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TOWN OF MIDDLEBURY

Office of Selectmen

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MEMORANDUM

TO: Planning & Zoning Commission
Conservation Commission
J. Calabrese
D. Seavey, WEO
J. Donegan, ZEO
T. O'Loskey, Building Official
E. Salisbury, Town Clerk

FROM: Edward B. St John, First Selectman *EBStJ*

DATE: June 26, 2007

RE: Road & Drainage Regulations

Enclosed is a revised copy of the Town's **Road & Drainage Regulations** as adopted by the Board of Selectmen. Please refer to the page title "Adoption and Revision Dates" for detail on the revisions.

Thank you.

Enclosure

cc w/o enclosure: Board of Selectmen
R. King

ROAD AND DRAINAGE REGULATIONS TOWN OF MIDDLEBURY, CONNECTICUT

Board of Selectmen

March 27, 1978

Revised to

March 26, 2007

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SECTION 1 - GENERAL PROVISIONS

- 1.1 General : These Regulations set forth the policies, rules, procedures, standards and specifications of the Town of Middlebury, Connecticut for the administration and enforcement of the construction and maintenance of streets.
- 1.2 Scope: All required street improvements, connections to public streets, storm drainage facilities and other improvements shall be constructed in accordance with these Regulations and as appropriate with the requirements of the Subdivision Regulations of the Town of Middlebury, Connecticut.
- 1.3 Driveways: Driveways connecting to public or private streets shall be constructed in accordance with the applicable Ordinances and/or Regulations of the Town of Middlebury, and only after the issuance of a driveway permit by the Board of Selectmen.
- 1.4 Definitions: Whenever used in these Regulations, the following words or terms have the meanings indicated:
 - 1.4.1 Board: shall mean the Board of Selectmen of the Town of Middlebury, Connecticut.
 - 1.4.2 Agent: shall mean the person, firm or corporation designated by the Board of Selectmen to be responsible for the inspection of construction as carried out under these Regulations.
 - 1.4.3 Street: means a proposed public or private street, road or highway whether or not it is part of a subdivision or re-subdivision approved by the Planning and Zoning Commission of the Town of Middlebury, Connecticut, or a Planned Residential Development, Special Development District, Planned Residential Development Overlay District, Planned Residential Development for Elderly People or the Lake Quassapaug Preservation District approved by the Planning and Zoning Commission of the Town of Middlebury, Connecticut.
 - 1.4.4 Form 814: shall mean the "State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 814" dated 1988 as amended, and is hereby made a part of these Regulations.
 - 1.4.5 Driveway: shall mean any area providing for vehicular access to or from a street as defined in Section 1.4.3 of these Regulations.
- 1.5 Standard Details: Drawings of Town of Middlebury Standard Details for streets, storm sewers and other construction, which are part of these Regulations may be procured at the office of the Board of Selectmen.

- 1.6 Standards, Specifications and Drawings: Where conflict occurs between or within Regulations, Standards, Specifications and Drawings, the more stringent or higher quality requirements shall be assumed to apply, except that the Board of Selectmen shall make the final decision as to which stipulation will provide the best work and will be most consistent with design intent.

SECTION 2 - APPLICATION PROCEDURES

- 2.1 Applicability to Streets: The provisions hereof are applicable to the construction of streets as defined in Section 1.4.3 of these Regulations.
- 2.2 Maps: Maps showing rights-of-way for streets, rights-of-way and easements for drainage and other improvements shall be prepared in accordance with the standards for a record subdivision map specified in the Subdivision Regulations of the Town of Middlebury. Construction plans for streets, drainage and other improvements shall be prepared in accordance with the standards for construction plans specified in the Subdivision Regulations of the Town of Middlebury, as the same may from time to time be amended. All maps shall be prepared by and shall bear the name, embossed seal and original signature of a land surveyor and/or engineer licensed as such by the State Board of Registration for Connecticut Engineers and Land Surveyors of the State of Connecticut and in accordance with the "Rules and Regulations" of the State Board of Registration for Professional Engineers and Land Surveyor, dated January 1, 1966, as amended.
- 2.3 Computations: Sufficient computations to permit the Board of Selectmen to check drainage design. Such computations shall include conditions before and after development, shall consider the entire upstream watershed and downstream area affected by the storm water runoff and shall be accompanied by a drainage map showing upstream water shed and downstream affected by the storm water runoff. The design for the drainage system shall be based on the provisions of Section 7 - Storm Drainage.
- 2.4 Applications: The application for a street construction permit shall be made in writing to the Board of Selectmen, and shall include the following:
- 2.4.1 Maps and Plans: One mylar and two prints of the maps and plans as specified in Section 2.2 and the computations provided for in Section 2.3 of these Regulations.
- 2.4.2 Fee: A fee of \$100.00
- 2.4.3 Insurance: In the event that such proposed construction is within or relates to an existing Town street and/or other town improvements, evidence of workmen's compensation and contractor's liability insurance in amounts and with carriers acceptable to the Board of Selectmen with the Town named as an additional insured. Coverage shall include all subcontractors doing any part of the work covered by the permit and if the policy is changed or cancelled during the policy period, the policy shall provide that written notice will be given to the First Selectman of the Town of Middlebury at least 30 days before the effective date of such change or cancellation.

- 2.5 Permit Procedures: A road construction permit shall be issued in writing by the Board of Selectmen subject to:
- 2.5.1 Plan Revisions: The completion of maps and plans for the construction of streets, drainage and other improvements requested by the Board of Selectmen, approved by the Planning and Zoning Commission as appropriate, and thereafter approved by the Board of Selectmen.
 - 2.5.2 Inspection Fee: A deposit shall be made to the Town of Middlebury to cover the cost of administration, review and inspection equal to 10% of the cost of streets, drainage and other improvements, based on cost estimates approved by the Board of Selectmen. If the deposit is inadequate to cover administration, review and inspection costs, additional deposits will be required by and in an amount set by the Board of Selectmen. Any portion of the deposit that is unexpended as of the acceptance of the improvements at a Town meeting will be returned to the applicant.
 - 2.5.3 Performance Guarantee: to insure completion of the street improvements, the applicant shall file with the Board a surety bond before approval of the proposed activity is given. Said bond shall be in an amount and form satisfactory to the Board and Town Counsel; and the surety in said bond shall be a surety company authorized to do business in the State of Connecticut. Said bond shall provide for and secure to the Town of Middlebury all improvements constructed under these Regulations within two (2) years of the date of filing said bond.
 - 2.5.4 Agreements, Deeds and Easements: A written agreement, in form satisfactory to Town Counsel, permitting entrance by the Town onto the land shown on the subdivision plan for the purposes of inspection and of installing the required improvements in the event of the failure of the applicant to make such improvements or properly to maintain them until the Town has assumed responsibility for them; and shall execute and deliver to the Town a warranty deed with certificate of title to the area of the street or streets and easements shown on the subdivision plans as approved, including any strips reserved for future street purposes.
- 2.6 Length of Permit: The Road Construction Permit shall be valid for a period of time that Board of Selectmen deems necessary for the completion of construction. Permits may be extended for a period not to exceed one (1) year upon written approval of the Board of Selectmen. Upon the expiration of the extended time period, the Board shall either require re-application by the applicant for the uncompleted work or pay for the completion of the work by calling the performance guarantee.
- 2.7 Reduction of Performance Guarantee: Reduction of the Performance Guarantee provided

for in Section 2.5.3 of these Regulations by the Board of Selectmen shall require:

2.7.1 Inspection: Streets, storm drainage and other improvements have been inspected and approved by the Board of Selectmen.

2.7.2 As-Built Plans have been filed with the Board pursuant to Section 2.9 of these Regulations and approved by said Board.

2.7.3 Performance Guarantee: The applicant has executed a new Performance Guarantee provided for in Section 2.5.3 of these Regulations.

2.8 Release of Performance Guarantee: Release of the Performance Guarantee provided for in Section 2.5.3 of these Regulations by the Board of Selectmen shall require:

2.8.1 Inspection: Streets, storm drainage and other improvements have been inspected and approved by the Board of Selectmen.

2.8.2 As-Built Plans have been filed with the Board pursuant to Section 2.9 of these Regulations and approved by said Board.

2.8.3 Maintenance Guarantee: The applicant has executed an agreement and filed a maintenance guarantee for maintenance of streets, drainage and other improvements. Said guarantee shall be in form and amount and with surety acceptable to the Board of Selectmen and Town Counsel. In the case of improvements which are not to be offered for acceptance by the Town, the maintenance guarantee must be in effect for a period of twenty-four (24) months from the release of the performance guarantee. In the case of improvements which are to be offered for acceptance by the Town, the maintenance guarantee shall be in effect for a period of twenty-four (24) months from the release of the performance guarantee or until acceptance of the improvements by the Town prior to the end of the twenty-four (24) month period.

2.9 As-Built Drawings: Upon completion of any street, drainage or other improvements, an as-built map shall be filed by the applicant which includes:

2.9.1 Required Details: The applicant's land surveyor, licensed to practice in the State of Connecticut, shall certify the installation and precise location of monuments to a "Class A-2" accuracy by noting such monuments and their location on the linen transparency or polyester film construction plans and by signing (original signature) and sealing (embossed seal) the plans; and shall certify on the linen transparency or polyester film construction plans and profiles the precise location and elevation of all required improvements and by signing (original signature) and sealing (embossed seal) the plans and profiles to show "as-built conditions".

- 2.9.2 Control Data: All mathematical and control data necessary to reproduce any and all street and easement lines on the ground and all bench mark locations and elevations
- 2.9.3 Number of Copies: One (1) linen transparency or polyester film of the as-built drawings noted in Section 2.9.1 above and four (4) prints of the as-built drawings
- 2.10 Acceptance of Streets: Not earlier than one (1) year but before two (2) years, after the release of the performance guarantee, a petition may be made in writing to the Board of Selectmen for the acceptance of a street by the Town meeting. Such petition shall be signed by the owner(s) of the street and shall include the following:
- 2.10.1 A current Certificate of Title including a Waiver of Mechanic's Liens or title insurance insuring against mechanic's liens and a letter from the Tax Collector indicating full payment of taxes due
- 2.10.2 Any other certificates and documents required by Town Counsel

Upon receipt of the required documents, the Board shall refer said documents to the Planning and Zoning Commission for their review under Section 8-24 of the Connecticut General Statutes, as amended.

When all requirements of these Regulations and the Subdivision Regulations have been fulfilled, the Board of Selectmen shall place the petition for acceptance on the call of the next regular Town meeting.

SECTION 3 – SUPERVISION AND INSPECTION

- 3.1 General: All construction shall be subject to the approval of and should be carried out under the inspection of the Board of Selectmen or its authorized agent.
- 3.2 Access: The Board shall have free access to the construction work at all times and shall be authorized to take material samples, cores, other tests and field surveys as deemed necessary to determine compliance with these Regulations.
- 3.3 Testing: The Board may require the contractor, at their own expense, to have such tests made by certified laboratory and certified by a professional engineer licensed to practice in the State of Connecticut.
- 3.4 Notification: The applicant or contractor for the street, drainage or other improvements shall notify the Board of Selectmen, in writing, of his intent to start any construction project at least five (5) days prior to starting the work. Should the applicant or contractor close down the construction project for a period exceeding one (1) week he shall notify the Board, in writing, of such closing; he shall also notify the Board, in writing, of his intention to resume the project at least three (3) days prior to resuming the work. In addition, he shall give timely written notice to the Board of Selectmen for inspection purposes at least 48 hours before each of the following stages of work:
- 3.5 Required Inspections:
 - 3.5.1 Initial: prior to commencing site clearing and after the construction work has been staked out;
 - 3.5.2 Clearing: prior to commencing excavation and grading of streets, and installation of embankments;
 - 3.5.3 Excavation: prior to commencing installation of drainage and other utilities or improvements;
 - 3.5.4 Drainage: prior to backfilling structures and drainage pipes, facilities and other utilities;
 - 3.5.5 Subgrade: prior to placement of the stabilization fabric on the subgrade of a street;
 - 3.5.6 Stabilization Fabric: prior to the placement of the subbase on the stabilization fabric;
 - 3.5.7 Subbase: prior to placement of pre mixed base material on subbase;

- 3.5.8 Base: prior to the placement of bituminous concrete binder course on base;
 - 3.5.9 Binder Course: prior to installation of curbs;
 - 3.5.10 Curbs: prior to placement of the surface course of bituminous concrete;
 - 3.5.11 Final: after completion of all work; and
 - 3.5.12 Other: Depending on the individual project, the Board may require inspections at other times and the Board reserves the right to inspect the project, without notice, at any time.
- 3.6 Boards Approval: The Board of Selectmen shall have three (3) days in which to inspect the completed work in each of the above stages of the project prior to approving the work. No work shall be commenced on succeeding stages of construction until the required inspection has been made and approval given in writing by the Board of Selectmen. The Board of Selectmen may issue a Stop Work Order and may suspend the Road Construction Permit if in its judgment, the construction project or any stage thereof is not being carried out in accordance with these Regulations or if unforeseen field circumstances are encountered for which the approved plans are insufficient; the Board shall withdraw such Order and reinstate the Permit when it determines that there is compliance with these Regulations.

SECTION 4 - FIELD SURVEY

- 4.1 Survey and Field Layout: Instrument surveys shall be made, maintained and recorded as follows:
- 4.1.1 Centerline Survey: of the street shall be run in the field and suitable construction ties established to all control points. Stations shall be established at all control points at fifty (50) foot intervals and at all points of curvature and points of tangent. Offset hubs beyond disturbed areas shall be provided as part of the centerline survey.
 - 4.1.2 Construction Stakes: shall be placed perpendicular to the tangent, or radial in the case of curves, at each station on both sides of the streets and clear of all construction. The construction stake shall be marked with the station, offset to centerline and cut or fill to profile grade as measured from the top of the stake.
 - 4.1.3 Cut Sheets: showing the stations and cuts and fills for all construction stakes shall be prepared and presented to the Board of Selectmen before construction starts.
 - 4.1.4 Permanent Bench Marks: shall be established throughout the duration of the project and recorded with the Board of Selectmen throughout the length of the project at not more than 300 foot intervals or as directed by the Board. The datum for bench marks shall be Town, State or U.S. datum; and assumed datum may be used only with the permission in writing from the Board.
- 4.2 Grade Stakes: shall be protected and preserved until the construction work is approved by the Board of Selectmen.

SECTION 5 - TRAFFIC CONTROL

- 5.1 Notification of Construction: The Contractor shall notify the appropriate authorities or agencies prior to commencing construction and shall make all arrangements relative to establishing detours, partial road closures and alternate traffic patterns and shall further keep all emergency departments informed of the day to day status of these roadways.
- 5.2 Signs: All such directional or warning devices furnished shall conform to the Manual on Uniform Traffic Control Devices for Street and Highways published by the Bureau of Public Roads.
- 5.3 Uniformed Police: The Contractor shall make all arrangements for the services of uniformed police officers to such extent and at such locations as to protect and facilitate the movement of vehicular and pedestrian traffic on Town streets or State highways.
- 5.4 Barricades: The Contractor shall furnish, erect and maintain suitable barricades, fences, traffic signs, flashing lights, safety cones and all other devices necessary to protect all roadways partially or wholly obstructed and closed to vehicular or pedestrian traffic.
- 5.5 Rights of Safe Passage: The applicant or his contractor shall provide safe and convenient passage for public travel around or over any excavation in a Town street or State highway and shall keep such passage free from earth, stones, trenches or any other materials which may hinder travel of pedestrians or vehicles. The applicant or his contractor shall comply with any order of the Board of Selectmen or its authorized agent for protection of safe passage.
- 5.6 Suspension of Work: All work shall be suspended if the Contractor fails to provide such adequate directional or warning device to control and protect both vehicular and/or pedestrian traffic.

SECTION 6 - EARTHWORK

- 6.1 Grubbing and Clearing: Unless otherwise specified herein, all grubbing and clearing shall conform to the provisions of Section 2.01 of Form 814.
- 6.1.1 General: All trees, shrubs, stumps, roots and other objectionable material which obstruct operations shall be cut or grubbed whenever applicable, ground up and disposed of in accordance with Town and State Regulations off site. Within the fill lines where an embankment is to be made, trees, stumps, roots, etc., shall be removed.
- 6.1.2 Excavation Below Subgrade: All excavation made below subgrade surface by the removal of trees, stumps and other objectionable material shall be filled with suitable material, which shall be compacted thoroughly in accordance with the provisions of Section 2.02 of Form 814.
- 6.1.3 Topsoil: All topsoil to remain on the site shall be located as shown on the construction plans approved by the Planning and Zoning Commission and the Board of Selectmen.
- 6.1.4 Stone Walls: The end of any stone wall at the top or toe of slope shall be reworked to square off the stone wall in a workmanship manner.
- 6.1.5 Shade Trees: With the approval of the Board, desirable shade trees may be left in place when not closer than five (5) feet from the edge of pavement or behind any required sight line, whichever is greater. Shade trees shall be protected as required by the Board, so as to insure survival of the trees.
- 6.1.6 Protection of Plant Material: The Contractor shall take all precautions to minimize damage to trees, shrubs, hedges, lawns and other plant material on public and private property. The Contractor will be held responsible to repair or replace all damaged property.
- 6.2 Excavation and Embankments: Unless otherwise specified herein, all excavation and embankments shall conform to the provisions of Section 2.02 of Form 814.
- 6.2.1 Excavation: Excavation shall not be made below grade except where rock, stone or unsuitable material is encountered.
- 6.2.2 Rock: Where ledge, rock or stone is encountered, this material shall be excavated to a depth of not less than two (2) feet below bottom of subgrade. Material removed shall be replaced with suitable material and thoroughly compacted.

6.2.3 Unsuitable Material: Unsuitable material shall be removed and replaced with suitable material that is thoroughly compacted. Test holes may be required by the Board at the contractor's expense to determine the extent and depth of unsuitable material.

6.2.4 Suitable Material: Only material from excavation or borrow pits approved by the Board shall be used as fill.

6.2.5 Fill in Wet Areas: all fill that is placed to an elevation of less than three (3) feet above water table at the time of filling shall consist of stone or free draining material.

6.2.6 Compaction: Fills shall be placed in ten (10) inch to twelve (12) inch layers and compacted with three (3)-wheel power roller weighing eight (8) to twelve (12) tons or other suitable equipment approved by the Board of Selectmen or its authorized agent. Compaction must be such that no creeping or weaving appears ahead of the roller on the final rolling. No stone over five (5) inches, in its greatest dimension, shall be placed within twelve (12) inches of the elevation of the bottom of subgrade. All streets shall be graded the entire width of the right-of-way with side slopes as indicated on the Standard Construction Details.

Compaction requirements for embankment layers shall comply with Section 2.02.03-6 of Form 814.

6.2.7 Frozen Material: No frozen material shall be deposited on an embankment and no embankment layer shall be deposited on surfaces of snow or ice, nor shall it be placed on frozen or unstable surfaces.

6.2.8 Placement of Material: When the excavated material consists of rock fragments or boulders of such size that the material cannot be placed in horizontal layers of twelve (12) inches without crushing or further breaking down the pieces resulting from the excavation methods, such material may be placed in the embankments in horizontal layers not exceeding three (3) feet in thickness under the following conditions:

Large stones shall not be placed in nests, but shall be distributed over the area; and the interstices shall be filled with spalls, finer fragments or earth to form a solid compact mass; the entire area of each layer shall be leveled off by suitable grading equipment and shall be compacted as specified hereinbefore.

Stones up to one (1) cubic yard in volume may be used provided that a volume of granular material surrounding the shoulders is at least equal to the volume of the

largest stone placed.

6.2.9 Embankment Slopes: Cut or fill sections beyond the street line shall not exceed a slope of one (1) to three (3) except in rock. The Board may require a decrease in the amount of slope to whatever extent is necessary to maintain the stability of the bank under the particular soil conditions.

6.2.10 Grading Limits: No cut or fill sections beyond the street line shall extend into property not owned by the contractor unless appropriate slope rights are obtained for the Town; in the absence of such slope rights, appropriate reinforced concrete retaining walls shall be constructed to prevent encroachment upon adjoining property.

6.2.11 Sight Line Grading: Embankments adjacent to street intersections shall be lowered or removed in order to assure the provision of sight distances as required by the Middlebury Subdivision Regulations.

6.3 Trench Excavation: Unless otherwise specified herein, all trench excavation shall conform to the provisions of Section 2.05 of Form 814.

6.3.1 Required Equipment: Excavating equipment shall be of a type to properly execute the required work. Equipment with stabilizers shall have pads or blocks to prevent marring of road or sidewalk surfacing and rubber tired machinery for backfilling is required in all paved public and private ways unless otherwise approved by the Board.

6.3.2 Excavation: Trenches shall be excavated to the required line and grade and of sufficient width to permit proper installation of pipe and thorough tamping of backfill.

6.3.3 Unsuitable Material: Soft or unsuitable material existing above or below the required bottom of trench shall be removed and replaced. When suitable backfill material cannot be obtained from excavation, the Contractor shall furnish and place gravel or sandy borrow.

Gravel borrow shall consist of inert material that is hard durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials and shall conform with requirements of Article M.02.01 of Form 814.

Sand borrow shall consist of clean inert, hard, durable grains of quartz or other hard durable rock, free from loam or clay, surface coatings and deleterious materials.

- 6.3.4 Foundation Material: A minimum six (6) inch thick layer of crushed or broken stone not larger than three (3) inches in greatest dimension shall be placed under the pipe and two (2) – six (6) inch layers under structures.

Foundation material shall be placed in 6 inch layers and compacted simultaneously on both sides of the pipe to a depth of not less than twelve (12) inches.

- 6.3.5 Backfill: Material used for backfilling to a point two (2) feet over the pipe shall contain no stones larger than three (3) inches in greatest dimension. Backfill below top of pipe shall be placed in six (6) inch layers and compacted simultaneously on both sides of the pipe. Backfill above the top of pipe shall be placed and compacted in six (6) inch layers to a depth of at least twenty four (24) inches and then placed in one (1) foot layers and compacted to the full height of the trench.

All layers shall be compacted to not less than 95 percent of the maximum dry density of the material as determined by the Standard AASHTO Test Designation T99 compaction test Method C at optimum moisture content as determined by the Board.

After the backfill has been placed and compacted properly to a minimum depth of twenty four (24) inches above the pipe, the Contractor has the option of compacting remaining backfill using hydraulic means of either puddling or jetting, or pneumatic, mechanical or vibrating equipment in accordance with a written request approved by the Board.

At the end of each working day, the Contractor shall completely backfill the trenches and remove all equipment from the traveled ways, where directed by the Board or its Agent.

- 6.3.6 Protection: Whenever the work is suspended, the excavations shall be protected and the roadways and sidewalks left unobstructed, with all surfaces left in a safe and satisfactory condition. Sufficient lights and barricades shall be used, and proper safety precautions provided at all times in accordance with Section 5 of these Regulations.

- 6.3.7 Notification: In locations where high ground water, spring or seepage water is encountered, the Board shall be notified.

- 6.4 Rock Excavation: Unless otherwise specified herein all rock excavation shall conform to the provisions of Subarticle 2.02.03-4 of Form 814.

- 6.4.1 Qualified Personnel: Blasting operations shall be carried out in a safe manner to avoid injury to persons and property. Only qualified personnel shall be employed in this work, and if any employees of the contractor shows any laxity or is not qualified to do this work; or in any way violates the rules and regulations of the State relative to this work, he shall be immediately relieved of his duties.
- 6.4.2 Mats or Cover: All rock blasts shall be well covered with approved blasting mats or sufficient earth cover to contain the blast. The Contractor shall take great care to clean all loose rock and other debris from blasting mats prior to detonating charges.
- 6.4.3 Sufficient Warning: Prior to detonating charges, the Contractor shall also give sufficient warning to all persons in the vicinity of the work.
- 6.4.4 Explosives: The explosives used shall be of such strength and placed in such quantities and positions so as not to make the excavations unduly large, shatter unnecessarily the rock upon or against which the pipelines or structures are to be constructed, injure existing utilities or structures or new work.

The use of the maximum number of drill holes together with the minimum quantities of explosives in each drill hole, utilizing split second delays, is the preferable method of accomplishing the blasting operations.

- 6.4.5 Pneumatic Equipment: If blasting operations may be unsafe or dangerous to persons or to existing structures and utilities, the Contractor shall employ pneumatic equipment to remove boulders or ledge.
- 6.4.6 Blasting Logs: The Contractor shall keep blasting logs of all his blasting operations. The blasting logs shall include all pertinent data as it may relate to blasting operations, including personnel, times, locations, description of charges, methods, blasting patterns and excavations, and any other information that may be required. Where specifically requested by the Police, Fire Officials and the Board, the Contractor shall furnish, at the end of each day in which blasting operations are performed, certified copies of blasting logs.
- 6.4.7 O.S.H.A.: In the even that any provisions of these specifications are contrary to or inconsistent with the Occupational Safety and Health Act, the provisions of this Act shall prevail.
- 6.4.8 Trench Rock: For structures, boulders and rock shall be moved not less than twelve (12) inches below the structure and not less than twelve (12) inches beyond the structure wall.

6.4.9 Future Connection to Pipes: Whenever provisions for a future connection are placed in pipelines in rock areas, the rock shall be removed for a distance of at least three (3) feet, or more if directed by the Board, horizontally from the end or face of the pipe and in the direction of the future connection. The rock at this point shall be drilled and blasted below the level of the future connection to permit its subsequent removal.

6.4.10 Notification: Prior to any blasting, the Contractor shall notify the Board, necessary Town Officials and abutting property owners

6.4.11 Test Blasts: a series of test blasts shall be performed prior to any production blasting. The plan shall show location of test blasts and not less than four monitoring stations, powder loads and vibration records. Based on the results of the test blasts, a detailed blasting plan, together with the test blast plan, prepared by a professional engineer licensed in the State of Connecticut, shall be submitted to the Board for review. Both a pre blast photographic or video survey of all adjacent buildings, structures or property and a post blast photographic or video survey of all adjacent buildings, structures or property shall be submitted to the Board.

6.5 De-watering: The Contractor shall provide, operate and maintain adequate facilities for dewatering the excavation. Excavations are to be kept dry at all times.

6.5.1 General: The Contractor shall provide temporary diversion channels, excavations, embankments, sheeting, drains, flumes, pumps or other effective procedures or structures together with all labor, materials and equipment necessary for dewatering the excavation areas. Such work shall be subject to the approval of the Board or its Agent, but such approval will not relieve the Contractor of responsibility for the adequacy of construction, maintenance, operation and safety of the water control system.

6.5.2 Discharge of Water: All water pumped or bailed from the excavations shall be conveyed to suitable points or discharge to avoid injury to persons or public health, damage to public or private property, or to work in progress. Where pumps must be used, both the inlet and outlet shall be filtered to protect against surge action.

6.5.3 Stabilized Trench: No pipe shall be laid or structures installed until the Board or its Agent has determined that trench bottoms are stabilized. Where semi-fluid materials are encountered, the Contractor shall use crushed stone to control and stabilize the trenches.

The methods and materials employed will be determined by the Contractor and will be subject to review and approval by the Board or its Agent prior to their incorporation in the work.

- 6.5.4 Completion of Work: Upon completion of the work, all temporary embankments and structures shall be removed from the site. All temporary excavation shall be backfilled as directed. All catch basins, drains and drain manholes shall be cleaned of all sand or other debris, as a result of their use as discharge points.
- 6.6 Sheeting and Bracing: Unless otherwise specified herein, all sheeting and bracing shall conform to the provisions of Sections 7.14 and 7.15 of Form 814.
- 6.6.1 General: The Contractor shall furnish all labor, equipment and materials and perform all operations in connection with the installation and maintenance and removal of all steel and timber sheeting and bracing necessary to permit the proper installation and construction of the work, to prevent injury to personnel and to prevent excessive caving, bulging, erosion and to maintain and safeguard pedestrian and vehicular traffic. The Contractor shall submit to the Board or its Agent for approval, a plan indicating the location of sheeting, proposed methods of sheeting, of excavations, size and type of materials, methods of installation and removal thereof. Approval by the Engineer shall in no way relieve the Contractor of his responsibilities for protection of public property and workmen, nor his obligations to conform to Federal and State Regulations.
- 6.6.2 O.S.H.A.: Shoring of trenches shall be done in accordance with the provisions of O.S.H.A regulations.
- 6.6.3 Support of Excavation: As the work progresses, the Contractor shall, with the approval of the Board or its Agent, employ whatever means he deems most suitable to support the sides of the trench and protect personnel. Such means shall include a steel box or steel or timber sheeting.
- 6.6.4 Sheeting and Bracing: Where excavations are made, with vertical sides which requires supporting, sheeting and bracing shall be provided. Sheetings shall consist of vertical wooden timbers installed continuously in intimate contact with each other along both walls of the trench. Bracing shall consist of timber or steel walers and cross braces which hold the sheeting firmly in place.
- 6.6.5 Removal of Sheeting: Unless otherwise noted, all sheeting, shoring, or bracing no longer required to support or contain the work shall be removed. The withdrawal of sheeting shall be carefully done to prevent movement or damage to existing utilities, structures, new work, or injury to personnel. Sheeting shall be withdrawn in suitable lifts. Voids shall be filled and compacted with selected

material as this work progresses.

- 6.7 Unsuitable Material: Unsuitable material shall be removed and replaced with suitable material that is thoroughly compacted.

- 6.7.1 Removal: If existing material below trench grade is unsuitable for properly placing bedding material and laying pipe, the Contractor shall excavate and remove the unsuitable material and replace same with suitable backfill material, properly consolidated. Excavation of unsuitable material shall include the removal and disposal of any trees, stumps, root, organic material, as well as any other soft, spongy or unstable material which is unsuitable for foundation. Unsuitable material shall be excavated down to a firm bottom. All such unsuitable material shall be removed from the excavation before backfill operations are started.
- 6.7.2 Backfill Material: Above grade backfill material shall be sand borrow. Below grade, backfill material shall be bank run gravel, screened gravel, or gravel stone, depending upon the depth of the excavation. The size and type of the material used for refilling shall be selected by the Contractor, who will be wholly responsible for any subsequent settlements or other problems experienced in these areas.
- 6.7.3 Peat Areas: Backfilling of peat areas shall be made in such manner as to push ahead any remaining soft material in the excavation. Any such soft material shall be removed and disposed of as the backfilling progresses. Material used for backfilling shall be thoroughly compacted.
- 6.7.4 Disposal: All unsuitable material to be disposed of on the site shall be located as shown on the construction plans approved by the Planning and Zoning Commission and Board of Selectmen. Suitable material shall be used to cover the unsuitable excavated material.

- 6.8 Excess and Waste Materials: All excess sand and gravel excavated from trenches, roads and rights-of-way shall be stockpiled at sites shown on the construction plans approved by the Board.

This material is to be preserved and used as refill material as may be required in the work, wherever objectionable earth excavation is encountered.

All rejected materials, surplus excavation, blasted rock, boulders and other unsuitable backfill material from the excavations shall be promptly removed from the job site.

- 6.9 Cutting and Removing Pavement: The Contractor shall precut all bituminous concrete and cement concrete road surfacing prior to excavating. Pavement saws shall be used where pavement thickness is two and one-half (2 ½) inches or more. Paving spades or wheel cutters may be used for cutting driveways, aprons, sidewalks or paved surfaces less than two and one-half (2 ½) inches in thickness.

The cut lines are to be laid out to proper width (i.e., sufficient width to accommodate the excavating equipment, to prevent breaking back the exposed edges during excavating). The lines are to be kept as straight as practical to minimize widths upon re-cutting prior to final resurfacing.

All bituminous concrete and cement concrete surfacing shall be stripped and removed from the job site. It shall not be cast into or mixed in any way with material from the trench and used as refill material.

SECTION 7 – STORM DRAINAGE

- 7.1 Storm Drainage Design: Storm drainage shall be planned and designed in accordance with the following:
- 7.1.1 General: Sufficient pipe shall be installed to carry existing water courses in the street right-of-way and to drain both the proposed street or streets and extensions thereof or other streets which, based on topography, will be served by the same drainage system. Street drainage systems shall take into account the effects upon downstream systems, shall be coordinated with general drainage requirements for the use and development of the abutting land and shall provide for the protection and improvement, if needed, of the natural drainage system, the interception of storm water from adjoining property or streets, the protection of locations in use or proposed for on-site sewage disposal and water supply facilities and the prevention of flooding and soil erosion.
- 7.1.2 Diversions: The diversion of other than nominal quantities of drainage from one watershed or watercourse to another is to be avoided in all instances. All diversions shall be reported to the Board for their approval. Special studies will be required in all cases of diversions to support the need therefore and to eliminate any potential damages which may be consequent to the diversion.
- 7.1.3 Streams and Watercourses: All work on established watercourses and streams shall be accomplished in such a way as to minimize effects which would be adverse to the regimen of such stream or watercourse. Adequate provision shall be made to prevent or minimize scour or erosion in the adjacent reaches of the channel both up and down stream or any appreciable increase in the sediment load carried, particularly during periods of low or normal flow, by the stream.
- 7.1.4 Point of Discharge: All storm water shall be discharged into suitable streams or rivers or into Town or State drainage systems with adequate capacity to carry the discharge. There shall be no discharge onto or over private property within or adjoining the subdivision unless (a) proper easements and discharge rights have been secured by the applicant, (b) such easements and rights are transferable to the Town where the discharge includes storm water from any street, and (c) there will be adequate safeguards against soil erosion and flood danger. Discharge shall be made in a manner that protects wetlands and watercourses from pollution.

- 7.1.5 Discharge into Public Street: Any and all discharges of water into a public street from private lands, including waters directed to a street by virtue of changes in grades on the private lands, is subject to the review and approval of the Board prior to the initiation of construction. Minor drainage of storm water or seepage, including roof drains, foundation drains, water from sump pumps, driveway drains, etc., shall be connected to any existing storm drains in the street. Where storm drains do not exist in the street the landowner shall solicit the advice of the Board as to how the drainage must be treated to avoid public nuisance. The Board may require that the property owner submit plans prepared by an engineer licensed to practice in the State of Connecticut.
- 7.1.6 Drainage Away from Buildings: The yard for each lot shall be graded away from the foundation of any building at a minimum of two (2) percent for a horizontal distance of not less than ten (10) feet to ensure positive drainage away from buildings. The drainage shall be designed to avoid the concentration of storm water from each lot onto adjacent lots.
- 7.1.7 Protection of Downhill Properties: The Town Engineer may require the installation of curtain drains, under drains and other surface and groundwater control to control drainage, icing, slope stability and to avoid adverse impact on downhill properties.
- 7.1.8 Retention of Increased Runoff: Each lot must install, within the lot, a catch basin galley or galleys with a capacity based on the amount of impervious material thereon and the increase in storm water runoff from the impervious material. This will provide groundwater recharge and a limited amount of storm water detention. The galley or galleys should be sized to contain one inch of storm water runoff from the impervious areas and a percolation rate based on the soil but in no case faster than 1 inch in 10 minutes.
- 7.2 Design Computations: The protection of life and property shall be of paramount importance and drainage facilities shall be located and sized so as to minimize danger to such life and property. Therefore, the contractor shall submit design computations and engineering designs, prepared by an engineer licensed to practice in the State of Connecticut, for the review and approval of the Board.

- 7.2.1 Runoff Calculations: For small drainage areas the Rational Method shall be used in determining runoff. For larger drainage areas the Soil Conservation Services Technical Release – 55 and/or Technical Release – 20 is to be used.

All storm drainage facilities shall be designed in accordance with the following standards based on the total potential watershed development available by existing zoning.

- a. Drainage System: All drainage systems within the subdivision and which are not part of an established drainage course shall be designed for a storm return frequency of 25 years.
- b. Cross Culverts: All culverts not part of an established drainage course crossing any street shall be designed for a storm return frequency of 50 years.
- c. Minor Streams: All minor streams (less than 1,000 acres) shall be designed for a storm return frequency of 50 years.
- d. Major Streams: All major streams (more than 1,000 acres) shall be designed for a storm return frequency of 100 years.

The applicant's consultant shall provide the Board with drainage computations and a drainage map to determine the adequacy of storm water systems, including the spacing of catch basins and the need for double basins in roadway sags.

- 7.2.2 Additional Criteria: The Board reserves the right to require more stringent design criteria where it deems appropriate.

7.3 Drainage Pipe: Drainage pipe shall conform to the following:

- 7.3.1 Pipe Design: Pipes shall be sized so that the HW/D (headwater depth divided by the diameter of the pipe) shall be 1.2 (one point two) or less at peak flow. The minimum grade for storm drains shall be one (1) percent unless otherwise permitted by the Board. The minimum size shall be fifteen (15) inches. The minimum cover over pipe shall be four (4) feet from the invert, but in no case shall be less than two (2) feet six (6) inches over top of pipe. Culverts under the street shall extend to the edge of right-of-way.

Catch basins, manholes or other drainage structures shall be provided at all changes in horizontal or vertical alignment. Length of pipes shall not exceed three hundred (300) feet between structures.

Pipe shall be generally laid in straight lines between structures. All storm drainage pipe shall be reinforced concrete Class IV in accordance with the requirements of Article M.08.01-6 of Form 814, except when fill heights require Class V.

7.3.2 Pipe Construction: Unless otherwise specified herein, all pipe construction shall conform to the provisions of Article 6.51.03 of Form 814.

- a. The Storm drain to be constructed shall conform to the details shown on the drawings.
- b. Construction must be accomplished in dry conditions. The Contractor must dam up the existing pipe on the upstream side of his work area and either pipe or pump the stream flow past so that all work is installed "in the dry". Pumps which are to operate overnight or over the weekend must be electrically powered.
- c. Each pipe and fitting shall be checked for defects and injuries as laying proceeds. Imperfect pipe materials shall be rejected and removed from the work. Pipe found to be defective after laying shall be removed and replaced by undamaged material.
- d. The interior of all pipe shall be cleaned of dirt and other deleterious materials, and kept clean, as the next section of pipe is laid. During the progress of work, the exposed ends of the pipe shall be provided with the approved temporary watertight covers fitted to the pipe so as to exclude undesirable matter. Covers shall be kept in place except when pipe is being installed.
- e. Where pipe must be cut to fit as closing pieces, such cuts shall be evenly and squarely made in a workmanlike manner with approved equipment. Injury to linings or coatings shall be satisfactorily repaired.
- f. Each standard and random length of pipe shall be marked by the manufacturer with the trade name, nominal size, class and the date of manufacture.
- g. All RCP storm sewer pipe joints shall be sealed with a Cold Applied

Bituminous Sealer. It shall be of such consistency that it may be spread on the joints with a trowel when the temperature of the air is between twenty (20) deg. F and one hundred (100) deg. F. The bituminous material shall adhere to the concrete or clay pipe so as to make a watertight seal, and shall not flow, crack, or become brittle when exposed to the atmosphere. The bituminous sealer shall be delivered to the project in suitable containers for handling, and shall be sealed or otherwise protected from contamination. The container shall show the brand name, net weight, and the requirements for applications. The sealer shall be as manufactured by Pioneer # 301 Sewer Joint Compound, Perth Amboy, N.J. 08862 or equal.

- h. The Contractor shall provide under this item a minimum six (6) inch thick layer of compacted foundation material under the pipes and up the sides to a depth of not less than twelve (12) inches.

Foundation material shall consist of native crushed stone or trap rock that is a sound, tough, durable rock generally two (2) inches in size.

- i. Impervious trench stops shall be installed at the locations shown on the drawings and specified hereinafter.

7.4 Underdrains: In general, underdrains shall be installed on the uphill side of the road. In locations where high ground water, a spring or seepage is encountered, the Board shall be notified and underdrains shall be installed. The underdrains shall be installed in addition to the storm drainage shown on the plan. Combination storm drains and underdrains may be used with the approval of the Board.

7.4.1 Underdrain Material: The pipe for the underdrain shall be not less than a six (6) inch asphalt coated perforated corrugated metal pipe, eighteen (18) gauge.

7.4.2 Underdrain Construction: Unless otherwise specified herein all underdrain construction shall conform to the provisions of Section 7.51 of Form 814.

- a. The underdrain to be constructed shall conform to the details shown on the Standard Details.
- b. The pipe shall be surrounded with aggregate specified in Article M.08.03 of Form 814, four (4) inches under the pipe, nine (9) inches each side and two (2) feet six (6) inches on top minimum. The entire length of each drain pipe shall be wrapped with filter fabric. The top

surface of the curtain drain shall be covered with filter fabric before backfilling to grade.

- c. Connections to a catch basin, drain pipe or other structures as shown on the drawings or ordered by the Board or its agent, shall include repairing the structure with mortar and/or brick equal to its original condition.
- d. Where the upgrade end of the underdrain does not enter a structure, it shall be suitably capped or plugged. Measurements of its location shall be made by the Contractor for the record.

7.5 Storm Drain Manholes: Storm drainage manholes shall conform to the following:

7.5.1 Manhole Material: Reinforced concrete precast manholes shall conform to the latest revision of ASTM Designation C478, and shall have the specified manhole rungs cast in place. Manhole frames and covers shall be 24 inches in diameter of the best quality close grained gray iron castings conforming to the requirements of ASTM A48 Class No. 30. No exceptions to precast manholes will be authorized.

7.5.2 Manhole Construction: Unless otherwise specified herein all manhole construction shall conform to the provisions of Section 5.07 of Form 814.

- a. The Contractor shall submit for approval shop drawings and/or catalog cuts of precast manholes and manhole covers and frames.
- b. The rubber gasketed joints between sections of precast manhole pipe, shall be mortared over inside and out. All lifting holes shall be plugged with neoprene plugs provided by the manufacturer and mortared over inside and out.
- c. Mortar and grout shall consist of two parts Portland cement and five parts sand, thoroughly mixed prior to adding water.
- d. All manhole frames and covers used shall be new castings. Manhole frames and covers shall be cleaned and coated with a waterproof asphaltum applied by immersion while the castings are hot. The frames shall be set to grade on a full bed of grout.
- e. The precast concrete frame shall be adjusted to grade before paving. Concrete brick or blocks of the best quality shall be used and shall not exceed twelve (12) inches in height. The brick shall be thoroughly

wetted before being laid on full cement joints including sides and ends. All joints shall be thoroughly filled with mortar, and on the inside of the manholes shall be struck smooth.

- f. The waterways of all manholes shall be formed of the same sizes and shapes as the pipes to which they are connected. Special care shall be taken to form channels that will provide the best hydraulic conditions for smooth flow; steel trowel shall be provided.
- g. A twelve (12) inch minimum thick layer of compacted foundation material under each manhole or junction box shall be provided. Foundation material shall consist of native crushed stone or trap rock that is a sound, tough, durable rock generally two (2) inches in size.
- h. A four (4) inch perforated underdrain pipe with crushed stone backfill shall be installed as shown on the standard details specified in paragraph 1.5 hereinbefore.

7.6 Catch Basins: Catch basins shall conform to the following:

7.6.1 Catch Basin Material: Precast catch basins shall meet the requirements specified in Article M.08.02 of Form 814. Catch basin tops shall be constructed as follows: 3000 psi concrete with 5-7% entrained air, painted with anti-spalling compound. No exceptions to precast catch basins will be authorized. All catch basin grates shall be galvanized.

7.6.2 Catch Basin Construction: Unless otherwise specified herein all precast catch basin construction shall conform to the provisions of Section 5.07 of Form 814.

- a. Precast sump sections may be used with the approval of the Board. Where such sections are provided, they shall be bedded on twelve (12) inches of compacted foundation material to support the basin without settlement.
- b. Precast concrete catch basin tops shall be provided. Tops shall generally have curb inlets except in special cases where a flat grate is required, as shown on the approved construction plans.
- c. Setting the precast concrete frame to grade before paving is required. Concrete brick or blocks of the best quality shall be used and shall not exceed twelve (12) inches in height. The brick shall be thoroughly wetted before being laid on full cement joints including sides and ends.

All joints shall be thoroughly filled with mortar, and on the inside of the catch basins shall be struck smooth.

- d. Catch basins shall have a minimum sump of two feet (2'-0") below the lowest outgoing pipe.
- e. A minimum twelve (12) inch thick layer of compacted foundation material under each catch basin shall be provided. Foundation material shall consist of provided. Foundation material shall consist of native crushed stone or trap rock that is a sound, tough, durable rock generally two (2) inches in size.
- f. A 4" perforated underdrain pipe with crushed stone backfill shall be installed as shown on the standard details specified in paragraph 1.5 hereinbefore.

7.7 Endwall or Headwall: Endwalls or headwalls shall conform to the following:

- 7.7.1 General: Concrete endwall or headwall shall be built in the location and to the dimensions and details shown on the drawings and they shall be neatly and accurately finished, true to lines and grades given.
- 7.7.2 Design: Walls shall be designed to resist frost action and to support safely all vertical and lateral loads. The maximum stresses due to combined loads shall be within the values specified for the material used in the construction.
- 7.7.3 Endwall or Headwall Construction: Unless otherwise specified herein all endwall or headwall construction shall conform to the provisions of Section 5.06, 6.01 and 6.02 of Form 814.
 - a. Concrete shall be Type II Portland Cement of domestic origin with a minimum 28-day strength of 3500 pounds per square inch unless otherwise specified on the drawings.
 - b. All concrete of 3500 psi strength shall contain SIKA Plastiment added according to the directions of the manufacturer. When concrete is to be placed at temperatures below fifty (50) deg. F., SIKA Plastocrete shall be substituted for Plastiment.
 - c. Mix water shall be from an approved source and shall be clean and free from oils, salts, alkalinity, acidity or organic material.

- d. Reinforcing bars shall be free from rust or foreign substances which would reduce the bond with concrete. Reinforcing shall conform to ASTM A615 Grade 60, unless otherwise noted on the drawings, and shall bear the mill-imprinted mark of a U.S. manufacturer. Shop drawing will be required from the Contractor detailing the bar arrangement.
- e. No wall shall be constructed until a building permit has been issued by the Building Inspector, Town of Middlebury.

7.8 Drainage Swale: Bituminous concrete paved drainage swale construction shall conform to the following:

7.8.1 Drainage Swale Material: Material for this work shall conform to Article 8.03.02 of Form 814.

7.8.2 Drainage Swale Construction: Unless otherwise specified herein all drainage swale construction shall conform to the provisions of Section 8.03 of Form 814.

- a. Bituminous swales are to be constructed to the size and dimension shown on the approved construction plans.
- b. Subbase shall be constructed of a minimum of six (6) inch of compacted bank run gravel.
- c. Construct swale so as to provide adequate slope for proper flow characteristics.
- d. Upon completion of the swale, the Contractor shall grade and restore any portion of the ground disturbed by his operation.

7.9 Riprap: Riprap shall be designed and installed as follows:

7.9.1 Riprap Design: Design criteria for riprap shall conform to the provisions set forth in the "Connecticut Guidelines for Soil Erosion and Sediment Control", pages 8-121 thru 8-123.

7.9.2 Riprap Installation: Unless otherwise specified herein, the installation of riprap shall conform to the provisions of Section 7.03 of Form 814, and the "Connecticut Guidelines for Soil Erosion and Sediment Control", pages 8-124 and 8-125.

- a. Riprap. Stone for riprap shall be placed on the prepared slope or area in a manner which will produce a reasonably well-graded mass of stone with a minimum practicable percentage of voids and the minimum thickness specified above, for hand placed or dumped riprap. Riprap protection shall be placed to its full course thickness in one operation and in such a manner as to avoid displacing the underlying material. Placing of riprap protection in layers or by dumping into chutes or by similar methods likely to cause segregation shall not be permitted.
- b. The larger stones shall be well-distributed and the entire mass of stone shall conform to the gradations specified hereinbefore. All material going into riprap protection shall be so placed and distributed that there will be no larger accumulation of either the larger or smaller sizes of stones.
- c. It is the intent of these specifications to produce a compact riprap protection in which all sizes of material are placed in their proper proportions. All voids in the riprap, measuring four (4) inches or larger in any dimension, shall be filled with stone, (chinked).
- d. Control of gradation shall be by visual inspection. Any difference of opinion between the Board or its Agent and the Contractor shall be resolved by dumping and checking the gradation of two random loads of stone. Mechanical equipment, a sorting site and labor needed to assist in checking gradation shall be provided by the Contractor.

7.10 Sedimentation Chamber:

7.10.1 Design: Prior to the discharge of storm water from the drainage system into a water course or wetland and at such other locations as may be required by the Board, a sedimentation chamber shall be installed. All sedimentation chambers shall be located to facilitate mechanical cleaning of the chamber from a public street or gravel driveway approved by the Board of Selectmen.

7.10.2 Material: All material for the sedimentation chamber shall conform to the following:

- a. Precast concrete tanks used under this item shall have a minimum strength of 5000 psi at 28 days with steel meeting A.S.T.M. specifications A-79 Grade 60 and have one (1) inch cover.
- b. Unless otherwise approved by the Board, manhole risers, rims and

covers shall conform to the requirements specified hereinbefore.

- c. All construction joints between precast units shall be one (1) inch diameter butyl rubber or equal.
- d. Design loading shall be for AASHTO HS20-44 loading.
- e. Precast units to be as manufactured by Rotondo & Sons, Inc., 151 Old Farms Road, Avon CT. 06601, (203) 673-3291, or equal.

7.10.3 Construction: Unless otherwise approved by the Board, construction of the sedimentation chamber shall conform to the following:

- a. Sedimentation chambers shall be built in the location and to the dimensions and details shown on the approved construction plans and standard details.
- b. Installation to be in accordance with the manufacturer's recommendations.
- c. Precast units to be placed on a twelve (12) inch compacted gravel base.
- d. Baffle wall to be constructed of eight (8) inch solid concrete blocks and cement mortar in a neat workmanlike manner.

7.11 Storm Drainage Design: Storm drainage shall be constructed to the satisfaction of the Middlebury Board of Selectmen and designed to conform to the following standards:

7.11.1 Pipes and Ditches: Sufficient pipe and ditches shall be installed within the subdivision to carry existing water courses and to drain the proposed streets and streets which may reasonably be expected to be constructed at some future date on adjoining property which normally drains across the area of the proposed subdivision. If, in its judgment, there will be no substantial danger from soil erosion or danger to the public health and safety, the Board may permit the discharge of rivers and large streams in their natural courses and may permit the discharge of storm water and established water courses in open ditches across proposed lots. In general, open ditches should be confined to lots of one acre or larger and should not be planned in the portion of the lot customarily used for front and side yards or which might be used for private sewage disposal and/or water supply systems. All ditches shall be of such size and all pipe shall be of such diameter, not less than fifteen (15) inches, as will in the judgment of

the Board be sufficient to properly carry storm water expected to enter the ditch or pipe from the proposed subdivision and from other properties (if ultimately developed in accordance with the current zoning regulations) which normally drain across the area of the proposed subdivision. The minimum cover over pipe shall be two feet over the top of the pipe.

- 7.11.2 Manholes: Manholes shall be provided at each change in direction or grade of the pipe and shall not be spaced more than three hundred (300) feet apart.
- 7.11.3 Catch Basins: Catch basins shall be provided in order that surface water will travel without interception not more than four hundred (400) feet on streets with grades up to and including 5%, and not more than three hundred (300) feet on streets with grades over 5%, except that additional catch basins may be required by the Board where, in its opinion, conditions so dictate.
- 7.11.4 Discharge: The discharge of all storm water from the subdivision shall be into suitable streams or rivers or into Town drains, ditches or other Town drainage facilities with adequate capacity to carry the additional water. Where the discharge shall be into private property adjoining the proposed subdivision, proper easements and discharge rights shall be secured by the applicant for the Town before approval of the record subdivision map and acceptance of the drainage plan. Discharge shall be made in a manner that protects streams, ponds and swamps from pollution.
- 7.11.5 Headwalls and Culverts: Suitable headwalls shall be provided at the open end of any pipe; wing type headwalls shall be provided at the open end of large pipe. Culverts under streets shall be extended at least to the edge of the right-of-way of the street and further beyond if, in the opinion of the Board, roadway safety so dictates.
- 7.11.6 Easements: Easements, at least thirty (30) feet in width, and shall be provided for all storm water pipes that are not to be installed in a street. Easements shall also be provided for thirty (30) feet for any channel of any stream or drainage ditch in the subdivision which will carry drainage runoff from any proposed street, existing street or streets which may be constructed in the future on the undeveloped land within the watershed. Easement shall also be provided for storm water pipes that may need to be installed in the future to serve undeveloped land within the watershed that normally drains across the area of the proposed subdivision. Easements may be counted as part of the area of any parcel.

7.11.7 Channel Lines: Channel and building lines shall be provided along any major stream or river for the purpose of preventing encroachment upon and constriction of the natural water channel by buildings, filling operations or other facilities and construction. The width of the channel shall be based on sound engineering calculations, anticipating long range storms and flow potentials and recognizing proper alignment and gradients of the channel. A note shall be placed on the record subdivision map explaining the channel and building lines and stating the restrictions against encroachment upon the channel in a manner approved by Counsel for the Board.

SECTION 8 - OTHER UTILITIES

- 8.1 Sanitary Sewers: Sanitary sewers shall be designed and constructed in accordance with the rules and regulations of the Water Pollution Control Authority, Middlebury, Connecticut.
- 8.2 Public Water Supply: Water mains and appurtenances shall be designed and constructed in accordance with the rule, regulations and standards of the Water Commission, Middlebury, Connecticut or appropriate water company.
- 8.3 Electric, Telephone and Cable Television Service: All utility lines and equipment, including cable television shall be installed underground as shown on the maps approved by the Planning and Zoning Commission and Board of Selectmen. Any expense for said installations shall be the responsibility of the developer.

SECTION 9 – ROADS

9.1 Subgrade: Unless otherwise provided herein, construction of the subgrade shall conform to the requirements of Section 2.09 of Form 814.

9.1.1 Completion of Trenches: Subgrade formation shall be done when the Board or its Agent is satisfied that work in the trench areas is complete. All utilities within the paved area shall be in place, inspected and functioning prior to completion of the subgrade.

9.1.2 Compaction: The surface shall be compacted uniformly by rolling with an approved power roller having a minimum compression of three hundred (300) pounds per linear inch of contact width and weighing not less than ten (10) tons, or with an equivalent vibratory roller or compactor approved by the Board.

The rolling, vibrating or tamping shall be continued until the entire subgrade is uniformly and thoroughly compacted, true to the lines and grades given.

9.1.3 Protection of Subgrade: The subgrade shall be protected from damage by exercising such precautions as the Board may deem necessary. At all times the subgrade surface shall be kept in such condition that it will drain readily and correctly.

9.1.4 Tolerances: The sub-grade shall be checked for general compliance with specifications and approved construction plans before any remaining road construction material is placed upon it. The finished surface shall be smooth and even and shall not vary more than one-half ($\frac{1}{2}$) inch from the standard cross section or established grade. Any deviations from this cross section and grade shall be corrected by cutting or filling, followed by repeated rolling until a well-compacted surface is obtained.

9.1.5 Stabilization Fabric: The installation of stabilization fabric on the compacted subgrade shall conform to the following:

- a. All stabilization fabric shall be equal to or be better than Mirafi 500x. Depending on the condition of the subgrade or an increase in the wheel load, a high performance stabilization fabric may be required.
- b. Installation shall conform to the manufacturer's guidelines for unrolling fabric on prepared subgrade, overlapping fabric one or more feet depending on subgrade conditions, and dumping subbase material so equipment does not drive on fabric, spreading subbase material so as to prevent formation of mud waves beneath the fabric, and proper compaction.

9.2 Subbase: The construction of the subbase shall conform to the following:

9.2.1 Material: All pre-mixed material for the subbase shall conform to the requirements of Article M.02.02 and M.02.06 of Form 814 for bank or crushed gravel meeting Grading "A", crusher-run stone meeting Grading "A" or Article M.05.01 of Form 814 for processed aggregate base.

9.2.2 Construction: Unless otherwise provided herein, construction of the subbase shall conform to Section 2.12 of Form 814.

- a. The compacted thickness of the subbase shall be eight (8) inches, which may be placed in one thickness. However, if processed aggregate base is used for the subbase and base, it shall be spread uniformly in courses not to exceed six (6) inches in thickness after compaction. All drainage and utilities buried within the paved area shall be installed and tested to insure proper functioning prior to installation of the subbase.
- b. Depositing gravel for the subbase more than 500 feet ahead of the compacting operation will not be permitted.
- c. The subbase shall not be constructed during freezing weather or on a wet or frozen subgrade.
- d. Rolling shall proceed in a longitudinal direction beginning at the gutter line and proceeding toward the center. Sufficient overlap with the inside roller wheel shall be maintained to avoid any unrolled areas. Rolling shall be continued until the material is well-keyed and does not creep ahead of the roller.
- e. Should the subgrade beneath the subbase become churned up and mixed with subbase material at any time, the Contractor shall remove the mixture and replace it with new subbase material to the required thickness shown on the plans. Such replaced subbase material shall be compacted to the required minimum density.
- f. The subbase shall be checked for general compliance with the specifications before any remaining road construction material is placed upon it. The final surface shall not vary more than 3/8 inch from the established grade and standard cross-section.

9.3 Base: The construction of the base shall conform to the following:

- 9.3.1 Material: All pre-mixed material for the base shall conform to the requirements of Article M.05.01 of Form 814. The coarse aggregate shall be the broken stone type.
- 9.3.2 Construction: Unless otherwise provided herein, the construction of the base shall conform to Section 3.04 of Form 814.
- a. A four (4) inch processed aggregate base shall be constructed on the prepared subbase. However, if processed aggregate base is used for the subbase and base, it shall be spread uniformly in courses not to exceed six (6) inches in thickness after compaction.
 - b. After the aggregate is spread, it shall then be thoroughly compacted; and during the compacting water may be applied from an approved watering device by a vertical spray delivering a flushing stream.
 - c. The base shall be checked for general compliance with the specifications before any remaining road construction material is placed upon it. The final surface shall not vary more than 3/8 inch from the established grade and standard cross section.

9.4 Bituminous Concrete Binder Course: The construction of the bituminous concrete binder course shall conform to the following:

9.4.1 Material: All material for the binder course shall conform to the requirements of Section M.04, Class 1, of Form 814.

9.4.2 Construction: Unless otherwise provided herein, construction of the binder course shall conform to Section 4.06 of Form 814.

- a.. On the prepared base course there shall be spread, by a self-propelled paving machine acceptable to the Board, a binder course which after compaction shall be not less than two (2) inches.

Pavement shall extend three (3) inches behind the back of curb. Pavement widths shall be as required by the Middlebury Subdivision Regulations. The pavement shall have a cross slope of six (6) inches from centerline to gutter. No pavement shall be placed until all utility gates and manholes, sanitary sewer manholes and storm sewer catch basins and manholes have been raised to finished pavement elevations.

- b. Favorable tests of the bituminous concrete mix by an independent testing laboratory shall be submitted by the Contractor, at his own expense, to the

Board for approval prior to paving.

- c. All roadway pavements shall be laid using an approved, self-propelled paving machine; and the pavement shall be compacted with a tandem roller or self-propelled pneumatic tire roller weighing not less than ten (10) tons.
- d. Permanent paving shall be placed only when the underlying surface is dry, when the atmospheric temperature in the shade is above 40 deg. F., and when the weather is not foggy or rainy, provided however, that the Board may permit in case of sudden rain the placing of mixture then in transit from the plant if laid at proper temperature and if the roadbed is free from pools of water. Such permission shall in no way relax the requirements for quality of the pavement and smoothness of surface. No material shall be laid upon a frozen base course or when wind conditions are such that rapid cooling will prevent satisfactory compaction. No load shall be sent out so late in the day that spreading and compaction cannot be completed during daylight.
- e. No bituminous surfacing work shall be performed between October 15th and April 15th, except with the written consent of the Board.
- f. Any part of the pavement damaged by traffic or other causes occurring prior to its final acceptance shall be repaired or replaced by and at the expense of the Contractor in a manner satisfactory to the Board or its Agent. The Contractor shall protect the pavement against both public traffic and the traffic cause by his own employees and agents.

9.4.3 Existing Town Streets:

It is the intent of the Town that the existing Town roads shall be restored to a condition equal to or better than that in which they were prior to construction.

- a. The work to be performed on existing roads shall be done after a suitable period has elapsed for settlement of the backfilled trenches and when approved by the Board or its Agent.
- b. Where directed by the Board, existing roadway pavement which cannot be used in the restoration of the road shall be scarified, removed and disposed of by the Contractor.
- c. The Contractor shall raise to final grade all manhole covers, catch basin frames, valve boxes, or similar structures prior to placing the wearing course.
- d. Prior to paving over trenches, the Contractor shall cut the existing pavement

back in two neat parallel lines on either side of the trench so as to expose twelve (12) inches of undisturbed subgrade. He shall then pave over the backfilled trench and the two cut-back areas.

- e. The provisions of Sections 9.1 through 9.3 hereinbefore apply to this Subsection unless otherwise approved, in writing, by the Board.
- f. Before placing the permanent surfacing, the exposed edges of the existing pavement shall be completely cleansed of all surface dirt and debris.

9.5 Bituminous Concrete Surface Course: The construction of the bituminous concrete surface course shall conform to the following:

9.5.1 Material: All material for the surface course shall conform to the requirements of Section M.04, Class 2, of Form 814.

9.5.2 Construction: Unless otherwise provided herein, construction of the surface course shall conform to Section 4.06 of Form 814.

- a. On the prepared binder course there shall be spread, by a mechanical power acceptable to the Board, a surface course which after compaction shall be not less than two (2) inches.
- b. The provisions of Section 9.4 hereinbefore apply to this Section.

9.5.3 Existing Town Streets: See Subsection 9.4.3.

9.6 Extruded Concrete Curbing: The construction of extruded concrete curbing shall conform to the following:

9.6.1 Material: All material for extruded concrete curbing shall conform to the requirements established by Concrete Crafters of CT, Inc.

9.6.2 Construction: Construction of extruded concrete curbing shall conform to the requirements established by Concrete Crafters of CT, Inc.

- a. A cross section of the extruded concrete curb, approved by the Board, must have a height of eight (8) inches, top width of six (6) inches and base width of not less than eight and one-half (8½) inches.
- b. Curbing shall be supported from behind by backing it up with soil promptly after it is completed. The back-up material shall be topsoil, which shall be seeded and fertilized.

- 9.7 Granite Curbing: The construction of granite curbing shall conform to the following:
- 9.7.1 Material: All material for granite curbing shall conform to the requirements of Article M.12.06 for granite and bluestone curbing, Article M.11.04 for mortar, Article M.02.03 for gravel and Article M.06.01 for dowels of Form 814..
- 9.7.2 Construction: Unless otherwise provided herein, construction of granite curbing shall conform to the requirements of Section 8.13 of Form 814.
- a. Care shall be taken so that the curbing will curve uniformly at the radius specified.
- b. Backfilling shall occur promptly after the curbs have been installed.
- 9.8 Guide Railing: The construction of guide railing shall conform to the following:
- 9.8.1 Location: Guard rails shall be provided at the tops of fill slopes which are 4:1 or steeper. The Board may designate other areas where guard rails must be installed.
- 9.8.2 Material: All material for guide railing shall conform to the requirements of Subsection 9.10.2 for 588 steel guard rail and Subsection 9.18.02 for three-cable guide railing. For wooden guide railing, bolts and nuts shall conform to the requirements of Article M.06.02 and treated wood to Article M.10.04.2(b) of Form 814.
- 9.8.3 Construction: All construction of guide railing shall conform to Section 9.10 for metal beam rail and Section 9.18 for three-cable guide railing. Wooden guide railing construction shall conform to the specifications and requirements of the manufacturers.
- 9.9 Signs: At all street intersections and other appropriate locations or at locations designated by the Board, street signs shall be installed by the Contractor. The signs and their supporting elements shall be of a design and material approved by the Board.
- 9.10 Traffic Control: Traffic signs and traffic control devices including painted pavement markings in accordance with Section 12.09 of Form 814 shall be installed by the Contractor at such locations deemed necessary by the Board; and the type of sign or device or painted pavement markings shall be approved by the Board.
- 9.11 Street Lights: Street lights shall be installed at the cost of the applicant. All street lighting shall be of the "rustic type" and be approved by the Board.

9.12 Street Design: The plan for streets required by the subdivision Regulations shall be constructed to the satisfaction of the Middlebury Board of Selectmen and designed to conform to the following standards:

9.12.1 Right-of-way Width: Streets shall have the following minimum width of right-of-way according to their classification:

- a. Arterial Road: 60 feet
- b. Collector Street: 60 feet
- c. Residential Street: 50 feet

9.12.2 Street Lines: Street lines on each side of a proposed street shall be parallel or shall be concentric arcs, except at intersections and turnarounds designed in accordance with these Regulations. No street right-of-way shall be widened beyond the minimum width specified in the Regulations for the purpose of securing additional street frontage for proposed lots.

9.12.3 Existing Streets: Proposed subdivisions abutting an existing Town street or State highway shall provide for proper widening of the right-of-way of such street or highway to the width appropriate for the classification given such street or highway by the Board.

- a. Condition of Existing Town Streets: An application for subdivision must demonstrate, to the satisfaction of the Board, that existing Town street(s) providing access to the proposed subdivision are adequate. For the purpose of this subsection, an adequate Town street is one which provides safe and sufficient access and egress to the proposed lots in the proposed subdivision for the number and type of vehicles expected to utilize such access, taking into account, among other things, both existing and anticipated future traffic flow and volume in relation to the width of traveled surface, number of intersections and driveways, condition of surface and other conditions and standards for streets set forth in the Subdivision Regulations and the Town Road and Drainage Regulations. Unless the Board finds that existing Town street(s) providing access to the proposed subdivision are adequate, it shall deny the subdivision application.
- b. Conforming Existing Street Rights-of-way to Plan of Development: If any existing Town street right-of-way is less in width than as shown on the plan of Development, the Plan of Subdivision shall provide not less than one-half of the added width required by such Plan of Development as measured by

the centerline of the street right-of-way. The Applicant's conveyance to satisfy this subsection shall be by warranty deed, in form and substance satisfactory to Town counsel, conveying sufficient land to the Town so that the street(s) can be widened (and/or straightened) to the width specified herein. Where the future width of street is not otherwise indicated in the Plan of Development, it shall be fifty (50) feet. The requirements of this subsection are in addition to those set forth in subsection 9.13.3a of these Regulations and shall not, in any way, be construed or interpreted to impose upon the Town any obligation to improve or widen any existing Town street.

- 9.12.4 Turnarounds: A turnaround shall be provided at the closed end of a dead end street constructed in the form of a circle having a diameter of 200 feet, with a paved roadway in width as specified in Paragraph 9.12.6 of these Regulations, with the centerline of the pavement 25 feet from the street line for residential streets and 30 feet from the street line for arterial and collector streets; and the circle inside the roadway shall be suitably landscaped. The curve formed at the point of entrance of the dead end street into the turnaround circle shall have a radius of at least 60 feet. A turnaround on a temporary dead end street, which may at some future date be projected into adjoining property, may, in the discretion of the Board, be constructed using a minimum diameter of 120 feet without a center island. Land for such a temporary turnaround shall be provided in the form of a temporary easement to the Town which will automatically terminate upon extension of the street. The subdivision map to contain the following note: "Easement for temporary turnaround which automatically terminates upon extension of street". Any person or governmental body who thereafter makes application for an extension of a street from a temporary turnaround shall be required as a condition of any approval to remove the paved surface within the area of the temporary turnaround not required and replace it with a suitably graded, loamed and seeded surface.
- 9.12.5 Permanent Dead-end Streets: Where a street does not extend to the boundary of the subdivision and its continuation will not be required for future access to adjoining property, its terminus shall not be nearer to such boundary than one hundred (100) feet or the minimum lot depth prescribed by the Zoning Regulations, whichever is greater. Reserve strips of land shall not be left between the end of a permanent dead-end street and an adjacent piece of property. However, the Planning Commission may require the provision of an easement not less than 20 feet in width to accommodate pedestrian traffic or utilities. A turnaround shall be provided at the end of a permanent dead-end street. For greater convenience to traffic and more effective police and fire protection, permanent dead-end streets shall be limited in length to 2,000 feet.

9.12.6 Width of Pavement: Streets shall be designed with the following width of pavement centered between the street lines:

- a. Arterial Road: 36 feet
- b. Collector Street: 36 feet
- c. Residential Street: 28 feet

9.12.7 Grade: The minimum grade for any street shall be 1.0% and the maximum grade shall not exceed for following recommended, according to its classification:

	<u>Recommended</u>	<u>Maximum</u>
a. Arterial Road:	5%	8%
b. Collector Street:	5%	8%
c. Residential Street:	8%	10%
d. Turnarounds:	-	3%

Grades steeper than the recommended may be approved up to the maximum by the Board when the topography warrants such approval in order to prevent deep cuts and/or fills and will be in the best interests of the Town.

The maximum grades shall not be more than 400 feet between the beginning and end of successive vertical curves.

9.12.8 Vertical Curves: Appropriate vertical curves for transition shall be established on all streets and at street intersections to insure adequate sight distance according to the following:

	<u>Design Speed</u>	<u>Stopping Distance</u>
a. Arterial Road:	50	400'
b. Collector Street:	40	300'
c. Residential Street:	30	200'

The stopping sight distance shall be based on the driver's ability to see a 36 inch high object in the road ahead when his eye level is 3 feet 0 inches above the roadway surface.

Where any street approaches an intersection, a transition area having a maximum grade of 2% shall be provided for a minimum of 50 feet, measured from the right-of-way line of the street intersected. In the case of sag vertical curves, the curve may begin at the edge of pavement.

9.12.9 Intersections: The following standards shall apply to street intersections:

- a. No more than two streets shall intersect at one point. Intersections shall be spaced not less than 400 feet apart except when, in the opinion of the Board, conditions justify a variation from this requirement.
- b. Streets shall intersect one another at as near to a right angle as is practical; no intersection shall be at an angle of less than 60 degrees.
- c. At street intersections, curb radii shall be the following:

<u>Intersection</u>	<u>Curb Radius</u>
Residential to Residential	25 feet
Residential to Collector	30 feet
Residential to Arterial	30 feet
Collector to Collector	50 feet
Collector to Arterial	50 feet
Arterial to Arterial	50 feet

The street line radius shall be set a minimum of 10 feet inside the curb radius.

- d. At all intersections, the intersectional sight distance for the through street shall be as follows:

<u>Through Street</u>	<u>Design Speed</u>	<u>Intersection Sight Distance</u>
Arterial Road	50	575 feet

Collector Street	40	475 feet
Residential Street	30	350 feet

The sight distance shall be measured with the stopped driver located 20 feet behind the through street edge of pavement to the center of the travelway for traffic approaching from the left and right. No obstructions shall be located within this sight zone.

The sight distance shall be based on a height of eye of 3' 0" and height of object of 3' 0".

9.12.10 Alignment: Streets shall be aesthetically designed and shall conform to the "General Controls for Horizontal Alignment" as published by the American Association of State Highway and Transit Officials. The minimum radius of curvature at the center line of streets shall be as follows:

- a. Arterial Road: 600 feet
- b. Collector Street: 300 feet
- c. Residential Street: 150 feet

9.12.11 Cross Section: Streets shall be designed with a cross section providing for grading of the entire right-of-way and for a cross pitch of 1/2 inch per foot for the pavement but not to exceed a 6" crown, unless otherwise directed by the Board of Selectmen, constructed on a parabolic curve, and with the sidewalk area between the edge of pavement and right-of-way line graded to an elevation six (6) inches above the top of the crown of the pavement. The typical cut and fill cross section drawing shall be shown on the construction plans based on the Standard Details of the Town of Middlebury.

9.12.12 Street Names: Street shall bear names which are appropriate to the character of the Town and which do not duplicate or too closely approximate in spelling or sound existing street names in the Town of Middlebury or any adjoining town. All street names shall be subject to the approval of the Middlebury Planning and Zoning Commission.

9.13 Street Construction: All streets shall be constructed in accordance with the requirements of the Middlebury Board of Selectmen.

9.13.1 Street Improvements: A subdivision application must show all proposed work on Town street(s) providing access to the proposed subdivision to meet

the requirements of these Regulations and the Road and Drainage Regulations, together with a statement of the proposed method of meeting the cost of such work. Where a subdivision, in the opinion of the Board, requires expenditures to improve existing Town Streets to conform to these Regulations and the applicant is unwilling to make such expenditures and post performance bonds secured by letters of credit or cash collateral, in form and substance satisfactory to the Board, the Board shall disapprove such subdivision unless the Board of Selectmen, the Board of Finance, and the Town Meeting have approved such expenditures.

- 9.13.2 Utilities: In the case of subdivisions to which water, sewers or electric street lighting are to be furnished from a public source, all necessary mains, branch offsets to each lot, fire hydrants and street lighting equipment shall be installed, as approved by the corporation and/or municipal department having jurisdiction, and without cost to the Town.

SECTION 10 - FIRE PROTECTION

- 10.1 Fire Protection: Fire protection shall be designed and constructed in accordance with the following:

10.1.1 Design: Development which is not within 1 mile by public street of a reliable, year around source of water, with all weather access from which a fire truck can draw or pump water, shall install a precast concrete tank or construct a fire pond with a dry hydrant for fire protection at such locations and size as required by the Board. Fire ponds and fire protection tanks shall have the minimum capacity as determined by the Board, after consulting with the Fire Chief; but in no case less than 10,000 gallons for a fire protection tank. Fire ponds shall be accessible from a public street via a right-of-way in favor of the Town; and said right-of-way shall have a width of 30 feet and all weather access to allow emergency vehicles clear and safe entry free of all objects.

- 10.1.2 Fire Protection Tank Material: All material for the precast concrete tank shall conform to the following:

- a. Precast concrete tanks used under this item shall have a minimum strength of 5000 psi at 28 days with steel meeting A.S.T.M. specifications A-615 Grade 60 and have one (1) inch minimum cover.

Unless otherwise approved by the Board, manhole risers, rims and covers shall conform to the requirements specified hereinbefore.

All construction joints between precast units shall be sealed with closed cell neoprene gaskets and bolted in chamfered corners with 7/8 inch diameter bolts.

Design lading shall be for AASHTO HS20-44 loading.

Precast units to be as manufactured by Rotondo & Sons, Inc., 151 Old Farms Road, Avon CT. 06601, (203) 673-3291, or equal.

- b. All ductile iron pipe shall be six (6) inches and have push-on rubber gasket joints, except as may be otherwise approved by the Board. The six (6) inch ductile iron pipe shall have a strength of 42/00, thickness in inches of 0.31, thickness class of 52 and a rated working pressure of 350 pounds per square inch.

Cement lining to be twice the thickness specified in ANSI A21.4-1974 (C104-74 AWWA) or any revision thereto and to be asphalt seal coated twice.

Outside of pipe to be bituminous coated.

- c. All fittings shall be cast or ductile iron, mechanical joint to be used with ductile iron pipe, shall be Class 250 and shall conform to the weights, dimensions and tolerances shown in the latest edition of the Handbook of Ductile Iron Pipe and be complete with all joint accessories where required.
- d. All pipe and fittings shall have distinctly cast upon them the initial of the maker's name and the year in which they were cast. The weight and grade designation shall be conspicuously printed in white on the outside of each pipe after the coating has become hard.
- e. In order to insure standardization and compatibility, hydrants shall be A.P. Smith series H-200.
- f. All pipelines with less than 5'-0" cover shall be covered with an expanded polystyrene insulation conforming to the requirements of Federal Specification, HH-1-524, Insulation Board, Thermal Type I, Class 2, or revisions thereof. Under no conditions shall the minimum total thickness be less than three (3) inches. Insulation shall be secured to the pipe with 3/4 -inch x 0.015-inch thick corrugated aluminum jacket with internal vapor barrier shall be applied over the insulation, all edges to lap a minimum of two (2) inches. The jacket shall be secured with strapping as specified above at a spacing of twelve (12) inches on center. A suitable adhesive that is compatible with polystyrene shall be applied to all joints and seams of the jacket making them completely watertight. Prior to the application of the aluminum jacket, all open ends of insulation covering flanges, fittings and pipe clamps shall be covered with a layer of 20 x 20 mesh, asphalt coated glass fabric embedded in a suitable asphalt mastic cement.

10.1.3 Fire Protection Tank Construction: Unless otherwise approved by the Board, construction of the fire protection tank shall conform to the following:

- a. Fire protection tank shall be built in the location and to the dimensions and details shown on the approved construction plans and standard details.

Installation to be in accordance with the manufacturer's recommendations.

Precast units to be placed on a twelve (12) inch compacted gravel base.

- b. Pipes, fittings and hydrant shall be joined and/or laid in accordance with the manufacturer's latest published instructions.

- c. The Contractor shall excavate the trench below the pipe invert and to a width sufficient to permit proper alignment of the pipe and thorough tamping of the backfill around and under the pipe and fittings. There shall be at least six (6) inches of clearance between the extremities of the pipe or appurtenances and the sides of the trench of shoring. Backfilling of the trench shall meet the requirements as set forth in Section 6.3 hereinbefore. Selected fine material shall be used to at least one (1) foot above the top of pipe and shall contain no stones larger than two (2) inches. All pipes and fittings shall be laid on a four (4) inch minimum thickness of sand.
- d. Concrete thrust blocks shall be provided at all elbows, bends, tees or other specials and at any other change of direction. The thrust block shall be of sufficient size and shape to withstand all thrusts created, as detailed on the approved construction drawings.

10.1.4 Fire Pond Construction: All fire ponds shall be constructed in accordance with the standards and practices of the U.S. Department of Agriculture, Soil Conservation Service.

SECTION 11 – EROSION CONTROL

- 11.1 Erosion Control: In addition to any erosion and siltation control plan certified by the Planning and Zoning Commission and/or approved by the Conservation Commission, soil and erosion control measures shall be installed and maintained in accordance with the following standards:

11.1.1 Standards: Erosion and siltation control requirements are applicable to all construction work which causes disturbance to the existing ground surface. All control measures shall be constructed and maintained during construction in accordance with the standard details, drawings, this Section and the Erosion & Sediment Control Handbook, latest edition, Soil Conservation Service, U.S. Department of Agriculture.

11.1.2 Embankments: All embankments shall be mulched with hay as soon as practical after formation. The embankment formation operation shall not proceed more than 500 feet in front of the mulching operation unless approved by the Board. The initial application of hay shall be at a rate equal to 110 bales per acre. Subsequent applications as necessary or ordered shall be at sufficient rate to minimize erosion of the previously formed embankments.

As needed or as ordered, a broken stone chute shall be installed to convey collected storm water down cut and fill slopes to avoid erosion of these slopes. Hay bales and stone filter shall be installed at the bottom of these chutes to filter and disperse the flow.

11.1.3 Wetlands: All streams and wetlands within fifty (50) feet of a proposed construction activity shall be protected with a continuous filter fence or closely butted row of hay bales prior to commencing work in those areas.

11.1.4 Runoff from Disturbed Areas: All runoff from disturbed areas is to be controlled and filtered. Hay bale or broken stone filters are to be installed at discharge locations shown on the drawings. Additional hay bales and/or mulch may be required during construction as site conditions dictate, or as ordered by Town officials.

11.1.5 Runoff from Embankments: The collection and conveyance of runoff at the top of the embankments shall be provided for as the work progresses. Methods include, but are not limited to: temporary piping, broken stone lined swales, installation of permanent drainage structure as work progresses.

- 11.1.6 Storm Sewers: In the event that the Contractor shall schedule construction such that storm sewers are installed prior to constructing the downstream facilities they are tributary to, the Contractor shall provide an energy dissipater at each discharge end of the pipe. The energy dissipater shall be a mat of intermediate rip rap approximately ten (10) feet wide by ten (10) feet long.
- 11.1.7 Stream Crossings: When crossing streams, flow is to be carried through or around construction in temporary pipes or properly prepared rip-rapped channels. Culverts shown on the approved construction plans are to be installed as soon as possible.
- 11.1.8 Road Bed: During construction of a road, the road bed is to be graded to form interception dikes as shown or ordered and to route flow in a gutter where indicated on drawings or as directed. Interceptors are to be maintained in good working order throughout the construction period.
- 11.1.9 Inspections: Erosion control measures shall be inspected by the Contractor on a weekly basis or following each rain storm, whichever occurs first.
- 11.1.10 Removal of Sediment: Accumulated sediment is to be periodically removed and disposed of in a manner approved by the Board.
- 11.1.11 Catch Basins: All catch basins or drop inlets are to be protected with hay bales.
- 11.1.12 Energy Dissipaters: Rip rap or energy dissipaters are to be placed as shown on the approved construction drawings, or as directed.
- 11.1.13 Operation of Equipment: All equipment shall be operated and all construction activities performed so as to minimize pollution. Any operations which would increase erosion during rain storms shall cease unless proper erosion and sedimentation controls have been installed and approved by the Board or its Agent.
- 11.1.14 Changes in Construction: If changes in construction methods or schedules occur which would, in the opinion of the Board, adversely affect the designed erosion controls, construction shall not proceed until such revised erosion control plans have been approved by the appropriate Town Commissions and the Board of Selectmen.

11.1.15 Impending Shutdown: The Board of Selectmen shall be given sufficient notice of impending shutdowns to enable them to examine the project so that the Contractor can install additional erosion and sedimentation protection as directed by the Board of Selectmen.

SECTION 12 - MISCELLANEOUS

- 12.1 Underground Utilities: The Contractor's attention is directed to underground utilities which may be in the vicinity of the proposed construction. The Contractor must cooperate with the utility company in protecting these utilities.
- 12.2 Dust Control: The Contractor shall spread the calcium chloride in accordance with the manufacturer's instructions. Under dry conditions the road surface shall first be moistened. The Contractor shall remove all excess materials from the site at the end of each working day.
- 12.3 Clean Up: General clean up, grading, sweeping, picking up of surplus materials, etc., shall not be delayed until the end of the project. The Contractor shall schedule his work in such a manner as to allow sufficient time in each work day to accomplish this work. Roadway surfaces are to be swept by hand or by machine to alleviate dust problems. The use of power sweepers or drag brooms shall be carefully controlled. Where heavy concentrations of material exist on the road surfaces, the Contractor shall clean by hand or by machine such material in advance of sweeping.
- 12.4 Sidewalks: Sidewalks, where required by the Planning and Zoning Commission and for the Board of Selectmen, shall be in accordance with the approved Construction Plans and Standard Details. At all intersections where sidewalks exist or will be constructed handicapped ramps shall be provided. Additional handicapped ramps shall be constructed at locations designated by the Board.
- 12.4.1 Material: All material for sidewalks shall conform to Article M.03.01 for Class "C" concrete for concrete sidewalks, to Section M.04 Class 2 for bituminous concrete sidewalks and Article M.02.01 for gravel fill for the base course, all of Form 814.
- 12.4.2 Construction: All sidewalks shall conform to Section 9.21 for concrete sidewalks and Section 9.22 for bituminous concrete sidewalks, of Form 814.
- 12.5 Turf Establishment: Turf establishment shall conform to the following:
- 12.5.1 Material: All material for establishing turf shall conform to Subarticle M.13.01-1 for topsoil, M.13.02 for lime, M.13.03 for fertilizer and M.13.04 for seed and M.13.05 for hay mulch, all of Form 814.
- 12.5.2 Construction: Turf establishment shall conform to Section 9.44 for topsoil, Section 9.46 for liming and Section 9.50 for turf establishment of Form 814, unless otherwise specified herein:

- a. Slopes shall have a uniform surface not varying more than four (4) inches above or below a true plane, as shown on the plans or as ordered by the Board; however, the variations within any section 100 feet in length shall approximately compensate. The degree of finish shall be that obtained from acceptable blade grader or scrape operations. Where not accessible with a machine, slopes shall be raked by and to a uniform surface and degree of finish acceptable with a blade grader or scraper operations.
- b. No topsoil shall be delivered in a frozen or muddy condition.
- c. After spreading not less than four (4) inches of topsoil, rake up large stiff clods, hard lumps, roots, litter, other foreign matter and large stones. Remove from the premises or waste where directed in satisfactory manner. Rake topsoil areas to a smooth, uniform surface.
- d. Grade and re-grade until satisfactory grades as shown are obtained with a depth of not less than four (4) inches of topsoil. Do not finish grade during unsuitable weather. Perform grading around existing trees with extreme care to avoid disturbing feeder roots lying near the surface of the ground.
- e. Seeding operations shall be carried out only between April 1 and May 30 or between September 1 and October 15, unless otherwise approved by the Board.
- f. Grass seed shall be stored in such a manner that its effectiveness will not be impaired.
- g. Grass seed shall be sown by hand, uniformly in two directions or by approved machine in such a manner that a uniform stand will result.
- h. The Contractor shall be responsible for mowing lawns and shoulders until the improvements have been accepted, as specified in Section 2.10 hereinbefore.
- i. Treat all seeded areas showing signs of insect infestation with an approved non-persistent pesticide (i.e. Savin), applied in strict accordance with manufacturer's instructions.
- j. All areas which fail to show a uniform stand of grass, for any reason whatsoever, shall be re-seeded and such areas shall be seeded repeatedly until all areas are covered with a satisfactory growth of grass.
- k. After the disturbed areas have been seeded, they shall be covered with a two (2) inch thick blanket of hay mulch. The hay shall be from acceptable grass

and be free of weeds. No salt hay shall be used.

12.6 Street Trees: All street trees shall be provided in accordance with paragraph 4.15 of the Subdivision Regulations of the Town of Middlebury.

12.6.1 Plant Material: Trees shall be nursery grown, of specimen quality, balled and burlapped, and shall conform to the requirements of the current edition of the "American Standards for Nursery Stock". Trees shall be straight stemmed, free from disease, and prior bark injuries shall be fully calloused over.

12.6.2 Standards: Street/shade deciduous trees shall be at least 1 ¾ inches in caliber or larger and shall have a minimum height of ten (10) feet. Small and flowering trees shall be at least 7/8 inches in caliber and shall have a height of six (6) to eight (8) feet. Only small and flowering trees shall be planted beneath overhead utility lines or wires.

12.7 Retaining Walls: All retaining walls shall conform to the following:

12.7.1 Design: Retaining walls shall be of reinforced concrete, designed by an engineer licensed to practice in the State of Connecticut, and shall have a textured surface suitable to the Board.

12.7.2 Material: Unless otherwise noted, concrete shall be Class "A" conforming to Article M.03.01 of Form 814 and reinforcing steel shall conform to Article M.06.01 of Form 814.

12.7.3 Construction: Unless otherwise specified herein the construction of retaining walls shall conform to Section 5.06 and 6.02 of Form 814.

**ADOPTION AND REVISION DATES
FOR
ROAD AND DRAINAGE REGULATIONS
TOWN OF MIDDLEBURY, CONNECTICUT**

ROAD AND DRAINAGE REGULATIONS
BOARD OF SELECTMEN
TOWN OF MIDDLEBURY, CONNECTICUT

REGULATIONS

Mar. 27, 1978	Adoption
Feb. 17, 2004	Adoption with modifications

TEXT REVISIONS

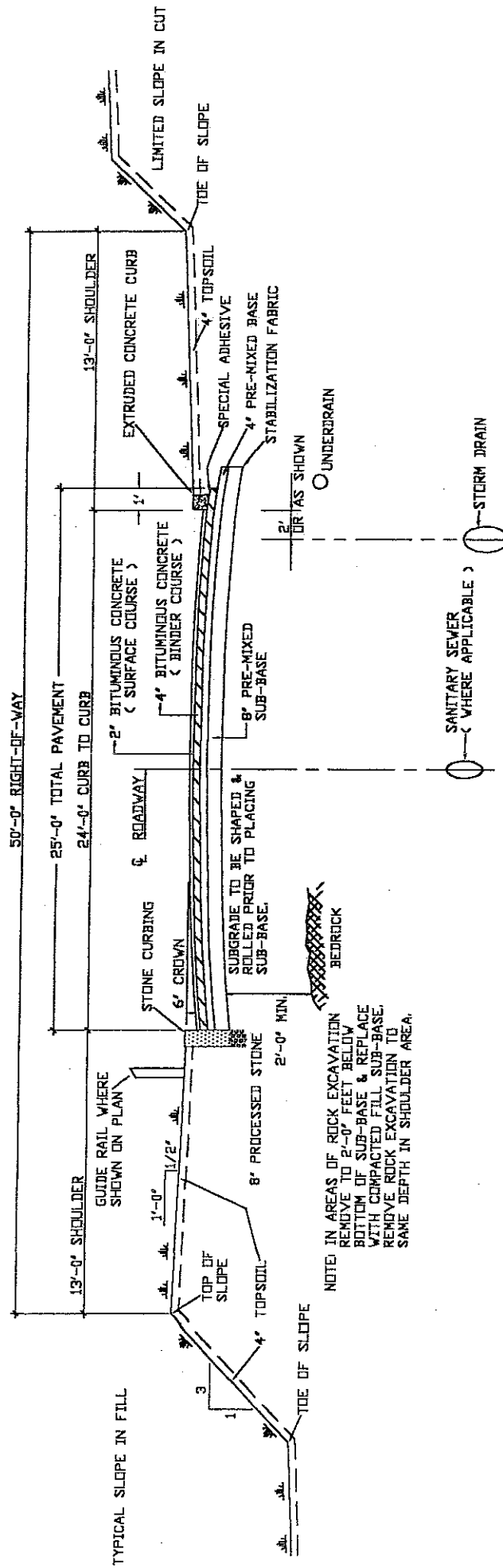
Sept. 14, 1991	General revision and recodification	
June 15, 1992	6.4.11	Test Blasts
	7.6.1	Catch Basin Material
	9.7.1	Bituminous Concrete Curbing
	9.8	Granite Curbing
	9.8.1	Material
	9.11	Traffic Control
Mar. 18, 1996	1.4.3	Street
	3.5.6	Stabilization Fabric
	3.5.8	Base
	3.5.9	Bituminous Concrete Base Course
	7.1.4	Discharge
	9.1.5	Stabilization Fabric
Feb. 17, 2004	7.1.6	Drainage Away from Buildings
	7.1.7	Protection of Downhill Properties
	7.1.8	Retention of Increased Runoff
Mar. 26, 2007	7.11	Storm Drainage Design
	7.11.1	Pipes and Ditches
	7.11.2	Manholes
	7.11.3	Catch Basins
	7.11.4	Discharge
	7.11.5	Headwalls and Culverts
	7.11.6	Easements
	7.11.7	Channel Lines
	9.13	Street Design
	9.13.1	Right-of-way Width
	9.13.2	Street Lines
	9.13.3	Existing Streets
	9.13.4	Turnarounds
	9.13.5	Permanent Dead-end Streets

9.13.6	Width of Pavement
9.13.7	Grade
9.13.8	Vertical Curves
9.13.9	Intersections
9.13.10	Alignment
9.13.11	Cross Section
9.13.12	Street Names
9.14	Street Construction
9.14.1	Street Improvements
9.14.2	Utilities

STANDARD DETAIL REVISIONS

May 8, 1990	Type C Catch Basin
June 18, 1990	Underdrain
June 15, 1992	Typical Shoulder Cross Section in Cut Typical Roadway Cross Section Standard Endwall Typical Concrete or Masonry Wing Type Headwall Type "L" Endwall
Mar. 18, 1996	Typical Roadway Cross Section
Mar. 26, 2007	Typical Roadway Cross Section Typical Shoulder Cross Section in Cut Concrete Sidewalk Detail Extruded Concrete Curbs

**STANDARD DETAILS
FOR
ROAD AND DRAINAGE REGULATIONS
TOWN OF MIDDLEBURY, CONNECTICUT**



TYPICAL ROADWAY CROSS-SECTION

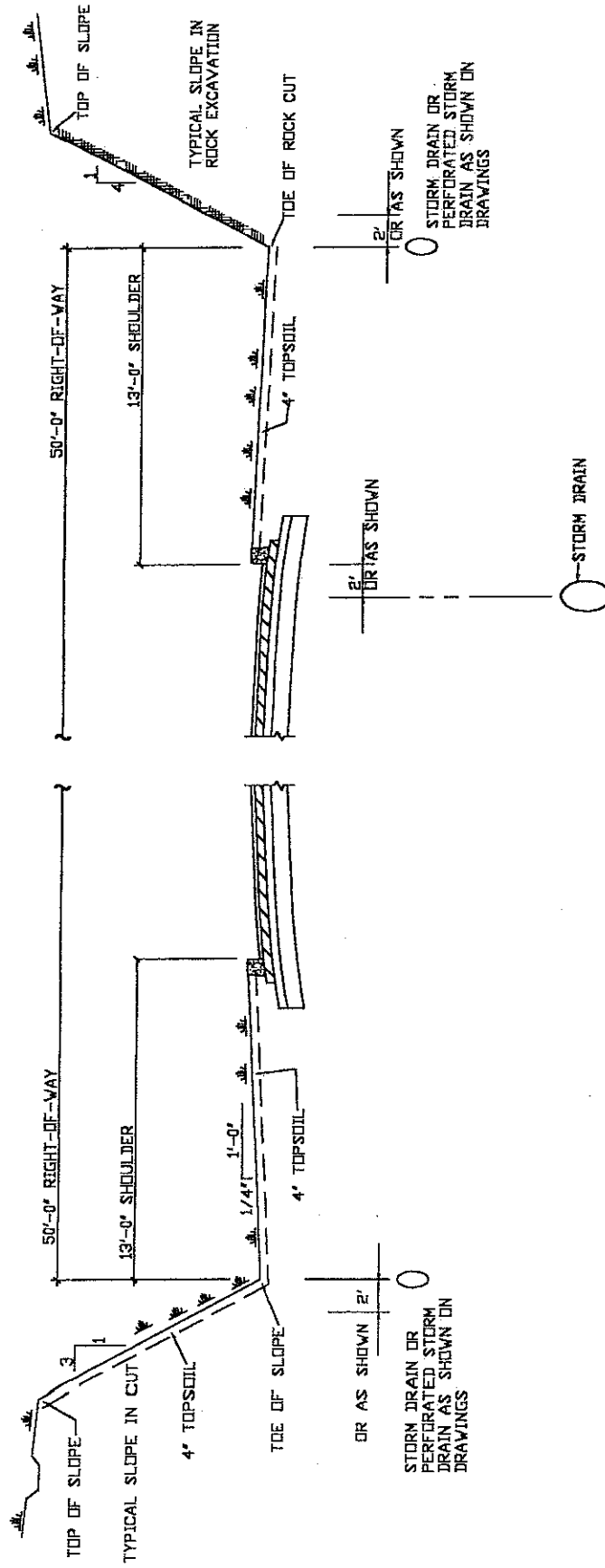
SCALE: N.T.S.

STANDARD DETAILS BOARD OF SELECTMEN TOWN OF MIDDLEBURY

APPROVED MARCH 18, 1996

REVISED MARCH 26, 2007

DRAINAGE SWALE WHERE
SHOWN ON DRAWINGS



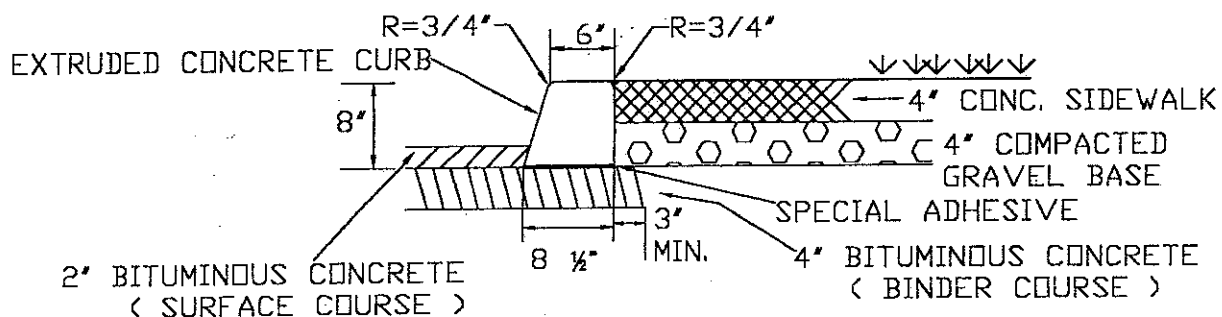
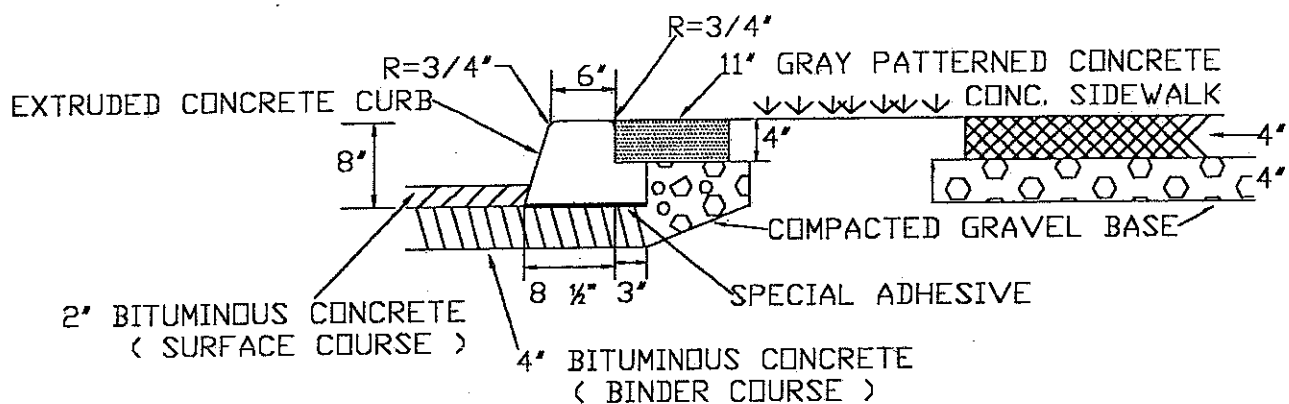
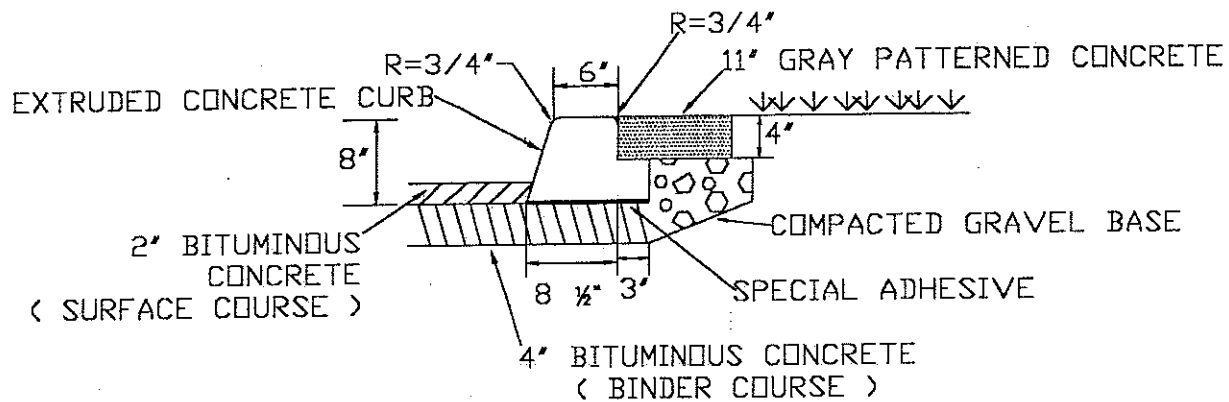
TYPICAL SHOULDER CROSS-SECTION IN CUT

SCALE: N.T.S.

STANDARD DETAILS BOARD OF SELECTMEN TOWN OF MIDDLEBURY

APPROVED JUNE 15, 1992

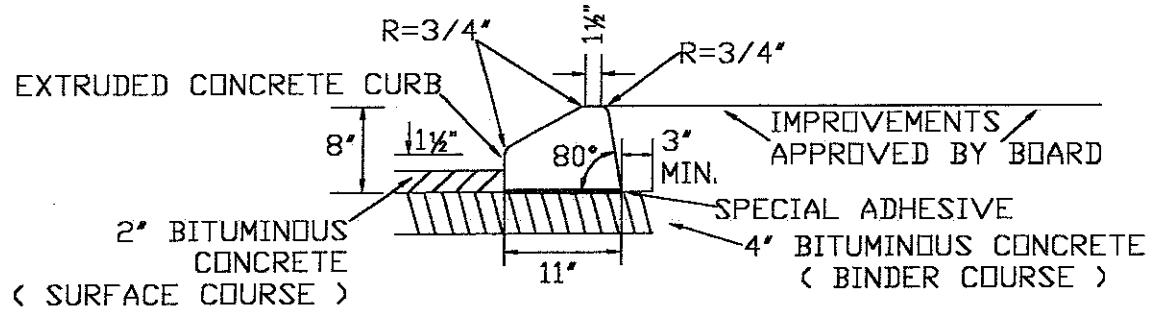
REVISED MARCH 26, 2007



EXTRUDED CONCRETE CURBS

SCALE: N.T.S. APPROVED MARCH 26, 2007

STANDARD DETAILS BOARD OF SELECTMEN TOWN OF MIDDLEBURY



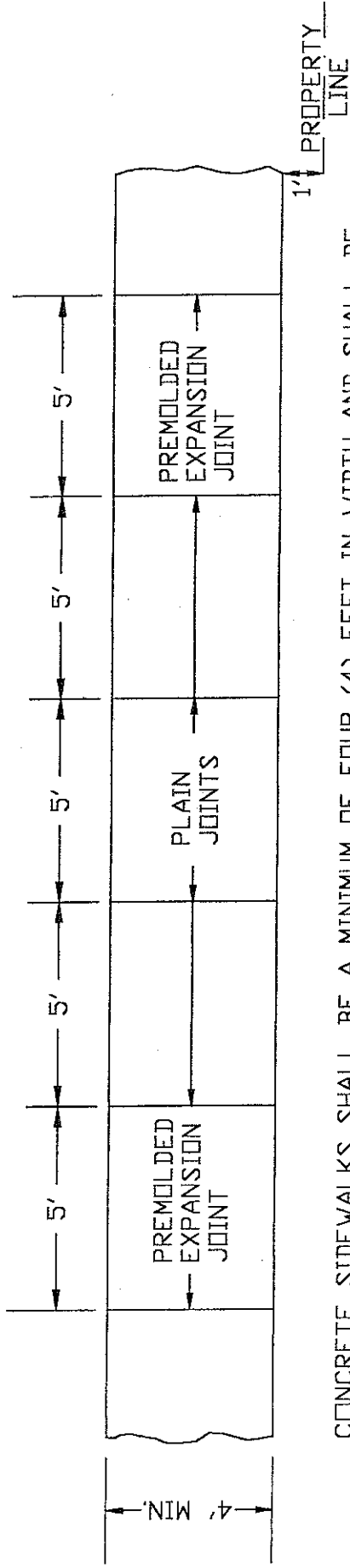
MOUNTABLE CURB

EXTRUDED CONCRETE CURBS

SCALE: N.T.S.

APPROVED MARCH 26, 2007

STANDARD DETAILS BOARD OF SELECTMEN TOWN OF MIDDLEBURY



CONCRETE SIDEWALKS SHALL BE A MINIMUM OF FOUR (4) FEET IN WIDTH AND SHALL BE LOCATED WITHIN THE STREET LINE WITH ONE EDGE ONE (1) FOOT FROM THE PROPERTY LINE. ALL SIDEWALKS SHALL BE LAID ON A FOUR (4) INCH BANK RUN GRAVEL BASE, WATERED AND ROLLED TO AN OPTIMUM MOISTURE CONTENT AND COMPACTED PRIOR TO POURING. THE SIDEWALK SHALL BE CONSTRUCTED OF CONCRETE, FOUR (4) INCHES THICK, HAVING AN ULTIMATE 28 DAY COMPRESSIVE STRENGTH OF 3,000 POUNDS PER SQUARE INCH AND HAVING EXPANSION JOINTS WITH PREMOLDED FILLERS SPACED NOT MORE THAN 25 FEET APART AND WITH SUITABLE WEAKENED PLAIN JOINTS EVERY FIVE (5) FEET. THE WALK SHALL HAVE A CROSS SLOPE OF $\frac{1}{4}$ INCH PER FOOT, SHALL BE POURED IN ONE POUR AND SHALL BE FINISHED WITH THE USE OF A WOOD FLOAT, WHERE THE CONCRETE SIDEWALK IS SUBJECT TO VEHICULAR TRAFFIC, AS AT DRIVEWAYS, THE THICKNESS SHALL BE INCREASED TO SIX (6) INCHES AND A 6X6-6/6 WIRE MESH REINFORCEMENT SHALL BE PLACED IN THE MIDDLE OF THE SLAB.

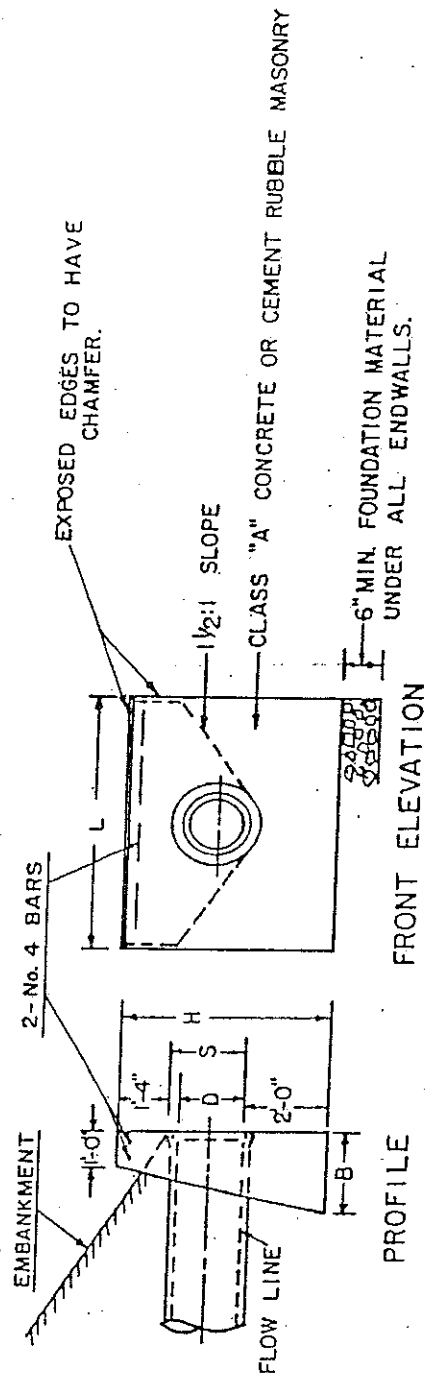
CONCRETE SIDEWALK DETAIL

SCALE: N.T.S.

APPROVED MARCH 26, 2007

STANDARD DETAILS BOARD OF SELECTMEN TOWN OF MIDDLEBURY

EXPOSED HEIGHT OF BACK OF WALL ABOVE SLOPES
TO BE 7" FOR SLOPES OF 1½:1 & 4:1 AND 9" FOR
SLOPE OF 2:1.



H= TOTAL HEIGHT
B= BASE
D= INSIDE DIAMETER OF PIPE
S= HEIGHT OF SLOPE ABOVE INVERT
L= LENGTH = 3S + D

ENDWALL DIMENSIONS					
D	S	H	L	B	VOL.
INS.	FT&INS	FT&INS	FT&INS	FT&INS	CU. YD.
12"	1'-2"	4'-6"	4'-6"	2'-0"	1.10
15"	1'-5"	4'-9"	5'-6"	2'-0"	1.45
18"	1'-8"	5'-0"	6'-6"	2'-0"	1.83
24"	2'-2"	5'-6"	8'-6"	2'-2"	2.72
30"	2'-8"	6'-0"	10'-6"	2'-3"	3.79
36"	3'-2"	6'-6"	12'-6"	2'-8"	5.45
42"	3'-8"	7'-0"	14'-6"	2'-9"	6.40
48"	4'-2"	7'-6"	16'-6"	2'-11"	8.00

*VOLUME BASED ON "D" AND WALL THICKNESS AT $\frac{1}{2}$ OF PIPE HAS BEEN DEDUCTED

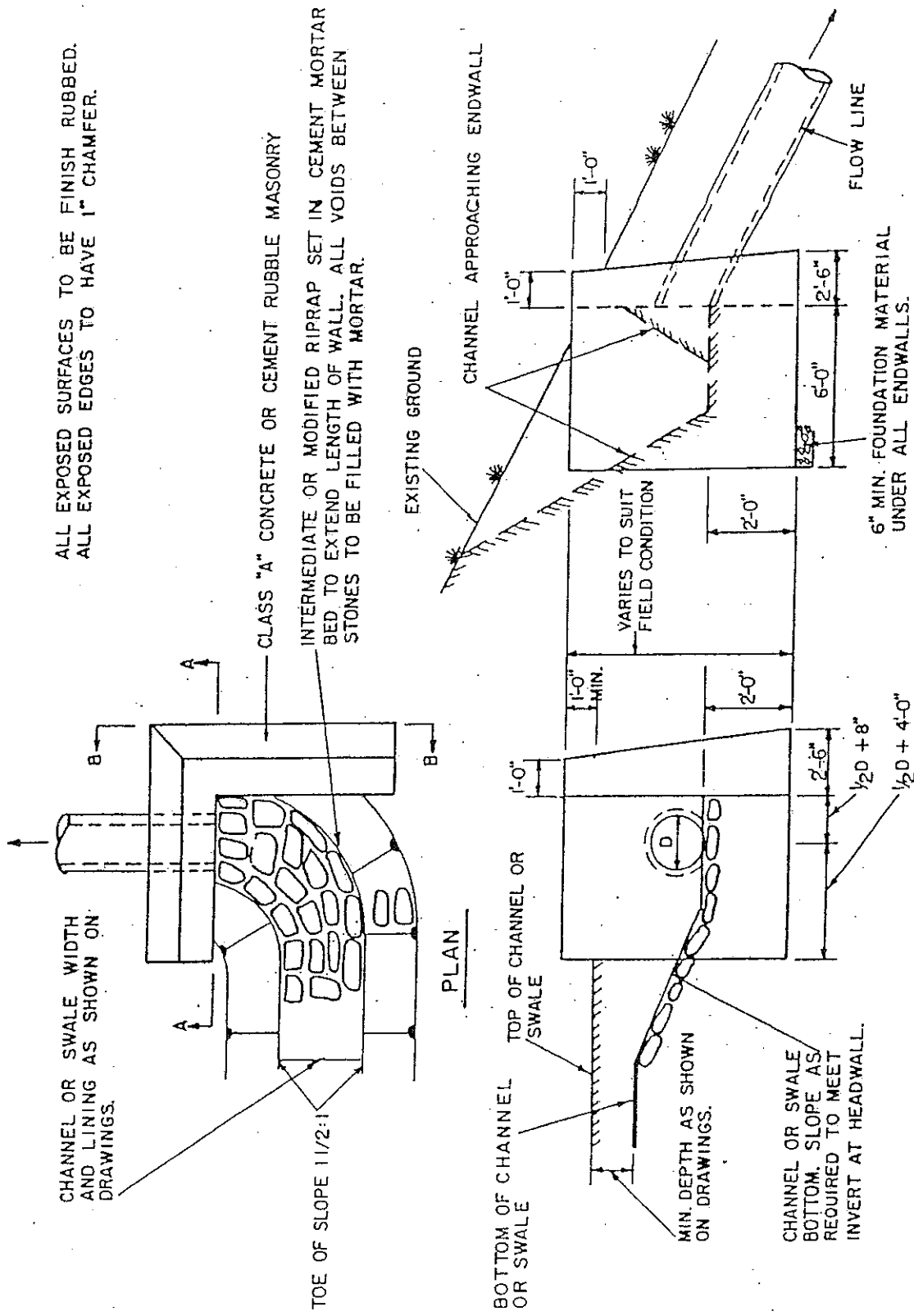
STANDARD ENDWALL

N.T.S.

APPROVED JUNE 15, 1992

STANDARD DETAILS BOARD OF SELECTMEN TOWN OF MIDDLEBURY

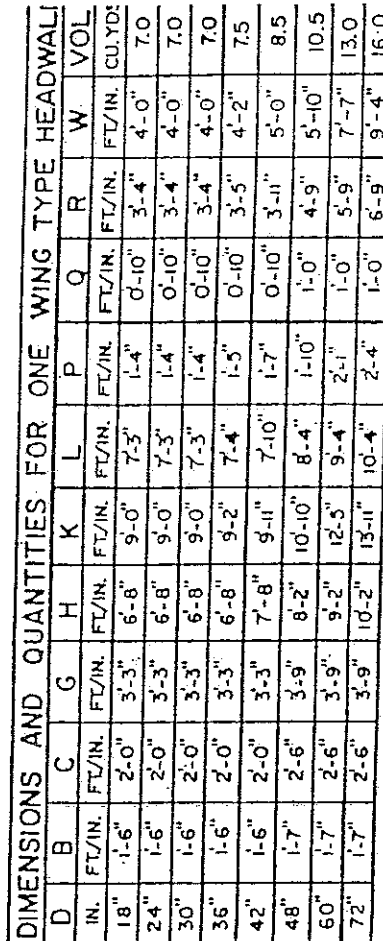
ALL EXPOSED SURFACES TO BE FINISH RUBBED.
ALL EXPOSED EDGES TO HAVE 1" CHAMFER.



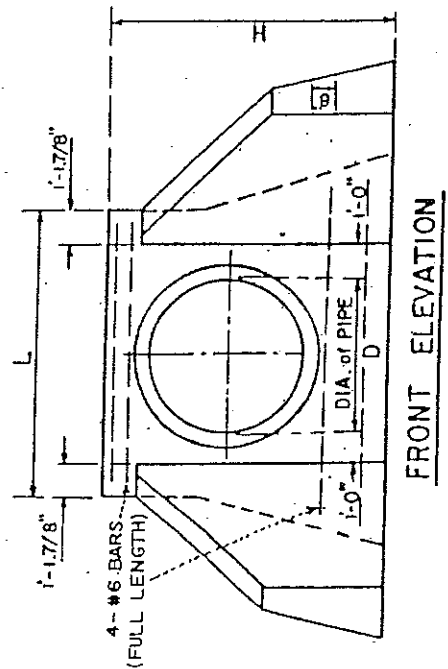
TYPE "L" ENDWALL

N.T.S.

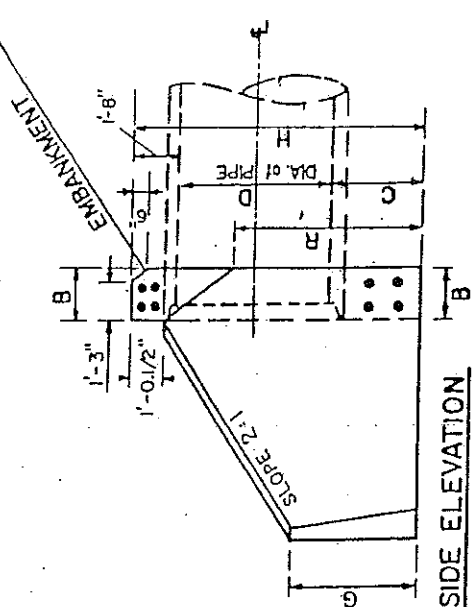
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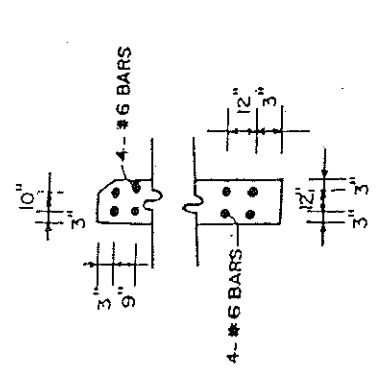
6" MIN. FOUNDATION MATERIAL
UNDER ALL HEADWALLS



FRONT ELEVATION



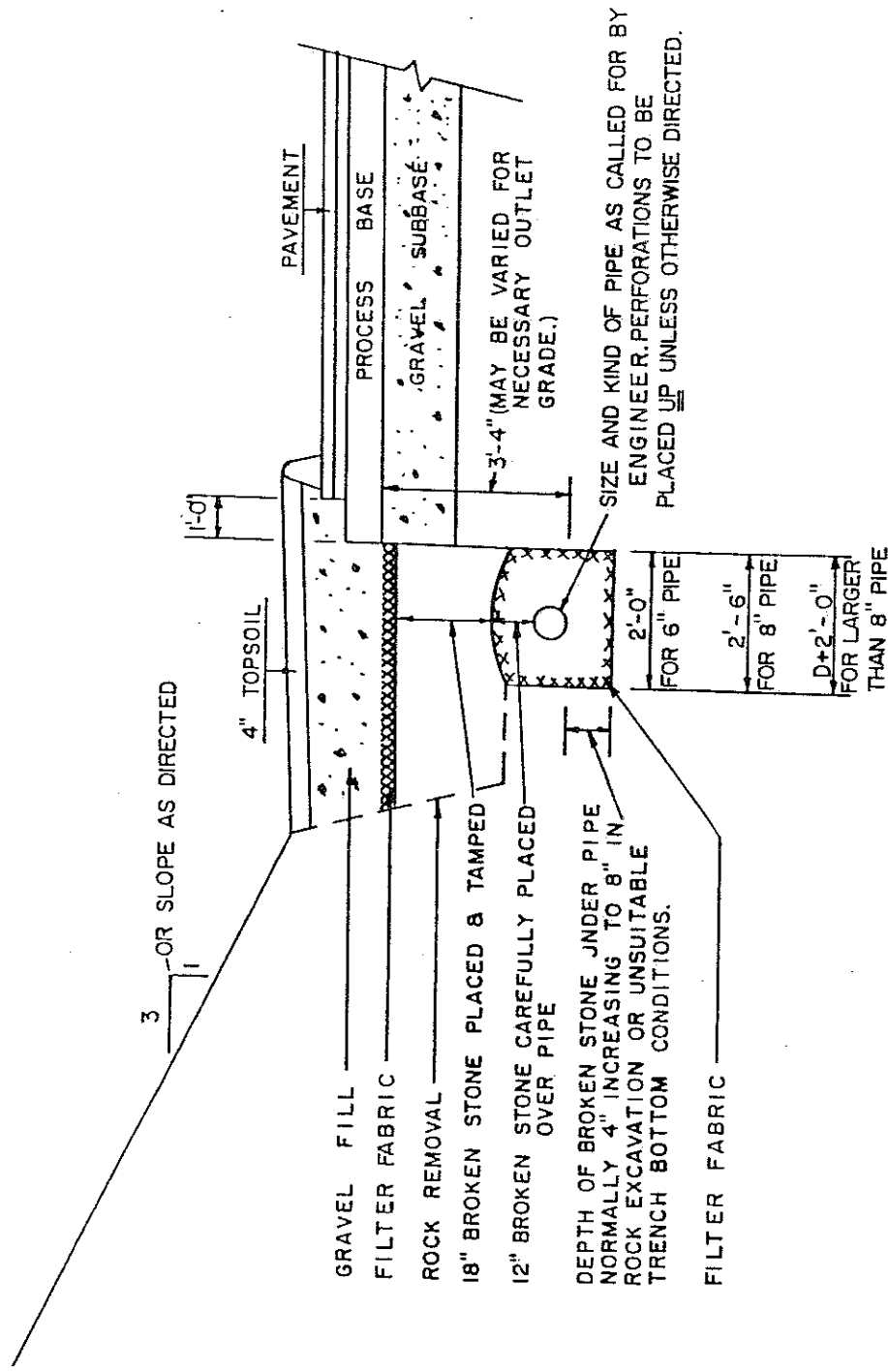
SIDE ELEVATION



DETAIL OF BAR SPACING

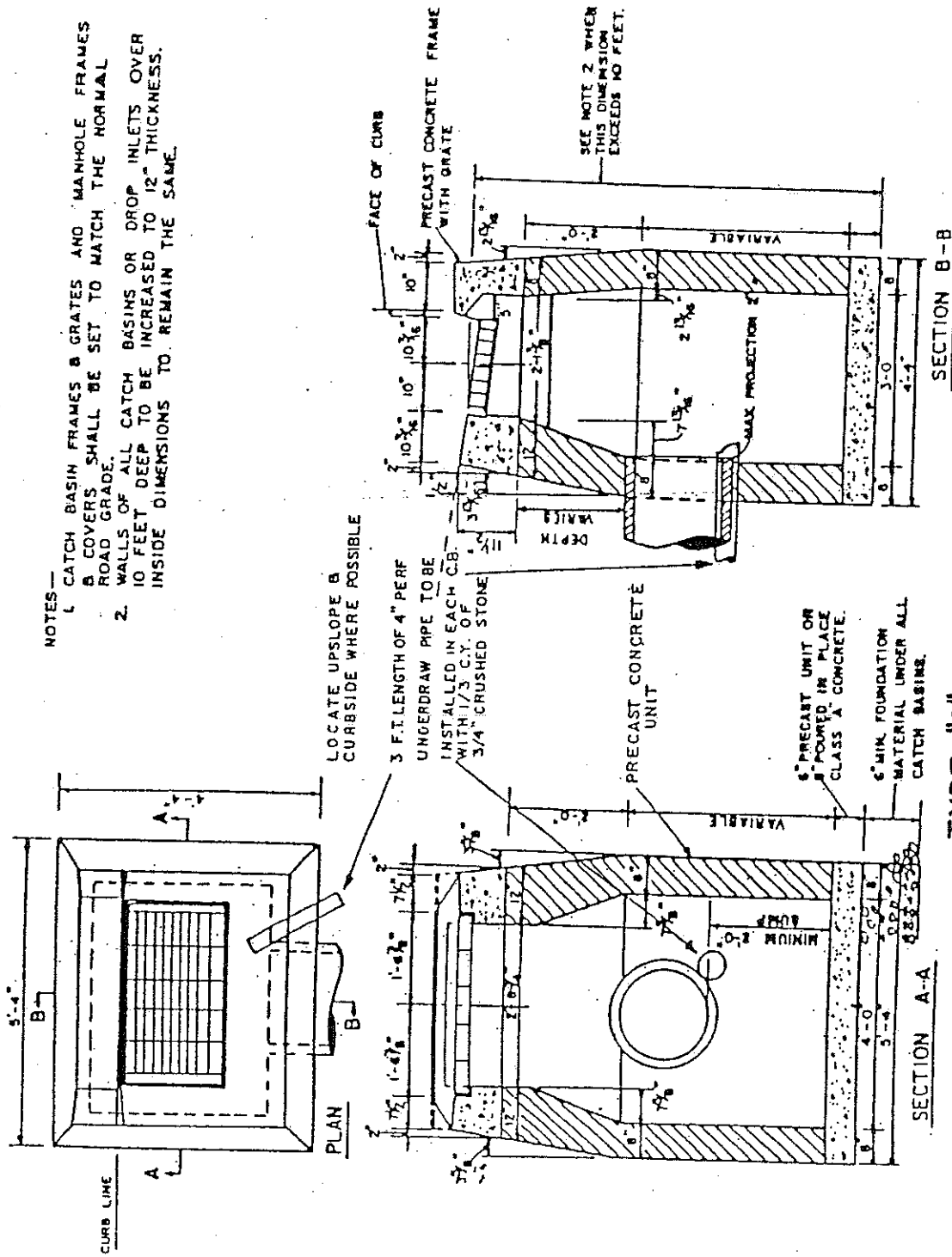
TYPICAL CONCRETE or MASONRY WING TYPE HEAD WALL

N.T.S.



UNDERDRAIN N.T.S.

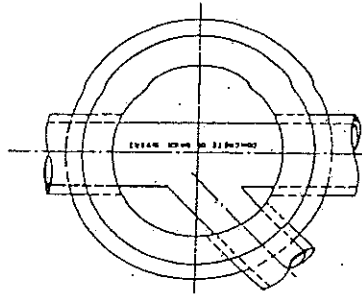
APPROVED JUNE 18, 1990



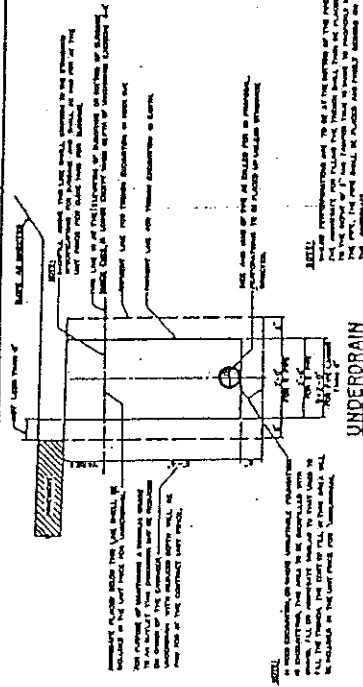
TYPE "C" CATCH BASIN

N.T.S.

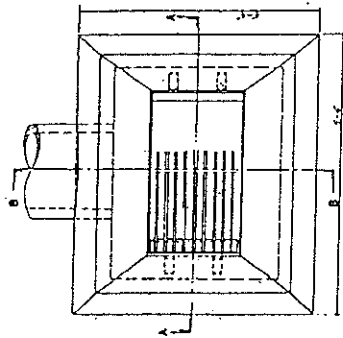
EFFECTIVE MAY 8, 1990



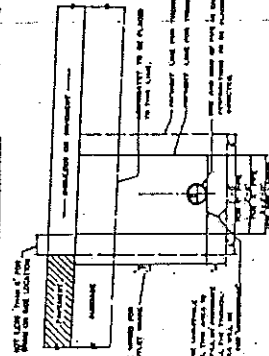
CROSS SECTION A-A



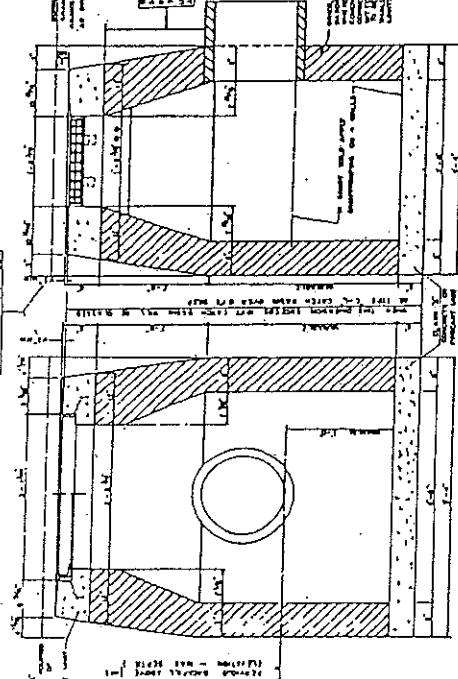
TYPE 'C-L' CATCH BASIN



UNDERDRAIN

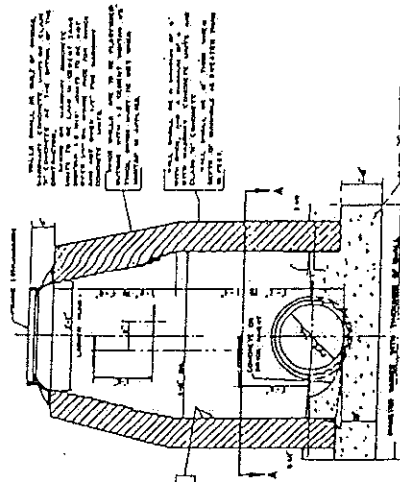


FOUNDATION UNDERDRAIN

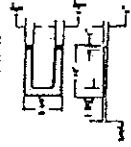


SECTION B-B

TYPE 'C-L' CATCH BASIN



VERTICAL SECTION
MANHOLE



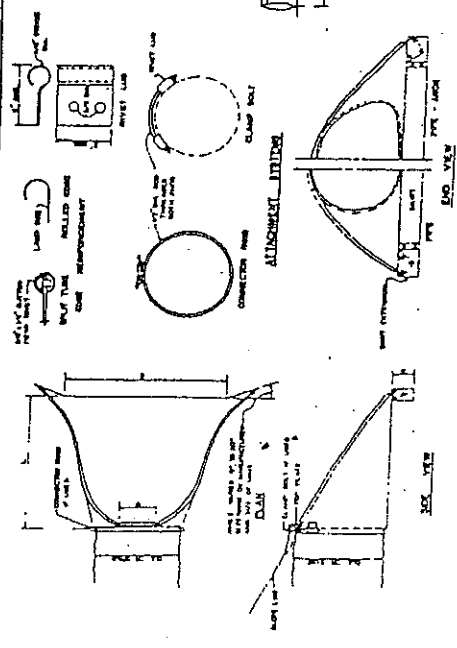
DETAIL OF LADDER RUNGS

REVISION	DATE	BY	CHKD	APP'D
1	10/1/54	J. H. B.		
2	10/1/54	J. H. B.		
3	10/1/54	J. H. B.		
4	10/1/54	J. H. B.		
5	10/1/54	J. H. B.		
6	10/1/54	J. H. B.		
7	10/1/54	J. H. B.		
8	10/1/54	J. H. B.		
9	10/1/54	J. H. B.		
10	10/1/54	J. H. B.		

TYPE 'C-L' CATCH BASIN, UNDERDRAIN,
FOUNDATION UNDERDRAIN & MANHOLE

STANDARD CONSTRUCTION DETAILS
BOARD OF SELECTMEN
TOWN OF MOOREHEAD, CONN.

SCALE: 1" = 1'-0"



METAL CULVERT END

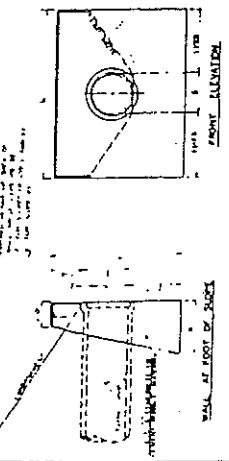
TABLE 1
DIMENSIONS OF METAL CULVERT ENDS

PIPE DIA.	WALL THICKNESS	END WALL THICKNESS	END WALL HEIGHT	END WALL WIDTH
12	1/4	1/2	12	12
18	1/4	1/2	18	18
24	1/4	1/2	24	24
30	1/4	1/2	30	30
36	1/4	1/2	36	36
42	1/4	1/2	42	42
48	1/4	1/2	48	48
54	1/4	1/2	54	54
60	1/4	1/2	60	60
66	1/4	1/2	66	66
72	1/4	1/2	72	72
78	1/4	1/2	78	78
84	1/4	1/2	84	84
90	1/4	1/2	90	90
96	1/4	1/2	96	96
102	1/4	1/2	102	102
108	1/4	1/2	108	108
114	1/4	1/2	114	114
120	1/4	1/2	120	120

TABLE 2
DIMENSIONS OF METAL CULVERT ENDS

PIPE DIA.	WALL THICKNESS	END WALL THICKNESS	END WALL HEIGHT	END WALL WIDTH
12	1/4	1/2	12	12
18	1/4	1/2	18	18
24	1/4	1/2	24	24
30	1/4	1/2	30	30
36	1/4	1/2	36	36
42	1/4	1/2	42	42
48	1/4	1/2	48	48
54	1/4	1/2	54	54
60	1/4	1/2	60	60
66	1/4	1/2	66	66
72	1/4	1/2	72	72
78	1/4	1/2	78	78
84	1/4	1/2	84	84
90	1/4	1/2	90	90
96	1/4	1/2	96	96
102	1/4	1/2	102	102
108	1/4	1/2	108	108
114	1/4	1/2	114	114
120	1/4	1/2	120	120

METAL CULVERT END



STANDARD END WALL

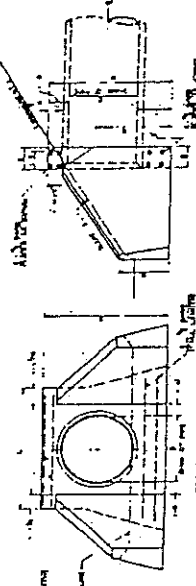
TABLE 3
DIMENSIONS AND QUANTITIES FOR ONE WING TYPE ENDWALL

PIPE DIA.	WALL THICKNESS	END WALL THICKNESS	END WALL HEIGHT	END WALL WIDTH
12	1/4	1/2	12	12
18	1/4	1/2	18	18
24	1/4	1/2	24	24
30	1/4	1/2	30	30
36	1/4	1/2	36	36
42	1/4	1/2	42	42
48	1/4	1/2	48	48
54	1/4	1/2	54	54
60	1/4	1/2	60	60
66	1/4	1/2	66	66
72	1/4	1/2	72	72
78	1/4	1/2	78	78
84	1/4	1/2	84	84
90	1/4	1/2	90	90
96	1/4	1/2	96	96
102	1/4	1/2	102	102
108	1/4	1/2	108	108
114	1/4	1/2	114	114
120	1/4	1/2	120	120

STANDARD WING TYPE ENDWALL

TABLE 4
DIMENSIONS AND QUANTITIES FOR ONE WING TYPE ENDWALL

PIPE DIA.	WALL THICKNESS	END WALL THICKNESS	END WALL HEIGHT	END WALL WIDTH
12	1/4	1/2	12	12
18	1/4	1/2	18	18
24	1/4	1/2	24	24
30	1/4	1/2	30	30
36	1/4	1/2	36	36
42	1/4	1/2	42	42
48	1/4	1/2	48	48
54	1/4	1/2	54	54
60	1/4	1/2	60	60
66	1/4	1/2	66	66
72	1/4	1/2	72	72
78	1/4	1/2	78	78
84	1/4	1/2	84	84
90	1/4	1/2	90	90
96	1/4	1/2	96	96
102	1/4	1/2	102	102
108	1/4	1/2	108	108
114	1/4	1/2	114	114
120	1/4	1/2	120	120



TYPE 2 ENDWALL

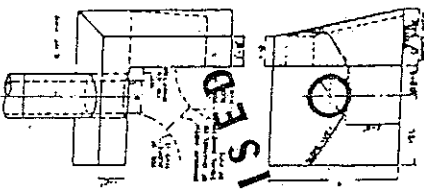


TABLE 5
DIMENSIONS

PIPE DIA.	WALL THICKNESS	END WALL THICKNESS	END WALL HEIGHT	END WALL WIDTH
12	1/4	1/2	12	12
18	1/4	1/2	18	18
24	1/4	1/2	24	24
30	1/4	1/2	30	30
36	1/4	1/2	36	36
42	1/4	1/2	42	42
48	1/4	1/2	48	48
54	1/4	1/2	54	54
60	1/4	1/2	60	60
66	1/4	1/2	66	66
72	1/4	1/2	72	72
78	1/4	1/2	78	78
84	1/4	1/2	84	84
90	1/4	1/2	90	90
96	1/4	1/2	96	96
102	1/4	1/2	102	102
108	1/4	1/2	108	108
114	1/4	1/2	114	114
120	1/4	1/2	120	120

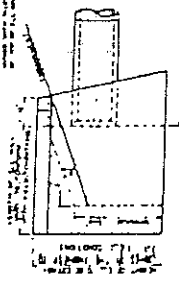
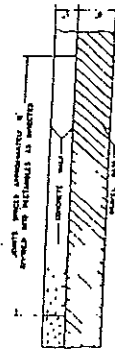
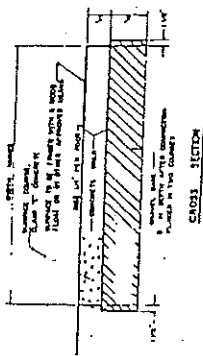


TABLE 6
DIMENSIONS

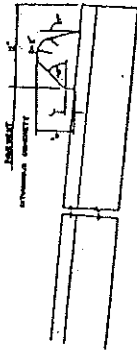
PIPE DIA.	WALL THICKNESS	END WALL THICKNESS	END WALL HEIGHT	END WALL WIDTH
12	1/4	1/2	12	12
18	1/4	1/2	18	18
24	1/4	1/2	24	24
30	1/4	1/2	30	30
36	1/4	1/2	36	36
42	1/4	1/2	42	42
48	1/4	1/2	48	48
54	1/4	1/2	54	54
60	1/4	1/2	60	60
66	1/4	1/2	66	66
72	1/4	1/2	72	72
78	1/4	1/2	78	78
84	1/4	1/2	84	84
90	1/4	1/2	90	90
96	1/4	1/2	96	96
102	1/4	1/2	102	102
108	1/4	1/2	108	108
114	1/4	1/2	114	114
120	1/4	1/2	120	120

STANDARD CONSTRUCTION DETAILS
BOARD OF SELECTMEN
TOWN OF MIDDLEBURY, CONN.

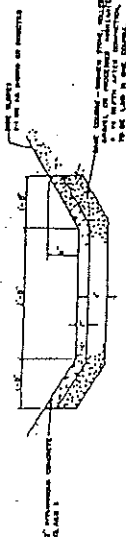
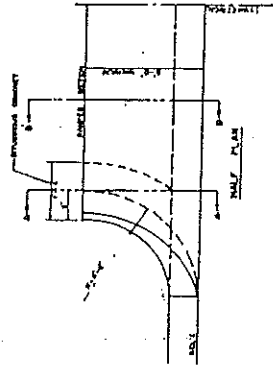


LONGITUDINAL SECTION

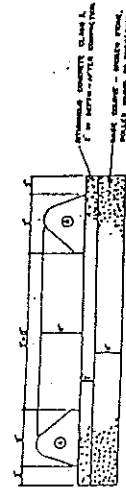
5" CONCRETE SIDEWALK



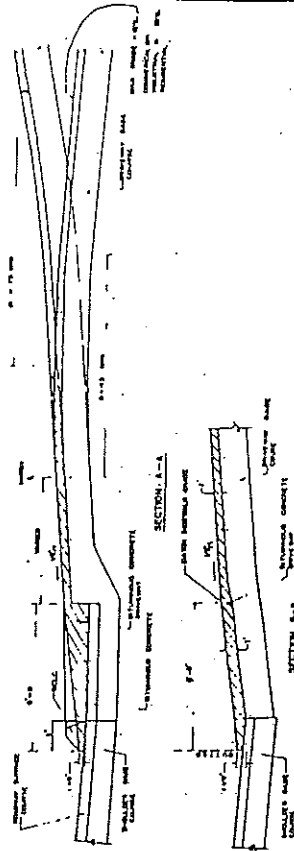
BITUMINOUS CONCRETE LIP CURBING



PAVED DITCH



ALTERNATE PAVED DITCH



CURBING INSTALLATION AT BITUMINOUS CONCRETE DRIVES

REVISION	DATE	BY	CHKD	APP'D	NOTED
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5" CONCRETE SIDEWALK, PAVED DITCH, ALTERNATE PAVED DITCH, BITUMINOUS CONCRETE LIP CURBING & CURBING INSTALLATION AT BIT. CONC. DRIVES

STANDARD CONSTRUCTION DETAILS

BOARD OF SELECTMEN

TOWN OF MIDDLEBURY, CONN.

DATE: 10-1-54

BY: [Signature]

CHKD: [Signature]

APP'D: [Signature]

NOTED: [Signature]