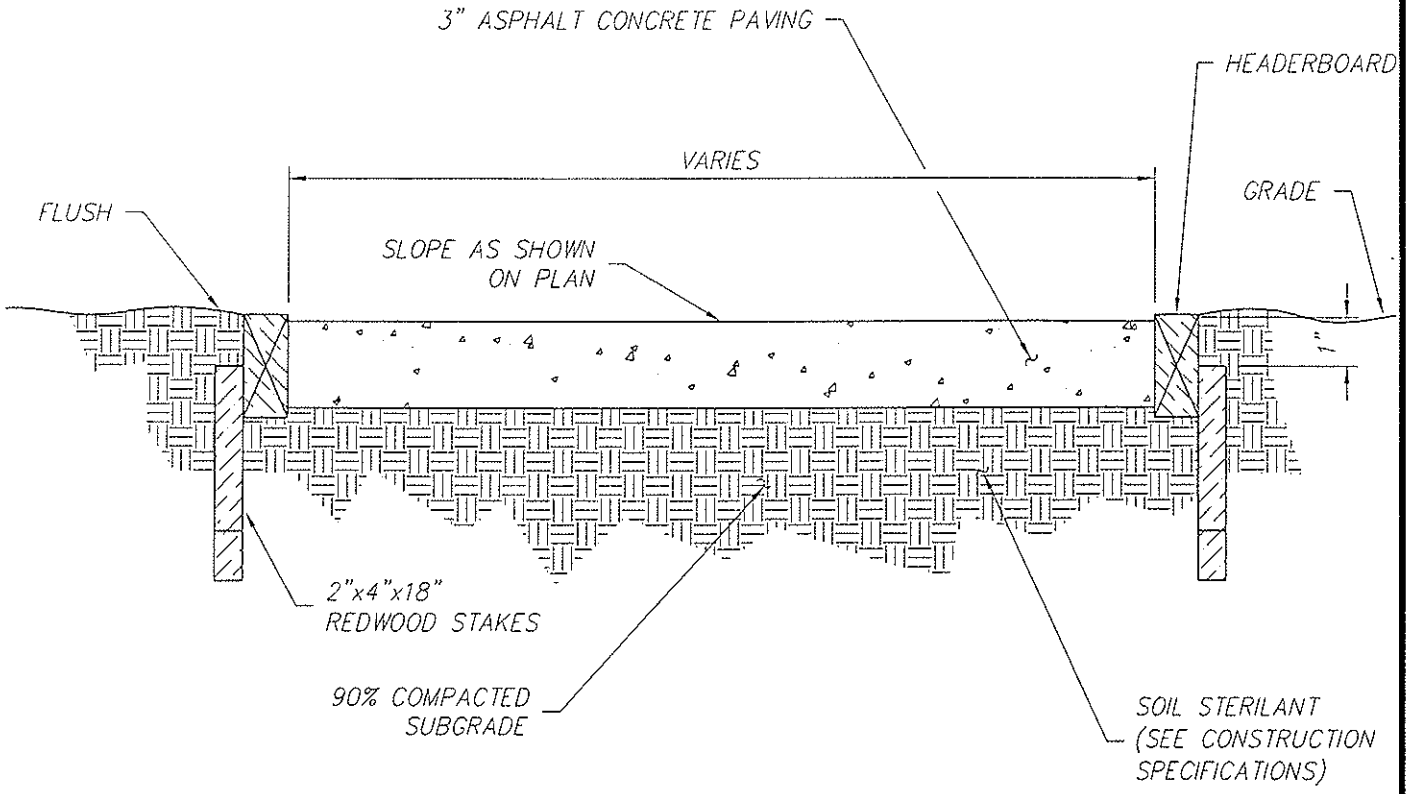
REVISED:

TOWN OF LOOMIS

CONCRETE WALK

DEPARTMENT OF PUBLIC WORKS

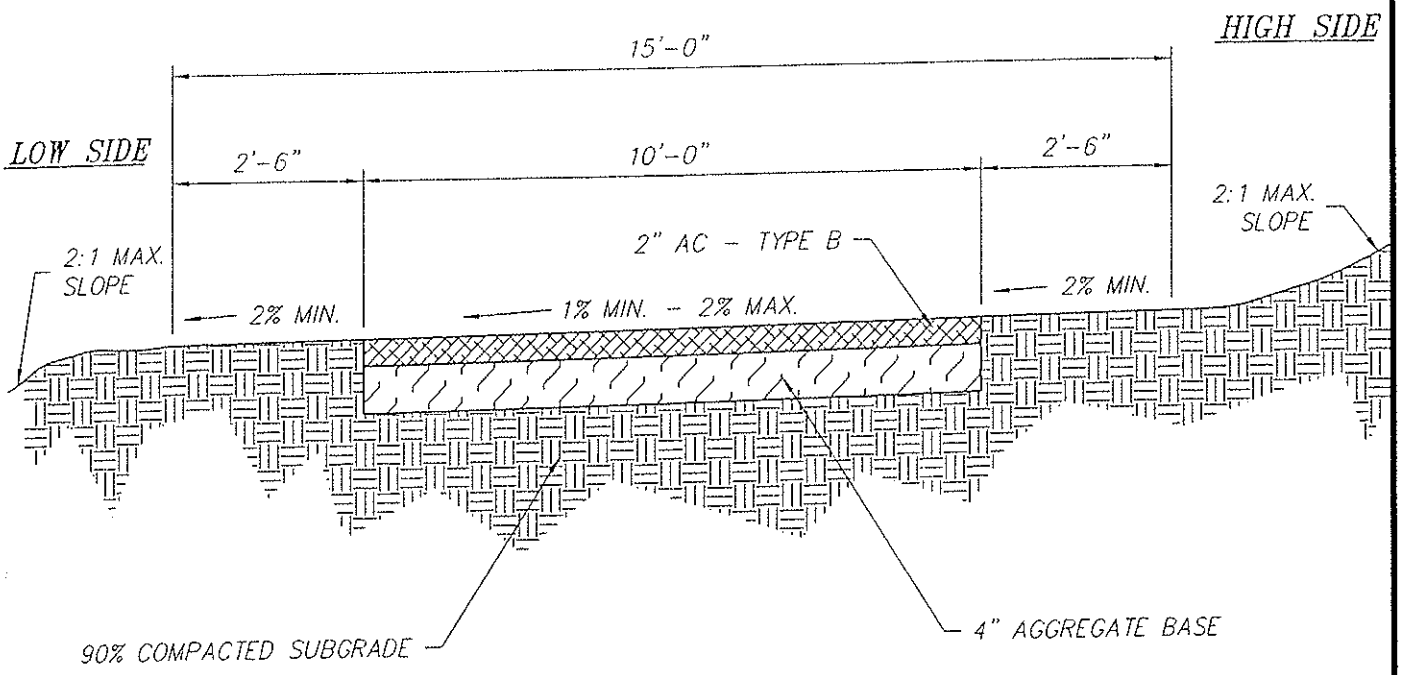
LSC-17



HEADER BOARD SHALL BE:

1. REDWOOD, ROUGH, CONSTRUCTION HEART GRADE, IN ACCORDANCE TO CALIFORNIA REDWOOD ASSOCIATION GRADING RULES.
2. DOUGLAS FIR, ROUGH, CONSTRUCTION GRADE, PRESSURE TREATED FOR UNDERGROUND USE.
3. ALL NAILS SHALL BE GALVANIZED – 16 PENNY.

APPROVED BY: BRIAN J. FRAGIAO DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER REVISED:		TOWN OF LOOMIS **PEDESTRIAN ASPHALTIC CONCRETE WALK** DEPARTMENT OF PUBLIC WORKS	**LSC-18**



APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

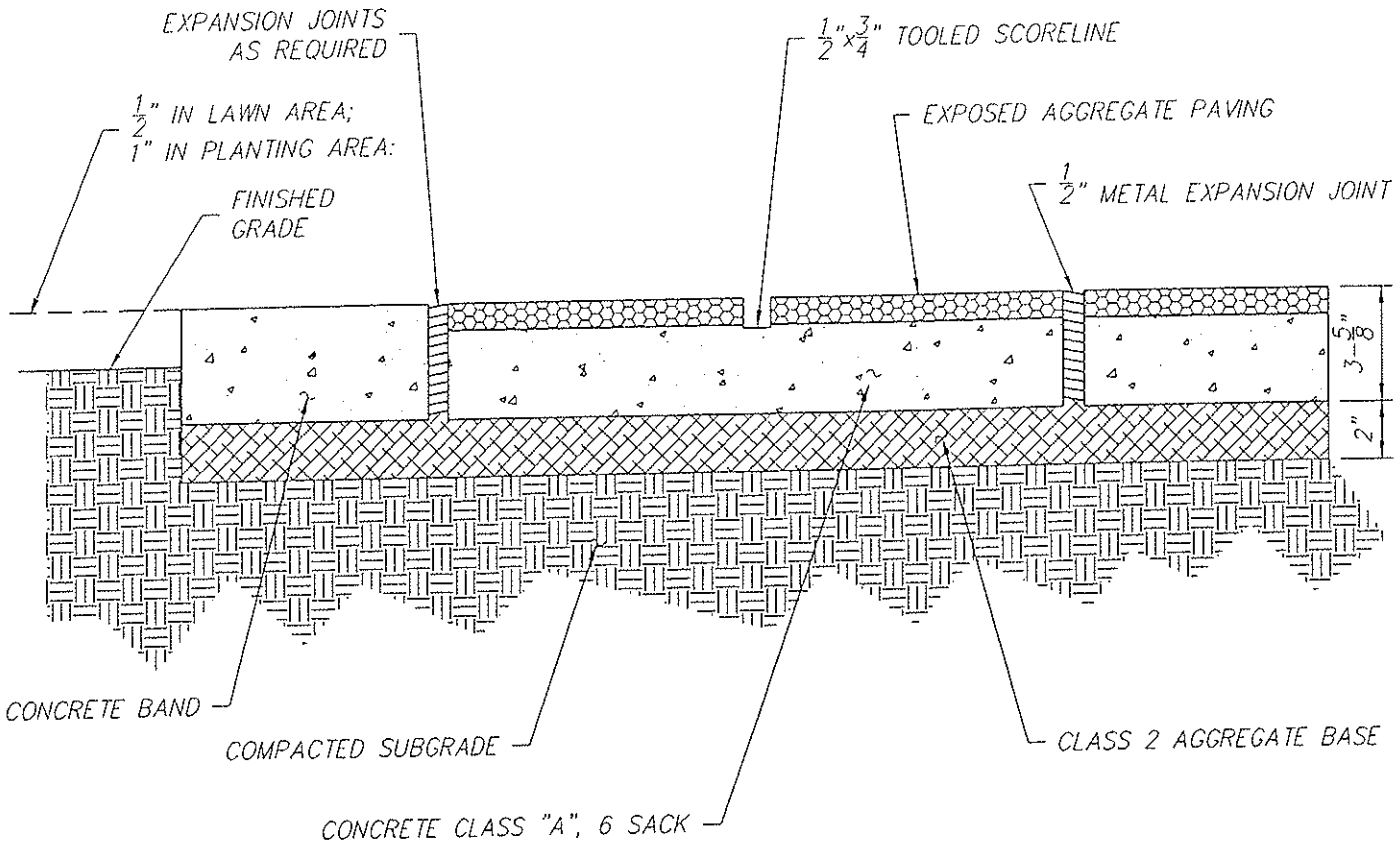
REVISED:

TOWN OF LOOMIS

A.C. BIKE PATH

DEPARTMENT OF PUBLIC WORKS

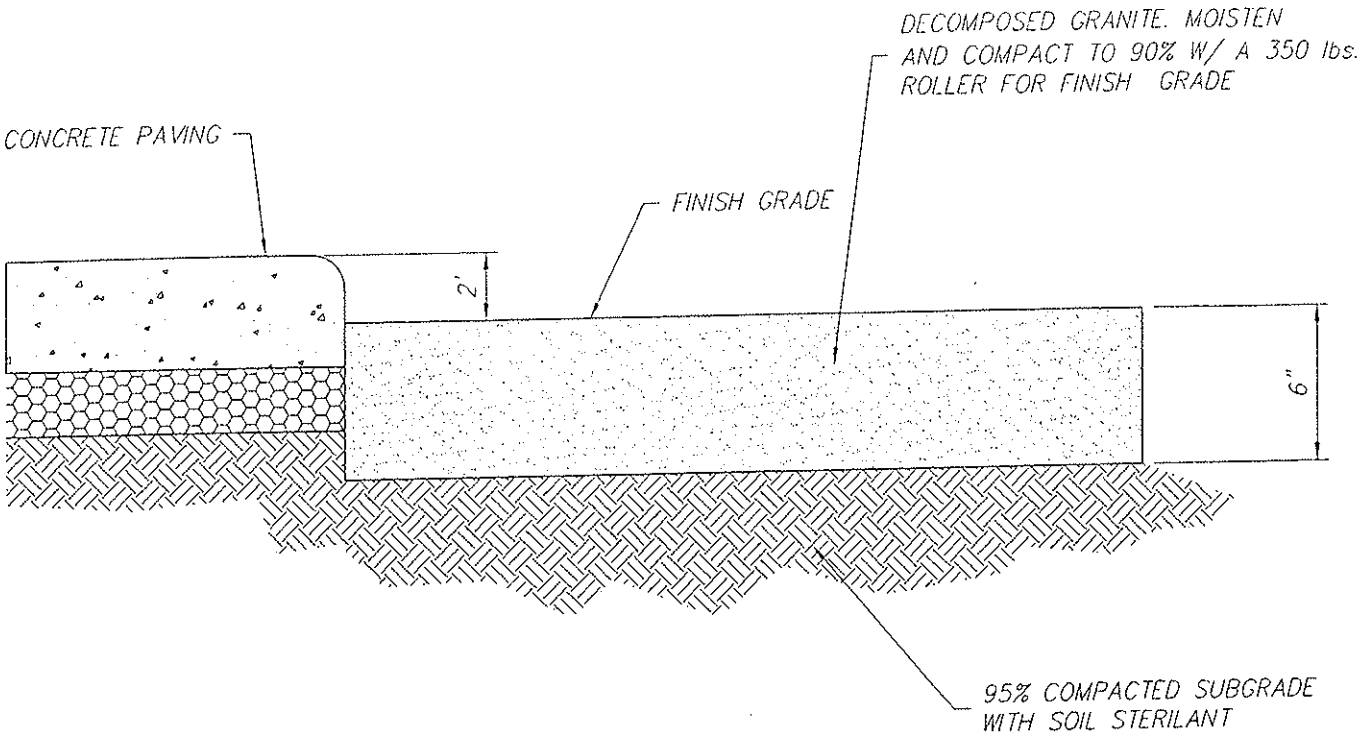
LSC-19



NOTES:

1. REFER TO APPROVED IMPROVEMENT PLANS FOR AGGREGATE SPECS.
2. REFER TO LAYOUT AND CONSTRUCTION PLANS AND APPROPRIATE DETAILS FOR LOCATION OF EXPANSION JOINTS AND SCORELINES.

APPROVED BY: BRIAN J. FRAGIAO DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER REVISED:		TOWN OF LOOMIS EXPOSED AGGREGATE PAVING DEPARTMENT OF PUBLIC WORKS	LSC-20



'SECTION'

CONTRACTOR TO SUBMIT SAMPLE OF LIGHT TAN DECOMPOSED GRANITE FOR APPROVAL BY LANDSCAPE ARCHITECT.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

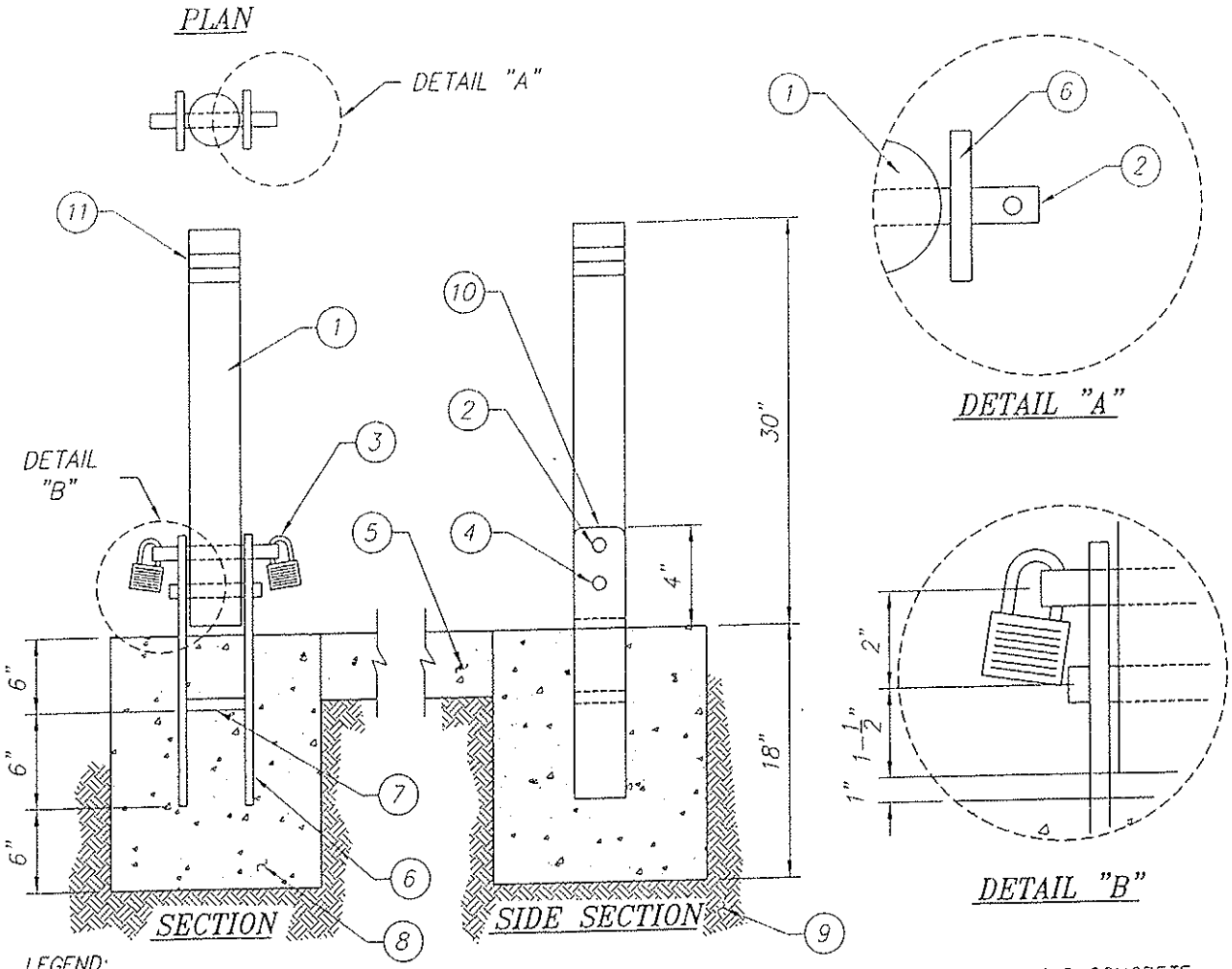
REVISED:

TOWN OF LOOMIS

DECOMPOSED GRANITE

DEPARTMENT OF PUBLIC WORKS

LSC-21



LEGEND:

1. 11 GAUGE, 2 3/4" O.D. ROUND STEEL POST WITH CAPPED TOP & 3/4" HOLES FOR SWIVEL ROD AND 3/4" HOLES FOR LOCKING PIN. EASE ALL EDGES OF STEEL POST.
2. 3/8" DIA x 6" LOCKING PIN WITH 3/8" HOLES 1/4" FROM EACH END OF PIN OR 3/8" DIA x 5" LOCKING PIN WITH WITH FLAT WASHER ON ONE END AND 3/8" HOLE 1/4" FROM END OF PIN.
3. PADLOCKS TO BE PROVIDED BY CONTRACTOR
4. 5/8" DIA STEEL SWIVEL ROD. WELD SWIVEL ROD TO SIDE PLATES – NO WASHERS.
5. CONCRETE PAVING / ASPHALT. HOLD CONCRETE 2" BELOW FINISHED GRADE. BLACK TOP REST.
6. 3/8" x 16" x 4" STEEL BASE PLATE WITH 1" RADIUS CORNERS. EASE ALL EDGES.
7. 3/8" STEEL BRACE. FILET WELD BOTH SIDES TO BASE PLATES.
8. 2" ROUND CONCRETE x 18" DEEP FOOTING.
9. COMPACTED SUBGRADE.
10. 1" RADIUS CORNERS, TYP.
11. 1" RED DIAMOND REFLECTIVE TAPE.

NOTES:

1. ALL PIPE SHALL BE BLACK STEEL PIPE.
2. ALL JOINTS SHALL BE WELDED IN ACCORDANCE W/ CA STATE STANDARD SPECIFICATIONS FOR WELDING STRUCTURAL STEEL.
3. ALL PARTS (EXCEPT PADLOCK) SHALL BE PAINTED W/ 2 COATS OF ZINC CHROMATE PRIMER AND 2 COATS OF EXTERIOR ENAMEL. COLOR: YELLOW PER CITY STANDARD.
4. BOLLARD SHALL BE INSTALLED SUCH THAT WHEN FOLDED IT LAYS FLAT.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

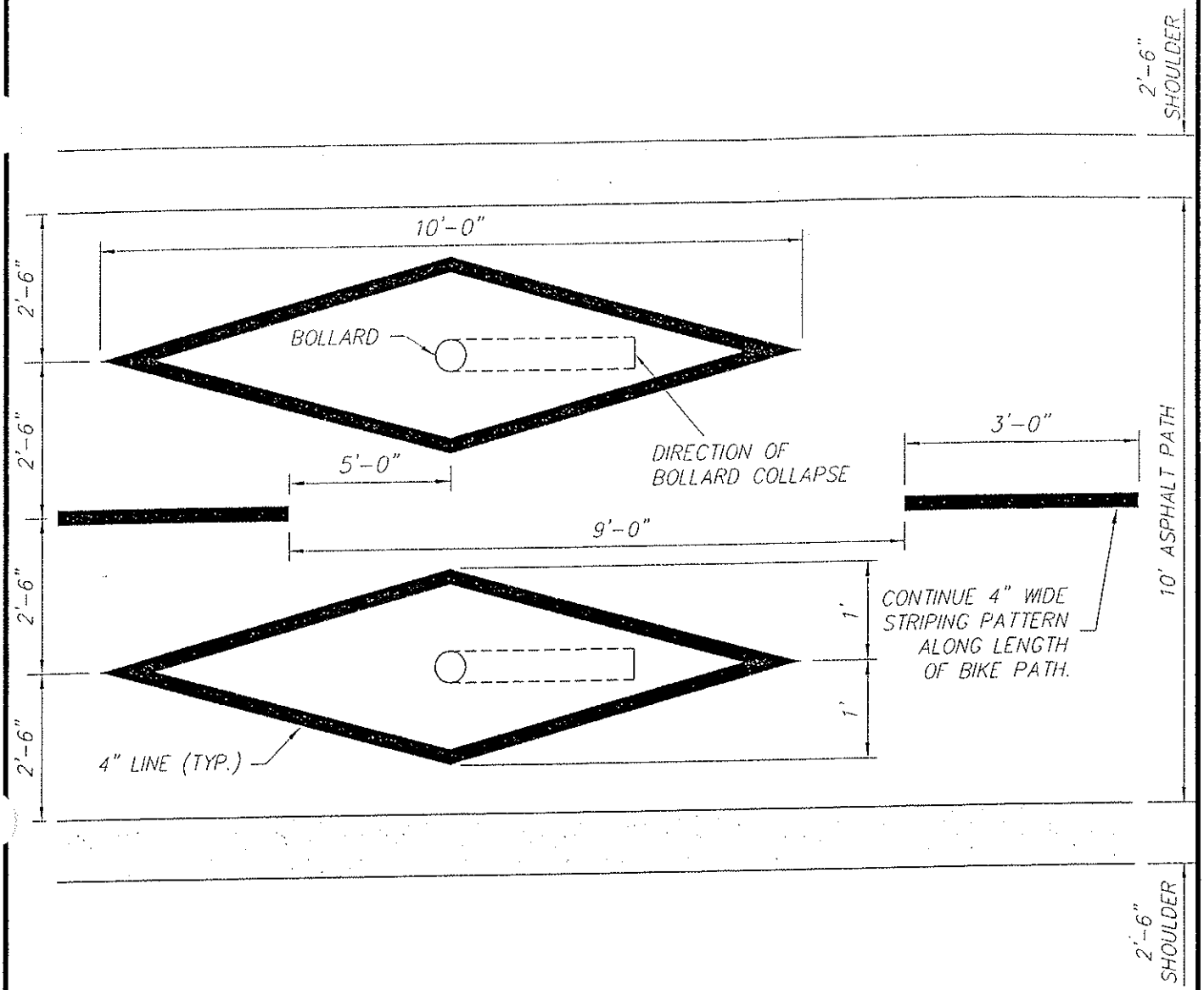
REVISED:

TOWN OF LOOMIS

COLLAPSIBLE BOLLARD

DEPARTMENT OF PUBLIC WORKS

LSC-22



NOTES:

1. STRIPPING SHALL CONFORM W/ CAL TRANS HIGHWAY DESIGN MANUAL JULY 1990, SECTIONS 1004.2 AND 1003.115 AND 1003.16 AS WELL AS ALL PERTINENT TOWN OF LOOMIS STANDARDS.

2. STRIPING TO BE YELLOW.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

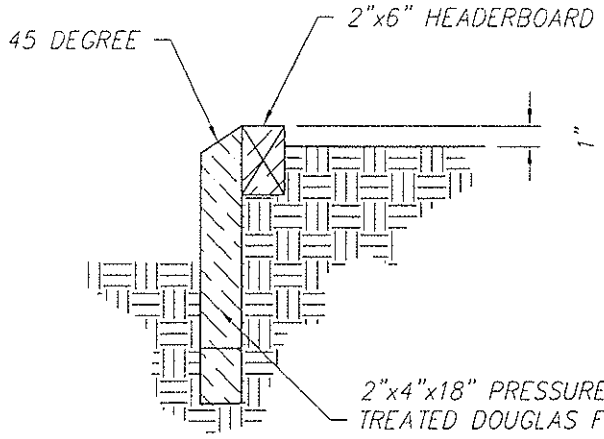
REVISED:

TOWN OF LOOMIS

BIKE PATH STRIPING/ BOLLARD INSTALLATION

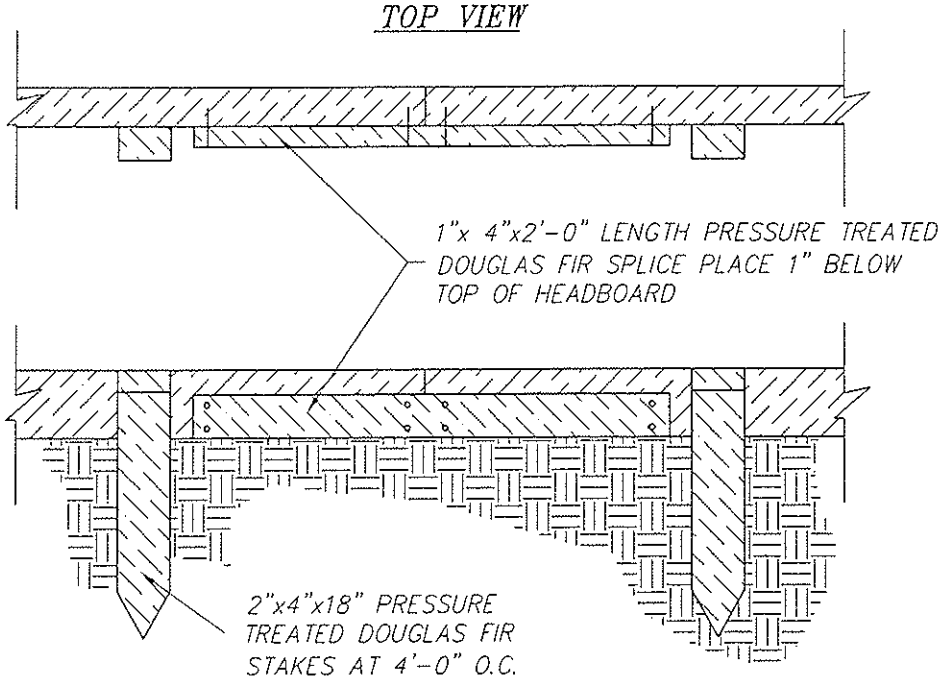
DEPARTMENT OF PUBLIC WORKS

LSC-23



SECTION

TOP VIEW

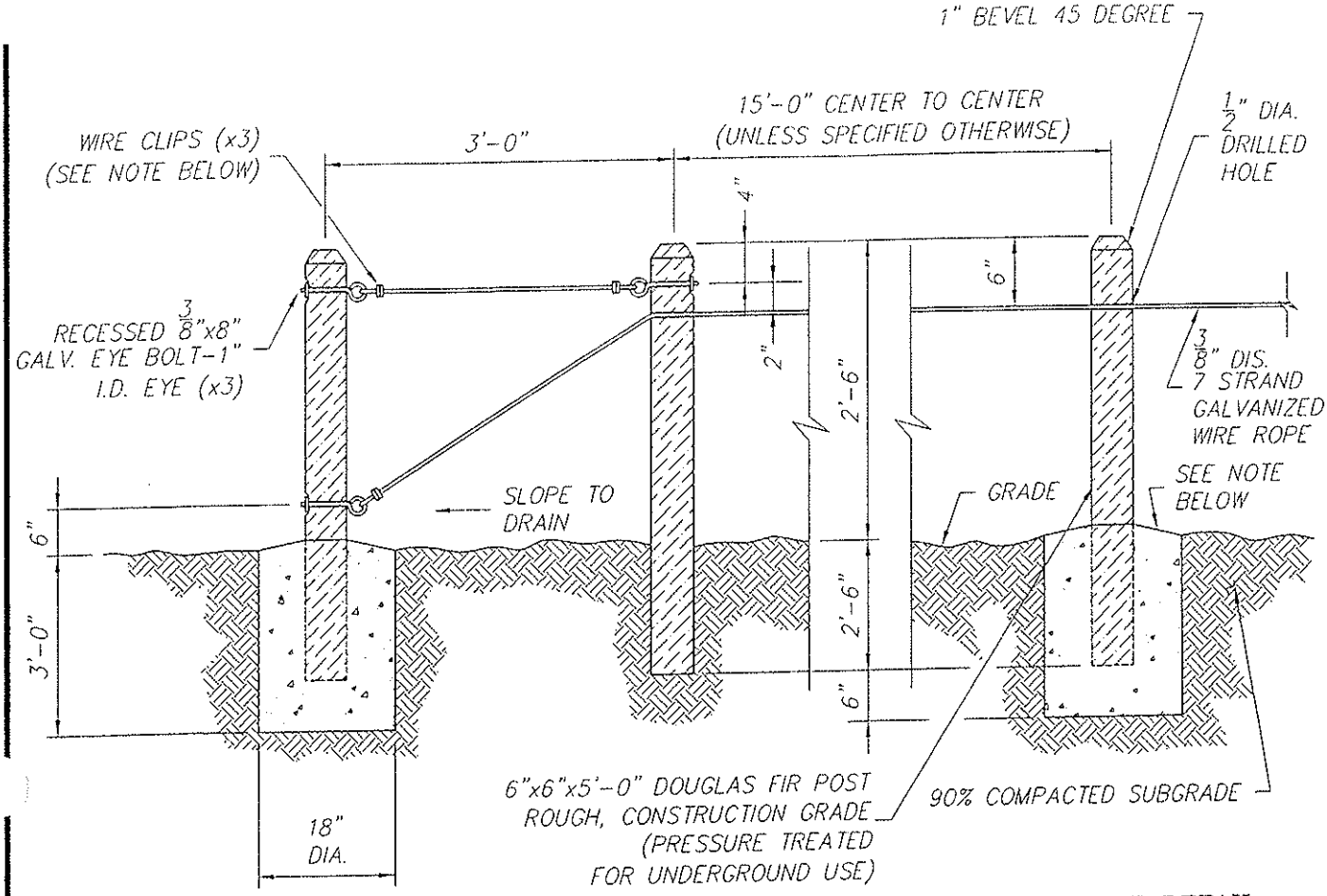


SPLICE DETAIL

NOTES:

1. USE TWO 1"x6" PRESSURE TREATED DOUGLAS FIR ON ALL CURVES (WHERE NECESSARY).
2. INSTALL ALL STAKES AND SPLICES ON PLANTING SIDE OF HEADER BOARD.
3. ALL NAILS SHALL BE GALVANIZED.
4. ALL LUMBER SHALL BE PRESSURE TREATED DOUGLAS FIR, ROUGH CONSTRUCTION HEART GRADE IN ACCORDANCE TO CALIFORNIA STATE SPECIFICATIONS 56-2.02(B).

APPROVED BY: BRIAN J. FRAGIAO DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER REVISED:		TOWN OF LOOMIS **PRESSURE TREATED HEADERBOARD** DEPARTMENT OF PUBLIC WORKS	**LSC-24**



TERMINAL POST ANCHOR DETAIL

LINE POST DETAIL

NOTES:

1. PROVIDE CONCRETE FOOTINGS AT ALL END POSTS, AT ALL BENDS AND AS SPECIFIED ON APPROVED PLANS.

2. USE 3/8"x 2" GALVANIZED WIRE ROPE CLIPS FOR CONNECTION AND SPLICES. ALL CLIPS SHALL BE PLACED WITH NUTS FACING DOWNWARD.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

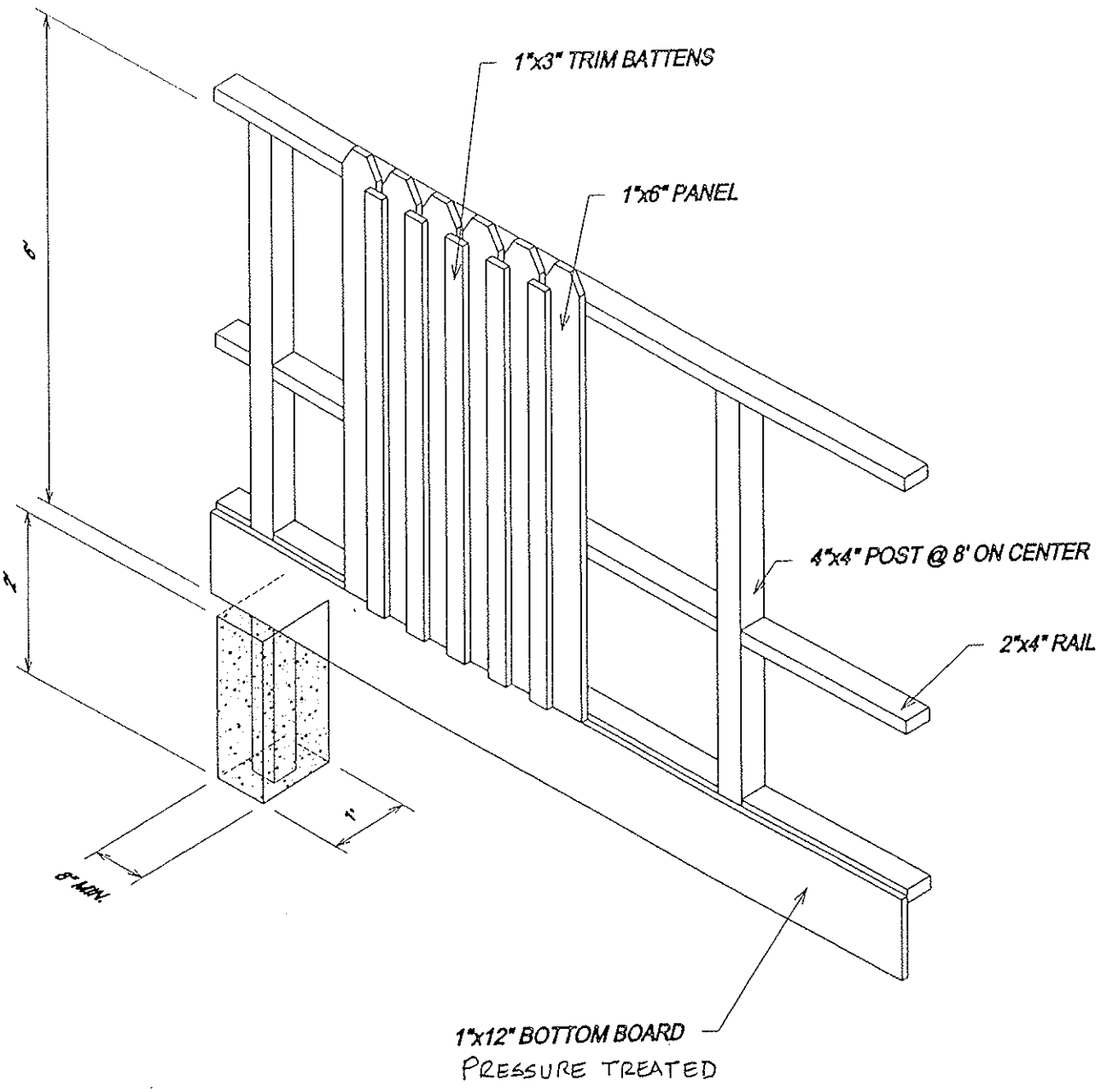
REVISED:

TOWN OF LOOMIS

POST & CABLE

DEPARTMENT OF PUBLIC WORKS

LSC-25



APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

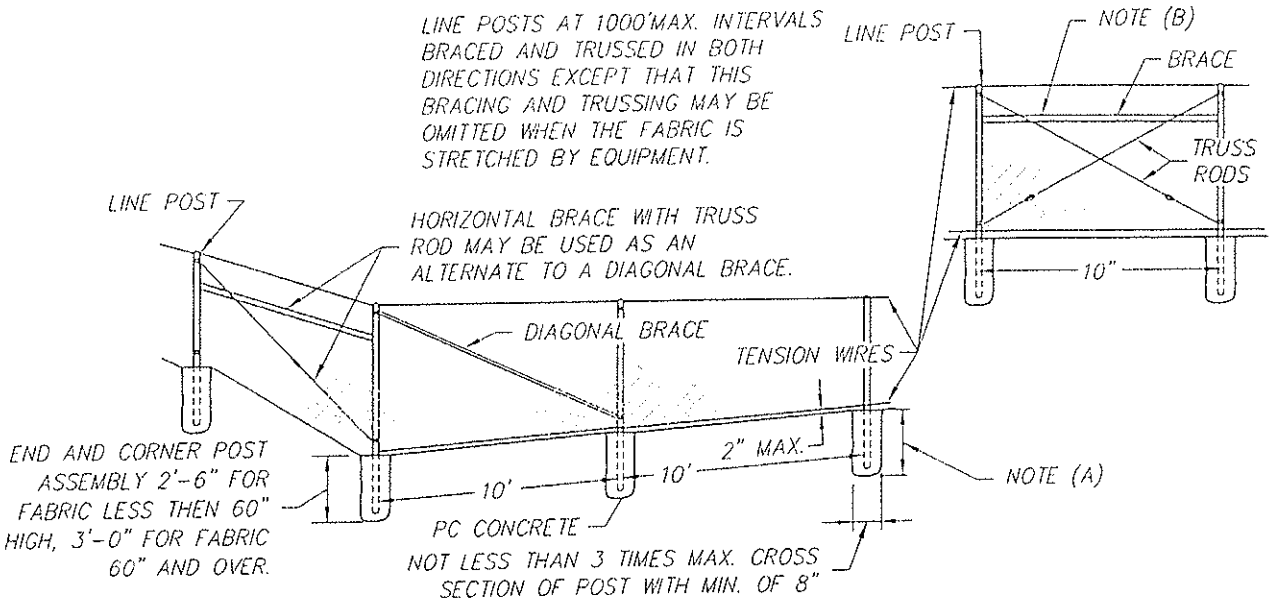
REVISED:

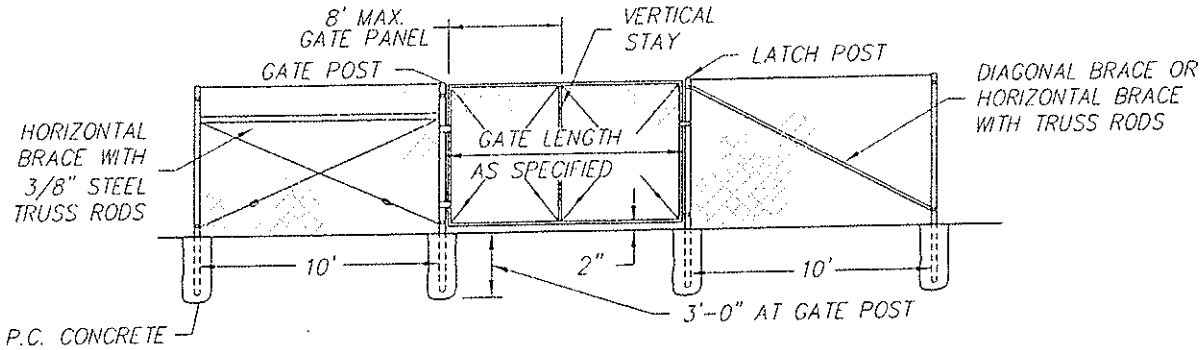
TOWN OF LOOMIS

REDWOOD FENCE

DEPARTMENT OF PUBLIC WORKS

LSC-26





TYPE CL-4=48" FABRIC (11 GUAGE)
TYPE CL-6=72" FABRIC (9 GUAGE)

NOTES:

(A) 2'-6" FOR FABRIC LESS THAN 60" HIGH
3'-0" FOR FABRIC 60" AND OVER

(B) BRACE TO BE REMOVED AFTER ALL OTHER FENCE CONSTRUCTION IS COMPLETED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

NOTES:

1. THE ABOVE TABLE SHOWS EXAMPLES OF POST AND BRACE SECTIONS WHICH MAY COMPLY WITH THE SPECIFICATIONS.
2. SECTIONS SHOWN IN THE TABLES MUST ALSO COMPLY WITH THE STRENGTH REQUIREMENTS AND OTHER PROVISIONS OF THE SPECIFICATIONS.
3. OTHER SECTIONS WHICH COMPLY WITH THE STRENGTH REQUIREMENTS AND OTHER PROVISIONS OF THE SPECIFICATIONS MAY BE USED ON APPROVAL OF THE TOWN ENGINEER.
4. OPTIONS EXERCISED SHALL BE UNIFORM ON ANY ONE PROJECT.
5. DIMENSIONS SHOWN ARE NOMINAL.
6. TYPICAL MEMBER DIMENSIONS AND GATE POST TABLES DETAIL (LSC-27A).

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

TOWN OF LOOMIS

CHAIN LINK FENCE
DETAIL ONE

DEPARTMENT OF PUBLIC WORKS

LSC-27

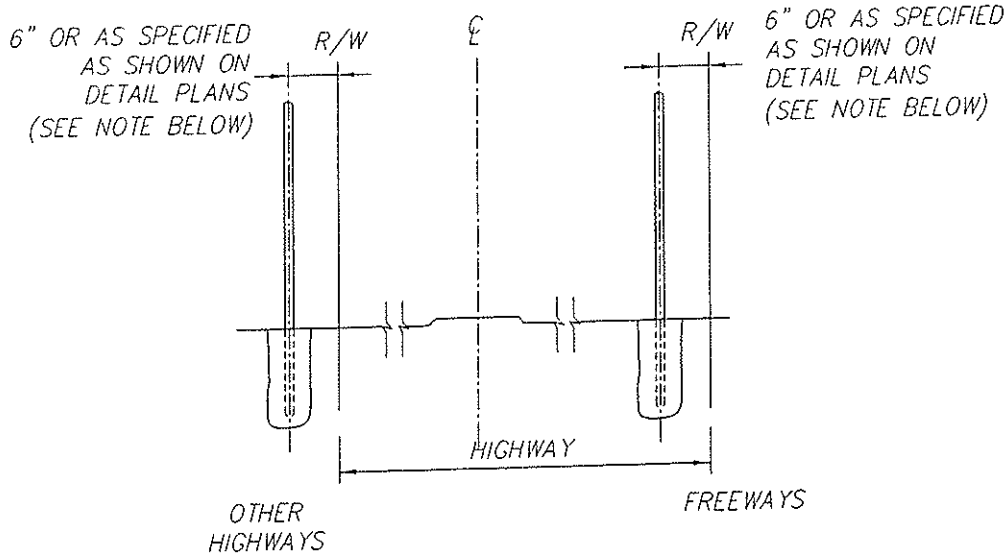
TYPICAL MEMBER DIMENSIONS

FENCH HEIGHT	LINE POSTS			END, LATCH & CORNER POSTS			BRACES			
	ROUND (I.D.)	H	ROLL FORMED	ROUND (I.D.)	ROLL FORMED		ROUND (I.D.)	H	ROLL FORMED	
LESS THEN 6'	1-1/2"	1-7/8"x1-5/8"	1-3/4"x1-3/4"	2"	3-1/2"x3-1/2"	2"x1-3/4"	1-1/4"	1-1/2"x1-5/16"	1-5/8"x1-1/4"	1-3/4"x1-1/4"
OVER 6'	2"	2-1/4"x2"	2"x1-3/4"	2"x2-1/2"	3-1/2"x3-1/2"	2"x1-3/4"	1-1/4"	1-1/2"x1-5/16"	1-5/8"x1-1/4"	1-3/4"x1-1/4"

GATE POST

FENCE HEIGHT	GATE WIDTHS	NOMINAL I.D.	WEIGHT PER FOOT
6'-0" AND LESS	UP THRU 6'	2-1/2"	4.95
	OVER 6' THRU 12'	4"	10.79
	OVER 12' THRU 18'	5"	14.62
	OVER 18' TO 24' MAX.	6"	18.97
OVER 6'	UP THRU 6'	3"	7.58
	OVER 6' THRU 12'	5"	14.62
	OVER 12' THRU 18'	6"	18.97
	OVER 18' TO 24' MAX.	8"	28.55

NOTE: ABOVE POST DIMENSIONS AND WEIGHTS ARE MINIMUMS LARGER SIZES MAY BE USED ON APPROVAL OF ENGINEER.



NOTE:

OFFSET TO BE 2'-0" AT MONUMENT LOCATIONS, MEASURED AT RT. ANGLE TO R/W LINES. TAPER TO ACHIEVE OFFSET TO BE AT LEAST 20' LONG.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

TOWN OF LOOMIS

CHAIN LINK FENCE DETAIL TWO

DEPARTMENT OF PUBLIC WORKS

LSC-27A

SECTION 9

STREET LIGHTS, SIGNALS, SIGNS, STRIPING & MARKINGS (SL)

CONSTRUCTION
IMPROVEMENT STANDARDS

SECTION 9

STREET LIGHTS (SL)

9-1 GENERAL -- All streetlights shall be constructed in accordance with requirements of these improvement standards as recommended by the manufacturer, or as directed by the Utility Agency. The manufacturer's guidelines shall be available at the construction site at all times.

9-2 STREET LIGHTS REQUIRED -- Streetlights shall be required for all lots and parcels being developed or constructed upon. In addition, streetlights may be required for lots and parcels containing existing structures which are being improved or altered, depending on the nature and extent of the work.

9-3 DEVELOPER'S RESPONSIBILITY -- Existing streetlights, which must be relocated or repositioned, as a result of the construction of new streets or driveways into a development shall be the responsibility of the developer.

9-4 UTILITY COMPANY AUTHORIZATION -- A written notice from the serving utility company stating that line clearances and service have been checked and are adequate shall be submitted to the Town Engineer for all developments.

9-5 GENERAL PLAN DETAILS -- The plans shall show and identify all street lights to be installed, all existing lights in the immediate vicinity of the project, conduit and conductor runs, service points, trees, and all applicable provisions and details specified in these Standards.

On subdivision plans, the streetlights shall be shown separately. In addition to the above, the following shall be required on the street light portion of subdivision plans even though duplications may be involved.

9-6 DESIGN STANDARDS -- Street lighting shall be designed in conformance with these Standards and the "American National Standard Practice for Roadway Lighting" of the American Standards Institute, and as required by the Utility Agency.

9-7 STREET LIGHT DESIGN DETAILS -- Design details for streetlights are as follows:

A. Intersection -- Intersections shall have at least one street light. Intersection street light locations and the number required shall conform to Standard Details SL-1 and SL-2.

B. Cul-de-sacs -- All cul-de-sacs exceeding 130 feet in length measured from the street light locations at the intersection to the right-of-way line at the end of the cul-de-sac shall have a street light within the bulb. The location of the street light within the bulb shall be at the end of the cul-de-sac or at the radius neck of the cul-de-sac.

C. Pedestrian Lanes -- Streetlights shall be placed at both ends of pedestrian lanes.

D. Spacing -- Maximum street light spacing measured along the street centerline shall conform to Standard Detail SL-2 except on 84 and 94 foot streets with a 1,000 foot radius horizontal curve or less in which case the maximum spacing is 170 feet. Spacing on all other streets is based on a two side arrangement. The one side spacing arrangement is a system whereby the street light spacing relates to the distance between streetlights all on the same side of the street. The two side arrangement relates to the distance between streetlights taking into consideration the street lights on both sides of the street.

E. Street Light Poles -- All streetlight poles shall be of galvanized steel, aluminum, or concrete except as provided for by Item "F" below. All pole construction and materials shall conform to the Standards outlined below and the Standard Details contained therein. Poles shall be identified on the plans by construction material, luminaries mounting height, pole dimensions, and by length of mast arm.

The Town may approve special or unusual designs if the character of the surrounding neighborhood warrants unusual design. Where special or unusual design street light poles not specified in these Standards are to be used, the developer shall supply to the Town additional poles to be used for future pole replacement. The minimum number of replacement poles to be supplied to the Town shall be 10% of the poles being installed with any fractional percent being rounded to the next whole number.

F. Street Lights on Existing Utility Owned Poles -- Where there are permanent existing (or necessary planned) utility owned poles adjacent to the roadway, the streetlights may be installed upon the utility pole in lieu of the poles required. Should the utility pole option be utilized, the following shall apply:

1. In the Pacific Gas and Electric Company (P.G.& E.) service area, the developer shall arrange to install P.G.& E. owned and maintained street lights on existing utility poles in accordance with P.G.& E. Rate LS1.

2. Spacing of lights shall be varied to meet locations of existing utility poles but shall not exceed the maximum spacing specified in these Standards.

G. Luminaires -- The type of street light and the appropriate wattage shall be specified on the plans. The luminaires shall be high pressure sodium type with internal ballasts.

The light pattern for each luminaire shall be specified on the plans. If required, light shielding shall be provided to prevent glare and/or reflections on to adjacent residential or business buildings. The Contractor shall submit samples of the light shield for approval by the Town Engineer.

H. **Service** -- All street light systems shall have underground service provided. Service points shall be provided within a utility easement immediately adjacent to or within the right-of-way and shall be open and easily accessible to the street frontage. Types of service are as follows:

1. A direct underground service consists of one or two lights being served from a single service point. The service point may be in the form of a pullbox installed by the developer or a service pedestal provided by the utility district.

2. Multiple service is three or more lights being served from a single service point installed by the developer. The service point shall be a pullbox. Multiple systems shall have a service can normally located adjacent to the service point between the service point and the light system.

I. **Pullboxes** -- All pullboxes, including the size, shall be shown and identified on the plans. Pullboxes shall be installed at the locations where more than two conduit runs intersect, where conduit runs are more than 250 feet long, where shown on Standard Details, at critical angle points, behind each light when No. 4 A.W.G. is used, and at such locations ordered by the Town Engineer. Normally a No. 3-1/2 pullbox will be allowed when three conduits or less are involved. For all other situations, a No. 5 or No. 6 pullbox shall be specified.

J. **Conductors** -- All conductors, including quantity and size, shall be identified on the plans. Unless otherwise specified, conductors shall be single conductor, solid, or stranded copper, sized in accordance with these Standards and the National Electric Code.

1. On a direct underground service, the minimum conductor shall be No. 8 A.W.G.

   No conductor shall be larger than No. 4 A.W.G.

2. On multiple service, the minimum conductor size from the service point to the service shall be No. 8 A.W.G. The site of each conductor from the service point to the luminaires shall be such that the voltage drop along each circuit will not exceed 7% for 2 wire systems and 6% for 3 wire system of the nominal service voltage to the farthest luminaire. The nominal service voltage to be used is a 115 volts. Calculations shall be submitted substantiating the design criteria for every circuit. Calculations shall also be submitted showing the total load in amperes of each circuit at the service can.

   Where only one photocell is required in a multiple service system, it shall be connected to the service can with three No. 14 A.W.G.

K. **Photo Cell** -- A single photo cell receptacle shall be provided on the luminaire nearest to the service point for multiple service containing four or more lights. All other light systems shall have a photocell in each luminaire.

L. **Conduit** -- All conduit runs, including the size, shall be shown and identified on the plans. The conduit size shall be determined using Standard Detail SL-9 as a guideline with the minimum size being on inch diameter conduit.

For a system designed using the 3 wire principle, only 2 circuits (one set of 3 wires) shall be allowed in any conduit. Further circuits based on 2 wire principle and 3 wire principle shall not be mixed in any conduit. All circuits may, however, be mixed in same conduit form can to first pullbox.

The design may include more than two circuits in a conduit if the conductors for each circuit (2 wire) or set of conduits (3 wire) are identified by conductor insulation, which is a solid color or a basic color with a permanent colored stripe. The identification stripe shall be continuous over the entire length of the conductor.

M. **Electrical Equipment and Work** -- Control and switching equipment and fusing of all circuits shall meet the requirements of the National Electrical Code, the Basic Electrical Regulations, Title 24, Park 3, of the California Administrative Code, the rules of the National Board of Fire Underwriters, and the Town of Loomis.

N. **Foundations** -- Foundations for poles, posts, and pedestals shall conform to Section 86 - 2 03 of the State Specifications except as herein modified. Standard bases shall conform to the sizes show on the drawings or as detailed on the plans. All concrete shall be Class "B".

O. **Lighting Poles** -- All poles shall be galvanized steel, aluminum, or concrete. The type of standard shall be as shown on the plans or in the Special Provisions.

1. Galvanized Steel Poles

   a. Type "A" street lights shall use the "A" series poles as detailed on the drawings.

   Galvanizing shall be as provided in Section 75 - 1.05, "Galvanizing", of the State Standard Specifications.

2. Aluminum Poles/Concrete Poles -- Aluminum and concrete lighting poles will conform to the American Association of State Highway and Transportation Officials (AASHTO) "Standard Specifications for

Structural Supports for Highway Signs, Luminaires, and Traffic Signals", and these Standards. Poles shall be round in cross section and have continuous tapered shafts and arms of approximately 1/4 inch per foot. A wind velocity of 70 mph and a projected area of three square feet of luminaire will be used for the design of the pole. Hand holes for poles will be reinforced in such a manner as to distribute the load. Hand holes will be proved on the side normal to the luminaire and have tamper - proof hand hole cover. Eight nuts and flat washers will be provided for plumbing the poles. Shop plans for poles will be submitted for approval before any fabrication is begun.

a. Type "A" street light poles shall be equipped with a "2" diameter by 7" long tenon. Arm to pole connections will be a three bolt simplex type with 5/8" H.S. cap screws. Poles with arms shall be provided with a raintight metal cap. Base plates for aluminum poles will be provided with 11-1/2 inch bolt circles. Bolt circles for concrete poles shall be 12-1/2 inches.

3. Special approvals from Community Development and Public Works Departments are required for all streetlights other than type "A".

P. Luminaires

1. Mercury Vapor or High Pressure Sodium Luminaires as specified on the plans:

a. Type "A" street light luminaires shall have their ballasts integral to the housing. Glare shields shall not be required. Luminaires shall be as provided in Section 86-6.01, "High Intensity Discharge Luminaires", of the 1978 State Standard Specifications and Section 86-601B, "High Intensity Discharge Luminaires", of the 1981 State Standard Specifications.

2. Fluorescent Luminaires

a. Type "A" fluorescent luminaires shall have their ballasts integral to the housing. Specifications shall be as specified and approved by the Town Engineer for each project.

Q. Lamps

1. Lamps for mercury vapor and high pressure sodium shall be as follows:

a. Each mercury vapor luminaire shall be furnished with a mercury vapor lamp of wattage as shown on the plans. The lamps shall be ANSI Type H39KC - 175/DX for 175 watts, ANSI Type H37KC - 250/DX for 250 watts, and ANSI Type H33GL - 400/DX for 400 watts.

b. The lamp shall be operated at a wattage necessary to produce 7,500 lumens with 175 watt lamps, 11,500 lumens with 250 watts lamps, and 21,500 lumens with 400 watt lamps. All lamps shall have a minimum rated average life of 24,000 hours based on 10 hours burning per start.

c. Each high-pressure sodium luminaire shall be furnished with a sodium lamp of wattage as shown on the plans. The lamps shall be ANSI S54 for 100 watts, ANSI S55 for 150 watts, and ANSI S50 for 250 watts. The lamps shall be operated at a wattage necessary to produced 9,500 lumens with 100 watt lamps, 16,000 lumens with 150 watt lamps, and 30,000 lumens with 250 watt lamps. All lamps shall have a minimum rated average life of 20,000 hours based on 10 hours burning per start and shall be 55 volts.

2. Fluorescent Lamps

a. Each fixture shall be provided with lamps of high luminous efficiency and ability to withstand high current loading, shock, and vibration. Lamps shall be cool white.

R. Ballasts -- All ballasts shall be designed to operate on a nominal primary voltage of 120/240 volts.

1. Mercury vapor ballasts shall be as provided in Section 86-6.10, "Ballasts", of the 1981 State Standard Specifications.

2. High pressure sodium ballasts shall be as provided in Sections 86-6.10, "High-Intensity-Discharge Lamp Ballasts", and Section 86-6.10A, "Regulator Type Ballasts", of the State Standard Specifications.

3. Fluorescent ballasts shall be designed to provide the electrical characteristics recommended by the lamp manufacturer for proper starting and burning of the designated lamp.

S. **Conductors** -- Conductors for street lighting shall conform to Sections 86-2.08, "Conductors", 86-2.08A, "Traffic Signal and Multiple Lighting Conductors", and 86-2.08C, "Conductor Identification", of the State Standard Specifications. Contractor shall use color coded wires using a different color for each circuit with continuous color maintained throughout each circuit. Color coding shall be as required by the Town Engineer or as detailed on the plans or in the special provisions.

T. **Wiring** -- Wiring for street lighting shall conform to Section 86-2.09, "Wiring", of the State Standard Specifications, except as herein modified. Section 86-2.09E, "Splice Insulation", which provides for use of heat shrinkable insulating tubing, shall not be allowed. Splice insulation -- on 600 volt conductor splices of solid or stranded conductor of =14 A.W.G. to = 6A.W.G., the contractor may use, at his option, an electrical spring connector of three part construction. The three park construction shall consist of a zinc coated free expanding steel spring enclosed in shell, with an outer jacket of polyvinyl chloride. The outer jacked shall have a flared skirt, be flexible, and able to withstand 105 degree centigrade temperature continuously. Each piece must have the spring connector sized in accordance with the manufacturer's recommendations for the number of conductors and gauges being spliced. Wire strip lengths shall also be in accordance with the manufacturer's recommendations. After spring connector has been applied to the connection, the splice shall be coated (by submersion) with a corrosive-resistant, solvent-resistant, sealing/bonding, flexible electrical coating, having at least 100 volt/mil electrical strength. Upon coating of the splice, the flared skirt end shall be positioned in an upright alignment and maintained there until the electrical coating is dry. In addition to the requirements of Section 86-2.09F, "Fused Splice Connectors", of the State Standard Specifications, the standard midget ferrule type fuse shall be further interpreted as being rated at 30 amps at 600 volts. It shall also be constructed to accommodate a 13.32 located in the hand hole section of the pole.

U. **Fuses** -- Luminaires with up to 175-watt bulbs shall have 6 amps fuses installed. Luminaires with 250 to 400 watt bulbs shall have 10 amp fuses installed. All fuses shall be the fast blowing type.

V. **Photoelectric Unit** -- The photoelectric units shall be supplied by the contractor for installation.

W. **Service** -- The service shall conform to the provisions of Section 86 -2.11 of the State Standard Specifications, except as herein modified. The service shall be a three wire A.W.G. = 5 or as shown on the plans and drawings. It shall contain main breakers, auxiliary breakers, test switch, and contractor in accordance with the drawings. The contractor shall provide "American" padlocks for the service cans to unlock with key D233.

The contractor shall supply three = 14 A.W.G. conductors from the service pedestal to the photoelectric unit. The location of service points will be as shown on the plans with the concurrence and approval of the serving utility.

All components within the service box shall be clearly marked with the manufacturer's name and part number with a metallic or permanently marked engraved stencil for future identification. All control and switching equipment and fusing of the circuits shall meet the requirements of the National Electrical Code, the Electrical Safety Orders of the Industrial Accident Commission of the State of California, the rules of the National Board of Fire Underwriters, and Town of Loomis.

X. **Painting** -- Painting of electrical equipment and materials shall conform to the provisions in Section 59, "Painting", of the State Standard Specifications, with the following additions and modifications:

1. Paint material for electrical installations, unless otherwise specified, shall conform to the provisions in Section 91, "Paint", of the State Standard Specifications.

2. In lieu of the temperature and seasonal restrictions for painting as provided in Section 59, "Painting", of the State Standard Specifications, paint may be applied to equipment and materials for electrical installations at any time approved by the Town Engineer.

3. All ferrous surfaced to be pained shall be cleaned as provided in Section 59, "Painting", of the State Standard Specifications prior to applying the vinyl wash primer or prime coat. Blast cleaning of galvanized metal surfaced in good condition, as determined by the Town Engineer, will not be permitted.

4. Existing equipment to be painted in the field shall be washed with a stiff bristle brush using a solution of water containing 2 tablespoonfuls of heavy duty detergent powder per gallon. After rinsing, all surfaced higher than 8 feet above ground level shall be wire brushed with a coarse, cup shaped, power driven brush to remove all poorly bonded paint, rust scale, corrosion, grease, or dirt. Any dust or residue remaining after wire brushing shall also be removed prior to priming. All surfaced between the ground level and 8 feet in height shall all paint, rust, scale, corrosion, grease, and dirt removed to bare metal.

5. Immediately after cleaning, all bare metal in corrosive atmospheres, all galvanized surfaces, and all nonferrous metal surfaces shall be coated with PreTreatment, Vinyl Wash Primer, Section 91-2.07 of the State Standard Specifications, followed by two prime coats of Zinc Chromate Primer for metal, Section 91-2.05 of the State Standard Specifications, in non-corrosive atmospheres.

Pre-Treatment, Vinyl Wash Primer may be omitted on bare metal surfaces and the prime coats shall be applied immediately after cleaning.

6. Where standards are to be finished with enamel, the color shall be Light Green Finish Coat (see Section 91-2.17 of the State Standard Specifications); the final prime coat shall be of Zinc Chromate Primer for Metal.

7. Equipment previously finished as specified shall be given a spot finishing coat on newly primed areas, followed by on finishing coat over the entire surface.

8. All paint coats may be applied either by hand brushing or by approved spraying machine in the hands of skilled operators. The work shall be done in a neat and workmanlike manner. The Town Engineer reserves the right to require the use of brushes for the application of paint should the work done by the pain spraying machine prove unsatisfactory or objectionable, as determined by the Town Engineer.

Y. **Cleanup** -- During the progresses of the work, the Contractor shall keep the entire job site in a clean and orderly condition. Spillage resulting from hauling operations along or across existing streets or roads shall be removed immediately by the contractor.

Z. **Acceptance Test** -- After completion of the installation of the street lights the contractor shall test all streetlights in the presence of the Town Engineer. The contractor shall furnish all material and equipment for such testing. The street light system shall be energized for a period of one hour or 20 minutes per lamp, whichever is greater. The test will identify light distribution patterns; accept ability of the ballasts, fixtures, and lamps for electrical and noise standards; to verify that all connections are electrically and mechanically sufficient; and other purposes as directed by the Town Engineer.

9-8 MASTER PLANNING -- Master planning is the determination of street light locations between control points. Control points are proposed street light locations at street intersections in accordance with Section 9-7 and existing streetlights. The purpose for master planning is to end up with an overall uniform street light system meeting minimum requirements. On 74 foot, 84 foot, and 94 foot streets, master planning shall apply to only one side of the street. On all other streets, master planning shall apply to both sides of the street. The procedure for master planning is outlined as follows:

A. Determine the nearest intersections each way from the street light locations required. Determine the location of the streetlights at the intersections in conformance with these design standards.

B. Determine the existence of any streetlights situated between the adjacent intersections above.

C. Determine the distance between the adjacent designed intersection street lights above and/or adjacent to existing street lights, whichever are nearest to the street light locations being determined.

D. Divide the distance into the most possible equal spaces between lights that can be obtained in conformance with the spacing requirements herein.

E. Compare the light locations to intersecting property lines, driveways, pedestrian lanes, and utility obstructions as follows:

1. If the location falls close to a property line and the street light location can be adjusted to the property line while staying within the maximum spacing allowed, then the adjustment should be made.

2. Generally, streetlights should be situated at intersecting property lines for residential lots and parcel with minimal frontage (75 feet or less). The light spacing may have to be unbalanced with additional lights being added to attain this and still comply with the maximum spacing allowed.

3. Street light locations shall be adjusted to miss driveways and existing utility obstructions by five feet.

F. Where utility owned poles with overhead lines are existing, the serving utility company shall be contacted to determine if the streetlights can be installed upon the poles.

G. Street light locations on 84 foot and 94 foot streets may be adjusted to obtain a more uniform light distribution, should there be existing streetlights on the opposite side of the street.

H. Street lights, if required, shall be shielded to prevent glare and/or reflection on to adjacent residential or business buildings. The project shall submit samples of the light shield for approval by the Town Engineer.

SIGNS

9-9 GENERAL - - Sign shall be constructed/installed in accordance with the approved improvement plans and specifications, these Construction Standards, the Town Specifications, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the CalTrans Standard Specs.

As a minimum, all signs shall be the standard size as shown in the CalTrans Traffic Manual or CalTrans Sign Specifications, with the exception of type R2, 25 mph, 30 mph, or 35 mph speed limit signs, which may be 24 inches by 30 inches. On collector and arterial streets, the minimum size of type R1 stop signs shall be 36 inches. Type R1 stop signs on other streets shall be 30 inches. Type R1 stop signs installed on bike trails may be either 24 inches or 18 inches as approved by the Engineer.

Fluorescent Yellow Green (FYG) background colored signs shall be installed for all type W54, W54A, W63, W64, W65, W66, W79, and W80 signs.

All Overhead Signs (Signal Mounted) and advance warning G7 Guide signs shall have a 1.25 inch white reflective border around the perimeter of the sign as shown in Code G7-1 of the CalTrans Sign Specifications.

All sign panels, except as otherwise directed in these standards, shall be fabricated using reflective engineering grade sheeting. Message and sheeting shall be on one side of the panel only. No mixing of diamond, high intensity, or engineering grade sheeting on the same panel shall be allowed.

Overhead Signs (Signal Mounted) shall be fabricated using high intensity sheeting. All Fluorescent Yellow Green (FYG) background colored signs shall be fabricated using diamond grade sheeting. Al type G7 (street name and advance warning) signs along arterials and collectors shall be high intensity grading.

All existing traffic signs, which are in conflict with the proposed work as shown on the plans, shall be removed by the Contractor and returned to the Town. The Engineer shall make the final decision if a question arises as to what represents said conflict.

OVERHEAD SIGN STRUCTURES
(Signal Mounted)

9-10 MATERIAL - - G-7 and G-8 street sign lettering shall be white high intensity reflectorized Series D, with eight inch upper case and six inch lower case lettering. When text is too long for a single line, lettering other than Series D, but not smaller than Series B, may be used with the approval of the Engineer.

G-7 and G-8 Signs with one line of text shall be 24 inches tall. Signs with two lines of text shall be 36 inches tall.

All white symbols and arrows on G-8 signs shall be reflectorized.

Internally illuminated Street Name Signs (IISNS) shall not be used unless otherwise directed in writing by the Engineer.

9-11 SIGN PANELS & FASTENING HARDWARE - Overhead sign structures shall be attached to signal mast arms per CalTrans Standard Detail ES-7N, or as directed by the Engineer.

A. All street name signs mounted on signal mast arms shall not be the swinging arm type. One end of each street name sign shall be attached to the signal pole in at last two places, and the other end shall be attached to the signal mast arm. Fastener shall pass through both sign panels and stiffening braces, unless otherwise noted.

B. All signal mast arm mounted signs shall have back stiffening braces attached to the sign panel.

ROADSIDE SIGNS

9-12 MATERIAL - G-7 and G-8 Signs with one line of text shall be 18 inches tall. Signs with two lines of text shall be 24 inches tall.

9-13 METAL POLE - Metal pole, square tube, shall conform to the standard specifications for cold rolled carbon sheet steel, commercial quality, ASTM A-446 or hot rolled carbon steel sheet, structural quality, ASTM A-570-90 and ASTM A-653-94, structural grade 50. The square end of the post can be pointed for easy penetration and shall be capable of being driven into the ground by the use of an approved driving cap.

A. Square tubes shall be installed into a sleeve of same material with two holes showing above finished grade. All holes below grade shall be taped closed. The sleeve shall be embedded in concrete.

B. Corner weld steel shall be carefully rolled to size and shall be welded directly in the corner by high frequency resistance welding and externally scarfed to agree with corner radii. Corner weld shall be zinc coated after scarfing operation.

Permissible Dimensions	Squareness Tolerance	Twist In 3' length
1-¾" x 1 - ¾"	Plus or Minus .010"	0.62"
2" x 2"	Plus or Minus .012"	0.62"
2-1/4" x 2- ¼"	Plus or Minus .014"	0.62"

Note: A square tube may have its side failing to be 90 degrees to each other by the tolerance listed above.

Permissible variation in the straightness is one-sixteenth of an inch in three feet.

Standard outside corner radius shall be five-thirty seconds of an inch plus or minus one sixty-fourth of an inch.

Welding flash on the inside corner of the welded square tubes shall be controlled to permit a nine sixty-fourths inch radius gauge to be placed in the corner.

Square tubes shall be manufactured from hot dipped galvanized steel with 1.40 ounces of zinc coating, conforming to ASTM A-653, also referred to as G-140.

Square tubes shall be produced utilizing a Polyester TGIC Powder Coating in a white high-glass finish.

Corner weld should be zinc coated after scarfing operation. Interior and exterior walls of the tubing shall be galvanized, or tubing shall be given a triple coated protection by an in-line application of hot-dipped zinc (galvanization) per AASHTO M-120 followed by a chromate conversion coating and a clear organic exterior coating. The inside surface shall be given corrosion protection by double in-line application of a full zinc-base organic coating.

9-14 SIGN PANEL FASTENING HARDWARE - All signs with a surface area greater than 5 square feet shall have back bracing attached from the post support to the sign panel. Sign panels 16 square feet or larger shall have box framework.

9-15 SIGN PANEL INSTALLATION - Efforts shall be made to ensure that all signs in the center median or shoulder areas are not installed next to landscaping or other objects which may impair visibility of the sign.

The bottom of roadside signs shall be mounted at a minimum height of seven (7) feet above the grade of the sidewalk (or traveled way if there is no sidewalk), with the following exceptions:

1. The bottom of type R7, W56, and W57 signs shall be mounted at a minimum height of five (5) feet.
2. The bottom of type R10 signs located in the median shall be mounted at a minimum height of (1.5) feet.
3. The bottom of type W81 signs located outside of sidewalk areas shall be mounted at a minimum height of three (3) feet.
4. At intersections in residential areas, the bottom of street name signs shall be mounted at a minimum height of eight (8) feet. If a stop sign is attached to the same post, the street name sign shall be mounted ten (10) feet above the finished grade.

MARKERS AND DELINEATORS

9-16 DESCIPTION - Markers and delineators shall be installed in accordance with the approved improvement plans and specifications, these Construction Standards, The State of California Traffic Manual, the State of California Department of Transportation Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the CalTrans Standard Specs.

9-17 REFLECTORS - Type K-4 (type Q in the CalTrans Traffic Manual) markers (aka: Superducks) shall be 36 inches tall and have 3 bands of reflective sheeting per Section A73C of the CalTrans Standard Plans.

TRAFFIC STRIPES & PAVEMENT MARKINGS

9-18 DESCRIPTION - Traffic stripes and pavement markings shall be installed in accordance with the approved improvement plans and specifications, these Construction Standards, The State of California Traffic Manual, the State of California

Department of Transportation Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the CalTrans Standard Specs.

9-19 TOLERANCES & APPEARANCES -The following clarifications or modifications shall be applied when installing traffic stripes and pavement markings:

1. In addition to locations as shown on the plans, bike lane signs and pavement markings shall be installed at no more than one half-mile intervals. The BIKE LANE legend shall be centered in the lane to ensure the legend does not run into the lane striping.
2. Unless otherwise specified on the plans, crosswalks shall be eleven (11) feet wide, measured from the centerline of the strip.
3. Traffic stripes and pavement markings shall not be placed over utility covers including, but not limited to, manhole covers, utility boxes, hand holes, or water valve covers.
4. STOP legend pavement markings and limit lines are required with stop signs. YIELD legend pavement markings are not required with YIELD signs. The yield limit line shall consist of a 12-inch wide white broken line. The broken yield limit line shall be spaced 3 feet solid, 2 foot break, 3 feet solid, 2 foot break (etc.)... until the area is filled.
5. Pavement arrows shall be one of the following types unless otherwise directed by the Engineer: Type II (L, R or B), Type III (L, R, or B), Type IV, Type VI or Bike lane Arrow. Type IV arrows shall only be allowed at approaches controlled by a stop sign.
6. At signalized intersections with left turn lanes longer than 150 feet the Type II, or Type II arrows shall be placed 20 feet behind the limit line, and the arrow in the number 2 left turn lane shall be placed 20 feet behind the limit line. The intent is to have the two arrows line up side by side, even though the limit lines are staggered.
7. All turn lanes shall have a Type II or Type II arrow at the beginning of the turn lane such that the tail of the arrow lines up with the beginning of the Detail 38 striping. All turn lanes 150 feet or longer shall have a minimum of two Type II or Type III arrows.
8. Type IV (L) arrows shall only be allowed at approaches controlled by a stop sign.
9. All traffic lane striping shall be discontinued through any four way public intersection from crosswalk to crosswalk, marked or unmarked. Striping shall be continuos through private intersections unless there is a striped left turn lane and/or traffic signal. For public "T" intersections, the through and bike lane striping shall be continuous for the non-intersections direction, i.e. "across the top of the "T".
10. At locations where bike lane striping is parallel striping used to channelize traffic, right turn acceleration/deceleration lanes and bus turnouts, both strips shall be detail 38. Reflective pavement markers shall be placed along the stripe next to the through lane, the other stripe shall have no pavement markers.

11. Left turn arrows shall not be placed in Two Way Left Turn Lanes unless otherwise directed by the Engineer.

THERMOPLASTIC TRAFFIC STRIPES & PAVEMENT MARKINGS

9-20 MATERIAL - The thermoplastic material shall conform to State Specification 8010-19A, Thermoplastic traffic Striping Material, Alkyd Binder, White and Yellow.

9-21 APPLICATION - The Contractor shall apply an adhesive primer base coat prior to the application of any thermoplastic material on pavement older than 30 days.

As shown on the plan, the following permanent traffic lane striping shall be thermoplastic and placed as one of the following types: detail 25, 27B, 38, 39, and Detail 39A. Pavement markers are also required for placement of detail 25 and 38.

PAVEMENT MARKERS

9-22 DESCRIPTION - Pavement markers shall be installed in accordance with the approved improvement plans and specifications, these Construction Standards, The State of California Traffic Manual, the State of California Department of Transportation Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the CalTrans Standard Specs.

9-23 NON-REFLECTIVE PAVEMENT MARKERS - All nonreflective pavement markers shall be ceramic.

9-24 PLACEMENT - As shown on the plans, the following permanent traffic lane striping shall be raised pavement markings, and placed as one of the following types: detail 4, 7, 10, 13, 17, 20, 23, 25, 26, 30, 33, 37C, 38, or Detail 40A. Thermoplastic striping is also required for placement of Detail 25 and 38.

Detail 26 markers shall be placed 6 inches from the face of the median curb.

At all fire hydrant locations, a blue reflective pavement marker shall be installed one foot off paved centerline or median on the hydrant side of the roadway.

All traffic lane striping shall be discontinued through any four way public intersection from crosswalk to crosswalk, marked or unmarked. Striping shall be continuous through private intersections unless there is a striped left turn lane and/or traffic signal. For public "T" intersections, the through and bike lane striping shall be continuous for the non-intersections directions, i.e. "across the top of the T".

At locations where bike lane striping is parallel striping used to channelize traffic, right turn acceleration/deceleration lanes and bus turnouts, both strips shall be detail 38. Reflective pavement markers shall be placed along the stripe next to the through lane, the other stripe shall have no pavement markers.

9-25 GENERAL -Signals, lighting electrical systems shall be constructed/installed in accordance with the approved improvement plans and specifications, these Construction Standards, The State of California Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the CalTrans Standard Specs.

9-26 EQUIPMENT LIST AND DRAWINGS - The Town shall provide, as discussed in these Standards, the following traffic signal equipment and materials; Controller Cabinet Assembly, Electrical Service and Emergency Vehicle Preemption.

Upon ten day notice to the Town, the equipment and materials to be provided by the Town will be available for pick-up by the Contractor at the Town's Corporation Yards. The Contractor shall provide all labor and equipment necessary to transport the Town provided equipment and materials to the job site.

9-27 MAINTAINING EXISTING & TEMPORATRY ELECTRICAL SYSTEMS -Roadway closures requiring restrictions of turning movements and/or signal red flash operations shall not be allowed without the written consent of the Town Engineer.

9-28 FOUNDATIONS - Placement (location) of all foundations shall be verified by the Engineer prior to installation.

There shall be a minimum 6-inch high curb around the signal controller/service pad, excluding the sidewalk/roadway side of the pad. The minimum curb height shall increase as necessary to ensure no steeper than a 2:1 slope of the native material around the pad. Masonry blocks may be utilized to achieve the required 2:1 slope. The Contractor shall be responsible for acquiring building permits for retaining walls if the wall is greater than four feet from base of footing to top of wall. Refer to drawing number TS-4 for further details.

Signal pole anchor bolts shall be aligned to ensure a maximum mast arm offset of two(2) degrees from perpendicular to the roadway.

9-29 STANDARD, STEEL PEDESTAL AND POST -- Any 18 standard having a signal head display, 4 sections or larger, shall be installed under the following criteria:

1. Four (4) section display will be side (SV-1-T or SV-2-T) mounted. The 1B standard shall be 13 feet in height. A PVC cap shall be provided as a pole cap. Special mounting instructions as described in these Standards shall apply. (See Section 86-4.06).

   Five (5) section display shall be side (SV-1-T or SV-2-T) mounted. The 1B standards shall be 14 feet in height. A PVC cap shall be provided as a pole cap. Special mounting instructions as described in these Standards shall apply. (See Section 86-4-.06).

2. Individuals certified by the pole manufacturer shall perform signal standard welding. The contractor shall give seven (7) days advance notification prior to any welding on existing poles installed in the public right-of-way. The Contractor shall certify that any welding of signal standards will not degrade the integrity of the standards. Upon completion of welding on a signal mast arm, the Contractor shall replace any existing electrical wires in the arm.

3. All future tenons shall be covered with a plastic cap and a pull wire shall be installed to the tenon.

9-30 CONDUIT MATERIAL - All conduits shall be gray PVC, minimum Schedule 40.

9-31 CONDUIT USE -- All conduit shall be two (2) inch or larger.

9-32 CONDUIT INSTALLATION - All trenches in existing streets shall be constructed and shall be per these Standards and as required in this section.

All new conduit placed in the roadway, with the exception of conduit between detector handholds and the first pull box, shall be buried at a depth of 30" below finished grade or 18" below finished subgrade, or which ever is deeper.

Conduit size shall be limited to 3 inches maximum for new installations.

Unless otherwise specified, all signal interconnect shall be installed using 2 inch conduit with 2 foot radius 90 degree sweeps into each number 6 pull box. End bells shall be installed on the pull box end of each 90-degree sweep conduit into all pull boxes.

After conductors have been installed, the ends of conduits terminating in pull boxes and controller cabinets shall be sealed with a duct seal type of sealing compound.

If delay to motorists will not exceed 10 minutes, conduit may be installed as allowed by "Trenching In Pavement Method" as provided in the CalTrans Standard Specifications and these requirements

1. The trench shall be maximum six inches wide and two inches wider than the outside diameter of the conduit to be installed. There shall be one-inch minimum clearance between the conduit and the trench wall. The trench shall be crumbed clean prior to placement of conduit.
2. Aggregate material in concrete shall be pea gravel. Concrete shall be thoroughly consolidated around the conduit filling all voids.

9-33 PULL BOXES - Pull boxes shall not be placed within the area of an access ramp unless directed by the Engineer. Pull boxes should be installed offset 1' from back of curb. The bottoms of pull boxes shall be bedded in 6 inches of clean crushed rock. Grout in the bottom of pull boxes is not required. The pull box rim and lid shall be flush with surrounding surface. In unpaved areas, the pull box rim and lid shall be 1-inch above the finish grade.

Conduit termination in the pull box shall be a minimum of 2" from the sides of the pull box, 2" above the crushed rock, and at least 8" below the bottom of the pull box cover. Conduits shall enter and exit pull box quadrants relative to the direction of the run.

All pull boxes and lids shall be precast reinforced concrete unless otherwise directed by the Engineer.

All pull boxes shall be minimum number 5 unless otherwise specified.

Traffic Signal Interconnect pull boxes shall be a number 6 and shall be located adjacent to street light pull box locations, or as directed by the Engineer. The "Home Run" pull box (typically adjacent to the controller) shall be number 6 unless otherwise specified.

All pull boxes to be abandoned shall have conductors removed from the pull boxes and conduits and the pull box shall be removed. The remaining hole shall be backfilled and compacted with similar material as the surrounding material.

9-34 COVER MARKING - - Strips shall be fastened with ¼ inch stainless steel rivets.

Pull box covers shall read "TRAFFIC SIGNAL", except covers for pull boxes used solely for traffic signal interconnect, which shall read 'SIGNAL INTERCONNECT".

9-35 CONDUCTORS - Conductors installation in new conduits shall be limited to 26 percent fill of the conduit maximum. Conductors installed in existing conduits shall be limited to 33 percent fill of the conduit maximum.

All traffic signal conduit and interconnect conduit shall have a green No. 10 pull wire.

9-36 CONDUCTOR IDENTIFICATION - - Additional marking of all conductors and cables shall be made at each termination point or as directed by the Engineer. Conductors for each vehicle and pedestrian phase shall be bundled together and banded with plastic tire-wrap labels in all pull boxes and at the signal controller cabinet.

9-37 MULTIPLE CIRCUIT CONDUCTORS - - Multiple circuit conductors shall not be permitted.

9-38 SIGNAL INTERCONNECT CABLE - - Signal interconnect cable shall consist of twelve (six pairs) number 20, minimum, stranded copper conductors. Each pair shall be wrapped with an aluminum polyester shield and shielded pair. **No splicing of the Interconnect cable shall be allowed.**

The signal interconnect cable shall not be placed in any conduit runs or pull boxes containing live conductors, unless otherwise directed by the Engineer.

Six (6) feet of slack shall be provided in each pull box. Fifty (50) feet of slack for each signal interconnect cable run shall be provided in the Home Run pull box in front of each signal controller, or the last pull box before the controller.

9-39 WIRING - - All wiring shall meet or exceed the current CalTrans Standards and National Electrical Code Standards.

9-40 WIRING INSTALLATION - - Ends of spare conductors or conductors terminated in pull boxes shall be taped and water sealed with Scotch Kote or approved equivalent.

9-41 CONNECTORS AND TERMINALS - Field conductor wiring shall not be doubled up on any single wire connector. For conductor sizes larger than number 10, connections shall be spliced by the use of "c" shaped compression connectors as shown in the CalTrans Standard Plans.

9-42 SPLICING - Grounding conductor splicing shall be water sealed with Scotch Kote Sealant or an approved equivalent. Two applications are required.

9-43 SPLICE INSULATION - All splices shall be Method B.

9-44 FUSED SPLICE CONNECTORS - Field fuses shall be installed in the hand hole of the standard.

All field wiring connections shall be soldered after crimping the wire connector.

9-45 BONDING AND GROUNDING - The second paragraph of Section 86-2.10 of the CalTrans Standard Specifications is amended to read as follows:

Grounding jumper shall be attached by 3/8 inch or larger galvanized bolt in the signal standard or controller pedestal and shall be run to the conduit, ground rod or bonding wire in adjacent pull box. Grounding jumper shall be visible after cap has been placed on foundation. All ground connections shall be watertight.

Grounding electrodes shall be of copper clad steel rod, not less than 5/8 of an inch in diameter x 8 feet in length.

A grounding electrode rod in the Controller Assembly shall be paralleled with the grounding electrode rod in the Service. This connection shall consist of a continuous solid #6 bare conductor. The ground connection shall be on the line side of the electrical entrance terminal block.

A continuous #6 bare copper conductor shall connect the ground bus in the electrical service, the grounding electrode in the service, the grounding electrode in the service, the grounding electrode in the controller, and the ground entrance lug in the controller cabinet.

The equipment-bonding conductor for all standards shall be visible and accessible after completion of work.

9-46 SERVICE - The Town shall supply an electrical service consisting of Type II AF, low body configuration, 43 inches high, by 12 inches wide, by 9 inches deep service pedestal. A 50-amp 120/250-volt Hart Lock receptacle shall be installed two inches below spare circuit breakers. A 60-amp 240 volt fuse block will be installed two inches to the left of the inside door latch and one inch below latch and one inch below the test switch. A mercury contactor shall be used for the 120-volt street lighting circuit control. Refer to

drawing number TS-1 for further details. The base shall be reinforced with 3/8-inch aluminum of ¼ inch steel. A 2,000-pound hasp shall be installed in two locations on the circuit breaker door. The meter window will have a metal door cover. The metal shall be anodized aluminum.

The Contractor shall obtain a building permit prior to installation of a new electrical service.

The service pedestal shall be installed a minimum of five (5) feet from the controller cabinet.
There shall be a 1 inch grouted section between the service and the foundation. A ¼ inch weep drain hole shall be installed in this grout section.

9-47 TESTING - The Contractor shall contact the Public Works Inspector at least five (5) business days prior to installation of a tested controller assembly and/or electrical service.

9-48 GROUND -- Before electrical power can be connected, the grounding electrode shall be tested for earth ground resistance. The Town Engineer shall perform this ground resistance testing. The earth ground resistance shall be a maximum of 5 ohms.

9-49 FUNCTIONAL TESTING -A shutdown of the electrical system resulting from damage caused by public traffic or from a power interruption shall not constitute discontinuity of the functional test.

During interconnect cable installation, the Contractor shall in the presence of the Town Engineer, perform a high resistance to ground test, DC resistance test and a dB attenuation loss test. The Contractor shall supply factory specifications prior to the test. The Contractor shall notify the Engineer at least 48 hours prior to interconnect cable installation.

9-50 CONTROLLER CABINET ASSEMBLY - - The Town shall supply the controller cabinet assembly.

The traffic signal controller shall have a 1" bead of clear silicone sealant applied immediately before installation between the foundation and the controller cabinet bottom. The bead shall be centered 2" in from the outer edge of the controller cabinet, around the entire perimeter. All excess silicone on the outer edges shall be cleaned off.

The sealant shall be 35 year rated. There shall be no substitution for the silicone sealant.

The field wire entrance section of the controller shall face the intersection or as directed by the Engineer.

No access to the controller shall be permitted without supervision of the Town Engineer, unless otherwise directed.

9-51 EMERGENCY VEHICLE PREEMPTION EQUIPMENT - - The Town shall supply emergency vehicle preemption equipment, with the exception of the required cabling from the optical detector to the discriminator in the Controller Cabinet Assembly.

Where existing signals are being modified, and said signals are already equipped with emergency vehicle preemption equipment, the Contractor shall perform any necessary remodel and reinstallation of said equipment as required by the plans or as directed by the Town Engineer.

Preemption cables shall be labeled in the following manner;

Phase 2&5	Single gray band
Phase 4&7	Double gray ban
Phase 1&6	Triple gray band
Phase 3&8	Quadruple gray band

Labels shall consist of banded colored tape visible at the preemption detector, signal standard hand hole, adjacent pull box and the Controller Cabinet. Cables in the Controller Cabinet shall have tie wrap labels with appropriate phasing descriptions.

9-52 VEHICILE SIGNAL FACES - - All signal faces shall be aluminum. Mountings for MAT and MAS signal sections shall be bronze metal.

9-53 SIGNAL SECTIONS -All signal sections shall be 12-inch mold-cast aluminum.

9-54 LIGHT EMITTING DIODE SIGNAL AND PEDESTRIAN MODULE - All vehicle and pedestrian displays shall be supplied with LED signal lamps that conform to the latest ITE & CalTrans certifications.

9-55 BACKPLATES - All vehicle signal sections shall include aluminum backplates with perforated louvers.

9-56 PROGRAMMED VISIBILITY VEHICLE SIGNAL FACES (PVDISPLAY) - All programming of the optic display shall be done in accordance with the manufacturer and the Town Engineers' specifications.

9-57 FRONT SCREEN - - The front screen shall be plastic.

9-58 PEDESTRIAN SIGNAL FACES - Pedestrian signals shall be aluminum Type "A" with international symbols. Pedestrian head mounts shall be clamshell type with bronze mounting hardware. Mounting shall include one Allen head screw for opening, and all wiring shall be quick connect type (plug in).

9-59 SIGNAL MOUNTING ASSEMBLIES - - Terminal compartments (TV & SV) and mast arm slip fitters (MAS & MAT) shall be bronze.

Signal mast arm mounted four (4) section displays shall be type MAS-4C.

Extra support shall be incorporated whenever the following conditions arise;

1. The use of a SV-3TA or SV-3-TB display.
2. If any display on a side mount is larger than a 3-section 12" display.

The extra support method shall consist of a 1" stand off w/1/4" x 20 threaded hole. The stand-off shall be banded to the signal standard, 3" below the bottom of the top slip fitting of the displays'' 1- ½ inch riser. A ¼ inch hole shall be frilled in the center of the 1-½ inch riser to match the position of the thread hole on the stand-off. The riser shall be attached to the standoff with a ¼" x 20 bolt, which shall include a lock washer and flat washer.

All signal display mounting assembly top members shall be watertight. The watertight sealing methods shall be a ½" thick layer of clear silicone around the top jointing member of all displays. Additional sealant shall be installed in the same manner on all plugs installed in the top of any signal display. Rubber washers used for water-sealing the top assembly shall not be permitted on any display framework or MAT mounting.

All MAT mounted signal displays shall have only one (1) serrated washer installed between the lock nut and the display.

All MAT and MAS mounts shall be sealed with approved clear silicone around the tenon attachment area, including the through bolt and tenon openings.
The sealant shall be 35 year rated. There shall be no substitution for the silicone sealant.

Where vehicle or pedestrian display is to be installed on the side of a signal pole, a terminal compartment only shall be installed on the signal pole at the vehicle display position. All signal display wiring from the signal mast arm shall terminate at this location.

9-60 VEHICLE DETECTORS CONSTRUCTION MATERIALS - The first detector at the limit line shall be inductive loop detector Type "Q". All other vehicle detectors shall be inductive loop detector Type "A". Refer to drawing number TS-5 for further details.

Loop wire shall be Type 1, RHW-USE, neoprene-jacketed, cross-linked polyethylene insulated, #12 stranded copper.

Lead-in cable shall be Type B copper. Tinned copper shall not be permitted.

Vehicle detector hand holes shall be Type "B".

Exclusive right turn loops shall be type "A" loops.

9-61 VEHICLE DETECTORS INSTALLATION DETAILS - The Engineer prior to saw cutting shall verify all loop locations. The contractor shall give 48 hours notice prior to loop verification.

Loop wires shall be labeled in the following manner:

Lane 1-Black	Right turn lane - orange
Lane 2 - Red	
Lane 3 - Blue	

Lane- White
Lane 5 - Yellow

1. Labels shall consist of banded colored tape visible in the pull boxes, where the loop wire is spliced to the detector lead-in cable.
2. Loop detectors shall be clearly marked to reference their location in relation to the limit line and lane. The loop closest to the crosswalk in the left most lane shall be labeled as loop number 1-1. The second loop in the same lane shall be labeled 1-2, and so on. Refer to drawing number TS-5 for further details.
3. The start and end leads of a loop detector shall be clearly marked by a means of plastic tie wrap labels.

Loop Home Run slots be double cut to accommodate the twisted pair (3-turns/foot), or as directed by the Engineer. Sealant for filling slots shall be Hot Melt Rubberized Asphaltic Sealant or equivalent as approved by the Engineer. All excess sealant shall be squeegeed off after application.

During loop installation, the Contractor shall in the presence of the Engineer, perform a high resistance test and an inductive reactance test. The Contractor shall notify the Engineer at least 48 hours prior to loop installation.

All wires for each detector loop shall terminate in the nearest pull box, not the hand hole.

Lead-in cables shall not be spliced between the termination point (the pull box adjacent to loop detectors) and the controller cabinet terminals.

Where the approved plans call for preformed detector loops, the following shall apply:

1. The conduit shall be sealed to prevent the entrance of water and the movement of wires within the conduit.

2. The loop wires from the preformed loop to the adjacent pull box or hand hole shall be twisted together into a pair (at least two turns per foot) and encased in Schedule 40 or Schedule 80 PVC or polypropylene conduit (3/8 inches minimum diameter). The lead-in conduit shall be sealed to prevent the entrance of water at the pull box or hand hole end.

3. The preformed loop and lea-in conduits shall be placed prior to pouring final concrete. The top of the conduit shall be between 2 and 3 inches below top of finished surface. Where the concrete is steel reinforced, the preformed loops may rest on the steel.

4. All detector loop shields shall be grounded in the controller cabinet to the ground bus.

9-62 DETECTOR LOOP CIRCUITRY - Adjacent loops on the same sensor unit channel shall be wound in opposite directions (refer to drawing details). All loops shall be wound in a manner such that any adjacent loop will be wound in the opposite direction. The loop at the limit line, closest to the center median (lane 1), shall be wound in a clockwise direction. The next loop back in the same lane shall be wound in a counter-clockwise direction and so on. The loop detector in lane 2 closest to the limit line, shall be wound in a counter-clockwise direction.

9-63 PEDESTRIAN PUSH BUTTON ASSEMBLIES -Pedestrian push buttons shall be aluminum Type "B" with metal international symbol signs. Push buttons shall meet all Americans with Disabilities Act guidelines and be placed 36 inches above the grade of the closest edge of sidewalk and require a horizontal reach of no more than 18 inches outside the closest edge of sidewalk.

Pedestrian push buttons shall be within five (5) feet from the edge of the access ramp pan.

9-64 HIGH PRESSURE SODIUM LUMINAIRES - Unless otherwise noted, all luminaires shall be 250 watt HPS. Specifications for Luminaires:

1. Medium, cutoff, Type II or III lighting distribution (MSII or MSIII).
2. Multi-voltage ballast (120/208/240/277) with lag-type magnetic regulator.
3. Power door ballast assembly & plug in starter.
4. Photo eye receptacle with shorting cap.
5. Flat glass lens.
6. Polyester fiber gasket breathing seal.
7. Voltage tap connection.

9-65 PHOTOELECTRIC CONTROLS - Photoelectric controls shall be Type II and pole top mounted.

9-66 WIRING - Wiring from the photoelectric cell assembly to the electrical service shall be #14. Wire color for the PEU shall be as follows: black for ungrounded conductor, red for ungrounded switch-leg conductor, and white for grounded conductor.

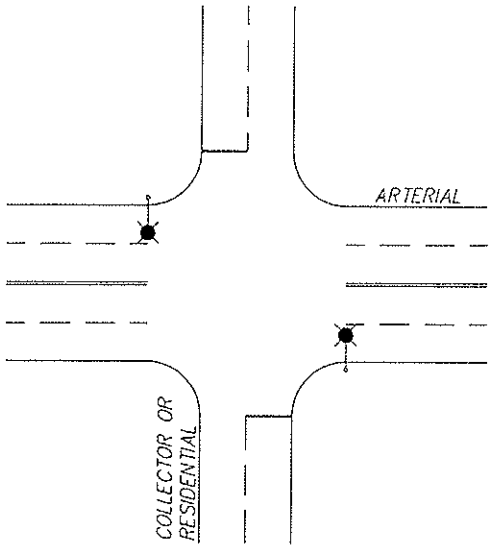
9-67 REMOVE ELECTRICAL EQUIPMENT - All existing traffic control devices, lighting devices, signs, and equipment to be removed and not reused in the work shall be salvaged, unless otherwise specified or directed by the Town Engineer. Salvageable equipment shall remain the property of the Town. Equipment determined to be unsalvageable by the Town Engineer shall become the property of the Contractor. The Contractor shall deliver salvaged equipment to the Town's Corporation Yard.

Damaged conduits deemed to not be reusable shall be removed from existing pull boxes and ends plugged solid with grout. Existing conductors shall be removed from said conduits prior to plugging. Contractor shall dispose of said conductors.

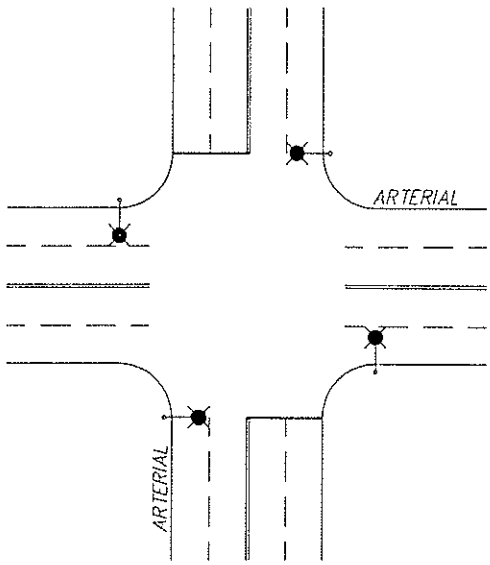
Abandoned conduits deemed reusable shall have the line blown out, existing conductors shall be removed, a number 10 green locate wire shall be installed, and the ends of the conduits shall be sealed.

STREET LIGHTING STANDARD DETAILS

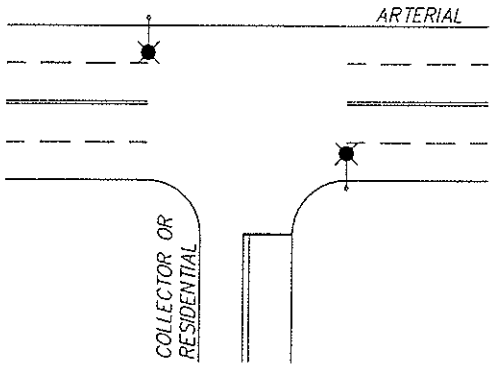
INTERSECTION WITH 2-LANE STREET

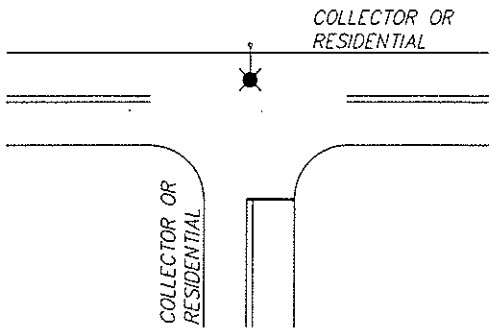


INTERSECTION WITH 4-LANE STREET



TEE INTERSECTIONS





APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

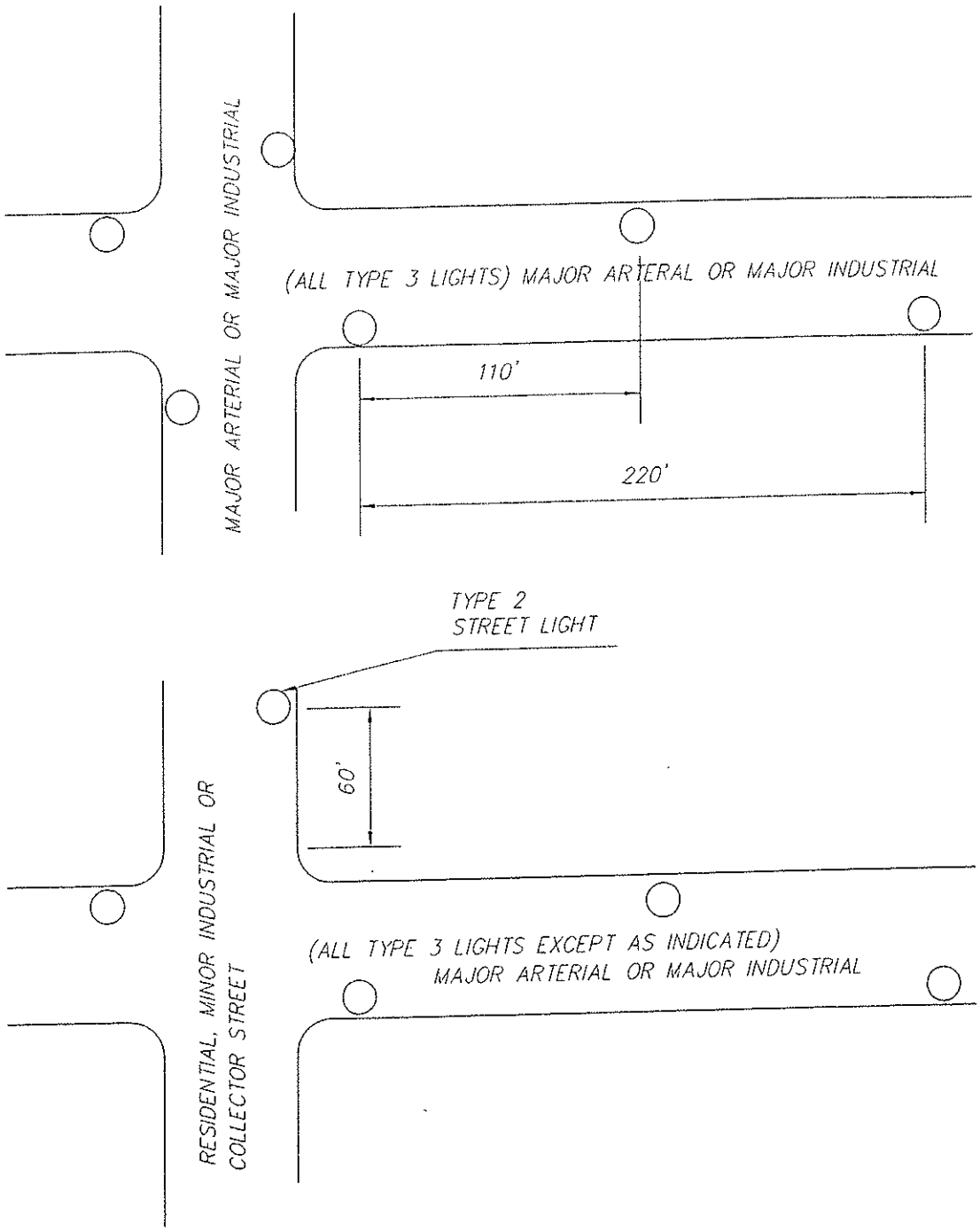
REVISED:

TOWN OF LOOMIS

INTERSECTION LIGHTING

DEPARTMENT OF PUBLIC WORKS

SL-1



NOTES: ANY MODIFICATIONS REQUIRE APPROVAL OF TOWN ENGINEER.

APPROVED BY: BRIAN J. FRAGIAO DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER REVISED:		TOWN OF LOOMIS **STREET LIGHT LOCATIONS AT MAJOR ARTERIALS & MAJOR INDUSTRIAL** DEPARTMENT OF PUBLIC WORKS	**SL-2**

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

TOWN OF LOOMIS

TYPICAL SERVICE AND WIRING SCHEDULE

DEPARTMENT OF PUBLIC WORKS

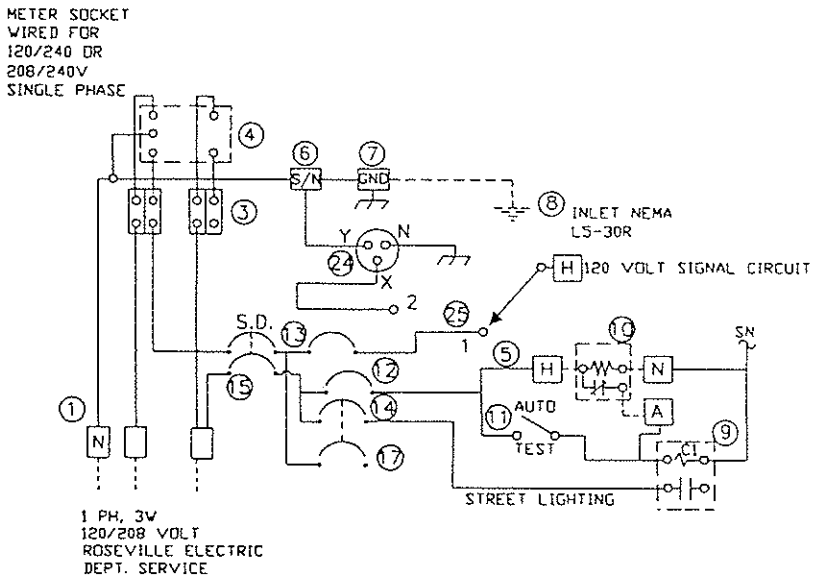
TS-1

TYPE III-AF SERVICE EQUIPMENT SCHEDULE

	COMPONENT	NAME PLATE DESCRIPTION
1	NEUTRAL LUG	
2	LANDING LUG	
3	TEST BYPASS FACILITIES	
4	METER SOCKET AND SUPPORT	
5	TERMINAL BLOCKS	
6	SOLID NEUTRAL BUS	
7	GROUND BUS	
8	GROUND ROD	
9	35A MERCURY CONTACTOR	
10	PHOTO ELECTRIC UNIT	
11	15 AMP SWITCH SPST	LIGHTING TEST SWITCH
12	15A,120V,1P,CKT.BKR.	LIGHTING CONTROL
13	50A,120V,1P.CKT.BKR.	SIGNALS
14	20A,240V,1P,CKT.BKR.	STREET LIGHTS (TRAF.SIG.)
15	100A,240V,2P,CKT.BKR.	SERVICE DISCONNECT
17	20A,120V,1P,CKT.BKR.	SPARE
24	50A,120V,FLANGED RECEPTACLE	
25	55A,120V,1P	TRANSFER SWITCH

SERVICE ENCLOSURE WIRING DIAGRAM

METERED PER UTILITY REQUIREMENTS



APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

TOWN OF LOOMIS

TYPICAL SERVICE AND WIRING SCHEDULE

DEPARTMENT OF PUBLIC WORKS

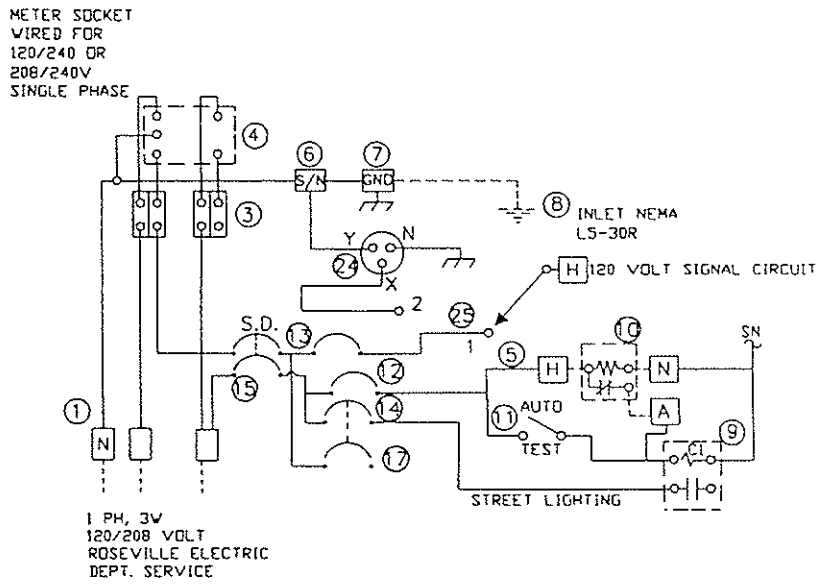
TS-1

TYPE III-AF SERVICE EQUIPMENT SCHEDULE

	COMPONENT	NAME PLATE DESCRIPTION
(1)	NEUTRAL LUG	
(2)	LANDING LUG	
(3)	TEST BYPASS FACILITIES	
(4)	METER SOCKET AND SUPPORT	
(5)	TERMINAL BLOCKS	
(6)	SOLID NEUTRAL BUS	
(7)	GROUND BUS	
(8)	GROUND ROD	
(9)	35A MERCURY CONTACTOR	
(10)	PHOTO ELECTRIC UNIT	
(11)	15 AMP SWITCH SPST	LIGHTING TEST SWITCH
(12)	15A,120V,1P,CKT.BKR.	LIGHTING CONTROL
(13)	50A,120V,1P.CKT.BKR.	SIGNALS
(14)	20A,240V,1P,CKT.BKR.	STREET LIGHTS (TRAF.SIG.)
(15)	100A,240V,2P,CKT.BKR.	SERVICE DISCONNECT
(17)	20A,120V,1P,CKT.BKR.	SPARE
(24)	50A,120V,FLANGED RECEPTACLE	
(25)	55A,120V,1P	TRANSFER SWITCH

SERVICE ENCLOSURE WIRING DIAGRAM

METERED PER UTILITY REQUIREMENTS



POLE & EQUIPMENT SCHEDULE

NO.	STANDARD TYPE	STANDARD SIG. MA (FEET)	STANDARD LUM. MA (FEET)	VEHICLE SIGNAL MOUNTING MAST ARM	VEHICLE SIGNAL MOUNTING POLE	PEDESTRIAN SIGNAL MOUNTING	PPB ø	HPS LUMINAIRE WATTAGE	NOTES
(A)	26-4-70	40'	15'	MAS MAS	SV-1-T	SP-2-CS	2 8	250	MOUNT G7 SIGN (Taylor Road) & R73-3 ON SMA. INSTALL OPTICOM DETECTOR EVC ON SMA.
(B)	1-B				TV-2-T	SP-2-CS			
(C)	18-3-70	30'		MAS		SP-1-CS			MOUNT G7 SIGN (King Road) & R34 ON SMA. INSTALL OPTICOM DETECTOR EVB ON SMA.
(D)	1-B				TV-2-T				MOUNT R96, R96A ON 1-B POLE.
(E)	18-3-70	25'		MAS	SV-1-T	SP-1-CS			MOUNT G7 SIGN (Taylor Road) & R34-2 ON SMA. INSTALL OPTICOM DETECTOR EVA ON SMA. MOUNT R96, R96A ON SIGNAL POLE.
(F)	1-B				TV-1-T		2		
(G)	TYPE 15		15'					250	INSTALL PEU ATOP THIS POLE.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

TOWN OF LOOMIS

TYPICAL POLE AND EQUIPMENT SCHEDULE

DEPARTMENT OF PUBLIC WORKS

TS-2

CONDUCTOR SCHEDULE

AWG	CIRCUIT	1	2	3	4	5	6	7	8	9	10	11
No. 14	ø1	3	3	3	3	3		3	3	6		
	ø2						6	6	3	9		
	ø3		3	3	3	3		6		12		
	ø4		3	3	9	9		12		12		
	ø5					3	3	6		6		
	ø6	6	6	6	6	9		9		9		
	ø7											
	ø8											
	ø2 PED						2	2	2	4		
	ø4 PED				2	2		4		4		
	ø6 PED	2	2	2	4	4		4		4		
	ø8 PED											
	ø2 PPB							1	1	2		
	ø4 PPB					1	1	2		2		
	ø6 PPB		1	1	2	2		2		2		
	ø8 PPB											
	SPARES	6	12	12	15	21	6	33	6	42		
	P.E.U.									2		
	TOTAL No.14	17	30	30	44	57	18	57	15	116		
No.12	PPB COMMON		1	1	1	1	1	2	1	2		
No.10	LUMINAIRE	2	2	2	2	2	2	2		2		
No. 8	SIGNAL COMMON	1	1	1	1	1	1	2	1	2		
No.10	PULL WIRE	1	1	1	1	1	1	1	1	1		
DLC	ø1 DETECTORS					4		4		4		
	ø2 DETECTORS								12	12		
	ø3 DETECTORS			7	7	7		7		7		
	ø4 DETECTORS							9		9		
	ø5 DETECTORS								4	4		
	ø6 DETECTORS					11		11		11		
	ø7 DETECTORS											
	ø8 DETECTORS											
	TOTAL DLC			7	7	22		31	16	47		
OPTICOM CABLES	EVA						1	1		1		
	EVB				1	1		1		1		
	EVC	1	1	1	1	1		1		1		
	EVD									1		
	TOTAL CABLES	1	1	1	2	2	1	3		4		
TOTAL CONDUCTORS												
CONDUCTOR SIZES		3"	2.5"	4"	1.5"	(2)4"	3"	2.5"				
PERCENT FILL												

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

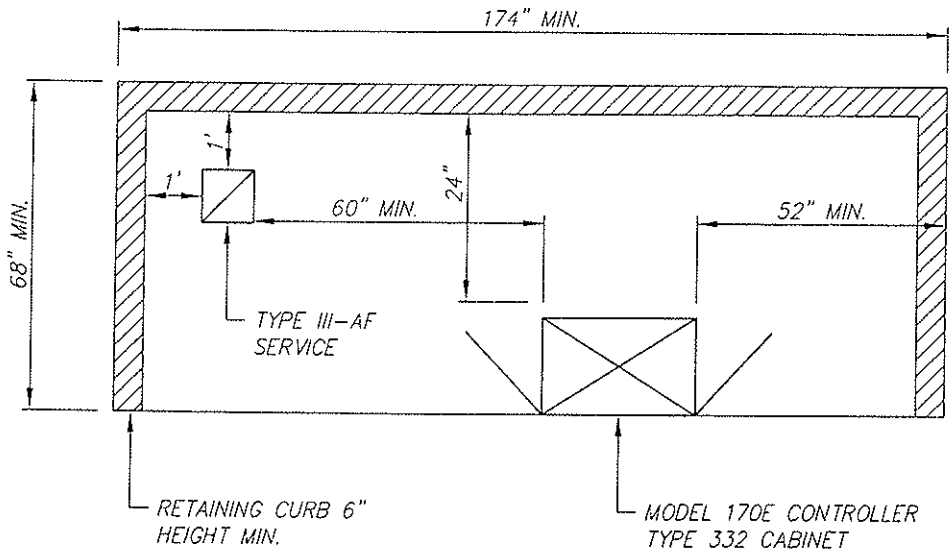
REVISED:

TOWN OF LOOMIS

TYPICAL CONDUCTOR SCHEDULE

DEPARTMENT OF PUBLIC WORKS

TS-3



ROADWAY/SIDEWALK SIDE

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

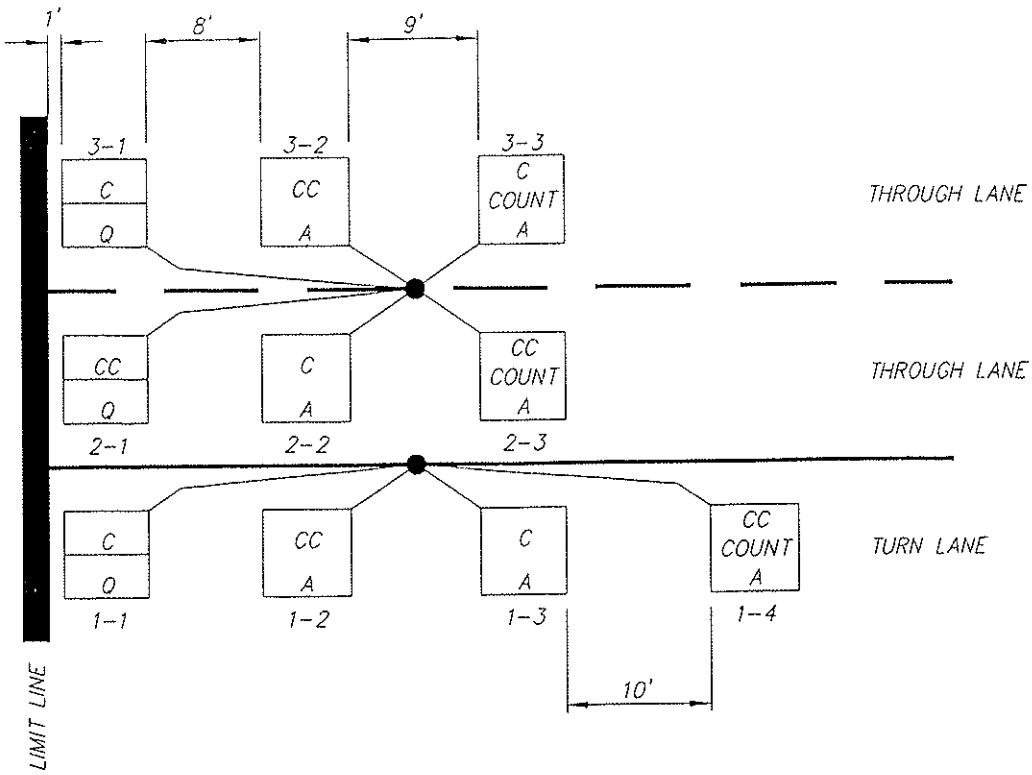
REVISED:

TOWN OF LOOMIS

TYPICAL CONTROLLER / SERVICE CABINET PAD DETAIL

DEPARTMENT OF PUBLIC WORKS

TS-4



LOOP DETECTOR ASSIGNMENTS

	LT (1)	LT (2)	THRU (1)	THRU (2)	THRU (3)
CALL	111U 315U 5J1U 7J5U	111L 315L 5J1L 7J5L	214U 418U 6J4U 8J8U		214U 418U 6J4U 8J8U
COUNT	119U 319L 5J9U 7J9L (SEE NOTE 3)		213U 417U 6J3U 8J7U	212U 416U 6J2U 8J6U	212L 416L 6J2L 8J6L
ADVANCE			213L 417L 6J3L 8J7L		

LEGEND:

A = TYPE "A" LOOP
Q = TYPE "Q" LOOP
C = CLOCKWISE WOUND LOOP
CC = COUNTER CLOCKWISE WOUND LOOP
1-1 = LANE #, LOOP #
COUNT = COUNT LOOP

NOTES:

1. CENTER LOOPS IN EFFECTIVE AREA.
2. HANDHOLES TO BE PLACED BETWEEN PRESENCE & COUNT LOOPS IN THE THROUGH LANES.
3. SEPERATE DLC'S SHALL BE REQUIRED FOR EACH LOOP, AND A PERMANENT LABEL SHALL BE REQUIRED TO DESIGNATE THEIR LOCATION.

APPROVED BY:

BRIAN J. FRAGIAO
DIRECTOR OF PUBLIC WORKS/TOWN ENGINEER

REVISED:

TOWN OF LOOMIS

TYPICAL LOOP DETECTOR LAYOUT

DEPARTMENT OF PUBLIC WORKS

TS-5